Ultrix

ULTRIX-MODX-IO User Guide

ROSS

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1. Provide a Superior Customer Experience
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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
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Ross Video Code of Ethics

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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

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- Software Issue: **5.2.0**

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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.

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

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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.

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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.

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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.

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Introduction

This guide is for system administrators and installers of the Ross Video ULTRIX-MODX-IO and its modules. This guide contains the following chapters that cover the installation and configuration of your blade and its modules:

- "**Introduction**" summarizes the guide and provides important terms, and conventions.
- "**Getting Started**" provides an overview for
- "**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.
- "**Power Connection**" outlines how to connect an external power supply to the ULTRIX-MODX-IO blade. Note that this is an optional step and only required if advised by Ross Technical Support.
- "**Installing a Module**" provides a general summary of how to install a module into an ULTRIX-MODX-IO blade.
- "**Populating an SFP Port**" outlines how to install an SFP module into a port on the ULTRIX-MODX-IO blade and its modules.
- "**ULTRIX-MOD-SFP**" provides an overview of the hardware features, installation, and cabling of the ULTRIX-MOD-SFP module.
- "**ULTRIX-MOD-SDI**" provides an overview of the hardware features, installation, and cabling of the ULTRIX-MOD-SDI module.
- "**Configuration**" outlines how to configure the ports using the DashBoard interface.
- "**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 documentation before installing and operating your ULTRIX-MODX-IO:

- *DashBoard User Manual*, Ross Part Number: 8351DR-004
- *ULTRIX-MODX-IO Quick Start Guide*, Ross Part Number: 2101DR-002
- *ULTRIX SFP Modules Guide*, Ross Part Number: 2101DR-008
- *ULTRIX-FR12 User Guide*, Ross Part Number: 2101DR-604
- *ULTRIX-FR1, ULTRIX-FR2, and ULTRIX-FR5 User Guide*, Ross Part Number: 2101DR-004

✱ 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 section "**Assigning an IP Address**" in the *ULTRIX-MODX-IO 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-MODX-IO router cannot connect to the network, a **Message** dialog box 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.

- **Technical Support**: (+1) 613-652-4886
- **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
- Three AUX ports (AUX A, AUX B, and AUX D[1])
- 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:

- UltriSpeed — if the blade and/or its modules include an SFP-HDB-IN-12G, SFP-FIBER-12G, and/or SFP-HDB-OUT-12G.
- Ultriscape — for each port that will be used to provide an Ultriscape head output.
- UltriSRC — for each port configured for an asynchronous MADI input.
- 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.
- UltriSync— a per input 3G frame sync license enabling alignment to router sync.
- UltriStreamOut license to enable the encoding of one NDI stream of a configured Ultriscape Multiviewer Head per blade.
- Ultrimix-MXR — enables the configuration and use of audio mixer soft panels.

✶ Refer to the user guide for your Ultrix router for more information on license keys.

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1. AUX D is reserved for the UltriStreamOut licensed feature.

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

Hardware Features

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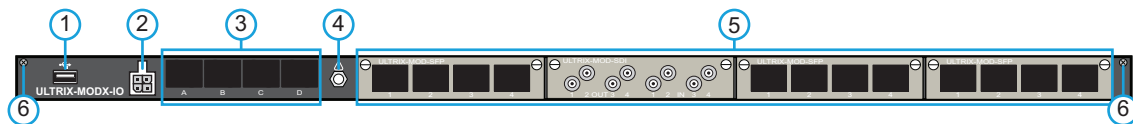

Figure 1 ULTRIX-MODX-IO

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 various 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]

✽ AUX C is reserved for future use.

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1. SFP28 (25G) is not supported.

✱ AUX D is reserved for use with the UltriStreamOut 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-SFP, ULTRIX-MOD-SDI) 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.

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-FR1-NS, ULTRIX-FR2-NS, and ULTRIX-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 9.5.0 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-FR1-NS, ULTRIX-FR2-NS, or ULTRIX-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.

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

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. While the figures show an ULTRIX-FR1-NS chassis, the procedure is also applicable to the ULTRIX-FR2-NS and ULTRIX-FR5.

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.

Retaining Screw   Retaining Screw
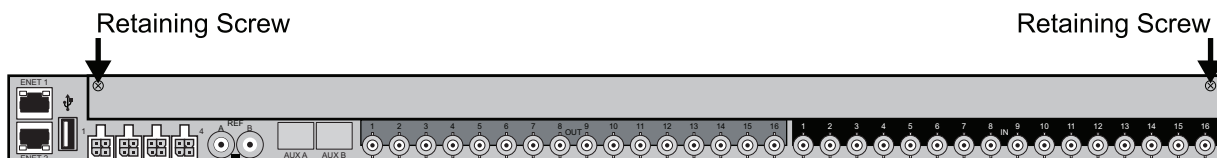

Figure 2 Ultrix Rear Panel — Retaining Screw Locations on the Blank Plate

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

Removing a Blade from the Router Chassis

If you are replacing an I/O 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

