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A **BELDEN** BRAND

KMX-3921

SCALABLE KALEIDO MULTIVIEWER FOR DENSITÉ 3+

Installation & Service Manual

M3033-9903 AC

2018-06-19

www.grassvalley.com

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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.

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.

Recycling

Visit www.grassvalley.com for recycling information.

Certification and Compliance

Safety of Laser Modules



This equipment may incorporate modules containing Class 1 lasers. These modules are certified by the manufacturer to comply with:

- IEC/EN 60825-1:2014 Safety of laser products

Electromagnetic Compatibility



This equipment has been tested for verification of compliance with FCC Code of Federal Regulations, Title 47, Part 15 (47 CFR 15), Subpart B, Class A, Digital Devices, Unintentional Radiators.

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.



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

- EN 55022:2010 Class A radiated and conducted emissions
- EN 61000-3-2:2014 Limits for harmonic current emissions
- EN 61000-3-3:2013 Limitation of voltage changes, voltage fluctuations and flicker
- EN 61000-4-2:2009 Electrostatic discharge immunity
- EN 61000-4-3:2006+A1:2008+A2:2010 Radiated, radio-frequency, electromagnetic field immunity
- EN 61000-4-4:2004+A1:2010 Electrical fast transient/burst immunity
- EN 61000-4-5:2006 Surge transient immunity
- EN 61000-4-6:2009 Conducted disturbances immunity
- EN 61000-4-8:2010 Power frequency magnetic field immunity
- EN 61000-4-11:2004 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
组装风扇 Fan assemblies	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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1 Overview

Welcome to the Kaleido family of multiviewers! This Installation & Service Manual is designed to help you get your KMX-3921 multiviewer up and running. The following chapters will guide you through the installation of a KMX-3921 system in its default configuration. This chapter provides an overview of the KMX-3921 unit.

The KMX-3921 is a flexible and scalable 4K- and HDR-ready multiviewer for TV production optimized for the space, power and weight considerations found in studios and outside broadcast trucks.

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 Multiviewer Product Comparison Charts
M770-9905	Kaleido Multiviewer Documentation Resource Guide
M3033-9903	KMX-3921 Installation & Service Manual
M969-9900	Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual
M3007-9900	Densité 3+ FR4 Housing Frame User 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
Published online	iControl Online Help iControl Solo Online Help
M3033-6202	DXF-300-F Optical AV Media Extender Installation Guide

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

The KMX-3921 multiviewer can be installed in either a Densité 3+ FR1 frame or a Densité 3+ FR4 frame. The KMX-3921 cards are installed in the frame with a corresponding back panel that is installed at the rear of the frame. Each KMX-3921 card can display up to nine SD, HD, or 3G-SDI video sources in up to nine video windows across one or two high-resolution mosaic outputs. Combine up to six KMX-3921 cards, to configure a single-, dual- or quad-mosaic output system in a range of sizes (see [Supported Frames and Multiviewer Scaling](#), on page 13). According to the number of KMX-3921 cards chosen for an installation, a correspondingly sized rear panel is used to interconnect the cards.

The connectors for KMX-3921 multiviewer's SDI inputs and mosaic SFP outputs are located on the multiviewer's rear panel. The mosaic outputs require one or two SFP output modules for connection to a display.

The multiviewer can be genlocked to the frame's reference. For the Densité 3+ FR1 frame, the optional REF-1801-FR1 card must previously have been installed in the frame.

The KMX-3921 is ideal for production monitoring in trucks. It integrates tightly with other Densité signal processing cards, routers and production switchers.

Features and Limitations

Feature Support

KMX-3921 features

Feature	Description
Space-efficient modular design	Modular design offers wide range of input/output configurations, for streamlined, cost-saving cabling and optimization of space usage. Standard Densité 3+ frame housings enable <i>mix-and-match</i> capability of multiviewers with signal processing modules, URS frame reference, and GPI I/O via GPI-1501 cards.
Unmatched image quality	Unmatched multiviewer picture quality, and superior on-screen graphics. Mosaic outputs at full 1080p 50/60Hz resolution on up to four multiviewer displays. Input signal processing up to 3 Gb/s signal formats. Capable of producing a seamless, pixel-perfect 4K UHD quad-link mosaic output image.
Robust and serviceable design	Hot swappable cards with unique auto-recovery feature, which provides fast automated recovery after a <i>cold</i> spare is inserted. Densité 3+ frame housings, with redundant power supplies, and quiet cooling.
Multi-room, multi-user oriented	A single KMX-3921 multiviewer can be used to share sources across multiple rooms or operator positions, with fully independent displays, audio monitoring and control panels dedicated to each operator.

KMX-3921 features (continued)

Feature	Description
Seamless control across multiple multiviewers	Kaleido multiviewers can be <i>mixed and matched</i> to create a seamless monitoring system across a facility. Choice of control options such as the standalone Kaleido-RCP2 or RCP-200 panels, integrated with router control systems and panels, iControl, and third-party control systems.
Scalable for the largest systems	Virtually limitless multiviewer system expansion with an upstream router.
High Dynamic Range Support and Wide Color Gamut support ^a	Support for HDR and WCG input signals. This supports a mix of multiviewer signal input types (SDR, HDR, color gamut) to be viewed in the mosaic output at the same time within the limits of the ITU Rec. 709 output. The HDR format permits the display of a wider range of luminance between the brightest and darkest parts of an image. WCG permits an extended color space range of an image.
SDR mosaic output	The mosaic outputs always use Standard Dynamic Range (SDR) and colors according to ITU Rec. 709.

a. Optional. See [Available Hardware and Software Options](#), on page 120.

Supported Frames and Multiviewer Scaling

The frame the KMX-3921 multiviewer is installed in and the frame's controller model has a direct effect on the multiviewer's implementation:

- A KMX-3921 9 × 1 or 9 × 2 multiviewer can fit in either a Densité 3+ FR1 or Densité 3+ FR4 frame (with any frame controller model type).
- All other larger multiviewer models are only compatible with a Densité 3+ FR4 frame that is equipped with either the CPU-ETH3-STD standard or CPU-ETH3-ADV advanced frame controller.

If the frame has available slots, multiple individual multiviewers can coexist in the same frame. This is summarized in the table below.

Supported Frame	Available Slots	Frame Controller Model	Multiviewer Scaling
Densité 3+ FR1	4	CPU-ETH2 frame controller	Each card acts as a standalone 9 × 1 or 9 × 2 multiviewer. Up to four multiviewers can coexist in this frame.
Densité 3+ FR4	24	CPU-ETH3 basic frame controller ^a	Each card acts as a standalone 9 × 1 or 9 × 2 multiviewer. Up to 24 multiviewers can coexist in this frame.

Supported Frame	Available Slots	Frame Controller Model	Multiviewer Scaling (<i>continued</i>)
Densité 3+ FR4	24	CPU-ETH3-STD standard frame controller ^a	Combine up to six KMX-3921 cards, to configure a dual- or quad-mosaic output system in the following sizes: 1 card: 9 × 1 and 9 × 2 2 cards: 18 × 2 and 18 × 4
Densité 3+ FR4	24	CPU-ETH3-ADV advanced frame controller ^a	3 cards: 27 × 2 and 27 × 4 4 cards: 36 × 2 and 36 × 4 6 cards: 54 × 2 and 54 × 4 According to the number of KMX-3921 cards chosen for an installation, a correspondingly sized rear panel is used to interconnect the cards. Up to four 54 × 4 multiviewers can coexist in this frame for example.

a. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

Current Limitations

The KMX-3921 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 11).

KMX-3921 Models and Related Hardware

The following components when added to a Densité 3+ FR1 / Densité 3+ FR4 frame creates a multiviewer.

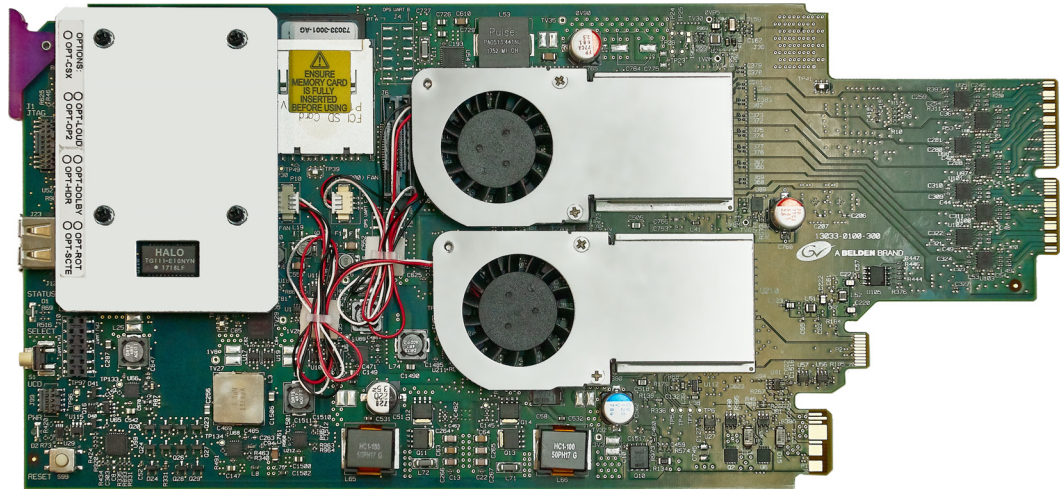
- KMX-3921 Multiviewer Card(s)
- KMX-3921 Rear Panel
- Optional SFP output Module(s)

Certain optional features must be licensed to make to make the feature available for use. See [Available Hardware and Software Options](#), on page 120 for more information.

KMX-3921 Multiviewer Cards

The KMX-3921 is available in a number of models shown in the table below.

KMX-3921 module selection	Description
KMX-3921-9X1	9x1 Kaleido multiviewer card for Densité 3+ (SD/HD/3G SDI).
KMX-3921-9X2	9x2 Kaleido multiviewer card for Densité 3+ (SD/HD/3G SDI).



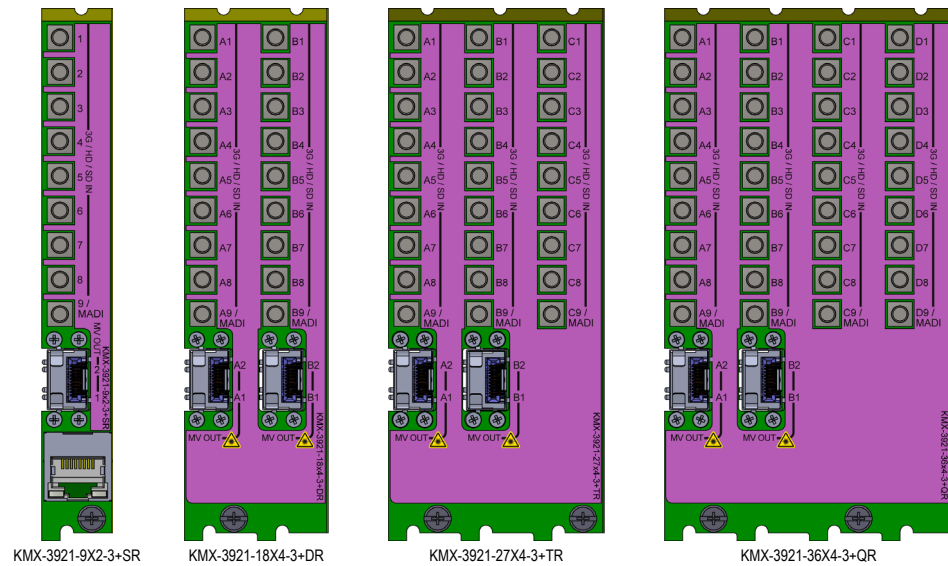
See also [About Swapping KMX-3921 Cards into a Multiviewer](#), on page 128.

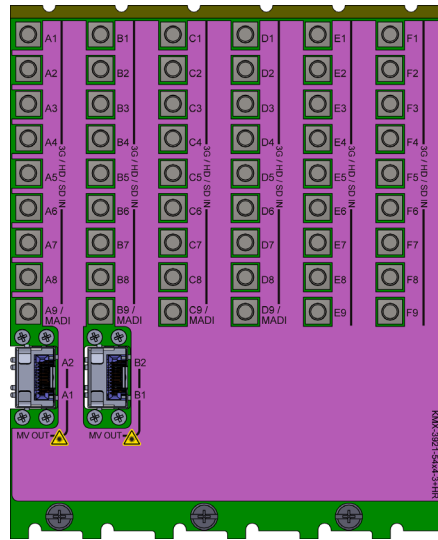
KMX-3921 Rear Panels

The KMX-3921 rear panels provide SFP slots for optional rear panel connection for up to four displays. Rear panels that support between two and six cards also serve to interconnect the KMX-3921 cards. These rear panels are available in a number of models shown in the table below.

Rear panel selection	Description	Compatible Frame
KMX-3921-9X2-3+SR	Single rear panel with a single SFP slot for one KMX-3921 card.	Densité 3+ FR1 Densité 3+ FR4
KMX-3921-18X4-3+DR	Double rear panel with dual SFP slots for two KMX-3921 cards.	Densité 3+ FR4 equipped with either a CPU-ETH3-STD standard or a CPU-ETH3-ADV advanced frame controllers only ^a
KMX-3921-27X4-3+TR	Triple rear panel with dual SFP slots for three KMX-3921 cards.	
KMX-3921-36X4-3+QR	Quadruple rear panel with dual SFP slots for four KMX-3921 cards.	
KMX-3921-54X4-3+HR	Sextuple rear panel with dual SFP slots for six KMX-3921 cards.	

a. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.





KMX-3921-64X4-3+HR

Multiviewer Scaling

The multiviewer is scaled by selecting an appropriate KMX-3921 rear panel model for your solution with the corresponding number of KMX-3921 cards to be used with that rear panel as shown below.

KMX-3921-9X2-3+SR Rear Panel

This configuration can be installed either in a Densité 3+ FR1 or Densité 3+ FR4 frame.

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
9 × 1	1 × KMX-3921-9X1	One single Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
9 × 2	1 × KMX-3921-9x2	One dual Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.

KMX-3921-18X4-3+DR Rear Panel

This configuration can be installed only in a Densité 3+ FR4 frame equipped with either a CPU-ETH3-STD standard or a CPU-ETH3-ADV advanced frame controller. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's](#)

[Controller Model](#), on page 22.

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
18 × 1	2 × KMX-3921-9X1	One single Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
18 × 2	2 × KMX-3921-9x2	Two single Tx SFP modules or one dual Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
18 × 4	2 × KMX-3921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

KMX-3921-27X4-3+TR Rear Panel

This configuration can be installed only in a Densité 3+ FR4 frame equipped with either a CPU-ETH3-STD standard or a CPU-ETH3-ADV advanced frame controller. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
27 × 1	3 × KMX-3921-9X1	One single Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
27 × 2	3 × KMX-3921-9x2	Two single Tx SFP modules or one dual Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
27 × 4	3 × KMX-3921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

KMX-3921-36X4-3+QR Rear Panel

This configuration can be installed only in a Densité 3+ FR4 frame equipped with either a CPU-ETH3-STD standard or a CPU-ETH3-ADV advanced frame controller. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's](#)

[Controller Model](#), on page 22.

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
36 × 1	4 × KMX-3921-9X1	One single Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
36 × 2	4 × KMX-3921-9x2	Two single Tx SFP modules or one dual Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
36 × 4	4 × KMX-3921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

KMX-3921-54X4-3+HR Rear Panel

This configuration can be installed only in a Densité 3+ FR4 frame equipped with either a CPU-ETH3-STD standard or a CPU-ETH3-ADV advanced frame controller. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
54 × 1	6 × KMX-3921-9X1	One single Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
54 × 2	6 × KMX-3921-9x2	Two single Tx SFP modules or one dual Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.
54 × 4	6 × KMX-3921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

Compatible SFP Modules

To connect display(s) to the multiviewer's rear panel mosaic output, the appropriate SFP module(s) must be ordered.

SFP module selection	Description
SFP-3G-2OUT-L	Dual output HD/3G SDI long-reach coaxial SFP with DIN 1.0/2.3 connectors.
SFP-HDMI-OUT	Single output HDMI type D SFP with retention lock, cable not included (see below).
SFP-T-S13-LC	Single Tx Fiber Module at 1310nm with LC Connector.
SFP-TT-S13S13-LC	Dual Fiber Tx (output) cartridge at 1310nm with LC/PC connector.
SFP-TT-W13W15-LC	Single fiber dual Tx cartridge at 1310 & 1550nm with WDM LC/PC connector
SFP-T-IP6-S13-LC	Single output SMPTE 2022-6 transmitter, 10GBASE-LR interface, single mode 1310 nm, LC/PC connector
SFP-TT-IP6-S13-LC	Dual output SMPTE 2022-6 transmitter, 10GBASE-LR interface, single mode 1310 nm, LC/PC connector



For more SFP fiber options refer to http://www.grassvalley.com/products/sfp_optical_plugin_cartridges. See also Grass Valley's [DXF-300 Optical AV Media Extender](#).

Note: All dual SFP transmitter modules require the purchase of the multiple head activation option. See [Available Hardware and Software Options](#), on page 120.

Cable for SFP Modules

Cable for SFP module selection	Description
HDMI-D-A-2	HDMI type D to A cable (2m) with retention lock.

Quad-Link 3G to HDMI 2.0 Converter

For 18 × 4, 27 × 4, 36 × 4, and 54 × 4 multiviewers, a 2160p output is available through an optional external quad-link 3G to HDMI 2.0 converter.

Quad-Link converter selection	Description
KMX-4K-QL-TO-HDMI	4K quad-link square division to HDMI 2.0 converter

Multiviewer SDI / MADI Input Combinations

Certain multiviewer inputs can accept a MADI signal instead of an SDI input as detailed in the table below. For input specifications, see [Video Inputs](#), on page 143 and [Discrete Audio Inputs](#), on page 145.

Multiviewer Capacity	Multiviewer Cards	SDI / MADI input combinations
9 × 1, 9 × 2	1 × KMX-3921	Up to 9 SDI inputs with 0 MADI inputs
		Up to 8 SDI inputs with 1 MADI input
18 × 1, 18 × 2, 18 × 4	2 × KMX-3921	Up to 18 SDI inputs with 0 MADI inputs
		Up to 17 SDI inputs with 1 MADI input
		Up to 16 SDI inputs with 2 MADI inputs
27 × 1, 27 × 2, 27 × 4	3 × KMX-3921	Up to 27 SDI inputs with 0 MADI inputs
		Up to 26 SDI inputs with 1 MADI input
		Up to 25 SDI inputs with 2 MADI inputs
		Up to 24 SDI inputs with 3 MADI inputs
36 × 1, 36 × 2, 36 × 4	4 × KMX-3921	Up to 36 SDI inputs with 0 MADI inputs
		Up to 35 SDI inputs with 1 MADI input
		Up to 34 SDI inputs with 2 MADI inputs
		Up to 33 SDI inputs with 3 MADI inputs
		Up to 32 SDI inputs with 4 MADI inputs
54 × 1, 54 × 2, 54 × 4	6 × KMX-3921	Up to 54 SDI inputs with 0 MADI inputs
		Up to 53 SDI inputs with 1 MADI input
		Up to 52 SDI inputs with 2 MADI inputs
		Up to 51 SDI inputs with 3 MADI inputs
		Up to 50 SDI inputs with 4 MADI inputs

See [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30 for more information where you can connect a MADI input.

Optional Ancillary Equipment

The following optional equipment may be supplied with your order.

- Kaleido-RCP2 or RCP-200 multi-function remote control panel
- DXF-300-F Optical AV Media Extender

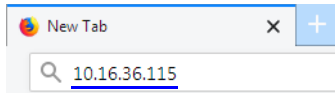
How to Identify a Densité 3+ FR4 Frame's Controller Model

All Densité 3+ FR4 frames are equipped with a CPU-ETH3 frame controller. However, there are a number of different available CPU-ETH3 frame controller models that may limit the multiviewer capacity supported by the frame. To know what multiviewer capacity a Densité 3+ FR4 frame can support, you must first identify the CPU-ETH3 frame controller model currently installed in the frame by proceeding as follows.

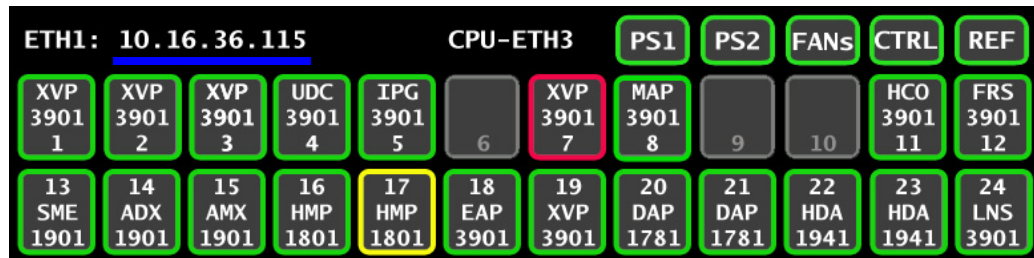
Prerequisites: For this procedure, the frame must be powered up, you must have a PC with network connectivity to the frame's controller, and you must know the frame controller's IP address or have access to the frame controller's display.

To find the frame's controller model in a powered frame

- 1 On your PC, connect to the frame controller's web page with a Web browser using the frame controller's IP address.



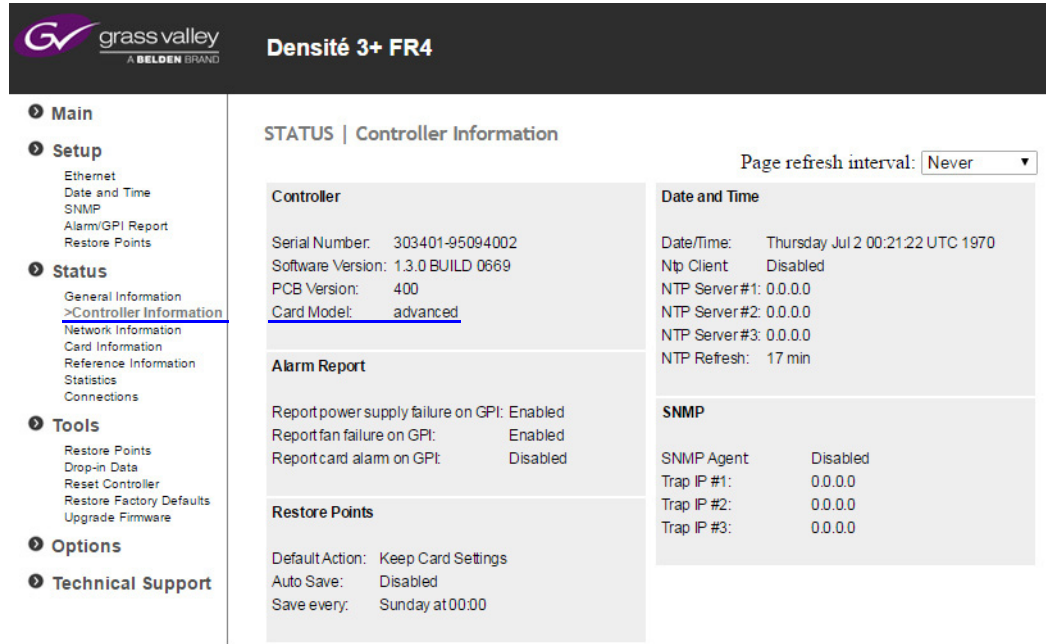
For example, the frame controller's IP address is shown after **ETH1** on the home screen of frame's local control panel.



Densité 3+ FR4 frame Local Control Panel's Home Screen

The home page of the CPU-ETH3 Web client appears.

2 Navigate to **Controller Information** found under **Status**.

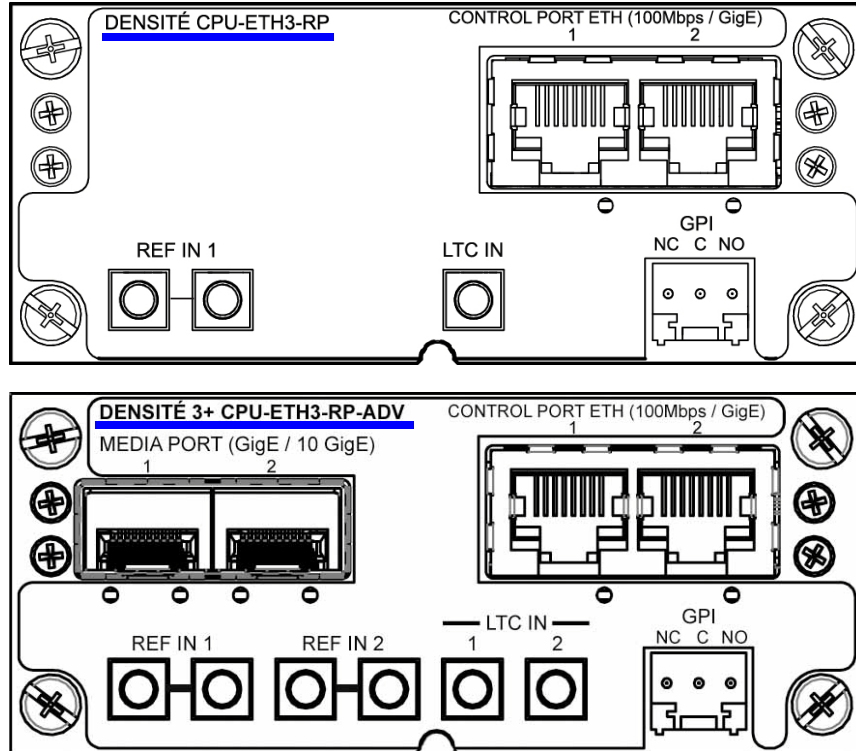


3 Identify the frame's controller model found after **Card Model**.

Card Model	Description	Corresponding Rear Panel
basic	The frame is currently equipped with a CPU-ETH3 basic frame controller. This Densité 3+ FR4 frame can support KMX-3921 multiviewers with the following capacities: 9 × 1 and 9 × 2.	Densité CPU-ETH3-RP
standard	The frame is currently equipped with a CPU-ETH3-STD standard frame controller. This Densité 3+ FR4 frame can support KMX-3921 multiviewers with the following capacities: 9 × 1, 9 × 2, 18 × 2, 18 × 4, 27 × 2, 27 × 4, 36 × 2, 36 × 4, 54 × 2, and 54 × 4.	
advanced	The frame is currently equipped with a CPU-ETH3-ADV advanced frame controller. This Densité 3+ FR4 frame can support KMX-3921 multiviewers with the following capacities: 9 × 1, 9 × 2, 18 × 2, 18 × 4, 27 × 2, 27 × 4, 36 × 2, 36 × 4, 54 × 2, and 54 × 4.	Densité 3+ CPU-ETH3-RP-ADV

To find the frame's controller model by visual inspection

If the frame is unpowered, another way to know if your Densité 3+ FR4 frame is equipped with a CPU-ETH3-ADV advanced frame controller is to visually inspect the rear of the Densité 3+ FR4 frame and look for the model number of the frame controller's rear panel, located at the top center of the Densité 3+ FR4 frame.



CPU-ETH3 Rear Panel Part Number	Description
Densité CPU-ETH3-RP	The frame is currently equipped with either a CPU-ETH3 basic or a CPU-ETH3-STD standard frame controller. To know what multiviewer capacity supported is supported by the frame, you must power the frame and confirm the CPU-ETH3 controller model through its web interface. See To find the frame's controller model in a powered frame , on page 22.
Densité 3+ CPU-ETH3-RP-ADV	The frame is currently equipped with a CPU-ETH3-ADV advanced frame controller. This Densité 3+ FR4 frame can support KMX-3921 multiviewers with the following capacities: 9 × 1, 9 × 2, 18 × 2, 18 × 4, 27 × 2, 27 × 4, 36 × 2, 36 × 4, 54 × 2, and 54 × 4.

Kaleido Software Minimum Version Compatibility

A KMX-3921 multiviewer cannot be downgraded to a Kaleido Software version earlier than 10.00. When downgrading this multiviewer, certain other requirements and limitations may be in effect; see [Upgrading the Multiviewer](#), on page 136 for more information.

To upgrade a multiviewer's software, see [Upgrading the Multiviewer](#), on page 136. To find a card's Kaleido Software version number, see [Finding the Multiviewer's IP Address and Application Version](#), on page 126 or [Information Panel](#), on page 110.

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

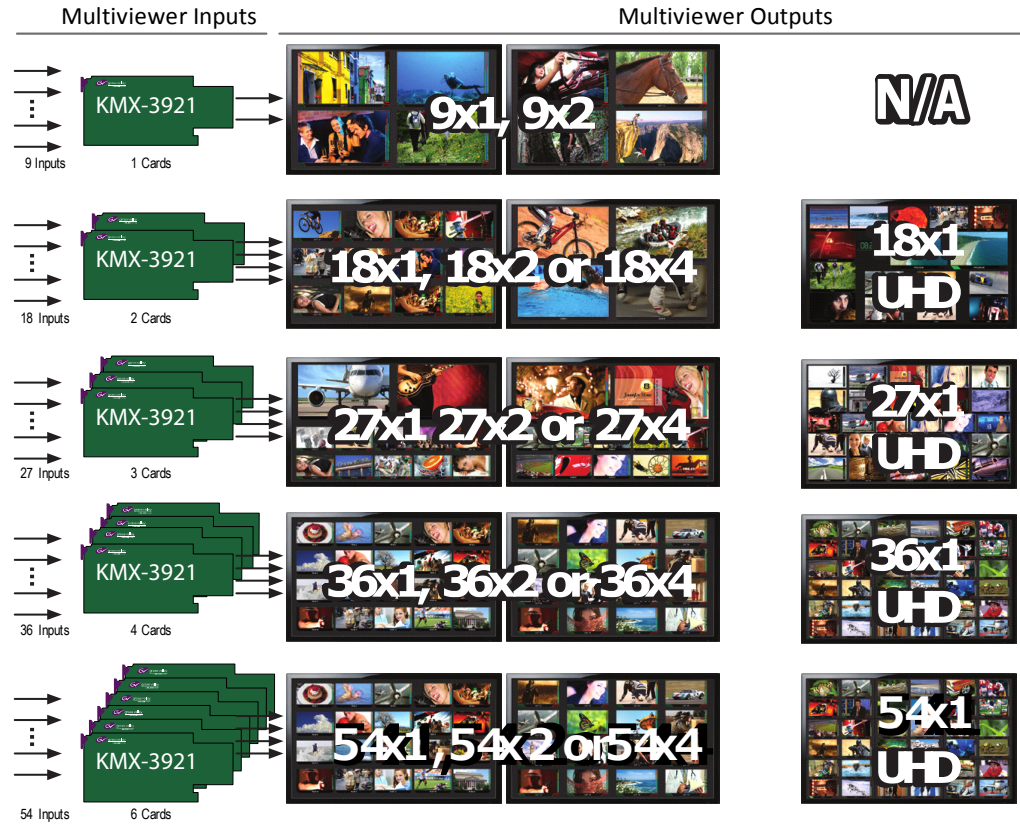
If a frame is equipped with more than one multiviewer, each multiviewer must be individually updated, one at a time.

