



Grass Valley
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KALEIDO-IP X320

KALEIDO-IP X120

High quality IP video multiviewers

Installation & Service Manual

M926-8902-111
2023-06-26

www.grassvalley.com

FCC Compliance

In order to comply with FCC/CFR47: Part 15 regulations, it is necessary to use high-quality, triple-screened Media or Monitor cable assemblies with integrated ferrite suppression at both ends.

Patent Information

This product may be protected by one or more patents.

For further information, please visit: www.grassvalley.com/patents/

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Title	Kaleido-IP X330 & X130 Installation & Service Manual
Part Number	M926-8902-111
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Important Safety Information

This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions appear throughout the manual where they apply. Please read and follow this important information, especially those instructions related to the risk of electric shock or injury to persons.

Symbols and Their Meanings



Indicates that dangerous high voltage is present within the equipment enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



Indicates that the user, operator or service technician should refer to the product manuals for important operating, maintenance, or service instructions.



This is a prompt to note the fuse rating when replacing fuses. The fuse referenced in the text must be replaced with one having the ratings indicated.



Identifies a protective grounding terminal which must be connected to earth ground prior to making any other equipment connections.



Identifies an external protective grounding terminal which may be connected to earth ground as a supplement to an internal grounding terminal.



Indicates that static sensitive components are present, which may be damaged by electrostatic discharge. Use anti-static procedures, equipment and surfaces during servicing.



Indicates that the equipment has more than one power supply cord, and that all power supply cords must be disconnected before servicing to avoid electric shock.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Underwriters Laboratory (UL) regulations and recommendations for USA.



The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Canadian Standard Association (CSA) regulations and recommendations for USA/Canada.



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The presence of this symbol in or on Grass Valley equipment means that it has been tested and certified as complying with applicable Intertek Testing Services regulations and recommendations for USA/Canada.



The presence of this symbol in or on Grass Valley product means that it complies with all applicable European Union (CE) directives.



The presence of this symbol in or on Grass Valley product means that it complies with safety of laser product applicable standards.

Warnings



A warning indicates a possible hazard to personnel, which may cause injury or death. Observe the following general warnings when using or working on this equipment:

- Appropriately listed/certified mains supply power cords must be used for the connection of the equipment to the rated mains voltage.
- This product relies on the building protection. Ensure that a fuse or circuit breaker for the rated mains voltage is used on the phase conductors.
- Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only.
- Do not operate the equipment in wet or damp conditions.
- This equipment is grounded through the grounding conductor of the power cords. To avoid electrical shock, plug the power cords into a properly wired receptacle before connecting the equipment inputs or outputs.
- Route power cords and other cables so they are not likely to be damaged. Properly support heavy cable bundles to avoid connector damage.
- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.
- Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.
- High leakage current may be present. Earth connection of product is essential before connecting power.
- Prior to servicing, remove jewelry such as rings, watches, and other metallic objects.
- To avoid fire hazard, use only the fuse type and rating specified in the service instructions for this product, or on the equipment.
- To avoid explosion, do not operate this equipment in an explosive atmosphere.
- Use proper lift points. Do not use door latches to lift or move equipment.
- Avoid mechanical hazards. Allow all rotating devices to come to a stop before servicing.
- Have qualified service personnel perform safety checks after any service.

Cautions



A caution indicates a possible hazard to equipment that could result in equipment damage. Observe the following cautions when operating or working on this equipment:

- This equipment is meant to be installed in a restricted access location.
- When installing this equipment, do not attach the power cord to building surfaces.
- Products that have no on/off switch, and use an external power supply must be installed in proximity to a main power outlet that is easily accessible.
- Use the correct voltage setting. If this product lacks auto-ranging power supplies, before applying power ensure that each power supply is set to match the power source.
- Provide proper ventilation. To prevent product overheating, provide equipment ventilation in accordance with the installation instructions.
- Do not operate with suspected equipment failure. If you suspect product damage or equipment failure, have the equipment inspected by qualified service personnel.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.
- This unit may have more than one power supply cord. Disconnect all power supply cords before servicing to avoid electric shock.
- Follow static precautions at all times when handling this equipment. Servicing should be done in a static-free environment.
- To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

Cautions for LCD and TFT Displays



Excessive usage may harm your vision. Rest for 10 minutes for every 30 minutes of usage.

If the LCD or TFT glass is broken, handle glass fragments with care when disposing of them. If any fluid leaks out of a damaged glass cell, be careful not to get the liquid crystal fluid in your mouth or skin. If the liquid crystal touches your skin or clothes, wash it off immediately using soap and water. Never swallow the fluid. The toxicity is extremely low but caution should be exercised at all times.

Mesures de sécurité et avis importants

La présente section fournit des consignes de sécurité importantes pour les opérateurs et le personnel de service. Des avertissements ou mises en garde spécifiques figurent dans le manuel, dans les sections où ils s'appliquent. Prenez le temps de bien lire les consignes et assurez-vous de les respecter, en particulier celles qui sont destinées à prévenir les décharges électriques ou les blessures.

Signification des symboles utilisés



Signale la présence d'une tension élevée et dangereuse dans le boîtier de l'équipement ; cette tension peut être suffisante pour constituer un risque de décharge électrique.



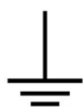
Avertit linstructions importantes relatives à lla documentation accompagnant l'équipement.



Invite lcalibre du fusible lors du remplacement de ce dernier. Le fusible auquel il est fait référence dans le texte doit être remplacé par un fusible du même calibre.



Identifie une borne de mise à la terre de protection. Il faut relier cette borne à la terre avant d'effectuer toute autre connexion à l'équipement.



Identifie une borne de mise à la terre externe qui peut être connectée en tant que borne de mise à la terre supplémentaire.



Signale la présence de composants sensibles à l'électricité statique et qui sont susceptibles d'être endommagés par une décharge électrostatique. Utilisez des procédures, des équipements et des surfaces antistatiques durant les interventions d'entretien.



Le symbole ci-contre signifie que l'appareil comporte plus d'un cordon dtoute opération d'entretien, afin de prévenir les chocs électriques.



La marque UL certifie que l'appareil visé a été testé par Underwriters Laboratory (UL) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque C-CSA-US certifie que l'appareil visé a été testé par lcanadienne de normalisation (CSA) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque C-UL-US certifie que l'appareil visé a été testé par Underwriters Laboratory (UL) et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



La marque ETL Listed d'Intertek pour le marché Nord-Américain certifie que l'appareil visé a été testé par Intertek et reconnu conforme aux exigences applicables en matière de sécurité électrique en vigueur au Canada et aux États-Unis.



Le marquage CE indique que l'appareil visé est conforme aux exigences essentielles des directives applicables de l'Union européenne en matière de sécurité électrique, de compatibilité électromagnétique et de conformité environnementale.



Le symbole ci-contre sur un appareil Grass Valley ou à l'intérieur de l'appareil indique qu'il est conforme aux normes applicables en matière de sécurité laser.

Avertissements



Les avertissements signalent des conditions ou des pratiques susceptibles d'occasionner des blessures graves, voire fatales. Veuillez vous familiariser avec les avertissements d'ordre général ci-dessous :

- Un cordon d'alimentation dûment homologué doit être utilisé pour connecter l'appareil à une tension de secteur de 120 V CA ou 240 V CA.
- La protection de ce produit contre les courts-circuits (surintensités) dépend de l'installation électrique du bâtiment. Assurez-vous qu'120 V CA ou 240 V CA est utilisé sur les conducteurs de phase.
- Dans le présent manuel, toutes les instructions qui nécessitent d'ouvrir le couvercle de l'équipement sont destinées exclusivement au personnel technique qualifié.
- N'utilisez pas cet appareil dans un environnement humide.
- Cet équipement est mis à la terre par le conducteur de mise à la terre des cordons d'alimentation. Pour éviter les chocs électriques, branchez les cordons d'alimentation sur une prise correctement câblée avant de brancher les entrées et sorties de l'équipement.
- Acheminez les cordons d'alimentation et autres câbles de façon à ce qu'ils ne risquent pas d'être endommagés. Supportez correctement les enroulements de câbles afin de ne pas endommager les connecteurs.
- Coupez l'alimentation avant de nettoyer l'équipement. Ne pas utiliser de nettoyeurs liquides ou en aérosol. Utilisez uniquement un chiffon humide.
- Des tensions dangereuses peuvent exister en plusieurs points dans cet équipement. Pour éviter toute blessure, ne touchez pas aux connexions ou aux composants exposés lorsque l'appareil est sous tension.
- Avant de procéder à toute opération d'entretien ou de dépannage, enlevez tous vos bijoux (notamment vos bagues, votre montre et autres objets métalliques).
- Pour éviter tout risque d'incendie, utilisez uniquement les fusibles du type et du calibre indiqués sur l'équipement ou dans la documentation qui l'accompagne.
- Ne pas utiliser cet appareil dans une atmosphère explosive.
- Présence possible de courants de fuite. Un raccordement à la masse est indispensable avant la mise sous tension.
- Après tout travail d'entretien ou de réparation, faites effectuer des contrôles de sécurité par le personnel technique qualifié.

Mises en garde



Les mises en garde signalent des conditions ou des pratiques susceptibles d'endommager l'équipement. Veuillez vous familiariser avec les mises en garde ci-dessous :

- L'appareil est conçu pour être installé dans un endroit à accès restreint.
- Au moment d'installer l'équipement, ne fixez pas les cordons d'alimentation aux surfaces intérieures de l'édifice.
- Les produits qui nd'alimentation externe doivent être installés à proximité dd'accès.
- Si l'équipement n'est pas pourvu d'un modules d'alimentation auto-adaptables, vérifiez la configuration de chacun des modules dtension.
- Assurez une ventilation adéquate. Pour éviter toute surchauffe du produit, assurez une ventilation de l'équipement conformément aux instructions d'installation.
- N'utilisez pas l'équipement si vous suspectez un dysfonctionnement du produit. Faites-le inspecter par un technicien qualifié.
- Pour réduire le risque de choc électrique, ncelles qui sont décrites dans le présent manuel, sauf si vous êtes qualifié pour le faire. Confiez les réparations à un technicien qualifié. La maintenance doit se réaliser dans un milieu libre d'électricité statique.
- L'appareil peut comporter plus d'un cordon délectriques, débrancher tous les cordons dd'entretien.
- Veillez à toujours prendre les mesures de protection antistatique appropriées quand vous manipulez l'équipement.
- Pour réduire le risque de choc électrique, branchez chaque cordon ddes circuits de dérivation distincts utilisant des zones de service distinctes.

Précautions pour les écrans LCD et TFT



Regarder l'écran pendant une trop longue période de temps peut nuire à votre vision. Prenez une pause de 10 minutes, après 30 minutes d'utilisation.

Si lmoment de vous en débarrasser. veillez à ce que le cristal liquide navec la peau ou la bouche. En cas de contact avec la peau ou les vêtements, laver immédiatement à lextremement faible, mais la prudence demeure de mise en tout temps.

Environmental Information

European (CE) WEEE directive.



This symbol on the product(s) means that at the end of life disposal it should not be mixed with general waste.

Visit www.grassvalley.com for recycling information.

Grass Valley believes this environmental information to be correct but cannot guarantee its completeness or accuracy since it is based on data received from sources outside our company. All specifications are subject to change without notice.

If you have questions about Grass Valley environmental and social involvement (WEEE, RoHS, REACH, etc.), please contact us at environment@grassvalley.com.

Laser Safety - Fiber Output SFP and QSFP Modules Warning

LASER SAFETY



The average optical output power does not exceed 0 dBm (1mW) under normal operating conditions. Unused optical outputs should be covered to prevent direct exposure to the laser beam.

Even though the power of these lasers is low, the beam should be treated with caution and common sense because it is intense and concentrated. Laser radiation can cause irreversible and permanent damage of eyesight. Please read the following guidelines carefully:

- Make sure that a fiber is connected to the board applied. If a fiber cable (e.g. patchcord) is already connected to an output, make sure that the cable
- **Do not** look in the end of a fiber to see if light is coming out. The laser wavelengths being used are totally invisible to the human eye and can cause permanent damage. Always use optical instrumentation, such as an optical power meter, to verify light output.

Mains Supply Voltage

Before connecting the equipment, observe the safety warnings section and ensure that the local mains supply is within the rating stated on the rear of the equipment.

Safety and EMC Standards

This equipment complies with the following standards:

Safety Standards



Information Technology Equipment - Safety Part 1

EN60950-1: 2006

Safety of Information Technology Equipment Including Electrical Business Equipment.

UL1419 (4th Edition)

Standard for Safety – Professional Video and Audio equipment (UL file number E193966)

EMC Standards

This unit conforms to the following standards:

EN55032:2015 (Class A)

Electromagnetic Compatibility of multimedia equipment - Emission requirements

EN61000-3-2:2014 (Class A)

Electromagnetic Compatibility - Limits for harmonic current emissions

EN61000-3-3:2013

Electromagnetic Compatibility - Limits of voltage changes, voltage fluctuations and flicker

EN55103-2:2009 (Environment E2)

Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

WARNING

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

FCC / CFR 47:Part 15 (Class A)

Federal Communications Commission Rules Part 15, Subpart B

Caution to the user that changes or modifications not expressly approved by the party responsible for compliance could void the user

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

EMC Performance of Cables and Connectors

Grass Valley products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

SIGNAL/DATA PORTS

For unconnected signal/data ports on the unit, fit shielding covers. For example, fit EMI blanking covers to SFP+ type ports; and fit 75 Ω RF terminators to BNC type ports.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M and Belden 1694A (for 3Gbps).

D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

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1 Overview

Introduction

Welcome to the Kaleido family of multiviewers! This Installation & Service Manual is designed to help you get your Kaleido-IP multiviewer up and running. The following chapters will guide you through the installation of a Kaleido-IP system in its default configuration. This chapter provides an overview of the Kaleido-IP unit.



Related Documentation

Use the following related documentation to configure the multiviewer and to better understand the features available with this multiviewer. You can obtain the latest product documentation from the Documentation Library section of Grass Valley's website ([https://www.wapps.grassvalley.com/cgi-bin/doc_jn4.pl?c=^Kaleido-IP\\$|Kaleido-IP:%20Video%20Multiviewer&set=multiviewers&super=broadcast&skin=jumpnav&sort=rev](https://www.wapps.grassvalley.com/cgi-bin/doc_jn4.pl?c=^Kaleido-IP$|Kaleido-IP:%20Video%20Multiviewer&set=multiviewers&super=broadcast&skin=jumpnav&sort=rev)).

Document Number	Title
M770-2800	Kaleido Software User's Manual
M770-2103	Kaleido Software Release Notes
M770-9904	Kaleido Software Product Comparison Charts
GVB-1-0133F-EN-DS	Kaleido-IP Datasheet
M770-9905	Kaleido Multiviewers Documentation Resource Guide
M926-8902	Kaleido-IP Installation & Service Manual
M926-3804	Kaleido-IP Cascade Step-by-Step Configuration
MNL-1678-QRG	Supermicro SuperServer 1028U Series User's Manual for model 1028U-TR4+
M735-9902	Kaleido-RCP2 Guide to Installation and Operation
M876-9900	RCP-200 Guide to Installation and Operation
M407-9900	iControl Router User Guide

Document Number	Title
Published online	iControl Online Help iControl Solo Online Help
13-00926-010	Kaleido-IP Migration to Version 11 or Higher Upgrade Guide

Software and Firmware Updates

You can obtain the latest Kaleido Software, drivers, and sample databases from the *Downloads* section of the Grass Valley's website (www.grassvalley.com/dl/multiviewers).

About the Multiviewer

The Kaleido-IP can monitor and display UHD, HD, and SD television programs distributed over IP, through up to four displays or through up to four streaming outputs. It supports numerous compressed and uncompressed video and audio formats. See [Decoding Capacity](#), on page 124 for more information about the supported number of video programs.

A Kaleido-IP multiviewer system in its default configuration includes a predefined room and some layouts. Once you have connected your Kaleido-IP to your local *Management* and *Media Networks*, hooked up to up to four displays, and specified source information, you can start using these layouts to monitor video signals distributed over IP. Consult the *Kaleido Software User's Manual* (see [Related Documentation](#), on page 17) for instructions on how to define more rooms and layouts to suit your specific requirements.

Limitations

The Kaleido-IP multiviewer supports a subset of the features offered by other Kaleido Multiviewer series models as shown in the *Kaleido Multiviewer Product Comparison Guide* (see [Related Documentation](#), on page 17).

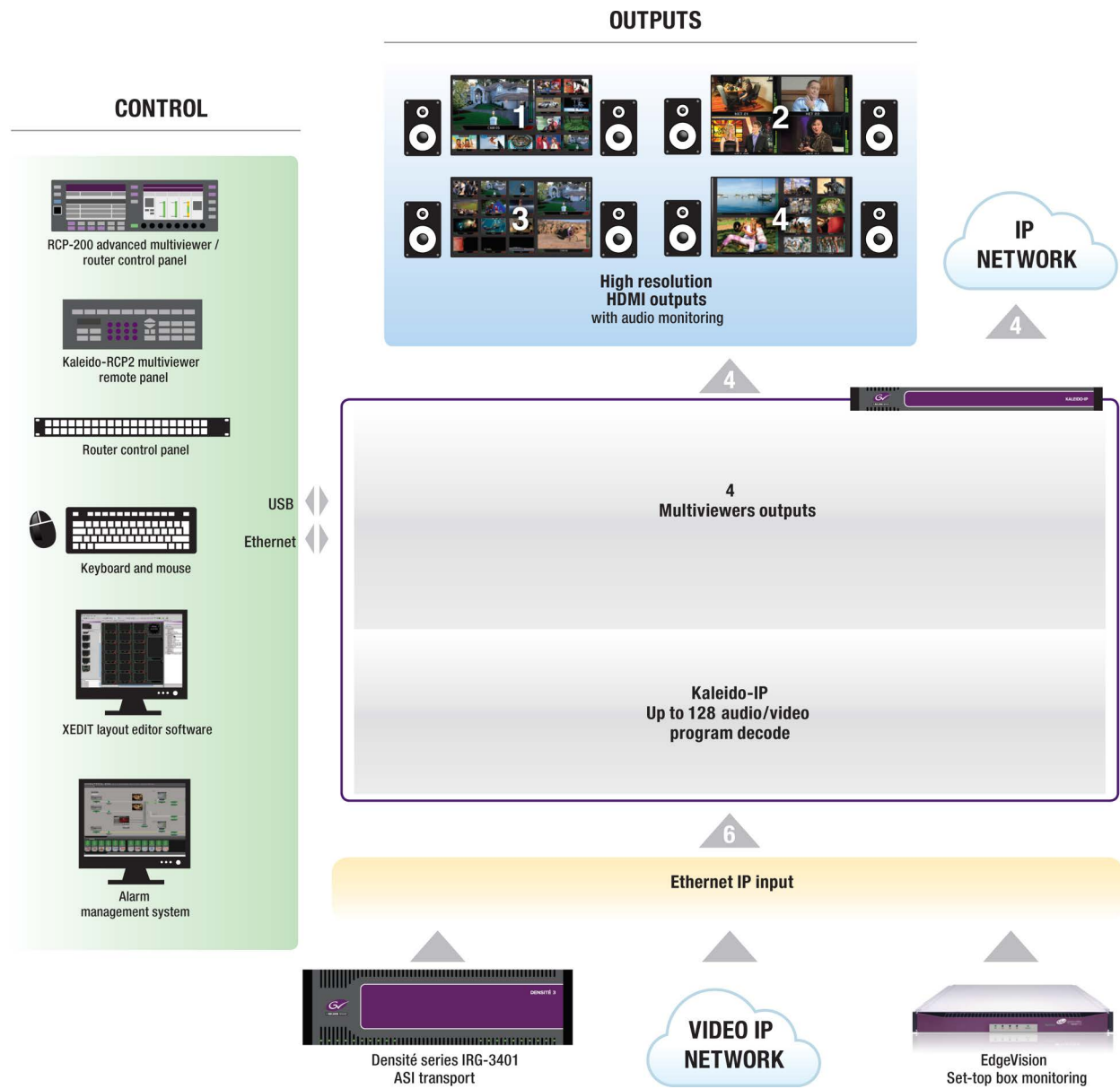
Kaleido Software Minimum Version Compatibility

A Kaleido-IP multiviewer cannot be downgraded to a Kaleido Software version earlier than 8.60. When downgrading this multiviewer, certain other requirements and limitations may be in effect; see [Upgrading the Multiviewer](#), on page 110 for more information.

To upgrade a multiviewer, see [Upgrading the Multiviewer](#), on page 110.

Whenever possible, upgrade the multiviewer to use the latest Kaleido Software version to take advantage of the latest bug fixes and stability enhancements. See the Kaleido Software Release Notes for more information about a Kaleido Software release.

Overview of the Kaleido-IP System



2 Installation

Introduction

This chapter provides information about system requirements, items shipped with your Kaleido-IP unit and it will guide you through the installation of a Kaleido-IP X320, or Kaleido-IP X120 multiviewer.

Getting Organized / Unpacking

Required Materials

Your Kaleido-IP system package includes the following:

- Kaleido-IP unit
- Installation hardware and rails, including manufacturer's documentation for the rails
- 2 × 20 cm (8 in.) DisplayPort-to-HDMI active adapter cables
- 2 × power cords
- The Kaleido Multiviewers Documentation Resource Guide, which provides instructions on how to access the documentation you need to install and use your new multiviewer. See [Related Documentation](#), on page 17.

Note: In line with our commitment to environmental preservation, only the *Kaleido Multiviewers Documentation Resource Guide*, and some related documents (e.g., welcome letters, warranty cards) are distributed in printed form. You can obtain the latest version of the Kaleido Software User's Manual and Installation & Service Manual for this multiviewer model, as well as the Release Notes, from the *Documentation Library* section of the Grass Valley website. Software, drivers, and sample databases are available from the *Downloads* section of the website.

In addition to the above, you will need the following (not supplied):

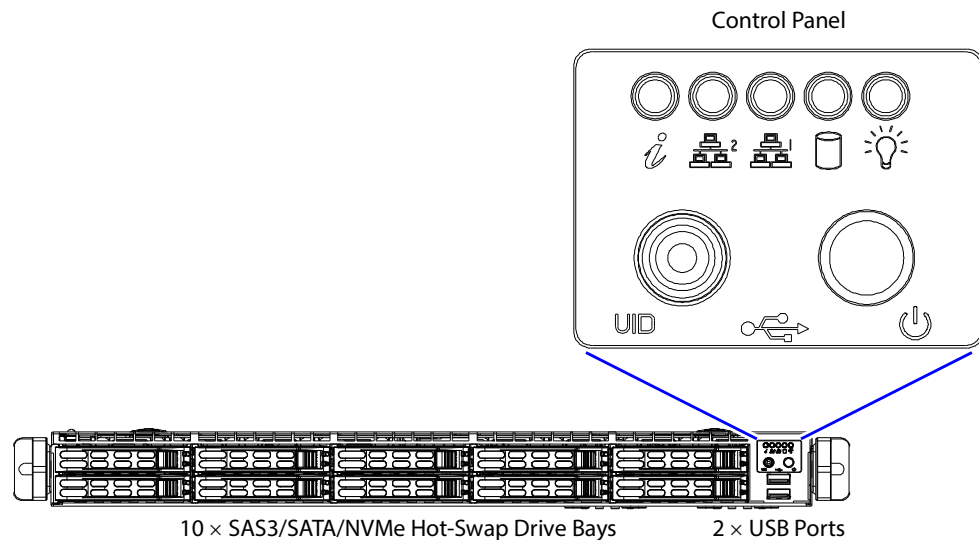
- Up to four displays for every Kaleido-IP unit
- Keyboard, mouse for basic Kaleido-IP configuration
- One dedicated 1000Base-T (or 100Base-T) Ethernet switch with enough ports for your Kaleido-IP units, client PCs, and Kaleido-RCP2 devices
- Dedicated 1000Base-T (or 100Base-T) Ethernet switches
 - Up to three more dedicated 1000Base-T (or 100Base-T) Ethernet switches for your Kaleido-IP X120 units equipped with four network adapters to connect to high-bitrate data streams

- Up to five more dedicated 1000Base-T (or 100Base-T) Ethernet switches for your Kaleido-IP X320 units equipped with six network adapters to connect to high-bitrate data streams
- Client PC (see [System Requirements for a Client PC](#), on page 47)
- Cables (to connect your multiviewers to displays, and to the networks):

Cable type	Purpose
CAT-5	For Ethernet connectivity (<i>Management Network, Media Networks</i>)
Display cables	To connect the multiviewer's HDMI outputs to displays using HDMI cables or use long-range active cables when more than a short length is required. Contact Technical Support to purchase long-range active cables that have been tested to work with this multiviewer. See Grass Valley Technical Support , on page 130.
DisplayPort adapters	For converting DisplayPort to HDMI connectivity. Use optional DisplayPort-to-HDMI passive adapters to support 1080i outputs.

Frame Physical Interface

When the front cover is removed, the following controls and indicators are available.



For more information about the frame's controls and indicators, refer to the *Supermicro SuperServer User's Manual*. See [Related Documentation](#), on page 17.

