

# UltraLink E-Series

KVM IP System

## Installation and Operation Manual



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# LIMITED WARRANTY

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# INTRODUCTION

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## Disclaimer

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While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, circuitry of the product, and manual content at any time without notice. The manufacturer cannot accept liability for damages due to misuse of the product or other circumstances outside the manufacturer's control. The manufacturer will not be responsible for any loss, damage, or injury arising directly or indirectly from the use of this product. (See limited warranty.)

## System Introduction

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Thank you for choosing UltraLink E-Series KVM IP System. These products are the result of Rose Electronics' continuing commitment to providing state-of-the-art KVM extension solutions for today's demanding workplace. The UltraLink E-Series product uses a highly optimized, ultra-low bitrate encoding platform to transmit 4Kp60 4:4:4 DisplayPort desktops (3840x2160@60Hz) over CATx cables at distances up to 325 feet (100m). Fiber interconnects increase the extension distance, from 1804 feet (multi-mode cable) to 6.20 miles (single-mode cable).

The UltraLink E-Series KVM IP System can be deployed in point-to-point mode or networked mode, enabling remote access to a single computer or to multiple computers. In addition to DisplayPort video, these devices extend the signals of multiple types of computer peripherals: USB keyboard and mouse, USB 2.0 devices, analog audio devices, and RS-232 devices). The UltraLink E-Series 4-port models support up to four video streams and monitors. The 2-port models support up to two streams and monitors.

If an integrated solution is preferred at the computer rack, the PCIe card versions of the transmitter model mount inside the computers. The PCIe card versions also support two or four video displays.

## Features

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- Available as compact 2-port or 4-port transmitter and receiver models, or as PCIe transmitter cards for installation in a PC case
- USB device support includes keyboard and mouse as well as flash drives and a range of USB 2.0 devices
- Low network bandwidth simplifies and lowers the cost of network installation
- Video is encrypted for increased security
- Seamless switching function presents new video instantly
- OSD provides user login and switching capability with a thumbnail preview function
- Based on user login, access to computers or type of USB device can be restricted
- USB keyboard and mouse can be programmed for shared or single user access only
- Programmable hot keys sequences simplify switching
- Integrates with existing networking equipment and standard gigabit Ethernet infrastructure
- Appliance models offer redundant network support
- Compatible with Microsoft® Active Directory Services for user authentication, and with SNMP for remote monitoring
- Rack mounting available
- DisplayPort active converters for HDMI or DVI input or output are available

## Package Contents

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The package contents consist of the following:

### **2-Port and 4-port PCIe transmitter card**

- 1 x PCIe transmitter card
- 1 x USB cable (A to mini B)
- 1 x RJ45 transceiver

### **2-port and 4-port transmitter models**

- 1 x transmitter appliance
- 1 x USB-AB cable
- 1 x external PSU
- 1 x power cord

### **2-port and 4-port receiver models**

- 1 x receiver appliance
- 1 x external PSU
- 1 x power cord

SFP modules may be already inserted or supplied separately depending upon order details.

Additional cables are usually ordered separately. If the package contents are not correct, contact Rose Electronics or your reseller so the problem can be quickly resolved.

Other items may be required to complete your installation. These items can include any of the following. Contact Rose Electronics if any of the following items are required.

- Rack mount kit
- CAT5e, CAT6, or CAT7 cable
- LC terminated multi-mode fiber optic cable (62.5/125  $\mu\text{m}$  (OM1), 50/125  $\mu\text{m}$  (OM2, OM3, or OM4))
- LC terminated single-mode fiber optic cable (9/125  $\mu\text{m}$  (OS1 or OS2))
- Shielded DisplayPort 1.1 or 1.2 cable
- Mini DisplayPort to DisplayPort adapter
- Analog audio cable

## Rose UltraLink Device Manager software

In networked mode (see [Setting up networked mode](#)), you can remotely manage, monitor, and configure your networked devices with Rose UltraLink E-series Device Manager software. This runs under Windows on a separate PC attached to the LAN (see [Installing Rose UltraLink Device Manager software](#)). This software is not required in order to operate the product, but may be required for advanced configuration and can also be used to do switching. This is not used when connected in point-to-point mode (see [Setting up point-to-point mode](#)).

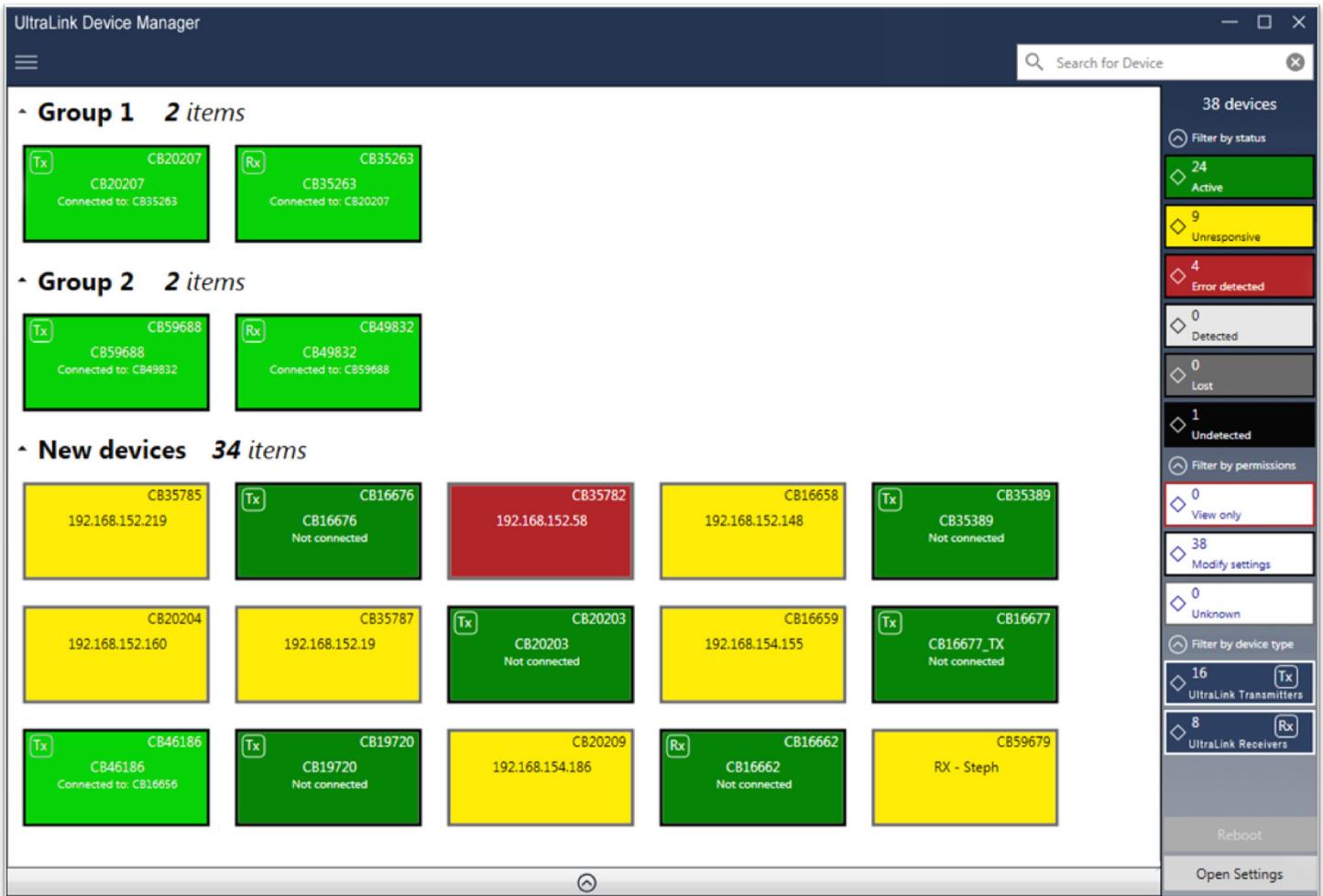


Figure 1. UltraLink Device Manager main screen

## OSD (on-screen display)

The OSD on the receiver appliance is accessed from the keyboard. The OSD is invoked with a programmable hot-key whose default is ScrollLock. It is available for both networked and point-to-point modes. Use it for configuration and in networked mode to preview video streams and perform switching to different transmitters.

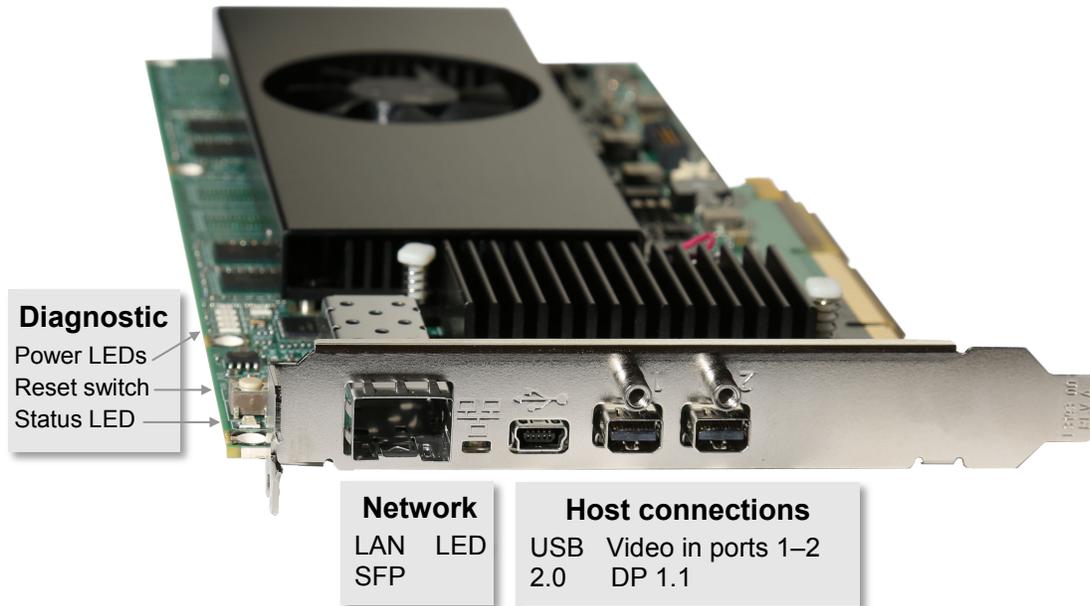
# HARDWARE DESCRIPTION

## UltraLink E-Series Models

The UltraLink E-Series is available in the models described below.

### PCIe Transmitter Cards

#### 2-port Transmitter Card



#### 4-port Transmitter Card

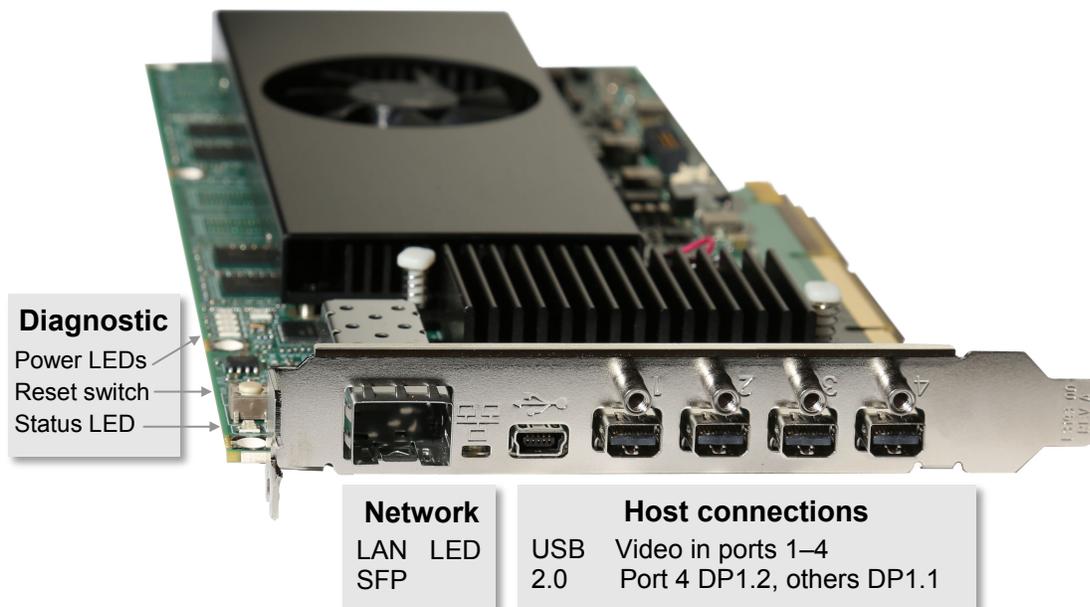


Figure 2. PCIe transmitter cards

<b>Host connections</b>																					
<b>2-Port model Video in ports 1–2</b>	Connect your host computer or video sources here using DisplayPort male to male cables (not supplied). Standard DisplayPort 1.1 resolutions are supported. Maximum resolution depends upon number of ports used. For more information, see <a href="#">DisplayPort video resolutions</a> .																				
<b>4-Port model Video in ports 1–4</b>	Connect your host computer or video sources here using DisplayPort (mini) male to male cables (not supplied). Standard DisplayPort 1.1 resolutions are supported. In addition port 4 supports DisplayPort 1.2 resolutions when this is the only port used. Maximum resolution depends upon number of ports used. For more information, see <a href="#">DisplayPort video resolutions</a> and <a href="#">Connecting DisplayPort video</a> .																				
<b>USB 2.0</b>	This USB mini B female receptacle connects to the host computer using the included USB A to mini-B cable.																				
<b>Network</b>																					
<b>Network LED</b>	<table border="0"> <thead> <tr> <th style="text-align: left;"><b>LED Color</b></th> <th style="text-align: left;"><b>Status</b></th> </tr> </thead> <tbody> <tr> <td>Off</td> <td>No connection</td> </tr> <tr> <td>Green (fast blink)</td> <td>Network cable detected, transmitting at 1Gbps</td> </tr> <tr> <td>Amber (fast blink)</td> <td>Network cable detected; current transmission speed not supported</td> </tr> <tr> <td>Red (fast blink)</td> <td>Network cable detected; transmission error occurred</td> </tr> </tbody> </table>	<b>LED Color</b>	<b>Status</b>	Off	No connection	Green (fast blink)	Network cable detected, transmitting at 1Gbps	Amber (fast blink)	Network cable detected; current transmission speed not supported	Red (fast blink)	Network cable detected; transmission error occurred										
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Red (fast blink)	Network cable detected; transmission error occurred																				
<b>LAN SFP Fiber or Copper</b>	This SFP cage supports a standard SFP plug-in module, either fiber or copper. The module can then be connected with fiber Dual LC cables or a cat5e or better Ethernet cable to either a receiver unit in point-to-point mode or to a 1Gb Ethernet switch in networked mode. For more information, see <a href="#">Installing the SFP module</a> . Distances are governed by the choice of module that has been installed.																				
<b>Diagnostic</b>																					
<b>Power LEDs</b>	When PCIE card is powered on, these LEDs should all turn green right away.																				
<b>Reset switch</b>	Hardware reboot	Quickly press the reset button (1 second) to reboot the device.																			
	Configuration reset	Press and hold the reset button for about 5 seconds (until the LED turns fast blinking green) to reboot the device and reset to the default settings.																			
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**Table 1. Description of transmitter card connections**

# Transmitter Appliances

## 2-port Transmitter Appliance



## 4-port Transmitter Appliance



Figure 3. Transmitter appliance - front and rear view

## Power and Status

<b>Power LED</b>	Illuminates with green, amber, or red either solid or flashing to indicate various conditions of booting and maintenance. See <a href="#">Transmitter and Receiver Appliance – Power and Status LEDs</a> .	
<b>Status LED</b>	Illuminates with green, amber, or red either solid or flashing to indicate various conditions of peripheral conditions or errors. See <a href="#">Transmitter and Receiver Appliance – Power and Status LEDs</a> .	
<b>Power switch</b>	This momentary switch is used to power the unit on and off. By the OSD you can disable the power switch or set the unit to come up in a specified on/off state when power is applied to the unit by programming the power policy state. See <a href="#">Additional OSD options</a> .	
<b>Reset switch</b>	Recessed switch is accessed with tip of paper clip for reboot or reset to factory default.	
	Hardware reboot	Press the reset button (1 second) to reboot the device.
	Configuration reset	Press and hold the reset button for about 5 seconds (until the LED turns fast blinking green) to reboot and reset to default.

## Local connections

### FEATURE NOT ENABLED AS OF FIRMWARE VERSION 3.01

<b>Video loop out</b>	Optionally connect a DisplayPort monitor to this connector using a DisplayPort male to male cable (not supplied). This port is electrically split from the DisplayPort video input 1 from the host for convenience purposes of viewing the host at its location.
<b>USB 2.0 Devices</b>	Connect a keyboard and mouse to these ports to allow interaction with the host at its location. This is typically used along with a display connected to the Video loop out mentioned above.

## Host connections

<b>2-Port model Video in ports 1–2</b>	Connect your host computer or video sources here using DisplayPort male to male cables (not supplied). Standard DisplayPort 1.1 resolutions are supported. Maximum resolution depends upon number of ports used. For more information, see <a href="#">DisplayPort video resolutions</a> and <a href="#">Connecting DisplayPort video</a> .
<b>4-Port model Video in ports 1–4</b>	Connect your host computer or video sources here using DisplayPort male to male cables (not supplied). Standard DisplayPort 1.1 resolutions are supported. In addition port 4 supports DisplayPort 1.2 resolutions when this is the only port used. Maximum resolution depends upon number of ports used. For more information, see <a href="#">DisplayPort video resolutions</a> and <a href="#">Connecting DisplayPort video</a> .
<b>Line In (audio)</b>	Connect the line out connector (usually lime green on PC) of your host computer here using a 3.5mm male to male audio cable (not supplied). Audio is also carried on the video signals, so this connection is optional or can be used with a separate audio source.
<b>Line Out (audio)</b>	Connect the line in connector (usually light blue on PC) of your host computer here using a 3.5mm male to male audio cable (not supplied). This connection must be used if a microphone will be used at the remote side or with an additional audio output.
<b>Serial (RS232)</b>	This is a general purpose RS232 port that can route signals from unit to unit. There is support for virtual serial ports where data can be sent from the network. If your RS232 device has a DB25 connector, use a DB9 to DB25 adapter to connect your device to this connector.
<b>USB 2.0</b>	This USB B female receptacle connects to the host computer using the included USB AB cable.

## Network and Power in

<b>LAN 1 Copper with dual LED</b>	Connect this RJ45 connector using a standard copper Ethernet cable to either a receiver appliance in point-to-point mode or to a 1Gb Ethernet switch in networked mode. Use CAT5e or better for connection distance of up to 100m.
<b>LAN 2 Fiber or Copper SFP with LED</b>	This SFP cage supports a standard SFP plug-in module, either fiber or copper. The module can then be connected with fiber Dual LC cables or a cat5e or better Ethernet cable to either a receiver appliance in point-to-point mode or to a 1Gb Ethernet switch in networked mode. For more information, see <a href="#">Installing an SFP module</a> . Distances are governed by the choice of SFP module that has been installed. The two ports LAN1 and LAN2 can either operate as one or the other or be paired in a redundant fashion.
<b>Power in</b>	This is the incoming power for the unit. Connect the 12V DC power supply included with your product to this connector. Maximum power requirement for the product is 5 Amps at 12V.

