PIERO

Maintenance Guide

VERSION 01

ROSS

Thank You for Choosing Ross

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

Our mission is to:

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

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

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

David Ross

CEO, Ross Video

dross@rossvideo.com

Ross Video Code of Ethics

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

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

PIERO Maintenance Guide

- Ross Part Number: 3400DR-003-01 Rev 2
- Version: 01

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

Copyright

Patents

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

Notice

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

Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the "Important Safety Instructions" listed below so as to avoid personal injury and to prevent product damage.

Products may require specific equipment, and /or installation procedures be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

Protective Earth — *This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system's protective earth (green or green/yellow) conductor.*

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product. Failure to heed this information may present a risk of damage or injury to persons or equipment.

Warning — *The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury*

Caution — *The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*

Notice — *The symbol with the word "**Notice**" within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation, which could place the equipment in a non-compliant operating state.*

Warning Hazardous Voltage — *The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of shock to persons*

ESD Susceptibility — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event*.

Important Safety Instructions

1) Read these instructions.

2) Follow all instructions and heed all warnings.

3) Refer all servicing to qualified service personnel.

4) The equipment's AC appliance inlets are the means to disconnect the product from the AC Mains and must remain readily operable for this purpose.

5) Parts of the equipment's power supplies can still present a safety hazard even when the product is in the "OFF" state. To avoid the risk of electrical shock and to completely disconnect the apparatus from the AC Mains, remove all power supply cords from the product's AC appliance inlets prior to servicing.

6) If the product nameplate indicates that the chassis is “Rack Mounted”, it is to be rack mounted only. To ensure safe operation and maintain long-term system reliability, proper installation requires that the front and back area of the chassis remain clear of obstructions so as not to restrict airflow.

7) The Optical Disk Drive within this product is a “Laser - Class 1 product”.

Warning

8) No operator access to internal parts in this product. The power supply outputs are considered an Energy Hazard (>240VA). To avoid the risk of contact with the Energy Hazard and to completely de-energize the apparatus, remove all power supply cords from the product’s AC appliance inlet(s) prior to servicing.

Warning

9) Indoor Use: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Warning

10) This product includes an “Ethernet Port” which allows this product to be connected to a local area network (LAN). Only connect to networks that remain inside the building. Do not connect to networks that go outside the building.

Caution

11) This apparatus contains a Lithium battery, which if replaced incorrectly, or with an incorrect type, may cause an explosion. Replace only with the same type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instruction by qualified service personnel.

Caution / Attention

12) This unit may have more than one power supply cord. Disconnect all power supply cords before servicing to avoid electric shock / Cet appareil peut comporter plus d’un cordon d’alimentation. Afin de prévenir les chocs électriques, debrancher tous les cordons d’alimentation avant de faire le dépannage.

Use of Hazardous Substances in Electrical and Electronic Products (China RoHS)

Ross Video Limited has reviewed all components and processes for compliance to:

"Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products" also known as China RoHS.

The "Environmentally Friendly Use Period" (EFUP) and Hazardous Substance Tables have been established for all products.

The Hazardous substances tables are available on our website at:

http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html

电器电子产品中有害物质的使用

Ross Video Limited 按照以下的标准对所有组件和流程进行了审查：

“ 电器电子产品有害物质限制使用管理办法 ”也被称为中国RoHS。

所有产品都具有“ 环保使用期限”(EFUP）和有害物质表。目前，我们正在更新我们所有的产品手册。

有害物质表在我们的网站：

http://www.rossvideo.com/about-ross/company-profile/green-practices/china-rohs.html

EMC Notices

US

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.

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

CANADA

This Class "A" digital apparatus complies with Canadian **ICES-003**.

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

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

AUSTRALIA

This equipment has been tested to **AS/NZS CISPR32:2015 AMD1:2020** and found to comply with the limits for a Class A Digital device.

INTERNATIONAL

This equipment has been tested to **CISPR 32:2015 AMD1:2019** 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.

KOREA

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며,
가정외의 지역에서 사용하는 것을 목적으로 합니다.

Warranty and Repair Policy

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

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

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

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

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

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

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

Extended Warranty

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

Environmental Information

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

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

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

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

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

Company Address

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Technical Support:	(+1) 613 · 652 · 4886
After Hours Emergency:	(+1) 613 · 349 · 0006
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E-mail for General Information:	solutions@rossvideo.com
Website:	http://www.rossvideo.com

Contents

Introduction

Thank you for choosing a Ross Video PIERO system.

Ross Video designed PIERO with the needs of live production in mind. PIERO is a system for adding graphics to sports footage to aid in analysis of incidents in the match and illustrate points made by analysts.

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

About This Guide

This guide covers the installation and maintenance of the PIERO system. Refer to this guide and the accompanying *Quick Start Guide* when you first install or need to reconfigure your system.

If, at any time, you have questions pertaining to the operation of the PIERO system, please contact Ross Video at the numbers listed in the section Getting Help 2. Our technical staff are always available for consultation, training, or service.

Documentation Conventions

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

Bold text	Bold text identifies a user interface element such as a dialog box, menu item, or button. For example: In the **Slug** column, type a slug name for the story.
Bold Italic text	Italic text is used to identify the titles of referenced guides, manuals, or documents. For example: For more information, refer to the ***DashBoard User Guide***.
`Courier text`	Courier text identifies text that a user must type. For example: In the **Username** box, type `postgres`.
Hypertext	Identifies a hyperlink to a related topic.

Getting Help

PIERO documentation is accessible by selecting the **Documents** icon in the PIERO Launcher.

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:

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

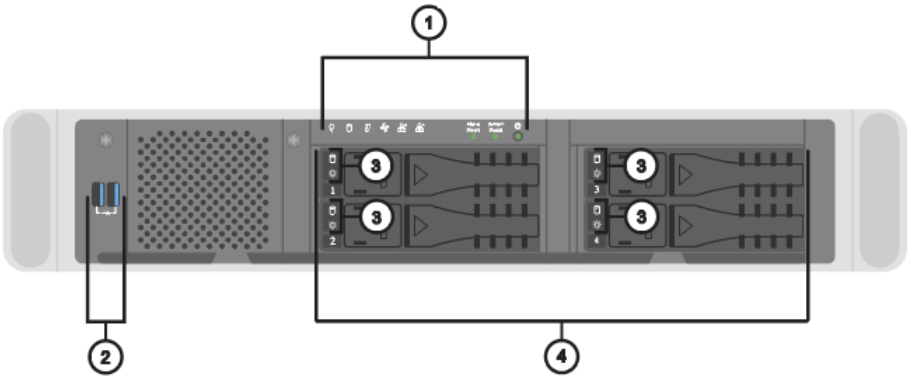
Hardware Overview

This section provides a brief overview of the PIERO system hardware.

Front View of the System

The following diagram displays the front of the PIERO system with the front door removed.

Descriptions of individual components are contained in the legend below the diagram.



