XPression

User Guide

VERSION 14.0



ROSS

Thank You for Choosing Ross

You've made a great choice. We expect you will be very happy with your purchase of Ross Technology.

Our mission is to:

1. Provide a Superior Customer Experience
    - offer the best product quality and support
2. Make Cool Practical Technology
    - develop great products that customers love

Ross has become well known for the Ross Video Code of Ethics. It guides our interactions and empowers our employees. I hope you enjoy reading it below.

If anything at all with your Ross experience does not live up to your expectations be sure to reach out to us at solutions@rossvideo.com.



David Ross

CEO, Ross Video

dross@rossvideo.com

Ross Video Code of Ethics

Any company is the sum total of the people that make things happen. At Ross, our employees are a special group. Our employees truly care about doing a great job and delivering a high quality customer experience every day. This code of ethics hangs on the wall of all Ross Video locations to guide our behavior:

1. We will always act in our customers' best interest.
2. We will do our best to understand our customers' requirements.
3. We will not ship crap.
4. We will be great to work with.
5. We will do something extra for our customers, as an apology, when something big goes wrong and it's our fault.
6. We will keep our promises.
7. We will treat the competition with respect.
8. We will cooperate with and help other friendly companies.
9. We will go above and beyond in times of crisis. *If there's no one to authorize the required action in times of company or customer crisis - do what you know in your heart is right. (You may rent helicopters if necessary.)*

XPression User Guide

- Ross Part Number: 3500DR-001
- Version: 14.0
- Document Revision: 1
- Date/Time: 10/27/2026 10:18 AM

The information contained in this guide is subject to change without notice or obligation.

Copyright

©2026 Ross Video Limited, Ross®, and any related marks are trademarks or registered trademarks of Ross Video Limited. All other trademarks are the property of their respective companies. PATENTS ISSUED and PENDING. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, photocopying, recording or otherwise, without the prior written permission of Ross Video. While every precaution has been taken in the preparation of this document, Ross Video assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

End User Software License Agreement

This End User Software License Agreement is a legal agreement between you (the "**Licensee**") and Ross Video Limited ("**Ross Video**") specifying the terms and conditions of your installation and use of the Software and all Documentation (as those terms are defined herein).

IMPORTANT:

BY DOWNLOADING, ACCESSING, INSTALLING OR USING THE SOFTWARE AND/OR DOCUMENTATION AND/OR BY AUTHORIZING ANY THIRD PARTY, INCLUDING WITHOUT LIMITATION AN INSTALLER OR COMMISSIONER ACTING ON YOUR BEHALF TO DO SO, LICENSEE AGREES TO THE TERMS OF THIS AGREEMENT AND THE LICENSE GRANTED HEREUNDER SHALL BE EFFECTIVE AS OF AND FROM SUCH DATE. IF YOU DO NOT WISH TO ACCEPT THE TERMS AND CONDITIONS OF THIS AGREEMENT, DO NOT DOWNLOAD, ACCESS, INSTALL, REFER TO OR OTHERWISE USE THE SOFTWARE AND/OR DOCUMENTATION.

1. **INTERPRETATION.** In this Agreement, (a) words signifying the singular number include the plural and vice versa, and words signifying gender include all genders; (b) every use of the words "herein", "hereof", "hereto" "hereunder" and similar words shall be construed to refer to this Agreement in its entirety and not to any particular provision hereof; (c) reference to any agreement or other document herein will be construed as referring to such agreement or other document as from time to time amended, modified or supplemented (subject to any restrictions on such amendment, modification or supplement set forth therein); (d) every use of the words "including" or "includes" is to be construed as meaning "including, without limitation" or "includes, without limitation", respectively; and (e) references to an Article or a Section are to be construed as references to an Article or Section of or to this Agreement unless otherwise specified.

2. **DEFINITIONS.** In this Agreement, in addition to the terms defined elsewhere in this Agreement, the following terms have the meanings set out below:

   "**Affiliate**" means, with respect to any Person, any other Person who directly or indirectly controls, is controlled by, or is under direct or indirect common control with, such Person. A Person shall be deemed to control a Person if such Person possesses, directly or indirectly, the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise; and the term "controlled" and "controlling" shall have a similar meaning.

   "**Agreement**" means this End User Software License Agreement including the recitals hereto, as the same may be amended from time to time in accordance with the provisions hereof.

   "**Backup System**" means the secondary piece of Designated Equipment upon which the Software is installed and mirrored for the sole purpose of replacing a Primary System in the event such Primary System is not available or functioning properly for any reason.

   "**Change of Control**" means (a) the direct or indirect sale, transfer or exchange by the shareholders of a Party of more than fifty percent (50%) of the voting securities of such Party, (b) a merger or amalgamation or reorganization or other transaction to which a Party is party after which the shareholders of such Party immediately prior to such transaction hold less than fifty percent (50%) of the voting securities of the surviving entity, (c) the sale, exchange, or transfer of all or substantially all of the assets of a Party.

"Confidential Information" means all data and information relating to the business and management of either Party, including the Software, trade secrets and other technology to which access is obtained or granted hereunder by the other Party, and any materials provided by Ross Video to Licensee; provided, however, that Confidential Information shall not include any data or information which:

(i) is or becomes publicly available through no fault of the other Party;

(ii) is already in the rightful possession of the other Party prior to its receipt from the other Party;

(iii) is already known to the receiving Party at the time of its disclosure to the receiving Party by the disclosing Party and is not the subject of an obligation of confidence of any kind;

(iv) is independently developed by the other Party;

(v) is rightfully obtained by the other Party from a third party; or

(vi) is disclosed with the written consent of the Party whose information it is.

"Designated Equipment" shall mean (a) the hardware products sold by Ross Video to Licensee on which the Software is installed and licensed for use, as the same may be replaced from time to time by Ross Video; or (b) in the case of Software licensed on a stand-alone basis, the equipment of Licensee on which the Software is to be installed and meets the minimum specifications set out in the Documentation.

"Documentation" shall mean manuals, instruction guides, user documentation and other related materials of any kind pertaining to the Software (whether in electronic, hard-copy or other media format) that are furnished to Licensee by or on behalf of Ross Video in relation to the Software.

"Freeware" means Software that is available free of charge from Ross Video, and includes, without limitation the master control system software known as "DashBoard".

"Governmental Authority" means (a) any federal, provincial, state, local, municipal, regional, territorial, aboriginal, or other government, governmental or public department, branch, ministry, or court, domestic or foreign, including any district, agency, commission, board, arbitration panel or authority and any subdivision of any of them exercising or entitled to exercise any administrative, executive, judicial, ministerial, prerogative, legislative, regulatory, or taxing authority or power of any nature; and (b) any quasi-governmental or private body exercising any regulatory, expropriation or taxing authority under or for the account of any of them, and any subdivision of any of them.

"Improvements" means all inventions, works, discoveries, improvements and innovations of or in connection with the Software, including error corrections, bug fixes, patches and other updates in Object Code form to the extent made available to Licensee in accordance with Ross Video's release schedule.

"License Fee" means the fee(s), if any, payable in respect of the Software in accordance with the relevant invoice(s) or other purchase documents delivered in connection with this Agreement.

"License Period" means the period of time that Licensee will have the rights granted under this Agreement, as may be specified in an Order.

"**Modifications**" means any enhancements, changes, corrections, translations, adaptations, revisions, developments, upgrades or updates thereto; and "Modify" shall mean the creation of any of the foregoing.

"**Object Code**" means the machine readable executable form of a computer software program.

"Open Source Components" means third party Open Source software, libraries or other components.

"Open Source License" means the license that governs each Open Source Component.

"Order" means the documents provided by Ross Video to Licensee detailing the Ross Video products contemplated for purchase, the corresponding fees and License Period that may apply to the Software, including any and all quotations, purchase orders, acknowledgments, pro formas, invoices and other purchase documentation.

"**Parties**" means both Ross Video and Licensee and "Party" means either one of them as the context requires.

"**Person**" will be broadly interpreted and includes (a) a natural person, whether acting in his or her own capacity, or in his or her capacity as executor, administrator, estate trustee, trustee or personal or legal representative; (b) a corporation or a company of any kind, a partnership of any kind, a sole proprietorship, a trust, a joint venture, an association, an unincorporated association, an unincorporated syndicate, an unincorporated organization or any other association, organization or entity of any kind; and (c) a Governmental Authority.

"**Primary System**" means the Designated Equipment upon which the Software is installed and executed to deliver its intended functionality.

"Released Claims" has the meaning ascribed to it in Section 9(b).

"Released Parties" has the meaning ascribed to it in Section 9(b).

"Ross Video" means Ross Video Limited and its Affiliates.

"Software" means the version of the Object Code licensed and delivered to Licensee by Ross Video concurrently with delivery of this Agreement, including without limitation the Freeware, and any subsequent error corrections, updates, Modifications or Improvements provided to Licensee by Ross Video pursuant to this Agreement, but specifically excluding any features or plug-ins that may be purchased by you directly from third parties as upgrades or enhancements to the Software.

"**Source Code**" means the human readable form of a computer software program, and all tools and documentation necessary for a reasonably competent computer programmer to understand, maintain and Modify the Software.

"**Third Party Software**" means those portions of the Software, if any, which are owned or controlled by third parties and licensed to Ross Video pursuant to certain license agreements or arrangements with such third parties, including the Open Source Components and NDI®[1] software (http://NDI.video); and

"**Use**" means to execute, run, display, store, merge, network, Modify, translate, host or integrate with Licensee's products or other third party software.

[1] NDI® is a registered trademark of Vizrt NDI AB.

3. **LICENSE.** Subject to the terms and conditions of this Agreement, upon payment of the applicable License Fee by Licensee, or, in the case of Freeware only, upon download of the Software by Licensee onto its Designated Equipment, Ross Video hereby grants to Licensee a non-transferable and non-exclusive right to Use the Software and Documentation solely for the internal use of Licensee (the "License"), during the License Period. In the event that a License Period is not identified on the Order, such License Period shall be deemed to be perpetual, subject to paragraph 10 (c) of this Agreement. The Software shall only be used in connection with or installed on the Designated Equipment and, where applicable, shall only be used on the Primary System, provided such Primary System is operating properly."

   If the Primary System is not operating properly for any reason, the Software may be used on the designated Backup System for that Primary System until such time that the Primary System begins operating properly. The Software and Documentation are provided to Licensee for the exclusive use by Licensee's organization for its ordinary business purposes and shall not be used by any third party for any purposes. Licensee may make copies of the Software as required for internal backup and archival purposes. To the extent permitted hereunder, Licensee may distribute copies of the Software and/or Documentation to members of its organization, provided (a) this Agreement is included with each copy, (b) any member of its organization who uses the Software and/or Documentation accepts and agrees to be bound by the terms of this Agreement and by any other license agreements or other agreement incorporated by reference into this Agreement, and (c) Licensee has paid any applicable additional License Fees in respect of copying and redistributing of the Software. To the extent Licensee is permitted to make copies of the Software under this Agreement, Licensee agrees to reproduce and include on any copy made or portion merged into another work, all Ross Video proprietary notices, including any notices with respect to copyrights, trademarks and this License. With the exception of copying the Software for backup or archival purposes, Licensee agrees to keep a record of the number and location of all such copies and will make such record available at Ross Video's request. The Software may include mechanisms to limit or inhibit copying.

4. **LICENSE RESTRICTIONS.** Except as otherwise provided in section 3 above, Licensee shall not: (1) copy any Software or Documentation, or part thereof, which is provided to Licensee by Ross Video pursuant to this Agreement, in Object Code form, Source Code form or other human or machine readable form, including written or printed documents, without the prior written consent of Ross Video; (2) in any way market, distribute, export, translate, transmit, merge, Modify, transfer, adapt, loan, rent, lease, assign, share, sub-license, sell, make available for download on any website or make available to another Person, the Software and/or Documentation, in whole or in part, provided that Licensee shall not be prohibited from renting or leasing the Software if Ross Video has consented, in writing, to Licensee engaging in such activities in respect of the Software; (3) reverse engineer, decompile or disassemble the Software or electronically transfer it into another computer language; or (4) use the Software or Documentation in a manner that is inconsistent with the License granted hereunder or that will result in a breach of this Agreement. Licensee agrees to take all reasonable precautions to prevent third parties from using the Software and/or Documentation in any way that would constitute a breach of this Agreement, including such precautions Licensee would ordinarily take to protect its own proprietary software, hardware or information.

5. **DELIVERY.** Ross Video shall deliver to Licensee one (1) master copy of the Software in compiled binary (executable) form suitable for reproduction in electronic files only and Ross Video shall deliver to Licensee a minimum of one copy of the Documentation.

6. **IMPROVEMENTS.** Licensee may from time to time request Ross Video to incorporate certain Improvements into the Software. Ross Video may, in its sole discretion, undertake to incorporate and provide such Improvements to Licensee with or without payment of a fee to be negotiated at the time of such request. All Improvements, whether recommended and developed by Ross Video or Licensee, shall be considered the sole property of Ross Video and shall be used by Licensee pursuant to the terms of the License granted under this Agreement.

7. **FREEWARE.** Other than the obligation to pay a License Fee, which does not apply to the Freeware, all other provisions of this End User Software License Agreement apply to the Freeware in the same way as they apply to all other Software that is the subject of this Agreement. In addition, in connection with the Freeware, the following provisions apply:

   a. Licensee will not Use the Freeware to engage in or allow others to engage in any illegal activity.

   b. Licensee will not Use the Freeware in any way that will interfere with or damage the operation of the services of any third parties by overburdening/disabling network resources through automated queries, excessive usage or similar conduct.

   c. Licensee will not Use the Freeware to engage in any activity that will violate the rights of others, including, without limitation, by using it for operations that involve child labour, suppressing the right of freedom of expression or endangering the security of person.

8. **OWNERSHIP.** The Parties acknowledge and agree that, as between the Parties, Ross Video shall be the owner of all intellectual property rights in the Software, Documentation and all related Modifications and Improvements, written materials, logos, trademarks, trade names, copyright, patents, trade secrets and moral rights, registered or unregistered. No proprietary interest or title in or to the intellectual property in the Software, Documentation or any Improvements or Modifications is transferred to Licensee by this Agreement. Ross Video reserves all rights not expressly licensed to Licensee under section 3.

9. **OPEN SOURCE SOFTWARE.**

   a. Software may use and/or be provided with Open Source Components, including those detailed in the Third Party section below. To the extent stipulated by its Open Source License, each such Open Source Component is licensed directly to Licensee from its respective licensors and not sub-licensed to Licensee by Ross Video, and such Open Source Component is subject to its respective Open Source License, and not to this Agreement. If, and to the extent, an Open Source Component requires that this Agreement effectively impose, or incorporate by reference, certain disclaimers, permissions, provisions, prohibitions or restrictions, then such disclaimers, permissions, provisions, prohibitions or restrictions shall be deemed to be imposed, or incorporated by reference into this Agreement, as required, and shall supersede any conflicting provision of this Agreement, solely with respect to the corresponding Open Source Component which is governed by such Open Source License.

   b. If Licensee, or another party on Licensee's behalf, modifies, replaces or substitutes any Open Source Component used in or provided with this Software, Licensee hereby fully, forever, irrevocably and unconditionally releases and discharges Ross Video, its Affiliates and its and their employees, officers, directors, resellers, distributors and representatives (collectively, "Released Parties") from any and all claims, charges, complaints, demands, actions, causes of action, suits, rights, debts, covenants, liabilities, warranties, performance and maintenance and support obligations (collectively, "Released Claims"), of every kind and nature, with respect to such Software, including without limitation any such Released Claims that arise as a matter of applicable Law.

   c. If an Open Source License requires that the source code of its corresponding Open Source Component be made available to Licensee, and such source code was not delivered to Licensee with the Software, then Ross Video hereby extends a written offer, valid for the period prescribed in such Open Source License, to obtain a copy of the source code of the corresponding Open Source Component, from Ross Video from https://www.rossvideo.com/open-source-information/.

10. **THIRD PARTY SOFTWARE.**

a. Licensee acknowledges that the Third Party Software is not owned by Ross Video. Notwithstanding any other provision of this Agreement, Ross Video, to the extent permitted by applicable law, offers no warranties (whether express, implied, statutory or by course of communication or dealing with Licensee, or otherwise) with respect to the Third Party Software. Ross Video may pass through to Licensee, if and to the extent permitted by applicable law, any warranties expressly provided by such third parties to Ross Video for such Third Party Software.

b. FFmpeg Notice. The Software may utilize FFmpeg video components and their included libraries. FFmpeg is a trademark of Fabrice Bellard (originator of the FFmpeg project). Ross Video disclaims any ownership claim to FFmpeg. Please refer to http://ffmpeg.org (copyright is in the FFmpeg developers). FFmpeg is licensed under the GNU Lesser General Public License v2.1 or Lesser General Public License v3.0. GNU Lesser General Public License contact information: Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA. Licensee can distribute it and/or modify it under the terms of such licenses.

11. **INTELLECTUAL PROPERTY INDEMNITY.**

a. Ross Video agrees to defend, indemnify and hold harmless Licensee from final damages awarded by a court of competent jurisdiction (hereinafter referred to as the "**Losses**"), which Licensee, or any of its officers or directors, may incur, suffer or become liable for as a result of, or in connection with, any third party claim asserted against Licensee to the extent such claim is based on a contention that the Software, Documentation or any portion thereof, infringes any valid, registered, enforceable patents, copyrights, trade secrets, trademarks or other intellectual property rights of any third party, provided that (a) the allegedly infringing Software or Documentation has been used within the scope of and in accordance with the terms of this Agreement, and (b) Licensee notifies Ross Video in writing of such claim within ten (10) days of a responsible officer of Licensee becoming aware of such claim. If the Software, Documentation or any portion thereof is held to constitute an infringement of a third party's intellectual property rights, and use thereof is enjoined, Ross Video shall, at its election and expense, either (i) procure the right to use the infringing element of the Software or Documentation; or (ii) replace or modify the element of the Software or Documentation so that the infringing portion is no longer infringing and still performs the same function without any material loss of functionality. Ross Video shall make every reasonable effort to correct the situation with minimal effect upon the operations of Licensee.

b. Notwithstanding the above, Ross Video reserves the right to terminate this Agreement and the License granted hereunder on immediate notice to Licensee, and without liability to Licensee, in the event that the Software or Documentation constitutes or may, in Ross Video's determination, constitute, an infringement of the rights of a third party that Ross Video, in its sole discretion, does not consider to be affordably remediable.

c. Either party may terminate this Agreement immediately should any Software become, or in either party's opinion be likely to become, the subject of a claim of infringement of any intellectual property right and, in such event, there shall be no claim by either Licensee or Ross Video against the other arising out of such termination, provided that the foregoing shall not apply to a claim for infringement by Ross Video against Licensee in the event that Licensee is alleged to have infringed Ross Video's intellectual property rights, in which case Licensee shall remain liable for all outstanding License Fees and other amounts owing to Ross Video.

d. Notwithstanding the foregoing, Ross Video shall have no liability for any claim of infringement based on use of other than a current, unaltered release of the Software and/or Documentation available from Ross Video if such infringement would have been avoided by the use of a current, unaltered release of the Software and/or Documentation provided that such current, unaltered release performs substantially in conformity with the specifications set out in the Documentation and was provided, at no additional cost by Ross Video, to those subscribing for maintenance services for the Software or Documentation.

12. **CONFIDENTIALITY.** Each Party shall maintain in confidence all Confidential Information of the other Party, shall use such Confidential Information only for the purpose of exercising its rights and fulfilling its obligations under this Agreement, and shall not disclose any Confidential Information of the disclosing Party to any third party except as expressly permitted hereunder or make any unauthorized use thereof. Each Party shall disclose the Confidential Information only to those of its employees, consultants, advisors, and/or subcontractors who have a need to know the Confidential Information. Each Party shall, prior to disclosing the Confidential Information to such employees, consultants, advisors and/or subcontractors, obtain their agreement to receive and use the Confidential Information on a confidential basis on the same terms and conditions contained in this Agreement. The receiving Party shall treat the Confidential Information of the disclosing Party with the same degree of care against disclosure and/or unauthorized use as it affords to its own information of a similar nature, or a reasonable degree of care, whichever is greater. The receiving Party further agrees not to remove or destroy any proprietary or confidential legends or markings placed upon any documents or other materials of the disclosing Party. The obligations of confidence set forth in this Agreement shall extend to any Affiliates that have received Confidential Information of the disclosing Party and shall also cover Confidential Information disclosed by any Affiliate. The receiving Party shall be responsible for any actions or omissions of its Affiliates as if such actions or omissions were its own.

    Either party may disclose certain Confidential Information if it is expressly required to do so pursuant to legal, judicial, or administrative proceedings, or otherwise required by law, provided that (i) such Party provides the other Party with reasonable written notice prior to such disclosure; (ii) such Party seeks confidential treatment for such Confidential Information; (iii) the extent of such disclosure is only to the extent expressly required by law or under the applicable court order; and (iv) such Party complies with any applicable protective or equivalent order.

    Each of Ross Video and Licensee (the **"Indemnifying Party"**, as applicable) agree to indemnify the other (the **"Indemnified Party"**, as applicable) for all Losses incurred by the Indemnified Party as a result of a failure of the Indemnifying Party to comply with its obligations under this Section 12 provided that the Indemnified Party has given prompt notice of any such claim and, to the extent that a claim may lie against a third party for the unauthorized disclosure of such Confidential Information, the right to control and direct the investigation, preparation, action and settlement of each such claim and, further, provided that the Indemnified Party reasonably co-operates with the Indemnifying Party in connection with the foregoing and provides the Indemnifying Party with all information in the Indemnified Party's possession related to such claim and such further assistance as reasonably requested by the Indemnifying Party.

    The Parties acknowledge and agree that any breach of the confidentiality provisions of this Agreement by one Party may cause significant and irreparable injury to the other Party that is not compensable monetarily, as well as damages that may be difficult to ascertain, and agrees that, in addition to such other remedies that may be available at law or in equity, the other Party shall be entitled to seek injunctive relief (including temporary restraining orders, interim injunctions and permanent injunctions) in a court of competent jurisdiction in the event of the breach or threatened breach by such party of any of the confidentiality provisions of this Agreement. The relief contemplated in this Section shall be available to each Party without the necessity of having to prove actual damages and without the necessity of having to post any bond or other security. Each Party further agrees to notify the other Party in the event that it learns of or has reason to believe that any Person has breached the confidentiality provisions of this Agreement.

13. **LIMITATION OF LIABILITY.** The limitation of liability provisions of this Agreement reflect an informed voluntary allocation of the risks (known and unknown) that may exist in connection with the licensing of the Software or Documentation hereunder by Ross Video, and that voluntary risk allocation represents a material part of the Agreement reached between Ross Video and Licensee. Should Ross Video be in breach of any obligation, Licensee agrees that Licensee's remedies will be limited to those set forth in this Agreement. No action, regardless of form, arising out of this Agreement may be brought by Licensee more than twelve (12) months after the facts giving rise to the cause of action have occurred, regardless of whether those facts by that time are known to, or reasonably ought to have been discovered by, Licensee.

    (A) EXCEPT AS EXPRESSLY PROVIDED IN THIS AGREEMENT, THE SOFTWARE AND DOCUMENTATION ARE PROVIDED "AS IS" AND ROSS VIDEO (I) MAKES NO OTHER REPRESENTATIONS, AND PROVIDES NO WARRANTIES OR CONDITIONS OF ANY KIND, EXPRESS OR IMPLIED, STATUTORY, BY USAGE OF TRADE CUSTOM OF DEALING, OR OTHERWISE, AND (II) SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING ANY IMPLIED WARRANTY OF UNINTERRUPTED OR ERROR FREE OPERATION, MERCHANTABILITY, QUALITY OR FITNESS FOR A PARTICULAR PURPOSE. ROSS VIDEO DOES NOT REPRESENT OR WARRANT THAT THE SOFTWARE WILL MEET ANY OR ALL OF LICENSEE'S PARTICULAR REQUIREMENTS, THAT THE USE AND OPERATION OF THE SOFTWARE WILL OPERATE ERROR-FREE OR UNINTERRUPTED, THAT ALL PROGRAMMING ERRORS IN THE SOFTWARE CAN BE FOUND IN ORDER TO BE CORRECTED, OR THAT THE SOFTWARE WILL BE COMPATIBLE WITH OTHER PROGRAMS, SYSTEMS, AND HARDWARE.

    (B) IN NO EVENT SHALL ROSS VIDEO, ITS AFFILIATES AND LICENSORS, AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES AND AGENTS, BE LIABLE FOR ANY CLAIM FOR INDIRECT, CONSEQUENTIAL, SPECIAL, INCIDENTAL, PUNITIVE, EXEMPLARY, AGGRAVATED DAMAGES; LOST PROFITS, OR LOST REVENUE ARISING FROM OR IN CONNECTION WITH THIS AGREEMENT, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT, OR IN TORT, EVEN IF THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

    (C) IN ANY EVENT THE AGGREGATE LIABILITY OF ROSS VIDEO, ITS AFFILIATES AND LICENSORS, AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES AND AGENTS, FOR ANY CLAIM FOR DIRECT DAMAGES WITH RESPECT TO THE SUBJECT MATTER OF THIS AGREEMENT SHALL NOT EXCEED THE AMOUNT OF THE PURCHASE PRICE PAID TO ROSS VIDEO UNDER THIS AGREEMENT.

14. **TERM AND TERMINATION**.

    (1) Unless terminated earlier in accordance with the terms of this Agreement, the term of this Agreement shall commence upon Licensee's first download, access, installation, or other use of the Software or Documentation and continues until, in the case of Software licensed with Designated Equipment provided by Ross Video, the earliest of (a) the end of the License Period, or (b) if the Designated Equipment is assigned or transferred in accordance with this Agreement, the date on which the Designated Equipment is no longer owned by Licensee;

    (2) Either Party shall have the right to terminate this Agreement on notice to the other Party if:

        (a) the other Party fails to pay any fees or other amounts when due hereunder or under any other agreement between the Parties (or any Affiliates of the Parties, as applicable) in connection with the Software and/or Designated Equipment and such breach is not cured within thirty (30) days after written notice of such failure to pay is given to the defaulting Party by the non-defaulting Party;

        (b) the other Party shall file a voluntary petition in bankruptcy or insolvency or shall petition for reorganization under any bankruptcy law, consent to an involuntary petition in bankruptcy, or if a receiving order is given against it under the Bankruptcy and Insolvency Act (Canada) or the comparable law of any other jurisdiction (and such is not dismissed within ten (10) days);

(c) there shall be entered an order, judgment or decree by a court of competent jurisdiction, upon the application of a creditor, approving a petition seeking reorganization or appointing a receiver, trustee or liquidator of all or a substantial part of the other Party's assets and such order, judgment or decree continues in effect for a period of thirty (30) consecutive days; or

(d) the other Party shall fail to perform any of the other material obligations set forth in this Agreement and such default, in the case of a default which is remediable, continues for a period of thirty (30) days after written notice of such failure has been given by the non-defaulting Party or, in the case of a non-remediable default, immediately upon notice.

(3) Notwithstanding anything to the contrary contained in this Agreement:

(a) Ross Video may forthwith terminate this Agreement if Licensee is in breach of any of sections 3, 4 or 12 of this Agreement. For greater certainty, in such instances Ross Video shall provide written notice of such termination as soon as practicable but written notice shall not be a necessary prerequisite to such termination; and

(b) in the event of a Change of Control of Licensee, Ross Video shall have the right to terminate this Agreement and the License granted hereunder upon thirty (30) days' prior written notice to Licensee. For greater certainty, Ross Video's right to terminate in the event of a Change of Control of Licensee shall continue for a period of six (6) months from the date Licensee delivers notice of such Change of Control to Ross Video.

(c) Ross Video may terminate the License immediately on the date on which it provides notice to Licensee, if its agreements for Third Party Software are terminated.

(4) Upon the termination or expiry of this Agreement:

(a) Licensee shall immediately cease and desist all use of the Software and Documentation;

(b) Licensee shall immediately deliver to Ross Video any of Ross Video's Confidential Information provided hereunder (including the Software and Documentation) then in its possession or control, if any, and shall deliver a certificate of an officer of Licensee certifying the completeness of same;

(c) Licensee shall refrain from further use of such Confidential Information; and

(d) Licensee shall forthwith pay all amounts owing to Ross Video or any of its Affiliates hereunder.

15. **SURVIVAL.** The provisions of sections 1, 2, 6, 8, 9, 10, 11, 12, 13, 14, 18, 22, 23, and 24 herein shall survive the expiry or termination of this Agreement.

16. **FORCE MAJEURE.** Dates and times by which Ross Video is required to render performance under this Agreement shall be automatically postponed to the extent and for the period that Ross Video is prevented from meeting them by reason of events of force majeure or any cause beyond its reasonable control provided Ross Video notifies Licensee of the commencement and nature of such cause and uses its reasonable efforts to render performance in a timely manner.

17. **ASSIGNMENT.** Ross Video may assign this Agreement, or any of its rights or obligations hereunder, in whole or in part, upon notice to Licensee. Licensee shall not assign this Agreement, or any of its rights or obligations hereunder, in whole or in part, without the prior written consent of Ross Video, which consent may not be unreasonably withheld. This Agreement enures to the benefit of and is binding upon each of the Parties and their respective successors and permitted assigns.

18. **GOVERNING LAW.** If Licensee acquired the Ross Product(s) in the United States or Canada, the laws of the state or province where Licensee's principal place of business is located govern the interpretation of this Agreement, claims for its breach, and all other claims regardless of conflict of laws principles. If Licensee acquired the Ross Product(s) in the European Union or the United Kingdom, then the laws of England and Wales apply. If Licensee acquired the Ross Product(s) in any other country, then the laws of the Province of Ontario, Canada shall apply.

19. **LANGUAGE.** The Parties have expressly required that this Agreement and all documents relating thereto be prepared in English. Les parties ont expressément exigé que cette convention ainsi que tous les documents qui s'y rattachent soient rédigés en anglais.

20. **GOVERNMENT CONTRACTS.** If the Software and/or Documentation to be furnished to Licensee hereunder are to be used in the performance of a government contract or subcontract, the Software and/or Documentation shall be provided on a "restricted rights" basis only and Licensee shall place a legend, in addition to applicable copyright notices, in the form provided under the applicable governmental regulations. For greater certainty, Ross Video shall not be subject to any flow-down provisions required by any customer of Licensee that is a Governmental Authority unless Ross Video expressly agrees to be bound by such flow-down provisions in writing.

21. **EXPORT AND IMPORT LAWS.** Licensee acknowledges and agrees that the Software (including any technical data and related technology) may be subject to the export control laws, rules, regulations, restrictions and national security controls of the United States and other applicable countries (the "**Export Controls**") and agrees not to export, re-export, import or allow the export, re-export or import of such export-controlled Software (including any technical data and related technology) or any copy, portion or direct product of the foregoing in violation of the Export Controls. Licensee hereby represents that it is not an entity or person to whom provision of the Software (including any technical data and related technology) is restricted or prohibited by the Export Controls. Licensee agrees that it has the sole responsibility to obtain any authorization to export, re-export, or import the Software (including any technical data and related technology), as may be required. Licensee will defend, indemnify and hold Ross Video harmless from any and all claims, losses, liabilities, damages, fines, penalties, costs and expenses (including attorney's fees) arising from or relating to any breach by Licensee of its obligations under this Section.

22. **AMENDMENT AND WAIVER.** No amendment, discharge, modification, restatement, supplement, termination or waiver of this Agreement or any Section of this Agreement is binding unless it is in writing and executed by the Party to be bound. No waiver of, failure to exercise or delay in exercising, any Section of this Agreement constitutes a waiver of any other Section (whether or not similar) nor does any waiver constitute a continuing waiver unless otherwise expressly provided.

23. **SEVERABILITY.** Each Section of this Agreement is distinct and severable. If any Section of this Agreement, in whole or in part, is or becomes illegal, invalid, void, voidable or unenforceable in any jurisdiction by any court of competent jurisdiction, the illegality, invalidity or unenforceability of that Section, in whole or in part, will not affect (a) the legality, validity or enforceability of the remaining Sections of this Agreement, in whole or in part; or (b) the legality, validity or enforceability of that Section, in whole or in part, in any other jurisdiction.

24. **ENTIRE AGREEMENT.** This Agreement, and any other documents referred to herein, constitutes the entire agreement between the Parties relating to the subject matter of this Agreement and supersedes all prior written or oral agreements, representations and other communications between the Parties.

Updated: November 1, 2023

Warranty and Repair Policy

Ross Video Limited (Ross) warrants its XPression systems to be free from defects under normal use and service for the following time periods from the date of shipment:

- XPression Server — 12 months
- XPression Software Upgrades — 12 months free of charge
- System and Media hard drives — 12 months

If an item becomes defective within the warranty period Ross will repair or replace the defective item, as determined solely by Ross.

Warranty repairs will be conducted at Ross, with all shipping FOB Ross dock. If repairs are conducted at the customer site, reasonable out-of-pocket charges will apply. At the discretion of Ross, and on a temporary loan basis, plug in circuit boards or other replacement parts may be supplied free of charge while defective items undergo repair. Return packing, shipping, and special handling costs are the responsibility of the customer.

This warranty is void if products are subjected to misuse, neglect, accident, improper installation or application, or unauthorized modification.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profit). Implied warranties, including that of merchantability and fitness for a particular purpose, are expressly limited to the duration of this warranty.

This warranty is TRANSFERABLE to subsequent owners, subject to Ross' notification of change of ownership.

Extended Warranty

For customers that require a longer warranty period, Ross offers an extended warranty plan to extend the standard warranty period by one year increments. For more information about an extended warranty for your XPression system, contact your regional sales manager.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

Company Address

Ross Video Limited	Ross Video Incorporated
8 John Street Iroquois, Ontario Canada, K0E 1K0	P.O. Box 880 Ogdensburg, New York USA 13669-0880

General Business Office:	(+1) 613-228-0688
Toll Free:	(+1) 844-652-0645
Fax:	(+1) 613-652-4425
Toll Free Technical Support:	1-833-859-0499 (North America) +800 3540 3545 (International)
Alternately, you can contact:	
Technical Support:	(+1) 613-686-1557
Australia/Sydney Local Support:	1300 007 677*
India	+91-22-5016-6177
E-mail for Technical Support:	techsupport@rossvideo.com
E-mail for General Information:	solutions@rossvideo.com
Website:	http://www.rossvideo.com

*If the local support specialist is not available, your call will be transferred automatically to our North America center.

Contents

Introduction 1
About This Guide 2
Getting Help 3
Installation Notes 4
User Interface Overview 5
The Layout Interface 6
The Sequence Interface 8
System Setup 9
Setting Preferences 10
Editor 11
Hardware Renderer 13
Viewports 14
Path Persistence 15
Import 18
Folders 19
Texture & Image Cache 20
On Disk Cache 22
Sequencer 24
Sequencer (cont.) 26
MOS Settings 27
XML Take Item List 28
Fonts 30
Remote Server 31
CII 32
RossTalk 34
Video Engine 35
ClipStore 37
OpenMAM 38
As Run Log 39
Advanced 40
Localization 42
Log Level 43
Certificate Management 44
Configuring an AJA NTV2 Video FrameBuffer 51
Board 52
Outputs 55
Inputs 58

Misc 59
Conversion 61
IP 63
Configuring an AJA Video FrameBuffer (Legacy) 73
Board 74
Outputs 75
Inputs 77
Misc 78
Configuring a Blackmagic Design FrameBuffer 79
Configuring a Blackmagic Design FrameBuffer (Legacy) 85
Configuring a Graphite FrameBuffer 90
Configuring Matrox DSX, X.mio3, and X.mio5 FrameBuffers 94
Board 96
Outputs 98
Inputs 102
Misc 105
IP 107
SMPTE 2110 109
SMPTE 2110 with Redundancy 117
SMPTE 2022-6 125
SMPTE 2022-6 with Redundancy 127
Configuring a Matrox Video X.mio2 FrameBuffer 130
Board 131
Outputs 133
Inputs 137
Configuring a Ross GeminiIO FrameBuffer 138
Board 140
Outputs 141
Inputs 144
Configuring NDI® 145
Configuring an XPression AVI Recorder 151
Configuring an XPression Desktop Preview Client 153
Configuring an XPression Direct Display Output 155
Configuring an XPression DirectShow Capture Source 159
Configuring an XPression RossLinq Connector 161
Configuring the XPression Tile Mapper 164
Configuring an XPression Virtual Input 166
Configuring an XPression Virtual Output 168
Changing the Order of Video Inputs / Outputs 170
Deleting a Video Input / Output 172
Configuring an Audio Device 174
Deleting an Audio Device 176

Adding a Timecode Source 178
Configuring Video Preview and Audio Monitor 182
Configuring RS232 CTS/DSR GPI for Contact Closures 185
Configuring a 25-Pin GPIO Port 187
Configuring a SeaLevel GPIO Board 189
Configuring Smart GPI / RossTalk 191
Configuring a TSL Tally Input 194
Configuring an X-Keys Device 197
Configuring the PBus Interface and PBus Recalls 199
Configuring Camera Tracking 202
Setting Up OpenMAM 204
Dali Driver 206
XPression Maps 207
MediaBeacon (v3.0) Driver 208
MediaBeacon (v5.0+) Driver 209
Streamline Server 211
Setting Up Server Channels 214
Configuring XPression for the XPression Clip Store 216
PBus Interface 217
PBus Overview 218
PBus Triggers 219
PBus LEARN Commands 221
PBus Mapping 222
Configuring PBus Mapping 223
Assigning an Action to a PBus Register 226
Adding a Global Macro to a Take Item 228
Remapping a PBus Register 229
Loading and Saving Maps 234
Using PBus from a Switcher to Recall Items 235
Using PBus for Clips 236
Projects 237
Creating a New Project 238
Importing From a Project 241
Exporting Items 245
Exporting Projects to Chameleon 247
Scenes 249
Creating or Deleting a Scene 250

Creating a Custom Size Scene 252
Configuring a Scene 254
Creating or Deleting a Scene Group 256
Duplicating a Scene or Scene Group 258
Creating a Roll/Crawl from a Scene Group 259
Customizing a Scene Group Roll/Crawl 261
Using Transition Logic 264
Prerequisites 265
Setting Up Rules and Conditions 273
Configuring Transitions 278
Creating Global Macros 283
Base Objects 284
Creating a Text Object 285
Using Tabs in a Text Object 288
Applying User Input Controls to a Text Object 290
Aligning Text Objects to Build a Table 293
Applying a Material to a Text Object 298
Applying Word Wrap to a Text Object 300
Applying Texture Mapping to a Text Object 302
Formatting a Text Object in the Main Viewport 305
Formatting a Text Object in the Take Inspector 307
Creating a Background Object 308
Mesh Objects 311
Importing a .3ds, .c4d, .fbx, or .obj Model into a Scene 312
Adding a 3D Model to a Scene Director 315
Primitives 317
Creating a Quad Object 318
Creating a Sphere Object 321
Creating a Cube Object 324
Setting the Culling Mode for a Cube Object 327
Creating a Cylinder Object 329
Creating a Torus Object 332
Creating a Slab Object 335
Setting the Culling Mode for a Slab Object 340
Creating a Lines Object 341

Lights 346
Adding a Directional Light Object to a Scene 347
Adding a Point Light Object to a Scene 350
Adding a Spot Light Object to a Scene 353
Cameras 356
Adding a Perspective Camera to a Scene 357
Adding an Orthographic Camera to a Scene 362
Layers 365
Adding a Layer Object to a Scene 366
Adding a Camera Layer Object to a Scene 371
Markers 373
Adding an Event Marker to a Scene 374
Miscellaneous Objects 376
Grouping Scene Objects 377
Positioning Objects 378
Publishing Template Links 381
Materials 384
Creating a Texture Material 385
Creating a Video Material 395
Creating a Render View Material 407
Creating a Server Channel Material 417
Creating a Reflection Map Material 427
Creating a Bump Map Material 437
Creating a Refraction Material 442
Creating a Live Source Material 450
Creating a Tessera Preview Material 462
Creating a Gradient Material 470
Creating a Window Capture Material 481
Creating an API Texture Material 493
Setting DataLinq Properties for a Material 501
Fonts 505
Adding a Private Font Using the Font Manager 506
Adding a Private Font Using the Scene Fonts Tab 510

Applying a Material to a Font 512
Animations 516
Adding Continuous Animation to an Object 517
Adding Key Frame Animation to an Object 521
Moving Key Frames in the Animation Controller Timeline 524
Deleting a Key Frame Animation 526
Triggering Clips and Audio 527
Creating an Animation with Multiple Controllers 531
Copying Keyframes to Animate an Object 533
Copying and Pasting Animation Controllers 537
Scaling an Active Animation Controller 539
Stagger Animations 540
Adding a Stagger Animation to a Text or Group Object 541
Widgets 545
Adding a Realtime Clock Display to a Scene 546
Customizing the Time Format of a Widget 549
Renaming a Widget 551
Adding a Timer Display to a Scene 552
Adding a Counter Display to a Scene 558
Customizing the Counter Format of a Widget 561
Adding a Text List to a Scene 565
Effects 568
Adding an Effect or Transition to an Object or Scene 569
DataLinq™ 573
Configuring an XPression DataLinq Server 574
Certificate Management 577
Connecting XPression to an XPression DataLinq Server 583
Exporting and Loading DataLinq Files 585
Starting the XPression DataLinq Server 586
Configuring the Selected DataLinq Source 587
ADODB DataLinq Source 590
AMQ DataLinq Source 596
Amtote DataLinq Source 598
ANC DataLinq Source 600
ASCII DataLinq Source 601
Bodet Scorepad DataLinq Source 609

Captioning DataLinq Source 611
Colorado Time Systems Scoreboards DataLinq Source 613
Daktronics DataLinq Source 615
Daktronics RTD DataLinq Source 617
DashBoard DataLinq Source 619
Electro-Mech Scoreboards DataLinq Source 620
FairPlay DataLinq Source 622
Genius Sports InArena DataLinq Source 624
GSIS DataLinq Source 625
JSON DataLinq Source 626
NBA NGSS DataLinq Source 630
NHL Hits DataLinq Source 633
OES Scoreboards DataLinq Source 635
PGA Meekus WebSocket DataLinq Source 637
Raiden DataLinq Source 642
RSS / HTTP DataLinq Source 645
SMT Tennis Umpire Clock DataLinq Source 657
Sportech DataLinq Source 658
StatsPerform API DataLinq Source 660
Stats Perform DataLinq Source 667
Swiss Timing Scoreboards DataLinq Source 668
TeleTimer DataLinq Source 670
Teleview DataLinq Source 672
Text DataLinq Source 674
WebSocket DataLinq Source 677
White Way DataLinq Source 681
XML DataLinq Source 683
XML/JSON TCP DataLinq Source 687
Linking Objects to a DataLinq Source 693
Linking a Text Object to a DataLinq Source 694
Linking a Background Object to a DataLinq Source 696
Linking a Quad Object to a DataLinq Source 698
Linking a Cube Object to a DataLinq Source 700
Linking a Sphere Object to a DataLinq Source 702
Linking a Cylinder Object to a DataLinq Source 704
Linking a Torus Object to a DataLinq Source 706
Linking a Slab Object to a DataLinq Source 708
Using DataLinq Keys with an ADODB DataLinq 710
Using DataLinq Keys with an XML DataLinq 713
Using SQL Queries 717
Using a Macro with a DataLinq Key 720
Creating a Data Page 722
Using a Static URL 725
Using a Dynamic URL 727

Using URL Macros 732
Using Table Presets 734
Sequences 738
Creating a Sequence 739
Modifying Template Content 741
Controlling Sequence Playout 744
Playing Out a Sequence in Manual Mode 748
Playing Out a Sequence in Automatic Mode 750
Creating a Roll/Crawl from a Take Item Group 752
Customizing a Take Item Group Roll/Crawl 754
Playing Out a Take Item or Take Item Group Using Timecode 756
Rendering Take Items to Video 758
Record Client 764
Recording a Video from an Input 765
Capturing a Still Image from an Input 769
Using Multiple Record Clients 774
Using Fill/Key Simultaneously 776
Creating a Material from a Video or Image 778
Sending a Video or Image to the Clip Store 781
Output 785
Previewing Output in a Virtual Output 786
Rendering Output to an AVI File 787
Project Server 791
Setting up a Project Server 792
Publishing a Project to the Project Server 793
Deploying a Project from the Project Server 799
Keyboard and GPI Mapping 802
Creating a Custom Keyboard Map 803
Assigning a Project Shortcut 805
Assigning a Global Shortcut 807
Assigning a Local Shortcut 817
Creating a Custom GPI Map 819
Using the Quick Menu 821

Project Manager 822
Creating a Category 823
Adding a Scene or Scene Group to a Category 825
Deleting a Category 827
Opening Multiple Projects in the Project Manager 828
Activating a Project from a Project Group 829
Removing a Project from a Project Group 830
Clips 831
XPression Clips Playback Overview 832
Adding Clips to the Clip Store 833
Generating Proxies for Clips 835
Opening the Server Channels 836
Loading a Clip in the Server Channels 837
Opening the Clip Browser 840
Using the Clip Browser 841
Ganging Fill and Key Clips in the Clip Browser 843
Using the Server Channels 844
Editing a Clip/Adding a Sub Clip 847
Updating the Thumbnail in the Clip Browser 852
Creating a 4-Point Loop 855
Creating a 3-Point Loop 857
Importing / Exporting Clips 859
Visual Logic 862
Opening the Visual Logic Editor 863
Understanding Objects and Function Blocks 864
Connecting Object and Function Blocks 866
Selecting Multiple Object and Function Blocks 868
Copying and Pasting Object and Function Blocks 869
Assigning and Pasting a Copied Object Attribute 870
Deleting Object and Function Blocks 872
Adding or Deleting a Visual Logic Tab 873
Saving and Opening Visual Logic Files 874
XPression Tessera 875
Tessera User Interface Overview 876
XPression Tessera Region Mapper - Source Region Layout Settings 877

XPression Tessera Region Mapper - Destination Region Layout Settings 878
Setting up XPression Tessera 879
Tessera Multiple Engine Mode 880
Tessera Single Engine Mode 893
Region Mapping 895
Saving Region Mappings 902
Using a Preview Output on a Tessera Master 903
Preview and Monitoring 905
Previsualization 909
Scenes 918
Saving and Publishing a Project 919
Tessera Backup System 920
Tessera Master / Tessera SE Replication 930
Assigning a Source Output to a Scene or Scene Group in the Object Inspector 933
Tessera Playback 934
Appendix A: Keyboard Shortcuts 935
Menu Shortcuts 936
Toolbar Shortcuts 937
Scene Manager Shortcuts 938
Object Manager Shortcuts 939
Object Inspector Shortcuts 940
Text Objects Shortcuts 941
Keyframe Editor Shortcuts 942
Sequencer Shortcuts 943
Material Manager Shortcuts 944
Main Viewport Shortcuts 945
Clip Browser Shortcuts 946
Server Channels Shortcuts 947
Visual Logic Shortcuts 948
Appendix B: Troubleshooting Certificates 949

Introduction

XPression is Ross Video's real-time motion graphics platform for creating, managing, and delivering broadcast-quality graphics across news, sports, entertainment, corporate, and live production environments. From simple lower thirds and full-screen graphics to sophisticated data-driven templates, augmented reality experiences, and virtual production workflows, XPression provides the tools required to design and playout graphics with speed, flexibility, and reliability.

This guide describes the features, workflows, and configuration options available in XPression. It explains how to create and manage projects, build scenes and templates, configure hardware and video I/O, integrate with newsroom and automation systems, work with data sources, and control graphics during live production. In addition, the guide covers advanced capabilities such as scene directors, transition logic, camera tracking, virtual set integration, and graphics playout across multiple channels and outputs.

Whether you are a graphics designer, operator, system administrator, or broadcast engineer, this guide provides the information needed to install, configure, operate, and maintain an XPression system. Procedures are presented in a step-by-step format to help you quickly locate the information required to perform common tasks and implement production workflows.

As XPression can be deployed in a wide variety of environments, some features and hardware options described in this guide may depend on your software license, hardware configuration, or system architecture. Refer to the documentation provided with your specific Ross Video products and workflows for additional integration details.

We appreciate your business and sincerely hope that you have a great experience with your new XPression system. As always, if there is anything we at Ross Video can do to assist you, please do not hesitate to contact us.

About This Guide

This user guide describes the two main components of XPression, an editor and a sequencer. The toolbar contains two buttons to switch between these sections. The layout section serves to create scenes with graphics and animations. The sequence section serves to set scenes in a sequence list and to play out the scenes. Both sections contain a number of dockable and non-dockable windows, to be used in the process of creating scenes, templates, and animations.

If, at any time, you have a question pertaining to the installation or operation of XPression, please contact us at the numbers listed in the Getting Help section. Our technical staff are always available for consultation, training or service.

For More Information on...

XPression system hardware, refer to the *Maintenance Guide*.

Documentation Conventions

Special text formats are used in this guide to identify parts of the user interface, text that a user must enter, or a sequence of menus and sub-menus that must be followed to reach a particular command.

Bold text	Bold text identifies a user interface element such as a dialog box, menu item, or button. For example: In the **Slug** column, type a slug name for the story.
Italic text	Italic text is used to identify the titles of referenced guides, manuals, or documents. For example: For more information, refer to the *DashBoard User Guide.*
`Courier text`	Courier text identifies text that a user must type. For example: In the **Username** box, type `postgres`.
Menu Sequences	Menu arrows are used in procedures to identify a sequence of menu items that you must follow. For example: If a step reads **Server > Save As**, you would select the **Server** menu and then select **Save As**.
Hypertext	Identifies a hyperlink to a related topic.

Getting Help

The XPression Online Help system is accessed by selecting **Help Topics** from the **Help** menu in any component of XPression. Online Help opens in a Help Viewer window.

The Online Help system contains the following navigation tabs to locate information contained in Online Help topics and the User Guide:

Contents — table of contents

Search — full text search

Favorites — preferred information storage and access

The XPression Online Help system displays, by default, the **Contents** pane. To access **Search** pane, select the **Search** button on the top toolbar in the Online Help system.

The *XPression Maintenance Guide* and *XPression User Guide* are also supplied as print-ready PDF files. Locate the guides in the C:\Archive folder to open a guide PDF in Adobe® Reader® for viewing or printing.

XPression documentation is available online at Product Documentation and is also accessible on the product USB key and by selecting the **Help** icon in the user interface.

Contacting Technical Support

At Ross Video, we take pride in the quality of our products, but if problems occur, help is as close as the nearest telephone.

Our 24-hour Hot Line service ensures you have access to technical expertise around the clock. After-sales service and technical support is provided directly by Ross Video personnel. During business hours (Eastern Time), technical support personnel are available by telephone. After hours and on weekends, a direct emergency technical support phone line is available. If the technical support person who is on call does not answer this line immediately, a voice message can be left and the call will be returned shortly. This team of highly trained staff is available to react to any problem and to do whatever is necessary to ensure customer satisfaction.

Technical Support:

- 1-613-686-1557
- 1-833-859-0499 (Toll free within North America)
- +800 3540 3545 (Toll free International)
- +91-22-5016-6177 (India)
- 1300 007 677 (Australia/Sydney)*
- E-mail: techsupport@rossvideo.com
- Website: http://www.rossvideo.com

*If the local support specialist is not available, your call will be transferred automatically to our North America center.

Installation Notes

NVIDIA Drivers

If NVIDIA drivers are installed while XPression is running and actively outputting graphics, the output will turn green and not recover until XPression is restarted.

Windows updates can install NVIDIA drivers automatically, which can create this situation.

Solution:

Schedule Windows updates for a time when XPression is not running.

XPression Updates

When installing a new XPression build or updates to XPression, if the installation is canceled before it finishes, the existing framebuffers will be cleared and clips will not play out.

Solution:

Reinstall XPression fully.

User Interface Overview

The XPression interface is made up of two sections: a layout section, and a sequencer section. Both sections contain specific windows, as well as common windows. The layout section is the interface used to create and edit graphics and animations. The sequencer section is used to output graphics and animations placed on a sequence list.

The following topics are discussed in this section:

The Layout Interface

The Sequence Interface

The Layout Interface

The following screen capture displays the main elements of the XPression **Layout** section of the user interface. Descriptions of individual elements are contained in the legend below the diagram.



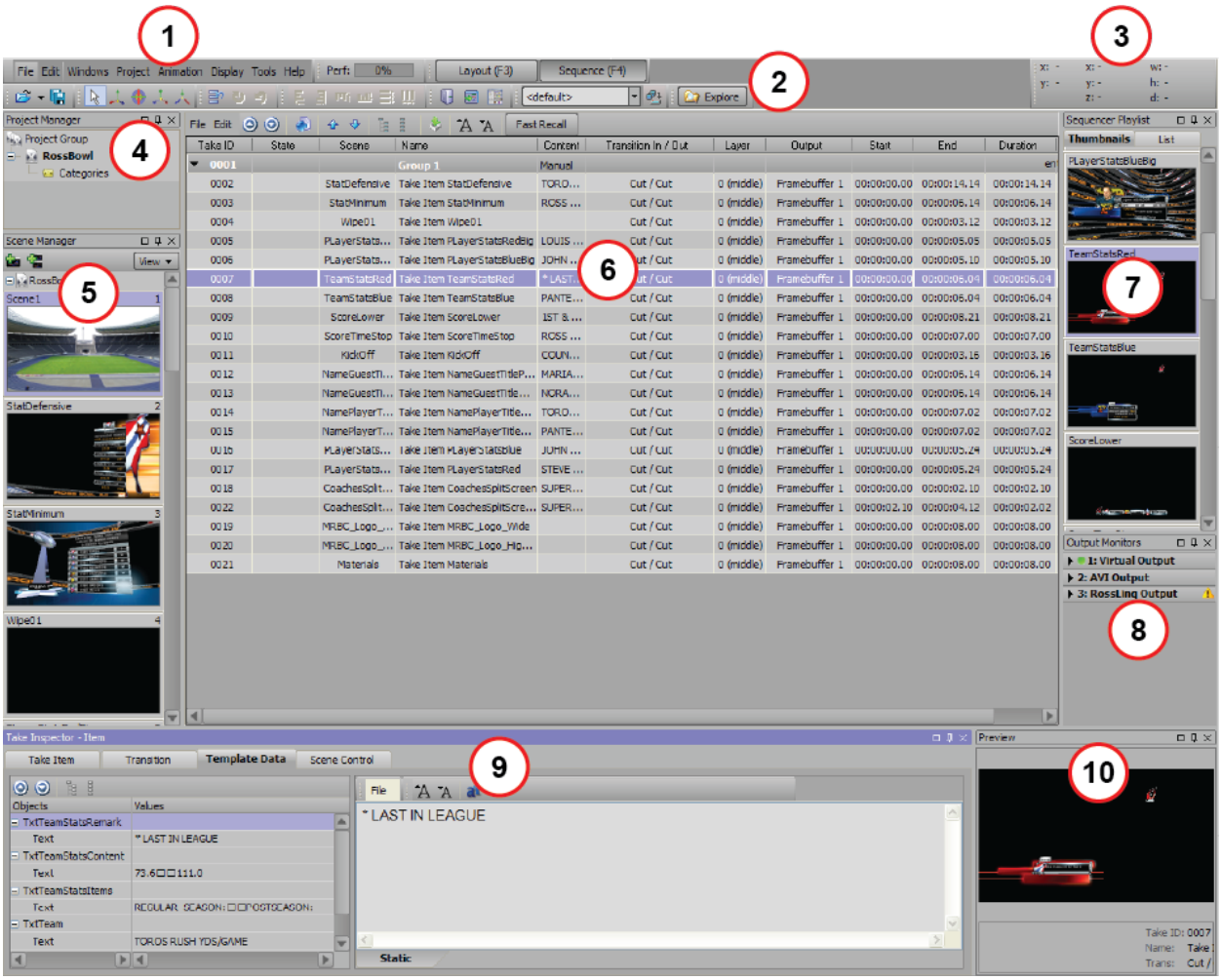
1. **Menu Bar** — access the File, Edit, Windows, Projects, Animation, Display, Tools, and Help menus.
2. **Toolbar** — quickly access XPression tools.
3. **Position** — displays various position values related to the Main viewport.
4. **Project Manager** — view and manage the projects and project groups.
5. **Scene Manager** — view and manage the scenes and scene groups contained in a project.
6. **Main Viewport** — design scenes using objects from the Object Library.

1. **Material Manager** — view, apply, and manage the materials in a project.
8. **Object Library** — select the objects with which to build scenes.
9. **Scene Director** — create and manage tracks for animation controllers and audio files.
10. **Output Monitors** — select the output framebuffer. Each output framebuffer contains an infinite number of layers, and each layer can contain a scene. The hierarchical order for scene visibility runs from +# to -#, with positive layers being the top layers and negative layers being the lower layers.
11. **Object Manager** — view and manage the objects contained in a scene.
12. **Object Inspector** — edit the properties of a selected object. The tabs displayed in this window depend on the type of object selected.

	13. **Animation Controller** — play back individual animations.

The Sequence Interface

The following screen capture displays the main elements of the XPression **Sequence** section of the user interface. Descriptions of individual elements are contained in the legend below the diagram.



1. **Menu Bar** — access the File, Edit, Windows, Projects, Animation, Display, Tools, and Help menus.
2. **Toolbar** — quickly access XPression tools.
3. **Position** — displays various position values related to the Main viewport.
4. **Project Manager** — view and manage the projects and project groups.
5. **Scene Manager** — view and manage the scenes and scene groups contained in a project.

1. **Sequencer** — view and control a list of scenes or scene groups to be played in the order from top to bottom. A list is built by adding scenes from the Scene Manager.
2. **Sequencer Playlist** — view a list of all scenes and/or scene groups in the sequencer.
3. **Output Monitors** — select the output framebuffer. Each output framebuffer contains an infinite number of layers, and each layer can contain a scene. The hierarchical order for scene visibility runs from +# to -#, with positive layers being the top layers and negative layers being the lower layers.
4. **Take Inspector** — edit the properties of a selected group or take item.
5. **Preview** — preview a selected take item from the sequencer.

System Setup

Before you start using XPression to create projects, XPression needs to be configured for your environment. In addition to describing how to set preferences for XPression, this section also describes how to configure GPIs, video framebuffers, audio devices, video preview, and audio monitors.

★A backup copy of the preferences and hardware setup is created when changes in the **Preferences** and **Hardware Setup** dialogs are made and **OK** is selected, or when XPression is exited.

The following topics are discussed in this section:

Setting Preferences

Configuring an AJA NTV2 Video FrameBuffer

Configuring an AJA Video FrameBuffer (Legacy)

Configuring a Blackmagic Design FrameBuffer

Configuring a Blackmagic Design FrameBuffer (Legacy)

Configuring a Graphite FrameBuffer

Configuring a Matrox DSX, X.mio3 and X.mio5 FrameBuffer

Configuring a Matrox Video X.mio2 FrameBuffer

Configuring NDI®

Configuring an an XPression AVI Recorder

Configuring an XPression Desktop Preview Client

Configuring an XPression Direct Display Output

Configuring an XPression DirectShow Capture Source

Configuring an XPression RossLinq Connector

Configuring the XPression Tile Mapper

Configuring an XPression Virtual Input

Configuring an XPression Virtual Output

Changing the Order of Video Inputs / Outputs

Deleting a Video Input / Output

Configuring an Audio Device

Deleting an Audio Device

Adding a Timecode Source

Configuring the Video Preview and Audio Monitor

Configuring RS232 CTS/DSR GPI for Contact Closures

Configuring a 25-Pin GPIO Port

Configuring a SeaLevel GPIO Board

Configuring Smart GPI / RossTalk

Configuring a TSL Tally Input

Configuring an X-Keys Device

Configuring the PBus Interface and PBus Recalls

Configuring Camera Tracking

Setting Up OpenMAM

Setting Up Server Channels

Configuring XPression for the XPression Clip Store

Setting Preferences

Before getting started with designing in XPression, take some time to set up your project preferences.

To set preferences:

1. In XPression, select **Edit** > **Preferences**.

   The **Preferences** window opens.
2. From the list on the left side, select a component.
3. Follow the instructions in the topics below to configure each component.

Editor

Hardware Renderer

Viewports

Path Persistence

Import

Folders

Texture & Image Cache

On Disk Cache

Sequencer

Sequencer (cont.)

MOS Settings

XML Take Item List

Fonts

Remote Server

CII

RossTalk

Video Engine

ClipStore

OpenMAM

As Run Log

Advanced

Localization

Log Level

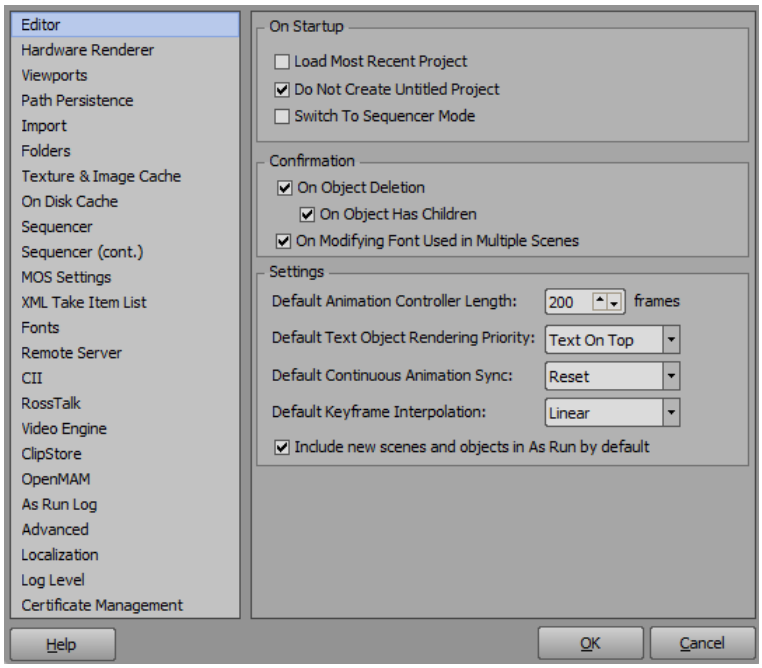
Certificate Management

Editor

Use the **Editor** panel to set **Startup** options, when you want to see a **Confirmation** message, and various other settings.

To configure the Editor settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Editor** panel.



3. In the **On Startup** section, select from the following options as needed:
   - Select the **Load Most Recent Project** checkbox to automatically load the last opened project after starting XPression.
   - Select the **Do Not Create Untitled Project** chec box to avoid creating a new project when launching XPression.

     This is useful for MOS workflows.
   - Select the **Switch To Sequencer Mode** checkbox to automatically display the **Sequencer** layout after starting XPression.
4. In the **Confirmation** section, select from the following options as needed:
   - Select the **On Object Deletion** checkbox to display a **Confirmation** dialog and request confirmation when deleting an object from a project.
   - Select the **On Object Has Children** checkbox to display a **Confirmation** dialog and request confirmation when child objects belong to the object selected for deletion.

     ★Deleting an object also deletes any related child objects.
   - Select the **On Modifying Font Used in Multiple Scenes** checkbox to display a **Confirmation** dialog and request confirmation when changing the properties of a font that is used in multiple scenes.

5. In the **Settings** section, select from the following options as needed:

   - In the **Default Animation Controller Length** field, enter or select the default frame length of the animation controller.
   - From the **Default Text Object Rendering Priority** drop-down, select the default rendering priority for text objects.

     The available options are:

     Normal — new text objects display in front of other objects.

     Text On Top — text objects always display in front of other objects.
   - From the **Default Continuous Animation Sync** drop-down, select the default method to use to start a continuous animation track.

     The available options are as follows:

     Reset — start a continuous animation track at the starting point of the animation.

     Clock — base the start of a continuous animation track on the clock. Select this method to synchronize a continuous animation track with previous animations. When using XPression Tessera, this setting is based on the Tessera clock.
   - From the **Default Keyframe Interpolation** drop-down, select the default method used for keyframe interpolations in the **Keyframe Editor**.

     The available options are:

     TCB Spline — use a TCB spline between keyframes.

     Bezier Spline — use a Bezier spline between keyframes.

     Simple Bezier — use a standard Bezier interpolation between keyframes.

     Linear — use a straight line between keyframes.

     Hold — no action is performed until one frame before the selected keyframe.
   - Select the **Include new scenes and objects in As Run by default** checkbox to include all newly created scenes and objects in the **As Run Log** by default.

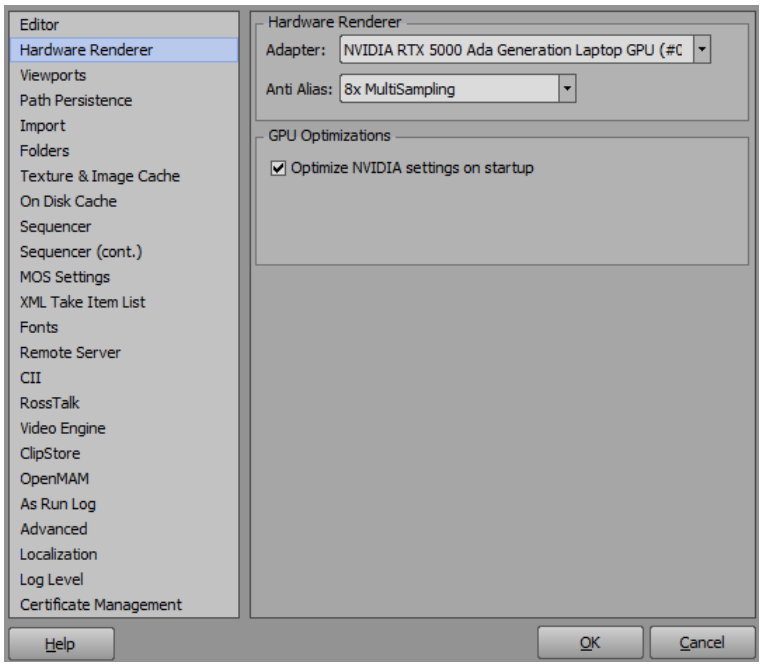
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Hardware Renderer

Use the **Hardware Renderer** panel to select the graphics device installed in the XPression computer and the **Anti Alias** quality and to optimize the GPU.

To configure the Hardware Renderer settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Hardware Renderer** panel.



3. From the **Adapter** drop-down, select the graphics device used by XPression to render scenes to output framebuffers.
4. From the **Anti-Alias** drop-down, select the sampling value used to control the visual quality of rendered output.

   The higher the sampling value, the smoother the rendered graphic edges. The **<none>** option is equal to 1x multi-sampling.

   For most situations, set the sampling value according to the best quality/performance ratio, usually around **8x**.
5. In the **GPU Optimizations** section, select **Optimize NVIDIA settings on startup** to optimize the NVIDIA global settings on startup to disable options like **Anti-aliasing Gamma Correction**.

   This option is selected by default. When selected XPression will set NVIDIA power management to maximum performance.
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Viewports

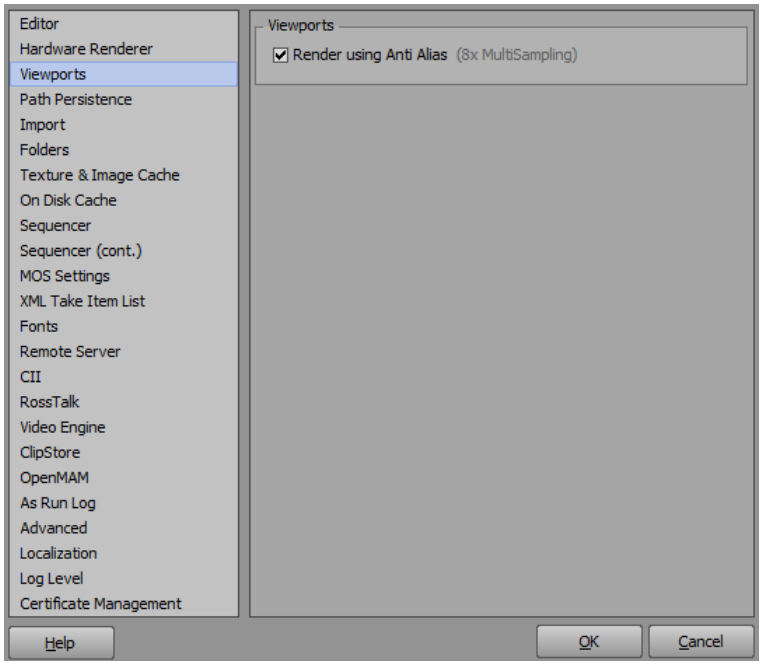
Use the **Viewports** panel to select whether or not to render scenes using anti-alias.

The higher the **Multi-sampling** value, the smoother the graphic edges will be rendered in a viewport.

★This option is only available when the multi-sampling value set in the **Hardware Renderer** panel is something other than **<none>**.

To configure the Viewport setting:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Viewports** panel.



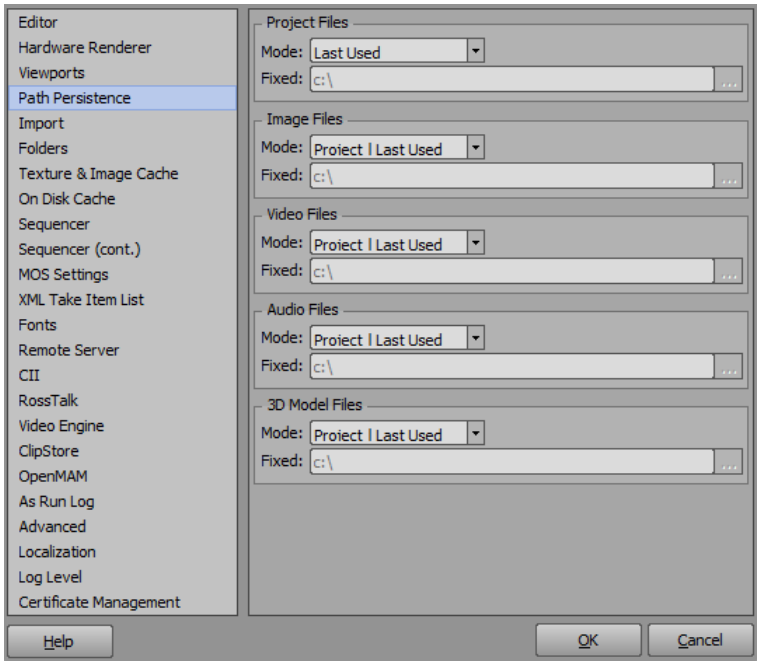
3. Select **Render Using Anti-Alias** to use the multi-sampling value selected from the **Anti Alias** list in the Hardware Renderer panel to control the visual quality of scenes rendered to viewports.
4. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Path Persistence

Use the **Path Persistence** panel to set the folder locations used by XPression to search for and store XPression resources and files.

To configure the Path Persistence settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Path Persistence** panel.



3. In the **Project Files** section, do the following:
   - From the **Mode** drop-down, select the folder to open when selecting **Open** from the **File** menu.

     The available options are:

     Last Used — open the folder last used to save an XPression project file.

     Fixed — open the folder specified in the **Fixed** field.

     If you select the **Fixed** option, enter the full path to the project folder in the **Fixed** field, or select **Browse (...)** to navigate to the location of the project folder.
4. In the **Image Files** section, do the following:
   - From the **Mode** drop-down, select the folder used to store image files.

     The available options are as follows:

     Project | Last Used — first search for image files in the folder set as the project folder, and if no image files are found, then look in the folder last used by XPression.

     Last Used — search for image files in the folder that was last used by XPression.

     Fixed — search for image files in the folder specified in the **Fixed** field.

     If you select the **Fixed** option, enter the full path to the image folder in the **Fixed** field, or select **Browse (...)** to navigate to the image folder.

     Project — always return to the project folder for image files.

5. In the **Video Files** section, do the following:

   - From the **Mode** drop-down, select the folder used to store video files.

     The available options are as follows:

     Project | Last Used — first search for video files in the folder set as the project folder, and if no video files are found, then look in the folder last used by XPression.

     Last Used — search for video files in the folder that was last used by XPression.

     Fixed — search for video files in the folder specified in the **Fixed** field.

     If you select the **Fixed** option, enter the full path to the video folder in the **Fixed** field, or select **Browse (...)** to navigate to the video folder.

     Project — always return to the project folder for video files.

6. In the **Audio Files** section, do the following:

   - From the **Mode** drop-down, select the folder used to store audio files.

     The available options are as follows:

     Project | Last Used — first search for audio files in the folder set as the project folder, and if no audio files are found, then look in the folder last used by XPression.

     Last Used — search for audio files in the folder that was last used by XPression.

     Fixed — open the folder specified in **Fixed** field.

     If you select the **Fixed** option, enter the full path to the audio folder in the **Fixed** field, or select **Browse (...)** to navigate to the audio folder.

     Project — always return to the project folder for audio files.

7. In the **3D Model Files** section, do the following:

   - From the **Mode** drop-down, select the folder used to store 3D model files.

     The available options are as follows:

     Project | Last Used — first search for 3D model files in the folder set as the project folder, and if no 3D model files are found, then look in the folder last used by XPression.

     Last Used — search for 3D model files in the folder that was last used by XPression.

     Fixed — open the folder specified in **Fixed** field.

     If you select the **Fixed** option, enter the full path to the 3D model folder in the **Fixed** field, or select **Browse (...)** to navigate to the 3D model folder.

     Project — always return to the project folder for 3D model files.

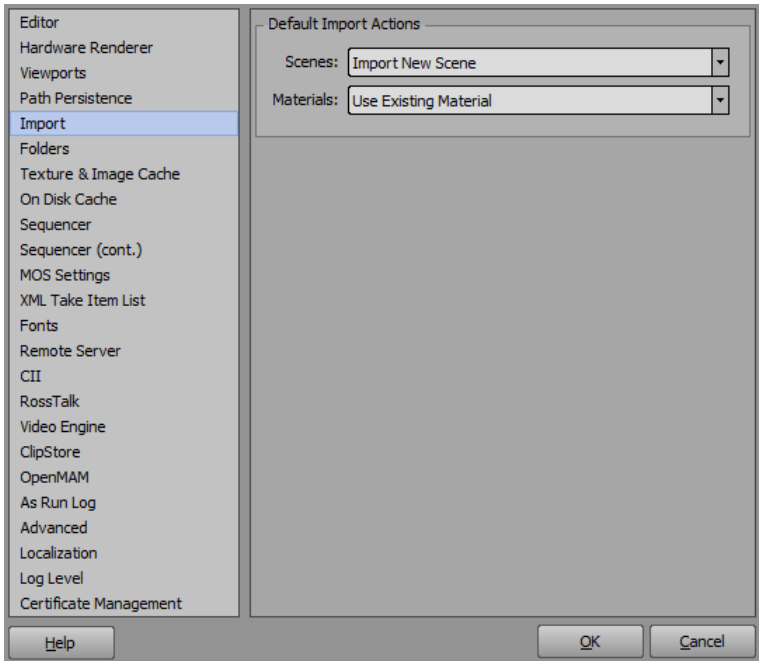
8. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Import

Use the **Import** panel to configure the default behavior of the **Import** actions.

To configure the default Import actions:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Import** panel.



3. In the **Default Import Actions** section, from the **Scenes** drop-down, select the default import setting for scenes.

   The options are:

   - **Import New Scene** — import a scene into a project as a new scene if it has a scene name that exists in the open project in XPression.
   - **Replace Scene** — replace a scene in an open project in XPression with the same name as the imported scene.

4. From the **Materials** drop-down, select the default import setting for materials.

   The options are:

   - **Use Existing Material** — use the existing material in a project open in XPression.
   - **Replace Material** — replace the material in an open project in XPression with the same name as the imported material.
   - **Create New Material** — create a new material in the project open in XPression with the imported material.

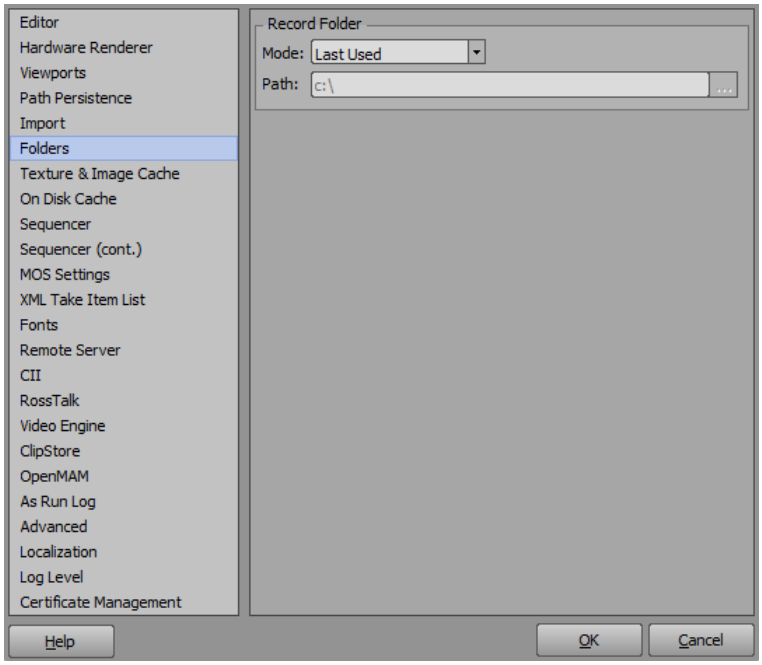
5. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Folders

Use the **Folders** panel to select the folders used by XPression to store files created by the **Record Client**.

To configure the Folders options:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Folders** panel.



3. In the **Record Folder** section, from the **Mode** drop-down, select the mode of folder management to use to store files created by the **Record Client**.

   The options are:

   - **Project | Last Used** — save the files to the last folder used in a project folder for saving a file.
   - **Last Used** — save the files to the last folder used for saving a file.
   - **Fixed** — always save the files to the folder file path entered or selected in the **Path** field.
   - **Project** — always save the files to the last project folder used for saving a file.

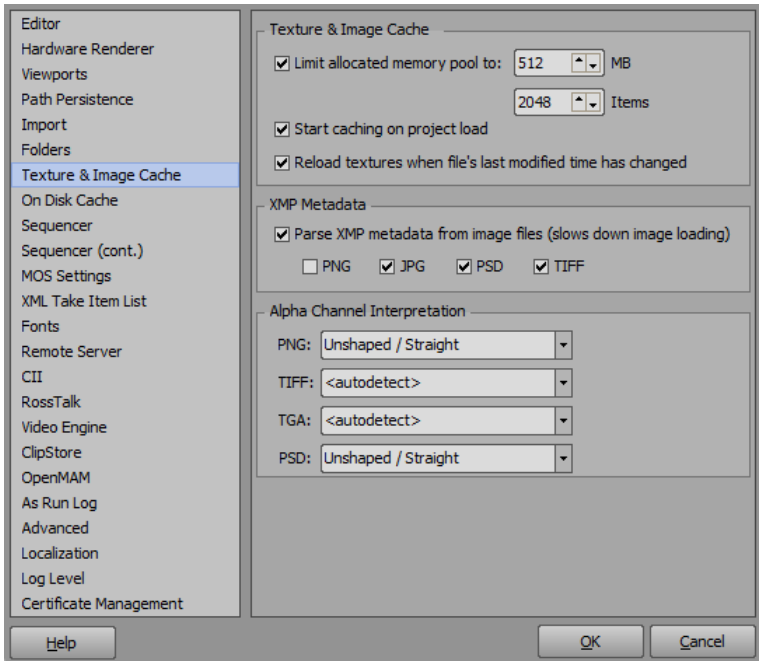
4. If using the **Fixed** folder mode, in the **Path** field enter the full path to the folder in which to save files created using the **Record Client**, or select **Browse (...)** to locate and select a folder.
5. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Texture & Image Cache

Use the **Texture & Image Cache** panel to set the texture and image cache settings, select whether or not to parse XMP metadata from image files and select the **Alpha Channel Interpretation** for image file formats.

To configure the Texture & Image Cache settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Texture & Image Cache** panel.



3. In the **Texture & Image Cache** section, select **Limit allocated memory pool to** and in the **MB** field, enter or select the size to which to limit the texture and image files stored in the cache folder.
4. In the **Items** field enter or select the size limit according to the number of items in case of a high count of small images and/or textures.
5. Select **Start caching on project load** to start caching texture and image files when a project starts loading.
6. Select **Reload textures when file's last modified time has changed** to reload cached textures that have been changed on disk.
7. In the **XMP Metadata** section, select **Parse XMP metadata from image files** to parse the XMP metadata from image files in a project.

   It is enabled by default. Disabling this function will increase the loading speed of image files. Individual image file types can be enabled or disabled for parsing as follows:

   - **PNG** — enable XMP metadata parsing of PNG image files when the Parse XMP metadata from image files check box is enabled.
   - **JPG** — enable XMP metadata parsing of JPG image files when the Parse XMP metadata from image files check box is enabled.
   - **PSD** — enable XMP metadata parsing of PSD image files when the Parse XMP metadata from image files check box is enabled.

- **TIFF** — enable XMP metadata parsing of TIFF image files when the Parse XMP metadata from image files check box is enabled.

8. In the **Alpha Channel Interpretation** section, from the PNG, TIFF, TGA, and PSD drop-downs, select how the alpha channel will interpret the respective image files.

   The options are:

   <autodetect> — interpret the image file according to the source file.

   Shaped / Premultiplied — the image file uses a shaped key, where the key alpha cuts a hole based on the monochrome value of the alpha. Shades of gray are translated into either white or black, giving the key a hard edge.

   Unshaped / Straight — the image file uses an unshaped key, where the key alpha cuts a hole based on the gradient values of the alpha. Shades of gray are translated into transparency levels, giving the key a soft edge.

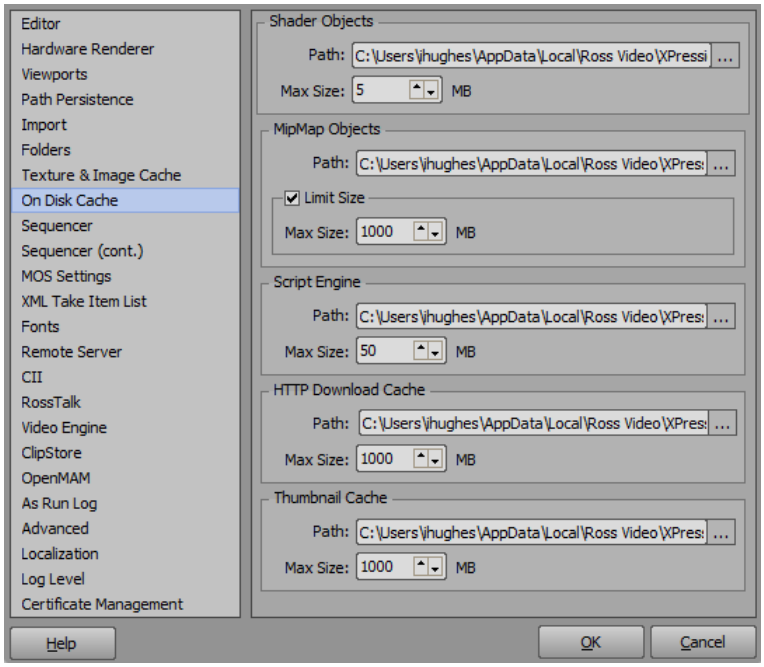
9. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

On Disk Cache

Use the **On Disk Cache** panel to set the folder locations used by XPression to store cache files on disk.

To configure the Texture & Image Cache settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **On Disk Cache** panel.



3. In the **Shader Objects** section, do the following:
   - In the **Path** field, enter the full path to the folder in which to cache shader object files or select **Browse (...)** to locate and select the **Shader Objects Cache** folder.
   - In the **Max Size** field, enter or select the size limit in MB for the total of all the cache files stored in the **Shader Objects Cache** folder.
4. In the **MipMap Objects** section, do the following:
   - In the **Path** field, enter the full path to the folder in which to cache MipMap object files or select **Browse (...)** to locate and select the **MipMap Objects Cache** folder.
   - Select **Limit Size** to limit the total size of MipMap object files stored in the **MipMap Objects** cache folder.
   - In the **Max Size** field, enter or select the size limit in MB for the total of all the **MipMap Objects** cache files stored in the **MipMap Objects Cache** folder.
5. In the **Script Engine** section, do the following:
   - In the **Path** field, enter the full path to the folder in which to cache script engine files or select **Browse (...)** to locate and select the **Script Engine Cache** folder.
   - In the **Max Size** field, enter or select the size limit in MB for the total of all the **Script Engine** cache files stored in the **Script Engine Cache** folder.

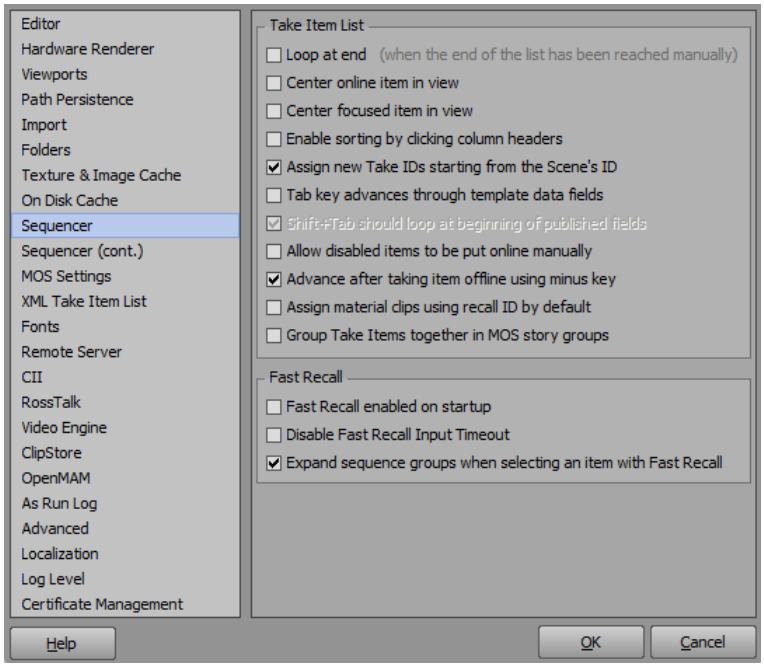
6. In the **HTTP Download Cache** section, do the following:
   - In the **Path** field, enter the full path to the folder in which to cache files from HTTP downloads or select **Browse (...)** to locate and select the **HTTP Download Cache** folder.
   - In the **Max Size** field, enter or select the size limit in MB for the total of all the **HTTP Download** cache files stored in the **HTTP Download Cache** folder.
7. In the **Thumbnail Cache** section, do the following:
   - In the **Path** field, enter the full path to the folder in which to cache thumbnails or select **Browse (...)** to locate and select the **Thumbnails Cache** folder.
   - In the **Max Size** field, enter or select the size limit in MB for the total of all the **Thumbnail** files stored in the **Thumbnails Cache** folder.
8. **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Sequencer

Use the **Sequencer** panel to control the behavior of the sequencer.

To configure the Sequencer behavior:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Sequencer** panel.



3. In the **Take Item List** section, select from the following options as needed:
   - Select **Loop at end** to automatically loop a sequence list when the end is reached manually.
   - Select **Center online item in view** to position the active scene in a sequence list in the middle of the view, provided the sequence list extends the size of the view.
   - Select **Center focused item in view** to position a focused scene in a sequence list in the middle of the view, provided the sequence list extends the size of the view.
   - Select **Enable sorting by clicking column headers** to sort the information in the columns of the sequencer by heading.
   - Select **Assign new Take IDs starting from the Scene's ID** to assign newly created take items an ID starting from the ID of the template scene.
   - Select **Tab key advances through template data fields** to enable the use of the **Tab** key to cycle through template data fields in the sequencer.
   - Select **Shift+Tab should loop at beginning of published fields** to use the **Shift+Tab** keyboard command to loop to the end of the published object list when it reaches the top of the list in the take item inspector.
   - Select **Allow disabled items to be put online manually** to allow disabled items in the sequencer to go on air when triggered manually.
   - Select **Advance after taking item offline using minus key** to advance the sequence when taking an item off air using the **- / Take Offline** key on the number pad.
   - Select **Assign material clips using recall ID by default** to assign clips to materials by recall ID by default when dragging a clip from the **Clip Browser** to a published material.

- Select **Group Take Items together in MOS story groups** to display MOS take items together in groups with the slug header as the group name, making them easily identifiable in the **Sequencer**.

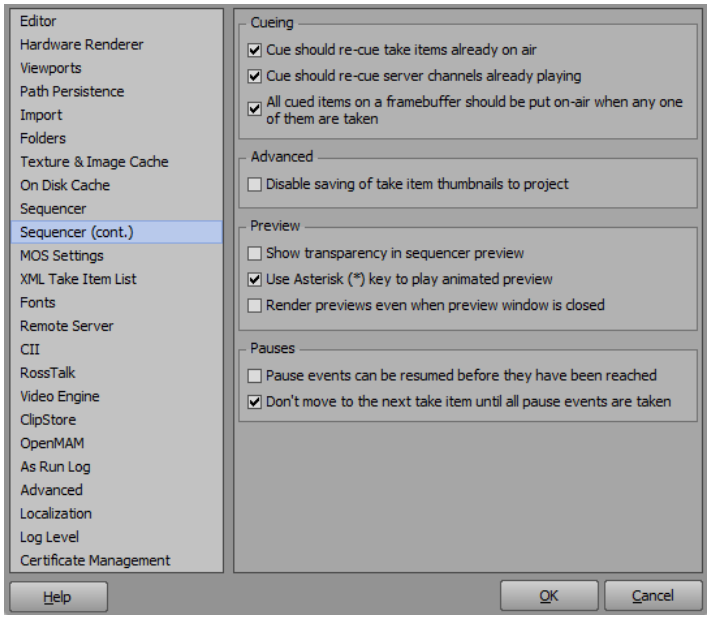
4. In the **Fast Recall** section, select from the following:
   - Select the **Fast Recall enabled on startup** to automatically enable fast recall in the sequencer on startup.
   - Select the **Disable Fast Recall Input Timeout** to turn off the user entered input timeout for **Take IDs** in the sequencer.
   - Select the **Expand sequence groups when selecting an item with Fast Recall** to expand the parent group of an item when it is selected using **Fast Recall**.
5. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Sequencer (cont.)

Use the **Sequencer (cont.)** panel to configure more options for controlling the behavior of the sequencer.

To configure the additional Sequencer behavior settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Sequencer (cont.)** panel.



3. In the **Cueing** section, select from the following options as needed:
   - Select **Cue should re-cue take items already on air** to re-cue on air take items when the cue button is pressed.
   - Select **Cue should re-cue server channels already playing** to re-cue on air server channels when the cue button is pressed.
   - Select **All cued items on a framebuffer should be put on-air when any one of them are taken** to take all cued items on a framebuffer on air when one of them is taken online.
4. In the **Advanced** section, select **Disable saving of take item thumbnails to project** to save projects without thumbnails.

   Saving is faster, but the thumbnails may need to be regenerated upon loading of the project.
5. In the **Preview** section, select from the following options:
   - Select **Show transparency in sequencer preview** to display transparency when previewing a take item in the sequencer preview window.

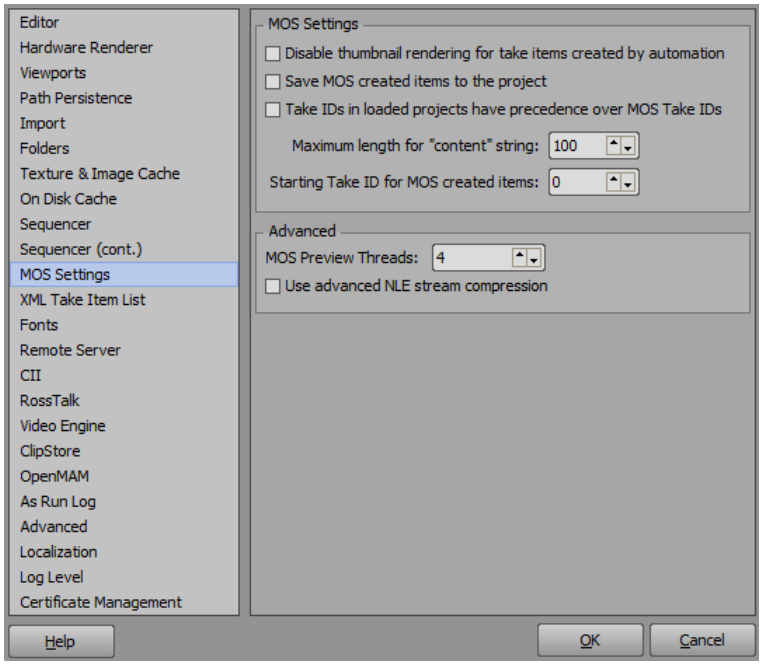
     Alternatively, right-click in the sequencer **Preview** window and select **Show Transparency** from the shortcut menu.
   - Select **Use Asterisk (*) key to play animated preview** to enable the display of a live moving preview in the sequence mode when the asterisk key (*) is pressed on the number pad.
   - Select **Render previews even when preview window is closed** to allow for external previews to be updated or for logic in **OnPreviewRender** scripts to be executed even when the preview window is closed.
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

MOS Settings

Use the **MOS Settings** panel to configure the MOS settings when using XPression within a MOS workflow.

To configure the MOS settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **MOS Settings** panel.



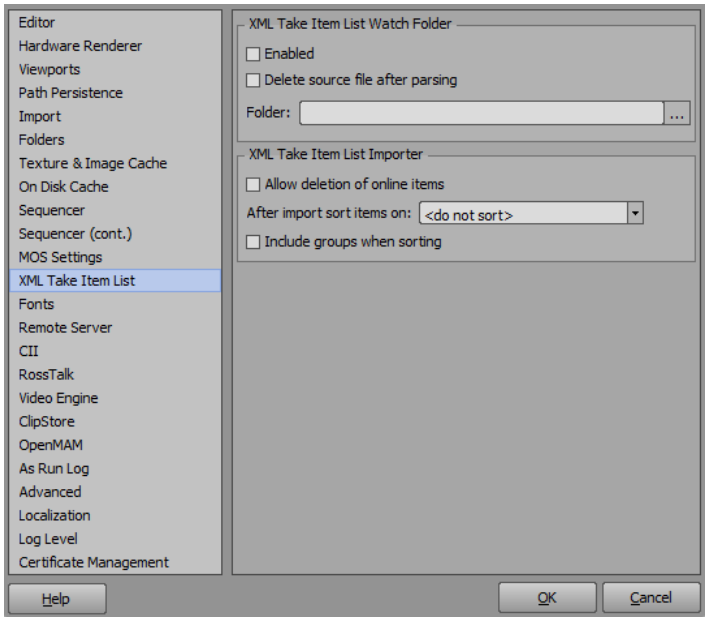
3. In the **MOS Settings** section, select from the following options as needed:
   - **Disable thumbnail rendering for take items created by automation** — disable displaying scene thumbnails in the **Sequencer Playlist** for MOS items.
   - **Save MOS created items to the project** — save MOS items in the sequencer.
   - **Take IDs in loaded projects have precedence over MOS Take IDs** — give priority to the take IDs of take items from a subsequently loaded project over those from MOS.
   - **Maximum length for Content string** — enter or select a maximum character length for the take item content string in the sequencer.
   - **Starting Take ID for MOS created items** — enter or select a take ID number at which to start the MOS take IDs in the sequencer.
4. In the **Advanced** section, in the **MOS Preview Threads** field, enter or select the number of simultaneous MOS previews that can be rendered at a time.
5. Select the **Use advanced NLE stream compression** checkbox to use RLE and LZO compression for NLE if the network connection is saturated.
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

XML Take Item List

Use the **XML Take Item List** panel to configure the path and settings for XML Take Items.

To configure the XML Take Items settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **XML Take Item List** panel.



3. In the **XML Take Item List Watch Folder** section, select **Enabled** to use XML Take Items from a folder.
4. Select **Delete source file after parsing** to delete XML Take Items after they are parsed from the selected folder.
5. In the **Folder** field, enter the full path to the folder containing the XML Take Items or select **Browse (...)** to locate and select the folder.
6. In the **XML Take Item List Importer** section, select **Allow deletion of online items** to enable the removal of take items that are currently active on an output.
7. From the **After import sort items on** drop-down, select a method to sort the imported take items.

   The available options are as follows:

   - **<do not sort>** — do not sort the take items.
   - **take item id** — sort the take items by ID.
   - **take item state** — sort the take items by state.
   - **take item scene name** — sort the take items by scene name.
   - **take item name** — sort the take items by name.
   - **take item layer** — sort the take items by layer.
   - **take item framebuffer** — sort the take items by framebuffer.
8. Select **Include groups when sorting** to import the XML Take Items according to the groups to which the items have been assigned.

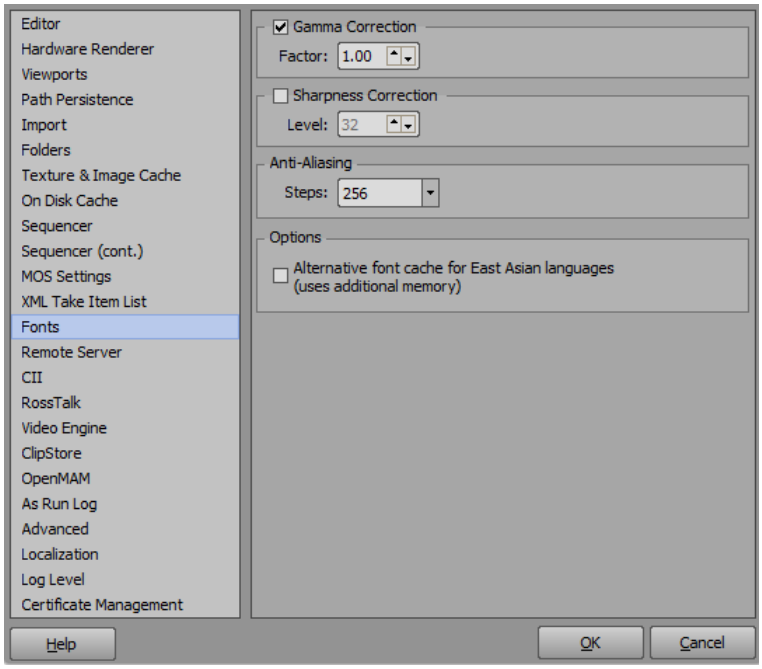
9. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Fonts

Use the **Fonts** panel to control gamma correction, sharpness correction, and anti-aliasing for fonts.

To configure fonts:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Fonts** panel.



3. Select **Gamma Correction** to apply gamma correction when changing the font factor.

   Gamma correction influences the degree of transparency used to anti-alias font edge steps. Changes to this factor are visible after re-rendering characters (e.g., changing font size).

4. In the **Factor** field, enter or select the gamma correction value.
5. Select **Sharpness Correction** to apply sharpness correction when changing the font sharpness level.

   The sharpness correction value influences the degree of the combination between the resolution and acutance of the font. Changes to this factor are visible after re-rendering characters (e.g. changing font size).

6. In the **Level** field, enter or select the sharpness correction level.
7. In the **Anti-Aliasing** section, from the **Steps** drop-down, select the anti-alias step size to use when rendering fonts.

   An anti-alias step size of **256** is the recommended setting.

8. In the **Options** section, select **Alternative font cache for East Asian languages** to enable font cache optimizations for East Asian languages.

   This setting uses increased memory and is not recommended for Latin languages.

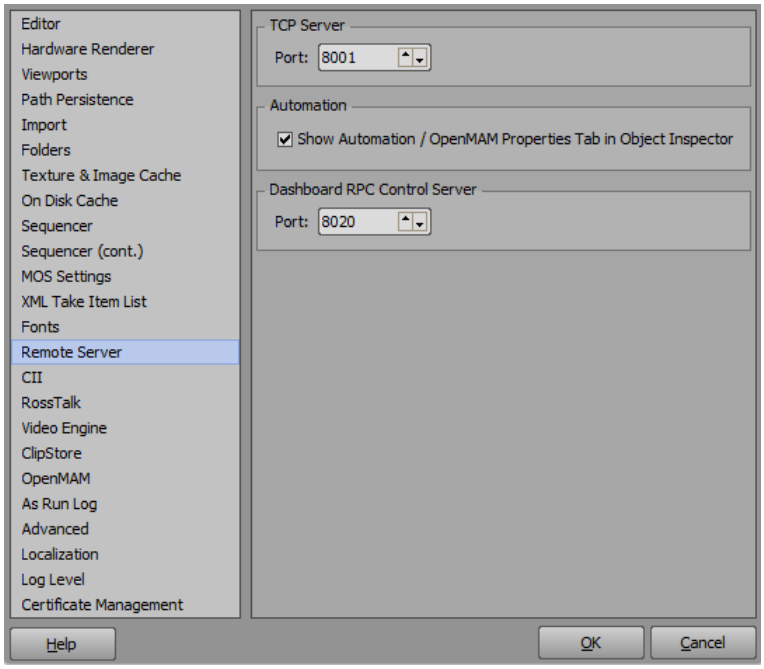
9. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Remote Server

Use the **Remote Server** panel to configure the TCP server settings.

To configure the TCP server settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Remote Server** panel.



3. In the **TCP Server** section, enter or select the port number for the remote server.

   This is the port number on which XPression will listen for incoming connections from other applications such as the MOS Gateway, CII gateway, and Media Control Gateway.

4. In the **Automation** section, select **Show Automation / OpenMAM Properties Tab in Object Inspector** to display the **Automation** tab in the Object Inspector when a scene or scene group is selected in the Object Manager and/or the OpenMAM tab in the Object Inspector when a background, quad, sphere, cube, cylinder, torus, or slab object is selected in the Object Manager.

   ★For information on using the **OpenMAM** tab in a distributed workflow, refer to the *XPression Distributed Workflow User Guide*.

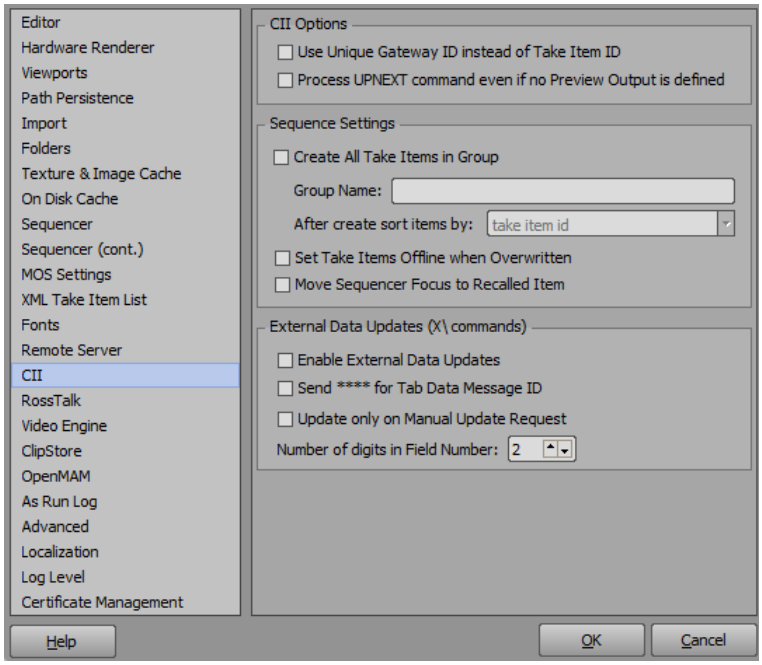
5. In the **DashBoard RPC Control Server** section, in the **Port** field, enter or select the port number that specifies the TCP port used by the DashBoard API control protocol.
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

CII

Use the **CII** panel to configure the CII settings.

To configure the CII settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **CII** panel.



3. In the **CII Page Recall** section, select **Use Unique Gateway ID instead of Take Item ID** to recall CII pages using a **Unique Gateway ID**.
4. Select **Process UPNEXT command even if no Preview Output is defined** to process **UPNEXT** commands from OverDrive when no preview output has been defined in the hardware setup.
5. In the **Sequence Settings** section, select from the following options as needed:
   - Select **Create All Take Items in Group** to create the CII Take Items in a specific group.
   - In the **Group Name** field, enter a name for the group of CII Take Items.
   - From the **After create sort items by** drop-down, select the method for sorting the imported take items.

     The available options are as follows:

     - **<do not sort>** — do not sort the take items.
     - **take item id** — sort the take items by ID.
     - **take item state** — sort the take items by state.
     - **take item scene name** — sort the take items by scene name.
     - **take item name** — sort the take items by name.
     - **take item layer** — sort the take items by layer.
     - **take item framebuffer** — sort the take items by framebuffer.

- Select **Set Take Items Offline when Overwritten** to take the original take item offline when it is overwritten.
- Select **Move Sequencer Focus to Recalled Item** to move the sequencer focus to a recalled graphic when the graphic is recalled through CII.

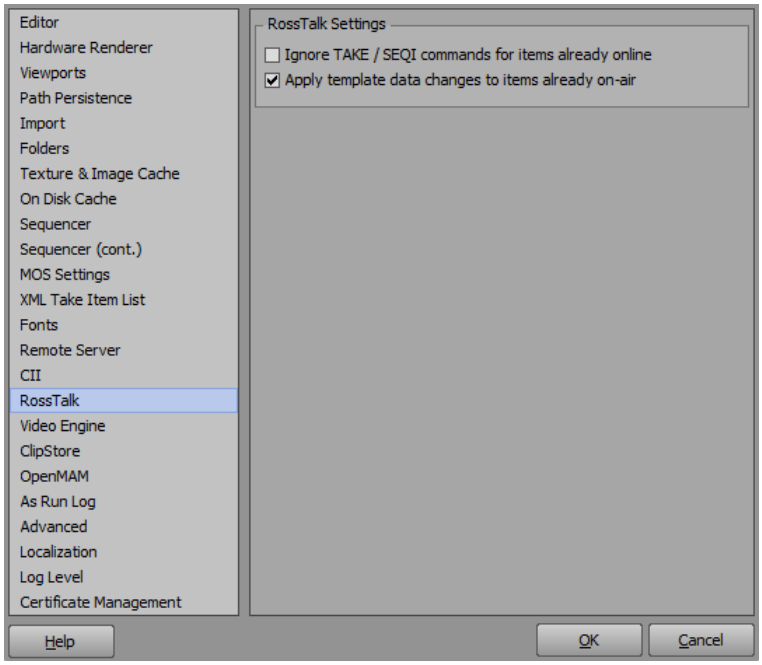
6. In the **External Data Updates (X\ commands)** section, select from the following options as needed:
   - Select **Enable External Data Updates** to query for updates to data from external devices that support the workflow.
   - Select **Send **** for Tab Data Message ID** when using a system that doesn't support field ID messages.
   - Select **Update only on Manual Update Request** to disable the automatic CII X\ requests when cueing an item.
7. In the **Number of digits in Field Number** field, enter or select a number of digits to use for the CII external update command field numbers.
8. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

RossTalk

Use the **RossTalk** panel to configure the RossTalk settings for XPression.

To configure the RossTalk settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **RossTalk** panel.



3. In the **RossTalk Settings** section, select **Ignore TAKE / SEQI commands for items already online** to ignore TAKE and SEQI RossTalk commands for an item if it is already in the online state.
4. Select **Apply template data changes to items already on-air** to allow RossTalk TEMPLATEDATA commands to update published fields in sequencer items that are already on-air.

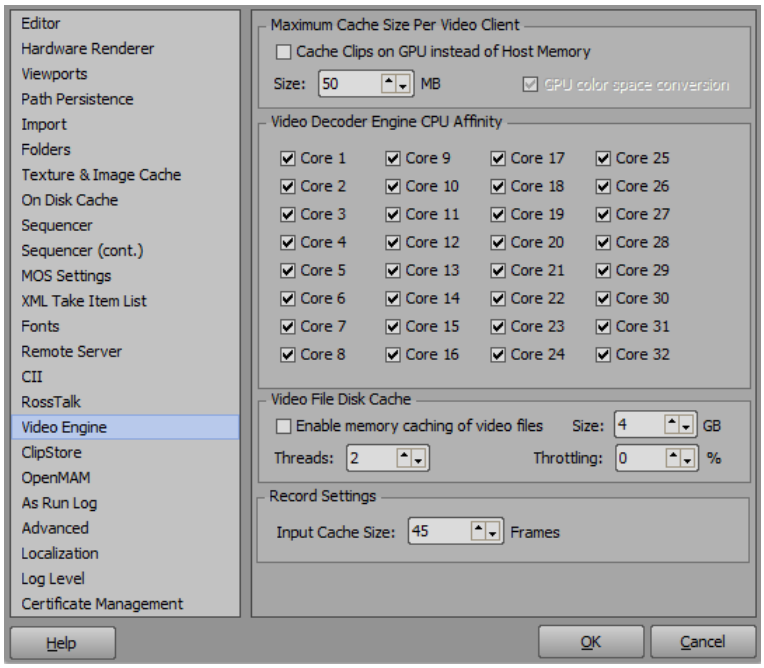
   This option is selected by default.
5. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Video Engine

Use the **Video Engine** panel to configure the cache size and select the CPU core of the video clients. You can also cache video files and set the **Input Cache Size**.

To configure the video client settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Video Engine** panel.



3. In the **Maximum Cache Size Per Video Client** section, select **Cache Clips on GPU instead of Host Memory** to cache directly on the GPU to improve playback performance.

   If **Cache Clips on GPU instead of Host Memory** is selected, the **GPU color space conversion** option is automatically enabled.

   This option means that the XPVC2 video codec will provide XPression with YCoCg 4:2:2 data, which requires less bandwidth than ARGB (4:4:4).

   This option is only for XPVC2 and requires both XPression and the codec to be of build 12.4.6094 or later.
4. In the **Size** field, enter or select the maximum cache size in MB per video client.
5. In the **Video Decoder Engine CPU Affinity** section, select the CPU core of the video client.
6. In the **Video File Disk Cache** section, do the following:
   - Select the **Enable memory caching of video files** to enable video file caching.

   The remaining options should only be changed with the guidance of Ross Video Technical Support.
   - In the **Size** field, enter or use the arrows to select the size (in GB) of the video file cache.
   - In the **Threads** field, enter or use the arrows to select the number of threads to use for simultaneous loading of video files into memory.
   - In the **Throttling** field, enter or use the arrows to the select the percentage of throttling for the read-ahead threads.
7. In the **Record Settings** section, in the **Input Cache Size** field, enter or select the number of frames to

cache when recording with the **Record Client**.

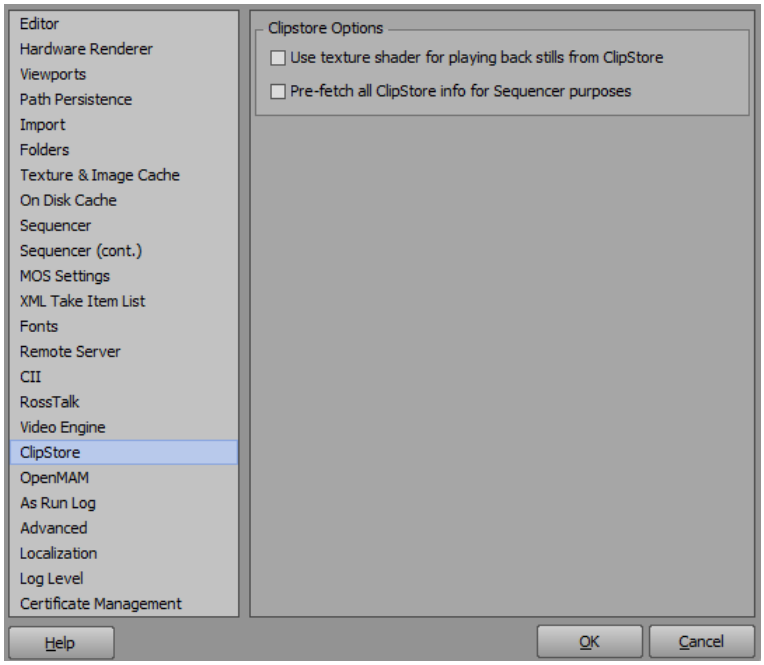
8. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

ClipStore

Use the **ClipStore** panel to configure the ClipStore **Texture Shader** option for XPression.

To configure the ClipStore Texture Shader option:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **ClipStore** panel.



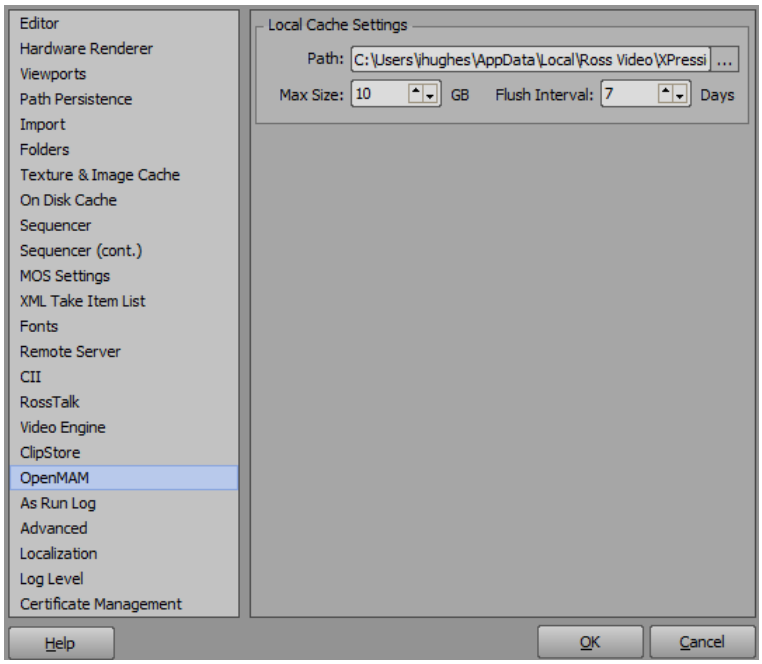
3. In the **ClipStore Options** section, select from the following as needed:
   - **Use texture shader for playing back stills from ClipStore** to assign ClipStore stills to published material using a texture shader instead of a video shader.
   - **Pre-fetch all ClipStore info for Sequencer purposes** to speed up cueing take items containing several clips from the ClipStore.
4. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

OpenMAM

Use the **OpenMAM** panel to configure the cache settings for items retrieved from remote asset management systems.

To configure the cache settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **OpenMAM** panel.



3. In the **Local Cache Settings** section, in the **Path** field, enter the full path to the folder or select **Browse (...)** to locate and select the folder in which to store items retrieved from remote asset management systems.
4. In the **Max Size** field, enter or select the maximum size limit in MB for the total of all the cache files stored in the cache folder.
5. In the **Flush Interval** field, enter or select the interval at which OpenMAM assets that aren't being used should be flushed from the system.
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

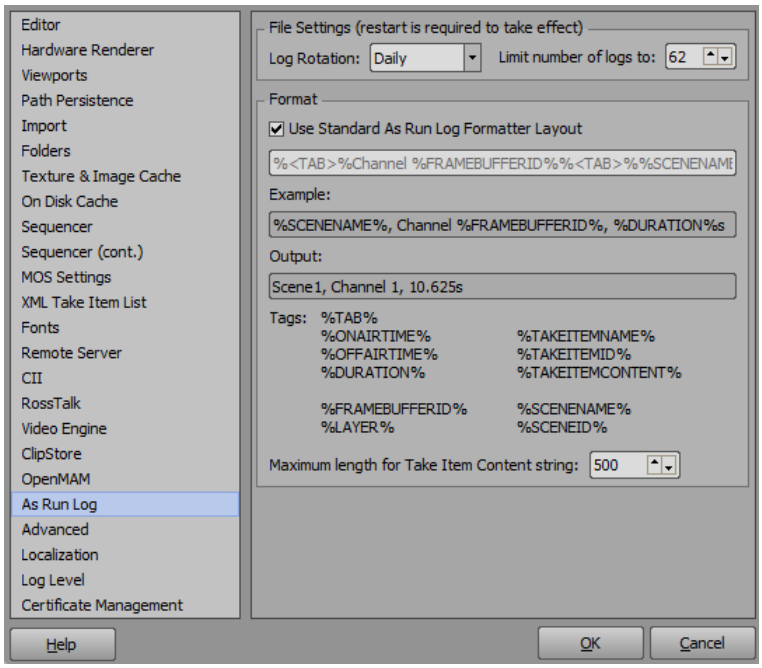
As Run Log

Use the **As Run Log** panel to configure the file settings and format for the XPression As Run Log.

The **As Run Log** is located in **C:\Program Files (x86)\XPressionStudio\logs\AsRun**.

To configure the As Run Log settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **As Run Log** panel.



3. In the **File Settings** section, from the **Log Rotation** drop-down, select the frequency with which the logging takes place.

   The available options are:

   - **Daily**
   - **Weekly**
   - **Monthly**

4. In the **Limit number of logs to** field, enter or select the maximum number of log files to keep.

   ★XPression needs to be restarted for any changes to the file settings to take effect.

5. In the **Format** section, select **Use Standard As Run Log Formatter Layout** to set the **As Run Log** format to the standard layout required by the (external) XPression As Run Log formatter.
6. In the text field, enter a tag string for the items you want to log.

   Use the example string and output to assist in constructing the format using the available tags.

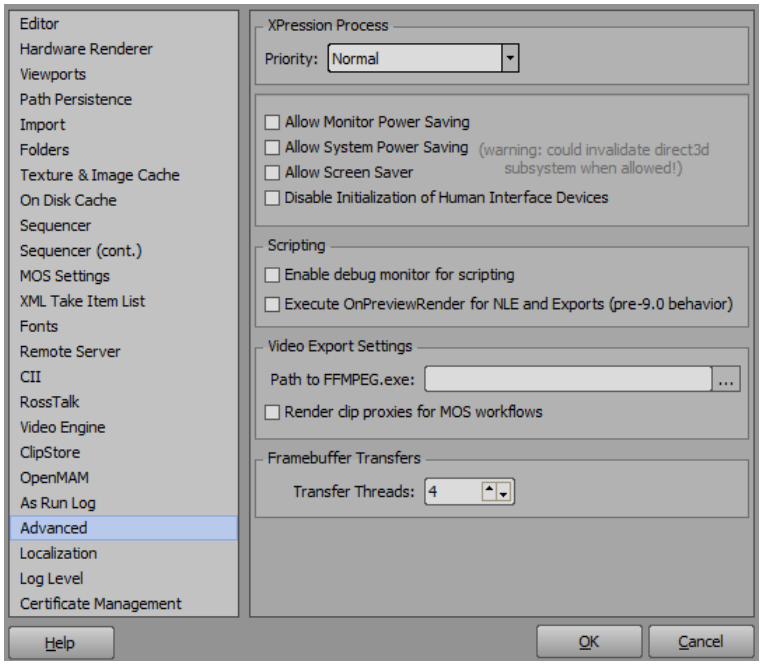
7. In the **Maximum length for Take Item Content string** field, enter or select a maximum character length for the take item content string logged in the **As Run** Log.
8. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Advanced

Use the **Advanced** panel to manage screen settings.

To configure the screen settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Advanced** panel.



3. In the **XPression Process** section, from the **Priority** drop-down, select the CPU usage priority for XPression.

   The available CPU usage priorities are:

   - **Normal** — evenly distribute the CPU time between system processes with similar priority.
   - **High** — give XPression preference and allocate the majority of the CPU time to XPression.
   - **Real-Time** — allocate all CPU time to XPression.

   ★Use the **Real-Time** CPU usage priority with caution, as this priority may cause other applications running on the XPression computer to freeze.

4. In the next section, select from the following options:

   - **Allow Monitor Power Saving** — to allow the monitor to run in sleep mode.
   - **Allow System Power Saving** — to reduce system load and save power while the system is idling.
   - **Allow Screen Saver** — to allow the screen saver to run.

     ★A screen saver may compromise output performance. For maximum performance, clear this checkbox to stop the screen saver from running on the XPression computer.

   - **Disable Initialization of Human Interface Devices** — to ignore a 3Dconnexion 3D mouse connected to an XPression system.

5. In the **Scripting** section, select from the following options as needed:
   - **Enable debug monitor for scripting** — display errors and warnings from the scripting engine.
   - **Execute OnPreviewRender for NLE and Exports (pre-9.0 behavior)** — allow **OnPreviewRender** scripts to be run in NLE workflows and when exporting to images or video.
6. In the **Video Export Settings** section, do the following:
   - In the **Path to FFMPEG.exe** field, enter the full path to an FFMPEG executable or select **Browse (...)** to locate the executable (if using XPression 64-bit).

     ★XPression 64-bit editions cannot use QuickTime for export, so it is necessary to use a user-supplied FFMPEG version to perform a .MOV export.
   - Select the **Render clip proxies for MOS workflows** checkbox, to automatically generate proxies when clips are created in the **Sequencer** and/or sent to the clipstore directly from the Record Client.
7. In the **Framebuffer Transfers** section, use the arrows to enter the number of **Transfer Threads** to use simultaneously.

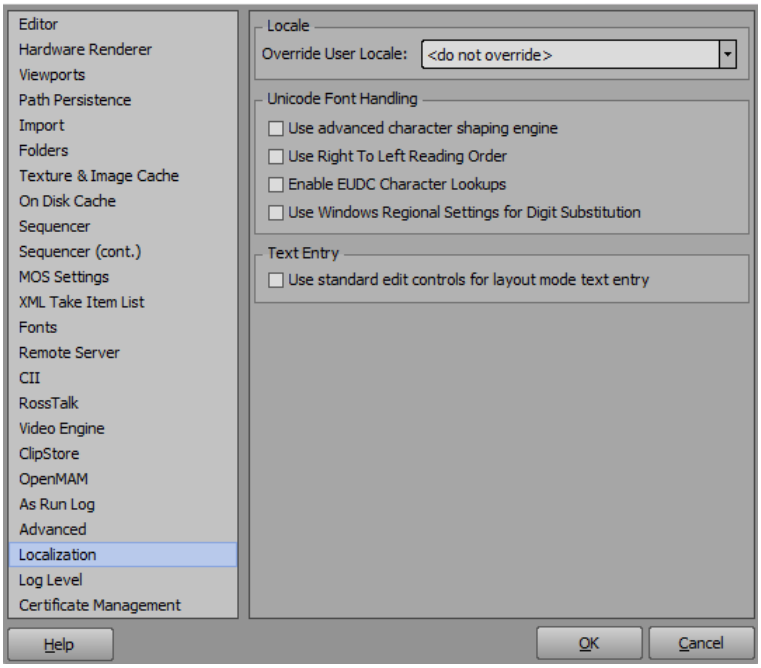
   Using several transfer threads can speed up framebuffer transfers, but having too many transfer threads can ultimately slow down processing. The optimal setting is **4**. Only change this setting if advised to do so by technical support personnel.
8. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Localization

Use the **Localization** panel to configure regional language settings.

To configure regional language settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Localization** panel.



3. In the **Locale** section, from the **Override User Locale** drop-down, select a place to use instead of the local settings.
4. In the **Unicode Font Handling** section, select from the following options as needed:

   Use advanced character shaping engine — enable optimal support for languages with diacritic marks and character shaping.

   Use Right To Left Reading Order — default certain XPression components to right-to-left mode for Arabic language users.

   Enable EUDC Character Lookups — enable end user defined character lookups.

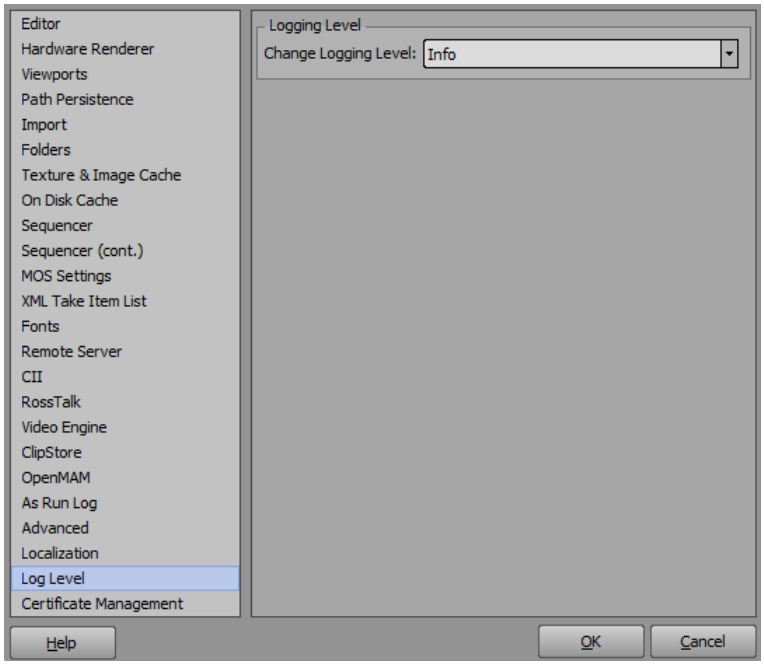
   Use Windows Regional Settings for Digit Substitution — enable the use of Windows settings for digit substitution (for example, Arabic and Persian languages).
5. In the **Text Entry** section, select **Use standard edit controls for layout mode text entry** to enable use of the text tab for text entry in layout mode when not using right to left languages.
6. Select **OK** to close the **Preferences** window or select another panel to continue with configuring your preferences.

Log Level

Use the **Log Level** panel to configure the XPression log settings.

To configure the log settings:

1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Log Level** panel.



3. In the **Logging Level** section, from the **Change Logging Level** drop-down, filter the items displayed in the XPression log.

   The options are:

   - **Emergency** — only display instances of emergencies in the XPression log.
   - **Alert** — only display instances of alerts in the XPression log.
   - **Critical** — only display instances deemed critical in the XPression log.
   - **Error** — only display errors in the XPression log.
   - **Warning** — only display warnings in the XPression log.
   - **Notice** — only display notices in the XPression log.
   - **Info (default)** — display all actions and items in the XPression log.

4. Select **OK** to close the **Preferences** window.

Certificate Management

Use the **Certificate Management** panel to check if a certificate has been assigned to XPression and to access the Ross Graphics Certificate Manager to assign a certificate, if necessary.

For issues with certificates, see Appendix B: Troubleshooting Certificates.

The following procedures are described in this topic:

Assigning a certificate

Replacing an expired certificate

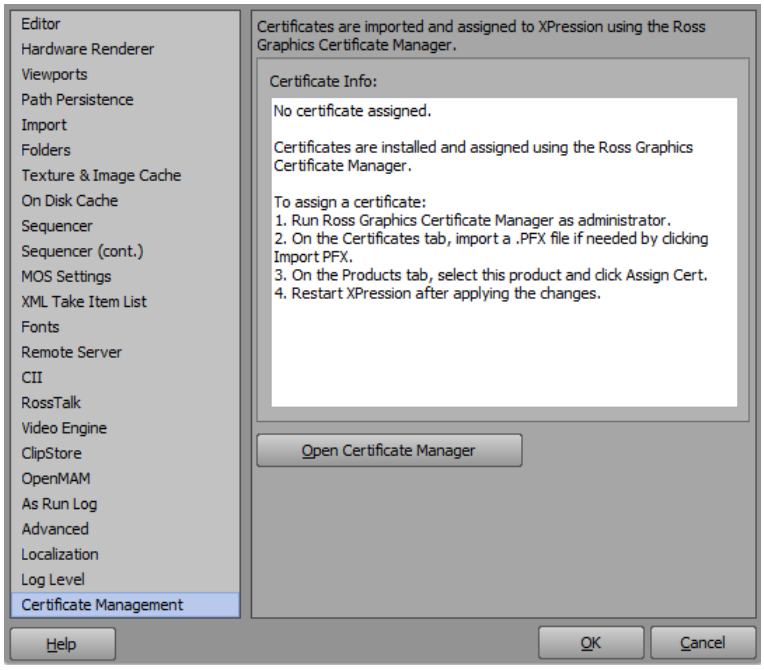
Adding a certificate to the Ross Graphics Certificate Manager

Viewing certificate details

To assign a certificate to XPression:

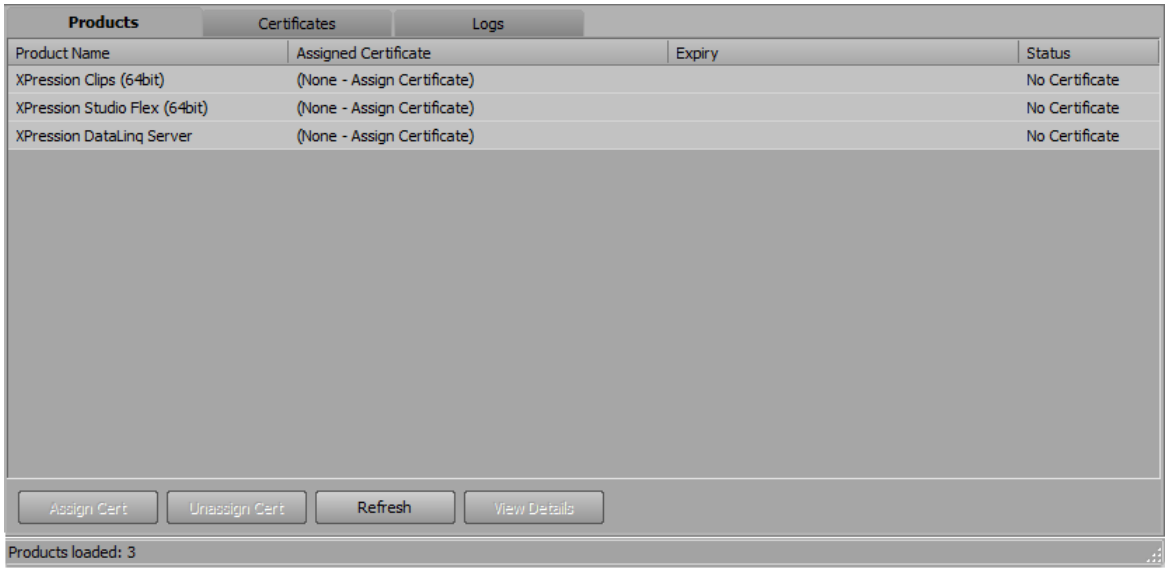
1. Select **Edit > Preferences**.
2. In the **Preferences** window, select the **Certificate Management** panel.

   If there is no certificate assigned to XPression, you will see the **Certificate Info** shown in the image below:



3. Select the **Open Certificate Manager** button to launch the **Ross Graphics Certificate Manager**.

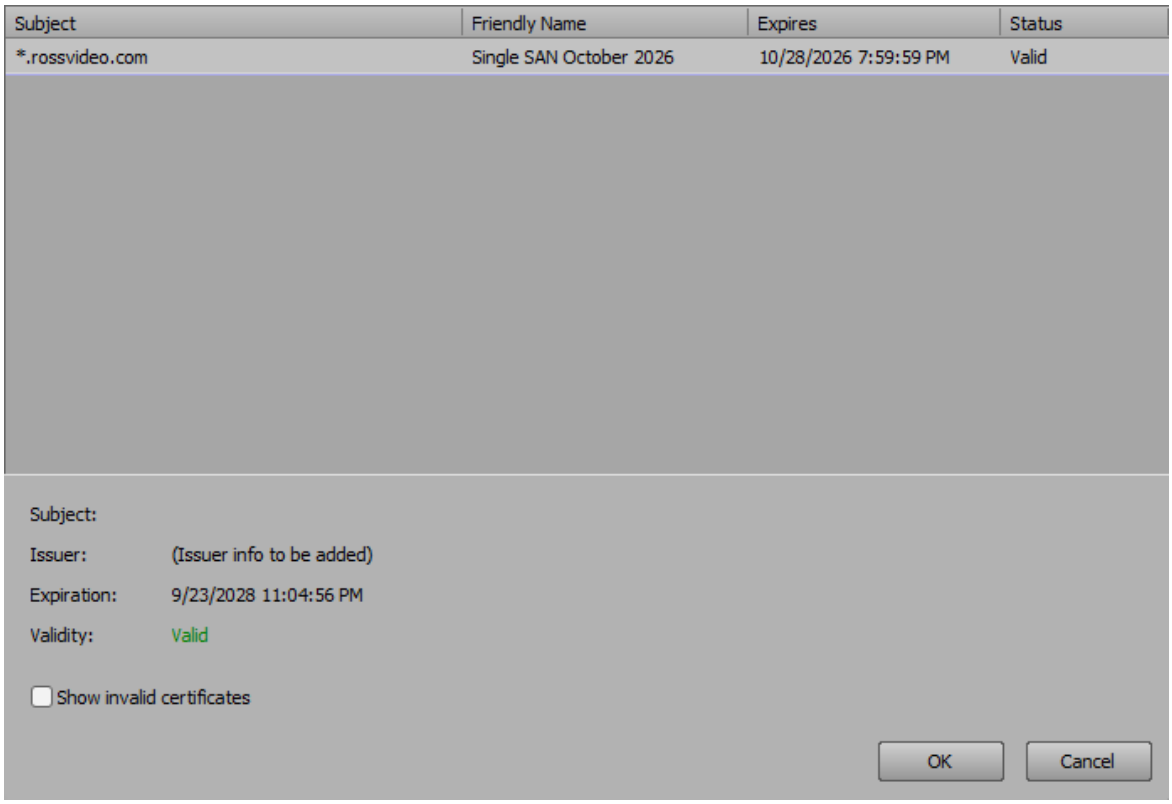
The **Ross Graphics Certificate Manager** application opens.



4. In the **Products** tab, select XPression and then select **Assign Cert**.

   The same certificate can be assigned to multiple products.

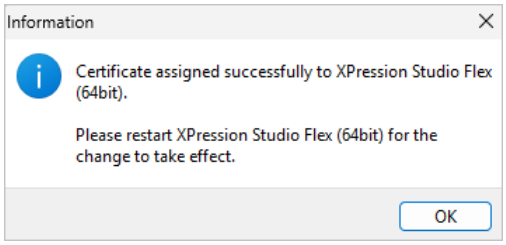
   The **Select Certificate** dialog opens.



5. Select the certificate you want to assign to XPression, and then select **OK**.

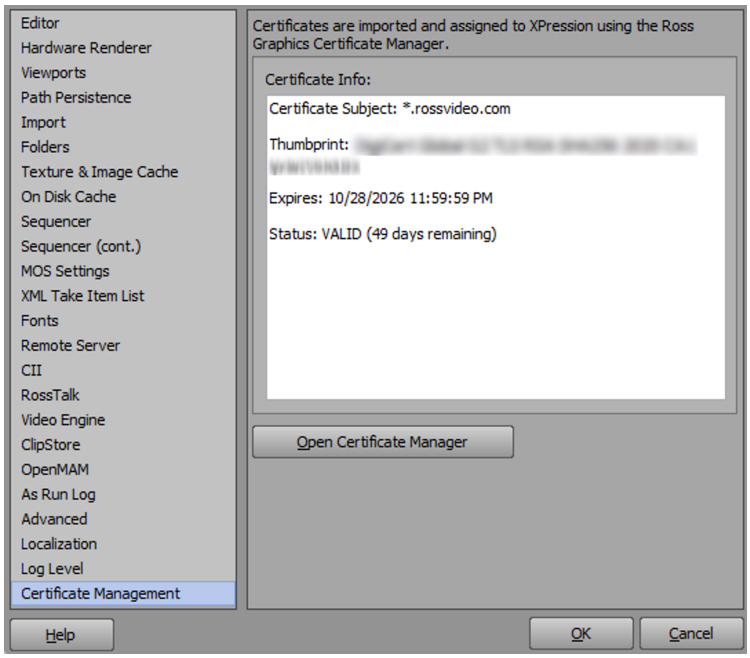
   If there are no certificates displayed, see To add a certificate to the Ross Graphics Certificate Manager.

6. An **Information** dialog opens to indicate that the certificate was successfully assigned.



7. Select **OK**, and then shut down and relaunch XPression from the Windows **Start** menu.

   When a certificate has been assigned to XPression, in the **Certificate Management** section, you will see the **Certificate Info** as shown in the image below:

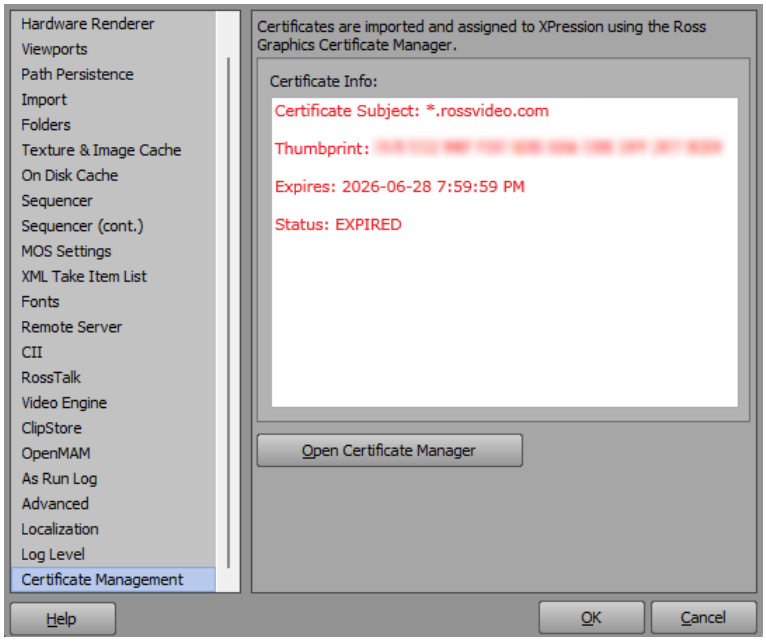


★Assigning a certificate alone does not mean that communication is secure. You will also need to enable secure communication in each connected application (e.g., RossTalk, RossLinq, DataLinq, etc.).

To replace an expired certificate:

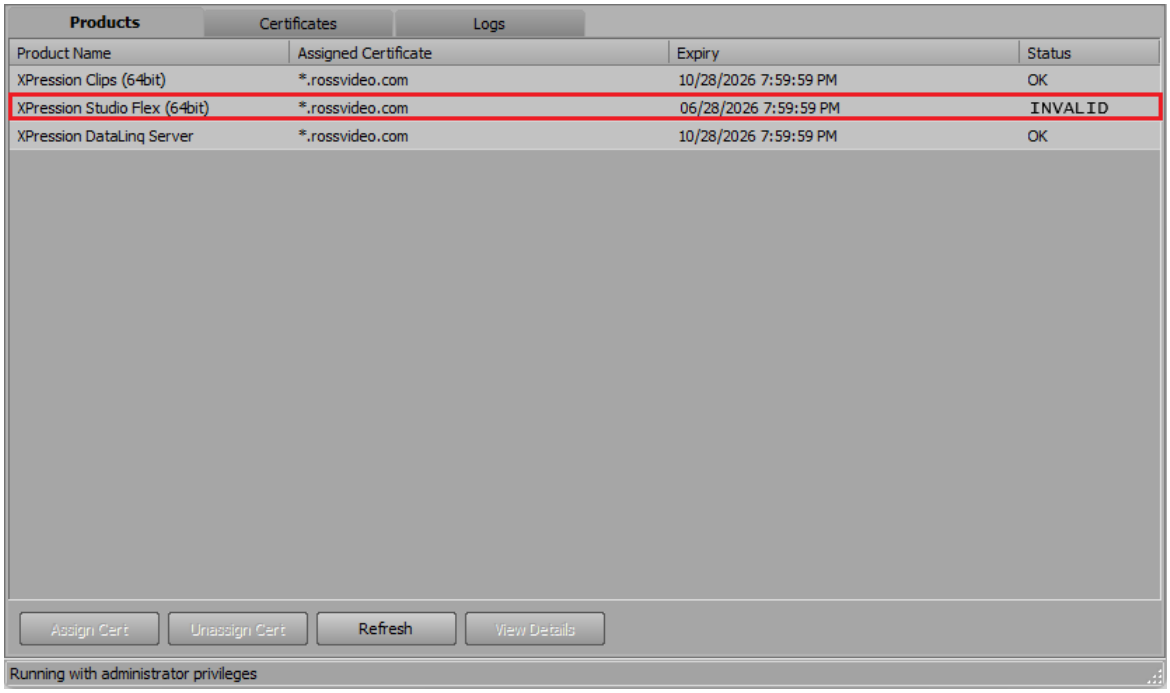
1. Select **Certificate Management**.

   The **Certificate Management** section opens in the main window. If the current certificate has expired, you will see the following info:



2. Select **Open Certificate Manager**.

   The **Ross Graphics Certificate Manager** opens. You will see that the XPression **Status** column indicates **INVALID**.



3. Select the XPression product and then select **Unassign Cert**.
4. In the **Confirmation** dialog, select **Yes**.

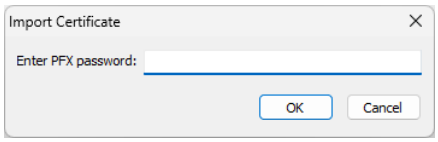
5. In the **Information** dialog, select **OK**, but do not restart XPression yet.
6. Select the XPression product again, and then select **Assign Cert**.
7. In the **Select Certificate** window, select the certificate you want to assign to XPression and then select **OK**.

   If there are no certificates showing, see To add a certificate to the Ross Graphics Certificate Manager.
8. In the **Information** dialog that indicates the certificate has been successfully assigned, select **OK**.
9. Shut down and relaunch XPression from the Windows **Start** menu.

To add a certificate to the Ross Graphics Certificate Manager:

1. In the **Certificates** tab, select **Import PFX**, then navigate to and select the **.PFX** certificate file.

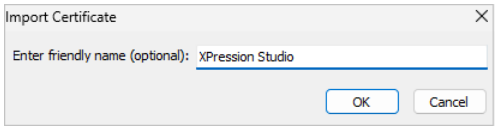
   Contact your IT department to get the location of the **.PFX** certificate file.
2. The **Import Certificate** dialog opens.



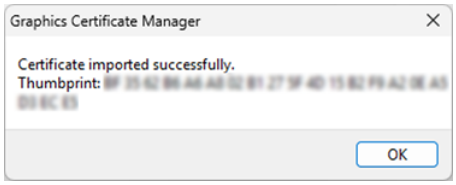
3. In the **Import Certificate** dialog, enter the **.PFX** password and select **OK**.

   Contact your IT department to get this password.
4. In the next dialog, enter a "friendly name" for the certificate.

   This is optional but will help you identify the certificate later, if necessary.



5. The **Graphics Certificate Manager** dialog opens indicating that the import was successful.



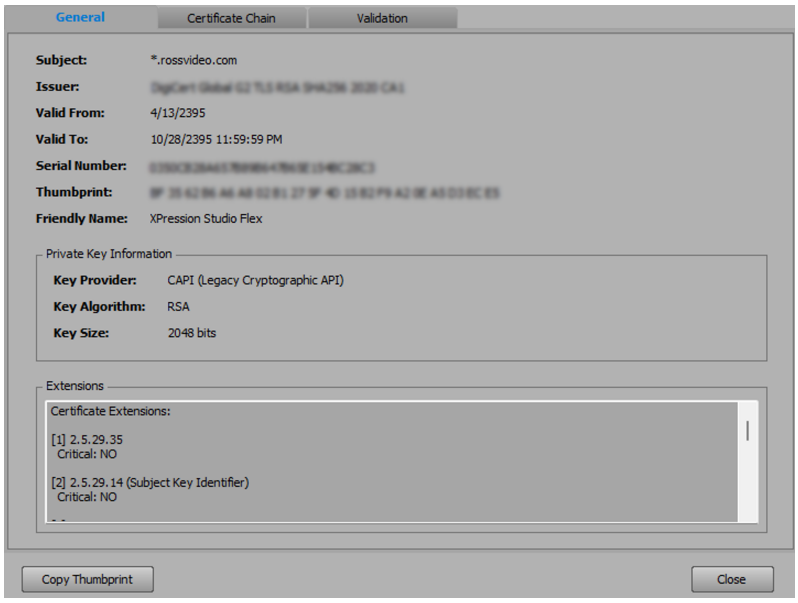
6. Select **OK** to close the dialog.

   You can now assign this certificate to XPression.

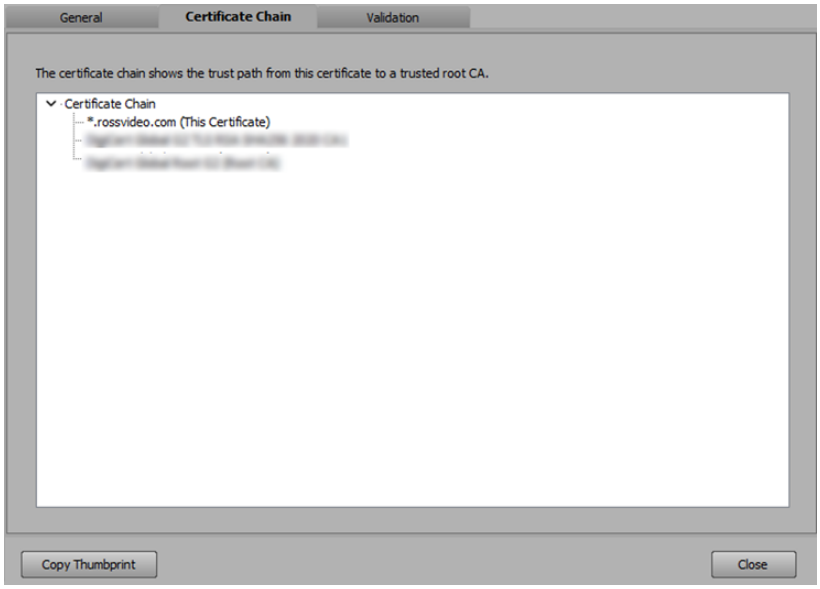
To view certificate details:

1. Select the **Certificates** tab.
2. Select a certificate and either double-click it or select the **View Details** button.

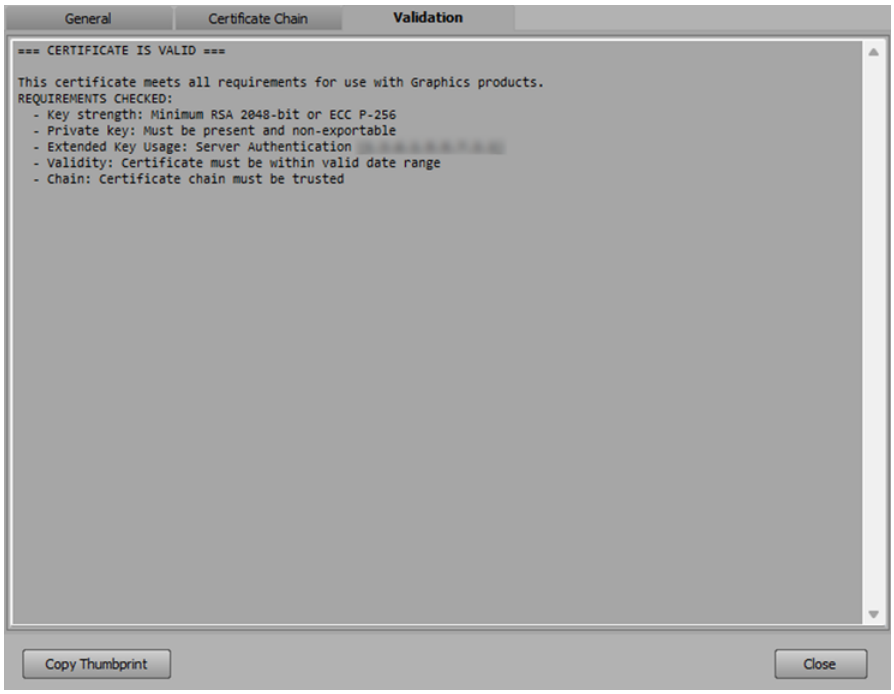
   The **Certificate Details** window opens on the **General** tab.



3. Select **Copy Thumbprint** to configure a non-XPression application to use the certificate or if you need to search for the thumbprint in a log file.
4. Select the **Certificate Chain** tab to view the trust path from the certificate to a trusted root CA.



5. Select the **Validation** tab to view the requirements that have been met by the certificate.



6. Select **Close** to exit the **Certificate Details**.

Configuring an AJA NTV2 Video FrameBuffer

This topic describes the selection and configuration of an AJA NTV2 video framebuffer.

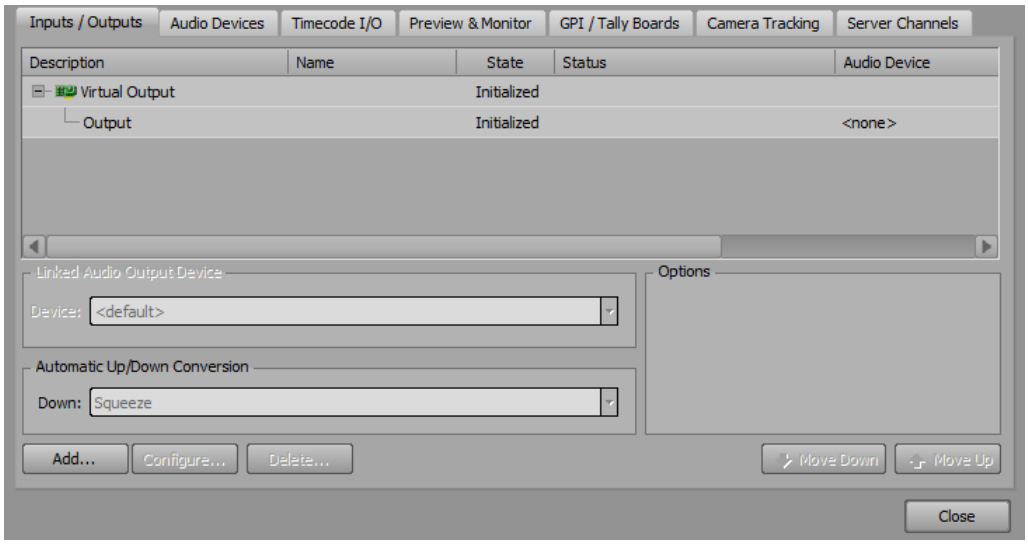
The NTV2 framebuffer is a dedicated video channel provided by an AJA card that XPression can use to ingest live video, output graphics, or perform key/fill playout within a professional broadcast workflow.

To select an AJA NTV2 Video FrameBuffer:

1. In XPression, select **Edit > Hardware Setup**.

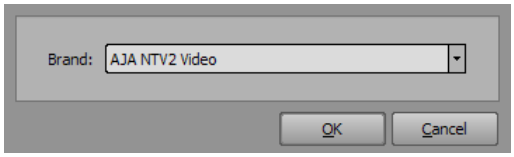
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **AJA NTV2 Video**.
5. Select **OK**.

   The **AJA NTV2 Video - Framebuffer Setup** dialog opens.

   Continue with configuring the **Hardware**, **GenLock** and **I/O** settings in the Board tab.

   When the configuration is complete, the configured AJA NTV2 Video framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

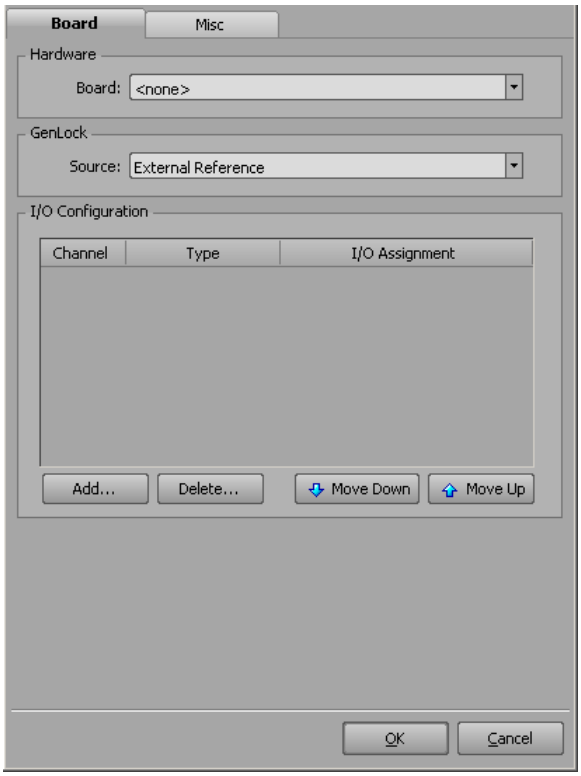
6. Select **Close** to exit the **Hardware Setup** dialog.

Board

This section describes how to configure an AJA NTV2 video framebuffer board.

To configure the AJA NTV2 Video FrameBuffer Board:

1. Select the **Board** tab.



2. Configure the following settings:

   Hardware

   Genlock

   I/O Configuration

Hardware

To configure the Hardware board:

- In the **Hardware** section, from the **Board** drop-down, select the installed board.

  This menu is automatically populated based on installed hardware (such as Corvid22, Corvid88, Kona IP).

Genlock

- In the **GenLock** section, from the **Source** drop-down, select the source of the GenLock signal with which to synchronize XPression.

  The available GenLock signal sources are as follows:

  External Reference — Synchronize with a GenLock signal received from an external application through the GenLock In port of the XPression computer. Ross Video recommends using an external reference for the GenLock signal source.

  Input 1 — Sync to Video In 1 source signal.

  Input 2 — Sync to Video In 2 source signal.

  Input 3 — Sync to Video In 3 source signal.

  Input 4 — Sync to Video In 4 source signal.

  Input 5 — Sync to Video In 5 source signal.

  Input 6 — Sync to Video In 6 source signal.

  Input 7 — Sync to Video In 7 source signal.

  Input 8 — Sync to Video In 8 source signal.

  Free Running — Do not synchronize XPression with an external source.

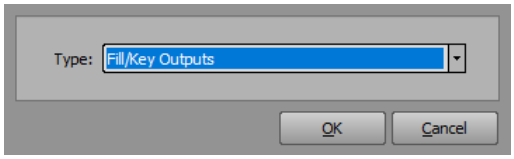
  ★The availability of inputs depends on the output board of the XPression system. For example: up to two inputs with the Corvid22 or up to eight inputs with the Corvid88.

  ★If the output keying mode is set to **Internal** in the **Output** tab, it is recommended that the GenLock source be set to an SDI input.

I/O Configuration

1. In the **I/O Configuration** section, select **Add** to add an input or output channel.

   The **Select I/O Type** dialog opens.



2. From the **Type** drop-down, select an input /output type.

   The options are:

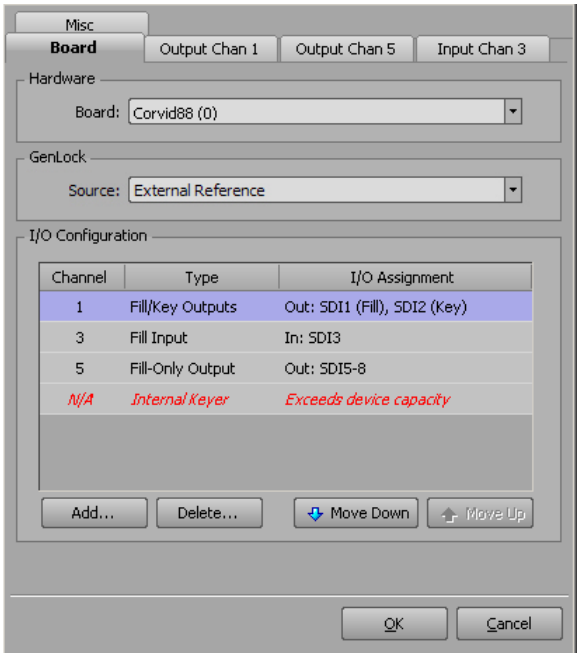
   - **<none>** (this option is not applicable)
   - **Fill-Only Output** (1 output, no input) (requires a separate license or the XPression Clips option)
   - **Fill/Key Outputs** (2 outputs, no input)
   - **Fill Input** (1 input, no output)
   - **Internal Keyer** (1 input, 1 output)

   ★If the installed card does not have bidirectional I/Os, adding the output channels before the input channels is recommended.

3. Select **OK**.

   The input/output assignment is added to the **I/O Configuration** list.

4. Repeat steps 1 to 3 to add as many input and output channels as necessary.



   ★SDI channel assignments are automatic and any channels beyond the number of channels supported by the graphics card will be listed as N/A.

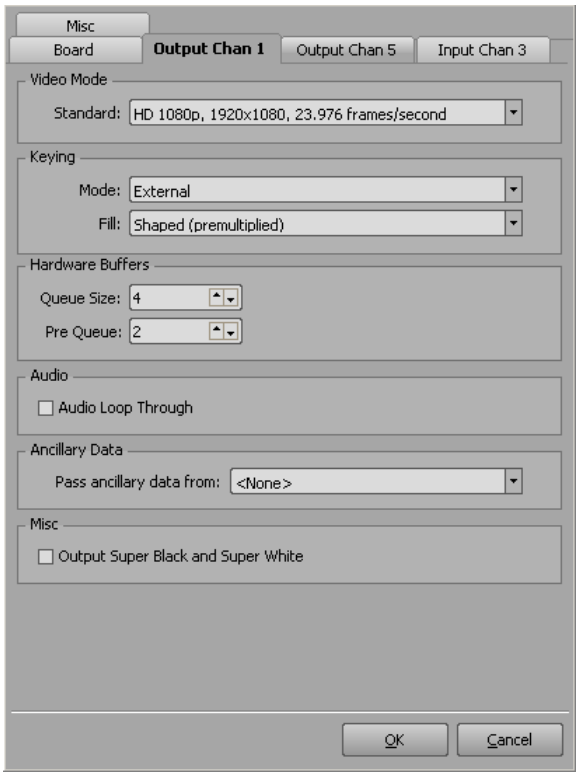
   Continue with configuring the Output settings.

Outputs

This section describes how to configure the output channels of an AJA NTV2 video framebuffer.

To configure the Output Channels:

1. Select an **Output** tab to configure output channel settings.



2. In the **Video Mode** section, from the **Standard** drop-down, select the video format in which to output an XPression project.

   ★When configuring more than one output, they must share the same base frame rate that matches the GenLock reference.

   The available formats depend on the graphics card in your system.

Video Formats

- **<from project>** — automatically switch the output video format to the video format of the currently loaded project.

  The project video format is ignored when a specific output video format is selected, and the selected video format is used to play out scenes.

- **PAL, 720x576, 25 frames/second**
- **NTSC, 720x486, 29.97 frames/second**
- **HD 1080i, 1920x1080, 25 frames/second**
- **HD 1080i, 1920x1080, 29.97 frames/second**
- **HD 1080p, 1920x1080, 23.976 frames/second**
- **HD 1080p, 1920x1080, 29.97 frames/second**

- **HD 1080p, 1920x1080, 50 frames/second**
- **HD 1080p, 1920x1080, 59.94 frames/second**
- **HD 1080p, 1920x1080, 60 frames/second**
- **HD 720p, 1280x720, 50 frames/second**
- **HD 720p, 1280x720, 59.94 frames/second**
- **HD 720p, 1280x720, 60 frames/second**
- **HD 1080psf, 1920x1080 23.976 frames/second**
- **HD 1080psf, 1920x1080 24 frames/second**
- **HD 1080psf, 1920x1080 25 frames/second**
- **HD 1080psf, 1920x1080 29.97 frames/second**
- **HD 1080psf, 1920x1080 30 frames/second**
- **UHD 2160p (Quad), 3840x2160, 29.97 frames/second**
- **UHD 2160p (Quad), 3840x2160, 50 frames/second**
- **UHD 2160p (Quad), 3840x2160, 59.94 frames/second**
- **UHD 2160p (2SI), 3840x2160, 29.97 frames/second**
- **UHD 2160p (2SI), 3840x2160, 50 frames/second**
- **UHD 2160p (2SI), 3840x2160, 59.94 frames/second**
- **UHD 2160psf (Quad), 3840x2160, 23.976 frames/second**
- **UHD 2160psf (Quad), 3840x2160, 24 frames/second**
- **UHD 2160psf (Quad), 3840x2160, 25 frames/second**

★UHD formats are only available on cards that support UHD.

3. In the **Keying** section, from the **Mode** drop-down select how graphics are output to a video stream.

   The available modes are as follows:

   - **Off (Fill Only)** — output a video signal with no key.
   - **External** — output the key and fill graphics as separate video signals. Graphics mixing occurs in an external keyer/mixer.
   - **Internal** — key and fill graphics are mixed internally and output as a single video signal from the framebuffer. In this mode the framebuffer functions as the keyer/mixer.

   ★Selecting external or internal keying will change the number of inputs/outputs required and the I/O assignments in the **Board** tab.

   ★If the output keying mode is set to Internal, it is recommended that the GenLock source in the **Board** tab be set to an SDI input.

4. When **External** is selected from the **Mode** drop-down, use the **Fill** drop-down to select the method used to process fill graphics before output.

   The available processing methods are as follows:

   - **Shaped (premultiplied)** — multiply/shape the fill signal color information by the luminance information in the key signal.
   - **Unshaped** — output fill and key signals "as is".

5. In the **Hardware Buffers** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to the output.

   Use this setting to avoid buffer under runs, which may cause frame skipping. Larger queue sizes ensure smooth playout of generated graphics, but add delay to the output.

6. In the **Pre Queue** field, enter or select the number of frames to buffer for the pre-queue.

   The pre-queue size can be between 1 and 8.

7. In the **Audio** section, select the **Audio Loop Through** checkbox to enable embedded audio loop through.

   This option applies to internal keyer only.

8. In the **Ancillary Data** section, select the **Pass Ancillary Data From** checkbox and from the drop-down, select an input from which to pass the vertical ancillary data from a live source.

   The functionality of this feature is based on the availability of an ancillary input that is determined by the installed output board.

9. In the **Misc** section, select the **Output Super Black and Super White** to output using the full super black to super white range.

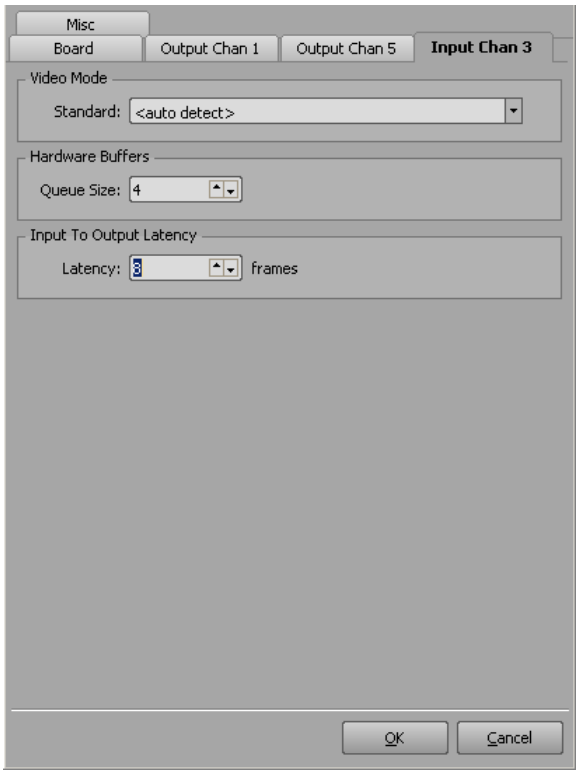
   Continue with configuring the Input settings.

Inputs

This section describes how to configure the input channels of an AJA NTV2 video framebuffer.

To configure the input channels:

1. Select the **Input** tab to configure input settings.



2. In the **Video Mode** section, from the **Standard** drop-down, select the video format in which to receive video.
3. In the **Hardware Buffers** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to XPression.
4. In the **Input to Output Latency** section, in the **Latency** field, enter or select a fixed delay, in frames, between the input and output.

   To remain fixed, the delay must be large enough to accommodate the **Queue Size** and **Pre Queue** values in the **Hardware Buffers** section.

   Continue with configuring the Miscellaneous settings.

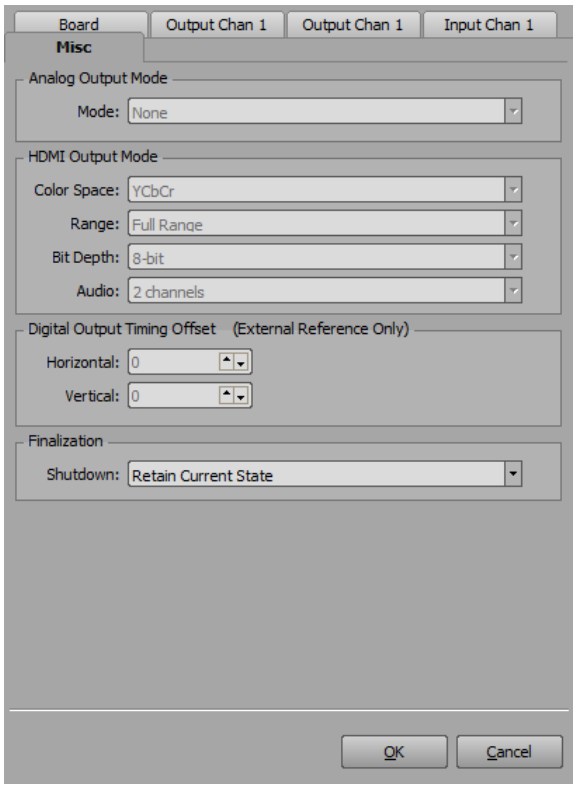
Misc

This section describes how to configure the miscellaneous settings of an AJA NTV2 video framebuffer.

To configure the miscellaneous settings:

1. Select the **Misc** tab.

   ★Analog output and HDMI output are only available on cards that provide them.



2. In the **Analog Output Mode** section, from the **Mode** drop-down, select the video format in which to output an analog video signal.
3. In the **HDMI Output Mode** section, from the **Color Space** drop-down, select the specific organization of colors for the HDMI output.

   The options are:

   - **YCbCr**
   - **RGB**
4. From the **Range** drop-down, select the color range for the selected color space.

   The options are:

   - **SMPTE Range**
   - **Full Range**

5. From the **Bit Depth** drop-down, select the number of bits used for a pixel.

   The options are:

   - **8-bit**
   - **10-bit**

6. From the **Audio Channels** drop-down, select the number of audio channels to output.

   The options are:

   - **2 channels**
   - **8 channels**

7. In the **Digital Output Timing Offset** section, enter the following information:

   - In the **Horizontal** field, enter or select the horizontal delay timing offset with regards to an external reference.

     This setting is for external reference only.

   - In the **Vertical** field, enter or select the number of lines for vertical delay timing offset with regards to an external reference.

     This setting is for external reference only.

8. In the **Finalization** section, from the **Shutdown** drop-down, select the video state at shutdown.

   The available states are as follows:

   - **Retain Current State** — do not clear the content of the framebuffers on shutdown.
   - **Clear Framebuffers** — clear all framebuffers from the output framebuffer.

   If the installed card provides up/down conversion, continue with the Conversion settings to enable or disable output conversion to a predefined signal.

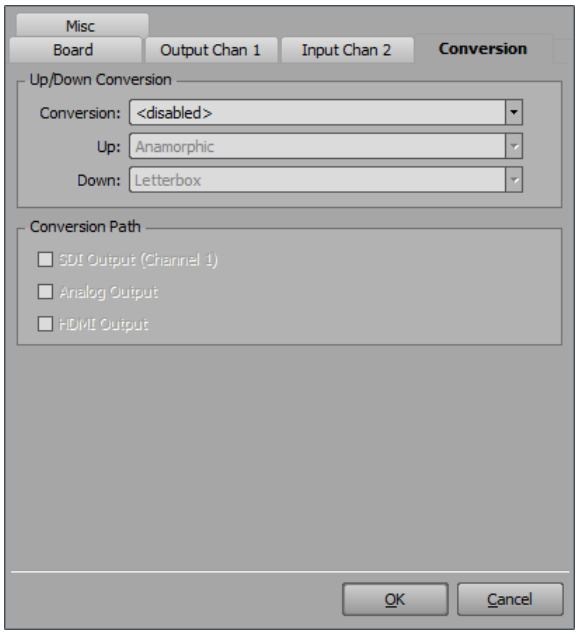
   Otherwise, continue with configuring the IP settings.

Conversion

This section describes how to configure the conversion settings of an AJA NTV2 video framebuffer.

To configure the conversion settings:

1. Select the **Conversion** tab to enable or disable output conversion to a predefined signal.



2. In the **Up/Down Conversion** section, from the **Conversion** drop-down, select the video mode for the conversion.
3. From the **Up** drop-down, select a format for the up converted output.

   The available output formats are:

   - **Anamorphic** — display a full-screen image.
   - **Pillar box 4:3** — display a 4:3 image in the center of the screen with black sidebars.
   - **Zoom 14:9** — display a 4:3 image zoomed to fill a 14:9 image with black sidebars.
   - **Letterbox** — display an image zoomed to fill letterbox displays or display a reduced image with black bars added to top and bottom of the image area with aspect ratio preserved.
   - **Zoom Wide** — display an image zoomed and horizontally stretched to fill full screen.
4. From the **Down** drop-down, select a format for the down converted output.

   The available output formats are:

   - **Letterbox** — display a reduce image with black bars added to the top and bottom of the image area with the aspect ratio preserved.
   - **Crop** — crop the image to fit the new screen size.
   - **Anamorphic** — display a 16:9 image in a 4:3 box.

5. In the **Conversion Path** section, select the checkbox or checkboxes of the outputs to use to display the converted video:

   - **SDI Output (Channel 1)**
   - **Analog Output**
   - **HDMI Output**

   If configuring a Kona IP card, continue with configuring the IP settings.

   Otherwise, your AJA NTV2 framebuffer is now fully configured.

IP

This section describes how to configure the IP settings of an AJA NTV2 video framebuffer.

The settings in the IP tab will depend on the card firmware configuration. There are 2 options:

1-SFP — the primary streams will be on the top SFP module. If 1-SFP is enabled with 2022-7 protocol, the bottom SFP module will be used for the redundant streams.

2-SFP — the same primary streams will be on the top SFP module and others on the bottom SFP module.

Specifically:

- output streams 1 and 2 on the bottom
- output streams 3 and 4 on the top
- input streams 1 and 2 on the top
- input streams 3 and 4 on the bottom

1-SFP

2-SFP

1-SFP

This section describes the configuration for a 1-SFP module setup, with and without redundancy.

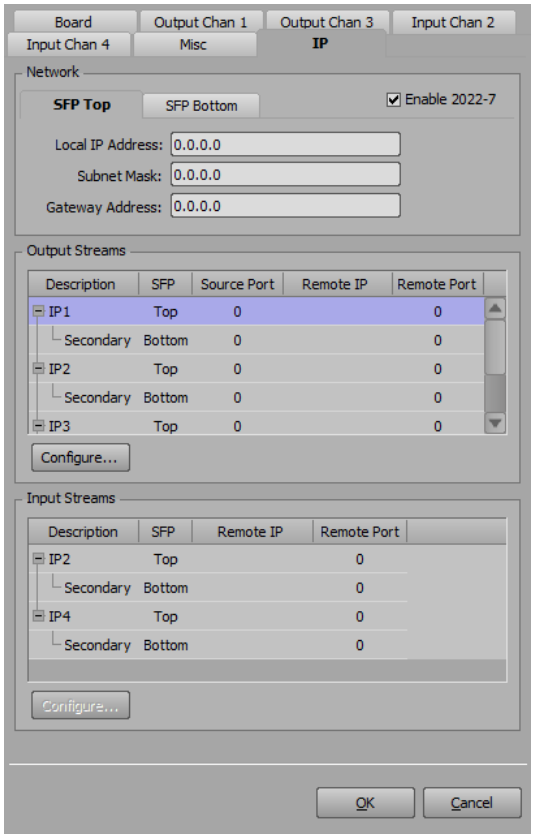
Configuring the IP settings with Redundancy

If you are using a second SFP module to provide redundancy, the output streams will include both a primary and secondary stream.

To configure the Network settings with redundancy:

1. Select the **IP** tab.

   The **IP** tab is displayed.

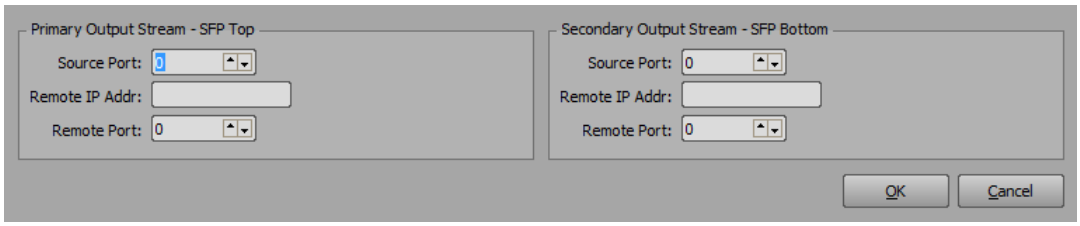


2. In the **Network** section, select the **Enable 2022-7** checkbox to use the 2022-7 standard to enable redundancy for the SFP module connection.
3. In the **SFP Top** and **SFP Bottom** tabs, in the **Local IP Address** field, enter the IP address of the location to connect the small form-factor pluggable transceiver.
4. In the **Subnet Mask** field, enter the subnet mask of the location to connect the small form-factor pluggable transceiver.
5. In the **Gateway Address** field, enter the IP address of the location to connect the small form-factor pluggable transceiver.
6. Continue with configuring the **Output Streams**.

To configure the Output Streams:

1. In the **Output Streams** section, select an output stream and then select **Configure**.

   The **AJA NTV2 - IP Output Stream Setup** dialog opens.



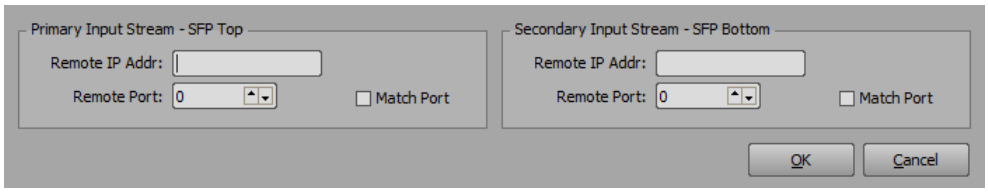
2. In the **Primary Output Stream - SFP Top** section, configure the following settings:
   - **Source Port** — use this box to enter or select the port number of the primary output stream source.
   - **Remote IP Addr** — use this box to enter the remote IP address of the primary output stream.
   - **Remote Port** — use this box to enter or select the remote port number for the primary output stream.
3. In the **Secondary Output Stream - SFP Bottom** section, configure the following settings:
   - **Source Port** — use this box to enter or select the port number of the secondary output stream source.
   - **Remote IP Addr** — use this box to enter the remote IP address of the secondary output stream.
   - **Remote Port** — use this box to enter or select the remote port number for the secondary output stream.
4. Select **OK**.

   The **AJA NTV2 - IP Output Stream Setup** dialog closes and the settings are added to the selected output stream.
5. Repeat steps 1 to 4 for any other output streams.
6. Continue with configuring the **Input Streams**.

To configure the Input Streams:

1. In the **Input Streams** section, select an input stream and then select **Configure**.

   The **AJA NTV2 - IP Input Stream Setup** dialog opens.



2. In the **Primary Input Stream - SFP Top** section, configure the following settings:
   - **Remote IP Addr** — use this box to enter the remote IP address of the primary video input stream.
   - **Remote Port** — use this box to enter or select the remote port number for the primary video input stream.
   - **Match Port** — select this check box to enable that the remote IP address and remote port must match. When not selected, only the remote IP address needs to match and the remote port is ignored.
3. In the **Secondary Input Stream - SFP Bottom** section, configure the following settings:
   - **Remote IP Addr** — use this box to enter the remote IP address of the secondary video input stream.
   - **Remote Port** — use this box to enter or select the remote port number for the secondary video input stream.
   - **Match Port** — select this check box to enable that the remote IP address and remote port must match. When not selected, only the remote IP address needs to match and the remote port is ignored.
4. Select **OK**.

   The **AJA NTV2 - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.
5. Repeat steps 1 to 4 for any other input streams.
6. When you have finished configuring the input streams, in the **Hardware Setup** dialog, select **Close**.

   The **Hardware Setup** dialog closes.

   The configured AJA Video framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

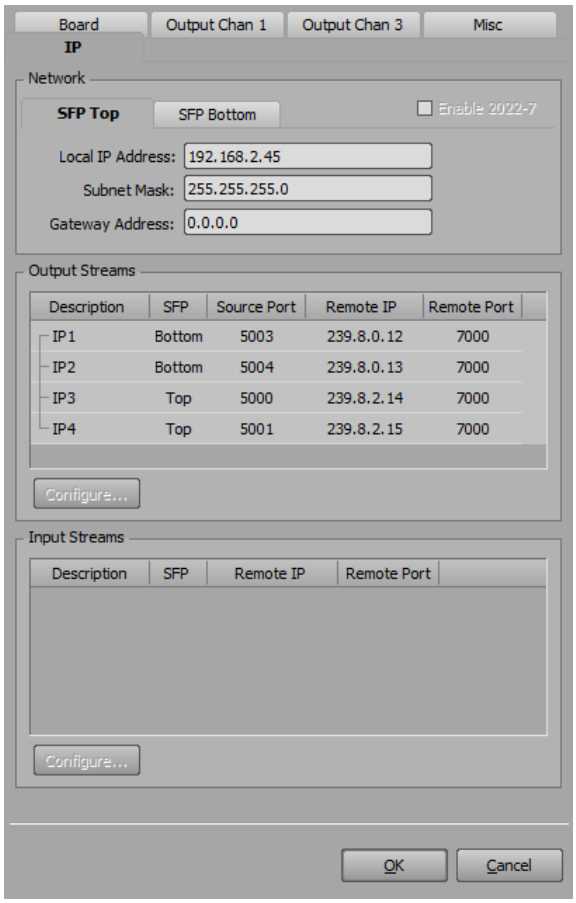
Configuring the IP Settings without Redundancy

If you do not require redundancy, you will only have primary output and input streams.

To configure the Network settings without redundancy:

1. Select the **IP** tab.

   The **IP** tab is displayed.

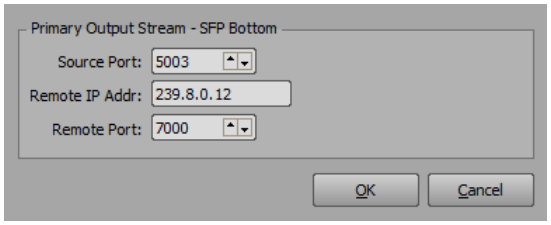


2. In the **Network** section, in the **SFP Top** and **SFP Bottom** tabs, in the **Local IP Address** field, enter the IP address of the location to connect the small form-factor pluggable transceiver.
3. In the **Subnet Mask** field, enter the subnet mask of the location to connect the small form-factor pluggable transceiver.
4. In the **Gateway Address** field, enter the IP address of the location to connect the small form-factor pluggable transceiver.
5. Continue with configuring the **Output Streams**.

To configure the Output Streams:

1. In the **Output Streams** section, select an output stream and then select **Configure**.

   The **AJA NTV2 - IP Output Stream Setup** dialog opens.



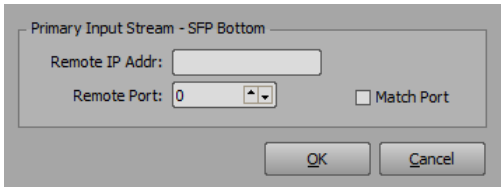
2. Configure the following settings:
   - **Source Port** — enter or select the port number of the primary output stream source.
   - **Remote IP Addr** — enter the remote IP address of the primary output stream.
   - **Remote Port** — enter or select the remote port number for the primary output stream.
3. Select **OK**.

   The AJA NTV2 - IP Output Stream Setup dialog closes and the settings are added to the selected output stream.
4. Repeat steps 1 to 3 for any other output streams.
5. Continue with configuring the **Input Streams**.

To configure the Input Streams:

1. In the **Input Streams** section, select an input stream and then select **Configure**.

   The **AJA NTV2 - IP Input Stream Setup** dialog opens.



2. Configure the following settings:

   - **Remote IP Addr** — enter the remote IP address of the primary video input stream.
   - **Remote Port** — enter or select the remote port number for the primary video input stream.
   - **Match Port** — select this checkbox to require that the remote IP address and remote port match.

   ★When not selected, only the remote IP address needs to match and the remote port is ignored.

3. Select **OK**.

   The **AJA NTV2 - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.

4. Repeat steps 1 to 3 for any other input streams.

5. When you have finished configuring the input streams, in the **Hardware Setup** dialog, select **Close**.

   The **Hardware Setup** dialog closes.

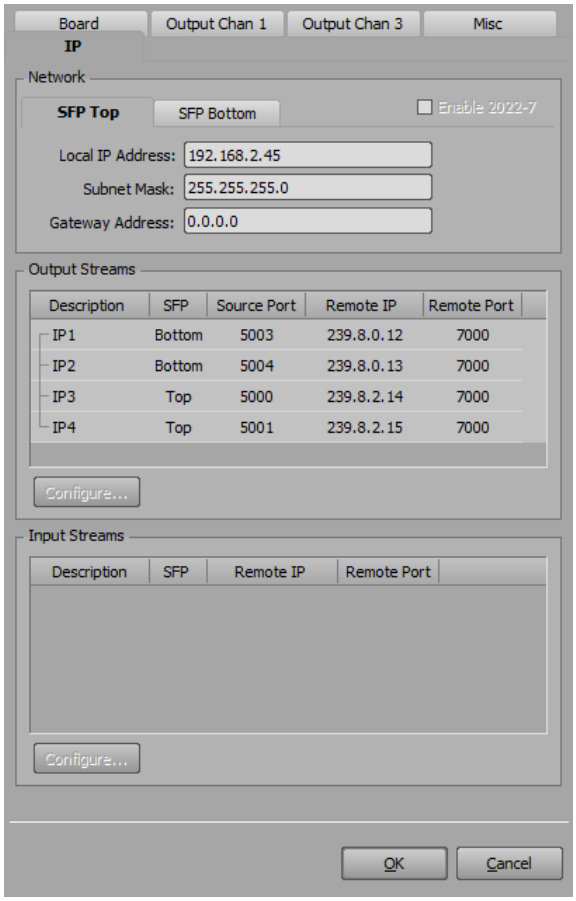
   The configured AJA Video framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

2-SFP

This section describes the configuration for a 2-SFP module setup.

To configure the Network settings:

1. Select the **IP** tab.
2. The **IP** tab is displayed.

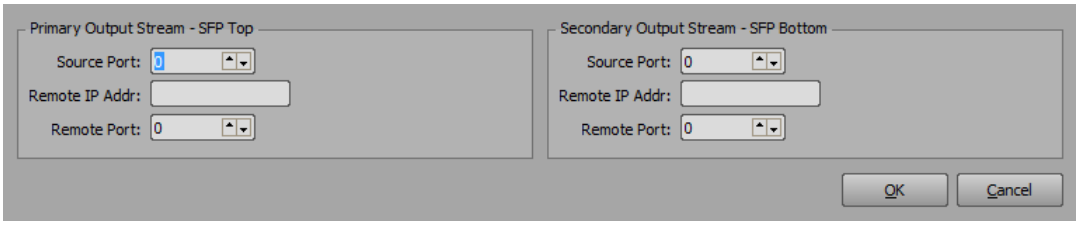


3. In the **Network** section, in the **SFP Top** and **SFP Bottom** tabs, in the **Local IP Address** field, enter the IP address of the location to connect the small form-factor pluggable transceiver.
4. In the **Subnet Mask** field, enter the subnet mask of the location to connect the small form-factor pluggable transceiver.
5. In the **Gateway Address** field, enter the IP address of the location to connect the small form-factor pluggable transceiver.
6. Continue with configuring the **Output Streams**.

To configure the Output Streams:

1. In the **Output Streams** section, select an output stream and then select **Configure**.

   The **AJA NTV2 - IP Output Stream Setup** dialog opens.



2. In the **Primary Output Stream - SFP Top** section, configure the following settings:

   Source Port — enter or select the port number of the primary output stream source.

   Remote IP Addr — enter the remote IP address of the primary output stream.

   Remote Port — enter or select the remote port number for the primary output stream.

3. In the **Secondary Output Stream** - SFP Bottom section, configure the following settings:

   Source Port — enter or select the port number of the secondary output stream source.

   Remote IP Addr — enter the remote IP address of the secondary output stream.

   Remote Port — enter or select the remote port number for the secondary output stream.

4. Select **OK**.

   The AJA NTV2 - IP Output Stream Setup dialog closes and the settings are added to the selected output stream.

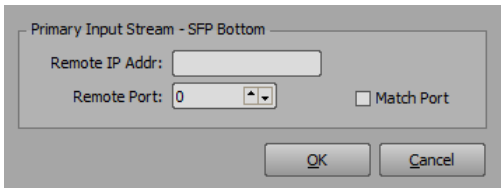
5. Repeat steps 1 to 3 for any other output streams.

6. Continue with configuring the **Input Streams**.

To configure the Input Streams:

1. In the **Input Streams** section, select an input stream and then select **Configure**.

   The **AJA NTV2 - IP Input Stream Setup** dialog opens.



2. Configure the following settings:
   - **Remote IP Addr** — use this box to enter the remote IP address of the primary video input stream.
   - **Remote Port** — use this box to enter or select the remote port number for the primary video input stream.
   - **Match Port** — select this check box to enable that the remote IP address and remote port must match. When not selected, only the remote IP address needs to match and the remote port is ignored.
3. Select **OK**.

   The **AJA NTV2 - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.
4. Repeat steps 1 to 3 for any other input streams.
5. Select **OK**.

Configuring an AJA Video FrameBuffer (Legacy)

This topic describes the selection and configuration of an AJA Video framebuffer.

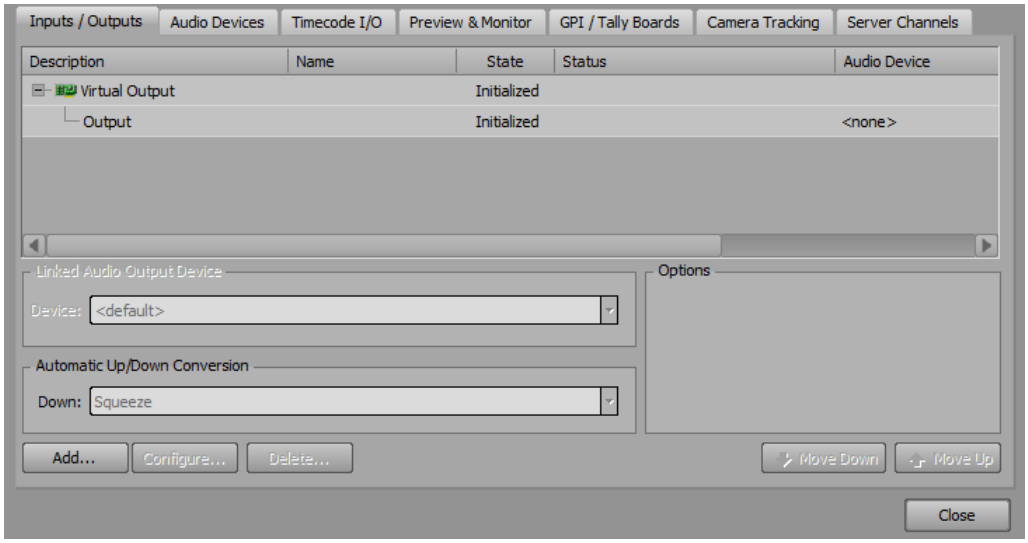
The AJA Video Framebuffer is typically the primary interface between the graphics engine and the broadcast video infrastructure, providing the high-performance video input and output channels required for live television production.

To configure an AJA Video framebuffer:

1. In XPression, select **Edit > Hardware Setup**.

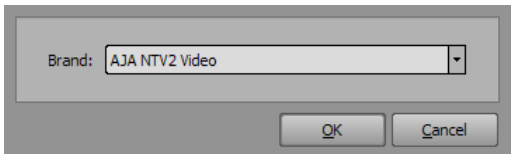
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



3. Select **Add**.

4. The **Add New FrameBuffer Board** dialog opens.



5. From the **Brand** drop-down, select **AJA Video (legacy)** and then select **OK**.

6. Select **OK**.

   The **AJA Video (Legacy) - Framebuffer Setup** dialog opens.

   Continue with configuring the Board settings.

   When the configuration is complete, the configured AJA Video framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

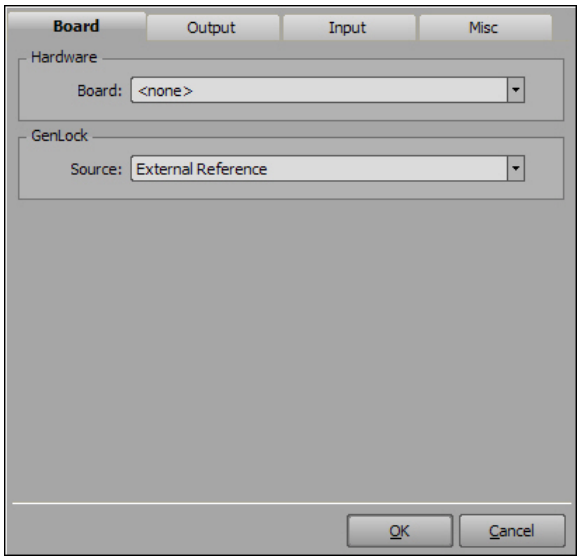
7. Select **Close** to exit the **Hardware Setup**.

Board

This section describes how to configure the AJA video framebuffer board.

To configure the AJA video framebuffer board:

1. Select the **Board** tab.



2. In the **Hardware** section, from the **Board** drop-down, select the installed board.

   This menu is automatically populated based on installed hardware.

3. In the **GenLock** section, from the **Source** drop-down, select the source of the GenLock signal with which to synchronize XPression.

   The available GenLock signal sources are as follows:

   External Reference — Synchronize with a **GenLock** signal received from an external application through the **GenLock In** port of the XPression computer.

   ★Ross Video recommends using an external reference for the GenLock signal source.

   Input 1 — Sync to Video In 1 source signal.

   Input 2 — Sync to Video In 2 source signal.

   Free Running — Do not synchronize XPression with an external source.

   ★If the output keying mode is set to **Internal** in the **Output** tab, the GenLock source needs to be set to an SDI input.

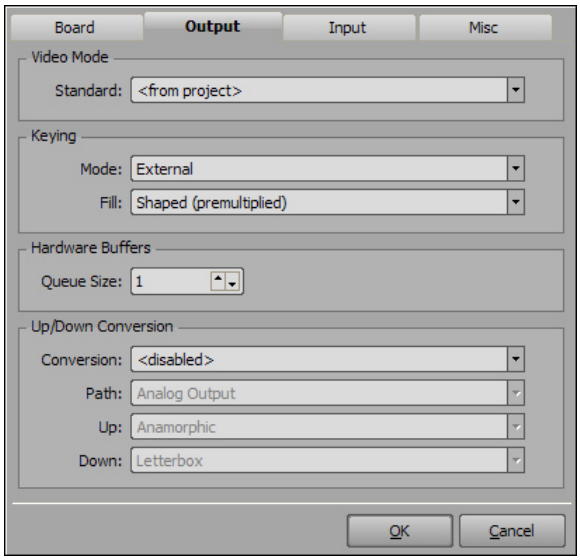
   Continue with configuring the Output settings.

Outputs

This section describes how to configure the outputs of the AJA video framebuffer.

To configure the outputs:

1. Select the **Output** tab.



2. In the **Video Mode** section, from the **Standard** drop-down, select the video format in which to output an XPression project.

   ★When configuring more than one output, they must share the same base frame rate that matches the GenLock reference.

   The available video formats are:

   - **<from project>** — automatically switch to the output video format to the video format of the currently loaded project.

     The project video format is ignored when a specific output video format is selected, and the selected video format is used to play out scenes.
   - **PAL, 720x576, 25 frames/second**
   - **NTSC, 720x486, 29.97 frames/second**
   - **HD 1080i, 1920x1080, 25 frames/second**
   - **HD 1080i, 1920x1080, 29.97 frames/second**
   - **HD 1080p, 1920x1080, 23.976 frames/second**
   - **HD 1080p, 1920x1080, 50 frames/second**
   - **HD 1080p, 1920x1080, 59.94 frames/second**
   - **HD 1080p, 1920x1080, 60 frames/second**
   - **HD 720p, 1280x720, 50 frames/second**
   - **HD 720p, 1280x720, 59.94 frames/second**

3. In the **Keying** section, from the **Mode** drop-down, select how graphics are output to a video stream.

   The available modes are as follows:

   - **External** — Output the key and fill graphics as separate video signals. Graphics mixing occurs in an external keyer/mixer.
   - **Internal** — Key and fill graphics are mixed internally and output as a single video signal from the framebuffer. In this mode the framebuffer functions as the keyer/mixer.

4. When **External** is selected as the keying mode, from the **Fill** drop-down, select the method used to process fill graphics before output.

   The available processing methods are:

   Shaped (premultiplied) — Multiply/shape the fill signal color information by the luminance information in the key signal.

   Unshaped — Output fill and key signals "as is".

5. In the **Hardware Buffers** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to the output.

   ★Use this setting to avoid buffer under runs, which may cause frame skipping. Larger queue sizes ensure smooth playout of generated graphics, but add delay to the output.

6. In the **Up/Down Conversion** section, from the **Conversion** drop-down, select whether to enable or disable output conversion to a predefined signal.
7. From the **Path** drop-down, select the source display on the output.
8. From the **Up** drop-down, select the format for up converted output.

   The available output formats are:

   - **Anamorphic** — Display a full-screen image.
   - **Pillar box 4:3** — Display a 4:3 image in the center of the screen with black sidebars.
   - **Zoom 14:9** — Display a 4:3 image zoomed to fill a 14:9 image with black sidebars.
   - **Letterbox** — Display an image zoomed to fill full screen.
   - **Zoom Wide** — Display an image zoomed and horizontally stretched to fill full screen.

9. From the **Down** drop-down, select the format for down converted output.

   The available output formats are:

   - **Letterbox** — Display a reduce image with black bars added to the top and bottom of the image area with the aspect ratio preserved.
   - **Crop** — Crop the image to fit the new screen size.
   - **Anamorphic** — Display a 16:9 image in a 4:3 box.

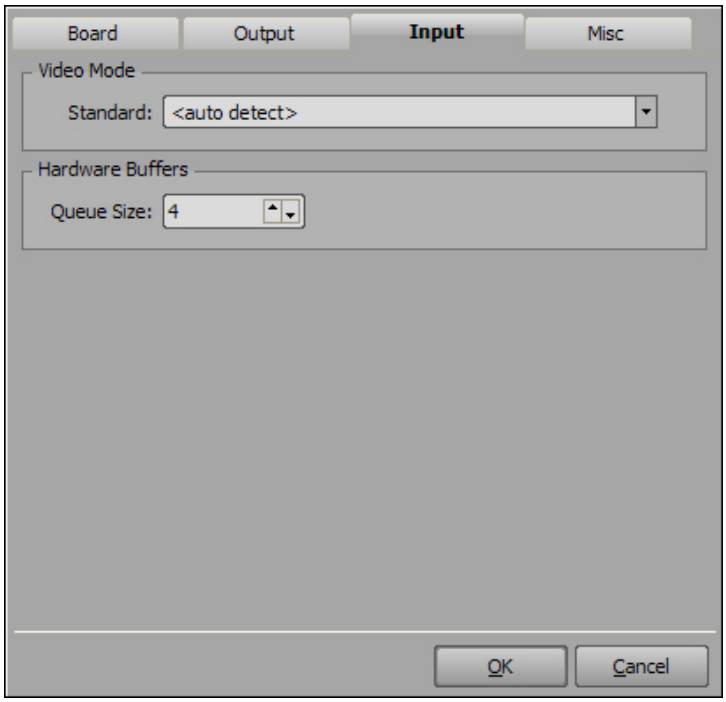
   Continue with configuring the Input settings.

Inputs

This section describes how to configure the inputs of the AJA video framebuffer.

To configure the inputs:

1. Select the **Input** tab.



2. In the **Video Mode** section, from the **Standard** drop-down, select the analog video format in which to receive video.
3. In the **Hardware Buffers** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to XPression.

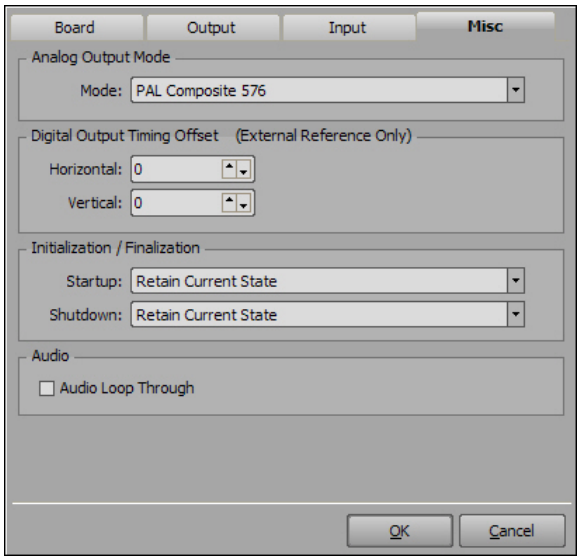
Continue with configuring the Miscellaneous settings.

Misc

This section describes how to configure the miscellaneous settings of the AJA video framebuffer.

To configure the miscellaneous settings:

1. Select the **Misc** tab.



2. In the **Analog Output Mode** section, from the **Mode** drop-down, select the video format in which to output an analog video signal.
3. In the **Digital Output Timing Offset** section, in the **Horizontal** field, enter or select the number of lines for horizontal delay timing offset with regards to an external reference.
4. In the **Vertical** field, enter or select the number of lines for vertical delay timing offset with regards to an external reference.
5. In the **Initialization / Finalization** section, from the Startup drop-down, select the video state at startup.

   The available states are:

   - **Retain Current State** — Retain resources to use once again.
   - **Clear Framebuffers** — Clear all framebuffers from the output framebuffer.
6. From the Shutdown drop-down, select the video state at shutdown.

   The available states are:

   - **Retain Current State** — Retain resources to use once again.
   - **Clear Framebuffers** — Clear all framebuffers from the output framebuffer.
7. In the **Audio** section, select the **Audio Loop Through** checkbox to enable embedded audio loop through.
8. Select **OK**.

Configuring a Blackmagic Design FrameBuffer

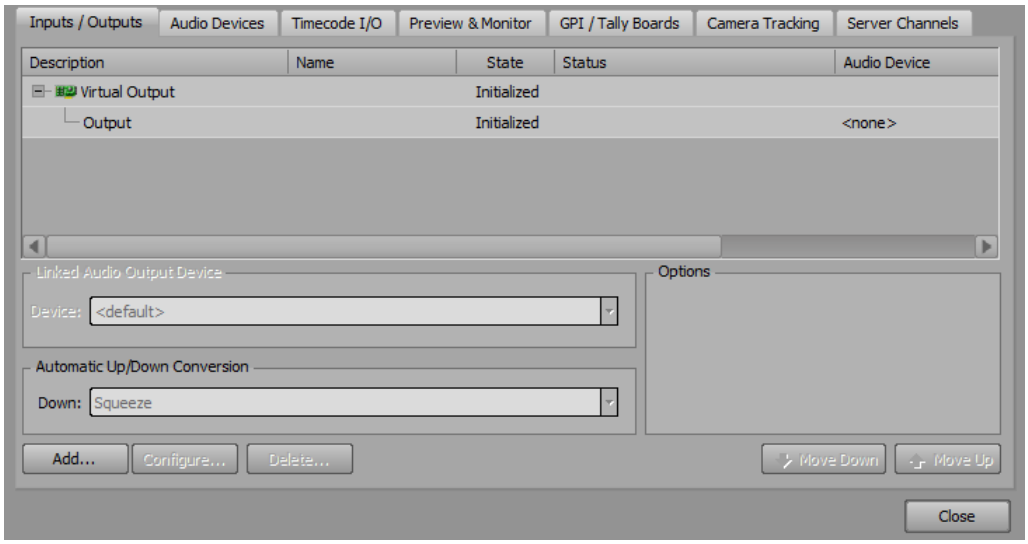
This topic describes the selection and configuration of an Blackmagic Design framebuffer.

To select a Blackmagic Design framebuffer:

1. In XPression, select **Edit > Hardware Setup**.

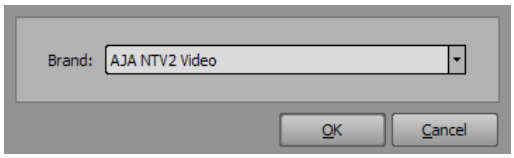
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



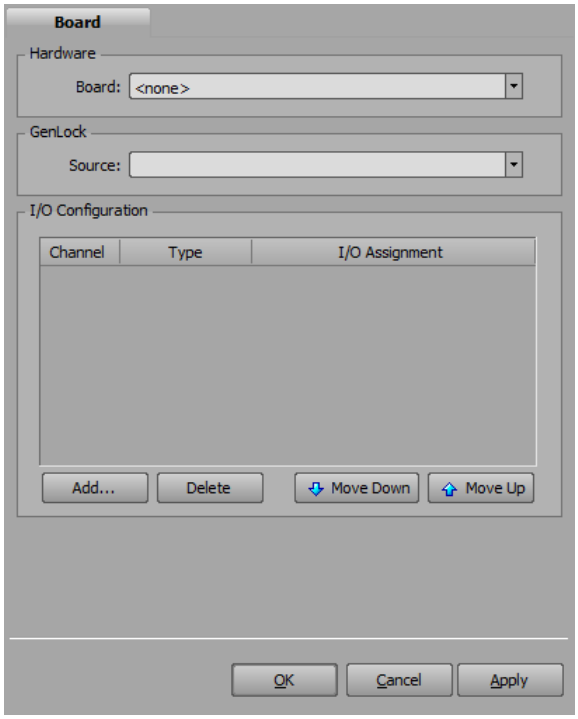
4. From the **Brand** drop-down, select **Blackmagic Design** and then select **OK**.

   The **Blackmagic Design - Framebuffer Setup** dialog opens.

5. Continue with the instructions for configuring the hardware settings.

To configure the hardware settings:

1. Select the **Board** tab to configure the hardware settings.

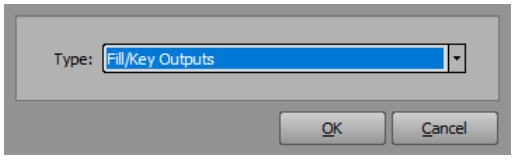


2. In the **Hardware** section, from the **Board** drop-down, select the installed Blackmagic Design card to configure.
3. In the **GenLock** section, from the **Source** drop-down, select the source of the GenLock signal with which to synchronize XPression.

   The available GenLock signal sources are as follows:

   - **External Reference** — Synchronize with a GenLock signal received from an external application through the **GenLock In** port of the XPression computer. Ross Video recommends using an external reference for the GenLock signal source.
   - **Free Running** — Do not synchronize XPression with an external source.
4. In the **I/O Configuration** section, select **Add** to add an input or output channel.

   The **Select I/O Type** dialog opens.



5. From the **Type** drop-down, select an input /output type.

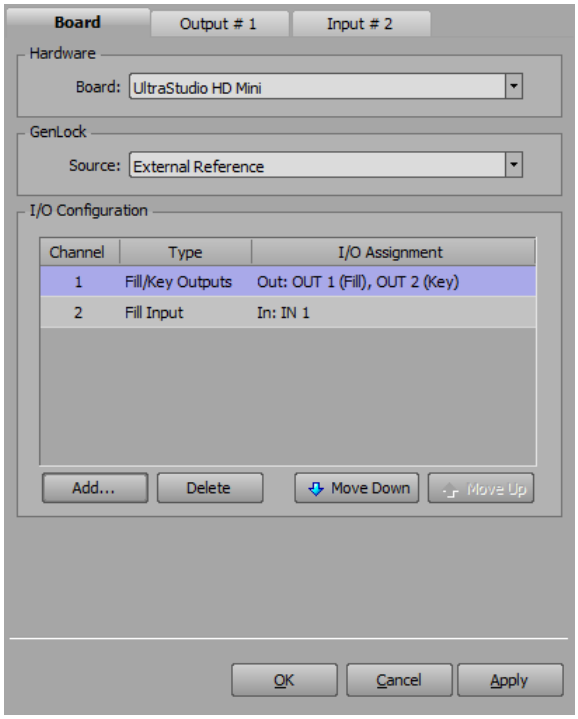
   The options are:

   - **<none>** (this option is not applicable)
   - **Fill-Only Output** (uses 1 output) (requires a separate license or the XPression Clips option)
   - **Fill/Key Output** (uses 2 outputs)
   - **Fill Input** (uses 1 input)
   - **Internal Keyer** (uses 1 input, 1 output)

6. Select **OK**.

   The input/output assignment is added to the **I/O Configuration** list.

7. Repeat steps 3 to 5 for as many channels as necessary.

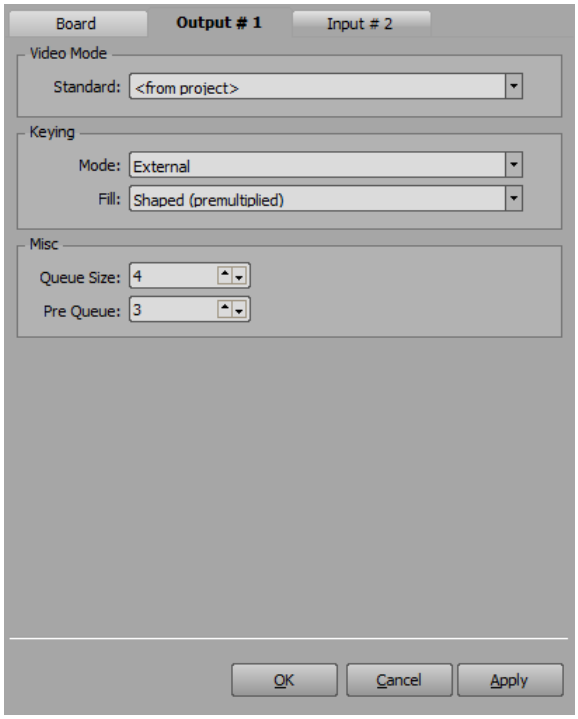


★SDI channel assignments are automatic and any channels beyond the number of channels supported by the graphics card will be listed as **Exceeds device capacity**.

8. Continue with the instructions for configuring the output settings.

To configure the output settings:

1. Select the **Output** tab to configure output settings.



2. In the **Video Mode** section, from the **Standard** drop-down, select the video format in which to output an XPression project.
3. In the **Keying** section, from the **Mode** drop-down, select how graphics are output to a video stream.

   The modes are:

   - **Off (Fill Only)** — Only output a video signal. In this mode, graphics are excluded from the output.
   - **External** — Output the key and fill as separate video signals. Graphics and video mixing occurs in an external keyer/mixer.
   - **Internal** — Key and fill are mixed internally. Graphics and video input are outputted as a single video signal from the framebuffer. In this mode the framebuffer functions as the keyer/mixer.
4. When **External** is selected in the **Mode** list, from the **Fill** drop-down, select the method used to process fill graphics before output.

   The available processing methods are as follows:

   - **Shaped (premultiplied)** — Multiply/shape the fill signal color information by the luminance information in the key signal.
   - **Unshaped** — Output fill and key signals "as is".

5. In the **Misc** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to the output.

   Use this setting to avoid buffer under runs, which may cause frame skipping. Larger queue sizes ensure smooth playout of generated graphics, but add delay to the output.

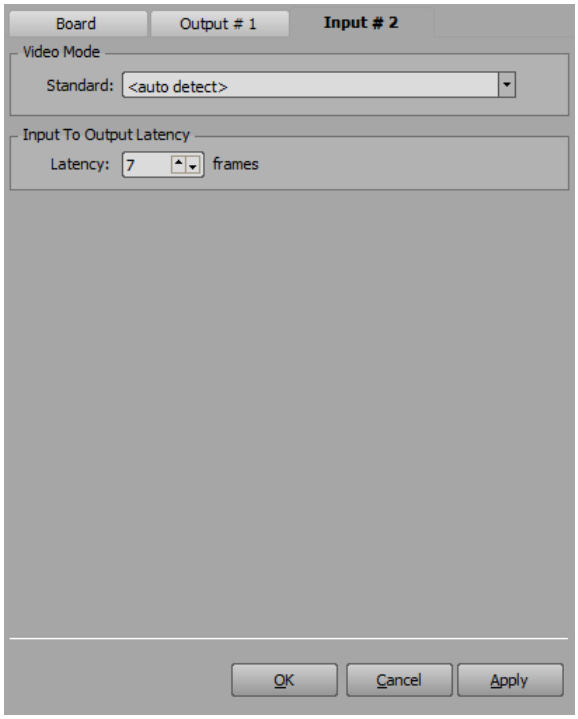
6. In the **Pre Queue** field, enter or select the number of frames to buffer for the pre-queue.

   The pre-queue size can be between 1 and 8.

7. Continue with the instructions for configuring the input settings.

To configure the input settings:

1. Select the **Input** tab to configure input settings.



2. In the **Video Mode** section, from the **Standard** drop-down, select the analog video format in which to receive video.

   The only option currently available is **<auto detect>**.

3. In the **Input to Output Latency** section, in the Latency field, enter or select a fixed delay, in frames, between the input and output.

   To remain fixed, the delay must be large enough to accommodate the **Queue Size** and **Pre Queue** values in the **Hardware Buffers** section of the corresponding **Output** tab.

4. Select **Apply**.

   The changes to the Blackmagic Design framebuffer board are applied.

5. Select **OK**.

   The configured Blackmagic Design framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

6. Select **Close** to exit the **Hardware Setup** dialog.

Configuring a Blackmagic Design FrameBuffer (Legacy)

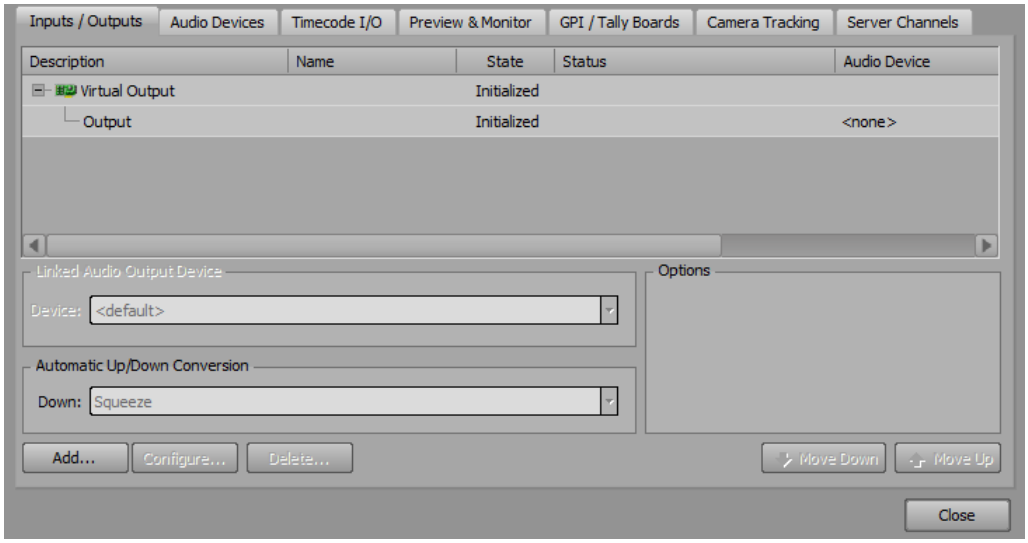
This topic describes the selection and configuration of a Blackmagic Design framebuffer. This option is only available in the 32-bit version of XPression.

To configure a Blackmagic Design framebuffer:

1. In XPression, select **Edit >Hardware Setup**.

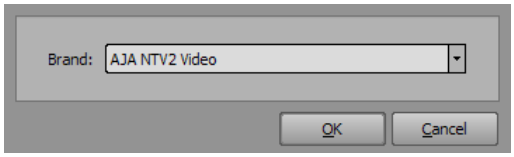
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



3. Select **Add**.

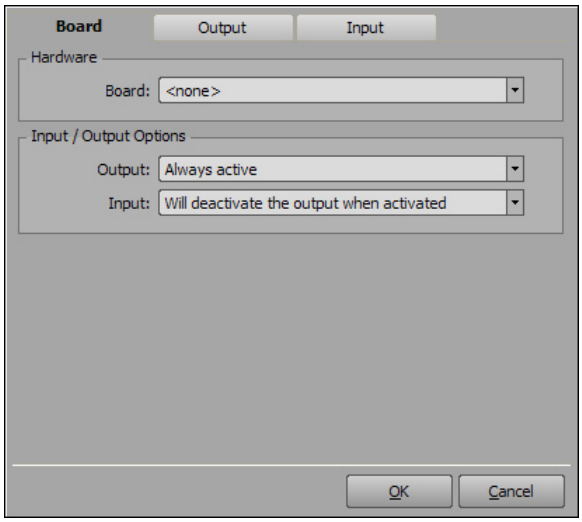
   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **Blackmagic Design (Legacy)** and select **OK**.

   The **Blackmagic Design (Legacy) - Framebuffer Setup** dialog opens.

5. Select the **Board** tab to configure hardware settings.



6. In the **Hardware** section, from the **Board** drop-down, select the installed DeckLink Studio card to configure.
7. In the **Input / Output Options** section, from the **Output** drop-down, select when to activate video output from the Blackmagic Design framebuffer.

   The options are:

   - **Always active** — Always output video.
   - **Active on use only** — Only output video when the card is in use.

8. From the **Input** drop-down, select when to activate video input through the Blackmagic Design framebuffer.

   The options are:

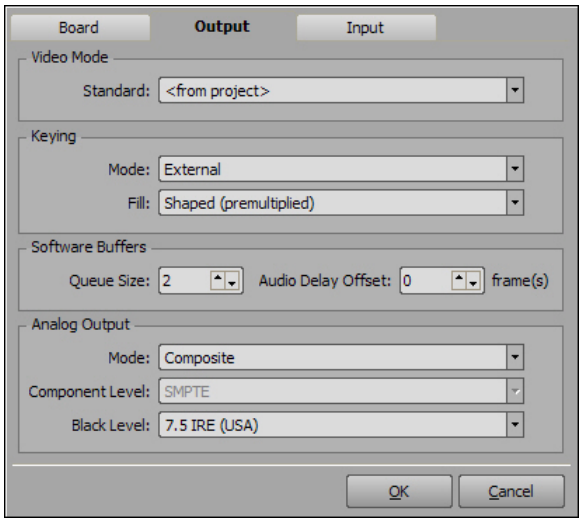
   - **Will deactivate the output when activated** — automatically deactivate the output when the input is activated.
   - **Can only be activated when the output is not active** — input can only be activated when the output is not active.
   - **Always disabled** — disable the input.
   - **Always enabled (output will always be disabled)** — enable the input and disable the output at all times.

   ★Input grabbing may compromise output performance.

9. Continue with configuring the output settings.

To configure the output settings:

1. Select the **Output** tab.



2. In the **Video Mode** section, from the **Standard** drop-down, select the video format in which to output an XPression project.
3. In the **Keying** section, from the **Mode** drop-down, select how graphics are output to a video stream.

   The modes are:

   - **External** — Output the key and fill as separate video signals. Graphics and video mixing occurs in an external keyer/mixer.
   - **Internal** — Key and fill are mixed internally. Graphics and video are output as a single video signal from the framebuffer.

     In this mode the framebuffer functions as the keyer/mixer.
   - **Off** — Only output a video signal. In this mode, graphics are excluded from the output.
4. When **External** is selected as the keying mode, from the **Fill** drop-down, select the method used to process fill graphics before output.

   The available processing methods are as follows:

   - **Shaped (premultiplied)** — Multiply/shape the fill signal color information by the luminance information in the key signal.
   - **Unshaped** — Output fill and key signals "as is".
5. In the **Software Buffers** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to the output.

   ★Use this setting to avoid buffer underruns, which may cause frame skipping. Larger queue sizes ensure smooth playout of generated graphics, but add delay to the output.
6. In the **Audio Delay Offset** field, enter or select an amount of frames as a buffer.

7. In the **Analog Output** section, from the **Mode** drop-down, select the type of analog video signal to output.

   The available output video signals are:

   - **Composite** — output a single video signal that combines luminance and chroma.
   - **Component** — output three channels (Y, R-Y, and B-Y).
   - **S-Video** — output a video signal that carries the video data as two separate signals (brightness and color), unlike composite video which carries the entire set of signals through a signal line.

8. When **Component** is selected output video signal, from the **Component Level** drop-down, select the output component analog level.

   The available levels are:

   - **SMPTE** — use this level for monitoring component analog video.
   - **Betacam** — use this level for output to Sony Betacam SP decks.

9. From the **Black Level** drop-down, select the default black level analog video signal.

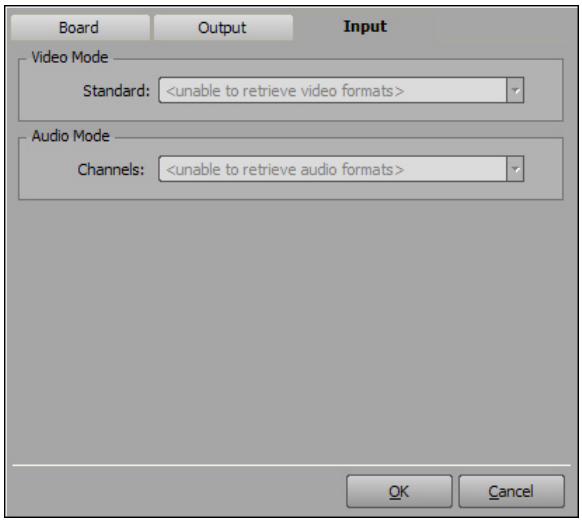
   The available levels are as follows:

   - **7.5 IRE (USA)** — standard black level for all NTSC countries except Japan.
   - **0.0 IRE (Japan)** — standard black level for Japan.

10. Continue with configuring the input settings.

To configure the input settings:

1. Select the **Input** tab.



2. In the **Video Mode** section, from the **Standard** drop-down, select the analog video format in which to receive video.
3. In the **Audio Mode** section, from the **Channels** drop-down, select the channel inputs in which to receive the embedded audio.

   The options available are:

   - **2 channel**
   - **4 channel**
   - **6 channel**
   - **8 channel**
   - **10 channel**
   - **12 channel**
   - **16 channel**
4. Select **OK**.

   The configured Blackmagic Design framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.
5. Select **Close** to exit the **Hardware Setup** dialog.

Configuring a Graphite FrameBuffer

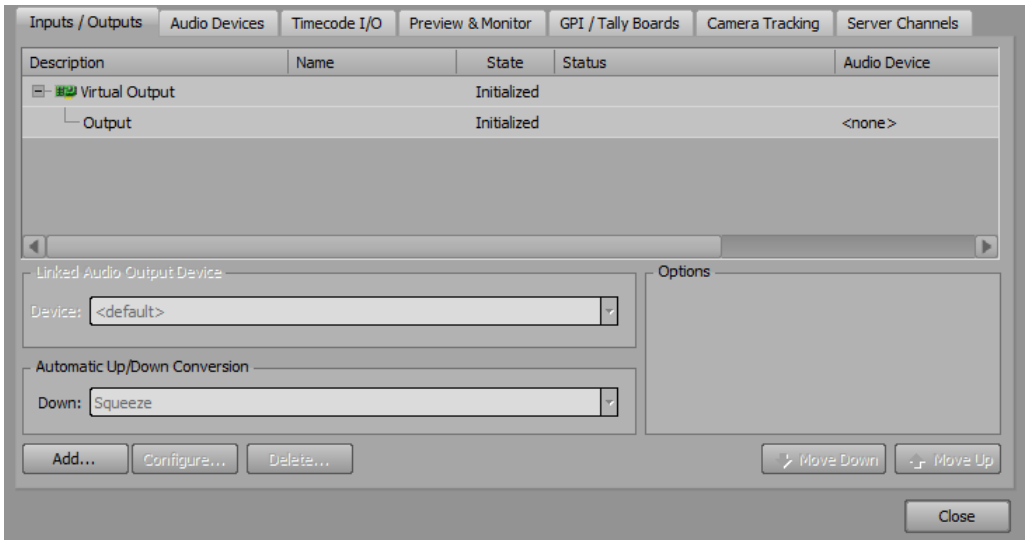
This topic describes the selection and configuration of a Graphite framebuffer.

To select a Graphite framebuffer:

1. In XPression, select **Edit > Hardware Setup**.

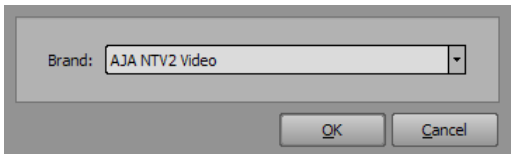
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



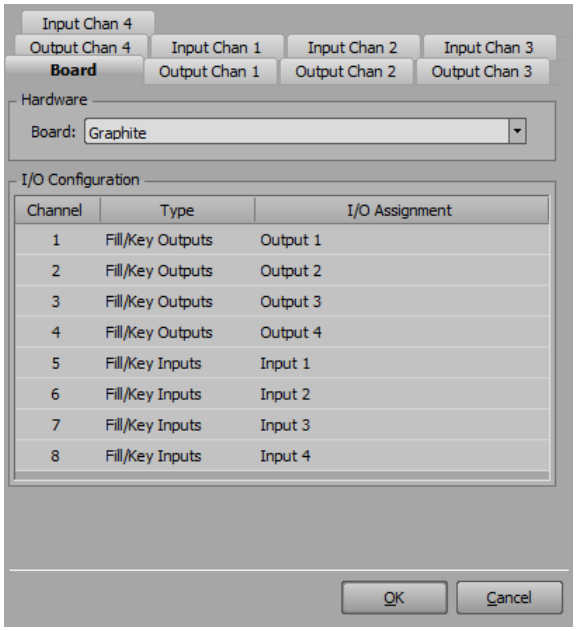
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **Graphite** and then select **OK**.

   The **Graphite - Framebuffer Setup** dialog opens.



5. Continue with configuring the **Board** settings.

To configure the board settings:

1. Select the **Board** tab to choose and configure an installed card.

   This menu is automatically populated based on installed hardware.

2. In the **Hardware** section, from the **Board** drop-down, select a Graphite card to configure, if not already selected.

   The **I/O Configuration** list will be populated according to the type of XPression system:

   - **XPression Graphite and XPression Studio SCE**:

     3 Fill/Key Outputs

     1Fill/Key Input

   - **XPression Studio**:

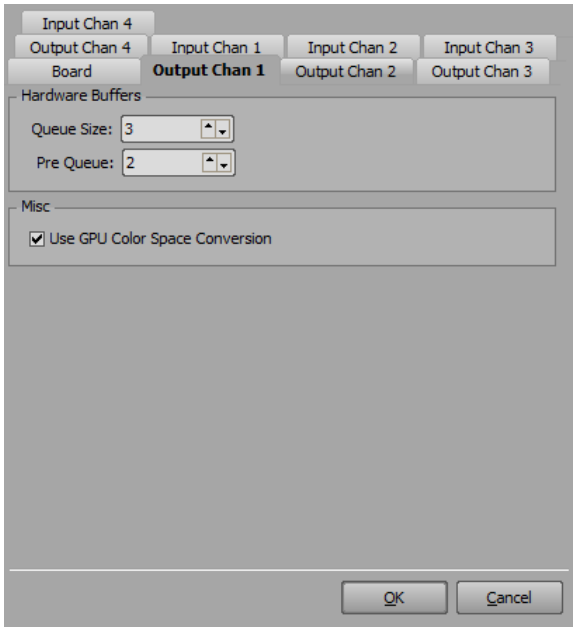
     4 Fill/Key Outputs

     4 Fill/Key Inputs

3. Continue with configuring the output channels.

To configure the output channels:

1. Select an **Output Chan** (Output Channel) tab.



2. In the **Hardware Buffers** section, in the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to the output.

   ★Use this setting to avoid buffer under runs, which may cause frame skipping. Larger queue sizes ensure smooth playout of generated graphics, but add delay to the output.

3. In the **Pre Queue** field, enter or select the number of frames to buffer for the pre-queue.

   The pre-queue size can be between 1 and 8.

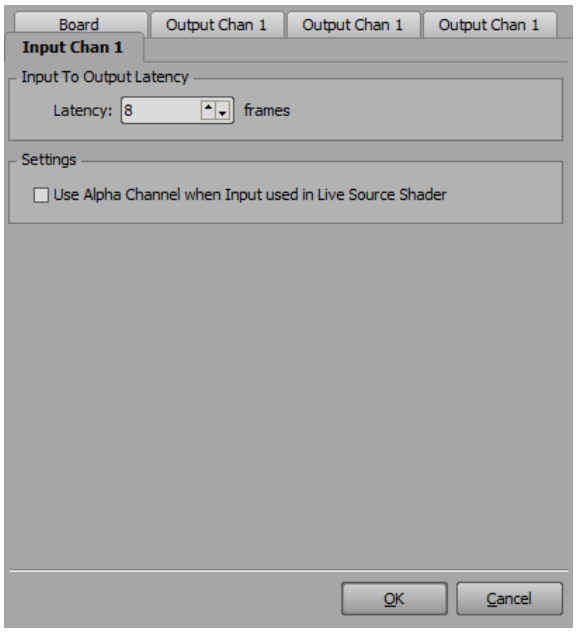
1. In the **Misc** section, select the **Use GPU Color Space Conversion** to use the GPU to perform the color space conversion on the outputs.

   This option provides optimal performance.

2. Continue with configuring the input channels.

To configure the input channels:

1. Select an **Input Chan** (Input Channel) tab.



2. In the **Input to Output Latency** section, in the **Latency** field, enter or select a fixed delay, in frames, between the input and output.

   To remain fixed, the delay must be large enough to accommodate the **Queue Size** and **Pre Queue** values in the **Hardware Buffers** section of the corresponding **Output** tab.

3. In the **Settings** section, select the **Use Alpha Channel when Input used in Live Source Shader** checkbox to use the alpha channel when the selected input is used in a live source shader.

4. Repeat steps 1 to 3 for as many channels as necessary.

5. When all input channels have been configured, select **OK**.

   The configured Graphite framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

6. Select **Close** to exit the **Hardware Setup** dialog.

Configuring Matrox DSX, X.mio3, and X.mio5 FrameBuffers

This topic describes the selection and configuration of a Matrox DSX LE4, DSX LE5 D25, LE5L, X.mio3, or X.mio5 framebuffer board.

★No 2SI support with XPression 10.5 combined with Matrox driver version 10.0.3. Matrox driver 10.1 is required.

★XPression v14.0 supports the Matrox DSX v11.2 driver.

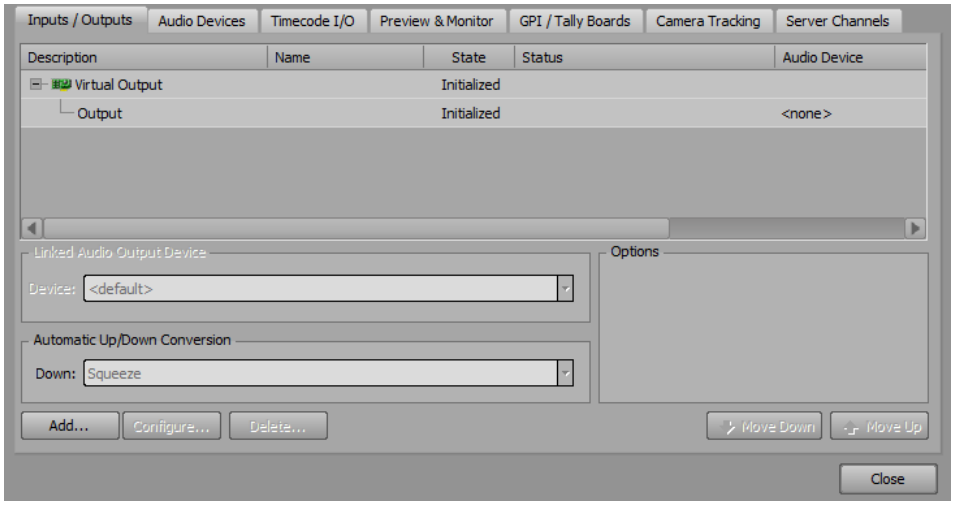
Quick Setup Workflow:

1. Add framebuffer.
2. Configure board (hardware and GenLock).
3. Configure outputs.
4. Configure inputs.
5. Configure miscellaneous settings.
6. Configure IP (if applicable).

To add a framebuffer:

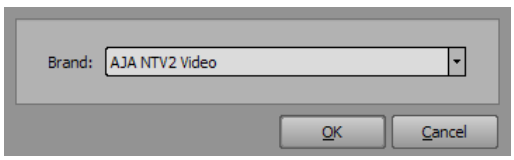
1. In XPression, select **Edit > Hardware Setup > Inputs/Outputs**.

   The **Hardware Setup** window opens.



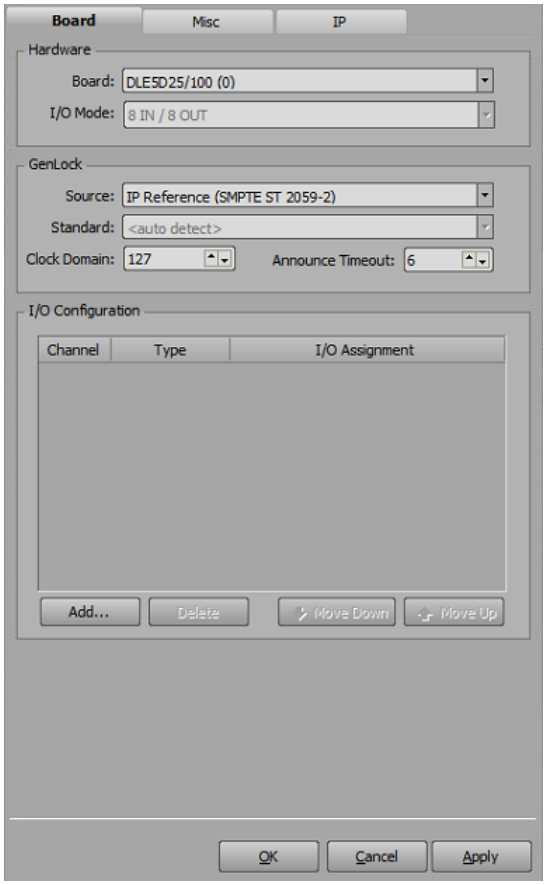
2. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



3. From the **Brand** drop-down, select **Matrox DSX**.

   The **Matrox DSX - Framebuffer Setup** dialog opens.



4. Select the **Board** tab to choose and configure hardware and GenLock.

   Continue with configuring the **Hardware** and **GenLock** settings in the Board tab.

Board

To configure the Hardware and GenLock settings:

1. From the **Board** drop-down, select the installed framebuffer card.

   Verify the I/O mode (read-only)

   The defaults are:

   2 IN / 2 OUT (for DSX LE5L/4/100)

   2 IN / 6 OUT (for DSX LE4/8/100 and X.mio3/6/100)

   4 IN / 4 OUT (for DSX LE IP and X.mio3 IP)

   8 IN / 8 OUT, 2 IN / 2 OUT for UHD (for DSX LE5 D25)

   Depending on the XPression software version, extra fill outputs on the DSX LE4, DSX LE5 D25, and X.mio3 can be used for preview purposes. Contact a Ross representative for details.

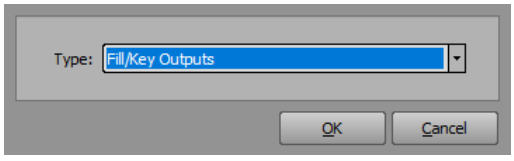
2. In the **GenLock** section, from the **Source** drop-down, select the source of the GenLock signal.

   The available **GenLock** signal sources vary based on the card and card configuration.

External Reference	Synchronize with a GenLock signal received from an external application through the GenLock In port of the XPression computer. Ross Video recommends using an external reference for the GenLock signal source.
SDI IN #	Sync to an available SDI Input source signal. The SDI input numbers will vary based on the card and how it was flashed.
IP Reference (SMPTE ST 2059-2)	
SFP A (SMPTE ST 2059-2)	
SFP B (SMPTE ST 2059-2)	
Free Running	Do not synchronize XPression with an external source.

3. From the **Standard** drop-down, select the format of the incoming **GenLock** signal.
4. For IP only, set the following:
   - In the **Clock Domain** field, enter or select the PTP clock domain when using an **IP GenLock** (SMPTE ST-2059).
   - In the **Announce Timeout** field, enter or select the number of announce messages that can be missed before triggering the **Best Master Clock Algorithm (BMCA)** to find a new **Grand Master (GM)**.
5. In the **I/O Configuration** section, select **Add** to add an input or output channel.

   The **Select I/O Type** dialog opens.



6. From the **Type** drop-down, select an input /output type.

<none>	this option is not applicable
Fill-Only Output	uses 1 output (requires a separate license or the XPression Clips option)
Fill/Key Outputs	uses 2 outputs
Fill Input	uses 1 input
Fill/Key Inputs	uses 2 inputs
Internal Keyer	uses 1 input, 1 output

7. Select **OK**.
8. Add more inputs and outputs as necessary.

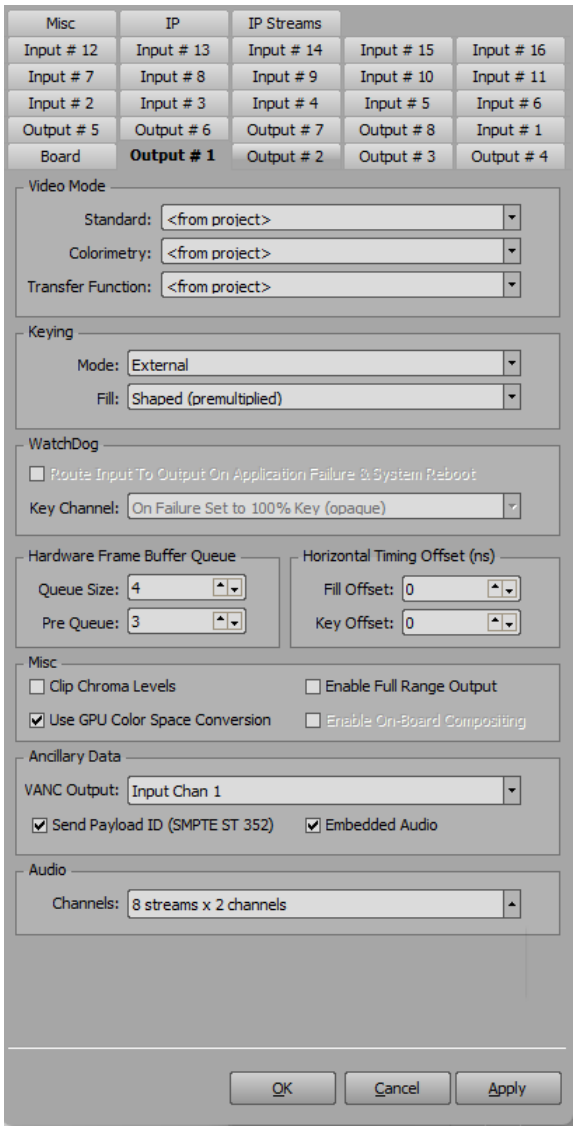
   ★For DSXLE4, when adding three fill/key and one fill, the one fill must be at the bottom of the list. If not, one fill/key will show as exceeding device capacity and will be removed from the hardware setup I/O list.

   Continue with configuring the Output settings.

Outputs

To configure an Output:

1. Select an **Output** tab to configure the parameters of the selected output.



2. Configure each section as needed:

   Video Mode

   Keying

   Watchdog

   Hardware Frame Buffer Queue

   Horizontal Timing Offset

   Misc

   Ancillary Data

   Audio

Video Mode

1. In the **Video Mode** section, from the **Standard** drop-down, select the video format for the output.

   ★When configuring more than one output, they must share the same base frame rate that matches the GenLock reference.

2. From the **Colorimetry** drop-down, select the range of colors that can be represented in the color space:

   <from project> (appears only when <from project> is selected in the **Standard** list)

   ITU-R BT.709 (HD)

   ITU-R BT.2020 (WCG)

3. From the **Transfer Function** drop-down, select the dynamic range standard to use on the output.

   The options are:

   <from project> (appears only when <from project> is selected in the **Standard** list)

   ITU-R BT.1886 (SDR)

   ITU-R BT.2100 (HLG)

Keying

To configure the Keying mode and fill:

1. In the **Keying** section, from the **Mode** drop-down, select a keying mode for the output.

   The available modes are as follows:

   Off (Fill-Only) — select to only output a video signal. In this mode, key is excluded from the output.

   External — select to output video and alpha channels.

   Internal — select to key scenes to the associated input.

   ★If the output mode is set to **Internal**, the **GenLock Source** in the **Board** tab needs to be set to an SDI input.

2. From the **Fill** drop-down, select the fill mode.

   The available fill options are as follows:

   Shaped (premultiplied) — select to use an additive key to cut precise holes for the fill.

   Unshaped — select to use a multiplicative key based on the gradient values of the alpha.

Watchdog

To configure the Watchdog settings:

1. Select the **Route Input To Output On Application Failure & System Reboot** checkbox to route the input to an output in the event of application failure or a system reboot.
2. From the **Key Channel** drop-down, select the **On Failure Set to % Key (transparent)** channel.

Hardware Frame Buffer Queue

To configure the Hardware Frame Buffer Queue settings:

1. In the **Queue Size** field, enter or select the framebuffer queue size.

   The framebuffer queue size can be between 2 and 7.

2. In the **Pre Queue** field, enter or select the pre-queue size.

   The pre-queue size can be between 1 and 6.

Horizontal Timing Offsets

To configure the Horizontal Timing Offsets:

1. In the **Fill Offset** field, enter or select the offset of the fill.
2. In the **Key Offset** field, enter or select the offset of the key.

Misc

To configure the Misc settings:

1. Select the **Clip Chroma Levels** checkbox to limit the chroma levels in the output.
2. Select the **Enable Full Range Output** checkbox to output using the full super black to super white range.
3. Select the **Use GPU Color Space Conversion** checkbox to use the GPU to perform the fastest possible color space conversion on the output.

   It is selected by default.

   ★If you are using the HLG transfer function, the **Use GPU Color Space Conversion** checkbox should always be selected.

4. Select the **Enable On-Board Compositing** checkbox to allow use of the low latency material scalar with a Live Source material.

Ancillary Data

To configure the Ancillary Data settings:

1. From the **VANC Output** drop-down, select the vertical ancillary data output.

None	do not set a vertical ancillary data output.
Input	pass the vertical ancillary data from an input to the selected output.
Video Shader (Closed Captioning)	select this option to output 608 closed caption (in a 708 CDP) when a video shader is playing back a file with embedded captioning.

   When the XPression INcoder is set to a target folder, it will extract 608 closed captioning from an MOV file. The INcoder will transcode the MOV file to an XPression AVI file as well as an XMD file that contains the closed caption metadata. When the AVI file is played back from XPression, XPression will look for the XMD file and play out with the AVI file.

   ★Files played back from the Clip Store do not support Closed Captioning.

2. Select the **Send payload ID (SMPTE ST 352)** checkbox to send the video payload ID (SMPTE ST 352) in the ancillary data.
3. Select the **Embedded Audio** checkbox to include embedded audio in the ancillary data.

Audio

To configure the Audio settings:

- In the **Audio** section, from the **Channels** drop-down, select the number of audio channels to output in the IP audio stream.

  The options are:

  - **1 stream x 16 channels** (125us only)
  - **2 streams x 8 channels**
  - **4 streams x 4 channels**
  - **8 streams x 2 channels** (only available if **Use New Flow Mapping Allowing I/O Configurations With 8 Audio Flows** is selected in the **IP Streams** tab)

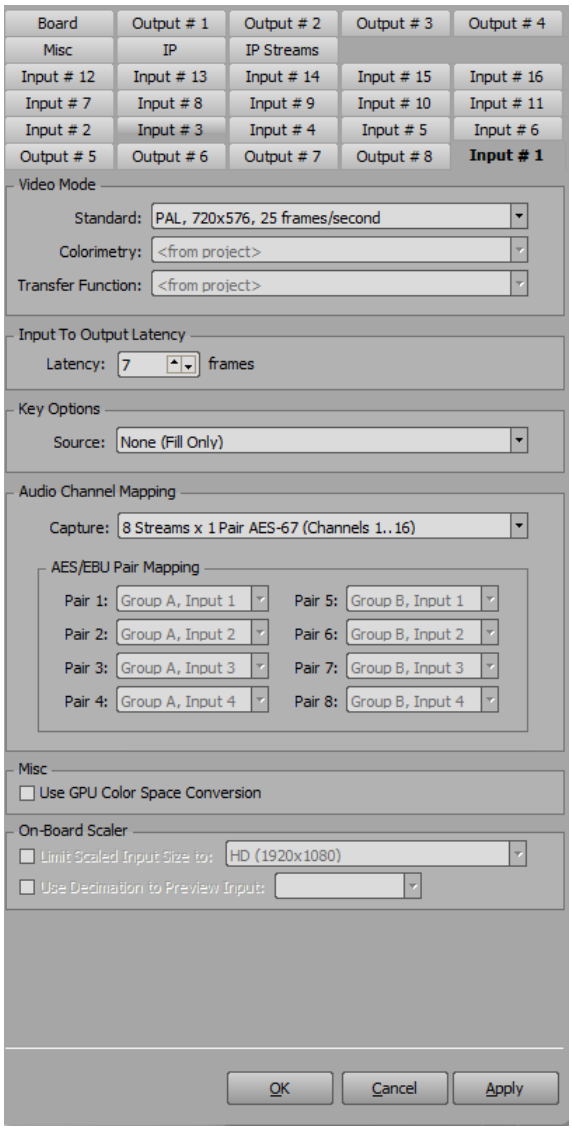
★The output audio channels are only available when using the DSX LE4 IP, DSX LE5 D25 IP, or X.mio3 IP board in **SMPTE 2110** mode.

Continue with configuring the Input settings.

Inputs

To configure the inputs:

1. Select an **Input** tab to configure the parameters of the selected input.



2. Configure the following parameters:

   Video Mode

   Input To Output Latency

   Key Options

   Audio Channel Mapping

   Misc

Video Mode

1. From the **Standard** drop-down, select the video format for the input.
2. From the **Colorimetry** drop-down, select the range of colors that can be represented in the color space:
   - **<from project>** (appears only when <from project> is selected in the Standard list)
   - **ITU-R BT.709 (HD)**
   - **ITU-R BT.2020 (WCG)**
3. From the **Transfer Function** drop-down, select the dynamic range standard to use on the output.

   The options are:
   - **<from project>** (appears only when <from project> is selected from the **Standard** drop-down)
   - **ITU-R BT.1886 (SDR)**
   - **ITU-R BT.2100 (HLG)**

Input To Output Latency

- In the **Latency** field, enter or select a time interval offset, in frames, between the input and output.

Key Options

- From the **Sources** drop-down, select the keying options for the input.

  The options are:

  None (Fill Only)

  Paired Input (Fill/Key)

Audio Channel Mapping

1. From the **Capture** drop-down, select the audio type for the input.

   The options are:
   - **No Audio**
   - **1 Pair AES-67 (Channels 1..2)**
   - **2 Pairs SES-67 (Channels 1..4)**
   - **4 Pairs AES-67 (Channels 1..8)**
   - **8 Pairs AES-67 (Channels 1..16)**
   - **2 Streams x 1 Pair AES-67 (Channels 1..4)**
   - **2 Streams x 2 Pairs AES-67 (Channels 1..8)**
   - **2 Streams x 4 Pairs AES-67 (Channels 1..16)**
   - **4 Streams x 1 Pair AES-67 (Channels 1..8)**
   - **4 Streams x 2 Pairs AES-67 (Channels 1..16)**
   - **8 Streams x 1 Pair AES-67 (Channels 1..16)** only available if **Use New Flow Mapping Allowing**

I/O Configurations With 8 Audio Flows is selected in the **IP Streams** tab

2. In the **AES/EBU Pair Mapping** area, use the **Pair** drop-downs to define the mapping of the AES/EBU inputs.

   ★The AES/EBU pair mapping is only available on cards that support AES audio.

Misc.

To use the GPU to perform the fastest possible color space conversion on the input:

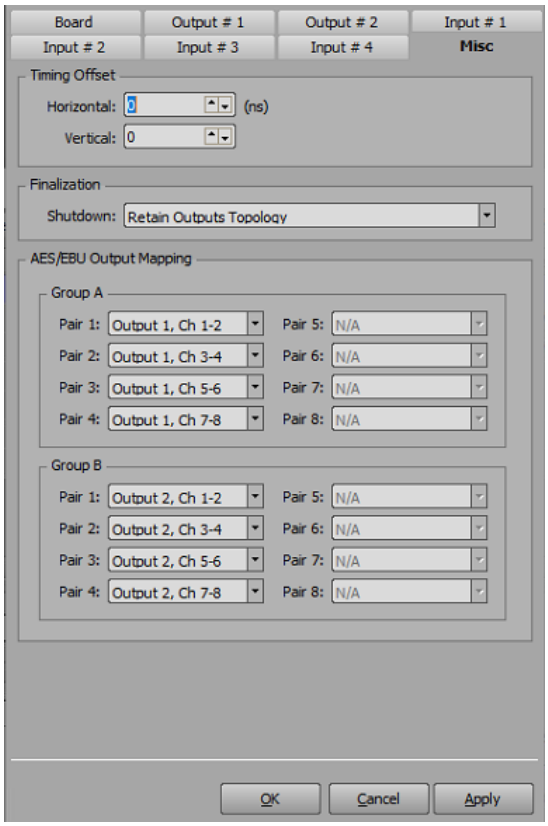
- In the **Misc** section, select the **Use GPU Color Space Conversion** checkbox.

  Continue with configuring the Misc settings.

Misc

To configure the horizontal and vertical offsets:

1. Select the **Misc** tab .



2. In the **Timing Offset** section, do the following:
   - In the **Horizontal** field, enter or select a horizontal delay timing offset (in nanoseconds) with regards to an external reference.

     This setting is for external reference only.
   - In the **Vertical** field, enter or select a vertical delay timing offset (in nanoseconds) with regards to an external reference.

     This setting is for external reference only.
3. In the **Finalization** section, from the **Shutdown** drop-down, select one of the following options for the outputs on shutdown:
   - **Retain Outputs Topology** — retain the output topology when XPression is closed.
   - **Clear Outputs Topology** — clear the output topology when XPression is closed so that NMOS senders are no longer reported after XPression closes.

4. In the **AES/EBU Output Mapping** section, use the **Pair** drop-downs for **Group A** and **Group B** to define the mapping of the AES/EBU outputs.

   The default settings are framebuffer one to AES Group A and framebuffer two to AES Group B.

   ★The AES/EBU output mapping is only available if using the DSX LE4 FH card.

   If you are configuring a DSX LE4 IP, DSX LE5 D25, X.mio3, or X.mio 5 IP card, continue with configuring the IP settings.

IP

This section applies to the DSX LE4 IP, DSX LE5L, DSX LE5 D25, X.mio3, or X.mio 5 IP cards only.

To configure the IP settings:

1. Select the **IP** tab.

   The available settings depend on the card configuration and protocol. The Matrox DSXLE5 D25 and X.mio5 Q25 only support the **SMPTE 2110** protocol and not **SMPTE 2022-6**.

2. Configure the **Network** settings as follows:

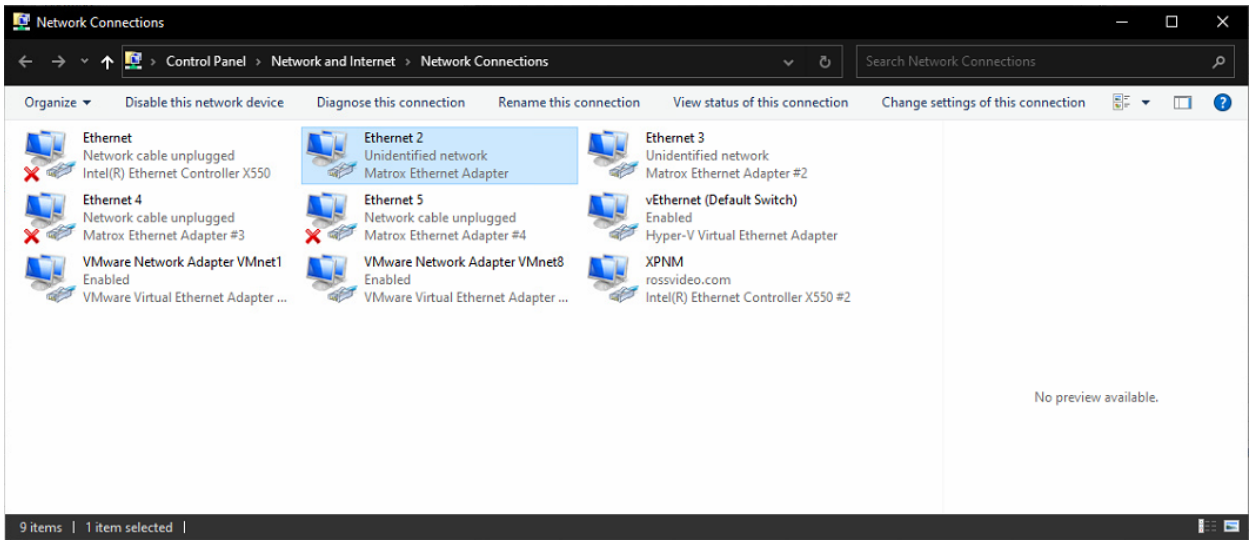
   For Matrox DSXLE4 and X.mio3

   - In the **Network** section, in the **SFP A** and **SFP B** tabs, in the **Local IP Address** field, enter the IP address of the small form-factor pluggable transceivers (Matrox DSXLE4 and X.mio3 only).

