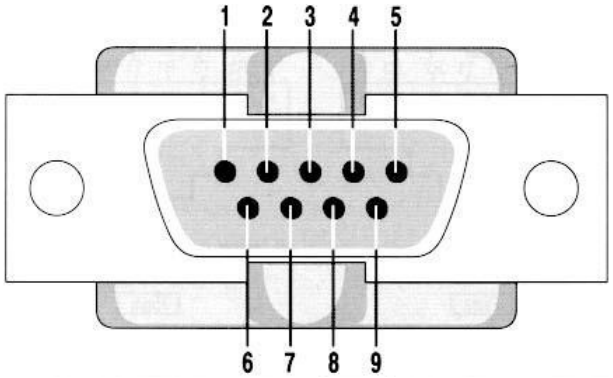
XPression PBus Configuration

Overview

PBus (Peripheral Bus) is an industry standard protocol designed to allow production switchers to communicate with external devices. Most large production switchers have some capability of sending PBus commands to a device.

XPression supports PBus over standard RS232 or TCP/UDP sockets.



Pin	Signal	Pin	Signal
1	Data Carrier Detect	6	Data Set Ready
2	Received Data	7	Request to Send
3	Transmitted Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	Signal Ground		

The chassis of some turnkey XPression systems might not include a standard RS232 port. However, it is possible to use an RS232-USB adaptor.

If the production switcher has an RS422 serial port, then you will require an RS232-RS422 adaptor. This adaptor will require its own power supply. Generally, the adaptors that are port-powered will not function for these purposes.

★On an XPression Bluebox system, a limited subset of PBus functionality is available. PBus commands can be used to trigger take items that have been pre-built in an XPression sequence using either XPression Designer or Studio. It is not possible to customize the PBus registers actions using Bluebox. Each register number corresponds to a specific take item number and can not be changed. It is not possible to load the PBM or PBMS PBus mapping files on Bluebox.

Phone: +1 613-686-1557 • Technical Support: +1-833-859-0499 (North America) • +800 3540 3545 (Int'l) • 1 300 007 677 (Australia) • +91-22-5016-6177 (India) • 3500DR-522 • October 2026 © 2026 Ross Video Limited. Ross® and any related marks are trademarks or registered trademarks of Ross Video Limited. All other trademarks are the property of their respective companies. PATENTS ISSUED and PENDING. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, photocopying, recording or otherwise, without the prior written permission of Ross Video. While every precaution has been taken in the preparation of this document, Ross Video assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

The following topics are covered in this document:

Configuring PBus and PBus Recalls

PBus Triggers

PBus Store Commands

PBus Mapping

Using PBus from a Switcher to Recall Items

Using PBUS for XPression Clips with Recall IDs

Configuring PBus and PBus Recalls

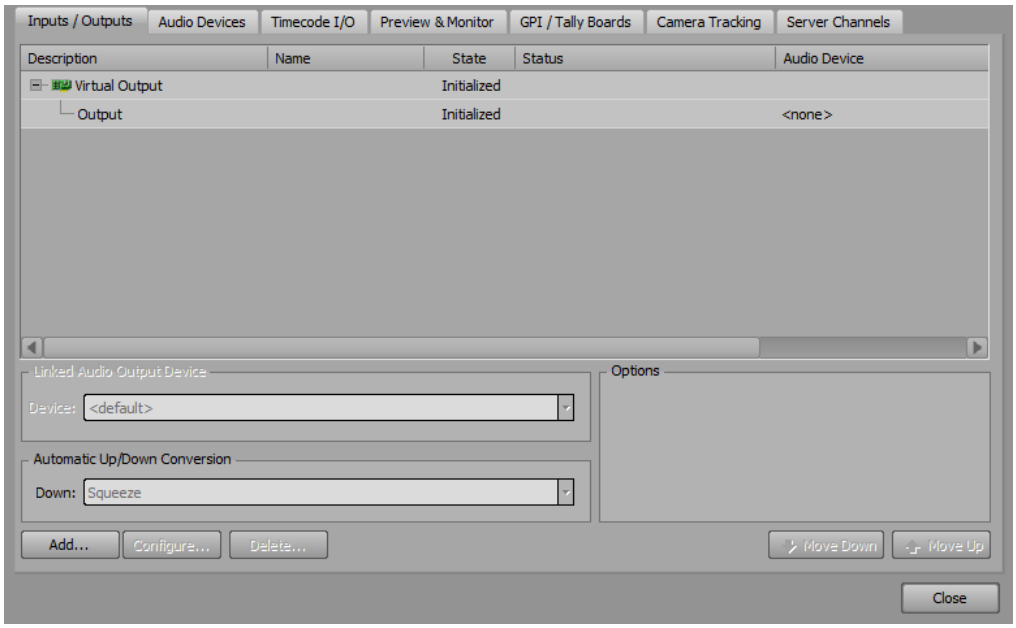
Use the **Hardware Setup** to enable XPression to accept PBus commands, configure settings, and configure recall options.

