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A **BELDEN** BRAND

# **KMX-4911 / KMX-4921**

SCALABLE KALEIDO MULTIVIEWER FOR GV NODE

## **Installation & Service Manual**

M3033-9902-106

2018-06-19

[www.grassvalley.com](http://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.

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## 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.

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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.

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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-4911 / KMX-4921 multiviewer up and running. When the content of this document applies equally to both KMX-4911 / KMX-4921 multiviewer models, the **KMX-49N1** designation is used to refer to either multiviewer model for simplicity. The following chapters will guide you through the installation of a KMX-49N1 system in its default configuration. This chapter provides an overview of the KMX-49N1 unit.

The KMX-49N1 is a flexible and scalable 4K- and IP-ready multiviewer for TV production optimized for the space, power and weight considerations found in studios and outside broadcast trucks. The KMX-49N1 multiviewer modules are part of the GV Node IP aggregation, processing, and edge routing platform, designed for live broadcast production.

## 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](http://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
GVB-1-0577B-EN-DS	KMX-4911 / KMX-4921 Datasheet
M770-9905	Kaleido Multiviewer Documentation Resource Guide
M3033-9902	KMX-4911 / KMX-4921 Installation & Service Manual
M6103-9805	GV Node Quick Start Guide
M6103-9800	GV Node IP Aggregation, Processing and Edge Routing Platform 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
M407-9900	iControl Router User Guide

Document Number	Title
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](http://www.grassvalley.com/dl/multiviewers)).

### Introduction

KMX-49N1 cards are installed in a GV Node frame with a corresponding back panel that is installed at the rear of the GV Node frame. Each KMX-49N1 card can display up to nine GV Node video sources in up to nine video windows across one or two high-resolution mosaic outputs. Combine up to six KMX-49N1 cards, to configure a dual- or quad-mosaic output system in the following sizes:  $9 \times 1$ ,  $9 \times 2$ ,  $18 \times 2$ ,  $18 \times 4$ ,  $27 \times 2$ ,  $27 \times 4$ ,  $36 \times 2$ ,  $36 \times 4$ ,  $54 \times 2$ , and  $54 \times 4$ . According to the number of KMX-49N1 cards chosen for an installation, a correspondingly sized rear panel is used to interconnect the cards.

KMX-49N1 inputs are sourced from the GV Node's fabric module, and thus from any SDI input or IP input available to the GV Node. KMX-49N1 mosaic outputs are made available to the GV Node's fabric module where they can be routed within the frame as any other signal for IP distribution and these mosaic outputs are also optionally available on the rear panel of the GV Node through one or two SFP output modules for connection to a display.

A single 4 RU GV Node frame can hold up to 16 KMX-49N1 multiviewer cards, which can be combined into various multiviewer combinations with appropriate rears. The KMX-49N1 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-49N1 features

Feature	Description	Multiviewer Model	
		KMX-4911	KMX-4921
Space-efficient modular design	Modular design offers wide range of input/output configurations, for streamlined, cost-saving cabling and optimization of space usage. Standard GV Node 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. 4 RU GV Node frame housings, with redundant power supplies, and quiet cooling.	•	•
Multi-room, multi-user oriented	A single KMX-49N1 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.	•	•
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 upstream COTS IP switches.	•	•

**KMX-49N1 features (continued)**

Feature	Description	Multiviewer Model	
		KMX-4911	KMX-4921
High Dynamic Range Support and Wide Color Gamut support	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.		Optional <sup>a</sup>
SDR mosaic output	The mosaic outputs always use Standard Dynamic Range (SDR) and colors according to ITU Rec. 709.	•	•

a. See [Available Hardware and Software Options](#), on page 113.

## Current Limitations

The KMX-49N1 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). The KMX-49N1 currently also does not support the following Kaleido Software V9.00 or higher features:

- Sending alarms via SNMP
- Layout, and video display:
  - Duplicated/repeated video
  - Overlapping video monitors
  - Custom cropping and zooming vertically
  - Overscan mode
  - Automatic aspect ratio adjustment based on decoded AFD/WSS information
  - Video monitors larger than 1920×1080 pixels
  - Custom display resolutions

## KMX-49N1 Models and Related Hardware

The following components when added to a GV Node Frame creates a multiviewer.

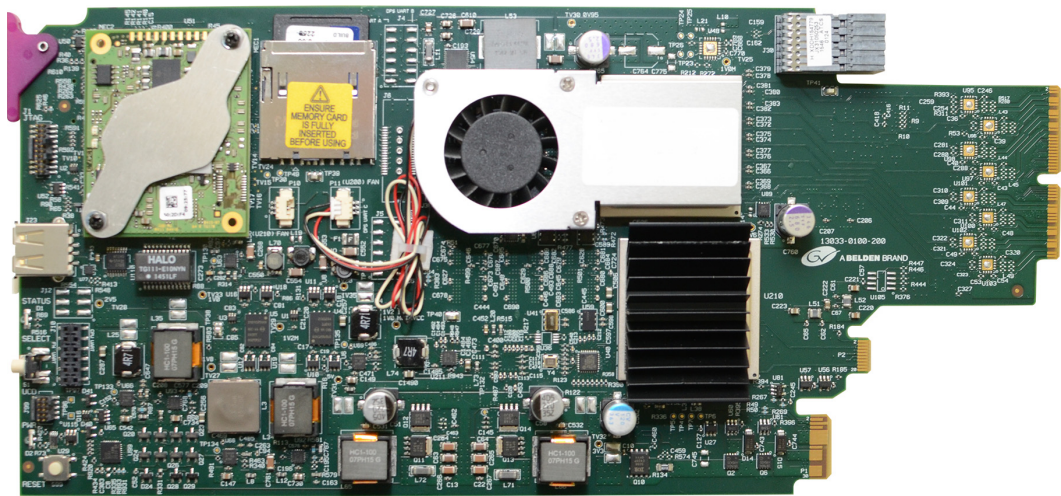
- KMX-49N1 Multiviewer Cards
- KMX-49N1 Rear Panel
- Optional SFP output Module(s)

Certain optional features must be licensed to make to make the feature available for use. See [Available Hardware and Software Options](#), on page 113.

## KMX-49N1 Multiviewer Cards

The KMX-49N1 is available in a number of models shown in the table below.

KMX-49N1 module selection	Description
KMX-4911-9X1	9x1 Kaleido multiviewer card for GV Node (SD/HD/3G SDI).
KMX-4911-9X2	9x2 Kaleido multiviewer card for GV Node (SD/HD/3G SDI).
KMX-4921-9X1	9x1 Kaleido multiviewer card for GV Node (SD/HD/3G SDI).
KMX-4921-9X2	9x2 Kaleido multiviewer card for GV Node (SD/HD/3G SDI).



Note: Certain models have two cooling fans.

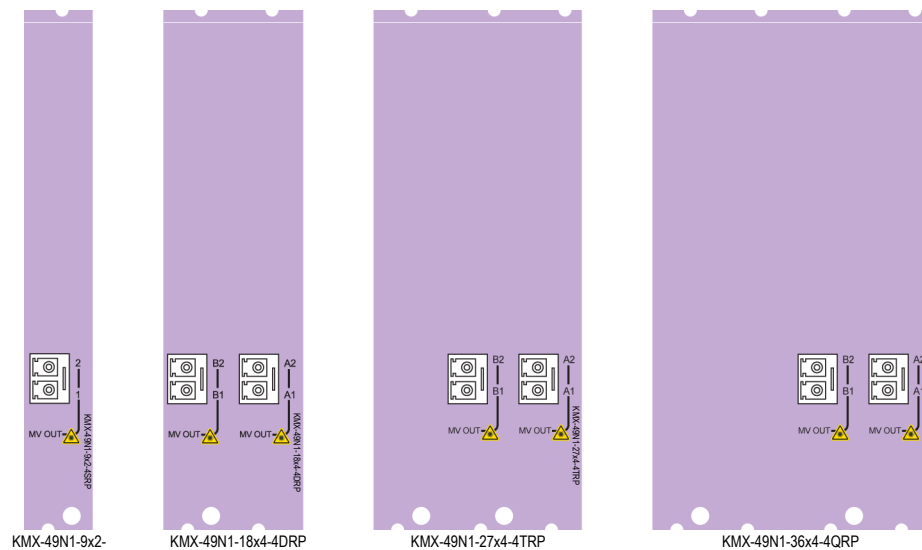
See also [About Swapping KMX-49N1 Cards into a Multiviewer](#), on page 122.

## KMX-49N1 Rear Panels

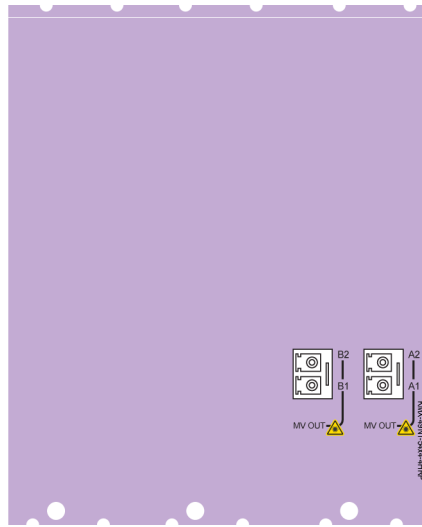
The KMX-49N1 rear panels provide SFP slots for optional rear panel connection for up to four displays. Rear panels that support between two and six cards also serve to interconnect the KMX-49N1 cards. These rear panels are available in a number of models shown in the table below.

Rear panel selection	Description
KMX-49N1-9x2-4SRP	Single rear panel with a single SFP slot for one KMX-49N1 card.
KMX-49N1-18x4-4DRP	Double rear panel with dual SFP slots for two KMX-49N1 cards.
KMX-49N1-27x4-4TRP	Triple rear panel with dual SFP slots for three KMX-49N1 cards.
KMX-49N1-36x4-4QRP	Quadruple rear panel with dual SFP slots for four KMX-49N1 cards.
KMX-49N1-54x4-4HRP	Sextuple rear panel with dual SFP slots for six KMX-49N1 cards.

**Note:** A rear panel with KMX-4911 in its model number is equivalent to a rear panel with KMX-49N1 in its model number and these parts can be interchangeably used. For example, a KMX-4911-27x4-4TRP rear panel can be used in place of a KMX-49N1-27x4-4TRP rear panel.







KMX-49N1-54x4-4HRP

## Multiviewer Scaling

The multiviewer is scaled by selecting an appropriate KMX-49N1 rear panel model for your solution with the corresponding number of KMX-49N1 cards to be used with that rear panel as shown below.