Mechanical Installation

Setting up the Kaleido-IP Hardware

To set up the Kaleido-IP hardware

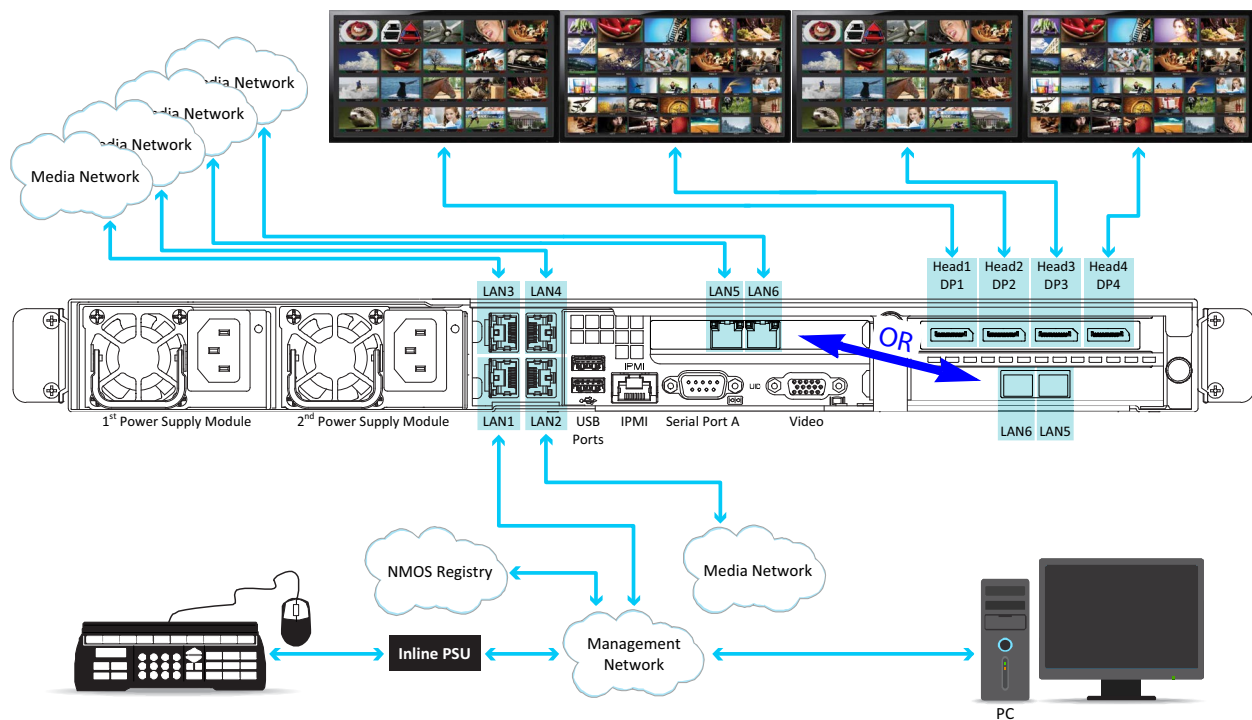
- Refer to the *Supermicro SuperServer User's Manual* (see [Related Documentation](#), on page 17) shipped with your Kaleido-IP unit, mount the unit in a standard 19-inch rack. Make sure that the unit has adequate ventilation.

3 Multiviewer Cabling

Introduction

This chapter shows how to interconnect the multiviewer with its associated equipment.

Cabling Diagram



Typical cabling diagram for a Kaleido-IP X320 with two optional Media Ports (LAN5 & LAN6). The Kaleido-IP X120 rear panel is identical, except for LAN5 and LAN6, which are not available for this model.

For a Kaleido-IP X320, the location of the optional Media Ports (LAN5 & LAN6) depends on the network interface option card that has been ordered / installed. See [Network Interface Card Installation Location in the Server](#), on page 82.

Kaleido-IP Multiviewer Ethernet Port Usage

On the Kaleido-IP multiviewer's rear panel are Ethernet connections that are to be used as follows:

- The management port LAN1 is used for multiviewer management: that is, any PC that uses XEdit or XAdmin to configure this multiviewer and any Kaleido-RCP2 / RCP-200

must have IP connectivity to the **LAN1** port. The management port **LAN1** port can be used for media streams also.

- The media ports **LAN2** and higher are to be used for media streams only.
- Media ports **LAN5** and **LAN6** available on a Kaleido-IP X120 / X320 can specifically be used to:
 - Receive SMPTE ST 2022-6 / SMPTE ST 2110 encoded streams.
 - Transmit SMPTE ST 2110-20 video streams.

These are licensed options. See [Available Hardware and Software Options](#), on page 77.

Commissioning the Multiviewer

Connect the multiviewer as follows.

- 1 With the Kaleido-IP frame installed in its designated rack position, power up the frame. The multiviewer starts up. The startup sequence takes approximately four minutes.
- 2 Connect your Kaleido-IP multiviewer's Ethernet ports to two or more Ethernet switches (one *Management Network* and one or more *Media Networks*) according to [Kaleido-IP Multiviewer Ethernet Port Usage](#), on page 25 and [Cabling Diagram](#), on page 25).

Note: To disconnect an RJ-45 network cable connected to the optional **LAN5** or **LAN6** media ports, you may need to use the blade of a flat screwdriver to reach the cable's locking mechanism.

- 3 Connect a client PC, and the Kaleido-RCP2 (if available) to the switch on **LAN1**. You can also connect a mouse and a keyboard to your Kaleido-RCP2.

Notes

- The Kaleido-RCP2 is an optional device, and may not have been shipped with your Kaleido-IP system. For information on this and other options for your multiviewer system, contact your Grass Valley sales representative.
 - You may need to upgrade your Kaleido-RCP2 devices (if available) to the latest firmware. See [Software and Firmware Updates](#), on page 18. Refer to the *Kaleido-RCP2 Guide to Installation and Operation* for instructions on how to determine the firmware level, and how to perform the upgrade. See [Related Documentation](#), on page 17.
-

- 4 Connect the first of the DisplayPort outputs of the multiviewer to a display that supports a resolution of 1920 × 1080 @ 60 Hz (HDTV) (see [Cabling Diagram](#), on page 25).

Notes

- Depending on your display type, you may use the DisplayPort-to-HDMI active adapter that shipped with your system, or DisplayPort-to-DVI adapters (not included).
- To support 1080i outputs, use an optional DisplayPort-to-HDMI passive adapter. Note that a DisplayPort-to-HDMI passive adapter will not support 4K/UHD. Contact Technical Support to purchase DisplayPort-to-HDMI passive adapters that have been tested to work with this multiviewer. See [Grass Valley Technical Support](#), on page 130.
- Although the Kaleido-IP unit has four DisplayPort outputs, only the first two DisplayPort outputs are used.
- To disconnect a display cable at the DisplayPort outputs, you may need to use an object (e.g., the blade of a flat screwdriver) to reach the cable's locking mechanism.

Notes (continued)

- Disconnecting and reconnecting any Kaleido-IP DisplayPort-to-HDMI adapter may require a restart. The adapter cables must be properly connected when the multiviewer restarts. If you connect such an adapter after the multiviewer has restarted, the display will remain blank.
 - If your displays are not collocated with your Kaleido-IP unit, use long-range active cables when more than a short cable length is required. Contact Technical Support to purchase long-range active cables that have been tested to work with this multiviewer. See [Grass Valley Technical Support](#), on page 130.
In this case, use the provided active DisplayPort-to-HDMI cable between the Kaleido-IP and the active cable.
-

- 5 Connect the power cords, and then turn the power on. The power switch is located on the front panel.¹

IMPORTANT

Should you want to add or replace a display or AV receiver at a later time, make sure the multiviewer is powered off, before making these changes. In the event that you have connected such a device while the multiviewer was running, you must restart the multiviewer for audio monitoring to be restored. Refer to *Restarting and Shutting Down a Kaleido-IP Multiviewer*, in the Kaleido Software User's Manual. See [Related Documentation](#), on page 17.

- 6 If you want to use a different display resolution, see [Changing the Output Resolution](#), on page 28, for detailed instructions.

Note: To connect the multiviewer for SMPTE ST 2022-7 hitless redundancy, see [Cabling and Configuring the Head Streaming to support SMPTE ST 2022-7 Redundancy](#), on page 92.

Changing the Output Resolution

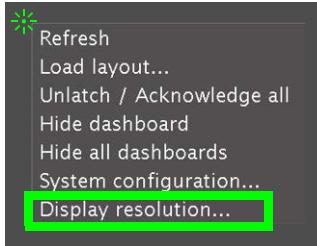
The multiviewer's output resolution can also be set in XEdit in the Rooms tab. To set the multiviewer's streaming output resolution, see [Configuring Head Streaming](#), on page 88.

To change a display's resolution from the monitor wall

- 1 Connect a mouse to one of the Kaleido-IP frame's USB ports. See [Troubleshooting with the Kaleido-IP frame's USB ports](#), on page 118 for more information about this.

1. The Kaleido Software does not support activating a soft shutdown from the Kaleido-IP frame's power button.

- 2 Right-click anywhere on the monitor wall, point to **Monitor Wall** (if you clicked a monitor), and then click **Display resolution**.



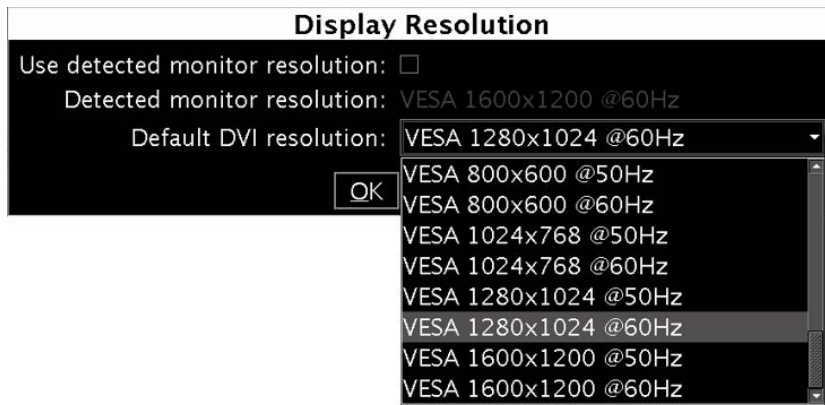
The **Display Resolution** window appears.



- 3 Clear the **Use detected monitor resolution** check box.

Note: The value indicated for **Detected monitor resolution** in the **Display Resolution** window is always “unknown” since the Kaleido-IP does not support automatic resolution detection.

- 4 Select the desired resolution from the **Default DVI resolution** list.



- 5 Click **OK**.

The output resolution is adjusted accordingly.

4 IP Network Setup

Introduction

This chapter shows how to implement IP network connectivity with the multiviewer.

Networking Essentials

The following network prerequisites must be met:

- The type of network traffic to be found on the Kaleido-IP multiviewer's Ethernet ports must be segregated according to [Kaleido-IP Multiviewer Ethernet Port Usage](#), on page 25
- The Ethernet switch for the *Management Network* must support 1000 Mbps full-duplex connections. The Ethernet switch associated with the *Media Network* should support 1000 Mbps full-duplex.
- The port on the Ethernet switch to which the multiviewer is connected should be configured to auto-negotiate. By default, multiviewers have their Ethernet ports set to auto-negotiate. If a switch does not support auto-negotiation, the recommended settings are 1000 Mbps, full-duplex for a switch associated with a Kaleido-IP *Media Network*. As required by the IEEE-802.3 standard, section 28D.5, 1000 Mbps full-duplex communication is only supported via auto-negotiation.

- **Kaleido-IP support for multicast join and leave:** it is possible to add and configure up to 6000 logical sources in a Kaleido-IP system without exceeding the network's bandwidth or the unit's decoding resources. See [Decoding Capacity](#), on page 124 for details on the number of programs and total streaming bandwidth supported.

The Kaleido-IP multiviewer joins a multicast group only when decoding is required, that is when a source is being monitored on the wall. In addition, streams that are not decoded are joined momentarily in a polling manner, one stream at a time, to update the PMT and PAT information. The Kaleido-IP leaves the multicast group as soon as a change of layout implies that a different set of streams must be decoded.

However, if your situation involves frequent changes of layout (e.g., loading a new layout to the monitor wall every minute) then, when you are creating or editing a layout, make sure to terminate XEdit's connection to the Kaleido-IP once configuration tasks are completed.

The Kaleido-IP multiviewer must be configured with at least two IP addresses; one for the *Management Network*, and one for a *Media Network*, with the corresponding network mask and gateway settings, and a system name. The Kaleido-IP X320 model may require up to six IP addresses. In XAdmin and XEdit, a Kaleido-IP X120 or Kaleido-IP X320 with *four* network adapters is identified as **Kaleido-IP-4**, and a Kaleido-IP X120 or Kaleido-IP X320 with *six* network adapters is identified as **Kaleido-IP-6**.

A client PC must have IP connectivity with the *Management Network*, to communicate with the multiviewer (see [System Requirements for a Client PC](#), on page 47) so it can be configured with XEdit and XAdmin. You must also configure any Kaleido-RCP2 units you may have ordered (see [Using a Kaleido-RCP2 with Default Settings](#), on page 75).

The Kaleido-IP is shipped with the following default settings.

Kaleido-IP default IP settings

Parameter	Kaleido-IP-6	Kaleido-IP-4
Management Port IP address (LAN1)	Assigned by the network's DHCP server	Assigned by the network's DHCP server
Network mask	255.255.0.0	255.255.0.0
Default gateway	10.0.0.1	10.0.0.1
Link mode	Auto-negotiate	Auto-negotiate
Media Port 1 IP address (LAN2)	10.0.3.70	10.0.3.70
Network mask	255.255.255.0	255.255.255.0
Gateway	None	None
Link mode	Auto-negotiate	Auto-negotiate
Media Port 2 IP address (LAN3)	10.0.3.71	10.0.3.71
Network mask	255.255.255.0	255.255.255.0
Gateway	None	None
Link mode	Auto-negotiate	Auto-negotiate
Media Port 3 IP address (LAN4)	10.0.3.72	10.0.3.72
Network mask	255.255.255.0	255.255.255.0
Gateway	None	None
Link mode	Auto-negotiate	Auto-negotiate
Media Port 4 IP address (LAN5)	172.30.3.74	—
Network mask	255.255.255.0	
Gateway	None	
Link mode	Auto-negotiate	
Media Port 5 IP address (LAN6)	172.30.3.75	—
Network mask	255.255.255.0	
Gateway	None	
Link mode	Auto-negotiate	

Note: If the *Management Port* IP address of your Kaleido-IP has been changed (i.e. it no longer corresponds to the as-shipped configuration), it is still possible to determine the current *Management Port* IP address setting. See [Verifying the Management Port IP Address and Application Version](#) on page 107.

Unicast and Multicast Sources and Destinations

Video sources and the multiviewer's streamed mosaic outputs support both unicast and multicast operation. The IP address used determines the operating mode (unicast / multicast).

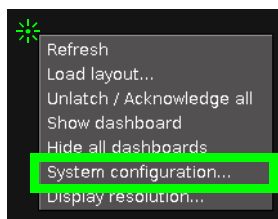
IP Packet Transmission Method	Description	IP Address Range
Unicast	One source sends a stream to a specific destination (point-to-point)	0.0.0.0 and 223.255.255.255
Multicast	One source streams to one or more destinations at the same time on the same subnet	224.0.0.0 and 239.255.255.255

Changing the Management Network IP Address from the Monitor Wall

The *Management Network* IP address, system name, and other parameters can be set via a control panel on the monitor wall, however this will also change the current IP address of the *Media Network* interfaces.

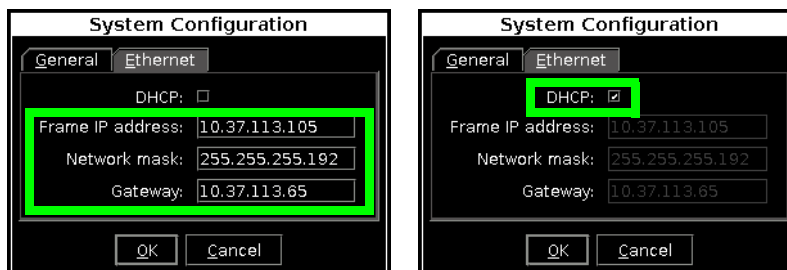
To change the Management Network IP address of the Kaleido-IP from the monitor wall

- 1 Connect a mouse to one of the USB connectors of the Kaleido-IP. See [Troubleshooting with the Kaleido-IP frame's USB ports](#), on page 118 for more information about this.
- 2 Connect a keyboard to one of the USB connectors of the Kaleido-IP.
- 3 Right-click anywhere on the monitor wall, point to **Monitor Wall** (if you clicked a monitor), and then click **System configuration**.



The **System Configuration** window appears.

- 4 Click the **Ethernet** tab.



- 5 If your network has a DHCP server, set DHCP to automatically obtain an IP address from the network. Otherwise, set a fixed IP address manually: type the required **Frame IP address** (for the *Management Network*), **Network mask**, and **Gateway** address in the appropriate boxes.

Note: When the DHCP server's lease time for IP addresses expires, DHCP-enabled devices on the network renew their IP configuration data.

When the multiviewer is assigned a new IP address from the DHCP server, you must reboot the multiviewer so it can apply the new IP address to its configuration.

For this reason, once the DHCP server has assigned an IP address to the multiviewer and you have IP connectivity to the multiviewer, set a static IP address for the multiviewer. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35. Ask your network administrator to provide you with one or more static IP addresses you need for this purpose. However, if you are using an NMOS registry with the Kaleido-IP, then the LAN1 (management network) must be set to use DHCP.

- 6 Click **OK**.
- 7 When prompted to restart the system to apply your changes, click **Yes**.
- 8 Continue with the next procedure to set the IP addresses for the *Media Networks*.

Once you have configured the *Management Network* IP address from the monitor wall, use XAdmin to configure an IP address for the network adapter that is connected to the *Media Network*.

Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin

To change the Kaleido-IP's management and Media IP addresses

- 1 Open a Web browser window and type your multiviewer's *Management* IP address in the address bar. See [Opening XAdmin](#), on page 56.

The XAdmin *Status and Options* page appears.

- 2 Click **System configuration**, in the navigation area on the left of the page.

The *System Configuration* page appears, showing the current system name, management and Media IP addresses, network masks, default gateway, connection-speed and duplex-mode settings, NMOS settings, as well as the date and time settings.

The screenshot displays the XAdmin interface for system configuration. The left sidebar shows a navigation menu with 'System configuration' highlighted. The main content area is divided into several sections:

- General:** System name: kip-43f6ca892ed2ebc1
- Ethernet:**
 - LAN1 (management port): DHCP is checked. System IP address: 10.37.65.223, Network mask: 255.255.255.0, Default gateway: 10.37.65.1, Link mode: 1000Mbps full-duplex.
 - LAN6 (media port): DHCP is unchecked. IP address: 192.193.30.2, Network mask: 255.255.255.252, Gateway: 192.193.30.1, Link mode: 10000Mbps full-duplex.
- DNS and proxy configuration:** A 'Configure' button is visible.
- Date and Time:**
 - Date and time source in use: PTP
 - Current date and time: Monday September 13, 2021 04:32:38 PM UTC-4
 - Date and time format: English (United States)
 - Time zone: America/New_York
 - PTP configuration: Domain number (0-127): 127, Announce interval (sec): 1, Announce receipt timeout count: 3, Locked to PTP: (checked), Grand master: 08:00:11:FF:FE:22:03:FF, Boundary clock: B4:DE:31:FF:FE:B1:0E:77, Interfaces in use: LAN5/LAN6 (with 'Restart PTP service to update interfaces' button), LAN6, Step: Two step, Average offset: 0ns.
 - NTP configuration: NTP server IP address: 10.10.10.66
 - Local configuration: New date: September 13, 2021, New time: 4:32:38 PM
- Nmos Registry Configuration:** Nmos registry IP address: 10.37.65.24, Nmos Registration Port: 4041, Nmos Query Port: 4041
- Font configuration:** A 'Configure' button is visible.
- Virtual LAN configuration:** A 'Configure' button is visible.

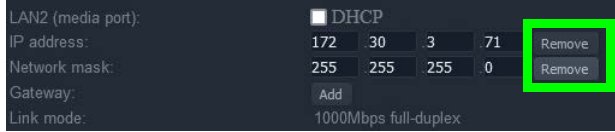

At the bottom of the page, there is a 'Save' button and a message: 'Click Save to save your settings and continue.'


- 3 Under **General**, type a descriptive name for your system to make it readily identifiable. If there are more than one multiviewer in the same network environment, it is important to assign each a unique system name, so that you can tell them apart (for example, when using a remote control panel such as the Kaleido-RCP2 or RCP-200).

Note: The system name must comply with RFC 1123, because it is also used as the device's host name. Up to 8 characters are allowed, limited to A-Z, a-z, 0-9, and the hyphen character. The system name cannot start or end with a hyphen character.

- 4 Under **Ethernet**, type the appropriate IP addresses, network masks, and gateway settings, and review the detected connection speeds and duplex modes for your Kaleido-IP's network adapters. Certain configurations require further specific configuration procedures to be followed.

To implement	For further information, see also
SMPTE ST 2022-6 / 2110 Inputs	Configuring Uncompressed IP SMPTE ST 2022-6 / 2110 Inputs , on page 86
SMPTE ST 2110-20 output(s)	Configuring Head Streaming , on page 88
SMPTE ST 2022-7	Cabling and Configuring the Head Streaming to support SMPTE ST 2022-7 Redundancy , on page 92
NMOS AMWA IS-04 and IS-05 for use with SMPTE ST 2110 streams	Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS , on page 96

Parameter	Description
DHCP	<p>Enable this option to allow the network's DHCP server set the port's IP configuration.</p> <p>If you are using an NMOS registry with the Kaleido-IP, then the LAN1 (management network) must be set to use DHCP.</p> <p>Note: When the DHCP server's lease time for IP addresses expires, DHCP-enabled devices on the network renew their IP configuration data.</p> <p>When the multiviewer is assigned a new IP address from the DHCP server, you must reboot the multiviewer so it can apply the new IP address to its configuration.</p> <p>For this reason, once the DHCP server has assigned an IP address to the multiviewer and you have IP connectivity to the multiviewer, set a static IP address for the multiviewer. Ask your network administrator to provide you with one or more static IP addresses you need for this purpose.</p>
LAN1 (management port) IP address	<p>Set the network IP address to be used for multiviewer management: that is, any PC that uses XEdit or XAdmin to configure this multiviewer and any Kaleido-RCP2 / RCP-200 must have IP connectivity to the LAN1 port. See also Kaleido-IP Multiviewer Ethernet Port Usage, on page 25.</p>
LAN2 or higher (media port)	<p>Set the network IP addresss to be used for these <i>Media Networks</i>. These ports must have IP connectivity to the associated streaming devices (e.g. encoders, multiplexers). See also Kaleido-IP Multiviewer Ethernet Port Usage, on page 25.</p> <p>To omit the network configuration for an unused Media Port, clear the corresponding IP address and network mask by clicking Remove.</p> 
Network mask	<p>Set the connected network's subnet mask.</p>
Default gateway	<p>If your <i>Management Network</i> is not configured with a gateway, clear the default gateway IP address, by clicking Remove.</p> 

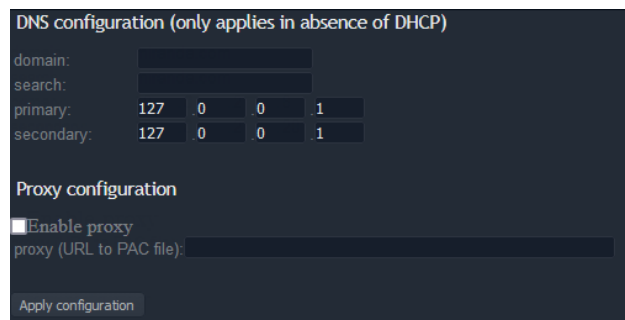
Parameter	Description
Gateway	<p>If LAN1, LAN2, or higher are configured within different subnets, and this multiviewer is meant to monitor HLS, RTSP, or RTMP sources, then add the required gateway addresses by clicking Add, and then typing the appropriate gateway address, for each LAN section.</p> 
Link mode	<p>All network ports are set to auto-negotiate. The connection speed and duplex mode will be set automatically based on the corresponding port settings on the associated switch.</p> <p>1000 Mbps full-duplex communication can only be achieved via auto-negotiation, as required by the IEEE-802.3 standard, section 28D.5.</p>

5 In XEdit, a URL path can be used to identify a source located on a remote server to access HTTP, RTSP, or RTMP streams. When using a URL, the multiviewer's DNS server configuration must be configured to allow the multiviewer to be able to resolve the URL to the stream server's current network IP address.

If your network uses a proxy server, then you must configure the proxy server's URL.

a Click **Configure**, under **DNS and proxy configuration**.

The DNS and Proxy Configuration page appears.

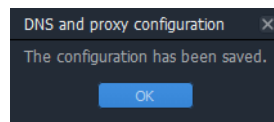


b Type the appropriate suffixes for your primary domain, and search domain, and the IP addresses for the primary, and secondary DNS server.

c Select **Enable proxy**, and then type the URL of the appropriate proxy auto-config (PAC) file, if required.

d Click **Apply configuration**.

A message appears confirming that the changes have been applied.



e Click **OK** to dismiss the message.