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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.
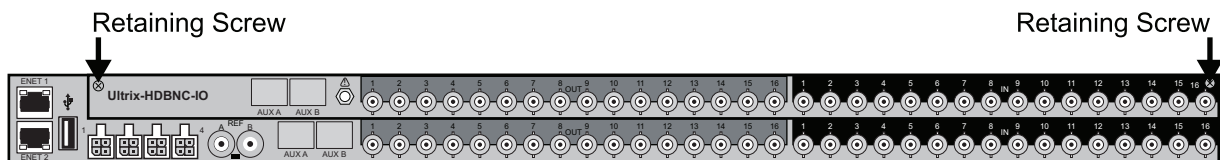
Retaining Screw   Retaining Screw

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.*
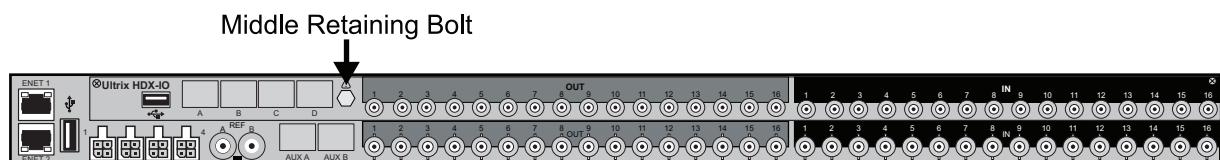
Middle Retaining Bolt

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.
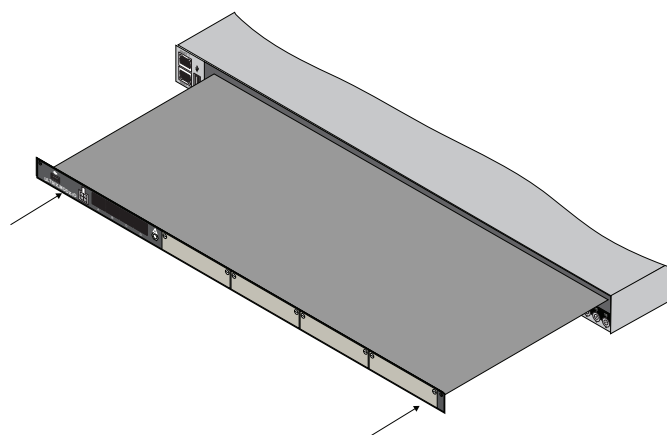
Figure 5 Sliding the Blade into the Chassis

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.*
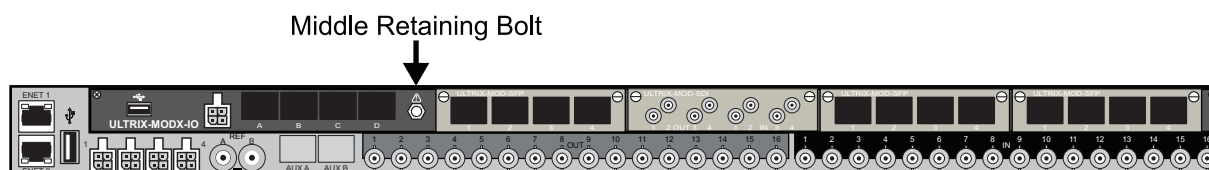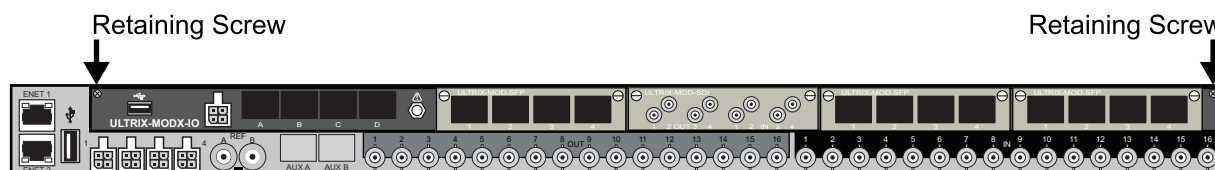

Figure 6 Ultrix Rear Panel — Location of Middle Retaining Bolt on the Blade

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.

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.

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

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.