   For Matrox DSXLE5 and X.mio5

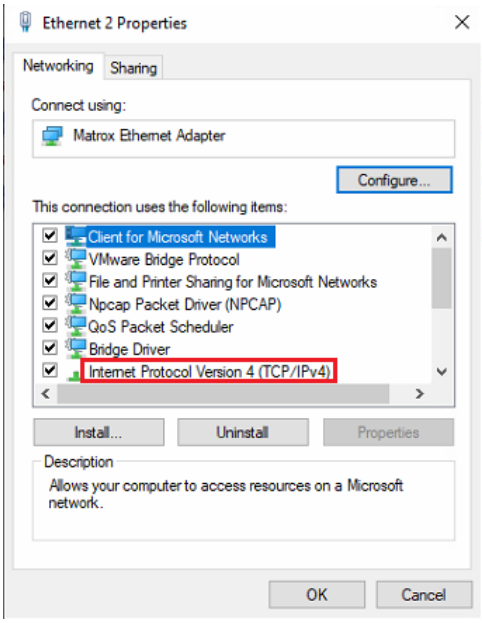
   a. Open **Network Connections** in Windows.

   Depending on the configuration, there can be up to four **SFPs** (SFP A, SFP B, SFP C, and SFP D).



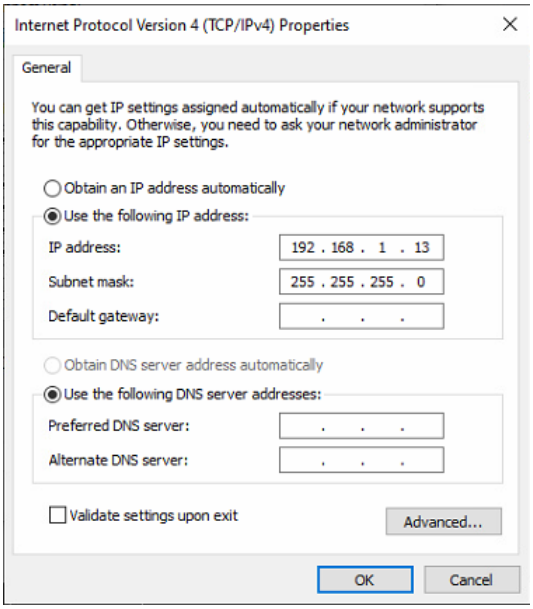
   b. Right-click on the **Matrox Ethernet Adapter** and select **Properties**.

The **Ethernet Properties** window opens.



c. In the **Networking** tab, select **Internet Protocol Version 4 (TCP/IPv4)** and then select **Properties**.

The **Internet Protocol Version 4 (TCP/IPv4) Properties** window opens.



d. Configure the properties as necessary.

e. Repeat this procedure for any remaining **Matrox Ethernet Adapters**.

3. Select the appropriate protocol link for further instructions:

SMPTE 2110

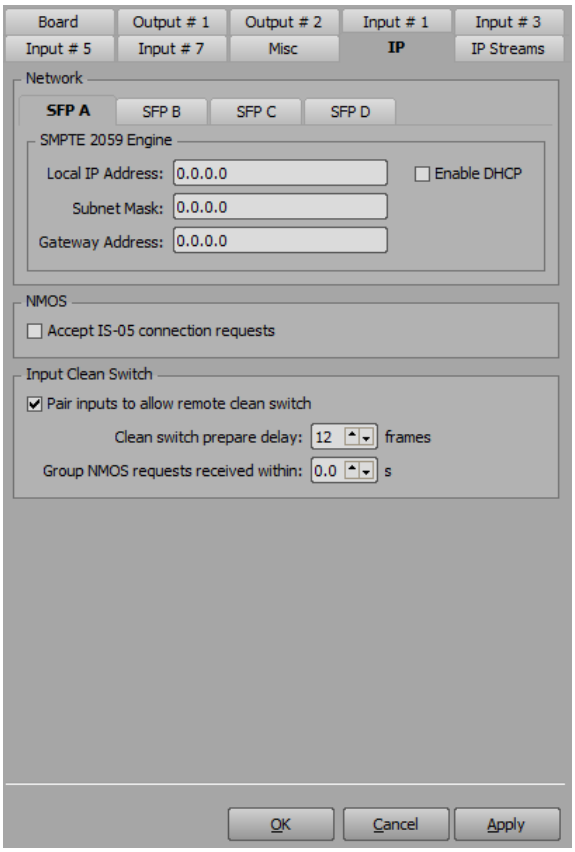
SMPTE 2110 with Redundancy

SMPTE 2022-6

SMPTE 2022-6 with 2022-7

SMPTE 2110

If the IP card is configured for **SMPTE 2110** protocol, the **IP** tab is displayed as follows:



To configure the NMOS setting:

- Select **Accept IS-05 connection requests** if you want to allow connection commands from an external NMOS controller.
- Clear the checkbox if connections are configured locally or by another control method.

To configure the Input Clean Switch settings:

1. If using the DSX LE5 D25, DSX LE5 Q25, X.mio5 D25 or X.mio5 Q25, in the **Input Clean Switch** section, select the **Pair inputs to allow remote clean switch** checkbox to create pairs of inputs (effectively dividing the number of available inputs by two) so that when doing a switch, the 'inactive' input is prepared with the new multicast settings first, then made active when ready.

   ★Clean switch is supported on 2110 receivers of the Matrox LE5 D25 when multicast is set by NMOS IS-05 registration commands.

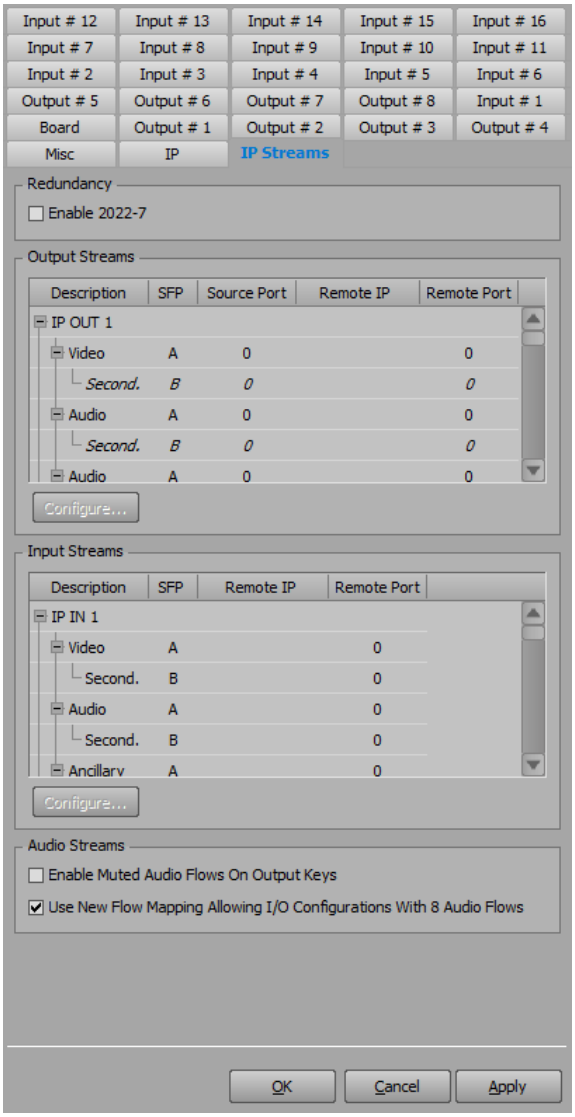
2. If selected, configure the following settings:

   - **Clean switch prepare delay** — enter or select the number of frames to prepare the delay for the IP clean switch option.
   - **Group NMOS requests received within** — enter or select time in seconds to configure a delay to collect any NMOS connection requests (video/audio/ancillary) received for an input within that time period before applying the IP clean switch.

To configure redundancy:

1. Select the **IP Streams** tab.

   The **Matrox DSX - IP Streams Setup** dialog opens.



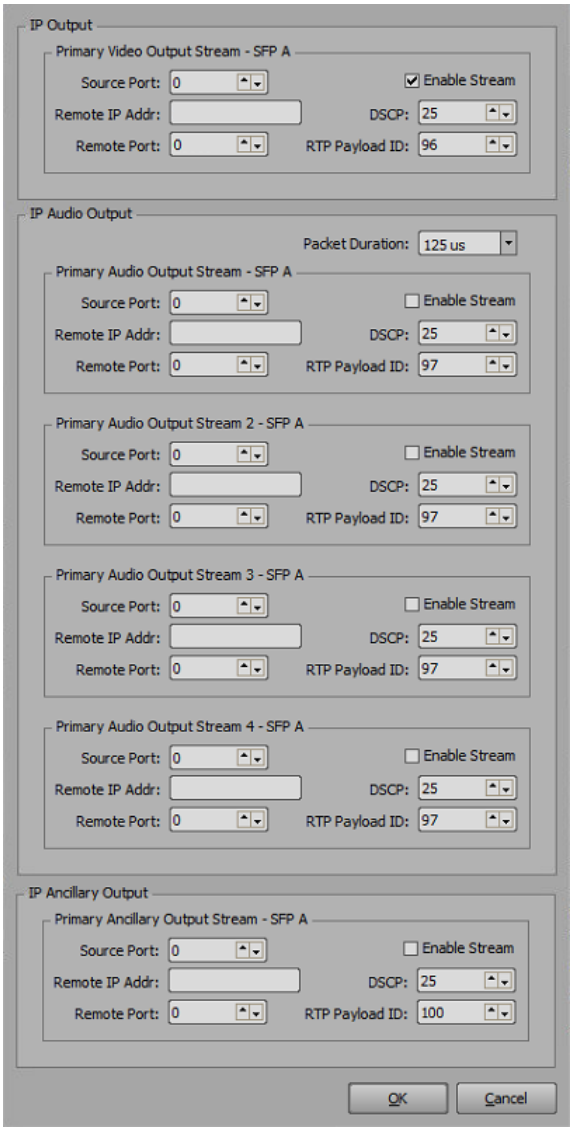
2. In the **Redundancy** section, select **Enable 2022-7** to use the 2022-7 standard to enable redundancy for the SFP module connection.

   If using 2022-7 redundancy, see SMPTE 2110 with Redundancy for configuration information.

To configure the Output Streams:

1. In the **Output Streams** section, select **Configure**.

   The **Matrox DSX - IP Output Stream Setup** dialog opens.



2. In the **Primary Video Output Stream** section configure the following settings:
   - **Source Port** — enter or select the local port number of the primary video output stream source.
   - **Enable Stream** — enable the primary video output stream.
   - **Remote IP Addr** — enter the remote IP address of the primary video output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary video output stream.
   - **Remote Port** — enter or select the remote port number for the primary video output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.
3. In the **IP Audio Output** section, configure the following **Primary Audio Output Streams** settings for each audio output stream in use:
   - **Source Port** — enter or select the local port number of the of the primary audio output stream

source.

- **Enable Stream** — enable the primary audio output stream.
- **Remote IP Addr** — enter the remote IP address of the primary audio output stream.
- **DSCP** — enter or select the differentiated services code point of the primary audio output stream.
- **Remote Port** — enter or select the remote port number for the primary audio output stream.
- **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.

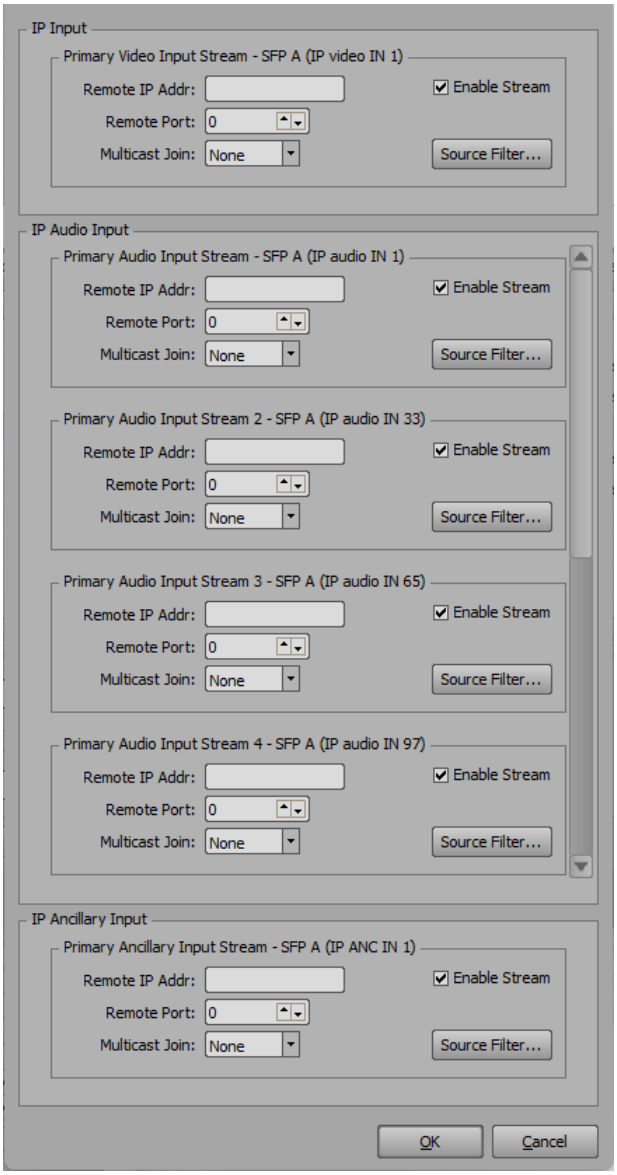
4. In the **IP Ancillary Output** section configure the following settings:
   - **Source Port** — enter or select the local port number of the of the primary ancillary output stream source.
   - **Enable Stream** — enable the primary ancillary output stream.
   - **Remote IP Addr** — enter the remote IP address of the primary ancillary output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary ancillary output stream.
   - **Remote Port** — enter or select the remote port number for the primary ancillary output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.
5. Repeat steps 1 to 4 for any other output streams.
6. Select **OK**.

   The **Matrox DSX - IP Output Stream Setup** dialog closes and the settings are added to the selected output stream.

To configure the Input Streams:

1. In the **Input Streams** section, select an input stream and select **Configure**.

   The **Matrox DSX - IP Input Stream Setup** dialog opens.



2. In the **Primary Video Input Stream** section configure the following settings:

   - **Remote IP Addr** — enter the remote IP address of the primary video input stream.
   - **Enable Stream** — enable the primary video input stream.
   - **Remote Port** — enter or select the remote port number for the primary video input stream.
   - **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary video input stream.

     The options are:

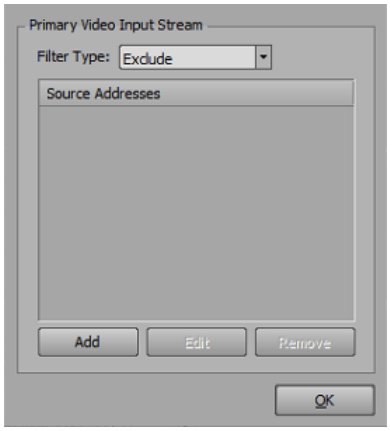
     ➢ **None** — select this option if not using IP multicast. This is the default setting.

     ➢ **IGMP v2** — use internet group management protocol version 2.

- **IGMP v3** — use internet group management protocol version 3.

3. Select the **Source Filter** button to configure IP multicast source filtering if using multicast.

   The **Matrox DSX - IGMP Multicast Source Filter** dialog opens.



   a. From the **Filter Type** drop-down, select one of the following filtering options:

      - **Exclude** — exclude specific source addresses from the IP multicast.
      - **Only Include** — include specific source addresses from the IP multicast.

   b. Select **Add** to add and enter a source address to either exclude or only include (depending on the filter type selected) specific source addresses.

   c. Once any necessary addresses have been added, select **OK**.

4. In the **IP Audio Input** section, configure the following **Primary Audio Input Stream** settings:

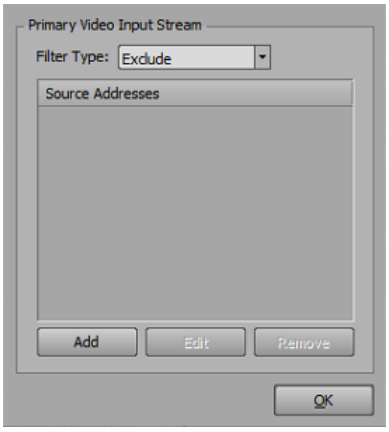
   - **Remote IP Addr** — enter the remote IP address of the primary audio input stream.
   - **Enable Stream** — enable the primary audio input stream.
   - **Remote Port** — enter or select the remote port number for the primary audio input stream.
   - **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary audio input stream.

     The options are:

     - **None** — select this option if not using IP multicast. This is the default setting.
     - **IGMP v2** — use internet group management protocol version 2.
     - **IGMP v3** — use internet group management protocol version 3.

5. Select the **Source Filter** button to configure IP multicast source filtering if using multicast.

   The **Matrox DSX - IGMP Multicast Source Filter** dialog opens.



   a. From the **Filter Type** drop-down, select one of the following filtering options:

      - **Exclude** — exclude specific source addresses from the IP multicast.
      - **Only Include** — include specific source addresses from the IP multicast.

   b. Select **Add** to add and enter a source address to either exclude or only include (depending on the filter type selected) specific source addresses.

   c. Once any necessary addresses have been added select **OK**.

6. Repeat step 4 and optionally, step 5 for any other primary audio input streams.

7. In the **Primary Ancillary Input Stream** section configure the following settings:

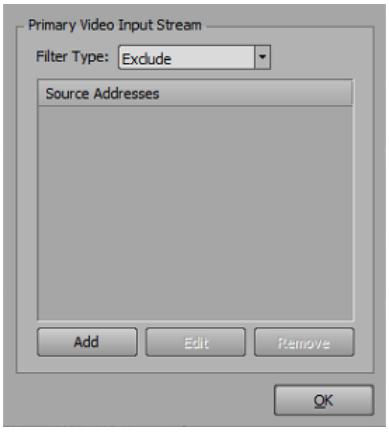
   - **Remote IP Addr** — enter the remote IP address of the primary ancillary input stream.
   - **Enable Stream** — enable the primary ancillary input stream.
   - **Remote Port** — enter or select the remote port number for the primary ancillary input stream.
   - **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary ancillary input stream.

     The options are:

     - **None** — select this option if not using IP multicast. This is the default setting.
     - **IGMP v2** — use internet group management protocol version 2.
     - **IGMP v3** — use internet group management protocol version 3.

8. Select the **Source Filter** button to configure IP multicast source filtering if using multicast.

   The **Matrox DSX - IGMP Multicast Source Filter** dialog opens.



   a. From the **Filter Type** drop-down, select one of the following filtering options:

      - **Exclude** — exclude specific source addresses from the IP multicast.
      - **Only Include** — include specific source addresses from the IP multicast.

   b. Select **Add** to add and enter a source address to either exclude or only include (depending on the filter type selected) specific source addresses.

   c. Once any necessary addresses have been added select **OK**.

   The **Matrox DSX - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.

9. Repeat steps 1 to 8 for any other input streams.

To configure the Audio Streams:

- In the **Audio Streams** section, do the following:

  ➢ Select **Enable Muted Audio Flows On Output Keys** to enable ST 2110 audio flows for key outputs even when those audio channels are muted. Use this option when downstream IP equipment or the facility's ST 2110/NMOS configuration requires the audio flows associated with key outputs to remain present.

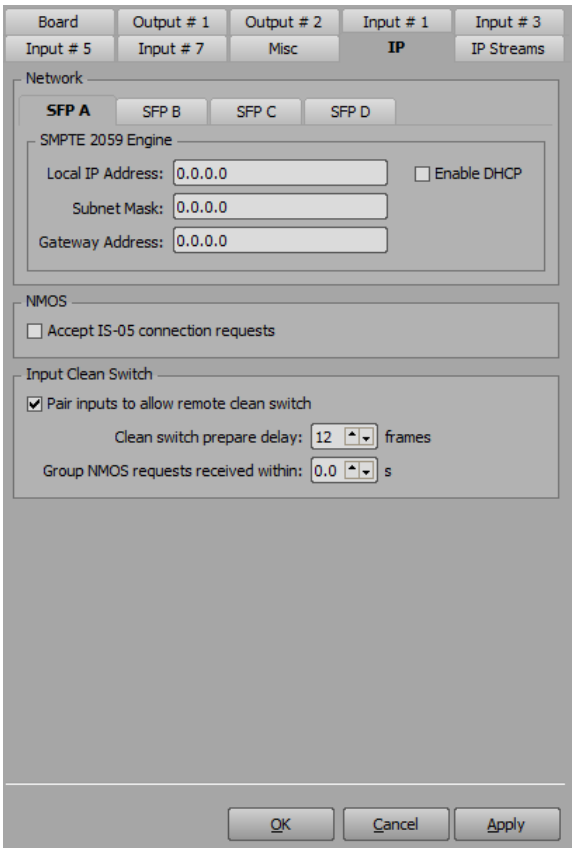
  ➢ Enable **Use New Flow Mapping Allowing I/O Configurations With 8 Audio Flows**.

  When enabled, audio (and ancillary) flows are mapped so that all of an input's or output's audio stays on the same SFP as its video, allowing up to 8 audio streams per video. This applies to the whole board, not a single input or output.

  When not enabled, behavior is identical to previous XPression versions. No configuration or NMOS controller change is required.

SMPTE 2110 with Redundancy

If the IP card is configured for **SMPTE 2110-30** protocol, the **IP** tab is displayed as follows:



To configure the NMOS setting:

- Select **Accept IS-05 connection requests** if you want to allow connection commands from an external NMOS controller.
- Clear the checkbox if connections are configured locally or by another control method.

To configure the Input Clean Switch settings:

1. If using the DSX LE5 D25, DSX LE5 Q25, X.mio5 D25 or X.mio5 Q25, in the Input Clean Switch section, select the Pair inputs to allow remote clean switch checkbox to create pairs of inputs (effectively dividing the number of available inputs by two) so that when doing a switch, the 'inactive' input is prepared with the new multicast settings first, then made active when ready.

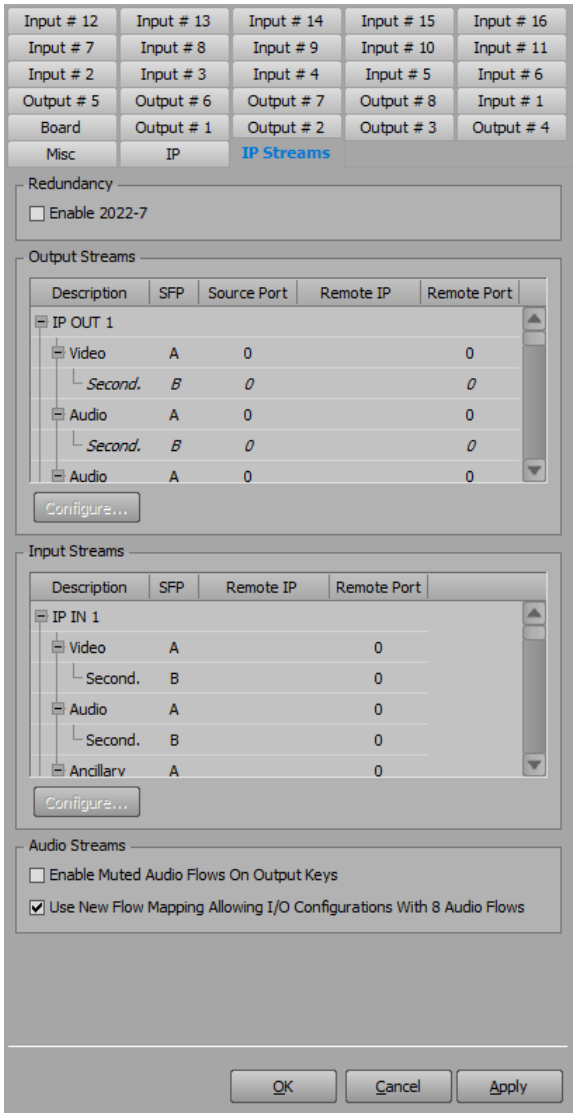
   ★Clean switch is supported on 2110 receivers of the Matrox LE5 D25 when multicast is set by NMOS IS-05 registration commands.

2. If selected, configure the following settings:
   - Clean switch prepare delay — enter or select the number of frames to prepare the delay for the IP clean switch option.
   - Group NMOS requests received within — enter or select the time in seconds to configure a delay to collect any NMOS connection requests (video/audio/ancillary) received for an input within that time period before applying the IP clean switch.

To configure redundancy:

1. Select the **IP Streams** tab.

   The **Matrox DSX - IP Streams Setup** dialog opens.

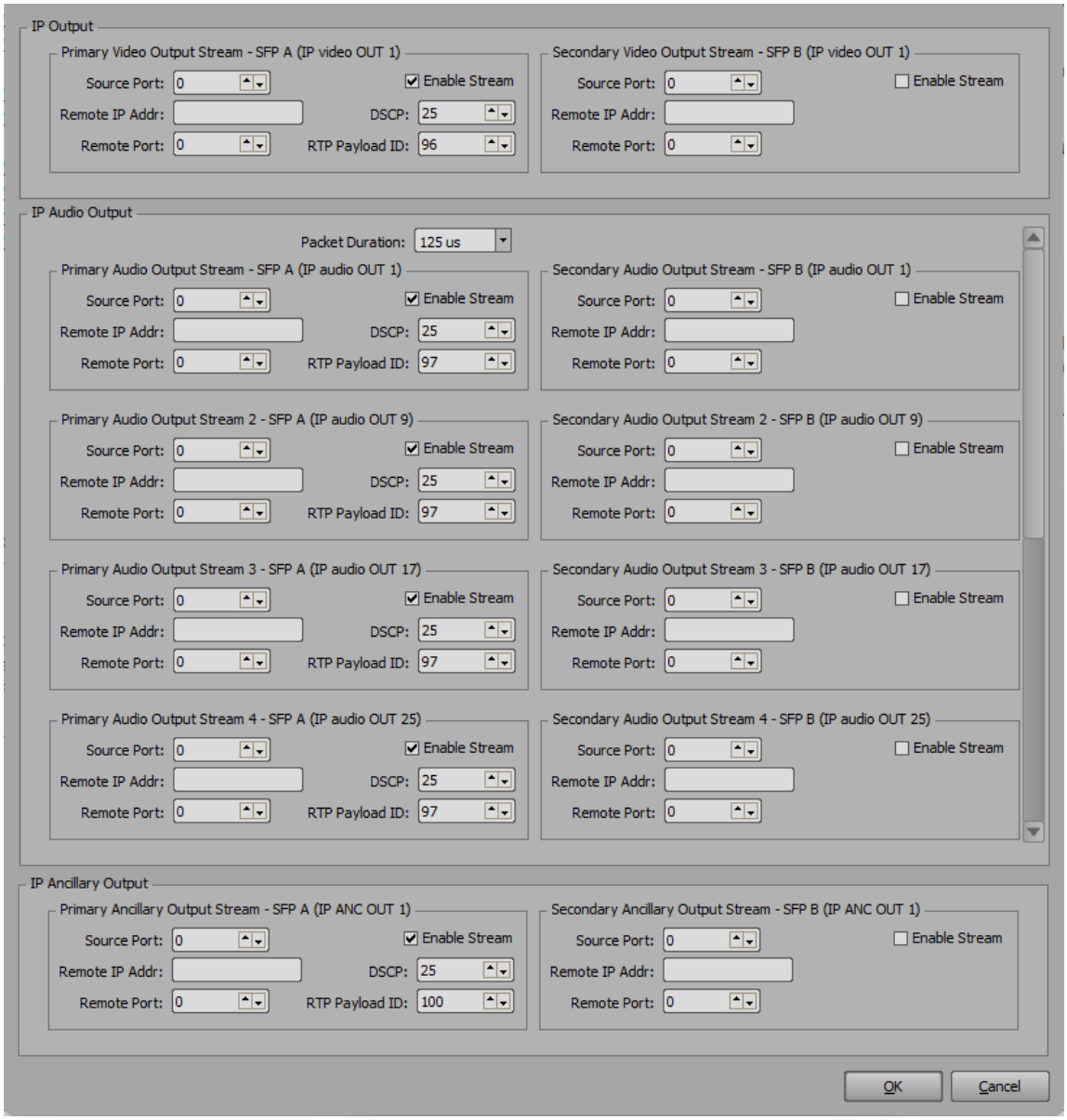


2. In the **Redundancy** section, select **Enable 2022-7** to use the 2022-7 standard to enable redundancy for the SFP module connection.

To configure the Output Streams:

1. In the **Output Streams** section, select an output stream and select **Configure**.

   The **Matrox DSX - IP Output Stream Setup** dialog opens.



2. In the **Primary Video Output Stream** section, configure the following settings:
   - **Source Port** — enter or select the local port number of the primary video output stream source.
   - **Enable Stream** — enable the primary video output stream.
   - **Remote IP Addr** — enter the remote IP address of the primary video output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary video output stream.
   - **Remote Port** — enter or select the remote port number for the primary video output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for

that RTP stream within the IETF standard which specifies it.

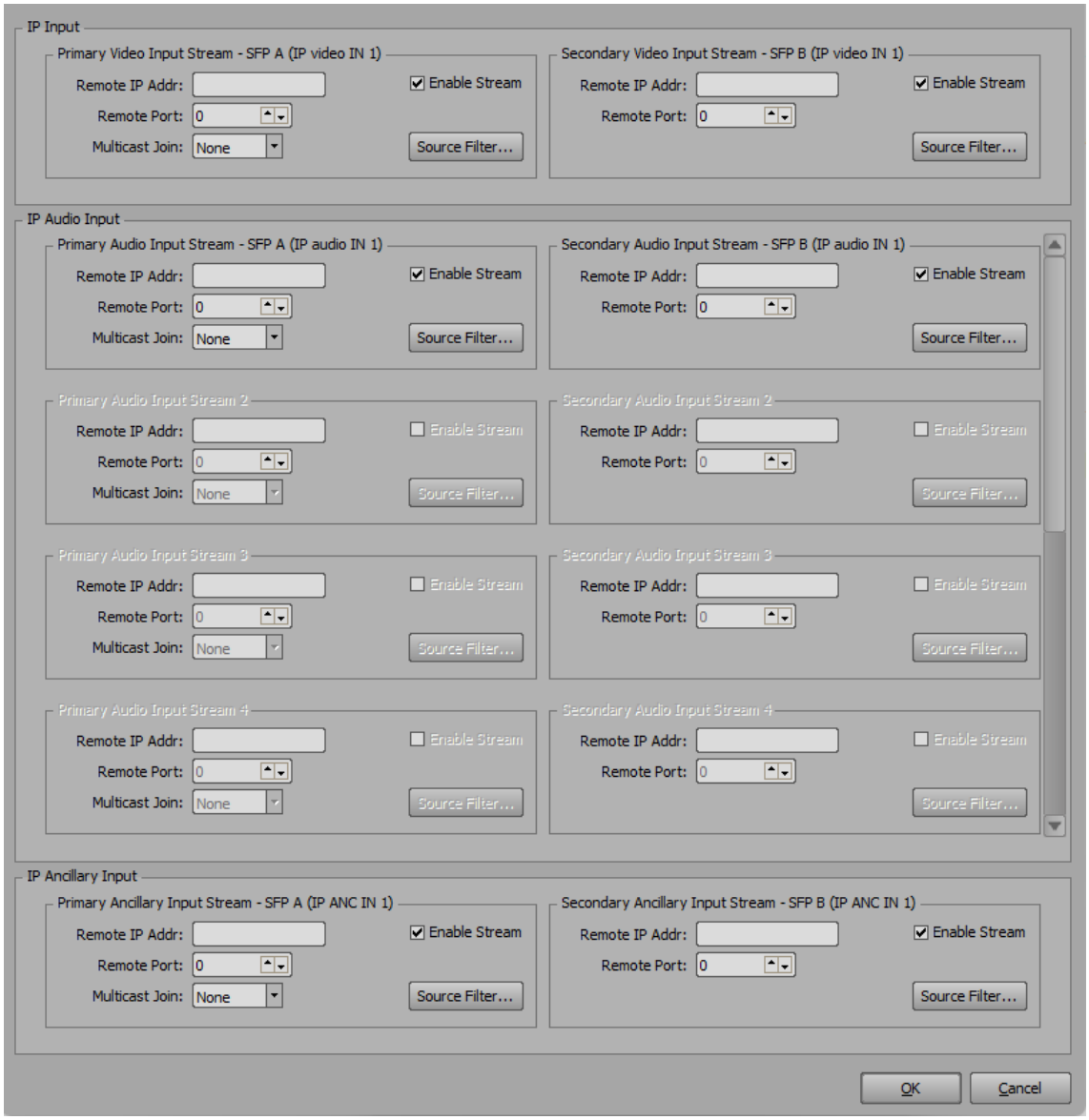
3. In the **Primary Audio Output Stream** section, configure the following settings:
   - **Source Port** — enter or select the local port number of the primary audio output stream source.
   - **Enable Stream** — enable the primary audio output stream.
   - **Remote IP Addr** — enter the remote IP address of the primary audio output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary audio output stream.
   - **Remote Port** — enter or select the remote port number for the primary audio output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.
4. Repeat step 3 for any other primary audio output streams.
5. In the **Primary Ancillary Output Stream** section, configure the following settings:
   - **Source Port** — enter or select the local port number of the primary ancillary output stream source.
   - **Enable Stream** — enable the primary ancillary output stream.
   - **Remote IP Addr** — enter the remote IP address of the primary ancillary output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary ancillary output stream.
   - **Remote Port** — enter or select the remote port number for the primary ancillary output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.
6. Repeat steps 1 to 5 for another output streams.
7. Select **OK**.

   The **Matrox DSX - IP Output Stream Setup** dialog closes and the settings are applied to the selected output stream.

To configure the Input Streams:

1. In the **Input Streams** section, select an input stream and select **Configure**.

   The **Matrox DSX - IP Input Stream Setup** dialog opens.



2. In the **Primary Video Input Stream** section configure the following settings:
   - **Remote IP Addr** — enter the remote IP address of the primary video input stream.
   - **Enable Stream** — enable the primary video input stream.
   - **Remote Port** — enter or select the remote port number for the primary video input stream.

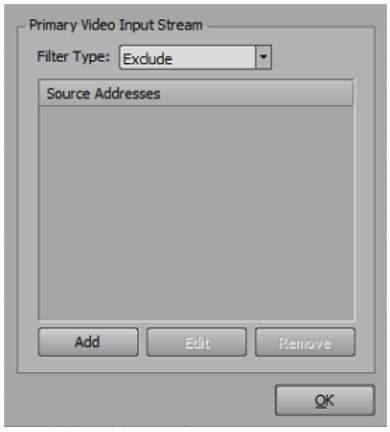
- **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary video input stream.

  The options are:

  - **None** — select this option if not using IP multicast. This is the default setting.
  - **IGMP v2** — use internet group management protocol version 2.
  - **IGMP v3** — use internet group management protocol version 3.

3. Select the **Source Filter** button to configure IP multicast source filtering if using multicast.

   The **Matrox DSX - IGMP Multicast Source Filter** dialog opens.



   a. From the **Filter Type** drop-down, select one of the following filtering options:

      - **Exclude** — exclude specific source addresses from the IP multicast.
      - **Only Include** — include specific source addresses from the IP multicast.

   b. Select **Add** to add and enter a source address to either exclude or only include (depending on the filter type selected) specific source addresses.

   c. Once any necessary addresses have been added, select **OK**.

4. In the **Primary Audio Input Stream** section configure the following settings:

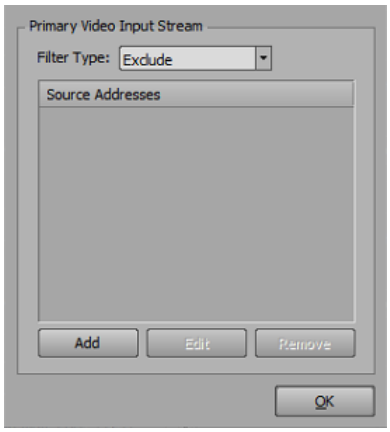
   - **Remote IP Addr** — enter the remote IP address of the primary audio input stream.
   - **Enable Stream** — enable the primary audio input stream.
   - **Remote Port** — enter or select the remote port number for the primary audio input stream.
   - **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary audio input stream.

     The options are:

     - **None** — select this option if not using IP multicast. This is the default setting.
     - **IGMP v2** — use internet group management protocol version 2.
     - **IGMP v3** — use internet group management protocol version 3.

5. Select the **Source Filter** button to configure IP multicast source filtering if using multicast.

   The **Matrox DSX - IGMP Multicast Source Filter** dialog opens.



   a. From the **Filter Type** drop-down, select one of the following filtering options:

      - **Exclude** — exclude specific source addresses from the IP multicast.
      - **Only Include** — include specific source addresses from the IP multicast.

   b. Select **Add** to add and enter a source address to either exclude or only include (depending on the filter type selected) specific source addresses.

   c. Once any necessary addresses have been added select **OK**.

6. Repeat step 4 and optionally, step 5 for any other primary audio input streams.

7. In the **Primary Ancillary Input Stream** section configure the following settings:

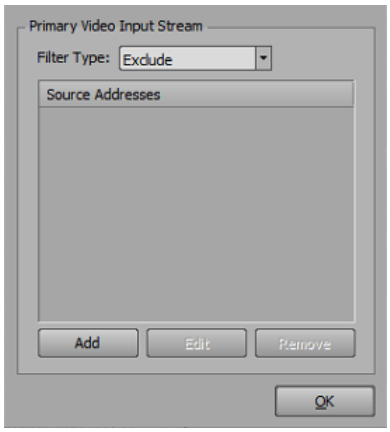
   - **Remote IP Addr** — enter the remote IP address of the primary ancillary input stream.
   - **Enable Stream** — enable the primary ancillary input stream.
   - **Remote Port** — enter or select the remote port number for the primary ancillary input stream.
   - **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary ancillary input stream.

     The options are:

     - **None** — select this option if not using IP multicast. This is the default setting.
     - **IGMP v2** — use internet group management protocol version 2.
     - **IGMP v3** — use internet group management protocol version 3.

8. Select the **Source Filter** button to configure IP multicast source filtering if using multicast.

   The **Matrox DSX - IGMP Multicast Source Filter** dialog opens.



   a. From the **Filter Type** drop-down, select one of the following filtering options:

      - **Exclude** — exclude specific source addresses from the IP multicast.
      - **Only Include** — include specific source addresses from the IP multicast.

   b. Select **Add** to add and enter a source address to either exclude or only include (depending on the filter type selected) specific source addresses.

   c. Once any necessary addresses have been added select **OK**.

   The **Matrox DSX - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.

9. Repeat steps 1 to 8 for any other input streams.

To configure the Audio Streams:

- In the **Audio Streams** section, do the following:

  ➢ Select **Enable Muted Audio Flows On Output Keys** to enable ST 2110 audio flows for key outputs even when those audio channels are muted. Use this option when downstream IP equipment or the facility's ST 2110/NMOS configuration requires the audio flows associated with key outputs to remain present.

  ➢ Enable **Use New Flow Mapping Allowing I/O Configurations With 8 Audio Flows**.

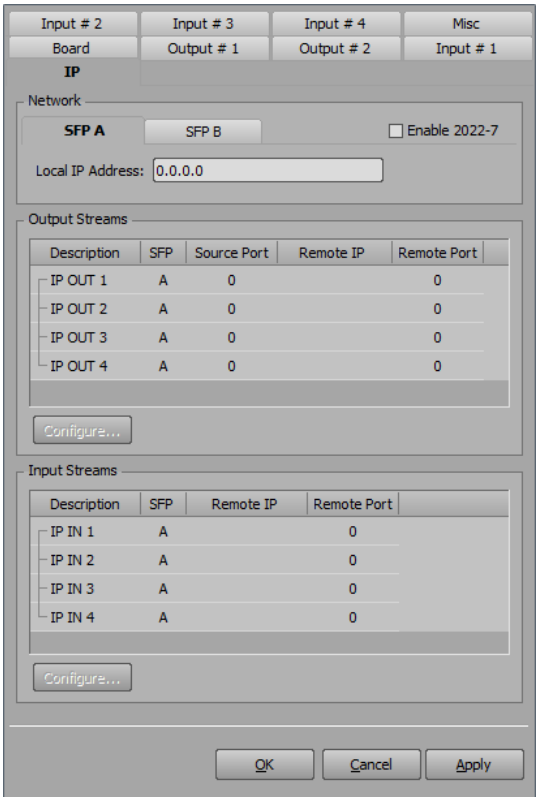
  When enabled, audio (and ancillary) flows are mapped so that all of an input's or output's audio stays on the same SFP as its video, allowing up to 8 audio streams per video. This applies to the whole board, not a single input or output.

  When not enabled, behavior is identical to previous XPression versions. No configuration or NMOS controller change is required.

SMPTE 2022-6

★SMPTE 2022-6 is not supported on the Matrox DSXLE5 D25 and X.mio5 Q25.

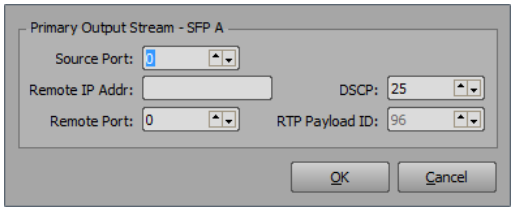
If the IP card is configured for SMPTE 2022-6 protocol, the IP tab is displayed as follows:



To configure the Primary Output Stream:

1. In the **Output Streams** section, select an output stream and select **Configure**.

   The **Matrox DSX - IP Output Stream Setup** dialog opens.

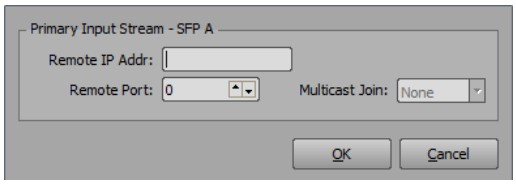
2. In the **Primary Output Stream - SFP A** section configure the following settings:
   - **Source Port** — enter or select the local port number of the primary video output stream source.
   - **Remote IP Addr** — enter the remote IP address of the primary video output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary video output stream.
   - **Remote Port** — enter or select the remote port number for the primary video output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.

3. Repeat steps 1 and 2 for any other output streams.

To configure the Primary Input Stream:

1. In the **Input Streams** section, select an input stream and select **Configure**.

   The **Matrox DSX - IP Input Stream Setup** dialog opens.



2. In the **Primary Input Stream - SFP A** section configure the following settings:
   - **Remote IP Addr** — use this box to enter the remote IP address of the primary video input stream.
   - **Remote Port** — use this box to enter or select the remote port number for the primary video input stream.
   - **Multicast Join** — use this list to select an internet group management protocol for joining an IP multicast for the primary video input stream.

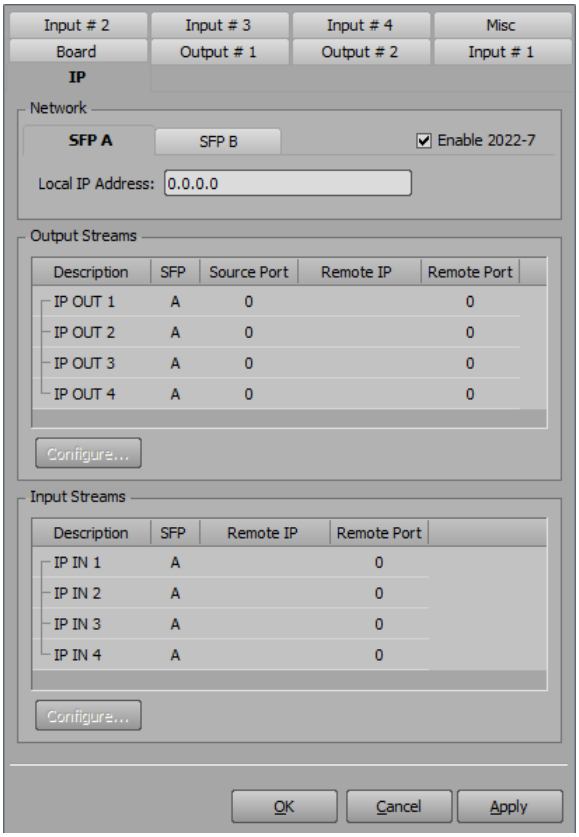
     The options are:

     - **None** — select this option if not using IP multicast. This is the default setting.
     - **IGMP v2** — use internet group management protocol version 2.
     - **IGMP v3** — use internet group management protocol version 3.
3. Select **OK**.

   The **Matrox DSX - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.
4. Repeat steps 1 and 2 for any other input streams.

SMPTE 2022-6 with Redundancy

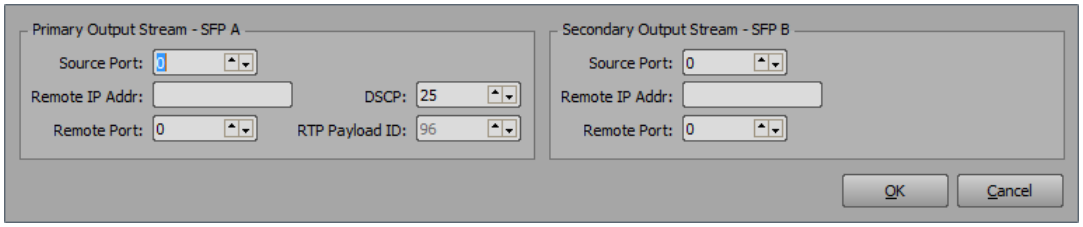
If the IP card is configured for SMPTE 2022-6 protocol and the **Enable 2022-7** checkbox is selected, the IP tab is displayed as follows:



To configure the Primary Output Stream:

1. In the **Output Streams** section, select an output stream and select **Configure**.

   The **Matrox DSX - IP Output Stream Setup** dialog opens.



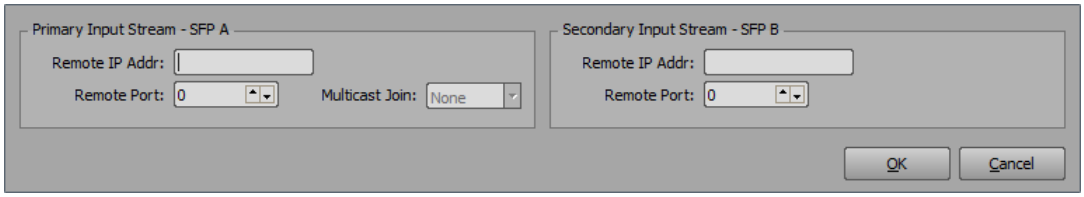
2. In the **Primary Output Stream - SFP A** section configure the following settings:
   - **Source Port** — enter or select the local port number of the primary video output stream source.
   - **Remote IP Addr** — enter the remote IP address of the primary video output stream.
   - **DSCP** — enter or select the differentiated services code point of the primary video output stream.
   - **Remote Port** — enter or select the remote port number for the primary video output stream.
   - **RTP Payload ID** — enter or select the dynamic payload type chosen in the range of 96 through 127, signaled as specified in section 6 of IETF RFC 4566, unless a fixed payload type designation exists for that RTP stream within the IETF standard which specifies it.
3. In the **Secondary Output Stream - SFP B** section configure the following settings:
   - **Source Port** — enter or select the local port number of the primary video output stream source.
   - **Remote IP Addr** — enter the remote IP address of the primary video output stream.
   - **Remote Port** — enter or select the remote port number for the primary video output stream.
4. Select **OK**.

   The **Matrox DSX - IP Output Stream Setup** dialog closes and the settings are added to the selected output stream.
5. Repeat steps 1 to 4 for any other output streams.

To configure the Primary Input Stream:

1. In the **Input Streams** section, select an input stream and select **Configure**.

   The **Matrox DSX - IP Input Stream Setup** dialog opens.



2. In the **Primary Input Stream - SFP A** section configure the following settings:
   - **Remote IP Addr** — enter the remote IP address of the primary video input stream.
   - **Remote Port** — enter or select the remote port number for the primary video input stream.
   - **Multicast Join** — select an internet group management protocol for joining an IP multicast for the primary video input stream.

     The options are:

     - **None** — select this option if not using IP multicast. This is the default setting.
     - **IGMP v2** — use internet group management protocol version 2.
     - **IGMP v3** — use internet group management protocol version 3.
3. In the **Secondary Input Stream - SFP B** section configure the following settings:
   - **Remote IP Addr** — enter the remote IP address of the primary video input stream.
   - **Remote Port** — enter or select the remote port number for the primary video input stream.
4. Select **OK**.

   The **Matrox DSX - IP Input Stream Setup** dialog closes and the settings are added to the selected input stream.
5. Repeat steps 1 to 3 for any other input streams.
6. Select **Apply** to implement the settings.
7. Select **OK**.

   The configured Matrox framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

Configuring a Matrox Video X.mio2 FrameBuffer

This topic describes the selection and configuration of a Matrox Video X.mio2 framebuffer.

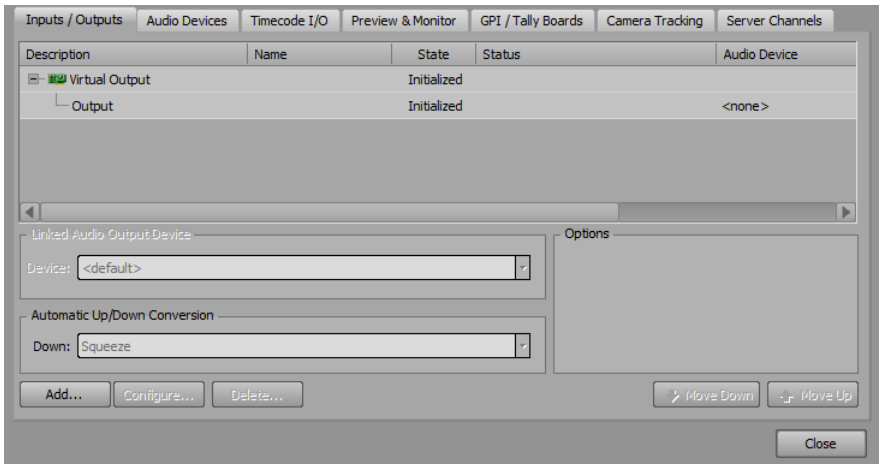
★If using Matrox X.mio2 and upgrading to XPression 64-bit, Matrox driver 9.4.2.9297 must be installed.

To add a Matrox Video X.mio2 framebuffer card:

1. In XPression, select **Edit > Hardware Setup**.

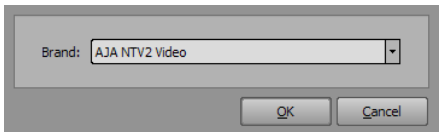
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



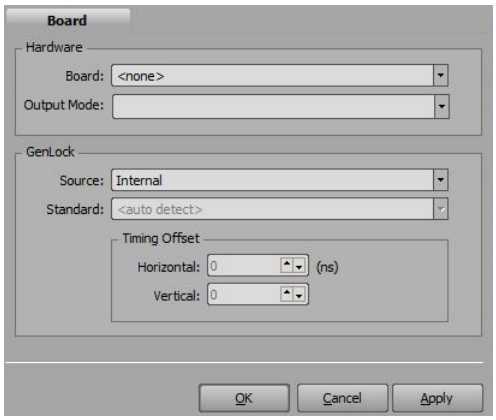
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **Matrox Video X.mio2**.
5. Select **OK**.

   The **Matrox XMIO - Framebuffer Setup** dialog opens.



   Continue with configuring the **Hardware** and **Genlock** settings in the Board tab.

Board

To configure the Hardware and GenLock settings:

1. From the **Output Mode** drop-down, select the output configuration for the card:

   - **2 Fill/Key Outputs**

     The AES outputs will be mapped as follows:

     ➢ Output 1: AES Output A 1-16

     ➢ Output 2: AES Output B 1-16

   - **1 Fill/Key + 2 Fill Outputs**

     The AES outputs will be mapped as follows:

     ➢ Output 1 Fill/Key: AES Output A 1-16

     ➢ Output 2 Fill: AES Output B 1-8

     ➢ Output 3 Fill: AES Output B 9-16

   - **4 Fill Outputs**

     The AES outputs will be mapped as follows:

     ➢ Output 1: AES Output A 1-8

     ➢ Output 2: AES Output B 1-8

     ➢ Output 3: AES Output A 9-16

     ➢ Output 4: AES Output B 9-16

   If using XPression Studio SCE, select the output configuration for the card from the following options:

   - **1 Fill/Key Output**
   - **2 Fill Outputs**

   ★These options are only available if the **Fill-Only** option has been purchased for XPression Studio and XPression Studio SCE. Otherwise, the only options are **2 Fill/Key** for XPression Studio and **1 Fill/Key** for XPression Studio SCE.

2. In the **GenLock** section, from the **Source** drop-down, select the source of the GenLock signal with which to synchronize XPression.

   The available GenLock signal sources are:

   - **Internal** — generate internal sync on the video card for all output channels.
   - **Blackburst** — sync to analog black.
   - **SDI Input 1** — sync to SDI Input 1 source signal.
   - **SDI Input 2** — sync to SDI Input 2 source signal.
   - **SDI Input 3** — sync to SDI Input 3 source signal.
   - **SDI Input 4** — sync to SDI Input 4 source signal.

   ★If the output mode is set to **Internal** in the **Output** tab, the GenLock **Source** needs to be set to an SDI input.

3. From the **Standard** drop-down, select the format of the incoming GenLock signal.

4. In the **Timing Offset** section, in the **Horizontal** field, enter or select the number of nanoseconds for horizontal timing offset with regards to an external reference.
5. In the **Vertical** field, enter or select the number of lines for vertical delay timing offset with regards to an external reference.

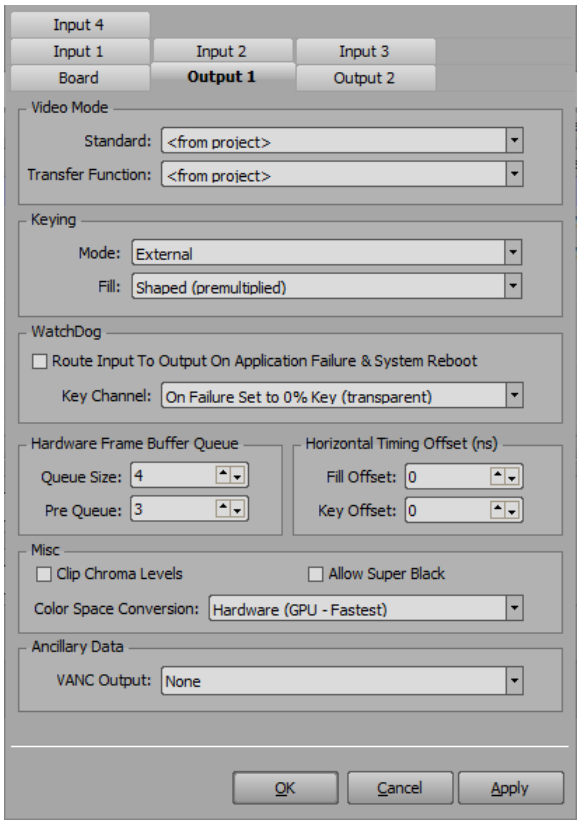
   If configuring an XMIO card when using XPression with a switcher, the **Horizontal** timing offset must be set to **9930** and the **Vertical** timing offset must be set to **1124** if using 1080i/29.27 frames per second and a Tri Level Sync reference.

   Continue with configuring the Output settings.

Outputs

To configure the outputs:

1. Select an **Output** tab to configure the parameters of the selected output.



2. Configure each section as needed.

   Video Mode

   Keying

   WatchDog

   Hardware Frame Buffer Queue

   Horizontal Timing Offset (ns)

   Misc

   Ancillary Data

Video Mode

1. In the **Video Mode** section, from the **Standard** drop-down, select the video format for the output.

   ★When configuring more than one output, they must share the same base frame rate that matches the GenLock reference.

2. From the **Transfer Function** drop-down, select how the physical (linear) light is mapped and encoded.

   The options are:

   - **<from project>** (appears only when <from project> is selected in the **Standard** drop-down)
   - **ITU-R BT.1886 (SDR)**
   - **ITU-R BT.2100 (HLG)**

Keying

1. In the **Keying** section, from the **Mode** drop-down, select a keying mode for the output.

   The options are:

   - **External** — output video and alpha channels.
   - **Internal** — key scenes to the associated input.

   ★If the output mode is set to **Internal**, set the GenLock **Source** in the **Board** tab to an SDI input.

2. From the **Fill** drop-down, select the fill mode.

   The options are:

   - **Shaped (premultiplied)** — use an additive key to cut precise holes for the fill.
   - **Unshaped** — use a multiplicative key based on the gradient values of the alpha.

WatchDog

1. In the **WatchDog** section, select the **Route Input To Output On Application Failure & System Reboot** checkbox to route the input to an output in the event of application failure or a system reboot.
2. From the **Key Channel** drop-down, select a transparent or opaque key channel.

   The options are:

   - **On Failure Set to 0% Key (transparent)** — set the key channel to transparent in the event of failure.
   - **On Failure Set to 100% Key (opaque)** — set the key channel to opaque in the event of failure.

Hardware Frame Buffer Queue

1. In the **Hardware Frame Buffer Queue** section, in the **Queue Size** field, enter or select the framebuffer queue size.

   The framebuffer queue size can be between 2 and 7.

2. In the **Pre Queue** field, enter or select the pre-queue size.

   The pre-queue size can be between 1 and 6.

Horizontal Timing Offset (ns)

1. In the **Horizontal Timing Offset (ns)** section, in the **Fill Offset** field, enter or select the offset of the fill.
2. In the **Key Offset** field, enter or select the offset of the key.

Misc

1. In the **Misc** section, select the **Clip Chroma Levels** checkbox to limit the chroma levels in the output.
2. Select the **Allow Super Black** chec box to output using the full super black to super white range.
3. From the **Color Space Conversion** drop-down, select the color space conversion for the outputs.

   The options are:

   - **Hardware (GPU - Fastest)** (default)
   - **Hardware (Board)**
   - **Software (No Chroma Filter)**

   ★If using the **HLG** transfer function, always select the **Hardware (GPU - Fastest)** option.

4. Select the **Enable RGBA -> YUV Filter** checkbox to enhance the conversion from 4:4:4 RGB to 4:2:2 YUV color space by filtering the down-conversion of the chrominance.

   If running in 1080p video modes, you should not enable this on more than one channel simultaneously. This option is only available with Matrox drivers 9.4.2 or higher.

Ancillary Data

- In the **Ancillary Data** section, from the **VANC Output** drop-down, set the vertical ancillary data output.

  The options are:

  - **None** — do not set a vertical ancillary data output.
  - **Pass VANC from Input 1 to Output 1** — pass the vertical ancillary data from input 1 to output 1
  - **Use Closed Captioning from Video Shader** — when using a Matrox card, select this option to output 608 closed caption (in a 708 CDP) when a video shader is playing back a file with embedded captioning.

When the XPression INcoder is set to a target folder, it will extract 608 closed captioning from an MOV file. The INcoder will transcode the MOV file to an XPression AVI file as well as an XMD file that contains the closed caption metadata. When the AVI file is played back from XPression, XPression will look for the XMD file and play out with the AVI file.

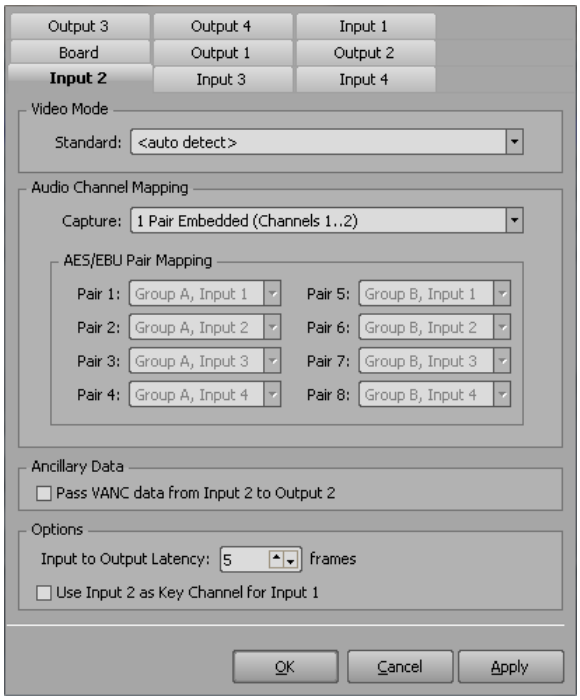
★ Files played back from the Clip Store do not support Closed Captioning.

Continue with configuring the Input settings.

Inputs

To configure the inputs:

1. Select an **Input** tab to configure the parameters of the selected input.



2. In the **Video Mode** section, from the Standard drop-down, select the video format for the input.
3. In the **Audio Channel Mapping** section, from the Capture drop-down, select the audio type for the input.
4. In the **AES/EBU Pair Mapping** section, use the **Pair** drop-downs to define the mapping of the AES/EBU inputs.
5. In the **Ancillary Data** section, select the **Pass VANC data from Input 1 to Output 1** checkbox to pass vertical ancillary data from Input 1 to Output 1 when using a Live Source shader in the scene and a Matrox board.

   ★Requires Matrox DSX version 7.5.2.457.
6. In the **Options** section, in the **Input to Output Latency** field, enter or select a time interval offset, in frames, between the input and output.
7. If configuring **Input 2**, select the **Use Input 2 as Key Channel for Input 1** to use the input as the key channel for Input 1, if necessary.
8. Select **OK**.

   The configured Matrox framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.
9. In the **Hardware Setup** dialog, select **Close**.

Configuring a Ross GeminiIO FrameBuffer

This topic describes the selection and configuration of a Ross GeminiIO framebuffer.

The Ross GeminiIO framebuffer provides high-performance video input and output capabilities for XPression, supporting both HD and UHD production workflows. Through the **Hardware Setup** dialog, you can configure GeminiIO boards to match the requirements of your environment, including a variety of input and output channel combinations, fill and key configurations, internal keying workflows, GenLock synchronization, embedded audio, and latency management. This section explains how to add a GeminiIO board, configure its video and keying settings, define input and output assignments, and optimize framebuffer performance to ensure reliable integration with broadcast video infrastructure.

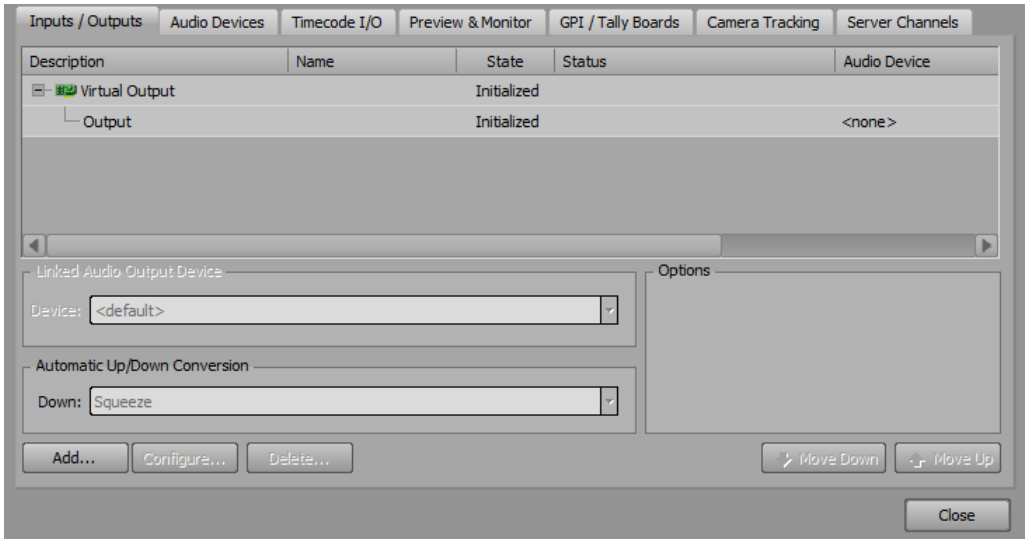
The Ross GeminiIO FrameBuffer supports the following configuration options:

- 3 Outputs/2 Inputs (default)
- 2 Outputs/2 Inputs
- 2 Outputs/4 Inputs (if an output is configured as an Internal Keyer, you can use the same input as a live source)

  ★The video format configured for the output and the corresponding input in this configuration must match.
- 1 Output/2 Inputs
- 4 Outputs/0 Inputs

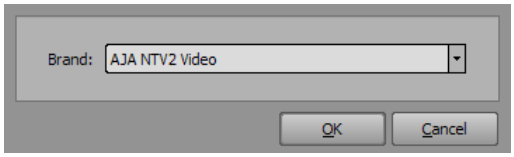
To select a GeminiIO board:

1. In XPression, select **Edit > Hardware Setup**.
2. Select the **Inputs / Outputs** tab.



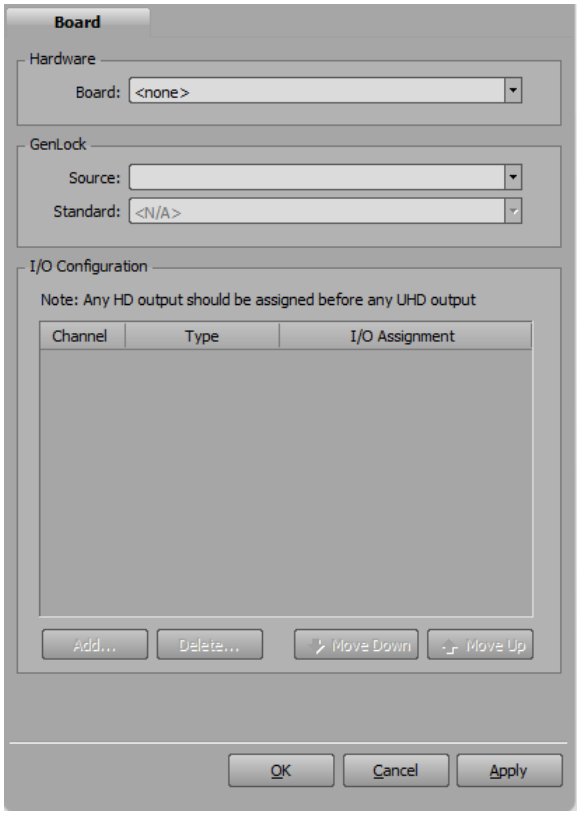
3. Select **Add**.

The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **Ross GeminiIO** and then select **OK**.

   The **Ross Gemini - Framebuffer Setup** dialog opens.



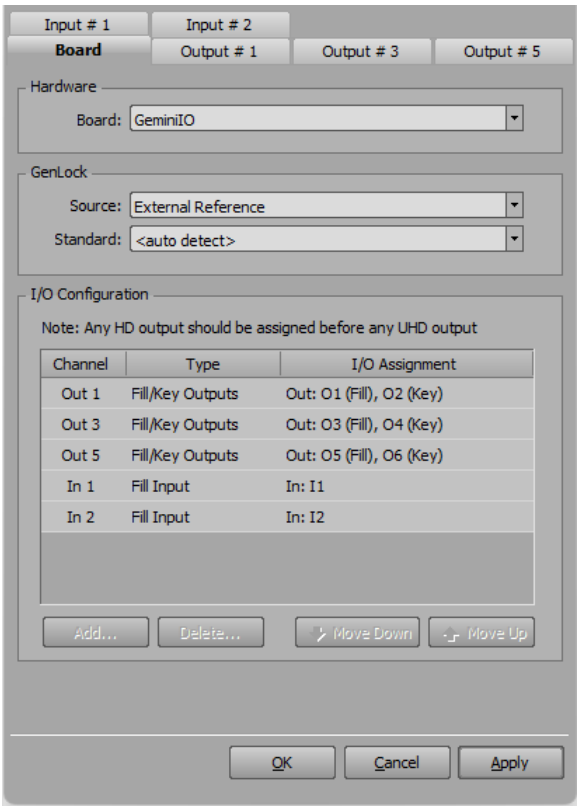
5. Continue with the instructions for configuring the board.

Board

To configure the board:

1. In the **Board** tab, from the **Board** drop-down, select **GeminiIO**.

   The default configuration of three HD outputs and 2 inputs is shown in the **I/O Configuration** section.



2. In the **GenLock** section, from the **Source** drop-down, select the source of the GenLock signal with which to synchronize XPression.

   The available GenLock signal sources are as follows:

   External Reference — Synchronize with a GenLock signal received from an external application through the **GenLock In** port of the XPression computer. Ross Video recommends using an external reference for the GenLock signal source.

   Free Running — Do not synchronize XPression with an external source.

3. From the **Standard** drop-down, select the format of the incoming **GenLock** signal or select **<auto detect>** to allow the correct standard to be automatically selected.

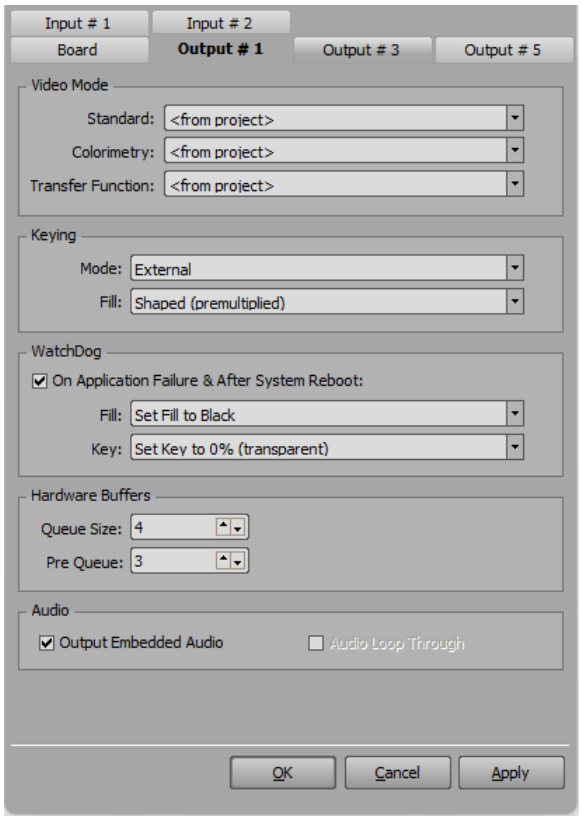
4. In the **I/O Configuration** section, double-click an output to change the configuration if the default isn't appropriate for your project.

5. Continue with configuring an output.

Outputs

To configure an output:

1. Select an **Output** tab to configure the parameters of the selected output.



2. Configure each section as needed:

   Video Mode

   Keying

   Watchdog

   Hardware Buffers

   Audio

   Adding an Output

   Configuring a UHD Output

Video Mode

1. In the **Video Mode** section, from the **Standard** drop-down, select the video format for the output or select **<from project>** to automatically switch the output video format to the video format of the currently loaded project.

   The project video format is ignored when a specific output video format is selected, and the selected video format is used to play out scenes.

   ★When configuring more than one output, they must share the same base frame rate that matches the GenLock reference.

2. From the **Colorimetry** drop-down, select the range of colors that can be represented in the color space:

   <from project> (appears only when <from project> is selected in the **Standard** list)

   ITU-R BT.709 (HD)

   ITU-R BT.2020 (WCG)

3. From the **Transfer Function** drop-down, select the dynamic range standard to use on the output.

   The options are:

   <from project> (appears only when <from project> is selected in the **Standard** list)

   ITU-R BT.1886 (SDR)

   ITU-R BT.2100 (HLG)

Keying

To configure the Keying mode and fill:

1. In the **Keying** section, from the **Mode** drop-down, select a keying mode for the output.

   The available modes are as follows:

   Off (Fill-Only) — select to only output a video signal. In this mode, key is excluded from the output.

   External — select to output video and alpha channels.

   Internal — select to key XPression scenes to the associated input.

   ★If the output mode is set to **Internal**, the **GenLock Source** in the **Board** tab needs to be set to an SDI input.

2. From the **Fill** drop-down, select the fill mode.

   The available fill options are as follows:

   Shaped (premultiplied) — select to use an additive key to cut precise holes for the fill.

   Unshaped — select to use a multiplicative key based on the gradient values of the alpha.

Watchdog

To configure the Watchdog settings:

1. In the **Watchdog** section, select the **On Application Failure & After System Reboot** checkbox to enable the following options in the event of an application failure or a system reboot.
2. From the **Fill** drop-down, select one of the following options:

   Set Fill to Black — clears the screen.

   Route Input to Output — video coming in goes directly to the output.

3. From the **Key** drop-down, select one of the following options:

   Set Key to 0% (transparent) — the input remains visible.

   Set Key to 100% (opaque) — the screen goes to solid white.

   Route Key Input to Key Output — video coming in goes directly to the output.

Hardware Buffers

To configure the Hardware Frame Buffer Queue settings:

1. In the **Queue Size** field, enter or select the number of frames to buffer in memory before sending to the output.

   The framebuffer queue size can be between 2 and 6.

2. In the **Pre Queue** field, enter or select the number of frames to buffer for the pre-queue.

   The pre-queue size can be between 1 and 6.

Audio

To configure the Audio settings:

- In the **Audio** section, select one of the following options:

  Output Embedded Audio — to play out any imbedded audio.

  Audio Loop Through — not currently supported

  This option applies to internal keyer only.

Adding an Output

To add an output:

1. Select each of the two inputs and select **Delete**.
2. Select **Add**.
3. In the **Select I/O Type** dialog, from the **Type** drop-down, select either **Fill Only Output** or **Fill/Key Output**.
4. Then select **OK**.
5. In the **Ross Gemini - Framebuffer Setup** dialog, select **Apply**.

Configuring a UHD Output

To configure a UHD output:

1. Load a UHD project or convert the project mode to UHD.

   (Select **Project > Convert Project Mode** and from the **Editing Mode** drop-down, select either **UHD 2160p** or **2160psf**.)

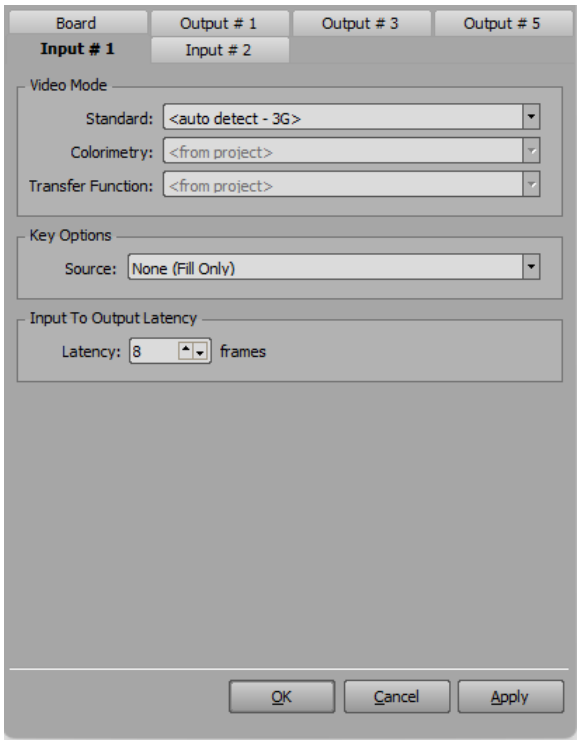
2. Select any existing HD output and select **Delete**.
3. Select **Add**.
4. In the **Select I/O Type** dialog, from the **Type** drop-down, select either **Fill Only Output** or **Fill/Key Output** and then select **OK**.
5. In the **Ross Gemini - Framebuffer Setup** dialog, select **Apply**.

Continue with configuring the Input settings.

Inputs

To configure an input:

1. Select an **Input** tab to configure the parameters of the selected input.



2. In the **Video Mode** section, from the **Standard** drop-down, select the video format for the input.

   The **Colorimetry** and **Transfer Function** settings are not currently supported.

3. In the **Key Options** section, from the **Source** drop-down, select the keying options for the input.

   The options are:

   - **None (Fill Only)**
   - **Paired Input (Fill/Key)**

4. In the **Input to Output Latency** section, in the **Latency** field, enter or select a time interval offset, in frames, between the input and output.
5. Select **Apply**.
6. Select **OK** to close the **Ross Gemini Framebuffer Setup** dialog.

Configuring NDI®

This topic describes the selection and configuration of an NDI framebuffer.

XPression versions 8.5 build 4518 and newer support up to eight channels of audio.

The NDI plugin now runs on the NDI Advanced SDK 6.3.2 (including the move of NDI audio capture to the v6 SDK), with the associated installer and build updates. This keeps NDI interoperability current with the NDI ecosystem and is the foundation for hardware-accelerated outputs (NDI HX).

An NDI framebuffer can now expose several inputs and outputs at once. Existing NDI configurations are migrated automatically the first time they are loaded — no inputs, outputs, names, or per-channel settings are lost — and configurations remain readable by an older XPression version.

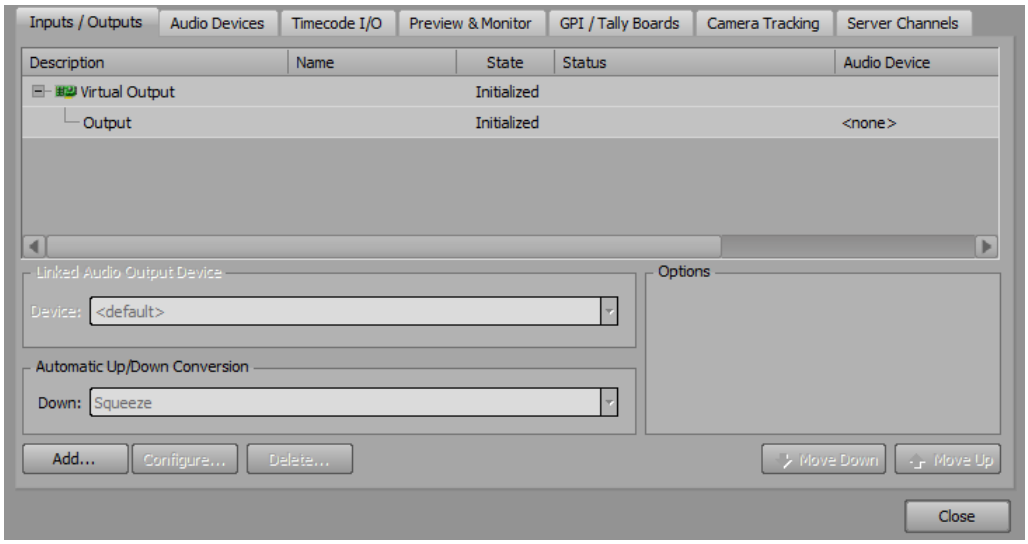
NDI outputs can now be sent as NDI HX (the bandwidth-efficient HX2/HX3 formats) using on-GPU H.264 or HEVC encoding via NVIDIA NVENC, in both fill-only and fill+key modes. This significantly reduces the network bandwidth required for NDI output compared to NDI High Bandwidth. Because encoding runs on the GPU instead of the CPU, enabling HX outputs also lowers CPU load and improves overall XPression performance, as reflected in the performance meter. The option is available only on systems with a compatible NVIDIA GPU and a progressive video format; XPression detects hardware-encode availability automatically and falls back to NDI High Bandwidth output when it is not available.

To configure a NewTek Network Device:

1. In XPression, select **Edit > Hardware Setup**.

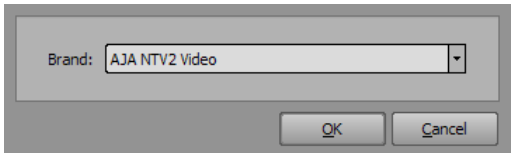
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



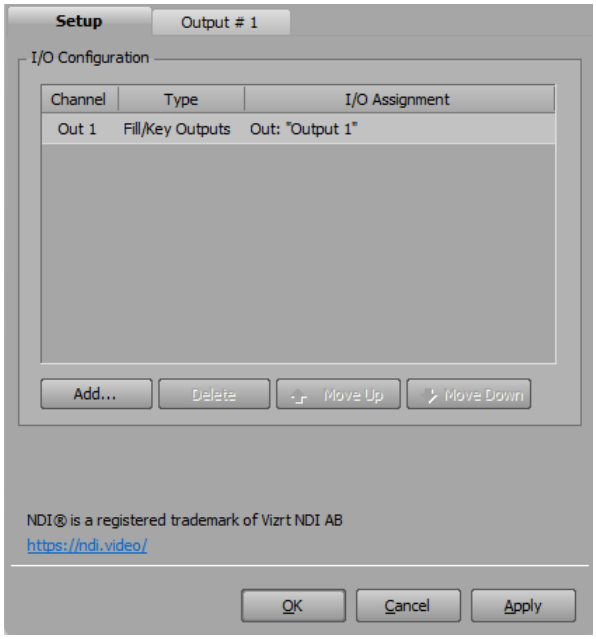
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



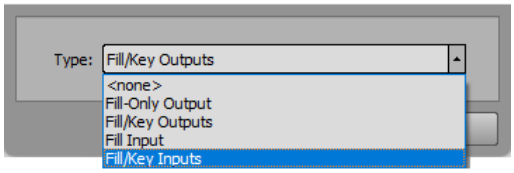
4. From the **Brand** drop-down, select **NDI®** and then select **OK**.

   The **NDI® - Framebuffer Setup** dialog opens with one **Output # 1** tab by default.



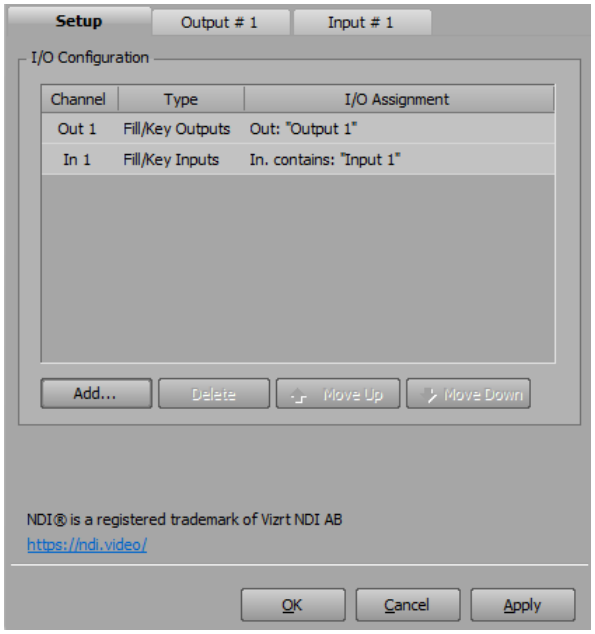
5. In the **Setup** tab, select **Add**.

   The **Select I/O Type** dialog opens.



6. From the **Type** drop-down, select an input or output option.

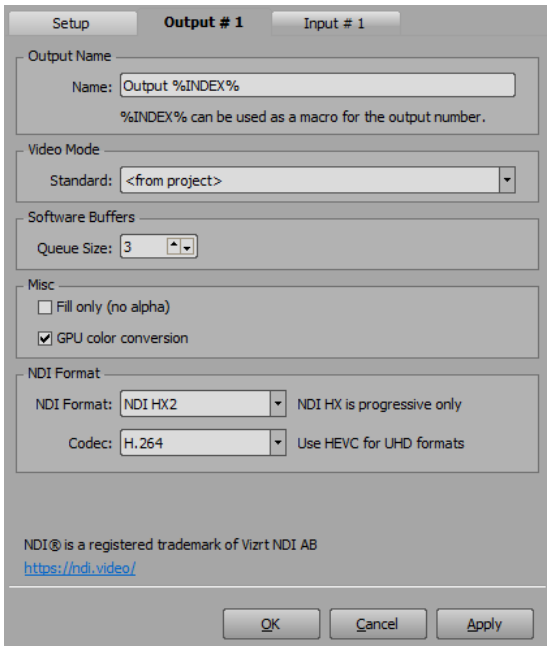
   The selected input or output is added to the UI.



To configure an output:

1. Select an **Output** tab, and in the **Output Name** field, enter an output name for the NDI output source (for example, NDI Output 1).

   This output name will be the source to connect the device receiving the output signal. %INDEX% can be used as a macro for the output number.



2. In the **Video Mode** section, from the **Standard** drop-down, select one of the standard formats or leave the selection at **<from project>** to follow the project format.
3. In the **Software Buffers** section, in the **Queue Size** field, enter or use the arrows to select the depth of the software queue or leave the selection at the default of 3.
   - Increasing the queue size will improve output stability but this will also increase output latency.
   - Decreasing the queue size will improve latency but will increase the risk of dropped frames if the system cannot consistently keep up with the output rate.
4. In the **Misc** section, leave the default settings as is.

   Fill only (no alpha) is automatically set depending on the type of output selected and **GPU color conversion** should be enabled so that color conversion runs on the GPU.
5. In the **NDI Format** section,

   Select **NDI High Bandwidth** for a project using an interlaced, PAL, or NTSC format.

   OR

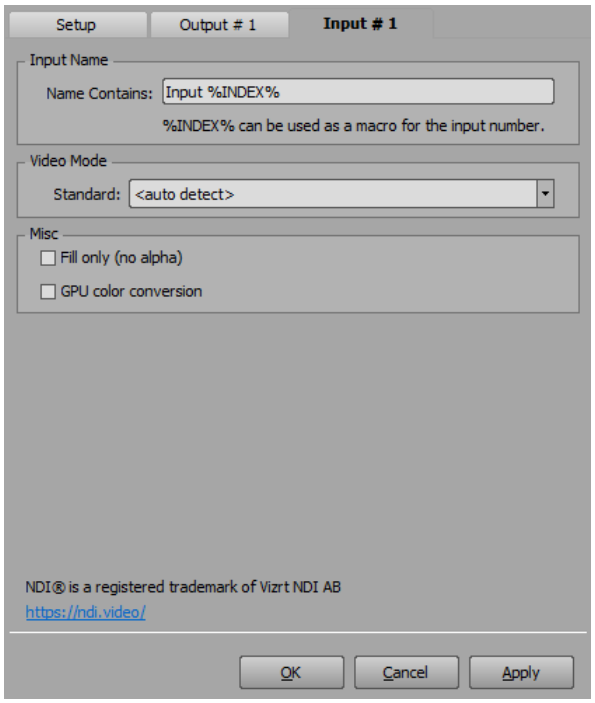
   Select **NDI HX2** or **NDI HX3** for a project using a progressive format on systems with a supported NVIDIA GPU.
6. If **NDI HX2** or **NDI HX3** is selected, from the **Codec** drop-down, select **H.264** or **HEVC** (select **HEVC** for UHD formats).
7. Select **Apply** to save the configuration and continue configuring other outputs or inputs, or select **OK** to save the configuration and close the **NDI® - Framebuffer Setup** dialog.

   The configured NDI framebuffer is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

To configure an input:

1. Select an **Input** tab and in the **Input Name** section, in the **Name Contains** field, enter text that matches part of the source's NDI name.

   Matching is case-sensitive and the first matching live source is selected. %INDEX% can be used as a macro for the input number.



2. In the **Video Mode** section, from the **Standard** drop-down, leave the default selection of **<auto detect>**.
3. In the **Misc** section, leave the **Fill only (no alpha)** setting as is, as it is automatically set depending on the type of input selected.
4. Enable **GPU color conversion** for better performance.
5. Select **Apply** to save the configuration and continue configuring other outputs or inputs, or select **OK** to save the configuration and close the **NDI® - Framebuffer Setup** dialog.

   The configured NDI framebuffer is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

To configure a self-contained data source panel for XPression in DashBoard or connect to another XPression as the output for the NDI source:

DashBoard

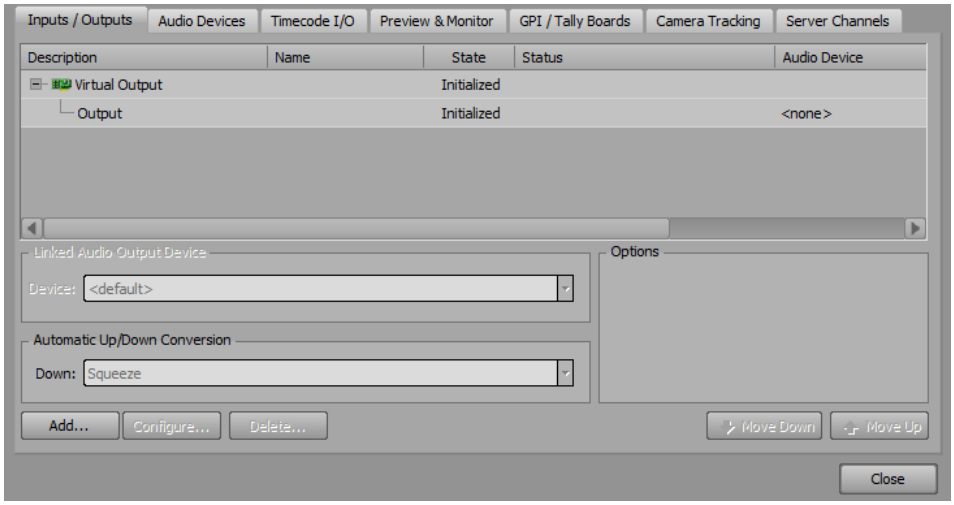
1. In DashBoard, create an NDI data source video monitor for XPression using PanelBuilder.
2. In the **NDI Tag Attributes** section of the **Insert into ABS Component** dialog, from the **Source Name** drop-down, select an NDI output for the NDI data source video monitor in the DashBoard panel.
3. Select **OK**.

   When the source NDI output is online in the **Sequencer** in XPression, it will display in the NDI data source video monitor in the DashBoard panel.

XPression

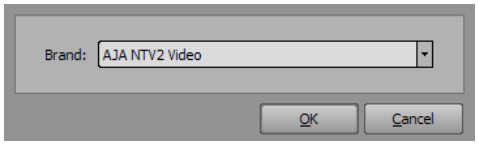
1. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.
2. Select the **Inputs / Outputs** tab.



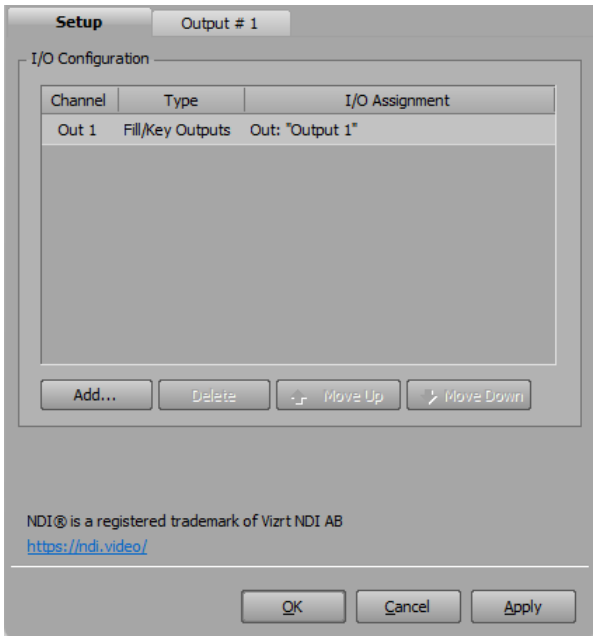
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **NDI®** and then select **OK**.

The **NDI® - Framebuffer Setup** dialog opens.



5. In the **Setup** tab, select **Add** to add an input.
6. Select the **Input** tab and in the **Input Name** section, in the **Name Contains** field, enter the name of the NDI input source to use (for example, NDI Output 1).

   This input name is the output name from the device outputting the signal.

   Matching is case-sensitive and the first matching live source is selected.
7. Select **OK** to save the configuration and close the **NDI® - Framebuffer Setup** dialog.

   The configured NDI framebuffer is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.
8. Select **Close** to exit the **Hardware Setup** dialog.

Configuring an XPression AVI Recorder

This topic describes the selection and configuration of an XPression AVI Recorder.

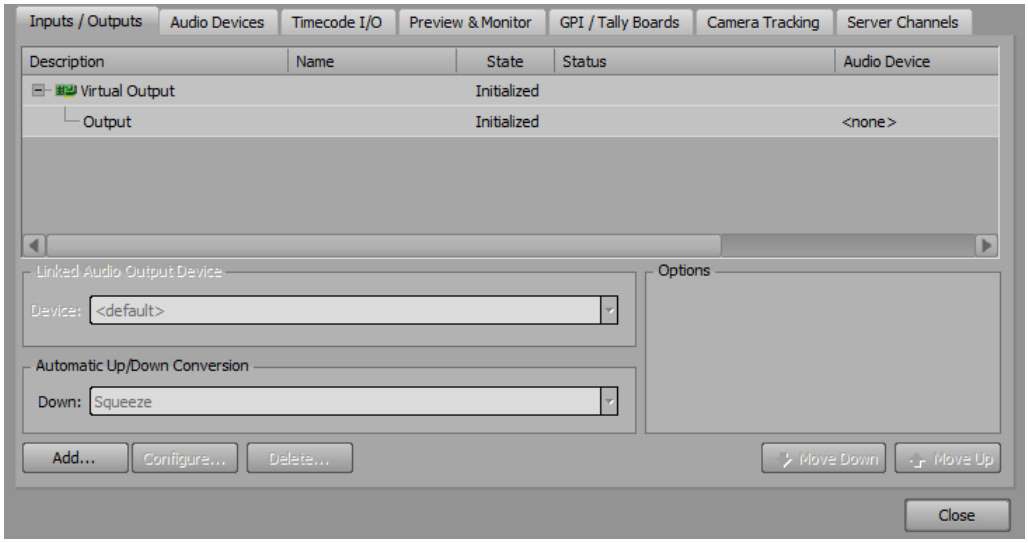
The **XPression AVI Recorder** is used to render scenes or scene groups and save the output as an AVI file. Before using this functionality, the AVI Recorder must be configured as a video output in the Hardware Setup dialog.

To configure an XPression AVI Recorder:

1. In XPression, select **Edit > Hardware Setup**.

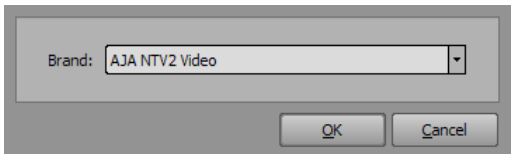
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



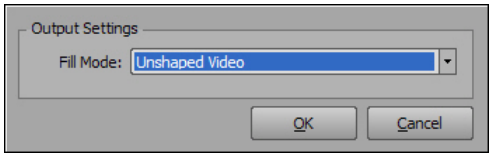
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression AVI Recorder** and then select **OK**.

   The **AVI Recorder - Setup** dialog opens.



5. From the **Fill Mode** drop-down, select the method used to process fill graphics before output.

   The available processing methods are as follows:

   - **Unshaped Video** — Output fill and key signals "as is".
   - **Shaped Video (premultiplied fill)** — Multiply/shape the fill signal color information by the luminance information in the key signal.

6. Select **OK**.

   An **XPression Virtual Output** is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

7. Select **Close** to exit the **Hardware Setup** dialog.

For More Information on...

- rendering output to an AVI file, refer to the procedure Rendering Output to an AVI File.

Configuring an XPression Desktop Preview Client

This topic describes the selection and configuration of an XPression Desktop Preview Client.

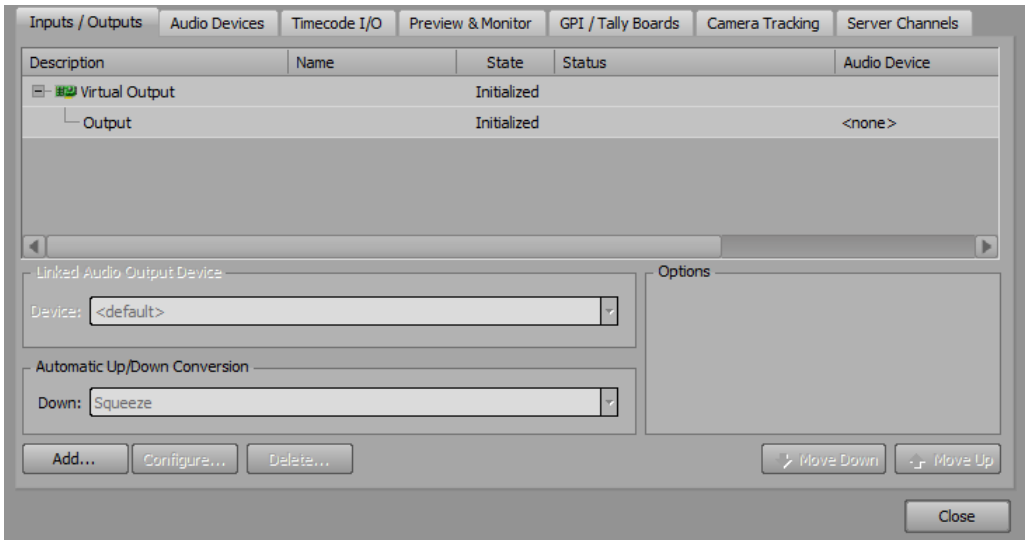
The XPression Desktop Preview Client offers an IP based preview server for multi-channel and MOS Remote Sequencer workflows.

To configure an XPression Desktop Preview Client:

1. In XPression, select **Edit > Hardware Setup**.

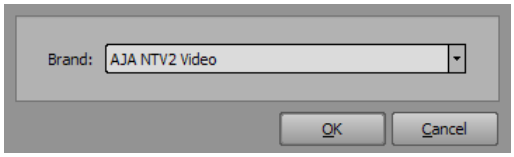
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



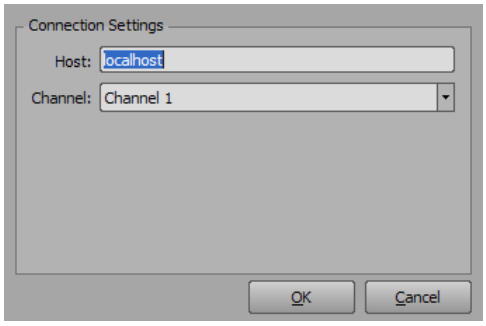
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression Desktop Preview Client** and then select **OK**.

   The **Desktop Preview Client - Setup** dialog opens.



5. In the **Host** field, enter the IP address of the XPression Desktop Preview Client.

6. From the **Channel** drop-down, select a preview channel in the XPression Desktop Preview Client for the output and then select **OK**.

   A Desktop Preview Client connection is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

7. Select **Close** to exit the **Hardware Setup** dialog.

For More Information on...

- the XPression Desktop Preview Server, refer to the *XPression Desktop Preview Server User Guide*.

Configuring an XPression Direct Display Output

This topic describes the selection and configuration of an XPression Direct Display Output.

The XPression Direct Display Output allows XPression to output directly from the NVIDIA GPUs monitor output or NVIDIA Mosaic display. Direct Display outputs support custom resolutions and 4:4:4 color space and are useful for feeding LED display processors that only support Display Port or HDMI connections and for driving high resolution workflows from a single XPression system.

★Audio is not currently supported.

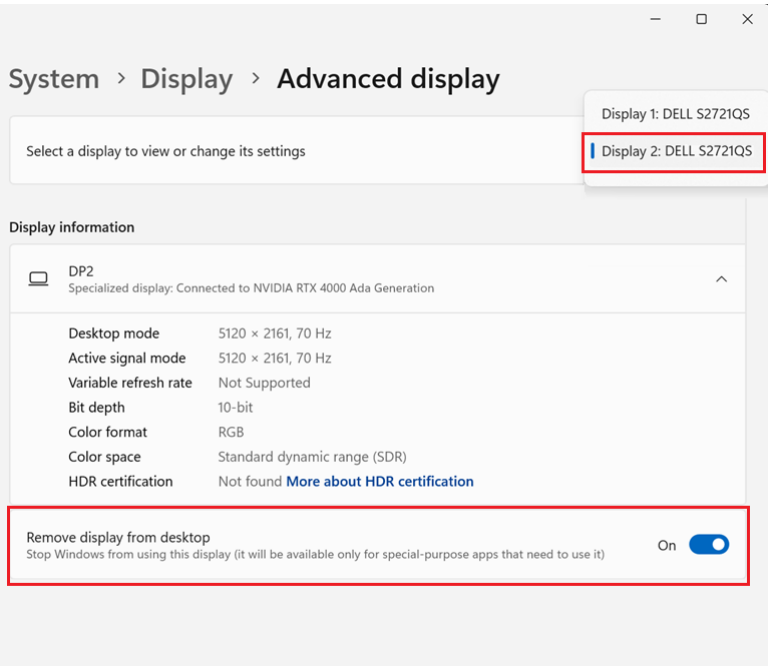
★Ensure that the **Allow Monitor Power Saving** and **Allow Screen Saver** options are NOT enabled in **Edit > Preferences > Advanced**.

Prerequisites:

- Two display monitors connected initially.
- M9 platform or better.
- Windows 11 for Workstation.
- XPression 12.5 or better.

To configure display monitors:

1. Right-click on the desktop and select **Display Settings**.
2. Select **Advanced display**.
3. From the **Select a display to view or change its settings** drop-down, select the second display monitor.

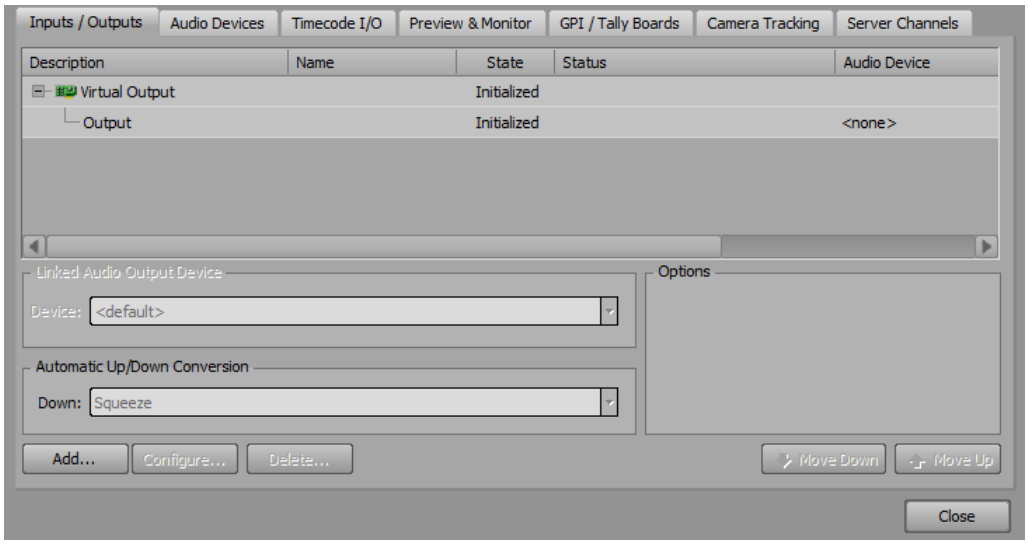


4. Turn the **Remove display from desktop** option on for this monitor.

To configure an XPression Direct Display Output:

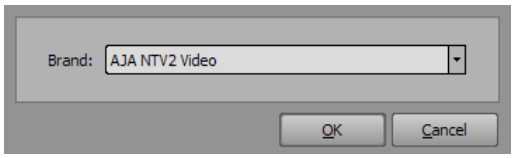
1. Launch your XPression project.
2. Select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.
3. Select the **Inputs / Outputs** tab.



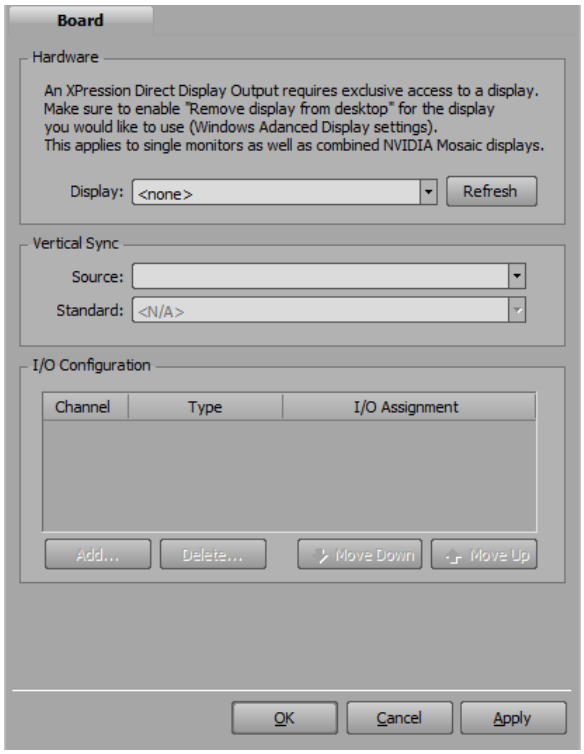
4. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



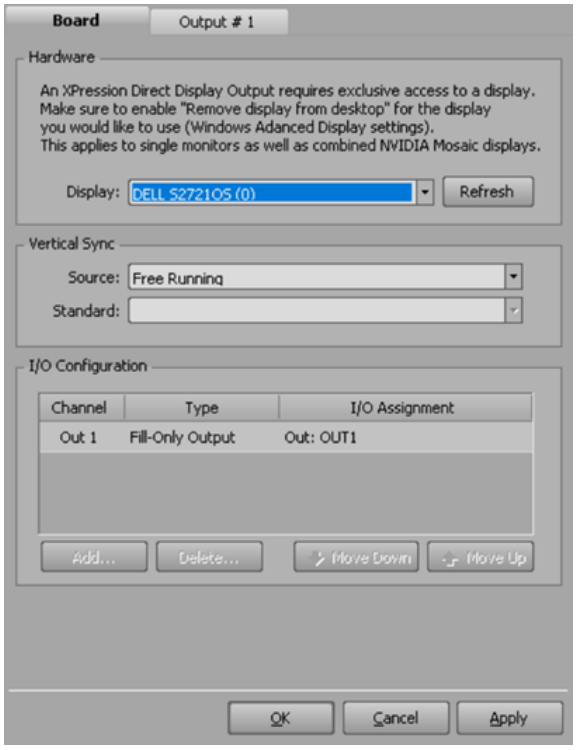
5. From the **Brand** drop-down, select **XPression Direct Display Output** and then select **OK**.

The **XPression Direct Display - Framebuffer Setup** dialog opens.



6. From the **Display** drop-down, select **XPression Direct Display Output**.
7. In the **Vertical Sync** section, from the **Source** drop-down, select **Vertical Sync: Free Running**.

   In the **I/O Configuration** section, you will see **Out 1 - Fill Only Output**.



8. Select **OK**.

   An XPression Direct Display Output is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

9. Select **Close** to exit the **Hardware Setup** dialog.

To view the output:

1. In the **Sequencer** editor, drag a scene from the **Scene Manager** into the sequence.
2. In the **Framebuffer** column for the **Take Item**, select **Framebuffer 1**.
3. Double-click the take item to view the output.

Configuring an XPression DirectShow Capture Source

This topic describes the selection and configuration of an XPression DirectShow compatible device as an input.

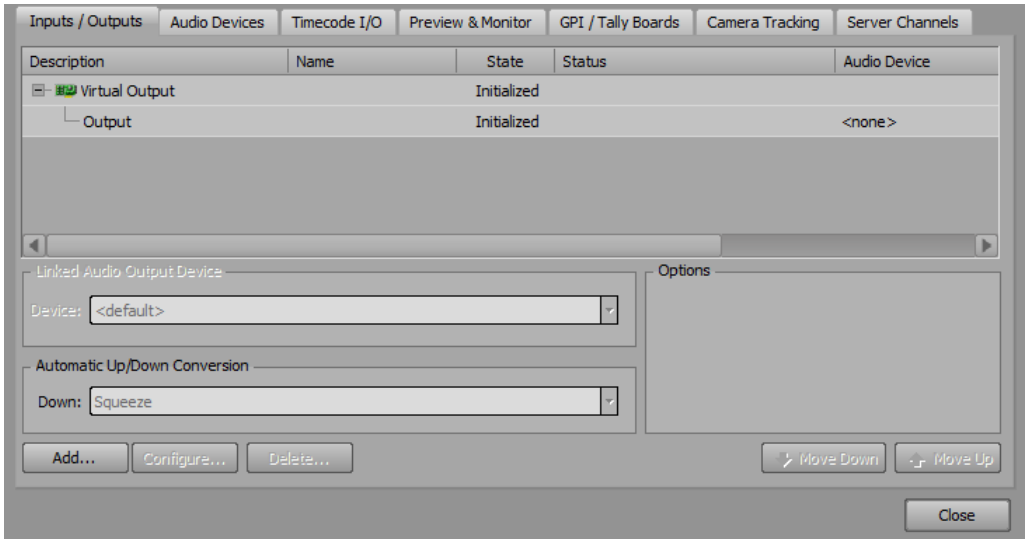
The DirectShow Capture Source in XPression is a live video input source that allows graphics to use video from any Windows device that exposes a DirectShow interface. This includes webcams, USB cameras, capture cards, video converters, and other DirectShow-compatible video devices. DirectShow is Microsoft's multimedia framework for video and audio capture and playback on Windows.

To configure an XPression DirectShow Capture Source:

1. In XPression, select **Edit > Hardware Setup**.

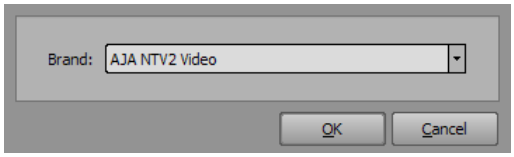
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



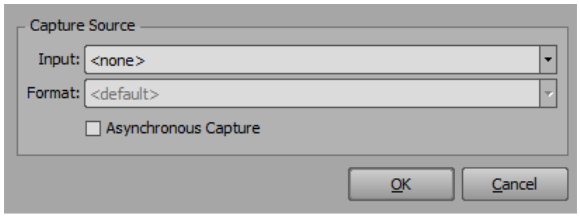
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression DirectShow Capture Source** and then select **OK**.

   The **Capture Source Setup** dialog opens.



5. From the **Input** drop-down, select an input for the capture source.
6. From the **Format** drop-down, select a frame format for the input.

7. Select **Asynchronous Capture** to allow better support for webcams that are running at a framerate lower than the framerate of the project.
8. Select **OK**.

   An XPression DirectShow Capture Source framebuffer input is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.
9. Select **Close** to exit the **Hardware Setup** dialog.

Configuring an XPression RossLinq Connector

This topic describes the selection and configuration of an XPression RossLinq Connector.

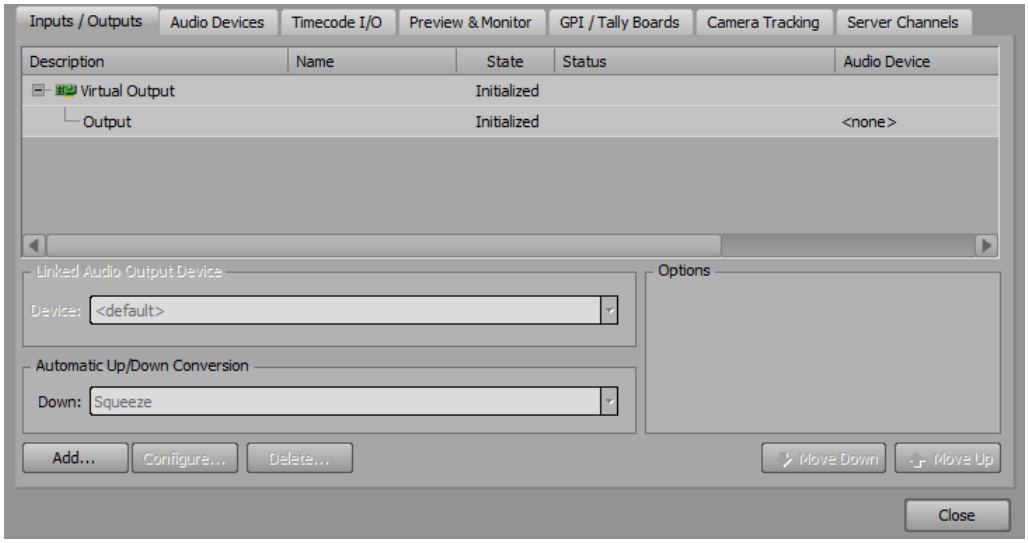
The XPression RossLinq Connector feature allows you to connect XPression directly to RossLinq compatible devices over Ethernet and have XPression render images and graphics to the RossLinq compatible devices without using any of the video input BNC.

To configure an XPression RossLinq Connector:

1. In XPression, select **Edit > Hardware Setup**.

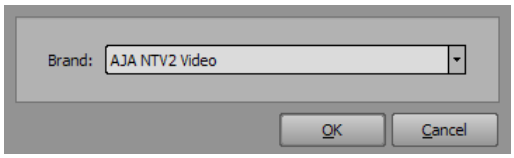
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



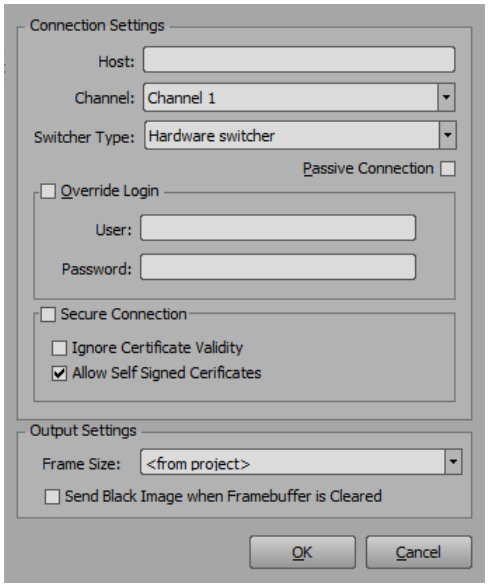
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression RossLinq Connector** and then select **OK**.

The **RossLinq Setup** dialog opens.



5. In the **Connection Settings** section, do the following:
   - In the **Host** field, enter the IP address of the RossLinq compatible device.
   - From the **Channel** drop-down, select the channel on the device that you want to upload images to.
   - From the **Switcher Type** drop-down, select either **Hardware switcher** or **Software switcher**, as appropriate.
   - Select **Passive Connection** to establish a passive FTP connection.
6. In the **Override Login** section, do the following:
   - Select **Override Login** to override the username and password for the connection.
   - In the **User** field, enter a username for the connection to the RossLinq compatible device.
   - In the **Password** field, enter a password for the connection to the RossLinq compatible device.
7. In the **Secure Connection** section, do the following:
   - Select the **Secure Connection** checkbox to enable File Transfer Protocol Secure (FTPS).
   - Select the **Ignore Certificate Validity** checkbox to allow certificates certificates that have not been vetted by a certificate authority (not recommended).
   - Select the **Allow Self Signed Certificates** checkbox to allow certificates that have verified by the user, rather than by a certificate authority.

8. In the **Output Settings** section, do the following:

   - From the **Frame Size** drop-down, select the resolution of the images rendered and sent to the compatible RossLinq device.

     The available options are:

     - **<from project>** — use the same format as the project.
     - **PAL, 720x576**
     - **NTSC, 720x486**
     - **HD 720p, 1280x720**
     - **HD 1080i, 1920x1080**
     - **HD 1080p, 1920x1080**
     - **UHD 2160p, 3840x2160**

   - Select **Send Black Image when Framebuffer is Cleared** to display a black screen when the framebuffer is cleared and then select **OK**.

   An XPression RossLinq connection is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

9. Select **Close** to exit the **Hardware Setup** dialog.

Configuring the XPression Tile Mapper

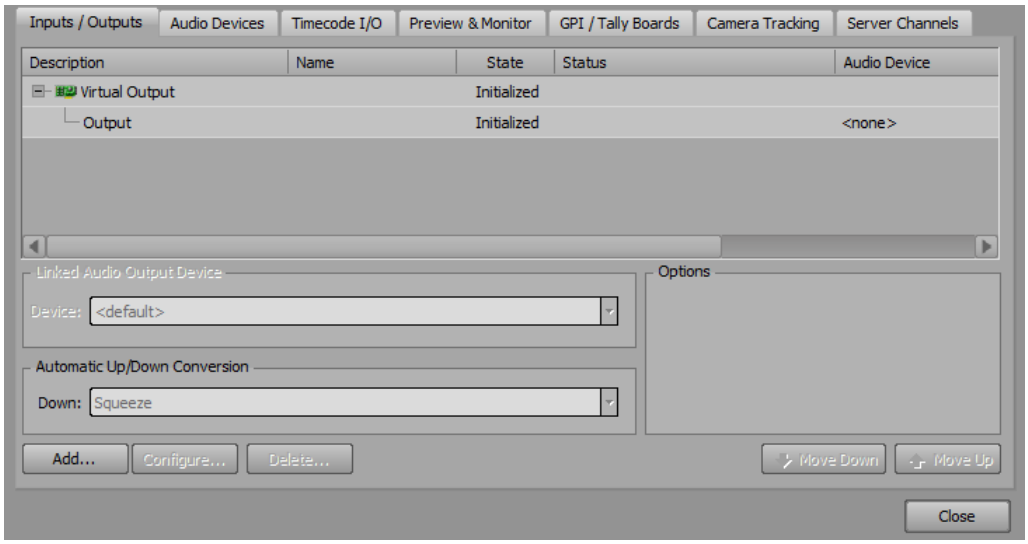
The **XPression Tile Mapper** enables XPression to create an output framebuffer to simultaneously render a scene through multiple outputs for videowall applications.

To configure the XPression Tile Mapper:

1. In XPression, select **Edit > Hardware Setup**.

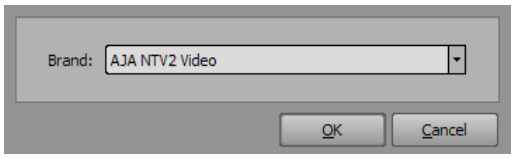
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



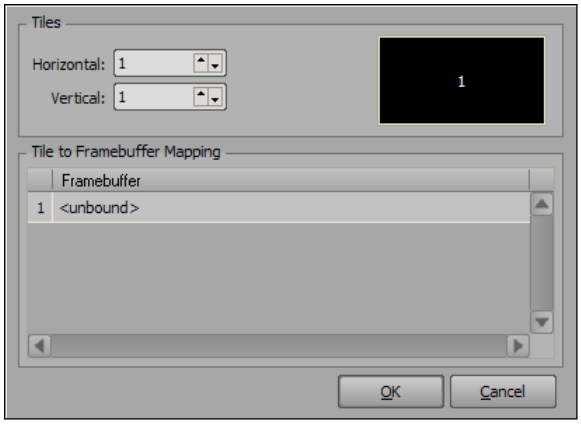
3. Select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression Tile Mapper** and then select **OK**.

   The **Tile Mapper** dialog opens.



5. In the **Tile Mapper** dialog, in the **Tiles** section, configure the number and position of the tiles used to render the scene, as follows:

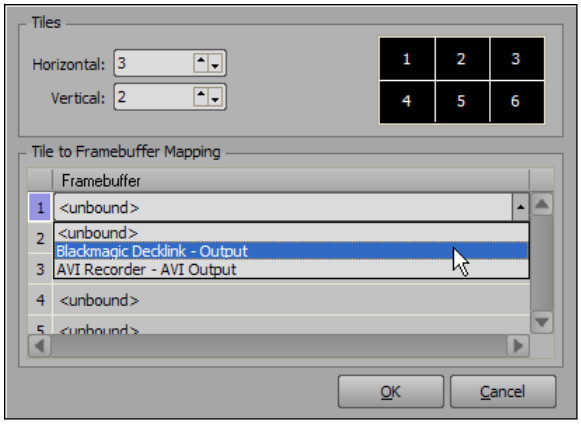
   In the **Horizontal** field, enter or select the number of horizontal tiles used to render a scene.

   In the **Vertical** field, enter or select the number of vertical tiles used to render a scene.

6. In the **Tile to Framebuffer Mapping** table, select the output for each tile number from the **Framebuffer** list.

   ★Virtual outputs can not be used for the **Tile Mapper** framebuffer.

   ★The first mapped output supports audio output.



7. Select **OK**.

   The configured Tile Mapper framebuffer board is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

8. Select **Close** to exit the **Hardware Setup** dialog.

Configuring an XPression Virtual Input

This topic describes the selection and configuration of an XPression Virtual Input.

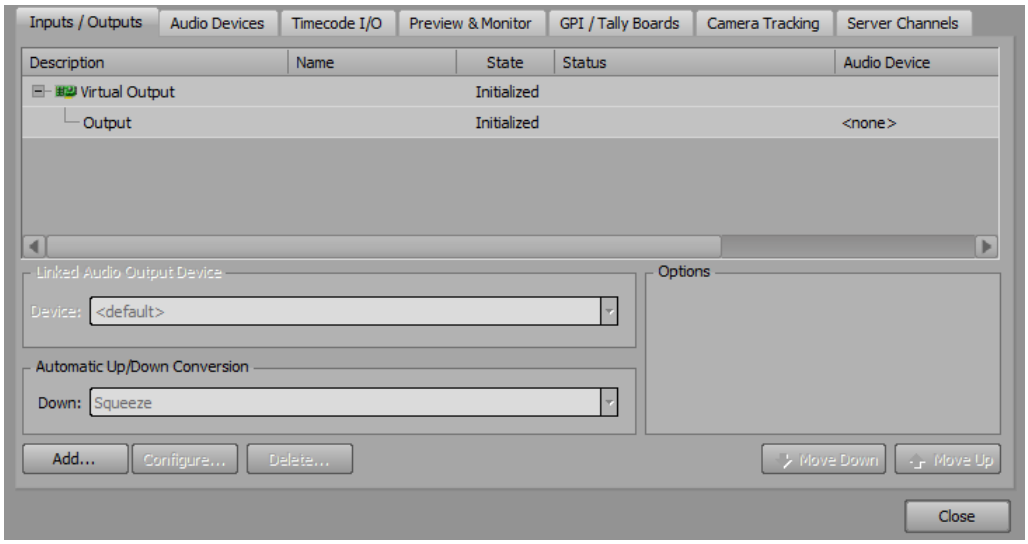
The XPression Virtual Input enables XPression to create live source materials without a physical input card installed in the XPression computer.

To configure an XPression Virtual Input:

1. In XPression, select **Edit > Hardware Setup**.

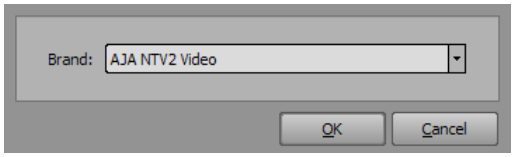
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



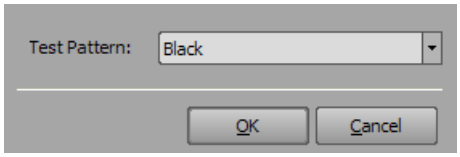
3. Select the **Add** button.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression Virtual Input** and then select **OK**.

   The **Virtual Input Settings** dialog opens.



5. From the **Test Pattern** drop-down, select a test signal for the virtual input.
6. The options are:
   - **Black**
   - **White**
   - **Color Bars**

   The color bar test pattern includes -18dbFS audio tone.

7. Select **OK**.

   An **XPression Virtual Input** is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.

8. In the **Hardware Setup** dialog, select **Close**.

Configuring an XPression Virtual Output

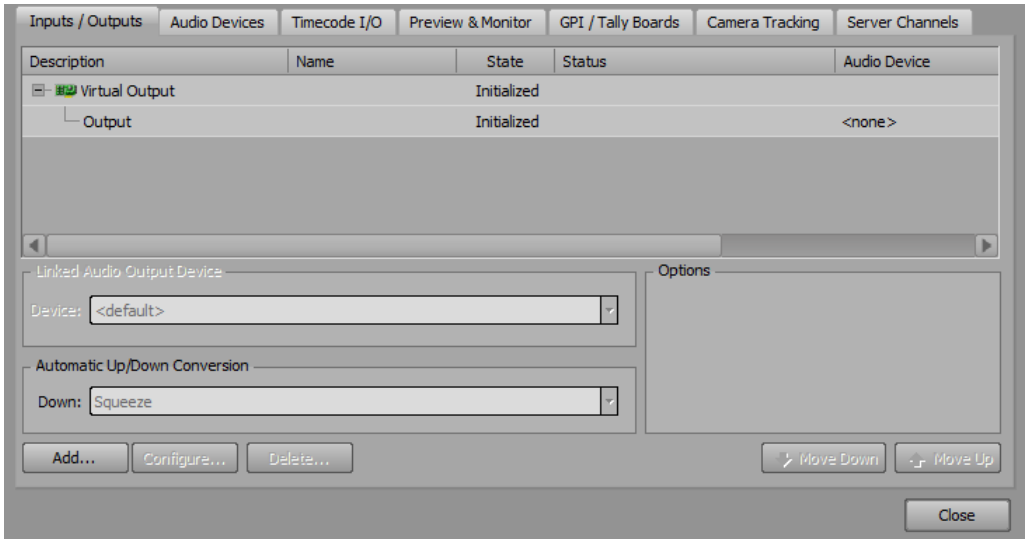
The **XPression Virtual Output** enables XPression software to run without any framebuffer cards installed in the XPression computer. In this case, the **Virtual Output** is used to display output in a window on the XPression computer.

To configure an XPression Virtual Output:

1. In XPression, select **Edit > Hardware Setup**.

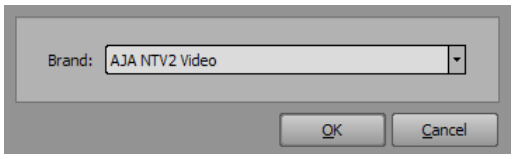
   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



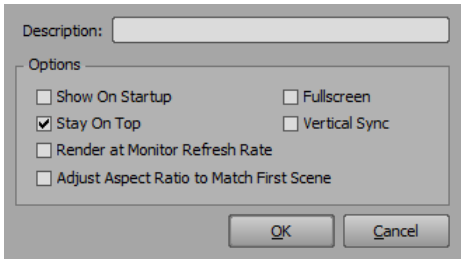
3. Select the **Add** button.

   The **Add New FrameBuffer Board** dialog opens.



4. From the **Brand** drop-down, select **XPression Virtual Output** and then select **OK**.

   The **Virtual Output Settings** dialog opens.



5. In the **Description** field, enter a name or brief description for the virtual output.

6. In the **Options** section, configure the following:
   - **Show On Startup** — select to have the virtual output open when XPression is launched.
   - **Fullscreen** — make the virtual output window fullscreen.
   - **Stay On Top** — select to always display the virtual output on top of all other open and/or active windows on the screen.
   - **Vertical Sync** — currently not implemented.
   - **Render at Monitor Refresh Rate** — currently not implemented.
   - **Adjust Aspect Ratio to Match First Scene** — change the aspect ratio of the virtual framebuffer to match the scene played on it as opposed to the format of the project.
7. Select **OK**.

   An **XPression Virtual Output** is added to the **Inputs / Outputs** tab of the **Hardware Setup** dialog.
8. In the **Hardware Setup** dialog, select **Close**.

Changing the Order of Video Inputs / Outputs

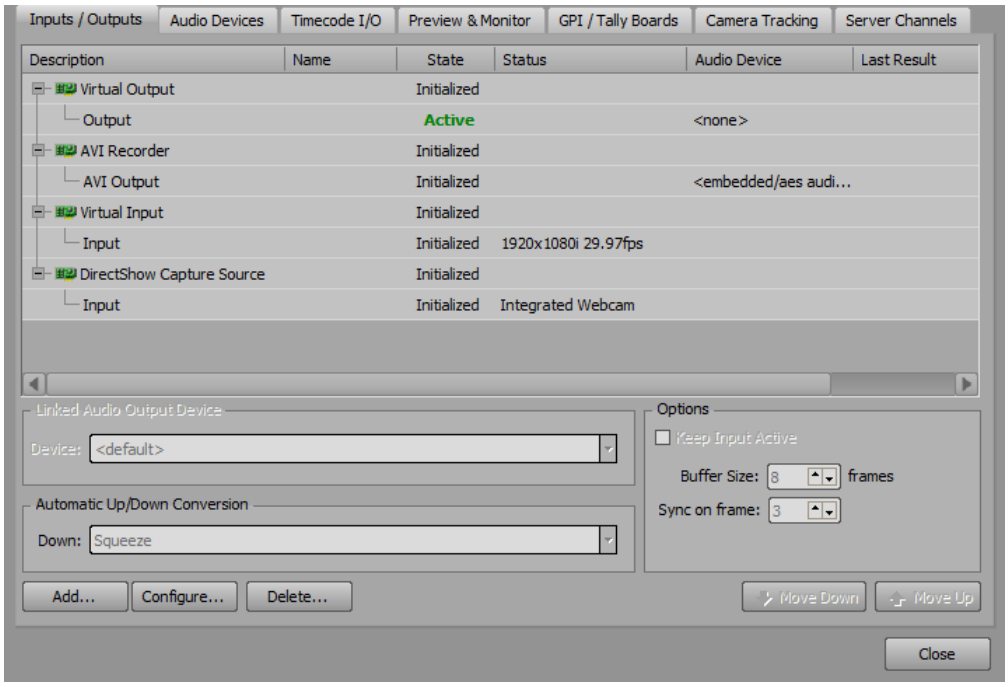
With several inputs and outputs configured, you may prefer to have certain inputs or outputs at the top of the list to make them easy to find. The inputs and outputs can be reordered to suit your needs.

To change the order of video inputs and outputs:

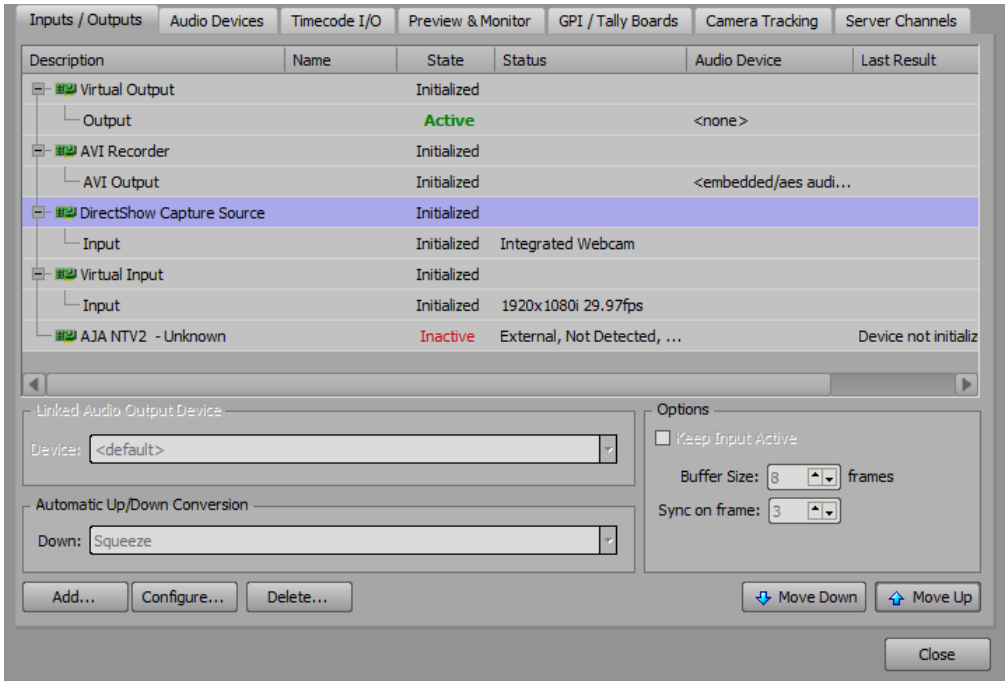
1. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



3. In the **Inputs / Outputs** list, select an input or output to move in the list.



4. At the bottom of the dialog, select **Move Down** to move the selected device down one position in the **Inputs / Outputs** list, or **Move Up** to move up one position in the list.

   The **Move Up** button is not available when the selected device is positioned at the top of the list. The **Move Down** button is not available when the selected device is positioned at the bottom of the list.

5. Select **Close** to exit the **Hardware Setup** dialog.

Deleting a Video Input / Output

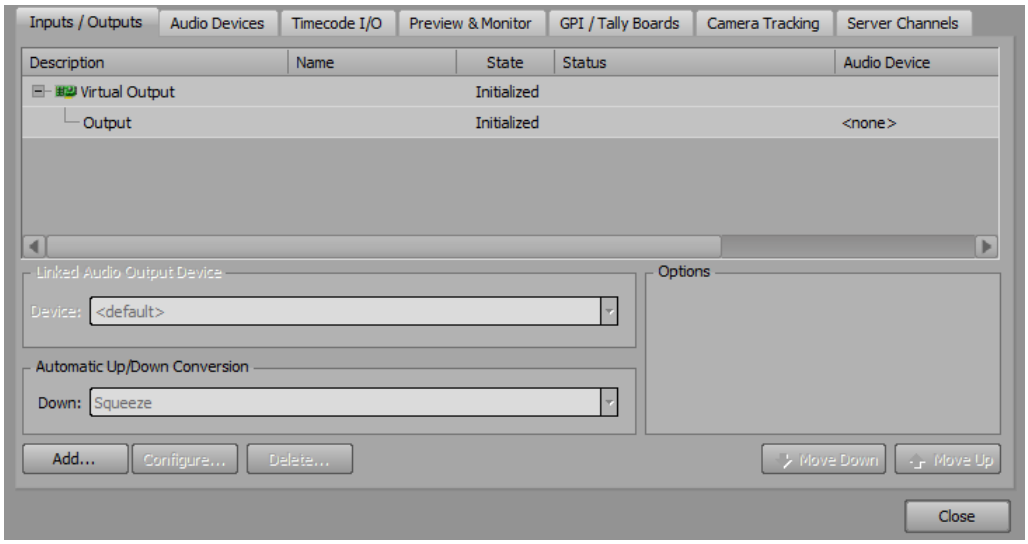
Video inputs and outputs configured in XPression provide the connection between the graphics engine and external video devices, such as capture cards, framebuffers, and monitoring outputs. As system requirements change, you may need to remove video devices that are no longer in use or have been replaced. XPression allows configured video inputs and outputs to be managed through the **Hardware Setup** dialog, where devices can be added, configured, reordered, or deleted. This section explains how to safely remove an existing video input or output from the system configuration.

To delete a video input or output:

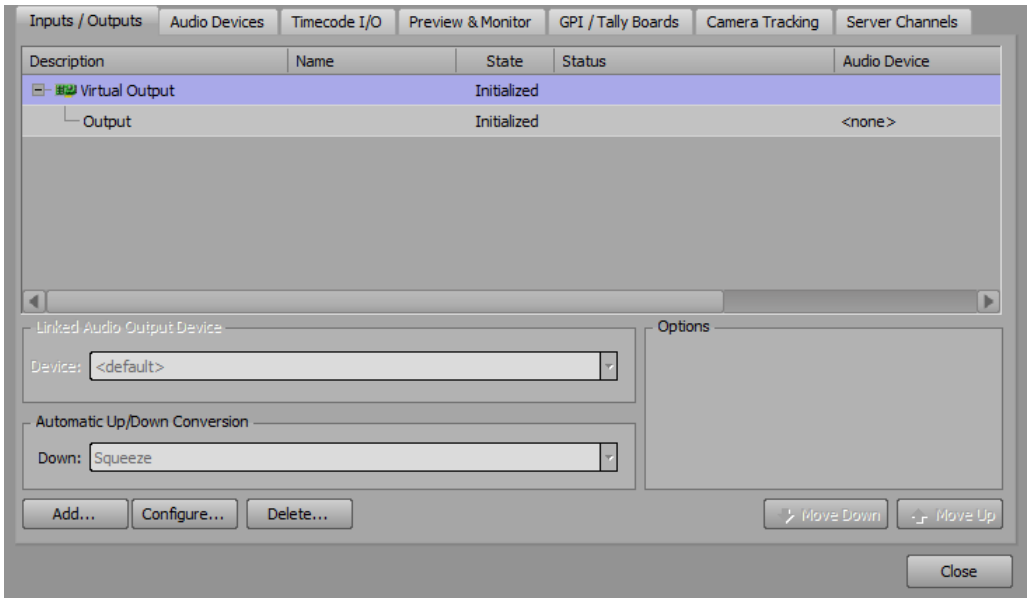
1. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.

2. Select the **Inputs / Outputs** tab.



3. In the **Inputs / Outputs** list, select the input or output to delete.



4. Select **Delete** at the bottom of the dialog.

   A **Warning** dialog opens.

5. Select **Yes**.

   The selected video device is deleted from **Inputs / Outputs** list.

6. Select **Close**.

Configuring an Audio Device

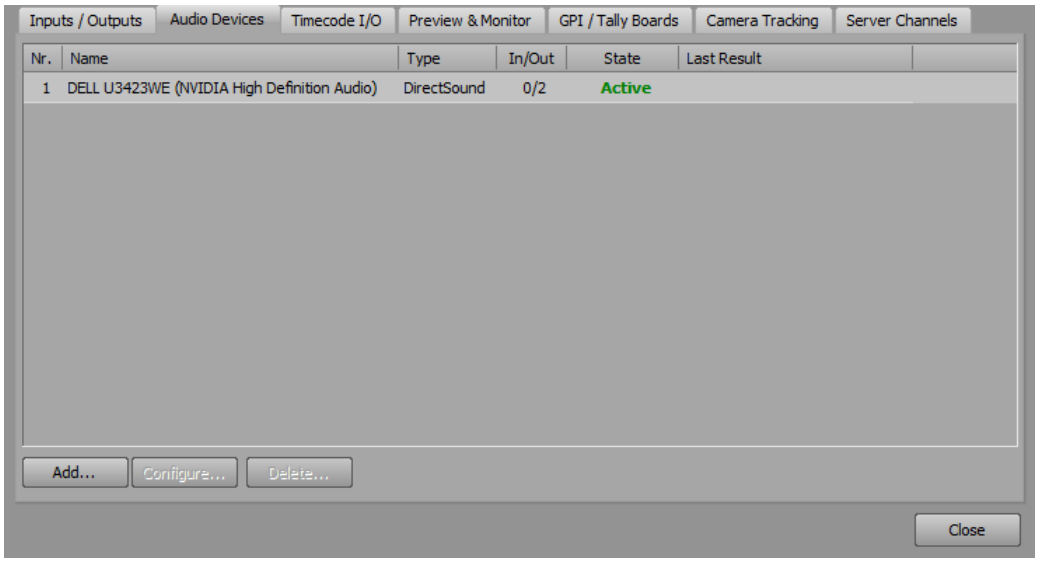
★Adding an audio device is not required to output embedded or AES audio.

To configure an audio device:

1. In XPression, select **Edit > Hardware Setup**.

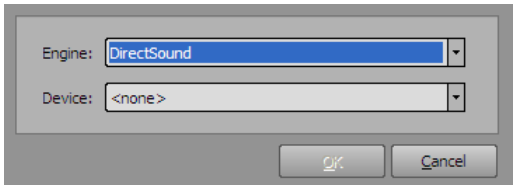
   The **Hardware Setup** dialog opens.

2. Select the **Audio Devices** tab.



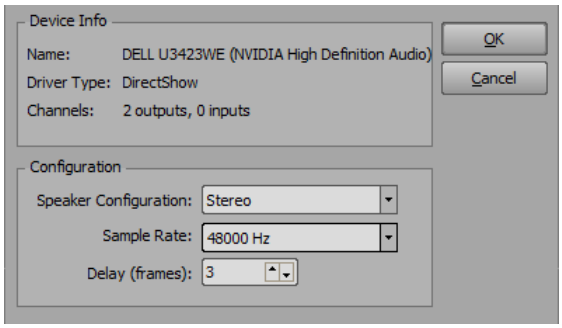
3. Select **Add**.

   The **Add Audio Device** dialog opens.



4. From the **Engine** drop-down, select the engine to use to produce audio.
5. From the **Device** drop-down, select the sound card to use to output audio.
6. Select **OK**.

   The **Audio Engine Setup** dialog opens. The **Configuration** settings may differ slightly depending on the audio device selected.



7. In the **Configuration** section, do the following:
   - From the **Speaker Configuration** drop-down, select the speaker type.
   - From the **Sample Rate** drop-down, select the sample rate for the audio signal.

     The selected sample rate defines the number of samples per second taken from an analog signal to make a digital signal. A sample rate of 48 kHz is the recommended setting, but 44.1 kHz can also be used.
   - In the **Delay (frames)** field, enter or select the number of frames to delay the audio signal.
8. Select **OK**.

   The configured audio device is added to the **Audio Devices** tab of the **Hardware Setup** dialog.
9. In the **Hardware Setup** dialog, select **Close**.

Deleting an Audio Device

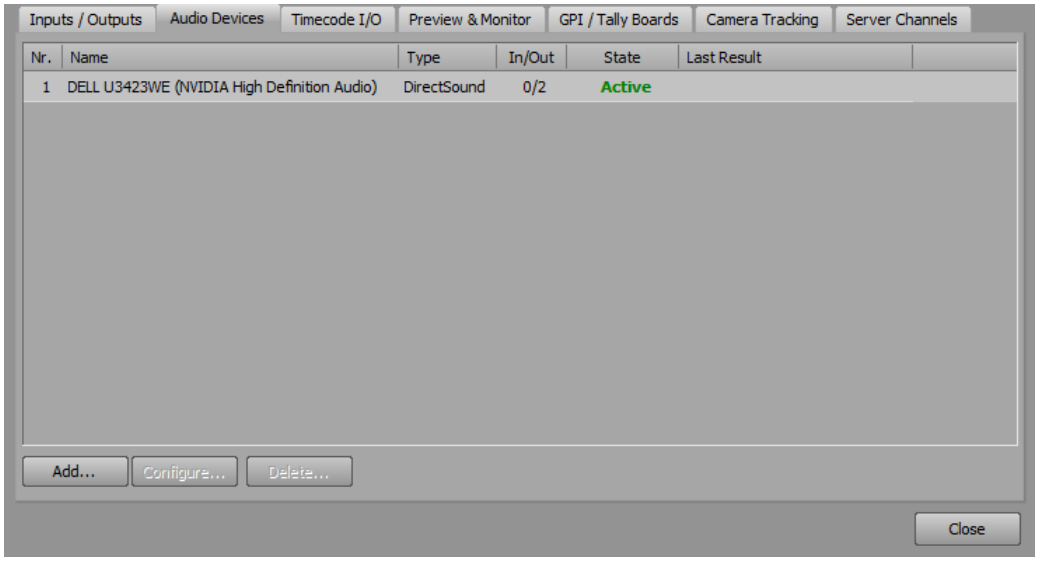
Audio devices configured in XPression provide the connection between the application and the audio hardware used for playback, monitoring, and other production workflows. As hardware configurations evolve, it may become necessary to remove audio devices that are no longer required, have been replaced, or are causing configuration conflicts. XPression allows audio devices to be managed through the **Hardware Setup** window, where administrators can add, configure, and delete device connections. This section explains how to remove an existing audio device from the system configuration.

To delete an audio device:

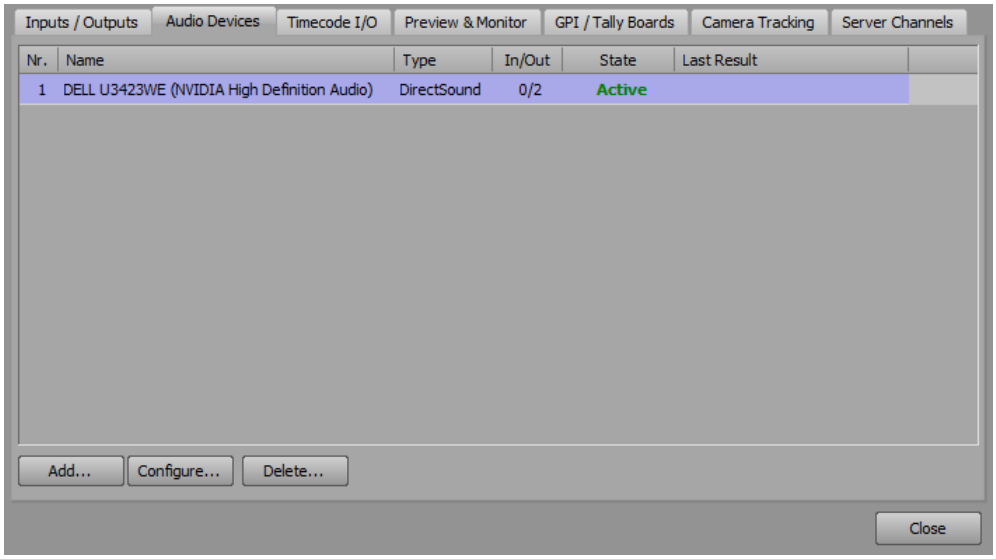
1. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** window opens.

2. Select the **Audio Devices** tab.



3. From the **Audio Devices** list, select the **Audio Device** to delete.



4. Select **Delete** at the bottom of the window.

   A **Warning** dialog opens.

5. Select **Yes**.

   The selected audio device is deleted from the **Audio Devices** list.

6. Select **Close**.

   The **Hardware Setup** window closes.

Adding a Timecode Source

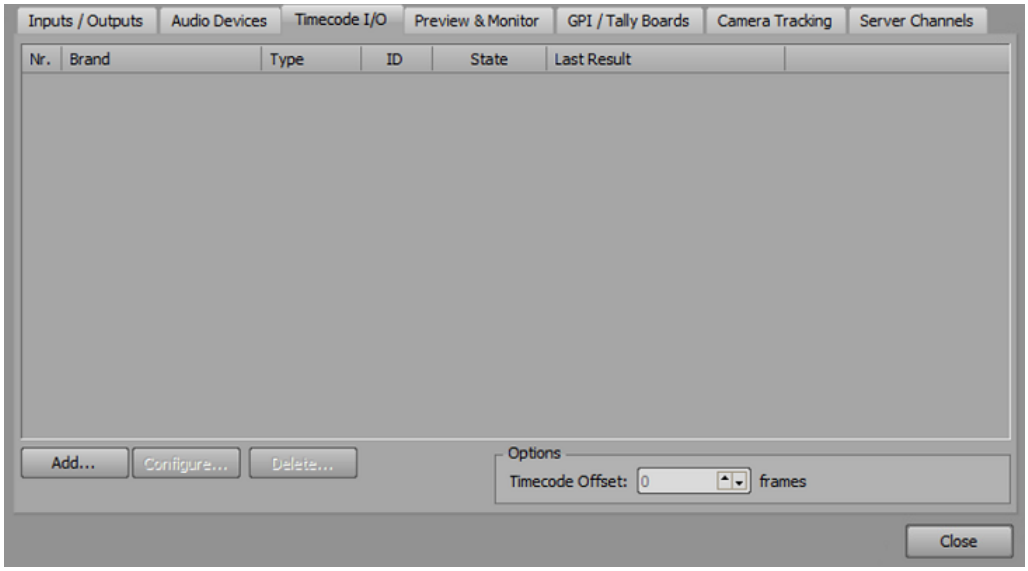
Timecode provides a common timing reference that allows XPression to synchronize graphics, animations, video clips, and external systems during production and playout. Depending on your workflow, XPression can receive timecode from dedicated hardware devices, embedded video signals, network-based countdown timers, or an internally generated source. Timecode sources are configured through the **Hardware Setup** window, where you can select the appropriate source type, configure its operating parameters, and apply timing offsets as needed. This section explains how to add and configure a timecode source to ensure accurate synchronization across your production environment.

To add and configure a timecode source:

1. In XPression, select **Edit > Hardware Setup**.

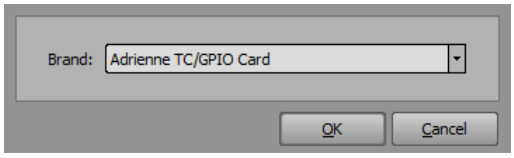
   The **Hardware Setup** window opens.

2. Select the **Timecode I/O** tab.



3. Select **Add**.

4. The **Add New TimeCode Source** dialog opens.



5. From the **Brand** drop-down, select a timecode source.

   The possible options include:

   Adrienne TC/GPIO Card — if installed, select the Adrienne TC/GPIO card as the timecode source.

   Blackmagic Design (Legacy) — if installed, select the Blackmagic Design (legacy) card as the timecode source.

   Countdown Timer Broadcast — send countdown clocks via UDP to DashBoard or other devices.

   Free Running Timecode — use the system clock of the machine or a custom preset time as the timecode source.

6. Select **OK**.

   The setup dialog for the selected timecode source opens.

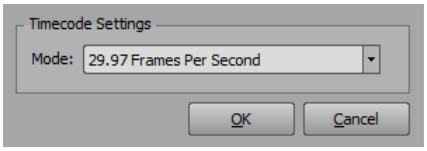
7. Select the timecode source from the following list to see the configuration instructions for that source:

Adrienne TC/GPIO Card

- In the **Timecode Settings** section, from the **Mode** drop-down, select the frame rate to use for the timecode.

  The options are:

  - **24 Frames Per Second**
  - **25 Frames Per Second**
  - **29.97 Frames Per Second**
  - **30 Frames Per Second**

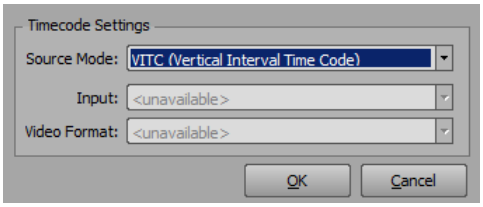


Blackmagic Design (Legacy) Card

a. In the **Timecode Settings** section, from the **Source Mode** drop-down, select a source mode for the timecode data.

   The options are:

   - **VITC** (Vertical Interval Time Code)
   - **HANC** (Horizontal Ancillary Data)
   - **RS-422** (Serial)



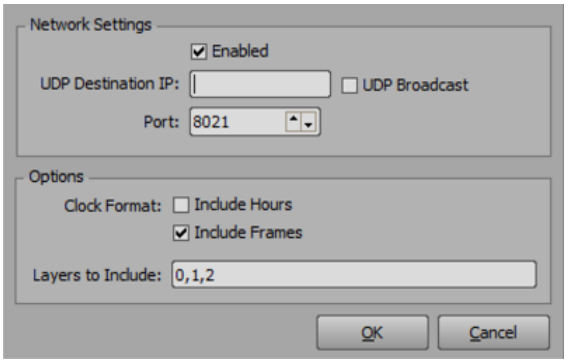
b. From the **Input** drop-down, select an input on the card to receive the timecode data.

c. From the **Video Format** drop-down, select the video format of the received video signal.

Countdown Timer Broadcast Card

a. In the **Network Settings** section, select the **Enabled** checkbox to send countdown clocks via UDP to DashBoard or other devices.

It is enabled by default.



b. In the **UDP Destination IP** field, enter the IP address of the device to receive the countdown timer.

c. Select the **UDP Broadcast** checkbox to send UDP countdown timer packets to a range of IP addresses within a subnet.

When the **UDP Broadcast** checkbox is selected, the **UDP Destination IP** field changes to **Broadcast Address**.

d. In the **Port** field, enter or select the port number to use for the connection.

e. In the **Options** section, use the **Clock Format** checkboxes to select the format of the timer to send to the receiving device:

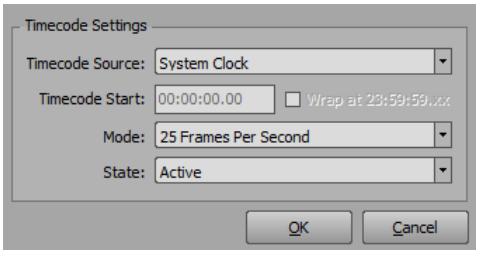
Include Hours — use hours in the clock format.

Include Frames — use frames in the clock format.

f. In the **Layers to Include** field, enter the framebuffer layers to include in the clock format.

XPression - Free Running Timecode Card

a. In the **Timecode Settings** section, from the **Timecode Source** drop-down, select a source mode for the timecode.



The options are:

System Clock — use the internal system clock for the timecode.

Preset Time — use a custom start time for the timecode.

If using a preset time, in the **Timecode Start** field, enter a start time for the timecode.

b. Select the **Wrap at 23:59:59.xx** checkbox to restart at the configured preset start time when the time has reached 23:59:59:xx.

c. From the **Mode** drop-down, select the frame rate to use for the timecode.

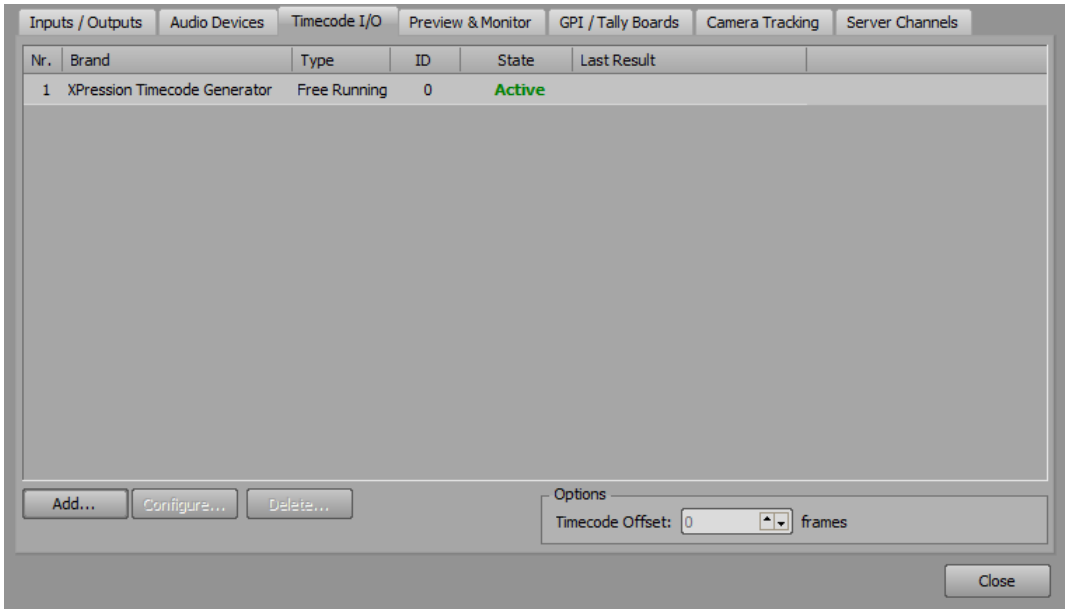
d. From the **State** drop-down, select a status for the timecode:

Active — use the selected timecode.

Inactive — disable the selected timecode.

8. When you have finished configuring the timecode source, select **OK**.

The timecode source is added to the list in the **Timecode I/O** tab.



9. In the **Options** section, enter or select a number of frames to offset the timecode when playing out a scene or clip and select **Close**.

Configuring Video Preview and Audio Monitor

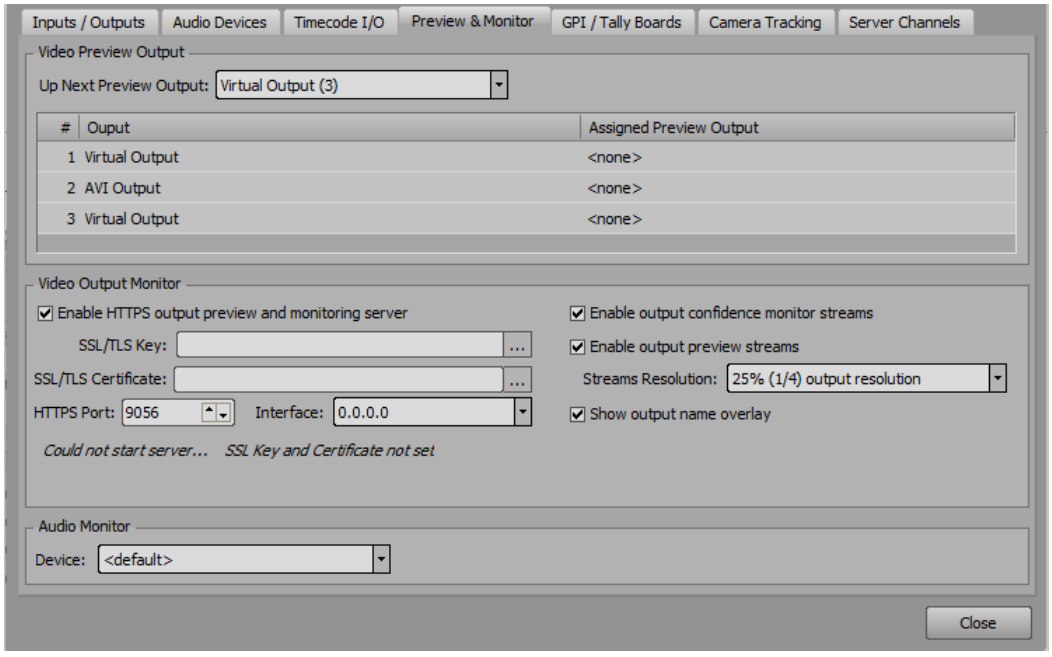
In the **Preview & Monitor** tab, you can select a framebuffer on an output to preview video and select an audio output device from which to monitor audio. Web streams for outputs and previews are accessible through specific URLs, supporting browsers with a VideoDecoder API.

To configure video preview and audio monitor:

1. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.

2. Select the **Preview & Monitor** tab.



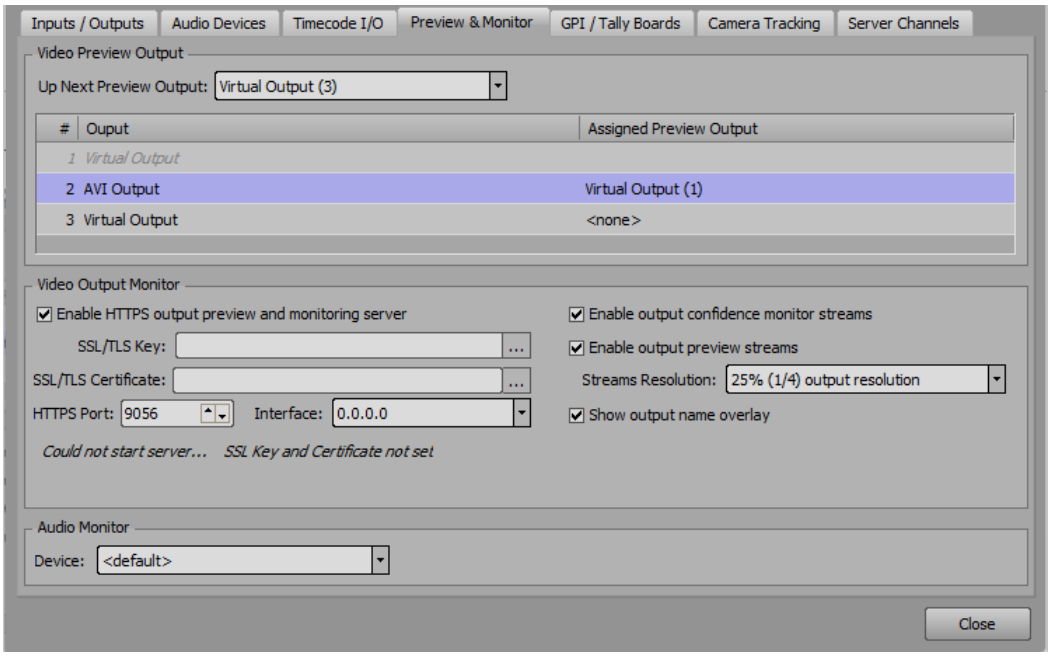
3. In the **Video Preview Output** section, from the **Up Next Preview Output** drop-down, select the video output device on which to preview video.

   All framebuffers can be used to preview video.

   When **<none selected>** is the selected preview output, video preview is only possible within XPression.

   ★If a configured framebuffer from the **Inputs / Outputs** tab is used as a preview output, the **Hardware Setup** dialog must be closed and reopened before the configured framebuffer is available in the **Output** list.

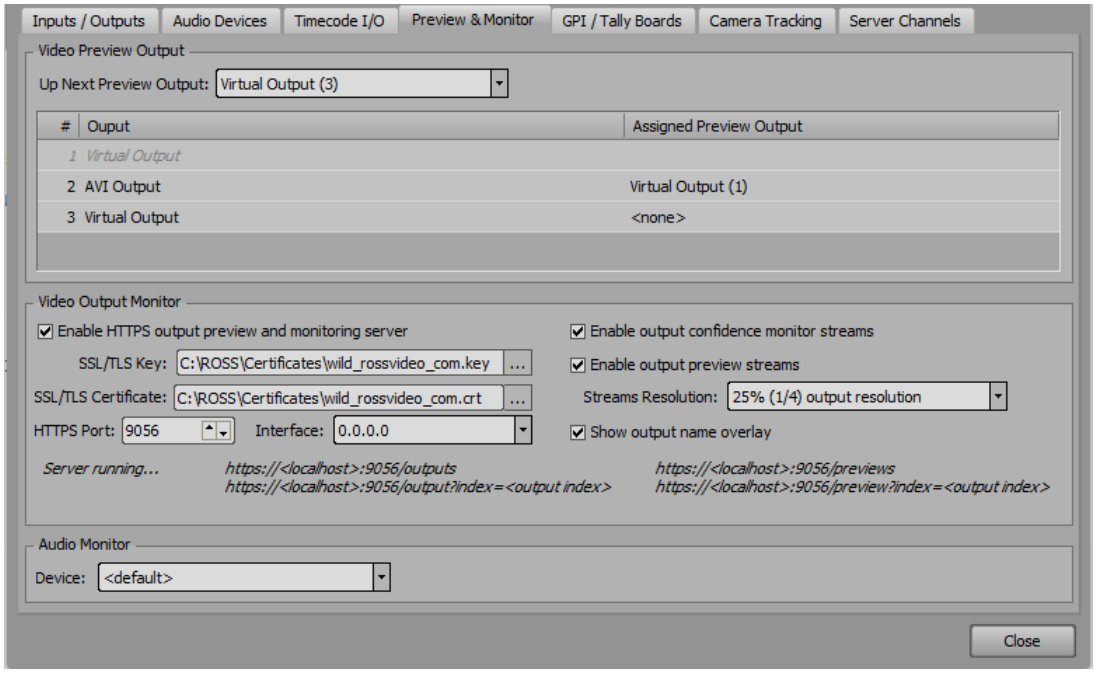
4. In the **Output** list, click inside the **Assigned Preview Output** column and from the **Assigned Preview Output** drop-down, select a framebuffer as the individual preview output for the selected framebuffer.



5. In the **Video Output Monitor** section, do the following:

   - Select **Enable HTTPS output preview and monitoring server** to enable the preview web server.
   - Select the **Browse** button beside the **SSL/TLS Key** field, navigate to the location on your machine where you have stored the key file and select the file.
   - Select the **Browse** button beside the **SSL/TLS Certificate** field, navigate to the location on your machine where you have stored the certificate file and select the file.

     With the key and certificate entered, you will see the status change to *Server running*.



   - In the **HTTPS Port** field, accept the default port or enter a different port if necessary.

- If you need to start the server using a specific network interface controller (NIC), in the **Interface** field, enter any interface that is different from the default.
- Select **Enable output confidence monitor streams** if you want to monitor live feeds for each output.
- Select **Enable output preview streams** if you want to see the up-next preview for each output.
- From the **Streams Resolution** drop-down, select the desired resolution (size of the frames).

  The options are:

  ➢ Native output resolution

  ➢ 50% (1/2) output resolution

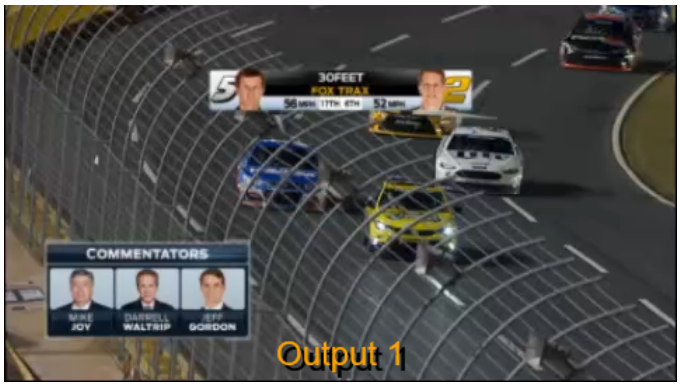
  ➢ 25% (1/4) output resolution

  ➢ 12% (1/8) output resolution

  ★25% is the default resolution and gives a good balance between system workload/bandwidth and resolution.

  The streams can be viewed in a browser that supports VideoDecoder in the WebCodecs API (JavaScript).

  In the browser, enter `https://<hostname or machine IP address>:9056/outputs`.
- Select **Show output name overlay** to display the output number in the monitor window.



6. In the **Audio Monitor** section, from the **Device** drop-down, select the audio output device from which to monitor audio.

   The audio monitor device monitors audio from the **Scene Director** in the scene loaded in the layout. It is not used for any scenes on framebuffer outputs, etc.
7. Select **Close** to exit the **Hardware Setup** dialog.
8. In your browser settings, find and select the **Use graphics acceleration when available** or **Use hardware acceleration when available** (depending on the browser) option.

   ★This option must be selected for the output to work.

Configuring RS232 CTS/DSR GPI for Contact Closures

Ensure that a USB-232 dongle is installed and assigned to a Communication port or that the system has a built-in RS232 port before configuring GPI for RS232.

Not all USB to serial converters support contact closures.

When enabled, RS232 GPI (General Purpose Interface) is used to control functions of XPression in sequencer mode. RS232 GPI can trigger the state of the next take of scenes and scene groups from top to bottom of a sequence.

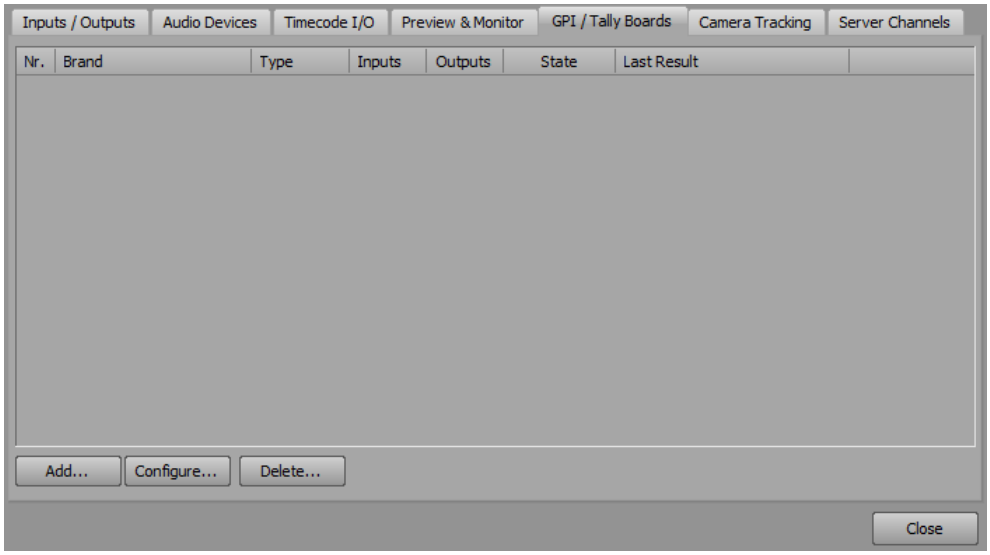
A standard RS232 serial port can support two GPI signals using the CTS and DSR pins. Connect Pins 6 and 7 for GPI 1 and connect Pins 7 and 8 for GPI 2.

To configure an RS232 CTS/DSR GPI for contact closures:

1. In XPression, select **Edit > Hardware Setup**.

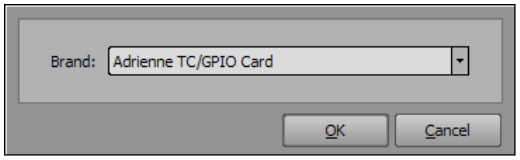
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



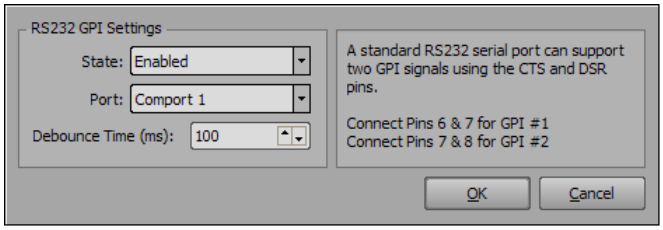
3. Select **Add**.

   The **Add New GPI Board** dialog opens.



4. From the **Brand** drop-down, select **Serial GPI (CTS/DSR)** and then select **OK**.

   The **Serial GPI Setup** dialog opens.



5. In the **RS232 GPI Settings** section, from the **State** drop-down, select **Enabled**.

   Select **Disabled** to turn off RS232 GPI.

6. From the **Port** drop-down, select the **Communication** port that receives RS232 GPI signals.

7. In the **Debounce Time** field, enter or select the number of milliseconds between sequential GPI pulses.

   When using a contact closure GPI on the CTS/DSR lines, some devices might send GPI signals that are noisy. Connecting the GPI to a mechanical push-button may also exhibit this problem. If the connection is noisy, it could generate multiple triggers that cause the sequence to advance by two or three events at a time. Setting a **Debounce Time** can help filter out any noise during the GPI trigger. This value is the amount of time XPression will wait before acting upon a second GPI trigger. A value of **50-100 milliseconds** should be sufficient.

8. Select **OK**.

   The **Serial GPI Setup** dialog closes and the configuration appears in the **GPI / Tally Boards** list.

For More Information on...

- configuring and working with GPIs, refer to the *GPI White Paper* available from Ross Video.

Configuring a 25-Pin GPIO Port

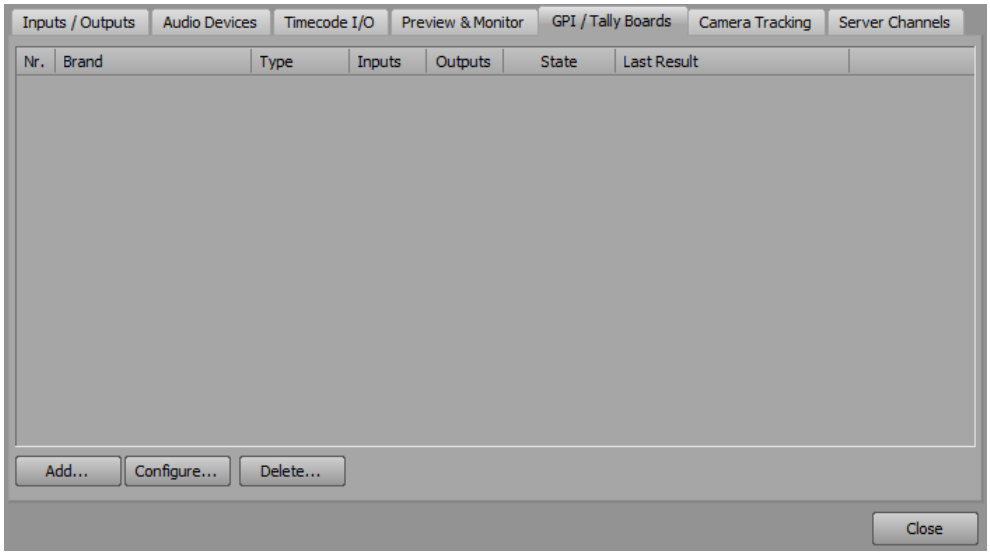
The **Adrienne TC/GPIO** card is installed in Ross Video Turnkey systems and used to read external LTC/VITC timecode, provide frame-accurate synchronization for graphics playout and supply GPIO triggers for automation and control workflows. The 25-pin GPIO port can be accessed through .NET applications or by using the **Keyboard / GPI Mapping** dialog to configure functions.

To configure a 25-pin GPIO port:

1. In XPression, select **Edit > Hardware Setup**.

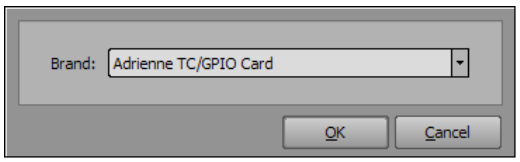
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



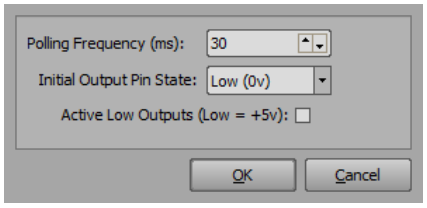
3. Select **Add**.

   The **Add New GPI Board** dialog opens.



4. From the **Brand** drop-down, select **Adrienne TC/GPIO Card** and then select **OK**.

   The **Adrienne Setup (GPI)** dialog opens.



5. In the **Polling Frequency** field, enter or select a polling frequency in milliseconds for checking the GPI inputs.

6. From the **Initial Output Pin State** drop-down, select the state of the pins when XPression is launched.

   The options are:

   - **Low (0v)**
   - **High (+5v)**

7. Select **Active Low Outputs** to use the active low status (0v) when the GPI is activated in XPression.

   If not enabled, the GPI is +5v when the GPI is activated in XPression.

8. Select **OK**.

   The **Adrienne TC/GPIO** card is displayed in the **GPI / Tally Board** list.

9. Select **Close** to exit the **Hardware Setup** dialog.

For More Information on...

- configuring and working with GPIs, refer to the *GPI White Paper* available from Ross Video.
- creating a custom GPI, refer to the section Creating a Custom GPI Map.

Configuring a SeaLevel GPIO Board

SeaLevel 8004e and SeaLevel 8012 GPIO cards are customer-supplied.

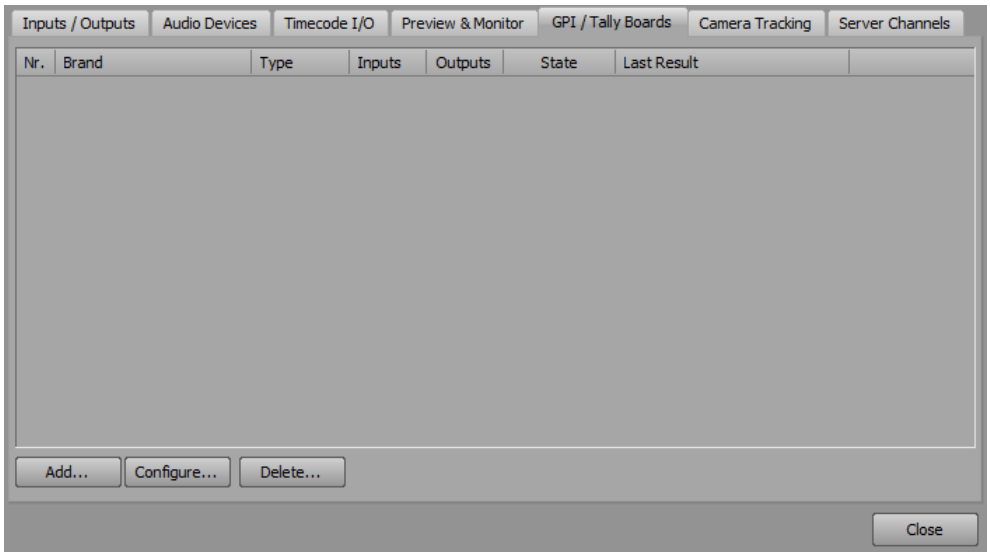
The 32 pin GPIO port can be accessed through .NET applications or by using the **Keyboard / GPI Mapping** dialog to configure functions.

To configure a SeaLevel GPIO Board:

1. In XPression, select **Edit > Hardware Setup**.

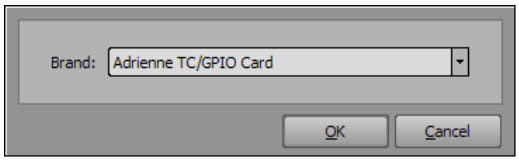
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



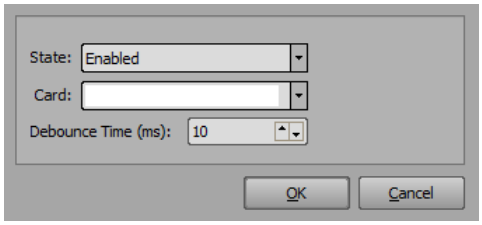
3. Select **Add**.

   The **Add New GPI Board** dialog opens.



4. From the **Brand** drop-down, select **Sealevel GPIO** and then select OK.

   The **SeaLevel I/O Setup** dialog opens.



5. From the **State** drop-down, select **Enabled**.
6. From the **Card** drop-down, select the SeaLevel GPIO card to use.

7. In the **Debounce Time (ms)** field, enter or select the number of milliseconds between sequential GPI pulses.
8. Select **OK**.

   The **SeaLevel 8004e** card is displayed in the **GPI / Tally Board** list.
9. Select **Close** to exit the **Hardware Setup** dialog.

For More Information on...

- configuring and working with GPIs, refer to the *GPI White Paper* available from Ross Video.
- creating a custom GPI, refer to the section Creating a Custom GPI Map.

Configuring Smart GPI / RossTalk

Smart GPI/RossTalk is an ASCII based protocol that can be sent over TCP/IP, UDP or RS232 to XPression.

Smart GPI provides intelligent hardware-triggered control, while RossTalk provides command-based software and network control, enabling XPression to integrate with automation systems, switchers, control panels, and other Ross Video products.

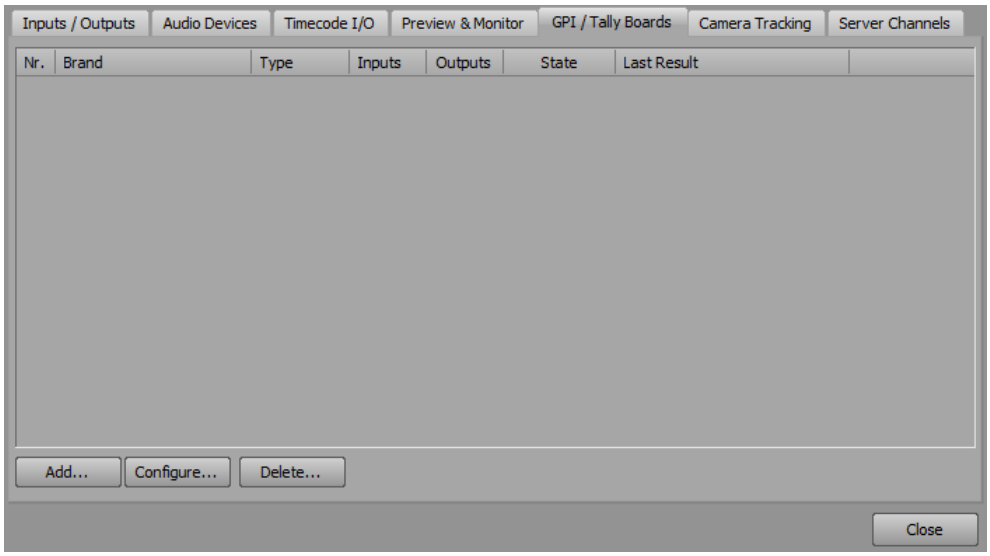
For more information on configuring and working with GPIs, refer to the *GPI White Paper* available from Ross Video tech support.

To configure Smart GPI / RossTalk:

1. In XPression, select **Edit > Hardware Setup**.

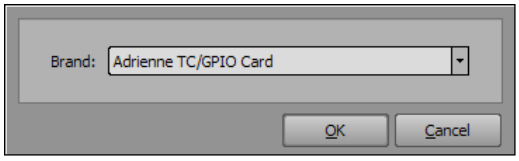
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



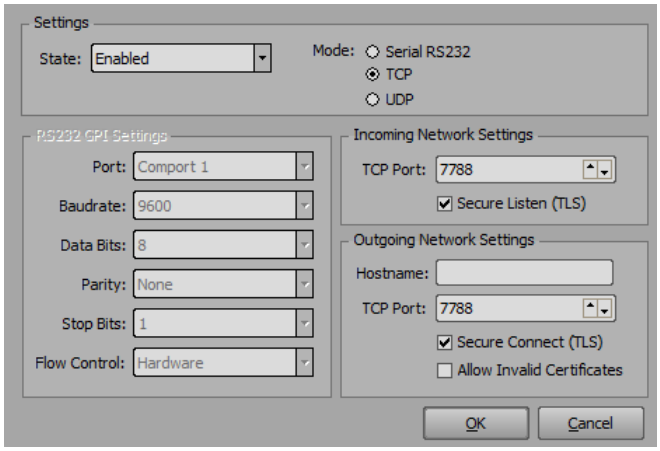
3. Select **Add**.

   The **Add New GPI Board** dialog opens.



4. From the **Brand** drop-down, select **Smart GPI / RossTalk** and then select **OK**.

   The **Smart GPI / RossTalk Setup** dialog opens.



5. In the **Settings** section, from the **State** drop-down, select **Enabled**.

   Select **Disabled** to turn off Smart GPI/RossTalk.

6. Select a network connection **Mode**:

   - **Serial RS232** — use RS232 to send Smart GPI/RossTalk signals to XPression.
   - **TCP** — use TCP to send Smart GPI/RossTalk signals to XPression.
   - **UDP** — use UDP sockets to send Smart GPI/RossTalk signals to XPression.

7. Configure the selected GPI mode.

   Serial RS232

   - From the **Port** drop-down, select the communication port that receives GPI signals.
   - From the **Baudrate** drop-down, select the communication speed for GPI signals.
   - From the **Data Bits** drop-down, select the number of bits used to represent one character of data for GPI signals.
   - From the **Parity** drop-down, select the method used to check for lost data in a GPI signal.
   - From the **Stop Bits** drop-down, select the number of bits used to indicate the end of a byte in a GPI signal.
   - From the **Flow Control** drop-down, select the data transmission rate controller for a GPI signal.

     Flow Control can be set to **Hardware** or **None**, but it must be set the same in both XPression and the transmitting device.

TCP

- In the **Incoming Network Settings** section, in the **TCP Port** field, enter or select the communication port that receives GPI signals.
  - Select **Secure Listen (TLS)** to secure communications between TCP and Smart GPI/RossTalk, making them unreadable by other machines.
- In the **Outgoing Network Settings** section, in the **Hostname** field, enter the host name of a remote device that is to receive RossTalk messages.
  - In the **TCP Port** field, enter or select the communication port that receives the signals.
  - If **Secure Listen (TLS)** was selected in the **Incoming Network Settings** section, then select the **Secure Connect (TLS)** checkbox to secure communications between TCP and Smart GPI/RossTalk, making them unreadable by other machines.
  - Select **Allow Invalid Certificates** only when the DataLinq Server certificate name will not match the host (for example, when connecting by IP address to a server whose certificate was issued for a DNS name), or when the revocation server cannot be reached.

    ★Expired and untrusted certificates are always rejected. Existing projects that used secure connections before this version open with this option selected, preserving prior behavior.

UDP

- In the **Incoming Network Settings** section, in the **UDP Port** field, enter or select the communication port that receives GPI signals.
- In the **Outgoing Network Settings** section, in the **Hostname** field, enter the host name of a remote device that is to receive RossTalk messages.
- In the **UDP Port** field, enter or select the communication port that receives the signals.

8. Select **OK**.

   The **Smart GPI/RossTalk** GPI board is displayed in the **GPI / Tally Board** list.
9. Select **Close** to exit the **Hardware Setup** dialog.

Configuring a TSL Tally Input

This topic describes the selection and configuration of TSL (Television Systems Limited) Tally Input.

TSL Tally Input is a tally interface in XPression that allows the system to receive tally information from devices that support the TSL, UMD and Tally Protocol. Tally signals indicate which source, camera, graphic, or channel is currently on-air or queued for air.

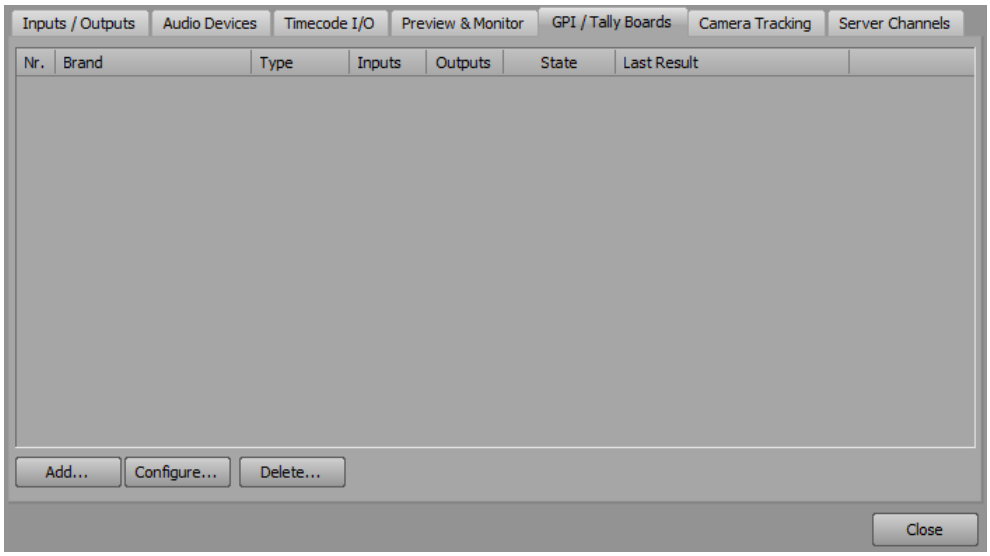
★TSL Version 3.1 and 4.0 are supported.

To configure a TSL Tally input:

1. In XPression, select **Edit > Hardware Setup**.

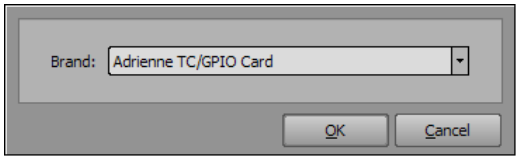
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



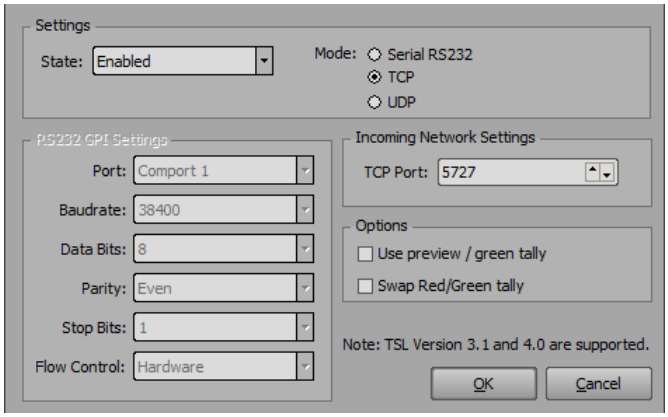
3. Select **Add**.

   The **Add New GPI Board** dialog opens.



4. From the **Brand** drop-down, select **TSL Tally** and then select **OK**.

   The **TSL Tally Input Settings** dialog opens.



5. In the **Settings** section, from the **State** drop-down, select **Enabled**.

   Select **Disabled** to turn off **TSL Tally Input**.

6. Select a network connection **Mode**:

   - **Serial RS232** — use RS232 to send **TSL Tally Input** signals to XPression.
   - **TCP** — use TCP/IP to send **TSL Tally Input** signals to XPression.
   - **UDP** — use UDP sockets to send **TSL Tally Input** signals to XPression.

7. Configure the selected GPI mode.

   Serial RS232

   - From the **Port** drop-down, select the communication port that receives GPI signals.
   - From the **Baudrate** drop-down, select the communication speed for GPI signals.
   - From the **Data Bits** drop-down, select the number of bits used to represent one character of data for GPI signals.
   - From the **Parity** drop-down, select the method used to check for lost data in a GPI signal.
   - From the **Stop Bits** drop-down, select the number of bits used to indicate the end of a byte in a GPI signal.
   - From the **Flow Control** drop-down, select the data transmission rate controller for a GPI signal.

     Flow Control can be set to **Hardware** or **None**, but it must be set the same in both XPression and the transmitting device.

   TCP

   - In the **Incoming Network Settings** section, in the **TCP Port** field, enter or select the communication port that receives GPI signals.

   UDP

   - In the **Incoming Network Settings** section, in the **UDP Port** field, enter or select the communication port that receives GPI signals.

8. In the **Options** section, configure the following:
   - Select the **Use preview / green tally** checkbox to use the green tally to indicate previews (red will be used for on-air).
   - Select the **Swap Red/Green tally** checkbox to reverse the colors (e.g., use red for previews and green for on-air).
9. Select **OK**.

Configuring an X-Keys Device

This topic describes the selection and configuration of an X-Keys device.

X-Key devices are customer-supplied programmable devices, that are ideal for use with 1RU and 2RU systems. They can be accessed by using the **Keyboard / GPI Mapping** dialog to configure functions.

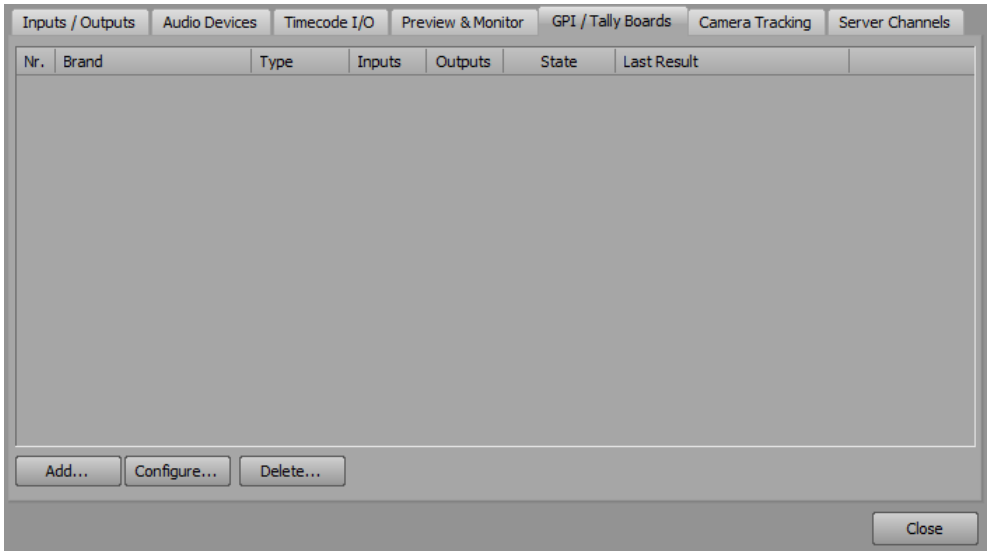
The X-Keys GPIO supports:

- USB 3.0 and USB 3.1.
- Inputs and Outputs
- X-Keys Software Modes PID 1351 and PID 1354.

To configure an X-Keys device:

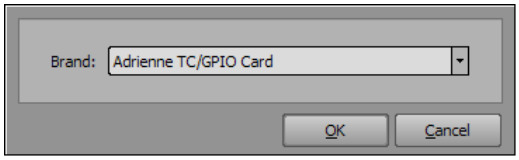
1. Using the official X-Keys software, configure the **Unit ID** and all pins.
2. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** window opens.
3. Select the **GPI / Tally Boards** tab.



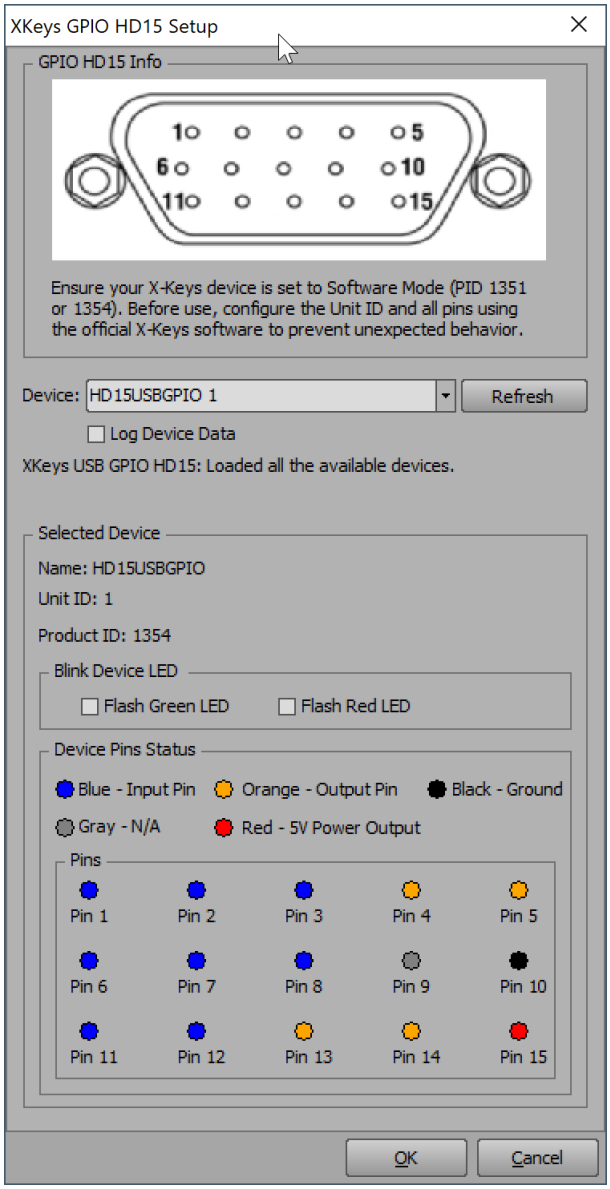
4. Select **Add**.

   The **Add New GPI Board** dialog opens.



5. From the **Brand** drop-down, select **P I Engineering**.

   The **XKeys GPIO HD15 Setup** dialog opens.



6. From the **Device** drop-down, select the connected X-Keys device.

   If you don't see your device in the drop-down, select **Refresh** to update the list.

7. Select the **Log Device Data** to show logging in the **XPression Live Log** and save logging in the XPression logs.

   The XPression logs are located in **C:\ProgramData\Ross Video\XPression\XPressionStudio or XPressionStudioFlex or others\logs**.

8. In the **Selected Device** section, select the **Flash Green LED** or **Flash Red LED** checkbox to aid in identifying the selected device in a server room.

   The device will blink the selected colored LED.

9. Select **OK** to save the configuration and close the setup dialog.

Configuring the PBus Interface and PBus Recalls

This topic describes the selection and configuration of the PBus Interface and PBus Recalls.

PBus is an industry standard protocol designed to allow production switchers to communicate with external devices.

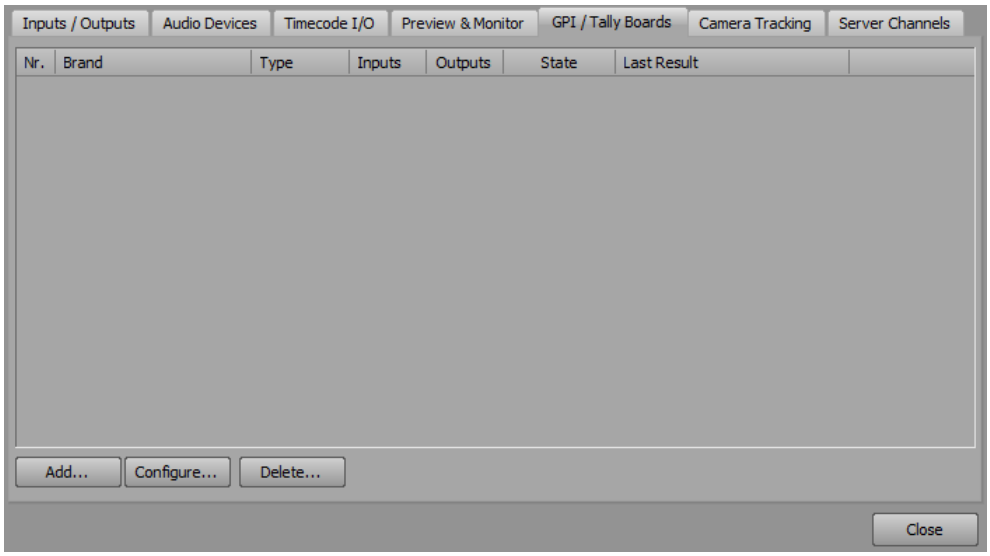
XPression normally does not perform any action when a PBus recall command is issued. Instead, it stores the recall ID to be used later when a PBus trigger command is issued.

To configure the PBus interface and PBus recalls:

1. In XPression, select **Edit > Hardware Setup**.

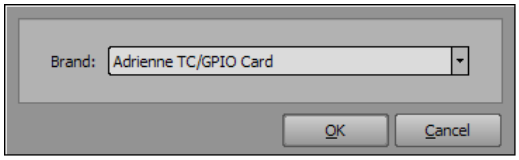
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



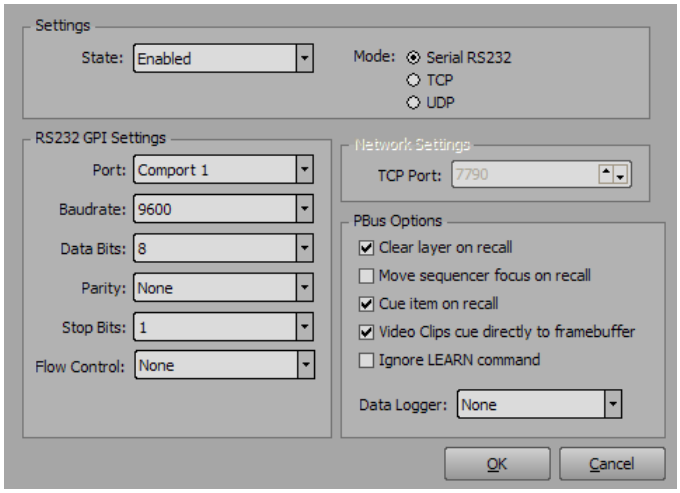
3. Select **Add**.

   The **Add New GPI Board** dialog opens.



4. From the **Brand** drop-down, select **PBus** and then select **OK**.

   The **PBus Setup** dialog opens.



5. In the **Settings** section, from the **State** drop-down, select **Enabled**.

   Select **Disabled** to turn off PBus.

6. Select a network connection **Mode**:

   - **Serial RS232** — use RS232 to send PBus signals to XPression.
   - **TCP** — use TCP/IP to send PBus signals to XPression.
   - **UDP** — use UDP sockets to send PBus signals to XPression.

7. Configure the selected mode.

   Serial RS232

   - From the **Port** drop-down, select the communication port that receives signals.
   - From the **Baudrate** drop-down, select the communication speed for signals.
   - From the **Data Bits** drop-down, select the number of bits used to represent one character of data for the signals.
   - From the **Parity** drop-down, select the method used to check for lost data in a signal.
   - From the **Stop Bits** drop-down, select the number of bits used to indicate the end of a byte in a signal.
   - From the **Flow Control** drop-down, select the data transmission rate controller for a signal.

     Flow Control can be set to **Hardware** or **None**, but it must be set the same in both XPression and the transmitting device.

   TCP and UDP

   - In the **Network Settings** section, in the **TCP** or **UDP Port** field, enter or select the communication port that receives the signals.

8. In the **PBus Options** section, configure the PBus recall options.

   Clear layer on recall — when a PBus recall command is received, XPression will check to which channel and layer the take item being recalled has been assigned. It will then immediately clear that layer and channel. However, the take item will not be read to air until such time as a **PBus Trigger** command is received to put the item on air. This configuration option is recommended in situations where XPression might be used to play back clips/graphics and to ensure that as soon the recall command is issued, any previous graphic that might have been left over on the layer will be removed.

   Move sequencer focus on recall — moves the sequencer focus to the item that is being recalled. This can be useful as a means of generating a preview output that will show a rendered frame from the item that will be put on air when the PBus trigger command is received.

   Cue item on recall — places the take item into a cued state when the recall command is received. This is useful when using video clips which might take a few frames to cue.

   Video Clips cue directly to framebuffer — video clips from the Clip Store that are assigned to a PBus register will be cued directly onto the hardware output of XPression in a paused state. When the play command is received, they will begin playing.

   Ignore LEARN command — ignores the LEARN command. LEARN stores the clip currently loaded into a server channel into the PBus register list when the LEARN command is received.

9. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   None — do not use data logging.

   ASCII — use ASCII encoding for the data log.

   HEX — use HEX file formatting for the data log.

   Both — use both ASCII encoding and HEX file formatting for the data log.

10. Select **OK**.

    PBus is displayed in the **GPI / Tally Board** list.

11. Select **Close** to exit the **Hardware Setup** dialog.

For More Information on...

- configuring and working with GPIs, refer to the *GPI White Paper* available from Ross Video.

Configuring Camera Tracking

This topic describes the selection and configuration of camera tracking sources.

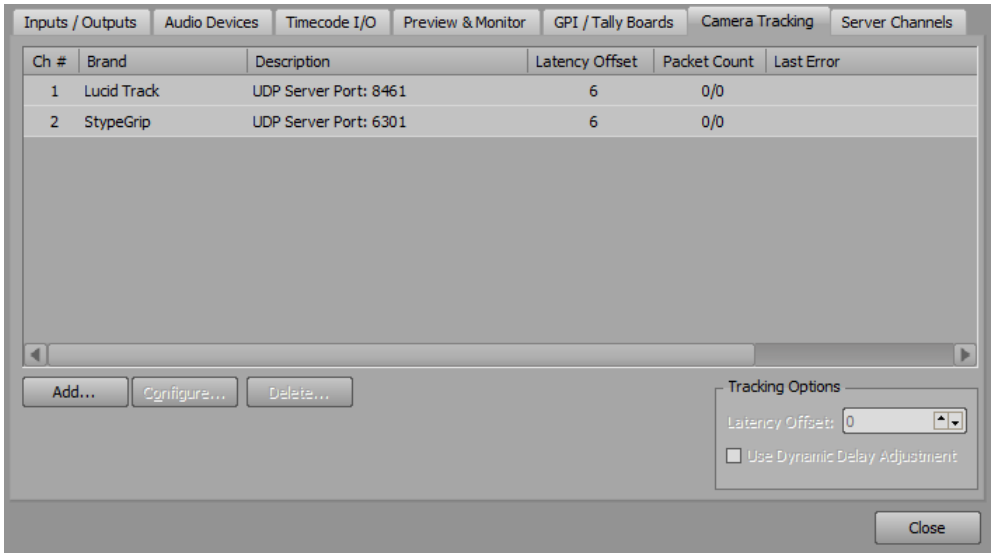
Camera tracking enables XPression to synchronize virtual graphics with the movement and positioning of a physical camera, creating the foundation for augmented reality and virtual production workflows. By receiving real-time tracking data from supported camera tracking systems, XPression can accurately update the position, orientation, and timing of virtual cameras to maintain proper alignment between graphics and live video. The **Camera Tracking** tab in **Hardware Setup** allows you to configure supported tracking sources, including NCam, Lucid Track, StypeGrip, and TrackMen, as well as adjust synchronization and latency settings to ensure smooth and accurate tracking performance.

To configure a camera tracking source:

1. In XPression, select **Edit > Hardware Setup**.

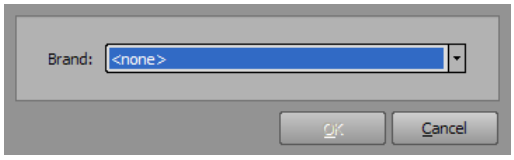
   The **Hardware Setup** window opens.

2. Select the **Camera Tracking** tab.



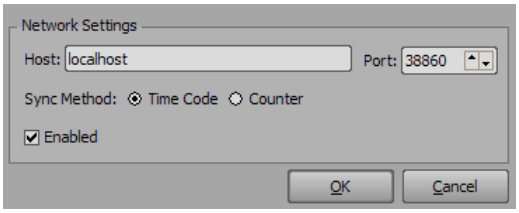
3. Select **Add**.

   The **Select Tracker Source** dialog opens.



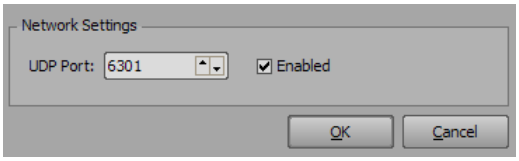
4. From the **Brand** drop-down, select one of the following camera tracking sources:
   - **<none>**
   - **NCam**
   - **Lucid Track**
   - **StypeGrip**
   - **TrackMen**
5. Configure the selected camera tracking source as follows:

NCam



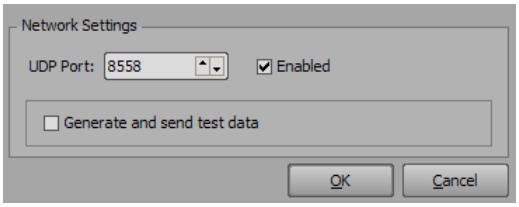
- In the **Network Settings** section, in the Host field, enter the IP address of the host server.
- From the **Port** drop-down, enter or select the communication port that receives the camera tracking source information.
- Select a **Sync Method** for the camera tracking source and the XPression virtual camera:
  - **Time Code** — synchronize using a time code to label individual frames of video.
  - **Counter** — synchronize using a sequential clock.
- Select **Enabled** to use the camera tracking source.

Lucid Track



- In the **UDP Port** field, enter or select the communication port that receives the camera tracking source information.
- Select **Enabled** to use the camera tracking source.

StypeGrip/TrackMen



- In the **UDP Port field**, enter or select the UDP communication port that receives the camera tracking source information.
- Select **Enabled** to use the camera tracking source.
- Select **Generate and send test data** to compile and send information about the camera tracking source.

  When enabled, this option will automatically be disabled when real camera tracking data is received.

6. Select **OK**.

   The dialog closes and the camera tracking source appears in the **Camera Tracking** list.
7. In the **Tracking Options** section, in the **Latency Offset** field, enter or select the latency offset in frames to match video and rendering delay.
8. Select **Use Dynamic Delay Adjustment** to automatically adjust the delay to maintain a fixed packet buffer level.
9. Select **Close** to exit the **Hardware Setup** dialog.

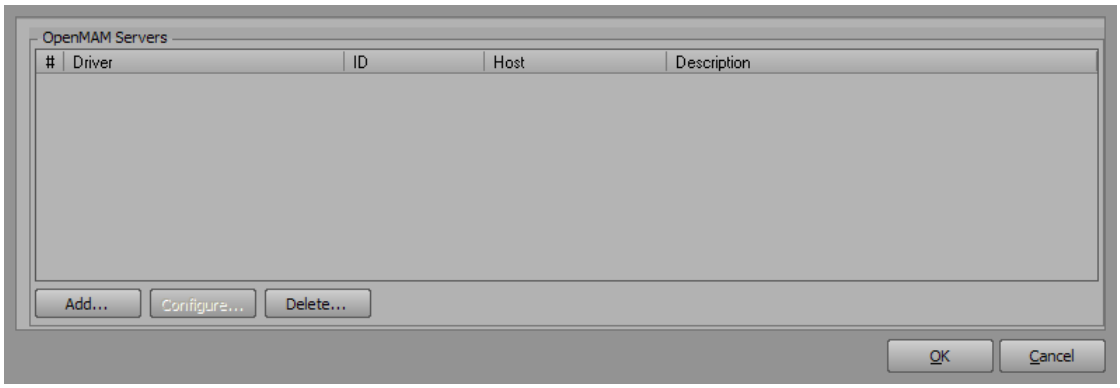
Setting Up OpenMAM

This section describes how to set up an OpenMAM server. If an OpenMAM asset cannot be retrieved, the original texture from the scene will be used instead.

To configure an OpenMAM server:

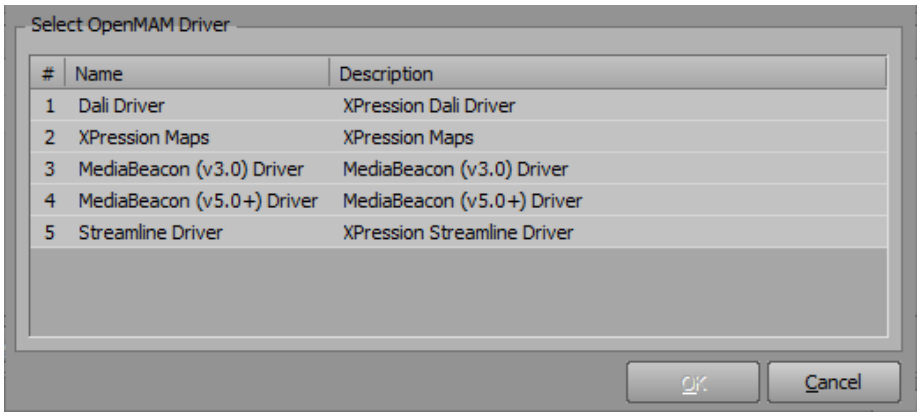
1. In XPression, select **Edit > OpenMAM Setup**.

   The **OpenMAM Setup** dialog opens.



2. Select **Add**.

   The **Add OpenMAM Server** dialog opens.



3. From the **Select OpenMAM Driver** drop-down, select an OpenMAM driver.
4. Select **OK**.

   The configuration dialog for the selected OpenMAM driver opens.

5. Configure the server and connection settings for the selected driver as described in the following sections:

   Dali Driver

   XPression Maps

   MediaBeacon (v3.0) Driver

   MediaBeacon (v5.0+) Driver

   Streamline Driver

6. When you have finished configuring the selected driver, select **OK** to close the OpenMAM setup dialog.

For More Information on...

- configuring the local cache settings for storing retrieved assets, refer to the OpenMAM settings in Setting Preferences.

Dali Driver

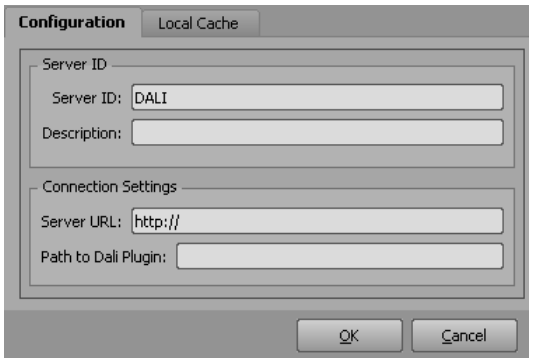
Use the instructions below to configure a Dali Driver.

To configure a Dali Driver:

1. In the **Server ID** section, in the **Server ID** field, enter a user-friendly name for the Dali server.

   This ID will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

   Make a note of this ID because it will be the same for any other XPression device connecting to the Dali Driver server.



2. In the **Description** field, enter a brief description for the server (optional).

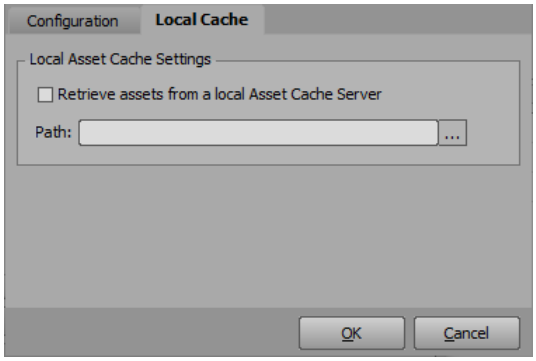
   The description will override the entry in the **Server ID** field and will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

3. In the **Connection Settings** section, in the **Server URL** field, enter the URL of the Dali Driver server.

4. In the **Path to Dali Plugin** field, enter the file path for the Dali Driver Web Client executable.

5. Select the **Local Cache** tab.

   The **Local Cache** tab opens.



6. In the **Local Asset Cache Settings** section, select the **Retrieve assets from a local Asset Cache Server** checkbox to retrieve assets from a cache server.

7. In the **Path** field, enter the location of the local server or select **Browse** (...) to select a location.

8. Select **OK**.

   The **Dali Server Configuration** window closes and the server is added to the **OpenMAM Servers** list.

XPression Maps

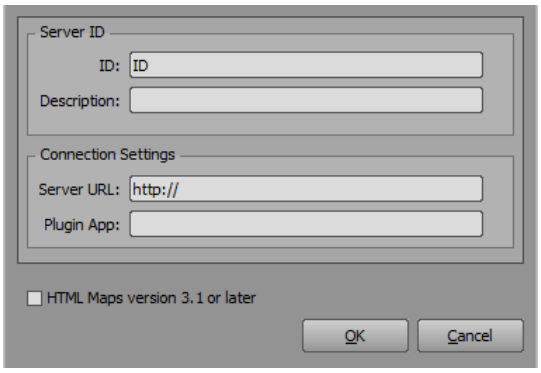
Use the instructions below to configure an XPression Maps server.

To configure the XPression Maps server:

1. In the **Server ID** section, in the **ID** field, enter a user-friendly name for the XPression Maps server.

   This ID will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

   Make a note of this ID because it will be the same for any other XPression device connecting to the XPression Maps server.



2. In the **Description** field, enter a brief description for the server (optional).

   The description will override the entry in the **ID** field and will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

3. In the **Connection Settings** section, in the **Server URL** field, enter the URL of the XPression Maps server.

4. In the **Plugin App** field, enter the file path for the XPression Maps Web Client executable.

5. Select the **HTML Maps version 3.1 or later** if you are using XPression Maps version 3.1 or later.

6. Select **OK**.

   The **XPression Maps Server Configuration** window closes and the server is added to the **OpenMAM Servers** list.

MediaBeacon (v3.0) Driver

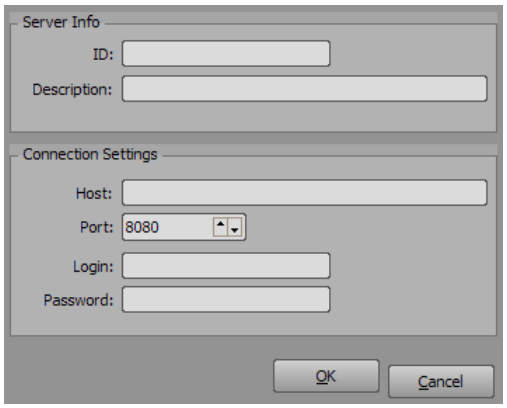
Use the instructions below to configure a MediaBeacon (v3.0) driver.

To configure the MediaBeacon (v3.0) Driver:

1. In the **Server ID** section, in the **ID** field, enter a user-friendly name for the MediaBeacon server.

   This ID will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

   Make a note of this ID because it will be the same for any other XPression device connecting to the MediaBeacon server.



2. In the **Description** field, enter a brief description for the server (optional).

   The description will override the entry in the **ID** field and will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

3. In the **Connection Settings** section, in the **Host** field, enter the IP address of the MediaBeacon server.
4. In the **Port** field, enter or select the port number for the MediaBeacon server.
5. In the **Login** field, enter the username configured on the MediaBeacon server.
6. In the **Password** field, enter the password for the MediaBeacon username.
7. Select **OK**.

   The **MediaBeacon Driver Configuration** window closes and the server is added to the **OpenMAM Servers** list.

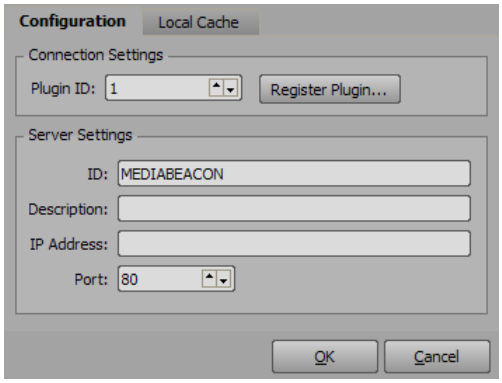
MediaBeacon (v5.0+) Driver

★To connect the XPression Gateway to a MediaBeacon 5.0+ server, you must first register the MediaBeacon plugin on the MediaBeacon server.

Use the instructions below to configure a MediaBeacon (v5.0+) driver.

To configure the MediaBeacon (v5.0+) Driver:

1. In the **Connection Settings** section of the **Configuration** tab, in the **Plugin ID** field, enter or select the plugin identification number.



2. In the **Server ID** section, in the **ID** field, enter a user-friendly name for the MediaBeacon server.

   This ID will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

   Make a note of this ID because it will be the same for any other XPression device connecting to the MediaBeacon server.

3. If this is the first device you are connecting to the server, select **Register Plugin** to be redirected to the MediaBeacon login screen in Google Chrome and enter the login information.

   Once the login information has been entered, you should see a message indicating the plugin has been successfully registered.

   The plugin only has to be registered once. When configuring other engines, use the same plugin ID.

4. In the **Description** field, enter a brief description for the server (optional).

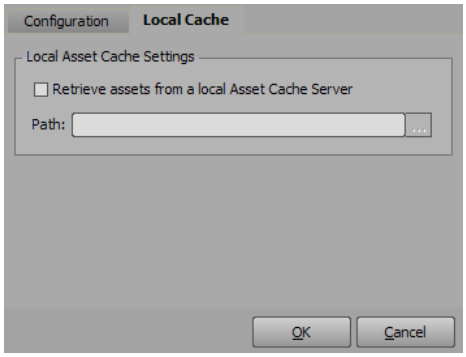
   The description will override the entry in the **ID** field and will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

5. In the **IP Address** field, enter the IP address of the MediaBeacon server.

   ★The **Port** field is set to 80 by default and must remain set to 80.

6. Select the **Local Cache** tab.

   The **Local Cache** tab opens.



7. In the **Local Asset Cache Settings** section, select the **Retrieve assets from a local Asset Cache Server** to retrieve assets from a cache server.
8. In the **Path** field, enter the location of the local server or select **Browse** (...) to select a location.
9. Select **OK**.

   The **MediaBeacon Driver Configuration** window closes and the server is added to the **OpenMAM Servers** list.

Streamline Server

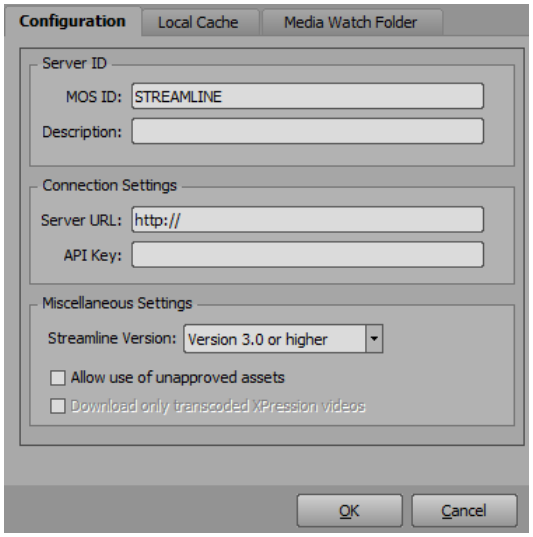
Use the instructions below to configure a Streamline driver.

To configure a Streamline Driver:

1. In the **Server ID** section, in the **MOS ID** field, enter a user-friendly name for the Streamline server.

   This ID will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

   Make a note of this ID because it will be the same for any other XPression device connecting to the Streamline server.



2. In the **Description** field, enter a brief description for the server (optional).

   The description will override the entry in the **MOS ID** field and will appear in the **OpenMAM** drop-down in the plugin and in the **OpenMAM Server** list in the server.

3. In the **Connection Settings** section, in the **Server URL** field, enter the URL of the Streamline server.

   ★The Streamline server must be on the same domain as the HTML5 plugin.

4. In the **API Key** field, enter the API key of the Streamline user.

5. In the **Miscellaneous Settings** section, from the **Streamline Version** drop-down, select the version of Streamline software being used in the workflow.

6. Select the **Allow use of unapproved assets** checkbox if allowing the use of unapproved assets.

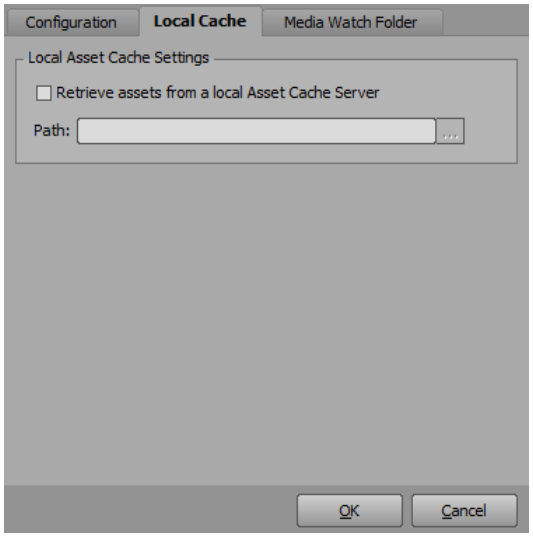
7. Select the **Download only transcoded XPression videos**, if allowing only transcoded videos to be used.

8. Continue with configuring the **Local Cache**.

To configure the Local Cache:

1. Select the **Local Cache** tab.

   The **Local Cache tab** opens.

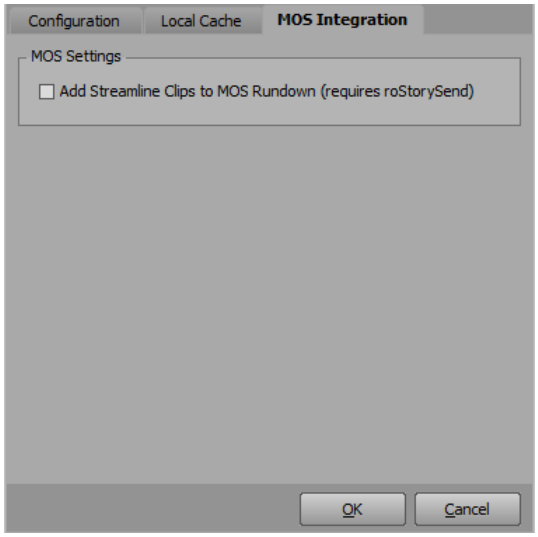


2. In the **Local Asset Cache Settings** section, select the **Retrieve assets from a local Asset Cache Server** to retrieve assets from a cache server.
3. In the **Path** field, enter the location of the local server or select **Browse** (...) to select a location.
4. Continue with configuring MOS Integration.

To configure MOS Integration:

1. Select the **MOS Integration** tab.

   The **MOS Integration** tab opens.



2. In the **MOS Settings** section, select the **Add Streamline Clips to MOS Rundown** checkbox, if you intend to use a MOS workflow.

3. Select **OK**.

   The **Streamline Server** configuration dialog closes and the driver is added to the **OpenMAM Servers** list.

4. In the **Gateway** panel, in the **MOS Objects & Messages** section, select the **Parse roStorySendMessage** checkbox, which is required when adding Streamline clips to a MOS rundown.

Setting Up Server Channels

The **Server Channels** are used for previewing and playing out clips.

Before using the server channels, they must be configured in the XPression **Hardware Setup**. Once outputs have been configured in XPression, use the following procedure to set up the server channels.

A virtual channel should be assigned a real physical output onto which the clip will be played. It is these virtual channels that the **AMP/VDCP Media Control Gateway** is controlling.

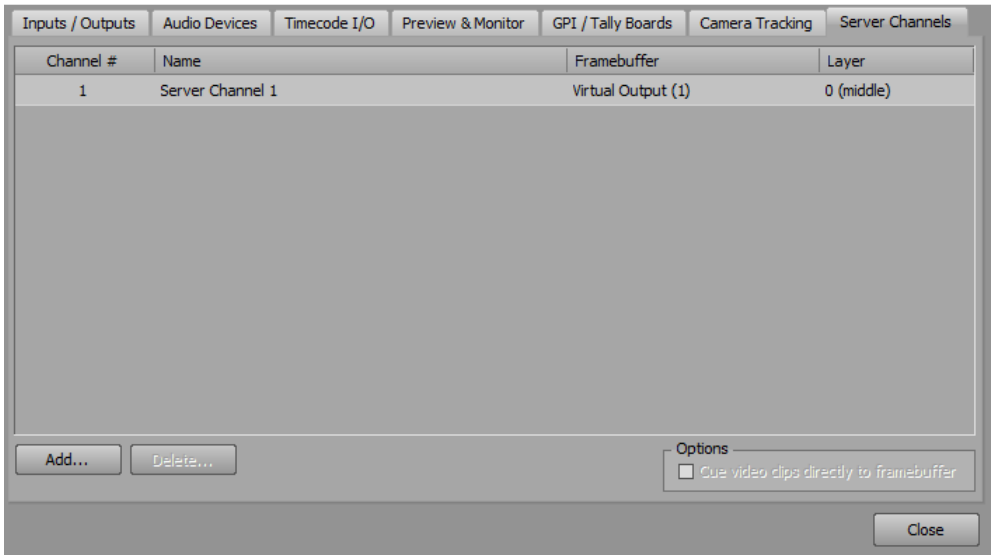
To set up server channels:

1. In XPression, select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.

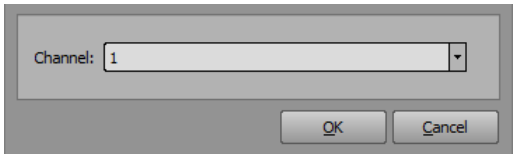
2. Select the **Server Channels** tab.

   The **Server Channels** tab opens.



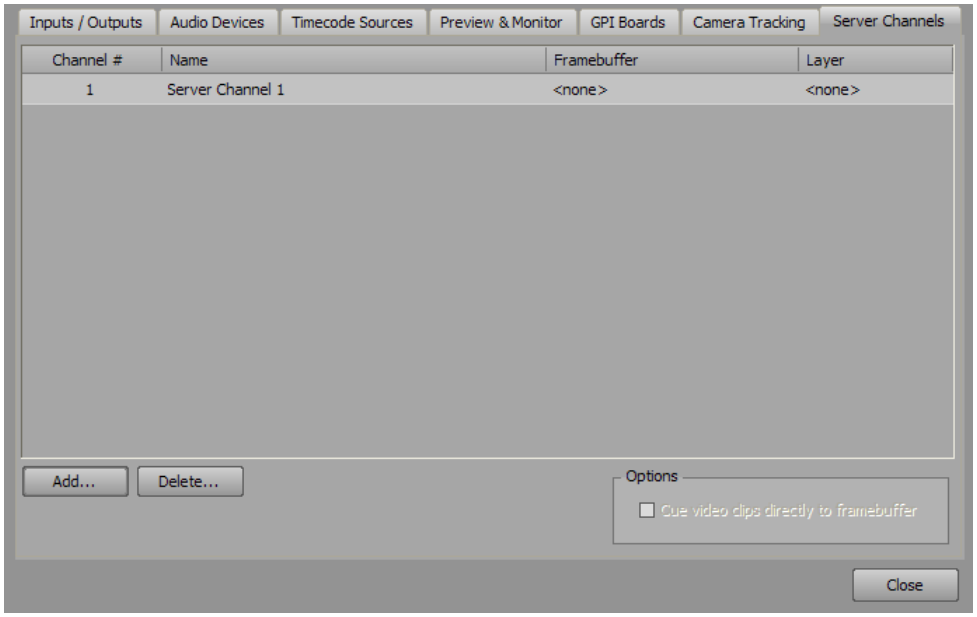
3. Select **Add**.

   The **Select Server Channel #** dialog opens.



4. From the **Channel** drop-down, select a server channel number and then select **OK**.

   The server channel is added to the list.



5. Configure the following as necessary:
   - In the **Name** column, enter a name for the server channel. The default is Server Channel #.
   - In the **Framebuffer** column, use the list to select an output framebuffer for the server channel.
   - In the **Layer** column, enter or select a layer for rendering. The default is 0 (middle).
   - In the **Options** section, select **Cue video clips directly to framebuffer** to cue clips to air immediately when dropped on a server channel from the Clip Browser.
6. Repeat steps 3 to 6 to add more server channels as necessary.
7. Select **Close** to exit the **Hardware Setup** dialog.

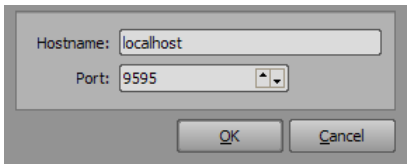
For More Information on...

- configuring outputs, refer to Configuring an AJA Video FrameBuffer (Legacy), Configuring a Blackmagic Design FrameBuffer (Legacy), or Configuring an XPression Virtual Output.

Configuring XPression for the XPression Clip Store

1. Once the XPression Clip Store has been configured using the **Clip Store Manager**, XPression needs to be set up for use with the Clip Store.
2. In XPression, select **Edit > Clip Store Setup**.

   The **Clip Store Setup** dialog opens.

3. In the **Hostname** field, enter the IP address of the Clip Store service if using remotely.

   OR

   If using the Clip Store service locally, use **localhost (default)**.
4. In the **Port** field, enter or select the port number for the Clip Store server connection.

   The default port is **9595**.
5. Select **OK**.

   XPression is now connected to the Clip Store service.

PBus Interface

The following topics are discussed in this section:

PBus Overview

PBus Triggers

PBus LEARN Commands

PBus Mapping

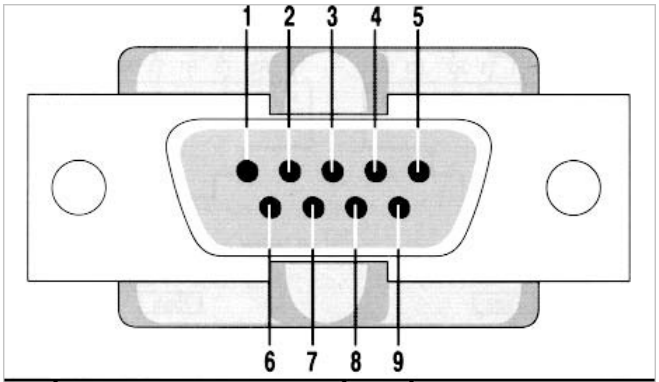
Using PBus from a Switcher to Recall Items

Using PBus for Clips

PBus Overview

PBus (Peripheral Bus) is an industry standard protocol designed to allow production switchers to communicate with external devices. Most large production switchers have some capability of sending PBus commands to a device.

XPression supports PBus over standard RS232 or TCP/UDP sockets.



Pin	Signal	Pin	Signal
1	Data Carrier Detect	6	Data Set Ready
2	Received Data	7	Request to Send
3	Transmitted Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	Signal Ground		

The chassis of some turnkey XPression systems might not include a standard RS232 port. However, it is possible to use an RS232-USB adapter.

If the production switcher has an RS422 serial port, then you will require an RS232 to RS422 adapter. This adapter will require its own power supply. Generally, the adapters that are port-powered will not function for these purposes.

★On an XPression Bluebox system, a limited subset of PBus functionality is available. PBus commands can be used to trigger take items that have been pre-built in an XPression sequence using either XPression Designer or Studio. It is not possible to customize the PBus registers actions using Bluebox. Each register number corresponds to a specific take item number and can not be changed. It is not possible to load the PBM or PBMS PBus mapping files on Bluebox.

For More Information on...

- configuring the PBus interface and PBus recalls, refer to Configuring the PBus Interface and PBus Recalls.

PBus Triggers

XPression supports many PBus Trigger commands.

PBus Trigger Command	Description
Trigger 0 – Play Item	This trigger can be overridden in the PBus mapping. Trigger 0 is normally used to play a take item to air. However, this can be overridden to perform other actions on a per-register basis. These actions can be configured in the PBus mapping menu.
Trigger 1 – Take Sequence Item Off-Air	Trigger 1 is used to take an item off air (assuming it was already on air). The item taken off air will be the take item that was previously recalled using a PBus recall command.
Trigger 2 – Execute GPI	Trigger 2 is used to emulate a standard GPI input. In the XPression Keyboard/GPI Mapping, various actions can be configured to be executed on a GPI input being triggered. It is possible to trigger up to 99 different GPIs through PBus. The GPI number that will be triggered is the number that was previously recalled using a PBus recall command.
Trigger 3 – Clear Framebuffer	Trigger 3 will clear the framebuffer assigned to the device in the PBus channel configuration. If the channel is set to <default>, this trigger will clear Channel 1.
Trigger 4 – Clear Framebuffer Channel 2	Trigger 4 will clear the framebuffer assigned to the device in the PBus channel configuration. If the channel is set to <default>, this trigger will clear Channel 2.
Trigger 5 – Read Current Sequence Item to Air	Trigger 5 will take the currently selected sequence item from the sequencer to air. It ignores the PBus recall command and uses whichever item currently has focus in the XPression sequencer.
Trigger 6 – Resume Channel	Trigger 6 will resume all paused graphics currently on the framebuffer assigned to the device in the PBus Channel Configuration. If the framebuffer is set to <default>, this will resume Channel 1.
Trigger 7 – Resume Channel	Trigger 7 will resume all paused graphics currently on the framebuffer assigned to the device in the PBus Channel Configuration. If the framebuffer is set to <default>, this will resume Channel 2.
Trigger 8 – Resume Take Item	Trigger 8 will resume a single paused take item. The take item will be the item previously recalled by a PBus recall command.
Trigger 10 – Bank 0	Trigger 10 will change the last recall command into an ID in the 0-99 range (refer to the Bank 1 command below for more details).

PBus Trigger Command	Description
Trigger 11 – Bank 1	Trigger 11 is used to allow switchers that can only send PBus recall commands up to 99 to be able to recall take items with values of between 100 and 199. This "bank 1" command will add 100 to the last recalled item using a PBus recall command. For example; to recall take ID 135 and put it on air, a switcher could send: • Recall 035 • Trigger 11 (changes the 035 into 135) • Trigger 0 It is not necessary to switch back to bank 0 after sending a bank 1 command. XPression will automatically revert to bank 0 for the next PBus recall command.
Trigger 12 – Bank 2	Changes the last PBus recall command into an ID in the 200-299 range.
Trigger 13 – Bank 3	Changes the last PBus recall command into an ID in the 300-399 range.
Trigger 14 – Bank 4	Changes the last PBus recall command into an ID in the 400-499 range.
Trigger 15 – Bank 5	Changes the last PBus recall command into an ID in the 500-599 range.

For More Information on...

- configuring the PBus interface and PBus recalls, refer to Configuring the PBus Interface and PBus Recalls.

PBus LEARN Commands

When a PBus LEARN command is received from a remote device, XPression will look to the configured server channel for the PBus device, and if there is a clip currently cued on that server channel it will assign that clip into the PBus register via the recall ID, if assigned.

There is an option **Ignore LEARN command** in the **PBus Setup** dialog in **Hardware Setup**. This option is useful if you are manually assigning clips to PBus registers and you do not want to change/overwrite them when storing memories on the production switcher. Most production switchers automatically send the PBus LEARN command when storing the memory.

For More Information on...

- the PBus LEARN command, refer to the appropriate switcher documentation.

PBus Mapping

Use PBus mapping to assign clips, functions, scenes, scripts, and other actions and functions to device registers, and then save and load the maps.

The following procedures are covered in this section:

Configuring PBus Mapping

Assigning an Action to a PBus Register

Adding a Global Macro to a Take Item

Remapping a PBus Register

Loading and Saving Maps

For More Information on...

- configuring the PBus interface and PBus recalls, refer to Configuring the PBus Interface and PBus Recalls.

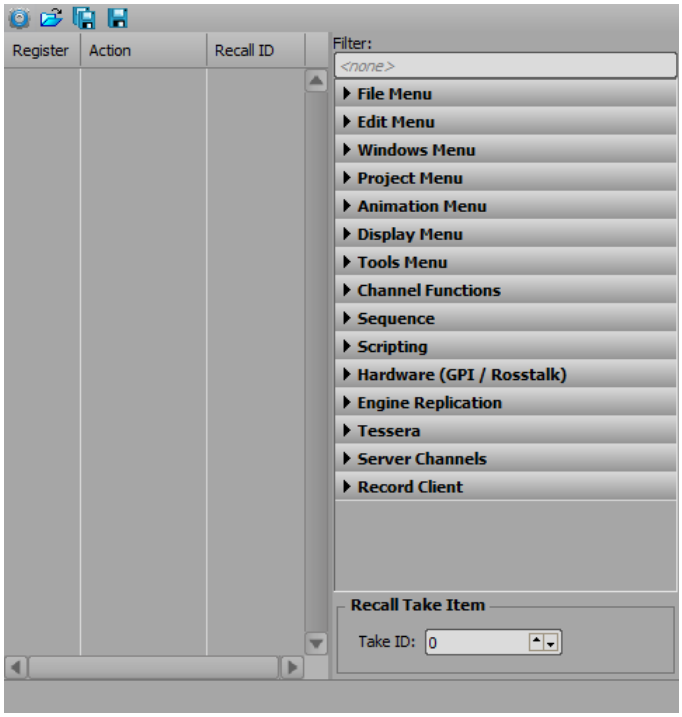
Configuring PBus Mapping

Use the **PBus Device Configuration** dialog to configure the **Device IDs** and server channels.

To configure PBus Mapping:

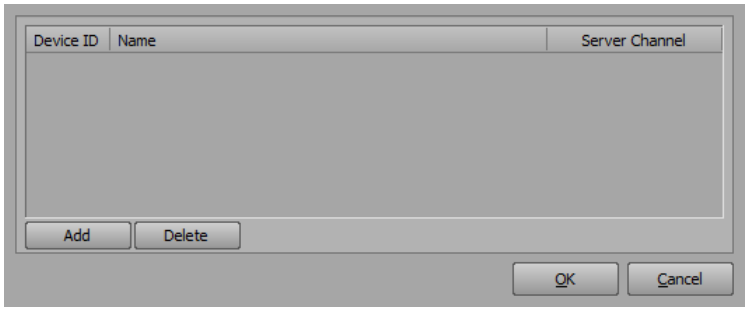
1. In XPression, select the **Sequence** editor.
2. Select **Display > PBus Mapping**.

   The **PBus Mapping** window opens.



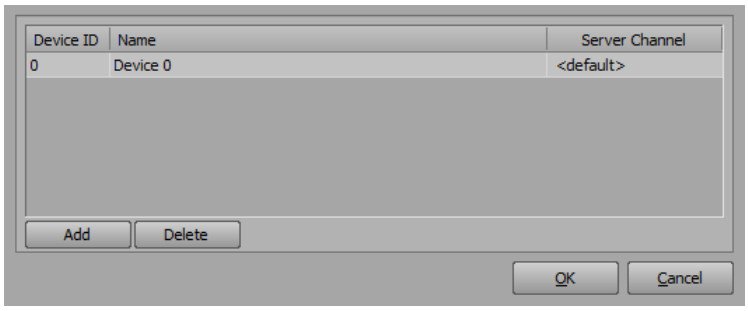
3. Select the **Setup Device Configuration** () icon.

   The **PBus Device Configuration** dialog opens.



4. Select **Add** to add a **Device ID**.

   A device ID is added to the **PBus Device Configuration** list. At least one **Device ID** must be added. The **Device ID** is the ID number that will be sent in PBus messages transmitted from the production switcher.



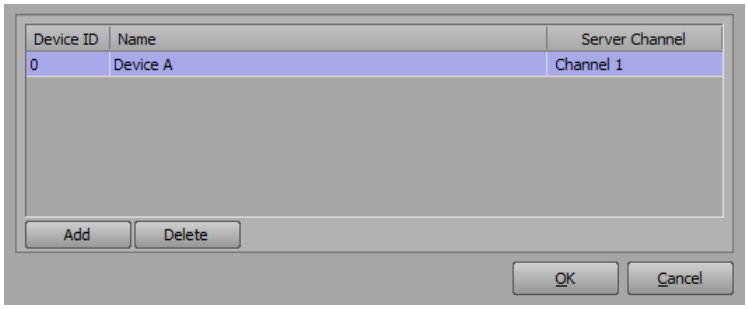
5. Click inside the **Device ID** column of the ID and enter or select a different ID number from the default number, if necessary.

   PBus **Device IDs** must be between 0 and 23.

6. Click inside the **Name** column of the ID and enter a name to refer to the **Device ID**. For example, **Device A**.

7. Click inside the **Server Channel** column of the ID and from the drop-down, select a specific output framebuffer or use the **<default>** framebuffer.

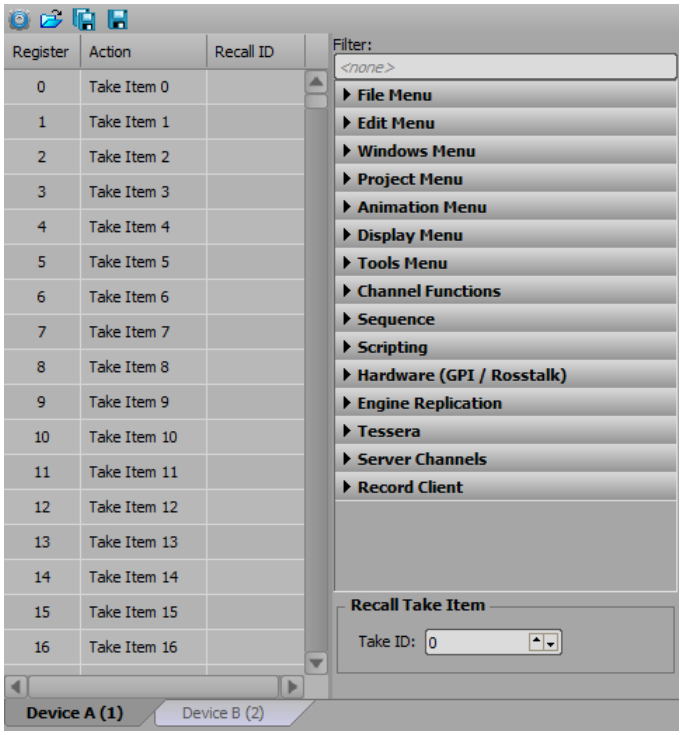
   If the framebuffer is set to anything other than **<default>** when a PBus recall command is received for a specific **Device ID**, the item will be played on the selected framebuffer. If **<default>** is selected, the item will be played on the framebuffer for which the original take item was configured. When a clip from the Clip Store is assigned to a register and **<default>** was selected for the **Server Channel**, the first device configured will use **Server Channel 1**, the next will use **Server Channel 2**, etc.



   If XPression does not have the **Clips** option, then the **Server Channel** configuration column will be missing and all take items will be cued to the channel assigned to them through the **Sequencer**.

8. Repeat steps 4 to 7 to add additional PBus devices as necessary.
9. When all PBus devices have been added and configured, select **OK**.

   The **Device IDs** are added as tabs at the bottom of the **PBus Mapping** window under the assigned device names. If there are no tabs added, then a **Device ID** was not added to the **PBus Device Configuration** list.



Assigning an Action to a PBus Register

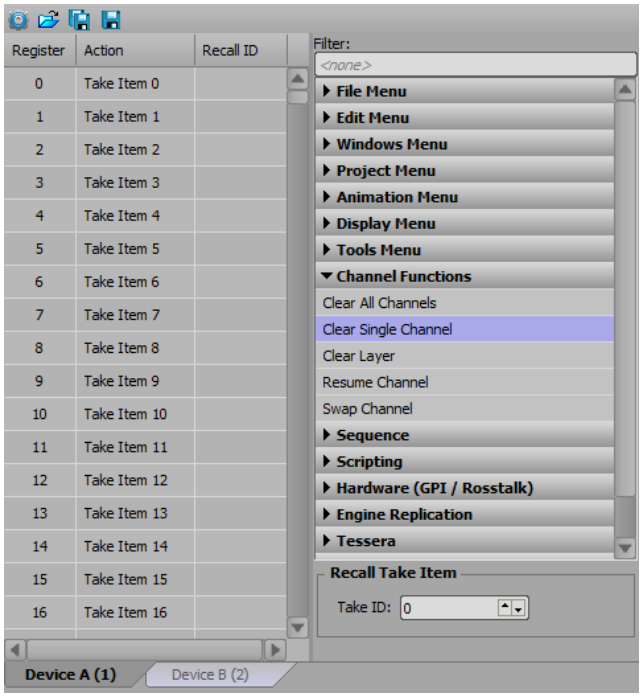
Each device has a list of 4095 registers which can be recalled through PBus.

★Some switchers can only support the first 99 registers.

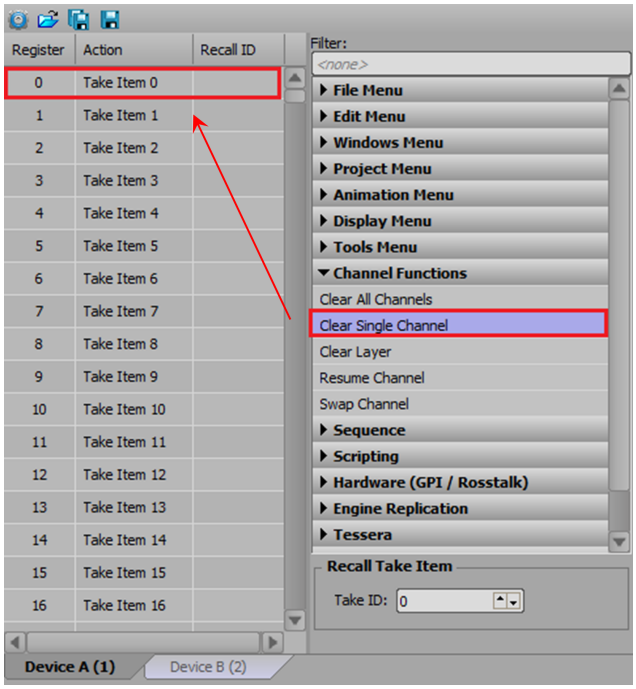
Each PBus register can be assigned an action that will be executed after the register is recalled and **Trigger 0** is received. The default action for each register is to play the corresponding **Take Item** with the same number as the PBus register.

To assign an action to a PBus register:

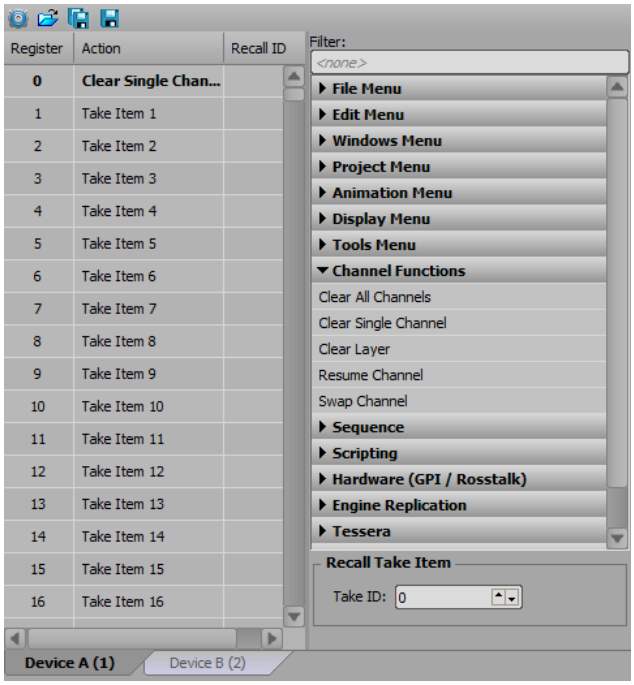
1. In the **PBus Mapping** window, select an action from the actions list to the right of the devices.



2. Drag and drop the action onto a register.



The action is added to the register.



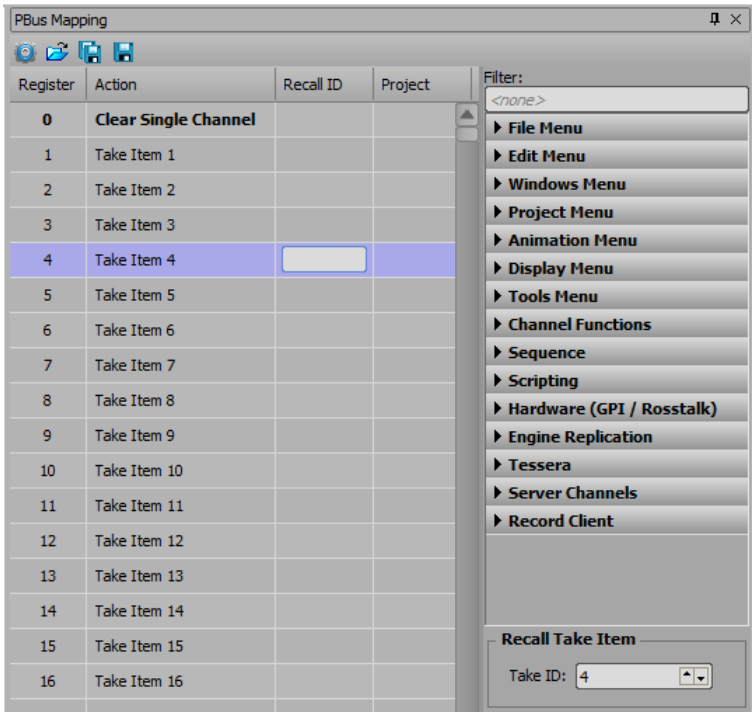
Adding a Global Macro to a Take Item

XPression supports the use of global macros, allowing user to dynamically replace clips associated with a register, based on macro values like team names or network IDs.

To add a global macro to a Take Item:

1. In the XPression **Sequence** editor, select **Display > PBus Mapping**.

   The **PBus Mapping** window opens.



2. Select the take item for which you want to add a global macro.
3. Left-click in the **Recall ID** column for that take item and enter the macro.