To enable XPression to accept PBus commands:

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

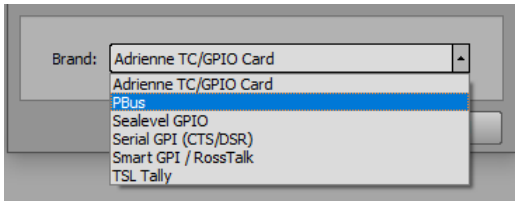
   The **Hardware Setup** window opens.

2. Select the **GPI / Tally Boards** tab.



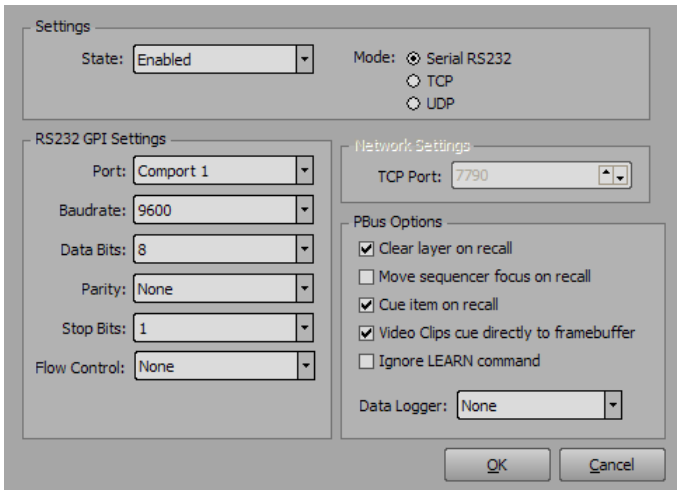
3. Select **Add**.

   The **Add New GPI / Tally Board** window opens.



4. From the **Brand** drop-down, select **PBus**.
5. Select **OK**.

   The **PBus Setup** window opens.



6. In the **Settings** section, from the **State** drop-down, select **Enabled**.

   Select **Disabled** to turn off PBus.

7. Select a **Mode** for PBus:
   - **Serial RS232** — select to use RS232 to send PBus signals to XPression.
   - **TCP** — select to use TCP/IP to send PBus signals to XPression.
   - **UDP** — select to use UDP sockets to send PBus signals to XPression.
8. Configure the settings for your chosen mode.

To Configure the settings for Serial RS232:

- From the **Port** drop-down, select the communication port that receives the signals.
- From the **Baudrate** drop-down, select the communication speed for the signals.
- From the **Data Bits** drop-down, select the number of bits used to represent one character of data for the signals.
- From the **Parity** drop-down , select the method used to check for lost data in a signal.
- From the **Stop Bits** drop-down , select the number of bits used to indicate the end of a byte in a signal.
- From the **Flow Control** drop-down, select the data transmission rate controller for a signal.

★The flow control can be set to **Hardware** or **None**, but it must be set the same in both XPression and the transmitting device.

To Configure the settings for TCP & UDP:

- In the **Network Settings** section, use the **TCP/UDP Port** box to enter or select the communication port that receives the signals.

To configure the PBus Options:

★XPression does not perform any action when a PBus command is issued. It stores the ID to be used later when a PBus trigger command is issued.

1. In the **PBus Options** section, select the desired options:
   - **Clear layer on recall** — when this option is selected and a **PBus Recall** command is received, XPression will look to see to which channel and layer the take item being recalled has been assigned. It will then immediately clear that layer and channel. However, the take item will not be read to air until such time as a **PBus Trigger** command is received to put the item on air. This configuration option is recommended to be enabled in situations where XPression might be used to play back clips/graphics and to ensure that as soon as the **Recall** command is issued, any previous graphic that might have been left over on the layer will be removed.
   - **Move sequencer focus on recall** — select this option to move the sequencer focus to the item that is being recalled. This can be useful for generating a preview output that will show a rendered frame from the item that will be put on air when the **PBus Trigger** command is received.
   - **Cue item on recall** — select this option to place the take item into a cued state when the recall command is received. This is useful when using video clips which might take a few frames to cue.
   - **Video Clips cue directly to framebuffer** — select this option to cause the video clips from the Clip Store that are assigned to a PBus register to cue directly onto the hardware output of XPression in a paused state. When the play command is received, they will begin playing.
   - **Ignore LEARN command** — select this option to disable the switcher command that enables PBus to learn a set of commands or procedures in XPression that can be recalled by the switcher.

2. To select an encoding scheme for the data log, use the **Data Logger** list.
   The options are:
   - **None —** select this option to use no data logging.
   - **ASCII** — select this option to use ASCII encoding for the data log.
   - **HEX** — select this option to use HEX file formatting for the data log.
   - **Both** — select this option to use both ASCII encoding and HEX file formatting for the data log.

To save PBus settings and options:

1. In the **PBus Setup** window, select **OK**.

   The PBus interface is displayed in the **GPI/Tally Board** list.
2. Select **Close**.