### KMX-49N1-9x2-4SRP Rear Panel

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
9 × 1	1 × KMX-4911-9X1 - OR - 1 × KMX-4921-9X1	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-4911-9x2 - OR - 1 × KMX-4921-9x2	One dual Tx SFP module is required to support this capacity when displays are directly connected to the multiviewer's rear panel.

### KMX-49N1-18x4-4DRP Rear Panel

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
18 × 1	2 × KMX-4911-9X1 - OR - 2 × KMX-4921-9X1	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-4911-9x2 - OR - 2 × KMX-4921-9x2	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-4911-9x2 - OR - 2 × KMX-4921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

### KMX-49N1-27x4-4TRP Rear Panel

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
27 × 1	3 × KMX-4911-9X1 - OR - 3 × KMX-4921-9X1	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-4911-9x2 - OR - 3 × KMX-4921-9x2	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-4911-9x2 - OR - 3 × KMX-4921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

### KMX-49N1-36x4-4QRP Rear Panel

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
36 × 1	4 × KMX-4911-9X1 - OR - 4 × KMX-4921-9X1	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-4911-9x2 - OR - 4 × KMX-4921-9x2	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-4911-9x2 - OR - 4 × KMX-4921-9x2	Two dual Tx SFP modules are required to support this capacity when displays are directly connected to the multiviewer's rear panel.

### KMX-49N1-54x4-4HRP Rear Panel

Multiviewer Capacity	Required Multiviewer Cards	SFP Module Requirements
54 × 1	6 × KMX-4911-9X1 - OR - 6 × KMX-4921-9X1	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-4911-9x2 - OR - 6 × KMX-4921-9x2	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-4911-9x2 - OR - 6 × KMX-4921-9x2	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

When display(s) are directly connected to the multiviewer's rear panel, the appropriate SFP module(s) must also 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](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 113.

### 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

### 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

### Kaleido Software Minimum Version Compatibility

When installing a KMX-49N1 card into a multiviewer, the Kaleido Software version currently loaded into a KMX-49N1 card must meet the minimum Kaleido Software version number. The minimum Kaleido Software version number varies according to the multiviewer's capacity and the card model. A KMX-49N1 card cannot be downgraded to a Kaleido Software version earlier than shown below. When downgrading this multiviewer, certain other requirements and limitations may be in effect; see [Upgrading the Multiviewer](#), on page 134 for more information.

Multiviewer Capacity	Card Model	Minimum required Kaleido Software version number
9 × 1, 9 × 2	KMX-4911	8.00 or higher
18 × 1, 18 × 2, 18 × 4	KMX-4911	8.20 or higher
27 × 1, 27 × 2, 27 × 4	KMX-4911	8.30 or higher
36 × 1, 36 × 2, 36 × 4	KMX-4911	8.30 or higher
54 × 1, 54 × 2, 54 × 4	KMX-4911	8.70 or higher
9 × 1, 9 × 2 18 × 1, 18 × 2, 18 × 4 27 × 1, 27 × 2, 27 × 4 36 × 1, 36 × 2, 36 × 4 54 × 1, 54 × 2, 54 × 4	KMX-4921	9.00 or higher

Kaleido Software Version 8.51 or higher is required for the fan monitor status to work correctly with KMX-4911 multiviewer cards that have two fans.

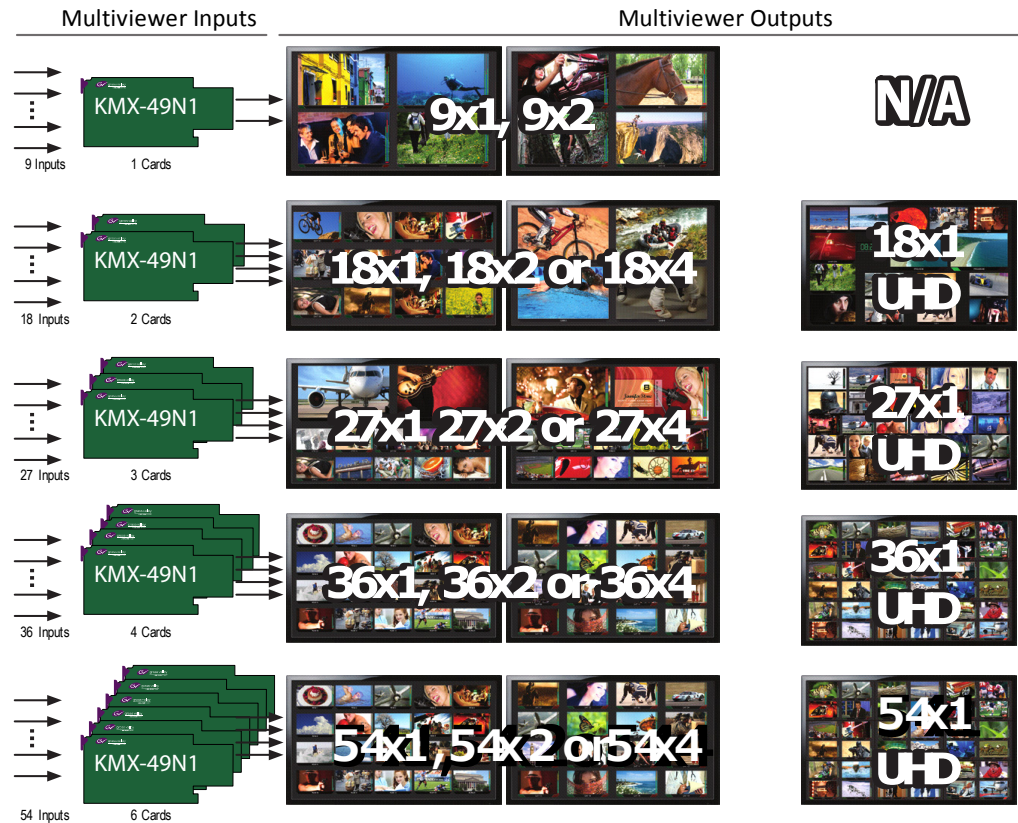
To upgrade a multiviewer's software, see [Upgrading the Multiviewer](#), on page 134. To find a card's Kaleido Software version number, see [Finding the Multiviewer's IP Address and Application Version](#), on page 120 or [Information Panel](#), on page 105.

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.

For a multiviewer that has two or more KMX-49N1 multiviewer cards, and all multiviewer cards meet the minimum version according to the above table, 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-49N1 in a GV Node Frame](#), on page 25 for the location of card 'A' in each multiviewer model. When a KMX-49N1 multiviewer card does not meet the minimum Kaleido Software version according to the above table is inserted to a multiviewer, special upgrade procedures will be required for this card in order to make the multiviewer fully functional. See [About Swapping KMX-49N1 Cards into a Multiviewer](#), on page 122.

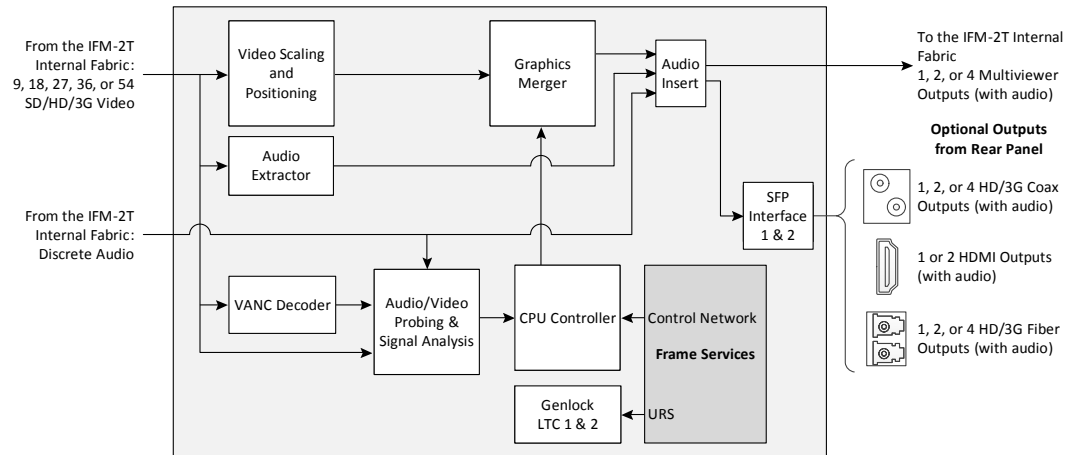
## Overview of the KMX-49N1 System

Between one to six KMX-49N1 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-49N1 building block*

## Functional Block Diagram



KMX-49N1 functional block diagram

# 2 Installation

This chapter provides information about system requirements, items shipped with your KMX-49N1 multiviewer and it will guide you through the installation of a KMX-49N1 multiviewer.

## Getting Organized / Unpacking

Make sure the following items have been shipped with your KMX-49N1 order. If any of these are missing, contact your distributor or Grass Valley (see [Grass Valley Technical Support](#), on page 152).

Your KMX-49N1 package includes the following:

- KMX-49N1 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

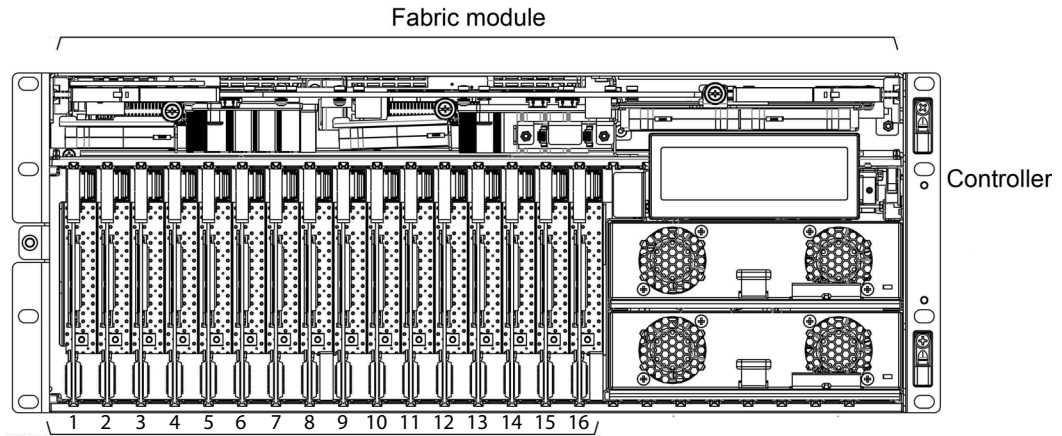
## Required Material

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)
- At least one GV Node housing frame with available modular card slots
- Ethernet network connectivity

## GV Node Frame Physical Interface

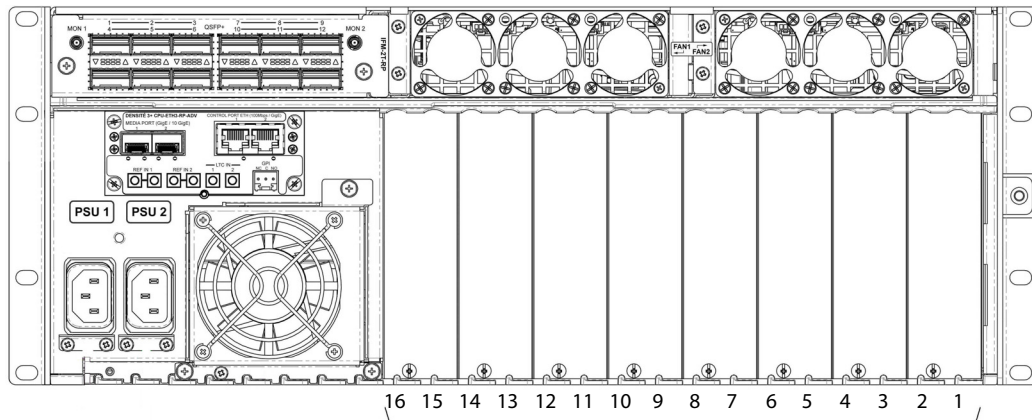
The KMX-49N1 cards are installed in up to six consecutive modular card slots in the GV Node frame. When the frame door is closed, the status LEDs on each of the cards in the frame is visible through the door.