**Table 2. Description of transmitter appliance connections**

## Receiver Appliances

### 2-port Receiver Appliance

#### Power and Status

#### Remote connections USB and Audio

USB 2.0 Devices x4

Headphone Line in

Microphone Line out



#### Remote connections Video and Serial

Video out ports 1 – 2  
DP1.1

Serial

#### Network and Power in

LAN2

LAN1

Power in

### 4-port Receiver Appliance

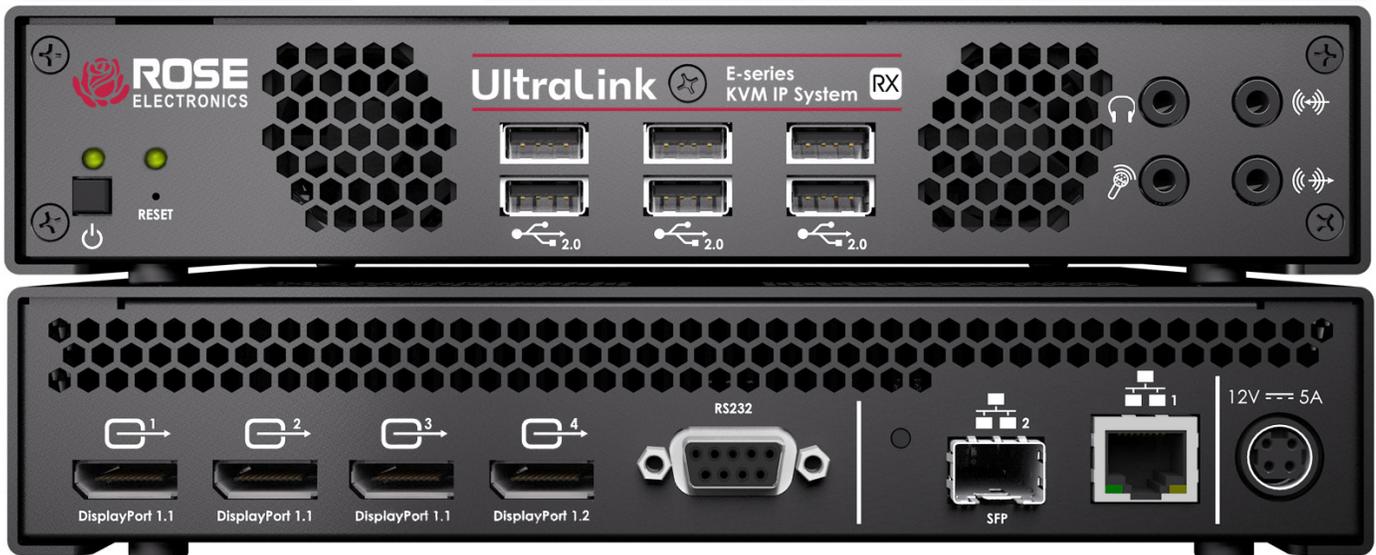
#### Power and Status

#### Remote connections USB and Audio

USB 2.0 Devices x6

Headphone Line in

Microphone Line out



#### Remote connections Video and Serial

Video out ports 1 – 4  
Port 4 DP1.2, others DP1.1

Serial

#### Network and Power in

LAN2

LAN1

Power in

Figure 4. Receiver appliance - front and rear view

## Power and Status

<b>Power LED</b>	Illuminates with green, amber, or red either solid or flashing to indicate various conditions of booting and maintenance. See <a href="#">Transmitter and Receiver Appliance – Power and Status LEDs</a> .	
<b>Status LED</b>	Illuminates with green, amber, or red either solid or flashing to indicate various conditions of peripheral conditions or errors. See <a href="#">Transmitter and Receiver Appliance – Power and Status LEDs</a> .	
<b>Power switch</b>	This momentary switch is used to power the unit on and off. By the OSD you can disable the power switch or set the unit to come up in a specified on/off state when power is applied to the unit by programming the power policy state. See <a href="#">Additional OSD options</a> .	
<b>Reset switch</b>	Recessed switch is accessed with tip of paper clip for reboot or reset to factory default.	
	Hardware reboot	Press the reset button (1 second) to reboot the device.
	Configuration reset	Press and hold the reset button for about 5 seconds (until the LED turns fast blinking green) to reboot and reset to default.

## Remote connections USB and Audio

<b>USB 2.0 Devices</b>	Connect your standard USB devices such as keyboard and mouse directly into the receiver. You can also plug in storage device such as flash drive or peripherals such as printers.
<b>Headphone</b>	Connect a standard headphone here using its standard 3.5mm audio jack. If headphone does not have 3.5mm, use the appropriate adapter to convert it. This can be separate or combined as a headset with headphone and microphone. Plugging this in will disconnect any speakers present in the display monitor.
<b>Microphone</b>	Connect a standard microphone here using its standard 3.5mm audio jack. If microphone does not have 3.5mm, use the appropriate adapter to convert it. This can be separate or combined as a headset with headphone and microphone.
<b>Line In (audio)</b>	The receiver accepts an audio source on the line in jack, routed to the line out jack at the transmitter. Connect an audio source with a 3.5mm male to male audio cable (not supplied).
<b>Line Out (audio)</b>	The receiver outputs an audio signal on the line out jack. The source can be from the line in jack at the transmitter or the audio signal in the video source. Connect your audio output such as speakers or amplifier using a 3.5mm male to male audio cable (not supplied).

## Remote connections Video and Serial

<b>2-Port model Video out ports 1–2</b>	Connect your displays here using DisplayPort male to male cables (not supplied). Standard DisplayPort 1.1 resolutions are supported. For more information, see <a href="#">DisplayPort video resolutions</a> and <a href="#">Connecting DisplayPort video</a> .
<b>4-Port model Video out ports 1–4</b>	Connect your displays here using DisplayPort male to male cables (not supplied). Standard DisplayPort 1.1 resolutions are supported. In addition port 4 supports DisplayPort 1.2 resolutions when this is the only port used. For more information, see <a href="#">DisplayPort video resolutions</a> and <a href="#">Connecting DisplayPort video</a> .
<b>Serial (RS232)</b>	This is a general purpose RS232 port that can route signals from unit to unit. There is support for virtual serial ports where data can be sent from the network. If your RS232 device has a DB25 connector, use a DB9 to DB25 adapter to connect your device to this connector.

## Network and Power in

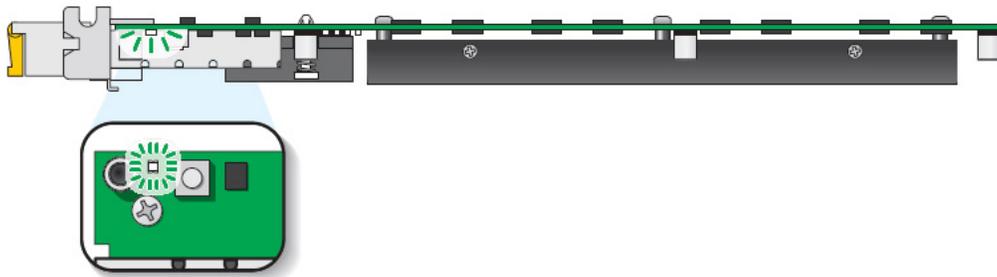
<b>LAN 1 Copper with dual LED</b>	Connect this RJ45 connector using a standard copper Ethernet cable to either a receiver appliance in point-to-point mode or to a 1Gb Ethernet switch in networked mode. Use CAT5e or better for connection distance of up to 100m.
<b>LAN 2 Fiber or Copper SFP with LED</b>	This SFP cage supports a standard SFP plug-in module, either fiber or copper. The module can then be connected with fiber Dual LC cables or a cat5e or better Ethernet cable to either a receiver appliance in point-to-point mode or to a 1Gb Ethernet switch in networked mode. For more information, see <a href="#">Installing an SFP module</a> . Distances are governed by the choice of SFP module that has been installed. The two ports LAN1 and LAN2 can either operate as one or the other or be paired in a redundant fashion.
<b>Power in</b>	This is the incoming power for the unit. Connect the 12V DC power supply included with your product to this connector. Maximum power requirement for the product is 5 Amps at 12V.

**Table 3. Description of receiver appliance connections**

## Description of LED Indicators

The LED Indicators on each device provide information on the power and status of the device and help in troubleshooting the product.

### PCIe Transmitter Card Status LED

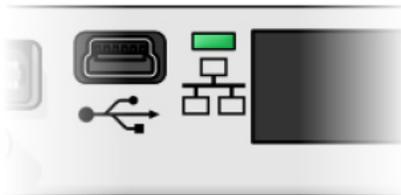


**Figure 5. PCIe Transmitter Card – Status LED**

LED Color	Status
<b>Green (standby)</b>	Device is turned off, but still powered
<b>Green (solid)</b>	Device is active
<b>Green (fast blink)</b>	Configuration reset in process
<b>Amber (solid)</b>	Card is in maintenance mode
<b>Amber (slow blink)</b>	Card is restarting in maintenance mode
<b>Amber (fast blink)</b>	Device is updating firmware
<b>Red (solid)</b>	No source detected
<b>Red (slow blink)</b>	No network detected
<b>Red (fast blink)</b>	Device has detected a fatal error. Try rebooting the card. If the LED is still rapidly blinking red after rebooting the card, contact Rose Electronics for technical support. For more information on rebooting see <a href="#">Rebooting or resetting your UltraLink devices</a> .

**Table 4. PCIe Transmitter Card: Indicator LEDs**

### PCIe Transmitter Card: Network LED

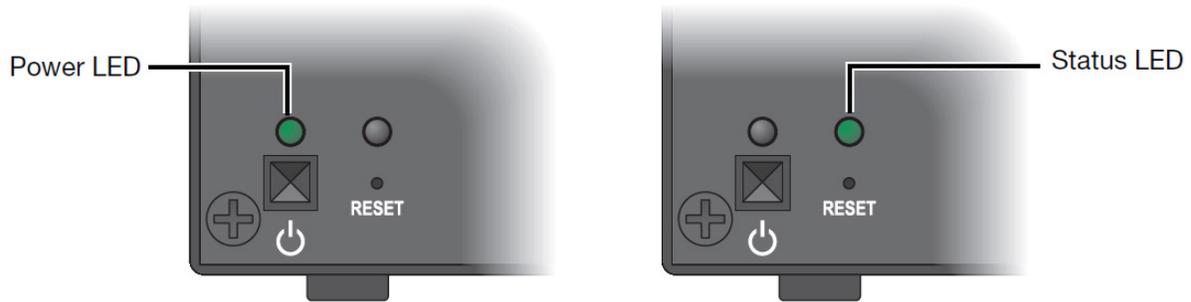


**Figure 6. PCIe Transmitter Card – Network LED**

LED Color	Network
<b>Off</b>	No power
<b>Green (fast blink)</b>	Network cable detected, transmitting at 1Gbps
<b>Amber (fast blink)</b>	Network cable detected; current transmission speed not supported
<b>Red (fast blink)</b>	Network cable detected; transmission error occurred

**Table 5. PCIe Transmitter Card Network Indicator**

## Transmitter and Receiver Appliance – Power and Status LEDs

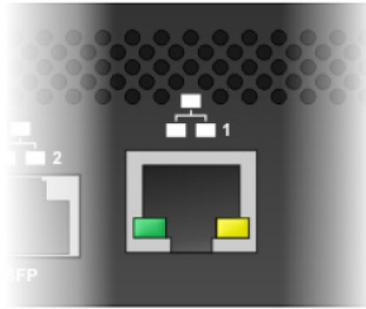


**Figure 7. Transmitter and Receiver Appliance – Power and status LEDs**

LED color	Power LED	Status LED
<b>Green (solid)</b>	Device is active	Software is ready
<b>Green (slow blink)</b>	Device is restarting	---
<b>Green (fast blink)</b>	Configuration reset in process	---
<b>Amber (solid)</b>	Device is in maintenance mode	Device is restarting
<b>Amber (slow blink)</b>	Device is restarting and is in maintenance mode	Firmware mismatch detected
<b>Amber (fast blink)</b>	Device is updating the firmware	Transmitter – No USB host connected Receiver – No keyboard detected
<b>Red (solid)</b>	---	Transmitter – no video detected Receiver – No monitor detected
<b>Red (slow blink)</b>	---	No network connected or link redundancy network cable connection is invalid,
<b>Red (fast blink)</b>	Error detecting the driver	Fatal error occurred
<b>Off</b>	No power. Make sure your device is properly installed. Also, make sure your system isn't in power saving mode.	-

**Table 6. Transmitter and Receiver Appliance – Power and status LEDs**

## Transmitter and Receiver Appliance – LAN1 Network LED

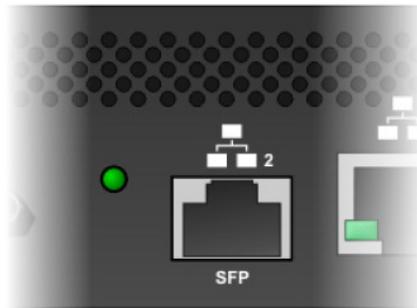


**Figure 8. Transmitter and Receiver Appliance – LAN 1 network Indicators**

LED Color	LAN 1 (Left LED)	LAN 2 (Right LED)
<b>Off</b>	No activity detected	Transmitting at 1Gbps
<b>Green (solid)</b>	---	---
<b>Green (fast blink)</b>	Network activity detected	---
<b>Amber (solid)</b>	---	Transmitting at 100Mbps

**Table 7. Transmitter and Receiver Appliance – LAN 1 network LEDs**

## Transmitter and Receiver Appliance – LAN2 Network LED



**Figure 9. Transmitter and Receiver Appliance – LAN 2 network Indicator**

LED Color	LAN 2
<b>Off</b>	No power
<b>Green (solid)</b>	Network activity detected
<b>Green (fast blink)</b>	Data transfer in process
<b>Amber (solid)</b>	No transceiver detected
<b>Red (solid)</b>	Error establishing communication. Verify all network connections, then reboot the devices (see <a href="#">Rebooting or resetting your UltraLink devices</a> ).

**Table 8. Transmitter and Receiver Appliance – LAN 2 network LED**

## Reset switch for rebooting or configuration reset

**Warning:** A configuration reset restores the default settings of the UltraLink E-Series device. This resets all of the device settings, including the IP configuration and password.

**Warning: Point-to-point mode** – Performing a configuration reset on a Receiver also resets the configuration of the connected Transmitter.

### PCIe Transmitter Card – Reset switch

For the PCIe transmitter card, since this switch is not accessible when the PC has been closed, it is recommended that you understand its significance in programming point-to-point mode. If you intend for the transmitter to operate in networked mode, then do not program the product for point-to-point. Once point-to-point mode is programmed the only way to return it to networked mode is by using this switch.

**Hardware reboot** – Press the **Reset** button for one second (the front panel LED turns slow blinking green) to reboot the device.

**Configuration reset** – Press and hold the **Reset** button for about 5 seconds (until the front panel LED turns fast blinking green) to reboot the device and restore default settings.

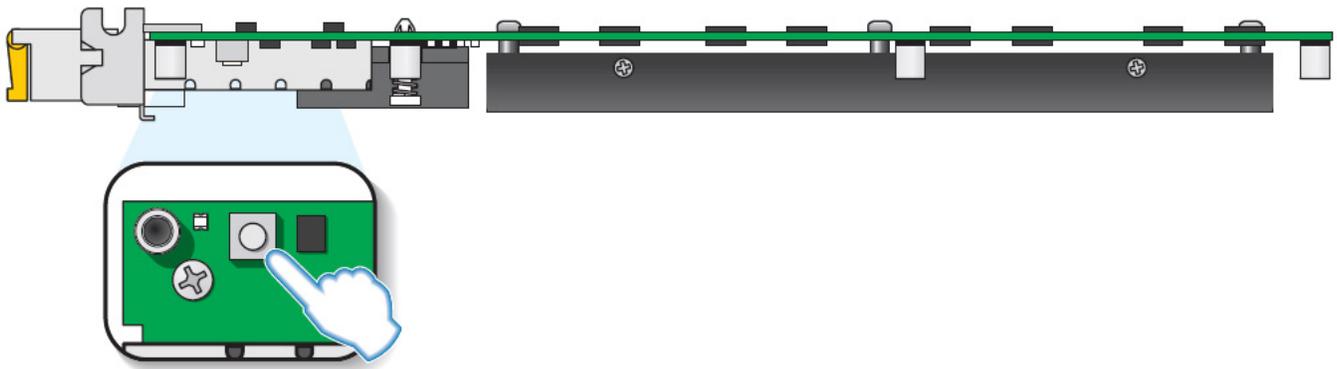


Figure 10. PCIe card – reset switch

### Transmitter and Receiver Appliance – Reset switch

**Hardware reboot** – Press the recessed **Reset** button with the tip of a paper clip for one second (the power LED turns slow blinking green) to reboot the device.

**Configuration reset** – Press and hold the recessed **Reset** button with the tip of a paper clip for about 5 seconds (until the power LED turns fast blinking green) to reboot the device and restore default settings.

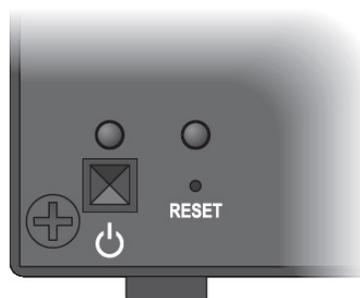


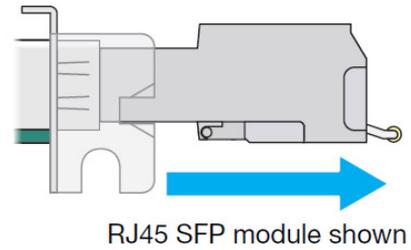
Figure 11. Transmitter and Receiver Appliance – reset switch

# Preparing your UltraLink hardware

## Installing the PCIe Transmitter Card

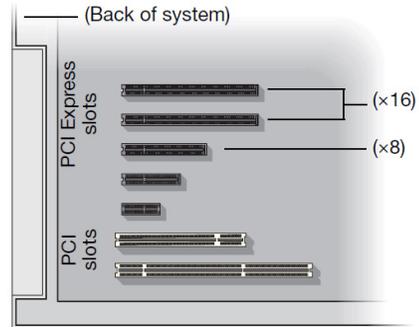
### Remove SFP module if installed.

Before installing the transmitter card, make sure to remove the SFP module. (For more information, see [Removing an SFP Module](#)).



### Choose an expansion slot.

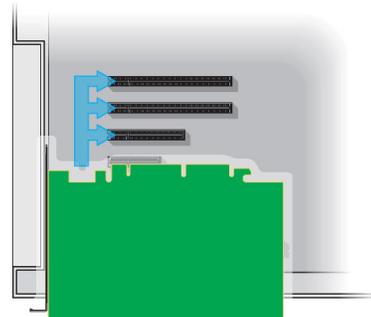
Most systems have different types of expansion slots. Choose a PCIe E@ x8 or x16 slot. The computer's system manual should identify the location of each type of expansion slot in your system.



### Insert the Transmitter Card.

1. Position the PCIe transmitter card over the expansion slot.
2. Push the card in firmly and evenly until it's fully seated in the slot.
3. Secure the bracket of the PCIe transmitter card to the frame of your system.

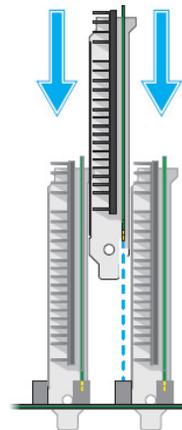
The PCIe transmitter card is now installed. Before restarting the system, connect the necessary devices to the card.



### Installing multiple cards

The computer may support the installation of multiple PCIe transmitter cards.

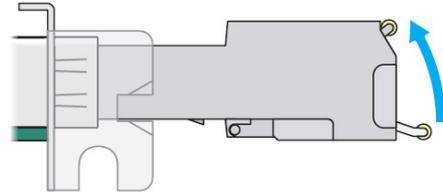
**WARNING:** To avoid damaging cards, always insert them as straight as possible into the slot. Don't rock cards from side to side. Don't force the card into the slot.



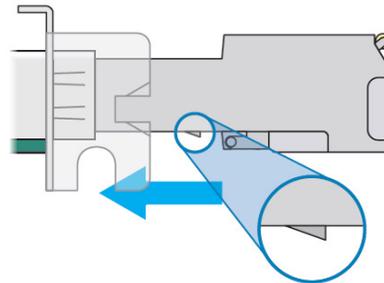
**Table 9. PCIe Transmitter Card installation**

## Installing an SFP module

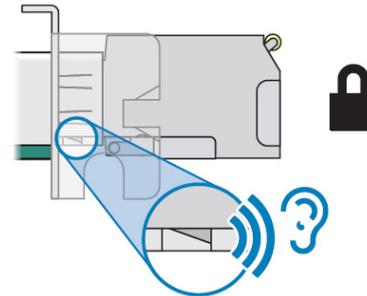
1. Close the latch handle.



2. Push the module into the SFP cage. Make sure the module is properly oriented. A properly oriented module should slide easily into the housing.



3. Make sure the SFP module is inserted all the way into the housing. When it locks in place, you may hear a “click”. To make sure the SFP module is securely inserted, pull gently on the module without lowering the latch handle.

