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A **BELDEN** BRAND

KALEIDO-MX 4K (3RU)

ULTRA HIGH-DEFINITION MULTIVIEWER

Installation & Service Manual

M933-7502-104

2018-03-05

www.grassvalley.com

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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 Canadian Standard Association (CSA) regulations and recommendations for USA/Canada.



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/Canada.



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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 mains voltage at either 120 V AC or 240 V AC.
- This product relies on the building's installation for short-circuit (over-current) protection. Ensure that a fuse or circuit breaker for 120 V AC or 240 V AC 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. Servicing should be done in a static-free environment.
- 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.

Electrostatic Discharge (ESD) Protection



Electrostatic discharge occurs when electronic components are improperly handled and can result in intermittent failure or complete damage adversely affecting an electrical circuit. When you remove and replace any card from a frame always follow ESD-prevention procedures:

- Ensure that the frame is electrically connected to earth ground through the power cord or any other means if available.
- Wear an ESD wrist strap ensuring that it makes good skin contact. Connect the grounding clip to an *unpainted surface* of the chassis frame to safely ground unwanted ESD voltages. If no wrist strap is available, ground yourself by touching the *unpainted* metal part of the chassis.
- For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms.
- When temporarily storing a card make sure it is placed in an ESD bag.
- Cards in an earth grounded metal frame or casing do not require any special ESD protection.

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 l'utilisateur, l'opérateur ou le technicien de maintenance que des instructions importantes relatives à l'utilisation et à l'entretien se trouvent dans la documentation accompagnant l'équipement.



Invite l'utilisateur, l'opérateur ou le technicien de maintenance à prendre note du calibre 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 d'alimentation et qu'il faut débrancher tous les cordons d'alimentation avant toute opération d'entretien, afin de prévenir les chocs électriques.



La marque C-CSA-US certifie que l'appareil visé a été testé par l'Association canadienne 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'un fusible ou un disjoncteur pour 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 n'ont pas d'interrupteur marche-arrêt et qui disposent d'une source d'alimentation externe doivent être installés à proximité d'une prise de courant facile d'accès.
- Si l'équipement n'est pas pourvu d'un module d'alimentation auto-adaptable, vérifiez la configuration de chacun des modules d'alimentation avant de les mettre sous tension.
- 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, n'effectuez pas de réparations autres que celles 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 d'alimentation. Afin de prévenir les chocs électriques, débranchez tous les cordons d'alimentation avant toute opération d'entretien.
- Veillez à toujours prendre les mesures de protection antistatique appropriées quand vous manipulez l'équipement.

Protection contre les décharges électrostatiques (DES)



Une décharge électrostatique peut se produire lorsque des composants électroniques ne sont pas manipulés de manière adéquate, ce qui peut entraîner des défaillances intermittentes ou endommager irrémédiablement un circuit électrique. Au moment de remplacer une carte dans un châssis, prenez toujours les mesures de protection antistatique appropriées :

- Assurez-vous que le châssis est relié électriquement à la terre par le cordon d'alimentation ou tout autre moyen disponible.
- Portez un bracelet antistatique et assurez-vous qu'il est bien en contact avec la peau. Connectez la pince de masse à une *surface non peinte* du châssis pour détourner à la terre toute tension électrostatique indésirable. En l'absence de bracelet antistatique, déchargez l'électricité statique de votre corps en touchant une surface métallique *non peinte* du châssis.

- Pour plus de sécurité, vérifiez périodiquement la valeur de résistance du bracelet antistatique. Elle doit se situer entre 1 et 10 mégohms.
- Si vous devez mettre une carte de côté, assurez-vous de la ranger dans un sac protecteur antistatique.
- Les cartes qui sont reliées à un châssis ou boîtier métallique mis à la terre ne nécessitent pas de protection antistatique spéciale.

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 l'écran LCD ou TFT est brisé, manipulez les fragments de verre avec précaution au moment de vous en débarrasser. veillez à ce que le cristal liquide n'entre pas en contact avec la peau ou la bouche. En cas de contact avec la peau ou les vêtements, laver immédiatement à l'eau savonneuse. Ne jamais ingérer le liquide. La toxicité est extrêmement faible, mais la prudence demeure de mise en tout temps.

Recycling

Visit www.grassvalley.com for recycling information.

Certification and Compliance

Safety Compliance



This equipment complies with the European Directive 2006/95/EC – Low voltage directive, in addition to the following standards on safety of information technology equipment:

- CAN/CSA 22.2 No. 60950-1-07, 2nd Edition, A1:2011
- UL 60950-1:2007, 2nd Edition
- IEC 60950-1:2005, 2nd Edition, A1:2009
- EN 60950-1:2006, A11:2009, A1:2010, A12:2011

The power cords supplied with this equipment meet the appropriate national standards for the country of destination.

Electromagnetic Compatibility

FC This equipment has been tested for verification of compliance with FCC Part 15, Subpart B requirements for class A digital devices.

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.

CE This equipment has been tested and found to comply with the requirements of the EMC directive 2014/30/EU:

- EN 55022 Class A Radiated and conducted emissions
- EN 61000-3-2 Limits for harmonic current emissions
- EN 61000-3-3 Limitation of voltage fluctuations and flicker
- EN 61000-4-2 Electrostatic discharge immunity
- EN 61000-4-3 Radiated, radio-frequency, electromagnetic field immunity
- EN 61000-4-4 Electrical fast transient immunity
- EN 61000-4-5 Surge transient immunity
- EN 61000-4-6 Conducted disturbances immunity
- EN 61000-4-11 Voltage dips, short interruptions and voltage variations immunity

Environmental Compliance

部件名称 Part name	有毒有害物质或元素 (Toxic or hazardous substances and elements)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
电缆及电缆组件 Cables and cable assemblies	X	O	O	O	O	O
电路模块 Circuit modules	X	O	O	O	O	O
显示装置 Display assemblies	X	O	O	O	O	O
组装风扇 Fan assemblies	X	O	O	O	O	O
金属零件 Metal parts	X	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572-2011 规定的限量要求以下。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572-2011.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572-2011 规定的限量要求。

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in GB/T 26572-2011.

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toc

Table of Contents

1 Overview	17
Related Documentation	17
Software and Firmware Updates	18
Introduction	18
Features	18
Current Limitations	19
Cards	19
Available Options	20
Optional Ancillary Equipment	20
Kaleido Software Minimum Version Compatibility	20
2 Installation	21
Getting Organized / Unpacking	21
Required Tools	21
Required Materials	21
Physical Interface	23
Frame Interface	23
Card Interfaces	28
Mechanical Installation	32
Mounting the Kaleido-MX 4K (3RU) in a Rack	32
Ventilation	32
3 Multiviewer Cabling	33
Cabling Diagram	33
Signal Connections to the Multiviewer	34
Output Modules	34
Input Modules	37
Reference Modules	38
GPI I/O Modules	39
System Control	39
Commissioning the Multiviewer	40
4 Frame Control Panel Operation and IP Network Setup	43
Introduction	43

Using the Densité Frame Control Panel	44
Navigating the Local Control Panel Menu	44
Local Control Panel Menu Structure	45
Enabling the Frame's Automatic Restore Feature	46
Disabling the Frame's Automatic Restore Feature	47
Saving a Restore Point to the CPU-ETH2 for a Single Card	47
Saving Restore Points to the CPU-ETH2 for All Cards	47
Changing the Mosaic Output Resolution	48
Enabling EDID Auto-Detection from the Monitor Wall	49
Networking Essentials	50
Assigning an IP Address to Each Device in your System	50
Setting the Multiviewer's IP addresses.....	50
Setting a Densité Frame's Controller's IP Address	53
Setting the Multiviewer's Time and Date	54
Configuring the Network Settings for a Kaleido-MX 4K (3RU).....	55
Network Considerations	57
TCP/UDP Port Usage.....	57
Network Considerations for a Multiviewer Cluster	60

5 System Configuration..... 63

System Requirements for a Client PC	63
Multiviewer Model Representation in XEdit and XAdmin.....	63
XEdit Installation	63
Installing Kaleido Software Client Applications	63
Installing XEdit from your Multiviewer's Home Page	64
Uninstalling XEdit	68
Installing Router Control.....	69
Uninstalling Router Control.....	72
Installing Signal Path Viewer.....	72
Uninstalling Signal Path Viewer	75
Opening XAdmin	76
Connecting to a Multiviewer with a Different XEdit Version from your PC's Version	76
Ways to Access XAdmin	77
Opening XAdmin from a Browser	77
Opening XAdmin from XEdit.....	78
Opening XAdmin from iControl or iControl Solo.....	78
Registering your Multiviewer's Security Credentials with your Browser	80
Enabling the Compatibility View in Internet Explorer	88
XAdmin Access Control.....	88
Enabling XAdmin Access Control	88
Changing the XAdmin Password.....	90
Disabling XAdmin Access Control.....	91
Closing a Password-Protected XAdmin Session.....	93
Opening Signal Path Viewer	93
Viewing a Multiviewer's Status Information.....	94

Remote Control Using iControl.....	99
Kaleido-MX 4K Service Control Panels in iControl.....	99
Output Settings Panel.....	101
Network Settings Panel.....	102
Info Panel.....	103
Setting the System Name.....	105
Genlocking the Multiviewer.....	109
Using the URS - LTC IN Time Code Input.....	109
Configuring the RCP-200.....	111
Configuring the RCP-200's IP settings.....	111
Specifying multiviewers for the RCP-200.....	111
Specifying lookup servers for the RCP-200.....	112
Logging on to the RCP-200.....	112
Correlating Monitor Wall Destinations and KX Router Logical Routers for the RCP-200.....	114
Configuring the Kaleido-RCP2.....	115
Assigning a static IP address to the Kaleido-RCP2.....	115
Selecting a room for the Kaleido-RCP2.....	116
Connecting the Kaleido-RCP2 to Other Kaleido Multiviewer Systems.....	116
Logging on to the Kaleido-RCP2.....	117
Configuring an Audio Bridge Terminal.....	118
Configuring a PC to Configure an ABT's Network Settings.....	120
Available Hardware and Software Options.....	122
Enabling Options.....	122

6 Maintenance & Troubleshooting 125

System Verification.....	125
Verifying the Kaleido-MX 4K Multiviewer Status.....	125
Verifying the Kaleido-RCP2.....	127
Loading a Layout.....	127
Customizing Layouts, Logical Sources, and other Kaleido-IP Elements.....	128
Verifying the Audio Bridge Terminal.....	128
Verifying the Multiviewer's IP Addresses and Application Version.....	129
Maintenance.....	130
Required Tools.....	130
Field Replaceable Units.....	130
Opening and Closing the Front Door.....	131
Replacing Cards.....	132
Replacing the Frame Controller Card.....	132
Replacing Power Supply Modules.....	133
Cooling Fan Replacement.....	133
Replacing KMX-3911 Card Fans.....	136
Replacing Frame Ventilation Fans.....	140
Replacing the Frame's Air Filter.....	140
Generating a System Snapshot.....	141
Upgrading the Multiviewer.....	142
Pre-upgrade Checklist.....	142
Upgrade Overview.....	143
Upgrading the Multiviewer Using a USB Key.....	144
Downgrading the Multiviewer System.....	150

Troubleshooting	151
Troubleshooting with the card's front edge USB connector	151
Dashboard Messages	151
Troubleshooting Common Issues	153
7 Specifications	157
Kaleido-MX 4K Inputs	157
Video Inputs (32, 48, or 64)	157
Discrete Audio Inputs	159
Kaleido-MX 4K Outputs	159
Kaleido-MX 4K Control	160
Reference Inputs	160
LTC Inputs	161
Communication	161
GPI-1501 GPI I/O module	161
Kaleido-MX 4K (3RU) Frame	162
Multiviewer Integration with other Systems and Equipment	163
Optional Drivers for Controlling Routing Devices from the Multiviewer	163
Optional Drivers for Controlling Tally Interface Devices from the Multiviewer	164
Optional Drivers for Scoreboards and Timers	165
Built-in Communications Protocols	166
RS-422 Connection Diagram	166
Contact Us	168

1 Overview

Welcome to the Kaleido family of multiviewers! This Installation & Service Manual is designed to help you get your Kaleido-MX 4K multiviewer up and running. The following chapters will guide you through the installation of a Kaleido-MX 4K system in its default configuration. This chapter provides an overview of the Kaleido-MX 4K unit.

The Kaleido-MX 4K multiviewer system is ideal for production control rooms, trucks and outside broadcast operations.

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 (www.grassvalley.com/docs/multiviewers).

Document Number	Title
M770-2800	Kaleido Software User's Manual
M770-2103	Kaleido Software Release Notes
M770-9904	Kaleido Software Product Comparison Charts
GVB-1-0498B-EN-DS	Kaleido-MX 4K Datasheet
M770-9905	Kaleido Multiviewers Documentation Resource Guide
M933-7502	Kaleido-MX 4K (3RU) Hardware Description & Installation Manual
M659-9900	CPU-ETH2 Guide to Installation and Operation
M906-9900	GPI-1501 Guide to Installation and Operation
M845-9900	REF-1801 Guide to Installation and Operation
M452-9500	VDA-1002 Operation and installation manual
M735-9902	Kaleido-RCP2 Guide to Installation and Operation
M876-9900	RCP-200 Guide to Installation and Operation
M770-0900	Kaleido Remote Control Protocol (Gateway) User's Guide
M796-9902	Audio Bridge Terminal Guide to Installation and Operation
M807-9700	KXI-DVI-Bridge User's Manual
M407-9900	iControl Router User Guide
Published online	iControl Online Help iControl Solo Online Help



Software and Firmware Updates

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

Introduction

Available in two form factors (1 RU, and 3 RU), and four configurations, the **Kaleido-MX 4K** ultra high-definition multiviewer can monitor up to 64 video inputs, on a 4K UHD display, without visible quadrants.

Available in two form factors (1 RU, and 3 RU), the Kaleido-MX 4K supports up to 64 video inputs. Pre-configured Kaleido-MX 4K systems are available in the following sizes:

Frame	Inputs × outputs
 <p><i>Kaleido-MX 4K (1RU) frame</i></p>	16 inputs × 1 UHD output
 <p><i>Kaleido-MX 4K (3RU) frame</i></p>	32 inputs × 1 UHD output 48 inputs × 1 UHD output 64 inputs × 1 UHD output

A Kaleido-MX 4K multiviewer system in its default configuration includes a number of layout presets. Each preset shows the video signals from a specific input module (card). Refer to the *Kaleido Software User's Manual* (see [Related Documentation](#), on page 17) for instructions on how to create rooms and layouts according to meet your specific requirements.

Features

Kaleido-MX 4K features

Uncompromised I/O capabilities	<ul style="list-style-type: none"> Up to 64 inputs 3G/HD/SD SDI formats Quad-link 3 Gb/s output or HDMI 2.0 output at 3840 × 2160 @ 59.94/50p
Unmatched image quality and layout flexibility	<ul style="list-style-type: none"> Unmatched multiviewer picture quality and superior on-screen graphics. Ultimate level of layout flexibility, with unlimited signal repetition and sizing across all displays, without blocking, grouping restrictions or bandwidth restrictions Display up to 128 images (64 unique) on a 4K UHD display

Kaleido-MX 4K features (continued)

Router and switcher integration	<ul style="list-style-type: none"> • Kaleido-MX 4K offers rich integration with the NVISION router family and Grass Valley's Kayenne/Karrera production switchers • Supports third-party routers and production switchers for tally and labels
Robust and serviceable design	<ul style="list-style-type: none"> • Fast automated recovery after a <i>cold</i> spare is inserted into the frame • Hot-swappable modules and power supplies • 1 RU and 3 RU frame models with quiet cooling
Seamless control across multiple multiviewers	<ul style="list-style-type: none"> • Kaleido multiviewers can be <i>mixed-and-matched</i> to create a seamless monitoring system across a facility • Choice of control options such as standalone Kaleido-RCP2/RCP-200 panels, integrated with router control systems and panels, iControl and third-party control systems
Scalable for the largest systems	<ul style="list-style-type: none"> • Virtually limitless multiviewer system expansion with upstream NVISION router • A combined multiviewer/router system may include up to 1152 video inputs, and 72 UHD multiviewer outputs
Advanced probing and alarming	<ul style="list-style-type: none"> • Closed captioning and teletext subtitling display and alarming to ensure compliance with regulation, includes XDS and AFD • Software licensable Dolby E metadata extraction for metering and content alarming • On-screen alarm displays for operator alerts, supporting multicolor and blinking statuses based on severity, latching and status

Current Limitations

The Kaleido-MX 4K 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).

Cards

The table below indicates how the cards are distributed in the Kaleido-MX 4K (3RU) housing frame:

Slot	Card	Card model	Applies to
1	GPI I/O 1	GPI-1501	All 3RU configurations
2	GPI I/O 2	GPI-1501	All 3RU configurations (optional)
4	Input D	KMX-3901-IN-16-Q	64 × 1
7	Input C	KMX-3901-IN-16-Q	48 × 1, 64 × 1
9	Reference	VDA-1002	All 3RU configurations
10	URS	REF-1801	All 3RU configurations (optional)
12	Input B	KMX-3901-IN-16-Q	All 3RU configurations
15	Input A	KMX-3901-IN-16-Q	All 3RU configurations

Slot	Card	Card model	Applies to
17	Output B	KMX-3901-OUT-D	All 3RU configurations
19	Output A	KMX-3901-OUT-D	All 3RU configurations

Available Options

The following multiviewer options are available:

- Second power supply for redundant power security
- Second GPI-1501 GPI I/O module
- REF-1801 HD/SD frame reference module

Optional Ancillary Equipment

The following optional equipment may be supplied with your order.

- Kaleido RCP-2 or RCP-200 multi-function remote control panel
- Audio Bridge Terminal (ABT)

Kaleido Software Minimum Version Compatibility

A Kaleido-MX 4K multiviewer cannot be downgraded to a Kaleido Software version earlier than 7.70. When downgrading this multiviewer, certain other requirements and limitations may be in effect; see [Upgrading the Multiviewer](#), on page 144 for more information.

To upgrade a multiviewer, see [Upgrading the Multiviewer](#), on page 144.

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.

2 Installation

This chapter provides information about system requirements, items shipped with your Kaleido-MX 4K multiviewer and it will guide you through the installation of a Kaleido-MX 4K multiviewer.

Getting Organized / Unpacking

This section provides information about system requirements, and items shipped with your Kaleido-MX 4K (3RU).

Required Tools

Use a field-supplied Phillips #2 screwdriver to install optional modules into the frame.

Required Materials

Make sure the following items have been shipped with your Kaleido-MX 4K (3RU). If any of these are missing, contact your distributor or Grass Valley (see [Grass Valley Technical Support](#), on page 168).

- A Kaleido-MX 4K (3RU) unit with pre-installed cards (2–4 input cards, 2 output cards, a Densité CPU-ETH2 controller card, a VDA-1002 analogue video distribution amplifier module, 1 or 2 GPI-1501 GPI I/O modules), and 1 or 2 power supplies
A REF-1801 HD/SD frame reference module, the second power supply, and a second GPI-1501 module are optional. The table below indicates how the cards included in your Kaleido-MX 4K (3RU) are installed in the housing frame:

Slot	Card	Card model	Applies to
1	GPI I/O 1	GPI-1501	All 3RU configurations
2	GPI I/O 2	GPI-1501	All 3RU configurations (optional)
4	Input D	KMX-3901-IN-16-Q	64 × 1
7	Input C	KMX-3901-IN-16-Q	48 × 1, 64 × 1
9	Reference	VDA-1002	All 3RU configurations
10	URS	REF-1801	All 3RU configurations (optional)
12	Input B	KMX-3901-IN-16-Q	All 3RU configurations
15	Input A	KMX-3901-IN-16-Q	All 3RU configurations
17	Output B	KMX-3901-OUT-D	All 3RU configurations
19	Output A	KMX-3901-OUT-D	All 3RU configurations

Notes

- Removing more than one input card at a time from a Kaleido-MX 4K system in operation is not supported.

- Two AC power cords
- Two cable retainers
- One quad link SDI to HDMI 2.0 converter
- Five WECO mating connector: two for each output card, for the analog audio monitoring outputs, plus one for the CPU-ETH2 controller card's GPI output.
- Four serial port adapters (two with straight cabling and two with crossover cabling—see [RS-422 Connection Diagram](#), on page 166):

Part number	Adapter cabling	RS-422 pinout at the DE-9P connector
1737-3000-102	Straight	Controller (SMPTE master) mode
1792-3700-100	Crossover	Tributary (SMPTE slave) mode

- 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 might need the following (not supplied):

- One 4K UHD display
- A dedicated 100Base-T Ethernet switch with enough ports for the Kaleido-MX 4K, client PCs, Kaleido-RCP2, and Audio Bridge Terminals
- Client PC (see below for system requirements)
- Cables (to connect your multiviewer to the video sources, to the display, and to the network):

Cable type	Purpose
CAT-5	For Ethernet connectivity
Display cables	Standard coaxial cables with DIN 1.0/2.3 connectors, to connect the multiviewer's SDI outputs to a 4K UHD display, or to the SDI to HDMI 2.0 converter
Video cables	Standard coaxial cables with DIN 1.0/2.3 connectors

Note: On all Kaleido multiviewers, the network adapters are set to auto-negotiate. By default, the connection speed and duplex mode will be set automatically based on the corresponding port settings on the switch.

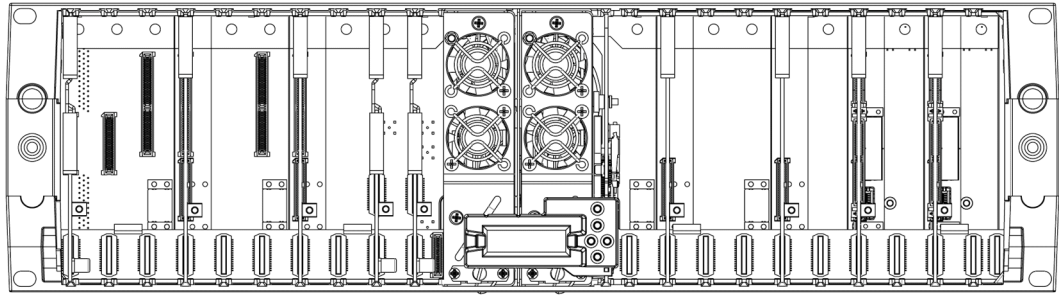
Physical Interface

Frame Interface

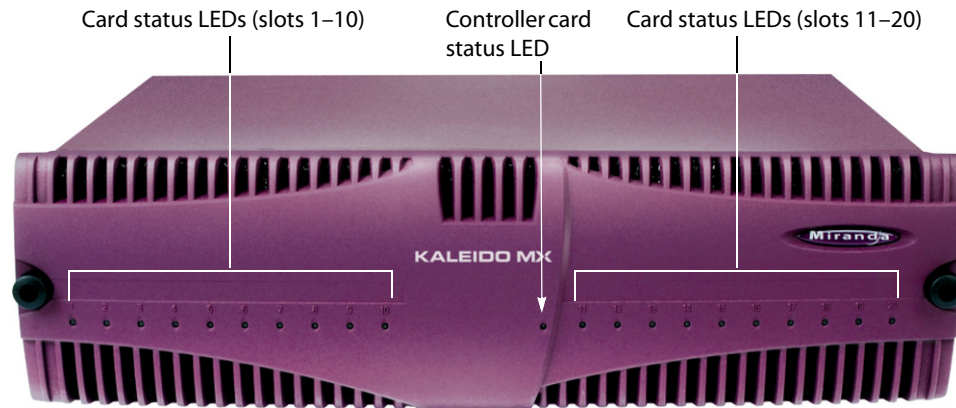
Front of the Kaleido-MX 4K (3RU) frame

When the frame door is opened, the front of the Kaleido-MX 4K (3RU) unit is visually divided into three sections:

Left side	Card slots 1–10 are laid out vertically. Input cards require 3 slots. A GPI-1501 card occupies slot number 1, and a VDA-1002 card occupies slot 9. Slot number 2 is reserved for a second GPI-1501 card (optional), and slot number 10 is reserved for a REF-1801 card (optional).
Center	The <i>controller</i> card with its attached control panel occupies the unnumbered slot to the right of the PSU and fan assemblies.
Right side	Card slots 11–20 are laid out vertically. Input cards require 3 slots. Output cards require 2 slots.

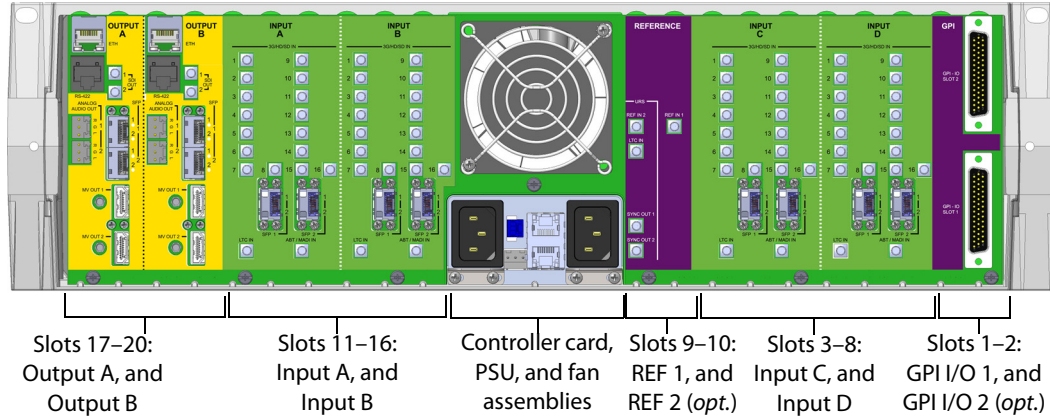


When the frame door is closed, the status LED on each of the cards in the frame is visible via a light pipe in the door. No other controls or indicators are present.



Rear of the Kaleido-MX 4K (3RU) frame

The rear of the Kaleido-MX 4K (3RU) frame is organized in three sections, matching the front.



Viewed from the rear, the three sections are laid out as follows:

Right	Connectors associated with card slots 1–10 are distributed across color-coded areas: REFERENCE (mauve), INPUT C and INPUT D (green), and GPI (mauve).
Center	The <i>controller</i> card rear connectors are located between the power sockets, below the fan assembly.
Left	Connectors associated with card slots 11–20 are distributed across color-coded areas: OUTPUT A and OUTPUT B (yellow), INPUT A and INPUT B (green).

Note: The Kaleido-MX 4K (3RU) offers a wide variety of ports for incoming and outgoing signals. With a view towards future expansion, there are ports whose connections exist but that are currently not fully supported. The SFP ports are not yet supported.

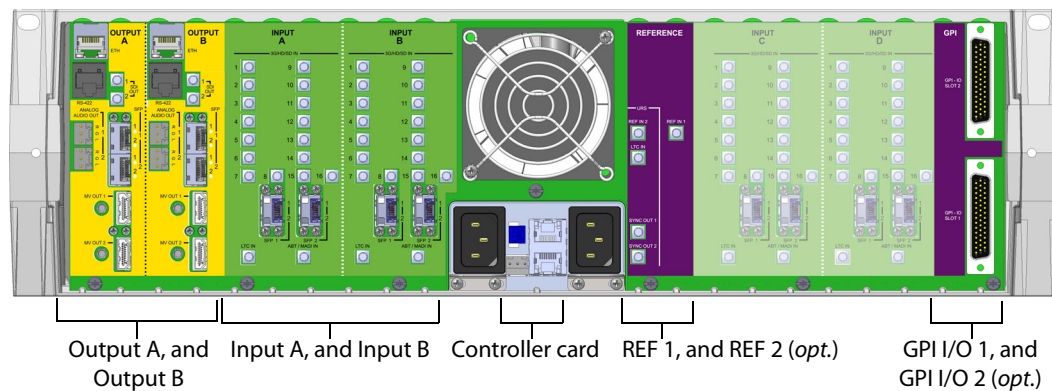
The number of supported connectors varies, depending on the Kaleido-MX 4K (3RU) model. The following table lists the supported number of each connector type, for every Kaleido-MX 4K (3RU) model.

Number of connectors supported by Kaleido-MX 4K (3RU) model

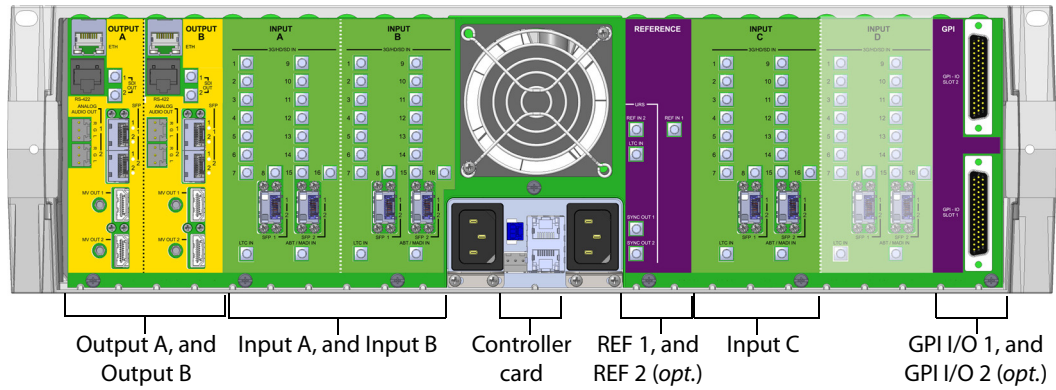
Connectors	32 × 1	48 × 1	64 × 1
3G/HD/SD inputs	32	48	64
SDI outputs	4	4	4
HDMI outputs	<i>Not supported for seamless 4K UHD monitoring.</i>		
Analog audio outputs	4	4	4
ABT/MADI audio inputs	2	3	4
LTC inputs	3	4	5
Reference inputs	2	2	2
Ethernet connector	3	3	3
RS-422 connector	2	2	2
GPI inputs	40	40	40
Configurable GPI input/output	16	16	16

The diagrams below show the supported connector areas, for every Kaleido-MX 4K (3RU) model.

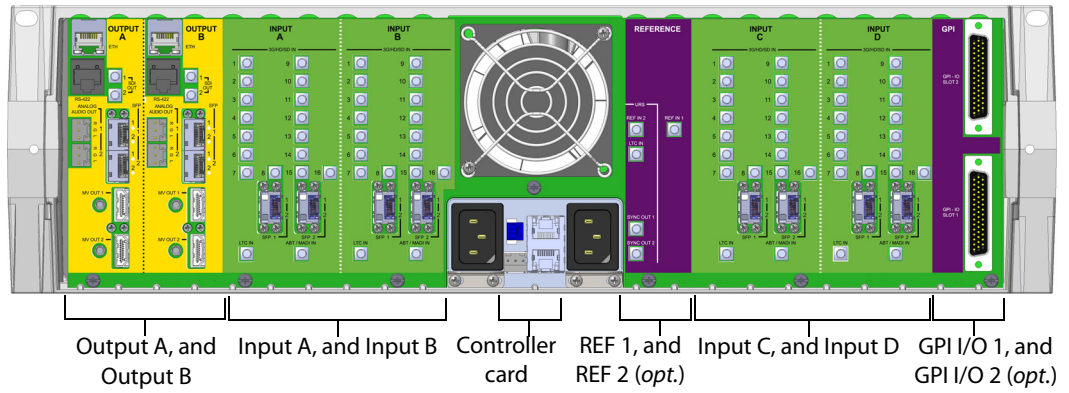
Kaleido-MX 4K (3RU) 32 × 1



Kaleido-MX 4K (3RU) 48 × 1

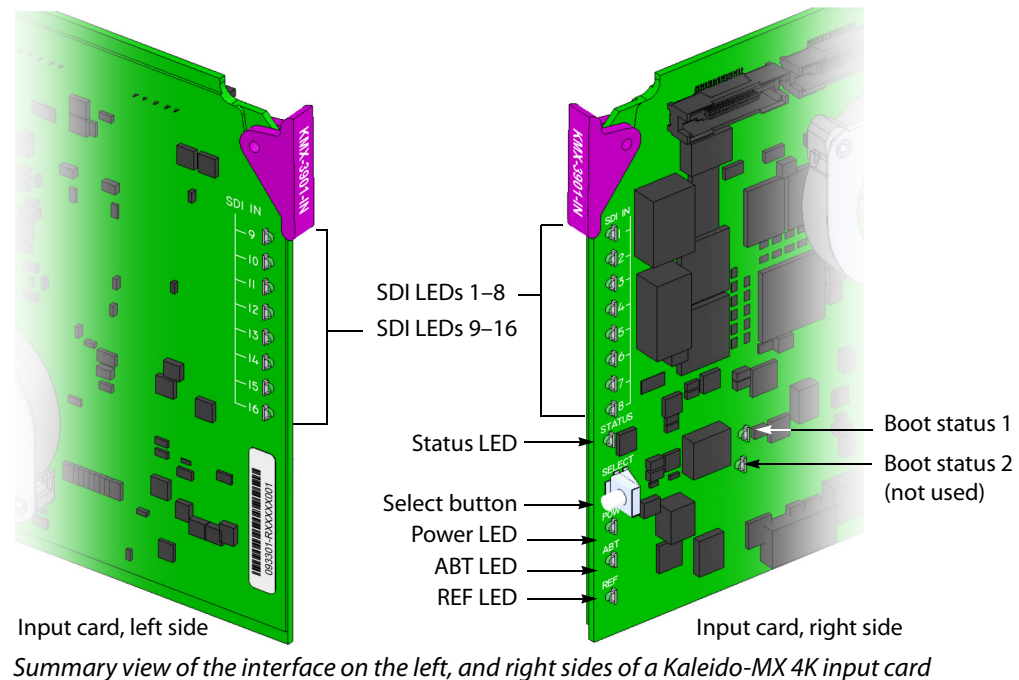


Kaleido-MX 4K (3RU) 64 × 1



Card Interfaces

Kaleido-MX 4K Input Card Interface



Summary view of the interface on the left, and right sides of a Kaleido-MX 4K input card

Input card Status LED

The Status LED is located on the front edge of a Kaleido-MX 4K card, immediately above the Select button, and is visible through the front access door of the Densité frame. This multi-color LED indicates the status of the card, by color, and by blinking/steady illumination:

LED	Meaning
Green	Normal (communication established with an output card)
Blinking orange	Booting (or the card is selected for local control)
Red	Default color before firmware initialization is complete / update in progress (may last more than 10 minutes)
Blinking red	Fan failure / no rear

The Status LED always shows the most severe detected error status. In the table above, error severity increases from top to bottom, with green representing no error/disabled, and blinking red the most severe error conditions.

If the Status LED is blinking orange, it means that the card is selected for local control using the Densité frame's control panel (or that the card is booting up). See [Using the Densité Frame Control Panel](#), on page 44 for details.

If the Status LED is steady red (not blinking), use the Densité frame control panel to review card status information (see [Local Control Panel Menu Structure](#), on page 45). If the card status menu reports that an update is in progress, then you know that you should not interrupt this process (by reseating the card, for example).