   The **Hardware Setup** window closes.

PBus Triggers

XPression supports many **PBus Trigger** commands.

- **Trigger 0 – Play Item**

  ★This trigger can be overridden in the PBus mapping.

  Trigger 0 is normally used to play a take item to air. However, this can be overridden to perform other actions on a per-register basis. These actions can be configured in the PBus mapping menu.

- **Trigger 1 – Take Sequence Item Off-A**

  Trigger 1 is used to take an item off air (assuming it was already on air). The item taken off air will be the take item that was previously recalled using a **PBus Recall** command.

- **Trigger 2 – Execute GPI**

  Trigger 2 is used to emulate a standard GPI input. In the XPression Keyboard/GPI Mapping, various actions can be configured to be executed on a GPI input being triggered. It is possible to trigger up to 99 different GPIs through PBus. The GPI number that will be triggered is the number that was previously called using a **PBus Recall** command.

- **Trigger 3 – Clear Framebuffer**

  Trigger 3 will clear the framebuffer assigned to the device in the **PBus Channel Configuration**. If the channel is set to **<default>**, this trigger will clear **Channel 1**.

- **Trigger 4 – Clear Framebuffer Channel 2**

  Trigger 4 will clear the framebuffer assigned to the device in the **PBus Channel Configuration**. If the channel is set to **<default>**, this trigger will clear **Channel 2**.

- **Trigger 5 – Read Current Sequence Item to Air**

  Trigger 5 will take the currently selected sequence item from the sequencer to air. It ignores the **PBus Recall** command and uses whichever item currently has focus in the XPression Sequencer.

- **Trigger 6 – Resume Channel**

  Trigger 6 will resume all paused graphics currently on the framebuffer assigned to the device in the **PBus Channel Configuration**. If the framebuffer is set to **<default>**, this will resume **Channel 1**.

- **Trigger 7 – Resume Channel**

  Trigger 7 will resume all paused graphics currently on the framebuffer assigned to the device in the **PBus Channel Configuration**. If the framebuffer is set to **<default>**, this will resume **Channel 2**.

- **Trigger 8 – Resume Take Item**

  Trigger 8 will resume a single paused take item. The take item will be the item previously recalled by a **PBus Recall** command.

- **Trigger 10 – Bank 0**

  Trigger 10 will change the last recall command into an ID in the 0-99 range (refer to the **Bank 1** command below for more details).

- **Trigger 11 – Bank 1**

  Trigger 11 is used to allow switchers that can only send **PBus Recall** commands up to 99 to be able to recall take items with values of between 100 and 199.

  This **Bank 1** command will add 100 to the last recalled item using a **PBus Recall** command.
  For example; to recall take ID 135 and put it on air, a switcher could send:

  - Recall 035
  - Trigger 11 (changes the 035 into 135)
  - Trigger 0

  It is not necessary to switch back to **Bank 0** after sending a **Bank 1** command. XPression will automatically revert to **Bank 0** for the next **PBus Recall** command.

- **Trigger 12 – Bank 2**

  Changes the last **PBus Recall** command into an ID in the 200-299 range.

- **Trigger 13 – Bank 3**

  Changes the last **PBus Recall** command into an ID in the 300-399 range.

- **Trigger 14 – Bank 4**

  Changes the last **PBus Recall** command into an ID in the 400-499 range.

- **Trigger 15 – Bank 5**

  Changes the last **PBus Recall** command into an ID in the 500-599 range.

PBus Store Commands

When a **PBus LEARN** command is received from a remote device, XPression will check the configured server channel for the PBus device, and if there is a clip cued on that channel, will assign the clip to the PBus register.

There is an option to **Ignore LEARN command** in the **PBus Setup** dialog box in the **Hardware Setup**. This option is useful if you are manually assigning clips to PBus registers and you do not want to change/overwrite them when storing memories on the production switcher. Most production switchers automatically send the **PBus LEARN** command when storing the memory.

For more information on the **Ignore LEARN** command, refer to the appropriate switcher documentation.

PBus Mapping

Use PBus mapping to assign clips, functions, scenes, scripts, and other actions and functions to device registers, and then save and load the maps.

PBus mapping supports duplicate **Recall IDs**. If two clips with the same **Recall ID** are added to the register, in the **Project** column, you can enter which project the clip comes from. Global macros are supported in the **Project** column.

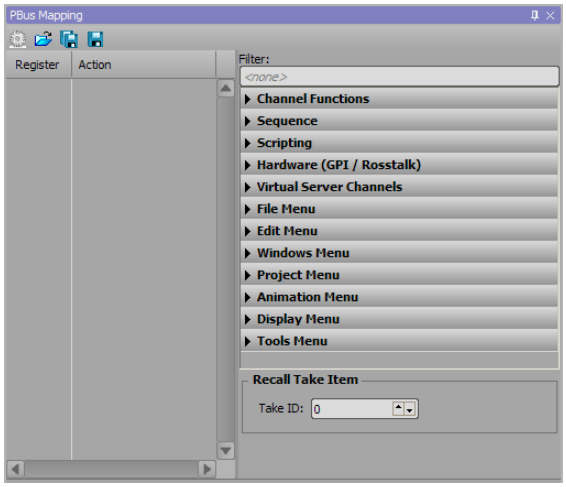
Configuring PBus Mapping

Use the **PBus device configuration** window to configure the **Device IDs** and **Channels**.

