ULTRIX-MODX-IO User Guide

www.rossvideo.com

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.)*

ULTRIX-MODX-IO · User Guide

- Ross Part Number: **2101DR-020-03**
- Revision: 7
- Release Date: August 15, 2025.
- Software Issue: **6.7**

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

Copyright

Audinate/Dante Trademarks and Patents

The incorporation of and use of Dante functionality in the Ross Video Ultrimix-Dante feature is covered by specific Trademarks and Patents as referenced below:

Trademarks

Audinate®, the Audinate logo and Dante® are registered trademarks of Audinate Pty Ltd. All other trademarks are the property of their respective owners.

Patents

Audinate products are protected by one or more of US Patents 7747725, 8005939, 8478856, 9003009, 9398091, 10097296, 10461872, 9178927, 9979767, 7978696, 8411679, 8913612, 9860291, 10536499, 8171152, 8966109, 9479573, 10291944, 9497103, 10439848, 10419506, 11075967, 11539773;European Patents 1872533, 2033360, 2033361, 2165541, 2255541, 2764631, 3155735, 3571598; Chinese Patents ZL200780026677.0, 101491002B, 101563886B, 101731011B, 102017652B, 103959664B, 106576007A, 110462600A; World Intellectual Property Organization Patent 2018/132872 and other patents pending or issued.

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.

Trademarks

- Audinate®, and Dante® are trademarks or registered trademarks of Audinate Pty Ltd.
- Google® is a registered trademark of Google Inc.
- Microsoft® Excel® and Edge® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- Mozilla® and Firefox® are registered trademarks of the Mozilla Foundation.
- Oracle® and Java® are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.
- Safari® is a trademark of Apple Inc., registered in the U.S. and other countries.

Safety Notices

Refer to the "**Important Regulatory and Safety Notices**" document that accompanied your product.

Statement of Compliance

This product has been determined to be compliant with the applicable standards, regulations, and directives for the countries where the product is marketed.

Compliance documentation, such as certification or Declaration of Compliance for the product is available upon request by contacting techsupport@rossvideo.com. Please include the product; model number identifiers and serial number and country that compliance information is needed in request.

EMC Notices

United States of America - FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a Commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada

This Class A device complies with Canadian ICES-003 and part 15 of the FCC Rules.

Cet appariel numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

Notice — *Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.*

European Union

This equipment is in compliance with the essential requirements and other relevant provisions established under regulation (EC) No 765/2008 and Decision No 768/2008/EC referred to as the "New Legislative Framework".

Warning — *This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.*

Australia/New Zealand

This equipment is in compliance with the provisions established under the Radiocommunications Act 1992 and Radiocommunications Labeling (Electromagnetic Compatibility) Notice 2008.

Korea

This equipment is in compliance with the provisions established under the Radio Waves Act.

Class A equipment (Broadcasting and communications service for business use).

This device is a business-use (Class A) EMC-compliant device. The seller and user are advised to be aware of this fact. This device is intended for use in areas outside home.

Type of Equipment	User's Guide
A급 기기 (업무용 방송통신기자재)	이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.
Class A Equipment (Industrial Broadcasting & Communication Equipment)	This equipment is **Industrial (Class A) electromagnetic wave suitability equipment** and seller or user should take notice of it, and this equipment is to be used in the places except for home.

International

This equipment has been tested under the requirements of CISPR 22:2008 or CISPR 32:2015 and found to comply with the limits for a Class A Digital device.

Notice — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

Warranty and Repair Policy

The product is backed by a comprehensive one-year warranty on all components.

Notice — *Changes or modifications to this equipment not expressly approved by Ross Video Ltd. could void the user's authority to operate this equipment.*

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.

Environmental Information

The equipment 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.

This appliance may contain a Coin type battery which should not be treated as household waste.

To ensure that the battery will be treated properly use the appropriate take-back systems in your area. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

Company Address

Ross Video Limited
8 John Street
Iroquois, Ontario
Canada, K0E 1K0

Ross Video Incorporated
P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office: (+1) 613 • 652 • 4886
Fax: (+1) 613 • 652 • 4425

Technical Support: (+1) 613 • 652 • 4886
After Hours Emergency: (+1) 613 • 349 • 0006

E-mail (Technical Support): techsupport@rossvideo.com
E-mail (General Information): solutions@rossvideo.com
Website: http://www.rossvideo.com

Contents

Introduction

This guide is for system administrators and installers of the Ross Video ULTRIX-MODX-IO and its modules. This guide outlines the installation and configuration of your ULTRIX-MODX-IO blade and its modules.

The following chapters are included:

- "**Introduction**" summarizes the guide and provides important terms, and conventions.
- "**Getting Started**" outlines the features, and licenses available for the ULTRIX-MODX-IO.
- "**Hardware Overview**" provides an introduction to the ULTRIX-MODX-IO hardware features.
- "**Installing the ULTRIX-MODX-IO**" provides instructions for the basic physical installation of the ULTRIX-MODX-IO into an Ultrix router.
- "**Installing a Module**" provides outlines how to install a module into an ULTRIX-MODX-IO blade.
- "**Populating the SFP Ports**" outlines how to install an SFP module into a port on the ULTRIX-MODX-IO blade and its modules.
- "**Cabling the AUX Ports**" outlines the AUX ports cabling designations for the ULTRIX-MODX-IO blade when using specific licensed features of the Ultrix router.
- "**ULTRIX-MOD-DPT**" outlines the ULTRIX-MOD-DPT features, cabling designations, DashBoard interfaces, and configuration options.
- "**ULTRIX-MOD-NDI**" summarizes the features, cabling, and configuration of the ULTRIX-MOD-NDI module.
- "**ULTRIX-MOD-SDI**" outlines the hardware features, and cabling of the ULTRIX-MOD-SDI module.
- "**ULTRIX-MOD-SFP**" outlines the hardware features, and cabling of the ULTRIX-MOD-SFP module.
- "**DashBoard Overview**" provides a general overview of how to access the interfaces, tabs, and menus for an ULTRIX-MODX-IO blade and its modules in DashBoard.
- "**Port Configuration**" summaries the configuration options in DashBoard for the I/O ports.
- "**Monitoring**" summarizes how to monitor the ULTRIX-MODX-IO via the DashBoard interfaces.
- "**Upgrading the Software**" outlines how to use DashBoard to upgrade the ULTRIX-MODX-IO blade and the ULTRIX-MOD-NDI module in the field.
- "**Technical Specifications**" provides the specifications, such as pinouts and power consumption, for the ULTRIX-MODX-IO.

If you have questions pertaining to installation of this Ross Video product, contact us at the numbers listed in "**Contacting Technical Support**". Our technical staff is always available for consultation, training, or service.

Related Publications

It is recommended to consult the following Ross Video documentation before installing and operating your ULTRIX-MODX-IO:

- ***DashBoard User Guide***, Part Number: 8351DR-004
- ***UltriScape User Guide***, Ross Part Number: 2101DR-018
- ***Ultrix and Ultricore Database Guide***, Ross Part Number: 2201DR-109
- ***ULTRIX SFP Modules Guide***, Ross Part Number: 2101DR-008
- ***ULTRIX-FR1, ULTRIX-FR2, and ULTRIX-FR5 User Guide***, Ross Part Number: 2101DR-004
- ***ULTRIX-FR12 User Guide***, Ross Part Number: 2101DR-604

✶ The user documentation is available for download from our website.

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.

Interface Elements

Bold text is used to identify a user interface element such as a dialog box, menu item, or button. For example:

In the **Save Layout** dialog, click **OK**.

User Entered Text

Courier text is used to identify text that a user must enter. For example:

In the **Language** box, enter `English`.

Referenced Guides

Italic text is used to identify the titles of referenced guides, manuals, or documents. For example:

For more information, refer to the ***ULTRIX-FR12 User Guide***.

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 "**File** > **Save**," you would click the **File** menu and then click **Save**.

Important Instructions

Star icons are used to identify important instructions or features. For example:

✶ When the Ultrix router cannot connect to the network, a **Message** dialog opens to report the connection problem.

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.

- **Toll Free Technical Support (North America)**: 1-844-652-0645
- **Toll Free Technical Support (International)**: +800 1005 0100
- **After Hours Emergency**: (+1) 613-349-0006
- **E-mail**: techsupport@rossvideo.com
- **Website**: http://www.rossvideo.com

Getting Started

The ULTRIX-MODX-IO enables broad signal format support on the Ultrix router using high-density hot-swappable I/O modules. Each ULTRIX-MODX-IO blade hosts four IO modules available with different video interfaces including support for compressed streams and embedded audio. Mix and match modules within a single blade to get the density and formats you need for your production.

Features

Each ULTRIX-MODX-IO blade supports:

- Up to four Plug-and-Play I/O modules
- Maximum 16 UHD IN + 16 UHD OUT
- GigE interface to frame ethernet network
- Color space of YUV 4:2:2 10-bit
- 384 channels of embedded audio
- Up to 3 x Ultriscape MV Licenses
- Four AUX ports
- Up to 3 UHD Frame Syncs inputs
- 18 UHD Clean/Quiet Switch outputs
- An UltriMix matrix of 128 x 64

Before You Begin

You may also need to install the following license keys:

- Ultrimix-Dante — enables 64 x 64 input/output audio channels via ethernet on the AUX C port of the ULTRIX-MODX-IO blade.

✶ UltriStream and Ultrimix-Dante cannot be enabled simultaneously on the same slot. By enabling an Ultrimix-Dante license on a slot, an UltriStream cannot be enabled on the same slot until the Ultrimix-Dante license is disabled.

- Ultrimix-MXR — enables the configuration and use of audio mixer soft panels.
- UltriProc or UltriProc-3DLUT — a license key is required for each port that will be used by an UltriProc engine.
- Ultriscape — for each port that will be used to provide an Ultriscape head output.
- UltriSpeed — if the blade and/or its modules include an SFP-HDB-IN-12G, SFP-FIBER-12G, and/or SFP-HDB-OUT-12G.
- UltriSRC — for each port configured for an asynchronous MADI input.
- UltriStream — enables the encoding of one NDI stream of a configured Ultriscape Multiviewer Head per blade.
- UltriSync— a per input 3G frame sync license enabling alignment to router sync.
- Ultrisync-UHD —a per input frame sync license to support UHD video rates. Each slot supports up to 3 Ultrisync-UHD ports. Requires software version 4.2.0 or higher and is applicable only to the ULTRIX-HDBNC-IO, ULTRIX-SFP-IO, and ULTRIX-MODX-IO blades.

✶ Refer to the ***Ultrix User Guide*** for your router for more information on license keys.

Hardware Overview

This chapter outlines the hardware features of the ULTRIX-MODX-IO.

Supported Routers

You can install the ULTRIX-MODX-IO into the following Ultrix routers:

- ULTRIX-NS-FR1
- ULTRIX-NS-FR2
- ULTRIX-FR5
- ULTRIX-NS-FR5
- ULTRIX-FR12

Hardware Features

This section provides an overview of the ports, connections, and other hardware features of the ULTRIX-MODX-IO.

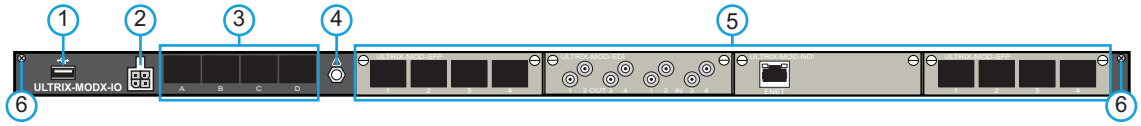


Figure 1 ULTRIX-MODX-IO

1) USB 3.0 Port	3) AUX A-D Ports	5) Module Slots
2) PSU Connection	4) Retaining Bolt	6) Blade Retaining Screws

1. USB 3.0 Port

This is an USB 3.0 Type A port and provides the ability for supported USB-serial converters to be attached for serial communications with the Ultrix router.

2. PSU Connection

Each ULTRIX-MODX-IO includes a power connector that requires a 15VDC connection to an external power supply. The blade supplies up to 15W per module.

✶ Refer to the Ross Ultrix Configuration Tool on our website, or contact Ross Technical Support, for help determining if this power connection is needed for your system.

3. AUX A-D Ports

The AUX ports are labeled as A-D starting with the leftmost port. AUX A and AUX B support:

› HDMI
› Unidirectional coax
› Bidirectional coax
› Fiber
› MADI
› SFP+ (10G) [1]

1. SFP28 (25G) is not supported.

- AUX C is reserved for use with the Ultrimix-Dante licensed feature and must be populated with an 1GE SFP module.
- AUX D is reserved for use with the UltriStream licensed feature and must be populated with an 1GE SFP module.

The AUX ports can be populated with Small Form-factor Pluggable (SFP) modules from the factory or by installing modules in the field. When an AUX port is populated on the ULTRIX-MODX-IO, its status is reported in DashBoard and options are provided for mapping and configuring the I/O as required. For a list of SFP modules available from Ross Video, refer to the ***ULTRIX SFP Modules Guide***.

4. Retaining Bolt

The retaining bolt is used to secure the blade to the router chassis.

5. Module Slots

Each ULTRIX-MODX-IO accepts up to four modules (e.g. ULTRIX-MOD-NDI, ULTRIX-MOD-SDI, ULTRIX-MOD-SFP) enabling you to customize the I/O of the blade as required. Each slot is numbered (1-4) with Group 1 as the first slot on the left. This information is also reported in the Group column of the Port Configuration interface in DashBoard.

The modules are hot swappable, allowing you to replace any module with the same type or another supported type. The DashBoard interface updates automatically to report the new module.

Notice — *When a module slot within the ULTRIX-MODX-IO blade is not populated with a module, a blank plate for the module slot must be installed to ensure proper cooling and ventilation.*

6. Blade Retaining Screws

There is a retaining screw on each end of the blade. These screws help to affix the blade to the router chassis.

Installing the ULTRIX-MODX-IO

The ULTRIX-MODX-IO blade is installed in a slot of an Ultrix router. The steps required to install a blade depends on the router type. This chapter provides two installation methods: one for the ULTRIX-NS-FR1, ULTRIX-NS-FR2, and ULTRIX(-NS)-FR5, and the second for installing in the ULTRIX-FR12.

If you have questions pertaining to the installation of your ULTRIX-MODX-IO blade, contact us at the numbers listed in "**Contacting Technical Support**".

Before You Begin

This chapter assumes the following:

- The relevant Ross equipment is installed into a ventilated rack frame.
- The relative humidity in the environment of the equipment should be <70% (non-condensing).
- The ambient temperature of the air entering the front panel should not exceed 40°C (104°F), and should not fall below 0°C (32°F).
- It is recommended to leave a 1RU gap between each device.
- When installing more than one ULTRIX-MODX-IO in a router, it is recommended to group the blades into consecutive slots.

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Working with Fiber Optic Connectors

Keep the following in mind if the SFP module(s) installed in a port includes a fiber optic connector:

- Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.
- Connectors must always be inserted into a device or have a dust cap on.
- A poor optical connection is often similar to a poor electrical connection. Try removing the connector, cleaning, and re-inserting the connector. A bad connection can result in experiencing instability of signal, high loss, or a noisy signal.

Verify the Router Software Version

✶ This section is applicable to all Ultrix router models.

Before installing a new ULTRIX-MODX-IO blade in an existing routing system, the router software version must be noted. Your new blade ships with a default firmware installed and must match the current version running in the router. This will require contacting Ross Technical Support for the appropriate software version (which includes the blade firmware). The router software (and corresponding blade firmware) is upgraded through the DashBoard client.

✶ There may be newer software versions available than what is currently running on your router. The opportunity may be taken at this time to upgrade to a newer software version, however, some database editing may be required as features between versions are added.

To verify the software version currently installed on your router

1. Ensure the router has a valid Ethernet connection.
2. Ensure that you are running DashBoard client software version 9.13.0 or higher and that the computer running the DashBoard client is located on the same network as the router.
3. Launch DashBoard by double-clicking its icon on your computer desktop.
4. In the Basic Tree View, locate the router you want to verify the software for.
5. Locate the router in the Tree View of DashBoard.
6. Expand the Ultrix node to display a list of sub-nodes in the Tree View.
7. Expand the Ultrix sub-node.
8. Double-click the **System Status** node to display the tabs in the DashBoard window.
9. Select the **Product** tab. This tab is located in the series of tabs on the left-side of the DashBoard window.
10. Make a note of the value in the **System Version** field. This is the software version your router is currently running. You will need to provide Ross Technical Support this information when you contact them.
11. Contact Ross Technical Support for the appropriate software version (which includes the blade firmware) for your setup. Refer to "**Contacting Technical Support**" for contact details.

Installing in an ULTRIX-NS-FR1, ULTRIX-NS-FR2, or ULTRIX(-NS)-FR5

Before installing the ULTRIX-MODX-IO, you must first ensure the required slot is available. This may require you to either remove a blank plate or an installed blade from the slot in the rear panel of the router. Both methods are outlined in this section.

Notice — *When a slot within the Ultrix router is not populated with any blade, a blank plate for the slot must be installed to ensure proper cooling and ventilation. This is particularly important when you have an empty slot above a ULTRIX-MODX-IO blade with high temperature modules (such as an ULTRIX-MOD-NDI module).*

Removing a Blank Plate from the Ultrix Router Chassis

If you are not replacing an existing blade, you will need to first remove the blank plate from the required slot. You will need a #1 Phillips screwdriver to disengage the retaining (captive) screws on the plate. While the figures show an ULTRIX-NS-FR1 chassis, the procedure is also applicable to the ULTRIX-NS-FR2 and ULTRIX(-NS)-FR5.

✶ It is recommended to install the ULTRIX-MODX-IO blade in a slot that does not impede access to the neighboring blade connectors.

To remove the blank plate from the router chassis

1. Power down the router and disconnect it from mains power.
2. Use a #1 Phillips screwdriver to disengage the captive retaining screws on either end of the blank plate. Refer to **Figure 2** for screw locations.

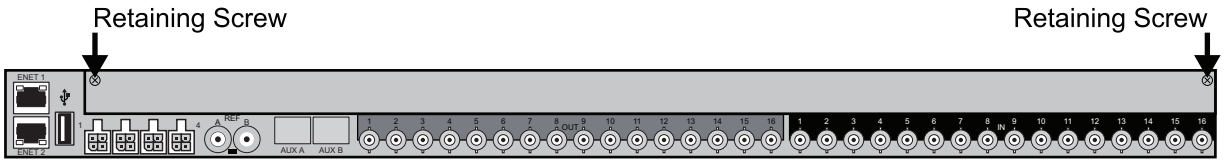


Figure 2 Ultrix Rear Panel — Retaining Screw Locations on the Blank Plate

3. Remove the blank plate from the chassis and set it aside.

Removing a Blade from the Router Chassis

If you are replacing a blade, you must first remove the old blade from the chassis before installing the new blade.There are two screws and one bolt that affix the blade to the chassis: a screw on each end of the blade and then a Middle Retaining Bolt. You must disengage all three before the blade can be removed from the chassis. You will need a 3/16″ socket to disengage the bolt (included in the kit shipped with your router).

Caution — *Steps must be followed in the presented order. Failing to do so can damage the blade.*

To remove an existing blade from the router chassis

1. Power down the Ultrix router and disconnect it from mains power.
2. Ensure all cabling is removed from the ports on the I/O Blade.
3. Disengage the retaining screws on either end of the I/O Blade. Refer to **Figure 3** for screw locations.

✶ We strongly recommend to disengage each screw until its head is approximately 0.25″ away from the faceplate. Do not fully extract the screws from the chassis.

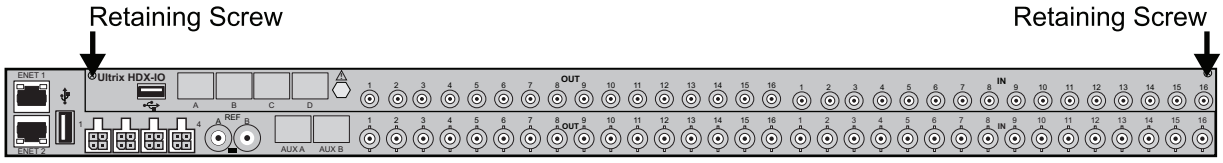


Figure 3 Ultrix Rear Panel — Location of Retaining Screws on an ULTRIX-HDBNC-IO Blade

4. From the Ultrix rear panel, unfasten the Middle Retaining Bolt. Note that this bolt is not removable but it does extract the blade. Refer to **Figure 4** for the bolt location on the rear panel.

Caution — *Ensure the Middle Retaining Bolt is fully unfastened before attempting to remove the blade from the chassis. While the bolt is not removable and serves as a threaded insertion and extraction tool. It should be free to move in and out a few millimeters in its socket once unfastened.*

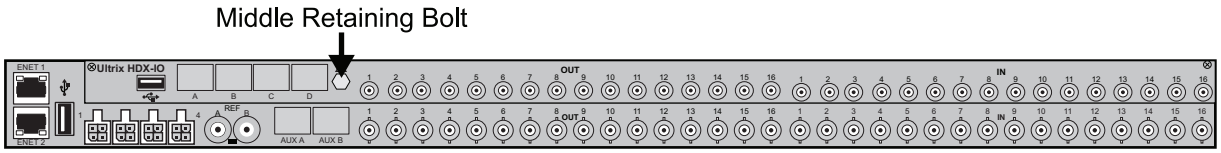


Figure 4 Ultrix Rear Panel — Location of Middle Retaining Bolt on the Blade

5. Grasp the blade with both hands and gently pull it towards you to remove it from the router backplane.

Installing an ULTRIX-MODX-IO Blade into the Router Chassis

The ULTRIX-MODX-IO blade is a complete unit. There are two screws and one bolt that affix the blade to the chassis: a screw on each end of the blade and a Middle Retaining Bolt.

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semi-conductor devices. Avoid handling circuit blades in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit blades and related equipment.*

To install an ULTRIX-MODX-IO blade into the router chassis

1. Using the card guides inside the chassis, gently slide the ULTRIX-MODX-IO blade into the chassis while lifting up slightly to take the weight.

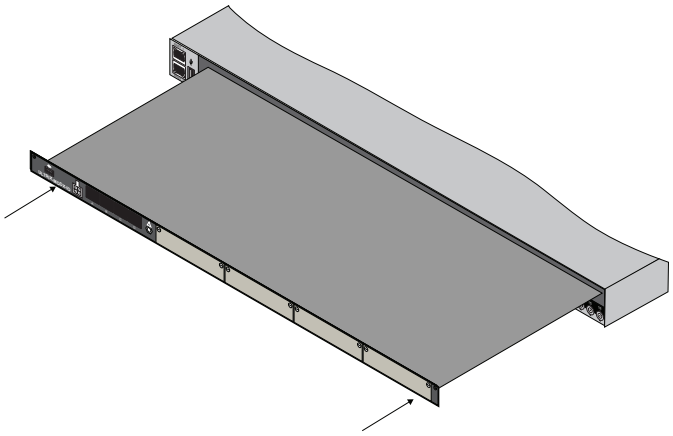


Figure 5 Sliding the Blade into the Chassis

2. Gently slide the blade in until you feel it start to resist as the edge connectors begin to mate. This will occur approximately 1/8" (3mm) before the blade is fully seated. At this stage, the Middle Retaining Bolt should be used to pull the blade into its final mated position.
3. Using a 3/16" socket, fully tighten the Middle Retaining Bolt. This bolt secures the blade to the chassis from the interior, ensuring proper contacts between the blade and the router backplane.

Caution — *You must first fully tighten the Middle Retaining Bolt before tightening the screws on the ULTRIX-MODX-IO. Not doing so will damage the blade, the connectors on the backplane, or both.*

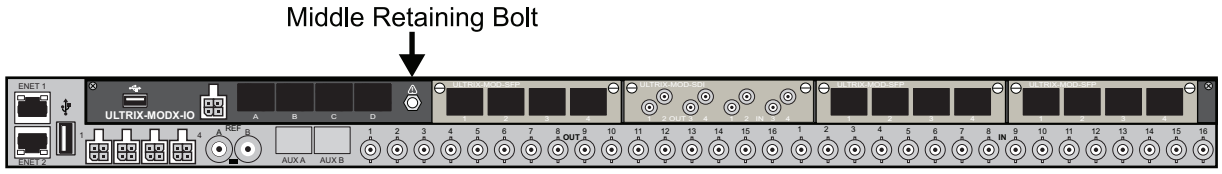


Figure 6 Ultrix Rear Panel — Location of Middle Retaining Bolt on the Blade

4. Using a Phillips screwdriver, tighten the retaining screws located on the left and right sides of the blade.

✶ Tightening these screws is required to ensure proper alignment between the blade and the router backplane.

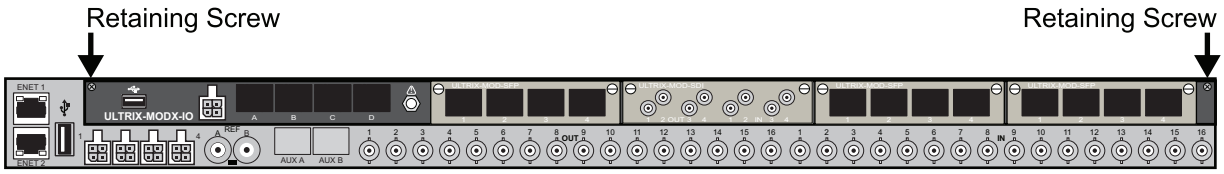


Figure 7 Ultrix Rear Panel — Location of Retaining Screws on the Blade

5. Power on the router as outlined in the ***ULTRIX-FR1, ULTRIX-FR2, and ULTRIX-FR5 Installation Guide***.

Notice — *The router automatically powers on when power is applied.*

Installing in an ULTRIX-FR12 Chassis

Before installing the ULTRIX-MODX-IO, you must first ensure the required slot is available in the ULTRIX-FR12. This may required you to either remove the blank plate or an installed blade from the required slot in the rear panel of the router. Both methods are outlined in this section.

Notice — *When a blade slot within the ULTRIX-FR12 is not populated with any blade, a blank plate for the slot must be installed to ensure proper cooling and ventilation. This is particularly important when you have an empty slot above an ULTRIX-MODX-IO blade with high temperature modules (such as an ULTRIX-MOD-NDI module).*

Removing a Blank Plate from the ULTRIX-FR12 Chassis

If you are not replacing an existing blade, you will need to first remove the blank plate from the required slot. You will need a #1 Phillips screwdriver to disengage the captive screw.

✶ It is recommended to install the ULTRIX-MODX-IO in a slot that does not impede access to the neighboring blade connectors.

To remove the blank plate from the ULTRX-FR12 chassis

1. Power down the router and disconnect it from mains power.
2. Disengage the captive retaining screws on either end of the blank plate In **Figure 8**, the user is removing the blank plate in slot 16.

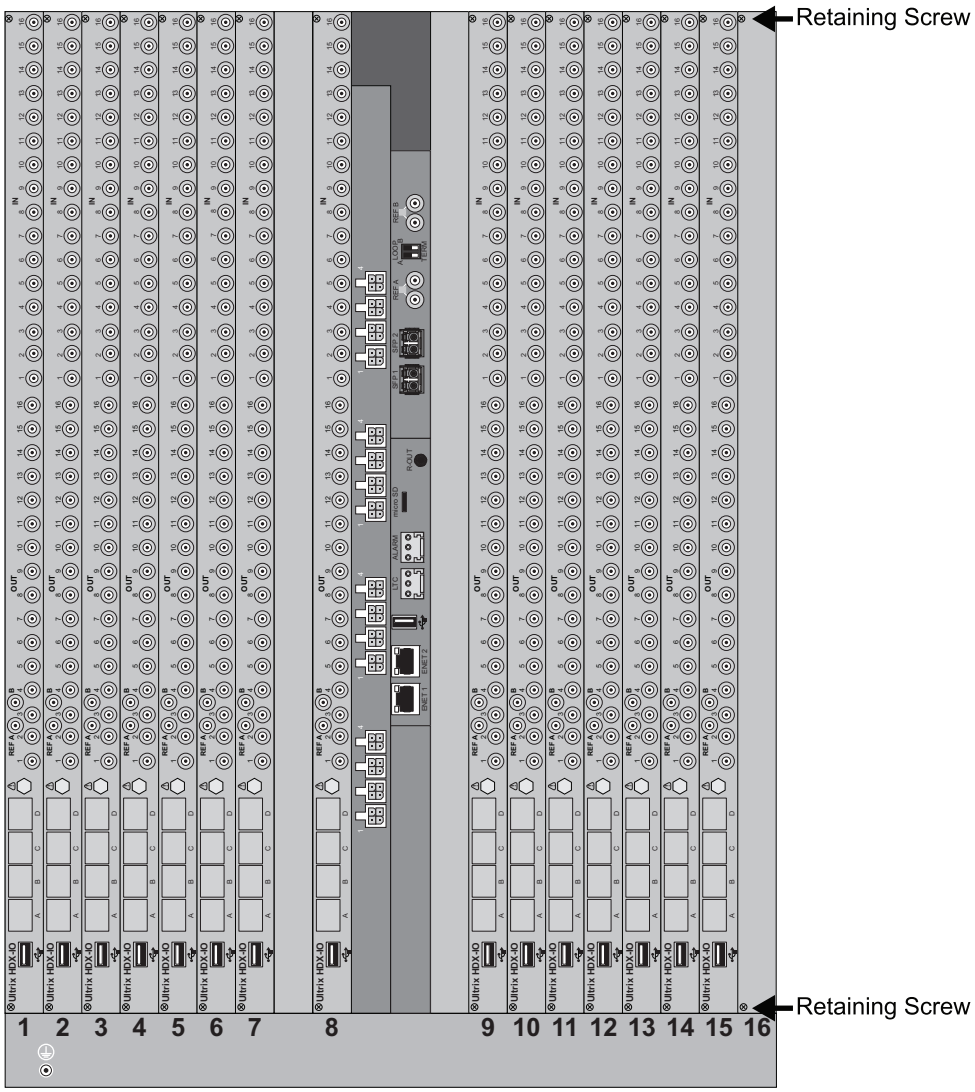


Figure 8 ULTRIX-FR12 Rear Panel — Retaining Screw Locations on a Blank Plate

3. Remove the blank plate from the chassis and set it aside.

Removing a Blade from the ULTRIX-FR12 Chassis

If you are replacing a blade, you must first remove the old blade from the chassis before installing the new blade.There are two screws and one bolt that affix the blade to the chassis: a screw on each end of the blade and then a Middle Retaining Bolt. You must disengage all three before the blade can be removed from the chassis. You will need a 3/16" socket to disengage the bolt (included in the kit shipped with your router).

Caution — *Steps must be followed in the presented order. Failing to do so can damage the blade.*

To remove an existing blade from the ULTRIX-FR12 chassis

1. Power down the ULTRIX-FR12 and disconnect it from mains power.
2. Ensure all cabling is removed from the ports on the I/O Blade.
3. Disengage the retaining screws on either end of the I/O Blade. Refer to **Figure 9**.

✶ We strongly recommend to disengage each screw until its head is approximately 0.25" away from the faceplate. Do not fully extract the screws from the chassis.