Input card power LED

Monitors the status of the 1.8V and 3.3V power supplies on board the Kaleido-MX 4K input card.

LED	Meaning
Green	OK
OFF	Failure of the 1.8V or 3.3V on-board PSUs

SDI LEDs

This group of LEDs monitors the status of the 16 inputs on the Kaleido-MX 4K input cards. The frame door must be open for the LEDs to be visible.

LED	Meaning
Green	SD-SDI, HD-SDI or 3G input signal detected
Red	No input signal detected

ABT LED

This LED monitors the status of the ABT/MADI input on the Kaleido-MX 4K input cards.

LED	Meaning
Green	ABT/MADI signal detected
Red	No signal detected

REF LED

This LED monitors the status of the REF input on the Kaleido-MX 4K input cards.

LED	Meaning
Green	Black-burst or tri-level-sync signal detected
Red	No signal detected

Boot status LED 1

Monitors the status of the firmware.

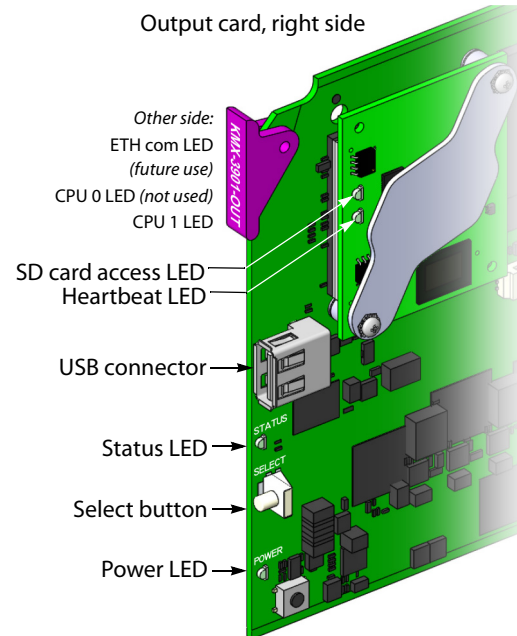
LED	Meaning
Green	Normal (firmware has completed initialization and communication was established with at least one output card)
Blinking orange	Error or no communication with an output card
Blinking green/red	Transitory state during firmware initialization
Red	Initial state

Boot status LED 2

This LED is always red, and currently not relevant.

KMX-3901-OUT Output Card Interface

Every output module also has one USB connector, into which you may connect a mouse, keyboard, or USB flash memory for a software upgrade or data backup.



Summary view of the interface on a Kaleido-MX 4K output card edge

Output card Status LED

The Status LED is located on the front edge of a Kaleido-MX 4K card, immediately above the Select button, and is visible through the front access door of the Densité frame. This multi-color LED indicates the status of the card, by color, and by blinking/steady illumination:

LED	Meaning
Green	Normal
Blinking orange	Booting (or the card is selected for local control)
Red	Firmware initialization in progress / no Ethernet / SD card error / CPU kernel error / update in progress (may last up to 10 minutes)
Blinking red	Fan failure / no rear / duplicate IP address

The Status LED always shows the most severe detected error status. In the table above, error severity increases from top to bottom, with green representing no error/disabled, and blinking red the most severe error conditions.

If the Status LED is blinking orange, it means that the card is selected for local control using the Densité frame's control panel (or that the card is booting up). See [Using the Densité Frame Control Panel](#), on page 44 for details.

If the Status LED is steady red (not blinking), use the Densité frame control panel to review card status information (see [Local Control Panel Menu Structure](#), on page 45). If the card status menu reports that an update is in progress, then you know that you should not interrupt this process (by reseating the card, for example).

Output card power LED

Monitors the status of the power supplies on board the Kaleido-MX 4K output card.

LED	Meaning
Green	OK
OFF	Failure of an on-board PSU, or there was a glitch on the 3.3V PSU (in which case reseating the card may resolve the problem). In the first case, reseating the card will not resolve the problem.

Output card heartbeat LED

Monitors the status of the system firmware.

LED	Meaning
Blinking red	System OK (<i>heartbeat</i> signal)

Memory card access LED

Monitors read/write operations to the SD memory card.

LED	Meaning
OFF	No read/write operations in progress
Blinking green	Read of write operation in progress

ETH communication LED

This LED is always OFF, and currently not relevant.

CPU 0 LED (not used)

This LED is always orange, and currently not relevant.

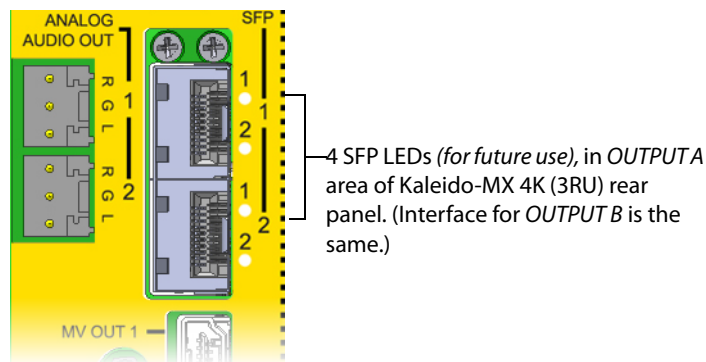
CPU 1 LED

Monitors the status of the firmware during the startup process.

LED	Meaning
Green	Normal (the Kaleido Software, XEdit, XAdmin are available)
Blinking orange	Firmware initialization completed (waiting for the Kaleido Software to start)
Orange	Transitory state during firmware initialization
Red	Initial state

Output module SFP LEDs

In a Kaleido-MX 4K (3RU), every output module has 4 SFP LEDs located on the rear connector panel. These LEDs are always OFF, and currently not relevant.



Mechanical Installation

Mounting the Kaleido-MX 4K (3RU) in a Rack

The Kaleido-MX 4K (3RU) housing frame occupies 3RU, in a standard 19-inch rack.

To mount the frame

- 1 Open the front door to expose the rack mounting flanges at the ends of the chassis (see [Opening and Closing the Front Door](#), on page 131).
- 2 Install the frame in the rack using 4 standard rack-mounting screws (not supplied) through the four holes in the mounting flanges.

Ventilation

In a Kaleido-MX 4K (3RU), ventilation for the frame is provided by a fan mounted in the center of the rear panel. The fans draw air through the frame and exhaust it to the rear. Ventilation slots in the front panel allow air to flow into the frame, and an air filter is mounted in the frame door.

IMPORTANT

To ensure proper cooling, the front panel of the Kaleido-MX 4K frame must be closed at all times when cards are installed and operating.

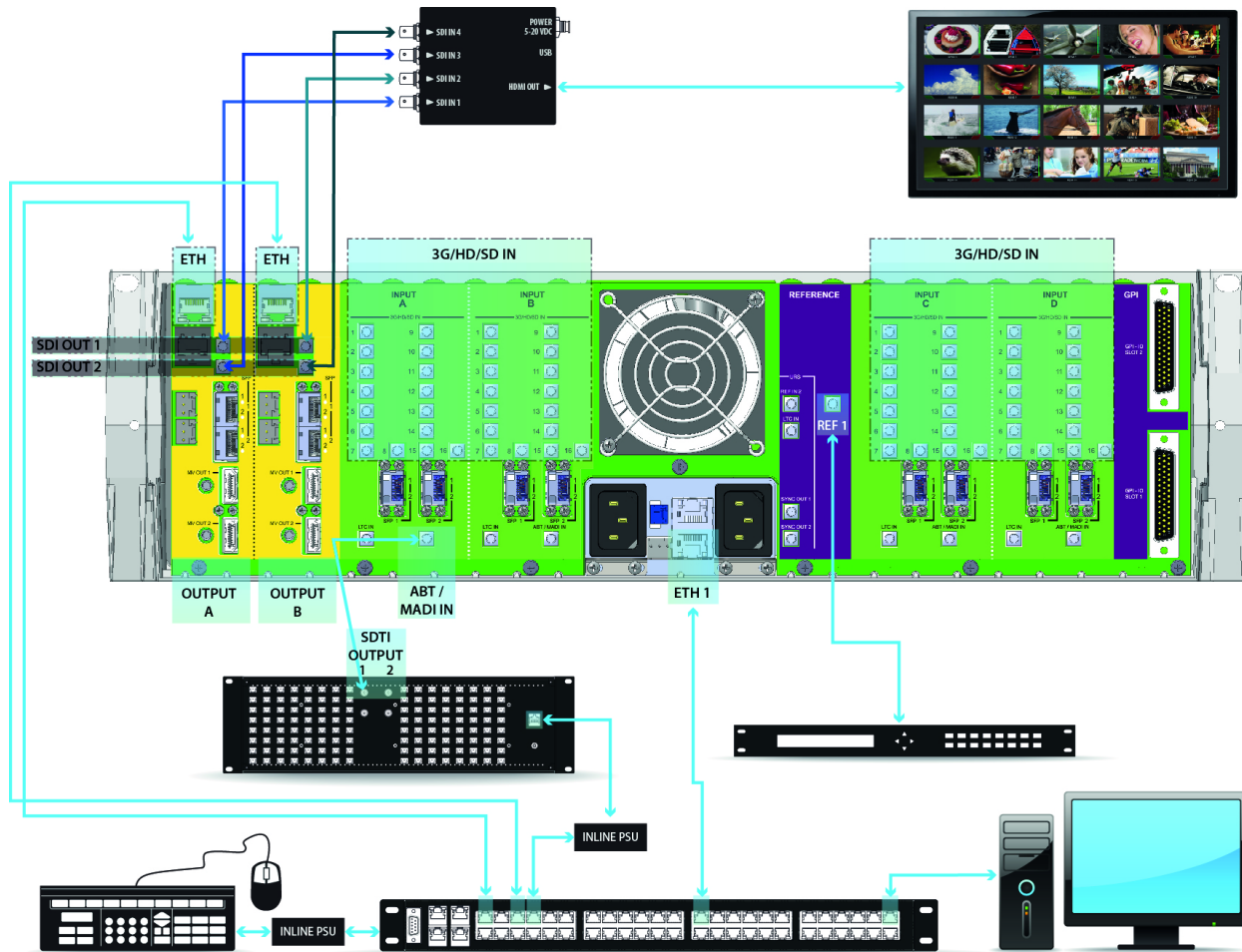
The frame-mounted fans are supplemented by thermostatically-controlled fans mounted in each power supply. They are not field-serviceable.

Ensure that the front panel ventilation slots are not obstructed. Check the air filter regularly to ensure that it is not plugged up with debris. The filter may be cleaned by rinsing in warm water. Dry thoroughly before replacing it in the frame. See [Replacing the Frame's Air Filter](#) on page 140, for details.

3 Multiviewer Cabling

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

Cabling Diagram

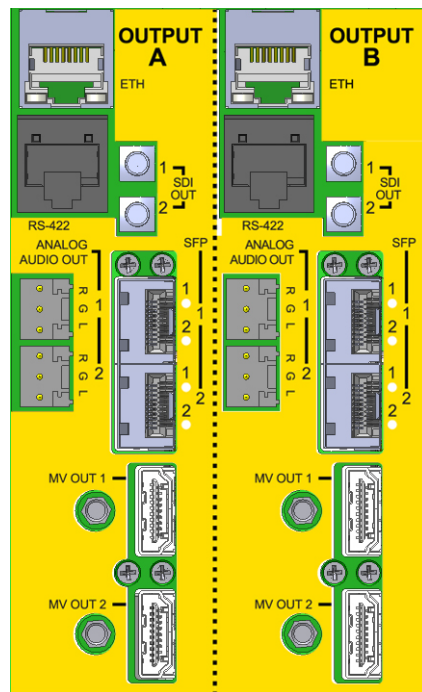


Cabling diagram, showing the rear view of a Kaleido-MX 4K 64 x 1 system

Signal Connections to the Multiviewer

This section describes the connectors found on the Kaleido-MX 4K (3RU) models' rear panel.

Output Modules

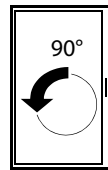


The following table lists the function of each connector associated with the output heads, on Output A, and Output B.

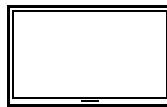
Connector label	Connector type	Function
Output A, SDI OUT 1	DIN 1.0/2.3	Serial digital HD output signal from Output A, Head 1. Top-left quadrant of quad link (square division) 4K UHD output (with embedded audio). See Multiviewer Mosaic Output to a 4K Display Input Cable Connections on page 35 for connection information.
Output A, SDI OUT 2	DIN 1.0/2.3	Serial digital HD output signal from Output A, Head 2. Bottom-left quadrant of quad link (square division) 4K UHD output (with embedded audio).
Output B, SDI OUT 1	DIN 1.0/2.3	Serial digital HD output signal from Output B, Head 1. Top-right quadrant of quad link (square division) 4K UHD output (with embedded audio).
Output B, SDI OUT 2	DIN 1.0/2.3	Serial digital HD output signal from Output B, Head 2. Bottom-right quadrant of quad link (square division) 4K UHD output (with embedded audio).
Output A, ANALOG OUT 1 L, 1 R, 2 L, 2 R; Output B, ANALOG OUT 1 L, 1 R, 2 L, 2 R	WECO	Analog audio outputs (left, right channels) to feed the audio monitoring system.
Output A, MV OUT 1, and MV OUT 2; Output B, MV OUT 1, and MV OUT 2	HDMI	<i>Not supported for 4K UHD monitoring.</i> A seamless 4K UHD output is only supported at the SDI OUT connectors. The quad-link SDI to HDMI converter that ships with each multiviewer provides one progressive scan HDMI 2.0 output.
Output A, SFP 1 1, SFP 1 2, SFP 2 1, and SFP 2 2; Output B, SFP 1 1, SFP 1 2, SFP 2 1, and SFP 2 2	—	Optional ports. <i>Not yet supported.</i>

Multiviewer Mosaic Output to a 4K Display Input Cable Connections

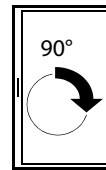
The multiviewer's display can be rotated when the license for this feature is enabled (see [Available Hardware and Software Options](#), on page 122). The following display orientations are supported.



Portrait: Display Rotated
90° Counter-Clockwise



Landscape:
Not Rotated



Portrait: Display Rotated
90° Clockwise

To support a 4K UHD display, connect the four multiviewer mosaic outputs to an SDI to HDMI 2.0 Converter. The way the SDI to HDMI 2.0 Converter connections are made to the multiviewer will change according to the display's mounting orientation.

Landscape Multiviewer Display Orientation

When the display's orientation is landscape, connect the SDI to HDMI 2.0 Converter as follows.

Multiviewer Output	Connects to the SDI to HDMI 2.0 Converter Input
SDI OUT A1	SDI IN 1
SDI OUT A2	SDI IN 3
SDI OUT B1	SDI IN 2
SDI OUT B2	SDI IN 4

Refer to *Creating a 4K UHD Room*, and to *4K UHD Spanning*, in the Kaleido Software User's Manual, for instructions on how to create 4K UHD rooms and layouts. See [Related Documentation](#), on page 17.

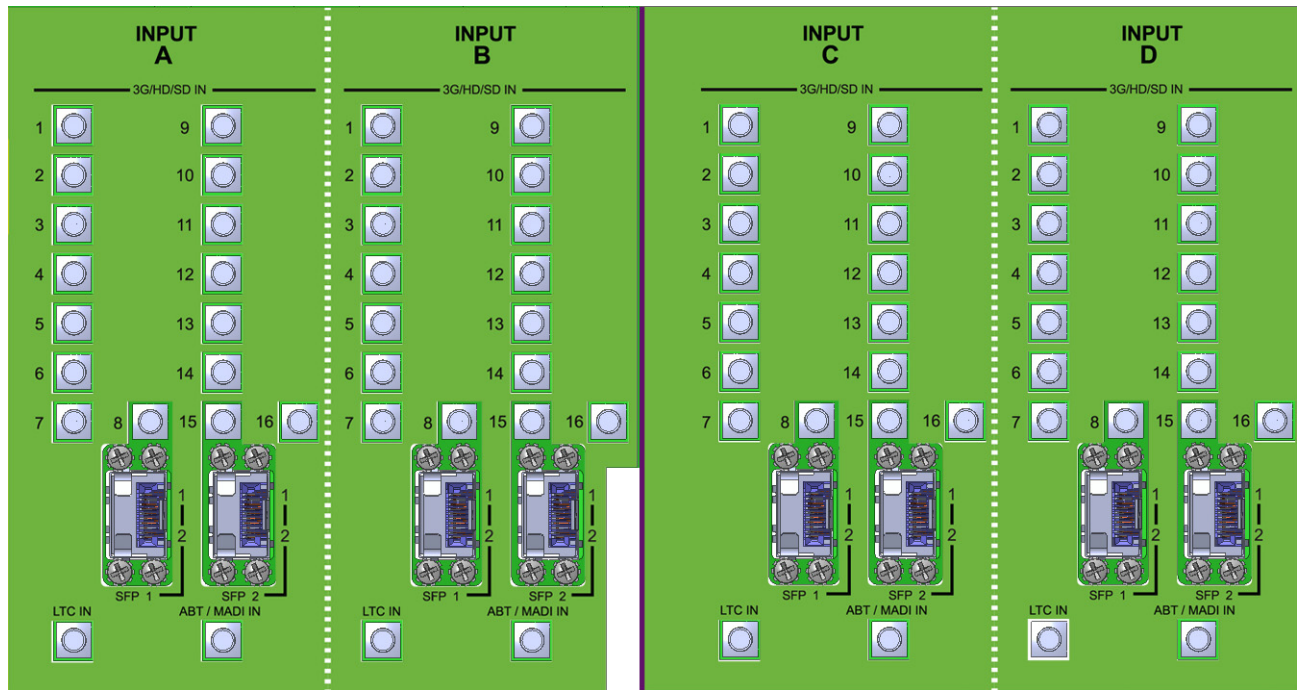
Portrait Multiviewer Display Orientation

When the display's orientation is portrait, connect the SDI to HDMI 2.0 Converter as above, however the connections between the multiviewer and the SDI to HDMI 2.0 Converter are to be made according to the table below.

Multiviewer Output	Connects to the SDI to HDMI 2.0 Converter Input	
	Display is Mounted 90° Counter-Clockwise	Display is Mounted 90° Clockwise
SDI OUT A1	SDI IN 2	SDI IN 3
SDI OUT A2	SDI IN 1	SDI IN 4
SDI OUT B1	SDI IN 4	SDI IN 1
SDI OUT B2	SDI IN 3	SDI IN 2

Furthermore, the display rotation must be set in the Kaleido Software for this configuration to work. In the **Kaleido Software User's Manual**, see *Creating a 4K UHD Room*, *4K UHD Spanning*, and *Changing a Display's Rotation*. See [Related Documentation](#), on page 17.

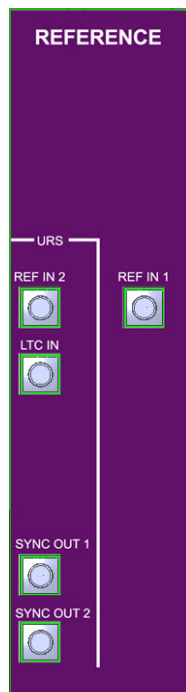
Input Modules



The following table lists the function of each connector associated with the input modules.

Connector label	Connector type	Function
3G/HD/SD IN 1 to 3G/HD/SD IN 16	DIN 1.0/2.3	SD-SDI, HD-SDI, or 3G-SDI video inputs
ABT/MADI IN	DIN 1.0/2.3	Multiplexed audio from an external device (e.g., MADI multiplexer, or Audio Bridge Terminal)
LTC IN	DIN 1.0/2.3	Time code input. See also Using the URS - LTC IN Time Code Input , on page 109.
SFP 1 1, SFP 1 2, SFP 2 1, and SFP 2 2	—	Optional ports. <i>Not yet supported.</i>

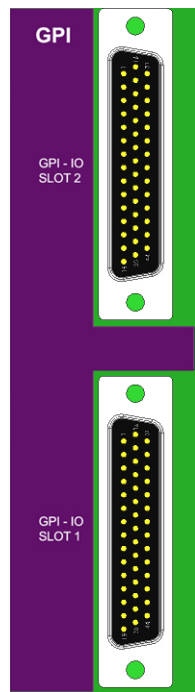
Reference Modules



The REFERENCE area of the Kaleido-MX 4K (3RU) rear panel exposes one connector associated with the VDA-1002 card (slot 9), and four connectors associated with an optional REF-1801 card (slot 10, if present).

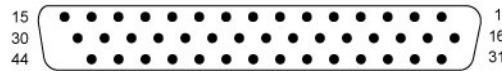
Connector label	Connector type	Function
REF IN 1	DIN 1.0/2.3	Reference signal to be distributed to all input cards in the frame. See Genlocking the Multiviewer , on page 109.
REF IN 2	DIN 1.0/2.3	Reference signal to be distributed to all input cards in the frame for redundancy. For this, the REF-1801 option must be installed.
LTC IN	DIN 1.0/2.3	Time code input. For this, the REF-1801 option must be installed. To use this LTC input, you must first configure the REF-1801 card's time code source and processing options. Refer to the <i>REF-1801 Guide to Installation and Operation</i> , for more information. See Related Documentation , on page 17. See also Using the URS - LTC IN Time Code Input , on page 109.
SYNC OUT 1, SYNC OUT 2	DIN 1.0/2.3	Programmable sync outputs. Require the REF-1801 card's <i>SPG</i> option (refer to the <i>REF-1801 Guide to Installation and Operation</i>).

GPI I/O Modules



A GPI-1501 module supports 20 GPI inputs, and 8 configurable GPI input/output terminals. The pinout of the associated DB-44 connectors (labelled GPI-I/O SLOT 1, and GPI-I/O SLOT 2), is as follows:

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GPIO-1 +	12	GPI-I 7	23	RS422-TX +	34	GPIO-5 -
2	GPIO-3 -	13	GPI-I 4	24	GPI-I 19	35	GND
3	GPIO-4 +	14	GPI-I 1	25	GPI-I 17	36	GPIO-7 +
4	GPIO-6 -	15	GND	26	GPI-I 13	37	RS422-RX -
5	GPIO-7 -	16	GPIO-1 -	27	GPI-I 11	38	GPI-I 20 / LTC
6	GPIO-8 +	17	GPIO-2 +	28	GPI-I 8	39	GPI-I 16
7	RS422-TX -	18	GPIO-4 -	29	GPI-I 5	40	GPI-I 14
8	GPI-I 18	19	GPIO-5 +	30	GPI-I 2	41	GND
9	GPI-I 15	20	GPIO-6 +	31	GND	42	GPI-I 9
10	GPI-I 12	21	GPIO-8 -	32	GPIO-2 -	43	GPI-I 6
11	GPI-I 10	22	RS422-RX +	33	GPIO-3 +	44	GPI-I 3



GPI-I/O connector

For ease of connection, you may use the GPI-1501-TBA terminal block adapter with integral 44-pin connector. Refer to the *GPI-1501 Guide to Installation and Operation*, for more information. Refer to the *Kaleido Software User's Manual* for detailed instructions on configuring a GPI-1501 within your multiviewer system. See [Related Documentation](#), on page 17.

System Control

The following table lists the purpose of each connector associated with system control, on Output A, and Output B.

Connector label	Connector type	Function
ETH	RJ-45	100 Base-T Ethernet connection
RS-422	RJ-45 ^a	Connect to an RS-422 (SMPTE ST 207, EBU-3245) or RS-485 device or network

a. The Kaleido-MX 4K multiviewers' RS-422 ports have an RJ-45 connector in order to preserve space on a busy panel. The RS-422 interface specifies a DE-9 connector, so if you are using this interface, you will require a DE-9-to-RJ-45 adapter. Grass Valley supplies two adapter models, correctly wired for this application: a straight adapter (part no. 1737-3000-102), and a crossover adapter (part no. 1792-3700-100).

Commissioning the Multiviewer

To make the multiviewer operational

- 1 With the Kaleido-MX 4K (3RU) frame (enclosure) installed in its designated rack position, and before powering up the unit, verify that each card is securely seated in its slot, and leave the frame door open so that you can monitor all the card's LEDs.

Note: For more information on the card's LEDs, see [Card Interfaces](#), on page 28.

- 2 Power up the frame.

The Kaleido-MX 4K starts up. The startup sequence takes approximately four minutes, during which time every card's status LED is blinking orange. See [Kaleido-MX 4K Input Card Interface](#), on page 28 and [KMX-3901-OUT Output Card Interface](#), on page 30.

Once the startup has completed, the status LEDs on the *output cards* should be red (steady) because the cards are not connected to the network yet. See [Input card Status LED](#), on page 28 and [Output card Status LED](#), on page 30.

- 3 Connect the Kaleido-RCP2 and the Audio Bridge Terminal (if available) to a dedicated 100Base-T Ethernet switch (see [Cabling Diagram](#), on page 33). You can also connect a mouse and a keyboard to your Kaleido-RCP2.

Notes

- You may need to upgrade your Audio Bridge Terminal and 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*, and to the *Audio Bridge Terminal Guide to Installation and Operation* for instructions on how to determine the firmware level, and how to perform the upgrade for these devices. See [Related Documentation](#), on page 17.
- The Kaleido-MX 4K supports one ABT device. With a 3RU model, you can achieve redundancy by connecting the ABT to more than one input card, in which case the Kaleido-MX 4K uses the signal from the input card that is the farthest from the output cards (i.e., Input D, if you have a 64-input model, Input C if you have a 48-input model, or Input B if you have a model with 32-inputs).

- 4 Connect the multiviewer's outputs to your 4K UHD display, using the SDI-to-HDMI converter that shipped with your system, if needed. See [Multiviewer Mosaic Output to a 4K Display Input Cable Connections](#), on page 35.
- 5 Connect one or more video sources to the multiviewer's inputs (see [Cabling Diagram](#), on page 33).
- 6 Connect a reference source (if available) to one or more reference inputs:
 - Connect the house reference source to **REF IN 1**. See also [Genlocking the Multiviewer](#), on page 109.
The VDA-1002 (in slot 9) will distribute the reference to all input cards in the frame.
 - If you ordered a REF-1801 card, you can connect the house reference source to **REF IN 2** to make provision for redundancy.

Should the VDA-1002 become unavailable, the system will fall back to the reference signal distributed by the REF-1801 through the URS.

Note: A reference is optional but, if minimal processing delay is required for your monitoring purposes, then you must reference your system. However, if you must monitor 50 Hz input signals on 60 Hz displays (or vice-versa), then do not reference your system.

- 7 If you intend to use the GPI interface, see [GPI I/O Modules](#), on page 39 to make the necessary connections to GPI I/O 1 (and to GPI I/O 2, if your order includes a second GPI-1501 card).
- 8 Connect the controller card's ETHERNET 1 port to your Ethernet switch (see [Cabling Diagram](#), on page 33).

Note: The Kaleido-MX 4K does not support the controller card's second Ethernet port (ETHERNET 2).

- 9 Connect the output cards' ETH ports to your Ethernet switch.
You can now proceed with the networking setup (see [Networking Essentials](#), on page 50).

IMPORTANT

Make sure to connect your Densité controller and output cards to the same subnet, and that your Ethernet switch remains isolated from the rest of your network (consult your network administrator if necessary) until all required networking setup is complete.

4 Frame Control Panel Operation and IP Network Setup

Introduction

This chapter shows the multiviewer interfaces, explains the local operations that can be performed, and it explains how to implement IP network connectivity with the multiviewer.

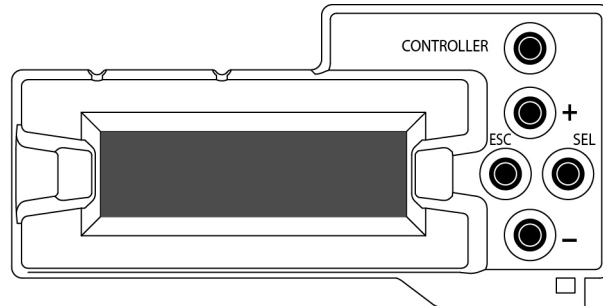
The Kaleido-MX 4K can be controlled in the following ways:

- In the housing frame, you can monitor card operating status of your Kaleido-MX 4K input and output cards by looking at the card-edge LEDs (see [Card Interfaces](#), on page 28), and use the Densité CPU-ETH2 local control panel and its buttons to navigate menus and adjust parameter values (see [Using the Densité Frame Control Panel](#), on page 44).
- The loading and management of layouts is handled via a client application, XEdit, accessed through a dedicated Ethernet port (refer to the Kaleido Software User's Manual; see [Related Documentation](#), on page 17).
- Grass Valley's iControl system can be used to access the card's operating parameters from a remote computer, using a convenient graphical user interface (see [Remote Control Using iControl](#), on page 99).
- A GPI interface allows remote layout selection.
- The RCP-200 advanced remote control panel, and the Kaleido-RCP2 control panel allow you to perform operations on the monitor wall, either by themselves or in association with an external keyboard and a mouse. Refer to the RCP-200, Kaleido-RCP2, and Kaleido Software documentation. See [Related Documentation](#), on page 17.

Using the Densité Frame Control Panel

All of the cards installed in a Densité frame are connected to the frame's controller card, which handles all interaction between the cards and the outside world. There are no operating controls located on the cards themselves. The controller supports remote operation via its Ethernet ports, and local operation using its integrated control panel.

The local control panel is fastened to the controller card, and consists of a display unit capable of displaying two lines of text, each 16 characters in length, and five buttons.



Densité CPU-ETH2 local control panel

The panel is assigned to operate any card in the frame by pressing the Select button *on the front edge of that card*. The Status LED on the selected card will then be blinking orange.

Press the CONTROLLER button on the control panel to select the controller card itself.

Navigating the Local Control Panel Menu

The Kaleido-MX 4K has operating parameters which may be adjusted locally at the controller card interface. Press the Select button *on the front edge of a Kaleido-MX 4K input or output card* (see [Card Interfaces](#), on page 28) to assign the local control panel to operate the card. The local control panel displays a menu that can be navigated using the four buttons located next to the display. The functionality of the buttons is as follows:

[+] and [-] Used for menu navigation and value modification.

SEL Gives access to the next menu level. When a parameter value is shown, pressing this button once enables modification of the value using the [+] and [-] buttons; pressing a second time confirms the new value.

ESC Cancels the effect of parameter value changes that have not been confirmed; pressing ESC causes the parameter to revert to its former value. Pressing ESC moves the user back up to the previous menu level. At the main menu, ESC does not exit the menu system. To exit, press the Select button on the front edge of the card being controlled.

If no controls are operated for 30 seconds, the controller reverts to its normal standby status, and the selected card's Status LED reverts to its normal operating mode. If a parameter was changed on the card but not submitted (SEL was not pressed) and the 30 second timeout occurs, the parameters will be confirmed as if the SEL button had been pressed.

Local Control Panel Menu Structure

Where applicable, default values are underlined.

Kaleido-MX 4K output card local menu

STATUS	{CARD STATUS}**	
{CARD VERSION}**		
RESOLUTION	HEAD1	{List of resolutions;* = current}**
	HEAD2	{List of resolutions;* = current}**
{LINK STATE}**		
FANS	{CPU FAN STATUS}**	
	{FPGA FAN STATUS}**	
NETWORK SETTINGS	FRAME IP ADDRESS EDIT	###.###.###.###
	NETMASK EDIT	###.###.###.###
	DEFAULT GW EDIT	###.###.###.###
	LINK MODE EDIT	<u>Auto-negotiate</u> 100Mbps half-duplex 100Mbps full-duplex
	OUTPUT A IP EDIT	###.###.###.###
	OUTPUT B IP EDIT	###.###.###.###
	{POSITION}**	
	{MAC ADDRESS}**	

* All output cards within a Kaleido-MX 4K frame must have their output heads configured with the same refresh rate. If your frame is referenced, then the heads' refresh rate must also match the reference signal's refresh rate.

** Parameters shown here in braces { } will display the actual value of the item and not the text shown above.

Kaleido-MX 4K input card local menu

STATUS	CARD STATUS	{CARD STATUS}**	
	INPUT STATUS	1 {FORMAT}**	
		2 {FORMAT}**	
		3 {FORMAT}**	
		:	
		16 {FORMAT}**	
CONFIG***	4K UHD PRESCALER	ENABLE	
		<u>DISABLE</u>	
	SFP CONFIG	SFP OUT 1	<u>ON</u>
			OFF
		SFP OUT 2	<u>ON</u>
			OFF
		SFP OUT 3	<u>ON</u>
			OFF
		SFP OUT 4	<u>ON</u>
			OFF
FACTORY DEFAULT	RESTORE		
{CARD VERSION}**			

** Parameters shown here in braces {} will display the actual value of the item and not the text shown above.
 *** The Kaleido-MX 4K does not support converting an input module into a 4K UHD prescaler. The SFP ports are not yet supported.

Enabling the Frame's Automatic Restore Feature

To enable the CPU-ETH2 automatic restore feature

- 1 On the Densité frame's local control panel, press the CONTROLLER button. See [Using the Densité Frame Control Panel](#), on page 44.
- 2 Press the [-] button repeatedly until RESTORE POINTS appears on the display, and then press the SEL button.
- 3 Press the [-] button repeatedly until DEFAULT ACTION appears on the display, and then press the SEL button.
 - If the control panel's display shows UPDATE SETTINGS, then the automatic restore feature is already enabled.
 - If the control panel's display shows KEEP SETTINGS, navigate to UPDATE SETTINGS by pressing the [-] button, and then press the SEL button to apply your change.
- 4 Press the CONTROLLER button to exit the controller's menu.

Disabling the Frame's Automatic Restore Feature

To disable the CPU-ETH2 automatic restore feature

- 1 On the Densité frame's local control panel, press the CONTROLLER button. See [Using the Densité Frame Control Panel](#), on page 44.
- 2 Press the [-] button repeatedly until RESTORE POINTS appears on the display, and then press the SEL button.
- 3 Press the [-] button repeatedly until DEFAULT ACTION appears on the display, and then press the SEL button.
 - If the control panel's display shows KEEP SETTINGS, then the automatic restore feature is already disabled.
 - If the control panel's display shows UPDATE SETTINGS, navigate to KEEP SETTINGS by pressing the [+] button, and then press the SEL button to apply your change.
- 4 Press the CONTROLLER button to exit the controller's menu.

Saving a Restore Point to the CPU-ETH2 for a Single Card

To save a restore point to the controller's non-volatile memory

- 1 On the Densité frame's local control panel, press the CONTROLLER button. See [Using the Densité Frame Control Panel](#), on page 44.
- 2 Press the [-] button repeatedly until RESTORE POINTS appears on the display, and then press the SEL button.
- 3 Press the [-] button repeatedly until SAVE A CARD appears on the display, and then press the SEL button.
- 4 Press the [-] button repeatedly until CARD # N—where N matches the slot number for the Kaleido-Modular card whose configuration you wish to save—appears on the display, and then press the SEL button.
- 5 Press the CONTROLLER button to exit the controller's menu.