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 7**, the user is removing the blank plate in slot 16.
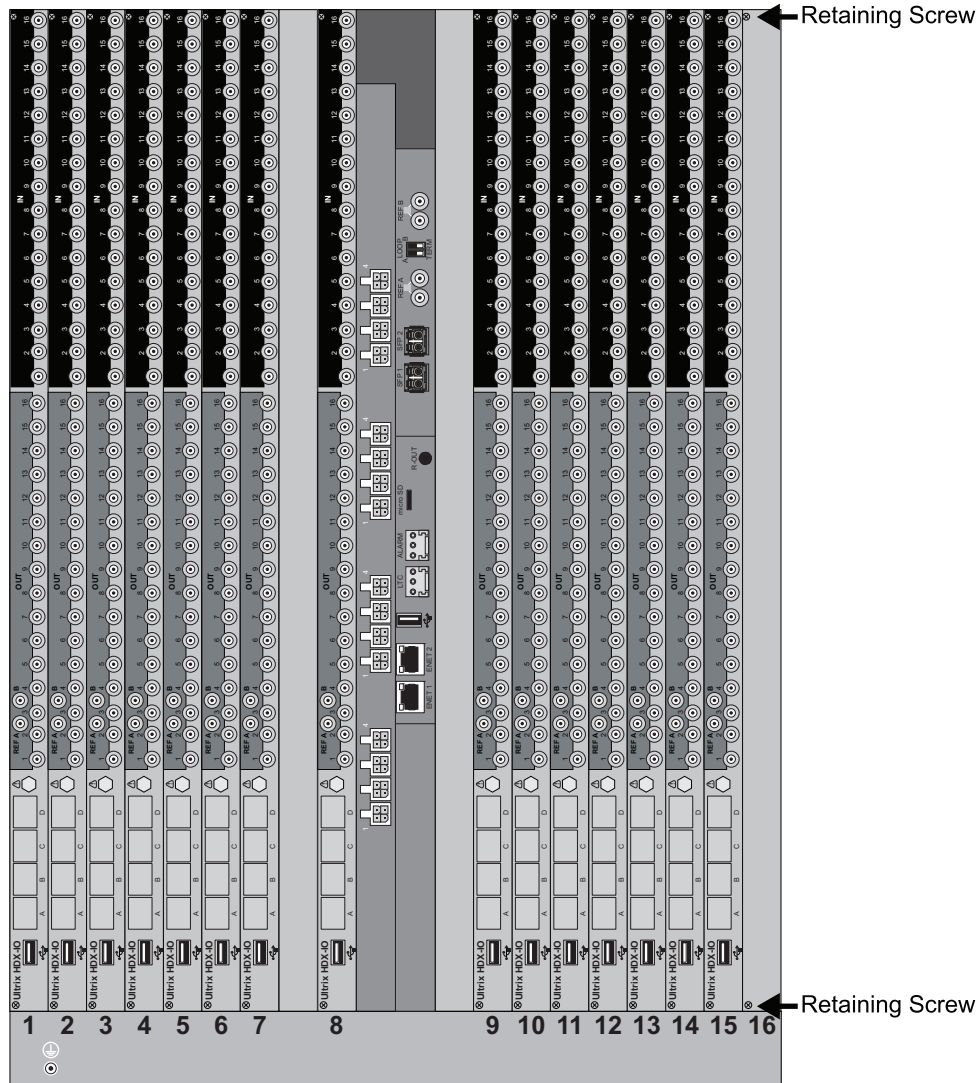
Figure 7 ULTRIX-FR12 Rear Panel — Retaining Screw Locations on a Blank Plate

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

Removing a Blade from the ULTRIX-FR12 Chassis

If you are replacing an I/O 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

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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 8**.

✱ 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.
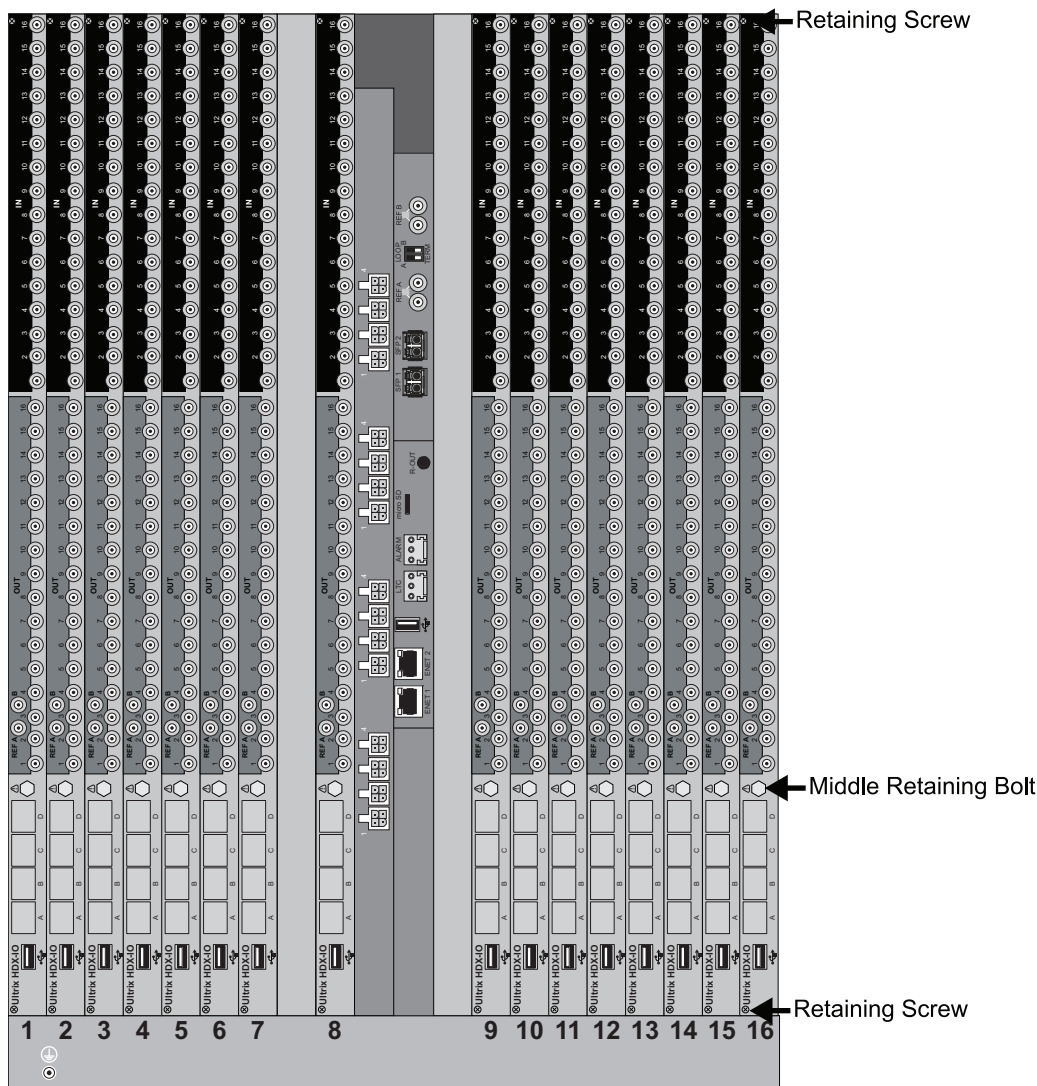