For a Densité 3+ FR4 frame equipped with either a CPU-ETH3-STD standard or a CPU-ETH3-ADV advanced frame controller only:

For a multiviewer that has two or more KMX-3921 multiviewer cards (to identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22), all multiviewer cards will be automatically upgraded or downgraded to the Kaleido Software version currently loaded on multiviewer card 'A', as a function of the live-update (auto-upgrade) feature. See [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30 for the location of card 'A' in each multiviewer model.

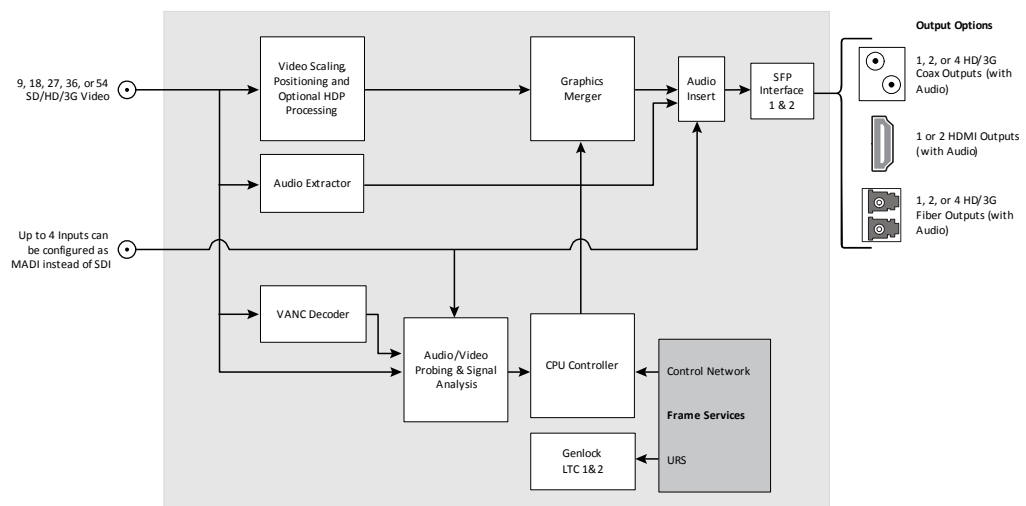
Overview of the KMX-3921 System

Between one to six KMX-3921 cards are interconnected through the rear panel according to your application's sizing as shown below.



Scalable input and mosaic output capability using the same KMX-3921 building block

Functional Block Diagram



KMX-3921 functional block diagram

2 Installation

This chapter provides information about system requirements, items shipped with your KMX-3921 multiviewer and it will guide you through the installation of a KMX-3921 multiviewer.

Getting Organized / Unpacking

Make sure the following items have been shipped with your KMX-3921 order. If any of these are missing, contact your distributor or Grass Valley (see [Grass Valley Technical Support](#), on page 156).

Your KMX-3921 package includes the following:

- KMX-3921 cards (front and rear modules), as per order
- SFP modules, as per order, with adapter cables if required
- Kaleido Multiviewers Documentation Resource Guide

Required Tools

In addition to the above, you will need the following tools (field supplied):

- Phillips #2 screwdriver to remove and install rear panels
- DIN 1.0/2.3 extractor tool

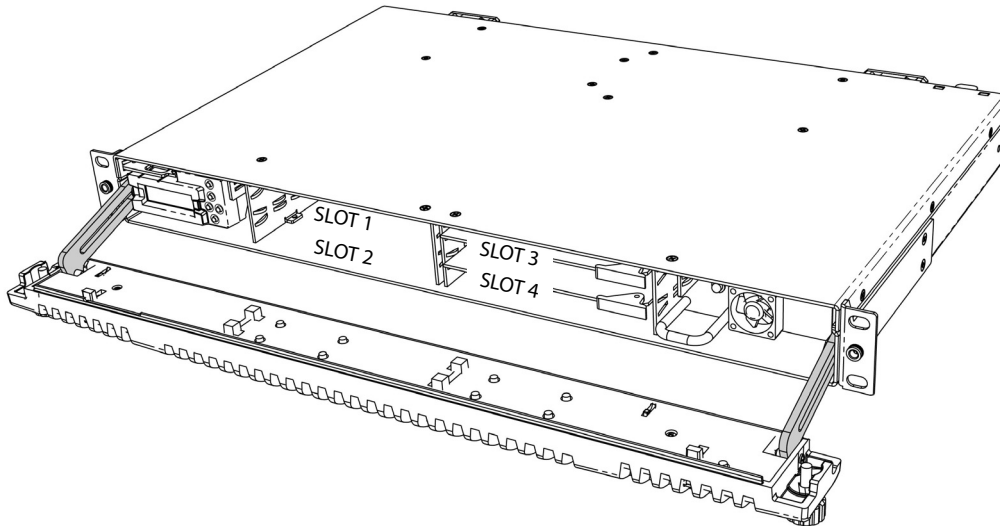
Required Material

In addition to the above, you will need the following (field supplied):

- Up to 4 displays
- Client PC
- Display cables (to connect your multiviewer to displays)
- SDI interconnection cables to bring signals into the multiviewer
- At least one Densité 3+ FR1 housing frame or Densité 3+ FR4 housing frame with available modular card slots
- Ethernet network connectivity

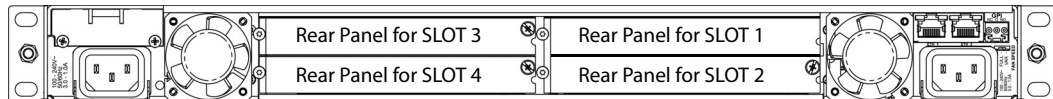
Densité 3+ FR1 Frame Physical Interface

A single KMX-3921 card is installed in the Densité 3+ FR1 frame. When the frame door is closed, the status LEDs on each of the cards in the frame is visible through the door.



Front of Densité 3+ FR1 frame (door removed) with modular card slot numbers labelled 1 to 4

The rear panel for the KMX-3921 card(s) are installed at the rear of the Densité 3+ FR1 frame. The rear panel must be installed on the same modular card slots used by the KMX-3921 card(s).

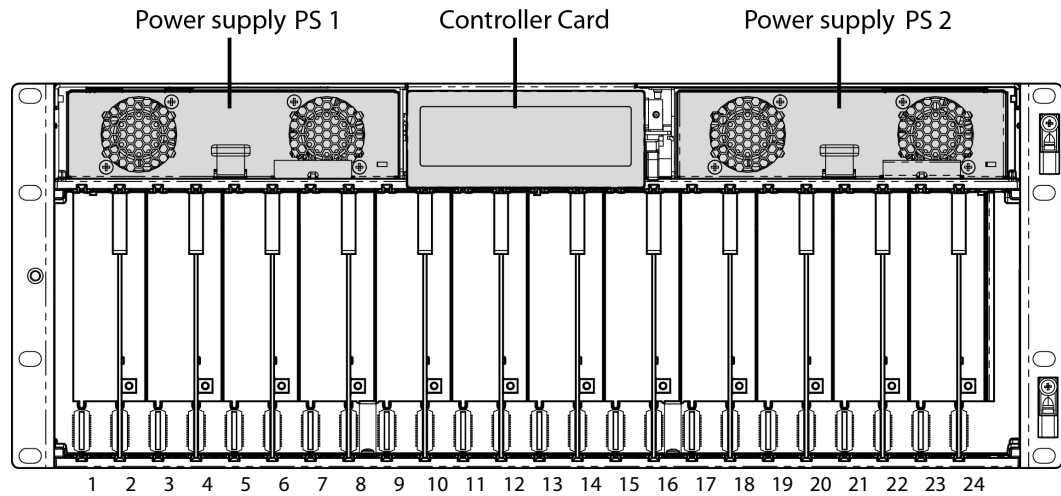


Rear of Densité 3+ FR1 frame with rear panel positions labelled for card slots 1 to 4

To open the front door, see [Opening and Closing the Front Door](#), on page 127.

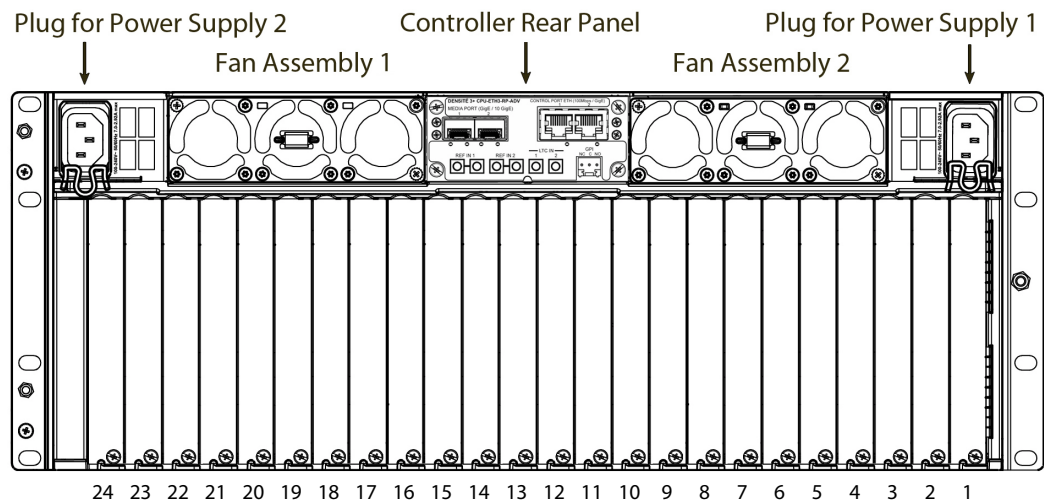
Densité 3+ FR4 Frame Physical Interface

The KMX-3921 cards are installed in up to six consecutive modular card slots in the Densité 3+ FR4 frame. When the frame door is closed, the status LEDs on each of the cards in the frame is visible through the door.



Front of Densité 3+ FR4 frame (door removed) with modular card slot numbers labelled 1 to 24

The rear panel for the KMX-3921 card(s) are installed at the rear of the Densité 3+ FR4 frame. The rear panel must be installed on the same modular card slots used by the KMX-3921 card(s).



Rear of Densité 3+ FR4 frame with rear panel positions labelled for card slots 1 to 24; this also shows the rear panel for the CPU-ETH3-ADV advanced frame controller

To open the front door, see [Opening and Closing the Front Door](#), on page 127.

Installation of the KMX-3921 in a Densité 3+ Frame

The KMX-3921 multiviewer can be installed in either a Densité 3+ FR1 frame or a Densité 3+ FR4 frame. The frame must be networked and powered, and configured for use. To avoid any network IP address conflict, see [Avoiding Networked Equipment IP Address Conflicts](#), on page 47.

The KMX-3921 cards are installed in the frame along with its associated rear panel. The rear panel must be installed in the frame before the card can be inserted into the frame. All cards and rear panels can be installed with the frame power on. The card has connectors which plug into a mid-frame mother board for distribution of power and for connection to the controller card, and a second connector which plugs directly into the rear panel for input and output connections.

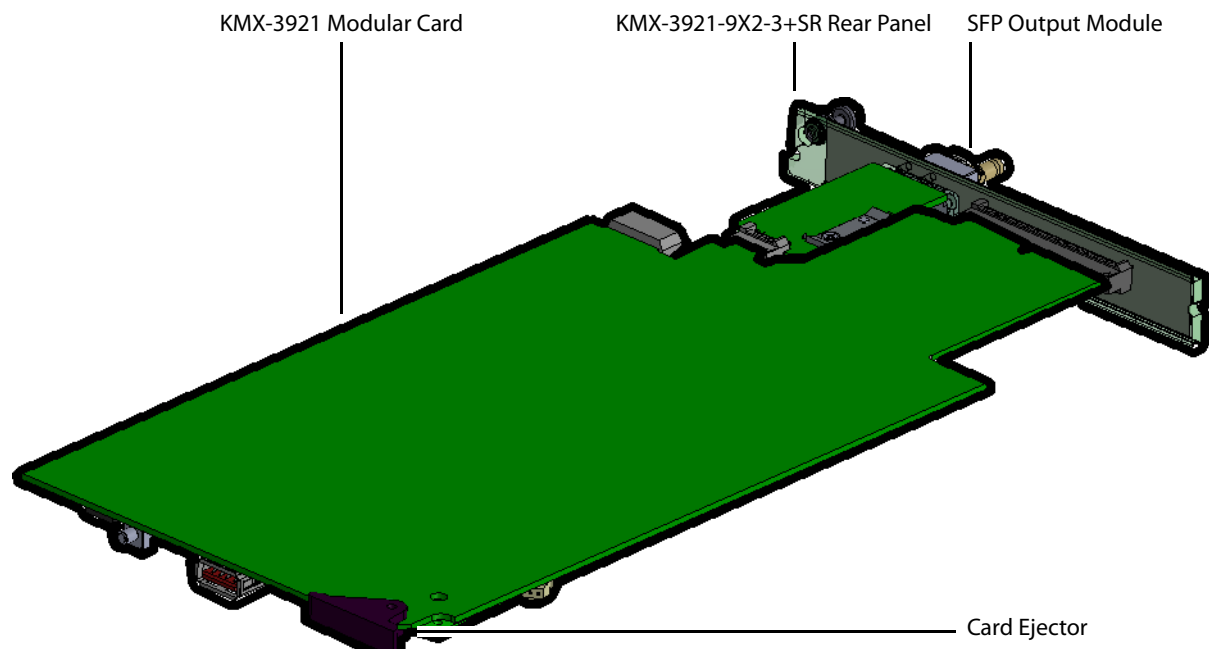
To install a KMX-3921 multiviewer into a Densité 3+ FR1 frame, see [Installation overview in a Densité 3+ FR1 Frame](#), on page 30. To install a KMX-3921 multiviewer into a Densité 3+ FR4 frame, see [Installation overview in a Densité 3+ FR4 Frame](#), on page 31.

Installation overview in a Densité 3+ FR1 Frame

To support a video wall mosaic output, one SFP module must be installed in the rear panel. See [KMX-3921 Models and Related Hardware](#), on page 14 for a summary of the hardware that can be installed. See also the *Densité 3+ FR1 Housing Frame User Manual* for information about how to install, power up, and configure a Densité 3+ FR1 frame.

Multiviewer with a KMX-3921-9X2-3+SR Rear Panel

The one KMX-3921 card is installed in a Densité 3+ FR1 Frame slot that the KMX-3921-9X2-3+SR rear panel occupies.



A KMX-3921 Card shown Assembled with a KMX-3921-9X2-3+SR Rear Panel in a Densité 3+ FR1 Frame

This KMX-3921 card accepts up to 9 SDI video inputs and can source up to 2 mosaic outputs through an SFP output module.

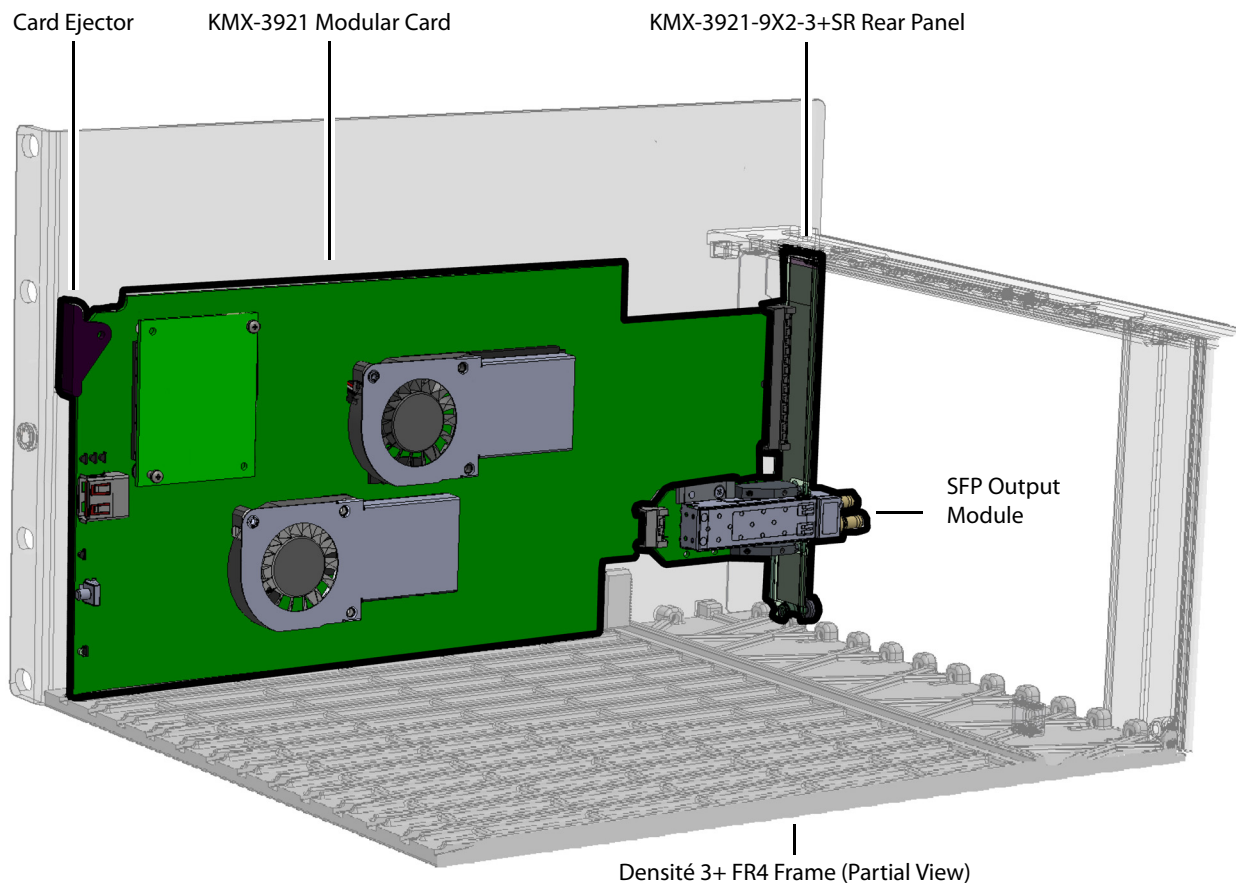
The 9th input can be used either as a video input or as a MADI audio input. See [Cabling Diagrams](#), on page 39 for how to connect MADI inputs. See also [Multiviewer SDI / MADI Input Combinations](#), on page 21.

Installation overview in a Densité 3+ FR4 Frame

To support a video wall mosaic output, one or two SFP module(s) must be installed in the rear panel. See [KMX-3921 Models and Related Hardware](#), on page 14 for a summary of the hardware that can be installed. See also the *Densité 3+ FR4 Housing Frame User Manual* for information about how to install, power up, and configure a Densité 3+ FR4 frame.

Multiviewer with a KMX-3921-9X2-3+SR Rear Panel

The one KMX-3921 card is installed in a Densité 3+ FR4 Frame slot that the KMX-3921-9X2-3+SR rear panel occupies.



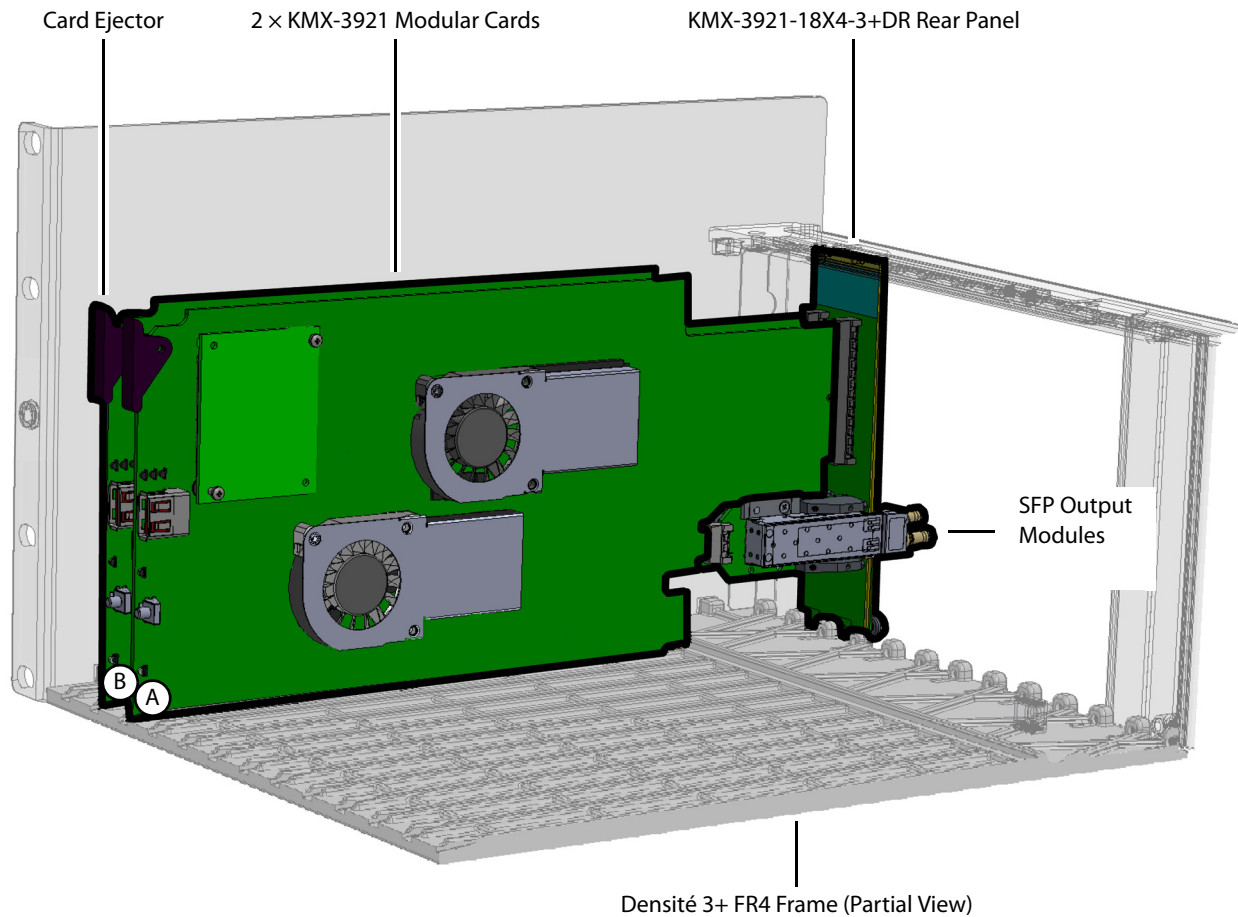
A KMX-3921 Card shown Assembled with a KMX-3921-9X2-3+SR Rear Panel in a Densité 3+ FR4 Frame

This KMX-3921 card accepts up to 9 SDI video inputs and can source up to 2 mosaic outputs through an SFP output module.

The 9th input can be used either as a video input or as a MADI audio input. See [Cabling Diagrams](#), on page 39 for how to connect MADI inputs. See also [Multiviewer SDI / MADI Input Combinations](#), on page 21.

Multiviewer with a KMX-3921-18X4-3+DR Rear Panel

The two KMX-3921 cards are installed in two consecutive Densité 3+ FR4 Frame slots that the KMX-3921-18X4-3+DR rear panel occupies.



Two KMX-3921 Cards shown Assembled with a KMX-3921-18X4-3+DR Rear Panel in a Densité 3+ FR4 Frame equipped with either a CPU-ETH3-STD standard or CPU-ETH3-ADV advanced frame controller¹

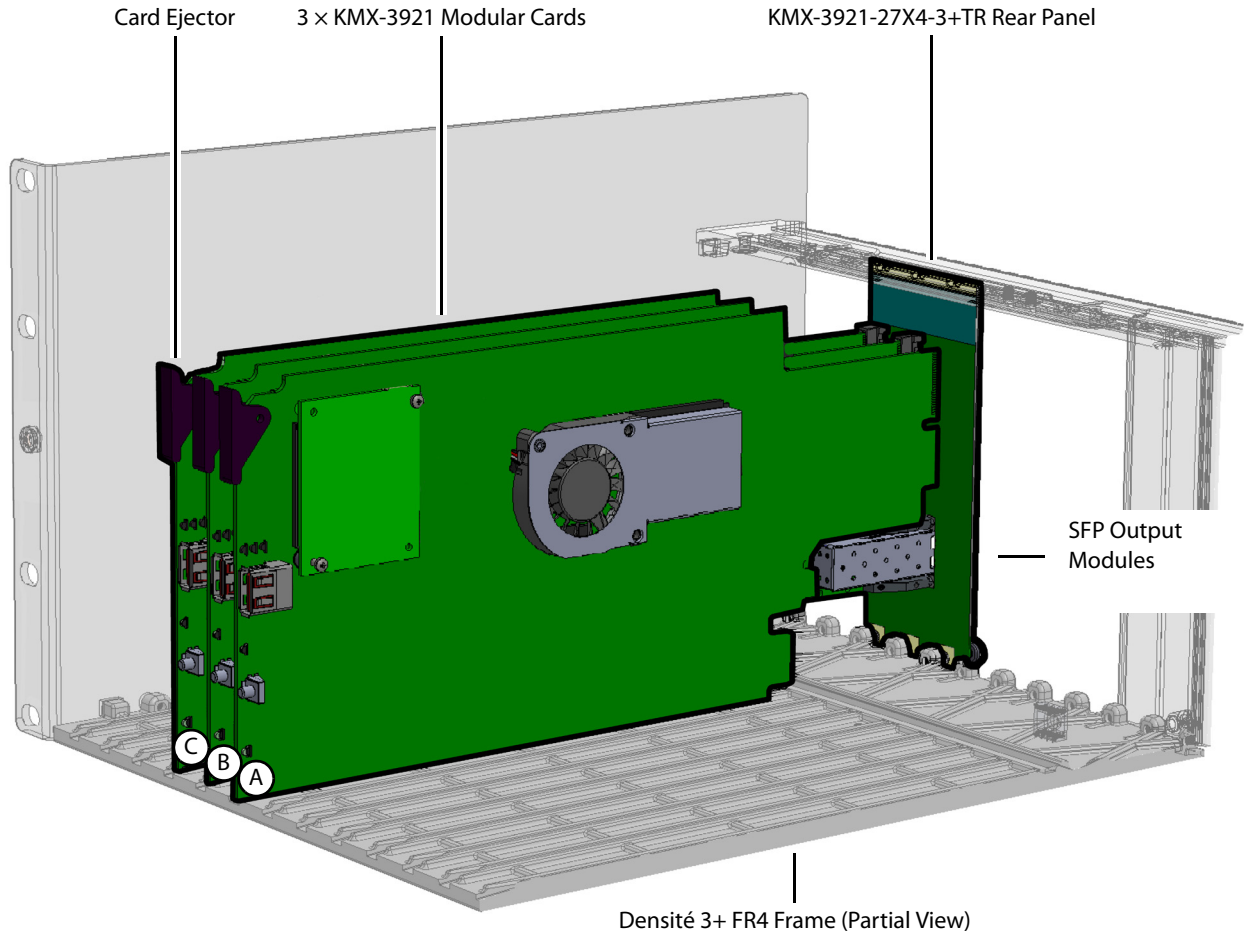
Each KMX-3921 card accepts up to 9 SDI video inputs and provides up to 2 mosaic outputs for a total of up to 18 video inputs and up to 4 mosaic outputs.

The 9th input for each card can be used either as a video input or as a MADI audio input. See [Cabling Diagrams](#), on page 39 for how to connect MADI inputs. See also [Multiviewer SDI / MADI Input Combinations](#), on page 21.

1. See [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

Multiviewer with a KMX-3921-27X4-3+TR Rear Panel

The three KMX-3921 cards are installed in three consecutive Densité 3+ FR4 Frame slots that the KMX-3921-27X4-3+TR rear panel occupies.



Three KMX-3921 Cards shown Assembled with a KMX-3921-27X4-3+TR Rear Panel in a Densité 3+ FR4 Frame equipped with either a CPU-ETH3-STD standard or CPU-ETH3-ADV advanced frame controller²

In the above diagram, the cards are identified with letters. The capacity of each KMX-3921 card is explained in the table below.

Identification Letter	Inputs	Mosaic Outputs
A & B	Up to 9 video inputs per KMX-3921 card. Input #9 of each card can accept either MADI or SDI signals input.	Up to 2 mosaic outputs per KMX-3921 card.