To configure PBus Mapping:

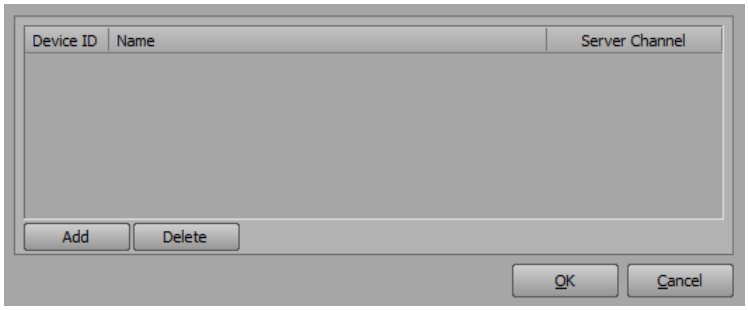
1. In **XPression**, open the **Sequencer**.
2. Select **Display** > **PBus Mapping**.

   The **PBus Mapping** window opens.



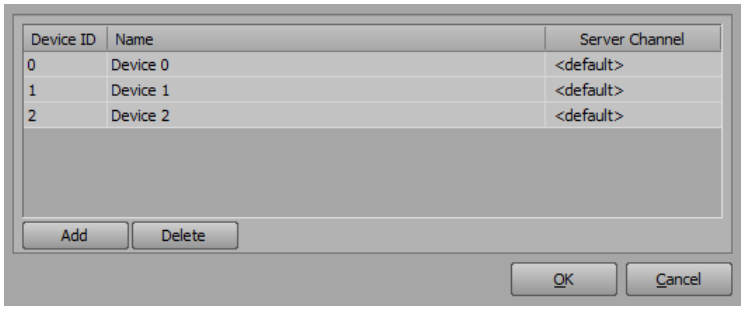
3. Select the **Setup Device Configuration** icon.

   The **PBus Device Configuration** window opens.



4. To add a **Device ID,** select **Add**.

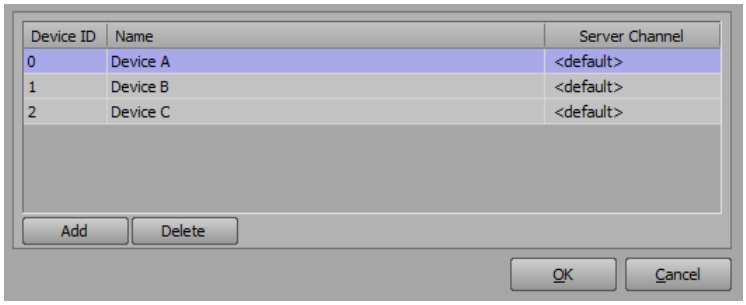
   A **Device ID** is added to the **PBus Device Configuration** list. At least one **Device ID** must be added. The **Device ID** is the ID number that will be sent in PBus messages transmitted from the production switcher.



5. To assign a **Device ID** number, click inside the **Device ID** column and enter or select an ID number.

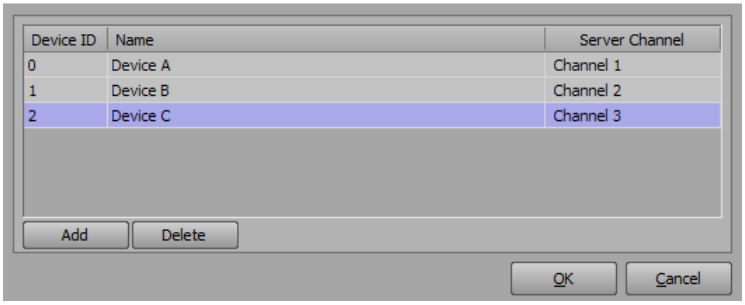
   ★**PBus Device IDs** must be between 0 and 23.

6. To assign a name to the **Device ID,** click inside the **Name** column and enter a name, e.g., **Device A**.



7. To select a specific output framebuffer or use the **<default>** framebuffer, click inside the **Server Channel** column of the ID and select a framebuffer from the drop-down.