6 Configure the **Date and Time**, set the time reference for the multiviewer.

Parameter	Description
Date and time source in use	Shows the current date and time's source: PTP / NTP / Local
Current date and time	Shows the Kaleido-IP's current date and time.
Date and time format	Select the appropriate time format for your location.
Time zone	Select the appropriate time zone for your location.
PTP configuration	<p>This option must be enabled if this Kaleido-IP is meant to be used with:</p> <ul style="list-style-type: none"> • SMPTE ST 2110-20 / -30 / -40 inputs. • SMPTE ST 2110-20 output(s). • Both SMPTE ST 2110-20 / -30 / -40 inputs and SMPTE ST 2110-20 output(s). <p>Use this option also when your network has a PTP grandmaster.</p> <p>Domain number (0-127): set the domain number for the PTP grandmaster to be used. The PTP grandmaster must be on the same domain as the Kaleido-IP.</p> <p>Announce interval (sec): sets the interval between PTP announce messages on the active interface.</p> <p>Announce receipt timeout count: sets the number of PTP intervals before a timeout occurs on the active interface.</p> <p>Locked to PTP: the connection status to the PTP grandmaster. Green: The Kaleido-IP is locked to the PTP clock. Red: The Kaleido-IP is unable to lock to the PTP clock.</p> <p>Grand master: the PTP grandmaster clock's identity.</p> <p>Boundary clock: the boundary clock's identity.</p> <p>Interfaces in use: the PTP protocol is currently enabled and detected on these ports.</p> <p>Restart PTP service to update interfaces: After adding a network interface, click to restart the PTP service to refresh the list of available interfaces.</p> <p>Interface active: the PTP protocol is currently active on this port.</p> <p>Step: Shows the clock's message type.</p> <p>Average offset: the measured Kaleido-IP's time offset (delay or advance) with respect to the PTP grandmaster. The maximum permitted operating offset is ± 500 nanoseconds. This refreshes every 30 seconds. When commissioning the Kaleido-IP, wait for the offset to settle below 500 nanoseconds before proceeding.</p>

Parameter	Description (<i>continued</i>)
NTP configuration	If this Kaleido-IP is meant to monitor HLS sources, enable this option, and then type the NTP server's IP address. The Kaleido-IP must have network connectivity to the NTP server.
Local configuration	Use the Kaleido-IP server's internal time base and set the current date and time. This option is the least accurate time keeping option. You may need to readjust this setting every few months to maintain clock accuracy.

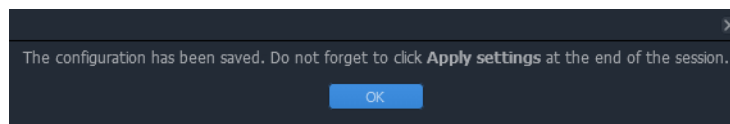
7 If an NMOS registry is available:

- Under **NMOS Device Configuration**, set the **Number of audio receivers per Input**.
- Under **NMOS Registry Configuration**, point the multiviewer to the NMOS registry.

See [Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS](#), on page 96 for more information.

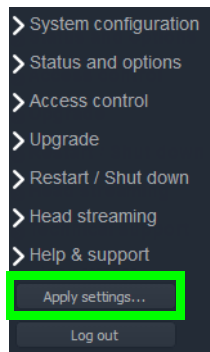
8 Click **Save**.

The new settings are saved locally.



9 Click **OK**.

10 Once a setting change has been saved, the **Apply settings** button becomes available.



11 Click **Apply settings**.

The multiviewer must be restarted for changes to the network configuration to take effect. A message appears prompting you to reboot the system immediately.

12 Click **OK**.

Your Kaleido-IP restarts.

Note: Settings cannot be applied to a multiviewer system while an upgrade is in progress. If the multiviewer does not reboot after 10 seconds or so, try clicking **Apply settings** again after a minute or two, until the multiviewer reboots.

13 If this system must monitor sources from a VLAN environment, then see [Configuring Virtual LAN Adapters on a Kaleido-IP](#), on page 99 to add the required Virtual LAN Adapters.

- 14 If you need to change the head streaming settings, see [Configuring Head Streaming](#), on page 88.
- 15 If this system requires new fonts to support subtitles, then see [Adding Fonts to a Kaleido-IP](#), on page 101 to add the required fonts.

Network Considerations

It is possible to add and configure up to 6000 logical sources without exceeding the network's bandwidth or the unit's decoding resources.

The Kaleido-IP supports concurrent decoding of up to 512 elementary streams within a program.

The Kaleido-IP supports layouts using up to 600 Mbps of streaming bandwidth. However, when using a layout touring application, the total bandwidth usage per layout should be limited to 400 Mbps across all network interfaces, and the touring period should be at least 30 seconds. In the case of the Kaleido-IP-6, layout touring should be avoided (a source cycling application should be preferred when required). Implementing a source cycling or layout touring configuration requires iControl.

The Kaleido-IP supports streaming over wide area networks (WAN), which are subject to packet delay variation (jitter), latency, packet reordering, and packet loss. It also supports encoders that transmit in bursts or with long delays between packets. The Kaleido-IP can handle transmission delays matching the encoder's video buffer delay, and, in the case of RTP streams, up to ± 120 ms of packet delay variation.

The Kaleido-IP multiviewer joins a multicast group only when decoding is required, that is when a source is being monitored on the wall. In addition, streams that are not decoded are joined momentarily in a polling manner—one stream at a time—to update the PMT and PAT information. The Kaleido-IP leaves the multicast group as soon as a change of layout implies that a different set of streams must be decoded.

However, if your situation involves frequent changes of layout (e.g., loading a new layout to the monitor wall every minute), then, when you are creating or editing a layout, make sure to terminate XEdit's connection to the Kaleido-IP once configuration tasks are completed.

TCP/UDP Port Usage

The various Kaleido-IP communication protocols require access to specific ports. In networks where a firewall is present between device A and device B, the ports used to communicate **from** device A **to** device B must be open on the incoming (external) side of the firewall.

Note: All necessary ports are open by default on the multiviewer. There is no mechanism provided for changing the default settings.

From client to multiviewer

The following ports must be open on the Client (i.e., the workstation running XEdit):

Port	Used for	Transport	Notes
443	HTTPS	TCP	Used by XAdmin for secure access
7	HTTP	TCP	Used by XEdit for ping probing
80		TCP	Used by XEdit and XAdmin
5122		TCP	Used by XEdit for <i>keepalive</i> (heartbeat)
5432		TCP	Used by XEdit for export operations

Port	Used for	Transport	Notes
7600		TCP	Used for troubleshooting the REST API (remote control)
13000		TCP	Online connection
13100		TCP	Used for calibration data from XEdit
5120	RCP2	TCP	Used to listen for Kaleido Software discovery packets
10000		TCP	For RCP2 protocol
10001		TCP	For RCP2 protocol
5120		UDP	On multicast 230.8.8.9 for RCP2 protocol
5121		UDP	For RCP2 protocol

From multiviewer to client

Port	Used for	Transport	Notes
1024–5000 ⁱ 49152–65535 ⁱⁱ	Java RMI	TCP	Remote Method Invocation (client/server communication). Dynamic Allocation of ports. Required for communication between client and Application Server.

i. For Windows XP and earlier

ii. For Windows 7 and later

From multiviewer to multiviewer

The following ports, used for inter-frame communications, are open by default on all Kaleido Software systems:

Port	Used for	Transport	Notes
22	SSH	TCP	Secure Shell Login is required to login to a multiviewer for maintenance.
4160	Java Jini	TCP	Responsible for discovery and communications between devices/services on a network.
8080	HTTP	TCP	Internal communication
8082		TCP	Internal communication
8083		TCP	Internal communication
8084		TCP	Internal communication
8085		TCP	Internal communication
8086		TCP	Internal communication
8087		TCP	Used for debugging purposes
8090		TCP	Web service
32769		TCP	filenet-rpc
5120		UDP	On multicast 230.8.8.9 for RCP2

Port	Used for	Transport	Notes
7572		UDP	On multicast 230.8.8.8 for "keep-alive" (heartbeat)
7571		UDP	For "keep-alive" (heartbeat)

From iControl to multiviewer

Port	Used for	Transport	Notes
4160	Java Jini	TCP	Responsible for discovery and communications between devices/services on a network.
32768–65535	Java RMI	TCP	Remote Method Invocation (client/server communication). Dynamic Allocation of ports. Required for communication between client and Application Server. This range can be restricted to match specific security requirements. A minimum of 4000 ports should be allocated.

Between multiviewer and remote control panel

The following ports, used for communications to/from RCP-200 and Kaleido-RCP2 control panels, are open by default on all Kaleido Software systems:

Port	Used for	Transport	Notes
5120	RCP2	TCP	Used to listen for Kaleido Software discovery packets
10000		TCP	For RCP2 protocol
10001		TCP	For RCP2 protocol
5120		UDP	On multicast 230.8.8.9 for RCP2 protocol
5121		UDP	For RCP2 protocol
80	HTTP	TCP	Used by the RCP-200 to obtain information from the multiviewer's system database
13000		TCP	Used by the RCP-200 to control the multiviewer via the gateway

From multiviewer to peripheral devices

Port	Used for	Transport	Notes
25	SMTP	TCP	Simple Mail Transfer Protocol, for e-mail alerts.
5100	GPI-1501	TCP	Used to obtain information from GPI-1501 General Purpose Interface I/O modules. ⁱ
5353	mDNS discovery	UDP	Used for mDNS discovery on multicast 224.0.0.251
8851	Alpermann+Velte	TCP	Used to obtain information from Plura (Alpermann+Velte) Studio Production Timer (SPT) systems.
8910 ⁱⁱ	TSL (network)	TCP	Used to obtain information from TSL devices that use the TSL UMD version 5.0 protocol.

i. See also: [From multiviewer to multiviewer](#), on page 43.

ii. Configurable.

From peripheral devices to multiviewer

The following ports must be open on peripheral devices (e.g., router controllers):

Port	Transport	Notes
2000	TCP	Used to control a multiviewer's internal router via the SAM (Snell/Pro-Bel) SW-P-02 protocol
4381	TCP	Used to control a multiviewer's internal router via the Nevion (Network) protocol
5194	TCP	Used to control a multiviewer's internal router via the NVEP Router (NP0016) protocol.
5353	UDP	Used for mDNS discovery on multicast 224.0.0.251
7600	TCP	Used to control a Kaleido-IP multiviewer via a REST API
14000	TCP	Used to control a multiviewer's internal router via the SAM (Snell/Pro-Bel) SW-P-08 protocol

Router drivers also use default ports:

Port	Driver	Transport	Notes
4000	ETL	TCP	
12345	GVG 7000 Native	TCP	
9193	NVEP NV9000 (NP0017)	TCP	
4381	VikinX Modular	TCP	
9100	Quintech	TCP	
12345	Sony HKSPC	TCP	GVGNP Emulator
5001	Utah RCP-3	TCP	SC-4 Ethernet
2000	SAM (Snell/Pro-Bel) SW-P-02	TCP	
14000	SAM (Snell/Pro-Bel) SW-P-08	TCP	

Note: This is configurable in XEdit—you can choose any UDP or TCP/IP port to use for communications between the multiviewer and an external router.

Between multiviewer and SNMP managers

Port	Used for	Transport	Notes
161	SNMP	UDP	Used for SNMP (Simple Network Management Protocol) communications between external SNMP managers and a multiviewer (e.g., sending get, get-next, and set messages to a multiviewer's SNMP agent, and receiving the response).
1161		UDP	Used for SNMP (Simple Network Management Protocol) communications between external SNMP managers and a <i>Kaleido-IP</i> multiviewer (e.g., sending get, get-next, and set messages to a multiviewer's SNMP agent, and receiving the response).

Between multiviewer and NTP server

The following ports, used for communications to/from Network Time Protocol servers, are open by default on all Kaleido Multiviewer systems:

Port	Used for	Transport	Notes
123	NTP	TCP	Used for Network Time Protocol synchronization. Port needs to be open in both directions.

Network Considerations for a Multiviewer Cluster

IMPORTANT

Before changing the system name or IP address of a multiviewer associated with a cluster, review the following.

- If you change the system name or IP address of a cluster member while another cluster member is offline or otherwise unavailable, the cluster's integrity will be broken. If you attempt to make such a change, XEdit will alert you of the situation, prompting you to cancel the operation and try again later, when all cluster members are available. However, in the advent that such a change was made by mistake, or that it as been forced for some reason, you will have to repair the broken cluster (see "Repairing a Cluster System" in the Kaleido Software User's Manual).
- To maintain the integrity of a cluster configuration, such changes must be made by using the system configuration features available in XAdmin.

5 System Configuration

Introduction

This chapter shows how to configure the multiviewer.

System Requirements for a Client PC

A client PC or laptop meeting the following requirements is required to access the XAdmin Web client, and the other Kaleido Software client applications.

Operating system	Microsoft Windows 10, Windows 8.1, Windows 8, or Windows 7.
Processor	The minimum required by the operating system or better.
Memory	The minimum required by the operating system plus 2 GB or more.
Disk space	The minimum required by the operating system plus 2 GB or more.

Multiviewer Model Representation in XEdit and XAdmin

The name used to represent a multiviewer model is shown in the table below.

Multiviewer model	Represents
Kaleido-IP-4	A Kaleido-IP X120 or X320, frame with four network adapters
Kaleido-IP-6	A Kaleido-IP X320 frame with six network adapters

Installing Kaleido Software Client Applications

In addition to the XAdmin Web client, which does not require installation, the Kaleido Software includes the following client applications:

- XEdit is a client application used to create layouts for the monitor wall, and to configure your multiviewer system, from your PC. When this PC has network connectivity to the multiviewer, you can use XEdit to modify layouts and settings directly on the multiviewer, or you can work locally on the computer and then export your changes to the multiviewer.
- If you have only one multiviewer (or if you have more than one but you intend to always have the same version of the Kaleido Software on all of them), download the XEdit installer file from the multiviewer's home page. Whenever you install a new version of the Kaleido Software on the multiviewer, the next time you open XEdit, your copy of the application will be automatically updated from the multiviewer. See [Installing XEdit from your Multiviewer's Home Page](#) on page 48.

- The Router Control Software Single Bus and Matrix View applications (also part of the iRouter Router Control Software packaged with iControl Application Servers) can be used to control your multiviewer's logical sources and monitor wall destinations, via the *KX Router* logical router, or to control other logical routers configured within your multiviewer system. See [Installing Router Control](#) on page 52.

Installing XEdit from your Multiviewer's Home Page

To install XEdit from your multiviewer's home page

- 1 With your PC, open a Web browser window and type the multiviewer's IP address in the address bar.

The multiviewer's home page appears.



- 2 Click the **XEdit** button.

The browser prompts you to save an executable file to your hard drive (`Kaleido-windows64-online.exe1`). This file is an online installer, which will download XEdit and other companion elements from your multiviewer, and install them. Some browsers may allow you to run the file directly. Depending on your browser's security features, warnings may appear, which you can safely dismiss.


1. Installers for Linux or Mac OS X are not available.

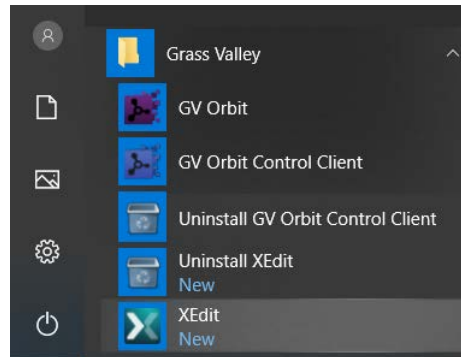
- 3 Unless your browser let you run the file (and you chose to do so), navigate to the location were you saved the installer file and open it.

More security warnings or prompts may appear, which you may safely dismiss or accept.

A window appears, showing the download and installation progress.



At the end of the installation process, with Windows 7, or Windows 10, shortcuts () are added to your desktop and to the Start menu (under **Grass Valley**).



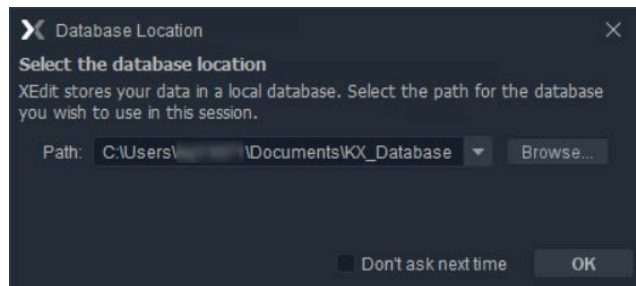
Once the installation has completed, the XEdit startup screen appears.



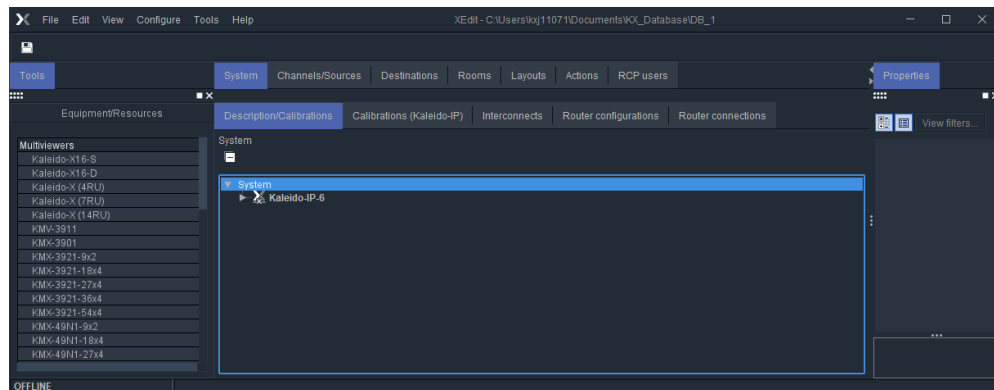
Depending on your Windows Firewall settings, a security alert may appear.


- Click **Allow access** to unblock the application.
If XEdit cannot find all of the fonts it needs already on your PC, it downloads them from the multiviewer automatically, in which case a message will appear to confirm the font update, and instruct you to restart the application.
- Click **OK** to continue, and then open XEdit again, by using the shortcut on your desktop, in your Apps view (Windows 8.1) or Start screen (Windows 8), or from the Start menu (Windows 7, Windows 10).

- 4 When prompted to specify a database, choose one from the **Path** list, or click **Browse** to navigate to the database you wish to use as your local workspace, and then click **OK**.



Once the database has completed loading, XEdit's main application window appears.



Note: Once it has been installed from the multiviewer, XEdit remains on your PC, and can be launched from the  shortcut that was added to your desktop, Apps view, or Start screen (see [page 49](#)), or from the Start menu. Whenever you install a new version of the Kaleido Software on the multiviewer, the next time you open XEdit, your installed copy of the application will be automatically updated from the multiviewer.

For more information about calibrating your system, configuring rooms, creating layouts, and operating the monitor wall, refer to the *Kaleido Software User's Manual*. See [Related Documentation](#), on page 17.

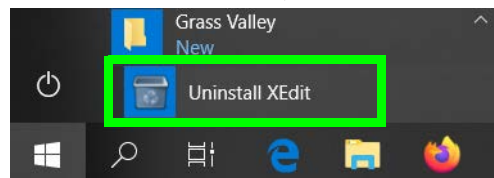
Uninstalling XEdit

With recent versions of XEdit, an uninstall program is available from the Windows Start menu.

Uninstalling XEdit

To uninstall XEdit (dynamic version 7.20 or later)

- 1 Close all XEdit windows you may have open.
- 2 Locate the **Uninstall XEdit** shortcut.
 - If you have Windows 7, or Windows 10: Open the Start menu, click **All Programs**, scroll to the **Grass Valley** folder.



- If you have Windows 8.1, or Windows 8: Switch to the App view or your Start screen.
- 3 Click **Uninstall XEdit**.

An uninstall screen appears.



- 4 Click **Uninstall**.

This removes XEdit, including all shortcuts, launchers, and other elements that were installed with it, from your system.

Installing Router Control

To install Router Control from your multiviewer's home page

- 1 From a workstation on the same subnet as the multiviewer, open a Web browser window and type the multiviewer's IP address in the address bar.

The multiviewer's home page appears.
- 2 Click the **Router Control** button.

The browser prompts you to save an executable file to your hard drive (Kaleido__RouterControl-windows64-online.exe²). This file is an online installer,

which will download Router Control and other companion elements from your multiviewer, and install them. Some browsers may allow you to run the file directly. Depending on your browser's security features, warnings may appear, which you may safely dismiss.


- 3 Unless your browser let you run the file (and you chose to do so), navigate to the location were you saved the installer file and open it.

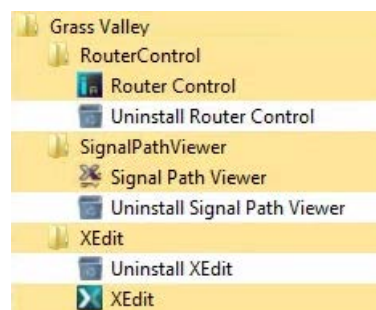
More security warnings or prompts may appear, which you may safely dismiss or accept.

A window appears, showing the download and installation progress.



At the end of the installation process:

- If you have Windows 7, or Windows 10, shortcuts () are added to your desktop and to the Start menu (under **Grass Valley**).

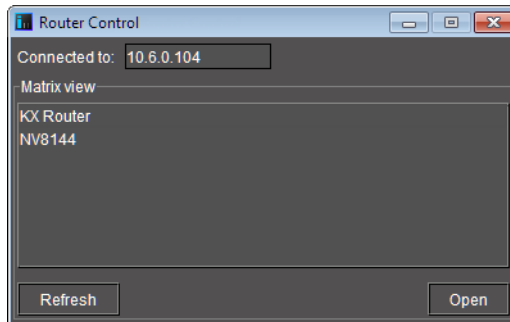


- If you have Windows 8.1, or Windows 8, Router Control will appear on your desktop, in the Apps view with all other installed applications on your PC (Windows 8.1), or in your Start screen (Windows 8).

Once the installation has completed, the Router Control main application window appears. The application automatically connects to your multiviewer. The main

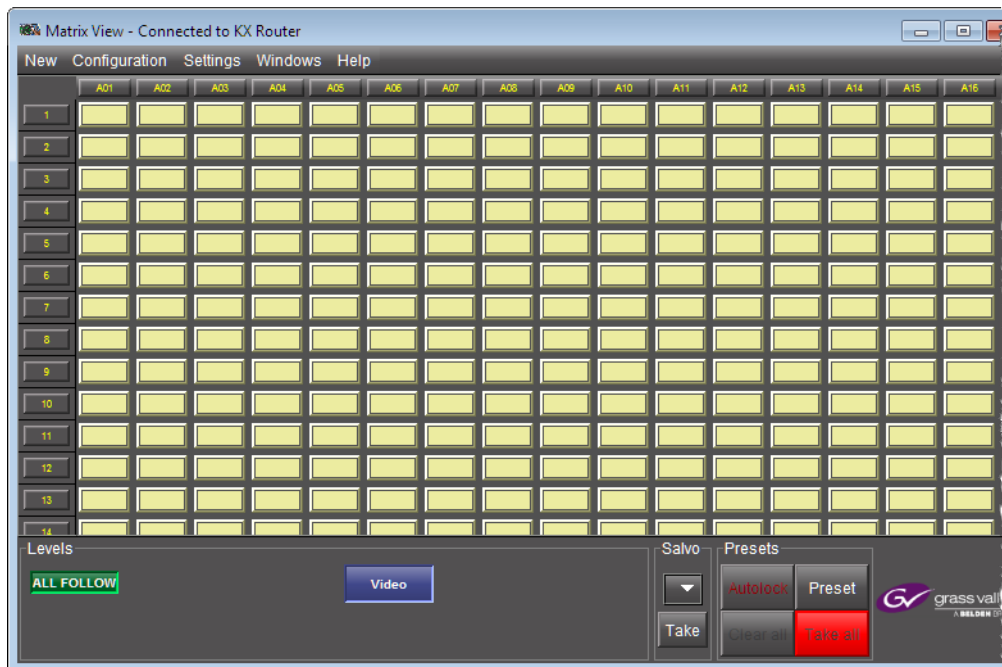
2. Installers for Linux or Mac OS X are not available.

window lists all logical routers configured within your multiviewer system, in addition to the *KX Router* logical router.




- 4 In **Router Control**, click the router you want to control, and then click **Open**. Depending on your Windows Firewall settings, a security alert may appear.
 - Click **Allow access** to unblock the application.

The Matrix View application window opens.



On the **Help** menu, click **Help** to access the online documentation, or refer to the *iControl Router User Guide*, see [Related Documentation](#), on page 17.

Notes

- Once it has been installed from the multiviewer, Router Control remains on your PC, and can be launched from the  shortcut that was added to your desktop, Apps view, Start screen (step on page 53), or from the Start menu. Whenever you install a new version of the Kaleido Software on the multiviewer, the next time you open Router Control, your installed copy of the application will be automatically updated from the multiviewer.