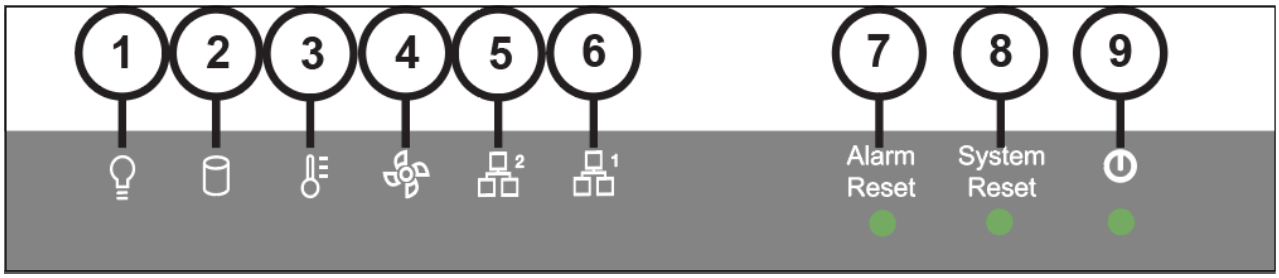
Front View of PIERO System

1) **Power and Alarm LED Area** — This area includes the PIERO system **Power** button and alarm LEDs for system components. Refer to the section, Power and Alarm LED Area 4 for further information. 2) **USB Ports** — These ports can be used to transfer media to and from USB drives.	3) **HDD Power and Status LED Area** — This area includes the alarm LEDs for the HDD hardware. Refer to the section HDD Power and Status LED Area 5 for further information.

Power and Alarm LED Area

The Power and Alarm LED area is located on the front of the PIERO system, in the middle top of the chassis above the first drive bay. This area contains the **Power** button for the PIERO system, as well as activity and alarm LEDs for system components. Refer to the section Front View of the System 4 to locate the **Power and Alarm LED Area** on the front of the PIERO system.

The following diagram displays the **Power and Alarm LED Area** of the PIERO system. Descriptions of individual components are contained in the legend below the diagram.



Power and Alarm LED Area

1) **Power Active Indicator LED** — This LED is active when the system is powered on.
2) **Hard Disk Activity LED** — This LED activates when there is read/write activity on any system hard disk.
3) **Temperature Status LED** — This LED is blue when the temperature in the chassis is normal.

   It is red when there is an alarm.
4) **Cooling Fan Status LED** — This LED is blue when the cooling fan in the chassis is operating normally.

   It is red when there is an alarm.
5) **Network 2 Activity LED** — This LED is not active.
6) **Network 1 Activity LED** — This LED is not active.
7) **Alarm Reset Button** — Press this button to stop the audible alarm beep when a system alarm is active.

   Always check that the system is running properly when the alarm is activated.
8) **System Reset Button** — Press this button to reset the system after a hardware of software failure.

   Pressing this button also reboots the system.
9) **Power Button** — Press this button to begin the boot procedure.

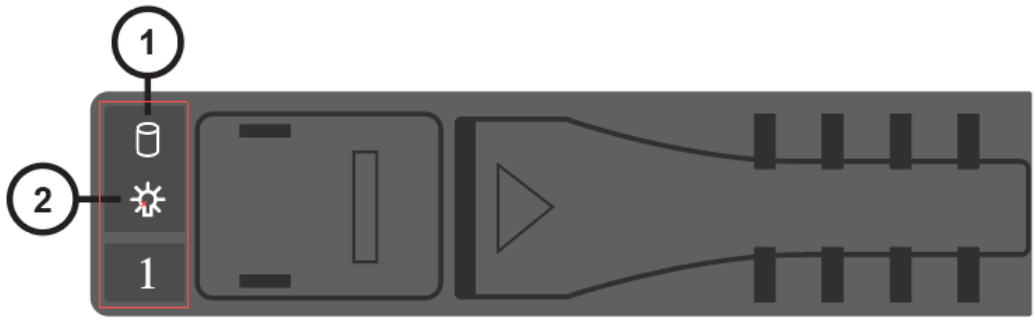
   When the system is turned on and there is a hardware or software failure, press this button to reboot the system.

HDD Power and Status LED Area

The **HDD Power and Status LED** area is located on the front left side of each of the PIERO system drives. Refer to the section Front View of the System 3 to locate the HDD Power and Status LED Area on the front of the PIERO system.

The following diagram displays the HDD Power and Status LED Area of the PIERO system.

Descriptions of individual components are contained in the legend below the diagram.



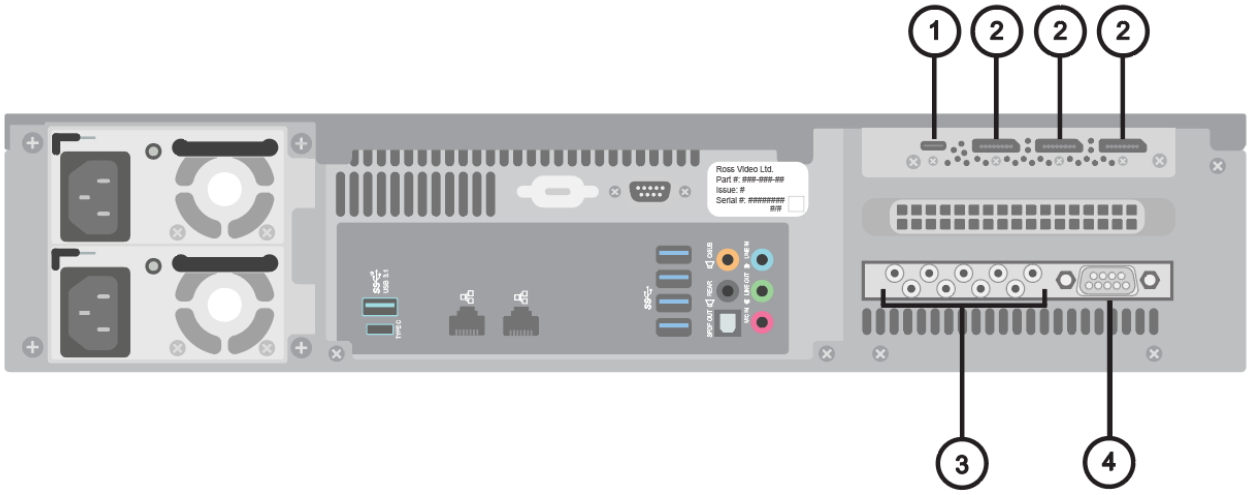
HDD Power and Status LED Area

1) **HDD Status LED** — This LED activates when there is read/write activity on the respective system hard disk.	2) **HDD Power Status LED** — This LED is green when the respective system hard disk is powered on. If it is not turned on, check that the system hard disk is connected properly.

Rear Input/Output Connections

The following diagram displays the **Input/Output** portion of the PIERO system.

Descriptions of individual components are contained in the legend below the diagram.