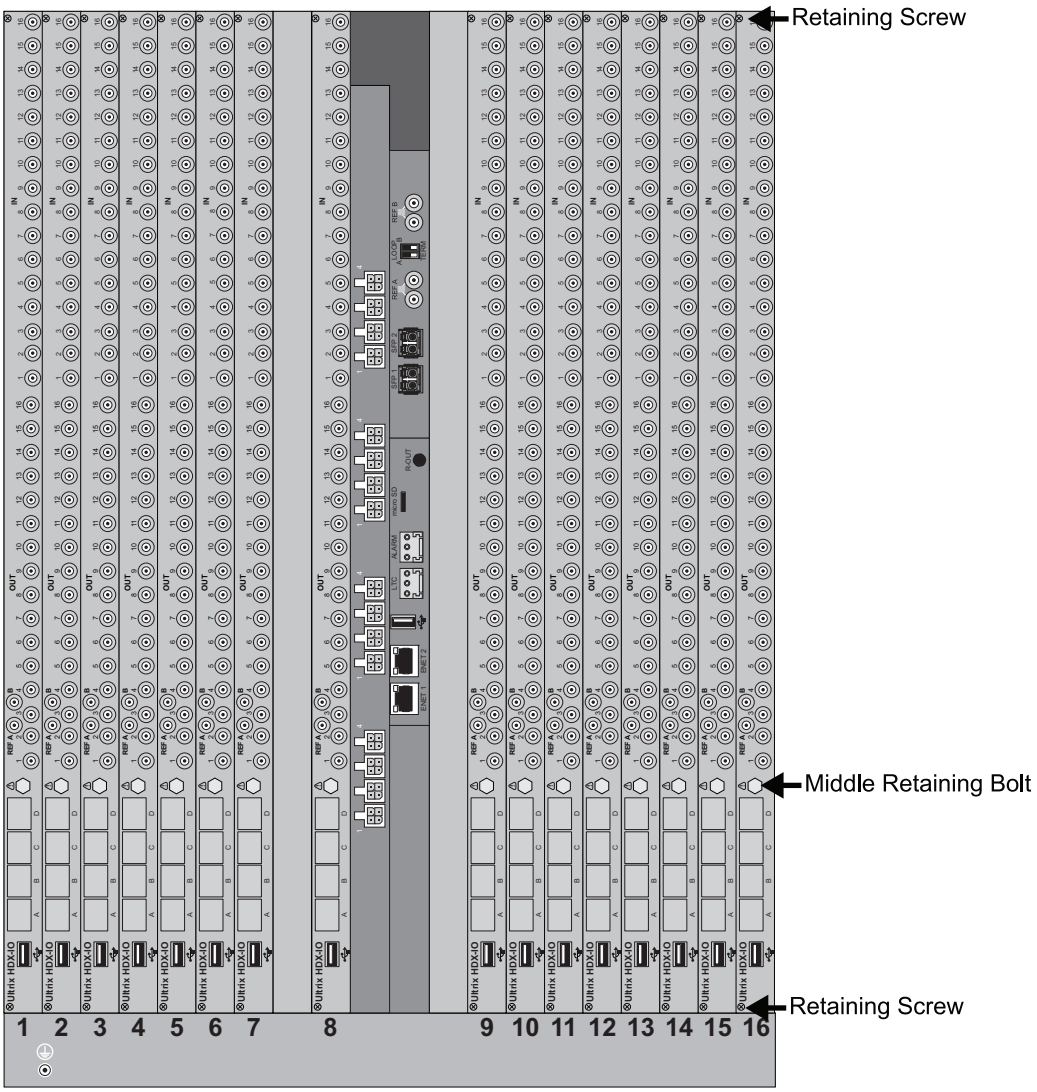


Figure 9 ULTRIX-FR12 Rear Panel — Location of Retaining Screws on an ULTRIX-HDX-IO Blade

4. From the ULTRIX-FR12 rear panel, unfasten the Middle Retaining Bolt. Note that this bolt is not removable but it does extract the blade. Refer to **Figure 9** for the bolt location.

Caution — *Ensure the Middle Retaining Bolt is fully unfastened before attempting to remove the blade from the chassis. While the bolt is not removable and serves as a threaded insertion and extraction tool. It should be free to move in and out a few millimeters in its socket once unfastened.*

5. Grasp the blade with both hands and gently pull it towards you to remove it from the router backplane.

Installing an ULTRIX-MODX-IO Blade into the ULTRIX-FR12 Chassis

The ULTRIX-MODX-IO blade is a complete unit. There are two screws and one bolt that affix the blade to the chassis: a screw on each end of the blade and a Middle Retaining Bolt.

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semi-conductor devices. Avoid handling circuit blades in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit blades and related equipment.*

To install an ULTRIX-MODX-IO blade into the ULTRIX-FR12 chassis

1. Using the card guides inside the chassis, gently slide the ULTRIX-MODX-IO blade into the chassis while lifting up slightly to take the weight.

✶ Ensure the blade is oriented with the ULTRIX-MODX-IO logo on the bottom (the side nearest to the slot silk-screen numbering on the chassis). Refer to the other blades installed in the chassis for orientation.

2. Gently slide the blade in until you feel it start to resist as the edge connectors begin to mate. This will occur approximately 1/8" (3mm) before the blade is fully seated. At this stage, the Middle Retaining Bolt should be used to pull the blade into its final mated position.

3. Using a 3/16" socket, fully tighten the Middle Retaining Bolt. This bolt secures the blade to the chassis from the interior, ensuring proper contacts between the blade and the router backplane.

Caution — *You must first fully tighten the Middle Retaining Bolt before tightening the screws on the ULTRIX-MODX-IO. Not doing so will damage the blade, the connectors on the backplane, or both.*

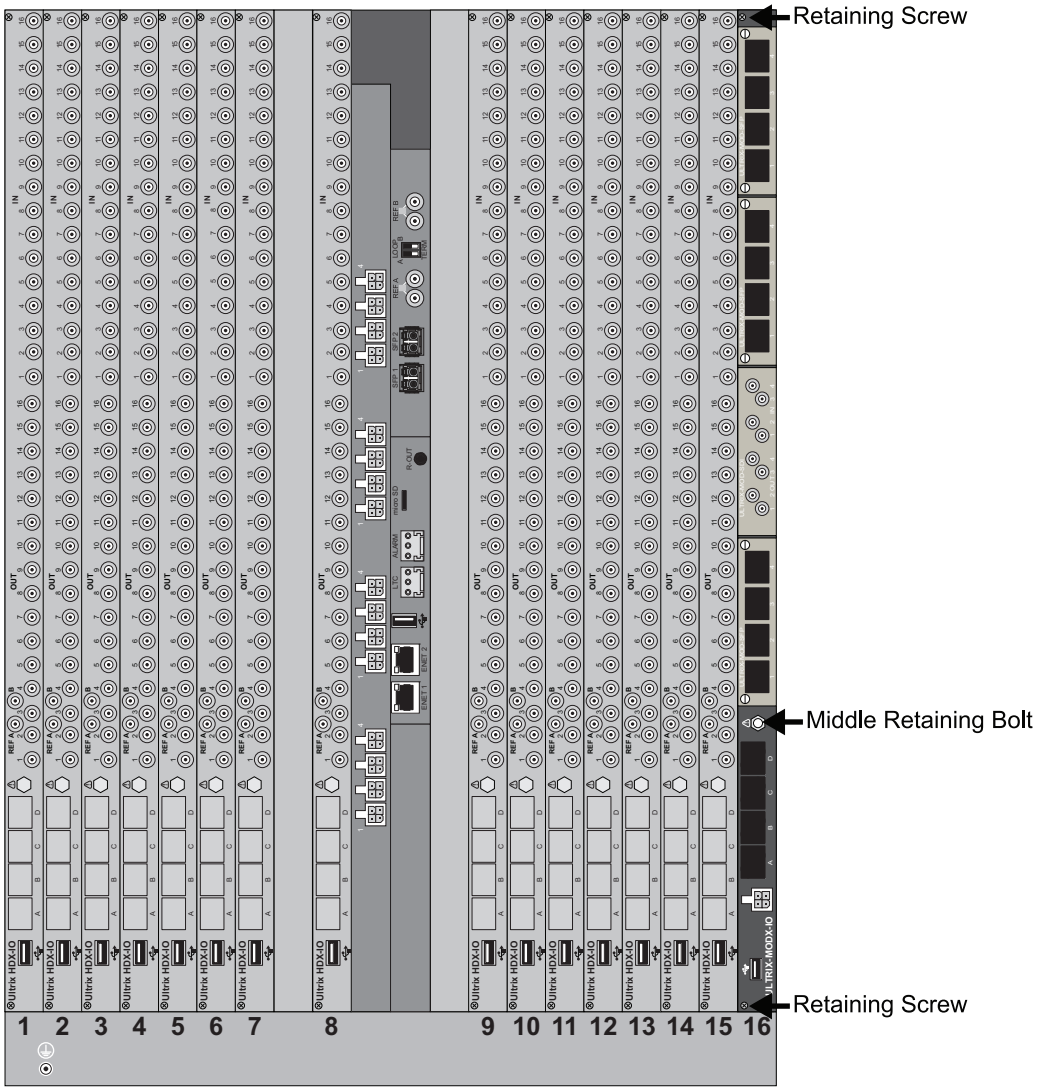


Figure 10 ULTRIX-FR12 Rear Panel — Location of Middle Retaining Bolt on the Blade

4. Using a Phillips screwdriver, fully tighten the screws located on the top and bottom sides of the blade.

✶ Tightening these screws is required to ensure proper alignment between the blade and the router backplane.

5. Power on the router as outlined in the ***ULTRIX-FR12 Installation Guide***.

Notice — *The router automatically powers on when power is applied.*

Upgrading the Router Software

Upon the initial power up of the router after the hardware upgrade the **Alarms** table in the **Hardware Configuration** interface in DashBoard may report a "`System Error`" with a Failed state (red indicator), and the **Frame Information** table in the **Hardware Configuration** interface reports a new Firmware version for the newly upgraded slot. To complete the ULTRIX-MODX-IO blade install, you must upgrade the software and clear the alarm states.

Contact Ross Technical Support for the appropriate software version and the blade firmware for your setup. Refer to "**Contacting Technical Support**" for contact details.

Optional Power Connection

This section only applies if your configuration requires that extra power be supplied directly to the modules installed in the ULTRIX-MODX-IO blade.

Notice — *Refer to the Ross Ultrix Configuration Tool on our website, or contact Ross Technical Support, for help determining if this power connection is needed for your system.*

For More Information on…

- how to contact Ross Technical Support, refer to "**Contacting Technical Support**".

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Connecting the ULTRIX-MODX-IO to a 15V PSU

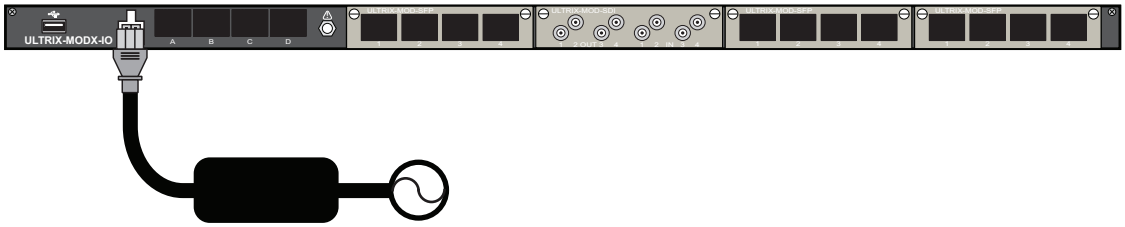
The ULTRIX-MODX-IO can connect to a power supply that provides regulated +15V DC (5%) @ up to 4A. The DC Power cord has a locking connector that securely fastens into the power supply DC jack on the ULTRIX-MODX-IO blade.

Caution — *Ensure to connect the DC Power cord of the power supply to the PSU connection on the ULTRIX-MODX-IO before connecting the power supply to the power source.*

Caution — *Use of improper adapters may damage the ULTRIX-MODX-IO and will void the warranty.*

To connect the power cable to the ULTRIX-MODX-IO

1. Connect the female end of the provided power cable into the PSU connection on the ULTRIX-MODX-IO blade.



Note: It is recommended that you always connect the Power Supply Unit to the blade before connecting to Mains Power.

Figure 11 ULTRIX-MODX-IO — PSU Connection

2. Connect the supplied AC power cable into the power module.
3. Connect the supplied power cable's three-prong male connector to Mains Power.

Installing a Module

Installing a module into an ULTRIX-MODX-IO blade in an Ultrix router requires you to remove the blank plate in the required blade slot, install the required module into the blade, and then install the required SFP modules into the required port(s). The procedure for installing a module is the same for all module and router types.

✶ A single ULTRIX-MODX-IO blade can accommodate up to four modules.

If you have questions pertaining to the installation of the module, contact us at the numbers listed in "**Contacting Technical Support**". Our technical staff is always available for consultation, training, or service.

Before You Begin

Ensure the ULTRIX-MODX-IO blade is installed in the Ultrix router. Refer to "**Installing the ULTRIX-MODX-IO**" for details.

Required Equipment

The following equipment is required:

- the I/O module to be installed in the ULTRIX-MODX-IO blade
- a #1 Phillips screwdriver

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Working with Fiber Optic Connectors

Keep the following in mind if the SFP module(s) installed in a port includes a fiber optic connector:

- Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.
- Connectors must always be inserted into a device or have a dust cap on.
- A poor optical connection is often similar to a poor electrical connection. Try removing the connector, cleaning, and re-inserting the connector. A bad connection can result in experiencing instability of signal, high loss, or a noisy signal.

Installing a Module into the ULTRIX-MODX-IO Blade

When a blade slot is not populated with a module, a blank plate must be installed to protect the chassis interior and ensure proper cooling. When installing the module into an unpopulated slot of the ULTRIX-MODX-IO blade, you must first remove this blank plate from the slot.

Notice — *When a module slot within the ULTRIX-MODX-IO blade is not populated with a module, a blank plate for the module slot must be installed to ensure proper cooling and ventilation.*

To remove the blank plate from the ULTRIX-MODX-IO blade slot

1. Locate the blade slot you wish to install the module into.
2. Use a #1 Phillips screwdriver to unfasten each retaining screw from the blank plate.

   Figure 12 shows the retaining screws for slot 1. The location of the screws on the blank plate is the same for all slots.

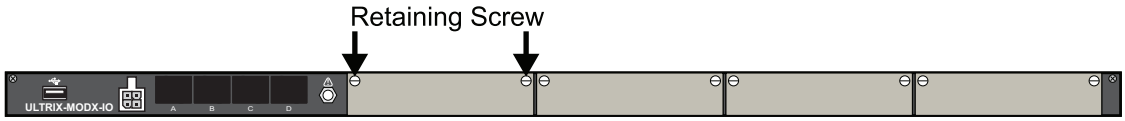


Figure 12 ULTRIX-MODX-IO — Location of Retaining Screws for a Slot

3. Remove the blank plate from the blade and set aside.

To install a module into the ULTRIX-MODX-IO blade

1. Grasp the module with both hands.
2. Align the module with the available slot.
3. Gently slide the module into the slot until you feel it start to resist as the edge connectors begin to mate.
4. Using a #1 Phillips screwdriver and the retaining screws, fasten the module to the blade.

✶ Tightening these screws is required to ensure proper alignment between the module and the blade backplane.

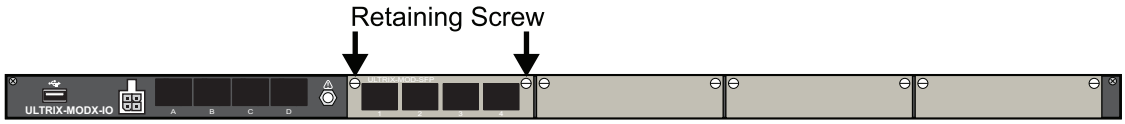


Figure 13 ULTRIX-MODX-IO — Location of Retaining Screws on a Module

Replacing a Module

You can hot-swap any module in/out of an ULTRIX-MODX-IO blade.

✶ Be aware that when hot swapping an ULTRIX-MOD-NDI, the new ULTRIX-MOD-NDI module will have a different MAC Address. This can potentially cause disruptions in the video streams previously configured for that module slot (e.g. obtaining a different IP address via DHCP). Receivers may need to be manually reconfigured or reapplied to account for this change.

To replace a module

1. In DashBoard, navigate to the ULTRIX-MODX-IO interface as outlined in "**To display the IO Module interface in DashBoard**".
2. Remove any cables attached to the module.
3. Use a #1 Phillips screwdriver to disengage the retaining screws on either end of the module.
4. Grasp the module with both hands and gently pull it towards you to remove it from the blade.

5. Set the module on a clean, flat, and static-free surface.

Notice — *When you remove module from its slot in the ULTRIX-MODX-IO blade, wait a minimum of 5 seconds to allow the bade to register the empty module slot. Then proceed to install a new module in the same slot. Failure to do so could result in improper operation.*

6. Install the new module as outlined in "**To install a module into the ULTRIX-MODX-IO blade**".
7. Verify that the new module is reported in the ULTRIX-MODX-IO interface in DashBoard.

✶ When a module is installed in a slot of the ULTRIX-MODX-IO blade, the module software may not match that of the blade[1]. There is an option to upgrade only the module software. This upgrade will only affect the modules that do not match the blade software. If there is a mismatch between the blade software and the module software, refer to "**Upgrading the Software**".

1. Not all modules include software.

Populating the SFP Ports

This chapter provides general instructions on how to populate a port on the ULTRIX-MODX-IO blade or an SFP port on the ULTRIX-MOD-SFP module.

For More Information on...

- installing an SFP module, refer to the documentation that accompanied your SFP module.
- the SFP modules supported by the router, refer to the ***Ultrix SFP Module User Guide***.
- cabling the ports on the ULTRIX-MOD-SFP, refer to "**ULTRIX-MOD-SFP**".
- cabling the BNCs on the ULTRIX-MOD-SDI, refer to "**ULTRIX-MOD-SDI**".
- cabling the ENET port on the ULTRIX-MOD-NDI, refer to "**ULTRIX-MOD-NDI**".

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Working with Fiber Optic Connectors

Keep the following in mind if the SFP module(s) installed in a port includes a fiber optic connector:

- Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.
- Connectors must always be inserted into a device or have a dust cap on.
- A poor optical connection is often similar to a poor electrical connection. Try removing the connector, cleaning, and re-inserting the connector. A bad connection can result in experiencing instability of signal, high loss, or a noisy signal.

✶ Refer to the document ***Important Regulatory and Safety Notices*** that shipped with your router, for safety information when handling fiber optic components.

Populating a Port with an SFP Module

This section provides a general overview of how to install an SFP module into an available port of the ULTRIX-MODX-IO blade or ULTRIX-MOD-SFP module.

Keep the following in mind:

✶ An SFP module can only be installed in the AUX A or AUX B ports in the ULTRIX-MODX-IO blade.

✶ The AUX C port is reserved for the Ultrimix-Dante licensed feature.

✶ The AUX D port is reserved for use with the UltriStream licensed feature and must be populated with an 1GE SFP module.

To install an SFP module in a port

Caution — *Do not remove the dust caps from the port until you are ready to install the SFP module.*

1. Remove the dust cap from the port on the ULTRIX-MODX-IO or ULTRIX-MOD-SFP as follows:
   a. Locate the port you wish to install the SFP module into.
   b. Grasp the cap between your thumb and forefinger and gently press on the sides.
   c. Pull the cap towards you and away from the port.
   d. Store the dust cap for later use.
2. Locate the markings on the SFP module that identify the orientation for installing. These markings may include Tx/Rx icons, or arrows that indicate the signal flow direction.

Caution — *Do not install an SFP module with fiber-optic cables attached. Doing so can damage the cables, the cable connector, the SFP module or all three.*

3. Align the SFP module in front of the empty port.
4. Insert the SFP module into the port, ensuring it is seated home and the latch is engaged.

Caution — *Do not remove the dust caps from a SFP module until you are ready to connect the cables.*

Cabling the AUX Ports

This chapter outlines the cabling designations for the ULTRIX-MODX-IO blade AUX ports when using specific licensed features of the Ultrix router.

For More Information on…

- UltriProc cabling on the ULTRIX-MOD-SDI, refer to "**UltriProc Cabling**".
- UltriScape cabling on the ULTRIX-MOD-SFP, refer to "**UltriScape Cabling**".

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Ultrimix-Dante Cabling

The Ultrimix-Dante license provides 64 x 64 input/output audio channels accessible via ethernet on the AUX C port of the ULTRIX-HDX-IO and ULTRIX-MODX-IO blades. It utilizes the Audinate® Dante® proprietary IP-based audio transport system.

The Ultrix router identifies the Dante channels as a single pipeline consisting of 64 input and 64 output channels. Ultrimix-Dante enables the Ultrix router to include Audinate Dante audio inputs and outputs into the Ultrix routing matrix. Audio sources from a Dante network can be configured as inputs into the Ultrix router. The Ultrix router can also output audio channels to the same Dante network.

✶ The AUX B audio channels are not available for use when Ultrimix-Dante is enabled on a blade. AUX B can still be used to route SDI video. Refer to the ***Ultrix User Guide*** for details.

Before cabling for Ultrimix-Dante, ensure that the AUX C port on the ULTRIX-MODX-IO blade is populated with an 1GE SFP module. (**Figure 14**)

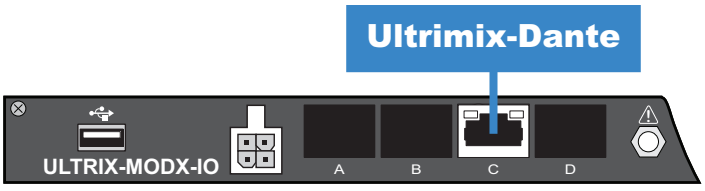


Figure 14 Ultrimix-Dante Cabling

For More Information on…

- cabling the ULTRIX-HDX-IO blade for Ultrimix-Dante, refer to the ***Ultrix Installation Guide*** for your router.

UltriStream Cabling

The UltriStream licensed feature provides the ability to encode one NDI stream of a configured Ultriscape Multiviewer Head per the AUX D port on an ULTRIX-HDX-IO and ULTRIX-MODX-IO blades.

Before cabling for UltriStream, ensure that the AUX D port on the ULTRIX-MODX-IO blade is populated with an 1GE SFP module. (**Figure 15**)

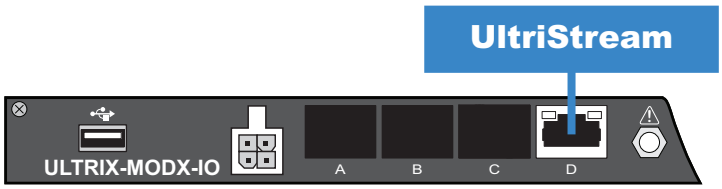


Figure 15 UltriStream Cabling

✶ The Multiviewer Head for the video source must be one from the same blade that is transmitting the NDI stream. For example, a licensed ULTRIX-MODX-IO blade in Slot 1 cannot send an NDI stream of a Multiviewer Head from a licensed ULTRIX-HDX-IO blade in Slot 2.

For More Information on...

- configuring the UltriStream licensed feature, refer to the ***Ultrix User Guide*** for your router.
- enabling and configuring the Ultriscape Head(s), refer to the ***Ultriscape User Guide***.
- cabling the ULTRIX-HDX-IO blade for UltriStream, refer to the ***Ultrix Installation Guide*** for your router.

ULTRIX-MOD-DPT

This chapter outlines the ULTRIX-MOD-DPT features, cabling designations, DashBoard interfaces, and configuration options.

For More Information on…

- installing an ULTRIX-MOD-DPT in the ULTRIX-MODX-IO blade, refer to "**Installing a Module**".

Overview

The ULTRIX-MOD-DPT offers flexibility for installations where an SDI or SMPTE-2110 input is not available or preferred by providing:

- the ability to drive a range of displays, from local monitors and Multiviewers to large-scale LED walls on sets and in stadiums;
- a solution for display processors that require DisplayPort input;
- support for other AV-centric devices, such as AVOIP encoders;
- a single point of efficient status and control via DashBoard.

Features

The following features are standard for the ULTRIX-MOD-DPT module:

- 4 x USB-C ports
- Provides color space conversion:
  - › YUV 4:2:2 8bit or 10bit
  - › RGB 4:4:4 8bit or 10bit
- Provides a test pattern source of up to 2160p 60Hz
- A single point of efficient status and control via DashBoard

Supported DisplayPort Video Formats

Table 1 outlines the video formats that the ULTRIX-MOD-DPT supports.

✶ Ensure that you are using a supported video format. Using unsupported formats may result in undefined behavior.

✶ Interlace video formats are not supported.

Table 1 Supported Video Formats — ULTRIX-MOD-DPT

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
HD		
720	P	50
720	P	59.94
720	P	60
1080[a]	P	23.98
1080	P	24

Table 1 Supported Video Formats — ULTRIX-MOD-DPT (Continued)

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
1080	P	25
1080	P	29.97
1080	P	30
3G		
1080	P	50
1080	P	59.94
1080	P	60
6G		
2160	P	23.98
2160	P	24
2160	P	25
2160	P	29.97
2160	P	30
12G (UHD)		
2160	P	50
2160	P	59.94
2160	P	60

a. 1080p Level B and 1080pSF formats are not supported.

Hardware Overview

The ULTRIX-MOD-DPT module includes four USB-C ports that are auto-populated.

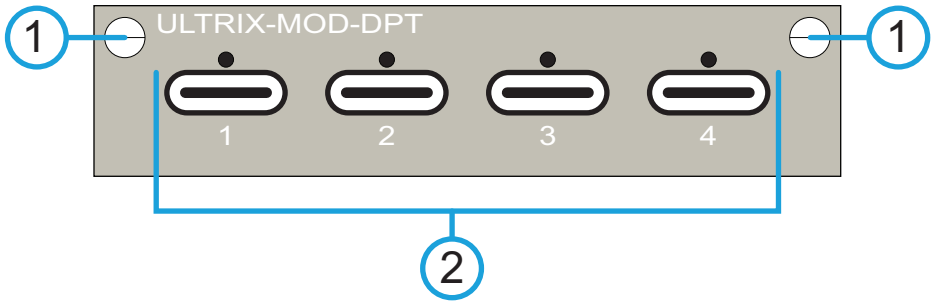


Figure 16 Hardware Features of the ULTRIX-MOD-DPT

1) Retaining Screws	2) USB-C Ports

1. Retaining Screws

There is a retaining screw on each end of the module. These screws affix the module to the ULTRIX-MODX-IO blade. Refer to "**Installing a Module**" for details.

2. USB-C Ports

The ULTRIX-MOD-DPT module includes four USB-C ports that support DisplayPort Alternate Mode. A threaded hole is located above each USB-C port that is top-lock screw cable compatible.

If required, connect a cable that has a top screw locking mechanism to secure it to the ULTRIX-MOD-DPT port.

Each port provides an output up to DisplayPort 1.4. Each port auto detects a sink hot-plug.

✶ Audio support is not implemented on the ULTRIX-MOD-DPT.

Cabling

The ULTRIX-MOD-DPT uses DisplayPort Alternate mode when transmitting to a third-party device. This allows the delivery of DisplayPort signals from Ultrix via one of the four available USB Type-C ports.

Notice — *Do not use the USB-C ports for non-display purposes (e.g. charging).*

✶ The USB-C cables must support DisplayPort Alt mode for DP 1.4 for full format functionality.

To achieve optimal video performance:

- Use a DisplayPort cable that is compatible with your video configuration.
- Ensure the cable supports the required DisplayPort version (e.g., DP 1.4).
- Ensure the cable is of an appropriate length to maintain signal integrity.

✶ Using an incompatible or excessively long cable may result in reduced video quality or connectivity issues.

Supported Sinks

A sink refers to a device or component that receives and processes signals or data from a source. For example, in an ULTRIX-MOD-DPT setup, a monitor could act as the sink for video signals sent from the ULTRIX-MOD-DPT.

The ULTRIX-MOD-DPT can be used with sinks that support DisplayPort as an input. For example, monitors, display encoders for driving display, etc.

Displaying the ULTRIX-MOD-DPT in DashBoard

The options for configuring the ULTRIX-MOD-DPT are displayed in the **Port Configuration** interface of the router. This interface enables you to configure the color space settings, configure a test pattern, and monitor the status of the output signals. (**Figure 17**)

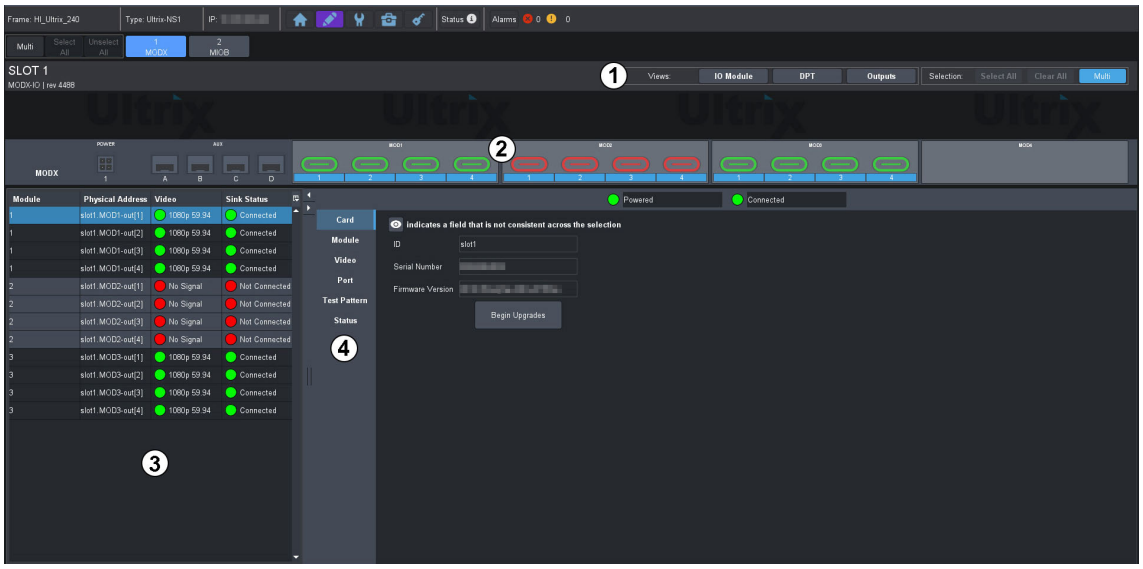


Figure 17 Example of the ULTRIX-MOD-DPT in DashBoard

1. Views Toolbar for ULTRIX-MOD-DPT

Set Views > IO Module > DPT > Outputs to display the ULTRIX-MOD-DPT module(s) in your router.

2. Slot Map

This area displays a map of the selected ULTRIX-MODX-IO blade as filtered using the Views menus. Select the Display Port directly from the required ULTRIX-MOD-DPT module to display its settings on the Port Configuration interface.

The color of the port icon on the slot map indicates the following:

› Green — A valid video source signal is detected and a sink is connected.

› Yellow —A sink is connected but a valid video source signal is not detected.

› Red — A sink is not connected.

3. Detected Ports Table

This table lists the available ULTRIX-MOD-DPT ports as determined by the selections made in the Views toolbar. This table provides the physical address, video status, and sink status of each detected ULTRIX-MOD-DPT port.

Use the list of ports in this table to select the physical address that is to be configured to output a DisplayPort signal.

4. Configuration Options

Select a port from the leftmost table to display its configuration options in the right pane.

The port labeling follows the same nomenclature as other modules and appears in the Ultrix database. Each port is labeled as `slot`**`x`**`.MOD`**`y`**`-out[`**`z`**`]` where **`x`** is the physical router slot, **`y`** is the blade slot that the ULTRIX-MOD-DPT is installed in, and **`z`** is the port number.

The ULTRIX-MOD-DPT settings are organized into six tabs.

› **Card** — reports the slot identifier, serial number, and the firmware version for the ULTRIX-MODX-IO blade that houses the selected ULTRIX-MOD-DPT. Refer to **Table 28** for details.

› **Module** — reports read-only information on the ULTRIX-MOD-DPT such as serial number, firmware version, and temperature. Refer to **Table 28** for details.

› **Video** — provides the video signal configuration options for the ULTRIX-MOD-DPT. Refer to **Table 30** for details.

› **Port** — provides configuration options for the selected port on the ULTRIX-MOD-DPT. Refer to "**Configuring the Color Space Converter for an Output**" and "**Configuring a Test Pattern Output**".

› **Test Pattern** — enables you to specify the video format for the internally generated SMPTE color bars test pattern for the ULTRIX-MOD-DPT. Refer to "**Configuring a Test Pattern Output**".

› **Status** — enables you to monitor the source validity status of each sink connected to the ULTRIX-MOD-DPT (e.g. monitors, display drivers). Refer to "**Monitoring**".

✶ Settings that are common to the selected ports, but are assigned different values, are noted with an  icon. Refer to "**Selecting the Ports to Configure**" for more information on this icon.

Displaying the ULTRIX-MOD-DPT in DashBoard

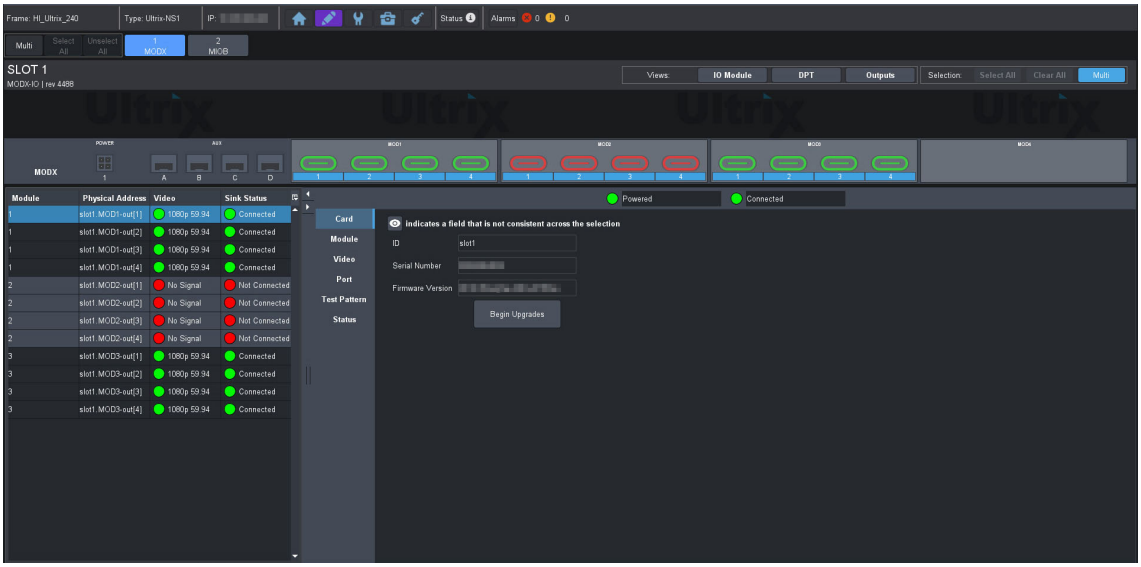
To display the ULTRIX-MOD-DPT settings, you set the Views to IO Module > DPT.