Figure 8 ULTRIX-FR12 Rear Panel — Location of Retaining Screws on an ULTRIX-HDX-IO Blade

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 8** 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.*

5. Grasp the I/O 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.*
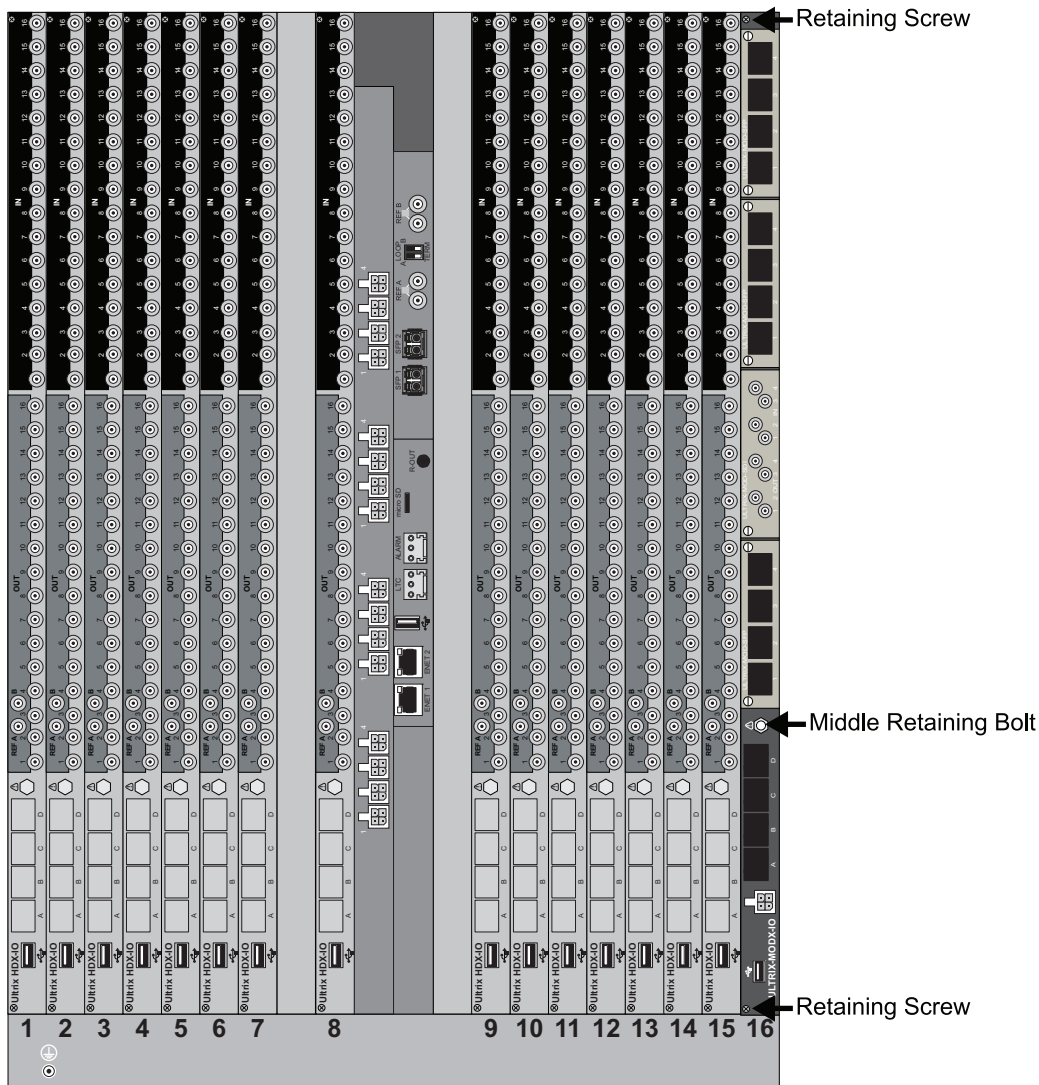
Figure 9 ULTRIX-FR12 Rear Panel — Location of Middle Retaining Bolt on the Blade

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.

✷ This section is applicable to all Ultrix router models.

To upgrade the router software

1. 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.

2. Repeat steps 1 to 8 in the procedure "**To verify the software version currently installed on your router**" of this document to display the **System Status** tab for your router.