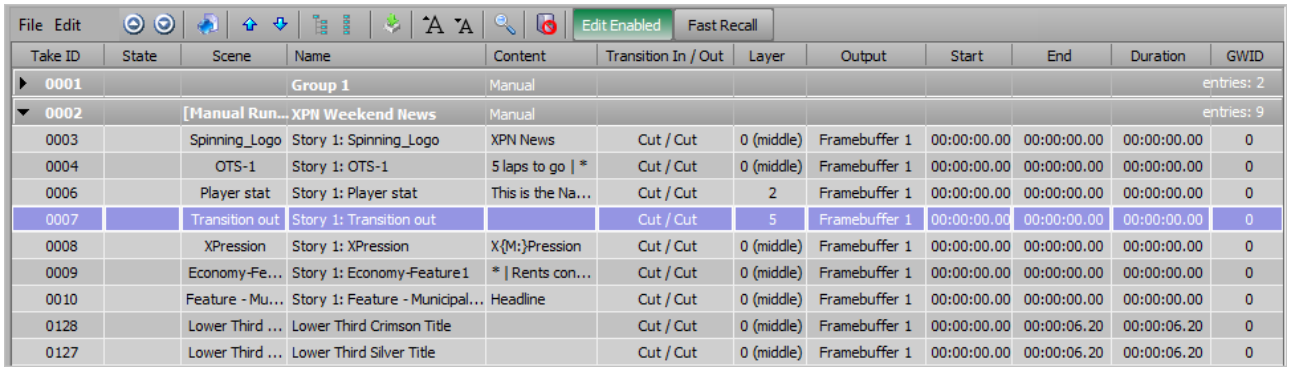
Remapping a PBus Register

To remap a PBus register to play a different take item, the take item can be dragged and dropped from the sequencer onto the register in the **PBus Mapping** window or you can enter or select a different take ID using the **Take ID** field in the **Recall Take Item** section of the **PBus Mapping** window.

Duplicate Recall Ids are supported. If two clips with the same Recall ID are added to the register, in the **Project** column, you can enter which project the clip comes from. Global macros are supported in the **Project** column.

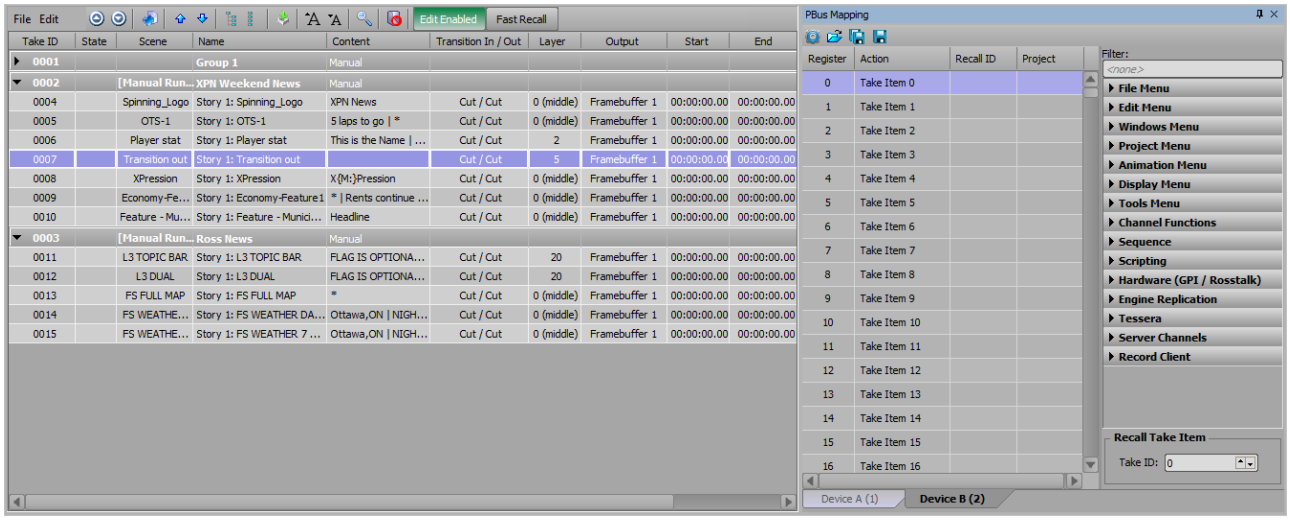
To remap a PBus register using drag and drop from the Sequencer:

1. In the **Sequencer**, select a take item from the **Take ID** list.

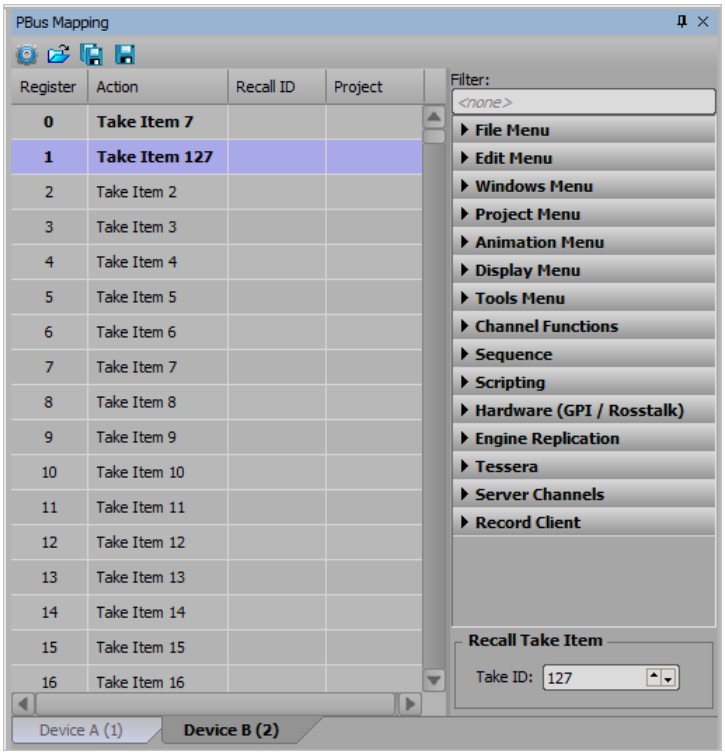


Take ID	State	Scene	Name	Content	Transition In / Out	Layer	Output	Start	End	Duration	GWID
0001			Group 1	Manual							entries: 2
0002		[Manual Run...	XPN Weekend News	Manual							entries: 9
0003		Spinning_Logo	Story 1: Spinning_Logo	XPN News	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0004		OTS-1	Story 1: OTS-1	5 laps to go | *	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0006		Player stat	Story 1: Player stat	This is the Na...	Cut / Cut	2	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0007		Transition out	Story 1: Transition out		Cut / Cut	5	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0008		XPression	Story 1: XPression	X{M:}Pression	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0009		Economy-Fe...	Story 1: Economy-Feature1	* | Rents con...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0010		Feature - Mu...	Story 1: Feature - Municipal...	Headline	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0128		Lower Third ...	Lower Third Crimson Title		Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0127		Lower Third ...	Lower Third Silver Title		Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0

2. Drag and drop the take item onto a register in the **PBus Mapping** window.

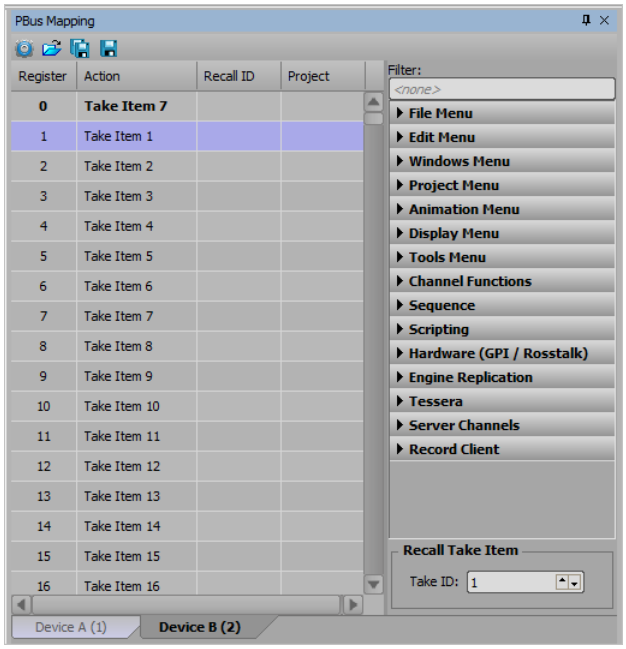


The take item is added to the register.

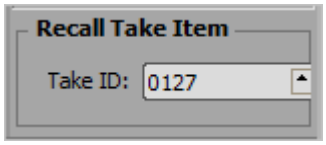


To remap a register using the Take ID field:

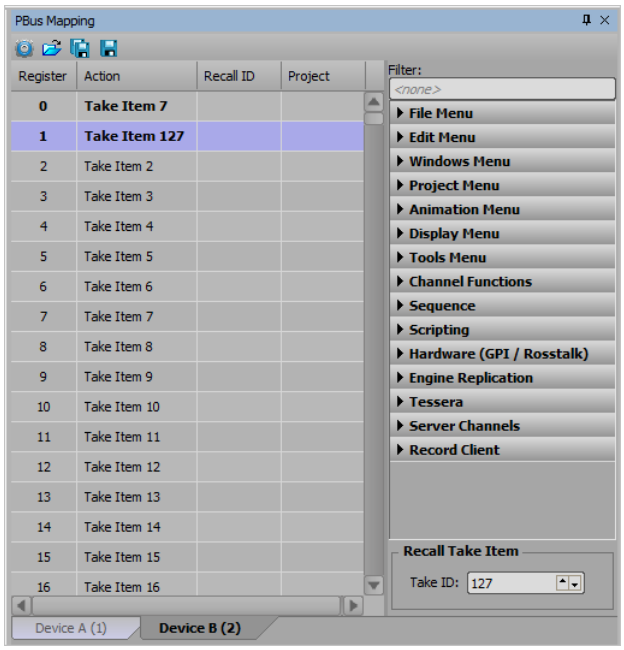
1. In the **PBus Mapping** window, select a register number from the devices to the left of the actions list.



2. In the **Recall Take Item** section, in the **Take ID** field, enter or select a take item to add to the selected register.



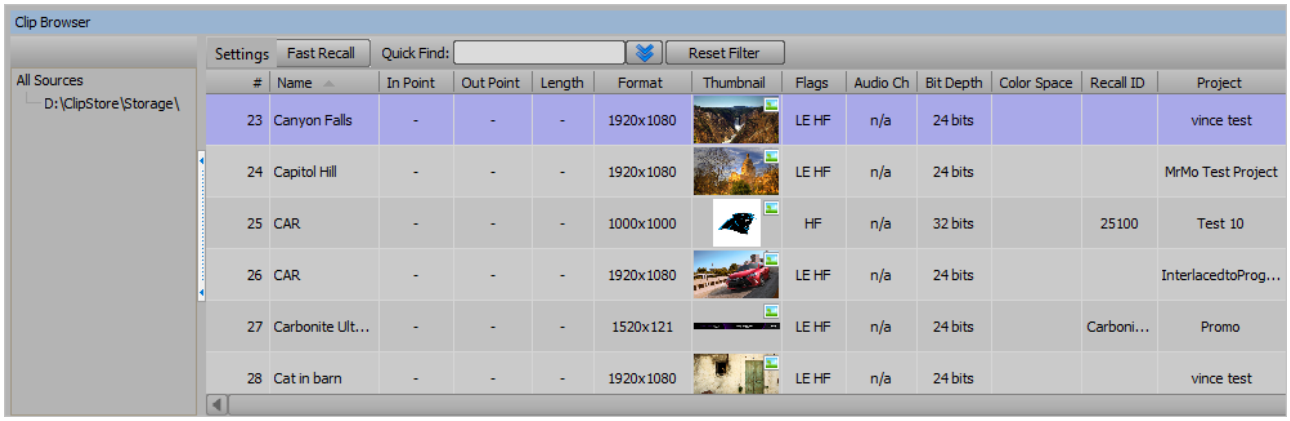
The take item is added to the selected PBus register.



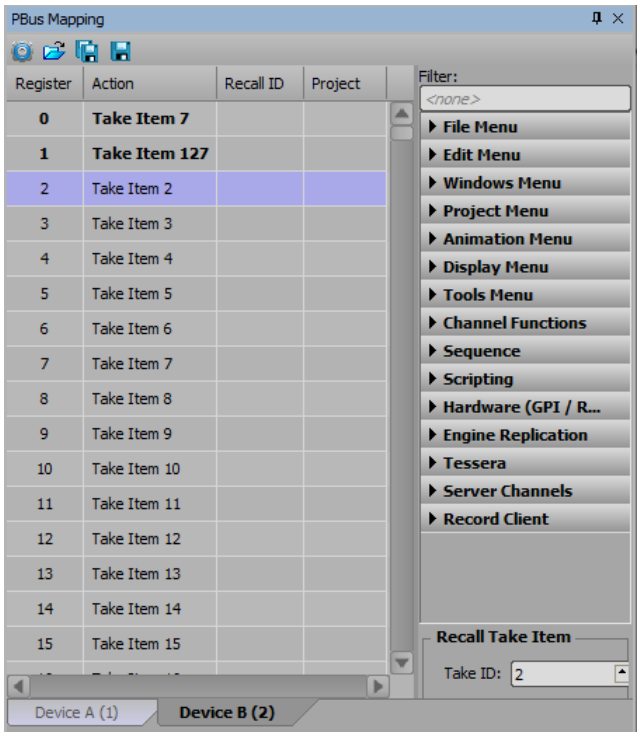
To remap a PBus register using drag and drop from the Clip Browser:

1. In the **Clip Browser**, select a clip from the list.

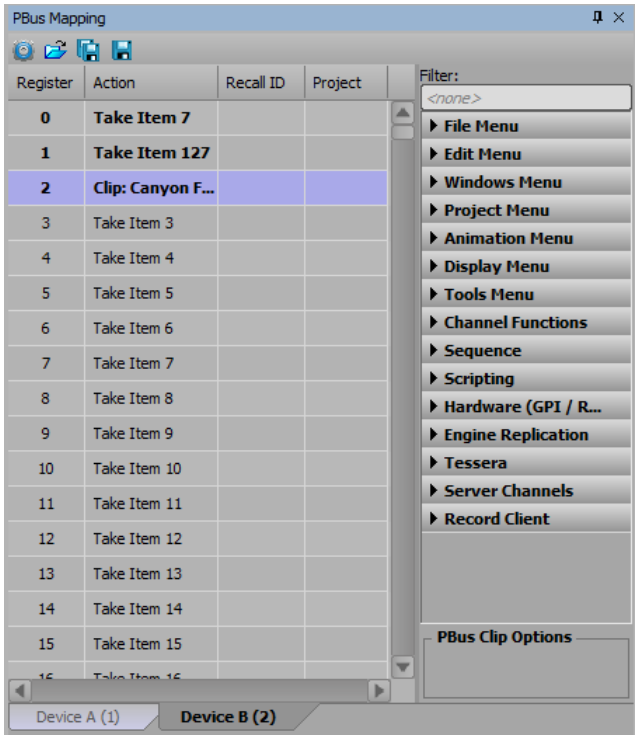
   Optionally, you can press **Shift** and select a range of clips or press **Ctrl** to select multiple clips.



2. Drag and drop the clip(s) onto a register in the **PBus Mapping** window.



The clip is added to the register.



Loading and Saving Maps

PBus maps are not loaded and saved with XPression projects. They are loaded and saved to disk as .pbm or .pbms files using the PBus Mapping window. The .pbm file extension is used for a single PBus map and the .pbms file extension is used for multiple PBus maps.

Use the following PBus Mapping window toolbar icons to load and save PBus maps:



Load — open a file browser to select a PBus map or multiple PBus maps to load.



Save All — save multiple PBus maps to disk.



Save — save a single PBus map to disk.

Using PBus from a Switcher to Recall Items

★Consult the switcher documentation for a complete description of how to use PBus with your particular manufacturer/model. This section is only intended to provide some background information and tips.

Normally switchers will send a PBus recall command when an EMEM is recalled. The following procedure is an example using take item 0005.

For More Information on...

- configuring the PBus interface and PBus recalls, refer to Configuring the PBus Interface and PBus Recalls.

To recall and play a specific take item from XPression:

1. In XPression, in the **Sequencer**, create a take item and give it an ID of **0005**.
2. Create an **EMEM/Memory** on the switcher and store it as **EMEM 5**.
3. Within **EMEM 5**, ensure that you have enabled the sending of PBus commands.
4. Within the timeline for **EMEM 5**, issue a **PBus Trigger 0** command.

   When **EMEM 5** is recalled, it will send a PBus recall 5 command to XPression.

   This command will not yet do anything (unless the configuration options discussed in the Configuring the PBus Interface and PBus Recalls section are enabled).

   When the timeline is run, the switcher will send a **PBus Trigger 0** command. At this time, XPression will put take item #5 on the output channel/layer previously assigned to that item in the sequencer.

   ★There may be several frames of delay between issuing the **Trigger 0** command and when the video for the item appears on the SDI output of XPression. This is normal and should be accounted for inside of the timeline on the switcher. For example, you will need a delay between the issuing of **Trigger 0** and when the keyer containing the XPression is keyed onto the PGM output.
5. To recall different take items, copy the timeline on the switcher into different switcher registers.

For More Information on...

- PBus triggers, refer to PBus Triggers.

Using PBus for Clips

Firstly, the PBus configuration must be set to assign a PBus device ID to a specific server channel. This controls the server channel onto which PBus commands to a device will load the clip. Valid device IDs are from 0 to 23.

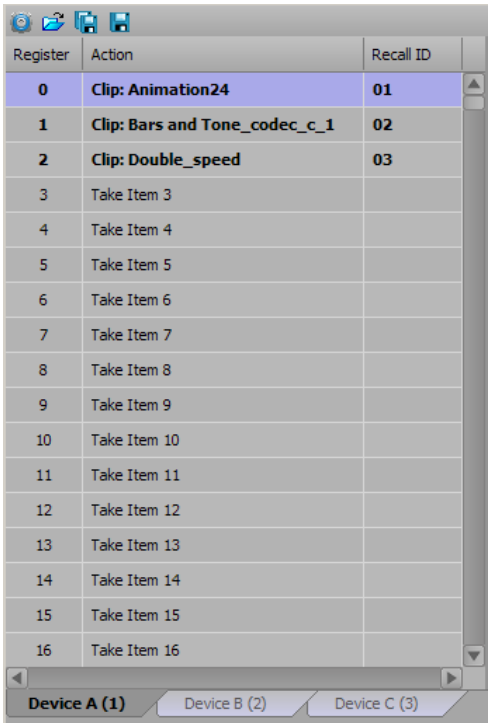
By default, every PBus register (0 to 4095) will cue/play the corresponding take item with that ID number. However, clips from the Clip Browser can be assigned to a PBus register simply by dragging them from the **Clip Browser** onto a PBus register. Alternatively, various actions (same ones accessible in the keyboard mapping menu) can be assigned to a PBus register by dragging them from the action list on the right to a PBus register. This is useful for assigning scripts or actions like **Take Next/Clear Channel**, etc. to a PBus register.

Right-click on a register with a clip and select **Find Clip in Clip Browser** to find a clip or select a different clip in the **Clip Browser**.

A PBus register map can be saved to disk to a file using the .PBM extension, or maps for all devices can be saved to a .PBMS file. Maps can be loaded from these PBM files or from a specific format of XML file. When using the XML file import, it will assign clips to PBus registers using their recall ID from the clip database.

Using PBus for Clips with Recall IDs

The PBus map contains a column named **Recall ID**.



If a clip in the Clip Store exists with that recall ID, it will be assigned to that PBus register. A clip's recall ID can also be entered into the column to assign it to the respective register. The PBus register will always recall the clip with that specific recall ID, so if a new clip is ingested with a matching recall ID, the PBus register will recall the new clip instead. If the clip is manually edited and the recall ID is changed or removed, the PBus register will no longer recall that clip.

A similar behavior exists when dragging a clip with a recall ID into the PBus register; meaning that the PBus register is bound to a specific recall ID and not to a specific clip. Holding **Ctrl-Shift** and dragging a clip onto a PBus register will link the clip with the PBus register, and it will not be replaced even if a clip with a duplicate recall ID is ingested.

Projects

Before you can begin designing graphics in XPression, you must create a project. A project defines the video format, timing, resolution, and organizational structure used for all assets and scenes within your production. XPression provides a variety of predefined project presets for common broadcast standards, as well as the ability to create custom presets tailored to your workflow. During project creation, you can specify a storage location, assign a project name, and optionally generate a project folder structure to help organize media, fonts, models, and other resources.

You can import scenes, materials, models, fonts, audio clips, stagger animations, and widgets from an existing project into your new project.

You can also save scenes, materials, models, fonts, audio clips, stagger animations, widgets, and global lists from your currently open XPression project as an **.xpe** file to be exported to another project.

Creating a New Project

Importing From a Project

Exporting Items

Exporting Projects to Chameleon

Creating a New Project

Once your preferences and system setup have been configured, you can get started with creating a new project. You can use any of the many presets that are provided or you can create a custom preset.

To create a project:

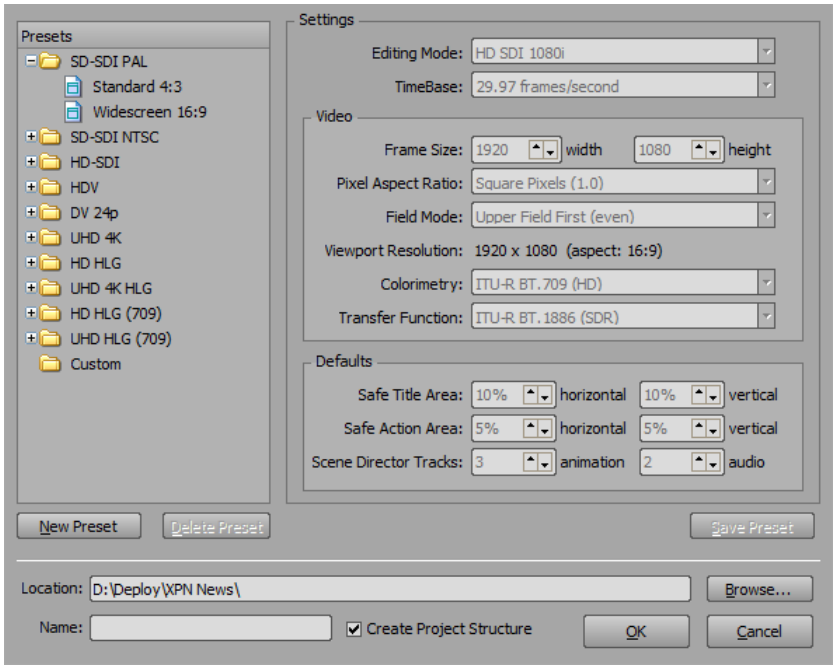
1. In XPression, select **File > New**.

   If there is a project currently open, the **Confirm** dialog opens.

2. Select one of the following options for the current project:

   - **Yes** — save changes to the current project, then close the project.
   - **No** — close the project without saving changes.
   - **Cancel** — continue working on the project.

3. After selecting **Yes** or **No**, the **New Project** dialog opens.



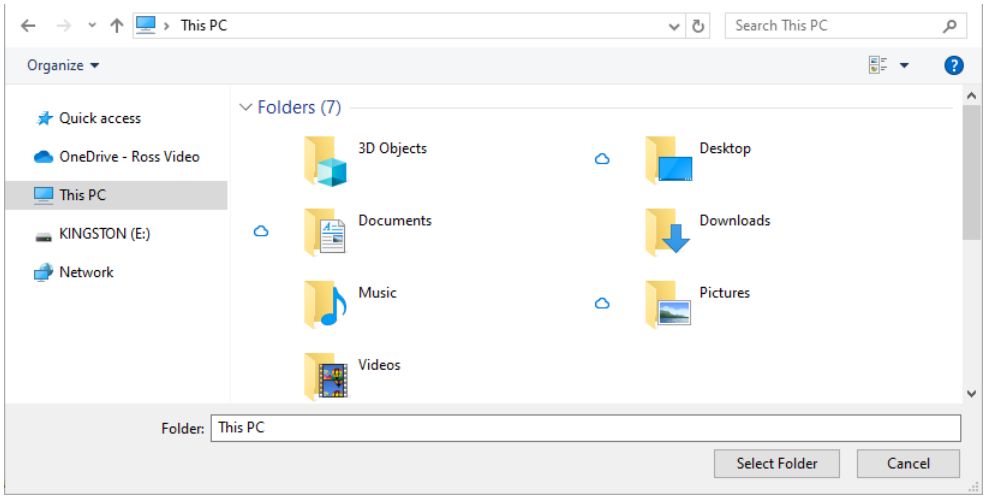
4. In the **Presets** tree view, expand any video format node to view the available presets for the selected video format.

   The available presets for the selected video format are displayed in the **Settings** section on the right side of the dialog.

5. Select the preset to use for the new project.

6. Select **Browse** to the right of the **Location** field to select a folder in which save the new project.

The **Select Project Folder** dialog opens.



7. In the **Folder** tree view, locate and select a folder in which save the new project and choose **Select Folder**.

   In the **New Project** dialog, the full path of the selected folder is displayed in the **Location** field.

8. In the **Name** field, enter a name for the new project.

   Project names may only contain letters, numbers, spaces, hyphens, or underscores.

   Project files are saved with the extension **.xpf**.

9. Select **Create Project Structure** to automatically create folders within the project folder to store project items (audio, video, dedicated fonts, images. models, etc.) and select **OK**.

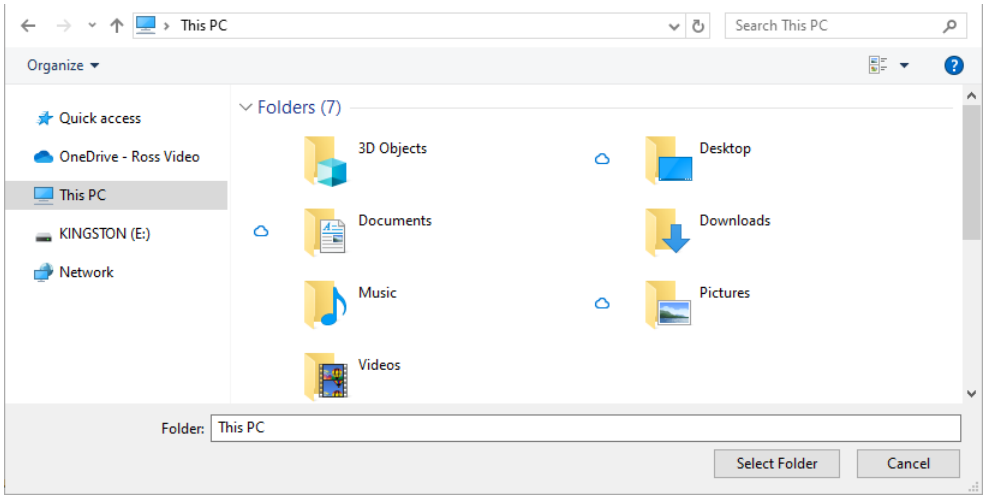
   The new project is saved in the project folder.

To create a custom preset:

1. Select **New Preset**.
2. In the **New Preset** field, enter a name for the preset.
3. In the **Settings** section configure the new preset.
4. Select **Save Preset**.

5. Select **Browse** to the right of the **Location** field to select a folder in which save the new project.

   The **Select Project Folder** dialog opens.



6. In the **Folder** tree view, locate and select a folder in which save the new project and choose **Select Folder**.

   In the **New Project** dialog, the full path of the selected folder is displayed in the **Location** field.

7. In the **Name** field, enter a name for the new project.

   Project names may only contain letters, numbers, spaces, hyphens, or underscores.

   Project files are saved with the extension **.xpf**.

8. Select **Create Project Structure** to automatically create folders within the project folder to store project items (audio, video, dedicated fonts, images. models, etc.) and select **OK**.

   The new project is saved in the project folder.

Importing From a Project

Use the **Import From Project** feature to import scenes, materials, models, fonts, audio clips, stagger animations, and widgets from an existing XPression project.

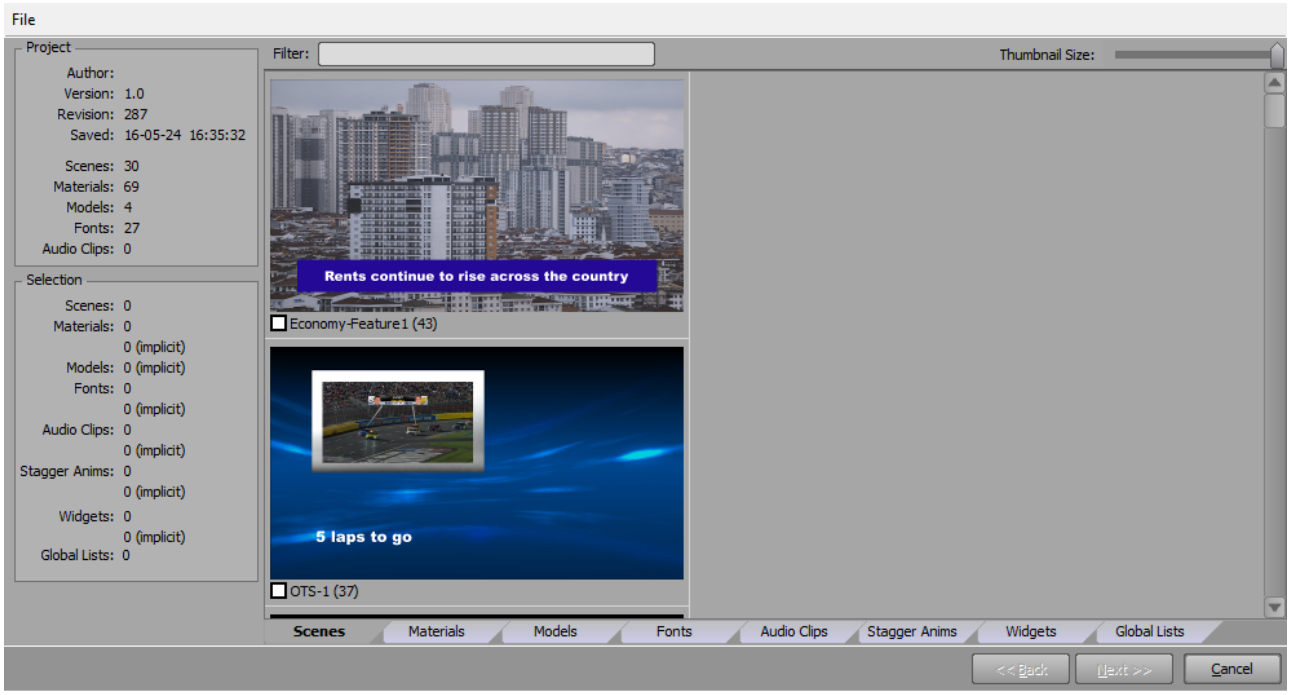
To import items from another project:

1. In XPression, select **File > Import > From Project/File**.

   A file browser opens.

2. Locate the project from which you want to import items and select **Open**.

   The **Import From Project** dialog opens with the selected project loaded.



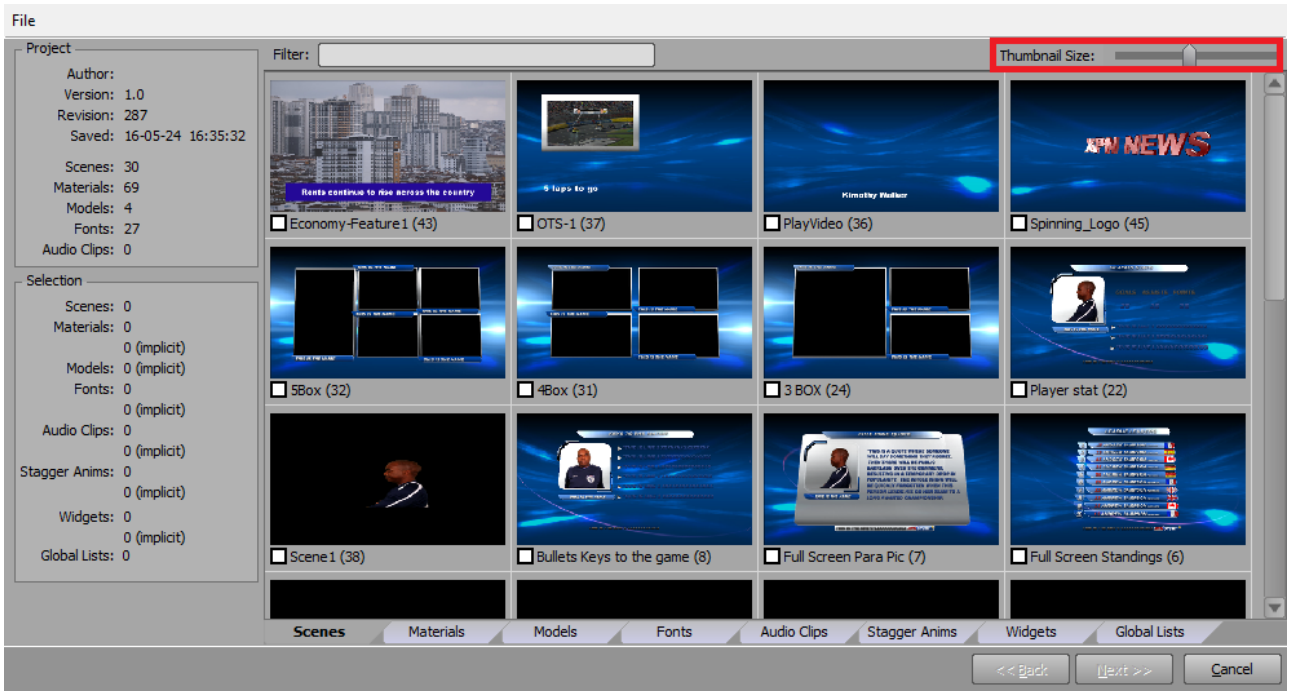
3. In the **Scenes**, **Materials**, **Models**, **Fonts**, **Audio Clips**, **Stagger Anims**, **Widgets**, and **Global Lists** tabs, select the items to import by selecting the checkbox for the individual item.

   OR

   Use the **Filter** field in the **Scenes** tab to enter the name or details of specific scenes to locate.

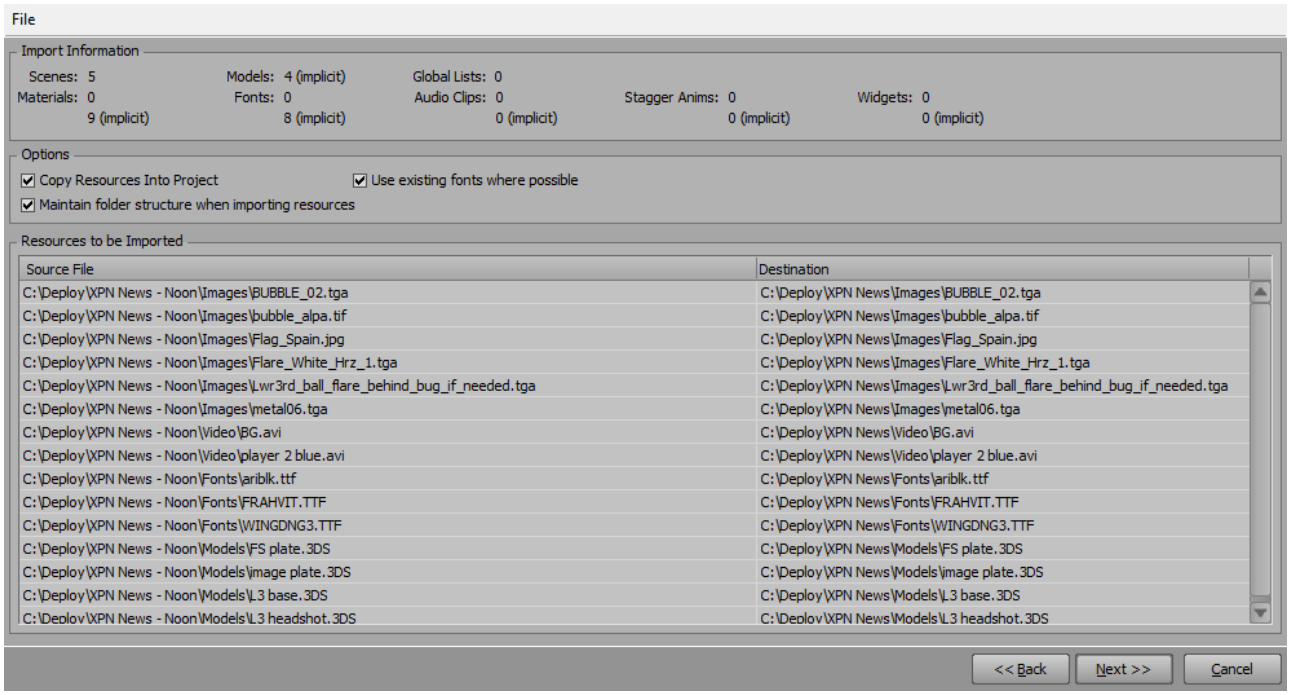
4. Select and drag the **Thumbnail Size** slider to increase or decrease the thumbnail size by sliding right or left.

   This allows you to see a greater number of thumbnails at once.



5. Select **Next** once all necessary items have been selected.

   The details of the import are displayed as well as some import options.



6. In the **Options** section, configure the following import options:

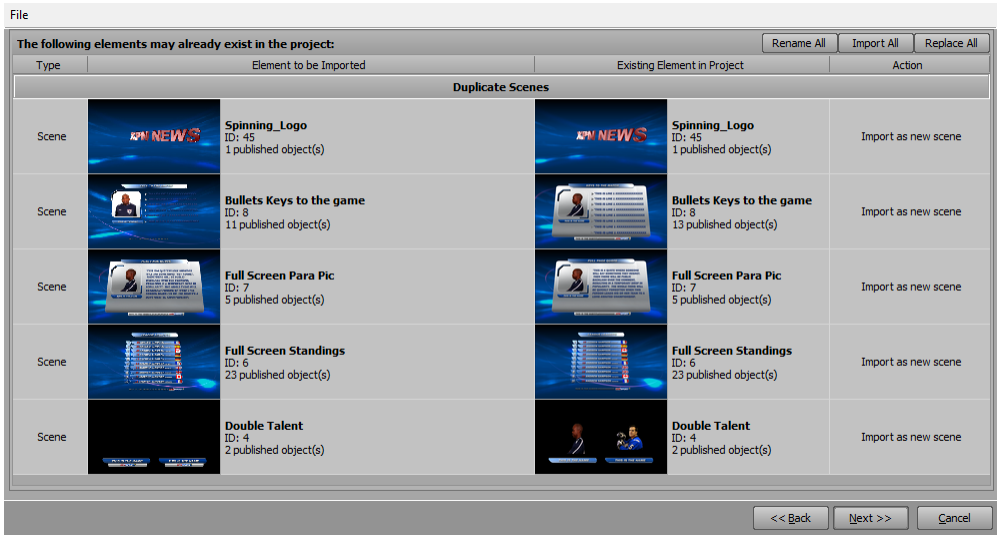
   - **Copy Resources Into Project** — copy resources into the local project using its local directory structure. If disabled, the local project will point to the location of the resource in the second project. It is selected by default.
   - **Use existing fonts where possible** — use the existing fonts of a project already open in XPression, where possible.
   - **Maintain folder structure when importing resources** — preserve the subfolder structure of resources when importing materials and scenes into a project. This is useful when the source project has a number of subfolders underneath Images\ or Videos\ etc. It is selected by default.

   ★To adjust the default settings for the import options, refer to the Import section in **Setting Preferences**.

7. Select **Next**.

   One of 2 results can occur:

   - The items are ready for import. In this case, proceed to step 8.
   - Imported scenes and materials might have names and/or material GUIDs that overlap with scenes and materials in the open project in XPression.



   In this case, do the following, as necessary:

   - ➢ **Rename All** to give the imported scenes and materials new names, so the scenes and materials in the current project will not be replaced.
   - ➢ Select **Import All** to import all scenes and materials as new items.
   - ➢ Select **Replace All** to replace the existing scenes and materials with the imported ones.
   - ➢ From the drop-down in the **Action** column, select the rename, import, import as new scene, or create new material option for each individual item.

   Any existing sequencer items will be updated to use the newly overwritten scene. It is recommended to ensure published fields are a match.

   Once all duplicate import items are configured, select **Next** and proceed to step 8.

8. Select **Finish** to import the items.

   The items begin importing.

When **Import as new scene** is selected, a new scene is imported with "1" appended to its name. Any associated clip is also imported as a new clip with "1" appended to its name. The original scene and clip remain unchanged in the project.

9. Once all items have completed importing, select **Close** to exit the **Import From Project** dialog.

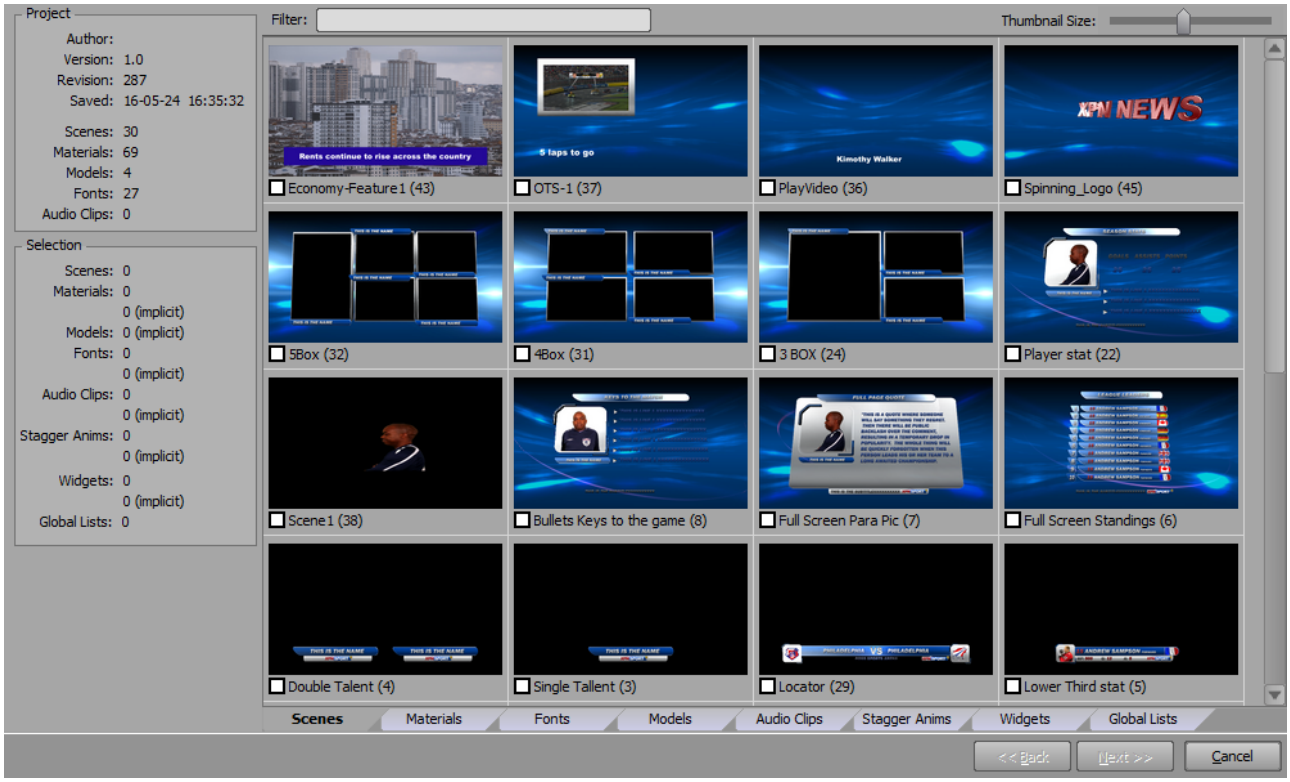
Exporting Items

Use the **Export** feature to save scenes, materials, models, fonts, audio clips, stagger animations, widgets, and global lists from the currently open XPression project as an **.xpe** file that can be exported to another project.

To export items:

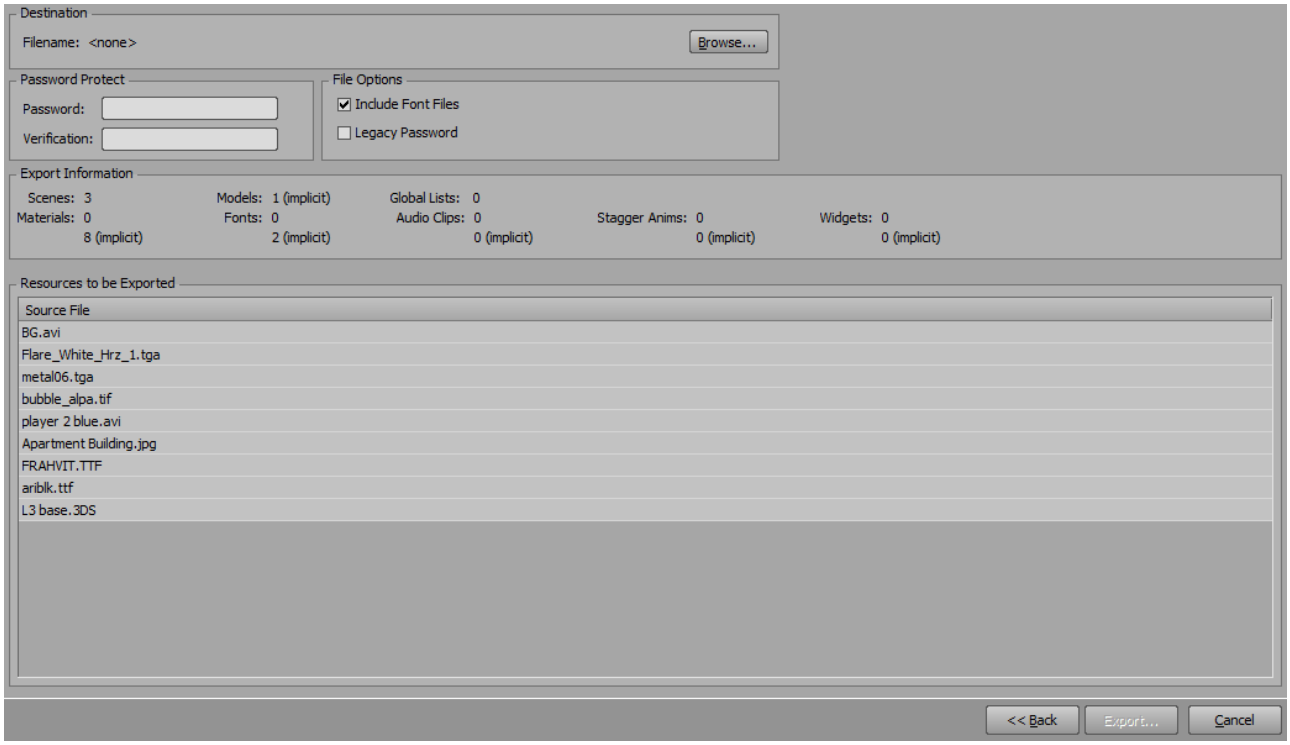
1. In XPression, select **File > Export > Export Items**.

   The **Export From Project - [Name of project]** dialog opens with the scenes from the current project loaded.



2. Select the checkbox for each scene, material, font, model, audio clip, stagger animation, widget and global list that you want to save.
3. Select **Next** and in the **Save As** dialog, locate and select the folder in which to save the file.
4. Give the file a name and select **Save**.

The **Export From Project** dialog changes to a dialog with a **Password** option and some **File Options**.



5. In the **Password Protect** section, in the **Password** field, enter a password for the file (optional).
6. In the **Verification** field, re-enter the password.
7. In the **File Options** section, do the following:
   - Select the **Include Font Files** to include the font files used in any of the selected scenes.
   - Select **Legacy Password** to allow passwords created in previous versions of XPression to be accepted regardless of whether they match the case. Passwords in XPression 12.0 and forward are case-sensitive.

   The items being exported are listed in the **Resources to be Exported** section.
8. Select **Export**.
9. When the export is finished select **Close** to exit the dialog.

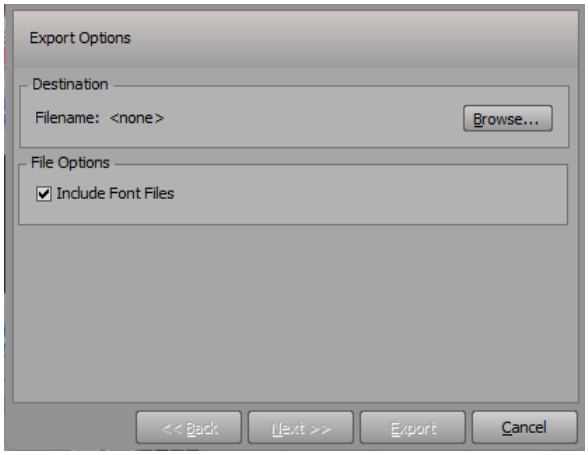
Exporting Projects to Chameleon

Exporting a project to Chameleon prepares it for use with XPression Chameleon, allowing scenes and their associated resources to be rendered in an HTML5 environment. During the export process, XPression packages the project, transcodes supported media into formats suitable for HTML5 playback, and copies the required resources to the selected destination. You can also choose to include the project's font files. When the export is complete, a file is created that can be opened in Chameleon Designer.

To export a project to Chameleon:

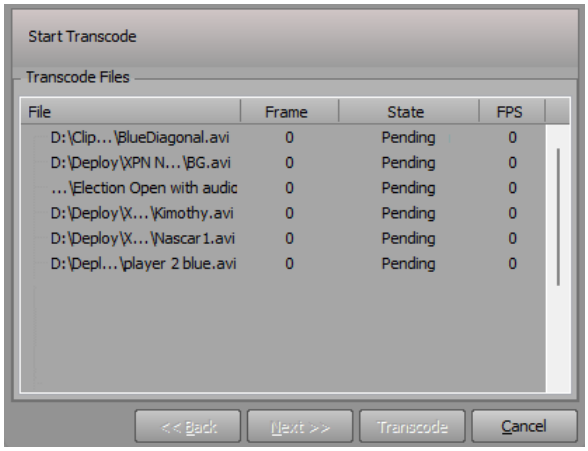
1. In XPression, select **File > Export to Chameleon Project**.

   The **XPression - Export Project to Chameleon Project** dialog opens.



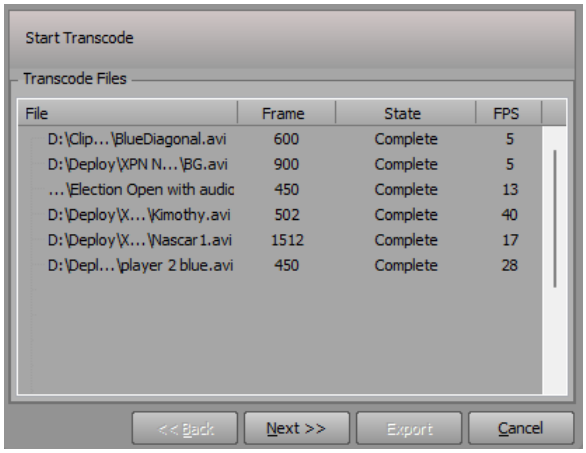
2. In the **Destination** section, select the **Browse** button and navigate to the folder where you want to save the Chameleon project files, making a new folder if necessary.
3. In the **File Options** section, select **Include Font Files** to include any font files used in the current project's scenes in the export.
4. Select **Next**.

   The **Start Transcode** dialog opens, listing the video files that will be transcoded.



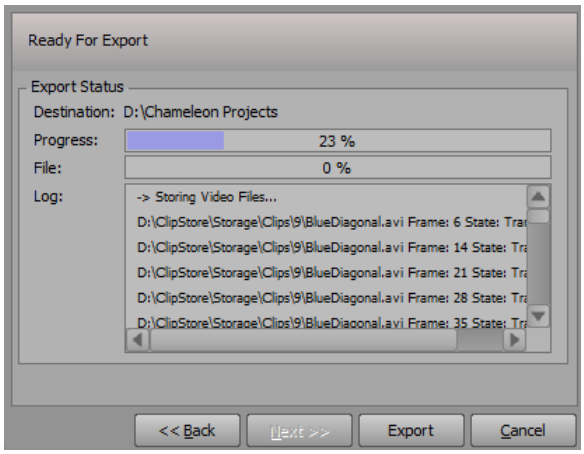
5. Select **Transcode**.

   The transcoding process begins.

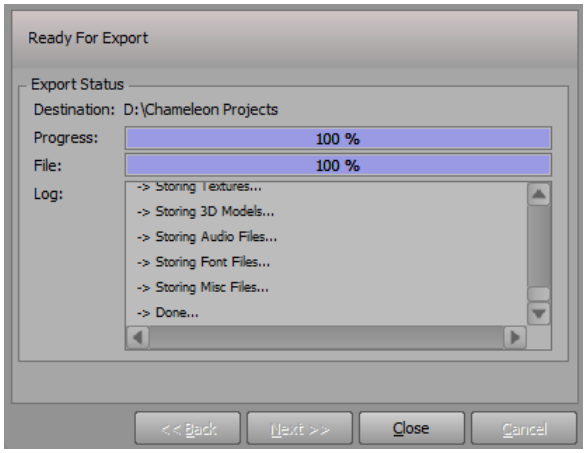


6. When transcoding is complete, select **Next**.

   The **Ready for Export** dialog opens.



7. Select **Export**.



8. When the log indicates that the export is done, select **Close**.

Scenes

Scenes are the fundamental building blocks of every XPression project. A scene acts as a container for the objects, materials, animations, logic, and effects that combine to create an individual graphic. Whether you are building a simple lower third, a complex animated full-screen graphic, a rolling credits sequence, or a dynamic data-driven template, all design work begins within a scene. XPression provides tools for creating, organizing, duplicating, and configuring scenes, as well as grouping scenes together to create rolls and crawls. Advanced features such as transition logic allow scenes to interact intelligently during playout, enabling smooth on-air transitions and automated animation workflows. This section explains how to create and manage scenes, configure scene properties, build scene groups, customize roll and crawl behavior, implement transition logic, and create global macros that can be reused throughout a project.

Creating or Deleting a Scene

Creating a Custom Size Scene

Configuring a Scene

Creating or Deleting a Scene Group

Duplicating a Scene or Scene Group

Creating a Roll/Crawl from a Scene Group

Customizing a Scene Group Roll/Crawl

Using Transition Logic

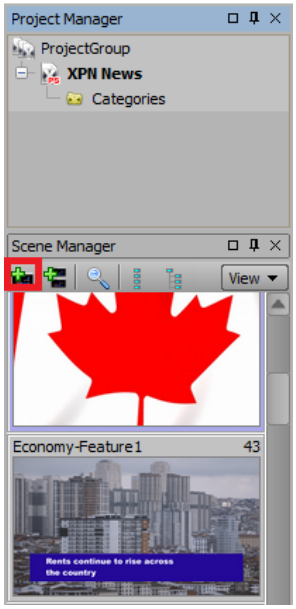
Creating Global Macros

Creating or Deleting a Scene

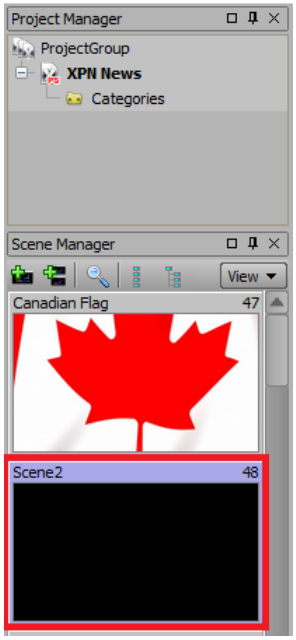
This topic describes how to add a new scene to your project and how to delete a scene.

To create a scene:

1. In the **Layout** editor, in **Scene Manager**, select the **New Scene** ( ) icon in the toolbar.



   A new scene is added to the **Scene Manager** below the scene or scene group selected in the scene list.

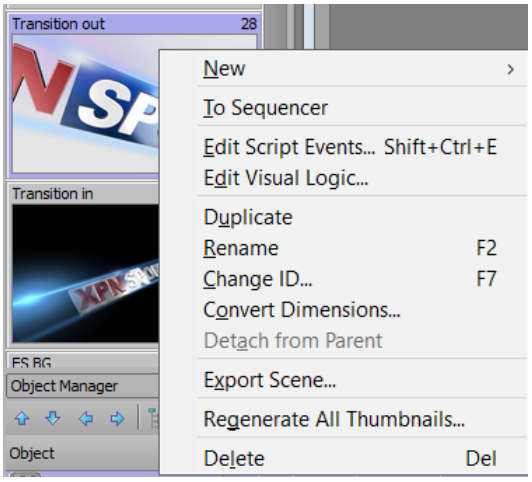


2. In the title bar of the new scene, right-click the scene name and select **Rename**.
3. Enter a new name for the scene.
4. Press the **Return** key to save the new scene name.

   The name is displayed in the scene title bar.

To delete a scene:

1. In the **Scene Manager**, right-click the scene to delete and from the shortcut menu, select **Delete**.



   The **Warning** dialog opens

2. Select **Yes**.

   The selected scene is deleted from the **Scene Manager**.

Creating a Custom Size Scene

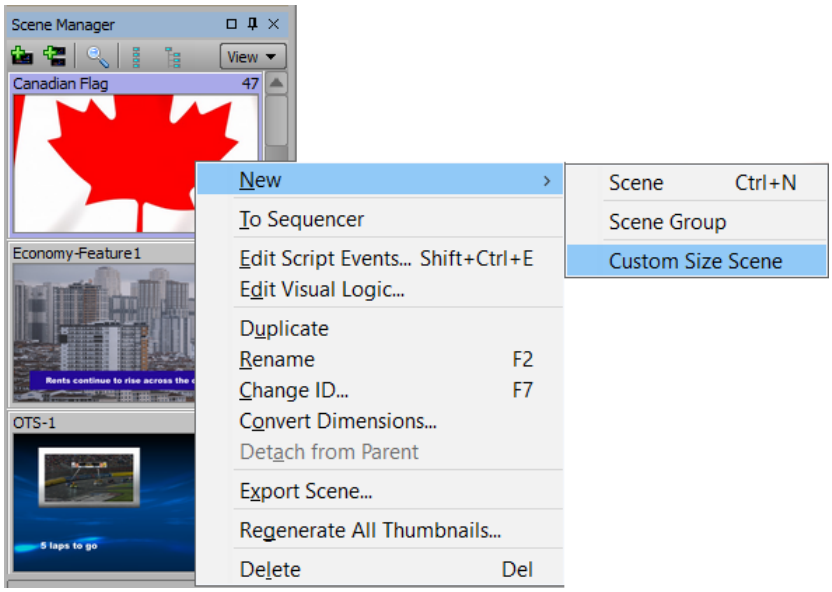
If you need to create a scene that differs in size from that set in the project presets, you can do so when you create a new scene.

To create a custom size scene:

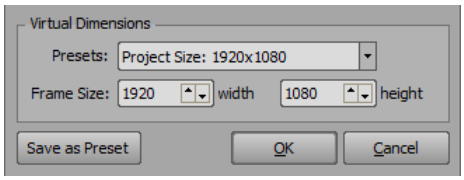
1. In the **Scene Manager** window, right-click the scene or scene group below which to add a new scene.

   The shortcut menu opens.

2. Select **New > Custom Size Scene** from the shortcut menu.



3. The **New Scene** dialog opens.



4. In the **Virtual Dimensions** section, in the **Frame Size** fields do the following:
   - In the **width** field, enter or select the frame width in pixels of the new scene.
   - In the **height** field, enter or select the frame height in pixels for the new scene.
5. To save the virtual dimensions of the custom size scene, select the **Save as Preset** button.

   Once a custom virtual dimension has been saved as a preset, it can be selected using the **Presets** list when creating another custom size scene.

6. Select **OK** to create a new scene with the defined settings and close the **New Scene** dialog.

   A new scene is added to the **Scene Manager** window below the scene or scene group selected in the scene list.



7. In the title bar of the new scene, right-click the scene name and select **Rename** from the shortcut menu.

   The scene name is selected for editing.

8. Enter a new name for the scene.
9. Press the **Return** key to save the new scene name.

Configuring a Scene

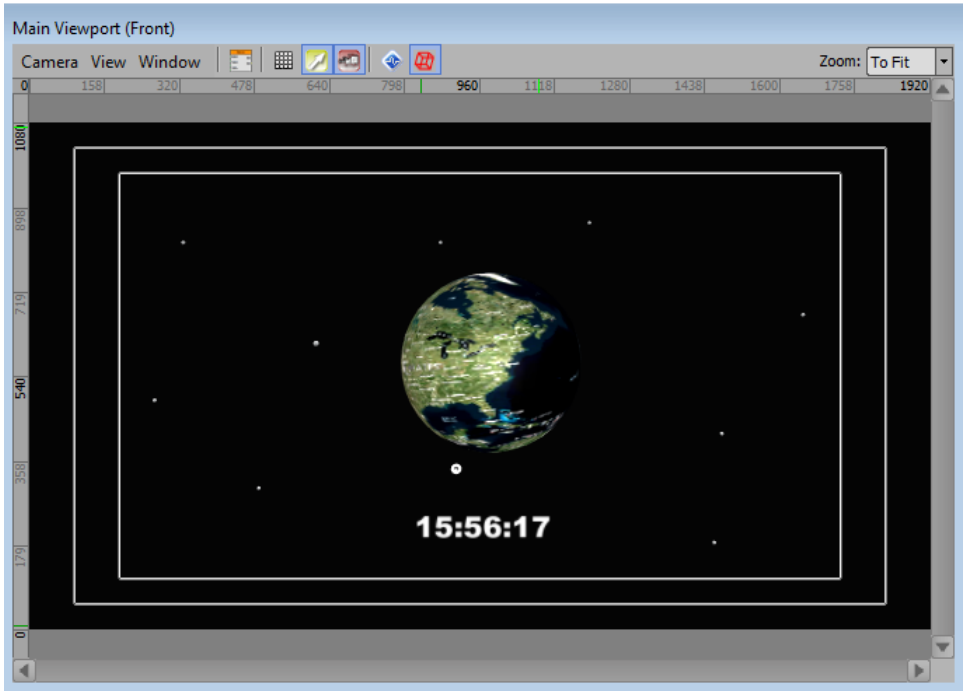
In the **Object Inspector** for the scene, you can configure the safe title area and the safe action area, crop the output, choose to visualize tab lines and include the scene in the **As Run Log**. You can also hide the scene from the MOS and NLE plugins, if it's not required for a particular rundown.

To configure a scene:

1. In the **Scene Manager**, select the scene to be configured.
2. In the **Object Inspector**, in the **Scene** tab, in the **Safe Title Area** section, select the **Visualize** checkbox to see a visual representation of the **Safe Title Area** margins.
3. Then enter or use the arrows to set the **Left**, **Right**, **Top**, and **Bottom** margins of the safe title area.

   The margins are calculated as a percentage of the total screen; the large the margins, the smaller the safe title area.

   In the image below, the **Safe Title Area** is indicated by the inner white rectangle.



4. In the **Safe Action Area** section, select the **Visualize** checkbox to see a visual representation of the **Safe Action Area** margins.
5. Then enter or use the arrows to adjust the margins of the area where action can take place.

   The margins are calculated as a percentage of the total screen; the large the margins, the smaller the safe title area.

   In the image above, the **Safe Action Area** is indicated by the outer white rectangle.
6. In the **Crop Output** section, do the following:
   - Enter or use the arrows to adjust the size of the output.

     For example, by setting the **Left** and **Top** margins at **0**, the **Right** margin at **1920**, and the **Bottom** margin at **1080**, you will get 1920 x 1080 output.
   - Select the **Visualize** checkbox to see a visual representation of the output.

- Select the **Enabled** checkbox to enable cropping.

7. In the **Visualize** section, select the **Tab Lines** checkbox to see the location of any tabs in a text object.
8. In the **Misc** section, select the **Include in As Run Log**, to include the scene in the log.
9. In the **MOS** section, select the **Hide scene from MOS / NLE plugin** to hide the scene if it's not needed for a particular rundown.

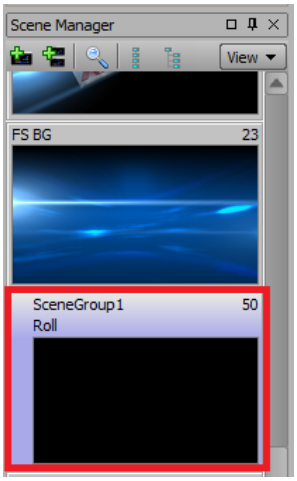
Creating or Deleting a Scene Group

A scene group is a collection of scenes that when played out, displays a vertical rolling credits effect or a horizontal crawling ticker effect. This topic describes how to create a scene group and how to delete a scene group.

To create a scene group:

1. In the **Scene Manager**, select the scene or scene group above which to add a new scene group and select the **New Scene Group** icon ( ) in the toolbar.

   A new scene group is added to the **Scene Manager** window below the scene or scene group selected in the scene list.



2. In the title bar of the new scene group, right-click the scene group name and select **Rename** from the shortcut menu.
3. Enter a new name for the scene group.
4. Press the **Return** key to save the new scene group name.

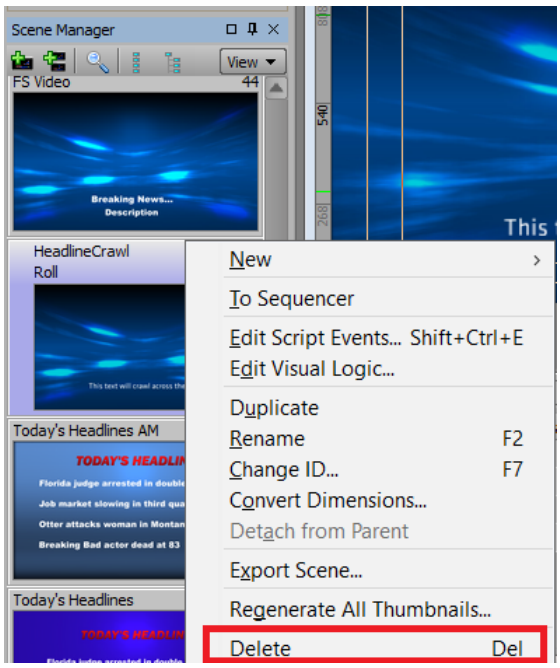
   The scene group title bar displays the entered name.

For More Information on...

- rendering output to an AVI file, refer to the procedure Creating a Roll/Crawl from a Scene Group..

To delete a scene group:

1. In the **Scene Manager**, right-click the scene group to delete and from the shortcut menu, select **Delete**.



   The **Warning** dialog opens

2. Select **Yes**.

   The selected scene is deleted from the **Scene Manager**.

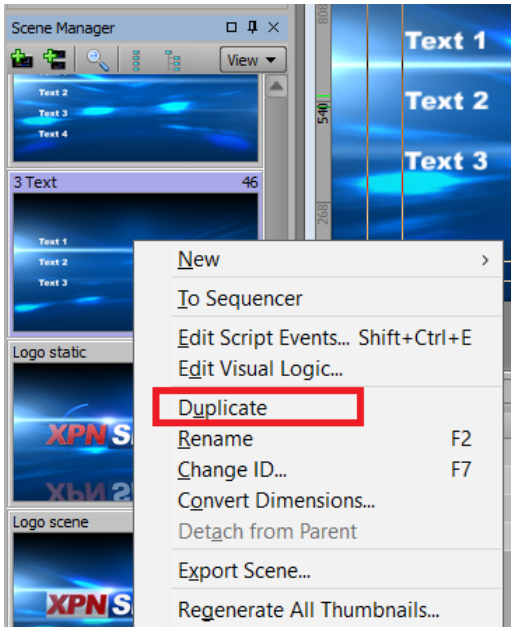
Duplicating a Scene or Scene Group

When there are elements of a scene/scene group that you want to appear in other scenes, such as the background image, light objects, lines of text, crawl, etc., you can make a copy of the scene/scene group that contains those elements to make creation of the new scenes/scene groups easier and quicker.

Scene duplication enables object reuse and object alignment to be maintained between scenes.

To duplicate a scene or scene group:

1. In the **Scene Manager**, right-click the scene or scene group you want to copy and select **Duplicate** from the shortcut menu.



2. A new scene or scene group is added to the **Scene Manager** below the scene selected to duplicate.



3. In the title bar of the new scene, right-click the scene/scene group name and select **Rename** from the shortcut menu.
4. Enter a new name for the scene/scene group.
5. Press the **Return** key to save the new name.

Creating a Roll/Crawl from a Scene Group

Your XPression project can include rolling text (text that moves vertically) commonly used for opening and closing credits, or crawling text (text that moves horizontally) commonly used for headline bulletins.

To create a roll/crawl from a scene group:

1. In the **Scene Manager**, select the scene or scene group above which to add a new scene group.
2. Select the **New Scene Group** icon in the toolbar.

   A new scene group is added to the **Scene Manager** below the selected scene or scene group. By default, new scene groups are configured to play a **Roll** (top to bottom) effect.
3. Add objects to the scene group scene that need to be displayed for the entire duration of the roll/crawl effect, for example, the background image.

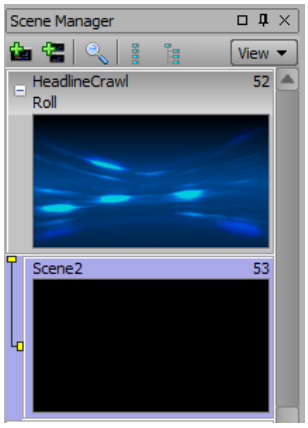


4. Select the **New Scene** icon in the toolbar to add the first scene for the roll/crawl effect.
5. A new scene is added below the scene group.



6. Select the new scene, and while pressing the left mouse button, drag the scene on top of the scene group scene.

The new scene is added to the scene group. Scenes contained in a scene group are indented and connected to the scene group by a leader line.



7. Add objects to the scene that are to move as part of the roll/crawl effect.

   For example, add text objects to the scene for credits to be played by the roll/crawl effect.

8. Add additional scenes to the scene group as required.

   Duplicating the first scene added to a scene group is a quick way to add the scenes required for a roll/crawl effect. Scene duplication enables object reuse and object alignment to be maintained between scenes.

9. Add objects to and/or edit existing objects in the scenes that were added to the scene group.

   For example, each scene could contain a text object that represents one line of text in a set of credits played by the roll/crawl effect.

10. If the position of a scene in the scene group needs to be changed, click on the scene and drag it to the required position in the scene group.

To play out the defined roll/crawl:

1. Double-click the scene group to playout the defined roll/crawl.

   The selected scene group is sent to the default output.

2. Press the **Space Bar** to start the scene group playout.

   The defined roll/crawl effect plays out through the default output.

3. Use the keyboard controls to increase or decrease the speed of the scene group roll/crawl during playout:

   - in **Layout** mode: **CTRL + ALT + NUMPAD +/-**
   - in **Sequence** mode: **CTRL + SHIFT + +/-**

For More Information on...

- duplicating scenes, refer to the procedure Duplicating a Scene or Scene Group
- customizing a scene group roll/crawl effect, refer to the procedure Customizing a Scene Group Roll/Crawl or the **Online Help** for the **Scene Group** tab of the **Object Inspector**.

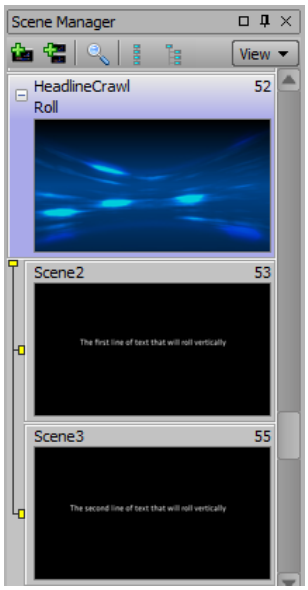
Customizing a Scene Group Roll/Crawl

You can customize a scene group roll/crawl in various ways, such as changing the speed of the roll/crawl, controlling the spacing between scenes, looping the roll/crawl, etc.

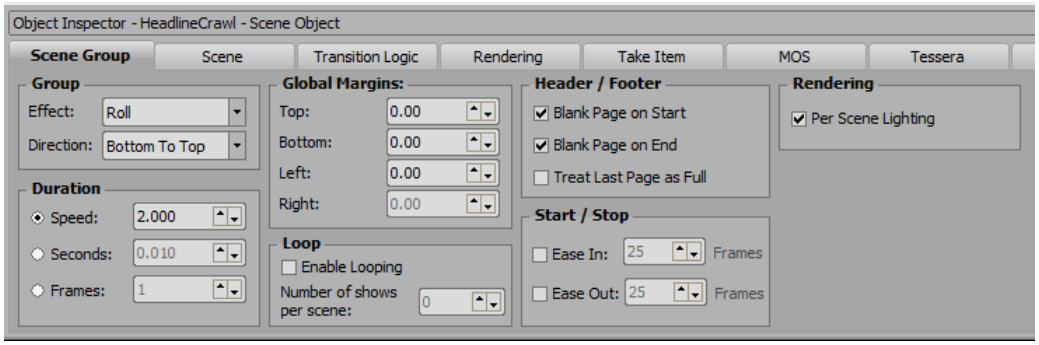
To customize a scene group roll/crawl:

1. In the **Scene Manager**, select the scene group to customize.

   The selected scene group and the objects contained in it are listed in the **Object Manager**.



2. In the **Object Inspector - Scene Object** window, select the **Scene Group** tab.
3. The **Scene Group** tab opens with the properties for the selected scene group.



4. Use the properties in the **Scene Group** tab to configure the following roll/crawl effect properties for a scene group:

Properties	Options	
Group Control the effect type and direction of the roll/crawl scenes.	**Effect** — Select whether to use a roll or crawl effect.	**Roll** — Move scene objects vertically. **Crawl** — Move scene objects horizontally.
	Direction — Select the direction in which scene objects should move. The options depend on the selected **Effect**.	**Roll** — **Bottom To Top** or **Top To Bottom**
		Crawl — **Right To Left** or **Left To Right**
Duration Control the duration over which the roll/screen will play out.	**Speed**	Set the roll/crawl playout duration in pixels per second.
	Seconds	Set the roll/crawl playout duration in seconds.
	Frames	Set the roll/crawl playout in number of frames.
Global Margins Control the spacing between scenes.	Affects the **Roll** effect only.	**Top** — Enter or select the size (in pixels) of the margin placed above objects in a scene.
		Bottom — Enter or select the size (in pixels) of the margin placed below objects in a scene.
	Affects the **Crawl** effect only.	**Left** — Enter or select the size (in pixels) of the margin placed to the left of objects in a scene.
		Right — Enter or select the size (in pixels) of the margin placed to the right of objects in a scene.
Loop	**Enable Looping**	Select to enable looping the playout of a roll/crawl effect.
	Number of shows per scene	Enter or select the number of times to loop the playout of the roll/crawl effect. Enter **0** to infinitely loop the playout.
Header / Footer	**Blank Page on Start**	Select to start the roll/crawl effect with a blank page. Clear to start the roll/crawl with the first scene in the scene group.
	Blank Page on End	Select to end the roll/crawl effect with a blank page after the last scene in the scene group. Clear to end the roll/crawl with the last scene in the scene group.

Properties	Options	
	Treat Last Page as Full	Select to treat the last scene in a roll/crawl as a full page.
Start / Stop Control the start and end playout speed of a roll/crawl.	**Ease In** — Select to slow the playout speed at the start of a roll/crawl.	**Frames** — Enter or select the number of frames over which to resume the roll/crawl to normal playout speed.
	Ease Out — Select to slow the playout speed at the end of a roll/crawl.	**Frames** — Enter or select the number of frames from the end of a roll/crawl to begin slowing playout.
Rendering Control the lighting for a roll/crawl.	**Per Scene Lighting**	Select to use a different lighting source for each scene in the roll/crawl. Clear to use the lighting source in the first scene of the scene group for all of the scenes in the roll/crawl.

To play out the defined roll/crawl:

1. Double-click the scene group to play out the defined roll/crawl.

   The selected scene group is sent to the default output.

2. Press the **Space Bar** to start the scene group playout.

   The defined roll/crawl effect plays out through the default output.

3. Use the keyboard controls to increase or decrease the speed of the scene group roll/crawl during playout:

   - in **Layout** mode: **CTRL + ALT + NUMPAD +/-**
   - in **Sequence** mode: **CTRL + SHIFT + +/-**

Using Transition Logic

Use Transition Logic to choreograph how XPression templates transition from one to the other or update on air. Set rules and conditions for different scenarios using the Transition Logic tab in the Object Inspector of a scene. When scenes are coordinated for visually coherent transitions with each other, graphics will always enter and exit the screen smoothly, regardless of which graphic is coming up next.

Transition Logic leverages the Scene Directors to create individual animations for different playout scenarios. Animations can be created for playing graphics created from the same scene to output back-to-back or graphics from different scenes playing back-to-back.

The following information is covered in this section:

Prerequisites

Setting Up Rules and Conditions

Configuring Transitions

Prerequisites

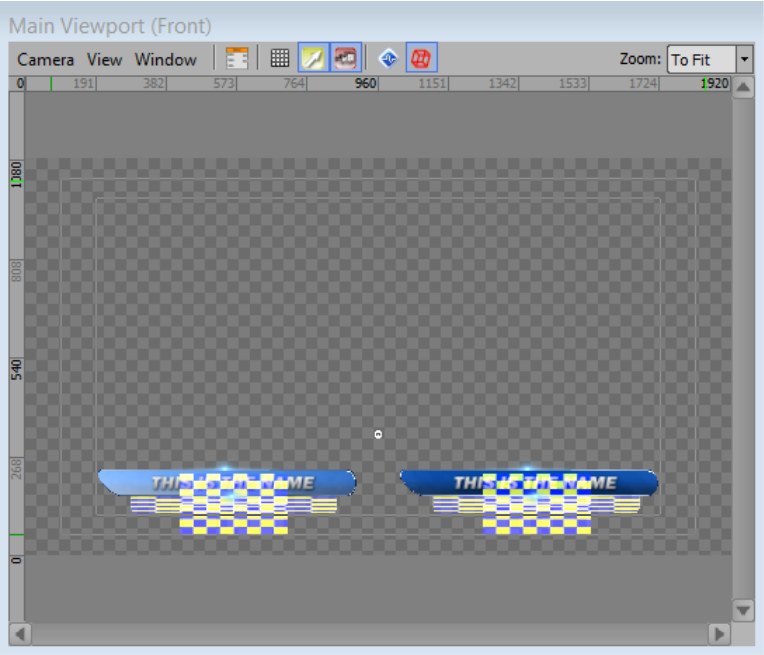
Before configuring the rules/conditions for **Transition Logic**, some items need to be set up in XPression:

- A scene containing the necessary objects (for example, text object and quad object)
- Scene Directors and animations for transitions

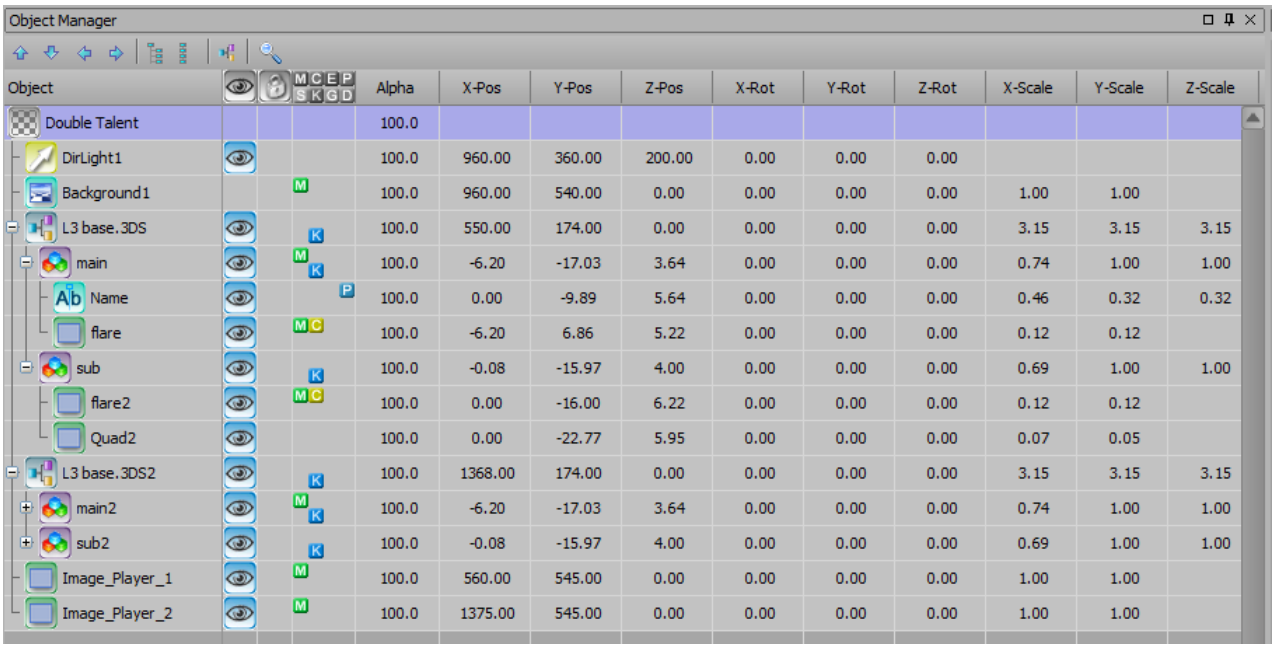
The following is an example of the prerequisite setup for using Transition Logic.

Scenes

Create a scene to use for **Transition Logic**, for example, a scene that will contain a lower third:

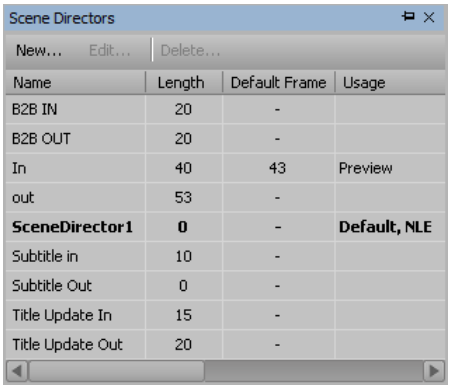


Add objects to the scene. These can be under the scene object itself or in a group object under the scene object. For example:

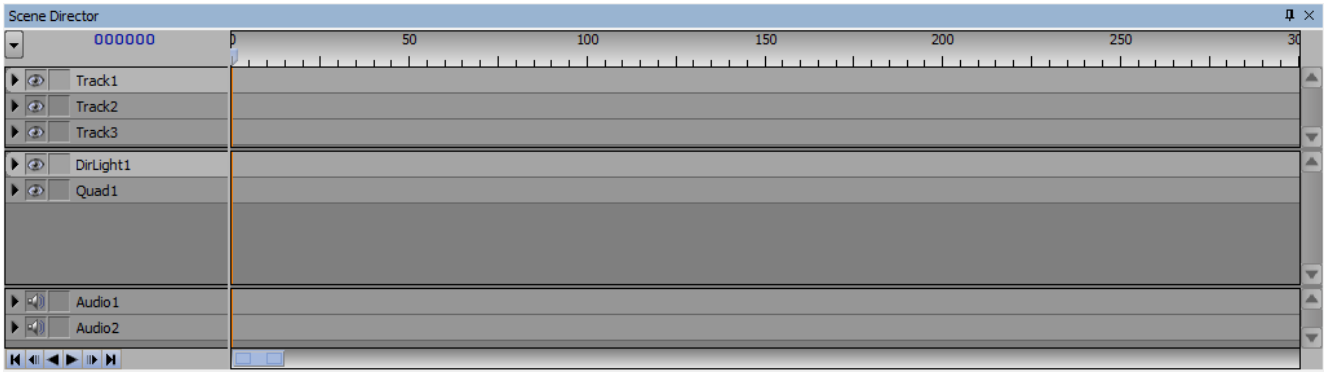


Scene Directors and Animations

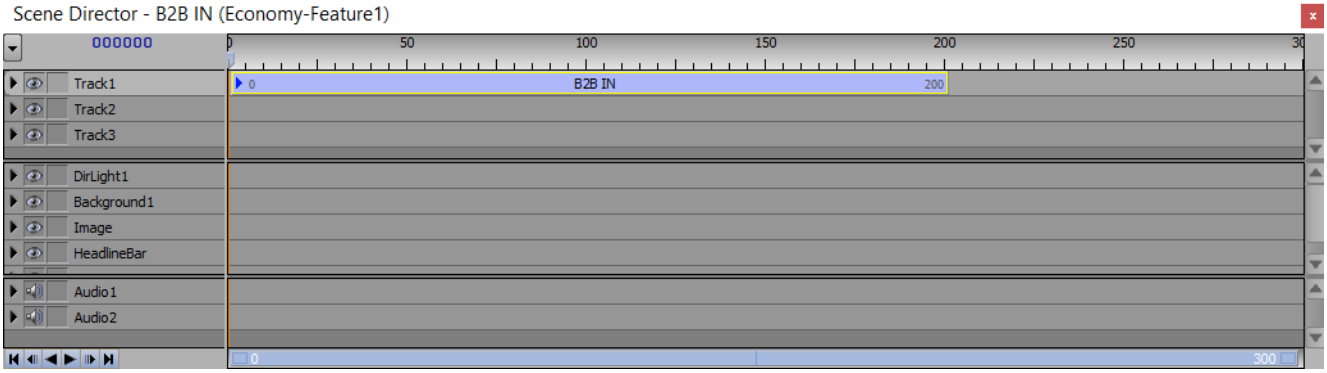
Create the Scene Directors, add animation, and edit in the timeline of the track or use the **Key Graph Editor** to create transitions. For example:



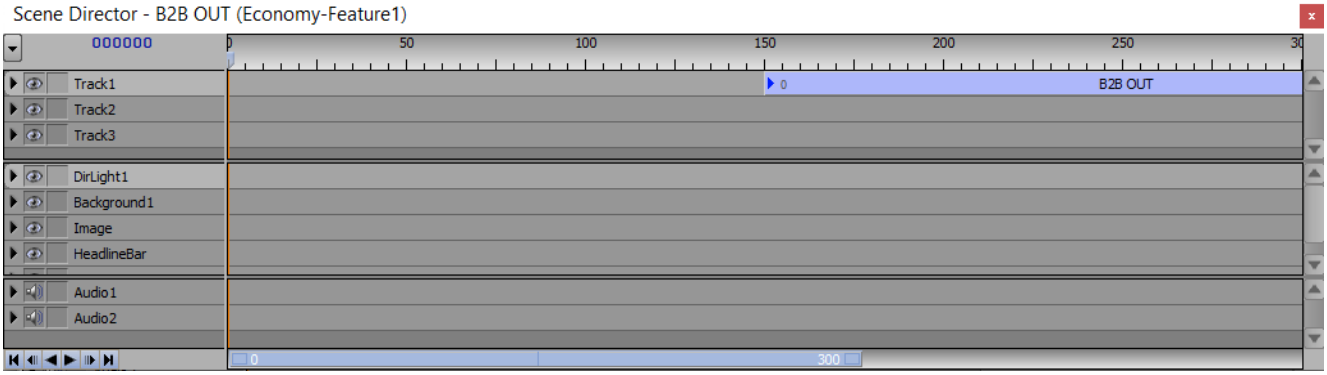
Create the Default Scene Director:



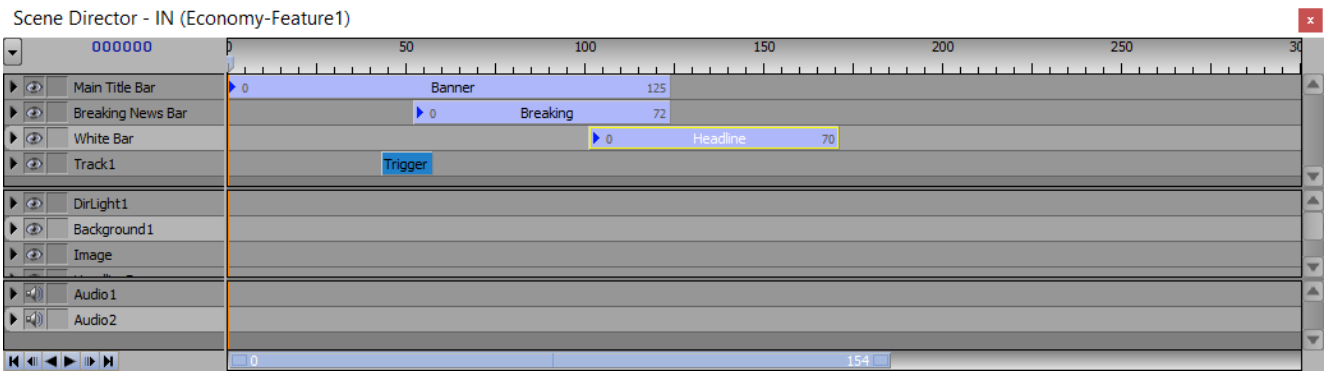
Create a Back-to-Back In Scene Director:



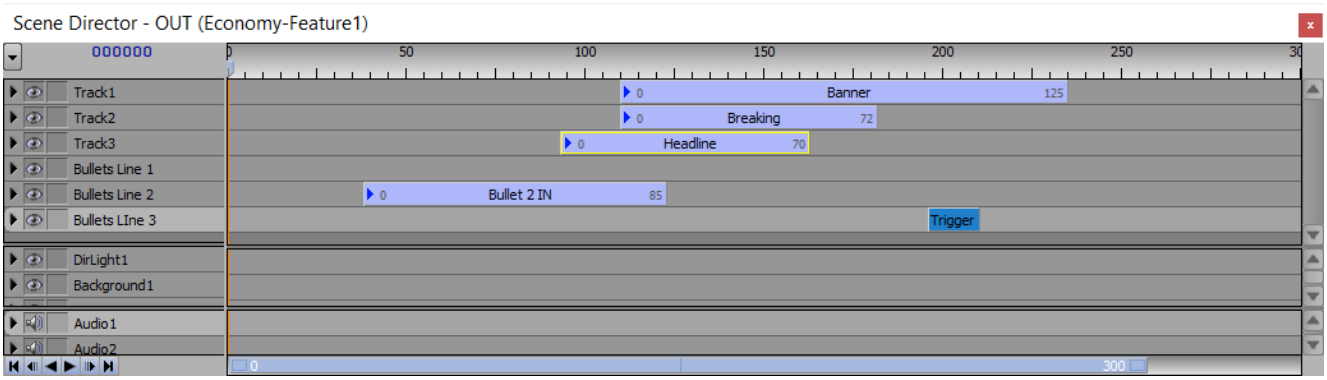
Create a Back-to-Back Out Scene Director:



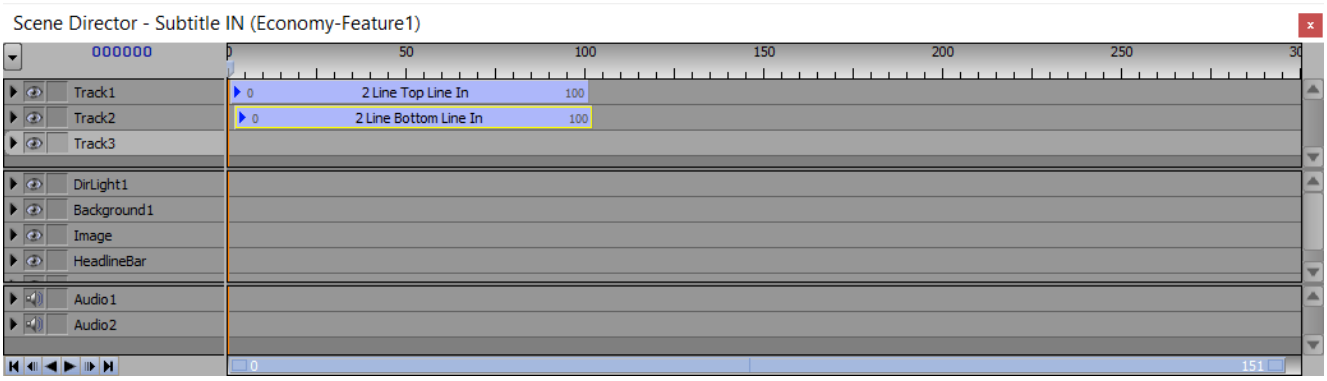
Create an IN Scene Director:



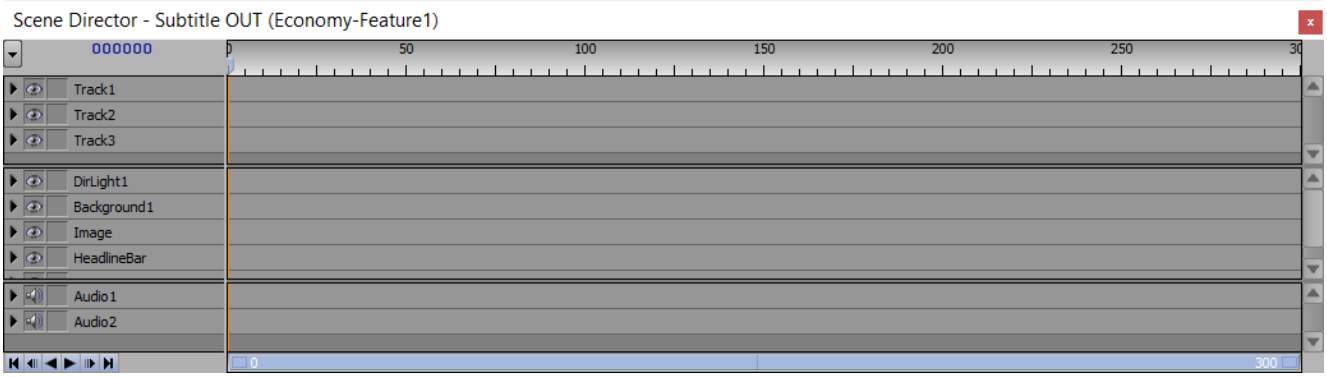
Create an OUT Scene Director:


Scene Director - OUT (Economy-Feature1)
000000
0
50
100
150
200
250
Track1
Track2
Track3
Bullets Line 1
Bullets Line 2
Bullets LIne 3
DirLight1
Background1
Audio1
Audio2
Banner
Breaking
Headline
Bullet 2 IN
Trigger
125
72
70
85
300

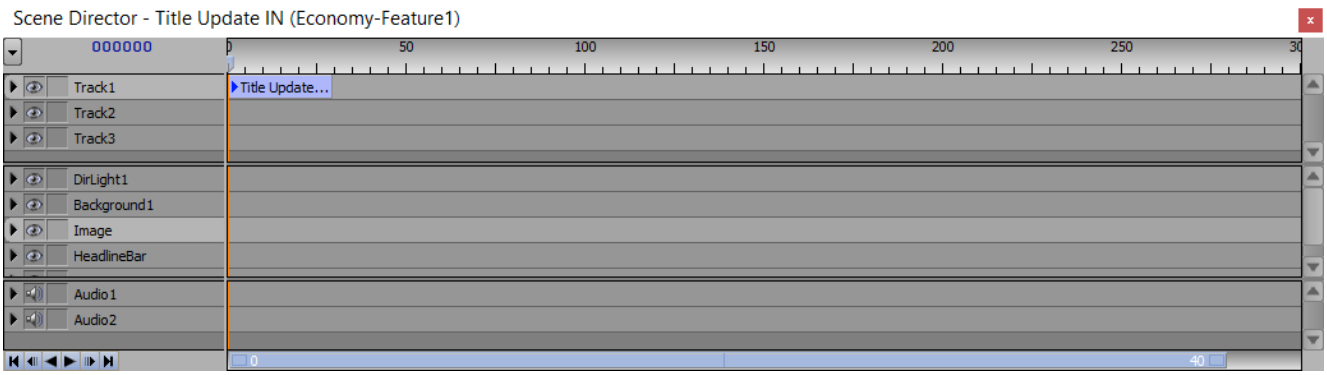
Create a Subtitle IN Scene Director:



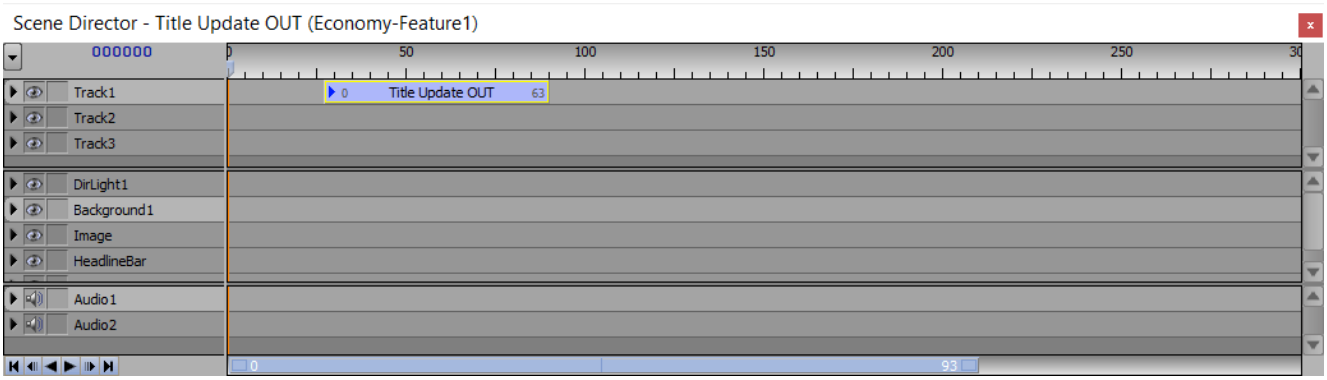
Create a Subtitle OUT Scene Director:



Create a Title Update IN Scene Director:



Create a Title Update OUT Scene Director:


Scene Director - Title Update OUT (Economy-Feature1)
000000
0
50
100
150
200
250
Track1
Track2
Track3
0
Title Update OUT
63
DirLight1
Background1
Image
HeadlineBar
Audio1
Audio2
0
93

Sequencer

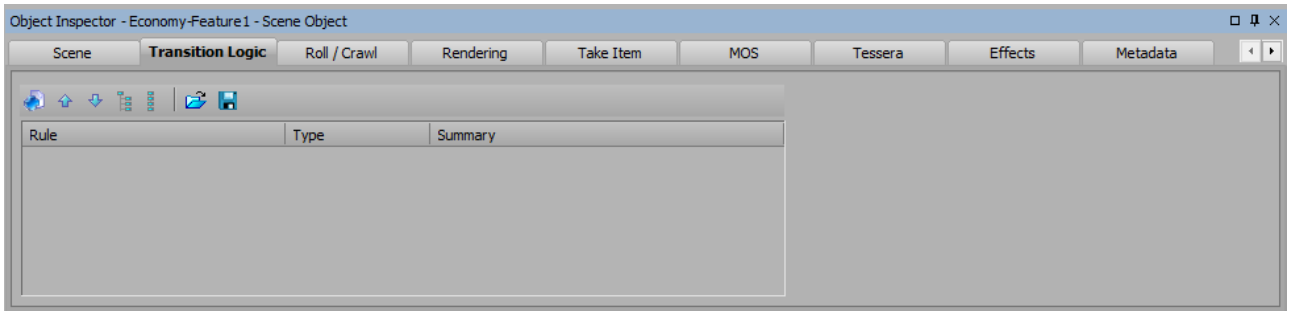
Add multiple instances of the scene to the sequencer. Once added, use the sequencer to view the transition logic effect played out between different scenes.

Setting Up Rules and Conditions

The following procedure explains how to set up the rules and conditions of transitions for a scene. After the general procedures for adding a rule, adding and configuring conditions, an example (with conditions) is provided using the example scene from the Prerequisites section for each of the **In/Out**, **Back To Back**, and **Scene Trigger** transitions.

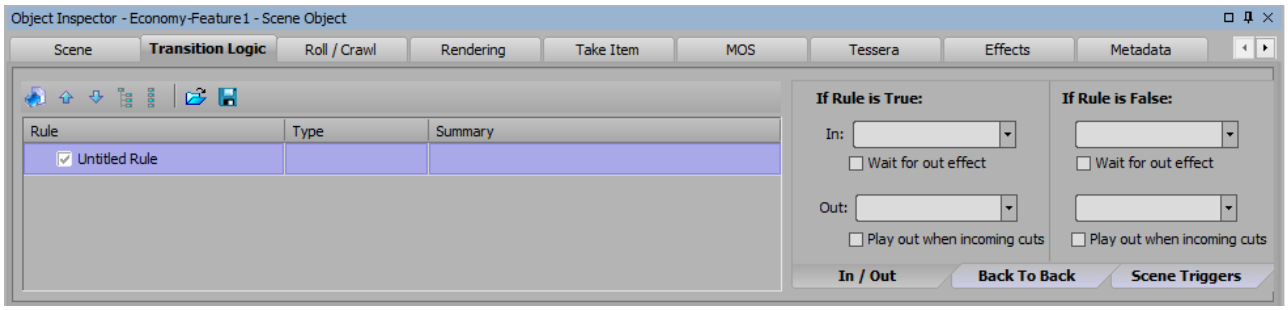
1. In the **Scene Manager**, select a scene.
2. In the **Object Inspector - Scene Object** window, select the **Transition Logic** tab.

   The **Transition Logic** tab opens.



3. Select the **Add a new rule** icon ( ) to add conditions or actions that determine whether or not the transition will occur.

   A new rule is added to the list.



4. Click inside the rule column and enter a name for the rule.
5. Right-click on a selected rule to add conditions to the rule as necessary.

   Conditions are checked before the rule is run in order to determine if the rule will be run or not.

   The options are:

   - **Add Condition > Back To Back Conditions > Compare Text Objects** — compare text assigned to text objects before the rule is applied.
   - **Add Condition > Back To Back Conditions > Compare Scene Name/ID** — compare a scene name or scene ID assigned to scenes before a rule is applied.
   - **Add Condition > Back To Back Conditions > Compare Object Material** — compare the materials assigned to an object before the rule is applied.
   - **Add Condition > Check Scene / Layer** — add specific scene and layer conditions to check before a rule is applied.
   - **Add Condition > Check Text Object** — add specific text object conditions to check before the rule is applied.
   - **Add Condition > Script** — add a specific script to check before the rule is applied.

6. If a condition has been applied, configure the properties of the selected condition:

Compare Text Objects

Compare Scene Name/ID

Compare Object Material

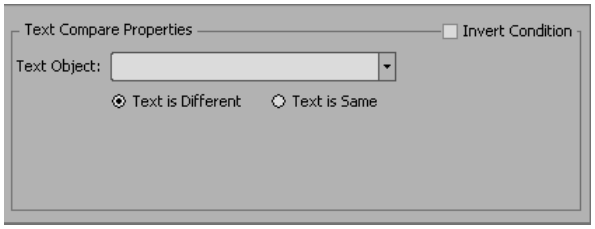
Check Scene / Layer

Check Text Object

Check Script

Compare Text Objects

If **Compare Text Objects** is selected, the **Text Compare Properties** section is displayed. Use this section to select the text properties for a back to back text compare condition on a rule.



To configure the Compare Text Objects condition:

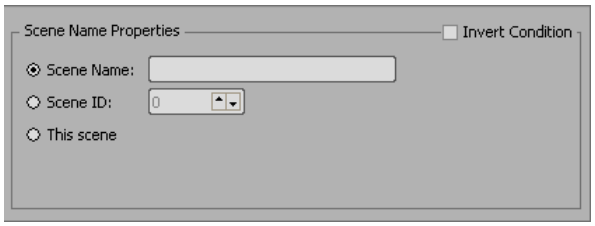
1. From the **Text Object** drop-down, select the object with which to compare a text object.

   The options are:

   - **Text is Different** — apply the rule if the text is different.
   - **Text is Same** — apply the rule if the text is the same.
2. To invert the properties of the text compare condition, select the **Invert Condition** checkbox.

Compare Scene Name/ID

If **Compare Scene Name/ID** is selected, the **Scene Name Properties** section is displayed. Use this section to select the scene name or ID properties for a back to back scene name/ID compare condition on a rule.

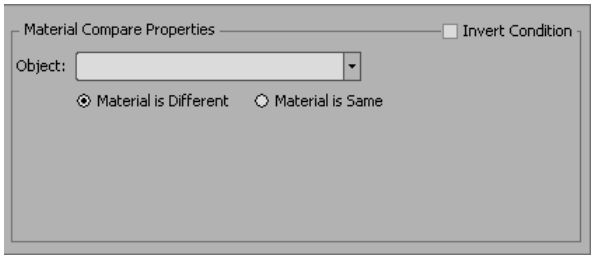


1. Select one of the following options:

   - **Scene Name** — enter the name of the scene with which to compare.
   - **Scene ID** — enter or select the scene ID with which to compare.
   - **This scene** — compare with the same scene.
2. To invert the properties of the scene name/ID compare condition, select the **Invert Condition** checkbox.

Compare Object Material

If **Compare Object Material** is selected, the **Material Compare Properties** section is displayed. Use this section to select the material properties for a back to back material compare condition on a rule.



1. From the **Object** drop-down, select the object with which to compare a material.

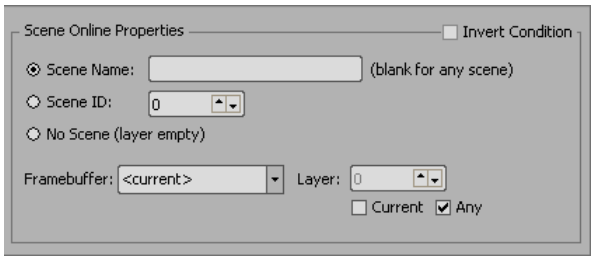
   The options are:

   - **Material is Different** — apply the rule if the material is different.
   - **Material is Same** — apply the rule if the material is the same.

2. To invert the properties of the material compare condition, select the **Invert Condition** checkbox.

Check Scene / Layer

If **Check Scene / Layer** is selected, the **Scene Online Properties** section is displayed. Use this section to select the scene and layer properties for a scene online condition on a rule.



1. Select one of the following options:

   - **Scene Name** — enter the name of a scene to which the rule will be applied, when the scene is online.

     Leave the field blank to apply the rule to any scene.

   - **Scene ID** — enter or select the ID of a scene to which the rule will be applied, when the scene is online.
   - **No scene (layer empty)** — apply the rule when no scene is online.

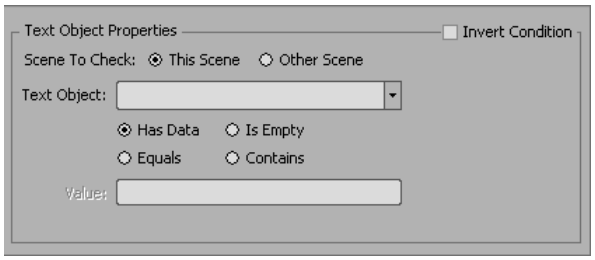
2. From the **Framebuffer** drop-down, select a framebuffer that the selected scene name or scene ID must be on for the rule to apply:
   - **Current** — use the current framebuffer that is being used for the selected scene.
   - **Any** — use any framebuffer that is being used for the scene.
   - **Framebuffer X** — use a specific framebuffer that is being used for the scene.
3. From the **Layer** drop-down, select a specific layer that the selected scene name or scene ID must be using for the rule to apply:

   Current — select this check box to select the current layer as the layer that the scene or scene ID must be using for the rule to apply.

   Any — select this check box to select any layer as the layer that the scene or scene ID must be using for the rule to apply.
4. To invert the properties of the scene online condition, select the **Invert Condition** checkbox.

Check Text Object

If **Check Text Object** is selected, the **Text Object Properties** section is displayed. Use this section to select the text object properties to check for a text object condition on a rule.



1. Select one of the following **Scene To Check** options:

   This Scene — check the text object of the current scene.

   Other Scene — check the text object from another scene.
2. From the **Text Object** drop-down, select a text object to check for the defined properties of the condition.
3. Select one of the following properties to check:

   Has Data — the selected text object has text/data.

   Is Empty — the selected text object has no text/data.

   Equals — the selected text object is equal to specific text/data.

   Contains — the selected text object contains specific text/data.
4. In the **Value** field, enter the specific text/data.
5. To invert the properties of the text object condition, select the **Invert Condition** checkbox.

Script

If **Script** is selected, the **Script Properties** section is displayed. Use this section to add a script to apply as a condition on a rule.



1. Select **Edit Script** to open the **Script Editor** to create or edit a script to apply as a condition on a rule.
2. To invert the properties of the script condition, select the **Invert Condition** checkbox.

Configuring Transitions

There are 3 tabs in the **Transition Logic** tab, in which to configure the transitions. Select a tab and apply rules and conditions as described in the following sections. Then add multiple instances of the scene to the sequencer and use the sequencer to see the transition logic effect as different scenes are played out.

In / Out

Back To Back

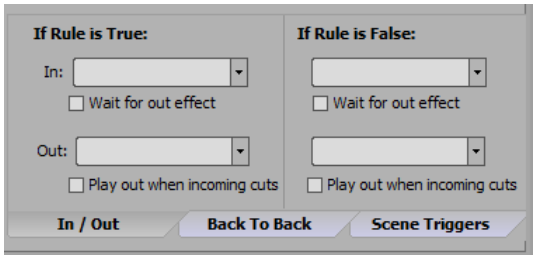
Scene Triggers

In / Out

Use the **In / Out** tab to configure the transition to execute for a scene when the rule is true or false.

To configure the In / Out Settings:

1. Select the **In / Out** tab.



2. In the **If Rule Is True** section, do the following:
   - From the **In** drop-down, select a Scene Director to use for a transition in when the rule is true.
   - Select the **Wait for out effect** checkbox to wait for a scene transitioning out with a transition out to finish before playing this scene in.
   - From the **Out** drop-down, select a Scene Director to use for a transition out when the rule is true.
   - Select the **Play out when incoming cuts** checkbox to play the out effect even when the transition of an incoming scene is set to **Cut**.
3. In the **If Rule Is False** section, do the following:

   From the **In** drop-down, select a Scene Director to use for a transition in when the rule is false.

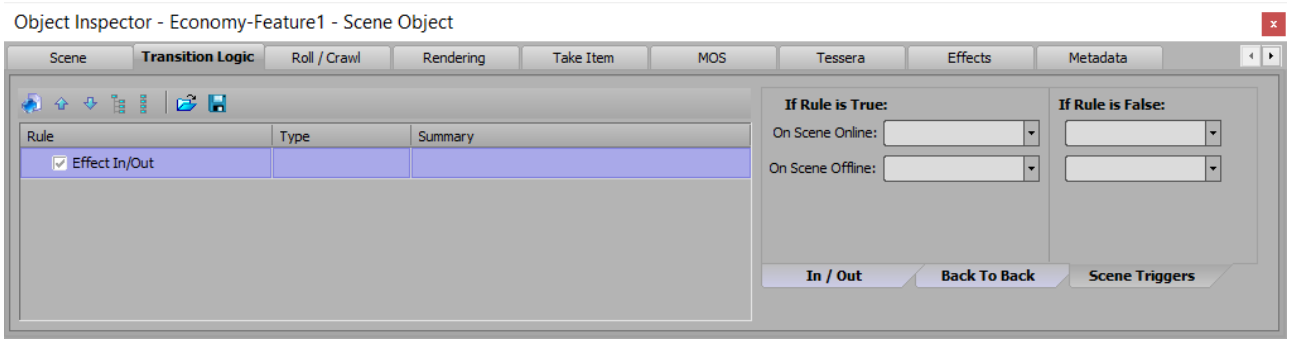
   Select the **Wait for out effect** checkbox to wait for a scene transitioning out with a transition out to finish before playing this scene in.

   From the **Out** drop-down, select a Scene Director to use for a transition out when the rule is false.

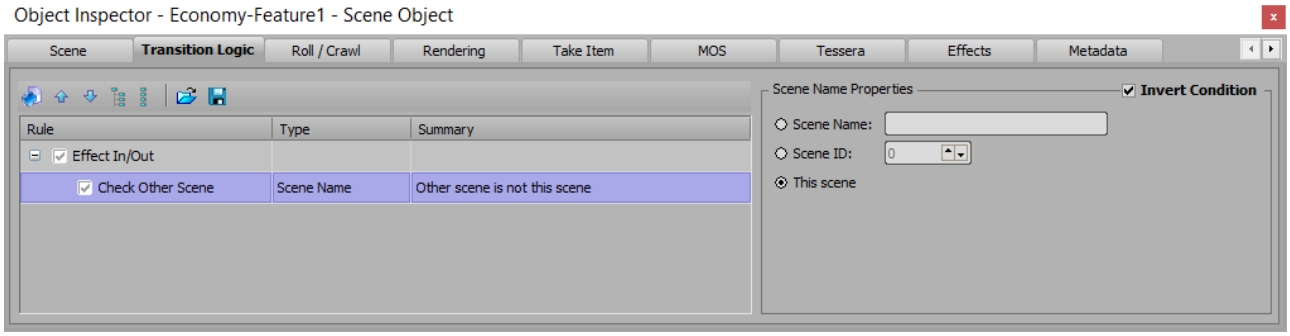
   Select the **Play out when incoming cuts** checkbox to play the out effect even when the transition of an incoming scene is set to **Cut**.

Example of In / Out with Conditions:

Using the scene example in the Prerequisites section, the scene has been assigned an **In / Out** transition as the first rule where if the rule is true, then use the **In** transition to transition the scene in and **Out** transition to transition the scene out:



This rule is to be applied if the previous scene on air is not the same as the **Economy-Feature 1** scene and the incoming scene after playout is not the same as the **Economy-Feature 1** scene, as noted by the selection of the **Inverse Condition** checkbox in the **Scene Name Properties** for the condition:

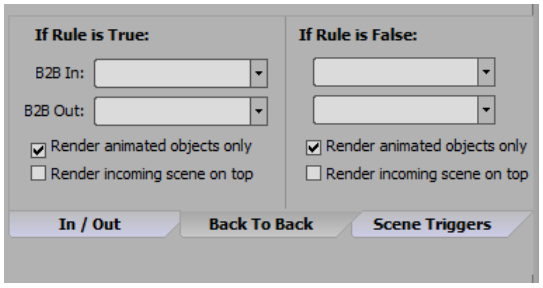


Back To Back

Use the **Back To Back** tab to configure a back to back transition to execute when the rule is true and/or false.

To configure the Back To Back settings:

1. Select the **Back To Back** tab.



2. In the **If Rule Is True** section, do the following:
   - From the **B2B In** drop-down, select a Scene Director to use for the back to back in scene transition when the rule is true.

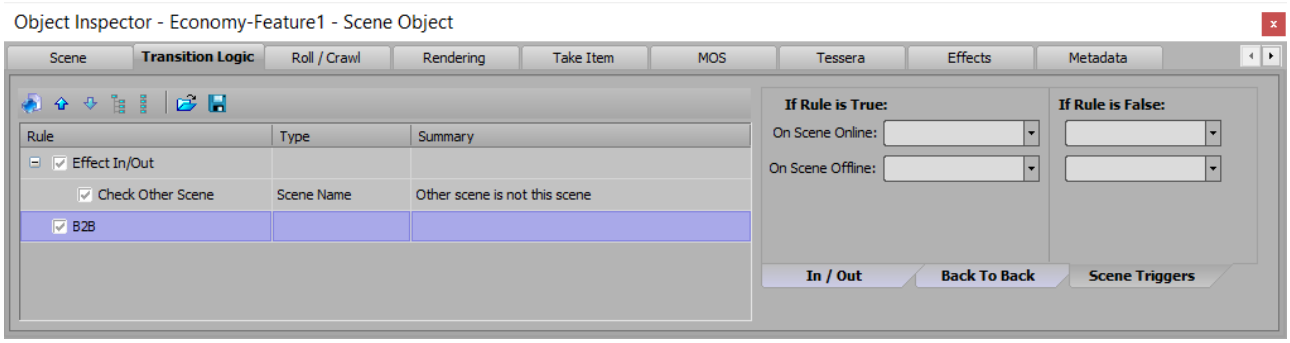
- From the **B2B Out** drop-down, select a Scene Director to use for the back to back out scene transition when the rule is true.
- Select the **Render animated objects only** checkbox to only render animated objects on the back to back out scene.
- Select the **Render incoming scene on top** checkbox to render the incoming scene on top of the outgoing scene.

3. In the **If Rule Is False** section, do the following:

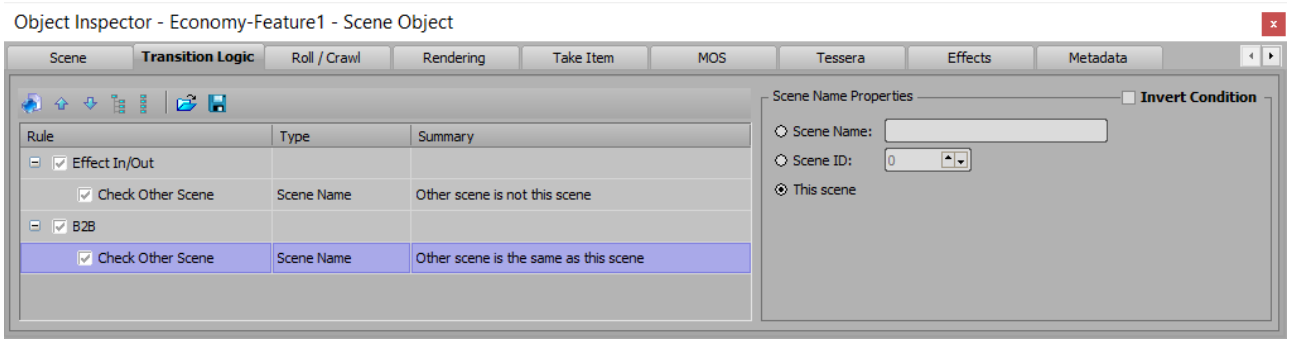
- From the **B2B In** drop-down, select a Scene Director to use for the back to back in scene transition when the rule is false.
- Use the **B2B Out** drop-down, select a Scene Director to use for the back to back out scene transition when the rule is false.
- Select the **Render animated objects only** checkbox to only render animated objects on the back to back out scene.
- Select the **Render incoming scene on top** checkbox to render the incoming scene on top of the outgoing scene.

Example of Back To Back with Conditions:

Using the scene example in the Prerequisites section, the scene has been assigned a **Back to Back** transition as the second rule where if the first rule is false, then use the **Back to Back** rule to use the **B2B In** transition to transition the scene in and the **B2B Out** transition to transition the scene out, and the only objects from the scene rendered in the transition are those that have animation:



This rule is to be applied if the previous scene on air is the same as the **Economy-Feature 1** scene and the incoming scene after playout is the same as the **Economy-Feature 1** scene:

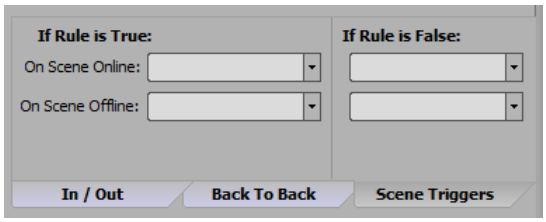


Scene Triggers

Use the **Scene Triggers** tab to configure the scene directors to be played in and out when any scene goes online or offline on a different layer when the rule is true and/or false.

To configure the Scene Triggers tab:

1. Select the **Scene Triggers** tab.

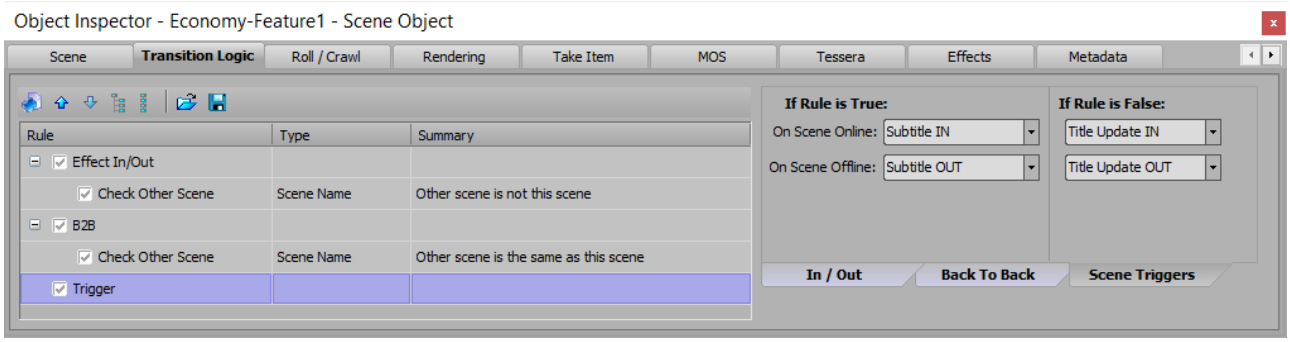


2. In the **If Rule Is True** section, do the following:
   - From the **On Scene Online** drop-down, select a Scene Director that will be played when any scene goes online on a different layer when the rule is true.
   - From the **On Scene Offline** drop-down, select a Scene Director that will be played when any scene goes offline on a different layer when the rule is true.
3. In the **If Rule Is False** section, do the following:
   - From the **On Scene Online** drop-down, select a Scene Director that will be played when any scene goes online on a different layer when the rule is false.
   - From the **On Scene Offline** drop-down, select a Scene Director that will be played when any scene goes offline on a different layer when the rule is false.

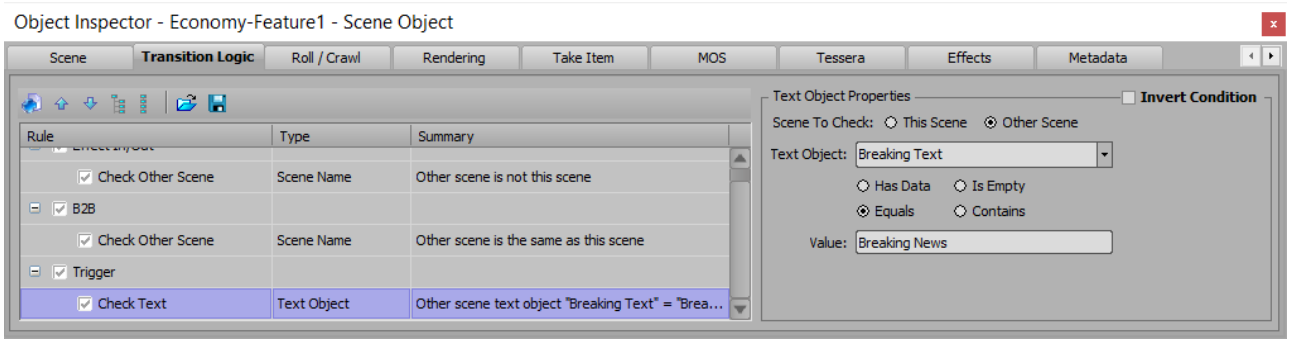
Example of Scene Trigger with Conditions:

Using the scene example in the Prerequisites section, the scene has been assigned a **Scene Triggers** transition as the third rule where if the first and second rules are false, then use the **Scene Triggers** rule to:

- use the **Subtitle In** transition as the Scene Director that will be played when any scene goes online on a different layer when the rule is true.
- use the **Subtitle Out** transition as the Scene Director that will be played when any scene goes offline on a different layer when the rule is true.
- use the **Title Update In** transition as the Scene Director that will be played when any scene goes online on a different layer when the rule is false.
- use the **Title Update Out** transition as the Scene Director that will be played when any scene goes offline on a different layer when the rule is false.



This rule is to be applied should the condition be met that the scene going online on a different layer is a different scene that still contains the **Breaking Text** text object and with a value that equals the text 'Breaking News':



Creating Global Macros

Create project specific global macros that can be used inside DataLinq or dynamic material paths. Global macros can be used inside DataLinq and dynamic materials by using `@MacroName@`. If a text object shares the same name, the global macro can be forced by prefixing it with `@G:MacroName@`.

1. In XPression, select **Project > Global Macros**.

   The **Edit Global Macros** dialog opens.



2. In the **Edit Global Macros** dialog, select **Add**.

   A new global macro is added to the list.



3. In the list, click inside the **Name** column of the macro to enter a unique name for the global macro.

   The default is **Macro 1**, **Macro 2**, etc.

4. Click inside the **Value** column of the macro to enter the value to assign to the global macro.

5. Select **Close**.

Base Objects

In XPression, text and backgrounds can be linked to various sources and formatted using defined styles.

The following topics are discussed in this section:

Creating a Text Object

Using Tabs in a Text Object

Applying User Input Controls to a Text Object

Aligning Text Objects to Build a Table

Applying a Material to a Text Object

Applying Word Wrap to a Text Object

Applying Texture Mapping to a Text Object

Formatting a Text Object in the Main Viewport

Formatting a Text Object in the Take Inspector

Creating a Background Object

Creating a Text Object

This topic describes how to create a text object, apply a font to the text, position the text within the scene and how to use right to left text.

To create a text object:

1. In the **Scene Manager**, select the scene or scene group to which to add a text object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Base Objects** section of the **Object Library** window, select the **Text** object.

   A new text object is added to the active Viewport.

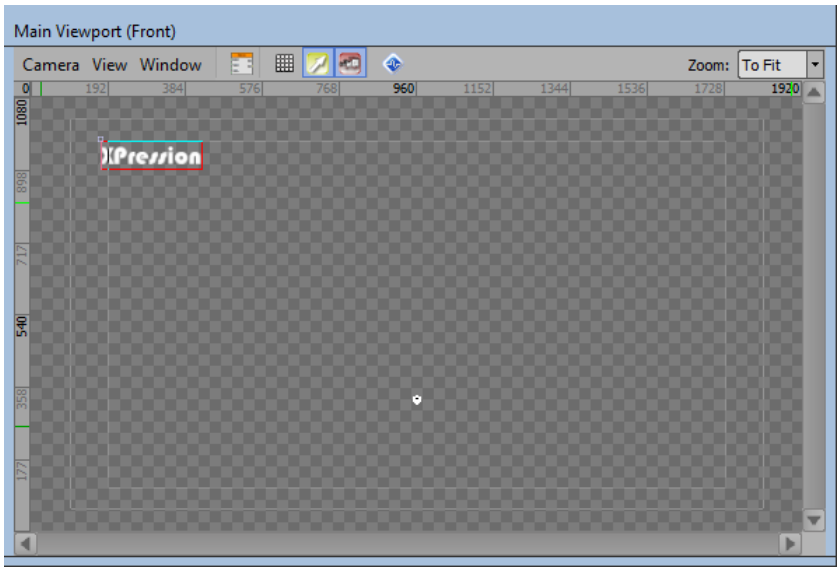
3. Select the text object in the **Object Manager**.

4. Select a font for the text.

   See Selecting a Font.

5. Type the text for the text object.

   The entered text is displayed in the text object.

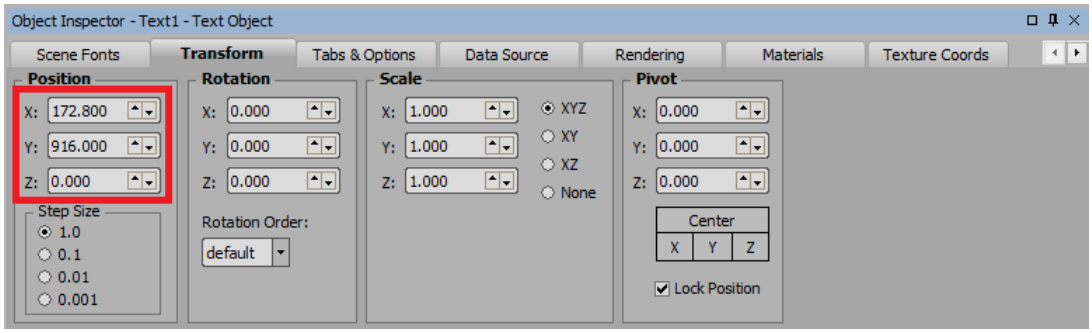


6. Position the text in the scene.

To position a text object:

- Press the **Ctrl** key, then select the text object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the text object.



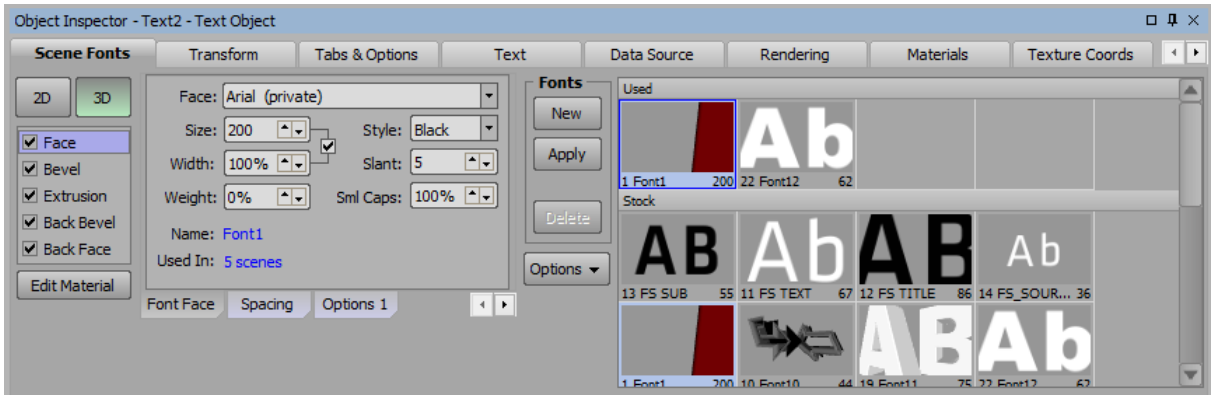
Selecting a Font

After adding a text object to your project, you can select a font for the text either from the **Scene Fonts** tab or from the **Font Manager**.

To select a font from the Scene Fonts tab:

1. In the **Object Inspector - Text Object** window, select the **Scene Fonts** tab.

   The **Scene Fonts** tab opens.

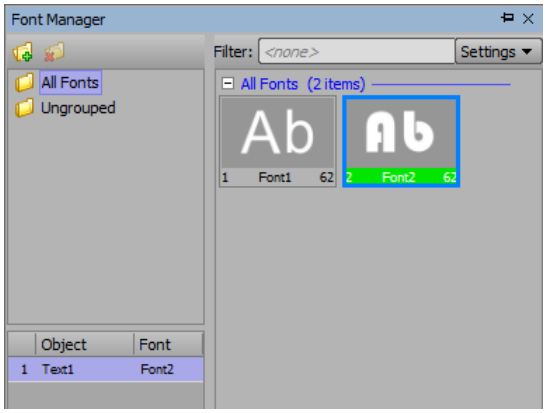


2. Select a font for the text object from the **Used** or **Stock** font list.

To select a font from the Font Manager:

1. Select **Display > Font Manager**.
2. In the **Font Manager** window, double-click a font for the text object from the **All Fonts** list.

   The selected font is highlighted in green in the **All Fonts** list and is applied to the text object.

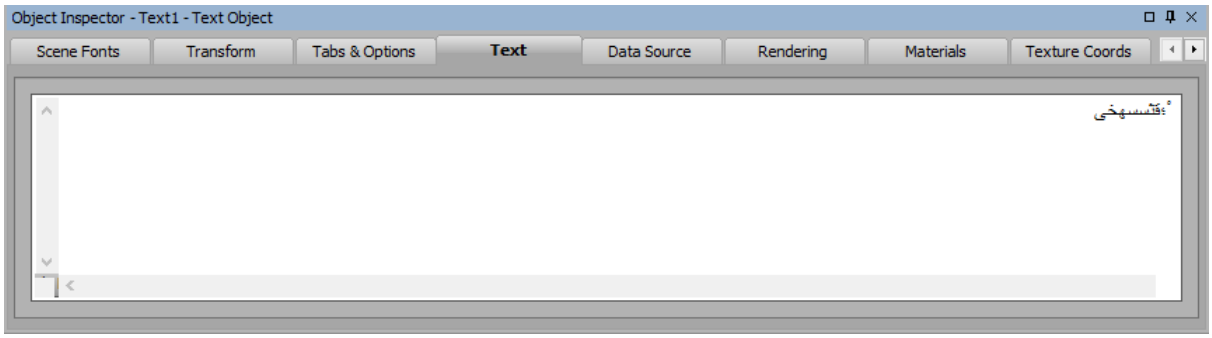


Using Right to Left Text

For Arabic, a language that uses right to left text, you will need to add a special tab to the **Object Inspector** and then edit the text in that tab.

To use right to left text:

1. Right-click inside the text object and select **Text Layout > Right To Left** from the shortcut menu.
2. A **Text** tab is added to the **Object Inspector - Text Object** window.
3. Select the **Text** tab.
4. In the **Text** tab, in the text editor, enter the text in Arabic.



For More Information on...

- fonts, refer to the section Fonts.
- using a text list, refer to the section Adding a Text List to a Scene.

Using Tabs in a Text Object

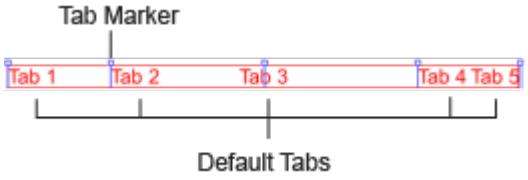
Tab are used to align text at set positions. The tabs are configured in the Tabs & Options tab of the Object Inspector along with Auto Squeeze and Auto Scale attributes.

★Word wrap is disabled when tabs are used.

To edit, add, or delete tabs:

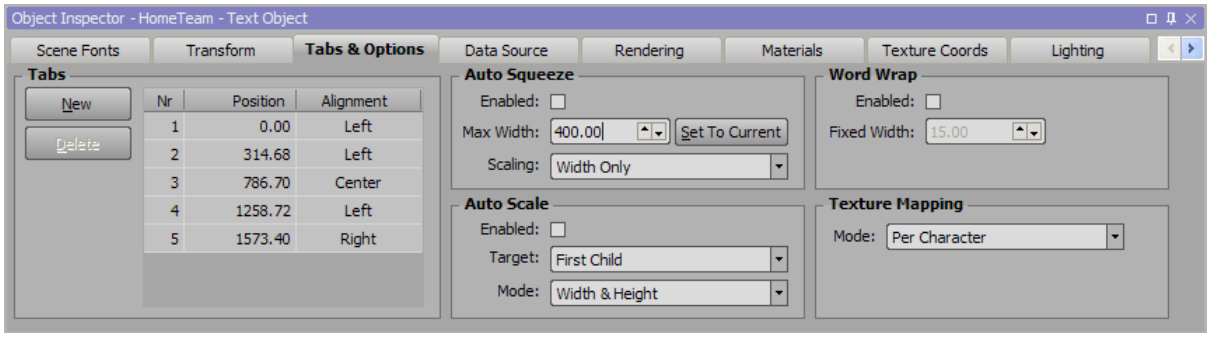
1. Add a text object to a scene.
2. Enter some text in the new text object, then press the **Tab** key.

   After the entered text, the cursor is positioned at the tab that follows the text. By default, five tabs are set for a text object. In a text object, tab positions are marked by a vertical line with an square on top.



3. Select the **Tabs & Options** tab in the **Object Inspector - Text Object** window.

   The **Tabs & Options** tab opens.



   The **Tabs** section lists the five default tab positions.

4. Use the **Tabs** section to edit, add, or delete tabs, as follows:

   - To edit the position of a tab, click in the **Position** column and enter or select a new tab position in pixels.

     The text associated with the edited tab automatically moves to the new tab position.

   - To edit the alignment of a tab, click in the **Alignment** column and select a new text alignment for the tab.

     The text associated with the edited tab automatically move to match the new text alignment set for the tab. The first tab sets the justification of a text object when no other tab are used.

   - To add a new tab, select **New**.

     The new tab is added to the end of the tab list. Edit the values in the **Position** and **Alignment** columns to modify the new tab.

   - To delete a tab, select the tab to delete in the tab list then select **Delete**.

     After a tab is deleted, text is reformatted to align with the remaining tabs.

Auto Squeeze

Use the **Auto Squeeze** section to set the size settings of the text object.

To edit the Auto Squeeze attributes:

1. Select the **Enabled** checkbox to scale the text content within the maximum width of the text object.
2. In the **Max Width** field, enter or select the maximum width of the text object.
3. Select **Set To Current** to set the maximum width to the current width of the text object.
4. From the **Scaling** drop-down, select the scaling condition of the auto squeeze.

   The available scaling options are:

   Width Only — apply auto squeeze to the width of the text object.

   Height & Width — apply auto squeeze to the height and width of the text object.

Auto Scale

Use the **Auto Scale** section to set the scaling of the children to the parent text object.

To edit the Auto Scale attributes:

1. Select the **Enabled** checkbox to scale children according to the auto squeeze settings of the selected text object.
2. From the **Target** drop-down, select the children to scale according to the auto squeeze configuration of the parent text object.

   The available target options are:

   - **First Child** — scale the first child according to the auto squeeze configuration of the parent text object.
   - **Children** — scale the children according to the auto squeeze configuration of the parent text object.
3. From the **Mode** drop-down, select the scaling condition of the auto scale.

   The available mode options are:

   - **Width & Height** — apply auto scale to the width and height of the first child or children.
   - **Width Only** — apply auto scale to the width of the of the first child or children.
   - **Height Only** — apply auto scale to the height of the of the first child or children.

For More Information on...

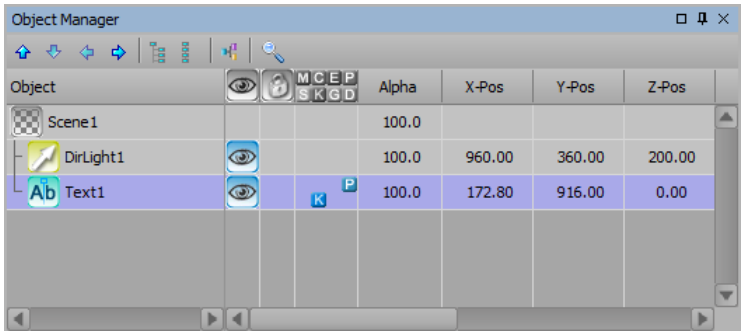
- how to add a text object to a scene, refer to Creating a Text Object.

Applying User Input Controls to a Text Object

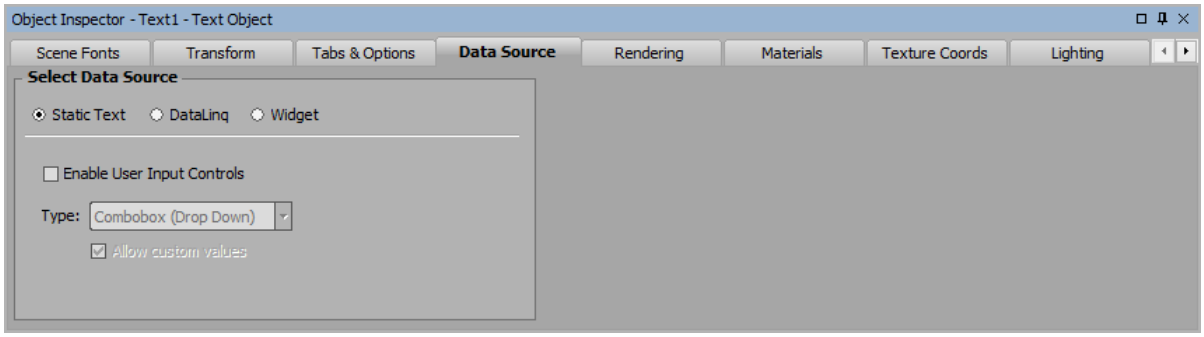
For text objects, user input controls can be created in the **Data Source** tab of the **Object Inspector**. Once created, user input controls will be displayed to use for selecting static text objects in the **Template Data** tab of the **Take Inspector** in XPression, and in the **Graphics** editor in the XPression MOS Plugin, and the XPression Template Builder.

To select user input controls for a text object:

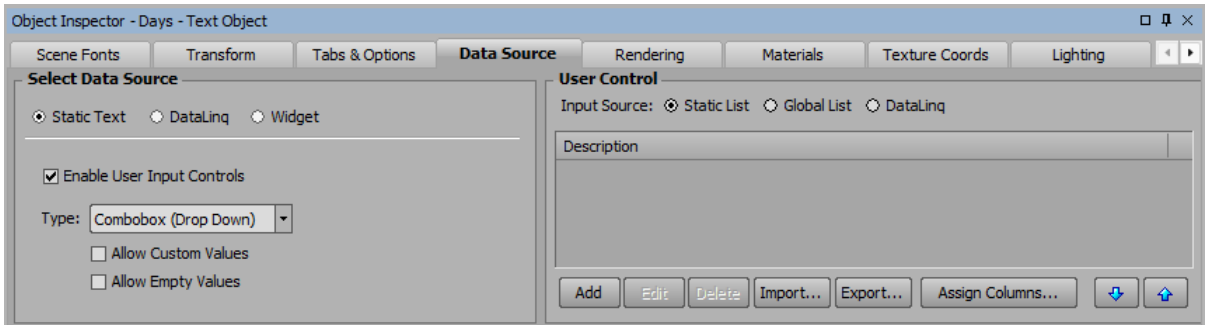
1. In the **Object Manager**, select a text object.



2. In the **Object Inspector**, select the **Data Source** tab.



3. In the **Select Data Source** section, select **Static Text** (selected by default).
4. Select the **Enable User Input Controls** checkbox.



5. From the **Type** drop-down, select one of the following options:
   - **List Box** — use a standard list for the values.
   - **Combobox (Drop Down)** — use a drop-down menu for the values.
   - **Radio Buttons** — use radio buttons for the values.
   - **Checkboxes** — use check boxes for the values.

6. Select the **Allow Custom Values** checkbox to enable the entering of custom configured values for the user input controls.
7. Select the **Allow Empty Values** checkbox to include empty entries in the source list in the user input control at runtime.

To configure the input source:

1. In the **User Control** section, select one of the following options:
   - **Static List** — use a list of items specific to the selected scene.
   - **Global List** — use a list or table of items that can be used throughout the project.
   - **DataLinq** — use lists or tables of items located externally via DataLinq and available across XPression.

   Static List

   a. Select **Add** and manually enter a value in the **Description** field or select **Import** and select a saved file of existing values.

   b. Select **Export**, select a folder location, and select **Save**.

   c. Select **Assign Columns** to open the **Column Mapping** dialog. Enter a column name from the data source and assign it to a published object. By default, columns will be assigned to published objects with the same name.

   Global List

   a. From the **Global List** drop-down, select an existing global list of values for the user input control.

   b. If there are no existing lists, select **Edit Global Lists** and add a new list and input the values for it.

   c. Select **Assign Columns** to open the **Column Mapping** dialog. Enter a column name from the data source and assign it to a published object. By default, columns will be assigned to published objects with the same name.

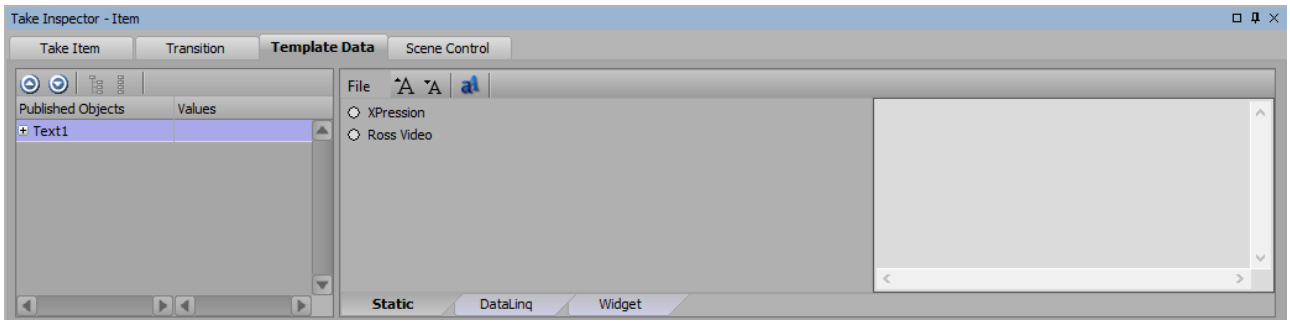
   DataLinq

   a. From the **DataLinq** drop-down, select a data source for the user input controls.

   b. Use the **Column** and **Table** fields to enter the column and table names in the DataLinq source that contain the values for the data or select **Browse** to open the **Select DataLinq Field** dialog and select them.

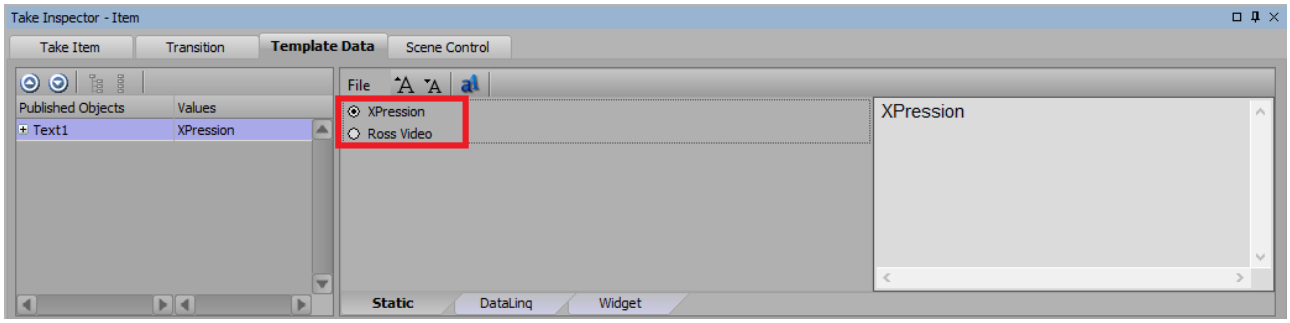
   c. Select **Assign Columns** to open the **Column Mapping** dialog. Enter a column name from the data source and assign it to a published object. By default, columns will be assigned to published objects with the same name.

2. In the **Sequencer**, select the **Template Data** tab in the **Take Inspector - Item** section for the scene with the user input controls.



3. In the **Static** tab, use the user input controls to select the value to apply to the text object.

   In the example below, the user input controls are configured as radio buttons.



   If **Allow custom values** has been applied, the values can be manually entered in the text field to the right of the user input controls.

For More Information on...

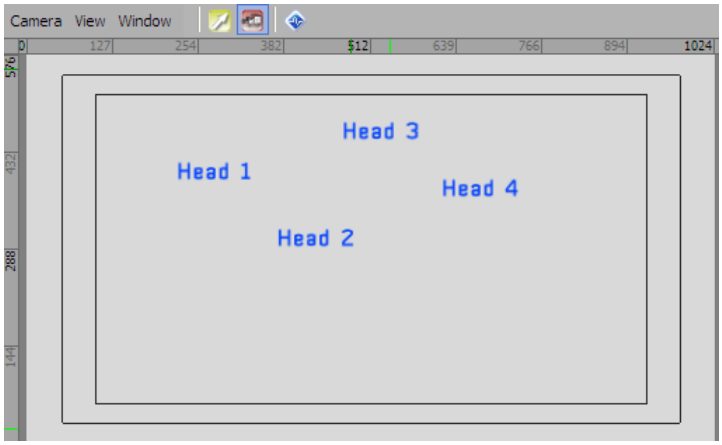
- configuring and using DataLinq, refer to DataLinq™.
- using user input controls in a MOS workflow, refer to the *XPression Distributed Workflow User Guide*.

Aligning Text Objects to Build a Table

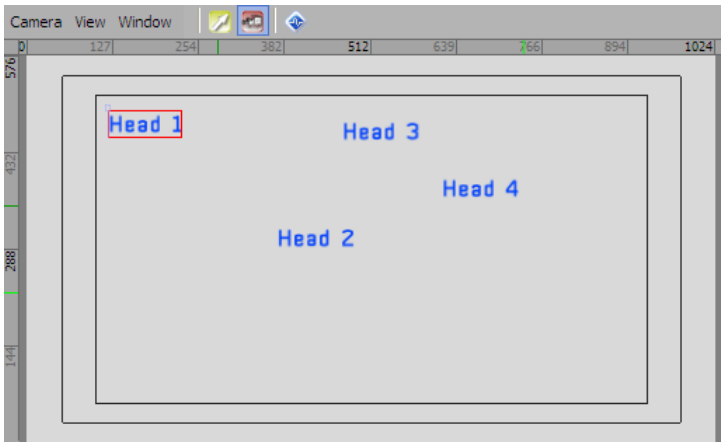
To build a table in an XPression scene, you will first set up the column headings using text objects and then add the data for each row, aligning the data into uniform columns and rows.

To set up column headings:

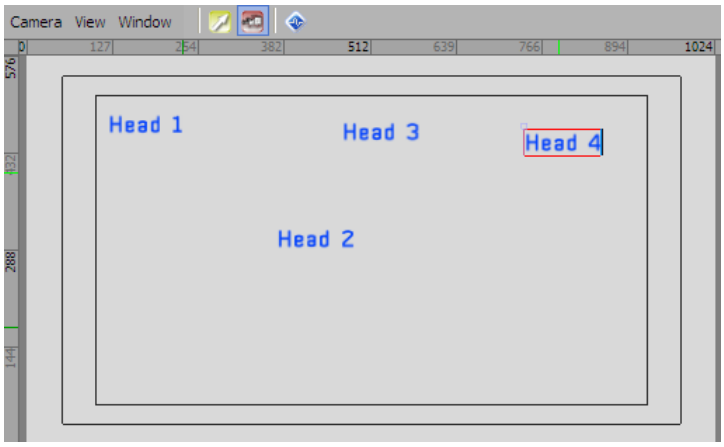
1. In the **Scene Manager**, select the scene or scene group to which you want to add a table.
2. Create a text object for each column heading in the table.



3. Position the text object of the first column heading in the scene to set the top left corner of the table.

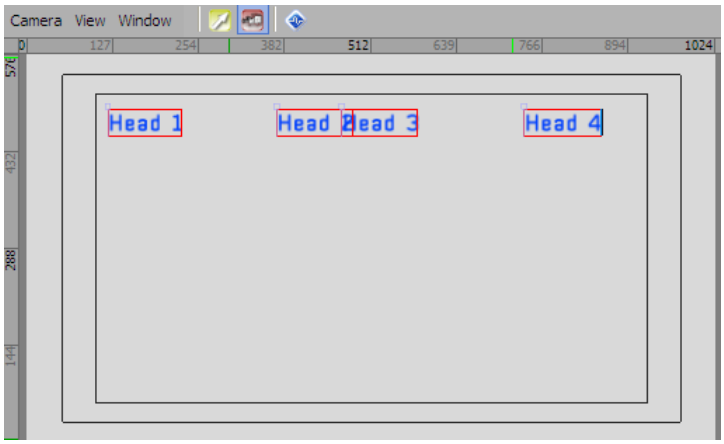


4. In relation to the first column heading text object, position the last column heading to set the table width.



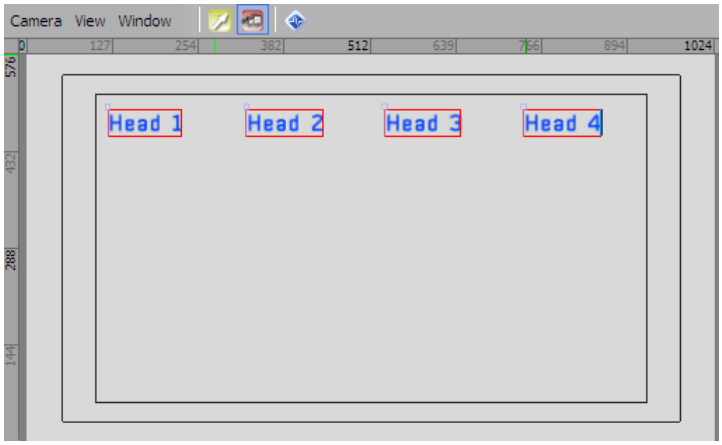
5. In the **Viewport**, use the **Selection** tool to select the text object of the first column heading.
6. Press **Shift** and select each of the remaining column heading text objects.
7. Select the **Align Bottom Edges** button in the toolbar.

   The bottom edges of all the column headings are aligned with the first column heading.



8. With the text objects still selected, select the **Distribute Objects Horizontally** button in the toolbar.

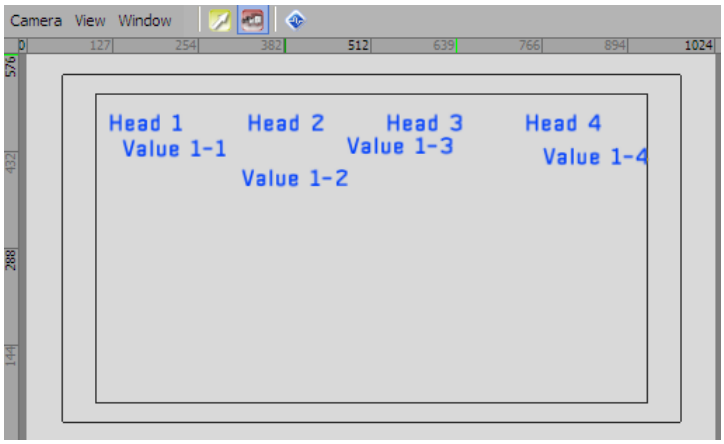
   The column heading text objects are evenly distributed between the first and last column heading.



9. Continue with adding row data.

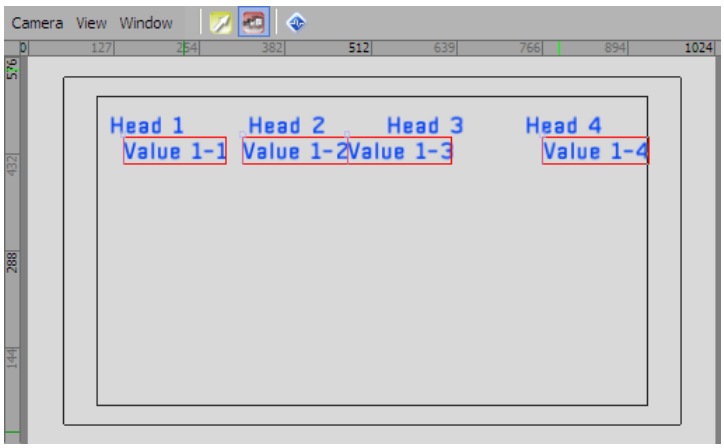
To add row data:

1. Below the column heading text objects, create a text object for each column value in the first row of the table.

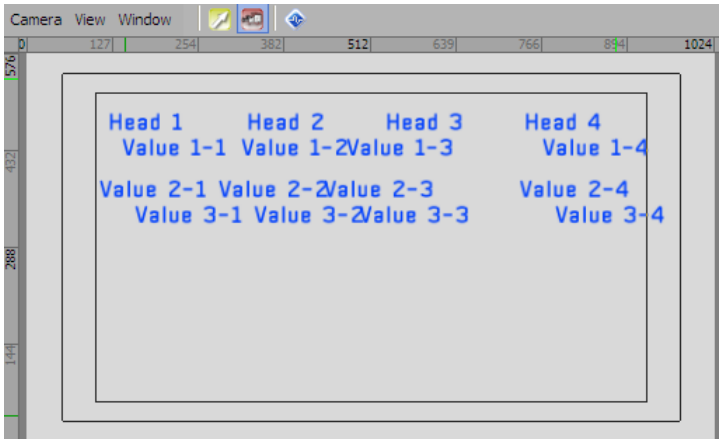


2. Use the **Selection** tool to select the text object of the first column value.
3. Press **Shift** and then select each of the remaining column value text objects.
4. Select the **Align Bottom Edges** button in the toolbar.

   The bottom edges of all the column values are aligned with the first column value.

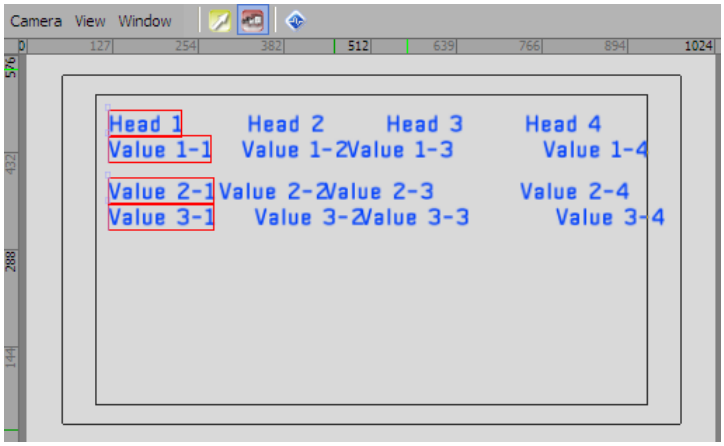


5. Create as many additional table rows as necessary, following the above steps.



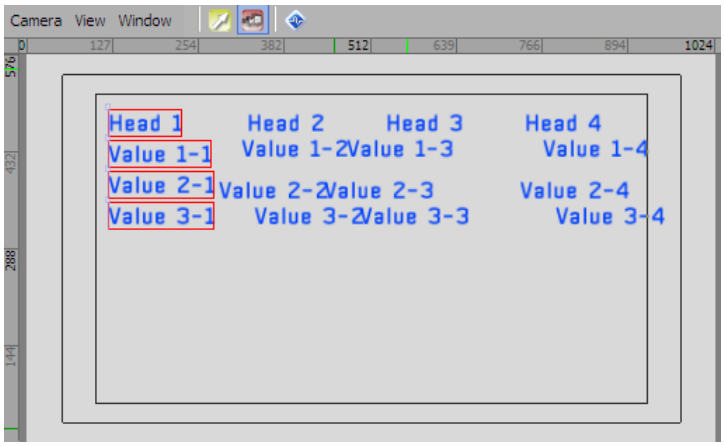
6. Use the **Selection** tool to select the text object of the first column heading.
7. Press **Shift** and select each of the remaining text objects in the first column of the table.
8. Select the **Align Left Edges** button in the toolbar.

   The left edges of the text objects in the first column of the table are aligned with the first column heading.

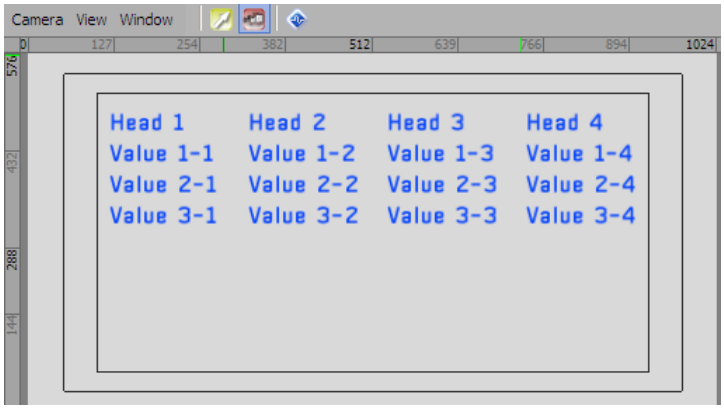


9. With the text objects still selected, select the **Distribute Objects Vertically** button in the toolbar.

   All the text objects in the first column of the table are evenly distributed between the column heading and the last table row.



10. For each of the remaining table columns, repeat steps 6 to 10.



For More Information on...

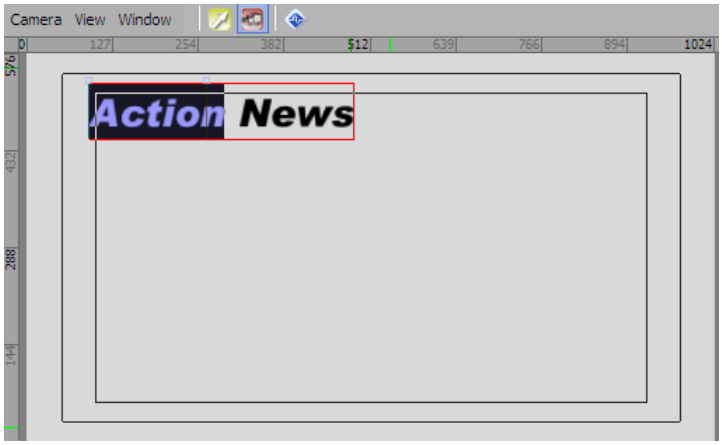
- how to add a text object to a scene, refer to Creating a Text Object.

Applying a Material to a Text Object

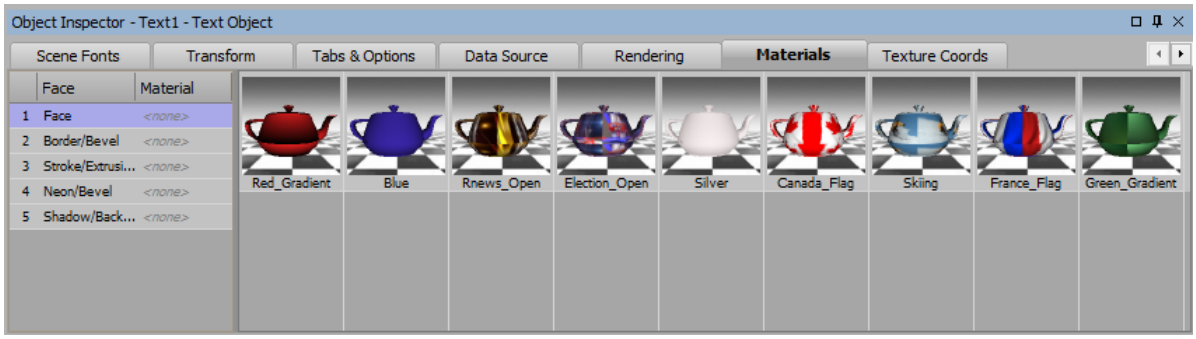
As with primitives, you can apply a material from the **Material Manager** to a text object, for example, to give it a textured appearance.

To apply a material to a text object:

1. In the Viewport, select the characters in the text object to which you want to apply a material.



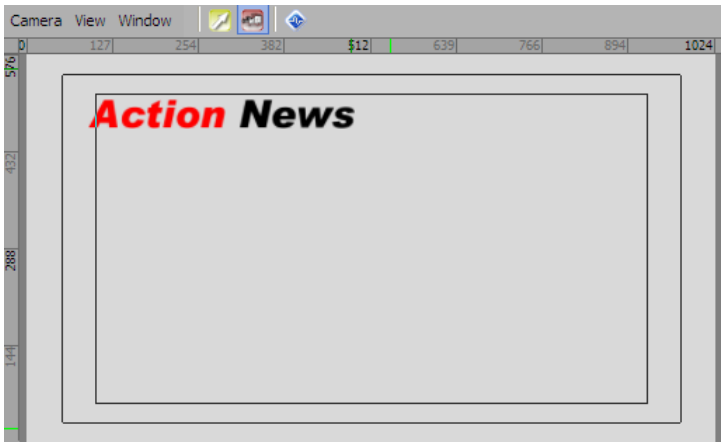
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. In the **Face** column, select one or more text elements to which to apply a material.
4. After selecting the initial text element, press **Shift** and select another element to select all elements between the two selections or press **Ctrl** and select individual elements to add them to the original selection.
5. Double-click a material thumbnail to apply the selected material to the selected text.

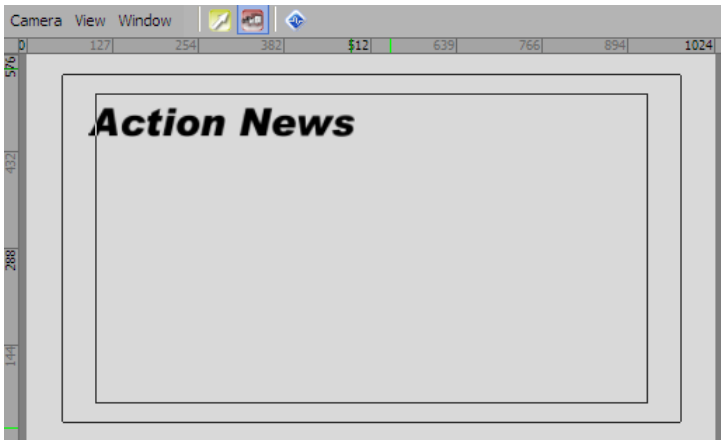
The selected text elements are updated with the material. The applied material does not affect the text font style.



To remove a material from a text element:

1. In the **Object Manager**, select the text object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the text object name in the **Face** column and select **Unbind** from the shortcut menu.

   The selected text element reverts to the material used by the text font style.



For More Information on...

- how to add a text object to a scene, refer to Creating a Text Object.

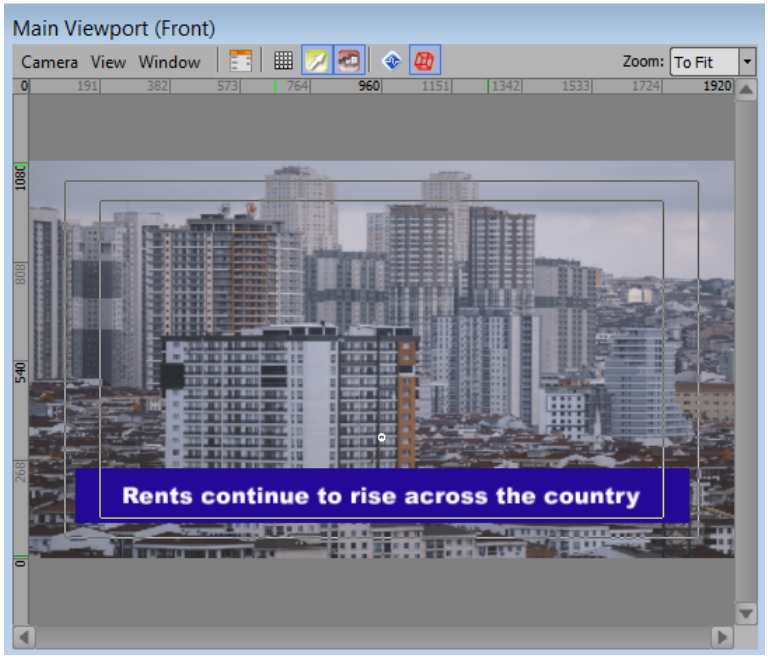
Applying Word Wrap to a Text Object

Word wrap enables the length of a text object to be adjusted so that the text will continue on a new line accordingly.

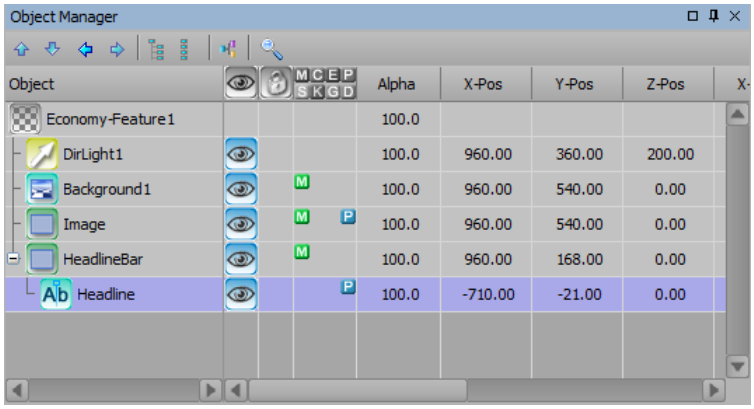
★Tabs are disabled when word wrap is enabled.

To apply Word Wrap to a text object:

1. Create a text object or open a scene or scene group that includes a text object.

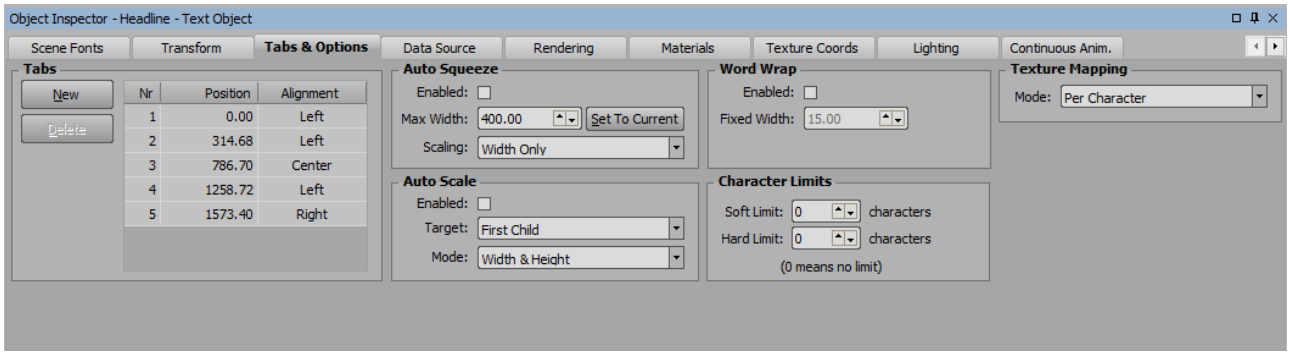


2. In the **Object Manager**, select the text object from the **Object** list.

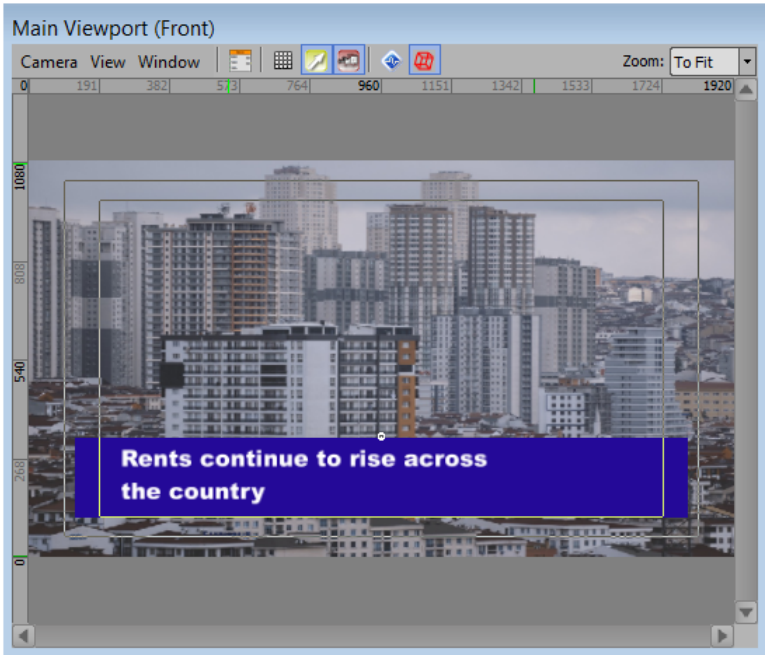


3. In the **Object Inspector**, select the **Tabs & Options** tab.

   The **Tabs & Options** tab opens.



4. In the **Word Wrap** section, select the **Enabled** checkbox to apply word wrap to the text object.
5. In the **Fixed Width** field, enter or select an amount to adjust the width of the text object and set the location where the line of text ends before the text continues on a new line.
6. The width can also be adjusted by clicking and dragging the handle at the end of the text object.



For More Information on...

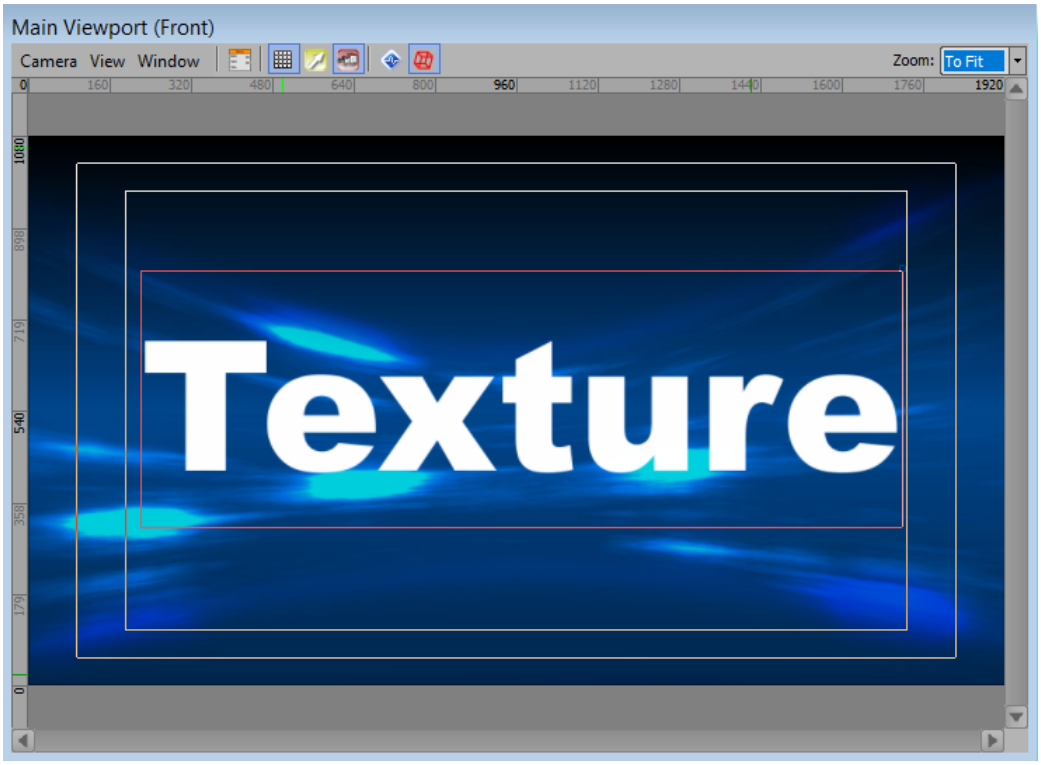
- how to add a text object to a scene, refer to Creating a Text Object.

Applying Texture Mapping to a Text Object

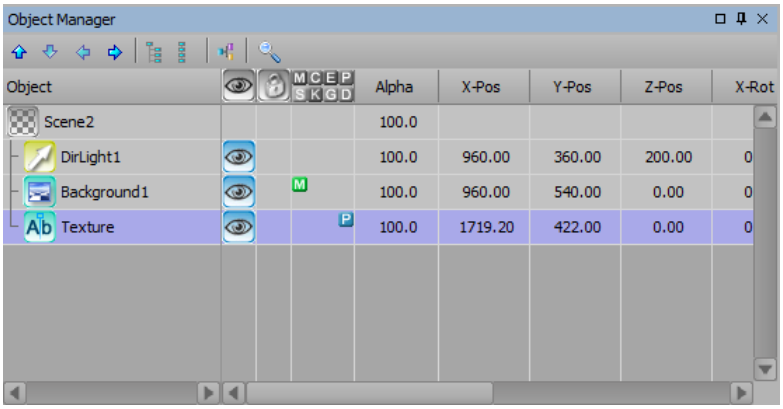
Use texture mapping to apply graphical detail to a text object.

To apply texture mapping to a text object:

1. Create a text object or open a scene or scene group that includes a text object.



2. In the **Object Manager**, select the text object from the **Object** list.

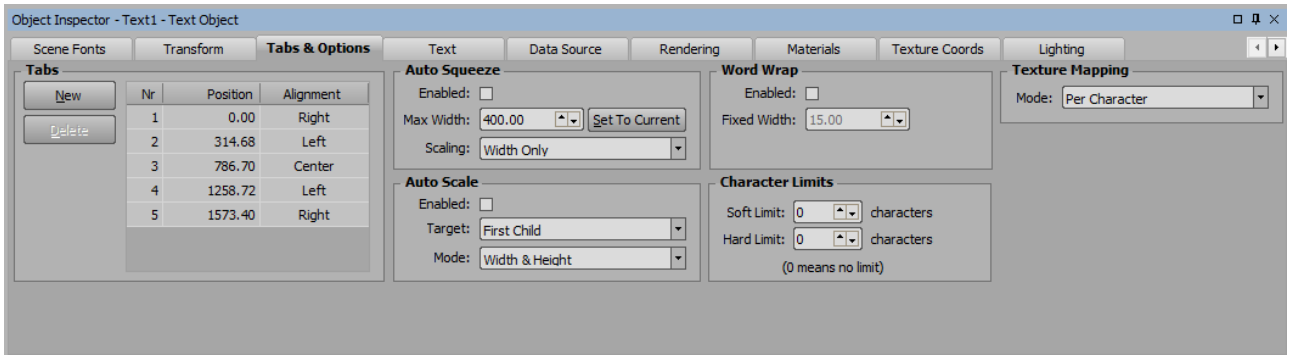


3. Apply a texture material to the text object.

   See Applying a Material to a Text Object for instructions.

4. In the **Object Inspector**, select the **Tabs & Options** tab.

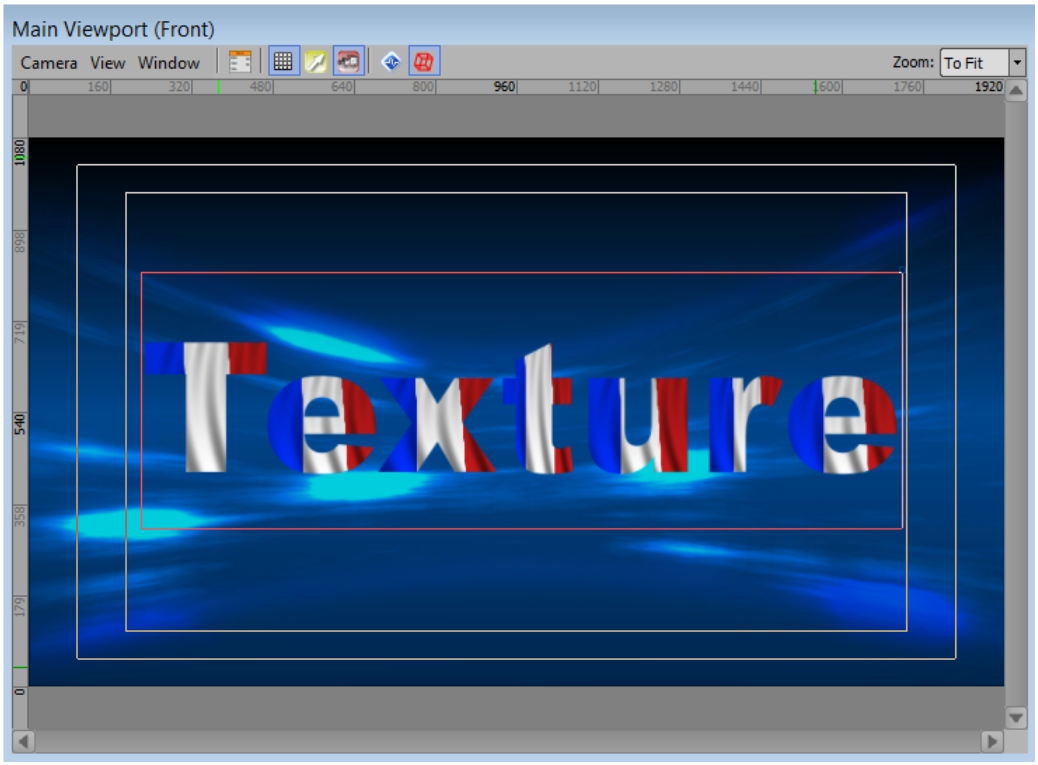
   The **Tabs & Options** tab opens.



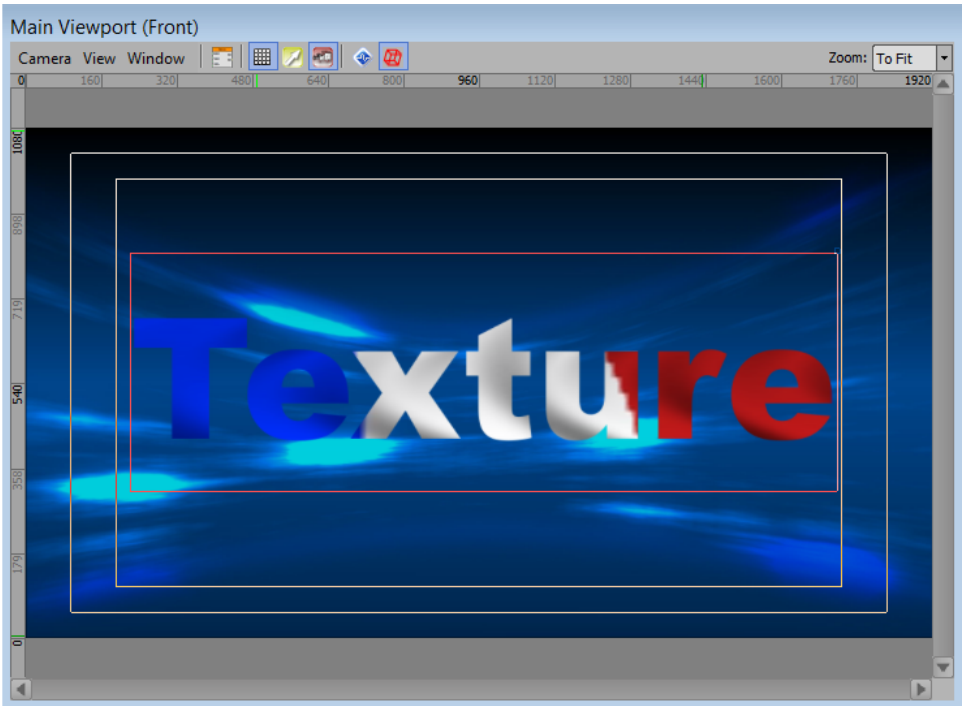
5. In the **Texture Mapping** section, from the **Mode** drop-down, select the method for applying the texture map to the text object.

   The options are:

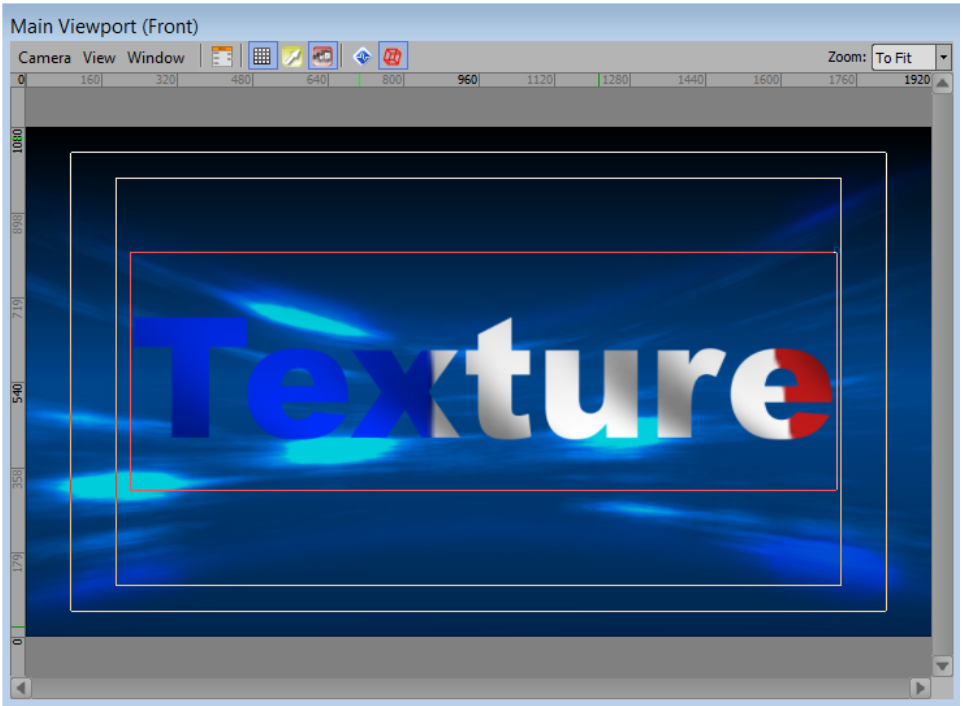
   Per Character — apply the texture map to the dimensions of each individual character of the text object.



Text Object Dimensions — apply the texture map to the dimensions of the text object.



Scene Dimensions — apply the texture map to the dimensions of the scene that contains the text object.



For More Information on...

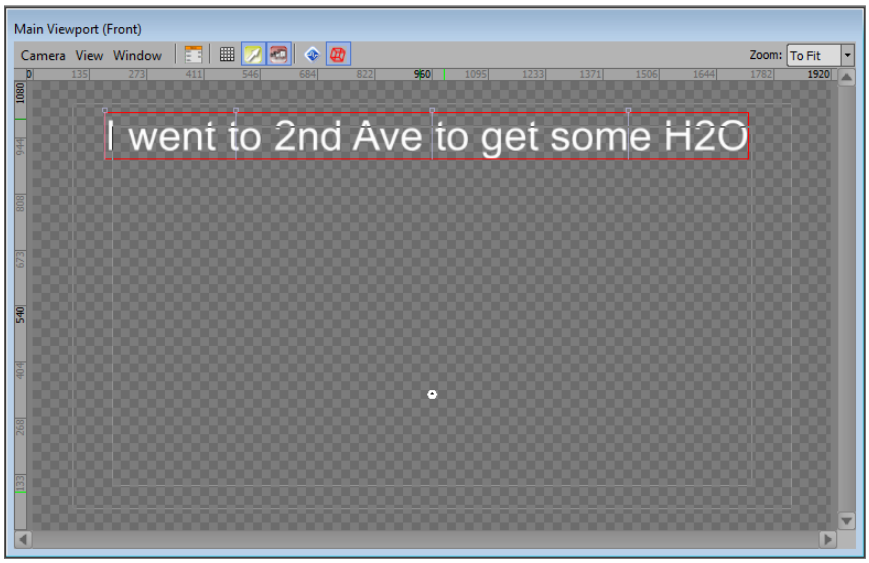
- how to add a text object to a scene, refer to Creating a Text Object.
- how to apply a material to a text object, refer Applying a Material to a Text Object.

Formatting a Text Object in the Main Viewport

Underline, superscript, and subscript font formats can be applied to 2D text objects in the Main Viewport.

To format a text object in the Main Viewport:

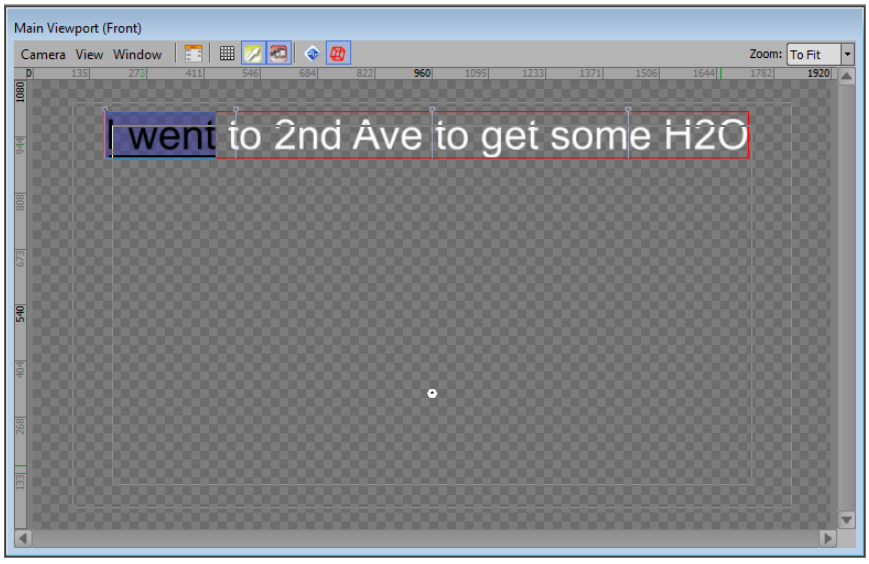
1. Create a 2D text object or open a scene or scene group that includes a 2D text object.



2. Highlight the portion of the text for applying the underline, superscript, or subscript.
3. Right-click on the highlighted text and select from the following options:

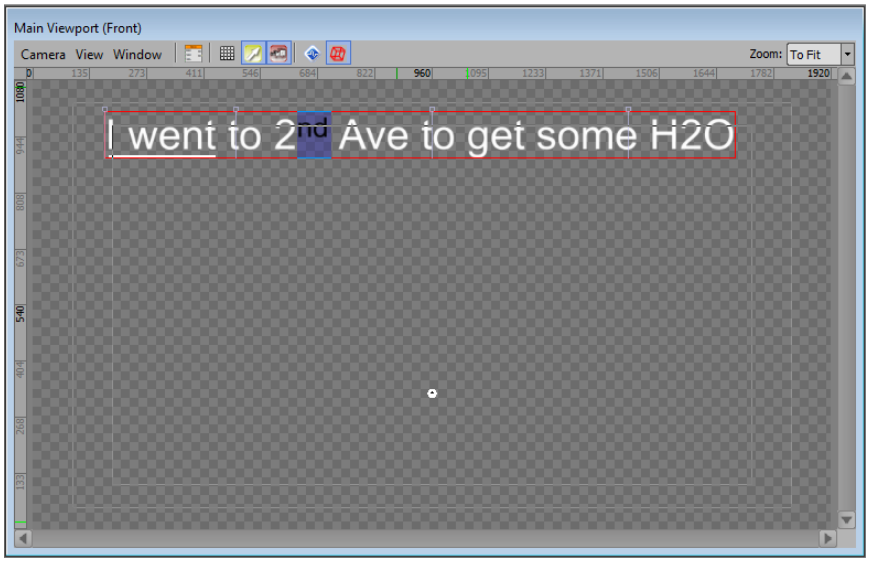
   Attributes > Underline (or **Ctrl+U**).

   The underline is applied to the highlighted text.



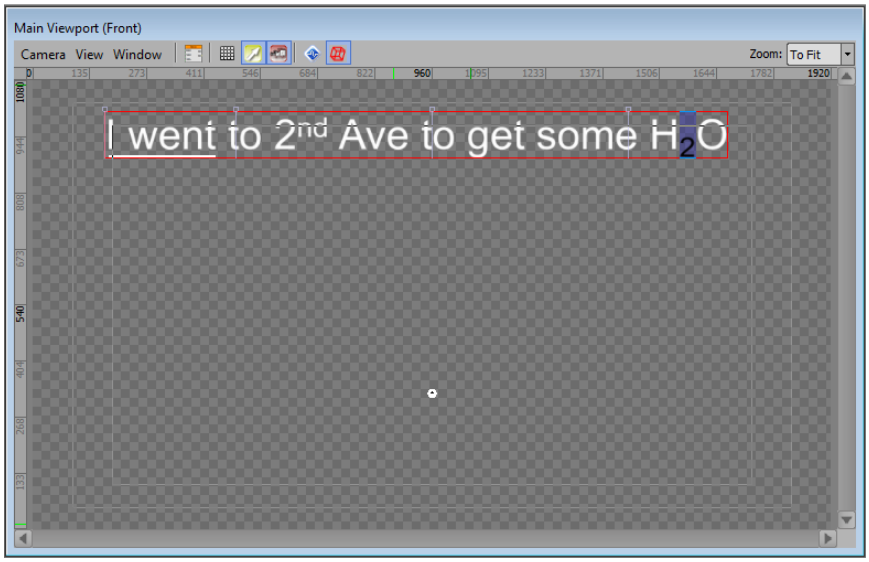
Attributes > Superscript (or **Ctrl+P**).

The superscript is applied to the highlighted text.



Attributes > Subscript (or **Ctrl+B**).

The subscript is applied to the highlighted text.



Once the underline, superscript, or subscript is applied in the Main Viewport, text typed immediately after retains settings and settings are retained when enter/return is used to add a new line.

For More Information on...

- how to add a text object to a scene, refer to Creating a Text Object.

Formatting a Text Object in the Take Inspector

Underline, superscript, and subscript font formats can be applied to 2D text objects in the Template Data tab of the Take Inspector.

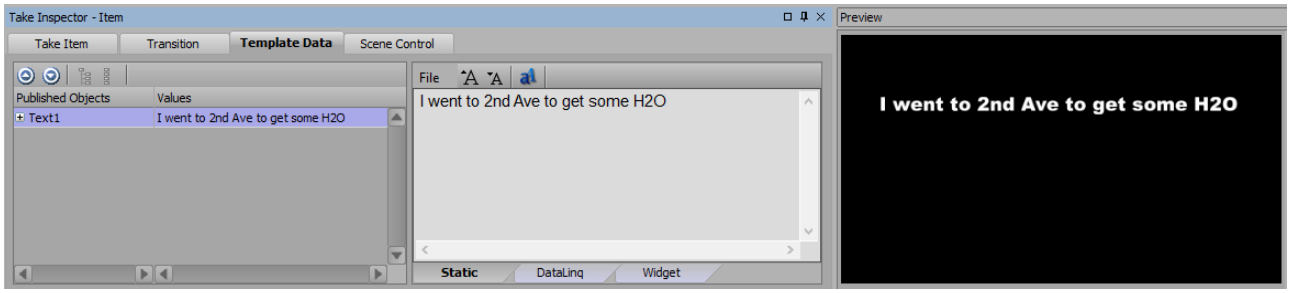
The following commands are used to apply or end underlines, superscripts, and subscripts:

- `{U}` — apply underline attribute
- `{/U}` — end underline attribute
- `{SUP}` — apply superscript attribute
- `{/SUP}` — end superscript attribute
- `{SUB}` — apply subscript attribute
- `{/SUB}` — end subscript attribute
- `{}` — end all text attributes

To apply underline, superscript, or subscript:

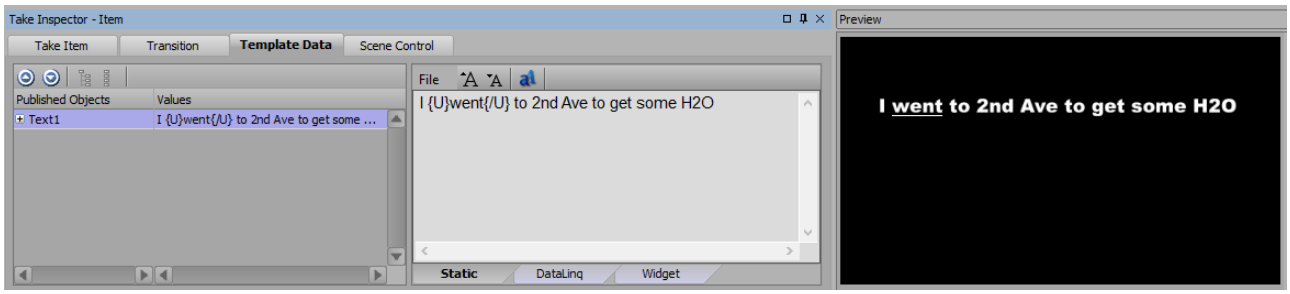
1. In the **Sequence** editor, in the **Scene Manager**, create, add, or select a scene that includes a 2D text object and drag it into the **Sequencer**.
2. In the **Take Inspector**, select the **Template Data** tab.

   The **Template Data** tab opens.



3. In the **Static** tab, place the cursor in front of the text you want to format and enter the command to apply the desired attribute.
4. Then place the cursor at the end of the text you want to format and enter the command to end the formatting.

   The attribute is applied to the selected text.



For More Information on...

- how to add a text object to a scene, refer to Creating a Text Object.

Creating a Background Object

You can insert a background object into a scene to provide a backdrop for the other objects you will add. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

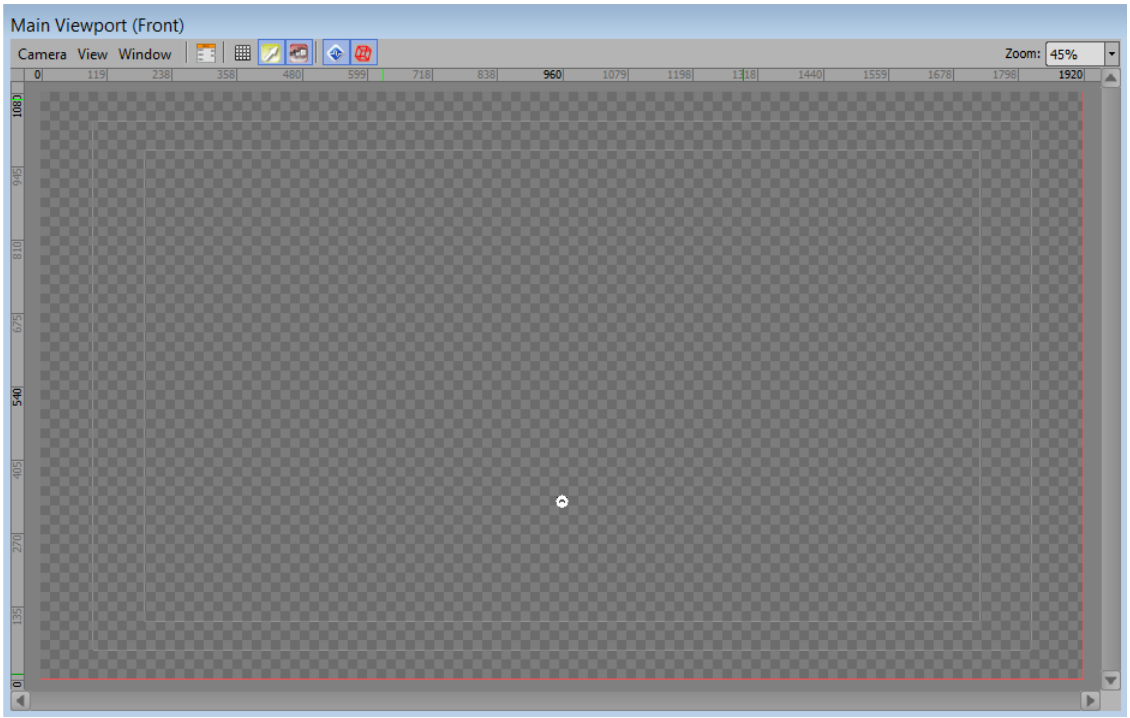
To create a background object:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a background object.

   The selected scene or scene group is displayed in the active Viewport.

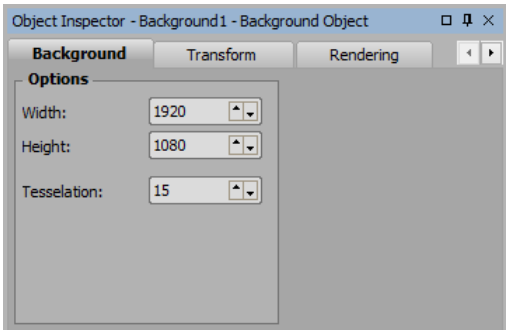
2. In the **Base Objects** section of the **Object Library**, select the **Background** icon.

   A new background object is added to the active Viewport.



3. In the **Object Inspector - Background Object**, select the **Background** tab.

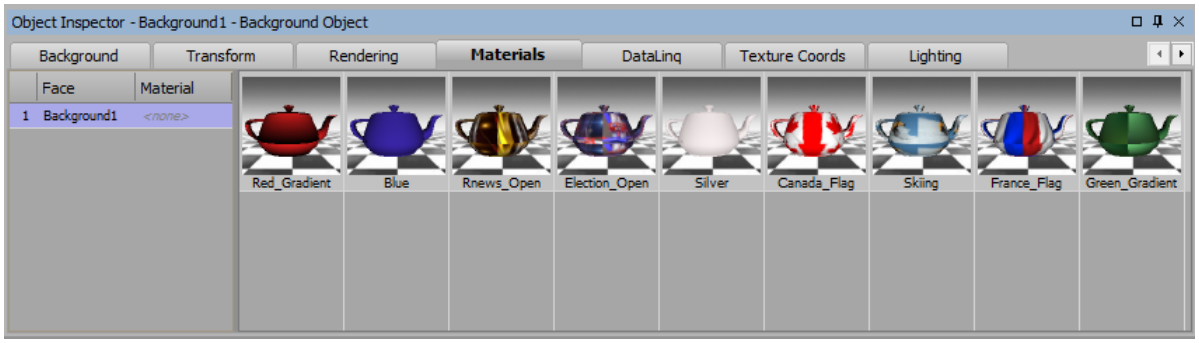
   The **Background** tab opens.



4. In the **Options** section, configure the parameters as required:
   - In the **Width** field, enter or select a value in pixels to set the width of the quad object.
   - In the **Height** field, enter or select a value in pixels to set the height of the quad object.
   - In the **Tesselation** field, enter or select the number of vertices used to construct the background object.

To apply a material to a background object:

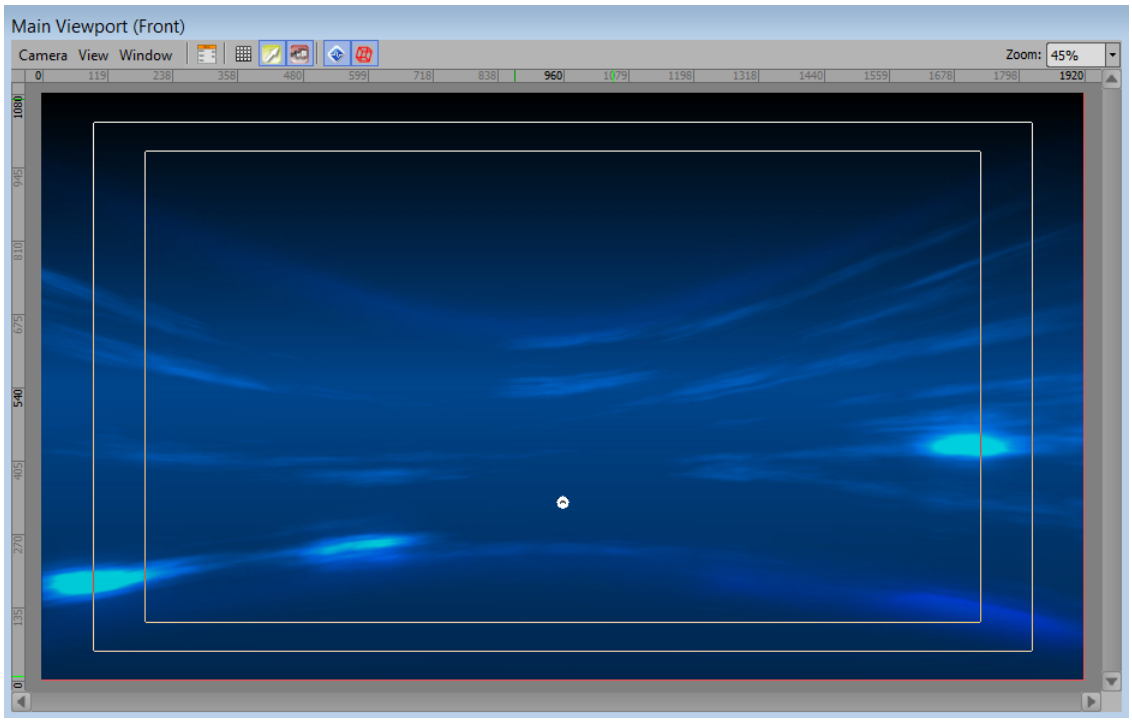
1. In the **Object Manager**, select the background object.
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. Double-click a material thumbnail to apply to the background object.

   The background is updated with the selected material.



To remove a material from a background object:

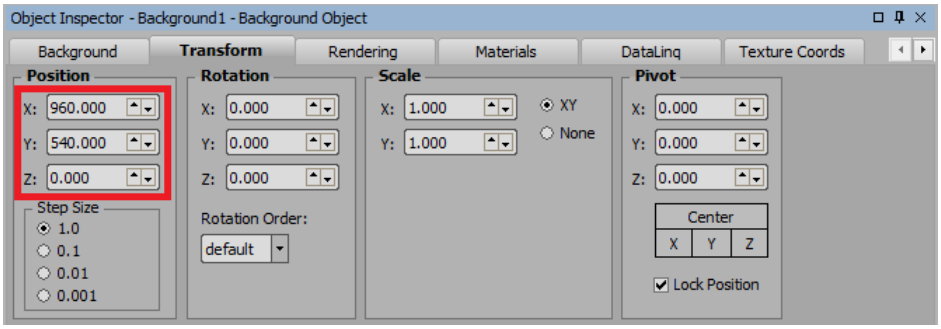
1. In the **Object Manager**, select the background object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the background object name in the **Face** column and select **Unbind** from the shortcut menu.

   The background object reverts to no applied material.

To position a background object in the Viewport:

- Press the **Ctrl** key, then select the background object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the background object.



For More Information on...

- adding continuous animation to an object, refer to Adding Continuous Animation to an Object.

Mesh Objects

XPression can build a graphic creation using 3D models imported from external 3D applications.

The following topics are discussed in this section:

Importing a .3ds, .c4d, .fbx, or .obj Model into a Scene

Adding a 3D Model to a Scene Director

Importing a .3ds, .c4d, .fbx, or .obj Model into a Scene

Model files of the type .3ds, .c4d, .fbx, and .obj are created using applications outside of XPression and can be imported to XPression to use in a scene. 3D models come with their own materials already applied, but you can change the material and the object can be re-sized and positioned anywhere within the Viewport.

When importing .c4d models, the models must have keyframes already baked in.

To import a .3ds, .c4d, .fbx, or .obj model into a scene:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a .3ds, .c4d, .fbx, or .obj model object.

   The selected scene or scene group is displayed in the active Viewport.

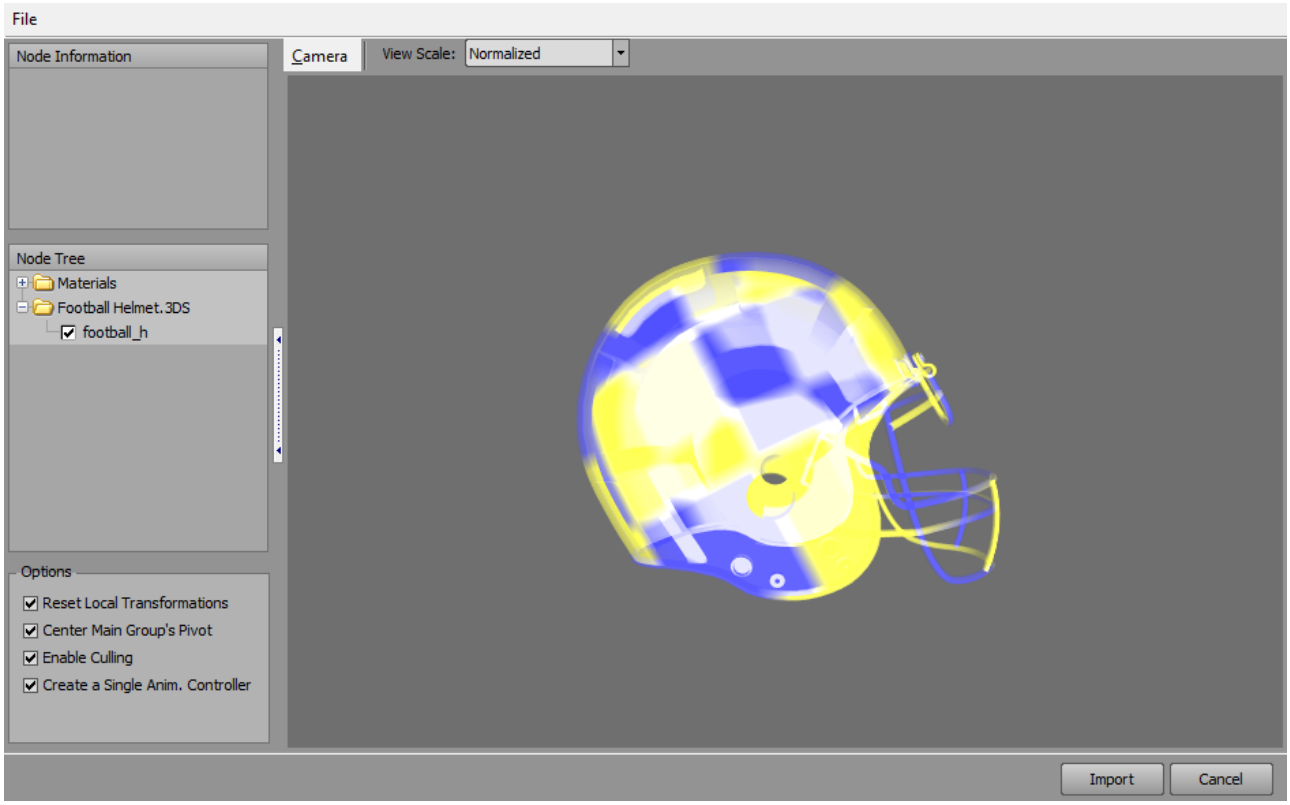
2. In the **Mesh Objects** section of the **Object Library**, select the **3D Model** object icon.

   Alternatively, you can select **File > Import > Model**.

   The **Open** dialog opens.

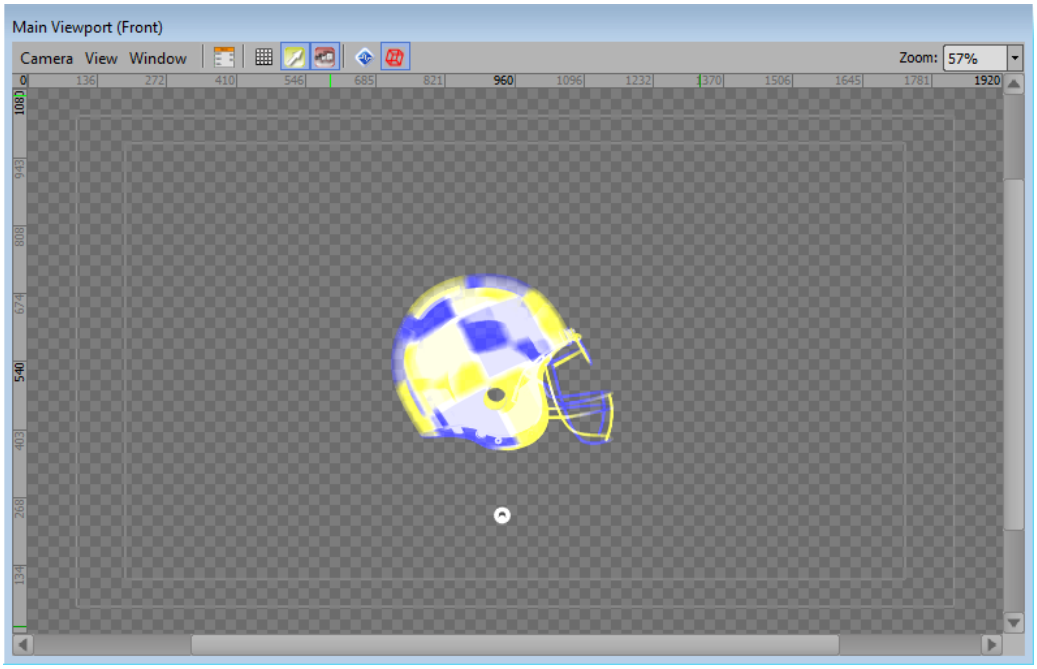
3. In the **Open** dialog, locate and select the model file to import into the current scene and select **Open**.

   The **XPression Model Importer** dialog opens.



4. In the **Options** section, do the following:
   - Select **Reset Local Transformations** to reset the position, rotation, and scale of each part of the model to its default (selected by default).
   - Select **Center Main Group's Pivot** to move the pivot point of the main model group to the center of its geometry (selected by default).
   - Select **Enable Culling** to render only the front-facing polygons of the model (selected by default).
   - Select **Create a Single Anim. Controller** to create one animation controller to contain all animations of the model (required for .c4d and .fbx models).
5. Select **Import**.

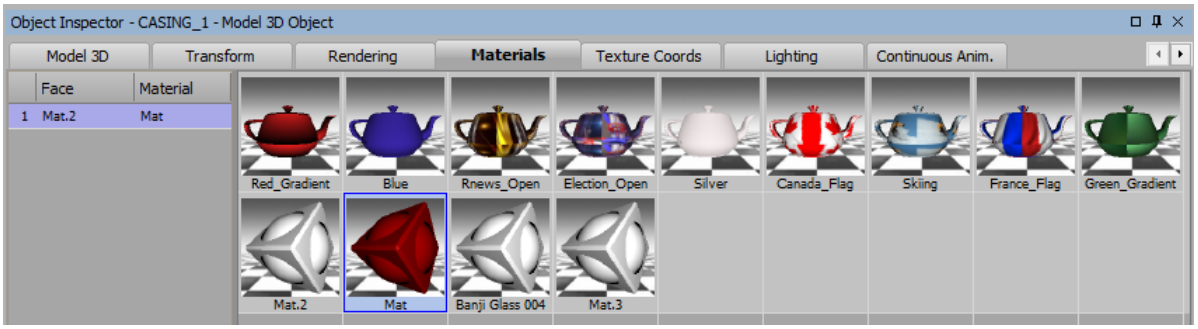
   The model is imported into XPression and placed at the center of the active Viewport.



To apply a material to a 3D model object:

1. In the **Object Manager**, select the 3D model object.

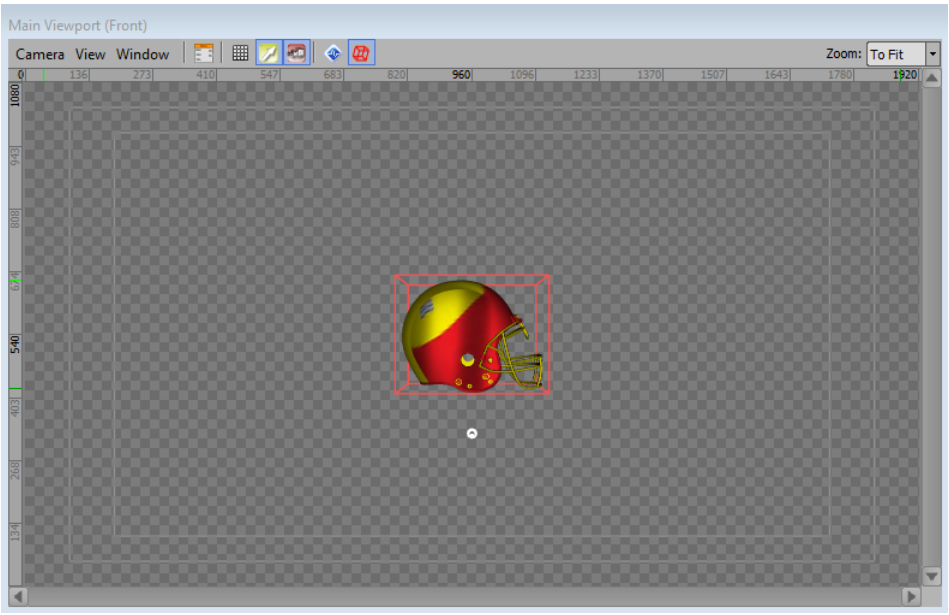
   Depending on the model, you may have to select a component of the model to apply a material.
2. In the **Object Inspector**, select the **Materials** tab.



   ★Materials can also be applied using the **Materials Manager**.
3. In the **Face** column, select one or more of the elements from the selected model or component to apply a material.

4. After selecting the initial element, press **Shift** and select another element to select all elements between the two selections or press **Ctrl** and select individual elements to add them to the original selection.
5. Double-click a material thumbnail to apply to the model or component.

   The selected elements are updated with the selected material.



To remove an applied material from an element:

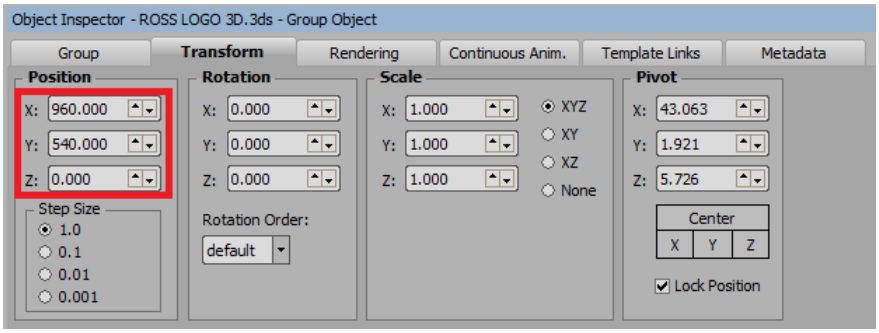
1. In the **Object Manager**, select the 3D model object containing the material you want to remove.
2. In the **Material Manager**, right-click the element names in the **Face** column and select **Unbind** from the shortcut menu.

   All material is removed from the selected elements.

To position the 3D Model object in the Viewport:

- Press the **Ctrl** key, then select the 3D model object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the 3D model object.



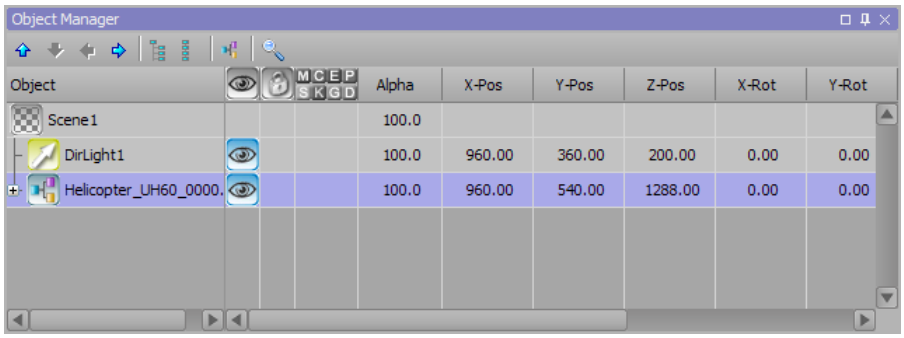
Adding a 3D Model to a Scene Director

Dragging and dropping a multi-file OBJ 3D model onto a Scene Director allows for the playout of 3D model rendered animation.

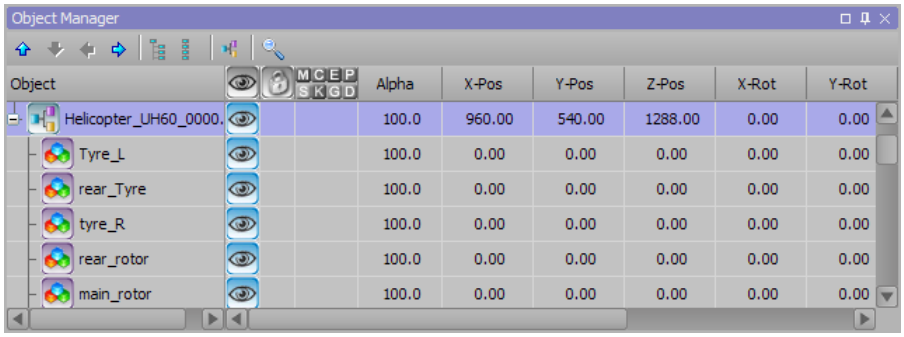
To add a 3D Model to a Scene Director:

1. Import a multi-file 3D model into a scene.

   The 3D model group object is added to the **Object Manager**.

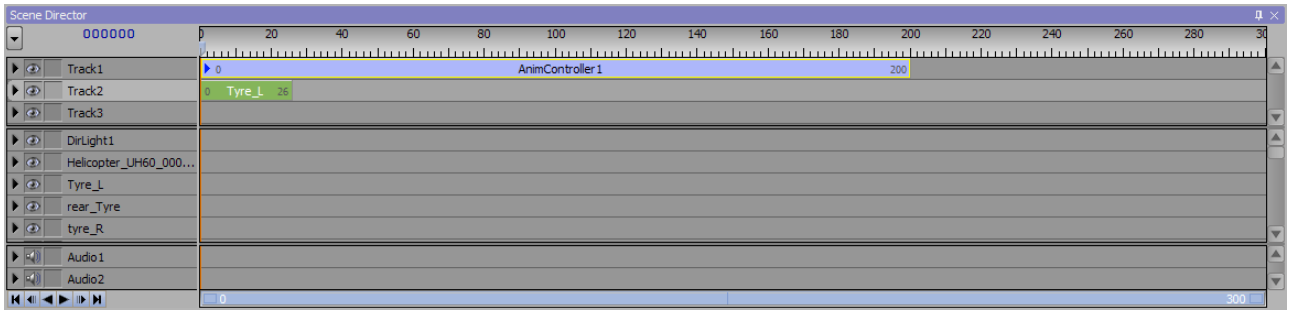


2. In the **Object Manager**, expand the 3D model group object.



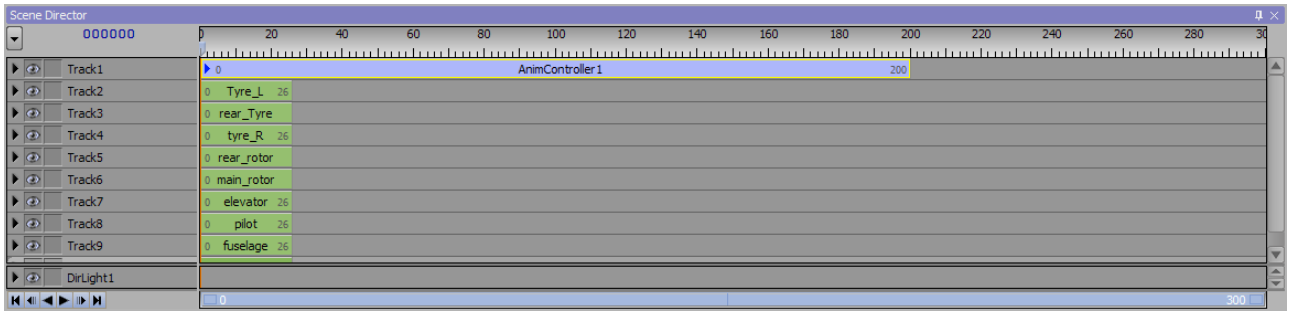
3. Drag and drop a 3D model object node onto a **Scene Director** track.

   The 3D model object is added to the **Scene Director** track.



4. Add the remaining 3D model object nodes.

   Each node should be placed on its own track, to align object playback properly in time.



Primitives

The primitives available in XPression to build a graphic creation include quads, spheres, cubes, cylinders, tori, slabs and lines.

The following topics are discussed in this section:

Creating a Quad Object

Creating a Sphere Object

Creating a Cube Object

Setting the Culling Mode for a Cube Object

Creating a Cylinder Object

Creating a Torus Object

Creating a Slab Object

Setting the Culling Mode for a Slab Object

Creating a Lines Object

Creating a Quad Object

You can insert a quad object into a scene to use as a surface for displaying an image, video, or text, or to be combined with other objects. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

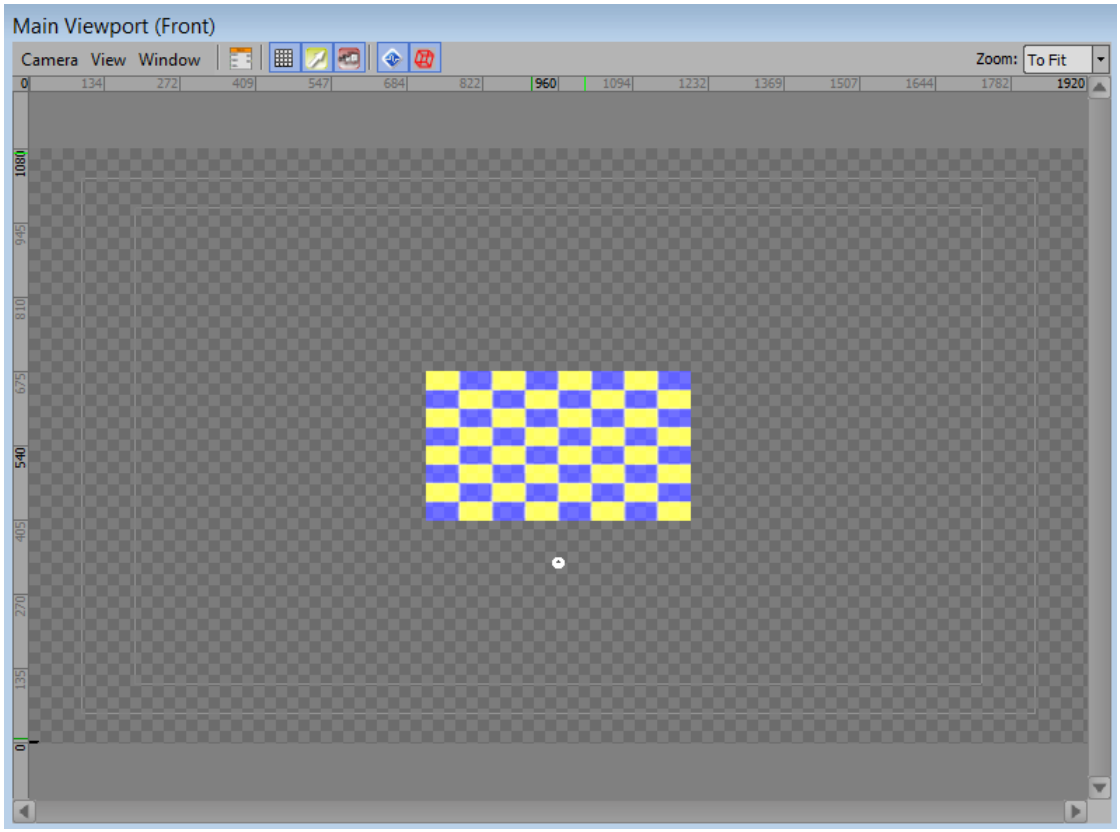
To create a Quad object:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a quad object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Quad** object.

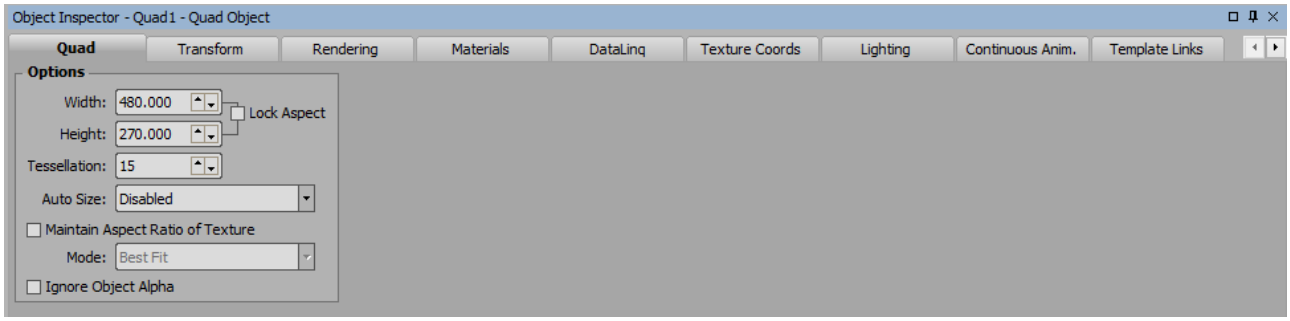
3. A new quad object is added to the center of the active Viewport.



   The new quad object is displayed as a wire frame mesh until a material is applied to it.

4. In the **Object Inspector**, select the **Quad** tab.

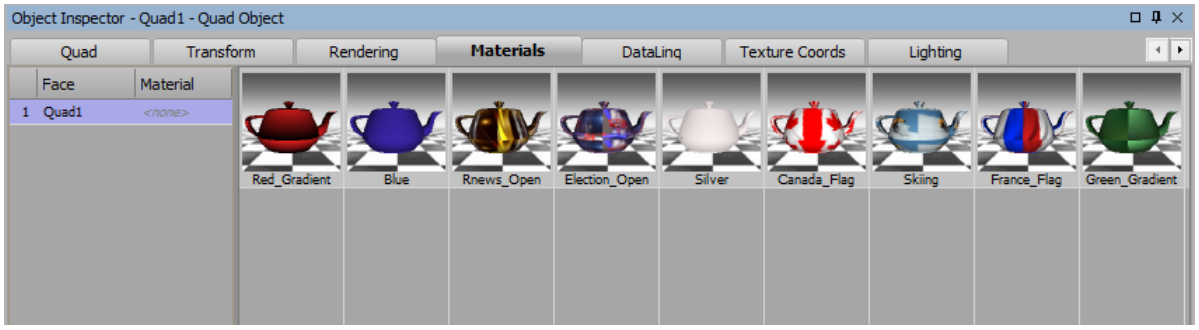
   The **Quad** tab opens.



5. In the **Options** section, configure the parameters as required:
   - In the **Width** field, enter or select a value in pixels to set the width of the quad object.
   - In the **Height** field, enter or select a value in pixels to set the height of the quad object.
   - Select the **Lock Aspect** checkbox to maintain the aspect ratio between the width and height of a quad object when changing the value in the **Width** field.
   - In the **Tesselation** field, enter or select the number of vertices used to construct a quad object.
   - From the **Auto Size** drop-down, select one of the following auto-size options for the quad object:
     - **Disabled** — disable auto-sizing of the quad object.
     - **On Material Assign Only** — automatically re-size the dimensions of a quad object to the size of the material applied to the quad object at the time the material is assigned.
     - **On Material Resize** — re-size the dimensions of a quad object when an applied material assigned to the quad object is re-sized.
   - Select the **Maintain Aspect Ratio of Texture** checkbox to maintain the aspect ratio of the texture when it is applied to the quad object and from the **Mode** drop-down, adjust the aspect according to one of the following options:
     - **Best Fit** — adjust the aspect of the texture to best fit within the dimensions of the quad. This is the default setting.
     - **Best Fit (Cropped)** — crop the texture to best fit within the dimensions of the quad.
     - **Fit Width** — adjust the aspect of the texture according to width.
     - **Fit Height** — adjust the aspect of the texture according to height.
     - **Crop** — crop the texture within the dimensions of the quad.
6. Select the **Ignore Object Alpha** checkbox so that the material will not be influenced by the alpha level of the quad object.

To apply a material to a quad object:

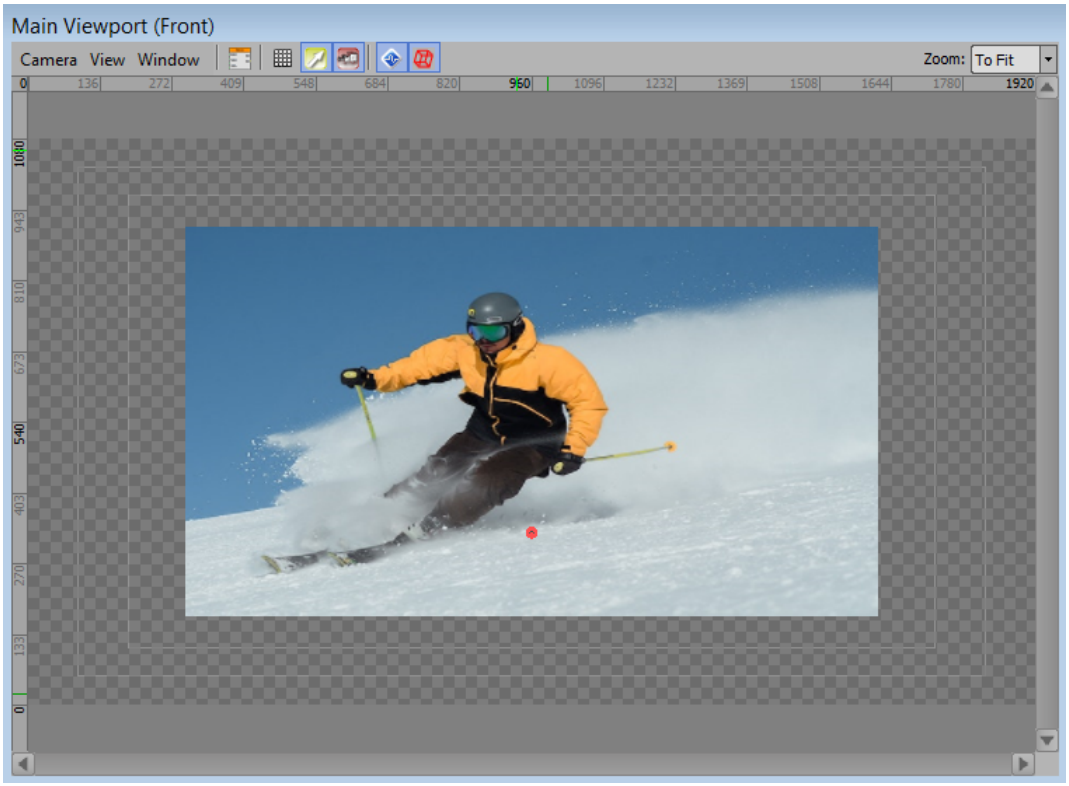
1. In the **Object Manager**, select the quad object.
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. Double-click a material thumbnail to apply to the quad object.

   The surface of the quad object is covered with the selected material.



To remove a material from a quad object:

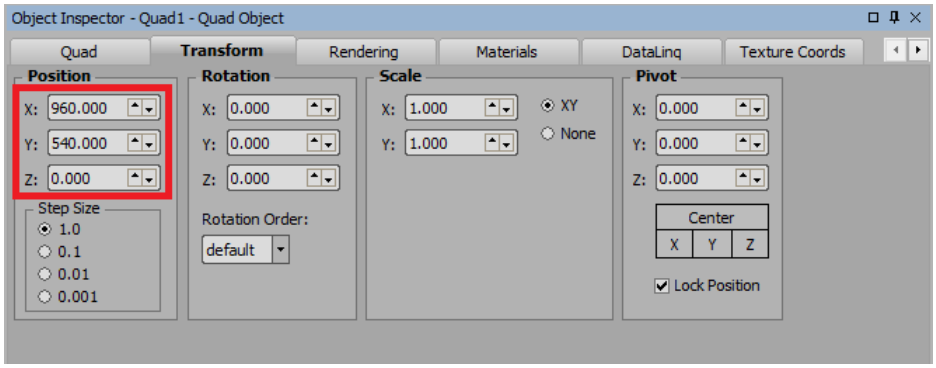
1. In the **Object Manager**, select the quad object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the quad object name in the **Face** column and select **Unbind** from the shortcut menu.

   Without a material, quad objects are displayed as a wire frame mesh.

To position the quad object in the Viewport:

- Press the **Ctrl** key, then select the quad object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the quad object.



Creating a Sphere Object

You can insert a sphere object into a scene to use as a surface for displaying an image, video, or text, or to be combined with other objects. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

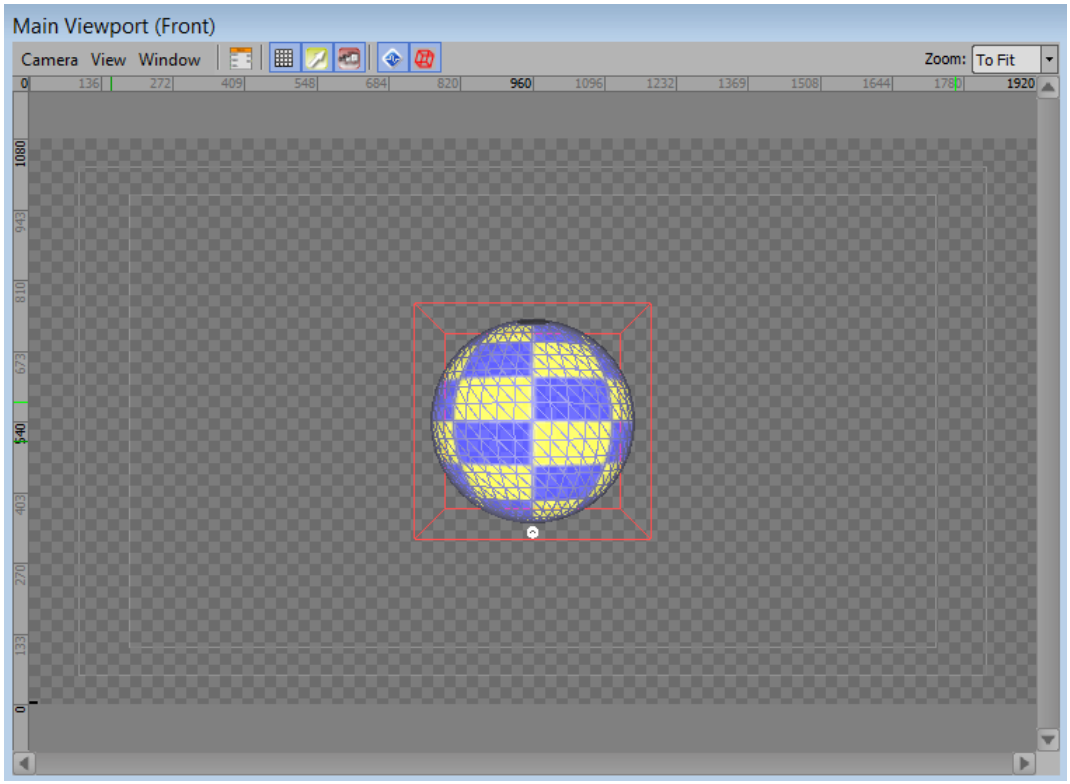
To create a sphere object:

1. In the Scene Manager, select the scene or scene group to which you want to add a sphere object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Sphere** object.

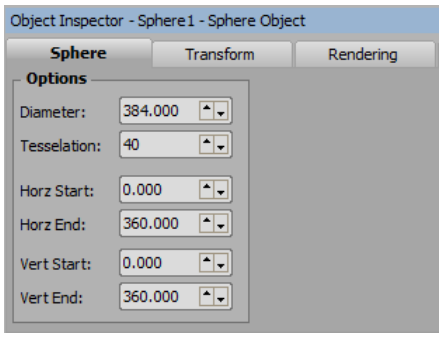
   A new sphere object is added to the center of the active Viewport.



   The new sphere object is displayed as a wire frame mesh until a material is applied to it.

3. In the **Object Inspector**, select the **Sphere** tab.

   The **Sphere** tab opens.



4. In the **Options** section, in the **Diameter** field, enter or select a value in pixels to set the diameter of the sphere object.
5. In the **Tesselation** field, enter or select the number of vertices used to construct the sphere object.

   ★The number of vertices used to construct a sphere object is directly related to the quality and smoothness of the sphere object. More vertices equals a higher quality sphere object with a smoother surface, but may compromise output performance.
6. In the **Horz Start** and **Horz End** fields, enter or select values to define the horizontal surface area of the sphere to be covered by a material.

   For example, if you enter a **Horz Start** of **0** and a **Horz End** of **180**, while the **Vert Start** and **Vert End** fields are set to **0**, half of the sphere's horizontal surface will be covered by a material when it is applied.
7. In the **Vert Start** and **Vert End** fields, enter or select values to define the vertical surface area of the sphere to be covered by a material.

   For example, if you enter a **Vert Start** of **0**, and a **Vert End** of **90**, while the **Horz Start** and **Horz End** fields are set to **0**, one quarter of the sphere's vertical surface will be covered by a material when it is applied.

   You will need to rotate the sphere in the Viewport to see the effect of these settings.

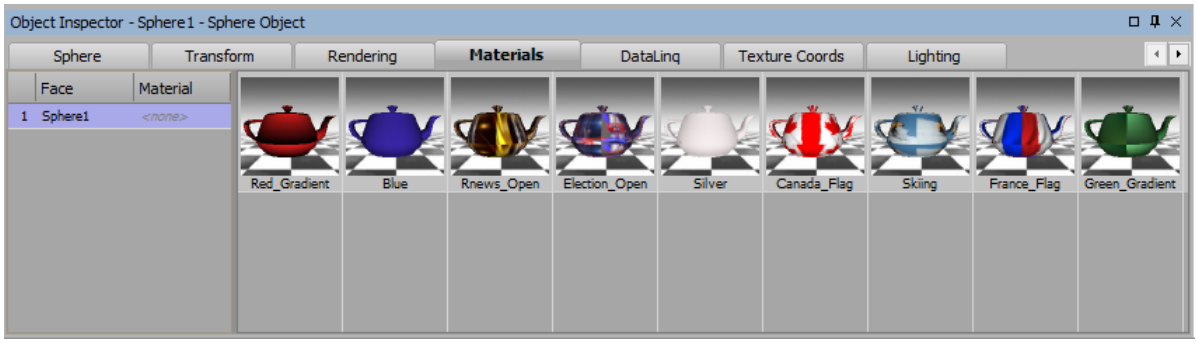
To rotate a sphere object:

1. From the toolbar, select the **Rotation** tool or press **Ctrl+E**.

   In the center of the sphere, you will see a smaller sphere with crosshairs.
2. Hover your cursor over the green crosshair until it is highlighted and then select it.
3. Move the cursor to the left or right to rotate the sphere horizontally.
4. Hover your cursor over the red crosshair until it is highlighted and then select it.
5. Move the cursor up or down to rotate the sphere vertically.
6. To return the rotation to the starting point, in the **Object Inspector**, in the **Transform** tab, in the **Rotation** section, set the **X**, **Y**, and **Z** rotation values to **0**.

To apply a material to a sphere object:

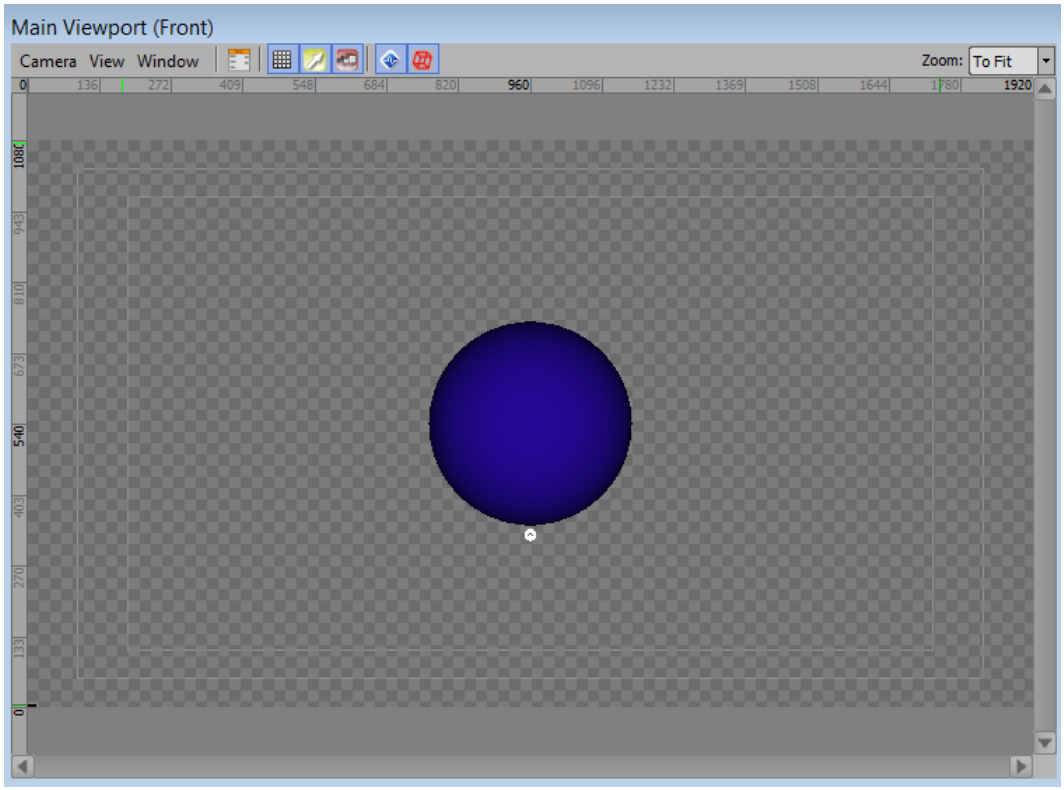
1. In the **Object Manager**, select the sphere object.
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. Double-click a material thumbnail to apply to the sphere object.

   The surface of the sphere object is covered with the selected material.



To remove a material from a sphere object:

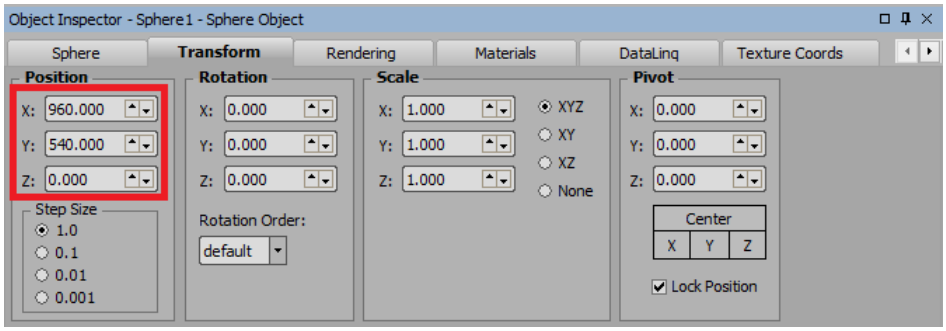
1. In the **Object Manager**, select the sphere object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the sphere object name in the **Face** column and select **Unbind** from the shortcut menu.

   Without a material, sphere objects are displayed as a wire frame mesh.

To position a sphere object in the Viewport:

- Press the **Ctrl** key, then select the sphere object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the sphere object.



Creating a Cube Object

You can insert a cube object into a scene to use as a surface for displaying an image, video, or text, or to be combined with other objects. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

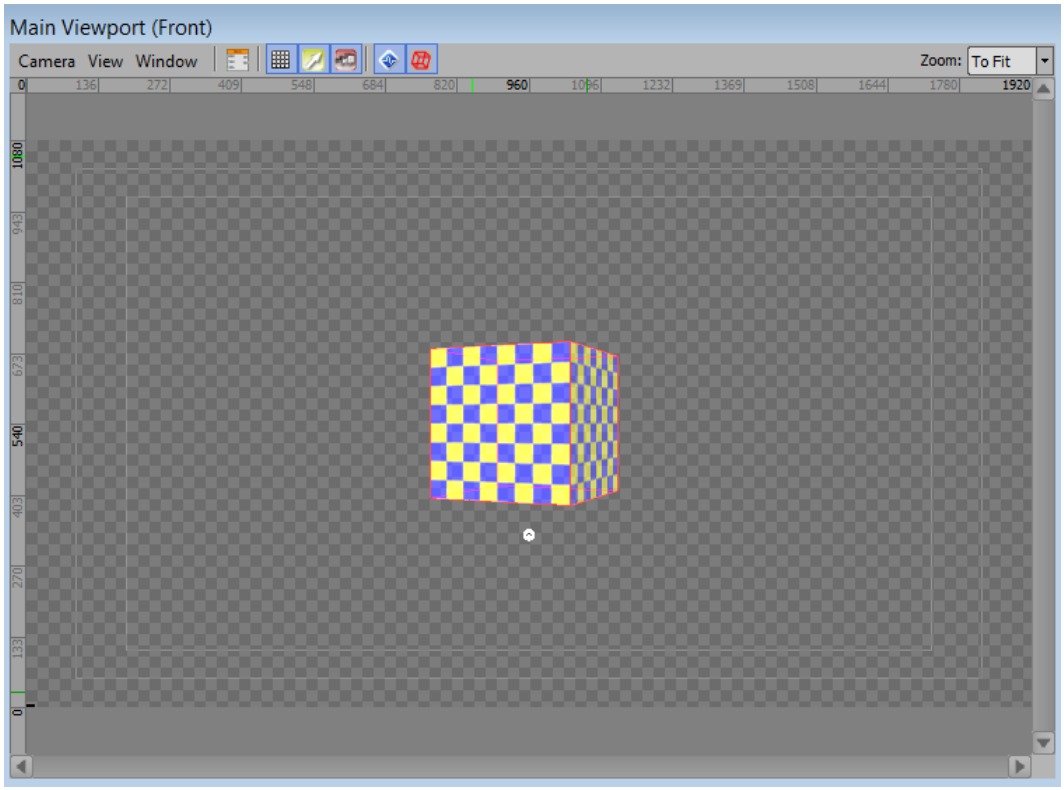
To create a Cube object:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a cube object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Cube** object.

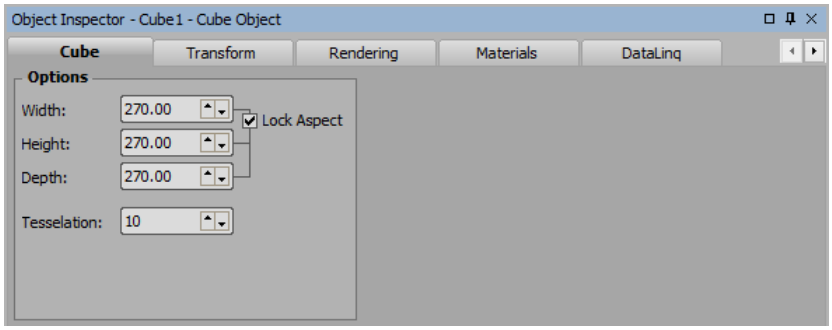
   A new cube object is added to the center of the active Viewport.



   The new cube object is displayed as a wire frame mesh until a material is applied to it.

3. In the **Object Inspector**, select the **Cube** tab.

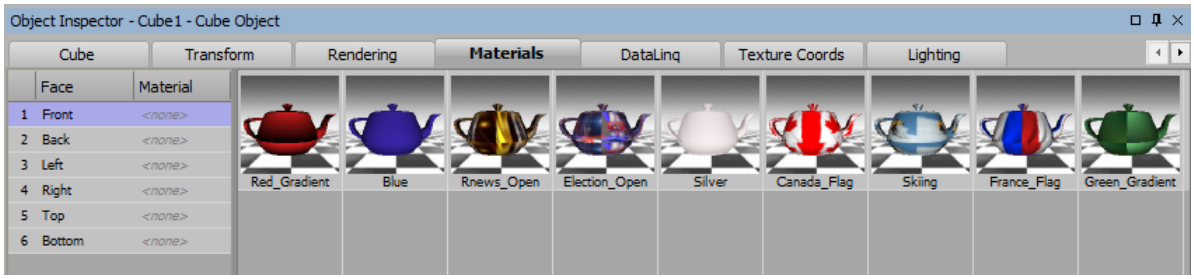
   The **Cube** tab opens.