Notes (continued)

- Router Control can also connect to other Kaleido multiviewers or iControl Application Servers, and control their routers.
 - Routers configured within a Kaleido multiviewer system are compatible with the Router Control modules packaged with iControl Application Servers version 6.10 and later.
 - When Router Control is connected to an Application Server, a router manager configuration application is available from the main application window. When Router Control is connected to a Kaleido multiviewer, this router manager configuration application is not available (router configuration is performed with XEdit, in this case).
-

Uninstalling Router Control

To uninstall Router Control

- 1 Close all Router Control windows you may have open.
- 2 Locate the **Uninstall Router Control** shortcut.
 - If you have Windows 7, or Windows 10: Open the Start menu, click All Programs, scroll to the Grass Valley folder.
 - If you have Windows 8.1, or Windows 8: Switch to the App view or your Start screen.
- 3 Click **Uninstall Router Control**.
An uninstall screen appears.
- 4 Click **Uninstall**.
This removes Router Control, including all shortcuts, and other elements that were installed with it, from your system.

Opening XAdmin

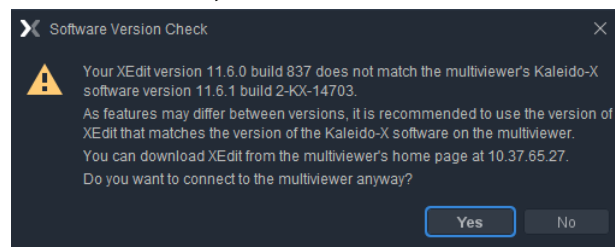
Connecting to a Multiviewer with a Different XEdit Version from your PC's Version

When connecting to a multiviewer with your PC and your PC already has XEdit installed, the XEdit version installed on your PC and the Kaleido Software version on the multiviewer must be same as explained below.

The composition of a Kaleido Software / XEdit version numbering is explained in the following table.

Kaleido Software / XEdit Version Reference	Description
Version <i>M.m.p</i>	M is the major revision number m is the minor revision number p is the patch revision number

When you connect to a multiviewer, the multiviewer's Kaleido Software major and minor version must match the XEdit major and minor version installed on your PC. When there is a version number mismatch between the multiviewer's Kaleido Software version and your PC's XEdit version, you will receive the following error when you try to connect to the multiviewer with your PC.



Under this circumstance, proceed as follows.

- There is no compatibility problem if only the patch revision number is different between the Kaleido Software version on the multiviewer and the XEdit version on your PC. Click **Yes** to the Software Version Check screen.
- There is a compatibility problem if the major version, minor version, or both are different between the Kaleido Software version on the multiviewer and the XEdit version on your PC. The solution is to downgrade / upgrade the XEdit version used on your PC to the Kaleido Software version used by the multiviewer. Proceed as follows:
 - Click **No** to the Software Version Check screen.
 - Uninstall XEdit from your PC (see [Uninstalling XEdit](#), on page 52).
 - Install XEdit from the multiviewer (see [Installing XEdit from your Multiviewer's Home Page](#), on page 48).

If you regularly connect to different multiviewer systems that use different Kaleido Software versions, and as a result you receive the Software Version Check error message, the best solution to avoid this is to upgrade all of your multiviewer systems to the same Kaleido Software version.

Ways to Access XAdmin

Access the XAdmin Web client as follows:

- from a **Web browser** (see [Opening XAdmin from a Browser](#) on page 57),
- from **XEdit** (see [Opening XAdmin from XEdit](#) on page 58),

The first time you access XAdmin for a multiviewer (and every time the multiviewer's IP address has changed), you may see a security warning or a certificate error message. The procedures below include instructions on how to address these messages (see [Registering your Multiviewer's Security Credentials with your Browser](#) on page 58). Internet Explorer users may also need to enable compatibility view (see [Enabling the Compatibility View in Internet Explorer](#) on page 67).

Opening XAdmin from a Browser

To open XAdmin from a browser

- 1 Open a Web browser window and enter the multiviewer's *Management* IP address in the address bar.

The Kaleido Multiviewer's home page appears.



- 2 Click the XAdmin button.
- 3 If you see a security warning, or a certificate error message, then see [Registering your Multiviewer's Security Credentials with your Browser](#), on page 58.
- 4 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.



- 5 **Internet Explorer users:** If a blank page appears, then see [Enabling the Compatibility View in Internet Explorer](#), on page 67.

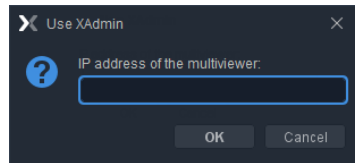
The XAdmin *Status and Options* page appears. You can access all XAdmin features, by clicking the links, in the navigation area on the left of the page.

Opening XAdmin from XEdit

To open XAdmin from XEdit

- 1 On the **Configure** menu, click **Use XAdmin**.

XEdit prompts you for the *Management* IP address of the multiviewer you want to access.



- 2 Type the IP address, and then click **OK**.

Your default Web browser opens.

- 3 If you see a security warning, or a certificate error message, then see [Registering your Multiviewer's Security Credentials with your Browser](#), on page 58.
- 4 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.



- 5 **Internet Explorer users:** If a blank page appears, then see [Enabling the Compatibility View in Internet Explorer](#), on page 67.

The XAdmin *Status and Options* page appears. You can access all XAdmin features, by clicking the links, in the navigation area on the left side of the page.

Registering your Multiviewer's Security Credentials with your Browser

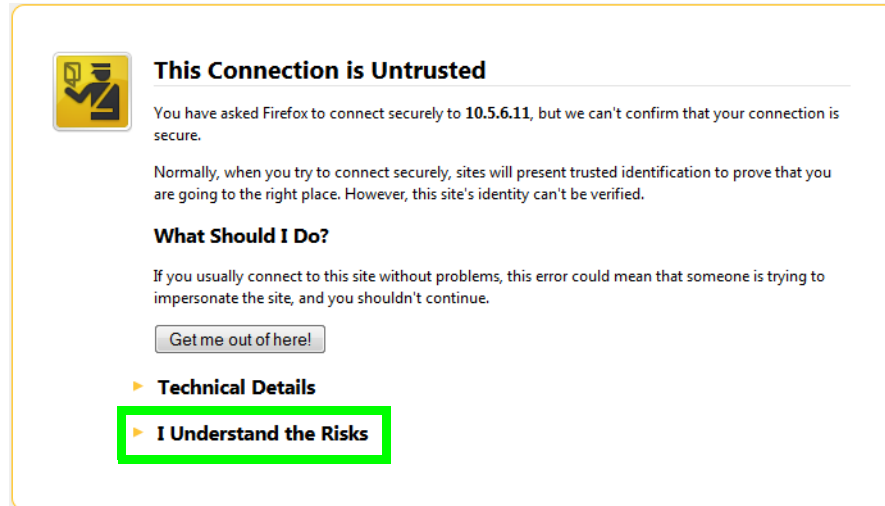
When you open your multiviewer's home page, or try to access XAdmin, your browser may report a certificate error (Internet Explorer), warn you about the site's security certificate (Chrome), or report an untrusted connection (Firefox). Follow the appropriate procedure below to register your multiviewer's security credentials with your browser:

- [Suppressing untrusted connection warning in Firefox](#), on page 59
- [Suppressing certificate error in Internet Explorer or Chrome](#), on page 61

You will be then able to access your multiviewer's client applications without seeing the error message again, as long as the multiviewer's IP address does not change.

Suppressing untrusted connection warning in Firefox

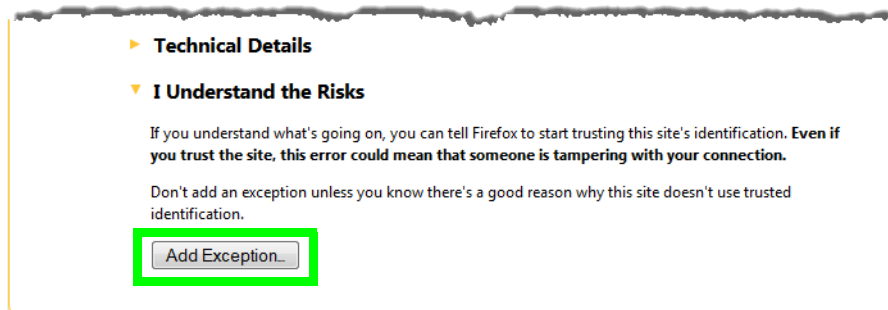
The first time you try to access XAdmin in Firefox, the browser may display the following page instead, prompting you to confirm the multiviewer's security credentials.



To register your multiviewer's security credentials with Firefox

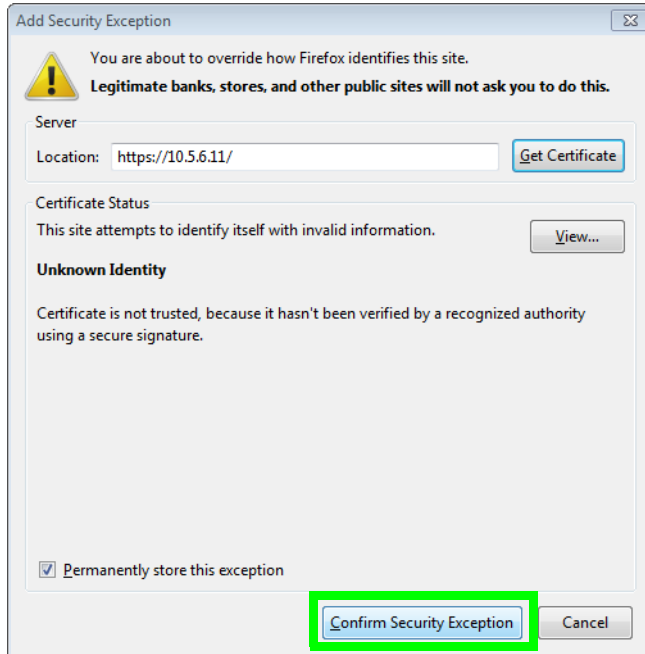
- 1 Click **I understand the Risks**, at the bottom of the page.

The message expands.



- 2 Click **Add Exception**.

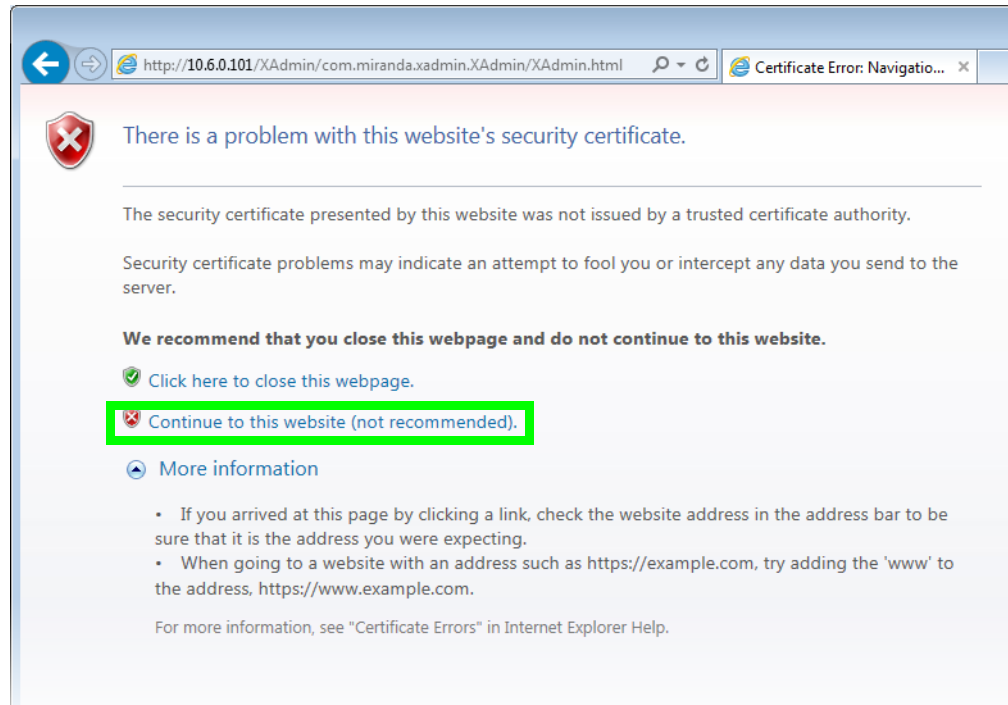
3 In Add Security Exception, click Confirm Security Exception.



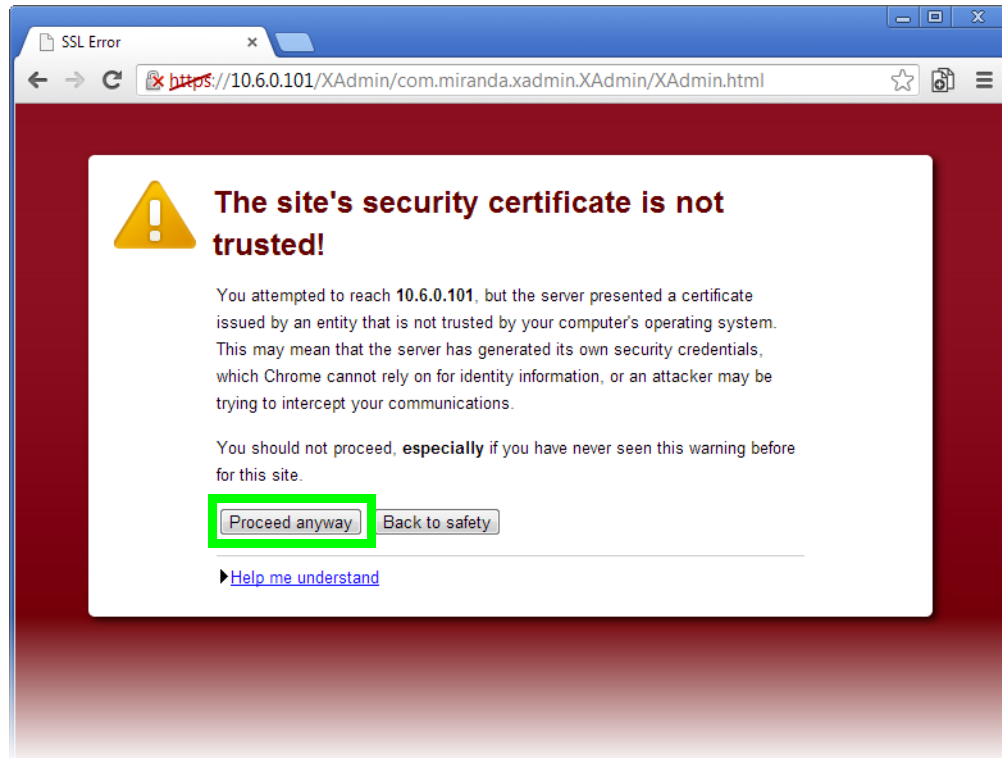
Your multiviewer's home page appears. You will now be able to access your multiviewer's client applications without seeing the warning. This will remain effective until the multiviewer's IP address is changed, in which case you will need follow the procedure again.

Suppressing certificate error in Internet Explorer or Chrome

The first time you try to access XAdmin in Internet Explorer or Chrome, the browser may prompt you to confirm the multiviewer's security credentials.



Internet Explorer's security warning



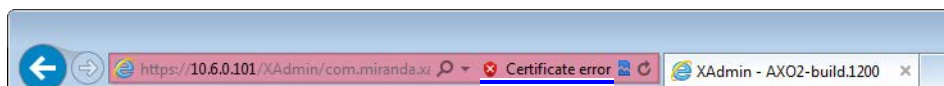
Chrome's security warning

Clicking **Continue to this website (not recommended)** (Internet Explorer), or **Proceed anyway** (Chrome) will let you access XAdmin but the browser's address bar will keep indicating that the multiviewer's identity is not verified. To suppress this warning, you need to perform the following, in Internet Explorer, *even if your preferred browser is Chrome*.

To register your multiviewer's security credentials with Internet Explorer

- 1 Click **Continue to this website (not recommended)**.

The address bar now indicates the certificate error.

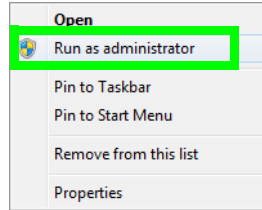


Special notes for Internet Explorer users

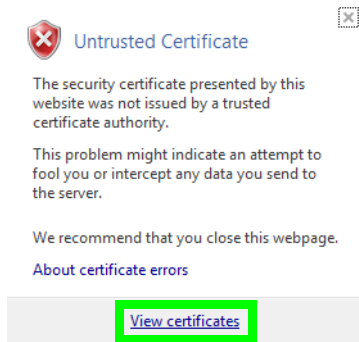
- If you see a blank page instead of XAdmin's *Status and Options* page, then see [Enabling the Compatibility View in Internet Explorer](#), on page 67.

Special notes for Internet Explorer users (continued)

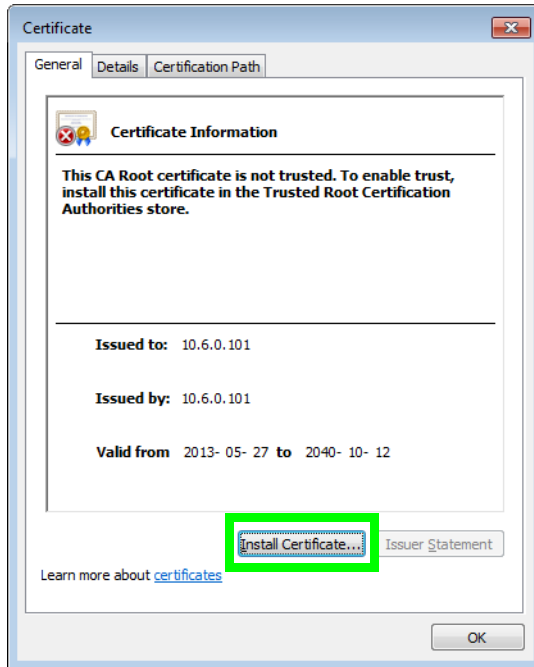
- You must have administrator status to accept the certificate error. If your user account does not have administrator status, then close your browser and, before you open it again, right-click the Internet Explorer icon, and then click **Run as administrator**:



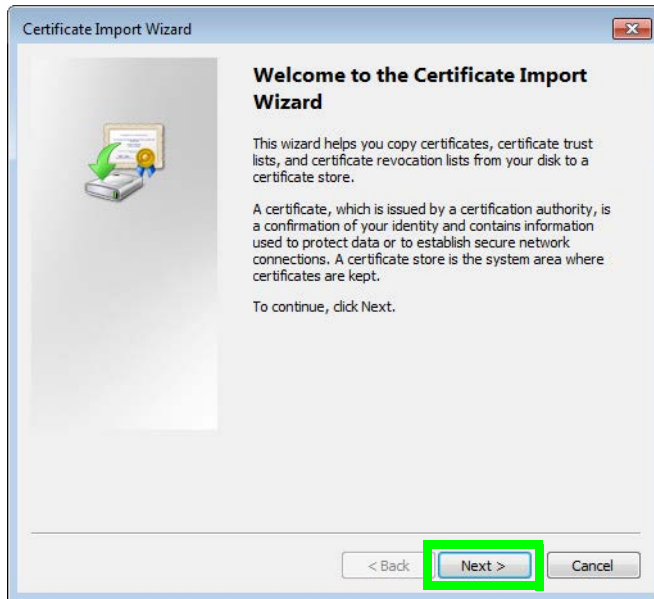
- 2 Click **Certificate error**.
- 3 In **Untrusted Certificate**, click **View certificates**.



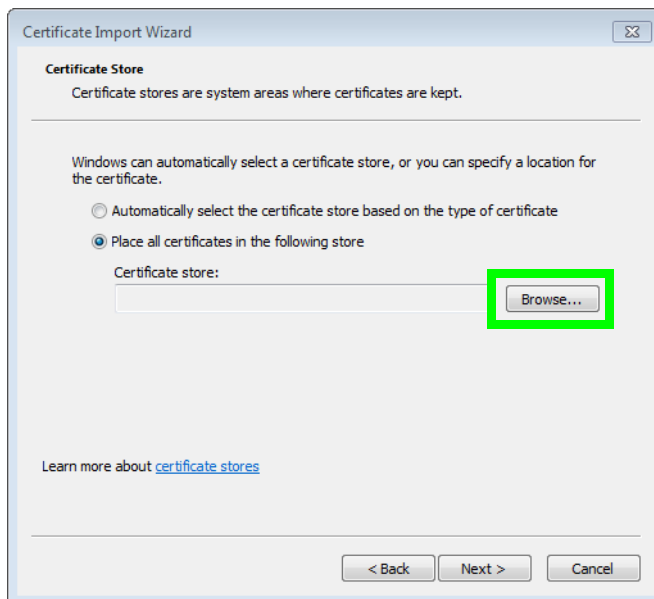
- 4 In **Certificate**, click **Install Certificate**.



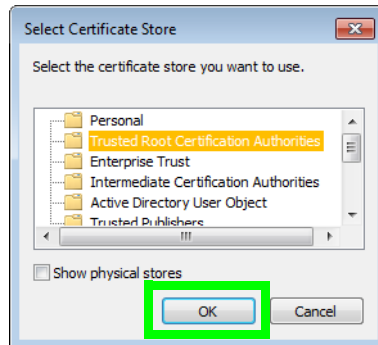
5 In **Certificate Import Wizard**, click **Next**.



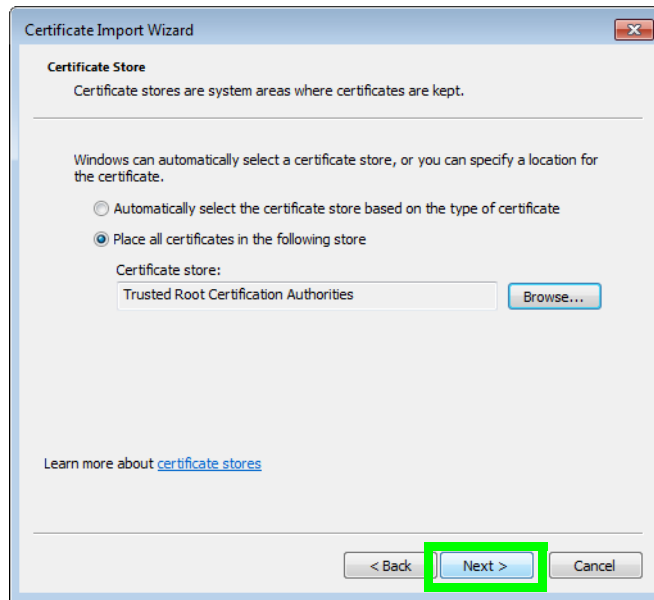
6 In **Certificate Import Wizard**, click **Place all certificates in the following store**, and then click **Browse**.



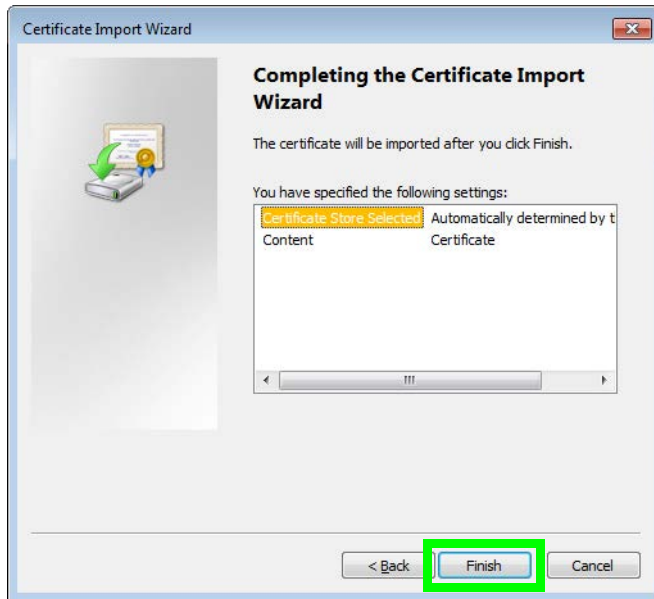
- 7 In **Select Certificate Store**, select **Trusted Root Certification Authorities**, and then click **OK**.



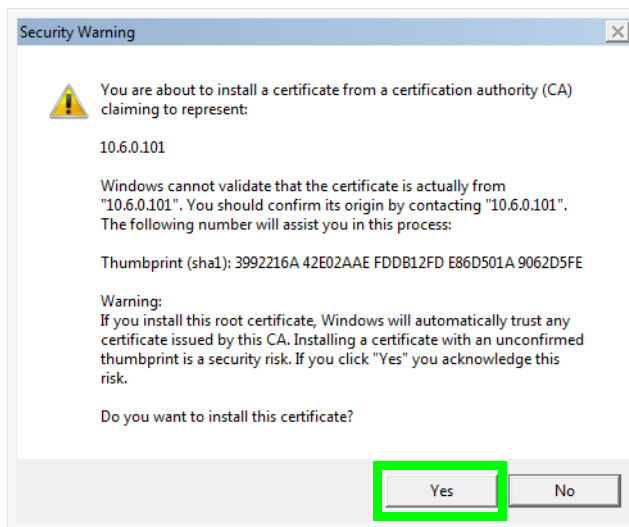
- 8 Back in **Certificate Import Wizard**, click **Next**.



9 Click **Finish**.

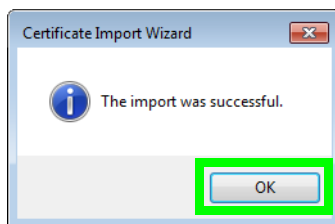


A security warning appears.