3. Click **Upload**, located near the bottom of the tab.

   The **Select File to Upload** dialog opens.

4. Navigate to the *.bin file you want to upload. This is the file that Ross Technical Support provided you.

5. Click **Open**.

6. Click **Finish** to start the upgrade.

7. Monitor the upgrade.

   An **Upload Status** dialog enables you to monitor the upgrade process.

✱ Avoid clicking **Reboot** until the router has successfully completed the file upload process and the **OK** button is enabled.

8. Click **OK** to reboot the router.

   The **Reboot Confirm** dialog opens, indicating the router will reboot.

9. Click **Yes** to continue the upgrade process.

✱ The router is temporarily taken off-line during the reboot process. The process is complete once the status indicators for the router return to their previous status.

10. Verify that the **Alarms** and **Frame Information** tables in the **Hardware Configuration** interface are updated:

    • Repeat steps 1 to 7 in the procedure "**To verify the software version currently installed on your router**" of this document.
    • Expand the **Devices** node and double-click the **Ultrix** sub-node to display the **Hardware Configuration** interface in DashBoard.
    • Click **Alarms** (located in the left toolbar of the interface) to verify that the "`System Error`" is not displayed.
    • Click **Frame Information** (located in the left toolbar of the interface) to verify the Firmware versions.

Power Connection

This chapter only applies if your configuration requires that extra power be supplied directly to the modules installed in the ULTRIX-MODX-IO blade. 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.
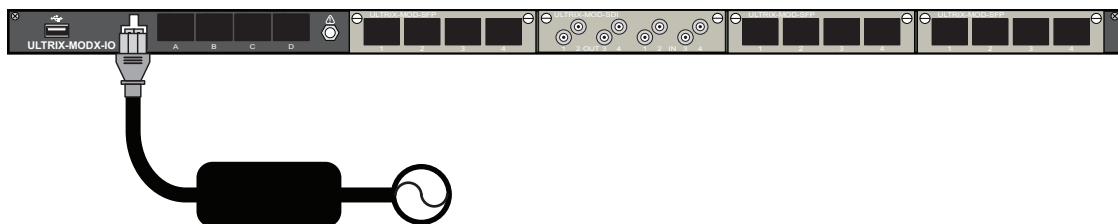
Note: It is recommended that you always connect the Power Supply Unit to the blade before connecting to Mains Power.

Figure 10 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.

**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.

   The example below shows the retaining screws for slot 1. The location of the screws on the blank plate is the same for all slots.
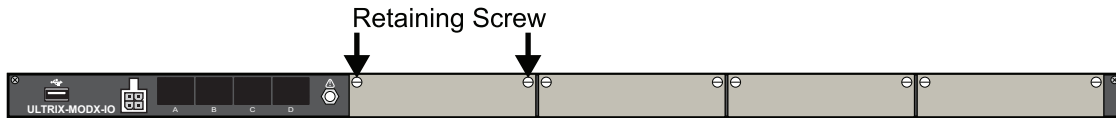
3. Remove the blank plate from the blade and set aside.

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.
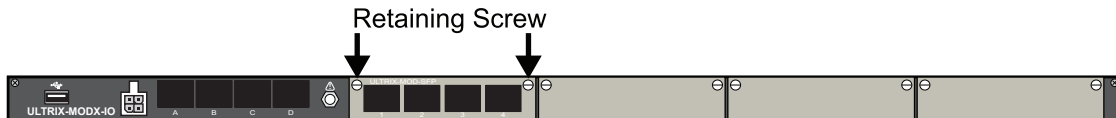
Populating an SFP Port

This chapter outlines how to populate an AUX 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**".

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.

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.

✸ 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 future use.

✸ The AUX D port is reserved for use with the UltriStreamOut 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.*

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 "**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
• Up to one Multiviewer Head (refer to **Figure 13**)

Supported Formats

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

Table 1 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		

Table 1 Supported Video Formats

Resolution (lines)	Interlace / Progressive	Frame Rate (Hz)
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-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.
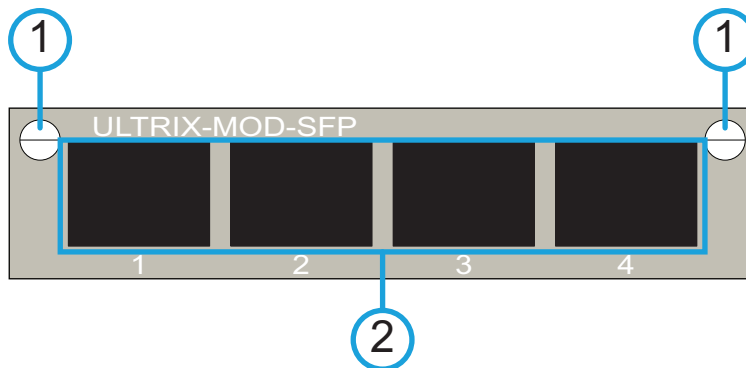
✶ **Figure 11** shows the ports unpopulated.

Figure 11 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**.