Saving Restore Points to the CPU-ETH2 for All Cards

To save restore points to the controller's non-volatile memory, for all cards

- 1 On the Densité frame's local control panel, press the CONTROLLER button. See [Using the Densité Frame Control Panel](#), on page 44.
- 2 Press the [-] button repeatedly until RESTORE POINTS appears on the display, and then press the SEL button.
- 3 Press the [-] button repeatedly until SAVE ALL CARDS appears on the display, and then press the SEL button.
- 4 Press the CONTROLLER button to exit the controller's menu.

Changing the Mosaic Output Resolution

IMPORTANT

Within a Kaleido-MX 4K system, all output heads must be configured with the same refresh rate. If your system is referenced, then the heads' refresh rate must also match the reference signal's refresh rate. If you must monitor 50 Hz input signals on 60 Hz displays (or vice-versa), then do not reference your system.

To change the display resolution from the Densité controller's local control panel

- 1 Press the Select button on the front edge of the *output card* whose heads you wish to configure. See [KMX-3901-OUT Output Card Interface](#), on page 30.
The Status LED on the selected card flashes orange, and the associated control menu appears on the LCD display of the Densité frame's local control panel.
- 2 On the local control panel, press the [-] button twice, until RESOLUTION appears on the LCD display. See [Using the Densité Frame Control Panel](#) on page 44.
- 3 Press the SEL button.
HEAD 1 appears on the LCD display.
- 4 Press the SEL button again.
- 5 The current resolution for the monitor wall display that is connected to the multiviewer's output head 1 (i.e. through the MV OUT 1 connector) appears on the LCD display.
- 6 Press the [+] and [-] buttons, to navigate to a suitable output resolution for your monitor wall display.
- 7 Press SEL to apply the value shown on the LCD display.
The selected resolution is applied to the multiviewer's output head 1.
- 8 Press ESC to return to the previous level in the local control menu.
HEAD 1 appears again on the display.
- 9 If you wish to change the resolution on the second output head (if available), then press the [-] button.
HEAD 2 appears on the LCD display and you can repeat [step 4](#) to [step 8](#) above to verify or configure the resolution of the display that is connected to the multiviewer's output head 2 (i.e. through the MV OUT 2 connector).
- 10 When you are satisfied with the selected output resolution settings, press the Select button *on the front edge of the output card* to exit the control menu.

Notes

- If you do not press any button on the local control panel, the Densité CPU-ETH2 controller will revert to its normal standby mode, and the selected card's status LED will revert to its normal operating mode, after 30 seconds.
 - If you changed a parameter from the card's control menu, but have not applied your change (you did not press the SEL button on the local control panel), once the 30-second timeout has occurred, the parameters will be confirmed as if you had pressed the SEL button.
-

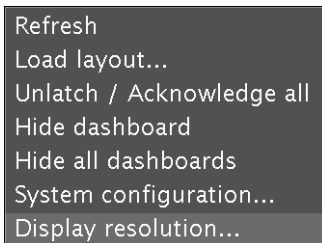
Enabling EDID Auto-Detection from the Monitor Wall

Notes

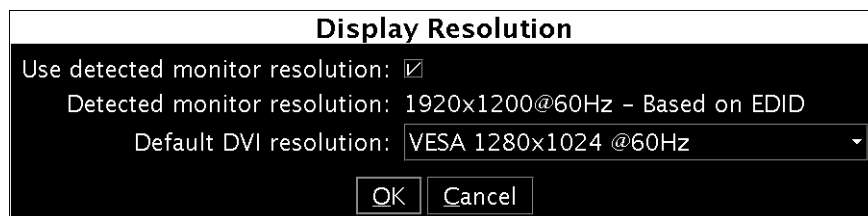
- The monitor EDID auto-detection feature is enabled by default in order to facilitate the initial setup of a Kaleido Software system. Setting an output head to a specific resolution, from a multiviewer service panel in iControl (if available), or from a Densité controller's local control panel disables the EDID auto-detection for this head (see See [Using the Densité Frame Control Panel](#) on page 44).

To enable EDID auto-detect for a display

- 1 Right-click the monitor wall background, and then click **Display Resolution** on the menu.



- 2 Select the **Use detected monitor resolution** check box.



- 3 Click **OK**.

Networking Essentials

The following network prerequisites must be met:

- Any multiviewer you wish to configure or access by using XEdit or XAdmin must be connected to an Ethernet switch.
- A client workstation must be connected to the LAN or Ethernet switch to access the multiviewer by using XAdmin or XEdit.
- The Ethernet switch must support 100 Mbps full-duplex connections.
- 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 100 Mbps, full-duplex.

Assigning an IP Address to Each Device in your System

Multiviewers and most peripheral devices that are part of a Kaleido-MX 4K system communicate through a TCP/IP network. Configuring your system's network parameters includes the following:

- Assigning an IP address, and specifying the appropriate network mask, gateway address, and a system name for each multiviewer. See [Setting the Multiviewer's IP addresses](#), on page 50.
- Assigning an IP address, and specifying the appropriate network mask, gateway address to the frame's controller. See [Setting a Densité Frame's Controller's IP Address](#), on page 53.
- Configuring the RCP-200, if available. See [Configuring the RCP-200](#), on page 111.
- Configuring the Kaleido-RCP2, if available. See [Configuring the Kaleido-RCP2](#), on page 115.
- Configuring the Audio Bridge Terminal (ABT), if available. See [Configuring an Audio Bridge Terminal](#), on page 118.

Setting the Multiviewer's IP addresses

For the Kaleido-MX 4K multiviewer to join a TCP/IP network, it must be configured with a system name, appropriate IP addresses, network mask, and gateway settings. You must also configure the Densité CPU-ETH2 controller's networking parameters, and any Kaleido-RCP2 and Audio Bridge Terminal units you may have ordered, and a client PC to communicate with the multiviewer and its peripheral devices (see [Configuring a PC to Configure an ABT's Network Settings](#), on page 120).

A Kaleido-MX 4K requires three IP addresses (one for each output card, one for the system). The Kaleido-MX 4K is shipped with the following default settings:

Kaleido-MX 4K default IP settings

System	IP address	192.168.3.30
	Network mask	255.255.255.0
	Gateway	0.0.0.0

Kaleido-MX 4K default IP settings (*continued*)

Output A	IP address	192.168.3.31
Output B	IP address	192.168.3.32

Note: The default gateway address is either 0.0.0.0, or the default system IP address. Both settings result in the same system behavior.

Kaleido-MX 4K frames are shipped with their CPU-ETH2 controller configured with the following default settings:

Densité CPU-ETH2 controller default IP settings

IP address 1	192.168.3.1
Network mask	255.255.255.0
Gateway	0.0.0.0
IP address 2	0.0.0.0
Network mask	0.0.0.0
Gateway	0.0.0.0

To set the system name and IP addresses for your Kaleido-MX 4K multiviewer

- 1 Configure the Densité CPU-ETH2 controller with an appropriate IP address (see [Setting a Densité Frame's Controller's IP Address](#), on page 53).
- 2 Verify that the Densité CPU-ETH2 controller's automatic restore feature is enabled (see [Enabling the Frame's Automatic Restore Feature](#), on page 46).

Note: For the card hot swap feature to function properly, the CPU-ETH2 automatic restore feature must be activated.

- 3 Configure your output cards' networking parameters, by replacing the system IP address, network mask, default gateway, and both output cards' IP addresses as appropriate. See [Configuring the Network Settings for a Kaleido-MX 4K \(3RU\)](#) on page 55.

The *system* IP address will be your system's virtual IP address. This is the address you will use to access your system from XEdit and XAdmin, for example.

- 4 Configure the Kaleido-RCP2, and Audio Bridge Terminal units you have connected to your system, if any. See [Configuring the Kaleido-RCP2](#) on page 115, and [Configuring an Audio Bridge Terminal](#), on page 118.
- 5 Complete your Kaleido-MX 4K system configuration by changing the system name, if desired. See [Setting the System Name](#) on page 105.

Note: 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).

You are now ready to open XAdmin and XEdit, from a client PC, and verify your system communication status (see [Multiviewer Model Representation in XEdit and XAdmin](#), on page 63, and [System Verification](#), on page 125).

Setting a Densité Frame's Controller's IP Address

To set the Densité controller's IP address

- 1 On the Kaleido-MX 4K frame's local control panel, press the CONTROLLER button. See [Using the Densité Frame Control Panel](#), on page 44.
- 2 Press the [-] button repeatedly until ETH1 OPTIONS appears on the display, and then press the SEL button.
- 3 Press the [-] button repeatedly until IP ADDRESS appears on the display.
- 4 Press the SEL button.
The current value appears on the display.
 - Press the [+] and [-] buttons, to change the digit at the current input position.
 - Press SEL to move one position to the right.
 - Press ESC to move one position to the left.
- 5 When the display shows the desired value, press SEL repeatedly until you reach the last position (if needed), and then press SEL once more to save your changes and return to the previous menu level.

Note: Pressing ESC when the input focus is in the first position returns to the previous menu level. Pressing SEL when the input focus is in the last position saves the changes and returns to the previous menu level.

IP ADDRESS appears on the control panel's display.

- 6 Press the [-] button.
NETWORK MASK appears on the control panel's display.
- 7 Repeat [step 4](#) and [step 5](#) to configure the netmask.
- 8 Once you have set the network mask, press the [-] button again.
GATEWAY appears on the control panel's display.
- 9 Repeat [step 4](#) and [step 5](#) to configure the gateway.
- 10 Once you have set the gateway, press the CONTROLLER button to exit the controller's menu.

The Densité controller restarts.

IMPORTANT

Make sure the controller's internal clock is set to the correct date and time.

To set the multiviewer's date and time, see [Setting the Multiviewer's Time and Date](#), on page 54.

- 11 Connect the controller card's ETH 1 port to your management network (see [Cabling Diagram](#), on page 33).

Notes

- To avoid IP-address conflicts, you should wait until you have configured the appropriate network settings for your KMX-3901 output cards before connecting the output cards' ETH ports to the management network.
-

Setting the Multiviewer's Time and Date

The multiviewer receives date and time information from the Densité CPU-ETH2 controller upon startup. The date/time or NTP settings for this multiviewer cannot be configured in XAdmin. Make sure the controller's internal clock is correctly set. The clock settings will persist for 10 days after a power loss. Should you need to change the time on a Densité CPU-ETH2 controller, then make sure to restart all multiviewers located in the same housing frame as the controller card.

Once you have set the Densité CPU-ETH2 controller's IP address, you can access the Densité CPU-ETH2 controller's web interface through the network to set the frame's parameters such as the multiviewer's time and date. You can obtain the Densité CPU-ETH2 controller's IP address through the:

- frame's local control panel. See [Setting a Densité Frame's Controller's IP Address](#), on page 53.
- XAdmin web interface, found under *System Configuration, Housing frame*. See [Configuring a Multiviewer's IP Settings with XAdmin](#), on page 96.

The multiviewer uses an internal clock to keep time. A network timeserver can optionally be used to keep the multiviewer's clock synchronized to a network time source using the Network Time Protocol (NTP). Using NTP synchronization eliminates the long term drift that affects the internal clock and ensures that all networked equipment operate with respect to the same network time reference.

To set the time and date

- 1 With your PC, open a Web browser window and type the Densité CPU-ETH2 controller's IP address in the address bar.

The Densité CPU-ETH2 controller's home page appears.

- 2 Click *Time/Date* or *Date and Time* under *Setup* in the left hand menu tree.

The time and date configuration parameters are shown.

SETUP | Time/Date

Current Date/Time: **Wed Sep 27 18:23:36 UTC 2017**

NTP Synchronization:

Enabled

NTP IP Address #1:	10	.36	.40	.10
NTP IP Address #2:	10	.36	.140	.10
NTP IP Address #3:	0	.0	.0	.0

NTP Refresh Rate: 4 min

Disabled

New Time: 18 : 23 : 36 UTC

New Date: 27 - Sep - 2017

Click the Apply button to save your changes.

- 3 Enable *NTP Synchronization*, then set the IP address of one or more time servers and set how often the network time server is to update the internal clock (*NTP Refresh Rate*). Otherwise disable *NTP Synchronization* and set the current time and date.
- 4 Click *Apply*.

Configuring the Network Settings for a Kaleido-MX 4K (3RU)

To configure the network settings for a Kaleido-MX 4K (3RU)

- 1 Press the Select button on the front edge of one of your system's *output* cards. See [KMX-3901-OUT Output Card Interface](#), on page 30.
The Status LED on the selected card flashes orange, and the associated control menu appears on the display of the Densité frame's local control panel.
- 2 On the local control panel, press the [-] button repeatedly until NETWORK SETTINGS appears on the display, and then press the SEL button. See [Using the Densité Frame Control Panel](#), on page 44.
FRAME IP ADDRESS EDIT appears on the display.
- 3 Press the SEL button again.
The current value appears on the display.
 - Press the [+] and [-] buttons, to change the digit at the current input position.
 - Press SEL to move one position to the right.
 - Press ESC to move one position to the left.
- 4 When the display shows the desired value, press SEL repeatedly until you reach the last position (if needed), and then press SEL once more to save your changes and return to the previous menu level.

Note: Pressing ESC when the input focus is in the first position returns to the previous menu level. Pressing SEL when the input focus is in the last position saves the changes and returns to the previous menu level.

FRAME IP ADDRESS EDIT appears on the control panel's display.

- 5 Press the [-] button.
NETMASK EDIT appears on the control panel's display.
- 6 Repeat [step 3](#) and [step 4](#) to configure the netmask.
- 7 Once you have set the network mask and navigated back to the previous menu level, press the [-] button again.
DEFAULT GW EDIT appears on the control panel's display.
- 8 Repeat [step 3](#) and [step 4](#) to configure the gateway.
- 9 Once you have configured the gateway and navigated back to the previous menu level, press the [-] button again.
LINK MODE EDIT appears on the control panel's display.
- 10 Press the SEL button.
- 11 The current link mode ("Auto-negotiate") appears on the LCD display.

Note: On all Kaleido multiviewers, the network adapters are set to auto-negotiate. By default, the connection speed and duplex mode will be set automatically based on the corresponding port settings on the switch.

- 12 If your network's mode of operation requires you to change the link mode, press the [+] and [-] buttons to navigate to the suitable option (100 Mbps half-duplex, or 100Mbps full-duplex), and then press SEL to apply the value shown on the display.

- The selected link mode is applied.
- 13 Press ESC to return to the previous level in the local control menu.
LINK MODE EDIT appears again on the LCD display.
 - 14 Press the [-] button.
OUTPUT A IP EDIT appears on the control panel's display.
 - 15 Repeat [step 3](#) and [step 4](#) to configure the IP address for Output A.
 - 16 Once you have set the IP address for Output A, and navigated back to the previous menu level, press the [-] button again.
OUTPUT B IP EDIT appears on the control panel's display.
 - 17 Repeat [step 3](#) and [step 4](#) to configure the IP address for Output B.
 - 18 Once you have set the IP address for Output B, press the Select button *on the front edge of the output card* to exit the control menu.

Notes

- If you do not press any button on the Densité frame local control panel, the Densité controller will revert to its normal standby mode, and the selected card's Status LED will revert to its normal operating mode, after 30 seconds.
 - If you changed a parameter from the card's control menu, but have not applied your change (you did not press the SEL button on the local control panel), once the 30-second timeout has occurred, the parameters will be confirmed as if you had pressed the SEL button.
-

After a moment, both output cards restart. The startup sequence takes approximately four minutes, during which time the cards' Status LEDs are first red and then blinking orange.

- 19 Once the startup has completed, check both cards' Status LEDs again, and make sure that they do not indicate an error condition.

Green	Normal
Blinking orange	Booting (or the card is selected for local control)
Red	Firmware initialization in progress / no Ethernet / SD card error
Blinking red	Fan failure / no rear / duplicate IP address

Should a Status LED indicate an error condition, see [Card Interfaces](#), on page 28 to find out what the other LEDs might be indicating.

- 20 Verify that both cards' and the system's new IP addresses are effective, by referring to [Verifying the Multiviewer's IP Addresses and Application Version](#), on page 129.

Network Considerations

This multiviewer generates a low to moderate amount of client-to-server data traffic, and therefore has a minimal bandwidth impact on a network.

TCP/UDP Port Usage

The various Kaleido-MX 4K 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
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
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 ^a 49152–65535 ^b	Java RMI	TCP	Remote Method Invocation (client/server communication). Dynamic Allocation of ports. Required for communication between client and Application Server.

a. For Windows XP and earlier

b. 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	
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
7572		UDP	On multicast 230.8.8.8 for "keep-alive" (heartbeat)
7571		UDP	For "keep-alive" (heartbeat)
5100		Densité	TCP

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.
8851	Alpermann+Velte	TCP	Used to obtain information from Plura (Alpermann+Velte) Studio Production Timer (SPT) systems.
5100	GPI-1501	TCP	Used to obtain information from GPI-1501 General Purpose Interface I/O modules. ^a
8910 ^b	TSL (network)	TCP	Used to obtain information from TSL devices that use the TSL UMD version 5.0 protocol.

a. See also: [From multiviewer to multiviewer](#), on page 58.

b. 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 the multiviewer's internal router via the SAM (Snell/Pro-Bel) SW-P-02 protocol
4381	TCP	Used to control the multiviewer's internal router via the Nevion (Network) protocol
5194	TCP	Used to control the multiviewer's internal router via the NVEP Router (NP0016) protocol.
14000	TCP	Used to control the multiviewer's internal router via the SAM (Snell/Pro-Bel) SW-P-08 protocol

Router drivers also use default ports:

Driver	Port	Transport	Notes
ETL	4000	TCP	
GVG 7000 Native	12345	TCP	
NVEP NV9000 (NP0017)	9193	TCP	
VikinX Modular	4381	TCP	
Quintech	9100	TCP	
Sony HKSPC	12345	TCP	GVGNP Emulator
Utah RCP-3	5001	TCP	SC-4 Ethernet
SAM (Snell/Pro-Bel) SW-P-02	2000	TCP	
SAM (Snell/Pro-Bel) SW-P-08	14000	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; see [Related Documentation](#), on page 17).
- Changing the system name or IP address of a KMV-3901/3911 multiviewer associated with a cluster, by using the card's control panel on the Densité housing frame, or by using the KMV-3901/3911 control panel in iControl, is not supported.
- 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

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 by XAdmin and XEdit to represent this multiviewer model is **KMX-3901**.

XEdit Installation

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 64.
- 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 69.

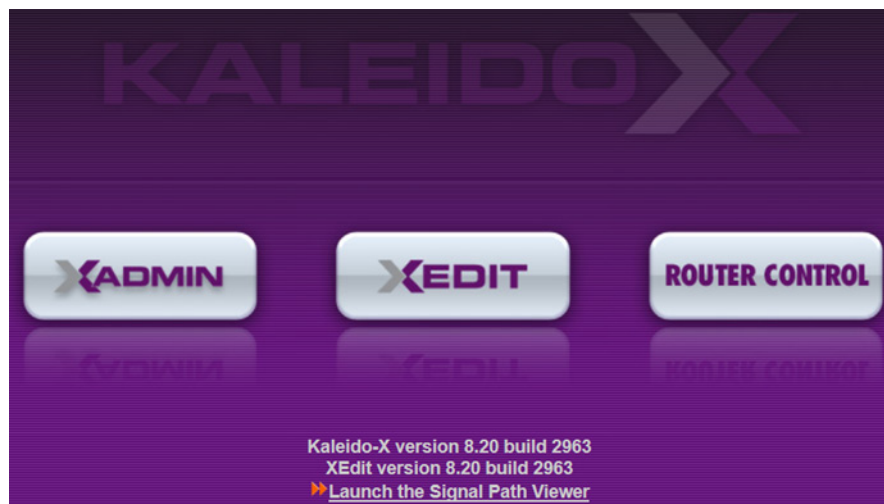
- Signal Path Viewer opens as a standalone panel, updated in real time, showing assignment information between router sources and multiviewer inputs. Signal Path Viewer is not used with Kaleido-IP. See [Installing Signal Path Viewer](#) on page 72.

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-windows32-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 may safely dismiss.

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

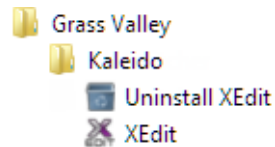
More security warnings or prompts may appear, which you may safely dismiss or accept.

A window appears, showing the download and installation progress.

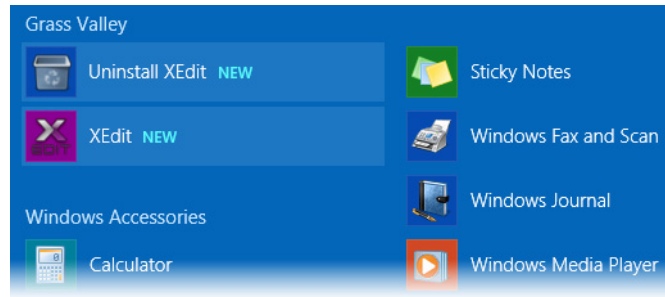


At the end of the installation process:

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



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



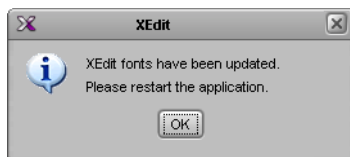
Once the installation has completed, the XEdit startup screen appears.



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

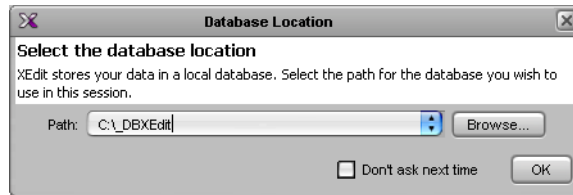
- Click **Allow access** to unblock the application.

If XEdit cannot find all of the fonts it needs already on your PC or laptop, 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.

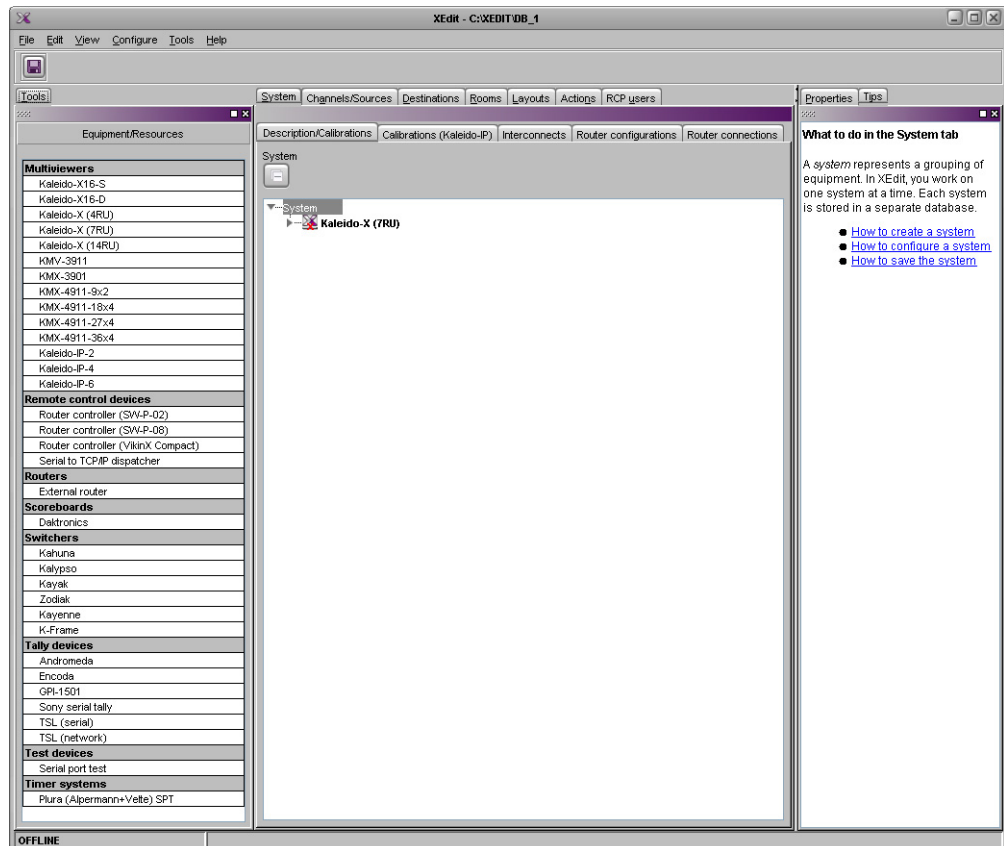



- Click **OK** to continue, and then open XEdit again, by using the shortcut on your desktop, in your Apps view (Windows 8.1) or Start screen (Windows 8), or from the Start menu (Windows 7, Windows 10).

- 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 or laptop, and can be launched from the  shortcut that was added to your desktop, Apps view, or Start screen (see [page 65](#)), 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

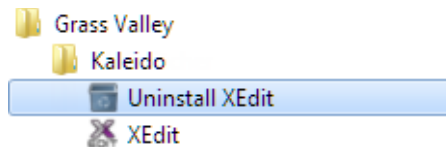
With recent versions of XEdit, an uninstall program is available from the Windows Start menu. See [Uninstalling XEdit \(Dynamic Version 7.20 or Later\)](#), on page 68.

If you have been using XEdit versions *earlier* than 7.20 you may want to uninstall them, by clearing the Java cache, on your PC or laptop. See [Uninstalling XEdit \(Version 7.11 or Earlier\)](#) on page 68.

Uninstalling XEdit (Dynamic Version 7.20 or Later)

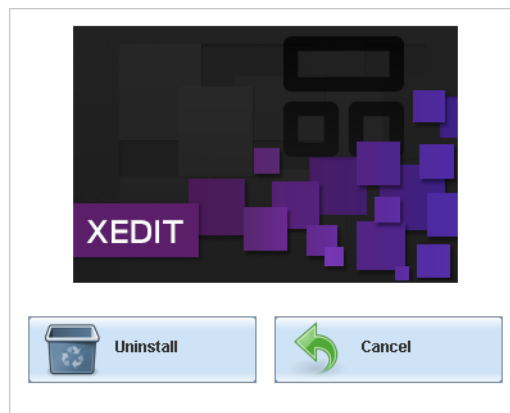
To uninstall XEdit (dynamic version 7.20 or later)

- 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** (or **Miranda Technologies²**) folder, and then expand the **Kaleido** 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.

Uninstalling XEdit (Version 7.11 or Earlier)

To uninstall XEdit (version 7.11 or earlier)

- 1 Close all Java applications you may have open.

2. Launcher icons for versions 7.20–7.52 would have been installed in the Miranda Technologies folder.

- 2 On the Start menu, click **Control Panels**, and then click **Java (32-bit)**.
Java Control Panel opens.
- 3 In the **General** tab, click **Settings**.
- 4 In **Temporary Files Settings**, click **Delete Files**.
- 5 In **Delete Files and Applications** select all the check boxes, and then click **OK**.
- 6 Close **Temporary Files Settings**, and then **Java Control Panel**, by clicking their **OK** button.


Installing Router Control

To install Router Control from your multiviewer's home page

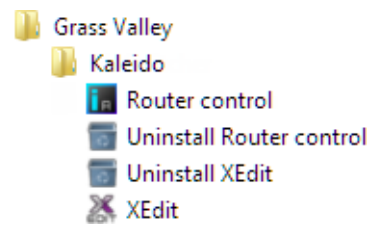
- 1 From a workstation on the same subnet as the multiviewer, open a Web browser window and type the multiviewer's IP address in the address bar.
The multiviewer's home page appears.
- 2 Click the **Router Control** button.
The browser prompts you to save an executable file to your hard drive (Kaleido__RouterControl-windows32-online.exe³). 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 where 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:

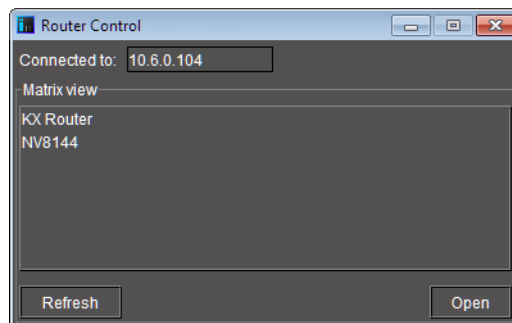
- If you have Windows 7, or Windows 10, shortcuts () are added to your desktop and to the Start menu (under **All Programs**).

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



- 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).

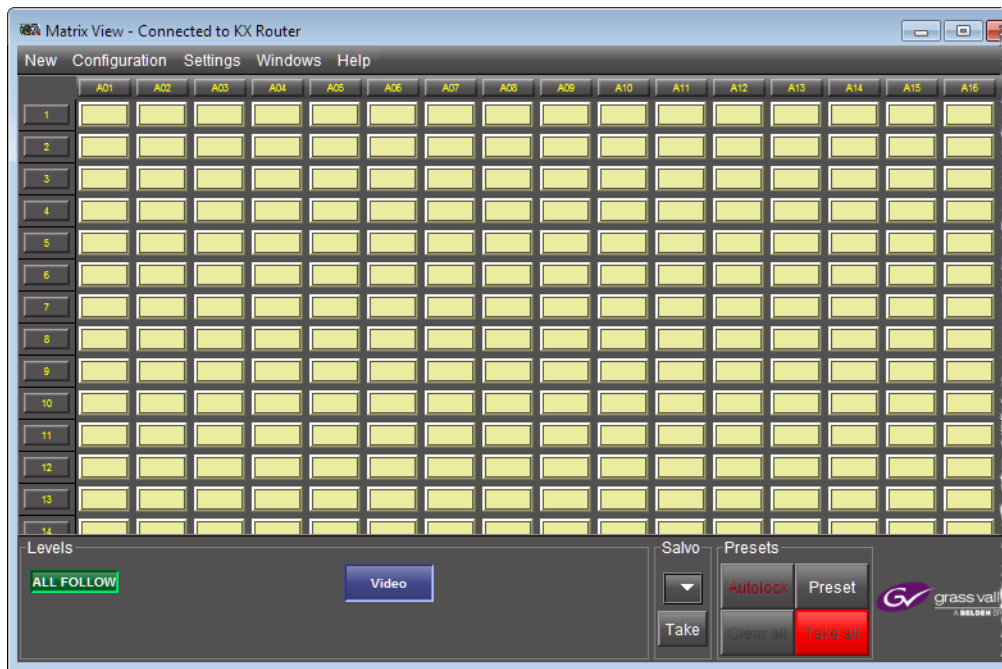
Once the installation has completed, the Router Control main application window appears. The application automatically connects to your multiviewer. The main window lists all logical routers configured within your multiviewer system, in addition to the *KX Router* logical router.



- 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.

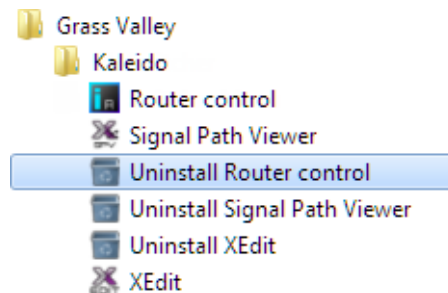
Notes

- Once it has been installed from the multiviewer, Router Control remains on your PC or laptop, and can be launched from the  shortcut that was added to your desktop, Apps view, Start screen (see [page 69](#)), 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.
- 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).

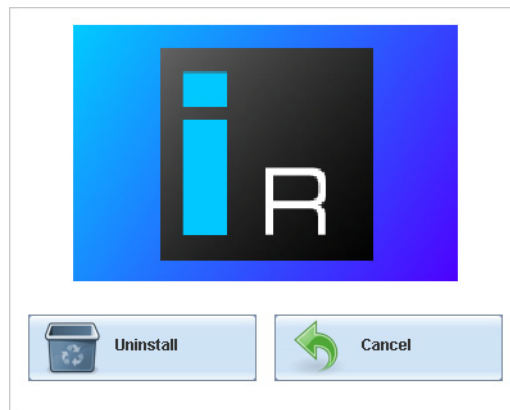
Uninstalling Router Control

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, and then expand the Kaleido 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.

Installing Signal Path Viewer

To install Signal Path Viewer 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 **Launch the Signal Path Viewer**.
The browser prompts you to save an executable file to your hard drive (Kaleido__SignalPathViewer-windows32-online.exe⁴). This file is an online installer, which will download Signal Path Viewer from your multiviewer, and install it.

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 where you saved the installer file and open it.

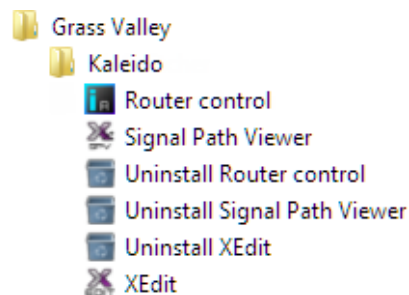
More security warnings or prompts may appear, which you may safely dismiss or accept.

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 **All Programs**).

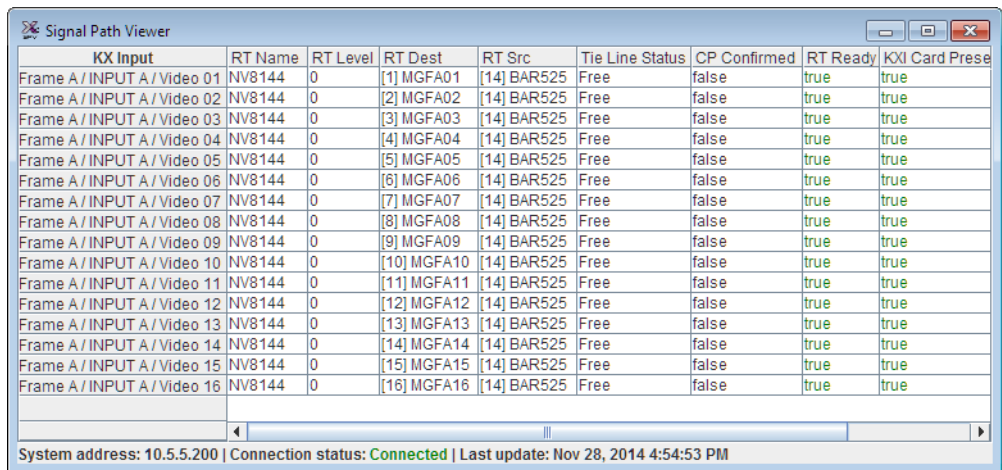


- If you have Windows 8.1, or Windows 8, Signal Path Viewer will appear on your desktop, in the Apps view with all the other installed applications on your PC (Windows 8.1), or in your Start screen (Windows 8).

Once the installation has completed, the Signal Path Viewer panel appears. Depending on your Windows Firewall settings, a security alert may also appear.

- Click **Allow access** to unblock the application.


The application automatically connects to your multiviewer.



The screenshot shows the Signal Path Viewer application window. The title bar reads "Signal Path Viewer". The main area contains a table with the following columns: KX Input, RT Name, RT Level, RT Dest, RT Src, Tie Line Status, CP Confirmed, RT Ready, and KXI Card Pres. The table lists 16 video inputs, each with a corresponding RT Name (NV8144), RT Level (0), RT Dest (MGFA01-16), RT Src (BAR525), Tie Line Status (Free), CP Confirmed (false), RT Ready (true), and KXI Card Pres (true). At the bottom of the window, a status bar displays: "System address: 10.5.5.200 | Connection status: Connected | Last update: Nov 28, 2014 4:54:53 PM".