Modular cards (16 slots)

Front of GV Node frame (door removed) with modular card slot numbers labelled 1 to 16

The rear panel for the KMX-49N1 card(s) are installed at the rear of the GV Node frame. The rear panel must be installed on the same modular card slots used by the KMX-49N1 card(s).



Rear panels for modular cards

Rear of GV Node frame with rear panel positions labelled for card slots 1 to 16

To open the front door, see [Opening and Closing the Front Door](#), on page 121.



## Installation of the KMX-49N1 in a GV Node Frame

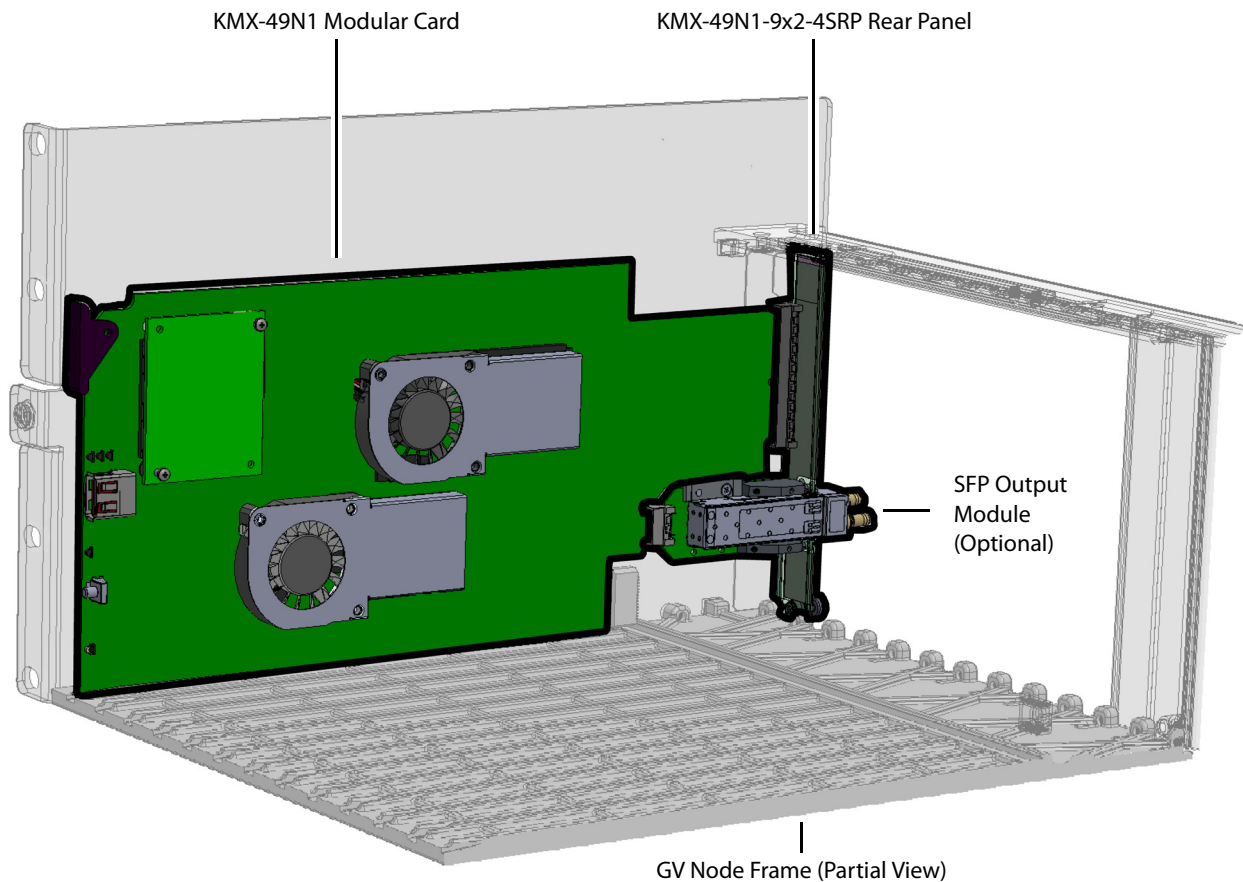
### Installation overview

The KMX-49N1 multiviewer is installed in a GV Node frame. As such, the GV Node 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 45.

The KMX-49N1 cards are installed in a GV Node frame along with its associated rear panel. The rear panel must be installed in the GV Node frame before the card can be inserted into the frame. If the KMX-49N1 card is to directly support a video wall mosaic output, one or two SFP module(s) must installed in the rear panel. See [KMX-49N1 Models and Related Hardware](#), on page 14 for a summary of the hardware that can be installed. See also the *GV Node IP Aggregation, Processing and Edge Routing Platform User Manual* for information about how to install, power up, and configure a GV Node frame. See [Related Documentation](#), on page 11.

### Multiviewer with a KMX-49N1-9x2-4SRP Rear Panel

The one KMX-49N1 card is installed in a GV Node Frame slot that the KMX-49N1-9x2-4SRP rear panel occupies.



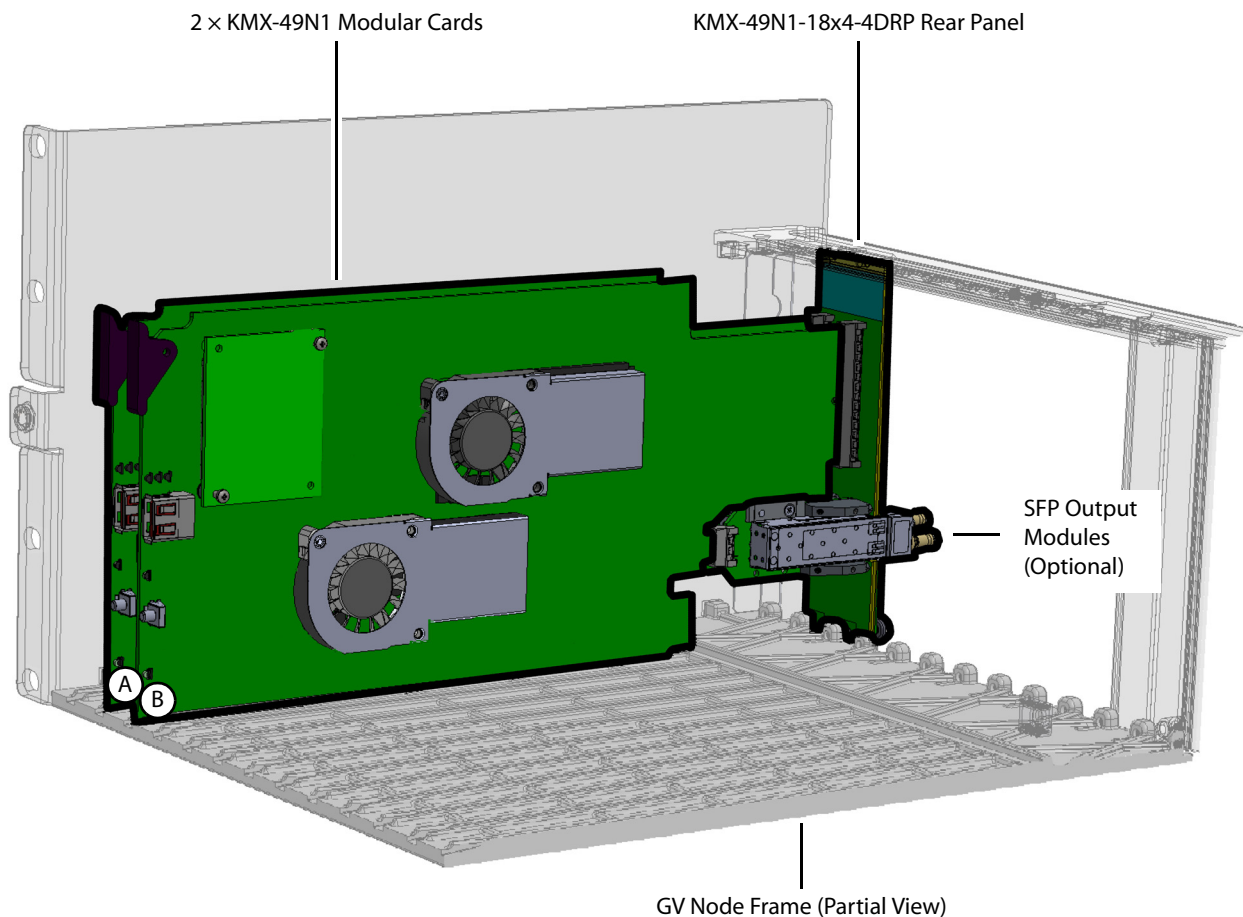
*A KMX-49N1 Card shown Assembled with a KMX-49N1-9x2-4SRP Rear Panel in a GV Node Frame*

This KMX-49N1 card accepts up to 9 video inputs from the GV Node frame's fabric and can source up to 2 mosaic returns to the GV Node frame's fabric. It can also accept up to 64 discrete and 144 embedded audio channels from the GV Node frame's fabric.

The slot a given KMX-49N1 card is installed in determines the input range / mosaic return range the card will use to interact with the GV Node frame's fabric. See [Routing Inputs and Mosaic Returns between the Multiviewer and the GV Node's Fabric](#), on page 34.

### Multiviewer with a KMX-49N1-18x4-4DRP Rear Panel

The two KMX-49N1 cards are installed in two consecutive GV Node Frame slots that the KMX-49N1-18x4-4DRP rear panel occupies.