10 Click **Yes**.

11 **Certificate Import Wizard** reports that the import was successful.




12 Click **OK** to continue, and then click **OK** to close the **Certificate** window.

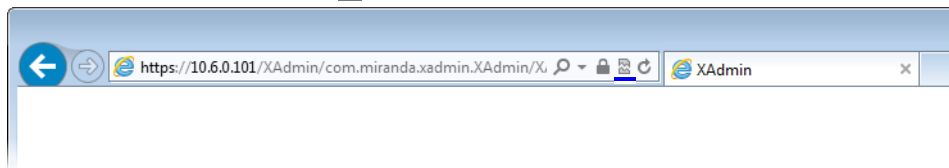
- 13 Close all Internet Explorer (and Chrome, if any) windows, and then open your browser again.
You should now be able to access XAdmin, from your multiviewer home page without ever seeing the security warning again, unless the multiviewer's IP address is changed, in which case you will want to repeat this procedure.

Enabling the Compatibility View in Internet Explorer

When you try to access XAdmin, from your multiviewer's home page, in *Internet Explorer 8, 9, or 10*, you may see a blank page instead of XAdmin's *Status and Options* page.³

To enable the compatibility view for your multiviewer's XAdmin Web client

- Click the Compatibility View  button at the end of your browser's address bar.



XAdmin's *Status and Options* page appears



The Compatibility View mode will remain enabled for this multiviewer as long as its IP address does not change.

3. Should this happen with Internet Explorer 11, refer to *Fix site display problems with Compatibility View*, at <http://windows.microsoft.com/en-us/internet-explorer/use-compatibility-view#ie=ie-11>

XAdmin Access Control

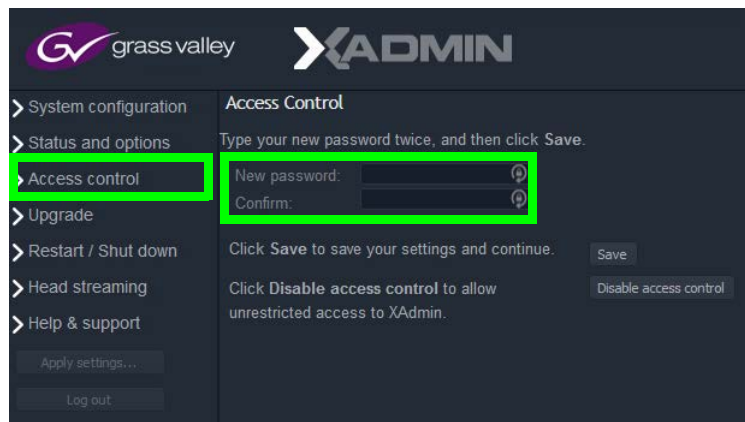
XAdmin supports a simple authentication mechanism to prevent unauthorized users from modifying a multiviewer's system configuration.

Enabling XAdmin Access Control

To enable access control in XAdmin

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Click **Access control**, in the navigation area on the left side of the page.

The Access Control page appears.

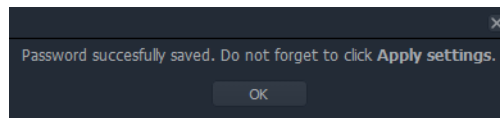


- 3 Type the password you want to enforce in both the **New password** and the **Confirm** boxes.

The password must contain between 6 and 20 alphanumeric characters or symbols.

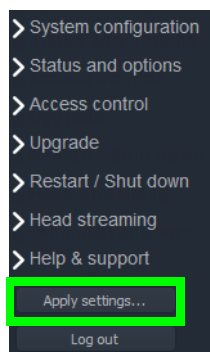
- 4 Click **Save**.

A confirmation message appears.



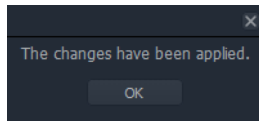
- 5 Click **OK** to close the message window.

The **Apply settings** button becomes available.



6 Click **Apply settings**.

XAdmin must upload the password to the multiviewer, for password enforcement to take effect. A progress indicator appears momentarily, followed by a confirmation message.



7 Click **OK**.

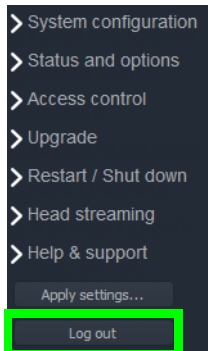
The Log in to XAdmin page appears. Other XAdmin sessions open against the same multiviewer are also redirected to the login page.



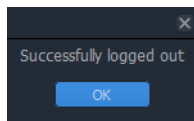
8 Type the password, and then click **Log in**.

The XAdmin *Status and Options* page appears.

9 Click **Log out**, when you are ready to close your session.



A confirmation message appears.



10 Click **OK**.

The login page appears. Only authorized users have access to XAdmin.

Changing the XAdmin Password

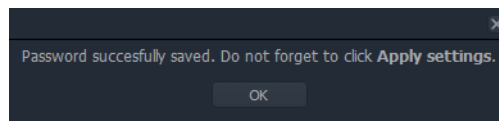
To change the password used to prevent access to your multiviewer from XAdmin

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Click **Access control**, in the navigation area on the left side of the page.
The Access Control page appears.

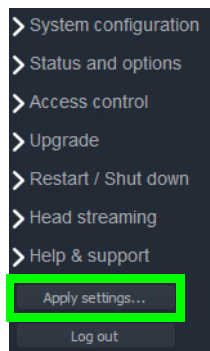


- 3 Type the new password you want to enforce in both the **New password** and the **Confirm** boxes.
The password must contain between 6 and 20 alphanumeric characters or symbols.
- 4 Click **Save**.

A confirmation message appears.

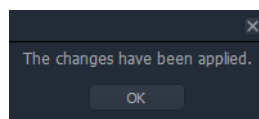


- 5 Click **OK** to close the message window.
The **Apply settings** button becomes available.



- 6 Click **Apply settings**.

XAdmin must upload the password to the multiviewer, for the password change to take effect. A progress indicator appears momentarily, followed by a confirmation message.



7 Click **OK**.

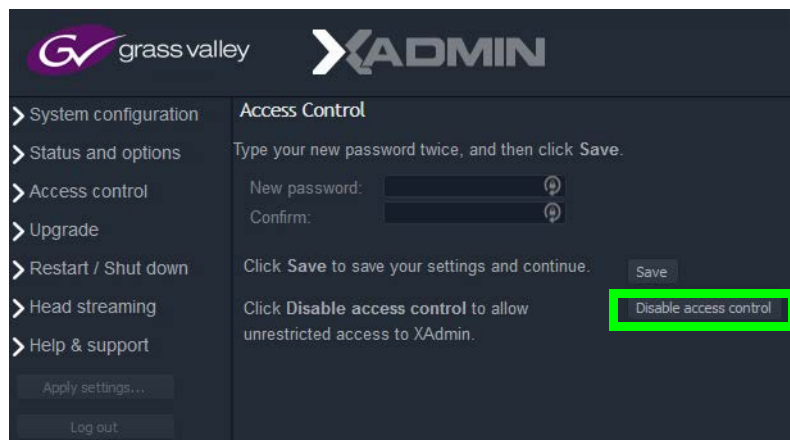
The Log in to XAdmin page appears. Other XAdmin sessions open against the same multiviewer are also redirected to the login page.



Disabling XAdmin Access Control

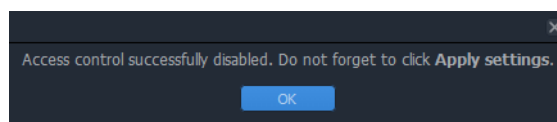
To disable access control in XAdmin

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Click **Access control**, in the navigation area on the left side of the page. The Access Control page appears.



3 Click **Disable access control**.

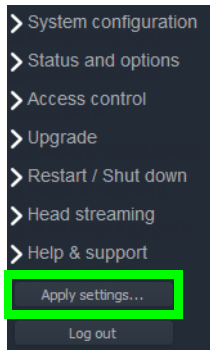
A confirmation message appears.



4 Click **OK** to close the message window, and then click **Apply settings**.

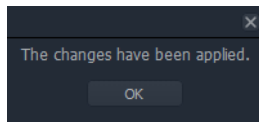
- 5 Click **OK** to close the message window.

The **Apply settings** button becomes available.



- 6 Click **Apply settings**.

A progress indicator appears momentarily, followed by a confirmation message.



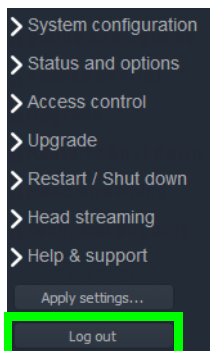
- 7 Click **OK**.

Unrestricted access to XAdmin is restored, for this multiviewer.

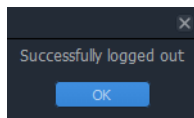
Closing a Password-Protected XAdmin Session

To close your XAdmin session

- 1 Click **Log out**, in the navigation area on the left side of the current page, when you are ready to close your session.



A confirmation message appears.



- 2 Click **OK**.

The login page appears. Only authorized users have access to XAdmin for this multiviewer.

Viewing a Multiviewer's Status Information


To view the status information for a multiviewer

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.

XAdmin's *Status and Options* page appears, showing the multiviewer model, and a list of licenses under **MULTIVIEWER STATUS AND LICENSES**



XAdmin Status and Options page

- 2 Click the arrow button  at the end of a module's heading row to see more details the item.



At any time you can click the Refresh button  to make sure the data displayed for the selected module is up to date.

Configuring Sources

Refer to *Configuring the System Representation* in the Kaleido Software User's Manual. See [Related Documentation](#), on page 17.

Using a Kaleido-RCP2 with Default Settings

By default, the Kaleido-RCP2 is configured with DHCP enabled, so it will automatically be assigned an IP address by a DHCP server. If no DHCP server can be found, the Kaleido-RCP2 will fall back to its default static IP address, subnet mask, and gateway settings:

Default IP address	10.0.3.191
Default subnet mask	255.255.0.0
Default gateway	0.0.0.0

If you need to operate with a fixed IP address, you must use the Kaleido-RCP2's configuration menu to disable DHCP and set up the correct IP address, Network Mask, and Gateway (see the "Enabling or Disabling DHCP" and "Setting an IP Address, Subnet Mask and Gateway" sections in the *Kaleido-RCP2 Guide to Installation and Operation*, available from the Documentation Library section of Grass Valley's website).

To access Kaleido-X rooms located in other subnets, the Kaleido-RCP2 must be configured with the appropriate unicast IP addresses (see the "Configuring Unicast IP Addresses" section in the *Kaleido-RCP2 Guide to Installation and Operation*, available from the Documentation Library section of Grass Valley's website).

To start using the Kaleido-RCP2 with its default settings

- 1 On the Kaleido-RCP2 unit, press the ENTER button and hold it until the ESC button lights up.

The following message appears on the LCD display:

Configuration

ROOM SELECTION

- 2 Press ENTER again to obtain the room list from the multiviewers that are currently available on the network.

The message **ROOM Select** followed by the name of the first room available appears on the LCD display.

- 3 Press the **2** key (to move up in the list) or the **8** key (to move down the list) until the name of the room you wish to access is displayed.
- 4 Press ENTER, and then press ESC to exit the configuration menu.

- 5 Press the LOGIN button.

The following message appears on the LCD display:

LOGIN Position

Admin

- 6 Press ENTER to log on to your system as *Admin*.

A message prompting you for a password appears on the LCD display.

- 7 Press ENTER again (by default, there is no password).

The message **Access granted** will appear on the LCD display if the login is successful. If a mouse is connected to the Kaleido-RCP2, then you should be able to see and move the mouse pointer on the monitor wall.

- 8 Press any of the LAYOUT PRESETS buttons to load a predefined layout on the monitor wall.

If your system was configured prior to shipment, then a layout will appear on all displays. Otherwise, a gray screen will appear with the following message in the middle:

“No layout has been assigned to this room. Please load a layout.”

Note: To access other layouts, press the LOAD button. To assign a layout to a preset button, press and hold the button for more than six seconds while the desired layout is showing on the monitor wall.

Customizing Layouts, Logical Sources, and other Kaleido-IP Elements

Refer to the *Kaleido Software User Manual* to learn how to customize the Kaleido-IP to suit your specific needs. See [Related Documentation](#), on page 17.

Available Hardware and Software Options

You can purchase various Kaleido Software and hardware options to expand your multiviewer's capabilities that are not part of the basic offer. Kaleido Software options are enabled by entering a software key that has been sent to you once you have purchased the option. The following table lists options that can be enabled via the XAdmin *Status and Options* page (see [Enabling Options](#) on page 83).

Kaleido-IP X320/X120 software options

Part Number	Option	Kaleido-IP		Feature
		X120	X320	
KIP-OPT-ACTIVATION	Kaleido-IP software activation	•	•	Makes the Kaleido-IP operable. One license is required per Kaleido-IP. This license is included with the purchase of a Kaleido-IP X120/X320.
KIP-OPT-UHD-HEVC	4K UHD HEVC/H.265 decode	•	•	Decode license for H.265/HEVC SD/HD and UHD video CODEC. One license per Kaleido-IP.
KIP-OPT-HD-HEVC	HD/SD HEVC/H.265 decode	•	•	Decode license for H.265/HEVC SD/HD video CODEC. One license per Kaleido-IP.
KIP-OPT-UCIP ⁱ	Uncompressed IP inputs ST 2022-6 / 2110 Rivermax license	•	•	Decode license for SMPTE ST 2022-6 / ST 2110 video. This is composed of two items: <ul style="list-style-type: none"> • One license key (Uncompressed IP inputs ST 2022-6 / 2110). • One activation file (Rivermax license file). One of each item is required per Kaleido-IP. See also Configuring Uncompressed IP SMPTE ST 2022-6 / 2110 Inputs , on page 86.
KIP-OPT-UCIP-OUT ⁱ	Uncompressed IP ST 2110 output Rivermax license	•	•	Stream SMPTE ST 2110 uncompressed redundant video output. This is composed of two items: <ul style="list-style-type: none"> • One license key (Uncompressed IP outputs ST 2110). • One activation file (Rivermax license file). One of each item is required per Kaleido-IP. See also Cabling and Configuring the Head Streaming to support SMPTE ST 2022-7 Redundancy , on page 92 and Configuring Head Streaming , on page 88.

Kaleido-IP X320/X120 software options (continued)

Part Number	Option	Kaleido-IP		Feature
		X120	X320	
KIP-OPT-STREAMING-OUT	Compressed IP outputs H.264/MPEG2	•	•	License for: <ul style="list-style-type: none"> • H.264/MPEG2 compressed video remote streaming of the multiviewer outputs over IP. • Using noVNC to view a head's mosaic output through a Web browser. To stream heads 3 and 4, activate KIP-OPT-OP34 . Note: Even when the multiviewer's display output is set to 4K output resolution, the maximum streaming output resolution is HD (1920 × 1080). See Configuring Head Streaming , on page 88.
KIP-OPT-DEC-DD-5.1	AC3 stereo and 5.1 decode	•	•	Decode license for up to 32 AC3 stereo or 5.1 programs.
KIP-OPT-DEC-DD-2.0	AC3 2.0 decode	•	•	Decode license for up to 32 AC3 stereo programs.
KIP-OPT-DEC-AAC-5.1	AAC stereo and 5.1 decode	•	•	Decode license for up to 32 Advanced Audio Codec (AAC) stereo or 5.1 programs.
KIP-OPT-DEC-AAC-2.0	AAC 2.0 decode	•	•	Decode license for up to 32 Advanced Audio Codec (AAC) 2.0 programs.
KIP-OPT-LOUDNESS	Loudness level measurement	•	•	Loudness level measurement for all audio program. One license per Kaleido-IP.
KIP-OPT-SCTE-35	SCTE-35 metadata extraction	•	•	SCTE-35 metadata extraction and alarming license for all programs. One license per Kaleido-IP.
KIP-OPT-TS-PROBE	TR 101 290 DVB transport stream probing	•	•	TR 101 290 DVB transport stream probing option for priority 1 and priority 2 indicators. One license per Kaleido-IP. Note: indicator 2.4 is not supported.
KIP-OPT-DEC-AVC	AVC/H.264 decode	•	•	Decode license for H.264/AVC SD/HD video CODEC. One license per Kaleido-IP.

Kaleido-IP X320/X120 software options (continued)

Part Number	Option	Kaleido-IP		Feature
		X120	X320	
KIP-OPT-OP34	Output heads 3 and 4	•	•	Activates output heads 3 and 4. This is required to use noVNC for viewing the mosaic output of heads 3 and 4 with a Web browser.
Rivermax license file	–	•	•	See KIP-OPT-UCIP / KIP-OPT-UCIP-OUT above.

i. Requires one of KIP-OPT-ETH-2S, KIP-OPT-ETH-2Q, or KIP-OPT-ETH-2C network interface card.

The following table lists hardware options that can be installed in the field. Refer to the *Supermicro SuperServer 1028U Series User's Manual for model 1028U-TR4+* for more information about how to install an option card. See [Related Documentation](#), on page 17. Only the network interface cards listed below have been tested to work with the multiviewer and are supported by Grass Valley.

Kaleido-IP X320/X120 PCI network interface add-on card options (choose one)

Part Number	Option	To be Installed in Server PCI Expansion Slot Number ⁱ	Feature
KIP-OPT-ETH-2B	Extra 2 × GigE RJ45 ports	4	Dual NIC card (1Gb/s) ⁱⁱ .
KIP-OPT-ETH-2S	Extra 2 × 10/25G SFP28 ports	2	Dual NIC card (1/10/25 Gbps) for SFP cartridges ⁱⁱ .
KIP-OPT-ETH-2Q	Extra 2 × 40/50G QSFP28 ports	4	Dual NIC card (40/50 Gb/s) for QSFP cartridges ⁱⁱ .
KIP-OPT-ETH-2C	Extra 2 × 100G QSFP28 ports	4	Dual NIC card (40/50/100 Gb/s) for QSFP cartridges ⁱⁱ .

i. See also [Network Interface Card Installation Location in the Server](#), on page 82.

ii. Adds **LAN5** and **LAN6** to the multiviewer (if not already installed). PCI network interface cards cannot be installed in both slot #2 and slot #4 at the same time; only one network interface card can be installed. The **KIP-OPT-UCIP / KIP-OPT-UCIP-OUT** and **Rivermax license** option(s) are also required for any one of these cards to receive SMPTE ST 2022-6 / SMPTE ST 2110 streams or send SMPTE ST 2110 streams (see the table [Kaleido-IP X320/X120 software options](#), on page 77).

Add-on cards must be installed in specific server card-slot locations. See [Network Interface Card Installation Location in the Server](#), on page 82.

The following table lists the SFP cartridges that can be installed in the field. Only the SFP cartridges listed below have been tested to work with the multiviewer and are supported by Grass Valley.

Kaleido-IP X320/X120 SFP hardware options

Part Number	Option	Feature	Minimum supported Kaleido Software version
SFP-ETH10G-RT-M85	850 nm / 10.3 G multimode SFP transceiver	Ethernet multimode fiber Cartridge/850nm with LC/PC connector ⁱ	9.20
SFP-ETH10G-RT-S13	1310 nm / 10.3 G single mode SFP transceiver	Optical 10GBase Ethernet cartridge, 1310 nm, LC/PC connector ⁱ	9.20
GVF-SFP-25G-SR	25 G pluggable optical SFP28 short range transceiver	Mellanox [®] transceiver, 25GbE, SFP28, LC-LC, 850nm, SR, up to 100m	9.20
GVF-SFP-25G-LR	25 G pluggable optical SFP28 long range transceiver	Mellanox [®] optical transceiver, 25GbE, 25Gb/s, SFP28, LC-LC, 1310nm, LR up to 10km	9.20
QSFP-40G-SR4	40 G pluggable optical QSFP transceiver	40GBASE-SR4, 4 lanes, 850 nm MMF, 1x12 MPO receptacle ⁱⁱ	9.20
QSFP-40G-ESR4	40 G pluggable optical QSFP transceiver	40GBASE-SR4, 4 lanes, 850 nm MMF, 1x12 MPO receptacle, extended range ⁱⁱ	9.20
QSFP-CBL-1MM	40 G integrated active optical cable	Multi-mode fiber QSFP+ 1m cable length ⁱⁱ	9.20
QSFP-CBL-5MM	40 G integrated active optical cable	Multi-mode fiber QSFP+ 5m cable length ⁱⁱ	9.20
GVF-AOC-100/50G-5M	100 G to 2 × 50 G integrated active optical cable	Active fiber hybrid solution, ETH 100GbE to 2 × 50GbE, QSFP28 to 2 × QSFP28, 5m cable length ⁱⁱⁱ	11.00
GVF-AOC-100G-5M	100 G integrated active optical cable	Multi-mode fiber QSFP, 5m cable length ^{iv}	11.00
GVF-AOC-100G-30M	100 G integrated active optical cable	Multi-mode fiber QSFP, 30m cable length ^{iv}	11.00
GVF-QSFP-100G-SR4	100 G pluggable optical QSFP28 transceiver	Transceiver, 100GbE, QSFP28, MPO, 850nm, SR4, up to 100m ^v	11.00
GVF-QSFP-100G-PSM4	100 G pluggable optical QSFP28 transceiver	Transceiver, 100GbE, QSFP28, MPO, 1310nm, PSM4, up to 500m ^v	11.00

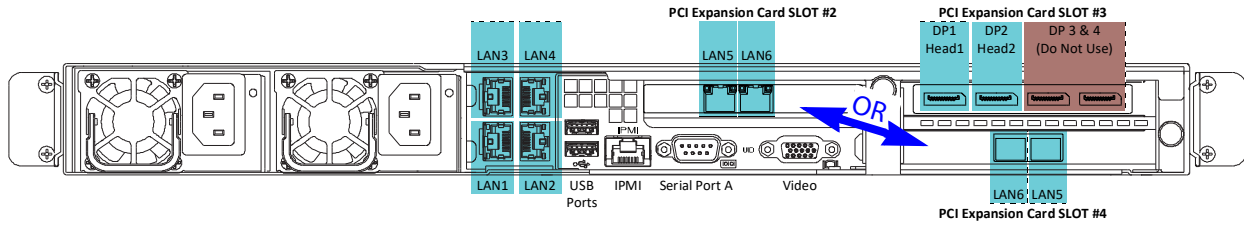
Kaleido-IP X320/X120 SFP hardware options (continued)

Part Number	Option	Feature	Minimum supported Kaleido Software version
GVF-QSFP-100G-CWDM	100 G pluggable optical QSFP28 transceiver	Optical module, 100GbE, 100Gb/s, QSFP28, LC-LC, 1310nm, CWDM4, up to 2km ^v	11.00
GVF-QSFP-100G-LR4	100 G pluggable optical QSFP28 transceiver	Mellanox® optical transceiver, 100GbE, 100Gb/s, QSFP28, LC-LC, 1310nm, LR4 up to 10km ^v	11.00

- i. For use with KIP-OPT-ETH-2S only
- ii. For use with KIP-OPT-ETH-2Q only
- iii. For use with KIP-OPT-ETH-2C at one end and KIP-OPT-ETH-2Q at the other end.
- iv. For use with KIP-OPT-ETH-2C only
- v. For use with KIP-OPT-ETH-2C at 100G or with KIP-OPT-ETH-2Q at 50G.

Network Interface Card Installation Location in the Server

Certain PCI add-on cards must be installed in a specific server PCI expansion slot according to the table [Kaleido-IP X320/X120 PCI network interface add-on card options \(choose one\)](#), on page 79. The location of server slots are shown below with the corresponding LAN port number designations. PCI network interface cards cannot be installed in both slot #2 and slot #4 at the same time.



Enabling Options

Certain licenses require further specific configuration procedures.

License Option(s)	To implement	For further information, see also
KIP-OPT-UCIP: Uncompressed IP ST 2022-6 / 2110 inputs Rivermax license	SMPTE ST 2022-6 / 2110 inputs	Configuring Uncompressed IP SMPTE ST 2022-6 / 2110 Inputs , on page 86
	NMOS	Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS , on page 96
KIP-OPT-UCIP-OUT: Uncompressed IP ST 2110 output Rivermax license	SMPTE ST 2110-20 output	Configuring Head Streaming , on page 88
	SMPTE ST 2022-7 output	Cabling and Configuring the Head Streaming to support SMPTE ST 2022-7 Redundancy , on page 92
	NMOS	Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS , on page 96

To enable options on a multiviewer

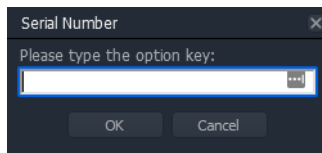
- 1 Obtain a license key from Grass Valley. See [Kaleido-IP X320/X120 software options](#), on page 77.
- 2 Open XAdmin.
The XAdmin Status and Options page appears.
- 3 Click the arrow button at the end of the heading row for **MULTIVIEWER STATUS AND LICENSES**.



- 4 Locate the entry for the option you want to enable.

- 5 Click the **Enable** button.

A window appears prompting you for the license key.



- 6 Enter the license key for the specific option in the box, and then click **OK**.
Once the option is enabled, the license key is displayed, the status indicator turns green, and a **Disable** button replaces the **Enable** button.