KX Input	RT Name	RT Level	RT Dest	RT Src	Tie Line Status	CP Confirmed	RT Ready	KXI Card Pres
Frame A / INPUT A / Video 01	NV8144	0	[1] MGFA01	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 02	NV8144	0	[2] MGFA02	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 03	NV8144	0	[3] MGFA03	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 04	NV8144	0	[4] MGFA04	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 05	NV8144	0	[5] MGFA05	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 06	NV8144	0	[6] MGFA06	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 07	NV8144	0	[7] MGFA07	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 08	NV8144	0	[8] MGFA08	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 09	NV8144	0	[9] MGFA09	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 10	NV8144	0	[10] MGFA10	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 11	NV8144	0	[11] MGFA11	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 12	NV8144	0	[12] MGFA12	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 13	NV8144	0	[13] MGFA13	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 14	NV8144	0	[14] MGFA14	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 15	NV8144	0	[15] MGFA15	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 16	NV8144	0	[16] MGFA16	[14] BAR525	Free	false	true	true

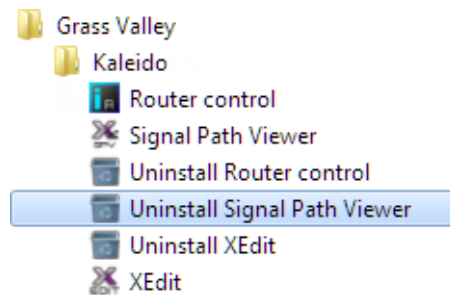
Notes

- Signal Path Viewer is not used with Kaleido-IP.
 - Once it has been installed from the multiviewer, Signal Path Viewer remains on your PC or laptop, and can be launched from the  shortcut that was added to your desktop, Apps view, Start screen (see [page 73](#)), or from the Start menu. Whenever you install a new version of the Kaleido Software on the multiviewer, the next time you open Signal Path Viewer, your installed copy of the application will be automatically updated from the multiviewer.
 - Should you need Signal Path Viewer to connect to a different multiviewer, then you must install it again, from the other multiviewer's home page.
 - In the case of a Kaleido-X multiviewer, if you remove or re-install output cards, Signal Path Viewer may stop displaying real-time updates, in which case close the application and then open it again (see [Opening Signal Path Viewer](#) on page 93).
 - In the case of a KMX-4911 multiviewer, if you remove or re-install input/output card A, or input/output card B, Signal Path Viewer may stop displaying real-time updates, in which case close the application and then open it again.
-

Uninstalling Signal Path Viewer

To uninstall Signal Path Viewer

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



- If you have Windows 8.1, or Windows 8: Switch to the App view or your Start screen.

- 3 Click **Uninstall Signal Path Viewer**.

An uninstall screen appears.



- 4 Click **Uninstall**.

This removes Signal Path Viewer, including all shortcuts, and other elements that were installed with it, from your system.

Opening XAdmin

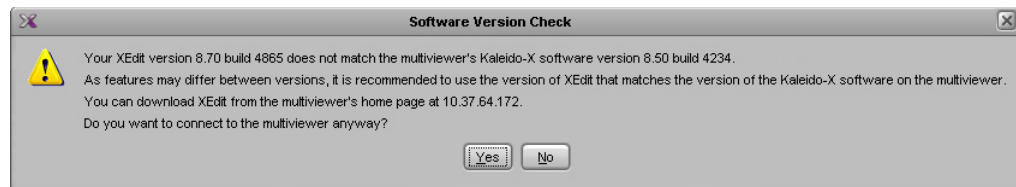
Connecting to a Multiviewer with a Different XEdit Version from your PC's Version

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.mp</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 68).
 - Install XEdit from the multiviewer (see [Installing XEdit from your Multiviewer's Home Page](#), on page 64).

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:

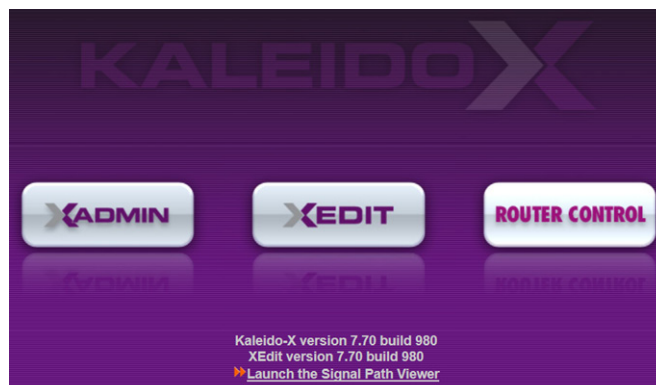
- from a **Web browser** (see [Opening XAdmin from a Browser](#) on page 77),
- from **XEdit** (see [Opening XAdmin from XEdit](#) on page 78),

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 80). Internet Explorer users may also need to enable compatibility view (see [Enabling the Compatibility View in Internet Explorer](#) on page 88).

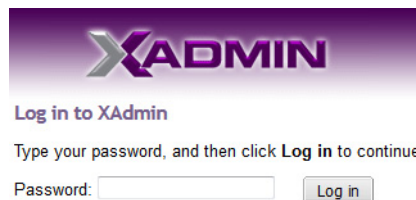
Opening XAdmin from a Browser

To open XAdmin from a browser

- 1 Open a Web browser window and enter the multiviewer's 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 80.
- 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 88.

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**.

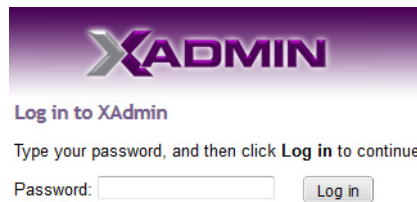
XEdit prompts you for the IP address of the multiviewer you want to access.



- 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 80.
- 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 88.

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.

Opening XAdmin from iControl or iControl Solo

Note: This section applies to the KMX-4911 multiviewer models only.

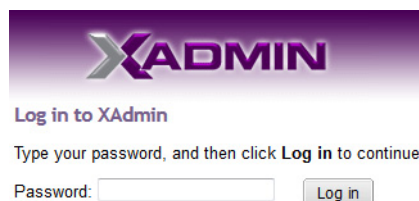
To open XAdmin from iControl or iControl Solo

- 1 Open iControl Solo (or iControl Navigator, if you have an iControl application server), and locate the control panel for the multiviewer you want to monitor, based on the slot number, and the GV Node frame's name (refer to the iControl Solo User Guide, or to the iControl User Guide, for more information; see [Related Documentation](#), on page 17).
- 2 Open the KMX-4911 control panel.

- 3 Click the **Input Status** button, in the control panel's navigation area.



- 4 In the **Input Status** tab, click **XAdmin status and options**.
Your default Web browser opens.
- 5 If you see a security warning, or a certificate error message, then see [Registering your Multiviewer's Security Credentials with your Browser](#), on page 80.
- 6 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.



- 7 **Internet Explorer users:** If a blank page appears, then see [Enabling the Compatibility View in Internet Explorer](#), on page 88.
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

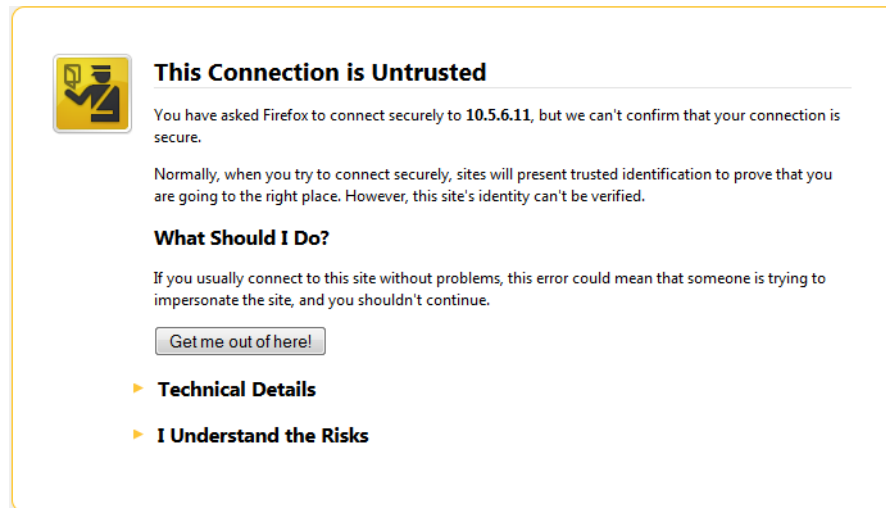
When you open your multiviewer's home page, or try to access XAdmin, your browser may report a certificate error (Internet Explorer), warn you about the site's security certificate (Chrome), or report an untrusted connection (Firefox). Follow the appropriate procedure below to register your multiviewer's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

- [Suppressing untrusted connection warning in Firefox](#), on page 80
- [Suppressing certificate error in Internet Explorer or Chrome](#), on page 81

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.

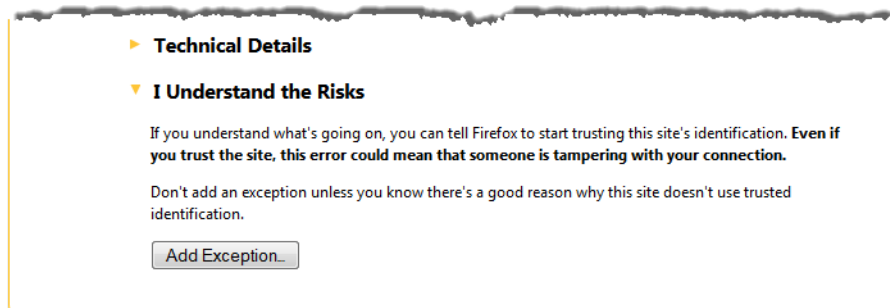


The screenshot shows a yellow warning dialog box with a shield icon containing a red 'X'. The title is "This Connection is Untrusted". The text reads: "You have asked Firefox to connect securely to 10.5.6.11, but we can't confirm that your connection is secure. Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified." Below this is a section titled "What Should I Do?" with the text: "If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue." There is a button labeled "Get me out of here!". At the bottom, there are two expandable options: "▶ Technical Details" and "▶ I Understand the Risks".

To register your multiviewer's security credentials with Firefox

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

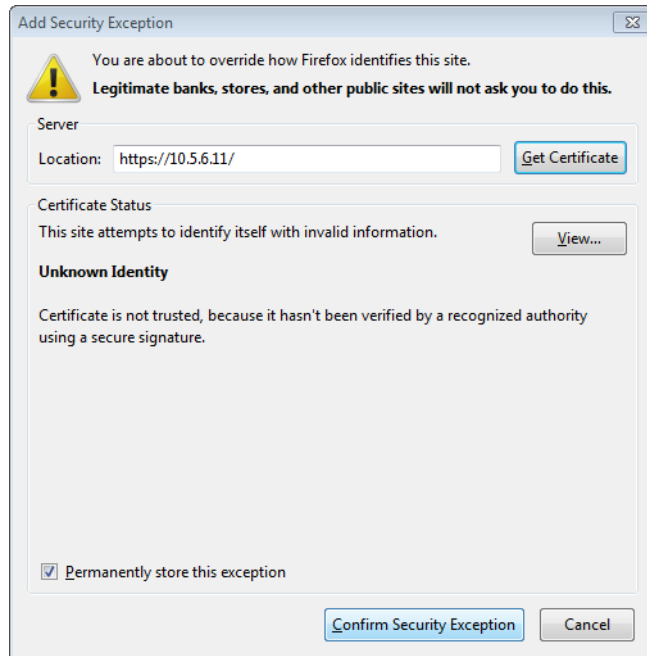
The message expands.



The screenshot shows the expanded version of the warning dialog. The "▶ I Understand the Risks" option is now expanded, showing a downward arrow. The text reads: "If you understand what's going on, you can tell Firefox to start trusting this site's identification. **Even if you trust the site, this error could mean that someone is tampering with your connection.** Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification." There is a button labeled "Add Exception...".

- 2 Click **Add Exception**.

3 In **Add Security Exception**, click **Confirm Security Exception**.



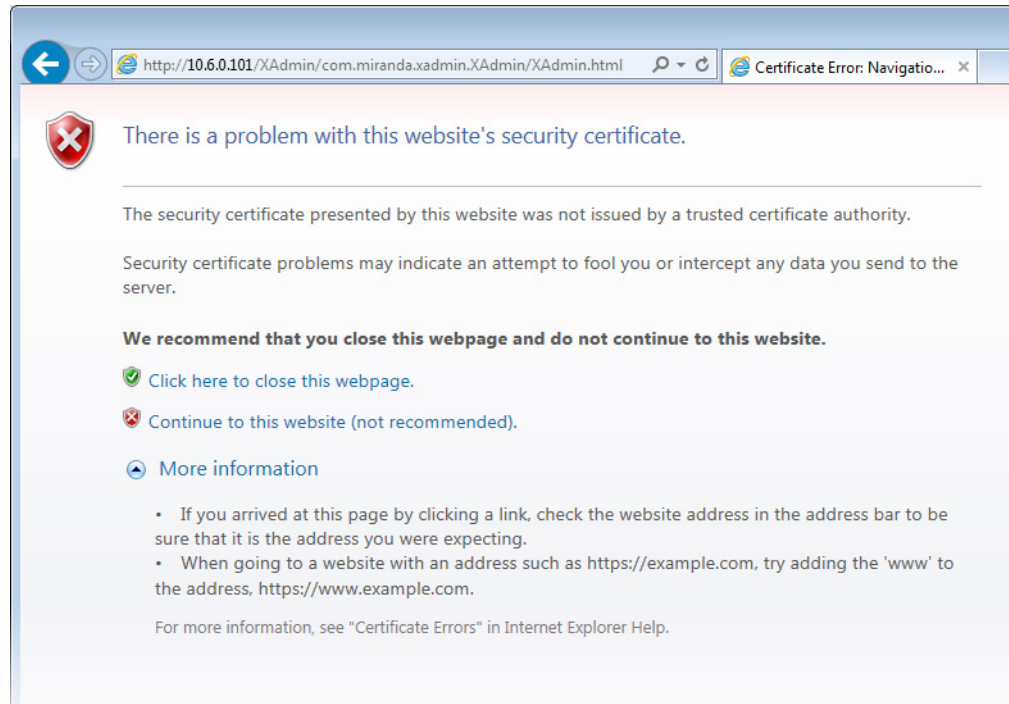
Your multiviewer's home page appears. You will now be able to access your multiviewer's client applications without seeing the warning. This will remain effective until the multiviewer's IP address is changed, in which case you will need follow the procedure again.

Suppressing certificate error in Internet Explorer or Chrome

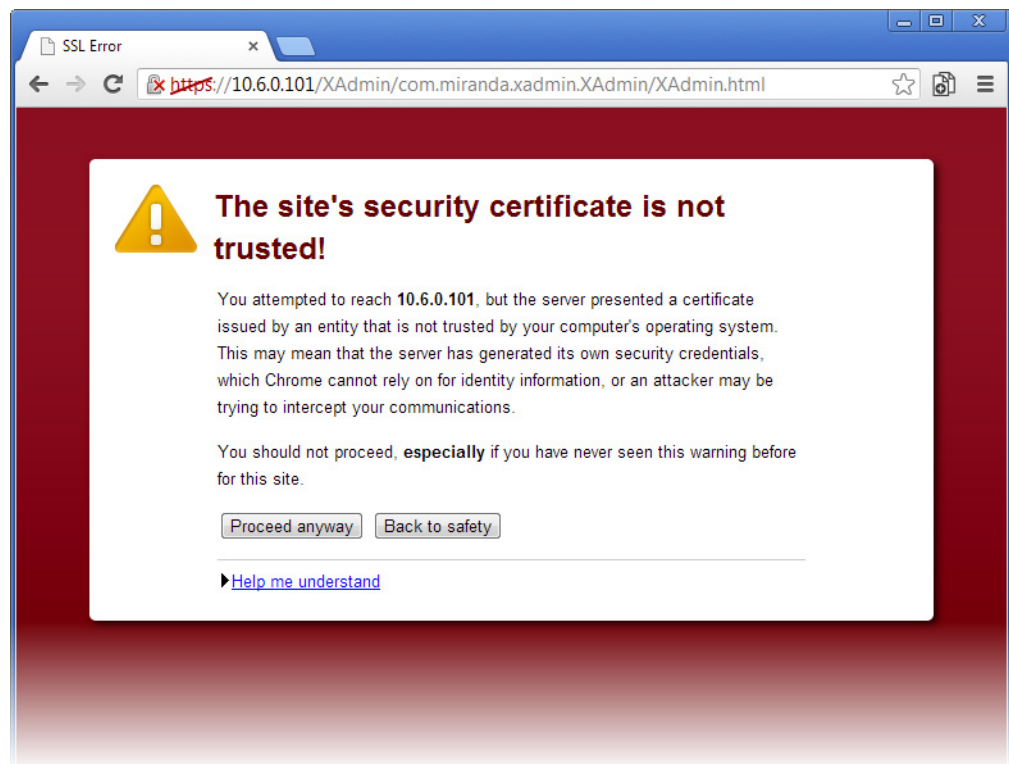
The first time you try to access XAdmin in Internet Explorer or Chrome, the browser may prompt you to confirm the multiviewer's security credentials.

System Configuration

Registering your Multiviewer's Security Credentials with your Browser



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

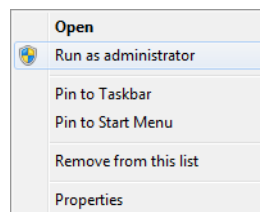
- 1 Click **Continue to this website (not recommended)**.

The address bar now indicates the certificate error.

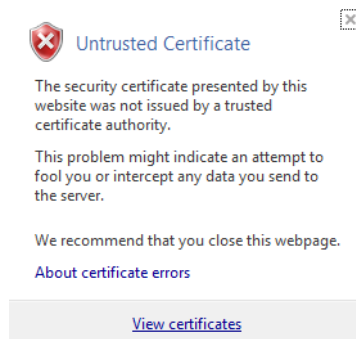


Special notes for Internet Explorer users

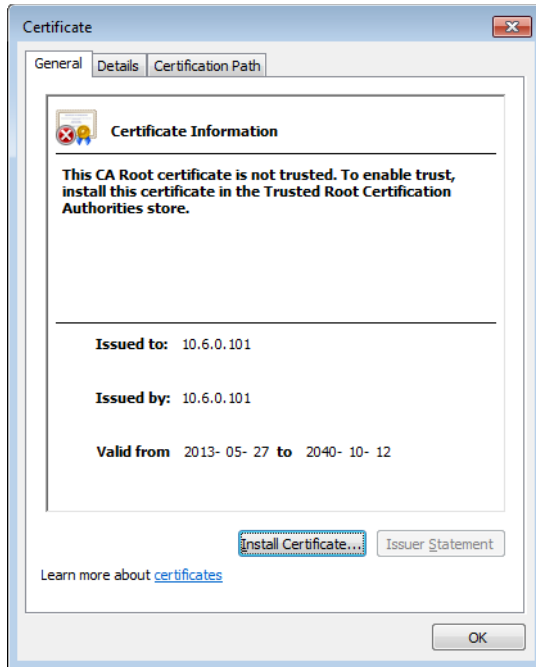
- If you see a blank page instead of XAdmin's Status and Options page, then see [Enabling the Compatibility View in Internet Explorer](#), on page 88.
- You must have administrator status to accept the certificate error. If your user account does not have administrator status, then close your browser 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**.



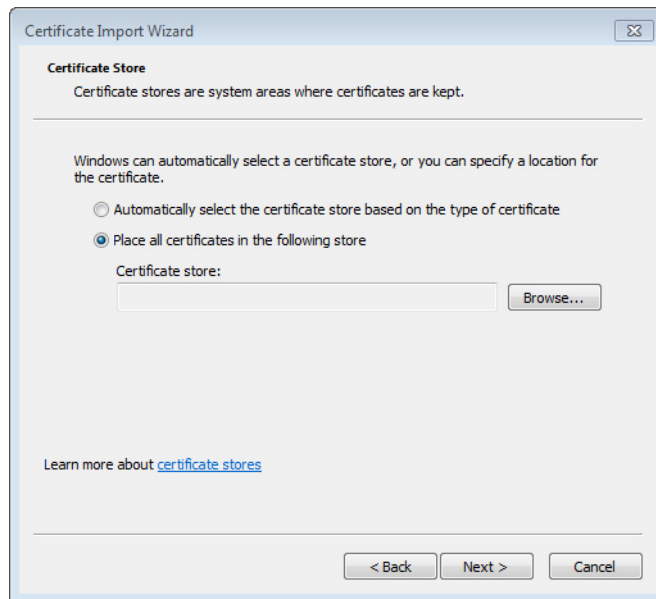
4 In **Certificate**, click **Install Certificate**.



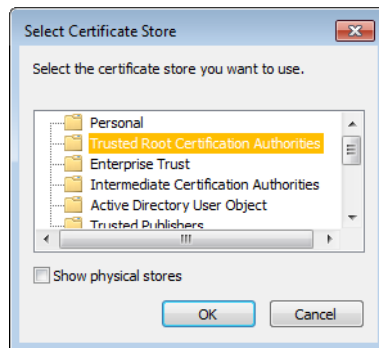
5 In **Certificate Import Wizard**, click **Next**.



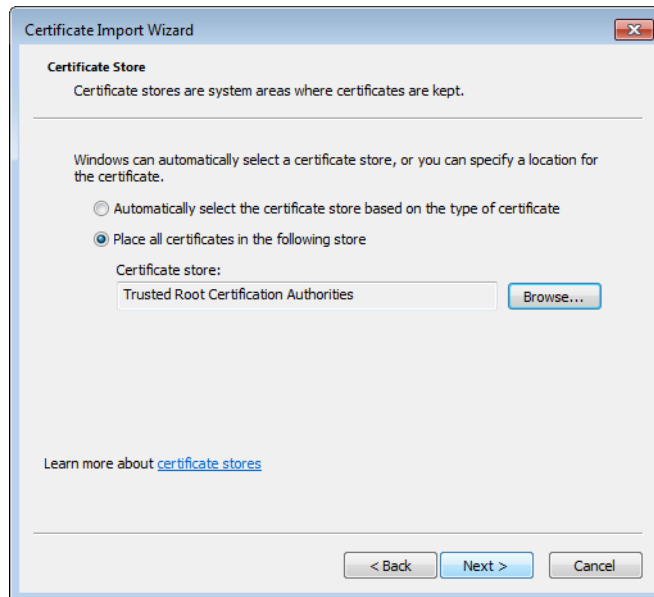
- 6 In **Certificate Import Wizard**, click **Place all certificates in the following store**, and then click **Browse**.



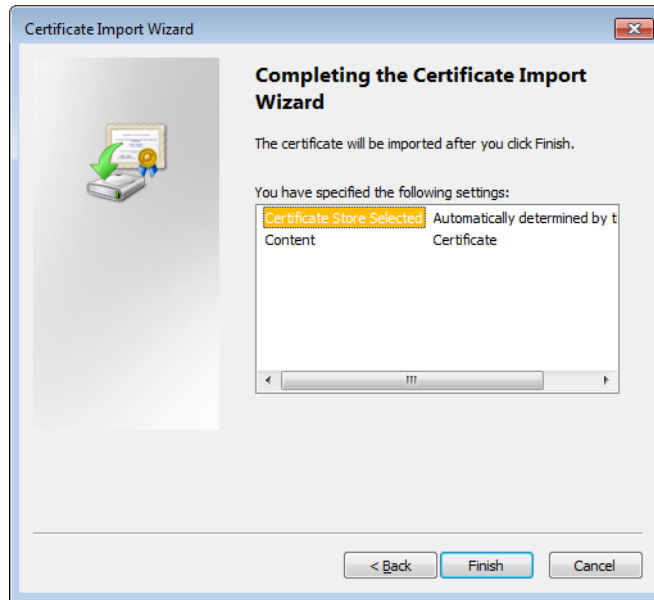
- 7 In **Select Certificate Store**, select **Trusted Root Certification Authorities**, and then click **OK**.



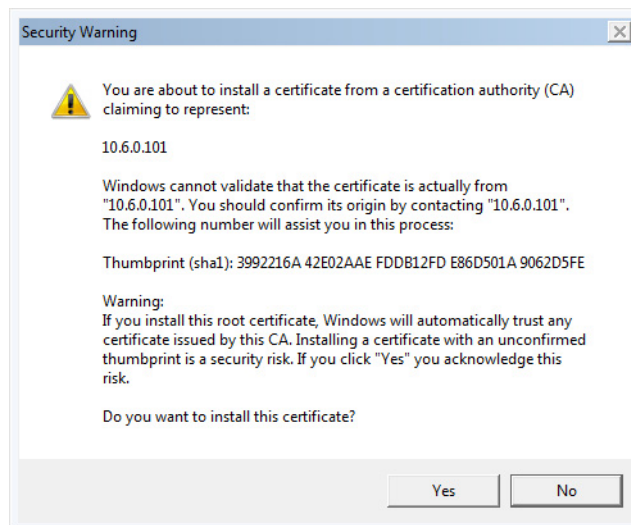
8 Back in **Certificate Import Wizard**, click **Next**.



9 Click **Finish**.

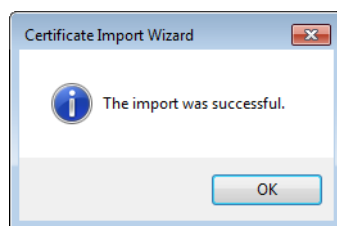


A security warning appears.



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.

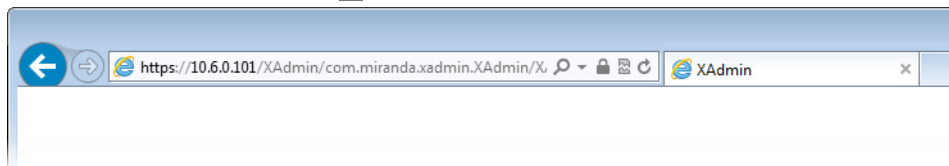
- 13 Close all Internet Explorer (and Chrome, if any) windows, and then open your browser again.
You should now be able to access XAdmin, from your multiviewer home page without ever seeing the security warning again, unless the multiviewer's IP address is changed, in which case you will want to repeat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

Enabling the Compatibility View in Internet Explorer

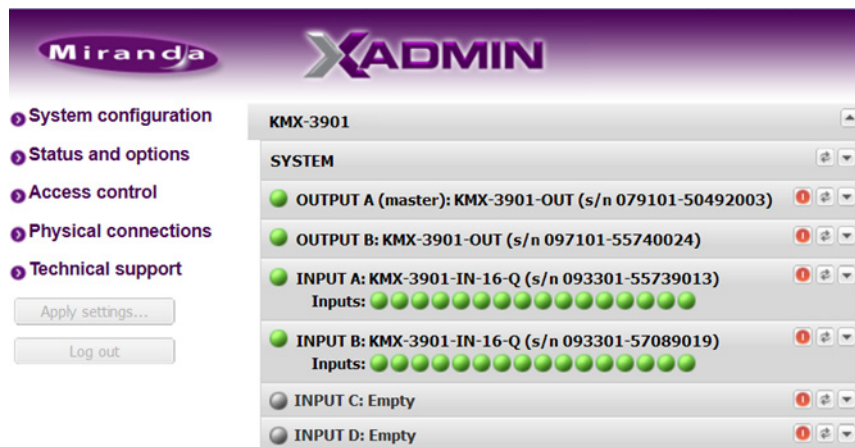
When you try to access XAdmin, from your multiviewer's home page, in Internet Explorer 8, 9, or 10, you may see a blank page instead of XAdmin's Status and Options page.⁵

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.

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 76.

⁵Should 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>

- 2 Click **Access control**, in the navigation area on the left side of the page.
The Access Control page appears.

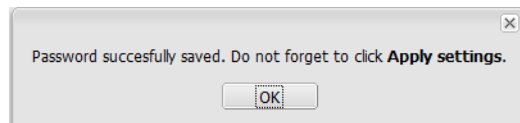


- 3 Type the password you want to enforce in both the **New password** and the **Confirm** boxes.

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

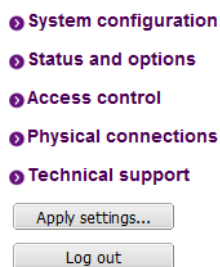
- 4 Click **Save**.

A confirmation message appears.



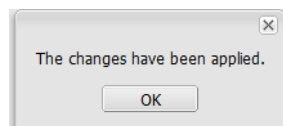
- 5 Click **OK** to close the message window.

The **Apply settings** button becomes available.



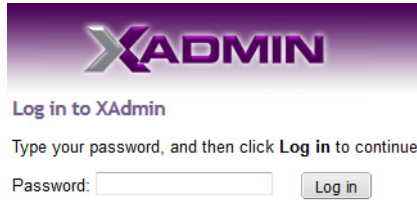
- 6 Click **Apply settings**.

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**.

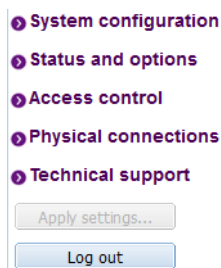
The Log in to XAdmin page appears. Other XAdmin sessions open against the same multiviewer are also redirected to the login page.



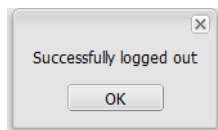
- 8 Type the password, and then click **Log in**.

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**.

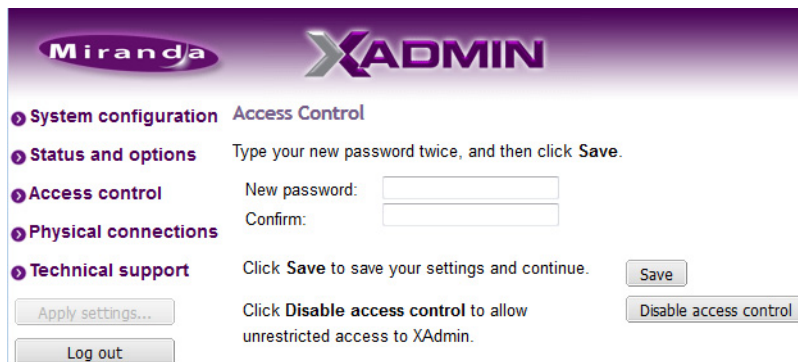
The login page appears. Only authorized users have access to XAdmin.

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 76.
- 2 Click **Access control**, in the navigation area on the left side of the page.

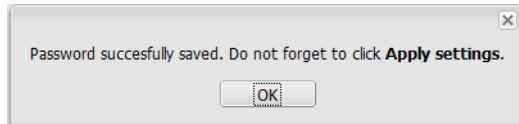
The Access Control page appears.



- 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.

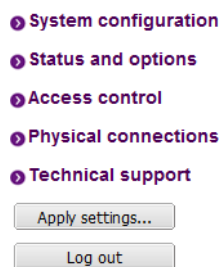
- 4 Click **Save**.

A confirmation message appears.



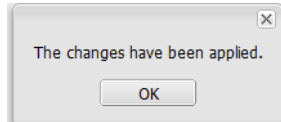
- 5 Click **OK** to close the message window.

The **Apply settings** button becomes available.



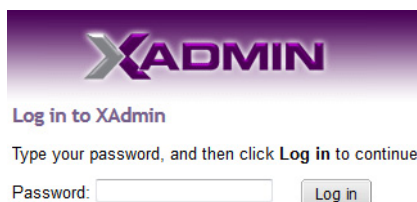
- 6 Click **Apply settings**.

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.

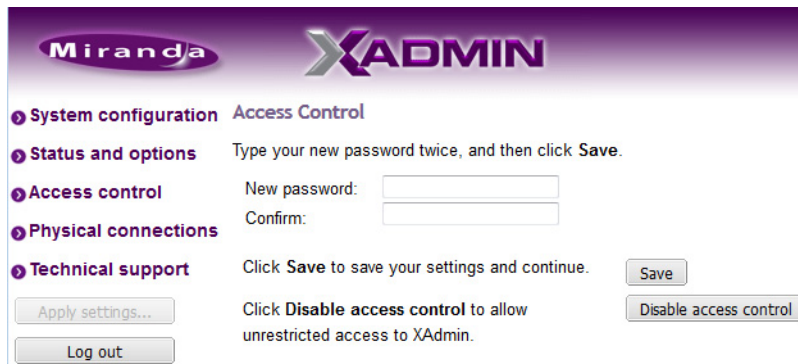


Disabling XAdmin Access Control

To disable access control in XAdmin

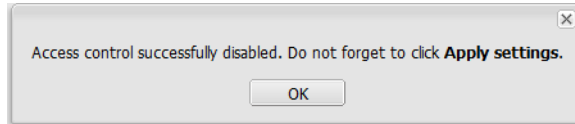
- 1 Open XAdmin. See [Opening XAdmin](#) on page 76.

- 2 Click **Access control**, in the navigation area on the left side of the page.
The Access Control page appears.

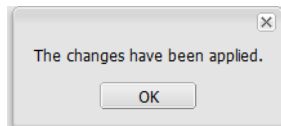


The screenshot shows the XAdmin configuration interface. At the top, there is a purple header with the 'Miranda XADMIN' logo. Below the header, a navigation menu on the left lists several categories: 'System configuration', 'Status and options', 'Access control', 'Physical connections', and 'Technical support'. The 'Access control' category is selected and expanded, showing a sub-section titled 'Access Control'. This section contains instructions: 'Type your new password twice, and then click Save.' Below this are two input fields labeled 'New password:' and 'Confirm:'. There are also several buttons: 'Apply settings...' and 'Log out' on the left; 'Save' and 'Disable access control' on the right; and a larger button labeled 'Disable access control' at the bottom right. A note at the bottom right states: 'Click **Disable access control** to allow unrestricted access to XAdmin.'

- 3 Click **Disable access control**.
A confirmation message appears.



- 4 Click **OK** to close the message window, and then click **Apply settings**.
A progress indicator appears momentarily, followed by a confirmation message.

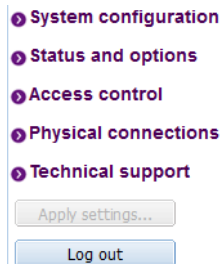


- 5 Click **OK**.
Unrestricted access to XAdmin is restored, for this multiviewer.

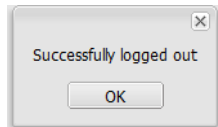
Closing a Password-Protected XAdmin Session

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.

Opening Signal Path Viewer

To open Signal Path Viewer

- Double-click the Signal Path Viewer shortcut  on your desktop.

The application automatically connects to your multiviewer, and the Signal Path Viewer panel appears.