✶ You can only configure the outputs on the ULTRIX-MOD-DPT.

To display the ULTRIX-MOD-DPT interfaces in DashBoard

1. Expand the Ultrix node to display a list of sub-nodes in the Tree View.
2. Expand the **System** sub-node.
3. Expand the **Configuration** sub-node.
4. Double-click the **Ultrix** node.

   The **Device Configuration** interface opens.
5. Select  .
6. From the **Views** toolbar:
   a. Use the first menu to select **IO Module**.
   b. Use the second menu to select **DPT**.
   c. Use the third menu to select **Outputs**.



Routing the ULTRIX-MOD-DPT Outputs

You route the video sources (SRC) to the ULTRIX-MOD-DPT output ports (DEST) through the Ultrix routing matrix. Refer to the ***Ultrix and Ultricore Database User Guide*** for details.

Configuring the Color Space Converter for an Output

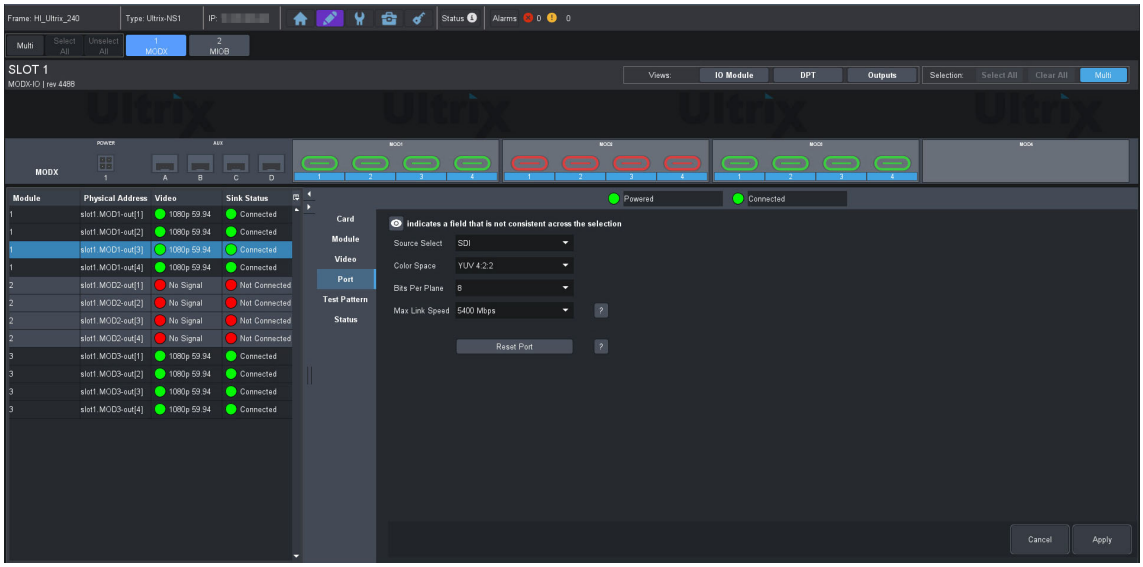
The ULTRIX-MOD-DPT supports color space conversion, which is the process of translating colors from one color space to another. Two commonly used color spaces are RGB (Red, Green, Blue) and YUV (Luminance, Chrominance).

- RGB Color Space is widely used in digital displays. In RGB, colors are represented as combinations of red, green, and blue light intensities.
- YUV Color Space is often used in video encoding and compression. YUV separates color information into luminance (Y) and chrominance (U and V).

To configure the color space converter for an output

1. Display the ULTRIX-MOD-DPT as outlined in "**To display the ULTRIX-MOD-DPT interfaces in DashBoard**".
2. From the blade map at the top of the interface, select the **DPT** port of the ULTRIX-MOD-DPT to configure.
3. Select the **Port** tab.
4. Select an ULTRIX-MOD-DPT port to configure.

   In the following example, the user is configuring slot1.MOD1-out[3].



5. Set the **Source Select** to **SDI**.

   The sourced video to the ULTRIX-MOD-DPT outputs will be SDI video. This will route the assigned SDI video source via the Ultrix database to the ULTRIX-MOD-DPT.

6. Use the **Color Space** menu to assign the color space settings for the video output of a selected ULTRIX-MOD-DPT port. Choose from the following:

   - RGB 4:4:4 — the red, green, and blue components of the video have the same sampling rate.
   - YUV 4:2:2 — the chrominance (U, V) components are sampled at half the horizontal sample rate of the luma (Y) component of the video. This is the default.

7. Use the **Bits Per Plane** menu to specify the number of bits per plane for the video output on a selected ULTRIX-MOD-DPT port. The default is 10.
8. Select the **Max Link Speed** for the ULTRIX-MOD-DPT port to use 5400Mbps (HBR2) or 8100Mbps (HBR3) when connected to a sink device.

Valid Video Configurations

Depending on the sink's capabilities some of the video configuration combinations may not be valid. The following tables summarize the configuration combinations that will work (shown with a check-mark), and which will not due to bandwidth restrictions (shown with 'N').

720p Configurations

Table 2 Valid Configurations for 720p 50/59.94/60Hz

DP Lane	DP Lane Speed (Gbps)	DP Max Bandwidth (Mbps)	720p YUV422 8bits	720p YUV422 10bits	720p RGB 8bits	720p RGB 10bits
4	8.1	25,920	✓	✓	✓	✓
4	5.4	17,280	✓	✓	✓	✓
4	2.7	8,640	✓	✓	✓	✓
2	8.1	12,960	✓	✓	✓	✓
2	5.4	8,640	✓	✓	✓	✓
2	2.7	4,320	✓	✓	✓	✓

1080p Configurations

Table 3 Valid Configurations for 1080p 23.98/24/25/30Hz

DP Lane	DP Lane Speed (Gbps)	DP Max Bandwidth (Mbps)	1080p YUV422 8bits	1080p YUV422 10bits	1080p RGB 8bits	1080p RGB 10bits
4	8.1	25,920	✓	✓	✓	✓
4	5.4	17,280	✓	✓	✓	✓
4	2.7	8,640	✓	✓	✓	✓
2	8.1	12,960	✓	✓	✓	✓
2	5.4	8,640	✓	✓	✓	✓
2	2.7	4,320	✓	✓	✓	✓

Table 4 Valid Configurations for 1080p 50/59.94/60Hz

DP Lane	DP Lane Speed (Gbps)	DP Max Bandwidth (Mbps)	1080p50 YUV422 8bits	1080p50 YUV422 10bits	1080p50 RGB 8bits	1080p50 RGB 10bits
4	8.1	25,920	✓	✓	✓	✓
4	5.4	17,280	✓	✓	✓	✓
4	2.7	8,640	✓	✓	✓	✓
2	8.1	12,960	✓	✓	✓	✓
2	5.4	8,640	✓	✓	✓	✓
2	2.7	4,320	✓	✓	✓	**N**

2160p Configurations

Table 5 Valid Configurations for 2160p 23.98/24/25/29.97/30Hz

DP Lane	DP Lane Speed (Gbps)	DP Max Bandwidth (Mbps)	2160p24 YUV422 8bits	2160p24 YUV422 10bits	2160p24 RGB 8bits	2160p24 RGB 10bits
4	8.1	25,920	✓	✓	✓	✓
4	5.4	17,280	✓	✓	✓	✓
4	2.7	8,640	✓	✓	✓	**N**
2	8.1	12,960	✓	✓	✓	✓
2	5.4	8,640	✓	✓	✓	**N**
2	2.7	4,320	**N**	**N**	**N**	**N**

Table 6 Valid Configurations for 2160p 50/59.94/60Hz

DP Lane	DP Lane Speed (Gbps)	DP Max Bandwidth (Mbps)	2160p50 YUV422 8bits	2160p50 YUV422 10bits	2160p50 RGB 8bits	2160p50 RGB 10bits
4	8.1	25,920	✓	✓	✓	✓
4	5.4	17,280	✓	✓	✓	**N**
4	2.7	8,640	**N**	**N**	**N**	**N**
2	8.1	12,960	✓	✓	**N**	**N**
2	5.4	8,640	**N**	**N**	**N**	**N**
2	2.7	4,320	**N**	**N**	**N**	**N**

Configuring a Test Pattern Output

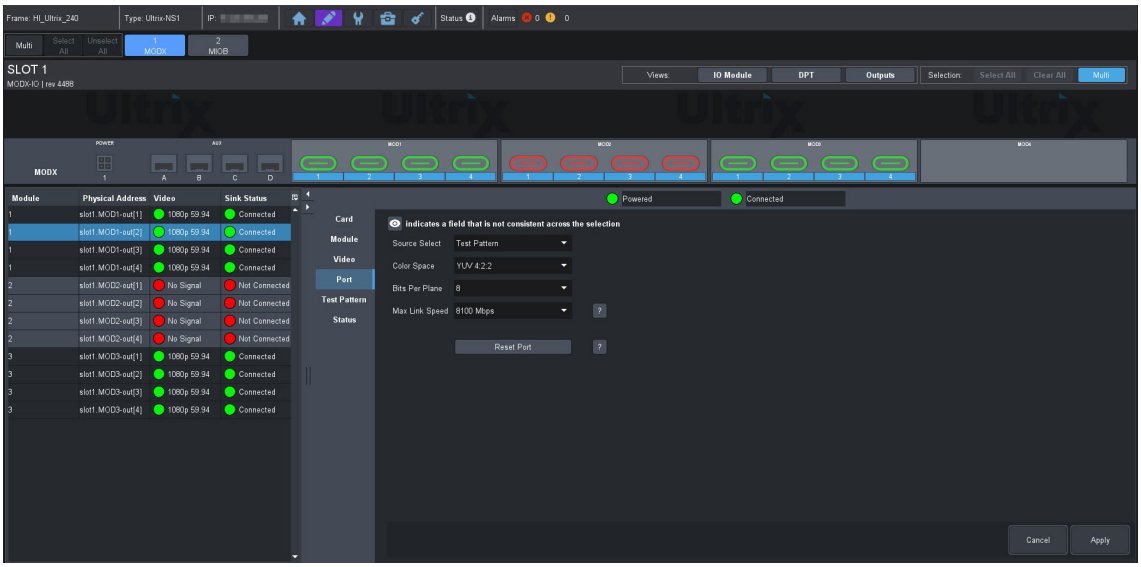
The ULTRIX-MOD-DPT can generate a SMPTE bars test pattern video output without the need of a source. This can be useful for quick testing/verifying of a sink device or setup.

To configure a test pattern output

1. Display the ULTRIX-MOD-DPT as outlined in "**To display the ULTRIX-MOD-DPT interfaces in DashBoard**".
2. Select the **Port** tab.
3. Select an ULTRIX-MOD-DPT port to configure.
4. Set the **Source Select** to **Test Pattern**.

   This assigns the internal generated test pattern as the sourced video for the selected port on the ULTRIX-MOD-DPT.

   In the following example, the user is configuring slot1.MOD1-out[2]



5. Use the **Color Space** menu to assign the color space settings for the video output of the test pattern. Choose from the following:

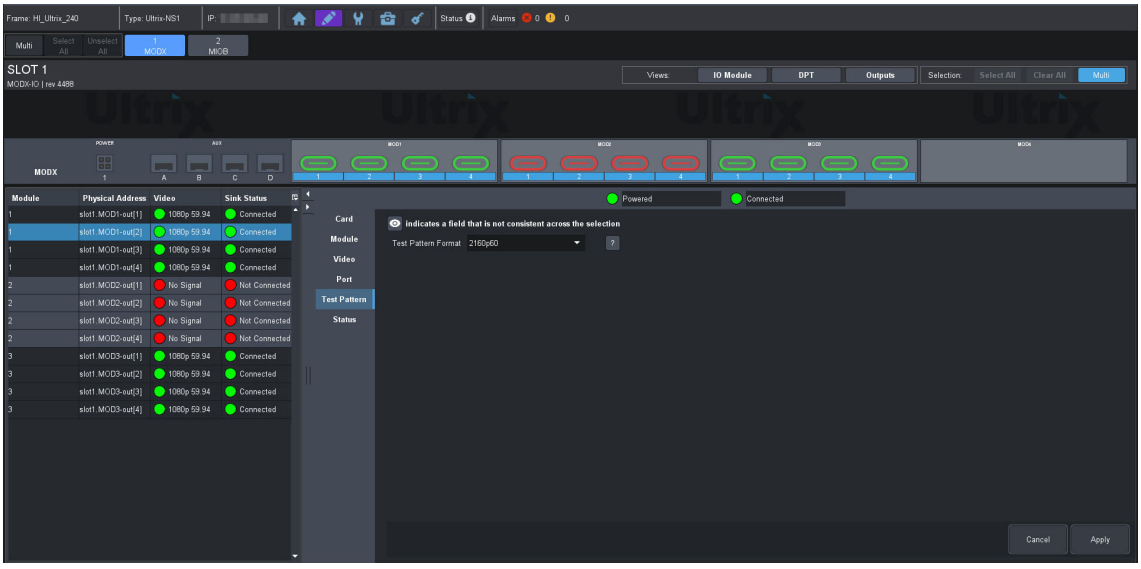
   - RGB 4:4:4 — the red, green, and blue components of the video have the same sampling rate.
   - YUV 4:2:2 — the chrominance (U, V) components are sampled at half the horizontal sample rate of the luma (Y) component of the video. This is the default.

6. Use the **Bits Per Plane** menu to specify the number of bits per plane for the test pattern output on the selected ULTRIX-MOD-DPT port. The default is 10.

7. Use the **Max Link Speed** menu to set the maximum link rate of the test pattern output on the selected ULTRIX-MOD-DPT port. Choose from the following:

   - 5400Mbps— the estimated bandwidth (transfer rate of data) between the ULTRIX-MOD-DPT and a sink device will be no more than 5.4Gbps. This is the default.
   - 8100Mbps — the estimated bandwidth (transfer rate of data) between the ULTRIX-MOD-DPT and a sink device will be no more than 8.1Gbps.

8. Select the **Test Pattern** tab.



9. Use the **Test Pattern Format** menu to specify the resolution and frame rate for the test pattern output.

✶ The Test Pattern Format setting applies to all ports that have their Source Select set to Test Pattern on the same ULTRIX-MOD-DPT module.

Monitoring

The ULTRIX-MOD-DPT > Status tab enables you to monitor the EDID, Sink Detection Status, Sink Link Train, and number of lanes for the port.

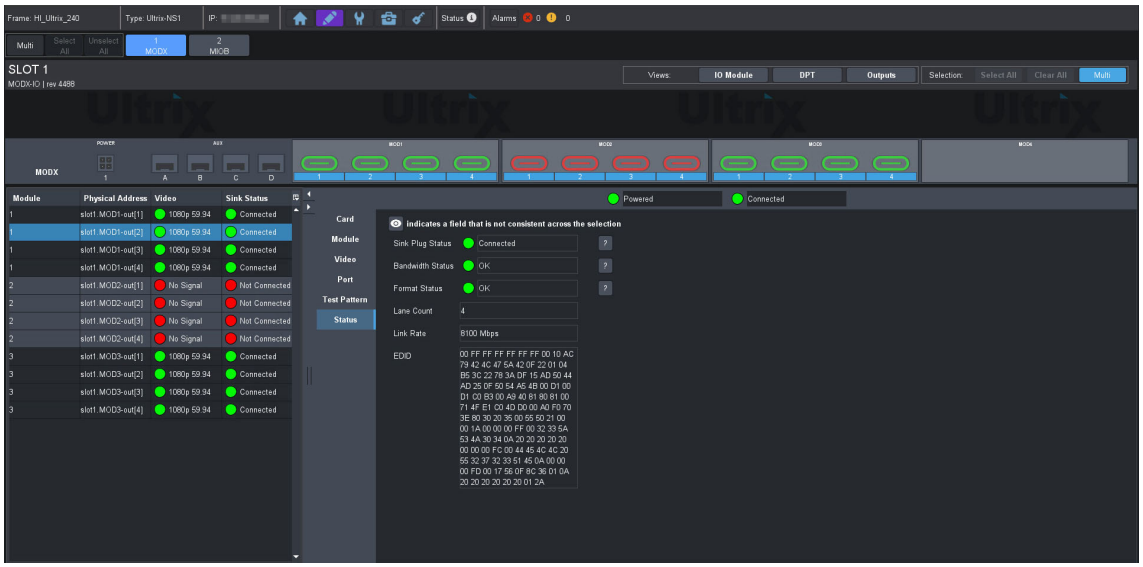


Figure 18 Example of the ULTRIX-MOD-DPT > Status Tab

Status Reporting

The ULTRIX-MOD-DPT also reports the following issues:

- Sink Plug Status (per-port) — Reports "`Connected`" when a valid sink is connected to the ULTRIX-MOD-DPT. Reports "`Not Connected`" when no sink or an invalid sink is detected (e.g. a cellphone charger).
- Bandwidth Exceeded (per-port) — See "**Valid Video Configurations**" for more information. This alarm is reported in the Status tab.
- Link Training Failed (per-port) — Link training is the process of establishing a reliable communication channel between the ULTRIX-MOD-DPT and the sink (e.g. a monitor). This issue is reported in the Ultrix Alarms tab (Systems > Configuration > Ultrix).
- Invalid Format (per-port) — Detects unsupported frame rates or resolution.

✶ The ULTRIX-MOD-DPT does not support interlace video formats.

EDID Reporting

EDID (Extended Display Identification Data) is metadata sent by a display (a monitor) to a source device (ULTRIX-MOD-DPT) over DisplayPort, HDMI, or other connections. It includes information about supported resolutions, refresh rates, color depth, audio formats, and other specifications. This data allows the source device to adjust its output for optimal display settings, enabling plug-and-play compatibility between devices.

The ULTRIX-MOD-DPT displays the raw 128bit EDID hex values read from the connected sink in the Status > EDID field. These hex values can be decoded using an EDID parsing tool.

Upgrading the ULTRIX-MOD-DPT Software

The ULTRIX-MOD-DPT can be upgraded in the same manner as any module for the ULTRIX-MODX-IO blade. You can choose to upgrade a specific ULTRIX-MOD-DPT, or all the ULTRIX-MOD-DPT modules in a single blade.

For More Information on...

- upgrading the ULTRIX-MOD-DPT software, refer to "**Upgrading the Software**".

Keep the following in mind:

- Ensure the Enable Upgrades & Support Access box is selected in the Ultrix > System > Configuration > Connections > Services tab.
- The ULTRIX-MOD-DPT *.bin file is uploaded to each module in a blade serially. Each module takes approximately 2.5 minutes to upgrade. A fully loaded blade could take up to 12 minutes to upgrade all modules.

Notice — *The ULTRIX-MOD-DPT can be hot plugged in/out of the ULTRIX-MODX-IO blade. When a module is unplugged from the blade, wait until the DashBoard interface reports that the module is no longer installed (typically about 5 seconds). You may then plug in a new module into the available slot. Failure to do so could result in improper operation.*

- In the case where the ULTRIX-MOD-DPT module is plugged into a blade and the module software does not match that of the blade, there is the option to do a module-level-only upgrade. This upgrade will only affect the modules that do not match the blade software. Options for this feature appear in the Ultrix > Port Configuration > IO Module View > Module tab. The user will need to select "Begin Upgrades" to update the module(s).

✶ If a new ULTRIX-MODX-IO blade with different software is plugged into a router slot, the modules in that new blade would upgrade to whatever software version is on that blade. This could lead to different module upgrade behaviors on blades in the same frame. In this scenario, it is recommended to go through the full Standard Remote Upgrade procedure again.

DashBoard Menus

This section briefly outlines the tabs that display when the Port Configuration > Views is set to IO Module > DPT > Outputs for an ULTRIX-MODX-IO populated with at least one ULTRIX-MOD-DPT.

For More Information on...

- the Card tab, refer to **Table 28**
- the Module tab, refer to **Table 28**.
- the Video tab, refer to **Table 25**.

Port Tab

The Port tab provides controls to define the video output(s) of an ULTRIX-MOD-DPT.

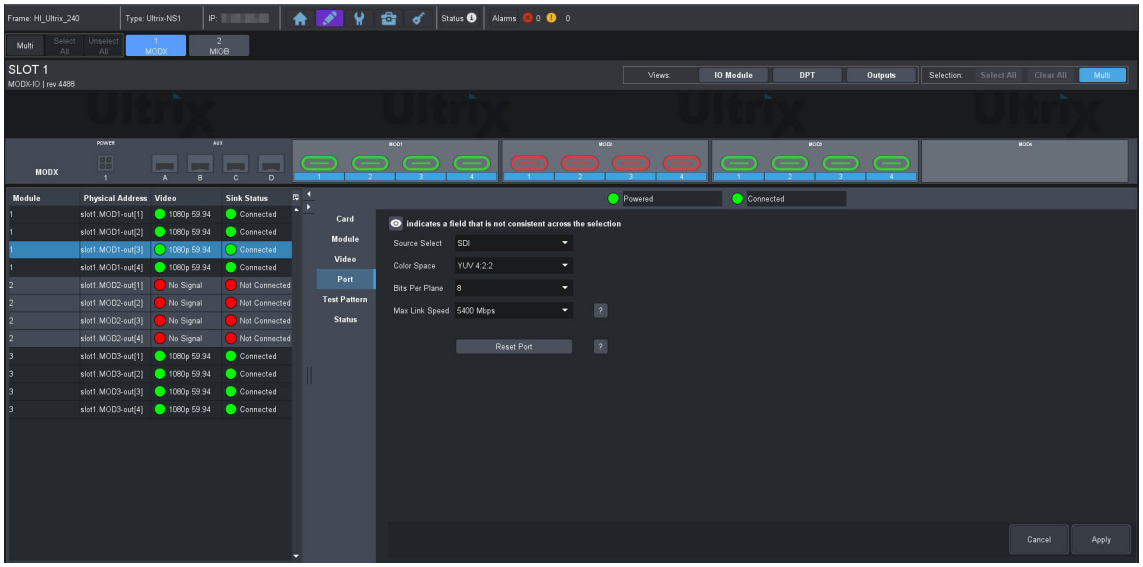


Figure 19 Example of the Port Tab

Table 7 summarizes the options on the Port tab.

Table 7 Port Configuration — Views > ULTRIX-MOD-DPT > Port Tab

Item	Parameters	Description
Source Select	SDI	Assigns SDI video as the source for a specific ULTRIX-MOD-DPT port. Refer to the ***Ultrix and Ultricore Database User Guide*** for details on assigning sources to destinations in your routing system.
	Test Pattern	A SMPTE bars test pattern replaces all of the output picture (but not the HANC and VANC) for a specific ULTRIX-MOD-DPT port.
Color Space	RGB 4:4:4	Converts the source video to RGB 4:4:4
	YUV 4:2:2	Converts the source video to YUV 4:2:2. This is the default.
Bits Per Plane	8	Specifies the number of bits per plane for the video being output. The default is 10.
	10	
Max Link Speed	5400 Mbps	The estimated bandwidth (transfer rate of data) between the ULTRIX-MOD-DPT and a sink device will be no more than 5.4Gbps (HBR2). This is the default.
	8100 Mbps	The estimated bandwidth (transfer rate of data) between the ULTRIX-MOD-DPT and a sink device will be no more than 8.1Gbps (HBR3)
Reset Port	Enables the user to reset the connection to the sink device connected to the selected ULTRIX-MOD-DPT port. Once this button is clicked, there is a disconnect, then a pause of 15sec. A sequence of actions is performed to re-initiate the link training to that sink device. Some sink devices are sensitive and may encounter issues that require a plug/unplug cycle to resolve. The Reset Port allows for some issues to be resolved remotely via DashBoard without having to physically unplug/plug the connection.	

Test Pattern Tab

When the ULTRIX-MOD-DPT Port > Source Select is set to Test Pattern, use the Test Pattern tab to determine the video format of the SMPTE bars test pattern.

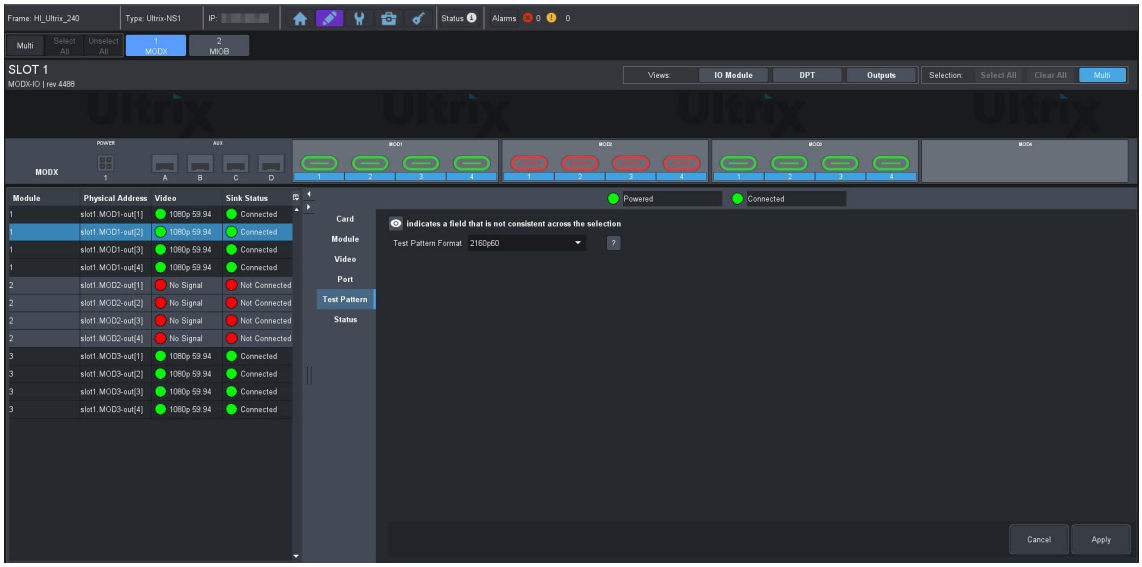


Figure 20 Example of the Test Pattern Tab

Table 8 summarizes the options on the Test Pattern tab.

Table 8 Port Configuration — Views > ULTRIX-MOD-DPT > Test Pattern Tab

Item	Parameters	Description
Test Pattern Format[a]	1080p60	Specifies the video format of the SMPTE bars test pattern
	1080p30	
	720p60	
	2160p60	

a. This setting applies to all ports with the Source Select set to Test Pattern on a selected ULTRIX-MOD-DPT.

Status Tab

The Status tab provides read-only fields that report video related status (such as format), and sink connection status.

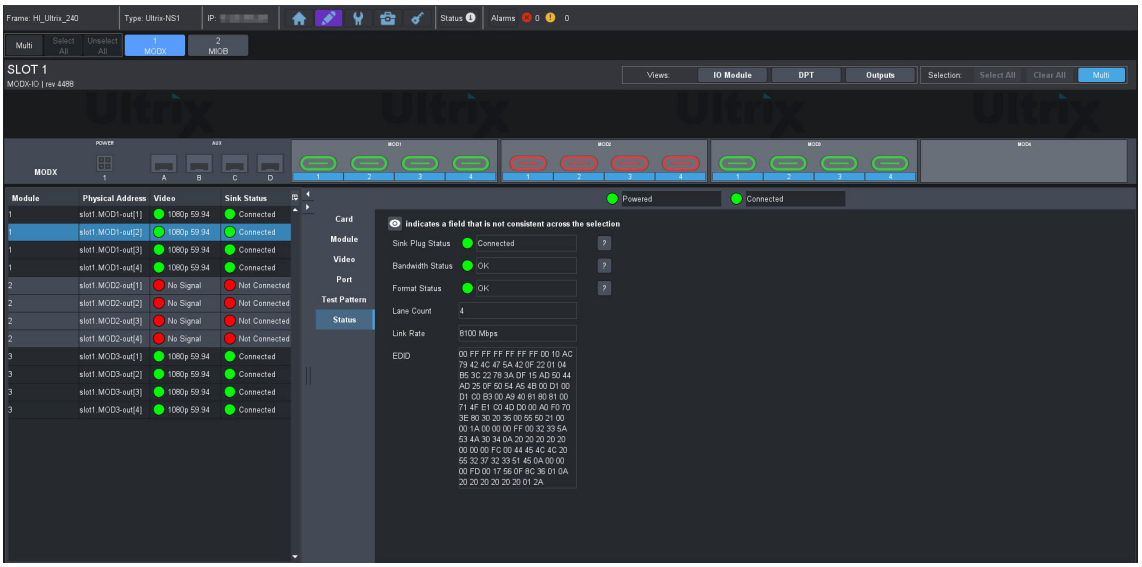


Figure 21 Example of the Status Tab

Table 9 summarizes the read-only information reported on the Status tab.

Table 9 Port Configuration — Views > ULTRIX-MOD-DPT > Status Tab

Item	Parameters	Description
Sink Plug Status	Connected (Green)	The ULTRIX-MOD-DPT port is connected to a valid DisplayPort-supported sink
	Not Connected (Red)	The ULTRIX-MOD-DPT port is not connected to a sink device
Bandwidth Status	OK (Green)	Indicates the current port settings are within the link training bandwidth
	Exceeded (Red)	Indicates the current port settings exceed the link training bandwidth. Verify the color space type, bits per plane value, and/or the quality of the signal routed to this port.
	N/A (Grey)	A connection to a sink device is not detected
Format Status	OK (Green)	The video format of the signal routed to this port is supported
	Invalid	The routed video is not of a supported format
	N/A (Grey)	A connection to a sink device is not detected
Lane Count	#	Reports the number of data lanes currently being used for transmitting video between the ULTRIX-MOD-DPT and the sink (a monitor). DisplayPort can use multiple lanes (typically 1, 2, or 4) to increase bandwidth and support higher resolutions and refresh rates.
	N/A (Grey)	A connection to a sink device is not detected

Table 9 Port Configuration — Views > ULTRIX-MOD-DPT > Status Tab (Continued)

Item	Parameters	Description
Link Rate	#	Reports the speed at which data is transmitted over each lane of the connection. Higher link rates allow for greater bandwidth, enabling support for higher resolutions, refresh rates, and color depths. For example, DisplayPort 1.4 supports link rates up to 8.1Gbps per lane, while DisplayPort 1.2 can go up to 5.4Gbps per lane.
	N/A (Grey)	A connection to a sink device is not detected
EDID Data	<text>	Displays the raw 128-bit EDID hex values read from the connected sink
	N/A (Grey)	A connection to a sink device is not detected

ULTRIX-MOD-NDI

This chapter summarizes the ULTRIX-MOD-NDI features, cabling requirements, and configuration.

For More Information on…

- installing an ULTRIX-MOD-NDI in the ULTRIX-MODX-IO blade, refer to "**Installing a Module**".
- upgrading the ULTRIX-MOD-NDI software, refer to "**Upgrading the Software**".

Overview

An ULTRIX-MOD-NDI module can be installed in any slot of the ULTRIX-MODX-IO blade. Each module supports up to 4 bidirectional HD (1080p[1]) NDI streams going directly to/from the Ultrix router. The video source for an NDI sender is determined by the Ultrix router (the SDI source that is routed to the destination provided by the ULTRIX-MOD-NDI). Each SDI source is decoded from NDI streams on the network and the SDI destinations are encoded to NDI streams that will go on the network.

Operation Mode

The number of NDI streams that an ULTRIX-MOD-NDI can manage depends on the Operation mode setting. There are two modes:

- 4in, 4out — supports 4 NDI sender streams and 4 NDI receiver streams up to 1080p 60Hz with a maximum of 2 channels of audio per stream (TCP transport mode only). This is the default.
- 2in, 2out — supports 2 NDI sender streams and 2 NDI receiver streams up to 1080p 60Hz with up to 8 channels of audio per stream (TCP, rUDP, UDP transport modes).

NDI Decoder

The ULTRIX-MOD-NDI can decode SDI video up to 1080p60 YUV422 received from one NDI stream on the network. Each received NDI stream is mapped as an SDI source in the Ultrix database. From the DashBoard interface you can monitor the decode stream state, and video format. The stream type is fixed to NDI High Bandwidth (NDI-HB).

NDI Encoder

The ULTRIX-MOD-NDI can encode SDI video up to 1080p60 YUV422. This enables you to send up to 4 NDI streams of SDI video up to 1080p 60Hz using NDI High Bandwidth (SpeedHQ2 Codec) to the network. From the DashBoard interface you can monitor the encode stream state, and video format. The stream type is fixed to NDI High Bandwidth (NDI-HB).