2. See [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

Installation

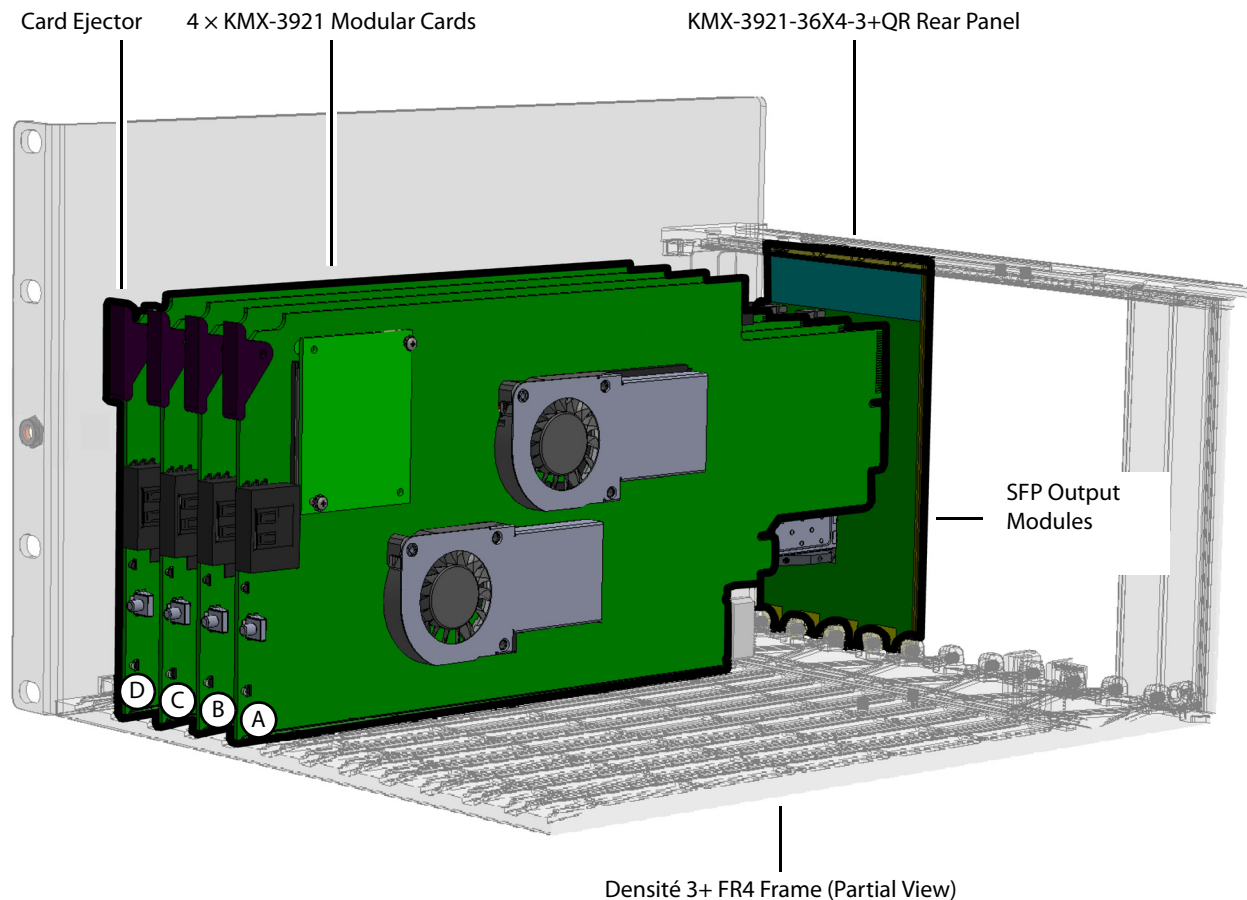
Installation overview in a Densité 3+ FR4 Frame

Identification Letter	Inputs	Mosaic Outputs
C	Up to 9 video inputs. Input #9 of each card can accept either MADI or SDI signals input.	0
Total for A, B, & C	Up to 27 video inputs total. See Multiviewer SDI / MADI Input Combinations , on page 21.	Up to 4 mosaic outputs total.

The 9th input for each card can be used either as a video input or as a MADI audio input. See [Cabling Diagrams](#), on page 39 for how to connect MADI inputs.

Multiviewer with a KMX-3921-36X4-3+QR Rear Panel

The four KMX-3921 cards are installed in four consecutive Densité 3+ FR4 Frame slots that the KMX-3921-36X4-3+QR rear panel occupies.



Four KMX-3921 Cards shown Assembled with a KMX-3921-36X4-3+QR Rear Panel in a Densité 3+ FR4 Frame equipped with either a CPU-ETH3-STD standard or CPU-ETH3-ADV advanced frame controller³

3. See [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

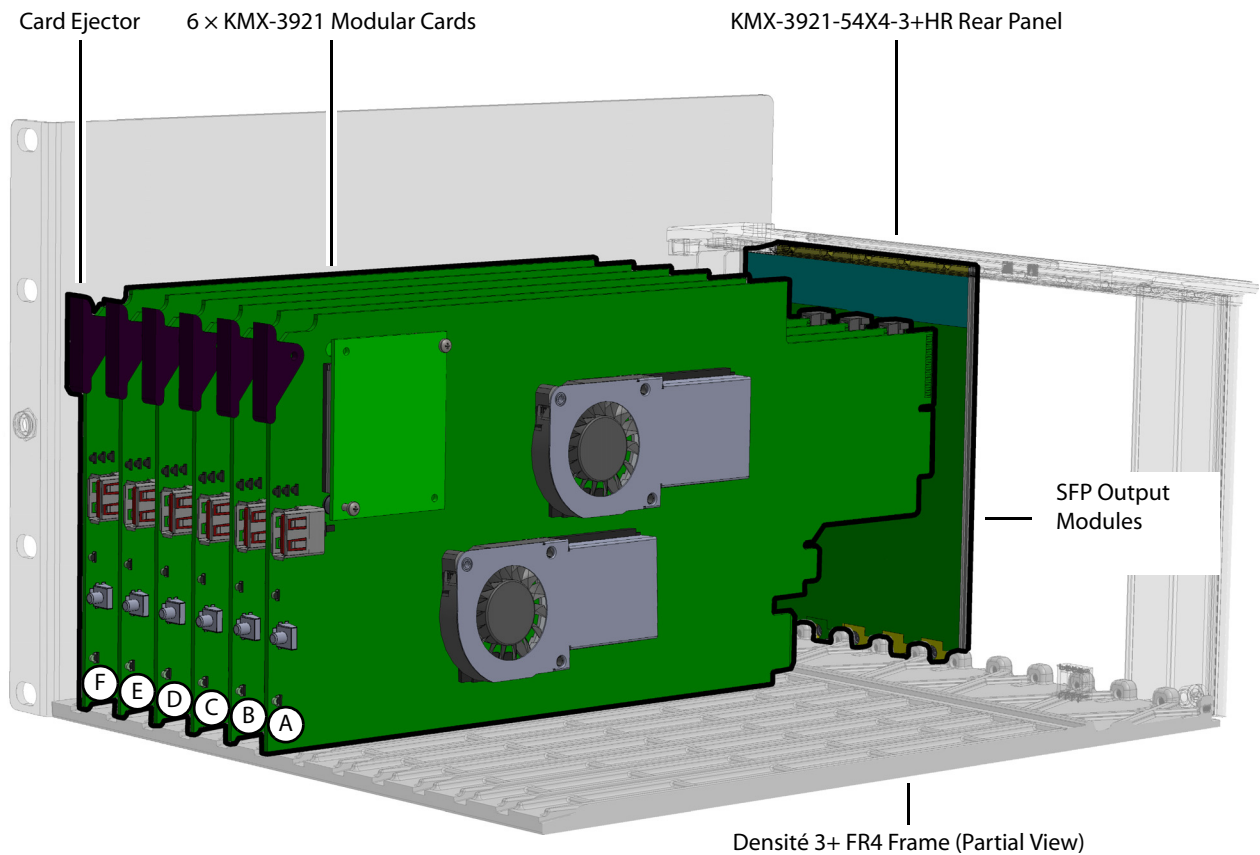
In the above diagram, the cards are identified with letters. The capacity of each KMX-3921 card is explained in the table below.

Identification Letter	Inputs	Mosaic Outputs
A & B	Up to 9 video inputs per KMX-3921 card. Input #9 of each card can accept either MADI or SDI signals input.	Up to 2 mosaic outputs per KMX-3921 card.
C & D	Up to 9 video inputs per KMX-3921 card. Input #9 of each card can accept either MADI or SDI signals input.	0
Total for A, B, C, & D	Up to 36 video inputs total. See Multiviewer SDI / MADI Input Combinations , on page 21.	Up to 4 mosaic outputs total.

The 9th input for each card can be used either as a video input or as a MADI audio input. See [Cabling Diagrams](#), on page 39 for how to connect MADI inputs.

Multiviewer with a KMX-3921-54X4-3+HR Rear Panel

The six KMX-3921 cards are installed in six consecutive Densité 3+ FR4 Frame slots that the KMX-3921-54X4-3+HR rear panel occupies.



Installation

Where to locate the KMX-3921 card(s) in the frame

Six KMX-3921 Cards shown Assembled with a KMX-3921-54X4-3+HR Rear Panel in a Densité 3+ FR4 Frame equipped with either a CPU-ETH3-STD standard or CPU-ETH3-ADV advanced frame controller⁴

In the above diagram, the cards are identified with letters. The capacity of each KMX-3921 card is explained in the table below.

Identification Letter	Inputs	Mosaic Outputs
A & B	Up to 9 video inputs per KMX-3921 card. Input #9 of each card can accept either MADI or SDI signals input.	Up to 2 mosaic outputs per KMX-3921 card.
C, & D	Up to 9 video inputs per KMX-3921 card. Input #9 of each card can accept either MADI or SDI signals input.	0
E, & F	Up to 9 video inputs per KMX-3921 card.	0
Total for A, B, C, D, E, & F	Up to 54 video inputs total. See Multiviewer SDI / MADI Input Combinations , on page 21.	Up to 4 mosaic outputs total.

The 9th input for cards A, B, C, and D can be used either as a video input or as a MADI audio input. See [Cabling Diagrams](#), on page 39 for how to connect MADI inputs.

Where to locate the KMX-3921 card(s) in the frame

Multiviewer Installation in a Densité 3+ FR1 Frame

The Densité 3+ FR1 frame has space for 4 modular card slots. Identify the space in the Densité 3+ FR1 frame the multiviewer is to be located. A single KMX-3921 card can be installed in any one of the 4 modular card slots with its corresponding rear panel. More than one multiviewer system can be installed in one Densité 3+ FR1 frame, however, each multiviewer system will be functionally independent of each other.

Multiviewer Installation in a Densité 3+ FR4 Frame

The Densité 3+ FR4 frame has space for 24 modular card slots. Identify the space in the Densité 3+ FR4 frame the multiviewer is to be located. A single KMX-3921 card can be installed in any one of the 24 modular card slots with its corresponding rear panel. When there are between two and six KMX-3921 cards to be installed⁵, they must be installed together side-by-side in a series and use the same common rear panel to form a multiviewer system. More than one multiviewer system can be installed in one Densité 3+ FR4 frame, however, each multiviewer system will be functionally independent of each other.

4. See [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

5. See [Supported Frames and Multiviewer Scaling](#), on page 13 for more information.

Installation requirements

It is not necessary to switch off the frame's power when installing or removing a card.

Each card has connectors which plug into a mid-frame mother board for distribution of power and for connection to the controller card, and a second connector which for certain cards plug directly into the rear panel for mosaic SFP output connections to the display(s).

IMPORTANT

First remove cards in any modular card slot where the rear panel is going to be installed.

Install the Multiviewer in a Frame

- To install the multiviewer in a Densité 3+ FR1 frame, see *Installing Cards in the Densité 3+ FR1 Frame* in the *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual*.
- To install the multiviewer in a Densité 3+ FR4 frame, see *Installing Cards in the Densité 3+ FR4 Frame* in the *Densité 3+ FR4 Housing Frame User Manual*.

See [Related Documentation](#), on page 11.

Install the SFP Module(s)

Once the multiviewer has been installed in the frame, install the SFP module(s) into the Rear Panel. See [Installing the SFP Output Module](#), on page 153.

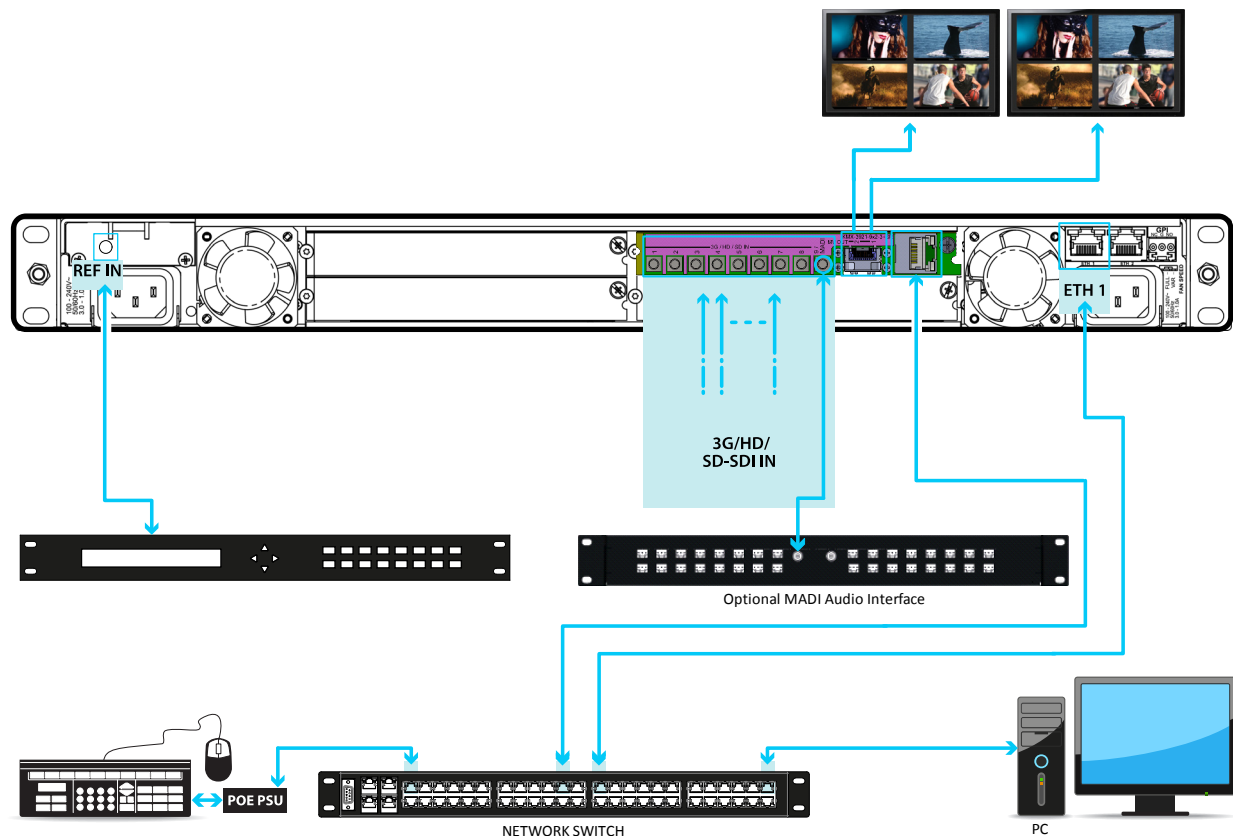
3 Multiviewer Cabling

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

Cabling Diagrams

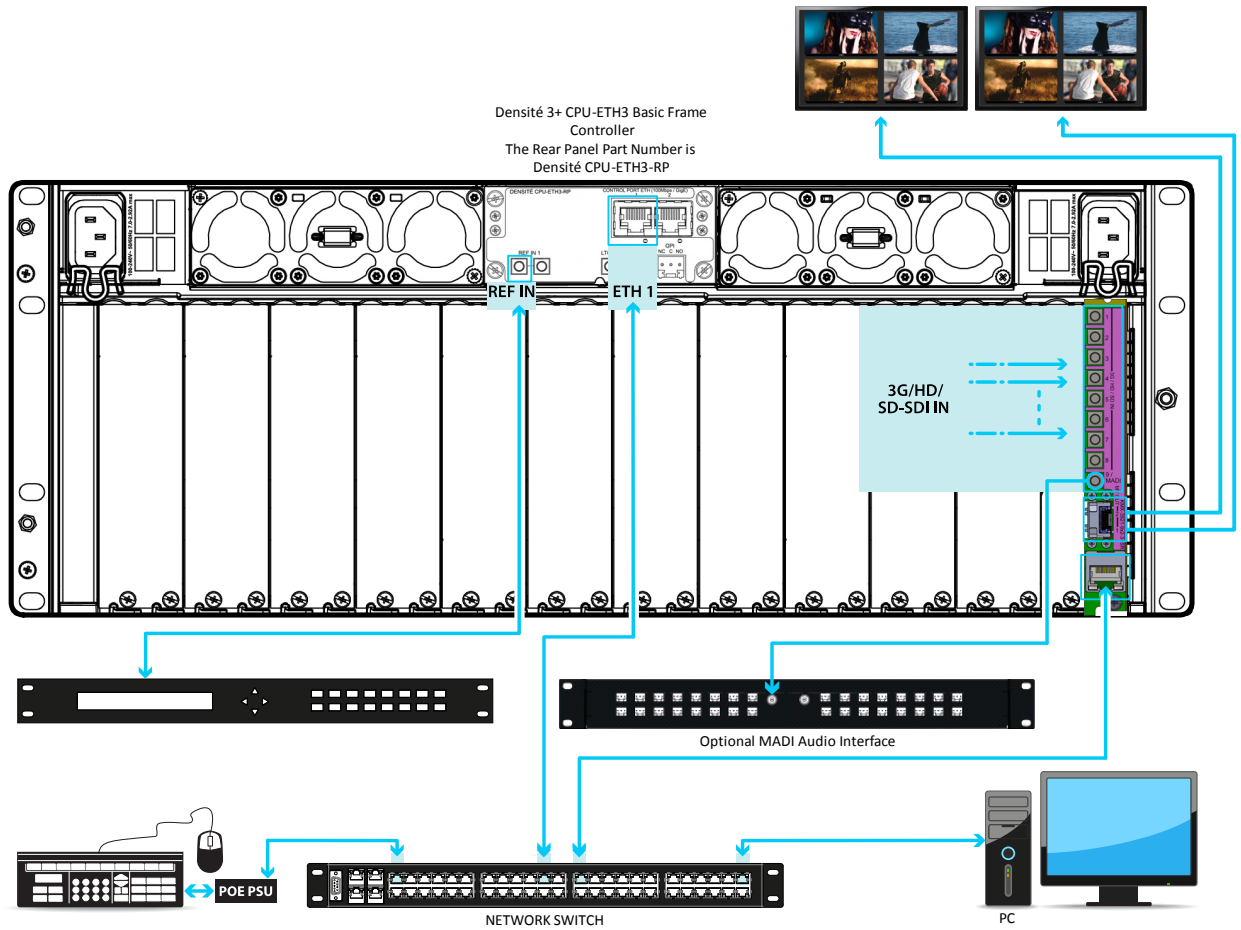
The following diagrams show a typical cable connections to the Densité 3+ FR1 / Densité 3+ FR4 frame and to the multiviewer. To avoid any network IP address conflict, see [Avoiding Networked Equipment IP Address Conflicts](#), on page 47.

To identify the type of frame controller currently installed in your frame, see [Supported Frames and Multiviewer Scaling](#), on page 13 and [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

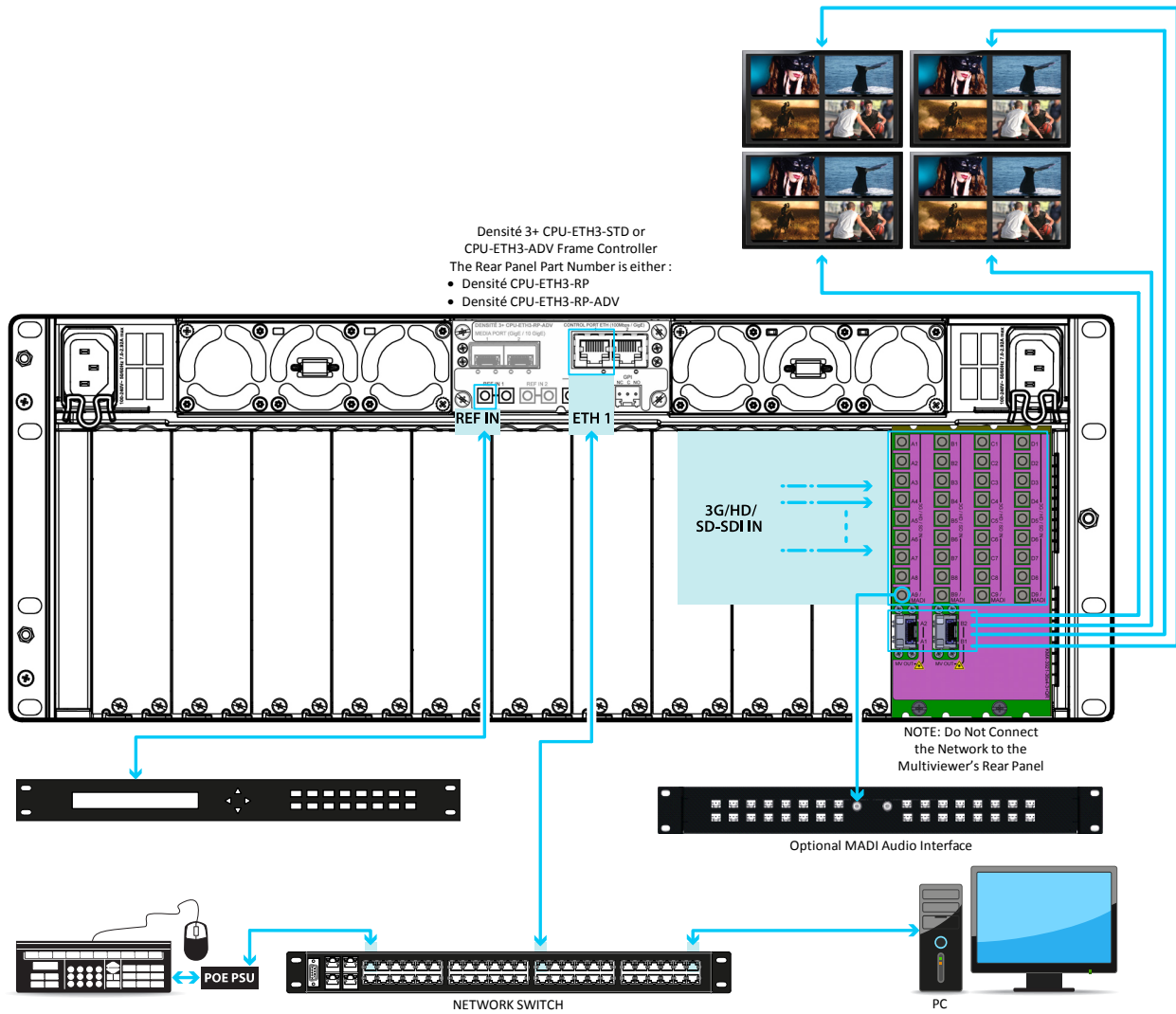


Cabling diagram for a KMX-3921 9 X 2 multiviewer installed in a Densité 3+ FR1 frame

Multiviewer Cabling
Cabling Diagrams



Cabling diagram for a KMX-3921 9 X 2 multiviewer installed in a Densité 3+ FR4 frame with a basic frame controller



Cabling diagram for a KMX-3921 36 X 4 multiviewer installed in a Densité 3+ FR4 frame with a standard or an advanced frame controller

Multiviewer Network Connections

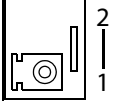
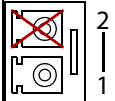
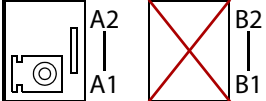
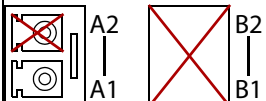
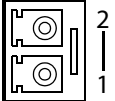
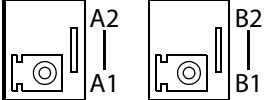
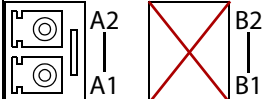
The required network connections for the KMX-3921 multiviewer changes according to the frame in which it is installed and the frame's controllers model. The KMX-3921 multiviewer can be installed in any one of the following frames.

Supported Frame	Frame Controller Model	Description	Network Connection
Densité 3+ FR1	CPU-ETH2 frame controller	This frame controller does not distribute its network connection with any card in the frame.	Connect the network directly to the RJ-45 connector on KMX-3921 multiviewer's rear panel for each multiviewer installed in the frame. Make a second network connection directly to the ETH1 connector on the rear of the Densité 3 frame.
Densité 3+ FR4	CPU-ETH3 basic frame controller ^a		
Densité 3+ FR4	CPU-ETH3-STD standard frame controller ^a	This frame controller distributes its network connection to all cards in the frame.	Connect the network directly to the ETH1 connector on the rear of the Densité 3+ FR4 frame only. Do not connect the network to the RJ-45 connector on KMX-3921 multiviewer's rear panel, when present.
Densité 3+ FR4	CPU-ETH3-ADV advanced frame controller ^a		

a. See [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22

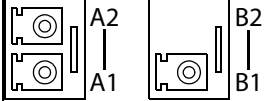
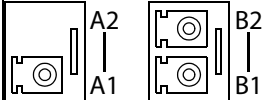
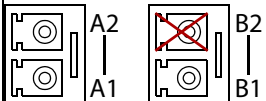
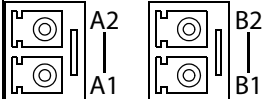
Multiviewer SFP Module Mosaic Output to Display Input Cable Connections

Connect displays to the SFP modules according to the following guidelines. Some SFP modules have two outputs and in rare cases, the output allocation for these modules may be reversed from what is shown. Configure the room layout in XEdit. The table below shows the nomenclature used in XEdit and the physical SFP output on the multiviewer's rear panel. Connections crossed-out with a red 'X' are not connected. For more information about the location of card A and B in the frame, see [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30.

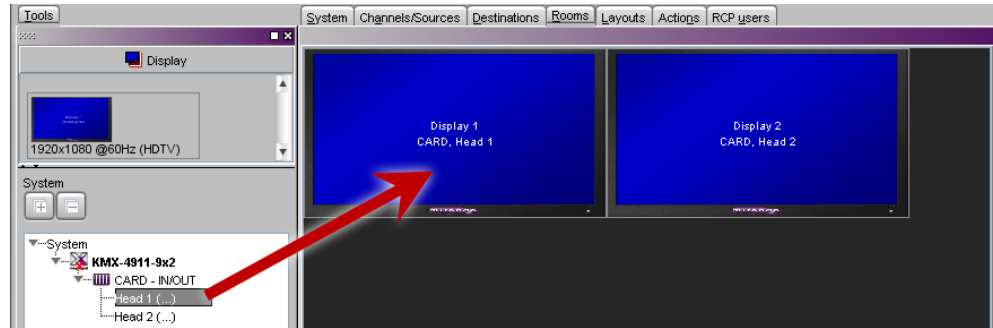
Multiviewer Capacity	Rear Panel Connections	KMX-3921 Room Configuration Nomenclature in XEdit
9 × 1	<p>Fiber Connection for a single Tx SFP module.</p>  <p>Fiber Connection for a double SFP output module.</p> 	<p><i>Card - IN/OUT Head 1 (...)</i> = SFP output 1 <i>Card - IN/OUT Head 2 (...)</i> = No Connection</p>
18 × 1 27 × 1 36 × 1 54 × 1	<p>Fiber Connection for a single Tx SFP module.</p>  <p>Fiber Connection for a double SFP output module.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1 <i>Card A - IN/OUT Head 2 (...)</i> = No Connection <i>Card B - IN/OUT Head 1 (...)</i> = No Connection <i>Card B - IN/OUT Head 2 (...)</i> = No Connection</p>
9 × 2	<p>Fiber Connection for a double SFP output module.</p> 	<p><i>Card - IN/OUT Head 1 (...)</i> = SFP output 1 <i>Card - IN/OUT Head 2 (...)</i> = SFP output 2</p>
18 × 2 27 × 2 36 × 2 54 × 2	<p>Fiber Connection for two single Tx SFP modules.</p>  <p>Fiber Connection for a double SFP output module.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1 <i>Card A - IN/OUT Head 2 (...)</i> = No Connection <i>Card B - IN/OUT Head 1 (...)</i> = SFP output B1 <i>Card B - IN/OUT Head 2 (...)</i> = No Connection</p> <p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1 <i>Card A - IN/OUT Head 2 (...)</i> = SFP output A2 <i>Card B - IN/OUT Head 1 (...)</i> = No Connection <i>Card B - IN/OUT Head 2 (...)</i> = No Connection</p>

Multiviewer Cabling

Multiviewer SFP Module Mosaic Output to Display Input Cable Connections

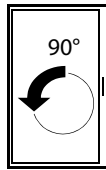
Multiviewer Capacity	Rear Panel Connections	KMX-3921 Room Configuration Nomenclature in XEdit
18 × 3 27 × 3 36 × 3 54 × 3	<p>Fiber Connection for a single Tx SFP module with a double SFP output module.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1</p> <p><i>Card A - IN/OUT Head 2 (...)</i> = SFP output A2</p> <p><i>Card B - IN/OUT Head 1 (...)</i> = SFP output B1</p> <p><i>Card B - IN/OUT Head 2 (...)</i> = No Connection</p>
	<p>Fiber Connection for a single Tx SFP module with a double SFP output module.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1</p> <p><i>Card A - IN/OUT Head 2 (...)</i> = No Connection</p> <p><i>Card B - IN/OUT Head 1 (...)</i> = SFP output B1</p> <p><i>Card B - IN/OUT Head 2 (...)</i> = SFP output B2</p>
	<p>Fiber Connection for two double SFP output modules.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1</p> <p><i>Card A - IN/OUT Head 2 (...)</i> = SFP output A2</p> <p><i>Card B - IN/OUT Head 1 (...)</i> = SFP output B1</p> <p><i>Card B - IN/OUT Head 2 (...)</i> = No Connection</p>
18 × 4 27 × 4 36 × 4 54 × 4	<p>Fiber Connection for two double SFP output modules.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i> = SFP output A1</p> <p><i>Card A - IN/OUT Head 2 (...)</i> = SFP output A2</p> <p><i>Card B - IN/OUT Head 1 (...)</i> = SFP output B1</p> <p><i>Card B - IN/OUT Head 2 (...)</i> = SFP output B2</p>

Assign a multiviewer display to an SFP output as follows: in the **Rooms** tab of XEdit, drag the multiviewer's card output onto a display. See [XEdit Installation](#), on page 67 and the *Kaleido Software User's Manual* for more information (see [Related Documentation](#), on page 11).

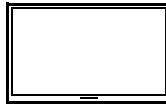


Multiviewer SFP Module Mosaic Output to a 4K Display Input Cable Connections

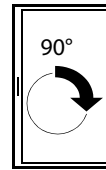
The multiviewer's display can be rotated. The following display orientations are supported.



Portrait: Display Rotated
90° Counter-Clockwise



Landscape:
Not Rotated

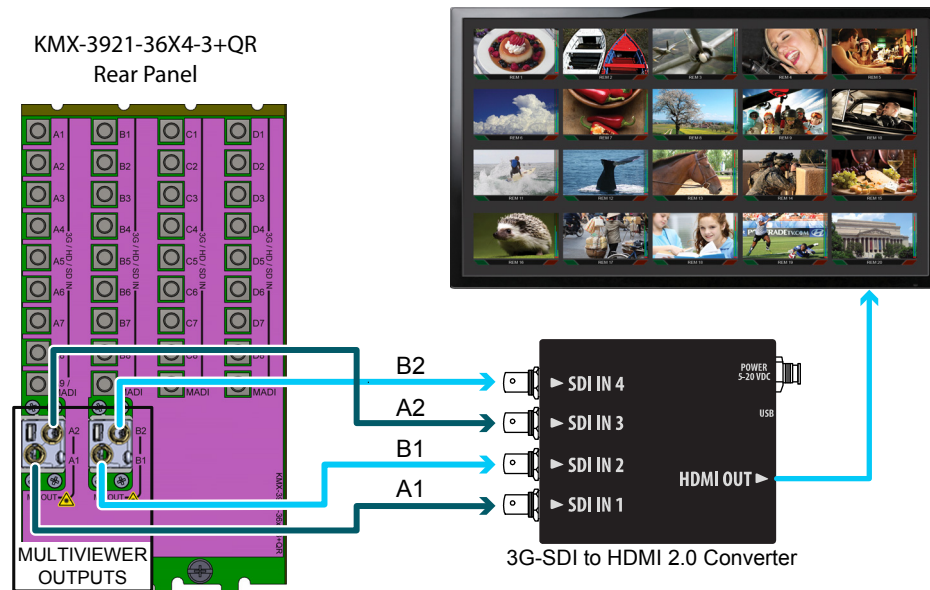


Portrait: Display Rotated
90° Clockwise

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 shown below.