4. In the **Options** section, in the **Width** field, enter or select a value in pixels to set the width of the cube object.
5. In the **Height** field, enter or select a value in pixels to set the height of the cube object.
6. In the **Depth** field, enter or select a value in pixels to set the depth of the cube object.
7. In the **Tesselation** field, enter or select the number of vertices used to construct a cube object.

To apply a material to a cube object:

1. In the **Object Manager**, select the cube object.
2. In the **Object Inspector**, select the **Materials** tab.



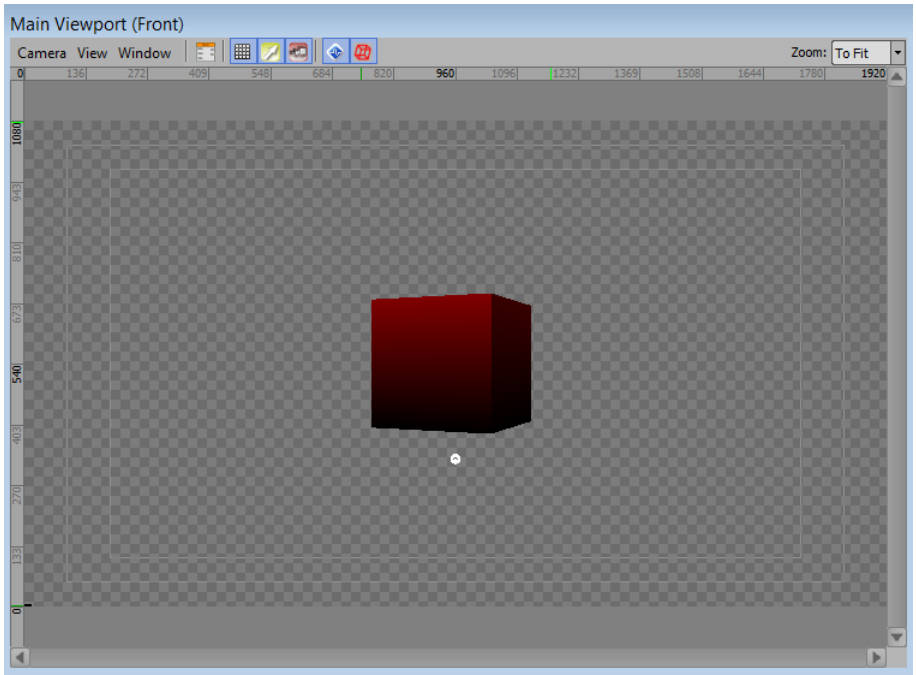
★Materials can also be applied using the **Materials Manager**.

3. In the **Face** column, select one or more cube faces to which to apply the material.

   After selecting the initial cube face, press **Shift** and select another face to select all the faces between the two selections or press **Ctrl** and select individual faces to add them to the original selection.

4. Double-click a material thumbnail to apply to the cube object.

   The selected cube faces are covered with the selected material.



To remove a material from a cube object:

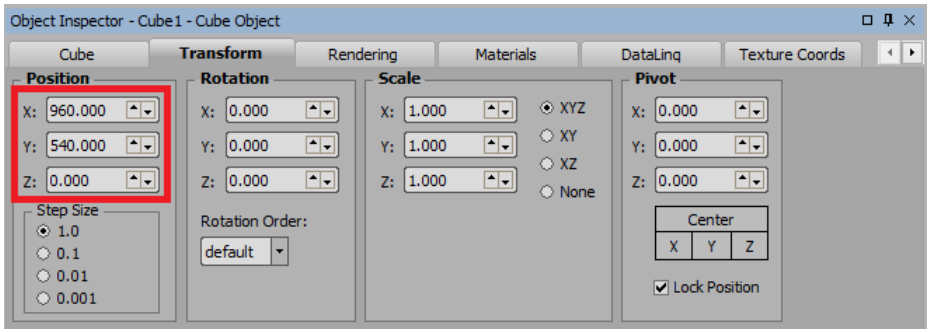
1. In the **Object Manager**, select the cube object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the the cube faces in the **Face** column and select **Unbind** from the shortcut menu.

   Without a material, cube objects are displayed as a wire frame mesh.

To position the cube object in the Viewport:

- Press the **Ctrl** key, then select the cube object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the cube object.

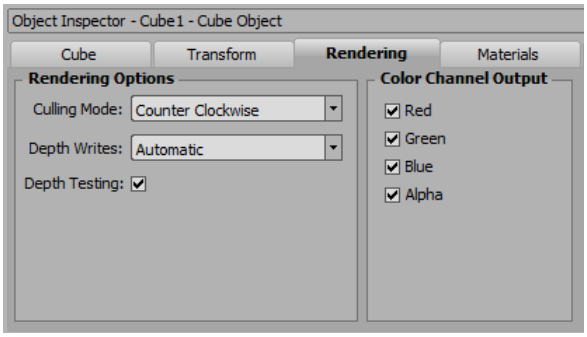


Setting the Culling Mode for a Cube Object

To set the culling mode for a cube object:

1. Add a cube object to a scene.
2. Select the new cube object.
3. In the **Object Inspector - Cube Object** window, select the **Rendering** tab.

   The **Rendering** tab opens.



4. From the **Culling Mode** drop-down, select the culling mode for the selected cube object.

   The available culling modes are:

   - **None** — do not cull the faces of a cube. This mode renders all faces of a cube object, even the faces that are not visible.
   - **Clockwise** — cull the back faces of a cube object that have clockwise vertices. In this mode, material is applied to the inside of a cube object.
   - **Counter Clockwise** — cull the back faces of a cube object that have counter clockwise vertices. In this mode, material is applied to the outside of a cube object.

   The **Clockwise** and **Counter Clockwise** culling modes decrease the time required to render a scene.

5. From the **Depth Writes** drop-down, select whether or not to render the hidden parts of a cube object.

   The available options are:

   - **Enabled** — do not display the hidden parts of a cube object.
   - **Disabled** — display the hidden parts of a cube object.
   - **Automatic** — use the set rendering method to control determine whether or not to display the hidden parts of a cube object.

6. Select the **Depth Testing** checkbox to use depth values to determine whether an object is displayed on top or behind other objects.

   Clear this checkbox to disable depth testing and use the render order of an object to determine whether an object is displayed on top or behind other objects.

7. Use this section to set the channels to display on an output source for a material.

   Red — display the red channel on an output source.

   Green — display the green channel on an output source.

   Blue — display the blue channel on an output source.

   Alpha — display the alpha channel on an output source.

For More Information on...

- how to add a cube object to a scene, refer to the procedure Creating a Cube Object.

Creating a Cylinder Object

You can insert a cylinder object into a scene to use as a surface for displaying an image, video, or text, or to be combined with other objects. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

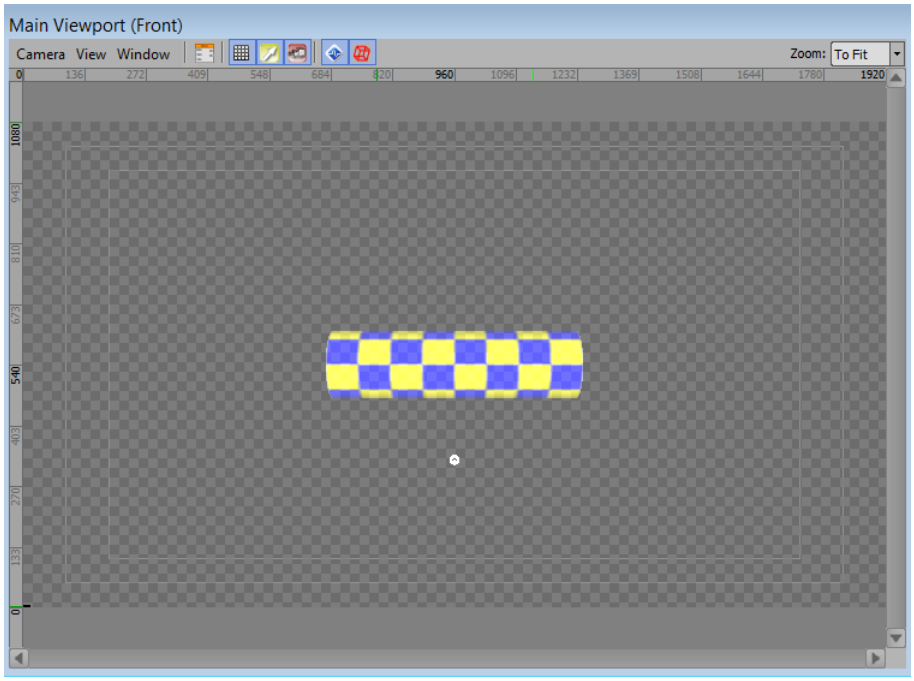
To create a Cylinder object:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a cylinder object.

   The selected scene or scene group is displayed in the active Viewport.

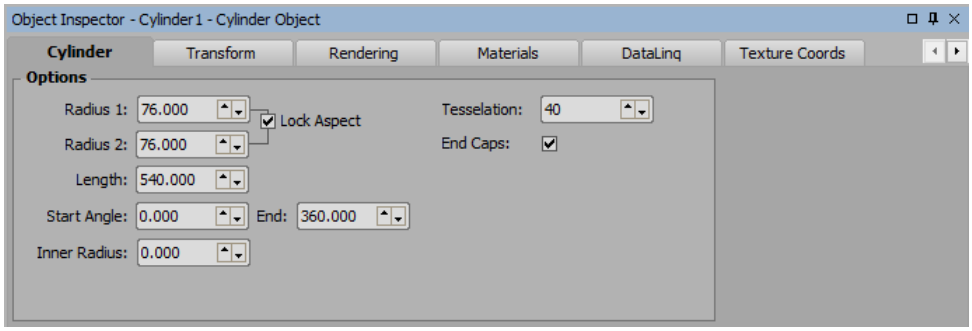
2. In the **Primitives** section of the **Object Library**, select the **Cylinder** object.

   A new cylinder object is added to the center of the active Viewport. The cylinder object is displayed as a wire frame mesh until a material is applied to it.



3. In the **Object Inspector**, select the **Cylinder** tab.

   The **Cylinder** tab opens.



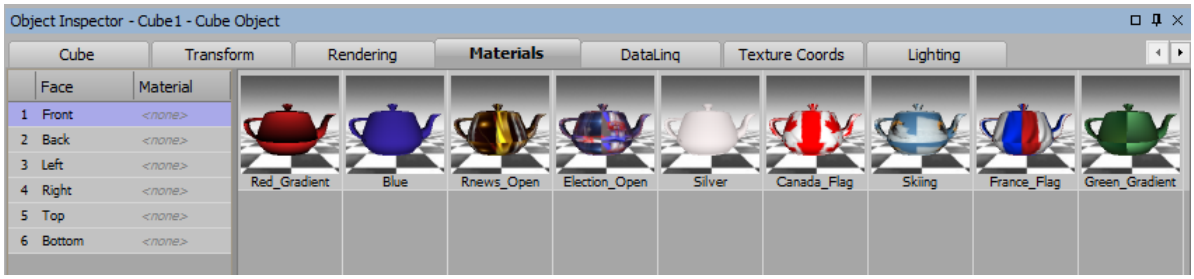
4. In the **Options** section, configure the options as required:

   - In the **Radius 1** and **Radius 2** fields, enter or select a value in pixels to set the radii of the cylinder object.

- Select the **Lock Aspect** checkbox to maintain the aspect ratio between the radii of a cylinder object when changing the value in the **Radius 1** field.
- In the **Length** field, enter or select a value in pixels to set the length of the cylinder object.
- In the **Start Angle** and **End** fields, enter or select a value in degrees for the start and end of the angle relative to the X axis of the cylinder object.
- In the **Inner Radius** field, enter or select an inner radius value to create hollow cylinders.
- In the **Tesselation** field, enter or select a number of vertices to construct the cylinder object.
- Select the **End Caps** checkbox to add a face to the ends of the cylinder object.

To apply a material to a cylinder object:

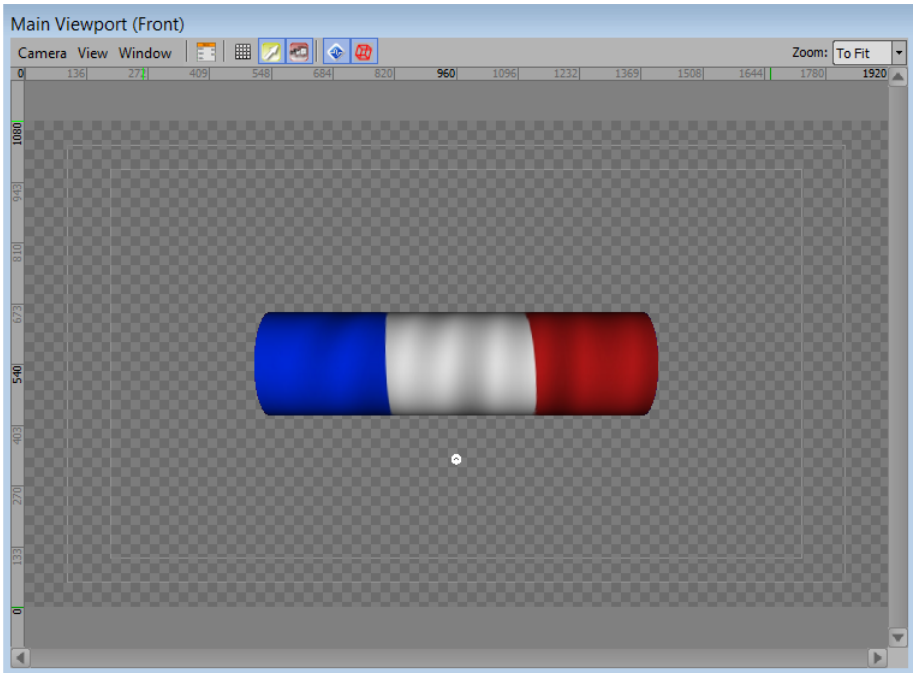
1. In the **Object Manager**, select the cylinder object.
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. In the **Face** column, select 1 or more cylinder faces to which to apply the material.
4. After selecting the initial cylinder face, press **Shift** and select another face to select all the faces between the 2 selections or press **Ctrl** and select individual faces to add them to the original selection.
5. Double-click a material thumbnail to apply to the cylinder object.

   The selected cylinder faces are covered with the selected material.



To remove a material from a cylinder object:

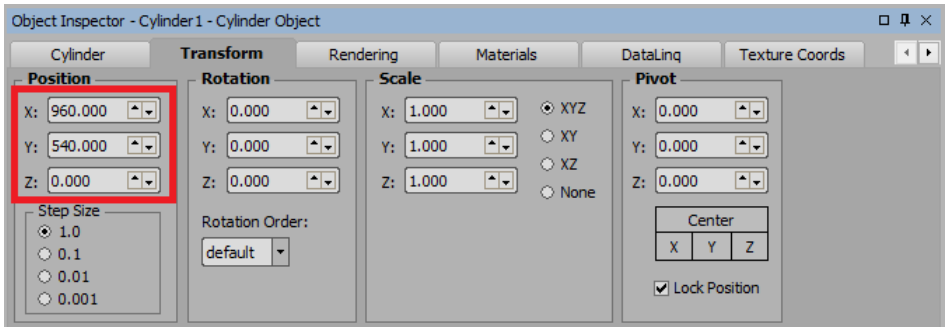
1. In the **Object Manager**, select the cylinder object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the the cylinder faces in the **Face** column and select **Unbind** from the shortcut menu.

   Without a material, cylinder objects are displayed as a wire frame mesh.

To position the cylinder object in the Viewport:

- Press the **Ctrl** key, then select the cylinder object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the cylinder object.



Creating a Torus Object

You can insert a torus object into a scene to use as a surface for displaying an image, video, or text, or to be combined with other objects. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

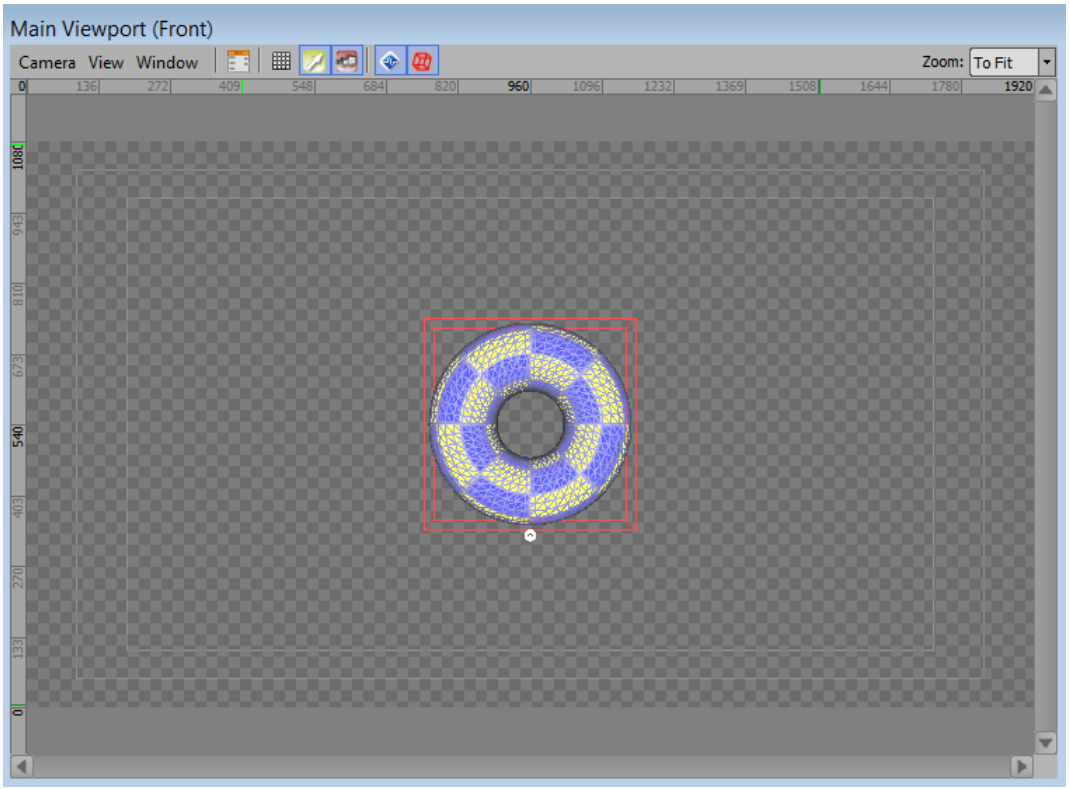
To create a Torus object:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a torus object.

   The selected scene or scene group is displayed in the active Viewport.

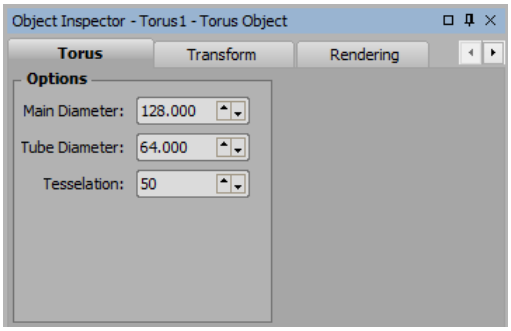
2. In the **Primitives** section of the **Object Library**, select the **Torus**  object.

   A new torus object is added to the center of the active Viewport. The torus object is displayed as a wire frame mesh until a material is applied to it.



3. In the **Object Inspector**, select the **Torus** tab.

   The **Torus** tab opens.

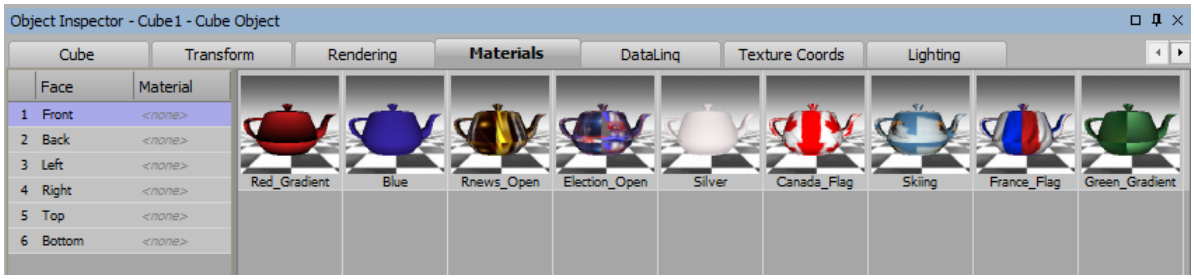


4. In the **Options** section, configure the options as required:

- In the **Main Diameter** field, enter or select a value in pixels to set the diameter of the center of the torus object.
- In the **Tube Diameter** field, enter or select a value in pixels to set the diameter of the tube of the torus object.
- In the **Tesselation** field, enter or select a number of vertices to construct the torus object.

To apply a material to a torus object:

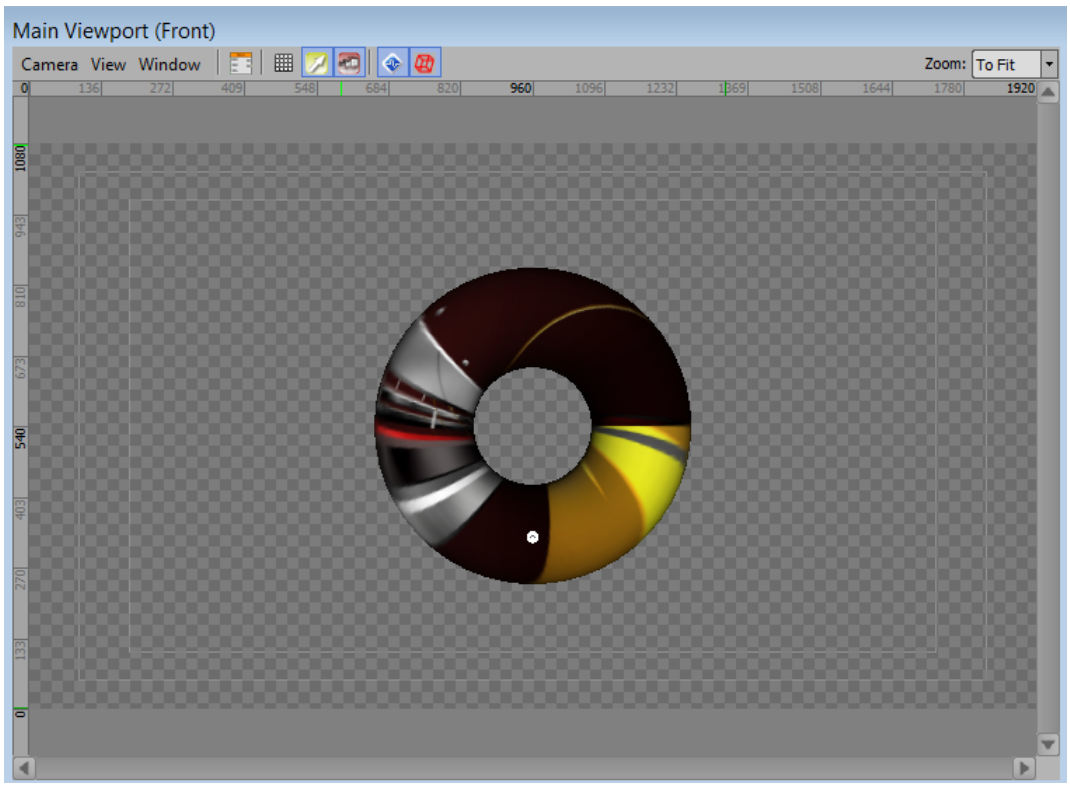
1. In the **Object Manager**, select the torus object.
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. Double-click a material thumbnail to apply to the torus object.

   The torus object is covered with the selected material.



To remove a material from a torus object:

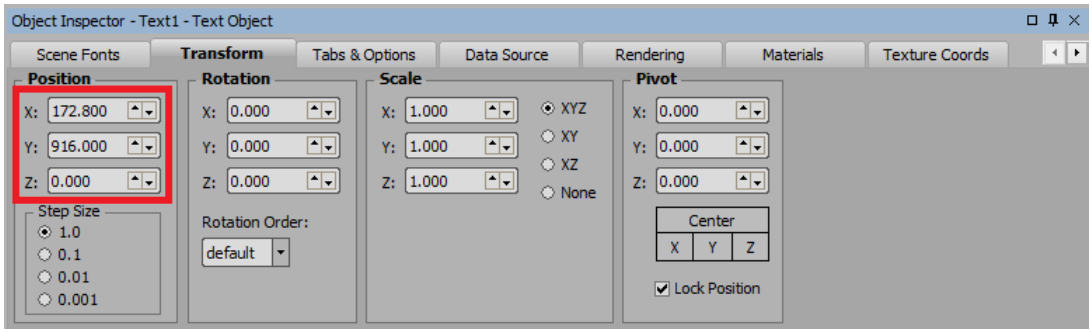
1. In the **Object Manager**, select the torus object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the the torus face in the **Face** column and select **Unbind** from the shortcut menu.

   Without a material, torus objects are displayed as a wire frame mesh.

To position the torus object in the Viewport:

- Press the **Ctrl** key, then select the torus object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the torus object.



Creating a Slab Object

You can insert a slab object into a scene to use as a surface for displaying an image, video, or text, or to be combined with other objects. A material can be added to the object and it can be resized and positioned anywhere within the Viewport.

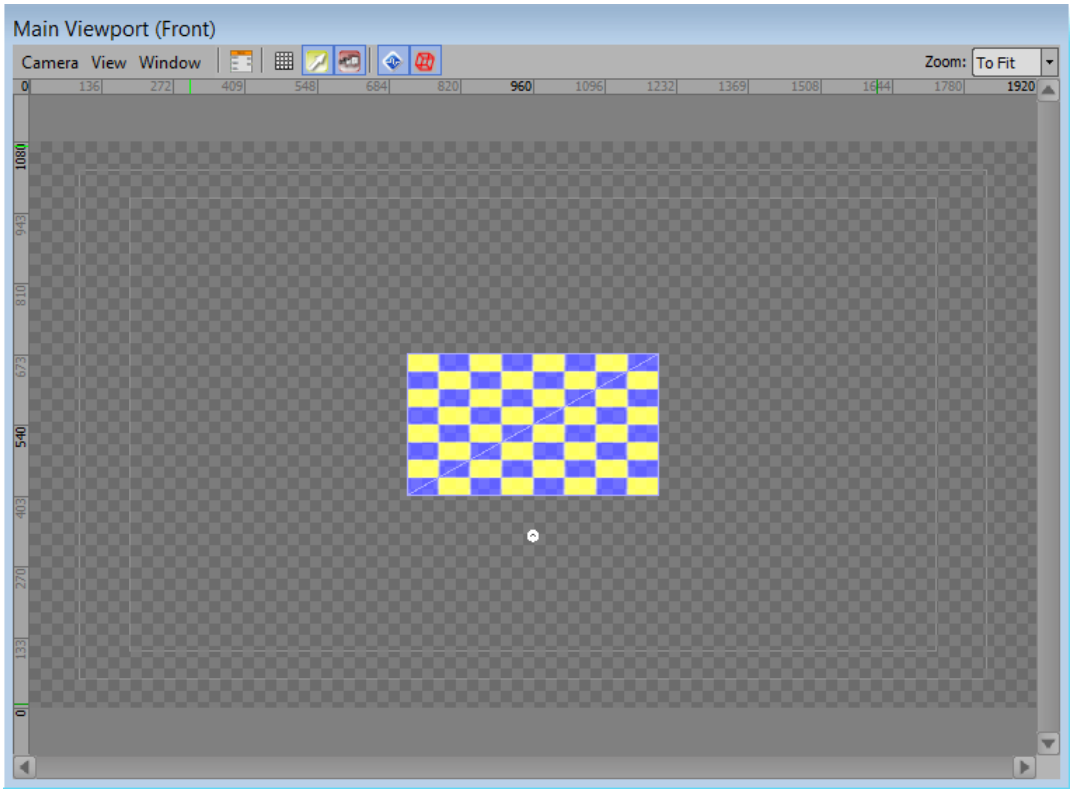
To add a slab object:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a slab object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Slab** object.

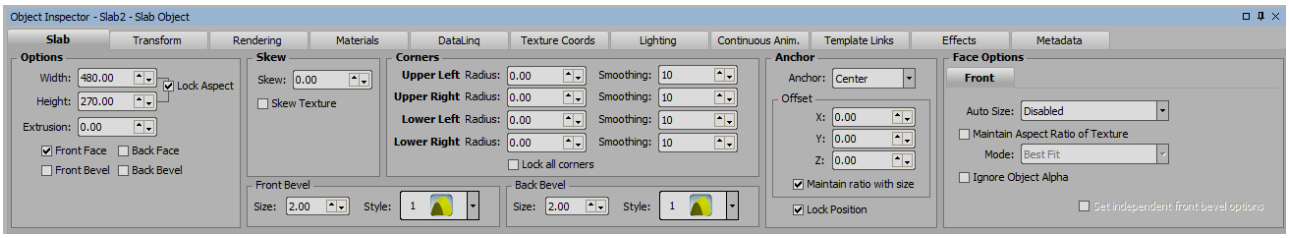
   A new slab object is added to the center of the active Viewport. The slab object is displayed as a wire frame mesh until a material is applied to it.



To configure a slab object:

1. In the **Object Inspector**, select the **Slab** tab.

   The **Slab** tab opens.



2. In the **Options** section, configure the options as required:
   - In the **Width** field, enter or select a value in pixels to set the width of the slab object.
   - In the **Height** field, enter or select a value in pixels to set the height of the slab object.
   - Select the **Lock Aspect** checkbox to maintain the aspect ration of the slab even if you later increase or decrease the scale.
   - In the **Extrusion** field, enter or select a value in pixels to set the 3D depth of the slab object.
   - Select the **Front Face** checkbox to make the front face of the slab object visible.
   - Select the **Back Face** checkbox to make the rear face of the slab object visible.
   - Select the **Front Bevel** checkbox to create a bevel effect on the front face of the slab object.
   - Select the **Back Bevel** checkbox to create a bevel effect on the rear face of the slab object.
2. If you are using a bevel effect on the slab object, use the **Front Bevel** and **Back Bevel** sections to configure the size and shape of the bevel(s).
   - **Size** — enter or select the size (in points) of the bevel between the front or back face and extrusion of the slab object.
   - **Style** — from the **Style** drop-down, select the shape of the bevel.

     The options are:

     Convex — the profile bows outward with a smooth curve.

     Concave — The profile curves inward.

     Rounded — A rounded transition concentrated towards the outer edge.

     Stepped — Creates a distinct step/shoulder rather than one continuous curve.

     2D — Creates a flat border that doesn't change when the slab is positioned near the edge of the viewport (with **Extrusion** set to **0**).
3. In the **Skew** section, configure the options as required:
   - In the **Skew** field, enter or select an angle (in degrees) at which to slant the slab object.

     Positive angles slant the slab object forwards, while negative angles slant the slab object backwards.
   - Select the **Skew Texture** checkbox to also skew any textures that have been applied to the slab object.
4. In the **Corners** section, configure the radius and smoothing amount to apply to the corners of the slab object.

   Radius — enter or select a radius for each corner of the slab object. The radius of each corner will be maintained when the slab is re-sized.

   Smoothing — enter or select the amount of smoothing to apply to the corners of the slab object.

   The higher the value, the smoother the corners will appear.
5. Select the **Lock all corners** checkbox to make all the radius and smoothing values the same as the **Upper Left** values.

6. In the **Anchor** section, if you have defined the radius of the corners of the slab, configure the options as required:

   Anchor — select an anchor position from the drop-down.

   Offset — enter an offset amount (in pixels) in the **X**, **Y**, and **Z** coordinate fields.

   Maintain ratio with size — when the width, height, or extrusion are modified, adjust the anchor offset to maintain the same ratio with respect to the updated size.

   Lock Position — when selected, the object remains in the same position, even if you change the **Anchor** position. When **Lock Position** is cleared, the object will move to the position of the **Anchor**, when it is changed.

7. In the **Face Options** section, configure the options as required:

   Select the tab of the face to be configured.

   - **Auto Size** — select if and when you want to re-size the slab to fit the material assigned to it.

     The options are:

     Disabled — do not re-size the slab.

     On Material Assign Only — re-size the slab to fit the material when the material is assigned to it.

     On Material Re-size — re-size the slab when the material is re-sized.

   - **Maintain Aspect Ratio of Texture** — select to ensure that the texture (material) will maintain its aspect ratio, regardless of the size of the slab. The texture may be cropped to retain its original aspect ratio.

   - **Mode** — select one of the following modes.

     - **Best Fit** — scales the texture to fit entirely within the slab object while preserving its aspect ratio. No cropping occurs, but empty space (letterboxing/pillarboxing) may appear if the proportions don’t match.

     - **Best Fit (Cropped)** — scales the texture so the slab object is completely filled while preserving aspect ratio. Parts of the texture will be cropped off to fit.

     - **Fit Width** — the texture will fit the width of the slab object and the height will be adjusted proportionally to retain the aspect ratio. This may result in vertical cropping, if the texture becomes taller than the slab.

     - **Fit Height** — the texture will fit the height of the slab object and the width will be adjusted proportionally to retain the aspect ratio. This may result in horizontal cropping, if the texture becomes wider than the target.

     - **Crop** — applies the texture at a scale that fills the slab object without distortion, then crops excess portions on both axes as needed. This behaves like a centered fill where anything outside the bounds is trimmed.

   - **Ignore Object Alpha** — applies the texture as if the slab were fully opaque, ignoring any transparency (alpha) defined in the slab properties.

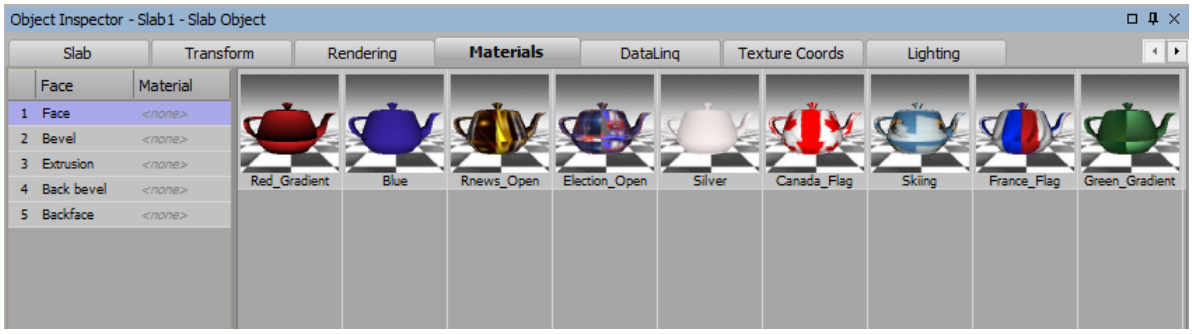
     This means the texture will cover the entire slab, without being affected by transparent or semi-transparent areas. Any holes, fades, or soft edges in the slab's alpha channel are disregarded, so the texture appears solid across the full area.

   - **Set independent front/back level options** — when selected, a **Front Bevel**, **Back Bevel**, and/or **Extrusion** tab is added to the face options. In these tabs, you can set the **Auto Size**, **Maintain Aspect Ratio of Texture**, **Mode**, and **Ignore Object Alpha** individually for each part of the slab as described above.

     This option is available for **Front Bevel** and **Back Bevel**, when they are selected in the **Options** section and for **Extrusion** when an **Extrusion** value is set in the **Options** section.

To apply a material to a slab object:

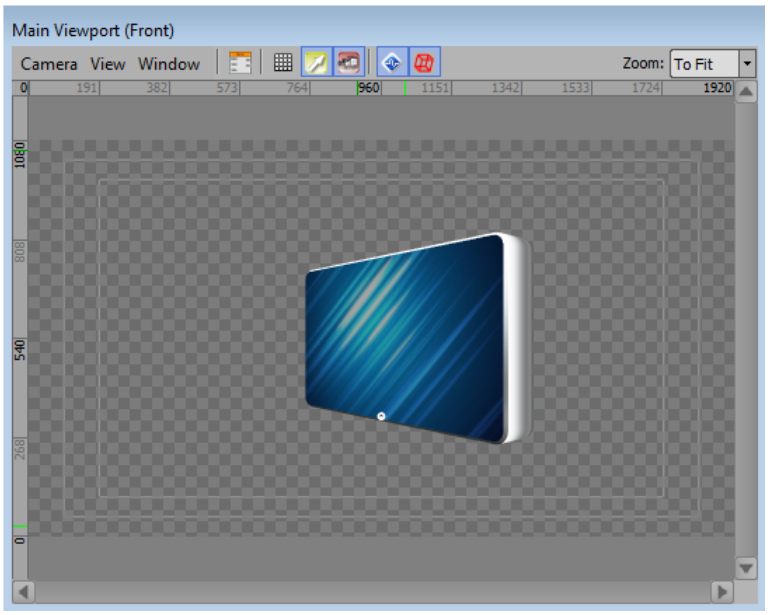
1. In the **Object Manager**, select the slab object.
2. In the **Object Inspector**, select the **Materials** tab.



★Materials can also be applied using the **Materials Manager**.

3. From the **Face** list, select the face of the slab to which to apply a material.
4. Then double-click a material thumbnail to apply the material to the slab object.

   The selected face of the slab object is covered with the selected material.



To remove a material from a slab object:

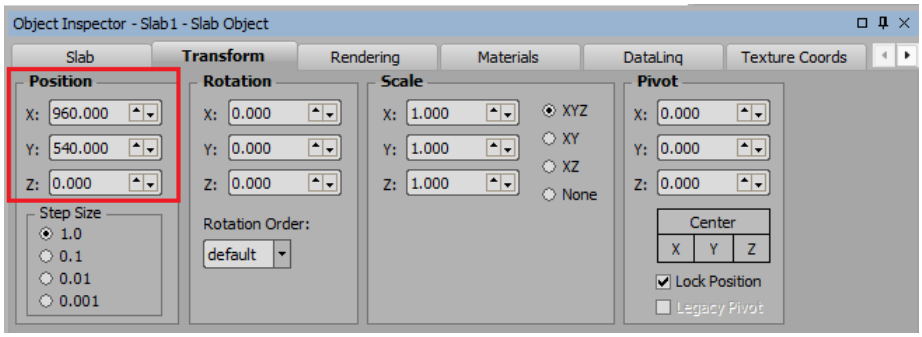
1. In the **Object Manager**, select the slab object containing the material you want to remove.
2. In the **Object Inspector - Materials** tab, right-click the the slab faces in the **Face** column and select **Unbind** from the shortcut menu.

   Without a material, slab objects are displayed as a wire frame mesh.

To position the slab object in the Viewport:

- Press the **Ctrl** key, then select the slab object in the Viewport and drag it into position.

Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the slab object.

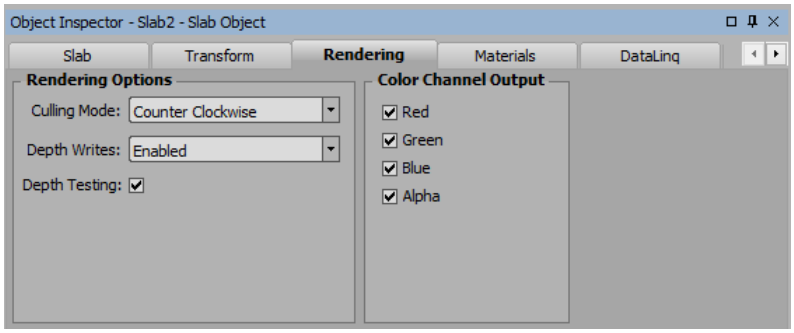


Setting the Culling Mode for a Slab Object

To set the culling mode for a slab object:

1. Add a slab object to a scene.
2. In the **Object Manager**, select the new slab object.
3. In the **Object Inspector**, select the **Rendering** tab.

   The **Rendering** tab opens.



4. From the **Culling Mode** drop-down, select the culling mode for the slab object.

   The available culling modes are:

   - **None** — do not cull the back faces of a slab object. This mode renders all faces of a slab object, even the faces that are not visible.
   - **Clockwise** — cull the back faces of a slab object that have clockwise vertices. In this mode, material is applied to the inside of a slab object.
   - **Counter Clockwise** — cull the back faces of a slab object that have counter clockwise vertices. In this mode, material is applied to the outside of a slab object.

   The **Clockwise** and **Counter Clockwise** culling modes decrease the time required to render a scene.

5. From the **Depth Writes** drop-down, select whether or not to render the hidden parts of a slab object.

   The available options are:

   - **Enabled** — do not display the hidden parts of a slab object.
   - Disabled — display the hidden parts of a slab object.
   - **Automatic** — use the set rendering method to determine whether or not to display the hidden parts of a slab object.

6. Select the **Depth Testing** checkbox to use depth values to determine whether an object is displayed on top or behind other objects.

   Clear this checkbox to disable depth testing and use the render order of an object to determine whether an object is displayed on top or behind other objects.

For More Information on...

- how to add a slab object to a scene, refer to the procedure Creating a Slab Object.

Creating a Lines Object

You can use the lines object to create 2D and 3D lines.

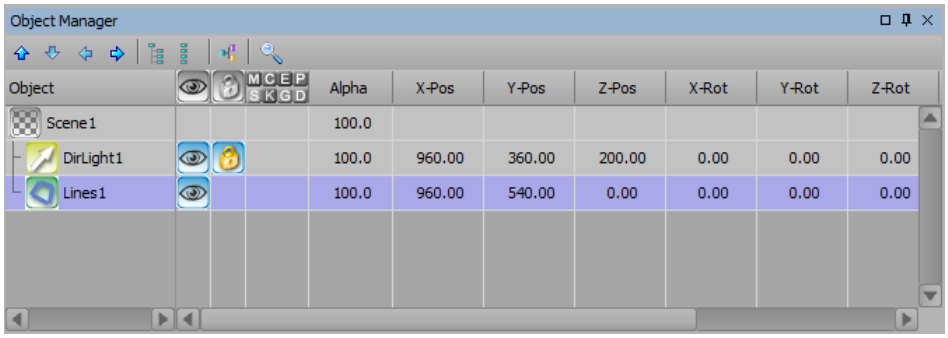
To create a Lines object:

1. In the **Scene Manager**, select the scene or scene group to which to add a lines object.

   The selected scene or scene group is displayed in the active Viewport.

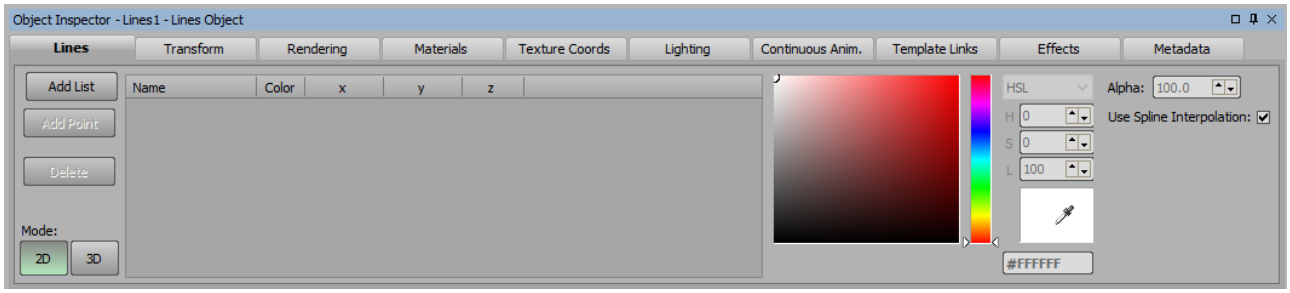
2. In the **Primitives** section of the **Object Library**, select the **Lines** object.

   A new line object is added to the **Object Manager**.



3. In the **Object Inspector**, select the **Lines** tab.

   The **Lines** tab opens.



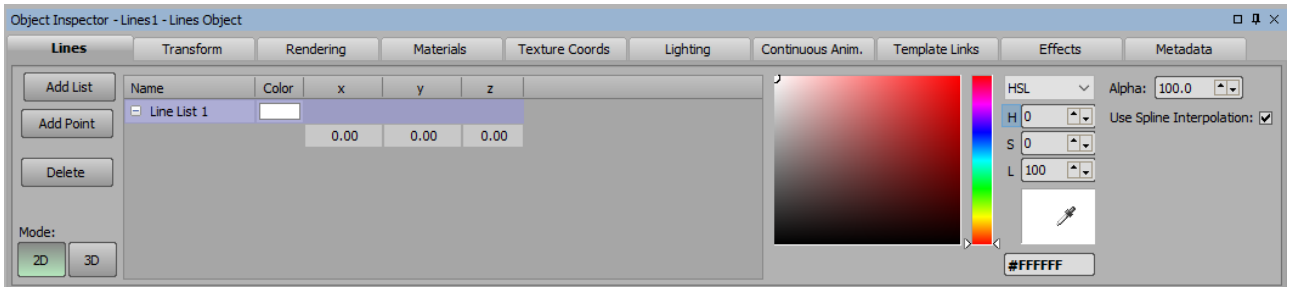
4. Select a lines object **Mode** and continue with the instructions for configuring the selected mode.
   - 2D — select to define the lines as a single pixel width line.
   - 3D — select to define the lines as a textured three-dimensional object with customizable thickness.

To create a 2D line object:

1. Select **Add List**.

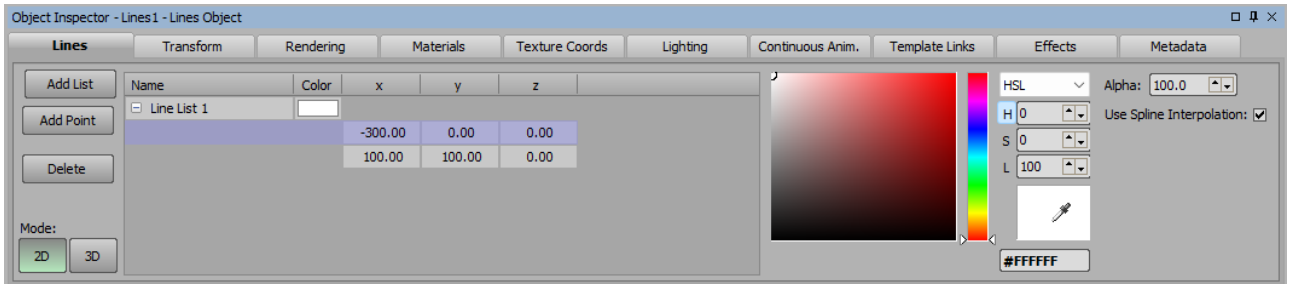
   A starting point for a line is added to the **Lines** list. The **X**, **Y**, and **Z** coordinates of the first line added to the list represent the origin point of the line in 3D space.

   By default, the **X**, **Y**, and **Z** coordinates are all **0.00**.



2. Click inside the **Name** column to enter a name for the line.
3. Change the **X**, **Y**, and **Z** coordinates of the line as needed to get the starting point of the line.
4. Select **Add Point**.

   A line point is added to the list. Line points enable the drawing out of a line.



5. Change the **X**, **Y**, and **Z** coordinates of the point to create the first segment of the line.
6. Add and configure as many points as desired.
7. From the **Color Mode** drop-down at the far right, select the color definition mode.

   The available modes are:

   - **HSL** — define color by setting hue, saturation, and lightness values.
   - **RGB** — define color by setting red, green, and blue values.

   Use the selected color definition mode to set the diffuse color of the line.

HSL Color Selection Mode

- Select the **H**, then use one of the following methods to set the hue value for the diffuse color:
  - ➢ Move the slider along the hue scale to set the hue value.
  - ➢ In the **H** field, enter or select the hue value (0 to 359).

  After setting the **H** value, the **S** and **L** color values can be set by selecting a color in the **Color Box**.
- Select the **S**, then use one of the following methods to set the saturation value for the diffuse color:
  - ➢ Move the slider along the saturation scale to set the saturation value.
  - ➢ In the **S** field, enter or select the saturation value (0 to 100).

  After setting the **S** value, the **H** and **L** color values can be set by selecting a color in the **Color Box**.
- Select the **L**, then use one of the following methods to set the lightness value for the diffuse color:
  - ➢ Move the slider along the lightness scale to set the lightness value.
  - ➢ In the **L** field, enter or select the lightness value (0 to 100).

  After setting the **L** value, the **S** and **H** color values can be set by selecting a color in the **Color Box**.

★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen. Then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

The **H**, **S**, and **L** color values are set to match the color selected from the screen.

RGB Color Selection Mode

- Select the **R**, then use one of the following methods to set the red value for the diffuse color:
  - ➢ Move the slider along the red scale to set the red value.
  - ➢ In the **R** field, enter or select the red value (0 to 255).

  After setting the **R** value, the **G** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **G**, then use one of the following methods to set the green value for the diffuse color:
  - ➢ Move the slider along the green scale to set the green value.
  - ➢ In the **G** field, enter or select the green value (0 to 255).

  After setting the **G** value, the **R** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **B**, then use one of the following methods to set the blue value for the diffuse color:
  - ➢ Move the slider along the blue scale to set the blue value.
  - ➢ In the **B** field, enter or select the blue value (0 to 255).

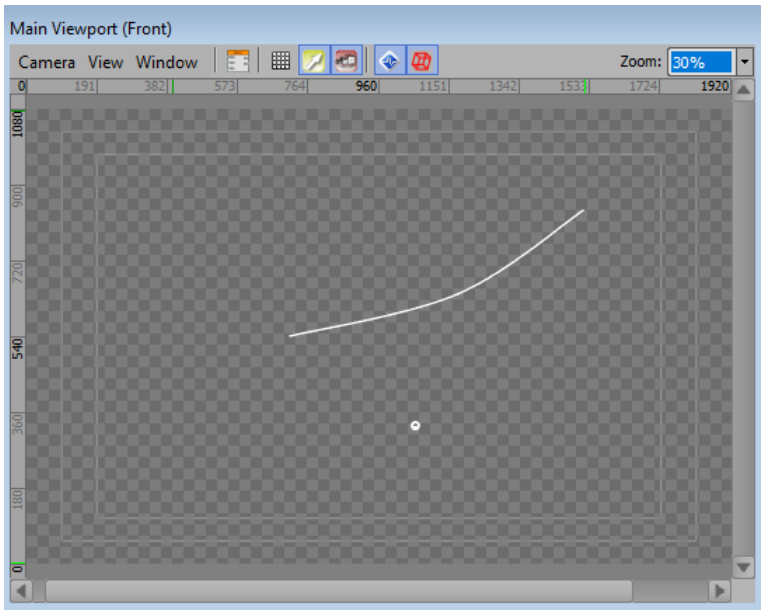
  After setting the **B** value, the **R** and **G** color values can be set by selecting a color in the **Color Box**.

★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen and then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

The **R**, **G**, and **B** color values are set to match the color selected from the screen.

8. In the **Alpha** field, enter or select a transparency value for the color of the line object (0.0 to 100).
9. Select the **Use Spline Interpolation** checkbox to add curvature between interpolating line segments.

   The line segments are visible in the **Main Viewport**.

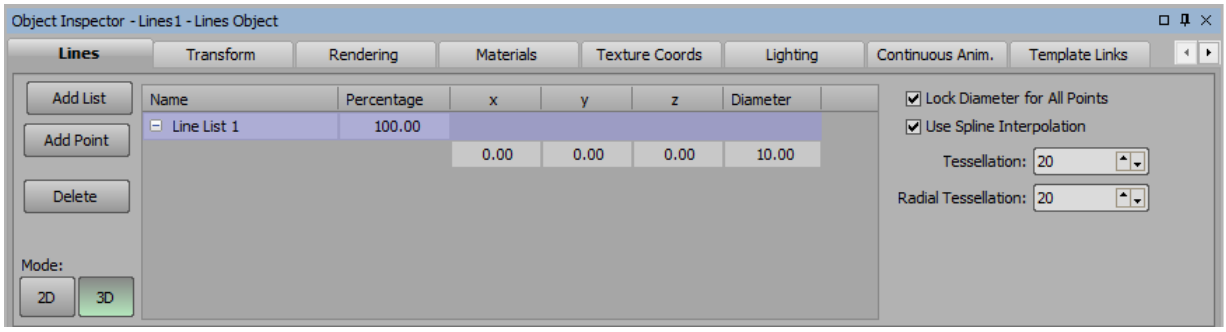


To create a 3D line object:

1. Select **Add List**.

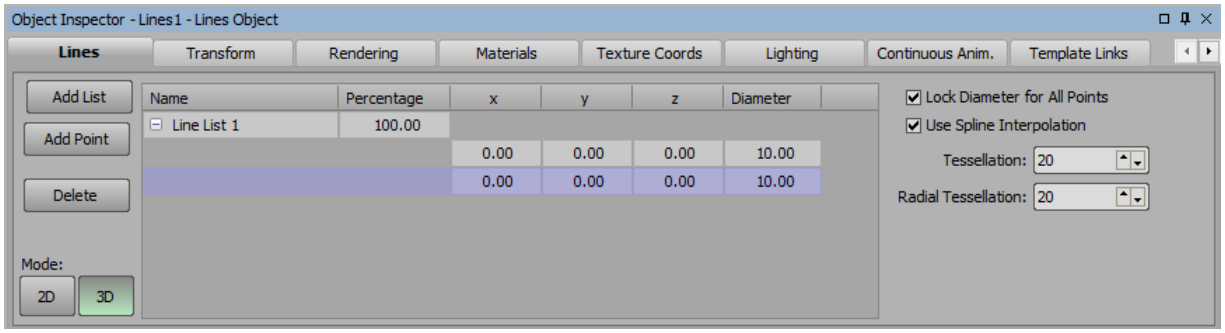
   A starting point for a line is added to the **Lines** list. The **X**, **Y**, and **Z** coordinates of the first line added to the list represent the origin point of the line in 3D space.

   By default, the **X**, **Y**, and **Z** coordinates are all **0.00**.



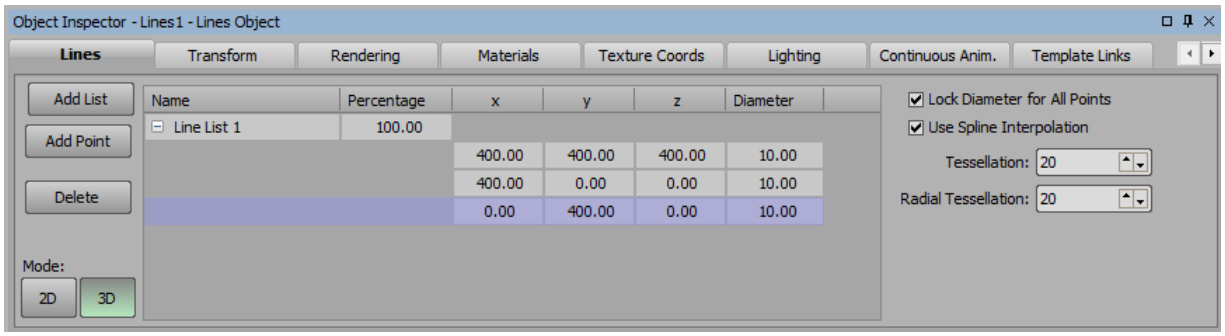
2. Click inside the **Name** column to enter a name for the line.
3. Select **Add Point**.

   A line point is added to the list. Line points enable the drawing out of a line.



4. Add as many points as desired and configure the **X**, **Y**, and **Z** coordinates.
5. Click inside the **Percentage** cell and enter or select an overall percentage of the lines to display.
6. In the **X**, **Y**, and **Z** columns in the line list, enter the pixel coordinates for the line segments.
7. Click inside the **Diameter** cell and enter or select a diameter in pixels for the lines object.
8. Select the **Lock Diameter for All Points** checkbox to lock the diameter for all points of the lines objects in the lines list.

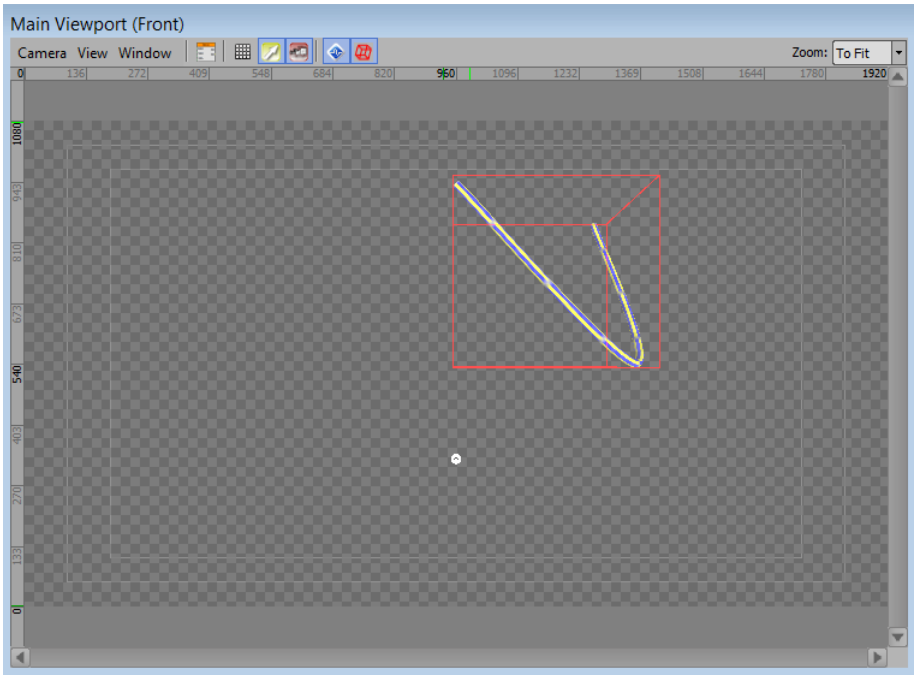
   If the diameter of one line in the lines list is adjusted, all other line diameters are adjusted accordingly.



9. Configure the remaining settings as required:

   - Select the **Use Spline Interpolation** checkbox to add curvature between interpolating line segments.
   - In the **Tessellation** field, enter or select the number of vertices used to construct the lines objects.
   - In the **Radial Tessellation** field, enter or select the number of vertices used to construct the radius of the lines objects.

   The line segments are visible in the **Main Viewport**.



Lights

The objects in an XPression scene are made visible by the light emitted by directional, point, and spot light objects.

The following topics are discussed in this section:

Adding a Directional Light Object to a Scene

Adding a Point Light Object to a Scene

Adding a Spot Light Object to a Scene

Adding a Directional Light Object to a Scene

When you create a new scene, there is by default one directional light object in the scene. You can add as many additional directional light objects as necessary to illuminate scene components.

To add a directional light object to a scene:

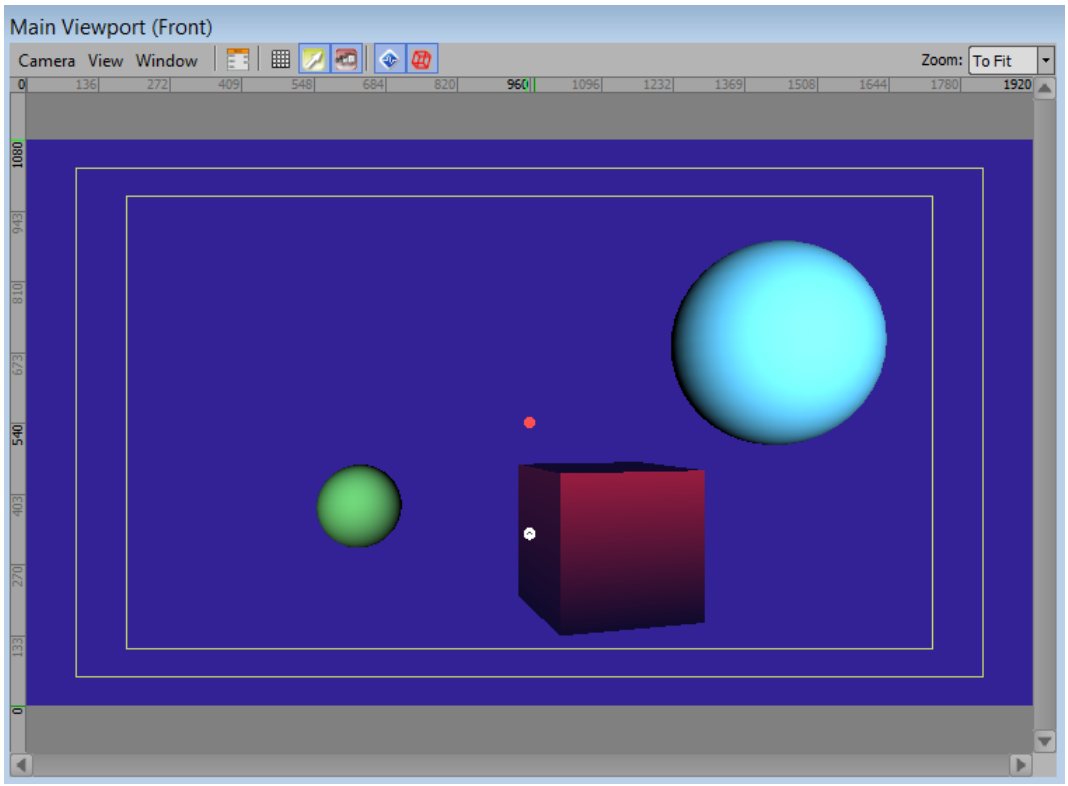
1. In the **Scene Manager**, select the scene or scene group to which to add a directional light source.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Directional Light** object.

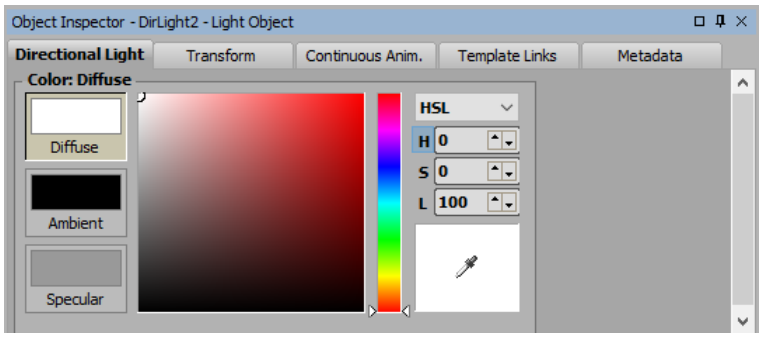
   Optionally, when adding a light object, hold **Shift** to keep the light object from automatically binding to the current scene objects.

   A new directional light object (center red dot) is added to the active Viewport.



3. In the **Object Inspector**, select the **Directional Light** tab.

   The **Directional Light** tab opens.



4. Select **Diffuse** to set the color of light projected by the directional light object.

   The diffuse color is set using the color controls to the right.

5. From the **Color Mode** drop-down at the far right, select the color definition mode.

   The available modes are:

   - **HSL** — define color by setting hue, saturation, and lightness values.
   - **RGB** — define color by setting red, green, and blue values.

   Use the selected color definition mode to set the diffuse color of the light.

   HSL Color Selection Mode

   - Select the **H**, then use one of the following methods to set the hue value for the diffuse color:
     - ➢ Move the slider along the hue scale to set the hue value.
     - ➢ In the **H** field, enter or select the hue value (0 to 359).

     After setting the **H** value, the **S** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **S**, then use one of the following methods to set the saturation value for the diffuse color:
     - ➢ Move the slider along the saturation scale to set the saturation value.
     - ➢ In the **S** field, enter or select the saturation value (0 to 100).

     After setting the **S** value, the **H** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **L**, then use one of the following methods to set the lightness value for the diffuse color:
     - ➢ Move the slider along the lightness scale to set the lightness value.
     - ➢ In the **L** field, enter or select the lightness value (0 to 100).

     After setting the **L** value, the **S** and **H** color values can be set by selecting a color in the **Color Box**.

   ★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen. Then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

   The **H**, **S**, and **L** color values are set to match the color selected from the screen.

   RGB Color Selection Mode

   - Select the **R**, then use one of the following methods to set the red value for the diffuse color:
     - ➢ Move the slider along the red scale to set the red value.
     - ➢ In the **R** field, enter or select the red value (0 to 255).

     After setting the **R** value, the **G** and **B** color values can be set by selecting a color in the **Color Box**.
   - Select the **G**, then use one of the following methods to set the green value for the diffuse color:
     - ➢ Move the slider along the green scale to set the green value.
     - ➢ In the **G** field, enter or select the green value (0 to 255).

     After setting the **G** value, the **R** and **B** color values can be set by selecting a color in the **Color Box**.
   - Select the **B**, then use one of the following methods to set the blue value for the diffuse color:
     - ➢ Move the slider along the blue scale to set the blue value.
     - ➢ In the **B** field, enter or select the blue value (0 to 255).

     After setting the **B** value, the **R** and **G** color values can be set by selecting a color in the **Color Box**.

★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen and then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

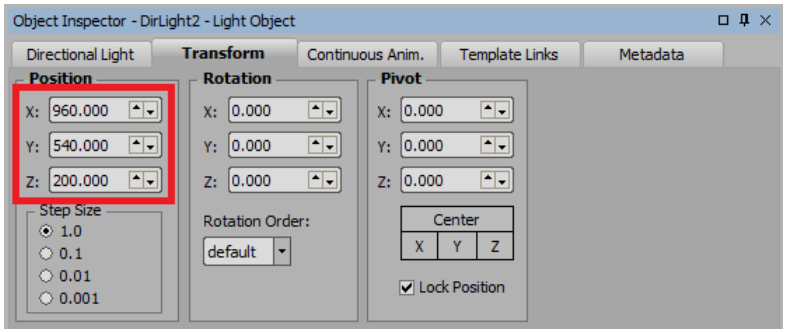
The **R**, **G**, and **B** color values are set to match the color selected from the screen.

6. Select **Ambient** to set the color of the light from other sources that blends with the directional light and refer to step 5 to set the ambient color.
7. Select **Specular** to set the color of light emitted by an object on which the directional light shines and refer to step 5 to set the specular color.

To position the directional light object in the Viewport:

- Press the **Ctrl** key, then select the directional light object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the directional light object.



Adding a Point Light Object to a Scene

You can add point light objects to a scene to illuminate scene components.

To add a point light object to a scene:

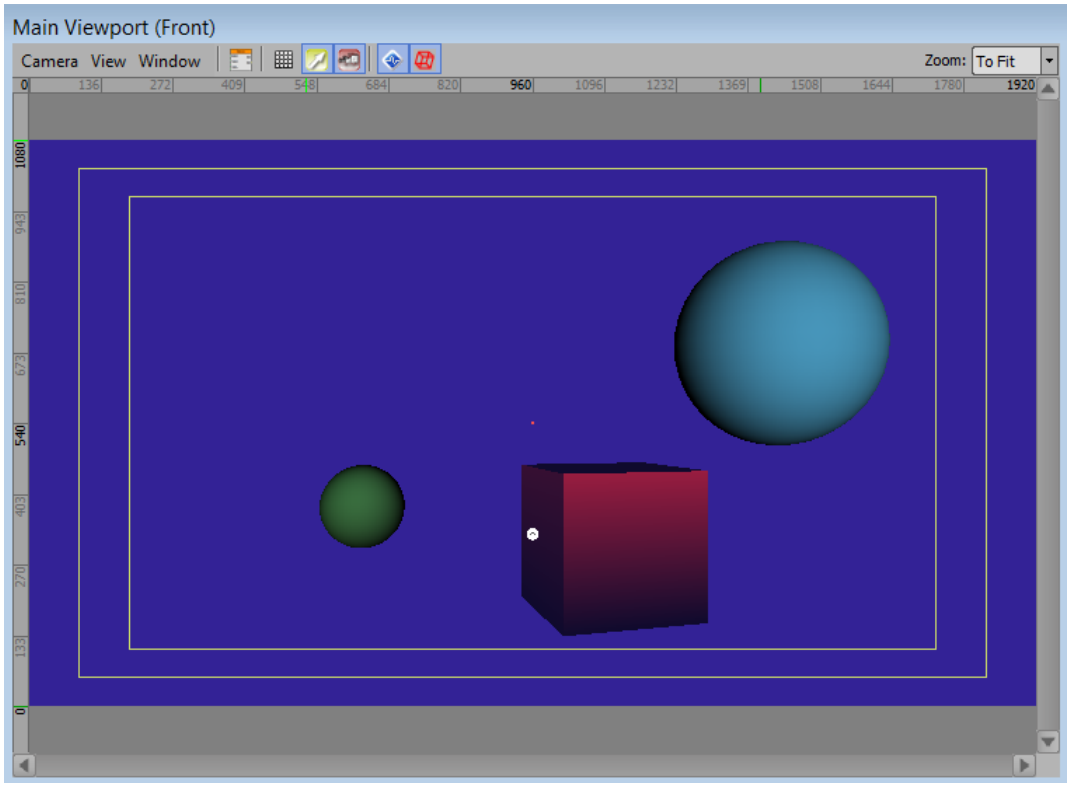
1. In the **Scene Manager**, select the scene or scene group to which to add a point light object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Point Light** object.

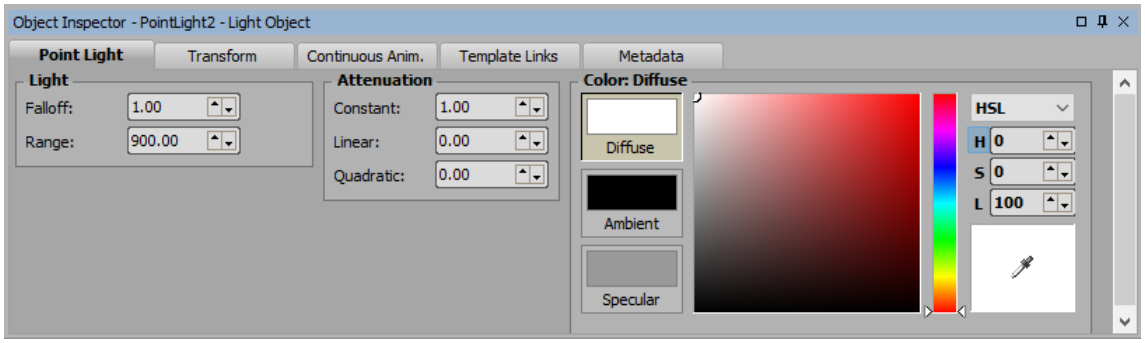
   Optionally, when adding a light object, hold **Shift** to keep the light object from automatically binding to the current scene objects.

   A new point light object (center red dot) is added to the active Viewport.



3. In the **Object Inspector**, select the **Point Light** tab.

   The **Point Light** tab opens.



4. In the **Light** section, configure the following settings:
5. In the **Falloff** field, enter or select the intensity of light as it spreads out from the point light object.
6. In the **Range** field, enter or select the overall size in pixels that is lit by the point light object.
7. In the **Attenuation** section, configure the following settings:
   - In the **Constant** field, enter or select the constant attenuation factor for the gradual loss in intensity for the point light object.

     The default value is 1.
   - In the **Linear** field, enter or select the linear attenuation factor times the distance between the light and the vertex being illuminated.

     The default value is 0.
   - In the **Quadratic** field, enter or select the quadratic attenuation factor times the square of the distance between the light and vertex.

     The default value is 0.
8. In the **Color** section, select **Diffuse** to set the color of light projected by the point light object.

   The diffuse color is set using the color controls to the right.
9. From the **Color Mode** drop-down at the far right, select the color definition mode.

   The available modes are:

   HSL — define color by setting hue, saturation, and lightness values.

   RGB — define color by setting red, green, and blue values.

   Use the selected color definition mode to set the diffuse color of the light.

   HSL Color Selection Mode

   - Select the **H**, then use one of the following methods to set the hue value for the diffuse color:
     - ➢ Move the slider along the hue scale to set the hue value.
     - ➢ In the **H** field, enter or select the hue value (0 to 359).

     After setting the **H** value, the **S** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **S**, then use one of the following methods to set the saturation value for the diffuse color:
     - ➢ Move the slider along the saturation scale to set the saturation value.
     - ➢ In the **S** field, enter or select the saturation value (0 to 100).

     After setting the **S** value, the **H** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **L**, then use one of the following methods to set the lightness value for the diffuse color:
     - ➢ Move the slider along the lightness scale to set the lightness value.
     - ➢ In the **L** field, enter or select the lightness value (0 to 100).

     After setting the **L** value, the **S** and **H** color values can be set by selecting a color in the **Color Box**.

   ★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen. Then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

   The **H**, **S**, and **L** color values are set to match the color selected from the screen.

RGB Color Selection Mode

- Select the **R**, then use one of the following methods to set the red value for the diffuse color:
  - ➢ Move the slider along the red scale to set the red value.
  - ➢ In the **R** field, enter or select the red value (0 to 255).

  After setting the **R** value, the **G** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **G**, then use one of the following methods to set the green value for the diffuse color:
  - ➢ Move the slider along the green scale to set the green value.
  - ➢ In the **G** field, enter or select the green value (0 to 255).

  After setting the **G** value, the **R** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **B**, then use one of the following methods to set the blue value for the diffuse color:
  - ➢ Move the slider along the blue scale to set the blue value.
  - ➢ In the **B** field, enter or select the blue value (0 to 255).

  After setting the **B** value, the **R** and **G** color values can be set by selecting a color in the **Color Box**.

★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen and then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

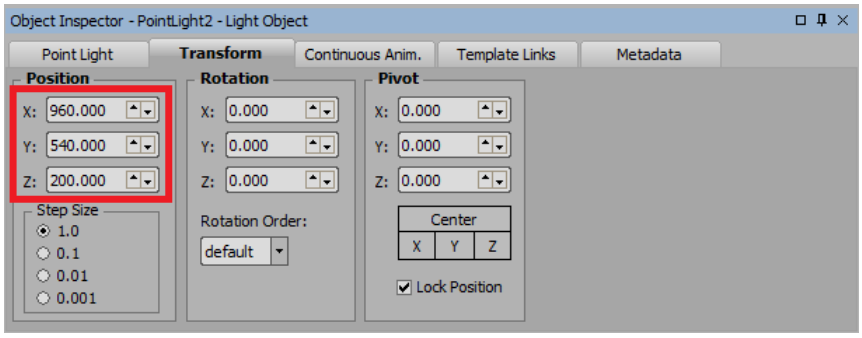
The **R**, **G**, and **B** color values are set to match the color selected from the screen.

10. Select **Ambient** to set the color of the light from other sources that blends with the point light and refer to step 9 to set the ambient color.
11. Select **Specular** to set the color of light emitted by an object on which the point light shines and refer to step 9 to set the specular color.

To position the point light object in the Viewport:

- Press the **Ctrl** key, then select the point light object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the point light object.



Adding a Spot Light Object to a Scene

You can add spot light objects to a scene to illuminate scene components.

To add a spot light object to a scene:

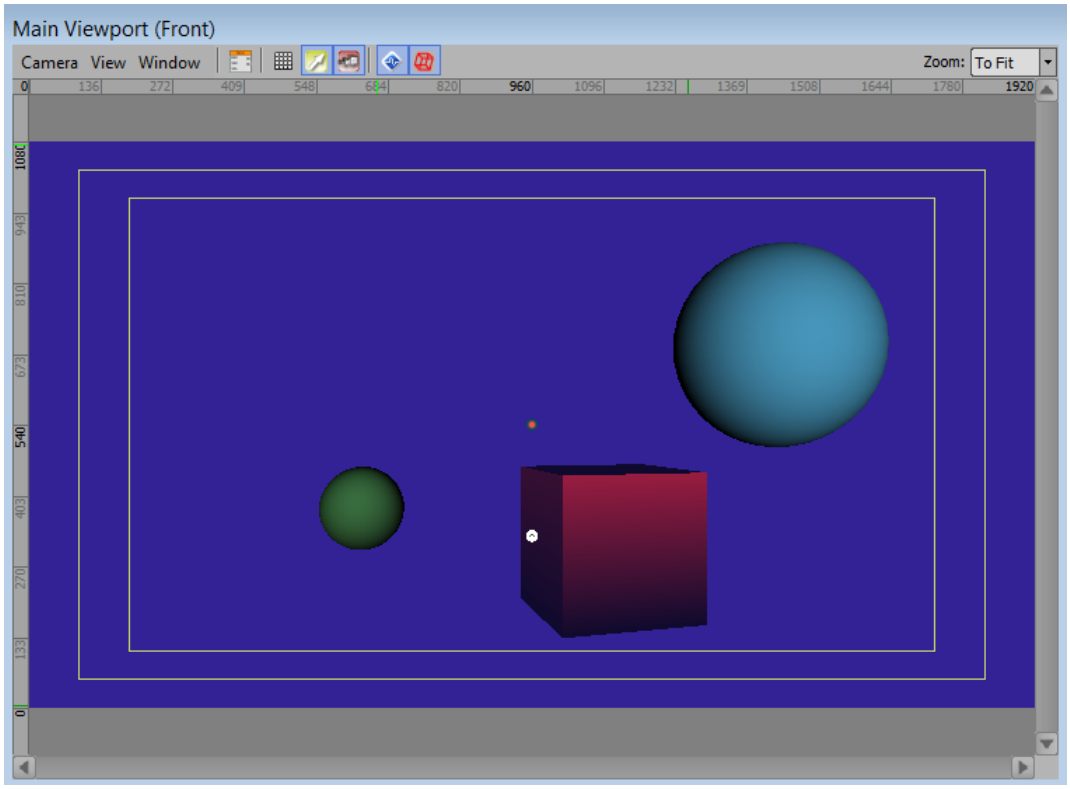
1. In the **Scene Manager**, select the scene or scene group to which to add a spot light object.

   The selected scene or scene group is displayed in the active Viewport.

2. In the **Primitives** section of the **Object Library**, select the **Spot Light** object.

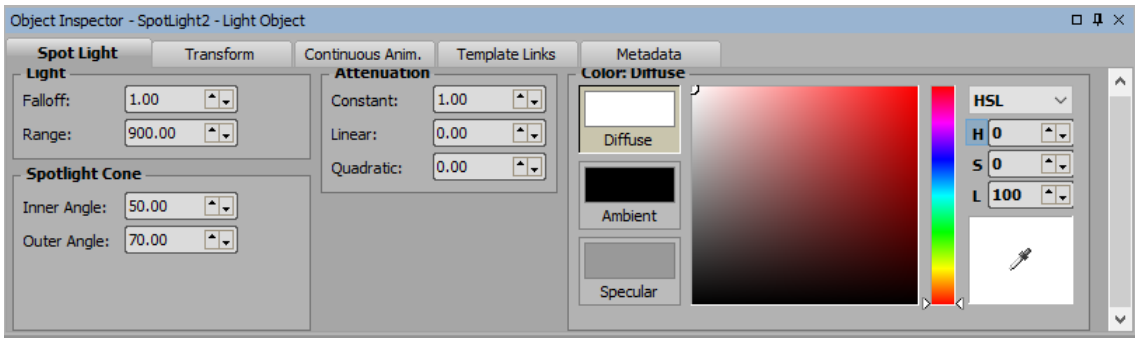
   Optionally, when adding a light object, hold **Shift** to keep the light object from automatically binding to the current scene objects.

   A new spot light object (center red dot) is added to the active Viewport.



3. In the **Object Inspector**, select the **Spot Light** tab.

   The **Spot Light** tab opens.



4. In the **Light** section, configure the following settings:
   - In the **Falloff** field, enter or select the intensity of light as it spreads out from the spot light object.
   - In the **Range** field, enter or select the overall size in pixels that is lit by the spot light object.
5. In the **Spotlight Cone** section, configure the following settings:
   - In the **Inner Angle** field, enter or select the size in degrees of the inner light (beam) emitted from the spot light object.

     Inner angle values range from 0 to 180 degrees.
   - In the **Outer Angle** field, enter or select the size in degrees of the outer light (blur light) emitted from the spot light object.

     Outer angle values range from 0 to 180 degrees.

   In order to display the entire outer angle, this value must be less than the value set for the Range field in the Light section.
6. In the **Color** section, select **Diffuse** to set the color of light projected by the spot light object.

   The diffuse color is set using the color controls to the right.
7. From the **Color Mode** drop-down at the far right, select the color definition mode.

   The available modes are:

   HSL — define color by setting hue, saturation, and lightness values.

   RGB — define color by setting red, green, and blue values.

   Use the selected color definition mode to set the diffuse color of the light.

   HSL Color Selection Mode

   - Select the **H**, then use one of the following methods to set the hue value for the diffuse color:
     - ➢ Move the slider along the hue scale to set the hue value.
     - ➢ In the **H** field, enter or select the hue value (0 to 359).

     After setting the **H** value, the **S** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **S**, then use one of the following methods to set the saturation value for the diffuse color:
     - ➢ Move the slider along the saturation scale to set the saturation value.
     - ➢ In the **S** field, enter or select the saturation value (0 to 100).

     After setting the **S** value, the **H** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **L**, then use one of the following methods to set the lightness value for the diffuse color:
     - ➢ Move the slider along the lightness scale to set the lightness value.
     - ➢ In the **L** field, enter or select the lightness value (0 to 100).

     After setting the **L** value, the **S** and **H** color values can be set by selecting a color in the **Color Box**.

   ★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen. Then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

   The **H**, **S**, and **L** color values are set to match the color selected from the screen.

RGB Color Selection Mode

- Select the **R**, then use one of the following methods to set the red value for the diffuse color:
  - ➢ Move the slider along the red scale to set the red value.
  - ➢ In the **R** field, enter or select the red value (0 to 255).

  After setting the **R** value, the **G** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **G**, then use one of the following methods to set the green value for the diffuse color:
  - ➢ Move the slider along the green scale to set the green value.
  - ➢ In the **G** field, enter or select the green value (0 to 255).

  After setting the **G** value, the **R** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **B**, then use one of the following methods to set the blue value for the diffuse color:
  - ➢ Move the slider along the blue scale to set the blue value.
  - ➢ In the **B** field, enter or select the blue value (0 to 255).

  After setting the **B** value, the **R** and **G** color values can be set by selecting a color in the **Color Box**.

★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen and then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

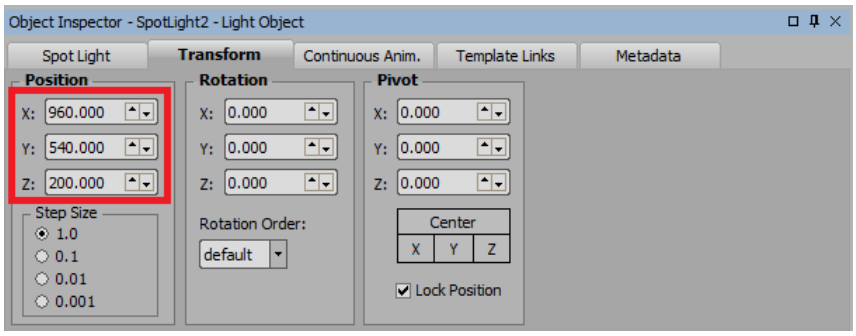
The **R**, **G**, and **B** color values are set to match the color selected from the screen.

8. Select **Ambient** to set the color of the light from other sources that blends with the spot light and refer to step 7 to set the ambient color.
9. Select **Specular** to set the color of light emitted by an object on which the spot light shines and refer to step 7 to set the specular color.

To position the spot light object in the Viewport:

- Press the **Ctrl** key, then select the spot light object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the spot light object.



Cameras

The point of view for an XPression scene is set by a camera object.

The following topic is discussed in this section:

Adding a Perspective Camera to a Scene

Adding an Orthographic Camera to a Scene

Adding a Perspective Camera to a Scene

A perspective camera provides the ability to view the scene from a different angle.

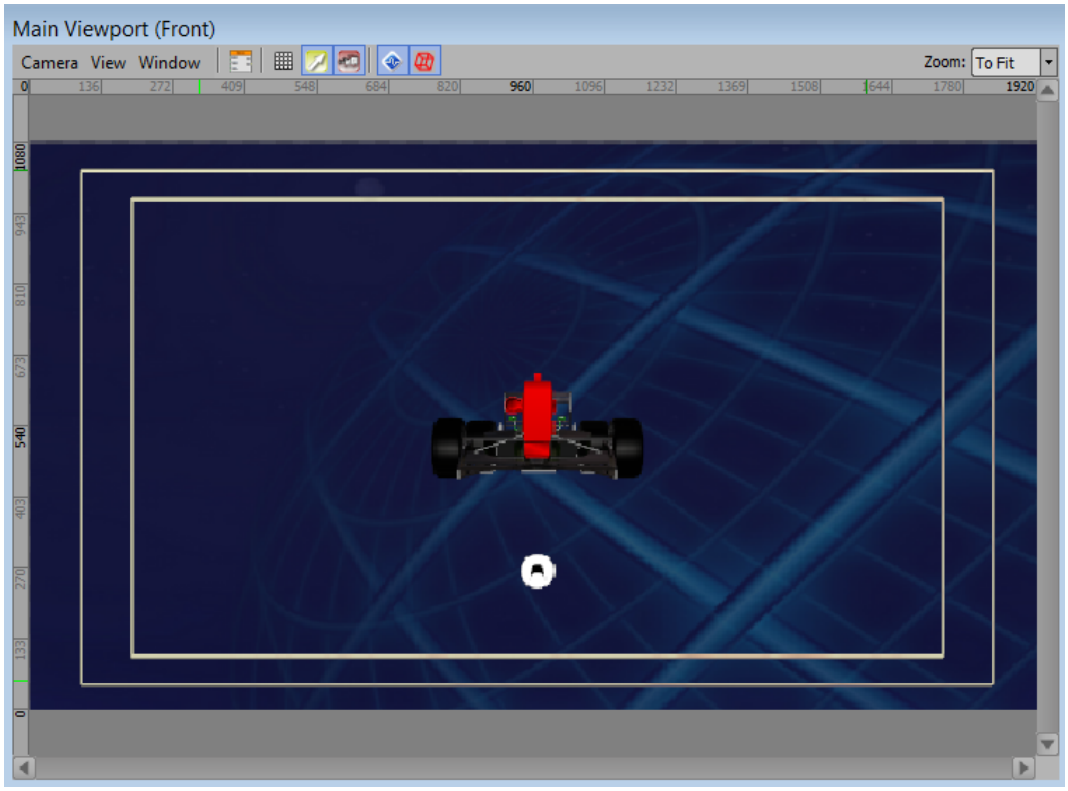
To add a perspective camera to a scene:

1. In the **Scene Manager**, select the scene or scene group to which you want to add a camera pbject.

   The selected scene or scene group is displayed in the active Viewport.

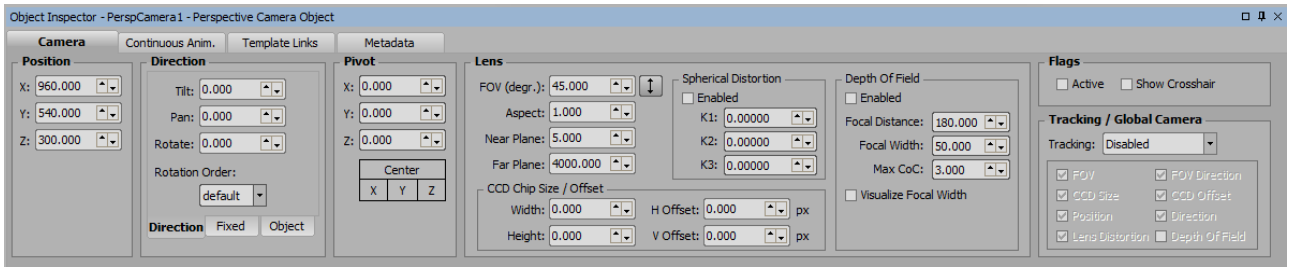
2. In the **Cameras** section of the **Object Library**, select the **Perspective Camera** object.

   A new perspective camera object is added to the center of the active Viewport.



3. In the **Object Inspector**, select the **Camera** tab.

   The **Camera** tab opens.



4. In the **Position** section, enter coordinates in the **X**, **Y**, and **Z** fields to set the position of the perspective camera object in the scene.

5. In the **Direction** section, select one of the following tabs to set the direction of view for the camera object:
   - **Direction** — set the direction of view by setting the orientation of the perspective camera object.
   - **Fixed** — set the direction of view by pointing the camera object at a fixed point.
   - **Object** — set the direction of view by pointing the camera object at an object in the scene.
6. Use the selected tab to set the direction of view for the camera object as described in the following table:

Direction	**Tilt**	Enter or select the degrees to rotate the camera object upwards or downwards, around the X axis. Positive values point the camera object view upwards, while negative values point the camera object view downwards.
	Pan	Enter or select the degrees to point the camera object to the right or left, around the Y axis. Positive values point the camera object view to the right, while negative values point the camera object view to the left.
	Rotate	Enter or select the degrees to rotate the camera object to the right or left, around the Z axis. Positive values rotate the camera object view to the right, while negative values rotate the camera object view to the left.
	Rotation Order	From the **Rotation Order** drop-down, select the mathematical sequence for the rotation of the object.
Fixed	**X**	Enter or select the **X** coordinate in pixels of the fixed point at which to face the camera object.
	Y	Enter or select the **Y** coordinate in pixels of the fixed point at which to face the camera object.
	Z	Enter or select the **Z** coordinate in pixels of the fixed point at which to face the camera object.
	Rotate	In the **Rotate** field, enter or select the degrees to rotate the camera object to the right or left, around the **Z** axis. Positive values rotate the camera object to the right, while negative values rotate the camera object to the left.
Object	**Object**	From the **Object** drop-down, select an object in the scene at which to point the camera object.

7. In the **Pivot** section, set the pivot point of a perspective camera object as follows:

   In the **X**, **Y**, and **Z** fields, enter or select the X, Y, and Z coordinates for the camera pivot point.

   Select one of the following:
   - Select the **Center** button to set the pivot point from the center of the X, Y, and Z coordinate.
   - Select the **X** button to pivot on the X axis.
   - Select the **Y** button to pivot on the Y axis.
   - Select the **Z** button to pivot on the Z axis.

8. In the **Lens** section, configure the following settings:

FOV (degr.)	Enter or select a value in degrees for the **Vertical** field of view of the camera (default). The default value is 45° Select the **Horizontal FOV** button to switch to a horizontal field of view for the camera.
Aspect	Enter or select the aspect ratio of the camera. This acts as a multiplier of the current aspect ratio of the project.
Near Plane	Enter or select the distance (in pixels) from the viewer to the nearest clipping plane. This distance is always positive.
Far Plane	Enter or select the distance (in pixels) from the viewer to the farthest clipping plane. This distance is always positive.
Spherical Distortion	Select the **Enabled** checkbox to apply a spherical distortion to the camera. If selected, configure the following: • **K1** — enter or select a value to create or adjust a barrel-shaped spherical distortion. • **K2** — Enter or select a value to create or adjust a pincushion-shaped spherical distortion. • **K3** — Enter or select a value to create or adjust a spherical distortion that combines the K1 value in the middle and the K2 value at the edges.
CCD Chip Size / Offset	**Width** — Enter or select the width (in millimeters) of the charge-coupled device chip. **Height** — Enter or select the height (in millimeters) of the charge-coupled device chip. **H Offset** — Enter or select the horizontal charge-coupled device offset (in pixels). **V Offset** — Enter or select the vertical charge-coupled device offset (in pixels). ★The **CCD Size** for a perspective camera will be used for calculating the aspect ratio of the camera. ★When the **CCD Size** is not set, the CCD offset will be in pixels and the 3rd order lens correction parameter will be enabled.
Depth of Field	Select the **Enabled** checkbox to configure a difference in sharpness between the nearest and farthest objects in the scene. If selected, configure the following: • In the **Focal Distance** field, enter or select a distance value for the focal point for the camera. • In the **Focal Width** field, enter or select a width value for the focal point for the camera. • In the **Max CoC** field, enter or select an average amount of pixels that are used to defocus for the blur kernel. Select the **Visualize Focal Width** checkbox to use color to visualize the affected areas of the objects in a scene.

9. In the **Flags** section, do the following:

- Select the **Active** checkbox to activate the selected perspective camera object for a scene and use it to view the scene from the perspective camera on the output.

  The new perspective camera object is set as the active camera object for the scene. Only one camera object can be active in a scene at any time.

- Select the **Show Crosshair** checkbox to display a crosshair for better accuracy when setting the CCD offset.

10. In the **Tracking / Global Camera** section:

    - From the **Tracking** drop-down, select one of the following tracking options:
      - **Disabled** — disable the use of the coordinates of the global camera when this camera is active.
      - **Global Tracker** — the active camera's position is dictated by the coordinates of the global camera.
      - **Video Shader** — associate the camera tracking data with a video shader using a matching **.xpCam** file.
    - Configure the following global camera options:
      - **FOV** — use the field of vision of the global camera.
      - **FOV Direction** — use the field of vision directional setting of the global camera.
      - **CCD Size** — use the charge-coupled device chip settings of the global camera.
      - **CCD Offset** — use the charge-coupled device chip offsets of the global camera.
      - **Position** — use the positional settings of the global camera.
      - **Direction** — use the directional settings of the global camera.
      - **Lens Dist**ortion — use the lens distortion settings of the global camera.
      - **Depth Of Field** — use the depth of field settings of the global camera.

11. Double-click the scene containing the perspective camera object.

    The selected scene is sent to the default output, and displayed using the active perspective camera object.



★Use the following keyboard and mouse commands to orbit, pan, and zoom the camera in the Main Viewport:

- **ALT + Left Mouse Button** — orbit the camera in the Main Viewport.
- **ALT + Middle Mouse Button** — pan the camera in the Main Viewport.
- **Mouse Wheel** — zoom in and zoom out in Main Viewport.

For More Information on...

- camera tracking, refer to Configuring Camera Tracking.

Adding an Orthographic Camera to a Scene

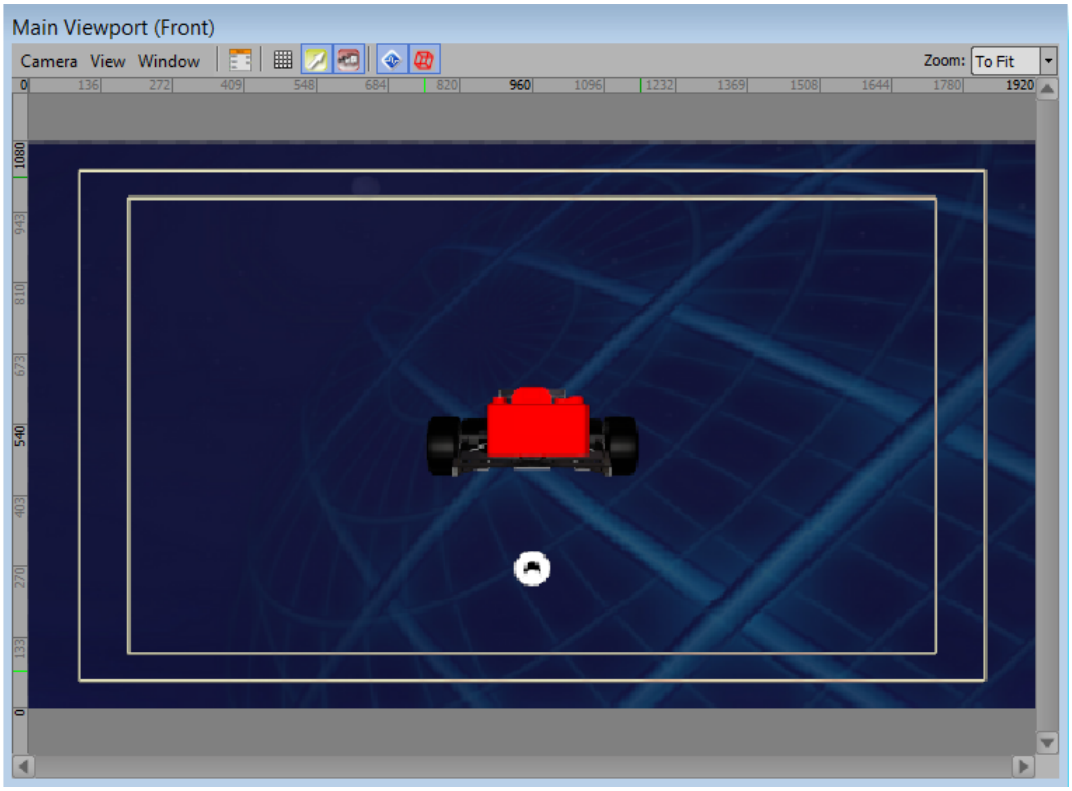
The view from an orthographic camera results in a flat display (no perspective) of the scene.

1. In the **Scene Manager**, select the scene or scene group to add an orthographic camera object.

   The selected scene or scene group is displayed in the active Viewport.

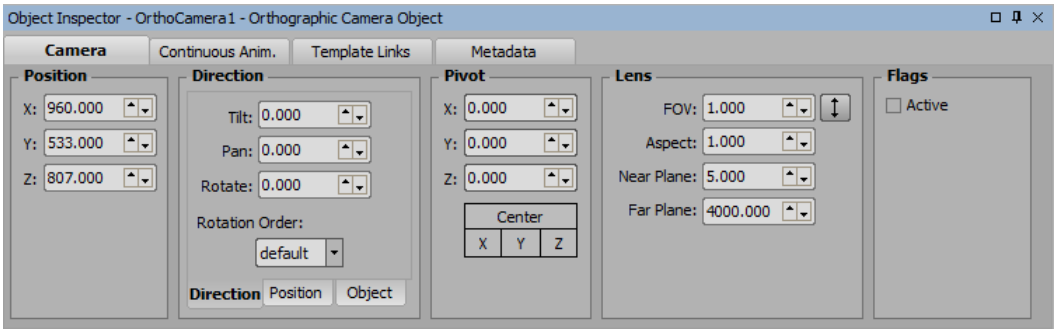
2. In the **Cameras** section of the **Object Library**, select the **Ortho. Camera** object.

   A new orthographic camera object is added to the center of the active Viewport.



3. In the **Object Inspector**, select the **Camera** tab.

   The **Camera** tab opens.



4. In the **Position** section, enter coordinates in the **X**, **Y**, and **Z** fields to set the position of the orthographic camera object in the scene.

5. In the **Direction** section, select one of the following tabs to set the direction of view for the camera object:
   - **Direction** — set the direction of view by setting the orientation of the orthographic camera object.
   - **Fixed** — set the direction of view by pointing the orthographic camera object at a fixed point.
   - **Object** — set the direction of view by pointing the orthographic camera object at an object in the scene.
6. Use the selected tab to set the direction of view for the camera object as described in the following table:

Direction	**Tilt**	Enter or select the degrees to rotate the camera object upwards or downwards, around the X axis. Positive values point the camera object view upwards, while negative values point the camera object view downwards.
	Pan	Enter or select the degrees to point the camera object to the right or left, around the Y axis. Positive values point the camera object view to the right, while negative values point the camera object view to the left.
	Rotate	Enter or select the degrees to rotate the camera object to the right or left, around the Z axis. Positive values rotate the camera object view to the right, while negative values rotate the camera object view to the left.
	Rotation Order	From the **Rotation Order** drop-down, select the mathematical sequence for the rotation of the object.
Position	**X**	Enter or select the **X** coordinate (in pixels) of the position at which to face the camera object.
	Y	Enter or select the **Y** coordinate (in pixels) of the position at which to face the camera object.
	Z	Enter or select the **Z** coordinate (in pixels) of the position at which to face the camera object.
	Rotation	In the **Rotation** field, enter or select the degrees to rotate the camera object to the right or left, around the **Z** axis. Positive values rotate the camera object to the right, while negative values rotate the camera object to the left.

7. In the **Pivot** section, set the pivot point of an orthographic camera object as follows:

   In the **X**, **Y**, and **Z** fields, enter or select the X, Y, and Z coordinates for the camera pivot point.

   Select one of the following:
   - Select the **Center** button to set the pivot point from the center of the X, Y, and Z coordinate.
   - Select the **X** button to pivot on the X axis.
   - Select the **Y** button to pivot on the Y axis.
   - Select the **Z** button to pivot on the Z axis.

8. In the **Lens** section, configure the following settings:

FOV (degr.)	Enter or select a value in degrees for the **Vertical** field of view of the camera (default). The default value is 45° Select the **Horizontal FOV** button to switch to a horizontal field of view for the camera.
Aspect	Enter or select the aspect ratio of the camera. This acts as a multiplier of the current aspect ratio of the project.
Near Plane	Enter or select the distance (in pixels) from the viewer to the nearest clipping plane. This distance is always positive.
Far Plane	Enter or select the distance (in pixels) from the viewer to the farthest clipping plane. This distance is always positive.

9. In the **Flags** section, do the following:
   - Select the **Active** checkbox to activate the selected orthographic camera object for a scene and use it to view the scene from the orthographic camera on the output.
10. Double-click the scene containing the orthographic camera object.

    The selected scene is sent to the default output, and displayed using the active orthographic camera object.



Layers

Layers are used to render a group of objects together but separately from other objects or layers. For example, use layers to mask a group of objects without masking other objects or layers.

The following topic is discussed in this section:

Adding a Layer Object to a Scene

Adding a Camera Layer Object to a Scene

Adding a Layer Object to a Scene

Use layer objects to render a group of objects together but keep them separate from other objects or layers.

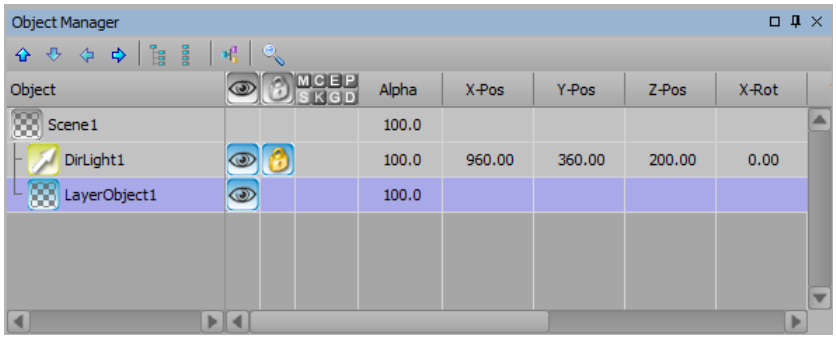
To add a layer object to a scene:

1. In the **Scene Manager**, select the scene or scene group to add a layer object.

   The selected scene or scene group is displayed in the active Viewport.

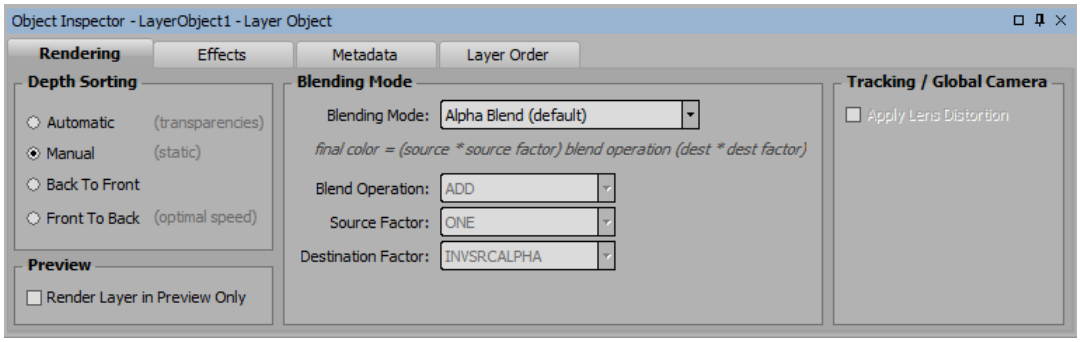
2. In the **Layers** section of the **Object Library**, select the **Layer** object.

   A new layer object is added to the scene or scene group in the **Object Manager**.



3. In the **Object Inspector**, select the **Rendering** tab.

   The **Rendering** tab opens.



4. In the **Depth Sorting** section, set one of the following rendering modes:

   - **Automatic** — use the **Z** value to determine the layering.
   - **Manual** — use the order of the objects in the **Object Manager** to determine the layering.
   - **Back To Front** — use the order of the objects from back to front to determine the layering.
   - **Front To Back** — use the order of the objects from front to back to determine the layering.

   By default, the depth sorting mode of a layer is set to **Manual**, meaning the order of objects within the **Layer Object** dictates the rendering order. In **Manual** mode, objects are drawn in descending order, with the top-most object in the object tree being drawn at the back and the bottom-most object in the tree being drawn in front.

   Switching the depth sorting mode to **Automatic** means objects will now be rendered based on their position in 3D space.

5. In the **Preview** section, select the **Render Layer in Preview Only** to render the layer object on preview only and not on air.

This is useful for visually distinguishing multiple scenes that are different but similar in appearance.

6. In the **Blending Mode** section, from the **Blending Mode** drop-down, select a blending mode.

   The options are:

   - **Custom —** A non-standard blending setup, often used for complex or performance-optimized operations. Can involve manually defined blend equations or GPU-specific behavior (e.g., blending RGB differently from alpha).
   - **AlphaBlend (Default) —** the standard blending mode used in most real-time rendering: Output = SrcRGB * SrcAlpha + DstRGB * (1 - SrcAlpha).
   - **Additive (Linear Dodge) —** adds color values together: Output = SrcRGB + DstRGB.
   - **Additive where Alpha —** like **Additive**, but scaled by the source alpha: Output = SrcRGB * SrcAlpha + DstRGB.
   - **Subtractive —** subtracts the source color from the destination: Output = DstRGB - SrcRGB.
   - **Multiply —** multiplies the source and destination colors: Output = SrcRGB * DstRGB.
   - **Darken —** chooses the minimum value per channel: Output = min(SrcRGB, DstRGB).
   - **Lighten —** chooses the maximum value per channel: Output = max(SrcRGB, DstRGB).
   - **Alpha Mask —** uses the alpha channel as a mask to fully show or hide pixels: Output = SrcRGB * SrcAlpha (Destination is ignored entirely).
   - **Premultiply —** assumes the input RGB values are already multiplied by alpha: Output = SrcRGB + DstRGB * (1 - SrcAlpha).
   - **Screen —** inverse multiply: Output = 1 - (1 - SrcRGB) * (1 - DstRGB).

   The following table summarizes the effect and typical use cases of each blending mode:

Mode	Effect	Typical Use Cases
Custom	Application-specific logic	Optimized or stylized workflows
AlphaBlend	Standard transparency	UI, glass, fading
Additive	Brighten, glowy	Fire, energy beams
Additive where Alpha	Brighten with softness	Volumetric effects
Subtractive	Color removal/darkening	Stylized effects
Multiply	Darkening blend	Shadows, decals
Darken	Chooses darker color	Burn or noir effects
Lighten	Chooses lighter color	Glow stacking, additive highlights
Alpha Mask	Hard-edged transparency	Cutouts, sprite masking
Premultiply	Correct alpha-weighted blend	Film compositing, clean edges
Screen	Soft additive (lighten)	Glow, lens flares

7. If **Custom** is selected as the **Blending Mode**, select from the following **Blend Operations**:

   - **ADD** — adds two inputs together after applying scaling factors: Output = Src * SrcFactor + Dst * DstFactor.
   - **SUBTRACT** — the destination value is subtracted from the source: Output = Src * SrcFactor - Dst * DstFactor.
   - **REVSUBTRACT** — the source is subtracted from the destination (opposite of **SUBTRACT**).

- **MIN** — chooses the minimum value per channel: Output = min(Src, Dst).
- **MAX** — chooses the maximum value per channel: Output = max(Src, Dst).

The following table summarizes the effect and use cases of each **Blend Operation**:

Blend Operation	Effect	Typical Use Cases
Add	Adds source and destination values	Standard alpha blending, additive glows, soft transparency
Subtract	Subtracts destination from source	Stylized effects, darkening, contrast-heavy visuals
RevSubtract	Subtracts source from destination	Inversion, burn effects, motion trails
Min	Chooses the lower value per channel	Shadow masking, intersection highlighting, screen burn effects
Max	Chooses the higher value per channel	Light accumulation, glow stacking, emissive enhancement

And then select from the following **Blend Factors**:

- **ZERO** — (0, 0, 0, 0).
- **ONE** — (1, 1, 1, 1).
- **SRCCOLOR** — Source RGB color.
- **INVSRCCOLOR** — 1 - Source RGB color.
- **SRCALPHA** — Source alpha.
- **INVSRCALPHA** — 1 - Source alpha.
- **DESTALPHA** — Destination alpha.
- **INVDESTALPHA** — 1 - Destination alpha.
- **DESTCOLOR** — Destination RGB color.
- **INVDESTCOLOR** — 1 - Destination RGB color.

The following table summarizes the effects and typical use cases of each **Blend Factor** (applies to both **Source Factor** and **Destination Factor**):

Blend Factor	Effect	Typical Use Cases
ZERO	Contributes nothing to the result.	Fully masks out the source (or dest). Used to isolate channels.
ONE	Full contribution from the source color.	Additive blending, lighting, unmodulated overlays.
SRCCOLOR	Multiplies source by its own RGB.	Color burn effects, feedback loops.
INVSRCCOLOR	Inverse of source color.	Desaturation, darkening, stylized effects.
SRCALPHA	Multiplies by the source’s alpha channel.	Standard alpha blending, UI transparency, fade in/out.
INVSRCALPHA	Inverse of source alpha.	Combined with SrcAlpha for smooth transitions.
DESTALPHA	Multiplies by destination alpha.	Advanced compositing, layered transparency.

Blend Factor	Effect	Typical Use Cases
INVDESTALPHA	Inverse of destination alpha.	Anti-overdraw techniques, masking.
DESTCOLOR	Multiplies by existing framebuffer color.	Multiply blending, burn effects, material overlays.
INVDESTCOLOR	Inverse of framebuffer color.	Inversion, contrast pushing, stylized compositing.

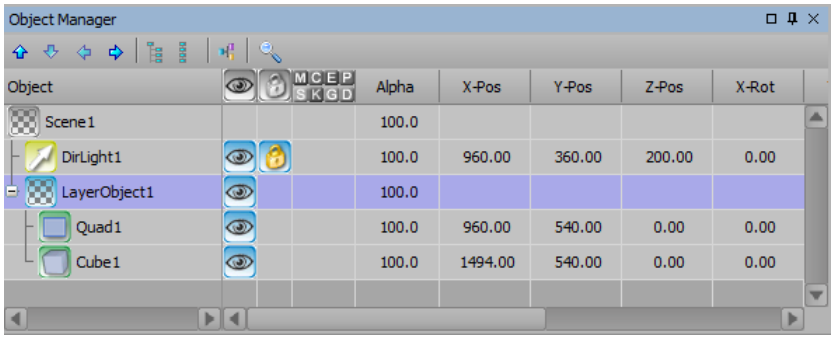
7. Continue with adding other objects to a layer object.

To add other objects to a layer object:

1. Add objects to the scene or scene group as needed.
2. In the **Object Manager**, left-click on an object and drag it to the layer object.

   Alternatively, you can use the **Right** and **Left Arrow** buttons in the toolbar to move an object into and out of layers.

   The selected object is added to the layer object. Objects contained in a layer object are indented and connected to the layer object by a leader line.

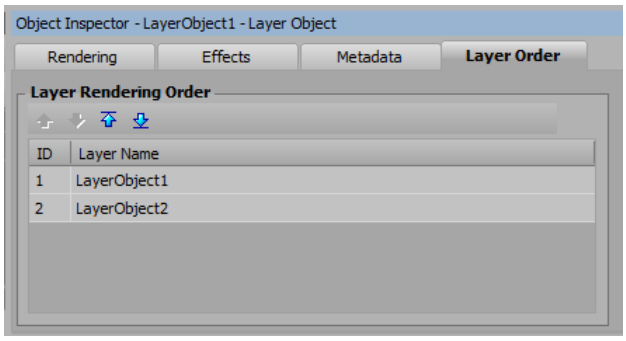


★All objects within a layer object must have **Depth Writes** enabled (in the **Rendering** tab of the object).

To reorder layer objects:

1. In the **Object Inspector**, select the **Layer Order** tab.

   The **Layer Order** tab opens.



2. Use the **Up** and **Down** arrows to reorganize the layer order.

   The layers listed in the **Layer Rendering Order** list are arranged from back to front so that they better match the ordering when using manual depth sorting.

For More Information on...

- creating a scene, refer to the procedure Creating or Deleting a Scene.
- creating a scene group, refer to the procedure Creating or Deleting a Scene Group.

Adding a Camera Layer Object to a Scene

Camera layers are used to view a group of objects together from a different angle but separately from other objects or layers.

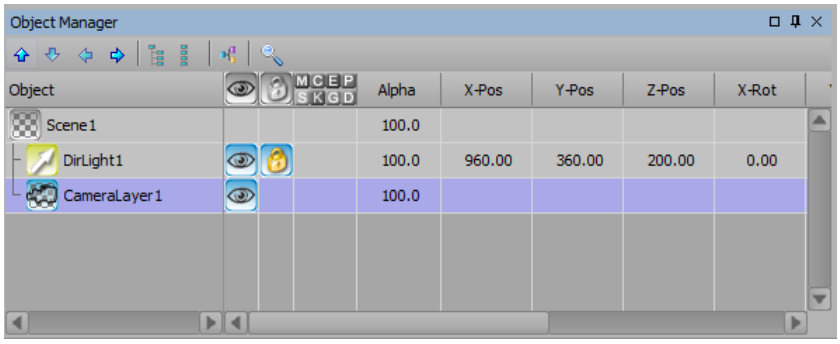
To add a camera layer object to a scene:

1. In the **Scene Manager**, select the scene or scene group to add a camera layer object.

   The selected scene or scene group is displayed in the active Viewport.

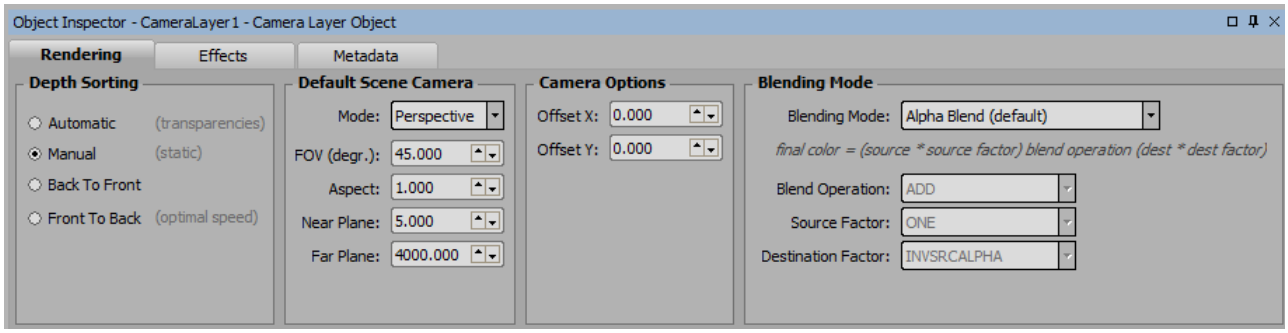
2. In the **Layers** section of the **Object Library**, select the **Camera Layer** object.

   A new camera layer object is added to the scene or scene group in the **Object Manager**.



3. In the **Object Inspector**, select the **Rendering** tab.

   The **Rendering** tab opens.



4. In the **Depth Sorting** section, select one of the following rendering modes:
   - **Automatic** — use the **Z** value to determine the layering.
   - **Manual** — use the order of the objects in the Object Manager to determine the layering.
   - **Back To Front** — use the order of the objects from back to front to determine the layering.
   - **Front To Back** — use the order of the objects from front to back to determine the layering.
5. In the **Default Scene Camera** section, set the following camera properties:
   - **Mode** — use the menu to select one of the following:
     - **Perspective** — view the scene from a different angle.
     - **Orthogonal** — view the scene in a flat display (no perspective).
   - **FOV** — enter or select the field of view value in degrees for the camera layer.

     The default value is 45 degrees.

- **Aspect** — enter or select the aspect ration for the camera.
- **Near Plane** — enter or select the distance in pixels from the viewer to the nearest clipping plane.

  This distance is always positive.
- **Far Plane** — enter or select the distance in pixels from the viewer to the farthest clipping plane.

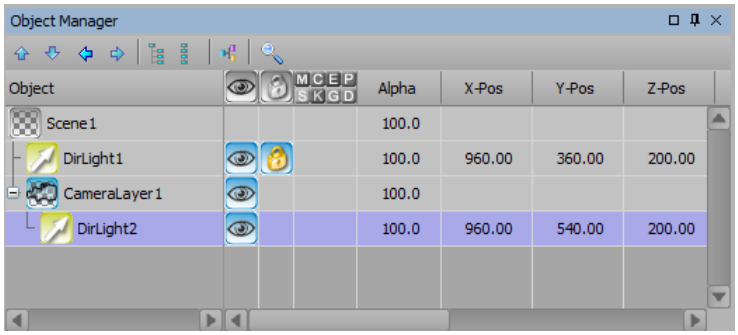
  This distance is always positive.

To add other objects to a layer object:

1. Add objects to the scene or scene group as needed.
2. In the **Object Manager**, left-click on an object and drag it to the camera layer object.

   Alternatively, you can use the **Right** and **Left Arrow** buttons in the toolbar to move an object into and out of layers.

   The selected object is added to the camera layer object. Objects contained in a layer object are indented and connected to the layer object by a leader line.



For More Information on...

- creating a scene, refer to the procedure Creating or Deleting a Scene.
- creating a scene group, refer to the procedure Creating or Deleting a Scene Group.

Markers

Use an event marker object to perform an action when the event marker either becomes rendered in the scene or is no longer rendered in the scene. It is used to script events or to modify the roll/crawl.

The following topic is discussed in this section:

Adding an Event Marker to a Scene

Adding an Event Marker to a Scene

Use an event marker object to trigger an action such as a roll or crawl in the scene.

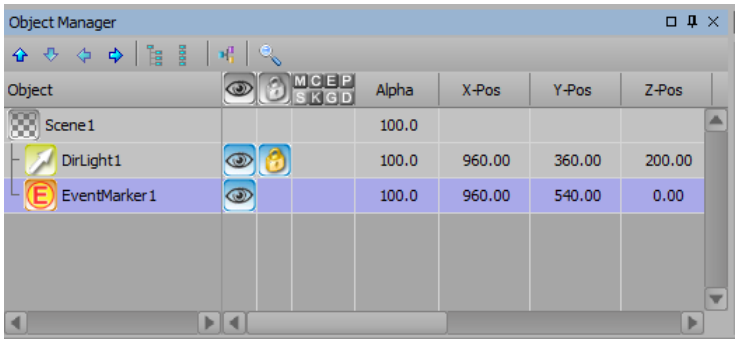
To add an event marker to a scene:

1. In the **Scene Manager**, select the scene or scene group to add an event marker.

   The selected scene or scene group is displayed in the active Viewport.

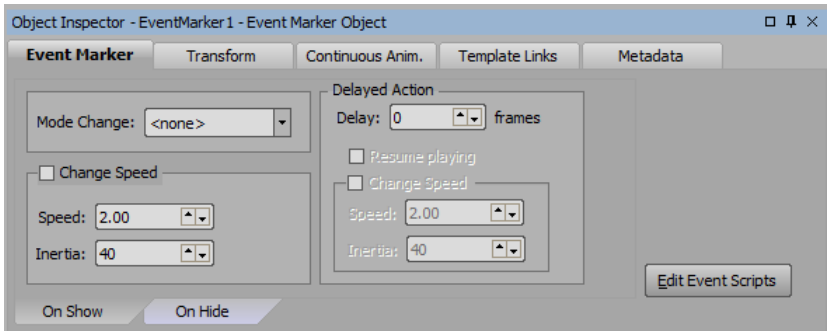
2. In the **Markers** section of the **Object Library**, click the **Event Marker** object.

   An event marker object is added to the **Object Manager** as part of the scene displayed in the active viewport.



3. In the **Object Inspector**, select the **Event Marker** tab.

   The **Event Marker** tab opens.



4. At the bottom of the **Event Marker** tab, select one of the following:
   - **On Show** — to configure the settings for the event marker when it is rendered in the scene.
   - **On Hide** — to configure the settings for the event marker when it is not rendered in the scene.
5. From the **Mode Change** drop-down, select the action of the event marker:
   - **<none>** — assign no mode change to the event marker.
   - **Pause** — assign a pause action to the event marker.
   - **Start** — assign a start action to the event marker.
   - **Take Offline** — take a scene group offline.

6. Select the **Change Speed** checkbox to adjust the speed of the roll/crawl or event script when the event marker is rendered or no longer rendered in the scene.

   Then configure the **Speed** and Inertia settings.

   - In the **Speed** field, enter or select the speed of the roll/crawl or event script.
   - In the **Inertia** field, enter or select the degree to which the roll/crawl or event script speed change accelerates or decelerates.

7. In the **Delayed Action** section, configure the settings as follows:

   - In the **Delay** field, enter or select the number of frames to delay the selected mode change.
   - Select the **Resume playing** checkbox to resume playing the scene or scene group after the selected mode change occurs.

8. If the **Resume playing** checkbox is selected, the **Change Speed** checkbox can be selected to change the speed of the roll/crawl or event script after the delayed action.

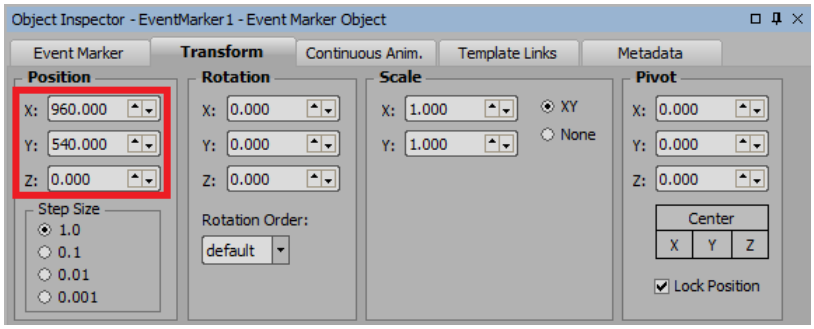
   Then configure the **Speed** and **Inertia** settings.

   - In the **Speed** field, enter or select the speed of the roll/crawl or event script.
   - In the **Inertia** field, enter or select the degree to which the roll/crawl or event script speed change accelerates or decelerates.

To position the event marker object in the Viewport:

- Press the **Ctrl** key, then select the event marker object in the Viewport and drag it into position.

  Alternatively, in the **Transform** tab, in the **Position** section, you can set the **X**, **Y**, and **Z** coordinates to precisely position the event marker object.



Miscellaneous Objects

Miscellaneous object functions can be performed using XPression, such as grouping objects, positioning objects, or publishing template links.

The following topics are discussed in this section:

Grouping Scene Objects

Positioning Objects

Publishing Template Links

Grouping Scene Objects

To group scene objects:

1. In the **Scene Manager** window, select the scene or scene group to add a group object.

   The selected scene or scene group is displayed in the active viewport.

2. In the **Misc** section of the **Object Library**, select the **Group** object.

   A new group object is added to the **Object Manager** as part of the scene displayed in the active viewport.



3. In the **Object** column of the **Object Manager**, left-click an object and drag it to the group object.

   Alternatively, you can use the **Right** and **Left Arrow** buttons in the toolbar to move an object into and out of groups.

   The selected object is added to the group object. Objects contained in a group object are indented and connected to the group object by a leader line.



4. To select a group object, select the group object in the **Object** column of the **Object Manager** window.

To change the order of objects in a group:

- In the **Object Manager**, left-click and drag an object to a new position.

  Alternatively, you can use the **Right** and Left **Arrow** buttons in the toolbar to move an object to a new position.

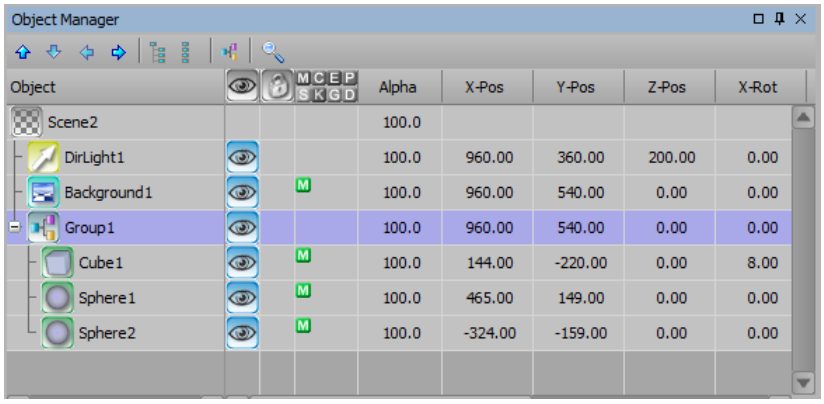
For information on positioning a group object in a scene, refer to the procedure Positioning an Object.

Positioning Objects

You can use the **Move Tool** and **Rotation Tool** to position objects at approximate locations in the scene, or you can use the **Transform** tab of the **Object Inspector** to position objects precisely.

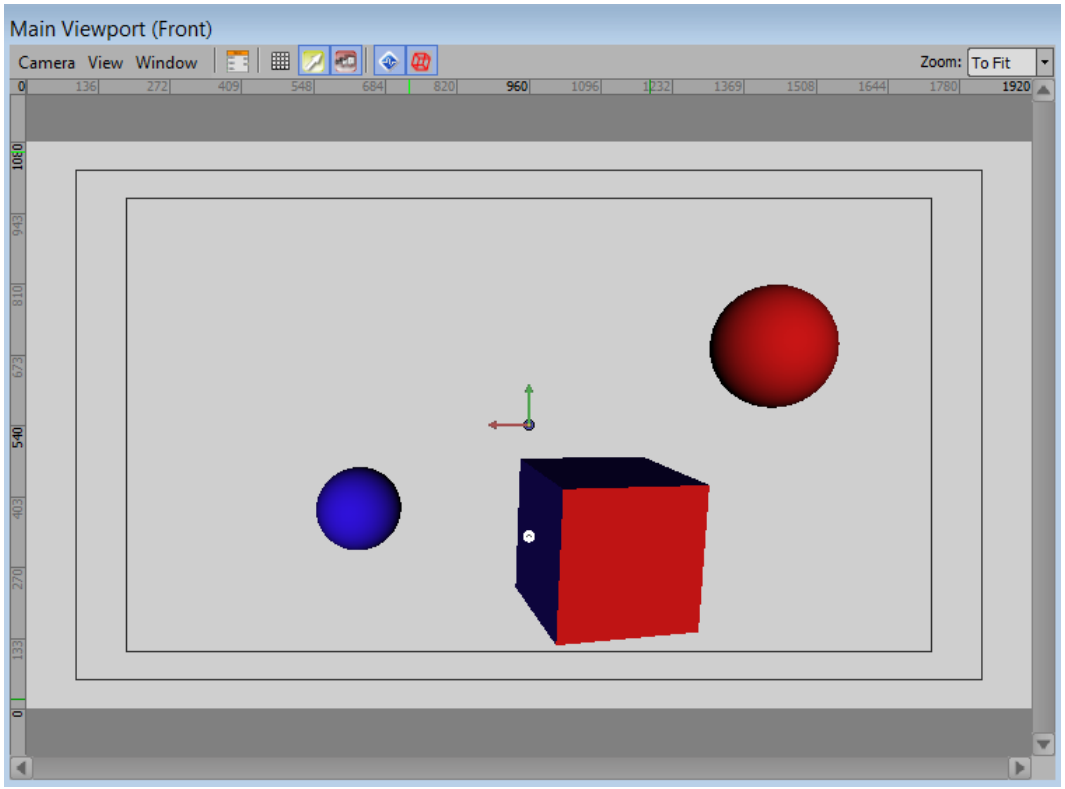
To position an object or object group using the Move and Rotation Tools:

1. In the **Object Manager**, select an object or object group to move or rotate.



2. In the **Editor** toolbar, select the **Move Tool** .

   The **Move Tool** axis is displayed at the pivot point of the selected object or group.



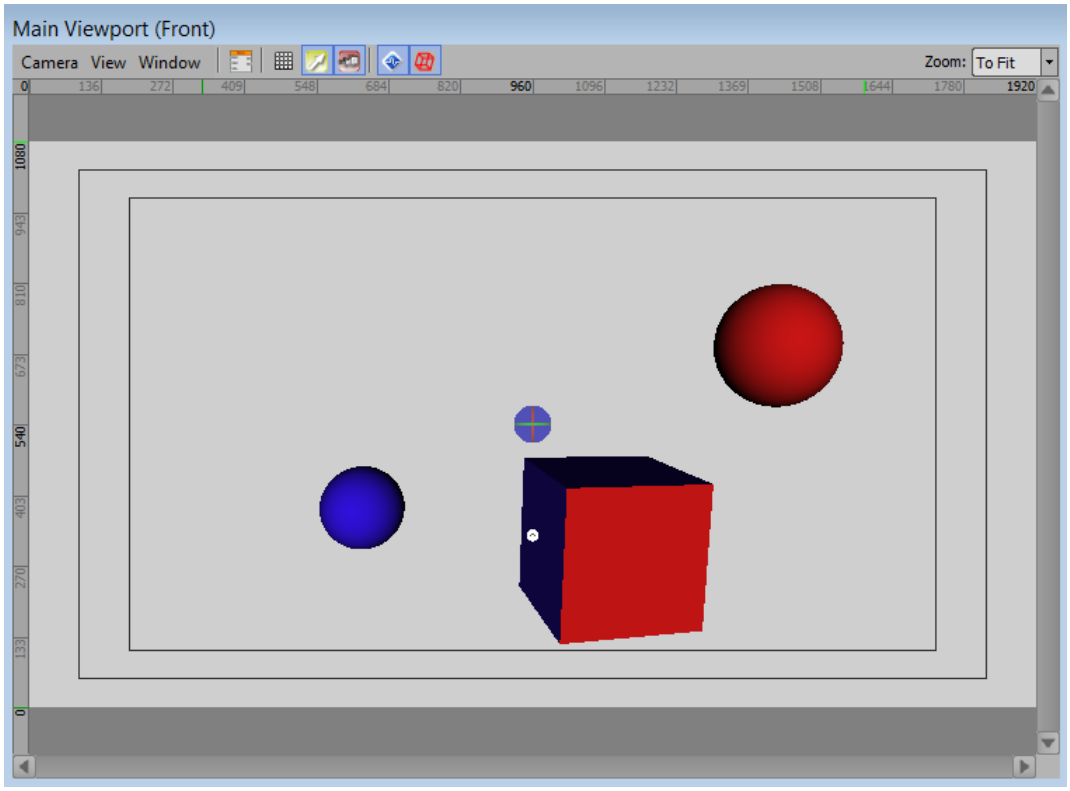
3. Use the **Move Tool** as follows to move the selected object:

   - Select and drag the **Red** (X), **Green** (Y), or **Blue** (Z) axis displayed at the object pivot point to move the object along the selected axis.

- Select and drag the **Yellow** center of the axis displayed at the object pivot point to move the object horizontally and/or vertically in the scene.

4. In the **Editor** toolbar, select the **Rotation Tool** to rotate the selected object.

   The **Rotation Tool** axis is displayed at the pivot point of the selected object.

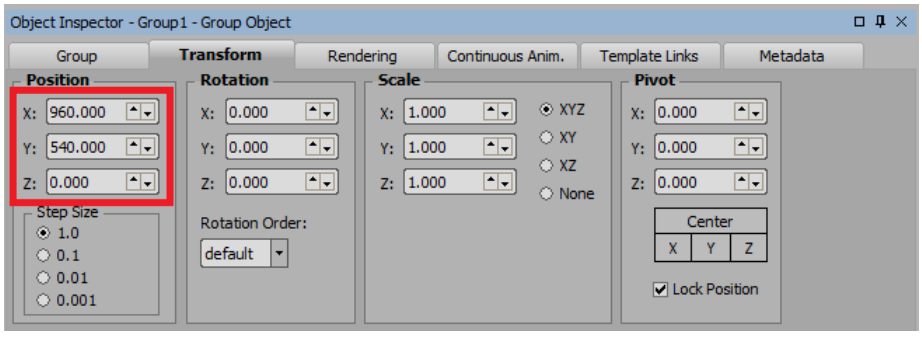


5. Use the **Rotate Tool** as follows to move the selected group object:

   - Select and drag the **Red** (X), **Green** (Y), or **Blue** (Z) axis ring displayed at the object pivot point to rotate the object around the selected axis.
   - Select and drag the **Yellow** center of the axis rings displayed at the object pivot point to rotate the object about the scene.

To position an object or object group using the Transform tab:

- In the **Object Inspector**, in the **Transform** tab, in the **Position** section, set the **X**, **Y**, and **Z** coordinates to precisely position the object or object group.



For More Information on...

- how to add a group object to a scene, refer to the procedure Grouping Scene Objects.

Publishing Template Links

The **Template Links** tab (found in the **Object Inspector** in **Layout** mode) lists the attributes associated with a selected object that can be published to the **Template Data** section in the **Sequencer**, where they are used in output mode to replace the template values.

Text objects are published by default. This default can be disabled in **Project > Properties > Preferences**.

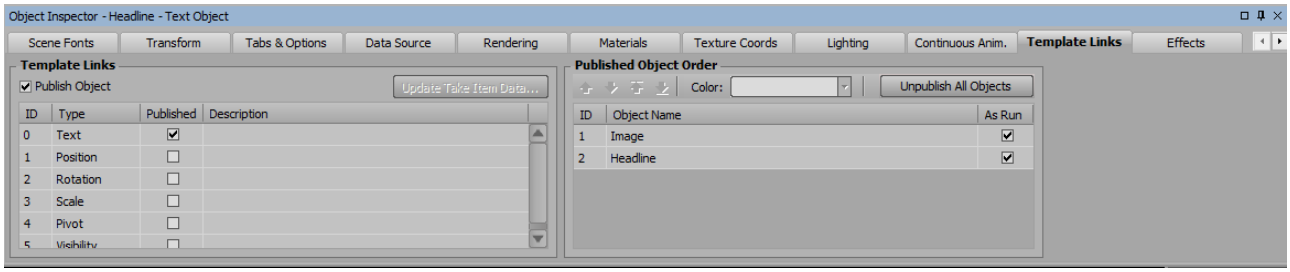
The publishing hierarchy, as set in the **Published Object Order** list, determines the order in which the published parameters are listed in the **Take Inspector - Template Data** tab in the **Sequence Editor**. Objects higher in the hierarchy are displayed higher in the list of published parameters.

You can also assign a specific color to an item, so that it is easily identifiable in the **Template Data** list.

To publish template links:

1. Add a text, 3D model, primitive, light, camera, event marker, or group object to a scene.
2. Select the new object.
3. In the **Object Inspector**, select the **Template Links** tab.

   The **Template Links** tab opens.



4. In the **Template Links** section, select the **Publish Object** checkbox to publish the selected object.

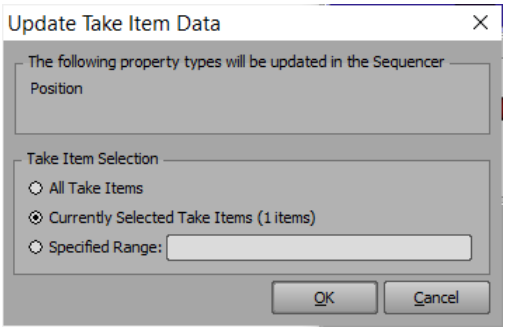
   The object attribute information available for publishing and automation is listed below the **Publish Object** checkbox.

5. In the **Published** column, select the checkbox for each object attribute you want to publish.

To update Sequencer items with the current values of publishable properties:

1. In the **Published** column, select one or more property types from the list.
2. Then select the **Update Take Item Data** button.

   The **Update Take Item Data** dialog opens.



3. In the **Take Item Selection** section, select the **Take Items** to be updated in the **Sequencer**.

   The options are:

   - **All Take Items** — All Take **Items** in the **Sequencer** based on the selected scene and containing the published object will be updated.
   - **Currently Selected Take Items** — only the currently selected **Take Items** will be updated.
   - **Specified Range** - all **Take Items** in the **Sequencer** based on the selected scene that fall within the specified range will be updated.

4. Then select **OK**.

To manage published objects:

1. In the **Published Object Order** section of the **Template Links** tab, select an object in the list.

   Multiple objects in the list can be selected at once by pressing the **Shift** key and selecting a range of objects, or by pressing the **Ctrl** key and selecting individual objects.

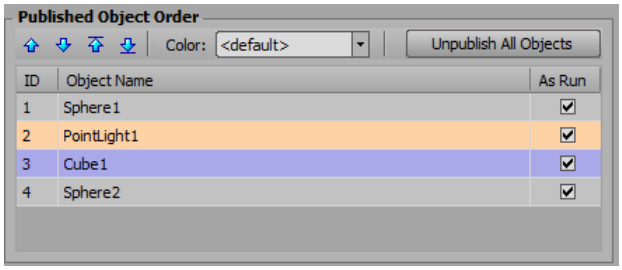
2. Then use the arrow icons to change the position of the selected object(s) in the publishing hierarchy.

   — select (or right-click and select from the shortcut menu) to move the selected object up one level in the publishing hierarchy.

   — select (or right-click and select from the shortcut menu) to move the selected object down one level in the publishing hierarchy.

   — select (or right-click and select from the shortcut menu) to move the selected object to the top of the publishing hierarchy.

   — select (or right-click and select from the shortcut menu) to move the selected object to the bottom of the publishing hierarchy.



3. Select an item from the **Object** list and from the **Color** drop-down, select a color for that item.
4. Select **Unpublish All Objects** to clear the list or right-click an object and from the shortcut menu, select **Unpublish Object** to only unpublish that object.

For More Information on...

- adding a text object to a scene, refer to the procedure Creating a Text Object.
- adding a 3D model to a scene, refer to the procedure Importing a 3D, FBX, or OBJ Model into a Scene.
- adding a primitive object (e.g. quad, sphere, etc.) to a scene, refer to the chapter Primitives.
- adding a light object to a scene, refer to the chapter Lights.
- adding a camera to a scene, refer to the chapter Cameras.
- adding an event marker to a scene, refer to the procedure Adding an Event Marker to a Scene.
- adding a group object to a scene, refer to the procedure Grouping Scene Objects.

- modifying template content for playout, refer to the procedure Modifying Template Content.

Materials

In XPression, materials are used to define the look and style of objects in a scene.

The following topics are discussed in this section:

Creating a Texture Material

Creating a Video Material

Creating a Render View Material

Creating a Server Channel Material

Creating a Reflection Map Material

Creating a Bump Map Material

Creating a Refraction Material

Creating a Live Source Material

Creating a Tessera Preview Material

Creating a Gradient Material

Creating a Window Capture Material

Creating an API Texture Material

Setting DataLinq Properties for a Material

Creating a Texture Material

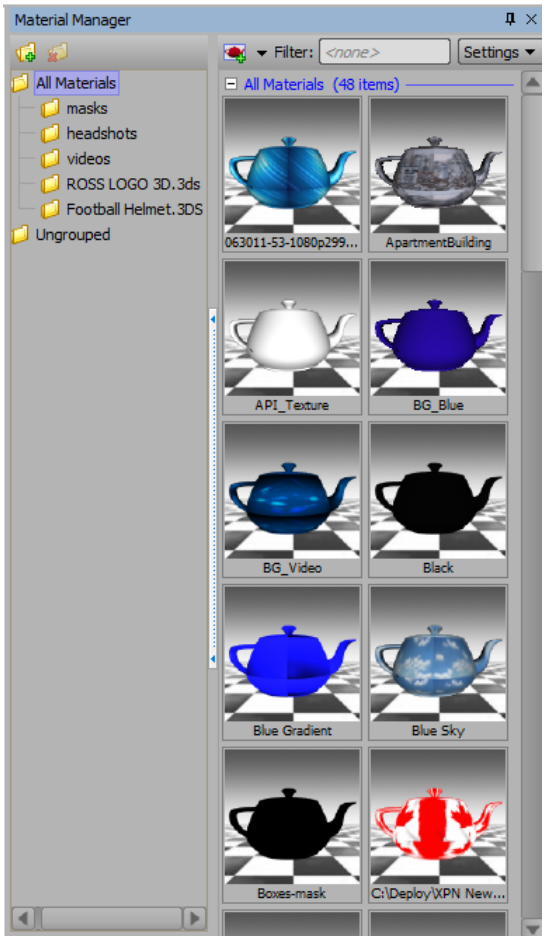
Use a **Texture** material to apply an image to the surface of an object.

★When a texture material is applied to an empty quad object, the quad is re-sized to fit the image in the material. When applied to a quad that already contains a material, the image is resized to fit the quad.

To create a texture material:

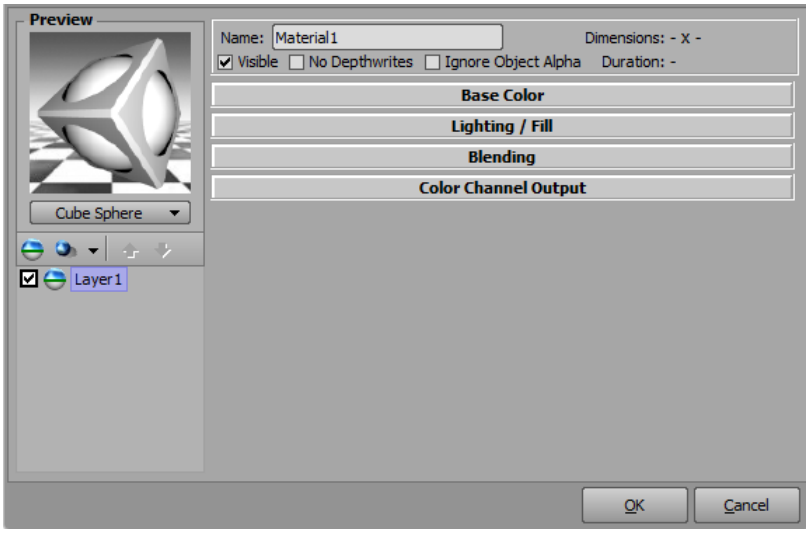
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

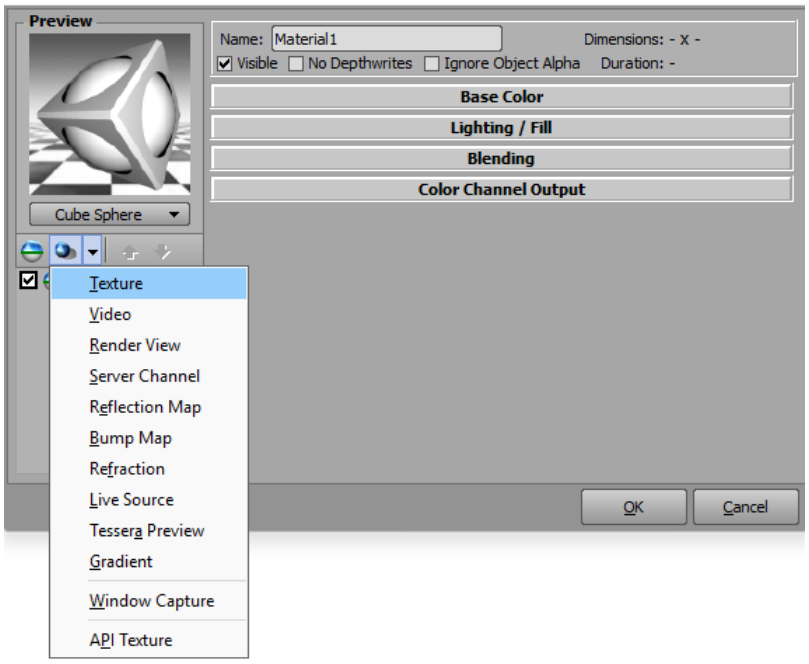


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

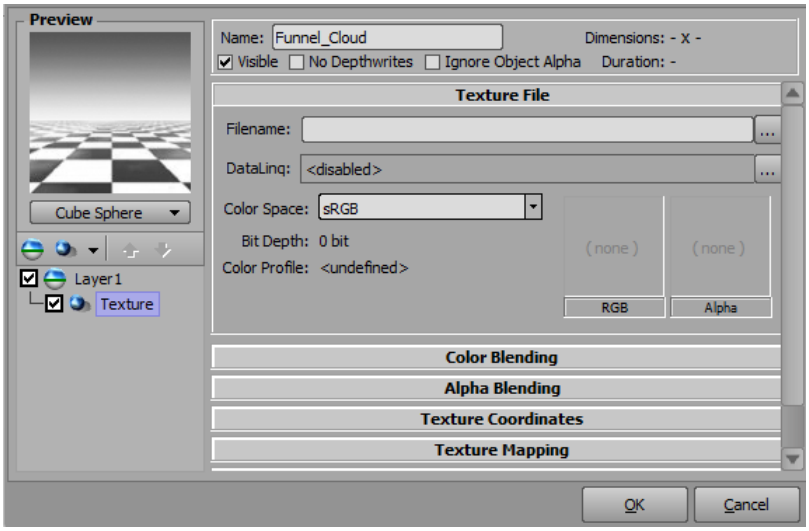
   The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Texture**.



A **Texture** shader is added to the material.

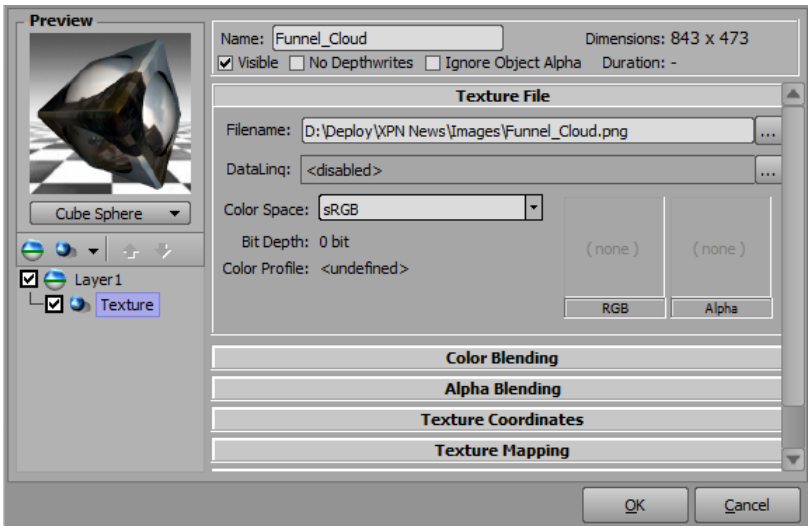


5. Continue with configuring the Texture File settings.

To configure the Texture File settings:

1. In the **Filename** field, enter the full path to the image file to use as a texture, or select **Browse** to locate and select the image file.

   The thumbnail displays the selected image file.



2. If you intend to use DataLinq to populate the material with images, in the **DataLinq** field, select the **Browse** button to open the **Set DataLinq Properties** dialog.

   Refer to Setting DataLinq Properties for a Material for information about configuring a DataLinq source.

3. From the **Color Space** drop-down, select either **sRGB** (Standard Red Green Blue) or **HLG** (Hybrid Log Gamma) depending on the format of your project.

4. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.

3. Continue with configuring the Texture Filtering settings.

To configure the Texture Filtering settings:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

Creating a Video Material

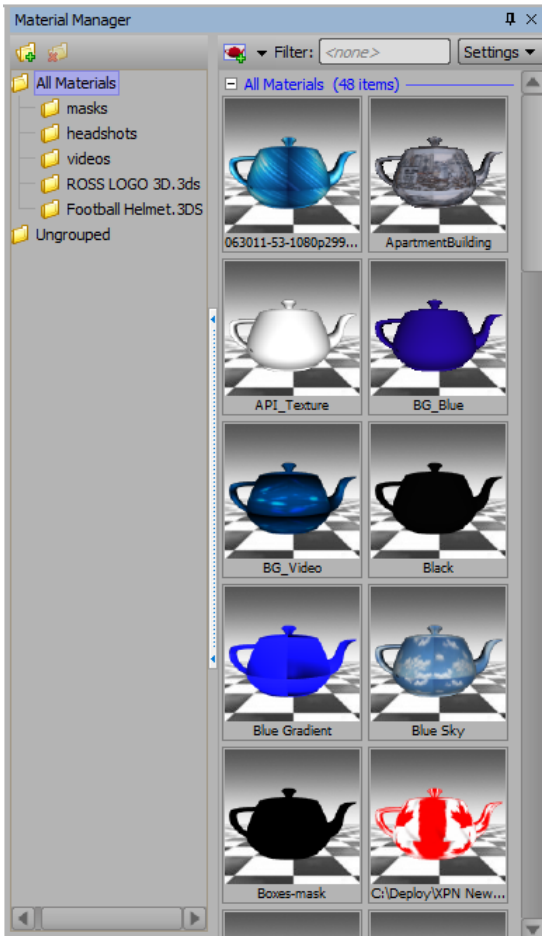
Use a **Video m**aterial to apply a video to the surface of an object.

★When a video material is applied to an empty quad object, the quad is re-sized to fit the video file in the material. When applied to a quad that already contains a material, the video file is re-sized to fit the quad.

To create a video material:

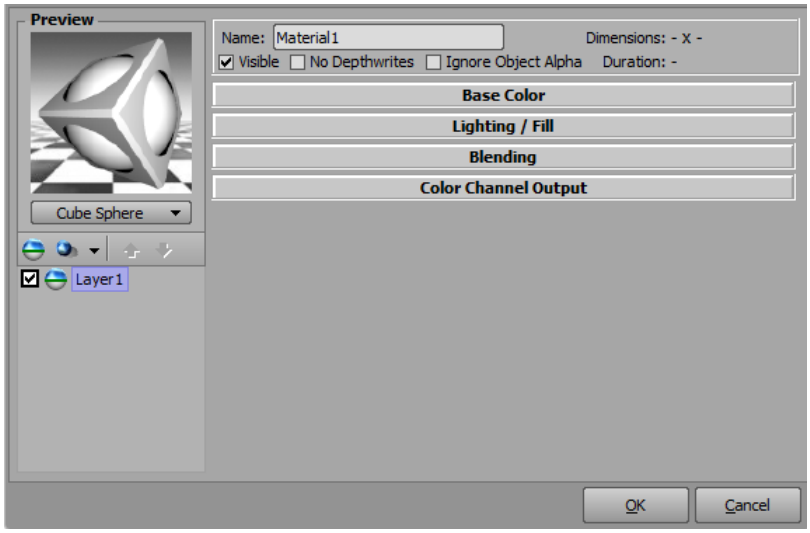
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

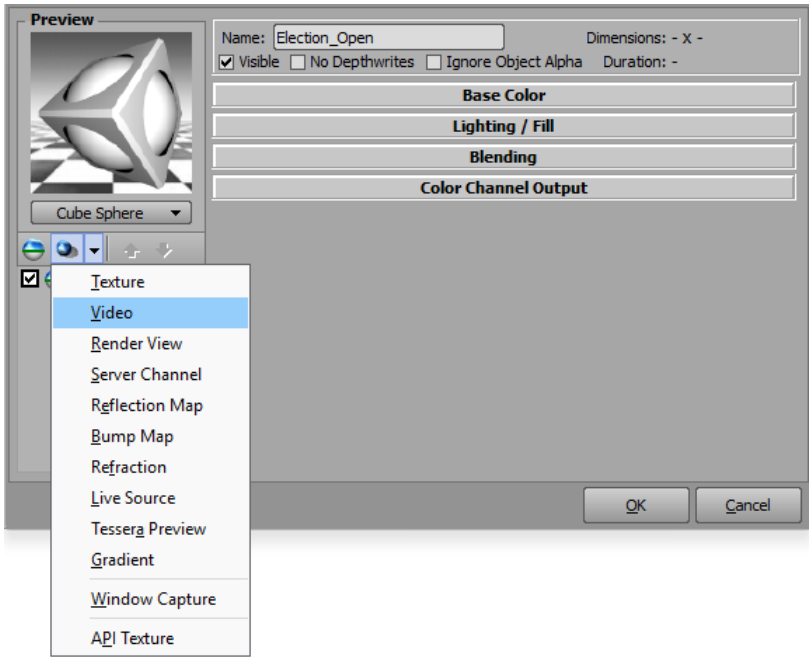


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

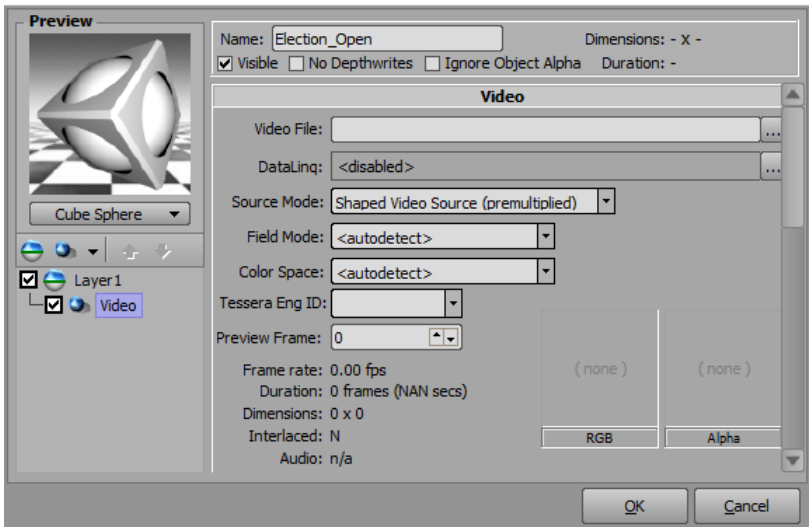
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Video**.



A **Video** shader is added to the material.



5. Continue with configuring the Video settings.

To configure the Video settings:

1. In the **Video** section, in the **Video File** field, enter the full path to the video file or select **Browse** to locate and select the video file.
2. In the **DataLinq** field, select **Browse** to open the **Set DataLinq Properties** dialog to select the DataLinq properties.
3. From the **Source Mode** drop-down, select the mode used by the video source to define transparency.

   The available modes are:

   - **Shaped Video Source (premultiplied)** — the video file uses a shaped key, where the key alpha cuts a hole based on the monochrome value of the alpha. Shades of gray are translated into either white or black, giving the key a hard edge.
   - **Unshaped Video Source** — the video file uses an unshaped key, where the key alpha cuts a hole based on the gradient values of the alpha. Shades of gray are translated into transparency levels, giving the key a soft edge.
4. If you intend to use DataLinq to populate the material with videos, in the **DataLinq** field, select the **Browse** button to open the **Set DataLinq Properties** dialog.

   Refer to Setting DataLinq Properties for a Material for information about configuring a DataLinq source.
5. From the **Field Mode** drop-down, select the mode for interpreting the video.

   The options are:

   - **<autodetect>** — interpret the video according to the source video.
   - **Progressive** — interpret the video as progressive scan.
   - **Upper Field First** — interpret the video using upper field first.
   - **Lower Field First** — interpret the video using lower field first.
6. From the **Color Space** drop-down, select the method for interpreting the color space.

   The options are:

   - **autodetect** — use the info retrieved from the file, where available.

- **sRGB** — use the sRGB color space.

7. If using Tessera, from the **Tessera Eng ID** drop-down, select a Tessera engine ID that will load the video in the video shader.

   Select multiple engines by typing in the engine IDs, using a comma to separate each engine ID.

8. In the **Preview Frame** field, enter or select a frame number from the video to use for generating previews.
9. Continue with configuring the Run Mode settings.

To configure the Run Mode settings:

1. In the **Run Mode** section, from the **Mode** drop-down, select the play mode for the video file.

   The available play modes are:

   - **Stopped** — display the first frame in the video file, but do not play the video file.
   - **Play Once** — only play the video file once, then display the last frame in the video file.
   - **Loop** — continuously play the video file from start to finish.
   - **Ping Pong** — continuously play the video file back and forth.

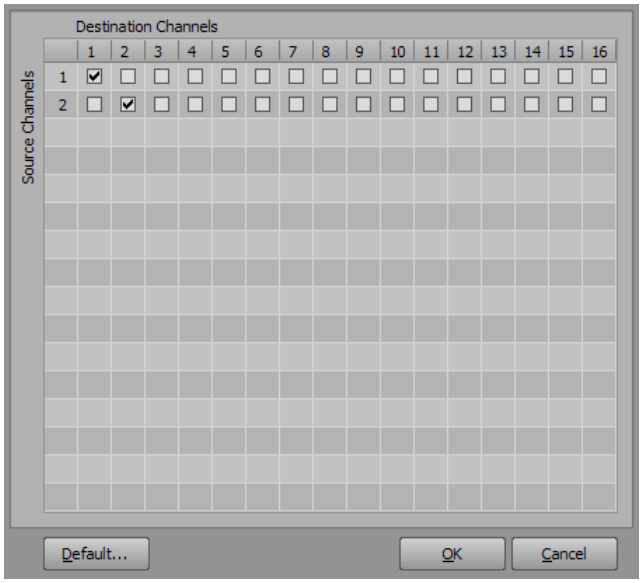
2. Select the **Auto Start** checkbox to enable the video to start immediately when the scene comes on-air.

   ★The start time of the video file may also be controlled from the **Scene Director** by dragging the video material to a **Scene Director** track.

3. Select the **Take Scene Offline At End** checkbox to take the scene offline at the end of the video.
4. Select the **Adjust Scene Director To Match Clip Length** checkbox to make the **Scene Director** the same length as the video. This only affects the scene when played in the sequencer, not the scene director in the original scene.
5. Select the **Free Running** checkbox to have the video run continuously.
6. If **Free Running** is selected, the **Sync to Clock** option becomes available, to sync a free running material to the clock to prevent volatile textures from restarting when used back to back.
7. Continue with configuring the Audio settings.

To configure the Audio settings:

1. Select **Set Channel Mapping** to open the **Audio Channel Mapping** dialog to configure the audio channel mapping for the video shader.



2. In the **Audio Channel Mapping** dialog, for each **Source Channel**, select a **Destination Channel**.
3. Select **OK** when finished or select **Default** to restore the default channel mapping.
4. In the **Master Audio Level** field, enter or select a master audio level in decibels for the shader.

   This value is applied to the existing per-channel volumes (but can only be modified using the **SetVolumeLevel** API call).

   ★If a ClipStore clip is applied to a published video material in a scene, the ClipStore audio level will be applied in addition to the master audio level of the published video shader.
5. Continue with configuring the Loop Points.

To configure the Loop Points:

1. In the **Loop Points** section, in the **Loop In Frame** field, enter or select the frame number where the loop should start.
2. In the **Loop Out Frame** field, enter or select the frame number where the loop should end.
3. In the **Loop Count** field, enter or select the number of times the loop should play.

   A value of **0** will create infinite looping.

   ★Loop points do not apply to clips placed on the **Scene Director**.
4. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Filtering settings.

To configure the Texture Filtering settings:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

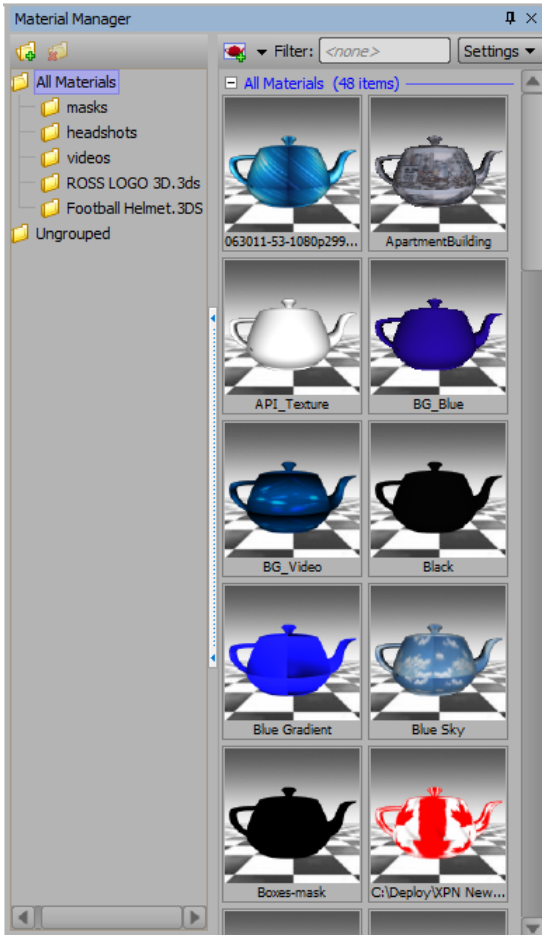
Creating a Render View Material

Use the **Render View** material to import an entire scene into a new scene, without affecting the camera perspective of either scene.

To create a Render View material:

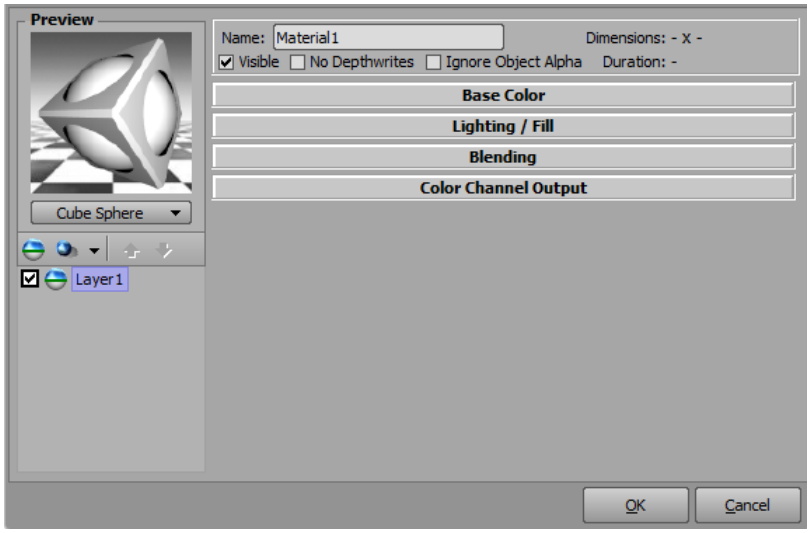
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

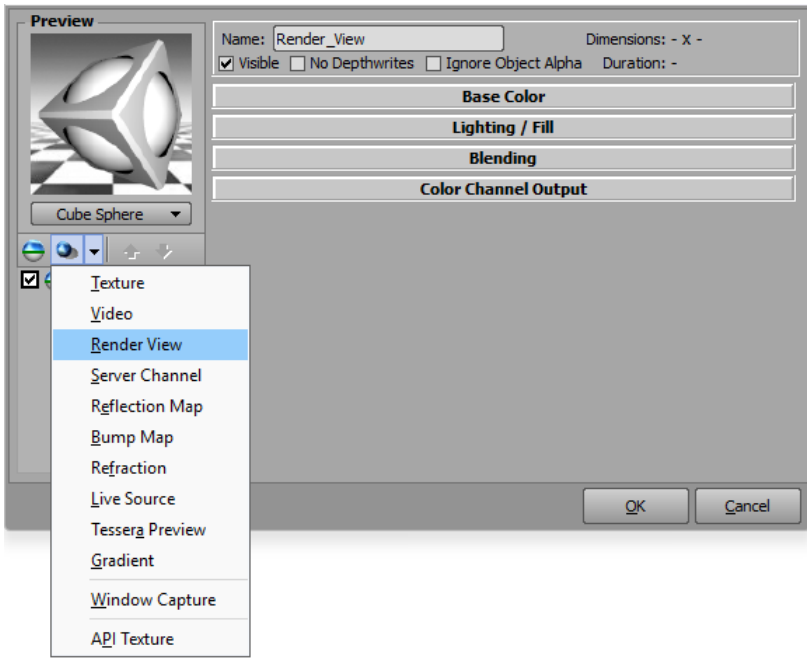


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

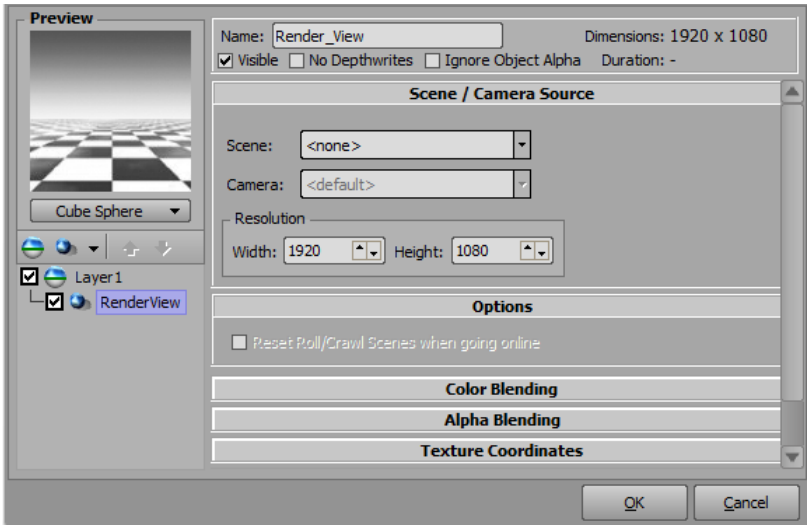
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Render View**.



A **Render View** shader is added to the material.



5. Continue with configuring the Scene / Camera Source settings.

To configure the Scene / Camera Source settings:

1. In the **Scene / Camera Source** section, from the **Scene** drop-down, select one of the scene options.

   The options are:

   <none> — do not apply a scene to the Render View shader.

   <owner scene> — apply the current scene to the Render View shader.

   Scene1, 2, 3, etc. — apply the selected scene to the Render View shader.
2. From the **Camera** drop-down, select which camera (if any) will be focused on the scene.

   The options will reflect the camera or cameras that are in the selected scene.
3. In the **Resolution** section, in the **Width** and **Height** fields, enter the desired resolution.
4. Continue with configuring the Options setting.

To configure the Options setting:

1. If the scene that's being imported contains a roll or crawl, select **Reset Roll/Crawl Scenes when going online** to ensure that the roll or crawl scene starts at the beginning.
2. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. From the **Mipmap Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image information into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image information into mip maps.

4. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the **Anisotropic** minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

5. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

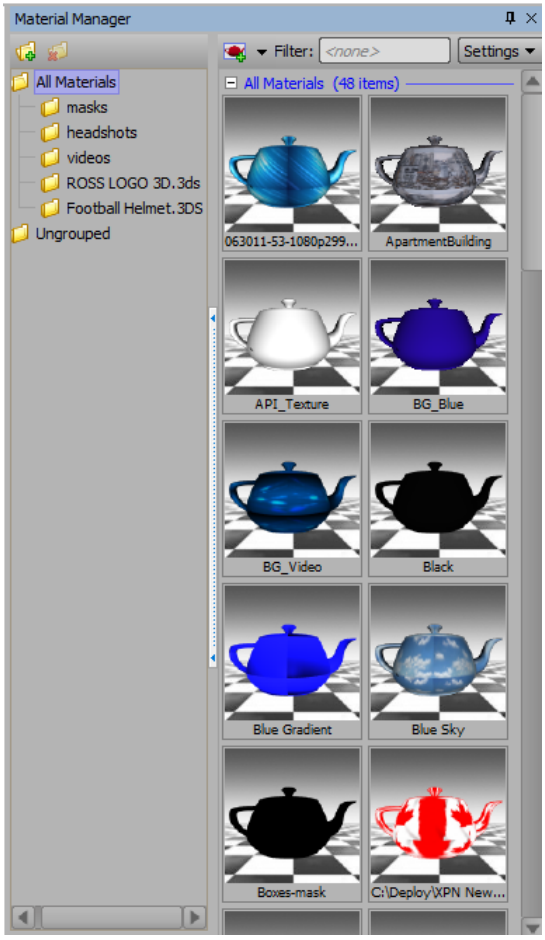
Creating a Server Channel Material

Use a **Server Channel** material to process and render complex visual effects.

To create a server channel material:

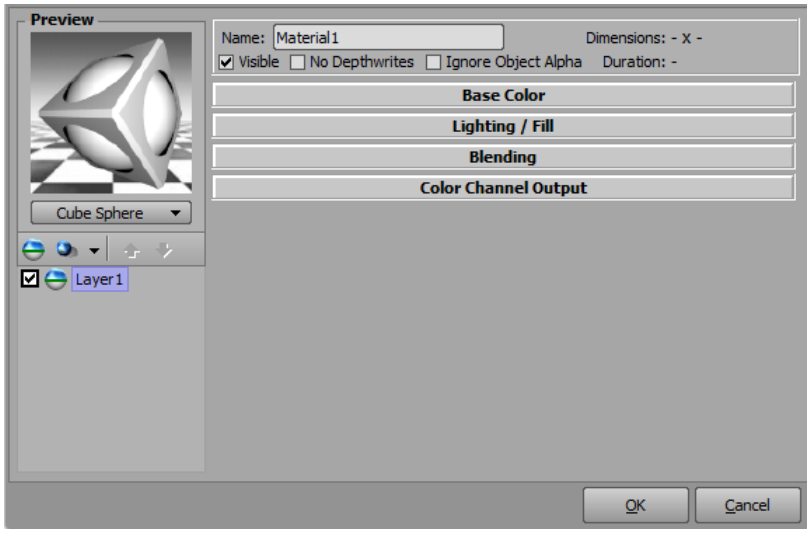
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar

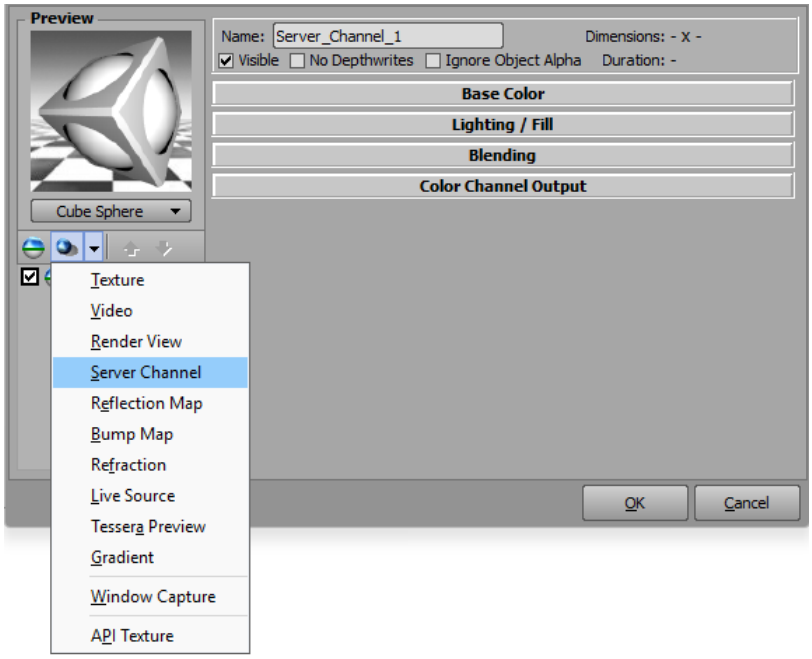


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

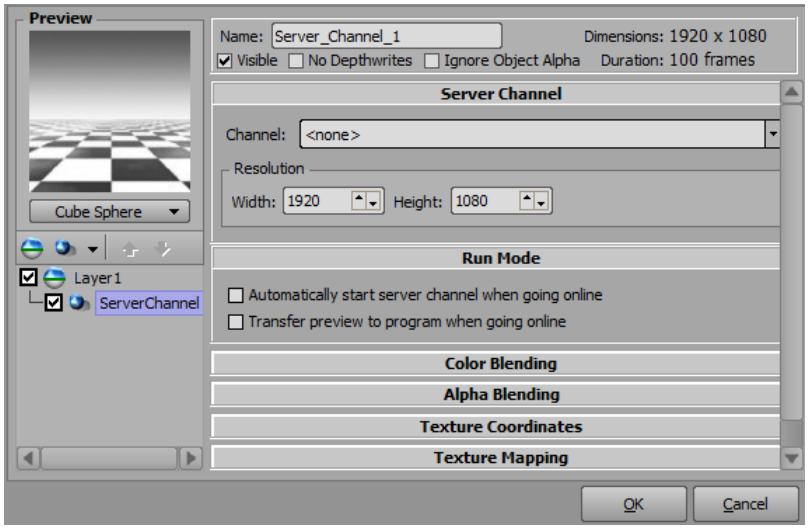
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Server Channel**.



A **Server Channel** shader is added to the material.



5. Continue with configuring the Server Channel settings.

To configure the Server Channel settings:

1. In the **Server Channel** section, from the **Channel** drop-down, select a server channel for the shader.
2. In the **Resolution** section, in the **Width** and **Height** fields, enter the resolution in pixels for the shader.
3. Continue with configuring the Run Mode settings.

To configure the Run Mode settings:

1. In the **Run Mode** section, select the **Automatically start server channel when going online** checkbox to start playing the server channel shader when the take item goes online.
2. Select the **Transfer preview to program when going online** to automatically transfer the preview to program when going online. This is useful for quick recovery scenarios (engine restart, failover).
3. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. From the **Mipmap Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image information into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image information into mip maps.

4. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the **Anisotropic** minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

5. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to the procedure Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

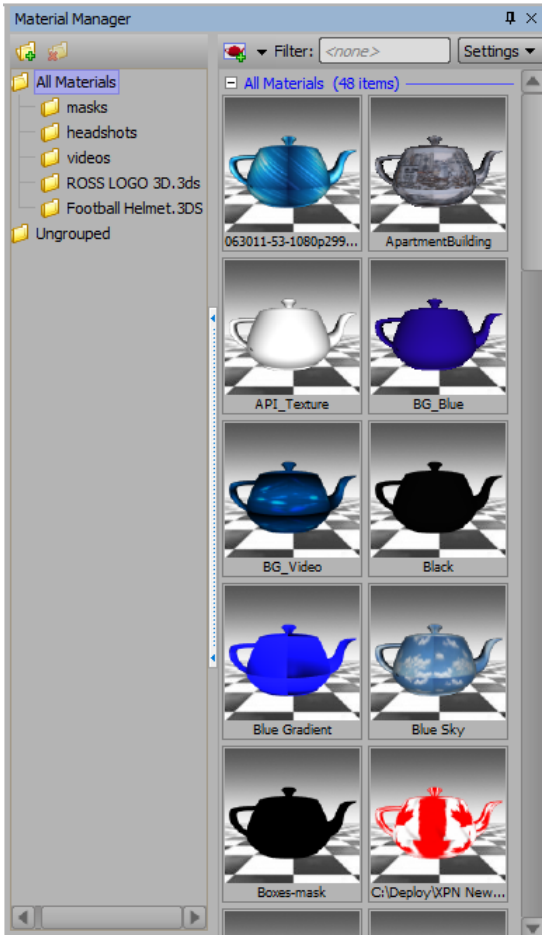
Creating a Reflection Map Material

Use a **Reflection Map** material to simulate the reflective properties of surfaces by defining what the environment or surroundings look like when reflected off a given object.

To create a Reflection Map material:

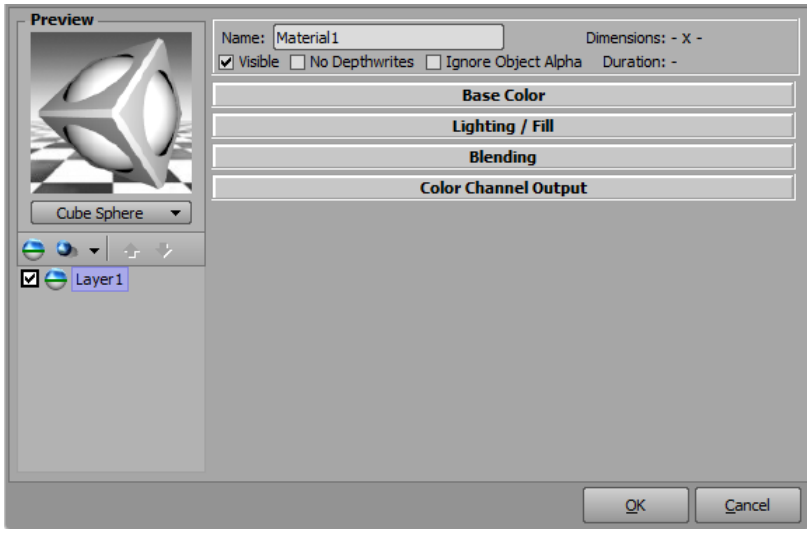
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

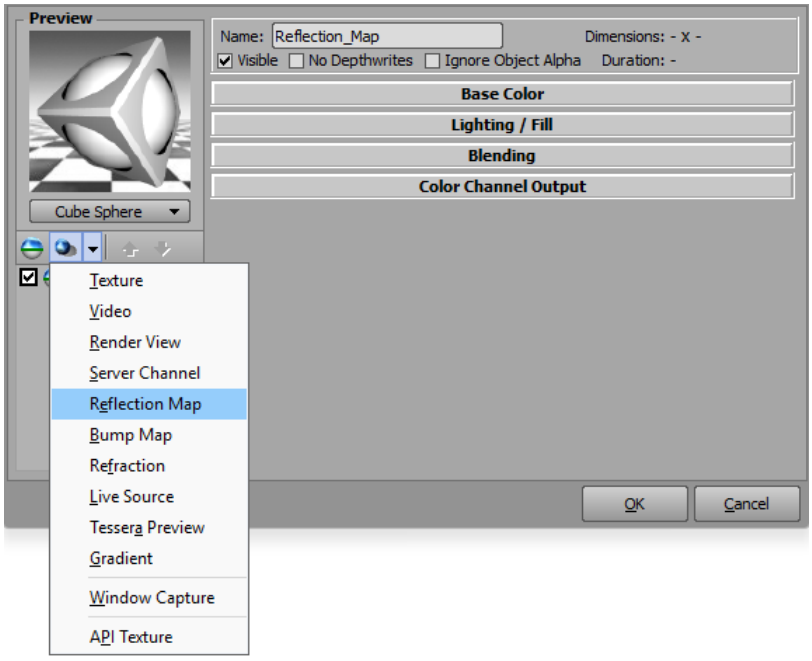


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

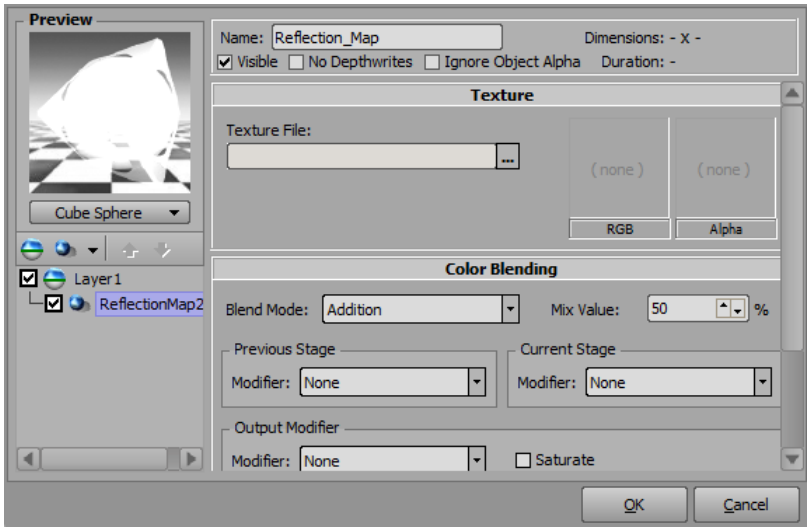
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Reflection Map**.



A **Reflection Map** shader is added to the material.



5. Continue with configuring the Texture setting.

To configure the Texture setting:

1. In the **Texture** section, in the **Texture File** field, select the **Browse** button to locate and select an image file to apply to the material.
2. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.

- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:
   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.
2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

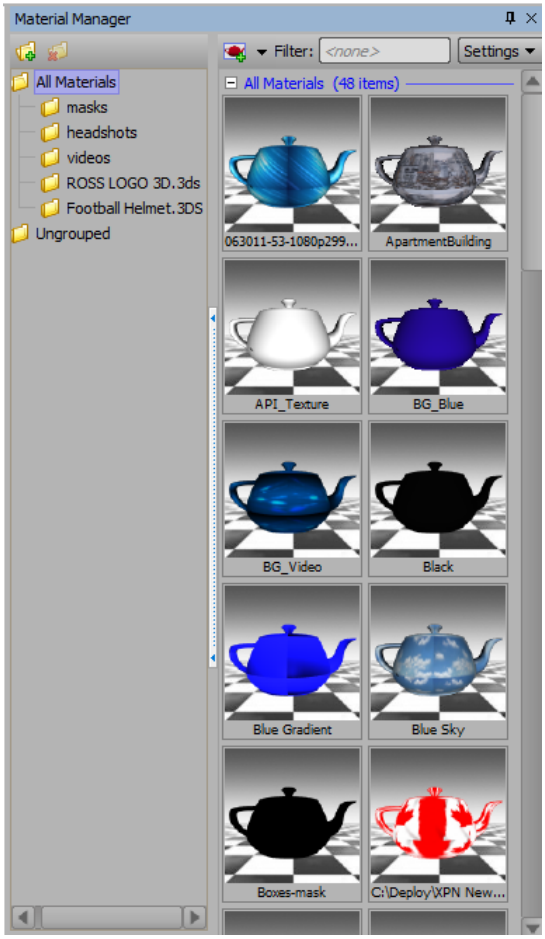
Creating a Bump Map Material

Use a **Bump Map** material to simulate small-scale surface details by altering how light interacts with a 3D model, creating the illusion of bumps, wrinkles, or texture without changing the model's geometry.

To create a Bump Map material:

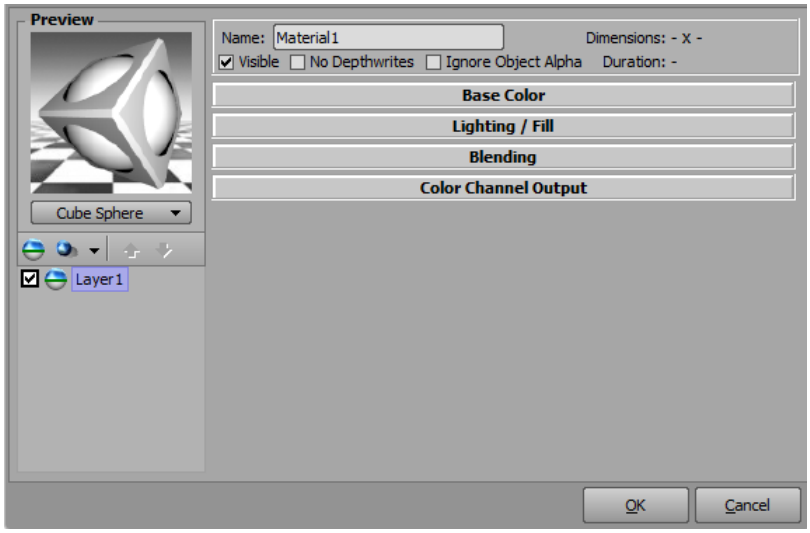
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

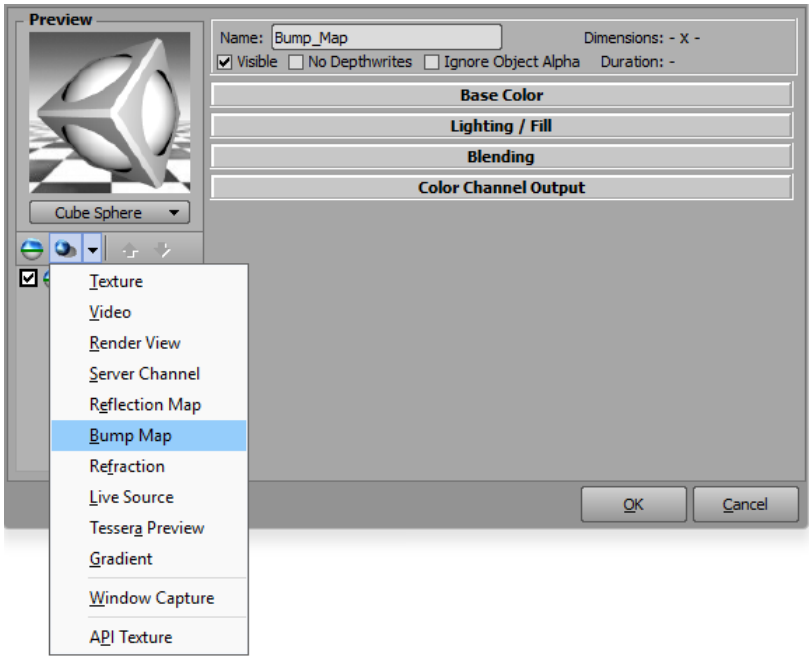


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

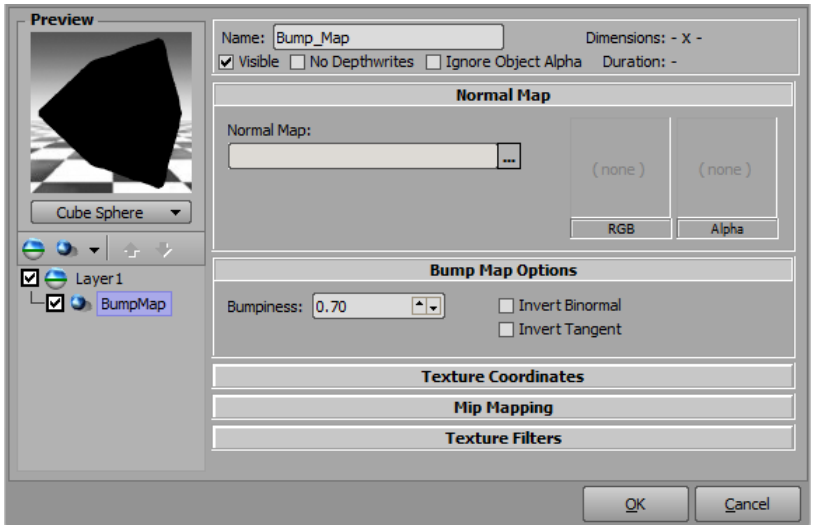
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Bump Map**.



A **Bump Map** shader is added to the material.



5. Continue with configuring the Normal Map settings.

To configure the Normal Map settings:

1. In the **Normal Map** section, in the **Normal Map** field, select the **Browse** button to locate and select an image file.
2. Continue with configuring the Bump Map Options.

To configure the Bump Map Options:

3. In the **Bump Map Options** section, in the **Bumpiness** field, enter or select a value to adjust the roughness of the material.
4. Select the **Invert Binormal** checkbox to reverse the direction of the binormal vector.
5. Select the **Invert Tangent** checkbox to reverse the direction of the tangent vector.
6. Continue with configuring the Texture Coordinates settings.

To configure the Texture Coordinates settings:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping Settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:
   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.
2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

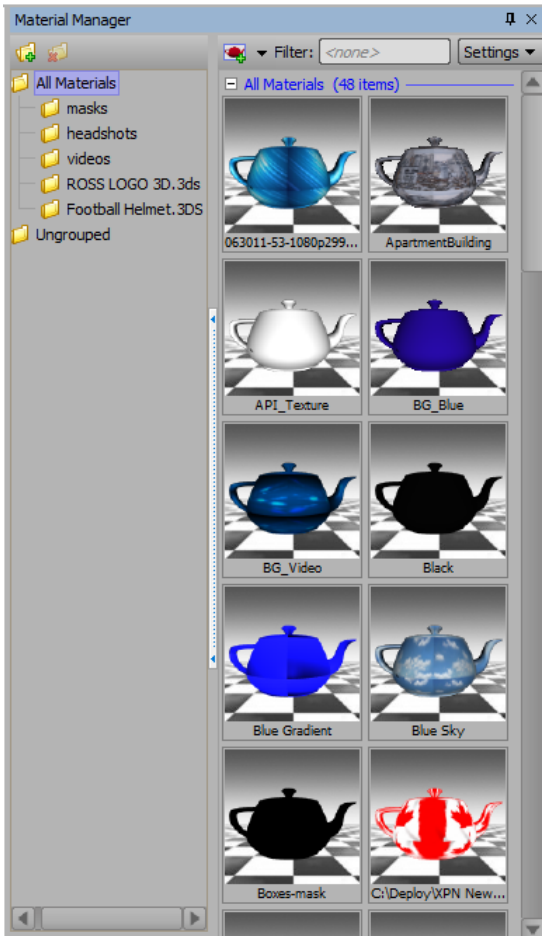
Creating a Refraction Material

Use a **Refraction** material to simulate the way light changes direction when it enters a material with a different refractive index. This is crucial for rendering realistic images of objects like glass, water, or any material that causes light to bend.

To create a Refraction material:

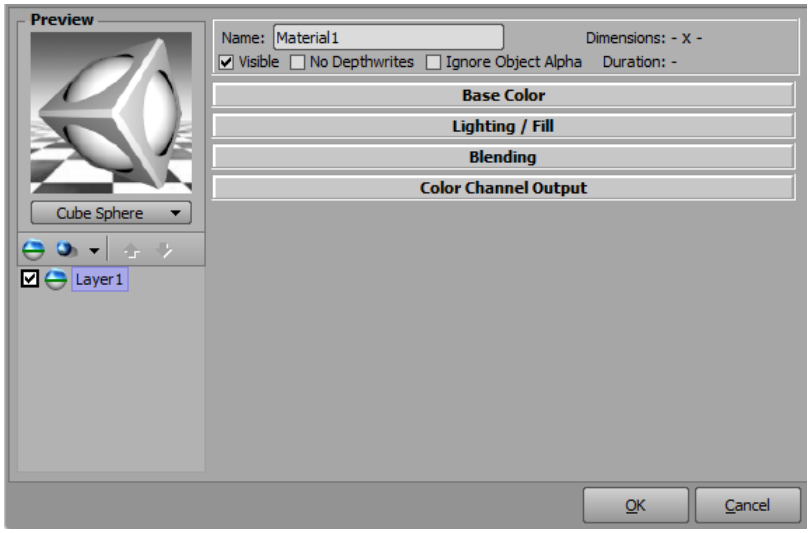
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

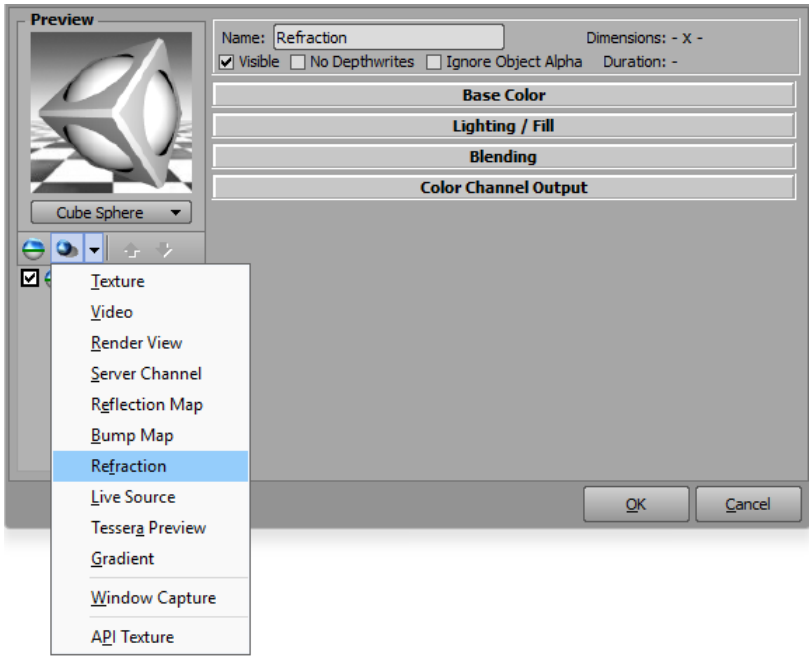


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

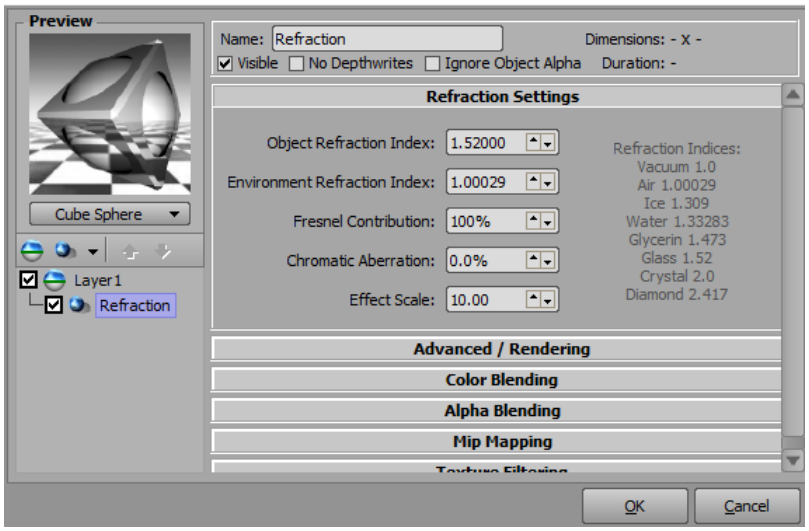
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Refraction**.



A **Refraction** shader is added to the material.



5. Continue with configuring the Refraction Settings.

To configure the Refraction Settings:

1. In the **Object Refraction Index** field, enter an index value to determine how much light bends when it passes through an object.

   A number of **Refraction Indices** appears to the right of the **Refraction Settings** fields. You can select the most appropriate one for your application.

2. In the **Environment Refraction Index** field, enter a value to determine how much light bends in the space around an object (such as when an object is shown underwater rather than in the open air).

3. In the **Fresnel Contribution** field, enter the percentage of light reflected and refracted at an interface between two materials with different refractive values.

   The higher the percentage, the more light will be refracted rather than reflected.

4. In the **Chromatic Aberration** field, enter the amount of distortion present in the focusing of the light due to different colors bending at different angles as they pass through an object.

   The higher the value, the more distorted and out of focus the light will appear.

5. In the **Effect Scale** field, enter a value to increase or decrease the refraction.

   A higher value will distort the background more, like looking through a thick lens or wavy water.

   A lower value will reduce the refraction; a very low value can make the object look mostly clear.

6. Continue with configuring the Advanced / Rendering settings.

To configure the Advanced / Rendering settings:

1. In the **Max Number of Render Layers** field, enter or use the arrows to select the maximum number of render layers to allow.

   Too many layers can consume a lot of system resources, so limiting layers ensures that only a manageable amount of data is processed at once.

2. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — Previous Stage value + the Current Shader value
   - **Subtract** — Previous Stage value - the Current Shader value
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Dot Product 3** — Previous Red value * Current Red value + Previous Green value * Current Green value + Previous Blue value * Current Blue value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains “as is”.
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Filtering settings.

To configure the Texture Filtering settings:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK**.

   The new material is added the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

Creating a Live Source Material

Use a **Live Source** material to capture real-time video.

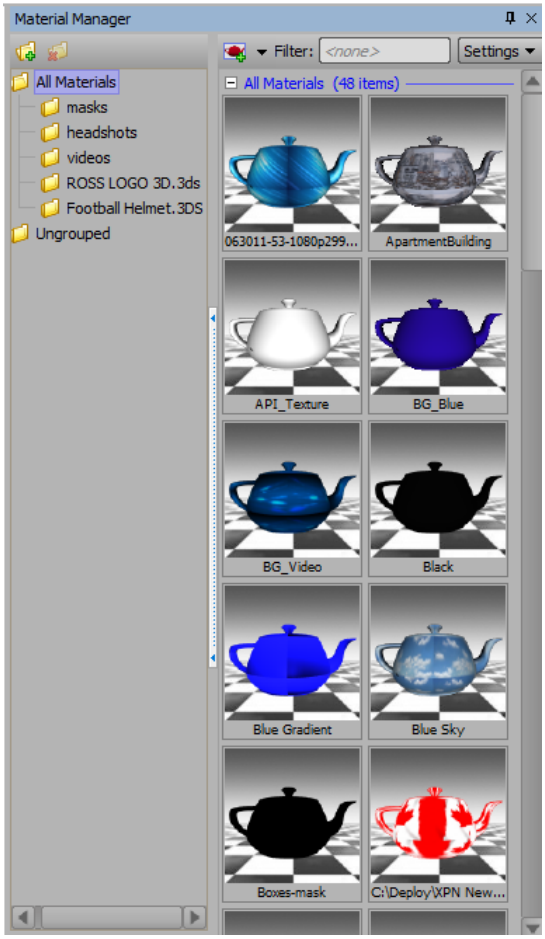
★When a live source material is applied to an empty quad object, the quad is re-sized to fit the input source. When applied to a quad that already contains a material, the input source is re-sized to fit the quad.

★With the on-board scaler enabled in the material, all other live source options are disabled and the material can only be applied to quad and background objects. The low latency scaler is only available if the **Enable On-Board Compositing** checkbox is selected for the output in the framebuffer hardware setup.

To create a live source material:

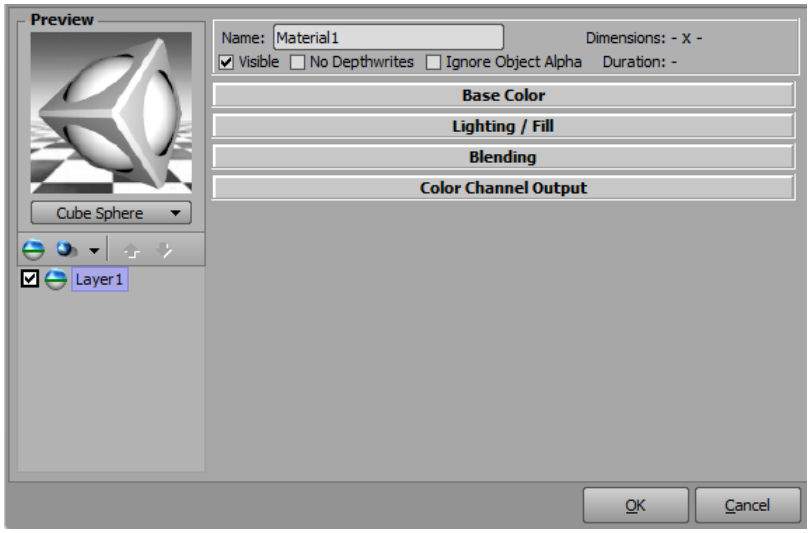
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar

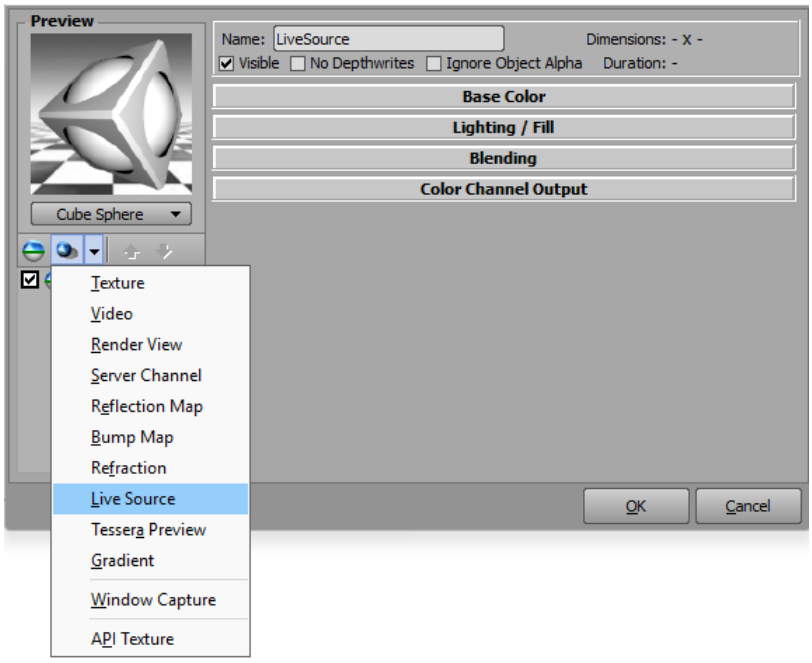


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

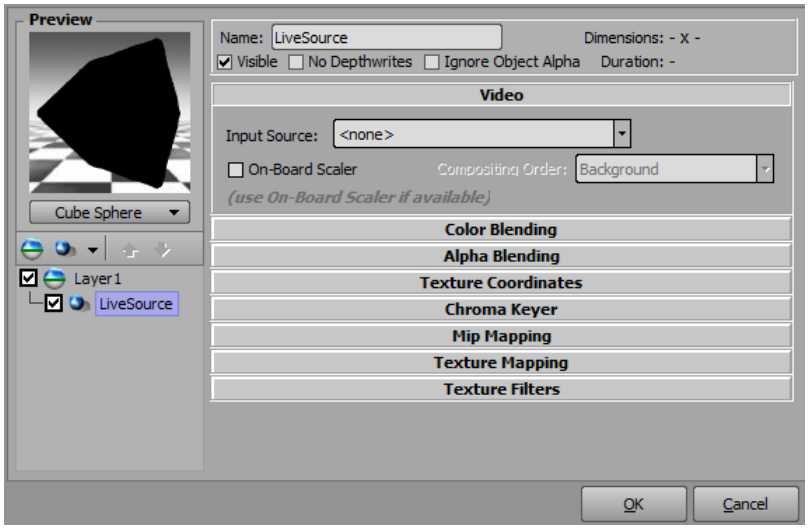
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Live Source**.



A **Live Source** shader is added to the material.



5. Continue with configuring the Video settings.

To configure the Video settings:

1. In the **Video** section, from the **Input Source** drop-down, select the source from which to capture live video.
2. If the **On-Board Scaler** checkbox is available, select it to enable the low latency material scaler.

   When **On-Board Scaler** is selected, the **Compositing Order** drop-down becomes available.
3. From the **Compositing Order** drop-down, select one of the following layer options:

   Background — layer the scaled input behind the graphics.

   Foreground — layer the scaled input over the graphics.
4. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Chroma Keyer settings.

To configure the Chroma Keyer settings:

1. In the **Matte Generation** section, do the following:
   - Set the base color for the chroma key to use on the mattes, using one of the following methods:
     - **Dropper** — select the dropper and drag it to a color on the screen to select that color.
     - **Col** — enter a standard hexadecimal notation to set the color.
   - Select the **Active** checkbox to enable the chroma keyer effect for the shader.
   - In the **Max. Angle** field, enter or select an angle to set the maximum difference in color between the selected chroma key color and the input color to be chroma keyed.
   - In the **Edge Width** field, enter or select a value to adjust the outside edge of the foreground image as follows:

     Increasing the value increases the amount that the key encroaches onto the foreground image.

     Decreasing the value decreases the amount that the key encroaches onto the foreground image.
   - In the **FG Clipping** field, enter or select a value to determine the range of colors which are considered foreground colors. Adjust the clipping as follows:

     Increasing the value removes lower-saturated colors from the foreground image.

     Decreasing the value includes lower-saturated colors in the foreground image.
   - In the **Edge Hardness** field, enter or select a value to add or remove edge hardening of the foreground image as follows:

     Increasing the value increases the amount of hardness applied to the foreground edges.

     Decreasing the value decreases the amount of hardness applied to the foreground edges.
2. In the **Output** section, select one of the following output modes:
   - **Composition** — set the shader output to show the final chroma keyed result.
   - **Fill** — set the shader output to show the fill without applying the generated matte.
   - **Matte** — set the shader output to show the generated matte only.
   - **Source** — set the shader output to show the input of the shader without any chroma keying.
3. In the **Matte Post-Processing** section, do the following:
   - In the **Soften** field, enter or select the value used to blur the edge of the generated matte.
   - In the **Sharpen Range** field, enter or select the range to which to apply the sharpen value.
   - In the **Sharpen** field, enter or select the value to set the amount of sharpening applied to the edge of the generated matte.
4. In the **Spill Suppression** section, do the following:
   - In the **Range** field, enter or select the range of the chroma key color, within the set **Max Angle**, to apply **Desaturation**.
   - In the **Desaturation** field, enter or select the amount of key color to remove from the set range.

     A value of 1 = 100% of the key color.
5. In the **Luma Clipping** section, do the following:

   In the **Clip Low** field, adjust the value to counteract dark areas of the chroma key backdrop and prevent them from being keyed out.

In the **Clip High** field, adjust the value to counteract bright areas of the chroma key backdrop and prevent them from being keyed out.

In the **Clip Softness** field, enter or select the value used to blur the edges between what has been keyed out and what has been prevented from being keyed out.

6. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Select **OK**.

   The new material is added the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

Creating a Tessera Preview Material

Use a **Tessera Preview Material** to display live or previewed Tessera content within XPression by connecting to Tessera output streams or local preview render proxies.

The shader is used for:

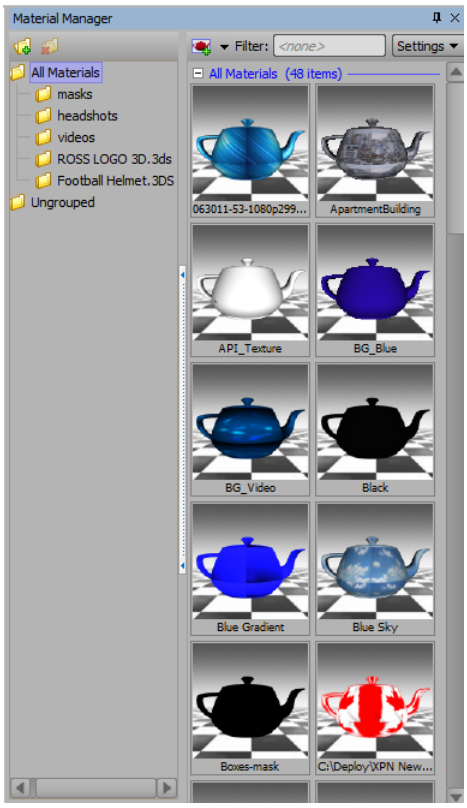
- Live output monitoring
- Up-next preview
- Previsualization
- Tessera Preview nodes
- Tessera Master virtual preview outputs

★The shader texture dimensions match the destination region size.

To create a Tessera Preview Material:

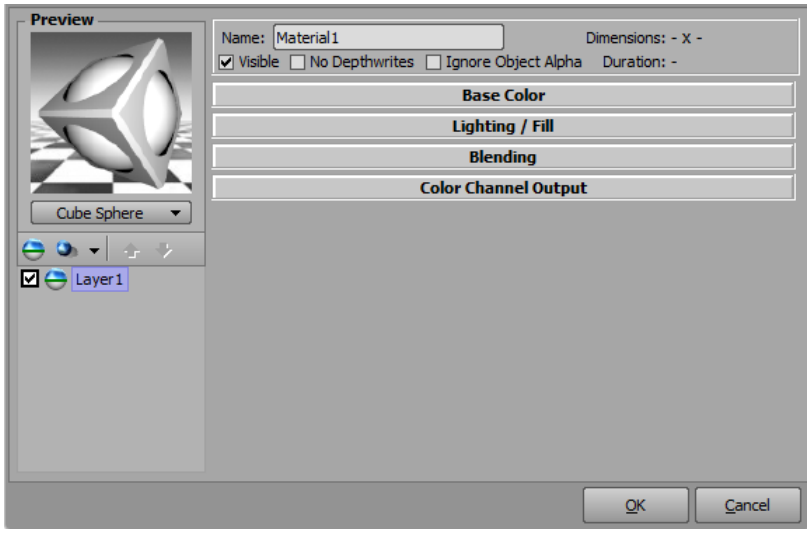
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

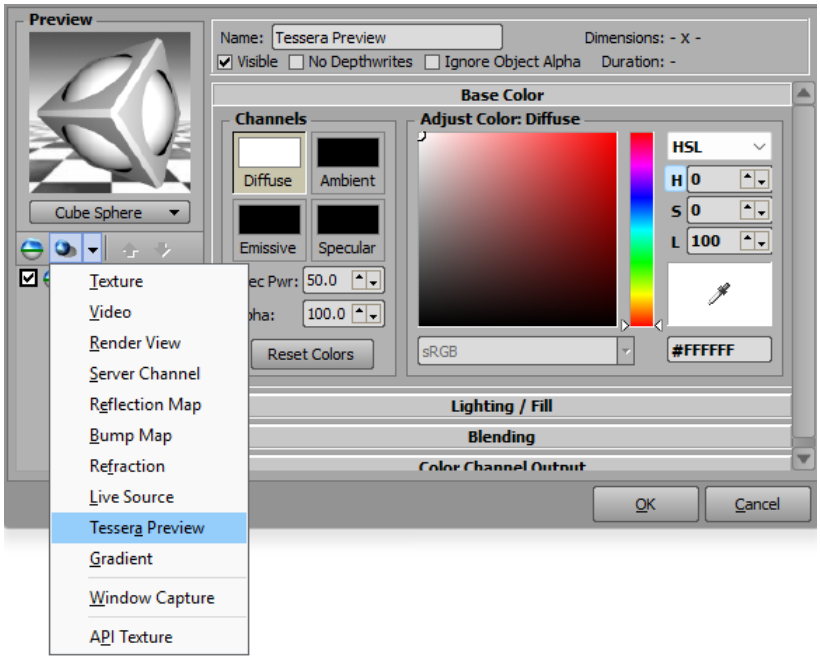


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

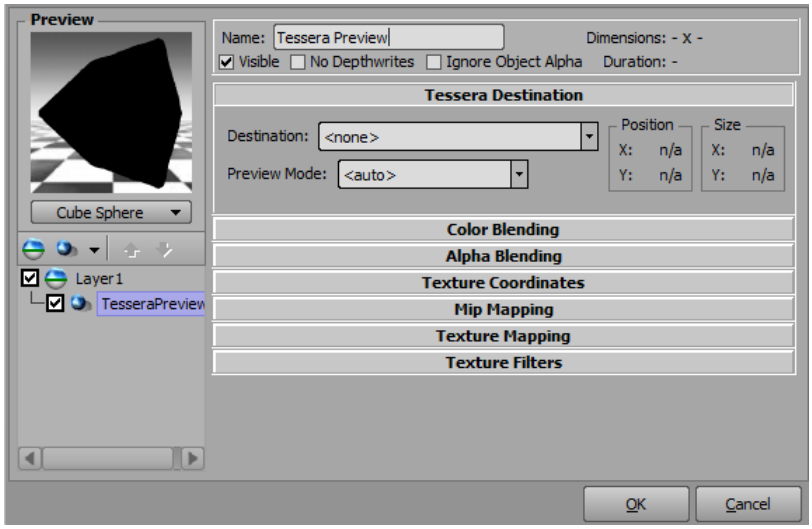
   The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Tessera Preview**.



A **Tessera Preview** shader is added to the material.



Continue with configuring the Tessera Destination settings.

To configure the Tessera Destination settings:

1. From the **Destination** drop-down, select the Tessera destination.

   Once the destination has been selected, the **Position** and **Size** of the region will be reflected in the read-only information to the right of the drop-down.

2. From the **Preview Mode** drop-down, select one of the following modes:

   <auto> — automatically selects the appropriate preview mode.

   Up Next Preview — displays upcoming content.

   Live Monitor — displays the currently active Tessera output.

   Previsualization — displays content rendered through the previsualization system.

3. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".

- **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
- **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains “as is”.
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.

- **Divide by 4** — the output value is divided by a value of 4.
- **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:

   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.

- **Wrap** — wrap the texture around rounded 3D objects such as spheres.
- **Mirror** — mirror the texture infinitely within the object.
- **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
- **Border** — add a border to the texture within the object.
- **Mirror Once** — reflect the texture once.

6. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**

- **Pyramidal**
- **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager** and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

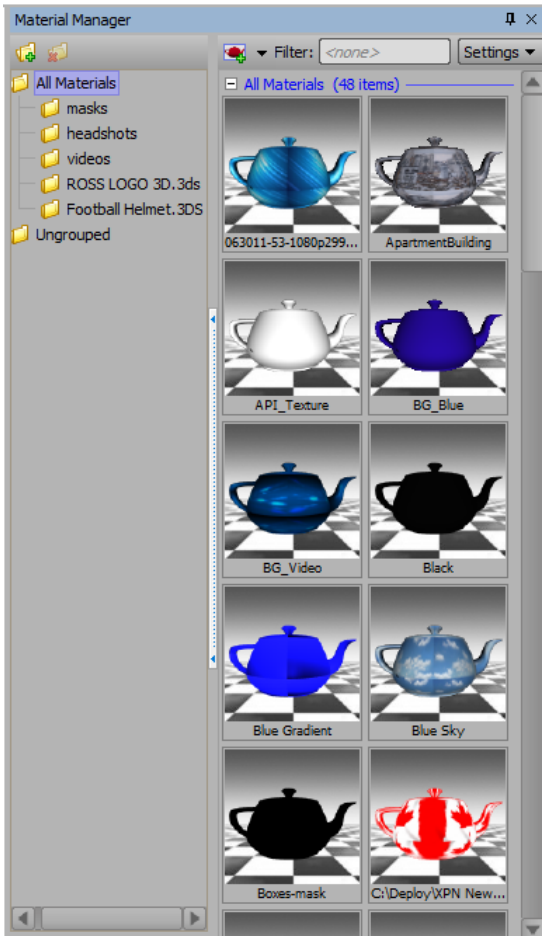
Creating a Gradient Material

Use a **Gradient** material to smoothly blend between 2 or more colors or shades in a progressive manner.

To create a gradient material:

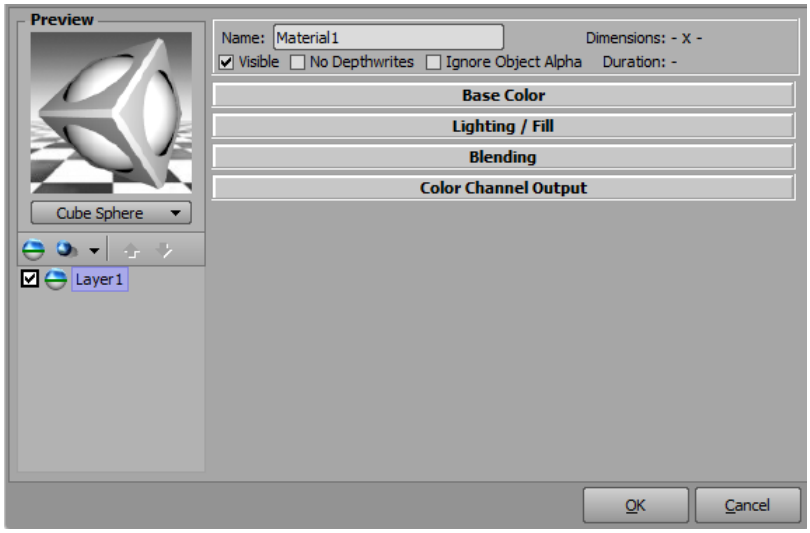
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

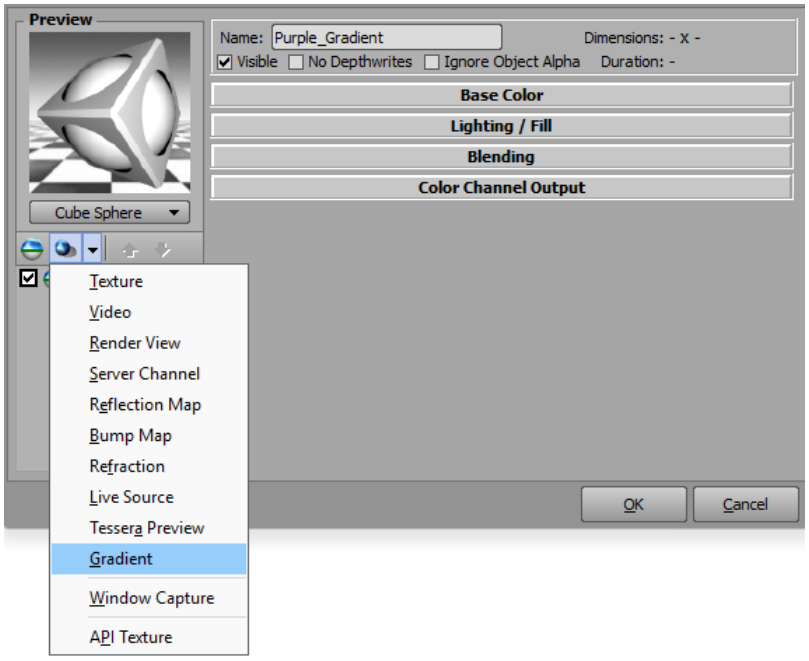


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

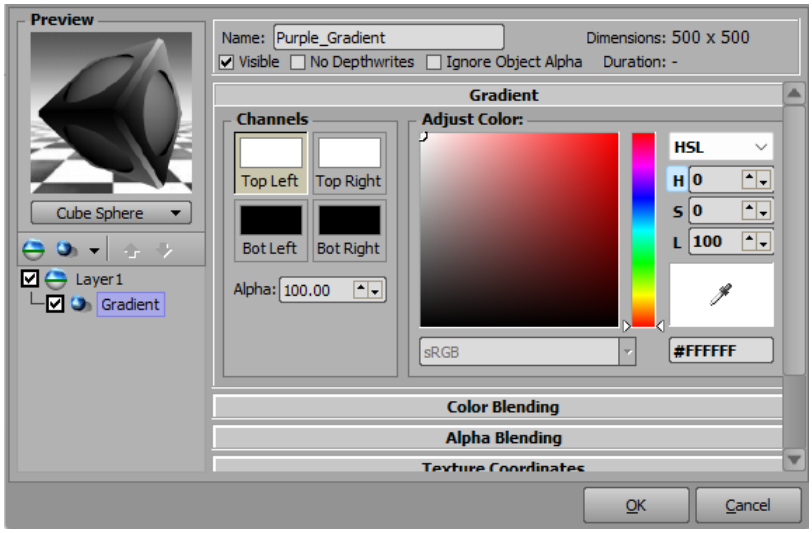
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Gradient**.



A **Gradient** shader is added to the material.



5. Continue with configuring the Gradient settings.

To configure the Gradient settings:

1. In the **Gradient** section, select the **Top Left** channel to set the color of the material at the top left.
2. From the **Color Mode** drop-down at the far right, select the color definition mode.

   The available modes are:

   - **HSL** — define color by setting hue, saturation, and lightness values.
   - **RGB** — define color by setting red, green, and blue values.

   Use the selected color definition mode to set the diffuse color of the light.

   ### HSL Color Selection Mode

   - Select the **H**, then use one of the following methods to set the hue value for the diffuse color:
     - ➢ Move the slider along the hue scale to set the hue value.
     - ➢ In the **H** field, enter or select the hue value (0 to 359).

     After setting the **H** value, the **S** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **S**, then use one of the following methods to set the saturation value for the diffuse color:
     - ➢ Move the slider along the saturation scale to set the saturation value.
     - ➢ In the **S** field, enter or select the saturation value (0 to 100).

     After setting the **S** value, the **H** and **L** color values can be set by selecting a color in the **Color Box**.
   - Select the **L**, then use one of the following methods to set the lightness value for the diffuse color:
     - ➢ Move the slider along the lightness scale to set the lightness value.
     - ➢ In the **L** field, enter or select the lightness value (0 to 100).

     After setting the **L** value, the **S** and **H** color values can be set by selecting a color in the **Color Box**.

   ★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen. Then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

The **H**, **S**, and **L** color values are set to match the color selected from the screen.

RGB Color Selection Mode

- Select the **R**, then use one of the following methods to set the red value for the diffuse color:
  - ➢ Move the slider along the red scale to set the red value.
  - ➢ In the **R** field, enter or select the red value (0 to 255).

  After setting the **R** value, the **G** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **G**, then use one of the following methods to set the green value for the diffuse color:
  - ➢ Move the slider along the green scale to set the green value.
  - ➢ In the **G** field, enter or select the green value (0 to 255).

  After setting the **G** value, the **R** and **B** color values can be set by selecting a color in the **Color Box**.
- Select the **B**, then use one of the following methods to set the blue value for the diffuse color:
  - ➢ Move the slider along the blue scale to set the blue value.
  - ➢ In the **B** field, enter or select the blue value (0 to 255).

  After setting the **B** value, the **R** and **G** color values can be set by selecting a color in the **Color Box**.

★Alternatively, left-click and drag the **Dropper Tool** to a color on the screen and then release the mouse button (before releasing the mouse button, the color preview will split to show the new color selection in the top half and the current color selection in the bottom half).

The **R**, **G**, and **B** color values are set to match the color selected from the screen.

3. Repeat step 6 for each of the other channels.
4. In the **Alpha** field, enter or select a value in percent for the degree of transparency in the material.

   0=Completely transparent, **100**=Completely opaque.
5. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).

- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.

7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Texture Filtering settings.

To configure the Texture Filtering:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.

3. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

Creating a Window Capture Material

Use a **Window Capture** material to render graphical content from a specific window, browser or application.

When an object uses the **Window Capture** material to display a selected window, the window must remain open while the objects are online. Closing the window removes the content from the online objects. Also, to not compromise the output, ensure that no other window covers the captured window.

If you are using a Chrome™ or Microsoft Edge® browser, in **Settings > System** (**Settings > System and Performance** for Edge), disable the **Use graphics acceleration when available** setting in order to use the window capture feature.

★When a window capture material is applied to an empty quad object, the quad is re-sized to fit the window being captured. When applied to a quad that already contains a material, the captured window is re-sized to fit the quad.

To capture a window:

1. Outside of XPression, open a window to be captured.

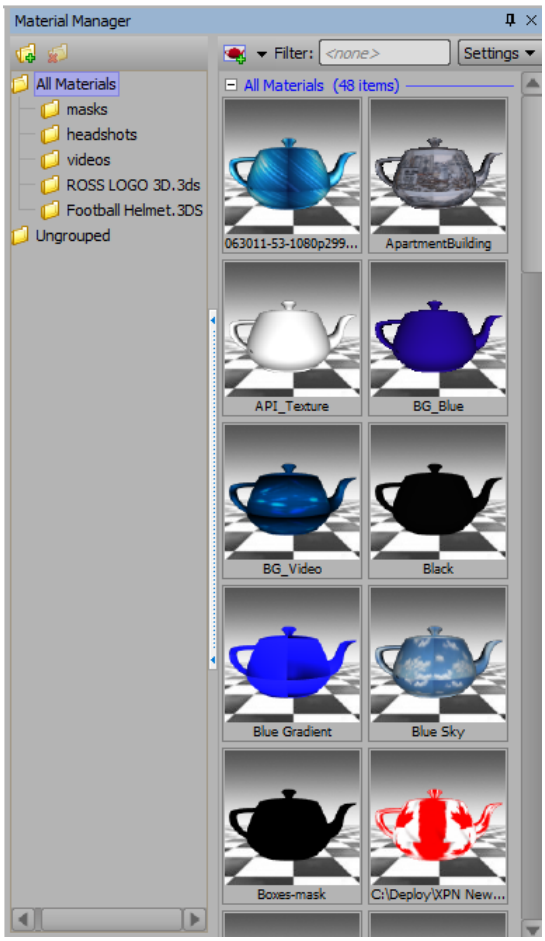
   Anything in Windows can be captured using this feature (for example, a web browser, file, etc.).

   If using a web browser, navigate to the web site containing the window to be captured.
2. Position the window on the screen so that it and the XPression window are visible at the same time.
3. Then create a **Window Capture** material and left-click and drag the mouse from the **Window Capture** thumbnail to the window to be captured.
4. When the window to be captured is highlighted by a red rectangle, release the left mouse button.

To create a window capture material:

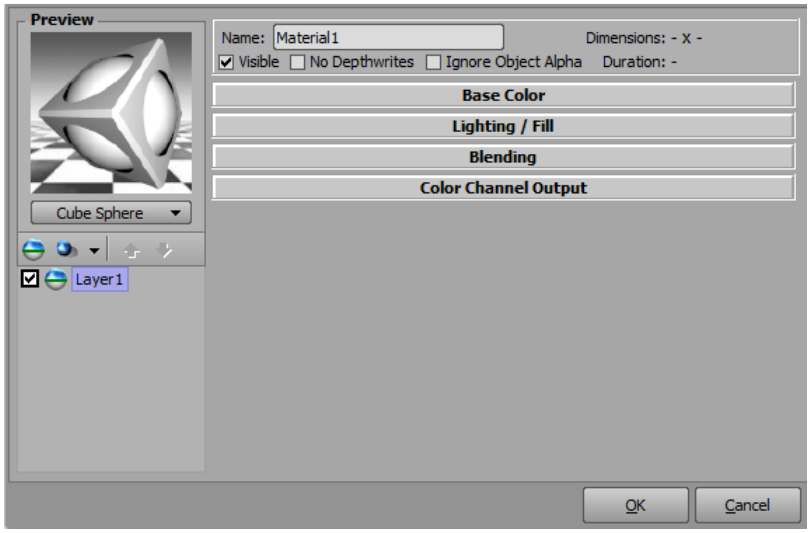
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar

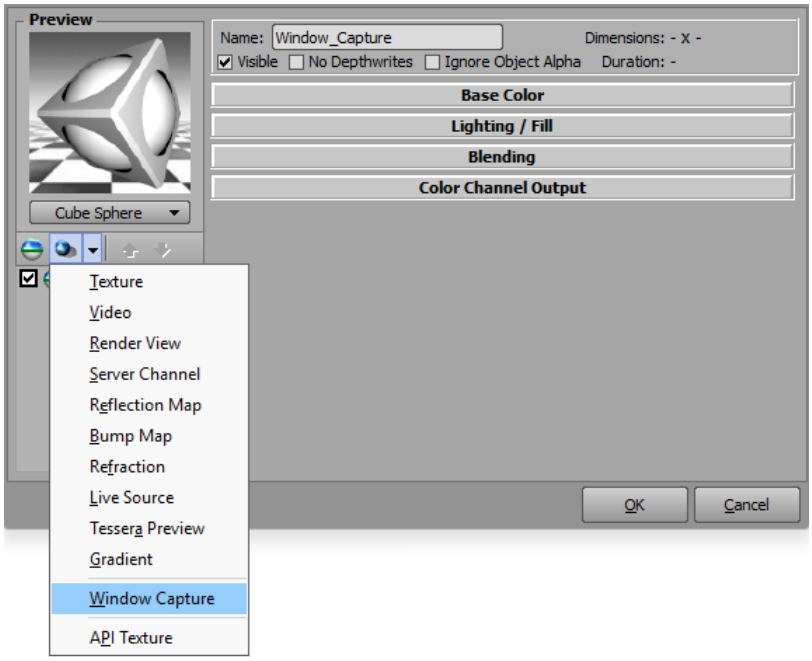


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

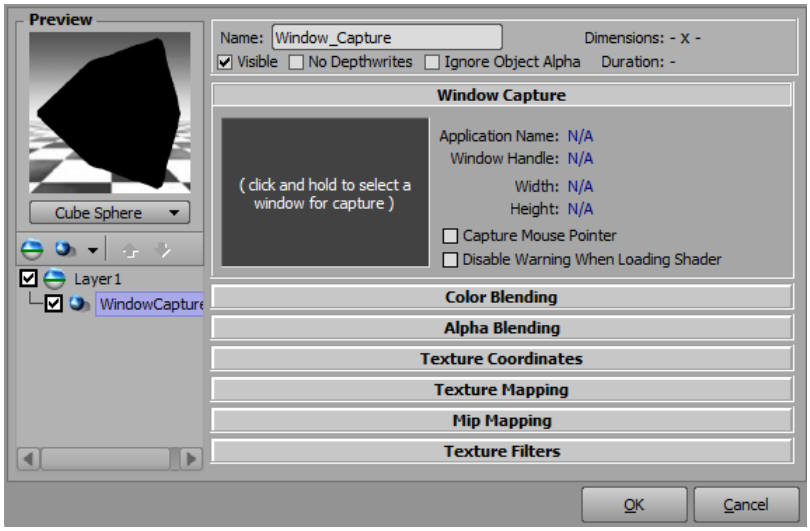
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **Window Capture**.



A **Window Capture** shader is added to the material.

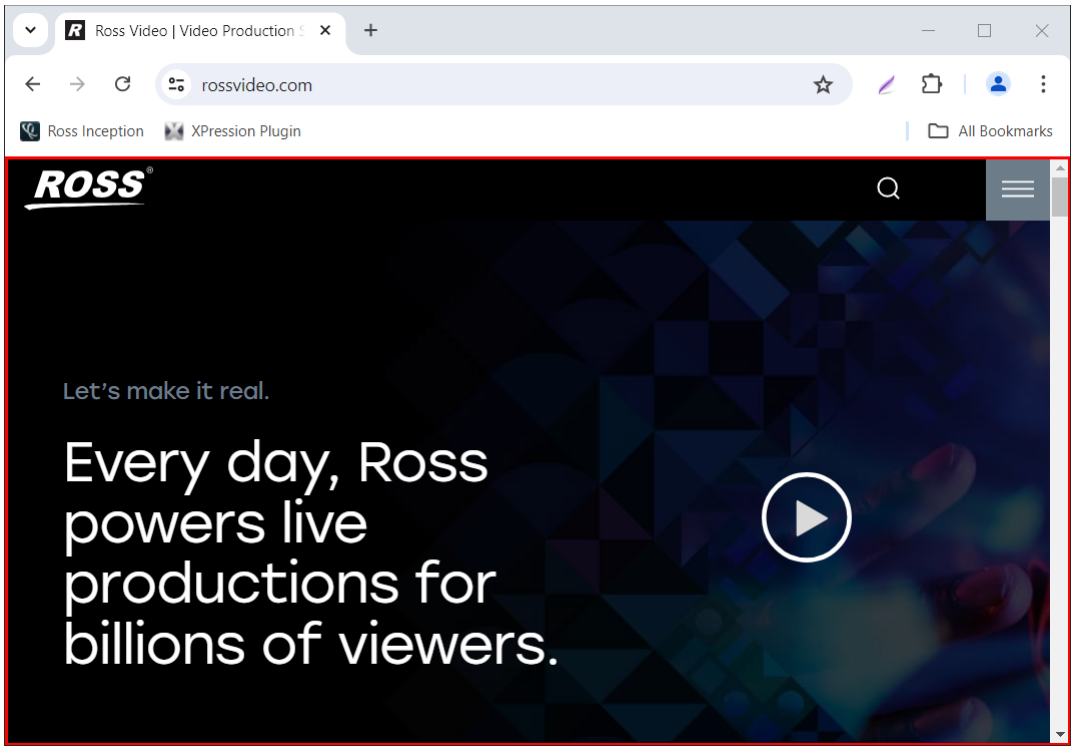


5. Continue with Capturing a Window.

To capture a window:

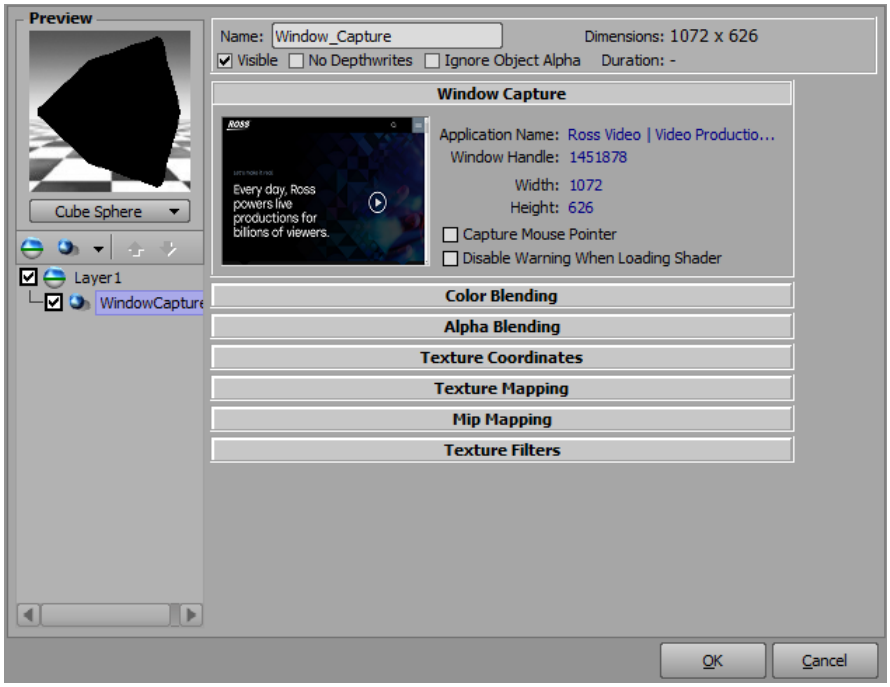
1. Left-click in the **Window Capture** area and then while holding the left mouse button down, drag the cursor to the window you want to capture.

   A red rectangle highlights the selected window.



2. When the selected window is highlighted, release the left mouse button.

   A snapshot of the selected window is displayed in the **Window Capture** thumbnail.



3. Select the **Capture Mouse Pointer** checkbox to display the mouse pointer along with the content from the captured window.
4. Select the **Disable Warning When Loading Shader** checkbox to hide the Warning dialog when loading the **Window Capture** shader.
5. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.

- **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
- **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).

- **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Texture Coordinates.

To configure the Texture Coordinates:

1. In the **Texture Coordinates** section, in the **Position** section, set the placement of the shader.
   - **X** — enter or select the **X** coordinate for the shader location.
   - **Y** — enter or select the **Y** coordinate for the shader location.
2. In the **Scale** section, set the size of a shader.
   - **X** — enter or select the scale factor to apply to a shader along the X (horizontal) axis.
   - **Y** — enter or select the scale factor to apply to a shader along the Y (vertical) axis.
   - **XY** — equally adjust the **Y** scale factor when changing the **X** scale factor. Changing the **Y** scale factor does not affect the **X** scale factor.
   - **None** — independently change scale factors.
3. In the **Rotation** section, enter or select the degree of rotation of the shader.
4. In the **Pivot** section, set the pivot point of the shader.
   - **X** — enter or select the **X** coordinate for the shader pivot point.
   - **Y** — enter or select the **Y** coordinate for the shader pivot point.
5. In the **Address Mode** section, from each of the **U** and **V** drop-downs, select the 2D image representation for the **U** and/or **V** texture coordinates of the texture.

   The options are:
   - **<default>** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **Clamp** option.
   - **Wrap** — wrap the texture around rounded 3D objects such as spheres.
   - **Mirror** — mirror the texture infinitely within the object.
   - **Clamp** — select this when the texture is smaller than the object. The edge pixels are repeated. This is the same as the **<default>** option.
   - **Border** — add a border to the texture within the object.
   - **Mirror Once** — reflect the texture once.
6. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Filters.

To configure the Texture Filters:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

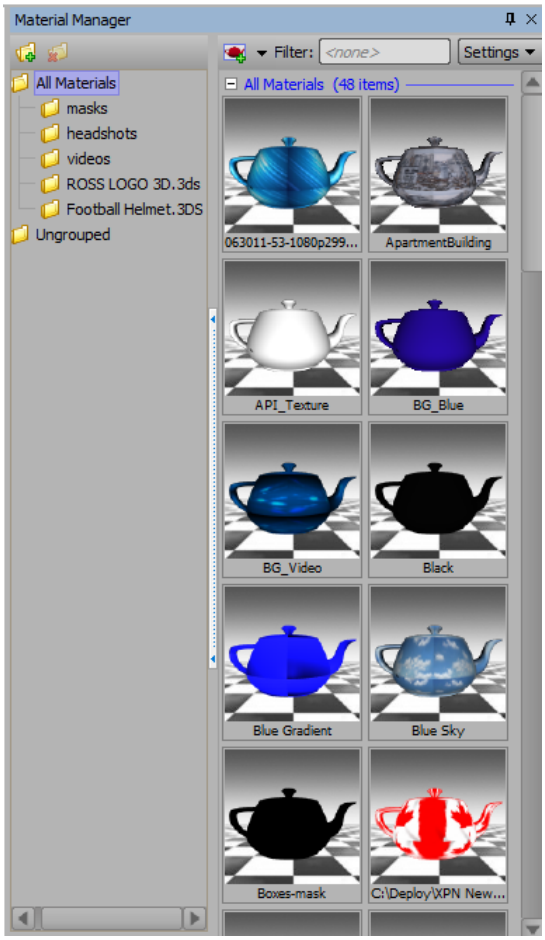
Creating an API Texture Material

An API texture is a bitmap image or pattern applied to the surface of a 3D model to add detail, color, or other surface properties. The term "API texture" emphasizes that these textures are created, manipulated, and used via a graphics API like OpenGL, Direct3D, or Vulkan.

To create an API Texture material:

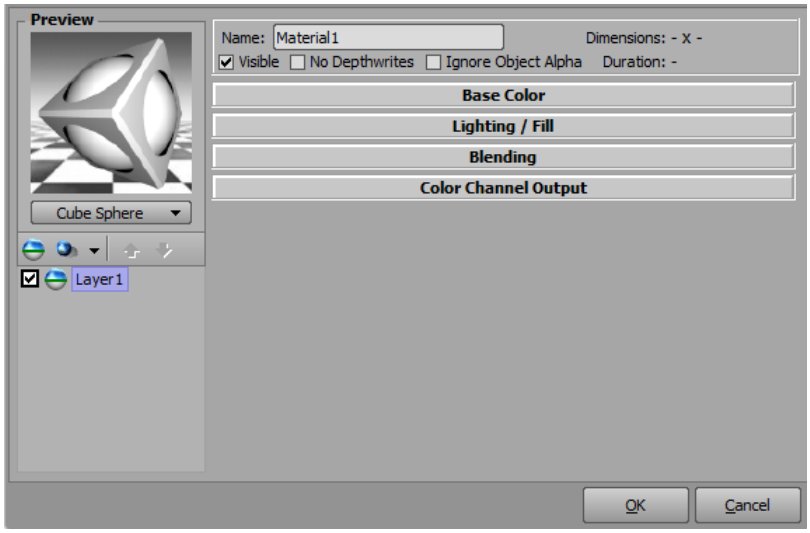
1. In XPression, select **Display > Material Manager**.

   The **Material Manager** opens. To prevent the **Material Manager** window from being hidden by other windows, select the **Pin** icon in the window title bar.

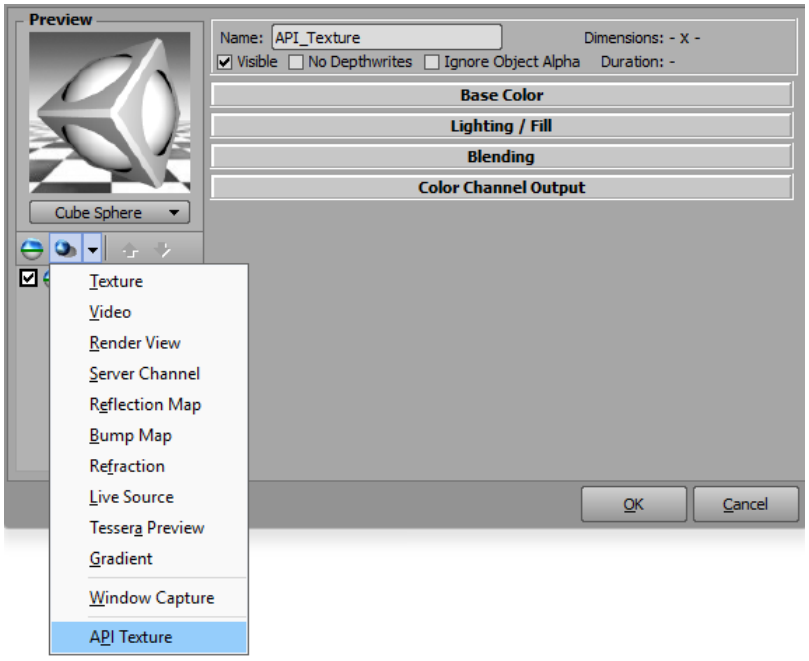


2. In the **Material Manager**, select the **Create New Material** icon in the toolbar.

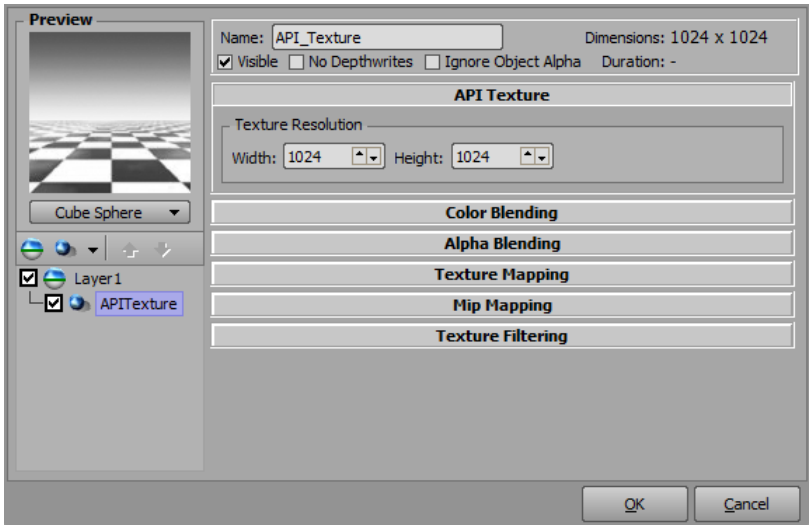
The **Material Editor** dialog opens.



3. In the **Name** field, enter a name for the new material.
4. In the **Preview** section, from the **Shader** drop-down, select **API Texture**.



An **API Texture** shader is added to the material.



5. Continue with configuring the API Texture resolution.

To configure the API Texture resolution:

1. In the **Texture Resolution** section, in the **Width** and **Height** fields, enter the desired resolution.
2. Continue with configuring the Color Blending settings.

To configure the Color Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0).
   - **Addition** — **Previous Stage** value + the **Current Shader** value
   - **Subtract** — **Previous Stage** value - the **Current Shader** value
   - **Mix** — (1 - Mix Value) * **Previous Stage** value + (**Mix Value** * **Current Shader** value)
   - **Dot Product 3** — **Previous Red** value * **Current Red** value + **Previous Green** value * **Current Green** value + **Previous Blue** value * **Current Blue** value
   - **Blend Alpha** — process the alpha value of the stage (shader or layer).
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.
   - **Overlay** — combines **Multiply** and **Screen** blend modes. Where the base layer is light, the top layer becomes lighter; where the base layer is dark, the top becomes darker; where the base layer is mid-grey, the top is unaffected.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.

- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + **ColorValue** (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + **ColorValue**) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * **ColorValue**) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains "as is".
   - **Multiply by 2** — the output value is multiplied by a value of 2.0.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Alpha Blending settings.

To configure the Alpha Blending settings:

1. From the **Blend Mode** drop-down, select the mode with which to blend the color (layer) and the object.

   The available modes are:

   - **Multiply —** multiply the color information of the current shader with the previous stage. For example: a **Previous Stage** value of white (1,1,1) multiplied by a **Current Shader** value of red (1,0,0) results in a shader output value of (1,0,0)
   - **Addition** — Previous Stage value + the Current Shader value.
   - **Mix** — (1 - Mix Value) * Previous Stage value + (Mix Value * Current Shader value)
   - **Subtract** — Previous Stage value - the Current Shader value.
   - **Use Previous Stage** — use the color information from the previous stage "as is".
   - **Use Previous Stage (Fill)** — use the **Fill** only from the previous shader.
   - **Use Current Stage** — ignore all previous stages and pass the current value without any elements of the previous stage in value.

2. In the **Mix Value** field, enter or select the mix value for the selected **Blend Mode**.

   This field is only available for the **Addition**, **Subtraction**, and **Mix** blend modes.

3. In the **Previous Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the previous stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.

- **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
- **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
- **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
- **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
- **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
- **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
- **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

4. In the **Current Stage** section, from the **Modifier** drop-down, select the modifier with which to blend the current stage.

   The available modifiers are:

   - **None** — the value of the stage is returned unmodified.
   - **Invert** — the color value of the stage is returned as (1-Red, 1-Green, 1-Blue).
   - **x2 (multiply by 2)** — the color value of the stage is returned multiplied by a value of 2.
   - **x2 + Negate** — the color value of the stage is returned multiplied by 2 and then negated (multiplied by -1).
   - **Bias** — the color value returned by this stage is -0.5 + Color value (-0.5 being the fixed bias value).
   - **Bias + Negate** — the color value returned by this stage is (-0.5 + ColorValue) * -1.
   - **Bias + x2** — the color value returned by this stage is (-0.5 + 2 * ColorValue).
   - **Bias + x2 + Negate** — the color value returned by this stage is (-0.5 + 2 * ColorValue) * -1.

5. In the **Output Modifier** section, from the **Modifier** drop-down, select the modifier with which to blend the output of the material.

   The available modifiers are:

   - **None** — the output remains “as is”.
   - **Multiply by 2** — the output value is multiplied by a value of 2.
   - **Multiply by 4** — the output value is multiplied by a value of 4.
   - **Multiply by 8** — the output value is multiplied by a value of 8.
   - **Divide by 2** — the output value is divided by a value of 2.
   - **Divide by 4** — the output value is divided by a value of 4.
   - **Divide by 8** — the output value is divided by a value of 8.

6. Select the **Saturate** checkbox to blend saturation between objects.
7. Continue with configuring the Texture Mapping settings.

To configure the Texture Mapping settings:

1. Select **Default** to display texture in the default state or **Spherical Reflection** to display texture as a spherical reflection.
2. Continue with configuring the Mip Mapping settings.

To configure the Mip Mapping settings:

1. From the **Map Filter** drop-down, select the method with which to determine the mip map object to display when the object size changes during animation.

   The available methods are:

   - **<disabled>** — do not use a mip filter.
   - **Nearest** — use a nearest neighbor filter when down scaling the original image info into mip maps.
   - **Linear** — use a linear interpolation filter when down scaling the original image info into mip maps.

2. From the **Minimum Mip Level** drop-down, select the minimum level of mip maps that can be used for a video shader.
3. Continue with configuring the Texture Filtering settings.

To configure the Texture Filtering settings:

1. From the **Minification Filter** drop-down, select the interpolation method for minifying a texture in relation to the original.

   The available methods are:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

2. From the **Magnification Filter** drop-down, select the interpolation method for magnifying a texture in relation to the original.

   The available methods are as follows:

   - **Nearest**
   - **Linear**
   - **Anisotropic**
   - **Pyramidal**
   - **Gaussian**

3. In the **Max Anisotropy** field, enter or select the maximum anisotropic value for the Anisotropic minification and/or magnification interpolation method.

   This field is only available when **Anisotropic** is selected for the **Minification Filter** or the **Magnification Filter**.

4. Select **OK** to close the **Material Editor**.

   The new material is added to the **Material Manager**, and is ready to be applied to objects.

For More Information on...

- how to apply a material to a text object, refer to Applying a Material to a Text Object.
- how to apply a material to a background object, refer to Creating a Background Object.
- how to apply a material to a quad object, refer to Creating a Quad Object.
- how to apply a material to a sphere object, refer to Creating a Sphere Object.
- how to apply a material to a cube object, refer to Creating a Cube Object.
- how to apply a material to a cylinder object, refer to Creating a Cylinder Object.
- how to apply a material to a torus object, refer to Creating a Torus Object.
- how to apply a material to a slab object, refer to Creating a Slab Object.

Setting DataLinq Properties for a Material

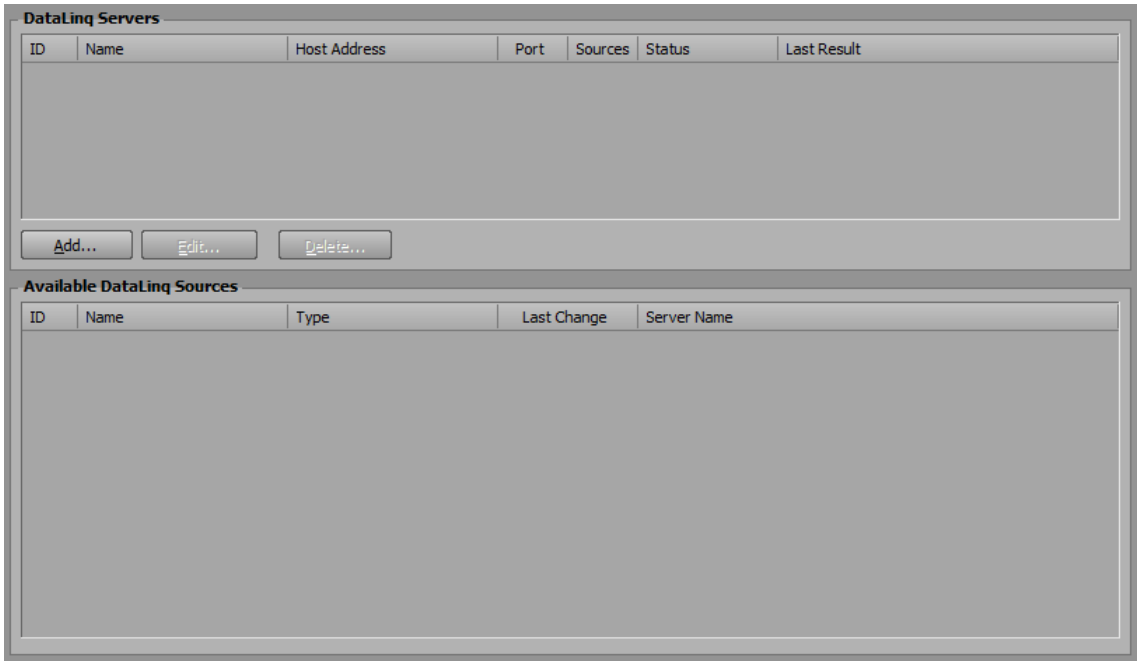
When you use a texture or video material on objects in a scene, you can use a DataLinq source to change the texture or video. In the **Material Editor**, when you add a **Texture** or **Video** shader, you'll see a DataLinq field with a **Browse** button which opens the **Set DataLinq Properties** dialog.