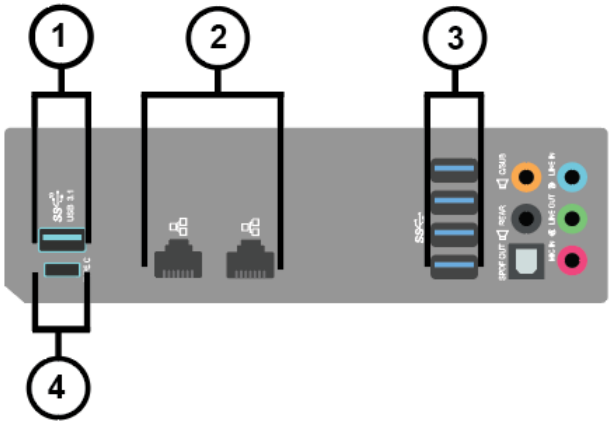


Rear Input/Output Connections

1) **USB-C Port** — Provides output for a computer monitor. Ensure the correct USB-C port to display port adapter is used. 2) **Display Ports** — Three display ports provide output for computer monitors. Ensure the correct display port to DVI adapters are used (DVI-D or DVI-I).	3) **Mini-BNC Connectors** — Provide SDI video input and output, as well as analog reference. Refer to Appendix A: Input and Output Configuration 35. 4) **RS422 Port** — Controls a video replay server.

Rear Peripheral Connections

The following diagram displays the peripheral connections. Descriptions of individual components are contained in the legend below the diagram.



Rear Peripheral Connections

1) **USB 3.1 Gen 2 Type-A Port** — Use this port to connect peripheral devices such as a keyboard or mouse to the system. This port can also be used to transfer media to and from USB drives.

   The port supports a maximum of 5 Gbit/s.

   ★Use of USB 3.1 certified cable and devices are required for USB 3.1 super-speed data rates.

2) **10 Gigabit LAN Controllers** — Use these ports to connect the PIERO system to an internal network.

   These ports can be used for high-speed file transfer between the PIERO system and other computers on the internal network.

3) **USB 3.0 Ports** — Use these ports to connect periperal devices such as a keyboard or mouse to the system. These ports can also be used to transfer media to and from USB drives.

4) **USB 3.1 Gen 2 Type-C Port** — Use this port to connect periperal devices such as a keyboard or mouse to the system. This port can also be used to transfer media to and from USB drives.

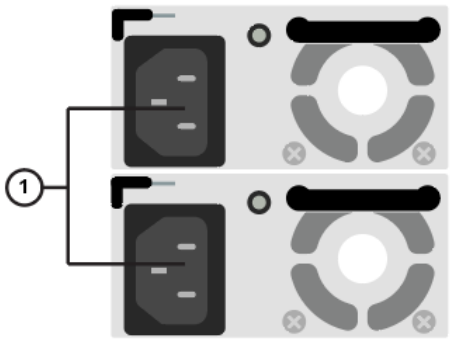
   The port supports a maximum of 5 Gbit/s.

   ★Use of USB 3.1 certified cable and devices are required for USB 3.1 super-speed data rates.

Power Supply

The PIERO system has two identical hot-swappable power supply modules, located at the rear of the system on the left-hand side. Since the system requires a minimum of one power supply module to operate, only one power supply module can be hot-swapped at a time. Each power supply module can be attached to a separate power circuit to provide redundancy in case of power failure.

The diagram below displays the parts of the power supply modules for the PIERO system.



System Power Supply Module

A/C Power Cord Connection

Connect the female end of the power cord to this connector, and the male end to a power circuit.

Hardware Installation

The following sections provide installation instructions for the PIERO system hardware.

Unpacking the Unit

Unpack the PIERO system from the received shipping container(s), and check the contents against the packing list to ensure all items are included. If any items are missing or damaged, contact your sales representative or Ross Video for assistance.

Installation Requirements

Note the following installation requirements:

- **Elevated Operating Ambient** — If installed in a closed or multi-rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma).
- **Reduced Air Flow** — Installation of the equipment in a rack or as a desktop/tower should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading** — Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring.

  Appropriate consideration of equipment nameplate rating should be used when addressing this concern.
- **Reliable Earthing** — Reliable earthing of rack and desktop/tower mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Installing the System in an Equipment Rack

The PIERO system is designed to be rack mounted in a 19 inch wide equipment rack using the slide rails in the supplied rack mount kit.

- Rack Units — 2 RU
- Width — 16.9 inches (429 mm), 19 inches (482 mm) including handles
- Height — 3.46 inches (88mm)
- Depth — 20.67 inches (525 mm), 24.4 inches (620 mm) including handles

The slide rails must be installed onto the PIERO 2RU system before it can be mounted in an equipment rack. Instructions for mounting the slide rails onto the PIERO 2RU system and equipment rack are included with the rack mount kit in the PIERO 2RU system shipping box.

★Failure to install the PIERO 2RU system into an equipment rack using the supplied rack mount kit will void the PIERO 2RU system warranty.

Installation Instructions

Note the following installation instructions:

- This equipment has an operating temperature range of 32° F (0º C) to 95° F (35º C). The ambient temperature in the rack shall not exceed this temperature range.
- A minimum clearance of 0.25 in (6.35 mm) on each side of the equipment must be maintained after installation in the rack.
- Take care not to compromise the stability of the rack while installing this equipment.

Attaching the Cables

Follow the instructions below to attach the cables to the PIERO system.

To attach the cables to the PIERO system:

1. On the back of the PIERO system, connect the supplied line cords to the two power supplies, then plug the line cord(s) into a grounded outlet.

   The power supplies are auto-sensing and can accept line voltages from 100 through 240 VAC. The PIERO system is equipped with two power supplies in a 1+1 redundant configuration. One power supply is required to run the PIERO system.

2. Plug the supplied USB keyboard into the upper **USB Port** on the back of the PIERO system.
3. Plug the supplied USB mouse into the lower **USB Port**.
4. Connect a monitor, customer supplied, to a **Display Port**.

   Ensure the correct display port to DVI adapters are used (DVI-D or DVI-I). A monitor may also be connected to the **USB-C Port** using a USB-C to display port adapter.

   Monitors can be connected to either of the other two Display **Ports** to provide additional space for virtual preview channels, custom applications, web page capture, and more.

   If using analog output, connect a monitor to a display port connector using a display port to VGA converter.

   ★KVM extenders (customer supplied) are required when the PIERO system monitor, keyboard, and mouse are located remotely from the rack room.

5. Plug an **Ethernet** cable from the internal network into one of the **10 Gigabit LAN Controllers**.

   PIERO systems can run standalone or accept a network connection if required to connect to a production network. PIERO systems also use this **TCP/IP** network connection to support the Smart GPI/RossTalk Feature.

6. Connect the **GenLock** signal cable to the **REF** (reference in) Mini-BNC connector.

   This connection is required to lock the PIERO system to the video timing of the facility. The PIERO system supports the following types of GenLock signal:

   - **Analog BlackBurst** — a composite color video signal comprised of sync, color burst, and black video, also called "color black", "house sync" or "house black". Typically used as the house reference synchronization signal.
   - **Tri-Level Sync** — a three-level pulse synchronization signal used in high definition systems. Recommended for HD installations.

7. Connect the ends of 2 **Mini-BNC** pigtail cables to **Mini-BNC Connectors 1** (input) and **3** (output) and attach the **SDI** cables to the **BNC** end of the pigtails.

   Refer to Appendix A: Input and Output Configuration 35 for further information on input and output configuration.

   For facilities requiring analog inputs, additional outboard analog to digital conversion equipment is also available from Ross Video.

Powering Up the System

Follow this procedure to power up the system.