Testing the Monitor Wall's Operation

The Kaleido-IP software must be activated through a license before a layout can be shown on the monitor wall. When the monitor wall shows the message *The Kaleido-IP software license is not activated. Please enable the license via XAdmin to be able to display a layout*, see [Available Hardware and Software Options](#), on page 77 for information about the required Kaleido-IP activation license (**KIP-OPT-ACTIVATION**) and [Enabling Options](#), on page 83 for how to install the license.

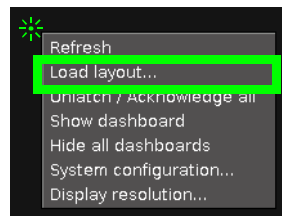
If your system was configured prior to shipment, then a layout appears on all displays. Otherwise, a gray screen will appear with the following message in the middle: *No layout has been assigned to this room. Please load a layout.*

To load a layout on the monitor wall

- If you have configured a Kaleido-RCP2 (see [Using a Kaleido-RCP2 with Default Settings](#), on page 75), press any of the LAYOUT PRESETS buttons to load a predefined layout on the monitor wall.

Note: To access other layouts, press the LOAD button. To assign a layout to a preset button, press and hold the button for more than six seconds while the desired layout is showing on the monitor wall.

- Alternatively, connect a mouse directly to one of the Kaleido-IP frame's USB ports. See [Troubleshooting with the Kaleido-IP frame's USB ports](#), on page 118 for more information about this.
 - a Right-click anywhere on the monitor wall, point to **Monitor Wall** (if you clicked a monitor), and then click **Load layout** on the shortcut menu.



A layout browser appears on the displays associated with the current room.

- b Select the layout you want to load from the list of available layouts for this room, and then click **OK**.
The selected layout appears on the room displays.

Configuring Uncompressed IP SMPTE ST 2022-6 / 2110 Inputs

When the multiviewer has been configured to use NMOS, an NMOS controller is able to remotely control the SMPTE ST 2022-6 / 2110-20 inputs through IS-05. To enable NMOS, see [Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS](#), on page 96.

PREREQUISITES:

- Uncompressed IP ST 2022-6 / 2110 inputs is a licensed feature. See [Available Hardware and Software Options](#), on page 77. Obtain the uncompressed IP ST 2022-6 / 2110 inputs (**KIP-OPT-UCIP** and **Rivermax license**) license keys from Grass Valley. See [Grass Valley Technical Support](#), on page 130.
- The connected network must have a PTP grandmaster server clock on its domain.
- The Kaleido-IP's date and time setting must be set to use **PTP**. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35.
- Multiviewer network ports **LAN5** and **LAN6** are only available on certain multiviewer models. See [Kaleido-IP Multiviewer Ethernet Port Usage](#), on page 25. The Kaleido-IP must have one of the following network interface cards installed: KIP-OPT-ETH-2S, KIP-OPT-ETH-2Q, KIP-OPT-ETH-2C. See [Kaleido-IP X320/X120 PCI network interface add-on card options \(choose one\)](#), on page 79 for more information.
- Media ports **LAN5** and **LAN6** must be configured. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35. Uncompressed streams must use **LAN5** and **LAN6**.

To configure uncompressed IP ST 2022-6 / 2110 inputs

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Install the uncompressed IP ST 2022-6 / 2110 inputs license keys (**KIP-OPT-UCIP** and **Rivermax license**) from Grass Valley. See [Enabling Options](#), on page 83.
- 3 Configure SMPTE ST 2022-6 / 2110 inputs as *Virtual Inputs* in XEdit. Refer to *Virtual Inputs* in the Kaleido Software User's Manual. See [Related Documentation](#), on page 17.

To configure uncompressed 2110-30 inputs

- "NMOS Device Configuration" determines the number of audio receivers per input. Possible values are 1, 2, 4 or 8.
 - If the selection is higher than 1 audio receiver per input, the Kaleido-IP will expect that each audio stream will contain only a single audio program.
 - If there are multiple audio channels/programs in a stream, you must select 1 then define the channel lineup in the section "NMOS Audio Program Configuration".
- "NMOS Audio Program Configuration" defines the channel lineup of multiple audio channels/programs inside a single 2110-30 stream.
 - Audio channel could be PCM or Dolby-E stream.
 - Kaleido-IP supports up to 8 audio programs.
 - Based on this program configuration, the Kaleido-IP will map the audio channels to the audio programs for probing/monitoring.
 - The channel mapping goes from left to right.
 - If the first program is composed of 2 channels, then the next program will start from channel 3 and so on.

- For example, a stream contains 8 audio channels, and the channel lineup is 5.1 + stereo. The Kaleido-IP will map the first 6 audio channels (1 to 6) to audio program 1 and map channels 7 and 8 to audio program 2.

Configuring Head Streaming

Notes

- Even when the multiviewer's display output is set to 4K output resolution, the maximum streaming output resolution is HD (1920 × 1080).
 - For a multiviewer that has streaming for two or more heads, all streamed heads must be configured with the same resolution.
-

When the multiviewer has been configured to use NMOS, an NMOS controller is able to remotely control the SMPTE ST 2110-20 head output streaming through IS-05. To enable NMOS, see [Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS](#), on page 96.

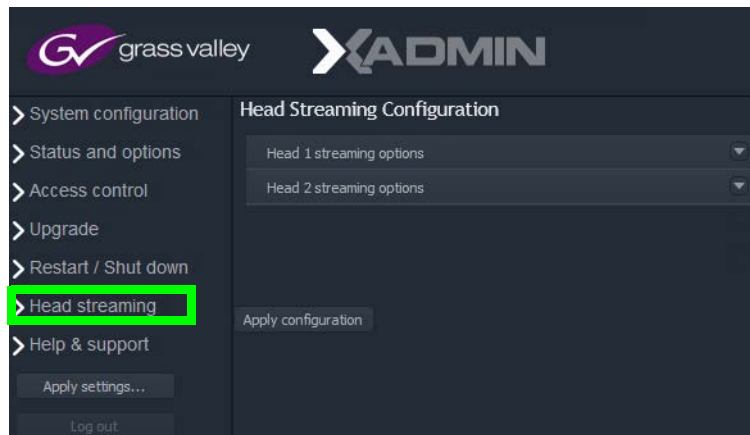
PREREQUISITES:

- Head streaming is a licensed feature. See [Available Hardware and Software Options](#), on page 77. Obtain the following head streaming (**KIP-OPT-STREAMING-OUT**) license key from Grass Valley. See [Grass Valley Technical Support](#), on page 130.
- To support SMPTE ST 2110-20 head streaming:
 - The connected network must have a PTP grandmaster server clock on its domain.
 - The Kaleido-IP's date and time setting must be set to use **PTP**. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35.
 - SMPTE ST 2110-20 head streaming is a licensed feature. See [Available Hardware and Software Options](#), on page 77. Obtain the head streaming (**KIP-OPT-UCIP-OUT** and **Rivermax license**) license keys from Grass Valley. See [Grass Valley Technical Support](#), on page 130.
 - To stream heads 3 or 4, the **KIP-OPT-OP34** license must also be active.
 - Multiviewer network ports **LAN5** and **LAN6** are only available on certain multiviewer models. See [Kaleido-IP Multiviewer Ethernet Port Usage](#), on page 25. The Kaleido-IP must have one of the following network interface cards installed: KIP-OPT-ETH-2S, KIP-OPT-ETH-2Q, KIP-OPT-ETH-2C. See [Kaleido-IP X320/X120 PCI network interface add-on card options \(choose one\)](#), on page 79 for more information.
 - Media ports **LAN5** and **LAN6** must be configured. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35. Uncompressed streams must use **LAN5** and **LAN6**.

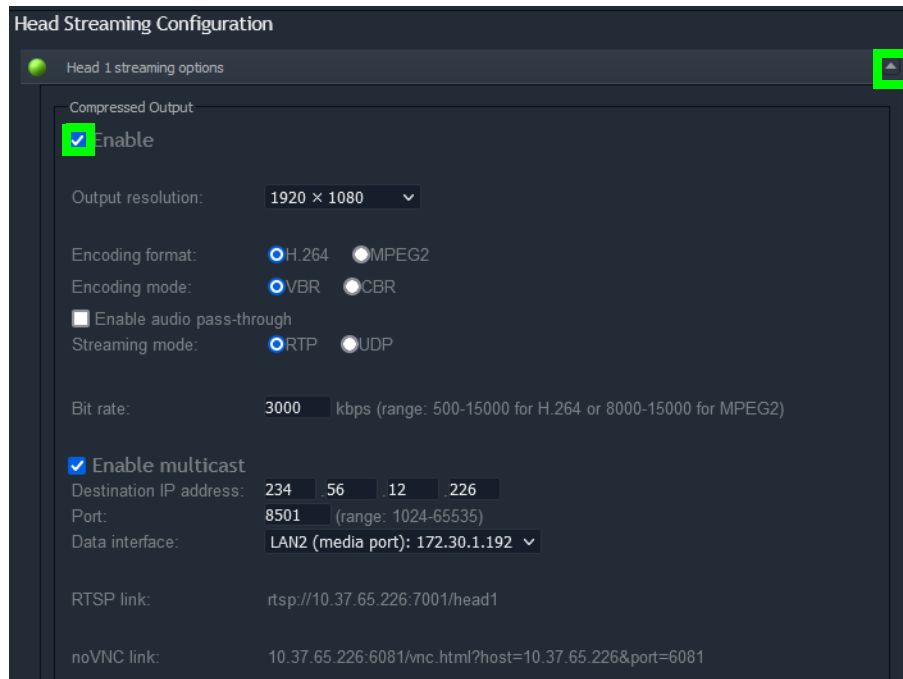
To configure head streaming

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Install the head streaming license key (**KIP-OPT-STREAMING-OUT**) from Grass Valley. See [Enabling Options](#), on page 83.

- 3 Click **Head streaming**, in the navigation area on the left side of the page.
The *Head Streaming Configuration* page appears.



- 4 Expand the streaming options section for the head you want to configure.



- 5 Under **Compressed Output**, set **Enable** and configure the appropriate parameters for your purposes:
 - a Select the streaming output resolution⁴, encoding format, encoding mode, audio pass-through, streaming mode.
 - b Set the appropriate bit rate.

4. To set the Kaleido-IP's mosaic output resolution on the monitor wall that is available through the DisplayPort outputs, see [Changing the Output Resolution](#), on page 28.

Notes

- If the streaming output is meant to feed a Kaleido-IP multiviewer, the following output resolution / bit rate combinations should ensure good video quality on the monitor wall:
 - 1920×1080 at 15000 kbps
 - 1280×720 at 11000 kbps
 - 960×540 at 8000 kbps
 - 720×480 at 8000 kbps
 - 720×576 at 8000 kbps
 - 480×270 at 3500 kbps
 - If you choose MPEG-2 compression:
 - Limit the output resolution to 720p.
 - The bit rate must be 8000kbps or more.
 - In CBR mode, the minimum bit rate is:
 - 8000 kbps for MPEG-2
 - 1500 kbps for H.264

XAdmin does not prevent you from specifying a lower bit rate but the Kaleido Software will ignore lower values and enforce the appropriate minimum listed above.
-

- c Use the **RTSP link** with a receiver such as a streaming player to view the head's mosaic output for example.
- d Copy the link shown after **noVNC link** into the address bar of your browser to view the head's mosaic output. From your browser, you can perform remote on-screen wall control as you would with a Kaleido-RCP2. For more information, see the chapter *Operation of the Monitor Wall* in the **Kaleido Software User's Manual**. See [Related Documentation](#), on page 21.

This feature:

- Is available on a per head basis.
 - Requires the **KIP-OPT-STREAMING-OUT** license to be activated on the multiviewer to enable compressed head output streaming. To noVNC heads 3 or 4, the **KIP-OPT-OP34** license must also be active.
 - Supports video only.
- e Optionally, the head's mosaic output can also be streamed to one or more receivers at once through multicasting if needed: set **Enable multicast**. A multicast IP address is in the range of 224.0.0.7 and 239.255.255.255. See [Unicast and Multicast Sources and Destinations](#), on page 33. Set the port number for the stream in **Port** and the **Data interface** (media port) on which the stream is to be sent to the network switch. Ensure that the chosen media port has sufficient bandwidth to support this streaming output.
- 6 Optionally, when enabled, the video essence of the head's mosaic output can be streamed according to the SMPTE ST 2110-20 standard:
- To a destination by enabling either **Enable streaming on LAN5 (A Network)** or **Enable streaming on LAN6 (B Network)**. Set the corresponding **Destination IP address** and **Port** number.

- To two separate destinations by enabling both **Enable streaming on LAN5 (A Network)** and **Enable streaming on LAN6 (B Network)** and by using a different **Destination IP address**. The **Port** number can be the same or not.
- With SMPTE ST 2022-7 hitless redundancy by enabling both **Enable streaming on LAN5 (A Network)** and **Enable streaming on LAN6 (B Network)** and by using a different **Destination IP address**. The **Port** number can be the same or not. Creating an SMPTE ST 2022-7 network has special requirements: see [Cabling and Configuring the Head Streaming to support SMPTE ST 2022-7 Redundancy](#), on page 92.

For this, obtain and install the uncompressed IP ST 2110 output license key (**KIP-OPT-UCIP-OUT** and **Rivermax license**) from Grass Valley. See [Available Hardware and Software Options](#), on page 77 and [Enabling Options](#), on page 83.

When the multiviewer has been configured to use NMOS, an NMOS controller is able to remotely control the SMPTE ST 2110-20 head output streaming through IS-05. The NMOS controller can discover the LAN port's IP address of a head's output stream and to set the **Destination IP address** and port number parameters as necessary. To enable NMOS, see [Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS](#), on page 96.

- 7 Set the SMPTE ST 2110-20 head output stream scan type (progressive or interlaced scan) in **IP Output resolution**.

Note: **HDMI Output resolution** shows the current monitor wall output resolution setting. When streaming a head, only the 1920 × 1080 50/60Hz monitor wall output resolution is supported.

You must ensure that you set the resolution for the mosaic output on the monitor wall to 1920 × 1080. See [Changing the Output Resolution](#), on page 28.

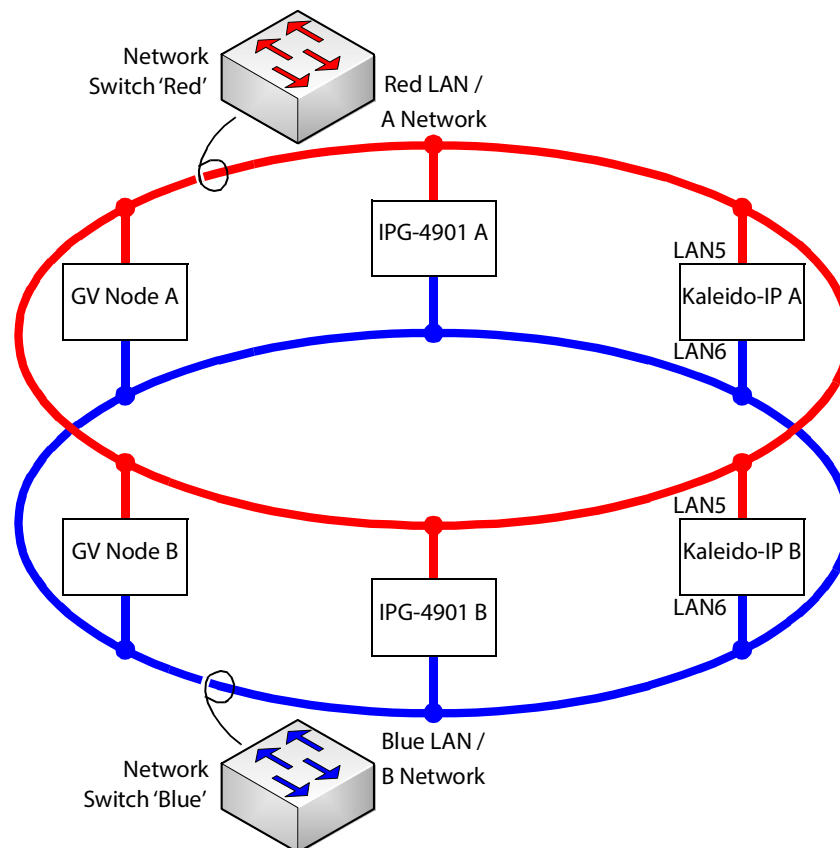
- 8 Click **Apply configuration**.

A message appears confirming that the configuration has been applied.

- 9 Click **OK** to continue.

Cabling and Configuring the Head Streaming to support SMPTE ST 2022-7 Redundancy

To make streaming more reliable over an IP network, the implementation of SMPTE ST 2022-7 seamless protection switching depends on stream redundancy. This protection scheme transmits two identical SMPTE ST 2110-20 packet streams over physically separate network routes (shown as Red LAN / A Network and Blue LAN / B Network in the figure below), so that if packets on one network are lost or delayed, the data can be reconstructed using packets from the second network stream. This process is seamless because switching between the streams is instantaneous and does not impact content. One or both multiviewer heads can be streamed in this way.



PREREQUISITES:

- At least two switches must be used for this application. Contact Grass Valley for more information about switch compatibility. See [Grass Valley Technical Support](#), on page 130. These switches must be configured to be used with SMPTE ST 2022-7. See the fabric configuration documentation supplied with the switch. For example, at minimum, subnets and IP address ranges must be set.
- SMPTE ST 2110 Output is a licensed feature. See [Available Hardware and Software Options](#), on page 77. Obtain the SMPTE ST 2110 Output (KIP-OPT-UCIP-OUT and Rivermax license) license keys from Grass Valley. See [Grass Valley Technical Support](#), on page 130.

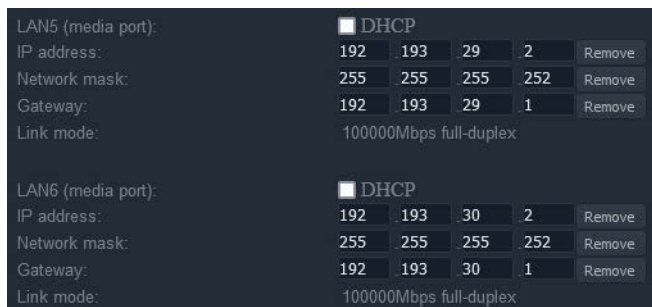
- Multiviewer network ports **LAN5** and **LAN6** are only available on certain multiviewer models. See [Kaleido-IP Multiviewer Ethernet Port Usage](#), on page 25. The Kaleido-IP must have one of the following network interface cards installed: KIP-OPT-ETH-2S, KIP-OPT-ETH-2Q, KIP-OPT-ETH-2C. See [Kaleido-IP X320/X120 PCI network interface add-on card options \(choose one\)](#), on page 79 for more information.
- Media ports **LAN5** and **LAN6** must be configured. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35. Uncompressed streams must use **LAN5** and **LAN6**.
- The room's resolution in XEdit must be set to 1920 × 1080 50/60Hz.
- The connected network must have a PTP grandmaster server clock on its domain.
- The Kaleido-IP's date and time setting must be set to use PTP. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35.

Example of how to cable a multiviewer for SMPTE ST 2022-7

- 1 As shown in the figure above, connect the multiviewer's network port LAN5 to the A Network shown in red.
- 2 Connect the multiviewer's network port LAN6 to the B Network shown in blue.
- 3 Connect all other equipment to the network switches that provide sources and are destinations.
- 4 The network switches need to be configured. See the switch's user documentation for more information.

To configure SMPTE ST 2022-7 example

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Install the SMPTE ST 2110 Output (KIP-OPT-UCIP-OUT and Rivermax license) license keys. See [Enabling Options](#), on page 83.
- 3 Click **System configuration**, in the navigation area on the left of the page.
The *System Configuration* page appears.
- 4 Set the media IP address settings for both LAN5 and LAN6 according to the needs of the switch's fabric configuration. See also [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35.



Parameter	Description
DHCP	This option is disabled by default. Enable it if your switch supports DHCP.
IP address	The Kaleido-IP's address for this interface. Make sure that this setting matches the switch's setting for each network port.

Parameter	Description
Network mask	The appropriate network mask for this subnet. Use the same setting as configured in the switch for each Kaleido-IP device's network ports.
Gateway	The IP address for the switch's port interface to which the Kaleido-IP's media port is connected.

- 5 Click **Head streaming**, in the navigation area on the left side of the page. See also [Configuring Head Streaming](#), on page 88 for more information.

The *Head Streaming Configuration* page appears.

- 6 Expand the streaming options section for the head(s) you want to stream SMPTE ST 2110-20 using SMPTE ST 2022-7 or not.



- 7 For SMPTE ST 2022-7 output redundancy, enable both **Enable streaming on LAN5 (A Network)** and **Enable streaming on LAN6 (B Network)**.
- 8 Set the **Destination IP address** and **Port** number for both SMPTE ST 2110-20 network streams: **LAN5 (A Network)** and **LAN6 (B Network)**. The **Destination IP addresses** are multicast IP addresses; see [Unicast and Multicast Sources and Destinations](#), on page 33.

Note: **HDMI Output resolution** shows the current monitor wall output resolution setting. When streaming a head, only the 1920 × 1080 50/60Hz monitor wall output resolution is supported.

You must ensure that you set the resolution for the mosaic output on the monitor wall to 1920 × 1080. See [Changing the Output Resolution](#), on page 28.

9 Click **Apply configuration**.

A message appears confirming that the configuration has been applied.

10 Click **OK** to continue.

Configuring the Kaleido-IP to use SMPTE ST 2022-6 / 2110 Inputs and ST 2110 Outputs with NMOS

Kaleido-IP supports Networked Media Open Specifications (NMOS) AMWA IS-04 for device discovery and registration and IS-05 for connection management. Furthermore, it supports AMWA BCP-002-01 for the natural grouping of NMOS resources.

The Kaleido-IP is discovered as a source for SMPTE ST 2110 (head streaming of the mosaic) and a receiver for SMPTE ST 2022-6 & ST 2110 streams (inputs). It uses DNS Service Discovery (DNS-SD) and multicast DNS (mDNS) protocols which for mDNS must be allowed on your network. The connection parameters to the NMOS registry can also be manually set when DNS-SD or mDNS are unavailable.

Once NMOS is configured, the multiviewer registers its senders and receivers with the NMOS registry. Receivers must be created by creating *Virtual Inputs* in XEdit. Refer to *Virtual Inputs* in the Kaleido Software User's Manual. See [Related Documentation](#), on page 17. For head streaming, senders are created when a head's mosaic output is configured to stream according to the SMPTE ST 2110-20 standard; see [Configuring Head Streaming](#), on page 88 for more information.

Once the multiviewer's connection to an NMOS registry has been made and the following prerequisites have been observed, an NMOS controller is able to:

- Assign a sender's IP address to a Kaleido-IP's virtual input (receiver).
- Discover the source IP address for a head's output stream.

PREREQUISITES:

- The multiviewer must have IP connectivity to a working NMOS registry.
- Only one discovery service can be used at a time: either DNS-SD or mDNS:
 - For DNS-SD:
 - The DNS server must contain a registration entry for an NMOS registry.
 - The NMOS registry can be discovered on any multiviewer LAN port.
 - The DHCP option must be enabled on the LAN port that has IP connectivity to the same DNS server on which the NMOS registry is registered. Ethernet port **LAN1** is recommended (as DHCP is enabled by default), however any LAN port where DHCP is enabled can be used. See [Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin](#), on page 35.

If the multiviewer successfully makes a connection to the NMOS registry through DNS-SD, no further configuration is necessary (it is automatic). You will see the multiviewer appear as a node in the NMOS registry.

- For mDNS:
 - When using mDNS, a working NMOS registry must be available on the same subnet switch that the Kaleido-IP's management port (**LAN1**) is connected to; see [Cabling Diagram](#), on page 25.

If multiple NMOS registries or mDNSs are found, then the registry with highest priority (the lowest number) is used.

- NMOS works with SMPTE ST 2110 output streams and SMPTE ST 2022-6 & ST 2110 input streams only.

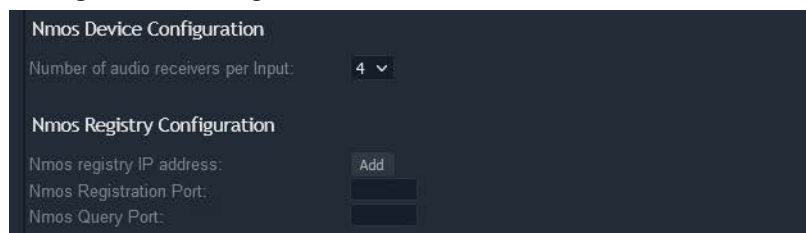
- To support uncompressed IP SMPTE ST 2022-6 / 2110 inputs for NMOS, this input type must have been configured. See [Configuring Uncompressed IP SMPTE ST 2022-6 / 2110 Inputs](#), on page 86. This also includes respecting all prerequisites for uncompressed IP SMPTE ST 2022-6 / 2110 inputs.
- To support uncompressed IP SMPTE ST 2110 outputs for NMOS, this output type must have been configured. See [Configuring Head Streaming](#), on page 88. This also includes respecting all prerequisites for uncompressed IP SMPTE ST 2110 outputs.
- NMOS is not a licensed feature, however SMPTE ST 2022-6 / 2110 inputs and SMPTE ST 2110 outputs are licensed features that are required to use NMOS. Ensure the following licenses are activated:
 - **KIP-OPT-UCIP-OUT** and **Rivermax license** to support uncompressed IP SMPTE ST 2110 Outputs.
 - **KIP-OPT-UCIP** and **Rivermax license** to support uncompressed IP SMPTE ST 2022-6 / 2110 inputs.