*Two KMX-49N1 Cards shown Assembled with a KMX-49N1-18x4-4DRP Rear Panel in a GV Node Frame*

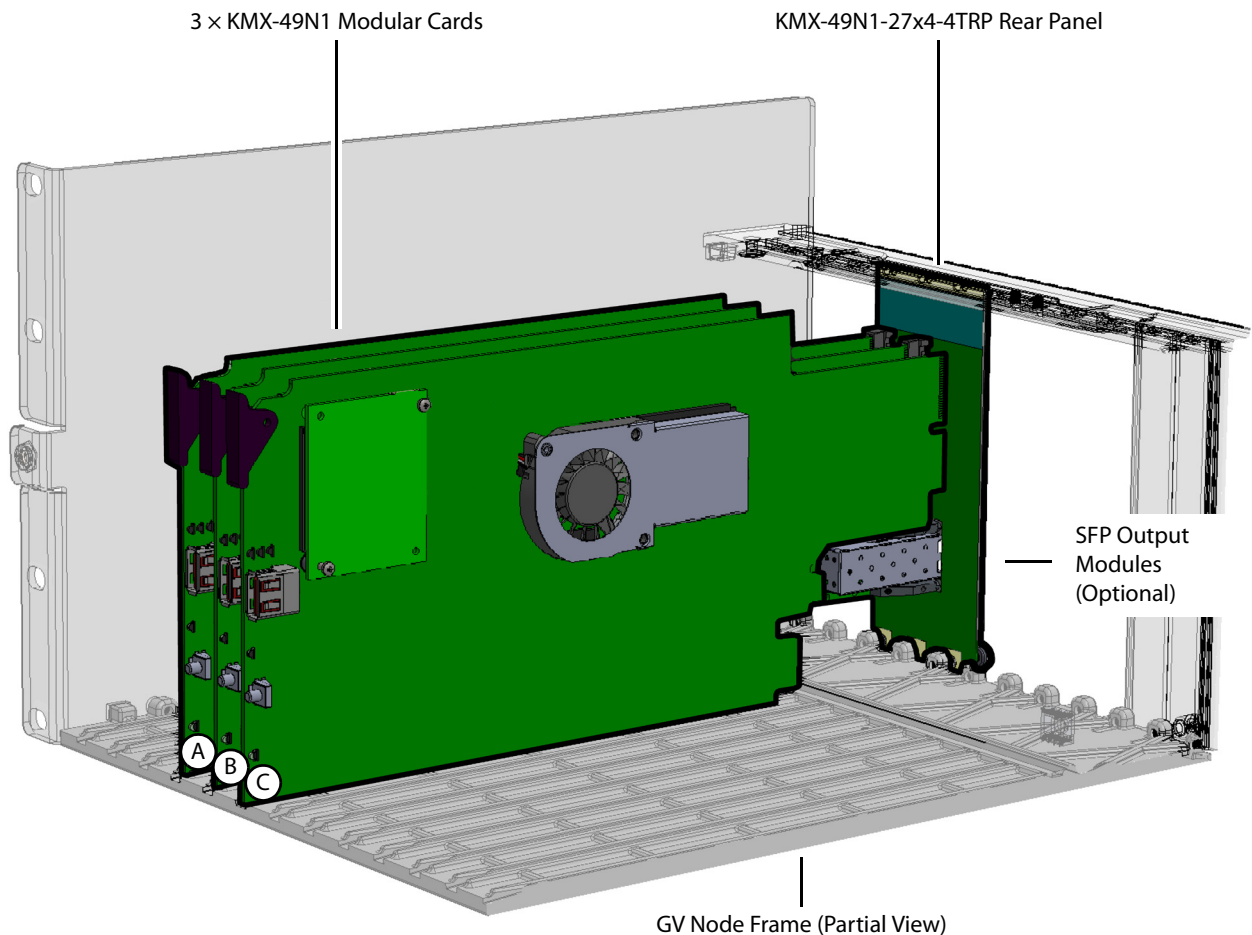
In the above diagram, the cards are identified with letters. How individual cards interact with the GV Node's fabric is explained in the table below.

Identification Letter	Inputs from GV Node frame's fabric	Mosaic returns to GV Node frame's fabric
A & B	Up to 9 video inputs per KMX-49N1 card. Up to 18 video inputs total. Up to 64 discrete and 144 embedded audio channels for each KMX-49N1 card in these slots. Up to 128 discrete and 288 embedded audio channels total.	Up to 2 mosaic returns per KMX-49N1 card. Up to 4 mosaic returns total.

The slot a given KMX-49N1 card is installed in determines the input range / mosaic return range the card will use to interact with the GV Node frame's fabric. See [Routing Inputs and Mosaic Returns between the Multiviewer and the GV Node's Fabric](#), on page 34.

### Multiviewer with a KMX-49N1-27x4-4TRP Rear Panel

The three KMX-49N1 cards are installed in three consecutive GV Node Frame slots that the KMX-49N1-27x4-4TRP rear panel occupies.



Three KMX-49N1 Cards shown Assembled with a KMX-49N1-27x4-4TRP Rear Panel in a GV Node Frame

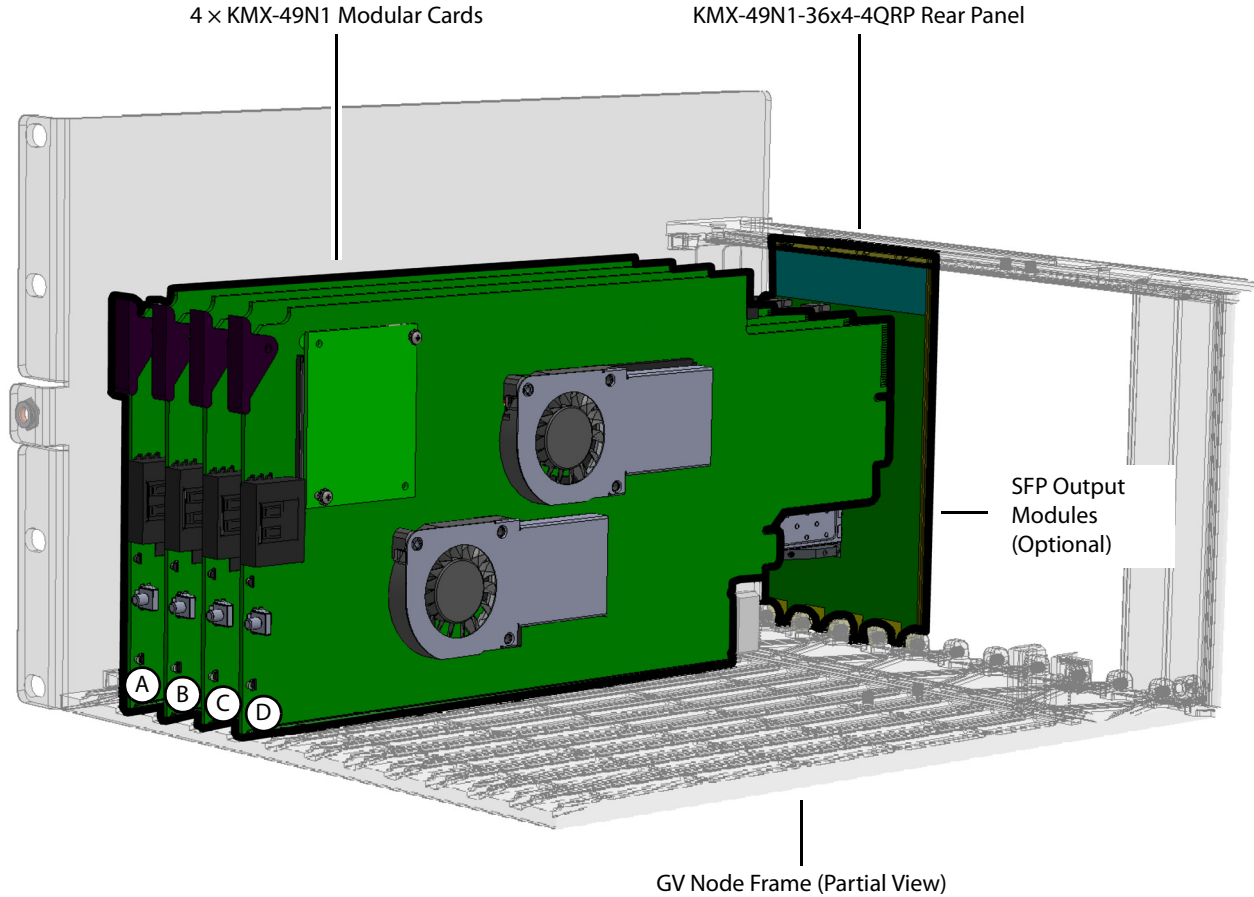
In the above diagram, the cards are identified with letters. How individual cards interact with the GV Node's fabric is explained in the table below.

Identification Letter	Inputs from GV Node frame's fabric	Mosaic returns to GV Node frame's fabric
A & B	Up to 9 video inputs per KMX-49N1 card. Up to 64 discrete and 144 embedded audio channels for each KMX-49N1 card in these slots.	Up to 2 mosaic returns per KMX-49N1 card.
C	Up to 9 video inputs. Up to 64 discrete and 144 embedded audio channels for the KMX-49N1 card in this slot.	0
Total for A, B, & C	Up to 27 video inputs total. Up to 192 discrete and 432 embedded audio channels total.	Up to 4 mosaic returns total.

The slot a given KMX-49N1 card is installed in determines the input range / mosaic return range the card will use to interact with the GV Node frame's fabric. See [Routing Inputs and Mosaic Returns between the Multiviewer and the GV Node's Fabric](#), on page 34.

### Multiviewer with a KMX-49N1-36x4-4QRP Rear Panel

The four KMX-49N1 cards are installed in four consecutive GV Node Frame slots that the KMX-49N1-36x4-4QRP rear panel occupies.