To power up the system:

1. Open the front door of the PIERO system.
2. Press the **Power** button to begin the boot procedure.
3. Close the front door to protect the PIERO system from dust.

Powering Down the System

Whenever the PIERO system needs to be powered down, use the following procedure:

To power down the system:

1. Log on to the PIERO system using the following user name and password:

   User name: PIERO

   Password: piero
2. From the **Start** menu, select **Shut down**.

   The PIERO system shuts down.

Hardware Maintenance

This chapter provides information on maintaining the PIERO system.

⚠	**Caution** — *Danger of Explosion if the system lithium battery is incorrectly replaced. Replace only with the same or equivalent type of battery recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions by a qualified service person.*

Removing and Replacing a System Drive

Follow the instructions in this section to remove and replace the PIERO system drive, if it becomes necessary.

⏚	**Protective Earth** — *Static discharge can cause serious damage to sensitive devices. Avoid handling any hard drive in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Touch the chassis to dissipate static charge before removing hard drives from the system, and exercise proper grounding precautions when working around the PIERO system.*

Removing a System Drive

Follow the procedure below to remove a system drive.

To remove a system drive from the PIERO system:

1. Open the front door of the PIERO system.

2. On the front of the #1 drive sled, slide the lock button to the left to unlock the drive sled lever.

3. Press the left end of the drive sled lever and pull the lever outward.

4. Gently slide the drive sled out of the drive bay using the black lever.

As the drive sled is pulled from the drive bay, place a hand underneath it for support.

5. Using a Phillips head screwdriver, remove the screws from the drive sled.

There are four screws in total.

6. Gently remove the drive from the drive sled, placing it to one side on a flat surface.
7. The drive sled is now empty and ready for the installation of a new drive.

Replacing a System Drive

Follow the procedure below to replace a system drive.

To replace a system drive:

1. Place the new drive onto the sled with the label facing upwards and the connectors at the open end of the sled.

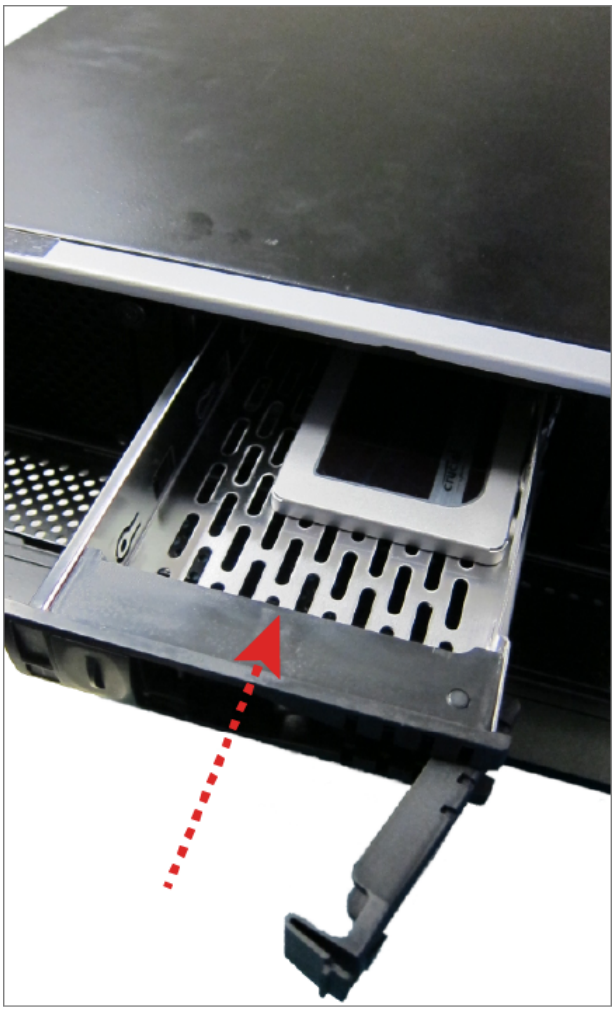
2. Align the four screw holes on the drive with the screw holes on the bottom of the sled.
3. Insert and tighten the Phillips head screws in the screw holes.

   There are four screws in total.

   The drive is now ready to be re-inserted into the PIERO system.

4. Replace the drive sled in the drive bay indicated in the PIERO system below.

5. If the drive sled lever has been closed and relocked since removal:
   a. On the front of the drive sled, slide the lock button to the left to unlock the drive sled lever.
   b. Then press the left end of the drive sled lever and pull the lever outward to open it.
6. Align the drive sled so that the rear connector area is at the bottom of the drive sled and facing the correct drive bay for the drive sled.
7. Slide the drive sled into the drive bay.



8. Push the drive sled firmly into place and close the black lever flush to the drive sled face.

9. Slide the lock button to the right to lock the drive sled lever.

   The green LED on the bottom left-hand side of the drive sled should activate to indicate that the drive is connected to the system.

10. Close the front door of the PIERO system.

Removing and Re-installing the Top Panel

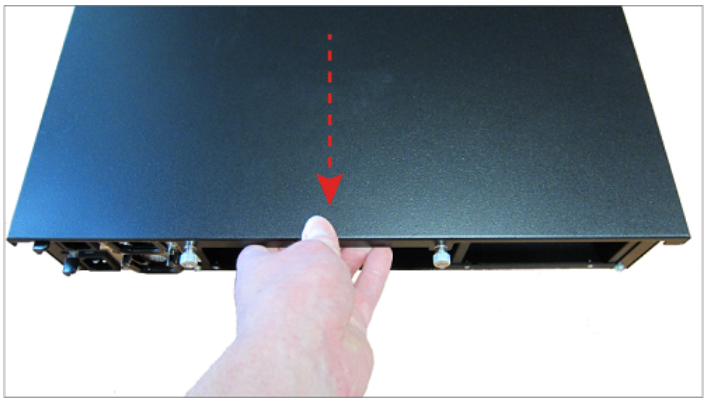
The top panel of the PIERO system can be removed to gain access to internal components such as fans, cards, and the USB security dongle.

⚠	**Caution** — *Do not operate the PIERO system with the top panel removed.*

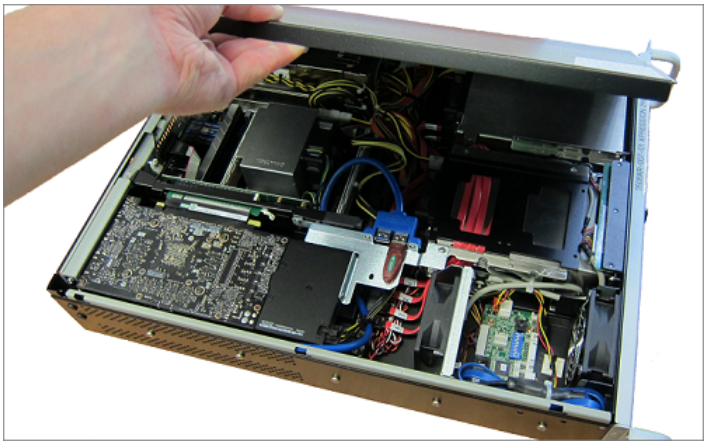
To remove the top panel of the PIERO system:

1. Shut down the PIERO system, remove all cabling, remove the system from the equipment rack, and place the system on a flat, non-slip surface.
2. Loosen the two thumbscrews at the back of the PIERO system until the top panel can be separated from the chassis.