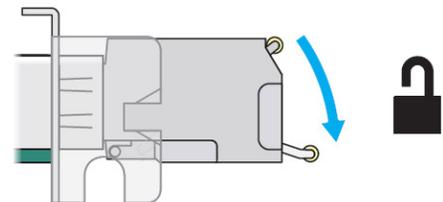


**Figure 12. Installing an SFP Module**

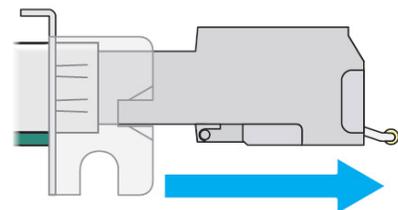
## Removing an SFP Module

1. Pull the latch handle down to unlock the SFP module from its housing.

**WARNING:** Forcing the module from its housing without unlocking it may damage the module and the cage.



2. Grasp the SFP module by the side walls and carefully pull the module out of the housing.



**Figure 13. Removing an SFP module**

## Connection precautions

To avoid possible problems that could damage your computers or prevent you from using your UltraLink E-Series product, read the following guidelines before connecting the product.

- Whenever you change your connection setup, make sure you're using the correct connectors and that all connectors are properly fastened.
- Make sure your devices are powered off. Never change connections while your computer, UltraLink E-Series transmitter, or receiver is turned on.
- Review the safety information provided (for more information, see [Safety](#)).

## DisplayPort video resolutions

The UltraLink supports single video or multi-head video input. The single video supports the highest resolution. Connecting more than one video lowers the maximum video resolution. For 4-port models, port number 4 is a special port which supports DisplayPort 1.2 4K60 video. The other ports only support DisplayPort 1.1 resolutions.

For 2-port models, maximum resolution depends upon number of ports used as follows:

1 port 2560×1600@60Hz/3840×2160@30Hz    2 ports 1920×1200@60Hz

For 4-port models, maximum resolution depends upon number of ports used as follows:

1 port 3840×2160@60Hz (port 4 only)                      2 ports 3840×2160@30Hz or 2560×1600@60Hz  
3 ports 1920×1200@60Hz                                      4 ports 1920×1080@60Hz

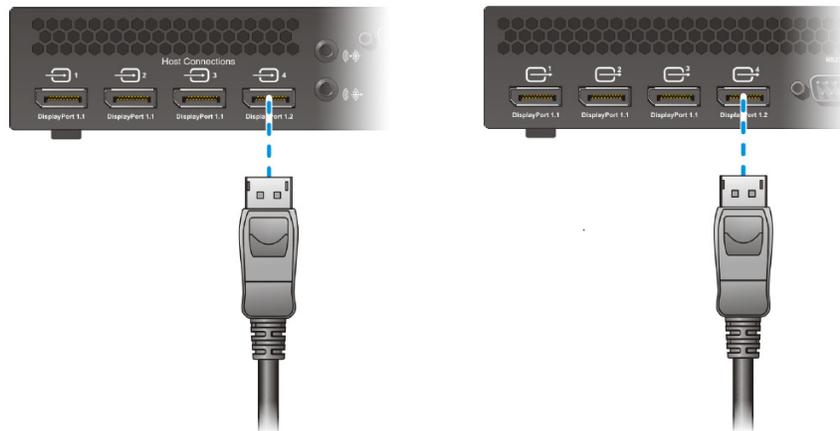


Figure 14. Transmitter and receiver connections for 4K60 resolution

## Using DisplayPort video – cable latch

**Warning:** To avoid damaging the DisplayPort connector on the monitor cable or on the UltraLink E-Series product, carefully remove the DisplayPort cable by pressing the latch on the top of the DisplayPort connector while removing the connector.

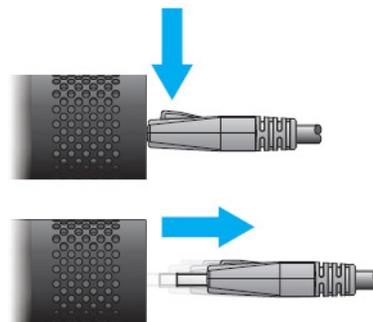


Figure 15. Removing DisplayPort cables with locking safety connectors

## Connecting your computers to the transmitter appliance

### Connecting host USB

The USB cable is provided. Simply connect it from the computer's USB port to your UltraLink hardware. The PCI Card uses a USB mini-B to A cable. The transmitter appliance uses a USB standard B to A cable. You can use any USB port on the computer including blue USB3.1 super-speed ports. The UltraLink will use the USB2.0 signals present and will not operate at super-speed rates. Longer lengths are supported up to the specified maximum length of USB 2.0. Even longer distances may be obtained with Rose active optical cables.

### Connecting DisplayPort video

Video cables are not supplied unless ordered separately from Rose. Once in hand, simply connect them from the computer's DisplayPort video to your UltraLink hardware. The following table provides the possible cables that may be used.

Standard passive cable	Description
<b>DisplayPort to DisplayPort</b>	Connection from transmitter appliance to computer with standard DisplayPort connector.
<b>Mini DisplayPort to DisplayPort</b>	Connection from PCI card to computer with standard DisplayPort connector.
<b>Mini DisplayPort to Mini DisplayPort</b>	Connection from PCI card to computer with mini DisplayPort connector.

Figure 16. DisplayPort video cables from computer to transmitter

### Connecting HDMI, DVI, or VGA video

If the video source is not DisplayPort, it must be converted to DisplayPort by an active converter/adaptor. Rose can supply these adapters, please consult sales for more information.

### Connecting audio and serial

These cables are not supplied unless ordered separately from Rose.

Connector	Description
<b>Line In (audio)</b>	Connect the line out connector (usually lime green on PC) of your host computer here using a 3.5mm male to male audio cable. Audio is also carried on the video signals, so this connection is optional or can be used with a separate audio source.
<b>Line Out (audio)</b>	Connect the line in connector (usually light blue on PC) of your host computer here using a 3.5mm male to male audio cable. This connection must be used if a microphone will be used at the receiver appliance or with an additional audio output.
<b>Serial (RS232)</b>	This is a general purpose RS232 port that can route signals from unit to unit. There is support for virtual serial ports where data can be sent from the network. If your RS232 device has a DB25 connector, use a DB9 to DB25 adapter to connect your device to this connector.

Figure 17. Audio and serial cables from computer to transmitter

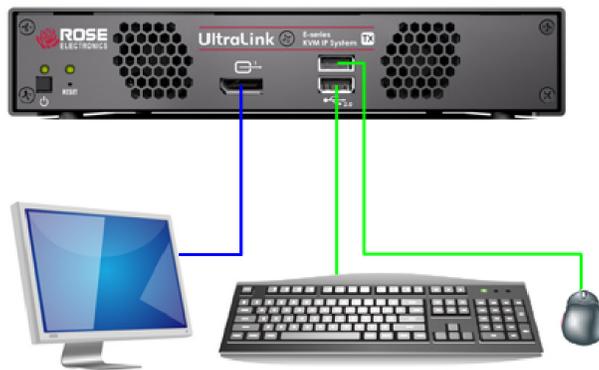
## Connecting local access to the transmitter appliance

**FEATURE NOT ENABLED AS OF FIRMWARE VERSION 3.01 AND IS RESERVED FOR FUTURE USE**

- Local output support (Video out) on the transmitter is expected in an upcoming release.
- The USB connectors on the front of the transmitter are currently disabled.

Optionally connect a DisplayPort monitor to the video loop out connector using a DisplayPort male to male cable (not supplied). This port is electrically split from the DisplayPort video input 1 from the host for convenience purposes of viewing the host at its location.

Connect a keyboard and mouse to these ports to allow interaction with the host at its location. This is typically used along with a display connected to the Video loop out mentioned above.



**Figure 18. Local connections on transmitter**

## Connecting your displays and devices to the receiver appliance

### Connecting USB Devices

Connect your standard USB devices such as keyboard and mouse here by plugging them in directly. You can also plug in storage device such as flash drive or peripherals such as printers.

**Note:** When using a touch screen monitor USB connection, make sure the monitor is set as the main display in Windows.

### Connecting DisplayPort video

Video cables are not supplied unless ordered separately from Rose. Once in hand, simply connect them from your display to your UltraLink receiver appliance. The following table provides the possible cables that may be used.

Standard passive cable	Description
DisplayPort to DisplayPort	Connection from receiver appliance to display with standard DisplayPort connector.
DisplayPort to Mini DisplayPort	Connection from receiver appliance to display with mini DisplayPort connector.

**Figure 19. DisplayPort video cables from transmitter appliance to display**

Connecting HDMI, DVI, or VGA displays

If the display has no DisplayPort connector, it must be converted to DisplayPort by an active converter/adaptor. Rose can supply these adapters, please consult sales for more information.

### Connecting audio and serial

These cables are not supplied unless ordered separately from Rose.

Connector	Description
Headphone	Connect a standard headphone here using its standard 3.5mm audio jack. If headphone does not have 3.5mm, use the appropriate adapter to convert it. This can be separate or combined as a headset with headphone and microphone. Plugging this in will disconnect any speakers present in the display monitor.
Microphone	Connect a standard microphone here using its standard 3.5mm audio jack. If microphone does not have 3.5mm, use the appropriate adapter to convert it. This can be separate or combined as a headset with headphone and microphone.
Line In (audio)	The receiver accepts an audio source on the line in jack. This is routed to the line out jack at the transmitter. Connect your audio source using a 3.5mm male to male audio cable (not supplied).
Line Out (audio)	The receiver outputs an audio signal on the line out jack. The source can be from the line in jack at the transmitter or from the audio signal from the video source. Connect your audio output such as a speaker or amplifier using a 3.5mm male to male audio cable (not supplied).

**Figure 20. Audio and serial connections from receiver appliance to audio device**

## Connecting power to the UltraLink transmitters and receivers

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### PCIe Transmitter Card power

The card gets its power from the computer and no further connection of power is required. This results in a very neat and compact installation. Since there is no on/off power switch on the card, turning on the computer also powers on the card.



**Figure 21. PCIe 2-port transmitter card with fiber**

### Transmitter and receiver power

Each appliance is shipped with an external power supply and power cord which will connect to the 12V power input of the appliance. The power connector is a DIN 4-pin male with lock. To remove the power connector pull on the body and it will slide back which unlocks it.

The front panel power switch is used to power the unit on and off. The default state is that the unit is off when connecting the power. Since the power switch has a flexible programmable power policy, you can set the unit to power on when power is applied to the unit, thus ignoring the power switch. See [Additional OSD options](#).

## Connecting network cable – point-to-point and networked modes

There are two distinct modes of operation of the UltraLink, either point-to-point mode or networked mode.

In point-to-point mode, UltraLink E-Series Transmitter and Receiver are directly linked to each other using copper or fiber cable to implement an extender. You can use the OSD for configuration or to view status.

In networked mode, the UltraLink E-Series products operate over a copper or fiber Gigabit Ethernet network. Switching, configuration, and viewing status can be done either through the OSD, from the UltraLink receiver, or through the UltraLink Device Manager software.

Both modes support redundant links which are used to ensure UltraLink E-Series devices continue to work in case of a network switch or cable failure. **Note:** Redundancy is not supported on Transmitter Cards.

For copper connection use standard Ethernet RJ45 cables, cat5e or better. For fiber connection use dual LC fiber compatible with the SFP modules installed, either single-mode or multi-mode.

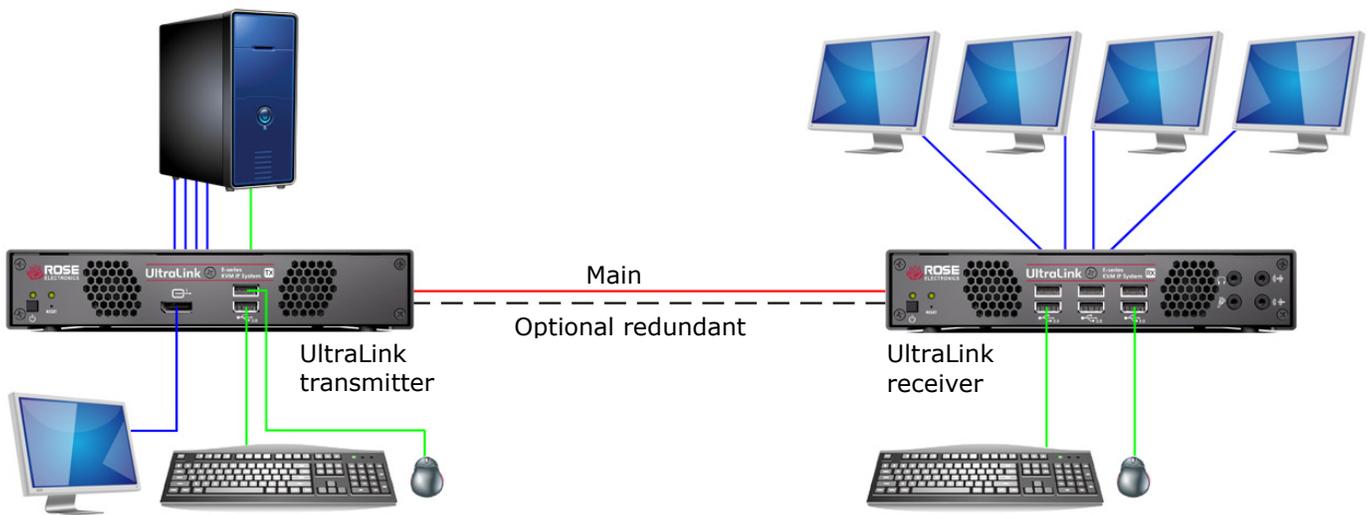


Figure 22. UltraLink E-series units in point-to-point mode

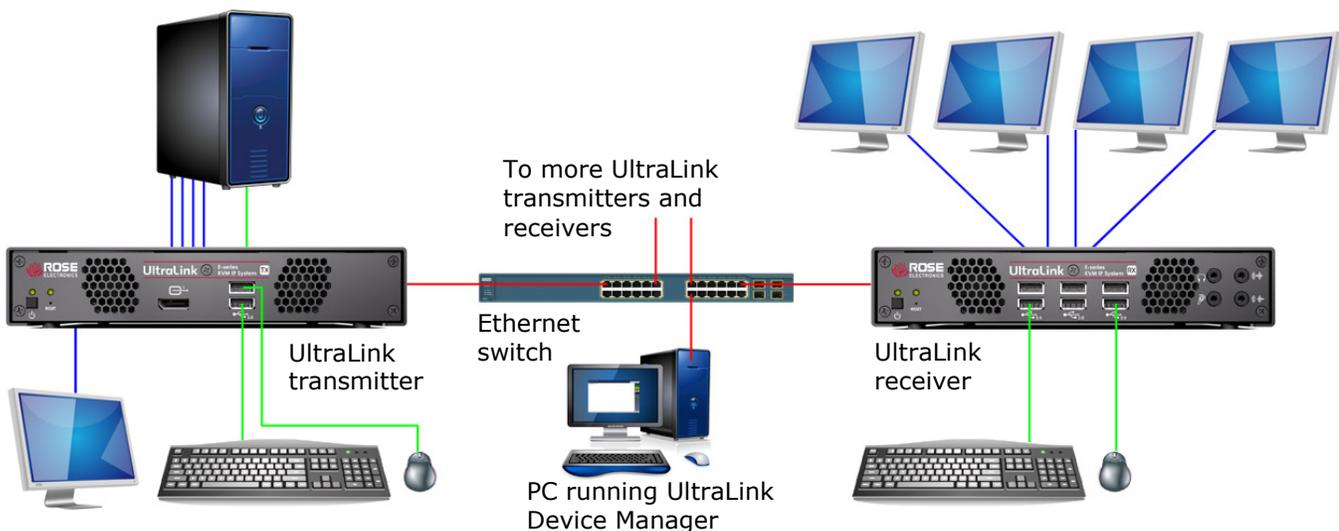


Figure 23. UltraLink E-series units in networked mode

## Setting up point-to-point mode

1. Install any transmitter cards in the PC case.
2. Connect all of the cables including the network cable from the transmitter to the receiver and power up the UltraLink devices from their front power switches.
3. Using the Receiver OSD, enable point-to-point mode.
4. Optionally configure the transmitter and receiver units through the OSD.

When using your devices fresh out of the box and setting them up for the first time for point-to-point mode, the on-screen display (OSD) on the receiver device shows an initial screen which indicates point-to-point mode is not enabled. This animation repeats for about six times and then is followed by the *Select the operation mode* screen. Using the mouse attached to the receiver, click on Enable Point-to-Point. After a few seconds of configuration and possible brief messages of Synchronizing and Connected to ..., you should see the video from the computer attached to the transmitter. This procedure is a one-time setup.

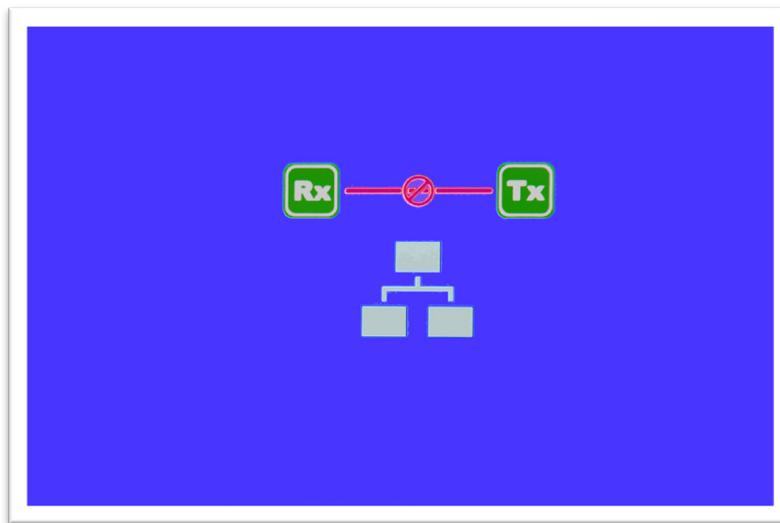
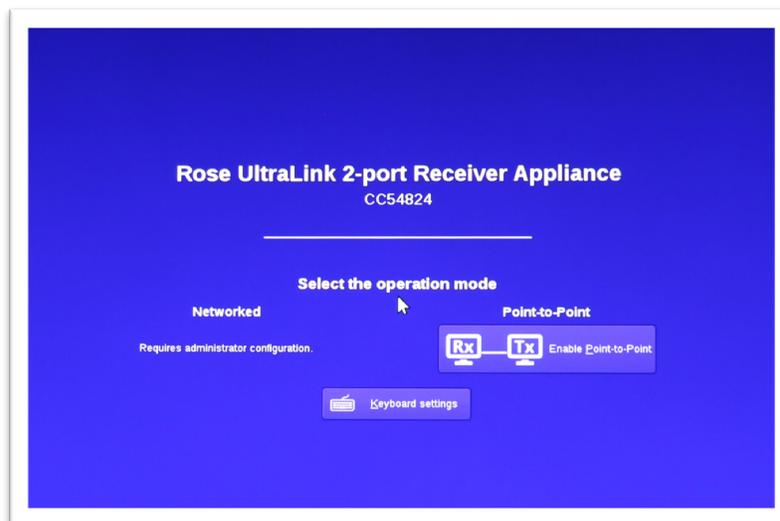


Figure 24. Screen showing initial point-to-point mode not enabled



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Figure 25. Screen showing select operation mode for enabling point-to-point mode

## **Setting up link redundancy in point-to-point mode**

### **Enabling point-to-point link redundancy**

1. Connect a second network cable between a Receiver and its Transmitter.
2. Open the OSD at the Receiver, select **More Options**, and activate **Enable link Redundancy**.
3. The device will automatically reboot to start the redundant link.

### **Disabling point-to-point link redundancy**

1. Disconnect the second network cable between a Receiver and its Transmitter.
2. Open the OSD at the Receiver, select **More Options**, and deselect **Enable link Redundancy**.

## **Accessing the OSD in point-to-point mode**

The OSD is available on UltraLink E-Series receivers. To display the OSD, enter the OSD keyboard shortcut with the keyboard connected to the Receiver. The default keyboard shortcut is the ScrollLock key.

### **Changing the OSD keyboard shortcut**

The keyboard shortcut used to access the OSD can be changed from the default. To change the keyboard shortcut, use the OSD settings option.

### **Basic OSD functions**

<b>Wake up transmitter</b>	Click this to wake up the transmitter if it turns off.
<b>Refresh connection</b>	Click this if the connection between the receiver and transmitter devices is lost. Wait until the connection is refreshed.
<b>Close</b>	Click this to close the OSD.

**Table 10. Basic OSD functions in point-to-point mode**

## OSD Sources tab in point-to-point mode

View the input, device, and network information for the transmitter.