Four KMX-49N1 Cards shown Assembled with a KMX-49N1-36x4-4QRP Rear Panel in a GV Node Frame

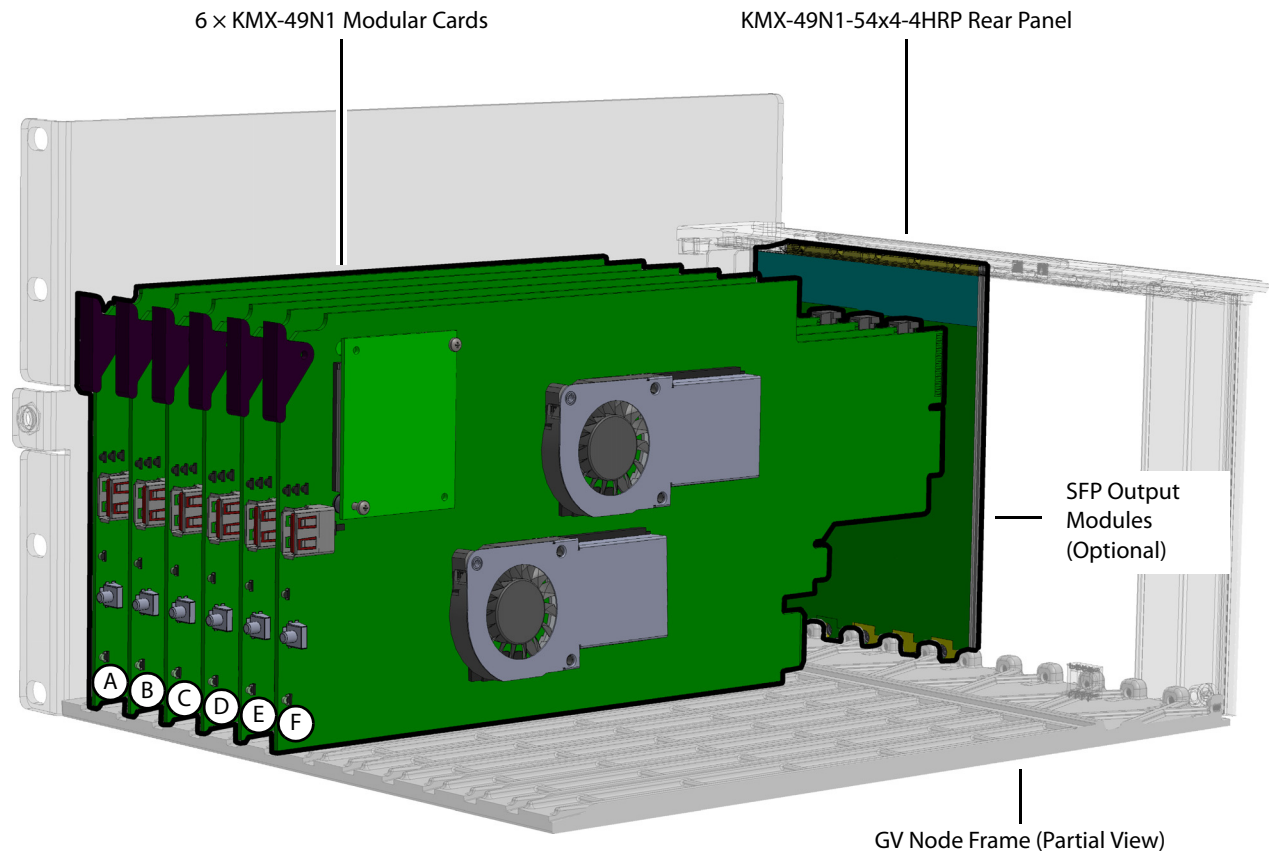
In the above diagram, the cards are identified with letters. How individual cards interact with the GV Node's fabric is explained in the table below.

Identification Letter	Inputs from GV Node frame's fabric	Mosaic returns to GV Node frame's fabric
A & B	Up to 9 video inputs per KMX-49N1 card. Up to 64 discrete and 144 embedded audio channels for each KMX-49N1 card in these slots.	Up to 2 mosaic returns per KMX-49N1 card.
C & D	Up to 9 video inputs per KMX-49N1 card. Up to 64 discrete and 144 embedded audio channels for each KMX-49N1 card in these slots.	0
Total for A, B, C, & D	Up to 36 video inputs total. Up to 256 discrete and 576 embedded audio channels total.	Up to 4 mosaic returns total.

The slot a given KMX-49N1 card is installed in determines the input range / mosaic return range the card will use to interact with the GV Node frame's fabric. See [Routing Inputs and Mosaic Returns between the Multiviewer and the GV Node's Fabric](#), on page 34.

### Multiviewer with a KMX-49N1-54x4-4HRP Rear Panel

The six KMX-49N1 cards are installed in six consecutive GV Node Frame slots that the KMX-49N1-54x4-4HRP rear panel occupies.



*Six KMX-49N1 Cards shown Assembled with a KMX-49N1-54x4-4HRP Rear Panel in a GV Node Frame*

In the above diagram, the cards are identified with letters. How individual cards interact with the GV Node's fabric is explained in the table below.

Identification Letter	Inputs from GV Node frame's fabric	Mosaic returns to GV Node frame's fabric
A & B	Up to 9 video inputs per KMX-49N1 card. Up to 64 discrete and 144 embedded audio channels for each KMX-49N1 card in these slots.	Up to 2 mosaic returns per KMX-49N1 card.

Identification Letter	Inputs from GV Node frame's fabric	Mosaic returns to GV Node frame's fabric
C, D, E, & F	Up to 9 video inputs per KMX-49N1 card. Up to 64 discrete and 144 embedded audio channels for each KMX-49N1 card in these slots.	0
Total for A, B, C, D, E, & F	Up to 54 video inputs total. Up to 256 discrete and 864 embedded audio channels total.	Up to 4 mosaic returns total.

The slot a given KMX-49N1 card is installed in determines the input range / mosaic return range the card will use to interact with the GV Node frame's fabric. See [Routing Inputs and Mosaic Returns between the Multiviewer and the GV Node's Fabric](#), on page 34.

## Where to locate the KMX-49N1 card(s) in the GV Node frame

The GV Node frame has space for 16 modular card slots. Identify the space in the GV Node frame the multiviewer is to be located. A single KMX-49N1 card can be installed in any one of the 16 modular card slots with its corresponding rear panel. When there are between two and six KMX-49N1 cards to be installed, 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 GV Node frame, however, each multiviewer system will be functionally independent of each other.

## Installation requirements

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

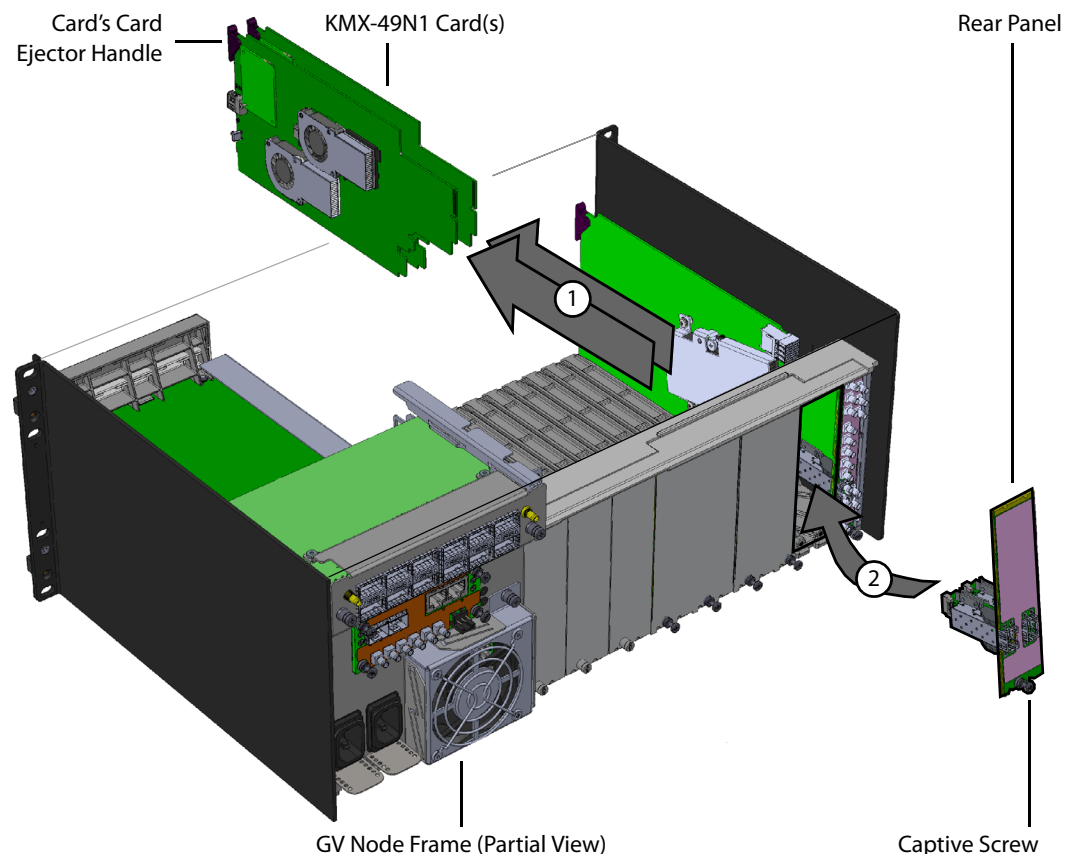
## Install the KMX-49N1 Rear Panel

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.

- To remove an existing card from the modular card slot, lift up the card ejector handle on the front of the card to lever the connectors apart, then use the handle to pull the card straight out of the modular card slot.



Example installation of a KMX-49N1-18x4-4DRP Rear Panel in slots 2 and 3 in a GV Node Frame

For example, when installing a KMX-49N1-18x4-4DRP rear panel in slots 2 and 3, first remove any cards located in modular card slots 2 and 3 as shown above.

### To install the rear panel

- 1 If a card is installed in the modular card slot whose rear panel is being changed, remove it as described above.
- 2 Remove the existing rear panel (either blank or belonging to an existing card that is being changed out) by releasing the captive screw(s) at the bottom.



- 3 Slide the top edge of the new rear panel under the lip at the top of the empty space and secure the panel in place with the captive screw(s) on the bottom.

### **Install the KMX-49N1 Modular Card(s)**

The rear panel occupies between 1 and 6 modular card slots in the frame. One KMX-49N1 card must be installed in each modular card slot covered by the rear panel. Once the rear panel has been installed, install the KMX-49N1 card(s) as follows:

- 1 Open the frame's front door. See [Opening and Closing the Front Door](#), on page 121.
- 2 Orient the card such that the card is up right with the card ejector handle located at the top edge of the card.
- 3 While holding the card by its card ejector handle, slide the KMX-49N1 card into the slot and gently push on the card ejector handle to seat the connectors.
- 4 Insert any remaining cards into the frame in the same manner.
- 5 Close the frame's front door. See [Opening and Closing the Front Door](#), on page 121.

### **Install the Optional SFP Module(s)**

If the KMX-49N1 card is to directly support a video wall mosaic output, install the SFP module(s) into the Rear Panel. See [Installing the SFP Output Module](#), on page 149.