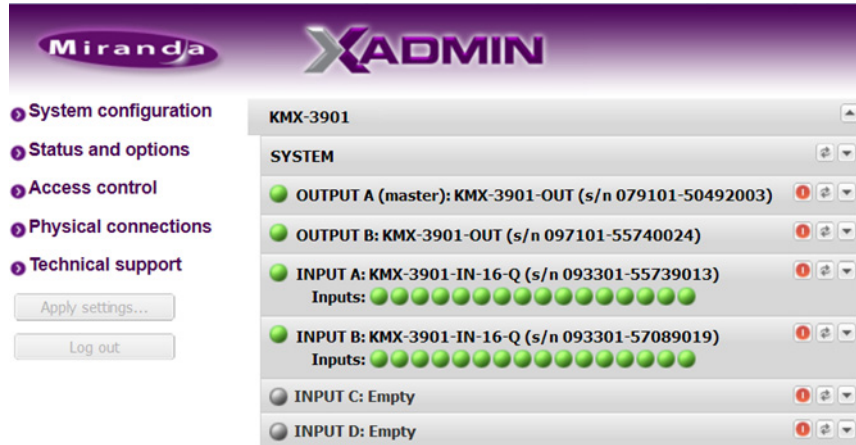
Note: Should you need Signal Path Viewer to connect to a different multiviewer, then you must install it again, from the other multiviewer's home page. See [Installing Signal Path Viewer](#) on page 72.

Viewing a Multiviewer's Status Information

To view the status information for a multiviewer

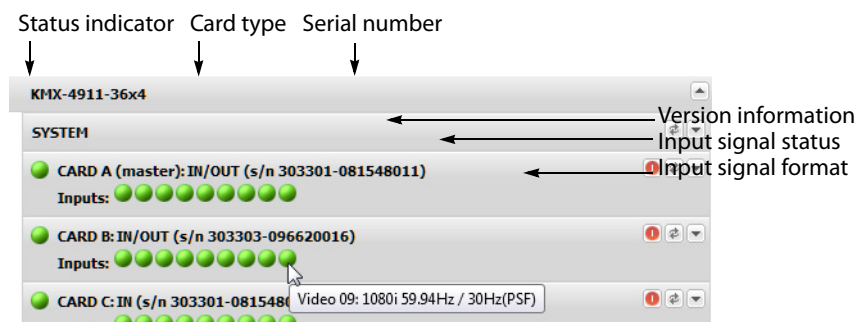
- 1 Open XAdmin. See [Opening XAdmin](#) on page 76.

XAdmin's Status and Options page appears, showing the multiviewer model, and a list of all modules and their statuses.




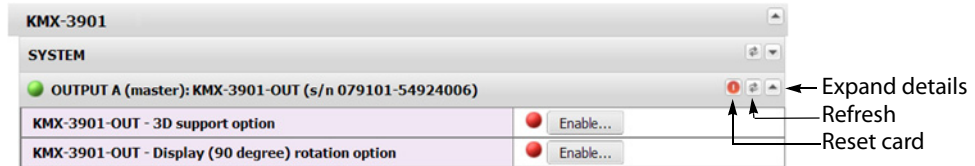
- The name used in Kaleido-X by XEdit and XAdmin to represent this multiviewer model is KMX-3901.
- Some heading rows may show a card type, serial number, firmware and safe mode versions, a module status indicator, and input signal status indicators.
- You can identify which output card currently assumes the *software master* role (and is thus assigned the multiviewer's IP address) by looking for the word "master" next to the card's identifier, for example: "OUTPUT A (master)".
- The module status indicator shows whether the card (or module) is running normally (green) or in safe mode (red).
- The signal status indicators reveals the presence of a valid input signal at the corresponding connector.



- 2 Move the pointer to an input signal status indicator to view the associated signal format.



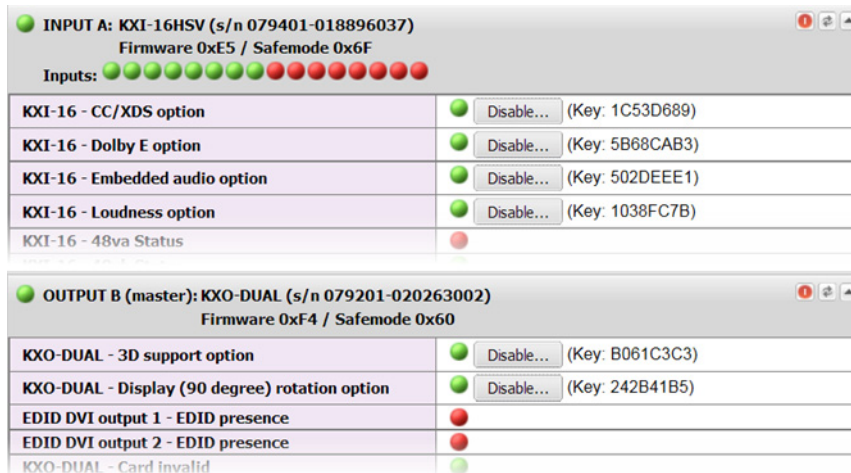
Note: The Kaleido Software does not distinguish neither between 1080PsF25 and 1080i50, nor between 1080PsF29.97 and 1080i59.94. Both 1080PsF25 and 1080i50 are reported as 1080i50, and both 1080PsF29.97 and 1080i59.94 are reported as 1080i59.94, on the monitor wall and in XAdmin's Status and Options page.

- 3 Click the arrow button  at the end of a module's heading row to view more detailed information about this card or multiviewer.



- At any time you can click the Refresh button  to make sure the data displayed for the selected module is up to date.
- Click the "Reset card" button  to reset the card or reset the multiviewer remotely from your Web browser. For a **Kaleido-IP** multiviewer, this restarts the multiviewer.

- 4 Review the enabled options for each module, and make sure that no error is reported.



Status and option information for a Kaleido Multiviewer's input and output cards (partial view)

For more information about software options, see [Available Hardware and Software Options](#), on page 122.

Configuring a Multiviewer's IP Settings with XAdmin

The multiviewer's current date and time are shown below in XAdmin, however the date and time settings are configured through the Densité CPU-ETH2 controller. See [Setting the Multiviewer's Time and Date](#), on page 54.

To change your system's IP address and other parameters

- 1 Open XAdmin. See [Opening XAdmin](#) on page 76.
- 2 Click **System configuration**, in the navigation area on the left side of the page.
The System Configuration page appears, showing the current system name, IP settings, as well as the date and time settings.

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XADMIN

- System configuration **General**
- Status and options
- Access control
- Physical connections
- Help & support

System name:

Ethernet

System IP address:

Network mask:

Default gateway:

Detected link mode: 100Mbps full-duplex

Configured link mode:

Output A:

Output B:

Housing frame

Input C
Controller IP address: 10.37.68.110
Slot: 22

Input A
Controller IP address: 10.37.68.90
Slot: 17

Input B
Controller IP address: 10.37.68.90
Slot: 13

Output A
Controller IP address: 10.37.68.90
Slot: 19

Output B
Controller IP address: 10.37.68.110
Slot: 23

Date and Time

Current date and time: Wednesday September 27, 2017 10:44:08 AM UTC-4

Date and time format:

Click **Save** to save your settings and continue.

- Optionally, 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: Only lower-ASCII characters are allowed in the system name. Braces and tilde are not allowed.

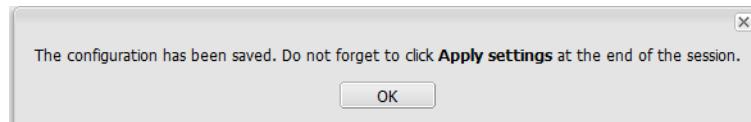
- Enter the appropriate IP information: frame or card IP addresses, network mask, and default gateway.
By default, all network adapters are set to auto-negotiate. The connection speed and duplex mode will be set automatically based on the corresponding port settings on the associated switch. The current speed and link mode are displayed next to **Detected link mode**, for every network adapter.
- Should your network configuration require specific speed and duplex mode settings, select the appropriate value from the **Configured link mode** list.

Ethernet

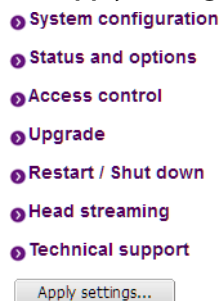
Frame IP address:	10	0	3	70
Network mask:	255	255	0	0
Default gateway:	10	0	0	1
Detected link mode:	100Mbps full-duplex			
Configured link mode:	Auto-negotiate 100Mbps half-duplex 100Mbps full-duplex Auto-negotiate			

Note: As required by the IEEE-802.3 standard, section 28D.5, 1000 Mbps full-duplex communication is only supported via auto-negotiation.

- Click **Save**.
The new settings are saved locally.



- Click **OK**.
The **Apply settings** button becomes available.



8 Click **Apply settings**.

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

9 Click **OK**.

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.

If you have changed the multiviewer's IP address, you will need to edit the XAdmin URL in your Web browser's address bar in order to log on to the multiviewer again.

Remote Control Using iControl

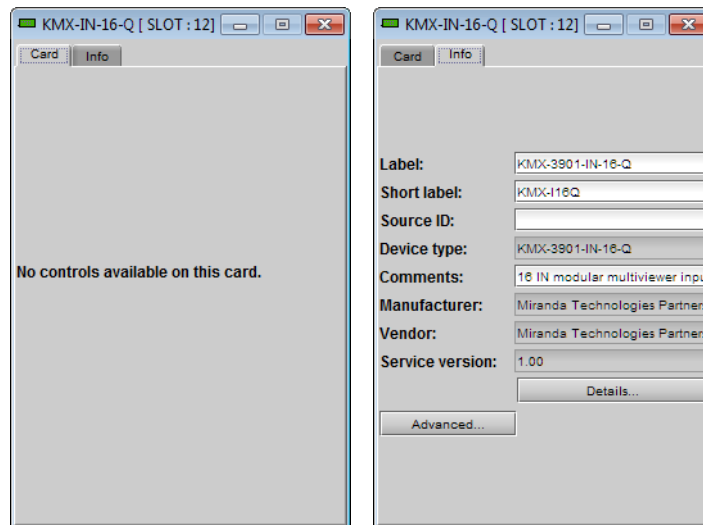
The Kaleido-MX 4K may be controlled by using Grass Valley's iControl version 4.43 or later. This section describes the two control panels associated with the Kaleido-MX 4K's input and output cards and their use. Refer to the iControl User's Guide for information about setting up and operating iControl. See [Related Documentation](#), on page 17.

In iControl Navigator, iControl Web, or iControl Solo, double-click the icon for a Kaleido-MX 4K input or output card (KMX-3901-OUT, or KMX-3901-IN-16-Q) to open the associated control panel.

Kaleido-MX 4K Service Control Panels in iControl

The card label (*KMX-IN-16-Q*, and *KMX-3901-OUT* in the examples below) and the slot number where the card is installed in the Densité frame are indicated in the window's title bar.

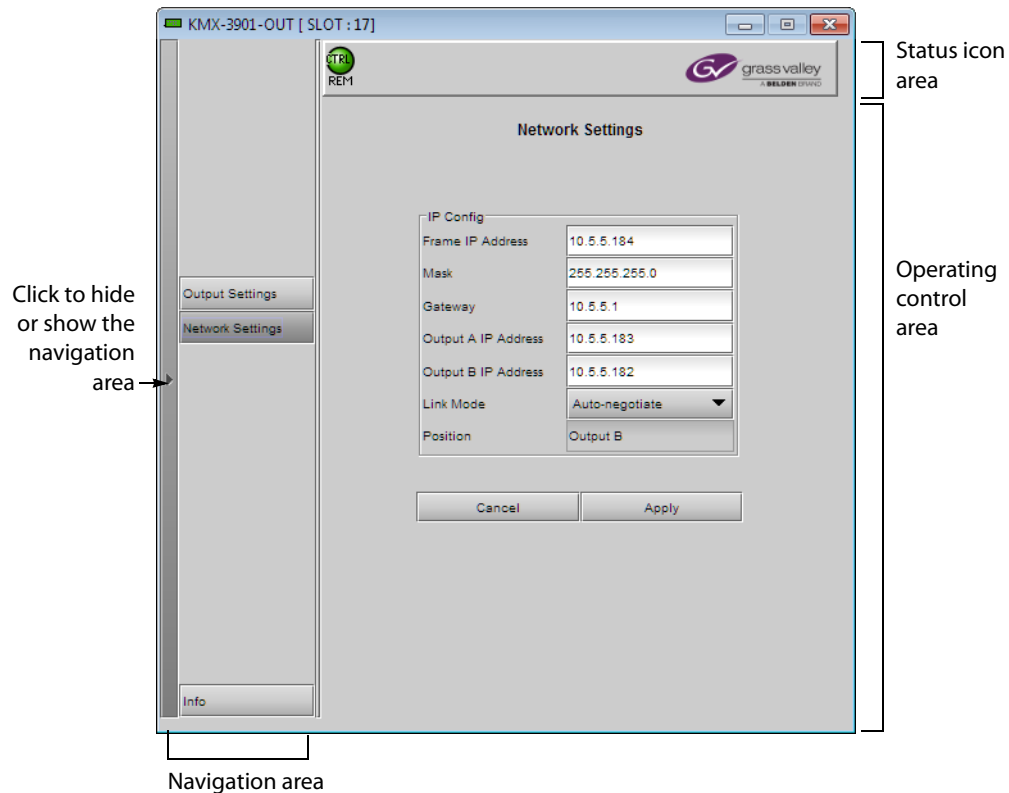
The service control panel for Kaleido-MX 4K input cards only offers information.



Service control panel for a Kaleido-MX 4K input card



See [Info Panel](#) on page 103 for more information.

In the **KMX-3901-OUT** control panel window, there are three main areas: the status icon area, the navigation area, and the operating control area.



Service control panel for a Kaleido-MX 4K output card

The status icon area contains only one icon: the control status icon.

- A green control status icon  indicates that the card is available for remote control from the service control panel in iControl.
- A yellow icon  indicates that someone is controlling the card from the control panel on the housing frame (see [Using the Densité Frame Control Panel](#), on page 44).

The navigation area contains buttons that control the contents of the main area.

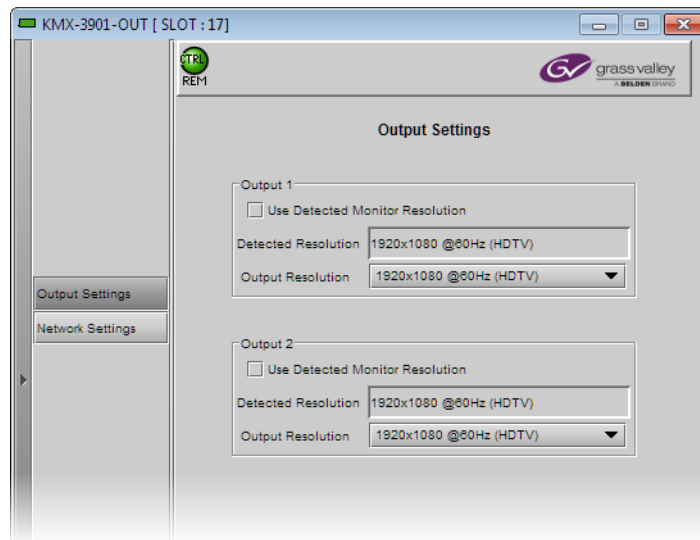
- Click a button to access the associated features.
- Click the left side border (identified by a small arrow icon) to hide or reveal this area.

The operating control area contains the main operating controls for managing the Kaleido-MX 4K multiviewer's feature set. The contents change depending on the button you clicked in the navigation area. The three panels are described individually in the following sections:

- [Output Settings Panel](#), on page 101
- [Network Settings Panel](#), on page 102
- [Info Panel](#), on page 103

Output Settings Panel

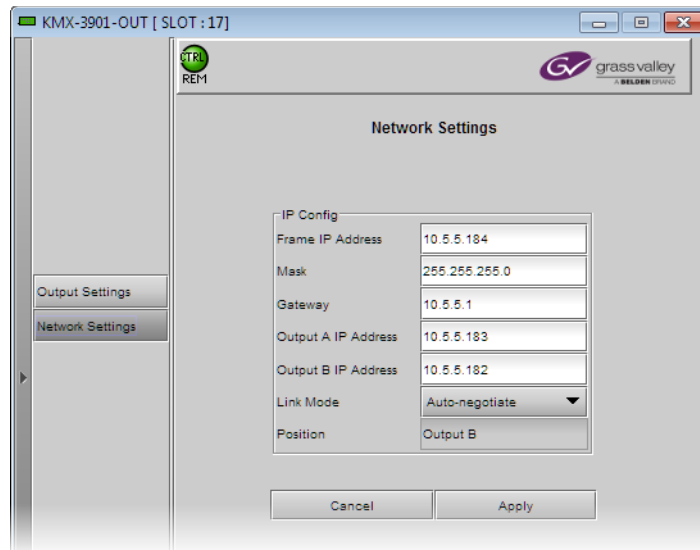
Set the resolution of the multiviewer output heads to 1080p50, or 1080p59.94, depending on your display's refresh rate. Each head corresponds to one quadrant of the quad link (square division) 4K UHD signal that feeds the display. The output cards must *not* be configured to use EDID (Extended Display Identification Data); make sure the check box is *not* selected). The value you select in the **Output resolution** list will be used.



Note: All output cards within a Kaleido-MX 4K frame must have their output heads configured with the same refresh rate. If your frame is referenced, then the heads' refresh rate must also match the reference signal's refresh rate.

Network Settings Panel

Kaleido-MX 4K output cards are shipped with default network settings, which you must replace with values suitable for your network environment. You may need to consult your network administrator to get the correct values. Enter the appropriate IP address, mask and gateway information to configure a Kaleido-MX 4K output card within your Ethernet network.



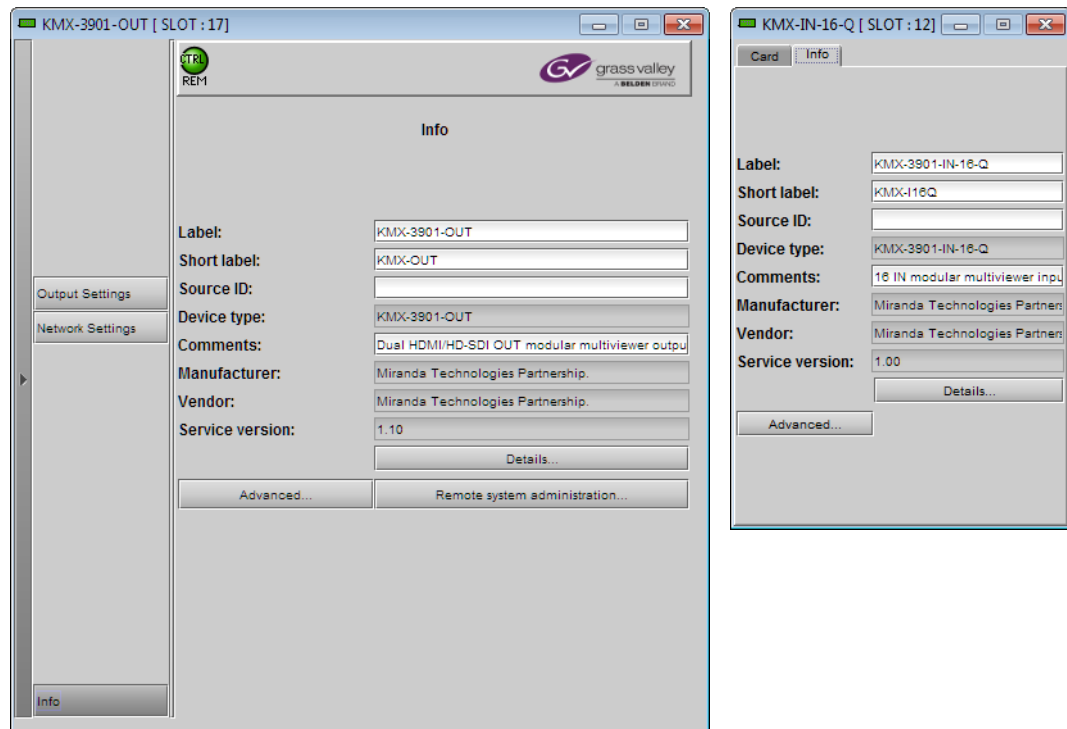
Click **Apply** to set these values into the card, or **Cancel** to leave the original values unchanged.

Notes

- These settings apply to the rear-panel Ethernet port of the Kaleido-MX 4K output cards; *not* to the Ethernet ports at the back of the Densité controller card.
 - On all Kaleido multiviewers, the network adapters are set to auto-negotiate. By default, the connection speed and duplex mode will be set automatically based on the corresponding port settings on the switch.
 - The position of the output card is not configurable; the information is presented here for information only.
 - Kaleido-MX 4K (3RU) systems, which include two output cards, require three IP addresses: one for each output card, and a virtual IP address for the system. See [Setting the Multiviewer's IP addresses](#), on page 50.
-

Info Panel

When a Kaleido-MX 4K input or output card is included in an iControl environment, certain information about the card may be made available to the iControl system. In the boxes with a white background, you can type labels and comments that will make this card easier to identify in a complex setup.



Label Type a label to identify this Kaleido-MX 4K card when it appears in iControl applications. This label appears in the service panel's title bar, in iControl Solo, and in the iControl Navigator views

Short label Type the shorter label that iControl uses in some cases (8 characters).

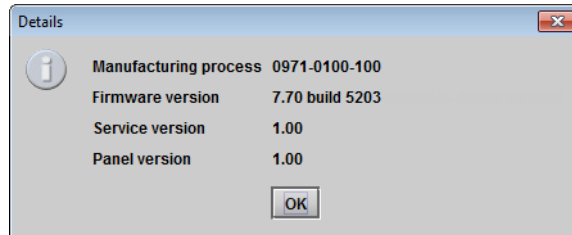
Source ID Type a descriptive name for this Kaleido-MX 4K card.

Comments Type any desired text.

The remaining boxes show manufacturing information about this card.

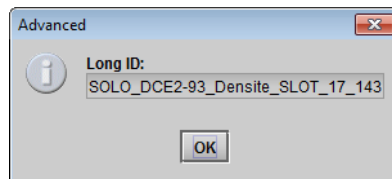
Three buttons give access to additional information and controls:

Details Reports the firmware version, service version, and panel version for this card.

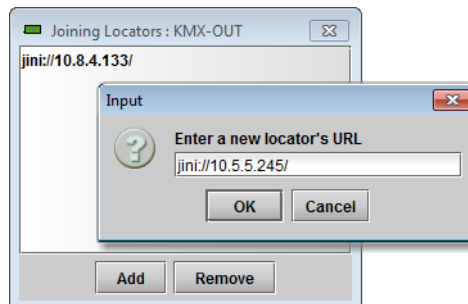


Output card Details window

Advanced Shows the Long ID for this Kaleido-MX 4K card. The Long ID is the address of this card in the iControl network.



Remote system administration Opens the **Joining Locators** window, which lists remote lookup services to which this Kaleido-MX 4K card is registered.



- Click **Add** to force the iControl service for this Kaleido-MX 4K card to register itself on a lookup service, by using the following syntax in the **Input** window:
`jini://<ip_address>`
where <ip_address> is the IP address of the server running the lookup service.
- Select one of the services listed in the window by clicking on it, and then click **Remove** to remove it from the list.

Setting the System Name

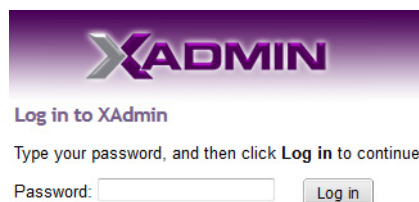
Once you have configured the output cards from the local control panel, use XAdmin to complete your system's network setup.

To set your Kaleido-MX 4K system name

- 1 Configure your client PC or laptop with an IP address in the same range as the multiviewer's current IP addresses if needed (see [Configuring a PC to Configure an ABT's Network Settings](#), on page 120).
- 2 Open a Web browser window and enter the multiviewer's *system* IP address in the address bar (see [Finding the System IP Address](#), on page 129, if needed).
- 3 The Kaleido Multiviewer's home page appears.

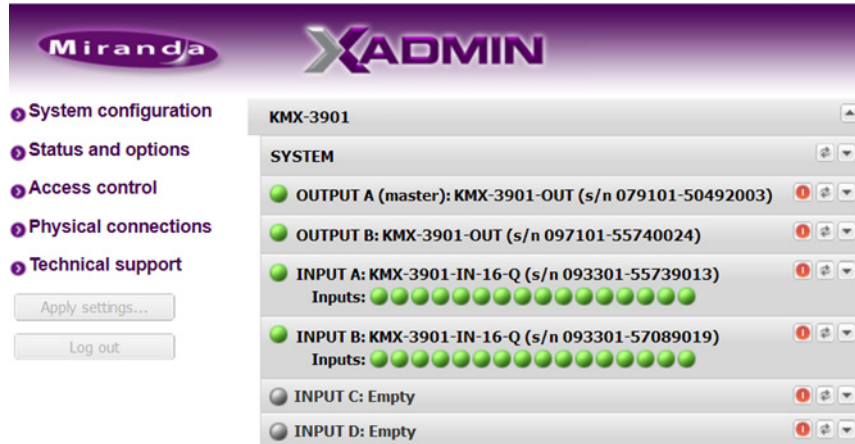


- 4 Click the XAdmin button.
- 5 If you see a security warning, or a certificate error message, then see [Registering your Multiviewer's Security Credentials with your Browser](#), on page 80.
- 6 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.



- 7 **Internet Explorer users:** If a blank page appears, then see [Enabling the Compatibility View in Internet Explorer](#), on page 88.

The XAdmin Status and Options page appears.



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

The System Configuration page appears, showing the current system name, IP addresses, network mask, default gateway, connection-speed and duplex-mode settings, information about your housing frame, the input cards and the output card you are currently connected to.

The multiviewer's current date and time are shown below in XAdmin, however the date and time settings are configured through the Densité CPU-ETH2 controller. See [Setting](#)

the Multiviewer's Time and Date, on page 54.

The screenshot displays the Miranda XADMIN web interface. On the left, a navigation menu includes: System configuration, Status and options, Access control, Physical connections, and Technical support. The main content area is titled 'General' and contains the following sections:

- System name:** S5-5-184
- Ethernet section:**
 - Frame IP address: 10.5.5.184
 - Network mask: 255.255.255.0
 - Default gateway: 10.5.5.1 (with a Remove button)
 - Detected link mode: 100Mbps full-duplex
 - Configured link mode: Auto-negotiate (dropdown menu)
 - Output A: 10.5.5.183 (with Next IP button)
 - Output B: 10.5.5.182 (with Next IP and Remove buttons)
- Housing frame section:**
 - Input A:** Controller IP address: 10.5.5.175, Slot: 13
 - Input B:** Controller IP address: 10.5.5.175, Slot: 18
 - Output A:** Controller IP address: 10.5.5.175, Slot: 4
 - Output B:** Controller IP address: 10.5.5.175, Slot: 7
- Date and Time section:**
 - Current date and time: Monday May 4, 2015 08:51:49 PM UTC-4
 - Date and time format: English (United States) (dropdown menu)

At the bottom, there is a 'Save' button and a prompt: 'Click **Save** to save your settings and continue.'

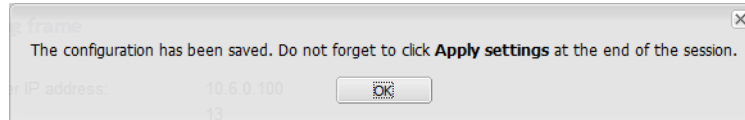
9 Under **General**, type the name you wish to use for your system.

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). Only lower-ASCII characters are allowed in the system name. Braces and tilde are not allowed.

Note: Under **Ethernet**, you may review the IP addresses, network mask, gateway settings, and the detected connection speeds and duplex modes. Should you wish to make any further changes to the network settings, you may find it more convenient to use XAdmin's System configuration page, from now on.

10 Click **Save**.

The new settings are saved locally, and XAdmin reminds you to click **Apply Setting** before closing your session.



11 Click **OK**.

The **Apply settings** button becomes available.

- ① System configuration
- ② Status and options
- ③ Access control
- ④ Physical connections
- ⑤ Technical support

Apply settings...

Log out

12 Click **Apply settings**.

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

13 Click **OK**.

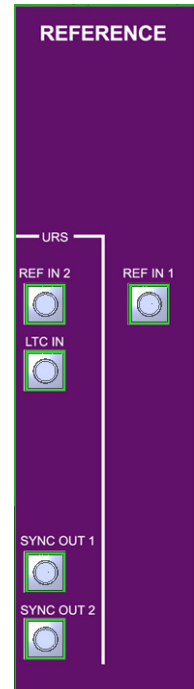
Note: Settings cannot be applied to a multiviewer system while an upgrade is in progress. If the multiviewer does not restart after 10 seconds or so, try clicking **Apply settings** again after a minute or two.

Genlocking the Multiviewer

A Kaleido-MX 4K multiviewer must be referenced. All multiviewer sources must be referenced also. To reference a Kaleido-MX 4K multiviewer system:

- Use the frame's internal reference: this is done by connecting the REF IN 1 input to the external house reference in every Kaleido-MX 4K multiviewer. The reference signal is distributed to all cards in the frame internally through the URS on the frame midplane (therefore there is no need to connect a reference signal to any individual multiviewer input card).
- If the REF-1801 card option is installed, connect the REF IN 2 input to the external house reference in every Kaleido-MX 4K multiviewer with a REF-1801 card to be distributed to all input cards in the frame for redundancy. In the Densité REF-1801 HD/SD Frame Reference Module configuration, the *URS generation mode* must be set to **Normal** (either from the card's REFERENCE menu or, in iControl, from the **Mode** tab on the control panel for this card).

Note: If the REF-1801 is configured properly, the Status LED on the front of the card will be green. Improper configuration results in periodical time code glitches. Refer to the REF-1801 HD/SD Frame Reference Module Guide to Installation and Operation. See [Related Documentation](#), on page 11.



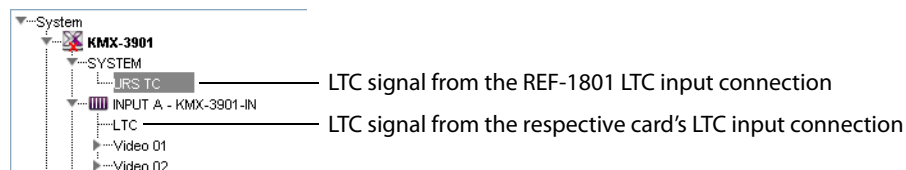
In all cases, Precision Time Protocol (PTP) is unsupported by this multiviewer.

For a time code input, the REF-1801 card option must be installed. Use LTC IN input for this signal. See [Using the URS - LTC IN Time Code Input](#), below.

Using the URS - LTC IN Time Code Input

Multiple distinct LTC signals can be used in the multiviewer. In XEdit, the LTC inputs are found under the **Channels/Sources** tab in the System hierarchical list.

The LTC input available under **System** is the LTC input signal connected to the **URS - LTC IN** input signal found under **REFERENCE** on the rear panel input of the REF-1801 card, when equipped. The LTC input available under an input card is the LTC input signal connected to that card's **LTC IN** input.



In the case where the frames are equipped with the REF-1801 card option, connect the LTC signal to the **URS - LTC IN** input found under **REFERENCE** on the rear panel. For this specific LTC Time Code Input to work with the multiviewer, certain requirements must be met.

- In the case of a non-standard time code (for example, a count down time code, or a time code that includes user bits with date information), the *time code processing*

mode must be set to **Pass through** (either from the card's REFERENCE menu or, in iControl, from the **Input** tab on the control panel for this card). The pass through mode is available as of version 1.10 of the REF-1801 firmware.

- Using an LTC count down time code as the reference for a count up timer is not supported.
- The *reference source* must be set to **External** (either from the card's REFERENCE menu or, in iControl, from the **Input** tab on the control panel for this card).

Configuring the RCP-200

The RCP-200 is shipped with an IP address of 10.0.3.200. On installation, you should consult your system administrator and replace this address with an appropriate address for your local network configuration (see [Configuring the RCP-200's IP settings](#) on page 111). Once your RCP-200 has an active connection to the network, you must then register the multiviewers you want to operate from the RCP-200 (see [Specifying multiviewers for the RCP-200](#) on page 111), and their respective *KX Router* logical routers (see [Specifying lookup servers for the RCP-200](#) on page 112). Once this is completed, you will be able to control the monitor wall from the RCP-200 (see [Logging on to the RCP-200](#) on page 112).

Configuring the RCP-200's IP settings

To assign an IP address to the RCP-200

- 1 Press the CONFIG button, located between the two screens on the front of the RCP-200.
- 2 Touch the COMM category at the top of the right-hand screen.
- 3 Touch the ETHERNET tab on the right-hand screen.
- 4 In the SELECT area, rotate the leftmost control knob to select IP ADDRESS.
- 5 Use the four control knobs in the CHANGE area to set the new address.
The current address is displayed in the CURRENT box for reference, and the new address you are setting appears in the MODIFIED box, as well as at the controls.
- 6 Press the SAVE control knob to store the new address.
- 7 Repeat from [step 4](#) to configure the NETWORK MASK and GATEWAY settings.
- 8 Press the RESTART control knob to apply the changes.
The panel will go dark for about 15 seconds before the startup screens appear.

Specifying multiviewers for the RCP-200

To specify a multiviewer for the RCP-200

- 1 Press the CONFIG button, located between the two screens on the front of the RCP-200.
- 2 Touch the COMM category on the right-hand screen.
- 3 Touch the KALEIDO DISCOVERY tab on the right-hand screen.
- 4 Use the four control knobs in the ADD TO LIST area to dial in the IP address of the multiviewer you want to operate.
The address appears in the TO ADD box.
- 5 Press the ADD control knob.
The multiviewer's IP address appears in the LOOKUP LIST area.
- 6 Press the CONFIG button, located between the two screens on the front of the RCP-200 to end the configuration process and return to normal operation.

Specifying lookup servers for the RCP-200

The RCP-200 needs to connect to a lookup server in order to control devices, including a multiviewer's *KX router* logical router.

To specify a lookup server for the RCP-200

- 1 Press the CONFIG button, located between the two screens on the front of the RCP-200.
- 2 Touch the COMM category on the right-hand screen.
- 3 Touch the DISCOVERY tab on the right-hand screen.
- 4 Use the four control knobs in the ADD TO LIST area to dial in the IP address of the multiviewer you want to operate.
The address appears in the TO ADD box.
- 5 Press the ADD control knob.
The multiviewer's IP address appears in the LOOKUP LIST area.
- 6 Press the CONFIG button, located between the two screens on the front of the RCP-200 to end the configuration process and return to normal operation.

Logging on to the RCP-200

Note: In a default system configuration, a multiviewer's video outputs are assigned to ROOM1.