3. Gently pull the top panel back towards the rear of the unit, creating a gap between the top panel of the unit and the front of the chassis.

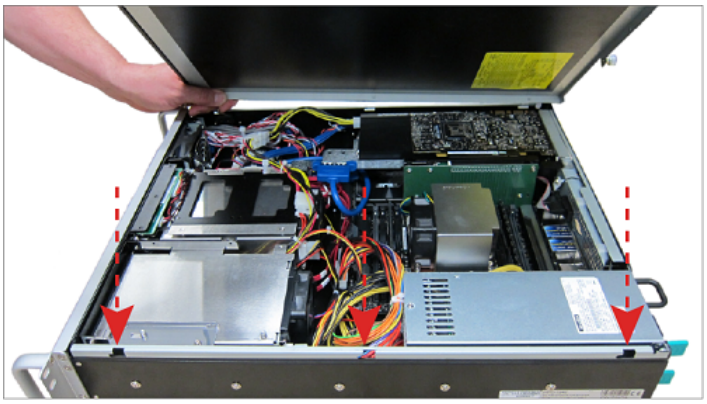


4. Lift the top panel off the chassis.

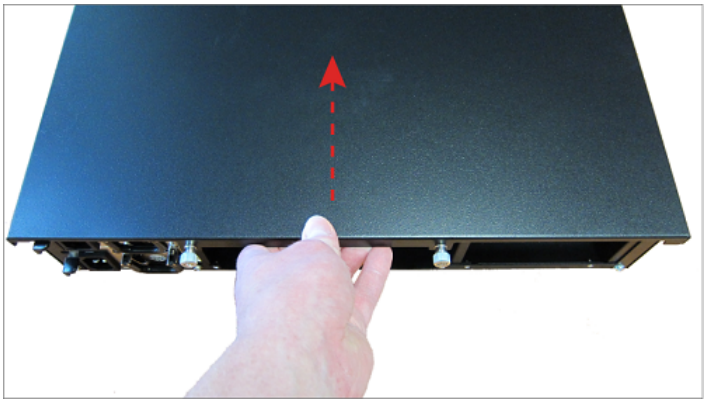


To re-install the top panel

1. Place the top panel onto the top of the PIERO system as follows:
   - Face the sides of the top panel down around the sides of the system.
   - Line up the three nubs on the inside of the sides of the top panel with the L-shaped grooves on the sides of the system.



2. Gently slide the top panel into place, until a clicking noise is heard and the top panel is flush to the front top of the PIERO system.



3. Insert and tighten the two thumbscrews into the back of the PIERO system.

Replacing Cooling Fans

The PIERO system has five cooling fans. There are four cooling fans in the PIERO system that can be replaced if they fail:

- the front chassis fan 23
- the inside chassis fan 27
- two system drive fans 29

There is one fan on the CPU cooler. To replace the CPU cooler fans, please contact Ross Video Technical Support at the numbers listed in the section Getting Help 2 for assistance.

★The PIERO system must be shut down when replacing the cooling fans.

Protective Earth — *Static discharge can cause serious damage to sensitive devices. Avoid handling any hard drive in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Touch the chassis to dissipate static charge before removing hard drives from the system, and exercise proper grounding precautions when working around the PIERO system.*

If a fan fails, the fan failure alarm will trigger. Refer to the section Power and Alarm LED Area 4 for further information on PIERO system hardware alarms.

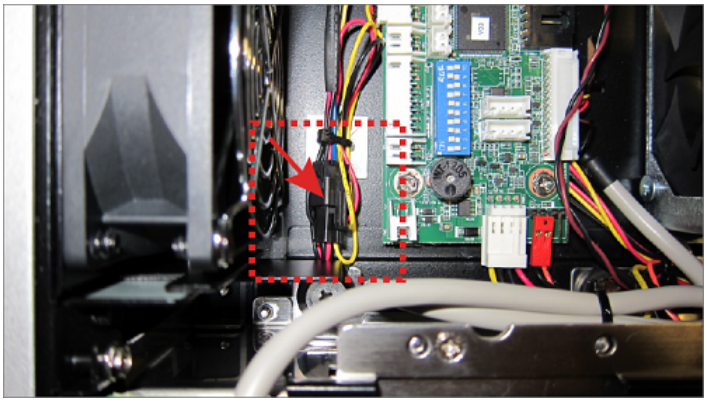
Replacing the Front Chassis Fan

This section describes how to replace the front chassis fan.

To remove the front chassis fan:

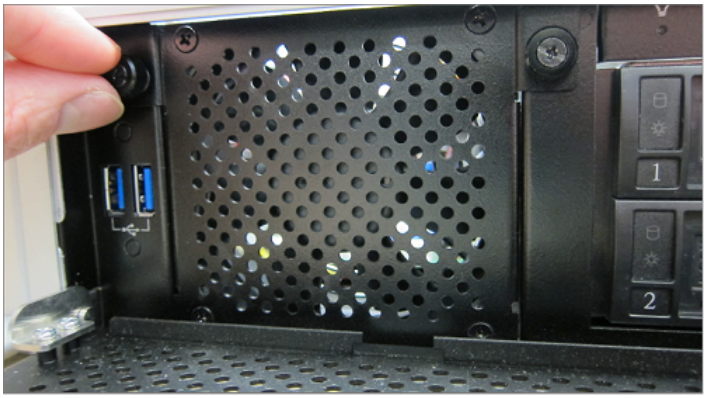
1. Make sure the PIERO system is shut down.
2. Remove the top panel from the PIERO system.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.
3. Disconnect the front chassis fan power supply wire.