Audio Streaming

As of the v6.7 software, each available NDI video decoder and encoder (as defined by the Operation mode) can be accompanied by an associated audio stream. An audio stream is encapsulated in its associated video stream with a device alias, stream name, and group.

✶ Audio-only NDI streams are not supported at this time.

The sample rate for all audio NDI streams (both sender and receiver) is 48kHz. On the decoder, the ULTRIX-MOD-NDI will attempt to perform sample rate conversion (SRC) to 48kHz for sources that have other sample rates.

1. 1080p Level B and 1080pSF formats are not supported.

Features

Each ULTRIX-MOD-NDI module provides:

- 1x GigE RJ45 copper connector
- a maximum of 4+4 NDI High Bandwidth streams up to 1080p 60Hz[1]
  - › SpeedHQ2 (8bit 4:2:2) Codec
  - › Full bandwidth I-frame compression
- Selectable transport / receive Unicast Transport (rUDP, UDP, Multi-TCP, TCP)
- Stream discovery via:
  - › mDNS
  - › Group filtering
  - › Discovery Server
- Audio support (Operation mode dependent)
  - › 4in, 4out mode — a maximum of 2 channels of audio per stream (TCP transport mode only)
  - › 2in, 2out — a maximum of 8 channels of audio per stream (TCP, rUDP, UDP transport modes)
- Hot-swappable capability

Supported Video Formats

Table 10 outlines the video formats that the ULTRIX-MOD-NDI supports.

✶ Ensure that you are using a supported video format. Using unsupported formats may result in undefined behavior.

Table 10 Supported Video Formats — ULTRIX-MOD-NDI

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
HD		
720	P	50
720	P	59.94
720	P	60
1080	I	50
1080	I	59.94
1080	I	60
1080[a]	P	23.98
1080	P	24
1080	P	25
1080	P	29.97
1080	P	30
3G		
1080	P	50

1. 1080p Level B and 1080pSF formats are not supported.

Table 10 Supported Video Formats — ULTRIX-MOD-NDI (Continued)

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
1080	P	59.94
1080	P	60

a. 1080p Level B and 1080pSF formats are not supported.

Hardware Overview

The ULTRIX-MOD-NDI module includes one ENET port that is auto-populated.

Figure 22 Hardware Features of the ULTRIX-MOD-NDI

1) Retaining Screws	2) ENET Port

1. Retaining Screws

There is a retaining screw on each end of the module. These screws affix the module to the blade.

2. ENET Port

One 1GbE RJ45 port that supports 4+4 full bandwidth streams, allowing you to integrate NDI devices into a primarily SDI or SMPTE ST-2110 facility. **Table 11** provides information on the ENET LED behavior.

Table 11 ULTRIX-MOD-NDI — LED Descriptions

LED Color	Description
Flashing Yellow	The ULTRIX-MOD-NDI has booted and the link is up
Yellow	The ULTRIX-MOD-NDI has booted but the link is not up
Red	The ULTRIX-MOD-NDI has not booted correctly
Off	The ULTRIX-MOD-NDI is not powered

Cabling

The primary function of the ENET port is to provide a 1GbE network interface that can be configured to send and/or receive NDI video in DashBoard. The exact steps for connecting your ULTRIX-MOD-NDI to your facility via ethernet depend on the network requirements of your facility.

- Contact your IT department before connecting to your facility network to ensure that there are no conflicts. They will provide you with an appropriate value for the IP address, subnet mask, and default gateway for your ULTRIX-MOD-NDI.
- If difficulties or problems are experienced when connecting the ULTRIX-MOD-NDI to a network hub, contact your network administrator.

Displaying the ULTRIX-MOD-NDI in DashBoard

The options for configuring the ULTRIX-MOD-NDI are displayed in the **Device Configuration** interface of the router. This interface enables you to assign the network settings, specify access to the NDI streams, and monitor the communication status of the streams. (**Figure 23**)

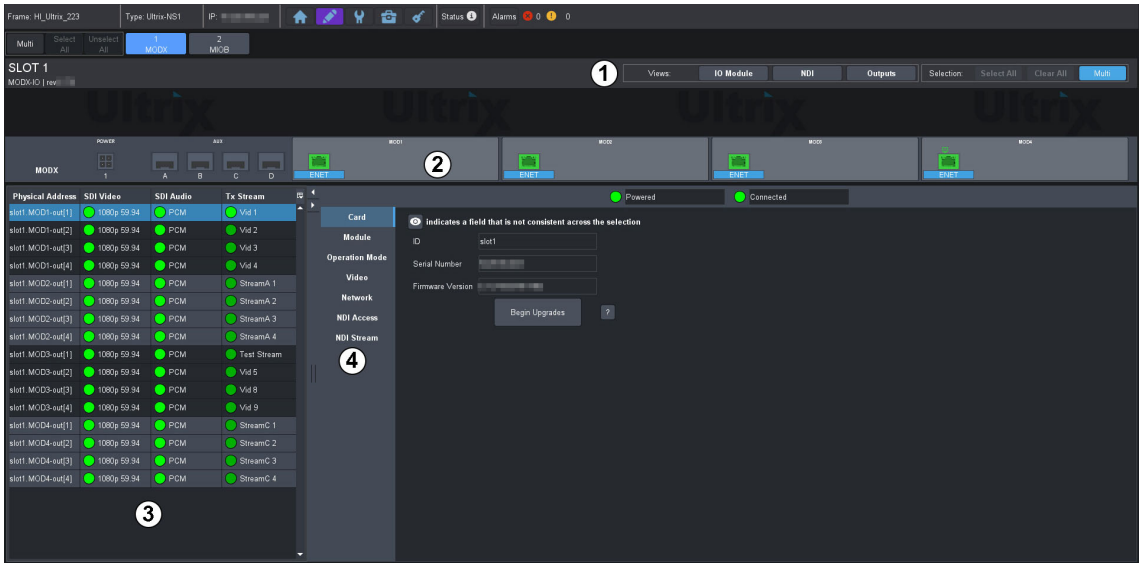


Figure 23 Example of the ULTRIX-MOD-NDI Configuration Options in DashBoard

1. Views Toolbar for ULTRIX-MOD-NDI

Use the Views > IO Module options to select between Input and Output (Decoder and Encoder) This determines what entries are displayed in the Detected NDI Streams table (the left pane of the interface). **Figure 23** displays the Views > IO Module > NDI > Outputs interface.

2. Slot Map

This area displays a map of the selected ULTRIX-MODX-IO blade as filtered using the Views menus. The ULTRIX-MOD-NDI ENET icon on the slot map reports an amalgamated signal status by color. The icon color is a combination of the Link, SDI Video, SDI Audio, Tx/Rx Stream status fields. **Table 12** provides information on the ENET color and associated status.

Table 12 ULTRIX-MOD-NDI — ENET Icon in DashBoard

Icon Color	Description
Green	• The link is connected/up • All encoders/decoders are configured and running successfully • There is valid SDI on all module inputs/outputs
Yellow	• The link is connected/up • Some encoders/decoders have errors and/or a SDI signal is not detected
Red	One of the following is occurring: • The link is down/physically unplugged; or • All configured encoders/decoders have errors and there is no SDI video routed

3. Detected NDI Streams Table

This table lists the available NDI streams as determined by the selections made in the Views toolbar and the NDI Access settings. This table provides the Physical Address, SDI Video status,

SDI Audio status, and Tx/Rx Stream status (a summary of the full status of the stream with a color indicator for state, and the stream name without the device alias).

Use the list of ports in this table to select the physical address that is to be configured to send/receive an NDI stream.

4. **Configuration Options**

   Select an NDI stream from the Detected NDI Streams table to display its configuration options in the right pane. There are sub-tabs for Network, NDI Access (Discovery and Global NDI Stream settings) and NDI Stream (Sender/Receiver configuration based on the selected Views > I/O Module options).

   Sources and Destinations follow the same nomenclature as other modules and appear in the Ultrix database. A source is labeled as: `slot`**`x`**`.MOD`**`y`**`-in[`**`z`**`]`, and a destination is labeled as `slot`**`x`**`.MOD`**`y`**`-out[`**`z`**`]` where **`x`** is the physical router slot, **`y`** is the blade slot that the ULTRIX-MOD-NDI is installed in, and **`z`** is the SDI port number.

   The ULTRIX-MOD-NDI settings are organized into seven tabs. The following five ULTRIX-MOD-NDI tabs are the same, regardless of whether the Views is set to Inputs or Outputs:

   › **Card** — reports additional read-only information. Refer to **Table 28** for details.

   › **Module** — reports read-only information on the ULTRIX-MOD-NDI such as serial number, firmware version, and temperature. Refer to **Table 28** for details.

   › **Operation Mode** — determines the number of decoders and encoders for this specific ULTRIX-MOD-NDI. Refer to "**Specifying an Operation Mode**".

   › **Network** — enables you to assign the network settings for the ENET port on the ULTRIX-MOD-NDI.

   › **NDI Access** — enables you to configure the global settings for all NDI streams of the ULTRIX-MOD-NDI.

   The remaining two tabs have different settings depending on whether you are viewing Inputs (Decoders) or Outputs (Encoders):

   › **Video** — reports the SDI fields for the ULTRIX-MOD-NDI (provides the relevant settings as the Views > Baseband > SDI interface). Refer to **Table 29** for details on the SDI input settings, and **Table 30** for details on the SDI output settings.

   › **NDI Stream** — enables you to define the decoders and/or encoders for the ULTRIX-MOD-NDI.

✶ Settings that are common to the selected ports, but are assigned different values, are noted with an icon. Refer to "**Selecting the Ports to Configure**" for more information on this icon.

Displaying the ULTRIX-MOD-NDI in DashBoard

To display the ULTRIX-MOD-NDI settings, you set the Views to IO Module > NDI and select between Inputs (Decoders) and Outputs (Encoders).

To display the ULTRIX-MOD-NDI interfaces in DashBoard

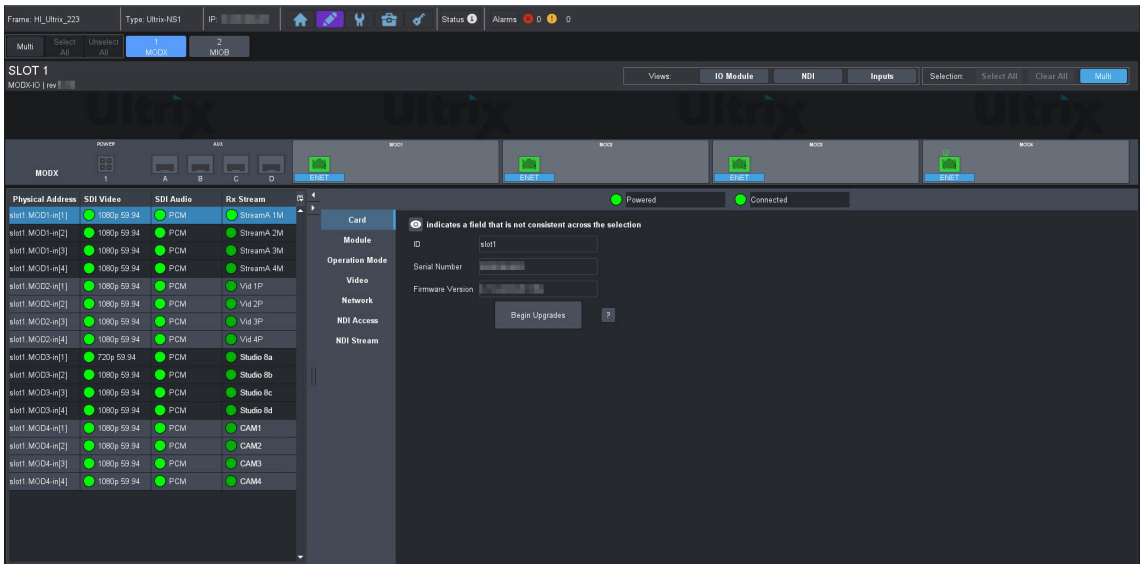
1. Expand the Ultrix node to display a list of sub-nodes in the Tree View.
2. Expand the **System** sub-node.
3. Expand the **Configuration** sub-node.
4. Double-click the **Ultrix** node.

   The **Device Configuration** interface opens.
5. Select  .
6. From the **Views** toolbar:

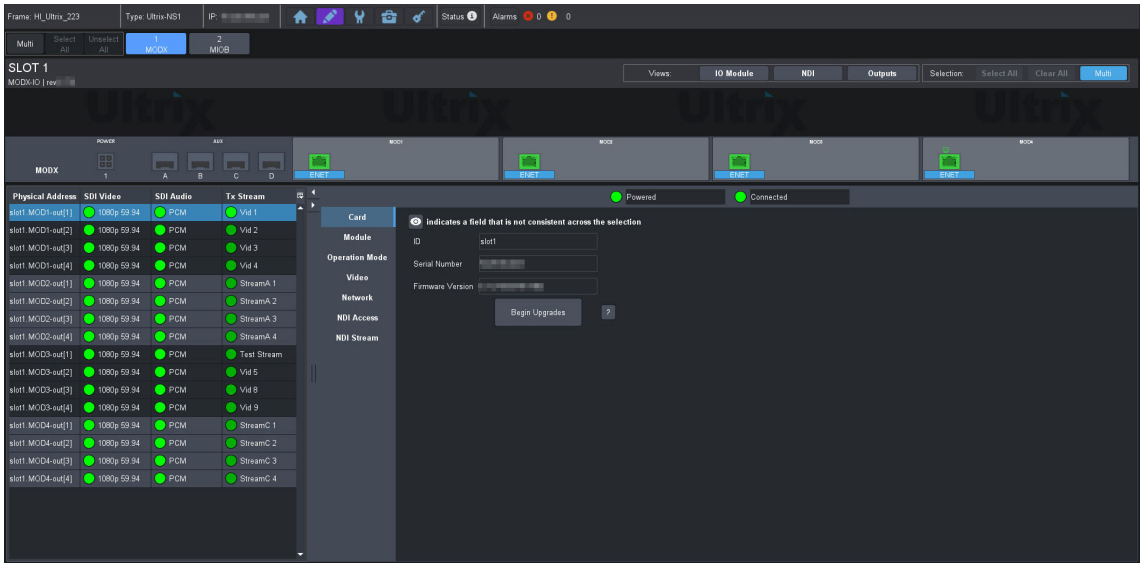
a. Use the first menu to select **IO Module**.

b. Use the second menu to select **NDI**.

7. To view the **Decoder** settings, set the third menu to **Inputs**.



8. To view the **Encoder** settings, set the third menu to **Outputs**.



Configure the Global Network Settings

This section outlines the method for assigning the network settings for the ENET port on the ULTRIX-MOD-NDI. A unique IP address must be assigned to each ULTRIX-MOD-NDI installed in the blade. This step is required before streams can be sent and/or received by the ULTRIX-MOD-NDI.

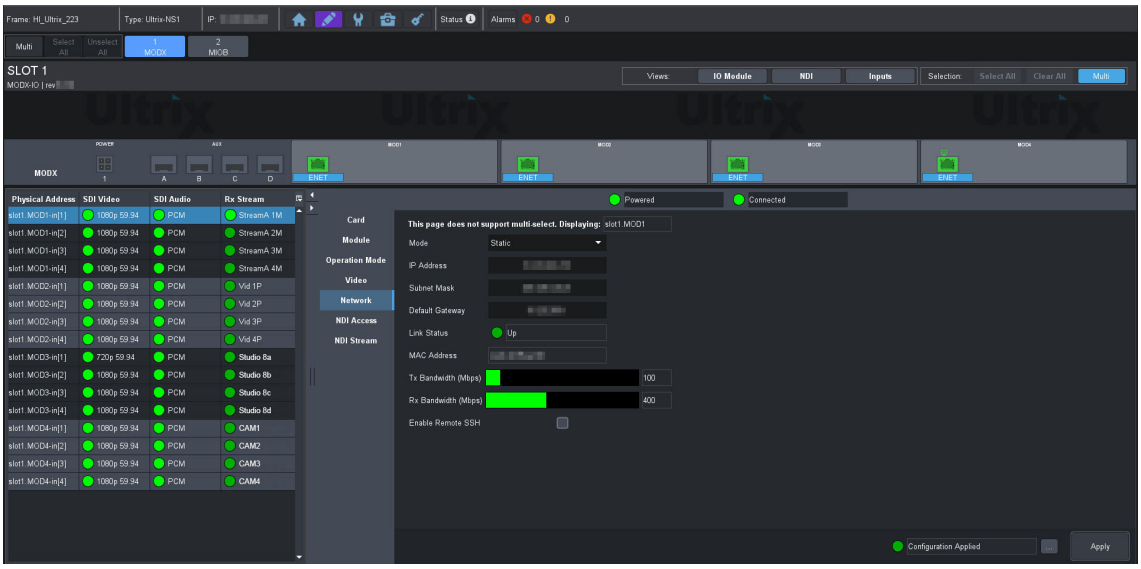
To configure the network settings for the ULTRIX-MOD-NDI

1. Display the ULTRIX-MOD-NDI as outlined in "**To display the ULTRIX-MOD-NDI interfaces in DashBoard**".
2. From the Detected NDI Streams Table on the left, select any port on the ULTRIX-MOD-NDI of which you want to configure network settings.

✶ The Network settings are global to the module (any of the 4 ports can be selected).

3. Select the **Network** tab.

   In the following example, the user is configuring the **ENET** port of the first ULTRIX-MOD-NDI.



4. To manually configure the network settings:

   a. Set the **Mode** to **Static**.

   b. Use the **IP address** field to specify the static IP address. This is the IP address that is used to communicate with the ULTRIX-MOD-NDI.

   c. Use the **Subnet mask** field to specify the subnet mask for the ULTRIX-MOD-NDI.

   d. Use the **Default gateway** field to specify the gateway for communications outside of the local area network (LAN) the ULTRIX-MOD-NDI will use.

5. If you want the network settings for the ULTRIX-MOD-NDI to be automatically obtained, and DHCP service is available on your control network, set the **Mode** to **DHCP**.

6. Click **Apply** (located in the bottom right corner).

Configuring the Global Settings for NDI Access

This section outlines how to configure the global settings for all NDI streams and is applicable to decoders and encoders of the ULTRIX-MOD-NDI.

To set the global NDI Access settings for the ULTRIX-MOD-NDI

1. Display the ULTRIX-MOD-NDI interface as outlined in "**To display the ULTRIX-MOD-NDI interfaces in DashBoard**".

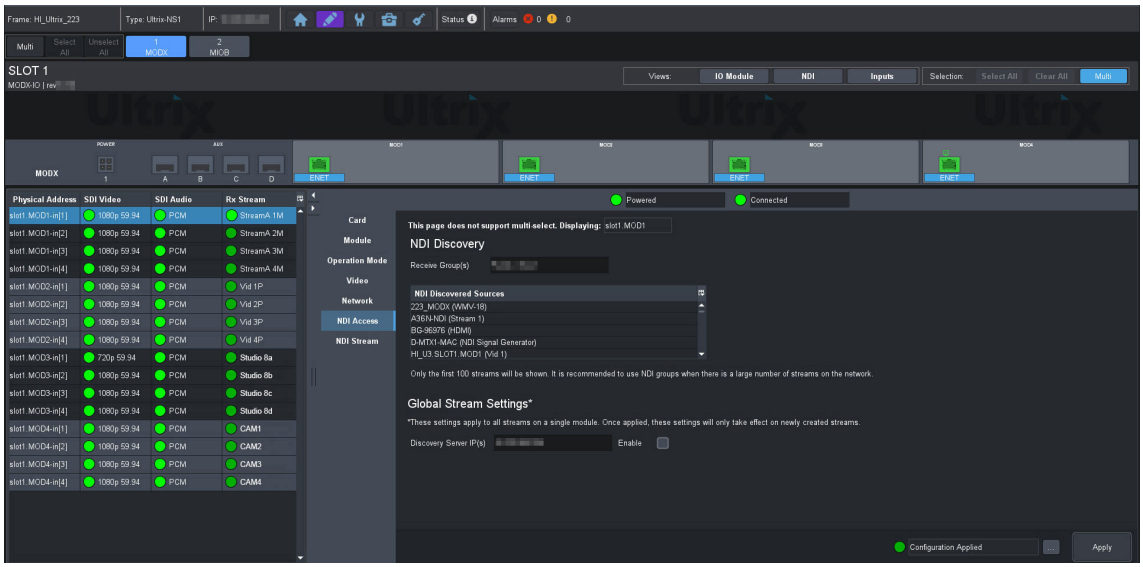
2. From the Detected NDI Streams Table on the left, select any port on the ULTRIX-MOD-NDI of which you want to configure the NDI Access settings.

✶ The NDI Access settings are global to the module.

3. Select the **NDI Access** tab.

4. Use the **Receive Group(s)** field to specify the groups on your network.

   By default, the **Receive Group(s)** field is populated by the group "`Public`". Group filtering can be used to view a subset of streams on a network with many NDI streams available. All desired groups should be entered in this field, separated by commas (e.g. Public,Group1).



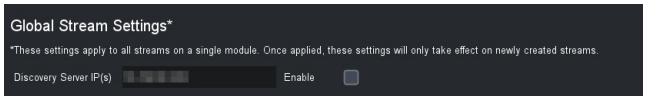
5. Use the **NDI Discovered Sources** table to view all the discovered NDI streams from the specified groups on your network.

✶ The streams listed in the **NDI Discovered Sources** table are defined by the entries in the **Receive Group(s)** field.

To use an NDI Discovery Server to discover the NDI streams (optional)

✶ Enabling this feature and pointing to the correct IP address will result in all newly created NDI encoder streams from this ULTRIX-MOD-NDI to be registered on the discovery server. The ULTRIX-MOD-NDI will also discover all streams that are registered on the discovery server and subscribe to them for configuring an NDI decoder.

1. Locate the **Global Stream Settings** area.



2. Use the **Discovery Server IP(s)** field to specify the IP address range.

   Multiple IP addresses can be used by separating with a comma (e.g. 127.0.0.1,10.0.0.1,10.0.0.2).

3. Select the **Enable** box.

Specifying an Operation Mode

Before proceeding to configure your ULTRIX-MOD-NDI, you must first specify the Operation mode for each module in the ULTRIX-MODX-IO blade. This will determine the number of available decoders/encoders.

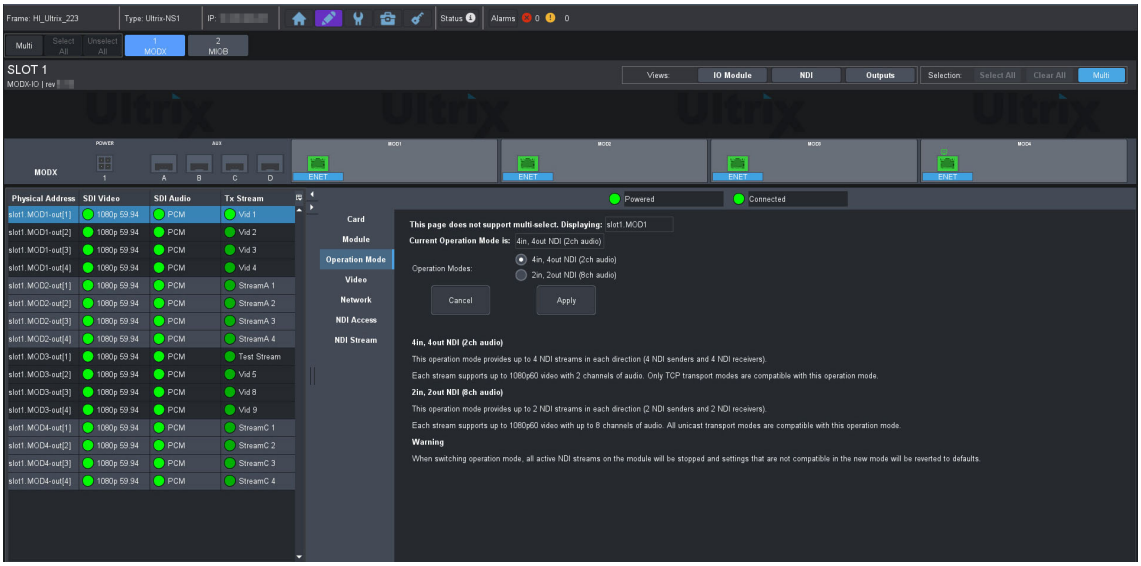
✶ When switching modes, all active NDI streams on the ULTRIX-MOD-NDI will be stopped and settings that are not compatible in the mode are reverted to the default.

To specify the operation mode

1. Display the ULTRIX-MOD-NDI interface as outlined in "**To display the ULTRIX-MOD-NDI interfaces in DashBoard**".
2. From the Detected NDI Streams Table on the left, select any port on the ULTRIX-MOD-NDI of which you want to configure the Operation mode.

✶ The Operation mode is global to the module.

3. Select the **Operation Mode** tab.



4. Select one of the following:
   - **4in, 4out** — supports 4 NDI decoder streams and 4 NDI encoder streams up to 1080p 60Hz with a maximum of 2 channels of audio per stream (TCP transport mode only). This is the default.
   - **2in, 2out** — supports 2 NDI decoder streams and 2 NDI encoder streams up to 1080p 60Hz with up to 8 channels of audio per stream (TCP, rUDP, UDP transport modes).
5. Click **Apply**.

   A Confirmation dialog opens.
6. Click **OK**.

   The Confirmation dialog closes and the new mode is applied.

Configuring an NDI Decoder

NDI Decoders are the input path to the Ultrix router. An NDI stream from the network is converted into SDI video to the router.

✶ The number of NDI streams that an ULTRIX-MOD-NDI can decode depends on the Operation mode. Refer to "**Specifying an Operation Mode**" for details.

Video Decoding

By default, the ULTRIX-MOD-NDI uses mDNS to register sources with other NDI devices on the network. This section outlines how to configure the decoder for an ULTRIX-MOD-NDI using the options in the Port Configuration interface in DashBoard.

✶ When the UltriSync licensed feature is enabled on the ULTRIX-MODX-IO inputs, it will synchronize the incoming NDI decoder streams from the network to the frame video reference. Refer to the ***Ultrix User Guide*** for your router to learn more about the supported frame reference and video format combinations.

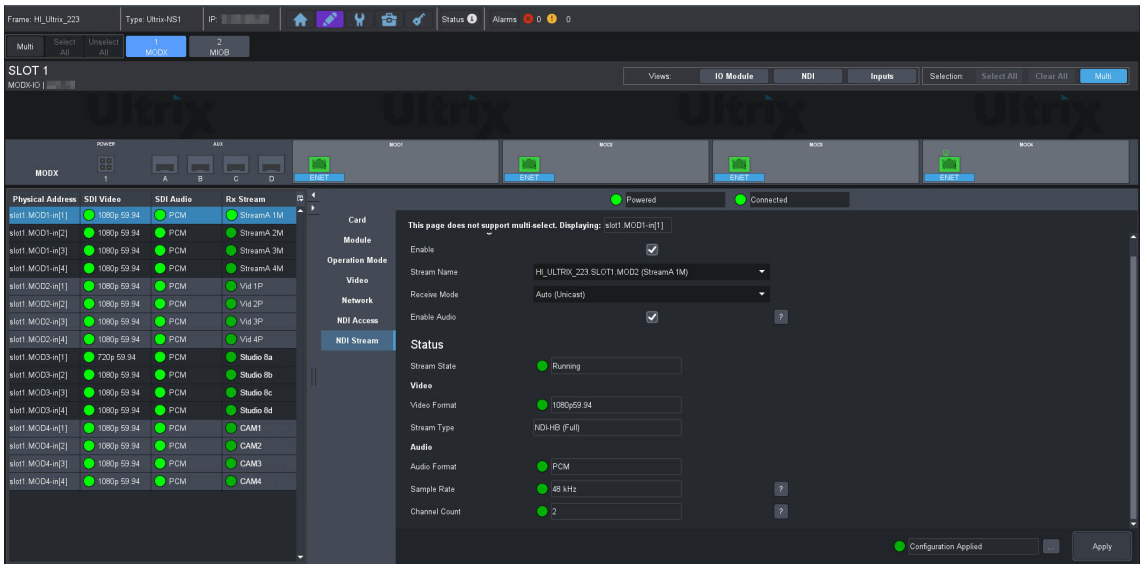
To configure a decoder for video streaming

1. Display the ULTRIX-MOD-NDI interface as outlined in "**To display the ULTRIX-MOD-NDI interfaces in DashBoard**".
2. To view the receiver streams, select **Inputs** from the **Views** toolbar.

Use this view to configure the decoder of a selected ULTRIX-MOD-NDI.

3. From the **Available Ports** table in the left pane, select the destination SDI port where the NDI stream will be decoded.
4. Select the **NDI Stream** tab.

   In the following example, the user is configuring slot1.MOD1-in[1].



5. Use the **Stream Name** field to select the stream to receive for decoding.

   The available streams in the **Stream Name** field are determined by the **NDI Access** settings. Undiscovered streams can also be manually subscribed to by typing the stream name into this field, using the format: `[NDI Device Alias] ([Stream Name])`.
6. If required, use the **Receive Mode** to specify the transport protocol.

✶ It is highly recommended to keep the Receive mode set to the default setting of Auto (Unicast).

7. Select the **Receiver Configuration** > **Enable** box.
8. Click **Apply**.

Audio Decoding

Each received NDI stream will be outputted as embedded audio in the SDI signal into the Ultrix router. This enables the audio to be routed as a source in the Ultrix.

✶ Audio streams must be accompanied by an associated video stream.

The ULTRIX-MOD-NDI will always supply a 16-channel audio signal embedded in the SDI video to the Ultrix router regardless of the channel count of the source NDI stream. The number of received audio channels is dependent on the Operation mode.

- In 4in, 4out mode, the maximum number of channels receivable is 2 channels.
- In 2in, 2out mode, the maximum number of channels receivable is 8 channels.
- For streams with channel counts *lower* than the maximum number of channels receivable, silence is applied to the inactive channels.
- For streams with channel counts *higher* than the maximum number of channels receivable, the ULTRIX-MOD-NDI will drop the higher order channels.

To configure a decoder for audio streaming

1. From the **Available Ports** table in the left pane, select the destination SDI port where the NDI stream will be decoded.
2. Select the **NDI Stream** tab.
3. Select the **Enable Audio** box.
4. Click **Apply**.

Configuring an NDI Encoder

NDI Encoders are the output path from the Ultrix router. The SDI video from the router is converted to an NDI stream that goes on the network.

✶ The number of NDI streams that an ULTRIX-MOD-NDI can encode depends on the Operation mode. Refer to "**Specifying an Operation Mode**" for details.

Video Encoding

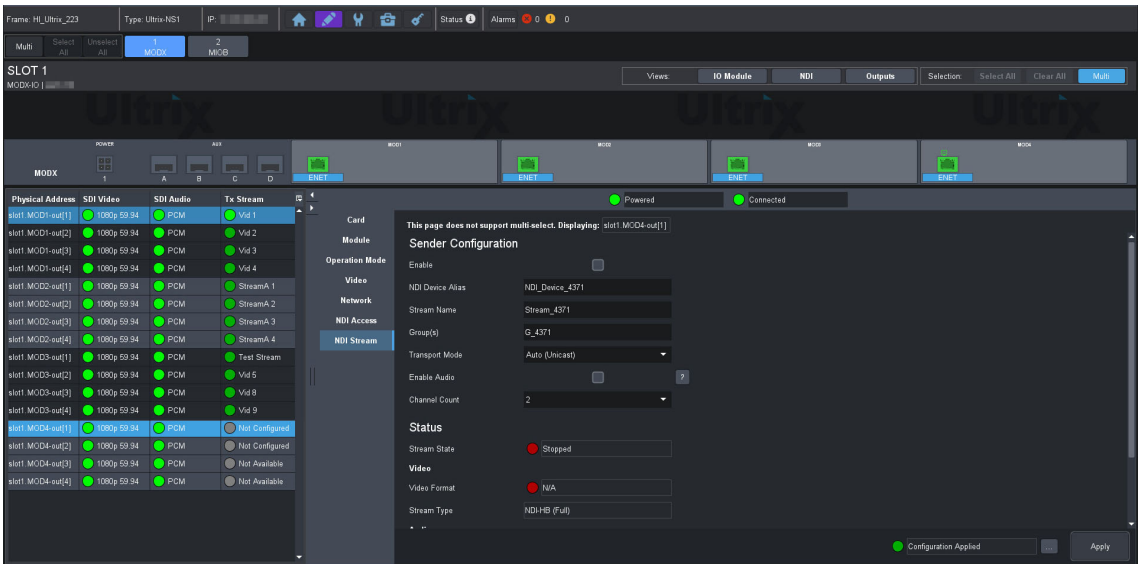
This section outlines how to configure a video encoder for an ULTRIX-MOD-NDI module.

✶ If the UltriScape licensed feature is enabled on the MOD1-1, MOD2-1, and/or MOD4-1 outputs of the blade, this has the effect of configuring those NDI encoder streams into a Multiviewer.