Cabling diagram for a KMX-3921 setup for a mosaic output with a quad-link 3G to HDMI 2.0 converter (partial view)

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
A1	SDI IN 2	SDI IN 3
A2	SDI IN 1	SDI IN 4
B1	SDI IN 4	SDI IN 1
B2	SDI IN 3	SDI IN 2

Display rotation is a licensed option; see [Available Hardware and Software Options](#), on page 120 for licensing information.



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* and *Changing a Display's Rotation*. See [Related Documentation](#), on page 11.

About HDMI-Type Signal Connections

HDMI-type multiviewer outputs are compatible with HDMI cables and display devices with HDMI-compliant inputs. The performance of HDMI cables has been standardized for each generation of supported technology by using a version number. The multiviewer requires the minimum cable version as shown below.

HDMI Video Cable Application	Requires an HDMI Cable Rated as Version
1K HD	1.4 or higher
4K UHD	2.0 or higher

HDMI cable connectors for use with the multiviewer are available in the following formats.

HDMI Connector Designation	Visual Representation
Full size A	
Micro D	

Commissioning the Multiviewer

The multiviewer installation presumes that the Densité 3+ FR4 / Densité 3+ FR1 frame is installed, networked, and powered according to the:

- Densité 3+ FR1 documentation: *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual*.
- Densité 3+ FR4 documentation: *Densité 3+ FR4 Housing Frame User Manual*.

See [Related Documentation](#), on page 11.

Avoiding Networked Equipment IP Address Conflicts

Networked equipment that use the same IP address (have a network IP address conflict) will not be able to communicate on the network. When the multiviewer and its networked ancillary equipment (for example, a RCP-200) are powered up for the first time, the equipment uses factory default IP addresses to communicate on the network (see [Factory-Default IP Addresses](#), on page 49). This could knock-out other equipment on the network should that equipment currently use the same IP address.

To avoid this situation, proceed as follows.

- 1 Before installing any KMX-3921 cards into the Densité 3+ FR1 / Densité 3+ FR4 frame, or power up any ancillary equipment, you will need to first temporarily disconnect this equipment from the network switch:
 - disconnect the *Control Port ETH 1/2* Ethernet cables from the Densité 3+ FR1 / Densité 3+ FR4 frame.
 - disconnect the Ethernet cable from the multiviewer's rear panel.
 - disconnect the Ethernet cables from the Kaleido-RCP2 PoE adapter or RCP-200, when equipped.

- 2 Insert the KMX-3921 card(s) into the Densité 3+ FR1 / Densité 3+ FR4 frame (see [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30) and verify that each card is securely seated in its slot.

The multiviewer starts up. The startup sequence takes approximately four minutes, during which time every card's status LED is blinking orange.

Once the startup has completed, the status LEDs on the *output cards* should be green (steady).

Note: For more information on the card's LEDs, see [Card Interface and Troubleshooting](#), on page 52.

- 3 Set a unique IP address for each piece of networked equipment according to [Assigning an IP Address to Each Device in your System](#), on page 57.

To make the multiviewer operational

For the following steps, see [Cabling Diagrams](#), on page 39.

- 1 Connect the multiviewer to the network switch. See [Multiviewer Network Connections](#), on page 42.
- 2 Connect the SDI signals to the multiviewer SDI inputs. If available, connect any MADI inputs to the **SDI 9 / MADI** inputs. See [Multiviewer SDI / MADI Input Combinations](#), on page 21 and [Cabling Diagrams](#), on page 39 for how to connect MADI inputs.
- 3 Connect the Kaleido-RCP2 or RCP-200 (if available) to a 100Base-T Ethernet switch. You can also connect a mouse and a keyboard to your Kaleido-RCP2.

Notes

- You may need to upgrade your Kaleido-RCP2 devices (if available) to the latest firmware. See [Software and Firmware Updates](#), on page 11. Refer to the *Kaleido-RCP2 Guide to Installation and Operation* for instructions on how to determine the firmware level, and how to perform the upgrade for these devices. See [Related Documentation](#), on page 11.
-

- 4 Connect the multiviewer's outputs to your displays. To change the display resolution, see [Changing the Mosaic Output Resolution](#), on page 55.

You can now proceed with the networking setup (see [Networking Essentials](#), on page 57).

Factory-Default IP Addresses

The KMX-3921 and its networked ancillary equipment is shipped with the following default network settings:

Equipment	System IP address	Network mask	Gateway
KMX-3921 Multiviewer	192.168.3.30	255.255.255.0	0.0.0.0
RCP-200	10.0.3.200	255.255.255.0	0.0.0.0
Kaleido-RCP2 ^a	10.0.3.191	255.255.255.0	0.0.0.0
CPU-ETH2 controller (Densité 3+ FR1 frame)	192.168.3.1	255.255.255.0	0.0.0.0
CPU-ETH3 controller (Densité 3+ FR4 frame)	192.168.3.3	255.255.0.0	0.0.0.0

a. When no network DHCP server is available.

Multiviewer Cabling

To make the multiviewer operational

4 Frame Operation and IP Network Setup

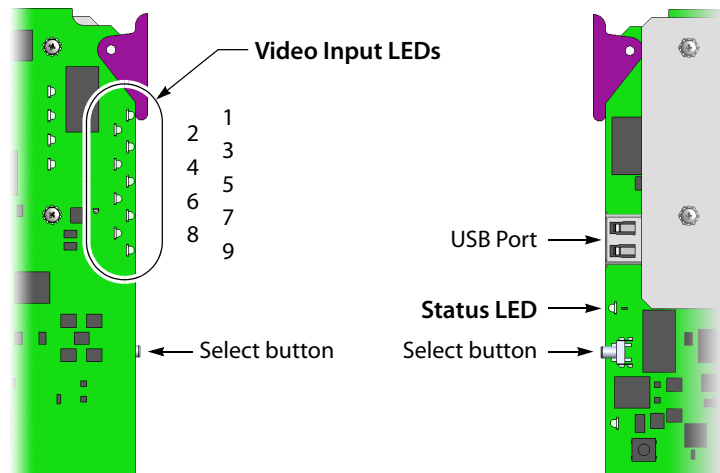
This chapter shows the multiviewer interfaces, explains the local operations that can be performed, and it explains how to implement IP network connectivity with the multiviewer.

A KMX-3921 multiviewer system can be controlled in the following ways:

- In the housing frame, the card-edge LEDs can be enabled to allow you to monitor the KMX-3921 card input's operating status (see [Card Interface and Troubleshooting](#), on page 52), or use the CPU-ETH3 local control panel and its buttons to navigate menus and adjust parameter values (see [Using the Frame Control Panel](#), on page 53).
- The loading and management of layouts is handled through XEdit, accessed through an Ethernet connection.
- 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 98).
- A GPI interface can be used to remotely control layout selection. See *GPI-1501 General Purpose Interface I/O Module* in the Kaleido Software User's Guide. See [Related Documentation](#), on page 11.
- The mosaic output resolution of the card can be controlled automatically through the EDID interface with the display.
- 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 11.
- The KMX-3921 multiviewer can be controlled as a router by router control systems which can trigger actions on this multiviewer. See the *Routers & Kaleido Multiviewer* chapter in the Kaleido Software User's Guide. See [Related Documentation](#), on page 11.

Card Interface and Troubleshooting

The front card edges of the KMX-3921 incorporate several operational elements shown below.



Summary view of the interface of a KMX-3921 card

The status LED shows the card's current operating status. During operation, the cards' Status LED should be green.

Status LED Color	Description
Extinguished	<ul style="list-style-type: none"> No power. Card not fully inserted.
Green	<ul style="list-style-type: none"> Normal operation.
Yellow	<ul style="list-style-type: none"> The meaning of this status is defined through the <i>Alarm config</i> panel. See Alarm Configuration Panel, on page 106.
Orange	<ul style="list-style-type: none"> The meaning of this status is defined through the <i>Alarm config</i> panel. See Alarm Configuration Panel, on page 106.
Flashing orange	<ul style="list-style-type: none"> The card is selected for local control.
Red	<ul style="list-style-type: none"> The meaning of this status is defined through the <i>Alarm config</i> panel. See Alarm Configuration Panel, on page 106.
Flashing red	<ul style="list-style-type: none"> No rear panel. Fan failure. High temperature.

Under normal operation, the Video Input LEDs are silenced. To make the Video Input LEDs operational, press the Select button on the front edge of a KMX-3921 card. Video Input LEDs for the corresponding video inputs that have been assigned a valid video signal should be green.

Video Input LED	Description
Green	<ul style="list-style-type: none"> Normal operation. A valid SDI or a valid MADI signal is connected. Note: the 9th input will be green if either a valid SDI or a valid MADI signal is connected.
Red	<ul style="list-style-type: none"> Input is unconfigured No signal

The select button allows you to access and set basic configuration parameters. The use of the select button is described in [Changing the Mosaic Output Resolution](#), on page 55 and [Networking Essentials](#), on page 57.

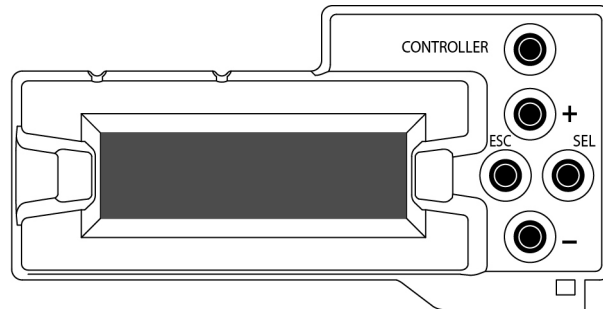
For more information about the USB port, see [Troubleshooting with the card's front edge USB connector](#), on page 139.

Using the Frame Control Panel

All of the cards installed in a Densité 3+ FR1 or Densité 3+ FR4 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.

CPU-ETH2 Local Control Panel

In the case of a Densité 3+ FR1 frame, the local control panel is fastened to the CPU-ETH2 controller card, and consists of a display unit capable of displaying two lines of text, each 16 characters in length, and five buttons.



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 flashing orange.

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

CPU-ETH3 Local Control Panel

The CPU-ETH3 local control panel is located in the top right side of the Densité 3+ FR4 frame. The control interface is a touch screen that allows you to view the status of Densité 3+ FR4 frame components including that of each card currently installed in the 24 slots. A number of buttons (PS1, PS2, FANs, CTRL, and REF) allow you to access the menus for the Densité 3+ FR4 frame components including its reference module. The outline color of the buttons behave like status indicators. For example, in the image below, the card in slot 13 is in alarm.



CPU-ETH3 local control panel - Top Menu

Once a card has been selected, four virtual navigation buttons (SEL, ESC, [+], and [-]) allow you to navigate through menus to view and configure the card's parameters.



CPU-ETH3 local control panel

The panel is assigned to operate any card in the frame by pressing the icon representing the appropriate card on the Densité 3+ FR4 frame's local control panel touch display. Alternatively, pressing the status button on the front edge of a card will also bring up the menu. The Status LED on the selected card becomes flashing orange.

Touch the CTRL button on the control panel to select the Densité 3+ FR4 frame's controller card itself.

Navigating the Local Control Panel Menu

The KMX-3921 has operating parameters which may be adjusted locally at the controller card interface. Press the Select button on the front edge of a KMX-3921 card 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, touching 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; touching ESC causes the parameter to revert to its former value. Touching 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

The Status LED on the selected card flashes orange, and the associated local menu and navigation controls appear on the frame's control panel touch display.

Note: You can navigate the menu by using the four virtual buttons on the touch display:

- Touch the [+] and [-] buttons, to navigate between menu options or between parameter values.
 - Touch SEL to access the next menu level. When a parameter value is shown on the display, modify the value by using the [+] and [-] buttons, and then touch SEL to apply the new value.
 - Touch ESC to go back to the previous menu level.
 - Once you have completed your changes, press the Select button *on the front edge of the KMX-3921 card* to exit the control menu.
-

- 2 On the local control panel, touch the [-] button, until RESOLUTION appears on the display.
- 3 Touch the SEL button.
HEAD 1 appears on the control panel's touch display.
- 4 Touch the SEL button again.
- 5 The current resolution for the display that is connected to the to the card's output head 1 (for example, through the SFP1 or SFP A1 connector) appears on the display.
- 6 Touch the [+] and [-] buttons, to navigate to a suitable output resolution for your display.
- 7 Touch SEL to apply the value shown on the display.
The selected resolution is applied to the display.
- 8 Touch ESC to return to the previous level in the local control menu.
HEAD 1 appears again on the display.
- 9 If you want to change the resolution on the second display (if available), then touch the [-] button.
HEAD 2 appears on the 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 card's output head 2 (for example, through the SFP2 or SFP A2 connector).
- 10 When you are satisfied with the selected output resolution settings, press the Select button *on the front edge of the KMX-3921 card* to exit the control menu.

Notes

- If you do not touch any button on the frame local control panel, the CPU-ETH2 / CPU-ETH3 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 touch the SEL button on the local control panel), once the 30-second timeout has occurred, the parameters will be confirmed as if you had touched the SEL button.
-

Enabling the Frame Controller's Automatic Restore Feature

The frame's ETH2 or ETH3 controller can backup a card's configuration parameters and the card's data base. When this feature is enabled, the card's configuration will be preserved when the card is swapped-out with a new card of the same type.

To activate this feature, refer to the frame's documentation. See *Data Restoration* in the *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual* or in the *Densité 3+ FR4 Housing Frame User Manual*. See [Related Documentation](#), on page 11.

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. See [Cabling Diagrams](#), on page 39 and [Multiviewer Network Connections](#), on page 42.
- 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 to be made on both the multiviewer and the Ethernet switch are 100 Mbps, full-duplex.

IMPORTANT

There is a risk that the Ethernet connection to the multiviewer will fail if the multiviewer's Ethernet port's configuration is not the same as the Ethernet switch's configuration to which the multiviewer is connected, and the switch or multiviewer reboots.

Assigning an IP Address to Each Device in your System

Multiviewers and most peripheral devices that are part of a KMX-3921 system communicate through a TCP/IP network. See *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. Refer to [Setting the Multiviewer's IP addresses](#), on page 58.
- Assigning an IP address, and specifying the appropriate network mask, gateway address to the frame's controller. Refer to the:
 - Densité 3+ FR1 documentation: *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual*.
 - Densité 3+ FR4 documentation: *Densité 3+ FR4 Housing Frame User Manual*.See [Related Documentation](#), on page 11.
- Configuring the RCP-200, if available. Refer to [Configuring the RCP-200](#), on page 114.

- Configuring the Kaleido-RCP2, if available. Refer to [Configuring the Kaleido-RCP2](#), on page 117.

Setting the Multiviewer's IP addresses

For the KMX-3921 multiviewer to join a TCP/IP network, it must be configured with a system IP address, a network mask, a gateway, and a system name. You may also need to configure networking parameters for the CPU-ETH3 frame controllers (if your housing frames were not already in operation), any new Kaleido-RCP2 unit you ordered, and a client PC to communicate with the multiviewer and its peripheral devices (see [XEdit Installation](#), on page 67).

Note: If the system IP address of the multiviewer has been changed (that is, it no longer corresponds to the as-shipped configuration), it is still possible to determine the current setting; see [Finding the Multiviewer's IP Address and Application Version](#), on page 126.

Network Switch Considerations

The Densité 3+ FR4 frame's **ETH** Ethernet connection can present to the connected network switch more than one MAC address as Densité 3+ FR4 has an internal switch that aggregates multiple network interfaces for the frame itself and that of certain cards or systems installed in the frame such as any KMX-3921 cards in a multiviewer system. Each KMX-3921 multiviewer system (as defined by each installed KMX-3921 rear panel) has its own MAC address.

By default, many network switches support only one MAC address to be connected to an individual switch's network port. This is done for security reasons to prevent people from extending the reach of the network by connecting unauthorized equipment to the network.

In cases where a Densité 3+ FR4 frame is connected to a network switch with such security enabled, network connectivity to all Densité 3+ FR4 frame components will be impossible. With administrative access to the switch, the solution is to increase the switch's setting for the number of MAC addresses it will support on the port used for the Densité 3+ FR4 frame to a number that reflects the current number of network interfaces used within Densité 3+ FR4. If the required number of network interfaces is undetermined, set the switch to allow 21 network interfaces for the Densité 3+ FR4 as this is the maximum number of network interfaces a Densité 3+ FR4 frame can support. Refer to the switch's administrator's guide for the appropriate configuration instructions.

For example, for a Cisco brand switch, use the following administrative command to increase the number of supported IP interfaces on a port to 21.

```
Switch(config-if)# switchport port-security maximum 21
```

Changing the Multiviewer's IP Address

Note: The multiviewer's IP address can also be remotely set through a the KMX-3921's iControl service panel. See [Network Settings Panel](#), on page 102.

To change the IP address of a KMX-3921 multiviewer using the local control panel

- 1 Press the icon representing the appropriate card on the Densité 3+ FR4 frame's local control panel touch display or press the Select button on the front edge of the card you want to configure on the Densité 3+ FR1 frame's local control panel

Note: You can configure a KMX-3921 system's network settings from any multiviewer card in a multi-card system (for example, cards A, B, C, and so on). These settings are automatically replicated to all other multiviewer cards. For more information about the location of multiviewer cards in the frame (cards A, B, C, and so on), see [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30.

The Status LED on the selected card flashes orange, and the associated control menu appears on the display of the Densité 3+ FR1 / Densité 3+ FR4 frame's local control panel.

Note: You can navigate the menu by using the four buttons on the display:

- Touch the [+] and [-] buttons, to navigate between menu options or between parameter values.
 - Touch SEL to access the next menu level. When a parameter value is shown on the display, modify the value by using the [+] and [-] buttons, and then touch SEL to apply the new value.
 - Touch ESC to go back to the previous menu level.
 - Once you have completed your changes, press the Select button *on the front edge of the KMX-3921 card* to exit the control menu.
-

- 2 On the local control panel, touch the [-] button repeatedly until NETWORK SETTINGS appears on the display, and then touch the SEL button.
SYSTEM IP EDIT appears on the control panel's display.

- 3 Touch the SEL button again.

The current IP address appears on the display.

- Touch the [+] and [-] buttons, to change the current value at the current input position.
- Touch SEL to move one position to the right.
- Touch ESC to move one position to the left.

Note: Touching ESC when the input focus is in the first position returns to the previous menu level.

- 4 When the display shows the correct IP address, touch SEL to apply your change.

- 5 Touch ESC to return to the previous menu level.

SYSTEM IP EDIT appears on the control panel's display.

- 6 Touch the [-] button.

NETMASK EDIT appears on the control panel's display.

- 7 Repeat [step 3](#) to [step 5](#) to configure the netmask.

- 8 Once you have set the network mask and navigated back to the previous menu level, touch the [-] button again.

DEFAULT GW EDIT appears on the control panel's display.

- 9 Repeat [step 3](#) to [step 5](#) to configure the gateway.
- 10 Once you have set the gateway, press the Select button on the front edge of the KMX-3921 card to exit the control menu.

Notes

- If you do not touch any button on the Densité 3+ FR4 frame local control panel, the CPU-ETH2 / CPU-ETH3 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 touch the SEL button on the local control panel), once the 30-second timeout has occurred, the parameters will be confirmed as if you had touched the SEL button.
-

The card restarts. The startup sequence takes approximately two minutes, during which time the Status LED is flashing orange. Once the startup has completed, the Status LED should be green.

- 11 Check the card's Status LED, and make sure that it does not indicate an error condition. See [Card Interface and Troubleshooting](#), on page 52.
- 12 Verify that the new IP address is effective, by referring to [Finding the Multiviewer's IP Address and Application Version](#), on page 126. Perform this verification for all the cards that are connected to your system's rear module.

Network Considerations

TCP/UDP Port Usage

The various KMX-3921 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 (for example, on 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)

Port	Used for	Transport	Notes
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	Used to listen for Kaleido Multiviewer discovery packets
10000		TCP	For Kaleido-RCP2 protocol
10001		TCP	For Kaleido-RCP2 protocol
5120		UDP	On multicast 230.8.8.9 for Kaleido-RCP2 protocol
5121		UDP	For Kaleido-RCP2 protocol

From multiviewer to client

Port	User 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 Kaleido-RCP2

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

From iControl to multiviewer

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

Between multiviewer and remote control panel

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

Port	Used for	Transport	Notes
5120	RCP2	TCP	Used to listen for Kaleido Multiviewer discovery packets
10000		TCP	For Kaleido-RCP2 protocol
10001		TCP	For Kaleido-RCP2 protocol
5120		UDP	On multicast 230.8.8.9 for Kaleido-RCP2 protocol
5121		UDP	For Kaleido-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 61.

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:

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

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

Between multiviewer and SNMP managers

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

Between multiviewer and NTP server

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

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

Network Considerations for a Multiviewer Cluster

IMPORTANT

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

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

5 System Configuration

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.

Frame Configuration Prerequisites

The multiviewer communicates with the frame, and it relies on certain information from the frame in order to correctly function. Before configuring the multiviewer, the following frame configuration parameters must be set.

- The Densité 3+ frame's network configuration.
- The Densité 3+ frame's date and time settings or the Network Time Protocol (NTP) settings.
- Frame reference configuration if the multiviewer's output is to be referenced.

Frame configuration information is found in the:

- Densité 3+ FR1 documentation: *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual*.
- Densité 3+ FR4 documentation: *Densité 3+ FR4 Housing Frame User Manual*.

See [Related Documentation](#), on page 11.

Multiviewer Model Representation in XEdit and XAdmin

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

In XEdit or XAdmin Select	To Represent a Multiviewer with a Capacity
KMX-3921-9x2	9 × 2 or 9 × 1 system
KMX-3921-18x4	18 × 4, 18 × 3, 18 × 2, or 18 × 1 system
KMX-3921-27x4	27 × 4, 27 × 3, 27 × 2, or 27 × 1 system

System Configuration

Multiviewer Model Representation in XEdit and XAdmin

In XEdit or XAdmin Select	To Represent a Multiviewer with a Capacity
KMX-3921-36x4	36 × 4, 36 × 3, 36 × 2, or 36 × 1 system
KMX-3921-54x4	54 × 4, 54 × 3, 54 × 2, or 54 × 1 system

XEdit Installation

Installing the 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 Kaleido Software version 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 67.
- 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 72.
- Signal Path Viewer opens as a standalone panel, updated in real time, showing assignment information between router sources and multiviewer inputs. See [Installing Signal Path Viewer](#) on page 75.

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.

- 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.

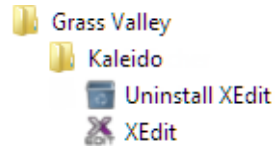
A window appears, showing the download and installation progress.



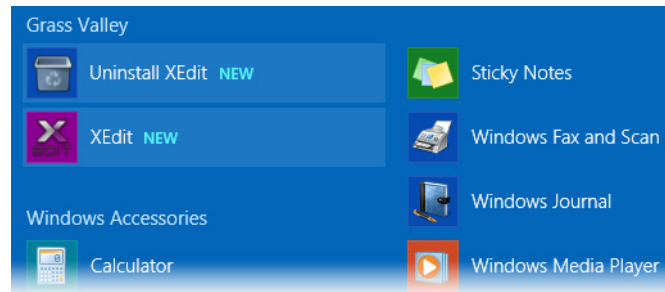
At the end of the installation process:

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

- 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).



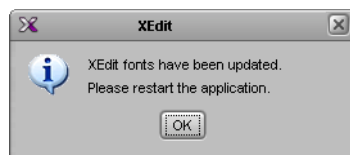
Once the installation has completed, the XEdit startup screen appears.



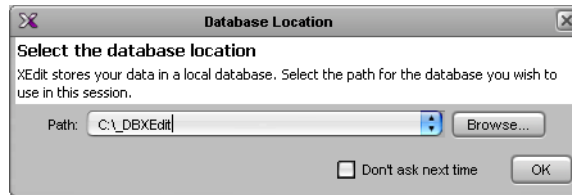
Depending on your Windows Firewall settings, a security alert may appear.

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

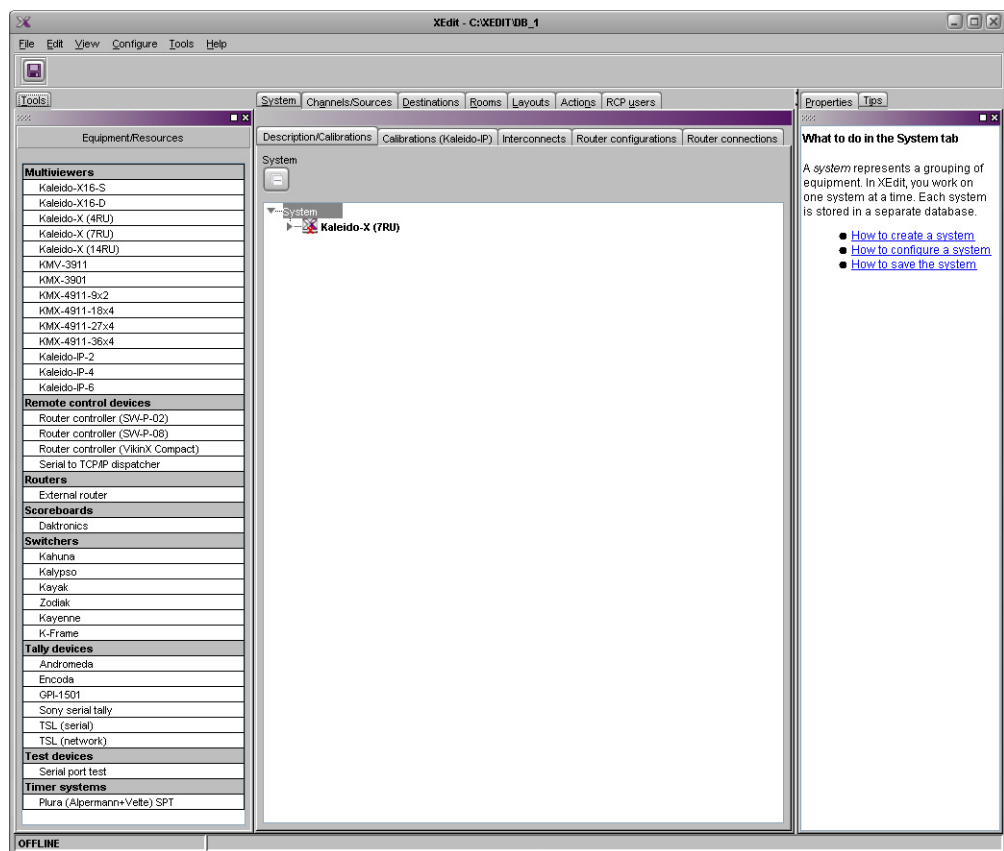
If XEdit cannot find all of the fonts it needs already on your PC or laptop, it downloads them from the multiviewer automatically, in which case a message will appear to confirm the font update, and instruct you to restart the application.




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



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



Note: Once it has been installed from the multiviewer, XEdit remains on your PC or laptop, and can be launched from the  shortcut that was added to your desktop, Apps view, or Start screen (see [page 68](#)), 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 11.

Uninstalling XEdit

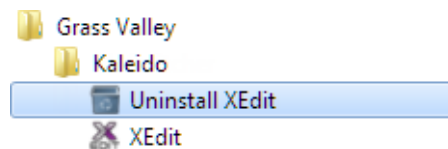
With recent versions of XEdit, an uninstall program is available from the Windows Start menu. If you installed XEdit from your multiviewer's home page, see [Uninstalling XEdit \(Dynamic Version 7.20 or Later\)](#), on page 71.

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 72.

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.

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

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 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 networked workstation that has IP connectivity to 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.

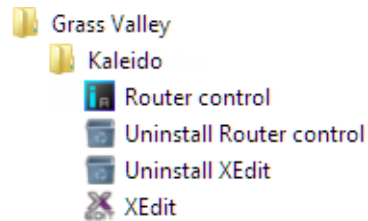
A window appears, showing the download and installation progress.



At the end of the installation process:

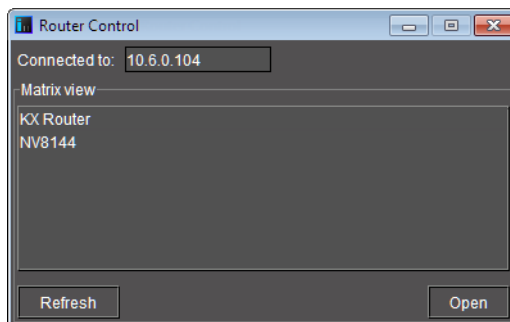
3. Installers for Linux or Mac OS X are not available.

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



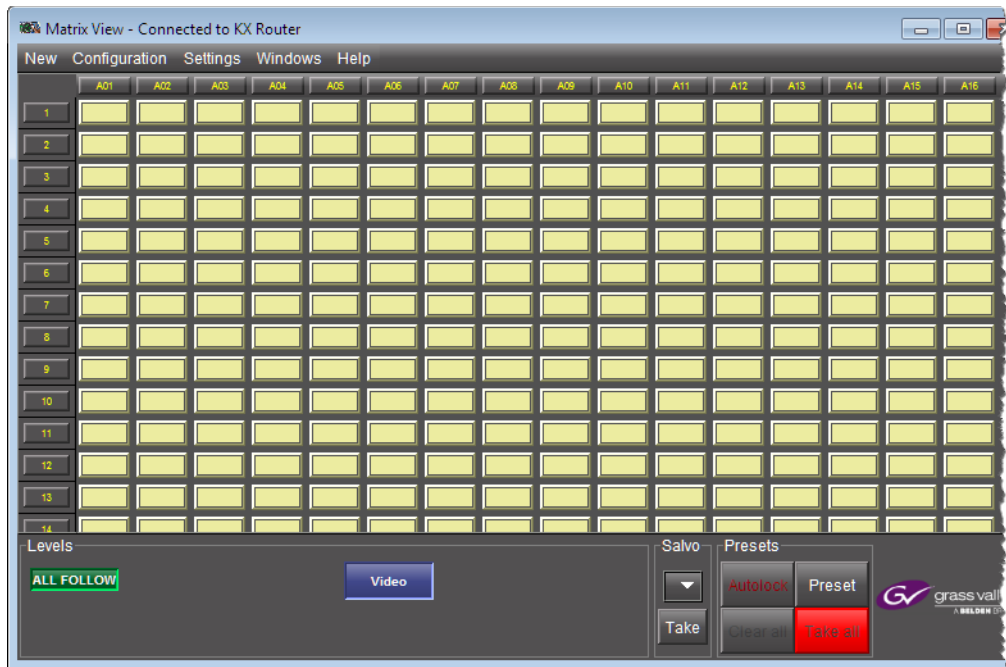
- If you have Windows 8.1, or Windows 8, Router Control will appear on your desktop, in the Apps view with all other installed applications on your PC (Windows 8.1), or in your Start screen (Windows 8).