To log on to a Kaleido Multiviewer room from the RCP-200

- 1 On an RCP-200 with an active connection to the network, press the LIST button.
All devices, and Kaleido Multiviewer rooms, detected by the RCP-200 appear on the left screen. Kaleido Multiviewer rooms are listed in the form [multiviewer name]\[room name].
If a room belongs to a cluster system, its name appears once for each of the member multiviewers (e.g., if two multiviewers, KX1 and KX2, are configured as a cluster, and ROOM1 includes displays fed by both multiviewers, then both KX1\ROOM1 and KX2\ROOM1 will be listed. To determine the one you should select, review the following:
 - Has the RCP user configuration you want to use been replicated on every member of the cluster? RCP Users are not automatically propagated to all multiviewers. Before a user can log on to a room associated with a cluster system, the corresponding RCP user configuration must be manually replicated on all member multiviewers across the cluster. See *Managing RCP Users* in the Kaleido Software User Guide. See [Related Documentation](#), on page 17.
 - Do you need to control an external router whose configuration is available only from one or some specific members of the cluster?
 - Does your system configuration include actions that were configured only on one or some specific members of the cluster?
 - Do you need to control a timer from the monitor wall in a cascade room?

If any of the above elements is available only from one or some specific members, then make sure you select the room name prefixed with the appropriate multiviewer name. In the case of a cascade room, unless you remember which multiviewer you were

connected to when you added the timer you need to control, you will have to proceed by trial and error.

- 2 Touch the room you want to access (press the DOWN or UP soft keys to scroll the list as needed).

The list of users assigned to this room appears on the right-hand screen.

- 3 Touch the user name under which you want to log on, enter your password, and then touch LOG IN.

Note: By default, the user “Admin” has no password.

The following message appears on the right-hand screen: PLEASE SELECT A ROUTER FROM THE LEFT-HAND SCREEN, prefixed with the name of the multiviewer that appeared before the room name you selected in [step 2](#).

- 4 In the list on the left-hand screen, touch the *KX Router* logical router associated with the same multiviewer (you can see the multiviewer name, its IP address, and the size of that particular KX Router).
- 5 Touch the Video level, in the area to the right of the router list, if it is not selected already, and then push SELECT.

The room’s monitor wall control panel appears on the right-hand screen, with the ASSIGN CHANNEL category selected. If a mouse is connected to the RCP-200, then after touching WALL MOUSE you should be able to see and move the mouse pointer on the monitor wall.

- If the room you selected belongs to a *cascade* system, touch a monitor showing a source you can identify as coming from a different multiviewer than the one indicated with the room name you selected in [step 2](#).
- If the room you selected belongs to a *cluster* system, rotate the HEAD knob (or touch the DISPLAY SELECT category) to display a head view from a different member of the cluster, and then touch a monitor.

The ROUTER SELECT category becomes selected instead of ASSIGN CHANNEL, and the right-hand screen shows the message prompting you to select a router from the left-hand screen, prefixed with the name of the multiviewer, which means that you still need to complete the correlation between some monitor wall destinations and the representation of the KX Router logical router for this multiviewer. See [Correlating Monitor Wall Destinations and KX Router Logical Routers for the RCP-200](#) on page 114. Repeat this for one head, with one layout, for every multiviewer that is part of the cluster of cascade. If you need to connect to a different instance of the same room then you will have to establish the correlation again, to be able to operate the monitor wall from the different context.

Notes

- The RCP-200 will remember your user credentials until you log out explicitly (by touching LOG OUT at the upper-right corner of the control panel).
 - The pointer may flicker when two RCP users access displays fed by the same multiviewer output.
 - Two users accessing the same display will be limited to sharing a single pointer.
-

For more information on the RCP-200, refer to the *RCP-200 Guide to Installation and Operation*. See [Related Documentation](#), on page 17.

Correlating Monitor Wall Destinations and KX Router Logical Routers for the RCP-200

To operate the monitor wall from the RCP-200's category/index router view, your system must have been configured to be controlled as a router. In a layout, the RCP-200 can only control monitors that have been assigned a monitor wall destination. The first time you log on to a room from the RCP-200, you will be prompted to select a router from the left-hand screen. By selecting the appropriate KX Router logical router, you will establish the correlation between your multiviewer's monitor wall destinations and the RCP-200's representation of the multiviewer's *KX Router* logical router. In the case of a cluster or cascade system, you will also be prompted to select a router, the first time to try to assign a source to a monitor located in a part of the layout that belongs to a different member of the cluster or cascade. You only need to do this once, for every multiviewer that is part of a cluster (or cascade).

To correlate a monitor wall destination in a layout and the corresponding KX Router logical router

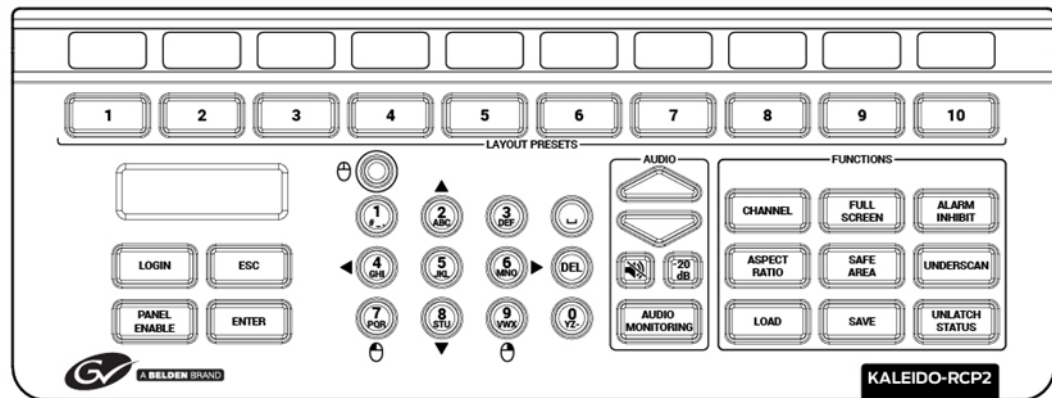
- 1 In the list on the left-hand screen, touch the *KX Router* logical router associated with the multiviewer whose name was indicated in the message prompting to select a router (you can see the multiviewer name, its IP address, and the size of that particular KX Router).
- 2 Touch the Video level, in the area to the right of the router list, if it is not selected already, and then push SELECT.

The RCP-200 will remember the association with the KX Router logical router's destinations for the current multiviewer's monitor wall destinations.

Configuring the Kaleido-RCP2

Note: The Kaleido-RCP2 unit is optional and is not included in the standard Kaleido-MX 4K package.

The Kaleido-RCP2 is a multi-function remote control panel designed for use with Kaleido multiviewers. Ethernet connectivity allows multiple RCP users to access multiple Kaleido Multiviewer systems, allowing convenient access to the real-time operating features. When logged on to a Kaleido multiviewer via its Ethernet connection, the RCP user can control various operating features.



Before you can use the Kaleido-RCP2 to operate your Kaleido Multiviewer, you must set up the Ethernet connection between the two devices. By default, the Kaleido-RCP2 is shipped with DHCP enabled, so it will automatically be assigned an IP address by a DHCP server. If no DHCP server is present on the network, the Kaleido-RCP2 will default to the static IP address 10.0.3.191.

Notes

- The Kaleido-RCP2 is powered through the RJ45 Ethernet connector. There is no power ON/OFF button, so the device is ON whenever a powered Ethernet cable is connected.
- If you purchased more than one Kaleido-RCP2 units, keep in mind that they all ship with the same default static IP address. Make sure to assign them different static IP addresses before connecting them to the network if DHCP is not used. See the Kaleido-RCP2 User Guide for more information. See [Related Documentation](#), on page 17.
- The time-out period before the Kaleido-RCP2 defaults to its static address is 1 minute. To speed up the initialization, disable the DHCP option.

Assigning a static IP address to the Kaleido-RCP2

To assign a static IP address to the Kaleido-RCP2

- 1 Press and hold the ENTER button until the ESC button lights up, to display the configuration menu.
- 2 Press the 8 key (to move down the list) until ETHERNET OPTIONS appears on the LCD display.

- 3 Press the ENTER key to display the ETHERNET OPTIONS menu.
- 4 Select the IP ADDRESS menu using the **2** key (to move up in the list) or the **8** key (to move down the list), and then press ENTER.
- 5 Using the numeric keypad, type the chosen IP address, and then press ENTER.
- 6 Select the NETWORK MASK menu using the **2** key (to move up in the list) or the **8** key (to move down the list), and then press ENTER.
- 7 Using the numeric keypad, type the chosen network mask, and then press ENTER.

You have assigned a static IP address to the Kaleido-RCP2.

Selecting a room for the Kaleido-RCP2

To select a room for the Kaleido-RCP2

- 1 Press and hold the ENTER button until the ESC button lights up, to display the configuration menu.
- 2 In the ROOM SELECTION display, press ENTER again to get the room list from the Kaleido Multiviewer systems that are currently available on the network.
- 3 In the room list, select the room you want to access by pressing the **2** key (to move up in the list) or the **8** key (to move down the list).

Note: By default, a multiviewer's video outputs are assigned to specific rooms: the outputs are assigned to ROOM1.

- 4 When the appropriate room name is highlighted, press ENTER to accept the new selection.
- 5 When prompted, log on to the selected room. See [Logging on to the Kaleido-RCP2](#) on page 117.

Connecting the Kaleido-RCP2 to Other Kaleido Multiviewer Systems

The unicast IP feature enables a Kaleido-RCP2 to find up to three Kaleido Multiviewer systems on different subnets and connect to them (via network gateways), while maintaining connections to Kaleido Multiviewer systems in its own subnet.

Notes

- To navigate the Kaleido-RCP2 menu, press the **2** key to move up, or the **8** key to move down.
 - There is no need to configure unicast IP addresses for Kaleido Multiviewer systems on the same subnet as the Kaleido-RCP2.
-

To configure a unicast IP address on the Kaleido-RCP2

- 1 Press and hold the ENTER button until the ESC button lights up, to display the configuration menu.
- 2 Select ETHERNET OPTIONS on the LCD display, and then press ENTER.
- 3 Select **Unicast host IP**, and then press ENTER.

- 4 Select **Enable IP 1**, and then press ENTER.
The Enable IP x parameter instructs the Kaleido-RCP2 to query the selected IP address for a list of rooms.
- 5 Select **Host IP ADDR**, and then press ENTER.
- 6 Using the numeric keypad, type the IP address of a Kaleido Multiviewer on a remote subnet, and then press ENTER.
- 7 Repeat [step 4](#) to [step 6](#) to add unicast IP addresses for up to three remote Kaleido Multiviewer systems.

Logging on to the Kaleido-RCP2

As a network device, the Kaleido-RCP2 provides access to any room configuration on any Kaleido Multiviewer system on the network. As a security measure, access is controlled by a login procedure.

To log on to a Kaleido Multiviewer system from the Kaleido-RCP2

- 1 Press the LOGIN key.
The following message will appear on the LCD display:
LOGIN Position
Admin
- 2 Press ENTER to select "Admin".
A message prompting you to enter a password will appear on the LCD display.
- 3 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.

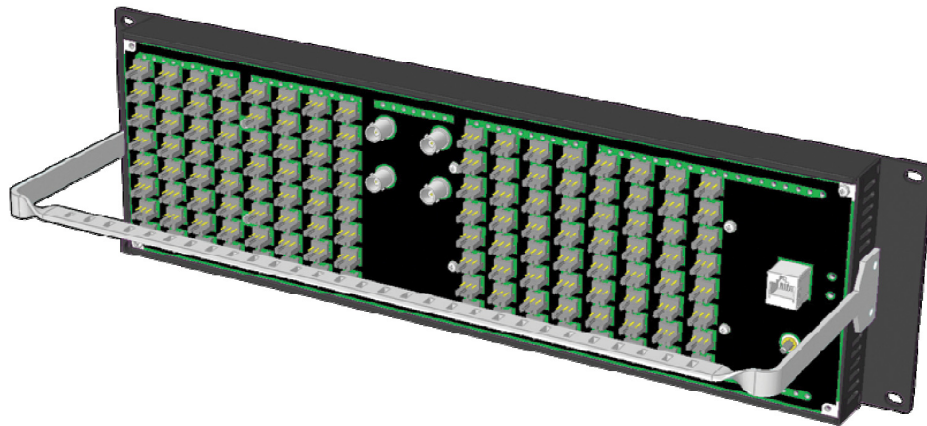
Note: If at any time the message "Target system is offline" or "No login list available" appears on the LCD display, press the ESC, ENTER and DEL keys simultaneously and go back to [step 1](#).

For more information, refer to the *Kaleido-RCP2 Guide to Installation and Operation*. See [Related Documentation](#), on page 17.

Configuring an Audio Bridge Terminal

The optional Audio Bridge Terminal (ABT) is an external audio multiplexer/serializer for the Kaleido-MX 4K. The Kaleido-MX 4K supports audio channel inputs from the ABT-64 or ABT-128 series of Audio Bridge Terminal panels through SDTI inputs. The ABT-64 supports 64 channels and the ABT-128 supports 128 channels.

The Audio Bridge Terminal (ABT) is an external audio multiplexer/serializer for Kaleido multiviewers. The ABT provides connector space for audio signal inputs, and multiplexes all the audio signals into combined serial feeds on coaxial cables that connect to the Kaleido-MX 4K input cards.



Note: The ABT is powered through the RJ45 Ethernet connector. There is no power ON/OFF button, so the device is ON whenever a powered Ethernet cable (PoE) is connected.

To configure the IP address and other network settings of the ABT

- 1 Connect a PC to a switch.
- 2 Referring to [Configuring a PC to Configure an ABT's Network Settings](#), on page 120, configure the PC with the following network settings:

Property	Setting
DHCP	Off
Static IP address	10.0.0.1
Subnet mask	255.255.0.0
Default gateway	10.0.0.1

- 3 Apply power to the Audio Bridge Terminal and make sure it is connected to the same switch as the PC.
 - If the switch is Power over Ethernet (PoE) enabled, simply connect it to the unit using an Ethernet cable.
 - If not, PoE mid-span (*inserter*) equipment must be placed between the switch and the Audio Bridge Terminal.

- Press the RESET button (located on the right-hand side of the ABT rear panel beside the ETHERNET/POWER RJ-45 connector) for at least 1 second.

The Audio Bridge Terminal will reboot with the following static network configuration:

Property	Setting
DHCP	OFF
Static IP address	10.0.3.190
Subnet mask	255.255.0.0
Default gateway	10.0.0.1

- Using a Web browser on the PC, connect to the ABT using the following address: 10.0.3.190.

The home page of the ABT's built-in Web server is displayed.

- Click **Network Configuration** (in the navigation pane).

The **Network Configuration** page is displayed.

Grass Valley - Audio Bridge Terminal

[Status](#)

[Parameters](#)

[Network Configuration](#)

[Information](#)

Network Configuration

MAC Address: 00:50:1E:01:FF:DD

Label: Valid characters: a-z A-Z 0-9 - _ *

DHCP: Disabled Enabled

Static IP Address:

Static Network Mask:

Static Default Gateway:

- Change the ABT's network settings, as necessary, and then click **Apply & Reboot**.

Notes

- The Kaleido-MX 4K supports one ABT device. You can achieve redundancy by connecting the ABT to more than one input card, in which case the Kaleido-MX 4K uses the signal from the input card that is the farthest from the output cards (for example, Input D, if you have 4 input cards, Input C if you have 3 input cards, Input B if you have 2 input cards).
- Keep in mind that all ABTs ship with the same default static IP address. If you are adding more than one ABT to your network and do not use DHCP, make sure to assign each ABT a different static IP address before connecting them to the network.

For more information about the ABT, refer to the *Audio Bridge Terminal Guide to Installation and Operation*. See [Related Documentation](#), on page 17.

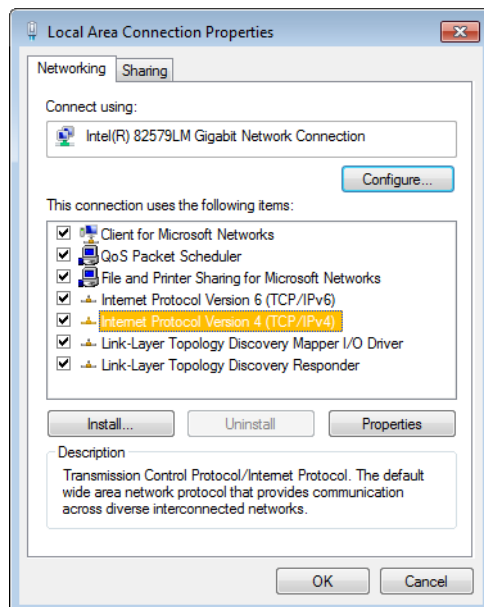
Configuring a PC to Configure an ABT's Network Settings

The PC that you will use to communicate with the ABT must have an IP addresses within the same subnet. The following procedure applies to a typical Windows 10, Windows 8, or Windows 7 system.

To change the IP address of the client PC

- 1 Press the Windows key on your keyboard, type "control panel" and then press Enter.
- 2 In the search box, type "adapter", and then, under **Network and Sharing Center**, click **View network connections**.
- 3 In **Network Connections**, right-click the network adapter you wish to configure (e.g., *Local Area Connection*, or *Ethernet*), and then click **Properties**. If the system prompts you for an administrator password or confirmation, type the password or provide confirmation.

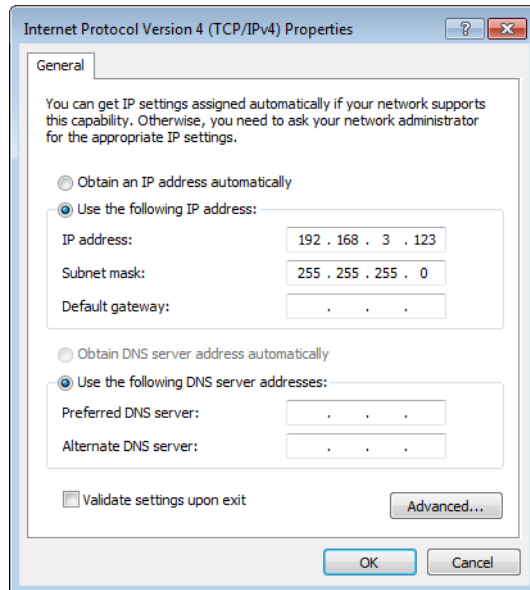
The Properties window for the selected network adapter opens.



- 4 On the **Networking** tab, under **This connection uses the following items**, click **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.

The **Internet Protocol Version 4 (TCP/IPv4) Properties** window opens.

- 5 On the **General** tab, click **Use the following IP address**.



- 6 Type an IP address in the same range as the current ABT's IP address.
For example, if the ABT's IP address is 10.0.3.190, then the IP address of your client PC could be 10.0.3.1. If you are unsure, contact your network administrator.
- 7 Type a subnet mask in the same range as that of the ABT such as 255.255.0.0.
- 8 Click **OK**.
- 9 In **Local Area Connection Properties**, click **Close**.

For more information about the ABT, refer to the *Audio Bridge Terminal Guide to Installation and Operation*. See [Related Documentation](#), on page 17.

Available Hardware and Software Options

You can purchase various software and hardware options to expand your multiviewer's capabilities that are not part of the basic offer. Software options are enabled by entering a software key that has been sent to you once you have purchased the option. The following tables list options that can be enabled via the XAdmin Status and Options page (see [Enabling Options](#) on page 122).

Kaleido-MX 4K input options

Option	Part No.	Feature
3G	KMX-IN-16-OPT-3GBPS	3 Gbps signal format license (16 inputs)
CC/XDS	KMX-IN-16-OPT-CSX	CC/subtitling and XDS data license (16 inputs)
Dolby E	KMX-IN-16-OPT-DOLBY	Dolby metadata extraction license (16 inputs)

Kaleido-MX 4K output option

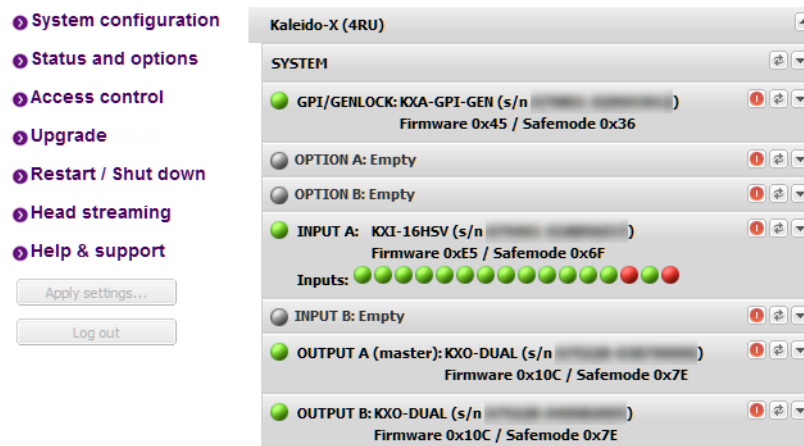
Option	Part No.	Feature
Display 90-Degree Rotation	KMX-OUT-ROTATOR-D	Rotation license. 2 licenses required for each Kaleido-MX 4K unit. See also Portrait Multiviewer Display Orientation , on page 36.

Enabling Options

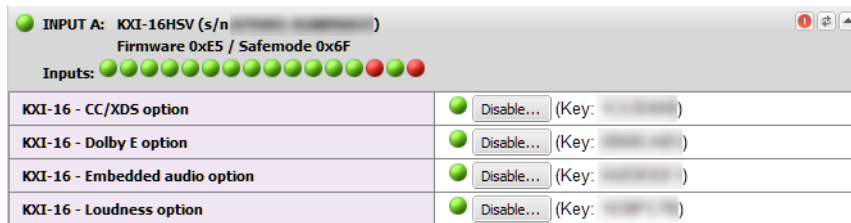
To enable options on a multiviewer

- 1 Obtain a license key from Grass Valley.
- 2 Open XAdmin.

The XAdmin Status and Options page appears.

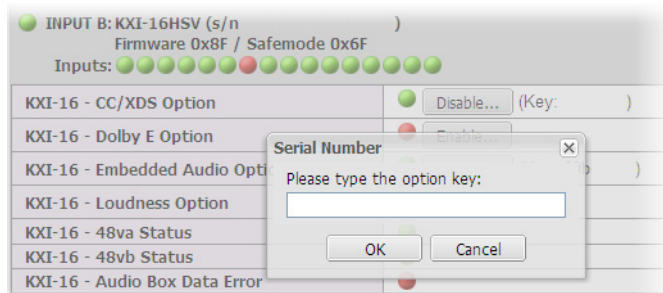


- 3 Click the arrow button at the end of the heading row that corresponds to the module for which you want to enable an option.



- 4 Locate the entry for the option you want to enable.
For example, to activate the Extraction of CC, Subtitling and XDS metadata option (CC/XDS Option) for an input card, you would need to locate the appropriate card in XAdmin's Status and Options page, expand it, and then locate the **KXI-16-CC/XDS option** line.

- 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, and a **Disable** button replaces the **Enable** button.

Maintenance & Troubleshooting

6

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.

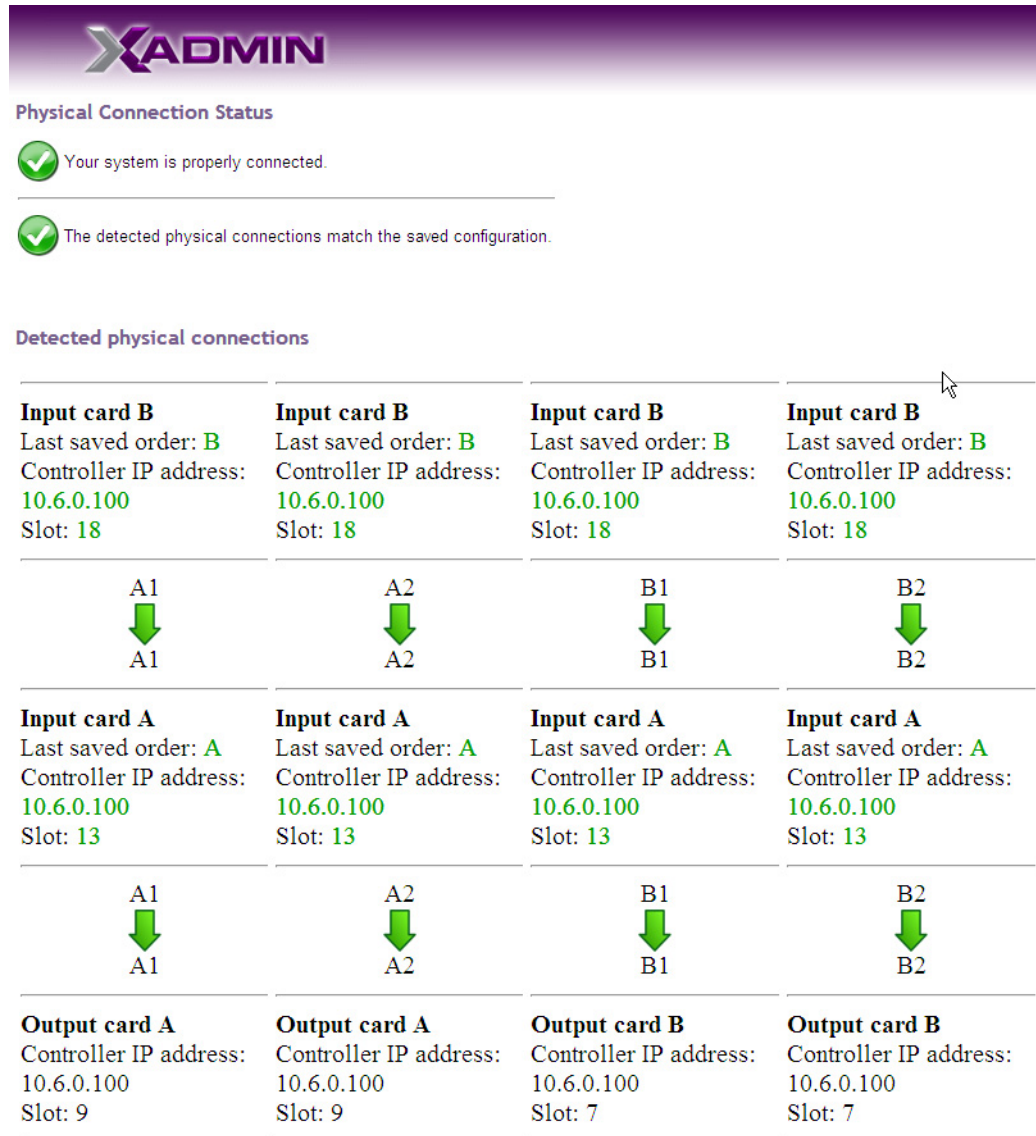
System Verification

Verifying the Kaleido-MX 4K Multiviewer Status


You can check internal system statuses via the Web-based XAdmin application.


To verify the status of your Kaleido-MX 4K multiviewer

- 1 Open a Web browser window and enter your multiviewer's *system* IP address (the virtual IP address you configured at [step 4](#) on page 55) in the address bar.
The Kaleido Software 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 80.
- 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 88.
The XAdmin Status and Options page appears, displaying a list of all modules and their statuses.
- 6 Click **Physical connections**, in the navigation area on the left of the page.
The Physical Connections page appears, showing the current connection status for your system, with a visual representation of the physical connections between the detected input cards and the output cards associated with the frame IP address.











Physical Connection Status

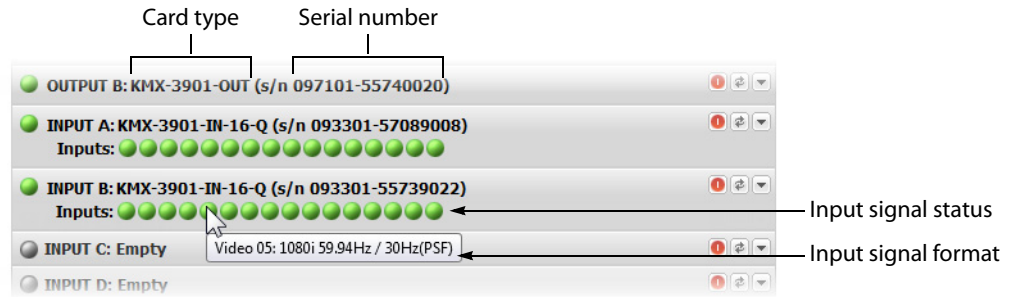
 Your system is properly connected.

 The detected physical connections match the saved configuration.

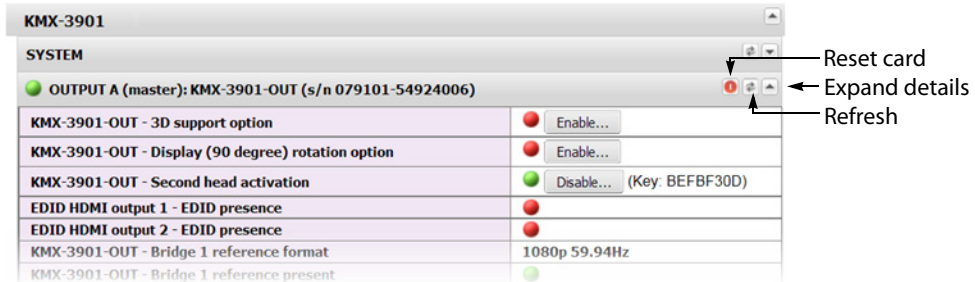
Detected physical connections

Input card B Last saved order: B Controller IP address: 10.6.0.100 Slot: 18	Input card B Last saved order: B Controller IP address: 10.6.0.100 Slot: 18	Input card B Last saved order: B Controller IP address: 10.6.0.100 Slot: 18	Input card B Last saved order: B Controller IP address: 10.6.0.100 Slot: 18
A1  A1	A2  A2	B1  B1	B2  B2
Input card A Last saved order: A Controller IP address: 10.6.0.100 Slot: 13	Input card A Last saved order: A Controller IP address: 10.6.0.100 Slot: 13	Input card A Last saved order: A Controller IP address: 10.6.0.100 Slot: 13	Input card A Last saved order: A Controller IP address: 10.6.0.100 Slot: 13
A1  A1	A2  A2	B1  B1	B2  B2
Output card A Controller IP address: 10.6.0.100 Slot: 9	Output card A Controller IP address: 10.6.0.100 Slot: 9	Output card B Controller IP address: 10.6.0.100 Slot: 7	Output card B Controller IP address: 10.6.0.100 Slot: 7

- 7 Review the information on this page, to make sure your input and output cards are all properly interconnected. Information in red indicates the location where a problem was detected.
- 8 Click **Status and options**, in the navigation area on the left of the page, to go back to the Status and Options page.
 The module headings show the card type and serial number for the input and output cards, and a summary view of the input signals for each input card.
- 9 Move the pointer to an input signal status icon to view the associated signal format.



- Click the arrow button (▼) at the end of a module's heading row to view detailed information.



- Review the enabled input and output options, and the main system statuses of the Kaleido-MX 4K frame, to make sure that there are no status errors, and no alerts related to system temperature, fan operation, FlexBridge connectivity, or card fault conditions.

Notes

- At any time you can click the **Refresh** button to make sure the data displayed for the selected card is up to date. Click the **Reset card** button at the end of a card's heading row to reset the card remotely, directly from your Web browser.
- Refer to [Available Hardware and Software Options](#), on page 122, for more information on the available options.

Verifying the Kaleido-RCP2

To verify that the Kaleido-RCP2 is functioning normally

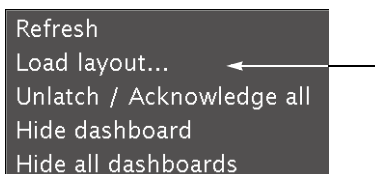
- Log on to the Kaleido-RCP2 (see [Configuring the Kaleido-RCP2](#), on page 115), and then test various operations using the Kaleido-RCP2 keyboard and the mouse (e.g. load a predefined layout).

Loading a Layout

To load a layout on the monitor wall

- Connect a mouse to the Kaleido-RCP2 (if available) and log on to the appropriate room, if you have not already done so (see [Configuring the Kaleido-RCP2](#), on page 115).
Alternatively, connect the mouse directly to the USB port at the front of one of your system's output card.

- 2 Right-click anywhere on the monitor wall, point to **Monitor wall** (if you clicked a monitor), and then click **Load layout** on the menu.



Monitor wall shortcut menu

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

- 3 Select the layout you wish to load from the list of available layouts for this room, and then click **OK**.

The selected layout appears on the room displays.

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

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

Verifying the Audio Bridge Terminal

To verify that the ABT is functioning normally

- Inspect the ACTIVITY and front panel LEDs on the unit to make sure there are no error conditions:

The ACTIVITY indicator is located on the right-hand side of the rear panel. This LED reports the status of the Ethernet connection as indicated in the table below.

Two LEDs are visible on the front panel, one for each power supply. When lit, they both indicate the same status.

When the ABT is powered up, all three LEDs will be orange until the boot sequence is terminated. This is a visual indicator that the LEDs are functioning properly.

ACTIVITY Indicator on Rear Panel		Power-Supply LEDs on Front Panel	
Color	Status	Color	Status
Off	No link detected	Green	Normal
Green	Normal (good link)	Flashing green	Normal, rebooting
Orange	Activity	Orange	Warning
Red	Hardware fault	Flashing orange	Warning, rebooting
Flashing red	Upgrading firmware	Red	Hardware fault
		Flashing red	Upgrading firmware

For more information, refer to the *Audio Bridge Terminal Guide to Installation and Operation*; see [Related Documentation](#), on page 17.

Verifying the Multiviewer's IP Addresses and Application Version

Finding the System IP Address

To find your multiviewer's system IP address

- 1 Press the Select button on the front edge of a Kaleido-MX 4K *output* card.
The Status LED on the selected card flashes orange, and the associated control menu appears on the display of the Densité frame's local control panel.
- 2 On the local control panel, press the [-] button repeatedly until NETWORK SETTINGS appears on the display, and then press the SEL button. See [Using the Densité Frame Control Panel](#), on page 44.
FRAME IP ADDRESS EDIT appears on the control panel's display.
- 3 Press the SEL button again.
The current system IP address appears on the display. This is your system's virtual IP address (i.e., the address you will use to access your system from XEdit and XAdmin).
- 4 Press the Select button *on the front edge of the output card* to exit the control menu.

Verifying an Output Card's IP Address and Application Version

To verify the IP address and application version on an output card

- 1 Press the Select button on the front edge of the Kaleido-MX 4K *output* card.
The Status LED on the selected card flashes orange, and the associated control menu appears on the display of the Densité frame's local control panel.
- 2 Note the position indication *A* or *B* in the card information shown on the first line of the LCD display: either KMX-OUTA, or KMX-OUTB, followed with the slot number (e.g., KMX-OUTA Slot 4).
- 3 On the local control panel, press the [-] button.
The version of the Kaleido Software that is running on the card (e.g. "8.40-build.987") appears on the display.
- 4 On the local control panel, press the [-] button repeatedly until NETWORK SETTINGS appears on the display, and then press the SEL button.
FRAME IP ADDRESS EDIT appears on the control panel's display.
- 5 If the card is identified as KMX-OUTA on the display, then press the [-] button repeatedly until OUTPUT A IP EDIT appears. If the card is identified as KMX-OUTB, then press the [-] button until OUTPUT B IP EDIT appears.
- 6 Press the SEL button.
The current IP address for this card appears on the display.