★In order to use DataLinq, you'll need to add a DataLinq Manager to your project and have the XPression DataLinq Server running.

To add a DataLinq Manager to your project:

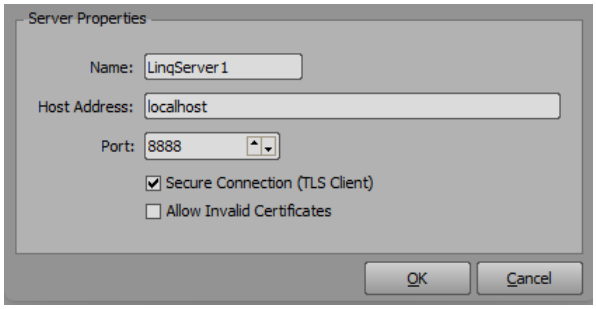
1. In XPression, in the **Layout Editor** toolbar, select the **DataLinq Manager** ( ) icon.

   The **DataLinq Manager** dialog opens.



2. In the **DataLinq Manager**, select **Add**.

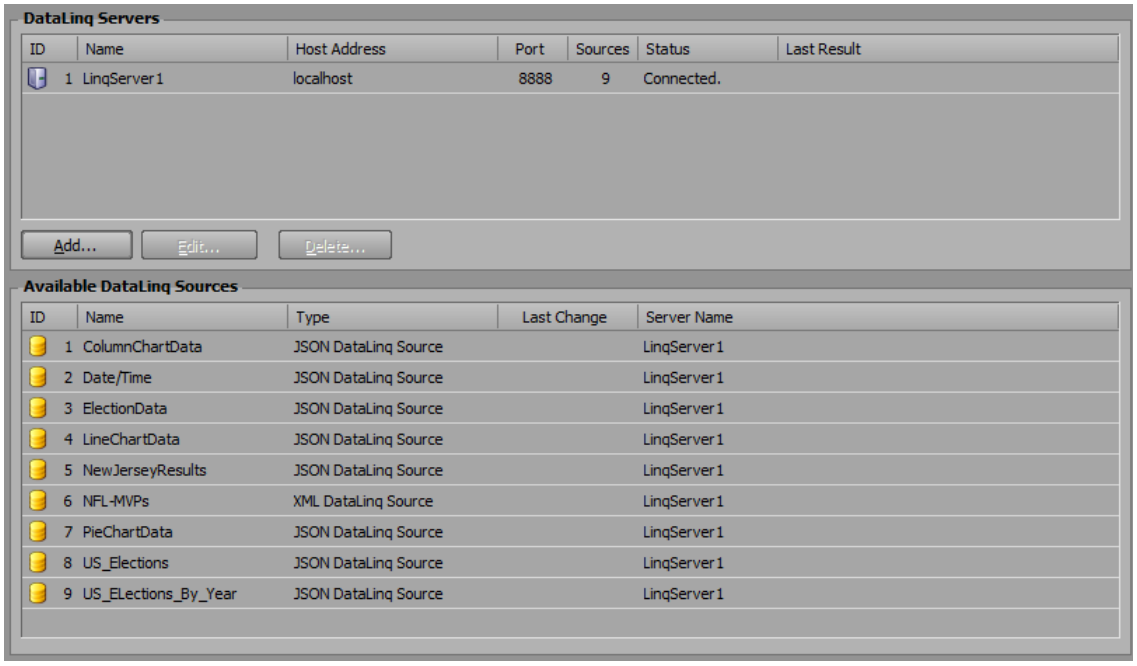
   The **DataLinq Server Properties** dialog opens.



3. In the **Name** field, enter a name for the server.
4. In the **Host Address** field, enter the URL of the machine on which the server is located (or enter localhost).
5. In the **Port** field, enter the port number on which the host machine will be communicating with other XPression engines.

6. Then select **OK**.

   The **DataLinq Manager** is populated with the data sources present on your XPression DataLinq Server.

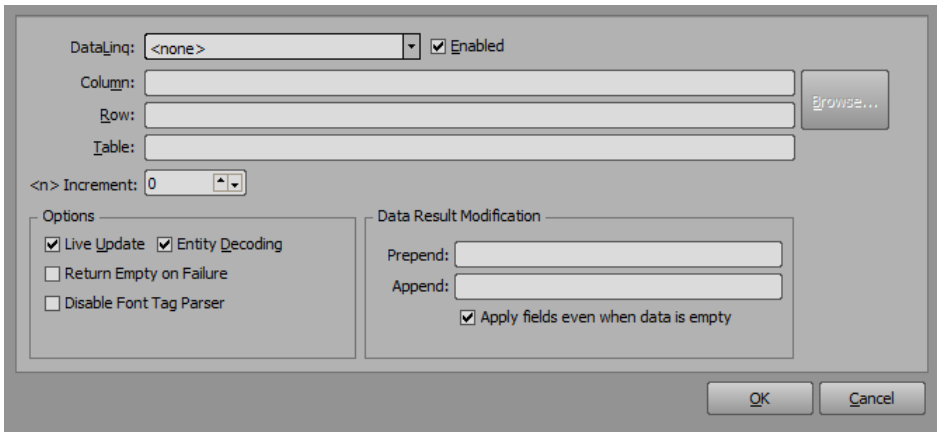


   Now you can access and set the properties of the desired DataLinq source from the **Material Editor**.

To set DataLinq properties for a material in the Material Editor:

1. In the **Material Editor**, select a **Texture** or **Video** shader.
2. In the **Texture File** or **Video** section, in the **DataLinq** field, select the **Browse** button.

   The **Set DataLinq Properties** dialog opens.



3. From the **DataLinq** dropdown, select the DataLinq source you want to use to change the texture or video and select the **Enabled** checkbox.
4. Beside the **Column/Row/Table** fields, select the **Browse** button to open the selected DataLinq source and select the column and row (and table, if necessary) containing the texture or video you want to use.

   The **Column**, **Row**, and **Table** (if used) fields are populated with the data from the selected cells in the DataLinq source.

5. In the **<n> Increment** field, enter or select the value by which to advance through the records in the data.
6. In the **Options** section, make the following selections:
   - Select **Live Update** to have the data update automatically as it changes in a live feed.
   - Select **Entity Decoding** to convert HTML entities back into their original characters.
   - Select **Return Empty on Failure** to display nothing if no DataLinq source is detected.
   - Select **Disable Font Tag Parser** to ensure that website content adheres to a CSS style sheet and to reduce the risk of cross-site scripting.
7. In the **Data Result Modification** section, in the **Prepend** and **Append** fields, enter the text that should appear before and after each data result.
8. Select the **Apply fields even when data is empty** checkbox to add the text even when there is no data.
9. Select **OK** to apply the settings and close the dialog.

Fonts

In XPression, fonts are used to define the look and style of text objects in a scene.

The fonts installed in the Windows system font directory are available to all XPression projects. Private fonts are kept in a **Fonts** folder within an XPression project folder, and are only available to that project.

Private fonts can be added using the **Font Manager** or the **Scene Fonts Tab** in the **Object Inspector**.

Just as with other objects in an XPression scene, you can add a material to a font.

The following topics are covered in this section:

Adding a Private Font Using the Font Manager

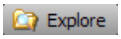
Adding a Private Font Using the Scene Fonts Tab

Applying a Material to a Font

Adding a Private Font Using the Font Manager

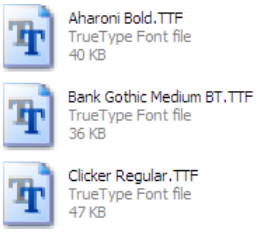
The **Font Manager** is accessed from the **Display** menu in the **Layout** editor.

To add a Private Font using the Font Manager:

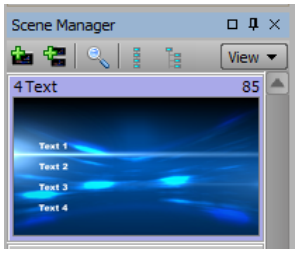
1. In XPression, select the **Explore** 

button to open the project folder.
2. In the project folder, create a new folder named **Fonts**.

   If a project is already loaded, a font folder will exist in the folder structure.
3. For each private font you want to add to the project, copy the associated **True Type Font** file into the **Fonts** folder.

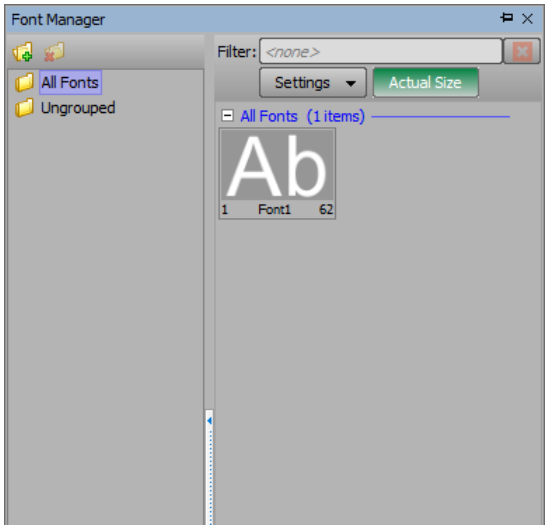


4. In the **Scene Manager**, select a scene or scene group that contains a text object.

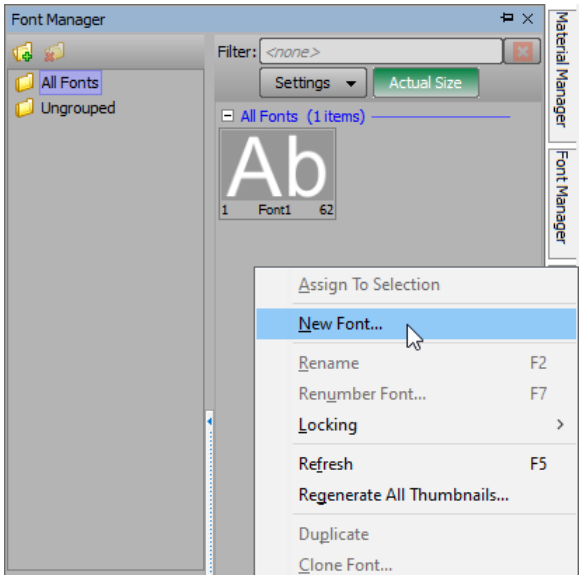


5. Select **Display > Font Manager**.

   The **Font Manager** window opens. To prevent the **Font Manager** window from being hidden by other windows, select the **Pin**  icon in the window title bar.

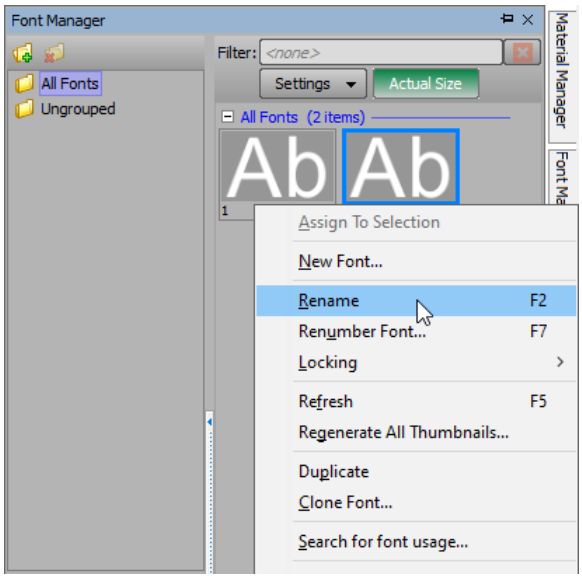


6. Right-click inside the **Fonts** list and from the shortcut menu, select **New Font**.



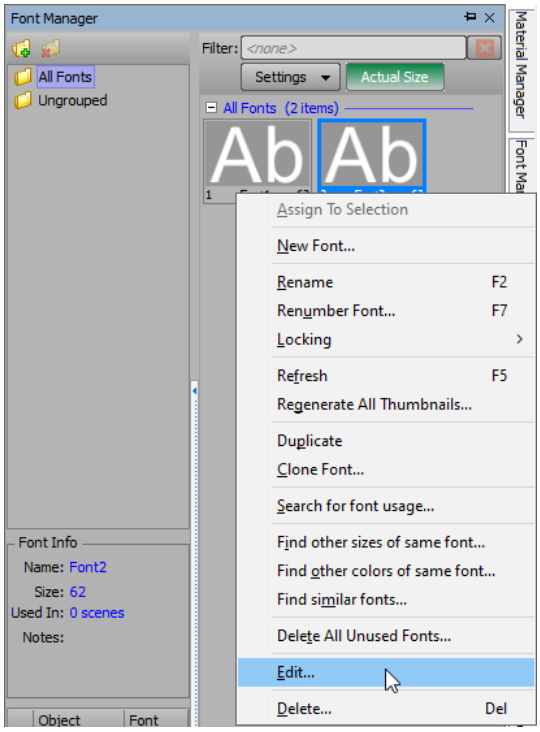
A new font is added to the list.

7. Right-click the new font and select **Rename** from the shortcut menu.

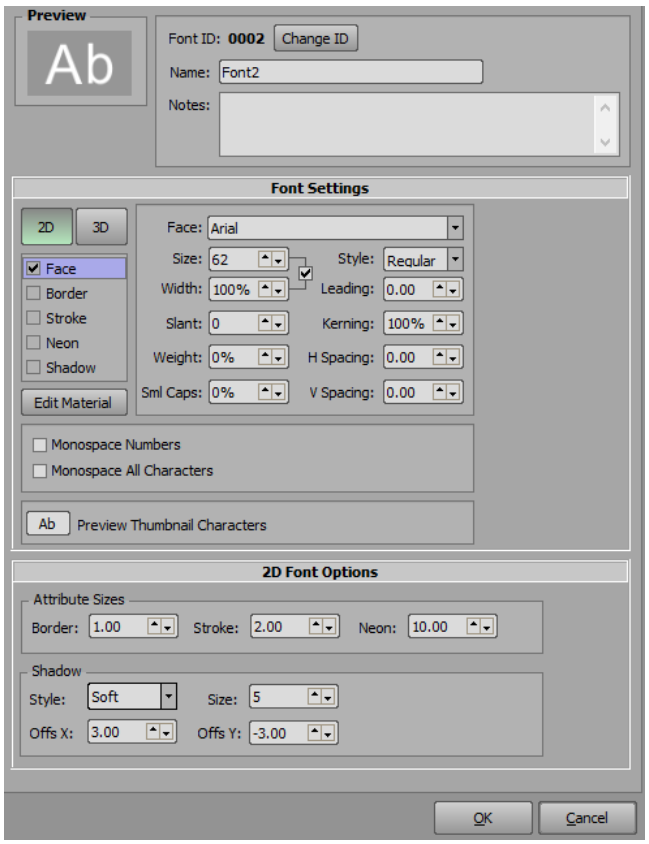


8. Enter a name for the new font.

9. Right-click the font and from the shortcut menu, select **Edit**.



The **Font Editor** opens.



10. In the **Font Settings** section, select the **Face** checkbox (selected by default).

11. From the **Face** drop-down, select a private font face, indicated by the (private) tag following the font face name, for the new font.

The new font is ready to be applied to text objects.

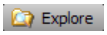
For More Information on...

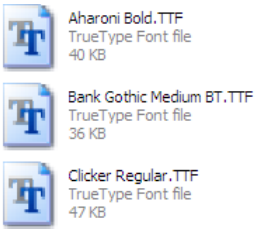
- how to apply a font to a text object, refer to Creating a Text Object.
- how to apply a material to a font, refer to Applying a Material to a Font.

Adding a Private Font Using the Scene Fonts Tab

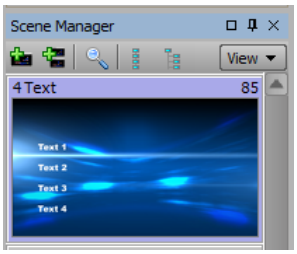
The **Scene Fonts** tab is accessed from the **Object Inspector** when a text object is selected on the **Object Manager**.

To add a Private Font Using the Scene Fonts Tab

1. In XPression, select the **Explore**  button to open the project folder.
2. In the project folder, create a new folder named **Fonts**.
3. For each private font to add to the project, copy the associated **True Type Font** file into the new **Fonts** folder.

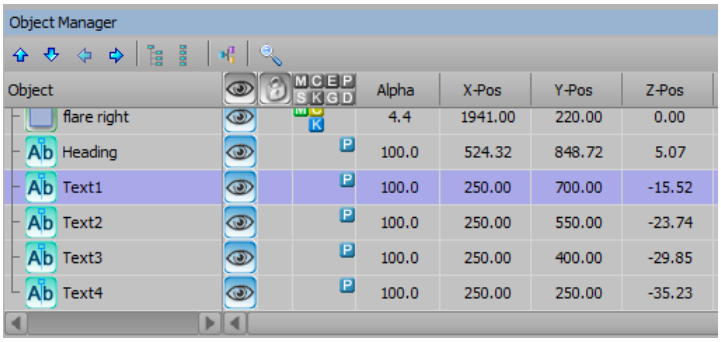


4. In the **Scene Manager**, select a scene or scene group that contains a text object.



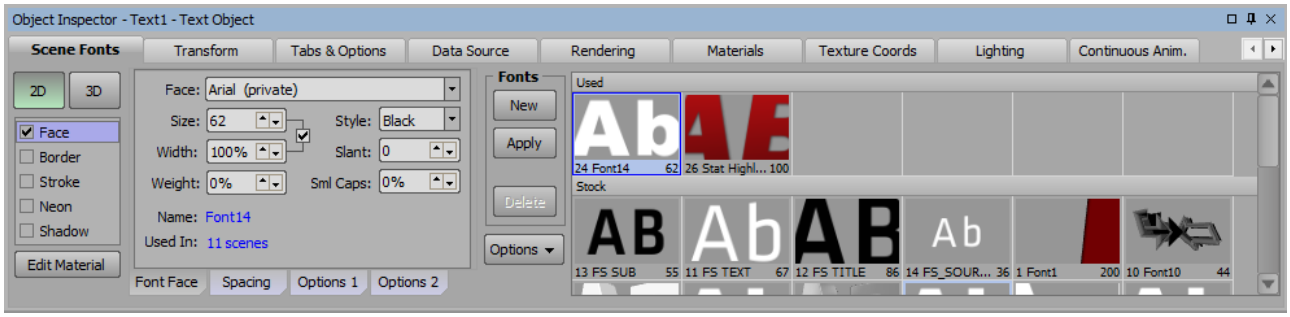
The objects contained in the selected scene or scene group are listed in the Object Manager.

5. In the **Object Manager**, select a text object.



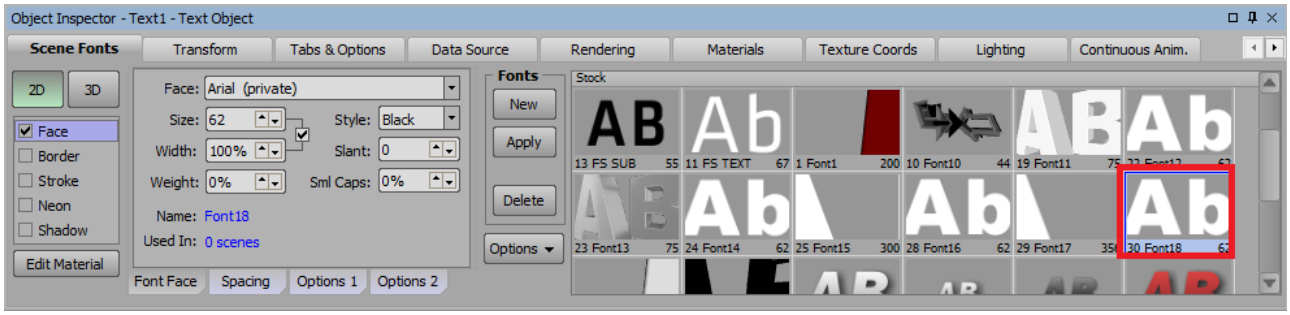
6. In the **Object Inspector**, select the **Scene Fonts** tab.

   The **Scene Fonts** tab opens.



7. In the **Fonts** section, select **New**.

   A new font is added to the **Stock** list.



8. Right-click the new font and select **Rename** from the shortcut menu.
9. Enter a name for the new font.
10. From the **Face** drop-down, select a private font face, indicated by the (private) tag following the font face name..

    The new font is ready to be applied to text objects.

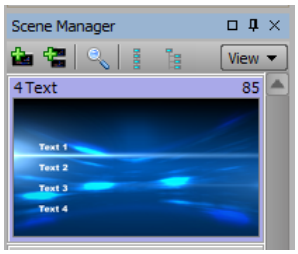
For More Information on...

- how to apply a font to a text object, refer to Creating a Text Object.
- how to apply a material to a font, refer to Applying a Material to a Font.

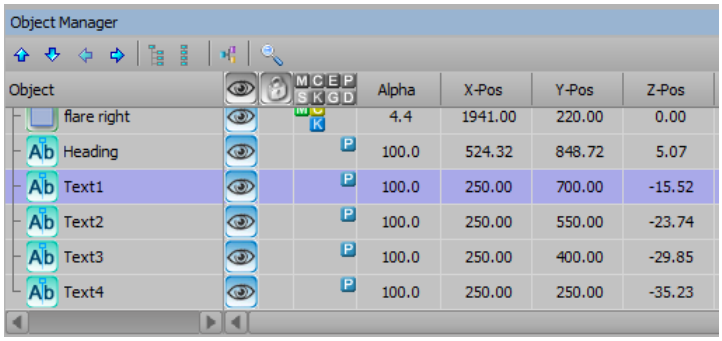
Applying a Material to a Font

To apply a material to a font:

1. In the **Scene Manager**, select a scene or scene group that contains a text object.



2. In the **Object Manager**, select a text object.

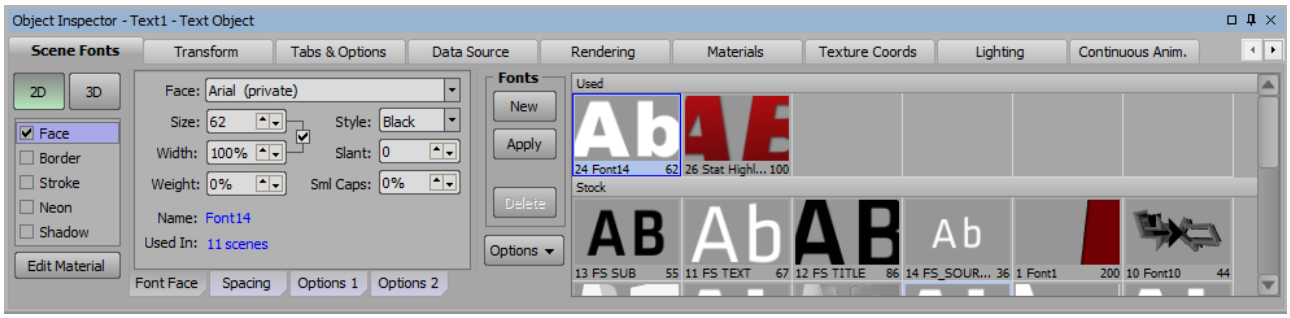


3. In the active Viewport, select the text to which you want to apply a material.
4. Select a font using the Scene Fonts tab or the Font Manager:

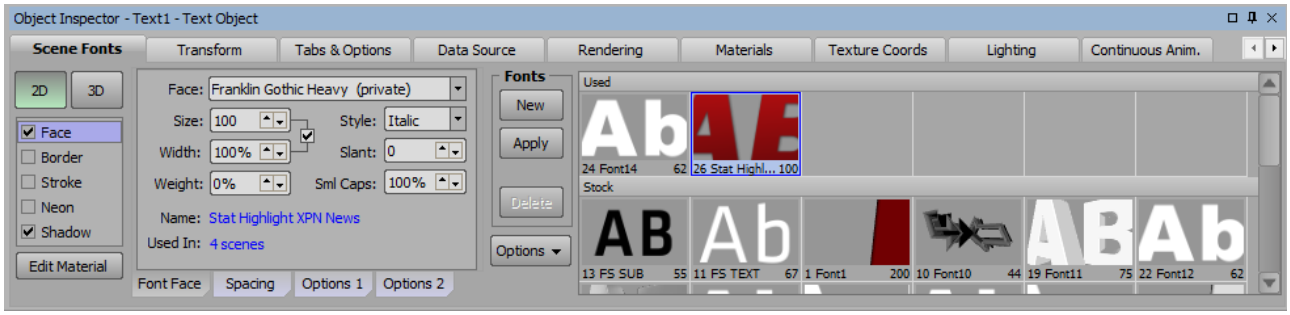
Scene Fonts

1. In the **Object Inspector**, select the **Scene Fonts** tab.

   The **Scene Fonts** tab opens.



2. From the **Used** or **Stock** list, select the font to use.



3. Select a font attribute to which to apply a material.

   Font attributes are:

2D Fonts	3D fonts
Face	Face
Border	Bevel
Stroke	Extrusion
Neon	Back Bevel
Shadow	Back Face

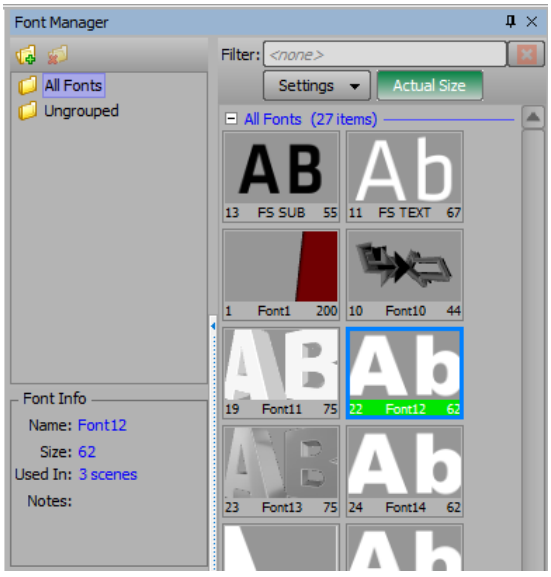
Font Manager

1. Select **Display > Font Manager**.

   The **Font Manager** window opens. To prevent the **Font Manager** window from being hidden by other windows, select the **Pin** button in the window title bar.

2. In the **Font Manager**, double-click a font for the text object from the **Fonts** list.

   The selected font is applied to the text object and is highlighted green in the **Fonts** list.



3. Right-click the font and from the shortcut menu, select **Edit**.

   If the font is not used in other scenes, the **Font Editor** opens. Continue with Step 5.

   If the font is used in other scenes, the **Confirm Font Change** dialog opens. Continue with Step 4.

4. If you want the changes you make to the font to be applied in all scenes using the font, select **Yes** and continue with Step 5.

   OR

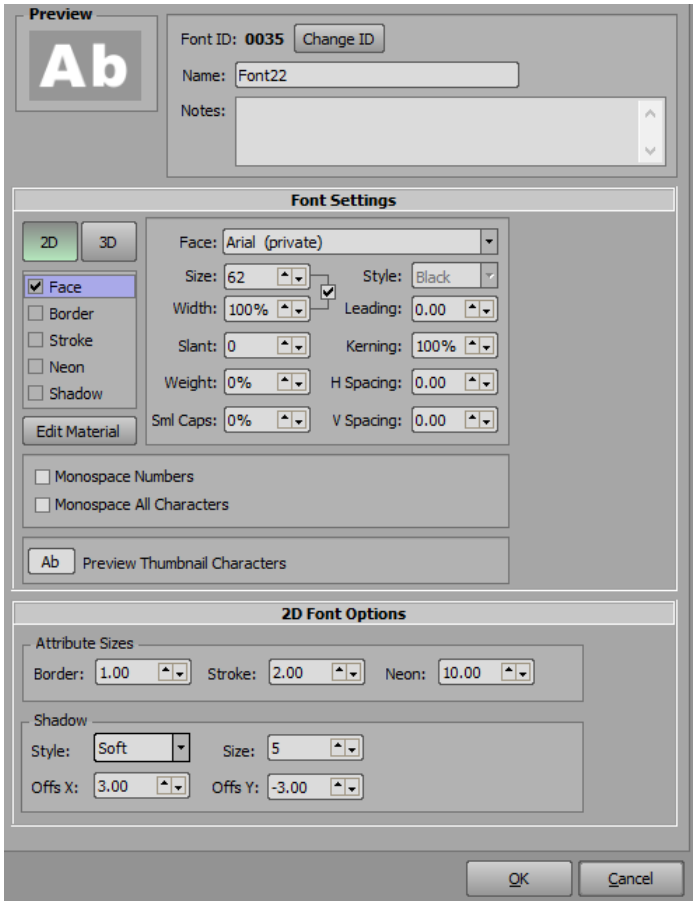
   If you want to only change the font in the current scene, select **Clone Font**.

   The **Clone Font** dialog opens.

   Select from the following options:

   - **Only Convert "Selected Text"** — the cloned font will only be applied to the selected text.
   - **Convert all objects** — the cloned font will be applied to all text objects in the current scene.
   - **Don't convert any objects** — the cloned font will be created but not be applied to any text objects in the current scene.
   - **Cancel** — do not clone the font.

5. The **Font Editor** opens.



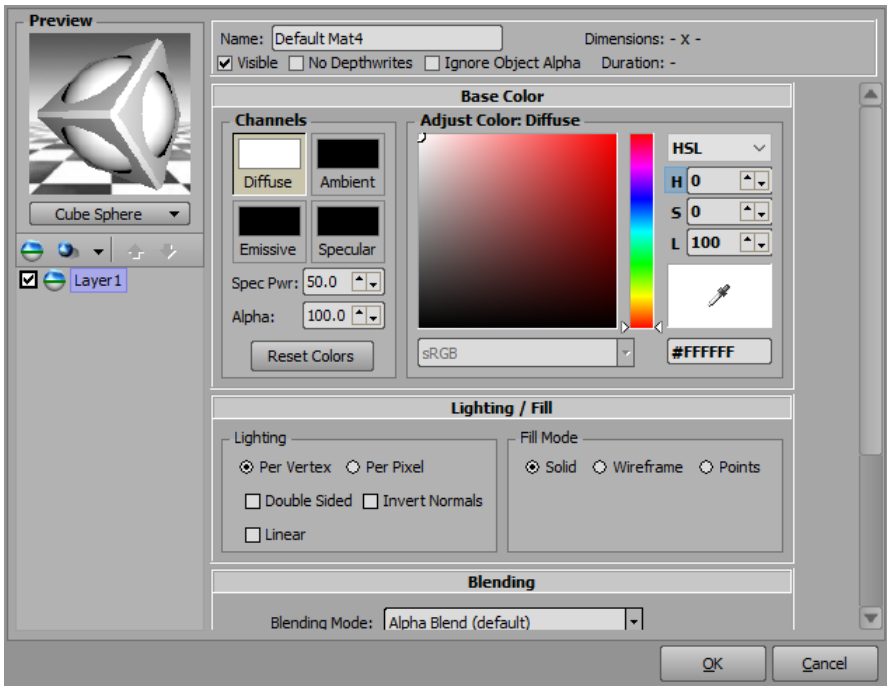
6. Select a font attribute to which to apply a material.

   Font attributes are:

2D Fonts	3D fonts
Face	Face
Border	Bevel
Stroke	Extrusion
Neon	Back Bevel
Shadow	Back Face

7. Select **Edit Material**.

   The **Material Editor** dialog opens.



8. Use the **Material Editor** to edit the material of the selected font attribute.
9. Select **OK**.

   The edited material is applied to the font attribute to change the style of the selected font. Materials applied to fonts in this manner are not displayed in the **Material Editor**.

   All of the text objects in the project that were created with the edited font are changed to match the new style of the font.

For More Information on...

- how to create a 2D texture material, refer to Creating a Texture Material.
- how to apply a material to text, refer to Applying a Material to a Text Object.

Animations

Continuous animation and keyframe animation are the methods used in XPression to add movement to objects in a scene.

The following topics are discussed in this section:

Adding Continuous Animation to an Object

Adding Key Frame Animation to an Object

Moving Key Frames in the Animation Controller Timeline

Deleting a Key Frame Animation

Triggering Clips and Audio

Creating an Animation with Multiple Controllers

Copying Keyframes to Animate an Object

Copying and Pasting Animation Controllers

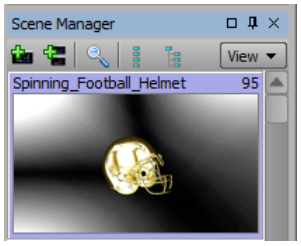
Scaling an Active Animation Controller

Adding Continuous Animation to an Object

The continuous animation feature allows you to create looping animations that add visual interest without needing to use videos.

To add continuous animation to an object:

1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains an object to animate.



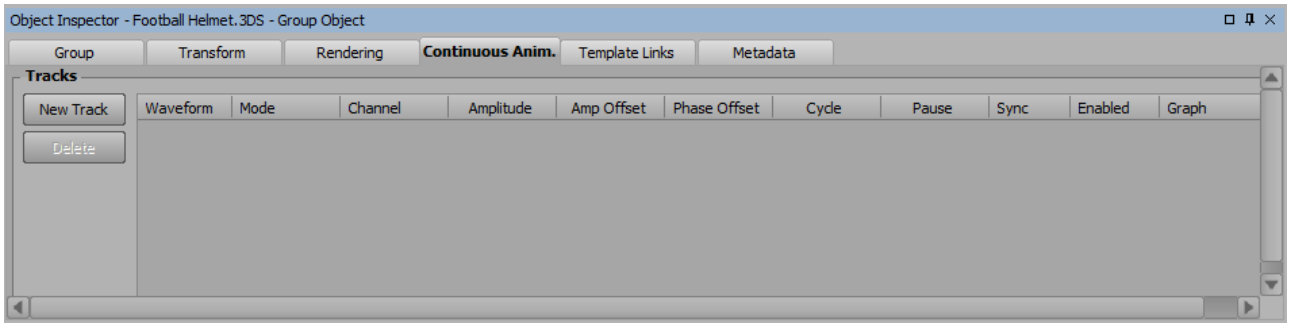
   The objects contained in the selected scene or scene group are listed in the **Object Manager**.

2. In the **Object Manager**, select an object to animate.



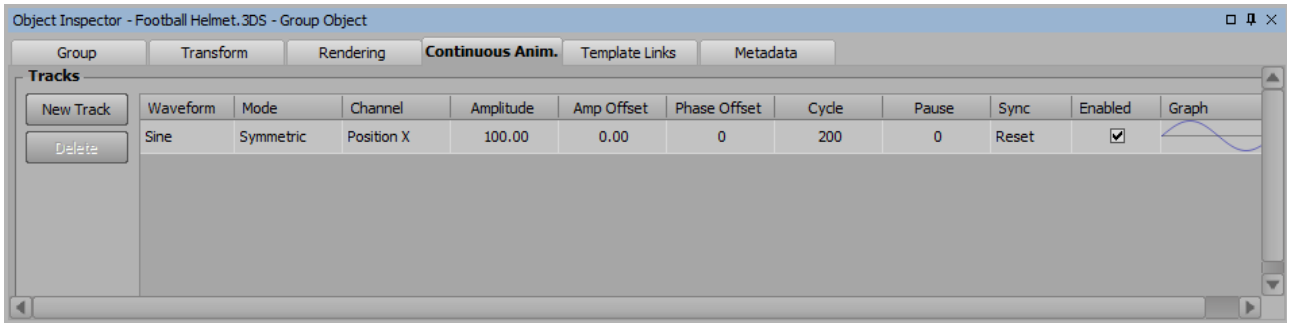
3. In the **Object Inspector**, select the **Continuous Anim** tab.

   The **Continuous Anim** tab opens.



4. Select **New Track**.

   A new continuous animation track is added to the **Tracks** table.



5. Click in the **Waveform** column, and from the drop-down, select the waveform to use.

   The options are:

   - **Sine** — 
   - **Cosine** — 
   - **Triangle** — 
   - **Square** — 
   - **Sawtooth** — 
   - **Random** — 

   The selected wave form is displayed in the **Graph** column.

6. Click in the **Mode** column, and from the drop-down, select the mode used to continue the animation when it reaches the set **Amplitude** value.

   The options are:

   - **Symmetric** — the amplitude value is copied after reaching the set value end.
   - **Asymmetric** — the animation flips over to the starting position after reaching the set amplitude value.

7. Click in the **Channel** column, and from the drop-down, select the channel to animate.

   The options are:

   - **Position X** — move the object along the X axis.
   - **Position Y** — move the object along the Y axis.
   - **Position Z** — move the object along the Z axis.
   - **Rotation X** — rotate the object around the X axis.
   - **Rotation Y** — rotate the object around the Y axis.
   - **Rotation Z** — rotate the object around the Z axis.
   - **Scaling X** — scale the object along the X axis.
   - **Scaling Y** — scale the object along the Y axis.
   - **Scaling Z** — scale the object along the Z axis.
   - **Pivot X** — pivot the object along the X axis.
   - **Pivot Y** — pivot the object along the Y axis.
   - **Pivot Z** — pivot the object along the Z axis.
   - **Alpha** — fade the alpha channel of the object in and out.
   - **Texture Pos X** — moves the texture applied to the object horizontally.
   - **Texture Pos Y** — moves the texture applied to the object vertically.

8. Click in the **Amplitude** column, and enter or select the extent of movement for the object.

   The unit of measurement depends on the channel selected. For example:

   - An amplitude of **180** set for **Rotation Z** rotates the object **180** degrees around the **Z** axis.
   - An amplitude of **100** set for **Position X** moves the object horizontally **100** pixels from its starting point.
   - An amplitude of **3** set for **Scaling X** multiplies the width of the object by 3.
   - An amplitude of **100** set for **Alpha**, changes the transparency of the object from 0% to 100%.

9. Click in the **Amp Offset** column, and enter or select the vertical starting point for the **Amplitude** setting.
10. Click in the **Phase Offset** column, and enter or select the horizontal starting point for the **Amplitude** setting.
11. Click in the **Cycle** column, and enter or select the speed of the animation cycle.

    The value in the **Cycle** column is the number of frames it takes to complete one cycle of the animation. Therefore, the higher the number, the slower the animation.

12. Click in the **Pause** column, and enter or select the number of frames to pause before beginning a new animation cycle.

13. Click in the **Sync** column, and from the drop-down, select the method used to start a continuous animation track.

    The available options are as follows:

    Reset — start a continuous animation track at the starting point of the animation.

    Clock — base the start of a continuous animation track on the clock. Select this method to synchronize a continuous animation track with previous animations.

14. In the **Enabled** column, select the checkbox to enable the continuous animation track.

    Clear this check box to turn off the continuous animation track.

15. To add additional continuous animation tracks to an object, repeat Steps 4 to 14.

To copy a track from one object to another:

1. In the **Object Manager**, select the object whose track you want to copy.
2. In the **Object Inspector**, in the **Continuous Anim** tab, right-click on the track you want to copy and from the shortcut menu, select **Copy**.
3. In the **Object Manager**, select the object to which you want to copy the track.
4. In the **Object Inspector**, in the **Continuous Anim** tab, right-click anywhere in the **Tracks** list and from the shortcut menu, select **Paste**.

To view the animation:

- Double-click the scene containing the animated object.

  The selected scene is sent to the default output and the object continuous animation tracks start running to animate object.

- To preview continuous animations in the active Viewport, select the **Show or Hide Continuous Animations and Other Effects**  button in the Viewport toolbar.

Adding Key Frame Animation to an Object

This topic describes how to configure an animation controller and then add keyframes to it to animate an object.

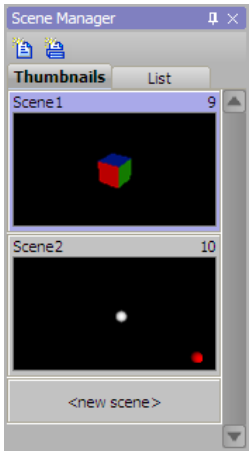
Configure an animation controller

Set keyframes

Play out the animation

To configure an animation controller:

1. In the **Scene Manager** window, select a scene or scene group that contains an object to animate.

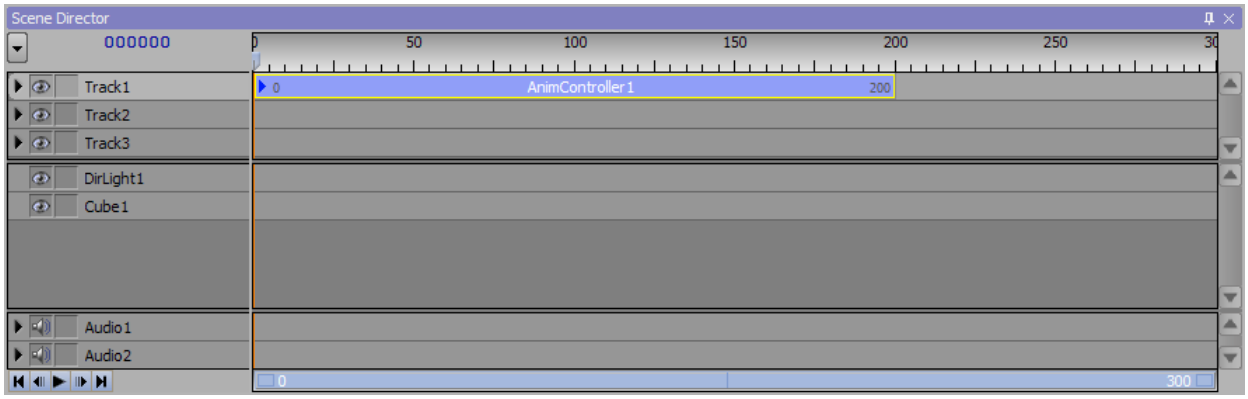


   The objects contained in the selected scene or scene group are listed in the **Object Manager** window.

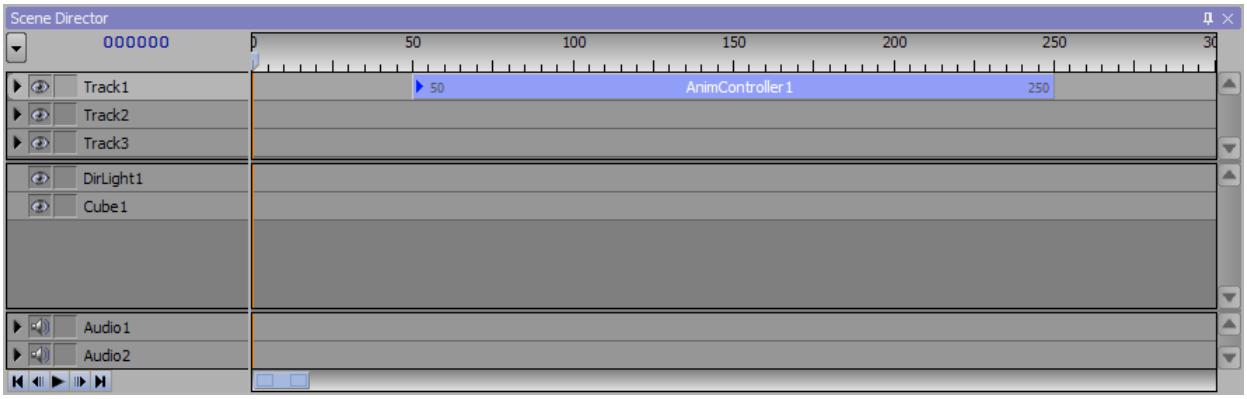
2. In XPression, select **Animation > Scene Director**.

   The **Scene Director** window opens with a default animation controller added for Track 1.

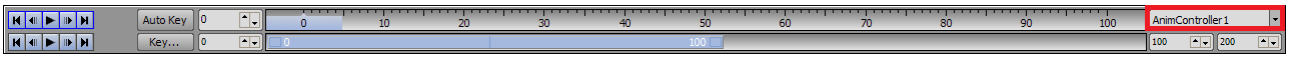
   ★Multiple scene directors can be added to a scene and managed using the **Scene Directors** window.



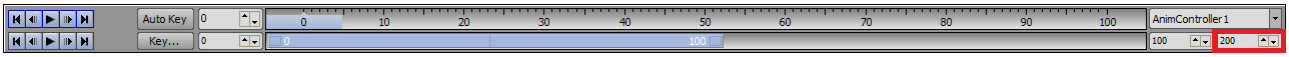
3. Select and hold the animation controller and move it to the position to start at in the Timeline.



4. In the **Animation Controller** window at the bottom of the **Editor**, from the **Animation Controller** drop-down at the bottom-right of the window, select the animation controller to use in the current scene.



5. In the **Total Range** field, enter or select the number of key frames in the animation.

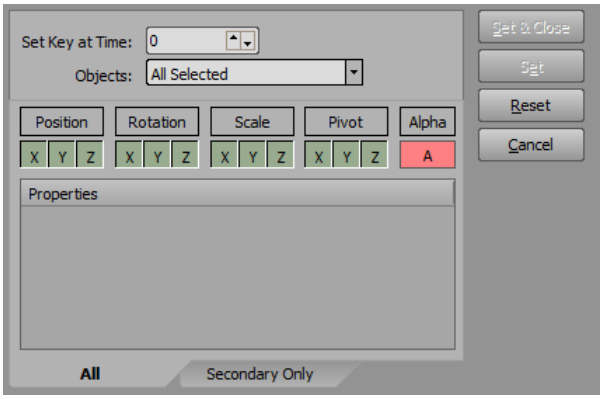


6. In the **Working Range Start** field, enter or select the key frame for the start of the key frame scale.
7. In the **Working Range End** field, enter or select the key frame for the end of the key frame scale.
8. Continue with the instructions for setting keyframes.

To set keyframes:

1. In the active **Viewport**, position the object to be animated at the start position of the animation.
2. Press the **Ctrl** and K **key** at the same time.

   The **Set Keyframe** dialog opens.



   The attributes highlighted in green (**Position**, **Rotation**, **Scale**, and **Pivot**) are captured. Red highlighted attributes (**Alpha**) are not captured.

3. In the **Set Key at Time** field, enter or select the key frame for the start position of the animation.

4. Select **Set & Close**.

   The set key frame is marked by a vertical line on the **Key Frame Scale** in the **Animation** window and in the active animation controller.

5. In the active **Viewport**, position the object to be animated at the next position in the animation.
6. Press the **Ctrl** and **K** key at the same time.

   The **Set Keyframe** dialog opens.

7. In the **Set Key at Time** field, enter or select the key frame for the next position in the animation.
8. Select **Set & Close**.

   The set key frame is marked by a vertical line on the **Key Frame Scale** in the **Animation** window.

9. To add more object positions to the animation, repeat steps 5 to 8.

To play out the animation:

1. Double-click the scene containing the animated object.

   The selected scene is sent to the default output.

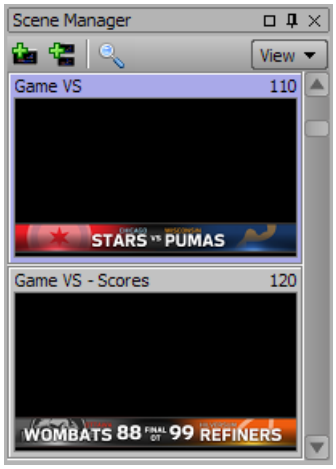
2. Select the **Play**  button.

   The defined animation starts playing in the default output.

Moving Key Frames in the Animation Controller Timeline

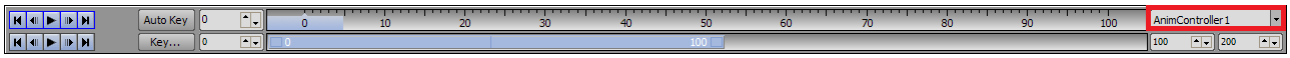
Once key frames have been set, they can be moved directly from within the timeline of the animation controller.

1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains object animation that uses key frames.

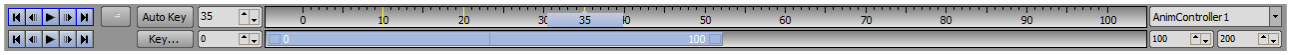


   The objects contained in the selected scene or scene group are listed in the **Object Manager** window.

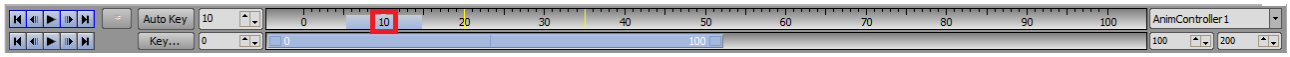
2. In the **Animation Controller** window at the bottom of the **Editor**, from the **Animation Controller** drop-down at the bottom-right of the window, select the animation controller to use in the current scene.



   The selected animation controller opens in the **Animation Controller** window.

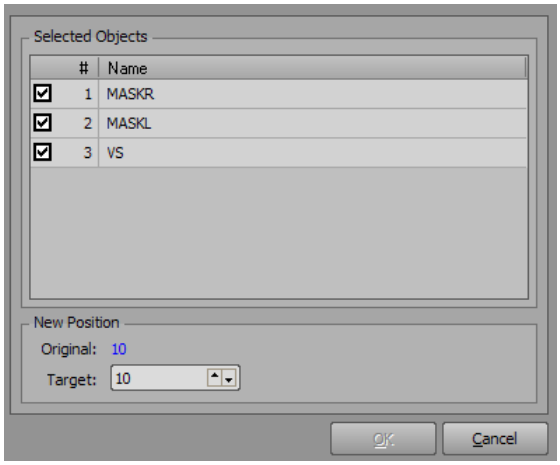


3. Select and drag the playout slider onto the vertical yellow key frame marker that is to be moved.



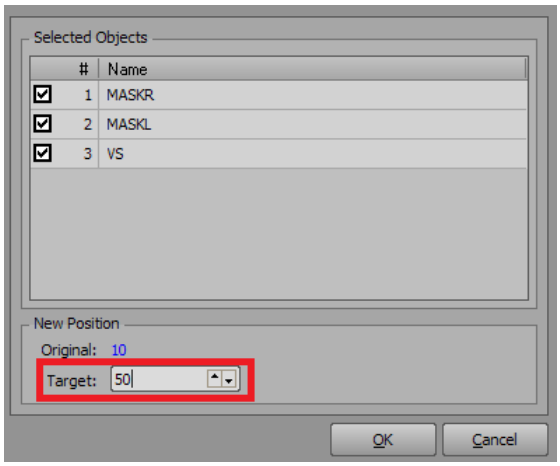
4. Right-click on the playout slider and select **Move Keys** from the shortcut menu.

   The **Move Key Frames** dialog opens.



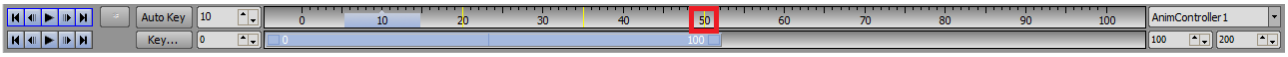
5. In the **Selected Objects** section, select the checkbox of the animated object from the scene for which the key frame is to be moved.

6. In the **New Position** section, in the **Target** field, enter or select the number of the frame in the timeline to which the key frame is to be moved.



7. Select **OK**.

   The **Move Key Frames** dialog closes and the vertical yellow key frame marker is moved to the selected frame number in the timeline.

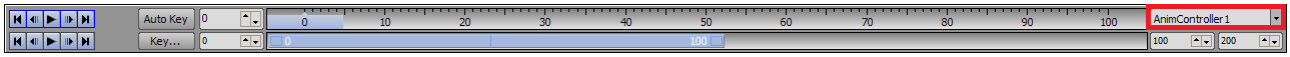


Deleting a Key Frame Animation

This topic describes how to delete a key frame animation from the **Animation Controller**.

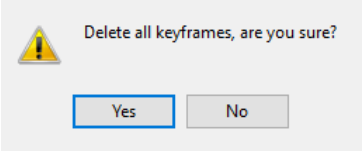
To delete a key frame animation:

1. In the **Animation Controller** window at the bottom of the **Editor**, from the **Animation Controller** drop-down at the bottom right of the window, select the animation controller for animating objects in the current scene.

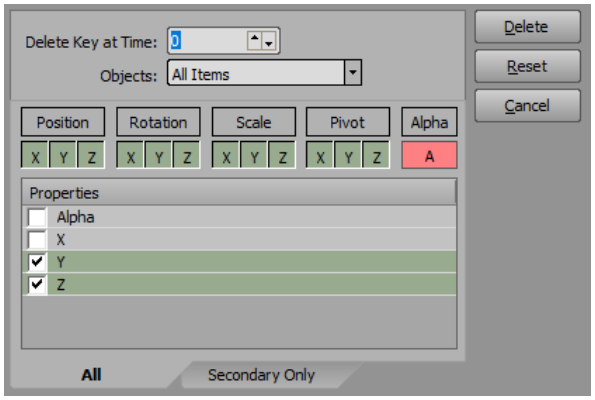


2. Right-click inside the animation controller timeline and select **Delete Key(s)** or **Delete All Keys**.

   If **Delete All Keys** is selected, a **Warning** prompt opens.



3. Select **Yes** to delete all keys.
4. If **Delete Key(s**) is selected, the **Delete Keyframe** dialog box opens.



5. In the **Properties** section, select the key frame properties to delete.
6. Select **Delete**.

   The selected key frames are deleted and the **Delete Keyframe** dialog closes.

Triggering Clips and Audio

This topic describes how to add an audio file to the scene director and map the audio channels. It also describes how to replace an audio file.

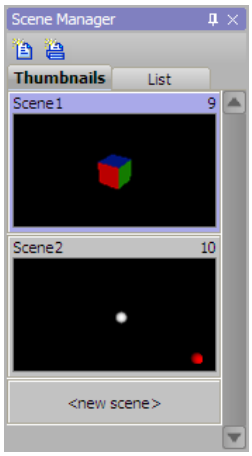
Add an audio file to a scene director

Map audio channels

Replace an audio file

To add an audio file to a scene director:

1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains an object to animate.

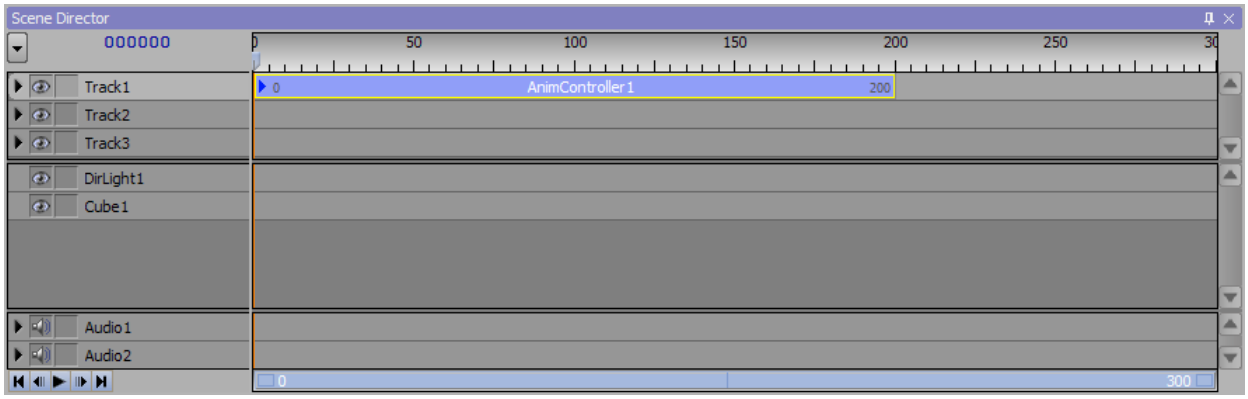


   The objects contained in the selected scene or scene group are listed in the **Object Manager** window.

2. In XPression, select **Animation > Scene Director**.

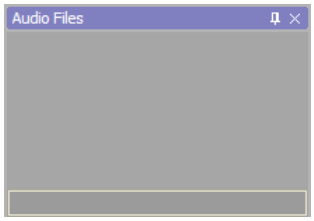
   The **Scene Director** window opens.

   ★Multiple scene directors can be added to a scene and managed using the **Scene Directors** window.



3. In the **Editor**, select **Display > Audio Files**.

   The **Audio Files** window opens.

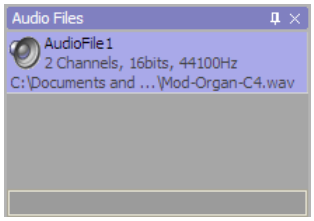


4. In the **Audio Files** window, right-click and select **Import File**.

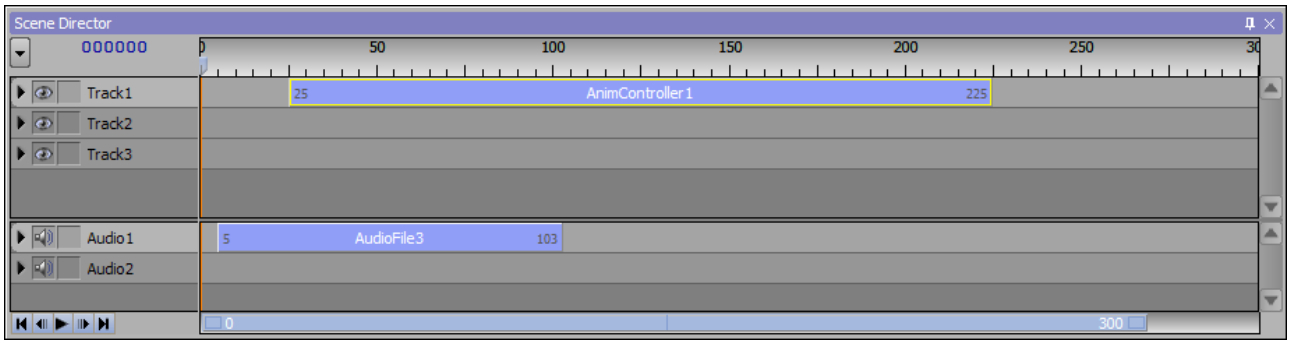
   The **Open** dialog opens.

5. In the **Open** dialog, locate and select one or multiple Waveform Audio File Format (.WAV) audio files to import into the project and select **Open**.

   The selected .WAV audio file or files are added to the **Audio Files** window.



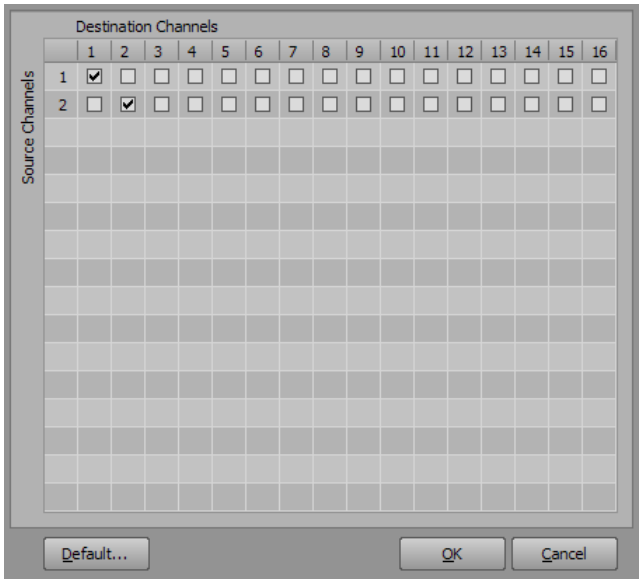
6. Drag the .WAV audio file from the **Audio Files** window onto an audio track in the **Scene Director**.



7. In the **Scene Director**, select and drag the audio track into the required position.
8. Continue with the instructions for audio channel mapping.

To map audio channels:

1. Right-click the audio track and select **Properties**.
2. The **Audio Channel Mapping** dialog opens.



3. Select the crosspoints for the **Source Channels** and **Destination Channels** as necessary.

   The AJA input framebuffer supports up to eight channels of embedded audio.

   ★If using four fill outputs on a Matrox card, the AES outputs can provide eight AES channels per output:

   2 Fill/Key Outputs

   The AES outputs will be mapped as follows:

   - Output 1: AES Output A 1-16
   - Output 2: AES Output B 1-16

   1 Fill/Key + 2 Fill Outputs

   The AES outputs will be mapped as follows:

   - Output 1 Fill/Key: AES Output A 1-16
   - Output 2 Fill: AES Output B 1-8
   - Output 3 Fill: AES Output B 9-16

   4 Fill Outputs

   The AES outputs will be mapped as follows:

   - Output 1: AES Output A 1-8
   - Output 2: AES Output B 1-8
   - Output 3: AES Output A 9-16
   - Output 4: AES Output B 9-16
4. Select **Default** to return the audio mapping to its default state.

5. Select **OK**.

   The **Audio Channel Mapping** dialog closes.

6. Select the **Play**  button.

   The defined animation starts playing in the default output.

To replace an audio file:

- In the Audio Files window, right-click on a file and select **Replace File**.

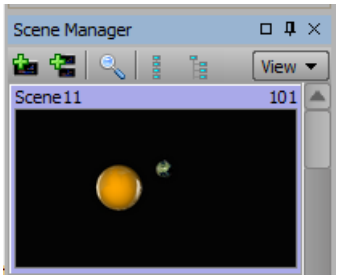
  Replacing an audio file removes the previous audio file from any **Scene Director** that uses that file and replaces it with the newly selected file.

Creating an Animation with Multiple Controllers

You can use multiple animations on an object, for example, having an object move and gradually fade away. To do this, you'll need to create additional animation controllers.

To create an animation with multiple controllers:

1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains two or more objects to animate.

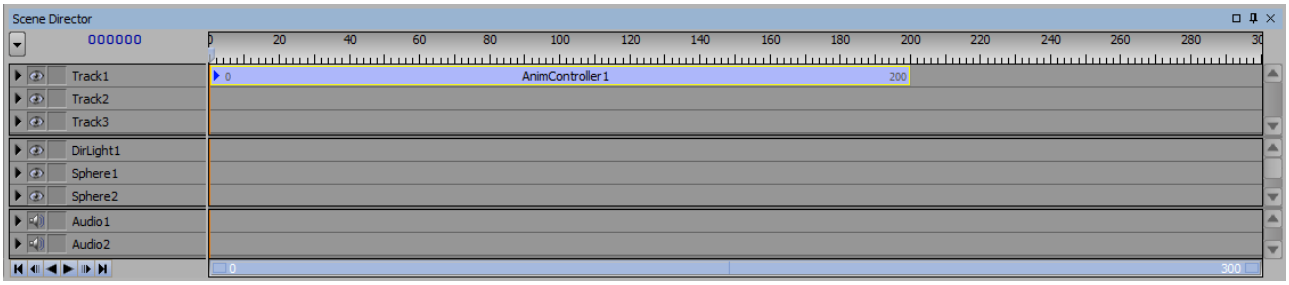


   The objects contained in the selected scene or scene group are listed in the **Object Manager**.

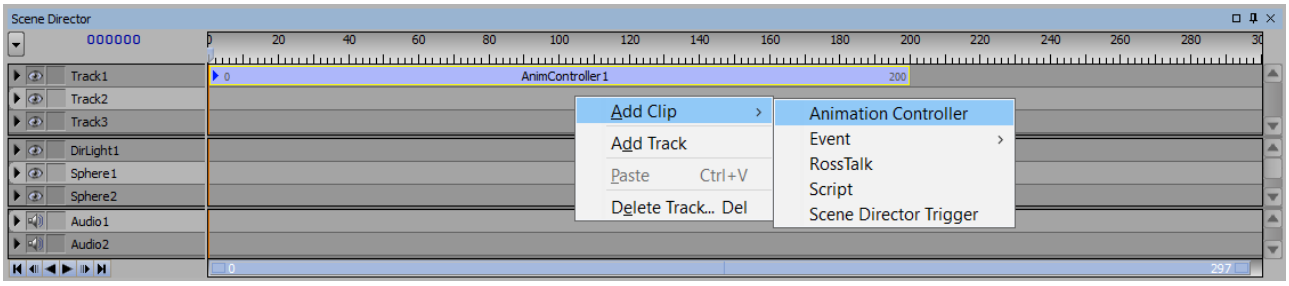
2. Select **Animation > Scene Director**.

   The **Scene Director** opens with a default animation controller added for Track 1.

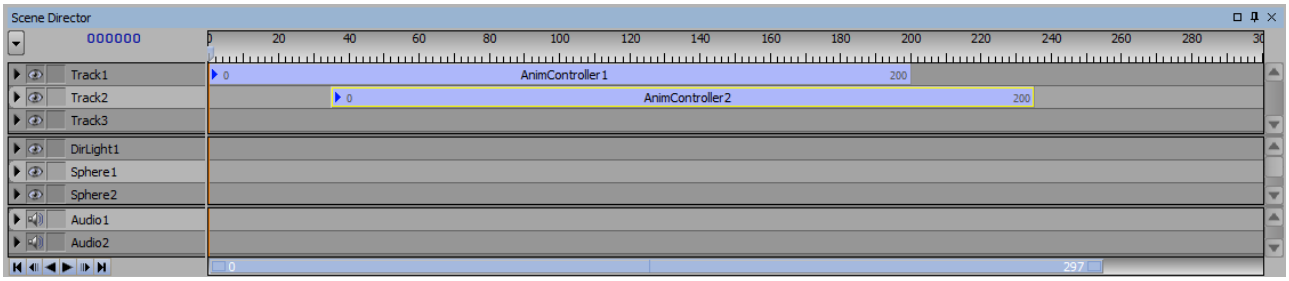
   ★Multiple scene directors can be added to a scene and managed using the **Scene Directors** window.



3. In the **Scene Director**, select an object to animate.
4. Use the animation controller to animate the selected object in the current scene.
5. Select a second object to animate.
6. In the **Scene Director**, right-click in an empty track and select **Add Clip > Animation Controller** from the shortcut menu.



An animation controller is added to the selected track.



7. Use the new animation controller to animate the selected object in the current scene.
8. In the two tracks, select and drag the animation controllers to set the relative timing for the associated objects.

   Both objects move at the same time where the two animation controllers overlap on the timeline.
9. Select the **Play** button.

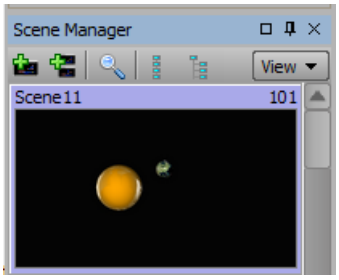
   The defined animations start playing in the default output.

Copying Keyframes to Animate an Object

If you want to use the same animation on several objects in a scene, you can copy the keyframes from one object to another.

To copy keyframes to animate an object:

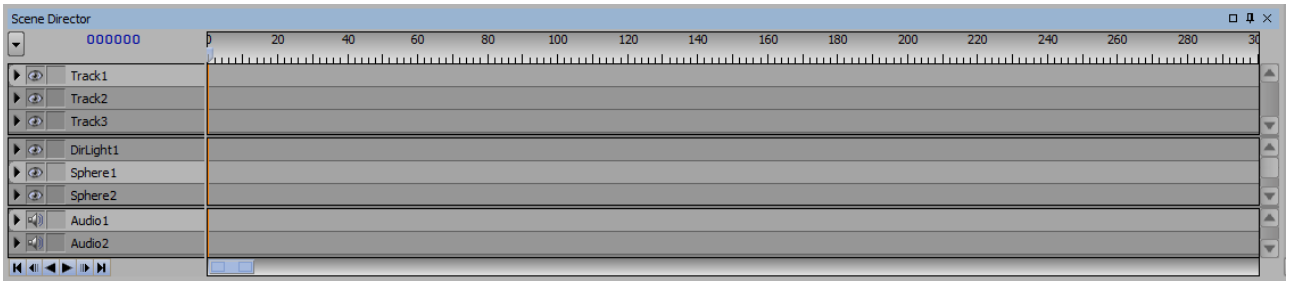
1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains two or more objects to animate.



   The objects contained in the selected scene or scene group are listed in the **Object Manager**.

2. Select **Animation > Scene Director**.

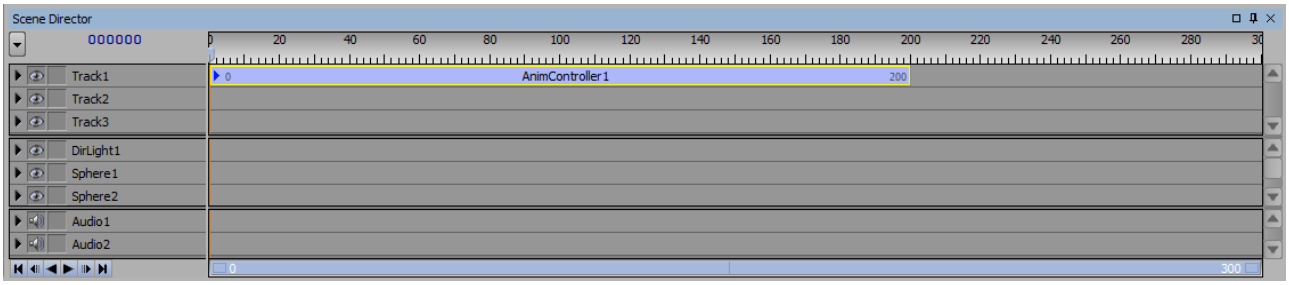
   The **Scene Director** window opens.



3. Select an object to animate.

4. In the **Scene Director**, right-click in an empty track and from the shortcut menu, select **Add Clip > Animation Controller**.

   An animation controller is added to the selected track.

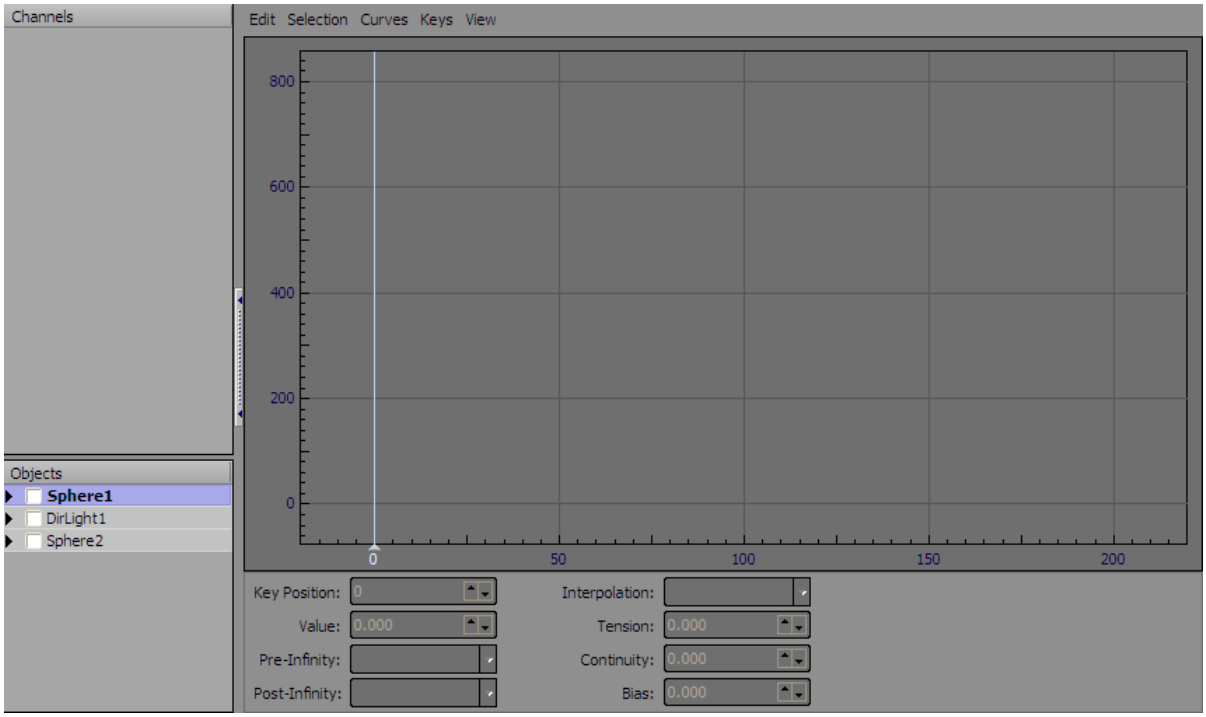


5. Select the new animation controller.

6. Create a keyframe-based animation for selected object.

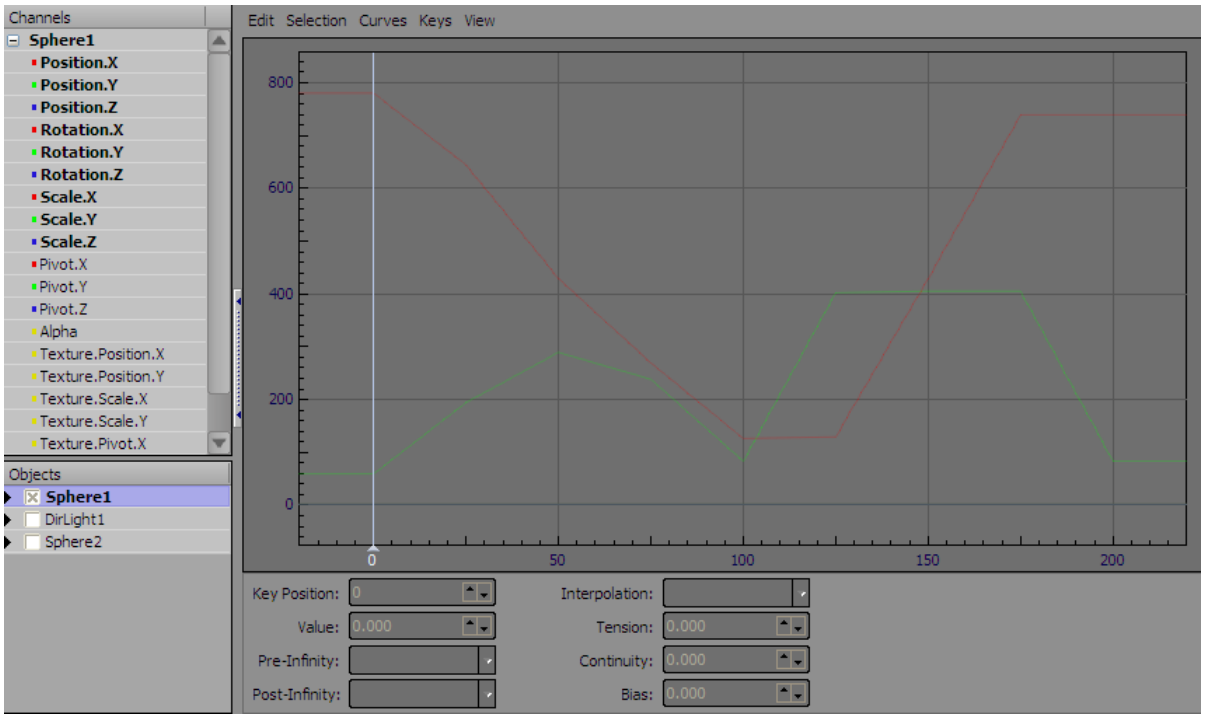
7. In the **Editor**, select **Animation > Key Graph Editor**.

   The **Key Graph Editor** window opens.



8. In the **Objects** list, double-click the name of the object displayed in bold face type.

   The selected object is added to the **Channels** list.



9. If required, expand the object added to the **Channels** list.

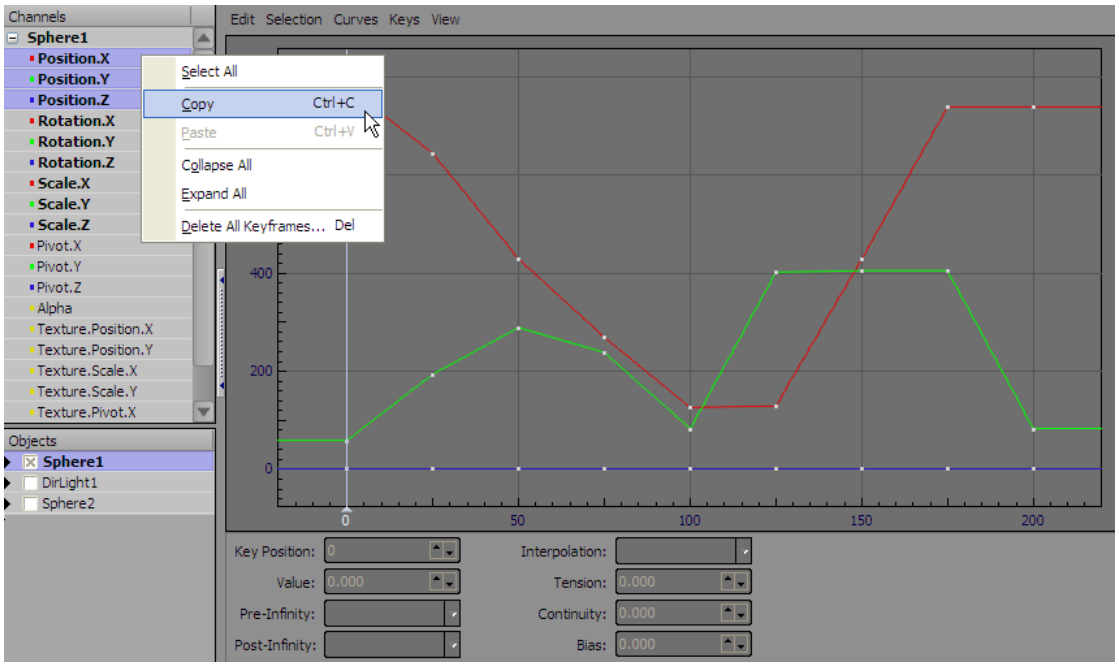
   The object channels are displayed below the expanded object.

10. Select one or more of the object channels displayed in bold face type.

Only the object channels displayed in bold face type can be copied to another object.

11. On the selected object channels, right-click and select **Copy** from the shortcut menu.

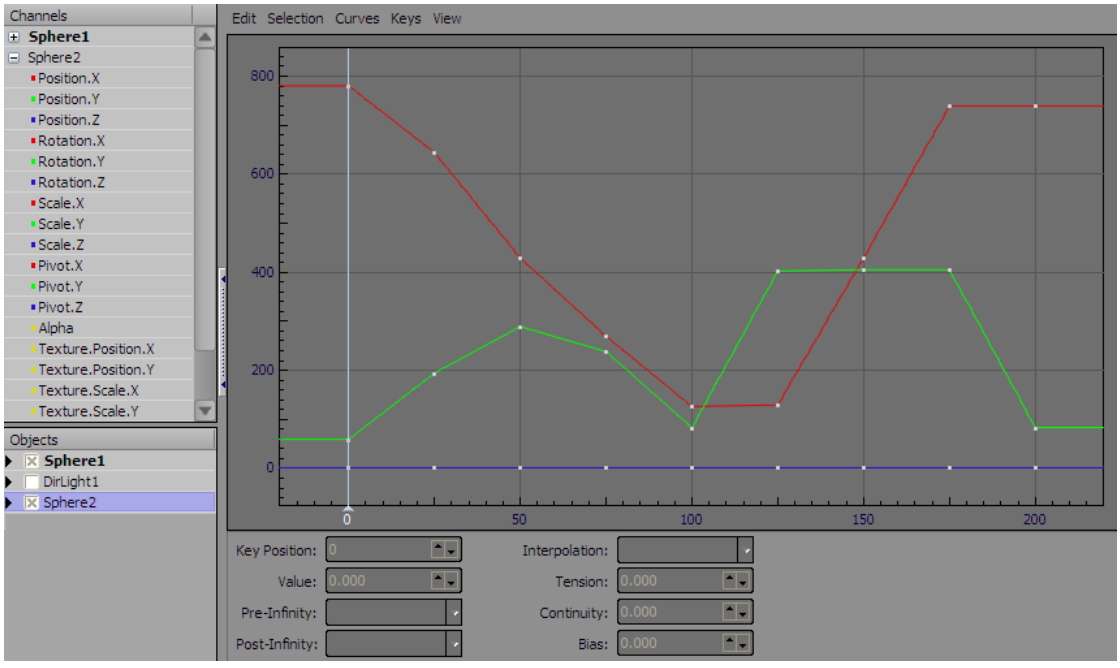
    The values of the selected channels are copied for each keyframe of the select object.



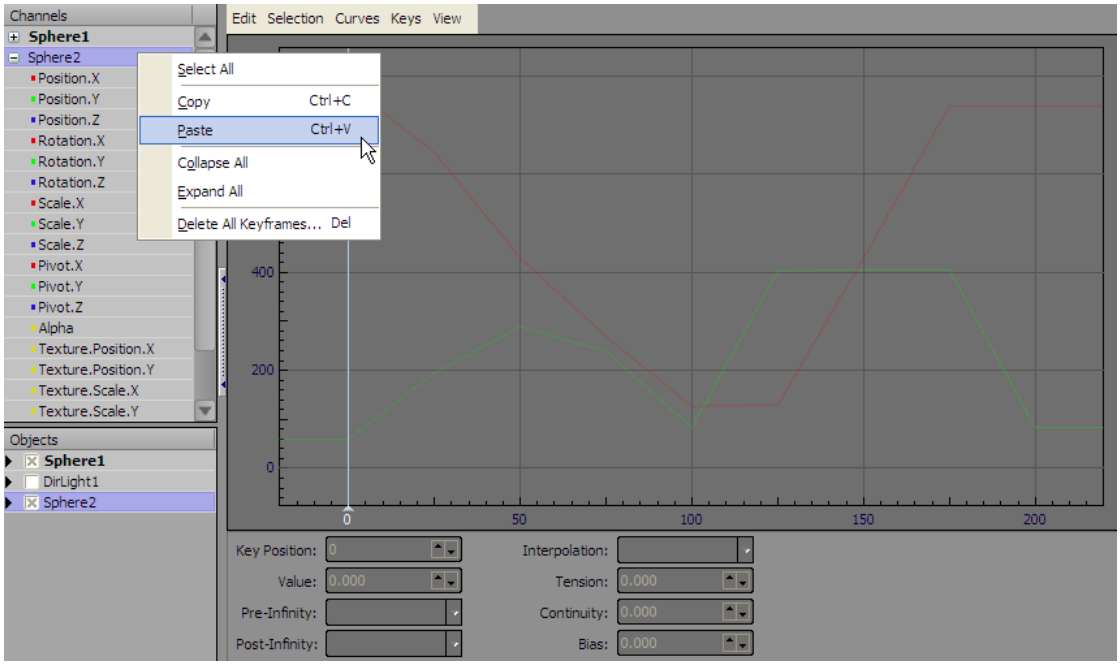
12. Collapse the object in the **Channels** list.

13. In the **Objects** list, double-click the object to which to copy the keyframes and object channels.

    The selected object is added to the **Channels** list.



14. In the **Channels** list, right-click the new object and select **Paste** from the shortcut menu.



The copied keyframes and object channel values are pasted into the selected object. The updated object channels are displayed in bold face type.

15. If required, edit the keyframes copied to the object.

    See To edit keyframes for further instructions.

16. Select the **Play** button.

    The edited animation starts playing in the default output.

To edit keyframes:

1. In the **Channels** list, select the channel to edit for an object.

   The graph displays the keyframes for the selected object channel. Each white square in the graph represents a keyframe.

2. In the graph, select the keyframe to edit.
3. To move the selected keyframe vertically in the graph, hold down the **CTRL** key and then select and drag the keyframe up or down.
4. To move the selected keyframe horizontally in the graph, hold down the **CTRL** + **Shift** keys and then select and drag the keyframe to the right or left.
5. Use the displayed properties to set the required values for the selected keyframe.

   The properties of the selected keyframe are displayed below the graph.

6. For each keyframe that requires editing, repeat steps 2 to 5 as required.
7. Close the **Key Graph Editor** window.

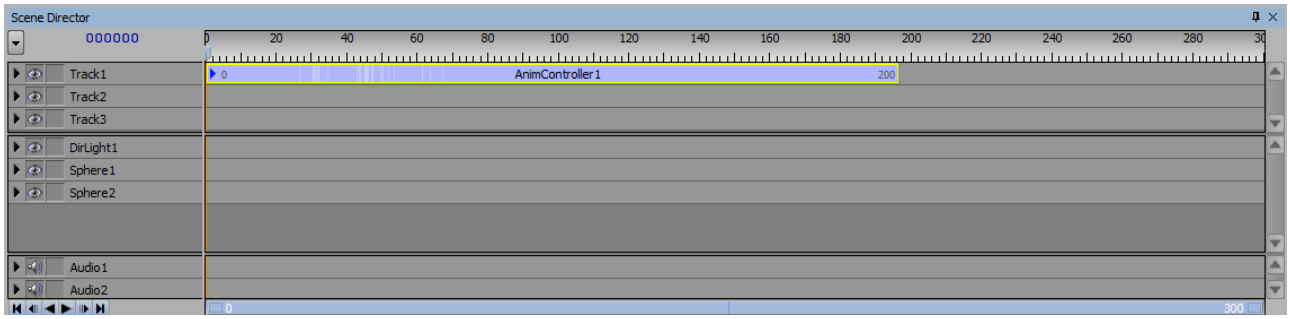
Copying and Pasting Animation Controllers

Animation Controllers can be copied and pasted to the same track in a scene, a different track in the scene, and a different scene altogether. This allows you to quickly and easily apply keyframe animations to other objects within a scene or in a different scene.

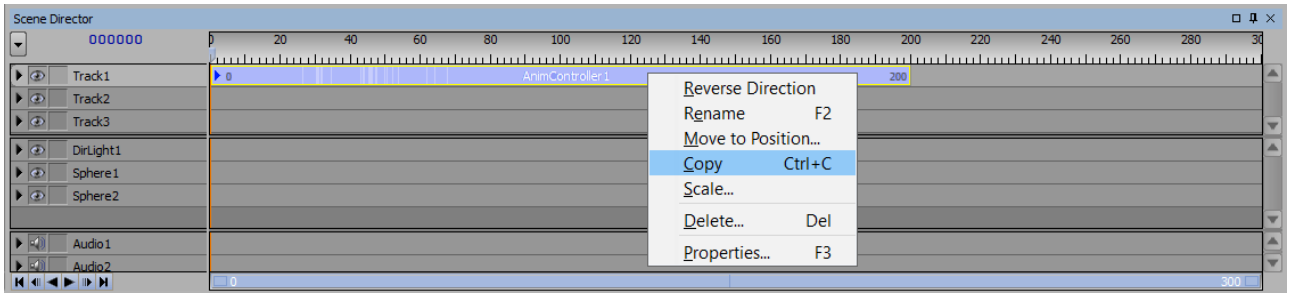
To copy and paste an animation controller:

1. In XPression, open a project and in the **Layout** editor, select a scene that contains keyframe animations.
2. Select **Animation > Scene Director**.

   The **Scene Director** opens.

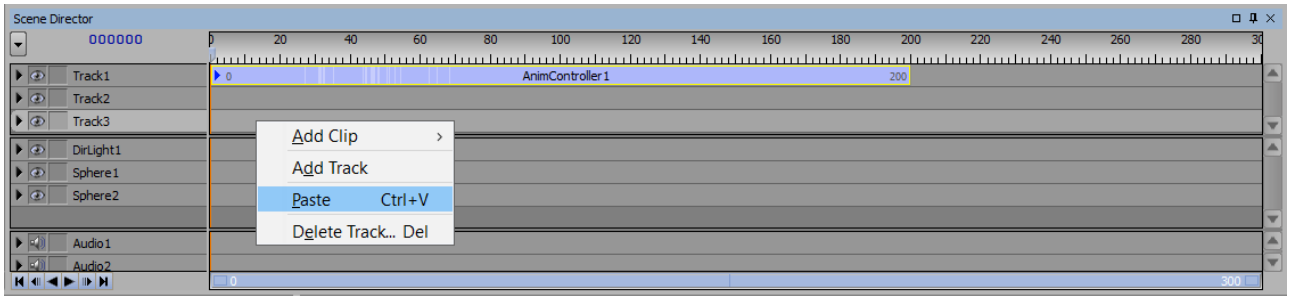


3. Right-click on the **Animation Controller** and select **Copy**.

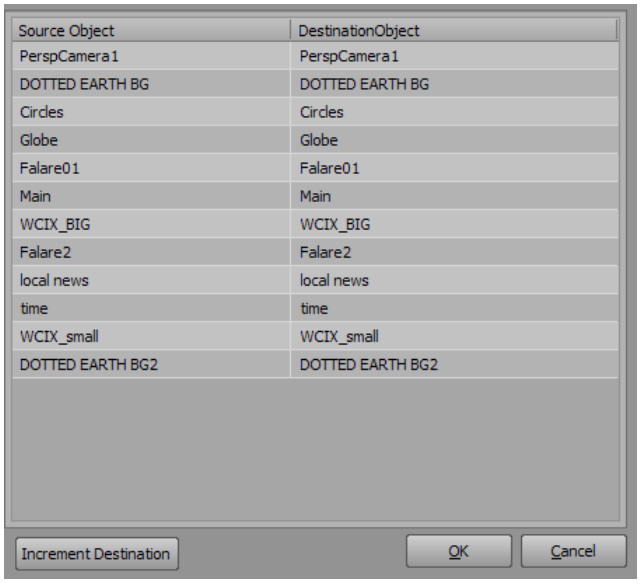


4. Right-click inside a track in the **Scene Director** and select **Paste**.

   ★The copied animation controller can be pasted onto the same track or a new track in the same scene, or onto tracks in the Scene Director from another scene.



The **Paste Animation Controller** dialog opens.



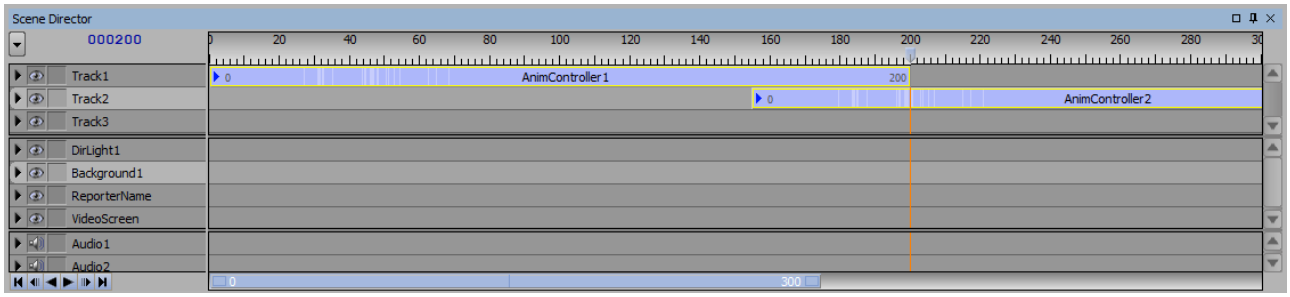
5. Do one of the following:

   - In the **Destination Object** column, select an object whose name includes a numeric (for example, PerspCamera1) to open a drop-down menu and select a different object increment (for example, PerspCamera2).
   - Select the **Increment Destination** button to select the next increment for objects in the **Destination Object** list.

6. Select **OK**.

   The **Paste Animation Controller** dialog closes and the copied animation controller is pasted onto the track in the **Scene Director**.

   The name of the pasted controller will be based on the name of the copied animation controller.



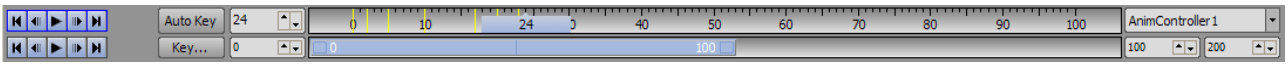
Scaling an Active Animation Controller

Active animation controllers can be scaled and the key frame animation will adjust proportionately.

To scale an active animation controller:

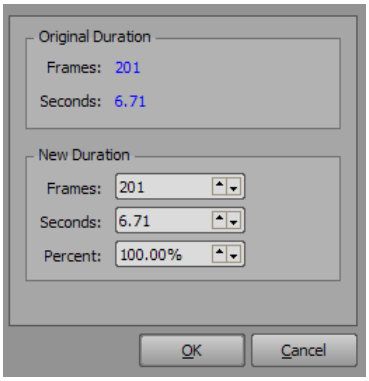
1. In the **Animation Controller** window at the bottom of the **Editor**, from the drop-down at the bottom right of the window, select the animation controller to scale.

   The selected animation controller opens in the **Animation Controller** window.



2. Right-click on the playout slider and select **Scale Time**.

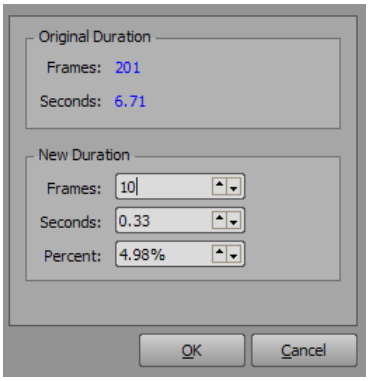
   The **Scale Animation Controller Time** dialog opens.



3. In the **New Duration** section of the **Scale Animation Controller Time** dialog, use one of the following 3 settings to configure a scaled animation controller:

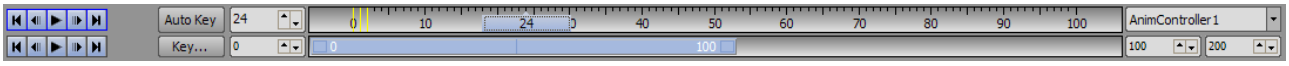
   - **Frames** — enter or select a number of frames as the duration for the animation controller.
   - **Seconds** — enter or select a number of seconds as the duration for the animation controller.
   - **Percent** — enter or select a percentage in relation to the original duration as the duration for the animation controller.

4. Adjusting any one of the duration settings will automatically adjust the other settings accordingly.



5. Select **OK**.

   The animation controller is scaled and the key frame animations are adjusted proportionally within the animation controller timeline.



Stagger Animations

Stagger animations are used in XPression to add animation to text objects character by character or to animate group objects in a scene.

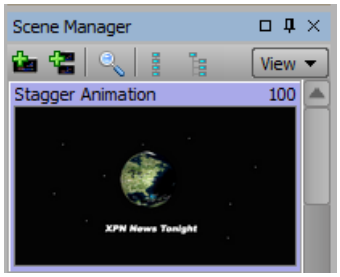
The following topic is discussed in this section:

Adding Stagger Animation to a Text or Group Object

Adding a Stagger Animation to a Text or Group Object

To add a stagger animation to a text or group object:

1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains a text or group object to animate.



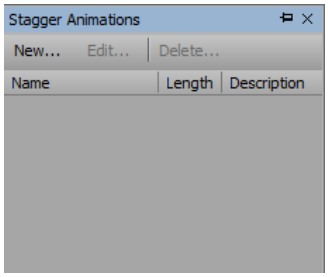
   The text or group objects contained in the selected scene or scene group are listed in the **Object Manager**.

2. In the **Object Manager**, select the text or group object to animate.



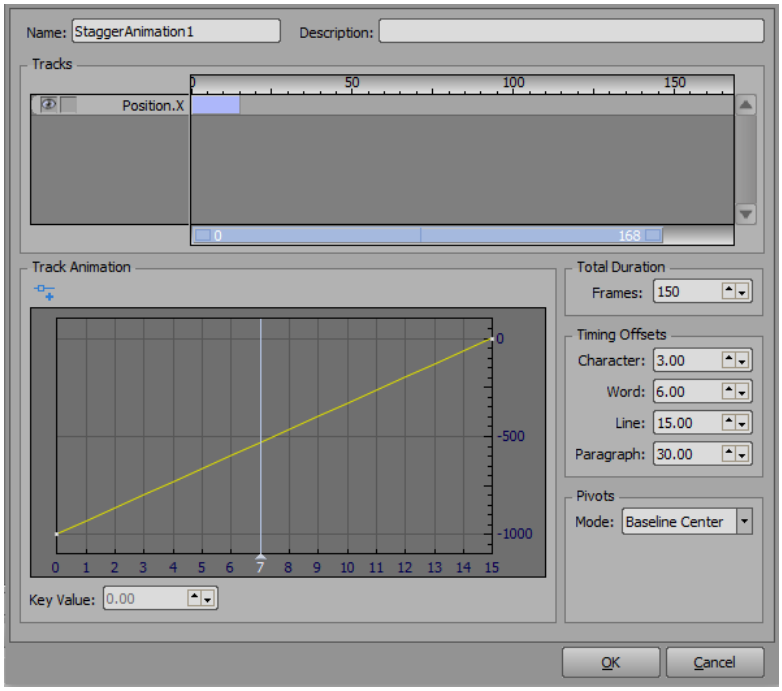
3. Select **Display > Stagger Animations**.

   The **Stagger Animations** window opens.



4. Select **New**.

   The **Edit Stagger Animation** dialog opens.



5. In the **Name** field, enter a name for the stagger animation.
6. In the **Description** field, enter a brief description to describe the stagger animation.
7. In the **Tracks** section, right-click and from the shortcut menu, select a track, or tracks, to add an animation.

   The track options are:

   - **Position.X** — move the object along the X axis.
   - **Position.Y** — move the object along the Y axis.
   - **Position.Z** — move the object along the Z axis.
   - **Rotation.X** — rotate the object around the X axis.
   - **Rotation.Y** — rotate the object around the Y axis.
   - **Rotation.Z** — rotate the object around the Z axis.
   - **Scale.X** — scale the object along the X axis.
   - **Scale.Y** — scale the object along the Y axis.
   - **Scale.Z** — scale the object along the Z axis.
   - **Alpha** — fade the alpha channel of the object in and out. The key increases transparency until it disappears.

8. Right-click a track in the timeline and select **Set Length** to open the **Edit Clip Length** dialog and edit the frame length of the clip (if necessary).
9. In the **Track Animation** section, select the **Insert Keyframe** button to insert a keyframe at the timeframe marker.

10. In the **Track Animation** graph, select a keyframe.

    A keyframe can also be selected by clicking and holding the left mouse button inside the **Track Animation** graph and dragging the mouse so that a dashed rectangle highlight surrounds the keyframe. Release the left mouse button to select the keyframe.

11. With a keyframe selected, in the **Key Value** field, enter or select a keyframe value.

12. In the **Total Duration** section, in the Frames field, enter or select the length in frames for the stagger animation.

13. In the **Timing Offsets** section, configure the offsets as follows:

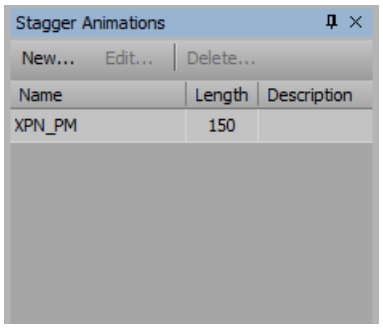
    - In the **Character** field, enter or select a value to offset the characters of a text object to the overall framerate of the stagger animation.
    - In the **Word** field, enter or select a value to offset the words of a text object to the overall framerate of the stagger animation.
    - In the **Line** field, enter or select a value to offset the lines of a text object to the overall framerate of the stagger animation.
    - In the **Paragraph** field, enter or select a value to offset the paragraphs of a text object to the overall framerate of the stagger animation.
    - In the **Pivots** section, from the **Mode** drop-down, select a method to pivot an object.

      The options are:

      - **Baseline Center** — pivots objects from the base of the object.
      - **Center** — pivots objects from the center of the object.
      - **Origin** — pivots objects from the center of the whole of the objects.

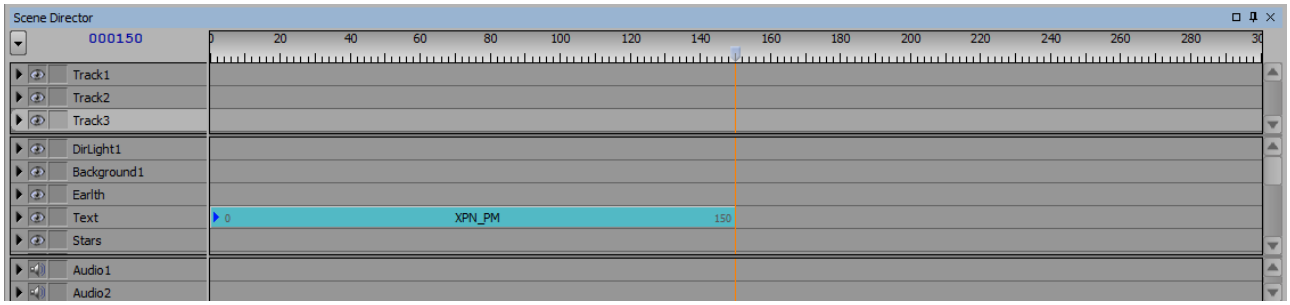
14. Select **OK**.

    The new stagger animation appears in the list in the **Stagger Animations** window.



15. Select and drag the stagger animation into the **Timeline** area for the text or group object in the **Scene Director**.

    The stagger animation appears in the timeline of the text or group object.



16. Select the **Play** button.

    The defined stagger animation starts playing in the default output.

To delete a keyframe:

- Right-click on a keyframe and select Delete from the shortcut menu.

To move a keyframe:

1. Select the keyframe you want to move.
2. To move the keyframe vertically, hold down the Ctrl key, and click and drag the keyframe up or down.

   OR

   To move the selected keyframe horizontally, hold down the **Ctrl** + **Shift** keys and click and drag the keyframe to the right or left.

To copy a stagger animation:

- Select the stagger animation and then press **Ctrl-C** and **Ctrl-V**.

  OR

- Right-click the stagger animation and use the **Copy** and **Paste** functions from the shortcut menu.

Widgets

XPression widgets are used to generate clocks, timers, and counters for scenes.

The following topics are discussed in this section:

Adding a Realtime Clock Display to a Scene

Customizing the Time Format of a Widget

Renaming a Widget

Adding a Timer Display to a Scene

Adding a Counter Display to a Scene

Customizing the Counter Format of a Widget

Adding a Text List to a Scene

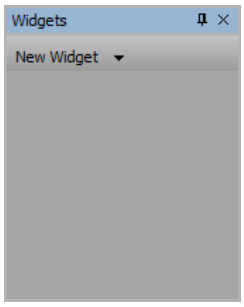
Adding a Realtime Clock Display to a Scene

Use this widget to use a clock to display a time of day.

To add a realtime clock display to a scene.

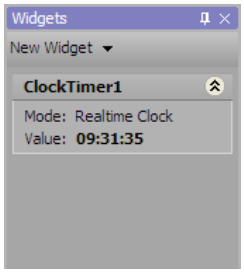
1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

   The **Widgets** window opens.



2. In the **Widgets** window, select **New Widget > Clock Timer**.

   A realtime clock widget is added to the **Widgets** window.

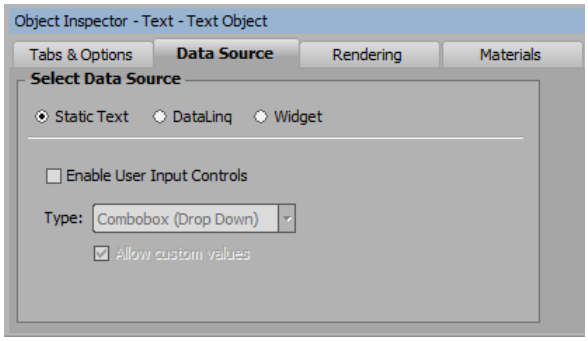


3. Add a text object to a scene.
4. In the **Object Manager**, select the text object for the realtime clock widget.



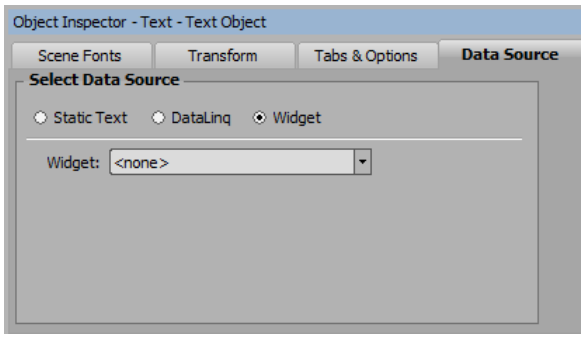
5. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



6. Select the **Widget** option.

   A **Widget** drop-down is displayed below the options.



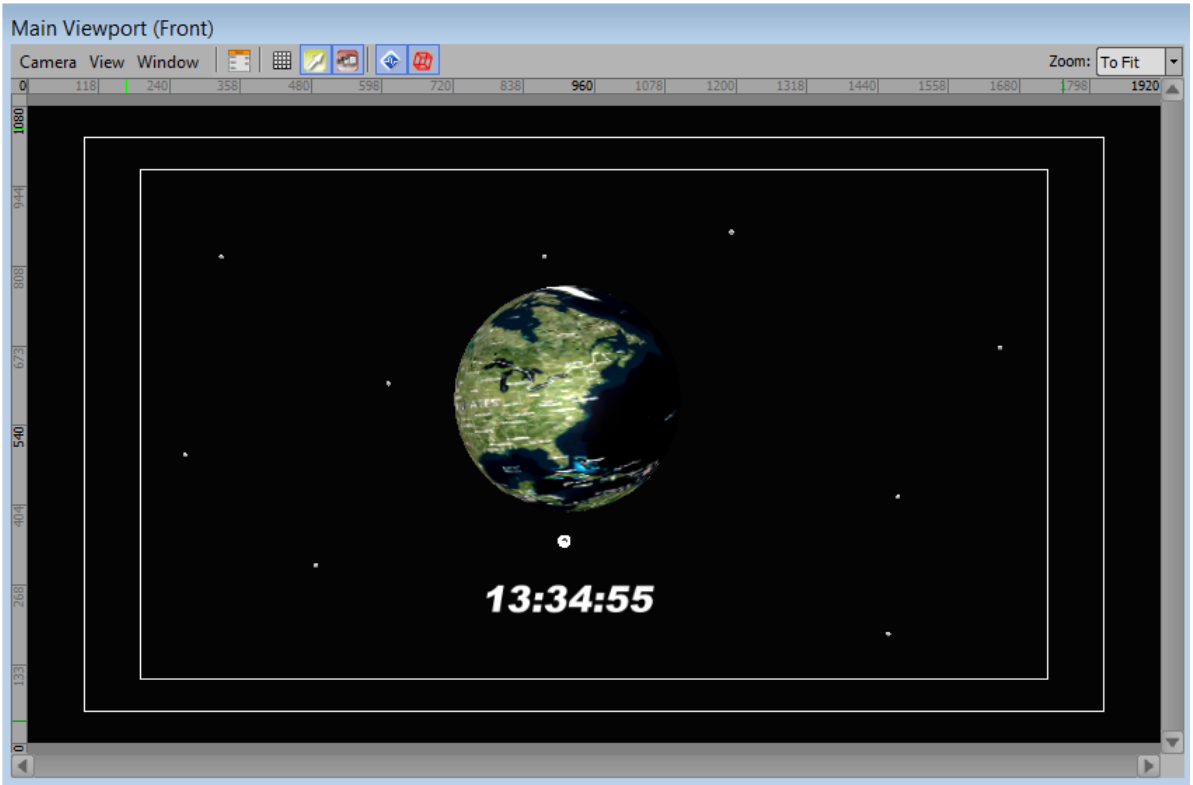
7. From the **Widget** drop-down, select a realtime clock widget.

   Since widget names can be modified, the names of realtime clock widgets vary between XPression systems.

   A **Warning** dialog opens asking if you want to clear the text object of its current content.

8. Select **Yes**.

   The text in the selected text object is replaced with the time of day generated by the selected realtime clock widget.



9. Double-click the scene containing the text object linked to the realtime clock widget.

   The selected scene is sent to the default output, and the clock in the linked text object starts running.

For More Information on...

- adding a text object to a scene, refer to Creating a Text Object.
- customizing the time displayed by a widget, refer to Customizing the Time Format of a Widget.
- configuring timecode sources, refer to Adding a Timecode Source.

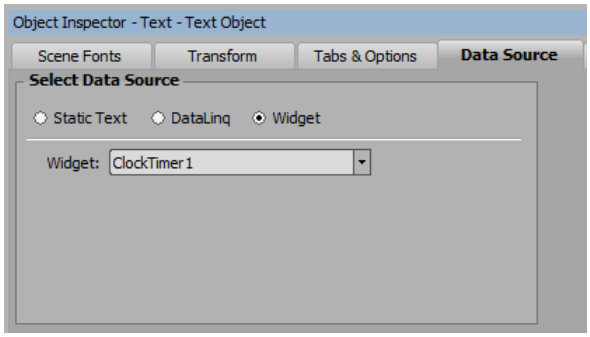
Customizing the Time Format of a Widget

You can customize the way the time is displayed in a **Realtime Clock** or **Timer** widget and offset the time from the current local time.

To customize the time format of a widget:

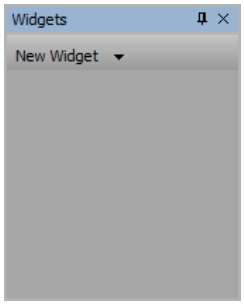
1. In a scene, select a text object that is associated with a realtime clock widget.
2. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



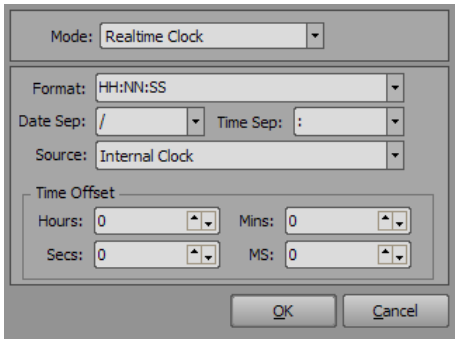
3. In the **Select Data Source** section, note the name of the widget associated with the selected text object.
4. From the main menu, select **Display > Widgets**.

   The **Widgets** window opens.



5. In the **Widgets** window, right-click the widget associated with the selected text object and from the shortcut menu, select Properties.

   The **Widget Properties** (Realtime Clock, Timer) dialog opens



6. From the **Format** drop-down, select or type the time format in which to display the current time and/or date.

   The options are:

   - **HH:NN** — 16:35
   - **HH:NN:SS** — 16:35:40
   - **HH:NN:SS.ZZZ** — 16:35:40.765
   - **HH:NN AM/PM** — 04:35 PM
   - **HH:NN:SS AM/PM** — 04:35:40 PM
   - **HH:NN:SS.ZZZ AM/PM** — 04:35:40.765 PM
   - **DD-MM-YY** — 27-11-09
   - **DD-MM-YY HH:NN** — 27-11-09 16:35
   - **DD-MM-YY HH:NN:SS** — 27-11-09 16:35:40
   - **DD/MM/YY** — 11/27/09
   - **DD/MM/YY HH:NN** — 11/27/09 16:35
   - **DD/MM/YY HH:NN:SS** — 11/27/09 16:35:40

   The characters used to separate the date and time strings can be changed for each time format.

7. From the **Date Sep** drop-down, select the character displayed between the elements of a date string.
8. From the **Time Sep** drop-down, select the character displayed between the elements of a time string.
9. From the **Source** drop-down, select the timecode source for the realtime clock widget.

   This menu is populated with the internal clock of the XPression system and the timecode sources that have been configured in the **Timecode Sources** tab of the **Hardware Setup** dialog.

10. In the **Time Offset** section, in the **Hours** field, enter or select the number of hours to offset the time displayed by a widget from the current local time.
11. In the **Mins** field, enter or select the number of minutes to offset the time displayed by a widget from the current local time.
12. In the **Secs** field, enter or select the number of seconds to offset the time displayed by a widget from the current local time.
13. In the **MS** field, enter or select the number of milliseconds to offset the time displayed by a widget from the current local time.
14. Select **OK**.

    The new settings are saved, and the **Widget Properties** dialog closes.

15. Double-click the scene containing the text object linked to the realtime clock widget.

    The selected scene is sent to the default output, and the customized clock in the liked text object starts running.

For More Information on...

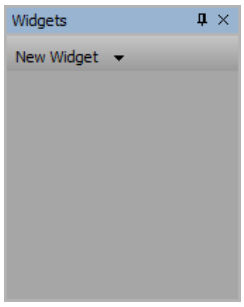
- configuring timecode sources, refer to Adding a Timecode Source.

Renaming a Widget

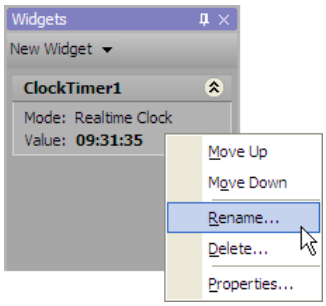
To rename a widget:

1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

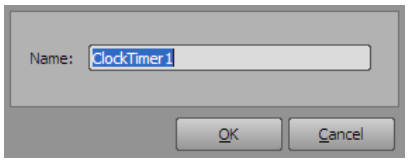
   The **Widgets** window opens.



2. In the **Widgets** window, right-click the widget and from the shortcut menu, select **Rename**.



   The **Rename Widget** dialog opens.



3. In the **Name** field, enter a new name for the selected widget.
4. Select **OK**.

   The selected widget is updated with the new name.

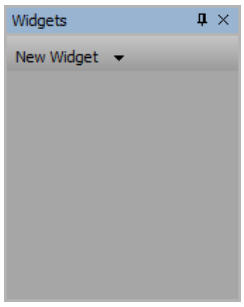
Adding a Timer Display to a Scene

Use this widget to add a timer to count time up or down.

To configure the timer format:

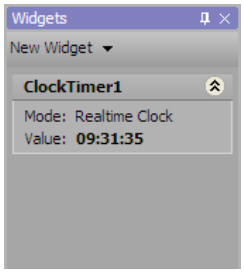
1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

   The **Widgets** window opens.

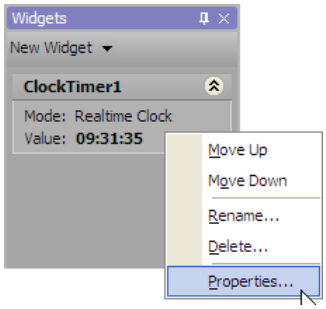


2. In the **Widgets** window, select **New Widget > Clock Timer**.

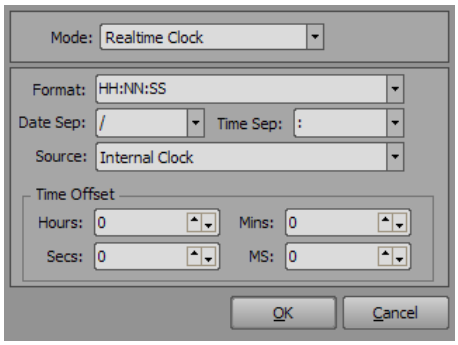
   A clock timer widget is added to the Widgets window.



3. In the **Widgets** window, right-click the widget associated with the selected text object and from the shortcut menu, select **Properties**.

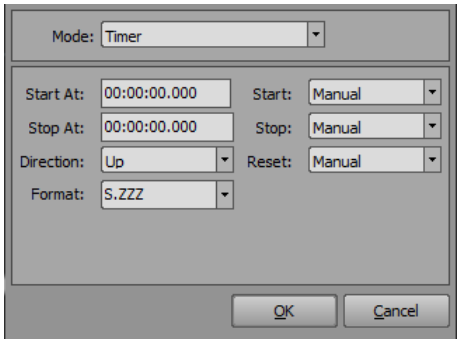


4. The **Widget Properties (Realtime Clock, Timer)** dialog opens



5. From the **Mode** drop-down, select **Timer**.

   The **Widget Properties** dialog displays the settings for a timer.



6. In the **Start At** field, enter the hours, minutes, seconds, and hundredths of seconds of the time at which to start the timer.
7. In the **Stop At** field, enter the hours, minutes, seconds, and hundredths of seconds of the time at which to stop the timer.
8. From the **Direction** drop-down, select the timer direction.

   The options are:

   Up — increase the time value from the time set in the **Start At** field until the timer is stopped.

   Down — decrease the time value from the time set in the **Start At** field until the timer is stopped.
9. From the **Format** list, select or type the time format used by the widget to display the current time value.

   The options are:

   - **S** — 16545
   - **SSS** — 16545
   - **S.ZZZ** — 16545.765
   - **SSS.ZZZ** — 16545.765
   - **HH:NN** — 04:35
   - **HH:NN:SS** — 04:35:40
   - **HH:NN:SS.ZZZ** — 04:35:40.765
   - **NN:SS** — 35:40
   - **NN:SS.ZZZ** — 35:40.765

To configure the start, stop and reset methods:

1. From the **Start** drop-down, select the method used to start the timer.

   The options are:

   - **Manual** — in the **Widget** window, select the **Start** button associated with the timer widget to start the timer.
   - **When Online** — start the timer when the scene goes online.
   - **Ctrl + 1** — press the **Ctrl** and **1** key at the same time to start the timer.
   - **Ctrl + 2** — press the **Ctrl** and **2** key at the same time to start the timer.
   - **Ctrl + 3** — press the **Ctrl** and **3** key at the same time to start the timer.
   - **Ctrl + 4** — press the **Ctrl** and **4** key at the same time to start the timer.
   - **Ctrl + 5** — press the **Ctrl** and **5** key at the same time to start the timer.
   - **Ctrl + 6** — press the **Ctrl** and **6** key at the same time to start the timer.
   - **Ctrl + 7** — press the **Ctrl** and **7** key at the same time to start the timer.
   - **Ctrl + 8** — press the **Ctrl** and **8** key at the same time to start the timer
   - **Ctrl + 9** — press the **Ctrl** and **9** key at the same time to start the timer.

2. From the **Stop** drop-down, select the method used to stop the timer.

   The options are:

   - **Manual** — in the **Widget** window, select the **Stop** button associated with the timer widget to stop the timer.
   - **When Online** — start the timer when the scene goes online.
   - **Ctrl + 1** — press the **Ctrl** and **1** key at the same time to start the timer.
   - **Ctrl + 2** — press the **Ctrl** and **2** key at the same time to start the timer.
   - **Ctrl + 3** — press the **Ctrl** and **3** key at the same time to start the timer.
   - **Ctrl + 4** — press the **Ctrl** and **4** key at the same time to start the timer.
   - **Ctrl + 5** — press the **Ctrl** and **5** key at the same time to start the timer.
   - **Ctrl + 6** — press the **Ctrl** and **6** key at the same time to start the timer.
   - **Ctrl + 7** — press the **Ctrl** and **7** key at the same time to start the timer.
   - **Ctrl + 8** — press the **Ctrl** and **8** key at the same time to start the timer.
   - **Ctrl + 9** — press the **Ctrl** and **9** key at the same time to start the timer.

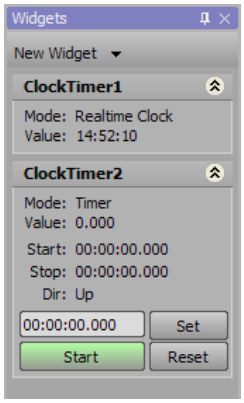
3. From the **Reset** drop-down, select the method used to reset the timer.

   The options are:

   - **Manual** — in the **Widget** window, select the **Reset** button associated with the timer widget to reset the timer to the start time set for the timer widget.
   - **When Online** — reset the timer when the scene goes online.
   - **When Offline** — reset the timer when the scene goes offline.
   - **Ctrl + 1** — press the **Ctrl** and **1** key at the same time to reset the timer.
   - **Ctrl + 2** — press the **Ctrl** and **2** key at the same time to reset the timer.
   - **Ctrl + 3** — press the **Ctrl** and **3** key at the same time to reset the timer.
   - **Ctrl + 4** — press the **Ctrl** and **4** key at the same time to reset the timer.
   - **Ctrl + 5** — press the **Ctrl** and **5** key at the same time to reset the timer.
   - **Ctrl + 6** — press the **Ctrl** and **6** key at the same time to reset the timer.
   - **Ctrl + 7** — press the **Ctrl** and **7** key at the same time to reset the timer.
   - **Ctrl + 8** — press the **Ctrl** and **8** key at the same time to reset the timer.
   - **Ctrl + 9** — press the **Ctrl** and **9** key at the same time to reset the timer.

4. Select **OK**.

   The new settings are saved, and the updated widget is displayed in the **Widget** window.

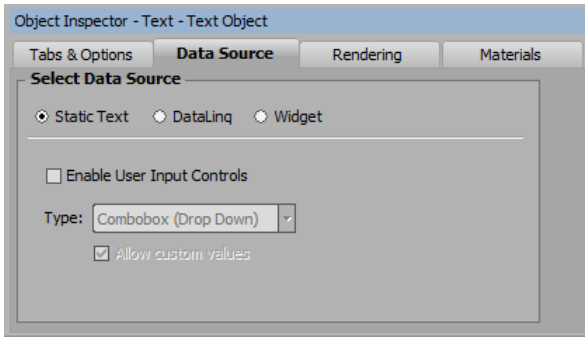


To add a timer to the scene:

1. Add a text object to a scene.
2. In the **Object Manager**, select the text object for the clock timer widget.



3. In the **Object Inspector**, select the **Data Source** tab.
4. The **Data Source** tab opens.



5. Select the **Widget** option.

   A **Widget** drop-down is displayed below the options.
6. From the **Widget** drop-down, select a timer widget.

   Since widget names can be modified, the names of timer widgets vary between XPression systems.

   A **Warning** dialog opens asking if you want to clear the text object of its current content.
7. Select **Yes**.

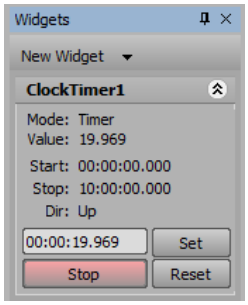
   The text in the selected text object is replaced with a time generated by the selected timer widget.
8. Double-click the scene containing the text object linked to the timer widget.

   The selected scene is sent to the default output, and the linked text object displays the timer.
9. Use the configured start method to start the timer.

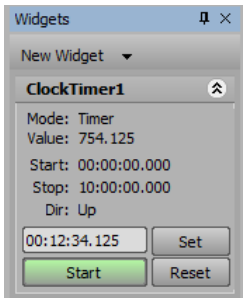
To edit the timer widget manually:

1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

   The **Widgets** window opens, showing the timer running.



2. Select **Stop** to stop the timer.
3. Enter a value in the time field and then select **Set**.



4. Select **Start** to restart the timer.

For More Information on...

- adding a text object to a scene, refer to Creating a Text Object.

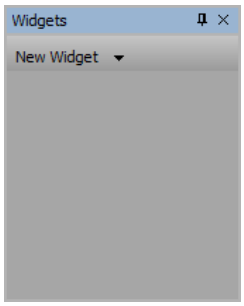
Adding a Counter Display to a Scene

Use this widget to display stats such as game scores, periods/quarters/innings, etc.

To add a counter display to a scene:

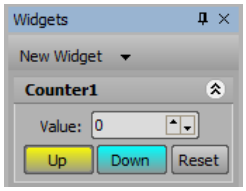
1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

   The **Widgets** window opens.



2. In the **Widgets** window, select **New Widget > Counter**.

   A counter widget is added to the **Widgets** window.

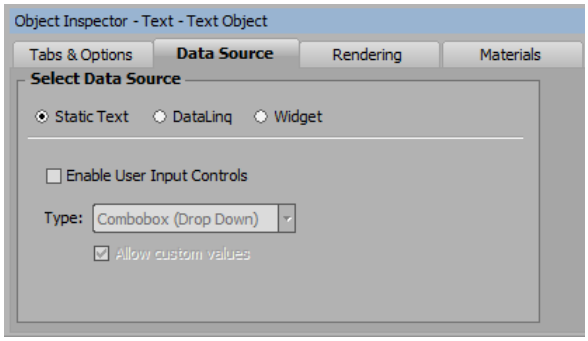


3. In the **Value** field, enter or select the number at which to start the counter.
4. Add a text object to a scene.
5. In the **Object Manager**, select the text object for the counter widget.



6. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



7. Select the **Widget** option.

   A **Widget** drop-down is displayed below the options.

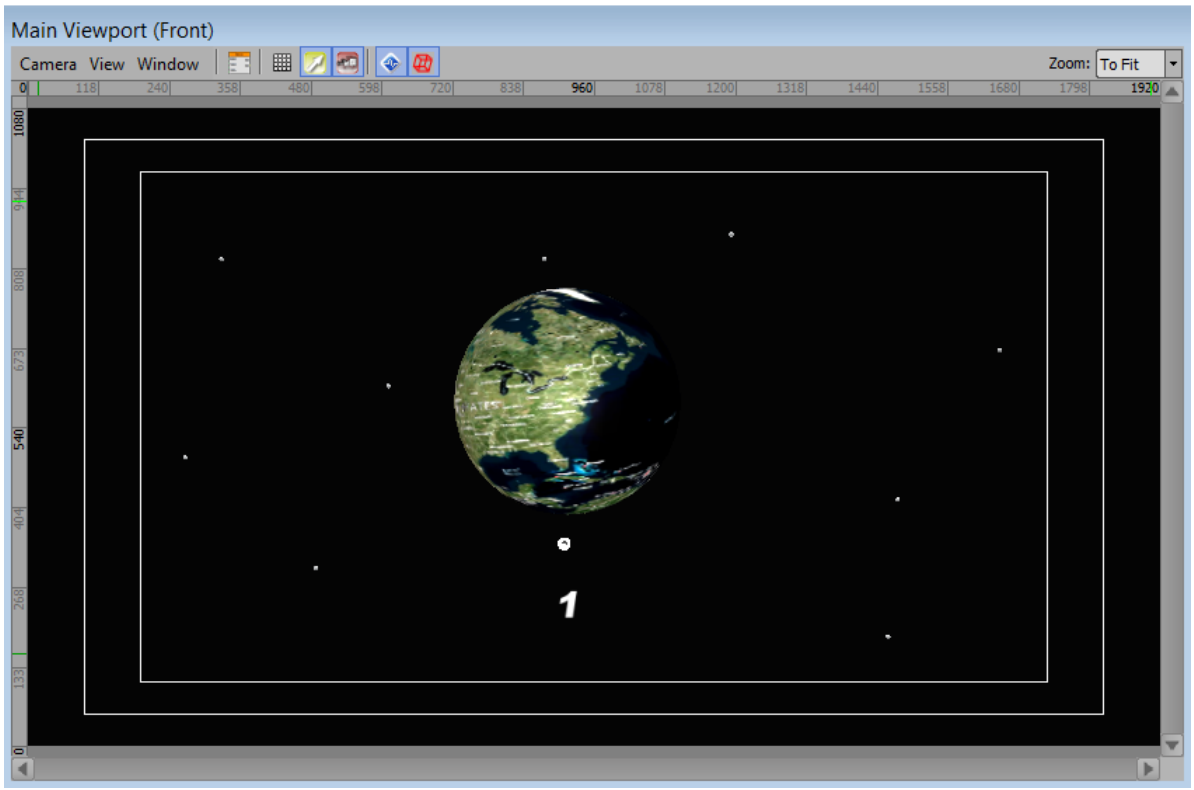
8. From the **Widget** drop-down, select a counter widget.

   Since widget names can be modified, the names of counter widgets vary between XPression systems.

   A **Warning** dialog opens asking if you want to clear the text object of its current content.

9. Select **Yes**.

   The text in the selected text object is replaced with the starting number set for the counter.



10. Double-click the scene containing the text object linked to the counter widget.

    The selected scene is sent to the default output, and the linked text object displays the counter starting number.

To manually adjust the counter:

1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

   The **Widgets** window opens.
2. In the **Widgets** window, in the **Counter** widget, select the **Up** button to increase the counter value.
3. To decrease the counter value, select the **Down** button.

For More Information...

- adding a text object to a scene, refer to Creating a Text Object.
- customizing the counter displayed by a widget, refer to Customizing the Time Format of a Widget.

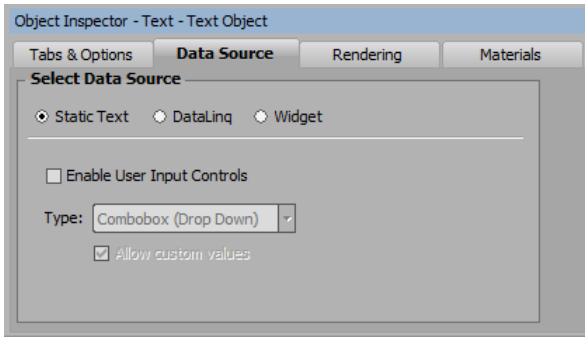
Customizing the Counter Format of a Widget

Once the counter widget has been added to a scene, you can change the formatting of the counter as necessary.

To access the counter widget properties:

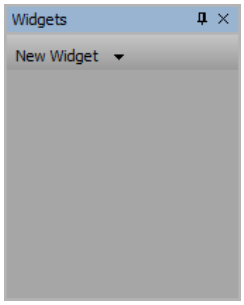
1. In a scene, select a text object that is associated with a counter widget.
2. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.

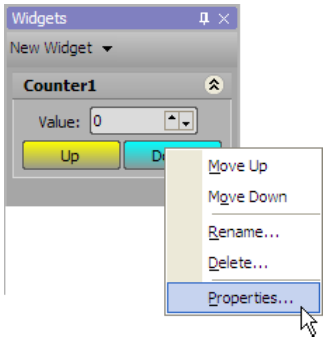


3. In the **Select Data Source** section, note the name of the widget associated with the selected text object.
4. From the main menu, select **Display > Widgets**.

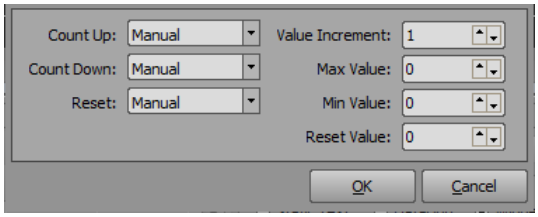
   The **Widgets** window opens.



5. In the **Widgets** window, right-click the widget associated with the selected text object and from the shortcut menu, select **Properties**.



The **Widget Properties (Counter)** dialog opens.



6. Continue with changing the properties of a counter widget.

To change the properties of a counter widget:

1. From the **Count Up** drop-down, select the method used to increase the counter value.

   The options are:

   Manual — in the **Widgets** window, select the **Up** button associated with the counter widget to increase the counter value.

   When Online — increase the counter value when the scene goes online.

   Ctrl + 1 — press the **Ctrl** and **1** key at the same time to increase the counter value.

   Ctrl + 2 — press the **Ctrl** and **2** key at the same time to increase the counter value.

   Ctrl + 3 — press the **Ctrl** and **3** key at the same time to increase the counter value.

   Ctrl + 4 — press the **Ctrl** and **4** key at the same time to increase the counter value.

   Ctrl + 5 — press the **Ctrl** and **5** key at the same time to increase the counter value.

   Ctrl + 6 — press the **Ctrl** and **6** key at the same time to increase the counter value.

   Ctrl + 7 — press the **Ctrl** and **7** key at the same time to increase the counter value.

   Ctrl + 8 — press the **Ctrl** and **8** key at the same time to increase the counter value.

   Ctrl + 9 — press the **Ctrl** and **9** key at the same time to increase the counter value.

2. From the **Count Down** drop-down, select the method used to decrease the counter value.

   The options are:

   Manual — in the **Widgets** window, select the **Down** button associated with the counter widget to decrease the counter value.

   When Online — decrease the counter value when the scene goes online.

   Ctrl + 1 — press the **Ctrl** and **1** key at the same time to decrease the counter value.

   Ctrl + 2 — press the **Ctrl** and **2** key at the same time to decrease the counter value.

   Ctrl + 3 — press the **Ctrl** and **3** key at the same time to decrease the counter value.

   Ctrl + 4 — press the **Ctrl** and **4** key at the same time to decrease the counter value.

   Ctrl + 5 — press the **Ctrl** and **5** key at the same time to decrease the counter value.

   Ctrl + 6 — press the **Ctrl** and **6** key at the same time to decrease the counter value.

   Ctrl + 7 — press the **Ctrl** and **7** key at the same time to decrease the counter value.

   Ctrl + 8 — press the **Ctrl** and **8** key at the same time to decrease the counter value.

   Ctrl + 9 — press the **Ctrl** and **9** key at the same time to decrease the counter value.

3. From the **Reset** drop-down, select the method used to reset the counter.

   The options are:

   Manual — in the **Widget** window, select the **Reset** button associated with the counter widget to reset the counter to the set starting value.

   When Online — reset the counter when the scene goes online.

   When Offline — reset the counter when the scene goes offline.

   Ctrl + 1 — press the **Ctrl** and **1** key at the same time to reset the counter.

   Ctrl + 2 — press the **Ctrl** and **2** key at the same time to reset the counter.

   Ctrl + 3 — press the **Ctrl** and **3** key at the same time to reset the counter.

   Ctrl + 4 — press the **Ctrl** and **4** key at the same time to reset the counter.

   Ctrl + 5 — press the **Ctrl** and **5** key at the same time to reset the counter.

   Ctrl + 6 — press the **Ctrl** and **6** key at the same time to reset the counter.

   Ctrl + 7 — press the **Ctrl** and **7** key at the same time to reset the counter.

   Ctrl + 8 — press the **Ctrl** and **8** key at the same time to reset the counter.

   Ctrl + 9 — press the **Ctrl** and **9** key at the same time to reset the counter.

4. In the **Value Increment** field, enter or select the amount to change the counter value when the counter value is increased or decreased.
5. In the **Max Value** field, enter or select the number at which the counter stops increasing the counter value.
6. In the **Min Value** field, enter or select the number at which the counter stops decreasing the counter value.
7. Select **OK**.

   The new settings are saved, and the **Widget Properties** dialog closes.

8. Double-click the scene containing the text object linked to the counter widget.

   The selected scene is sent to the default output, and the linked text object displays the counter starting number.

9. Use the increment methods set in Steps 1 and 2 to change the counter value.

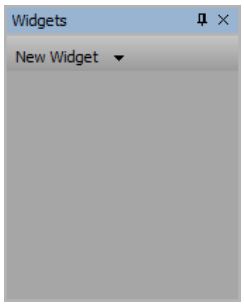
Adding a Text List to a Scene

Use this widget to display team names, player names, etc.

To add a text drop-down to a scene:

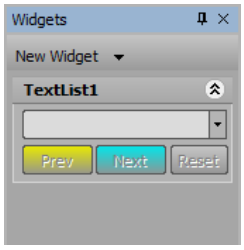
1. In the XPression **Layout** editor, from the main menu, select **Display > Widgets**.

   The **Widgets** window opens.

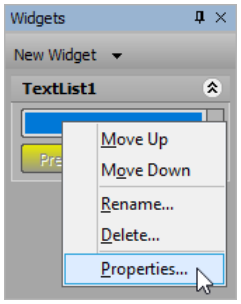


2. In the **Widgets** window, select **New Widget > Text List**.

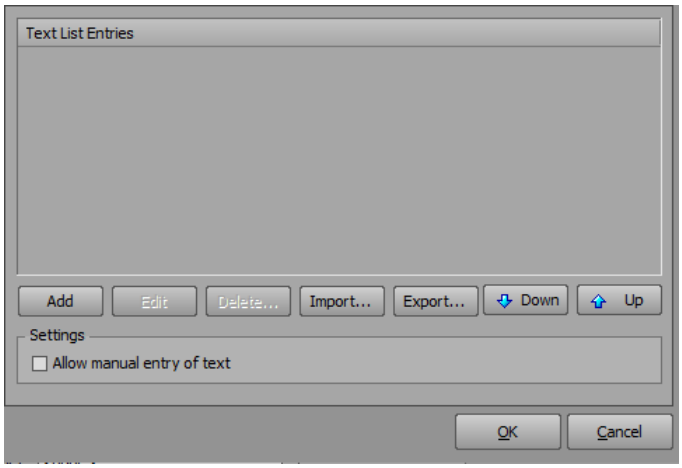
   A text list widget is added to the **Widgets** window.



3. Right-click inside the text list widget and from the shortcut menu, select **Properties**.

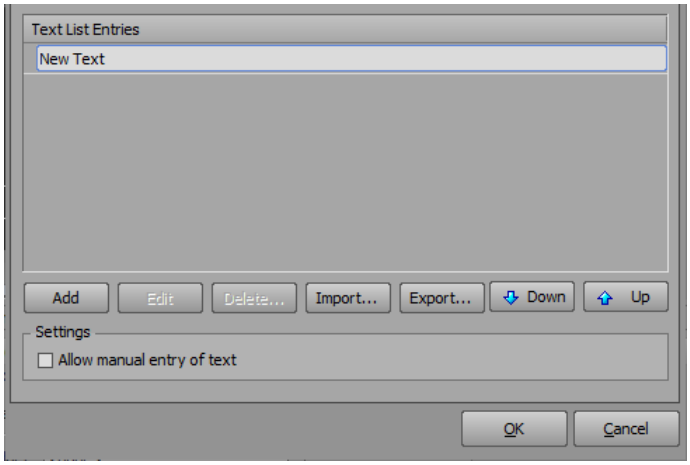


The **Widget Properties** (Text List) dialog opens.

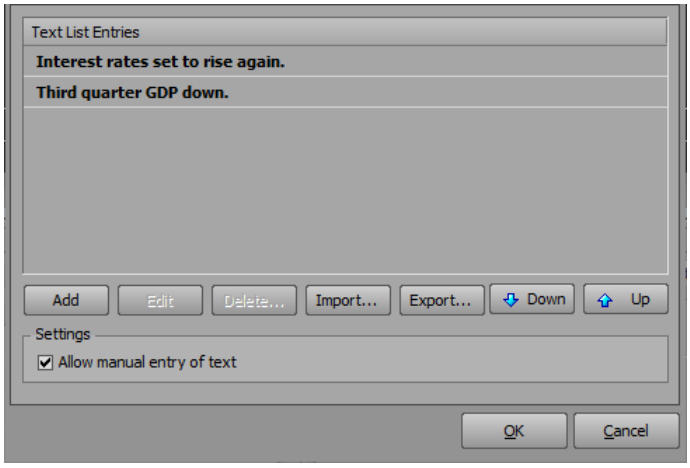


4. Select **Add**.

   A new text field is added to the **Text List Entries**.



5. Enter text for the new text item.



6. Repeat Steps 4 and 5 for additional text items as necessary.
7. Select the **Allow manual entry of text** checkbox to be able to enter text manually inside the text field of the Text List widget if necessary.

   You can also manually edit the text list in the **Take Inspector Template Data**. This allows for one-time error correction if any text entry in the widget list is incorrect before going to air.

8. **Text List** entries can also be imported from existing text list text files by selecting **Import** and selecting a file to import for the widget.

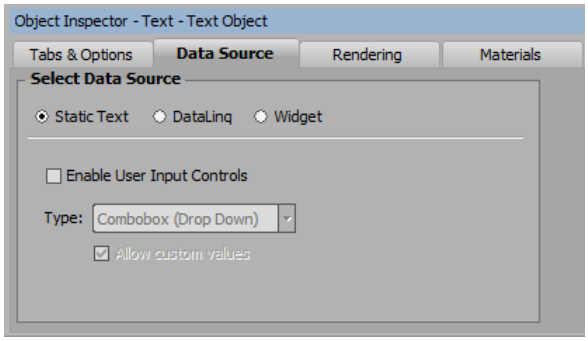
   The text list can also be exported as a text file by selecting **Export** and saving the file.

To add a text list to a scene:

1. In the **Object Manager**, select the text object for the text list widget.



2. In the **Object Inspector**, select the **Data Sources** tab.
3. The **Data Source** tab opens.



4. Select the **Widget** option.

   A **Widget** drop-down is displayed below the options.

5. From the **Widget** drop-down, select a text list widget.

   Since widget names can be modified, the names of text list widgets can vary.

   A **Warning** dialog opens asking if you want to clear the text object of its current content.

6. Select **Yes**.

   The text object displays the selected entry from the text list in the **Widgets** window.

7. In the **Widgets** window, use the list in the text list widget to select a different entry to display in the text object, or click inside the text field and manually type the text (if manual text entry has been enabled).

For More Information on...

- adding a text object to a scene, refer to Creating a Text Object.

Effects

XPression effects are used to add various post-effects to individual objects and entire scenes.

The following topics are discussed in this section:

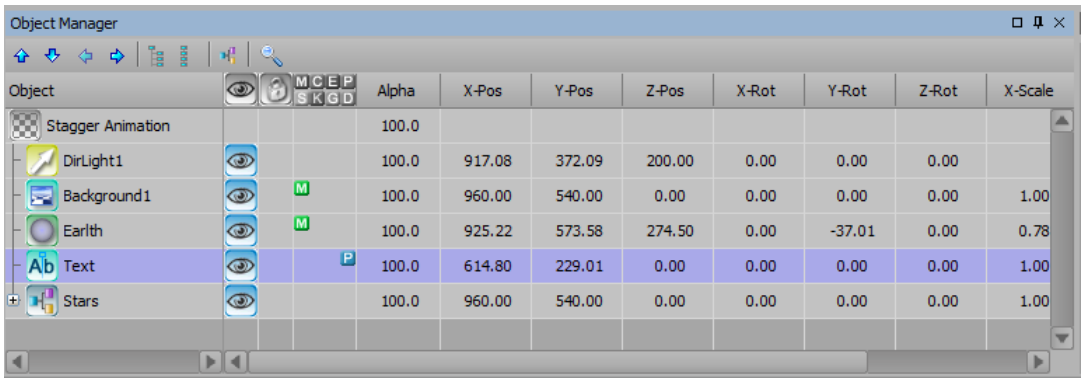
Adding an Effect or Transition to an Object or Scene

Adding an Effect or Transition to an Object or Scene

You can add an effect or transition to an object or scene in a couple of ways, using the **Object Inspector** or using the **Scene Director**.

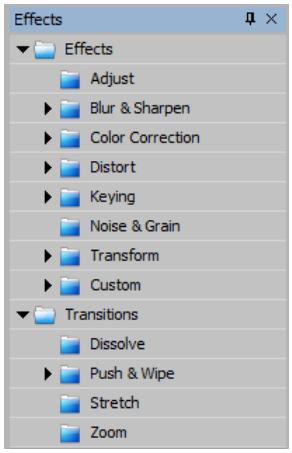
To add an effect or transition to an object or scene:

1. In XPression, create or select a scene.
2. In the **Object Manager**, select an object to which to apply the effect or transition.

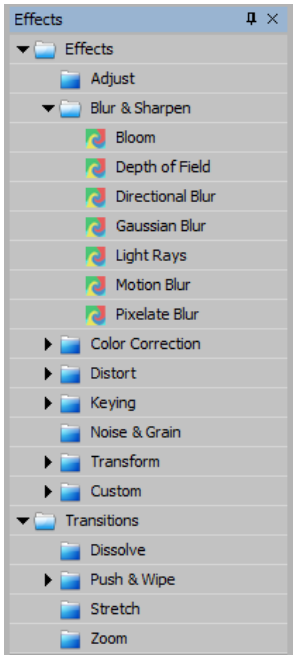


3. From the main menu, select **Display > Effects**.

   The **Effects** window opens.



4. In the **Effects** window, browse through the folders to select an effect or transition for the selected object.



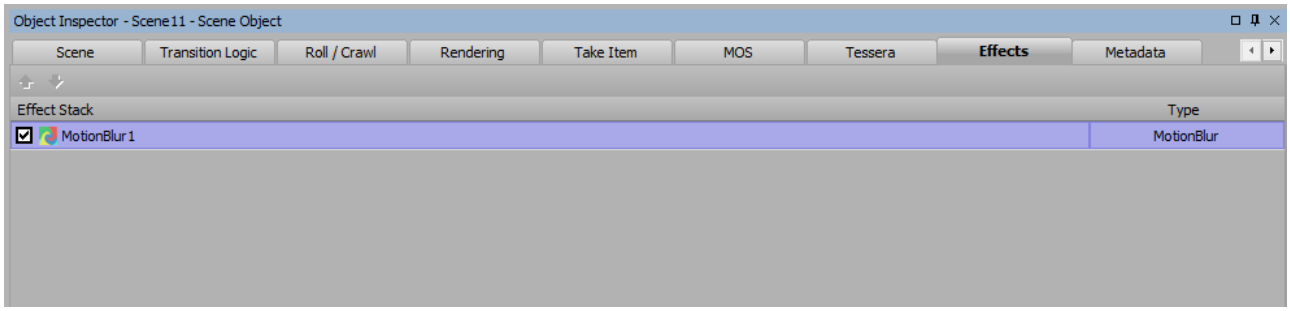
5. Add the effect or transition to the Object Inspector or add the effect to the Scene Director.

★Some effects can only be used for specific objects. For example, **Depth of Field** is only applicable to **Scene Objects**.

★Transitions can only be used in the **Scene Director**.

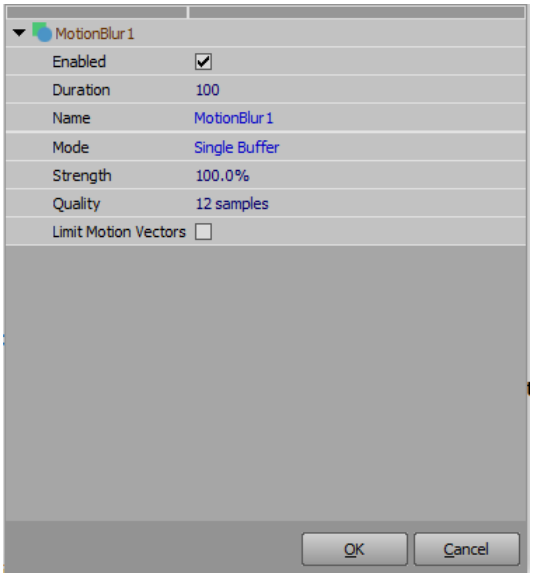
Object Inspector

1. Drag and drop the selected effect or transition into the **Effects** tab in the **Object Inspector**.



2. In the **Effects** tab list, double-click on the effect.

   The **Effect Properties** dialog opens.

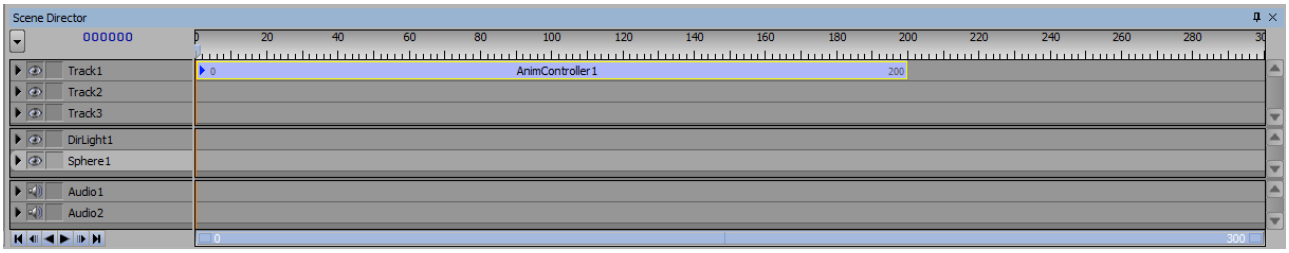


3. Use the **Effect Properties** dialog to configure the properties for the effect or transition.
4. Select **OK**.

Scene Director

1. From the main menu, select **Animation > Scene Director**.

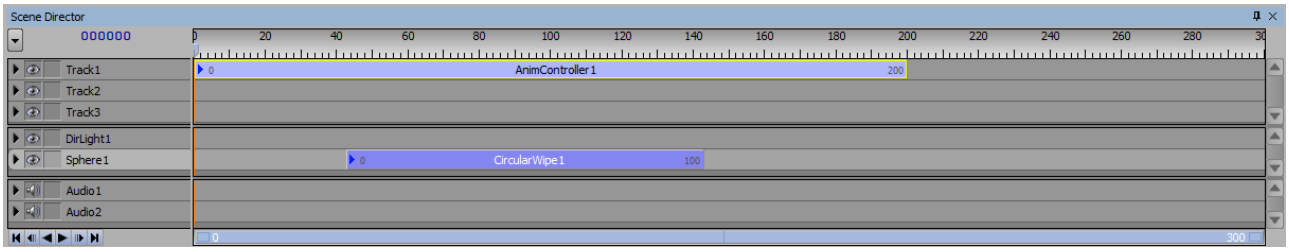
   The **Scene Director** window opens.



   ★Multiple scene directors can be added to a scene and managed using the **Scene Directors** window.

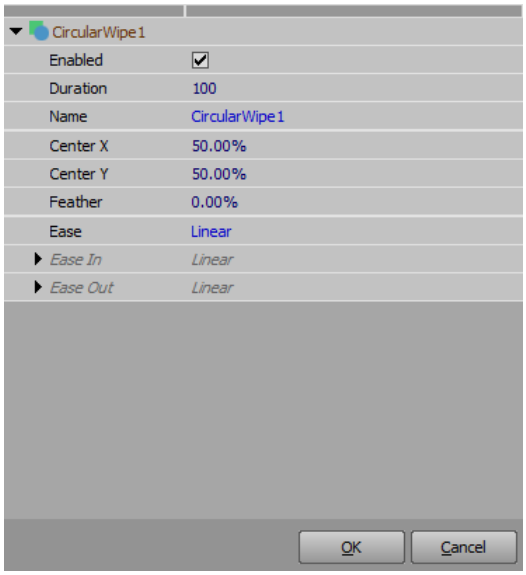
2. Drag and drop the selected effect or transition onto the object track in the **Scene Director**.

   A controller for the effect or transition is added to the object track.



3. In the controller for the effect or transition, double-click the object controller.

   The **Effect Properties** dialog opens.



4. Use the **Effect Properties** dialog to configure the properties for the effect or transition.
5. Select **OK**.

   The **Effect Properties** dialog closes.
6. Repeat steps 2 to 5 to add other effects or transitions to an object.

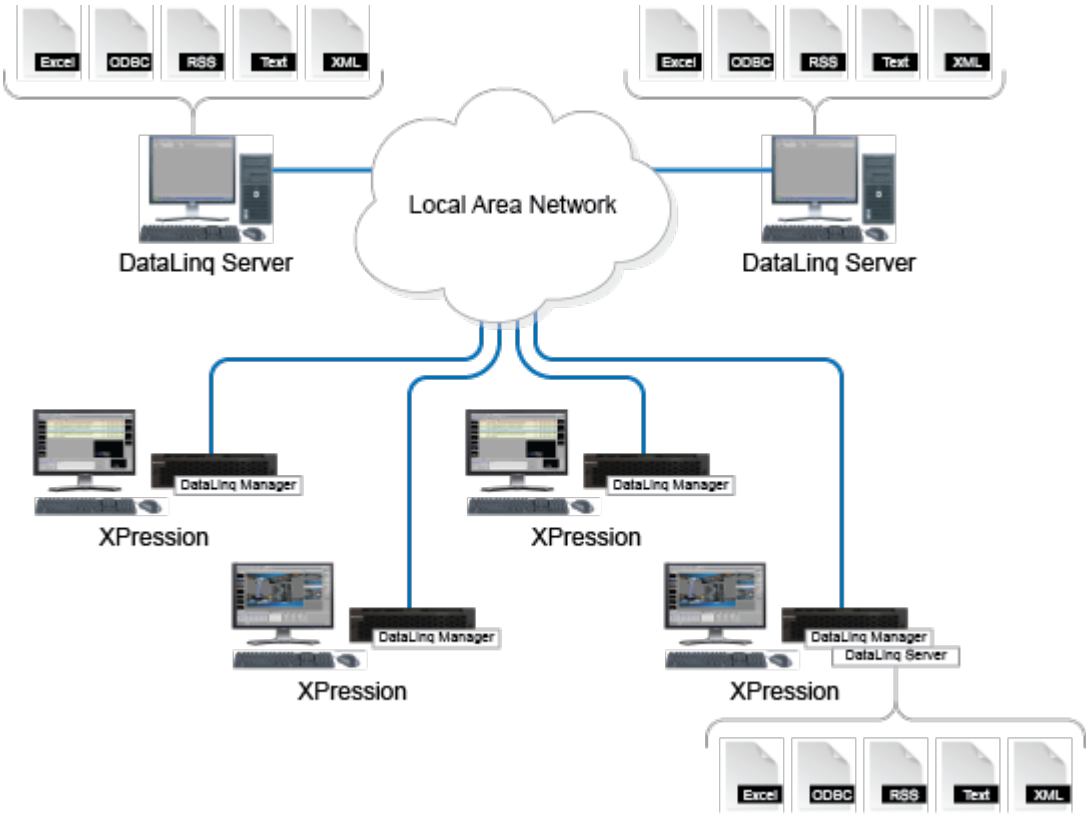
For More Information on...

- adding animations, refer to Animations.

DataLinq™

DataLinq enables live templates to be automatically filled with external data from XML files, RSS feeds, SMS servers, Text files, or any ODBC data source; like Access, MS SQL, Interbase, Firebird, or MySQL.

The XPression DataLinq Server software runs on either the XPression system itself, or on one or more other computer systems to gather data from external sources and make it available to XPression systems. XPression systems use the XPression DataLinq Manager to connect to one or more DataLinq Servers. The XPression DataLinq Manager enables objects in an XPression project to link to any of the external data sources gathered by the connected DataLinq Servers.



DataLinq Connections to External Data Sources

The following topics are discussed in this section:

Configuring an XPression DataLinq Server

Connecting XPression to an XPression DataLinq Server

Exporting and Loading DataLinq Files

Starting the XPression DataLinq Server

Configuring the Selected DataLinq Source

Linking Objects to a DataLinq Source

Using DataLinq Keys with an ADODB DataLinq

Using DataLinq Keys with an XML DataLinq

Using SQL Queries

Using a Macro with a DataLinq Key

Creating a Data Page

Using a Static URL

Using a Dynamic URL

Using URL Macros

Using Table Presets

Configuring an XPression DataLinq Server

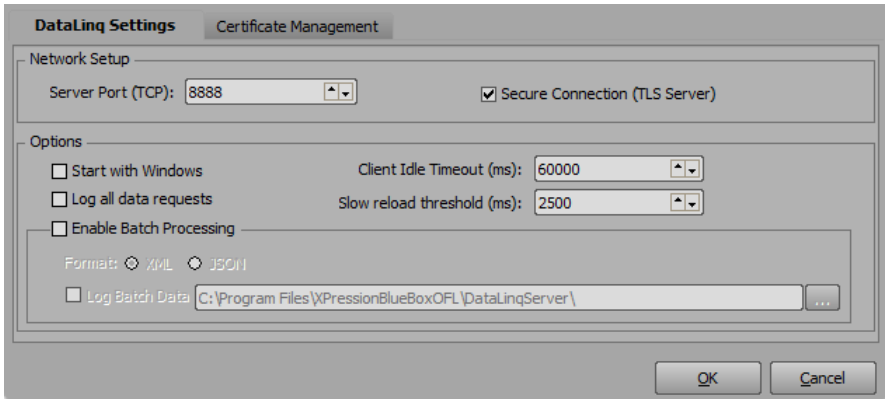
The XPression DataLinq Server enables users to easily access curated data outputs over TCP/IP. With batch processing, users can select specific fields from any configured data source and map them to a simplified output table. The field names can be customized based on the user's preferences, and the output can be formatted in either JSON or XML. This simplifies the process of accessing and integrating data for users requiring straightforward data output over TCP/IP.

XPression DataLinq operates as a server, with users connecting as clients.

To configure an XPression DataLinq Server:

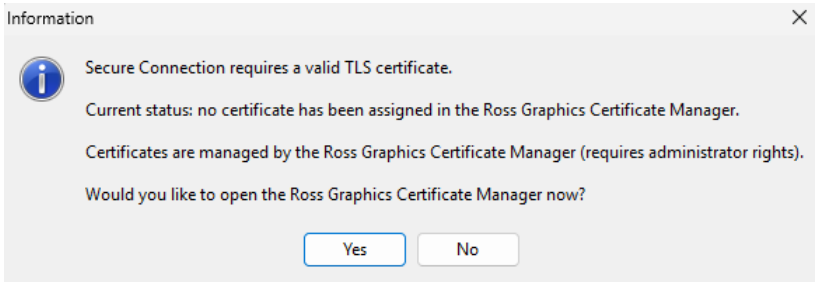
1. Launch the **XPression DataLinq Server**.
2. Select **File > Preferences**.

   The **XPression DataLinq Preferences** dialog opens.



3. In the **DataLinq Settings** tab, in the **Network Setup** section, in the **Server Port (TCP)** field, enter or select the port number on which a client will communicate with the XPression DataLinq Server.
4. Select **Secure Connection (TLS Server)** to encrypt the connection between the XPression DataLinq Server and the DataLinq clients.

   The **Secure Connection Information** dialog opens.



5. Select **Yes** to open the **Ross Graphics Certificate Manager** to assign a certificate to the XPression DataLinq Server (requires administrator rights). See Certificate Management for instructions on assigning a certificate.

   ★The DataLinq Server will not start if **Secure Connection** is enabled but no usable certificate is assigned. Enabling **Secure Connection** does not by itself secure the connection — a certificate must be assigned to the DataLinq Server using the Ross Graphics Certificate Manager.

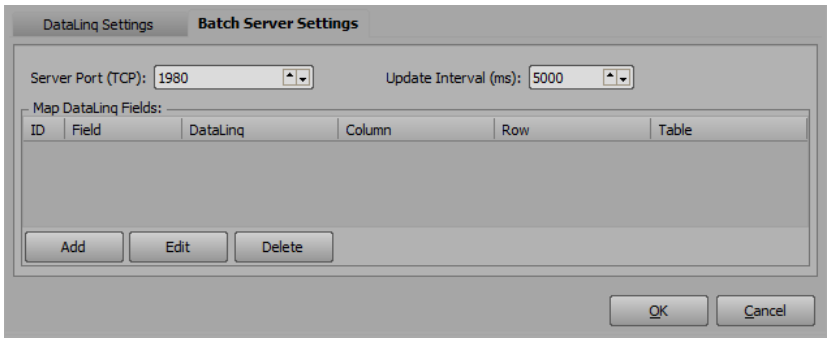
6. In the **Options** section, select from the following as needed:
   - **Start With Windows** — the XPression DataLinq Server will start when Windows starts.
   - **Log all data requests** — all data requests will be logged in the **XPression DataLinq Server** logs.

     The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.
   - **Client Idle Timeout (ms)** — increase the value when slow or remote data sources make clients appear idle; decrease the value to detect dead sockets
   - **Slow reload threshold (ms)** — adjust the value to define when data source reloads are considered slow; cached snapshots stay active until the reload completes.
   - **Enable Batch Processing** — when selected, additional settings become available and the Batch Server Settings tab is enabled.
7. In the **Enable Batch Processing** section, do the following:
   - Select the **Format** for batch processing, either **XML** or **JSON**.
   - Select the **Log Batch Data** checkbox and in the adjacent field, select the **Browse** button to browse to the folder where the batch data should be saved.

To configure the Batch Server Settings:

1. Select the **Batch Server Settings** tab.

   The **Batch Server Settings** tab opens.



2. In the **Server Port (TCP)** field, enter or select the port number on which the clients will connect.
3. In the **Update Interval (ms)** field, enter the time interval in milliseconds at which the batch data will be updated.

   The minimum update interval is 5000 ms, which is configurable.
4. In the **Map DataLinq Fields** section, select **Add**.

   The **Add DataLinq Field** dialog opens.



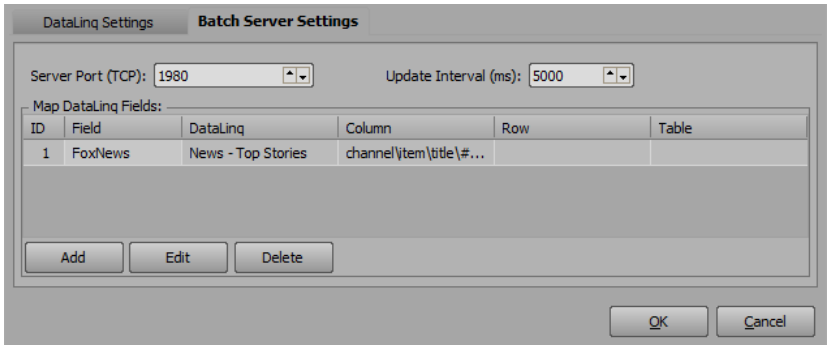
5. In the **Add DataLinq Field** dialog, from the **DataLinq** drop-down, select a DataLinq source.
6. In the **Field Name** field, enter a name that describes the data being sent (e.g., FoxNews).

7. Select the **Browse** button adjacent to the **Column**, **Row**, and **Table** fields and in the **Browse DataLinq** window, select the column, row, or table (if applicable) containing the data you want to process and select **OK**.

   The corresponding field(s) in the **Add DataLinq Field** dialog is populated with the data.

8. In the **Add DataLinq Field** dialog, select **OK** to save your selection and close the dialog.

   The **Batch Server Settings** tab is populated with the selected data.



9. Select **OK** to close the **XPression DataLinq Preferences** dialog.

Certificate Management

When **Secure Connection (TLS Server)** is selected in **File > Preferences > DataLinq Settings** and there is no certificate assigned to the DataLinq Server, you will be prompted to open the Ross Graphics Certificate Manager, where you will be able to assign a certificate to the DataLinq Server.

For issues with certificates see Appendix B: Troubleshooting Certificates

The following procedures are described in this topic:

Assigning a certificate

Replacing an expired certificate

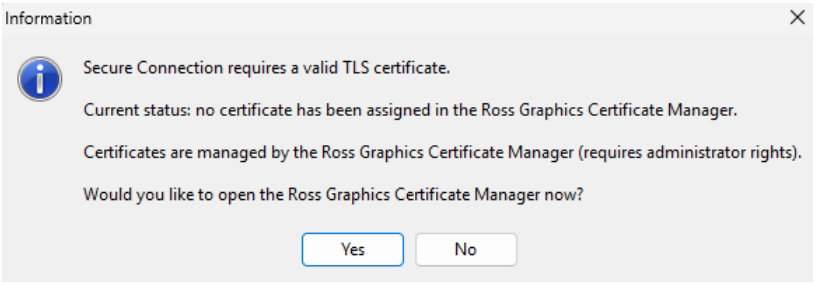
Adding a certificate to the Ross Graphics Certificate Manager

Viewing certificate details

To assign a certificate:

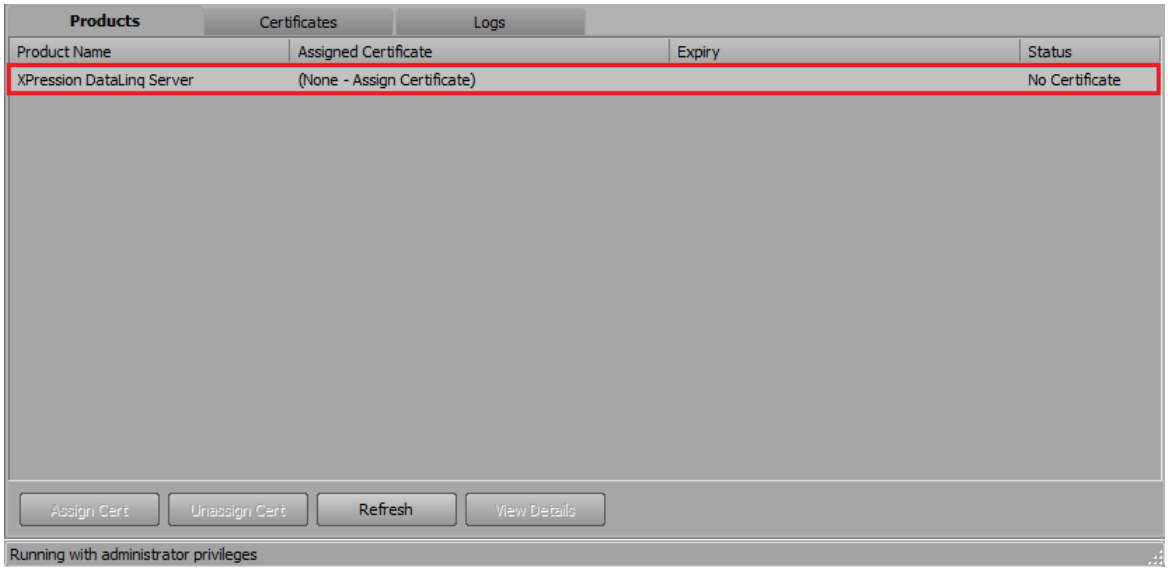
1. Select **Secure Connection (TLS Server)** to encrypt the connection between the XPression DataLinq Server and the DataLinq clients.

   The **Secure Connection Information** dialog opens.



2. Select **Yes**.

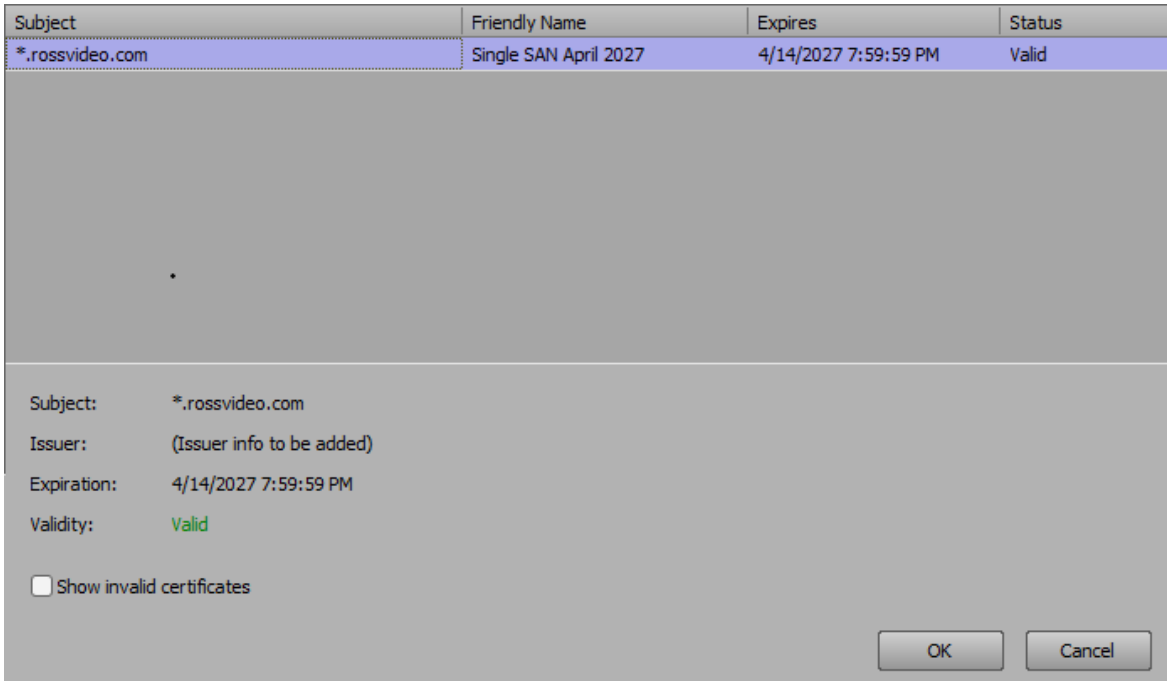
   The **Ross Graphics Certificate Manager** opens. The **Status** column will indicate that no certificate is assigned.



3. In the **Products** tab, select XPression DataLinq Server and then select **Assign Cert**.

The same certificate can be assigned to multiple products.

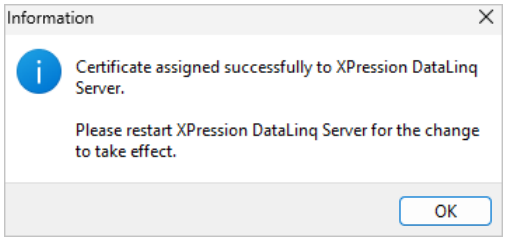
4. The **Select Certificate** dialog opens.



5. Select the certificate you want to assign to the XPression DataLinq Server, and then select **OK**.

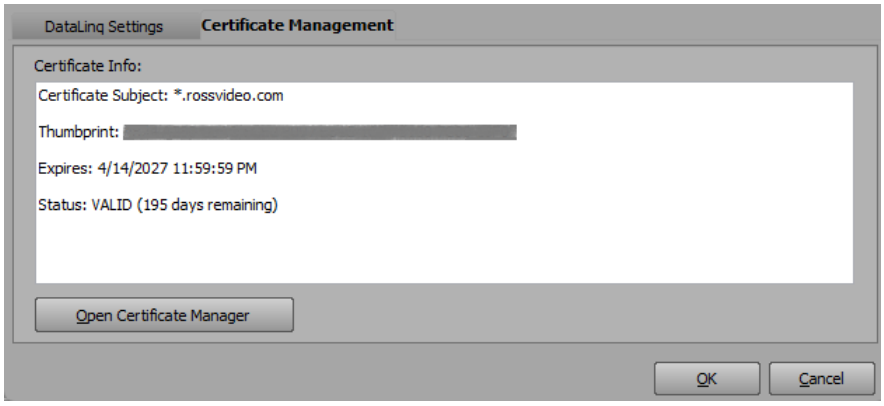
   If there are no certificates displayed, see To add a certificate to the Ross Graphics Certificate Manager.

   An **Information** dialog opens to indicate that the certificate was successfully assigned.



6. Select **OK**, and then shut down and relaunch the XPression DataLinq Server from the Windows **Start** menu.

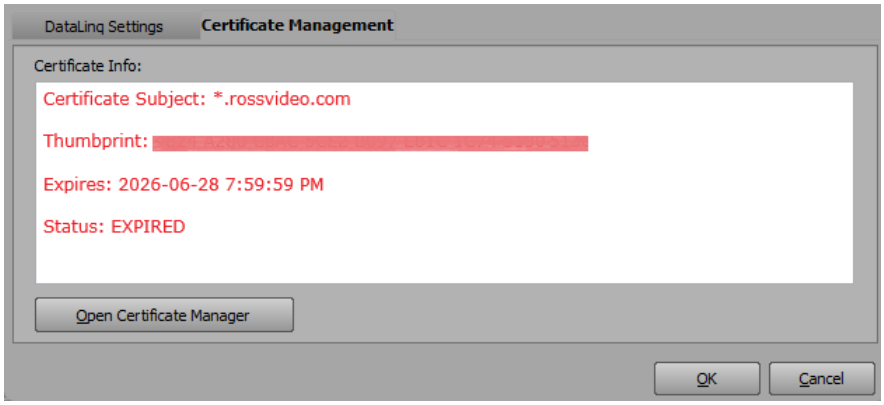
   When a certificate has been assigned to the XPression DataLinq Server, in the **Certificate Management** section, you will see the **Certificate Info** as shown in the image below:



To replace an expired certificate:

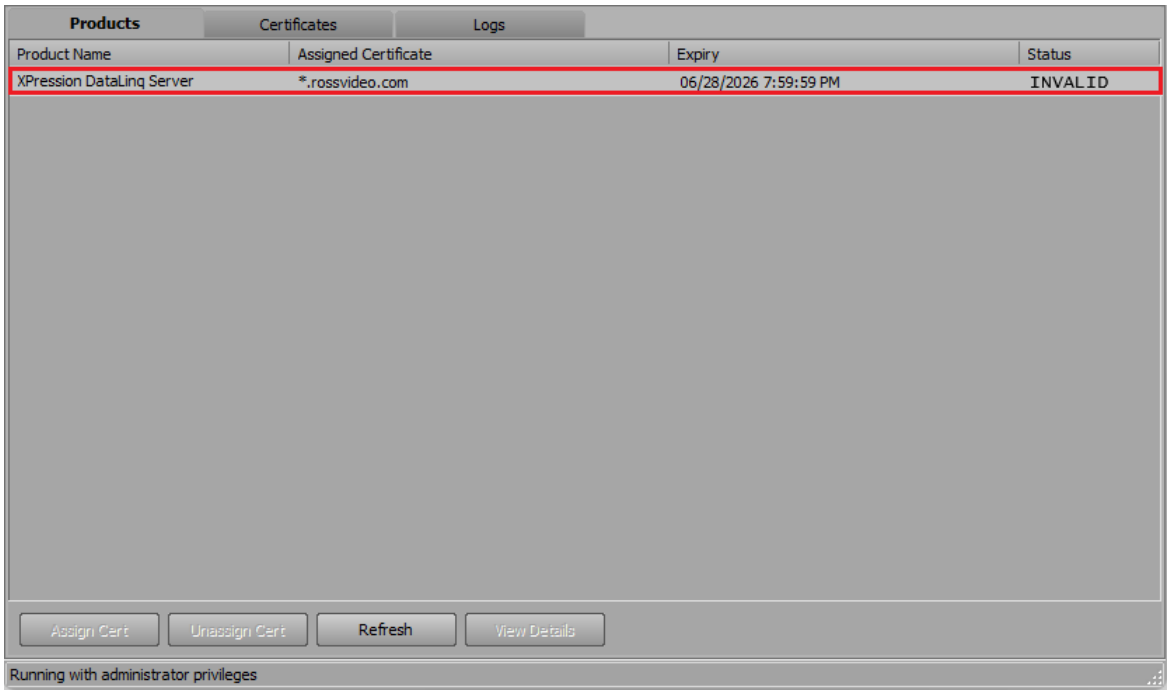
1. Select **Certificate Management**.

   The **Certificate Management** section opens in the main window. If the current certificate has expired, you will see the following info:



2. Select **Open Certificate Manager**.

   The **Ross Graphics Certificate Manager** opens. You will see that the XPression Gateway **Status** column indicates **INVALID**.



3. Select the XPression DataLinq Server and then select **Unassign Cert**.
4. In the **Confirmation** dialog, select **Yes**.
5. In the **Information** dialog, select **OK**, but do not restart the XPression DataLinq Server yet.
6. Select the XPression Gateway product again, and then select **Assign Cert**.
7. In the **Select Certificate** window, select the certificate you want to assign to the XPression Gateway and then select **OK**.

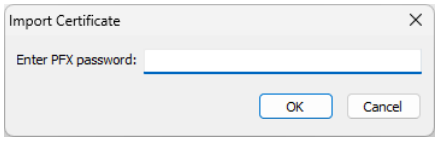
   If there are no certificates showing, see To add a certificate to the Ross Graphics Certificate Manager.

8. In the **Information** dialog that indicates the certificate has been successfully assigned, select **OK**.
9. Shut down and relaunch the XPression DataLinq Server from the Windows **Start** menu.

To add a certificate to the Ross Graphics Certificate Manager:

1. In the **Certificates** tab, select **Import PFX**, then navigate to and select the **.PFX** certificate file.

   Contact your IT department to get the location of the **.PFX** certificate file.
2. The **Import Certificate** dialog opens.



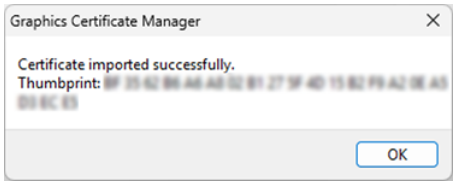
3. In the **Import Certificate** dialog, enter the **.PFX** password and select **OK**.

   Contact your IT department to get this password.
4. In the next dialog, enter a "friendly name" for the certificate.

   This is optional but will help you identify the certificate later, if necessary.



5. The **Graphics Certificate Manager** dialog opens indicating that the import was successful.

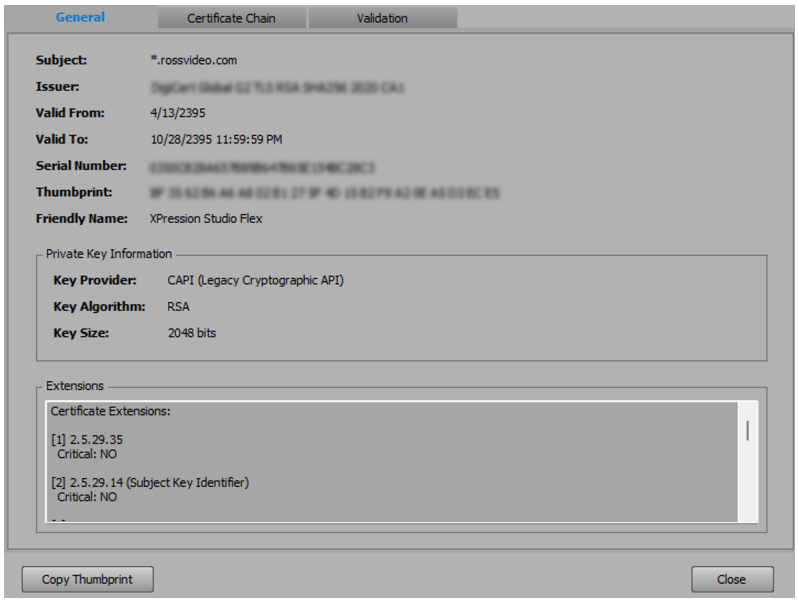


6. Select **OK** to close the dialog.

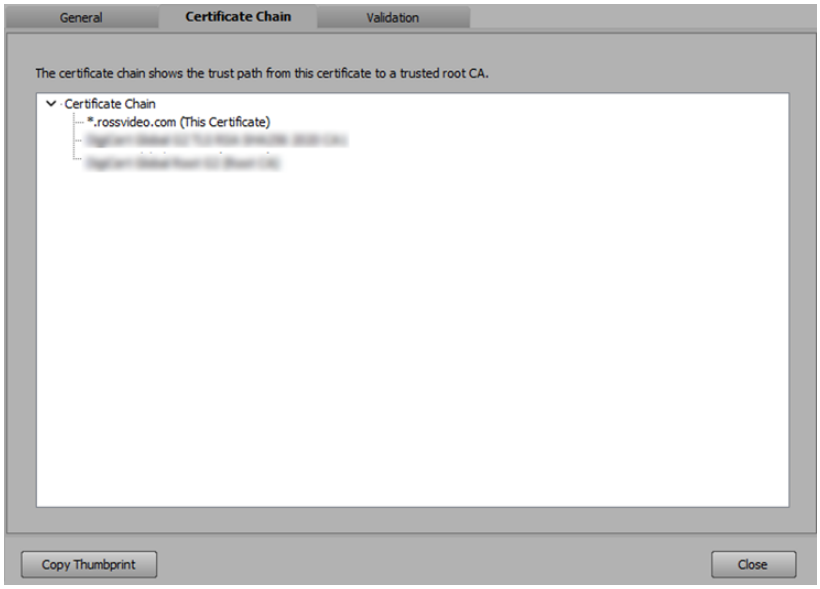
To view certificate details:

1. Select the **Certificates** tab.
2. Select a certificate and either double-click it or select the **View Details** button.

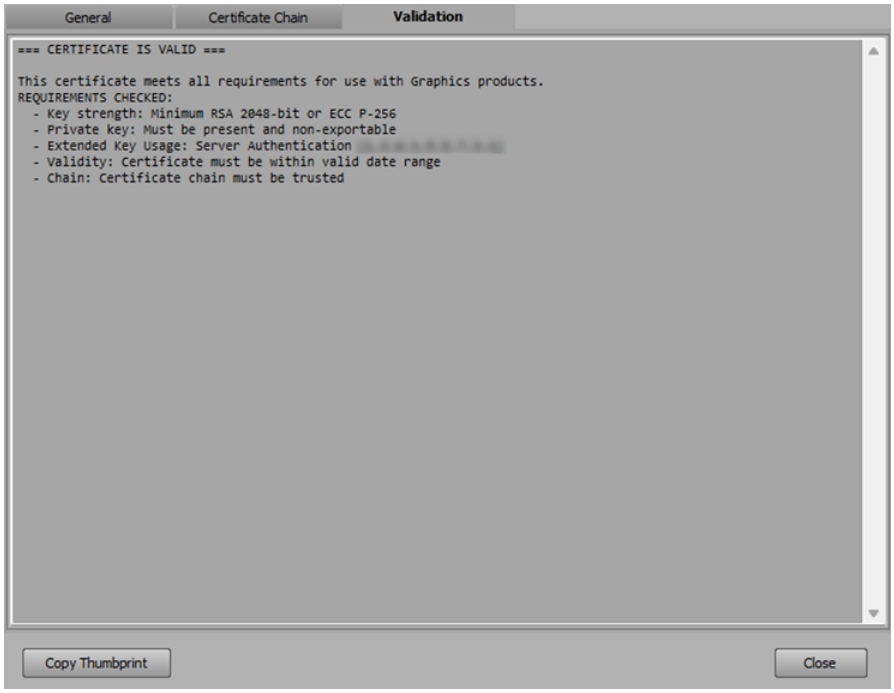
   The **Certificate Details** window opens on the **General** tab.



3. Select **Copy Thumbprint** to configure a non-XPression application to use the certificate or if you need to search for the thumbprint in a log file.
4. Select the **Certificate Chain** tab to view the trust path from the certificate to a trusted root CA.



5. Select the **Validation** tab to view the requirements that have been met by the certificate.



6. Select **Close** to exit the **Certificate Details**.

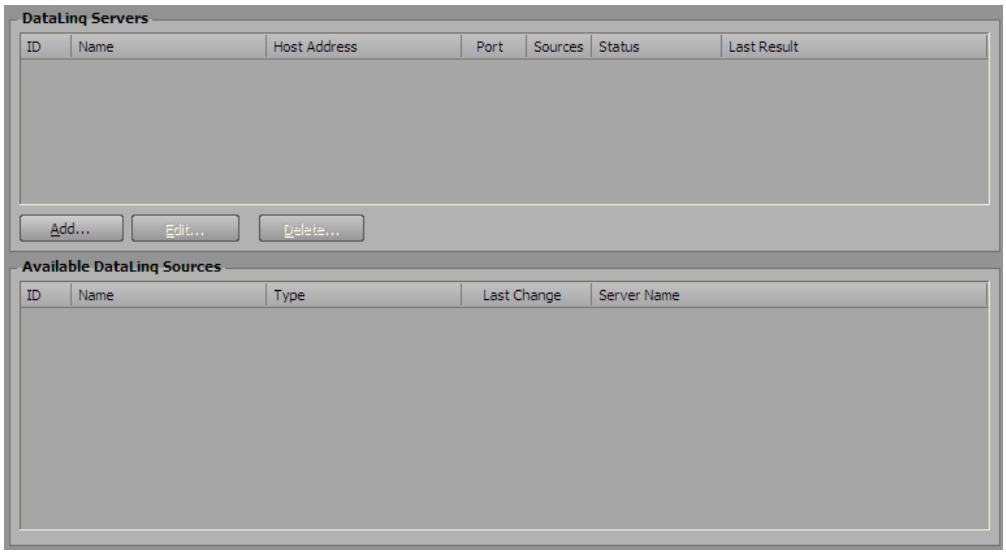
Connecting XPression to an XPression DataLinq Server

Use the XPression DataLinq Manager to configure the communication between the XPression DataLinq Server and the XPression Client.

To connect XPression to a DataLinq Server:

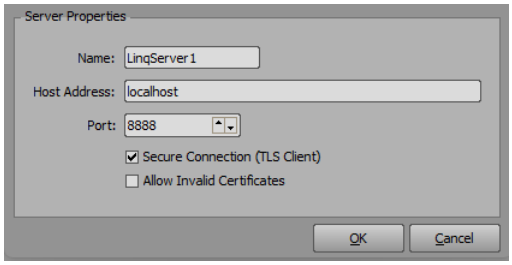
1. In the XPression **Layout** editor, select **Project > DataLinq Manager**.

   The **XPression DataLinq Manager** dialog opens.



2. Select **Add**.

   The **DataLinq Server - Properties** dialog opens.



3. In the **Name** field, enter a name for the new DataLinq server connection.
4. In the **Host Address** field, enter the fully qualified domain name of the computer running the DataLinq server to which to connect.
5. In the **Port** field, enter or select the port number used to communicate with the computer running the DataLinq server.

   The default port number is **8888**.

6. Select the **Secure Connection (TLS Client)** checkbox to encrypt the connection between the XPression DataLinq Server and XPression using the Transport Layer Security (TLS) protocol.

   When **Secure Connection (TLS Client)** is selected, the **Allow Invalid Certificates** option becomes available.

7. Select **Allow Invalid Certificates** only when the DataLinq Server certificate name will not match the host (for example, when connecting by IP address to a server whose certificate was issued for a DNS name), or when the revocation server cannot be reached.

★Expired and untrusted certificates are always rejected. Existing projects that used secure connections before this version open with this option selected, preserving prior behavior.

8. Select **OK**.

   The defined DataLinq server connection is added to the **DataLinq Servers** section of the **XPression DataLinq Manager** dialog. The DataLinq sources made available by the new DataLinq server connection are listed in the **Available DataLinq Sources** section.

9. To connect to additional DataLinq servers, repeat Steps 2 to 8.

For More Information on...

- configuring a DataLinq server, refer to Configuring an XPression DataLinq Server.
- configuring DataLinq sources, refer to Configuring the Selected DataLinq Source.

Exporting and Loading DataLinq Files

After configuring a DataLinq source, you can export the DataLinq file(s) to save it for future use. Once saved, you can then load it back to the server when needed.

To export a DataLinq file:

1. In the **XPression DataLinq Server**, select **File > Export Configuration** and select one of the following options:
   - **All DataLinqs**
   - **Enabled DataLinqs**
2. In the **Save Configuration** window, locate and select the folder in which you want to save your DataLinq files.
3. Select **Save**.

To load a DataLinq file:

1. In the **XPression DataLinq Server**, select **File > Load Configuration**.
2. In the **Open** window, locate and select the folder containing the DataLinq file you want to load and select **Open**.

Starting the XPression DataLinq Server

★If multiple DataLinq servers contain sources with the same name, the data retrieval can automatically failover to the other server if the primary server becomes disconnected. The order of priority is determined by the order of DataLinq servers added to the DataLinq Manager; so the primary server should be added before the backup servers.

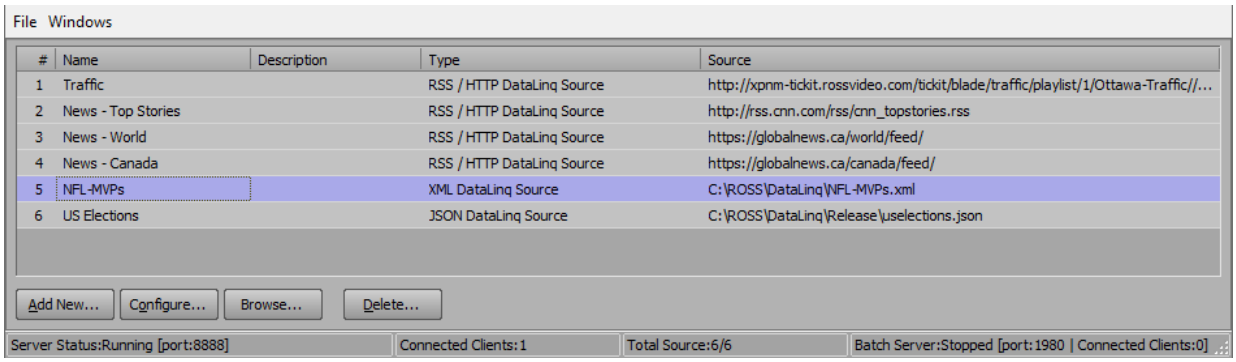
1. Use one of the following methods to start the DataLinq Server.

   - Double-click the **XPression DataLinq Server** icon on the desktop.

     OR

   - From the **Start** menu, select **All Programs > XPression > XPression DataLinq Server**.

   The **XPression DataLinq Server window** opens.

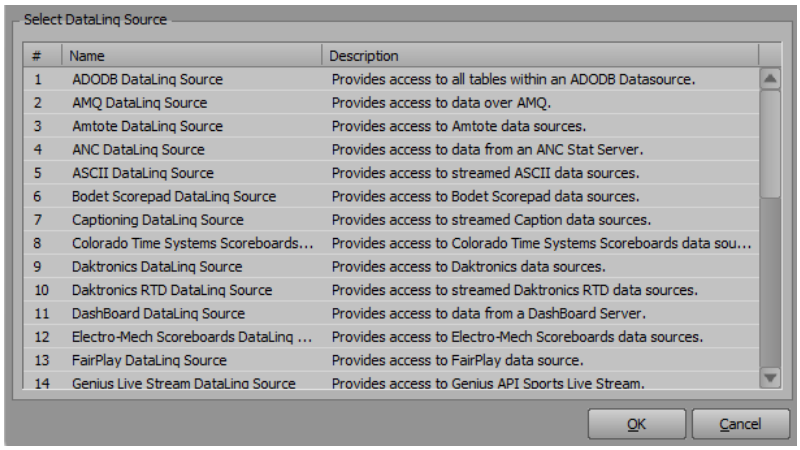


   At the bottom of the window, a **Status** bar provides information such as the port number used by the XPression DataLinq Server to connect to clients, the number of connected clients, the number of configured DataLinq sources, whether or not the Batch Server is running, etc.

   ★The port number can be changed in the **XPression DataLinq Server - Preferences** dialog box by selecting **File > Preferences**.

2. Select **Add New**.

   The **Add DataLinq Source** dialog opens.



3. From the list of DataLinq sources, select the type of external data source to access.
4. Select **OK**.

   The dialog that opens to define data source settings depends on the selected data source.

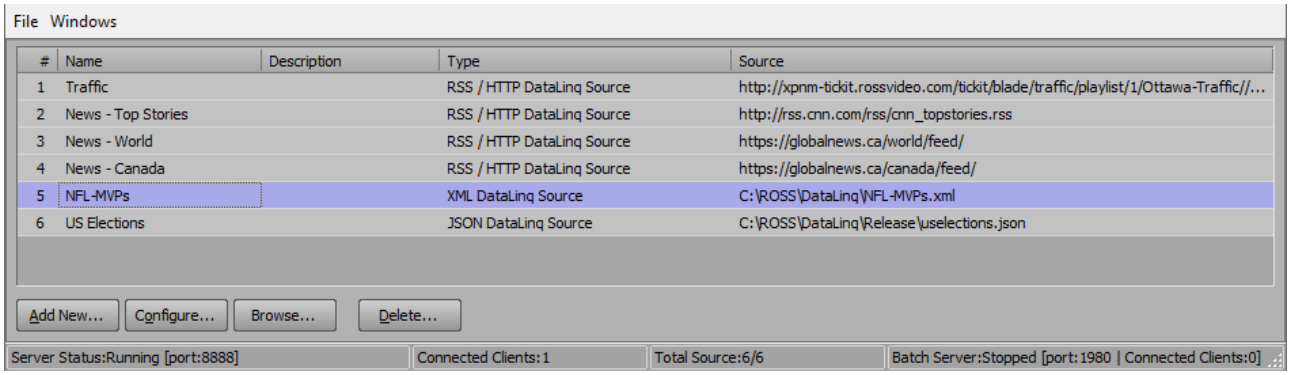
5. Continue with Configuring the Selected DataLinq Source..

Configuring the Selected DataLinq Source

To select a DataLinq source:

1. Use one of the following methods to start the DataLinq Server.
   - Double-click the **XPression DataLinq Server** icon on the desktop.
   - From the **Start** menu, select **All Programs > XPression > XPression DataLinq Server**.

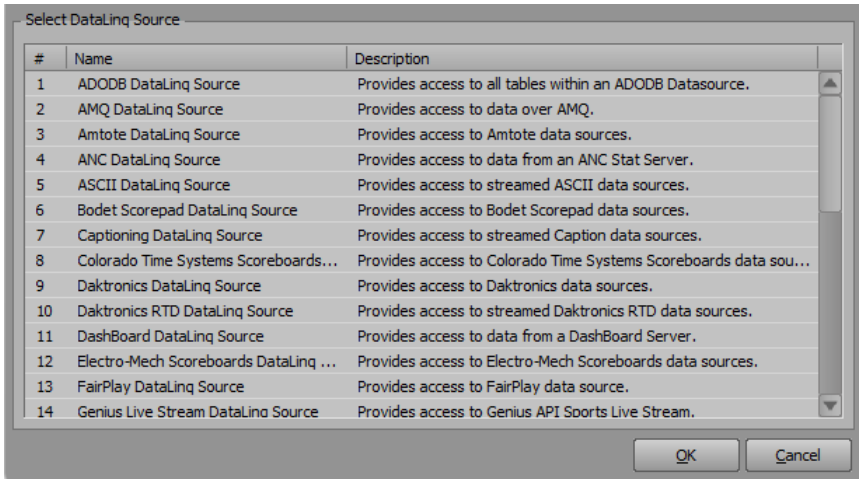
   The **XPression DataLinq Server window** opens.



   The port number used by the DataLinq Server to communicate with other XPression clients is displayed in the window title bar. The port number can be changed in the **XPression DataLinq Server - Preferences** dialog by selecting **File > Preferences**.

2. Select **Add New**.

   The **Add DataLinq Source** dialog opens.



3. From the list of DataLinq sources, select the type of external data source to access and select the corresponding link below for configuration instructions:

   ADODB DataLinq Source — access data contained in ADODB (OLEDB, ODBC, Access, Excel, Oracle, and other databases) sources. This source allows users to form SQL queries within their graphics templates to search and sort data from a variety of database types.

   AMQ DataLinq Source — access data over AMQ (Advanced Message Queuing), supporting AMQP and STOMP protocols.

   Amtote DataLinq Source — access data from an Amtote serial data source.

   ANC DataLinq Source — access data contained in ANC streaming scoreboard protocols.

   ASCII DataLinq Source — access data contained in a stream of ASCII data (serial, TCP, or UDP) and extract fixed length fields from the messages. This can be used to parse some generic protocols and other devices such as radar gun data. The ASCII DataLinq supports messages up to 4095 bytes.

   Bodet Scorepad DataLinq Source — access data from a Bodet Scorepad data source for a variety of common sports.

   Captioning DataLinq Source — access data from streamed Caption data sources.

   Colorado Time Systems Scoreboards DataLinq Source — access data from the Colorado Time Systems swimming feed database.

   Daktronics DataLinq Source — access data from the Daktronics sports feed database.

   Daktronics RTD DataLinq Source — access real-time data from Daktronics and other compatible data sources. Separate ITF files required to parse incoming data, based on the sport.

   DashBoard DataLinq Source — access data from a DashBoard server (DashBoard version 6.1 or higher).

   Electro-Mech Scoreboards DataLinq Source — access data from the Electro-Mech Scoreboards football or hockey/lacrosse data source.

   FairPlay DataLinq Source — access data from FairPlay data sources for a variety of common sports.

   Genius Sports InArena DataLinq Source — access data from the Genius Sports InArena data source.

   GSIS DataLinq Source — access data from the NFL Game Statistics & Information System. NFL NextGen Stats (REST/JSON) can be accessed with the RSS / HTTP DataLinq Source.

   JSON DataLinq Source — access data by parsing local JSON files.

   NBA NGSS DataLinq Source — access data from the NBA NGSS stats API.

   NHL Hits DataLinq Source — access to streamed NHL Hits Scoreboard Feed data source.

   OES Scoreboards DataLinq Source — access data from the OES Football, Lacrosse, Lacrosse (4 penalty feeds), Basketball, Field Hockey, Hockey, Soccer, Volleyball, Wrestling, Baseball Model 7929, Baseball ISC9000Std, or Baseball ISC9000Pro feeds.

   PGA Meekus WebSocket DataLinq Source — access tournament data from the PGA Meekus portal.

   Raiden DataLinq Source — access Raiden data sources.

   RSS / HTTP DataLinq Source — access live data from REST APIs, RSS feeds, XML, JSON, plain-text, and other HTTP endpoints. Supports static and dynamic URLs, Basic Authentication, OAuth 2.0, custom headers, API keys, proxy settings, and HTTPS/TLS for secure integration with web-based data providers (XML, JSON, or text).

   SMT Tennis Umpire Clock DataLinq Source — access data from the Tennis Umpire Clock data source.

   Sportech DataLinq Source — access data from a Sportech serial data source.

   Stats Perform API DataLinq Source — access data from the Stats Perform API data sources.

   Stats Perform DataLinq Source — access data from the Stats Perform Out of Town Scores data source.

Swiss Timing Scoreboards DataLinq Source — access data from the Swiss Timing Saturn/Vega Scoreboard and NBA Tissot Scoreboard data sources.

Teletimer DataLinq Source — access to Teletimer sources.

Televiewe DataLinq Source - access to Televiewe (International Sound) sources.

Text DataLinq Source — access data contained in delimited text files stored on disk.

WebSocket DataLinq Source — access data from WebSocket databases.

White Way DataLinq Source — access data from White Way databases for basketball or football.

XML DataLinq Source — access XML data files stored on disk.

XML/JSON TCP DataLinq Source — access XML/JSON data over TCP Server, TCP Client, or UDP.

4. After configuring the DataLinq source, in the **Name** column, replace the text with a name for the new DataLinq source.

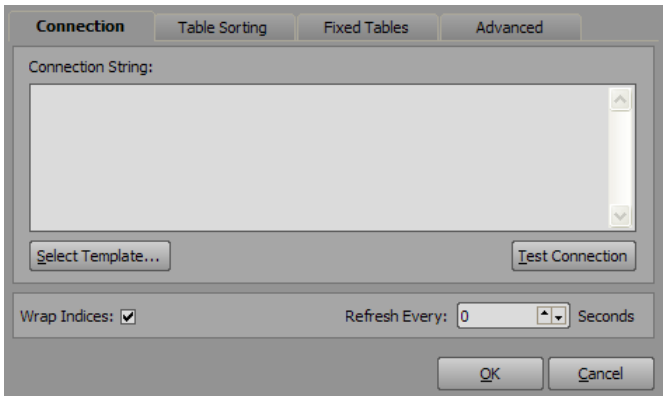
ADODB DataLinq Source

Follow these instructions to configure an ADODB DataLinq source.

To configure an ADODB DataLinq Source:

1. From the **Add DataLinq Source** dialog, select the **ADODB DataLinq Source** and then select **OK**.

   The **ADODB DataLinq Configuration** dialog opens.



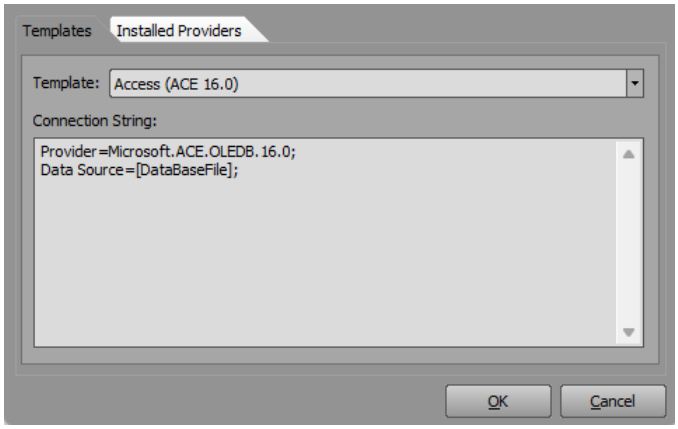
2. In the **Connection** tab, do one of the following:

   a. In the **Connection String** field, enter the **connection** string of the DataLinq Source.

   b. Then select **Test Connection** to view the status of the connection string.

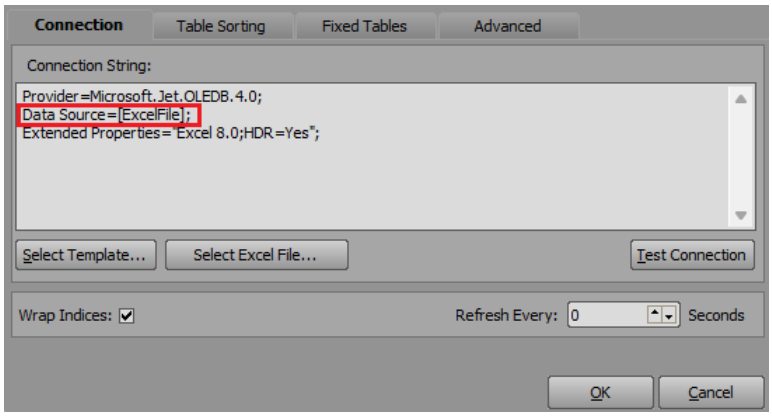
   OR

   a. Choose **Select Template** to select an existing connection string.



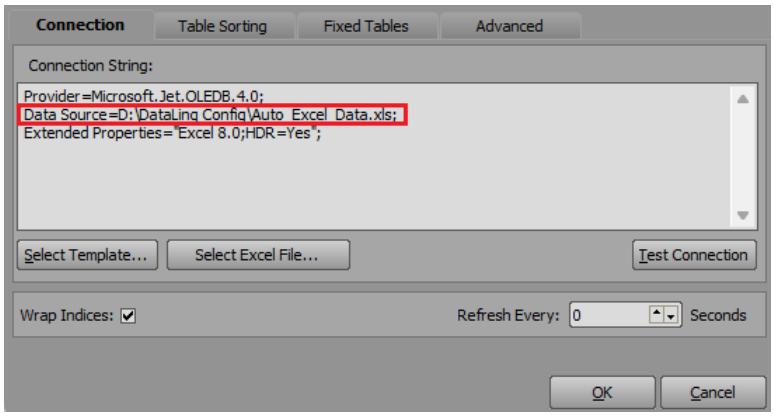
   b. From the **Template** drop-down, select the type of template used for the file and then select **OK**.

In the **Connection String** section, the **Data Source** line indicates the selected template type. For this example, an **Excel (XLS, Jet 4.0)** template was selected.



c. Select **Select Excel File** (the name of this button changes depending on the type of template selected).

d. Navigate to and select the file you want to use.



The **Data Source** line now indicates the path to the selected file.

e. Select **Test Connection** to view the status of the connection string.

If the connection is established, a dialog opens confirming the status.

f. Select **OK** to close the dialog.

g. If the connection is not successfully established, check that the selected provider is installed on your machine.

★The ACE OLEDB 16.0 templates require **Microsoft 365 Access Runtime** (32-bit version) to be installed on the computer running the XPression DataLinq Server. It is not installed with XPression.

3. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

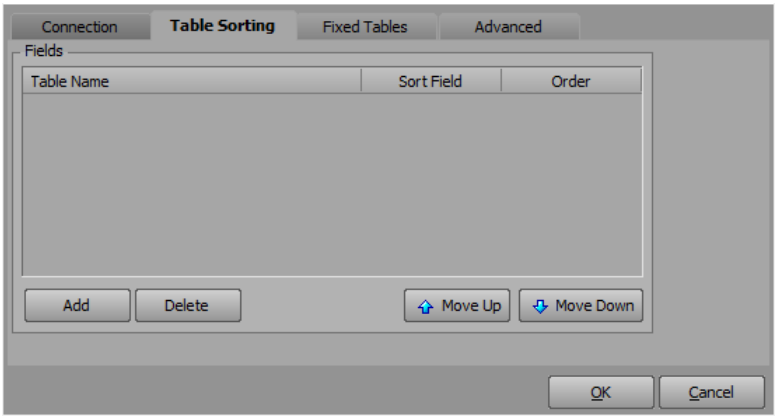
Wrap Indices should be selected when using looping queries and is selected by default.

4. In the **Refresh Every** field, enter or select the number of seconds after which to update the data retrieved from the database.

To configure Table Sorting:

1. Select the **Table Sorting** tab.

   The **Table Sorting** tab opens.



2. In the **Table Sorting** tab, do the following:

   In the **Fields** table, add a sort field for a table within a database.

   ★Some databases, such as Access and MySQL, require a specified sort order or the data could be returned in random order.

   - **Table Name** — from the drop-down, select a table for the DataLinq.
   - **Sort Field** — from the drop-down, select the sort field for the data.
   - **Order** — from the drop-down, select the sorting order for the data.

     The options are:

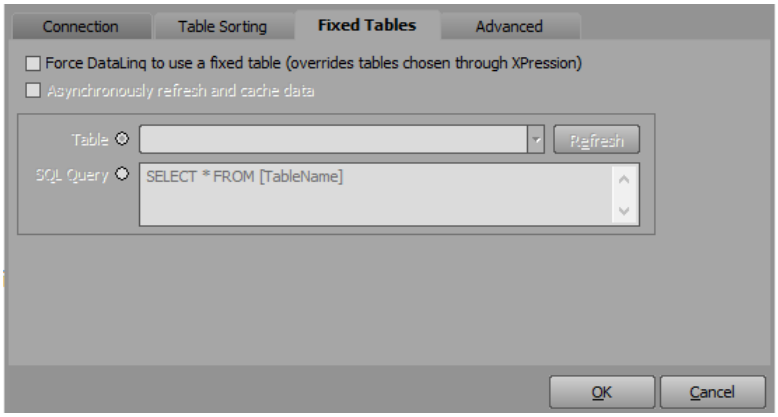
     ➢ **ASC** — sort the data in ascending order.

     ➢ **DESC** — sort the data in descending order.
   - **Add** — add a row to the **Fields** table.
   - **Delete** — delete a selected row from the table.
   - **Move Up** — move a selected row up in the table.
   - **Move Down** — move a selected row down in the table.

To configure the Fixed Tables:

1. Select the **Fixed Tables** tab.

   The **Fixed Tables** tab opens.



2. In the **Fixed Tables** tab, do the following:

   Select the **Force DataLinq to use a fixed table** checkbox to use fixed tables.

   Choose one of the following options:

   - Select the **Table** option and from the drop-down, select a table from the connected database.

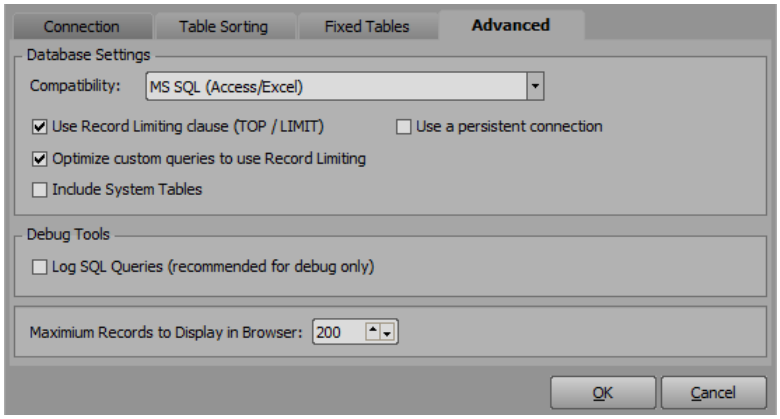
     Select **Refresh** to update the data retrieved from the database.

   - Select the **SQL Query** option and modify the string to query the database.

To configure the Advanced settings:

1. Select the **Advanced** tab.

   The **Advanced** tab opens.



2. In the **Advanced** tab, do the following:

   - In the **Database Settings** section, from the **Compatibility** drop-down, select a compatibility mode for the SQL database.

     The options are:

     - **MS SQL (Access/Excel)**
     - **MySQL**
     - **Oracle**
     - **Standard SQL**

   - Select the **Use Record Limiting clause (TOP / LIMIT)** checkbox to optimize the speed for accessing data by limiting the amount of records from the selected database using the **TOP** clause or **LIMIT** clause to specify the number of records to return.
   - Select the **Optimize custom queries to use Record Limiting** checkbox to automatically add a **TOP** clause so that the DataLinq will only retrieve the records specified in the query.
   - Select the **Include System Tables** checkbox to include the SQL database system tables in the list of tables in the source for the DataLinq.
   - Select the **Use a persistent connection** checkbox to maintain a persistent open connection to the SQL database.

3. In the **Debug Tools** section, select the **Log SQL Queries** checkbox to compile the SQL queries only if debugging.

   These queries can be viewed by selecting **Windows > Log Window** in the XPression DataLinq Server.

4. In the **Maximum Records to Display in Browser** field, enter or select a maximum number of data records to display in the **Select DataLinq Field** dialog.

   The maximum is **2000**.

5. Select **OK**.

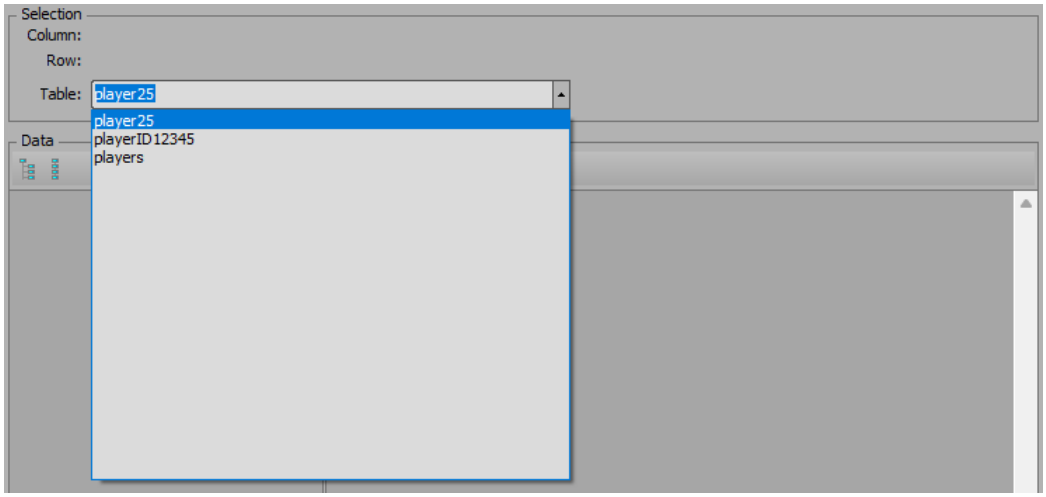
   The **ADODB DataLinq Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

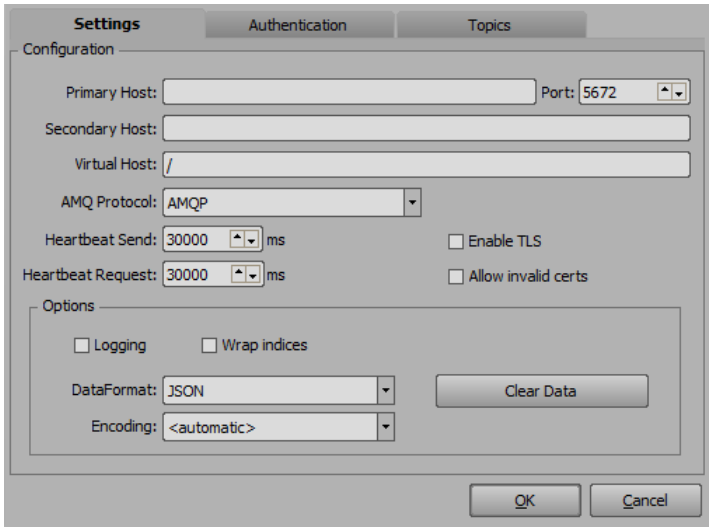
AMQ DataLinq Source

Follow these instructions to configure an AMQ (Advanced Message Queuing) DataLinq source.

To configure an AMQ DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **AMQ DataLinq Source** and then select **OK**.

   The **AMQ DataLinq Setup** dialog opens.



2. In the **Settings** tab, in the **Configuration** section, enter the following information:

   Primary Host — the main server address (hostname or IP address) of the AMQ broker.

   Port — the network port used by the AMQ service.

   Secondary Host — a backup broker address, used automatically if the primary host is unavailable.

   Virtual Host — a logical namespace on the AMQ broker that acts as a partition inside the same server (e.g., /prod, /dev, /sports).

   AMQ Protocol — the protocol/version used to communicate with the broker, either AMQP or STOMP (must match what the broker supports).

   Heartbeat Send — how often (in milliseconds) the client sends heartbeat signals to the broker (to keep the connection alive and detect dropped connections).

   Heartbeat Request — how often (in milliseconds) the client expects to receive heartbeats from the broker. If nothing is received within this interval, the connection is considered dropped.

   Enable TLS — turn on encrypted communication.

   Allow invalid certs — allow invalid or untrusted TLS certificates (useful for testing or self-signed certs, but not recommended in production).

3. In the **Options** section, select from the following options as needed:

   Logging — select the **Logging** checkbox to record the info in the **XPression DataLinq Server** logs.

   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.

   Wrap Indices — select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries and is selected by default.

DataFormat — select how the incoming message data should be structured.

The options are:

- **SimpleText** — read text sources.
- **XML** — read XML sources.
- **JSON** — read HTTP-based JSON sources.

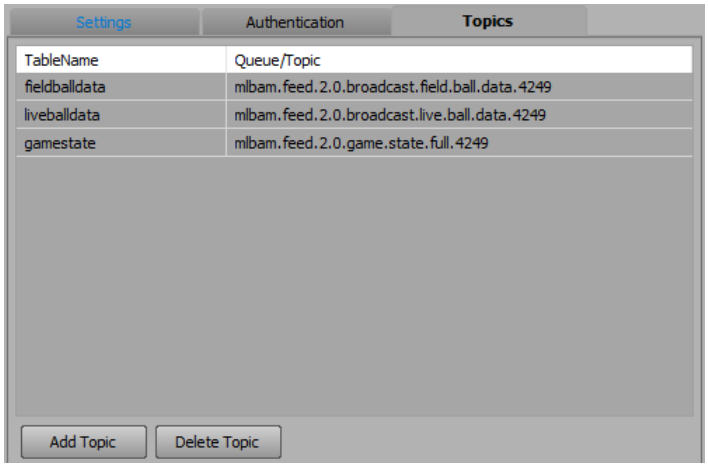
Encoding — select a file encoding protocol.

The options are:

- **<automatic>** — select this option to automatically detect the protocol.
- **UTF-8**
- **UTF-16 BE**
- **UTF-16 LE**
- **ISO-8859**
- **UCS2**
- **ASCII**

Clear Data — select to clear all data.

4. In the **Authentication** tab, enter a **Username** and **Password** for authentication.
5. In the **Topics** tab, select **Add Topic** to add a topic that will contain data of a specific type (e.g., game.stats, game.clock).
6. Click in the **TableName** field of the added topic and enter a name for the table.
7. Then click in the **Queue/Topic** field of the added table and enter the name of the topic for which you want to retrieve data.



8. To delete a topic, select the topic you want to delete and then select **Delete Topic**.
9. Select **OK**.

The **AMQ DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

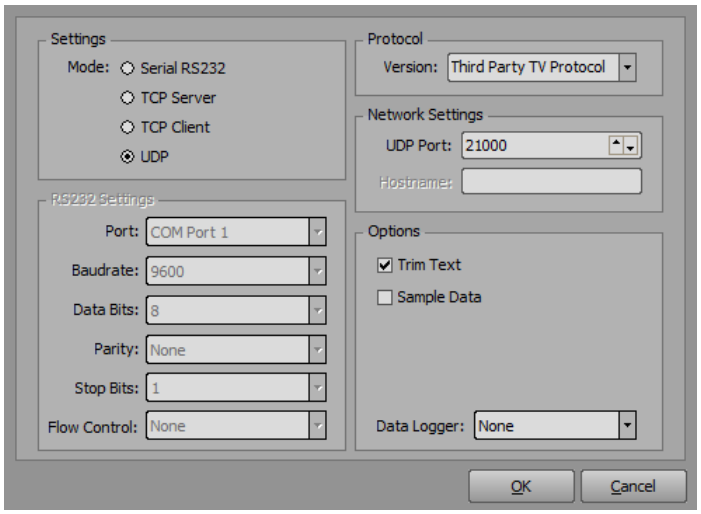
Amtote DataLinq Source

Follow these instructions to configure an Amtote DataLinq source.

To configure an Amtote DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Amtote DataLinq Source** and then select **OK**.

   The **Amtote DataLinq Source** dialog opens.



2. In the **Settings** section, use the **Mode** radio buttons to select the Amtote DataLinq connection type.

   The options are:

   - **Serial RS232** — use an RS232 serial GPI port as the connection type.
   - **TCP Server** — have the DataLinq Server listen for a connection from a remote client.
   - **TCP Client** — connect to a remote server listening and waiting for connections.
   - **UDP** — listen to UDP broadcasts.

3. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection.

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

   OR

   If **TCP Server**, **UDP**, or **TCP Client** is selected in the **Settings** section, use the **Network Settings** section to configure the corresponding port settings for the connection.

   - **Hostname** — if using TCP Client, enter the host name or IP address of the device.

4. In the **Protocol** section, from the **Version** drop-down, select the protocol of the Amtote data source.

5. In the **Options** section, select the **Trim Text** checkbox to remove extra spaces from the feed.
6. Select the **Sample Data** checkbox to receive sample data for building projects outside of races.
7. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
8. Select **OK**.

   The **Amtote Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

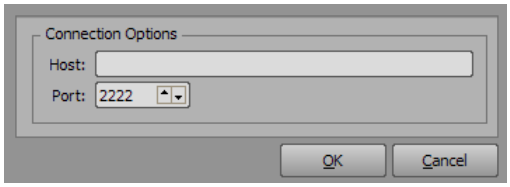
ANC DataLinq Source

Follow these instructions to configure an ANC DataLinq source.

To configure an ANC DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **ANC DataLinq Source** and then select **OK**.

   The **ANC Linq - Configuration** dialog opens.



2. In the **Host** field, enter the IP address of the ANC DataLinq database.
3. In the **Port** field, enter the port number for the ANC DataLinq database.
4. Select **OK**.

   The **ANC Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

ASCII DataLinq Source

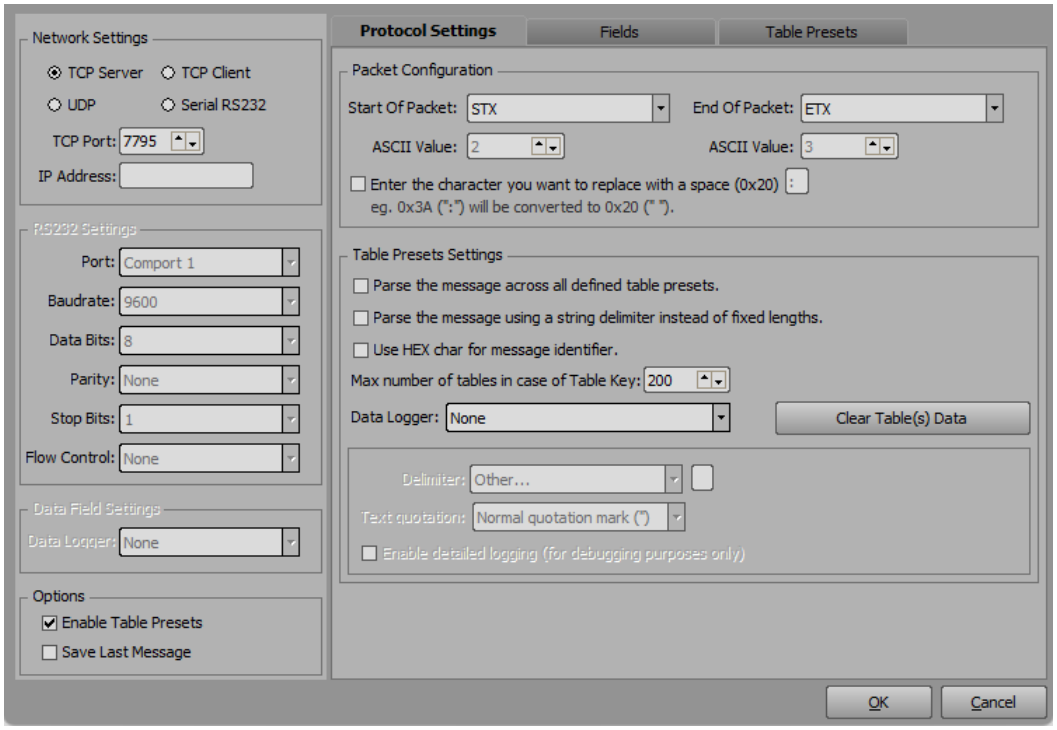
Follow these instructions to configure an ASCII DataLinq source.

Tables in an ASCII DataLinq source can be created manually or dynamically (automatically created or updated based on a designated key field's unique values). Dynamic instances are runtime-only and recreated as data arrives.

To configure an ASCII DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **ASCII DataLinq Source** and then select **OK**.

   The **ASCII DataLinq Setup** dialog opens.



2. In the **Network Settings** section, do the following:

   - Select the ASCII DataLinq connection type.

     The options are:

     - **TCP Server** — use a TCP port as the connection type.
     - **TCP Client** — use a TCP port and an IP address as the connection type.
     - **UDP** — use a UDP port as the connection type.
     - **Serial RS232** — use an RS232 serial GPI port as the connection type.

3. If **TCP Server**, **TCP Client**, or **UDP** is selected in the **Settings** section, use the **Port** field to configure the port for the connection:

   The options are:

   - **TCP Server** — enter or select the **TCP Port** number for the connection to the ASCII DataLinq source.
   - **TCP Client** — enter the **TCP Port** number and the **IP Address** for the connection to the ASCII DataLinq source.
   - **UDP** — enter or select the **UDP Port** number for the connection to the ASCII DataLinq source.

OR

If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection.

The options are:

- **Port** — enter or select the serial port number for the connection to the DataLinq source.
- **Baudrate** — select the communication speed for the signals.
- **Data Bits** — select the number of bits used to represent one character of data for the signals.
- **Parity** — select the method used to check for lost data in a signal.
- **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
- **Flow Control** — select the data transmission rate controller for a signal.

4. In the **Data Field Settings** section, from the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

5. Select the **Enable Table Presets** checkbox to enable table presets.
6. In the **Protocol Settings** tab, do the following:
   - From the **Start of Packet** drop-down, select a start of packet control code.

     The options are:

     - **<none>** — do not use a control code for the start of packet.
     - **STX** — use the start of text control code.
     - **SOH** — use the start of heading control code.
     - **Custom** — use a custom start of packet value. In the ASCII Value field, enter or select a custom start of packet value.

   - From the **End of Packet** drop-down, select an end of packet control code.

     The options are:

     - **CR** — use the carriage return control code.
     - **LF** — use the line feed control code.
     - **ETX** — use the end of text control code.
     - **EOT** — use the end of transmission control code.
     - **Custom** — use a custom end of packet value. In the ASCII Value field, enter or select a custom end of packet value.

   - Select the **Enter the Character you want to replace with a space (0x20)** checkbox and in the adjacent field, enter the character you want to replace with a space.

     For example, if you enter a colon in the field, the Hex representation of a colon (0x3A) will be changed to the Hex representation of a blank space (0x20).

7. In the **Options** section, select from the following options as needed:
   - Select **Enable Table Presets** to define reusable rules to automatically identify and parse different message formats in the data stream, instead of relying on fixed byte positions.
   - Select **Save Last Message** to save the most recently received data to disk and restore it on startup.
8. If **Enable Table Presets** is selected, in the **Table Presets Settings** section, do the following:
   - Select **Parse the message across all defined table settings** to process the message using the configuration defined by the table settings.
   - Select **Parse the message using a string delimiter instead of fixed lengths** to use the **Delimiter** character to separate the parts of the message.
   - Select **Use HEX char for message identifier** to use a hexadecimal number to identify messages.
   - In the **Max number of tables in case of Table Key** field, enter the maximum number of tables to be created when using the Table Key feature.
   - From the **Data Logger** drop-down, select an encoding scheme for the data log.

     The options are:

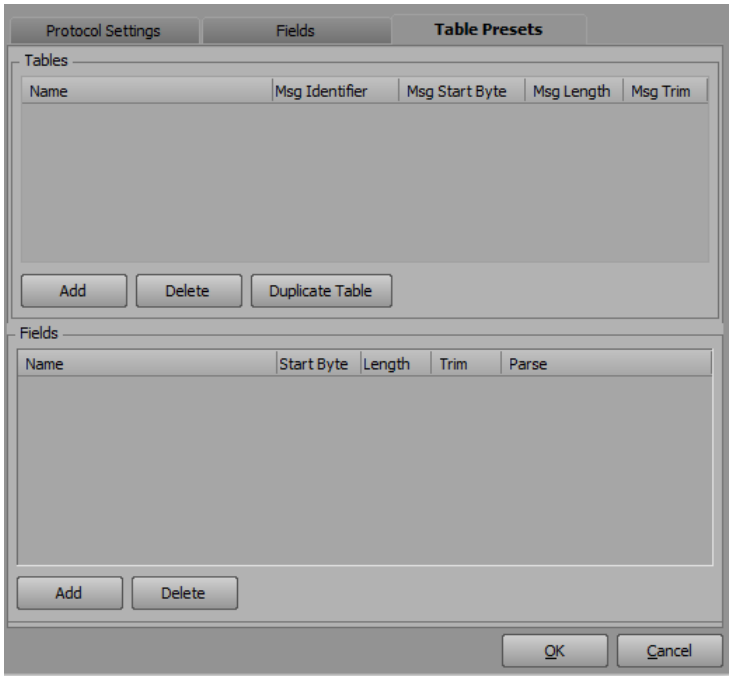
     - **None** — use no data logging.
     - **ASCII** — use ASCII encoding for the data log.
     - **HEX** — use HEX file formatting for the data log.
     - **Both** — use both ASCII encoding and HEX file formatting for the data log.
   - Select the **Clear Table(s) Data** button, to clear all data in any existing tables.
   - If **Parse the message using a string delimiter instead of fixed lengths** is selected, the following settings become available:
     - **Delimiter** — from the drop-down, select the character to be used as the separator or select **Other** and in the adjacent field, enter the character to use as the separator.
     - **Text quotation** — from the drop-down, select the type of punctuation to be used to indicate text, either **Normal quotation mark** ("), **Apostrophe** (') or **None**.
     - **Enable detailed logging** — used for debugging purposes only.
9. If **Enable Table Presets** is not selected, use the **Fields** table to define a region of the incoming ASCII data stream to locate specific information (for example, Home Score, Visitor Score, Period, etc.):
   - **Name** — click inside a row to enter or edit a name for the field.
   - **Start Byte** — click inside a row to enter or edit the location where the field begins in the data stream.
   - **Length** — click inside a row to enter or edit the amount of bytes the field uses.
   - **Trim** — click inside a row and then select the checkbox to remove extra spaces from the data.
   - **Add** — add a field to the table.
   - **Delete** — delete a selected field from the table.

To create table presets manually:

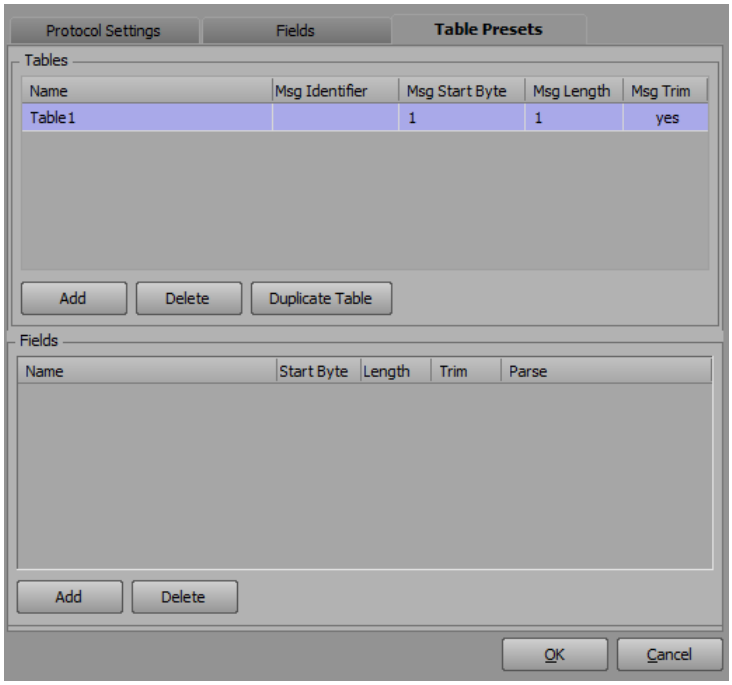
1. If **Enable Table Presets** has been selected, select the **Table Presets** tab to configure the list of table presets when using an ASCII DataLinq source.

   The **Table Presets** tab opens.

   ★If **Parse the message using a string delimiter instead of fixed lengths** is selected in the **Table Presets Settings**, the **Msg Start Byte** and **Msg Length** columns do not appear.



2. In the **Table Presets** tab, in the **Tables** section, select **Add** to add a table preset to the list.



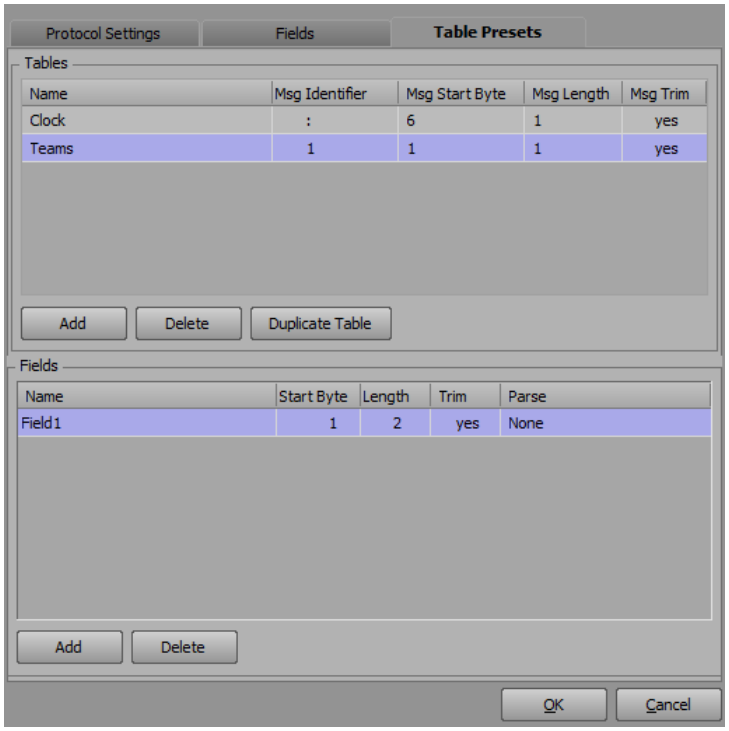
3. In the **Table** row, do the following:
   - Click in the **Name** column to edit the name of the table.
   - Click in the **Msg Identifier** column and enter the parseable message identifier and number of fields.

     For example, $H|||||||, where $H is the message identifier that starts the message and | is a delimiter for each field in the message; in this case, there are 8 fields. In this case the "Parse the message using a string delimiter instead of fixed lengths" option would not be selected and the parsing is completed by the definition in the **MSG Identifier** in **Tables**.
   - Click in the **Msg Start Byte** column and enter the start byte of the message (from the source table).

     ★If **Parse the message using a string delimiter instead of fixed lengths** is selected in the **Table Presets Settings**, this column does not appear.
   - Click in the **Msg Length** column and enter the length of the message (in bytes).

     ★If **Parse the message using a string delimiter instead of fixed lengths** is selected in the **Table Presets Settings**, this column does not appear.
4. Repeat steps 2 and 3 to add more table presets, as needed.

   Alternatively, if there are multiple similar table entries to be configured, you can select a table and then select the **Duplicate Table** button.
5. With a table selected, in the **Fields** section, select **Add** to add a field to the selected table.



6. In the **Field** row, do the following:
   - In the **Name** column, edit the name of the field.
   - In the **Start Byte** column, enter the start byte of the field.

     ★If **Parse the message using a string delimiter instead of fixed lengths** is selected in the **Table Presets Settings**, this column does not appear.
   - In the **Length** column, enter the number of characters in the field.

     ★If **Parse the message using a string delimiter instead of fixed lengths** is selected in the **Table Presets Settings**, this column does not appear.
   - In the **Parse** column, from the drop-down, select how to parse the incoming data.

     The options are:

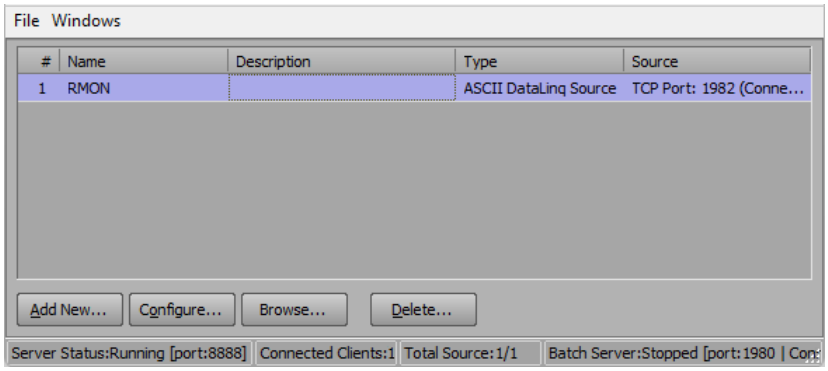
     - **None** — no parsing.
     - **HEX to Decimal** — converts a hexadecimal value into a decimal value (for numeric data like IDs, counters, etc.).
     - **HEX to String** — converts a hexadecimal value into text (for names, messages, etc.).
     - **HEX to Time** — converts a hexadecimal value into a time value (for timestamps, durations, time-of-day values, etc.).
     - **HEX to DateTime Unix Local** — converts a hexadecimal value into a Unix timestamp, and then formats it as a human-readable date/time in the system's local time zone.
     - **HEX to DateTime Unix UTC** — converts a hexadecimal value into a Unix timestamp, interpreted in Coordinated Universal Time (UTC) for systems that log data globally or across time zones.
7. Add additional fields as needed.
8. Select **OK**.

   The **ASCII DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To create and update tables automatically:

1. In the XPression DataLinq Server, select **File > Load Configuration** and open the configuration file for your ASCII DataLinq source.

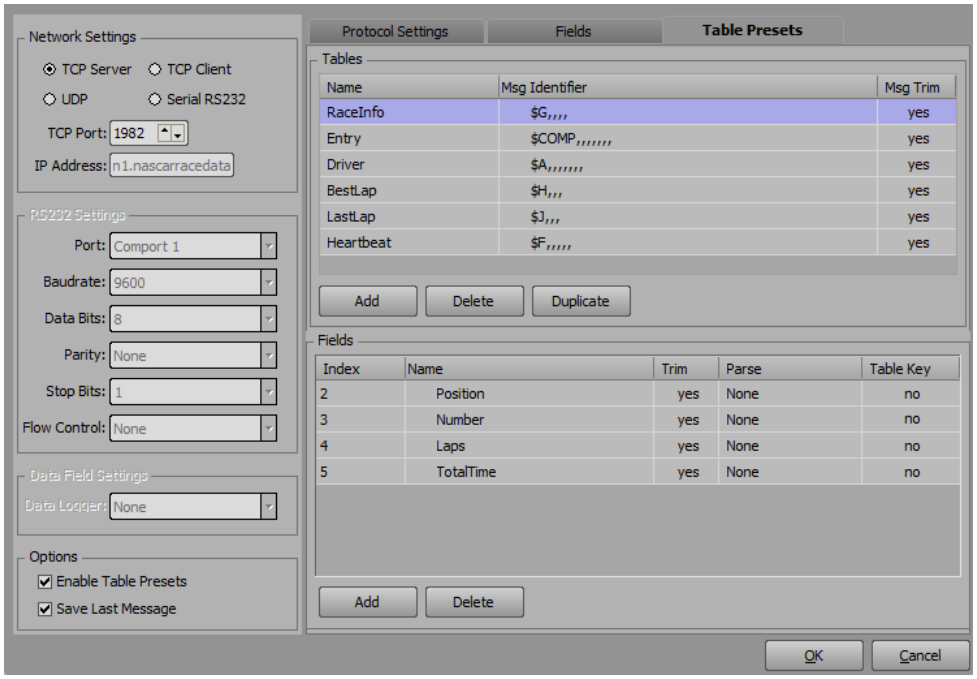
   The configuration file is added to the XPression DataLinq Server.



2. Select the new configuration and then select **Configure**.

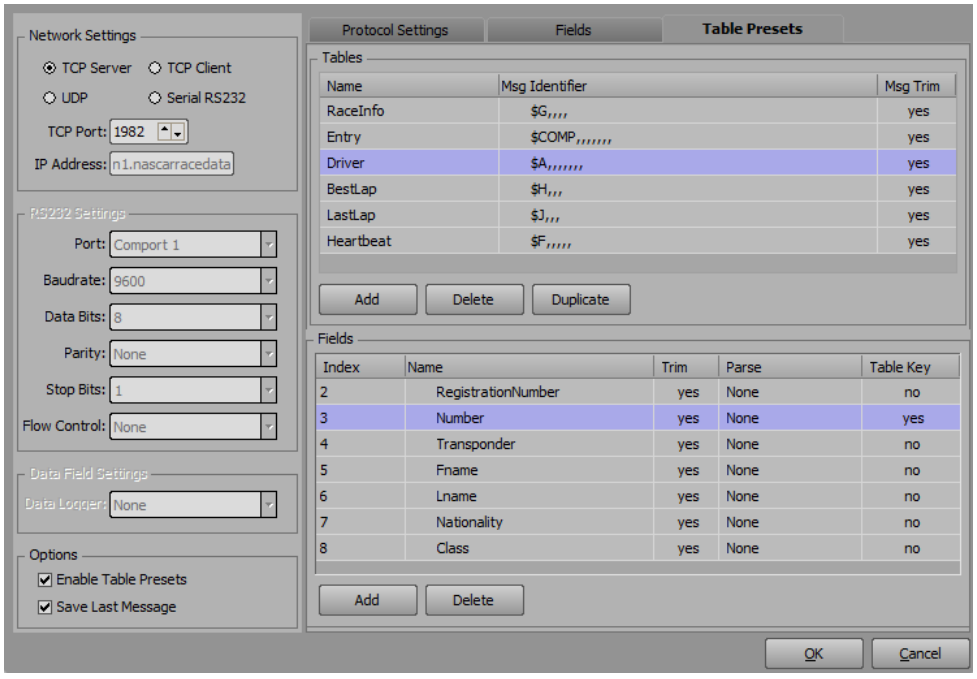
3. In the **Options** section, select the **Enable Table Presets** checkbox.

   In the **Table Presets** tab, you will see the list of tables that have been created by the configuration file and the fields for the selected table.



4. Select a table and in the **Fields** section, in the **Table Key** column, select which index to use as the **Table Key**.

   As new data is received that includes that index, either the table for that data will be updated or if no table exists, one will be created.



5. Select **OK** to close the **ASCII DataLinq Setup** dialog.

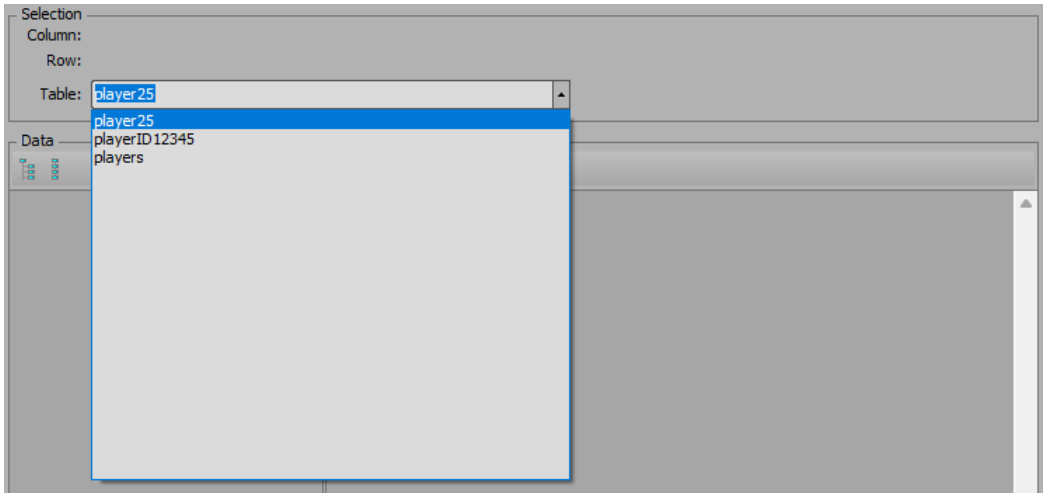
   The **ASCII DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

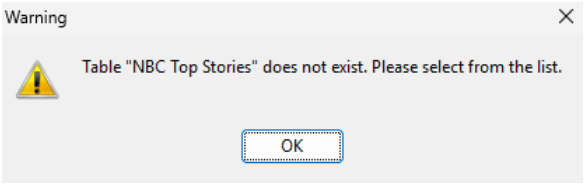
   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

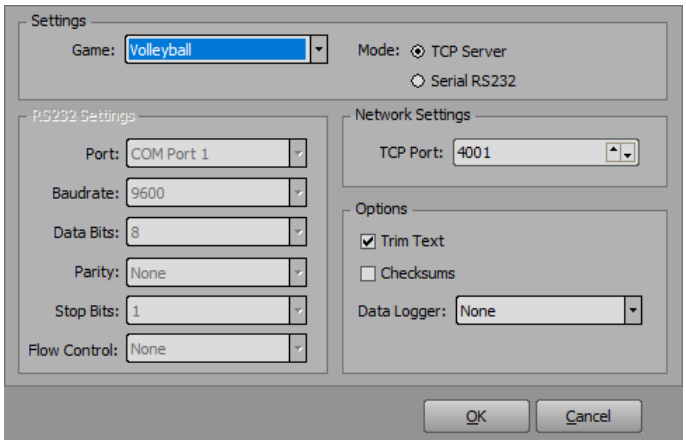
Bodet Scorepad DataLinq Source

Follow these instructions to configure a Bodet Scorepad DataLinq source.

To configure a Bodet Scorepad DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Bodet Scorepad DataLinq Source** and then select **OK**.

   The **Bodet Scorepad Linq - Configuration** dialog opens.



2. In the **Settings** section, from the **Game** drop-down, select a Bodet Scorepad sports feed.

   The available sports feeds are as follows:

   - **Badminton**
   - **Basketball**
   - **Basketball 3x3**
   - **Floorball**
   - **Futsal**
   - **Handball**
   - **Ice Hockey**
   - **Table Tennis**
   - **Tennis**
   - **Volleyball**

3. Select a **Mode** for the Bodet Scorepad feed:
   - **TCP Server** — use a TCP port as the connection type.
   - **Serial RS232** — use a serial RS232 port as the connection type.

4. If **TCP Server** was selected in **Settings**, in the **Network Settings** section, in the **TCP Port** field, enter or select the communication port that receives the signals.

   The default port number is 4001.

   OR

   If **Serial RS232** was selected in **Settings**, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   The options are:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

     ★**Flow Control** can be set to **Hardware**, **Software**, or **None**, but it must be set the same in both XPression and the transmitting device.

5. In the **Options** section, select the **Trim Text** checkbox to remove extra spaces from the feed.
6. Select the **Checksums** checkbox to enable processing of this error check method. Default is off.
7. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

8. Select **OK**.

   The **Bodet Scorepad Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

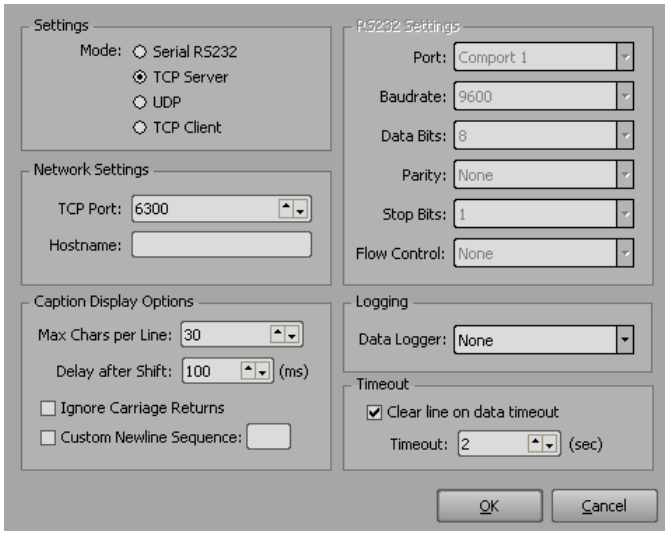
Captioning DataLinq Source

Follow these instructions to configure a Captioning DataLinq source.

To configure a Captioning DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Captioning DataLinq Source** and then select **OK**.

   The **Captioning DataLinq Setup** dialog opens.



2. In the **Settings** section, use the **Mode** radio buttons to select the **Captioning DataLinq** connection type.

   The options are:

   - **Serial RS232** — use an RS232 serial GPI port as the connection type.
   - **TCP Server** — have the DataLinq Server listen for a connection from a remote client.
   - **UDP** — listen to UDP broadcasts.
   - **TCP Client** — connect to a remote server listening and waiting for connections.

3. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

OR

If **TCP Server**, **UDP**, or **TCP Client** is selected in the **Settings** section, use the **Network Settings** section to configure the port settings for the connection:

- **TCP** — if **TCP Server** or **TCP Client** has been selected in the **Settings** section, enter or select the **TCP Port** number for the connection to the Captioning DataLinq.
- **UDP** — if **UDP** has been selected in the **Settings** section, enter or select the **UDP Port** number for the connection to the Captioning DataLinq.
- In the **Hostname** field, enter the host name or IP address of the device.

4. In the **Captioning Display Options** section, configure the following captioning options for the source:
   - **Max Chars per Line** — enter or select a maximum amount of characters to display per line.
   - **Delay after Shift** — enter a time in milliseconds to delay reading in data for the new blank line at the bottom after the lines are shifted up after receiving a full line of data.

     ★Without delay, and some sort of animation that visually shifts the lines on screen, one could end up with new words appearing on the bottom line before the animation finishes.
   - **Ignore Carriage Returns** — select this check box to ignore carriage returns from the source.
   - **Custom Newline Sequence** — select this check box and use the text box to enter a custom character sequence to search for in the incoming data to replace with a newline character in the rendered text.
5. In the **Logging** section, from the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:
   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
6. In the **Timeout** section, select the **Clear line on data timeout** checkbox and in the **Timeout** field, enter or select an amount of time in seconds before a line is cleared when the data has timed out.
7. Select **OK**.

   The **Captioning DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

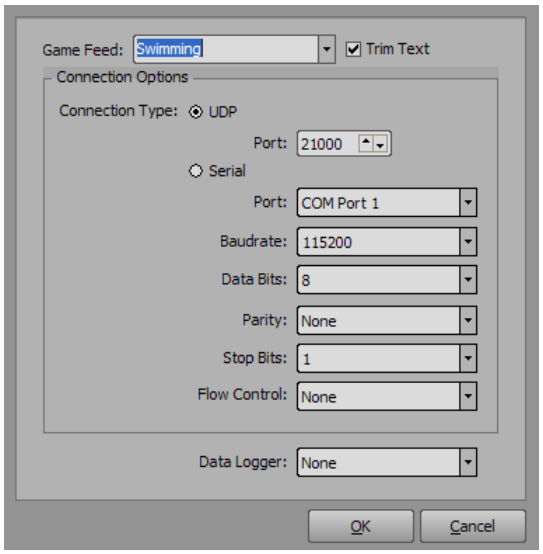
Colorado Time Systems Scoreboards DataLinq Source

Follow these instructions to configure a Colorado Time Systems Scoreboards DataLinq source.

To configure a Colorado Time Systems Scoreboard DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Colorado Time Systems Scoreboard DataLinq Source** and then select **OK**.

   The **Colorado Time Systems Linq - Configuration** dialog opens.



2. Select the **Trim Text** checkbox to remove extra spaces from the feed.
3. In the **Connection Options** section, use the **Connection Type** options to select the connection to the Colorado Time Systems device:

   UDP — use a UDP port as the connection type and configure the following.

   Serial — use a serial port as the connection type and configure the following.
4. If **UDP** was selected, in the **Port** field, enter or select the UDP port number for the Colorado Time Systems device.

   OR

   If **Serial** was selected, use the **Serial** section to configure the GPI settings for the serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

5. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

6. Select **OK**.

   The **Colorado Time Systems Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

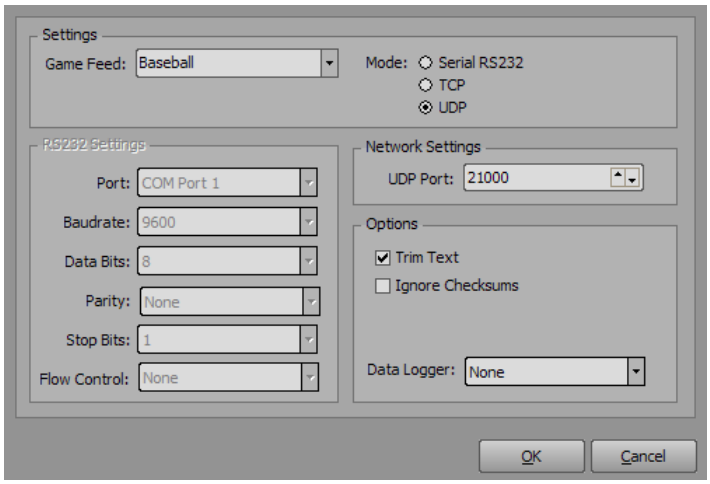
Daktronics DataLinq Source

Follow these instructions to configure a Daktronics DataLinq source.

To configure a DakTronics DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Daktronics DataLinq Source** and then select **OK**.

   The **Daktronics TV Feed - Configuration** dialog opens.



2. In the **Settings** section, from the **Game Feed** drop-down, select a Daktronics sports feed.

   The available sports feeds are:

   - **Baseball**
   - **Basketball (Rev 0)**
   - **Basketball (Rev 1)**
   - **Basketball (Rev 2)**
   - **Football**
   - **Football (Legacy protocol)**
   - **Hockey**
   - **Lacrosse**
   - **Soccer (Rev 1)**
   - **Soccer (Rev 2)**
   - **Volleyball**

3. Select a **Mode** for the Daktronics feed:

   The options are:

   - **Serial RS232** — use a serial RS232 port as the connection type.
   - **TCP** — use a TCP port as the connection type.
   - **UDP** — use a serial UDP port as the connection type.

4. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

   ★**Flow Control** can be set to **Hardware**, **Software**, or **None**, but it must be set the same in both XPression and the transmitting device.