To configure an encoder for video streaming

1. Display the IO Module interface as outlined in "**To display the ULTRIX-MOD-NDI interfaces in DashBoard**".
2. Select **Outputs** from the **Views** toolbar.

   Use this view to configure the encoder of a selected ULTRIX-MOD-NDI.
3. From the **Available Ports** table in the left table, select the SDI source to encode into an NDI stream and output it onto the network.
4. Select the **NDI Stream** tab.



5. Select the **Sender Configuration** > **Enable** box.
6. Use the **NDI Device Alias** field to specify a unique identifier for this stream. This name is used to identify the streams the ULTRIX-MOD-NDI is encoding.

7. Use the **Stream Name** field to assign a name to the stream and identify it on the network.

   The stream is reported as "`<NDI Device Alias> (<Stream Name>)`" when advertised on the network.

8. Use the **Group(s)** field to identify the NDI Sender Group name for the ULTRIX-MOD-NDI stream output.
9. If required, use the **Transport Mode** menu to specify the transport protocol for encoding on this ULTRIX-MOD-NDI.

✶ It is highly recommended to keep the Transport Mode set to the default setting of Auto (Unicast).

10. Click **Apply**.

Audio Encoding

The NDI sender stream will use the audio source as determined by the Ultrix router (the SDI source that is routed to the audio output(s) provided by the ULTRIX-MOD-NDI).

To configure an encoder for audio streaming

1. From the **Available Ports** table in the left pane, select the destination SDI port where the NDI stream will be decoded.
2. Select the **NDI Stream** tab.
3. Select the **Enable Audio** box.
4. If the **Operation mode** is set to **4in, 4out**, the **Channel Count** field is fixed to 2.
5. If the **Operation mode** is set to **2in, 2out**, use the **Channel Count** field to specify the maximum number of audio channels sent by this NDI encoder. You can choose from 2, 4, or 8 channels.

✶ While an SDI signal provides up to 16 channels of audio, the ULTRIX-MOD-NDI will only send the first *n* channels of audio in the order received from the SDI signal (where *n* is the Channel Count value). For example, if the Channel Count is 4, the ULTRIX-MOD-NDI will encode audio channels 1-4 only.

6. Click **Apply**.

DashBoard Menus

This section briefly outlines the interfaces that only display for the ULTRIX-MOD-NDI.

For More Information on...

- the Device Configuration interfaces in DashBoard, refer to "**Using the Device Configuration Interface**".

Operation Mode Tab

The Operation Mode tab enables you to specify how many inputs and outputs for a selected ULTRIX-MOD-NDI. This feature also determines the number of available audio channels to stream.

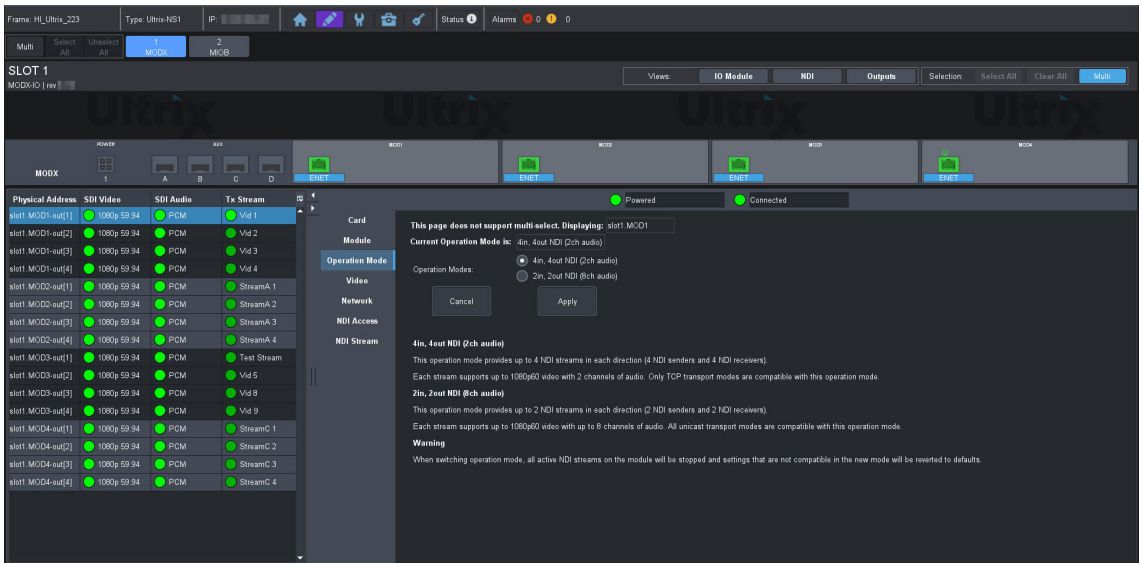


Figure 24 Example of the Views > IO Module > NDI > Operation Mode Tab

Table 13 summarizes the options displayed in the IO Module > NDI > Operation Mode tab.

Table 13 Port Configuration — Views > IO Module > NDI > Operation Mode

Item	Parameters	Description
Current Operation Mode is:	4in, 4out	Supports 4 NDI sender streams and 4 NDI receiver streams up to 1080p 60Hz with a maximum of 2 channels of audio per stream (TCP transport modes only). This is the default.
	2in, 2out	Supports 2 NDI sender streams and 2 NDI receiver streams up to 1080p 60Hz with up to 8 channels of audio per stream (TCP, rUDP, UDP transport modes).

Network Tab

The Network tab provides options for configuring the ULTRIX-MOD-NDI network settings to send and/or receive the NDI streams via the ENET port on the ULTRIX-MOD-NDI.

✶ The Network tab provides the global settings for the ULTRIX-MOD-NDI and applies to both the encoders and decoders.

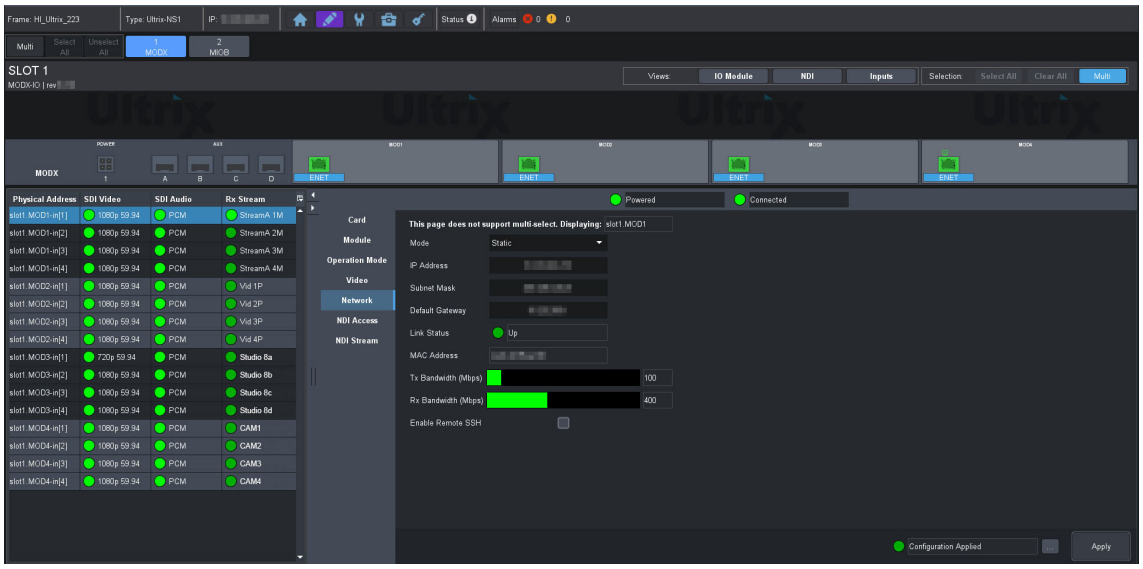


Figure 25 Example of the Views > IO Module > NDI > Network Tab

Table 14 summarizes the options displayed in the IO Module > NDI > Network tab.

Table 14 Port Configuration — Views > IO Module > NDI > Network

Item	Parameters	Description
Mode	Static	The user manually assigns the network settings for the ULTRIX-MOD-NDI
	DHCP	Automates the assignment of the network settings for the ULTRIX-MOD-NDI. This is the default.
IP Address	#	Assigns the IP address to the ULTRIX-MOD-NDI. This address is used to communicate with devices on your streaming network.
Subnet Mask	#	Specifies the subnet mask for the ULTRIX-MOD-NDI
Default Gateway	#	Specifies the gateway for communications outside of the local area network (LAN)
Link Status (read-only)	Up (Green)	The link for the ULTRIX-MOD-NDI ENET port is valid
	Down (Red)	The link for the ULTRIX-MOD-NDI ENET port is invalid (fails)
MAC Address (read-only)	#	Indicates the unique MAC Address currently assigned to the ENET port of the ULTRIX-MOD-NDI
Tx Bandwidth (Mbps)	#	Reports the bandwidth utilization (to the nearest 100Mbps) sent from the processor to the network links on the specified ULTRIX-MOD-NDI ENET port

Table 14 Port Configuration — Views > IO Module > NDI > Network (Continued)

Item	Parameters	Description
Rx Bandwidth (Mbps)	#	Reports the bandwidth utilization (to the nearest 100Mbps) received on the network link and forwarded to the processor on the ULTRIX-MOD-NDI ENET port
Enable Remote SSH	Selected	The ULTRIX-MOD-NDI can be accessed via a secure channel by a SSH server. This should only be selected if directed to do so by Ross Video Technical Support.
	Cleared*	Disables the ability for a user to log onto the ULTRIX-MOD-NDI via a SSH server

NDI Access Tab

The NDI Access tab provides options for determining the NDI streams received/sent via the ENET port on the ULTRIX-MOD-NDI. The NDI Access tab is organized into two areas: NDI Discovery and Global Stream Settings. (**Figure 26**)

- **NDI Discovery** — these settings determine what streams are reported in the Stream Name menu on the NDI Stream > Receiver Configuration tab. Any edits made in the NDI Discovery area affect all decoders/encoders on the ULTRIX-MOD-NDI.
- **Global Stream Settings** — these settings are applied to all encoders/senders and decoders/encoders across the ULTRIX-MOD-NDI. Note that editing the Global Stream Settings will not apply to existing streams until you reapply those streams individually to realize that change.

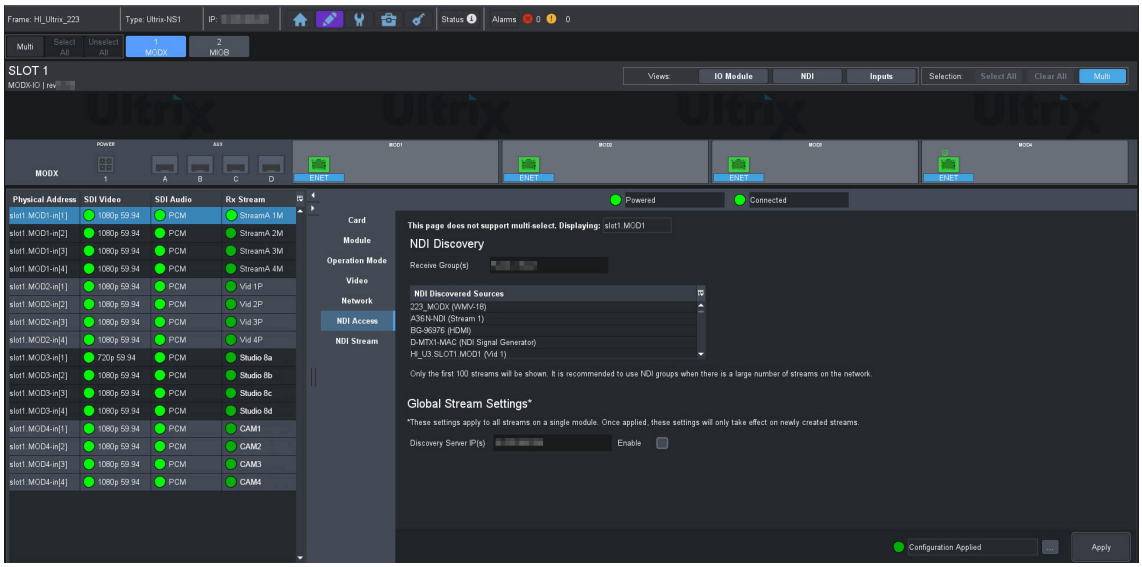


Figure 26 Example of the Views > IO Module > NDI > NDI Access Tab

Table 15 summarizes the NDI Access tab.

Table 15 Port Configuration — Views > IO Module > NDI > NDI Access

Item	Parameters	Description
Displaying (read-only)	slot#.MOD#	Reports the ULTRIX-MOD-NDI you are configuring
NDI Discovery		

Table 15 Port Configuration — Views > IO Module > NDI > NDI Access (Continued)

Item	Parameters	Description
Receive Group(s)	<text>	Enables you to filter the NDI Discovered Sources table to list only those sources included in the specified Group name. This also determines what is populated in the menus in the NDI > NDI Stream > Receiver Configuration > Stream Name.
NDI Discovered Sources	<text>	Provides a list of the auto detected network streams the ULTRIX-MOD-NDI is receiving. Note that the naming format of a network stream is determined by its device.
Global Stream Settings		
Discovery Server IP(s)	#	Specifies the IP address range when using an NDI Discovery Server for stream discovery. Multiple IP addresses can be used by separating them with a comma (e.g. 127.0.0.1,10.0.0.1,10.0.0.2).
Enable	Selected	Enables access to an NDI Discovery Server to facilitate stream discovery instead of using mDNS. The user is required to set up the NDI discovery server independently. For instructions about setting up the NDI discovery server, refer to the NDI SDK documentation.
	Cleared	Disables this feature. The ULTRIX-MOD-NDI ignores the address(es) listed in the Discovery Server IP(s) field.

Decoder Interfaces

This section outlines the decoder specific options when Views is set to IO Module > NDI > Inputs. (**Figure 27**) These options are used to select a network stream to receive the NDI stream and decode it. Once decoded, the stream is available as an SDI source in your active database.

NDI Stream Tab

The NDI Stream tab provides options to configure the NDI decoders of the ULTRIX-MOD-NDI.

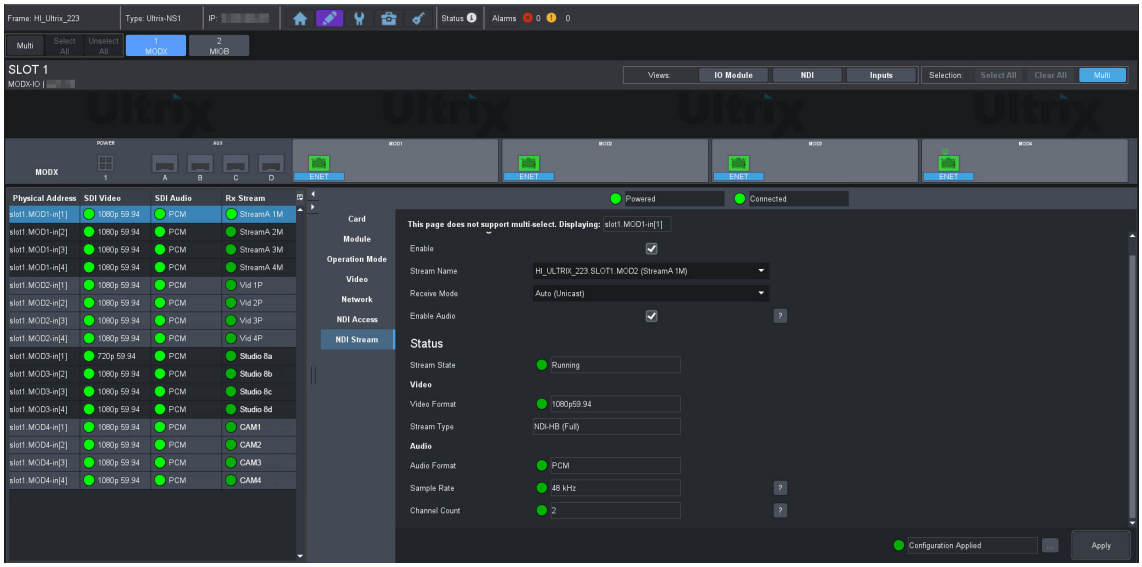


Figure 27 Example of the Views > IO Module > NDI > Inputs > NDI Stream Tab

Table 16 summarizes the Inputs > NDI Stream tab.

Table 16 Port Configuration — Views > IO Module > NDI > Inputs > NDI Stream

Item	Parameters	Description
Displaying (read-only)	slot#.MOD#-in[#]	Reports the selection from the Detected NDI Streams table (left pane)
Receiver Configuration		
Enable	Selected	Enables the selected input to receive and decode the NDI stream
	Cleared	Disables the NDI decoding via this stream
Stream Name	<text>	Specifies the unique identifier for the stream as determined by the NDI device. The maximum is 30 characters.
Receive Mode	#	Specifies the transport protocol for receiving and decoding NDI streams
Enable Audio	Selected	Configures the decoder for audio streaming
	Cleared	Disables this feature
Status (read-only)		
Stream State	Running (Green)	The decoder is initialized and operating correctly, and is attempting to receive the NDI stream
	Stopped (Red)	The decoder was stopped by the user and is not receiving an NDI stream
	Runtime Error (Red)	The decoder encountered an error and is no longer running
Video (read-only)		

Table 16 Port Configuration — Views > IO Module > NDI > Inputs > NDI Stream (Continued)

Item	Parameters	Description
Video Format	# (Green)	Reports the video format of the received stream. Refer to **Table 10** for a list of supported video formats.
	Video Source Inactive (Red)	A decoder is configured to receive an NDI stream from the network but the NDI source is removed from the network. The SDI video input status remains unchanged, but the video output has frozen.
	No Video Data (Red)	The stream does not exist or was never sending any video frames
	Format Unsupported (Red)	An attempt to receive a supported video format failed and the stream cannot be decoded
	N/A (Red)	The decoder was stopped by the user and is not receiving an NDI stream
Stream Type	#	Reports the type of compression used for NDI decoding. Only NDI-HB is supported at this time.
Audio (read-only)		
Audio Format	PCM (Green)	Indicates the audio stream is valid with no errors
	No Audio (Red)	The source video does not include an audio stream
	No Signal (Needs Video) (Red)	• The NDI source stream has no video data or is an unsupported format. • Audio streams must be accompanied by an associated video stream. • Audio-only NDI streams are not currently supported.
	Audio Disabled (Red)	The NDI Stream > Enable Audio box is not selected
Sample Rate	48kHz (Green)	The sample rate is fixed to 48kHz. The ULTRIX-MOD-NDI will attempt to perform sample rate conversion (SRC) to 48kHz for sources that have other sample rates.
Channel Count	#	Reports the audio channel count based on the maximum channel count of the current Operation mode (and not the source NDI Stream)

Encoder Interfaces

This section outlines the NDI Stream options when Views is set to IO Module > NDI > Outputs.

NDI Stream Tab

The NDI Stream tab enables you to configure the sender streams of a selected ULTRIX-MOD-NDI.

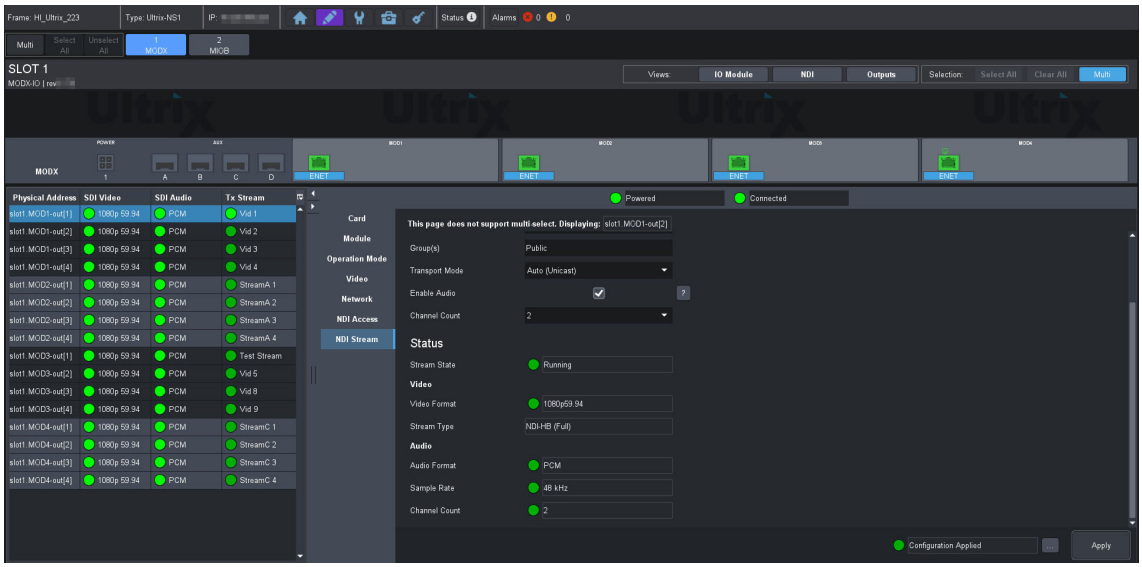


Figure 28 Example of the Views > IO Module > NDI > Outputs > NDI Stream Tab

Table 17 summarizes the Outputs > NDI Stream tab.

Table 17 Port Configuration — Views > IO Module > NDI > Outputs > NDI Stream

Item	Parameters	Description
Displaying (read-only)	slot#.MOD#-out[#]	Reports the selection from the Detected NDI Streams table
Sender Configuration		
Enable	Selected	Enables the sender to transmit the routed SDI video as an SDI stream
	Cleared	Disables the transmission of the NDI stream
NDI Device Alias	<text>	Specifies a unique identifier for this ULTRIX-MOD-NDI. This name is used to identify the streams this ULTRIX-MOD-NDI is managing.
Stream Name	<text>	Provides a unique identifier for the decoded stream. This name is used to identify the data within your network.
Group(s)	<text>	Specifies a unique identifier for the group
Transport Mode	#	Specifies the transport protocol for encoding and sending NDI streams
Enable Audio	Selected	Configures the encoder for audio streaming
	Cleared	Disables this feature
Channel Count	#	Specifies the audio channel count of the transmitted NDI stream. The maximum number depends on the Operation mode set for this ULTRIX-MOD-NDI.
Status (read-only)		

Table 17 Port Configuration — Views > IO Module > NDI > Outputs > NDI Stream (Continued)

Item	Parameters	Description
Stream State	Running (Green)	The encoder is initialized and operating correctly, and is attempting to send the NDI stream
	Stopped (Red)	The encoder was stopped by the user and is not sending an NDI stream
	Runtime Error (Red)	The encoder encountered an error and is no longer running
Video (read-only)		
Video Format	# (Green)	Indicates the video format detected on the stream
	Format Unsupported	Indicates the format is unsupported. Refer to **Table 10** for a list of supported video formats.
	No Signal	The NDI encoder does not detect a valid SDI signal from the Ultrix router
	N/A (Red)	The encoder was stopped by the user and is not receiving an NDI stream
Stream Type	#	Reports the type of compression used for NDI encoding. Only NDI-HB is supported at this time.
Audio (read-only)		
Audio Format	PCM (Green)	Indicates the audio stream is valid with no errors
	No Signal (Needs Video) (Red)	The SDI video signal routed to the NDI encoder is invalid. Audio-only NDI streams are not currently supported.
	Audio Disabled (Red)	The NDI Stream > Enable Audio box is not selected
Sample Rate	#kHz (Green)	Reports the sample rate. The Ultrix router will always supply audio at 48KHz.
Channel Count	#	Reports the audio channel count of the transmitted NDI stream

ULTRIX-MOD-SDI

This chapter outlines the ULTRIX-MOD-SDI features, and cabling designations.

For More Information on...

- installing an ULTRIX-MOD-SDI in the ULTRIX-MODX-IO blade, refer to "**Installing a Module**".
- configuring the ports, refer to "**Port Configuration**".

Features

Each ULTRIX-MOD-SDI provides:

- 4 UHD video inputs via HD-BNCs
- 4 UHD video outputs via HD-BNCs
- Support for YUV 4:2:2 10bit color space
- Support for 16 channels of embedded audio per video link
- Support for 24bit, 48kHz audio
- Hot-swappable
- One Multiviewer Head (refer to **Figure 31**)

Supported Video Formats

Table 18 outlines the video formats that the ULTRIX-MOD-SDI supports.

Table 18 Supported Video Formats — ULTRIX-MOD-SDI

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
SD		
480	I	59.94
576	I	50
HD		
720	P	60
720	P	59.94
720	P	50
1080	I	60
1080	I	59.94
1080	I	50
1080	I	24
1080	I	23.98
1080	P	30
1080	P	29.97
1080	P	25
1080	P	24

Table 18 Supported Video Formats — ULTRIX-MOD-SDI (Continued)

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
1080	P	23.98
3G		
1080	P	60
1080	P	59.94
1080	P	50
6G		
2160	P	30
2160	P	29.97
2160	P	25
2160	P	24
2160	P	23.98
12G (UHD)		
2160	P	60
2160	P	59.94
2160	P	50

Hardware Overview

Each ULTRIX-MOD-SDI provides 4 outputs and 4 inputs via HD-BNCs. (**Figure 29**)

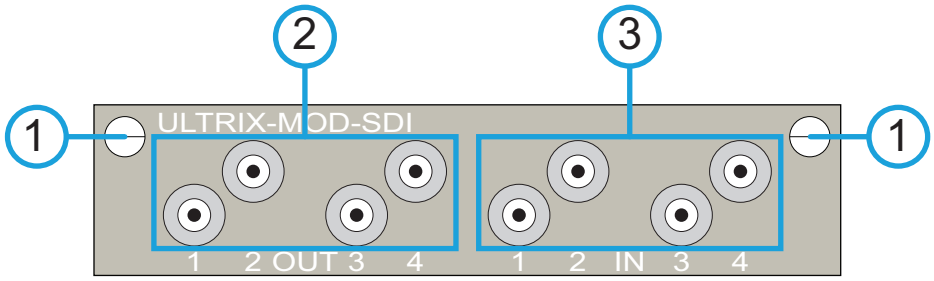


Figure 29 Hardware Features of the ULTRIX-MOD-SDI

1) Retaining Screws	2) OUT 1-4	3) IN 1-4

1. Retaining Screws

There is a retaining screw on each end of the module. These screws affix the module to the blade.

2. OUT 1-4

Each ULTRIX-MOD-SDI provides non-blocking connectivity for up to 4 SDI outputs with a maximum of 16 SDI outputs in a single ULTRIX-MODX-IO blade. The ports are labeled as 1-4 starting with the leftmost port. This numbering scheme is also reported in the DashBoard interfaces.

3. IN 1-4

Each ULTRIX-MOD-SDI provides non-blocking connectivity for up to 4 SDI inputs with a maximum of 16 SDI inputs in a single ULTRIX-MODX-IO blade. The ports are labeled as 1-4 starting with the leftmost port. This numbering scheme is also reported in the DashBoard interfaces.

Gearbox Cabling

Figure 30 illustrates the connections allocated for Gearbox groups on an ULTRIX-MODX-IO with four ULTRIX-MOD-SDI.

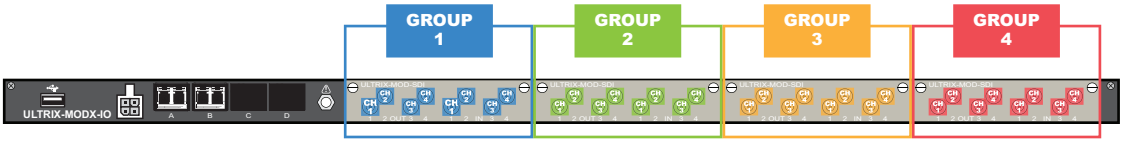


Figure 30 Example of Gearbox Mapping on a Single ULTRIX-MODX-IO Blade with Four ULTRIX-MOD-SDI

Outputs

When you configure an ULTRIX-MOD-SDI as a Gearbox output group, the signals of the four 3G Level A channels are grouped together to provide a single 12G signal to an output. **Table 19** outlines the default outputs for the ULTRIX-MODX-IO blade with four ULTRIX-MOD-SDI.

Table 19 Gearbox Mapping — Default Output Groups

Group	Channel 1	Channel 2	Channel 3	Channel 4
1	MOD1.out[1]	MOD1.out[2]	MOD1.out[3]	MOD1.out[4]
2	MOD2.out[1]	MOD2.out[2]	MOD2.out[3]	MOD2.out[4]
3	MOD3.out[1]	MOD3.out[2]	MOD3.out[3]	MOD3.out[4]
4	MOD4.out[1]	MOD4.out[2]	MOD4.out[3]	MOD4.out[4]

Inputs

When you configure an ULTRIX-MOD-SDI as a Gearbox input group, the signals of the four 3G Level A channels are multiplexed together. **Table 20** outlines the default inputs for the ULTRIX-MODX-IO blade with four ULTRIX-MOD-SDI.

Table 20 Gearbox Mapping — Default Input Groups

Group	Channel 1	Channel 2	Channel 3	Channel 4
1	MOD1.in[1]	MOD1.in[2]	MOD1.in[3]	MOD1.in[4]
2	MOD2.in[1]	MOD2.in[2]	MOD2.in[3]	MOD2.in[4]
3	MOD3.in[1]	MOD3.in[2]	MOD3.in[3]	MOD3.in[4]
4	MOD4.in[1]	MOD4.in[2]	MOD4.in[3]	MOD4.in[4]

UltriScape Cabling

Figure 31 illustrates the connections allocated for UltriScape Heads on an ULTRIX-MODX-IO with four ULTRIX-MOD-SDI.

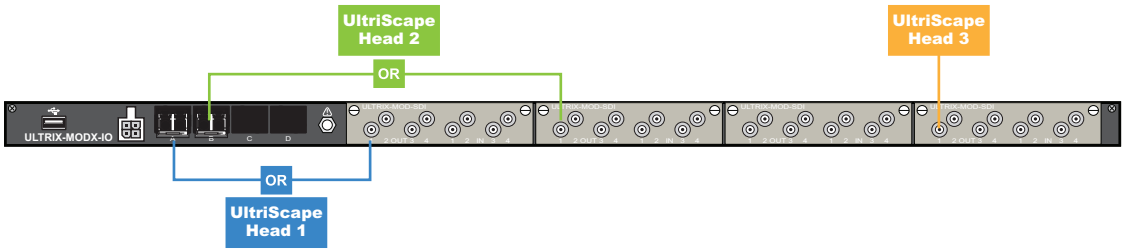


Figure 31 Example of UltriScape Head Mapping on a Single ULTRIX-MODX-IO Blade with Four ULTRIX-MOD-SDI

UltriSync Cabling

The UltriSync-UHD license is available on 3 inputs per blade. When cabling your module(s), make a note of the ports that will be used as inputs. Refer to "**Hardware Overview**" for port designations.

UltriProc Cabling

The UltriProc cabling designations depend on the data rate mode.

For More Information on...

- setting the data rate for UltriProc, refer to the ***Ultrix User Guide*** for your router.

Data Rates of 3Gbps

When the UltriProc operates at data rates up to 3Gbps[1], the license is available on the even numbered inputs (Input 2, 4) or outputs (Output 2, 4) per module.

Figure 32 illustrates the connections allocated for UltriProc on the ULTRIX-MODX-IO blade (with four ULTRIX-MOD-SDI) for data rates up to 3Gbps.

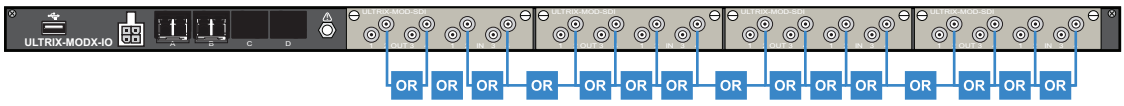


Figure 32 Example of UltriProc 3Gbps Mapping on a Single ULTRIX-MODX-IO Blade

Data Rates of 6Gbps or 12Gbps

When the UltriProc operates at data rates up to 6Gbps[2] and 12Gbps[3], the license is available on Input 2 or Output 2. This mode also requires an UltriSpeed license.

Figure 33 illustrates the connections allocated for UltriProc on the ULTRIX-MODX-IO blade (with four ULTRIX-MOD-SDI) for data rates up to 6Gbps and 12Gbps.

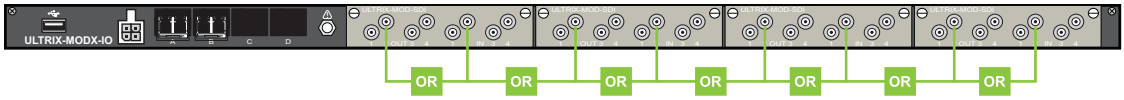


Figure 33 Example of UltriProc 6Gbps or 12Gbps Mapping on a Single ULTRIX-MODX-IO Blade

1. 1080p 50/59.94/60Hz
2. 2160p 23.98/24/25/29.97/30Hz
3. 2160p 50/59.94/60Hz

ULTRIX-MOD-SFP

This chapter outlines the ULTRIX-MOD-SFP features, and cabling designations.