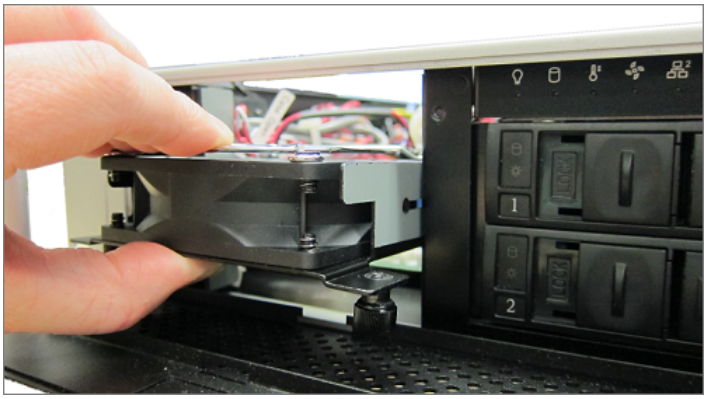


4. Open the front door of the PIERO system.

5. Unscrew the two thumb screws on the front fan cage.

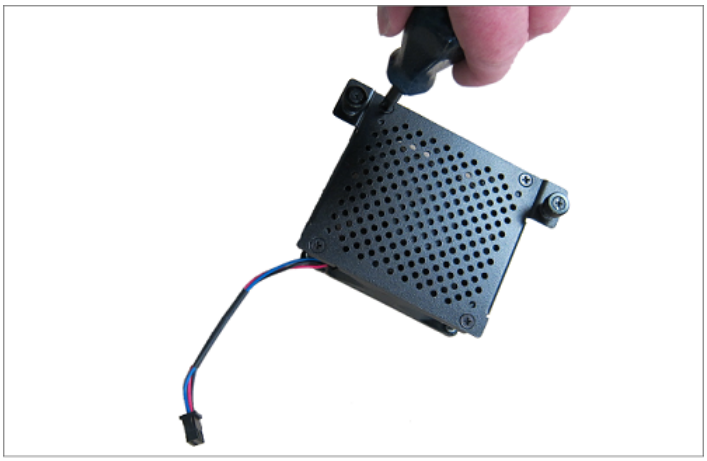


6. Remove the front fan cage from the PIERO system.



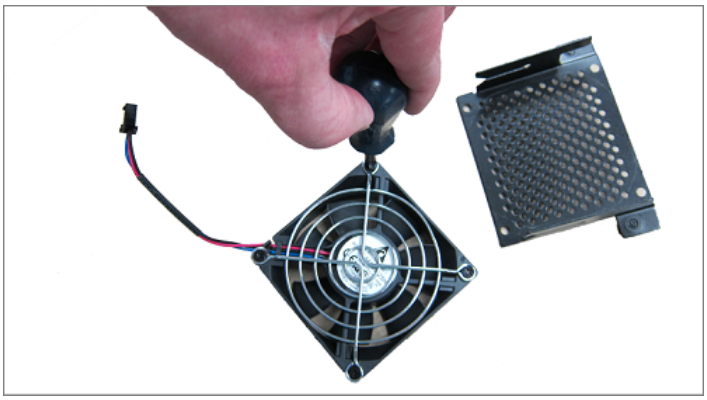
7. Using a Phillips head screwdriver, remove the screws from the fan cage.

   There are four screws in total.



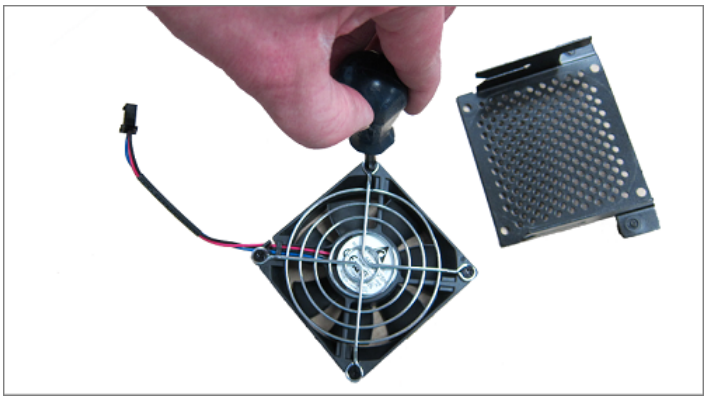
8. Remove the screws from the fan grill.

   There are four screws in total.



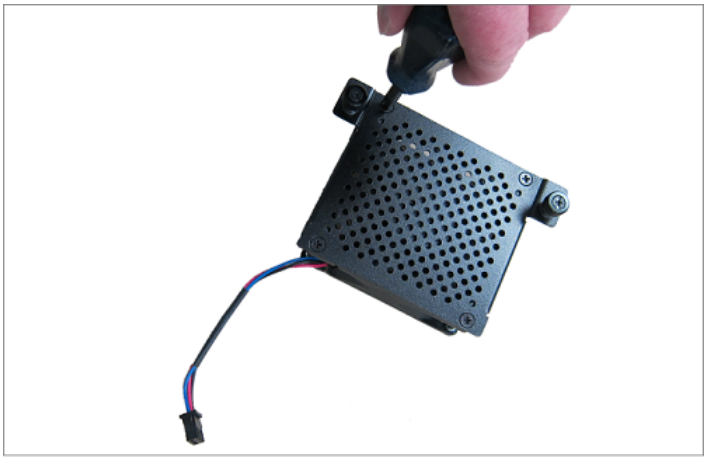
To install the front chassis fan:

1. Insert the new fan into the fan cage.



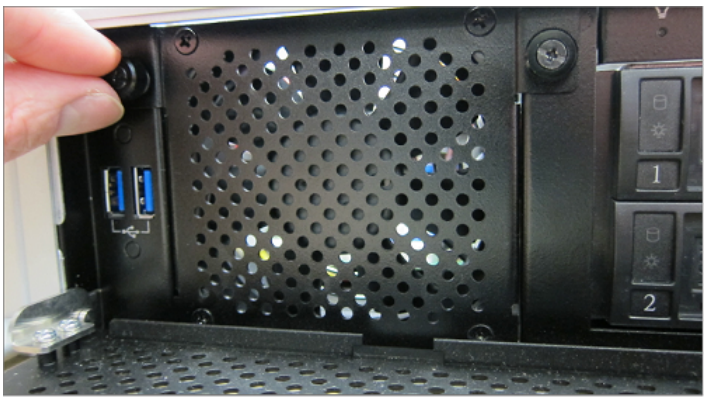
2. Insert and tighten the Phillips head screws in the screw holes.

   There are four screws in total.



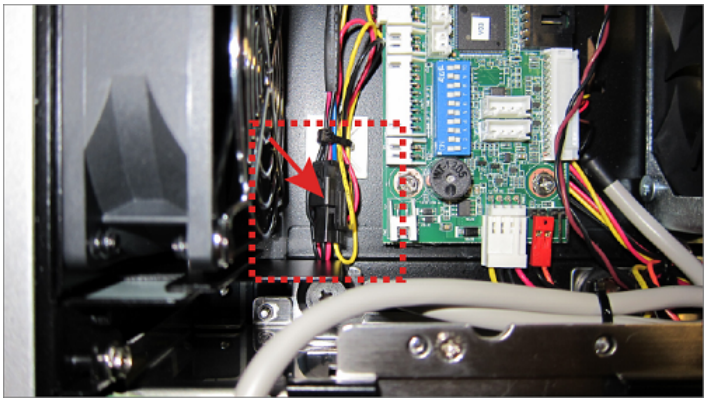
3. Insert the front fan cage in the PIERO system with the fan wire inside the PIERO chassis.

4. Tighten the two thumb screws on the front fan cage.



5. Close the front door of the PIERO system.

6. Connect the front chassis fan power supply wire.



7. Replace the top panel.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.

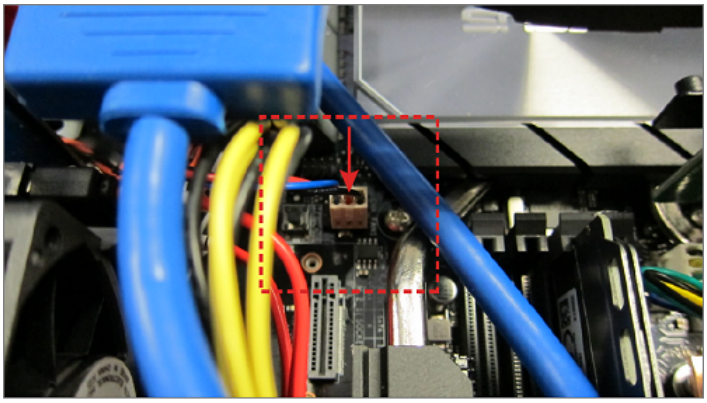
Replacing the Inside Chassis Fan

This section describes how to replace the inside chassis fan.