OR

If **TCP** or **UDP** is selected in the **Settings** section, use the **Network Settings** section to configure the port settings for the connection:

The options are:

- **TCP** — enter or select the **TCP Port** number for the connection to the Daktronics DataLinq source.
- **UDP** — enter or select the **UDP Port** number for the connection to the Daktronics DataLinq source.

5. In the **Options** section, select the **Trim Text** checkbox to remove extra spaces from the feed.
6. Select the **Ignore Checksums** checkbox to ignore the block of data that detects errors occurring during transmission.
7. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
8. Select **OK**.

   The **Daktronics TV Feed - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

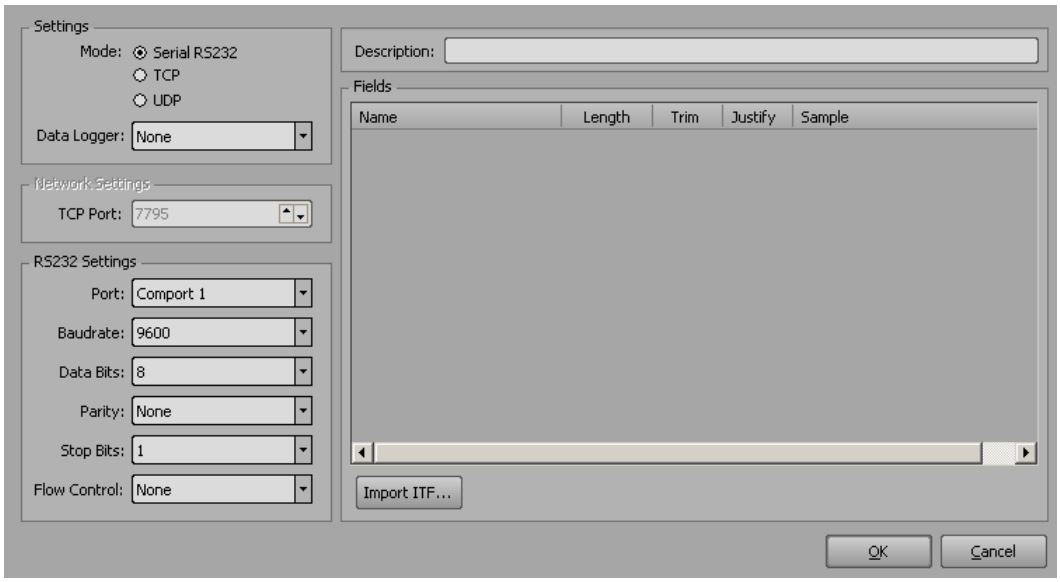
Daktronics RTD DataLinq Source

Follow these instructions to configure a Daktronics RTD DataLinq source.

To configure a Daktronics RTD DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Daktronics RTD DataLinq Source** and then select **OK**.

   The **Daktronics RTD DataLinq Setup** dialog opens.



2. In the **Settings** section, use the **Mode** radio buttons to select the Daktronics RTD DataLinq connection type.

   The options are:

   - **Serial RS232** — use an RS232 serial GPI port as the connection type.
   - **TCP** — use a TCP port as the connection type.
   - **UDP** — use a UDP port as the connection type.

3. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

OR

If **TCP** or **UDP** is selected in the **Settings** section, use the **Network Settings** section to configure the port settings for the connection:

- **TCP** — enter or select the **TCP Port** number for the connection to the Daktronics RTD DataLinq.
- **UDP** — enter or select the **UDP Port** number for the connection to the Daktronics RTD DataLinq.

4. In the **Description** field, enter a brief name or descriptor for the data source.
5. Select **Import ITF** to import a Daktronics .itf interface file to populate the data.

   The **Fields** table is populated with the data from the interface file.
6. Click inside the **Trim** row and then select the checkbox to remove extra spaces from the data.
7. Select **OK**.

   The **Daktronics RTD DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

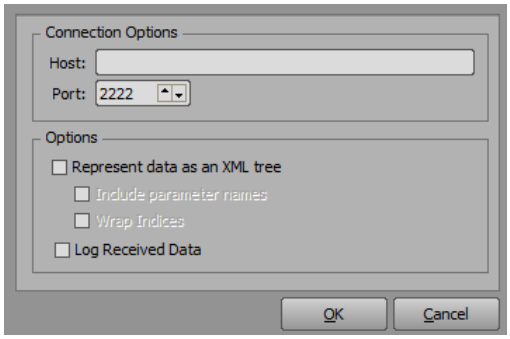
DashBoard DataLinq Source

Follow these instructions to configure a DashBoard DataLinq source.

To configure a DashBoard DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **DashBoard DataLinq Source** and then select **OK**.

   The **DashBoard Linq - Configuration** dialog opens.



2. In the **Connection Options** section, in the **Host** field, enter the IP address of the DashBoard DataLinq database.
3. In the **Port** field, enter the port number for the DashBoard DataLinq database.
4. In the **Options** section, select the **Represent data as an XML tree** checkbox to represent the data as an XML tree structure and allow DataLinq keys and normal XML searching.
   - Select the **Include parameter names** checkbox to include the parameter names in the data.
   - Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits. This checkbox should be selected when using looping queries.
5. Select the **Log Received Data** checkbox to collect the received data in the XPression DataLinq Server logs.

   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.
6. Select **OK**.

   The **DashBoard Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

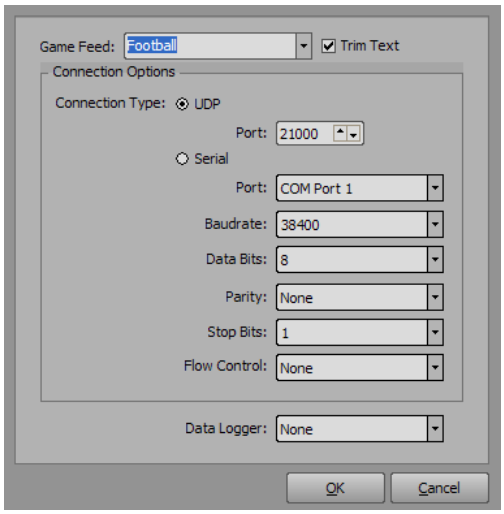
Electro-Mech Scoreboards DataLinq Source

Follow these instructions to configure an Electro-Mech Scoreboards DataLinq source.

To configure an Electro-Mech Scoreboards DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Electro-Mech Scoreboards DataLinq Source** and then select **OK**.

   The **Electro Mech Linq - Configuration** dialog opens.



2. From the **Game Feed** drop-down, select an Electro-Mech sports feed.

   The available sports feeds are:

   - **Football**
   - **Hockey - Lacrosse**
   - **Basketball**

3. Select the **Trim Text** checkbox to remove extra spaces from the feed.
4. In the **Connection Options** section, select a **Connection Type**:
   - **UDP** — use a UDP port as the connection type and configure the following.
   - **Serial** — use a serial port as the connection type and configure the following.
5. If **UDP** is selected as the **Connection Type**, in the **Port** field, enter or select the UDP port number for the Electro-Mech device.

   OR

   If **Serial** is selected as the **Connection Type**, use the **Serial Settings** section to configure the GPI settings for the serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

6. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

7. Select **OK**.

   The **Electro-Mech Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

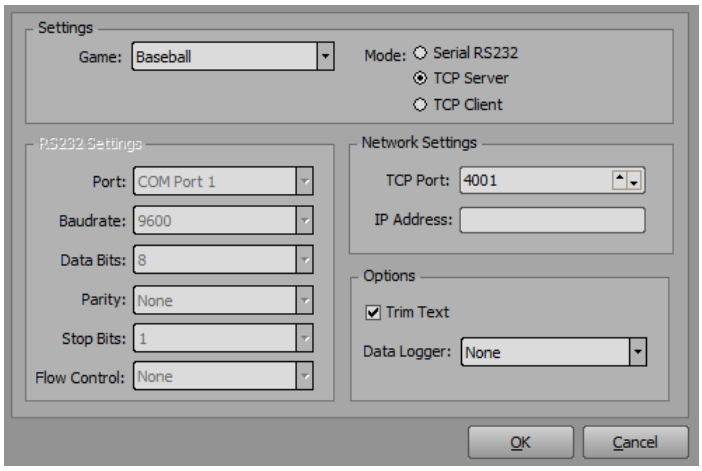
FairPlay DataLinq Source

Follow these instructions to configure a FairPlay DataLinq source.

To configure a FairPlay DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **FairPlay DataLinq Source** and then select **OK**.

   The **FairPlay Linq - Configuration** dialog opens.



2. In the **Settings** section, from the **Game** drop-down, select a FairPlay game feed.

   The options are:

   - **Baseball**
   - **Basketball**
   - **Football**
   - **Hockey**
   - **Lacrosse**
   - **Soccer**
   - **Volleyball**
   - **Wrestling**

3. Select a connection **Mode**.

   The options are:

   - **Serial RS232** — use an RS232 serial GPI port as the connection type.
   - **TCP Server** — have the DataLinq Server listen for a connection from a remote client.
   - **TCP Client** — connect to a remote server listening and waiting for connections.

4. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

OR

If **TCP Server** or **TCP Client** is selected in the **Settings** section, use the **Network Settings** section to configure the port settings and IP address for the connection:

- **TCP Port** — enter or select the **TCP Port** number for the connection to the FairPlay DataLinq.
- **IP Address** — enter the IP address of the FairPlay DataLinq source.

5. In the **Options** section, select the **Trim Text** checkbox to remove extra spaces from the feed.
6. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
7. Select **OK**.

   The **FairPlay Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

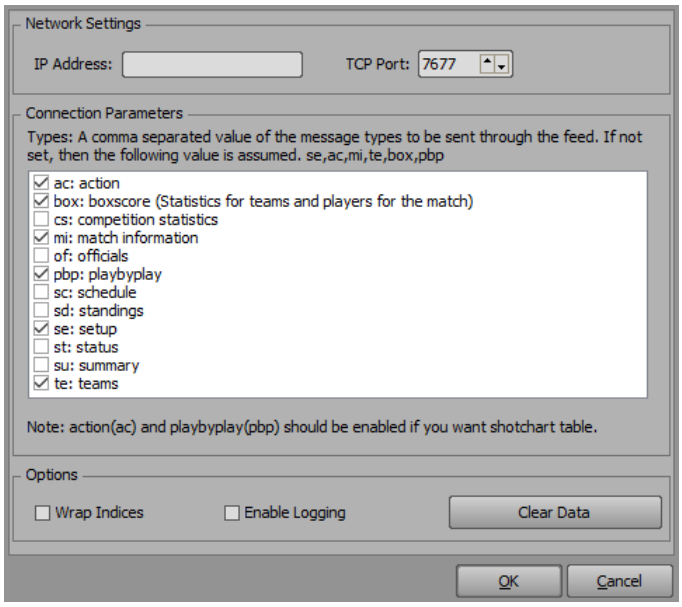
Genius Sports InArena DataLinq Source

Follow these instructions to configure a Genius Sports InArena DataLinq source.

To configure a Genius Sports InArena DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Genius Sports InArena DataLinq Source** and then select **OK**.

   The **Genius Sports InArena DataLinq Setup** dialog opens.



2. In the **Network Settings** section, in the **IP Address** field, enter the IP address of the Genius Sports InArena data source.
3. In the **TCP Port** field, enter or select the TCP port number for the connection to the Genius Sports InArena data source.
4. In the **Connection Parameters** section, select the checkbox or checkboxes for the message types to be sent through the feed.

   The default selections are **ac** (action), **box** (boxscore), **mi** (match information), **pbp** (playbyplay), **se** (setup), and **te** (teams).

5. In the **Options** section, select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries.

6. Select the **Enable Logging** checkbox to record the info in the **DataLinq Server Log**.
7. Select **OK**.

   The **Genius Sports InArena DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

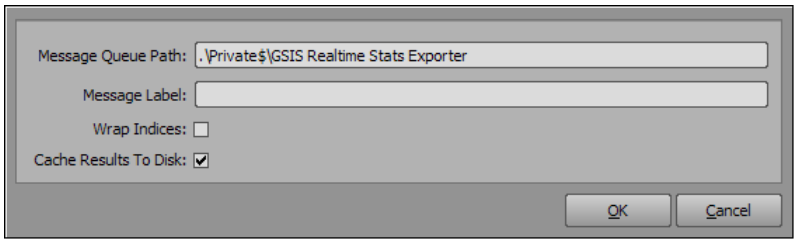
GSIS DataLinq Source

Follow these instructions to configure a GSIS DataLinq source.

To configure a GSIS DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **GSIS DataLinq Source** and then select **OK**.

   The **GSIS Linq - Configuration** dialog opens.



2. In the **Message Queue Path** field, enter the full pathname of the message queue folder.

   It is essential that the **Message Queue Path** matches the information sent from GSIS.

3. In the **Message Label** field, enter a name for the message queue.
4. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries.

5. Select the **Cache Results To Disk** checkbox to cache query results to disk.

   This checkbox should be selected when using looping queries.

6. Select **OK**.

   The **GSIS Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

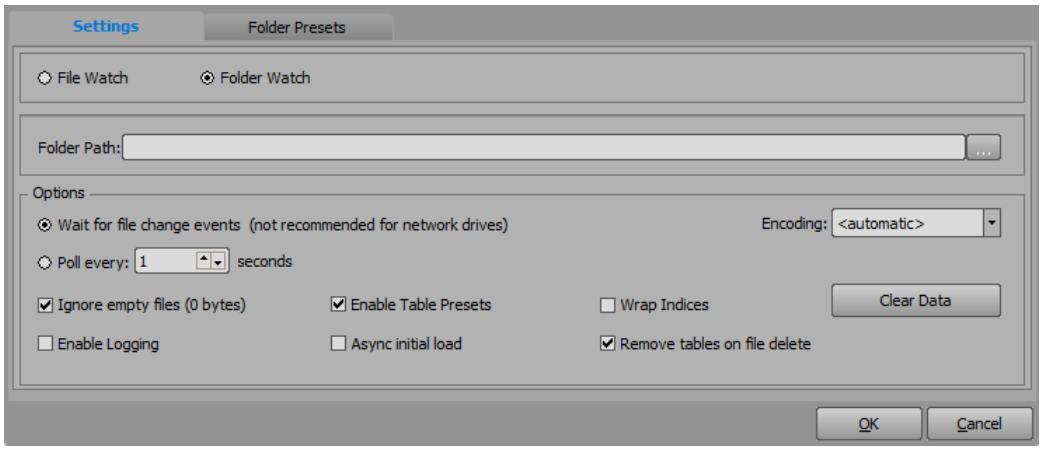
JSON DataLinq Source

Follow these instructions to configure a JSON DataLinq source.

To select a DataLinq source file or folder:

1. From the **Add DataLinq Source** dialog, select the **JSON DataLinq Source** and then select **OK**.

   The **JSON Linq - Configuration** dialog opens



2. Select **File Watch** to select a single DataLinq source file.

   OR

   Select **Folder Watch** to select a DataLinq source folder.

   Use this option when you have many files to monitor. The system will auto-create tables for each JSON file found.

3. If **File Watch** was selected in Step 2, in the **File Path** field, enter the full path of the JSON file that contains the data for the DataLinq source, or select **Browse** (...) to locate and open the JSON file.

   OR

   If **Folder Watch** was selected in Step 2, in the **Folder Path** field, enter the full path of the folder containing the JSON data files, or select **Browse (...)** to locate and open the folder.

To configure the DataLinq Source Options:

1. In the **Options** section, select one of the following radio buttons to determine when to check for JSON source file changes:

   Wait for file change events — update when the JSON source file is updated. This is not recommended for network drives.

   Poll every — select and enter a time interval in seconds at which to poll the JSON source file for any updates or changes.

2. From the **Encoding** drop-down, select a file encoding standard.

   The options are:

   - **<automatic>** — UTF-8, UTF-16-BE, and UTF-16-LE are automatically detected (with or without BOM). When no BOM is present, UTF-8 will be selected. BOM stands for Byte Order Mark and is a special sequence of bytes placed at the beginning of a text file to automatically detect BOM signatures and select the correct encoding.
   - **ASCII**
   - **UTF-8**
   - **UTF-16-BE**
   - **UTF-16-LE**
   - **ISO-8859**
   - **UCS2**

3. Select the **Ignore empty files (0 bytes)** checkbox to ignore empty files from the text source and retain the previous data.

   This will also apply to files filled with invalid characters.

4. Select the **Enable Table Presets** checkbox to use the **Table Presets** tab to configure a list of preset tables that will be available in the **Table** drop-down option when browsing for data.

5. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries.

6. Select the **Enable Logging** checkbox to record the JSON DataLinq info in the **XPression DataLinq Server** logs.

   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.

7. If **Enable Logging** is selected, select **Clear Data** to clear the accumulated data.

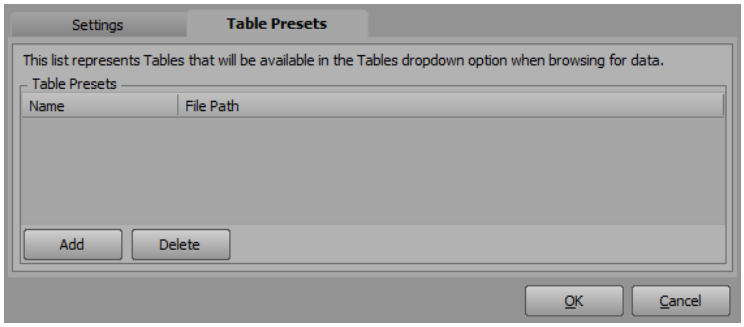
8. If **Folder Watch** is selected, the following additional settings appear:

   - **Async initial load** — select this option when the folder contains a large number of files and you do not need all the data to be available immediately on startup.
   - **Remove tables on file delete** — select this option to automatically remove tables when the source files for them are deleted.

To configure table presets:

1. If **Enable Table Presets** and **File Watch** have been selected, select the **Table Presets** tab to configure the list of table presets from a JSON DataLinq source.

   The **Table Presets** tab opens.



2. In the **Table Presets** tab, select **Add** to add a table preset to the list and configure the following:

   Name — enter a name for the table preset.

   Path — enter the path that will be used as a filter to match the streamed data.

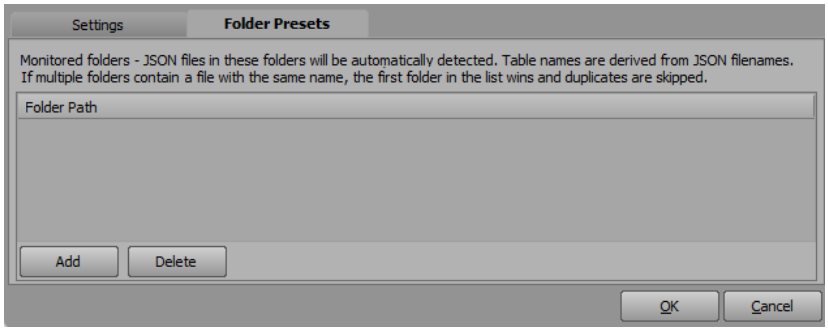
3. Select **OK**.

   The **JSON Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To configure folder presets:

1. If **Enable Table Presets** and **Folder Watch** have been enabled, select the **Folder Presets** tab to configure a list of folders containing JSON DataLinq source files.

   The **Folder Presets** tab opens.



2. In the **Folder Presets** tab, select **Add** and in the blank field that is added, select **Browse...** to navigate to and select the folder containing the JSON DataLinq source files.

   ★Multiple folders can be mapped here. However, if multiple folders contain a file with the same name, the file from the first folder in the list will be used and duplicates are skipped.

3. Select **OK**.

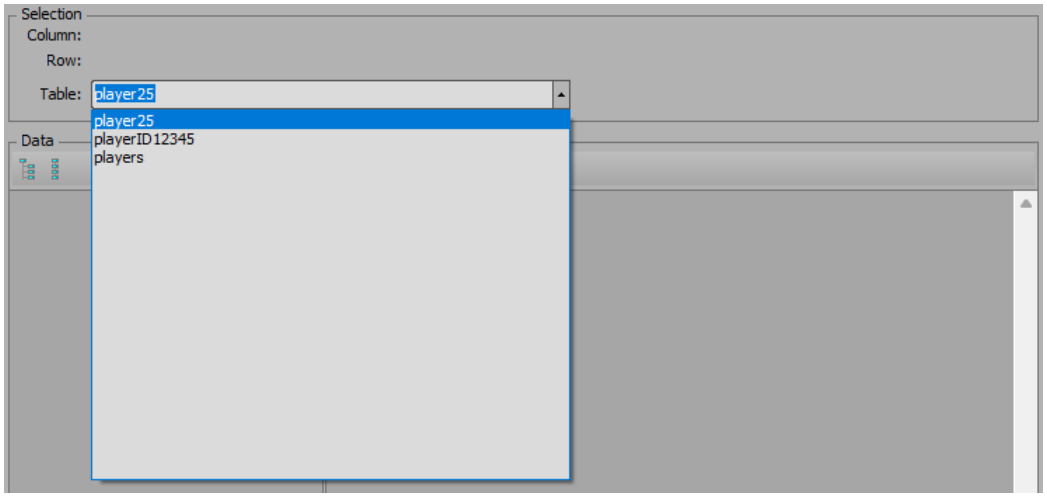
   The **JSON Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

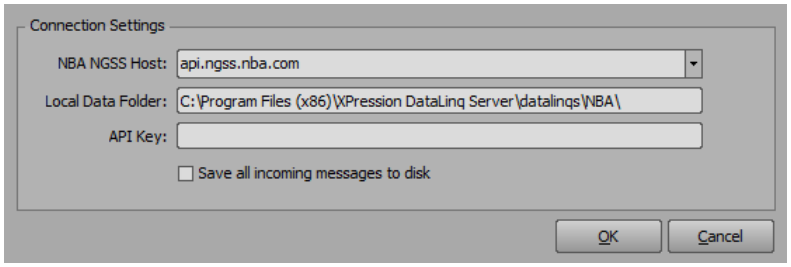
NBA NGSS DataLinq Source

Follow these instructions to configure an NBA NGSS DataLinq Source.

To configure an NBA NGSS DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **NBA NGSS DataLinq Source** and then select **OK**.

   The **Genius Live Stream Linq - Configuration** dialog opens.



2. In the **Connection Settings** section, from the **NBA NGSS Host** drop-down, select the host URL for the DataLinq connection.

   The options are:

   - **api.ngss.nba.com**
   - **api-uat.ngss.nba.com**

3. In the **Local Data Folder** field, enter the path to a local folder in which to store the data.

   The default location is **C:\Program Files\XPressionStudio\DataLinqServer\DataLinqs**.

4. In the **API Key** field, enter an API key to communicate with the NBA NGSS host from XPression.

   The API key is generated by the NBS NGSS host.

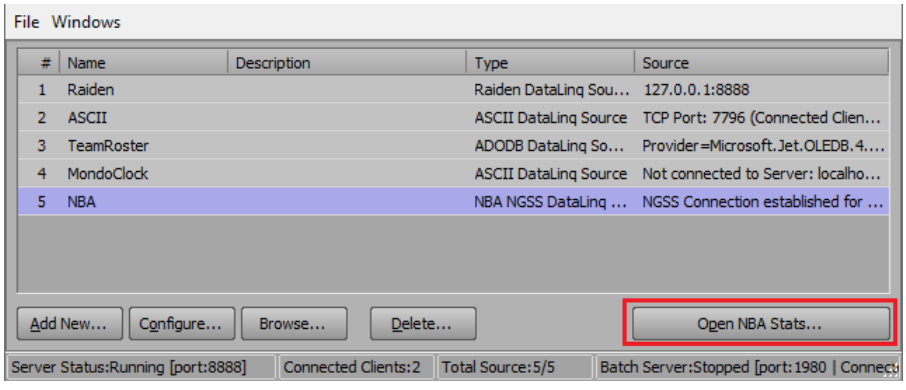
5. Select the **Save all incoming messages to disk** checkbox to store all incoming messages from the NBA NGSS host to the specified **Local Data Folder**.

6. Select **OK**.

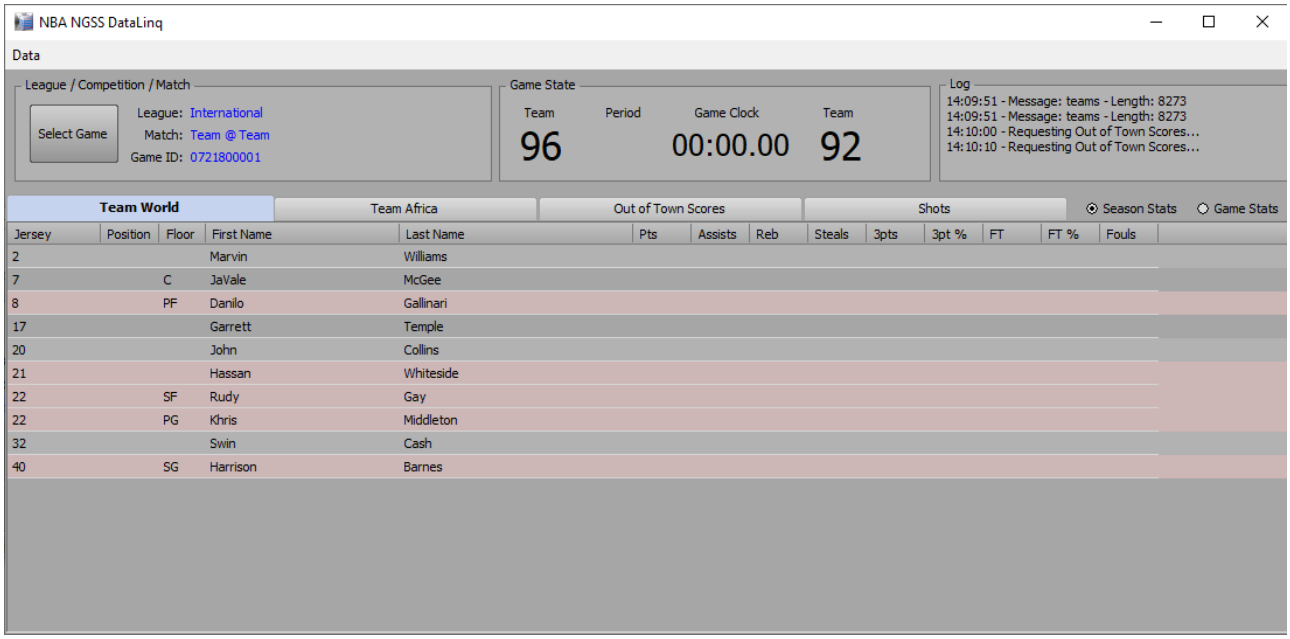
   The **Genius Live Stream Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To select a specific game to stream:

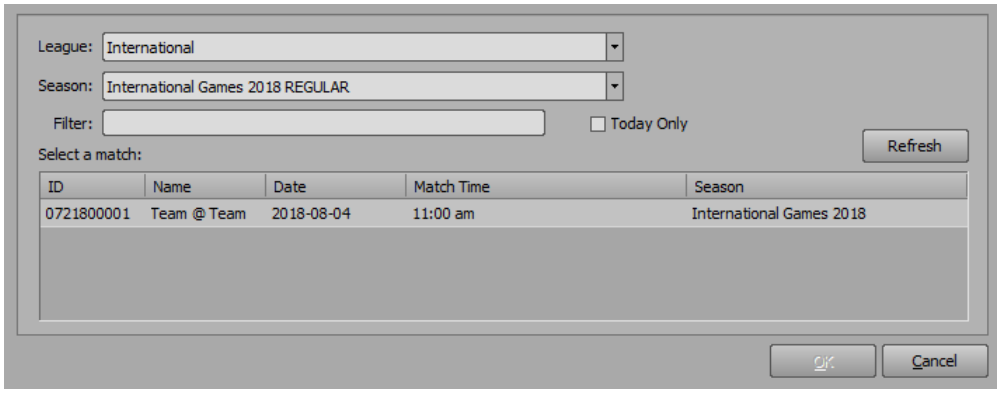
1. After configuring the **Genius Live Stream** data source, with the data source selected, in the **XPression DataLinq Server**, select **Open NBA Stats**.



   The **NBA NGSS DataLinq** dialog opens, with the last selected match displayed.

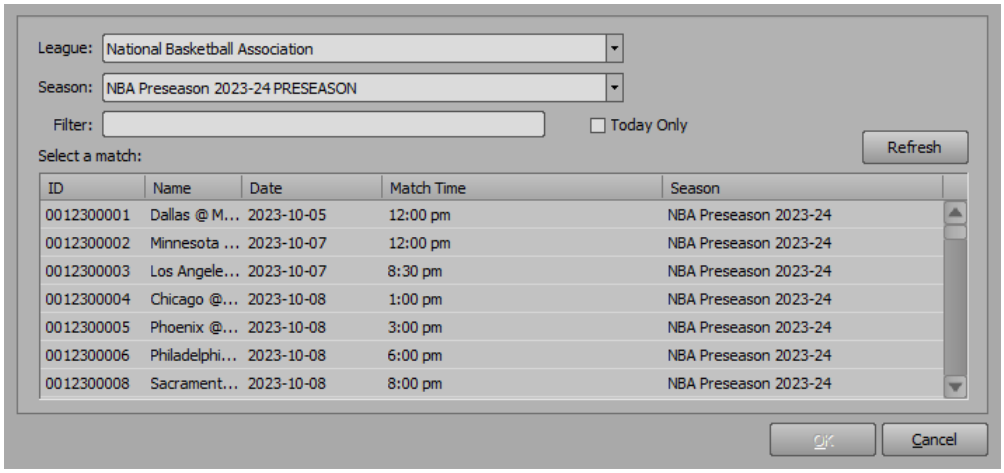


2. In the **League / Competition / Match** section, press the **Select Game** button.
3. The **Select a Match** dialog opens.



4. From the **League** drop-down, select the league for which you want to stream data.
5. From the **Season** drop-down, select the season for which you want to stream data.

   A list of the games in that competition is generated.



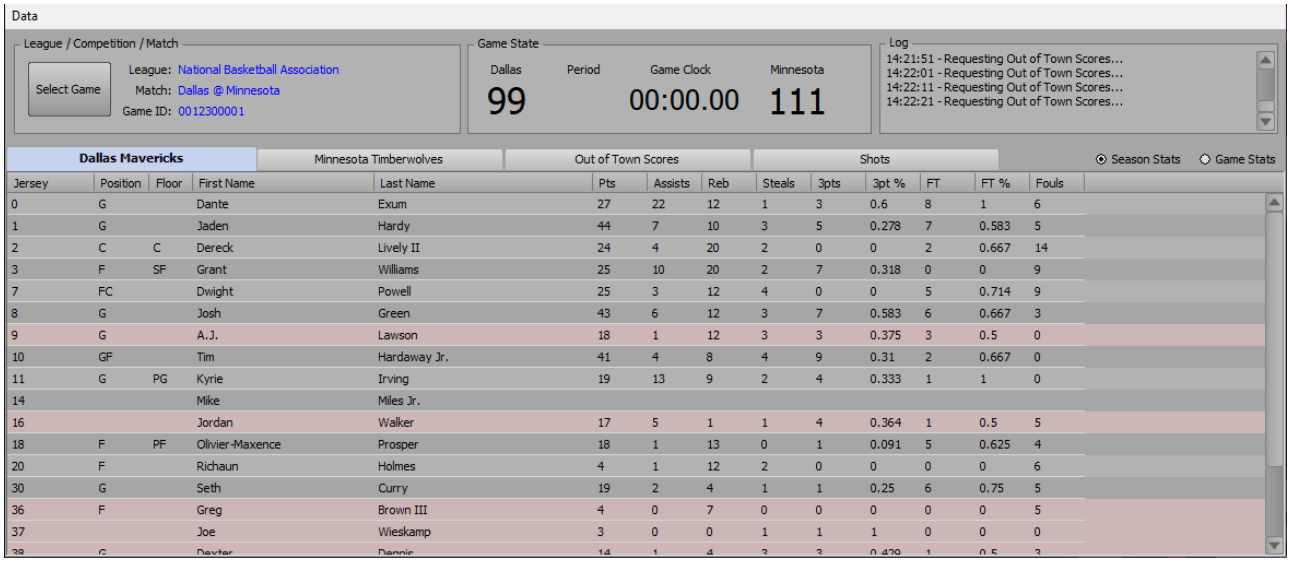
6. Select the game you want to stream from the list.

   Alternatively, in the **Filter** field, begin entering the **Match ID** or **Match Time** values, if known, to select the game.

7. Select the **Today Only** checkbox to limit the results to the current day's games or clear it, to get results from previous days.

8. Select **OK** to generate the results.

   The results appear in the lower half of the dialog.



Jersey	Position	Floor	First Name	Last Name	Pts	Assists	Reb	Steals	3pts	3pt %	FT	FT %	Fouls
0	G		Dante	Exum	27	22	12	1	3	0.6	8	1	6
1	G		Jaden	Hardy	44	7	10	3	5	0.278	7	0.583	5
2	C	C	Dereck	Lively II	24	4	20	2	0	0	2	0.667	14
3	F	SF	Grant	Williams	25	10	20	2	7	0.318	0	0	9
7	FC		Dwight	Powell	25	3	12	4	0	0	5	0.714	9
8	G		Josh	Green	43	6	12	3	7	0.583	6	0.667	3
9	G		A.J.	Lawson	18	1	12	3	3	0.375	3	0.5	0
10	GF		Tim	Hardaway Jr.	41	4	8	4	9	0.31	2	0.667	0
11	G	PG	Kyrie	Irving	19	13	9	2	4	0.333	1	1	0
14			Mike	Miles Jr.									
16			Jordan	Walker	17	5	1	1	4	0.364	1	0.5	5
18	F	PF	Olivier-Maxence	Prosper	18	1	13	0	1	0.091	5	0.625	4
20	F		Richaun	Holmes	4	1	12	2	0	0	0	0	6
30	G		Seth	Curry	19	2	4	1	1	0.25	6	0.75	5
36	F		Greg	Brown III	4	0	7	0	0	0	0	0	5
37			Joe	Wieskamp	3	0	0	1	1	1	0	0	0
38	G		Dexter	Dennis	14	1	4	3	3	0.429	1	0.5	3

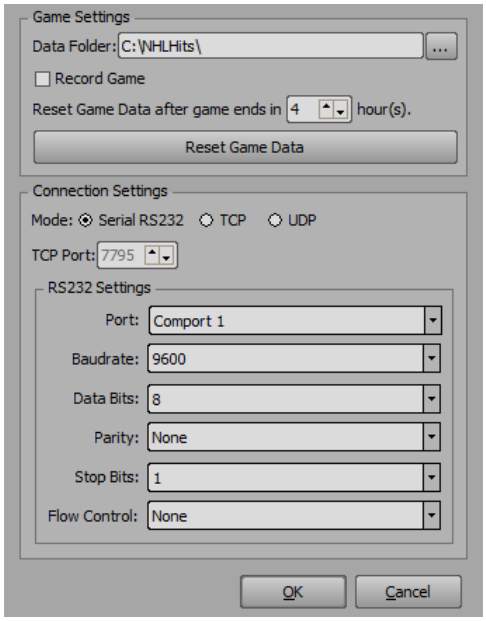
NHL Hits DataLinq Source

Follow these instructions to configure an NHL Hits DataLinq source.

To configure an NHL Hits DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **NHL Hits DataLinq Source** and then select **OK**.

   The **NHL Hits DataLinq Setup** dialog opens.



2. In the **Game Settings** section, accept the default **Data Folder** location or select the **Browse (...)** button to select a different folder location.
3. Select the **Record Game** checkbox to record the incoming game stream.
4. In the **Reset Game Data after game ends in** field, enter the number of hours post-game, after which the game data can be reset.

   OR

   To reset the game data immediately, select the **Reset Game Data** button.
5. In the **Connection Settings** section, select the connection **Mode**.

   The options are:

   - **Serial RS232** — use a serial RS232 port as the connection type.
   - **TCP** — use a TCP port as the connection type.
   - **UDP** — use a serial UDP port as the connection type.

6. If **Serial RS232** is selected in the **Connection Settings**, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

   OR

   If **TCP** or **UDP** is selected in the **Connection Settings**, in the **TCP Port** (or **UDP Port)** field, enter the port number for the connection to the data source.

7. Select **OK**.

   The **NHL Hits DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

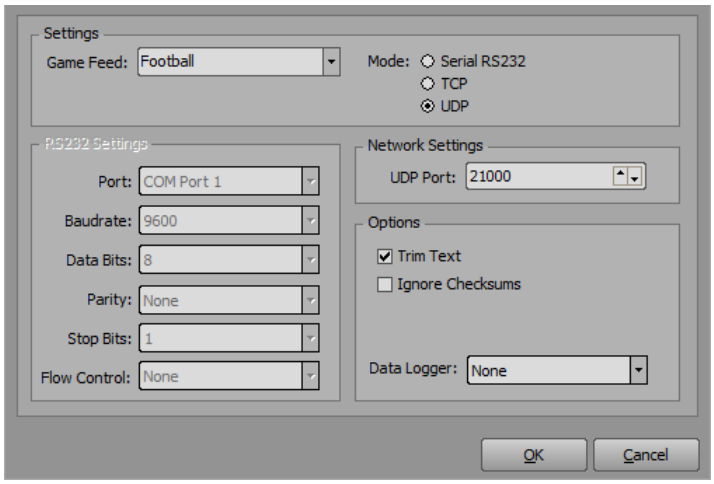
OES Scoreboards DataLinq Source

Follow these instructions to configure an OES Scoreboards DataLinq source.

To configure an OES Scoreboards DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **OES Scoreboards DataLinq Source** and then select **OK**.

   The **OES Linq - Configuration** dialog opens.



2. In the **Settings** section, from the **Game Feed** drop-down, select a sports feed.

   The available feeds are:

   - **Baseball ISC9000Pro**
   - **Baseball ISC9000Std**
   - **Baseball Model7929**
   - **Basketball**
   - **Field Hockey**
   - **Football**
   - **Hockey**
   - **Lacrosse (with 4 penalties feeds)**
   - **Soccer**
   - **Volleyball**
   - **Wrestling**

3. Select a connection **Mode** for the OES feed.

   The options are:

   - **Serial RS232** — select to use a serial RS232 port as the connection type.
   - **TCP** — select to use a TCP port as the connection type.
   - **UDP** — select to use a serial UDP port as the connection type.

4. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

OR

If **TCP** or **UDP** is selected in the **Connection Settings**, in the **TCP Port** (or **UDP Port**) field, enter the port number for the connection to the data source.

5. In the **Options** section, select the **Trim Text** checkbox to remove extra spaces from the feed.
6. Select the **Ignore Checksums** checkbox to ignore the block of data that detects errors occurring during transmission.
7. Select the **OES supports game time over 99 mins** checkbox to allow for soccer games that run over 99 minutes (OES soccer game feed only).
8. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
9. Select **OK**.

   The **OES Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

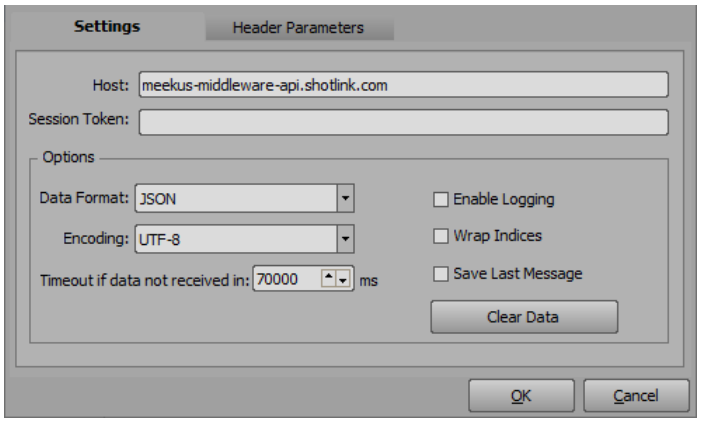
PGA Meekus WebSocket DataLinq Source

Follow these instructions to configure a PGA Meekus WebSocket DataLinq source.

To configure a PGA Meekus WebSocket DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **PGA Meekus WebSocket DataLinq Source** and then select **OK**.

   The **PGA Meekus WebSocket DataLinq Setup** dialog opens.



2. In the **Settings** tab, in the **Session Token** field, enter the unique Session ID for the particular tournament you have chosen from the PGA Meekus Portal.
3. In the **Options** section, from the **Encoding** drop-down, select the encoding protocol to use.

   The options are:

   - **<automatic>** — select this option to automatically detect the protocol.
   - **UTF-8**
   - **UTF-16 BE**
   - **UTF-16 LE**
   - **ISO-8859**
   - **UCS2**
   - **ASCII**
4. In the **Timeout if data not received in** field, enter or a select a time in milliseconds to time out the query if data has not been received in the specified amount of time.
5. Select the **Enable Logging** checkbox to record the JSON DataLinq info in the **XPression DataLinq Server** logs.

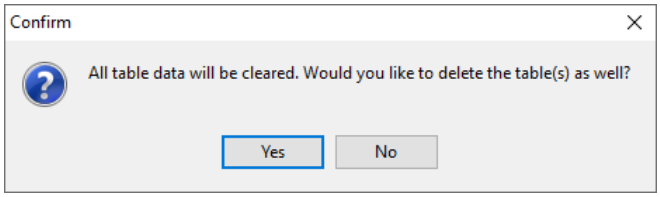
   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**.

   This option is mainly used for debugging.
6. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries.
7. Select the **Save Last Message** checkbox to restore the last received message for a table if the **XPression DataLinq Server** is restarted.

8. If **Enable Logging** is selected, select **Clear Data** to clear the accumulated data.

   A confirmation dialog opens asking if you want to also delete the tables.



9. Select **Yes** to delete any tables.

To configure the required header parameters:

1. Select the **Header Parameters** tab.
2. In the **Custom Header Parameters** section, in the **Name** field, enter the host name.
3. In the **host Value** field, enter the host URL.
4. In the second row, in the **Name** field, enter `x-api-key`.
5. In the **x-api-key Value** field, enter the api key provided by the Meekus Portal or representative.

To configure custom header parameters:

1. Select **Add** to add a custom header parameter to the list.
2. In the **Name** field, enter the header parameter name.
3. In the **Value** field, enter the header parameter value.

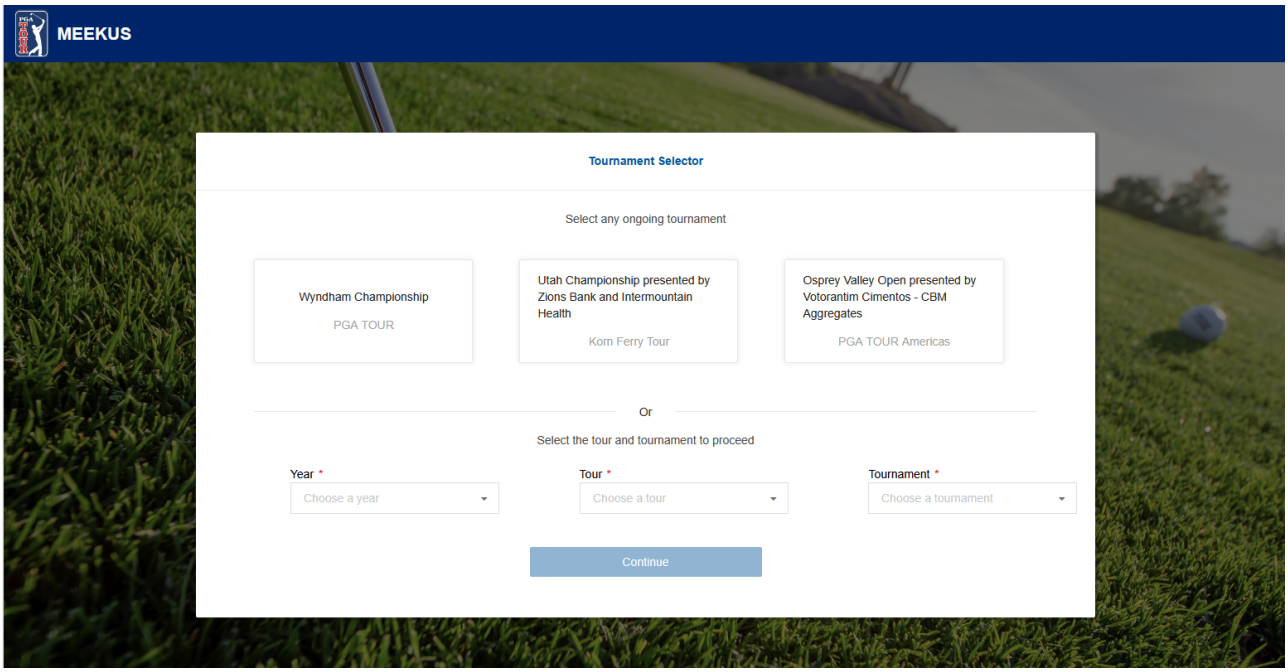
To delete a parameter:

- Select the parameter in the list and then select **Delete**.

To access the PGA Meekus game feed:

1. In a web browser, go to https://pgatour.onelogin.com/login.
2. Enter your login credentials and answer the security questions.

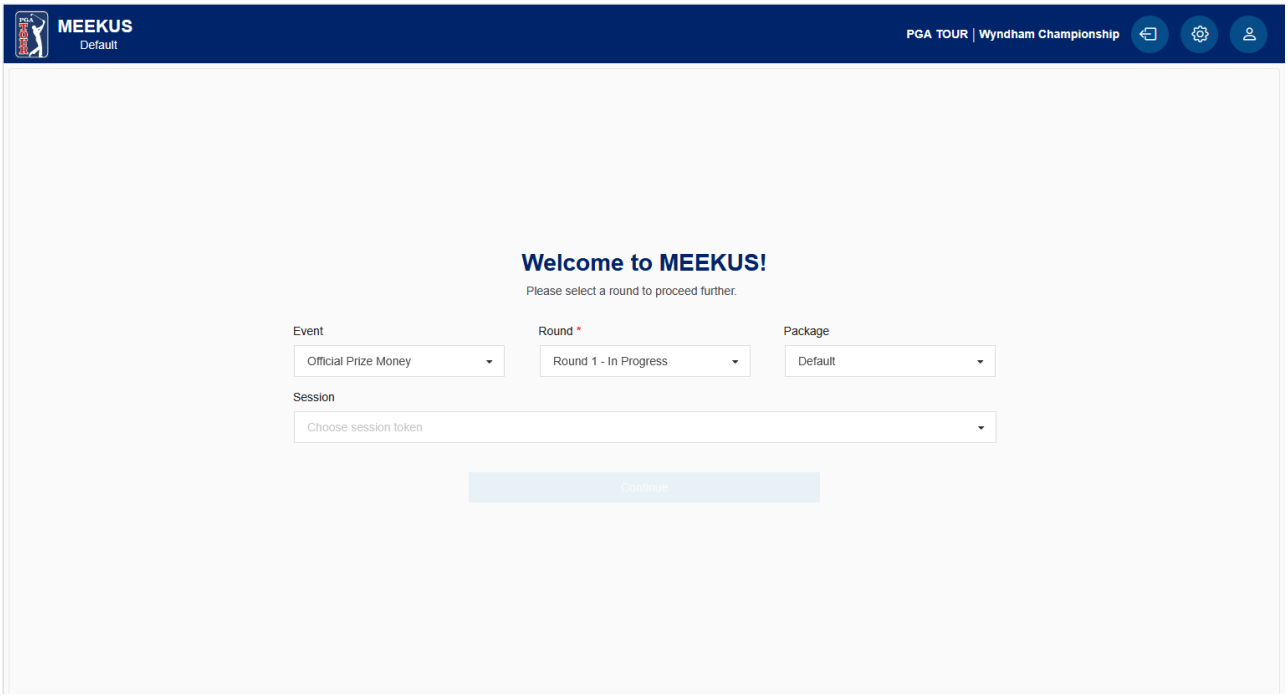
   The **PGA Meekus Tournament Selector** page opens.



PGA Meekus Tournament Selector

3. Select a tournament.

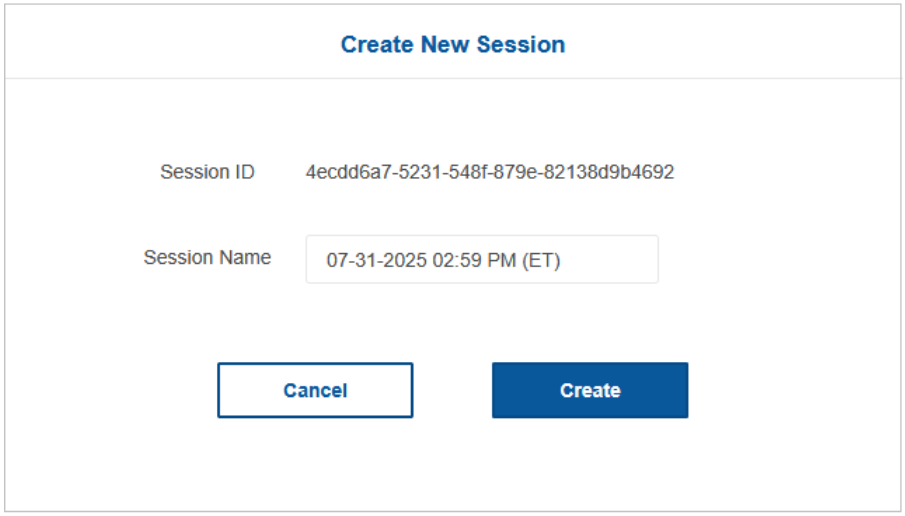
   The selected tournament welcome page opens.



PGA Meekus Tournament Welcome Page

4. In the **Welcome** page, do the following:
   - From the **Event** drop-down, select the competition you want to stream.
   - From the **Round** drop-down, select the round of the competition you want to stream.
   - From the **Package** drop-down, select Ross Xpression.
   - From the **Session** drop-down, select **Create new session**.

     The **Create New Session** page opens.



PGA Meekus - Create New Session

5. In the **Session Name** field, enter a name for the session and select **Create**.

   You will be returned to the **Welcome** page.

6. Select **Continue**.

   The **PGA Meekus Leaderboard** UI opens.

7. Place your cursor over the user icon in the top-right corner and from the menu, select the copy icon beside the **Session Token**.



8. Paste this token into the **Session Token** field in the **PGA Meekus WebSocket DataLinq Setup** dialog and select **OK**.

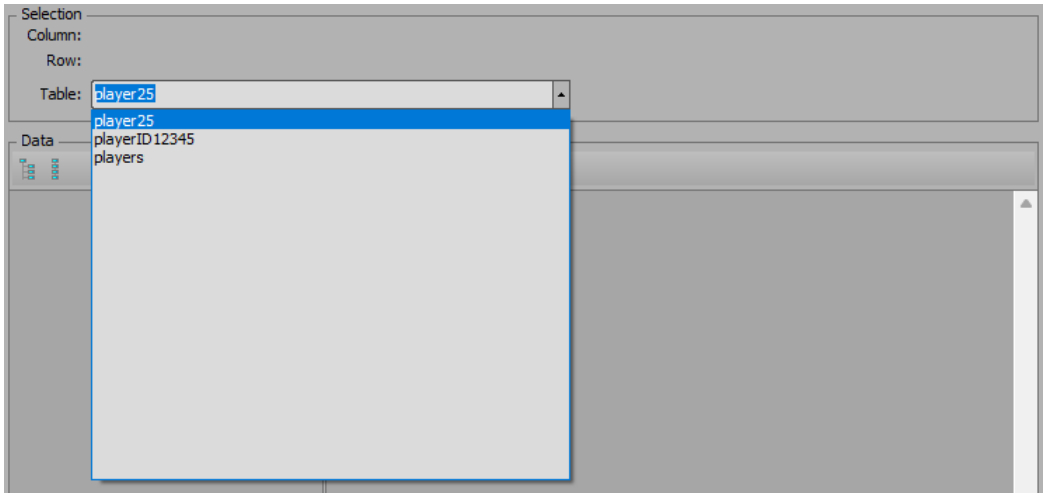
   The **PGA Meekus WebSocket DataLinqSetup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

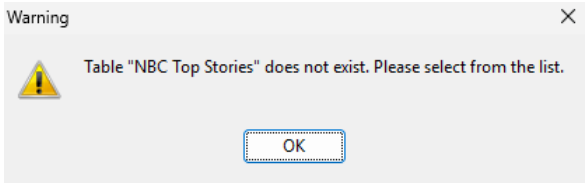
   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

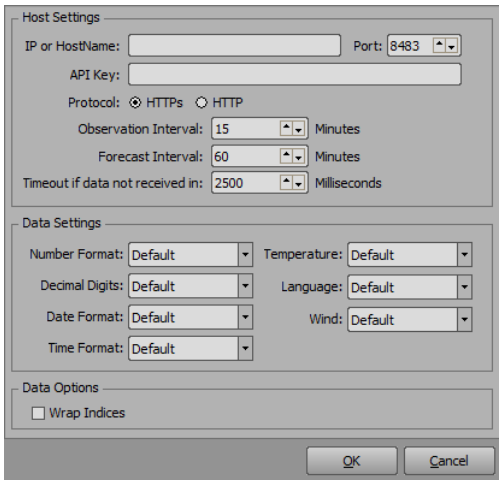
Raiden DataLinq Source

Follow these instructions to configure a Raiden DataLinq source.

To configure a Raiden DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Raiden DataLinq Source** and then select **OK**.

   The **Raiden DataLinq - Configuration** dialog opens.



2. In the **Host Settings** section, configure the following:
   - In the **IP or HostName** field, enter the IP address or **Host Name** of the Raiden DataLinq server.
   - In the **Port** field, enter the port number on which XPression will communicate with the Raiden DataLinq server.
   - In the **API Key** field, enter the API key of the Raiden DataLinq server.
   - Select a **Protocol**, either HTTPs or HTTP.
   - In the **Observation Interval** field, enter the intervals (minimum of 5 minutes) at which observation data should be retrieved.
   - In the **Forecast Interval** field, enter the intervals (minimum of 30 minutes) at which forecast data should be retrieved.
   - In the **Timeout if data not received in** field, enter the number of milliseconds after which the request should time out if data is not received.
3. In the **Data Settings** section, accept the **Default** settings (the settings configured in the Raiden DataLinq server) or configure the settings as needed for your purpose:
   - From the **Number Format** drop-down, select a format to define the thousand and decimal separator character, either a comma or a period.
   - From the **Decimal Digits** drop-down, select a format to define the number of digits following the decimal separator.

- From the **Date Format** drop-down, select a format to define how the date is expressed.

  The options are:

  - **DD/MM/YY**
  - **MM/DD/YY**

- From the **Time Format** drop-down, select whether to use a **12H** or **24H** time format.
- From the **Temperature** drop-down, select whether to express temperature in **Fahrenheit**, **Celsius**, or **Kelvin**.
- From the **Language** drop-down, select the language to use for the data.

  The options are:

  - **English**
  - **Spanish**
  - **French**
  - **Italian**
  - **Icelandic**

- From the **Wind** drop-down, select how to express wind speed.

  The options are:

  - **Kilometers per Hour**
  - **Miles per Hour**
  - **Meters per Second**
  - **Knots**

4. In the **Data Options** section, select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries.

5. Select **OK**.

   The **Raiden DataLinq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

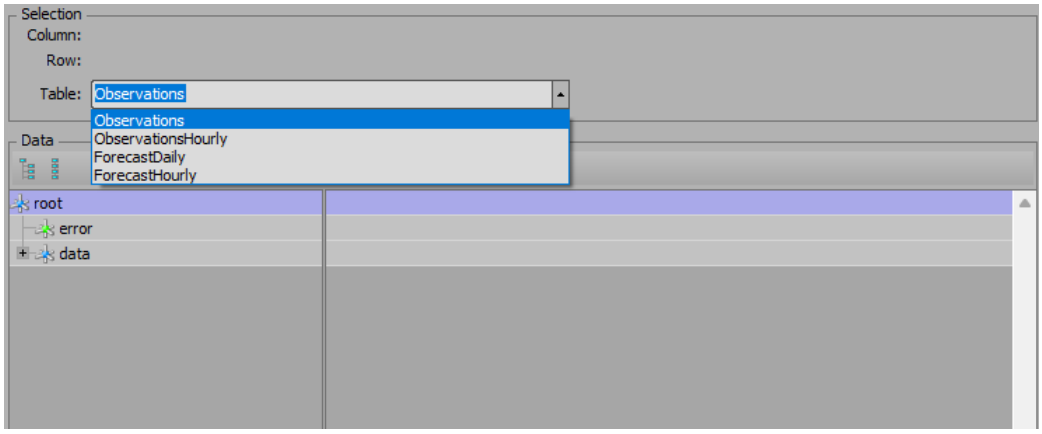
To view data:

1. In the XPression DataLinq Server, select the Raiden DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.

3. In the **Table** field, type the first character of the name of the table preset you want to view.

A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

RSS / HTTP DataLinq Source

Follow these instructions to configure an RSS / HTTP DataLinq source.

You can configure a multi-data request (a single query to contain multiple values) using Dynamic URL.

Example:

Query from Voyager

```
<packet type="u" id="8346">
<l n="Northwind_HTTPS_Freight>300">
<r o="2754934762240402036600000A44BD68C88" t=" " N="2" m="3">
<mr r="1" c="ShipCity"/>
<mr r="1" c="ShipPostalCode"/>
<mr r="1" c="ShipCountry"/>
<params/>
</r>
</l>
</packet>
```

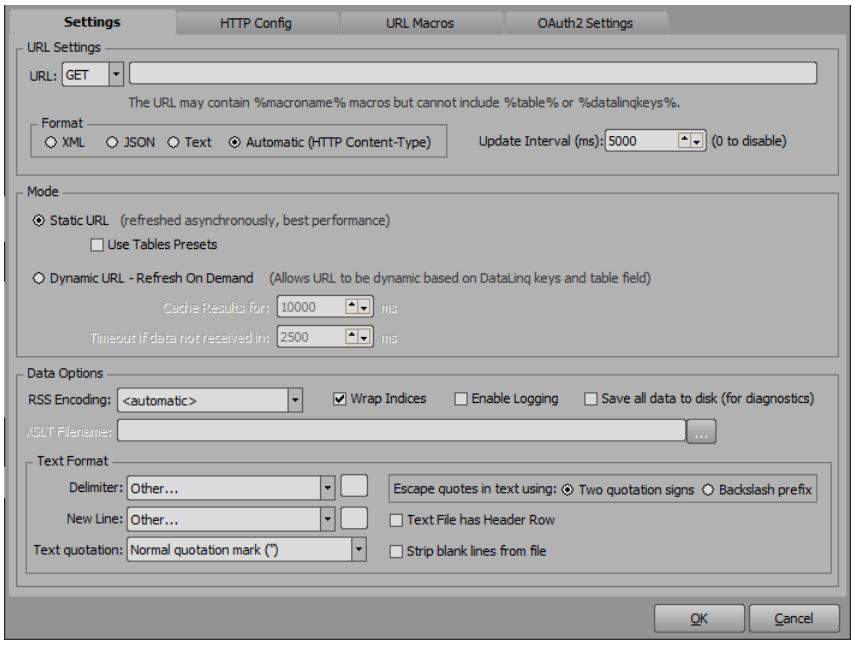
RSS/HTTP Dynamic URL Response

```
<packet type="r" id="8346">
<l n="Northwind_HTTPS_Freight>300">
<d mr="3" o="2754934762240402036600000A44BD68C88" s="1">
<r>Salzburg</r>
<r>5020</r>
<r>Austria</r>
</d>
</l>
</packet>
```

To configure an RSS / HTTP DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **RSS / HTTP DataLinq Source** and then select **OK**.

   The **RSS / HTTP DataLinq - Configuration** dialog opens.



2. In the **URL Settings** section, configure the following:
   - From the **URL** drop-down, select the request type.

     The options are:

     - **GET** — retrieve data
     - **POST** — add new data
   - In the **URL** field, enter the URL or macro used to access the RSS feed.
   - Select a data **Format** to read from the RSS feed:

     The options are:

     - **XML** — read XML sources.
     - **JSON** — read HTTP-based JSON sources.
     - **Text** — read RSS / HTTP text sources.
     - **Automatic (HTTP Content-Type)** — automatically detect XML versus JSON data based on the HTTP Content-Type header.
   - In the **Update Interval** field, enter or select the number of milliseconds to wait between RSS feed update checks.
3. In the **Mode** section, select a mode for the RSS / HTTP DataLinq.

   The options are:

   - **Static URL** — use the RSS feed of a single URL as entered in the URL settings. It is refreshed asynchronously.
     - **Use Table Presets** — use the **Table Presets** tab with Static URLs to allow multiple URLs to be queried by the same DataLinq, with each one exposed as a separate table source to XPression. If the base URL contains the %table% then each table preset entry will be substituted into the base URL where the %table% macro exists. If the base URL does not contain %table%, then each table entry must be its own URL to be queried.
   - **Dynamic URL - Refresh on Demand** — use multiple RSS feeds by configuring a dynamic URL based on DataLinq keys and table presets. The results are refreshed on demand.
     - **Cache Results for** — enter or select a time in milliseconds to cache the results of the query.
     - **Timeout if data not received in** — enter or a select a time in milliseconds to time out the query if data has not been received in the specified amount of time.
4. In the **Data Options** section, from the **RSS Encoding** drop-down, select an encoding protocol for RSS feeds.

   The options are:

   - **<automatic> —** select this option to automatically detect the protocol.
   - **UTF-8**
   - **UTF-16-BE**
   - **UTF-16-LE**
   - **ISO-8859**
   - **UCS2**

5. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   Wrap Indices should be selected when using looping queries and is selected by default.

6. Select **Enable Logging** to record data in the **XPression DataLinq Server** logs.

   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**.

   This option is mainly used for debugging.

7. Select the **Save all data to disk (for diagnostics)** checkbox to store all data for diagnostic purposes.

8. If using the XML data format, in the **XSLT Filename** field, enter a file path or select **Browse** (...) to locate and select an XSLT file to use with the XML data.

9. If using a text source, in the **Text Format** section, configure the following:

   - From the **Delimiter** drop-down, select the character used to divide the data values on each line in the text file.

     The options are:

     - **Comma (,)**
     - **Colon (:)**
     - **Semicolon (;)**
     - **Tab**
     - **None**
     - **Other**

     When **Other** is the selected delimiter, enter the delimiter character to use in the field to the right of the drop-down.

   - From the **New Line** drop-down, select the character used in the text file to start a new line.

     The options are:

     - **None**
     - **Break tag "<br>")**
     - **Paragraph "¶**
     - **"**
     - **Carriage Return Line Feed "\CrLf"**
     - **Slash n "{\n}"**
     - **Carat p "^p"**
     - **Other**

     When **Other** is the selected new line, enter the new line character to use in the field to the right of this list.

   - From the **Text Quotation** drop-down, select the character used in the text file to enclose quotations.

     The available characters are as follows:

     - **Normal Quotation Mark (")**
     - **Apostrophe (')**
     - **None**

- Use the **Escape Quotes in Text Using** setting to select the method used to treat quotation marks in the text file as a regular character.

  The options are:

  - **Two Quotation Signs** — treat two quotation marks (“”) as a single quotation mark (“) with no special meaning.
  - **Backslash Prefix** — treat the backslash character followed by a quotation mark (\“) as a single quotation mark (“) with no special meaning.

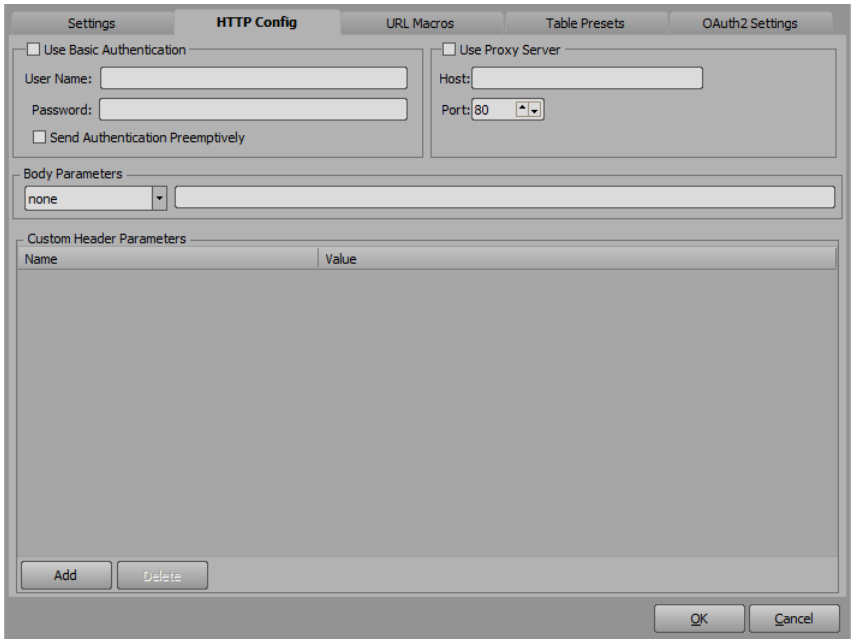
★HTML character entity references are converted to the correct symbol, such as &copy (©) and &reg (®).

- Select the **Text File has Header Row** checkbox to indicate that the first row of data in the text source represents the column names.
- Select the **Strip blank lines from file** checkbox to remove blank lines of text from the text source.

To configure the credentials for an HTTP server:

1. Select the **HTTP Config** tab.

   The **HTTP Config** tab opens.



2. Select **the Use Basic Authentication** checkbox to set a username and password for the DataLinq Source:

   - **User Name** — enter a username for the basic authentication.
   - **Password** — enter a password for the basic authentication.
   - **Send Authentication Preemptively** — sends the authentication prior to the server providing an unauthorized response. This reduces the number of messages required to set up a connection.

   OR

   Select the **Use Proxy Server** checkbox to use a proxy server to connect to the network and then enter the connection info:

   - **Host** — enter the host address of the proxy server.
   - **Port** — enter the port number for the proxy server.

     The default is 80.

3. In the **Body Parameters** section, from the drop-down, select the type of body data to send to the server side to provide additional data:

   - **none (default)** — select this if sending body data is not required.
   - **application/xml** — stores and transports body data in a structured, human-readable format.
   - **application/json** — represents structured body data in a text-based format that is easily read by humans and machines.
   - **text/plain** — content is unformatted and consists of raw body data without any encoding or special formatting.
   - **application/x-www-form** — used by web browsers when submitting form data. It represents the body data as key-value pairs, encoded in a URL-encoded format.

4. If any of the above options except **none** are selected, in the adjacent field, enter an authentication string to be passed in the body parameter, if needed.
5. Use the **Custom Header Parameters** section to configure custom parameters to send to the HTTP server.

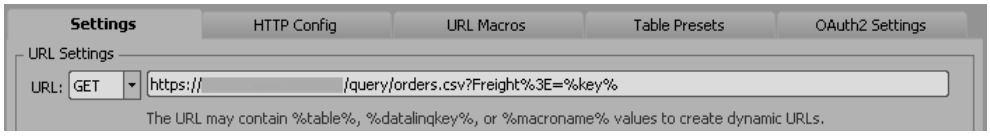
   Select **Add** to add a custom header parameter to the list and configure the following:

   Name — enter a name that describes the value being sent.

   Value — enter the value to send to the HTTP server.

To configure the URL Macros:

1. In the **URL Settings**, enter the URL for the data source using a %macroname% tag.

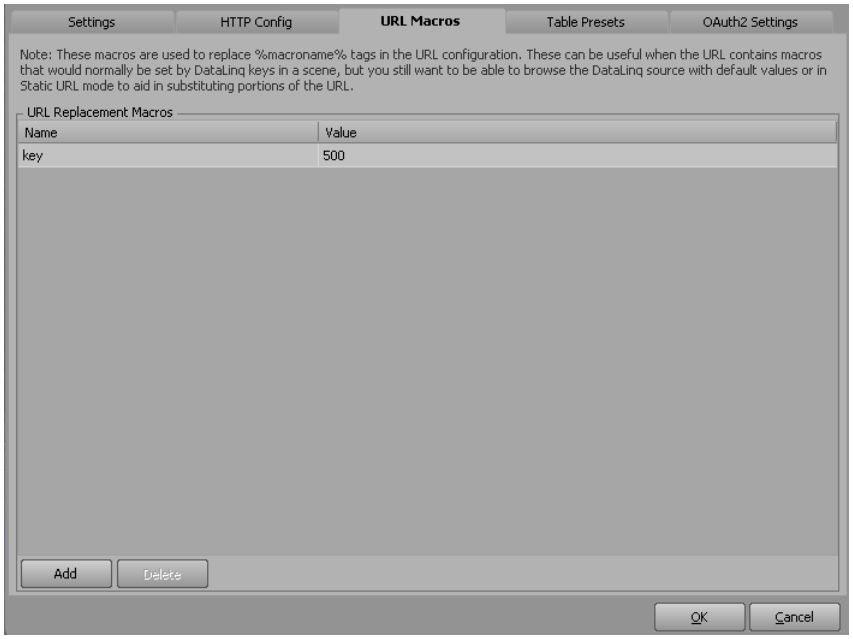


2. Select the **URL Macros** tab to configure macros that replace the %macroname% tags in the URL configuration.

   The **URL Macros** tab opens.

   In **Static URL** mode, the **Browse Data** request returns data based on the **Macro Key** configured when using URL macros.

   Note: A **Macro Key** cannot be used in the same way as a DataLinq key for Static URLs.



3. Select **Add** to add a URL replacement macro to the list and configure the following:

   - **Name** — enter a name for the URL replacement macro (for example, 'feed' if using a news website URL with an RSS feed).
   - **Value** — enter the value of the URL replacement macro (for example, 'world' if a news website URL has an RSS feed for world news).

   OR

   - If a %macroname% (such as %key%) has been entered as part of the URL in the **URL Settings** tab, the %macroname% in the URL will retrieve the information from the data source and add it as the **Value.**

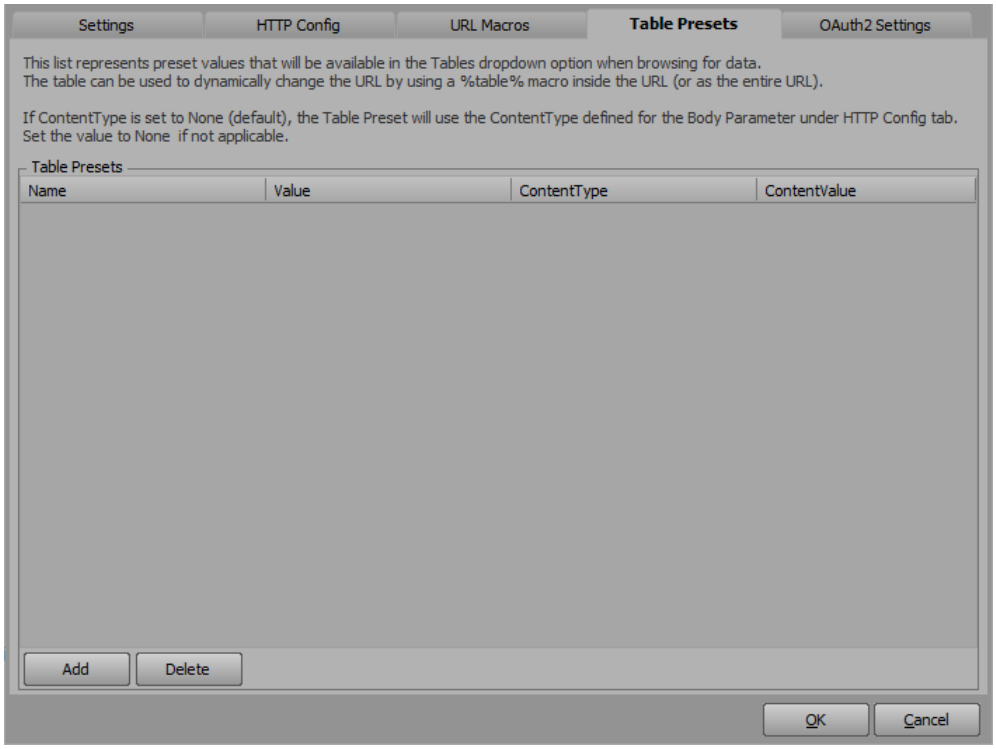
     In this example, the value for the %key% macro is 500).

To configure the Table Presets:

1. Select the **Table Presets** tab to configure URL preset values for the **Table** list in the **Select DataLinq Field** window when using an RSS / HTTP DataLinq with a text object.

   The **Table Presets** tab is available if **Use Table Presets** has been selected in the **Settings** tab.

   The **Table Presets** tab opens.



   The **Table Presets** list represents preset values that are available in the **Table** list when browsing for data. The table can be used to dynamically change the URL by using a %table% macro inside the URL or as the entire URL.

2. Select **Add** to add a table preset to the list and configure the following:

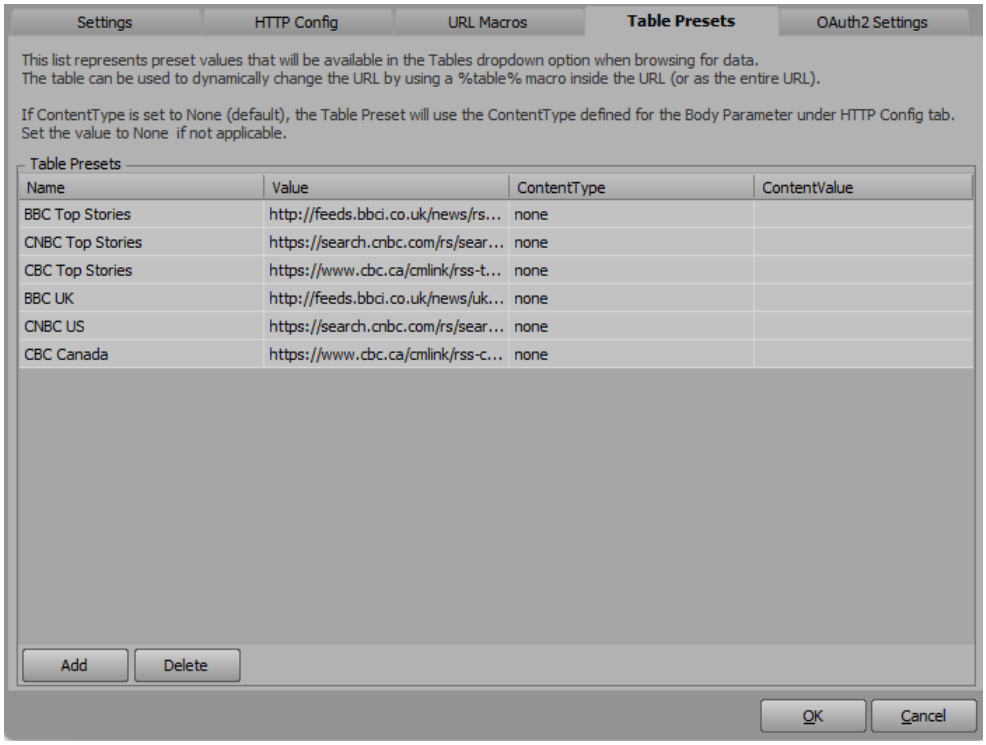
   Name — enter a name for the table preset (for example, 'world' if a news website URL has an RSS feed for world news).

   Value — enter the value of the table preset (for example, the URL of the world news RSS feed from a news website).

   ContentType — enter the data type (for example, application/xml, application/json, text/plain, or application/x-www-form-urlencoded).

   ContentValue — enter the labels/titles to index/parse.

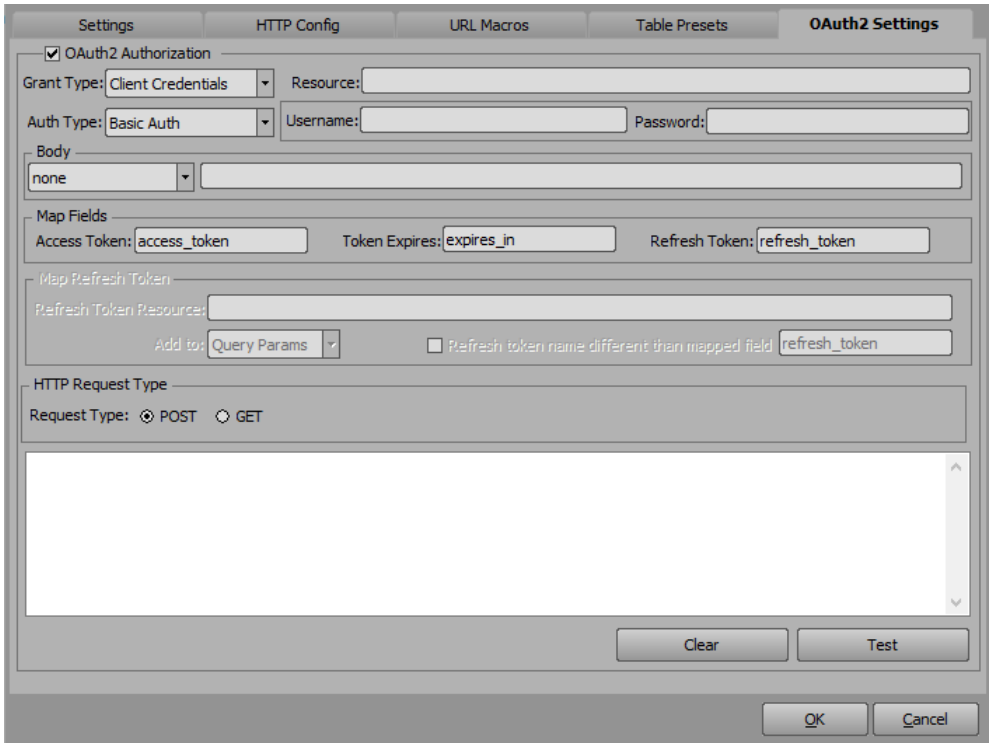
The **Table Presets** list will look similar to the image below.



To configure OAuth2 settings:

1. Select the **OAuth2 Settings** tab to configure OAuth2 protocol for the data source authorization.

   The **OAuth2 Settings** tab opens.



2. Select the **OAuth2 Authorization** checkbox to enable the OAuth2 settings.
3. From the **Grant Type** drop-down, select one of the following OAuth2 authorization granting methods.
   - **Client Credentials** — obtain an access token outside of the context of a user.
   - **Refresh Token** — exchange a refresh token for an access token when the access token has expired.
4. In the **Resource** field, enter the URL of the resource.
5. From the **Auth Type** drop-down, select an authentication method (refer to the documentation of the provider for any required authentication details):
   - **Basic Auth** — use username and password authentication:
     - **Username** — enter the username used for the authentication.
     - **Password** — enter the password used for the authentication.
   - **API Key** — use API key authentication.
     - **Key** — enter the key name used by the API on the server side (for example, apiKey).
     - **Value** — enter the value of the key.
     - **Add to** — select where the API key needs to be passed: as a query parameter (**Query Params**) or in the query header (**Header**).

6. In the **Body** section, from the drop-down, select the type of body data to send to the server side to provide additional data.

   The options are:

   - **none (default)** — select this if sending body data is not required.
   - **application/xml** — stores and transports body data in a structured, human-readable format.
   - **application/json** — represents structured body data in a text-based format that is easily read by humans and machines.
   - **text/plain** — content is unformatted and consists of raw body data without any encoding or special formatting.
   - **application/x-www-form** — used by web browsers when submitting form data. It represents the body data as key-value pairs, encoded in a URL-encoded format.

7. If any of the above options except **none** are selected, in the adjacent field, enter the authentication string to be passed in the body parameter, if needed.
8. In the **Map Fields** section, specify the field name that corresponds to the **Access Token**, **Token Expires**, and **Refresh Token** values in the API server response.
9. If using the **Refresh Token** grant type, in the **Map Refresh Token** section, configure the following:

   - **Refresh Token Resource** — enter the URL of the refresh token resource.
   - **Add to** — select if the refresh token needs to be sent as a query parameter (**Query Params**) or in a query header (**Header**) to regenerate the access token.
   - **Refresh token name different than mapped field** — configure the refresh token field name as expected by the server for the refresh token resource URL.

10. In the **HTTP Request Type** section, select a **Request Type**:

    - **POST** — submit data to be processed by the specified resource.
    - **GET** — retrieve data from the specified resource.

11. In the **HTTP Request Type** field, enter the request.
12. Select the **Clear** button to clear the request results.
13. Select the **Test** button to test if the set configuration for OAuth2 is working or not.

    The result is displayed in the result pane.

14. Select **OK**.

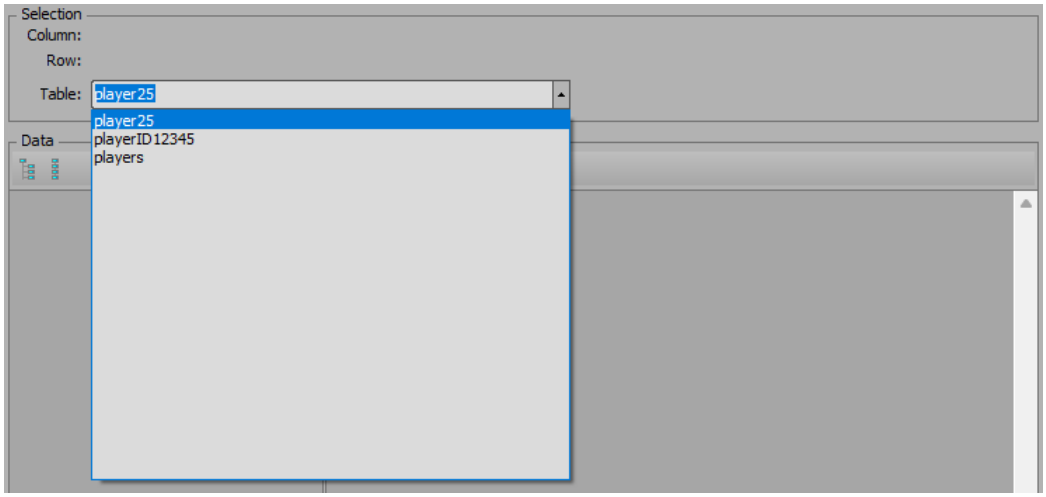
    The **RSS Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

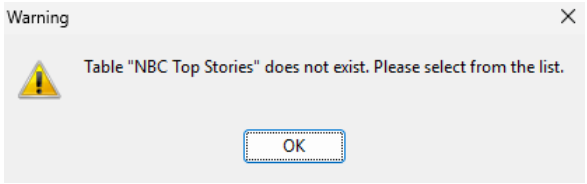
   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

For More Information on...

- using a static URL, refer to Using a Static URL.
- using a dynamic URL, refer to Using a Dynamic URL.
- using default URL macros, refer to Using URL Macros.
- using table presets, refer to Using Table Presets.

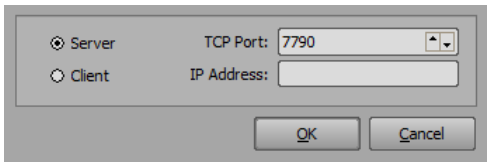
SMT Tennis Umpire Clock DataLinq Source

Follow these instructions to configure an SMT Tennis Umpire Clock DataLinq source.

To configure an SMT Tennis Umpire Clock DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **SMT Tennis Umpire Clock DataLinq Source** and then select **OK**.

   The **SMT Tennis DataLinq Setup** dialog opens.



2. Select one of the following connection options:
   - **Server** — have the DataLinq Server listen for a connection from a remote client.
   - **Client** — connect to a remote server listening and waiting for connections.
3. In the **TCP Port** field, enter or select the **TCP Port** number for the connection to the SMT Tennis DataLinq.
4. In the **IP Address** field, enter the IP address of the SMT Tennis DataLinq client.
5. Select **OK**.

   The **SMT Tennis DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

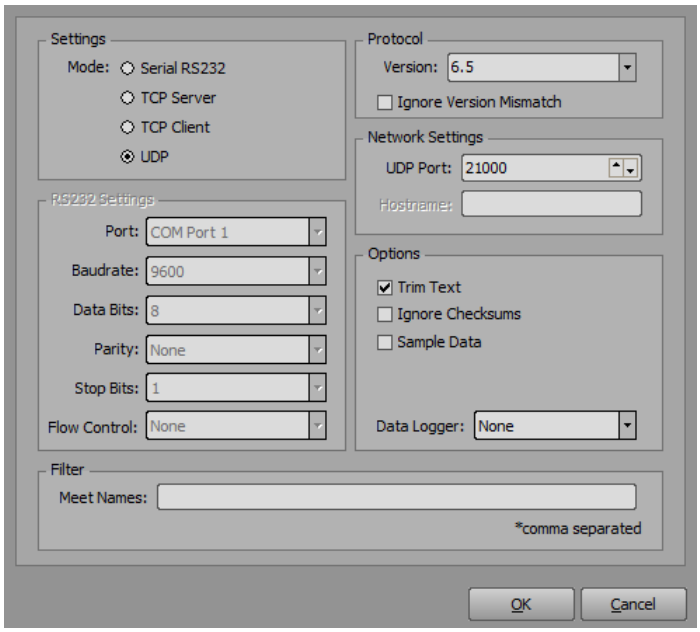
Sportech DataLinq Source

Follow these instructions to configure a Sportech DataLinq source.

To configure a Sportech DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Sportech DataLinq Source** and then select **OK**.

   The **Sportech Linq - Configuration** dialog opens.



2. In the **Settings** section, use the **Mode** radio buttons to select the Sportech DataLinq connection type.

   The options are:

   - **Serial RS232** — use an RS232 serial GPI port as the connection type.
   - **TCP Server** — have the DataLinq Server listen for a connection from a remote client.
   - **TCP Client** — connect to a remote server listening and waiting for connections.
   - **UDP** — listen to UDP broadcasts.

3. If **Serial RS232** is selected in the **Settings** section, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

OR

If **TCP Server**, **UDP**, or **TCP Client** is selected in the **Settings** section, use the **Network Settings** section to configure the port settings for the connection:

- **TCP Server** or **TCP Client** — enter or select the TCP Port number for the connection to the Sportech DataLinq.
- **UDP** — enter or select the UDP Port number for the connection to the Sportech DataLinq.
- If using **TCP Client**, in the **Hostname** field, enter the host name or IP address of the device.

4. In the **Protocol** section, from the **Version** drop-down, select the software version of the Sportech data source.
5. Select the **Ignore Version Mismatch** checkbox to have DataLinq not report errors when there is a mismatch between protocols.
6. In the **Options** section, make the following selections, as needed:
   - Select the **Trim Text** checkbox to remove extra spaces from the feed.
   - Select the **Ignore Checksums** checkbox to ignore the block of data that detects errors occurring during transmission.
   - Select the **Sample Data** checkbox to receive sample data for building projects outside of races.
7. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
8. In the **Filter** section, in the **Meet Names** field, enter the name of the meet for which you want to receive data.

   When receiving data for multiple meet names, separate the names using a comma.
9. Select **OK**.

   The **Sportech Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

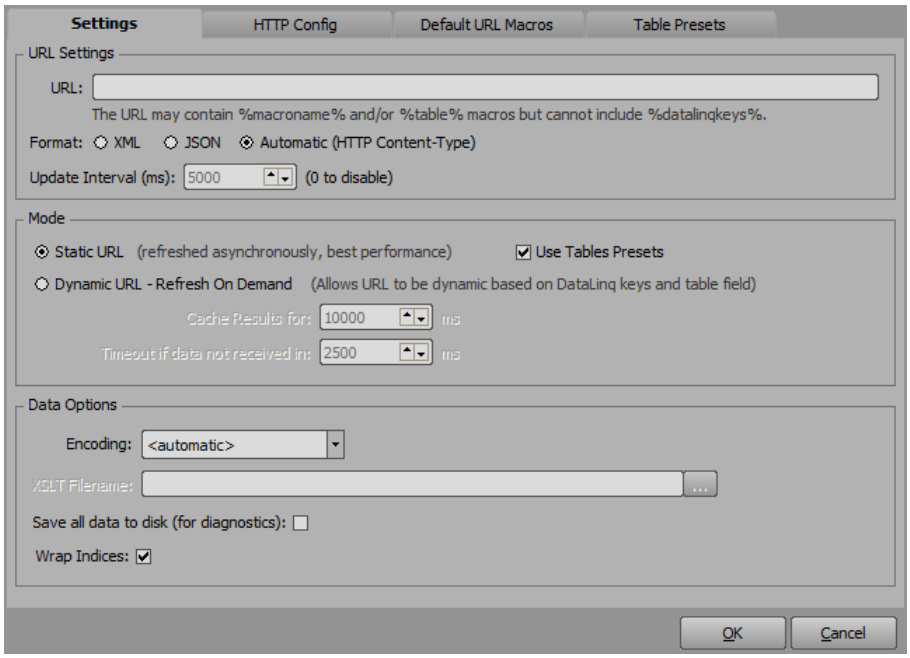
StatsPerform API DataLinq Source

Follow these instructions to configure a Stats Perform API DataLinq source.

To configure the Stats Perform API DataLinq source settings:

1. From the **Add DataLinq Source** dialog, select the **StatsPerform API DataLinq Source** and then select **OK**.

   The **StatsPerform DataLinq - Configuration** dialog opens.



2. In the **Settings** tab, in the **URL Settings** section, in the **URL** field, enter the URL used to access the Stats Perform feed.
3. Select a data Format to read from the Stats Perform feed:
   - **XML** — read XML sources.
   - **JSON** — read HTTP-based JSON sources.
   - **Automatic (HTTP Content-Type)** — automatically detect XML versus JSON data based on the HTTP Content-Type header.
4. In the **Update Interval** field, enter or select the number of milliseconds to wait between Stats Perform feed update checks.
5. In the **Mode** section, select a mode for the RSS / HTTP DataLinq.

   The options are:

   - **Static URL** — use the Stats Perform feed of a single URL as entered in the URL settings. It is refreshed asynchronously.
     - **Use Table Presets** — use the **Table Presets** tab with Static URLs to allow multiple URLs to be queried by the same DataLinq, with each one exposed as a separate table source to XPression.

       If the base URL contains the %table% then each table preset entry will be substituted into the base URL where the %table% macro exists. If the base URL does not contain %table%, then each table entry must be its own URL to be queried.

- **Dynamic URL** — use multiple Stats Perform feeds by configuring a dynamic URL based on DataLinq keys and table presets. The results are refreshed on demand.

  If **Dynamic URL** is selected, configure the following options:

  - **Cache Results for** — enter or select an amount of time in milliseconds to cache the results of the query.
  - **Timeout if data not received in** — enter or a select a time in milliseconds to timeout the query if data has not been received in the specified amount of time.

6. In the **Data Options** section, from the **Encoding** drop-down, select an encoding protocol for Stats Perform feeds.

   The options are:

   - **<automatic> —** select this option to automatically detect the protocol.
   - **UTF-8**
   - **UTF-16-BE**
   - **UTF-16-LE**
   - **ISO-8859**
   - **UCS2**

7. If using the **XML** data format, in the **XSLT Filename** field, enter a file path or select **Browse** (...) to locate and select an XSLT file to use with the XML data.

8. Select the **Save all data to disk (for diagnostics)** checkbox to store all data for diagnostic purposes in the **XPression DataLinq Server** logs.

   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.

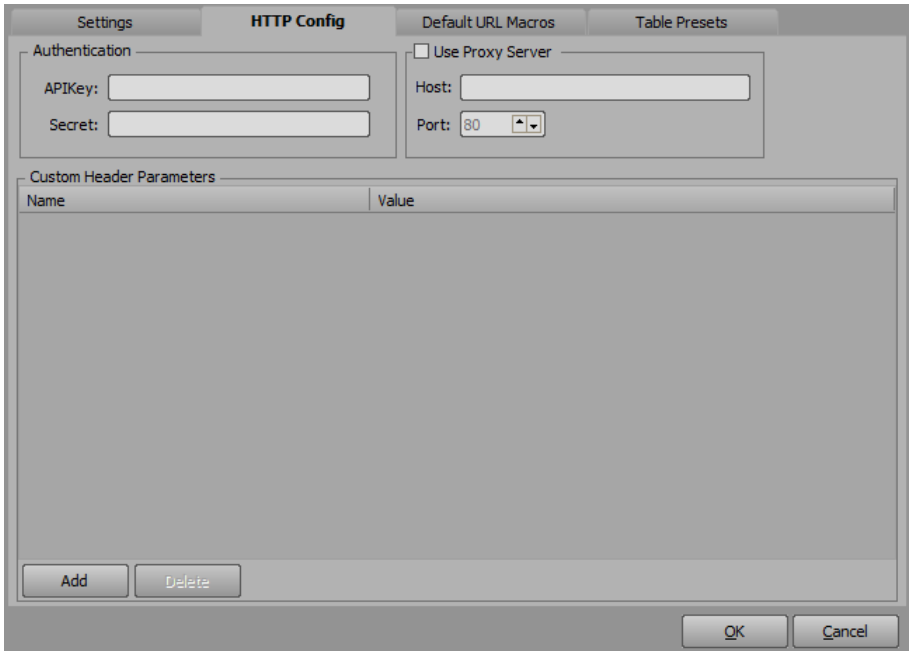
9. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   Wrap Indices should be selected when using looping queries and is selected by default.

To configure the HTTP Config credentials:

1. Select the **HTTP Config** tab.

   The **HTTP Config** tab opens.



2. Select the **Use Basic Authentication** checkbox to set a username and password for the DataLinq Source:

   - **User Name** — enter a username for the basic authentication.
   - **Password** — enter a password for the basic authentication.

   OR

   Select the **Use Proxy Server** checkbox to use a proxy server to connect to the network and then enter the connection info:

   - **Host** — host address of the proxy server.
   - **Port** — port number for the proxy server.

     The default is 80.

3. Use the **Custom Header Parameters** section to configure custom parameters to send to the HTTP server.

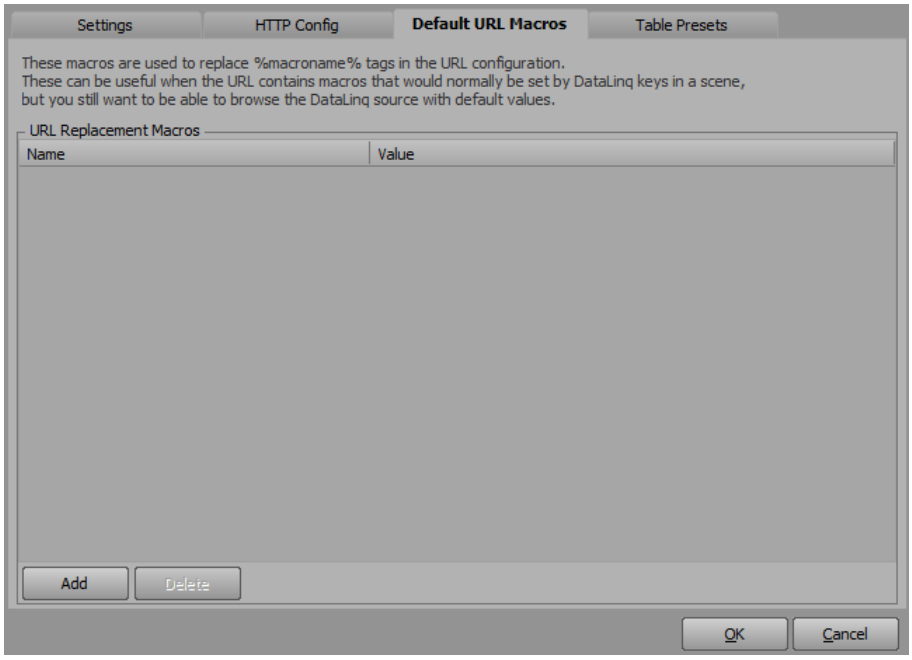
   Select **Add** to add a custom header parameter to the list and configure the following:

   - **Name** — enter a name that describes the value being sent.
   - **Value** — enter the value to send to the HTTP server.

To configure the Default URL Macros:

1. Select the **Default URL Macros** tab to configure macros that replace the %macroname% tags in the URL configuration.

   The **Default URL Macros** tab opens.



   Default URL macros enable browsing of the DataLinq source URL with default values when the URL contains macros that would usually be set by DataLinq keys in a scene.

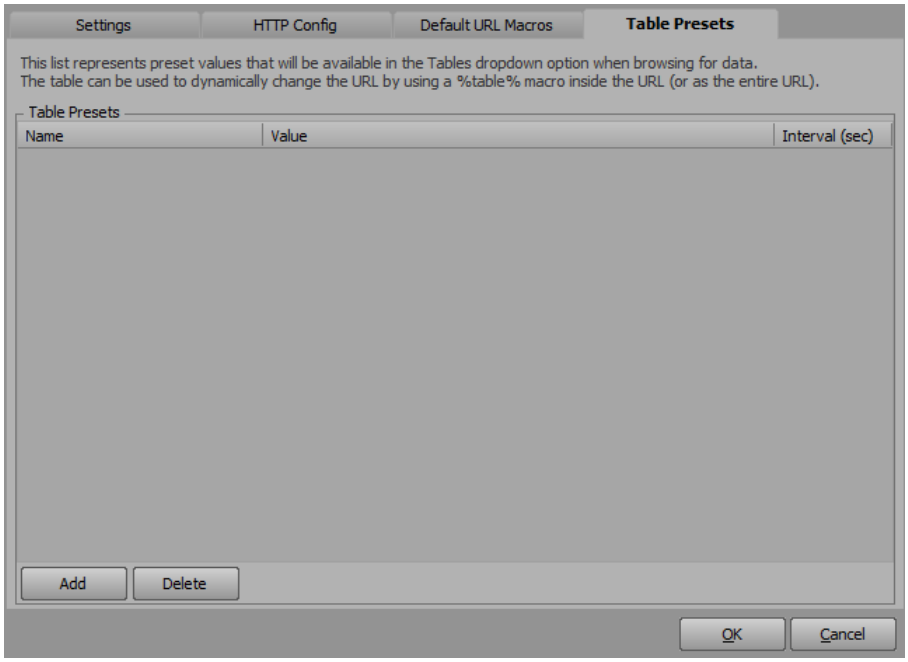
2. Select **Add** to add a URL replacement macro to the list and configure the following:

   - **Name** — enter a name for the URL replacement macro.
   - **Value** — enter the value of the URL replacement macro.

To configure Table Presets:

1. If **Static URL** has been selected in the **Settings** tab, select the **Table Presets** tab to configure URL preset values for the **Table** list in the **Select DataLinq Field** window when using an HTTP DataLinq with a text object.

   The **Table Presets** tab opens.

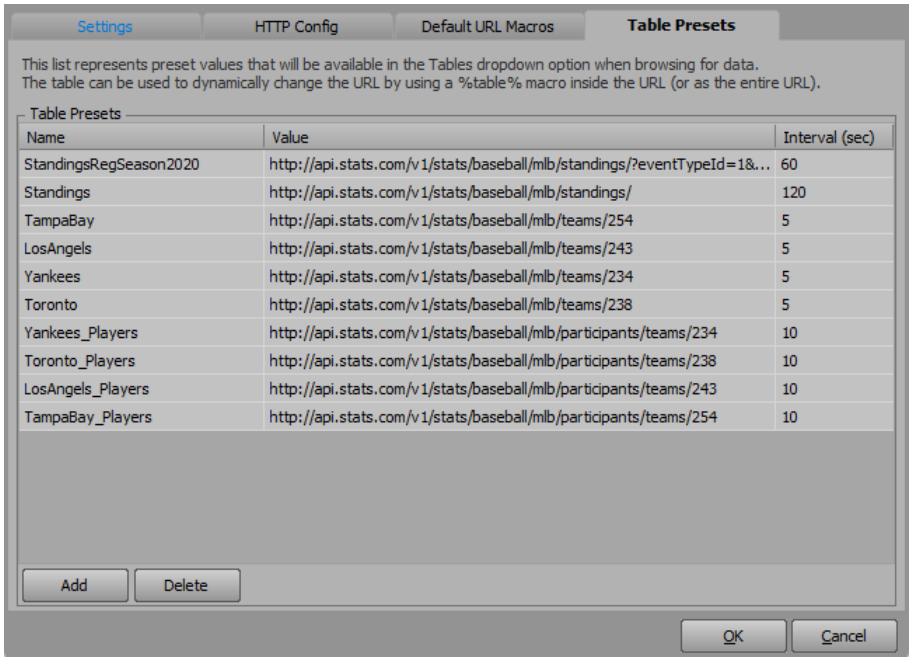


   The **Table Presets** list represents preset values that are available in the **Table** list when browsing for data. The table can be used to dynamically change the URL by using a %table% macro inside the URL or as the entire URL.

2. Select **Add** to add a table preset to the list and click in each column to configure the following:

   - **Name** — enter a name for the table preset.
   - **Value** — enter the URL of the table.
   - **Interval** — enter the number of seconds to wait before updating the table.

The **Table Presets** list will look similar to the image below.



3. Select **OK** to save the table presets and close the **Configuration** dialog.

   The **StatsPerform DataLinq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

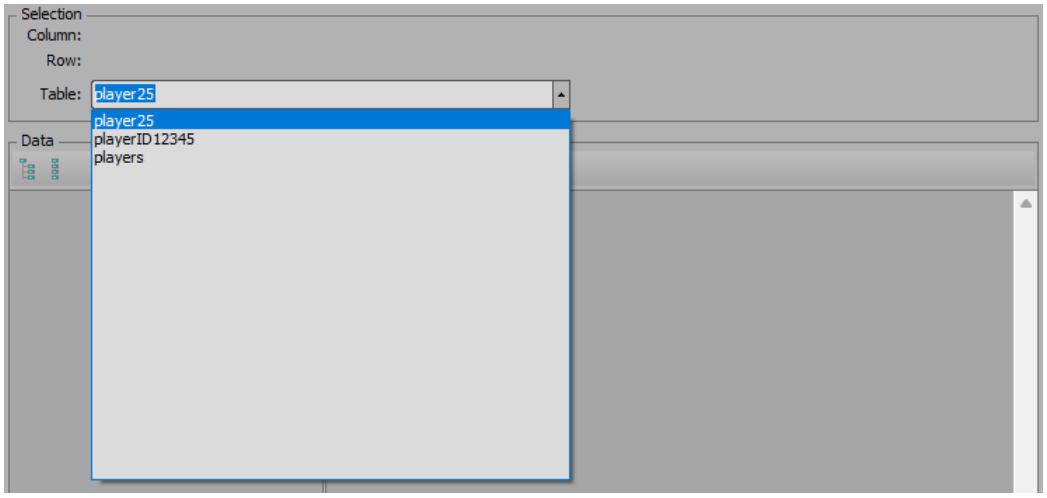
To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.

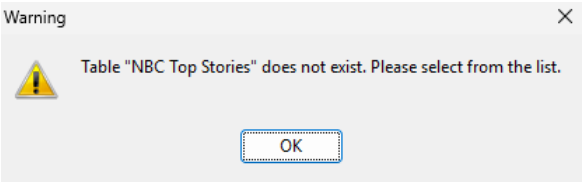
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

For More Information on...

- using a static URL, refer to Using a Static URL.
- using a dynamic URL, refer to Using a Dynamic URL.
- using default URL macros, refer to Using URL Macros.
- using table presets, refer to Using Table Presets.

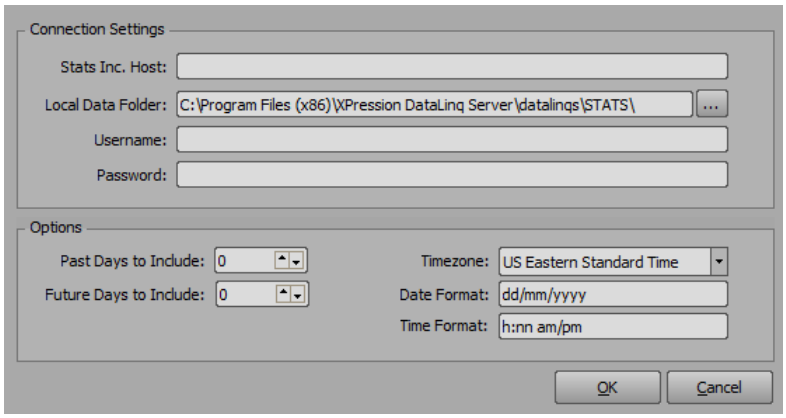
Stats Perform DataLinq Source

Follow these instructions to configure a StatsPerform DataLinq source.

To configure the Stats Perform DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Stats Perform DataLinq Source** and then select **OK**.

   The **Stats Perform - Configuration** dialog opens.



2. In the **Connection Settings** section, in the **Stats Inc. Host** field, enter or select the host URL for the DataLinq connection.
3. In the **Local Data Folder** field, enter a local folder path for the data or select **Browse** (...) to locate and select a folder in which to store the data.

   The default location is **C:\Program Files\XPressionStudio\DataLinqServer\DataLinqs**.
4. In the **Username** field, enter the user name for the Stats Perform login.
5. In the **Password** field, enter the password for the Stats Perform login.
6. In the **Options** section, configure the following:
   - In the **Past Days to Include** field, enter or select the number of previous days of stats to include in the results.
   - In the **Future Days to Include** field, enter or select the number of upcoming days of stats to include in the results.
   - From the **Timezone** drop-down, select a timezone to use for the date and time.
   - In the **Date Format** field, enter a date format to use for the DataLinq.
   - In the **Time Format** field, enter a time format to use for the DataLinq.
7. Select **OK**.

   The **Stats Perform - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

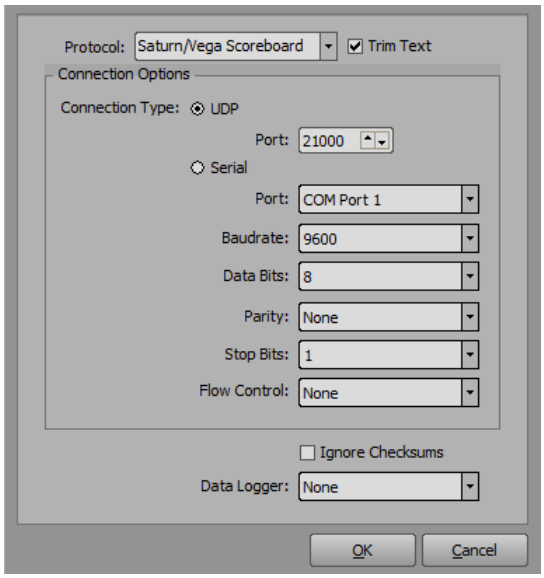
Swiss Timing Scoreboards DataLinq Source

Follow these instructions to configure a Swiss Timing Scoreboards DataLinq source.

To configure a Swiss Timing Scoreboards DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Swiss Timing Scoreboards DataLinq Source** and then select **OK**.

   The **Swiss Timing Linq - Configuration** dialog opens.



2. From the **Protocol** drop-down, select one of the following scoreboard protocols:
   - **Saturn/Vega Scoreboard**
   - **NBA Tissot Timer**
3. Select the **Trim Text** checkbox to remove extra spaces from the data.
4. In the **Connection Options** section, use the **Connection Type** radio buttons to select the connection to the Swiss Timing device:
   - **UDP** — use a UDP port as the connection type and configure the following:
   - **Serial** — use a serial port as the connection type and configure the following:
5. If **UDP** is selected as the **Connection Type**, in the **Port** field, enter or select the UDP port number for the Swiss Timing device.

   OR

   If **Serial** is selected as the **Connection Type**, use the **Serial** section to configure the GPI settings for the serial connection:
   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

6. Select the **Ignore Checksums** checkbox to ignore the block of data that detects errors occurring during transmission.
7. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.
8. Select **OK**.

   The **Swiss Timing Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

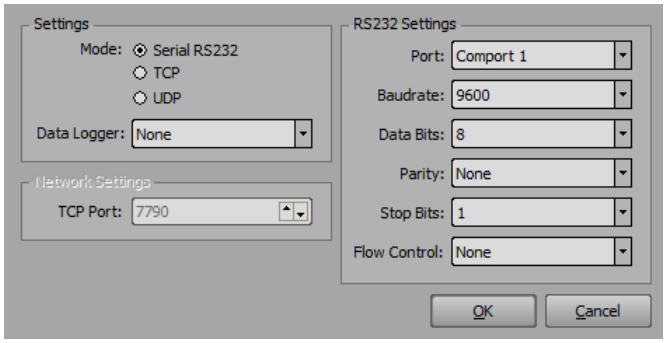
TeleTimer DataLinq Source

Follow these instructions to configure a TeleTimer DataLinq source.

To configure a TeleTimer DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **TeleTimer DataLinq Source** and then select **OK**.

   The **TeleTimer DataLinq Setup** dialog opens.



2. In the **Settings** section, select a connection **Mode** for the TeleTimer feed:
   - **Serial RS232** — use a serial RS232 port as the connection type.
   - **TCP** — use a TCP port as the connection type.
   - **UDP** — use a serial UDP port as the connection type.
3. If **Serial RS232** is selected as the **Mode**, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:
   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

   ★**Flow Control** can be set to **Hardware** or **None**, but it must be set the same in both XPression and the transmitting device.

   OR

   If **TCP** or **UDP** is selected as the **Mode**, in the **Network Settings** section, use the **TCP Port/UDP Port** field to enter or select the communication port that receives the signals.

4. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

5. Select **OK**.

   The **TeleTimer Datalinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

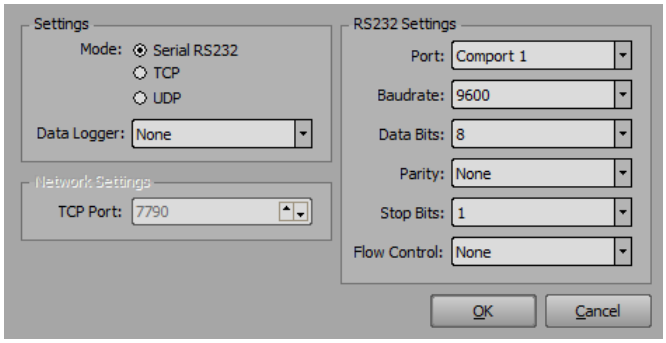
Teleview DataLinq Source

Follow these instructions to configure a Teleview DataLinq source.

To configure a Teleview DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Teleview DataLinq Source** and then select **OK**.

   The **Teleview (International Sound) DataLinq Setup** dialog opens.



2. In the **Settings** section, select a connection **Mode** for the Teleview feed:

   Serial RS232 — use a serial RS232 port as the connection type.

   TCP — use a TCP port as the connection type.

   UDP — use a serial UDP port as the connection type.

3. If **Serial RS232** is selected as the **Mode**, use the **RS232 Settings** section to configure the GPI settings for the RS232 serial connection:

   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

   ★**Flow Control** can be set to **Hardware** or **None**, but it must be set the same in both XPression and the transmitting device.

   OR

   If **TCP** or **UDP** is selected as the **Mode**, in the **Network Settings** section, use the **TCP Port/UDP Port** field to enter or select the communication port that receives the signals.

4. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

5. Select **OK**.

   The **Televiewer (International Sound) Datalinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

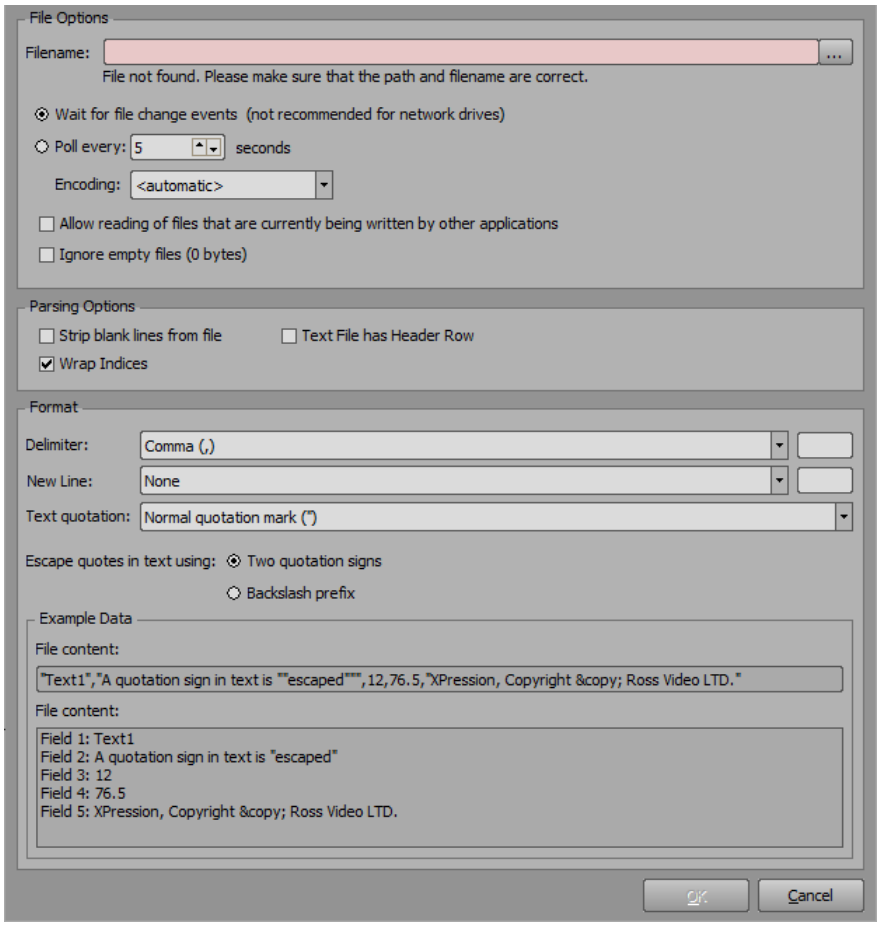
Text DataLinq Source

Follow these instructions to configure a Text DataLinq source.

To configure a Text DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **Text DataLinq Source** and then select **OK**.

   The **Text Source - Setup** dialog opens.



2. In the **File Options** section, in the **Filename** field, enter the full path of the text file that contains the data for the Datalinq source, or select **Browse** (...) to locate and open the text file.
3. Select one of the following radio buttons to determine when to check for text source file changes:
   - **Wait for file change events** — update the text when the text file source is updated. This is not recommended for network drives.
   - **Poll every** — select this radio button and then enter or select a time interval in seconds to poll the text source for any updates or changes.
4. From the **Encoding** drop-down, select a character encoding for the text file source.

   The encoding options are:

   - **<automatic> — selecting this option automatically uses ANSI for encoding the text file source.**
   - **UTF-8**
   - **UTF-16-BE**

- **UTF-16-LE**
- **ISO-8859**
- **UCS2**
- **ANSI**

5. Select the **Allow reading of files that are currently being written by other applications** checkbox to enable the Text DataLinq to read text files that are currently open for writing in other applications that lock the file.
6. Select the **Ignore empty files (0 bytes)** checkbox to ignore empty files from the text source and retain the previous data.

   This will also apply to files filled with invalid characters.
7. In the **Parsing Options** section, make the following selections as needed:
   - Select the **Strip blank lines from file** checkbox to remove blank lines of text from the text source.
   - Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

     This checkbox should be selected when using looping queries and is selected by default.
   - Select the **Text File has Header Row** checkbox to indicate that the first row of data in the text source represents the column names.
8. In the **Format** section, make the following selections as needed:
   - From the **Delimiter** drop-down, select the character used to divide the data values on each line in the text file.

     The options are:

     - **Comma (,)**
     - **Colon (:)**
     - **Semicolon (;)**
     - **Tab**
     - **None**
     - **Other**

     When **Other** is the selected delimiter, enter the delimiter character to use in the adjacent field.
   - From the **New Line** drop-down, select the character used in the text file to start a new line.

     The options are:

     - **None**
     - **Break tag "<br>")**
     - **Paragraph "¶**
     - **"**
     - **Carriage Return Line Feed "\CrLf"**
     - **Slash n "{\n}"**
     - **Carat p "^p"**
     - **Other**

     When **Other** is the selected new line, enter the new line character to use in the adjacent field.

- From the **Text Quotation** drop-down, select the character used in the text file to enclose quotations.

  The options are:

  - **Normal Quotation Mark (")**
  - **Apostrophe (')**
  - **None**

- Use the **Escape Quotes in Text Using** setting to select the method used treat quotation marks in the text file as a regular characters.

  The options are:

  - **Two Quotation Marks** — treat two quotation marks ("") as a single quotation mark (") with no special meaning.
  - **Backslash Prefix** — treat the backslash character followed by a quotation mark (\") as a single quotation mark (") with no special meaning.

  HTML character entity references are converted to the correct symbol, such as &copy (©) and &reg (®).

9. Select **OK**.

   The **Text Source - Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

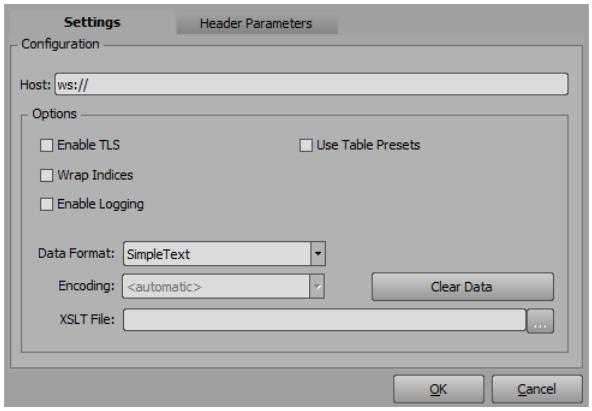
WebSocket DataLinq Source

Follow these instructions to configure a WebSocket DataLinq source and add header parameters for authentication. With **Table Presets**, you can define multiple DataLinq tables coming from a single WebSocket message.

To configure a WebSocket DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **WebSocket DataLinq Source** and then select **OK**.

   The **WebSocket DataLinq Setup** dialog opens.

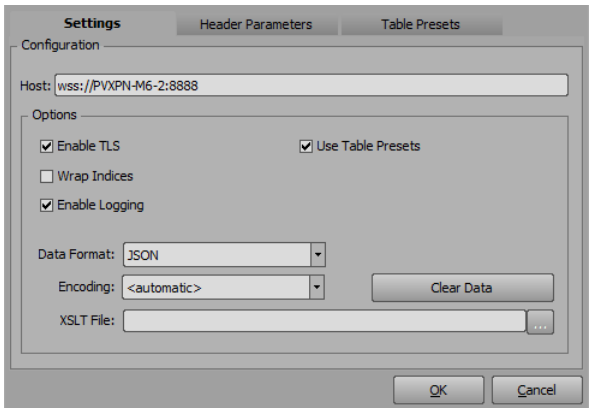


2. In the **Settings** tab, in the **Host** field, enter the machine name and port number of the WebSocket server.
3. In the **Options** section, do the following:
   - Select the **Enable TLS** checkbox to enable TLS protocols.
   - Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

     Wrap Indices should be selected when using looping queries.
   - Select the **Enable Logging** checkbox to register incoming messages from the WebSocket link in the **XPression DataLinq Server** logs.

     The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.
   - Select the **Use Table Presets** checkbox to configure table presets.

     When selected, the **Table Presets** tab is added to the UI.

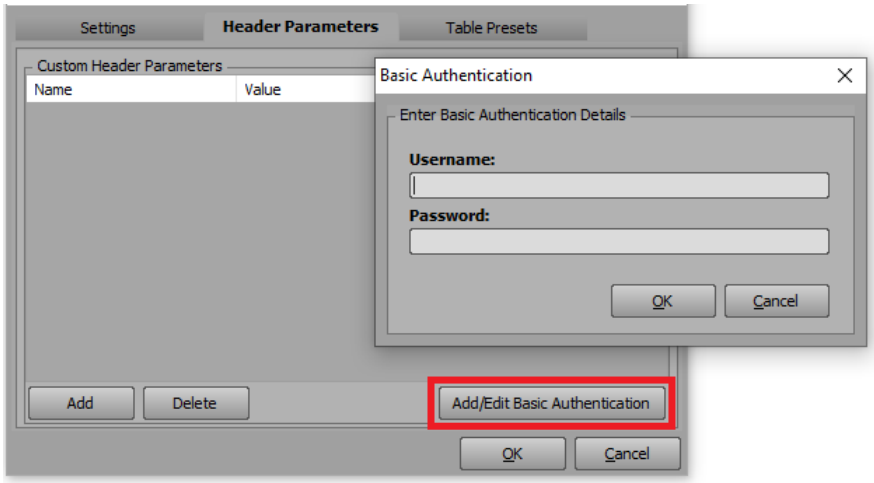


- From the **Data Format** drop-down, select a data format to read from the WebSocket feed:
  - **SimpleText** — read simple text sources.
  - **XML** — read XML sources.
  - **JSON** — read JSON sources.
- If using the XML or JSON data format, from the **Encoding** drop-down, select the encoding protocol for the data:
  - **<automatic>** — select this option to automatically detect the protocol.
  - **UTF-8**
  - **UTF-16-BE**
  - **UTF-16-LE**
  - **ISO-8859**
  - **UCS2**
  - **ASCII**
- If using **XML**, in the **XSLT File** field, enter the full pathname of the XSLT file to use with the XML file, or select **Browse** (...) to locate and open the XSLT file.

4. Select the **Clear Data** button to clear all table data.

To configure the Header Parameters:

1. Select the **Header Parameters** tab.
2. Use one of the following authentication modes:
   a. Select **Add/Edit Basic Authentication** and enter your **Username** and **Password**.
   b. Then select **OK**.



An authorization code will be entered in the **Value** field.

OR

a. Select **Add** and in the **Name** field, enter `X-API-Key` or `ApiKey`.

b. In the **Value** field, enter the API key.

OR

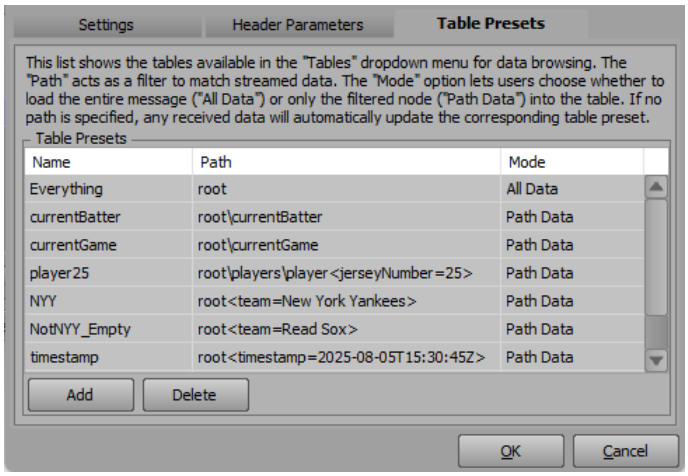
a. Select **Add** and in the **Name** field, enter `Bearer`.

b. In the **Value** field, enter the token number.

To configure Table Presets:

1. If you have selected the **Use Table Presets** checkbox, select the **Table Presets** tab.
2. In the **Table Presets** tab, select **Add**.
3. In the **Name** field, enter the name of the table to use.
4. In the **Path** field, enter the path to a specific data node in the table.
5. In the **Mode** field, enter one of the following:
   - **Path Data** — loads the data from the node specified in the **Path** field.
   - **All Data** — loads the entire table.

   The **Table Presets** list will look similar to the image below.



6. Select **OK**.

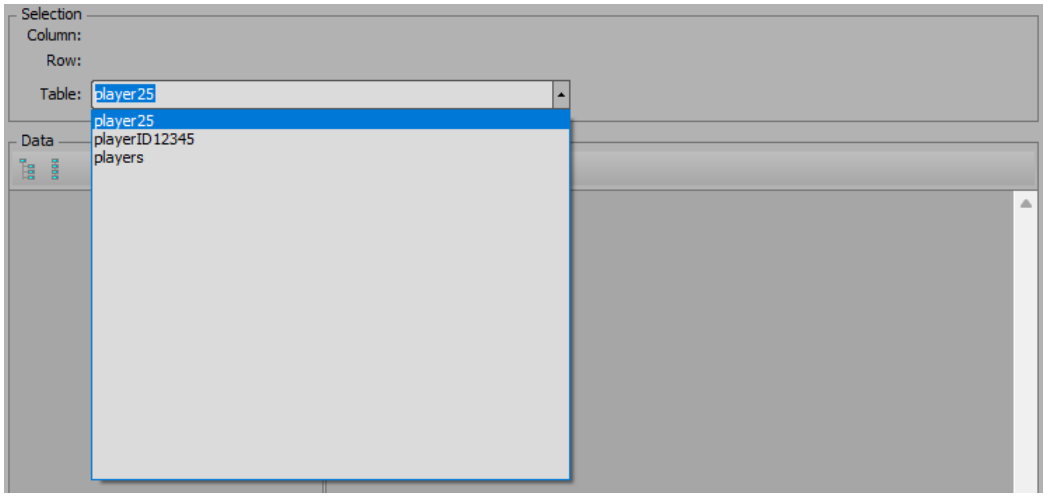
   The **WebSocket DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

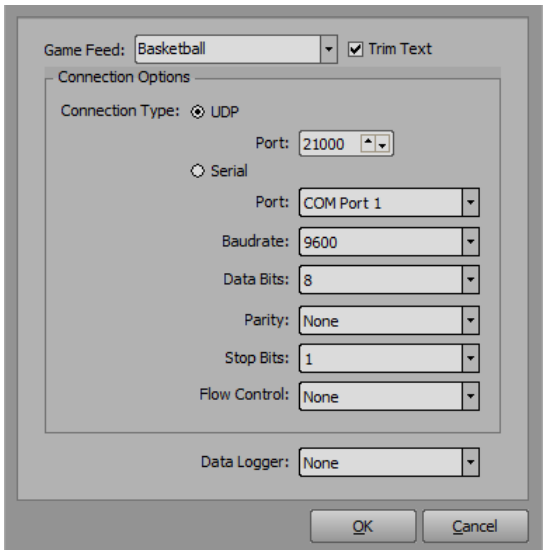
White Way DataLinq Source

Follow these instructions to configure a White Way DataLinq source.

To configure a White Way DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **White Way DataLinq Source** and then select **OK**.

   The **White Way Linq - Configuration** dialog opens.



2. From the **Game Feed** drop-down, select a sports feed:
   - **Basketball**
   - **Football (New)**
3. Select the **Trim Text** checkbox to remove extra spaces from the feed.
4. In the **Connection Options** section, use the **Connection Type** options to select the connection to the White Way device:
   - **UDP** — use a UDP port as the connection type and configure the following:
   - **Port** — enter or select the UDP port number for the White Way device.
   - **Serial** — use a serial port as the connection type and configure the following:
5. If **UDP** is selected as the **Connection Type**, in the **Port** field, enter or select the UDP port number for the White Way device.

   OR

   If **Serial** is selected as the **Connection Type**, use the **Serial** section to configure the GPI settings for the serial connection:
   - **Port** — enter or select the serial port number for the connection to the DataLinq source.
   - **Baudrate** — select the communication speed for the signals.
   - **Data Bits** — select the number of bits used to represent one character of data for the signals.
   - **Parity** — select the method used to check for lost data in a signal.
   - **Stop Bits** — select the number of bits used to indicate the end of a byte in a signal.
   - **Flow Control** — select the data transmission rate controller for a signal.

6. From the **Data Logger** drop-down, select an encoding scheme for the data log.

   The options are:

   - **None** — do not use data logging.
   - **ASCII** — use ASCII encoding for the data log.
   - **HEX** — use HEX file formatting for the data log.
   - **Both** — use both ASCII encoding and HEX file formatting for the data log.

7. Select **OK**.

   The **White Way Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

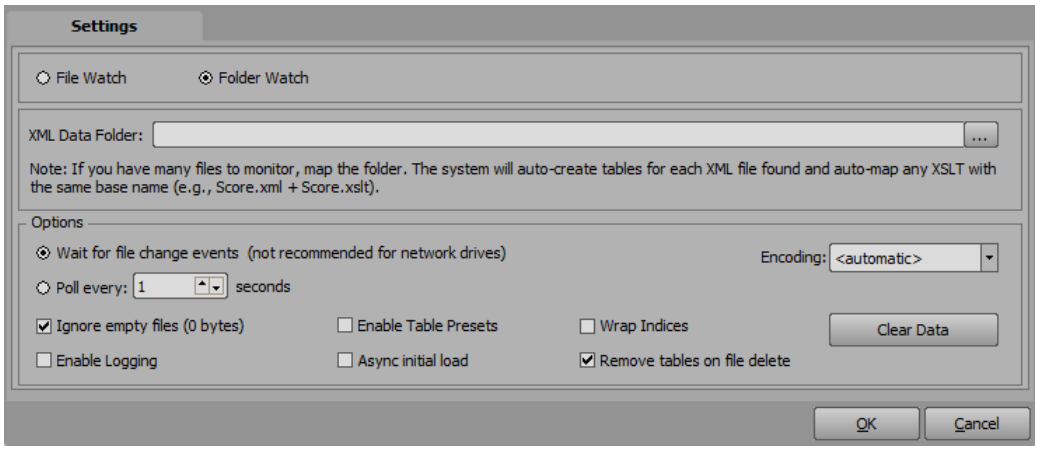
XML DataLinq Source

Follow these instructions to configure an XML DataLinq source.

To select a DataLinq source file or folder:

1. From the **Add DataLinq Source** dialog, select the **XML DataLinq Source** and then select **OK**.

   The **XML Linq - Configuration** dialog opens.



2. Select **File Watch** to select a single DataLinq source file.

   OR

   Select **Folder Watch** to select a DataLinq source folder.

   Use this option when you have many files to monitor. The system will auto-create tables for each XML file found and auto-map any XSLT with the same base name (e.g., Score.xml and Score.xslt).

3. If **File Watch** was selected in Step 2, in the **XML Filename** field, enter the full path of the XML file that contains the data for the Datalinq source, or select **Browse** (...) to locate and open the XML file.

   OR

   In the **XSLT Filename** field, enter the full path of the XSLT file to use with the XML file, or select **Browse** (...) to locate and open the XSLT file.

   OR

   If **Folder Watch** was selected in Step 2, in the **XML Data Folder** field, enter the full path of the folder containing the XML data files, or select **Browse (...)** to locate and open the folder.

To configure the DataLinq source options:

1. In the **Options** section, select one of the following radio buttons to determine when to check for XML source file changes:

   Wait for file change events — update when the XML source file is updated. This is not recommended for network drives.

   Poll every — select this radio button and then enter or select a time interval in seconds to poll the XML source file for any updates or changes.

2. From the **Encoding** drop-down, select an encoding protocol for XML data.

   The options are:

   <automatic> — UTF-8, UTF-16-BE, and UTF-16-LE are automatically detected (with or without BOM). When no BOM is present, UTF-8 will be selected. BOM stands for Byte Order Mark and is a special sequence of bytes placed at the beginning of a text file to automatically detect BOM signatures and select the correct encoding.

   UTF-8

   UTF-16-BE

   UTF-16-LE

   ISO-8859

   UCS2

3. Select the **Ignore empty files (0 bytes)** checkbox to ignore empty files from the text source and retain the previous data.

   This will also apply to files filled with invalid characters.

4. Select the **Enable Table Presets** checkbox to use the **Table Presets** tab to configure a list of preset tables that will be available in the **Table** drop-down option when browsing for data.

5. Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

   This checkbox should be selected when using looping queries.

6. Select the **Enable Logging** checkbox to record the XML DataLinq info in the **XPression DataLinq Server** logs.

   The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.

   If **Enable Logging** is selected, select **Clear Data** to clear the accumulated data.

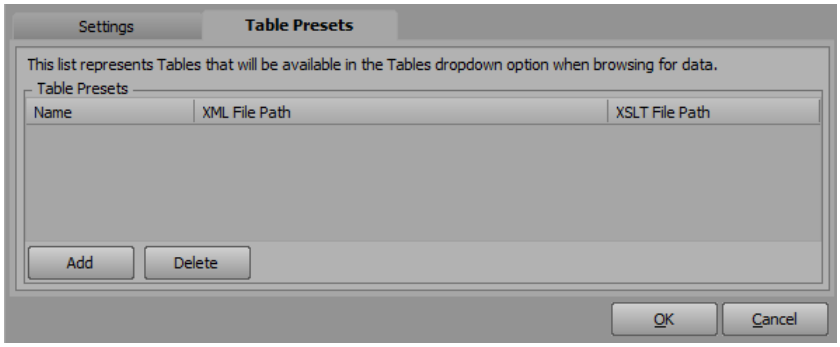
7. If **Folder Watch** is selected, the following additional settings appear:

   - **Async initial load** — select this option when the folder contains a large number of files and you do not need all the data to be available immediately on startup.
   - **Remove tables on file delete** — select this option to automatically remove tables when the source files for them are deleted.

To configure Table Presets:

1. If **Enable Table Presets** and **File Watch** have been selected, select the **Table Presets** tab to configure the list of table presets when using an XML DataLinq.

   The **Table Presets** tab opens.



2. Select **Add** to add a table preset to the list and configure the following:

   - **Name** — enter a name for the table preset.
   - **XML File Path** — enter the path for the XML data file or select **Browse** (...) to locate and select the file.
   - **XSLT File Path** — enter the path for the XSLT file that will be used with the XML data file or select **Browse** (...) to locate and select the file.

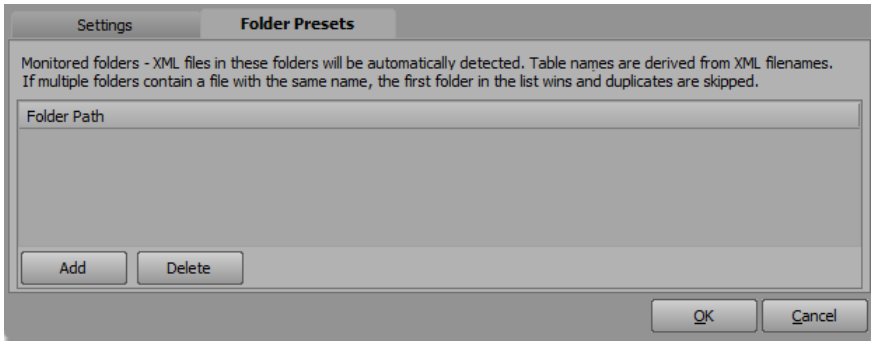
3. Select **OK**.

   The **XML Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To configure Folder Presets:

1. If **Enable Table Presets** and **Folder Watch** have been selected, select the **Folder Presets** tab to configure a list of folders containing XML DataLinq source files.

   The **Folder Presets** tab opens.



2. In the **Folder Presets** tab, select **Add** and in the blank field that is added, select **Browse...** to navigate to and select the folder containing the XML DataLinq source files.

   ★Multiple folders can be mapped here. However, if multiple folders contain a file with the same name, the file from the first folder in the list will be used and duplicates are skipped.

3. Select **OK**.

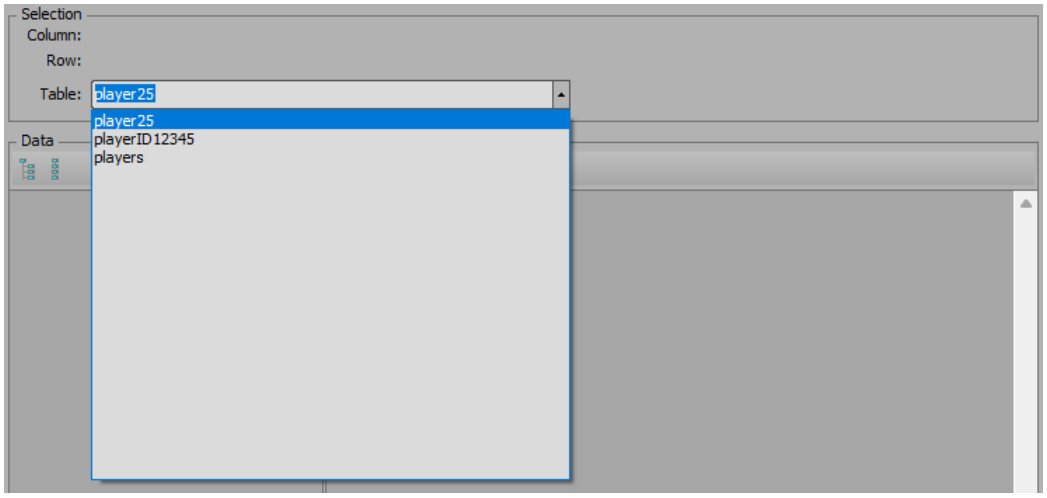
   The **XML Linq - Configuration** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

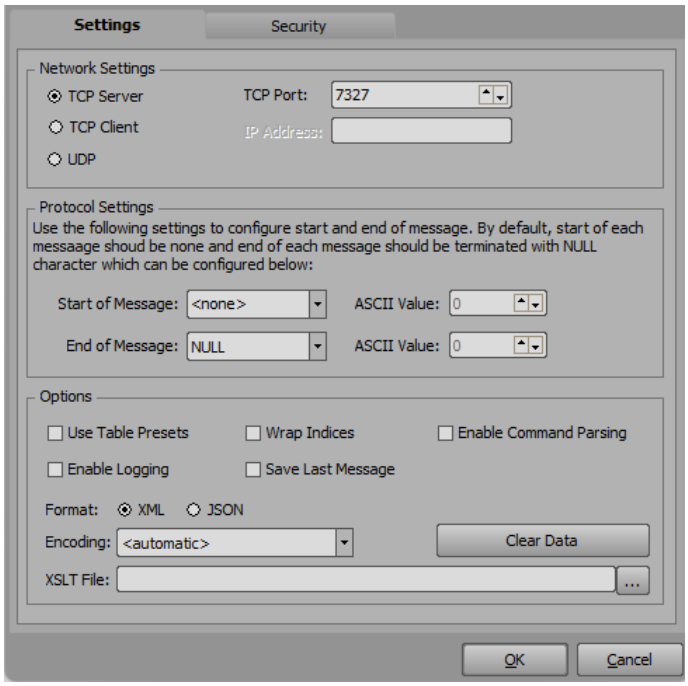
XML/JSON TCP DataLinq Source

Follow these instructions to configure an XML/JSON TCP DataLinq source.

To configure the settings for an XML/JSON TCP DataLinq source:

1. From the **Add DataLinq Source** dialog, select the **XML/JSON TCP DataLinq Source** and then select **OK**.

   The **XML/JSON TCP DataLinq Setup** dialog opens.



2. In the **Settings** tab, in the **Network Settings** section, select one of the following connection modes:
   - **TCP Server** — have the DataLinq Server listen for a connection from a remote client.
   - **TCP Client** — connect to a remote server listening and waiting for connections.
   - **UDP** — listen to UDP broadcasts.
3. If **TCP Server** or **TCP Client** is selected as the connection mode, in the **TCP Port** field, enter or select the **TCP** port number for the connection to the data.

   If **TCP Client** is selected as the connection mode, in the **IP Address** field, enter the IP address of the TCP client.

   If **UDP** is selected as the connection mode, in the **UDP Port** field, enter or select the **UDP** port number for the connection to the data.
4. In the **Protocol Settings** section, do the following:
   - From the **Start of Message** drop-down, select the control character to use for the start of the message.

     See table below for descriptions.
   - From the **End of Message** drop-down, select the control character to use for the end of the message.

     See table below for descriptions.

   If anything other than **Custom** is selected from the **Start of Message** or **End of Message** drop-downs, the **ASCII Value** fields are automatically updated.

If **Custom** is selected as either the **Start of Message** or **End of Message**, in the corresponding **ASCII Value** field enter or use the arrows to select the ASCII value for the **Start of Message** or **End of Message**.

Abbreviation	Meaning	Common Use
STX	Start of Text	Marks beginning of main content.
SOH	Start of Header	Marks beginning of header.
NULL	No Start/Stop Character	When no character is present or expected in the Start or Stop position.
CR	Carriage Return	Return to start of line.
LF	Line Feed	Adds a new line to the message content.
ETX	End of Text	Marks end of content.
EOT	End of Transmission	End of entire message.

5. In the **Options** section, do the following:
   - Select the **Use Table Presets** checkbox to use the **Table Presets** checkbox to configure a list of preset tables that will be available in the **Table** drop-down option when browsing for data.

     This adds the **Table Presets** tab to the UI.
   - Select the **Wrap Indices** checkbox to wrap the indices above the record count within record count limits.

     Wrap Indices should be selected when using looping queries.
   - Select the **Enable Command Parsing** checkbox to allow the XML/JSON TCP DataLinq to process table commands.
   - Select the **Enable Logging** checkbox to record the XML/JSON TCP DataLinq info in the **XPression DataLinq Server** logs.

     The default location of the logs is **C:\ProgramData\Ross Video\XPression\XPression DataLinq Server**. This option is mainly used for debugging.
   - Select the **Save Last Message** checkbox to restore the last received message for a table if the **XPression DataLinq Server** is restarted.
6. Select a data **Format**:
   - **XML** — select this option to read XML data over a TCP socket.
   - **JSON** — select this option to read JSON data over a TCP socket.

7. If using **XML**, from the **Encoding** drop-down, select an encoding protocol for the XML data.

   The options are:

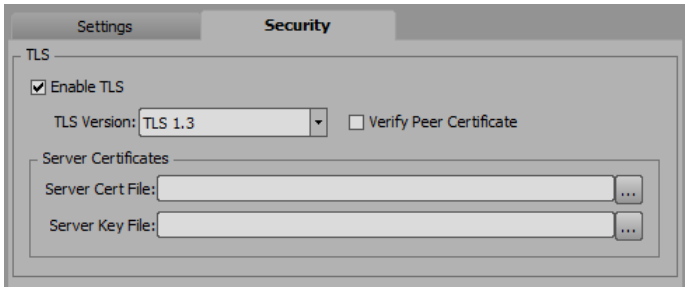
   - **<automatic> — select this option to automatically detect the protocol.**
   - **UTF-8**
   - **UTF-16-BE**
   - **UTF-16-LE**
   - **ISO-8859**
   - **UCS2**
   - **ASCII**

8. If using **XML**, in the **XSLT File** field, enter the full path of the XSLT file to use with the XML file, or select **Browse** (...) to locate and open the XSLT file.
9. If **Enable Logging** is selected, select **Clear Data** to clear the accumulated data.

   A confirmation dialog opens asking if you want to also delete the tables.

To configure the Security settings for a TCP Server:

1. In the **Settings** tab, in the **Network Settings** section, select **TCP Server** and configure the **TCP Port** as described in the **Settings** procedure.
2. In the **Security** tab, in the **TLS** section, select **Enable TLS** to enable the Transport Layer Security (TLS) protocol used to secure network communications.



3. From the **TLS Version** drop-down, select the version of TLS you want to use, either **TLS 1.2** or **TLS 1.3**.

   ★TLS 1.3 is preferable, but TLS 1.2 may be necessary for compatibility with older data providers or legacy infrastructure.

4. Select the **Verify Peer Certificate** checkbox to validate the certificate (can clear it when using self-signed certificates while developing and testing).
5. In the **Server Certificates** section, do the following:

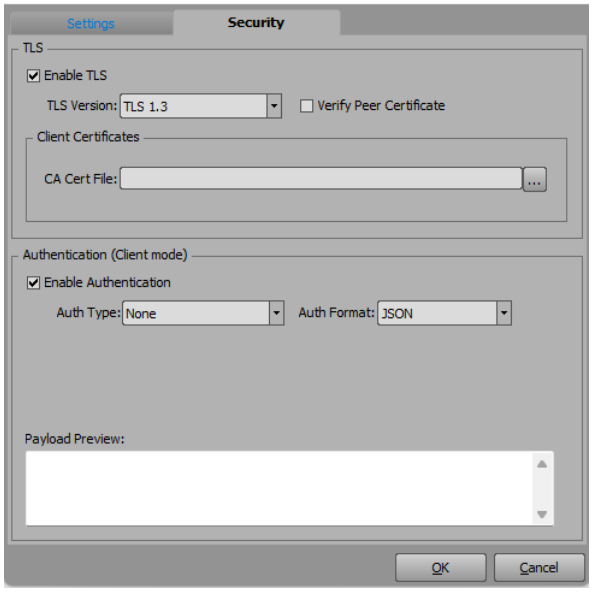
   In the **Server Cert File** field, enter the path to the Server Certificate file or use the **Browse (...)** button to navigate to and select the file.

   In the **Server Key File** field, enter the path to the Server Key file or use the **Browse (...)** button to navigate to and select the file.

   ★Incoming decrypted messages will appear in the **Payload Preview** window.

To configure the Security settings for a TCP Client:

1. In the **Settings** tab, in the **Network Settings** section, select **TCP Client** and configure the **TCP Port** and **IP Address** as described in the **Settings** procedure.
2. In the **Security** tab, in the **TLS** section, select **Enable TLS** to enable the Transport Layer Security (TLS) protocol used to secure network communications.



3. From the **TLS Version** drop-down, select the version of TLS you want to use, either **TLS 1.2** or **TLS 1.3**.

   ★TLS 1.3 is preferable, but TLS 1.2 may be necessary for compatibility with older data providers or legacy infrastructure.

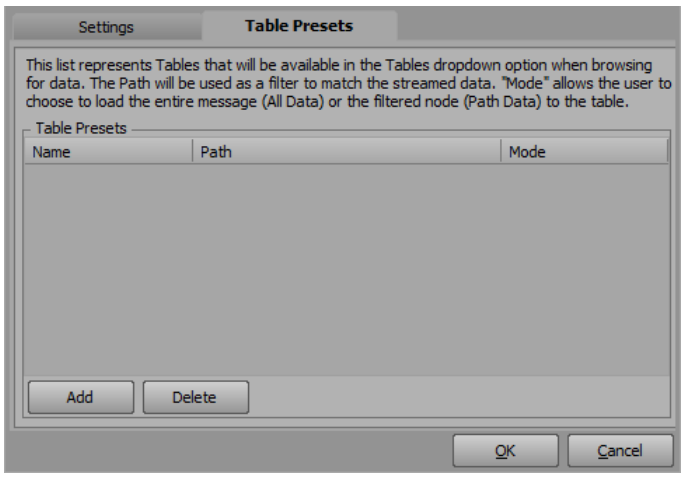
4. Select the **Verify Peer Certificate** checkbox to validate the certificate (can clear it when using self-signed certificates while developing and testing).
5. In the **Client Certificates** section, in the **CA Cert File** field, enter the path to the CA Certificate file or use the **Browse (...)** button to navigate to and select the file.
6. In the **Authentication** section, select **Enable Authentication**.
7. From the **Auth Type** drop-down, select an authentication method (refer to the documentation of the provider for any required authentication details) and then enter the corresponding credentials:
   - **Basic** — use username and password authentication:
     - **Username** — enter the username to be used for authentication.
     - **Password** — enter the password to be used for authentication.
   - **Bearer Token** — use a token for the authentication.
     - **Token** — enter the token to be used for authentication.
   - **API Key** — use API key authentication.
     - **API Key Name** — enter the key name used by the API on the server side (for example, apiKey).
     - **API Key Value** — enter the value of the key.
8. From the **Auth Format** drop-down, select which format to use for authentication, either **JSON** or **XML**.

   Incoming decrypted messages will appear in the **Payload Preview** window.

To configure Table Presets:

1. If table presets has been selected, select the **Table Presets** tab to configure the list of table presets when using an XML DataLinq.

   The **Table Presets** tab opens.



2. Select **Add** to add a table preset to the list and configure the following:

   - **Name** — enter a name for the table preset.
   - **XML File Path** — enter the path for the XML data file or select **Browse** (...) to locate and select the file.

     OR

   - **XSLT File Path** — enter the path for the XSLT file that will be used with the XML data file or select **Browse** (...) to locate and select the file.
   - **Mode** — from the drop-down, select one of the following options:

     ➢ **All Data** — load the entire message to the table.

     ➢ **Path Data** — load the filtered node to the table.

3. Select **OK**.

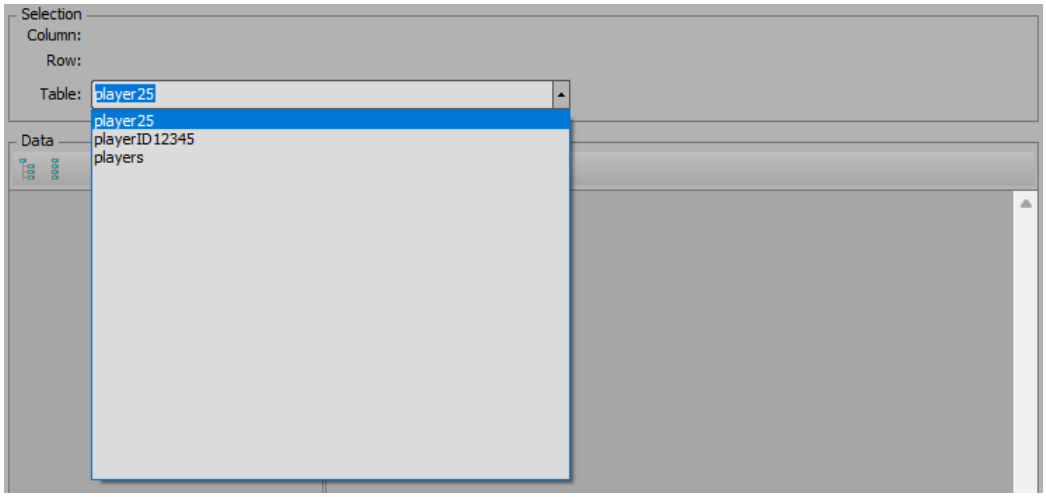
   The **XML/JSON TCP DataLinq Setup** dialog closes and the new DataLinq source is added to the **DataLinq Sources** section of the **XPression DataLinq Server**.

To view data:

1. In the XPression DataLinq Server, select the DataLinq source containing the table preset you want to view.
2. Then select **Browse**.

   The **Browse DataLinq** dialog opens.
3. In the **Table** field, type the first character of the name of the table preset you want to view.

   A drop-down list containing all table presets beginning with that character opens.



4. Type the first character again and then continue typing the name to narrow the results.

   If you enter a name that doesn't exist, you will receive this error message:



5. Select the table preset you want from the list and then select **OK**.

   The data for the selected preset is displayed in the **Data** section.

For More Information on...

- connecting to a DataLinq Server from XPression, refer to the procedure Connecting XPression to a XPression DataLinq Server.
- creating a text object from a DataLinq source, refer to the procedure Linking a Text Object to a DataLinq Data Source.

Linking Objects to a DataLinq Source

The XPression DataLinq Server enables the following objects in an XPression project to link to any of the external data sources gathered by the connected DataLinq Servers:

Configuring an XPression DataLinq Server

Connecting XPression to an XPression DataLinq Server

Exporting and Loading DataLinq Files

Starting the XPression DataLinq Server

Configuring the Selected DataLinq Source

Using DataLinq Keys with an ADODB DataLinq

Using DataLinq Keys with an XML DataLinq

Using SQL Queries

Using a Macro with a DataLinq Key

Creating a Data Page

Using a Static URL

Using a Dynamic URL

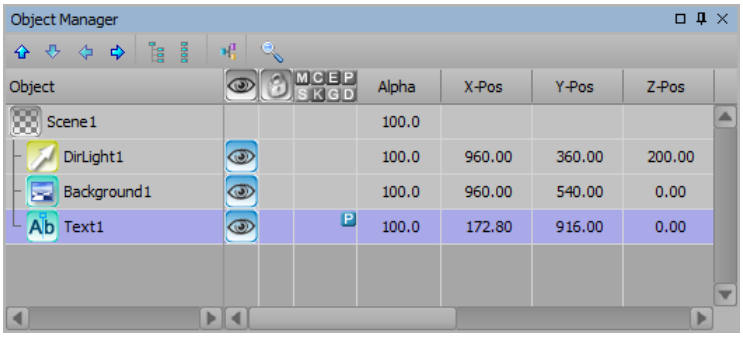
Using URL Macros

Using Table Presets

Linking a Text Object to a DataLinq Source

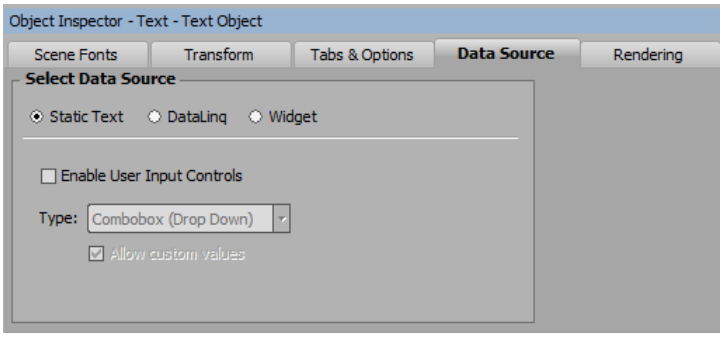
To link a text object to a DataLinq data source:

1. Add a text object to a scene.
2. In the **Object Manager**, select the text object for the DataLinq.



3. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



4. Select the **DataLinq** option.

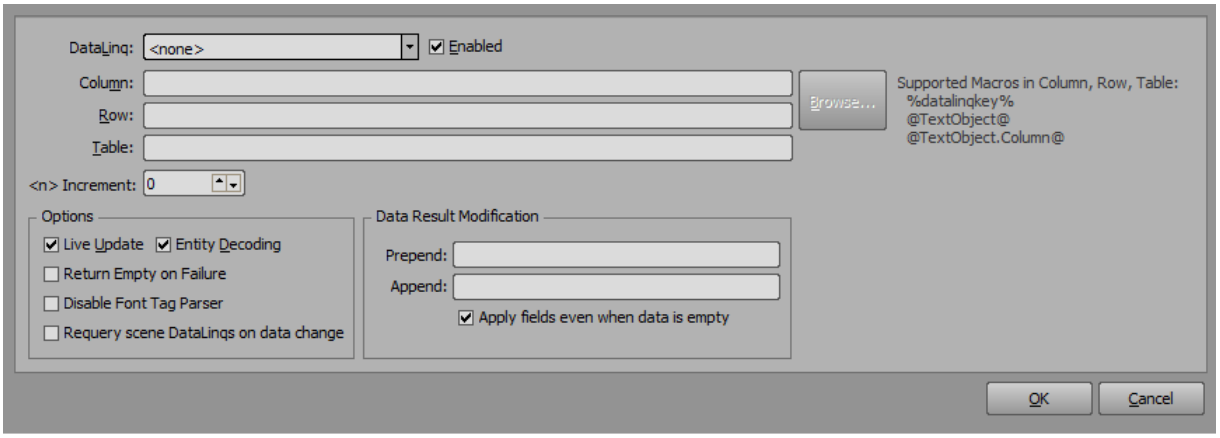
   DataLinq information and a **Set** button are displayed below the options.

5. Continue with setting the DataLinq properties.

To set DataLinq properties:

1. Select **Set**.

   The **Set DataLinq Properties** dialog opens.



2. Select the **Enabled** checkbox to enable DataLinq property configuration for the text object.
3. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the text object to display.
4. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contains the text object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the text object data.
5. In the **<n> Increment** field, select or enter a value other than 0 when the <n> increment differs from the number of templates.
   - In the **Options** section:
   - Select the **Live Update** checkbox to immediately update an online text object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding characters.

     For example, the HTML character entity reference code **&copy**; is translated into the **©** character for a text object.
   - Select the **Return Empty on Failure** checkbox to leave the object empty if the DataLinq fails.
   - Select the **Disable Font Tag Parser** checkbox to disable the parsing of {font} tags from the DataLinq source.
   - Select the **Requery scene DataLinqs on data change** checkbox to re-query all DataLinqs of a scene when a field with a DataLinq has been changed.

     This allows a DataLinq value such as 'JerseyNumber' to cause other fields such as 'Stats' to re-query.
6. In the **Data Result Modification** section, define an option string that will be prepended or appended to the resulting value that comes back from the DataLinq source, if necessary.

   This is useful for adding labels, units, or file paths to the data.
7. In the **Prepend** field, enter an option string to place at the beginning of the DataLinq value.

   The **%datalinqkey%** and **@textobject@** macros can be inserted.
8. In the **Append** field, enter an option string to place at the end of the DataLinq value.

   The **%datalinqkey%** and **@textobject@** macros can be inserted.
9. Select the **Apply fields even when data is empty** checkbox to apply the option strings when the DataLinq value is empty. This is selected by default.
10. Select **OK**.

    Data from the selected DataLinq source is displayed by the selected text object.

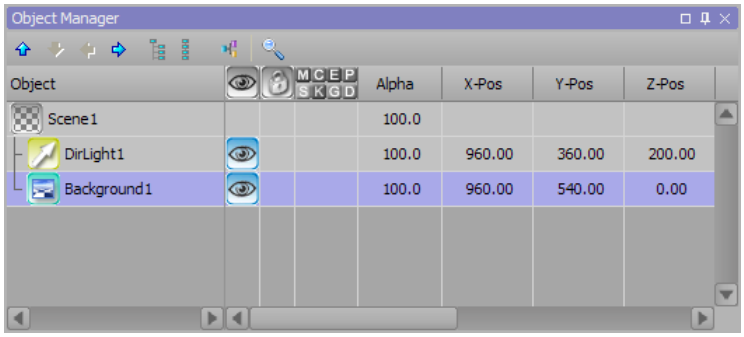
For More Information on...

- adding a text object to a scene, refer to Creating a Text Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Linking a Background Object to a DataLinq Source

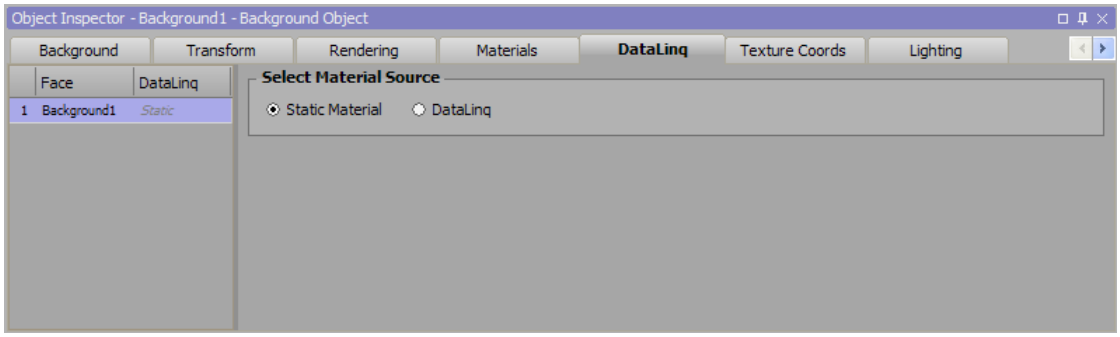
To link a background object to a DataLinq source:

1. Add a background object to a scene.
2. In the **Object Manager**, select the background object.



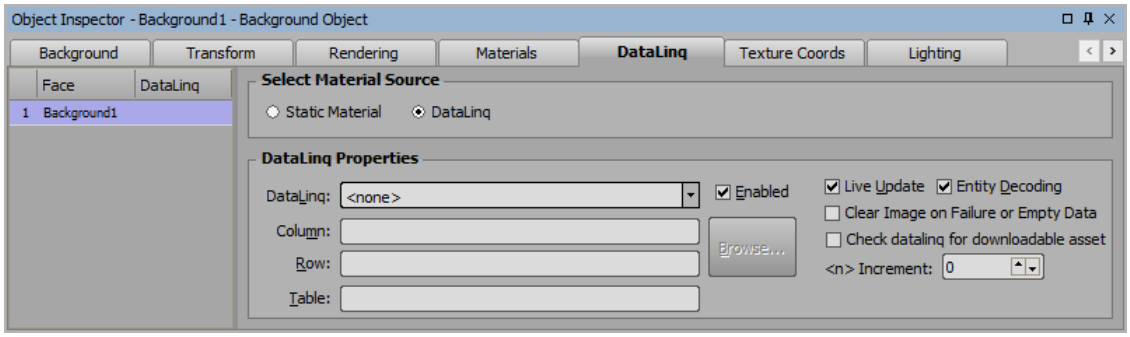
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



5. Select the **Enabled** checkbox to enable DataLinq property configuration for the background object.
6. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the background object to display.

7. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the background object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the background object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

8. Select from the following options as needed:
   - Select the **Live Update** checkbox to immediately update an online background object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer. This enables video clips from Inception to be DataLinq'd and downloaded for playout.
9. In the **<n> Increment** field, select or enter a value other than **0** when the **<n>** increment differs from the number of templates.

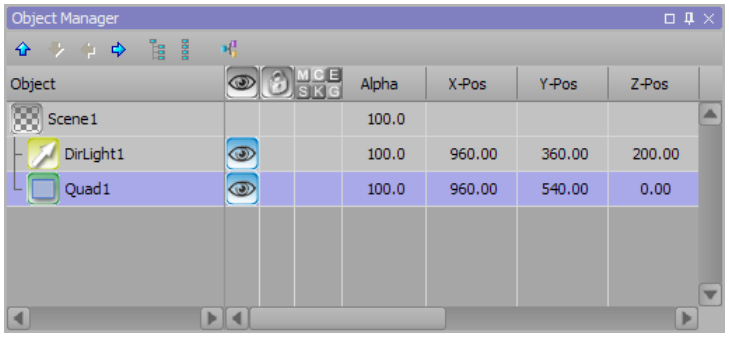
For More Information on...

- adding a background object to a scene, refer to Creating a Background Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Linking a Quad Object to a DataLinq Source

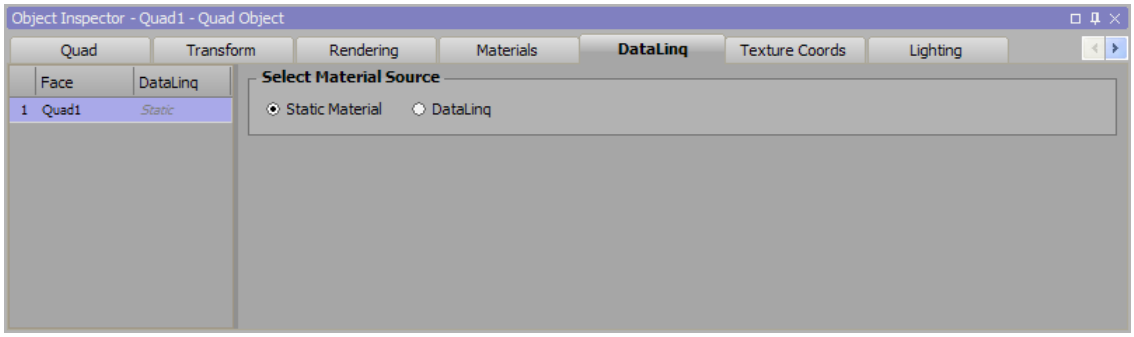
To link a quad object to a DataLinq source:

1. Add a quad object to a scene.
2. In the **Object Manager**, select the quad object.



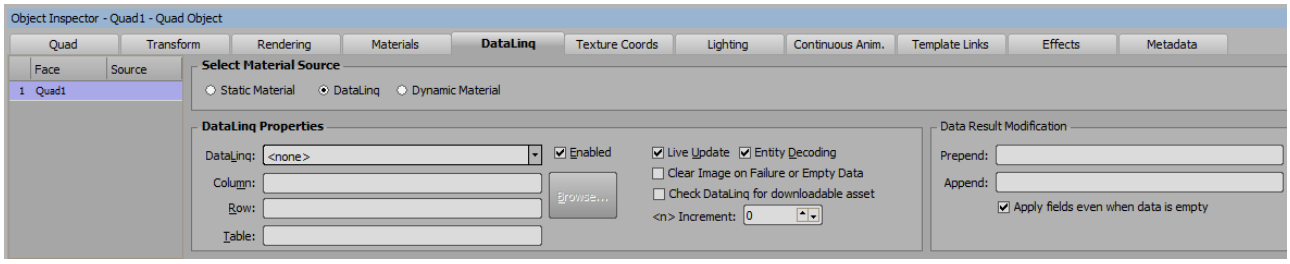
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



5. Select the **Enabled** checkbox to enable DataLinq property configuration for the quad object.
6. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the quad object to display.
7. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the quad object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the quad object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

8. Select from the following options as needed:
   - Select the **Live Update** checkbox to immediately update an online quad object with changes from the associated DataLinq source changes when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer.

     This enables video clips from Inception to be DataLinq'd and downloaded for playout.
9. From the **<n> Increment** field, enter or select a value other than **0** when the **<n>** increment differs from the number of templates.

To configure the data results:

1. In the **Data Result Modification** section, define an option string that will be prepended or appended to the resulting value that comes back from the DataLinq source, if necessary.

   This is useful for adding labels, units, or file paths to the data.
2. In the **Prepend** field, enter an option string to place at the beginning of the DataLinq value.

   The %datalinqkey% and @textobject@ macros can be inserted.
3. In the **Append** field, enter an option string to place at the end of the DataLinq value.

   The %datalinqkey% and @textobject@ macros can be inserted.
4. Select the **Apply fields even when data is empty** checkbox to apply the option strings when the DataLinq value is empty.

   This is selected by default.

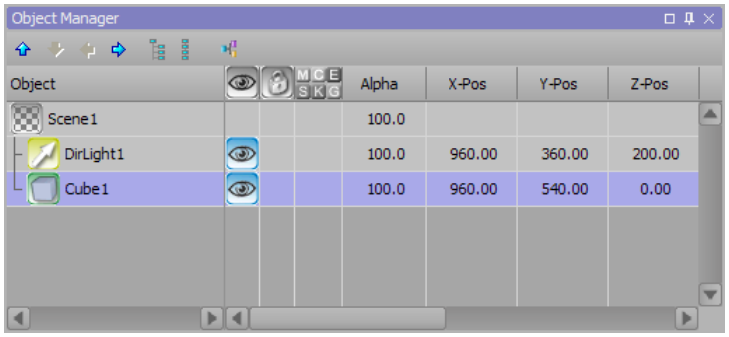
For More Information on...

- adding a quad object to a scene, refer to Creating a Quad Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Linking a Cube Object to a DataLinq Source

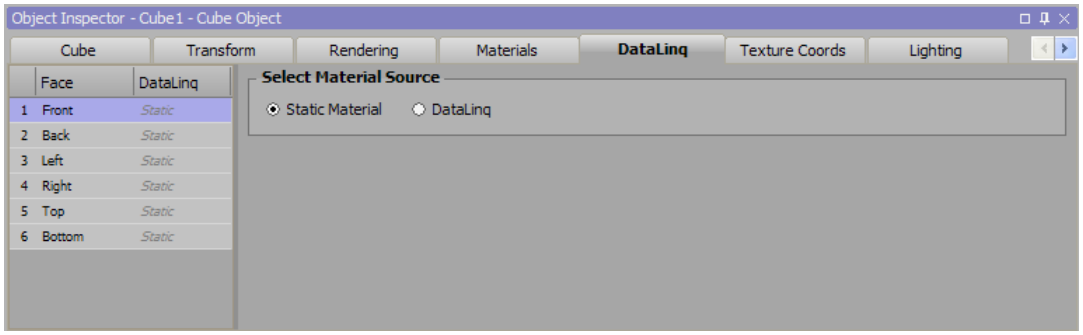
To link a cube object to a DataLinq source:

1. Add a cube object to a scene.
2. In the **Object Manager**, select the cube object.



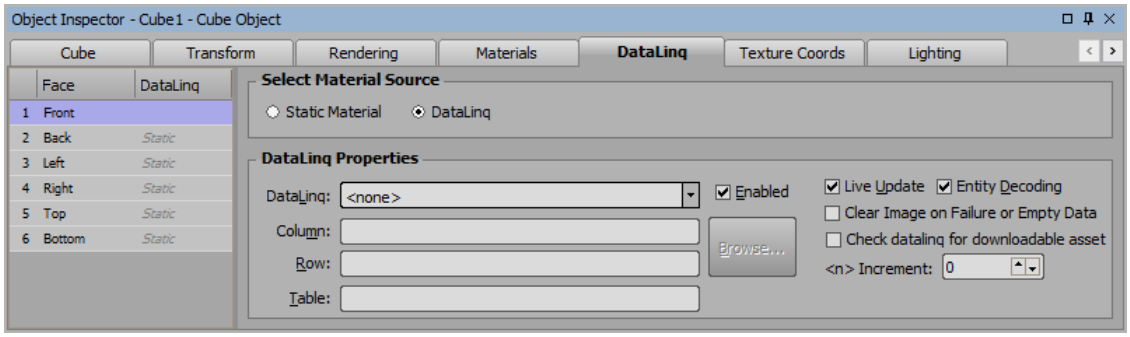
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. From the **Face** list, select the side of the cube object to which the material is to be applied.
5. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



6. Select the **Enabled** checkbox to enable DataLinq property configuration for the cube object.
7. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the cube object to display.

8. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the cube object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the cube object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

9. Select from the following options as needed:

   - Select the **Live Update** checkbox to immediately update an online cube object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer.

     This enables video clips from Inception to be DataLinq'd and downloaded for playout.

10. In the **<n> Increment** field, select or enter a value other than **0** when the **<n>** increment differs from the number of templates.

11. Repeat steps 4 to 10 for all other cube object faces that a material from a DataLinq source is to be applied.

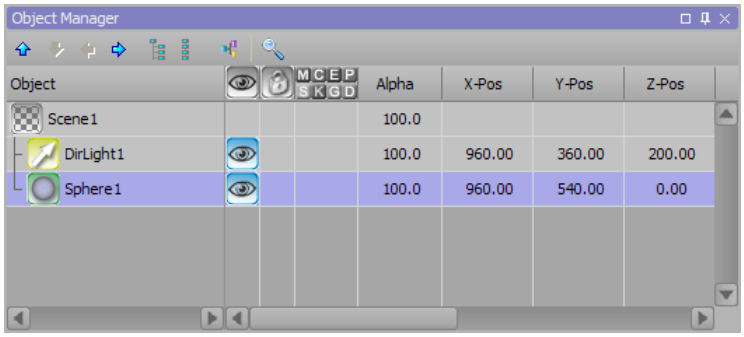
For More Information on...

- adding a cube object to a scene, refer to Creating a Cube Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Linking a Sphere Object to a DataLinq Source

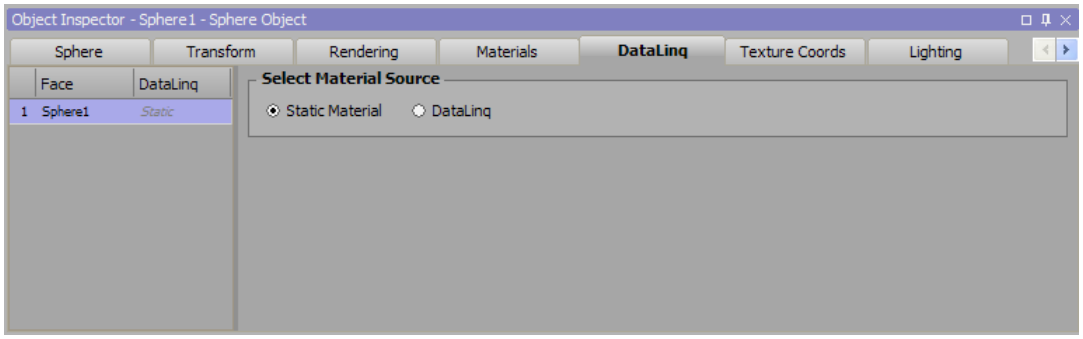
To link a sphere object to a DataLinq source:

1. Add a sphere object to a scene.
2. In the **Object Manager**, select the sphere object.



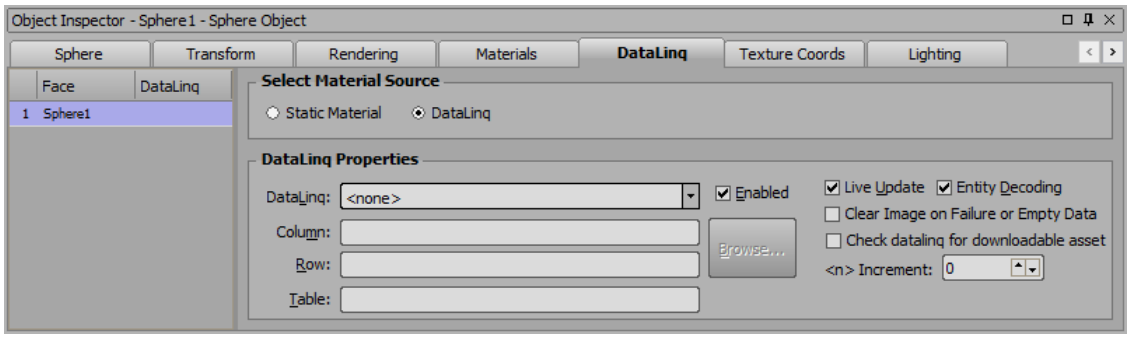
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



5. Select the **Enabled** checkbox to enable DataLinq property configuration for the sphere object.
6. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the sphere object to display.

7. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the sphere object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the sphere object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

8. Select from the following options as needed:

   - Select the **Live Update** checkbox to immediately update an online sphere object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer.

     This enables video clips from Inception to be DataLinq'd and downloaded for playout.

9. In the **<n> Increment** field, select or enter a value other than **0** when the **<n>** increment differs from the number of templates.

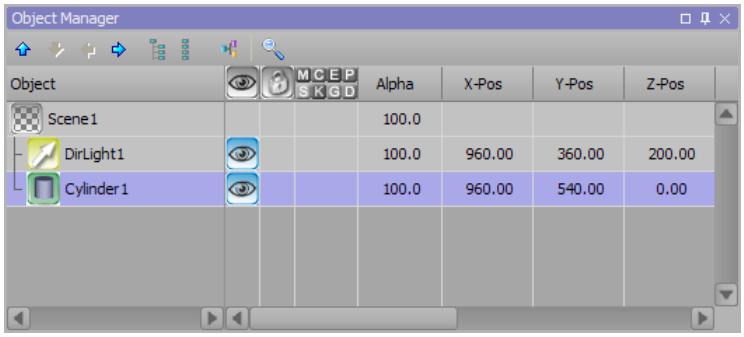
For More Information on...

- adding a sphere object to a scene, refer to Creating a Sphere Object.
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.

Linking a Cylinder Object to a DataLinq Source

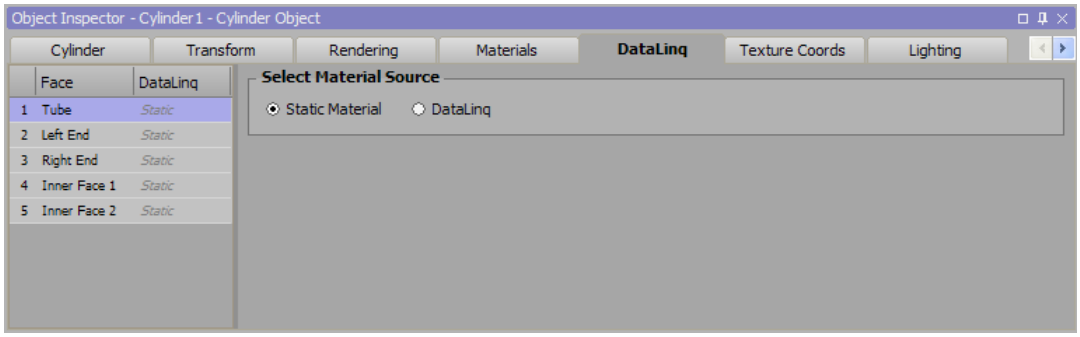
To link a cylinder object to a DataLinq source:

1. Add a cylinder object to a scene.
2. In the **Object Manager**, select the cylinder object.



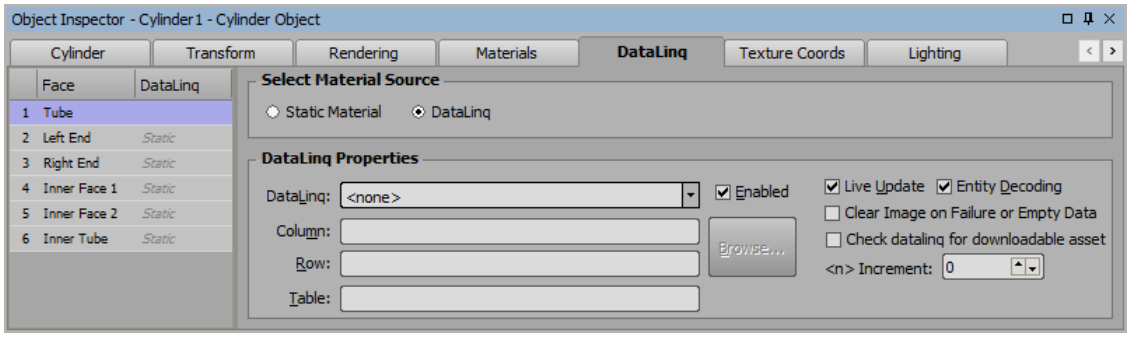
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. From the **Face** list, select the face of the cylinder object to which the material is to be applied.
5. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



6. Select the **Enabled** checkbox to enable DataLinq property configuration for the cylinder object.
7. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the cylinder object to display.

8. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the cylinder object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the cylinder object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

9. Select from the following options as needed:

   - Select the **Live Update** checkbox to immediately update an online cylinder object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer.

     This enables video clips from Inception to be DataLinq'd and downloaded for playout.

10. In the **<n> Increment** field, select or enter a value other than **0** when the **<n>** increment differs from the number of templates.

11. Repeat steps 4 to 10 for all other cylinder object faces that a material from a DataLinq source is to be applied.

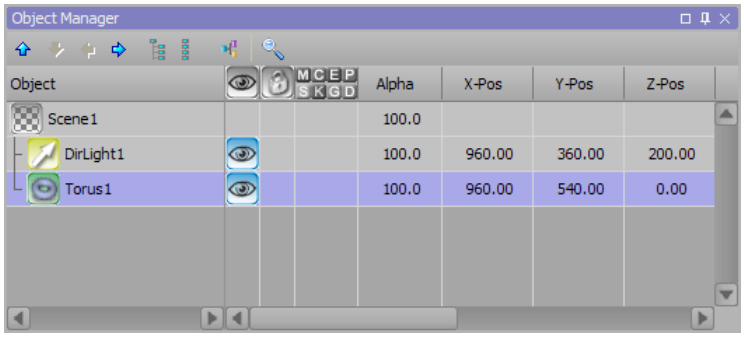
For More Information on...

- adding a cylinder object to a scene, refer to Creating a Cylinder Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Linking a Torus Object to a DataLinq Source

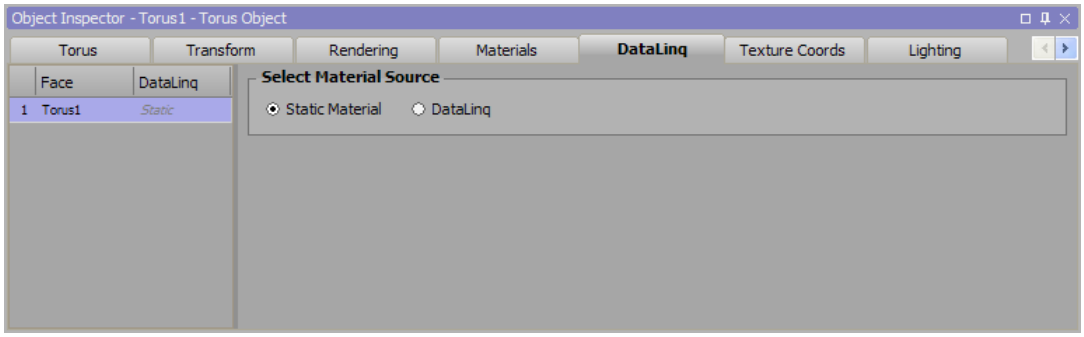
To link a torus object to a DataLinq source:

1. Add a torus object to a scene.
2. In the **Object Manager**, select the torus object.



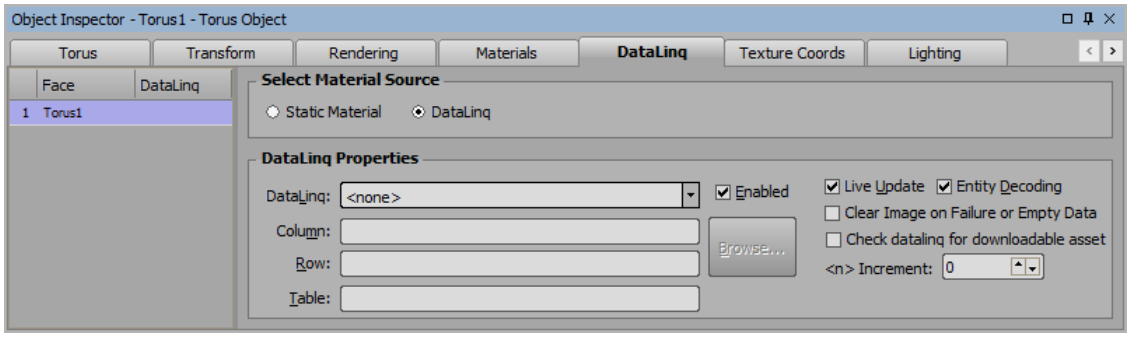
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



5. Select the **Enabled** checkbox to enable DataLinq property configuration for the torus object.
6. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the torus object to display.

7. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the torus object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the torus object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

8. Select from the following options as needed:

   - Select the **Live Update** checkbox to immediately update an online torus object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer.

     This enables video clips from Inception to be DataLinq'd and downloaded for playout.

9. In the **<n> Increment** field, select or enter a value other than **0** when the **<n>** increment differs from the number of templates.

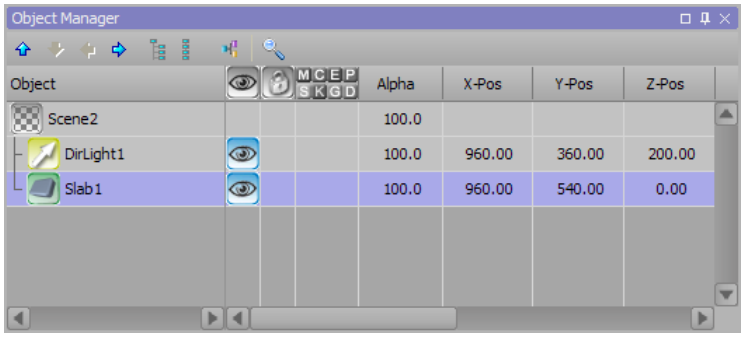
For More Information on...

- adding a torus object to a scene, refer to Creating a Torus Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Linking a Slab Object to a DataLinq Source

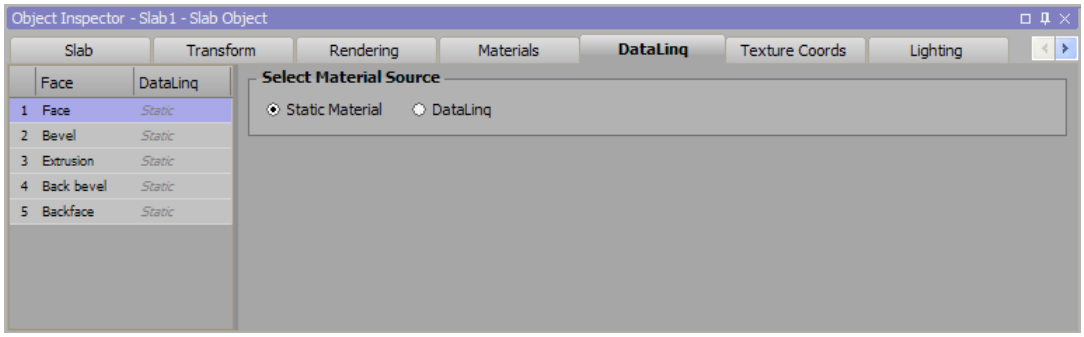
To link a slab object to a DataLinq source:

1. Add a slab object to a scene.
2. In the **Object Manager**, select the slab object.



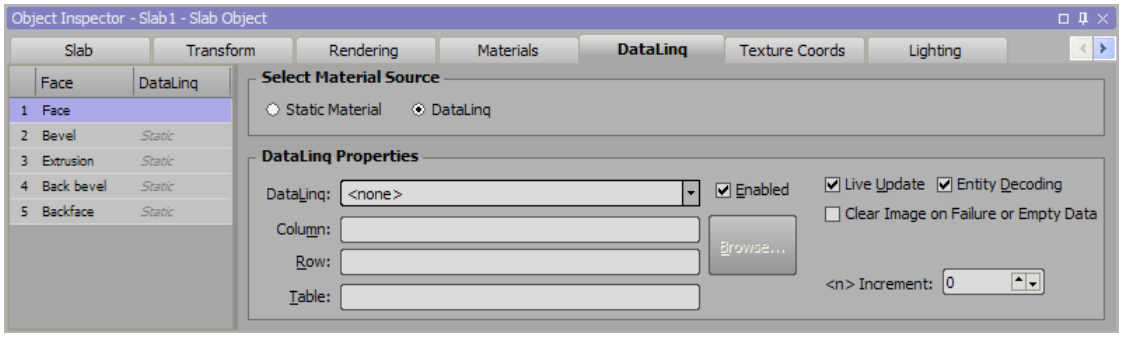
3. Select the **DataLinq** tab in the **Object Inspector**.

   The **DataLinq** tab opens.



4. From the **Face** list, select the face of the slab object to which the material is to be applied.
5. Select the **DataLinq** option.

   The **DataLinq Properties** section is displayed.



6. Select the **Enabled** check box to enable DataLinq property configuration for the slab object face.
7. From the **DataLinq** drop-down, select the DataLinq source that contains the data for the slab object to display.

8. Select **Browse** to use the **Select DataLinq Field** dialog to select the column and row, or table, that contain the slab object data.

   OR

   In the **Column**, **Row**, and **Table** fields, enter the names of the column and row, or table, that contain the slab object data.

   This data could be formatted as a file path or a material name from the currently loaded project.

9. Select from the following options as needed:

   - Select the **Live Update** checkbox to immediately update an online slab object with changes from the associated DataLinq source when the scene is on-air.
   - Select the **Entity Decoding** checkbox to translate HTML character entity reference codes into the correct corresponding materials.
   - Select the **Clear Image on Failure or Empty Data** checkbox to clear the image if the value returned from the DataLinq is empty.
   - Select the **Check datalinq for downloadable asset** checkbox to check the DataLinq for downloadable assets when the scene is placed in the sequencer.

     This enables video clips from Inception to be DataLinq'd and downloaded for playout.

10. In the **<n> Increment** field, select or enter a value other than **0** when the **<n>** increment differs from the number of templates.

11. Repeat steps 4 to 10 for all other slab object faces that a material from a DataLinq source is to be applied.

For More Information on...

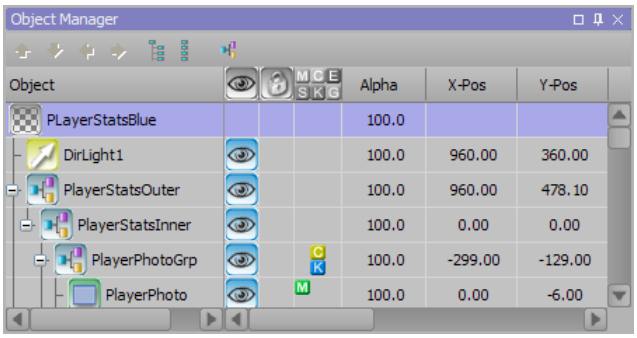
- adding a slab object to a scene, refer to Creating a Slab Object..
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server..
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server..

Using DataLinq Keys with an ADODB DataLinq

A **DataLinq Key** is a value that can be set up to globally increment the data field within a specific DataLinq template.

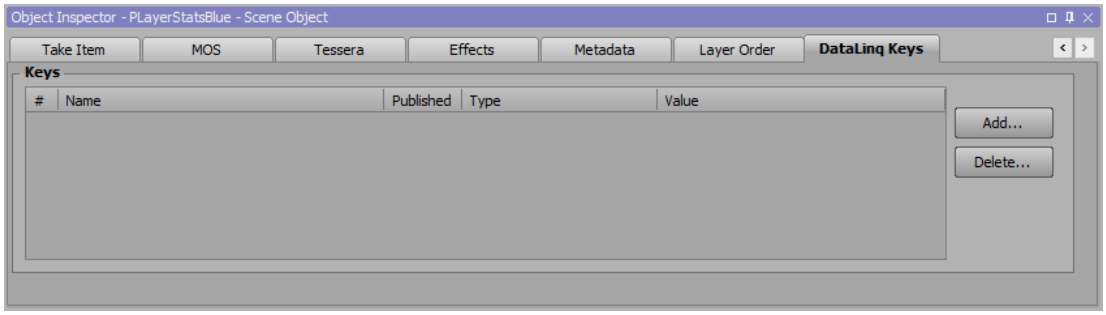
To add a DataLinq Key to a project:

1. Open or create a project in XPression that uses an ADODB DataLinq.
2. In the **Object Manager**, select a scene or scene group.



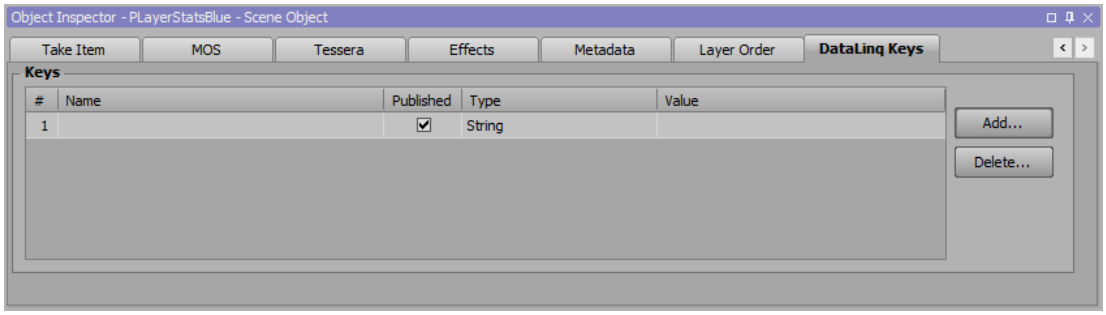
3. Select the **DataLinq Keys** tab in the **Object Inspector** window.

   The **DataLinq Keys** tab opens.



4. Select **Add**.

   A new **DataLinq Key** is added to the **Keys** list.



5. In the **Name** column, enter a name for the **DataLinq Key**.

   ★It is important to give the key a meaningful name in regards to the scene or scene group; for example 'Jersey Number'.

6. In the **Published** column, select the checkbox to publish the **DataLinq Key** to the sequencer if necessary.

   This is selected by default.

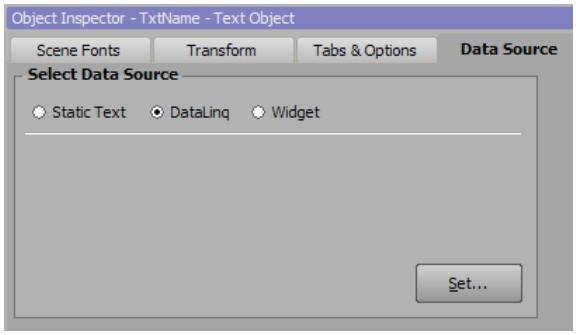
To connect the DataLinq Key to an object:

1. Select an object in the scene or scene group that uses DataLinq as its data source and is to be linked with the **DataLinq Key**.

   For example, a text object that has a player name or a quad object that contains a player headshot.

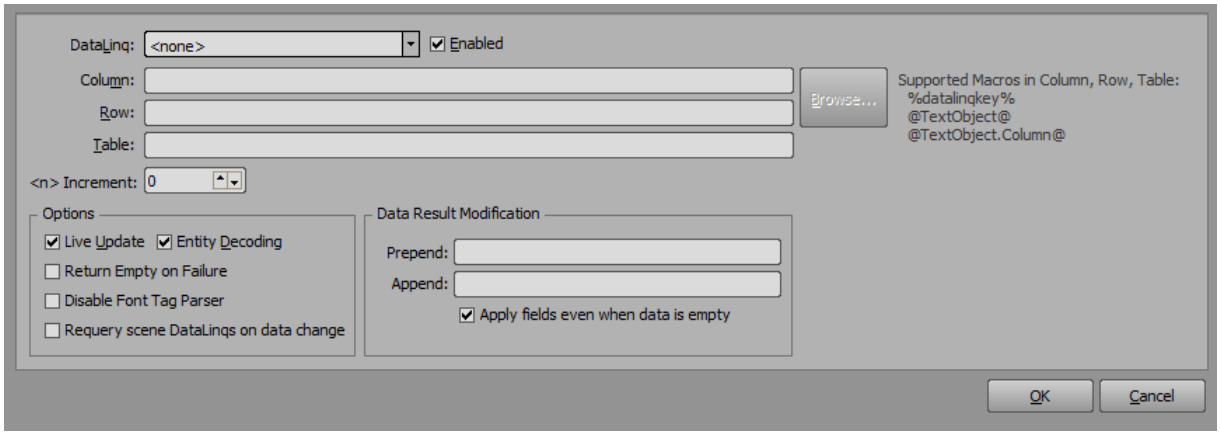
2. Depending on the selected object, select the **Data Source** or **DataLinq** tab in the **Object Inspector** of the object.

   The **Data Source** or **DataLinq** tab opens.



3. In the **Select Data Source** section, select **DataLinq**.
4. Select **Set**.

   The **Set DataLinq Properties** dialog opens.



5. In the **Row** field, enter the name of the **DataLinq Key** enclosed in per cent characters.

   For example, for the 'Jersey Number' example, enter `%Jersey Number%`.

6. Select **OK**.

   The **Set DataLinq Properties** dialog closes.

7. Repeat the above steps to link the **DataLinq Key** with other objects.

To configure the DataLinq Key:

1. In the **Object Manager**, select the scene or scene group that contains the **DataLinq Key**.
2. Select the **DataLinq Keys** tab in the **Object Inspector**.

   The **DataLinq Keys** tab opens.

3. Configure the value in the Layout Editor or the Sequencer:

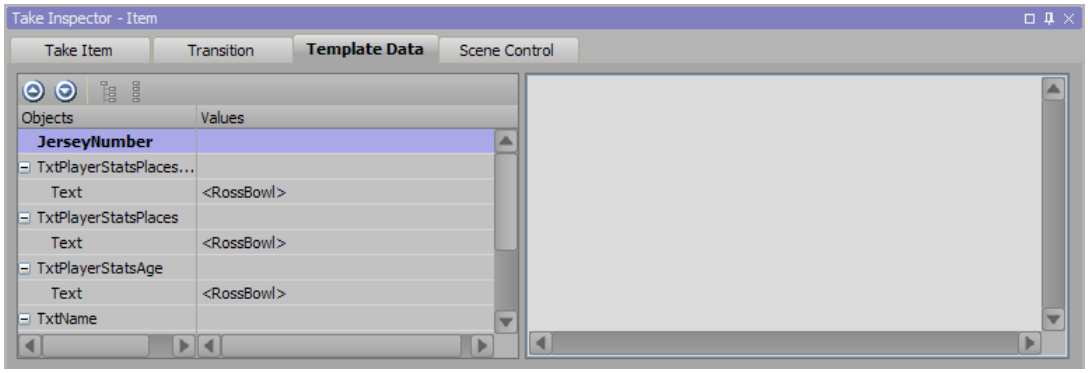
Layout Editor

1. In the **Object Manager**, select the scene or scene group object that contains the DataLinq Key.
2. In the **Object Inspector**, select the **DataLinq Keys** tab.
3. In the **Value** column, enter a value (for example, a player jersey number) or a macro and press **Enter**.

   The objects linked to the **DataLinq Key** are updated in the **Main Viewport** with the data from the DataLinq source.

Sequencer

1. In the **Sequencer**, select the take item that contains the objects linked to the **DataLinq Key**.
2. In the **Take Inspector**, select the **Template Data** tab.
3. The **Template Data** tab opens.



4. In the **Template Data** editor next to the **Object List**, enter a value for the **DataLinq Key**.

   The changes to the **DataLinq Key** value for the take item are reflected in the **Preview** window.

For More Information on...

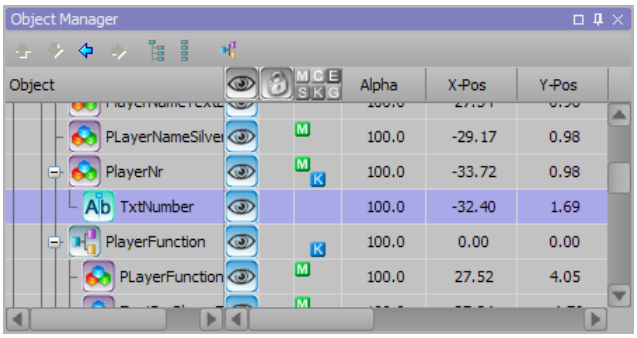
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.
- using a macro with a DataLinq Key, refer to Using a Macro with a DataLinq Key.

Using DataLinq Keys with an XML DataLinq

A **DataLinq Key** is a value that can be set up to globally increment the data field within a specific DataLinq template.

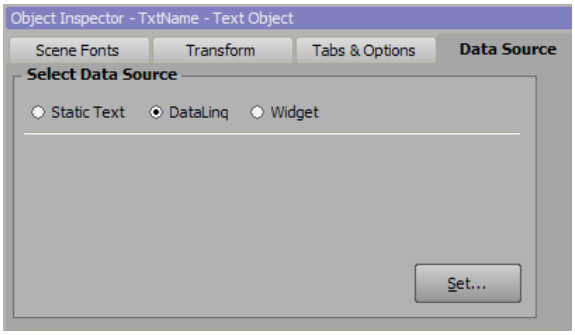
To connect an object to a DataLinq source:

1. Open or create a project in XPression that uses an XML DataLinq source.
2. In the **Object Manager**, select an object for the DataLinq.



3. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.

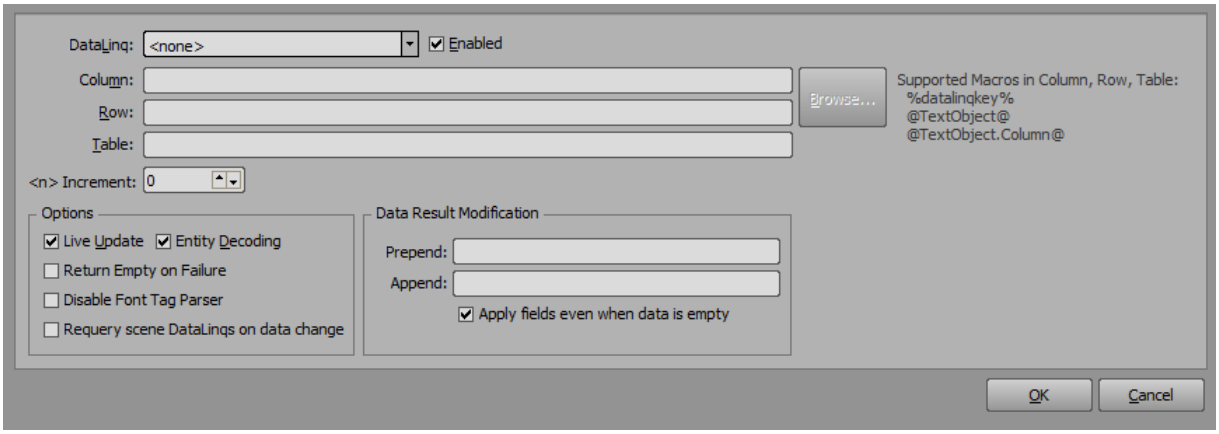


4. Select the **DataLinq** option.

   DataLinq information and a **Set** button are displayed below the options.

5. Select **Set**.

   The **Set DataLinq Properties** dialog opens.



6. Select the **Enabled** checkbox to enable DataLinq property configuration for the object.

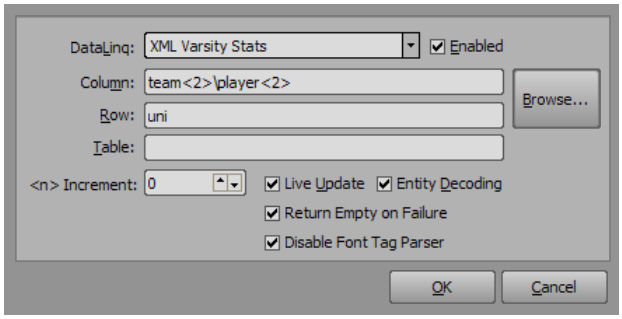
7. From the **DataLinq** drop-down, select the **XML DataLinq** source that contains the data for the object to display.
8. Select **Browse**.

   The **Select DataLinq Field** dialog opens.
9. In the **Data** section, select a data attribute or child data element to use for the object.

   For example, if using an XML DataLinq for a sporting event, select a player uniform number as the attribute.

   It is often easier to use a second record as the data attribute because it automatically enters the brace brackets required to enter the data increment format.
10. Select **OK**.

    The **Select DataLinq Field** dialog closes and the **Set DataLinq Properties** dialog is updated with the selected DataLinq settings.



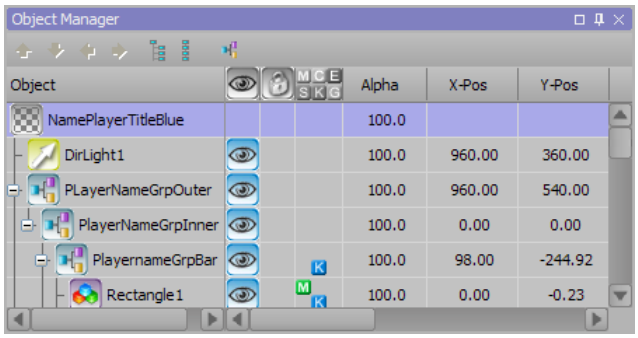
11. Select **OK**.

    The **Set DataLinq Properties** dialog closes.
12. Repeat steps 2 to 11 to configure other objects in the scene or scene group that are to use DataLinq Keys.

    For example, if using a DataLinq for a sporting event, select the player name from the **Data** section in the **Select DataLinq Field** dialog.

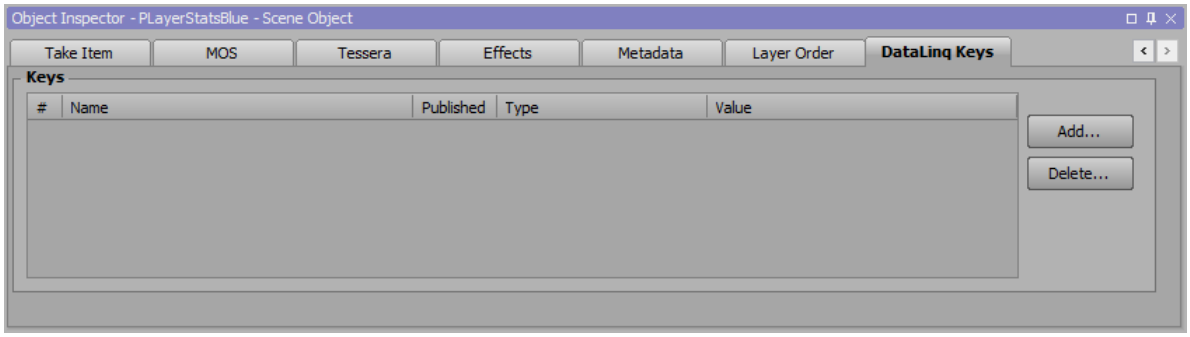
To add a DataLinq Key to a project:

1. In the **Object Manager**, select the scene or scene group that contains the DataLinq objects.



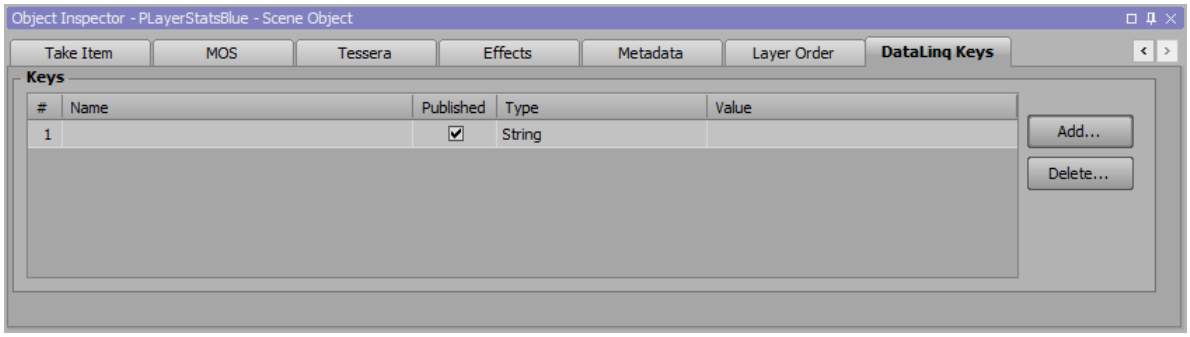
2. In the **Object Inspector**, select the **DataLinq Keys** tab.

   The **DataLinq Keys** tab opens.



3. Select **Add**.

   A new **DataLinq Key** is added to the **Keys** list.



4. In the **Name** column, enter a name for the **DataLinq Key**.

   ★It is important to give the key a meaningful name in regards to the scene or scene group; for example 'Jersey Number'.

5. In the **Published** column, select the checkbox to publish the **DataLinq Key** to the sequencer if necessary.

   This is selected by default.

6. In the **Value** column, enter a default value for the **DataLinq Key**.

   For example, a jersey number.

To configure the DataLinq properties:

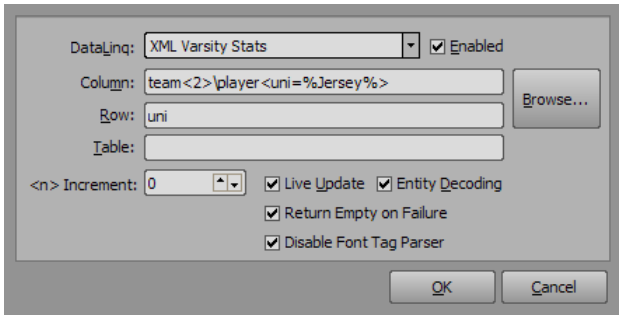
1. Select the object in the scene or scene group that uses the DataLinq as its data source and is to be linked with the **DataLinq Key**.
2. In the **Object Inspector**, select the **Data Source** tab.
3. Select **Set**.

   The **Set DataLinq Properties** dialog opens.

4. In the **Column** field, between the brace brackets, set up the data increments for the **DataLinq Key** value.

   For example, for the jersey number in this procedure, the data increment format would be `<uni=%jersey%>`.

   ★**DataLinq Keys** must always be wrapped in **%** characters.



   DataLinq Keys can search multiple attributes or elements to return a node that matches all search criteria. For example, players<team=NY;jersey=10>.

5. Select **OK**.

   The objects in the scene are updated with the DataLinq Key values and the DataLinq settings are updated in the Data Source tab of the object.

6. Repeat steps 1 to 5 for any other objects in the scene or scene group that use DataLinq.

For More Information on...

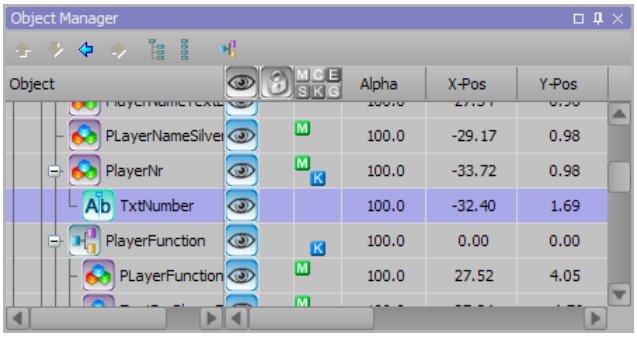
- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.

Using SQL Queries

Use SQL queries to sort and filter data in templates.

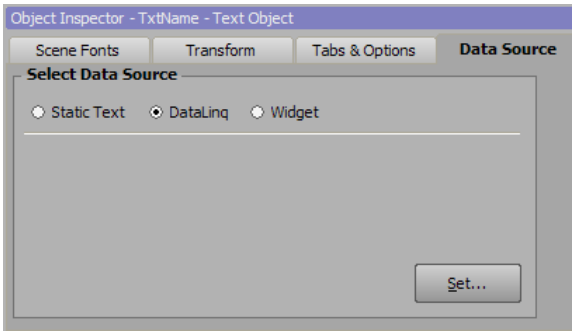
To use an SQL query to sort and filter data in templates:

1. Open or create a project in XPression that uses an ADODB DataLinq source.
2. In the **Object Manager**, select an object for the DataLinq.



3. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.

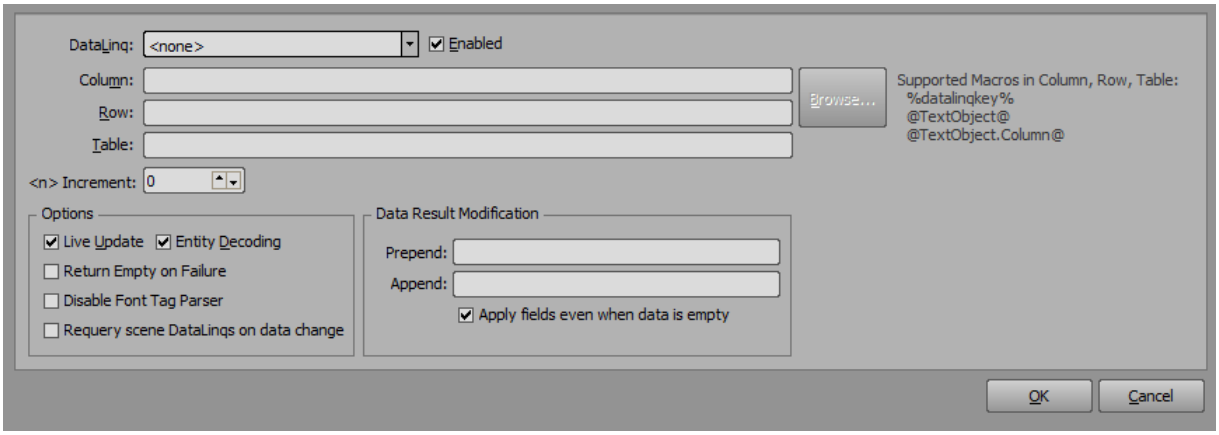


4. Select the **DataLinq** option.

   DataLinq information and a **Set** button are displayed below the options.

5. Select **Set**.

   The **Set DataLinq Properties** dialog opens.



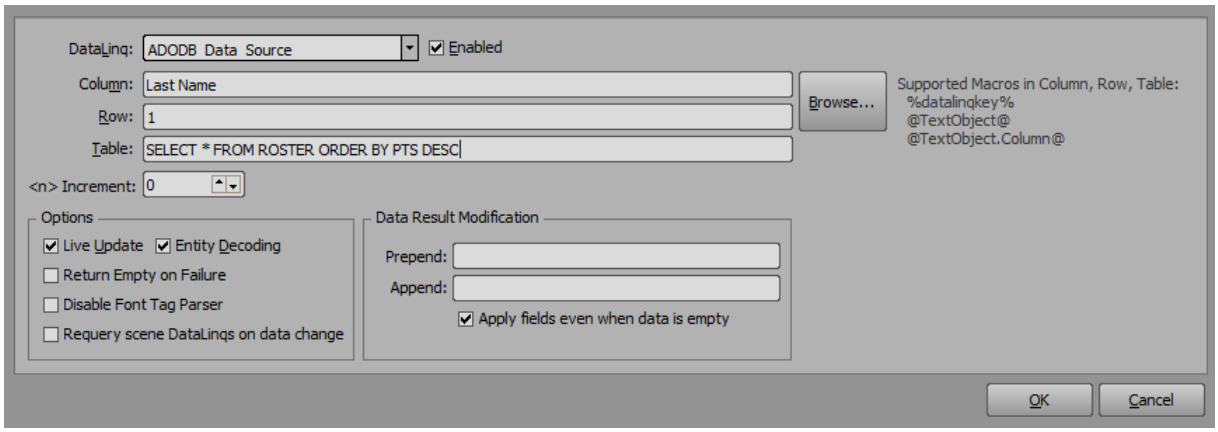
6. Select the **Enabled** checkbox to enable DataLinq property configuration for the object.

7. From the **DataLinq** drop-down, select the ADODB DataLinq source that contains the data for the object to display.
8. Select **Browse**.

   The **Select DataLinq Field** dialog opens.
9. Use the **Table** field to enter the query.

   For example, SELECT * FROM ROSTER ORDER BY PTS DESC. Queries entered into this field are case sensitive.
10. Select **OK**.

    The **Select DataLinq Field** dialog closes and the **Set DataLinq Properties** dialog is updated with the query.

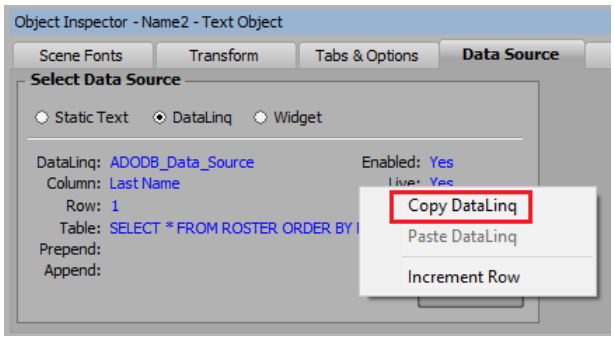


11. Select **OK**.

    The **Set DataLinq Properties** dialog closes.

To copy the DataLinq properties to other objects:

1. In the **Object Inspector**, in the **Data Source** tab, right-click inside the **Select Data Source** section and select **Copy DataLinq** from the shortcut menu.

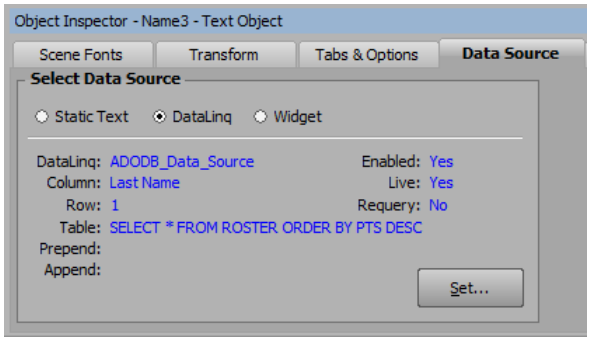


2. In the **Object Manager**, select a different object to be used for the DataLinq query.
3. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.
4. Select the **DataLinq** option.

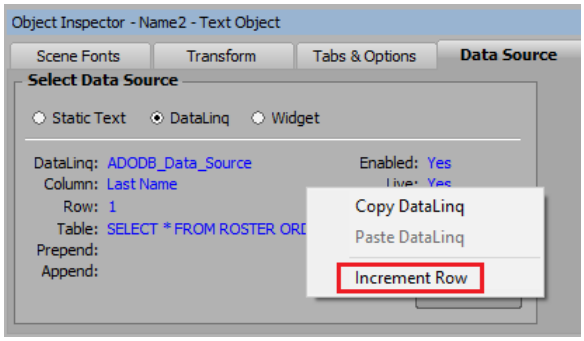
5. Right-click inside the **Select Data Source** section and select **Paste DataLinq** from the shortcut menu.

   The DataLinq source information is added to the **Select Data Source** tab.

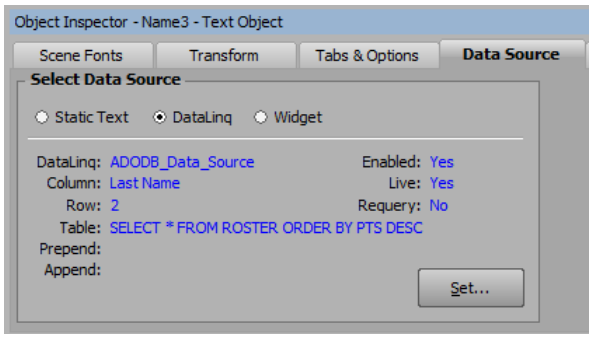


To increment the row number in a DataLinq source:

1. With the DataLinq object selected in the **Object Manager**, in the **Object Inspector**, select the **Data Source** tab.
2. Right-click inside the **Select Data Source** section and select **Increment Row** to increase the row number.



   The **Row** number increases by one.



3. Copy and paste the DataLinq properties to other objects to be used for the DataLinq query and then increment the row number in each object.

For More Information on...

- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.

Using a Macro with a DataLinq Key

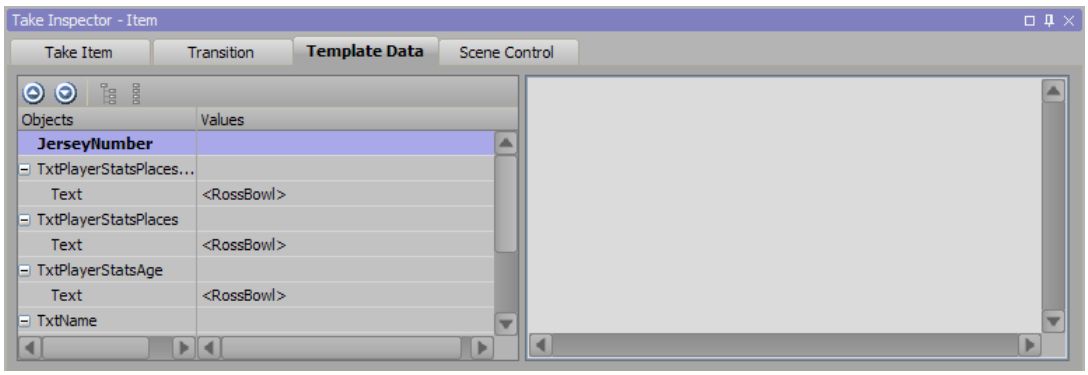
To use a macro with a DataLinq Key:

1. Open or create a project in XPression that uses DataLinq.
2. Create a **DataLinq Key**.
3. Use the Sequencer or Layout Editor to apply a macro to the DataLinq Key.

Sequencer

1. In the **Sequencer**, select the take item that contains the objects linked to the DataLinq Key.
2. In the **Take Inspector**, select the **Template Data** tab.

   The **Template Data** tab opens.



3. In the **Template Data** editor next to the **Object** List, right-click and select a macro.

   The options are:

   - **Insert Macro > takeid** — generates a **DataLinq Key** based on the **Take ID** number.

     This macro can be used as an equation. For example, if you have a **Take ID** number of **101** and want to access record **1** in the DataLinq, the takeid macro with an equation would be entered as `<%takeid % - 100>`.

   - **Insert Macro > groupid** — generates a **DataLinq Key** based on the **Group ID** number.

     This macro can be used as an equation. For example, if you have a **Group ID** number of **101** and want to access record **1** in the DataLinq, the groupid macro with an equation would be entered as `<% groupid% - 100>`.

   - **Insert Macro > relid** — generate a **DataLinq Key** value based on the **Take ID** value relative to the **Group ID** value.

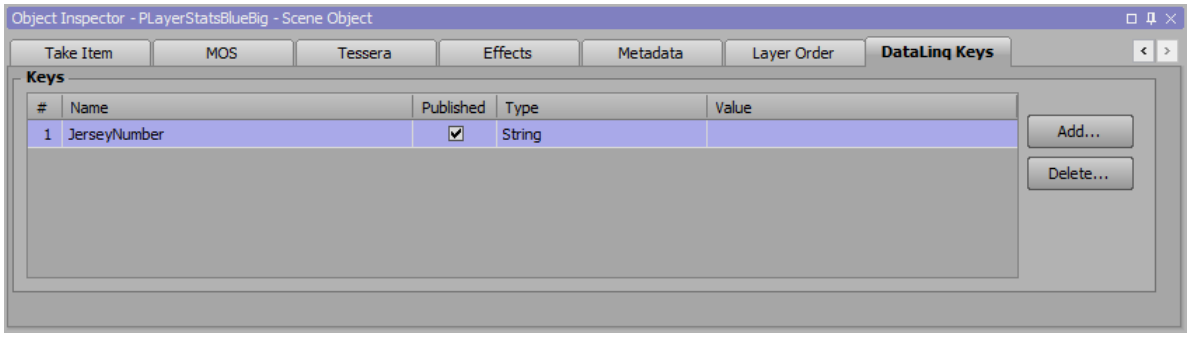
   - **Insert Macro > DataLinq Keys > DataLinq Key** — selects a **DataLinq Key** and its value as the macro.

     This macro can be used as an equation. For example, if you have a **DataLinq Key** with a value of **20** and want to access record **30** in the DataLinq, the DataLinq Key macro with an equation would be entered as `<%DataLinq Key% + 10>`.

Layout Editor

1. In the **Layout** editor, select the scene that contains the objects linked to the DataLinq Key.
2. In the **Object Manager** window, select the scene or scene group object that contains the DataLinq Key.
3. In the **Object Inspector**, select the **DataLinq Keys** tab.

   The **DataLinq Keys** tab opens.



4. In the **Value** column, enter a macro for the **DataLinq Key**.

   The options are as follows:

   - **Insert Macro > takeid** — generates a **DataLinq Key** based on the **Take ID** number.

     This macro can be used as an equation. For example, if you have a **Take ID** number of **101** and want to access record **1** in the DataLinq, the takeid macro with an equation would be entered as `<%takeid % - 100>`.

   - **Insert Macro > groupid** — generates a **DataLinq Key** based on the **Group ID** number.

     This macro can be used as an equation. For example, if you have a **Group ID** number of **101** and want to access record **1** in the DataLinq, the groupid macro with an equation would be entered as `<%groupid% - 100>`.

   - **Insert Macro > relid** — generate a **DataLinq Key** value based on the **Take ID** value relative to the **Group ID** value.

   - **Insert Macro > DataLinq Keys > DataLinq Key** — selects a **DataLinq Key** and its value as the macro.

     This macro can be used as an equation. For example, if you have a **DataLinq Key** with a value of **20** and want to access record **30** in the DataLinq, the DataLinq Key macro with an equation would be entered as `<%DataLinq Key% + 10>`.

For More Information on...

- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.
- creating a DataLinq Key, refer to Using DataLinq Keys with an ADODB DataLinq.

Creating a Data Page

Create **Data Pages** to use text/materials in an on-air scene to be updated via another take item in the **Sequencer**. **Data Pages** function as a holder for information. The **Data Page** can be cued prior to the original scene or taken after the original scene is already on the air.

To create a Data Page:

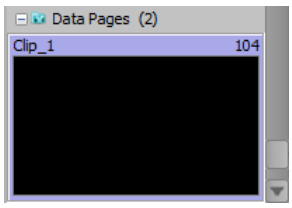
1. Open a project in XPression.
2. Create a **Category** in the **Project Manager** for storing the **Data Pages**.

   It is recommended that the category be given a meaningful name, e.g., **Data Pages**.

   The new category appears in the **Scene Manager**.



3. Create a new scene in the newly created category Data pages category and give it a meaningful name, e.g., **Clip_1**.

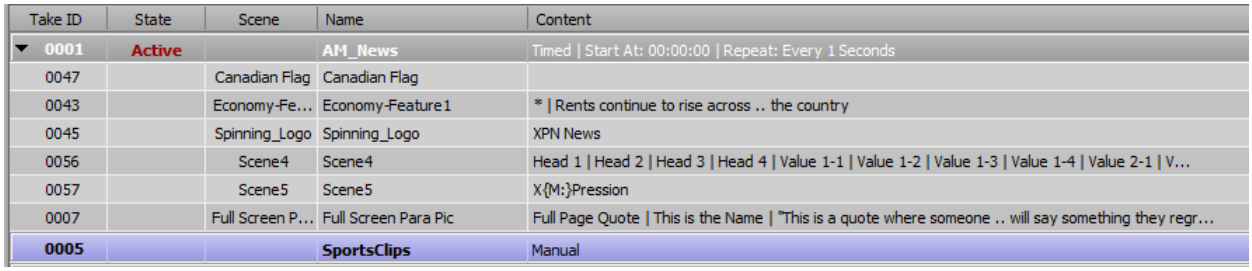


4. In the new scene, create a text object, an object that uses a material (such as a quad or cube object), or a widget.
5. In the **Object Manager**, enter a name for the new object that is the same as the object in the on-air scene that will use the **Data Page**.

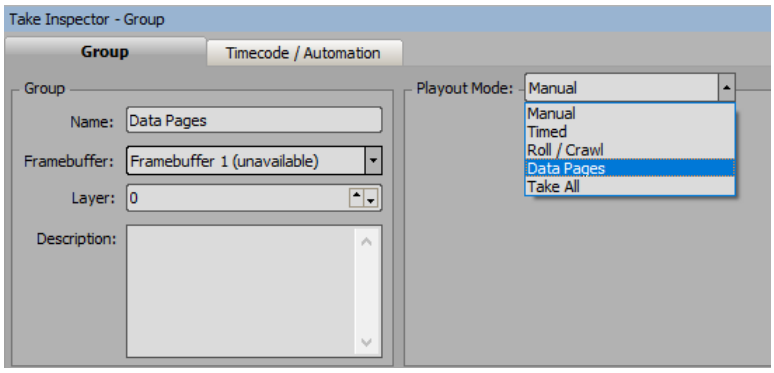
   For example, if the object in the on-air scene is named **VideoDescription**, name the object in the **Data Page** scene **VideoDescription**.
6. In the **Object Inspector**, in the **Template Links** tab, publish the object.

7. In the **Sequencer**, create a new group in the **Take Item** list and give it a meaningful name.

   For example, if the project is for a sports broadcast, the new group could be named **SportsClips**.



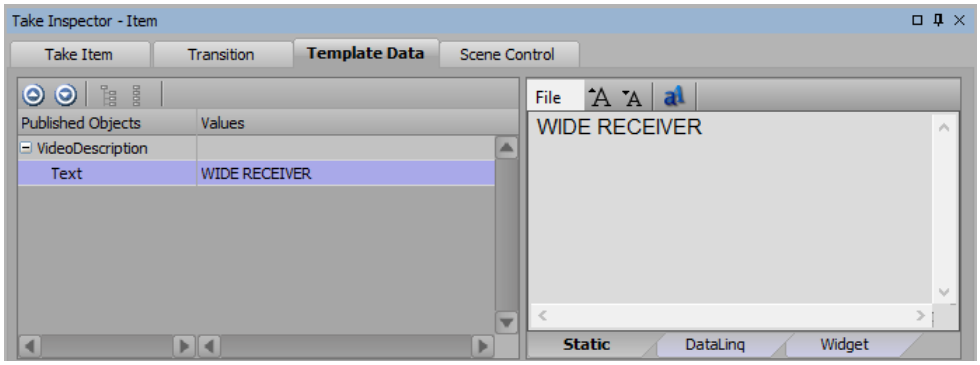
8. Add scenes to the new group in the **Take Item** list that are to be used with the **Data Page**.
9. Create a new group in the **Take Item** list for storing **Data Pages** and give it a meaningful name, e.g., **Data Pages**.
10. In the **Take Inspector**, in the **Group** tab, select **Data Pages** from the **Playout Mode** list.



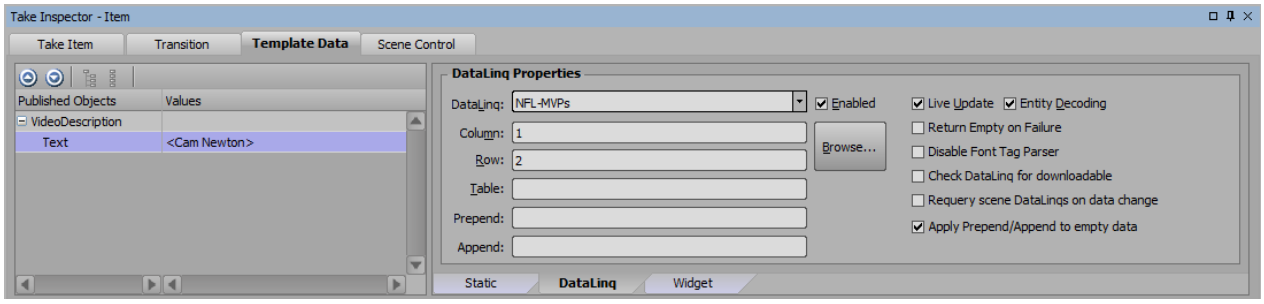
11. In the **Sequencer**, drag the scene from the **Data Pages Category** in the **Scene Manager** and drop it in the new **Group** item used for the **Data Pages** in the **Take Item** list (in this example, the **SportsClips** group).
12. Ensure that the **Data Page** and the scene to which the data is being added are outputting on the same **Layer** and **Framebuffer**.

To configure a Data Page scene:

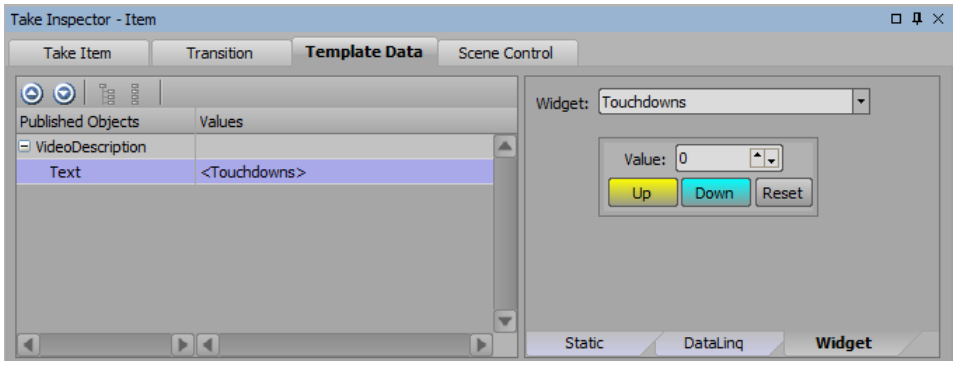
1. In the **Take Item** list, select the scene created in the **Data Pages** category.
2. In the **Take Inspector** for the **Data Page** scene (**Clip_1** in this example), in the **Template Data** tab:
   - Select the **Static** tab to use the **Template Data Editor** to enter text for the **Data Page** e.g., WIDE RECEIVER.



- Select the **DataLinq** tab to use the **DataLinq Properties** settings to link the **Data Page** to a DataLinq.



- Select the **Widget** tab to use the **Widgets** list to link the **Data Page** to a widget.



3. In the **Take Item** List, double-click the **Data Page** scene.

   The **State** displays as data cued.

4. Conversely, double-click a scene to cue it for use with the **Data Page** scene.

5. Take online the scene that uses the **Data Page** scene, or if a scene has been cued for use with the **Data Page** scene, double-click the **Data Page** scene.

   The preview for a **Data Page** scene displays the **Data Page** scene as applied to a cued/online scene on the same layer.

   Conversely, the preview for a scene displays the scene as applied to a cued/online **Data Page** scene on the same layer.

For More Information on...

- creating a category, refer to Creating a Category.
- publishing objects to the Sequencer, refer to Modifying Template Content.

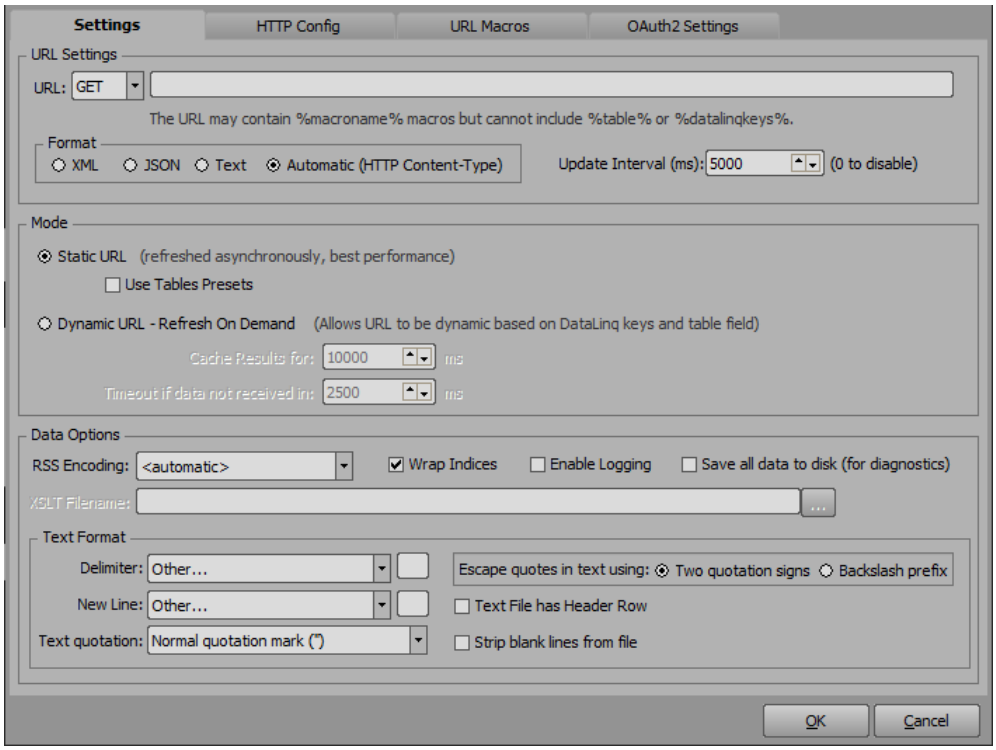
Using a Static URL

Use the RSS feed of a single URL as entered in the URL settings. It is refreshed asynchronously.

To use a static URL:

1. In the **XPression DataLinq Server**, add an RSS / HTTP DataLinq Source.

   The **RSS / HTTP DataLinq - Configuration** dialog opens.



2. In the **URL Settings** section, in the **URL** field, enter the URL of an RSS feed, e.g., https://www.rossvideo.com/media/rss-news.
3. Select **OK**.

   The **RSS / HTTP DataLinq - Configuration** dialog closes and the **RSS / HTTP DataLinq** source is added to the **DataLinq Sources** list in the **XPression DataLinq Server**.
4. In XPression, create or select a scene that contains a text object.
5. In the **Object Manager**, select the text object from the **Object** list.



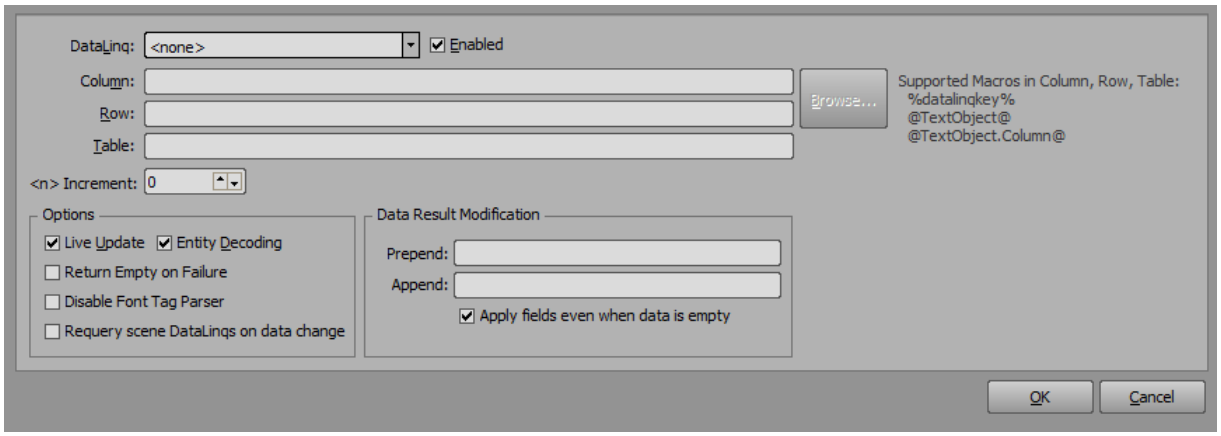
6. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



7. In the **Select Data Source** section, select the **DataLinq** radio button and select **Set**.

   The **Set DataLinq Properties** dialog opens.



8. From the **DataLinq** drop-down, select the **RSS / HTTP DataLinq** source.
9. Select **Browse**.

   The **Select DataLinq Field** dialog opens.

10. In the **Data** section, select the row from the RSS feed that contains the info to add to the text object and select **OK**.

    The **Select DataLinq Field** dialog closes.

11. Select **OK**.

    The **Set DataLinq Properties** dialog closes and the text object is updated with the text from the RSS feed.

For More Information on...

- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.

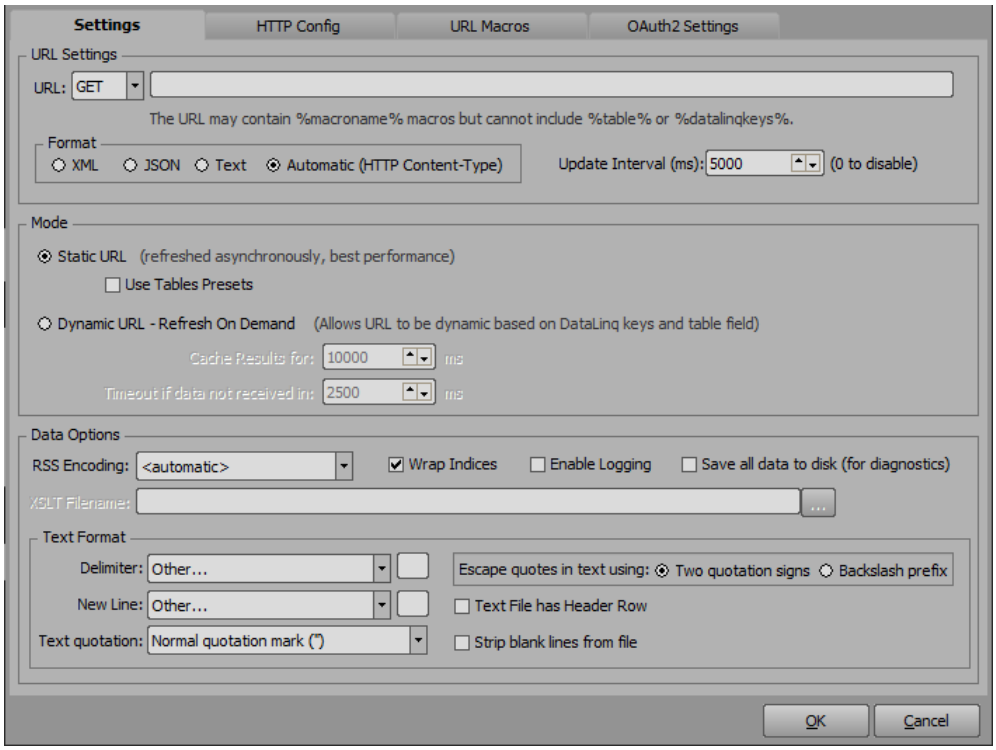
Using a Dynamic URL

Use multiple RSS feeds by configuring a dynamic URL. The results are refreshed on demand.

To configure the DataLinq source:

1. In the **XPression DataLinq Server**, add an RSS / HTTP DataLinq Source.

   The **RSS / HTTP DataLinq - Configuration** dialog opens.



2. In the **URL Settings** section, in the **URL** field, enter the URL of an RSS feed, e.g., https://www.rossvideo.com/media/rss-news.
3. In the **Mode** section, select the **Dynamic URL** radio button and configure the following settings as necessary:
   - **Cache Results for** — enter or select an amount of time in milliseconds to cache the results of the query.
   - **Timeout if data not received in** — enter or a select a time in milliseconds to timeout the query if data has not been received in the specified amount of time.
4. In the **URL Settings** section, in the **URL** field, enter a DataLinq key in place of the **RSS** section of the URL entered in step 2.

   For example, change `https://www.rossvideo.com/media/rss-news` to `https://www.rossvideo.com/media/rss-%feed%`.
5. Select **OK**.

   The **RSS / HTTP DataLinq - Configuration** dialog closes and the **RSS / HTTP DataLinq** source is added to the **DataLinq Sources** list in the **XPression DataLinq Server**.

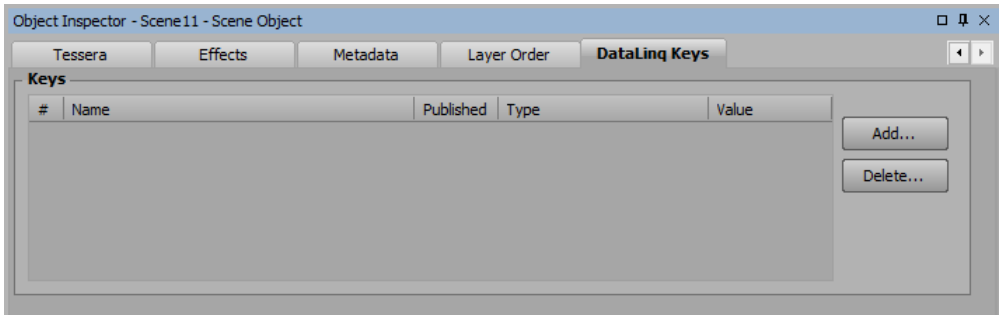
To add a DataLinq Key:

1. In XPression, create or select a scene that contains a text object.
2. In the **Object Manager**, select the scene object from the **Object** list.



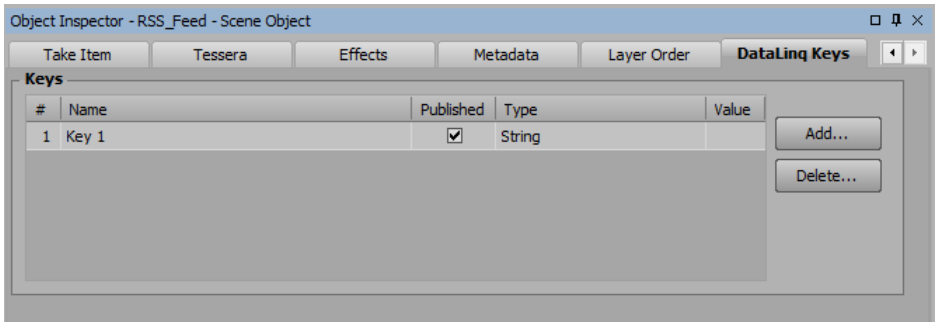
3. In the **Object Inspector**, select the **DataLinq Keys** tab.

   The **DataLinq Keys** tab opens.



4. In the **DataLinq Keys** tab, select **Add**.

   A **DataLinq Key** is added to the **Keys** list.

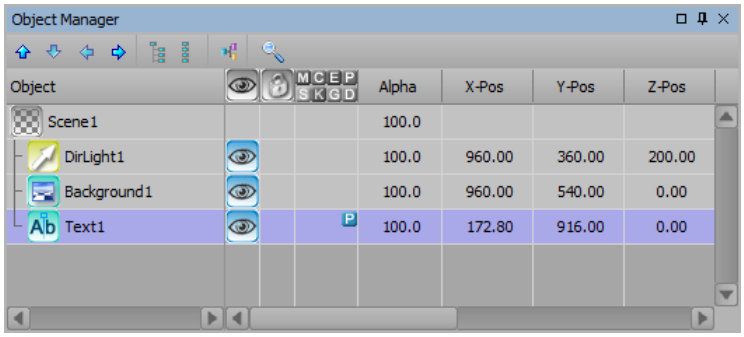


5. In the **Keys** list, click inside the **Name** column of the **DataLinq Key** and enter `feed` as the name.
6. Click inside the **Value** column and enter a variable ending of the URL being used for the DataLinq.

   For example, the URL being used is https://www.rossvideo.com/media/rss-news with the variable ending being replaced with the **DataLinq Key** %feed% (https://www.rossvideo.com/media/rss-%feed%) in the DataLinq configuration.

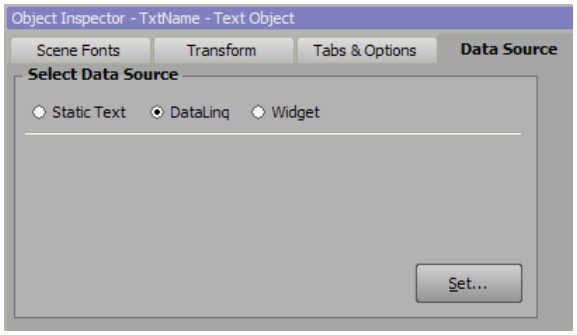
To configure the DataLinq Key properties:

1. In the **Object Manager**, select the text object from the **Object** list.



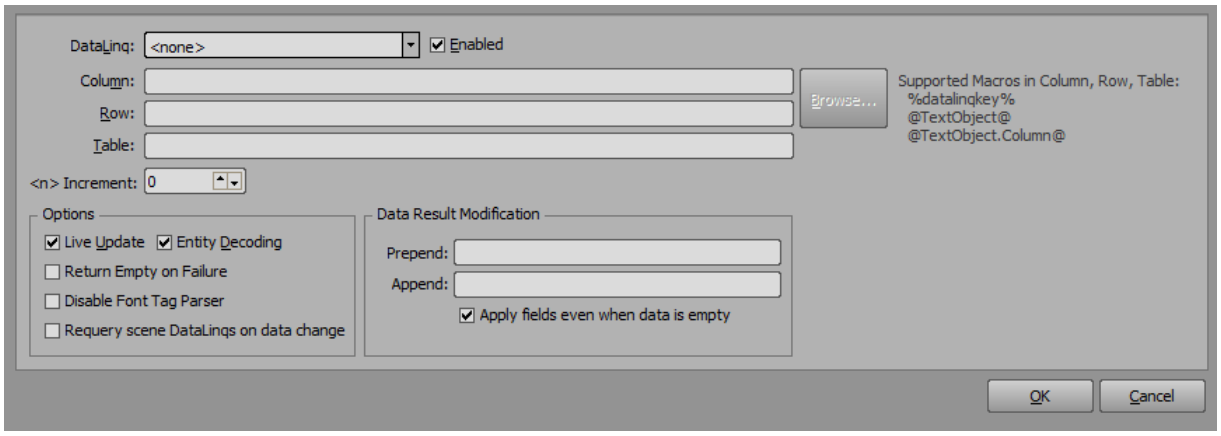
2. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



3. In the **Select Data Source** section, select the **DataLinq** radio button.
4. Select **Set**.

   The **Set DataLinq Properties** dialog opens.



5. From the **DataLinq** drop-down, select the RSS / HTTP DataLinq source.
6. Select **Browse**.

   The **Select DataLinq Field** dialog opens.

7. In the **Data** section, select the row from the RSS feed that contains the info to add to the text object and select **OK**.

   The **Select DataLinq Field** dialog closes.

8. Select **OK**.

   The **Set DataLinq Properties** dialog closes and the text object is updated with the text from the RSS feed.

9. If the website has other RSS feed URLs, such as https://www.rossvideo.com/media/rss-events or https://www.rossvideo.com/media/rss-announcements, enter one of events or announcements in the **Value** column.

   This can be executed for any number of RSS URLs that have the same URL other than where the %feed % **DataLinq Key** was entered, and any previous value entered can be returned to by re-entering it as the value for the **DataLinq Key**.

For More Information on...

- running a DataLinq server and configuring DataLinq sources, refer to Starting the XPression DataLinq Server.
- connecting to a DataLinq Server from XPression, refer to Connecting XPression to an XPression DataLinq Server.

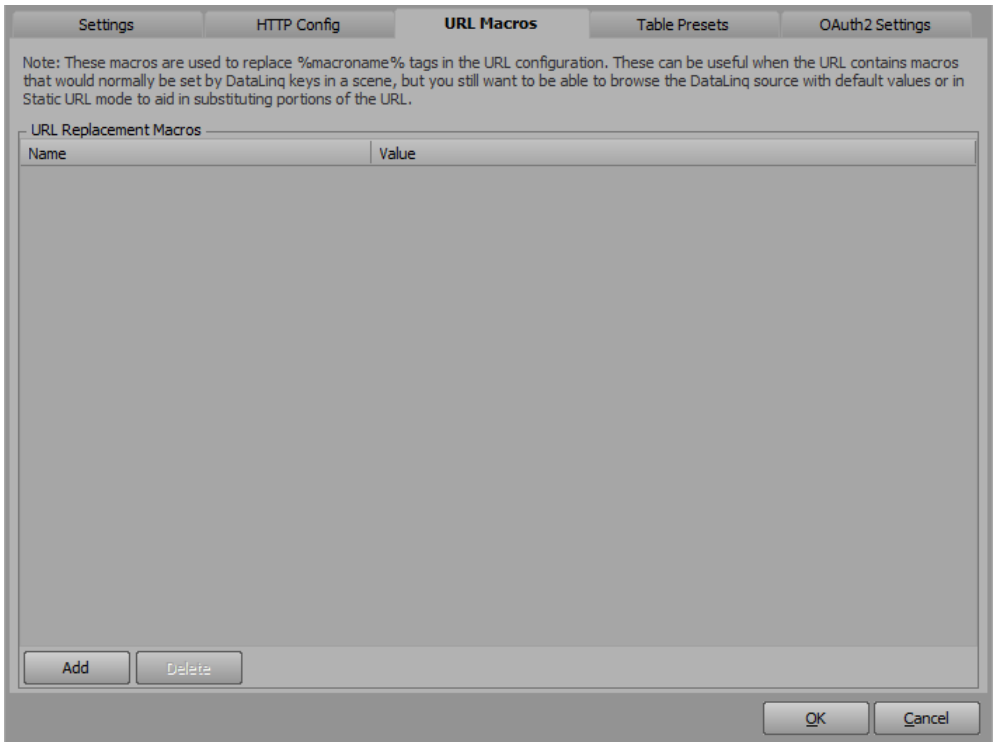
Using URL Macros

URL macros are macros that replace the %macroname% tags in the URL configuration. URL macros enable browsing of the DataLinq source URL with default values when the URL contains macros that would usually be set by DataLinq keys in a scene.