Gearbox Cabling

Figure 12 illustrates the connections allocated for Gearbox groups on an ULTRIX-MODX-IO with four ULTRIX-MOD-SFP.
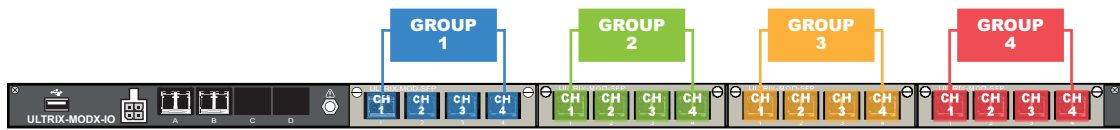
Figure 12 Example of Gearbox Mapping on a Single ULTRIX-MODX-IO Blade with Four ULTRIX-MOD-SFP

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 2 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 3** outlines the default inputs for the ULTRIX-HDX-IO blade with four ULTRIX-MOD-SFP.

Table 3 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 13 illustrates the connections allocated for UltriScape Heads on an ULTRIX-MODX-IO with four ULTRIX-MOD-SFP.
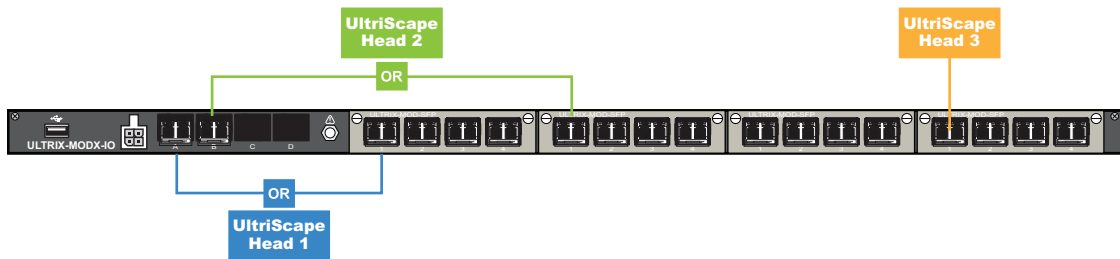

Figure 13 Example of UltriScape Head Mapping on a Single ULTRIX-HDX-IO Blade

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.

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 "**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
• Up to one Multiviewer Head (refer to **Figure 16**)

Supported Video Formats

Table 4 outlines the video formats that the ULTRIX-MOD-SDI supports.

Table 4 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 4 Supported Video Formats — ULTRIX-MOD-SDI

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. The ports are labeled as 1-4 starting with the leftmost port. This numbering scheme is also reported in the DashBoard interfaces.
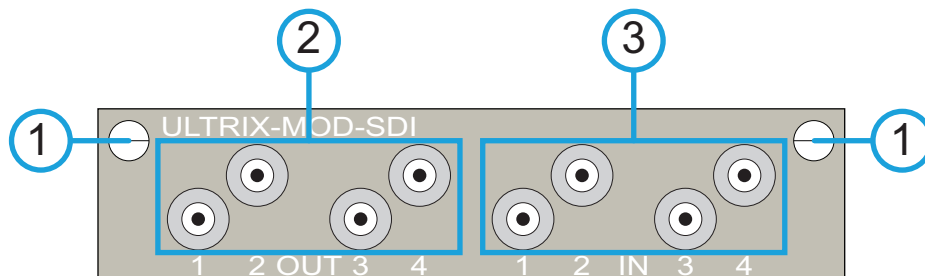

Figure 14 Hardware Features of the ULTRIX-MOD-SDI

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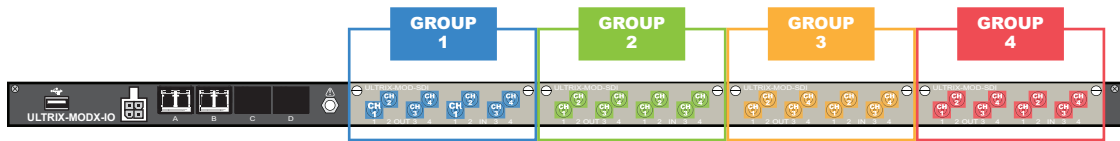

Figure 15 Example of Gearbox Mapping on a Single ULTRIX-MODX-IO Blade with Four ULTRIX-MOD-SDI

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 5 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 6** outlines the default inputs for the ULTRIX-MODX-IO blade with four ULTRIX-MOD-SDI.

Table 6 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 16 illustrates the connections allocated for UltriScape Heads on an ULTRIX-MODX-IO with four ULTRIX-MOD-SDI.
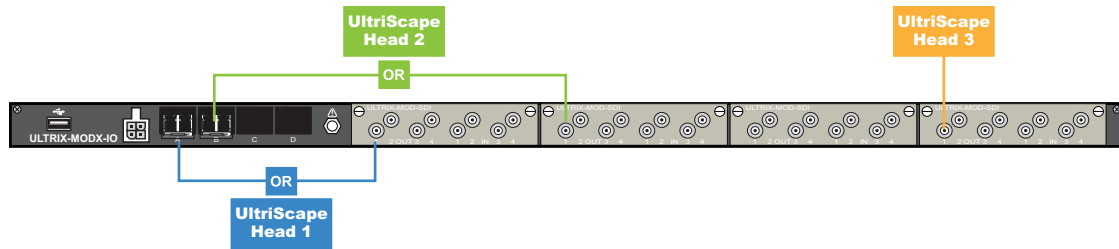

Figure 16 Example of UltriScape Head Mapping on a Single ULTRIX-MODX-IO Blade with Four ULTRIX-MOD-SDI

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.