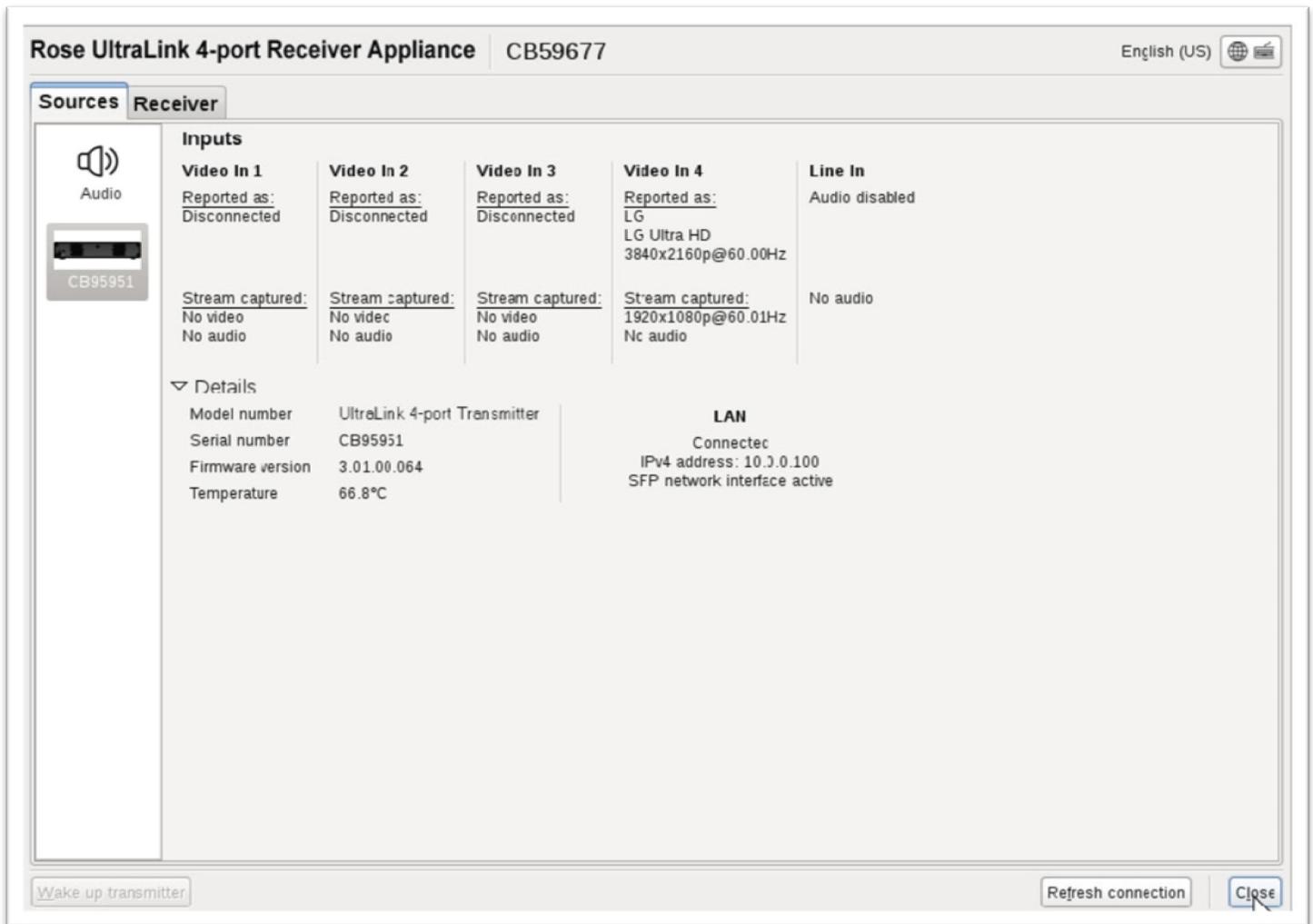


Figure 26. OSD Sources tab in point-to-point mode

### Inputs

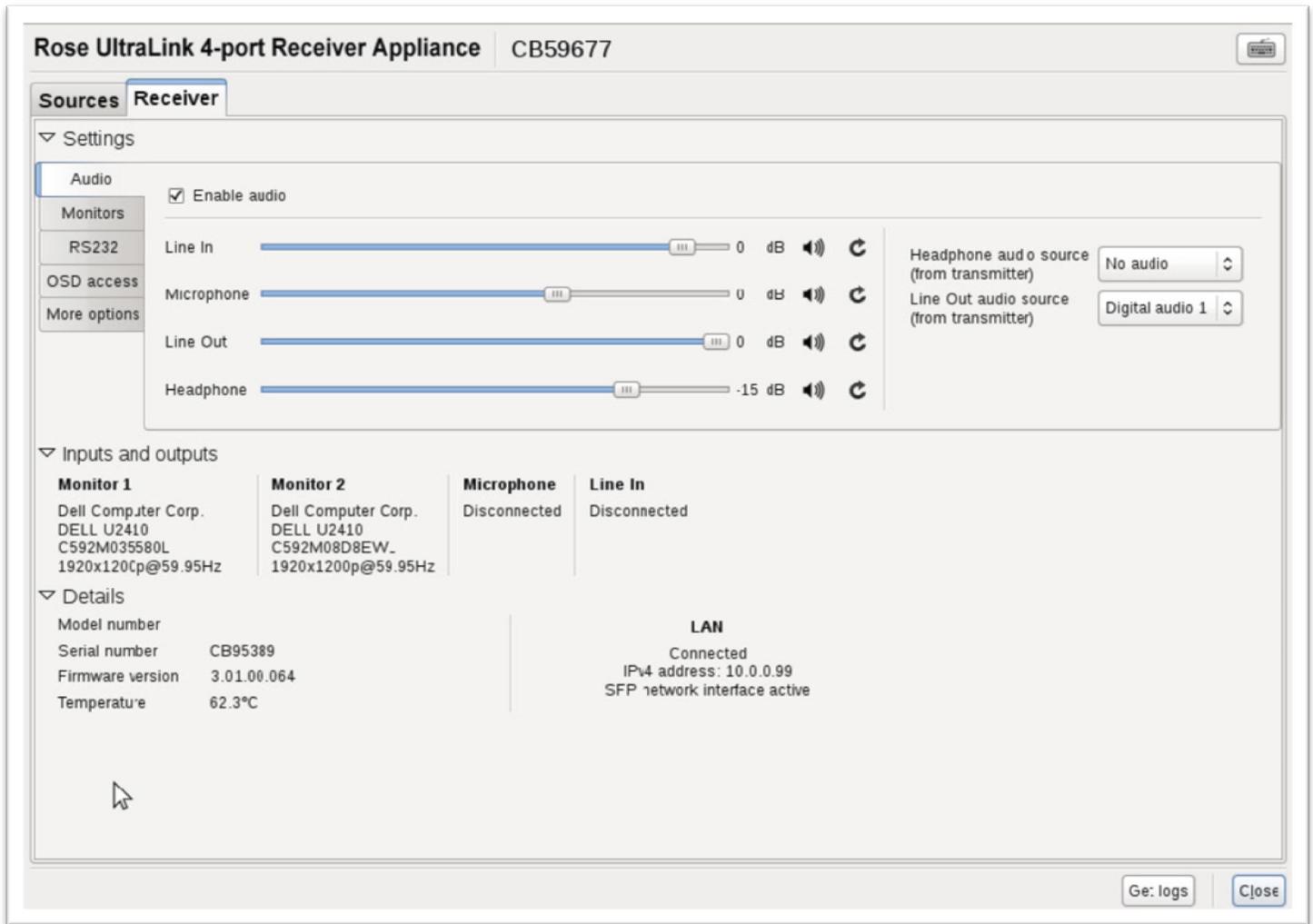
View the video stream information and information about devices connected to the transmitter (**Monitor**, **Microphone**, and **Line In**).

### Details

Provides information about the Transmitter itself (such as the model, serial number, firmware version, and temperature), and shows the connection status and IP address of the device (connected through the **LAN**).

## OSD Receiver tab in point-to-point mode

View and modify the settings for the Receiver.



**Figure 27. OSD Receiver tab in point-to-point mode**

### Audio settings

For audio input and output, click the **Enable audio** option. To adjust the audio settings for connected devices:

<b>Headphone audio source</b>	Select the Transmitter audio source for the headphone
<b>Line-Out audio source</b>	Select the Transmitter audio source for the Line Out device.
<b>Microphone or Line-In audio source</b>	Select the Receiver audio source to be input to the Transmitter.

**Table 11. Receiver: audio settings**

## Monitor settings

<b>Optimize video mode compatibility with monitors</b>	<p>When enabled, the receiver examines the monitor's display modes listed in its EDID and only allows modes that are part of the EDID.</p> <p>If the source system is sending a video resolution that's not part of the monitor's EDID, then the receiver will use the closest match and/or scale the resolution.</p> <p>This is a safety mechanism that prevents a user from accidentally applying a mode that the monitor cannot support and end up with no video.</p>
<b>Enable advanced display modes</b>	<p>Enable this option to support the following display modes:</p> <p>1× 3840x2160@60Hz and 1× 1920x1080@60Hz          1× 3840x1440@60Hz and 1× 1920x1080@60Hz          4× 2560x1600@60Hz          4× 1920x1200@60Hz</p>
<b>Stabilize display output</b>	<p>Enable this option to reduce flickering in video output. This option is disabled by default. For more information, see <a href="#">Troubleshooting</a>.</p>
<b>Allow monitors to enter power saving mode</b>	<p>Enable this option to turn off the display after X minutes of inactivity.</p>
<b>Configure monitor behavior on transmitter inputs</b>	<p>Select a <b>Monitor</b> (1, 2, 3, or 4) to apply a fixed EDID to that output. If a monitor is currently connected, click <b>Update</b> to apply the EDID settings of that monitor. If using a 4K resolution, make sure the transmitter reports only the monitor (output) supported. In this case, your transmitter must report the other monitors as disconnected (no monitor). To report those monitors as disconnected, click <b>No monitor</b>.</p>

**Table 12. Receiver: monitor settings**

## RS232 settings

To modify the RS232 settings, click **Edit RS232**. This opens a dialog box. To enable RS232, click the **Enable RS232** option, edit the RS232 settings, and then click **Apply**.

<b>Baud rate</b>	The byte transmission speed, in bits per seconds, used for the RS232 connection. The default is 115200.
<b>Data bits</b>	The number of bits per byte of data transmitted. The default is 8.
<b>Parity</b>	The type of parity bits used for the data transmitted ( <b>None</b> , <b>Odd</b> , or <b>Even</b> ). The default is <b>None</b> .
<b>Stop bits</b>	The number of bits used to identify the end of a data block. The default is 1
<b>Flow control</b>	The signal type ( <b>None</b> or <b>RTS/CTS</b> ) used to pause and resume data transmission. The default is <b>None</b> .

**Table 13. Receiver: RS232 settings**

## Additional OSD options

<b>OSD access</b>	Assign a keyboard shortcut for accessing the on-screen display (OSD).
<b>Enable link redundancy</b>	Enable this option to ensure network uptime. In case of network failure, your device will automatically switch to a secondary network path. If you need to disable the <b>Enable link redundancy</b> option, make sure to disconnect the secondary network cable.
<b>Disable shutdown using power button</b>	To disable the power button on your device, enable <b>Disable power button</b> .
<b>Power recovery policy</b>	<p><b>Never start</b> – Never start your device after a power loss.</p> <p><b>Always start</b> – Always start your device after a power loss.</p> <p><b>Restore last state</b> – Always start and restore the last state of your device after a power loss.</p>
<b>Reboot transmitter</b>	Click this to reboot your Transmitter.
<b>Reboot receiver</b>	Click this to reboot your Receiver.

**Table 14. Receiver: more options**

## Input and output information

View the connection information of the devices (**Monitor**, **Microphone**, and **Line In**) connected to the selected Receiver.

## Details

Provides information (such as the model, serial number, firmware package version, and temperature) on your device, and provides the connection status and IP address of the device (connected through LAN).

## Get logs

Provides detailed logs that are useful for auditing and troubleshooting.

1. Click the **Get logs** button. The **Log files retrieval** dialog box will be displayed.
2. Insert a new USB mass storage stick device.  
**Note:** USB hard drives are not supported.
3. In the **Log files retrieval** dialog box, select this USB device from the **USB mass storage inventory** list as the location to save the log files.
4. Click **OK**. Zip files of the logs are created in the root folder of the USB device.

## Setting up networked mode

---

1. Install any transmitter cards.
2. Connect all of the cables from the UltraLink transmitters/receivers and your DHCP server to the Ethernet switch.
3. Power up the Ethernet switch and once it and the DHCP server are operational, power up the UltraLink devices.
4. Validate network discovery by verifying all devices have been assigned IP addresses by the DHCP server and are visible on the network.
5. Install UltraLink Device Manager software on a separate computer attached to the network.
6. Configure the UltraLink E-Series devices using the UltraLink Device Manager software.
7. Log into the receiver and confirm switching to different transmitters using the OSD.

### Networked mode guidelines

- If you operate on a private Wide Area Network (WAN), make sure you have the required bandwidth. For a private WAN to be supported, you should have Quality of Service (QoS) and a Virtual Private Network (VPN) tunnel. For additional details, contact Rose.
- When changing connections, ensure that all connectors are securely fastened.
- Only change the connections of Transmitters and Receivers that are turned off.
- Make sure UltraLink Device Manager software is installed on a separate computer which is connected to the network.
- Use the UltraLink Device Manager software to allow appropriate connections between Transmitters and Receivers. For more information, see the UltraLink Device Manager User Guide.
- Make sure all Transmitters and Receivers have firmware updated to the latest version (see [Updating UltraLink E-Series firmware](#)). The firmware must match the version of the UltraLink Device Manager software.
- A DHCP server is required to assign devices an initial IP address.
- With Windows Server 2016 and Windows Server 2008 R2, make sure the SSDP Discovery service, network discovery, and file sharing options are enabled.
- Review the product safety information provided (see [Safety](#)).

### Validating network discovery

UltraLink E-Series devices are initially assigned IP addresses through DHCP (Dynamic Host Control Protocol). After connecting and powering up the Transmitters and Receivers, verify that all have been discovered by the network.

- In Windows 10, click **Start > File Explorer** and select **Network**. Under **Other Devices**, make sure all the connected UltraLink E-Series devices are listed.
- In Windows 7, click **Start > Accessories > Windows Explorer** and select **Network**. Under **Other Devices**, make sure all the connected UltraLink E-Series devices are listed.

If prompted to enable network discovery and file sharing on the network when validating network discovery, enable these features by clicking on the prompt at the top of the Windows Explorer pane. UltraLink Device Manager software requires both features be enabled to detect UltraLink E-Series devices.

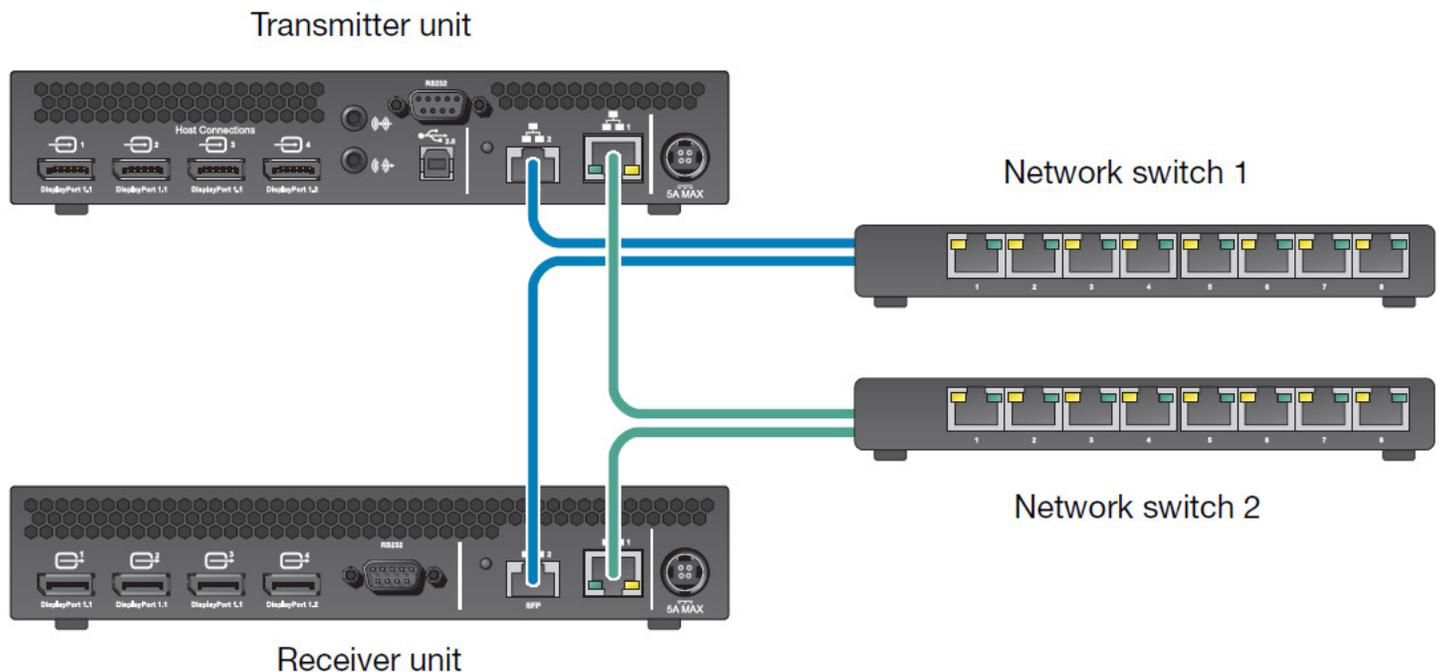
## Setting up link redundancy in networked mode

Link redundancy ensures UltraLink E-Series devices continue to work in case of a network switch or cable failure. Redundant Links can be employed for Networked mode devices and Point-to-point devices.

**NOTE:** Redundancy is not supported on Transmitter Cards.

### Networked mode Connection guidelines

- Make sure the UltraLink E-Series devices are all on the same subnet.
- Connect each UltraLink E-Series transmitter and receiver to a managed network switch pair. Cables from **LAN1** connectors should all connect to the same network switch, and cables from **LAN2** connectors should connect to the other network switch.
- Complete all connections before enabling the Link Redundancy Feature.
- For information on setting up network infrastructure and configuring network switches, contact the network administrator.



**Figure 28. Redundant Network Link Connections**

### Enabling link redundancy for Networked mode devices

1. Connect a second network cable between a device and a second network switch.
2. In the UltraLink Device Manager software, select the device, click **Network**, and then select **Enable link redundancy**.
3. The device will automatically reboot to start the redundant link.

### Disabling link redundancy for Networked mode devices

1. Disconnect the second network cable.
2. Verify that the device is still detected in the network.
3. In the UltraLink Device Manager software, select the device, click **Network**, and then deselect **Enable link redundancy**.

## **Installing Rose UltraLink Device Manager software**

UltraLink Device Manager software allows networked UltraLink E-Series equipment to be configured, managed, and monitored.

### **Supported operating systems**

UltraLink Device Manager supports the following operating systems: Windows® Server® 2016, Windows® 10 (64-bit), Windows® Server® 2008 R2, and Windows® 7.

### **Obtaining UltraLink Device Manager software**

To obtain the latest UltraLink Device Manager software, go to [www.rose.com/products/ultralink-e-series](http://www.rose.com/products/ultralink-e-series) or contact your Rose Electronics representative.

### **Installing UltraLink Device Manager software**

Run the installation program on any computer on the network with one of the supported operating systems and follow the on-screen instructions.

**Note:** Only one instance of UltraLink Device Manager software needs to be installed.

### **Accessing the UltraLink Device Manager software interface (Windows 7/10)**

- Windows 10 or 7 – Easiest way is to type ultralink into the search bar and choose the ultralink app
- Optionally add an icon to your taskbar or desktop

### **Configuring UltraLink Device Manager software**

The UltraLink Device Manager software must be configured in order to access and use the OSD. For information on how to use and configure the UltraLink Device Manager software, see the UltraLink Device Manager User Guide.

## Accessing the OSD in networked mode

For devices connected in Networked mode, the OSD enables Receiver log in and switching to Transmitters. The OSD is available on UltraLink E-Series Receivers. To display the OSD, enter the OSD keyboard shortcut on the keyboard connected to the receiver. The default keyboard shortcut is the ScrollLock key.

**Note:** To use the OSD and enable networked mode, make sure to obtain a user name and password from the network administrator. For more information, contact the UltraLink E-Series network administrator.