Note: If you have a single- or dual-head Kaleido-MX 4K multiviewer, then this IP address doubles as the system IP address.

- 7 Press the Select button *on the front edge of the output card* to exit the control menu.

Verifying an Input Card's Application Version

To verify the application version on an input card

- 1 Press the Select button on the front edge of the Kaleido-MX 4K *input* card. See [Kaleido-MX 4K Input Card Interface](#), on page 28.
The Status LED on the selected card flashes orange, and the associated control menu appears on the display of the Densité frame's local control panel.
- 2 On the local control panel, press the [-] button.
The version of the Kaleido Software that is running on the card (e.g. "8.40-build.987") appears on the display.
- 3 Press the Select button *on the front edge of the input card* to exit the control menu.

Maintenance

Required Tools

Use a field-supplied Phillips #2 screwdriver to remove and install multiviewer hardware.

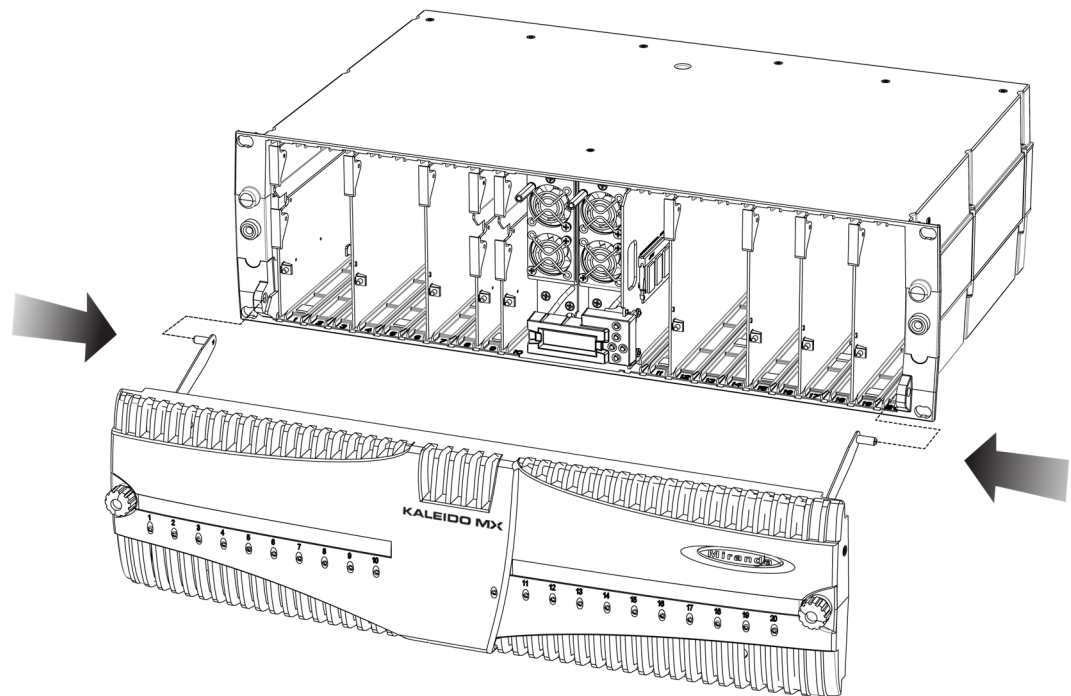
Field Replaceable Units

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

- [Replacing the Frame Controller Card](#), on page 132
- [Replacing Power Supply Modules](#), on page 133
- [Replacing Frame Ventilation Fans](#), on page 140

There are no user-serviceable parts within these components except that cooling fans can be replaced on some cards and in some frame components. See [Cooling Fan Replacement](#), on page 133.

Opening and Closing the Front Door



The front door of the Kaleido-MX 4K (3RU) frame is fastened in place by two captive thumbscrews, one at each end of the door.

Opening the front door

To open the door

- Turn both thumbscrews counterclockwise until they release, and then pull the door away from the front of the frame.

The door is attached to the frame by guides that slide out of the frame as the door is pulled, and allow the door to be lowered below the frame so that cards and power supplies can be removed and installed.

Removing the front door

To remove the door

- Slip the ends of the guides off the posts on the door assembly.

Note: You must tilt the door on an angle so the guides can move freely. There are no electrical connections to the door.

Closing the front door

To close the door

- Slide it into position against the front of the frame, and then turn the captive thumbscrews clockwise until the door is securely fastened into place.

Replacing Cards

All cards and rear panels can be installed with the frame power on. Each card has a connector which plugs into the frame's backplane for distribution of power and connection to the controller card, and one or two connectors (depending on the card type) that plug into the associated rear panel for inputs and outputs.

Removing a card

Note: Removing more than one input card from a Kaleido-MX 4K system in operation is not supported.

To remove a card

- 1 Open the front door of the frame (see [Opening the front door](#), on page 131).
- 2 Tilt the swivel handle, on the front of the card you wish to remove, to lever the connectors apart, and then use the handle to pull the card straight out of the slot.
- 3 Close the front door of the frame (see [Closing the front door](#), on page 131).

Installing a card

To install a card

- 1 Open the front door of the frame (see [Opening the front door](#), on page 131).
- 2 To install a card into an empty slot, slide the card into the slot, and push gently on the handle to seat the connectors.
Seating input cards requires more pressure. Inserting the card into the wrong slot will not damage the card, and will be flagged by the on-card status LED flashing, to indicate that there is no connection to the rear panel.
- 3 Close the front door of the frame (see [Closing the front door](#), on page 131).

Replacing the Frame Controller Card

To replace the CPU-ETH2 controller card

- 1 Open the front door of the frame (see [Opening the front door](#), on page 131).
The controller card is located to the right of the power supply slots at the center of the frame.
- 2 Hook your finger through the opening at the top of the card.
- 3 Pull gently until the card is released from the rear connector, and then slide the card out of the frame.

Note: Do not pull on the control panel to remove the card.

- 4 Slide the new card into the controller slot, and push gently on the card edge to engage the rear connectors.
- 5 Be sure to close the front door before operating the Kaleido-MX 4K, to ensure proper ventilation (see [Closing the front door](#), on page 131).

Replacing Power Supply Modules

The Kaleido-MX 4K frames support dual redundant hot-swappable power supplies. The basic configuration includes a single supply, with an empty slot for the optional redundant power supply. Installing a second power supply module and applying power to it automatically engages the redundant supply mode. Each power supply has its own power socket on the rear panel, and should be connected to the AC supply using the power cords that shipped with your hardware, or other approved cords.

Notes

- A single power supply can be installed in either of the two slots.
 - Power integrity is enhanced if the two power supplies are plugged into different circuits.
-

To install or change a power supply module in a Kaleido-MX 4K (3RU)

- 1 Open the front door of the frame (see [Opening the front door](#), on page 131).
- 2 Remove the controller card, to provide access to the power supply slots (see [Replacing the Frame Controller Card](#), on page 132).
- 3 Release the retaining spring by turning the captive screw mounted on the lower front panel of the power supply counterclockwise.
- 4 Remove the power supply module by pulling on the handle on its front panel and sliding it out of the frame.
- 5 Slide the new power supply module into the slot, and push it gently into position to seat the connectors.
- 6 Secure the supply in position by turning the captive screw mounted on the lower front of the power supply clockwise.
This engages a retaining spring which holds the supply securely in place.
- 7 Replace the controller card.
- 8 Close the front door of the frame (see [Closing the front door](#), on page 131).

Cooling Fan Replacement

A cooling fan has moving parts that, over time, can wear out. In the final stages of fan wear out, the fan may make a distinctive sound and it rotates at a slower speed, thereby reducing airflow which undermines its ability to remove heat from electronic circuitry. Under this condition, fan replacement is required.

Also, dust contained in the ambient air can accumulate on the fan and on surfaces around the fan and heatsink, thereby reducing airflow, and preventing air from coming into direct contact with the heatsink surfaces which undermines its ability to remove heat from the electronic component. Under this condition, cleaning is necessary and fan replacement may be required.

Some diagnostic procedures may interrupt normal system operation. Changing a card's cooling fan will interrupt normal system operation. Down time can be minimized by swapping in a new or a known good card to restore system operation quickly. Schedule maintenance operations during off hours when the system is not in use.

Diagnostics

The KMX-3901 card's electronic circuitry generates heat that must be shed by forcing air to move across heat-generating components. Reduced air flow or high ambient temperature results in heat build-up within temperature-sensitive components on the card. This can cause unexpected behavior such as glitches or even a system freeze or shutdown. The multiviewer self-diagnoses high temperature conditions by raising critical temperature and fan alarms.

Critical temperature and fan alarms are reported through the following mechanisms:

- The alarm statuses in XAdmin are called *XXXX fan failed* where *XXXX* identifies the specific fan. For example, *DAP 0 fan failed*.
- A *Fan Failure* message is displayed in the dashboard.

The fan alarm indicates that the fan is not rotating fast enough due to wear and thus it may not provide enough cooling. A fan alarm must be addressed right away. A critical temperature alarm can be ignored if it is accompanied by a fan alarm as the root cause is the fan not rotating fast enough.

Otherwise, if the fan is running properly according to the fan alarm, then the *Critical Temperature Alarm Corrective Actions* steps should be taken.

Critical Temperature Alarm Corrective Actions

If the fan alarm is inactive and the critical temperature alarm is active, then undertake the following diagnostic steps in the following order:

- 1 Confirm that the room temperature is within multiviewer's operating temperature range specification. If necessary, take corrective actions by, for example, increasing the amount of air conditioning made available to the multiviewer's frame.
- 2 Confirm that air flow around the multiviewer's frame is not obstructed. If necessary, take corrective actions by, for example, removing obstructions or rerouting cables around and away from the multiviewer's frame.
- 3 When the previous corrective actions do not eliminate a critical temperature alarm, verify that the Kaleido-MX 4K's onboard fan is working correctly. See [Fan Noise](#) below.

Fan Noise

Over time, a fan's performance (operating speed) can degrade which may raise critical temperature and fan alarms. Under this circumstance, a fan may emit a rough-sounding lower pitched sound as compared to the sound that other healthier fans emit. To confirm that the card / module has an abnormally-sounding fan, during off hours when the system is not in use, eject the card or if possible, the module from the multiviewer's frame to verify that the distinctive sound stops and take corrective actions (see below).

Or there may be no sound at all if the fan's rotation is completely blocked. While the card / module is in the multiviewer's frame, make a visual inspection with a flashlight to confirm fan rotation. If the fan is not rotating, then corrective actions must be taken.

Fan Alarm and Fan Noise Corrective Actions

When a fan alarm is raised, it must be addressed right away. During off hours when the system is not in use, eject the card or if possible, the module from the multiviewer's frame

and inspect the fan assembly: remove any accumulated dust and dirt from the card / module with compressed air and remove any obstruction to the fan's ability to freely rotate. Reinsert the card / module into the multiviewer's frame and restore system operation to see if the fan alarm becomes inactive.

The multiviewer's circuitry monitors the fan motor's rotational speed to detect that the fan is rotating fast enough to provide sufficient cooling; it raises a fan alarm when the fan's rotational speed has gone below a factory-set threshold.

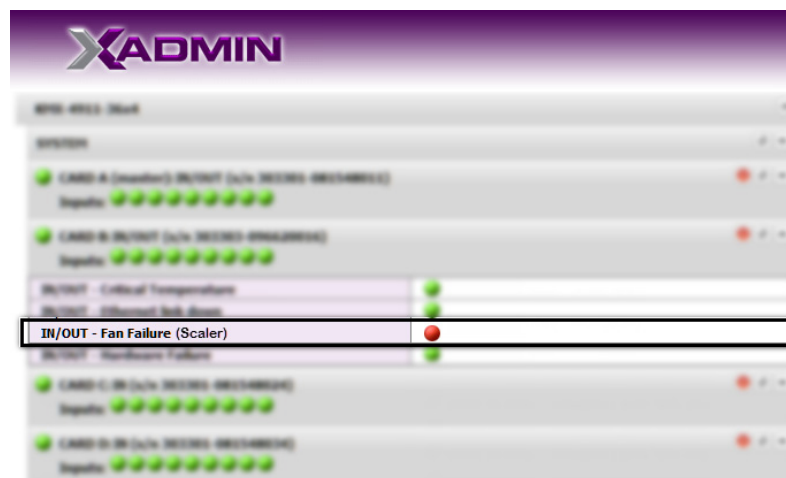
When the fan is not rotating fast enough (as detect by a fan alarm), is making abnormal noises, or is not rotating at all, the fan is worn out and it must be replaced with a new one.

Fan Replacement Kit

The replacement fan kit is available by contacting Customer Support. See [Grass Valley Technical Support](#), on page 168. The location of the card's part number and serial number is shown below.

Identifying the Fan to Replace for a Fan Fail Alarm

As some cards / modules have more than one fan, identify in XAdmin the specific fan to be changed on the card / module: check each card / module individually in XAdmin for a fan fail alarm. When there is a fan fail alarm for a fan in some modules, the entire fan assembly must be replaced.



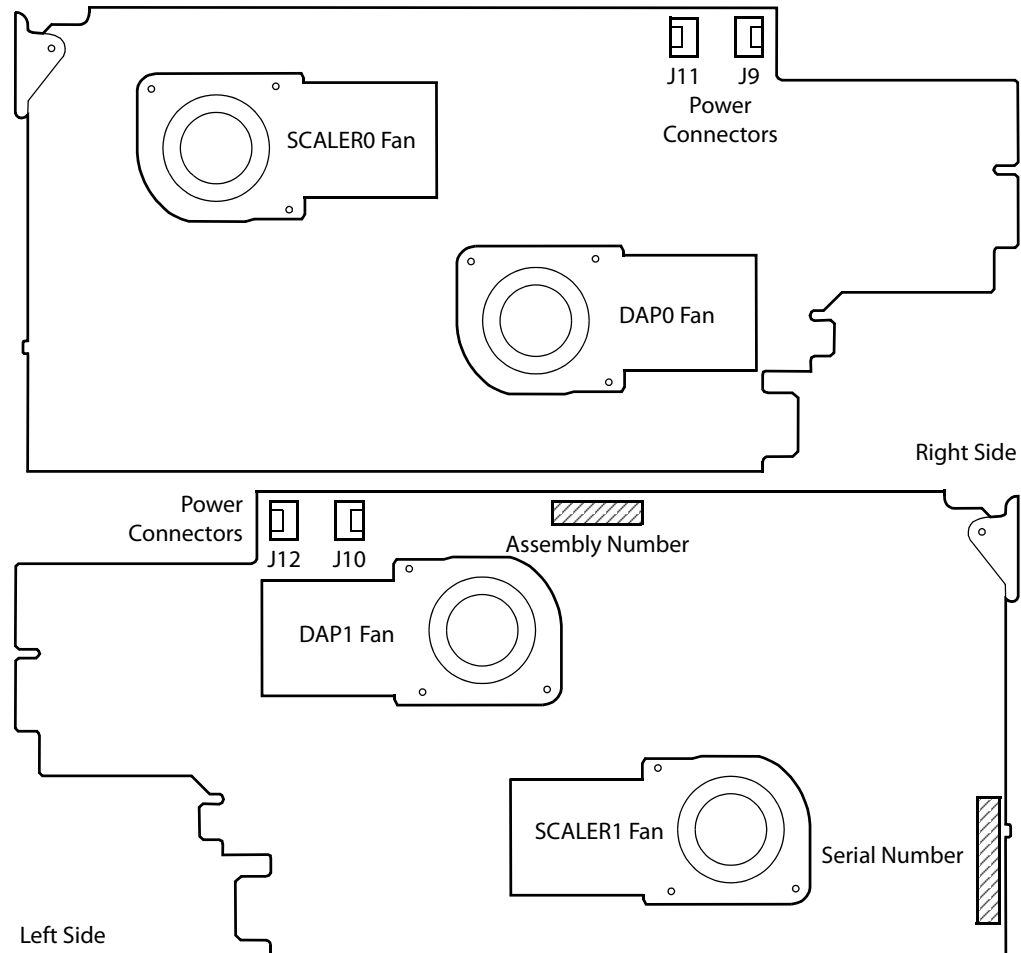
Fans are located on certain cards and within the multiviewer's frame. To replace a fan:

- on a card, see [Replacing KMX-3911 Card Fans](#), on page 136.
- within the multiviewer's frame, see [Replacing Frame Ventilation Fans](#), on page 140.

Replacing KMX-3911 Card Fans

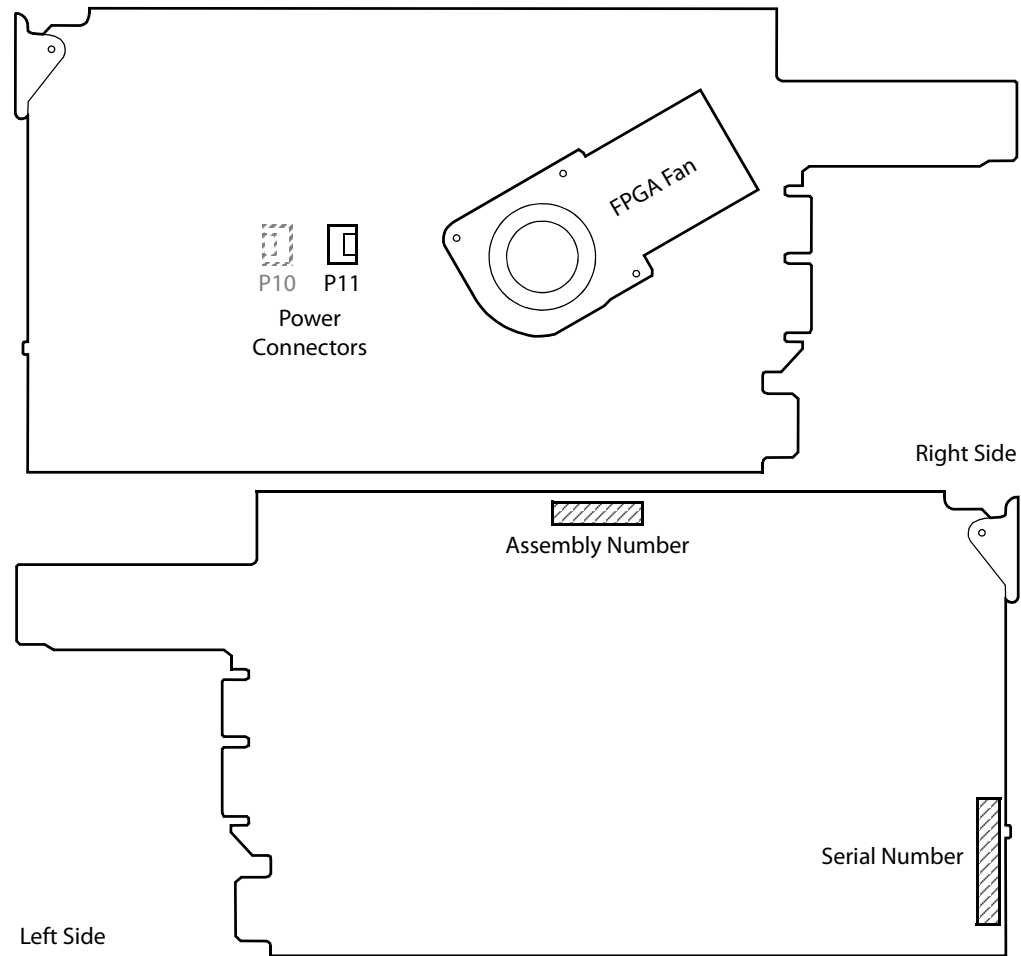
Note: Fans must be connected to their intended power connector shown in the tables below for XEdit to be able to correctly identify the specific fan that has failed.

The location of the fans on the KMX-3901-IN card are shown below. The number of fans on a card depends on the model.



XEdit Fan Fail Alarm	Applies to model			Uses Power Connector
	KMX-3901-IN-8-D	KMX-3901-IN-16-D	KMX-3901-IN-16-Q	
SCALER0 Fan Failed	●	●	●	J11
DAP0 Fan Failed	●	●	●	J9
DAP1 Fan Failed		●	●	J12
SCALER1 Fan Failed			●	J10

The location of the fan on the KMX-3901-OUT card is shown below.



XEdit Fan Fail Alarm	Uses Power Connector
FPGA Fan Failure	P11

Fan Replacement Kit

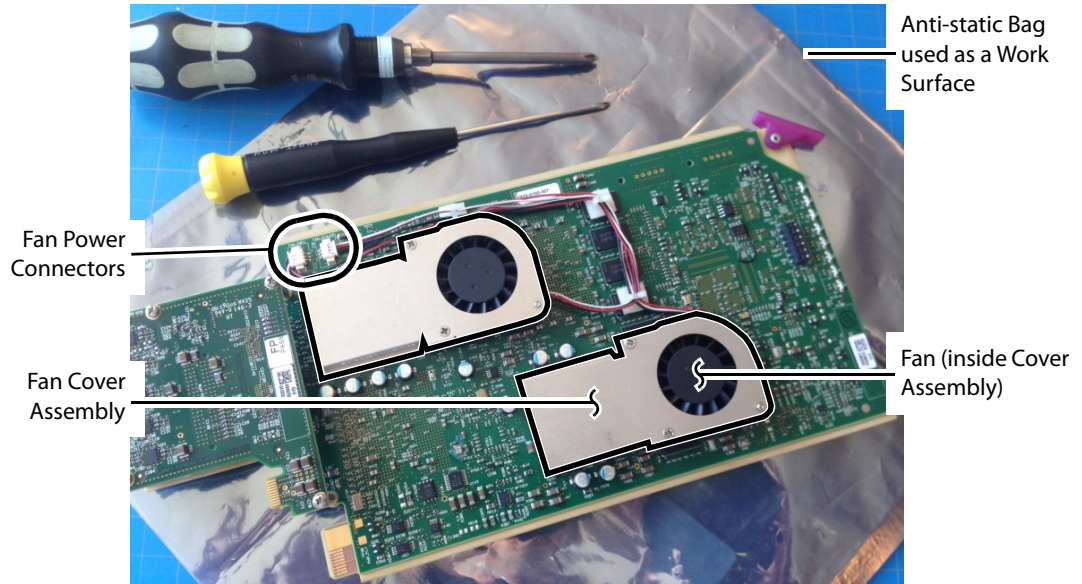
The fan replacement kit is available by contacting Customer Support. See [Grass Valley Technical Support](#), on page 168. The location of the card's part number and serial number is shown in the illustrations above.

Required Tools

The following field-supplied material is required:

- Compressed air to remove dust from the card.
- Flashlight to perform a visual inspection to confirm fan rotation.
- Phillips screwdrivers:
 - #1 jeweler's screwdriver with a miniature shaft to remove the fan from the fan cover assembly and install the replacement fan back onto the fan cover assembly.

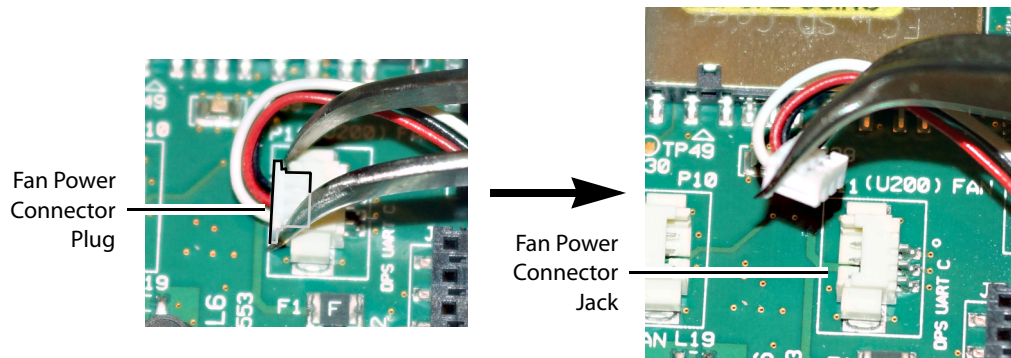
- #2 screwdriver to remove and install the fan cover assembly.
- Curved tweezers to disconnect the fan's power connector from the KMX-3901 card.
- Anti-static bag or anti-static work surface to reduce the possibility of electrostatic discharge damage to the card.



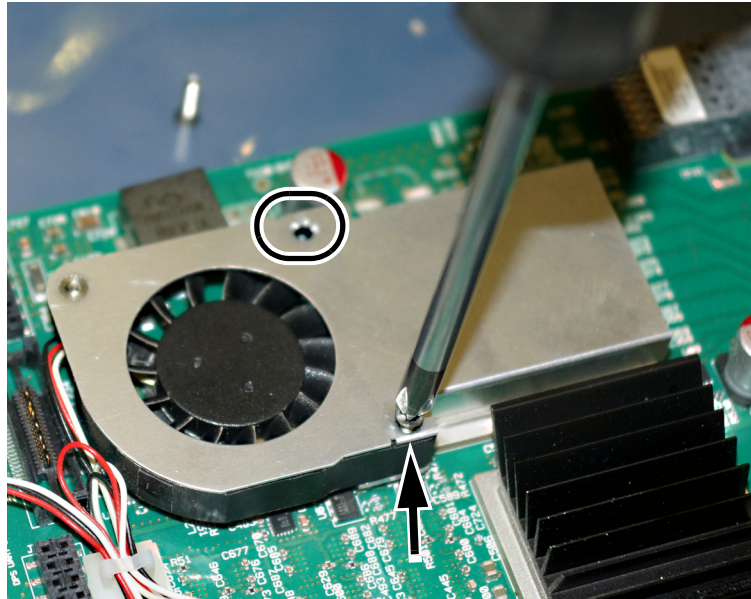
Typical card with onboard fan, screwdrivers, tweezers, and anti-static bag

To replace a fan

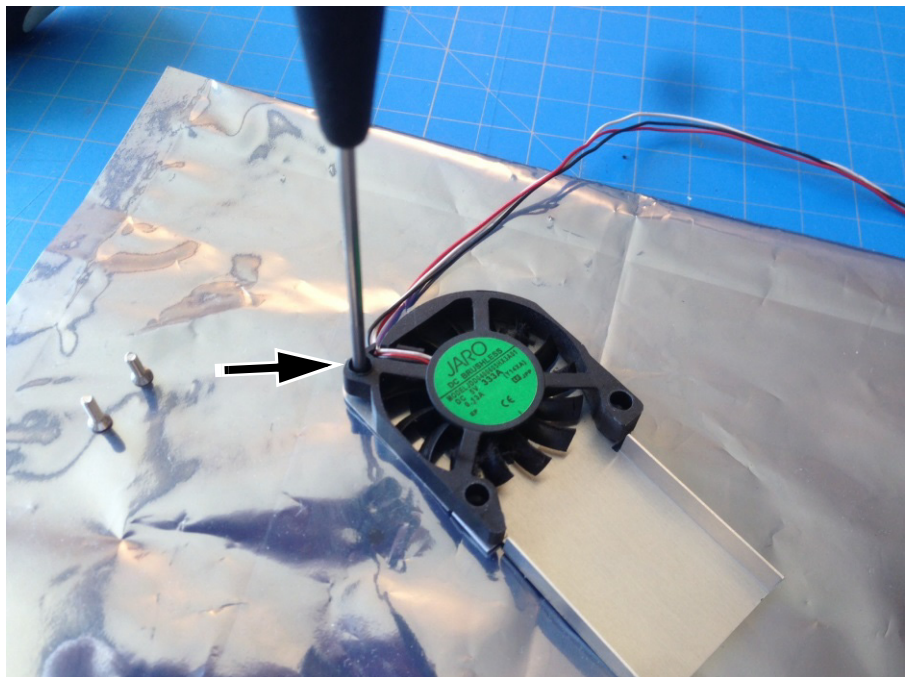
- 1 During off hours when the system is not in use, eject the card from the multiviewer's frame. See [Replacing Cards](#), on page 132.
- 2 Place the card on an anti-static bag or anti-static work surface.
- 3 Using curved tweezers, disconnect the fan power connector plug, very carefully; gently wiggle the connector plug from the socket (jack). Do not pull on the wires. If the wires are routed through wire holders, remove the wires from the holders first, before disconnecting.



- 4 Free up the fan cover assembly by removing the 2 screws in the middle. Once the 2 screws are removed, remove the fan cover assembly.



- 5 Flip the fan cover over, and remove the last screw holding the fan with the #1 Phillips screwdriver.



- 6 Remove any accumulated dust from the card with compressed air.
- 7 Replace the fan with the new one, and replace all screws, in the reverse order.
- 8 Route the fan's power wires through the wire holders, and make the connection to the card's fan power connector.
- 9 Restore system operation by inserting the card back into the multiviewer's frame. See [Replacing Cards](#), on page 132.

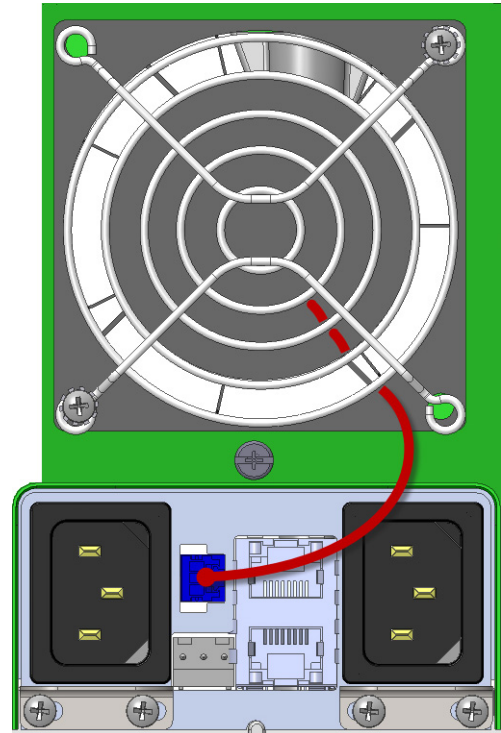
Put the multiviewer into operation and confirm that the critical temperature and fan alarms remain inactive.

Replacing Frame Ventilation Fans

The main cooling fan on the rear of Kaleido-MX 4K (3RU) frames may be replaced in case of failure. Replacement fans are Grass Valley part number 1971-2700-200.

To replace the frame ventilation fan in a Kaleido-MX 4K (3RU)

- 1 Grasp the fan unit's power connector, and pull it straight out of its power outlet located below the fan assembly, to the right of the left-hand power socket.
- 2 Remove the two screws that secure the grill and fan unit to the frame.
Retain the screws and grill, as they will be used with the replacement fan.
- 3 Pull the unit away from the frame.
- 4 Locate the arrow on the side of your new fan unit, and position the unit with the arrow pointing away from the frame, and with the power feed hanging from the bottom right corner of the unit.
- 5 Use the two screws you retained from the old fan, to install the new fan and grill.
- 6 Grasp the power connector, and push it onto the power outlet.



Replacing the Frame's Air Filter

You may remove the air filter for cleaning or replacement.

To replace the air filter

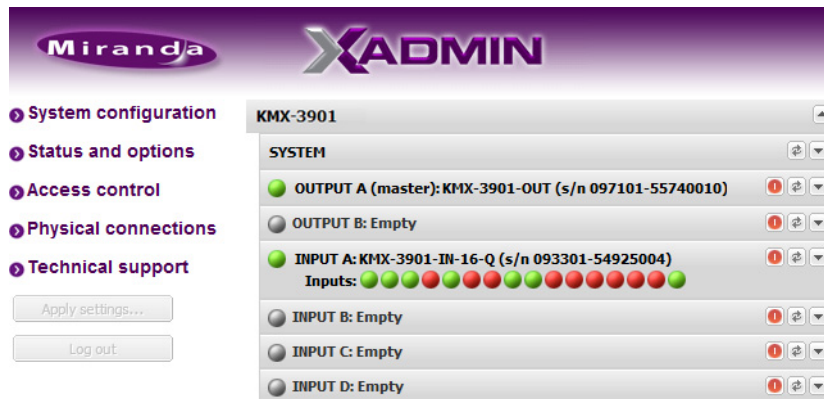
- 1 Open the front panel of the frame (see [Opening the front door](#), on page 131).
- 2 Remove the two screws that secure the metal retainer bar inside the door, and set the screws and bar aside.
- 3 Grasp the top of the filter installed on the rear of the door, and pull it gently out of its mounting slot.
- 4 Slide the filter into the slot at the bottom of the front panel door, and ensure that the filter is not bunched or folded.
- 5 Install the metal retainer bar and its two screws.
- 6 Close the front panel of the frame (see [Closing the front door](#), on page 131).

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. [Opening XAdmin](#), on page 76.
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.

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.

Multiviewer may require new assignments

As of Kaleido Software version 7.51, URS time code information appears under the SYSTEM module. You may need to reassign text, alarm, and time code levels, in the sources table, after you have upgraded from version 7.50 or earlier.

You may need to upgrade the Kaleido Software, BEFORE upgrading the Densité controller's CPU-ETH2 firmware to version 2.2.0 (or higher)

Multiviewers with a version of the Kaleido Software *earlier than 7.20* are not compatible with CPU-ETH2 version 2.2.0 (and later). Using these multiviewers with a Densité controller that has *version 2.2.0 or higher* of the CPU-ETH2 firmware may result in an inoperative multiviewer system, in which case you might need assistance from Grass Valley Technical Support.

Multiviewer may require a frame controller upgrade

To fully benefit from the auto recovery features introduced in Kaleido Software version 7.20, this multiviewer requires a controller with at least version 2.2.0 of the CPU-ETH2 firmware, and a 4 GB CompactFlash storage card. (With version 2.1.2 of the CPU-ETH2 firmware, or with less than 4 GB CompactFlash storage capacity, only IP address information, and frame configuration are recovered from the Densité CPU-ETH2 controller non-volatile memory.)

Multiviewer requires new restore points saved AFTER controller upgrade

After you have upgraded the CPU-ETH2 firmware *from version 2.1.2 (or earlier)* to version 2.2.0 (or higher), you must save restore points to the CPU-ETH2 controller's non-volatile memory, for all your multiviewer cards. See [Saving Restore Points to the CPU-ETH2 for All Cards](#), on page 47. Refer to the Densité CPU-ETH2 Release Notes for more information.

IMPORTANT (*continued*)

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 versions 8.70 and 6.50 introduce a hard compatibility break with previous Kaleido Software versions.

Cluster backups you create with version 8.70 and 6.50 (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 or pre-6.50 version, to version 8.70 or 6.50 (or higher) respectively.

Virtual alarms used in iControl Web pages

The internal representation of virtual alarms has changed as of version 6.30 of the Kaleido Software. If you are upgrading the multiviewer from a version prior to 6.30, then, once the upgrade is completed, it will be necessary to reassign any virtual alarms that were created on the multiviewer before the change, and used in iControl Web pages. Virtual alarms created in iControl are not affected.

iControl Alarm latching

As of version 6.60 of the Kaleido Software, multiviewer GSMs have their *acknowledgement snooze duration* set to 0 ms, by default. If you have set a non-default value for the acknowledgement snooze duration in the past, you may want to verify whether it is appropriate for your current purposes:

- 1 In the GSM alarm browser, click the **Admin** tab, and then click **Configuration** on the second-level tab bar.
- 2 Review the value indicated for **Acknowledgement snooze duration**.
- 3 Set it to 0 ms if needed, and then click **Save**.