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 11.

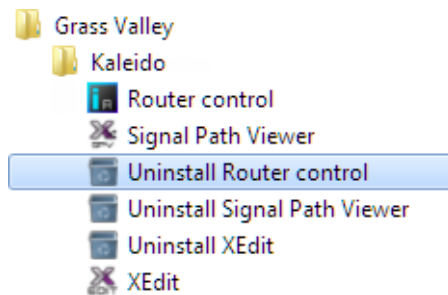
Notes

- 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 72](#)), 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

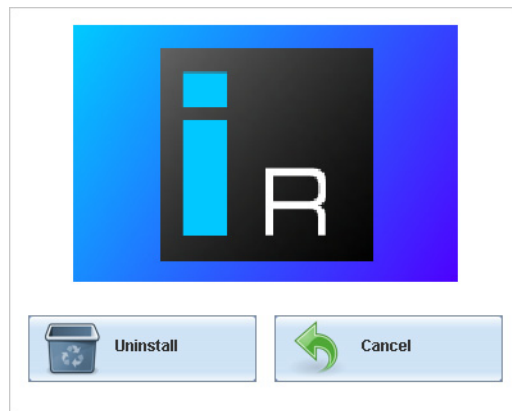
To uninstall Router Control

- 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 networked workstation that has IP connectivity to 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 were you saved the installer file and open it.

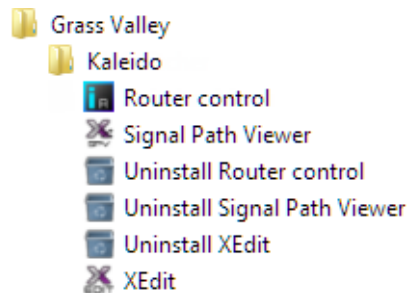
More security warnings or prompts may appear, which you may safely dismiss or accept.

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, 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.


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

The application automatically connects to your multiviewer.

KX Input	RT Name	RT Level	RT Dest	RT Src	Tie Line Status	CP Confirmed	RT Ready	KXI Card Prese
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

System address: 10.5.5.200 | Connection status: **Connected** | Last update: Nov 28, 2014 4:54:53 PM

Notes

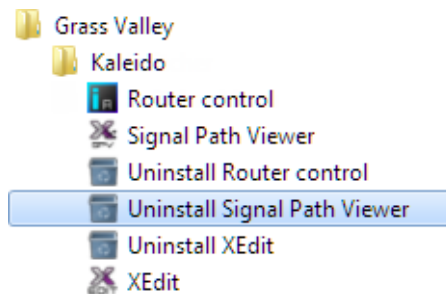
- Once it has been installed from the multiviewer, Signal Path Viewer remains on your PC or laptop, and can be launched from the  shortcut that was added to your desktop, Apps view, Start screen (see [page 76](#)), or from the Start menu. Whenever you install a new version of the Kaleido Software on 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.
- 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. For more information about the location of card A and B in the frame, see [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30.

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.

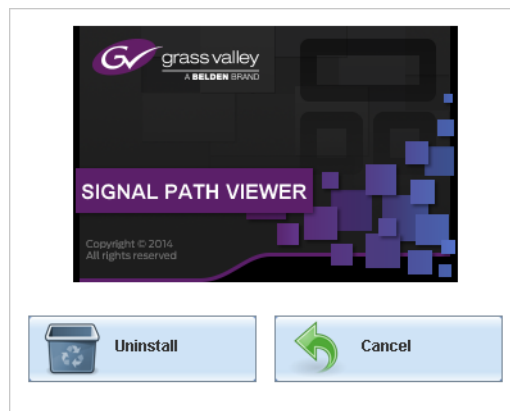
- If you have Windows 7, or Windows 10: Open the Start menu, click All Programs, scroll to the Grass Valley folder, and then expand the Kaleido folder.



- 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.m.p</i>	M is the major revision number m is the minor revision number p is the patch revision number

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



Under this circumstance, proceed as follows.

- There is no compatibility problem if only the patch revision number is different between the Kaleido Software version on the multiviewer and the XEdit version on your PC. Click **Yes** to the Software Version Check screen.
- There is a compatibility problem if the major version, minor version, or both are different between the Kaleido Software version on the multiviewer and the XEdit version on your PC. The solution is to downgrade / upgrade the XEdit version used on your PC to the Kaleido Software version used by the multiviewer. Proceed as follows:
 - Click **No** to the Software Version Check screen.
 - Uninstall XEdit from your PC (see [Uninstalling XEdit](#), on page 71).
 - Install XEdit from the multiviewer (see [Installing XEdit from your Multiviewer's Home Page](#), on page 67).

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 80),
- from **XEdit** (see [Opening XAdmin from XEdit](#) on page 80),
- from the multiviewer's control panel in **iControl** or **iControl Solo** (see [Opening XAdmin from iControl or iControl Solo](#) on page 82).

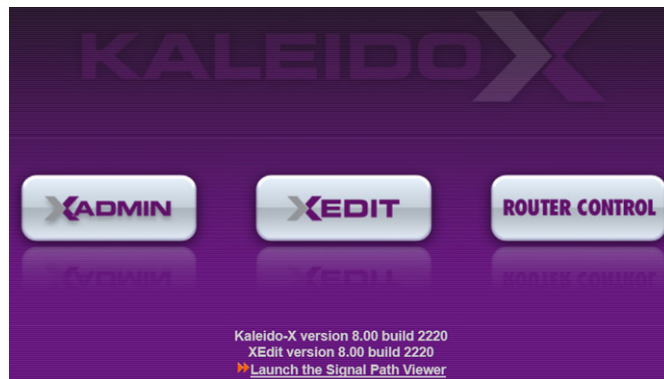
The first time you access XAdmin for a multiviewer (and every time the multiviewer's IP address has changed), you may see a security warning or a certificate error message. The procedures below include instructions on how to address these messages (see [Registering](#)

[your Multiviewer's Security Credentials with your Browser](#) on page 83). Internet Explorer users may also need to enable compatibility view (see [Enabling the Compatibility View in Internet Explorer](#) on page 91).

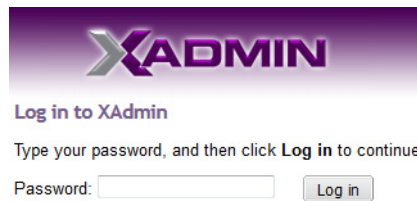
Opening XAdmin from a Browser

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 refer to [Registering your Multiviewer's Security Credentials with your Browser](#), on page 83.
- 4 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.

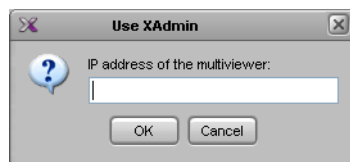


- 5 **Internet Explorer users:** If a blank page appears, then refer to [Enabling the Compatibility View in Internet Explorer](#), on page 91. The XAdmin Status and Options page appears. You can access all XAdmin features, by clicking the links, in the navigation area on the left of the page.

Opening XAdmin from XEdit

To open XAdmin from XEdit

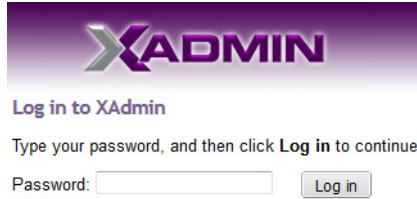
- 1 On the **Configure** menu, click **Use XAdmin**. XEdit prompts you for the IP address of the multiviewer you want to access.



- 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 refer to [Registering your Multiviewer's Security Credentials with your Browser](#), on page 83.
- 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 refer to [Enabling the Compatibility View in Internet Explorer](#), on page 91.

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

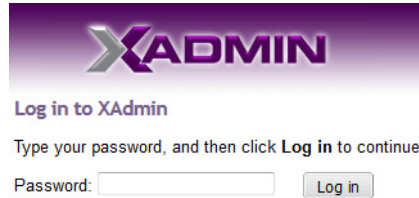
To open XAdmin from iControl or iControl Solo

- 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 Densité 3+ FR1 / Densité 3+ FR4 frame's name (refer to the iControl Solo User Guide, or to the iControl User Guide, for more information).
- 2 Open the KMX-3921 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 refer to [Registering your Multiviewer's Security Credentials with your Browser](#), on page 83.

- 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 refer to [Enabling the Compatibility View in Internet Explorer](#), on page 91.

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

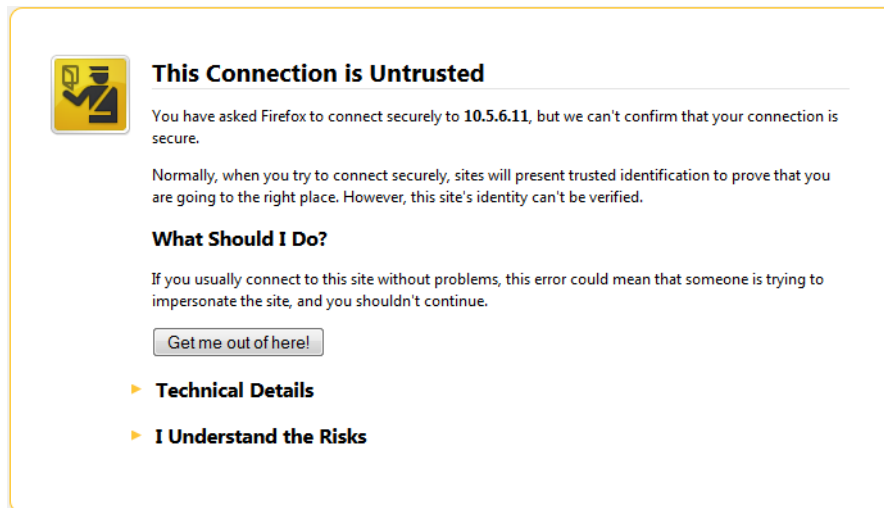
When you open your multiviewer's home page, or try to access XAdmin, your browser may report a certificate error (Internet Explorer), warn you about the site's security certificate (Chrome), or report an untrusted connection (Firefox). Follow the appropriate procedure below to register your multiviewer's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

- [Suppressing untrusted connection warning in Firefox](#), on page 83
- [Suppressing certificate error in Internet Explorer or Chrome](#), on page 85

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

Suppressing untrusted connection warning in Firefox

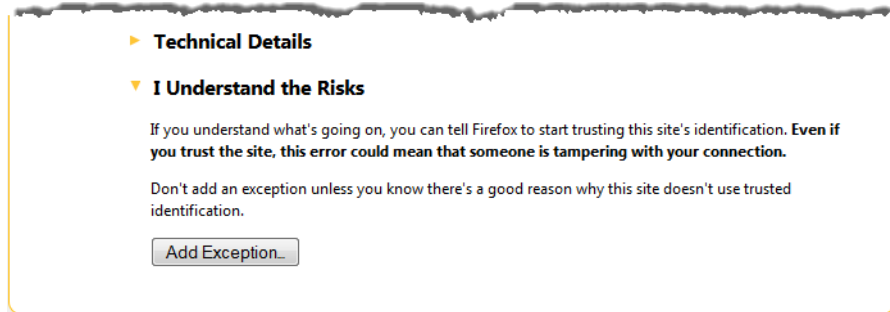
The first time you try to access XAdmin in Firefox, the browser may display the following page instead, prompting you to confirm the multiviewer's security credentials.



To register your multiviewer's security credentials with Firefox

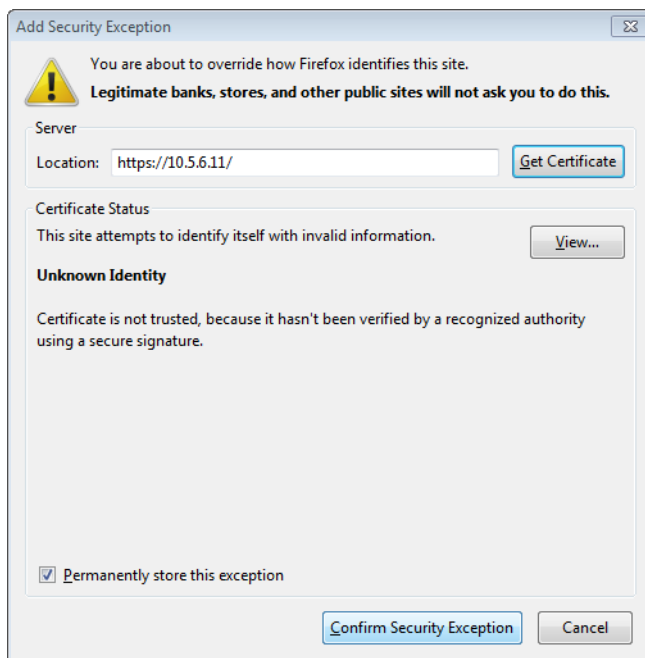
- 1 Click **I understand the Risks**, at the bottom of the page.

The message expands.



2 Click **Add Exception**.

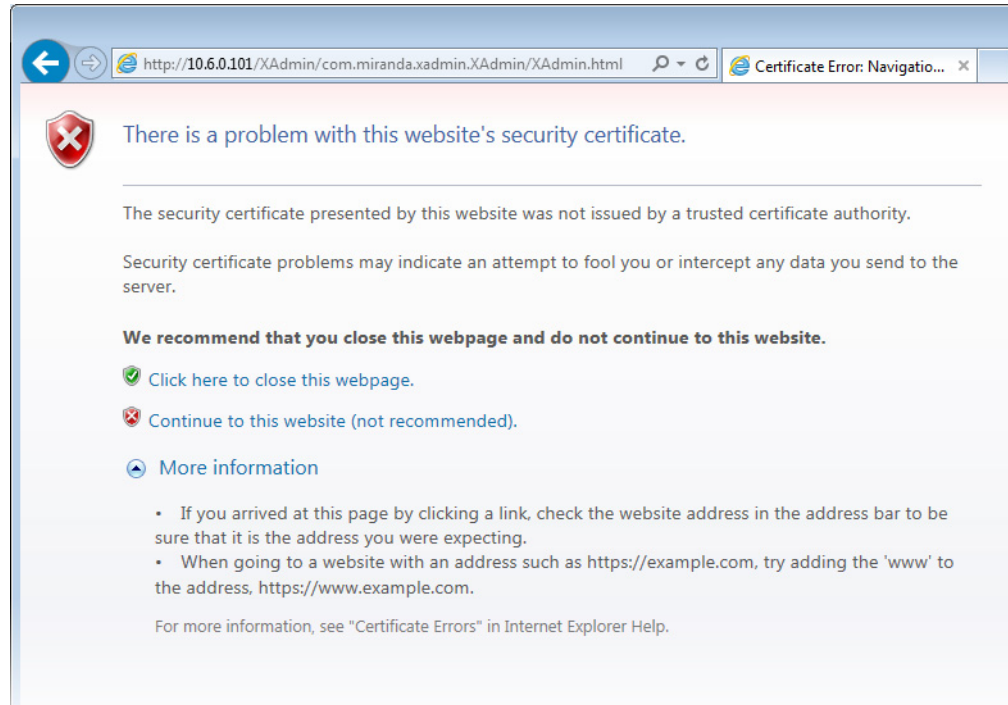
3 In **Add Security Exception**, click **Confirm Security Exception**.



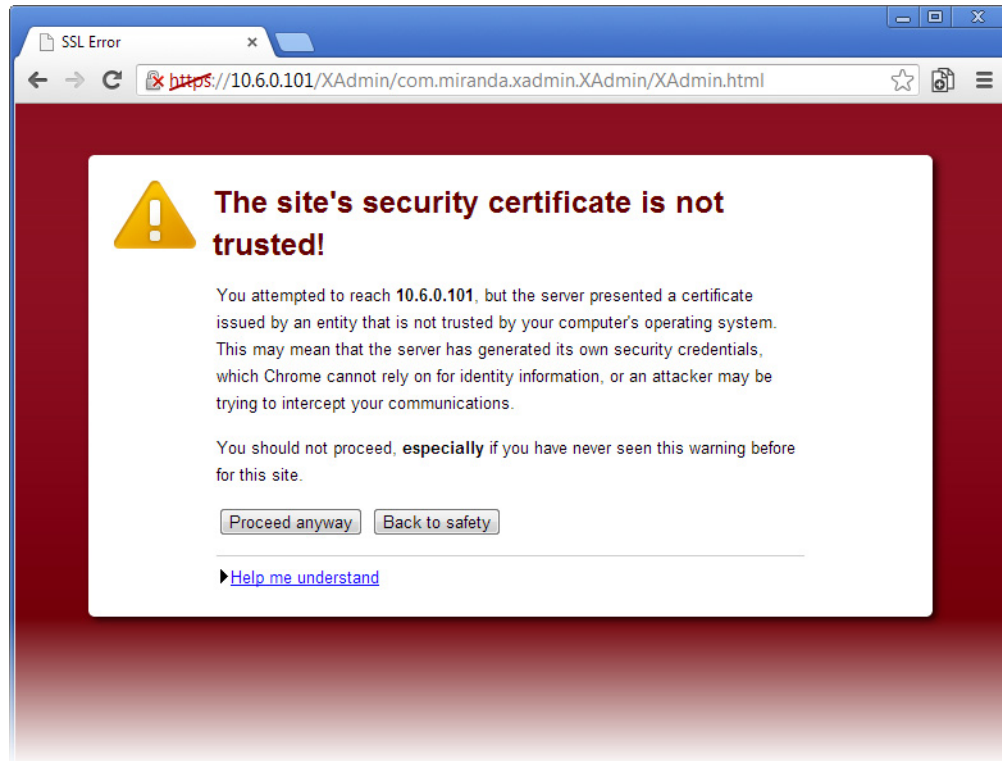
Your multiviewer's home page appears. You will now be able to access your multiviewer's client applications without seeing the warning. This will remain effective until the multiviewer's IP address is changed, in which case you will need follow the procedure again.

Suppressing certificate error in Internet Explorer or Chrome

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



Internet Explorer's security warning



Chrome's security warning

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

To register your multiviewer's security credentials with Internet Explorer

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

The address bar now indicates the certificate error.

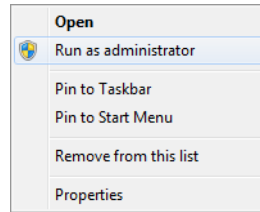


Special notes for Internet Explorer users

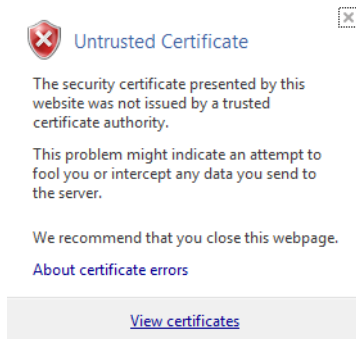
- If you see a blank page instead of XAdmin's Status and Options page, then see [Enabling the Compatibility View in Internet Explorer](#), on page 91.

Special notes for Internet Explorer users (*continued*)

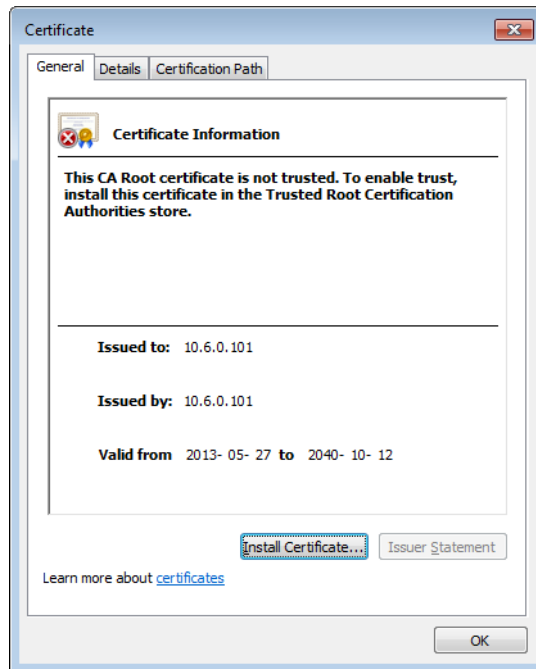
- You must have administrator status to accept the certificate error. If your user account does not have administrator status, then close your browser and, before you open it again, right-click the Internet Explorer icon, and then click **Run as administrator**:



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



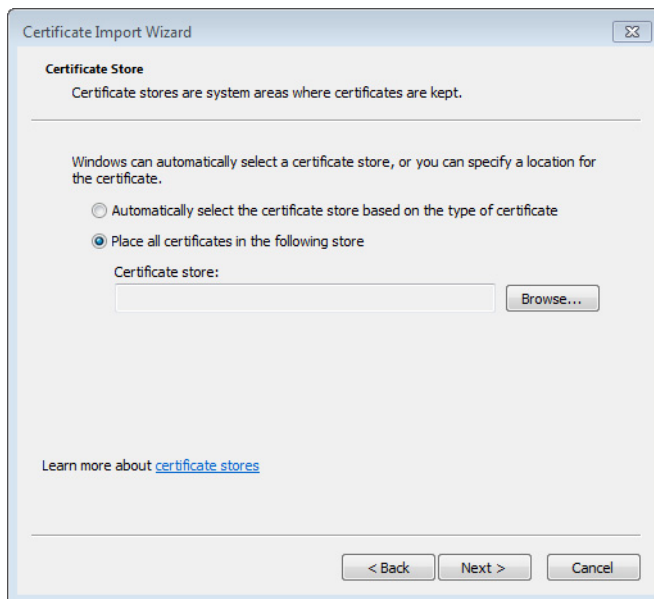
- 4 In **Certificate**, click **Install Certificate**.



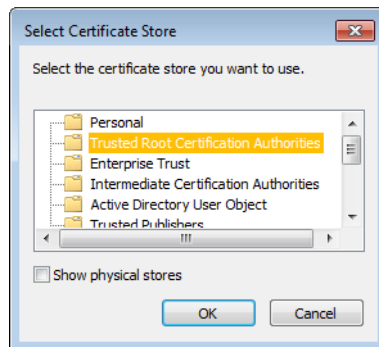
5 In **Certificate Import Wizard**, click **Next**.



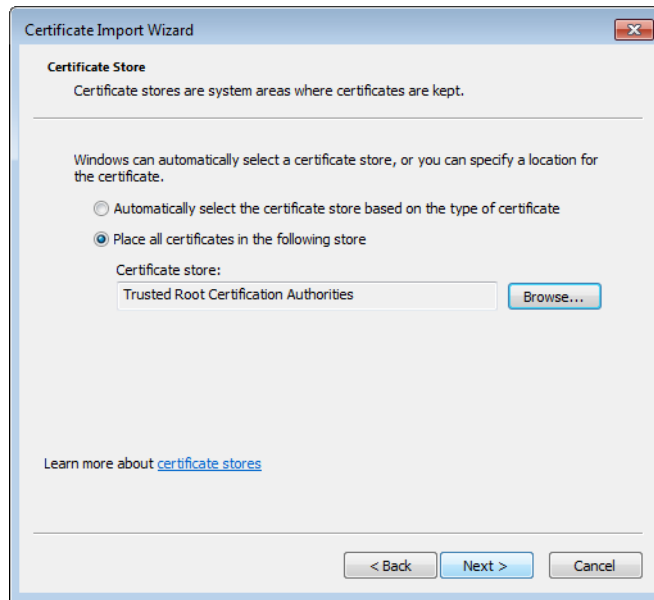
6 In **Certificate Import Wizard**, click **Place all certificates in the following store**, and then click **Browse**.



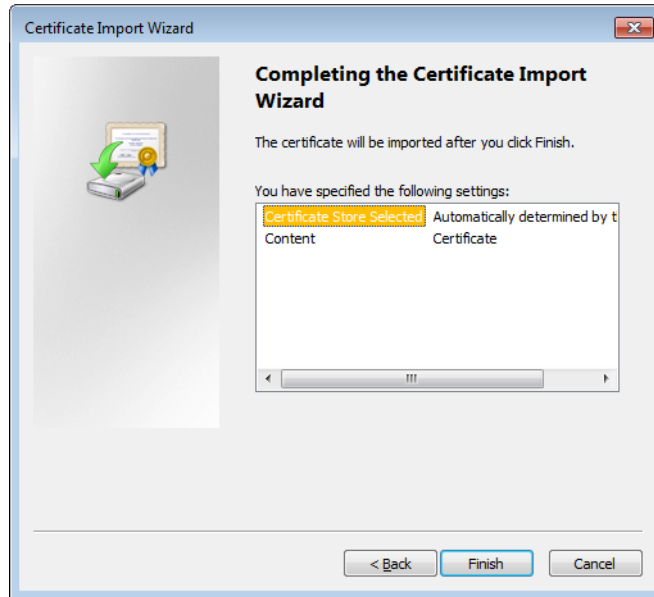
- 7 In **Select Certificate Store**, select **Trusted Root Certification Authorities**, and then click **OK**.



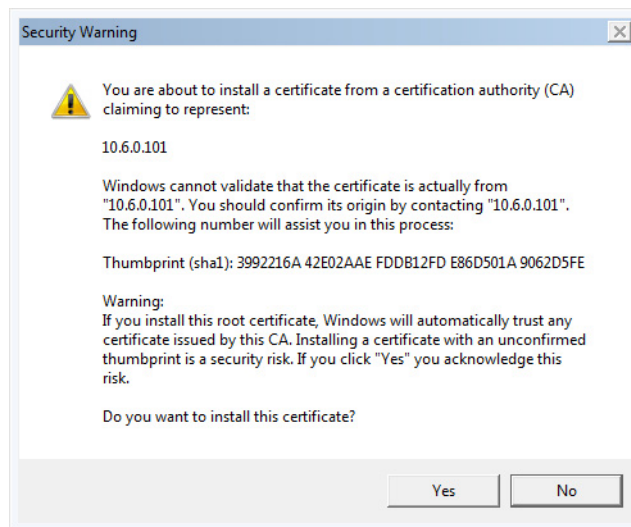
- 8 Back in **Certificate Import Wizard**, click **Next**.



9 Click **Finish**.

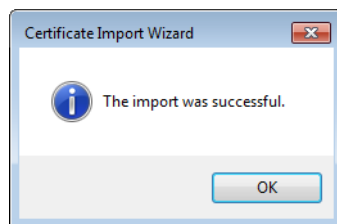


A security warning appears.



10 Click **Yes**.

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



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


13 Close all Internet Explorer (and Chrome, if any) windows, and then open your browser again.

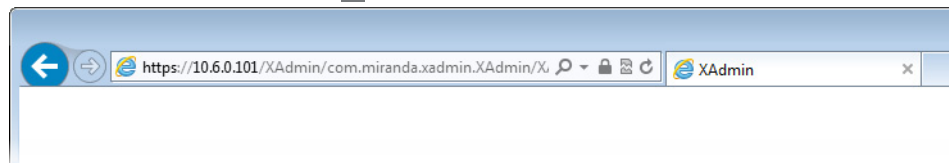
You should now be able to access XAdmin, from your multiviewer home page without ever seeing the security warning again, unless the multiviewer's IP address is changed, in which case you will want to repeat this procedure.

Enabling the Compatibility View in Internet Explorer

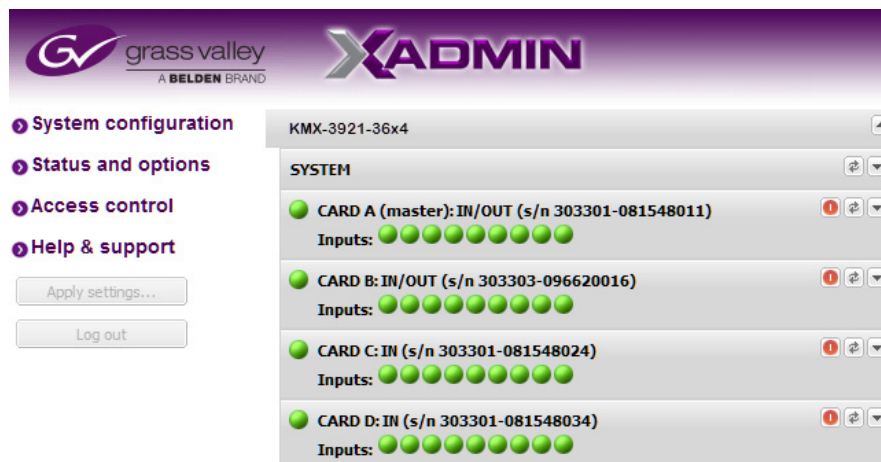
When you try to access XAdmin, from your multiviewer's home page, in *Internet Explorer 8, 9, or 10*, you may see a blank page instead of XAdmin's Status and Options page.⁵

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 78.
- 2 Click **Access control**, in the navigation area on the left side of the page.

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>

The Access Control page appears.

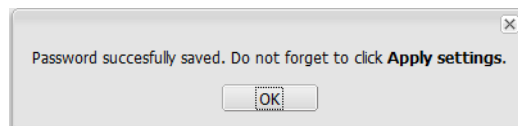
The screenshot shows the XAdmin interface with the 'Access Control' configuration page. At the top, there is a header with the 'grass valley' logo (A BELDEN BRAND) and the 'XADMIN' logo. Below the header, there are several sections: 'System configuration' (Access Control), 'Status and options' (Type your new password twice, and then click Save.), 'Access control' (New password: [text box], Confirm: [text box]), 'Physical connections', and 'Technical support' (Click Save to save your settings and continue.). There are buttons for 'Apply settings...', 'Log out', 'Save', and 'Disable access control'. The 'Disable access control' button is disabled.

- 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.