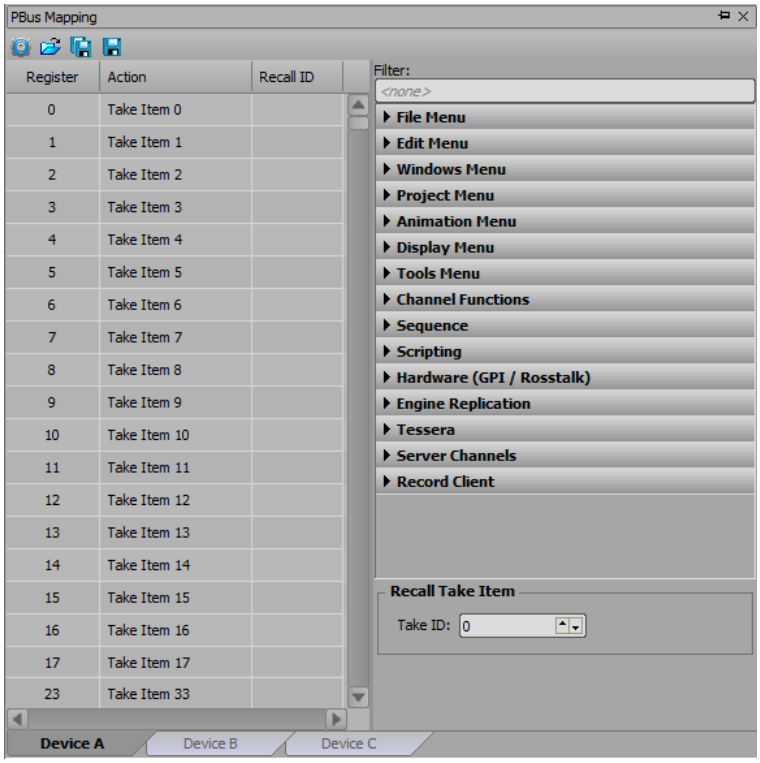
   If the framebuffer is set to anything other than **<default>** when a **PBus Recall** command is received for a specific **Device ID**, then the item will be played on the selected framebuffer. If **<default>** is selected, then the item will be played on the framebuffer for which the original take item was configured. When a clip from the Clip Store is assigned to a register and **<default>** was selected for the **Server Channel**, the first device configured will use **Server Channel 1**, the next will use **Server Channel 2**, etc.



   If XPression does not have the **Server Channel** option, then the **Server Channel** configuration column will be missing and all take items will be cued to the channel assigned to them through the Sequencer.

8. Select **OK**.

   The **Device IDs** are added as tabs at the bottom of the **PBus Mapping** window under the assigned device names. If there are no tabs added, then a **Device ID** was not added to the **PBus Device Configuration** list.



Assigning an Action to a PBus Register

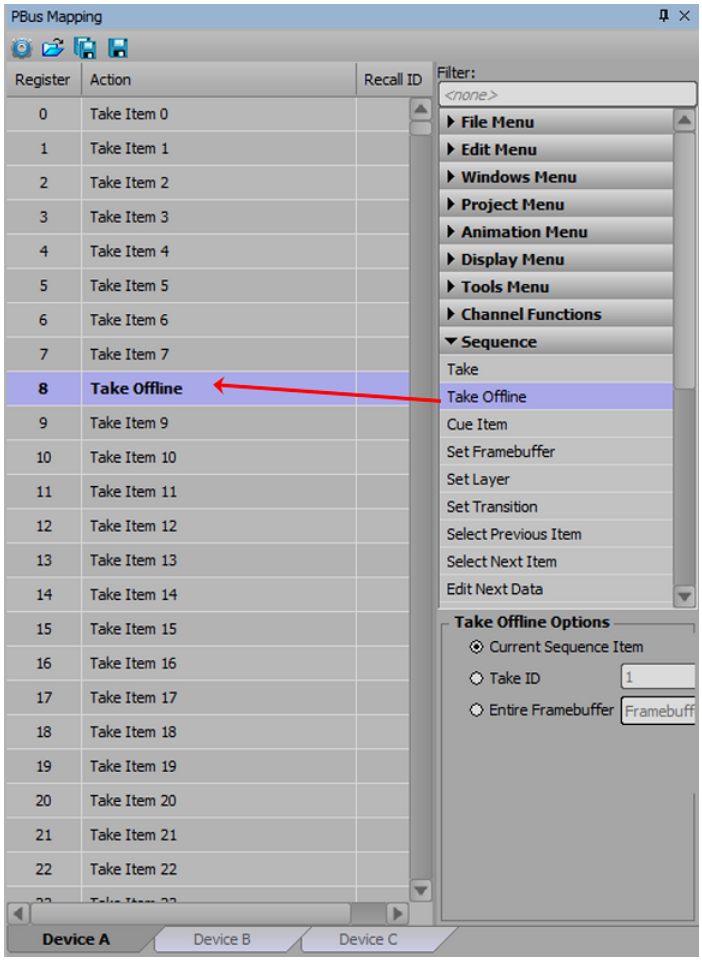
Each device has a list of 4095 registers which can be recalled through PBus.

★Some switchers can only support the first 99 registers.

Each **PBus Register** can be assigned an action that will be executed after the register is recalled and **Trigger 0** is received. The default action for each register is to play the corresponding **Take Item** with the same number as the **PBus Register**.