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.

For More Information on...

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

Before You Begin

You may also need to install an:

• 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.
• Ultriscape license for each port that will be used to provide an Ultriscape head output.
• UltriSRC license for each port to be configured for an asynchronous MADI input.
• Ultrisync-UHD for each input frame sync license to support UHD video rates.
• UltriSync license for each 3G input to enable alignment to the router sync.
• Ultrimix-MXR license to enable the configuration and use of audio mixer soft panels.
• UltriProc-HDR license for each port to be assigned to an UltriProc engine for color correction, Proc Amps, and HDR conversion.
• UltriStreamOut license to enable the encoding of one NDI stream of a configured Ultriscape Multiviewer Head per blade

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. The Device Configuration interface is accessed by clicking the corresponding button on the top toolbar of the interface.

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

• **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).

• **SFP Configuration** — configure each populated AUX port on the blade.

For More Information on...

• the Device Configuration interface, refer to the user guide for your Ultrix router.

Overview

The Ultrix router automatically detects when the ULTRIX-MODX-IO blade is populated with modules and SFPs. Each signal is made available in the routing system. The signals are initially named using the standard `Slot.Port.Type.Channel` nomenclature. For example, `slot1.MOD1-in[3].SDI.ch1` would represent input 3 of the first ULTRIX-MOD-SFP installed in an ULTRIX-MODX-IO blade located in router slot 1.
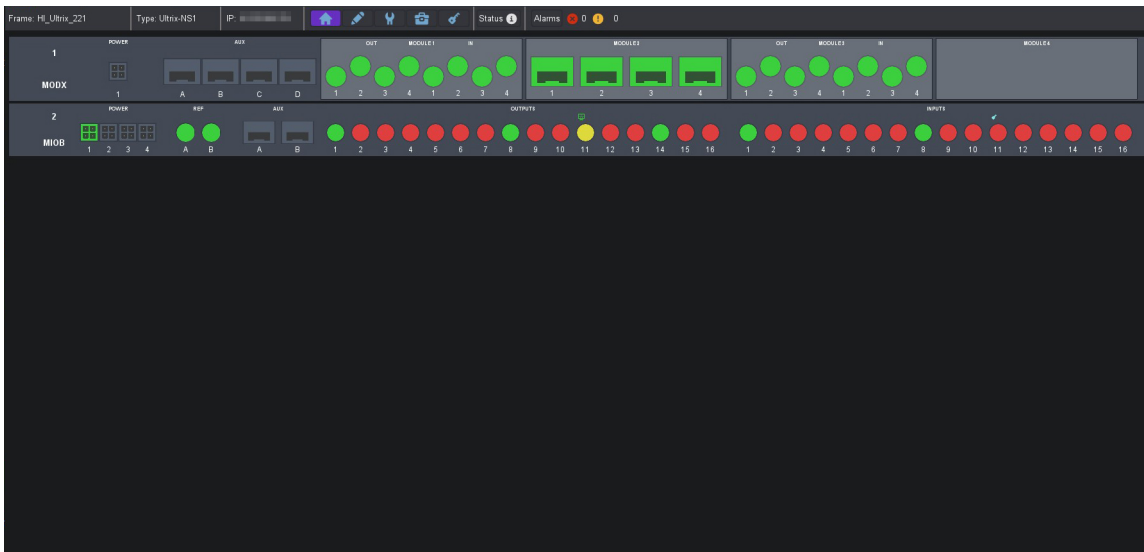
Figure 17   Example of the ULTRIX-MODX-IO with One ULTRIX-MOD-SFP and Three ULTRIX-MOD-SDI in DashBoard

Assigning the SFP Type

Once the SFP module is installed in an AUX port of the ULTRIX-MODX-IO blade or an available port on the ULTRIX-MOD-SFP module, you must specify the port type using the options on the **SFP Configuration** page. Keep the following in mind:

• The Flex slot in the ULTRIX-FR5 does not support any I/O in the AUX ports.

• The AUX C and AUX D ports on the ULTRIX-MODX-IO are reserved for future use.

To specify the port type for an SFP port

1. Expand the **Devices** node.

2. Expand the **Controllers + Matrices** node.

3. Double-click the node for your Ultrix router.

   The **Device Configuration** interface opens.