## Enabling networked mode

**Note:** To change the operation mode from networked mode to point-to-point mode and vice-versa, a configuration reset of the devices must be performed (see [Changing the operation mode of your devices](#)).

Using **Networked mode** requires a user name and password. To obtain a user name and password, contact the UltraLink E-Series network administrator.

## Changing the OSD keyboard shortcut

The keyboard shortcut used to access the OSD can be changed through the UltraLink Device Manager software. For more information, see the UltraLink Device Manager User Guide.

## Basic OSD functions

<b>Logout</b>	Click this to log out of the device.
<b>Search</b>	Search for a system by device serial number, user-friendly name, IP address, or the name of the user currently connected.
<b>Configure aggregator mode</b>	Use this to configure aggregator mode layout, steams, and audio. For more information, see <a href="#">Aggregator Mode</a> .
<b>Wake-on-LAN</b>	Click this to wake up the Transmitter if it turns off. This has no effect if a Transmitter is not detected.
<b>Rescan network</b>	Click this to discover devices outside of the Receiver's subnet or unicast network
<b>Disconnect</b>	Click this to disconnect from a Transmitter.
<b>Connect</b>	Click this to connect to a Transmitter.
<b>Close</b>	Click this to close the OSD

**Table 15. Basic OSD functions in networked mode**

## OSD Sources tab in networked mode

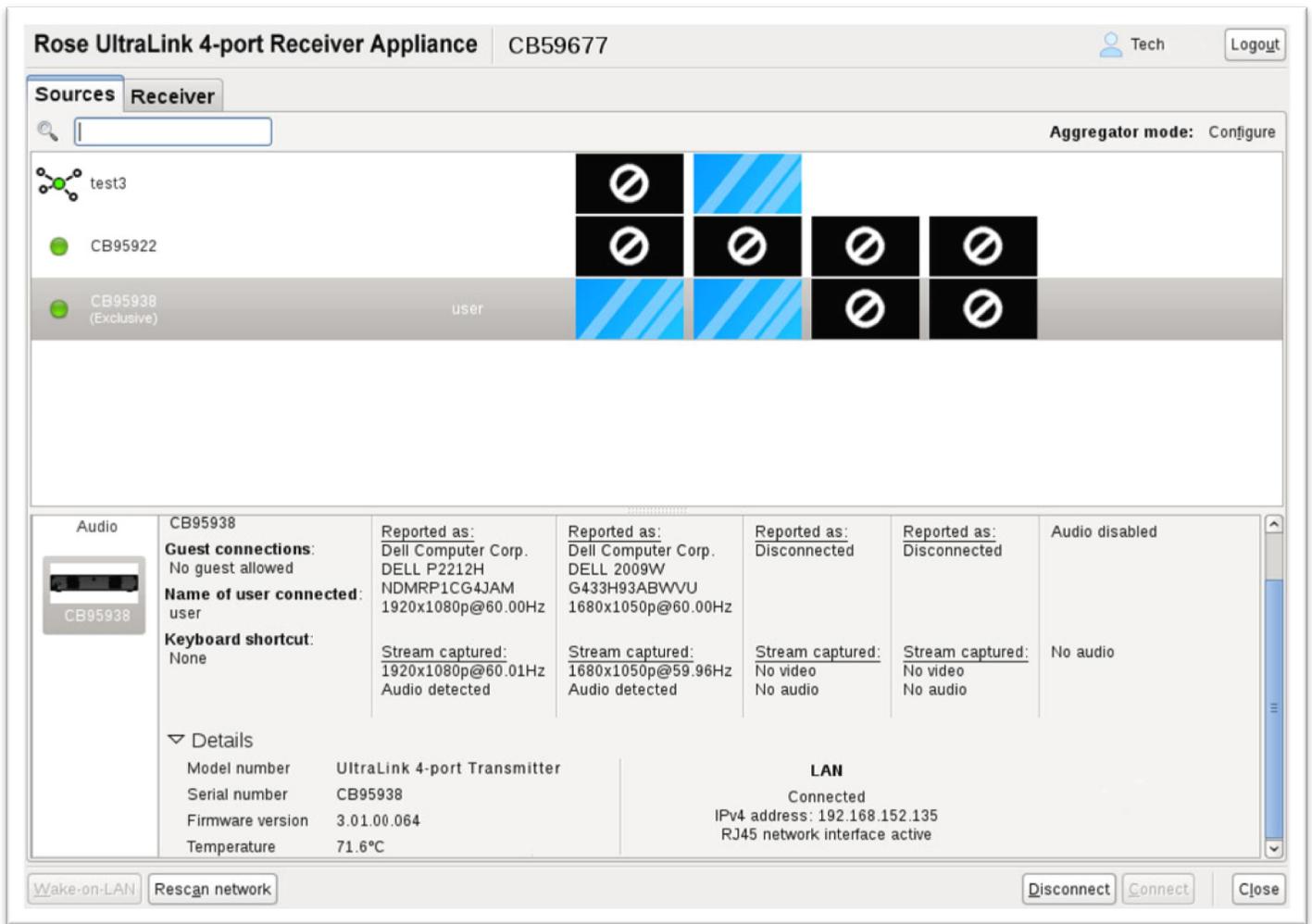


Figure 29. OSD Sources tab in networked mode

For the transmitters to be displayed in the Sources tab, an allowed connection must first be set between your UltraLink E-Series transmitter and receiver (see the UltraLink Device Manager User Guide). To view information about a source, select the Sources tab and select a transmitter

### Switching to a different transmitter

1. Select the transmitter in the Sources pane.
2. Click **Connect**.

### Transmitter status

View the status information of the selected Transmitter (Name, Guest connections, User connected, and keyboard shortcut).

### Inputs

View the connection information of devices on the selected transmitter (Monitor, Microphone, and Line In).

### Details

This area provides information about the device (model, serial number, firmware package version, and temperature) and the connection status and IP address of the device (connected through **LAN1** or **LAN2**).

## OSD Receiver tab in networked mode

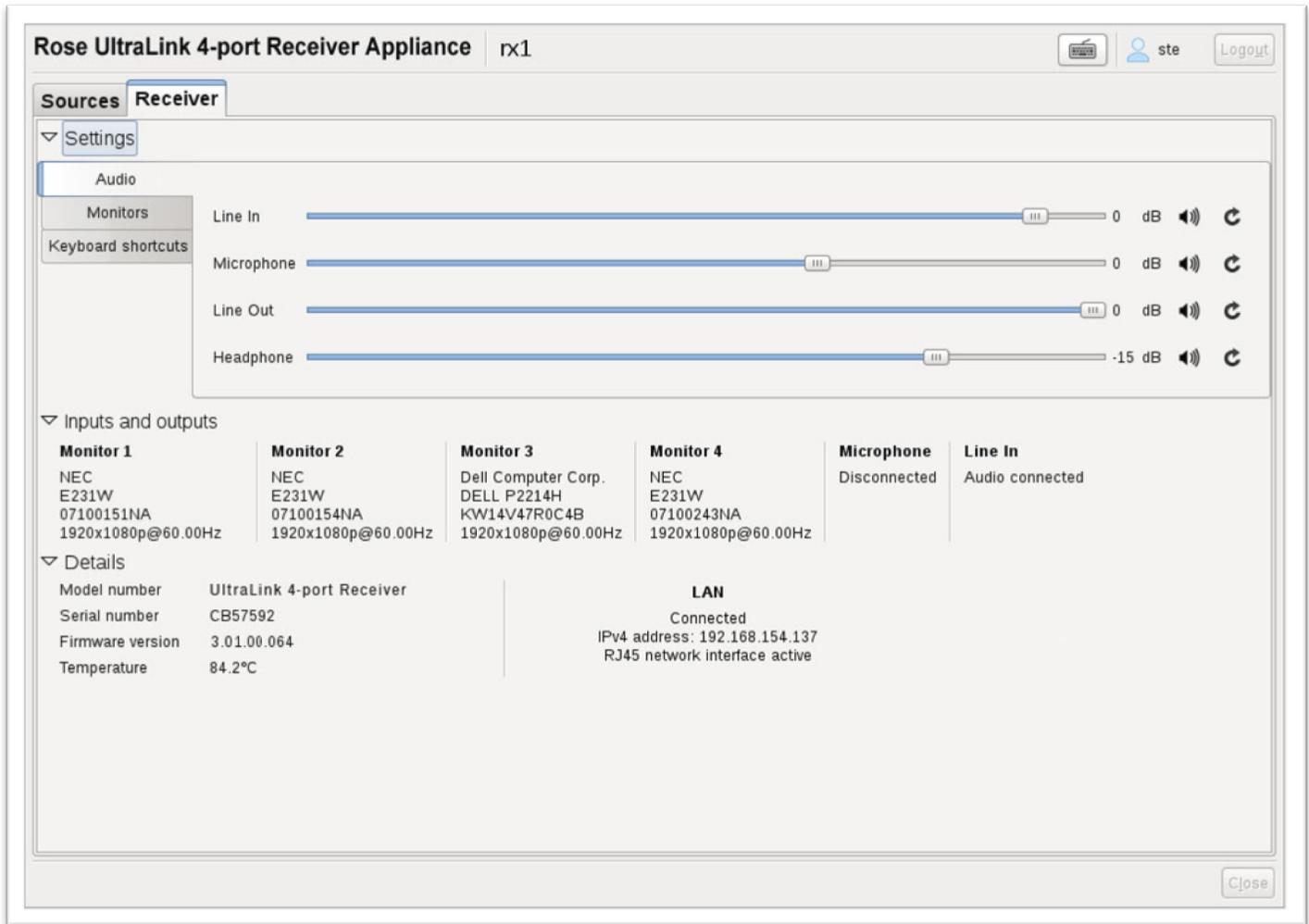


Figure 30. OSD Receiver tab in networked mode

### Settings

<b>Audio</b>	Control the settings of analog audio inputs and outputs (Line in, Microphone, Line Out, and Headphone)
<b>Monitors</b>	<b>Aggregator mode only</b> – To change a monitor layout for aggregator mode, click <b>Change monitor layout</b> . Use the arrow buttons to pivot the OSD left or right.
<b>Keyboard shortcuts</b>	<b>Aggregator mode only</b> – Keyboard shortcuts enable switching the mouse focus to a specific display (for example, 1, 2, 3, or 4) in the monitor layout.

### Inputs and outputs

View the connection information of the devices (**Monitor**, **Microphone**, and **Line In**) connected to the selected Receiver.

### Details

This area provides information about the Receiver (model, serial number, firmware package version, and temperature) and the connection status and IP address of the device (connected through **LAN1** or **LAN2**).

## Aggregator Mode

With Aggregator mode, UltraLink E-Series receivers can display video streams from multiple Transmitters in a single layout.

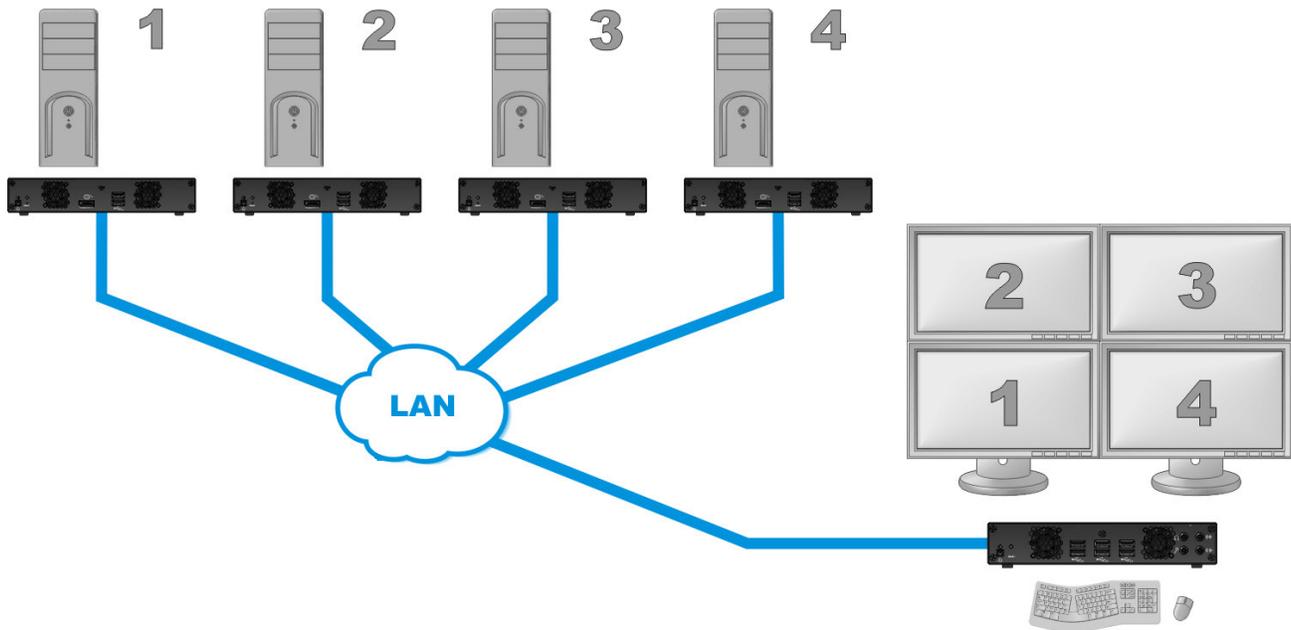


Figure 31. Aggregator mode

Aggregator prerequisites:

- Make sure the **Fixed EDID** option is enabled. Aggregator mode requires **Fixed EDID**.
- Audio configuration – Review the computers' Windows® audio settings to determine which DisplayPort output is configured to use audio. Depending on the audio configuration, the following should be considered:
  - Digital audio to displays with speakers: Make sure the computers are using the video output of the graphics card as the sound source.
  - Digital audio to analog (**Headphone** or **Line Out**) – In the UltraLink Device Manager software, select a Receiver and proceed to the **Audio** page. Make sure you select the proper **Headphone audio source** and **Line Out audio source** for the **Video in** of the Transmitter.
  - Analog audio (**Line In**) – Verify where the desired **Line In** is coming from (for example, **Line In** from the Transmitter going to monitor 1, 2, 3, or 4), or if you want **Line In** to follow the mouse position.
- USB switching – By default, the mouse can be used to switch between sources. Keyboard shortcuts can also be used to switch sources. To use **ONLY** keyboard shortcuts (no mouse), select the Receiver in the UltraLink Device Manager software, go to the **Keyboard shortcuts** page, and enable the option **"Use only keyboard shortcuts (no mouse) for USB switching"**.
- Dynamic sources - The Transmitter source (stream from a computer) displayed on a monitor attached to a Receiver in aggregator mode can be dynamically changed. This enables easy access to different computers without affecting the streams going to the other displays.
  - Only one monitor can be selected for dynamic sourcing in aggregator mode. The other monitors must be assigned to fixed sources.
  - Dynamic sources feature is only supported while aggregator mode is in use.

## Configuring aggregator mode

1. Create the monitor layout.

Select the OSD **Receiver** tab, then click **Monitors**, and then click **Change monitor layout**. A dialog box will be displayed.

Select a layout for the monitors, then drag the displays into the layout, and click **OK**.

2. Select the **Sources** tab, locate **Aggregator mode**, and click **Configure**.

3. Next to **Layout name** enter a name for the monitor layout.

4. Select the video streams:

To enable a display for dynamic sources, click the box representing the display in the aggregate layout under **Add video streams** (only one display can be assigned to show dynamic sources).

Click a tile representing a video stream on the left side of the menu and drag it to the appropriate display number under the **Add video streams** caption. Repeat this process for each stream to be added to the layout.

Click **Apply**.

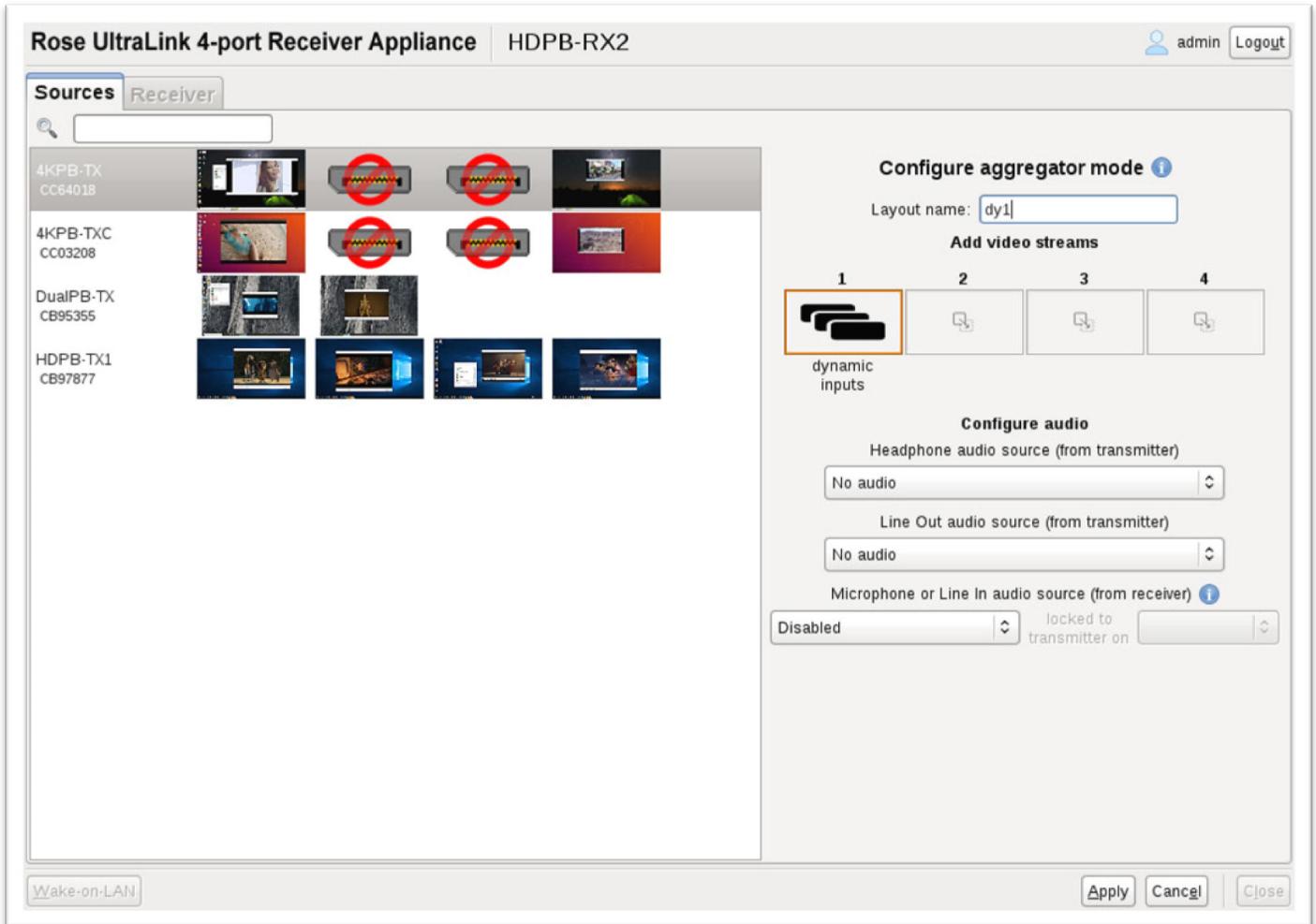
Connect to the aggregate. The dynamic sources display box will appear dark, and the others will show a thumbnail of their selected video stream. The input for the dynamic source display has not yet been selected.

Select a stream from the **Dynamic sources** tab that now appears between the **Sources** and **Receivers** tabs, and click **Connect**. For more information, see [Switching between dynamic sources](#).

5. Configure the analog audio source for the aggregate streams by selecting the appropriate options for **Headphone**, **Line Out**, and **Source destination**. For more information, see [Appendix D – Configuring your audio settings](#).

**Note:** Performing step 5 may overwrite audio settings made through the UltraLink Device Manager Software. If audio was previously configured with the software, skip this step.

6. Click **Apply**.



**Figure 32. Creating an Aggregate Mode Layout**

Remove a video stream from the monitor layout by:

- Right-clicking the video stream icon in the layout.
- Dragging the video stream icon and dropping it anywhere outside of the layout.

## Removing a layout

To remove a layout, use the following steps:

1. In the Sources tab, select from the list the aggregator mode layout to remove.
2. To the right of the label **Aggregator mode** click **Remove**.
3. When prompted, click **OK** to permanently remove the layout.