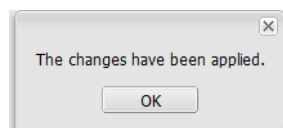
- 5 Click **OK** to close the message window.

The **Apply settings** button becomes available.

The screenshot shows the XAdmin interface after saving the settings. The 'Apply settings...' button is now enabled and highlighted. The 'Log out' button is also visible. The 'Save' and 'Disable access control' buttons are no longer visible.

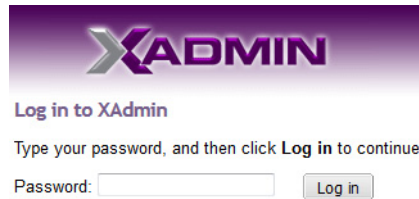
- 6 Click **Apply settings**.

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

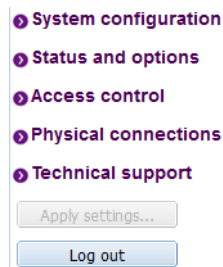


- 7 Click **OK**.

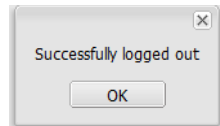
The Log in to XAdmin page appears. Other XAdmin sessions open against the same multiviewer are also redirected to the login page.



- 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.

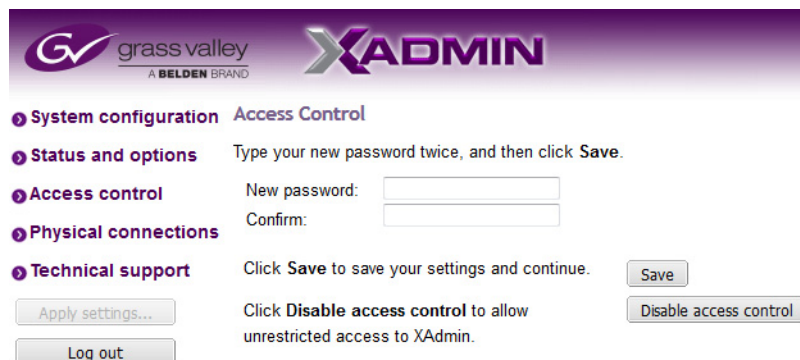


- 10 Click **OK**.
The login page appears. Only authorized users have access to XAdmin.

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 78.
- 2 Click **Access control**, in the navigation area on the left side of the page.
The Access Control page appears.

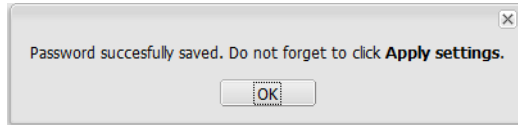


- 3 Type the new password you want to enforce in both the **New password** and the **Confirm** boxes.

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.

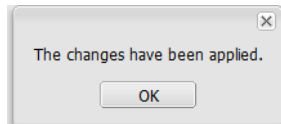
- System configuration
- Status and options
- Access control
- Physical connections
- Technical support

Apply settings...

Log out

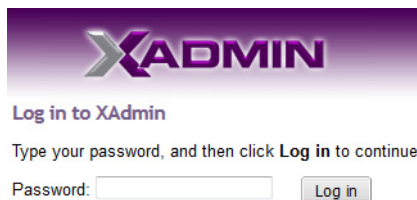
- 6 Click **Apply settings**.

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

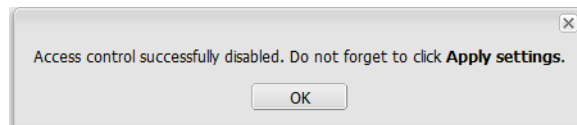
To disable access control in XAdmin

- 1 Open XAdmin. See [Opening XAdmin](#) on page 78.
- 2 Click **Access control**, in the navigation area on the left side of the page.

The Access Control page appears.

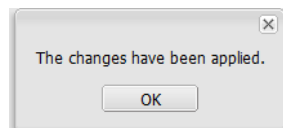
- 3 Click **Disable access control**.

A confirmation message appears.



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

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



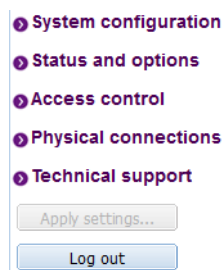
- 5 Click **OK**.

Unrestricted access to XAdmin is restored, for this multiviewer.

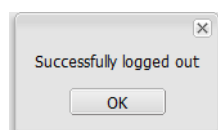
Closing a Password-Protected XAdmin Session

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 75.

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 in the frame. See [Frame Configuration Prerequisites](#), on page 65.

To change your system's IP address and other parameters

- 1 Open XAdmin. See [Opening XAdmin](#) on page 78.
- 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.

- 3 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).

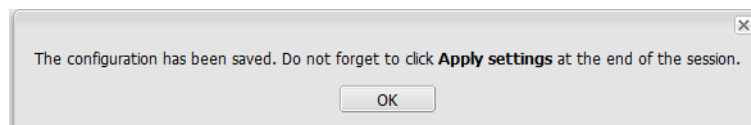
Note: Only lower-ASCII characters are allowed in the system name. Braces and tilde are not allowed.

- 4 Enter the appropriate IP information: multiviewer card IP addresses, network mask, and default gateway.

Note: The date and time settings are configured in the frame. See [Frame Configuration Prerequisites](#), on page 65.

- 5 Click **Save**.

The new settings are saved locally.



6 Click **OK**.

The **Apply settings** button becomes available.

- 1 System configuration
- 2 Status and options
- 3 Access control
- 4 Upgrade
- 5 Restart / Shut down
- 6 Head streaming
- 7 Technical support

Apply settings...

7 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.

8 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.

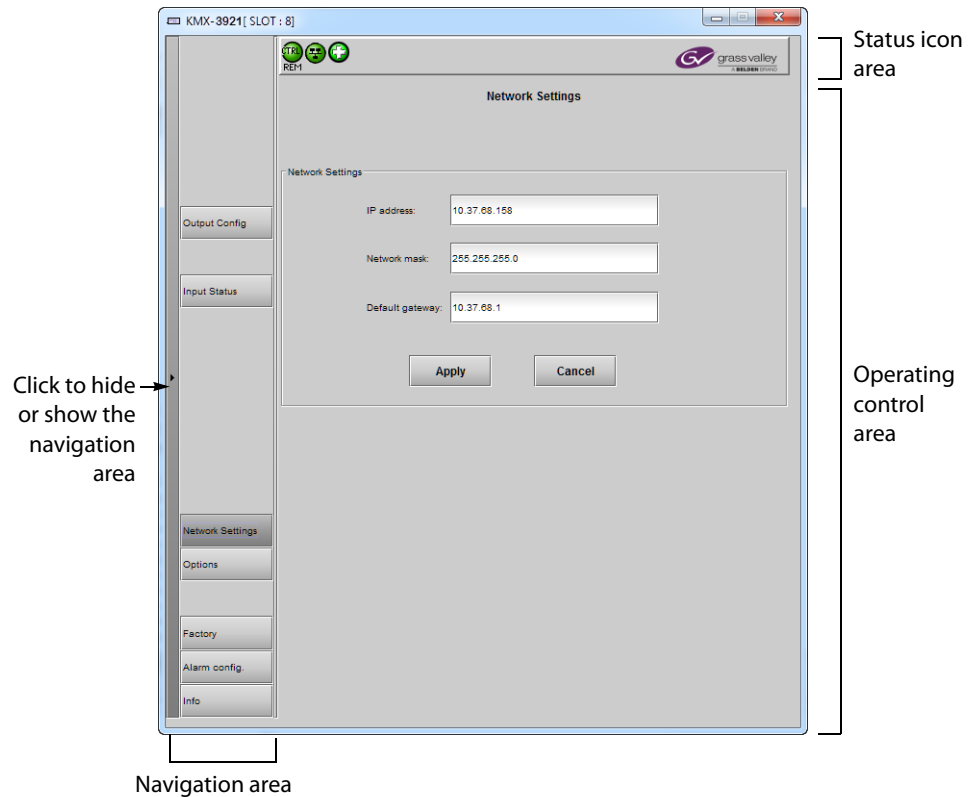
Remote Control Using iControl

The KMX-3921 cards may be controlled by using Grass Valley's iControl version 7.20 or later. This section describes the control panels associated with the KMX-3921 cards and their use. Refer to the iControl User's Guide for information about setting up and operating iControl.

In iControl Navigator, iControl Web, or iControl Solo, double-click the icon for a KMX-3921 card to open the associated control panel.








KMX-3921 Service Control Panels in iControl

The card label and the modular card slot number where the card is installed in the Densité 3+ FR1 / Densité 3+ FR4 frame are indicated in the window's title bar. In the 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 KMX-3921 card

The KMX-3921 panel's status icon has the following icons.

Status	Icon	Description
Manual Card Configuration	Green 	Remote card control activated. The iControl interface can be used to operate the card.
	Yellow 	Local card control active, The card is being controlled through the Densité 3+ FR1 / Densité 3+ FR4 frame control panel, as described in Using the Frame Control Panel , on page 53. Any changes made using the iControl interface will have no effect on the card.
Ethernet Port Status	Green 	The card's IP link up and active.
	Red 	The card has no IP link (port down).
	Gray 	The card's Ethernet port not used.
Card Health Status	Green 	Hardware OK.
	Yellow 	Hardware Health Monitoring (Hardware fault detected). If this icon appears flashing red, you need to call Technical Support.

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

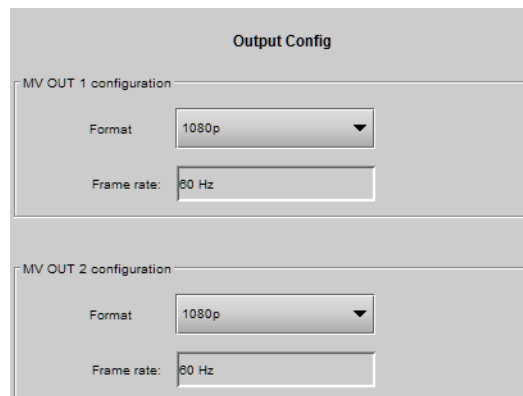
- Click a button to access the associated features.
- Click the left side border (identified by a small arrow icon) to show or hide this area.

The operating control area contains the main operating controls for managing the KMX-3921 multiviewer's feature set. The contents change depending on the button you clicked in the navigation area. The relevant panels are described individually in the following sections:

- [Output Configuration Settings Panel](#), on page 100
- [Input Status Panel](#), on page 101
- [Network Settings Panel](#), on page 102
- [Options Panel](#), on page 102
- [Factory Panel](#), on page 103
- [Alarm Configuration Panel](#), on page 106
- [Information Panel](#), on page 110

Output Configuration Settings Panel

Set the resolution of the multiviewer mosaic output heads to an appropriate value according to the displays being used. For a multiviewer system that has three, four, or six KMX-3921 cards, this panel is not available for the third, fourth, and sixth cards.



The screenshot displays the 'Output Config' panel with two sections for output configuration. The top section, 'MV OUT 1 configuration', shows a 'Format' dropdown menu set to '1080p' and a 'Frame rate' input field set to '60 Hz'. The bottom section, 'MV OUT 2 configuration', also shows a 'Format' dropdown menu set to '1080p' and a 'Frame rate' input field set to '60 Hz'.

The following table lists the mosaic output formats supported at the SFP outputs.

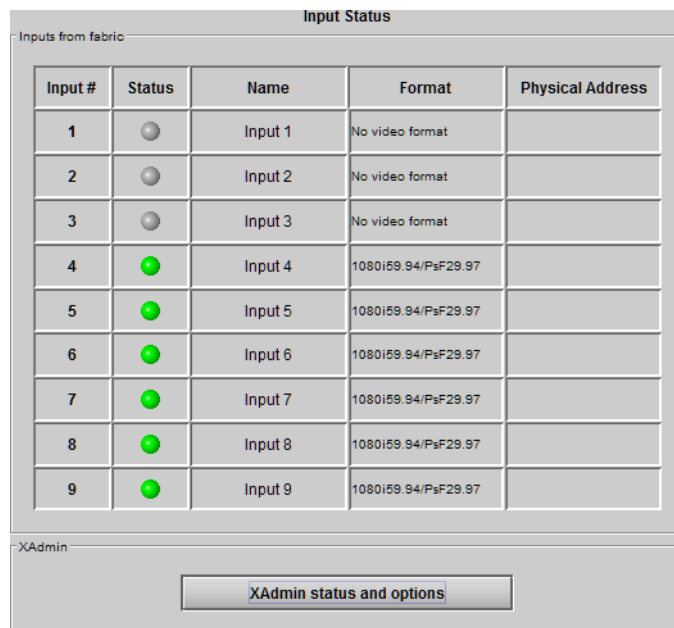
KMX-3921 mosaic output resolutions

Resolution	Refresh rates (Hz)
<ul style="list-style-type: none"> • 1920 × 1080i • 1920 × 1080p 	50.00, 59.94
<ul style="list-style-type: none"> • 2160p Square Division Quad Split (SDQS) over quad-link 3G • 2160p Square Division Quad Split (SDQS) over quad-link 3G • HDMI 2.0 2160p through an external quad-link 3G to HDMI 2.0 converter • HDMI 2.0 2160p through an external quad-link 3G to HDMI 2.0 converter 	50.00, 59.94

Note: The refresh rate is always determined by the reference signal connected to the Densité 3+ FR1 / Densité 3+ FR4 frame.

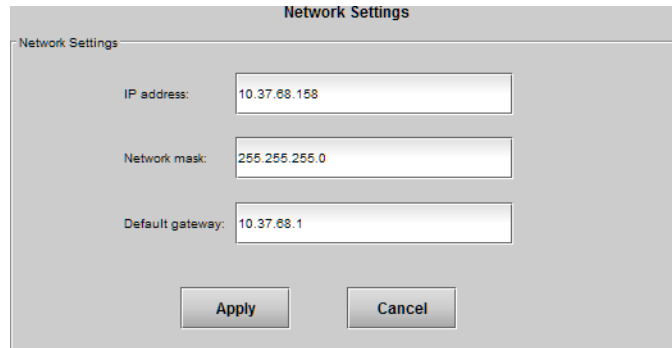
Input Status Panel

This screen shows the status of the current KMX-3921 card's inputs. Click *XAdmin status and options* for direct access to the card's web interface that provides more detail about the card's operating status.



Network Settings Panel

KMX-3921 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 KMX-3921 card so that it can work with your Ethernet network. For a multiviewer system that has three, four, or six KMX-3921 cards, this panel is not available for the third, fourth, and sixth cards.



The screenshot shows a dialog box titled "Network Settings". It contains three input fields: "IP address" with the value "10.37.68.158", "Network mask" with the value "255.255.255.0", and "Default gateway" with the value "10.37.68.1". Below the fields are two buttons: "Apply" and "Cancel".

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

Notes

- These settings apply to the *CONTROL PORT ETHERNET* ports at the back of the Densité 3+ FR1 / Densité 3+ FR4 frame.
 - 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.
 - A Densité 3+ FR4 frame can require more than one MAC address which could cause connectivity problems with certain network switch configurations. See [Network Switch Considerations](#), on page 58 for more information.
-

Options Panel

The Options panel is used to enable software options 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. See the [Available Hardware and Software Options](#), on page 120 for a list of available options and their corresponding part numbers.

To activate an option, see [Enabling Options](#), on page 121.

Factory Panel

Use this panel to revert a card's configuration settings back to their factory-default state. Set the checkbox for the configuration types you want to reset to their factory-default state and click *Load Factory*.

Configuration Type Checkbox	Description
Card Parameters	Resets the card's configuration parameters to their factory-default values, except for alarm and network configuration parameters.
Card Alarms	Resets the card's alarm configuration parameters to their factory-default values. See below.
Network Settings	Resets the card's network configuration parameters to their factory-default values.

Card Alarms only are reset to factory values; iControl Alarms and GSM alarms are not reset. With reference to the Alarm Configuration panel, this is shown below.

Alarms reset to factory-default by clicking *Load Factory*? Yes No No

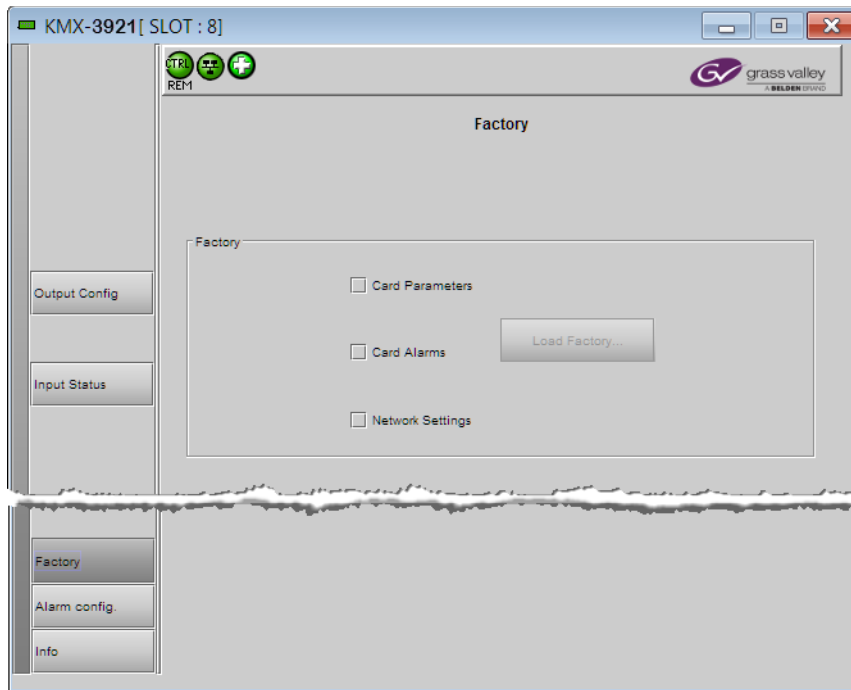
Status / Name	Card LED	Overall alarm	GSM contribution	Log eve...
KMX-4911	Set all	Set all	Set all	<input checked="" type="checkbox"/>
SYSTEM	Set all	Set all	Set all	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Critical temperature	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Duplicate IP	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Network link down	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Fan error	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Hardware failure	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>

Resetting a KMX-3921 Card to its Factory-Default Settings

To reset a KMX-3921 card's settings to their factory-default values

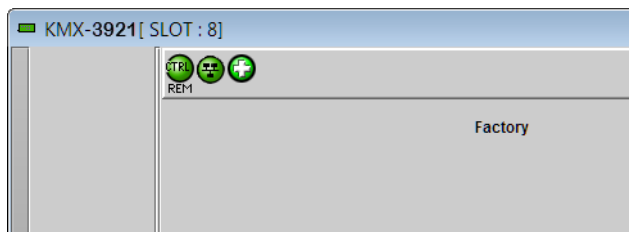
- 1 Open iControl Solo (or iControl Navigator, if you have an iControl application server), and locate the control panel for the KMX-3921 card whose settings you want to reset, based on the slot number, and the Densité 3+ FR1 / Densité 3+ FR4 frame's name (refer to the iControl Solo User Guide, or to the iControl User Guide, for more information).
- 2 Open the KMX-3921 control panel.

3 Click the **Factory** button, in the control panel's navigation area.



Note: The **Factory** tab is currently available for a KMX-3921 multiviewer's *card A*, and *card B* only. For more information about the location of card A and B in the frame, see [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30.

4 In the **Factory** tab, select the appropriate check boxes.



Select...	To...
Card Parameters	Reset the system name, system frame rate, date and time format, enable all SFP transmitter modules, and clear all log files.

Select...	To...
Card Alarms	Reset all status LED alarm contributions from this card, to their default configuration.
Network Settings	Revert the KMX-3921 system IP address, network mask, and gateway settings to their default values. Use this for <i>card A only</i> . After you reset the network settings for card A, card B will automatically detect the changes, and reboot to match the new settings. Attempting to revert the network settings from the service panel for card B would result in card A immediately restoring them. For more information about the location of card A and B in the frame, see Installation of the KMX-3921 in a Densité 3+ Frame , on page 30.

5 Click **Load Factory**.

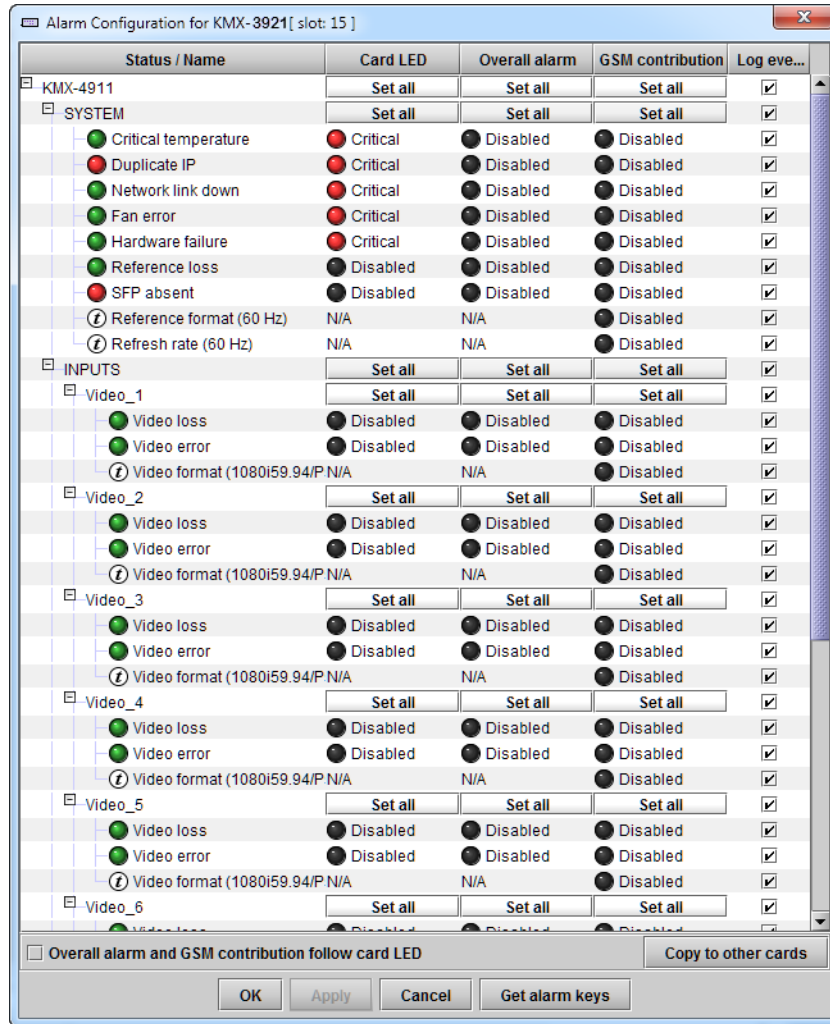
A message appears prompting you to confirm your choice.

6 Click **Yes**.


The selected parameters revert to their factory-default configuration.

Alarm Configuration Panel

This panel allows alarm reporting to be configured. The panel opens in a new window when the button is clicked, and can be resized if needed.



The panel is organized into the following columns.

Alarm Column	Description
Status/Name	<p>This contains an expandable tree listing all the alarms reported by this card.</p> <ul style="list-style-type: none"> • Each alarm name includes an icon that shows its current status. • Some alarms may be text-only and the alarm status is shown in the name and not by a status icon. <p>The Card LED, Overall Alarm and GSM Contribution columns contain pulldown lists that allow the level of contribution of each individual alarm to the alarm named in the column heading to be set.</p>  <p>Click on the alarm icon to see the available levels; then click on one to select it.</p>
Card LED	This column allows configuration of the contribution of selected individual alarms to the status LED located on the front card edge. The Card LED status is shown at the bottom of the alarm tree in the Status/Name column.
Overall Alarm	This column allows configuration of the contribution of each individual alarm to the Overall Alarm associated with this card. The Overall Alarm is shown in the upper left corner of the iControl panel, and also appears at the bottom of the Status/Name column.
GSM Contribution	<p>This column allows configuration of the contribution of each individual alarm to the GSM Alarm Status associated with this card. GSM is a dynamic register of all iControl system alarms, and is also an alarm provider for external applications. The possible values for this contribution are related to the Overall alarm contribution:</p> <ul style="list-style-type: none"> • If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value • If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.
Log Events	iControl maintains a log of alarm events associated with the card. The log is useful for troubleshooting and identifying event sequences. Click in the checkbox to enable logging of alarm events for each individual alarm.

Levels associated with these alarms:

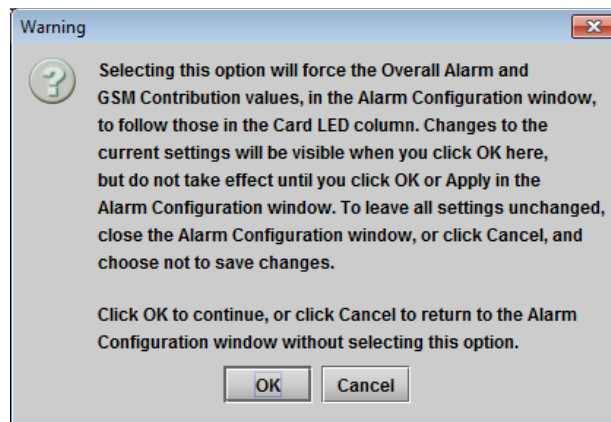
The pulldown lists may contain some or all of the following options:

Icon Label / Color	Description
Disabled (black icon)	The alarm makes no contribution
Minor (yellow icon)	The alarm is of minor importance

Icon Label / Color	Description
Major (orange icon)	The alarm is of major importance
Critical (red icon)	The alarm is of critical importance
Passthrough (light orange icon)	The alarm exists but has no effect (used for text and composite alarms)

Shortcut: If you click in one of the *Set All* boxes beside a section heading, you will open a pulldown that lets you assign a level to all alarms in that section of the column simultaneously.

Once alarms are configured, you may accept the changes or discard them:



Warning for Follow LED change

Overall alarm and GSM contribution follow card LED Checkbox

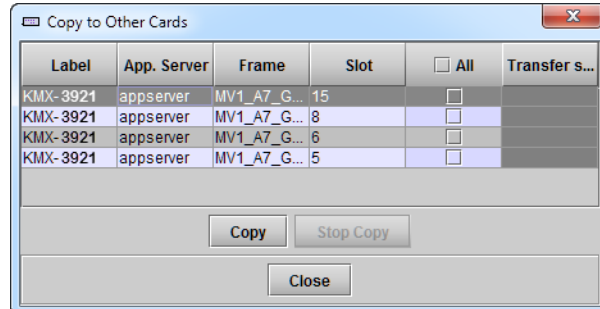
Click in this checkbox to force the Overall alarm and GSM contribution to be identical to the Card LED status

- All Overall alarms and GSM contributions for which there is a Card LED alarm will be forced to match the Card LED alarm
- All Overall Alarms and GSM contributions for which there is no Card LED alarm will be forced to Disabled

A warning box will open allowing you to confirm the action, since it will result in changes to the configuration and there is no *undo* function.

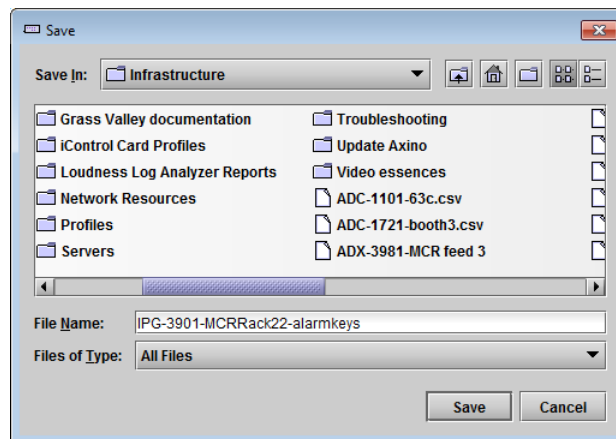
Copy to other cards

Click this button to open a panel that allows the alarm configuration set for this card to be copied into another KMX-3921 card.



Select one or more destination cards from the list in the window by clicking in the checkboxes, or all of them by clicking in the *All* checkbox

Get alarm keys



Click this button to open a save dialog where you can save a file containing a list of all alarms on this card and their current values, along with an Alarm Key for each. The alarm keys are useful for system integration and troubleshooting.

- The file is saved in .csv format

OK, Apply, Cancel

- **OK** accepts the settings and closes the window once the card confirms that there are no errors.
- **Apply** accepts the settings, but leaves the window open
- **Cancel** closes the window without applying any changes, and leaves the previous settings intact.

Information Panel

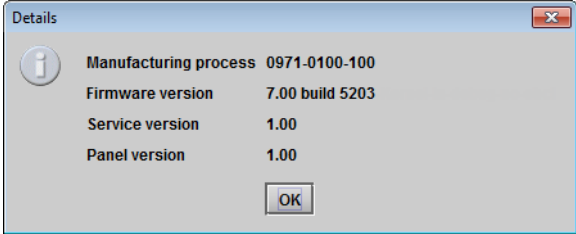
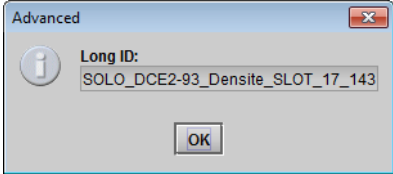
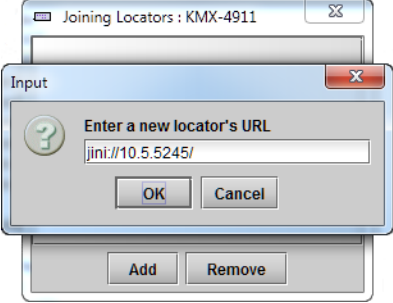
When a KMX-3921 card is included in an iControl environment, certain information about the card may be made available to the iControl system. In the boxes with a white background, you can type labels and comments that will make this card easier to identify in a complex setup.

Info	
Rear type:	KMX-3921-36X4-3+QR
KXS version:	master build 4161
SFP vendor:	
System name:	
Position:	Card A
Label:	KMX-3921
Short label:	
Source ID:	
Device type:	KMX-3921
Comments:	KMX-3921
Manufacturer:	Grass Valley
Vendor:	Grass Valley
Service version:	
Details...	
Advanced...	Remote system administration...

Parameter	Description
Label	Type a label to identify this KMX-3921 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 KMX-3921 card.
Comments	Type descriptive text.

The remaining boxes show manufacturing information about this card, including the card type, and the rear panel type.