For More Information on...

- installing an ULTRIX-MOD-SFP in the blade, refer to "**Installing a Module**".
- the SFP modules that the router supports, refer to the ***Ultrix SFP Module User Guide***.
- configuring the ports, refer to "**Port Configuration**".

Features

Each ULTRIX-MOD-SFP provides:

- 4 UHD video I/O via UNDI and/or SDI links
- 64 Channels of audio
- Hot-plug detection of SFP modules in DashBoard
- Hot-swappable
- One Multiviewer Head (refer to **Figure 36**)

Supported Formats

Table 21 outlines the video formats that the ULTRIX-MOD-SFP supports.

Table 21 Supported Video Formats

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
HD		
720	P	60
720	P	59.94
720	P	50
1080	I	60
1080	I	59.94
1080	I	50
1080	P	30
1080	P	29.97
1080	P	25
1080	P	24
1080	P	23.98
3G		
1080	P	60
1080	P	59.94
1080	P	50
6G		
2160	P	30

Table 21 Supported Video Formats (Continued)

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
2160	P	29.97
2160	P	25
2160	P	24
2160	P	23.98
12G (UHD)		
2160	P	60
2160	P	59.94
2160	P	50

Hardware Overview

Each ULTRIX-MOD-SFP provides up to 4 ports that can be populated with supported SFP modules. The ports are labeled as 1-4 starting with the leftmost port. This numbering scheme is also reported in the DashBoard interfaces.

✶ **Figure 34** shows the ports unpopulated.

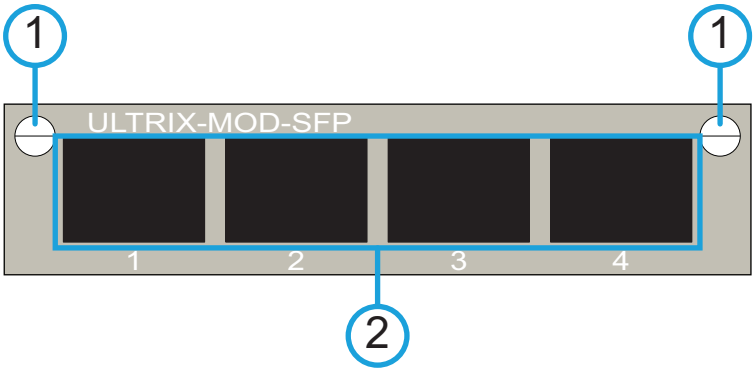


Figure 34 Hardware Features of the ULTRIX-MOD-SFP

1) Retaining Screws	2) SFP 1-4 Ports

1. Retaining Screws

There is a retaining screw on each end of the module. These screws affix the module to the blade.

2. SFP 1-4 Ports

Each port can be populated with a Small Form-factor Pluggable (SFP) module from the factory or by installing modules in the field. When an SFP port is populated on the module, its status is reported in DashBoard and options are provided for mapping and configuring the I/O as required. For a list of SFP modules available from Ross Video, refer to the ***ULTRIX SFP Modules Guide***.

Notice — *Every time you are required to insert a connector into a device or mating sleeve, you must clean the connector. All exposed surfaces of the ceramic ferrule must be clean. Follow your facility practices of cleaning fiber optic connectors.*

Connectors must always be inserted into a device or have a dust cap on.

Gearbox Cabling

Figure 35 illustrates the connections allocated for Gearbox groups on an ULTRIX-MODX-IO with four ULTRIX-MOD-SFP.

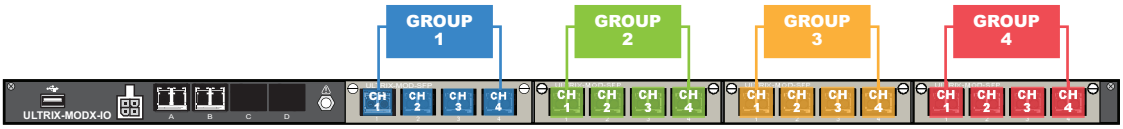


Figure 35 Example of Gearbox Mapping on a Single ULTRIX-MODX-IO Blade with Four ULTRIX-MOD-SFP

Outputs

When you configure an ULTRIX-MOD-SFP as a Gearbox output group, the signals of the four 3G Level A channels are grouped together to provide a single 12G signal to an output. Each ULTRIX-MOD-SFP can be configured as an output group. **Table 22** outlines the default outputs for the ULTRIX-HDX-IO blade with four ULTRIX-MOD-SFP.

Table 22 Gearbox Mapping — Default Output Groups

Group	Channel 1	Channel 2	Channel 3	Channel 4
1	MOD1.out[1]	MOD1.out[2]	MOD1.out[3]	MOD1.out[4]
2	MOD2.out[1]	MOD2.out[2]	MOD2.out[3]	MOD2.out[4]
3	MOD3.out[1]	MOD3.out[2]	MOD3.out[3]	MOD3.out[4]
4	MOD4.out[1]	MOD4.out[2]	MOD4.out[3]	MOD4.out[4]

Inputs

When you configure an ULTRIX-MOD-SFP as a Gearbox input group, the signals of the four 3G Level A channels are multiplexed together. **Table 23** outlines the default inputs for the ULTRIX-HDX-IO blade with four ULTRIX-MOD-SFP.

Table 23 Gearbox Mapping — Default Input Groups

Group	Channel 1	Channel 2	Channel 3	Channel 4
1	MOD1.in[1]	MOD1.in[2]	MOD1.in[3]	MOD1.in[4]
2	MOD2.in[1]	MOD2.in[2]	MOD2.in[3]	MOD2.in[4]
3	MOD3.in[1]	MOD3.in[2]	MOD3.in[3]	MOD3.in[4]
4	MOD4.in[1]	MOD4.in[2]	MOD4.in[3]	MOD4.in[4]

UltriScape Cabling

Figure 36 illustrates the connections allocated for UltriScape Heads on an ULTRIX-MODX-IO with four ULTRIX-MOD-SFP.

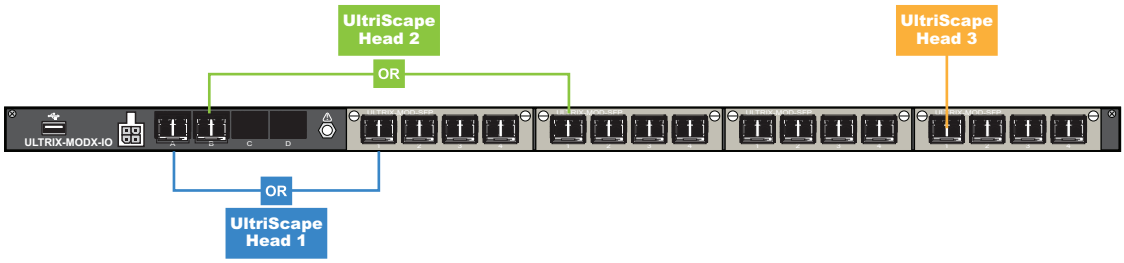


Figure 36 Example of UltriScape Head Mapping on a Single ULTRIX-MODX-IO Blade

UltriSync Cabling

The UltriSync-UHD license is available on 3 inputs per blade. When cabling your module(s) make a note of the ports that will be used as inputs.

DashBoard Overview

This chapter provides a general overview of how to access the interfaces, tabs, and menus for an ULTRIX-MODX-IO blade and its modules in DashBoard.

Overview

The **Port Configuration** page enables you to choose how to display the settings and read-only fields for your blades. A Views toolbar provides menus to filter what settings and fields are reported on the Port Configuration page.

By default, selecting an ULTRIX-MODX-IO blade displays its information in a table where the Views is set to Baseband > Ports > Inputs. This format is similar to other blades in the router. (**Figure 37**)

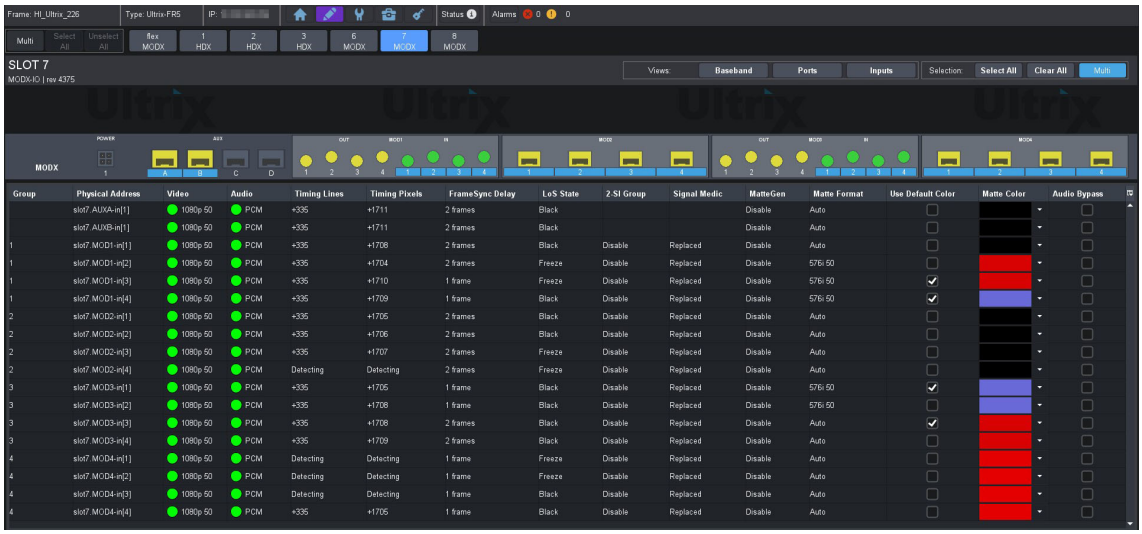


Figure 37 Example of the Baseband View for an ULTRIX-MODX-IO

If you select the same ULTRIX-MODX-IO blade, but set its Views to IO Module > SDI > Inputs, the information is displayed in a different format where the left pane displays the status, and the right pane displays the SDI input settings in a series of vertical tabs. (**Figure 38**)

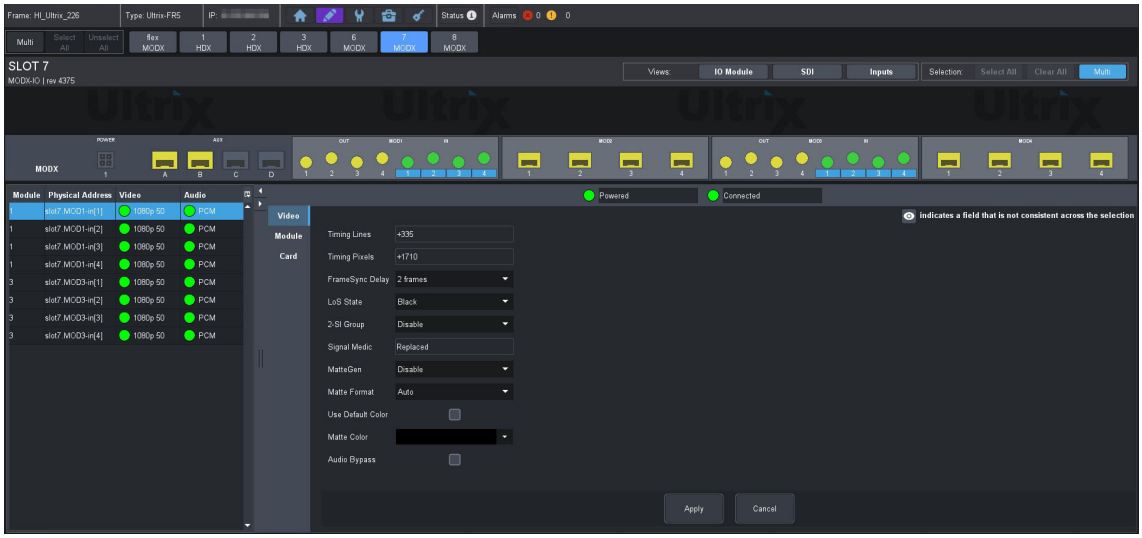


Figure 38 Example of the IO Module View for an ULTRIX-MODX-IO

If you are configuring multiple ULTRIX-MODX-IO blades and wish to edit the settings simultaneously, you can choose to display the IO Module interface by selecting the Multi button in the top left corner, and then setting the Views to IO Module. Filter the information by selecting the module type (SDI, SFP), and signal (Inputs, Outputs). The Port Configuration interface updates to display the status and settings for only those ports that match the Views filter criteria. For example, **Figure 39** is a View of only the inputs of ULTRIX-MODX-IO blades that have at least one ULTRIX-MOD-SDI module.

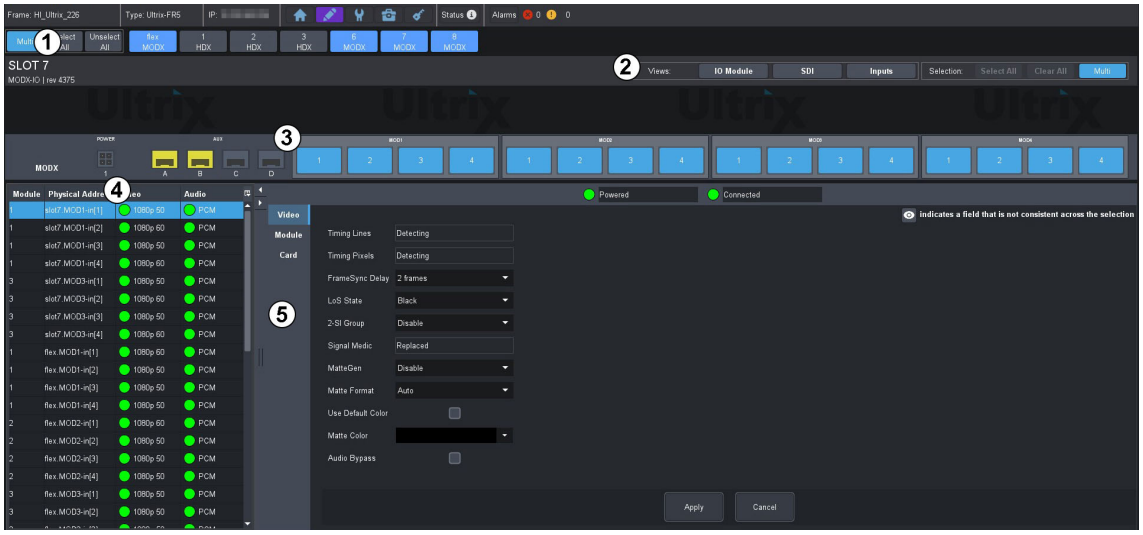


Figure 39 Example of Multiple Blades Selected in the Port Configuration > Views > IO Module Interface

1. Multi Button

Select this button when you wish to display more than one ULTRIX-MODX-IO blade and their modules in the Port Configuration interface. Once selected, notice that the button for each ULTRIX-MODX-IO blade is also now lit (selected). You can also click each blade button (next to the Multi button) to select/deselect the blades to view. A lit button indicates that the blade is included in the Available Ports table.

2. Views Toolbar

Use the Views toolbar to filter the blades and ports reported on the **Port Configuration** interface. There are three menus (left to right):

- The first menu determines the information to display. For the ULTRIX-MODX-IO, select **IO Module**.
- The second menu determines the module type to display. For example, select SDI to report only the ULTRIX-MODX-SDI modules.
- The third menu determines the signal (Inputs, or Outputs).

3. Map of the ULTRIX-MODX-IO Blade

This area displays a map of an ULTRIX-MODX-IO blade as filtered using the Views menus.

- If a single blade is selected, select a port directly from the map to display its settings on the Port Configuration interface.
- If the **Multi** button is also selected, a generic map displays where each module is represented with four buttons.

The two read-only status fields, located directly under the blade map, indicate the overall communication status.

4. Available Ports Table

This table lists the available modules and ports as determined by the selections made in the Views toolbar. A column of indicators report the video and audio status for each port.

The Ultrix router automatically detects when an ULTRIX-MODX-IO blade is populated with modules and their active ports. Each signal is made available in the routing system. The signals are named using the `Slot#.Module#-Port[#]` nomenclature. For example, `slot7.MOD1-in[3]` would represent input 3 of the first module installed in the ULTRIX-MODX-IO blade of slot 7.

5. Configuration Options

The tabs, menus, and settings that display in this area are determined by the Views menus, the specific slot you selected (either by selecting its row in the Available Ports table, or by clicking its icon on the map), and whether the **Multi** button was selected.

When multiple blades are selected, an  icon displays next to the settings that are common to all ports but are not set to the same values.

Customizing the IO Module Interface

The Port Configuration interface provides the Views toolbar that helps you to quickly filter the ULTRIX-MODX-IO ports, modules, and signal types. This enables you to display only the settings you need to modify, or filter to monitor specific ports.

Displaying the IO Module Interface

This section outlines how to display the IO Module interface and filter the information using the Views toolbar.

To display the IO Module interface in DashBoard

1. Launch the DashBoard client.
2. Locate the Ultrix node in the Tree View.
3. Expand the Ultrix node to display a list of sub-nodes in the Tree View.
4. Expand the **Systems** sub-node.
5. Expand the **Configuration** sub-node.
6. Double-click the Ultrix node.

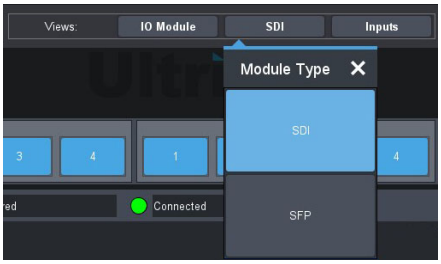
   The **Device Configuration** interface opens.
7. Select  from the top toolbar.

   The **Port Configuration** page opens.
8. If you want to edit the settings for all or selected ULTRIX-MODX-IO blades, click **Multi** in the top left corner and select/deselect the blades to edit.

9. From the **Views** toolbar:
   a. Use the first menu to select **IO Module**.

   b. Use the second menu to select the module type.

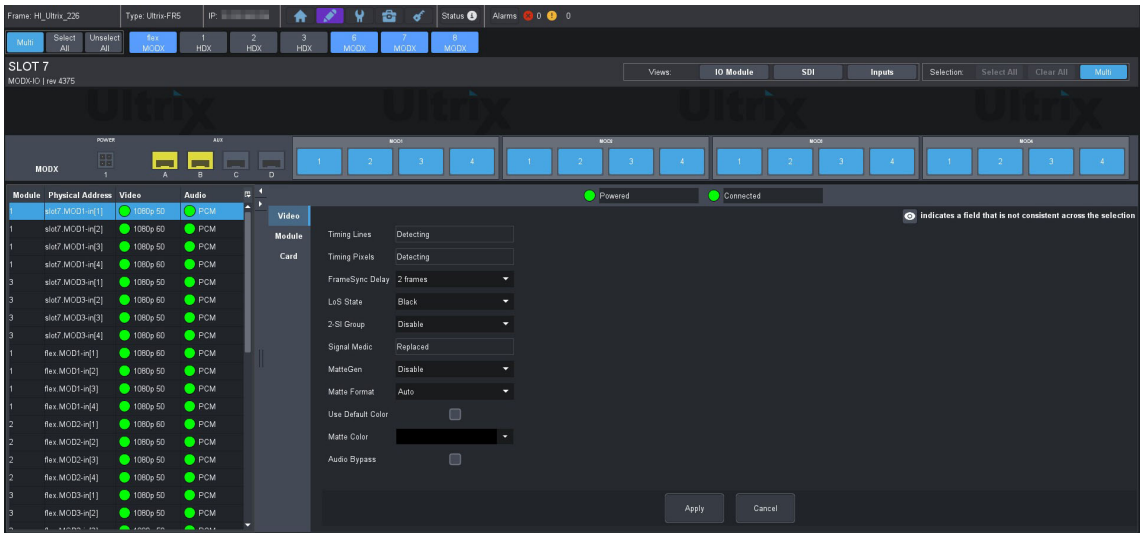
      In the following example, the user wants to display the ULTRIX-MOD-SDI modules.



   c. Use the third menu to select the signal type.

      In the following example, the user wants to display the inputs of the modules.

The **IO Module** interface now displays the tabs, menus, and settings for the selected port(s). By default, the first port in the table is automatically selected.



Selecting the Ports to Configure

Use this procedure if you have modules and ports of the same type and wish to access and configure their settings via a single interface.

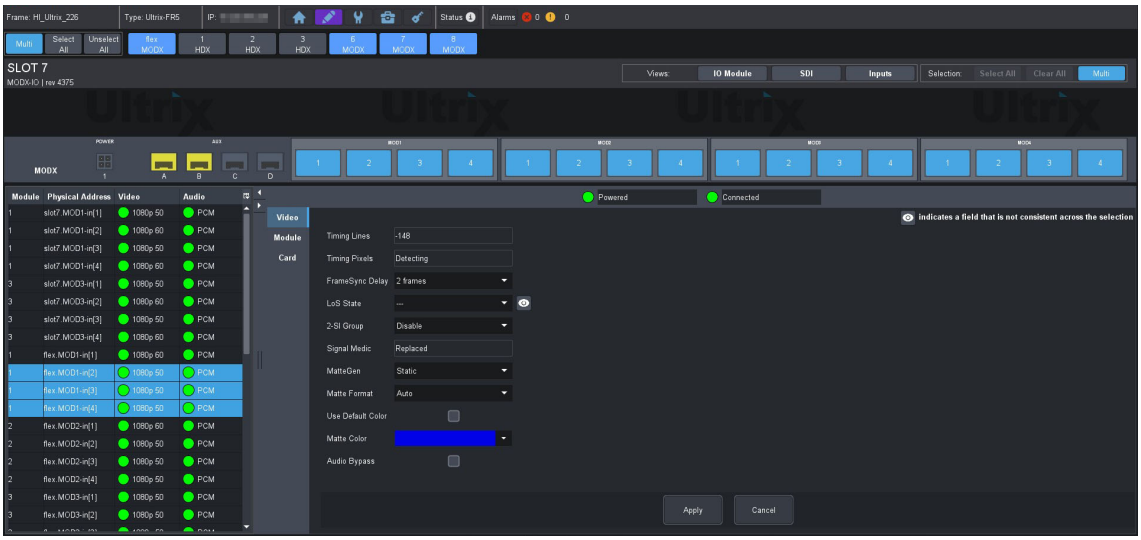
To select a specific port

1. Navigate to the IO Module interface as outlined in "**To display the IO Module interface in DashBoard**".
2. In the **Available Ports** table (located in the left pane of the window), select the port.

To select multiple ports

1. Navigate to the IO Module interface as outlined in "**To display the IO Module interface in DashBoard**".
2. In the **Available Ports** table (located in the left pane of the window), select the first port.
3. To select a consecutive series of ports:
   a. Press and hold **Shift**.
   b. Select the last port in the series.

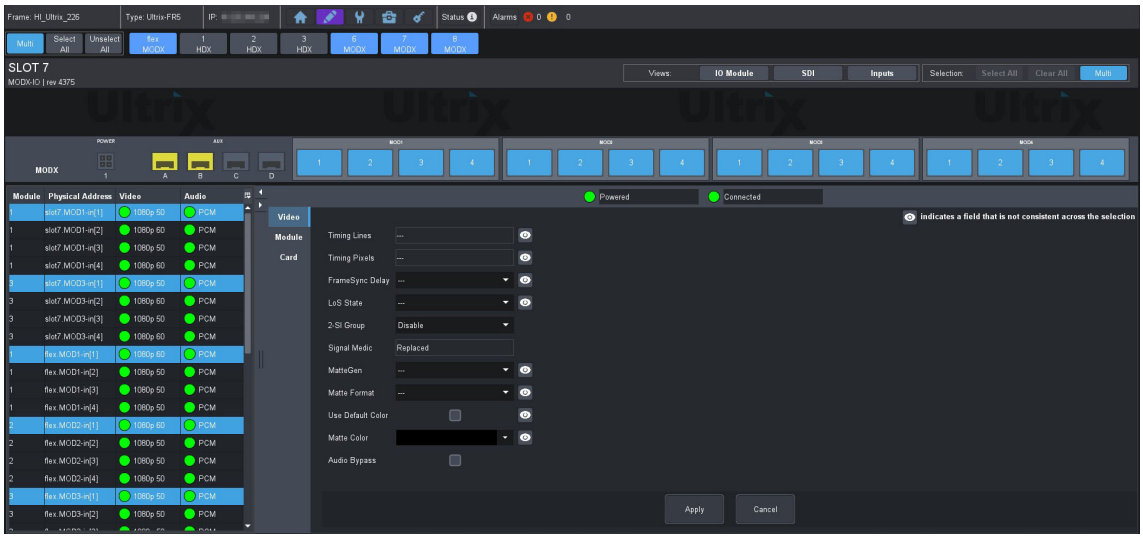
      The selected rows are highlight in blue. In the following example, the user selected inputs 2-4 of the ULTRIX-MOD-SDI module in the FLEX slot of an ULTRIX-FR5.



4. To select multiple ports:
   a. Press and hold **Ctrl**.
   b. Select each port in the series.

      The selected rows are highlight in blue.

      In the following example, the user selected the first input of each ULTRIX-MOD-SDI module.



5. Locate the first setting you wish to edit.
   - Settings that are common to the selected ports, but are assigned different values, are noted with an  . Proceed to step 7.
   - Settings that are assigned the same value for the selected ports do not display the icon. In the above example, the 2-SI group menu is set to Disable for all ports. Proceed to step 6.
6. Edit the setting as required. Refer to "**Port Configuration Options**" for menu options.
7. If you are editing a setting that is not consistently set to the same value for the ports:
   a. Click  to display the dialog for the setting.

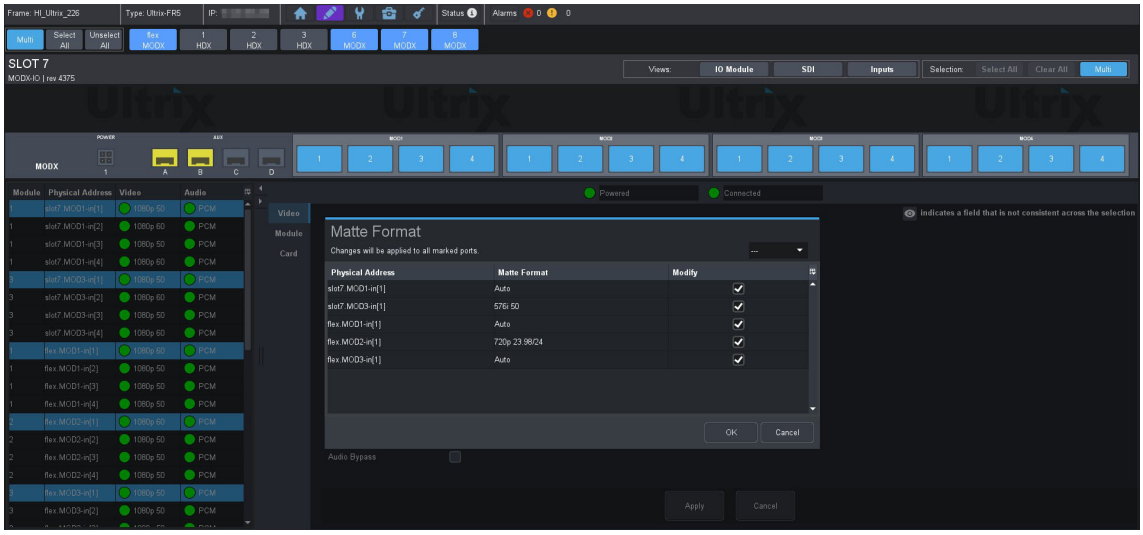
      In the following example, the user is modifying the Matte Format values for the selected ports.

   b. Locate the rows for the ports to edit.

   c. Edit the cells in each column as required.

   d. Select the **Modify** box for each port to apply the new value to.

   e. Click **OK** to apply the changes and close the dialog.



For More Information on...

- the available port settings, refer to "**Port Configuration Options**".

Port Configuration

Once the ULTRIX-MODX-IO blade and the modules are installed, you can proceed to configure the AUX ports, and module I/O ports in DashBoard. This chapter provides a brief overview of the configuration options in DashBoard for the blade I/O ports and is applicable to all module types.

Before You Begin

You may also need to install an:

- Ultrimix-Dante license to enable 64 x 64 input/output audio channels via ethernet on the AUX C port for use within an Audinate® Dante® system.

✶ UltriStream and Ultrimix-Dante cannot be enabled simultaneously on the same slot.

- Ultrimix-MXR license to enable the configuration and use of audio mixer soft panels.
- UltriProc or UltriProc-3DLUT license for each port to be assigned to an UltriProc engine for color correction, Proc Amps, and HDR conversion.
- Ultriscape license for each port that will be used to provide an Ultriscape Head output.
- UltriSpeed license if the blade includes one of the following SFP modules: SFP-HDB-IN-12G, SFP-FIBER-12G, and/or SFP-HDB-OUT-12G.
- UltriSRC license for each port to be configured for an asynchronous MADI input.
- UltriStream license to enable the encoding of one NDI stream of a configured Ultriscape Multiviewer Head per blade.
- UltriSync license for each 3G input to enable alignment to the router sync.
- Ultrisync-UHD for each input frame sync license to support UHD video rates.

For More Information on…

- installing license keys for your Ultrix router, refer to its user guide.

Using the Device Configuration Interface

The Device Configuration interface in DashBoard enable you to define the physical outputs, inputs, and communication ports of the Ultrix router. You can also monitor the overall status of the router, or just the status of a specific signal path or port on the rear panel. Use the top toolbar of the interface to navigate the interfaces for configuring your blades and ports on the router.

This section summarizes the steps specific to configuring the ULTRIX-MODX-IO blade and its modules using the following Device Configuration interfaces:

-  **Port Configuration** — reports individual I/O port status and settings. Selecting a slot updates the table for all installed ports. Selecting a port displays only the options for that port (the label under the port icon is lit blue). You can also choose to filter the information displayed in the table (e.g. only inputs, or only outputs). Refer to "**Customizing the IO Module Interface**" for more details.
-  **SFP Configuration** — configure each populated AUX port on the blade.

For More Information on…

- the Device Configuration interface, refer to the ***Ultrix User Guide*** for your router.

Overview

The Ultrix router automatically detects the ULTRIX-MODX-IO blade and its modules (**Figure 40**). Each signal is made available in the routing system. The signals are initially named using the standard `Slot#.Module#-Port[#]` nomenclature. For example, `slot1.MOD2-in[3]` would represent input 3 of the second module installed in an ULTRIX-MODX-IO blade located in router slot 1.

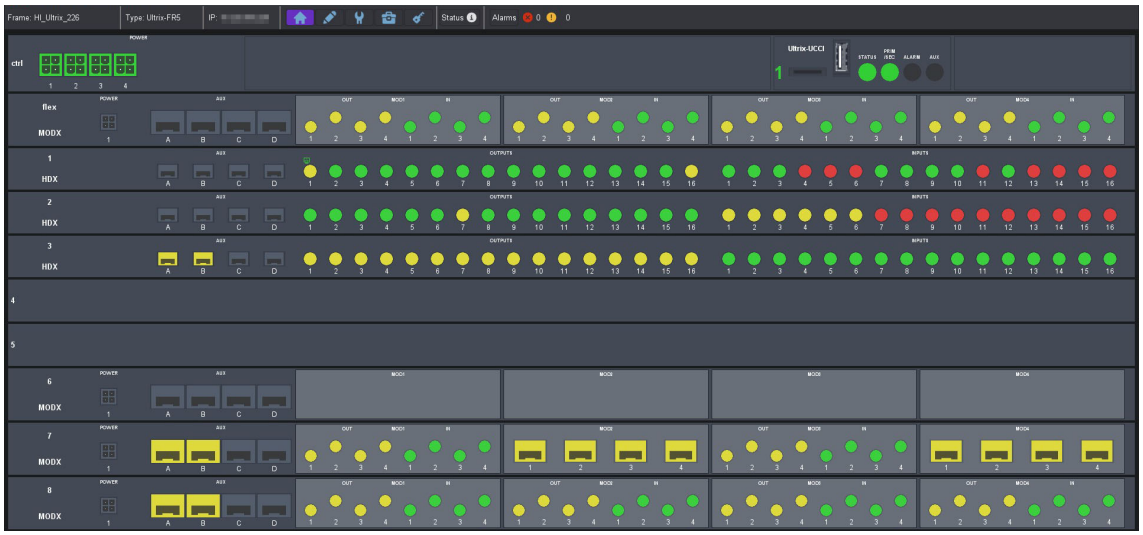


Figure 40 Example of the Device Configuration Interface with Multiple ULTRIX-MODX-IO Blades

Configuring an AUX Port

Once the SFP module is installed in an AUX port of the ULTRIX-MODX-IO blade, you can specify the port type using the options on the **SFP Configuration** interface.