See [Enabling Options](#), on page 83. Obtain license keys if necessary from Grass Valley. See [Grass Valley Technical Support](#), on page 130.

To manually configure the NMOS registry the multiviewer is to use

If the multiviewer did not automatically register itself as a node in the NMOS registry through DNS-SD or if DNS-SD is unavailable, then proceed as follows.

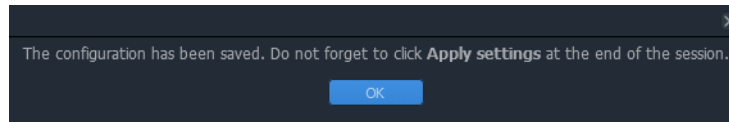
- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Click **System configuration**, in the navigation area on the left of the page. The *System Configuration* page appears. Scroll down to the **NMOS Registry Configuration** settings.



Parameter	Description
Number of audio receivers per input	Set the number of SMPTE ST 2110-30 audio receivers to expect per Input device. Available options are 1, 2, 4, or 8 audio streams. This controls the number of audio receivers per video receiver announced to the NMOS registry.
Nmos registry IP address	Click Add to set the NMOS Registry Query API URL IP address. For example, to use the NMOS registry built into GV Orbit, use the GV Orbit server's administrator IP address.
Nmos Registration Port	Set the NMOS Registry Query API URL registration port number. For example, when used with the NMOS registry built into GV Orbit, the default port number is 4041 .
Nmos Query Port	Set the NMOS Registry Query API URL query port number. For example, when used with the NMOS registry built into GV Orbit, the default port number is 4041 .

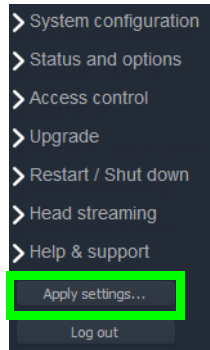
3 Click **Save**.

The new settings are saved locally.



4 Click **OK**.

5 Once a setting change has been saved, the **Apply settings** button becomes available.



6 Click **Apply settings**.

The multiviewer must be restarted for changes to the network configuration to take effect. A message appears prompting you to reboot the system immediately.

7 Click **OK**.

Your Kaleido-IP restarts.

8 Receivers must be created by creating *Virtual Inputs* in XEdit. Refer to *Virtual Inputs* in the Kaleido Software User's Manual. See [Related Documentation](#), on page 17.

9 For head streaming, senders are created when a head's mosaic output is configured to stream according to the SMPTE ST 2110-20 standard; see [Configuring Head Streaming](#), on page 88 for more information.

Configuring Virtual LAN Adapters on a Kaleido-IP

To add Virtual LAN adapters on a Kaleido-IP

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Click **System configuration**, in the navigation area on the left side of the page.
The *System Configuration* page appears.

The screenshot displays the XAdmin interface for system configuration. The left sidebar contains a navigation menu with 'System configuration' highlighted in green. The main content area is titled 'General' and includes sections for Ethernet, DNS and proxy configuration, Date and Time, Nmos Registry Configuration, Font configuration, and Virtual LAN configuration. The 'Virtual LAN configuration' section at the bottom has a 'Configure' button highlighted in green. The 'Ethernet' section shows settings for LAN1 (management port) and LAN6 (media port), both with DHCP enabled. The 'Date and Time' section shows PTP configuration with a domain number of 127 and a time zone of America/New_York. The 'Nmos Registry Configuration' section shows an Nmos registry IP address of 10.37.65.24 and registration and query ports of 4041.

System configuration General

System name: kip-43f6ca892ed2ebc1

Ethernet

LAN1 (management port) DHCP

System IP address: 10 37 65 223

Network mask: 255 255 255 0

Default gateway: 10 37 65 1 Remove

Link mode: 1000Mbps full-duplex

LAN6 (media port) DHCP

IP address: 192 193 30 2 Remove

Network mask: 255 255 255 252 Remove

Gateway: 192 193 30 1 Remove

Link mode: 100000Mbps full-duplex

DNS and proxy configuration

Configure

Date and Time

Date and time source in use: PTP

Current date and time: Monday September 13, 2021 04:32:38 PM UTC-4

Date and time format: English (United States)

Time zone: America/New_York

PTP configuration

Domain number (0-127): 127

Announce interval (sec): 1

Announce receipt timeout count: 3

Locked to PTP:

Grand master: 08:00:11:FF:FE:22:03:FF

Boundary clock: B4:DE:31:FF:FE:B1:0E:77

Interfaces in use: LAN5/LAN6 Restart PTP service to update interfaces

Interface active: LAN6

Step: Two step

Average offset: 0ns

NTP configuration

NTP server IP address: 10 10 10 66

Local configuration

New date: September 13, 2021

New time: 4:32:38 4 PM

Nmos Registry Configuration

Nmos registry IP address: 10 37 65 24 Remove

Nmos Registration Port: 4041

Nmos Query Port: 4041

Font configuration

Configure

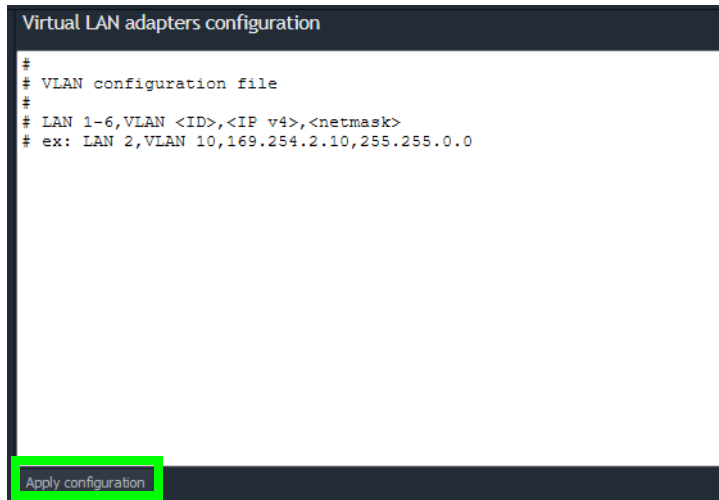
Virtual LAN configuration

Configure

Click Save to save your settings and continue. Save

- 3 Click **Configure**, under Virtual LAN configuration.

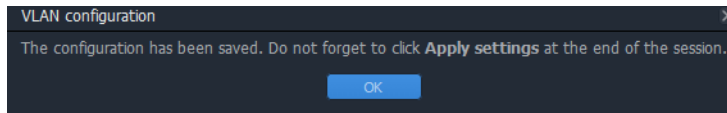
The “Virtual LAN adapters configuration” page appears.



- 4 Edit the VLAN configuration file as required. Refer to the Help pane for guidelines, if needed.

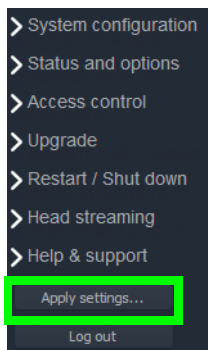
- 5 Click **Apply configuration**.

A message appears prompting you to restart the software.



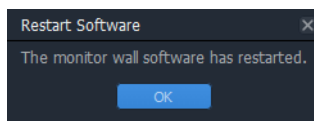
- 6 Click **OK** to close the message window.

The **Apply settings** button becomes available.



- 7 Click **Apply settings**.

A message appears confirming that the software has restarted.



- 8 Click **OK** to continue.

Adding Fonts to a Kaleido-IP

Certain subtitles use a specific font in order to work. Fonts can be added to the Kaleido-IP to support such subtitles.

To add fonts on a Kaleido-IP

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.
- 2 Click **System configuration**, in the navigation area on the left side of the page. The *System Configuration* page appears.

The screenshot shows the XAdmin interface for system configuration. The left sidebar has 'System configuration' highlighted in green. The main content area is titled 'General' and includes sections for Ethernet, DNS and proxy configuration, Date and Time, Nmos Registry Configuration, Font configuration, and Virtual LAN configuration. The 'Date and Time' section is expanded, showing PTP configuration options. The 'Configure' button at the bottom of the 'Font configuration' section is highlighted in green.

System configuration General

System name: kip-43f6ca892ed2ebc1

Ethernet

LAN1 (management port) DHCP

System IP address: 10 37 65 223

Network mask: 255 255 255 0

Default gateway: 10 37 65 1 Remove

Link mode: 1000Mbps full-duplex

LAN6 (media port) DHCP

IP address: 192 193 30 2 Remove

Network mask: 255 255 255 252 Remove

Gateway: 192 193 30 1 Remove

Link mode: 100000Mbps full-duplex

DNS and proxy configuration

Configure

Date and Time

Date and time source in use: PTP

Current date and time: Monday September 13, 2021 04:32:38 PM UTC-4

Date and time format: English (United States)

Time zone: America/New_York

PTP configuration

Domain number (0-127): 127

Announce interval (sec): 1

Announce receipt timeout count: 3

Locked to PTP:

Grand master: 08:00:11:FF:FE:22:03:FF

Boundary clock: B4:DE:31:FF:FE:B1:0E:77

Interfaces in use: LAN5/LAN6 Restart PTP service to update interfaces

Interface active: LAN6

Step: Two step

Average offset: 0ns

NTP configuration

NTP server IP address: 10 10 10 66

Local configuration

New date: September 13, 2021

New time: 4:32:38 PM

Nmos Registry Configuration

Nmos registry IP address: 10 37 65 24 Remove

Nmos Registration Port: 4041

Nmos Query Port: 4041

Font configuration

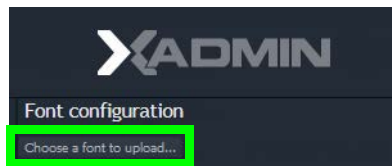
Configure

Virtual LAN configuration

Configure

Click Save to save your settings and continue. Save

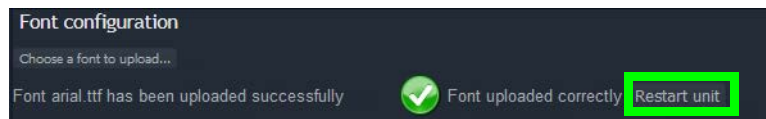
- 3 Click **Configure**, under *Font configuration*.
The “Font configuration” page appears.



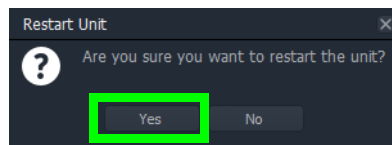
- 4 Click **Choose a font to upload**.
A file chooser window appears.
- 5 Navigate to the font file you want to upload, select it, and then click **Open**.

Note: The Kaleido Software supports true type fonts (TTF) only.

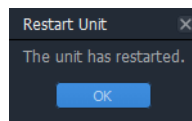
A progress indicator appears momentarily, followed by a confirmation message.



- 6 Click **Restart unit**.
The system prompts you to confirm.



- 7 Click **Yes** to proceed.
Your multiviewer will shut down, and then start again. Under certain conditions, this may take up to 5 minutes.



Once the multiviewer has restarted, the system notifies you.

- 8 Click **OK**.
The XAdmin *Status and Options* page appears.
- 9 Make sure the same font is available on the client PC where you use XEdit. (To install a font on Windows 7 or later, right-click the TTF file, and then click **Install**.)
- 10 Close XEdit and then open it again.

The new fonts are now available, if you:

- Connect XEdit to the multiviewer.
- Download the database from the multiviewer to your local workspace (see [Importing a Database](#) on page 103).

IMPORTANT

Upgrading or reinstalling the Kaleido Software removes all additional fonts you may have uploaded to the multiviewer. In such case, you will need to repeat this procedure.

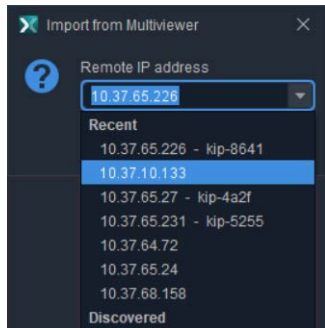
Importing a Database

XEdit must be offline from the multiviewer to import a database.

To import a database

- 1 On the **Configure** menu, point to **Database**, and then click **Import**.

The **Import from Multiviewer** window appears, prompting you for the IP address of the multiviewer whose database you want to import.



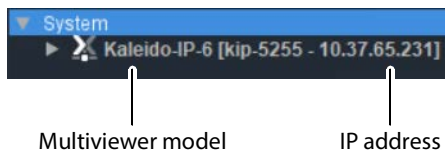
Your recent connections, and all the multiviewers that are on the same subnet as your PC are automatically included in the list.

- 2 Select the multiviewer from the list (if present), or type the appropriate IP address in the box, and then click **OK**.
- 3 Click **Yes**.

A progress window appears, followed by a message stating whether the import succeeded or not.

- 4 Click **OK**.

The imported data has replaced the former content in your local workspace. The originating system's multiviewer model and IP address now appear in the System list.



Restarting or Shutting Down the Multiviewer

The following options are available to restart or shutdown the multiviewer.

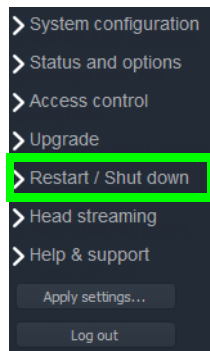
- Restarting the Monitor Wall Software
- Restarting a Kaleido-IP Multiviewer
- Shutting Down a Kaleido-IP Multiviewer

Note: The Kaleido Software does not support activating a soft shutdown from the Kaleido-IP frame's power button. Should you be unable to access XAdmin, then perform a hard shutdown by pressing and holding the power button.

Proceed as follows.

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.

The XAdmin *Status and Options* page appears.



- 2 Click **Restart / Shut down** in the navigation area on the left side of the page.

The Restart / Shut down page appears.

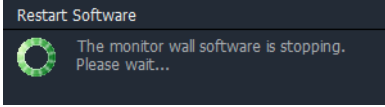
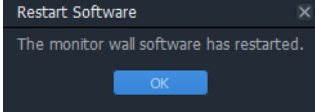
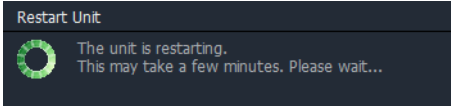
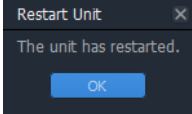


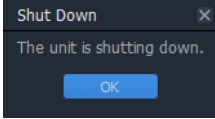
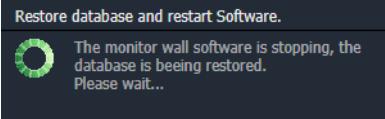
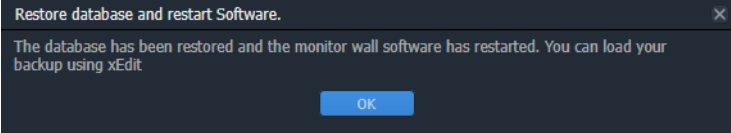
3 Click one of the following options.

Click	To
Restart software	Restart the monitor wall software.
Restart unit	Restart a Kaleido-IP multiviewer.
Shutdown	Shut down a Kaleido-IP multiviewer.
Reset database	Restore the multiviewer's database to its factory default configuration. The multiviewer's current database content (Rooms, Layouts, Channels/Sources, and so on) will be lost.

The system prompts you to confirm.

4 Click **Yes** to proceed.

To	Then
Restart software	<p>Your multiviewer's operating system will shut down, and then start again. Under certain conditions, this may take up to 5 minutes.</p>  <p>Once the monitor wall software has restarted, the system notifies you.</p>  <p>Click OK. The XAdmin <i>Status and Options</i> page appears.</p>
Restart unit	<p>Your multiviewer will shut down, and then start again, during which time you can observe messages associated with the Linux shutdown and boot sequences on the monitor wall display connected to Head 1. Under certain conditions, this may take up to 5 minutes.</p>  <p>Once the multiviewer has restarted, the system notifies you.</p>  <p>Click OK. The XAdmin <i>Status and Options</i> page appears.</p>

To	Then
Shutdown	<p>Your multiviewer will perform a clean shut down, during which time you can observe messages associated with the Linux shutdown sequence on the monitor wall display connected to Head 1.</p>  <p>Click OK to continue.</p>
Reset database	<p>Your multiviewer's monitor wall software will shut down, and then start again. Under certain conditions, this may take up to 5 minutes.</p>  <p>Once the database has been restored and the monitor wall software has restarted, the system notifies you.</p>  <p>Click OK. The XAdmin <i>Status and Options</i> page appears.</p>

Maintenance & Troubleshooting

6

Introduction

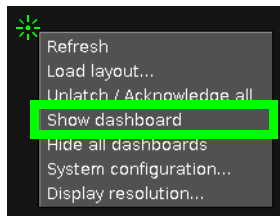
This chapter shows you the various maintenance operations and corrective actions that maybe required to be performed during system commissioning and over the multiviewer's lifetime.

System Verification

Verifying the Management Port IP Address and Application Version

To find the Management Port IP address and application version

- 1 Connect a mouse to one of the Kaleido-IP frame's USB ports. See [Troubleshooting with the Kaleido-IP frame's USB ports](#), on page 118 for more information about this.
- 2 Right-click anywhere on the monitor wall. On the shortcut menu, point to **Monitor Wall** (if you clicked a monitor), and then click **Show dashboard** to display the dashboard associated with the current head. A small window appears in the bottom-right area, revealing the *Management Port* IP address and the system version.



Maintenance

Field-Replaceable Units

The following components are field replaceable units (FRUs). The repair procedure is to swap in a new (known good) component to restore system operation.

- Power supply (#1 or #2)
- Other FRUs may be available: contact Customer Support.

There are no user-serviceable parts within FRU components. For the procedure to replace a FRU, see *Supermicro SuperServer 1028U Series User's Manual for model 1028U-TR4+*. See [Related Documentation](#), on page 17.

Contact Customer Support to order an FRU. See [Grass Valley Technical Support](#), on page 130.

Generating a System Snapshot

A system snapshot creates a compressed file that contains information that can be used by Technical Support for troubleshooting purposes.

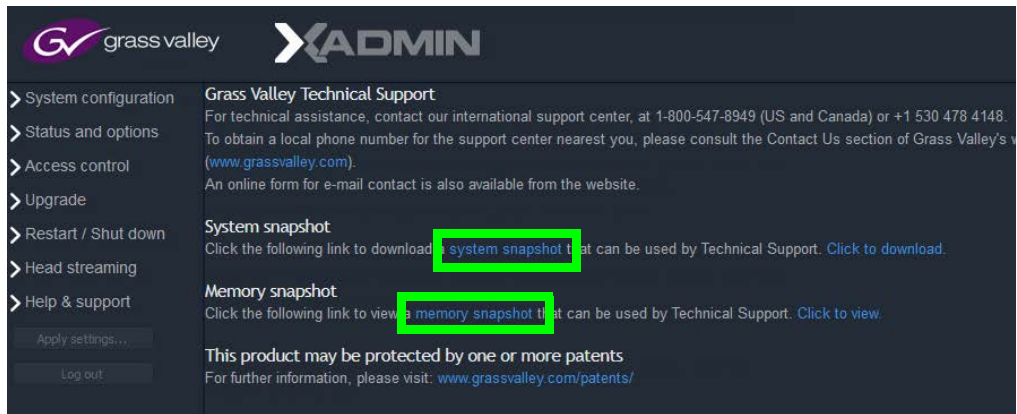
To generate a system snapshot

- 1 Open XAdmin. See [Opening XAdmin](#), on page 56.

The XAdmin *Status and Options* page appears.



- 2 Click the **Help & support** link in the navigation pane.
The Technical Support page appears.



- 3 Click **system snapshot**.
The system snapshot generation may take a few moments, after which your browser prompts you to save the resulting compressed folder to your hard drive.
- 4 Browse to the location where you want to save the ZIP file, and then click **Save**.

Upgrading the Multiviewer

Whenever possible, upgrade the multiviewer to use the latest Kaleido Software version number to take advantage of the latest bug fixes and stability enhancements. See the *Kaleido Software Release Notes* for more information about a Kaleido Software release.

When a Kaleido-IP X320 or X120 multiviewer is currently using Kaleido Software version 10.xx or lower, and you want to upgrade it to a Kaleido Software version 11.00 or higher, a special migration procedure must be followed. Refer to the *Migration to Version 11 or Higher Upgrade Guide* for more information about how to do this. See [Related Documentation](#), on page 17.

To downgrade the multiviewer to Kaleido Software version 10.xx or lower, refer to the *Migration to Version 11 or Higher Upgrade Guide* for more information about how to do this.

Upgrading and Downgrading a Multiviewer Running Kaleido Software Version 12.0.0 or Higher

The upgrade / downgrade pathway for a Kaleido-IP multiviewer is nuanced. Note that future software versions are presented here as an example. The Kaleido-IP multiviewer cannot be:

- Downgraded by a major version. For example, Kaleido Software version 12.X.X cannot be downgraded to any version of 11.X.X or lower.
- Downgraded more than two minor versions. For example, Kaleido Software version 12.3.0 cannot be downgraded to version 12.0.0. However, a downgrade from Kaleido Software version 12.3.0 to version 12.1.0 is possible.
- Downgraded two minor versions, and then further downgraded.

The table below summarizes the upgrade / downgrade pathway for a Kaleido-IP multiviewer.

Highest Software Version ⁱ ↓	Target Upgrade Kaleido Software Version →					
	12.0.0	12.1.0	12.2.0	12.3.0	12.4.0	13.0.0
12.0.0	—	Upgrade Kaleido Software	Upgrade Kaleido Software	Upgrade Kaleido Software	Upgrade Kaleido Software	Upgrade Kaleido Software
12.1.0	Downgrade Kaleido Software	—	Upgrade Kaleido Software	Upgrade Kaleido Software	Upgrade Kaleido Software	Upgrade Kaleido Software
12.2.0	Downgrade Kaleido Software	Downgrade Kaleido Software	—	Upgrade Kaleido Software	Upgrade Kaleido Software	Upgrade Kaleido Software
12.3.0	Not supported (minor version difference is >2) ⁱⁱ	Downgrade Kaleido Software	Downgrade Kaleido Software	—	Upgrade Kaleido Software	Upgrade Kaleido Software

Highest Software Version ⁱ ↓	Target Upgrade Kaleido Software Version →					
	12.0.0	12.1.0	12.2.0	12.3.0	12.4.0	13.0.0
12.4.0	Not supported (minor version difference is >2) ⁱⁱ	Not supported (minor version difference is >2) ⁱⁱ	Downgrade Kaleido Software	Downgrade Kaleido Software	—	Upgrade Kaleido Software
13.0.0	Not supported (major version downgrade is not supported) ⁱⁱ	Not supported (major version downgrade is not supported) ⁱⁱ	Not supported (major version downgrade is not supported) ⁱⁱ	Not supported (major version downgrade is not supported) ⁱⁱ	Not supported (major version downgrade is not supported) ⁱⁱ	—

- i. This is the highest Kaleido Software version ever installed on the multiviewer.
- ii. Re-install the multiviewer software image onto the multiviewer for this Kaleido Software version.

The Kaleido-IP software installer applies these guidelines to automatically block unsupported upgrade / downgrade pathways.

Pre-upgrade Checklist

IMPORTANT

Back up your system database

Before upgrading the multiviewer system, make sure you have a backup of the current system database so that you can return to the previous Kaleido Software version if necessary. Refer to *Creating a Backup* in the Kaleido Software User's Manual, for details. See [Related Documentation](#), on page 17.

Cluster and cascade systems

All multiviewers that are part of a cluster or cascade system must have the same Kaleido Software version.

For cluster systems, Kaleido Software version 8.70 introduce a hard compatibility break with previous Kaleido Software versions.

Cluster backups you create with version 8.70 (or higher), cannot be restored by using an earlier version of XEdit. Grass Valley recommends you make a backup of the individual databases for every cluster member, *before upgrading* from a pre-8.70 version, to version 8.70 (or higher).

Upgrade Overview

Upgrade packages are made available by contacting technical support (see [Grass Valley Technical Support](#), on page 130). Download the update files onto your PC's hard drive. The format of the file should be 926-XXG01-xxx.zip.

The upgrade is performed from your PC, by using XAdmin. See [Upgrading the Kaleido-IP Multiviewer](#) on page 112.

Upgrading the Kaleido-IP Multiviewer

To upgrade your Kaleido-IP multiviewer

- 1 From a workstation on the same subnet, open a Web browser window, and type the *Management Port* IP address of the multiviewer, in the address bar.
The Kaleido-IP home page appears. The current software version is shown.