Three buttons give access to additional information and controls:

Button	Description
Details	<p>Reports the firmware version, service version, and panel version for this card.</p>  <p><i>Output card Details window</i></p>
Advanced	<p>Shows the Long ID for this KMX-3921 card. The Long ID is the address of this card in the iControl network.</p> 
Remote system administration	<p>Opens the Joining Locators window, which lists remote lookup services to which this KMX-3921 card is registered.</p>  <ul style="list-style-type: none"> • Click Add to force the iControl service for this KMX-3921 card to register itself on a lookup service, by using the following syntax in the Input window: <pre style="margin-left: 40px;">jini://<ip_address></pre> 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.

Genlocking the Multiviewer

A multiviewer must be referenced for any of the following reasons:

- the multiviewer must be genlocked with other plant equipment
- if minimal processing delay is required for your monitoring purposes

Otherwise, referencing the multiviewer is optional.

Genlocking a Densité 3+ FR1 Frame

To genlock the multiviewer with other plant equipment, a reference signal is required. For this, certain requirements must be met.

- The Densité CPU-ETH2 Enhanced Ethernet Controller Card used in the Densité 3+ FR1 frame housing the multiviewer must use firmware version 2.0.4 or higher. A controller with an earlier version of the firmware cannot provide a time reference to a multiviewer card.
- If the time reference signal is provided by a Densité REF-1801 HD/SD Frame Reference Module, this module must be configured as follows:
 - An input reference signal must be connected to the BNC marked REF on the REF-1801's rear panel.
 - The LTC source must be locked to the same reference signal.
 - 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).
 - 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.
 - 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).

Notes

- 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.
 - Using an LTC count down time code as the reference for a count up timer is not supported.
-

Genlocking a Densité 3+ FR4 Frame

To reference a KMX-3921 multiviewer system, use the frame's internal reference:

- In the case of a Densité 3+ FR4 frame, this is done by connecting the Densité CPU-ETH3 frame controller to the external house reference in every Densité 3+ FR4 frame that contains KMX-3921 rear panels. The Densité CPU-ETH3 frame controller will distribute the reference to all cards in the frame internally through the URS on the frame midplane. The following conditions must be met:

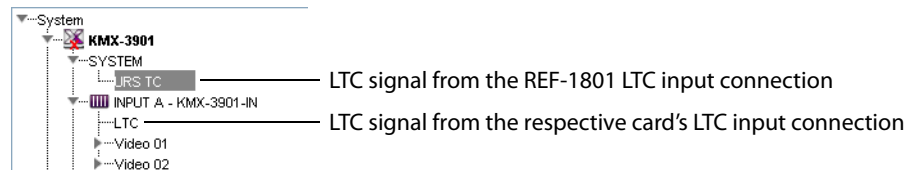
- reference input 2 must be disabled.
- the reference source must be a blackburst or tri-level sync signal.
- In the Densité REF-1801 HD/SD Frame Reference Module configuration, the *URS generation mode* must be set to **Normal** (either from the card's REFERENCE menu or, in iControl, from the **Mode** tab on the control panel for this card).
- In the case of a Densité 3+ FR4 frame equipped with a Densité CPU-ETH3 Advanced Ethernet Controller Card, use Precision Time Protocol (PTP). See *PTP* in the Densité 3+ FR4 documentation: *Densité 3+ FR4 Housing Frame User Manual*. See [Related Documentation](#), on page 11. To identify a Densité 3+ FR4 frame's controller model, see [How to Identify a Densité 3+ FR4 Frame's Controller Model](#), on page 22.

For a time code input, use the KMX-3901-IN input card's LTC input. See [Using a REF-1801 Card's LTC Time Code Input](#), below.

Using a REF-1801 Card's LTC 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 **LTC IN** input found on the REF-1801's rear panel, 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 **LTC IN** input found on the REF-1801's 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 114). 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 114), and their respective *KX Router* logical routers (see [Specifying lookup servers for the RCP-200](#) on page 114). 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 115).

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 left most 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

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

- 1 On an RCP-200 with an active connection to the network, press the LIST button.
All devices, and multiviewer's rooms, detected by the RCP-200 appear on the left screen. 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.
 - 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?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.
- 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 *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 116. 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 11.

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 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. You only need to do this once, for every multiviewer that is part of a cluster.

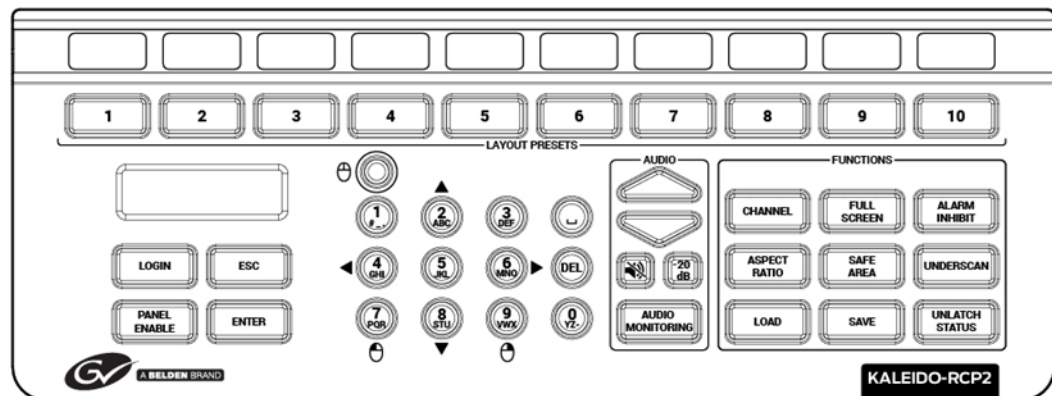
To correlate a monitor wall destination in a layout and the corresponding KX Router logical router

- 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

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.
- 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 119.

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 11.

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 121).

Contact Technical Support to purchase a software option. See [Grass Valley Technical Support](#), on page 156.

KMX-3921 input options

Option	Part Number	Feature	Notes
CC/XDS	KMX-3921-OPT-CSX	CC/subtitling and XDS data license	One CC/XDS option key is needed per card. Extraction of CC 608, CC 708, XDS and Subtitling WST metadata is activated as a single option.
Dolby E	KMX-3921-OPT-DOLBY	Dolby-E metadata extraction license	One Dolby-E option key is needed per card.
SCTE	KMX-3921-OPT-SCTE	License for extraction of SCTE 104 metadata	One SCTE option key is needed per card.
Loudness	KMX-3921-OPT-LOUD	Loudness level measurement license	One Loudness option key is needed per card.
High Dynamic Range and Wide Color Gamut	KMX-3921-OPT-HDR	Adds support for: <ul style="list-style-type: none"> High Dynamic Range (HDR) Wide Color Gamut (WCG) See Video Inputs - General , on page 143 for supported formats.	One HDR option key is needed per KMX-3921 card.

KMX-3921 output options

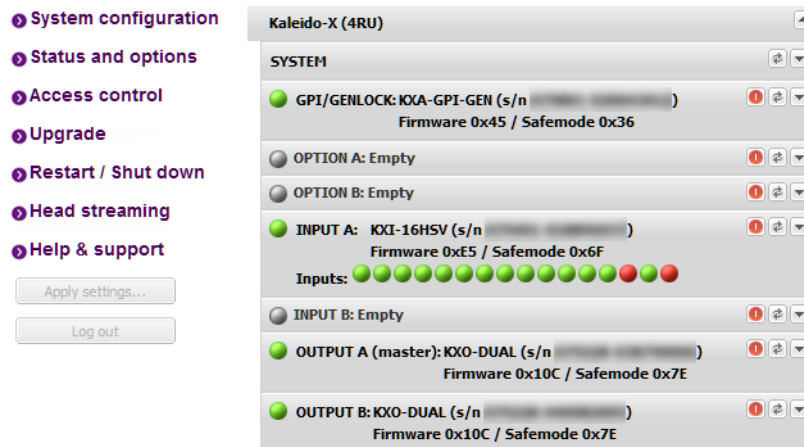
Option	Part Number	Feature	Notes
Additional Head Activation	KMX-3921-OPT-OP2	Additional head output enable license. In a multi-card system, if a card <i>does not</i> have this option enabled, then the only available multiviewer output is MV OUT A1 (MV OUT 1, in the case of a KMX-3921 9×2 system) for that card. There is no video output to the remaining heads. For more information about the rear panel nomenclature, see Multiviewer SFP Module Mosaic Output to Display Input Cable Connections , on page 42.	One additional head output option key is needed per card. <ul style="list-style-type: none"> • If this option is not enabled on all cards, the system supports a single SFP TX module in card A: <ul style="list-style-type: none"> • Single fiber • Single DIN • HDMI • If this option is enabled, the system also supports the following module combinations, in each of card A and card B (if present): <ul style="list-style-type: none"> • Two dual TX modules • Two single TX modules • One single TX, and one dual TX (in any order) For more information about the location of card A and B in the frame, see Installation of the KMX-3921 in a Densité 3+ Frame , on page 30.
Display 90-Degree Rotation	KMX-3921-OPT-ROT	Display rotation license	One Display 90-Degree Rotation option key is needed per card.

Enabling Options

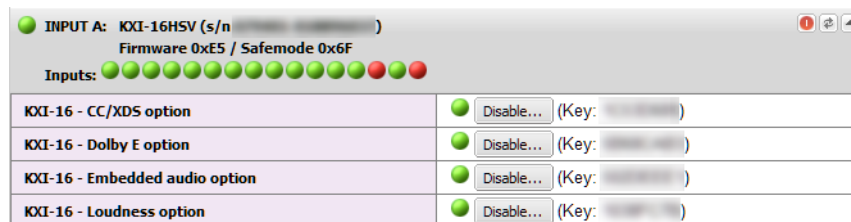
To enable options on a multiviewer

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

The XAdmin Status and Options page appears.



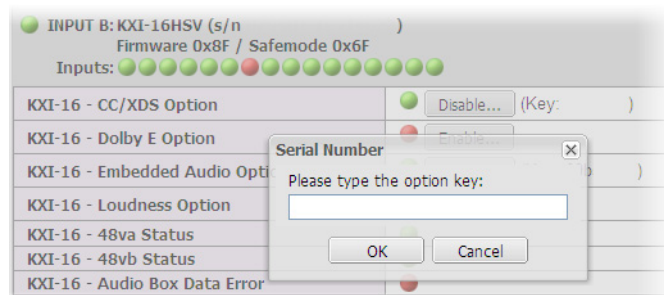
- 3 Click the arrow button at the end of the heading row that corresponds to the module for which you want to enable an option.



- 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

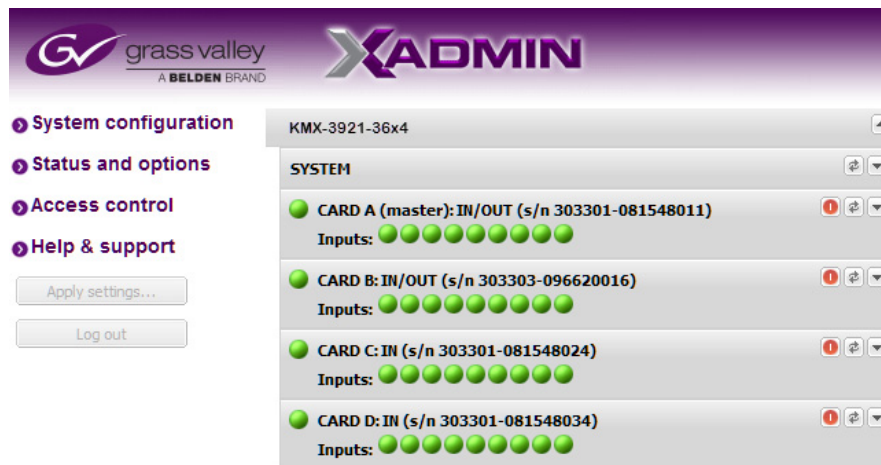
Verifying the KMX-3921 Multiviewer Status

You can check internal system statuses through the Web-based XAdmin application. For more information how the multiviewer model is represented in XAdmin, see [Frame Configuration Prerequisites](#), on page 65.

To view the status information for a multiviewer

- 1 Open XAdmin. See [Opening XAdmin](#) on page 78.

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



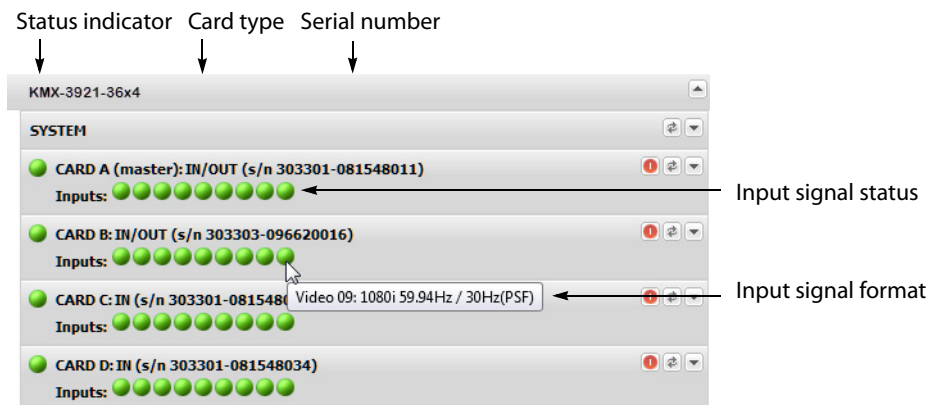
The module headings show the card type and serial number for the input and output cards, and a summary view of the input signals for each input card.

- In the case of a multiviewer with more than one card, the card in the left-most slot (the slot with the lowest number) is designated as *card A*, and is considered as your system's *master* card. You cannot operate a KMX-3921 system without a master card. For more information about the location of card A in the frame, see [Installation of](#)

the KMX-3921 in a Densité 3+ Frame, on page 30.

- 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.



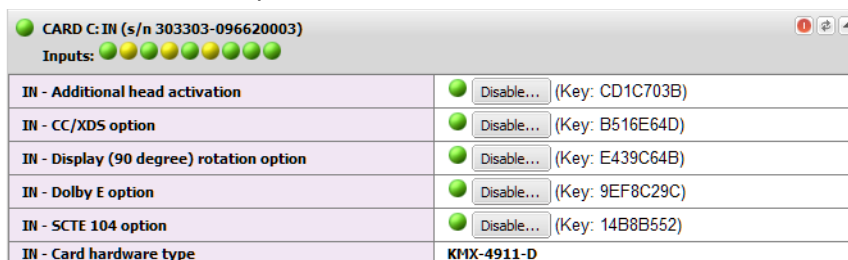
Note: The Kaleido Software does not distinguish neither between 1080PsF25 and 1080i50, nor between 1080PsF29.97 and 1080i59.94. Both 1080PsF25 and 1080i50 are reported as 1080i50, and both 1080PsF29.97 and 1080i59.94 are reported as 1080i59.94, on the monitor wall and in XAdmin's Status and Options page.

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.

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



A card's enabled Kaleido Software options

For more information about Kaleido Software options, see [Available Hardware and Software Options](#), on page 120.

- 5 Check the main system statuses of the multiviewer to make sure that there are no errors or alerts related to system temperature, power supply status, fan operation, or other card fault conditions. This information is found under the individual cards.

CARD C: IN (s/n 303303-096620003)	
Inputs: ●●●●●●●●●●	
IN - Additional head activation	● Disable... (Key: CD1C703B)
IN - CC/XDS option	● Disable... (Key: B516E64D)
IN - Display (90 degree) rotation option	● Disable... (Key: E439C64B)
IN - Dolby E option	● Disable... (Key: 9EF8C29C)
IN - SCTE 104 option	● Disable... (Key: 14B8B552)
IN - Card hardware type	KMX-4911-D
IN - Critical Temperature	● ← Temperature
IN - Ethernet link down	●
IN - Fan Failure	● ← Fan status(s)
IN - Hardware Failure	● ← Hardware Failure
IN - Rear card hardware type	KMX-4911-54x4-4HRP
Video 01	● 1080i 59.94Hz / 30Hz(PSF) (EAV/SAV OK)
Video 02	● (EAV/SAV error)
Video 03	● 1080i 59.94Hz / 30Hz(PSF) (EAV/SAV OK)
Video 04	● (EAV/SAV error)
Video 05	● 1080i 59.94Hz / 30Hz(PSF) (EAV/SAV OK)
Video 06	● (EAV/SAV error)
Video 07	● 1080i 59.94Hz / 30Hz(PSF) (EAV/SAV OK)
Video 08	● 1080i 59.94Hz / 30Hz(PSF) (EAV/SAV OK)
Video 09	● 1080i 59.94Hz / 30Hz(PSF) (EAV/SAV OK)

Multiviewer system status and option information

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.

Verifying the Kaleido-RCP2

To verify that the Kaleido-RCP2 is functioning normally

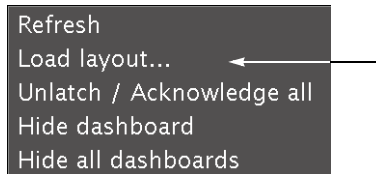
- Log on to the Kaleido-RCP2 (see [Logging on to the Kaleido-RCP2](#), on page 119), and then test various operations using the Kaleido-RCP2 keyboard and the mouse (for example, load a predefined layout).

Loading a Layout

To load a layout on the monitor wall

- 1 Connect a mouse to the Kaleido-RCP2 (if available) and log on to the appropriate room, if you have not already done so (see [Logging on to the Kaleido-RCP2](#), on page 119).
Alternatively, connect the mouse directly to the USB port at the front of one of your system's output card. See [Troubleshooting with the card's front edge USB connector](#), on page 139.

- 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 want 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.

Finding the Multiviewer's IP Address and Application Version

Note: The multiviewer's IP address can also be remotely set through a the KMX-3921's iControl service panel. See [Network Settings Panel](#), on page 102.

To find the system IP address and application version

- 1 Press the icon representing the appropriate card on the Densité 3+ FR1 / Densité 3+ FR4 frame's local control panel touch display.
The Status LED on the selected card is flashing orange, and the version of the Kaleido Software that is running on the card (e.g. "10.00 build 2230") appears on the display of the Densité 3+ FR1 / Densité 3+ FR4 frame's local control panel.
- 2 On the local control panel, touch the [-] button repeatedly until NETWORK SETTINGS appears on the display, and then touch the SEL button.
SYSTEM IP EDIT appears on the control panel's display.
- 3 Touch the SEL button again.
The current IP address appears on the display.
- 4 Press the Select button *on the front edge of the KMX-3921 card* to exit the control menu.

Maintenance

Required Tools

Use a field-supplied Phillips #2 screwdriver to remove and install rear panels.

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.

Description	Grass Valley Part Number
KMX-3921 Multiviewer Cards	See KMX-3921 Multiviewer Cards , on page 15
KMX-3921 Rear Panel	See KMX-3921 Rear Panels , on page 16
Optional SFP Module(s)	See Compatible SFP Modules , on page 20

There are no user-serviceable parts within these components except for the KMX-3921 multiviewer card in which the heatsink cooling fans can be replaced. See [Cooling Fan Replacement](#), on page 129.

Contact Technical Support to order an FRU. See [Grass Valley Technical Support](#), on page 156.

Opening and Closing the Front Door

The Densité 3+ FR4 Frame's Front Door

The front door of the Densité 3+ FR4 frame is hinged on the right-hand side, and latched by a captive thumbscrew on the left-hand side. There are no electrical connections to the door.

- Turn the thumbscrew counterclockwise until it releases, and pull the door open.
- The door can be removed completely after it is open by sliding it vertically off the hinge pins on the right-hand side.

Close the front door as follows:

- Slide the door down onto the hinge pins on the right-hand side.
- Swing the door shut and turn the thumbscrew clockwise until the door is secured shut.

The Densité 3+ FR1 Frame's Front Door

The front door of the Densité 3+ FR1 frame is fastened in place by two captive thumbscrews, on the left and right hand side of the door. There are no electrical connections to the door.

- To open the door, turn both thumbscrews counterclockwise until they release, and 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.

- The door can be removed completely by slipping the ends of the guides off the posts on the door assembly. Note that you must tilt the door on an angle so the guide can move freely.

Close the front door as follows:

- Close the door by sliding it into position against the front of the frame, and turning the captive thumbscrews clockwise until the door is securely fastened into place

About Swapping KMX-3921 Cards into a Multiviewer

The following instructions apply to a multiviewer that has two or more KMX-3921 cards. See [Supported Frames and Multiviewer Scaling](#), on page 13.

Overview

When each multiviewer card has the same license options enabled, the multiviewer features will be consistently available across all multiviewer inputs. For a list of multiviewer model features, see [Features and Limitations](#), on page 12.

Licensed options are purchased for individual multiviewer cards and thus the licensed feature for that card will follow the card wherever it is located in whichever multiviewer. See [Available Hardware and Software Options](#), on page 120. Enabling licensed features on some multiviewer cards but not on others may result in a mosaic output that show signals with mixed abilities (some signals may have subtitling or support HDR and others will not for example).

Swapping a KMX-3921 Card into a Multiviewer

When performing maintenance on a multiviewer, it may be necessary to replace a KMX-3921 card with another KMX-3921 card. Once a KMX-3921 card has been successfully swapped into the multiviewer, the multiviewer will live-update the multiviewer cards as necessary so that all multiviewer KMX-3921 cards will have the same Kaleido Software version level. See [Multiviewer Live-Update \(Auto-Upgrade\) Feature](#), on page 128.

To know the KMX-3921 card's Kaleido Software current version, see [Finding a KMX-3921 Card's Current Kaleido Software Version](#), on page 128.

For the procedure to remove a card from the frame and to insert a card into the frame, see [Replacing Cards](#), on page 129.

Multiviewer Live-Update (Auto-Upgrade) Feature

For a multiviewer that has two or more KMX-3921 multiviewer cards, all multiviewer cards will be automatically upgraded or downgraded to the Kaleido Software version currently loaded on multiviewer card 'A', as a function of the live-update (auto-upgrade) feature. See [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30 for the location of card 'A' in each multiviewer model.

Finding a KMX-3921 Card's Current Kaleido Software Version

To know the KMX-3921 card's Kaleido Software current version, insert the card into the Densité 3+ FR1 / Densité 3+ FR4 frame and then find the card's Kaleido Software version through the frame's local control panel (see [Using the Frame Control Panel](#), on page 53) or

through the Densité Upgrade Manager (launched from iControl Navigator, or iControl Solo). See [Information Panel](#), on page 110.

Replacing Cards

All cards and rear panels can be installed with the frame power on.

Each card has connectors which plug into a mid-frame mother board for distribution of power and for connection to the controller card, and a second connector which for certain cards plug directly into the rear panel for mosaic output connections to the display(s).

IMPORTANT

The rear panel must be installed before any KMX-3921 cards are inserted into the frame.

All KMX-3921 cards must be removed from the frame before the rear panel can be removed.

In install or replace a card or rear panel, see:

- To install the multiviewer in a Densité 3+ FR1 frame, see *Installing Cards in the Densité 3+ FR1 Frame* in the *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual*.
- To install the multiviewer in a Densité 3+ FR4 frame, see *Installing Cards in the Densité 3+ FR4 Frame* in the *Densité 3+ FR4 Housing Frame User Manual*.

See [Related Documentation](#), on page 11. See also [Opening and Closing the Front Door](#), on page 127.

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 makes a distinctive sound and it rotates at a slower speed, thereby reducing airflow which undermines its ability to remove heat from the card. 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 the ability to remove heat from the card. 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 these maintenance operations during off hours when the system is not in use.

Diagnostics

The KMX-3921 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 KMX-3921 card 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 status in XAdmin are called *XXXX fan failure* where *XXXX* identifies the specific fan. For example, *FSM 0 fan failure*.
- The alarm status in the iControl service's GSM is called *Hardware Failure*.
- The fan and critical temperature alarms are reported in iControl in the Alarms Configuration panel. See [Alarm Configuration Panel](#), on page 106 for more information.
- A KMX-3921 card's front Status LED flashes due to this condition (note that the Status LED can also flash due to other conditions). This cannot be stopped by a service panel action.
- 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 Densité 3+ FR4's operating temperature range specification. If necessary, take corrective actions by, for example, increasing the amount of air conditioning made available to the Densité 3+ FR1 / Densité 3+ FR4 frame.
- 2 Confirm that air flow around the Densité 3+ FR1 / Densité 3+ FR4's frame is not obstructed. If necessary, take corrective actions by, for example, removing obstructions or rerouting cables around and away from the Densité 3+ FR1 / Densité 3+ FR4 frame.
- 3 When the previous corrective actions do not eliminate a critical temperature alarm, verify that the KMX-3921'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 has an abnormally-sounding fan, during off hours when the system is not in use, eject the card from the Densité 3+ FR1 / Densité 3+ FR4 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 is in the 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 from the Densité 3+ FR1 / Densité 3+ FR4 frame and

inspect the card's fan assembly: remove any accumulated dust and dirt from the card with compressed air and remove any obstruction to the fan's ability to freely rotate.

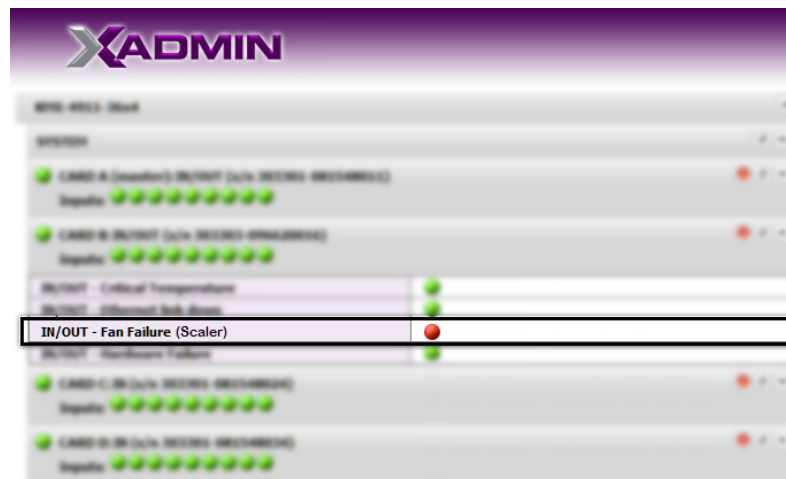
Reinsert the card into the frame and restore system operation to see if the fan alarm becomes inactive.

The card's onboard 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 card's fan is not rotating fast enough (as detected 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.

Identifying the Fan to Replace for a Fan Fail Alarm

As some cards have more than one fan, identify in XAdmin the specific fan to be changed on the card: check each card individually for a fan fail alarm.



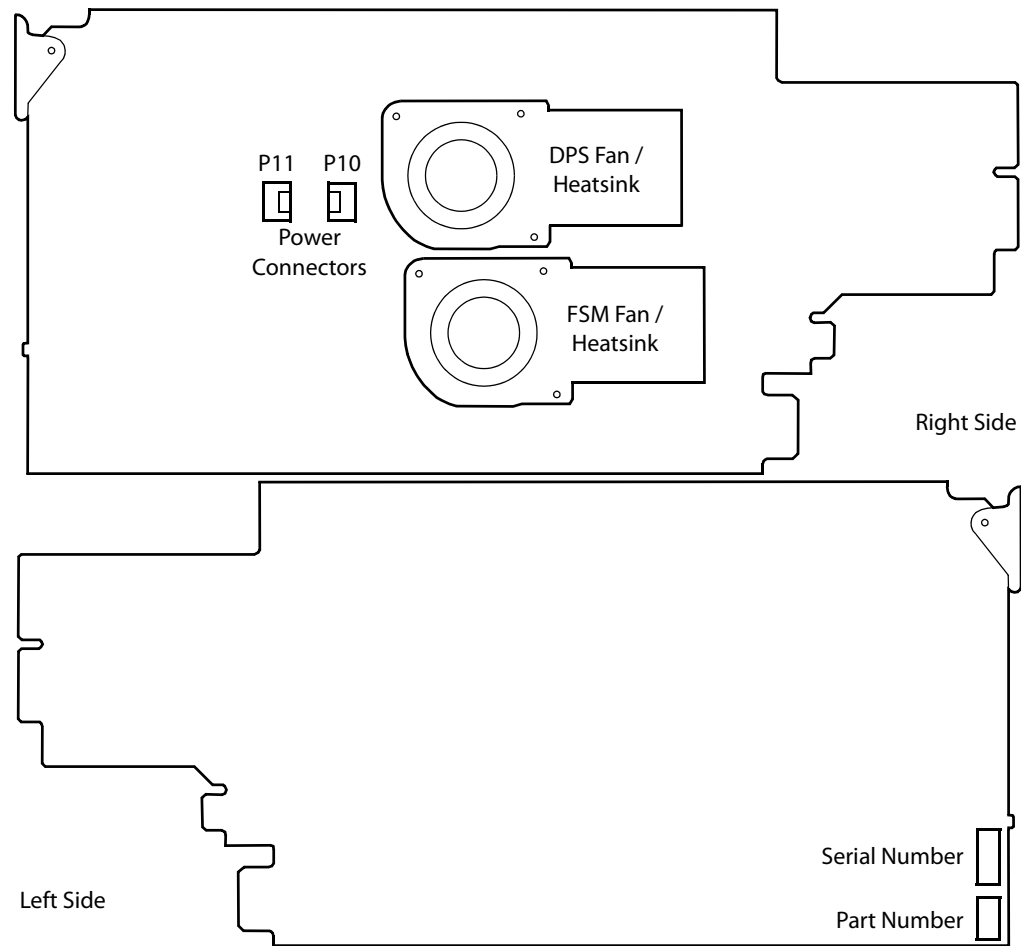
Fans are located on certain cards and within the multiviewer's frame. To replace a fan:

- on a card, see [Replacing KMX-3921 Card Fans](#), on page 132.
- within the multiviewer's frame, see *Replacing the Frame Ventilation Fans* in the *Densité 3+ FR1 1RU Housing Frame for Densité Modular Products User Manual* or in the *Densité 3+ FR4 Housing Frame User Manual*. See [Related Documentation](#), on page 11.

Replacing KMX-3921 Card Fans

The location of the fans on the card are shown below. The location of the card's part number and serial number is also shown.

Note: Some cards may be equipped with only one fan.