✶ The FLEX slot in the ULTRIX(-NS)-FR5 does not support any I/O in the AUX ports.

To configure an AUX port

1. Expand the Ultrix node to display a list of sub-nodes in the Tree View.
2. Expand the **Systems** sub-node.
3. Expand the **Configuration** sub-node.
4. Double-click the **Ultrix** node.

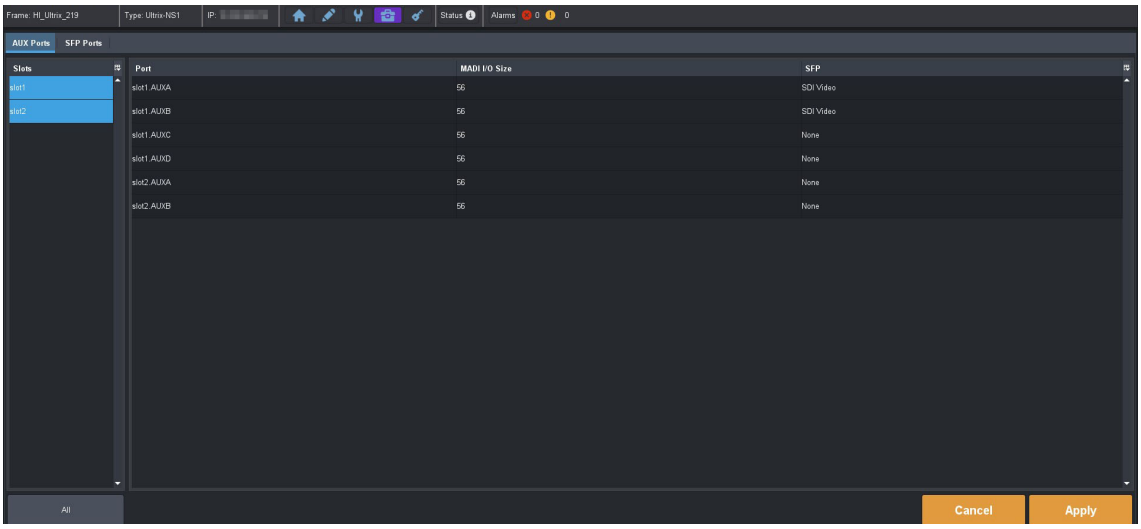
   The **Device Configuration** interface opens.
5. Select  .

   The **SFP Configuration** interface opens with the **AUX Ports** tab automatically selected.

✶ The SFP Ports tab is only applicable when configuring an ULTRIX-SFP-IO blade. Refer to the ***Ultrix Installation Guide*** for your router for details on the ULTRIX-SFP-IO.

6. From the **Slots** table, select each router slot that houses an ULTRIX-MODX-IO blade.

   The right pane of the tab updates to display a list of available ports based on the slot(s) selected.



7. In the rightmost pane, locate the row for the port you want to configure.
8. In the **SFP** column, assign a function to the port. Choose from the following:

✶ Other options may also be available depending on the licenses enabled on your router. Refer to the ***Ultrix User Guide*** for your router for details.

- **None** — the port is unpopulated or you do not wish to include this port in the routing system.
- **SDI Video** — the SFP module is one that supports SDI video signals.
- **MADI** — the SFP module is one that supports MADI audio signals.

9. In the **MADI I/O Size** column, specify the channel quantity as per your facilities' standard.
10. Click **Apply** to save your changes.

Port Configuration Options

This section outlines the options in the Port Configuration interface for the ULTRIX-MODX-IO based on the Views settings. Some options may depend on the module type and installed license keys.

✶ When configuring multiple ULTRIX-MODX-IO blades, filter the Port Configuration interface by using the **Views** and **Options** menus as described in "**Customizing the IO Module Interface**".

Baseband View

When in Baseband view, you can choose to view options based on the port or channel, and signal type (inputs or outputs).

Baseband > Ports > Inputs View

This section summarizes the options when Views is set to Baseband > Ports > Inputs.

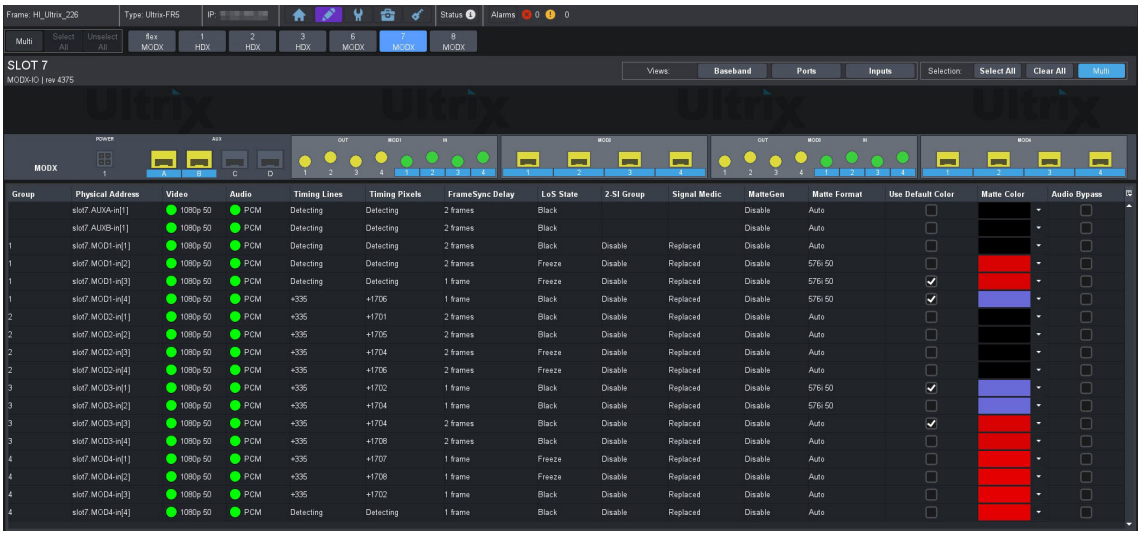


Figure 41 Example of the Baseband > Ports > Inputs View

Table 24 summarizes the options when Views is set to Baseband > Ports > Inputs.

Table 24 Port Configuration — Views > Baseband > Ports > Inputs

Item	Parameters	Description
Group	#	Indicates the Gearbox group where Group 1 is the first module in the blade. Refer to **Figure 30** and **Figure 35** for mapping details.
Physical Address (read-only)	slot**x**.MOD**y**-**z**[**#**]	Lists the physical ports, in ascending order where: • **x** represents the router slot number • **y** represents the module slot number • **z** represents the signal type (in or out) • **#** represents the port
Video (read-only)	#	If a port is used for video signals, this field indicates the video format
Audio (read-only)	#	If a port is used for audio signals, this field indicates the type of audio detected (e.g. PCM, AES etc.).
Timing Lines (read-only)	#	Reports the value of timing difference between input and frame reference in number of lines.
	Detecting	The timing difference is being detected; updates the field approximately every 33 seconds.
	Async	There is no timing relationship between the input signal and the frame reference.
Timing Pixels (read-only)	#	Reports the value of timing difference between input and frame reference in number of pixels.
	Detecting	The timing difference is being detected; updates the field approximately every 33 seconds.
Timing Pixels (read-only)	Async	There is no timing relationship between the input signal and the frame reference
Frame Sync Delay	# frame(s)	Specifies the frame buffer size for the selected input port

Table 24 Port Configuration — Views > Baseband > Ports > Inputs (Continued)

Item	Parameters	Description
LoS State[a]	Black	Sets the input to black during the loss of signal
	Freeze	Sets the input to the last valid frame of video before the loss of signal
UDC	Disable	This port will not use UltriFormat
	#	Specifies the video format that UltriFormat will convert this input signal to. Note that the UltriFormat output must match the router reference format. Refer to the ***Ultrix User Guide*** for your router for details on UltriFormat.
UDC Fallback	Bypass	The format converter is bypassed; the output format matches the input
	Black	The output is forced to black (using the UDC setting) but remains synchronized to the SPG. This is useful for preserving downstream sync without valid input. Refer to the ***Ultrix User Guide*** for your router for details.
2-SI Group	Enable	Gearbox is available on the indicated I/O Group in groups of 4 consecutive I/O. For example, selecting Enable in the row for slot1.in[1] creates a Gearbox group from slot1.in[1] to slot1.in[4]. Note that I/O Groups for Gearbox are defined in the table using colored backgrounds.
	Disable	The indicated I/O is not included in a Gearbox configuration
Signal Medic (read-only)[b]	Not available	This port does not support the Gearbox feature.
	Good	This port is included in a Gearbox setup.
	Replaced	This port can be included in a Gearbox setup but is currently not included in the 12G link.
Matte Gen	Disable	Disable an internally generated test pattern. This is the default.
	Static	Generates a static color matte
	Bouncing Box	Generates a static color matte with a complimentary colored moving box
	Luma Sequence	Generates a luminance shifting sequence based on chosen color
Matte Format	#	Specifies the signal format of the generated test pattern. If you select Auto, the test pattern automatically matches the incoming signal type.
Matte Color	#	Specifies the color of the test signal

Table 24 Port Configuration — Views > Baseband > Ports > Inputs (Continued)

Item	Parameters	Description
Audio Bypass	Selected	When Audio Bypass is enabled for an input, the audio will follow the SDI regardless of any individual audio channel routing or configuration on the output. The individual channels of an input in Bypass mode are still de-multiplexed and available for audio routing via the audio matrix.
	Cleared	Disables this feature

a. This affects Ultriscape and routed destinations.
b. Use this field to replace a missing 3G signal when one or more of the four 3G signals for a Gearbox configuration are unavailable.

Baseband > Ports > Outputs View

This section summarizes the options when Views is set to Baseband > Ports > Outputs.

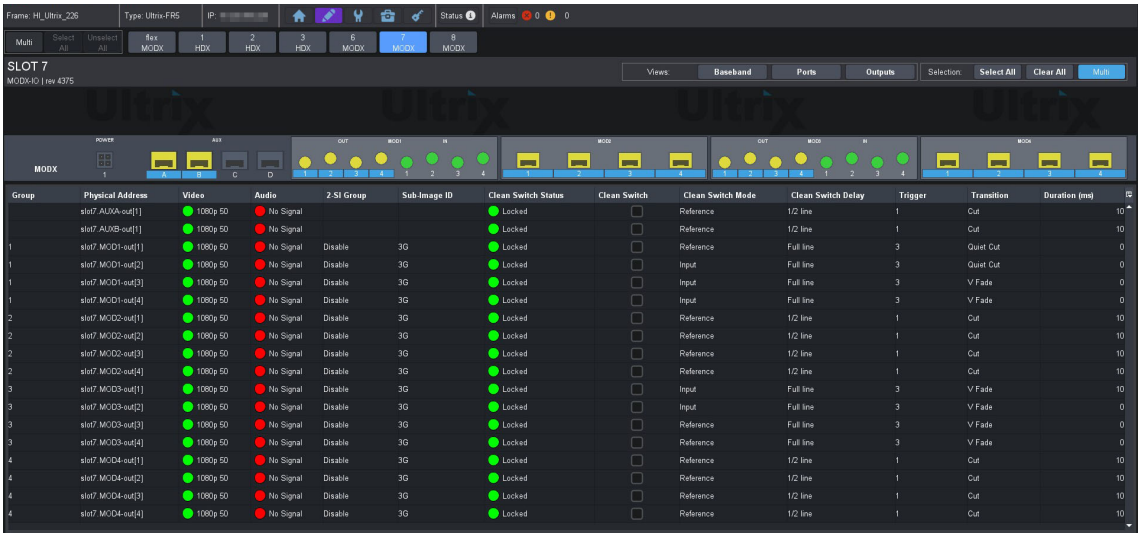


Figure 42 Example of the Baseband > Ports > Outputs View

Table 25 summarizes the options when Views is set to Baseband > Ports > Outputs.

Table 25 Port Configuration — Views > Baseband > Ports Outputs

Item	Parameters	Description
Group	#	Indicates the Gearbox group where Group 1 is the first module in the blade. Refer to **Figure 30** and **Figure 35** for mapping details.
Physical Address (read-only)	slot**x**.MOD**y**-**z**[**#**]	Lists the physical ports, in ascending order where: • **x** represents the router slot number • **y** represents the module slot number • **z** represents the signal type (in or out) • **#** represents the port
Video (read-only)	#	If a port is used for video signals, this field indicates the video format

Table 25 Port Configuration — Views > Baseband > Ports Outputs (Continued)

Item	Parameters	Description
Audio (read-only)	#	If a port is used for audio signals, this field indicates the type of audio detected (e.g. PCM, AES etc.).
2-SI Group	Enable	Gearbox is available on the indicated I/O Group in groups of 4 consecutive I/O. For example, selecting Enable in the row for slot1.in[1] creates a Gearbox group from slot1.in[1] to slot1.in[4]. Note that I/O Groups for Gearbox are defined in the table using colored backgrounds.
	Disable	The indicated I/O is not included in a Gearbox configuration
Sub-Image ID	3G	Some legacy equipment does not accept a 2SI SMPTE-352 payload identifier for quad-link SDI. You may need to select this if you are connecting legacy equipment to the specified output on the ULTRIX-MODX-IO.
	2SI	Set the SMPTE-352 payload identifier to 2SI for quad-link.
Clean Switch Status (read-only)	Locked	The specified output is locked to its input.
	Not Locked	The specified output is not locked to its input.
Clean Switch	Selected	Clean Switch is applied to the specified output. The Clean Switch Delay value is applied.
	Cleared	Clean Switch is not applied to the specified output.
Clean Switch Mode	Reference	Clean Switch is based on the reference signal available on the REF port of the router
	Input	Clean Switch is based on the input signal available on the specified port of the router
Clean Switch Delay	#	Specifies the Clean Switch buffer depth. Select between 1/16 to full line to clean switch between signals with slight timing offsets.
Trigger	#	Specifies which reference signal trigger to use. Refer to the ***Ultrix User Guide*** for your router.

Table 25 Port Configuration — Views > Baseband > Ports Outputs (Continued)

Item	Parameters	Description
Transition	Cut	The audio input channel is immediately switched to its selected output. A transition to or from Dolby® will always be a Cut transition regardless of what the Transition setting is set to.
	V Fade	The original audio input channel fades down to silence followed by the new input channel fades up from silence to unity gain level
	X Fade	The original audio input channel fades down to silence as the new input fades up from silence, and both will be mixed
	Cut Fade	The original audio input channel cuts to silence and the new input fades up from silence to unity gain level
	Fade Cut	The original audio channel fades down to silence and the new input is cut in at unity gain level.
	Quiet Cut	The original audio channel performs a V Fade transition with a 5ms duration
Duration (ms)	#	Specifies the length of the audio fade, in milliseconds, between audio transitions

Baseband > Channels > Inputs View

This section summarizes the options when Views is set to Baseband > Channels > Inputs.

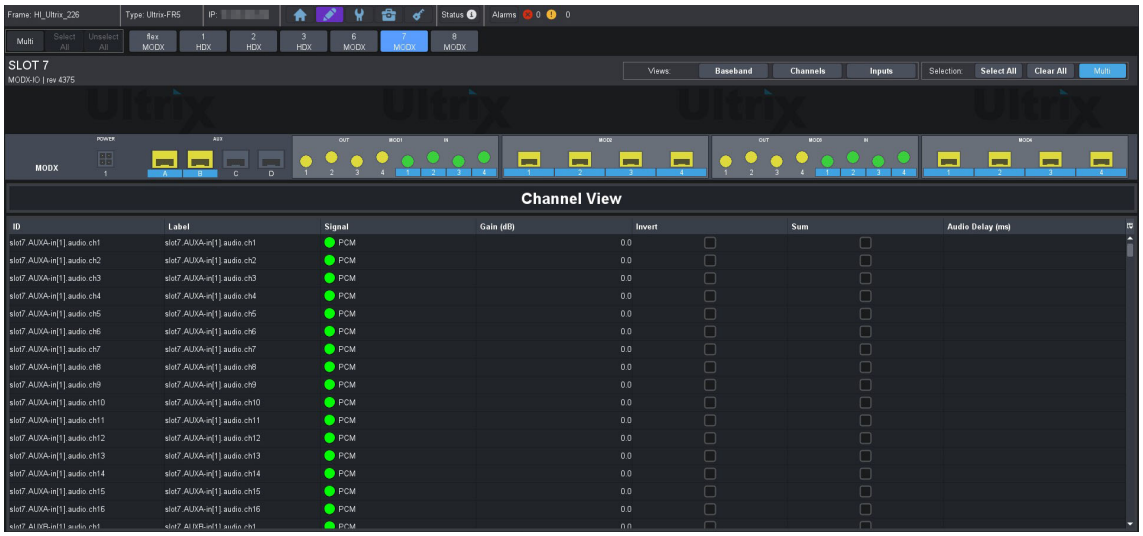


Figure 43 Example of the Baseband > Channels > Inputs View

Table 26 summarizes the columns that display when Views is set to Baseband > Channels > Inputs.

Table 26 Port Configuration — Views > Baseband > Channels > Inputs

Item	Parameters	Description
ID (read-only)	slot#.MOD#-port[#].type.ch	Auto-generated identifier for the channel where: • slot# represents which slot in the matrix the socket is located in • MOD# represents the module slot in the blade • port[#] identifies the physical input or output socket • type identifies the generic signal type (e.g. audio) • ch identifies the audio channel within an SDI stream For example, slot1.MOD2-out[4].audio.ch10.
Label (read-only)	<text>	Reports the text label that identifies the port in other interfaces of the database. This virtual label is used instead of the slot.port.type.channel format for logical label assignment. For example, you might re-name the port: slot1.AUXA.audio.ch1 to OUT 1.
Signal (read-only)	Provides status information on the specified channel.	
Gain (dB)	#	Provides a +/- 20dB gain range in 0.50dB increments. If you have added a gain to an input channel, the gain value specified for the output channel is an addition. For example, if you set the gain for an input to 10dB, then specify a gain of 2dB on the output, the total gain will be 12dB on the final output
Invert	Selected	Inverts the polarity of the audio signal for the selected channel
	Cleared	Disables this feature
Sum	Selected	Sum two adjacent audio channels. Each selected channel will carry the average of the two input channels ((A+B)/2). Select the Sum box for the first channel. The Sum box for the second channel is automatically selected. When the input is summed, the original signals are no longer available for output.
	Cleared	Disables this feature
Audio Delay (ms)	#	Applies up to 500ms of delay per channel. Note that an UltriSync license must be enabled to the port.

Baseband > Channels > Outputs View

This section summarizes the options when Views is set to Baseband > Channels > Outputs.

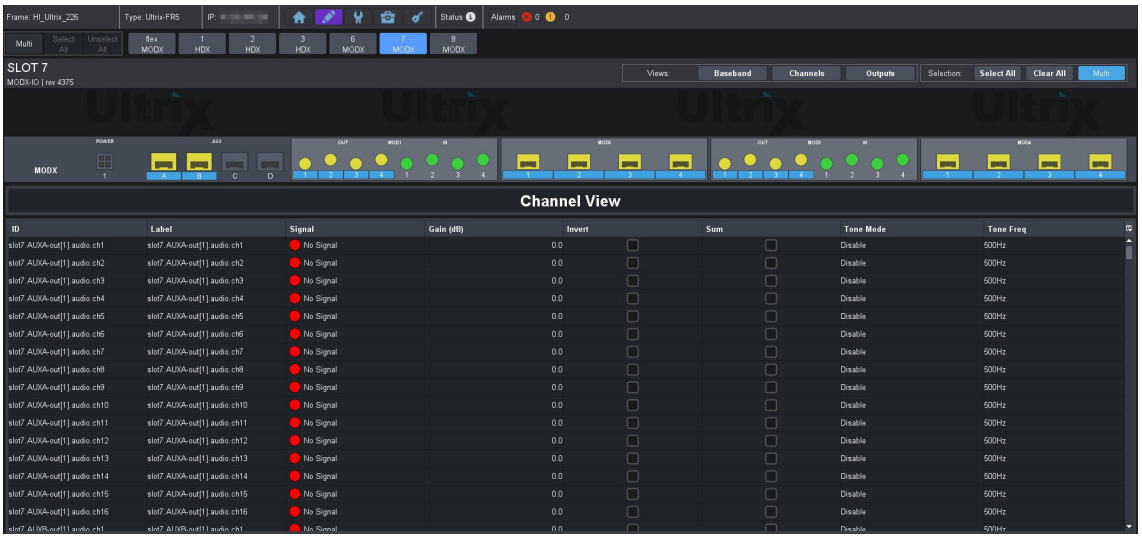


Figure 44 Example of the Baseband > Channels > Outputs View

Table 27 summarizes the columns that display when Views is set to Baseband > Channels > Outputs.

Table 27 Port Configuration — Views > Baseband > Channels > Outputs

Item	Parameters	Description
ID (read-only)	slot#.MOD#-port[#].type.ch	Auto-generated identifier for the channel where: • slot# represents which slot in the matrix the socket is located in • MOD# represents the module slot in the blade • port[#] identifies the physical input or output socket • type identifies the generic signal type (e.g. audio) • ch identifies the audio channel within an SDI stream For example, slot1.MOD2-out[4].audio.ch10.
Label (read-only)	<text>	Reports the text label that identifies the port in other interfaces of the database. This virtual label is used instead of the slot.port.type.channel format for logical label assignment. For example, you might re-name the port: slot1.AUXA.audio.ch1 to OUT 1.
Signal (read-only)	Provides status information on the specified channel.	
Gain (dB)	#	Provides a +/- 20dB gain range in 0.50dB increments. If you have added a gain to an input channel, the gain value specified for the output channel is an addition. For example, if you set the gain for an input to 10dB, then specify a gain of 2dB on the output, the total gain will be 12dB on the final output

Table 27 Port Configuration — Views > Baseband > Channels > Outputs (Continued)

Item	Parameters	Description
Invert	Selected	Inverts the polarity of the audio signal for the selected channel
	Cleared	Disables this feature
Sum	Selected	Sum two adjacent audio channels. Each selected channel will carry the average of the two input channels ((A+B)/2). Select the Sum box for the first channel. The Sum box for the second channel is automatically selected. When the input is summed, the original signals are no longer available for output.
	Cleared	Disables this feature
Tone Mode	Enable	Enable test tones for the specified channel
	Disable	Disables this feature
Tone Freq	#	Specifies the type of test tone to embed in the output

IO Module Views

This section summarizes the tabs, settings, and read-only fields when Views is set one of the IO Module options.

Table 28 summarizes the Module and Card tabs that are common to all IO Module interfaces.

Table 28 Port Configuration — Views > IO Module

Item	Parameters	Description
Module Tab		
Module ID	slot**x**.MOD**y**	• slot**x** indicates the physical slot in the router that the blade in installed in • MOD**y** indicates the module slot on the blade (1-4)
Module Type	#	Indicates the type of module (ULTRIX-MOD-NDI, ULTRIX-MOD-SDI, or ULTRIX-MOD-SFP)
Serial Number	#	Indicates the serial number of the module
Firmware Version	#	Indicates the firmware version running on the module
PCBA Part Number	#	Indicates the hardware version of the module
Current Temperature	#	Indicates the current temperature (in Celsius) reported by the module
	N/A	This module does not support temperature monitoring

Table 28 Port Configuration — Views > IO Module (Continued)

Item	Parameters	Description
Max Temperature	#	Indicates the maximum temperature (in Celsius) supported by the module
	N/A	This module does not support temperature monitoring
Begin Upgrades	Contact Ross Technical Support for upgrade files, and details. Refer to "**Upgrading the Software**".	
Card Tab		
ID	slot#	Indicates the slot in the router that this blade is located in
Serial Number	#	Indicates the serial number of this blade
Firmware Version	#	Indicates the firmware version running on this blade

IO Module > SDI > Inputs

Set the Views to SDI > Inputs to display the options for configuring the input BNCs of an ULTRIX-MOD-SDI module. Select the **Multi** button to display all the ULTRIX-MOD-SDI module ports.

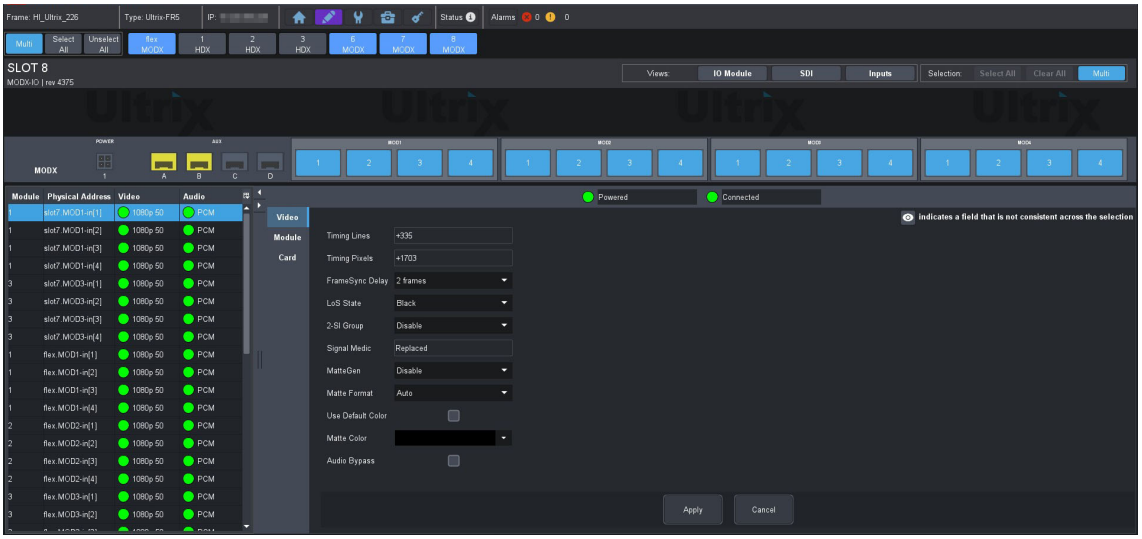


Figure 45 Example of the IO Module > SDI > Inputs View

Table 29 summarizes the options when Views is set to Views > IO Module > SDI > Inputs.

Table 29 Port Configuration — View > IO Module > SDI > Inputs

Item	Parameters	Description
Module	#	Indicates the module slot in the ULTRIX-MODX-IO blade
Physical Address (read-only)	slot**x**.MOD**y**-**z**[**#**]	Lists the physical ports, in ascending order where: • **x** represents the router slot number • **y** represents the module slot number • **z** represents the signal type (in or out) • **#** represents the signal index
Video (read-only)	#	If a port is used for video signals, this field indicates the video format
Audio (read-only)	#	If a port is used for audio signals, this field indicates the type of audio detected (e.g. PCM, AES etc.).
Video Tab		
Timing Lines (read-only)	#	Reports the value of timing difference between input and frame reference in number of lines.
	Detecting	The timing difference is being detected; updates the field approximately every 33 seconds.
	Async	There is no timing relationship between the input signal and the frame reference.
Timing Pixels (read-only)	#	Reports the value of timing difference between input and frame reference in number of pixels.
	Detecting	The timing difference is being detected; updates the field approximately every 33 seconds.
	Async	There is no timing relationship between the input signal and the frame reference
Frame Sync Delay	# frame(s)	Specifies the frame buffer size for the selected input port
LoS State[a]	Black	Sets the input to black during the loss of signal
	Freeze	Sets the input to the last valid frame of video before the loss of signal
UDC	Disable	This port will not use UltriFormat
	#	Specifies the video format that UltriFormat will convert this input signal to. Note that the UltriFormat output must match the router reference format. Refer to "**UltriFormat Configuration**" for details on UltriFormat.
UDC Fallback	Bypass	The format converter is bypassed; the output format matches the input
	Black	The output is forced to black (using the UDC setting) but remains synchronized to the SPG. This is useful for preserving downstream sync without valid input. Refer to "**UltriFormat Configuration**".

Table 29 Port Configuration — View > IO Module > SDI > Inputs (Continued)

Item	Parameters	Description
2-SI Group	Enable	Gearbox is available on the indicated I/O Group in groups of 4 consecutive I/O. For example, selecting Enable in the row for slot1.in[1] creates a Gearbox group from slot1.in[1] to slot1.in[4]. Note that I/O Groups for Gearbox are defined in the table using colored backgrounds.
	Disable	The indicated I/O is not included in a Gearbox configuration
Signal Medic (read-only)[b]	Not available	This port does not support the Gearbox feature.
	Good	This port is included in a Gearbox setup.
	Replaced	This port can be included in a Gearbox setup but is currently not included in the 12G link.
Matte Gen	Disable	Disable an internally generated test pattern. This is the default.
	Static	Generates a static color matte
	Bouncing Box	Generates a static color matte with a complimentary colored moving box
	Luma Sequence	Generates a luminance shifting sequence based on chosen color
Matte Format	#	Specifies the signal format of the generated test pattern. If you select Auto, the test pattern automatically matches the incoming signal type.
Matte Color	#	Specifies the color of the test signal
Audio Bypass	Selected	When Audio Bypass is enabled for an input, the audio will follow the SDI regardless of any individual audio channel routing or configuration on the output. The individual channels of an input in Bypass mode are still de-multiplexed and available for audio routing via the audio matrix.
	Cleared	Disables this feature

a. This affects Ultriscape and routed destinations.
b. Use this field to replace a missing 3G signal when one or more of the four 3G signals for a Gearbox configuration are unavailable.

IO Module > SDI > Outputs

Set the Views to SDI > Inputs to display the options for configuring the outputs BNCs of an ULTRIX-MOD-SDI module. Select the **Multi** button to display all the ULTRIX-MOD-SDI module output ports.

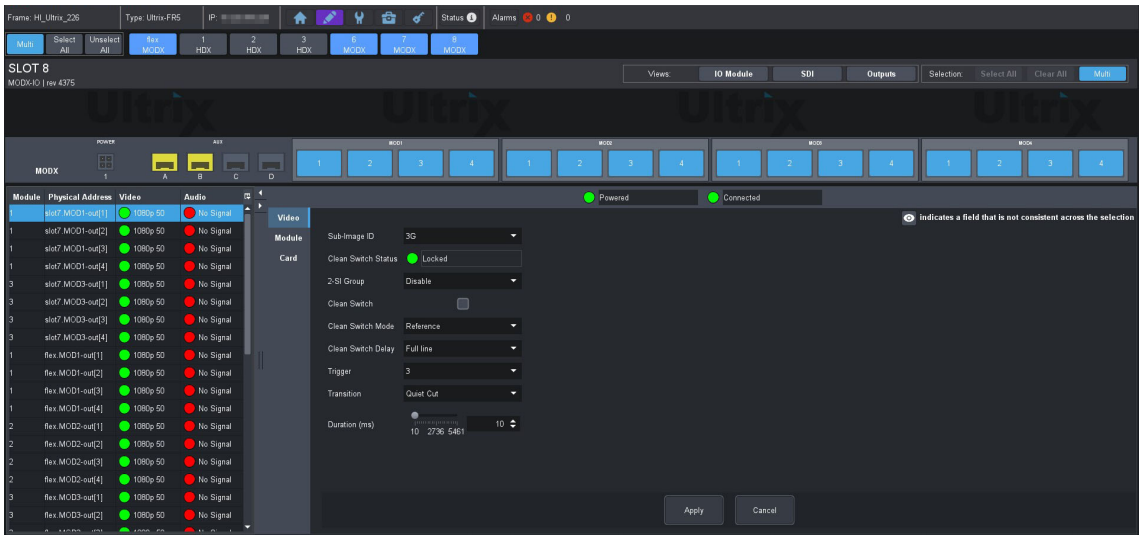


Figure 46 Example of the IO Module > SDI > Outputs View

Table 30 summarizes the options when Views is set to Views > IO Module > SDI > Outputs.