Firefox users:

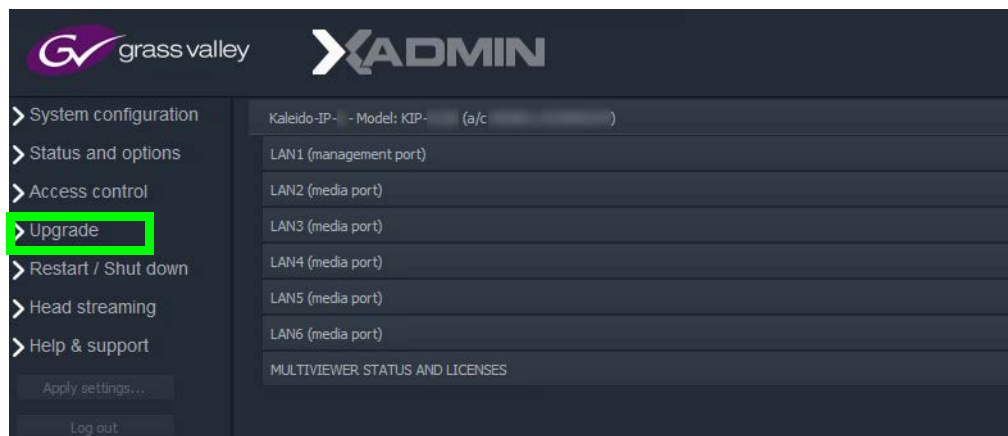
If you see a security warning instead of the home page, then see [Registering your Multiviewer's Security Credentials with your Browser](#), on page 58

Internet Explorer users:

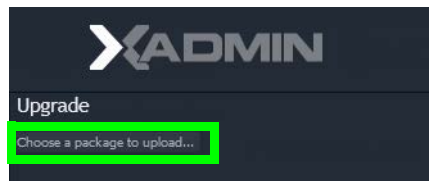
- If the page remains blank, then see [Enabling the Compatibility View in Internet Explorer](#), on page 67.
 - If you see a certificate error message instead of the *Status and Options* page, then see [Registering your Multiviewer's Security Credentials with your Browser](#), on page 58.
-

- 2 Click the **XAdmin** button.

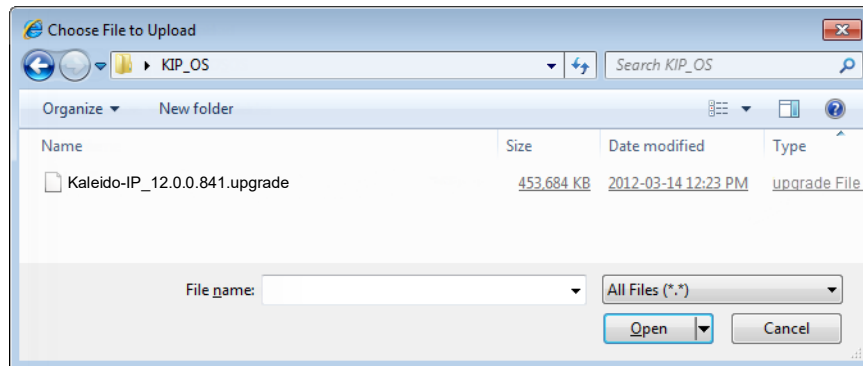
The XAdmin *Status and Options* page appears.



- 3 Click **Upgrade**, in the navigation area on the left of the page.
The *Upgrade* page appears.



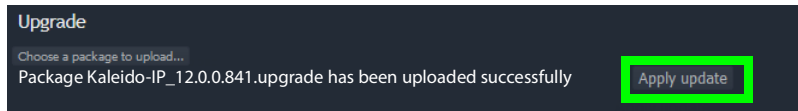
- 4 Click **Choose a package to upload**.
A file chooser window appears.
- 5 Navigate to the UPGRADE package to install, select it, and then click **Open**.
The upgrade file should have the following format: `Kaleido-IP_12.0.0.841.upgrade`
Where:
 - `12.0.0` is the version.major.minor software version.
 - `841` is the build number



The selected file is uploaded to the Kaleido-IP. This may take a few seconds.

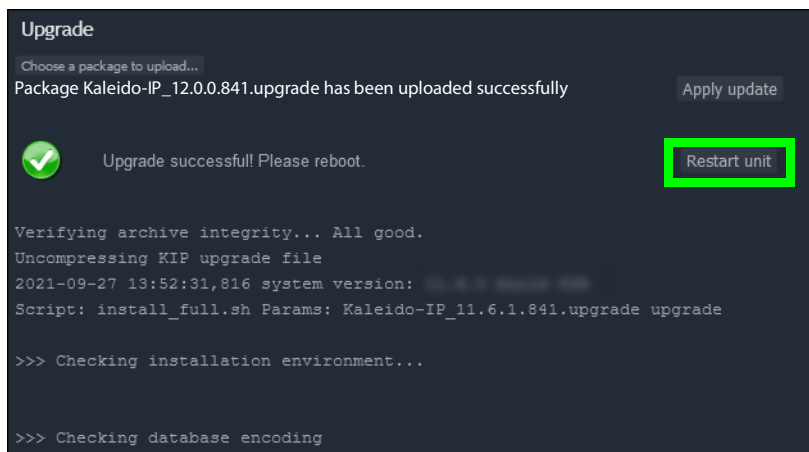


- 6 Once the upload has completed, click **Apply update**.

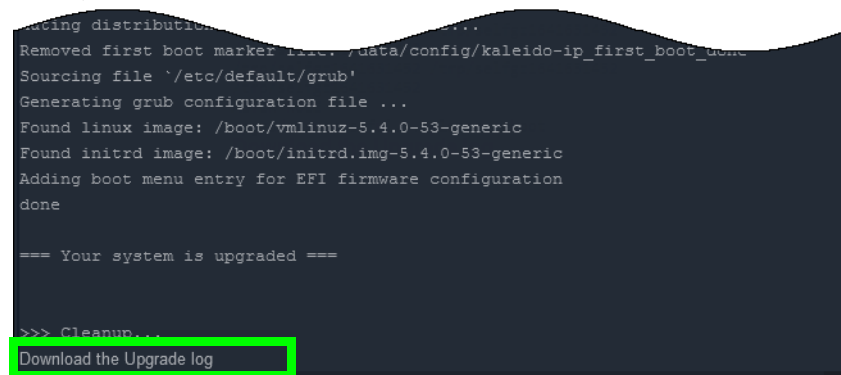


While the upgrade is taking place you can monitor its progress if you wish, or wait until the system prompts you to restart the Kaleido-IP unit.

Note: If nothing happens, verify that you are using the correct Kaleido Software UPGRADE package, with the following format:
Kaleido-IP_12.0.0.841.upgrade

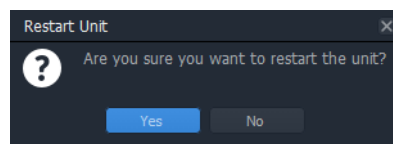


- 7 Once the upgrade has completed, if you wish to keep a copy of the log messages, scroll down to the bottom of the page, right-click **Download the Upgrade log**, and save the log to your hard drive as a text file.



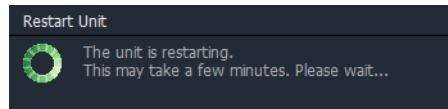
- 8 Click **Restart unit**.

The system prompts you to confirm.

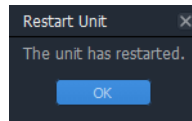


9 Click **Yes** to proceed.

Your multiviewer will shut down, and then start again, during which time you can observe messages associated with the operating system shutdown and boot sequences on the monitor wall display connected to Head 2. Under certain conditions, this may take up to 5 minutes.



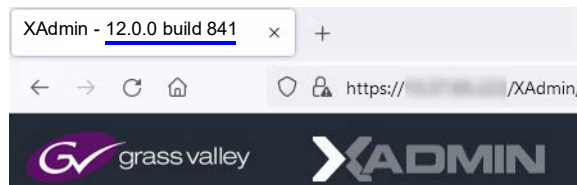
Once the multiviewer has restarted, the system notifies you.



10 Click **OK**.

The XAdmin *Status and Options* page appears.

11 Verify that the expected version number appears in the page title (check the tab label, or the browser's title bar).



At this point, the upgrade is complete.

You can verify the new version number by displaying the dashboard on the monitor wall. See [Displaying the Dashboard](#), on page 117.

Downgrading the Multiviewer System

IMPORTANT

The Kaleido-IP X320 and X120 multiviewers cannot be downgraded to a version earlier than 8.60.

To downgrade your multiviewer to an earlier version of Kaleido Software

- See [Upgrading and Downgrading a Multiviewer Running Kaleido Software Version 12.0.0 or Higher](#), on page 110.

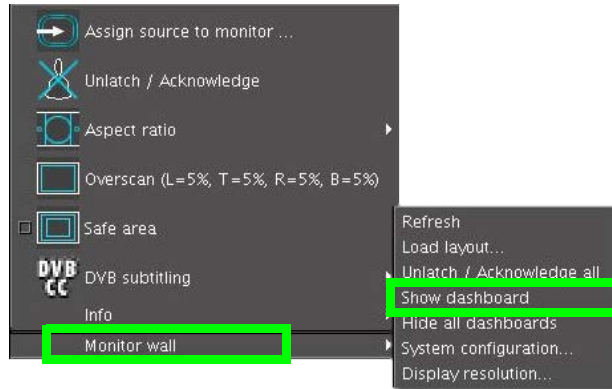
Displaying the Dashboard

The multiviewer supports the following types of dashboards:

- Status dashboard - displays IP address, Kaleido Software version, currently loaded layout, Frame name/Room, associated Output head
- Update dashboard - displays status of System upgrade.

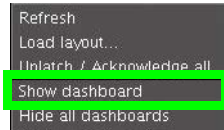
To display the dashboard

- 1 Right-click anywhere on the monitor wall. On the menu, point to **Monitor wall**, and then click **Show dashboard** to display the dashboard associated with the current head.



Monitor wall menu (within composite monitor menu)

Note: If you right-click the monitor wall background directly, then the monitor wall menu appears immediately. Click **Show dashboard**.



After a brief delay, the dashboard appears at the bottom-right corner of the monitor, and the command **Hide dashboard** replaces **Show dashboard** on the menu.



Dashboard on the monitor wall

Troubleshooting

Troubleshooting with the Kaleido-IP frame's USB ports

A USB mouse can be directly connected to the multiviewer for troubleshooting purposes (as opposed to connecting the mouse to a Kaleido-RCP2, for instance) with the following conditions.

- The pointer can only travel between the displays connected to the Kaleido-IP frame.
- When more than one display is connected to the multiviewer, the required mouse movement to go between displays does not always follow the wall layout set in XEdit. For example, you will have to move the mouse pointer horizontally or vertically in order to go from one display to the next.

Troubleshooting Common Issues

Troubleshooting consists of using fault-isolation techniques to narrow down the probable cause to a specific multiviewer component. Schedule these maintenance operations during off hours when the system is not in use if possible as troubleshooting can cause outage. Use the following troubleshooting table to diagnose common issues and take corrective actions to restore operation.

Symptom	Probable cause	Test	Corrective action
Closed captioning/XDS / Dolby E / SCTE / Loudness does not work for certain tiles / video feeds.	Insufficient licenses have been installed.	View license status in XAdmin. See Enabling Options , on page 83. Valid licenses have a green dot.	Purchase and install a sufficient number of licenses as required. Contact Technical Support for more information and see Available Hardware and Software Options , on page 77. See Grass Valley Technical Support , on page 130.
Kaleido Software upgrade / downgrade has failed	A Kaleido Software installation requirement was not observed	Review the Kaleido Software Release Notes for information about compatibility, requirements, limitations, known issues, and bug fixes for a given software version. Confirm that the multiviewer's memory has sufficient capacity for the upgrade.	Install a software version that is compatible with your hardware or upgrade your hardware as required. See also Kaleido Software Minimum Version Compatibility , on page 19. See Related Documentation , on page 17.

Symptom	Probable cause	Test	Corrective action
Display of an HDMI mosaic output is pixilated, blocked, intermittent, or blank (signal loss)	HDMI cable is too low-quality or is too long	Use a short (<6ft (1.8m)), high-quality cable with the display	Use a shorter HDMI cable, use an HDMI cable constructed with heavier conductors (for example, AWG 22 (0.34mm ²) or thicker), or both. Replace the HDMI cable with a long-range active display cable suited to longer distances. Contact Technical Support to purchase long-range active cables that have been tested to work with this multiviewer. See Grass Valley Technical Support , on page 130.
Video sync issues / glitches when using SMPTE ST 2110-20	The Kaleido-IP's time offset (delay or advance) with respect to the network's PTP grandmaster cannot be greater than ± 500 nanoseconds.	See the Average offset parameter in the XAdmin System configuration page under PTP configuration. See Configuring a Multiviewer's IP, Date, and Time Settings with XAdmin , on page 35.	During commissioning, wait for the offset to settle below 500 nanoseconds before proceeding. Take corrective network measures to improve the PTP offset time.
A newly connected display is blank	Disconnecting and reconnecting any Kaleido-IP HDMI adapter may require a restart.	If you connect such an adapter after the multiviewer has restarted, the display will remain blank.	The adapter cables must be properly connected when the multiviewer restarts.

Should you need further assistance, see [Grass Valley Technical Support](#), on page 130.

Swapping around a Power Supply in a Multiviewer

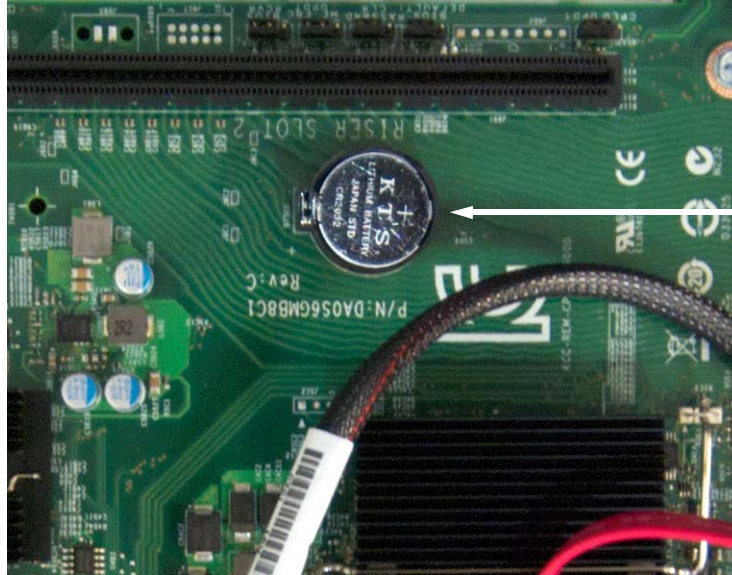
Schedule this maintenance operation during off hours when the system is not in use if possible as this procedure can cause multiviewer outage.

In an attempt to restore multiviewer operation and to perform fault isolation procedures, you can swap the position of a power supply around in the multiviewer frame to see if normal multiviewer operation can be restored.

If the frame has an empty power supply slot (for example, for a redundant power supply unit (PSU)), you can remove the PSU from the frame and insert it into the other power supply slot. Refer to the *Supermicro SuperServer 1028U Series User's Manual*; see [Related Documentation](#), on page 17. Ensure to connect a power cable at the rear of the frame's chassis for the PSU's new position in the frame. To RMA a defective PSU, see [Grass Valley Technical Support](#), on page 130.

Disposal and Recycling Information

Your Grass Valley equipment comes with at least one lithium button battery (Li-MnO₂) located on the main printed circuit board.



Before disposing of your Grass Valley equipment, remove the battery as follows:

- 1 Make sure the equipment's AC adapters are unplugged from the power outlet.
- 2 Remove the protective cover from your equipment.
- 3 Gently remove the battery from its casing using a blunt instrument for leverage such as a screwdriver if necessary.
- 4 Dispose of the battery and equipment according to your local environmental laws and guidelines.

IMPORTANT

Be careful not to short-circuit the batteries by adhering to the appropriate safe handling practices. Do not dispose of batteries in a fire as they may explode. Batteries may explode if damaged or overheated. Do not dispose of batteries as household waste. Do not dismantle, open or shred batteries. Keep batteries out of the reach of children.

The electrolyte of the batteries contains 1,2-dimethoxyethane (DME) (CAS 110-71-4, EINECS 203-794-9) above 0.1% by weight. DME is listed as a Substance of Very High Concern (SVHC) by the regulation (EC) No 1907/2006 of the European Parliament and of the Council. It is classified as a reprotoxic of category 2 in the European Union. Accordingly, exposure to DME may impair fertility and may cause harm to the unborn child. DME is also classified as harmful by inhalation.

Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is acute exposure when a cell vents. In the event of a battery leak, do not allow battery liquid to come in contact with skin or eyes. Seek medical help immediately in case of ingestion, inhalation, skin or eye contact, or suspected exposure to the contents of an opened battery.

For more information about recycling, contact Grass Valley.

7 Specifications

Kaleido-IP Inputs

IP Inputs

Kaleido-IP physical	1 × Gigabit Ethernet with RJ-45 connector (Management Port)
	3 × Gigabit Ethernet with RJ-45 connector (Media Ports)
	<p>One of the following:</p> <ul style="list-style-type: none"> • 2 × Gigabit Ethernet with RJ-45 connectors or • 2 × Gigabit Ethernet with SFP28 connectors or • 2 × Gigabit Ethernet with QSFP28 connectors. <p>See Kaleido-IP X320/X120 PCI network interface add-on card options (choose one), on page 79 and Kaleido-IP X320/X120 SFP hardware options, on page 80.</p>

Other Input Formats Supported through Ancillary Hardware

ASI	Densité IRD-3802 (optional)
ATSC RF	Densité IRD-3811-VQ (optional)
DVB-S/S2 RF	Densité IRD-3811-DVB-S2 (optional)
Set-top box	EdgeVision (optional)

Kaleido-IP Display Outputs

The Kaleido-IP supports up to four independently configurable and operable progressive scan display outputs.

Connectors	HDMI or DisplayPort
Standard	DisplayPort 1.2 HDMI 2.0
Resolution	Up to 3840 × 2160 @ 25 / 29.97 / 50 / 59.94 Hz (all progressive scan) 1080i is available when an optional DisplayPort-to-HDMI passive adapter is used.
Streaming	<p>SMPTE ST 2110-20 Video head output.</p> <p>When using ST 2110 uncompressed IP output, the four output streams are limited to HD resolution (1920 × 1080).</p> <p>Output streaming is a licensed feature. See Configuring Head Streaming, on page 88.</p>

The following table lists some (but not all) output formats supported at the DisplayPort connections.

Kaleido-IP HDMI output formats

Resolution	Format name	Refresh rates (Hz)
1600 × 1200	UXGA	50 / 59.94
1920 × 1080	HDTV	50 / 59.94
1920 × 1200	WUXGA	50 / 59.94
3840 × 2160	UHDTV-1	25 / 29.97 / 50 / 59.94

You can customize your own timing rates for resolutions ranging from 1280 × 1024 pixels up to 1920 × 1200 pixels (all progressive scan), by using XEdit.

Note: After configuring custom resolutions in XEdit, you must restart the Kaleido-IP for the new resolutions to become effective.

Decoding Capacity

The Kaleido-IP decoding capacity performance is available in the *Kaleido Multiviewer Product Comparison Guide*. See [Related Documentation](#), on page 17.

Kaleido-IP Frame

Height	43 mm (1.7 in), 1 RU
Width	437 mm (17.2 in)
Depth	710 mm (28 in)
Weight	12.7 kg (28 lbs)
Power supply	750 W (1+1) hot-swappable, redundant power supply 110VAC: 10 Amp 240VAC: 4 Amp
Nominal power Kaleido-IP X320 Frame	325 W
Nominal power Kaleido-IP X120 Frame	250 W
AC	100-240 V, 60-50 Hz
Operating temperature	10-35 °C (50-95 °F)
Max. storage humidity	90% RH non-condensing
Max. functional humidity	65% RH non-condensing

Operation and Configuration

On-screen control	Kaleido-RCP2 (optional), RCP-200, and http browser (NoVNC).
Source and layout configuration	XEdit
Alarms management	GV Orbit, iControl (optional)

Display Output Extender via Fiber Optic

Contact Technical Support to purchase long-range active HDMI cables that have been tested to work with this multiviewer. See [Grass Valley Technical Support](#), on page 130.

Remote Output via IP Streaming

Video formats	MPEG transport stream over Unicast or Multicast RTSP. See Configuring Head Streaming , on page 88 for supported streaming resolutions.
Audio format	MPEG-1 Layer 2 stereo
HTTP format	NoVNC

Multiviewer Integration with other Systems and Equipment

A number of configurable services are available to establish communications between the multiviewer and a wide variety of devices.

Optional Drivers for Controlling Routing Devices from the Multiviewer

Optional drivers are available to extend your Kaleido system with the ability to control routing devices that comply with the protocols listed in the following table. Contact your sales representative for details.

Company	Protocol	Text database download	Routers/Controllers
Datatek	D-2815 Control Module Protocol	No	
ETL	ETL Matrix	Yes	ETL Matrix
Evertz	Quartz Type 1	Yes	EQX
Grass Valley (Miranda)	Densité	Yes	HRS-1801
		No	HCO-1821, HCO-1822

Company	Protocol	Text database download	Routers/Controllers
Grass Valley (Miranda/NVISION)	NVEP NV9000 – Deprecated (NP0017) ^a	Yes	NV9000 system controllers
	NVEP NV9000 – Port Takes (NP0017) ^b	Yes	
	NVEP NV9000 – Device Takes (NP0017) ^c	Yes	
	NVEP Router (NP0016)	No	Compact router series
Grass Valley	GVG-NP Emulation	No	Jupiter CM-4000 and CM-4400 system controllers
	GVG 7000 Native Protocol ^d	Yes	Concerto-series routers, Encore-series control panels
Grass Valley (Thomson/Philips) ^e	Jupiter ASCII communications protocol	No	Venus-series and Trinx-series routers
Imagine Communications (Harris/Leitch)	Harris XY Passthrough Protocol	No	Platinum, Xplus, Integrator, Via-32, Panacea, Xpress
Lantronix	(Lightwave) Matrix-Hub Protocol	No	Matrix-Hub 1000
Nevion (Network Electronics)	Network Modular (Ethernet)	No	VikinX Modular
PESA	USP (Unsolicited Status Protocol)	No	Cheetah, Tiger, Jaguar, Cougar, Ocelot, Bobcat, TDM3000, PERC2000 system controller
Grass Valley (SAM / Snell / Pro-Bel)	General Switcher Protocol (SW-P-02)	No	
Sony	Sony HKSPC (GVGNP Emulator)	No	Sony routers (requires HKSPC card); GVG routers (Ethernet)
Utah Scientific	PL-160/PL-320	No	AVS-1B
	RCP-1	No	SC-1, SC-2, SC-3 series
	RCP-3	Yes	SC-4 series (Ethernet only)

a. Deprecated. To be used with legacy configurations only.

b. To be used in most cases. Supports native locks, and aliases from router (provided system controller has NV9000 router control system version 6.0.6 or later)

c. To be used in very specific scenarios involving physical router interconnects with tie lines, or with hybrid router configurations. Contact Technical Support for more information (see [Grass Valley Technical Support](#), on page 130).

d. For Thomson / Grass Valley Series 7000 devices, our current implementation of the Series 7000 Native Protocol supports some Encore system controller models, which are supported by Ethernet connection. For other Series 7000 devices you wish to control by Ethernet connection, use the Sony HKSPC (GVGNP Emulator).

e. Our current implementations of the protocols listed above for Grass Valley (Thomson/Philips) routers and controllers support neither the CM-4400 nor the CM-4000 system controllers.

Drivers for Controlling Tally Interface Devices from the Multiviewer

Drivers are available to extend your Kaleido-X system with the ability to control tally interface devices such as the ones listed in the tables below. Contact your sales representative for more information.

Production Switchers

Company	Device/System
Grass Valley (Thomson)	Kayenne K-Frame, Karrera K-Frame, Zodiac, XtenDD HD/SD series

UMD controllers

Company	Protocol	Device/System
TSL	TSL UMD protocol V5.0	UMD Controller (TCP/IP or UDP/IP) <i>IP Limitation: only one screen index can be received per unicast port.</i>
Image Video		TSI-1000 Tally System Interface (requires option from Image Video)

Automation systems

Company	Device/System
Sundance Digital	Fastbreak NXT Automation (requires option from Sundance Digital)

Drivers for Timers

Timer systems

Company	Device/System
Plura (Alpermann+Velte)	Studio Production Timer (SPT)

Built-in Communications Protocols

The multiviewer itself can be controlled by external devices (e.g. Kaleido-RCP2, router control panels) or applications (e.g. router control software application, Remote Control Gateway) via built-in communications protocols. Such devices or applications can be used to command monitor wall operations (e.g. source assignment) or routing operations.

The supported communications protocols are listed in the following table. Only TCP/IP connection type is supported and the dedicated port number on the multiviewer, for TCP/IP connections.

Company	Protocol	TCP/IP (port)
Grass Valley (Miranda)	Kaleido Remote Control Protocol	Yes (13000)
Grass Valley (Miranda/NVISION)	NVEP Router (NP0016)	Yes (5194)
Nevion (Network Electronics)	Network Modular	Yes (4381)
Grass Valley (SAM/Snell/Pro-Bel)	SW-P-08	Yes (14000)
	SW-P-02	Yes (2000)



Grass Valley Technical Support

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1 530 478 4148.

To obtain a local phone number for the support center nearest you, please consult the Contact Us section of Grass Valley's website (www.grassvalley.com).

An online form for e-mail contact is also available from the website.

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