## Routing Inputs and Mosaic Returns between the Multiviewer and the GV Node's Fabric

The GV Node's internal router, the IFM-2T fabric module, controls the signal flows into and out of the multiviewer's KMX-49N1 cards. To know the quantity of GV Node frame inputs from fabric and mosaic returns to fabric each KMX-49N1 card supports, see [Installation of the KMX-49N1 in a GV Node Frame](#), on page 25. The slot a given KMX-49N1 card is installed in determines the input range / mosaic return range the card will use to interact with the GV Node frame's fabric. This is shown in the following tables. Under certain conditions, audio stream signals are managed separately from video stream signals and are managed through a separate GV Node audio router.

### Video Input Streams

**KMX-49N1 Card Video Matrix Input from Fabric Number / Mosaic Return to Fabric Number for each GV Node Frame Slot**

Card's Input from GV Node Fabric / Mosaic Return to GV Node Fabric	GV Node Frame Slot Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
First Input / Mosaic Return 1	1	10	19	28	37	46	55	64	73	82	91	100	109	118	127	136
Second Input / Mosaic Return 2	2	11	20	29	38	47	56	65	74	83	92	101	110	119	128	137
Third Input	3	12	21	30	39	48	57	66	75	84	93	102	111	120	129	138
Fourth Input	4	13	22	31	40	49	58	67	76	85	94	103	112	121	130	139
Fifth Input	5	14	23	32	41	50	59	68	77	86	95	104	113	122	131	140
Sixth Input	6	15	24	33	42	51	60	69	78	87	96	105	114	123	132	141
Seventh Input	7	16	25	34	43	52	61	70	79	88	97	106	115	124	133	142
Eighth Input	8	17	26	35	44	53	62	71	80	89	98	107	116	125	134	143
Ninth Input	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144

### Audio Streams

The multiviewer has the following modes for processing audio source.

- MDX mode: enables embedding of discrete audio sources into the corresponding video source prior to monitoring/metering being done. This mode will replace any pre-existing embedded audio in the video source.
- Non-MDX mode: existing embedded audio is preserved and is monitored/metered by the multiviewer. Discrete audio is also monitored/metered separately by the multiviewer.

The MDX mode is set in the GV Node Manager application under *Enabled Options*.

**MDX Mode: KMX-49N1 Card Audio Matrix (discrete to embedded audio) Input from Fabric Number for each GV Node Frame Slot**

Card's Input from GV Node Fabric	GV Node Frame Slot Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
First Input	1 to 16	145 to 160	289 to 304	433 to 448	577 to 592	721 to 736	865 to 880	1009 to 1024	1153 to 1168	1297 to 1312	1441 to 1456	1585 to 1600	1729 to 1744	1873 to 1888	2017 to 2032	2161 to 2176
Second Input	17 to 32	161 to 176	305 to 320	449 to 464	593 to 608	737 to 752	881 to 896	1025 to 1040	1169 to 1184	1313 to 1328	1457 to 1472	1601 to 1616	1745 to 1760	1889 to 1904	2033 to 2048	2177 to 2192
Third Input	33 to 48	177 to 192	321 to 336	465 to 480	609 to 624	753 to 768	897 to 912	1041 to 1056	1185 to 1200	1329 to 1344	1473 to 1488	1617 to 1632	1761 to 1776	1905 to 1920	2049 to 2064	2193 to 2208
Fourth Input	49 to 64	193 to 208	337 to 352	481 to 496	625 to 640	769 to 784	913 to 928	1057 to 1072	1201 to 1216	1345 to 1360	1489 to 1504	1633 to 1648	1777 to 1792	1921 to 1936	2065 to 2080	2209 to 2224
Fifth Input	65 to 80	209 to 224	353 to 368	497 to 512	641 to 656	785 to 800	929 to 944	1073 to 1088	1217 to 1232	1361 to 1376	1505 to 1520	1649 to 1664	1793 to 1808	1937 to 1952	2081 to 2096	2225 to 2240
Sixth Input	81 to 96	225 to 240	369 to 384	513 to 528	657 to 672	801 to 816	945 to 960	1089 to 1104	1233 to 1248	1377 to 1392	1521 to 1536	1665 to 1680	1809 to 1824	1953 to 1968	2097 to 2112	2241 to 2256
Seventh Input	97 to 112	241 to 256	385 to 400	529 to 544	673 to 688	817 to 832	961 to 976	1105 to 1120	1249 to 1264	1393 to 1408	1537 to 1552	1681 to 1696	1825 to 1840	1969 to 1984	2113 to 2128	2257 to 2272
Eighth Input	113 to 128	257 to 272	401 to 416	545 to 560	689 to 704	833 to 848	977 to 992	1121 to 1136	1265 to 1280	1409 to 1424	1553 to 1568	1697 to 1712	1841 to 1856	1986 to 2001	2129 to 2144	2273 to 2288
Ninth Input	129 to 144	273 to 288	417 to 432	561 to 576	705 to 720	849 to 864	993 to 1008	1137 to 1152	1281 to 1296	1425 to 1440	1569 to 1584	1713 to 1728	1857 to 1872	2001 to 2016	2145 to 2160	2289 to 2304

**Non-MDX Mode: KMX-49N1 Card Audio Matrix (discrete audio) Input from Fabric Number for each GV Node Frame Slot**

Card's that Support Input from GV Node Fabric	GV Node Frame Slot Number															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Standalone, 'A', or 'B' cards only	1 to 64	145 to 208	289 to 352	433 to 496	577 to 640	721 to 784	865 to 928	1009 to 1072	1153 to 1216	1297 to 1360	1441 to 1504	1585 to 1648	1729 to 1792	1873 to 1936	2017 to 2080	2161 to 2224

Note that in the non-MDX mode, only the first four cards (when equipped) receive discrete audio inputs from the GV Node fabric.

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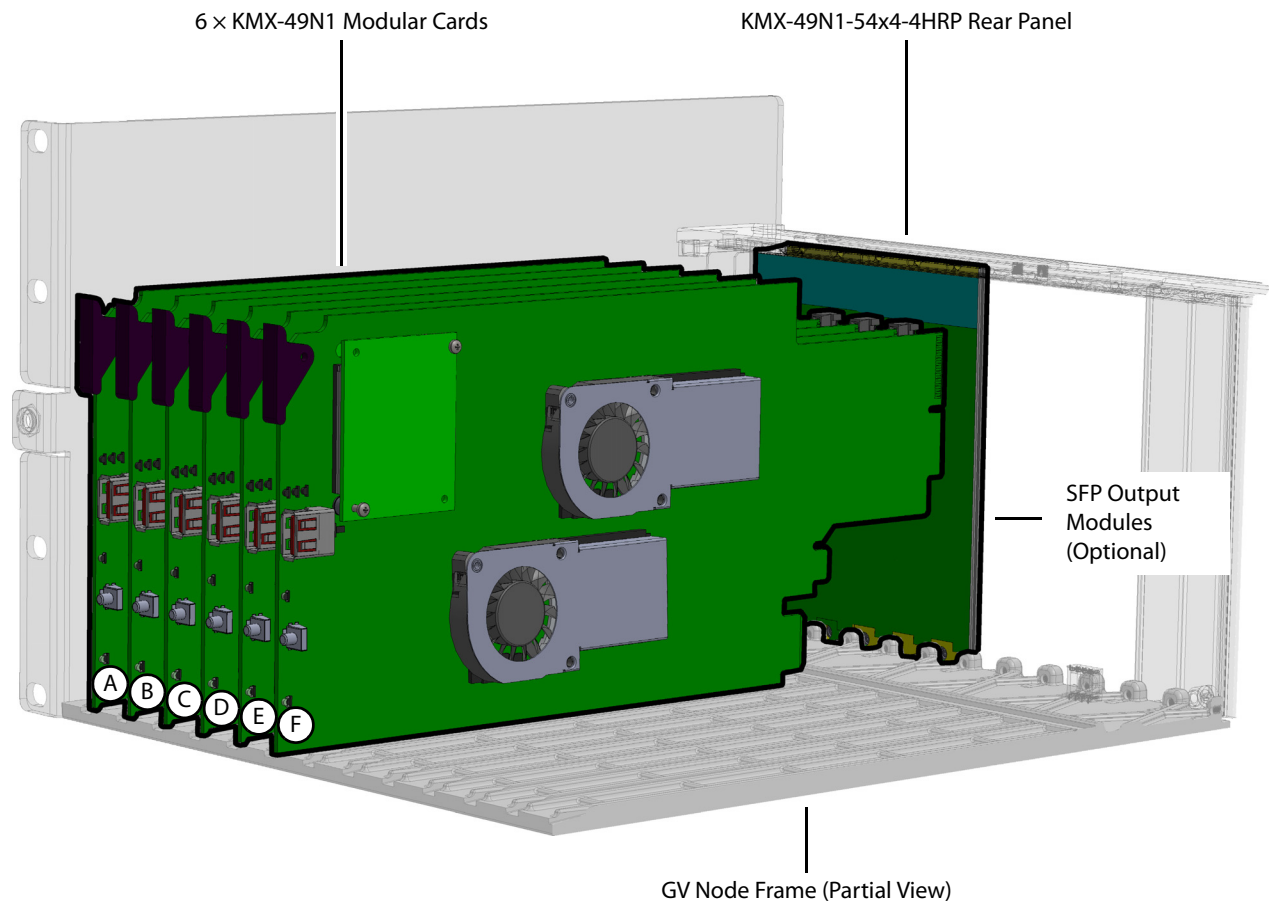
**Note:** Monitoring audio is embedded in the multiviewer's mosaic video outputs only, either through the GV Node's fabric or through an SFP output(s). The multiviewer does not provide any discrete audio monitoring outputs.

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To control the IFM-2T fabric module, use Grass Valley's NV9000 or GV Convergent router control system.

## Audio / Video Source Example

For example, a six KMX-49N1 card multiviewer is installed in slots 2, 3, 4, 5, 6, and 7 of a GV Node Frame as shown below. We want to know the video matrix input from fabric number and the mosaic return to fabric number for these cards.



*Example of Six KMX-49N1 Cards shown Assembled with a KMX-49N1-54x4-4HRP Rear Panel located in slots 2, 3, 4, 5, 6, and 7 of a GV Node Frame*

For this example, in the above diagram, the cards are identified with letters A, B, C, D, E, and F where A = slot 2, B = slot 3, C = slot 4, D = slot 5, E = slot 6, F = slot 7. Note that:

- Cards C, D, E, and F do not provide mosaic returns to the GV Node fabric.

- Cards E and F do not get discrete audio from GV Node's fabric.