Table 30 Port Configuration — Views > IO Module > SDI > Outputs

Item	Parameters	Description
Module	#	Indicates the module slot in the blade where 1 is the first slot (leftmost) in the blade
Physical Address (read-only)	slot**x**.MOD**y**-**z**[**#**]	Lists the physical ports, in ascending order where: • **x** represents the router slot number • **y** represents the module slot number • **z** represents the signal type (in or out) • **#** represents the signal index
Video (read-only)	#	If a port is used for video signals, this field indicates the video format
Audio (read-only)	#	If a port is used for audio signals, this field indicates the type of audio detected (e.g. PCM, AES etc.)
Video Tab		
Sub-Image ID	3G	Some legacy equipment does not accept a 2SI SMPTE-352 payload identifier for quad-link SDI. You may need to select this if you are connecting legacy equipment to the specified output on the ULTRIX-MODX-IO.
	2SI	Set the SMPTE-352 payload identifier to 2SI for quad-link
Clean Switch Status (read-only)	Locked	The specified output is locked to its input
	Not Locked	The specified output is not locked to its input

Table 30 Port Configuration — Views > IO Module > SDI > Outputs (Continued)

Item	Parameters	Description
2-SI Group	Enable	Gearbox is available on the indicated I/O Group in groups of 4 consecutive I/O. For example, selecting Enable in the row for slot1.in[1] creates a Gearbox group from slot1.in[1] to slot1.in[4]. Note that I/O Groups for Gearbox are defined in the table using colored backgrounds.
	Disable	The indicated I/O is not included in a Gearbox configuration
Clean Switch	Selected	Clean Switch is applied to the specified output. The Clean Switch Delay value is applied.
	Cleared	Clean Switch is not applied to the specified output
Clean Switch Mode	Reference	Clean Switch is based on the reference signal available on the REF port of the router
	Input	Clean Switch is based on the input signal available on the specified port of the router
Clean Switch Delay	#	Specifies the Clean Switch buffer depth. Select between 1/16 to full line to clean switch between signals with slight timing offsets.
Trigger	#	Specifies which reference signal trigger to use. Refer to the ***Ultrix User Guide*** for your router.
Transition	Cut	The audio input channel is immediately switched to its selected output. A transition to or from Dolby® will always be a Cut transition regardless of what the Transition setting is set to.
	V Fade	The original audio input channel fades down to silence followed by the new input channel fades up from silence to unity gain level
	X Fade	The original audio input channel fades down to silence as the new input fades up from silence, and both will be mixed
Transition	Cut Fade	The original audio input channel cuts to silence and the new input fades up from silence to unity gain level
	Fade Cut	The original audio channel fades down to silence and the new input is cut in at unity gain level
	Quiet Cut	The original audio channel performs a V Fade transition with a 5ms duration
Duration (ms)	#	Specifies the length of the audio fade, in milliseconds, between audio transitions

IO Module > SFP > Inputs

Set the Views to SFP > Inputs to display the options for configuring the input ports of an ULTRIX-MOD-SFP module. Select the **Multi** button to display all the ULTRIX-MOD-SFP module input ports.

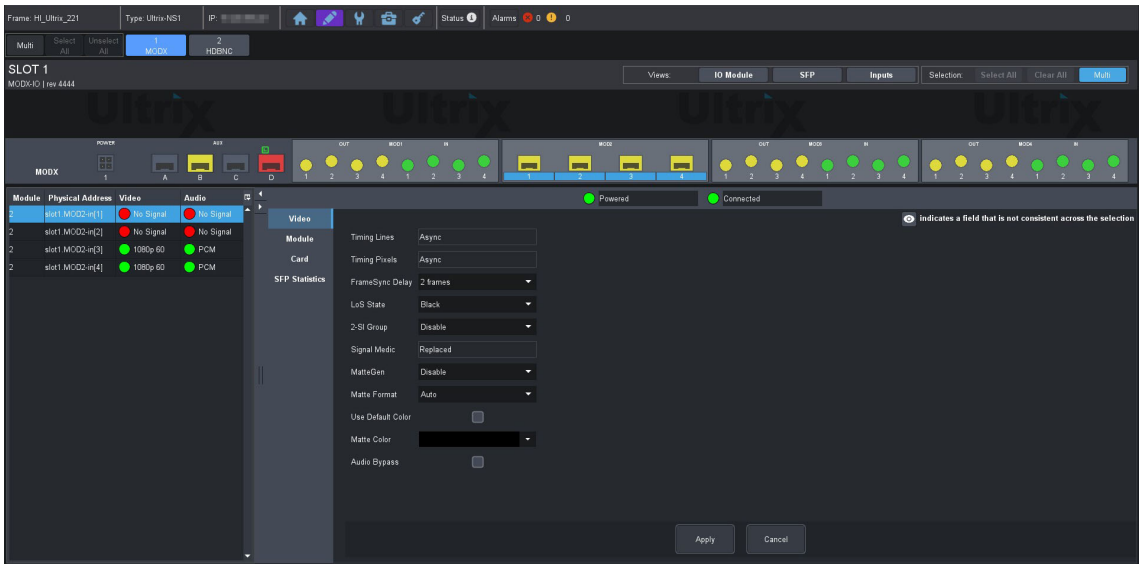


Figure 47 Example of the IO Module > SFP > Inputs View

Table 31 summarizes the options when Views is set to Views > IO Module > SFP > Inputs.

Table 31 Port Configuration — View > IO Module > SFP > Inputs

Item	Parameters	Description
Module	#	Indicates the module slot in the ULTRIX-MODX-IO blade
Physical Address (read-only)	slot**x**.MOD**y**-**z**[**#**]	Lists the physical ports, in ascending order where: • **x** represents the router slot number • **y** represents the module slot number • **z** represents the signal type (in or out) • **#** represents the signal index
Video (read-only)	#	If a port is used for video signals, this field indicates the video format.
Audio (read-only)	#	If a port is used for audio signals, this field indicates the type of audio detected (e.g. PCM, AES etc.).
Video Tab		
Timing Lines (read-only)	#	Reports the value of timing difference between input and frame reference in number of lines.
	Detecting	The timing difference is being detected; updates the field approximately every 33 seconds.
	Async	There is no timing relationship between the input signal and the frame reference.

Table 31 Port Configuration — View > IO Module > SFP > Inputs (Continued)

Item	Parameters	Description
Timing Pixels (read-only)	#	Reports the value of timing difference between input and frame reference in number of pixels.
	Detecting	The timing difference is being detected; updates the field approximately every 33 seconds.
	Async	There is no timing relationship between the input signal and the frame reference
Frame Sync Delay	# frame(s)	Specifies the frame buffer size for the selected input port
LoS State[a]	Black	Sets the input to black during the loss of signal
	Freeze	Sets the input to the last valid frame of video before the loss of signal
UDC	Disable	This port will not use UltriFormat
	#	Specifies the video format that UltriFormat will convert this input signal to. Note that the UltriFormat output must match the router reference format. Refer to "**UltriFormat Configuration**" for details on UltriFormat.
UDC Fallback	Bypass	The format converter is bypassed; the output format matches the input
	Black	The output is forced to black (using the UDC setting) but remains synchronized to the SPG. This is useful for preserving downstream sync without valid input. Refer to "**UltriFormat Configuration**".
2-SI Group	Enable	Gearbox is available on the indicated I/O Group in groups of 4 consecutive I/O. For example, selecting Enable in the row for slot1.in[1] creates a Gearbox group from slot1.in[1] to slot1.in[4]. Note that I/O Groups for Gearbox are defined in the table using colored backgrounds.
	Disable	The indicated I/O is not included in a Gearbox configuration
Signal Medic (read-only)[b]	Not available	This port does not support the Gearbox feature.
	Good	This port is included in a Gearbox setup.
	Replaced	This port can be included in a Gearbox setup but is currently not included in the 12G link.
Matte Gen	Disable	Disable an internally generated test pattern. This is the default.
	Static	Generates a static color matte
	Bouncing Box	Generates a static color matte with a complimentary colored moving box
	Luma Sequence	Generates a luminance shifting sequence based on chosen color

Table 31 Port Configuration — View > IO Module > SFP > Inputs (Continued)

Item	Parameters	Description
Matte Format	#	Specifies the signal format of the generated test pattern. If you select Auto, the test pattern automatically matches the incoming signal type.
Matte Color	#	Specifies the color of the test signal
Audio Bypass	Selected	When Audio Bypass is enabled for an input, the audio will follow the SDI regardless of any individual audio channel routing or configuration on the output. The individual channels of an input in Bypass mode are still de-multiplexed and available for audio routing via the audio matrix.
	Cleared	Disables this feature
SFP Statistics (read-only)		
Vendor Name	<text>	Reports the vendor details of the SFP installed in the specified SFP port
Vendor PN	#	Reports the vendor part number of the SFP installed in the specified SFP port
Vendor SN	#	Reports the vendor serial number of the SFP installed in the specified SFP port
Temperature	#	Internal temperature (in Celsius) reported by the SFP installed in the specified port
Voltage	#	Indicates the present voltage through the SFP (in volts)
Wavelength	#	If the SFP is a fiber module, this indicates the laser wavelength of the signal (in nanometers)
	N/A	The SFP is not a fiber module

a. This affects Ultriscape and routed destinations.
b. Use this field to replace a missing 3G signal when one or more of the four 3G signals for a Gearbox configuration are unavailable.

IO Module > SFP > Outputs

Set the Views to SFP > Outputs to display the options for configuring the output ports of an ULTRIX-MOD-SFP module. Select the **Multi** button to display all the ULTRIX-MOD-SFP module output ports.

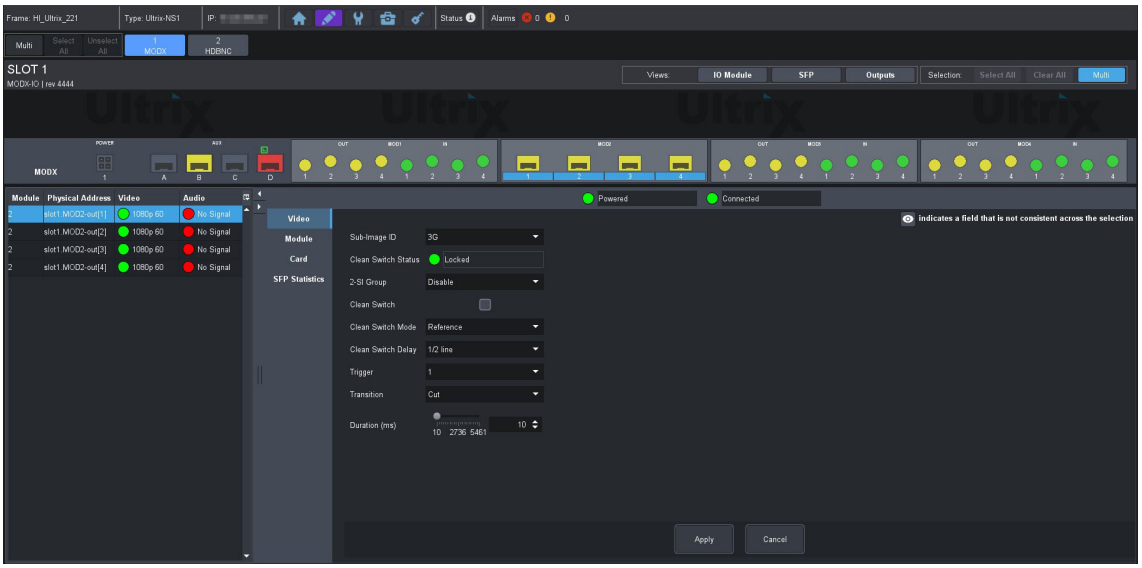


Figure 48 Example of the IO Module > SFP > Outputs View

Table 32 summarizes the options when Views is set to IO Module > SFP > Outputs.

Table 32 Port Configuration — Views > IO Module > SFP > Outputs

Item	Parameters	Description
Module	#	Indicates the module slot in the blade where 1 is the first slot in the blade
Physical Address (read-only)	slot**x**.MOD**y**-**z**[**#**]	Lists the physical ports, in ascending order where: • **x** represents the router slot number • **y** represents the module slot number • **z** represents the signal type (in or out) • **#** represents the signal index
Video (read-only)	#	If a port is used for video signals, this field indicates the video format.
Audio (read-only)	#	If a port is used for audio signals, this field indicates the type of audio detected (e.g. PCM, AES etc.).
Video Tab		
Sub-Image ID	3G	Some legacy equipment does not accept a 2SI SMPTE-352 payload identifier for quad-link SDI. You may need to select this if you are connecting legacy equipment to the specified output on the ULTRIX-MODX-IO.
	2SI	Set the SMPTE-352 payload identifier to 2SI for quad-link.
Clean Switch Status (read-only)	Locked	The specified output is locked to its input.
	Not Locked	The specified output is not locked to its input.

Table 32 Port Configuration — Views > IO Module > SFP > Outputs (Continued)

Item	Parameters	Description
2-SI Group	Enable	Gearbox is available on the indicated I/O Group in groups of 4 consecutive I/O. For example, selecting Enable in the row for slot1.in[1] creates a Gearbox group from slot1.in[1] to slot1.in[4]. Note that I/O Groups for Gearbox are defined in the table using colored backgrounds.
	Disable	The indicated I/O is not included in a Gearbox configuration
Clean Switch	Selected	Clean Switch is applied to the specified output. The Clean Switch Delay value is applied.
	Cleared	Clean Switch is not applied to the specified output.
Clean Switch Mode	Reference	Clean Switch is based on the reference signal available on the REF port of the router
	Input	Clean Switch is based on the input signal available on the specified port of the router
Clean Switch Delay	#	Specifies the Clean Switch buffer depth. Select between 1/16 to full line to clean switch between signals with slight timing offsets.
Trigger	#	Specifies which reference signal trigger to use. Refer to the ***Ultrix User Guide*** for your router.
Transition	Cut	The audio input channel is immediately switched to its selected output. A transition to or from Dolby® will always be a Cut transition regardless of what the Transition setting is set to.
	V Fade	The original audio input channel fades down to silence followed by the new input channel fades up from silence to unity gain level
	X Fade	The original audio input channel fades down to silence as the new input fades up from silence, and both will be mixed
	Cut Fade	The original audio input channel cuts to silence and the new input fades up from silence to unity gain level
	Fade Cut	The original audio channel fades down to silence and the new input is cut in at unity gain level.
Transition	Quiet Cut	The original audio channel performs a V Fade transition with a 5ms duration
Duration (ms)	#	Specifies the length of the audio fade, in milliseconds, between audio transitions
SFP Statistics (read-only)		
Vendor Name	<text>	Reports the vendor details of the SFP installed in the specified SFP port
Vendor PN	#	Reports the vendor part number of the SFP installed in the specified SFP port

Table 32 Port Configuration — Views > IO Module > SFP > Outputs (Continued)

Item	Parameters	Description
Temperature	#	Internal temperature (in Celsius) of the SFP installed in the specified SFP port
Voltage	#	Indicates the present voltage through the SFP (in volts)
Wavelength	#	If the SFP is a fiber module, this indicates the laser wavelength of the signal (in nanometers)

Gearbox Overview

A Gearbox is a group of four consecutive inputs or four consecutive outputs that are automatically grouped together in the routing database. The first port of the Gearbox group is automatically used for routing and Ultriscape, while the remaining three ports in the group are reserved but not used (they are not listed in the routing system database).

Keep the following in mind when configuring a Gearbox group on the ULTRIX-MODX-IO blade:

- Signal Medic — a function that attempts to 'repair' the incoming Gearbox signal group if one of the four input stream is temporarily interrupted. The Signal Medic will replace the missing stream with an interpolated version derived from the other incoming signals.
- Gearbox Timing — the Gearbox requires all four of the input signals be within 350ns of each other. Cable lengths to the Gearbox input should be as matched as practicable.

For More Information on...

- cabling a Gearbox group on the ULTRIX-MOD-SFP, refer to "**ULTRIX-MOD-SFP**".
- cabling a Gearbox group on the ULTRIX-MOD-SDI, refer to "**ULTRIX-MOD-SDI**".
- configuring a Gearbox, refer to the ***Ultrix User Guide*** for your router.

Ultrimix-Dante Overview

The Ultrimix-Dante license provides 64 x 64 input/output audio channels accessible via ethernet on the AUX C port of the ULTRIX-MODX-IO blade.

Keep the following in mind when configuring the Ultrimix-Dante features:

- Ultrix identifies the Dante channels as a single pipeline consisting of 64 input and 64 output channels.
- Audio sources from a Dante network can be configured as inputs into the router. The router can also output audio channels to the same Dante network.
- The AUX B audio channels are not available for use when Ultrimix-Dante is enabled on a blade. AUX B can still be used to route SDI video.

For More Information on...

- Ultrimix-Dante, refer to the ***Ultrix User Guide*** for your router.

UltriScape Overview

Ultriscape is the integrated Multiviewer for Ultrix routers. Use the Ultriscape Layout Editor to manage the layouts and the Ultriscape Head interface to assign sources to the Ultriscape Head outputs. You must have at least one Ultriscape license key installed to access the Ultriscape interfaces.

Keep the following in mind when configuring the Ultriscape features on an ULTRIX-MODX-IO blade:

- Each Ultriscape license enables one Multiviewer Head (output) per slot.
- Each slot supports up to three Multiviewer Heads.

For More Information on…

- the Ultriscape Head designations of the ULTRIX-MOD-SFP, refer to "**ULTRIX-MOD-SFP**".
- the Ultriscape Head designations of the ULTRIX-MOD-SDI, refer to "**ULTRIX-MOD-SDI**".
- the Ultriscape Head designations of other blades, refer to the installation guide for your router.
- configuring Ultriscape, refer to the ***Ultriscape User Guide***.

UltriSync Overview

UltriSync allows the re-timing of asynchronous or time offset input signals to the frame reference. UltriSync is a per input feature and requires a license for each input that will be used by the UltriSync.

Keep the following in mind when configuring the UltriSync features on an ULTRIX-MODX-IO blade:

- The **UltriSync** license allows for SDI data rates up to 3Gbps (1080p).
- The **UltriSync-UHD** license allows the Frame Sync to operate at up to 12Gbps (2160p) data rates. This license is available on 3 inputs per blade (AUX B or the first input of each module).

For More Information on…

- configuring the UltriSync feature, refer to the ***Ultrix User Guide*** for your router.

UltriClean Overview

UltriClean allows users to enable a Clean Switch mode and apply a line buffer (delay) on a per output basis. Incoming video is buffered based on the timing of the input, and is then output based on the timing of the router system reference (including any offsets added in the Triggers setup). Users can then switch between inputs that are not perfectly co-timed without perceiving any glitches of the incoming data. Video source timing must remain within the buffer to properly switch between sources (buffer depth is user-configurable).

For More Information on…

- configuring the UltriClean feature, refer to the ***Ultrix User Guide*** for your router.

UltriFormat Overview

UltriFormat converts the incoming video (of a supported video format) to any supported video format. A video frame synchronizer then allows the output video to be timed to an external video reference. Once an UltriFormat license is enabled on an input, the format conversion settings (UDC and UDC Fallback) in the Port Configuration interface are made available for that input.

For More Information on…

- configuring the UltriFormat feature, refer to the ***Ultrix User Guide*** for your router.

UltriSRC Overview

The UltriSRC license is a per port license enabling Sample Rate Conversion for MADI audio inputs. The sample rate conversion will re-sample incoming MADI up to 48kHz. This supports MADI sources that are not reference locked to the router.

For More Information on...

- configuring the UltriSRC feature, refer to the ***Ultrix User Guide*** for your router.

UltriProc Overview

UltriProc allows you to perform color correction, Proc Amps, and HDR conversion on Ultrix I/Os. An UltriProc can be assigned to either inputs or outputs. A license key is required for each selected I/O that will be used by the UltriProc.

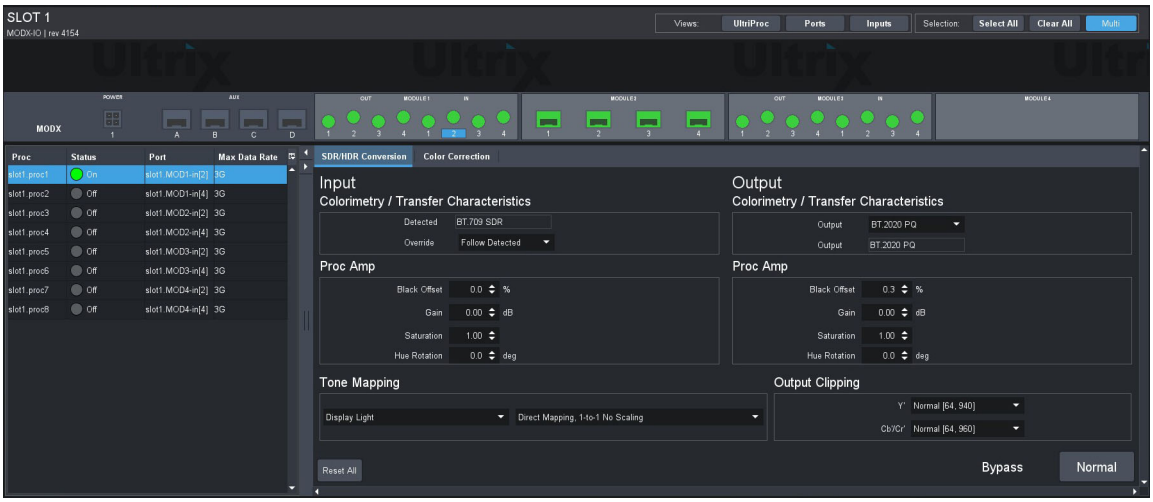


Figure 49 Example of the UltriProc Interface in DashBoard

UltriProc color correction is performed in the Y'CbCr color space or by RGB Color Correctors in the RGB color space. It is additive, allowing you to apply any combination of SDR/HDR and RGB Color Corrector based adjustment to a video signal.

The video input dynamic range and colorimetry/transfer characteristics settings can be manually configured or can be automatically detected from the SDI video input 352M payload identifier.

The video output dynamic range and colorimetry/transfer characteristics settings can be manually configured or can be automatically set to follow the SDI video input dynamic range and colorimetry/transfer characteristics.

For More Information on...

- configuring UltriProc, refer to the ***Ultrix User Guide*** for your router.

UltriStream Overview

The UltriStream licensed feature provides the ability to encode one NDI stream of a configured Ultriscape Multiviewer Head per ULTRIX-HDX-IO or ULTRIX-MODX-IO blade.

✶ The Multiviewer Head for the video source must be one from the blade that is transmitting the NDI stream. For example, a licensed ULTRIX-MODX-IO blade in slot1 cannot send an NDI stream of a Multiviewer Head from a licensed ULTRIX-HDX-IO blade in slot2.

For More Information on...

- configuring UltriStream, refer to the ***Ultrix User Guide*** for your router.

Monitoring

This chapter briefly summarizes how to monitor the ULTRIX-MODX-IO via the DashBoard interfaces.

Monitoring the Video and Audio Signals

Use the Ultrix > System > Monitoring interfaces provide options to monitor the video and audio signal status for any blade in the router. Refer to the ***ULTRIX-FR1, ULTRIX-FR2, and ULTRIX-FR5 User Guide*** or the ***ULTRIX-FR12 User Guide*** for details.

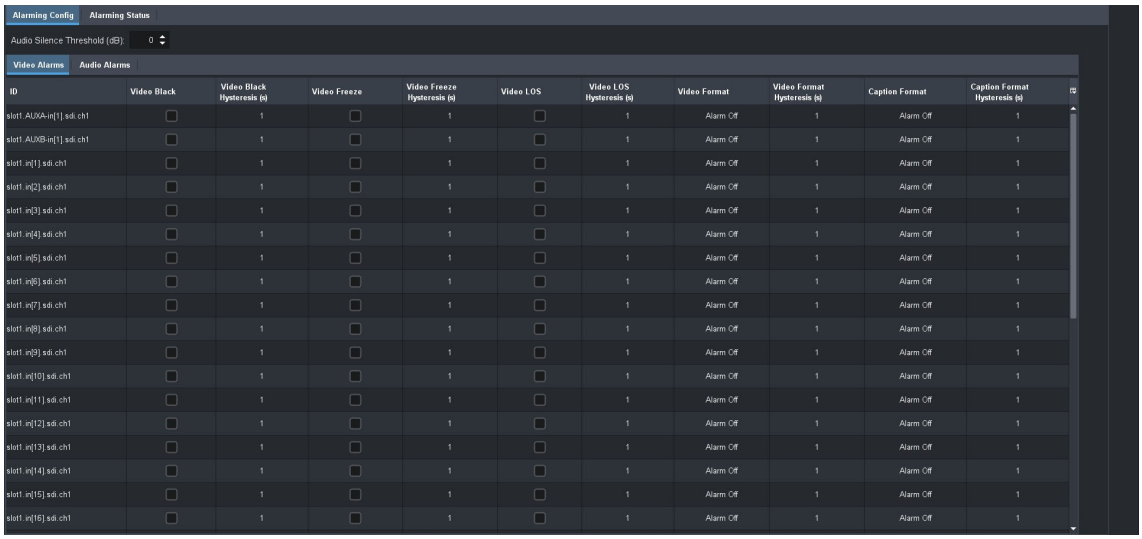


Figure 50 Example of the Ultrix > System > Monitoring > Alarm Config Tabs

Monitoring the Hardware

Use the Ultrix > System > Ultrix > Device Configuration > Alarms interface to monitor any detected error conditions for the entire router. These can range from yellow (caution) to red (warning) messages about individual blades, modules, or ports. This interface reports messages based on the alarms enabled in the Frame Configuration > Alarms tab.

Refer to the ***ULTRIX-FR1, ULTRIX-FR2, and ULTRIX-FR5 User Guide*** or the ***ULTRIX-FR12 User Guide*** for details.

To access the Alarms interface for the router

1. Expand the Ultrix node to display a list of sub-nodes in the Tree View.
2. Expand the **Systems** sub-node.
3. Expand the **Configuration** sub-node.
4. Double-click the **Ultrix** node.

   The **Device Configuration** interface opens.
5. Locate the **Alarms** area of the top toolbar.

6. Click **Alarms**.

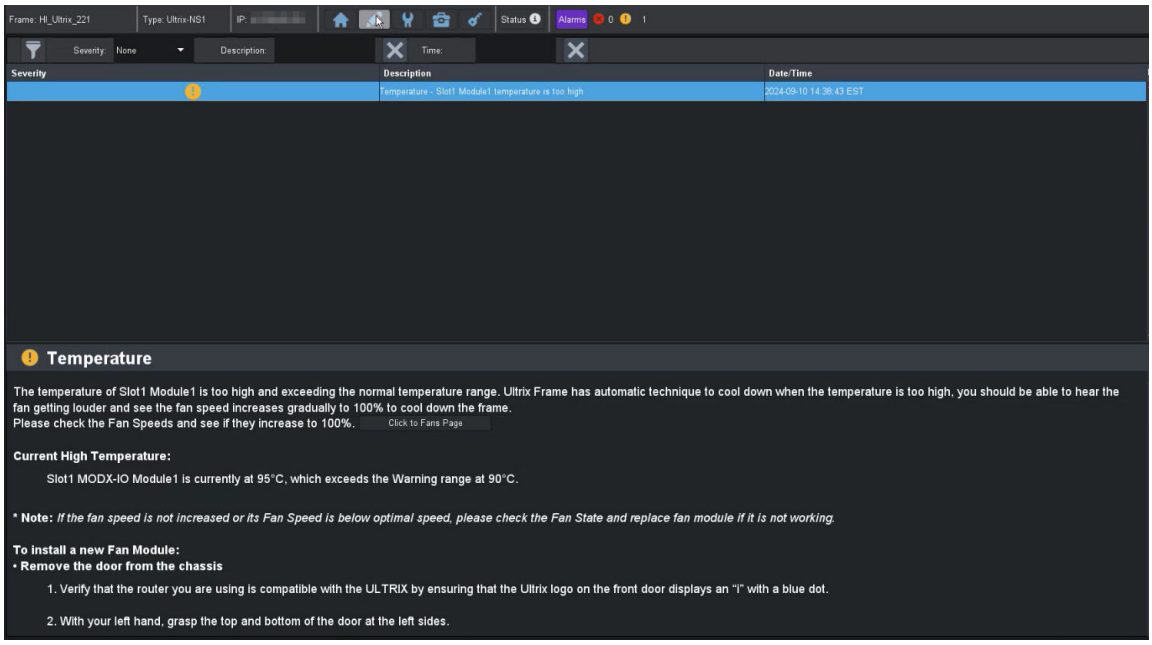


Figure 51 Example of a Device Configuration > Alarms > Temperature Caution

You can also use the Device Configuration > Port Configuration > Views > IO Module interfaces to monitor multiple ULTRIX-MODX-IO blades, a specific blade, a type of module, multiple ports, or a specific port. Refer to "**IO Module Views**" for details on the read-only fields of each interface.

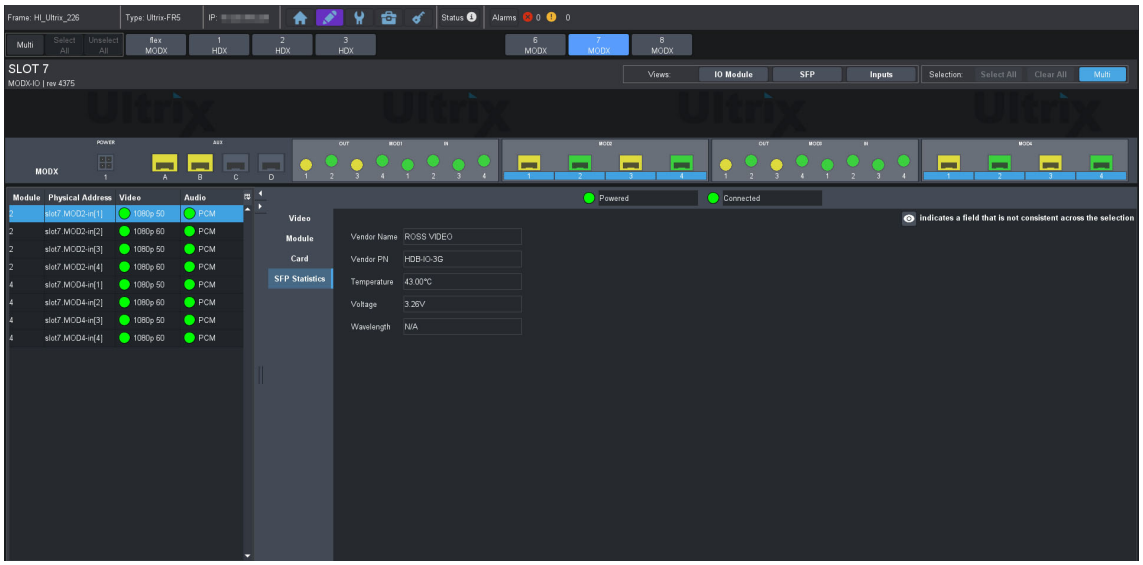


Figure 52 Example of the IO Module > SFP > Inputs > SFP Statistics Tab

Upgrading the Software

This chapter outlines how to use DashBoard to upgrade the ULTRIX-MODX-IO and the ULTRIX-MOD-NDI module in the field.

Before You Begin

Keep the following in mind before upgrading the software:

- A fully loaded ULTRIX-MODX-IO blade can take up to 15 minutes to upgrade all its modules.
- The Ultrix router is temporarily taken off-line during the upgrade process.
- If an ULTRIX-MOD-NDI module is newly installed in a slot of the ULTRIX-MODX-IO blade and the module software does not match that of the blade, there is the option to perform a module-level-only upgrade (step 10 below). This upgrade will only affect the modules that do not match the blade software.

Upgrading the Software via DashBoard

Upgrading the ULTRIX-MODX-IO and the ULTRIX-MOD-NDI requires three *.bin files: one for the Ultrix router, one for the ULTRIX-MODX-IO blade, and one for the ULTRIX-MOD-NDI module.

To upgrade the software on the ULTRIX-MODX-IO

1. Contact Ross Technical Support for the latest software *.bin files.
2. In DashBoard, navigate to the **Ultrix** > **System** > **Configuration** > **Connections** > **Services** tab.
3. Ensure the **Enable Upgrades & Support Access** box is selected.
4. Navigate to the **Product Info** interface for your router.
5. Verify that the **Upload** button displays on the interface.
6. Upload the **Frame** *.bin file.

   This file upgrades the software for the router to work with the ULTRIX-MODX-IO.
7. Upload the **Card** *.bin file.

   This file upgrades the software for the ULTRIX-MODX-IO blade.
8. Reboot the router.
9. Wait until the router returns from the reboot.
10. Upload the **Module** *.bin file.

    This file upgrades the software for the modules installed in the ULTRIX-MODX-IO.

✶ The Module *.bin is uploaded to each module in the ULTRIX-MODX-IO blade serially. Each module takes approximately 3.5 minutes to upgrade.

11. Verify the software versions of the Frame, Card, and Module after upgrade to ensure that each was updated correctly.
    - To view the frame software version: Select Ultrix > Ultrix > Product Info > Product > System Version.
    - To view the blade software version: Select Ultrix > Ultrix > Port Configuration > View > IO Module > Card.
    - To view the module software version: Select Ultrix > Port Configuration > View > IO Module > Module.

Technical Specifications

This chapter provides technical information for the ULTRIX-MODX-IO blade only. Note that specifications are subject to change without notice.

Power Specifications

✶ Refer to the Ross Ultrix Configuration Tool on our website, or contact Ross Technical Support for help determining the power needs of your system.

Table 33 Technical Specifications — Power Supply Ratings

Item	Specifications
ULTRIX-MODX-IO	90W
Per Module	15W
Total	150W

Environmental

Table 34 Technical Specifications — Environmental

Item	Specifications
Max. Ambient Temperature Range	0°C to 40°C (32°F to 104°F)
Humidity, non-condensing	< 95%

Supported SFP Modules

Refer to the document ***ULTRIX SFP Modules Guide*** for more information on the supported SFP models and their specifications.