To remove the inside chassis fan:

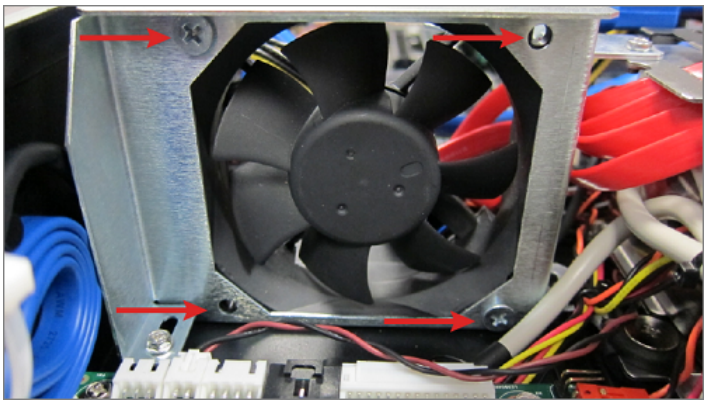
1. Make sure the PIERO system is shut down.
2. Remove the top panel from the PIERO system.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.
3. Disconnect the inside chassis fan power supply wire.



4. Using a Phillips head screwdriver, remove the screws from the fan cage.

   There are four screws in total.

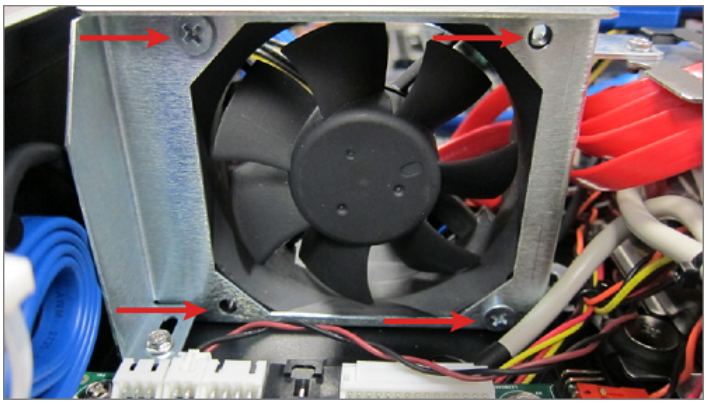


5. Remove the fan from the fan cage.

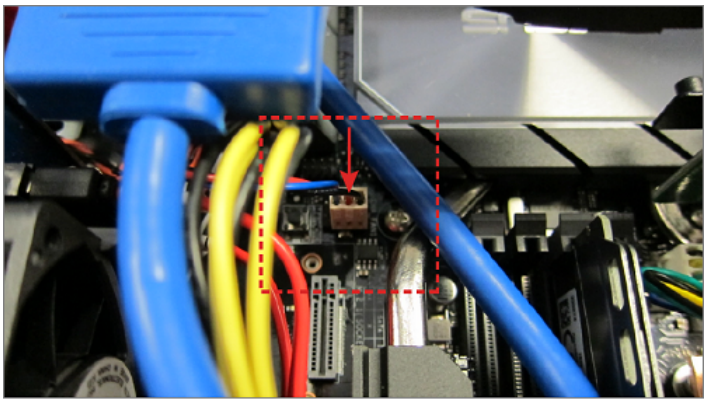
To install the inside chassis fan:

1. Insert the fan in the fan cage.
2. Using a Phillips head screwdriver, insert and tighten the screws in the fan cage.

   There are four screws in total.



3. Connect the inside chassis fan power supply wire.



4. Replace the top panel.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.

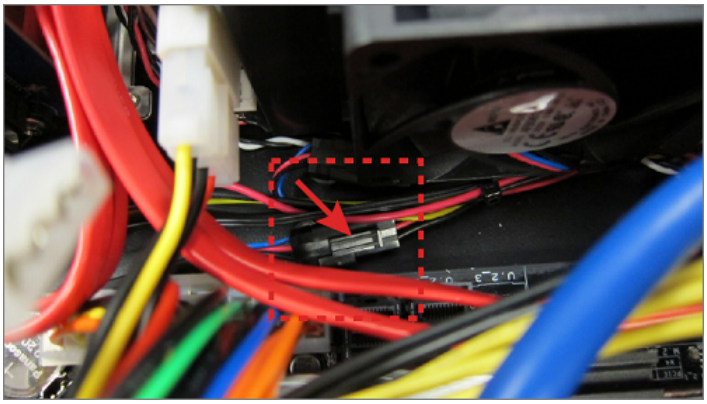
Replacing the System Drive Fan

This section describes how to replace a system drive fan.

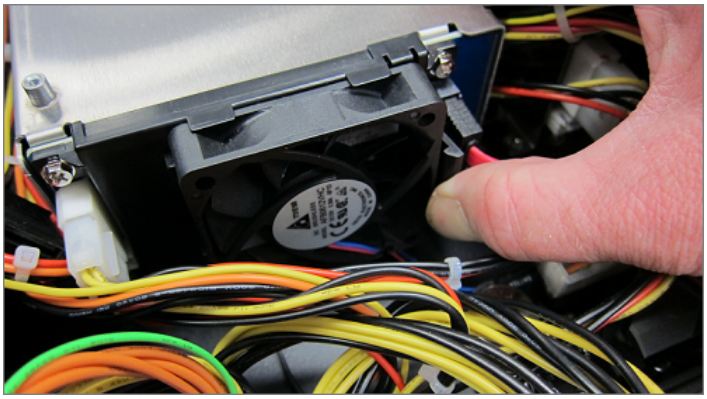
To remove the drive cage fan:

1. Make sure the PIERO system is shut down.
2. Remove the top panel from the PIERO system.

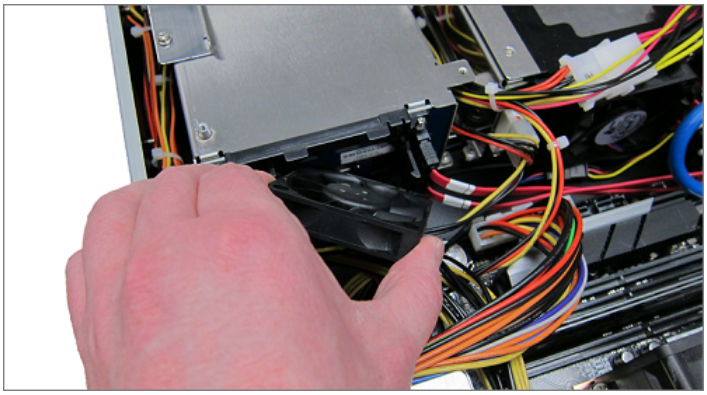
   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.
3. Disconnect the system drive fan power supply wire.