## Switching between dynamic sources

The dynamic source in an aggregator mode grouping can be changed as frequently as necessary.

1. Open the OSD and click the **Dynamic sources** tab. The tab shows all the source streams from accessible Transmitters. Each source is displayed as a preview image, the name assigned to the Transmitter, and the source input number. If a Transmitter has a single available source, the input number is omitted.
2. Select a stream. To find a stream from a large list, use the search box.
3. Click **Connect**. The stream is now displayed on the monitor selected for dynamic sources.

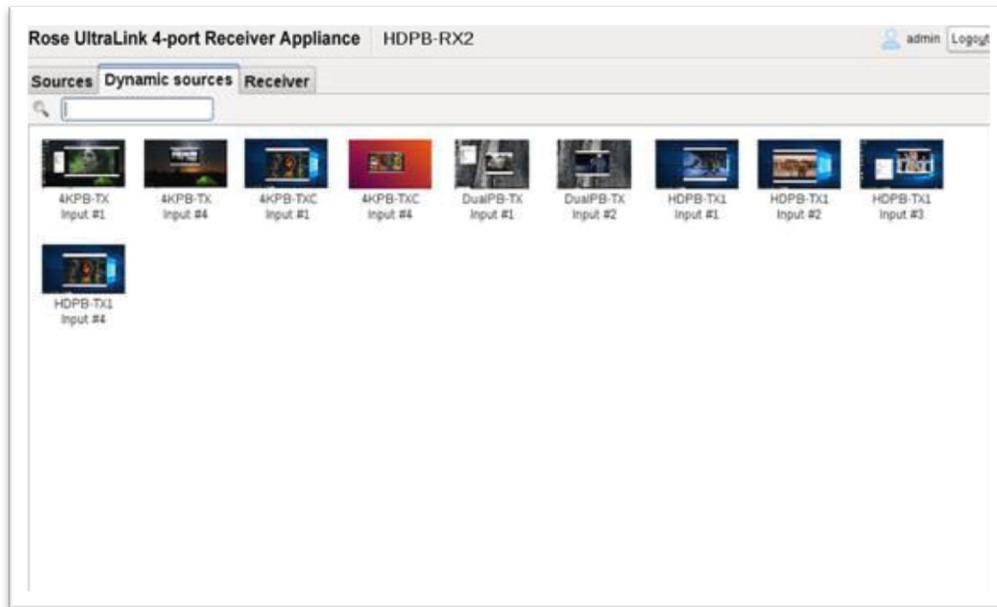


Figure 33. OSD Dynamic Sources Tab

## Disconnecting dynamic sources

To disconnect from a currently displayed dynamic source, display the OSD **Dynamic sources** tab, and click **Disconnect**. Disconnecting a dynamic source has no effect on the streams to the other fixed display monitors.

## Keyboard shortcut for the OSD Dynamic sources tab

The default shortcut key combination to immediately display the OSD **Dynamic sources** tab is [Right Shift] + [Scroll Lock]. The shortcut keys can be changed from the default, using the UltraLink Device Manager software. For more information, see the UltraLink Device Manager User Guide.

## Rebooting or resetting your UltraLink devices

This section describes how to reboot or perform a configuration reset of your UltraLink E-Series card or appliance

### When to reboot or reset your device

What to do ...	When to do it ...	What the result is ...
<b>Software reboot (UltraLink Device Manager)</b>	Your device has encountered an error (red device tile)	Keeps all of your device settings, including the IP configuration and password
<b>Software reboot (OSD in point-to-point mode only)</b>		
<b>Hardware reboot</b>	Your device is listed as unresponsive (yellow device tile). UltraLink Device Manager software is unresponsive, and you can't perform a software reboot	Keeps all of your device settings, including the IP configuration and password.
<b>Configuration reset</b>	Your device is still listed as unresponsive (yellow device tile) after a hardware reboot. You're changing the operation mode of your device.	Resets all of your device settings, including the IP configuration and password.

Table 16. Reboot or reset the UltraLink

### Software reboot using the UltraLink Device Manager

From the UltraLink Device Manager main interface, click the **Reboot** button to reboot the device.

For more information on UltraLink Device Manager software, see the UltraLink Device Manager user guide.



Figure 34. UltraLink Device Manager software reboot interface

### Software reboot using the OSD (point-to-point mode only)

From the OSD main interface, click **Reboot transmitter** to reboot the transmitter, or **Reboot receiver** to reboot the receiver.

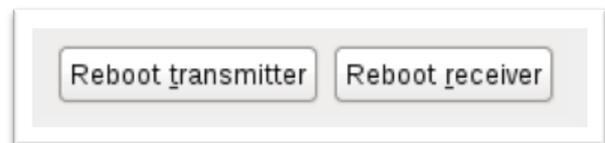


Figure 35. OSD software reboot interface

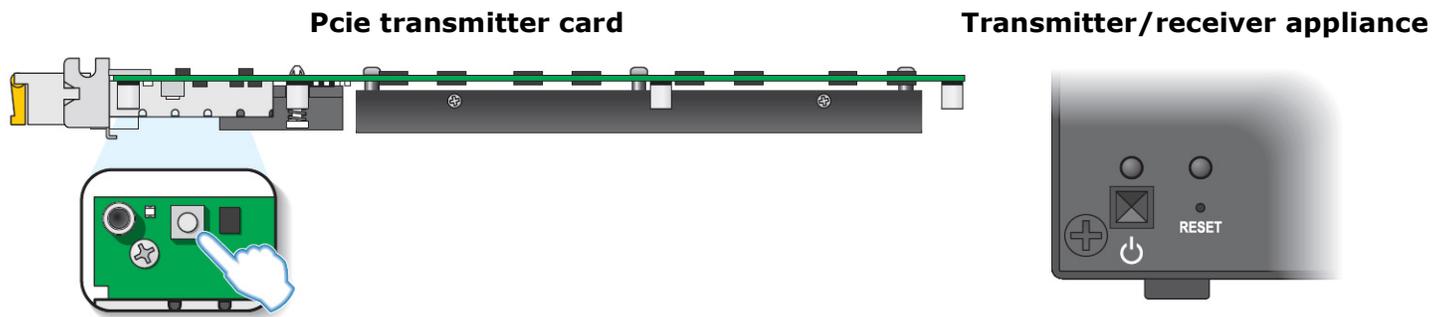
## Hardware reboot or configuration reset using the reset switch

**Warning:** A configuration reset restores the default settings of the UltraLink E-Series device. This resets all of the device settings, including the IP configuration and password.

**Warning: Point-to-point mode** – Performing a configuration reset on a Receiver also resets the configuration of the connected Transmitter.

**PCIe transmitter Card** – You must open the computer case to access this switch. It is located on the main component side toward the connector panel. When you press the switch, observe the status LED next to the switch for visual feedback about pressing the switch.

**Transmitter/receiver appliance** –The switch is recessed behind the small hole labelled RESET on the front of the unit. You must use the tip of a paper clip to access this switch. When you press the switch, observe the power LED above the power switch for visual feedback about pressing the switch.



**Figure 36. Reset switch location**

**Hardware reboot** – Press the **Reset** button for one second (the LED turns slow blinking green) to reboot the device.

**Configuration reset** – Press and hold the **Reset** button for about 5 seconds (until the LED turns fast blinking green) to reboot the device and restore the default settings.

## Changing the operation mode of your devices

To change the operation mode of your UltraLink product (changing from networked mode to point-to-point mode, or vice versa), do the following:

1. Disconnect the network cables from the Transmitter device and Receiver devices.
2. Perform a configuration reset on the Transmitters and Receivers (see [Rebooting or resetting your UltraLink devices](#)).
3. Change the connection setup of your devices.
4. Reboot both the Transmitter and Receiver products (see [Rebooting or resetting your UltraLink devices](#)).
5. Networked mode – use UltraLink Device Manager software to configure your devices by adding user-id and password, enable connections in the Connection Broker, and then login with that user-id and password from the OSD (see the UltraLink Device Manager User Guide). See [Accessing the OSD in networked mode](#) for more details.

Point-to-Point mode – use the OSD to enable point-to-point mode and then optionally configure further from the OSD. See [Setting up point-to-point mode](#) for more details.

## Updating UltraLink E-Series firmware

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**Note:** Your UltraLink E-Series products may ship with an older firmware version. Before using the UltraLink products, you must update the firmware version installed on the devices to use the version of your deployed release. All UltraLink E-Series devices must use the same version of the firmware.

Before you update any firmware, please read the following guidelines:

- Make sure your firmware installation computer has at least 1 GB of free disk space available.
- To avoid possible problems with the UltraLink, we recommend running only one instance of the firmware updater on the network at a time.
- Make sure you're running the latest version of the UltraLink E-Series Firmware Updater.
- Make sure Microsoft .NET Framework version 4.5.x is installed on the computer.
- Make sure you have a DHCP (Dynamic Host Configuration Protocol) server on the network. The firmware updater requires constant IP addresses to update the devices properly. Since the firmware updater requires a device to reboot multiple times, make sure the DHCP server maintains the IP address of a device when it reappears on the network. Otherwise, we recommend assigning fixed IP addresses to the devices.
- Close any programs that may be running (such as the UltraLink Device Manager).
- If the system doesn't have access to a DNS server, temporarily configure the system to use a fixed IP address (such as local host - 127.0.0.1) as its DNS server. Otherwise, the firmware update process may take a long time to complete.

### **Firmware update procedure – point-to-point mode**

You can update the firmware of a single transmitter, or of a transmitter and receiver pair (in point-to-point mode) using the USB connection between your host system and the transmitter.

#### **1. Download and extract the firmware package**

Download the latest firmware package and extract the files to a local folder on your host system (the system connected to your transmitter).

#### **2. Run the *Updaterfromhost* file**

On your host system, browse to the folder containing the extracted files, then run the *Updaterfromhost.exe* file.

**Note:** To update the firmware, the *Updaterfromhost.exe* file installs a USB mass storage device on the Transmitter. On certain systems, the Group Policy Object (GPO) may prevent the *Updaterfromhost.exe* file from installing the USB mass storage device. To allow the installation of this UltraLink E-series device, you may need to apply an exception to your GPO rules. For more information on modifying your GPO rules, contact your system administrator.

#### **3. Update the firmware**

Make sure the devices you want to update are listed in the program window. Devices that require an update are listed with a green status bar. Click **Update** to update your devices. Wait while the devices are being updated (up to 20 minutes).

## Firmware update procedure – networked mode

Please check with Rose Electronics for the latest firmware updater package available for the UltraLink E-Series products. **Note:** *If you're using networked mode, make sure the firmware version matches the version of the UltraLink Device Manager software installed on your controller system.*

### 1. Download the latest firmware package

Download the latest firmware package and extract the files to a local folder on your computer which is attached to the network and from which you are doing the firmware update. If you are using UltraLink Device Manager then that computer is ideal for this update procedure.

### 2. Run the Updater Over Network program

Browse to the folder containing the extracted files, then run the **UpdaterOverNetwork.exe** file

The procedure to update is first to **Search for devices** using **Automatic detection** (try this first) or **Manual detection** and to answer the **Authenticate** dialog that is presented. The panel on the right will be populated with the devices that are found, showing their details. The message bar at the bottom details the number of devices found and if they are a candidate for update. Devices which have the latest firmware already will not be candidates for update.

Once you are satisfied that the devices are correct and you are ready for the update, click **Stop** and skip ahead to **Update selected devices** in step 6. Otherwise, details on searching and authentication are explained further in steps 3, 4, and 5.

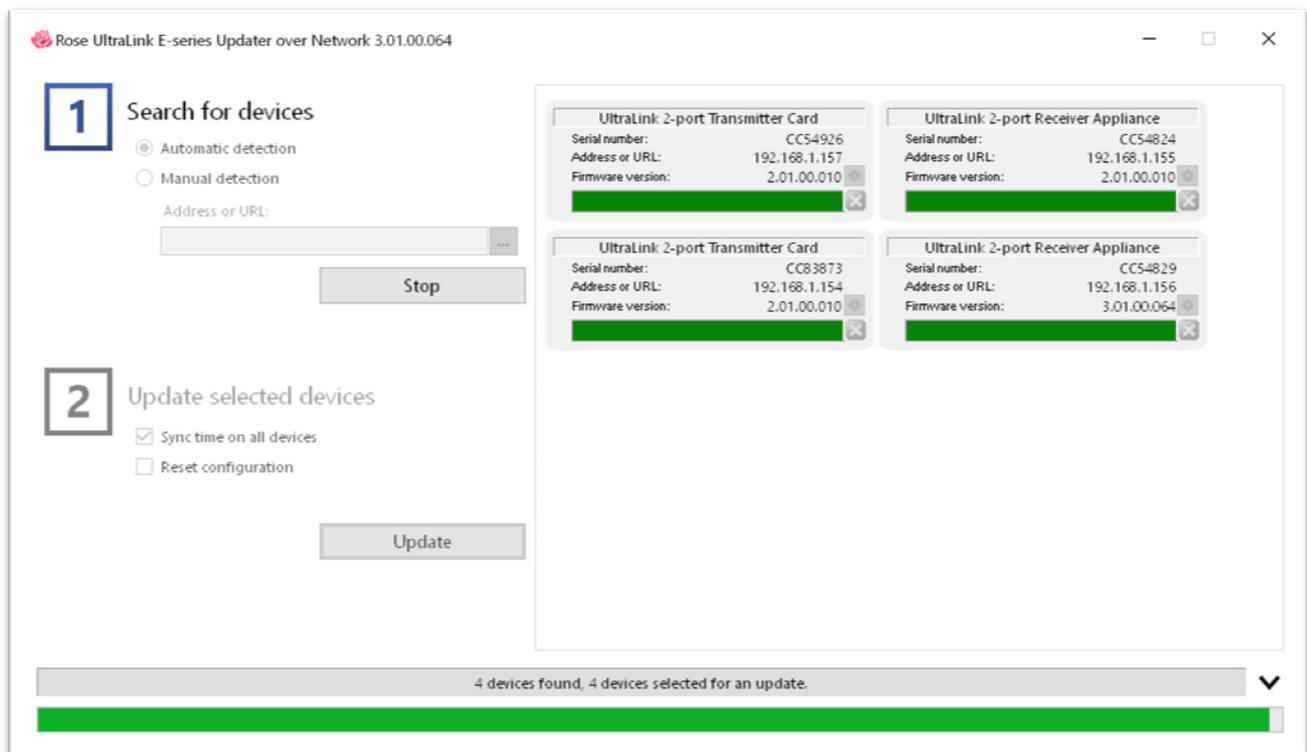


Figure 37. Update firmware – Devices found after automatic search and authentication

### 3. Using automatic detection

To search for devices on your subnet, using **Automatic detection**, click **Search**.

Wait while the Updater finds the devices and answer the authentication dialog detailed in step 5.

If the devices are present on your subnet, then all devices should be found. If your network is more complicated than a simple subnet you may need to use the manual detection method in step 4.

### 4. Using manual detection

If devices aren't automatically detected, you can manually locate one or more devices using their IP addresses. Select **Manual detection**, and below **Address or URL** enter the IP address of each device you want to locate.

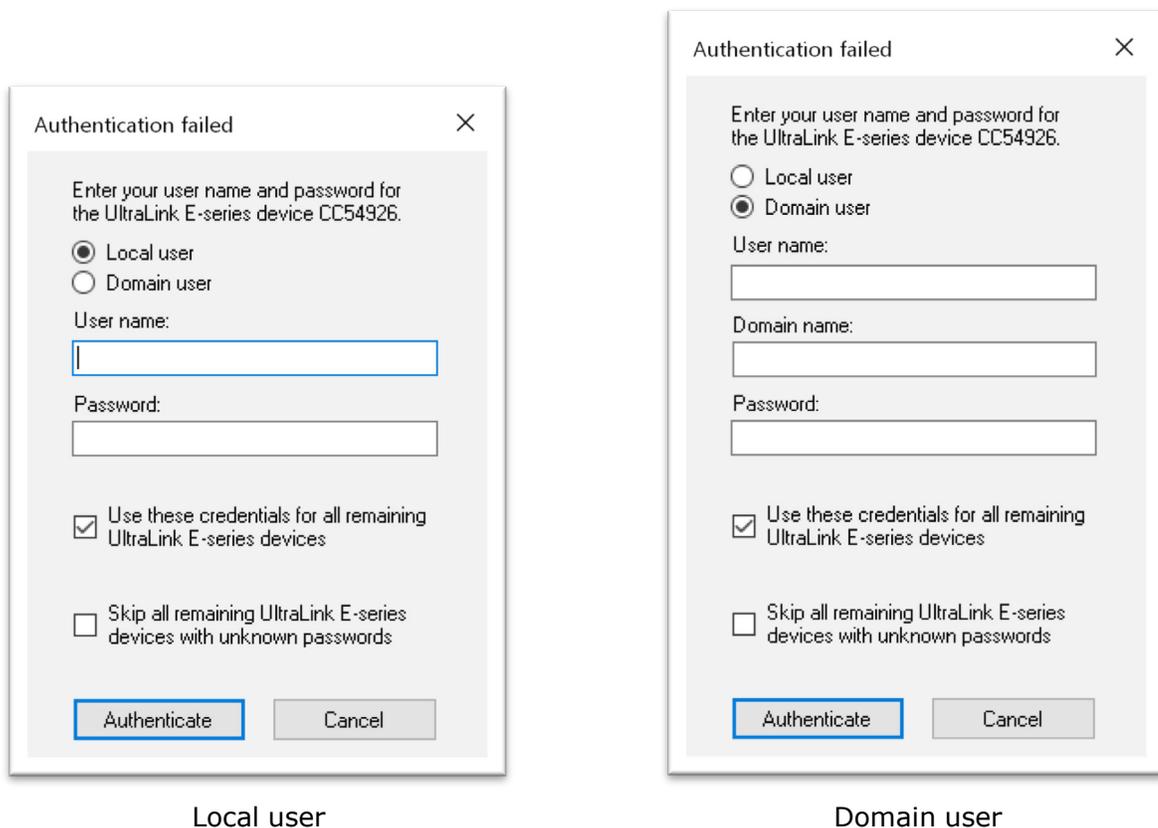
If you're entering multiple addresses, separate each address with a space. You can also enter the addresses or URLs by click the browse button and clicking one IP address per line. When you're done entering the addresses or URLs, click **Apply**. To discard the last changes made, click **Cancel**.

To start searching, click **Search**. Wait while the Updater finds the devices and answer the authentication dialog in step 5

### 5. Authenticate the devices found

If you provided a password for the UltraLink E-series devices, you may be prompted to authenticate the devices found.

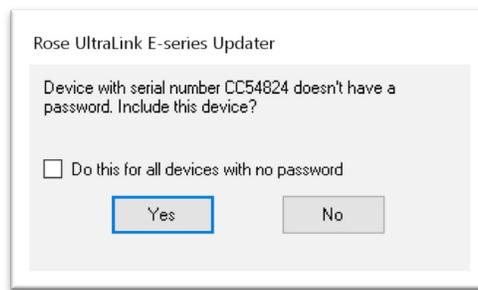
- If you're prompted, enter your credentials for the devices found:
  - **Local user** – Enter your user name and password.
  - **Domain user** – Enter your user name, the domain name of the server, and your network password.



**Figure 38. Update firmware – Authentication dialog for devices with a password**

- If you're updating multiple devices, enable the **Use these credentials for all remaining devices** check box.
- If you don't know the password of some of the devices on your network, enable **Skip all remaining devices with unknown passwords**. Enabling this option ignores the devices that don't use any of the passwords already entered. Any skipped devices won't be available for update.
- When you're done, click **Authenticate**.

**Note:** If a configuration reset of the device was performed, the device password was also reset. The device will be detected as having no password. In this case you'll be prompted to add the device to the list of devices to update. When prompted, click **YES**.