4. Select [icon].

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

5. 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.
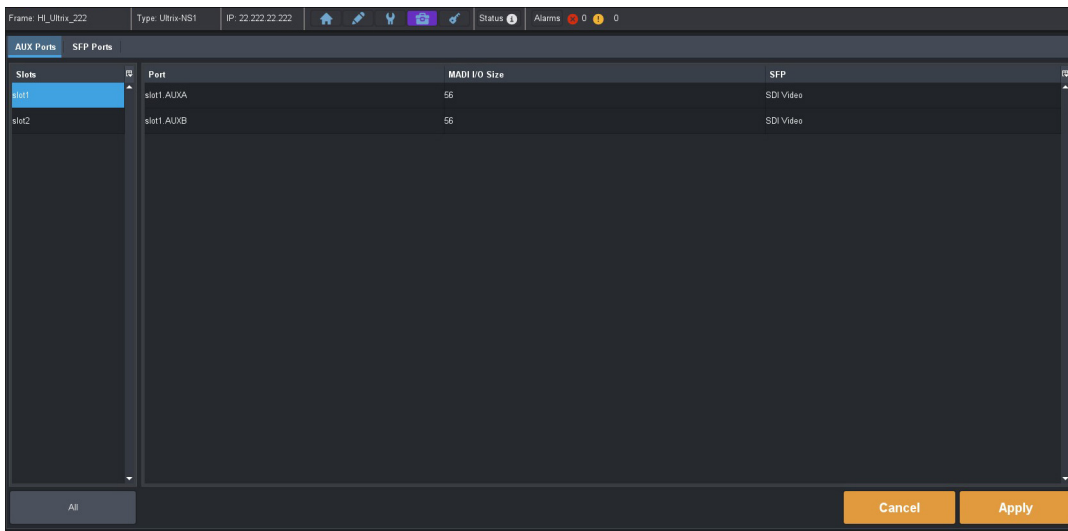
6. In the rightmost pane, locate the row for the port you want to configure.

7. In the **MADI I/O Size** column, specify the channel quantity as per your facilities' standard.

8. In the **SFP** column, select either SDI Video or MADI as appropriate for the fitted port. Choose from the following:

   • **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. Click **Apply** to save your changes.

Configuring a Port

The Port Configuration interface provides information in a table format which displays details on each port for the selected slot. Select the required ULTRIX-MODX-IO blade, using the buttons located in the Populated Slots selection bar, to display the Port Configuration table for that blade. The location of the port is reported at the top of the page. **Figure 18** shows an ULTRIX-MODX-IO blade installed in Slot 1 with one ULTRIX-MOD-SFP and two ULTRIX-MOD-SDI modules.

Figure 18 Example of Port Configuration — ULTRIX-MODX-IO with One ULTRIX-MOD-SFP and Two ULTRIX-MOD-SDI

✶ Filter the table by using the **Views** and **Options** menus in the top toolbar of the page.

Table 7 summarizes the columns that display when Views is set to Ports for an ULTRIX-MODX-IO blade populated with at least one module.

Table 7 Port Configuration — Views > Ports

Item	Parameters	Description
Group	#	Indicates the Gearbox group where Group 1 is the first module in the blade. Refer to **Figure 12** and **Figure 15** 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 type of video (e.g. HD, 3G, UHD, etc.).
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.
	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
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

Table 7 Port Configuration — Views > Ports

Item	Parameters	Description
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
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.

Table 7 Port Configuration — Views > Ports

Item	Parameters	Description
Trigger	#	Specifies which reference signal trigger to use. Refer to the 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.
	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

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.

Table 8 summarizes the columns that display when Views is set to Channels for an ULTRIX-MODX-IO blade populated with at least one module.

Table 8 Port Configuration — Views > Channels

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.

Item	Parameters	Description
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.
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

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 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 page 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**".
- 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 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 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 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 (UltriProc-HDR) is required for each selected I/O that will be used by the UltriProc.
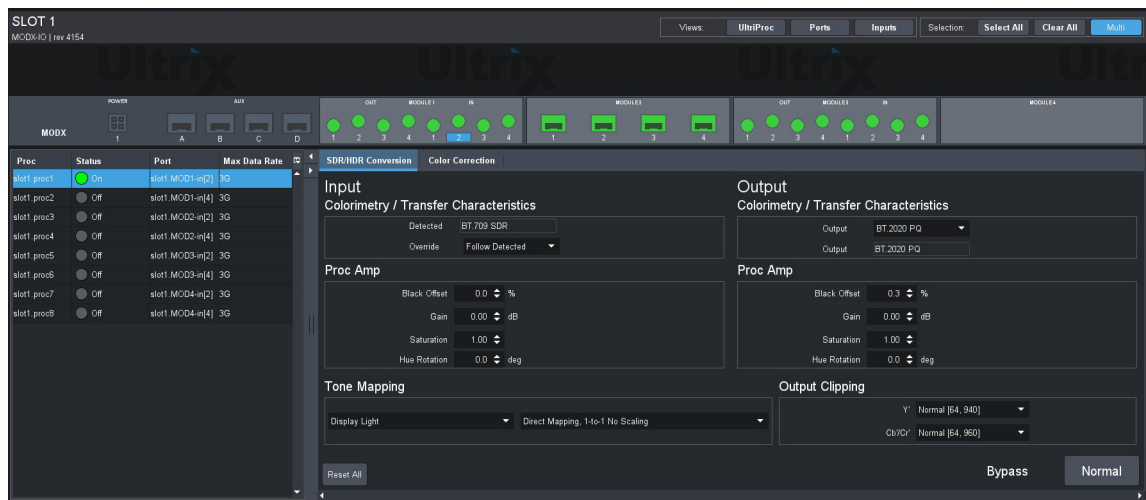

Figure 19 Example of the UltriProc Interface in DashBoard

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 user guide for your router.

UltriStreamOut Overview

The UltriStreamOut 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 UltriStreamOut, refer to the user guide for your router.

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 9 Technical Specifications — Power Supply Ratings

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

Environmental

Table 10 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.