**Example Video Matrix Input from Fabric Number / Mosaic Return to Fabric Number for Six KMX-49N1 Cards located in slots 2, 3, 4, and 5 of a GV Node Frame with a KMX-49N1-54x4-4HRP Rear Panel**

Card's Input from GV Node Fabric / Mosaic Return	GV Node Frame Slot Number															
	1	2 Card 'A'	3 Card 'B'	4 Card 'C'	5 Card 'D'	6 <sup>2</sup> Card 'E'	7 <sup>2</sup> Card 'F'	8	9	10	11	12	13	14	15	16
First Input / Mosaic Return 1	-	10	19	2 <sup>1</sup>	37 <sup>1</sup>	46 <sup>1</sup>	55 <sup>1</sup>	-	-	-	-	-	-	-	-	-
Second Input / Mosaic Return 2	-	11	20	29 <sup>1</sup>	38 <sup>1</sup>	47 <sup>1</sup>	56 <sup>1</sup>	-	-	-	-	-	-	-	-	-
Third Input	-	12	21	30	39	48	57	-	-	-	-	-	-	-	-	-
Fourth Input	-	13	22	31	40	49	58	-	-	-	-	-	-	-	-	-
Fifth Input	-	14	23	32	41	50	59	-	-	-	-	-	-	-	-	-
Sixth Input	-	15	24	33	42	51	60	-	-	-	-	-	-	-	-	-
Seventh Input	-	16	25	34	43	52	61	-	-	-	-	-	-	-	-	-
Eighth Input	-	17	26	35	44	53	62	-	-	-	-	-	-	-	-	-
Ninth Input	-	18	27	36	45	54	63	-	-	-	-	-	-	-	-	-

1 KMX-49N1 cards C, D, E, and F do not provide any mosaic return to the GV Node fabric. These cards only receive inputs from GV Node's fabric.

2 KMX-49N1 cards E and F do not accept discrete audio from the GV Node fabric.

- The value is not relevant as these card slots are not used by the multiviewer in this example.

As some discrete audio sources need to be monitored, the first four cards have been set to non-MDX mode. Consequently, these two cards will monitor the audio program embedded within the video signals when present. The audio sources coming from the audio matrix will be separately monitored.

**Example Non-MDX Mode: KMX-49N1 Card Audio Matrix (discrete audio) Input from Fabric Number for each GV Node Frame Slot**

Card's Input from GV Node Fabric	GV Node Frame Slot Number															
	1	2 Card 'A'	3 Card 'B'	4 Card 'C'	5 Card 'D'	6 <sup>1</sup> Card 'E'	7 <sup>1</sup> Card 'F'	8	9	10	11	12	13	14	15	16
Audio index number range	-	145 to 208	289 to 352	433 to 496	577 to 640	N/A	N/A	-	-	-	-	-	-	-	-	-

1 Not applicable; these KMX-49N1 cards do not receive discrete audio inputs from the GV Node fabric.

- The value is not relevant as these card slots are not used by the multiviewer in this example.

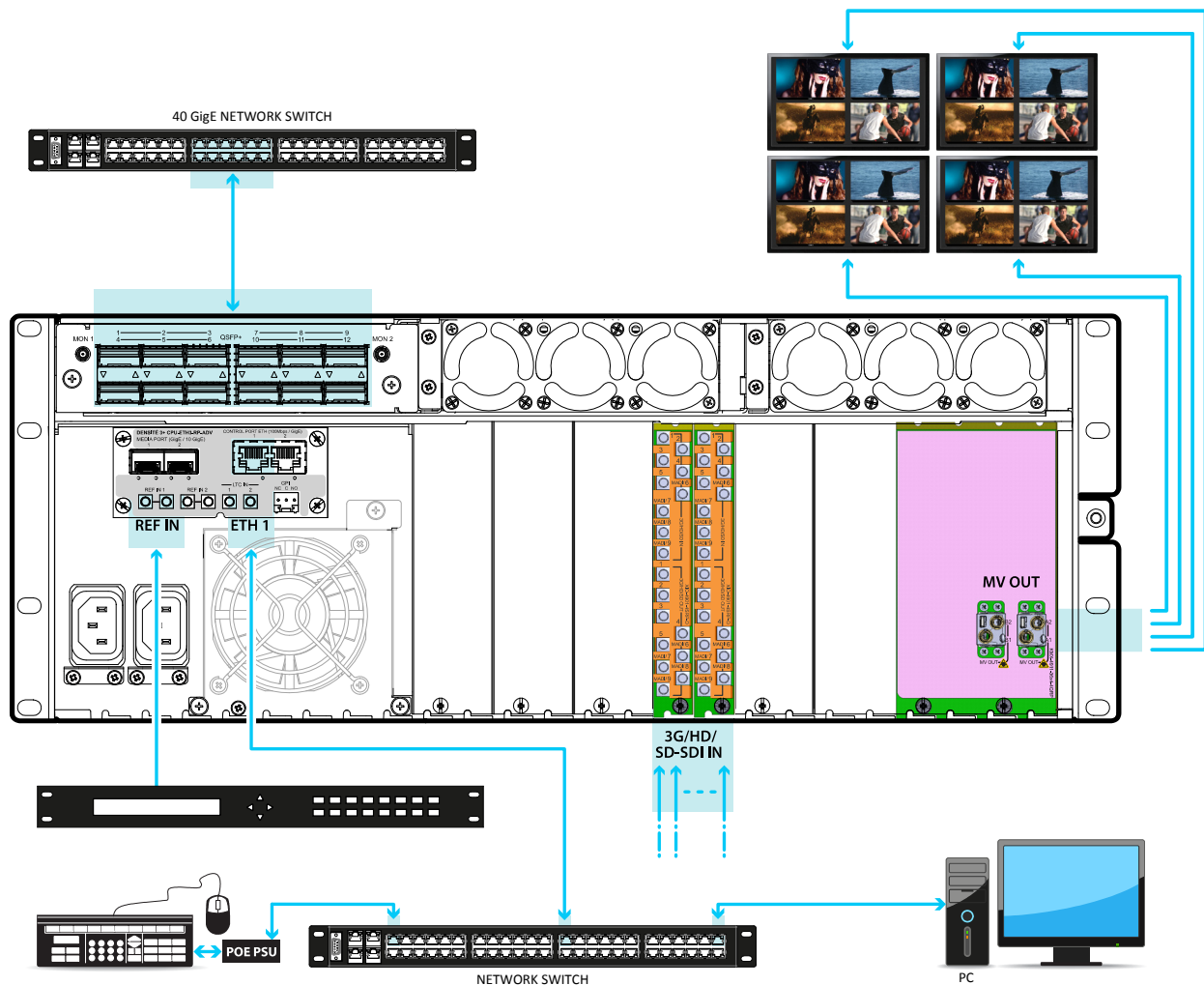


# 3 Multiviewer Cabling

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

## Cabling Diagrams

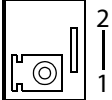
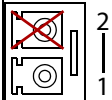
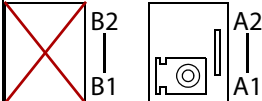
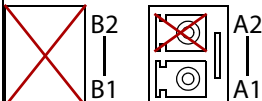
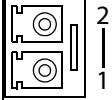
The following diagram shows a typical cable connections to the GV Node frame and to the multiviewer. To avoid any network IP address conflict, see [Avoiding Networked Equipment IP Address Conflicts](#), on page 45.



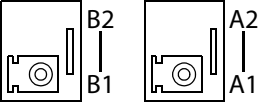
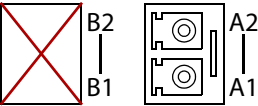
Cabling diagram for a KMX-49N1 multiviewer (typical setup)

## 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-49N1 in a GV Node Frame](#), on page 25.

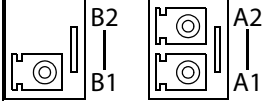
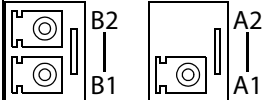
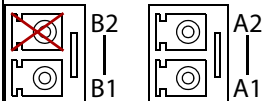
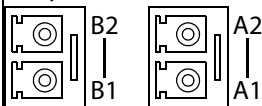
Multiviewer Capacity	Rear Panel Connections	KMX-49N1 Room Configuration Nomenclature in XEdit
9 × 1	<p>Fiber Connection for a single Tx SFP module.</p>  <p>Fiber Connection for a double SFP output module.</p> 	<p><i>Card - IN/OUT Head 1 (...)</i> = SFP output 1  <i>Card - IN/OUT Head 2 (...)</i> = No 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 <b>A1</b>  <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>



Multiviewer Capacity	Rear Panel Connections	KMX-49N1 Room Configuration Nomenclature in XEdit
18 × 2 27 × 2 36 × 2 54 × 2	<p>Fiber Connection for two single Tx SFP modules.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i>            = SFP output <b>A1</b>  <i>Card A - IN/OUT Head 2 (...)</i>            = No Connection  <i>Card B - IN/OUT Head 1 (...)</i>            = SFP output <b>B1</b>  <i>Card B - IN/OUT Head 2 (...)</i>            = No Connection</p>
	<p>Fiber Connection for a double SFP output module.</p> 	<p><i>Card A - IN/OUT Head 1 (...)</i>            = SFP output <b>A1</b>  <i>Card A - IN/OUT Head 2 (...)</i>            = SFP output <b>A2</b>  <i>Card B - IN/OUT Head 1 (...)</i>            = No Connection  <i>Card B - IN/OUT Head 2 (...)</i>            = No Connection</p>

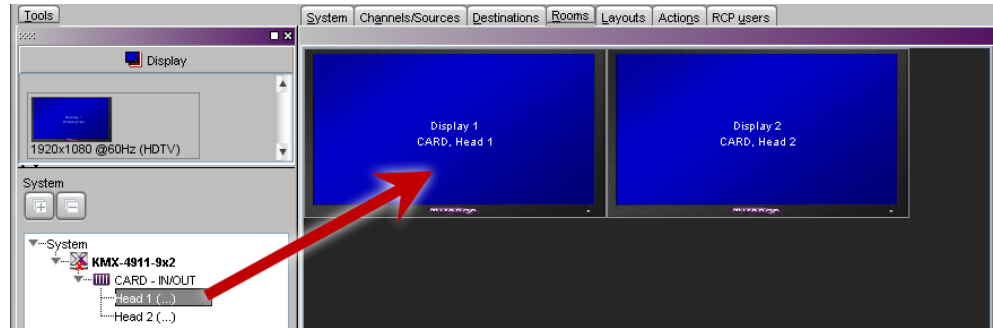
## Multiviewer Cabling

### Multiviewer SFP Module Mosaic Output to Display Input Cable Connections

Multiviewer Capacity	Rear Panel Connections	KMX-49N1 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>Card A - IN/OUT Head 1 (...) = SFP output <b>A1</b></p> <p>Card A - IN/OUT Head 2 (...) = SFP output <b>A2</b></p> <p>Card B - IN/OUT Head 1 (...) = SFP output <b>B1</b></p> <p>Card B - IN/OUT Head 2 (...) = No Connection</p>
	<p>Fiber Connection for a single Tx SFP module with a double SFP output module.</p> 	<p>Card A - IN/OUT Head 1 (...) = SFP output <b>A1</b></p> <p>Card A - IN/OUT Head 2 (...) = No Connection</p> <p>Card B - IN/OUT Head 1 (...) = SFP output <b>B1</b></p> <p>Card B - IN/OUT Head 2 (...) = SFP output <b>B2</b></p>
	<p>Fiber Connection for two double SFP output modules.</p> 	<p>Card A - IN/OUT Head 1 (...) = SFP output <b>A1</b></p> <p>Card A - IN/OUT Head 2 (...) = SFP output <b>A2</b></p> <p>Card B - IN/OUT Head 1 (...) = SFP output <b>B1</b></p> <p>Card B - IN/OUT Head 2 (...) = No Connection</p>
18 × 4 27 × 4 36 × 4 54 × 4	<p>Fiber Connection for two double SFP output modules.</p> 	<p>Card A - IN/OUT Head 1 (...) = SFP output <b>A1</b></p> <p>Card A - IN/OUT Head 2 (...) = SFP output <b>A2</b></p> <p>Card B - IN/OUT Head 1 (...) = SFP output <b>B1</b></p> <p>Card B - IN/OUT Head 2 (...) = SFP output <b>B2</b></p>