**Figure 39. Update firmware – Authentication dialog for devices without a password**

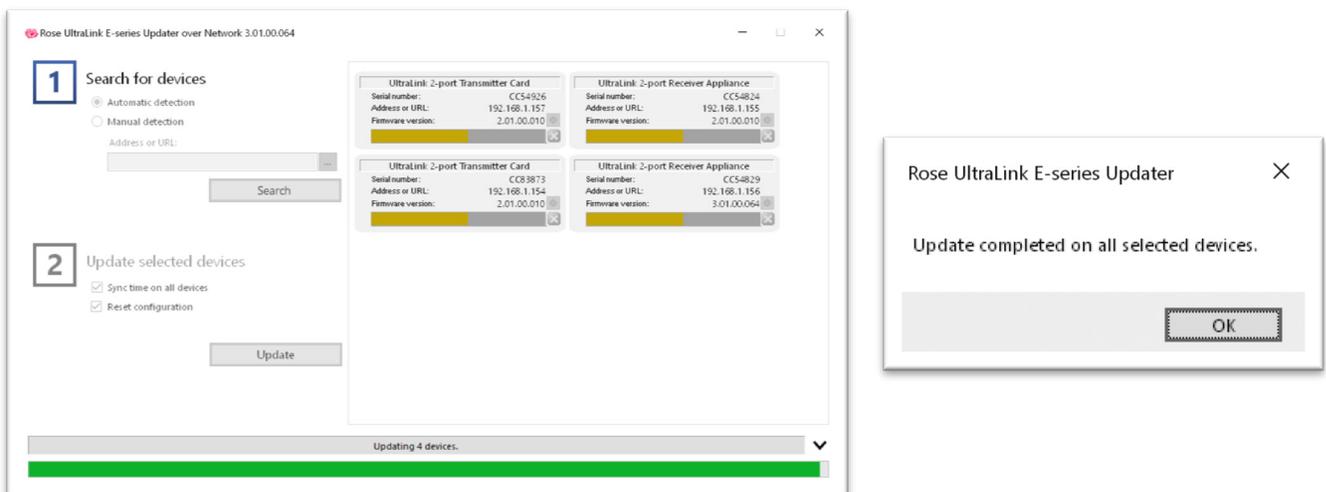
## 6. Update selected devices

If you want to sync the date and time of your device with the date and time of your system, enable **Sync time of all devices**.

If you want to reset device settings, including the IP address, while updating the firmware, enable **Reset configuration**.

To update the firmware of your devices and apply any changes made to your configuration, click **Update**. Wait while the devices are being updated. The green bars turn gold colored and show progress. The process takes about 15 minutes or so. When complete, bars turn from gold to green and update complete message appears.

For more information on the device update process, click **Show log** at the bottom of the program window.



**Figure 40. Update firmware – Update in progress and update complete message**

## Troubleshooting

### What to do if you have a problem

- Make sure your device is properly installed, you're using the correct connectors, and that all connectors are properly fastened.
- Try rebooting or resetting your device (see [Rebooting or resetting your UltraLink devices](#)).
- Make sure you have administrator rights on the system you want to use. For more information, see Windows documentation.
- For more information on problems related to the UltraLink Device Manager software, see *the UltraLink Device Manager User Guide*.
- Consult the firmware release notes. See [Appendix F – Firmware release notes version 3.01.00](#)

If your problem persists, contact Rose Electronics

### Common problems and solutions

This section addresses specific problems for your UltraLink product that could prevent you from using your system or product.

#### Problem: After changing operation mode, the UltraLink doesn't work

Cause	Your device may be trying to use settings that no longer exist
Solution	Try performing a configuration reset on your devices. A configuration reset restores the default settings of your device. For more information, see <a href="#">Changing the operation mode of your devices</a> .

#### Problem: The device is not discovered on the network

<b>Cause</b>	Your product may not be properly installed or connected
Solution	Verify the connection and status LEDs on your product (see <a href="#">Validating network discovery</a> ). Also, make sure your product is properly installed or connected, and that all connectors are properly fastened.
<b>Cause</b>	<b>Windows Server 2016/2008R2 only</b> – The Windows SSDP Discovery service may be disabled on your system
Solution	Make sure the SSDP Discovery service is enabled on your system
<b>Cause</b>	Network discovery and file sharing may not be enabled on your system
Solution	Enable network discovery and file sharing on your system
<b>Cause</b>	The firewall for your system or for your network may be enabled and may prevent communication with your devices
Solution	Make sure your firewall is properly configured to allow the necessary communication between your devices and the various networked components. For more information, see <a href="#">Appendix C – Firewall requirements</a> .

#### Problem: Screen image defects appear (example: image corruption or blocks)

<b>Cause</b>	Temporal dithering may be enabled on some GPUs
Solution	Configure your GPU settings so that the output's color format is set to RGB and the dynamic range is set to the highest level. For more information, see the documentation of your GPU

**Problem: Random display flickering occurs while using a point-to-point connection**

<b>Cause</b>	Your video output is unstable, or you may be using a fixed frequency monitor
<b>Solution</b>	Point-to-point mode only – In the OSD, click <b>Settings &gt; Monitors</b> . Make sure the <b>Stabilize display output</b> option is enabled

**Problem: Random display flickering occurs, or on-screen message (“Frame rate conversion or video scaler on”, “Frame rate conversion on”, or “Video scaler on”) appears**

<b>Cause</b>	Your video input and output are not at the same resolution or refresh rate
<b>Solution</b>	<b>Point-to-point mode</b> – In the OSD, click <b>Settings -&gt; Monitors</b> . Make sure the <b>Stabilize display output</b> option is enabled.

## Safety

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The UltraLink E-Series product, like all electronic equipment, should be used with care. To protect yourself from possible injury and to minimize the risk of damage to the Unit, read and follow these safety instructions and also review your warranty for more information.

- Follow all instructions and warnings marked on the products.
- Except where explained in this manual, do not attempt to service the products yourself.
- Do not use the products near water.
- Assure that the placement of the products is on a stable surface.
- Provide proper ventilation and air circulation.
- Keep connection cables clear of obstructions that might cause damage to them.
- Use only power cords, power adapter and connection cables designed for the products.
- Keep objects that might damage the products and liquids that may spill, clear from the products. Liquids and foreign objects might come in contact with voltage points that could create a risk of fire or electrical shock.
- Do not use liquid or aerosol cleaners to clean the products. Always unplug the products from the power source before cleaning.

Don't attempt to open or repair a power supply unit. Remove power from the Unit and refer servicing to a qualified service center if any of the following conditions occur:

- The connection cables are damaged or frayed.
- The Unit has been exposed to any liquids.
- The Unit does not operate normally when all operating instructions have been followed.
- The Unit has been dropped or the case has been damaged.
- The Unit exhibits a distinct change in performance, indicating a need for service.

### Safety – Installation and operation

- Read and retain all instructions. Only use your product according to the instructions, operating ranges, and guidelines provided in the product user guide. Failure to follow these instructions could result in damage to your product or injury to the user or installer.
- Don't expose your product to rain, water, condensation, or moisture.
- Your product (card or appliance) can become hot while operating. Always turn off your computer, unplug it, and then wait for it to cool before touching any of the internal parts of your computer or installing your PCIe card. Allow hot surfaces to cool before touching your product.
- Static electricity can severely damage electronic parts. Before touching any electronic parts, drain static electricity from your body (for example, by touching the metal frame of your computer).
- When handling a card, carefully hold it by its edges and avoid touching its circuitry.
- Don't stack devices or place devices so close together that they're subject to recirculated or preheated air.
- Don't operate your system or product near a heat source or restrict airflow to your system, and make sure the ambient temperature doesn't exceed the maximum recommended temperatures. Don't block ventilation holes on your unit or system.

## **Safety – if a power supply (internal or external) was included with your product**

- Don't place the external power supply directly on top of the device.
- Only use power supplies originally supplied with the product or use a replacement that's approved by Rose Electronics. Don't use the power supply if it appears to be defective or has a damaged housing.
- Don't defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug doesn't fit into your outlet, consult an electrician to replace the obsolete outlet.
- Make sure that nothing rests on the power cables and that the cables aren't located where they can be stepped on, pinched, or tripped over.
- Don't use damaged power cables.
- Unplug your system or device during lightning storms or if unused for long periods of time.

## **Safety - If your product includes laser-based technology**

- The device contains a Class 1 laser product for use only under the recommended operating conditions and guidelines. For more information, see your product user guide.
- Invisible laser radiation may be emitted from disconnected fibers or connectors. Don't stare into beams or view directly with optical instruments.
- Only use optical transceivers originally supplied with the product or use a replacement that's approved by Rose Electronics.
- For more information on laser support and compliance, see your product user guide.

## **Safety - if your product includes a battery**

- The battery is non replaceable.
- To dispose of your product, contact Rose Electronics.

## Maintenance and Repair

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The products do not contain any internal user-serviceable parts. In the event a Unit needs repair or maintenance, you must first obtain a Return Authorization (RA) number from Rose Electronics or an authorized repair center. This Return Authorization number must appear on the outside of the shipping container.

See Limited Warranty for more information.

When returning a Unit, it should be double-packed in the original container or equivalent, insured and shipped to:

Rose Electronics

Attn: RA\_\_\_\_\_

10707 Stancliff Road

Houston, Texas 77099 USA

## Technical Support

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If you are experiencing problems, or need assistance in setting up, configuring or operating your products consult the appropriate sections of this manual. If, however, you require additional information or assistance, please contact the Rose Electronics Technical Support Department at:

Phone : (281) 933-7673

E-mail : [TechSupport@rose.com](mailto:TechSupport@rose.com)

Web: [www.rose.com](http://www.rose.com)

Technical Support hours are from: 8:00 am to 6:00 pm CST (USA), Monday through Friday.

Please report any malfunctions in the operation of the products or any discrepancies in this manual to the Rose Electronics Technical Support Department.

# APPENDICES

## Appendix A – Specifications

<b>Cables (maximum distance in point-to-point mode)</b>	
Cat5e, CAT6	328 ft (100 meters)
OM2, OM3, OM4 (50/125µm)	1,805 ft (550 meters) multimode cable
OM1 (62.5/125µm)	902 ft (275 meters) multimode cable
OS1, OS2 (9/125µm)	3.10 miles (5 Km) single mode cable
<b>External power supply (Appliance models only)</b>	
Input AC voltage range	100V to 240V
Input frequency	50 to 60Hz
Input connector	IEC 60320-C14
Output voltage	+12V DC, 5A
Output connector	DIN 4-pin male with lock
Maximum power	60W
<b>Environmental</b>	
Temperature, operational	32°F to 104°F (0°C to 45°C)
Temperature, storage and transport	-40°F to 158°F (-40°C to 70°C)
Humidity operational (indoor)	20-80% non-condensing
Humidity, storage and transport	5-95% non-condensing
Atmospheric pressure, operational	660hPa (3,000 meters / 9,842 feet) to 1013hPa (0 meters / 0 feet)
Atmospheric pressure, non-operational	192hPa (12,000 meters / 39,370 feet) to 1020hPa (-50 meters / -164 feet)
<b>Regulatory compliance</b>	
Approvals	Class A: CE, FCC, ICES-3, KC, RCM, VCCI

<b>PCIe transmitter card specifications</b>	<b>2-port Transmitter Card</b>	<b>4-port transmitter card</b>
Product type	PCIe card (x8 electrical and mechanical, x16 mechanical)	PCIe card (x8 electrical and mechanical, x16 mechanical)
Form factor	Full height, ¾ length	Full height, ¾ length
Video input connectors	2× mini DisplayPort	4× mini DisplayPort
DisplayPort 1.1	Yes	Yes
DisplayPort 1.2	No	Yes, on connector #4 only
Color space	YUV 4:4:4, RGB 8:8:8	YUV 4:4:4, RGB 8:8:8
Networking interface	1000BASE-T Ethernet	1000BASE-T Ethernet
SFP cage	Yes	Yes
RJ45 copper transceiver	Optional	Optional
SFP fiber module	Optional	Optional
Power consumption	32.5W	41W
Laser emissions for multimode SFP	850 µm laser compliant to 21CFR, Subpart J, Class 1	

	Transmitter Appliance		Receiver Appliance	
	2-port	4-port	2-port	4-port
Dimensions (WxDxH)	8.526 in x 7.45 in x 1.676 in / 216.6 mm x 189 mm x 42.6 mm			
Form factor	1RU, half-width	1RU, half-width	1RU, half-width	1RU, half-width
DisplayPort V1.1	Yes	Yes	Yes	Yes
DisplayPort V1.2	No	Yes (on port#4 only)	No	Yes (on port#4 only)
Maximum input resolution	2×1920×1200@60Hz 1×2560×1600@60Hz 1×3840×2160@30Hz	4×1920×1080@60Hz 3×1920×1200@60Hz 2×2560×1600@60Hz 2×3840×2160@30Hz 1×3840×2160@60Hz	---	---
Maximum output resolution	---	---	2×1920×1200@60Hz 1×2560×1600@60Hz 1×3840×2160@30Hz	4×1920×1080@60Hz 3×1920×1200@60Hz 2×2560×1600@60Hz 2×3840×2160@30Hz 1×3840×2160@60Hz
Video input connectors	2× DisplayPort (with stereo L-PCM audio)	4× DisplayPort (with stereo L-PCM audio)	---	---
Video output connectors	1× DisplayPort (for local console)	1× DisplayPort (for local console)	2× DisplayPort (with stereo L-PCM audio)	4× DisplayPort (with stereo L-PCM audio)
Audio input (analog)	1× mini stereo jack	1× mini stereo jack	4× mini stereo jack	4× mini stereo jack
Audio output	1× mini stereo jack	1× mini stereo jack	1× mini stereo jack	1× mini stereo jack
Microphone input	---	---	1× mini stereo jack	1× mini stereo jack
RS232 connector	1× DB9 female	1× DB9 female	1× DB9 female	1× DB9 female
Network interface	1000BASE-T Ethernet	1000BASE-T Ethernet	1000BASE-T Ethernet	1000BASE-T Ethernet
USB ports	2× USB2.0 (front) 1× USB2.0 (back)	2× USB2.0 (front) 1× USB2.0 (back)	4× USB2.0 (front)	6× USB2.0 (front)
Color space	YUV 4:4:4, RGB 8:8:8	YUV 4:4:4, RGB 8:8:8	YUV 4:4:4, RGB 8:8:8	YUV 4:4:4, RGB 8:8:8
SFP cage	Yes	Yes	Yes	Yes
RJ45 transceiver	Yes	Yes	Yes	Yes
SFP fiber module	Optional	Optional	Optional	Optional
Laser emissions multimode SFP only	850 μm laser compliant to 21CFR, Subpart J, Class 1			
Power requirements	+12VDC max 5A (5A fuse for overcurrent protection)	+12VDC max 5A (5A fuse for overcurrent protection)	+12VDC max 5A (5A fuse for overcurrent protection)	+12VDC max 5A (5A fuse for overcurrent protection)
Power connector	DIN 4-pin female	DIN 4-pin female	DIN 4-pin female	DIN 4-pin female
Power consumption	24.5W	44W	26.5W	41W

## Appendix B – Part Numbers

Part number	Product description
ULE-RXA2	UltraLink E-Series Receiver Appliance, 2xDisplayPort 1.1, 4xUSB-A, audio 3.5mm, resolution up to 1920x1200@60Hz (2-ports), or 2560x1600@60Hz (1-port), 1xRS232(M), 1xRJ45, 1xSFP
ULE-RXA4	UltraLink E-Series Receiver Appliance, 3xDisplayPort 1.1 and 1xDisplayPort 1.2, 6 USB type-A, audio 3.5mm resolution up to 4K/60 4:4:4, 1xRS232(M), 1xRJ45, 1xSFP
ULE-TXA2	UltraLink E-Series Transmitter Appliance, 2xDisplayPort 1.1, 1xDisplayPort 1.1 (local), 1xUSB-B2.0 (input), 2xUSB type-A (local), resolution up to 1920x1200@60Hz, 1xRS232(M), 1xRJ45, 1xSFP
ULE-TXA4	UltraLink E-Series Transmitter Appliance, 3xDisplayPort 1.1 and 1xDisplayPort 1.2, 1xDisplayPort 1.1 (local), 1xUSB-B2.0 (input), 2xUSB type-A (local), resolution up to 3840x2160 4:4:4, 1xRS232, 1xRJ45, 1xSFP
ULE-TXC2	UltraLink E-Series PCIe Transmitter Card, 2xMini DisplayPort 1.1, 1xUSB 2.0 Type Mini-B, resolution up to 1920x1200@60Hz, 1xSFP
ULE-TXC4	UltraLink E-Series PCIe Transmitter Card, 3xMini DisplayPort 1.1, 1xMini DisplayPort 1.2, 1xUSB 2.0 Type Mini-B, resolution up to 4K/60, 3840x2160 4:4:4, 1xSFP
ULE-UDM/xxx	UltraLink E-Series Device Manager software where xxx is version number
RM-ULE2	Rack-mount shelf (for 2 Appliances side-by-side) and mounting kit

## Appendix C – Firewall requirements

### UltraLink E-Series Device Manager software

*Firewall requirements for the controller system*

Network port	Type	Inbound	Outbound	Functionality
53	TCP	---	Yes	<b>DNS:</b> DNS requests
443*	TCP	---	Yes	<b>HTTPS:</b> UltraLink Device Manager commands
1900*	UDP	Yes	Yes	<b>UPnP:</b> Microsoft SSDP for discovery of UPnP devices <b>Note:</b> ICMP must be enabled (ping)

(\* ) = minimum requirements

### UltraLink E-Series firmware updater

*Firewall requirements when running the firmware updater*

Network port	Type	Inbound	Outbound	Functionality
20,21	TCP	---	Yes	<b>FTP:</b> File upload
22*	TCP	Yes	Yes	<b>SSH:</b> Firmware update
443*	TCP	---	Yes	<b>HTTPS:</b> Authentication
1900*	UDP	Yes	Yes	<b>UPnP:</b> Microsoft SSDP for discovery of UPnP devices

(\* ) = minimum requirements

## UltraLink E-Series network firewall requirements

Network port	Type	Inbound	Outbound	Functionality
20,21	TCP	Yes	—	<b>FTP:</b> File upload
22*	TCP	Yes	Yes	<b>SSH:</b> Firmware update
69	UDP	—	Yes	<b>DHCP:</b> DHCP client
123	UDP	Yes	Yes	<b>NTP:</b> Network time protocol
161	UDP	Yes	Yes	<b>SNMP:</b> Network management (public community string)
443*	TCP	Yes	—	<b>HTTPS:</b> UltraLink Device Manager commands and firmware updaters authentication
1900*	UDP	Yes	Yes	<b>UPnP:</b> Microsoft SSDP for discovery of UPnP devices
Ephemeral*	UDP	Yes	Yes	<b>RTP/RTCP:</b> Audio and video streams and control
12000	TCP	Yes	Yes	<b>RS232:</b> RS232 virtualization
80	TCP	Yes	—	<b>Transmitter:</b> Publishing of desktop thumbnails
80	TCP	—	Yes	<b>Receiver:</b> Retrieving of desktop thumbnails
3240	TCP	Yes	—	<b>Receiver:</b> USB IP
3240	TCP	—	Yes	<b>Receiver:</b> USB IP
6804 - 6816	TCP	Yes	—	<b>Transmitter:</b> Audio back channel control
6804 - 6816	TCP	—	Yes	<b>Transmitter:</b> Audio back channel control
8884	TCP	Yes	—	<b>Receiver:</b> Control channel
8884	TCP	—	Yes	<b>Transmitter:</b> Control channel
8886	UDP	Yes	—	<b>Transmitter:</b> Audio back channel
8886	TCP	—	Yes	<b>Receiver:</b> Audio back channel
8809 - 8872	TCP	Yes	—	<b>Receiver:</b> A/V Streams control
8809 - 8872	TCP	—	Yes	<b>Transmitter:</b> A/V Streams control
9223 - 9254	UDP	Yes	—	<b>Receiver:</b> Multicast A/V streams
9223 - 9254	UDP	—	Yes	<b>Transmitter:</b> Multicast A/V streams
11900	UDP	Yes	—	<b>Transmitter:</b> SSDP unicast M-SEARCH requests for UPnP discovery and presence monitoring for out-of-subnet and WAN devices
11900	UDP	—	Yes	<b>Receiver:</b> SSDP unicast M-SEARCH requests for UPnP discovery and presence monitoring for out-of-subnet and WAN devices
12346 - 12752; 13414 - 13719	UDP	Yes	—	<b>Receiver:</b> Unicast A/V streams
12346 - 12752; 13414 - 13719	UDP	—	Yes	<b>Transmitter:</b> Unicast A/V streams

(\*) = minimum requirements

## UltraLink E-Series accessing your Windows firewall settings

**Note:** You may need administrator rights to modify your Windows Firewall settings. For more information, see Windows documentation or contact your system administrator.

- Windows 10: Click Start → Settings → Network & Internet → Ethernet → Windows → Firewall. In the left panel, click **Advanced Settings**
- Windows 7: Click **Control Panel** → **Network and Internet** → **Network and Sharing Center**. Windows 7 – In the left panel, click **Windows Firewall** → **Advanced Settings**.
- UltraLink E-Series adding rules to your Windows firewall settings

## Adding rules to your Windows Firewall settings

**Note:** You may need administrator rights to modify your Windows Firewall settings. For more information, see *Windows documentation* or contact your system administrator.