To assign an action to a PBus register:

1. In the **PBus Mapping** window, select a function from the actions list to the right of the devices.
2. Drag and drop the action onto a register.



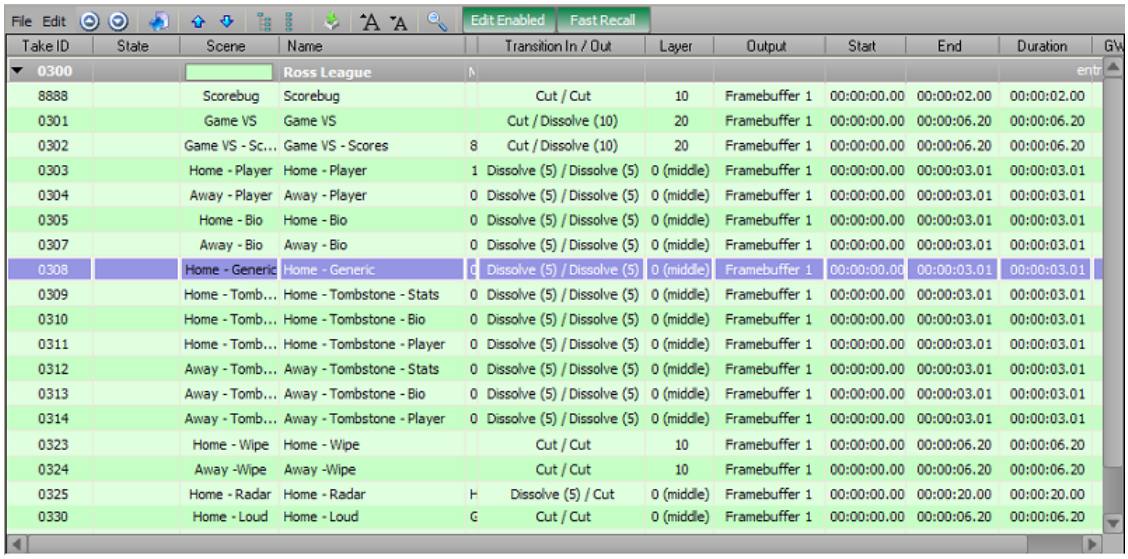
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Remapping a PBus Register

To remap a **PBus Register** to play a different take item, the take item can be dragged and dropped from the sequencer onto the register in the **PBus Mapping** window, or you can enter or select a different **Take ID** using the **Take ID** box in the **Recall Take Item** section of the **PBus Mapping** window.

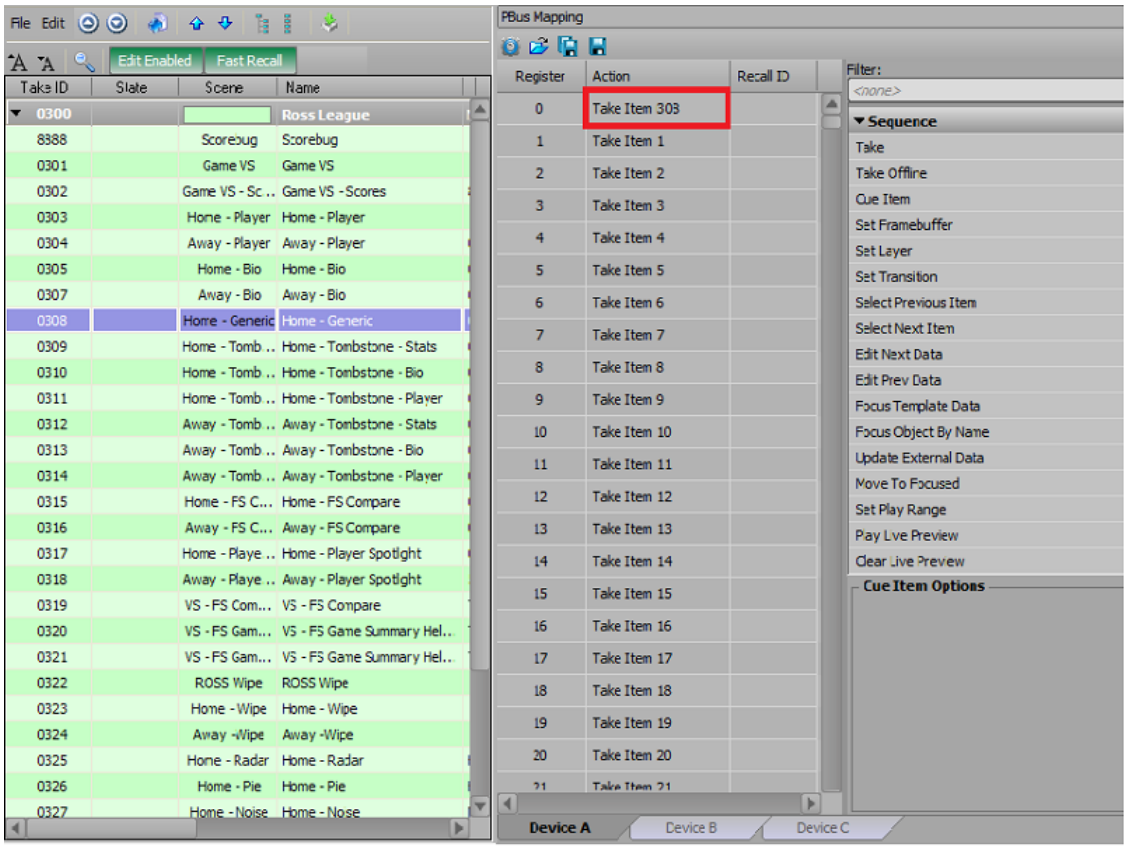
To remap a PBus register using drag and drop:

1. In the **Sequencer**, select a take item from the **Take ID** list.



Take ID	State	Scene	Name		Transition In / Out	Layer	Output	Start	End	Duration	GW
0300			Ross League	N							entr
8888		Scorebug	Scorebug		Cut / Cut	10	Framebuffer 1	00:00:00.00	00:00:02.00	00:00:02.00	
0301		Game VS	Game VS		Cut / Dissolve (10)	20	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	
0302		Game VS - Sc...	Game VS - Scores	8	Cut / Dissolve (10)	20	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	
0303		Home - Player	Home - Player	1	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0304		Away - Player	Away - Player	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0305		Home - Bio	Home - Bio	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0307		Away - Bio	Away - Bio	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0308		Home - Generic	Home - Generic	[	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0309		Home - Tomb...	Home - Tombstone - Stats	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0310		Home - Tomb...	Home - Tombstone - Bio	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0311		Home - Tomb...	Home - Tombstone - Player	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0312		Away - Tomb...	Away - Tombstone - Stats	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0313		Away - Tomb...	Away - Tombstone - Bio	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0314		Away - Tomb...	Away - Tombstone - Player	0	Dissolve (5) / Dissolve (5)	0 (middle)	Framebuffer 1	00:00:00.00	00:00:03.01	00:00:03.01	
0323		Home - Wipe	Home - Wipe		Cut / Cut	10	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	
0324		Away -Wipe	Away -Wipe		Cut / Cut	10	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	
0325		Home - Radar	Home - Radar	H	Dissolve (5) / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:20.00	00:00:20.00	
0330		Home - Loud	Home - Loud	G	Cut / Cut	0 (middle)	Framebuffer 1	00:00:00.00	00:00:06.20	00:00:06.20	

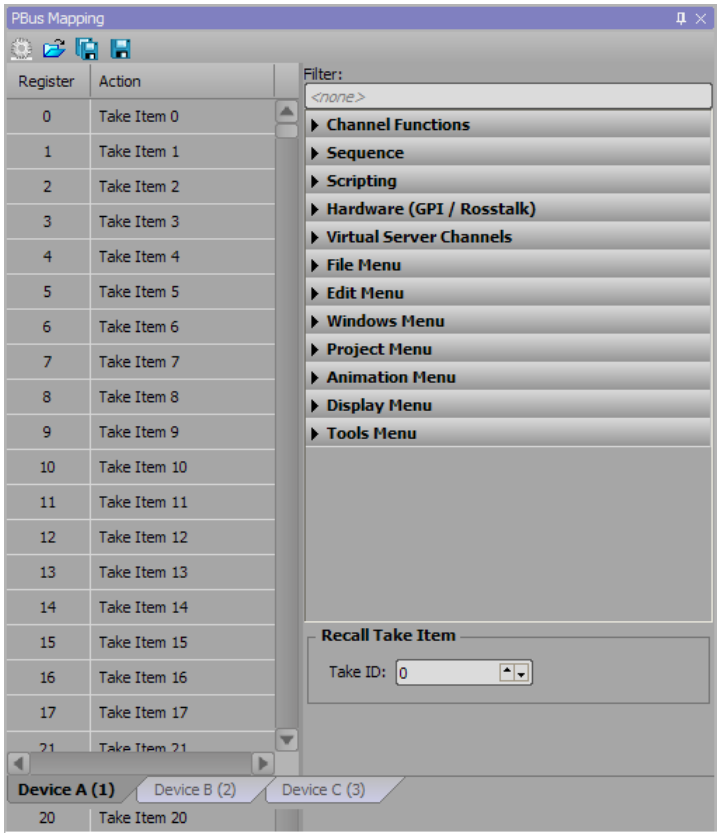
2. Drag and drop the take item onto a register.



The take item is added to the register.