Upgrade Overview

Upgrade packages are made available by download from a Grass Valley FTP server. The format of the file should be 971-31G01-xxx.zip. The upgrade package contains:

- the Kaleido Software Upgrade Manager application required to upgrade the multiviewer.
- one or more Kaleido Software operating system (.os, .zip, or .run) files.
- documentation, including the Release Notes.

If you do not have the upgrade package, contact Grass Valley Technical Support (see [Grass Valley Technical Support](#), on page 168).

If you have a **cascade system**, refer to the *Cascade Upgrade* section, in the Cascade Step-by-Step Configuration guide for your system (see [Related Documentation](#), on page 17).

You will need a USB key (not supplied) and a mouse to perform an upgrade of the Kaleido Software system. The USB key should be USB2.0 compliant, have a capacity of at least 1 GB, and must be



formatted using the FAT32 file system. See [Upgrading the Multiviewer Using a USB Key](#) on page 144.

Upgrading the Multiviewer Using a USB Key

IMPORTANT

Before upgrading the multiviewer system, review the following.

Kaleido-MX 4K

The *first time* you upgrade a Kaleido-MX 4K from version 7.80 R5 (or earlier) to version 7.82 (or later), expect an additional delay, after the multiviewer has restarted at the end of the installation process. See [Kaleido-MX 4K input cards](#) on page 149.

Upgrading from a version prior to 6.60

Version 6.60 of the Kaleido Software introduced a change in the **alarm debouncing calibrations**, which could result in alarms being raised earlier and more frequently, after upgrading. The following properties have been removed from the list of configurable parameters: **Occurrences** and **Detection window**. After the upgrade, the system behavior will be based on 1 occurrence of an alarm event. A detection window is no longer used.

If, prior to the upgrade, the **Occurrences** parameter was set to a value other than 1, then you will need to revise the **Set duration** value after the upgrade to take this change into account. For example:

- **Before the upgrade** — If you had the following settings: Occurrences = 3, Duration = 5 seconds, before the upgrade, then an alarm would be raised after 15 seconds.
- **After the upgrade** — The former settings will be replaced with the following: Set duration = 5 seconds, and the alarm will be raised after 5 seconds.

In this example, after the upgrade, you should set the **Set duration** parameter to 15 seconds to maintain the same behavior.

It is recommended to review and note down the alarm debouncing calibrations prior to the update, and to re-calibrate the alarm debouncing as needed after the upgrade.

To upgrade your multiviewer

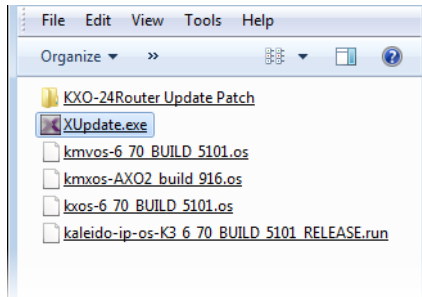
- 1 Copy the upgrade package files to a USB key (see [Preparing a USB Key](#), on page 144).
- 2 Upgrade your multiviewer's Kaleido Software and firmware from the USB key (see [Upgrading the Kaleido Software and Firmware](#), on page 146).
- 3 Verify the version number to confirm that the upgrade was successful (see [Verifying the Version Number](#), on page 149).

Preparing a USB Key

To copy all files required for the upgrade to a USB key

- 1 Download the update files onto your PC's hard drive. See [Software and Firmware Updates](#), on page 18.
- 2 Insert a USB key into one of your PC's USB ports.

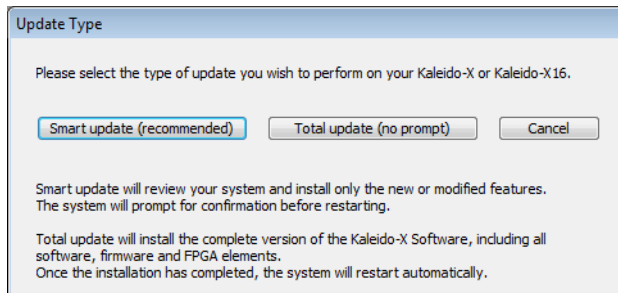
- 3 Locate and open the Kaleido Software Upgrade Manager application (XUpdate).



- 4 On the startup screen, click the appropriate update option for your multiviewer model:
KMX-3901 update

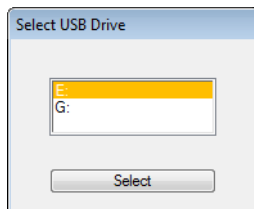


- 5 When prompted to select a type of update, click **Smart update (recommended)**.



Note: If you click **Total update (no prompt)**, then the update process, once initiated, cannot be halted. This option should only be used to recover from a failed upgrade.

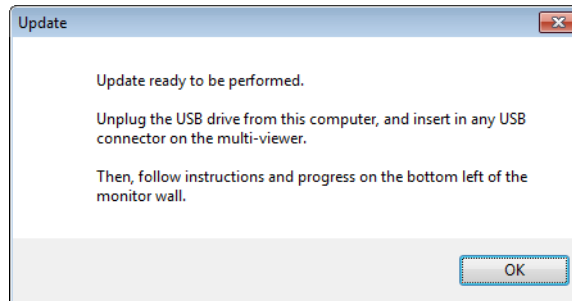
- 6 If the **Select USB Drive** window appears, click the letter corresponding to the USB key you inserted in step 2, and then click **Select**.




- 7 When prompted to select an update file, locate and open the following Kaleido Software operating system file, with the following format: `kmxos - 9.00_build_xxxx.os`

The `.os` file will be copied to the USB key. This may take a few minutes.

When the copying process has finished, a message appears.



- 8 Click **OK**.
- 9 Click **EXIT** on the startup screen.
- 10 Click the **Safely Remove Hardware** icon  in your desktop's notification area, and then click the USB key on the menu. When a message informs you that it is safe to remove the key, do so.

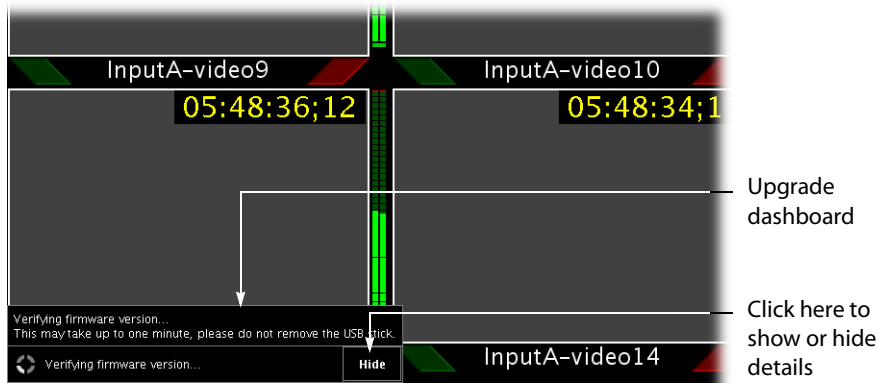
Upgrading the Kaleido Software and Firmware

At this point, you are ready to upgrade the Kaleido system software and firmware. The multiviewer should be powered up, with an active monitor wall display. You will need access to the monitor wall to observe the progress of the upgrade, and you will use a mouse to trigger a system restart from the monitor wall, once the upgrade has completed:

- If you have a Kaleido-RCP2, make sure that it is connected, and that you can use the mouse to move the pointer on the monitor wall. If the mouse is unresponsive, try rebooting the Kaleido-RCP2 by pressing **ENTER+ESC+DEL** on the Kaleido-RCP2's keypad.
- If your system does not include a Kaleido-RCP2, connect the mouse directly to a USB port on the multiviewer, and then make sure you can move the pointer on the monitor wall. See [Troubleshooting with the card's front edge USB connector](#), on page 151 for more information about using the USB port on the multiviewer.

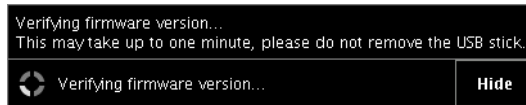
To upgrade the Kaleido system software and firmware

- 1 Insert the USB key into any USB port on the multiviewer. After a while, a message appears at the bottom left corner of the monitor wall, reporting that the Upgrade Manager is verifying software, firmware, and safe mode versions.



Note: You can click the **Details** button to view more information. The button label alternates between **Details** and **Hide**.

The firmware verification process may take a minute or so.



Note: If nothing happens, verify that you have loaded onto the USB key the correct Kaleido Software operating system file, with the following format: `kmxos-9.00_build_xxxx.os`

- 2 Once the verification process is complete, you will be advised what upgrade action, if any, needs to be performed.



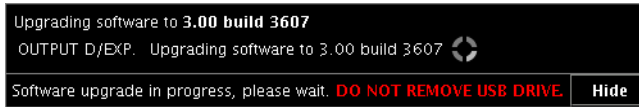
IMPORTANT

To cancel the upgrade process, you must click to ABORT within 30 seconds.

During the 30-second countdown period, you may expect that removing the USB key will cancel the upgrade. However, if you do so, the system will still report that it is updating the software, but the upgrade will fail after a minute or so.

Insert the USB key again to properly update your system.

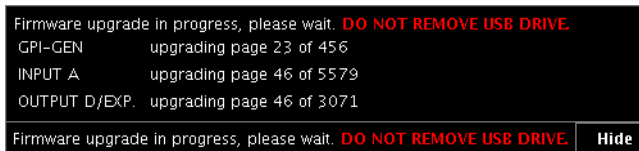
- 3 The upgrade process begins automatically, starting with the Kaleido Software upgrade.



IMPORTANT

In **Kaleido-MX 4K** multiviewers, all cards are updated in parallel, during which time their status LEDs will be flashing red. Do not interrupt this process. Do not insert or remove cards while an upgrade is in progress.

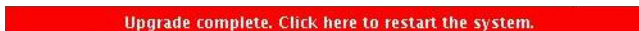
- 4 Once the Kaleido Software upgrade is complete, the firmware upgrade begins.



Note: Should the upgrade dashboard report that some cards' software upgrade could not be completed, then proceed with [Troubleshooting an Incomplete Upgrade](#), on page 149.



When the entire upgrade process has successfully completed, a red button appears at the bottom of the dashboard on all displays that are connected to the system.



- 5 Click any of the **Upgrade complete** buttons to restart the system.

Note: When the firmware upgrade (or downgrade) process involves several cards (for example, a fully populated expansion system), the dashboard may still be displaying firmware upgrade progress messages while the **Upgrade complete** button has already appeared. You can safely click the button to restart the system at this point.

The multiviewer now restarts.

IMPORTANT

Kaleido-MX 4K input cards

If this is the *first time* you upgrade a Kaleido-MX 4K, from *version 7.80 R5 (or earlier)* to *version 7.82 (or later)*, then an additional update process will now start on the *input* cards. This may take up to 20 minutes, after which the input cards will automatically restart. When you next upgrade your system the entire input card update will take place at the same time as the output card update, and no additional card restart will be required.

Troubleshooting an Incomplete Upgrade

Should the upgrade dashboard report that some cards' software upgrade failed, in a **Kaleido-MX 4K** multiviewer, then follow the troubleshooting steps below to bring the update to completion.

To bring a partially failed upgrade to completion

- If your system includes *only one output card*, and it failed to be upgraded, remove the USB key, and then repeat the upgrade procedure (see [Upgrading the Multiviewer Using a USB Key](#), on page 144).
- If the upgrade was successful on at least one output card, then:
 - a Power down every *output* card by tilting its swivel handle, to lever the connectors apart, and then use the handle to pull the card part way out of its slot.
 - b Power down the *input* cards, in the same fashion.
 - c Reseat a successfully updated *output* card.
This card becomes your system's *master card*.
 - d Once the master card's startup process has completed, reseat all other cards.

At this point, the system will recognize that the software version on some cards does not match the master card's version, and a *live update* process will start, to automatically bring all cards to the same version. At the end of the process, all updated cards will automatically restart.

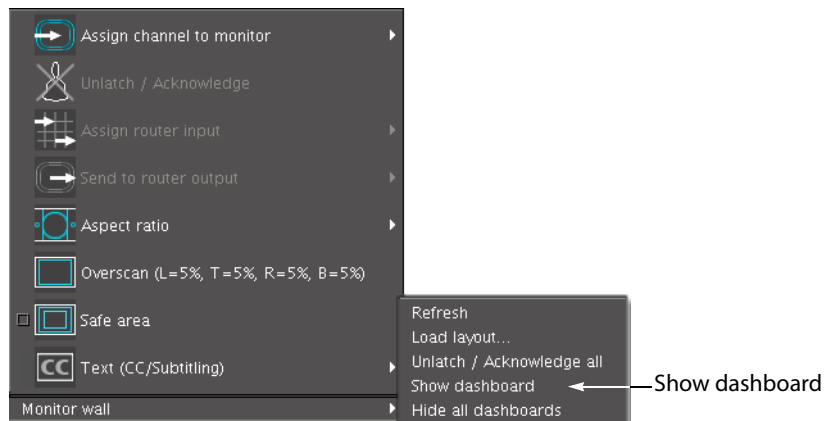
Verifying the Version Number

You can verify the new version number by displaying the dashboard on the monitor wall.

Displaying the Dashboard

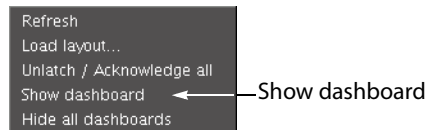
To display the dashboard

- 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

Downgrading the Multiviewer System

IMPORTANT

Before downgrading your Kaleido Software system, review the following.

- **Alarm debouncing may need to be recalibrated:** before downgrading from version 6.60 (or later) to version 6.50 (or earlier) of the Kaleido Software, make sure to review your system's alarm debouncing calibrations, some of which you may have to modify if you wish to maintain the same behavior. See [Upgrading from a version prior to 6.60](#), on page 144 for details.
- **Kaleido-MX 4K:**
 - Kaleido-MX 4K multiviewers cannot be downgraded to a Kaleido Software version earlier than 7.70.
- **Router control:** as of Kaleido Software version 4.00, router configuration changes made in Router Manager Configurator are not compatible with earlier versions of the Kaleido

Software. Downgrading is supported but any change to the router configuration made in Kaleido Software version 4.00 or later will be lost during the downgrade. After downgrading, any router configuration will have reverted to what it was before the last upgrade.

To downgrade your multiviewer to an earlier version of Kaleido Software

- Follow the upgrade instructions in the Release Notes that were published for the Kaleido Software version you want to downgrade to.

Troubleshooting

Troubleshooting with the card's front edge USB connector

A USB mouse can be directly connected to the multiviewer card 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 supported by that card.
- When more than one display is connected to the card, 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.

Dashboard Messages

The following tables explain messages that may appear in the *Status dashboard* (lower right corner) and in the *Upgrade dashboard* (lower left corner), on the Monitor wall.

Status dashboard messages

Message	Description
Duplicate IP Address Detected	Another equipment on the network shares the same IP address as an output card.
Duplicate frame IP address	Another equipment on the network shares the same IP address as the multiviewer system (in a multiple output card setup).
Ethernet Link Down	The output card to which this display monitor is connected has lost its network connection.
Card temperature critical	Card is overheating, which might result in decreased system performance (e.g., green dots, flickering, card not starting). You should halt operations until the overheating problem is resolved.
Card temperature high	Temperature warning; this indicates that the card is warmer than normal and that you should verify cooling and ventilation (e.g., check for anything obstructing the ventilation openings).
Critical voltage upper limit reached	One of the voltages is above its critical threshold.
Critical voltage lower limit reached	One of the voltages is below its critical threshold.

Status dashboard messages (*continued*)

Message	Description
Critical current upper limit reached	Current or power is above its critical threshold.
FPGA fan failed	FPGA fan failed
Firmware status	Tells whether firmware is running properly on the card.
HDMI 0 power failed	HDMI output for first head has a power failure.
HDMI 1 power failed	HDMI output for second head has a power failure.

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
Source signal input is unavailable.	Signal feed is unavailable.	Apply a signal from signal generator test set or another source to the multiviewer's input.	Verify what the input status LEDs show. See Card Interfaces , on page 28.
	Poor connection	The input status LED is amber.	Trace the cable's path and ensure connections at both ends are good.
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 for each card. See Enabling Options , on page 122. Valid licenses have a green dot.	Purchase and install a license for each card as required. Contact Technical Support for more information and see Available Hardware and Software Options , on page 122. See Grass Valley Technical Support , on page 168.
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 20. See Related Documentation , on page 17.
Layout changes aren't propagated properly. Signal probing and metadata extraction doesn't work properly	All network interfaces have not been configured or all necessary network connections have not been made to a switch	In XAdmin, <i>Physical Connections</i> , verify the frame's connection status.	Follow the help instructions in the right pane to correct any network configuration issues. Ensure the frame is properly connected to a switch. See Cabling Diagram , on page 33.
System behaves erratically and unpredictably	The card's database has become corrupted.	-	Using XEdit, restore a database backup

Symptom	Probable cause	Test	Corrective action
Occasional frame repeats. At failure, a brief impact on whole display is noticed. ½ second to re-lock.	Loss of Genlock signal.	System will switch over to its internal frame rate. See the reference source shown in XAdmin.	Make sure that the external reference is connected to the multiviewer. See Reference Modules , on page 38.
Input / Output card live update: Downgrade to Kaleido Software V7.3X or lower did not work	In a system using Kaleido Software V7.3X or earlier, if you replace an output card with a card that shipped with Kaleido Software V7.40 or higher, initially or after repairs, the system may not automatically downgrade the new card ^a .	-	Upgrade the multiviewer to Kaleido Software V7.40 or higher
	In a system using Kaleido Software V7.3X or earlier, if you replace an input card with a card that shipped with Kaleido Software V7.40 or higher, initially or after repairs, the system will not automatically downgrade the new card.	-	Prepare a USB key with the Kaleido Software version you want to keep using, and reapply the upgrade (see Upgrading the Multiviewer , on page 142). Refer to the upgrade instructions in the Release Notes that were published for this earlier software version.

a.KMX-3901-OUT cards with the latest hardware are not compatible with Kaleido Software versions earlier than 7.40.

Should you need further assistance, see [Grass Valley Technical Support](#), on page 168.

Swapping around a Card 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 cards around in the multiviewer's frame to see if the problem follows the card or to see if normal multiviewer operation can be restored.

To swap the position of a card around in the multiviewer, you must first identify two identical cards installed in the multiviewer's frame. For example, the model number marked on each card's ejector tabs are the same. If two identical cards are found, eject both cards from the multiviewer's frame and exchange their positions within the frame before firmly reinserting the cards into the frame. To RMA a defective card, see [Grass Valley Technical Support](#), on page 168.

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. See [Replacing Power Supply Modules](#), on page 133. 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 168.

7 Specifications

This chapter lists equipment specifications for the Kaleido-MX 4K (3RU) multiviewers and their cards.

Kaleido-MX 4K Inputs

Video Inputs (32, 48, or 64)

The supported video input types include SD-SDI, HD-SDI, and 3G-SDI (auto-detected). The processing delay is two fields at the SDI outputs, if the video inputs are genlocked (two or three fields if the video inputs are not genlocked), or four fields at the SDI to HDMI converter's HDMI output. Signal inputs require DIN 1.0/2.3 connectors.

SD-SDI inputs

Signal	4:2:2 SMPTE ST 259-C (270 Mbps), SMPTE ST 272
Formats	525 and 625
Audio	SMPTE ST 274
Return loss	> 15 dB up to 270 MHz
Alignment jitter (100 kHz)	< 0.2 UI
Timing jitter (10 Hz)	< 1 UI
Cable length	250 m (820 ft) (Belden 1694A) 150 m (492 ft) (Belden 1855A)

HD-SDI inputs

Signal	SMPTE ST 292-1 (1.485, 1.485/1.001 Gbps)
Formats ^a	720p29.97, 720p30, 720p50, 720p59.94 1080i50, 1080i59.94 1080PsF23.98, 1080PsF24, 1080PsF25, 1080PsF29.97 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30
Audio	SMPTE ST 299
Return loss	> 15 dB up to 1.5 GHz
Alignment jitter (100 kHz)	< 0.2 UI
Timing jitter (10 Hz)	< 1 UI
Cable length	100 m (328 ft) (Belden 1694A) 45 m (148 ft) (Belden 1855A)

a. The Kaleido Software does not distinguish between 1080PsF25 and 1080i50, between 1080PsF29.97 and 1080i59.94, between 720p29.97 and 720p30, and between 1080p29.97 and 1080p30. On the monitor wall and in XAdmin's Status and Options page, 1080PsF25 is reported as 1080i50, 1080PsF29.97 is reported as 1080i59.94, 720p30 as 720p29.97, and 1080p30 as 1080p29.97.

3G-SDI inputs

Signal	SMPTE ST 424 (2.97, 2.97/1.001 Gbps)
Formats	1080p50 1080p59.94
Audio	SMPTE ST 299
Return loss	> 15 dB up to 1.5 GHz > 10 dB up to 3 GHz
Alignment jitter (100 kHz)	< 0.3 UI
Timing jitter (10 Hz)	< 2 UI
Cable length	100 m (328 ft) (Belden 1694A) 45 m (148 ft) (Belden 1855A)

Graphic converted to HD-SDI from KXI-DVI-Bridge^a

Signal	SMPTE ST 292-1 (1.485, 1.485/1.001 Gbps)
Format	1080p60
Cable length	100 m (328 ft) (Belden 1694A) 45 m (148 ft) (Belden 1855A)

a. A *Dual Channel DVI to HD Bridge* must be connected between the multiviewer and the PC or laptop that provides the graphics to the multiviewer. To order this optional device (Part No. KXI-DVI-BRIDGE), contact your Grass Valley sales representative.

Discrete Audio Inputs

The Kaleido-MX 4K (3RU) models support up to four ABT/MADI audio inputs.

MADI audio inputs

Signal	AES10-2008
Sampling frequency	48 kHz nominal, 64 channels, synchronous with video reference signal
Return loss	≥ 15 dB 100 kHz to 125 MHz
Cable length	100 m (325 ft) (Belden 8281 or Belden 1694A)
Connector	Coaxial via DIN 1.0/2.3, 75 Ω

ABT audio inputs

Signal	SMPTE ST 259-C (270 Mbps), SMPTE ST 305
Format	SDTI
Return loss	> 15 dB up to 270 MHz
Alignment jitter (100 kHz)	< 0.2UI
Timing jitter (10 Hz)	< 1UI
Cable length	250 m (820 ft) (Belden 1694A) 150 m (492 ft) (Belden 1855A)
Connector	DIN 1.0/2.3

Kaleido-MX 4K Outputs

The Kaleido-MX 4K (3RU) supports one seamless quad link (square division) 4K UHD output (with embedded audio), using the multiviewer's four SDI monitoring outputs.

3G-SDI monitoring outputs

Signal	SMPTE ST 424 (2.97 Gbps / 2.97/1.001 Gbps)
Formats (Level A only)	1080p 50 Hz 1080p 59.94 Hz
Audio	SMPTE ST 299-1 (limited to one pair, embedded on group 1, pair 1)
Return loss	> 15 dB up to 1.5 GHz > 10 dB up to 3 GHz
Alignment jitter (100 kHz)	< 0.3 UI
Timing jitter (10 Hz)	< 2 UI
Cable length	100 m (328 ft) (Belden 1694A) 45 m (148 ft) (Belden 1855A)
Connectors	DIN 1.0/2.3
Quantization	8 bits

The Kaleido-MX 4K (3RU) multiviewer models support one progressive scan HDMI 2.0 output, via the quad link SDI to HDMI converter that ships with each multiviewer.

HDMI output

Signal	HDMI 2.0
Format	4K UHD TV (3840 × 2160) Supported refresh rates: 50 Hz and 59.94 Hz
Audio	24 bits (one pair, embedded on group 1, pair 1)
Connector	HDMI standard type A connector
Signal path	8 bits 4:2:0 YCbCr

The Kaleido-MX 4K (3RU) supports four analog audio outputs:

Analog audio outputs

Signal	Unbalanced analog stereo
Impedance	10 k Ω
Level	2 V p-p
Connector	WECO

Kaleido-MX 4K Control

Reference Inputs

The Kaleido-MX 4K (3RU) models support two reference inputs.

Reference Input

Signal	Any 1 Vp-p nominal signal
Supported formats	SMPTE ST 170 SMPTE ST 318 ITU 624-4 BT 470-6 SMPTE ST 274 SMPTE ST 296
Return loss	> 35 dB up to 10 MHz
Coupling	DC
Level	0.3 Vp-p to 1.5 Vp-p
Impedance	75 Ω bridging
Max. common mode signal	28 Vp-p
Connector	DIN 1.0/2.3

LTC Inputs

The Kaleido-MX 4K (3RU) models support up to five unbalanced LTC inputs, for clock synchronization.

LTC Inputs (3, 4, or 5)

Signal	SMPTE ST 309-1999, SMPTE ST 12-1995 (EBU-3097-E)
Level	500 mVp-p to 10 Vp-p
Impedance	>12 kΩ
Connector	DIN 1.0/2.3

Communication

Ethernet (3)

Signal	10/100 BASE-T
Standard	IEEE 802.3
Connector	RJ-45

Serial ports (2)

Signal	RS-422 (SMPTE ST 207, EBU-3245), RS-485
Connector	RJ-45

USB (2)

Standard	USB version 2.0
Peripherals supported	Mouse, keyboard, memory stick
Connector	USB type A

GPI-1501 GPI I/O module

A GPI-1501 card supports 20 GPI inputs, and 8 configurable GPI inputs/outputs.

GPI INPUT (up to 40)

Description	Contact closure to GND
Connector	DB-44
Pull-up voltage	2.3 Volts
Source current	2 mA when input shorted
Low-level activation	0.8 Volts max
Over voltage	25 Volts max

GPI bidirectional (up to 16)

Description	Contact closure to GND
Signal	Open collector 5 to 12 VDC
Connector	DB-44
<i>Input mode</i>	
Pull-up voltage	2.3 Volts
Source current	2 mA when input shorted
Low-level activation	0.8 Volts max
Over voltage	25 Volts max
<i>Output mode</i>	
Contact closure current	50 mA max
Reverse voltage	-15 Volts max
Reverse current	-50 mA max
V out low	0.6 Volts at 1.5mA

Kaleido-MX 4K (3RU) Frame

Power supply	Hot-swappable redundant power supply
Input voltage	100-240 V AC
Current	3.25–1.35 A
Frequency	50/60 Hz
Power	325 W max
Dimensions	3RU × 485 mm (19 in) × 286 mm (11.25 in)
Weight	6.9 kg (15.2 lb) for 32 × 1 7.3 kg (16.1 lb) for 48 × 1 7.7 kg (16.9 lb) for 64 × 1 <i>Add 0,7 kg (1.5 lb) for the SDI to HDMI converter, if used.</i>
Full spec. temperature range	0–40°C (32–104°F) (ambient)
Max. storage humidity	90% RH non-condensing
Max. functional humidity	65% RH non-condensing
Communication ports	Ethernet 10/100BASE-T
Alarm	GPI contact

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.

Note: This multiviewer does not have an RS-232 serial port for use with other systems and equipment. Any equipment integration must be made using an IP connection. Only use drivers that are IP capable before considering the use of the driver for a solution.

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
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	Jupiter VM-3000 system controller, Venus-series and Trinx-series routers
	ES-Switch protocol (serial) ^f	Yes	Jupiter VM-3000 system controller
Imagine Communications (Harris/Leitch)	Harris XY Passthrough Protocol	No	Platinum, Xplus, Integrator, Via-32, Panacea, Xpress

Specifications

Optional Drivers for Controlling Tally Interface Devices from the Multiviewer

Company	Protocol	Text database download	Routers/Controllers
Lantronix	(Lightwave) Matrix-Hub Protocol	No	Matrix-Hub 1000
Nevion (Network Electronics)	Network Compact (serial)	No	VikinX Compact
	Network Modular (Ethernet)	No	VikinX Modular
PESA	USP (Unsolicited Status Protocol)	No	Cheetah, Tiger, Jaguar, Cougar, Ocelot, Bobcat, TDM3000, PERC2000 system controller
	CPU Link Protocol No.1 (serial)	No	
Quintech	XRM/SRM/MRF/MRM Series Protocol (serial)	No	SRM 2150 Matrix Switching Systems
SAM (Snell/Pro-Bel)	General Switcher Protocol (SW-P-02)	No	
	General Remote Protocol (SW-P-08)	Yes	Halo, Aurora and Sirius Controller (serial control)
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 168).
- d. For Thomson / Grass Valley Series 7000 devices, our current implementation of the Series 7000 Native Protocol supports serial devices, in addition to some Encore system controller models, which are also supported over Ethernet. For other Series 7000 devices you wish to control via Ethernet, use 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.
- f. In the case of the Kaleido-X, and Kaleido-X16 multiviewers, the ES-Switch protocol is only supported with a baud rate of 19200.

Optional Drivers for Controlling Tally Interface Devices from the Multiviewer

Optional 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, Kayenne, Kalypso, Zodiak, KayakDD, Kayak SD/HD, DD35, XtenDD HD/SD series
Ross	Acuity, Synergy, and Vision Tritium series (via the Kalypso Serial Tally Protocol)
SAM (Snell & Wilcox)	Kahuna
Sony	DVS-9000, MVS-8000, MFS-2000

UMD controllers

Company	Device/System
Grass Valley (Thomson)	Andromeda UMD Controller
Image Video	TSI-1000 Tally System Interface (requires option from Image Video)
TSL	UMD Controller (serial, TCP/IP or UDP/IP) <i>IP Limitation:</i> only one screen index can be received per unicast port.

Automation systems

Company	Device/System
Imagine Communications (Harris/Encoda)	D-Series Playout Automation, A7500 Dual Master Automation
Sundance Digital	Fastbreak NXT Automation (requires option from Sundance Digital)

Optional Drivers for Scoreboards and Timers

Scoreboards

Company	Device/System	Sport	Protocol version
Daktronics	All Sport scoreboard controllers	Basketball	ED-16593, Rev 0–1
		Football	ED-16098, Rev 0–1
		Baseball	DD1492305, Rev 0
		Soccer	ED-16804, Rev 0–1
		Volleyball	ED-19266, Rev 0
		Hockey	ED-16092, Rev 0
	Pitch timer (requires All Sport 5000, with All Sport CG version 2.6 or later)	Baseball	DD3030549, Rev 1

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.

A router control device or application can control a Kaleido-X (7RU) or Kaleido-X16 multiviewer's internal router module, or any multiviewer's logical sources and monitor wall destinations, via the *KX Router* logical router. It can also control other logical routers configured within your multiviewer system. In the case of the *KX Router* logical router, the device or application must support the *NVEP Router (NP0016)* protocol.

The supported communications protocols are listed in the following table, with an indication of the supported connection types (TCP/IP or serial), and the dedicated port number on the multiviewer, in the case of a TCP/IP protocol.

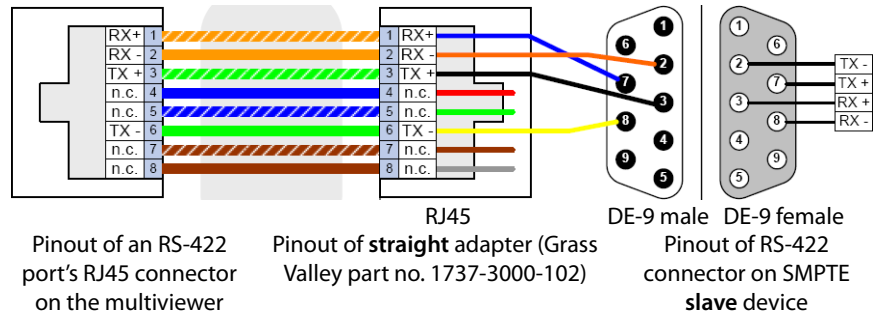
Company	Protocol	TCP/IP (port)	Serial
Grass Valley (Miranda)	Kaleido Remote Control Protocol	Yes (13000)	Yes
Grass Valley (Miranda/NVISION)	NVEP Router (NP0016)	Yes (5194)	No
Nevion (Network Electronics)	Network Compact	N/A	Yes
	Network Modular	Yes (4381)	No
SAM (Snell/Pro-Bel)	SW-P-08	Yes (14000)	Yes
	SW-P-02	Yes (2000)	Yes

RS-422 Connection Diagram

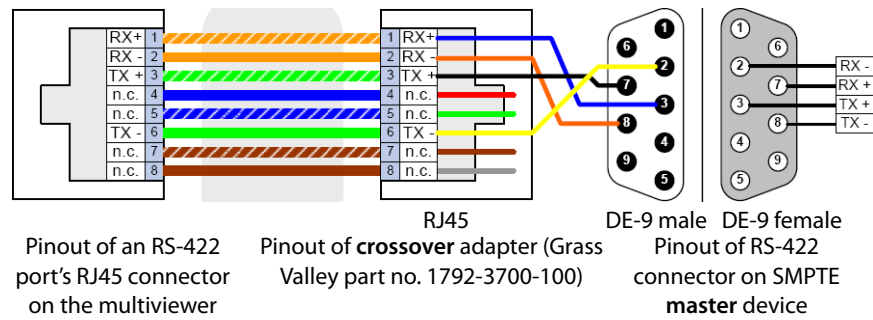
Each output card supports one RS-422 serial port over an RJ-45 connector. This port allows the Kaleido-MX 4K to connect to external serial devices such as a router, production switcher, or router controller.

Note: The RS-422 ports each have an RJ-45 connector in order to preserve space on a busy panel. The RS-422 interface specifies a DE-9 connector, so if you are using this interface, you will require a DE-9-to-RJ-45 adapter. Grass Valley supplies two adapter models, correctly wired for this application: a straight adapter (part no. 1737-3000-102), and a crossover adapter (part no. 1792-3700-100).

The pinout for the RS-422 signals on the RJ-45 connectors, and the wiring diagrams for the appropriate adapters, are shown here:



Standard wiring between multiviewer and devices wired to SMPTE "slave" specification (e.g. most routers, Ross Synergy switchers, Neveon ETH-CON)



Standard wiring between multiviewer and devices wired to SMPTE "master" specification (e.g. Philips Jupiter router control system, Grass Valley Presmaster PCS)

Note: The two RS-422 ports on the multiviewer side have no ground pin. Using the appropriate DE-9S-to-RJ-45 adapter, an external device should be able to communicate with a multiviewer despite the lack of a ground.

For more information about the serial ports' specifications, see [Serial ports \(2\)](#), on page 161. For more information about the RS-422 serial connections, see the "Serial Connections" section in the *Routers* chapter of the Kaleido Software User's Manual. See [Related Documentation](#), on page 17.



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, 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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