To use default URL macros:

1. In the **XPression DataLinq Server**, select the **RSS / HTTP DataLinq DataLinq Source**.
2. In the **Settings** tab, configure a dynamic URL in the **Settings**.
3. Select the **URL Macros** tab.

   The **URL Macros** tab opens.



4. Select **Add** to add a URL replacement macro to the list and configure the following:
   - **Name** — enter a name for the URL replacement macro (for example, 'feed' if using a news website URL with an RSS feed).
   - **Value** — enter the value of the URL replacement macro (for example, 'world' if a news website URL has an RSS feed for world news).
5. Repeat step 3 for any other URL replacement macros.

   For example, enter the name as `national` for a national feed and enter the value as 'canada'.
6. Select the **Settings** tab.

   The **Settings** tab opens.
7. In the **URL** field, enter a configured URL replacement macro in the section of the URL that represents the URL replacement macro.
8. Select **OK**.

The **RSS / HTTP DataLinq - Configuration** dialog closes.

9. In the **XPression DataLinq Server** window, select **Browse**.

   The **Browse DataLinq** dialog opens to the RSS URL provided by the URL replacement macro.

For More Information on...

- configuring a dynamic DataLinq URL, refer to Using a Dynamic URL.

Using Table Presets

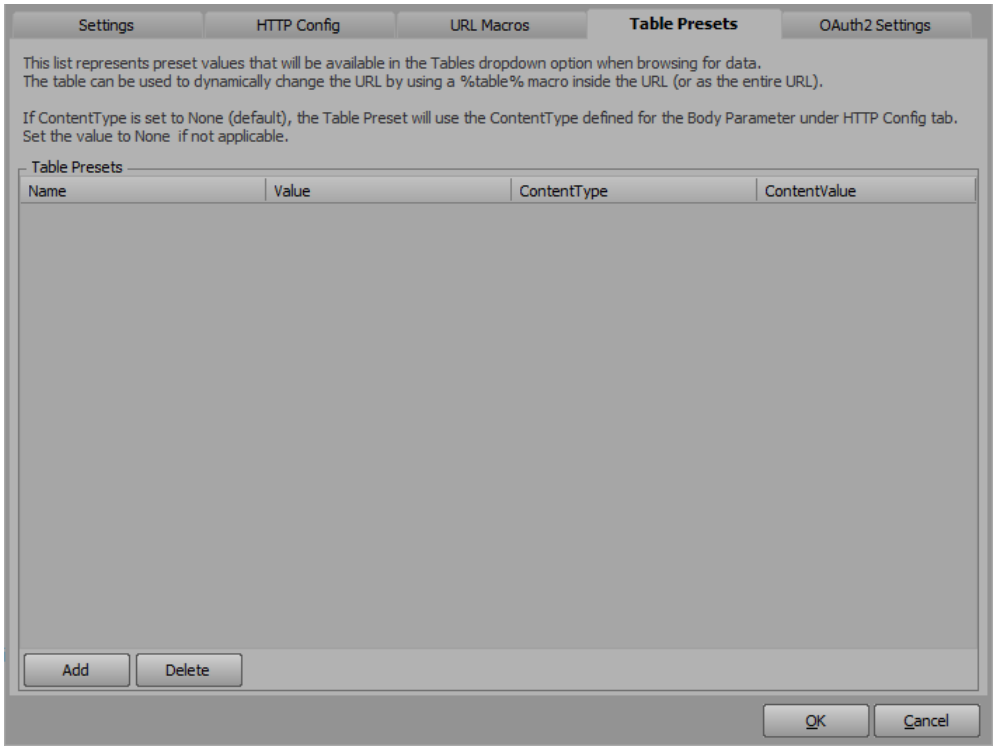
Table Presets are preset URL values for the **Table** list in the **Select DataLinq Field** window when using a dynamic URL RSS DataLinq with a text object. The **Table Presets** list represents preset values that are available in the **Table** list when browsing for data. The table can be used to dynamically change the URL by using a %table% macro inside the URL or as the entire URL.

To configure the RSS /HTTP DataLinq source:

1. Create a static URL RSS DataLinq.
2. In the **RSS / HTTP DataLinq - Configuration** dialog, in the **Settings** tab, in the **Mode** section, select **Dynamic URL.**

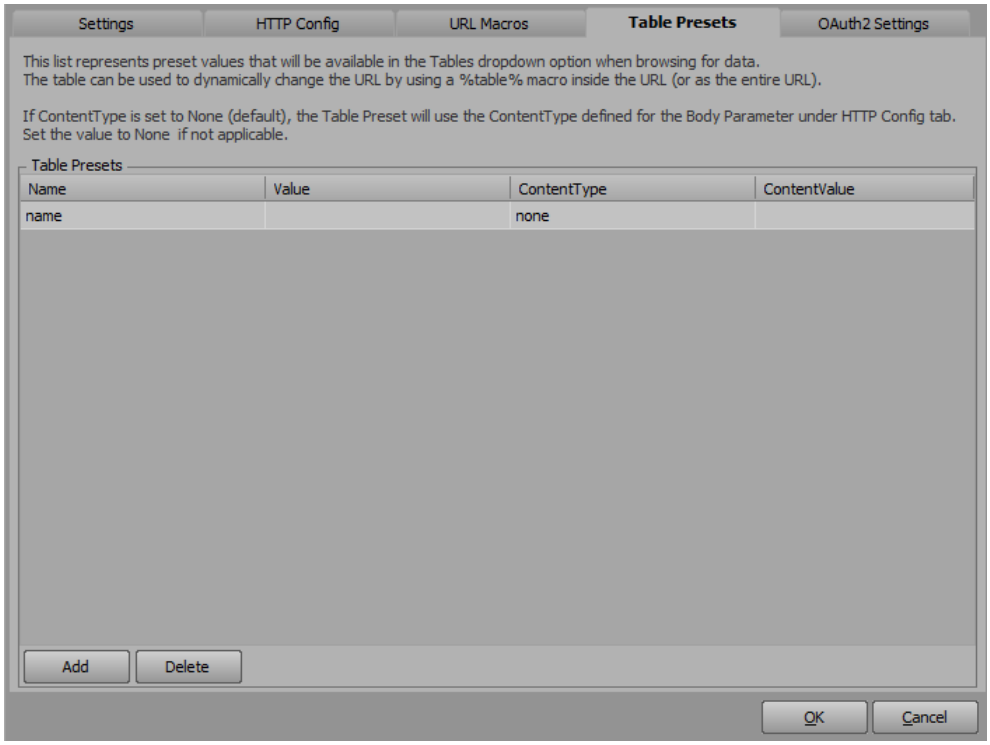
   The **Table Presets** tab is added to the dialog.
3. Select the **Table Presets** tab.

   The **Table Presets** tab opens.



4. In the **Table Presets** tab, select **Add**.

A new table preset is added to the **Table Presets** list.



5. In the **Table Presets** list, click inside the **Name** column and enter a name for the table preset.

   For example, `news` if the URL is https://www.rossvideo.com/media/rss-news.

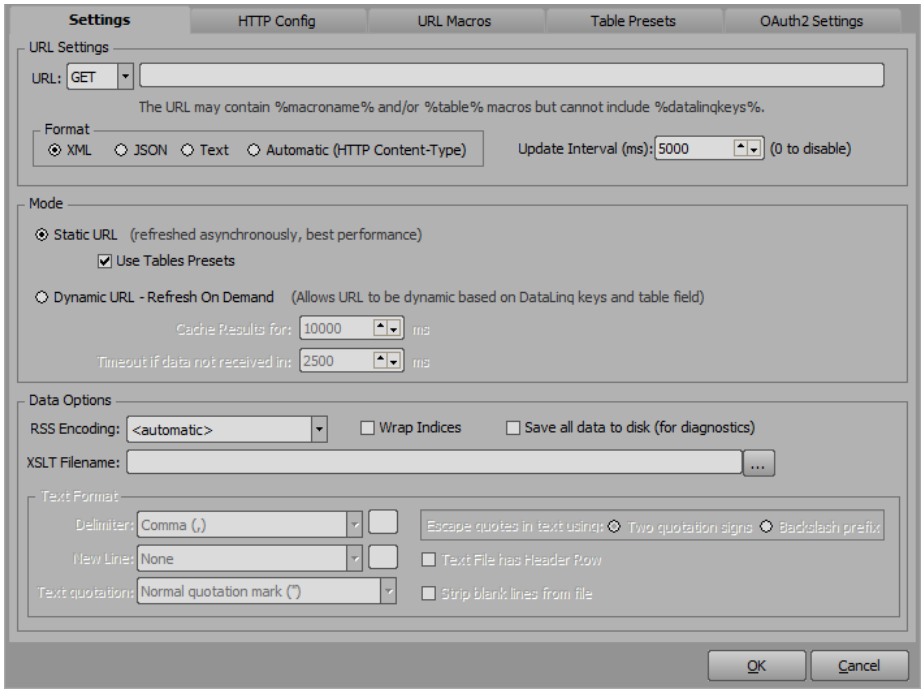
6. Click inside the **Value** column and enter a URL value for the table preset.

   For example, https://www.rossvideo.com/media/rss-news if the name entered is news.

7. Repeat steps 4 to 6 for other table presets as necessary.

8. Select the **Settings** tab.

   The **Settings** tab opens.



9. In the **URL Settings** section, in the **URL** field enter `%table%` and select **OK**.

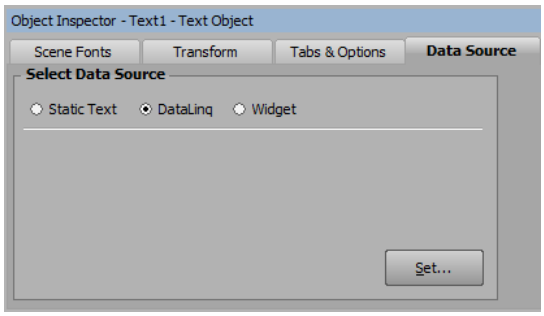
To use a table preset:

1. In XPression, create or select a scene that contains a text object.
2. In the **Object Manager**, select the text object from the **Object** list.



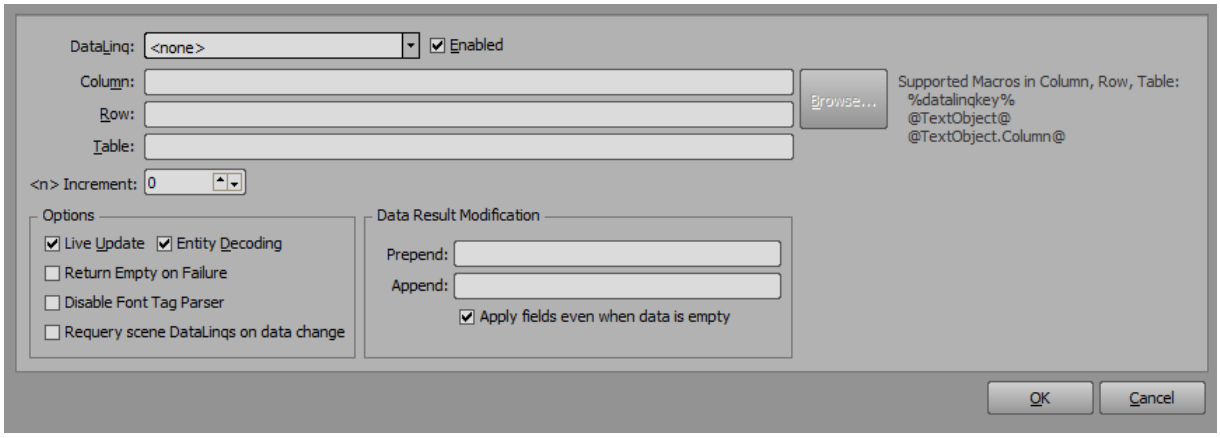
3. In the **Object Inspector**, select the **Data Source** tab.

   The **Data Source** tab opens.



4. In the **Select Data Source** section, select the **DataLinq** radio button and select **Set**.

   The **Set DataLinq Properties** dialog opens.

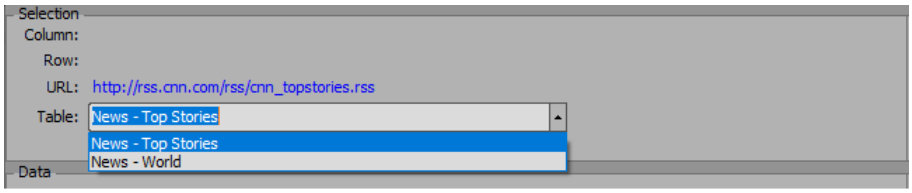


5. From the **DataLinq** drop-down, select the **RSS / HTTP DataLinq** source and then select **Browse**.

   The **Select DataLinq Field** dialog opens.

6. In the **Selection** section, from the **Table** drop-down, select an **RSS DataLinq URL** to display the data.

   The list is populated with the configured table presets.



7. In the **Data** section, select an item to display in the text object.
8. Select **OK**.

   The text object displays the selected item from the RSS URL.

For More Information on...

- configuring a dynamic DataLinq URL, refer to Using a Dynamic URL.

Sequences

XPression uses the **Sequencer** to play out the scenes in a project.

The following topics are discussed in this section:

Creating a Sequence

Modifying Template Content

Controlling Sequence Playout

Playing Out a Sequence in Manual Mode

Playing Out a Sequence in Automatic Mode

Creating a Roll/Crawl from a Take Item Group

Customizing a Take Item Group Roll/Crawl

Playing Out a Take Item or Take Item Group Using Timecode

Rendering Take Items to Video

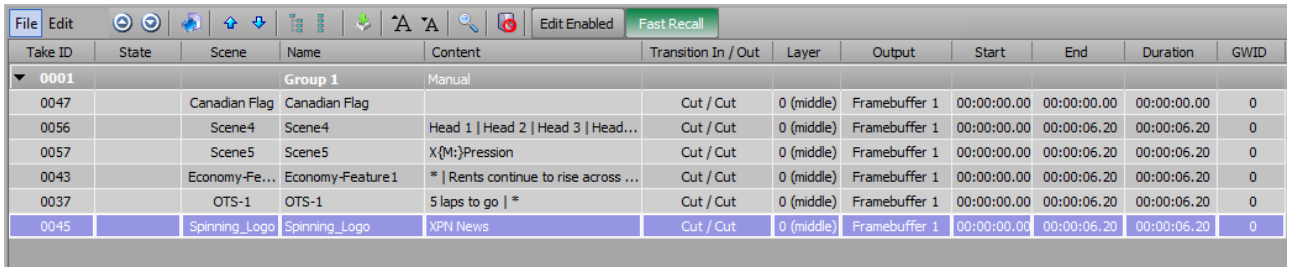
Creating a Sequence

After you have created all the necessary scenes and scene groups in the **Layout** editor, you can organize them for playout in the **Sequence** tab. Scenes and scene groups can be organized into groups and the groups can be configured to automatically play out the take items in the group.

To create a sequence:

1. Select the **Sequence** tab at the top of the XPression editor to use the **Sequencer** to place scenes or scene groups on a sequence timeline for playout.
2. In the **Scene Manager**, select and drag scenes or scene groups into the **Sequencer** list.

   Each scene or scene group added to the **Sequencer** list is given a **Take ID** and becomes a take item.



Take ID	State	Scene	Name	Content	Transition In / Out	Layer	Output	Start	End	Duration	GWID
0001			Group 1	Manual							
0047		Canadian Flag	Canadian Flag		Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0056		Scene4	Scene4	Head 1 | Head 2 | Head 3 | Head...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0057		Scene5	Scene5	X{M:}Pression	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0043		Economy-Fe...	Economy-Feature1	* | Rents continue to rise across ...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0037		OTS-1	OTS-1	5 laps to go | *	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0045		Spinning_Logo	Spinning_Logo	XPN News	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0

To reorder take items in the sequencer:

- Select and drag a take item to a new position in the list.

  Toolbar tools, shortcut menu commands, and keyboard shortcuts can also be used to reorder take items.

To group take items in the sequencer:

1. Select the **Create a New Group** button in the toolbar.

   A take item group is added to the **Sequencer**.
2. In the **Take Inspector > Group** tab, in the **Name** field, enter a new name for the group.
3. Select and drag take items from the **Sequencer** list into the new group.

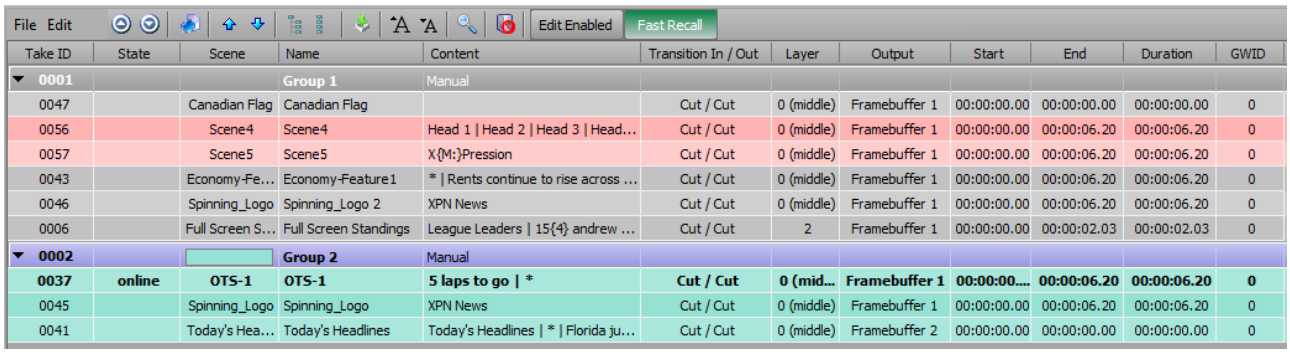
To color code take items:

1. Select one or more take items and/or take item groups.
2. Right-click and select **Color**.

   The **Color** menu opens.
3. Select a highlight color from the **Color** menu.

4. The background of the selected take items in the **Sequencer** list is shaded with the selected color.

   Coloring the background of a take item group colors each take item in the group.



Take ID	State	Scene	Name	Content	Transition In / Out	Layer	Output	Start	End	Duration	GWID
0001			Group 1	Manual							
0047		Canadian Flag	Canadian Flag		Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0056		Scene4	Scene4	Head 1 | Head 2 | Head 3 | Head...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0057		Scene5	Scene5	X{M:}Pression	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0043		Economy-Fe...	Economy-Feature1	* | Rents continue to rise across ...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0046		Spinning_Logo	Spinning_Logo 2	XPN News	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0006		Full Screen S...	Full Screen Standings	League Leaders | 15{4} andrew ...	Cut / Cut	2	Framebuffer 1	00:00:00.00	00:00:02.03	00:00:02.03	0
0002			Group 2	Manual							
0037	online	OTS-1	OTS-1	5 laps to go | *	Cut / Cut	0 (mid...	Framebuffer 1	00:00:00....	00:00:06.20	00:00:06.20	0
0045		Spinning_Logo	Spinning_Logo	XPN News	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0041		Today's Hea...	Today's Headlines	Today's Headlines | * | Florida ju...	Cut / Cut	0 (middle)	Framebuffer 2	00:00:00.00	00:00:00.00	00:00:00.00	0

To adjust the font size of take items:

- Select the **Increase the size of the sequencer font** button to make the font size larger.
- Select the **Decrease the size of the sequencer font** button to make the font size smaller.

For More Information on...

- creating scenes, refer to Creating or Deleting a Scene.
- controlling sequence playout, refer to Controlling Sequence Playout.

Modifying Template Content

The values of published attributes can be changed for playout through the **Sequencer** if they have first been selected to be published in the **Layout** editor.

To publish object attributes:

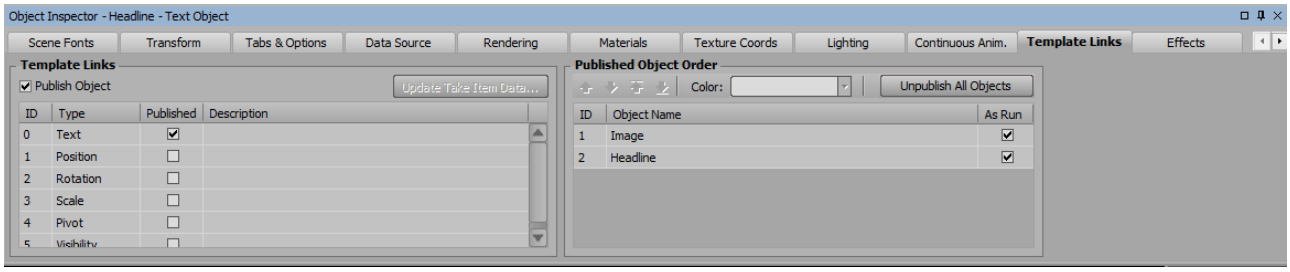
1. In the **Layout** editor, in the **Scene Manager**, select a scene or scene group that contains objects you want to be able to modify.

   The objects contained in the selected scene or scene group are listed in the **Object Manager**.

2. In the **Object Manager**, select an object you want to be able to modify.

3. In the **Object Inspector**, select the **Template Links** tab.

   The **Template Links** tab opens.



4. In the **Template Links** section, select the **Publish Object** checkbox.

   The table in the **Template Links** section lists the attributes of the selected object that can be published to the **Sequencer**.

5. In the **Published** column, select the checkboxes for each attribute you want to publish and modify.

   Text objects are published by default with the text attribute selected.

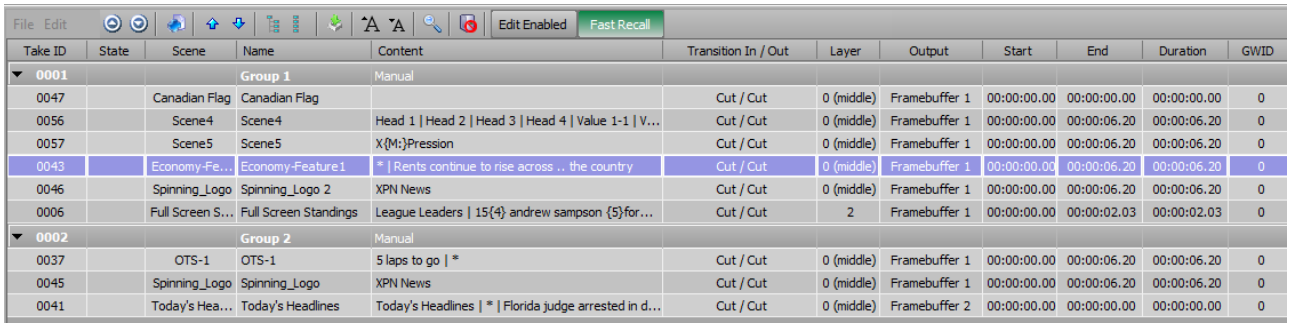
6. Note the name of the template object.

To modify object attributes:

1. Select the **Sequence** tab.

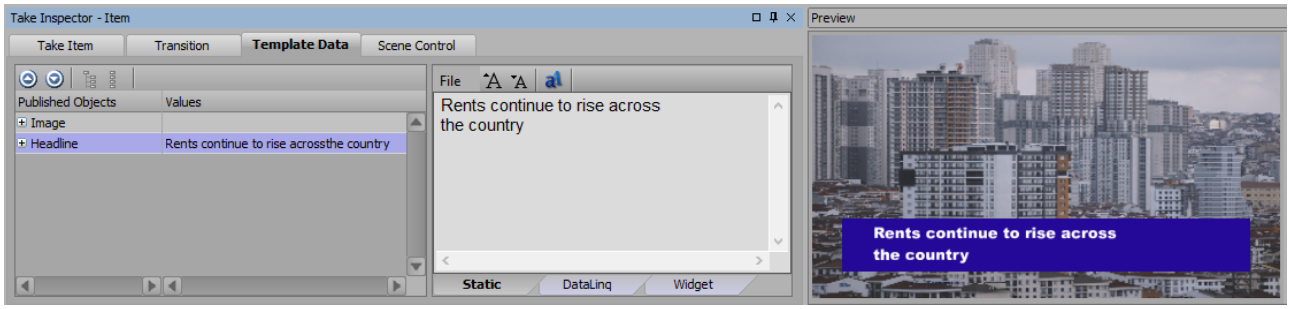
2. Add the template object scene or scene group you selected in the **Layout** editor to the **Sequencer**.

3. In the **Sequencer**, select the take item.



4. In the **Take Inspector** select the **Template Data** tab.

   The **Template Data** tab opens.



5. In the **Published Objects** column, expand the template object.

   The attributes published for the template object are displayed.

6. Select an attribute to set a value for playout.

   If the template object is a text object, the text box to the right in the **Static** tab displays the current value of the selected attribute. For other template objects, the **Materials** tab, **Image Files** tab, or **Video Files** tabs display the current value of the selected attribute.

7. Modify the attribute as described in the following sections:

   Text Objects

   Other Objects

8. In the **Sequencer**, double-click the template object take item.

   The selected take item plays out through the default output using the entered attribute values.

9. To stop playout, right-click the template object take item and select **Take Offline** from the shortcut menu.

Text Objects

- In the **Static** tab, in the text box, select the current text and enter new text as necessary.
- Enter a font tag, such as {font number} that represents the ID of the font to be used, to change the font of the text.

  Entering an empty font tag of {} will restore the original font.

  OR

- Select the **Insert Font Change Macro** button to select a font thumbnail to apply to the attribute.

  The tag for the selected font is automatically placed at the current cursor location.

- Enter and apply a material tag and font attribute layer by digit (1-5).

  For example, {M:1:material name} for Face, {M:2:material name} for Border, {M:3:material name} for Stroke, {M:4:material name} for Neon, {M:5:material name} for Shadow.

- Select **File > Import** to open the **Import Text File** dialog and locate and select a text file to replace the current text.

- Select the **Increase Font Size** button to make the font size larger or the **Decrease Font Size** button to make the font size smaller.

Other Objects

- Select the **Materials** tab to open the list of material thumbnails and double-click a material thumbnail to apply the material as the value of the attribute.
- Select the **Image Files** tab to open the list of image file thumbnails and double-click an image file thumbnail to apply the image as the value of the object attribute.

  OR

  Use the browser above the image file thumbnails to open a different image file location.
- Select the **Video Files** tab to open the list of video material thumbnails and double-click a video file thumbnail to apply the video file as the value of the object attribute.

  If the object had originally been assigned a video file, the properties of that video will be applied to the newly assigned video.

  OR

  Use the browser above the video file thumbnails to open a different video file location.

For More Information on...

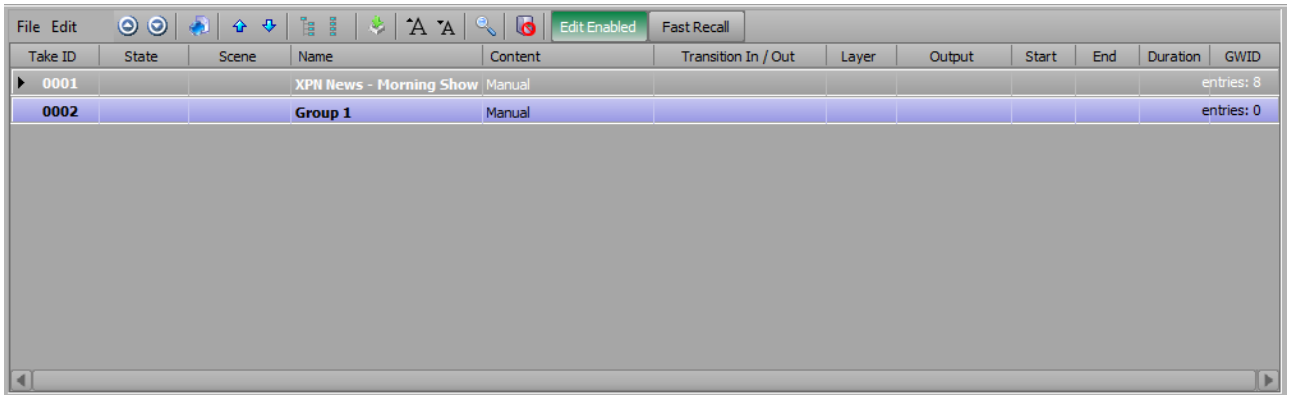
- creating sequences, refer to Creating a Sequence.
- controlling sequence playout, refer to the procedure Controlling Sequence Playout.

Controlling Sequence Playout

Use the **Sequencer** to organize and control the playout of scenes and scene groups in XPression.

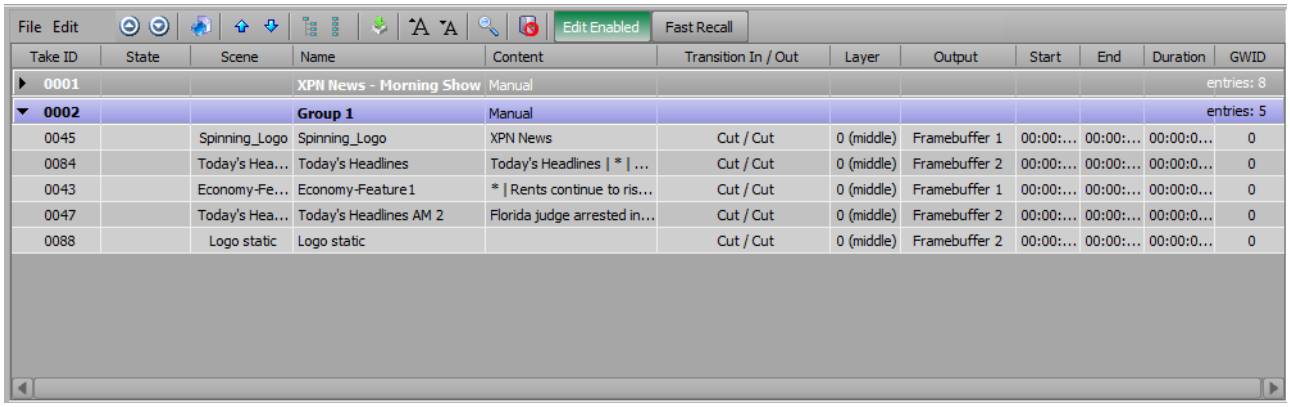
To control sequence playout:

1. In the **Sequencer**, select the **Create a New Group** button in the toolbar to create a take item group to contain the scenes or scene groups to play out.

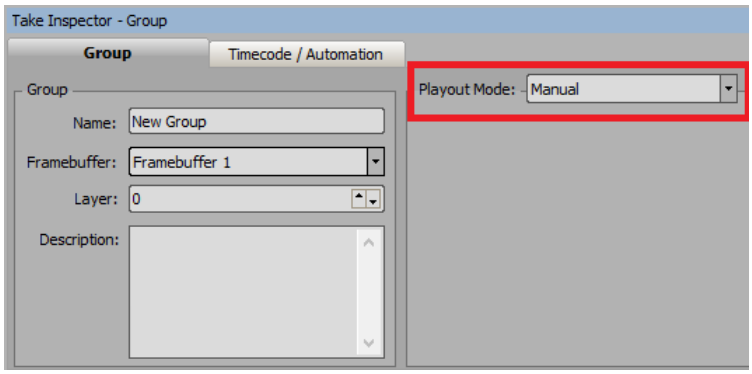


2. From the **Scene Manager**, select and drag the scenes and/or scene groups into the new take item group in the **Sequencer**.

   The selected scene or scene groups are added to the take item group as take items.



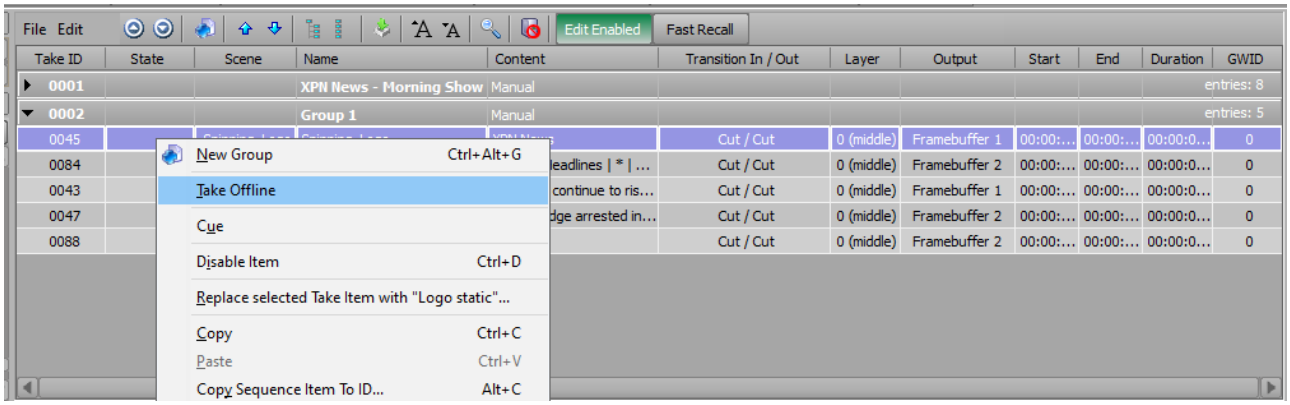
3. Select and drag a take item to a new position in the group to create the playout order.
4. Select the take item group that contains the take items to play out.
5. In the **Take Inspector**, in the **Group** tab, from the **Playout Mode** drop-down, select **Manual**.



6. In the **Sequencer**, double-click a take item to play out the selected take item.

   The selected take item plays out through the default output, and the **State** changes to **online** for take items or **Active** for take item groups.

7. To stop playout of an **online** or **Active** take item, right-click the take item and from the shortcut menu, select **Take Offline**.



See Assigning a Local Shortcut for more information.

Keyboard Control

The keyboard number pad can also be used to control the playout of a sequence.

The following keyboard shortcuts are available in the **Sequencer**:

- **Cursor Up Arrow** — select the previous take item in the sequence.
- **Cursor Down Arrow** — select the next take item in the sequence.
- **Cursor Left Arrow** — collapse an expanded sequence group.
- **Cursor Right Arrow** — expand a collapsed sequence group.
- **Home** — select the first take item in the sequence.
- **End** — select the last take item in the sequence.
- **Ctrl-Cursor Up Arrow** — move the selected take item up one position in the sequence.
- **Ctrl-Cursor Down Arrow** — move the selected take item down one position in the sequence.
- **Ctrl-Shift-Page Up** — select previous scene template.
- **Ctrl-Shift-Page Down** — select next scene template.
- **Ctrl-Page Up** — select the previous object in the **Template Data** tab for the selected take item.
- **Ctrl-Page Down** — select the next object in the **Template Data** tab for the selected take item.
- **Delete** — remove the selected take item from the sequence. The associated scene or scene group is not deleted.
- **+/-** — increase (+) or decrease (-) the speed of a roll/crawl while it is online.
- **Number Pad Enter** — play out the selected take item. This shortcut requires the **Fast Recall** button to be enabled.
- **Number Pad +** — play out the selected take item and select the next take item in the sequence.
- **Number Pad -** — take the current take item offline if it is online.
- **Number Pad .** — cue a selected take item prior to putting them online by pressing the decimal key on the number pad. Cueing them will pre-cache all video clips in the scene. Multiple items can be cued and brought to air simultaneously.

- **Number Pad *** — focus a take item. This shortcut requires the **Fast Recall** button to be enabled.

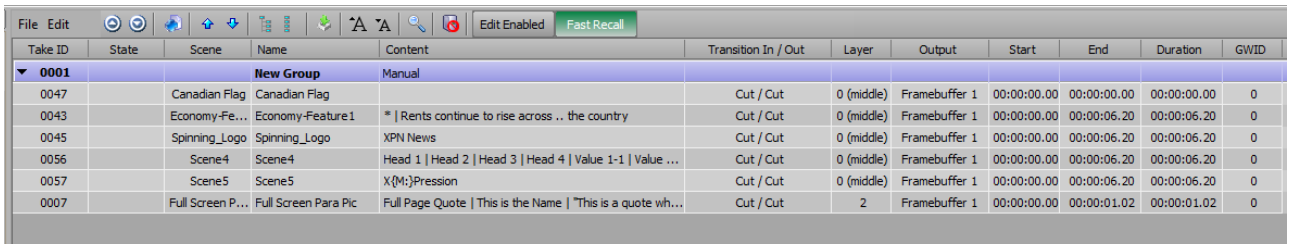
Playing Out a Sequence in Manual Mode

Sequences can be played out in **Manual** or **Automatic** mode. These instructions describe how to use **Manual** mode.

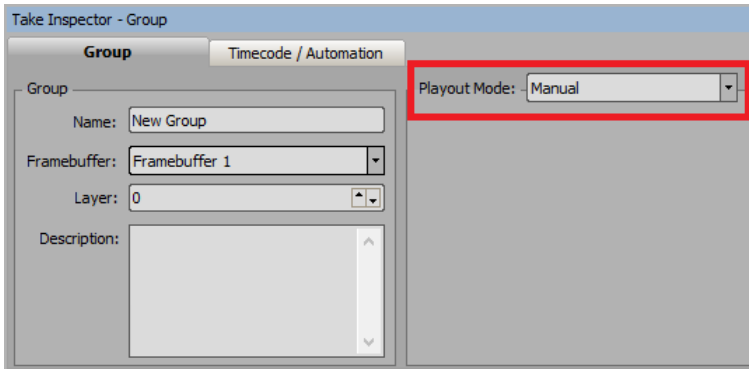
See Playing Out a Sequence in Automatic Mode for instructions for that mode.

To play out a sequence in Manual mode:

1. In the **Sequencer**, select the take item group that contains the take items to play out.



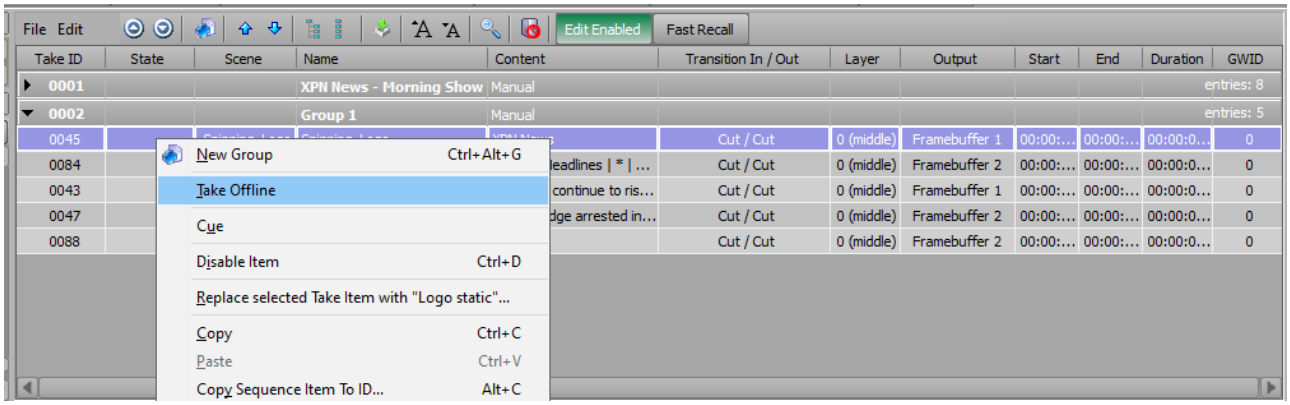
2. In the **Take Inspector**, from the **Playout Mode** drop-down, select **Manual**.



3. In the **Sequencer**, select the take item to play out.

   The selected take item plays out through the default output.

4. To stop playout of a take item, right-click the take item and select **Take Offline** from the shortcut menu.



For More Information on...

- creating sequences, refer to Creating a Sequence.
- controlling sequence playout, refer to the procedure Controlling Sequence Playout.

For More Information on...

- creating sequences, refer to Creating a Sequence.
- controlling sequence playout, refer to the procedure Controlling Sequence Playout.

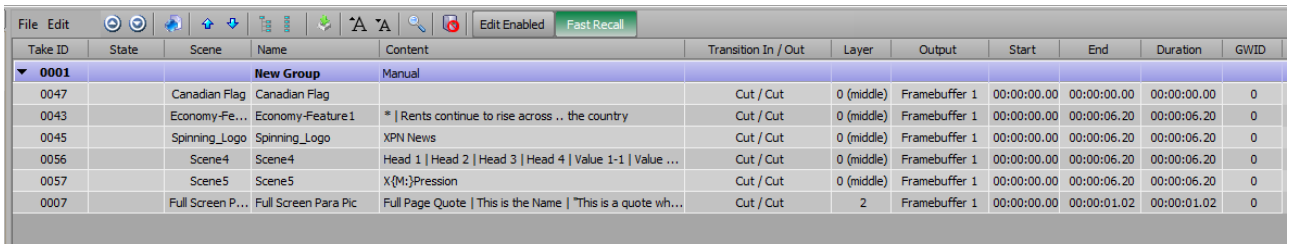
Playing Out a Sequence in Automatic Mode

Sequences can be played out in **Manual** or **Automatic** mode. These instructions describe how to use **Automatic** mode.

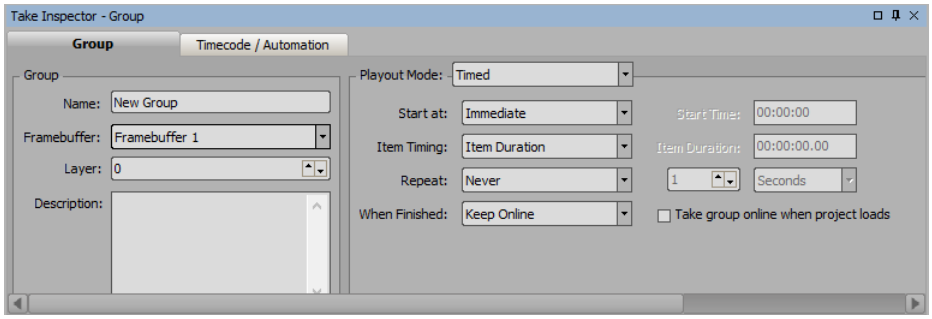
See Playing Out a Sequence in Manual Mode for instructions for that mode.

To play out a sequence in automatic mode:

1. In the **Sequencer**, select the take item group that contains the take items to play out.



2. In the **Take Inspector**, from the **Playout Mode** drop-down, select **Timed**.



3. From the **Start at** drop-down, select the playout start time for the group.

   The options are:

   - **Immediate** — start playout immediately upon selecting a take item group for playout.
   - **Clock Time** — start playout at the time set in the **Start Time** field after selecting a take item group for playout.

4. From the **Item Timing** drop-down, select the item level on which to base playout duration.

   The options are:

   - **Item Duration** — use the playout durations set for the items in the group.

     The playout duration for the item group equals the total of all the item durations.

   - **Group Duration** — set a playout duration for the entire group.

     Set the duration in the **Group Duration** field.

   - **Fixed Item Duration** — use the specified playout duration for each of the items in the group regardless of the durations of the individual take items.

     Set the duration in the **Item Duration** field.

   - **Scene Director** — use the default scene director of a scene to control when an item group should advance.
   - **Advance Manually** — double-click the scene group or use a script to advance the item group.

5. From the **Repeat** drop-down, select the number of times to playout the item group.

The options are:

- **Never** — do not repeat playout; only play out the item group once.
- **When Done** — repeat the playout of an item group when the playout ends.

  With this option, playout repeats until it is manually stopped.
- **After** — repeat the playout of an item group after the time set in the **Time Value** field and **Time Unit** drop-down.

  With this option, playout repeats until it is manually stopped.
- **Every** — repeat the playout of an item group at the time interval set in the **Time Value** field and **Time Unit** drop-down.

6. From the **When Finished** drop-down, set the action to complete after finishing the playout of the take item group.

   The options are:

   - **Keep Online** — leave the take item group status as **Active**, making the group available for immediate playout.
   - **Take Offline** — change the take item group status to **Offline**.
7. In the **Sequencer**, double-click the take item group that contains the take items to playout.

   The selected take item group plays out through the default output, and the **State** changes to **Active**.

For More Information on...

- creating sequences, refer to Creating a Sequence.
- controlling sequence playout, refer to the procedure Controlling Sequence Playout.

Creating a Roll/Crawl from a Take Item Group

Use the **Layout** editor to create the scenes that comprise the roll/crawl and then place them in a group in the **Sequencer** to play out the roll or crawl.

To create the roll/crawl scenes:

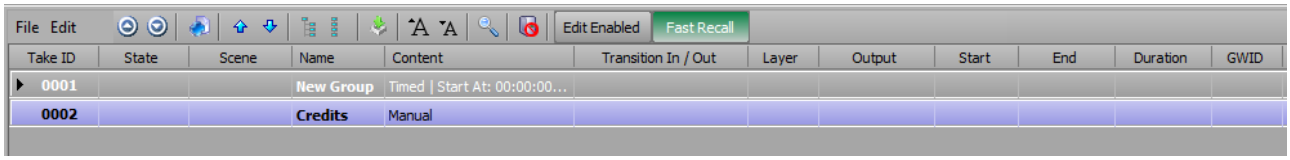
1. Create a new XPression project or open an existing project to add a roll/crawl effect.
2. In the **Layout** tab, create one or more scenes or scene groups to contain the objects displayed by the roll/crawl effect.
3. Select a scene and add scene objects to it that will move as part of the roll/crawl effect.

   For example, add a text object to a scene to represent the first line of text for a set of credits to be played by the roll/crawl effect.
4. Add objects to additional scenes as required.

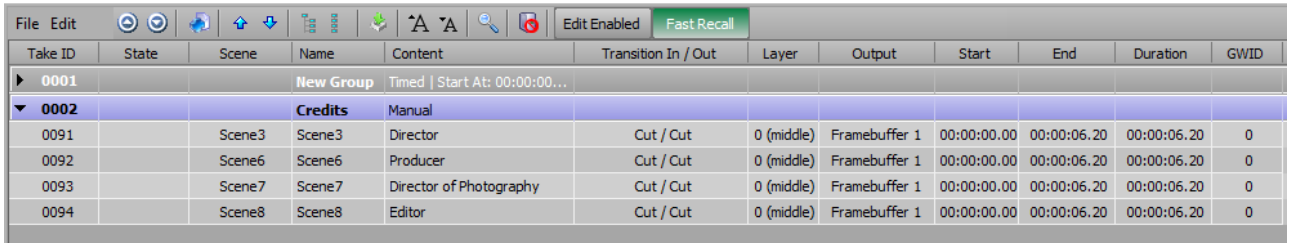
   For example, each scene might contain a text object that represents one line of text in a set of credits played by the roll/crawl effect.

To create the roll/crawl from a take item group:

1. Select the **Sequence** tab.
2. In the **Sequencer**, select the **Create a New Group** button in the toolbar to create a take item group to contain the scenes or scene groups that comprise the roll/crawl effect.

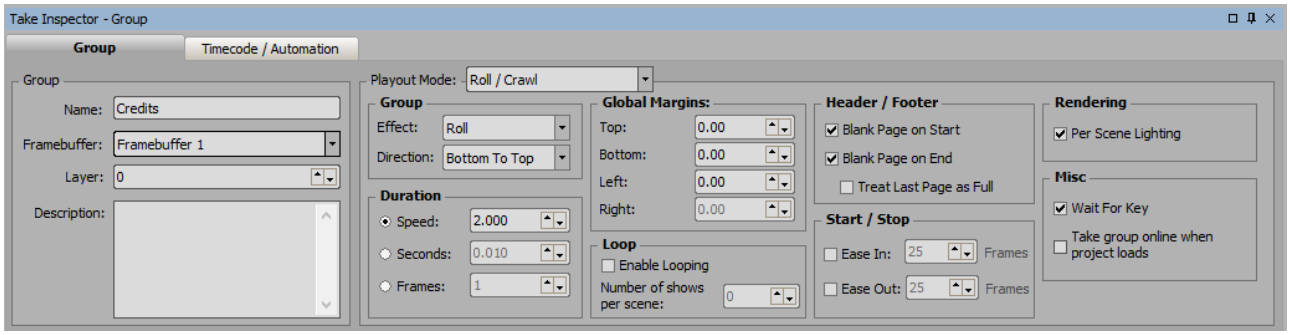


3. In the **Scene Manager**, select and drag the scenes or scene groups that comprise the roll/crawl effect into the new take item group.



4. To reorder take items in the roll/crawl effect, select and drag a take item to a new position in the take item group.
5. Select the take item group that contains the roll/crawl effect.

6. In the **Take Inspector**, in the **Group** tab, from the **Playout Mode** drop-down, select **Roll/Crawl** .



7. In the **Sequencer**, double-click the take item group that contains the roll/crawl effect to play out the defined roll/crawl effect.

   The selected take item group plays out through the default output, and the **State** changes to **Active**.

For More Information on...

- creating sequences, refer to Creating a Sequence.
- controlling sequence playout, refer to Controlling Sequence Playout.

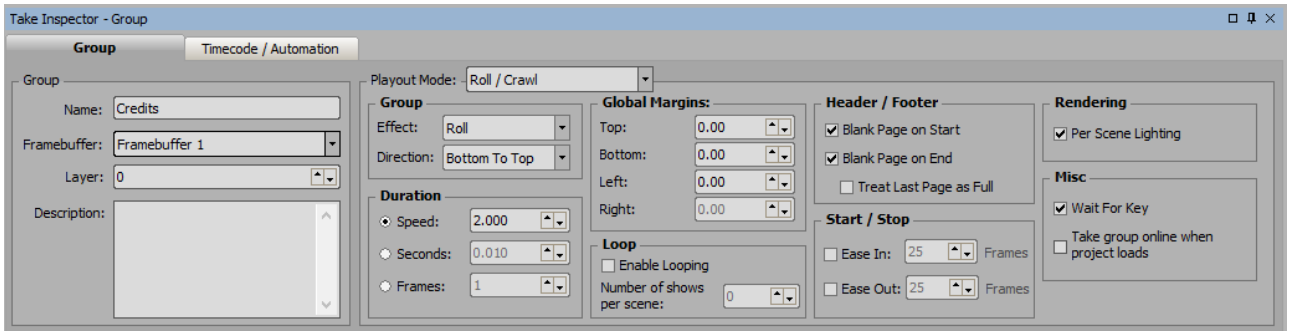
Customizing a Take Item Group Roll/Crawl

You can customize a roll or crawl effect by changing the direction, speed, margins, looping, start and end pages, easing and lighting as described in this topic.

To customize a take item group roll/crawl:

1. In the **Sequencer**, select the take item group that contains the roll/crawl effect to customize.
2. In the **Take Inspector**, in the **Group** tab, from the **Playout Mode** drop-down, select **Roll / Crawl**.

   The properties of the selected take item group are displayed in the **Group** tab.



3. Use the properties in the **Group** section to set roll/crawl effect properties for a take item group.
   - **Effect** — use this list to select the roll/crawl effect with which to playout take items in a take item group.

     The effects are:

     ➢ **Roll** — move take items vertically.

     ➢ **Crawl** — move take items horizontally.
   - **Direction** — from the drop-down, select the direction for the selected roll/crawl effect.

     The directions depend on the selected **Effect**, and are as follows:

Roll Effect	Crawl Effect
• Bottom To Top • Top To Bottom	• Right To Left • Left To Right

4. Use the properties in the **Duration** section to set the playout duration for the selected roll/crawl effect.

   Speed — defines the playout speed in pixels per second. Use the field to the right of this option to enter or select the speed.

   Seconds — defines the playout duration in seconds. Use the field to the right of this option to enter or select the duration.

   Frames — defines the playout duration in frames. Use the field to the right of this option to enter or select the number of frames over which to play out the effect.

5. Use the properties in the **Global Margins** section to set the spacing between take items displayed in a roll/crawl effect.

   Top — enter or select the size in pixels of the margin placed above take items. This margin is used to control vertical spacing between consecutive take items played out in a roll effect.

   Bottom — enter or select the size in pixels of the margin placed below take items. This margin is used to control vertical spacing between consecutive take items played out in a roll effect.

Left — enter or select the size in pixels of the margin placed to the left of take items. This margin is used to control horizontal spacing between consecutive take items played out in a crawl effect.

Right — enter or select the size in pixels of the margin placed to the right of take items. This margin is used to control horizontal spacing between consecutive take items played out in a crawl effect.

6. Use the properties in the **Loop** section to set the number of times to play out a roll/crawl effect.

   Enable Looping — select to loop the playout of a roll/crawl effect. Clear this checkbox to play out the roll/crawl effect one time.

   Number of Shows Per Scene — enter or select the number of times to loop the playout of a roll/crawl effect. Enter **0** to infinitely loop the playout.

   This field is only available when the **Enable Looping** checkbox is selected.

7. Use the properties in the **Header/Footer** section to set the type of page with which to start and end a roll/crawl effect.

   Blank Page on Start — start the effect with a blank page before displaying the take items in the roll/crawl effect. Clear this checkbox to start the effect with the first take item in the take item group.

   Blank Page on End — end the effect with a blank page after displaying the take items in the roll/crawl effect. Clear this checkbox to end the roll/crawl effect with the last take item in the take item group.

   Treat Last Page as Full — display the last take item in a roll/crawl effect as a full page.

8. Use the properties in the **Start/Stop** section to control the start and end playout speed of a roll/crawl effect.

   Ease In — slow the playout speed at the start of a roll/crawl effect.

   - **Frames** — enter or select the number of frames at which to return a roll/crawl effect to normal playout speed.

   Ease Out — slow the playout speed at the end of a roll/crawl effect.

   - **Frames** — enter or select the number of frames from the end of a roll/crawl effect at which to slow the playout speed.

9. Use the property in the **Rendering** section to control lighting for a roll/crawl effect.

   Per Scene Lighting — use a different lighting source for each take item in a roll/crawl effect. Clear this checkbox to use the lighting source in the first take item of the take item group for all of the other take items in the effect.

10. Double-click the take item group to play out the customized roll/crawl effect.

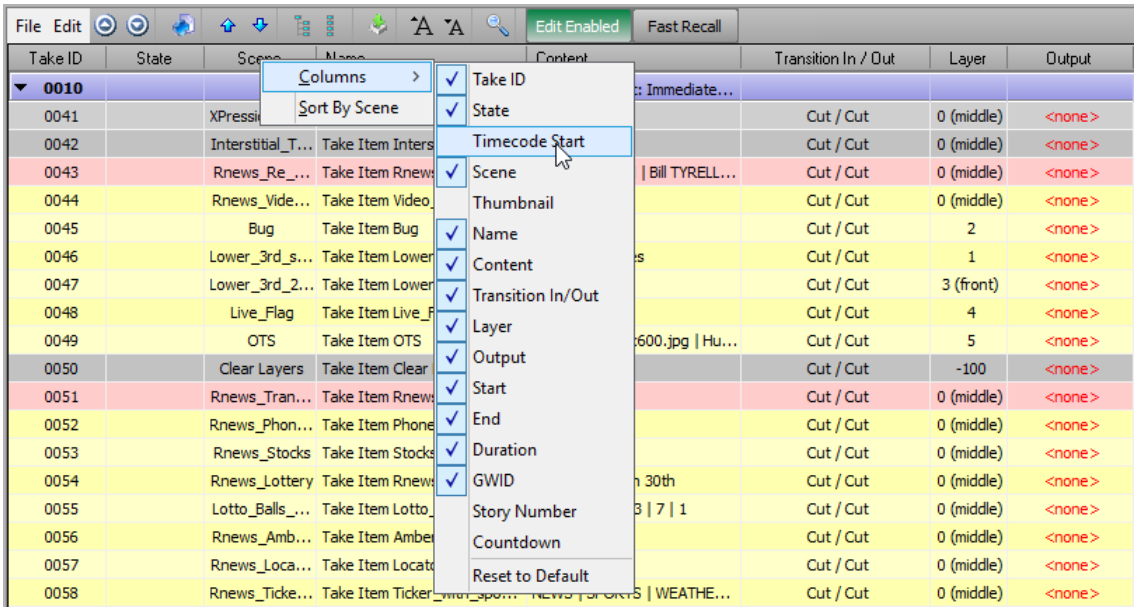
    The selected take item group is sent to the default output.

Playing Out a Take Item or Take Item Group Using Timecode

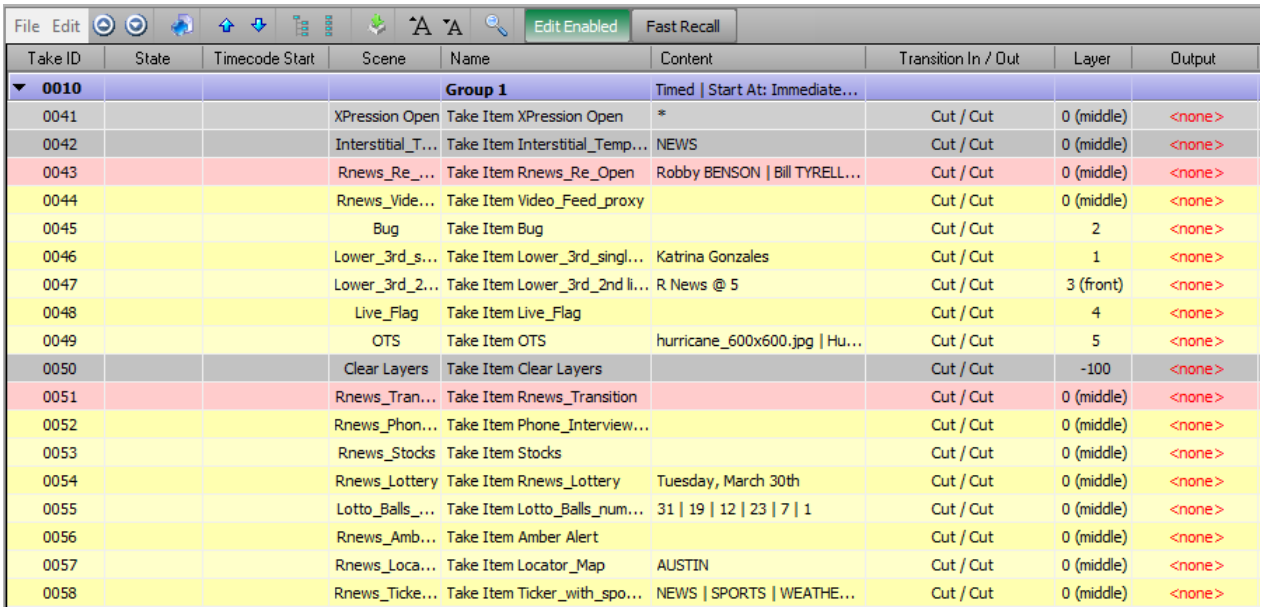
You can play out take items or take item groups in the Sequencer using a timecode source. A timecode source needs to be configured in the **Hardware Setup** before using timecode with a take item group.

To play out a take item or group using a timecode source:

1. In the **Sequencer**, enable timecode by right-clicking inside the column headers of the sequence list and selecting **Columns > Timecode Start**.

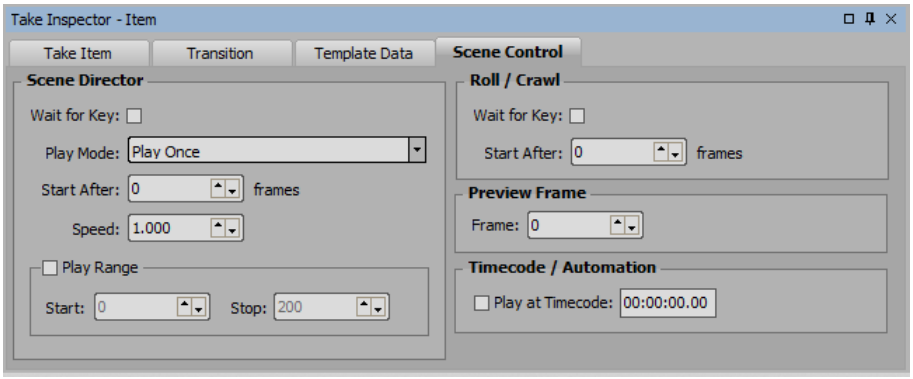


The **Timecode Start** column is added to the displayed columns of the sequence list.



2. Select a take item or take item group in the sequence list.
3. If you select a take item, do the following:
   a. In the **Take Inspector**, select the **Scene Control** tab.

The **Scene Control** tab opens.



b. In the **Timecode / Automation** section, select the **Play at Timecode** checkbox to enable a timecode start for the selected take item.

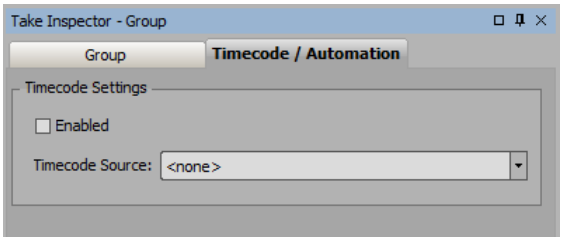
c. In the **Play at Timecode** field, enter or select a specific timecode start time for the selected take item.

OR

If you select a take item group, do the following:

a. In the **Take Inspector**, select the **Timecode / Automation** tab.

The **Timecode / Automation** tab opens.



b. In the **Timecode Settings** section, select the **Enabled** checkbox to enable a timecode source for the selected take item group.

c. From the **Timecode Source** drop-down, select an available timecode source.

This menu is populated with the internal clock of the XPression system and the timecode sources that have been configured in the Timecode Sources tab of the Hardware Setup dialog.

For More Information on...

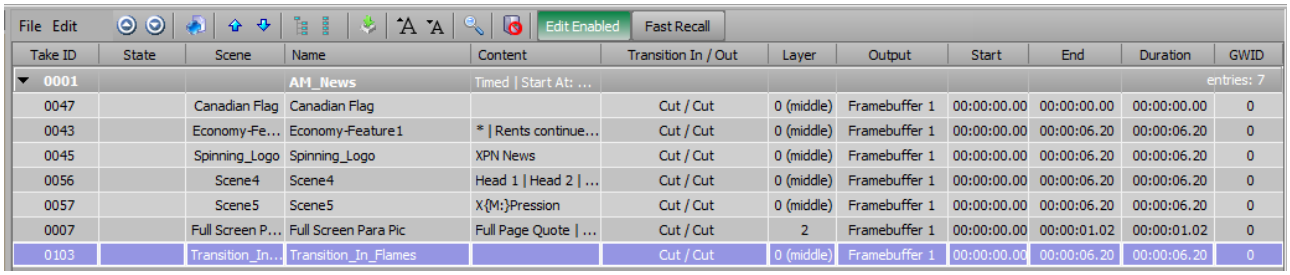
- configuring a timecode source, refer to Adding a Timecode Source.

Rendering Take Items to Video

Export take items in the **Sequencer** to video and store in a folder or in the Clip Store. Sequencer clip items automatically apply the HDR color space that is native to the clip, when that information is available.

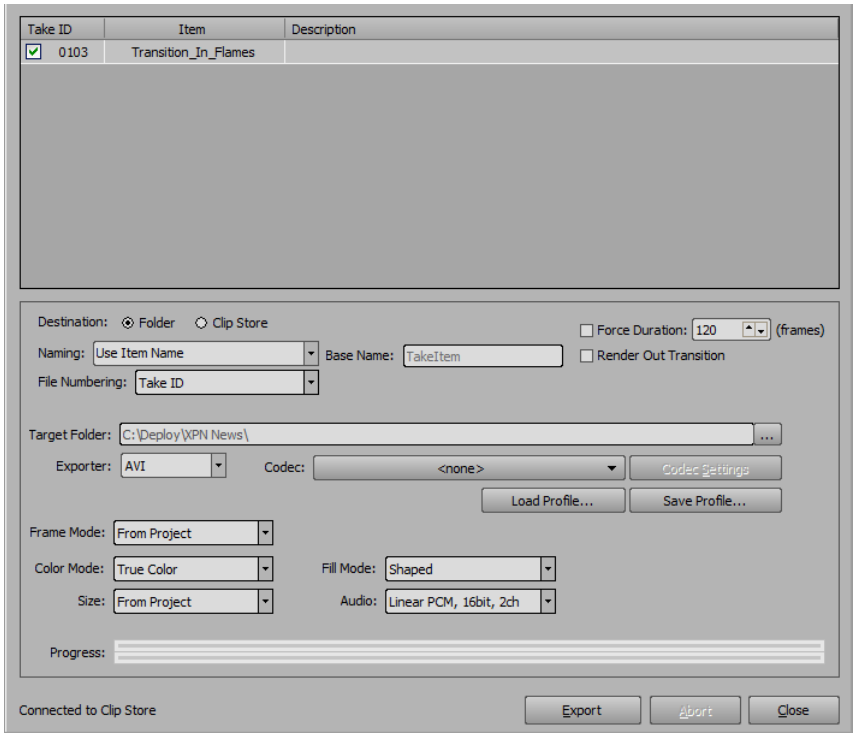
To render a take item to video:

1. Select a take item in the **Sequencer**.



2. Right-click the take item and select **Export Take Item To > Video**.

   The **Export to Video** dialog opens.



3. In the **Export to Video** dialog, select the checkbox(es) of the **Take ID(s)** to export.
4. Select a **Destination** for the video(s):
   - **Folder** — save the video(s) to a target folder.
   - **Clip Store** — save the video(s) to the Clip Store for use within a clips workflow.
5. If you selected **Folder**, see Folder for further instructions.

   If you selected **Clip Store**, see Clip Store for further instructions.

Folder

To save the video file to a folder:

1. From the **Naming** drop-down, select the name to use for the video.

   The options are:

   - **Base Name** — use a fixed base name for the video.

     If selected, in the **Base Name** field, enter a base name for the file or files to be exported. Unicode is supported for file names.

   - **Use Item Name** — use the take item name(s) for the file(s) to be exported.

2. From the **File Numbering** drop-down, select the numbering convention for the file(s) to be exported.

   The options are:

   - **Take ID** — save the file or files by **Take ID** number.
   - **Incremental** — save the file or files by incremental numbers.

3. Select the **Force Duration** checkbox to make the video conform to the number of frames set in the adjacent field.

4. Select the **Render Out Transition** checkbox to render the take item using the transition in/out effect in the **Take Inspector - Transition** settings for the take item.

5. In the **Target Folder** field, enter a file path for the target folder where the video will be saved, or select the **Browse** button to locate and select a folder.

To select the video format and codec:

1. From the **Exporter** drop-down, select the video format for the file or files.

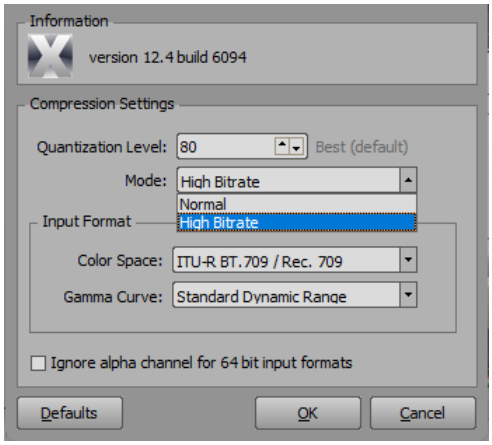
   The options are:

   - **MOV (QuickTime encoder required)**
   - **AVI**

2. From the **Codec** drop-down, select an encoder.

3. If the **XPression Video Encoder** is selected, select **Codec Settings**.

   The **XPression Video Codec 2** dialog opens.



a. In the **Compression Settings** section, in the **Quantization Level** field, enter or select the percentage of the color sampling.

   The higher the percentage, the better the color sampling quality. The default of 80 is recommended.

b. From the **Mode** drop-down, select the encoding mode, either **Normal** or **High Bitrate**.

   Consider using the **High Bitrate** option for high resolution clips (like UHD).

   ★Files that are encoded in **High Bitrate** mode require an XPression Video Codec 2 of build 12.0 6094 or later.

c. In the **Input Format** section, from the **Color Space** drop-down, select the specific organization of colors for the compression

   The options are:

   - **Standard RGB (sRGB)**
   - **ITU-R-BT.601 / Rec. 601**
   - **ITU-R BT.709 / Rec. 709**
   - **ITU-R BT.2020 / Rec. 2020**

d. From the **Gamma Curve** drop-down, select the method for optimizing the usage of bits for encoding the video.

   The options are:

   - **Standard Dynamic Range**
   - **Hybrid Log Gamma (HLG)**
   - **Perceptual Quantization (PQ)**

e. Select the **Ignore alpha channel for 64 bit input formats** checkbox to ignore the alpha channel in the encoding when using 64-bit input formats.

f. Select **OK**.

   The XPression Video Codec 2 dialog closes.

4. The video settings can be saved to a file by selecting the **Save Profile** button.

5. Select **Load Profile** to open a file browser to locate and select previously saved video settings.

To configure the remaining settings:

1. From the **Frame Mode** drop-down, select the frame mode for the video(s).

   The options are:

   - **From Project** — use the project frame mode.
   - **Upper Field First** — render in upper field first video.
   - **Lower Field First** — render in lower field first video.
   - **Frame Based** — render the video(s) as frame based.

2. From the **Color Mode** drop-down, select a color mode for the video file.

   The options are:

   - **True Color** — use 24-bit color.
   - **True Color + Alpha** — use 24-bit color with alpha.

3. From the **Size** drop-down, select a frame size for the video(s).

   The options are:

   - **From Project** — use the project dimensions.
   - **From Project (virtual)** — use the viewport resolution. This is only applicable to video formats with non-square pixels.
   - **From Scene** — use the scene dimensions.

4. From the **Fill Mode** drop-down, select the method used to process fill before output.

   The options are:

   - **Shaped** — shape the fill signal color information by the luminance information in the key signal.
   - **Unshaped** — output the fill and key signals "as is".

5. From the **Audio** drop-down, select an audio setting for the video(s).

   The options are:

   - **None** — do not use audio for the video(s).
   - **Linear PCM, 16bit, 2ch** — export with two-channel audio.

Clip Store

To save the video file to the clip store:

1. From the **Naming** drop-down, select the name to use for the video.

   The options are:

   - **Base Name** — use a fixed base name for the video.

     If selected, in the **Base Name** field, enter a base name for the file or files to be exported. Unicode is supported for file names.

   - **Use Item Name** — use the sequence item name(s) for the file(s) to be exported.

2. From the **File Numbering** drop-down, select the numbering convention for the file or files to be exported.

   The options are:

   - **Take ID** — save the file or files by **Take ID** number.
   - **Incremental** — save the file or files by incremental numbers.

3. From the **Project** drop-down, select a project in the Clip Store in which to save the video, or enter a new project name to add to the Clip Store.
4. Select the **Looping** checkbox to save the video with looping enabled by default.
5. Select the **Hold Last Frame** checkbox to hold the last frame of the saved video by default.
6. Select the **Force Duration** checkbox to make the file or files the number of frames specified in the adjacent field.
7. Select the **Render Out Transition** checkbox to render the take item using the transition in/out effect in the **Take Inspector - Transition** settings for the take item.

To configure the remaining settings:

1. From the **Frame Mode** drop-down, select the frame mode for the video(s).

   The options are:

   - **From Project** — use the project frame mode.
   - **Upper Field First** — render in upper field first video.
   - **Lower Field First** — render in lower field first video.
   - **Frame Based** — render the video(s) as frame based.

2. From the **Color Mode** drop-down, select a color mode for the video file.

   The options are:

   - **True Color** — use 24-bit color.
   - **True Color + Alpha** — use 24-bit color with alpha.

3. From the **Size** drop-down, select a frame size for the video(s).

   The options are:

   - **From Project** — use the project dimensions.
   - **From Project (virtual)** — use the viewport resolution. This is only applicable to video formats with non-square pixels.
   - **From Scene** — use the scene dimensions.

4. From the **Fill Mode** drop-down, select the method used to process fill before output.

   The options are:

   - **Shaped** — shape the fill signal color information by the luminance information in the key signal.
   - **Unshaped** — output the fill and key signals "as is".

5. From the **Audio** drop-down, select an audio setting for the video(s).

   The options are:

   - **None** — do not use audio for the video(s).
   - **Linear PCM, 16bit, 2ch** — export with two-channel audio.

6. Select **Export**.

   The take item is exported to video. The **Progress** bar displays the progress of the video(s) being saved.

Record Client

Use the Record Client dialog to record an input as a video file or as a still image.

The following topics are discussed in this section:

Recording a Video from an Input

Capturing a Still Image from an Input

Using Multiple Record Clients

Using Fill/Key Simultaneously

Creating a Material from a Video or Image

Sending a Video or Image to the Clip Store

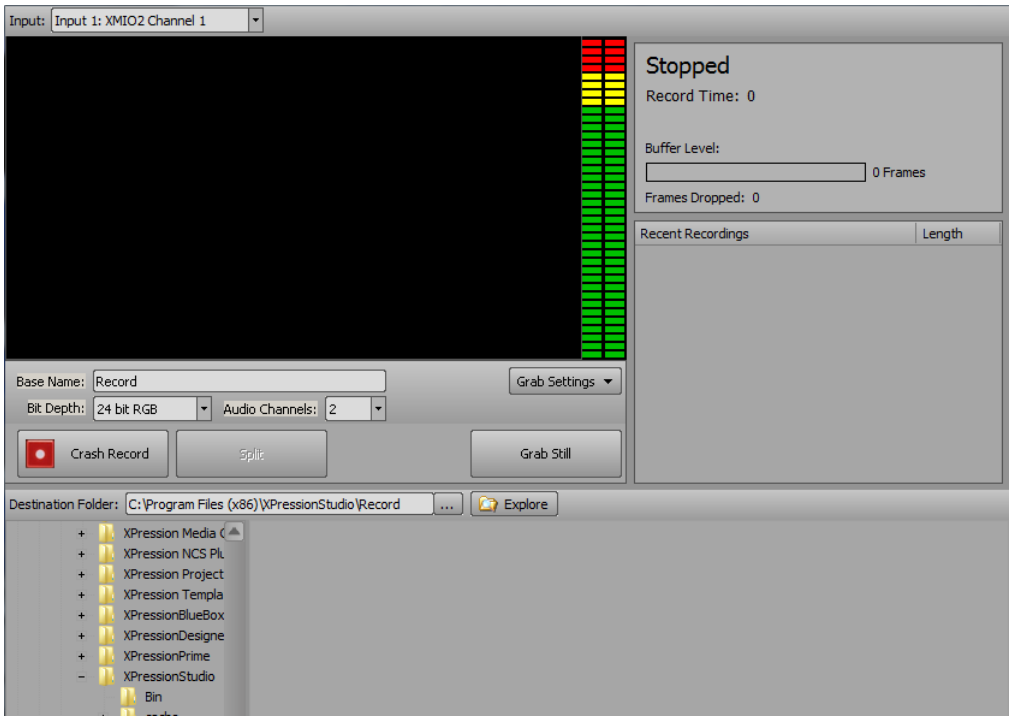
Recording a Video from an Input

Use the **Record Client** to record and save input video as a video file. The recordings will be made into the XPression Video Codec AVI format.

★When using a NewTek™ Network Device Interface (NDI™), XPression video recordings are in the format and video mode of the input NDI source, not the project mode.

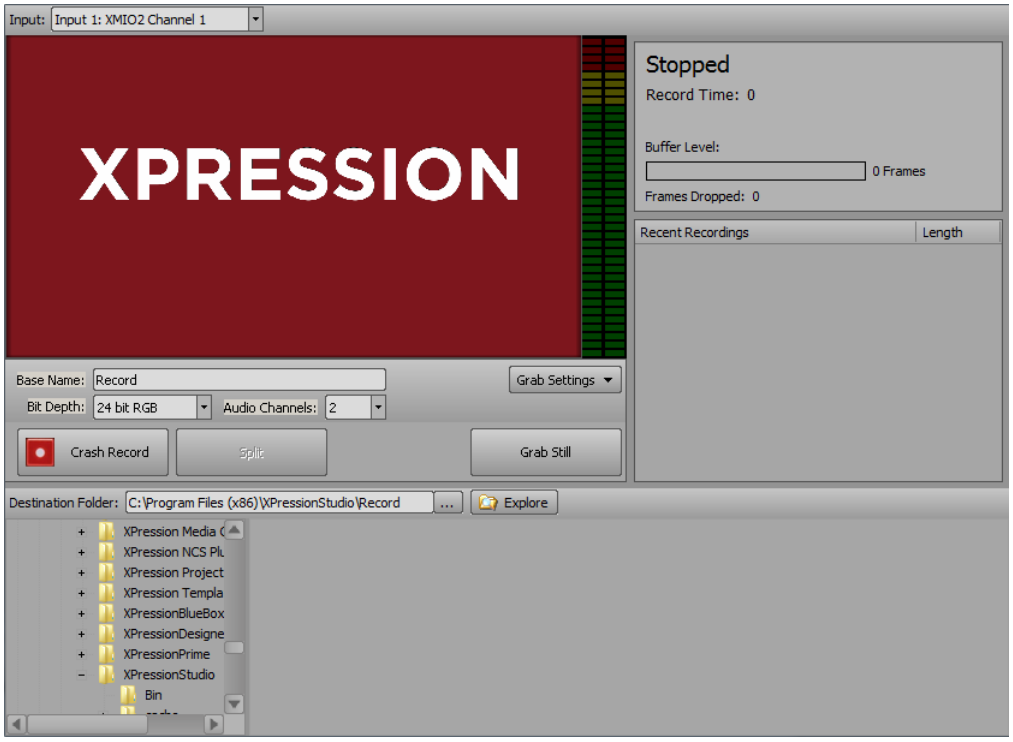
1. In XPression, select the **Record Client** ( ) toolbar icon.

   The **Record Client** dialog opens.



2. From the **Input** drop-down, select the input that contains the source video for the file to be recorded.

   The video loads in the preview window.



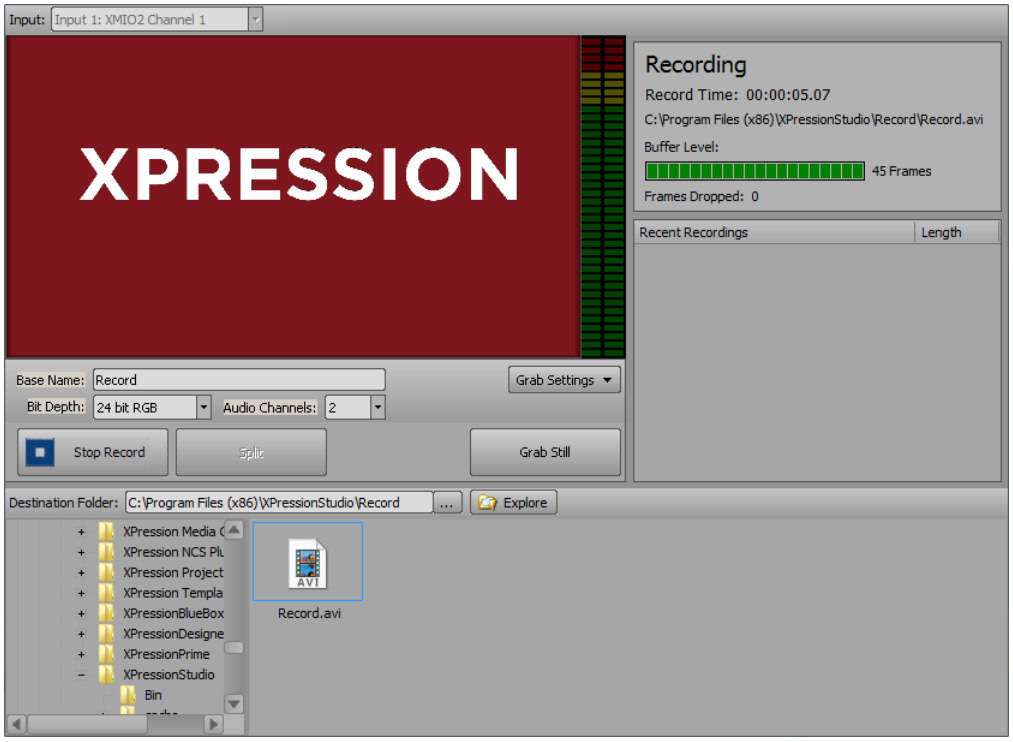
3. In the **Base Name** field, enter a name for the video file to be recorded.
4. From the **Bit Depth** drop-down, select the quality of the signal quantization for the clip:
   - **24 bit RGB** or
   - **32 bit RGBA** to include the alpha.
5. From the **Audio Channels** drop-down, select the number of active audio channels to use with the recording.
6. In the **Destination Folder** field, enter a file path for the destination folder where the video will be stored or select **Browse (...)** to open a file browser and select a file path.

   Any videos or images that have been previously stored in the selected destination folder will appear as AVI and TGA thumbnails next to the folder tree.

   ★A default record folder can be configured in the **Folders** section of the **Preferences** dialog.

7. Select **Crash Record** to start recording the video.

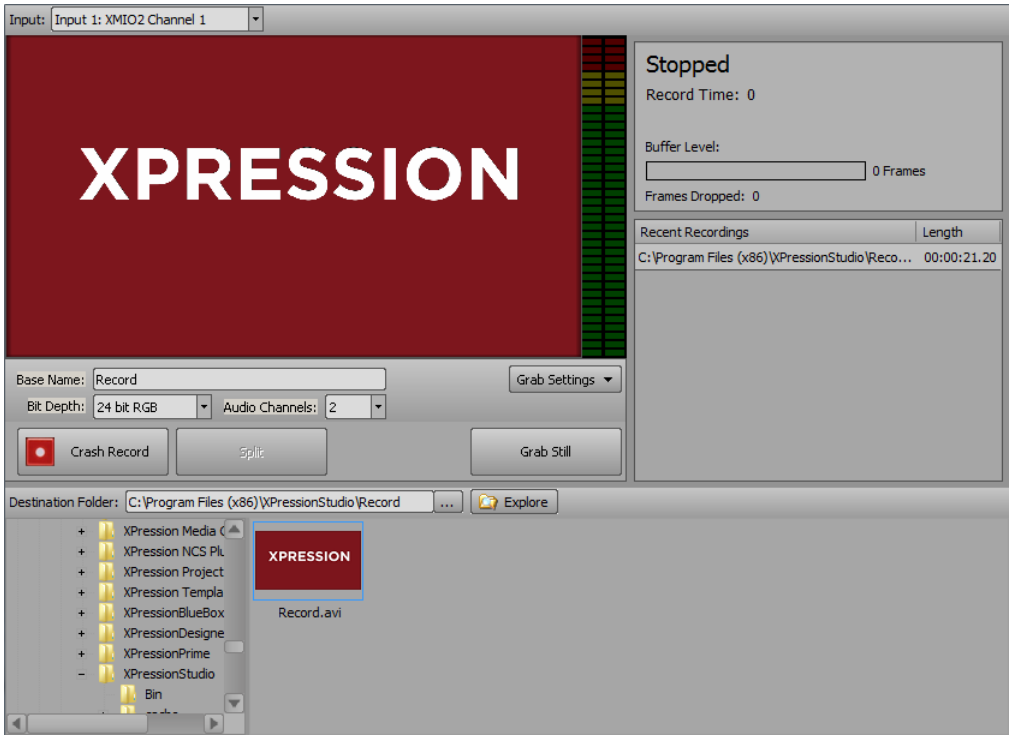
   The video begins recording and an **.avi** video file thumbnail is displayed.



   An indicator appears at the top of XPression that lists the active recording.

8. Select **Stop Record** to stop recording the video.

   The **.avi** video thumbnail is completed and the video is added to the **Recent Recordings** list.



To view the video file:

- Select **Explore** to locate and open the video file for viewing in a media player.

To manage the Record Client dialog:

- Select the **Split** button to stop the recording and begin recording a new video from the input.

  This is helpful when recording a lengthy video feed, such as a live feed. The filename for the new recording increments automatically.
- If the **Record Client** dialog has been closed or minimized, select the **Active Recording** indicator to open the **Record Client** dialog.
- If using the **XPression Clip Server** option, multiple **Record Clients** can be active and the **Active Recording** indicator will display multiple active recordings.

  In this case, selecting the **Active Recording** indicator will open the **Record Monitor** window where the multiple recordings can be tracked and managed.

For More Information on...

- using multiple **Record Clients**, refer to Using Multiple Record Clients.
- configuring a default record folder, refer to Folders.

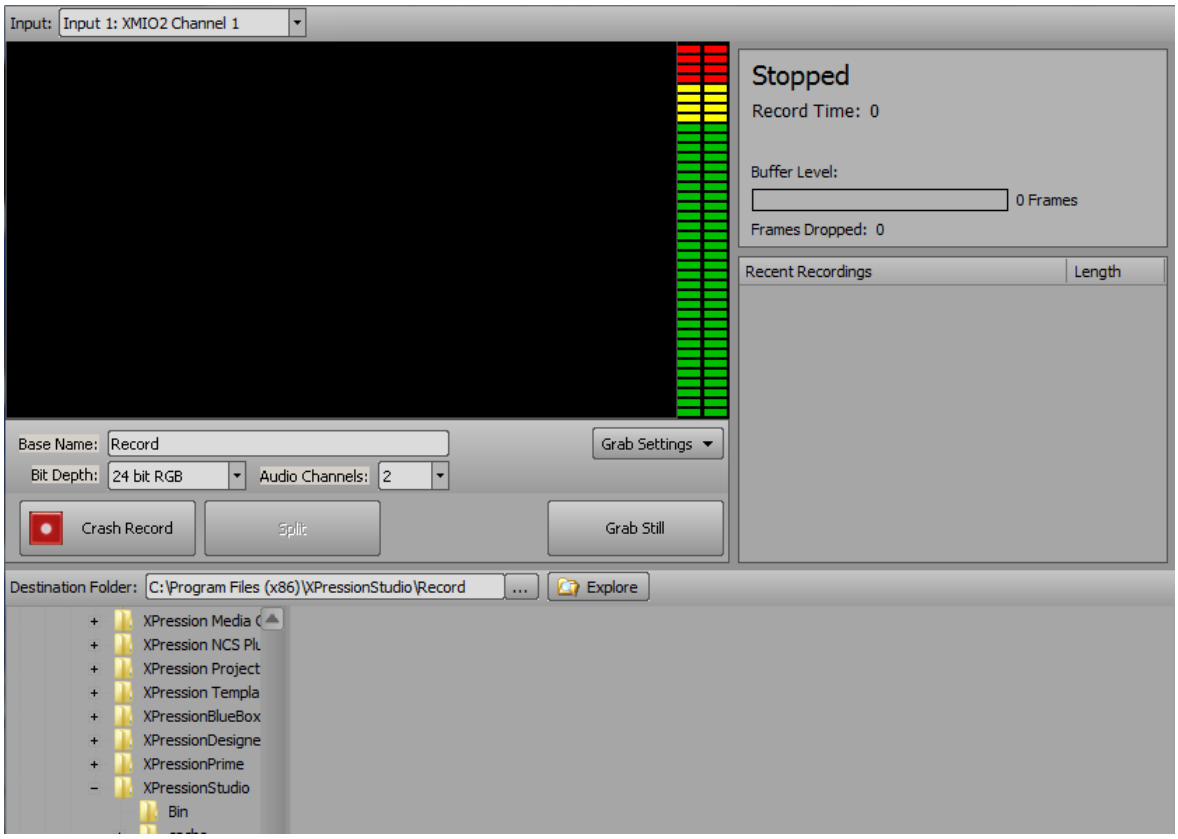
Capturing a Still Image from an Input

Use the **Record Client** to capture and save input video as a still image.

To capture a still image from an input:

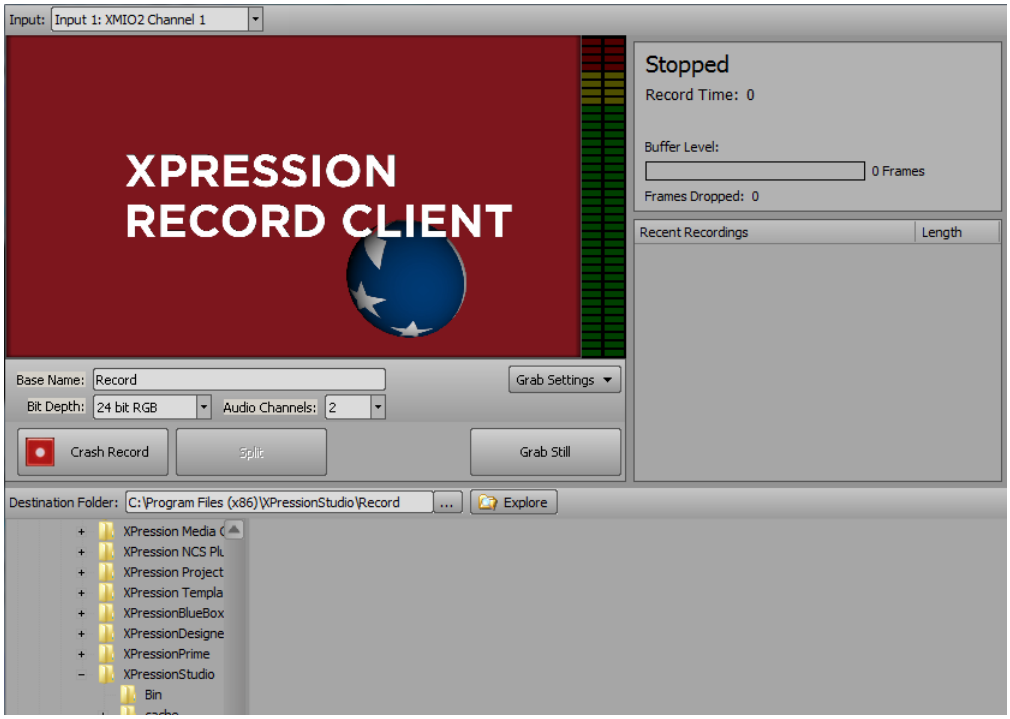
1. In XPression, select the **Record Client** ( ) toolbar icon.

   The **Record Client** dialog opens.



2. From the **Input** drop-down, select the input that contains the video to be captured as a still image file.

   The video loads in the preview window.



3. In the **Base Name** field, enter a name for the image file to be captured.
4. From the **Bit Depth** drop-down, select the quality of the signal quantization for the image:
   - **24 bit RGB** or
   - **32 bit RGBA** to include the alpha.
5. From the **Grab Settings** menu, select one of the following interlace options for the image file:
   - **Interlaced Settings > Frame Based** — capture the image file without deinterlacing. This setting works best for scenes with minimal motion.
   - **Interlaced Settings > Field (line doubled)** — capture the image file with each line doubled. For example, it will replace field two with a duplicate of field one.
   - **Interlaced Settings > Field (line interpolated)** — capture the image file by interpolating between odd lines to form even lines.
6. From the **Grab Settings** menu, select one of the following image file formats for the image:
   - **TGA** (Targa)
   - **PNG** (Portable Network Graphic)
   - **JPG**
7. In the **Destination Folder** field, enter a file path for the folder where the image will be stored or select **Browse (...)** to open a file browser and select a file path.

   Any videos or images that have been previously stored in the selected destination folder will appear as AVI and TGA, PNG, or JPG thumbnails next to the folder tree.

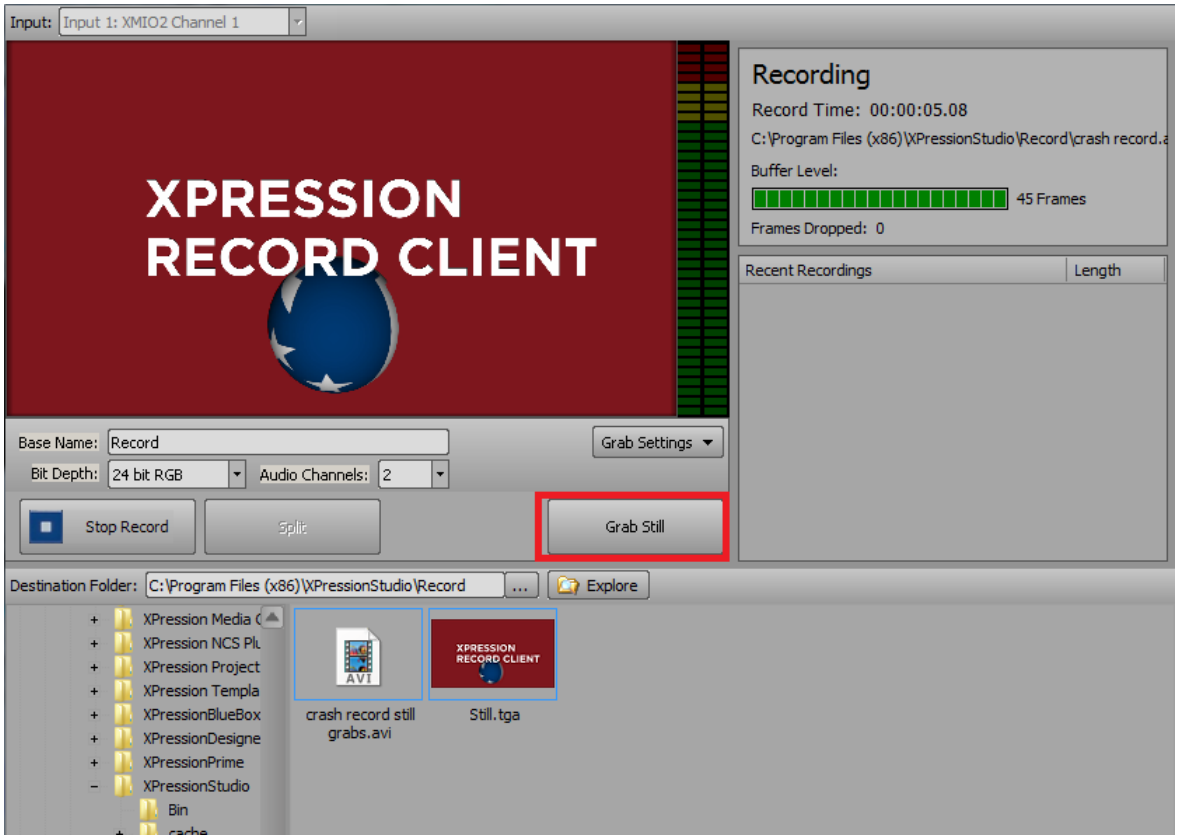
   ★A default record folder can be configured in the **Folders** section of the Preferences dialog.

8. Select **Grab Still** to capture a frame from the input video as a still image.

   Still images can be captured without recording the video or while the video is being recorded. Field-based still images can also be captured.

   A **.tga**, **.png**, or **.jpg** image thumbnail is displayed.

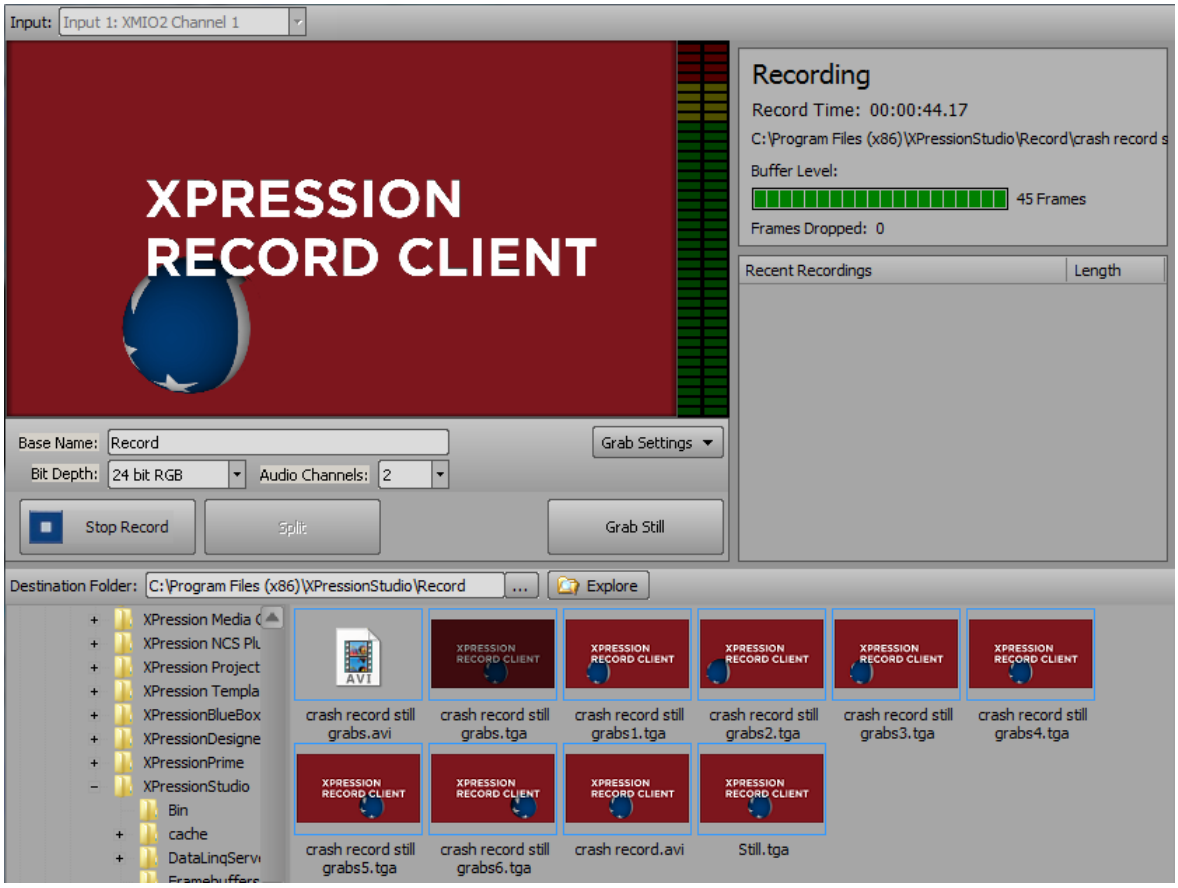
   In this procedure, the **Base Name** for the recording and still images has been changed to "crash record still grabs" for demonstrative purposes.



To capture still images while recording the input video:

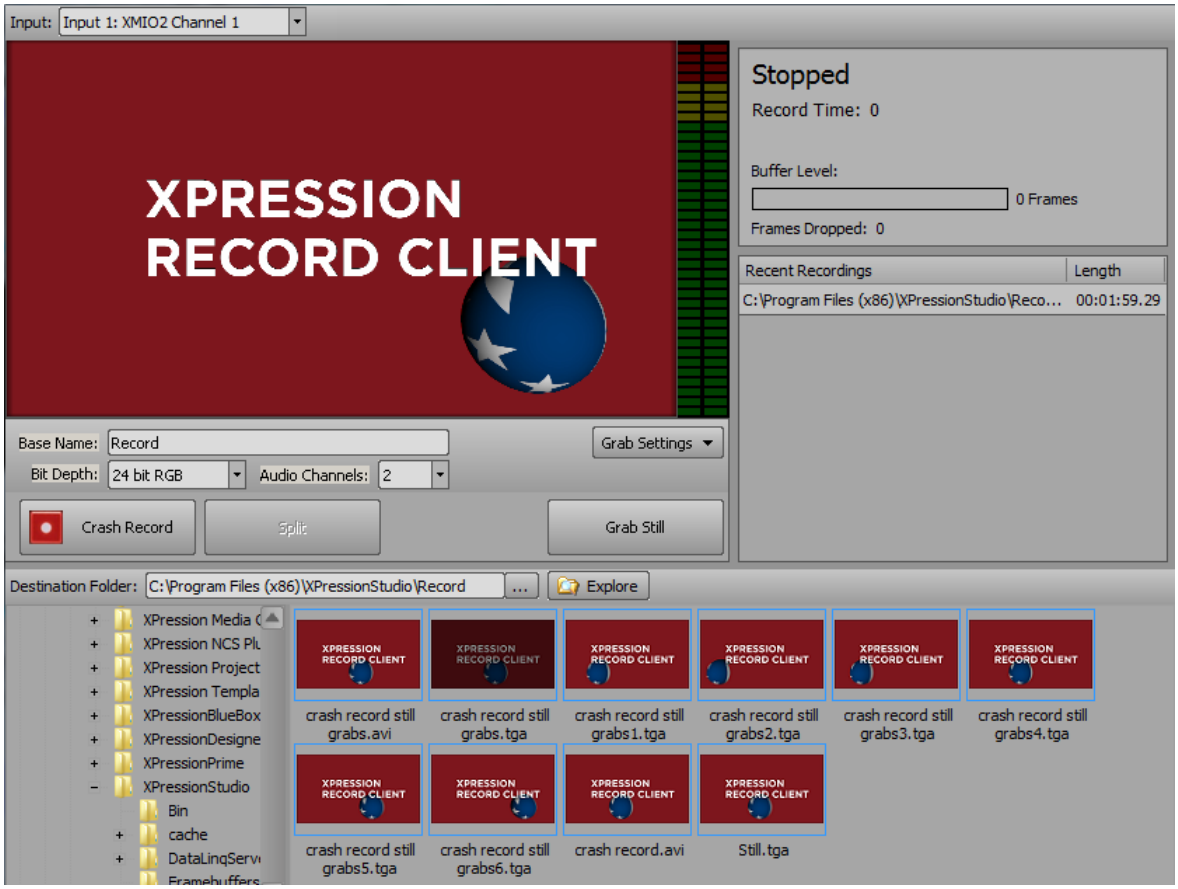
1. While recording the input video, select **Grab Still** as many times as necessary for the desired still images.

   Multiple .tga, .png, or .jpg image thumbnails are displayed.



2. Select **Stop Record** to stop recording the video once you have finished grabbing still images.

   The **.avi** video thumbnail(s) is completed and the video is added to the **Recent Recordings** list.



To view the video file:

- Select **Explore** to locate and open the video file for viewing in a media player.

For More Information on...

- configuring a default record folder, refer to Folders.

Using Multiple Record Clients

Multiple **Record Clients** can be opened and used simultaneously to record videos and capture still images.

★There is no limit to how many **Record Clients** can be open, but it is highly recommended that no more than 4 recordings occur at a time providing there is nothing being sent to output during recording. Otherwise, performance issues could occur. Recording to network locations (NAS/SAN) may or may not be possible depending on the bandwidth available.

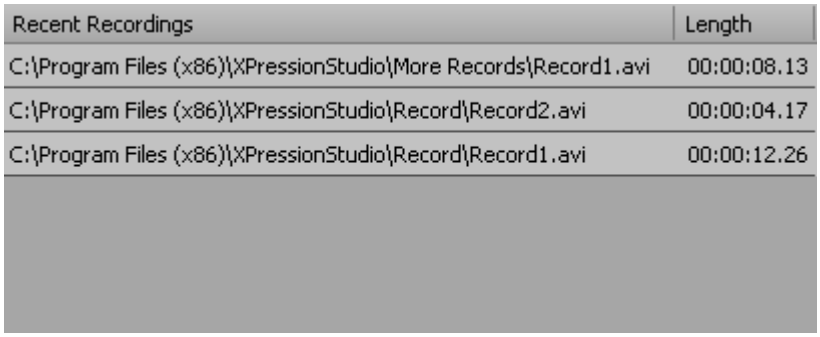
To configure multiple Record Clients:

1. In XPression, select the **Record Client** ( ) icon to open the **Record Client** dialog.
2. Select the **Record Client** ( ) toolbar icon again to open a second **Record Client** dialog, select it a third time to open a third, etc.
3. From the **Input** drop-down, select the input from which you will record a video file.
4. In the **Base Name** field in each **Record Client**, enter a name for the video file to be recorded.
5. From the **Bit Depth** drop-down in each **Record Client**, select the quality of the signal quantization for the clip:
   - **24 bit RGB** or
   - **32 bit RGBA** to include the alpha.
6. From the **Audio Channels** drop-down in each **Record Client**, select the number of active audio channels to use with the recording.
7. From the Grab Settings drop-down, select the **Interlaced Settings** and **File Format** to use for the still image to be taken (if one will be taken).
8. In the **Destination Folder** field in each **Record Client**, enter a file path for the destination folder where the video will be stored or select **Browse (...)** to locate and select a folder.

   When selecting a **Destination Folder** to store videos and images, if the selected folder already has stored videos or images, these previously created files will appear next to the folder tree as **AVI** and **TGA** thumbnails.

   If the same folder has been selected across multiple **Record Clients**, these files will appear in the area next to the folder tree in all the open **Record Clients** that are using that file path, as well as any currently recording video using that file path.

   All recent recordings, regardless of the selected file path, will appear in each of the open **Record Clients** in the **Recent Recordings** list.



   When recording a video using the **Record Client**, an indicator appears at the top of the UI that lists the number of active recordings.

To record a video:

1. Select **Crash Record** to begin recording from the input.
2. Select **Stop Record** to stop recording.

   If a selected recording has been stopped in its respective **Record Client**, the **Active** status will be listed as **Stopped**.
3. Select **Grab Still** to save an image to go with the recording.

To view all active recordings in all open Record Clients:

- Select the **Active Recordings** indicator to open the **Record Monitor** window.

To open an active Record Client:

- Select an active recording and select **Open Record Client**.

To delete an active recording:

- Select an active recording and select **Delete** to discard the selected recording.

For More Information on...

- recording an input video, refer to Recording a Video from an Input.
- capturing an input still image, refer to Capturing a Still Image from an Input.

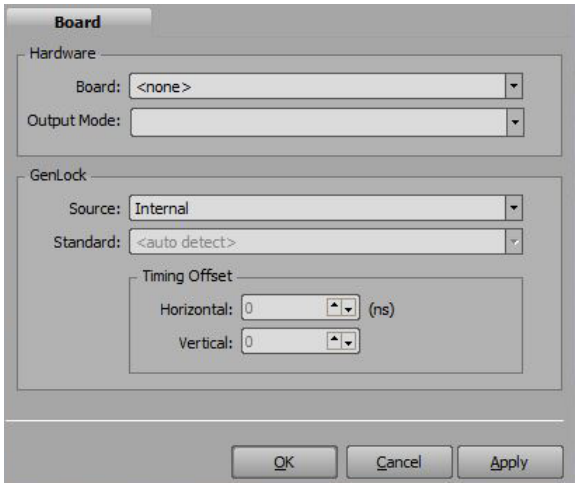
Using Fill/Key Simultaneously

★This option is only available if using the Matrox XMIO board with XPression.

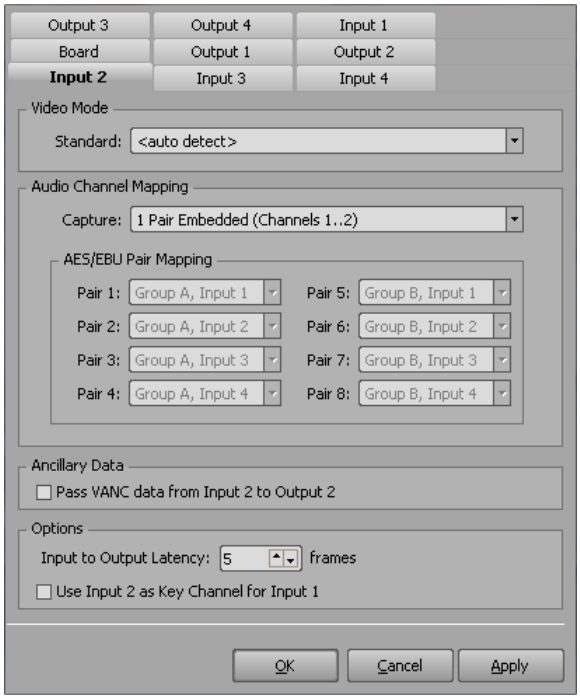
Using the **Record Client**, a video plus alpha can be recorded simultaneously by configuring the option in the **Input** tab in the **Matrox XMIO - Framebuffer Setup** dialog.

1. In XPression, select **Edit > Hardware Setup**.
2. In the **Inputs / Outputs** tab, select the **Matrox Video X.mio2 FrameBuffer** board and then select **Configure**.

   The **Matrox XMIO - Framebuffer** dialog opens.

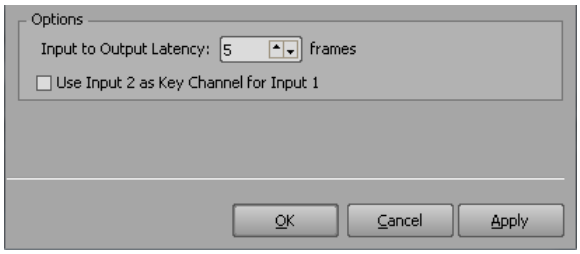


   The **Matrox XMIO - Framebuffer** dialog opens.



3. Select the **Input 2** tab.

4. In the **Options** section, select the **Use Input 2 as Key Channel for Input 1** checkbox to use key/fill simultaneously.



For More Information on...

- configuring the Matrox XMIO board, refer to Configuring a Matrox Video X.mio2 FrameBuffer.

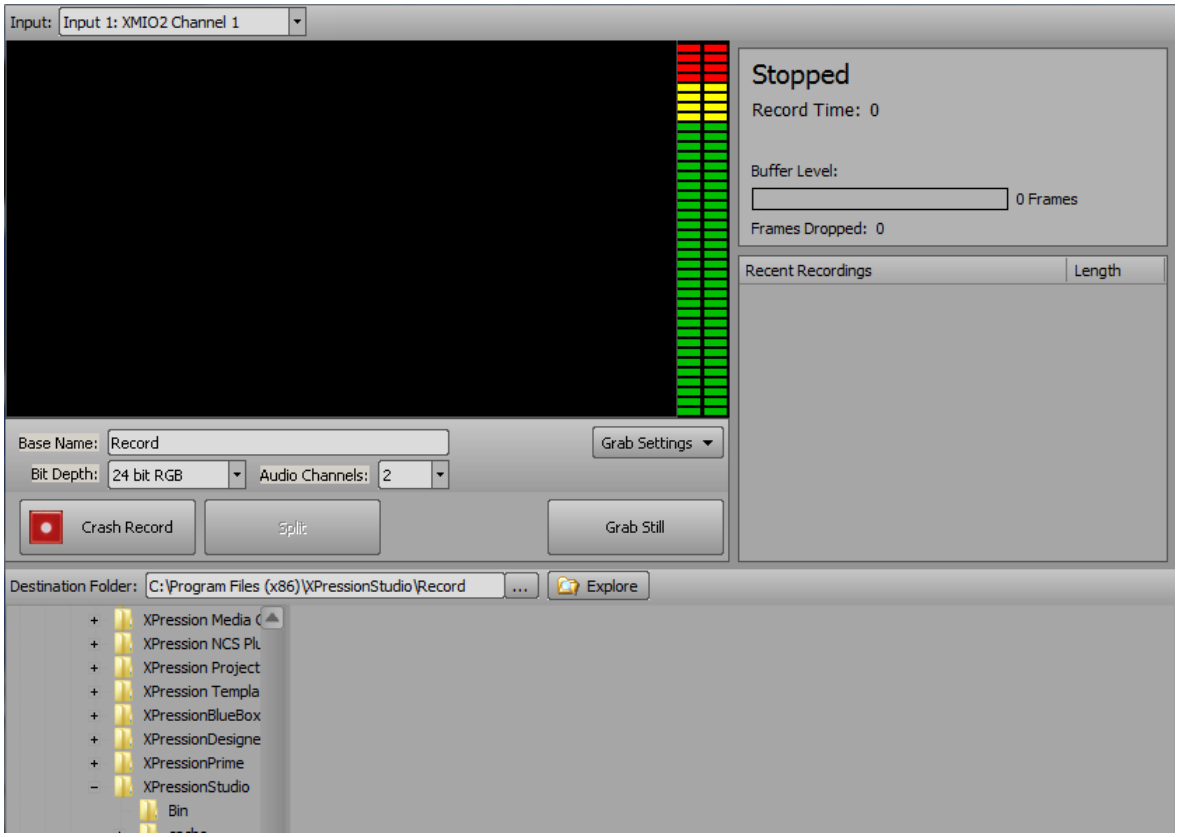
Creating a Material from a Video or Image

Once a recording has been completed it can be added to the **Material Manager** as a video material. Also, still grabs can be sent to the **Material Manager** as image materials.

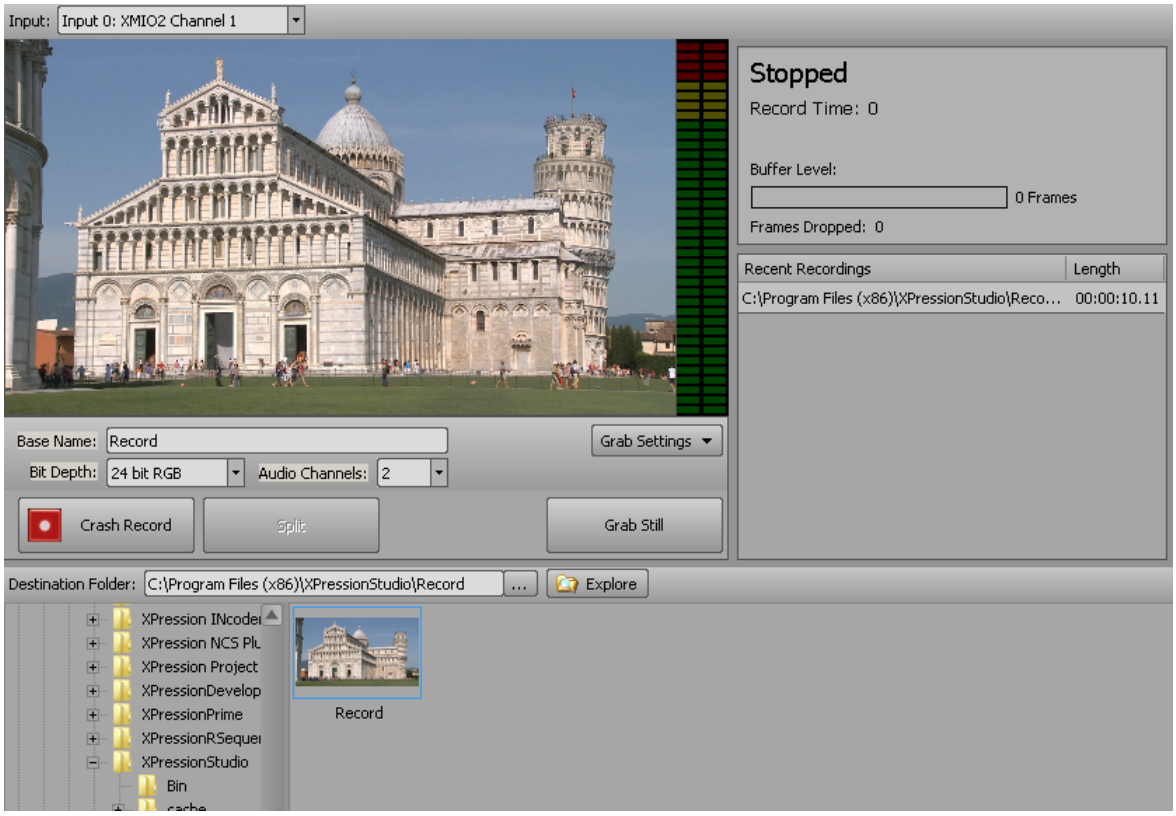
To create a material from a video or image:

1. In XPression, select the **Record Client** ( ) toolbar icon.

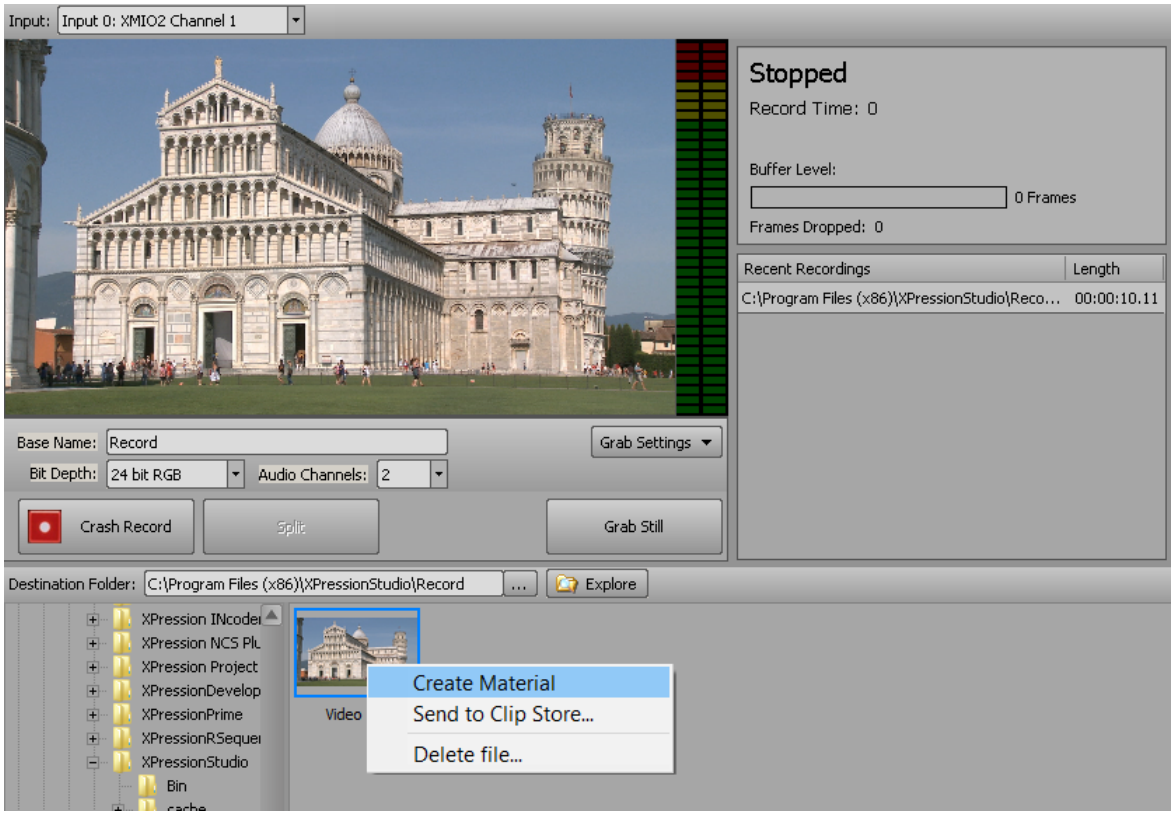
   The **Record Client** dialog opens.



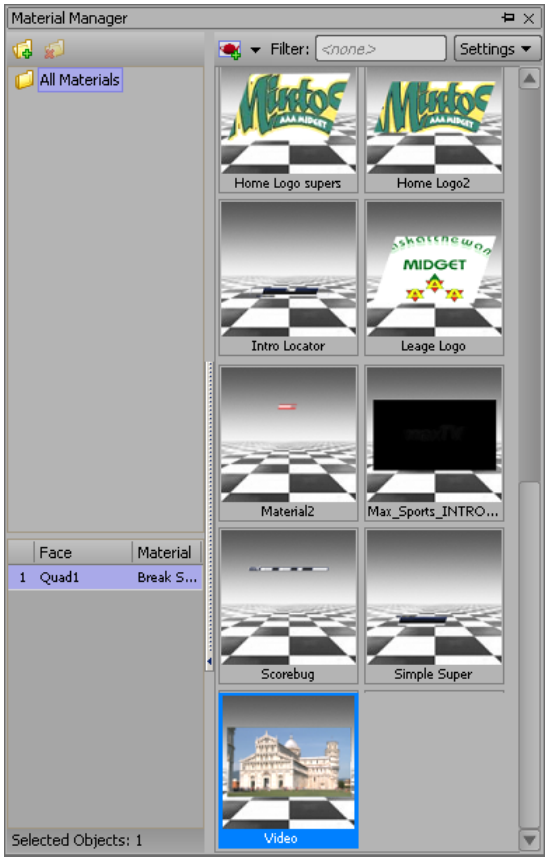
2. In the **Record Client**, create a video or capture a still image.



3. Right-click on a video or image thumbnail and select **Create Material** from the shortcut menu.



The newly created material is added to the **Material Manager**.



For More Information on...

- materials, refer to Materials.

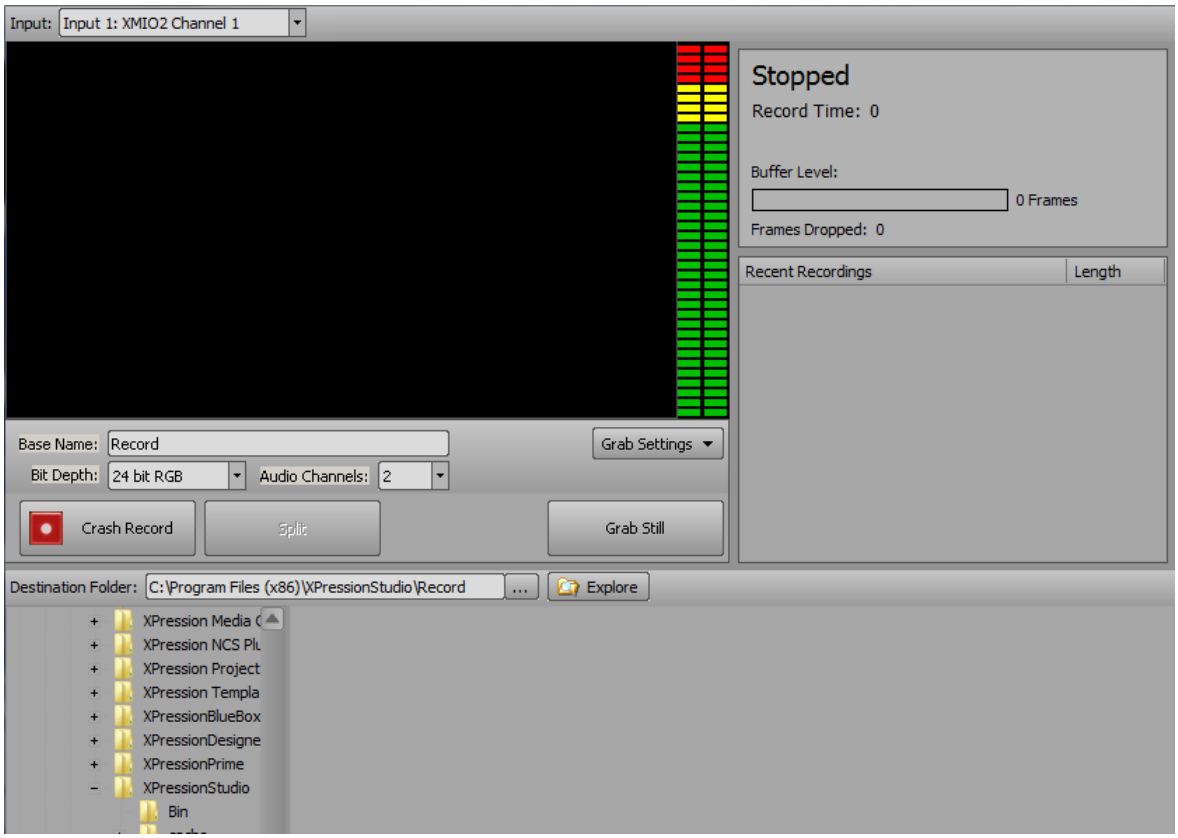
Sending a Video or Image to the Clip Store

Once a recording has been completed it can be sent to the **Clip Store** database to be used within the **Clips** workflow. Proxies of video clips are automatically generated when sent to the Clip Store.

1. In XPression, select the **Record Client** ( ) toolbar icon.

   Alternatively, select **Tools > Record Client**.

   The **Record Client** dialog opens.



2. Create a video in the **Record Client**.

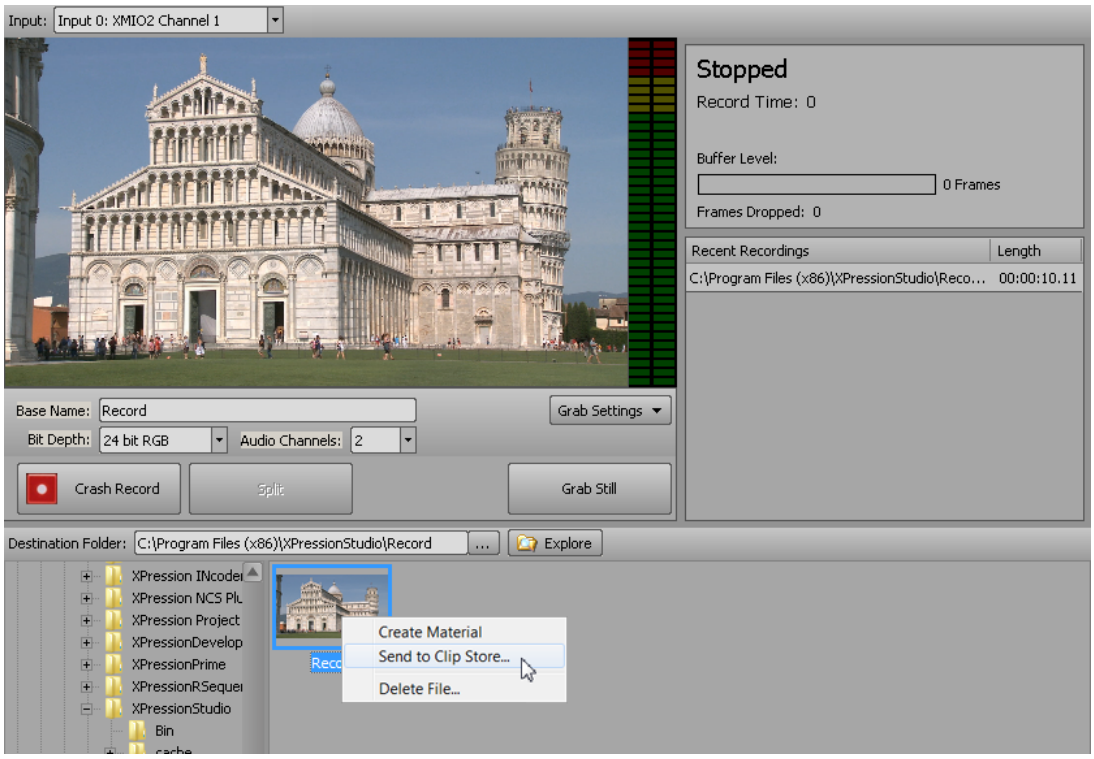
   OR

   In the folder tree, select the video or image you want to send to the Clip Store.

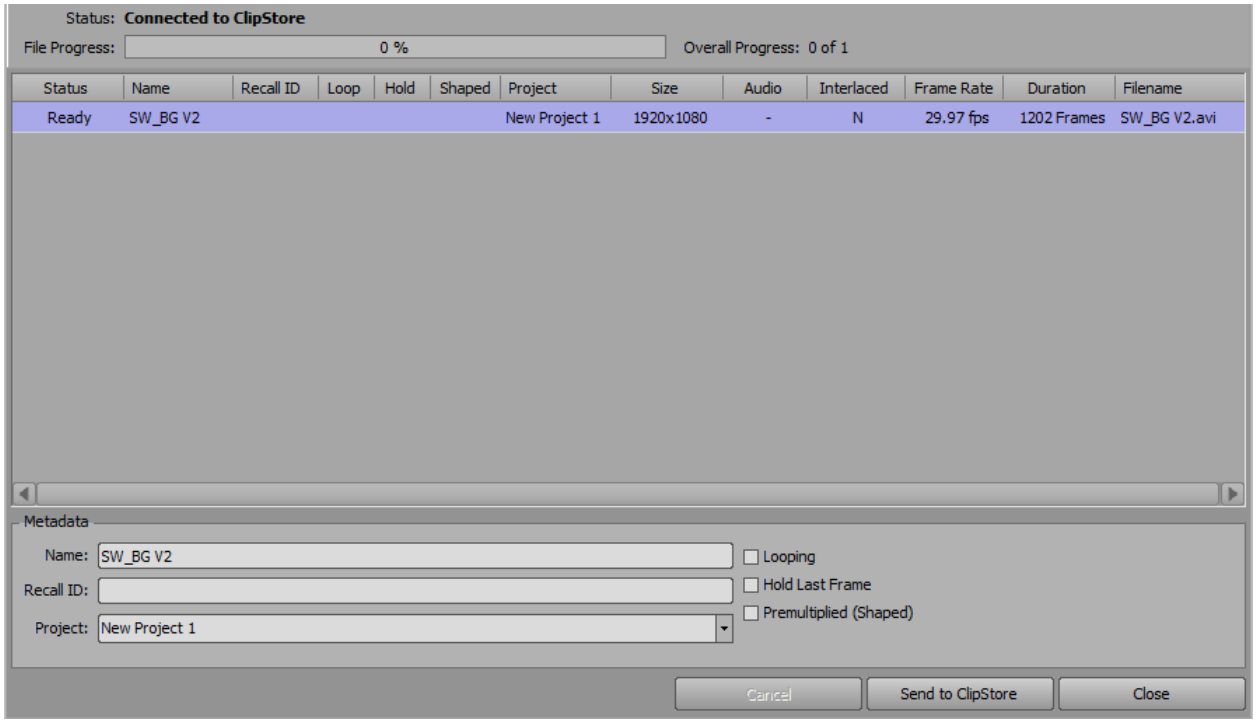
3. Right-click on the video or image thumbnail and select **Send to Clip Store** from the shortcut menu.

   Multiple videos and images can be selected by using **Shift + click** or holding **Ctrl** and selecting individual videos and images.

   ★Only XPression codec clips should be sent to the Clip Store.



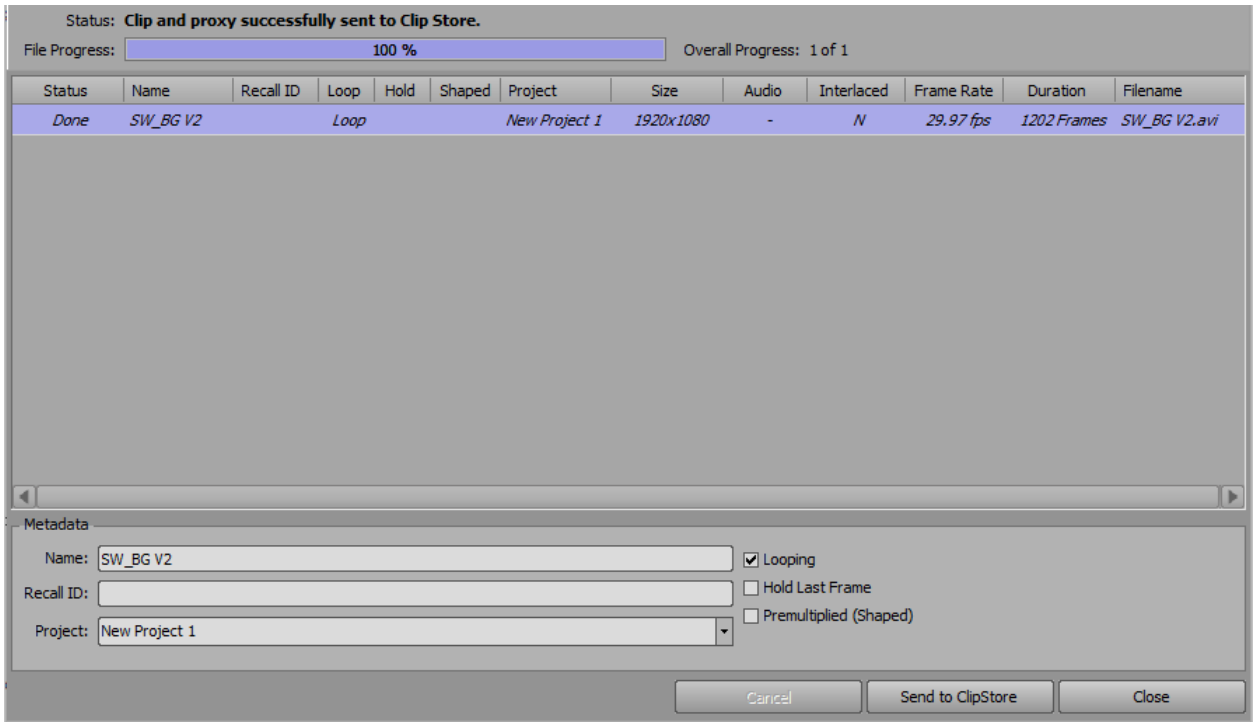
The **Send to Clip Store** dialog opens.



4. In the **Metadata** section, configure the following items:
   - **Name** — enter a new name for the video or image in Clip Store, if necessary.
   - **Recall ID** — enter an identifier to recall the video or image from an external device.
   - **Project** — from the drop-down, select any existing projects from Clip Store or enter a new project name for the video or image. New projects are automatically added to the Clip Store.
   - **Looping** — select to infinitely replay the video each time it reaches the end.
   - **Hold Last Frame** — select to freeze the video on the last frame after playing.
   - **Premultiplied (Shaped)** — select to multiply/shape the fill signal color information by the luminance information in the key signal.

5. Select **Send to ClipStore**.

   The video or image is transferred to the Clip Store. Once the transfer has successfully completed, the **Status** is listed as **Clip and proxy successfully sent to Clip Store**, the **Progress** bar is at 100%, and **Destination** details are listed.



6. Select **Close** to exit the dialog.

For More Information on...

- creating a video file in the **Record Client**, refer to Recording a Video from an Input.
- creating an image file in the **Record Client**, refer to Capturing a Still Image from an Input.

Output

The output of an XPression project can be sent to various locations, including being saved in an Audio Video Interleave format (.AVI) video file.

The following topics are discussed in this section:

Previewing Output in a Virtual Output

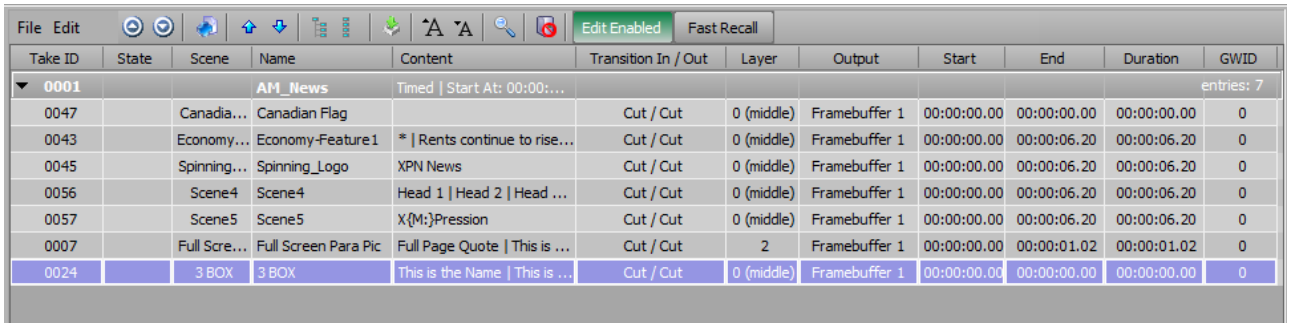
Rendering Output to an AVI File

Previewing Output in a Virtual Output

Configure an XPression Virtual Output in **Edit > Hardware Setup > Inputs / Outputs**. See Configuring an XPression Virtual Output for instructions.

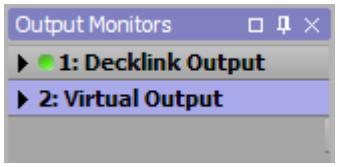
To preview output in a Virtual Output:

1. Select **Sequence** at the top of the **Editor** window.
2. In the **Scene Manager**, select and drag the scene or scene group to output into the **Sequencer**.



Take ID	State	Scene	Name	Content	Transition In / Out	Layer	Output	Start	End	Duration	GWID
0001			AM_News	Timed | Start At: 00:00:...							entries: 7
0047		Canadia...	Canadian Flag		Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0
0043		Economy...	Economy-Feature1	* | Rents continue to rise...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0045		Spinning...	Spinning_Logo	XPN News	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0056		Scene4	Scene4	Head 1 | Head 2 | Head ...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0057		Scene5	Scene5	X{M:}Pression	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	0
0007		Full Scre...	Full Screen Para Pic	Full Page Quote | This is ...	Cut / Cut	2	Framebuffer 1	00:00:00.00	00:00:01.02	00:00:01.02	0
0024		3 BOX	3 BOX	This is the Name | This is ...	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:00.00	00:00:00.00	0

3. In the **Output Monitors** window, note the framebuffer number of the **Virtual Output** output monitor.



4. Use the list in the **Output** column of the **Sequencer** to select the framebuffer number of the **Virtual Output** for the scene or scene group to output.
5. Double-click the scene or scene group in the **Sequencer** to take it "online".

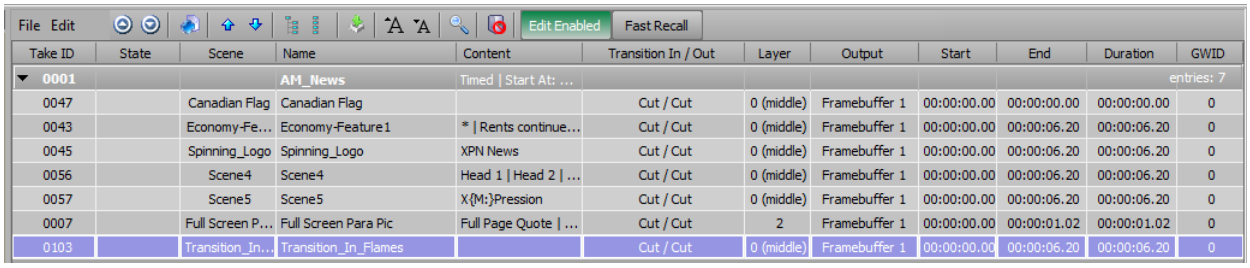
   The **XPression Virtual Output** window opens to display the output of the selected scene or scene group.
6. Right-click the output in the **XPression Virtual Output** window and select **Full Screen** to use full screen display.

Rendering Output to an AVI File

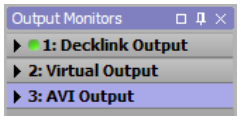
It is necessary to render the output of a scene or scene group as an .AVI file in order to play it in XPression.

To add a scene or scene group to the Sequencer:

1. Select the **Sequence** tab.
2. In the **Scene Manager**, select and drag the scene/scene group to output to an AVI file into the **Sequencer**.



3. In the **Output Monitors** window, note the framebuffer number of the **AVI Output**.

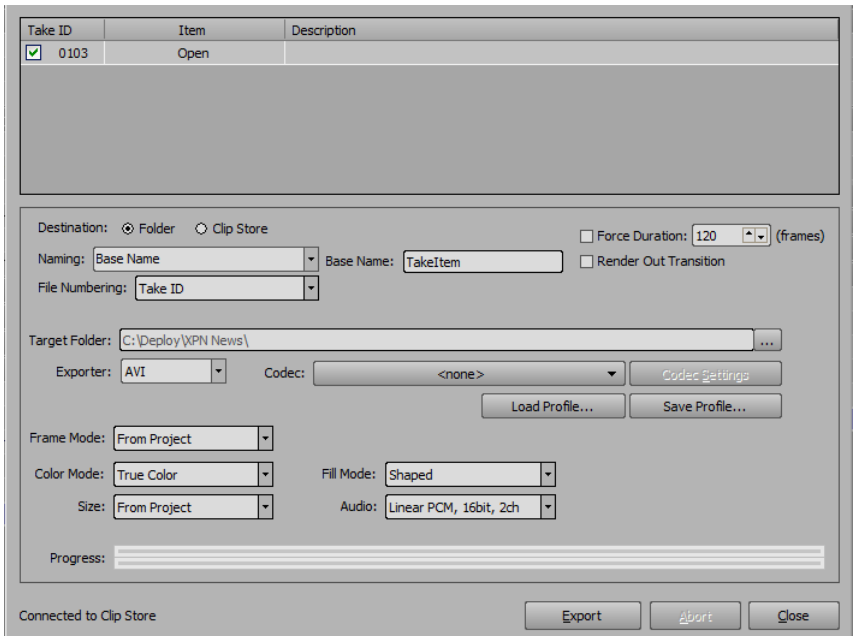


4. In the **Output** column of the **Sequencer**, click in the row for the scene/scene group to output to AVI and from the drop-down, select the **Framebuffer** number shown in the **Output Monitors** window.
5. Continue with the instructions for exporting the output.

To save the AVI file:

1. Right-click the selected take item or take item group in the **Sequencer** and select **Export Take Item To > Video**.

   The **Export To Video** dialog opens.



2. In the **Export to Video** dialog, select the checkbox of the **Take ID** to export.

   Select the respective checkboxes of **Take IDs** if exporting multiple videos.

3. Select a **Destination** for the video(s):

   - **Folder** — save the video(s) to a target folder.
   - **Clip Store** — save the video(s) to the Clip Store for use within a clips workflow.

4. Select the **Force Duration** checkbox to make the video conform to the number of frames set in the adjacent field.

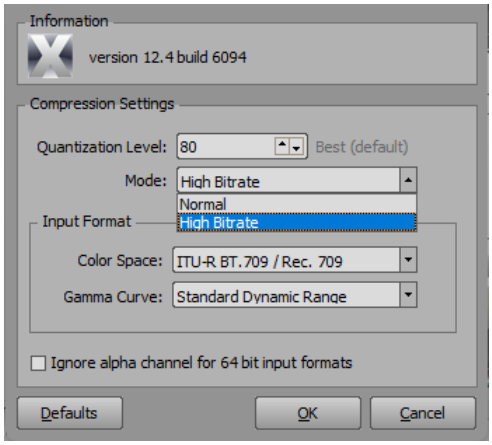
5. Select the **Render Out Transition** checkbox to render the take item using the transition in/out effect in the **Take Inspector - Transition** settings for the take item.

6. In the **Target Folder** field, enter the path to the folder in which to save the AVI file or select **Browse** to locate and select the folder.

To select the video format and codec:

1. From the **Exporter** drop-down, select **AVI**.
2. From the **Codec** drop-down, select an encoder.
3. If the **XPression Video Encoder** is selected, select **Codec Settings**.

   The **XPression Video Codec 2** dialog opens.



   a. In the **Compression Settings** section, in the **Quantization Level** field, enter or select the percentage of the color sampling.

      The higher the percentage, the better the color sampling quality. The default of 80 is recommended.

   b. In the **Input Format** section, from the **Color Space** drop-down, select the specific organization of colors for the compression

      The options are:

      - **Standard RGB (sRGB)**
      - **ITU-R-BT.601 / Rec. 601**
      - **ITU-R BT.709 / Rec. 709**
      - **ITU-R BT.2020 / Rec. 2020**

c. From the **Gamma Curve** drop-down, select the method for optimizing the usage of bits for encoding the video.

   The options are:

   - **Standard Dynamic Range**
   - **Hybrid Log Gamma (HLG)**
   - **Perceptual Quantization (PQ)**

d. Select the **Ignore alpha channel for 64 bit input formats** checkbox to ignore the alpha channel in the encoding when using 64-bit input formats.

e. Select **OK**.

The XPression Video Codec 2 dialog closes.

4. The video settings can be saved to a file by selecting the **Save Profile** button.
5. Select **Load Profile** to open a file browser to locate and select previously saved video settings.

To configure the remaining settings:

1. From the **Frame Mode** drop-down, select the mode to use.

   The options are:

   - **From Project** — use the project frame mode.
   - **Upper Field First** — render in upper field first video.
   - **Lower Field First** — render in lower field first video.
   - **Frame Based** — render the video as frame based.
2. From the **Color Mode** drop-down, select a color mode for the video file.

   The options are:

   - **True Color** — use 24-bit color.
   - **True Color + Alpha** — use 24-bit color with alpha.
3. From the **Size** drop-down, select a frame size for the video(s).

   The options are:

   - **From Project** — use the project dimensions.
   - **From Project (virtual)** — use the viewport resolution. This is only applicable to video formats with non-square pixels.
   - **From Scene** — use the scene dimensions.
4. From the **Fill Mode** drop-down, select the method used to process fill before output.

   The options are:

   - **Shaped** — shape the fill signal color information by the luminance information in the key signal.
   - **Unshaped** — output the fill and key signals "as is".

5. From the **Audio** drop-down, select an audio setting for the video(s).

   The options are:

   - **None** — do not use audio for the video(s).
   - **Linear PCM, 16bit, 2ch** — export with two-channel audio.

6. Select **Export**.

   The take item is exported to an AVI file. The **Progress** bar displays the progress of the video(s) being saved.

Project Server

The **Project Server** allows XPression and HTML5 projects to be published and deployed using a server.

The following topics are discussed in this section:

Setting up a Project Server

Publishing a Project to the Project Server

Deploying a Project from the Project Server

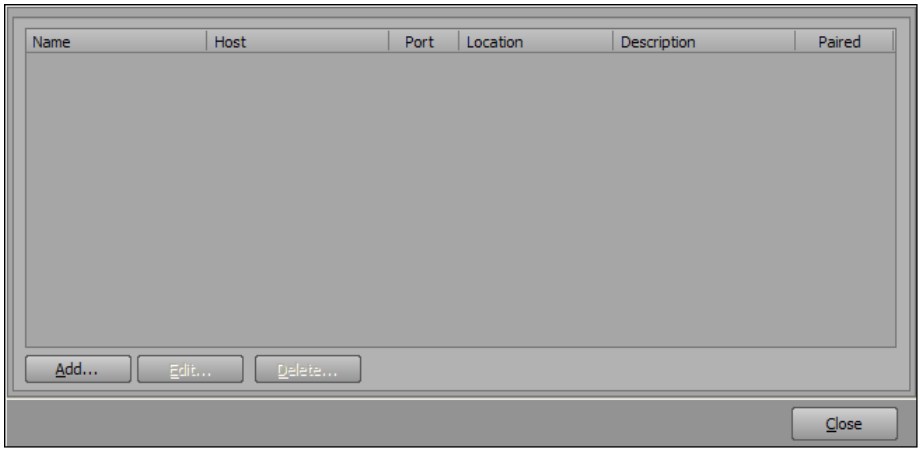
Setting up a Project Server

This topic explains how to add or modify a project server in XPression. It guides you through accessing the **Project Servers Setup** dialog, entering or updating the required server details, and saving the configuration so the project server is available for use within the application.

To set up a project server:

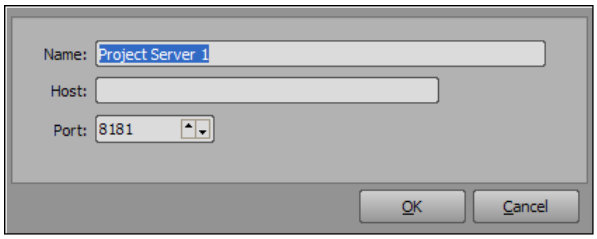
1. In XPression, select **File > Project Server > Setup**.

   The **Project Servers Setup** dialog opens.



2. Select **Add** to add a new project server or select **Edit** to edit an existing project server.

   The **Edit Project Server** dialog opens.



3. In the **Edit Project Server** dialog, enter or edit the project server information.
   - In the **Name** field, enter or edit a name for the project server.
   - In the **Host** field, enter or edit the host IP address.
   - In the **Port** field, enter or edit the host port number.
4. Select **OK**.

   The added or edited project server appears in the list in the **Project Servers Setup** dialog.
5. Select **Close**.

Publishing a Project to the Project Server

This topic describes how to log on to a project server from XPression and publish a project. It walks you through selecting or creating a show, entering project revision details, and completing the publishing process so the project and its revisions are made available on the project server.

When a new revision of a project is published, the XPression engine will download and deploy the new revision into the **Project Manager**, while also making sure that the previous version remains loaded if necessary (because a take item in the project is online). Take items that are online at this time continue to use the previous revision. Take items that are not online are replaced by the new revision of the project. When there are no more take items using the old revision, it will be unloaded. Take items that were online and are taken offline will take the new revision of the project the next time they go online.

★Publishing a revision of a project will send a notification of the revision to any MOS Plugin using that project.

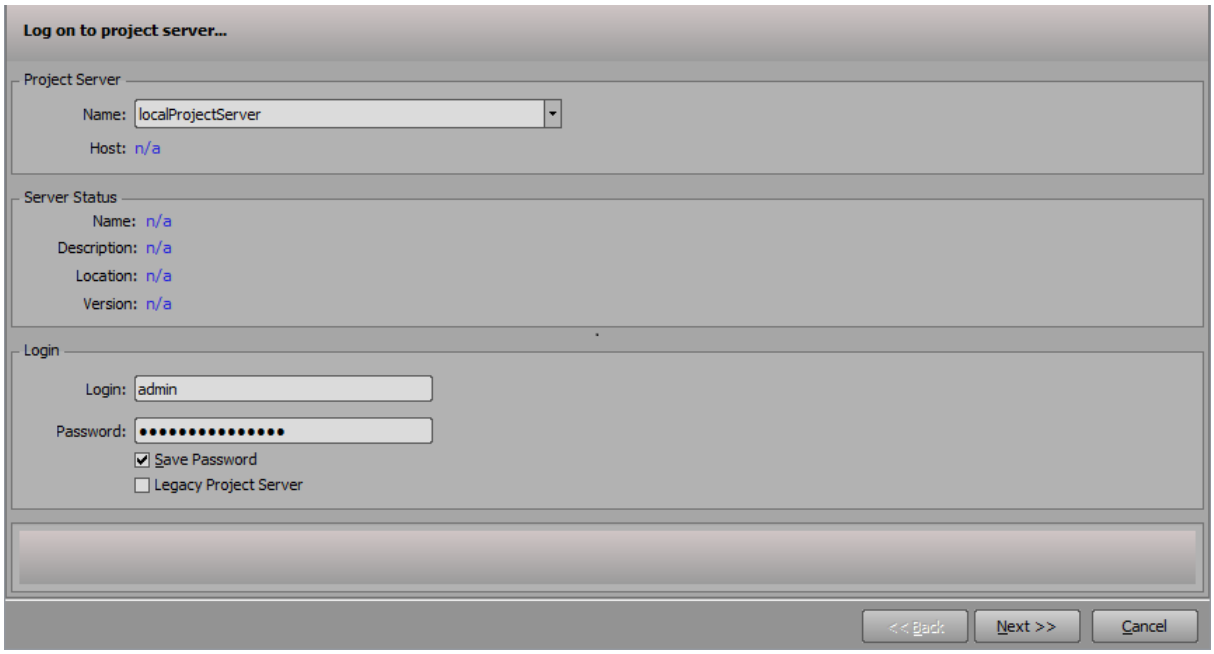
To log on to the Project Server:

1. Open a project in XPression and save it.

   Saving the project is required before publishing it to the project server.

2. In XPression, select **File > Project Server > Publish**.

   The **Log on to project server** dialog opens.



3. In the **Project Server** section, from the **Name** drop-down, select the project server.

   For a project server to appear in the **Name** list, a project server needs to be configured.

4. In the **Login** section, in the **Login** field, enter the project server login.

   The default login is **admin**.

5. In the **Password** field, enter the project server login password.

   The default password is **admin**.

6. Select the **Save Password** checkbox to save the password.

7. Select the **Legacy Project Server** checkbox if you have updated your XPression software, but are still using an older version of the **XPression Project Server**.
8. Select **Next**.
9. Continue with the instructions for one of the following actions:

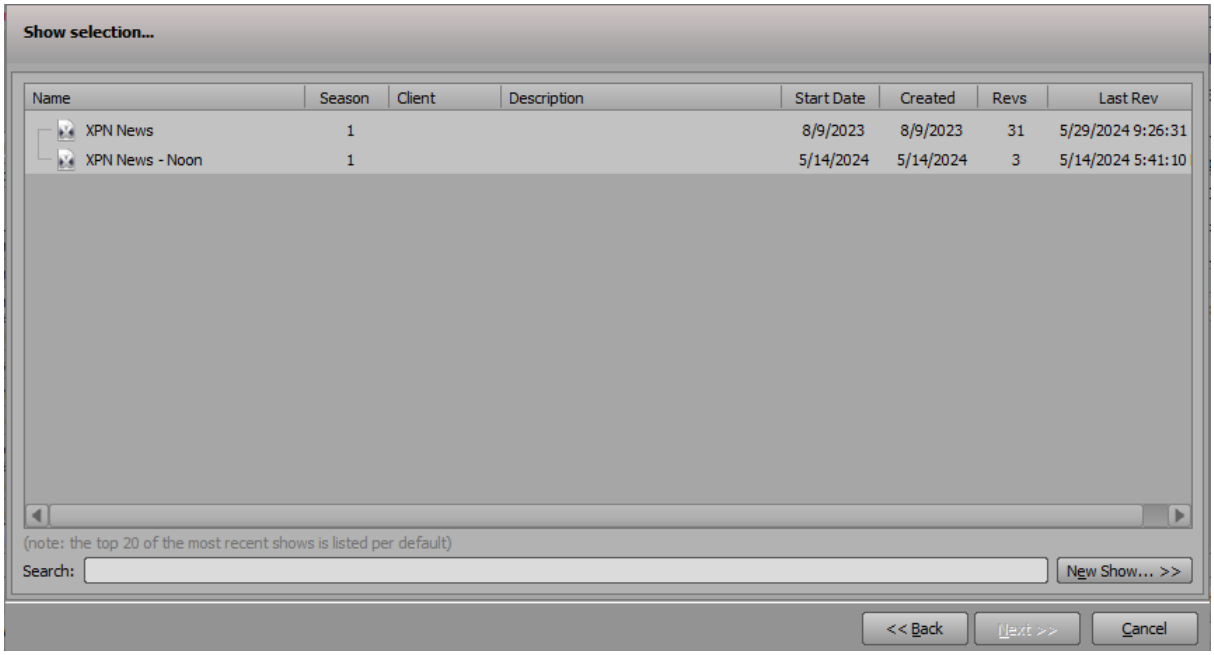
   Selecting a show

   Creating a new show

To select a show:

1. In the **Show selection** dialog, if the project has previously been published, select the show from the list.

   The top 20 of the most recent shows are listed by default.



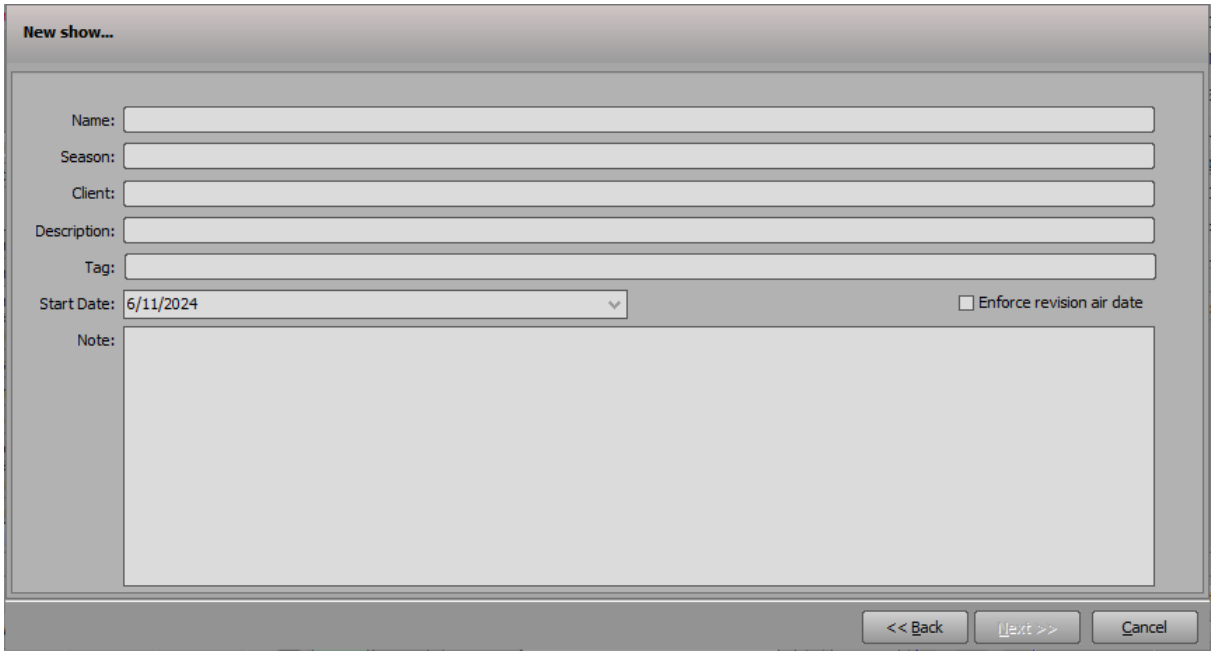
   Alternatively, you can enter the name of a show in the **Search** field.

2. Select **Next**.
3. Continue with the instructions for setting project revision information.

To create a new show:

1. Select **New Show**.

   The **New show** dialog opens.

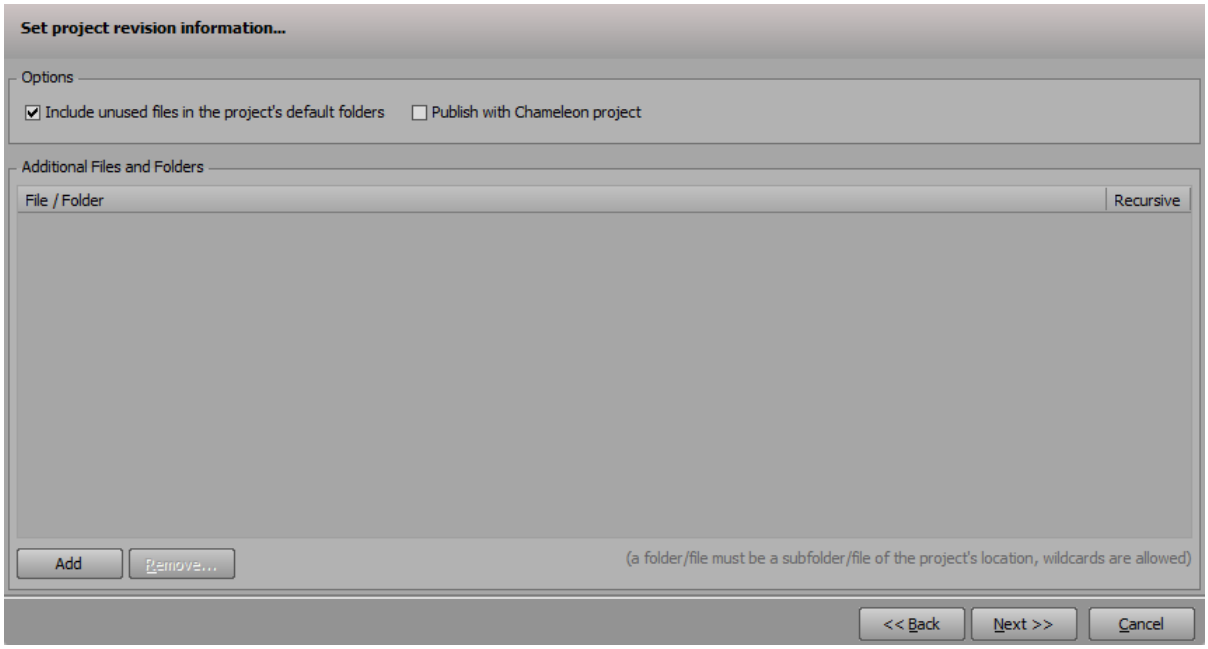


2. Enter the following information for the new show:
   - **Name** — enter the name of the new show.
   - **Season** — enter the season of the show (required).
   - **Client** — enter the intended recipient of the show.
   - **Description** — enter a brief descriptor.
   - **Start Date** — from the drop-down calendar, select the start date of the show.
   - **Note** — enter any notes for the show.
3. Select the **Enforce revision air date** checkbox to ignore any revision with a future air date when getting the latest revision of the show in the MOS and NLE plugins or through autonomous deployment.
4. Select **Next**.
5. Continue with the instructions for setting project revision information.

To set project revision information:

1. In the **Set project revision information** dialog, in the **New Project Revision Information** section, revise the following information as necessary:
   - **Project Name** — enter a revised name for the project.
   - **Author** — from the drop-down, select a revised author for the project.
   - **Description** — from the drop-down, select a revised description for the project.
   - **Air Date** — from the drop-down calendar, select a revised air date for the project.
   - **Note** — enter any revised notes for the project.
2. Select **Next**.

   The next **Set project revision information** dialog opens.



3. In the **Options** section, select from the following:
   - **Include unused files in the project's default folders** to include unused files for the project in the default folders.
   - **Publish with Chameleon Project** to include HTML5 assets (images, models, fonts, and videos) used in the project, allowing the project to be used in Chameleon Designer.
4. Select **Add** to add any additional folders to be included or **Remove** to remove a selected folder.
5. Select **Next**.
6. Continue with the instructions for publishing the project.

To publish the project:

1. If **Publish with Chameleon Project** was selected, XPression will now transcode the video files used in the project.

   If **Publish with Chameleon Project** was not selected, continue with Step 3.
2. When the transcoding is complete, select **Next**.

3. In the **Ready to publish** dialog, review the project information before publishing.
4. Select the **Publish** button to publish the project to the project server.

   If **Publish with Chameleon Project** was selected, the project manager will first publish the HTML5 files to the project server. A folder with the project's name is created within the project, containing the HTML5 resources.
5. When the project has finished publishing, select **Next**.

   The project is published again, this time to the regular XPression project folder.
6. When the project has finished publishing for the second time, select **Close**.

For More Information on...

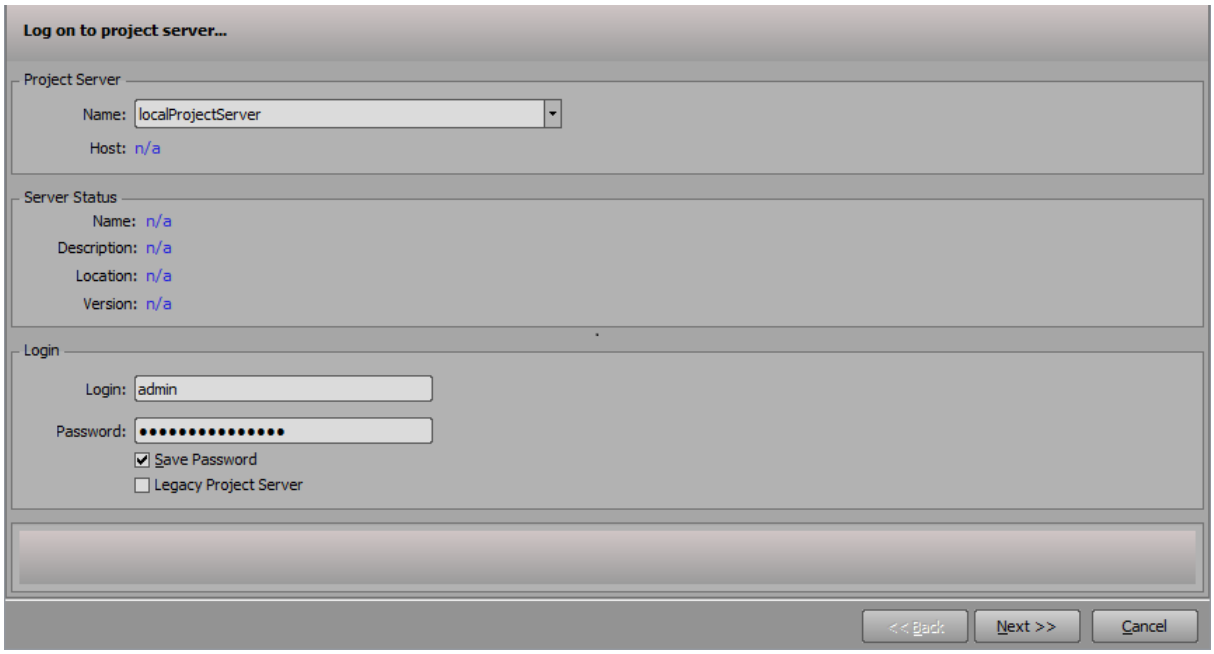
- configuring a project server, see the *XPression Project Server User Guide*.

Deploying a Project from the Project Server

This topic describes how to select a show and revision in the **Project Server** to deploy from and how to deploy the project.

To log on to the Project Server:

1. Open a project in XPression.
2. In XPression, select **File >Project Server > Deploy**.
3. The **Log on to project server** dialog opens.



4. In the **Project Server** section, from the **Name** drop-down, select the project server.

   For a project server to appear in the **Name** list, a project server needs to be configured.

5. In the **Login** section, in the **Login** field, enter the project server login.

   The default login is **admin**.

6. In the **Password** field, enter the project server login password.

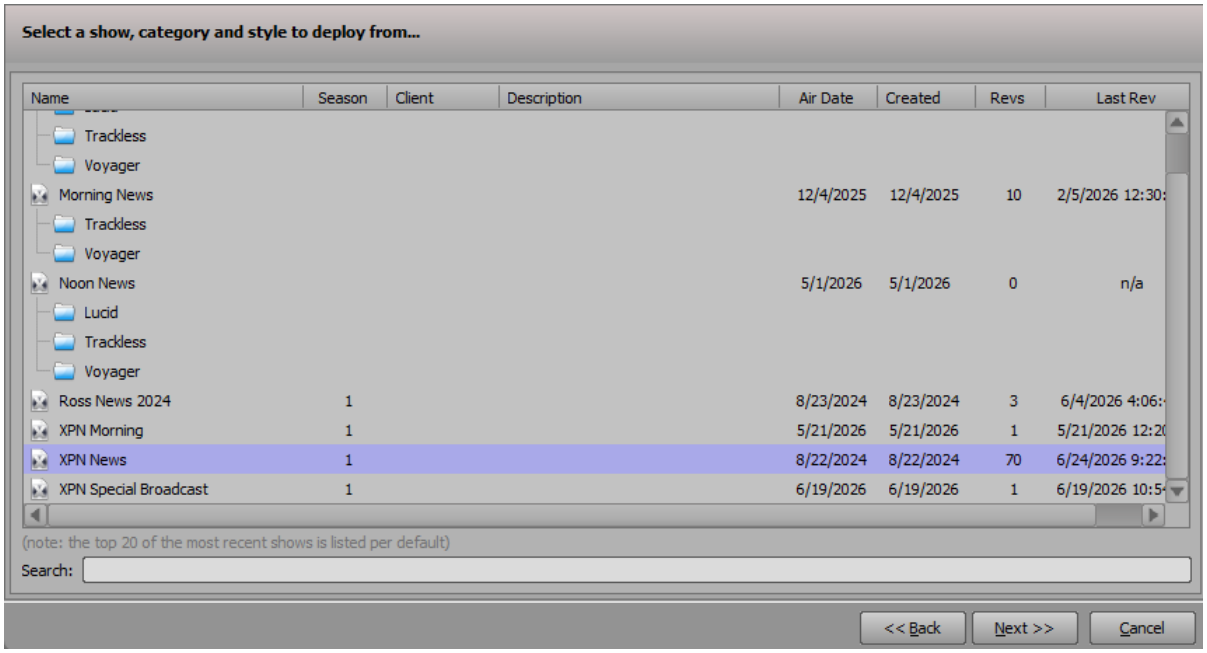
   The default password is **admin**.

7. Select the **Save Password** checkbox to save the password.
8. Select the **Legacy Project Server** checkbox if you have updated your XPression software, but are still using an older version of the **Project Server**.
9. Select **Next** and continue with the instructions for selecting a show, category and style to deploy from.

To select a show, category and style to deploy from:

1. In the **Select show, category and style to deploy from** dialog, select a show from the list or use the **Search** field to find and select a show.

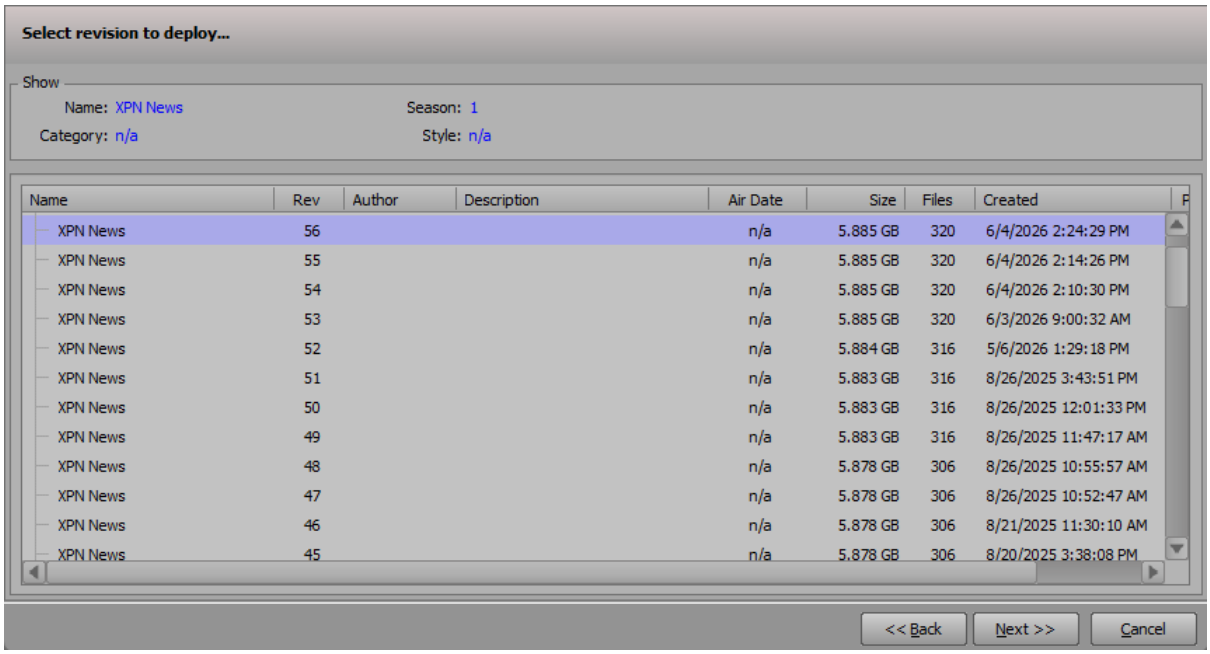
   The top 20 of the most recent shows are listed by default.



2. Select **Next**.
3. Continue with the instructions for selecting a revision to deploy.

To select a revision to deploy:

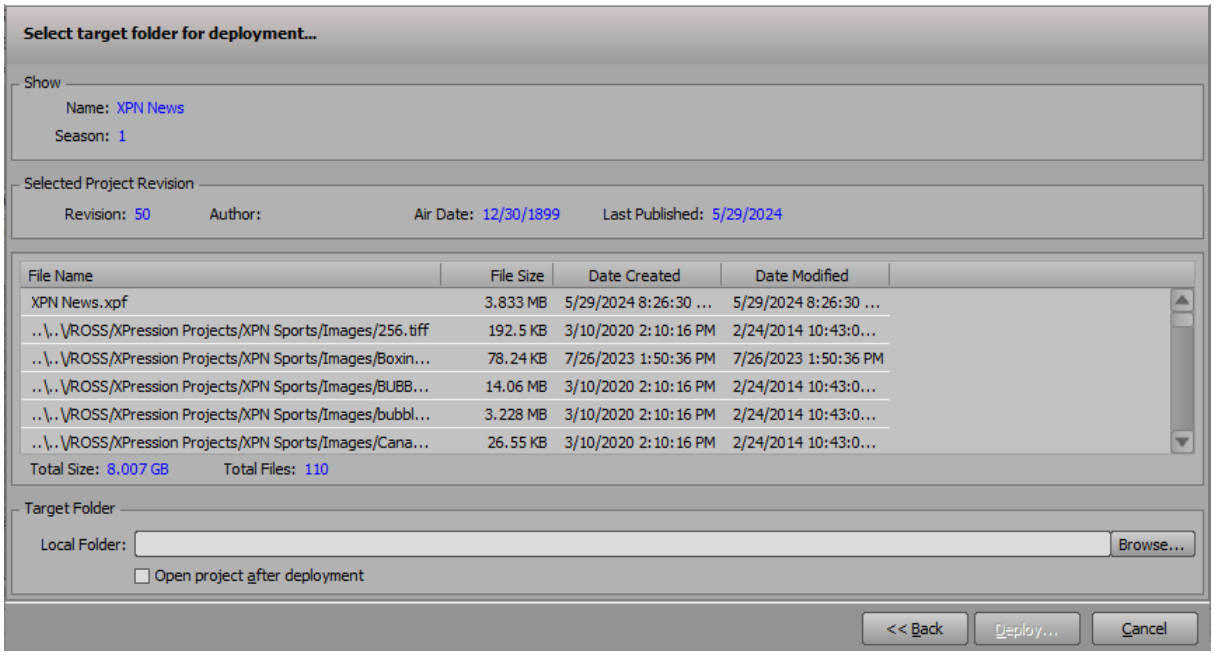
1. In the **Select revision to deploy** dialog, select the revision number to deploy from the project server.



2. Select **Next**.
3. Continue with the instructions for selecting a target folder for deployment.

To select a target folder for deployment:

1. In the **Select target folder for deployment** dialog, in the **Local Folder** field, type a filepath to a folder or select the **Browse** button to navigate to a folder.



2. Select the **Open project after deployment** checkbox if you want to open the project immediately after deploying.
3. Select the **Deploy** button to deploy the project from the project server.
4. Select **Close**.

Keyboard and GPI Mapping

Keyboard and GPI mapping enables many of the XPression functions to be assigned to keyboard shortcuts or GPI input triggers. Many of XPression's existing default keyboard shortcuts can also be customized.

The following topics are discussed in this section:

Creating a Custom Keyboard Map

Assigning a Project Shortcut

Assigning a Global Shortcut

Assigning a Local Shortcut

Creating a Custom GPI Map

Using the Quick Menu

Creating a Custom Keyboard Map

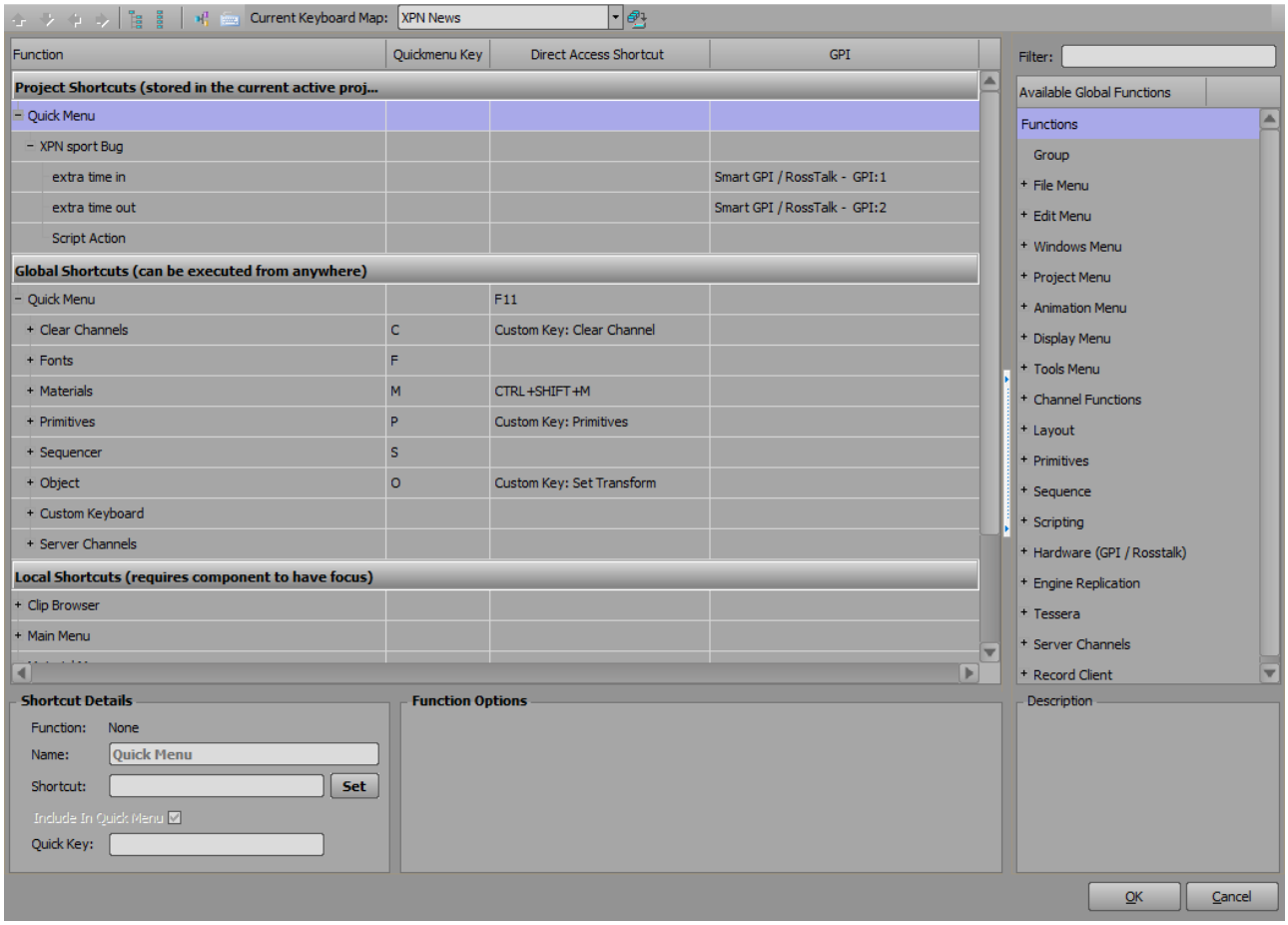
You can use the default keyboard map as a basis for creating a custom keyboard map, specific to your needs.

★The default keyboard map cannot be edited.

To create a custom keyboard map:

1. In XPression, select **Edit > Keyboard / GPI Mapping**.

   The **Keyboard / GPI Mapping** dialog opens.



2. Select the **Save Keyboard Mapping** button to create a new custom keyboard mapping.

   The **Save Keyboard Mapping** dialog opens.



3. In the **Save Keyboard Mapping** dialog, enter a name for the new custom keyboard mapping.
4. Select **OK**.

   The added custom keyboard mapping appears in the **Current Keyboard Map** list and is saved as a **.kbd** file.

For More Information on...

- assigning a **Global Shortcut**, refer to Assigning a Global Shortcut.
- assigning a **Local Shortcut**, refer to Assigning a Local Shortcut.

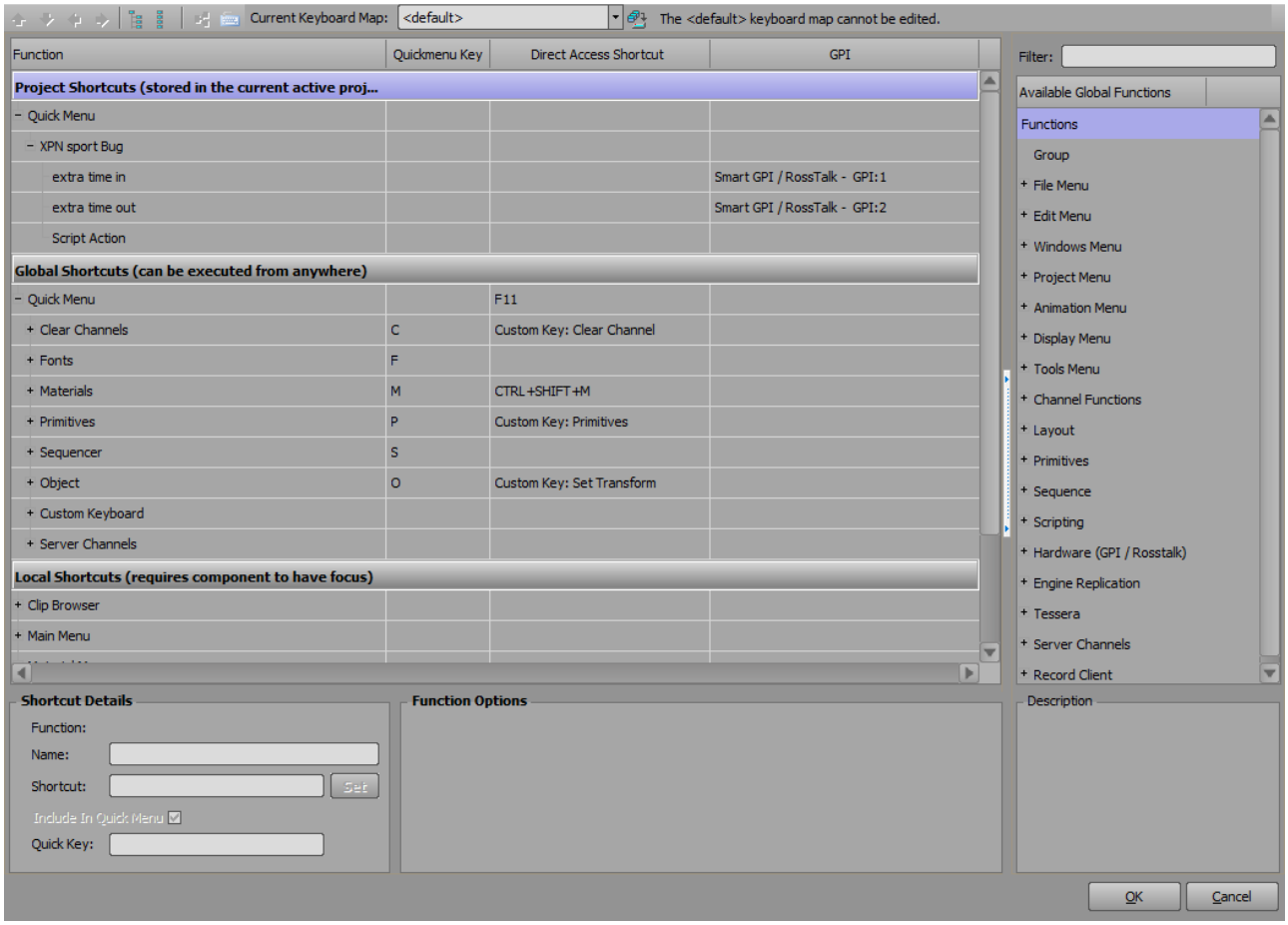
Assigning a Project Shortcut

Project shortcuts represent keyboard hotkeys that apply to a specific XPression project.

To assign a project shortcut:

1. In XPression, select **Edit > Keyboard / GPI Mapping**.

   The **Keyboard / GPI Mapping** dialog opens.



2. From the **Current Keyboard Map** drop-down, select a a keyboard map or create a custom keyboard map.
3. Drag an item from the **Global Functions** list into the **Project Shortcuts** table as necessary.
4. In the **Project Shortcuts** table, right-click on an item in the shortcuts tree and select **Assign Shortcut** to assign a custom keyboard control to the selected item.
5. In the **Shortcut Details** section, do the following:

   - In the **Name** field, edit the name of the selected item if necessary.
   - In the **Shortcut** field, enter a keyboard shortcut to assign to the selected item by entering the command on the keyboard.

   The assigned keyboard shortcut appears in the **Shortcut** field and in the **Project Shortcuts** table, in the row for the selected item in the **Direct Access Shortcut** column.

   If the assigned keyboard shortcut is already in use by another function, a warning icon ⚠ will appear next to the command in the **Direct Access Shortcut** column.

6. Place the cursor over the warning icon to view where the conflict occurs and select another shortcut for one of the items.
7. Select **OK**.

For More Information on...

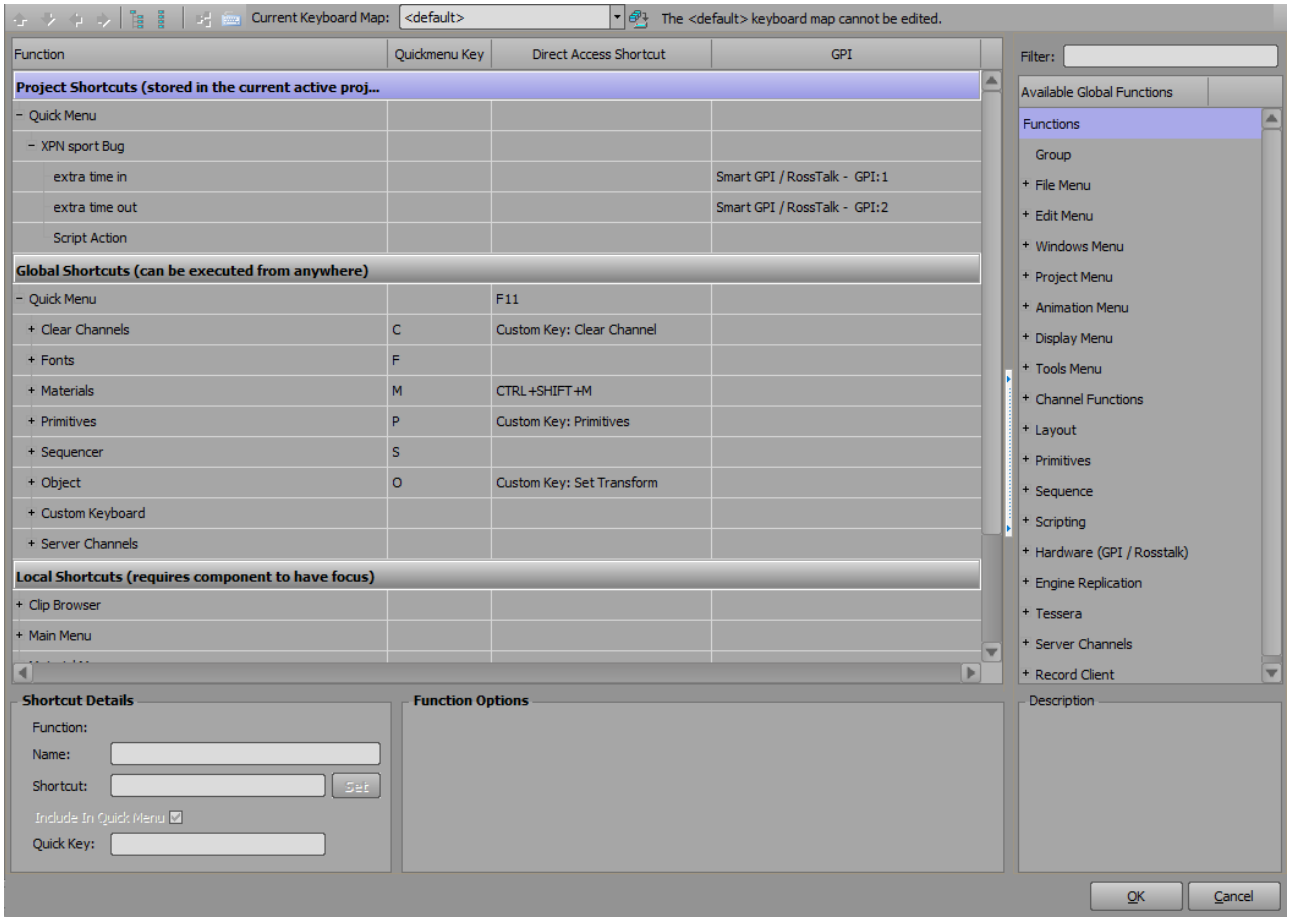
- creating a custom keyboard map, refer to Creating a Custom Keyboard Map.

Assigning a Global Shortcut

Global shortcuts represent functions that can be assigned to keyboard hotkeys that are active at any time while XPression is running.

1. In XPression, select **Edit > Keyboard / GPI Mapping**.

   The **Keyboard / GPI Mapping** dialog opens.



2. Select the **Save Keyboard Mapping** icon to create a custom keyboard map (the default keyboard map cannot be edited).

   The **Save Keyboard Mapping** dialog opens.



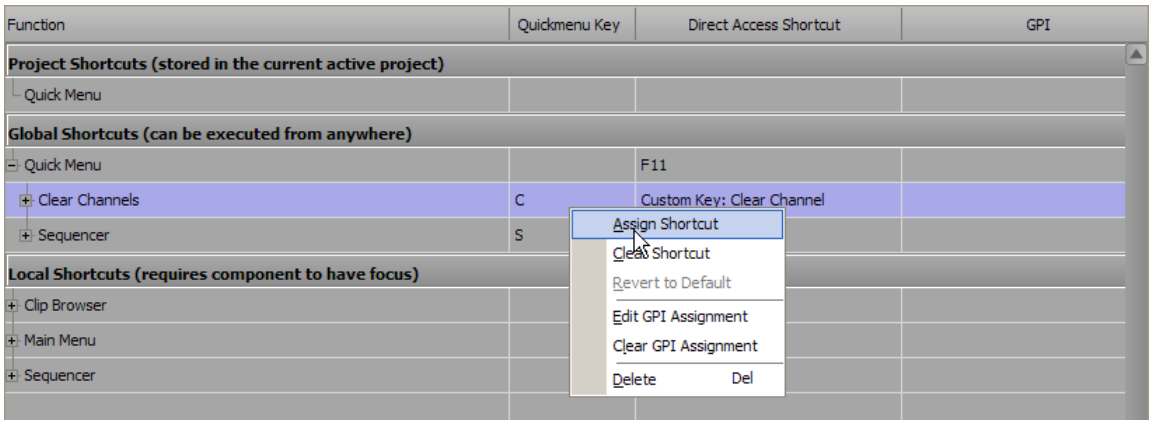
3. In the **Name** field, enter a name for the custom map.
4. In the **Available Global Functions** list, drag and drop the **Group** function onto the **Quick Menu** item in the **Global Shortcuts** tree.

   Alternatively, select the **Quick Menu** item in the **Global Shortcuts** tree and then select the **Add Group** button in the toolbar.

5. From the **Available Global Functions** list, select a function and drag and drop it into the new group you created in the **Global Shortcuts** tree to add the function.

   You can also enter a function in the **Filter** field to find a specific function.

6. In the **Global Shortcuts** table, right-click on an item in the shortcuts tree and select **Assign Shortcut** to assign a custom keyboard control to the selected item.



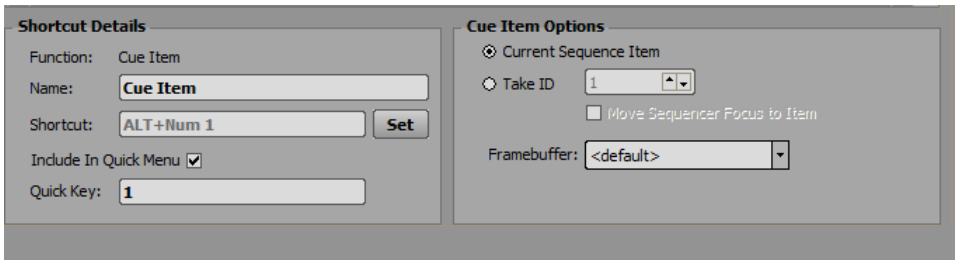
7. In the **Shortcut Details** section, do the following:

   - In the **Name** field, edit the name of the selected item if necessary.
   - In the **Shortcut** field, select the **Set** button and then enter a keyboard shortcut to assign to the selected item.

     The assigned keyboard shortcut appears in the **Shortcut** field and in the **Global Shortcuts** table, in the row for the selected item in the **Direct Access Shortcut** column.

     If the assigned keyboard shortcut is already in use by another item, a **Warning** icon ⚠ will appear next to the command in the **Direct Access Shortcut** column. Place the cursor over the warning icon to view where the conflict occurs and select another shortcut for one of the items.
   - Select the **Include In Quick Menu** checkbox to include the keyboard shortcut in a **Quick Menu**.

     Quick Menus are shortcut menus that appear when a **Quick Key** for a **Global Shortcut** is entered. The keyboard shortcuts available for the selected **Global Shortcut** are listed in the **Quick Menu** that appears. This feature only applies to **Global Shortcut** branches that contain child nodes.
   - In the **Quick Key** field, enter a letter or number as the **Quick Menu** command.



     The **Function Options** section will be populated with the options for the selected function.

8. In the **Function Options** section, configure the options for a selected function:

- Animation Menu Options
- Assign Material Options
- Clear Layer Options
- Clear Single Channel Options
- Clip Browser Options
- Color Options
- Cue Item Options
- Debug Options
- Display Menu Options
- Edit Menu Options
- Focus Options
- Group Options
- Import Options
- Material Manager Options
- New Options
- Object Manager Options
- Pivot Options
- Preview Options
- Project Menu Options
- Project Server Options
- Scene Manager Options
- Script Action Options
- Select Font Options
- Send RossTalk Message Options
- Set Framebuffer Options
- Set GPI Output Options
- Set Layer Options
- Set Transform Options
- Set Transition Options
- Take Offline Options
- Take Options
- Take Over Option
- Tessera Backup Options
- Tool Menu Options
- View Context Menu Options
- Windows Menu Options

Animation Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to an **Animation Menu** group is triggered.

Assign Material Options

Current Selected Material	Assign the selected material to an object.
Name	Select **Name** and enter a material name in the field to assign that material to an object. Select **Name** and leave the field blank to remove the material from an object.

Clear Layer Options

Framebuffer	From the drop-down, select a framebuffer for clearing the layer.
Layer	In the **Layer** field, enter or select the number of the layer to clear.

Clear Single Channel Options

Framebuffer	From the drop-down, select the framebuffer for clearing the layer.

Clip Browser Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Clip Browser** group is triggered.

Color Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Color** group is triggered.

Cue Item Options

Current Sequence Item	Apply the shortcut to the item currently in focus in the sequencer.
Take ID	Enter or select a **Take ID** number to which to apply the shortcut.
Move Sequencer Focus to Item	Set the **Sequencer** focus to the **Take ID**.
Framebuffer	Select a framebuffer for the item.

Debug Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Debug** group is triggered.

Display Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Display Menu** group is triggered.

Edit Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to an **Edit Menu** group is triggered.

Focus Options

Server Channel	From the **Server Channel** drop-down, select the channel on which to focus.

Group Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a group is triggered.

Import Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to an **Import** group is triggered.

Material Manager Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Material Manager** group is triggered.

New Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **New** group is triggered.

Object Manager Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to an **Object Manager** group is triggered.

Pivot Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Pivot** group is triggered.

Preview Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Preview** group is triggered.

Project Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Project Menu** group is triggered.

Project Server Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Project Server** group is triggered.

Scene Manager Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Scene Manager** group is triggered.

Script Action Options

Edit Script Action	Select the **Edit Script Action** button to open the **Script Editor - Script Shortcut** dialog and in the **OnKeyPress** tab, enter the .net scripting.

Select Font Options

By Name	Enter a font style name to assign a font to a text object.
By ID	Enter a font ID to assign the font to a text object.

Send RossTalk Message Options

GPI Board	From the **GPI Board** drop-down, select a GPI board for sending RossTalk messages.
RossTalk Message	From the **RossTalk Msg** drop-down, select a message to send using the assigned shortcut.
	The options are:
	CHANCUE [chan] — cue the current selection of a specified channel.
	CHANDOWN [chan] — move the current selection in a specified channel to the item below.
	CHANFOCUSSTORY [channel]:[RoID]:[StoryID] — set **Remote Sequencer** focus to a specified story in a specified channel.
	CHANNEXT [chan] — read the current selection of a specified channel to air and advance the current selection to the next item.
	CHANREAD [chan] — read the current selection of a specified channel to air.
	CHANUP [chan] — move the current selection in a specified channel to the item above.
	CFLB [buffer] — clear the framebuffer specified by the buffer ID.

	CLFB [buffer]:[layer] — clear a single layer on the framebuffer. When using XPression Tessera, this command can be used to clear layers. The framebuffer parameter specified by the channel will be ignored (set to 0).
	CLRA — clear all framebuffers.
	CUE [takeid]:[buffer]:[layer] — cue a take item on a specified layer of a channel.
	DATALINQKEY [takeid]:[key]:[value] — set the value of a specified **DataLinq Key** for a specified take item. For example: `DATALINQKEY 0002:Names:John.`
	DOWN — move the current selection in the sequencer to the item below it.
	FOCUS [takeid] — set sequencer focus to a specific take item.
	FOCUSSTORY [RoID]:[StoryID] — set the Remote Sequencer focus to the first item inside a specified story for a specified rundown.
	GAMESTATE — log an item in the **As Run Log** for each game state, such as first half, second half, etc.
	GPI [gpi num] — used to trigger a simulated GPI input. RossTalk/Smart GPI supports up to 64 simulated inputs.
	LAYEROFF [buffer]:[layer] — if there is a scene on the specific framebuffer/layer, take it offline using its out transition.
	LAYEROFF [buffer]:[Layer1]:[layer2] — remove a range of layers from a scene.
	NEXT — read the current selection in the sequencer to air and advance the current selection to the next item.
	NEXTSTORY — move the current selection to the top item of the next story in the linear rundown.
	PREVSTORY — move the current selection to the top item of the previous story in the linear rundown.
	PREVIZCLRA/PREVISCLRA — clear all previsualization.
	PREVIZSEND/PREVISSEND [takeid] — send item to previsualization.
	PREVIZREMOVE/PREVISREMOVE [takeid] — remove item from previsualization.
	READ — read the current selection in the sequencer to air.
	REPLACEPVLAYOUT [OutputChannel]:[GRID] — replace local engine output with the dynamic grid.
	REPLACEPVLAYOUT [OutputChannel]:[SCENE]:[SceneName] — replace local engine output with a custom scene.
	REPLACEPVLAYOUT [PreviewEngineIndex]:[OutputChannel]:[GRID] — replace remote preview engine output with the dynamic grid.

	REPLACEPVLAYOUT [PreviewEngineIndex]:[OutputChannel]:SCENE:[SceneName] — replace the remote preview engine output with a custom scene.
	RESUME [channel]:[layer] — resume a single layer on the framebuffer specified by the channel. If the layer is not specified, every layer on the channel will resume.
	ROFOCUS [roname] — move the focus to the first take item, in the linear rundown of the specified rundown.
	ROTAKE [roname]:[takeid] — take the specified remote sequencer take item online without moving the focus to that item.
	ROUTEIPIN <input>:<ip>:<port>[:AUDIO:<audio ip>:<audio port>] — perform a clean switch on a 2110 IP input. This command is supported on the Matrox DSX IP board with the Pair inputs to allow remote clean switch option enabled.
	SEQO [takeid] — takes the template off air.
	SEQI [takeid]:[layer] — loads a template to air on the specified layer and the template-defined output framebuffer.
	SWAP [channel] — switches from the current channel to the one specified in the message.
	TAKE [takeid]:[buffer]:[layer] — takes a template to air on the specific framebuffer and layer without moving the sequencer focus to that item.
	TEMPLATEDATA [takeid]:[object name]:[property]:[value] — set the value of a specified object in a specified take item.
	UNCUE [takeid] — uncue a take item that is currently in the cued state.
	UNCUEALL — uncue all take items items that are currently in the cued state.
	UP — move the current selection in the sequencer to the item above it.
	UPNEXT — set the preview in the sequencer without moving the focus bar.

Set Framebuffer Options

Framebuffer	From the **Framebuffer** drop-down, select a framebuffer or select <none>.

Set GPI Output Options

GPI Board	From the drop-down, select a GPI board for sending the GPI command.
GPI#	Enter or select a **GPI** pin number.
State	From the **State** drop-down, select the state of the signal.
	Low (Inactive) — Use low voltage for the signal.
	Low (Active) — Use high voltage for the signal.

Set Layer Options

Layer	Enter or select the layer number.

Set Transform Options

Position	Use the **Position** fields to enter the X, Y, and Z coordinates for an object's location. Select the **Center in Viewport** checkbox to center the object in the viewport.
Rotation	Use the **Rotation** fields to enter the degrees of rotation of an object around the X, Y, and Z axes.
Scale	Use the **Scale** fields to enter the scale factor to apply to an object along the X, Y, and Z axes.

Set Transition Options

Current Sequence Item	Use the transition options for the currently selected take item in the sequencer.
Take ID	Use the transition options for the specified **Take ID**.
Server Channel	From the drop-down, select the channel on which the transition will occur.
Transition In/Out	Select the in and out transitions for a take item. The available options are:
	Cut — Use and instantaneous transition from the selected take item to the next take item.
	Dissolve — Use a gradual transition where the selected take item dissolves into the next take item.
	Push — Use a sliding transition where the next take item pushes out the selected take item.
	Distort — Use a transition where the selected take item is warped out.
Duration	Enter or select the duration of the transition.

Take Offline Options

Current Sequence Item	Apply the shortcut to the item currently in focus in the sequencer.
Take ID	Enter or select a **Take ID** number to which to apply the shortcut.
Entire Framebuffer	Take all layers off of the framebuffer selected from the drop-down.

Take Options

Current Sequence Item	Apply the shortcut to the item currently in focus in the sequencer.
Take ID	Enter or select a **Take ID** number to which to apply the shortcut.
Move Sequencer Focus to Item	Set the **Sequencer** focus to the **Take ID**.
Framebuffer	Select a framebuffer for the item.
Advance Sequence After Take	Advance to the next Take Item in the sequence after the current or selected **Take Item** has finished playing.

Take Over Option

Engine	From the drop-down, select the Tessera engine to take control of the nodes.

Tessera Backup Options

Backup Node ID	From the drop-down, select a node ID to use as the **Backup Node ID**.
Assign as backup of	From the drop-down, select the node ID which will be backed up by the **Backup Node**.

Tool Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Tool Menu** group is triggered.

View Context Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **View Context Menu** group is triggered.

Windows Menu Options

Run all children actions when group triggered	Run all of the keyboard shortcuts of the children when the **Quick Key** assigned to a **Windows Menu** group is triggered.

9. When you have finished configuring the function options, select **OK**.

For More Information on...

- creating a custom keyboard map, refer to Creating a Custom Keyboard Map.
- using a **Quick Menu**, refer to Using the Quick Menu.

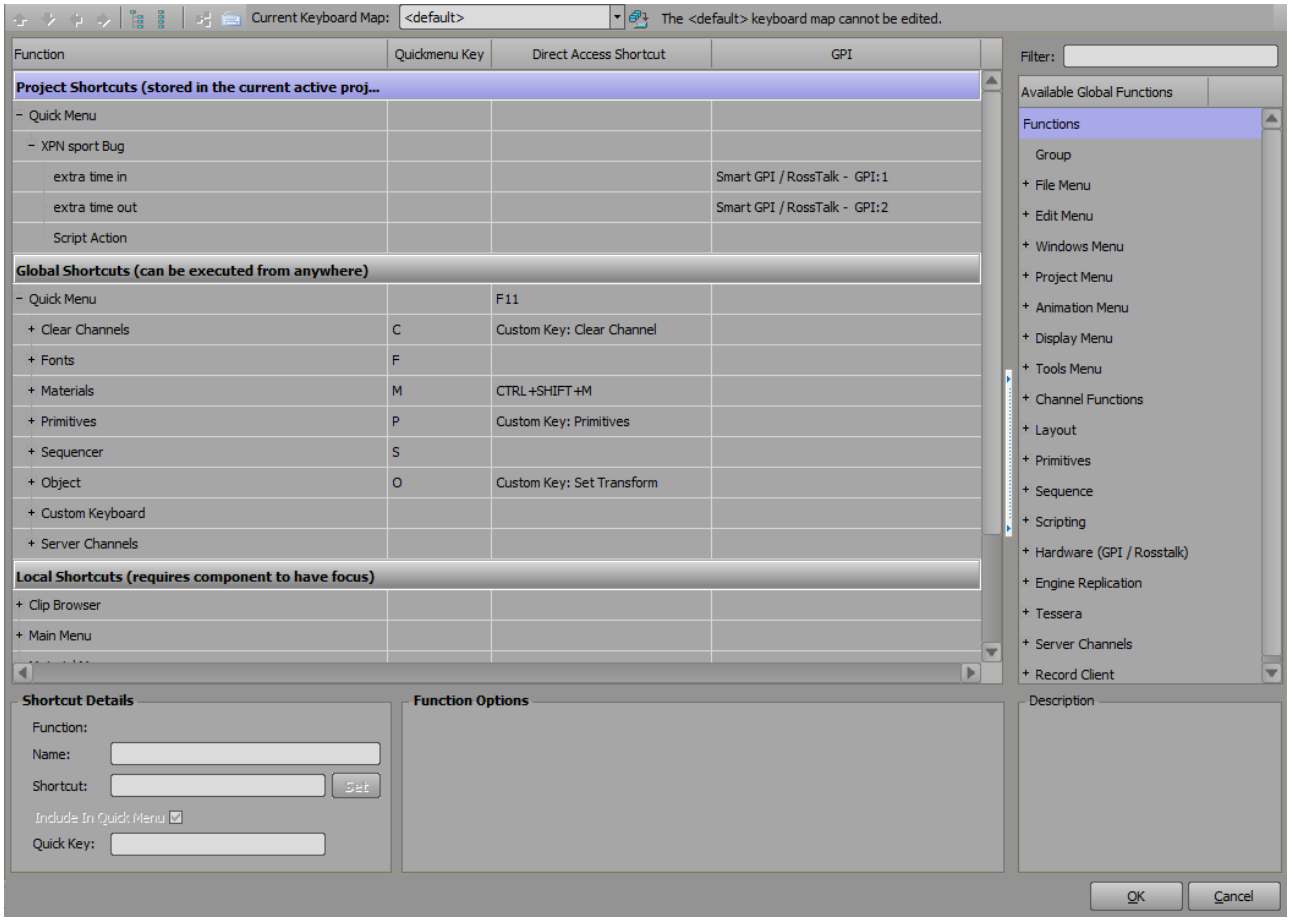
Assigning a Local Shortcut

Local shortcuts represent keyboard hotkeys that apply to one particular component of XPression, such as the **Sequencer**, and are only active when the particular component of XPression has keyboard/mouse focus.

To assign a local shortcut:

1. In XPression, select **Edit > Keyboard / GPI Mapping**.

   The **Keyboard / GPI Mapping** dialog opens.



2. Select the **Save Keyboard Mapping** icon  to create a custom keyboard map (the default keyboard map cannot be edited).

   The **Save Keyboard Mapping** dialog opens.



3. In the **Name** field, enter a name for the custom map.
4. In the **Local Shortcuts** table, right-click on an item in the shortcuts tree and select **Assign Shortcut** to assign a custom keyboard control to the selected item.

5. In the **Shortcut Details** section, do the following:
   - In the **Name** field, edit the name of the selected item if necessary.
   - In the **Shortcut** field, enter a keyboard shortcut to assign to the selected item.

     The assigned keyboard shortcut appears in the **Shortcut** field and in the **Local Shortcuts** table, in the row for the selected item in the **Direct Access Shortcut** column.

     If the assigned keyboard shortcut is already in use by another item, a **Warning** icon  will appear next to the command in the **Direct Access Shortcut** column.
6. Place the cursor over the warning icon to view where the conflict occurs and select another shortcut for one of the items.
7. Select **OK**.

For More Information on...

- creating a custom keyboard map, refer to Creating a Custom Keyboard Map.

Creating a Custom GPI Map

You can create a custom GPI map to use GPI triggers to execute events.

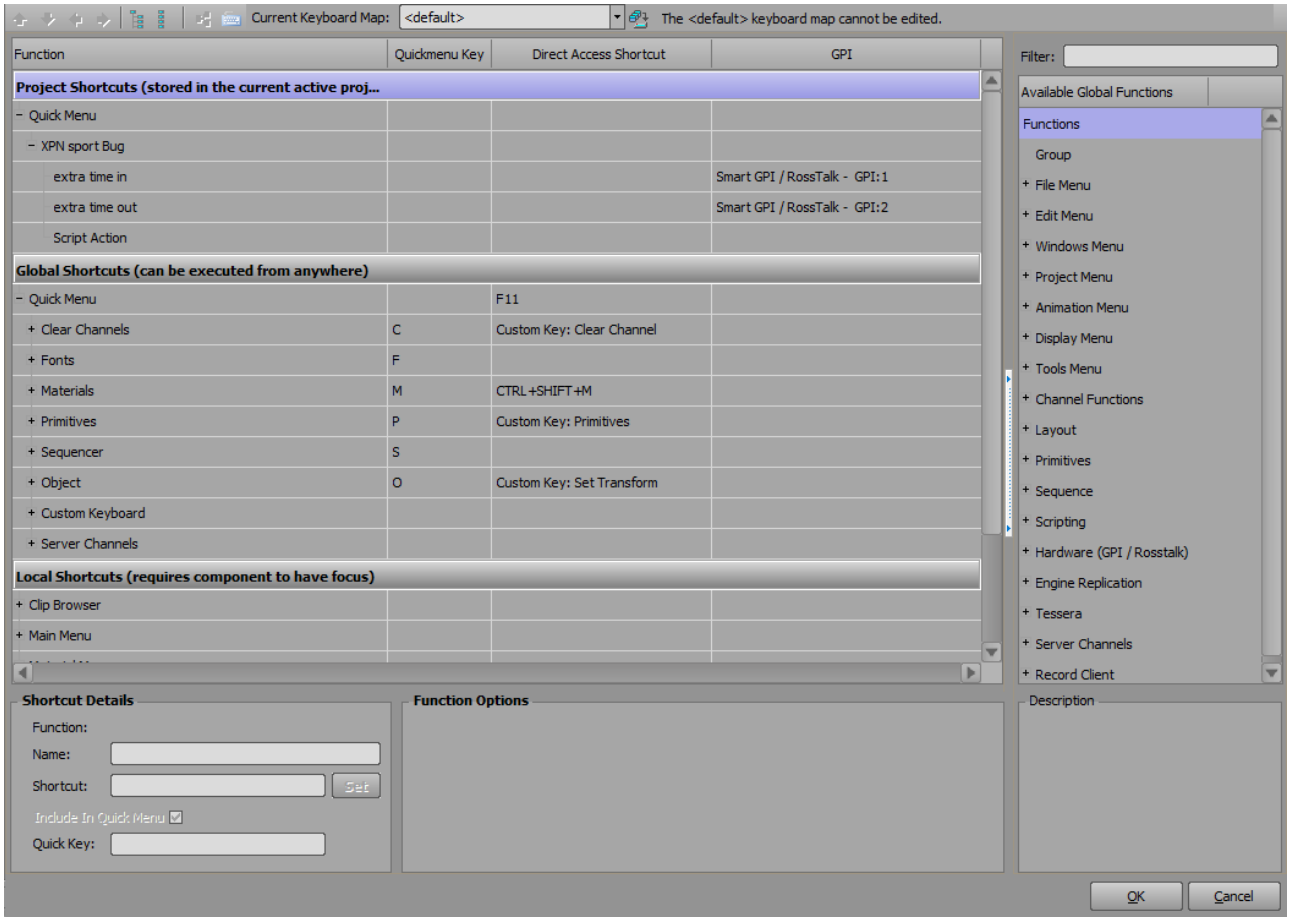
To create a custom GPI map:

1. In **Hardware Setup**, configure a GPI board for XPression.

   See Configuring a 25-Pin GPIO Port for instructions.

2. Then select **Edit > Keyboard / GPI Mapping**.

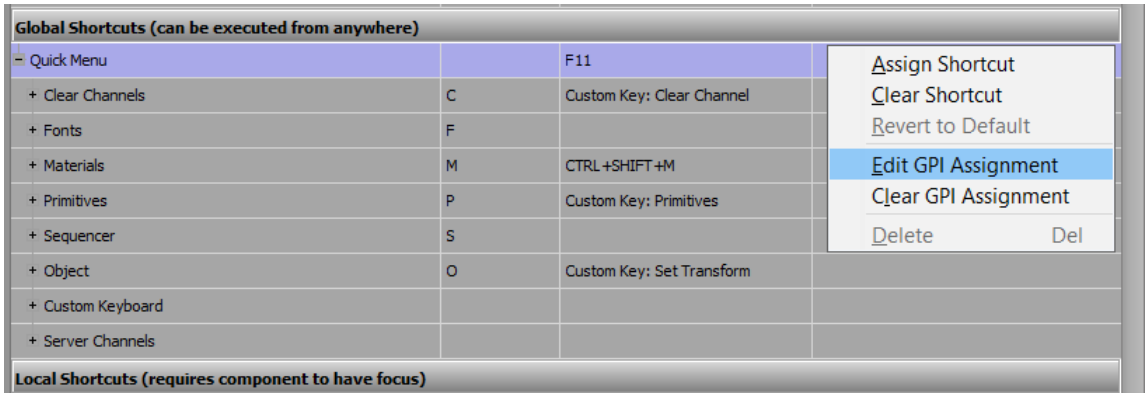
   The **Keyboard / GPI Mapping** dialog opens.



3. Create a custom keyboard mapping that includes global shortcuts.

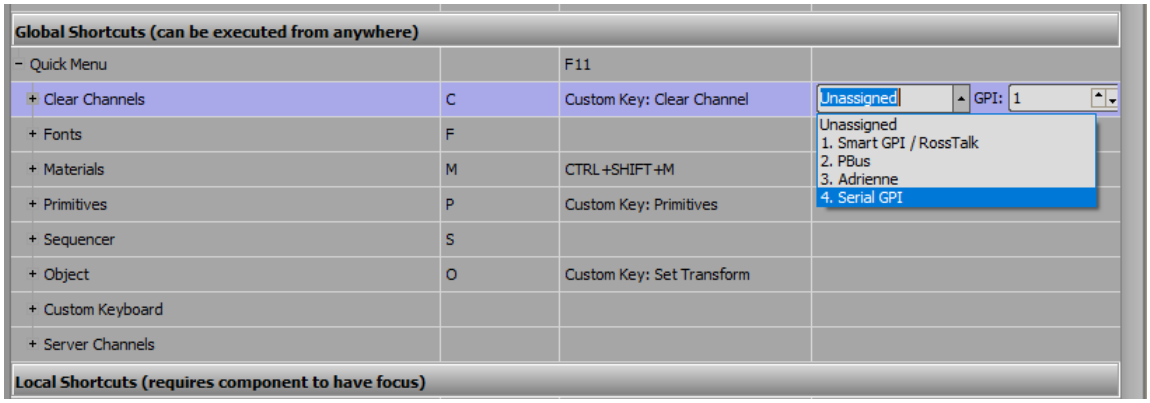
4. In the **Global Shortcuts** tree, right-click on a global shortcut and select **Edit GPI Assignment**.

   The same GPI trigger can be assigned to multiple global functions to execute them in order.



5. In the **GPI** column of the **Global Shortcuts** table, perform the following to the selected global shortcut:

   - Select a GPI board from the drop-down.



   - In the **GPI** field, enter or select a GPI input to assign to the selected global shortcut.

     If the assigned keyboard shortcut is already in use by another item, a **Warning** icon ⚠ will appear next to the command in the **Direct Access Shortcut** column.

     Place the cursor over the warning icon to view where the conflict occurs and select another shortcut for one of the items.

6. Select **OK**.

For More Information on...

- adding an Adrienne TC/GPIO card, refer to Configuring a 25-Pin GPIO Port.
- adding a Serial GPI board, refer to Configuring RS232 CTS/DSR GPI for Contact Closures.
- adding a Smart GPI/RossTalk board, refer to Configuring Smart GPI / RossTalk.
- creating a custom keyboard, refer to Creating a Custom Keyboard Map.

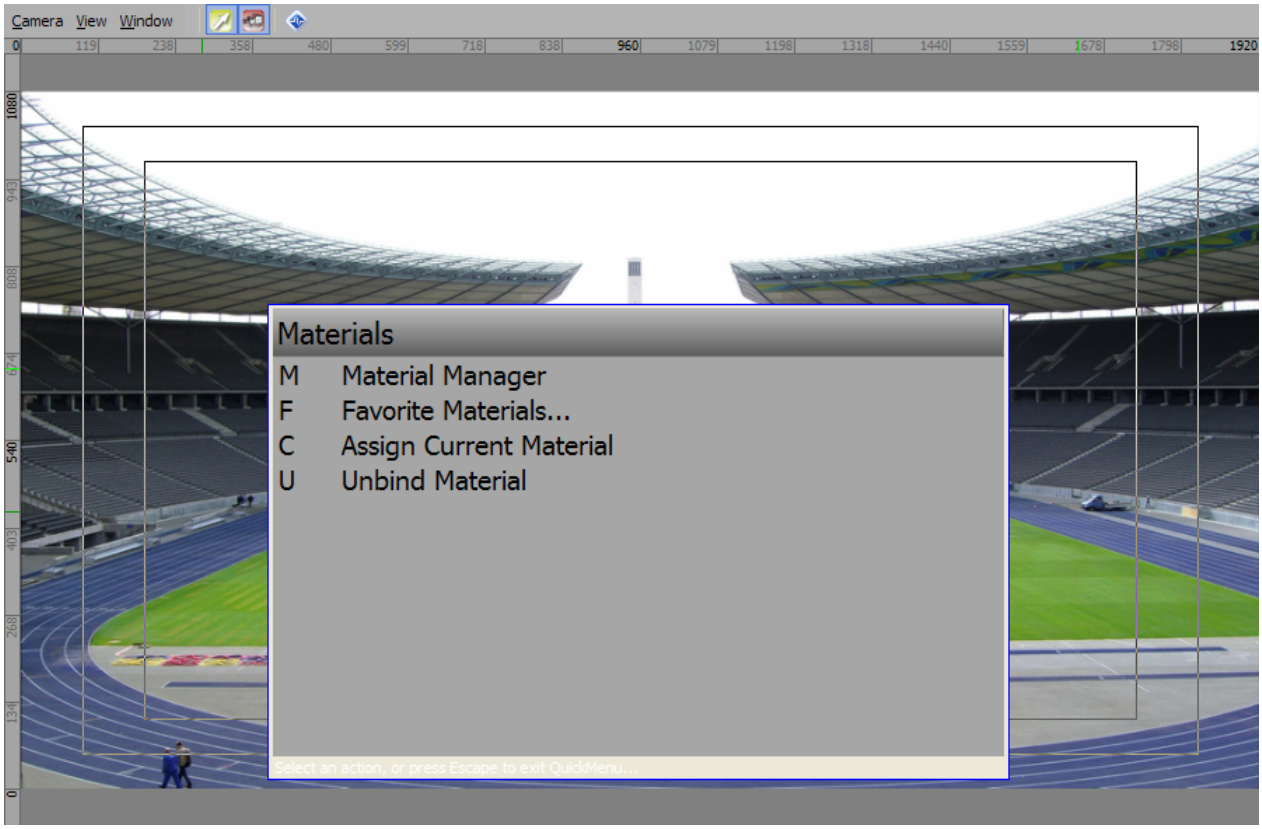
Using the Quick Menu

When you have created shortcuts and included them in the **Quick Menu**, they can be selected from the associated Global Shortcuts branch in XPression.

To use the Quick Menu:

1. Create a custom keyboard mapping that includes **Global Shortcuts**.
2. In XPression, enter the keyboard shortcut for a **Global Shortcut** branch.

   The **Quick Menu** for the **Global Shortcut** branch opens.



3. In the **Quick Menu** perform one of the following:
   - Press a **Quick Key** on the keyboard to select an item from the **Quick Menu**.

     OR

   - Use the keyboard arrows to select an item and press **Enter**.

   The selected **Quick Menu** item action is triggered.
4. Press **Esc** at any time to close the **Quick Menu**.

For More Information on...

- creating a custom keyboard, refer to Creating a Custom Keyboard Map.
- assigning a **Global Shortcut**, refer to Assigning a Global Shortcut.

Project Manager

The Project Manager window is used to create and organize category folders to organize XPression project scenes and scene groups.

The following topics are discussed in this section:

Creating a Category

Adding a Scene or Scene Group to a Category

Deleting a Category

Opening Multiple Projects in the Project Manager

Activating a Project from a Project Group

Removing a Project from a Project Group

Creating a Category

In the **Project Manager**, you can group scenes together into categories, to make finding the scene you want easier. For example, you might want to have a **Lower Thirds** category or an **Over the Shoulder** category.

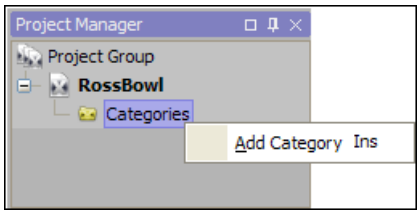
To create a category:

1. Open or create a new project in XPression.

   The project appears in the **Project Manager** window under the **Project Group** node.

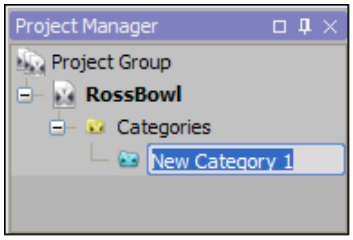
2. In the **Project Manager** window, right-click on the **Categories** node of the project.

   The shortcut menu opens.



3. Select **Add Category Ins**.

   A **New Category** node is added to the **Categories** node.



4. In the **Project Manager** window, enter a new name for the category.

5. Press the **Return** key to save the new category name.

   The new category also appears at the bottom of the **Scene Manager** window.



For More Information on...

- adding a scene or scene group to a category, refer to the procedure Adding a Scene or Scene Group to a Category.
- creating a new project in XPression, refer to the procedure Creating a Project.

Adding a Scene or Scene Group to a Category

In the **Scene Manager**, you can categorize scenes and scene groups that already exist in the project or add new scenes or scene groups to a category.

To add an existing scene or scene group to a category:

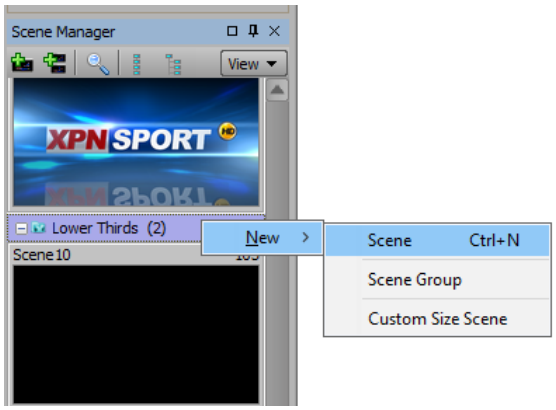
1. Create a category in the **Project Manager** window.
2. In the **Scene Manager**, select a scene or scene group and drag it into the category.



To add a new scene or scene group to a category:

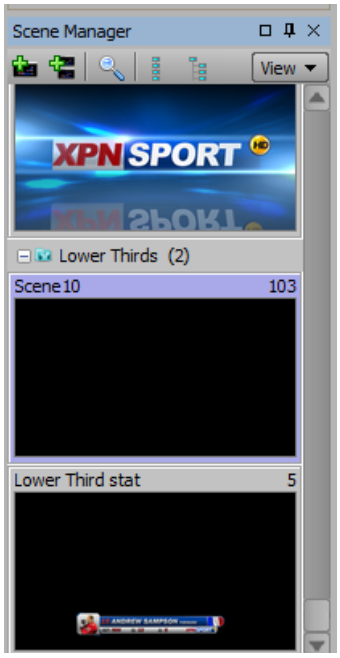
1. In the **Scene Manager**, right-click on the category.

   The shortcut menu opens.



2. Choose one of the following options from the shortcut menu:
   - **Scene**
   - **Scene Group**

The new scene or scene group appears in the category.



For More Information on...

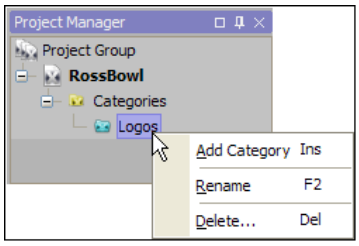
- creating a category, refer to the procedure Creating a Category.

Deleting a Category

To delete a category:

1. Open a project in XPression.
2. The project appears in the **Project Manager** window under the **Project Group** node.
3. Right-click on the **Category** node to be deleted.

   The shortcut menu opens.



4. Select **Delete**.

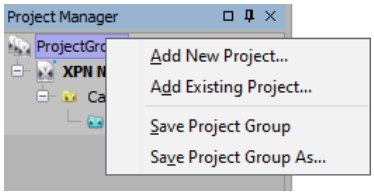
   The category is deleted from the **Project Manager** and the **Scene Manager**.

Opening Multiple Projects in the Project Manager

To open multiple projects in the project manager:

1. In the **Project Manager**, right-click on the **Project Group**  node.

   The **Project Group** shortcut menu opens.



2. Select one of the following options:

   - **Add New Project** — select to open the **New Project** dialog and create a new project to add to the **Project Group**.
   - **Add Existing Project** — select to open the browser and select an existing project to open in the **Project Group**.

   The new or existing project displays as a project node in the Project Group and opens in XPression.

3. Repeat the above steps to add more projects.

For More Information on...

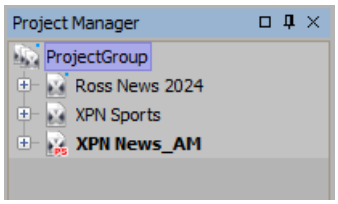
- creating a new project in XPression, refer to the procedure Creating a Project.

Activating a Project from a Project Group

To activate a project from a project group:

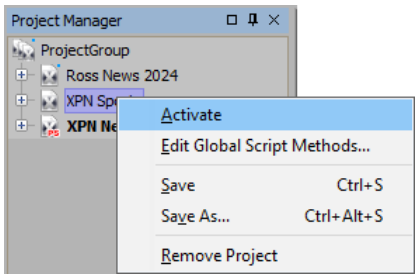
1. Open multiple projects in XPression.

   The projects appear in the **Project Manager**.



2. In the **Project Manager**, right-click on the **Project**  node of the project to be activated.

   The project shortcut menu opens.



3. Select **Activate** from the shortcut menu.

   The selected project is activated in the XPression **Editor** and **Sequencer**.

For More Information on...

- opening multiple projects in XPression, refer to Opening Multiple Projects in the Project Manager.
- creating a new project in XPression, refer to Creating a Project.

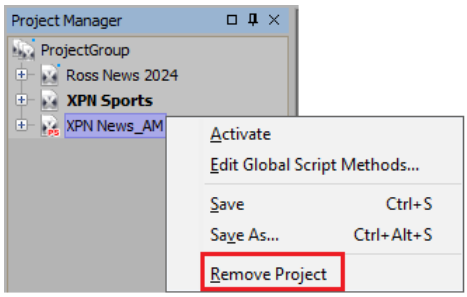
Removing a Project from a Project Group

You can remove unwanted projects from a project group.

To remove a project from a project group:

1. In the **Project Manager**, right-click on the **Project**  node of the project to be removed from the project group.

   The project shortcut menu opens.



2. Select **Remove Project** from the shortcut menu.

   The selected project is removed from the **Project Group**.

Clips

The following topics are discussed in this section:

XPression Clips Playback Overview

Adding Clips to the Clip Store

Generating Proxies for Clips

Opening the Server Channels

Loading a Clip in the Server Channels

Opening the Clip Browser

Using the Clip Browser

Ganging Fill and Key Clips in the Clip Browser

Using the Server Channels

Editing a Clip/Adding a Sub Clip

Updating the Thumbnail in the Clip Browser

Creating a 4-Point Loop

Creating a 3-Point Loop

Importing / Exporting Clips

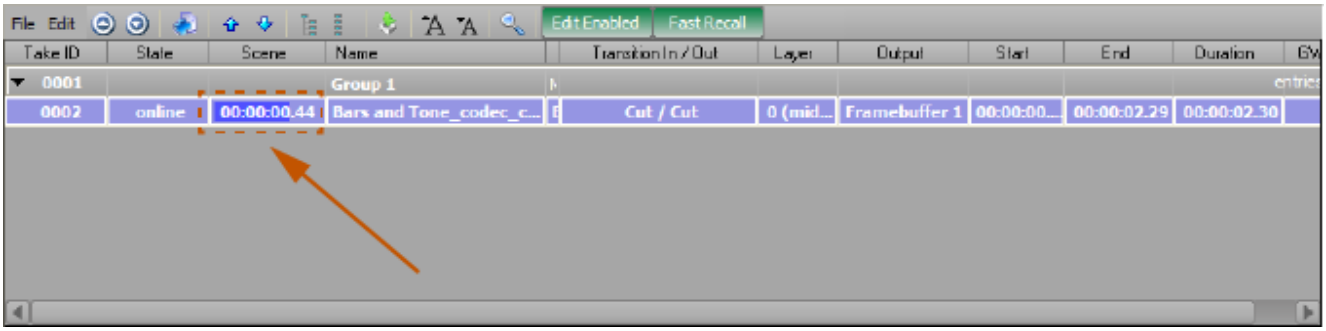
XPression Clips Playback Overview

Clip playback within XPression can be performed in many ways. The most basic is to drag clips from the **Clip Browser** and drop them into the **Sequencer**. This creates a take item which can be assigned an output framebuffer and layer, or server channel, and then played back as a regular take item or placed into a cued state using the number pad period key [**Num pad .**].

Regular XPression graphics can be rendered as a clip which will be sent directly to the **Clip Store**. By right-clicking on a take item in the **Sequencer** and selecting **Export Take Item to Video**, the **Export to Video** dialog will open and provide the option to render take items into clips transferred to the **Clip Store**.

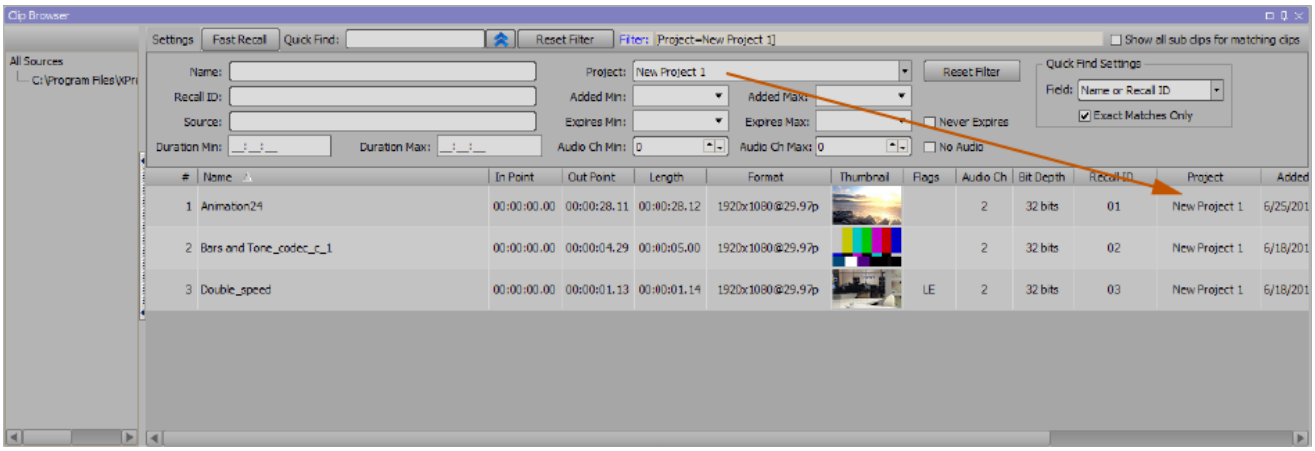
The number of clips that can be played back simultaneously falls under the same performance limitations as normal XPression scenes with clips (e.g., play back will be dependent on current generation hardware).

While playing back, a timer counts down the remaining time in the clip and a time bar indicates the playback amount completed:



Many clips can be dragged into a timed sequence group for a pseudo-playlist capability. Dissolves can even be set on the take items for transitions between the playlist items:

Clips within the **Clip Browser** can be sorted and filtered using the options in the **Advanced Search Options**. In the example image below they were filtered by **Project Name**.

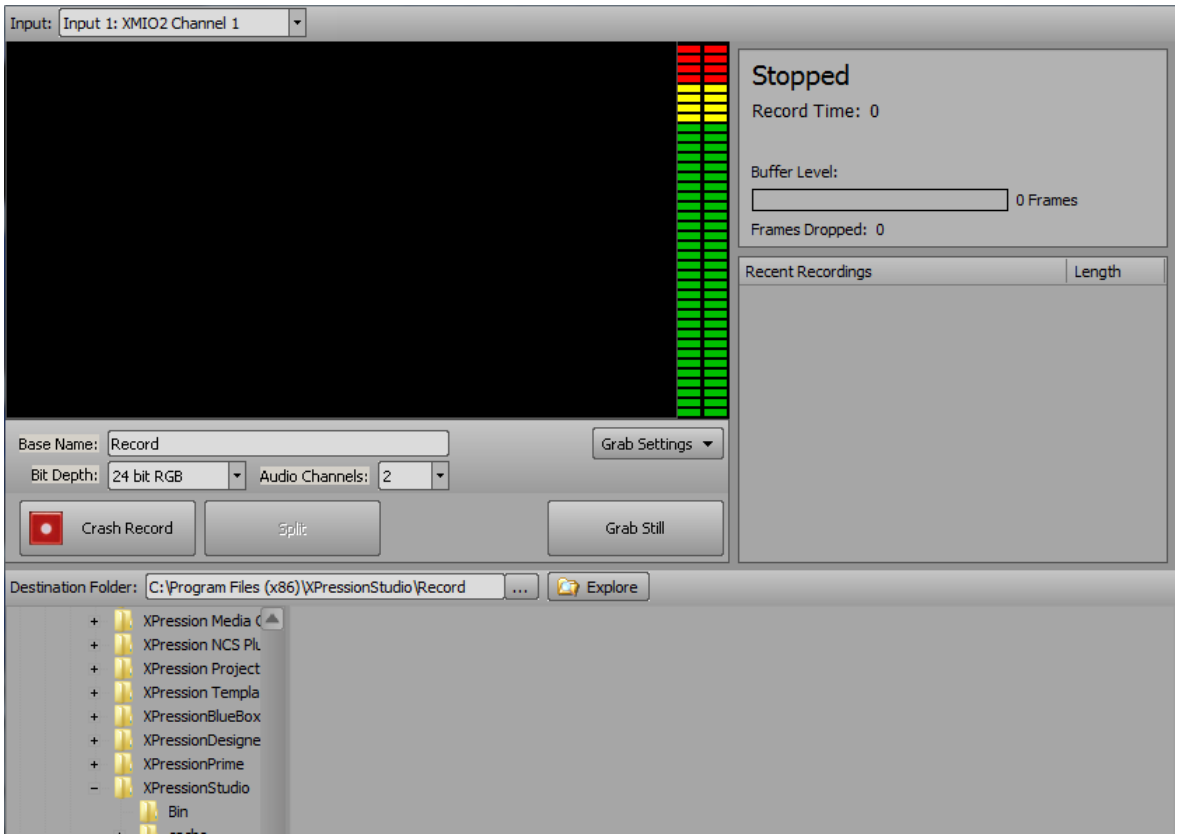


Adding Clips to the Clip Store

To add a clip to the clip store:

1. In XPression, select **Tools > Record Client**.

   The **Record Client** dialog opens.



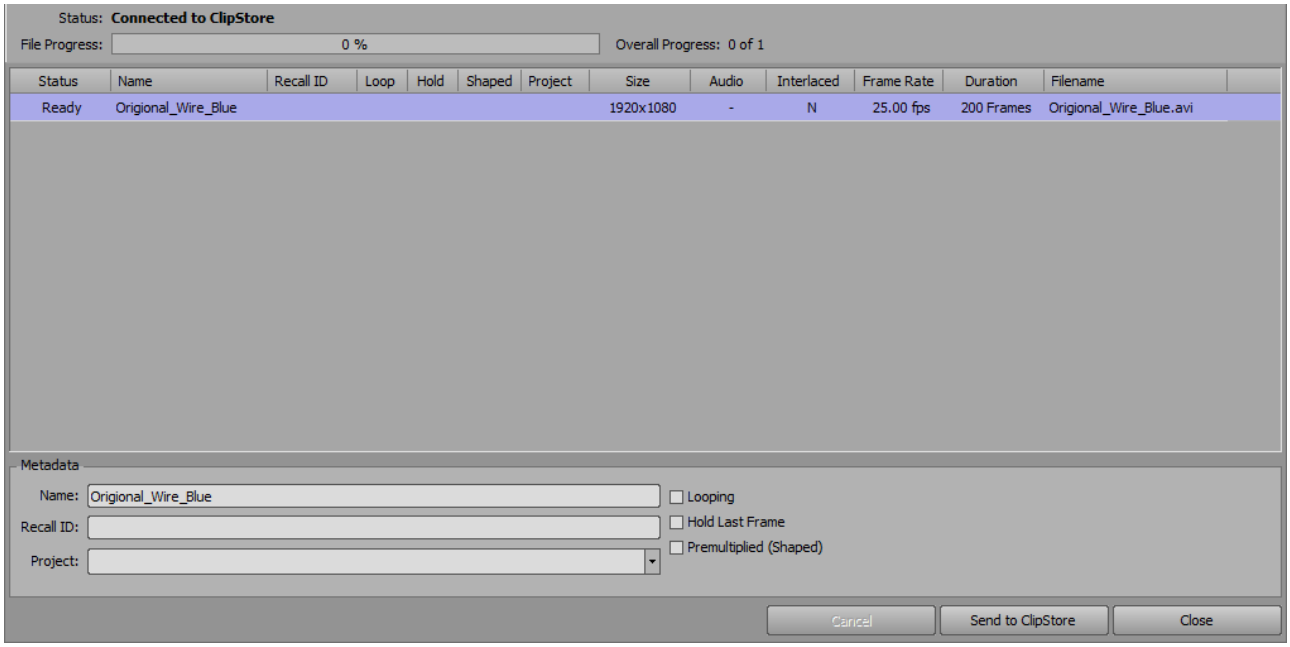
2. In the **Destination Folder** field, select **Browse (...)** navigate to the folder containing the clips you want to add to the clip store.

   Alternatively, you can navigate to the folder in the folder tree in the left column.

   The folder you selected opens in the **Record Client** and the clips are displayed.

3. In the folder containing your clips, right-click on a clip file and select **Send to Clip** Store.

   The **Send to Clip Store** dialog opens with the clip file selected.



4. In the **Metadata** section, the **Name** field is automatically populated with the name of the video file, but you can change it if you want.
5. In the **Recall ID** field, if it hasn't been automatically populated, enter a **Recall ID** (typically this is the same as the name).
6. In the **Project** field, enter the name of the project or use the drop-down to select a project.
7. Then select **Send to Clip Store**.

   You can see the progress of the import in the **File Progress** bar and when the import is complete, the **Status** will indicate **Import Complete**.
8. Select **Close** to exit the **Send to Clip Store** dialog.

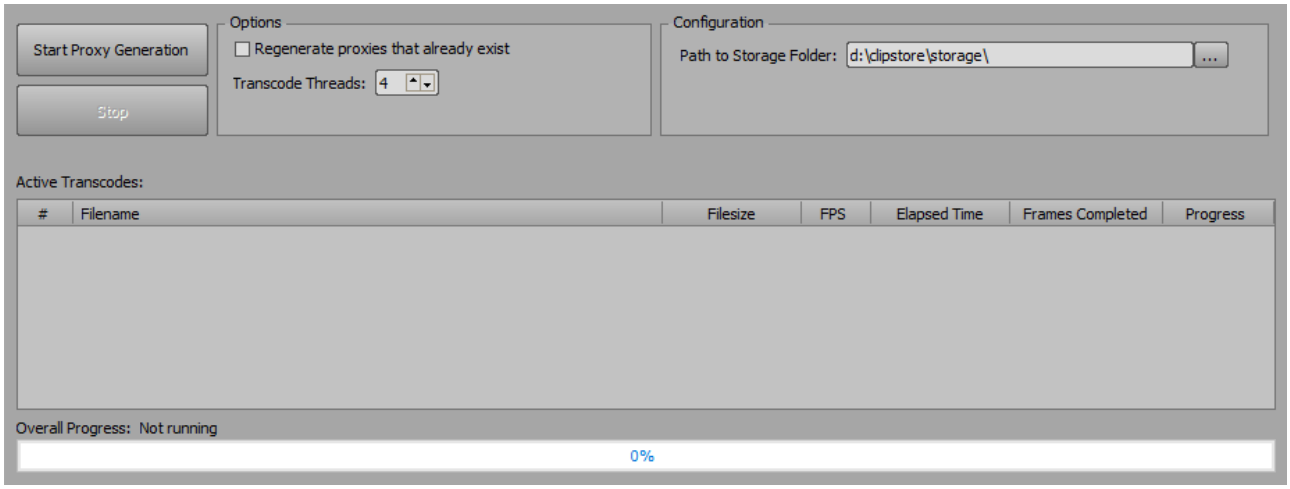
Generating Proxies for Clips

You will need to generate proxies (browser-friendly video files) for your clips in order to play them in the HTML5 plugin.

To generate proxies for clips:

1. Go to **C:\Program Files (x86)\XPression Clip Store\bin** and double-click the **xpCSProxyTool.exe** file.

   The **XPression ClipStore Proxy Generator** tool opens.



2. Select **Start Proxy Generation** to generate proxies for any clips in the clip store that do not already have proxies.

   In the **Active Transcodes** section, you will see the clip(s) being transcoded and the progress is indicated in the **Overall Progress** bar.

3. When the **Overall Progress** bar indicates 100%, select the **X** in the top-right corner to close the **Proxy Generator**.

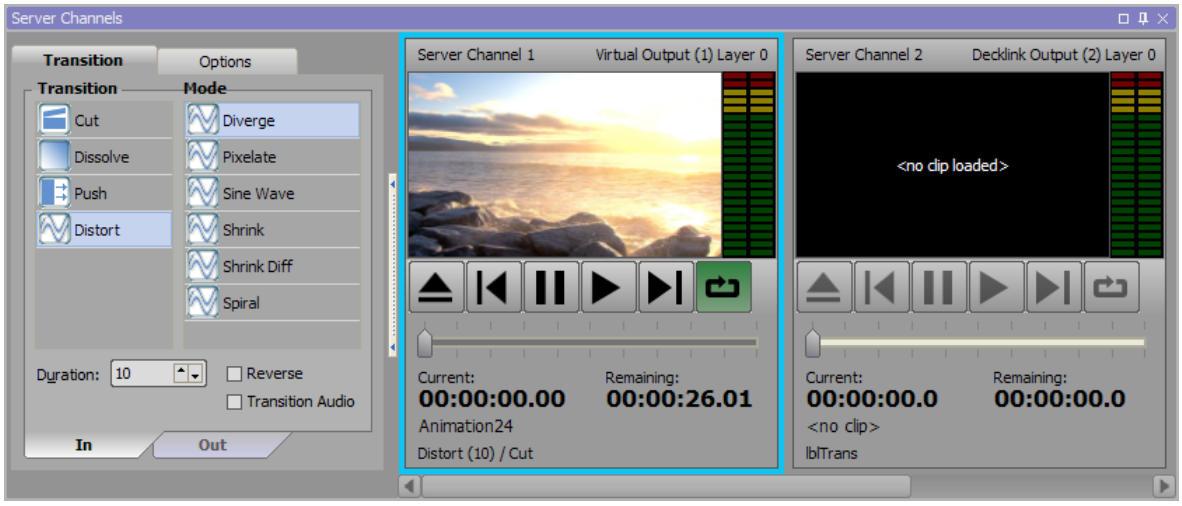
   The clip is now ready to be used in the HTML5 plugin.

Opening the Server Channels

To open the server channels:

1. In XPression, open the **Sequencer** layout.
2. In the **Menu** bar, select **Display > Server Channels**.

   The **Server Channels** window opens.

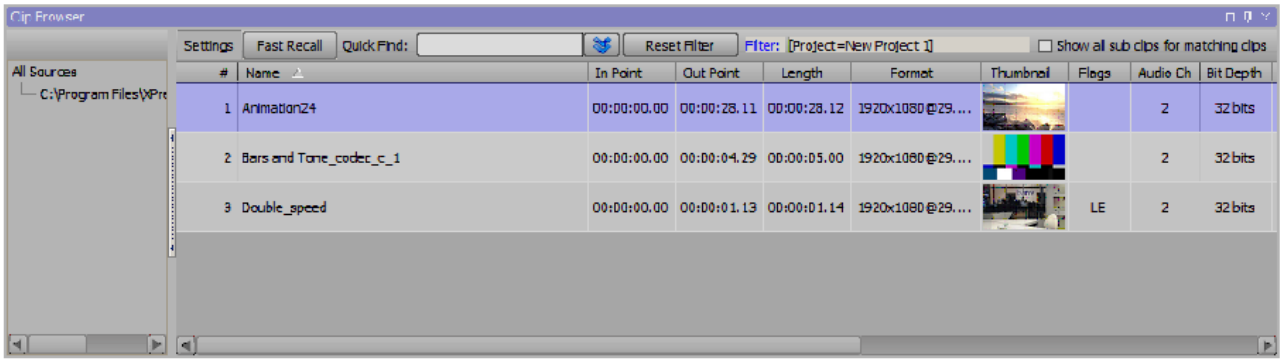


Loading a Clip in the Server Channels

For clips to load in the **Server Channels** window, server channels must be configured in the **Server Channels** tab of the XPression **Hardware Setup**. See Setting Up Server Channels .

To load a clip in the server channels:

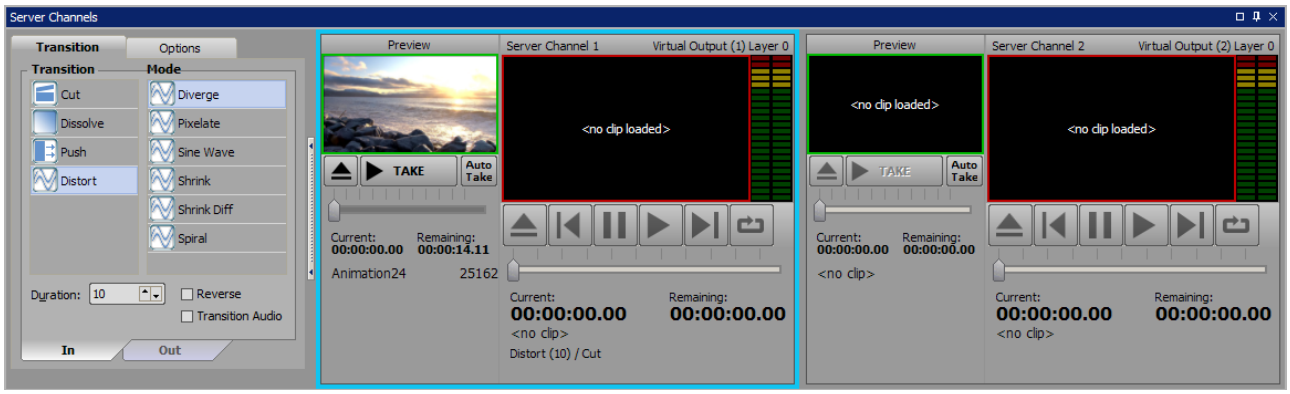
1. In the **Clip Browser**, select a clip.



   If clips have been sent to the Clip Browser from the **Record Client**, or if clips have been transcoded by the INcoder into the **Watch** Folder, clips will automatically load into the Clip Browser.

2. Drag and drop a clip from the Clip Browser onto a **Server Channel** in the **Server Channels** window.

   The clip is added to the **Preview** channel for the **Server Channel** (or directly to the **Server Channel** if the preview has been disabled in the options).



   The clip will be loaded to its pre-configured in point.

3. If loaded in the **Preview**, select **Take** to play the clip on air on the **Server Channel**.

   While a clip is on air, clips can be cued on the **Preview** channel while still allowing the on air clip to be controlled and have its timecode and countdown visible.

   Server Channel playback controls are provided or the space bar can be used to pause and start playback.

   A realtime proxy of the clip is shown as it plays in the server channel along with audio meters and a time remaining counter.

   Take items or timed groups in the **Sequencer** can also be dragged onto a server channel for playback. To preserve the original server channel assignment of a take item, press and hold **Ctrl** while dragging and dropping from the **Sequencer** to a server channel.

★Clips can also be loaded to a channel by double-clicking them in the Clip Browser. They will be loaded onto the active server channel, as shown by a cyan outline around the channel. Once a clip is loaded to a server channel, it can be dragged and dropped from one server channel to another as a duplicate. The active channel can be changed by double-clicking any other server channel.

Clips can also be dragged and dropped directly from Windows Explorer for situations where the clip is not loaded into the Clip Store (or there is no Clip Store present).

4. Select the **Transition** tab to set the in and out transitions for the clip in the active server channel:
5. In the **In** tab, select a **Transition** style and **Mode**:

   The options are:

   - **Cut** — select to use an instantaneous transition from the take item to the next take item.
   - **Dissolve** — select to use a gradual transition where a take item dissolves into the next take item.

     Configure the mode for the dissolve:

     - **Fade** — select to fade in to, or out from, the clip.
     - **Over Black** — select to fade in or out from black.
     - **Additive** — select to gradually add light to the clip when transitioning in or out.
     - **Saturate** — select to saturate the clip when transitioning in or out.
     - **Desaturate** — select transition to desaturate the clip when transitioning in or out.
     - **Invert** — select to invert the clip when transitioning in or out.
   - **Push** — select to use a sliding transition where the take item pushes out the previous take item.

     Configure the mode for the push:

     - **Right To Left** — select to push from right to left.
     - **Left To Right** — select to push from left to right.
     - **Top To Bottom** — select to push from top to bottom.
     - **Bottom To Top** — select to push from bottom to top.
     - **Bottom Right** — select to push to the bottom right.
     - **Top Right** — select to push to the top right.
     - **Bottom Left** — select to push to the bottom left.
     - **Top Left** — select to push to the top left.
   - **Distort** — select to use a transition where a take item is warped out.

     Configure the mode for the distortion:

     - **Diverge** — select to use multiple splits in the image in the clip.
     - **Pixelate** — select to pixelate the clip.
     - **Sine Wave** — select to apply a sine wave pattern to the clip.

- **Shrink** — shrink the clip in a **uniform** manner from full screen down to a single pixel when transitioning from online to offline; expand the clip in a **uniform** manner from a single pixel to full screen when transitioning from offline to online.
- **Shrink Diff** — shrink the clip in a **non-uniform** manner from full screen down to a single pixel when transitioning from online to offline; expand clip in a **non-uniform** manner from a single pixel to full screen when transitioning from offline to online.
- **Spiral** — select to spin the clip.