XEdit Fan Fail Alarm	Fan to change	Uses Power Connector
Fan Failure (DPS)	DPS Fan / Heatsink	P10
Fan Failure (FSM)	FSM Fan / Heatsink	P11

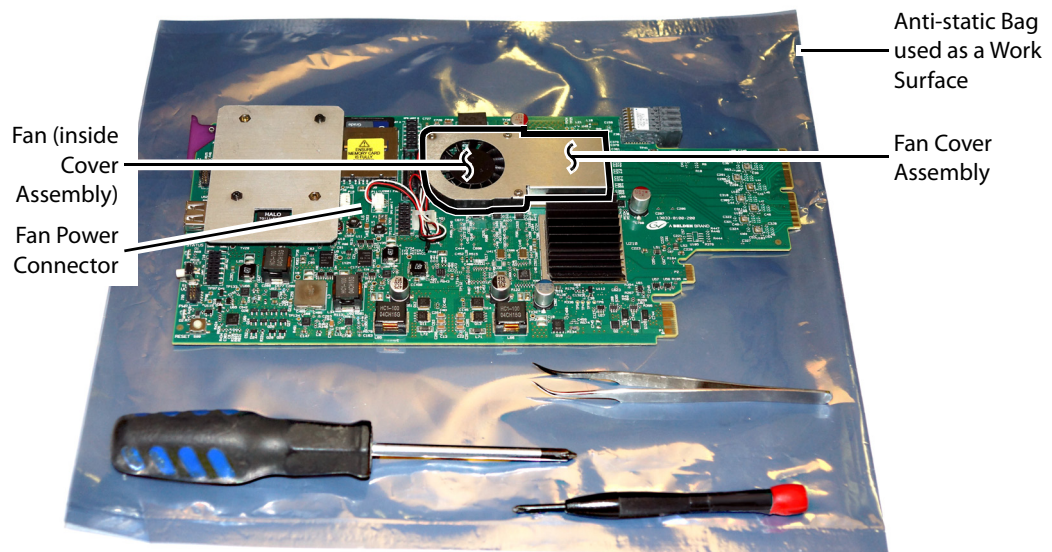
Fan Replacement Kit

The replacement fan kit is available by contacting Technical Support. See [Grass Valley Technical Support](#), on page 156. The location of the card's part number and serial number is shown 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-3921 card.
- Anti-static bag or anti-static work surface to reduce the possibility of electrostatic discharge damage to the card.

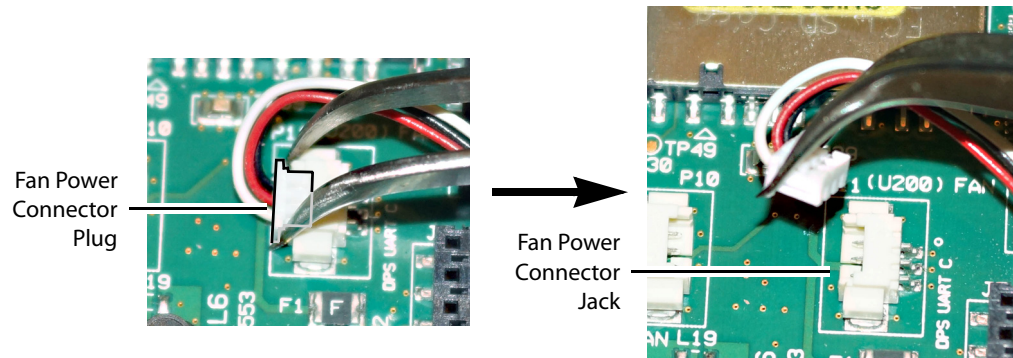


Typical card with onboard fan, screwdrivers, tweezers, and anti-static bag

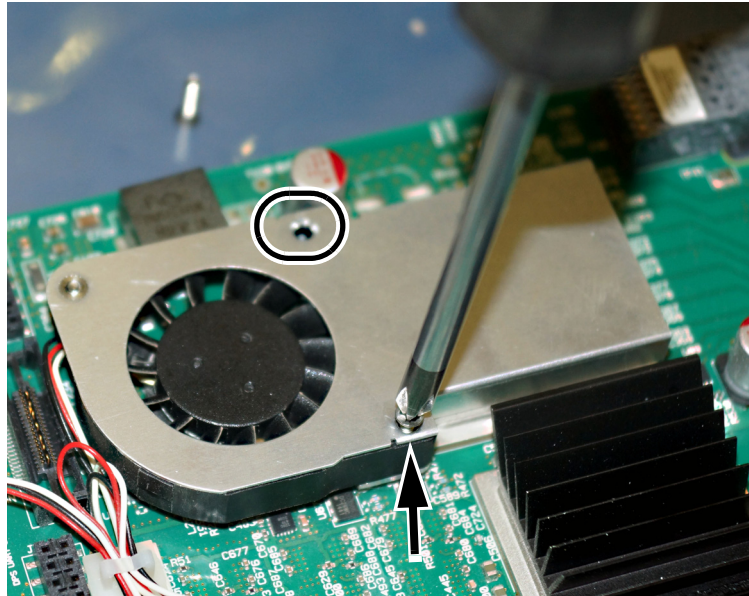
To replace a fan

- 1 During off hours when the system is not in use, eject the card from the Densité 3+ FR1 / Densité 3+ FR4 frame. See [Replacing Cards](#), on page 129.
- 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

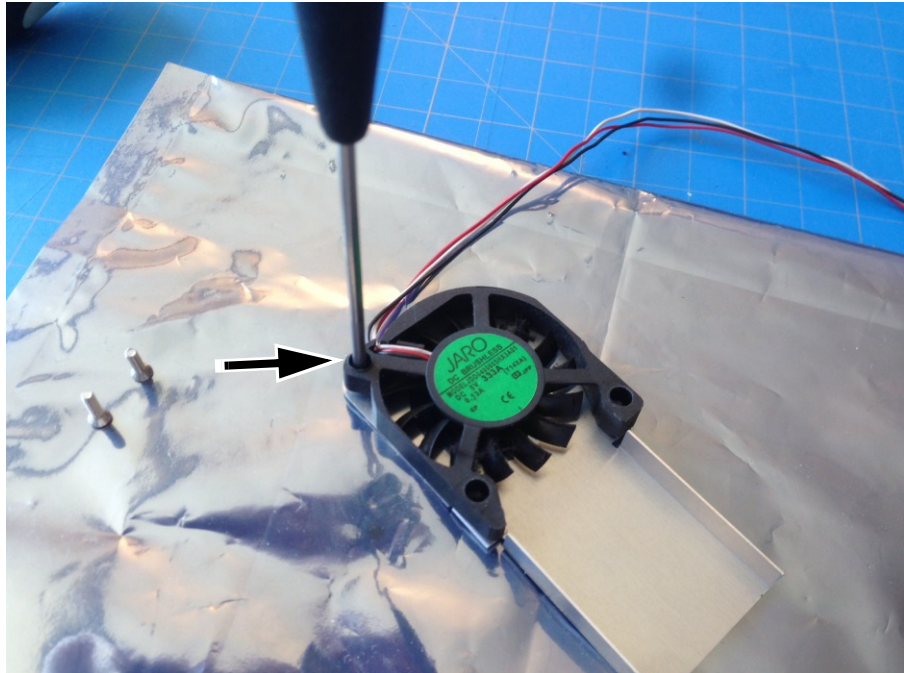
are routed through wire holders, remove the wires from the holders first, before disconnecting.



- 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 Densité 3+ FR1 / Densité 3+ FR4 frame. See [Replacing Cards](#), on page 129.

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

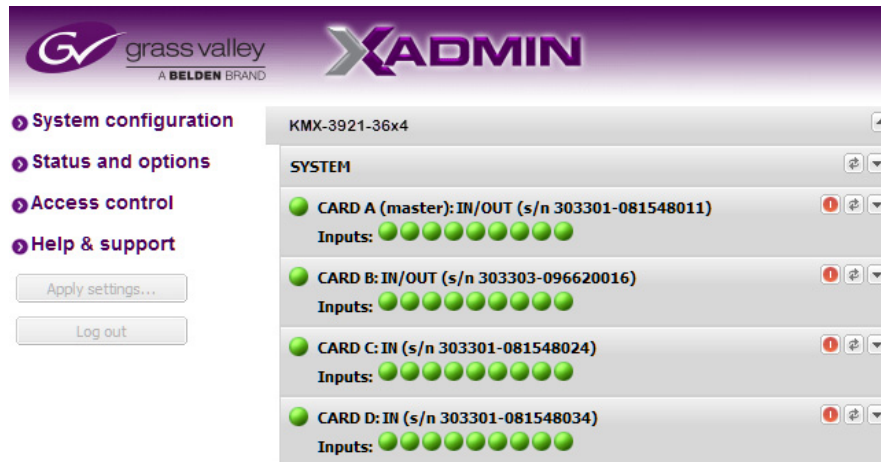
Generating a System Snapshot

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

To generate a system snapshot

- 1 Open XAdmin. See [Opening XAdmin](#) on page 78.

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, including limitations, known issues, and bug fixes.

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.

Upgrade Overview

The upgrade is performed from your PC by using the Densité Upgrade Manager application, which is part of iControl, and iControl Solo. Refer to the iControl Solo User Guide, or to the iControl User Guide, for more information. See [Related Documentation](#), on page 11 and [Software and Firmware Updates](#), on page 11.

Installing a Kaleido Software Upgrade

Upgrade packages are available by download. The format of the file should be `firmware-V.V.V.NNNN.zip` (V= version, N= build number). See [Software and Firmware Updates](#), on page 11. The upgrade package contains:

- the Kaleido Software Upgrade Manager application is required to upgrade the KMX-3921 multiviewer.
- one or more Kaleido Software operating system (.os, .zip, or .run) files.
- iControl drivers that are needed to update the card.
- upgrade documentation.

If you do not have the upgrade package, contact Grass Valley Technical Support (see [Grass Valley Technical Support](#), on page 156).

Loading the upgrade package into the Densité Upgrade Manager

- 1 From iControl Navigator, or iControl Solo, open Densité Upgrade Manager.
- 2 In **Densité Upgrade Manager**, click **Upload files**.
A file browser window opens.
- 3 Navigate to the upgrade package with the following format: `pmvos-10.00_build_5294.os`, select it, and then click **Open**.
A progress indicator window appears.
- 4 Click **Upload**, to transfer the upgrade package to the Densité manager.
- 5 Once the operation has completed, click **Close**.
- 6 In the **Available package** column of **Densité Upgrade Manager**, expand the appropriate list to verify that the new upgrade package is present.

Upgrading the KMX-3921 multiviewer

When upgrading a multi-card KMX-3921 multiviewer system (for example, a multiviewer with more than one KMX-3921 card), you should select *all* multiviewer cards in Densité Upgrade

Manager, so that they are all upgraded simultaneously and only one multiviewer reboot will be required.

- 1 Locate the KMX-3921 card(s) that belong to the multiviewer system you are upgrading.

TIP

If you have more than one KMX-3921 multiviewer system in the Densité 3+ FR1 / Densité 3+ FR4 frame, click the **Physical view** tab, where you can locate the multiviewer cards by their slot number.

- 2 For each card to be upgraded, select the upgrade package you uploaded in [step 3](#) (in [Loading the upgrade package into the Densité Upgrade Manager](#), on page 137) from the corresponding list, under **Available package**.
- 3 Make sure to set the check boxes under **Select/Bypass** for all the card(s) being upgraded.
- 4 Click **Upgrade**.
- 5 When prompted to confirm, click **Yes**.

During the upgrade, a progress bar appears in the **Install progress** column. Once the upgrade operation has completed, a message appears in the Install progress column. The multiviewer will reboot and the current KMX-3921 card Kaleido Software version will be shown under **Installed firmware** column.

Note: If nothing happens, verify that you are using the correct Kaleido Software upgrade package, with the following format: `pmvos - 10.00_build_5294.os`

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).
Hardware failure	Voltage, current or power is above or below their critical thresholds.
FPGA fan failed	FPGA fan failed
Fan Fail	One of the input card's fan is running too slow or not at all.
Firmware status	Tells whether firmware is running properly on the card.

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 that the input status LEDs are green. See Card Interface and Troubleshooting , on page 52.
	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 121. 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 120. See Grass Valley Technical Support , on page 156.
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 25. See Related Documentation , on page 11.
The multiviewer's time is incorrect and cannot be set in XAdmin	Time parameters were not set in the frame controller	-	Time is set in the multiviewer's frame configuration. Frame configuration information is found in the Densité 3+ FR1 / Densité 3+ FR4 frame's documentation under "Time Management". See Related Documentation , on page 11.
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. Press the REF button on the CPU-ETH3 Local Control Panel. See Using the Frame Control Panel , on page 53.
Occasionally when booting the multiviewer, the “B” card is not detected by iControl.	-	-	Restart the Densité Manager. See the iControl manual for the procedure to do this. Alternatively, reboot the card by using XAdmin will also solve the problem. See step 3 in procedure Verifying the KMX-3921 Multiviewer Status , on page 123.
The mosaic image of one of more HDR video streams appear: <ul style="list-style-type: none"> • faded-out (low-contrast image) • have poor color rendering 	A KMX-3921 card is not licensed for HDR/WCG	Swap a KMX-3921 card licensed for HDR/WCG into the unlicensed KMX-3921 card’s slot. See also About Swapping KMX-3921 Cards into a Multiviewer , on page 128.	Purchase and enable HDR/WCG licenses for all KMX-3921 cards. To see and enable an individual card’s licensing, see Enabling Options , on page 121.
Display of an HDMI mosaic output is pixilated, blocked, intermittent, or blank (signal loss)	HDMI cable is too low-quality or is too long	Use a short (<6ft (1.8m)), high-quality cable with the display	Use a shorter HDMI cable, use an HDMI cable constructed with heavier conductors (for example, AWG 22 (0.34mm ²) or thicker), or both.

Should you need further assistance, see [Grass Valley Technical Support](#), on page 156.

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 handle 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 156.

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. 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 156.

7 Specifications

This chapter lists equipment specifications for the KMX-3921 input, output, and companion cards, and their rear panels.

KMX-3921 Multiviewer Cards

Video Inputs

Video Inputs - General

Parameter	Description
Signal inputs	9 SDI inputs per KMX-3921 card. Some SDI inputs can accept a MADI signal instead of an SDI video input. See Discrete Audio Inputs , on page 145.
Connector	Coaxial via DIN 1.0/2.3, 75 Ω

SD-SDI inputs

Signal	4:2:2 SMPTE ST 259-C (270 Mbps), SMPTE ST 272
Formats	525i59.94 and 625i50
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

HD-SDI inputs *(continued)*

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 (level A and B) 1080p59.94 (level A and B)
High Dynamic Range (HDR) and Wide Color Gamut (WCG) support. Note: A multiviewer will fully support HDR/WCG on all inputs when one HDR option key has been enabled for each KMX-3921 card. See Available Hardware and Software Options , on page 120.	<ul style="list-style-type: none"> • HLG BT.2020 • HLG with BT.709 colors • PQ BT.2020 (ITU BT.2100) • PQ with BT.709 colors (SMPTE ST 2084) • S-LOG3 BT.2020 • S-LOG3 with BT.709 colors • S-LOG3 S-Gamut3
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)

Discrete Audio Inputs

Some SDI inputs can accept a MADI signal instead of an SDI video input. See [Installation of the KMX-3921 in a Densité 3+ Frame](#), on page 30 for more information.

MADI audio inputs

Signal	AES10-2008
Sampling frequency	48 kHz nominal, 64 channels, synchronous with video reference signal
Cable length	300 m (975 ft) (Belden 8281 or Belden 1694A)
Connector	Coaxial via DIN 1.0/2.3, 75 Ω

See also [Multiviewer SDI / MADI Input Combinations](#), on page 21.

Miscellaneous Inputs/Output

These inputs and outputs are available for use by the multiviewer, but are supported by the frame or by extra cards in the frame.

LTC Inputs (1 or 2 ^a)	With Densité 3+ FR4 frame controller or REF-1801 See also Genlocking the Multiviewer , on page 112.
Reference	With Densité 3+ FR4 frame controller or REF-1801 See also Genlocking the Multiviewer , on page 112.
GPIO	Device: Densité GPI-1501 (see webpage for full specifications)

a. Check for availability.

Mosaic Outputs

Mosaic Outputs - General

Parameter	Description
Delay, with display(s) in landscape orientation (non-rotated display(s))	Referenced: <ul style="list-style-type: none"> • 16.7 ms @ 59.94 Hz • 20 ms @ 50 Hz Free running: <ul style="list-style-type: none"> • Maximum 33.4 ms @ 59.94 Hz • Maximum 40 ms @ 50 Hz
Delay, with display(s) in portrait orientation (display(s) rotated 90°)	Referenced: <ul style="list-style-type: none"> • 33.4 ms @ 59.94 Hz • 40 ms @ 50 Hz Free running: <ul style="list-style-type: none"> • Maximum 50.1 ms @ 59.94 Hz • Maximum 60 ms @ 50 Hz

Mosaic Outputs - General (continued)

Parameter	Description
Formats	<ul style="list-style-type: none"> • 1080p59.94 (level A) • 1080p50 (level A) • 1080i59.94 • 1080i50 • 2160p59.94 Square Division Quad Split (SDQS) over quad-link 3G • 2160p50 Square Division Quad Split (SDQS) over quad-link 3G • HDMI 2.0 2160p59.94 through an external quad-link 3G to HDMI converter • HDMI 2.0 2160p50 through an external quad-link 3G to HDMI converter
Dynamic Range	Standard Dynamic Range (SDR) and colors according to ITU Rec. 709
Audio Monitoring	Embedded on mosaic outputs

HDMI SFP (optional)

Parameter	Description
Number of outputs	1 per SFP module
Connector	HDMI type D
Signal	HDMI V1.4
Format	1920x1080p 50 Hz or 59.94 Hz

SDI Coaxial SFP (optional)

Parameter	Description
Number of outputs	Up to 2 per SFP module
Connector	DIN 1.0/2.3
Signal HD	SMPTE ST 292-1 (1.485, 1.485/1.001 Gb/s)
Signal 3G	SMPTE ST 424 (2.97, 2.97/1.001 Gb/s) Level A
Formats	1080p59.94, 1080p50, 1080i59.95, 1080i50

Fiber SFP (optional)

Parameter	Description
Number of outputs	Up to 2 per SFP module
Formats	1080p59.94, 1080p50, 1080i59.95, 1080i50 For more SFP fiber options refer to http://www.grassvalley.com/products/sfp_optical_plugin_cartridges . See also Grass Valley's DXF-300 Optical AV Media Extender.

Supported Densité 3+ FR1 / Densité 3+ FR4 Frames and Multiviewer Capacity

Full specifications for the frame are found on the product's webpage:

- [Densité 3+ FR1](#)
- [Densité 3+ FR4](#)

The frame the KMX-3921 multiviewer is installed in and the frame's controller model has a direct effect on the multiviewer's permitted maximum capacity. See [Supported Frames and Multiviewer Scaling](#), on page 13 for more information.

Electrical

Each optional SFP module typically consumes 1.5 W maximum. Refer to the SFP module's datasheet for more information.

KMX-3921 Power consumption (without SFP Module)

Multiviewer Capacity	Multiviewer Cards	KMX-3921 rear panel	Total power consumption
9 × 1	1 × KMX-3921-9X1	KMX-3921-9X2-3+SR	28.5 W
9 × 2	1 × KMX-3921-9X2	KMX-3921-9X2-3+SR	28.5 W
18 × 1	2 × KMX-3921-9X1	KMX-3921-18X4-3+DR	57.0 W
18 × 2	2 × KMX-3921-9X2	KMX-3921-18X4-3+DR	57.0 W
18 × 4	2 × KMX-3921-9X2	KMX-3921-18X4-3+DR	57.0 W
27 × 1	3 × KMX-3921-9X1	KMX-3921-27X4-3+TR	87.0 W
27 × 2	3 × KMX-3921-9X2	KMX-3921-27X4-3+TR	87.0 W
27 × 4	3 × KMX-3921-9X2	KMX-3921-27X4-3+TR	87.0 W
36 × 1	4 × KMX-3921-9X1	KMX-3921-36X4-3+QR	117.0 W
36 × 2	4 × KMX-3921-9X2	KMX-3921-36X4-3+QR	117.0 W
36 × 4	4 × KMX-3921-9X2	KMX-3921-36X4-3+QR	117.0 W
54 × 1	6 × KMX-3921-9X1	KMX-3921-54X4-3+HR	147.0 W
54 × 2	6 × KMX-3921-9X2	KMX-3921-54X4-3+HR	147.0 W
54 × 4	6 × KMX-3921-9X2	KMX-3921-54X4-3+HR	147.0 W

Physical

Environment

Parameters	Value
Full specification temperature range	0–40°C (32–104°F) (ambient)
Maximum storage humidity	90% RH non-condensing
Maximum functional humidity	65% RH non-condensing

Each optional SFP module typically weighs 75 grams maximum. Refer to the SFP module's datasheet for more information.

KMX-3921 Weight (without SFP Module)

Multiviewer Capacity	Multiviewer Cards	KMX-3921 rear panel	Total weight
9 × 1	1 × KMX-3921-9X1	KMX-3921-9X2-3+SR	305.1 g
9 × 2	1 × KMX-3921-9X2	KMX-3921-9X2-3+SR	305.1 g
18 × 1	2 × KMX-3921-9X1	KMX-3921-18X4-3+DR	612.6 g
18 × 2	2 × KMX-3921-9X2	KMX-3921-18X4-3+DR	612.6 g
18 × 4	2 × KMX-3921-9X2	KMX-3921-18X4-3+DR	612.6 g
27 × 1	3 × KMX-3921-9X1	KMX-3921-27X4-3+TR	899.4 g
27 × 2	3 × KMX-3921-9X2	KMX-3921-27X4-3+TR	899.4 g
27 × 4	3 × KMX-3921-9X2	KMX-3921-27X4-3+TR	899.4 g
36 × 1	4 × KMX-3921-9X1	KMX-3921-36X4-3+QR	1186.2 g
36 × 2	4 × KMX-3921-9X2	KMX-3921-36X4-3+QR	1186.2 g
36 × 4	4 × KMX-3921-9X2	KMX-3921-36X4-3+QR	1186.2 g
54 × 1	6 × KMX-3921-9X1	KMX-3921-54X4-3+HR	1759.9 g
54 × 2	6 × KMX-3921-9X2	KMX-3921-54X4-3+HR	1759.9 g
54 × 4	6 × KMX-3921-9X2	KMX-3921-54X4-3+HR	1759.9 g

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	Venus-series and Trinx-series routers
Imagine Communications (Harris/Leitch)	Harris XY Passthrough Protocol	No	Platinum, Xplus, Integrator, Via-32, Panacea, Xpress
Lantronix	(Lightwave) Matrix-Hub Protocol	No	Matrix-Hub 1000

Company	Protocol	Text database download	Routers/Controllers
Nevion (Network Electronics)	Network Modular (Ethernet)	No	VikinX Modular
PESA	USP (Unsolicited Status Protocol)	No	Cheetah, Tiger, Jaguar, Cougar, Ocelot, Bobcat, TDM3000, PERC2000 system controller
Grass Valley (SAM / Snell / Pro-Bel)	General Switcher Protocol (SW-P-02)	No	
Sony	Sony HKSPC (GVGNP Emulator)	No	Sony routers (requires HKSPC card); GVG routers (Ethernet)
Utah Scientific	PL-160/PL-320	No	AVS-1B
	RCP-1	No	SC-1, SC-2, SC-3 series
	RCP-3	Yes	SC-4 series (Ethernet only)

- a. Deprecated. To be used with legacy configurations only.
- b. To be used in most cases. Supports native locks, and aliases from router (provided system controller has NV9000 router control system version 6.0.6 or later)
- c. To be used in very specific scenarios involving physical router interconnects with tie lines, or with hybrid router configurations. Contact Technical Support for more information (see [Grass Valley Technical Support](#), on page 156).
- d. For Thomson / Grass Valley Series 7000 devices, our current implementation of the Series 7000 Native Protocol supports some Encore system controller models, which are supported by Ethernet connection. For other Series 7000 devices you wish to control by Ethernet connection, use the Sony HKSPC (GVGNP Emulator).
- e. Our current implementations of the protocols listed above for Grass Valley (Thomson/Philips) routers and controllers support neither the CM-4400 nor the CM-4000 system controllers.

Drivers for Controlling Tally Interface Devices from the Multiviewer

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

Production Switchers

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

UMD controllers

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

Automation systems

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

Drivers for Timers

Timer systems

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

Built-in Communications Protocols

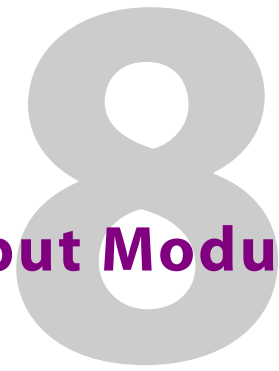
The multiviewer itself can be controlled by external devices (e.g. Kaleido-RCP2, router control panels) or applications (e.g. router control software application, Remote Control Gateway) via built-in communications protocols. Such devices or applications can be used to command monitor wall operations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

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), and the dedicated port number on the multiviewer, for TCP/IP connections.

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

Installing the SFP Output Module



Introduction

Installing and removing the SFP output interface cartridge requires special care. This annex describes the process.

Rear panels incorporate one or two SFP interface(s). The interface consists of two parts:

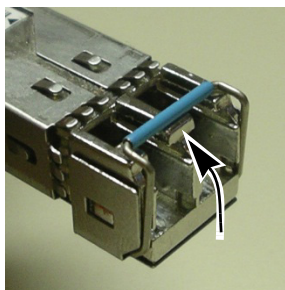
- A socket on the rear panel into which an SFP interface module is plugged
- An SFP (Small Form-factor Pluggable) module that performs output medium translation to which connections are made for optical fibers, coaxial copper, and so on.

CAUTION

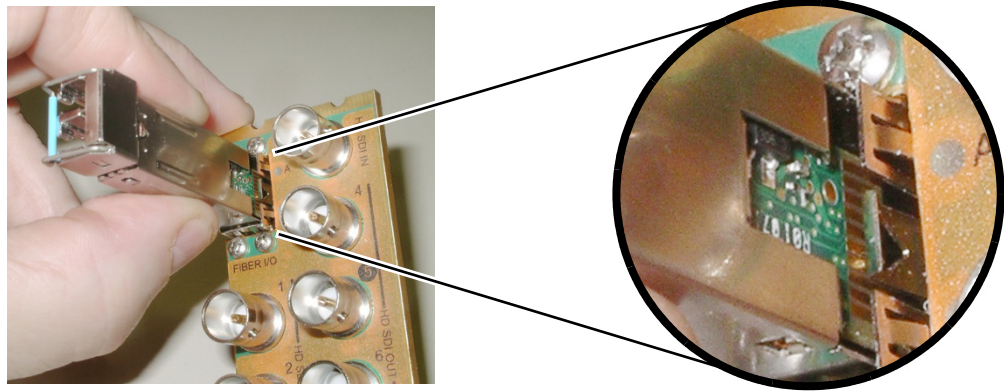
- SFP fiber Transmitter modules contain a class 1 laser, which emits invisible radiation whenever the module is powered up. Because the SFP is hot-swappable, the module may be powered up as soon as it is installed.
- DO NOT LOOK INTO AN OPERATING SFP FIBER MODULE'S CONNECTORS, AS EYE DAMAGE MAY RESULT.
- The SFP module is sensitive to electrostatic discharge (ESD). It is recommended that you use an ESD-preventive wrist strap grounded to the chassis while handling the SFP module.
- SFP modules are subject to wear, and their useful lifetime is reduced each time they are inserted or removed. Do not remove them more often than is absolutely necessary.
- Never remove or install an SFP fiber module with the fiber optic cables connected. Damage to the cables could result.
- The presence of dust and debris can seriously degrade the performance of an optical interface. It is recommended that you insert a dust plug into the SFP fiber module whenever a fiber optic cable is not connected.

Installing an SFP module

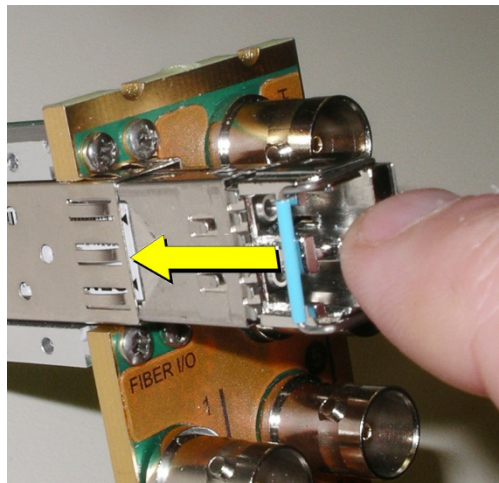
- 1 Make sure that the bale clasp lever is in the closed position.



- 2 Position the SFP module so that the recessed slot is lined up with the tab side of the socket.



- 3 Slide the module straight into the socket, and push gently until it clicks into position.



Connecting the fiber optic cables

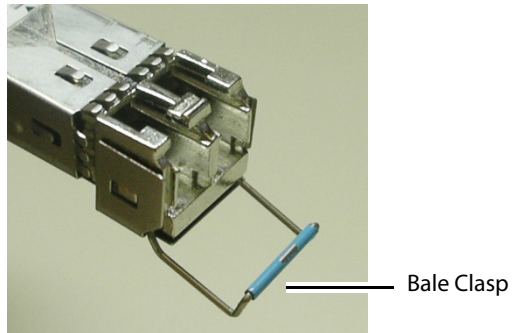
- 1 Remove the dust plug from the SFP module if present
- 2 Verify that the exposed end of the optical fiber in the LC connector is clean
 - Carefully remove any debris if necessary.
- 3 Plug the LC-terminated fiber optic cable into the SFP module

Removing the fiber optic cables

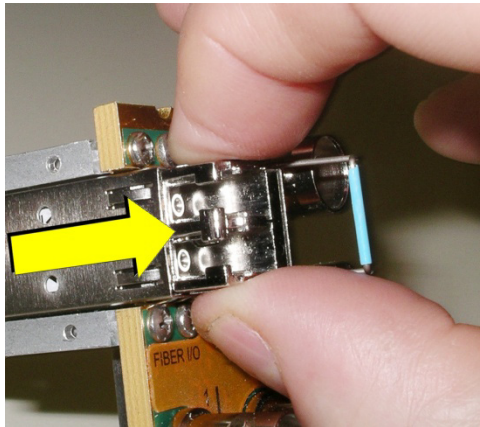
- 1 Grasp the LC fiber optic connector that is plugged into the SFP module, and pull it straight out to disengage the optical fiber from the SFP.
 - Never pull the fiber optic cable itself, as irreversible damage may occur.
- 2 Insert a dust plug into the SFP module.

Removing the SFP module

- 1 Move the bale clasp lever to the open position.



- 2 Grasp the SFP module between your thumb and forefinger, and pull it straight out of the slot.



- Do NOT pull on the bale clasp lever to remove the module, as it is easily damaged.
 - You may find that you need to wiggle the module, or perhaps push it into the slot a bit, before it will release and slide out.
- 3 For fiber optic models, insert a dust plug into the SFP module.



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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