4. Push the lever on the right side of the system drive fan casing outward to release the fan.



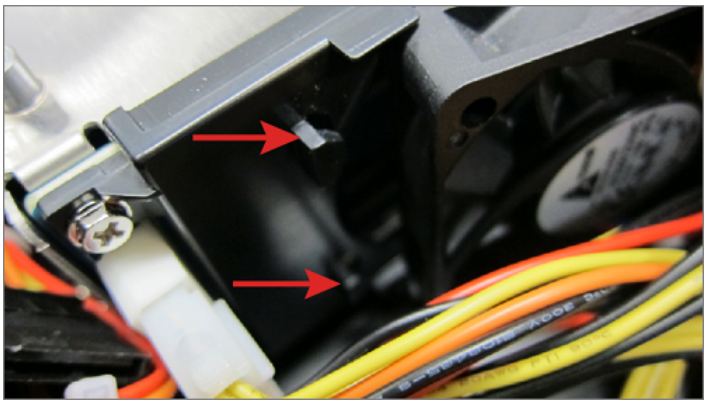
5. Remove the fan by pulling the system drive fan casing away from the system drive cage.



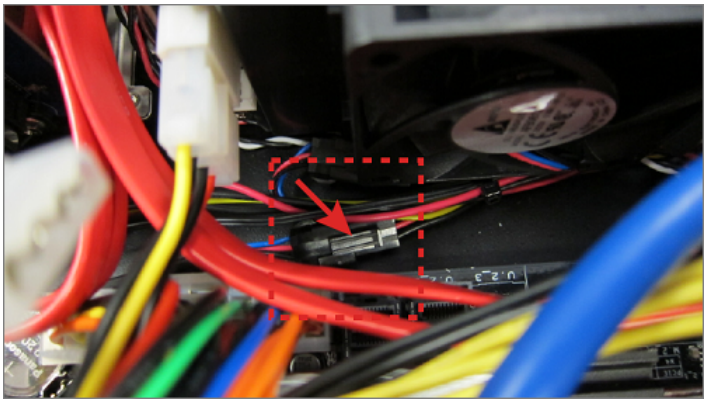
To install the system drive fan:

1. Attach the system drive fan to the system drive cage by placing the left side of the fan on the two black clasps on the left side of the drive cage and pushing the right side of the fan in towards the drive cage.

   The lever that locks the fan casing in place will click when the fan is secured to the system drive cage.

2. Connect the system drive fan power supply wire the system drive cage.

3. Replace the top panel.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.

Accessing the USB Security Dongle

You may be required to remove or replace the USB security dongle if instructed to do so by Ross Video Technical Support.

To access the USB security dongle:

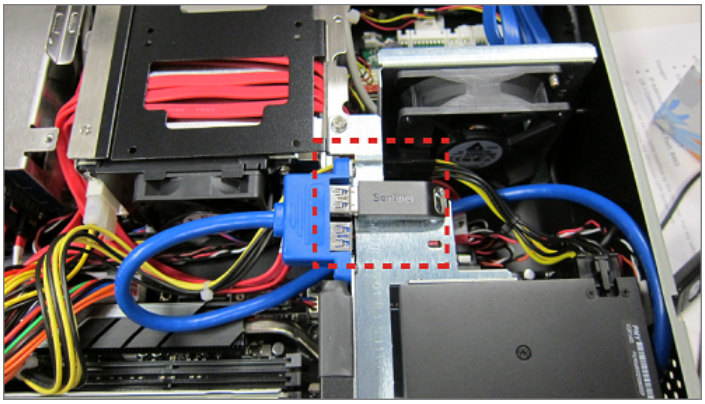
1. Remove the top panel from the PIERO system.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.

   The USB security dongle is located above the inside chassis fan behind the front chassis fan.

   The security dongle connects to the PIERO system via a USB interface.

2. Remove and replace the security dongle as instructed by Ross Video Technical Support.



3. Use the additional USB interface to install an additional dongle if necessary.
4. Replace the top panel.

   Refer to the section Removing and Re-Installing the Top Panel 19 for instructions.

Replacing Power Supplies

The PIERO system has two identical hot-swappable power supply modules, located at the rear of the system on the left-hand side. Since the system requires a minimum of one power supply module to operate, only one power supply can be hot-swapped at a time.

Protective Earth — *Static discharge can cause serious damage to sensitive devices. Touch the chassis to dissipate static charge before removing power supplies from the system, and exercise proper grounding precautions when working around the PIERO system.*

Keep the following safety information in mind while removing a power supply from the PIERO system:

- Always ground yourself before touching electronic equipment.
- When removing a power supply module, always support the module with two hands to help prevent dropping it.

Warning — *Hazardous voltages capable of delivering electric shock remain within the power supply module for a period of time after removal from the system.*

Ross Video power supply modules are intended to be factory serviced by qualified Ross Video service personnel only. Users should only remove and replace the power supply modules.

When removing or replacing a power supply module, follow the instructions below:

- *Disconnect the power cord from the power supply module or the power supply from AC mains before removing or replacing a power supply module.*
- *Do not open or try to remove the casing of the power supply module.*

Failure to follow these instructions can result in death or serious injury.

Removing a Power Supply Module

To remove a power supply module from the PIERO system:

1. At the back of the PIERO system, disconnect the power cord from the power supply module to be removed.
2. Push the black release lever inward to the right.

3. While pushing on the black release lever, grasp the removal handle and gently pull on the power supply module to disengage it from the power supply bay.

4. Support the power supply module with your other hand, and continue pulling until the module is completely removed from the power supply bay.

Installing a Power Supply Module

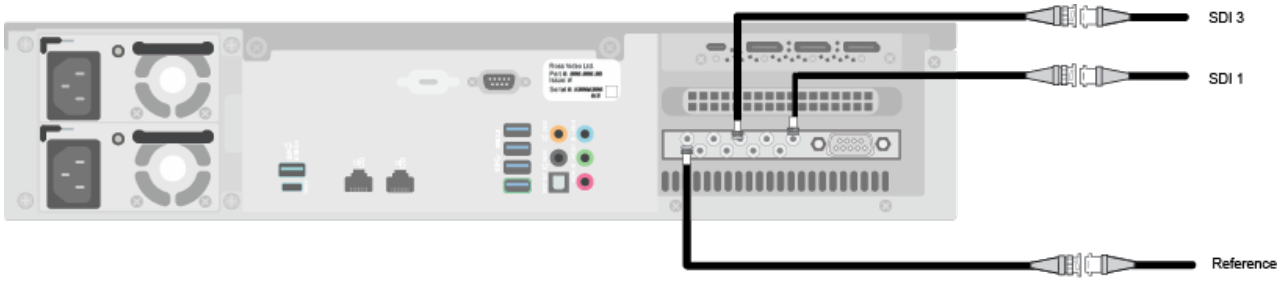
To install a new power supply module in the PIERO system:

1. In front of the open power supply bay, align the power supply module so that the black release lever is positioned to the left-hand side.
2. Slide the power supply module into the open bay and push it firmly until it snaps into place.

3. Connect the power cord to the new power supply module.

Appendix A: Input and Output Configuration

The input SDI cable is connected to the pigtail connected to Mini-BNC connector 1 and the output SDI cable is connected to the pigtail connected to Mini-BNC connector 3, as shown in the illustration below.



PIERO SDI Cabling

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

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