1. Windows 10 – Click **Start** → **Settings** → **Network & Internet** → **Ethernet** → **Windows Firewall**.  
Windows 7 – Click **Control Panel** → **Network and Internet** → **Network and Sharing Center**.
2. Windows 10 – In the left panel, click **Advanced Settings**.  
Windows 7 – In the left panel, click **Windows Firewall** > **Advanced Settings**.
3. Click **Inbound Rules**.
4. In the **Actions** panel, click **New Rule**. Configure the new rule with the following settings:
  - **Rule type** – Select **Custom**.
  - **Program** – Select **All programs**.
  - **Protocol and Ports** – Next to **Protocol**, select **TCP**. Next to **Local port**, select **Specific ports**. For the port number, enter **445**. Next to **Remote port**, select **All Ports**.
  - **Scope** – Under the remote IP address, add the IP range you want to use for your transmitter. You can use a range (such as *192.168.1.0/24*) or a single IP address (such as *192.152.168.62*).
  - **Action** – Select **Allow the connection**.
  - **Profile** – Select the network location of your system (**Domain**, **Private**, or **Public**).
  - **Name** – Enter the name for your rule (such as *UltraLink – TCP rule*).
5. In the **Actions** panel, click **New Rule**. Configure the new rule with the following settings:
  - **Rule type** – Select **Custom**.
  - **Program** – Select **All programs**.
  - **Protocol and Ports** – Under **Protocol type**, select **ICMPv4**.
  - **Scope** – Under the remote IP address, add the IP range you want to use for your transmitter. You can use a range (such as *192.168.1.0/24*) or a single IP address (such as *192.152.168.62*).
  - **Action** – Select **Allow the connection**.
  - **Profile** – Select the network location of your system (**Domain**, **Private**, or **Public**).
  - **Name** – Enter the name for your rule (such as *UltraLink – ICMPv4 rule*).

For more information on configuring your Windows firewall, see your network administrator.

## Appendix D – Rack-mounting options

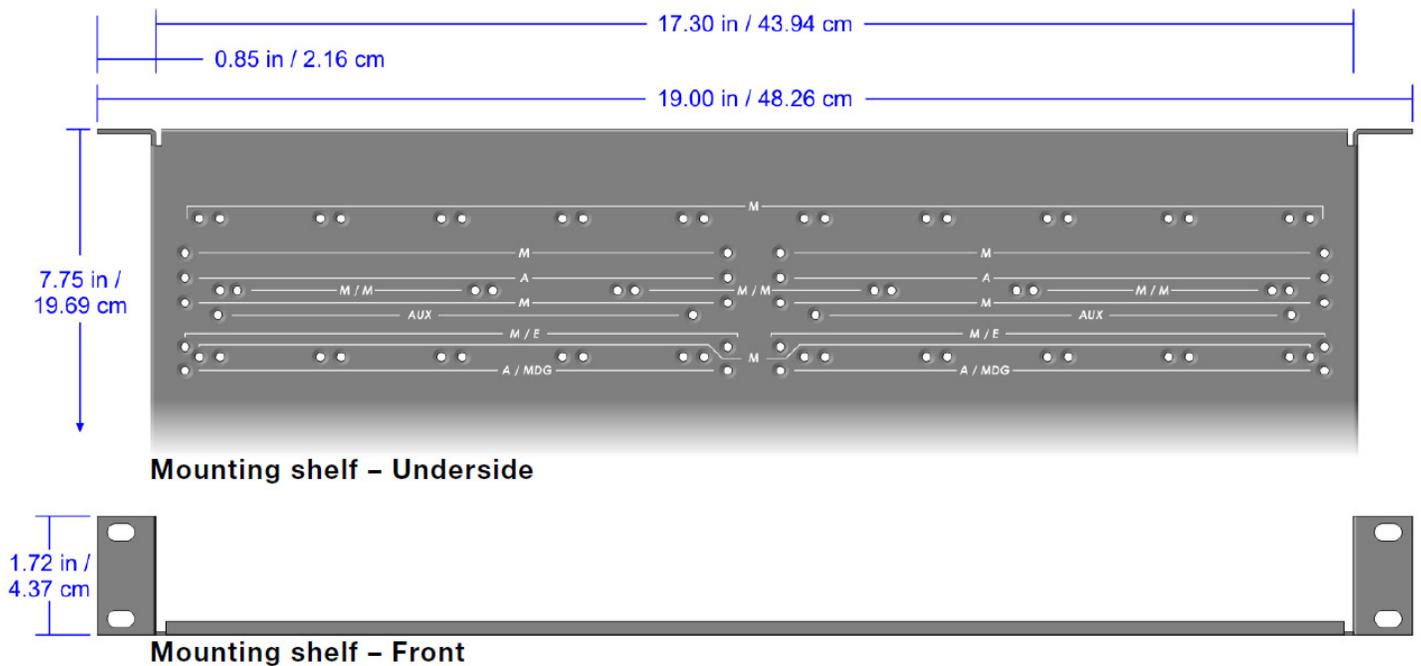
### Mounting guidelines

To prevent damage to your product, read the following guidelines before mounting your UltraLink hardware:

- Make sure not to block the ventilation holes on your device.
- Don't stack anything directly over the device.
- Make sure all cables and cords are slack.
- Make sure the ambient temperature doesn't exceed the maximum recommended temperatures.

### Mounting the appliance hardware

You can mount two (2) devices horizontally on a single shelf.



- To mount your device, use the holes labelled **M/E**. These holes are 3.15 inches (8.00 cm) from the front edge of the mounting shelf.
- Your device has two (2) mounting holes under its casing. Use two (2) 6 mm M3 flat-head screws (included in the rack-mounting kit) to secure each device. You need to remove the four (4) rubber pads under your device before you can secure your device to the shelf.

## Appendix E – Configuring your audio settings

**Note:** We recommend you review your system's Windows® audio settings to know which DisplayPort output is configured to use audio.

### Receiver output

Audio source from transmitter	Standard mode	Aggregator mode
	When receiver connects to a unique transmitter	When receiver connects to multiple transmitters
<b>No audio</b>	No audio available on the receiver output.	No audio available on the receiver output.
<b>Digital audio 1</b> *	Audio originates from the audio portion of the A/V signal of <b>DisplayPort 1</b> on the transmitter.	Audio originates from the digital A/V signal displayed on <b>monitor 1</b> of the receiver.
<b>Digital audio 2</b> *	Audio originates from the audio portion of the A/V signal of <b>DisplayPort 2</b> on the transmitter.	Audio originates from the digital A/V signal displayed on <b>monitor 2</b> of the receiver.
<b>Digital audio 3</b> *	Audio originates from the audio portion of the A/V signal of <b>DisplayPort 3</b> on the transmitter.	Audio originates from the digital A/V signal displayed on <b>monitor 3</b> of the receiver.
<b>Digital audio 4</b> *	Audio originates from the audio portion of the A/V signal of <b>DisplayPort 4</b> on the transmitter.	Audio originates from the digital A/V signal displayed on <b>monitor 4</b> of the receiver.
<b>Analog audio (follows USB)</b> †	Audio originates from the <b>Line In</b> connector of the transmitter.	Audio originates from the <b>Line In</b> connector of the transmitter where the keyboard and mouse are active.
<b>Analog audio, Line IN 1</b>	Audio originates from the <b>Line In</b> connector of the transmitter.	Audio originates from the <b>Line In</b> connector of the transmitter providing the video stream for <b>monitor 2</b> on the receiver.
<b>Analog audio, Line IN 2</b>	Audio originates from the <b>Line In</b> connector of the transmitter.	Audio originates from the <b>Line In</b> connector of the transmitter providing the video stream for <b>monitor 2</b> on the receiver.
<b>Analog audio, Line IN 3</b>	Audio originates from the <b>Line In</b> connector of the transmitter.	Audio originates from the <b>Line In</b> connector of the transmitter providing the video stream for <b>monitor 3</b> on the receiver.
<b>Analog audio, Line IN 4</b>	Audio originates from the <b>Line In</b> connector of the transmitter.	Audio originates from the <b>Line In</b> connector of the transmitter providing the video stream for <b>monitor 4</b> on the receiver.

\* In aggregator mode, the A/V signal may come from a transmitter input other than the monitor on which it's displayed (for example, monitor 1 shows a stream that comes from input 3 of a transmitter).

† In aggregator mode, the audio source switches from one transmitter to another when the mouse moves to a monitor showing an image from a different transmitter.

## Receiver input

Audio source from receiver	Standard mode	Aggregator mode
	When receiver connects to a unique transmitter	When receiver connects to multiple transmitters
<b>Disabled</b>	No audio available on the <b>Line Out</b> connector of the transmitter.	No audio available on any of the <b>Line Out</b> connectors of the transmitter.
<b>Microphone</b>	Audio from the <b>Microphone</b> connector of the receiver is sent to the <b>Line Out</b> connector of the transmitter	The <b>Microphone</b> signal from the receiver is sent to a transmitter following the destination option chosen (see <a href="#">Receiver audio destination</a> ).
<b>Line in</b>	Audio from the <b>Line In</b> connector of the receiver is sent to the <b>Line Out</b> connector of the transmitter	The <b>Line In</b> signal from the receiver is sent to a transmitter following the destination option chosen (see <a href="#">Receiver audio destination</a> ).
<b>Automatic detection</b>	Audio from the <b>Microphone</b> connector of the receiver is sent to the <b>Line Out</b> connector of the transmitter. If no cable is present on the <b>Microphone</b> connector of the receiver, but a cable is present on the <b>Line Out</b> connector, the signal of the <b>Line Out</b> connector is sent to the <b>Line Out</b> connector of the transmitter.	Audio from the <b>Microphone</b> connector of the receiver is used. If no cable is present on the <b>Microphone</b> connector of the receiver, but a cable is present on the <b>Line In</b> connector, the signal of the <b>Line In</b> connector is used. The signal is then sent to a transmitter following the destination option chosen (see <a href="#">Receiver audio destination</a> ).

## Receiver audio destination

Receiver audio destination	Standard mode	Aggregator mode
	When receiver connects to a unique transmitter	When receiver connects to multiple transmitters
<b>Monitor 1</b>	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter.	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter that provides the video stream to <b>monitor 1</b> .
<b>Monitor 2</b>	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter.	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter that provides the video stream to <b>monitor 2</b> .
<b>Monitor 3</b>	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter.	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter that provides the video stream to <b>monitor 3</b> .
<b>Monitor 4</b>	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter.	Audio from the selected audio source of the receiver ( <b>Microphone</b> or <b>Line In</b> ) is sent to the <b>Line Out</b> connector of the transmitter that provides the video stream to <b>monitor 4</b> .

### **Notes and limitations**

- Aggregator mode – The Link Redundancy feature isn't currently supported while using aggregator mode.
- Guest connections – With guest connections, the following aren't currently supported: RS232, audio Line In and microphone.
- Firmware – To ensure proper functioning of your devices, the firmware version installed on your Tx and Rx devices must match.
- Firmware – When updating your firmware, make sure your UltraLink setup is using either point-to-point mode or networked mode, and not a mix of operating modes.
- The following features aren't yet enabled:
  - Local output support (Video out) on the Tx device is expected in an upcoming release.
  - The USB connectors on the front of the Tx device are currently disabled.
- Power management – When using a PCIe transmitter card, power management on the host system isn't currently supported.
- If all of your devices are seen and configurable in UltraLink Device Manager, but the OSD of an Rx device doesn't reflect the connections that were configured in the Connection Broker, verify that the devices all have a valid IP address and that the network ports are accessible.
- If your devices are on a unicast network, on multiple subnets, or on a WAN network, use the new Transmitter Discovery option (in UltraLink Device Manager) to detect devices that may not be automatically discovered.
- Dell™ Precision™ Rack R7920 Workstation or PowerEdge™ R740 – If your PCIe transmitter card is installed in PCIe slot 1, that slot may not work. We recommend using a slot other than slot 1. If you need to use slot 1, you need to disable that slot. To disable the slot, enter the System Bios, then click Integrated Devices Slot disablement, and make sure the slot is marked as Disabled. When you're done, save your changes and reboot your system.
- USB devices – Some older keyboard and mouse combos that use a Bluetooth® mini-receiver aren't supported in networked mode. These devices may be used in point-to-point mode but need the manufacturer's device drivers.
- On some GPUs, outputs may have temporal dithering enabled. This may result in blocky images. To avoid this, make sure your GPU settings are configured to use RGB as the output color format and the maximum level (i.e. Full) as the output dynamic range.
- Hot plugging of SFP modules isn't supported. A reboot may be required after adding an SFP module to your device to ensure proper detection and functionality.
- Random loss of Sync while in point-to-point mode – You may lose monitor sync briefly if the display refresh rate reported in the OSD of your UltraLink receiver doesn't match the refresh rate of your monitor. For example, this may occur if the GPU reports a refresh rate of 59 Hz. Setting the refresh rate to 60 Hz should solve the issue.
- If you're using an adapter to connect your monitor to your UltraLink device, only active adapters (sold separately) are supported. Passive adapters aren't supported.
- When using aggregator mode and switching via keyboard shortcut, the mouse pointer will remain visible on all displays in the last position before the USB was switched.
- Windows 7 only – When using aggregator mode and mouse position, we recommend using either a single independent desktop or a stretched desktop. For more information, see "Aggregator mode compatibility."

## Known issues

- After adding a new Tx device and configuring it using UltraLink Device Manager software, it can take up to 45 seconds for the new Tx device to appear in the OSD as an available connection option for the Rx.
- USB – Switching while using USB 2.0 devices (i.e. USB keys, hard drives, scanners, etc.) isn't supported and may result in lost data or devices (need to unplug/replug device to redetect). We recommend stopping all USB 2.0 transfers before switching.
- USB – Loss of connection between a Tx and an Rx (power interruption, network failure or fiber failure) while doing USB 2.0 transfers may result in lost devices (need to unplug/replug device to redetect) or lost data.
- Firmware Updater – When the Updater has completed, a message may appear stating that not all UltraLink Series devices were properly updated. If this occurs, close the updater and re-launch it. If the devices report that they need an update, proceed with the update. If the update fails again, please contact Rose Technical Support.
- After updating your firmware, one of the displays connected to your Rx may be lost. To fix this, we recommend you turn off the monitor and then turn it on again.
- After rebooting your Tx or Rx, one of your displays may be lost. To fix this, we recommend you turn off the monitor, and then turn it on again.
- Point-to-point mode – When rebooting your source system or host system, the connection between the Tx and Rx devices may be lost. To fix this, we recommend you use the Refresh connection option in the OSD.
- Wake-on-LAN – PCIe transmitter cards support wake-on-LAN.
- Wake-on-LAN – When using the wake-on-LAN feature with a PCIe transmitter card installed in HP Z440 workstations, the devices may become unresponsive and require the system to be rebooted.

## Aggregator mode compatibility

Operating system	Single monitor	Multiple monitors				
		Independent mode		Stretched mode		
		Switch via mouse	Switch via keyboard	Switch via mouse	Switch via keyboard	Only primary stretched desktop
Windows 7 <sup>1</sup>	Yes		✓	✓	✓	✓
Windows 10 version 16xx <sup>2</sup>	Yes		✓	✓	✓	✓
Windows 10 version 18xx <sup>3</sup>	Yes	✓	✓	✓	✓	
Linux version 18.04	Yes	✓	✓	✓	✓	
macOS version 10.13.6	Yes		✓	N/A		

<sup>1</sup> While using USB switching, the mouse position is limited to the first display.

<sup>2</sup> While using USB switching with a 4x1 monitor layout, the mouse pointer is visible on all four displays.

<sup>3</sup> Certain limitations may occur (for example, the mouse pointer may disappear).

## Appendix G – Declaration of Conformity

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### USA

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 user 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.

**WARNING** Changes or modifications to this product not expressly approved by the party responsible for the compliance could void the user's authority to operate this equipment. The use of shielded cables for connection of the monitor to the card is required to meet FCC requirements.

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### CANADA

#### **(English) Innovation, Science and Economic Development Canada**

These digital apparatus do not exceed the Class A limits for radio noise emission from digital devices set out in the Radio Interference Regulation of Industry Canada.

#### **(Français) Innovation, Sciences et Développement économique Canada**

Ce présent appareil numérique n'émet aucun bruit radioélectrique dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par Industrie Canada.

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### JAPAN

#### **VCCI Compliance Statement**

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

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### REPUBLIC OF KOREA

#### **A 급 기기 (업무용 방송통신기자재)**

이 기기는 업무용 (A 급) 전자파적합기기로서 판 매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

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### EUROPE

#### **(English) European user's information – Declaration of Conformity**

These devices comply with EC Directive 2014/30/EU for a Class A digital device. They have been tested and found to comply with EN55032/CISPR32 and EN55024/CISPR24. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures. To meet EC requirements, shielded cables must be used to connect the monitor and other peripherals to the card. These products have been tested in a typical class A compliant host system. It is assumed that these products will also achieve compliance in any class A compliant system.

#### **(Français) Informations aux utilisateurs Européens – Déclaration de conformité**

Ces unités sont conformes à la directive communautaire 2014/30/EU pour les unités numériques de classe A. Les tests effectués ont prouvé qu'elles sont conformes aux normes EN55032/CISPR32 et EN55024/CISPR24. Le fonctionnement de ces produits dans un environnement résidentiel peut causer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre les mesures appropriées. Pour respecter les impératifs communautaires, les câbles de connexion entre le moniteur ou autres périphériques et la carte doivent être blindés. Ces produits ont été testés dans un système hôte typique compatible classe A. On suppose qu'ils présenteront la même compatibilité dans tout système compatible classe A.

**(Deutsch) Information für europäische Anwender – Konformitätserklärung**

Diese Geräte entsprechen EC Direktive 2014/30/EU für ein digitales Gerät Klasse A. Sie wurden getestet und entsprechen demnach EN55032/CISPR32 und EN55024/CISPR24. In einer Wohnumgebung können diese Produkte Funkinterferenzen erzeugen, und der Benutzer kann genötigt sein, entsprechende Maßnahmen zu ergreifen. Um EG-Anforderungen zu entsprechen, müssen zum Anschließen des Monitors und anderer Peripheriegeräte an die Karte abgeschirmte Kabel verwendet werden. Diese Produkt wurden in einem typischen, der Klasse A entsprechenden, Host-System getestet. Es wird davon ausgegangen, daß diese Produkte auch in jedem Klasse A entsprechenden System entsprechend funktionieren.

**(Italiano) Informazioni per gli utenti europei – Dichiarazione di conformità**

Questi dispositivi sono conformi alla direttiva CEE 2014/30/EU elativamente ai dispositivi digitali di Classe A. Sono stati provati e sono risultati conformi alle norme EN55032/CISPR32 e EN55024/CISPR24. In un ambiente domestico, questi prodotti possono causare radiointerferenze, nel qual caso all'utente potrebbe venire richiesto di prendere le misure adeguate. Per soddisfare i requisiti CEE, il monitor e le altre periferiche vanno collegati alla scheda grafica con cavi schermati. Questi prodotti sono stati provati in un tipico sistema host conforme alla classe A. Inoltre, si dà per scontato che questi prodotti acquisiranno la conformità in qualsiasi sistema conforme alla classe A.

**(Español) Información para usuarios europeos – Declaración de conformidad**

Estos dispositivos cumplen con la directiva de la CE 2014/30/EU para dispositivos digitales de Clase A. Dichos dispositivos han sido sometidos a prueba y se ha comprobado que cumplen con las normas EN55032/CISPR32 y EN55024/CISPR24. En entornos residenciales, estos productos pueden causar interferencias en las comunicaciones por radio; en tal caso el usuario deberá adoptar las medidas adecuadas. Para satisfacer las disposiciones de la CE, deberán utilizarse cables apantallados para conectar el monitor y demás periféricos a la tarjeta. Estos productos han sido sometidos a prueba en un típico sistema anfitrión que responde a los requisitos de la clase A. Se supone que estos productos cumplirán también con las normas en cualquier sistema que responda a los requisitos de la clase A.

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EUROPE

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**European user's information – Directive on Waste Electrical and Electronic Equipment (WEEE).**

The supply of these products complies with the WEEE Directive 2002/96/EC, and subsequently recast as Directive 2012/19/EU.



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