To remap a register using the Take ID box:

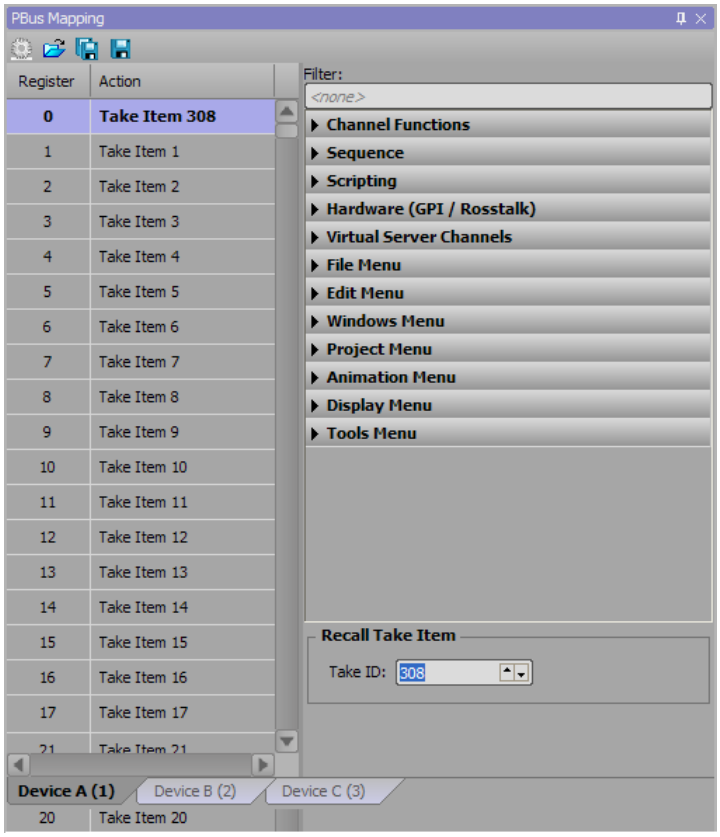
1. In the **PBus Mapping** window, select a **Register** number from the devices to the left of the actions list.



2. In the **Recall Take Item** section, in the **Take ID** field, enter the ID number of the **Take Item** you want to map to the selected **Register** number.



The take item is added to the selected PBus register.



Loading and Saving Maps

PBus maps are not loaded and saved with XPression projects. They are loaded and saved to disk as **.pbm** or **.pbms** files using the **PBus Mapping** window. The **.pbm** file extension is used for a single PBus map and the **.pbms** file extension is used for multiple PBus maps.

Use the following **PBus Mapping** window toolbar icons to load and save PBus maps:

- Load – to open a file browser to select a PBus map or multiple PBus maps to load, select this button.
- Save All – to save multiple PBus maps to disk, select this button.
- Save – to save a single PBus map to disk, select this button.

Using PBus from a Switcher to Recall Items

★Consult the switcher documentation for a complete description of how to use PBus with your particular manufacturer/model. This section is only intended to provide some background information and tips.

Normally switchers will send a **PBus Recall** command when an EMEM is recalled. The following procedure is an example using Take Item 0005.

To recall and play a specific take item from XPression:

1. Use the **Sequencer** to create a **Take Item** and give it an **ID** of **0005**.
2. Create an **EMEM/Memory** on the switcher and store it as **EMEM 5**.
3. In **EMEM 5**, enable the sending of PBus commands.
4. In the timeline for **EMEM 5**, issue a **PBus Trigger 0** command.

When EMEM 5 is recalled, it will send a **PBus Recall 5** command to XPression. This command will not yet do anything (unless the configuration options discussed in the Configuring PBus and PBus Recalls section are enabled).

When the timeline is run, the switcher will send a **PBus Trigger 0** command. At this time, XPression will put take item #5 on the output channel/layer previously assigned to that item in the **Sequencer**.

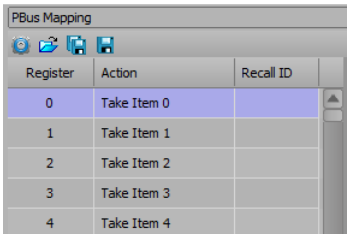
★There may be several frames of delay between issuing the **Trigger 0** command and when the video for the item appears on the SDI output of XPression. This is normal and should be accounted for inside of the timeline on the switcher. For example, you will need a delay between the issuing of **Trigger 0** and when the keyer containing the XPression is keyed onto the **PGM output**.

To recall different take items, the timeline on the switcher can be copied into different switcher registers.

Using PBUS for XPression Clips with Recall IDs

★The **Recall IDs** for clips is part of the XPression Clips purchase. To purchase XPression Clips or for more information, please contact your Ross Video sales representative.

The **PBus Map** contains a column named **Recall ID**:



If a clip in the Clip Store exists with that **Recall ID**, it will be assigned to that PBus register. The PBus register will always recall the clip with that specific **Recall ID**, so if a new clip is ingested with a matching **Recall ID**, the **PBus Register** will recall the new clip instead. If the clip is manually edited and the **Recall ID** is changed or removed, the **PBus Register** will no longer recall that clip.

A similar behavior exists when dragging a clip with a **Recall ID** into the **PBus Register**; meaning that the **PBus Register** is bound to a specific **Recall ID** and not to a specific clip.