6. Select the **Reverse** checkbox to reverse a **Dissolve**, **Push**, or **Distort** transition.
7. Select the **Transition Audio** checkbox to transition the audio along with the **Take Item**.
8. Use the **Duration** field to enter or select the duration of the transition in number of frames.
9. Select the **Out** tab and repeat steps 5 to 7 to configure the **Transition** style and **Mode** for the out transition.
10. Select the **Cue video clips directly to framebuffer** checkbox to cue clips to air immediately when dropped on a server channel from the Clip Browser or Sequencer.

For More Information on...

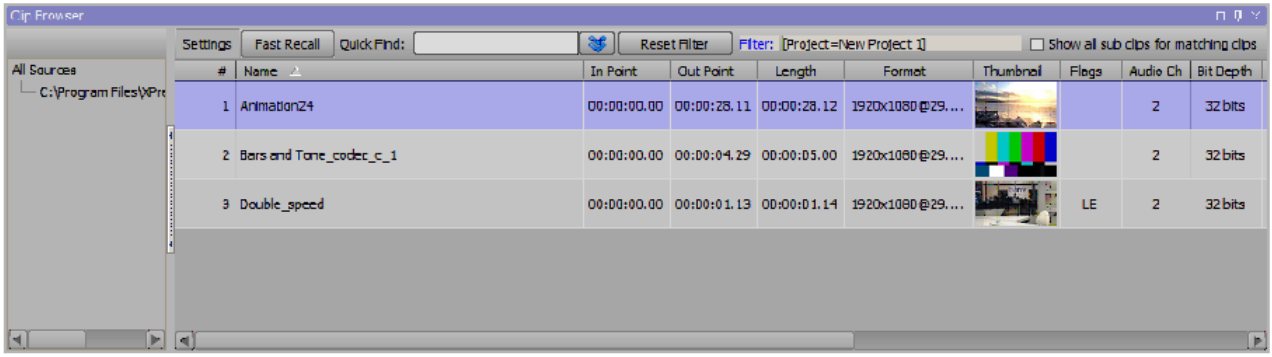
- setting up server channels and virtual outputs, refer to Setting Up Server Channels.
- sending clips from the **Record Client** to the Clip Browser, refer to Sending a Video or Image to the Clip Store.
- configuring a **Watch** Folder for the INcoder, refer to the *INcoder User Guide*.

Opening the Clip Browser

To open the Clip Browser:

1. In XPression, open the **Sequence** layout.
2. In the **Menu** bar, select **Display > Clip Browser**.

   The **Clip Browser** window opens.



Using the Clip Browser

To use the Clip Browser:

1. In the **Clip Browser**, select a clip in the clip list to play out.

   To search for a specific clip or sub clip, use one of the following methods:

   - Select the **Fast Recall** button (the button is green when turned on).

     When turned on, fast recall enables searching clips by recall ID by entering a recall ID number using the number pad on the keyboard.

     The clip will be automatically selected in the **Clip Browser**. Pressing **Enter** will cue the clip, and pressing **Enter** a second time will play the clip.

     Clear a recall ID from the **Quick Find** field by pressing **Esc**.

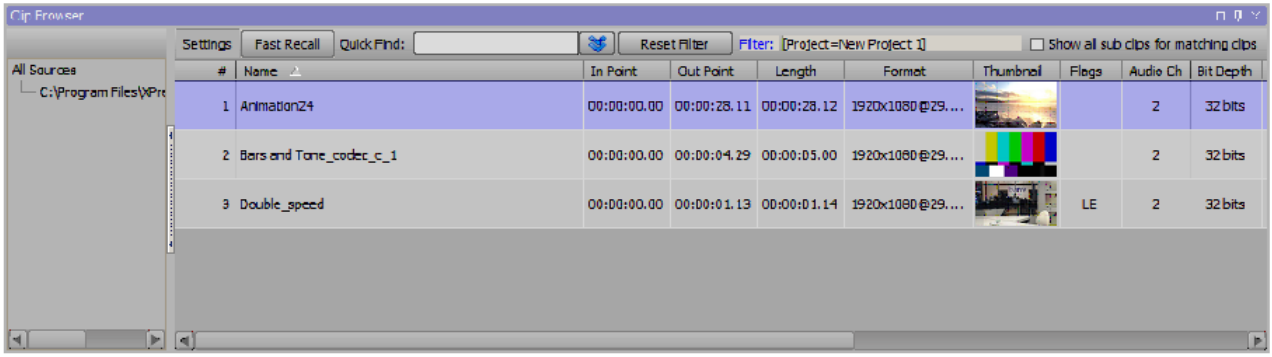
     A clip can be cued by entering the recall ID and pressing cue [.].

   - In the **Quick Find** field, enter a clip name or keyword to search for a specific clip in the Clip Browser.

     Press **Esc** to clear the field.

   - Select the **Show/Hide** advanced search options button ( ) to enter more criteria to search for a specific clip.

   - Select the **Show all sub clips for matching clips** checkbox to display any sub clips of a clip in the clip list when performing a **Quick Find**.



2. Right-click on a clip and select one of the following options:

   - **Edit** — select this command to open the **Edit Clip** dialog.
   - **Add Sub Clip** — select this command to open the **Add Sub Clip** dialog to create a sub clip from the selected clip.
   - **Set Recall ID** — use the **Set Recall ID** dialog to enter a recall ID to assign to a selected clip or the starting recall ID for the range of selected clips.
   - **Adjust Loop / Hold Last > Enable Looping** — enable looping for a clip or a range of selected clips.
   - **Adjust Loop / Hold Last > Disable Looping** — disable looping for the clip or a range of selected clips if looping is enabled.
   - **Adjust Loop / Hold Last > Enable Hold Last Frame** — hold the last frame of the clip or a range of selected clips when playout ends.

     ★Do not select this function if taking the clip(s) offline automatically using an out transition.

   - **Adjust Loop / Hold Last > Disable Hold Last Frame** — disable holding the last frame of the clip or a range of selected clips when playout ends if holding the last frame is already enabled.

- **Add to Sequencer** — add selected clip or range of clips to the Sequencer.

3. Add the clip to one of the following locations:

   Server Channels

   Sequencer**For More Information on...**

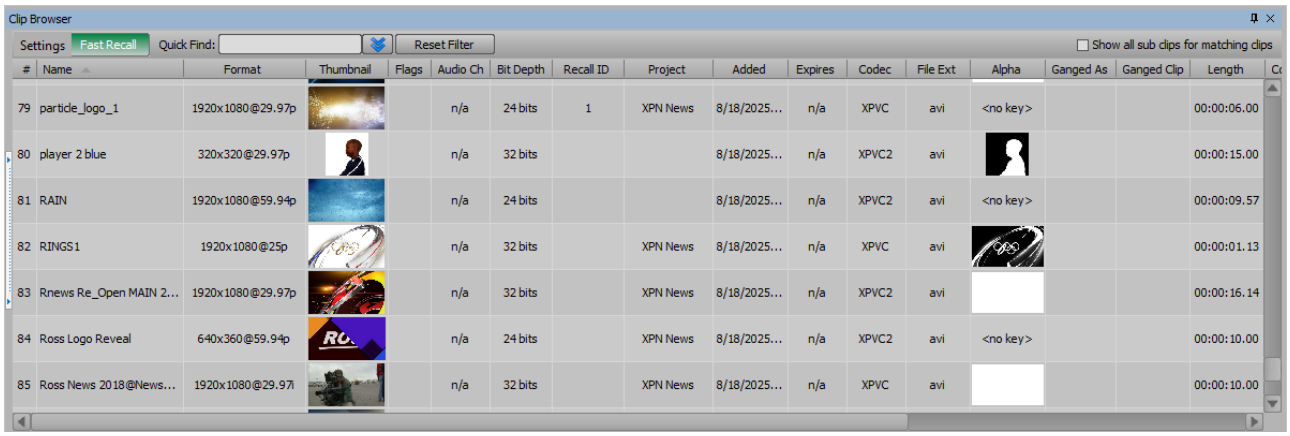
- the **Sequencer**, refer to Sequences.

Ganging Fill and Key Clips in the Clip Browser

In XPression, you can combine or "gang" two clips together, using the fill of one clip with the second clip used as its key (alpha).

1. In XPression, open the **Sequence** layout.
2. In the **Menu** bar, select **Display > Clip Browser**.

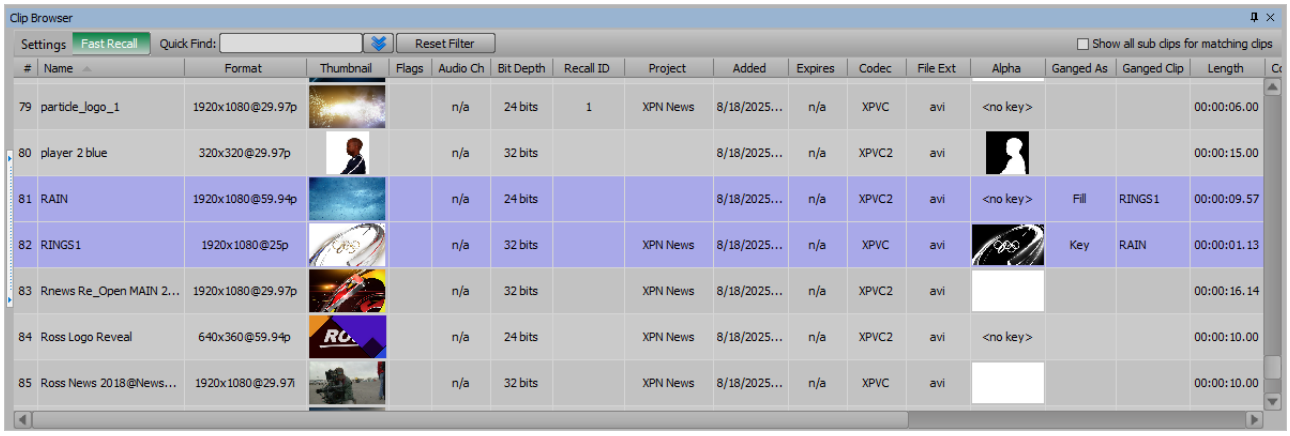
   The **Clip Browser** window opens.



3. Select the clip you want to use as fill, then press **Ctrl** and select the clip you want to use as its key.

   Alternatively, you can left-click on each clip to select it.

4. Right-click and from the shortcut menu, select **Gang Fill (name of the fill clip)**.



   After the association is made, the names of the clips being ganged will be displayed in the **Ganged Clip** column and their usage (**Fill** or **Key**) will be displayed in the **Ganged As** column.

To edit ganged clips:

- Right-click on the clip in the **Ganged Key** column and from the shortcut menu, select **Edit** to edit the key.
- Right-click anywhere else in the clip row and from the shortcut menu, select **Edit** to edit the fill.

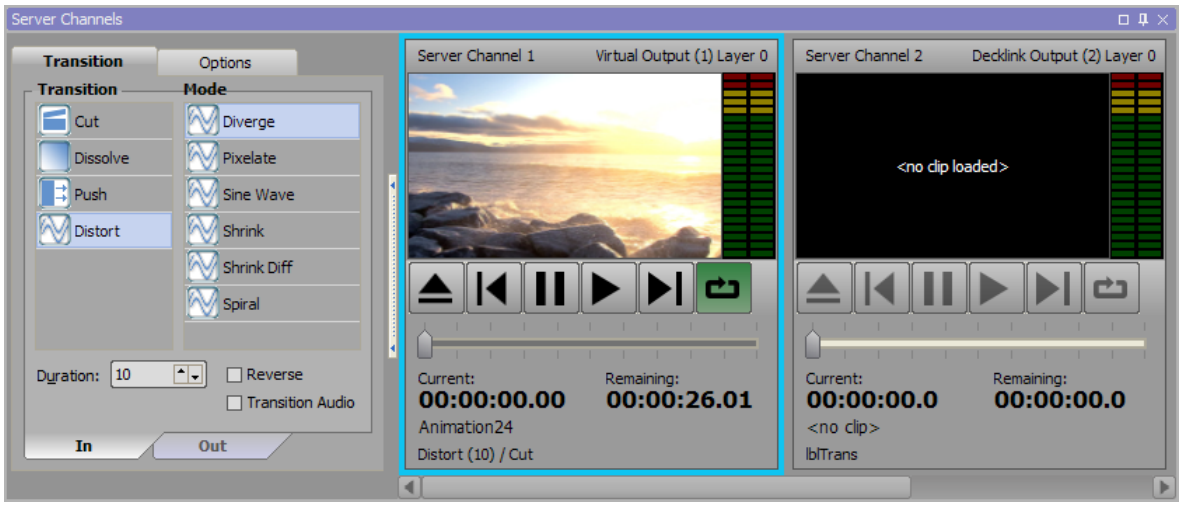
To separate ganged clips:

1. Select either of the ganged clips.
2. Right-click and select **Ungang Selected Clips**.

Using the Server Channels

To use the server channels:

1. In the **Server Channels** window, load a clip onto a **Server Channel**.



2. Select the **Transition** tab and configure the in and out transition for the clip:

   In the **In** and **Out** tabs, select an in and out transition for the clip:

   - **Cut** — transition instantaneously to and from the clip.
   - **Dissolve** — the clip gradually dissolves in or out.
   - **Push** — the clip slides in or out.
   - **Distort** — the clip is warped in or out.

3. In the **Mode** section, configure the **Dissolve**, **Push**, and **Distort** transition mode:

   Dissolve

   - **Fade** — fade in to, or out from, the clip.
   - **Over Black** — fade in or out from black.
   - **Additive** — gradually add light to the clip when transitioning in or out.
   - **Saturate** — saturate the clip when transitioning in or out.
   - **Desaturate** — desaturate the clip when transitioning in or out.
   - **Invert** — invert the clip when transitioning in or out.

   Push

   - **Right To Left** — push from right to left.
   - **Left To Right** — push from left to right.
   - **Top To Bottom** — push from top to bottom.
   - **Bottom To Top** — push from bottom to top.
   - **Bottom Right** — push toward the bottom right.
   - **Top Right** — push toward the top right.

- **Bottom Left** — push toward the bottom left.
- **Top Left** — push toward the top left.

Distort

- **Diverge** — use multiple splits in the image in the clip.
- **Pixelate** — pixelate the clip.
- **Sine Wave** — apply a sine wave pattern to the clip.
- **Shrink** — expand the clip from a shrunken image.
- **Shrink Diff** — expand the clip from a shrunken image.
- **Spiral** — spin the clip.
- **Duration** — enter or select the duration of the transition in number of frames.

4. Select the **Reverse** checkbox to reverse a **Dissolve**, **Push**, or **Distort** transition.
5. Select the **Transition Audio** checkbox to transition the audio along with the **Take Item**.
6. Use the **Duration** field to enter or select the duration of the transition in number of frames.
7. In the **Options** tab, select the **Cue video clips directly to framebuffer** checkbox to cue clips to air immediately when dropped on a server channel from the **Clip Browser** or **Sequencer**.
8. Use the playback controls to play out the clip:


Eject remove a loaded clip from the server channel.


Back return to the beginning of a clip.


Pause pause the clip.


Play play out the clip.


Forward go to the end of the clip.

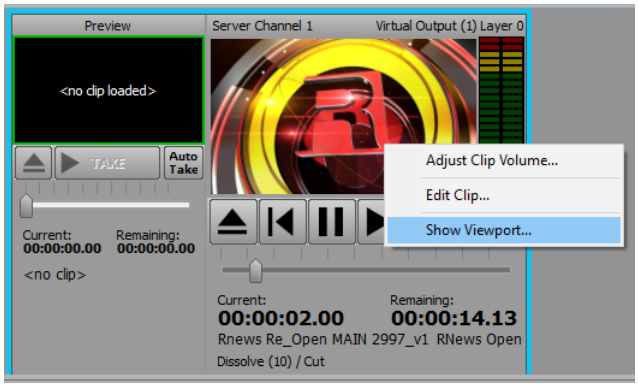

Loop continuously play the clip. When this button is green, the loop function is turned on. Pressing it again will turn off the loop function.

Scrub Bar select and hold the marker to drag it forward or backward along the time bar to move the clip position to a particular location.

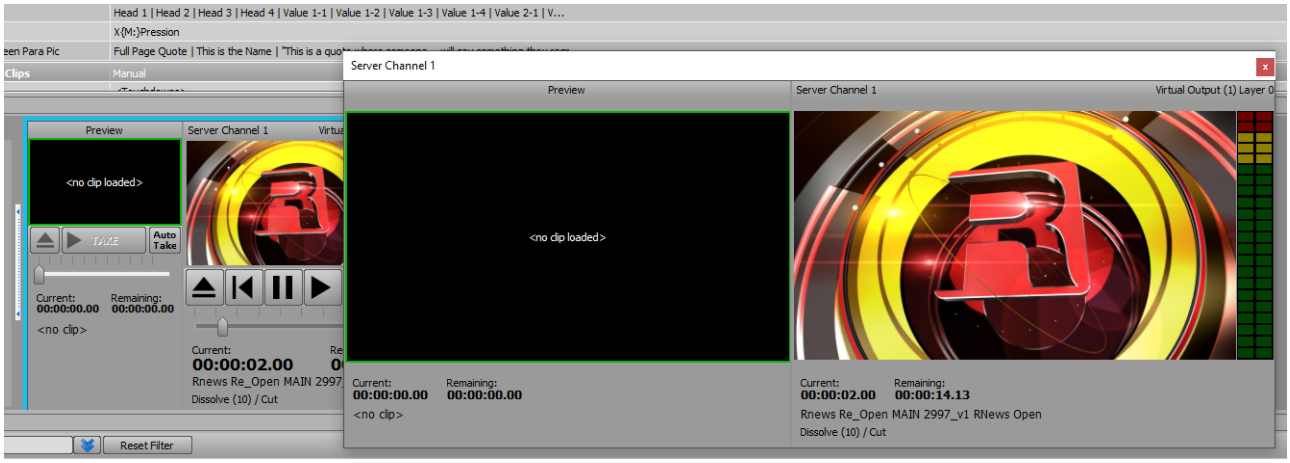
9. Right-click inside the **Server Channel** and:
   - select **Adjust Clip Volume** to open the **Adjust Clip Volume** dialog box and adjust the clip volume, if necessary.
   - select **Edit Clip** to open the **Edit Clip** dialog and edit a clip, if necessary.
   - select **Show Viewport** to open a separate server channel window.

To see a larger preview:

1. Right-click on the **Server Channel** and select **Show Viewport**.

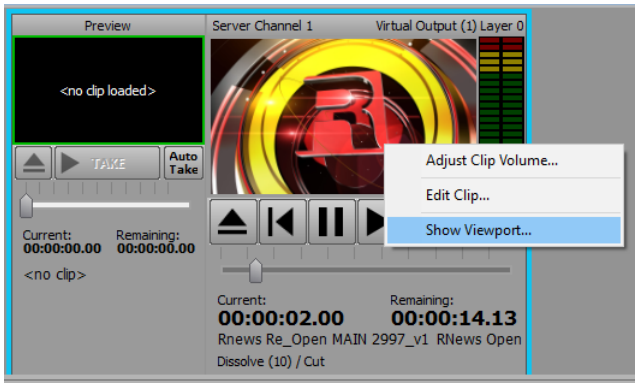


2. Drag out from the sides, top, or bottom of the viewport to enlarge it.



To dock a server channel on a secondary display:

1. Right-click on the **Server Channel** and select **Show Viewport**.



2. Select the viewport and drag it onto another display.

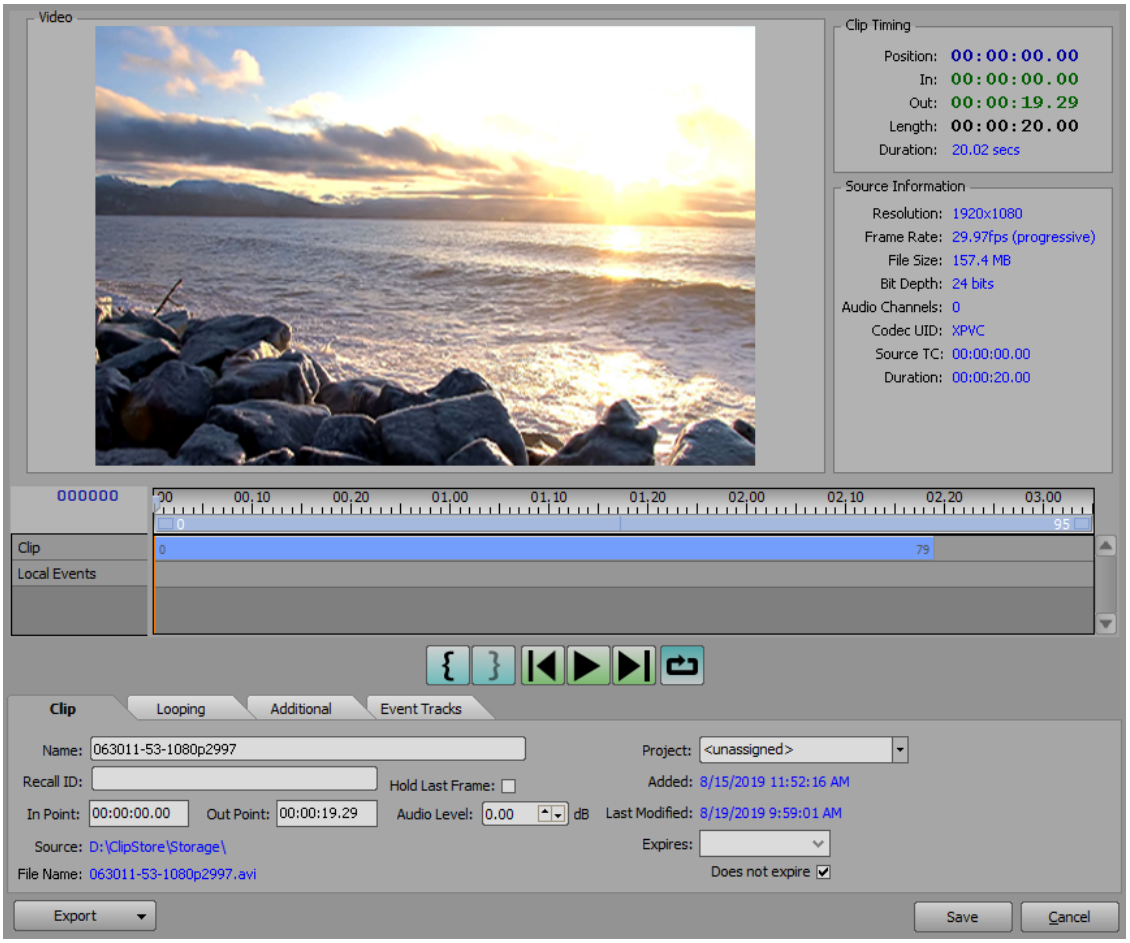
For More Information on...

- loading a clip on a server channel, refer to Loading a Clip in the Server Channels.
- editing a clip, refer to Editing a Clip/Adding a Sub Clip.

Editing a Clip/Adding a Sub Clip

Use the **Edit Clip** and **Add Sub Clip** dialogs to configure metadata for a clip. The **Add Sub Clip** dialog has the same interface as the **Edit Clip** dialog but is used to create a trimmed clip from an existing clip. A video can have multiple sub-clips defined within it, each with distinctive in/out points. Loading a sub-clip for playout is identical to loading a normal clip.

- The **Edit Clip** dialog can be accessed by right-clicking in the **Clip Browser** window and **Server Channels** window.
- The **Add Sub Clip** dialog can only be accessed by right-clicking in the **Clip Browser** window.



Video

This section displays the clip that has been selected for editing or creating a sub clip. The clip is rendered over a checkerboard pattern so that the alpha channel is visible unless the clip is full frame.

The following actions and commands can be performed:

- Use the timeline marker to select a specific frame in the timeline.
- The video can be scrubbed using the timeline bar; or using common NLE shortcuts like H,J,K to play/rewind at different speeds.
- During scrubbing, audio can be heard by configuring an **Audio Monitor** device in the **Hardware Setup**.

- Right-click inside the **Clip**, **Local Events**, or **Event Track** timeline to access the shortcut menu.

  ★Event Track timelines are available if global event tracks have been configured in the **Clip Store Manager** and added as a processor in the **INcoder**. They will appear in the timeline as named in the **Clip Store Manager**. They can be assigned as local events by selecting **Preset Event Track > Copy Events to Local Event Track** from the shortcut menu.

  - **Looping > Set Loop Start** — select the current position of the timeline marker as the start of the video loop.
  - **Looping > Set Loop End** — select the current position of the timeline marker as the end of the video loop.
  - **Looping > Reset Loop** — clear the loop settings.
  - **Clear In Point** — clear a configured start time for the clip.
  - **Clear Out Point** — clear a configured end time for the clip.
  - **Clear In and Out Points** — clear the configured start and end times for the clip.
  - **Update Clip Thumbnail** — update the thumbnail for the clip to reflect any edits or to use a specific frame as the thumbnail in the Clip Browser.
  - **Add Event > Rosstalk Event** — add a RossTalk event directly onto the clip timeline.
  - **Add Event > Scene Director Trigger** — add a Scene Director trigger event directly onto the clip timeline.
  - **Rename Event** — rename a selected RossTalk or Scene Director trigger event on the clip timeline.
  - **Delete Event** — delete a selected RossTalk or Scene Director trigger event on the clip timeline.

For More Information on...

- using global event tracks, refer to the *XPression Clips Workflow User Guide*.
- setting up an audio monitor device, refer to Configuring Video Preview and Audio Monitor.
- updating the thumbnail in the Clip Browser, refer to Updating the Thumbnail in the Clip Browser.
- looping, refer to Looping Tab.

Video Controls

	**Set In Point**	set the start time of the clip where the timeline marker has been positioned. Keyboard shortcut 'I' can be used to mark an in point.
	**Set Out Point**	set the end time of the clip where the timeline marker has been positioned. Keyboard shortcut 'O' can be used to mark an out point.
	**Move current position to in point**	return to the in point of the clip.
	**Start playback**	play the clip.
	**Move current position to end point**	go to the end of the clip.
	**Loop**	loop the playback of the clip. Press the button a second time to turn off looped playback.

Clip Timing (read-only)

Position — indicates the position of the timeline marker in the timeline for the clip.

In — displays the in point for the clip.

Out — displays the displays the out point for the clip.

Length — displays the total duration of the clip in frames.

Duration — displays the time length of the clip.

Source Information (read-only)

Resolution — displays the video format of the source clip.

Frame Rate — displays the frame rate of the source clip.

File Size — displays the file size of the source clip.

Bit Depth — displays the quality of the signal quantization of the source clip.

Audio Channels — displays the amount of embedded audio channels used in the source clip.

Codec UID — displays the type of encoding used for the source clip.

Source TC — displays the timecode of the source clip.

Duration — displays the total duration in frames of the source clip.

Clip Tab

Name — enter or edit a name for the clip.

Recall ID — enter an ID number for the clip when it is recalled.

Hold Last Frame — hold the last frame of the clip when playout ends. Do not select this checkbox if taking the clip offline automatically using an out transition.

In Point — enter a starting point for the clip.

Out Point — enter an ending point for the clip.

Audio Level — enter or select a volume level for the clip in decibels. Changing the audio level in the **Edit Clip** dialog will not affect live clips on a **Server Channel**. However, it will apply to the audio monitor if an audio monitor is configured in the **Hardware Setup**.

Source (read-only) — lists the location where the clip is stored.

File Name (read-only) — lists the name and file extension of the clip.

Project — select a project for the clip.

Added (read-only) — lists the date the clip was added to the clip store.

Last Modified (read-only) — lists the date the clip was last edited.

Expires — use the calendar to select an expiry date for the clip, if necessary.

Does not expire — use no expiry date for the clip.

Looping Tab

Enable Looping — enable looping for the clip.

Multi-Point — enable the multi-point loop settings.

Multi-Point Loop Settings

Use the multi-point loops to create free running 4-point and 3-point loops:

- 4-point loops use a frame in point, a loop section of start and end frames, and a frame out point.
- 3-point loops use a loop section of start and end frames with either a frame in point the same as the loop start frame or a frame out point the same as the loop end frame.

Loop Start	enter a starting frame for the loop within the clip time.
Loop End	enter an end frame for the loop within the clip time.
Loop Count	enter or select an amount of playbacks the clip will loop before stopping. Use 0 for infinite looping.
	set the start time or end time of the loop at the position of the timeline marker.
	skip to the start of the loop.
	skip to the end of the loop.

For More Information on...

- creating a 4-point loop, refer to Creating a 4-Point Loop..
- creating a 3-point loop, refer to Creating a 3-Point Loop..

Additional

Original File Name (read-only) — displays the original name of the file as uploaded.

Premultiplied / Shaped — select this check box to multiply/shape the fill signal color information by the luminance information in the key signal.

Event Tracks

Event tracks are configured in the Clip Store Manager, added as processors in the INcoder, and then available to use when editing clips from the Clip Browser. The **Event Tracks** tab provides a list of available global event tracks.

Assigned Event Tracks — lists the event tracks assigned to the clip.

Available Event Tracks — lists the available event tracks that can be assigned to the clip.

Add Track — select an available event track and select this button to assign it to the clip.

Remove Track — select an assigned event track and select this button to remove it from the clip.

For More Information on...

- using global event tracks, refer to the *XPression Clips Workflow User Guide*.

Other

Export — use this list to select one of the following options for exporting a clip:

- **To Video** — open the **Export to Video** dialog to save the clip as an AVI or MOV video file.
- **Still to Disk** — open a save dialog to save a still as a Targa (.TGA), Targa (RLE Compressed) (.TGA), Portable Network Graphic (.PNG), or JPEG (.JPG) format image file.
- **Still to Clipstore** — open the **Send to Clip Store** dialog to send a still to the Clip Store database to be used within the Clips workflow.
- **Interlaced Settings > Frame Based** — capture the image file without deinterlacing. This setting works best for scenes with minimal motion.
- **Interlaced Settings > Field (line doubled)** — capture the image file with each line doubled. For example, it will replace field two with a duplicate of field one.
- **Interlaced Settings > Field (line interpolated)** — capture the image file by interpolating between odd lines to form even lines.

Save — save the edited clip or sub clip.

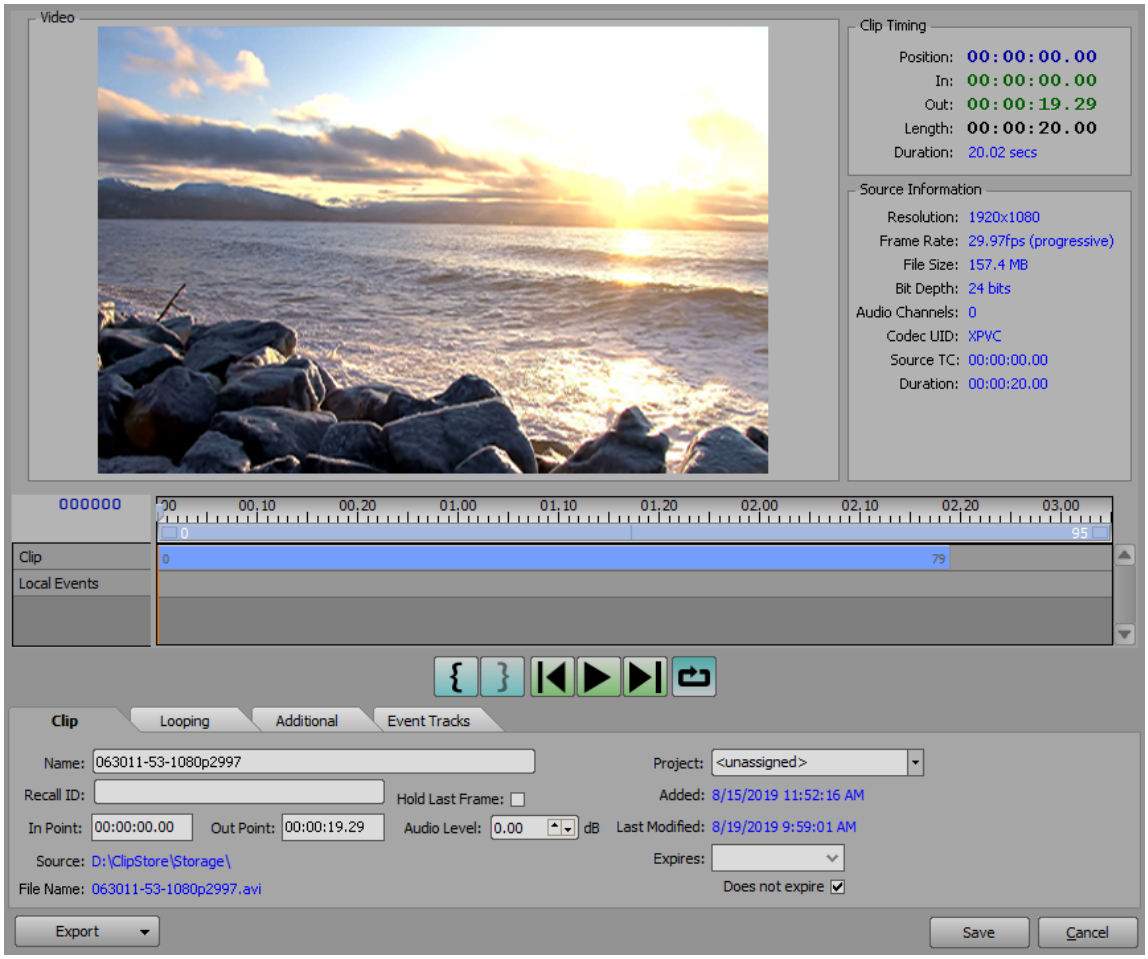
Cancel — exit the dialog without saving any changes.

Updating the Thumbnail in the Clip Browser

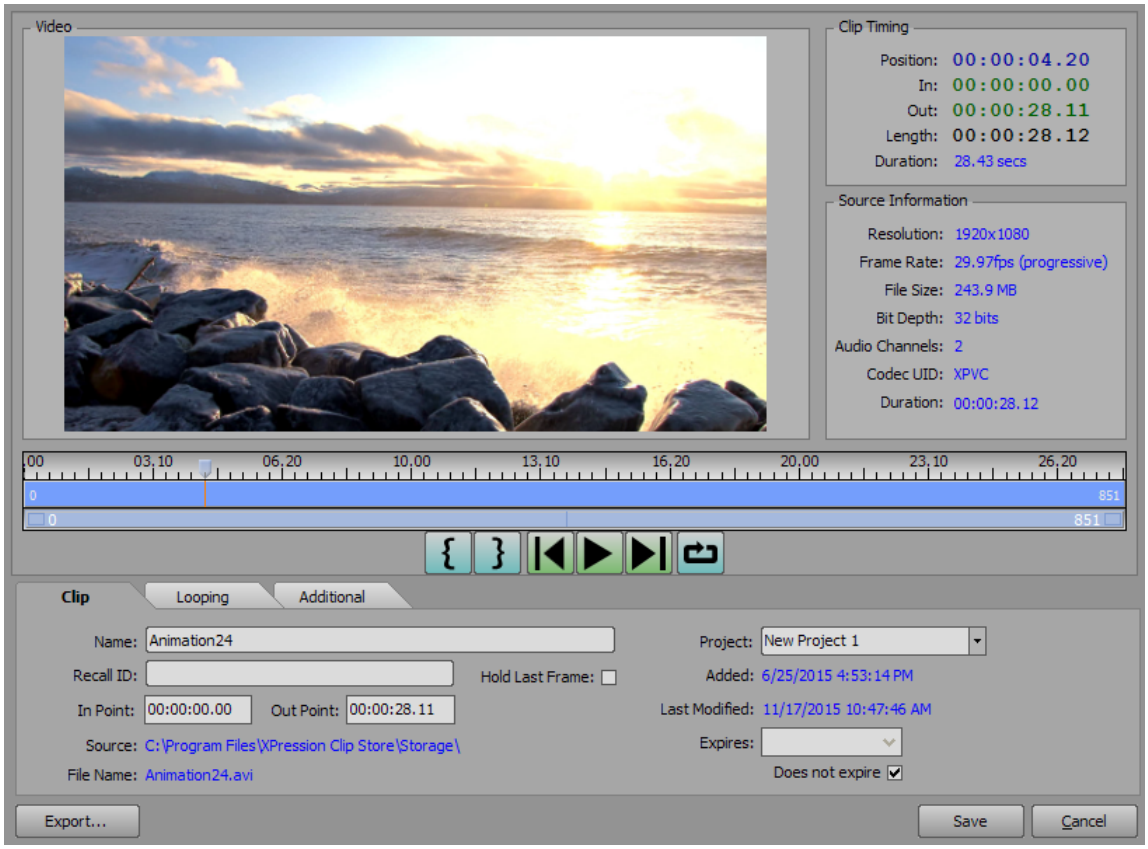
You can update the thumbnail in the **Clip Browser** to provide a more representative or preferred image to illustrate the content of the clip.

1. In the **Clip Browser**, right-click on a clip and select **Edit Clip** or **Add Sub Clip**.

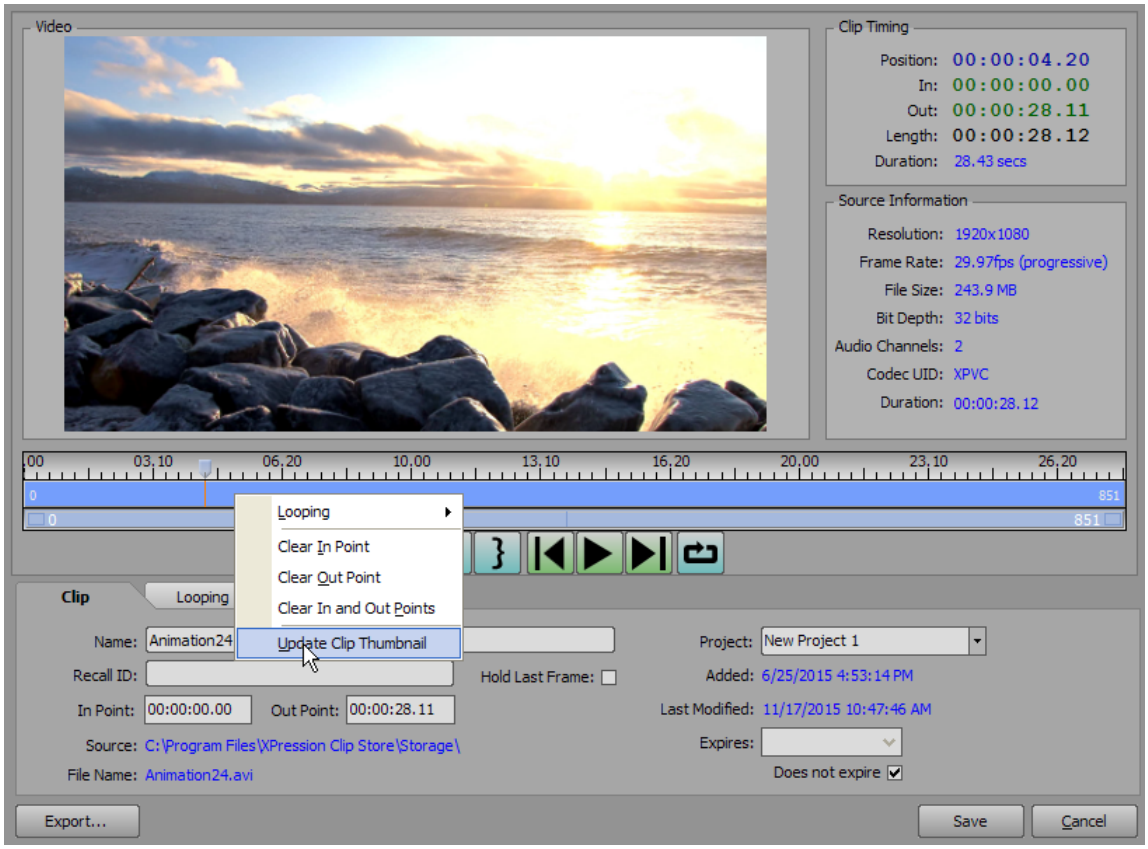
   The **Edit Clip / Add Sub Clip** dialog opens.



2. In the **Edit Clip** or **Add Sub Clip** dialog, move the timeline marker to a desired frame in the timeline.

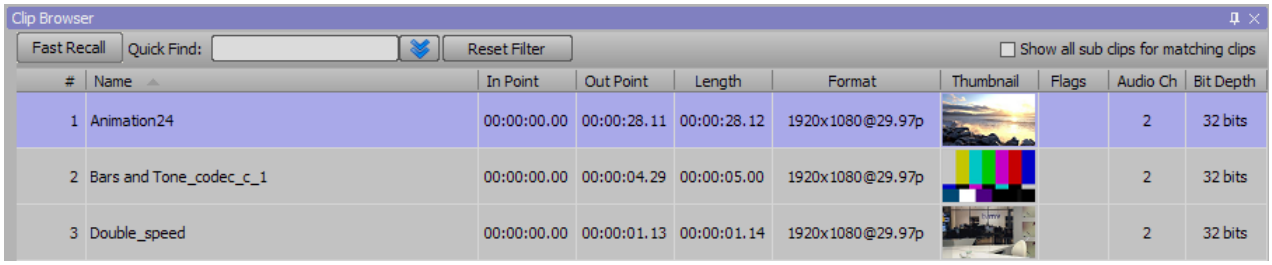


3. Right-click inside the timeline and select **Update Clip Thumbnail** from the shortcut menu.



4. Select **Save**.

   The thumbnail for the clip is updated in the **Clip Browser**.



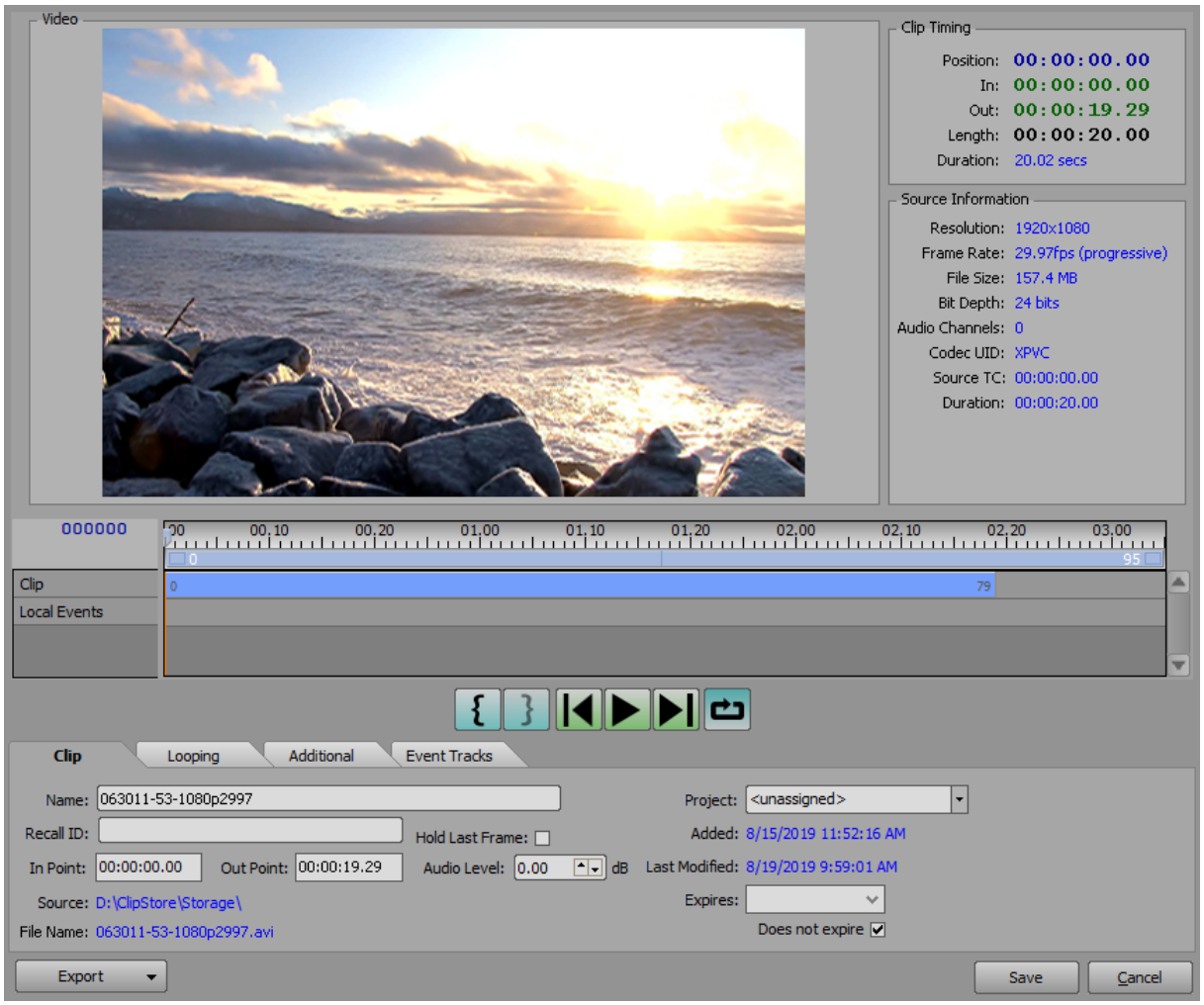
Creating a 4-Point Loop

4-point loops use a frame in point, a loop section of start and end frames, and a frame out point.

To create a 4-point loop:

1. In the **Edit Clip / Add Sub Clip** dialog, select the **Clip** tab.

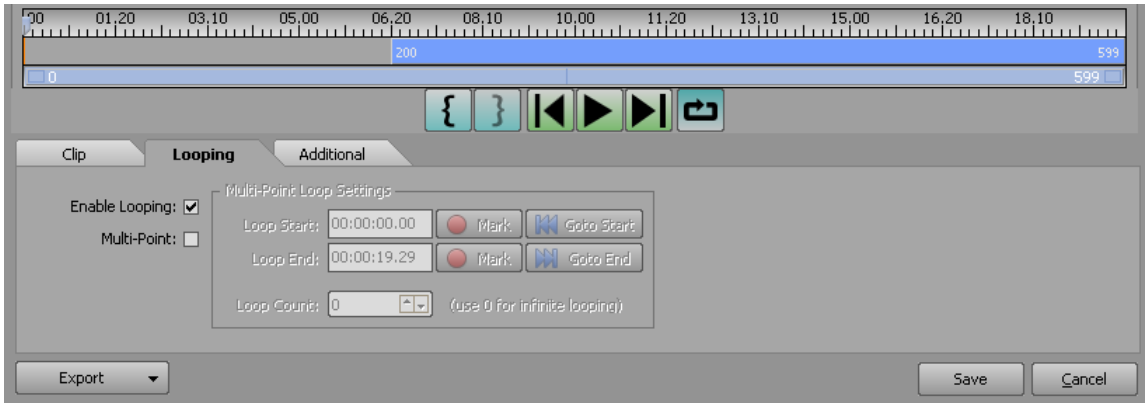
   The **Clip** tab opens.



2. In the **In Point** field, enter a frame in point.
3. In the **Out Point** field, enter a frame out point.

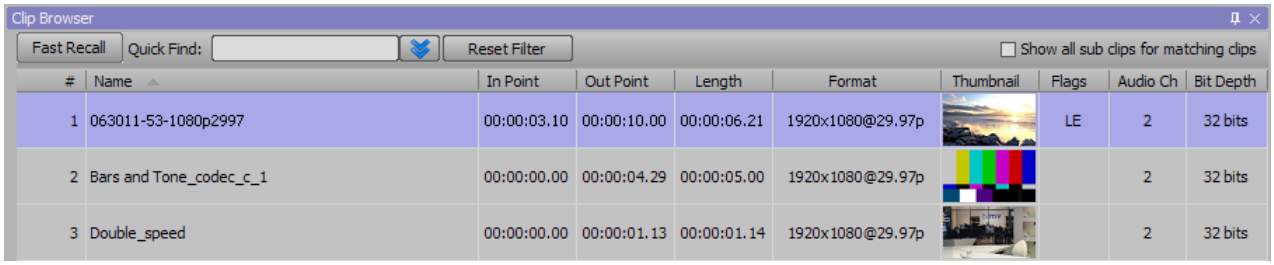
4. Select the **Looping** tab.

   The **Looping** tab opens.



5. In the **Looping** tab, select the **Enable Looping** checkbox.
6. Select the **Multi-Point** checkbox.
7. In the **Multi-Point Loop Settings** section:
   - In the **Loop Start** field, enter a frame start for the loop.
   - In the **Loop End** field, enter a frame stop for the loop.
   - In the **Loop Count** field, enter or select the number of times to play out the loop. Enter **0** for infinite looping.
8. Select **Save**.

   The edited clip is updated in the **Clip Browser**.



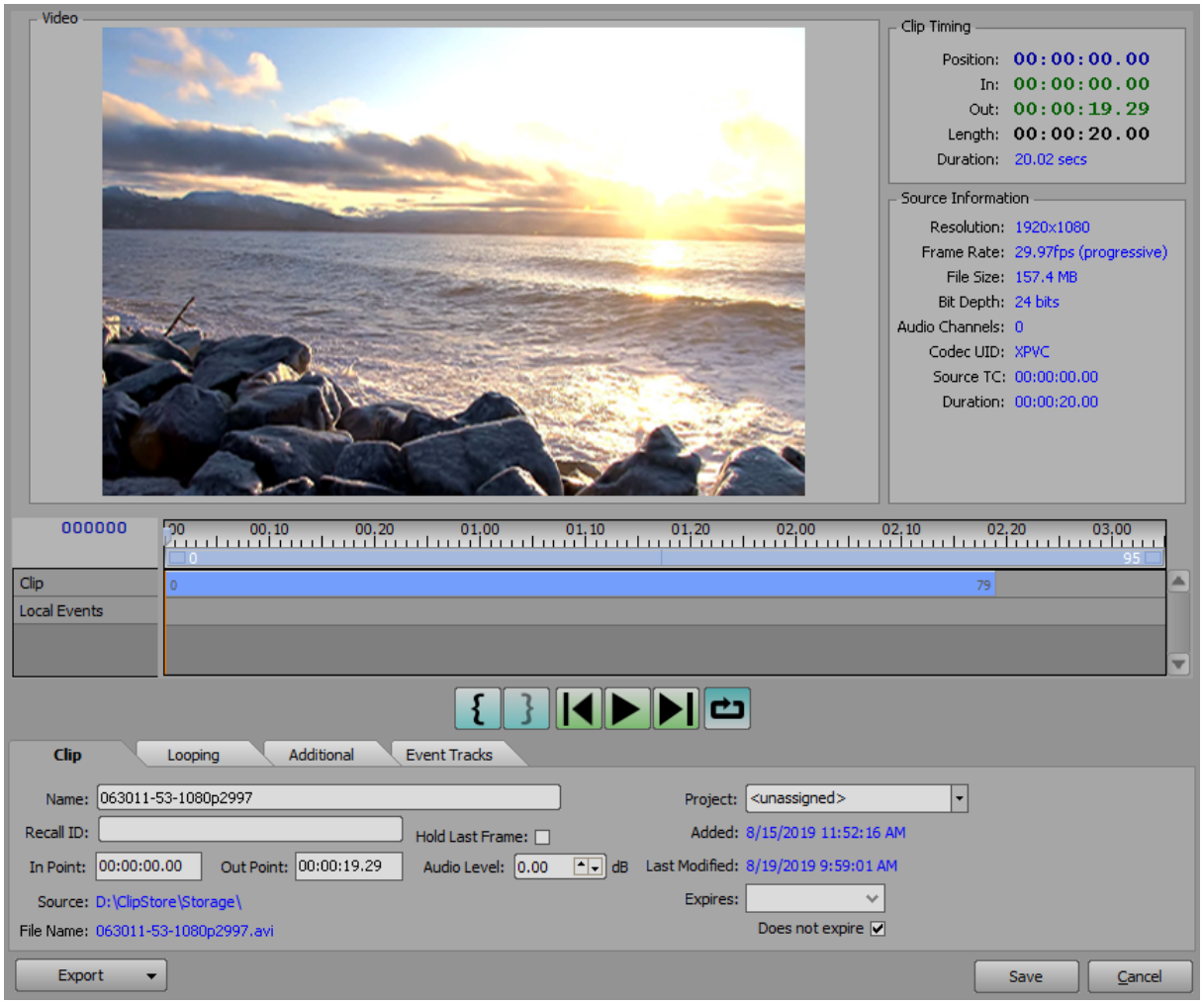
Creating a 3-Point Loop

3-point loops use a loop section of start and end frames with either a frame in point the same as the loop start frame or a frame out point the same as the loop end frame.

To create a 3-point loop:

1. In the **Edit Clip / Add Sub Clip** dialog, select the **Clip** tab.

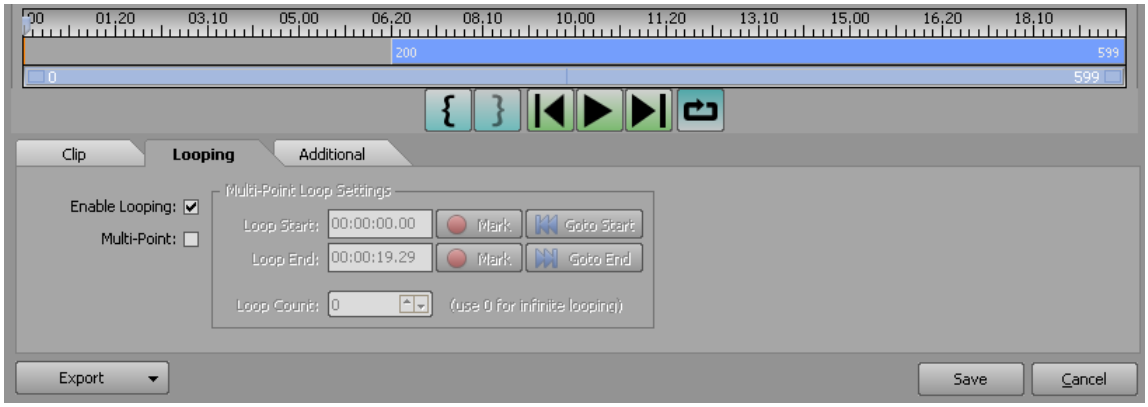
   The **Clip** tab opens.



2. In the **In Point** field, enter a frame in point.
3. In the **Out Point** field, enter a frame out point.

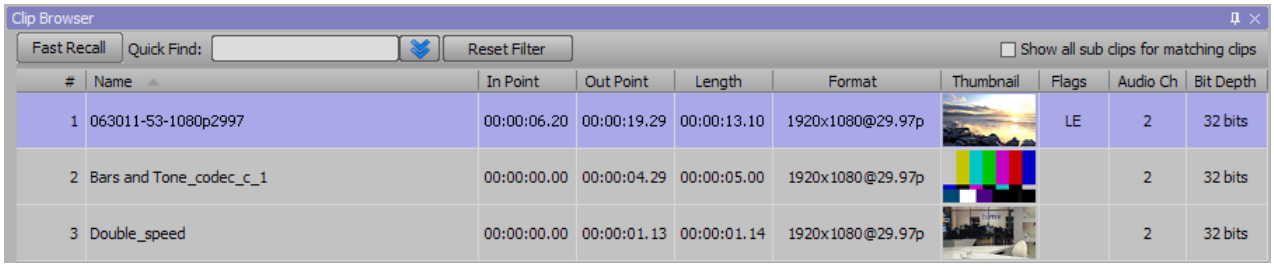
4. Select the **Looping** tab.

   The **Looping** tab opens.



5. In the **Looping** tab, select the **Enable Looping** checkbox.
6. Select the **Multi-Point** checkbox.
7. In the **Multi-Point Loop Settings** section:
   - In the **Loop Start** field, enter a frame start for the loop.
   - In the **Loop End** field, enter a frame stop for the loop.
   - In the **Loop Count** field, enter or select the number of times to play out the loop. Enter **0** for infinite looping.
8. Select **Save**.

   The edited clip is updated in the **Clip Browser**.



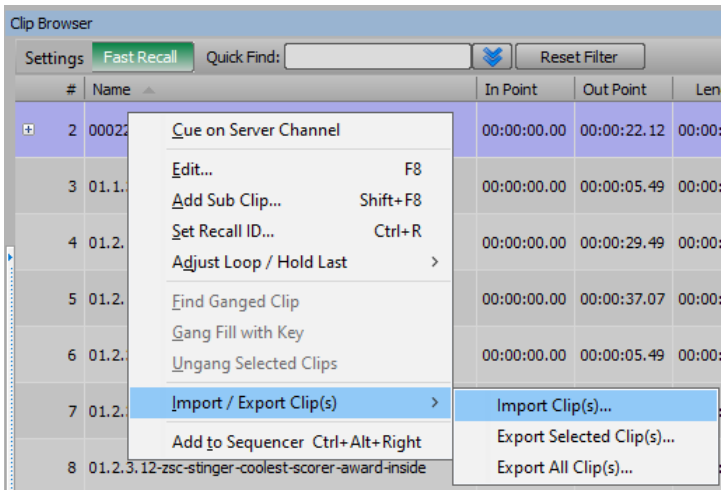
Importing / Exporting Clips

Clips and subclips can be imported from another project or exported to a **.XCP** file and saved to be used in another project.

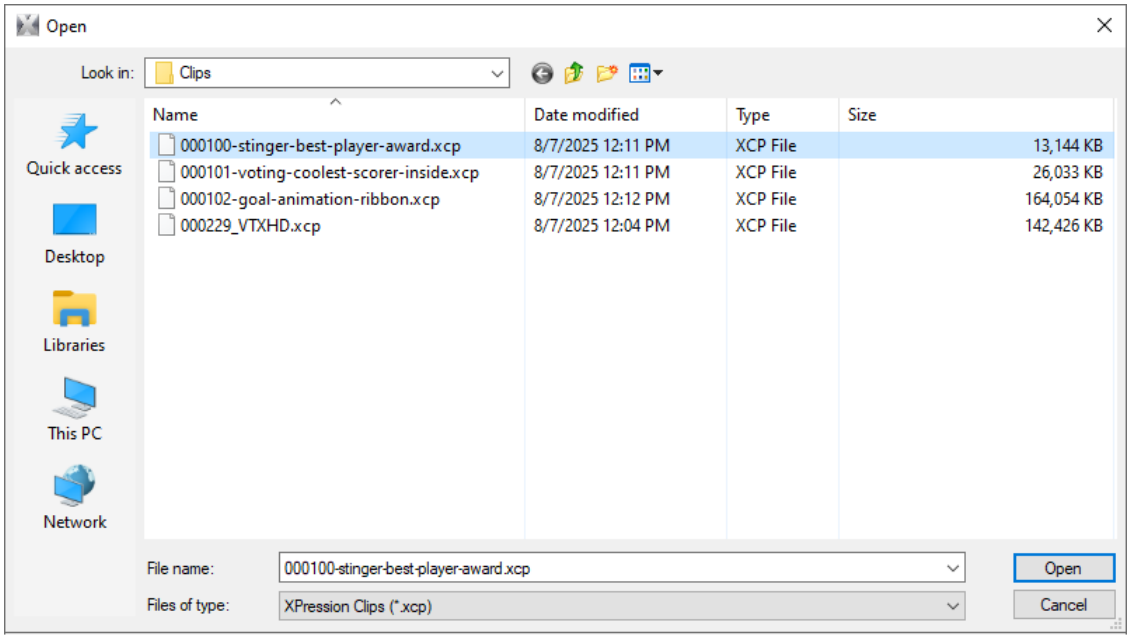
You can bulk export multiple clips and subclips.

To import clips:

1. In XPression, select any spot in the **Clip Browser**, right-click and select **Import / Export Clip(s) > Import Clip(s)**.



2. In the **Open** window, navigate to the folder containing your clips and select the clip to import.



3. Then select **Open**.

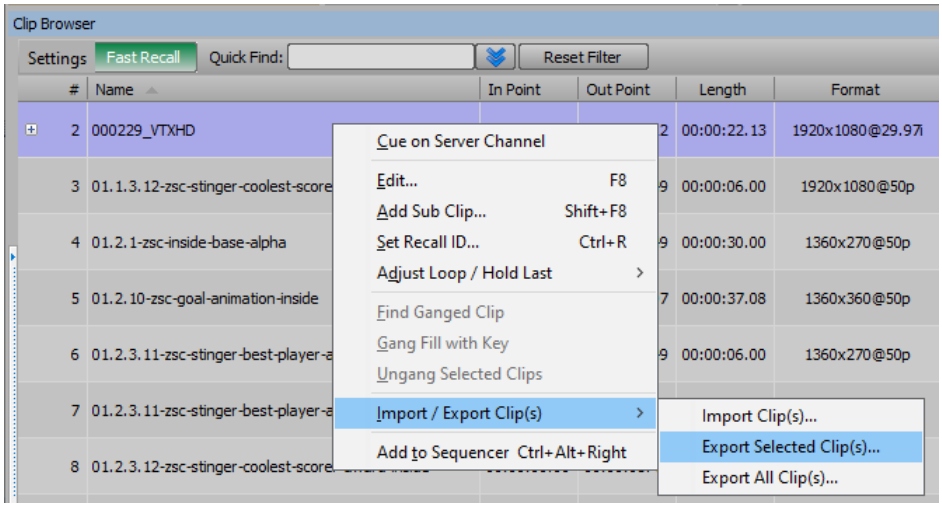
   If the clip you selected is a duplicate of one currently in the **Clip Browser**, you have the option to import the clip with a new GUID or skip the import.

   If you import a duplicate clip, the new clip will assume the **Recall ID** of the original clip and the original clip will have no **Recall ID**.

To export clips:

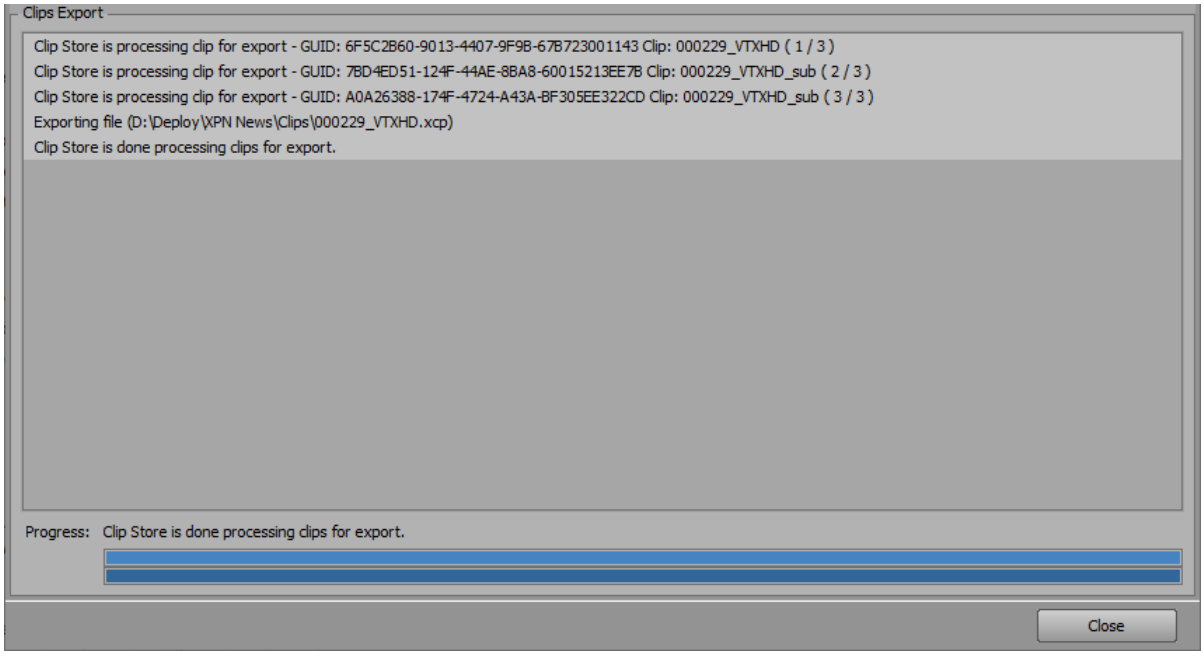
1. In XPression in the **Clip Browser**, right-click a clip and select **Import / Export Clip(s) > Export Selected Clip(s)**.

   Alternatively, press **Shift** and select the first and last clip, or press **Ctrl** and select individual clips to export multiple clips.



2. In the **Save XPression Clips** window, navigate to the folder where you want to save the clip.
3. In the **File name** field, enter a name for the clip and select **Save**.

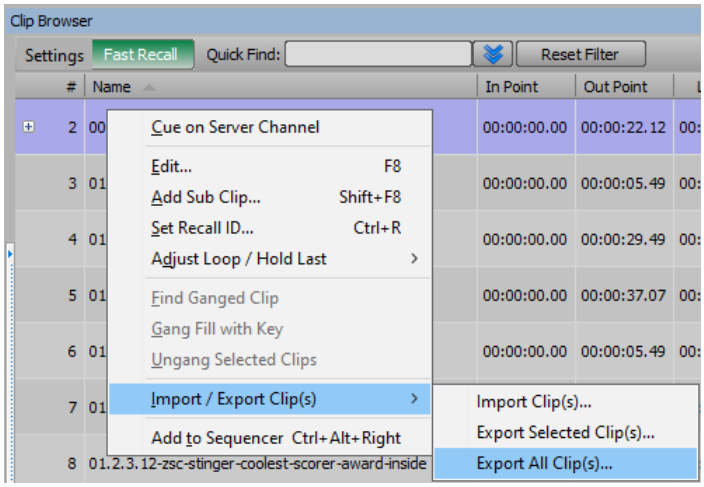
   The **Clip Exporter** window opens displaying the progress of the export.



4. When the Clip Store has completed processing the clip, select **Close**.

To export all clips in the clip browser:

1. In XPression, select any spot in the **Clip Browser**, right-click and select **Import / Export Clip(s) > Export All Clip(s)**.

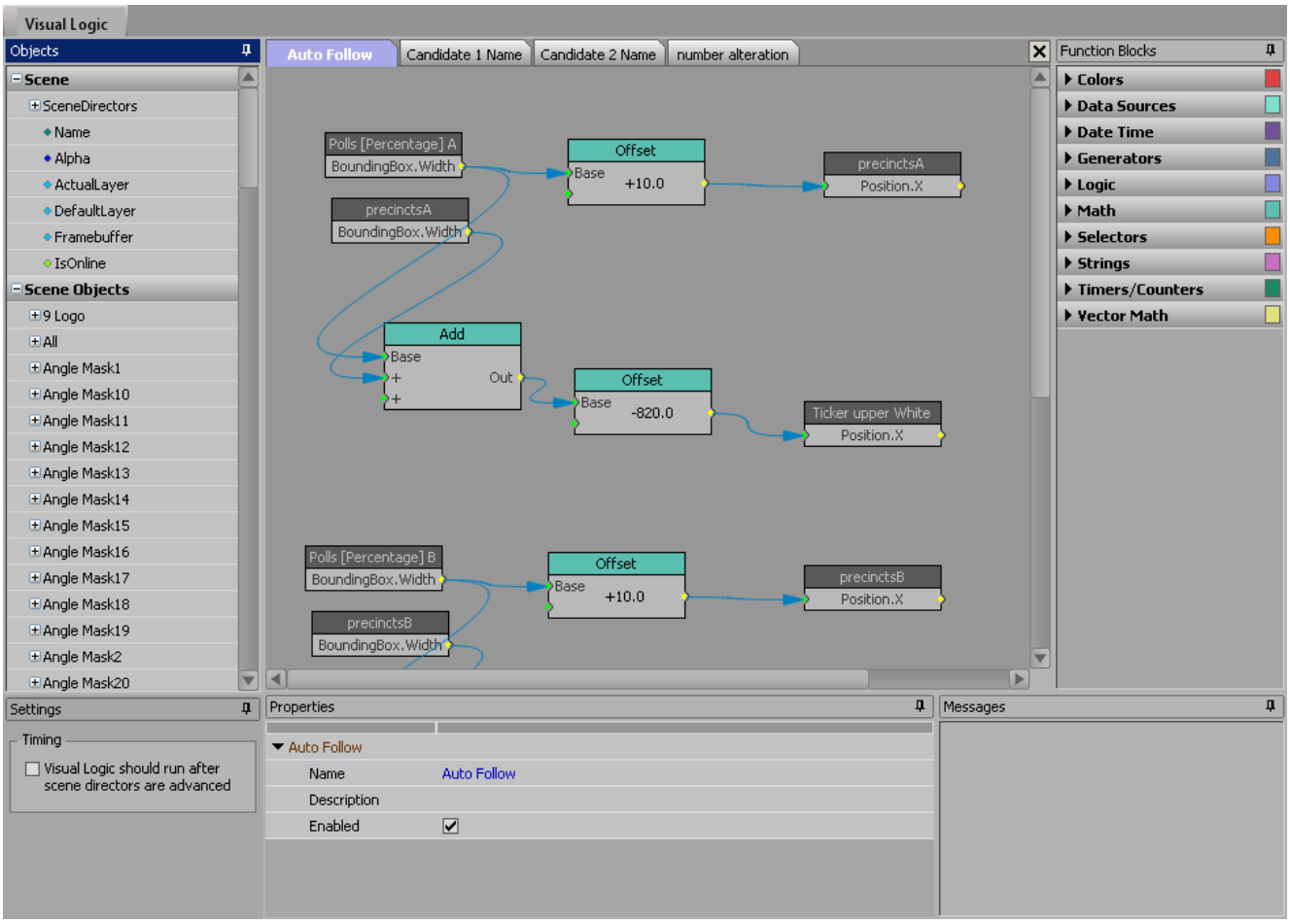


2. In the **Save XPression Clips** window, navigate to the folder in which to save your clips.
3. In the **File name** field, enter a name for the group of clips and select **Save**.

   The **Clip Exporter** window opens displaying the progress of the export.
4. When the Clip Store has completed processing the clip, select **Close**.

Visual Logic

Visual Logic is a visually-oriented code authoring environment that enables the quick creation and editing of segments of script code for scenes. Script can be done manually, or using Visual Logic to create and edit scenes visually. Visual Logic enables users with minimal script experience to more easily add script functionality and logic to scenes. In the Visual Logic interface, drag object and function blocks into the logic tab, and then connect them to define their logical relationships.



Visual Logic Editor

The following topics are discussed in this section:

Opening the Visual Logic Editor

Objects and Function Blocks

Connecting Object and Function Blocks

Selecting Multiple Object and Function Blocks

Copying and Pasting Object and Function Blocks

Deleting Object and Function Blocks

Adding and Deleting a Visual Logic Tab

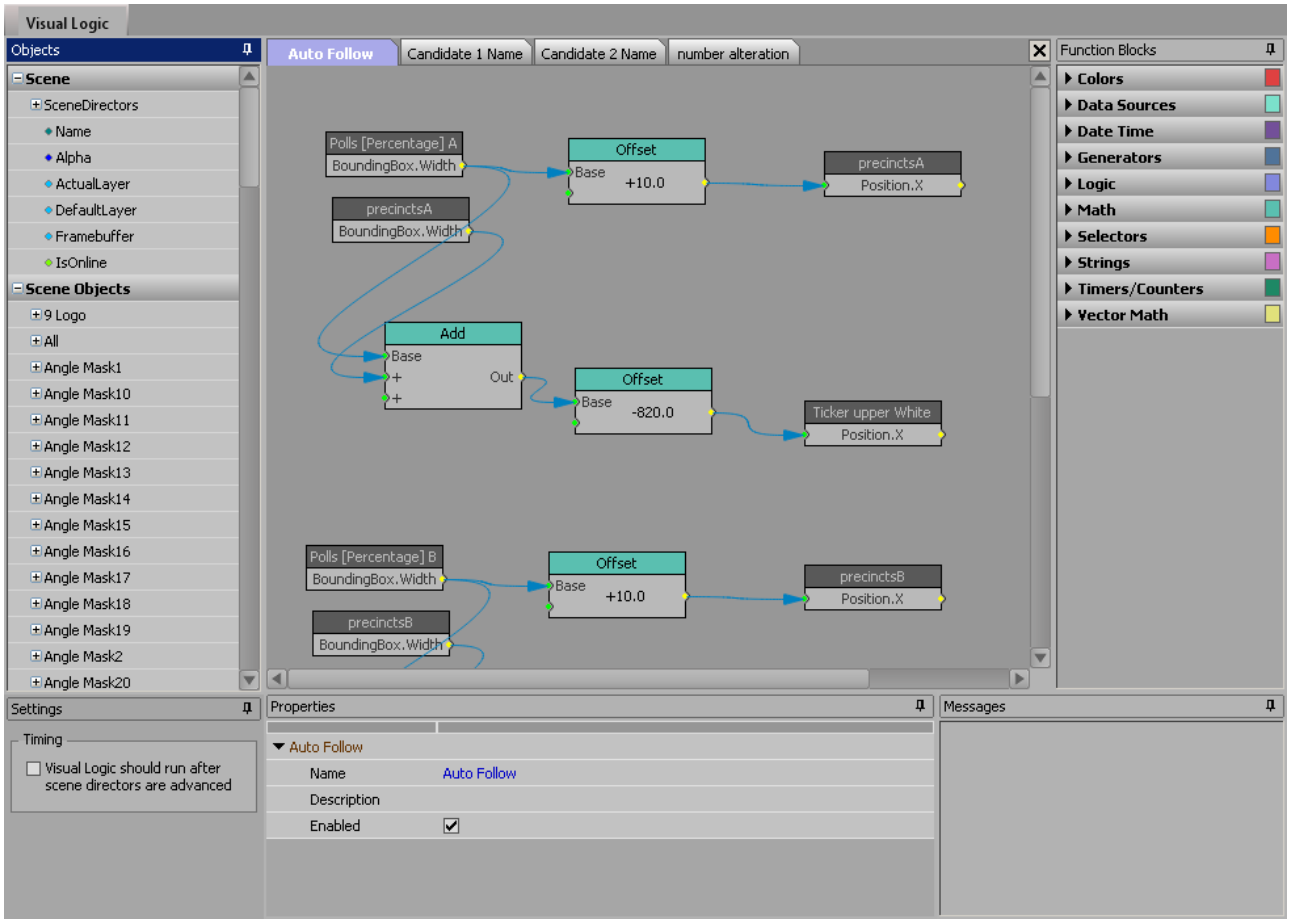
Saving and Opening Visual Logic Files

Opening the Visual Logic Editor

To open the Visual Logic editor:

1. Create or select a scene in XPression.
2. In the **Main Viewport**, select the Edit Visual Logic ( ) icon.

   The **Visual Logic** editor opens.

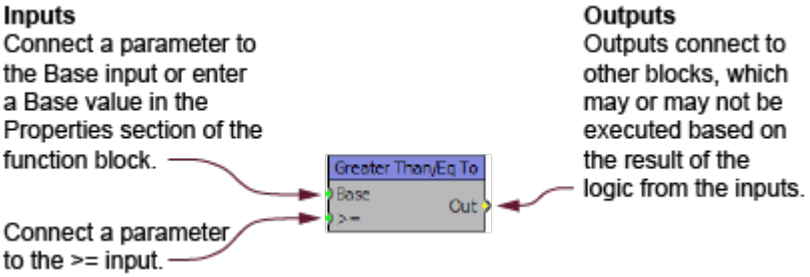


★It is helpful if **Show or Hide Continuous Animations** and **Other Effects** ( ) is turned on in the **Main Viewport** in order to view the logic from the **Visual Logic** editor in the scene.

Understanding Objects and Function Blocks

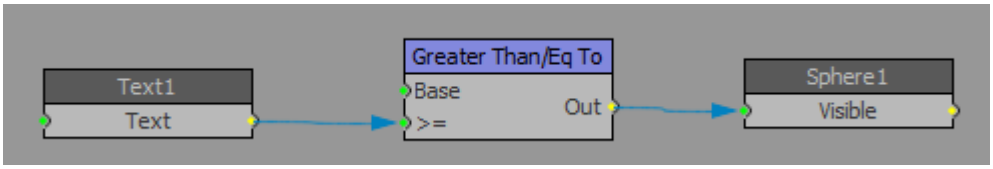
Objects and Function blocks are visual representations of script code segments. Each object block represents the respective parameters of a scene, object, or material. Each function block represents a functional unit, such as a parameter, a variable, a logical control, or a script function. To create a working visual logic segment, you drag multiple object and logic blocks into the workspace and then link them together to define how they interact.

The following image shows the parts of the **Greater Than/Equal To** logic function block, which is used to determine if one value is greater than, or equal, to the other:



The Greater Than/Equal To Logic Function Block

The following example shows a **Greater Than/Equal To** logic function block with inputted **Value** function blocks that are outputted to a **Quad** scene object:



The Greater Than/Equal To logic function block connected to other blocks

In the example, the two **Value** function blocks provide the data to be compared by the **Greater Than/Equal To** logic function block. Because the **Base** value is **2.0** and the **>=** value is **3.0**, the **Quad1** object to which the data is outputted will be visible in the scene.

Line Colors

The colors of the lines connecting the logic blocks have meaning:

- If a line is green, it indicates that the block can be connected to the selected input.
- Red lines with arrowheads indicate that the block cannot be connected to the selected input.
- Blue lines with arrowheads indicate the sharing of data from one logic block to another.

Data Inputs

A green dot on the left side of a block indicates a data input. A yellow dot on the right side of a block indicates a data output. Data inputs and outputs appear on almost every type of logic block. Data can come from objects and function blocks. To share data from one block to another, click and drag from a data output point (yellow dot) on one block to a data input point (green dot) on another block. Data can be shared from one block to multiple other blocks.

Block Colors

The title bars of logic blocks are colored, to visually group the blocks. By default, object blocks are gray, and function blocks are the following:

- Colors: red
- Data Sources: turquoise
- Generators: blue
- Logic: purple
- Math: aqua
- Selectors: orange
- Strings: magenta
- Timers/Counters: green
- Vector Math: yellow

Settings

Use the **Settings** section to configure specific individual settings for Visual Logic.

Timing

In the **Timing** section of the **Settings**, select the **Visual Logic should run after scene directors are advanced** checkbox to set Visual Logic to run after the scene directors are advanced so that any objects linked to animated objects will move in sync.

Connecting Object and Function Blocks

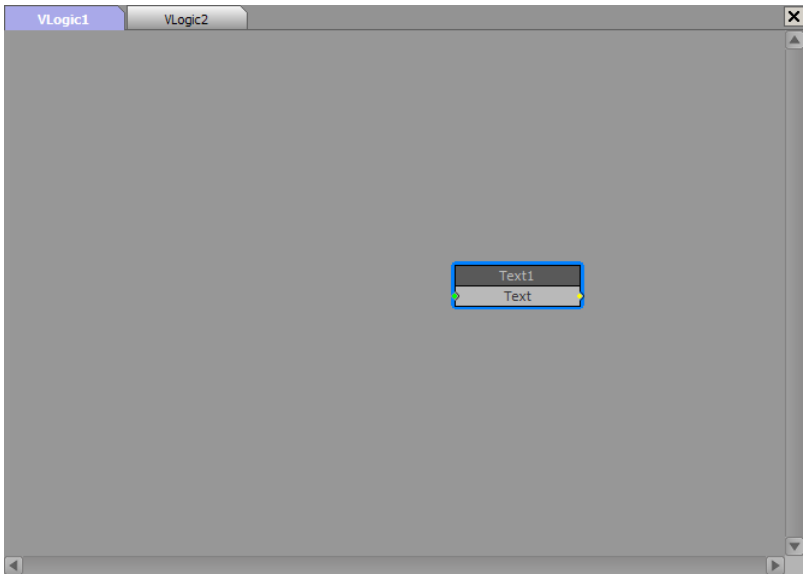
Use the workspace within the VLogic tab to drag and drop **Objects** and **Function Blocks**, and then link the blocks to establish logical connections between them.

The **Objects** tree lists scenes, scene objects, and materials and the parameters associated with the objects.

To connect object and function blocks:

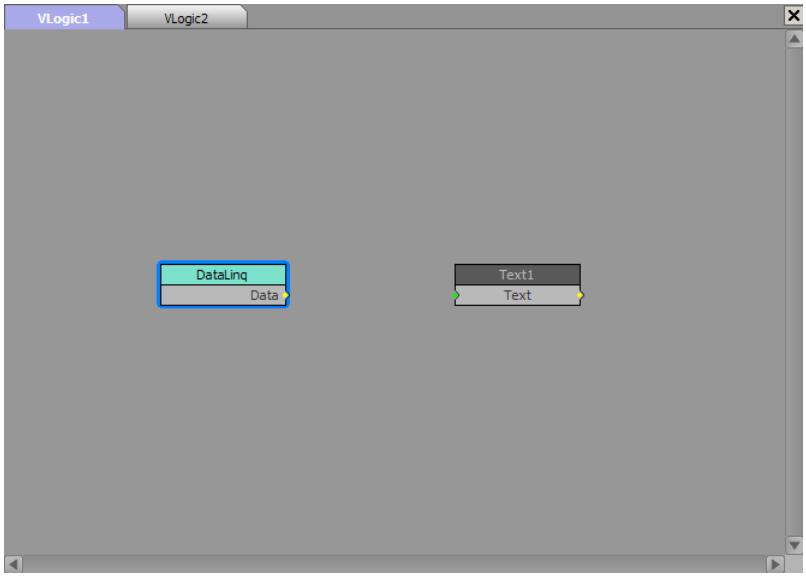
1. In the **Visual Logic** editor, drag an **Object** or **Function Block** and drop it onto the **VLogic** tab workspace.

   The block is added to the workspace.

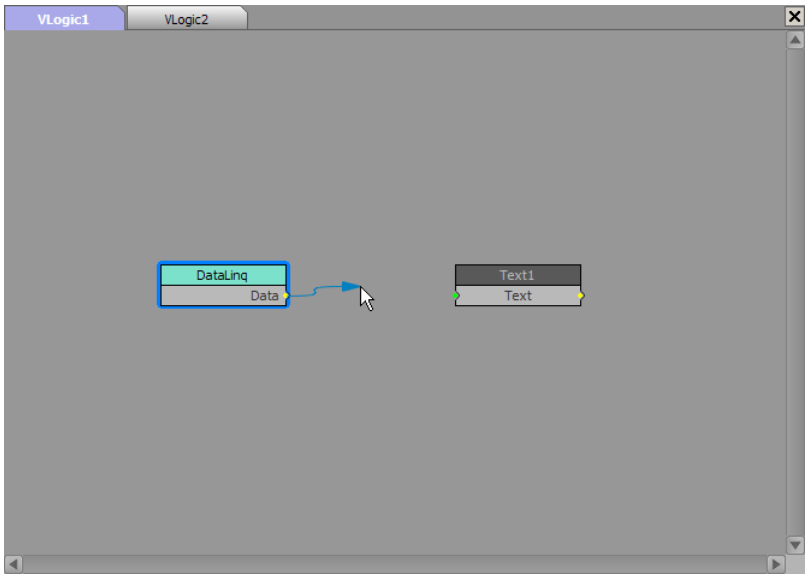


2. Drag another **Object** or **Function Block** and drop it onto the **VLogic** tab workspace.

   The block is added to the workspace.

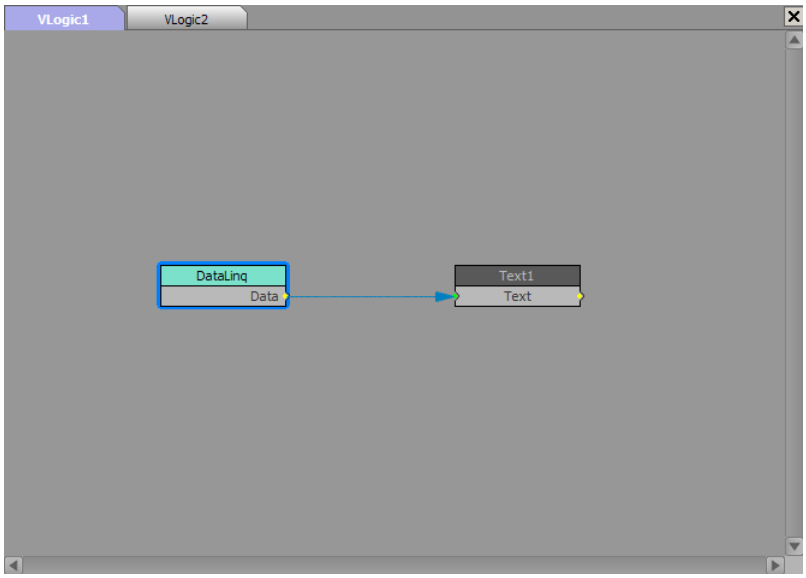


3. Select the yellow output of a block and drag the blue arrowhead towards the block with which to connect.



4. Drop the arrowhead onto the desired input of the block with which to connect.

   The arrowhead and line will turn green if it can be connected; red if it cannot. Once it is connected it will become blue again, or dark red if the connection type is [any].



Selecting Multiple Object and Function Blocks

Multiple object and function blocks can be selected in the VLogic tab workspace.

To select multiple object or function blocks:

- select multiple specific blocks by holding **Shift** or **Ctrl** and selecting the desired blocks.
- select and drag the selection border around the desired blocks. Release the left mouse button when the desired blocks have been surrounded.

Copying and Pasting Object and Function Blocks

Object and function blocks can be copied and pasted in the workspace of the VLogic tabs.

To copy object and function blocks:

1. In the workspace, select the block or multiple blocks to copy.
2. Right-click and select **Copy** or press **Ctrl+C**.

To paste object and function blocks:

1. Copy a block or blocks in the workspace.
2. Right-click and select **Paste** or press **Ctrl+V**.

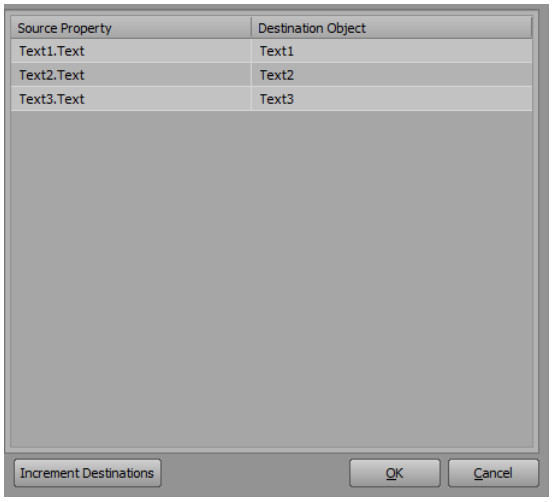
Assigning and Pasting a Copied Object Attribute

An object block can assigned the copied attributes of a different object by using the Assign & Paste function in the shortcut menu of the Visual Logic tab workspace.

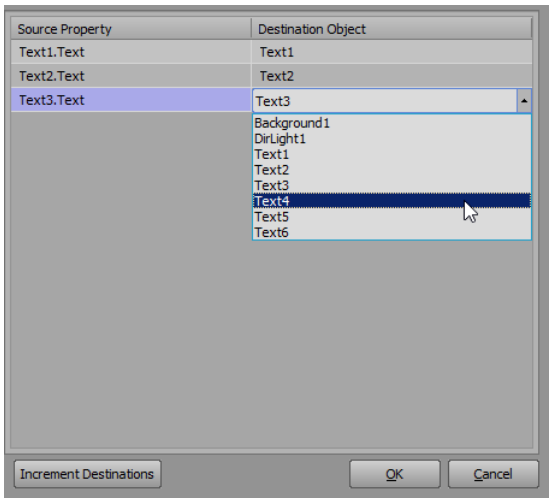
To assign and paste:

1. In the workspace, select an object block or multiple object blocks to copy.
2. Right-click and select **Copy** or press **Ctrl+C**.
3. Right-click and select **Assign & Paste** or press **Shift+Ctrl+V**.

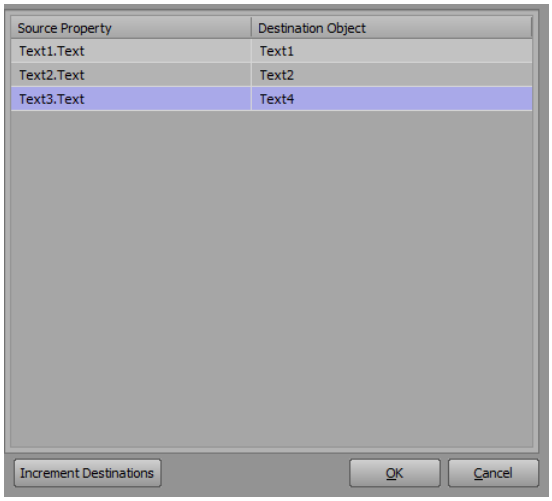
   The **Paste Visual Logic Properties** window opens.



4. In the **Paste Visual Logic Properties** window, from the **Destination Object** drop-down, select an object from the scene in which to paste the selected source property.



The selected source property is assigned to the select destination object.



5. Select the **Increment Destinations** button to assign the selected source property to the next destination object available in the list of destination objects for the scene (optional).
6. Select **OK**.

   The **Paste Visual Logic Properties** window closes and the source properties are assigned to the selected destination objects.

Deleting Object and Function Blocks

To delete object and function blocks:

1. In the workspace, select the block or multiple blocks to delete.
2. Right-click and select **Delete** or press the **Delete** key.

Adding or Deleting a Visual Logic Tab

By default, a Visual Logic tab (VLogic1) is created when the editor is first opened. Multiple tabs can be created and used for a scene or deleted if no longer needed.

To add a new Visual Logic tab:

1. Open the **Visual Logic** editor.
2. From the **Visual Logic** menu, select **Add New**.

   Alternatively, right-click on the top of the workspace where the **VLogic** tabs are located and select **Add New** from the shortcut menu.
3. A new **VLogic** tab is added to the workspace.

To delete a Visual Logic tab:

1. In the **Visual Logic** editor, select the tab to be deleted.
2. Right-click on the tab and from the shortcut menu, select **Delete**.

   The selected tab is deleted.

Saving and Opening Visual Logic Files

Visual Logic configurations for scenes can be saved to an **.XVL** file and loaded as desired.

To save a file:

1. In the **Visual Logic** editor, from the **Visual Logic** menu, select **Save** to save a tab as an **.XVL** file or **Save all** tabs to save all tabs as **.XVL** files.

   The **Save As** file browser opens.
2. Select a folder in which to save the file or files.
3. Select **Save**.

   The file or files are saved to the selected folder.

To open a saved file:

1. In the **Visual Logic** editor, from the **Visual Logic** menu, select **Open**.

   The **Open** file browser opens.
2. Navigate to and select the file(s) to open.
3. Select **Open**.

   The file or files are loaded in the **Visual Logic** editor.

XPression Tessera

XPression Tessera, part of Ross Video's broad line of real-time graphics products and workflow tools, is a multi-display real-time graphics designer/controller for sports venues & studio video walls.

Tessera enables users to link together multiple XPression engines to create a scalable matrix of channels for seamless output of scenes across large or irregularly assembled display panels. Perfect for sports scoreboards, ribbon boards, and studio video walls, Tessera's resolution can scale just by adding more XPression engines or "Tessera nodes" and adding to the mapping.

Frame-accurate, non-tearing recall of graphics and clips across any or all nodes is made possible with XPression's Multi-Engine Sync technology. More importantly, XPression's unlimited scene layering on output is preserved across Tessera nodes for incredibly dynamic animations and transitions.

The Tessera Region Manager allows operators to divide scenes into regions and assign those regions to specific nodes. The Tessera Node Manager allocates the XPression engines and channels to be used as render nodes. And, the XPression Project Server handles the automatic one-click publishing of scene updates and resources to all nodes for ultimate efficiency.

Whether you need to drive large displays in sports venues or build a studio video wall, XPression Tessera is the most powerful and cost-effective solution available.

In a distributed Tessera system, multi-cast is supported, allowing Tessera to subscribe and send data to a Multicast group using any source multicast.

The following topics are discussed in this section:

Tessera User Interface Overview

Setting up XPression Tessera

Tessera Playback

Tessera User Interface Overview

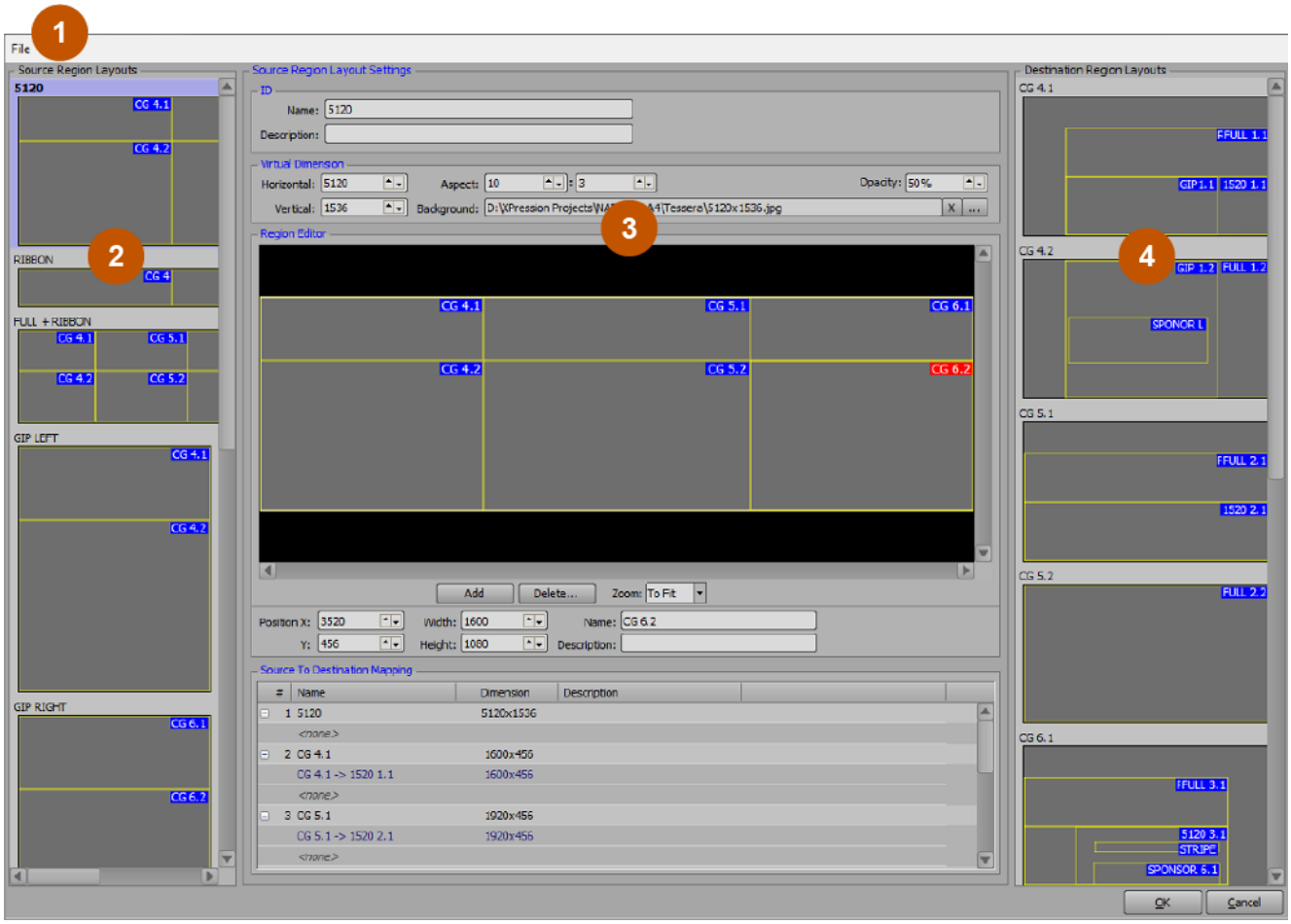
This section provides a user interface overview for the XPression Tessera Region Mapper. It includes the following:

XPression Tessera Region Mapper - Source Region Layout Settings

XPression Tessera Region Mapper - Destination Region Layout Settings

XPression Tessera Region Mapper - Source Region Layout Settings

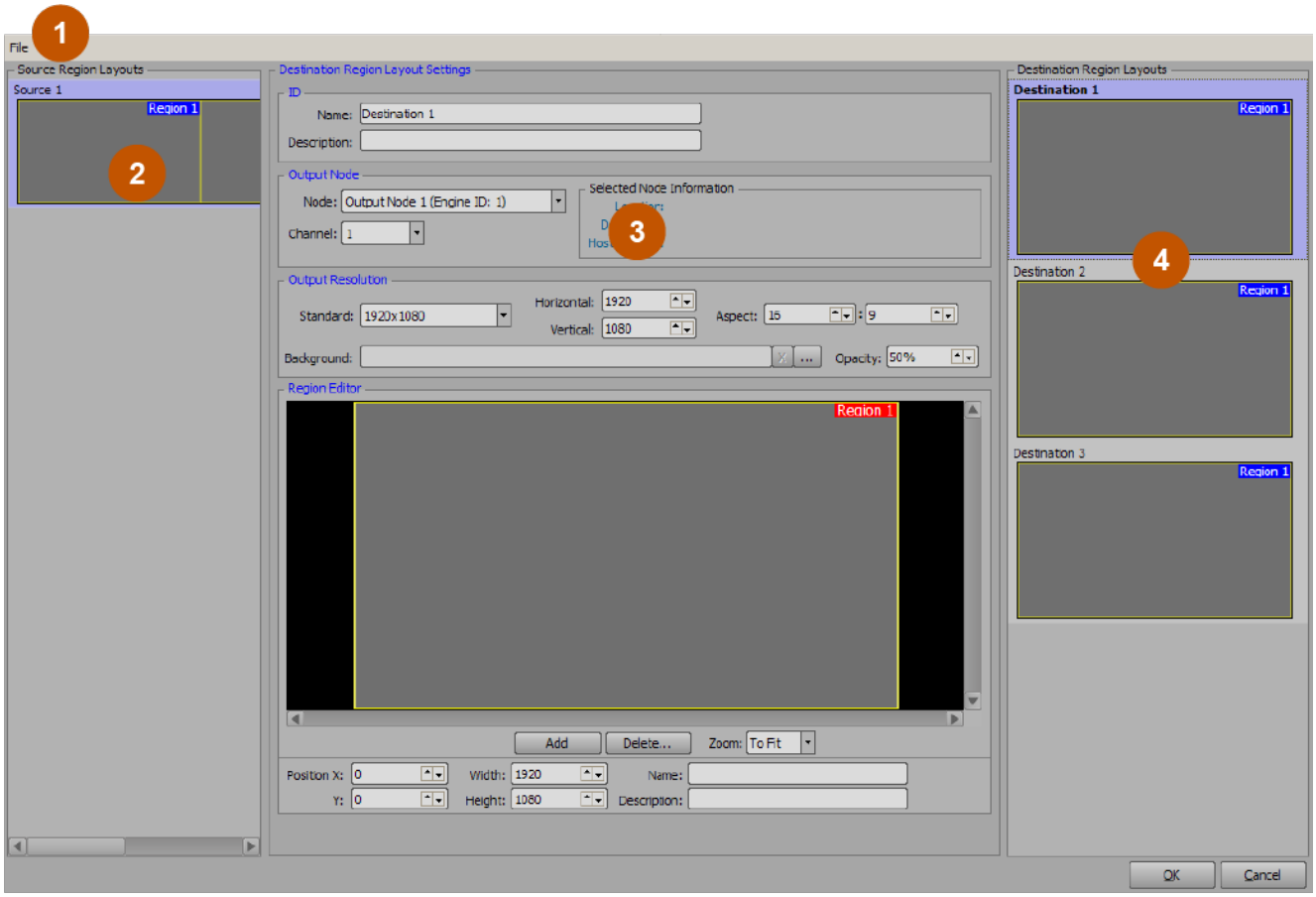
The following screen capture displays the main elements of the XPression Tessera Region Mapper window in XPression with the **Source Region Layout** section of the selected source region.



1. **Menu Bar** — use the **File** menu to load a configured region map from a saved file or save a configuration.
2. **Source Region Layouts** — use this section to add and delete source outputs of specific resolution and regions across multiple channels of XPression on multiple render engines.
3. **Source Region Layout Settings** — use this section to configure the settings for a selected source, including defining the region and mapping sources to destinations.
4. **Destination Region Layouts** — use this section to add and delete destination framebuffer outputs with rendered regions that are mapped to source outputs.

XPression Tessera Region Mapper - Destination Region Layout Settings

The following screen capture displays the main elements of the XPression Tessera Region Mapper window in XPression with the **Destination Region Layout** section of the selected destination region.



1. **Menu Bar** — use the File menu to load a configured region map from a saved file or save a configuration.
2. **Source Region Layouts** — use this section to add and delete source outputs of specific resolution and regions across multiple channels of XPression on multiple render engines.
3. **Destination Region Layout Settings** — use this section to configure the settings for a selected destination, including defining the region.
4. **Destination Region Layouts** — use this section to add and delete destination framebuffer outputs with rendered regions that are mapped to source outputs.

Setting up XPression Tessera

The XPression Tessera setup consists of the following concepts and workflow:

- Tessera can consist of either a master controller and output node engines, or a single engine setup. The master controller has no actual physical outputs. Output nodes are render devices which do not require a user interface. In single engine mode, the single engine acts as the master controller and output engine.
- Scenes are typically created at the actual size (resolution) that they are to be displayed, but do not have to be.
- There are two elements to a Tessera mapping: **Source Region Layouts** and **Destination Region Layouts**.
  - **Source Region Layouts** are "region masks" applied to an XPression scene, and in turn these regions are mapped to destination regions.
  - **Destination Region Layouts** can be viewed as if they are framebuffer outputs. Each destination has regions that will be rendered to, allowing for the slicing of pieces of the overall full resolution canvas should non-standard resolution displays be rendered to.
  - **Source Region Layouts** are eventually mapped to **Destination Region Layouts**. For example, a destination could have two regions from two sources that would be stitched together.
- Every engine must have GenLock. All engines must be locked to the same GenLock/reference.
- Each XPression turnkey engine has two network cards. One network interface can link to a public network for internet, and the other can link to the private Tessera network. The network synchronization is accomplished using UDP.

  Note: managed networks may prioritize TCP over UDP, affecting the performance of the synchronization.
- When using multiple engines, projects are centrally located on an XPression Project Server. Every Tessera graphics project MUST be uploaded once to the project server and then re-deployed to the local disk. If the project is simply saved, it will not be synced.

The following topics are discussed in this section:

Tessera Multiple Engine Mode

Tessera Single Engine Mode

Region Mapping

Saving Region Mappings

Using a Preview Output on a Tessera Master

Preview and Monitoring

Previsualization

Scenes

Saving and Publishing a Project

Tessera Backup System

Tessera Master / Tessera SE Replication

Assigning a Source Output to a Scene or Scene Group in the Object Inspector

Tessera Multiple Engine Mode

Using the **Tessera Settings** (XPression Studio) or **Tessera Setup** (XPression BlueBox) dialog, the output node engines, preview node engines, and the master engine can be defined and configured. Use the following sections to configure a multiple engine Tessera setup:

Preconditions

Setting up an Output Node Engine

Setting up a Preview Node Engine

Setting Up the Master Engine

Tessera Output Nodes

Using Clips with Tessera Multiple Engine Mode

Using DataLinq with Tessera Multiple Engine Mode

Preconditions

The following items should be completed before setting up an XPression Tessera project:

- The master XPression engine, the output node XPression render engines, and the XPression Project Server are connected within the network. All render engines must be linked to the same Project Server or else the render engines will not be able to retrieve the master project.
- If using multiple engines, projects have been centrally located on the XPression Project Server where they can be deployed from the master engine.

Setting up an Output Node Engine

Output node engines can be configured in XPression Studio and/or XPression BlueBox. Setting up the output render engines first allows for a one-stop configuration of the controlling master engine after.

★Output node channels should only be hardware channels; server channels or virtual outputs should not be used.

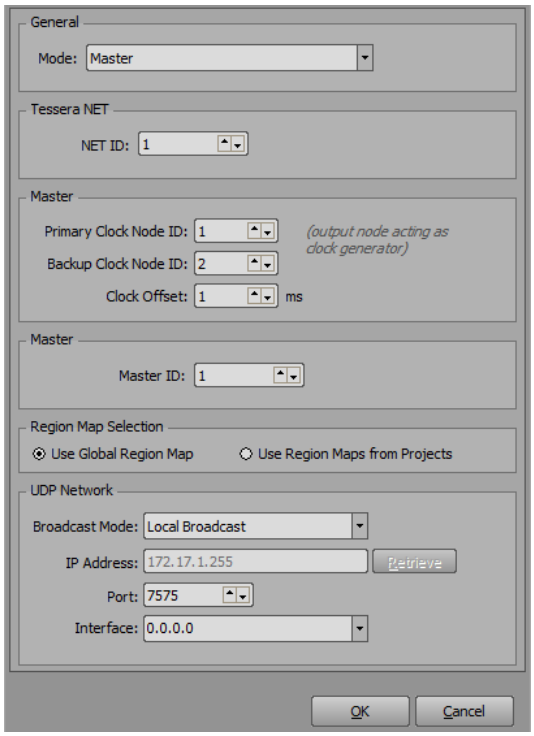
★Ensure in the **Editor** section of the **Preferences** menu (in Studio) and the **BlueBox** section of the **Preferences** menu (in BlueBox) that the **Do Not Create Untitled Project** checkbox is selected.

★For the Tessera Master Duo edition, you can only have two nodes, either one primary node and one backup node, or two primary nodes.

To set up an output node engine:

1. Depending on whether the output node engine is being configured on Studio or BlueBox, do one of the following:
   - In XPression Studio on an output node engine, select **Edit > Tessera > Settings** to open the **Tessera Settings** dialog.
   - On an XPression BlueBox machine, right-click on the **XPression BlueBox** icon ( ) in the Windows system tray and select **Tessera Setup** from the menu to open the **Tessera Setup** dialog.

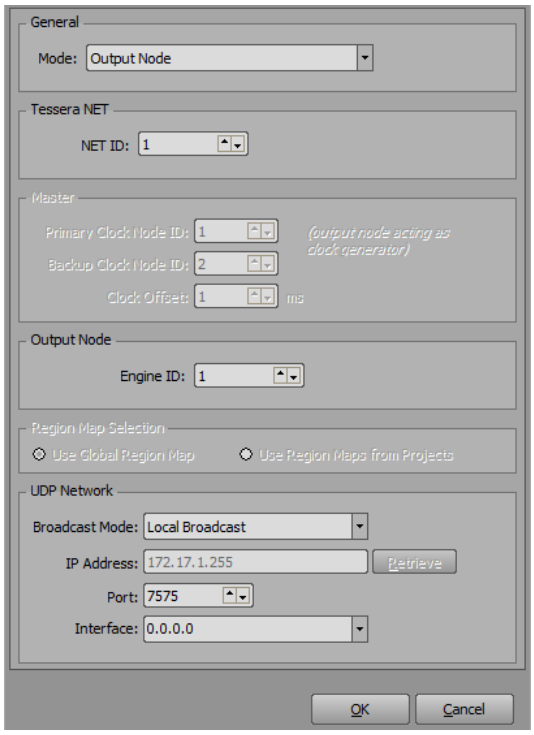
   The **Tessera Settings** / **Tessera Setup** dialog opens.



★The **Master** section with the **Clock Node ID** fields is only available on Studio versions.

2. In the **General** section, from the **Mode** drop-down, select **Output Node**.

   The **Tessera NET**, **Output Node**, and **UDP Network** sections become available for configuration.



3. In the **Tessera NET** section, in the **NET ID** field, enter or select a NET ID if using multiple master/node combinations in parallel on the same network.
4. In the **Output Node** section, in the **Engine ID** field, enter or select an engine ID to use to indicate to other machines which output device this output node engine is, relative to the rest of the system.

   A different engine ID is required for each output node engine in the system.
5. In the **UDP Network** section, from the **Broadcast Mode** drop-down, set the broadcast mode to one of the following and then follow the instructions in the link to configure the IP address and port:

   - Local Broadcast — broadcast packets to all local network addresses.
   - Broadcast IP — broadcast packets to a specific subsection of the network, for example, 192.168.1.255.

   ★Some routers prevent broadcasting packets as a local broadcast. For example, 255.255.255.

   - Multicast — allow Tessera to subscribe and send data to a Multicast group using any source multicast.

Local Broadcast

If using the **Local Broadcast** option, do the following:

- In the **IP Address** field, enter 255.255.255.255 as the IP broadcast address to broadcast packets to all of the local network addresses.
- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.

Broadcast IP

If using the **Broadcast IP** option, do the following:

- In the **IP Address** field, enter the IP address of the broadcast network.

  This address is used as an IP filter. For example, if the system is set up to function in a 192.168.1.XXX space, use 192.168.1.255 as the IP address to indicate that devices could be located anywhere between 192.168.1.1 and 192.168.1.254. This also ensures that if dual network cards are used, and one of the cards is on a different network address range, Tessera synchronization traffic will not be broadcast to the public side of the network.

  OR

  Select **Retrieve** to have XPression determine the subnet to use for broadcasting.

- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.

Multicast

If using the **Multicast** option, do the following:

- In the **IP Address** field, enter the IP address of the broadcast network.

  OR

  Select **Retrieve** to have XPression determine the subnet to use for broadcasting.

- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.

- In the **Interface** field, enter the IP address of the machine from which the broadcast will come.

6. Select **OK**.

   The output node engine settings are applied and the dialog closes.

7. Repeat steps 1 to 6 for any other output node engines in the system.

Setting up a Preview Node Engine

Preview node engines can be configured in XPression Studio and/or XPression BlueBox. Setting up the preview render engines first allows for a one-stop configuration of the controlling master engine after.

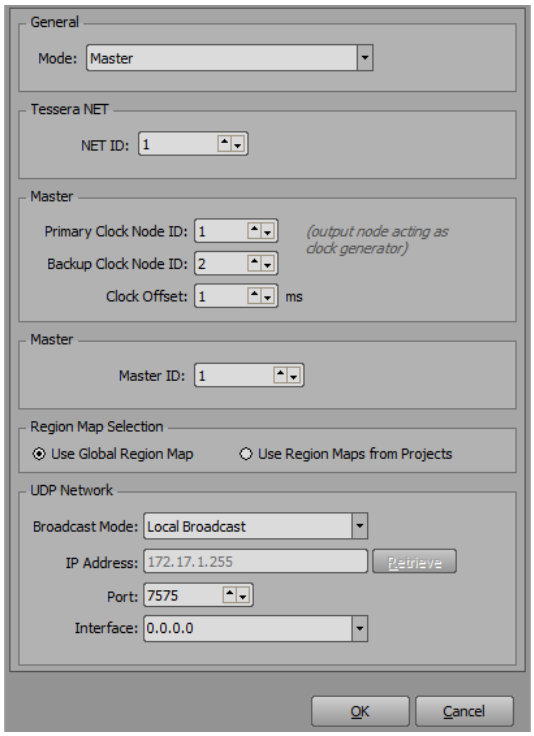
A Tessera preview node can be used to render a live confidence monitor, up-next preview, or previsualization.

To set up a preview node engine:

1. Depending on whether the preview node engine is being configured on XPression Studio or XPression BlueBox, do one of the following:

   - In XPression Studio on a preview node engine, select **Edit > Tessera > Settings** to open the **Tessera Settings** dialog.
   - On an XPression BlueBox machine, right-click on the XPression BlueBox icon ( ) in the Windows system tray and select **Tessera Setup** from the menu to open the **Tessera Setup** dialog.

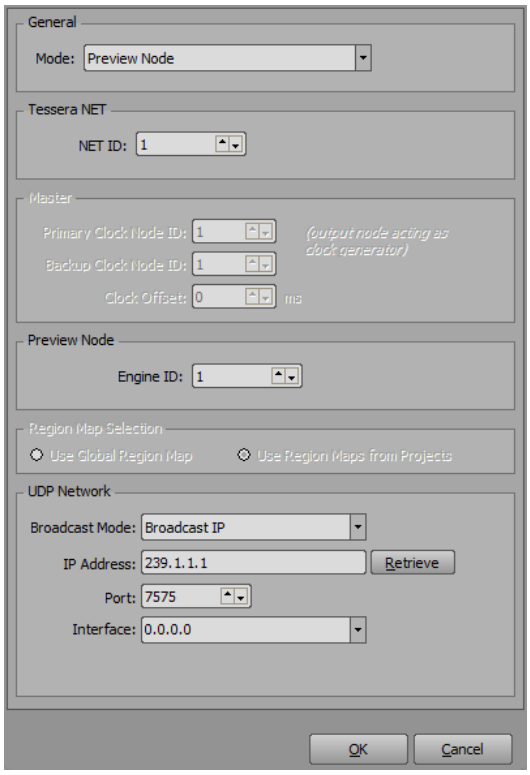
   The **Tessera Settings** / **Tessera Setup** dialog opens.



★The **Master** section with the **Clock Node ID** fields is only available when configuring a Master engine.

2. In the **General** section, from the **Mode** drop-down, select **Preview Node**.

   The **Tessera NET**, **Preview Node**, and **UDP Network** sections become available for configuration.



3. In the **Tessera NET** section, in the **NET ID** field, enter or select a NET ID if using multiple master/node combinations in parallel on the same network.
4. In the **Preview Node** section, in the **Engine ID** field, enter or select an engine ID to use to indicate to other machines which output device this preview node engine is, relative to the rest of the system.

   A different engine ID is required for each preview node engine in the system
5. In the **UDP Network** section, from the **Broadcast Mode** drop-down, set the broadcast mode to one of the following and then follow the instructions in the link to configure the IP address and port:
   - Local Broadcast — broadcast packets to all local network addresses.
   - Broadcast IP — broadcast packets to a specific subsection of the network, for example, 192.168.1.255.

     ★Some routers prevent broadcasting packets as a local broadcast. For example, 255.255.255.
   - Multicast — allow Tessera to subscribe and send data to a Multicast group using any source multicast.

Local Broadcast

If using the **Local Broadcast** option, do the following:

- In the **IP Address** field, enter 255.255.255.255 as the IP broadcast address to broadcast packets to all of the local network addresses.
- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.

Broadcast IP

If using the **Broadcast IP** option, do the following:

- In the **IP Address** field, enter the IP address of the broadcast network.

  This address is used as an IP filter. For example, if the system is set up to function in a 192.168.1.XXX space, use 192.168.1.255 as the IP address to indicate that devices could be located anywhere between 192.168.1.1 and 192.168.1.254. This also ensures that if dual network cards are used, and one of the cards is on a different network address range, Tessera synchronization traffic will not be broadcast to the public side of the network.

  OR

- Select **Retrieve** to have XPression determine the subnet to use for broadcasting.
- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.

Multicast

If using the **Multicast** option, do the following:

- In the **IP Address** field, enter the IP address of the broadcast network.

  OR

- Select **Retrieve** to have XPression determine the subnet to use for broadcasting.
- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.

- In the **Interface** field, enter the IP address of the machine from which the broadcast will come.

6. Select **OK**.

   The preview node engine settings are applied and the dialog closes.

7. Repeat steps 1 to 6 for any other preview node engines in the system.

Setting Up the Master Engine

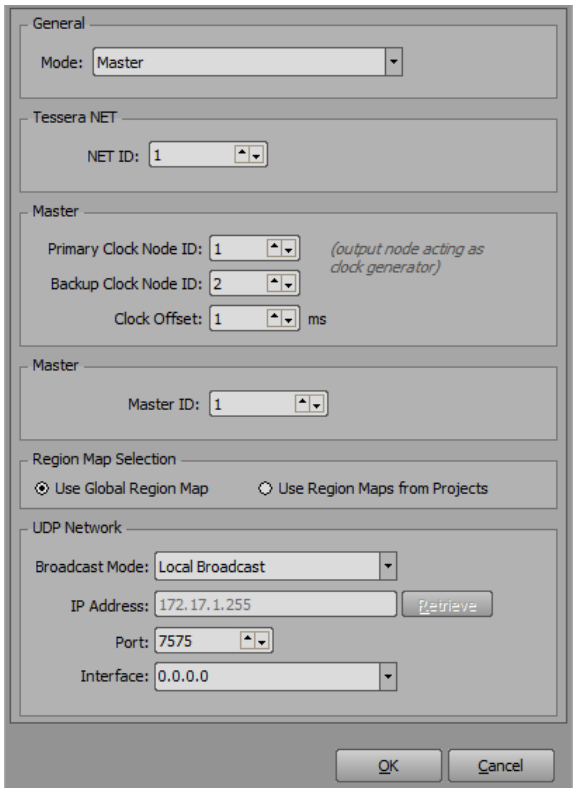
The master engine can only be configured in XPression Studio / XPression Tessera Master versions. Only one master can be configured, and there should be no hardware channels or server channels in the hardware profile. They should all be blank.

For the controlling master engine, use the **Tessera Settings** dialog to configure the master engine settings.

To set up the master engine:

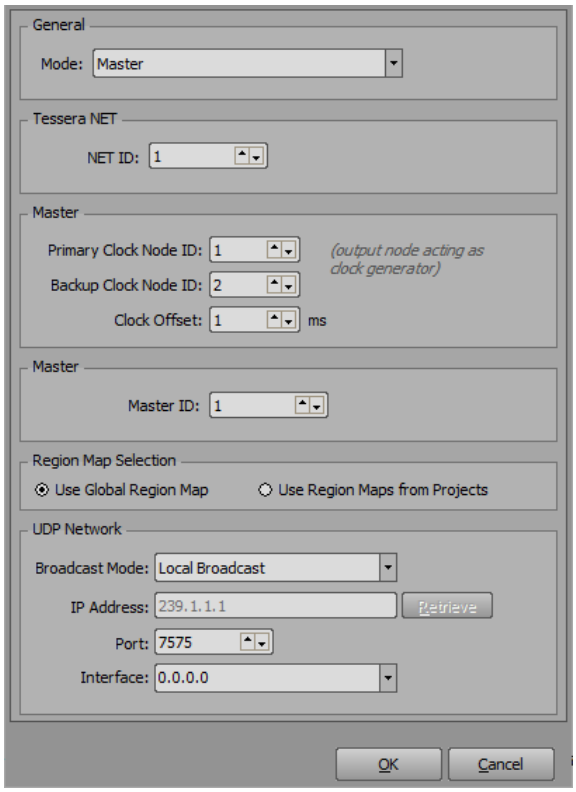
1. In XPression on the master engine, select **Edit > Tessera > Settings**.

   The **Tessera Settings** dialog opens.



2. In the **General** section, from the **Mode** drop-down, select **Master**.

   The **Master** and **UDP Network** sections become available for configuration.



3. In the **Tessera NET** section, in the **NET ID** field, enter or select a NET ID if using multiple master/node combinations in parallel on the same network.
4. In the **Master** section, in the **Primary Clock Node ID** field, enter or select the primary engine node ID to set the clock for all the engines.

   For a single controller setup, the **Primary Clock Node ID** will only be set to **1**.
5. In the **Backup Clock Node ID** field, enter or select an output node engine ID as the backup for the Tessera master should the **Primary Clock Node ID** enter a non-responsive state (**Output Node Timed Out**, **No Communication**, or **Unknown**).
6. In the **Region Map Selection** section, select one of the following:
   - **Use Global Region Map** — use region maps saved globally on the engine.
   - **Use Region Maps from Projects** — use region maps stored in a project file (required for Multicast broadcast).

   ★Using region maps from projects requires a project server.
7. In the **UDP Network** section, from the **Broadcast Mode** drop-down, select one of the following broadcast modes and then follow the instructions in the link to configure the IP address and port:
   - Local Broadcast — broadcast packets to all local network addresses.
   - Broadcast IP — broadcast packets to a specific subsection of the network, for example, 192.168.1.255.

   ★Some routers prevent broadcasting packets as a local broadcast. For example, 255.255.255.
   - Multicast — allow Tessera to subscribe and send data to a Multicast group using any source multicast.

Local Broadcast

If using the **Local Broadcast** option, do the following:

- In the **IP Address** field, enter 255.255.255.255 as the IP broadcast address to broadcast packets to all of the local network addresses.
- In the **Port** field, enter the port number to use for communication between the master and output node engines.

  The default port is **7575**.

Broadcast IP

If using the **Broadcast IP** option, do the following:

- In the **IP Address** field, enter the IP address of the broadcast network.

  This address is used as an IP filter. For example, if the system is set up to function in a 192.168.1.XXX space, use 192.168.1.255 as the IP address to indicate that devices could be located anywhere between 192.168.1.1 and 192.168.1.254. This also ensures that if dual network cards are used, and one of the cards is on a different network address range, Tessera synchronization traffic will not be broadcast to the public side of the network.

  OR

  Select **Retrieve** to have XPression determine the subnet to use for broadcasting.
- In the **Port** field, enter the port number to use for communication between the master and the output node engines.

  The default port is **7575**.

Multicast

If using the **Multicast** option, do the following:

- In the **IP Address** field, enter the IP address of the broadcast network.

  This address is used as an IP filter. For example, if the system is set up to function in a 192.168.1.XXX space, use 192.168.1.255 as the IP address to indicate that devices could be located anywhere between 192.168.1.1 and 192.168.1.254. This also ensures that if dual network cards are used, and one of the cards is on a different network address range, Tessera synchronization traffic will not be broadcast to the public side of the network.

  OR

  Select **Retrieve** to have XPression determine the subnet to use for broadcasting.
- In the **Port** field, enter the port number to use for communication between the output node engine and master engine.

  The default port is **7575**.
- In the **Interface** field, enter the IP address of the machine from which the broadcast will come.

8. Select **OK**.

   The master engine settings are applied and the dialog closes.

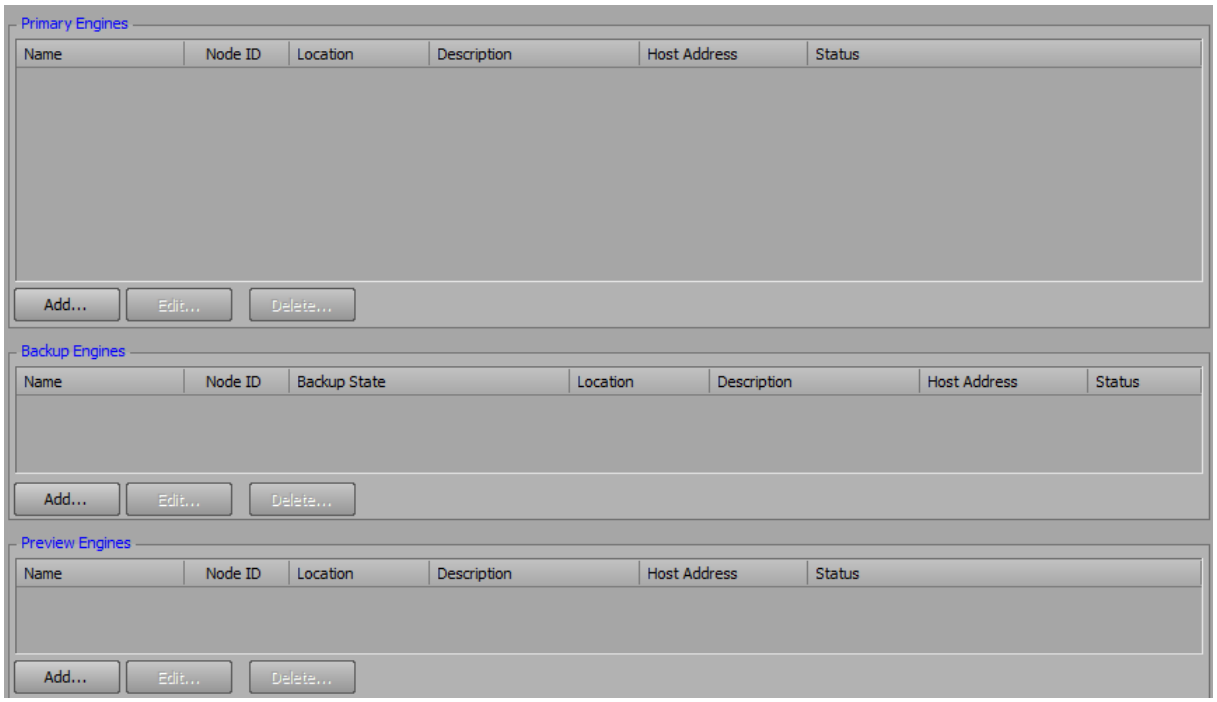
Tessera Output Nodes

Use the XPression Tessera Output Nodes dialog to direct the master device to the XPression output engines (configured as output nodes). Output nodes are configurable in XPression Studio and XPression BlueBox versions.

To configure the output nodes:

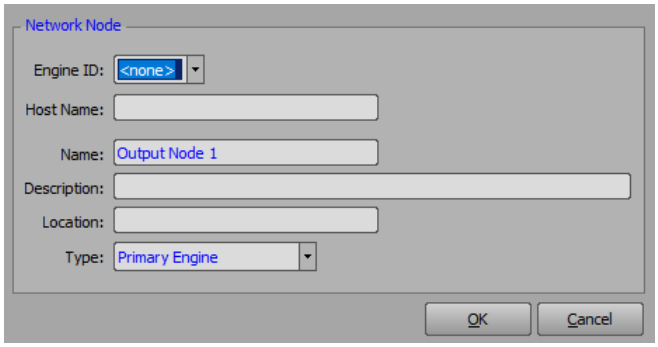
1. In XPression on the master device, select **Edit > Tessera > Output Nodes**.

   The **XPression Tessera Output Nodes** dialog opens.



2. In the **Primary Engines** section, or the **Backup Engines** section, or the **Preview Engines** section, select **Add** to add the type of output node you need.

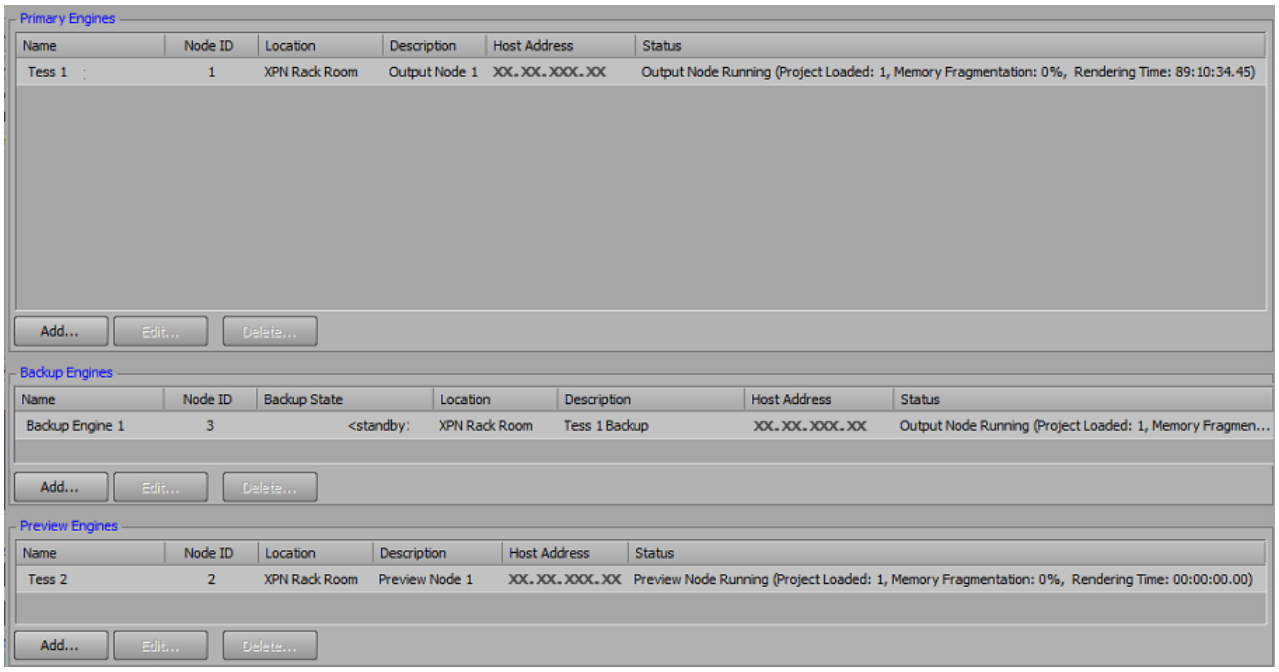
   The **XPression Tessera Output Node** dialog opens.



3. From the **Engine ID** drop-down, select the output node engine ID for the output/backup/preview node.
4. In the **Host Name** field, enter the UNC or IP address of the network to connect the output engines.
5. In the **Name** field, enter a custom name for the output node if necessary.
6. In the **Description** field, enter a brief description for the output node if necessary.

7. In the **Location** field, define the physical location of the engine if necessary.
8. From the **Type** drop-down, select the engine type.
   - **Primary Engine** — use the node as a primary engine. The primary engine is used to direct the master device to the XPression output engines (configured as output nodes).
   - **Backup Engine** — use the node as a backup engine. In the event that a primary engine is unavailable, the backup engine is used to direct the master device to the XPression output engines (configured as output nodes). The engine ID of the backup engine should be matched with a primary engine that uses the same engine ID.
   - **Preview Engine** — use the node as a preview engine. A preview engine is used to render a confidence monitor, an up-next preview, or local previsualization.
9. Select **OK**.

   Primary engines are added to the **Primary Engines** list, backup engines are added to the **Backup Engines** list, and preview engines are added to the **Preview Engines** list.



10. Repeat steps 2 to 9 for any other output engines.

Using Clips with Tessera Multiple Engine Mode

When using clips with Tessera multiple engine mode, ensure that the **XPression Clip Store Manager** is running on all engines. The master engine then needs to sync its contents to the **Clip Stores** on all the other engines so that they all have the same clip assets available.

Using DataLinq with Tessera Multiple Engine Mode

When using DataLinq with Tessera multiple engine mode, the **XPression DataLinq Server** only needs to run on the master engine.

For More Information on...

- the XPression Tessera backup system, refer to Tessera Backup System.

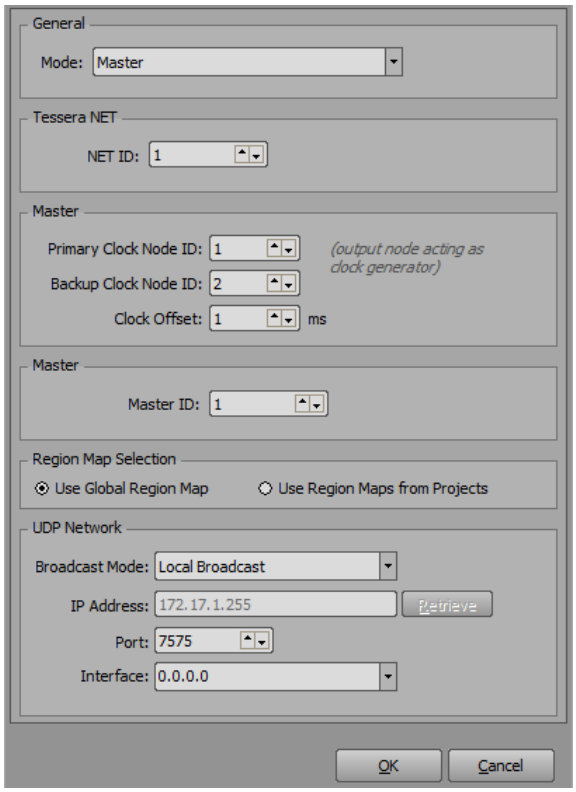
Tessera Single Engine Mode

Use the Tessera single engine option to enable local area mapping within an XPression system.

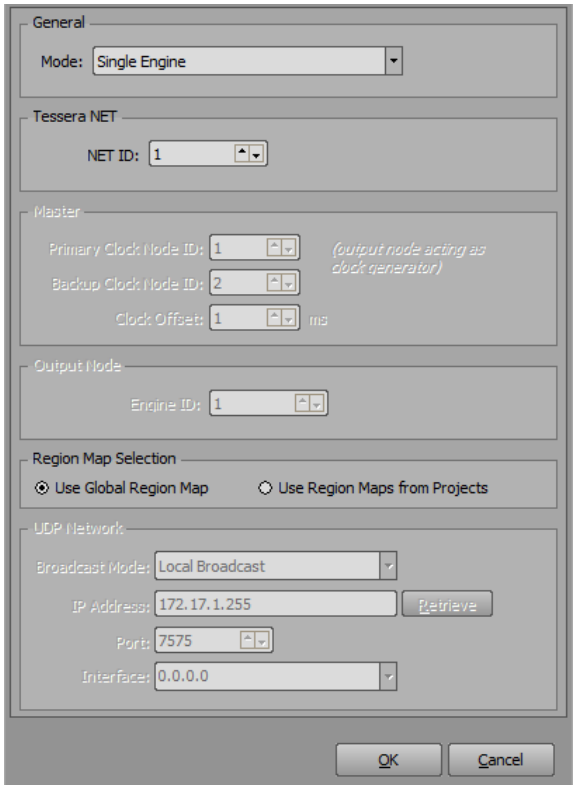
To set up a single engine system:

1. In XPression on the master engine, select **Edit > Tessera > Settings**.

   The **Tessera Settings** dialog opens.



2. In the **General** section, from the **Mode** drop-down, select **Single Engine**.



3. In the **Region Map Selection** section, select one of the following:
   - **Use Global Region Map** — use region maps saved globally on the engine.
   - **Use Region Maps from Projects** — use region maps stored in a project file.

     ★Using region maps from projects requires a project server.
4. Select **OK**.

   The **Tessera Settings** dialog closes.

   In single engine mode, there are no output nodes to configure.

Region Mapping

Use the **XPression Tessera Region Mapper** to map the sources, destinations, and regions. Region mapping is only configurable in Studio versions.

Destination regions are used to display a source that is mapped to it once the sources have been configured.

Source regions are used to select specific sections or portions of a source in order to add them to a specific playback destination.

Multiple sources can be mapped to multiple regions within the destination, which is then outputted to a channel on the output engine. For example, to stitch together multiple full resolution channels into one logical channel, create a region of the full resolution of the output channel, starting it at pixel coordinate width **0**, height **0**.

Once source regions are configured, they need to be mapped to a destination. Mapping indicates to each engine which area of the overall scene is to be rendered.

Configuring a Destination Region Layout

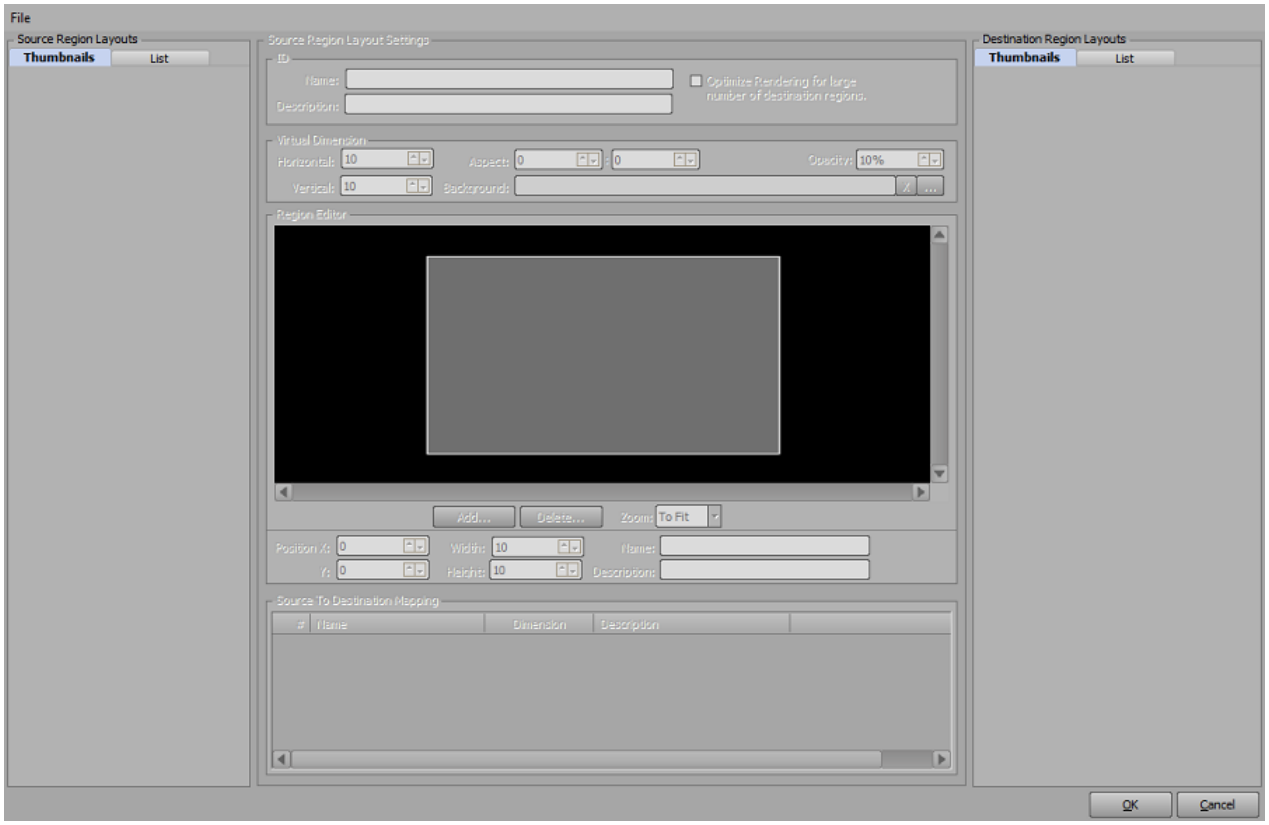
Configuring a Source Region Layout

Mapping a Source to a Destination

To configure a destination region layout:

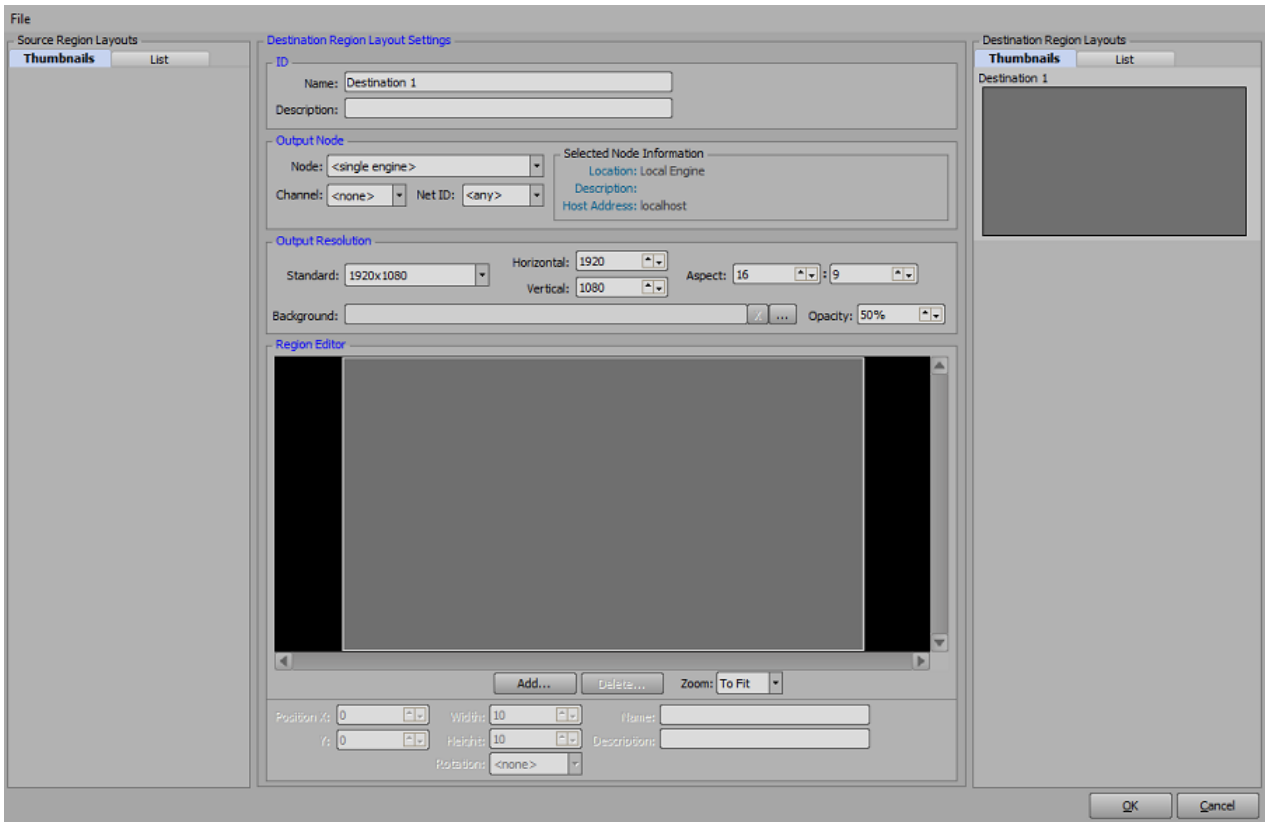
1. In XPression on the master device, select **Edit > Tessera > Region Mapping** (or press **Shift+Ctrl+Alt+R**).

   The **XPression Tessera Region Mapper** opens.



2. In the **Destination Region Layouts** section, right-click and select **Add Destination** from the shortcut menu.

   A new destination is added to the **Destination Region Layouts** list.



3. In the **Destination Region Layout Settings** section, configure the source ID, output node, output resolution, and regions.
4. Repeat steps 2 to 3 to add more destinations as necessary.

   The destination is the playback channel.

To configure the source ID:

1. In the **ID** section, in the **Name** field, enter a custom name for the destination.

   Assuming the output resolution is the same as what is displayed, it is recommended to give it a name. Enter a name that makes sense within the system (for example, CG 1-1, which might indicate output node 1-first output channel, etc.).

2. In the **Description** field, enter a description of the destination.

To configure the Output Node:

1. In the **Output Node** section, from the **Node** drop-down, select the output node of the output engine to be used to output the destination.

   The list is populated by the output nodes previously configured in the **XPression Tessera Output Nodes** dialog, or if using Tessera in single engine mode, is restricted to **<local engine>**.

2. From the **Channel** drop-down, select a playback channel on the output engine for outputting the destination region.

Although there are 12 channels in the list, the number of usable channels is dependent on the number of channels available on the output engine.

3. If using multiple Tessera SE or Tessera Master systems in a MOS workflow, from the **Net ID** drop-down, select a net ID to indicate to which Tessera system the MOS object should be sent.

To configure the Output Resolution:

1. In the **Output Resolution** section, from the **Standard** drop-down, select a standard pixel dimension or select **Custom** to use a custom resolution.
2. If using a custom resolution, in the **Horizontal** and **Vertical** fields, enter or select the dimensions for the custom resolution.

   Also, simply entering or selecting a different value will automatically select **Custom** from the **Standard** drop-down.
3. In the two **Aspect** fields, enter or select the aspect ratio for the destination.

   These fields are automatically entered if a **Standard** output resolution is selected.
4. In the **Opacity** field, enter or select the transparency value for the background image.
5. Select **Browse** (...) to locate and select a file to use as the background in the destination, or enter a file path in the **Background** field.

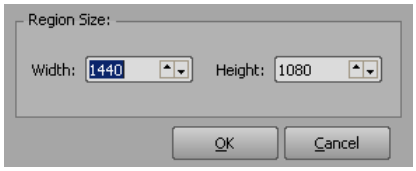
   Backgrounds are used as a reference to clearly delineate between regions and color code them as desired (for example, red regions can represent advertisements, blue regions can represent stats, etc.). Do this by creating an image file that fits the canvas and is representative of the regions.

To configure a Region:

1. From the **Zoom** drop-down, select a percentage size of the destination canvas to display in the **Region Editor** display.

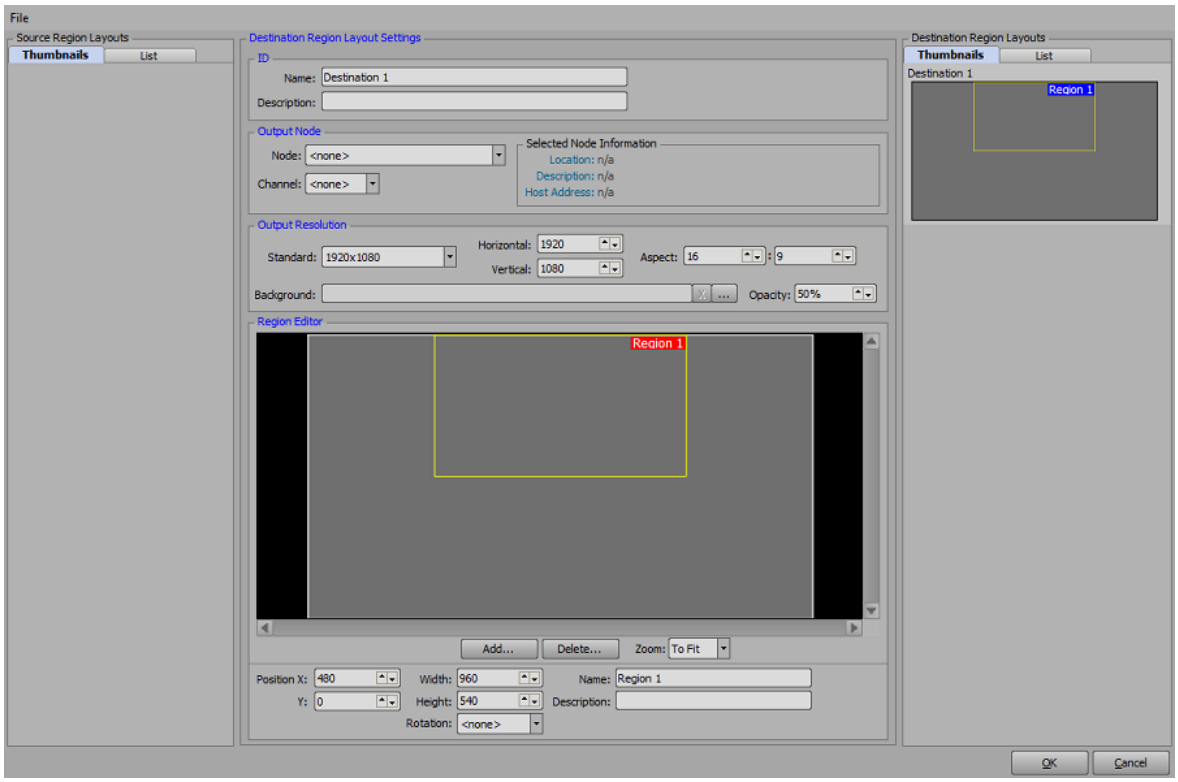
   Selecting **To Fit** will size the canvas to fit the size of the **Region Editor** display.
2. In the **Region Editor** section, select **Add** to create a destination region.

   The **New Region** dialog opens.



3. In the **Width** and **Height** fields, enter or select a size (in pixels) for the new region and select **OK**.

A region is added to the destination canvas in the **Region Editor** display and a thumbnail image is added to the **Destination Region Layouts** list.



4. In the **Position X** and **Y** fields, enter the coordinates to adjust the location of the region along the X-axis and Y-axis within the destination canvas.
5. In the **Width** and **Height** fields, enter the desired size (in pixels) of the region.
6. From the **Rotation** drop-down, select a degree of rotation for the region.

   The options are:

   - **<none>** — apply no degree of rotation to the selected region.
   - **90 degrees**
   - **180 degrees**
   - **270 degrees**

   ★The rotation is only visible on the output and not in the region editor.
7. In the **Name** field, enter a name for the region.
8. In the **Description** field, enter a description about the region.
9. Repeat steps 2 to 8 to add more regions to the destination as necessary.

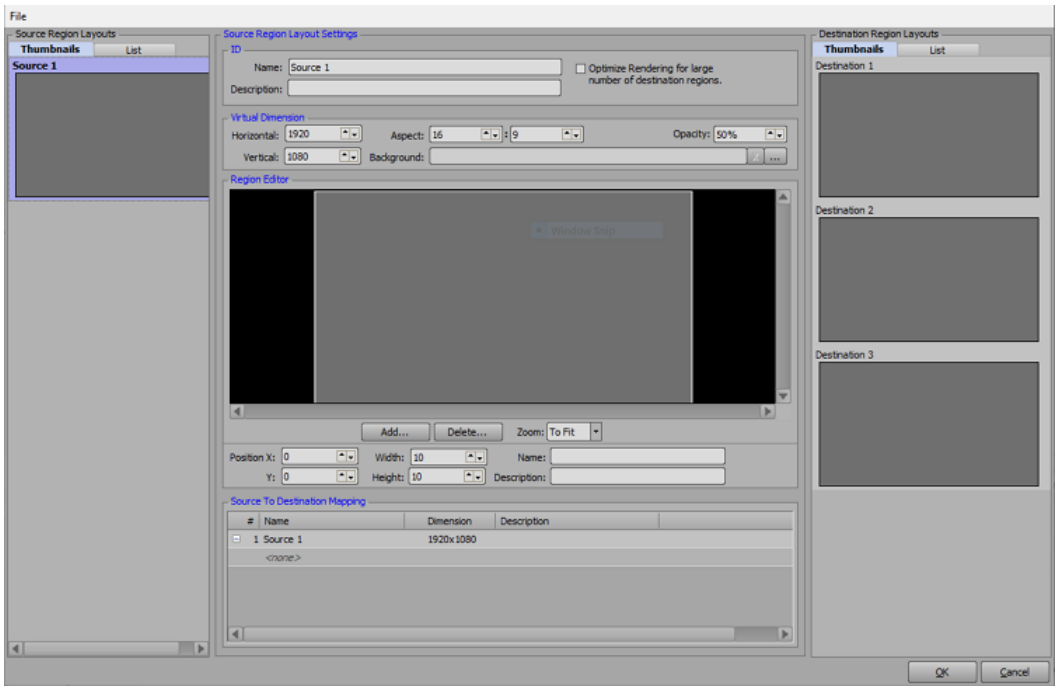
To copy and paste a region:

1. Right-click on a region in the **Region Editor** and select **Copy Region** from the shortcut menu.
2. Right-click in the same or a different **Region Editor** and select **Paste Region** from the shortcut menu.

To configure a source region layout:

1. In the **Source Region Layouts** section, right-click and select **Add Source** from the shortcut menu.

   A new source is added to the **Source Region Layouts** list. Sources in the list can be dragged and dropped into a different order.



2. In the **Source Region Layout Settings** section, configure the source ID, virtual dimensions, regions, and mapping.

   Because Tessera renders one single scene to multiple output channels, there is no single channel in which to render. So a virtual channel must be created, called a source.

To configure the source ID:

1. In the **ID** section, in the **Name** field, enter a custom name for the source.
2. In the **Description** field, enter a custom description of the source.
3. Select the **Optimize Rendering for large number of destination regions** checkbox for high performance rendering when a source is mapped to many destination regions and the scene size is extremely wide or tall.

   This is useful in ribbon board workflows, etc.

To configure the virtual dimensions:

1. In the **Virtual Dimension** section, in the **Horizontal** and **Vertical** fields, enter or select the horizontal and vertical dimensions (in pixels) for the source.
2. In the two **Aspect** fields, enter or select the aspect ratio for the source.

   The **Virtual Dimension** and **Aspect** fields automatically data-fill depending on which is configured first. For example, aspect ratios do not need to be manually calculated if the dimensions have been entered.

3. In the **Opacity** field, enter or select the percentage of opacity for the selected background.

4. Select **Browse** (...) to locate and select a file to use as the background in the source, or enter a file path in the **Background** field.

   Backgrounds are used as a reference to clearly delineate between regions and color code them as desired (for example, red regions can represent advertisements, blue regions can represent stats, etc.). Do this by creating an image file that fits the canvas and is representative of the regions.

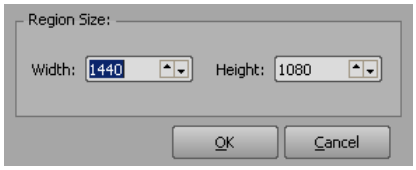
To configure a region:

1. Use the **Zoom** drop-down to select a percentage size of the region dimension to display in the **Region Editor** display.

   Selecting **To Fit** will size the source to fit the size of the **Region Editor** display.

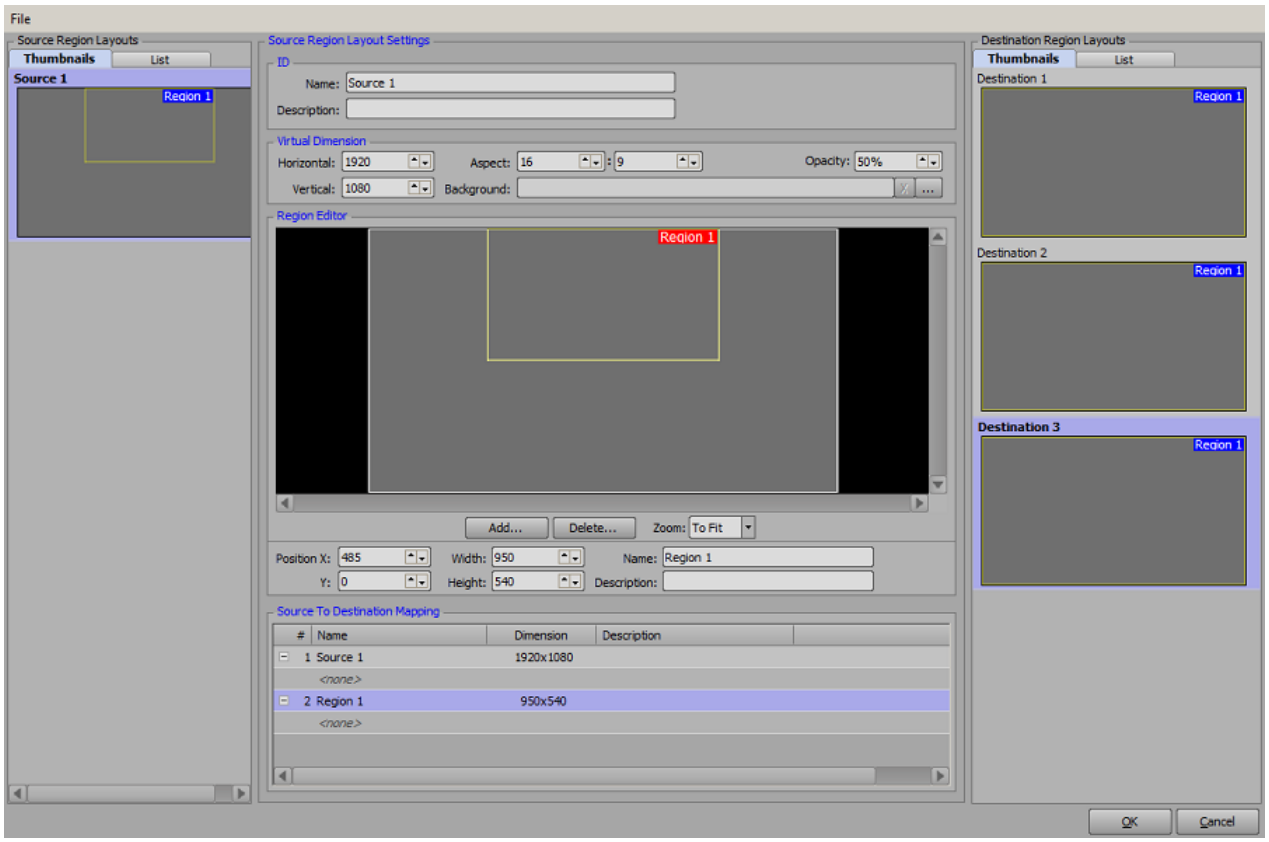
2. In the **Region Editor** section, select **Add** to create a source region.

   The **New Region** dialog opens.



3. In the **Width** and **Height** fields, enter or select a size (in pixels) for the new region and select **OK**.

   A region is added to the source canvas in the **Region Editor** display, and the **Source To Destination Mapping** list, and a thumbnail image is added to the **Sources** list.



4. In the **Position X** and **Y** fields, enter coordinates to adjust the location of the region along the X-axis and Y-axis within the source canvas.

5. In the **Width** and **Height** fields, enter the desired size (in pixels) of the region.

6. In the **Name** field, enter a name for the region.
7. In the **Description** field, enter a description of the region.
8. Repeat steps 2 to 7 for any other source region layouts as necessary.

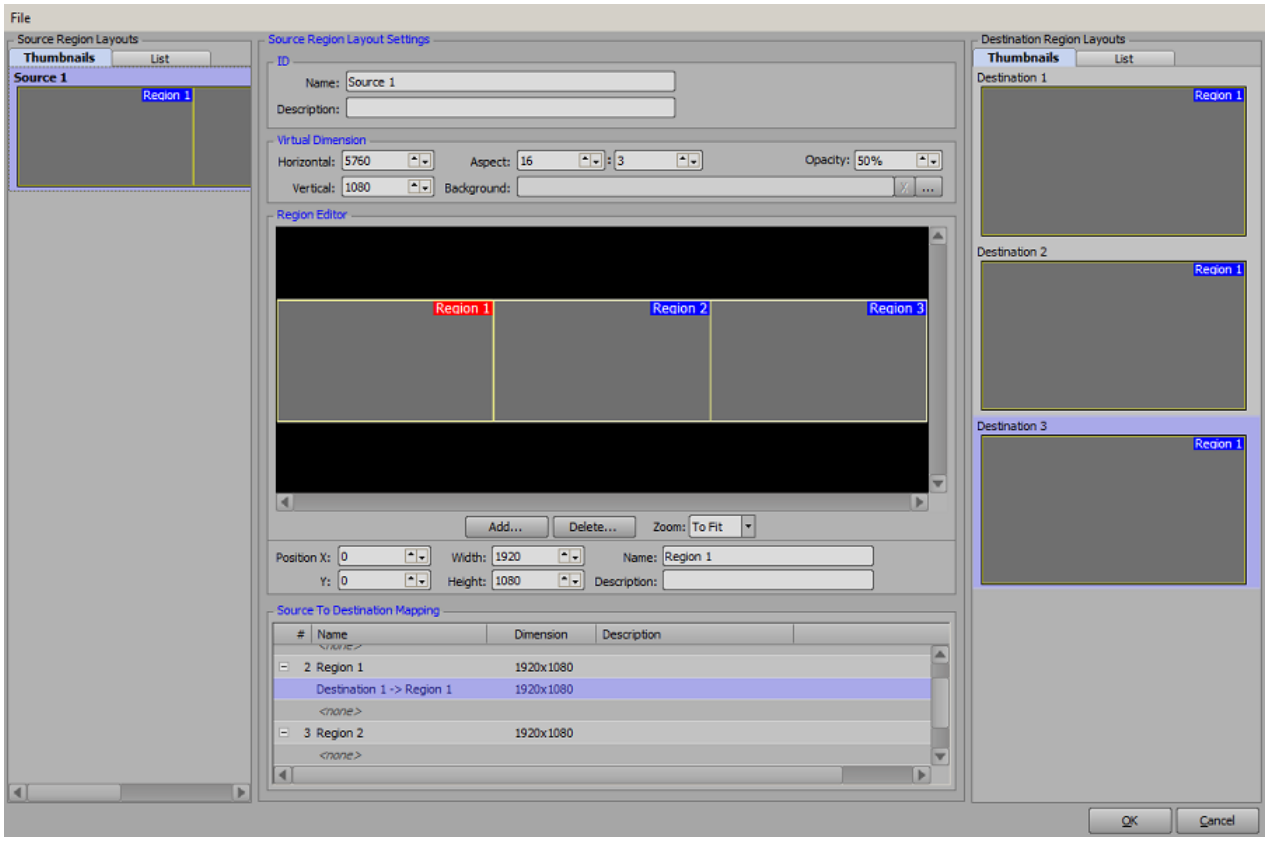
To duplicate a source region layout:

- Right-click a source and from the shortcut menu, select **Duplicate Source**.

To map a source to a destination:

1. In the **Source To Destination Mapping** table, select **<none>** under a source **Region** and from the drop-down, select the desired playback destination or destination region for the source region.

   If mapping the source to the entire destination canvas, select the destination. If mapping the source to a region within the destination canvas, select the specific region within the destination.



2. Repeat step 1 for all regions in the table.
3. Select **File > Save To File** to save the region mapping to an **.xprgm** file.

To copy and paste a region:

1. Right-click on a region in the **Region Editor** and select **Copy Region** from the shortcut menu.
2. Right-click in the same or a different **Region Editor** and select **Paste Region** from the shortcut menu.

Saving Region Mappings

Individual region mappings can be saved and loaded in the XPression Tessera Region Mapper.

To save a region mapping:

1. In the **XPression Tessera Region Mapper**, select **File > Save To File**.

   The **Save As** file browser opens.
2. Select a folder for the file and select **Save** to save the region mapping to an **.xprgm** region mapper file.

To load a saved file:

- In the **XPression Tessera Region Mapper**, select **File > Load From File**.

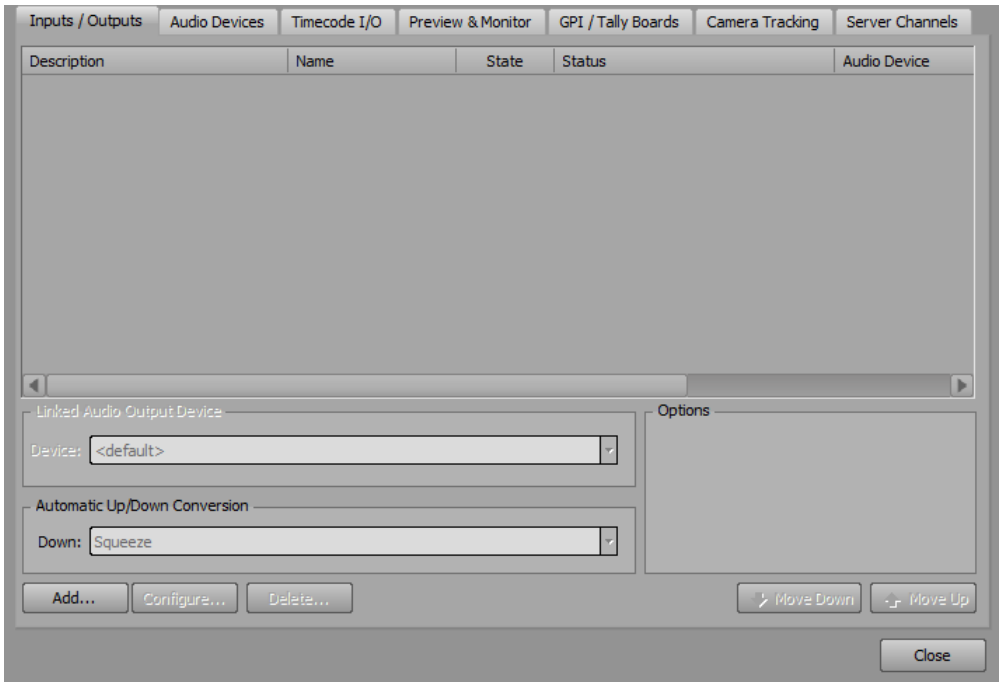
Using a Preview Output on a Tessera Master

The Tessera master can use local framebuffers as a preview output.

To set up a preview output:

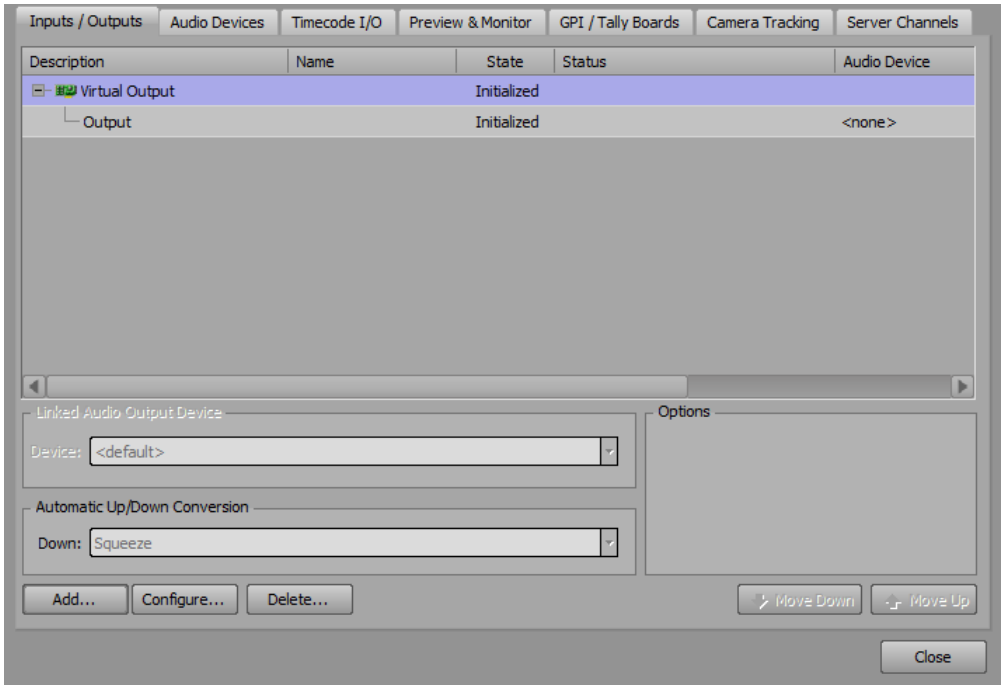
1. On the Tessera master, select **Edit > Hardware Setup**.

   The **Hardware Setup** dialog opens.



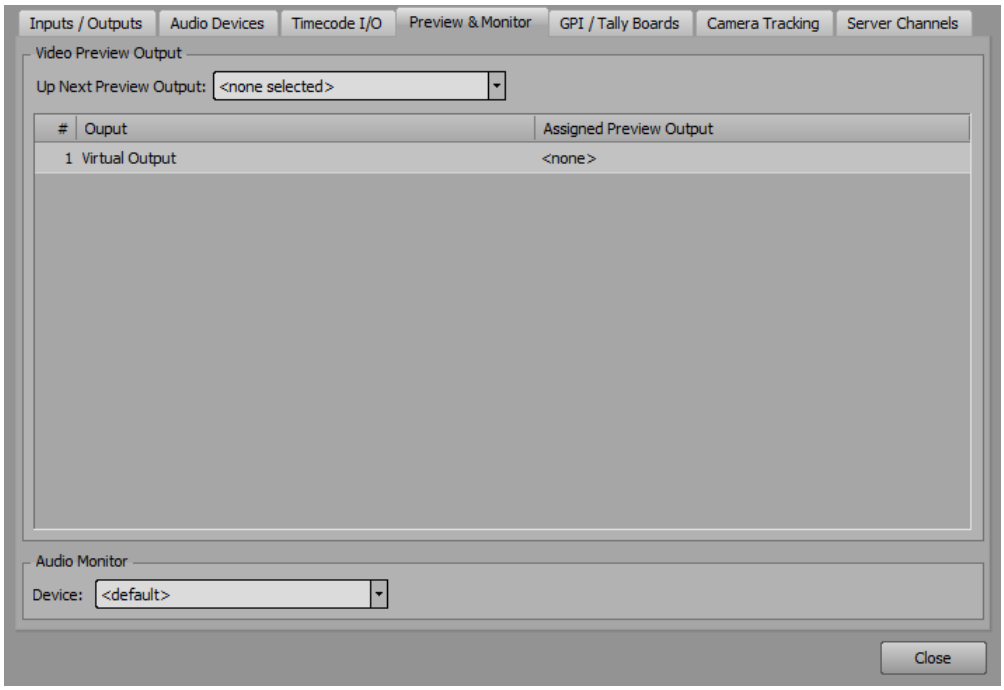
2. Configure an output.

   The output is added to the **Inputs / Outputs** list.



3. Select the **Preview & Monitor** tab.

   The **Preview & Monitor** tab opens.



4. In the **Video Preview Output** section, from the **Up Next Preview Output** drop-down, select the output to use for the Tessera master preview.

For More Information on...

- configuring a framebuffer output, refer to System Setup.

Preview and Monitoring

Tessera Preview and Monitoring is a set of features that provide live confidence monitoring and up-next previews for a Tessera workflow, as well as previsualization capabilities, either during design or during a show. The monitoring, preview, and previsualization outputs can be shared using one of the following layouts:

Dynamic Grid (default) — shows every Tessera output channel (from every configured Tessera output node) that is used by at least one Tessera destination in the region mapper. The outputs are arranged in a N x N grid, where N is the smallest value that can fit the total number of Tessera channels. Each output takes the same space. Each output is displayed sequentially by filling the first row from left to right, then going to the next row, etc. until all outputs are shown. Rows do not necessarily contain all outputs from an engine, nor do they necessarily contain only outputs from an engine.

Custom Scene — user-built custom scene that represents the physical layouts of the Tessera screens. Custom scene layouts are regular XPression scenes built using **Tessera Preview** materials and could use 3D models to match the physical layout. During operation, if a configured custom scene is not found in the loaded projects, any outputs that refer to it will revert to the **Dynamic Grid** layout.

By default, no preview, monitoring or previsualization features are enabled.

The **Tessera Preview and Monitoring** setup can be done on the Tessera Master engine or on a Tessera Single Engine. It also needs to be done on a Tessera Previsualization engine (offline). Note that the same system can be used either in Tessera Master (online) mode or Tessera Previsualization engine (offline/design) mode.

Multiple dynamic grids and/or custom scenes can be added.

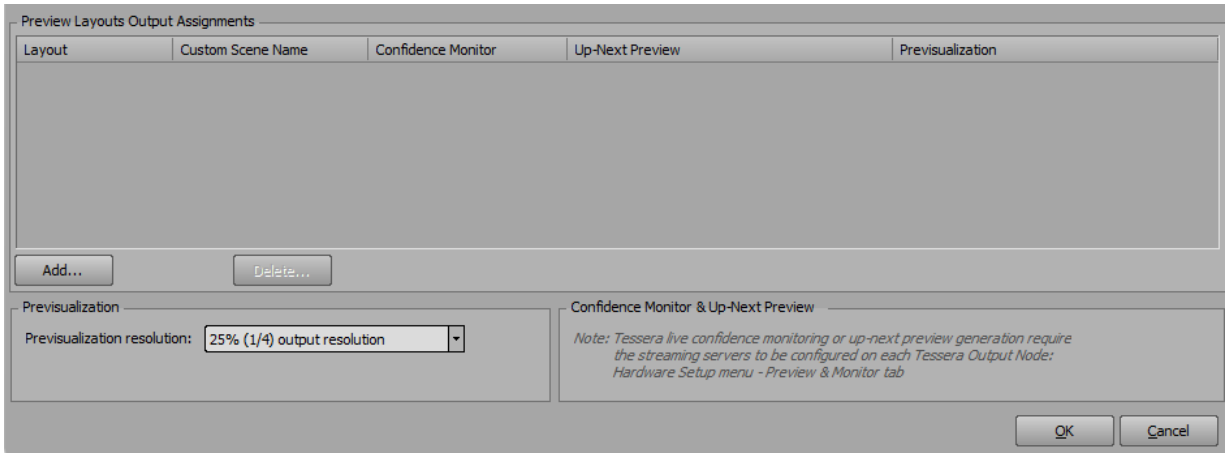
Once outputs are configured as either dynamic grid layouts or custom scenes, you can use RossTalk commands to replace the current Tessera preview scene on an output with either a dynamic grid layout or a custom scene. Refer to the *RossTalk / Smart GPI on XPression* application note for further information.

★Tessera live confidence monitoring or up-next preview generation require the streaming servers to be configured on each Tessera Output Node. See Configuring Video Preview and Audio Monitor for instructions.

To set up a Dynamic Grid:

1. Select **Edit > Tessera > Preview and Monitoring**.

   The **XPression Tessera Preview & Monitoring** window opens.



2. Select **Add**.

   The **Dynamic Grid** layout is added by default.

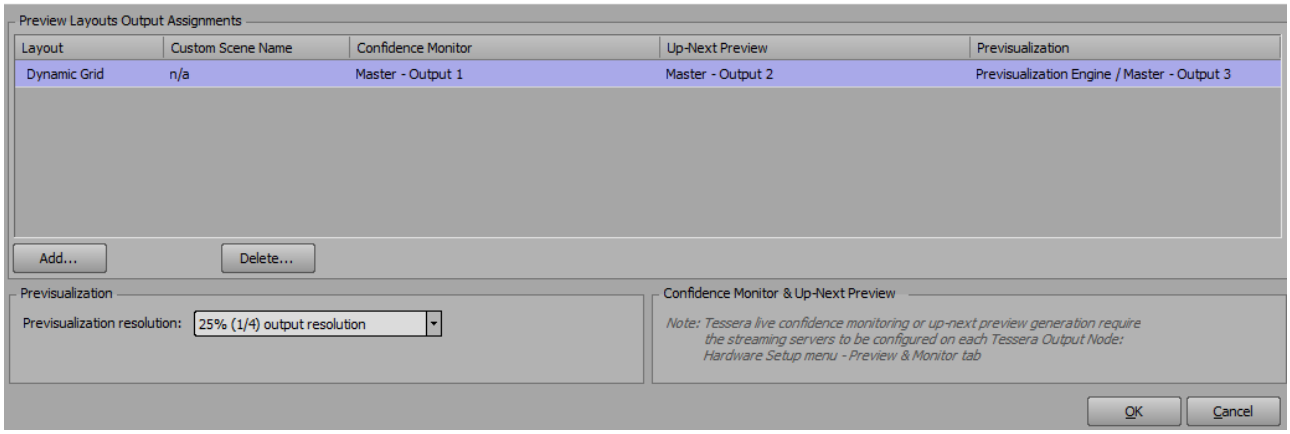
3. Select from the following options:

   In the **Confidence Monitor** field, from the drop-down, select the output on which to display the confidence monitor.

   AND/OR

   In the **Up-Next Preview** field, from the drop-down, select the output on which to display the up-next preview.

4. In the **Previsualization** field, from the drop-down, select the output on which to display the previsualization engine output (required).



5. From the **Previsualization resolution** drop-down, select a resolution.

   The options are:

   - 50% (1/2) output resolution
   - 25% (1/4) output resolution
   - 12.5% (1/8) output resolution
   - 6.25% (1/16) output resolution

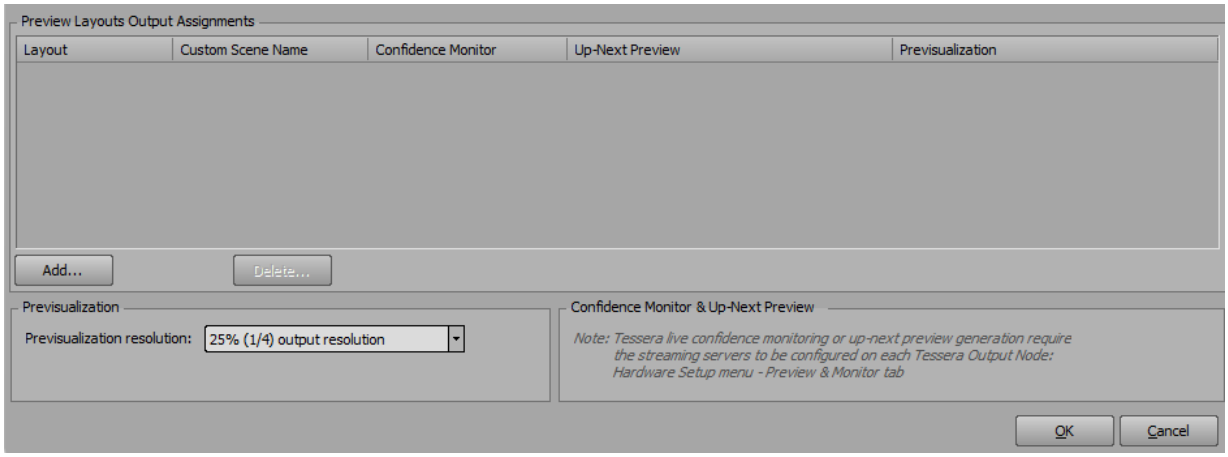
   ★A lower resolution consumes fewer resources and may be adequate for design and testing.

6. Select **OK** to save the settings and close the window.

To set up a custom scene:

1. Select **Edit > Tessera > Preview and Monitoring**.

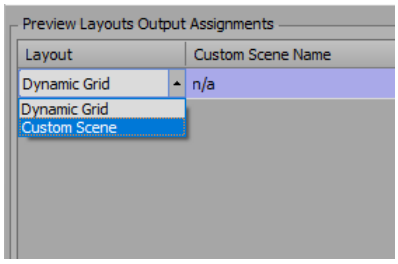
   The **XPression Tessera Preview & Monitoring** window opens.



2. Select **Add**.

   The default **Dynamic Grid** layout is added by default.

3. In the **Layout** column, from the drop-down, select **Custom Scene**.



4. In the **Custom Scene Name** field, enter the name of the custom scene that was created.

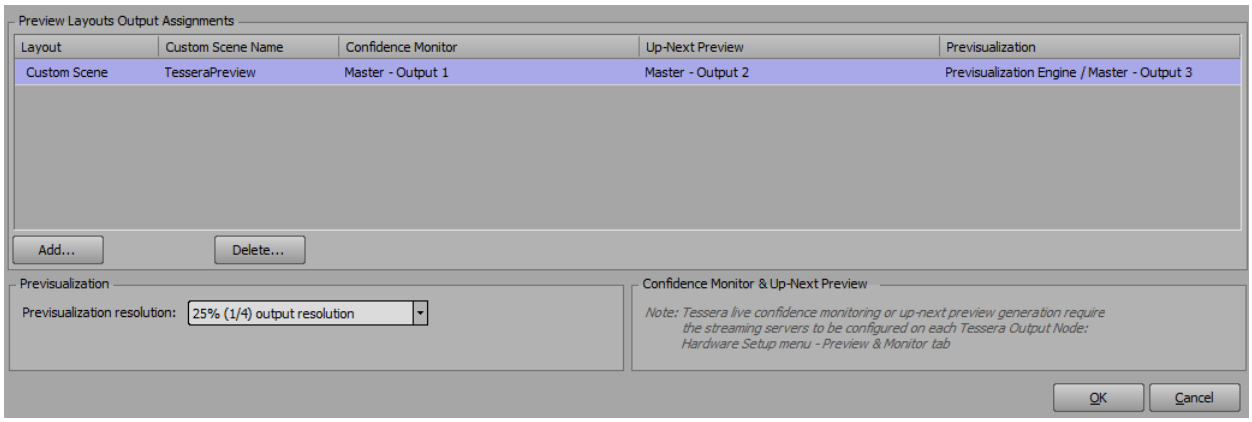
5. Select from the following options:

   In the **Confidence Monitor** field, from the drop-down, select the output on which to display the confidence monitor.

   AND/OR

   In the **Up-Next Preview** field, from the drop-down, select the output on which to display the up-next preview.

6. In the **Previsualization** field, from the drop-down, select the output on which to display the previsualization engine output (required).



7. From the **Previsualization resolution** drop-down, select a resolution.

   The options are:

   - 50% (1/2) output resolution
   - 25% (1/4) output resolution
   - 12.5% (1/8) output resolution
   - 6.25% (1/16) output resolution

   ★A lower resolution consumes fewer resources and may be adequate for design and testing.

8. Select **OK** to save the settings and close the window.

Previsualization

You can configure previsualization in Tessera to see how a scene will behave when it is played on-air. It allows you to test scene logic, sequencing, animation timing, data updates, conditional behaviors, and transitions before going live.

Previsualization can be set up on a dedicated Tessera Previsualization engine, on a Tessera Master, on a Tessera single engine, or on a Tessera Preview node.

Tessera Previsualization Engine — offline design and testing using a dedicated previsualization engine.

Tessera Master Engine — preview content while simulating a distributed Tessera deployment.

Tessera Single Engine — preview content on a standalone Tessera system.

Tessera Preview Node — render previsualization on a preview node (either an XPression Studio engine or an XPression BlueBox engine.

The same engine can be switched between Tessera Master and Tessera Previsualization Engine modes (i.e., the same system can be used in full Previsualization mode when designing and go back to Master mode during shows.

Each scene that is to be previsualized, needs to have a source defined.

For information about defining sources, see the Region Mapping section.

Viewing Scenes in a Web Browser

For workflows that include multiple nodes you can also view the outputs for each output or preview node in a web browser.

To view outputs in a web browser:

1. Open a web browser on your XPression Tessera Master engine.
2. In the **URL** field, enter the output engine or preview engine host name, followed by `:9056/outputs`.
3. Repeat for each output engine or preview engine in your system.

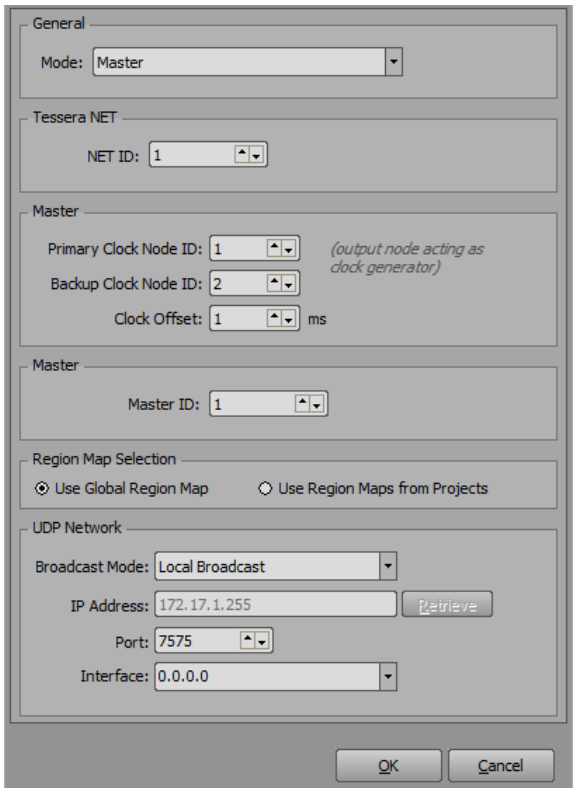
Tessera Previsualization Engine

Use a Tessera Previsualization Engine when designing a Tessera production offline. All you need is a Tessera project and a virtual output.

To configure previsualization on a Tessera Previsualization Engine:

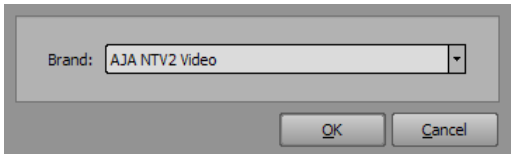
1. In XPression, select **Edit > Tessera > Settings**.

   The **Tessera Settings** dialog opens.



2. From the **Mode** drop-down, select **Previsualization Engine** and then select **OK**.
3. In **Edit > Hardware Setup**, in the **Inputs / Outputs** tab, select **Add**.

   The **Add New FrameBuffer Board** dialog opens.



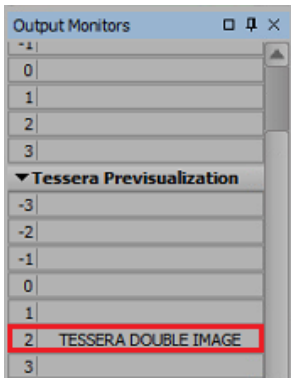
4. In the **Add New FrameBuffer Board** dialog, from the **Board** drop-down, select **XPression Virtual Output** and select **OK**.
5. In the **Virtual Output Settings** dialog, configure the behavior of the virtual output as desired and select **OK**.

   The virtual output is added to the **Inputs / Outputs** tab.

6. Select **Close** to exit from the **Hardware Setup** dialog.

7. Select **Edit > Tessera > Preview & Monitoring** and add a **Dynamic Layout** (this is the default option).
8. In the **Previsualization** column, select **Previsualization Engine / Master - Output 1** and then select **OK**.
9. In the XPression **Sequencer**, double-click a take item (needs to have a Tessera source defined).

   Scenes that are being previsualized will appear in the **Tessera Previsualization** output section and in the virtual output.



Tessera Master Engine

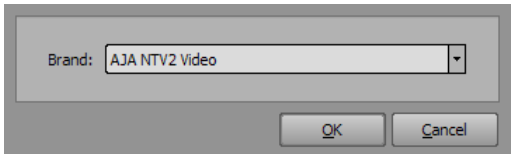
Use the Master engine for previsualization when you are designing for a large distributed Tessera installation, and you want to test the architecture you will actually deploy. You will need to configure at least one virtual output for this mode.

For this workflow, you will need to configure the **Video Output Monitor**. See Configuring Video Preview and Audio Monitor.

To configure previsualization on a Tessera Master:

1. In the XPression Tessera Master engine, select **Edit > Hardware Setup** and select the **Inputs / Outputs** tab.
2. In the **Inputs / Outputs** tab, select **Add**.

   The **Add New FrameBuffer Board** dialog opens.

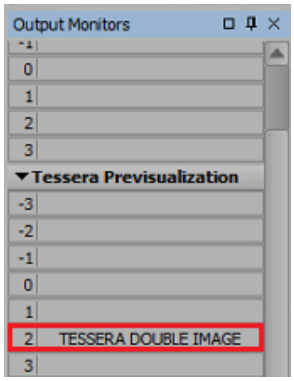


3. In the **Add New FrameBuffer Board** dialog, from the **Board** drop-down, select **XPression Virtual Output** and select **OK**.
4. In the **Virtual Output Settings** dialog, configure the behavior of the virtual output as desired and select **OK**.

   The virtual output is added to the **Inputs / Outputs** tab.
5. In **Edit > Tessera > Preview And Monitoring**, select **Add** and add either a **Dynamic Grid** or **Custom Scene**.
6. In the **Previsualization** column, from the drop-down, select **Previsualization Engine / Master - Output 1**.

   For information about configuring a **Dynamic Grid** or **Custom Scene** see Preview and Monitoring
7. Select **OK**.
8. In the XPression **Sequencer**, right-click a take item (needs to have a Tessera source defined) and select **Send Item to Previsualization**.

   Scenes that are being previsualized will appear in the **Tessera Previsualization** output section and in the virtual output window.



To clear the Tessera Previsualization output:

- Select **Remove Item From Previsualization** to clear the item from the Tessera Previsualization output.

  OR

  Select **Clear All Previsualization** to clear all items from the Tessera Previsualization output.

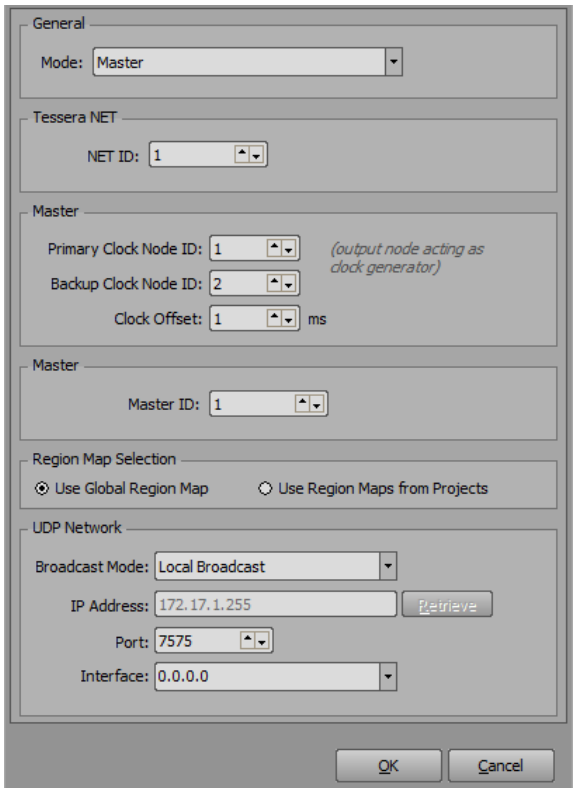
Tessera Single Engine

Use a Tessera Single Engine for previsualization to preview content on a standalone engine. You can use an output on the installed FrameBuffer board as your previsualization output or add a virtual output.

To configure previsualization on a Tessera Single Engine:

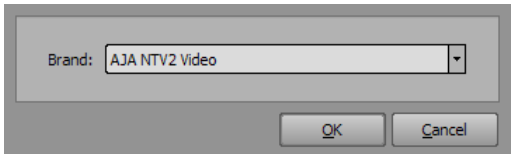
1. In XPression Studio, select **Edit > Tessera > Settings**.

   The **Tessera Settings** dialog opens.



2. From the **Mode** drop-down, select **Single Engine** and then select **OK**.
3. In **Edit > Hardware Setup**, in the **Inputs / Outputs** tab, select **Add**.

   The **Add New FrameBuffer Board** dialog opens.

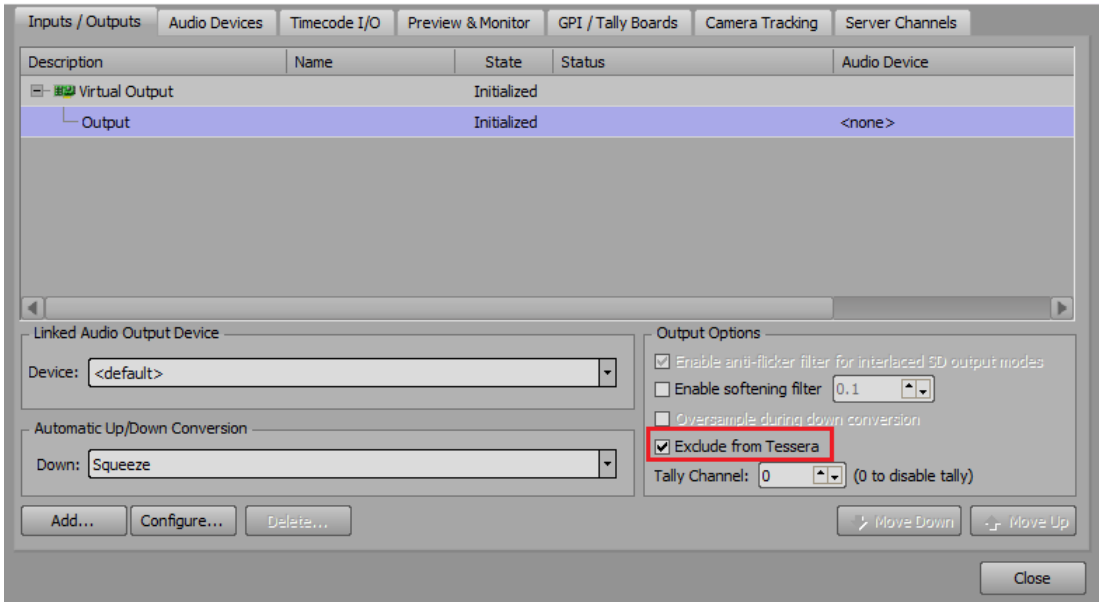


4. To add a virtual output, in the **Add New FrameBuffer Board** dialog, from the **Board** drop-down, select **XPression Virtual Output** and select **OK**.
5. In the next dialog, configure the virtual output as desired and select **OK**.

   The output is added to the **Inputs / Outputs** tab.

   ★Alternatively, you can use an output on the installed FrameBuffer board for previsualization.

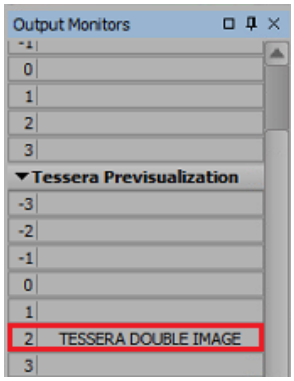
6. Select the output and in the **Output Options** section, select **Exclude from Tessera** and then close the dialog.



7. In **Edit > Tessera > Preview And Monitoring**, select **Add** and configure either a **Dynamic Grid** or a **Custom Scene**.
8. In the **Previsualization** column, from the drop-down, select **Local Engine - Output 1** and then select **OK**.

   For information about configuring a **Dynamic Grid** or **Custom Scene** see Preview and Monitoring
9. In the XPression **Sequencer**, right-click a take item (needs to have a Tessera source defined) and select **Send Item to Previsualization**.

   Scenes that are being previsualized will appear in the **Tessera Previsualization** output section and in the configured output.



To clear the Tessera Previsualization output:

- Select **Remove Item From Previsualization** to clear the item from the Tessera Previsualization output.

  OR

  Select **Clear All Previsualization** to clear all items from the Tessera Previsualization output.

Tessera Preview Node

Use multiple Tessera preview nodes, configured on XPression BlueBox engines, if you need to embed the preview into a custom scene, recreate the physical installation, or build a sophisticated monitoring interface.

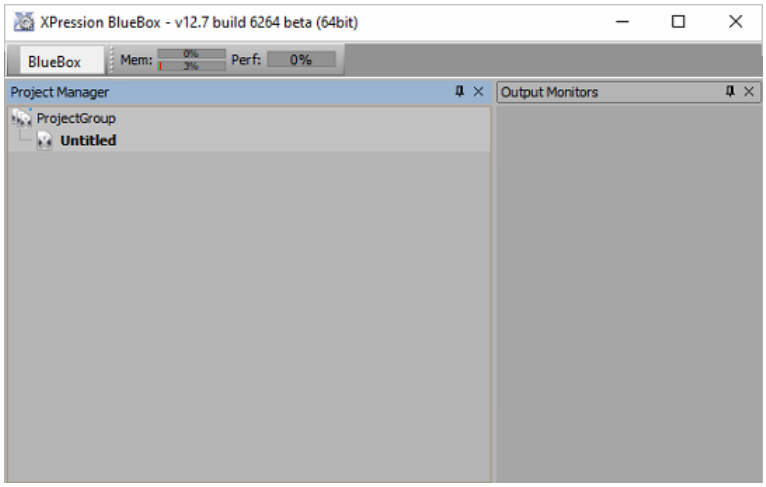
Only Tessera preview scenes created using the **Tessera Preview** shader material can be taken online on the preview node.

For instructions on using the **Tessera Preview** shader material, see Creating a Tessera Preview Material

For this workflow, you will need to configure the **Video Output Monitor**. See Configuring Video Preview and Audio Monitor.

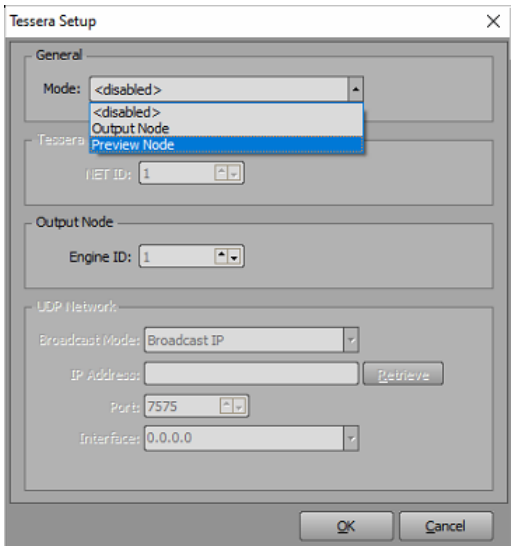
To configure previsualization on a Tessera preview node:

1. On your XPression BlueBox engine, right-click on the XPression BlueBox icon in the system tray and select **Admin** to open the BlueBox UI.



2. Left-click **BlueBox** and from the drop-down menu, select **Tessera Setup**.

   The **Tessera Setup** dialog opens.



3. From the **Mode** drop-down, select **Preview Node** and configure the **Engine ID** and **UDP Network** settings.

   Refer to Tessera Multiple Engine Mode for configuration instructions for preview engines.

4. Select **OK** to exit the **Tessera Setup** dialog.

5. Left-click **BlueBox** again and from the drop-down menu, select **Project Server > Deploy**.

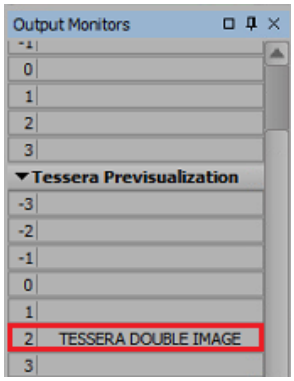
   If you don't already have a project server set up, see Setting up a Project Server for instructions.

6. Deploy the project you want to use.

   See Deploying a Project from the Project Server for instructions.

7. On your XPression Tessera Master engine, in the **Sequencer**, right-click a take item (needs to have a Tessera source defined) and select **Send Item to Previsualization**.

   Scenes that are being previsualized will appear in the **Tessera Previsualization** section of the **Output Monitors** panel on the XPression Tessera Master engine and in the web browser if that is being used to view the outputs.



To clear the Tessera Previsualization output:

- Select **Remove Item From Previsualization** to clear the item from the **Tessera Previsualization** output.

  OR

  Select **Clear All Previsualization** to clear all items from the **Tessera Previsualization** output.

Scenes

Projects can be designed as they are always designed in XPression, with a couple of caveats:

- Orthogonal cameras cannot be used in combination with Tessera.
- Background objects cannot be used in combination with Tessera.

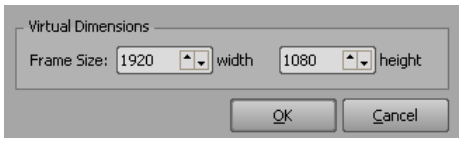
These objects are not compatible with how Tessera renders the scene.

Any size of scene can be used. It typically makes sense to have the aspect of the source scenes match the aspect of the destination.

To create a custom size scene:

1. Right-click inside the **Scene Manager** and select **New > Custom Size Scene** from the shortcut menu.

   The **New Scene** dialog opens.

2. In the **Virtual Dimensions** section, in the Width field, enter or select the width (in pixels) of the new scene.
3. In the **Height** field, enter or select the height (in pixels) for the new scene.

   The **Area Mapping** table is not applicable in the Tessera workflow.
4. Select **OK** to create the new scene with the defined settings.

   The **New Scene** dialog closes and the new scene is added to the **Scene Manager** window below the scene or scene group selected in the scene list.

Saving and Publishing a Project

Saving projects varies depending on whether Tessera uses multiple engines (master and output nodes) or a single engine.

Multiple Engines

Tessera using multiple engines uses the Project Server to automatically sync the project amongst the render engines (output nodes). To enable this mechanism it is required that certain steps are completed.

To enable the Save Project and Publish To Project Server button:

1. Save the project to disk.
2. Save the project to the project server.
3. Deploy the project in XPression.
4. Select the **Save Project and Publish To Project Server** button () to save the project and ensure all systems are queued to sync.

   ★When a new revision of a project is published, the XPression engine will download and deploy the new revision into the Project Manager, while also making sure that the previous version remains loaded if necessary (because a take item in the project is online). Take items that are online at this time continue to use the previous revision. Take items that are not online are replaced by the new revision of the project. When there are no more take items using the old revision, it will be unloaded. Take items that were online and are taken offline will take the new revision of the project the next time they go online.

Single Engine

If using Tessera with a single engine, the Project Server is not required and saving the project to disk is sufficient.

To save a project using a single engine:

- Save the project to disk.

Tessera Backup System

This section describes the **XPression Tessera Output Nodes** status list and its use in monitoring the status of the Tessera primary, backup, and preview nodes and assigning a backup node to act as a primary node. The **XPression Tessera Output Nodes** status list can be used to determine if a Tessera system is active and ready to be used.

To determine if a system is ready, confirm that all output nodes show a status of **Output Node Running** and display the correct number of **Projects Loaded**. If an engine shows **Output Node Running** and has the correct number of projects loaded, it is ready to receive commands from the Tessera master.

The **Backup Clock Node** and **Backup Tessera Master** methods and maintaining the backup system are also described.

The following topics are discussed:

Tessera Output Nodes Status List

Using a Backup Node

Using the Keyboard/GPI Map to Assign Backup Nodes

Video Routing

Backup Tessera Output Node Maintenance

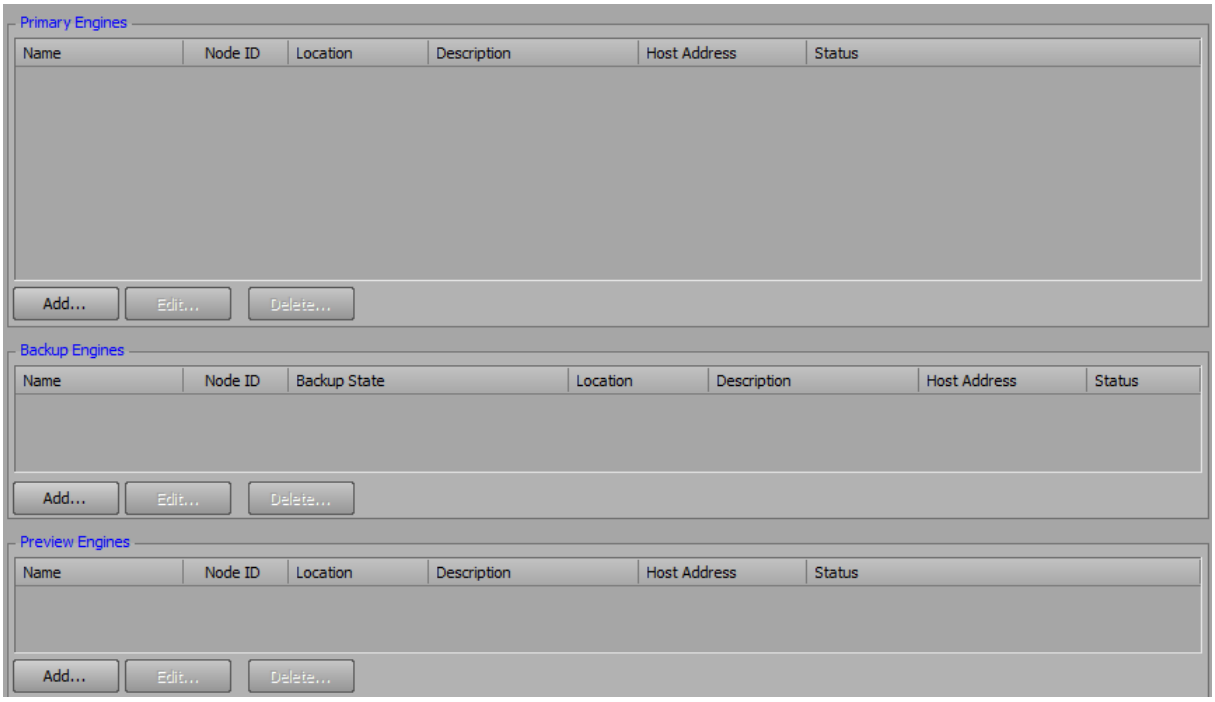
Backup Clock Node

Using a Backup Tessera Master

Backup Tessera Master Maintenance

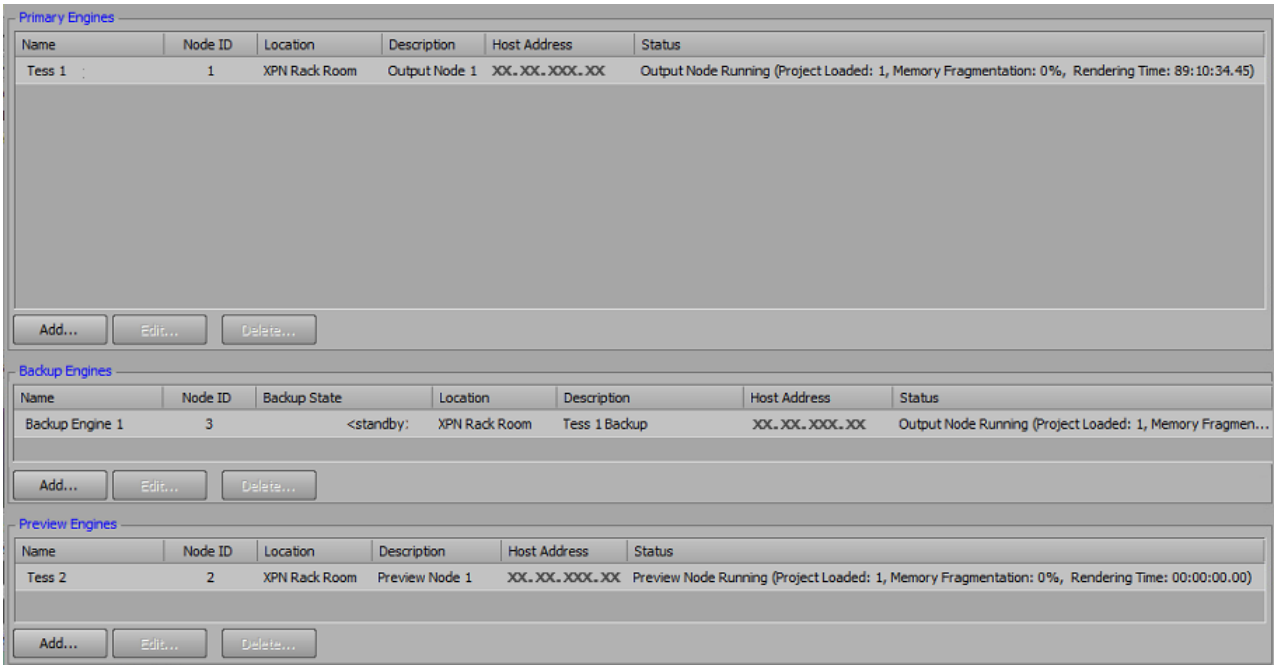
Tessera Output Nodes Status List

Open the **XPression Tessera Output Nodes** window and access the Tessera output nodes status list on the master engine by selecting **Edit > Tessera > Output Nodes**.



This window lists all the primary, backup, and preview output nodes to which the Tessera master is connected.

The **Output Nodes** window displays the status of each engine. Primary engines are actively being used by the Tessera master and the backup engines can be assigned a backup state at any time. By default, backup engines will be in the **<standby>** state. Preview engines are used for confidence monitoring, up-next previews, or previsualization.



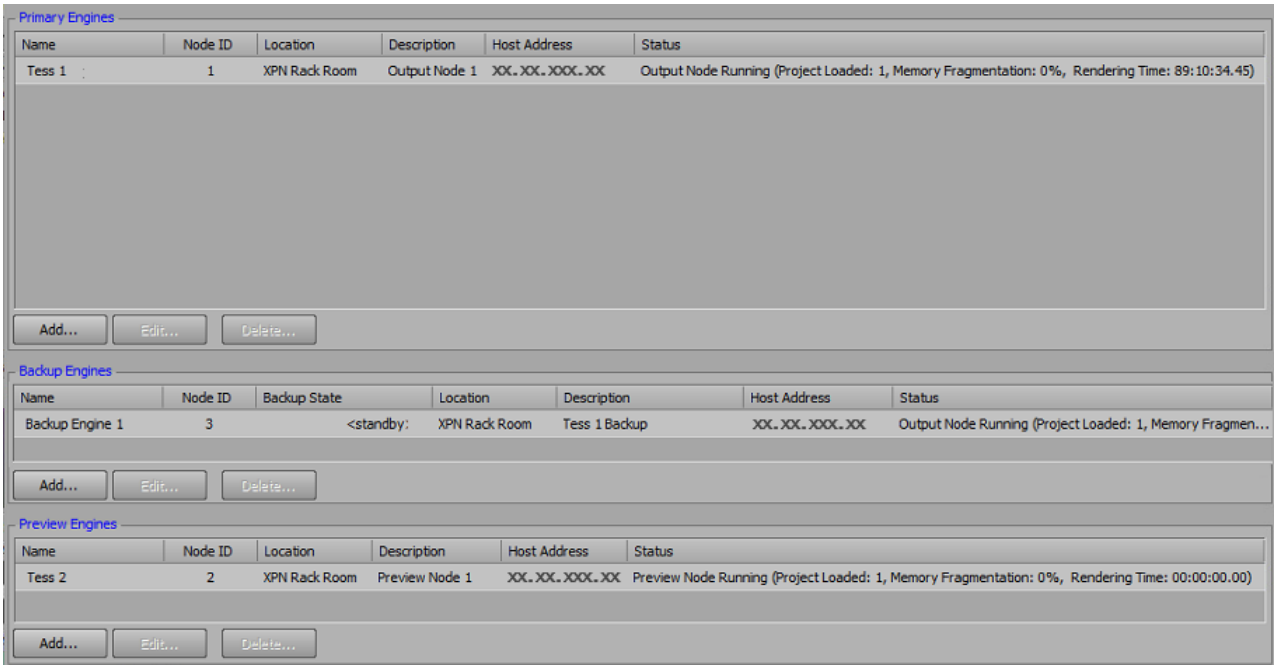
Primary, Backup, and Preview Nodes

In the **Primary Engines**, **Backup Engines**, and **Preview Engines** lists are the configured primary, backup, and preview nodes respectively.

- **Name** — the name of the node. Does not affect operation. For example, Left Mainboard Engine.
- **Node ID** — the Tessera output node engine ID set in the Tessera output node configuration on each node.
- **Location** — the location of the node. Does not affect operation. For example, Rack 10 Row 20.
- **Description** — a description of the node. Does not affect operation. For example, node used for interior boards.
- **Host Name** — the IP address or host name of the Tessera node running XPression Studio or BlueBox.
- **Status** — displays the status of the node. See Node Status below for more information.

Node Status

Tessera nodes will continuously send the Tessera master a status message when running.



There are four possible statuses that can be shown in the **XPression Tessera Output Nodes** status list:

- **Output Node Running** — the output node is running XPression Studio or BlueBox and is sending status packets.
  - **Projects Loaded** — number of projects loaded in the output node.
  - **Memory Fragmentation** — memory usage of XPression on the output node.
  - **Rendering Time** — uptime of the output node XPression Studio or BlueBox software application.
- **Output Node Timed Out** — the output node has stopped sending status messages. If an output node enters this state, the Tessera master will stop waiting for this node to respond to commands. Possible cause: XPression Studio or BlueBox is in a non-responsive state.
- **No Communication** — the Tessera master has not received status packets from the node in 15 seconds or more.

  Possible causes:
  - Network communication lost.
  - XPression Studio or BlueBox has not been closed since being launched.
  - XPression Studio or BlueBox has been configured incorrectly.
- **Unknown** — the Tessera master has not yet received any status packets from the output node.

  Possible cause: XPression Studio or BlueBox has not been launched on that output node since the Tessera master has been active.

Using a Backup Node

Backup engines (for backing up output nodes) can be activated without interrupting or changing the behavior of the Tessera system. Backup Engines can be used as warm or hot backups. A warm backup can be assigned any Primary Engine ID and a hot backup can be left running in parallel with any Primary Engine ID.

To use a backup node:

1. On the XPression Tessera master, select **Edit > Tessera > Output Nodes**.

   The **XPression Tessera Output Nodes** window opens.

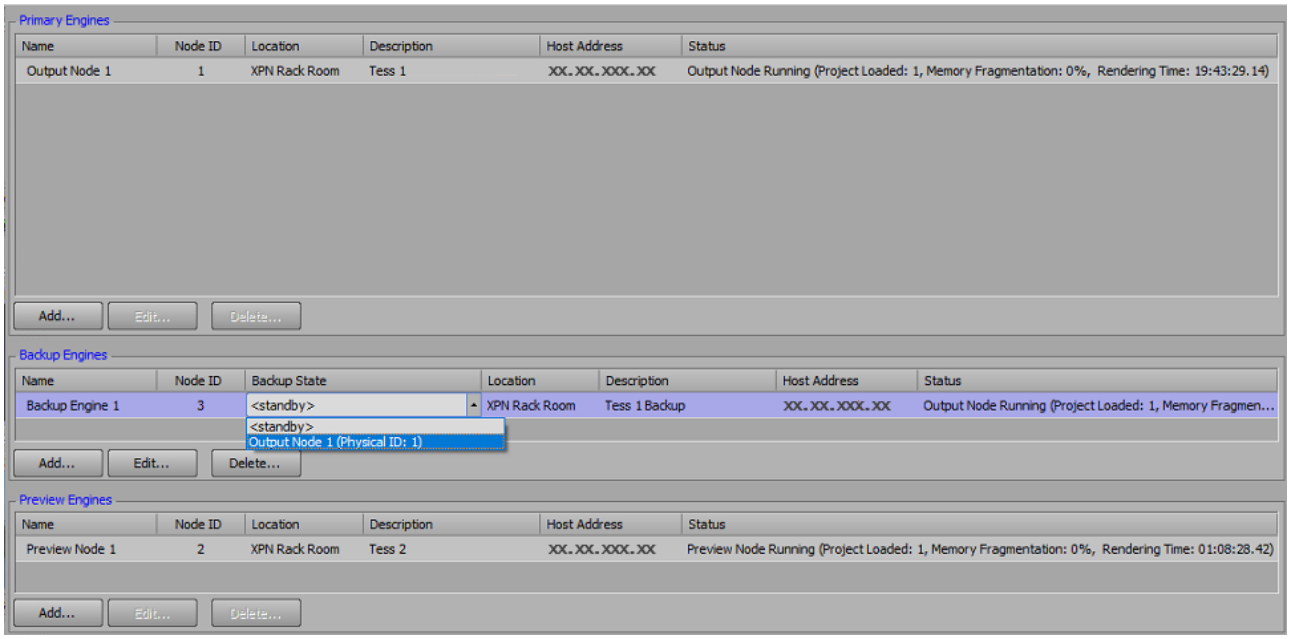
2. In the **Backup Engines** list, select a backup engine.

   If you don't have any backup engines configured, see Tessera Multiple Engine Mode for instructions.

3. Select the **Backup State** column.

   The **Backup State** column displays a drop-down menu that lists all the primary engines from the **Primary Engines** list by name and engine ID.

4. Select a primary engine for the backup state (the engine to be backed up).



The backup engine will now respond to all commands from the Tessera master that are assigned to that engine ID.

- If the primary engine is in **Output Node Running** status, both the primary engine and backup engine assigned to it will run in parallel (hot backup).
- If the primary engine is in **Output Node Timed Out/No Communication** or **Unknown** the Tessera master will only wait for the backup engine for playout.

A backup engine will only respond to commands sent from the Tessera master after it has been assigned a **Primary Engine ID**. It will not retroactively engage commands that were sent before it was assigned a **Primary Engine ID** or bring online take items that were already online on the primary engine.

Using the Keyboard/GPI Map to Assign Backup Nodes

XPression Keyboard and GPI mapping can also be used to assign a backup engine and primary engine node ID.

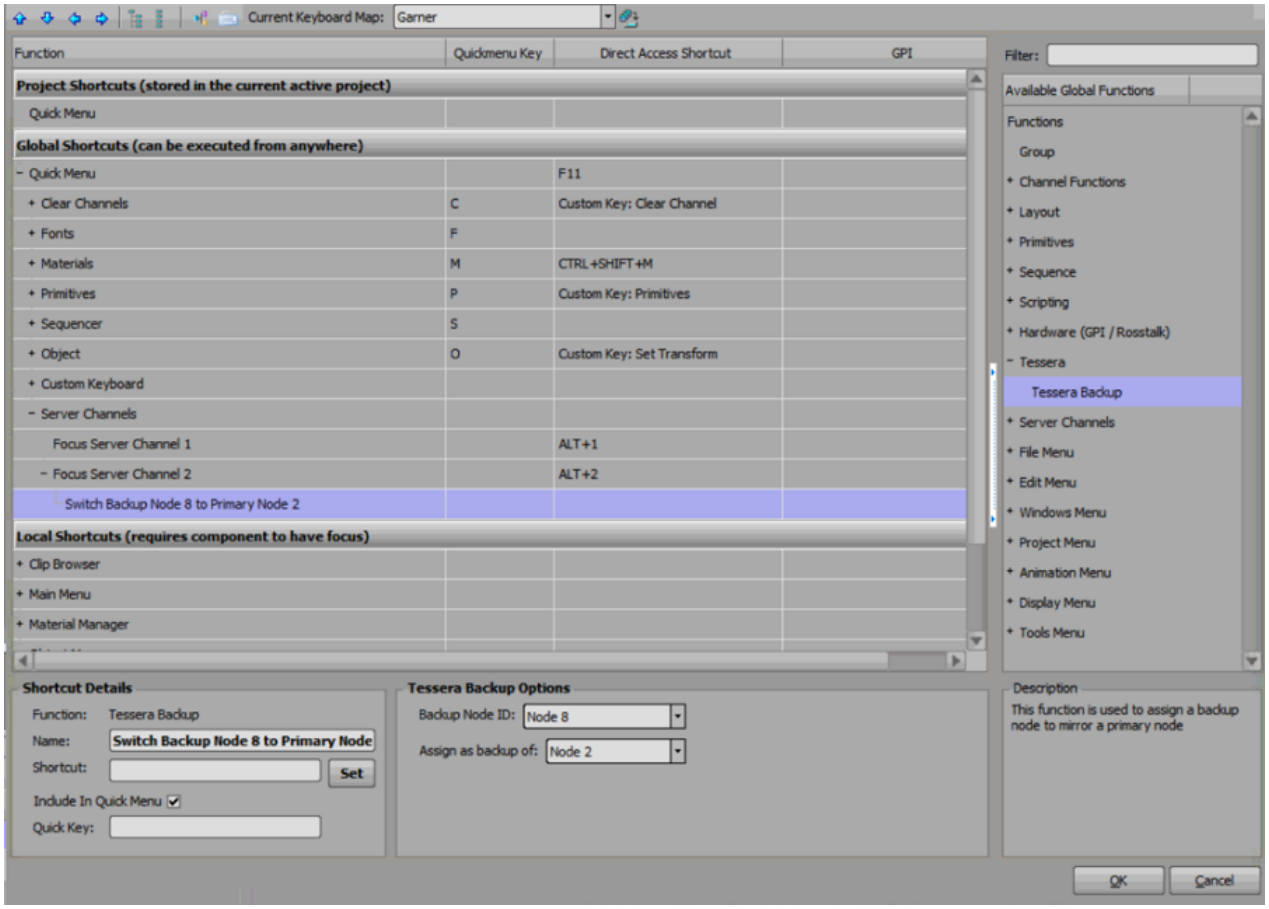
To assign backup nodes:

1. On the XPression Tessera master, select **Edit > Keyboard / GPI Mapping**.

   The **Keyboard / GPI Mapping** dialog opens.

2. In the **Available Global Functions** section, expand the Tessera menu and select **Tessera Backup**.

3. Drag the **Tessera Backup** function and drop it on an available **Global Shortcut**.



4. In the **Tessera Backup Options** section, from the **Backup Node ID** drop-down, select the backup node.

5. From the **Assign as backup of** drop-down, select the node to backup using the selected backup node ID.

6. Select **OK**.

   The **Keyboard / GPI Mapping** dialog closes.

Video Routing

Once a backup engine has been assigned as a primary engine, the video feed from the backup engine will need to be routed to the same destination that the primary engine had been. For example, this could be done as a router salve/macro or a video switcher custom control. Ensure that macros for every combination of backup engine replacing a primary engine are accounted for.

For example:

- Backup Node 4 replacing Primary Node 1, 2, and 3.
- Backup Node 5 replacing Primary Node 1, 2, and 3.

Backup Tessera Output Node Maintenance

Include the backup Tessera output node engines in the regular system maintenance schedule.

If using XPression Clip Store, verify that the Clip Stores on the Tessera backup engines are all being synced with the master Clip Store.

For More Information on...

- setting up Clip Store sync, refer to the *XPression Clips Workflow User Guide*.

Backup Clock Node

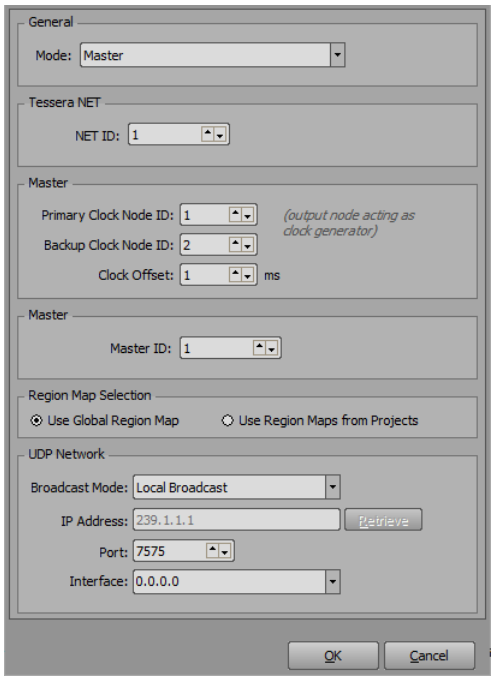
Tessera uses one of the outputs nodes as a clock node. The clock node is used as the clock generator (timer) by the Tessera master for triggering Tessera commands synchronously across all nodes. A backup clock node can also be configured, and this node will be used by the Tessera master if the primary clock node enters the **Output Node Timed Out**, **No Communication**, or **Unknown** states.

To configure a backup clock node:

1. On the XPression Tessera master, select **Edit > Tessera > Settings**.

   The **Tessera Settings** dialog opens.

2. Ensure that the **Mode** in the **General** section is set to **Master**.



3. In the **Master** section, in the **Primary Clock Node ID** field, enter or select the primary engine node ID to set the clock for all the engines.
4. In the **Backup Clock Node ID** field, enter or select an output node engine ID as the backup for the Tessera master should the **Primary Clock Node ID** enter a non-responsive state (**Output Node Timed Out**, **No Communication**, or **Unknown**).
5. Select **OK**.

Using a Backup Tessera Master

Using a backup Tessera master requires that the backup be configured identically to the primary Tessera Master, except for the **Master ID**, which needs to be different.

To configure the backup Tessera Master:

1. On the engine you want to use as the backup, select **Edit > Tessera > Settings**.
2. In the **Tessera Settings** dialog, from the **Mode** drop-down, select **Master**.
3. In the **Tessera Net** section, ensure that the **NET ID** is the same as in the primary Tessera Master.
4. In the **Master** section, in the **Master ID** field, enter a number that is different from the primary Tessera Master.
5. In the **UDP Network** section, ensure that all fields are identical to the primary Tessera Master settings.
6. Select **OK** to save the settings and close the dialog.

To use a backup Tessera master:

1. On the backup Tessera Master engine, select the red **Take Control** button located in the top-right corner of the UI.
2. Select the **Node Status** link above the **Take Control** button to verify that each output node is responding and shows that all project(s) are loaded.

Backup Tessera Master Maintenance

Include the backup Tessera master in the regular system maintenance schedule.

Keep the backup master Tessera deploy folder up to date by deploying the latest revision of the Tessera project(s) from the XPression Project Server.

To deploy latest Tessera project(s):

- Select **File > Project Server > Deploy** on the XPression Tessera master.

To save updated sequencer list **Take Items** on the backup, save the project on the primary.

If using DashBoard, keep the backup Tessera master DashBoard up to date with the latest Dashboard **.grid** files.

If using XPression Clip Store, check that the XPression Clip Stores on the Tessera backup master are being synced with the master Clip Store.

For More Information on...

- setting up Clip Store sync, refer to the *XPression Clips Workflow User Guide*.

Tessera Master / Tessera SE Replication

You can create a backup system to replace a failed Tessera Master or Tessera SE system. The backup system will monitor one or more Master or SE systems and keep a deployed copy of all projects used on those systems, as well as copies of the framebuffer configurations, preferences, Tessera settings, etc.

If the monitored engine fails, the backup can load the projects and configuration files and take over control of any distributed Tessera output nodes.

This procedure should not be used to replicate output nodes.

In a MOS workflow, any edits in the Tessera Master MOS sequences will not be brought over to the replication Master, as all changes are coming in from MOS.

You can assign keyboard/GPI actions for taking control of the system and turning monitoring on and off.

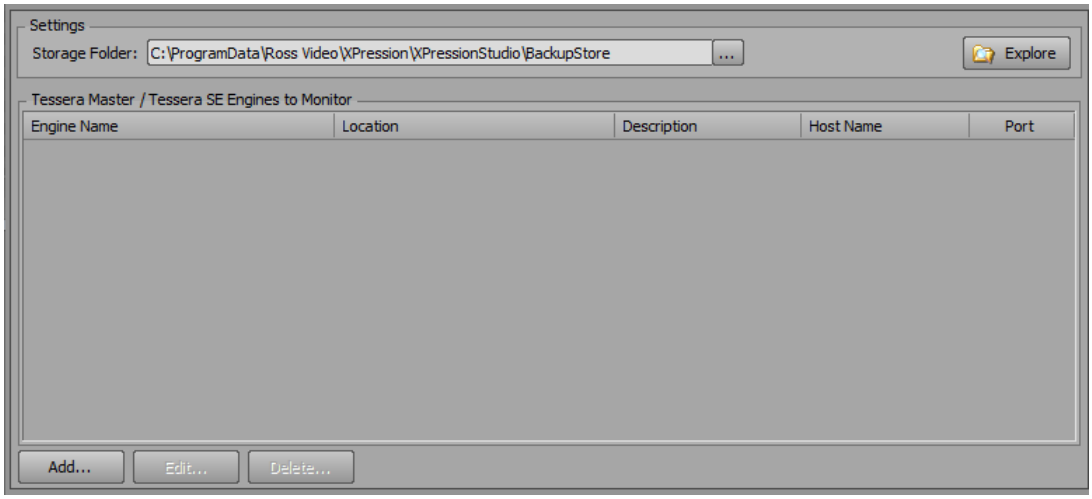
Prerequisites

- You must have a Tessera license for version 10.0 or newer.
- All engines must have the same type of framebuffer board (do not mix X.mio2 and DSXLE4 and/or IP boards).
- XPression Project Server is required and all engines must be connected to the same project server.
- In a MOS workflow, there cannot be a combination of a MOS sequence and a non-MOS sequence in the first Tessera Master.

To replicate a Tessera Master or SE system:

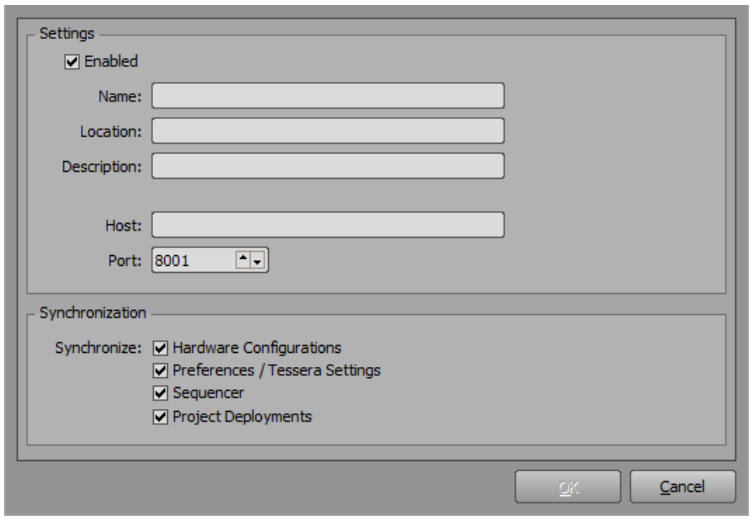
1. In XPression, select **Edit > Tessera > Tessera Master / SE Replication**.

   The **Tessera Master / SE Replication Settings** dialog opens.



2. Select **Add**.

   The **Edit Tessera Master / SE Engine Details** dialog opens.

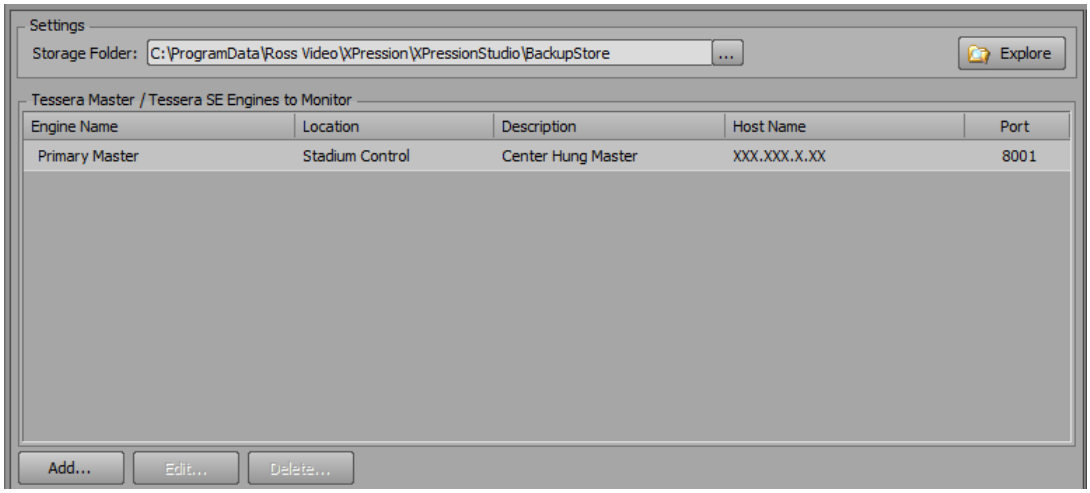


3. In the **Settings** section, enter the following details:
   - In the **Name** field, enter the name of the Tessera engine to be monitored and replicated if necessary.
   - In the **Location** field, enter the location of the Tessera engine to be monitored and replicated if necessary.
   - In the **Description** field, enter the description of the Tessera engine to be monitored and replicated if necessary.
   - In the **Host** field, enter the IP address of the Tessera engine to be monitored and replicated if necessary.

     The **Port** field is populated with the port number on which the Tessera Master is communicating with the output nodes.
4. In the **Synchronization** sections, select the checkboxes of the items to be included in the backup.

   It is recommended that all items be selected.
5. Select **OK** to save the details and close the dialog.

   The described engine is added to the **Tessera Master / Tessera SE Engines to Monitor** list.



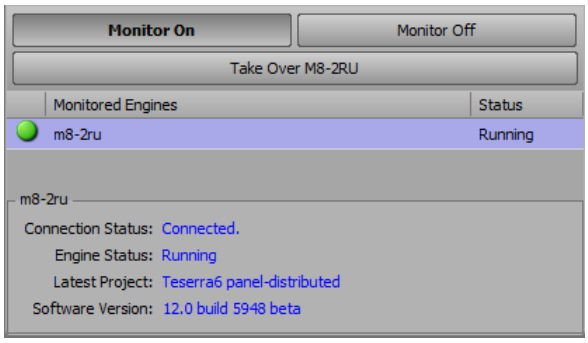
6. Repeat steps 2 to 5 to add any other engines to the list.

7. When all engines to be monitored are added, select **OK** to close the dialog.

To monitor the status of the engines:

1. In XPression, select **Display > Replication Status**.

   The **Replication Status** dialog opens.



   The **Replication Status** dialog displays the connection status of the engines. It can be moved and docked anywhere.

2. Select **Monitor On** to monitor the status of the engines or **Monitor Off** when not required.

   The **Node Status** is indicated above the **Take Control** button.

3. Select the underlined node status text to open the **Output Node** dialog to see the status of all the nodes.

To take control of a failed engine:

1. In the **Replication Status** dialog, select the engine that has failed and select **Take Over [Name of Engine]**.

   The status of the takeover will be displayed as synchronization of each item is completed.

2. When the synchronization is complete, on the backup engine, at the top of the XPression UI, select the **Take Control** button to give control of the output nodes to the backup engine.

3. When the primary engine is ready to resume operation, select the **Take Control** button on the primary engine to give control back to the primary engine.

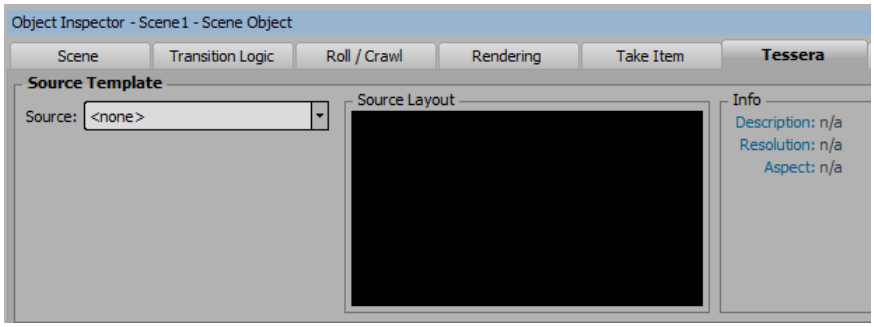
Assigning a Source Output to a Scene or Scene Group in the Object Inspector

Tessera source outputs can be assigned to a scene or scene group using the **Tessera** tab in the **Object Inspector** of the selected scene or scene group.

To assign a source output:

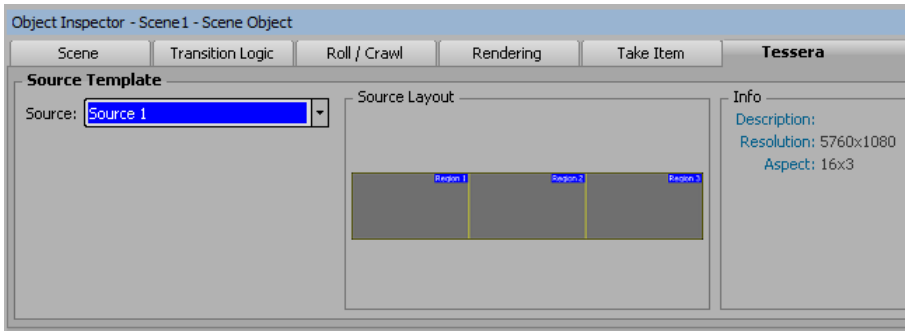
1. In the XPression **Editor**, select a scene or scene group.
2. In the **Object Inspector**, select the **Tessera** tab.

   The **Tessera** tab opens.



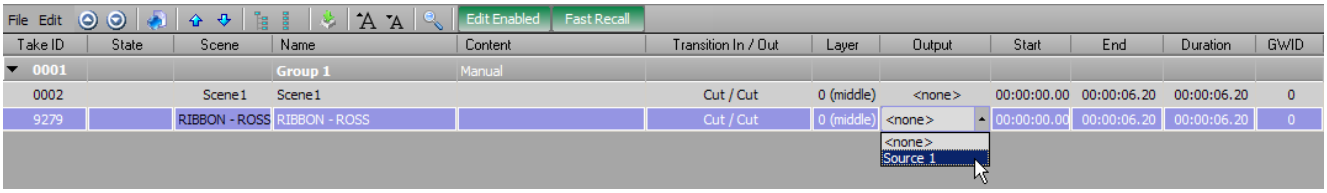
3. In the **Source Template** section, from the **Source** drop-down, select a source output for the scene object.

   The selected source output is assigned to the scene object and a preview of the layout is displayed in the **Source Layout** section.



Tessera Playback

Once the correct setup has been implemented for the Tessera workflow, use the XPression Sequencer in the master for playback. No outputs will be listed in the **Output** list in the **Sequencer**. The Tessera source regions previously created, which serve as an overlay for the current scene targeting the destination regions, are listed by name instead. Any scene or scene size can be sent to any channel, but sending the appropriate scene for the appropriate source will avoid distorting the output.



Taking elements to air is the same as it is in a regular XPression workflow.

★Source outputs can also be assigned using the Tessera tab in the Object Inspector of a scene or scene group. For more information on assigning source outputs in the Object Inspector, refer to Assigning a Source Output to a Scene or Scene Group in the Object Inspector .

Appendix A: Keyboard Shortcuts

Use the keyboard shortcuts in this section to perform various functions in XPression.

Menu Shortcuts

Toolbar Shortcuts

Scene Manager Shortcuts

Object Manager Shortcuts

Object Inspector Shortcuts

Text Objects Shortcuts

Keyframe Editor Shortcuts

Sequencer Shortcuts

Material Manager Shortcuts

Main Viewport Shortcuts

Clip Browser Shortcuts

Server Channels Shortcuts

Visual Logic Shortcuts

Menu Shortcuts

Menu	Keyboard Shortcut	Function
File	CTRL + ALT + N	New project Test
	CTRL + O	Open project
	F9	Revert project
	CTRL + S	Save project
	CTRL + ALT + S	Save project as...
	CTRL + SHIFT + ALT + S	Increment and save project
Edit	CTRL + Z	Undo
	CTRL + SHIFT + Z	Redo
	CTRL + Q	Select object tool
	CTRL + W	Move object tool
	CTRL + E	Rotate object tool
	CTRL + R	Scale object tool
	CTRL + T	Pivot object tool
	SHIFT + CTRL + ALT + R	Open the **XPression Tessera Region Mapper**
Windows	F12	Set main viewport as active
Project	CTRL + ALT + E	Display project path in Windows Explorer
Animation	CTRL + SHIFT + C	Open **Animation Controller**
	CTRL + D	Open **Scene Director**
	CTRL + SHIFT + K	Open **Keyframe Editor**
	CTRL + L	Open **Clip Info** window
	CTRL + K	Open **Set Keyframe** window
Display	CTRL + M	Display **Material Manager**
	CTRL + ALT + W	Display **Widgets** pane
	CTRL + ALT + O	Display **Object Library**
	CTRL + ALT + A	Display **Audio Files** pane
	CTRL + ALT + B	Display **Object** toolbar
	CTRL + ALT + F	Display **Font Manager**
	CTRL + ALT + L	Display **Status Log**
Tools	CTRL + SHIFT + U	Force engine unlock
Help	F1	Display **Online Help**

Toolbar Shortcuts

Keyboard Shortcut	Function
CTRL + ALT + M	Display DataLinq Manager

Scene Manager Shortcuts

Keyboard Shortcut	Function
CTRL + N	Create new scene
CTRL + ALT + NUMPAD +/-	Increase/decrease the speed of a scene group roll/crawl during playout (Layout mode only)
CTRL + SHIFT + +/-	Increase/decrease the speed of a scene group roll/crawl during playout (Sequence mode only)
CTRL + ALT + RIGHT ARROW	Add a selected scene or scene group to the sequencer (Sequence mode only)

Object Manager Shortcuts

Keyboard Shortcut	Function
CTRL + SHIFT + E	Edit script events
CTRL + SHIFT + G	Insert new group object
CTRL + UP ARROW	Move object up in object tree
CTRL + DOWN ARROW	Move object down in object tree
CTRL + LEFT ARROW	Move object left in object tree
CTRL + RIGHT ARROW	Move object right in object tree
CTRL + ALT + UP ARROW	Move selected object(s) up in the main viewport
CTRL + ALT + DOWN ARROW	Move selected object(s) down in the main viewport
CTRL + ALT + LEFT ARROW	Move selected object(s) left in the main viewport
CTRL + ALT + RIGHT ARROW	Move selected object(s) right in the main viewport
CTRL + F	Make the active camera frame a selected object into view
CTRL + I	Toggle object visibility
CTRL + L	Lock object
F2	Rename object
DEL	Delete object
TAB	Move between editing values.

Object Inspector Shortcuts

Keyboard Shortcut	Function
TAB	Move between editing values

Text Objects Shortcuts

Keyboard Shortcut	Function
CTRL + ALT + W	Word wrap
CTRL + ALT + L	Locked lines
CTRL + ALT + V	Vertical text layout
CTRL + NUMPAD +/-	Adjust kerning for a selected text object
CTRL + ALT + UP ARROW	Move line up (moves single character if one is selected)
CTRL + ALT + DOWN ARROW	Move line down (moves single character if one is selected)
CTRL + ALT + LEFT ARROW	Move line left (moves single character if one is selected)
CTRL + ALT + RIGHT ARROW	Move line right (moves single character if one is selected)
CTRL + HOME	Move cursor to first character of text object
CTRL + END	Move cursor past last character of text object
CTRL + LEFT ARROW	Move cursor to previous word
CTRL + RIGHT ARROW	Move cursor to next word
CTRL + SHIFT + LEFT ARROW	Select previous word
CTRL + SHIFT + RIGHT ARROW	Select next word
SHIFT + HOME	Select to beginning of line
CTRL + SHIFT + HOME	Select to beginning of text object
SHIFT + END	Select to end of line
CTRL + SHIFT + END	Select to end of text object
CTRL + NUMPAD KEYS	Set current font by ID
CTRL + TAB	Select next text object
CTRL + SHIFT + TAB	Select previous text object
CTRL + ALT + TAB	Select next object
CTRL + SHIFT + ALT + TAB	Select previous object

Keyframe Editor Shortcuts

Keyboard Shortcut	Function
SPACE	Play animation
CTRL + A	Select all keyframes
RIGHT ARROW	Move **Time Locator** forwards
LEFT ARROW	Move **Time Locator** backwards
HOME	Jump to first keyframe
END	Jump to end of animation
CTRL + RIGHT ARROW	Jump to next keyframe
CTRL + LEFT ARROW	Jump to previous keyframe
CTRL + HOME	Jump to first keyframe
CTRL + END	Jump to last keyframe

Sequencer Shortcuts

Keyboard Shortcut	Function
NUMPAD ENTER	Play selected take item, or if the item is a clip/still, it will assign the item to the active server channel
LEFT ARROW	Collapse an expanded sequence group
RIGHT ARROW	Expand a collapsed sequence group
UP ARROW	Select previous take item
DOWN ARROW	Select next take item
CTRL + UP ARROW	Move selected take item up the list
CTRL + DOWN ARROW	Move selected take item down the list
HOME	Select first take item
END	Select last take item
CTRL + SHIFT + PAGE UP	Select previous scene template
CTRL + SHIFT + PAGE DOWN	Select next scene template
CTRL + PAGE UP	Select previous template data field
CTRL + PAGE DOWN	Select next template data field
ALT + INSERT	Transfers scene from take item list
ALT + DELETE	Removes scene from take item list
CTRL + Fn KEY	Remove selected take item from the framebuffer represented by the Fn key
CTRL + SHIFT + X	Export selected take items to XML to be imported later
NUMPAD .	Cue a selected take item prior to putting them online by pressing the decimal key on the number pad. Cuing them will pre-cache all video clips in the scene. Multiple items can be cued and brought to air simultaneously
NUMPAD +	Playout the selected take item and select the next take item in the sequence
NUMPAD -	Take the selected take item(s) offline if they are online.
NUMPAD *	Scroll the **Sequencer** list to the currently focused item and, if applicable, expand the group containing the focused item. Requires the **Fast Recall** button to be enabled
NUMPAD *	Display a live moving preview of the selected take item. Can be disabled in the sequencer preferences.
NUMPAD ENTER	Playout the selected take item. This shortcut requires the **Fast Recall** button to be enabled
CTRL + I	Open the **Insert New Take Item** dialog box and create new take items based on the scene ID of the template
TAB	Advance through the template data fields. **Note**: This keyboard control needs to be enabled in the **Preferences** in order to be functional

Material Manager Shortcuts

Keyboard Shortcut	Function
CTRL + M	Open the Material Manager
SHIFT + DOUBLE-CLICK LEFT MOUSE BUTTON	Open selected material in the Material Editor

Main Viewport Shortcuts

Keyboard Shortcut	Function
ALT + LEFT MOUSE BUTTON	Orbit a perspective camera object
ALT + MIDDLE MOUSE BUTTON	Pan a perspective camera object
MOUSE WHEEL	Zoom a perspective camera object
CTRL + MOUSE WHEEL	Adjust the zoom level inside the viewport window
CTRL + ALT + UP ARROW	Move selected object(s) up
CTRL + ALT + DOWN ARROW	Move selected object(s) down
CTRL + ALT + LEFT ARROW	Move selected object(s) left
CTRL + ALT + RIGHT ARROW	Move selected object(s) right

Clip Browser Shortcuts

Keyboard Shortcut	Function
ALT + Q	Enable **Quick Find**
ESC	Clear **Quick Find**
ENTER	Cue/Play when **Fast Recall** is enabled
F8	Open the **Edit Clip** dialog to edit the selected clip
SHIFT + F8	Open the **Add Sub Clip** dialog to create a sub clip from the selected clip
CTRL + ALT + RIGHT ARROW	Add selected clip to **Sequencer**

Server Channels Shortcuts

Keyboard Shortcut	Function
ALT + #	Select a **Server Channel** number as the focused server channel.

Visual Logic Shortcuts

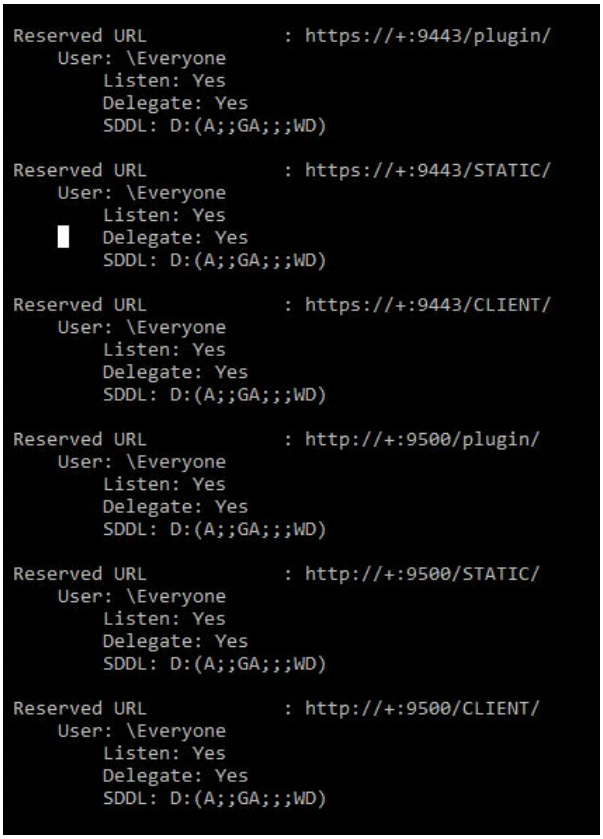
Keyboard Shortcut	Function
CTRL + C	Copy a selected block or blocks
CTRL + V	Paste a copied block or blocks
DEL	Delete a selected block or blocks
SHIFT + CTRL + V	Open the **Paste Visual Logic Properties** window to assign object attributes of copied objects to other objects in the scene.
ALT + V	Display the current values of visual logic blocks below each of the blocks

Appendix B: Troubleshooting Certificates

If there are issues with the webserver starting on XPression Gateway, this command can be run from the **Windows Command Prompt** console to view which URLs have been registered with the Web Server:

```
netsh http show urlacl
```

There should be three URLs registered against **9500** (if not using HTTPS), and **9443** (if using HTTPS):



SSL - Registered URLs

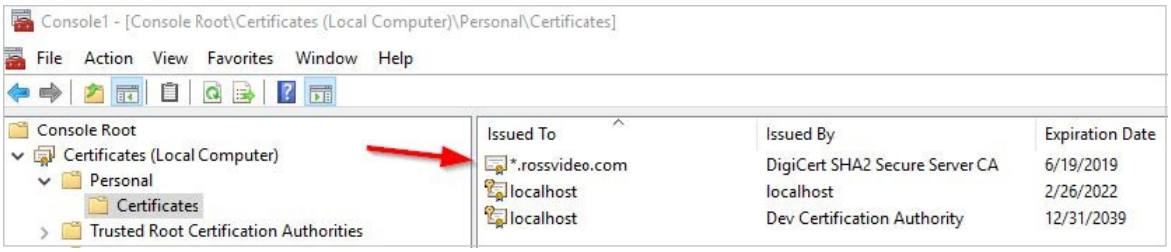
These URLs can be deleted if necessary, and the gateway will recreate them as needed, with the following command (repeated 3 times for each of client, static, and plugin):

```
netsh http delete urlacl url=https://+:9443/CLIENT
```

Certificate Not Attached to Private Key

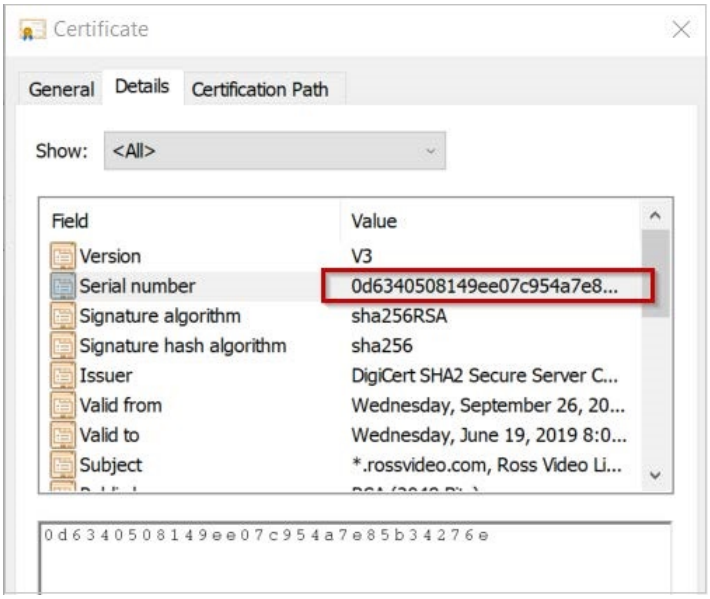
If the certificate is manually imported into the personal certificate store (by right-clicking import in the MMC certificate plugin), the certificate may not be linked with the private key.

This is visible by the certificate missing the "key" icon in its thumbnail:



SSL - Missing Key Icon

If this is the case, open up the certificate and find its serial number:



SSL - Open Certificate

Then open the **Windows Command Prompt** console as administrator and run the following command:

`certutil -repairstore my %serialnumber%`

where `%serialnumber%` is replaced with the serial number of the certificate.

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

Technical Support	**Telephone:**	+1 613-686-1557 +1 833-859-0499 (Toll free within North America) +800 3540 3545 (Toll free International) +91-22-5016-6177 (India) 1300 007 677 (Australia/Sydney)* *If the local support specialist is not available, your call will be transferred automatically to our North America center.
	Email:	techsupport@rossvideo.com

General Information	**Telephone:**	+1 613-228-0688 +1 844-652-0645
	Fax:	+1 613-652-4425
	Email:	solutions@rossvideo.com
	Website:	http://www.rossvideo.com

Visit Us

Visit our website for:

- Company information and news
- Related products and full product lines
- Online catalog
- Testimonials