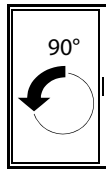
Assign a multiviewer display to an SFP output as follows: in the **Rooms** tab of XEdit, drag the multiviewer's card output onto a display. See [XEdit Installation](#), on page 62 and the *Kaleido Software User's Manual* for more information. See [Related Documentation](#), on

page 11.

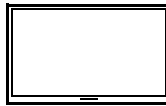


## Multiviewer SFP Module Mosaic Output to a 4K Display Input Cable Connections

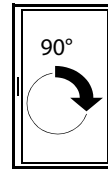
The multiviewer's display can be rotated. The following display orientations are supported.



Portrait: Display Rotated  
90° Counter-Clockwise



Landscape:  
Not Rotated

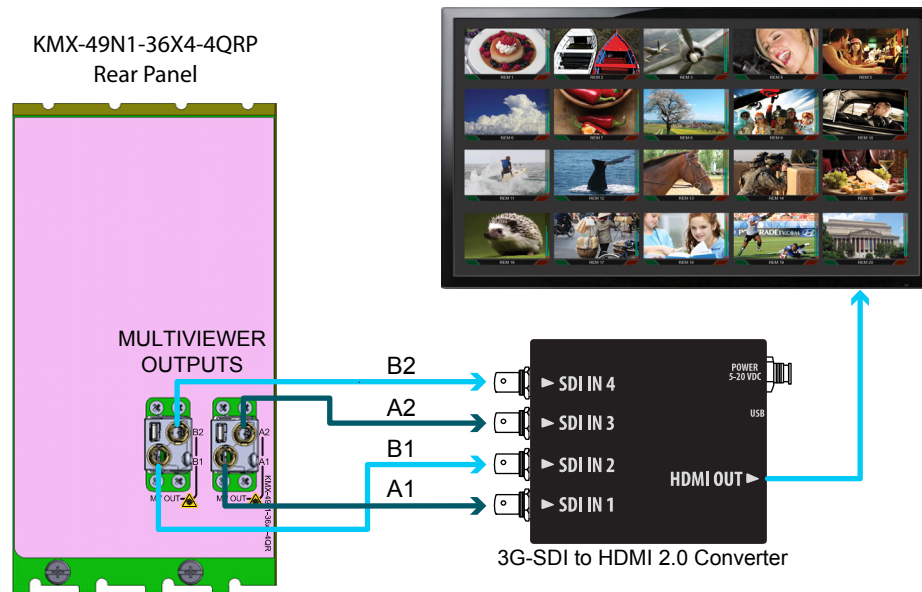


Portrait: Display Rotated  
90° Clockwise

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-49N1 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 113 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 GV Node frame is installed, networked, and powered according to the GV Node documentation: *GV Node IP Aggregation, Processing and Edge Routing Platform 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 46). 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-49N1 cards into the GV Node 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 GV Node frame.
  - disconnect the Ethernet cables from the Kaleido-RCP2 PoE adapter or RCP-200, when equipped.
- 2 Insert the KMX-49N1 cards into the GV Node frame (see [Installation of the KMX-49N1 in a GV Node Frame](#), on page 25) 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.

## Multiviewer Cabling

To make the multiviewer operational

---

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 48.

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- 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 53.

## To make the multiviewer operational

- 1 Connect the GV Node frame to the network switch. See [Cabling Diagrams](#), on page 39.
- 2 Connect the Kaleido-RCP2 or RCP-200 (if available) to a 100Base-T Ethernet switch (see [Cabling Diagrams](#), on page 39). 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 12. 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.
- 

- 3 Connect the multiviewer's outputs to your displays. See [Cabling Diagrams](#), on page 39. To change the display resolution, see [Changing the Mosaic Output Resolution](#), on page 51.

You can now proceed with the networking setup (see [Networking Essentials](#), on page 53).

## Factory-Default IP Addresses

The KMX-49N1 and its networked ancillary equipment is shipped with the following default network settings:

Equipment	System IP address	Network mask	Gateway
KMX-49N1 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 <sup>a</sup>	10.0.3.191	255.255.255.0	0.0.0.0
CPU-ETH3 controller	192.168.3.3	255.255.0.0	0.0.0.0

a. When no network DHCP server is available.

# 4 Frame Operation and IP Network Setup

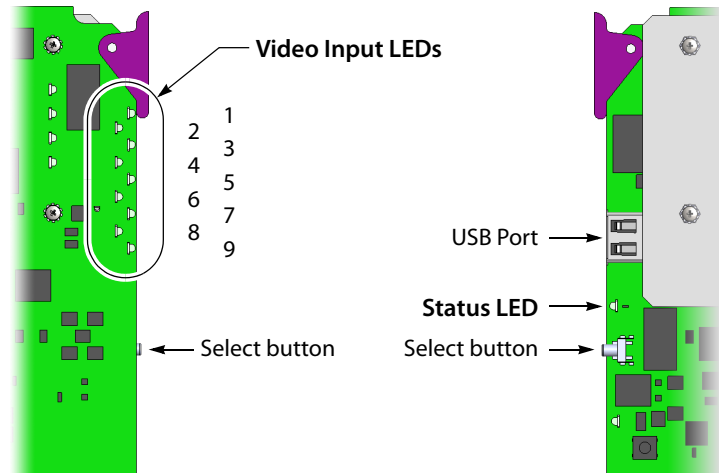
This chapter shows the multiviewer interfaces, explains the local operations that can be performed, and it explains how to implement IP network connectivity with the multiviewer.

A KMX-49N1 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-49N1 card input's operating status (see [Card Interface and Troubleshooting](#), on page 48), or use the CPU-ETH3 local control panel and its buttons to navigate menus and adjust parameter values (see [Using the GV Node Frame Control Panel](#), on page 49).
- The loading and management of layouts is handled through XEdit, accessed through the GV Node's ETH port.
- 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 93).
- 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-49N1 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-49N1 incorporate several operational elements shown below.



Summary view of the interface of a KMX-49N1 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"> <li>No power.</li> <li>Card not fully inserted.</li> </ul>
Green	<ul style="list-style-type: none"> <li>Normal operation.</li> </ul>
Yellow	<ul style="list-style-type: none"> <li>The meaning of this status is defined through the <i>Alarm config</i> panel. See <a href="#">Alarm Configuration Panel</a>, on page 100.</li> </ul>
Orange	<ul style="list-style-type: none"> <li>The meaning of this status is defined through the <i>Alarm config</i> panel. See <a href="#">Alarm Configuration Panel</a>, on page 100.</li> </ul>
Flashing orange	<ul style="list-style-type: none"> <li>The card is selected for local control.</li> </ul>
Red	<ul style="list-style-type: none"> <li>The meaning of this status is defined through the <i>Alarm config</i> panel. See <a href="#">Alarm Configuration Panel</a>, on page 100.</li> </ul>
Flashing red	<ul style="list-style-type: none"> <li>No rear panel.</li> <li>Fan failure.</li> <li>High temperature.</li> </ul>

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-49N1 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"> <li>Normal operation.</li> </ul>
Red	<ul style="list-style-type: none"> <li>Input is unconfigured</li> <li>No signal</li> </ul>



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 51 and [Networking Essentials](#), on page 53.

For more information about the USB port, see [Troubleshooting with the card's front edge USB connector](#), on page 137.

## Using the GV Node Frame Control Panel

All of the cards installed in a GV Node 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.

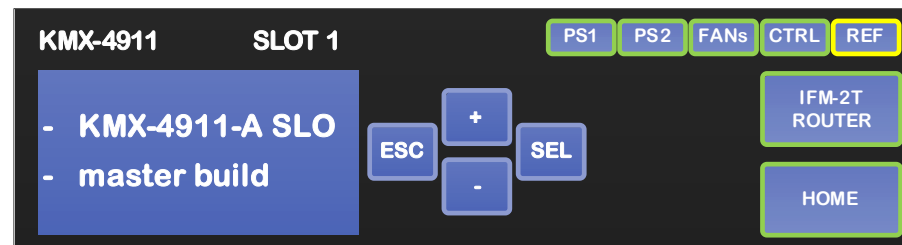
### CPU-ETH3 Local Control Panel

The CPU-ETH3 local control panel is located in the top right side of the GV Node frame. The control interface is a touch screen that allows you to view the status of GV Node frame components including that of each card currently installed in the 16 slots. A number of buttons (PS1, PS2, FANs, CTRL, and REF) allow you to access the menus for the GV Node 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 GV Node 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 GV Node frame's controller card itself.

## Navigating the Local Control Panel Menu

The KMX-49N1 has operating parameters which may be adjusted locally at the controller card interface. Press the Select button on the front edge of a KMX-49N1 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 parameter was changed on the card but not submitted (SEL was not pressed or touched) and the 30 second timeout occurs, the parameters will be confirmed as if the SEL button had been touched.

## Local Control Panel Menu Structure

Where applicable, default values are underlined.

### KMX-49N1 local menu

STATUS	CARD STATUS	{CARD STATUS}**	OFF
RESOLUTION	HEAD 1	{FORMAT}**	
	HEAD 2	{FORMAT}**	
NETWORK SETTINGS	SYSTEM IP EDIT	{IP ADDRESS}	
	NETMASK EDIT	{mask}	
	DEFAULT GW EDIT	{IP ADDRESS}	
	MAC ADDRESS		
CONFIG	SFP CONFIG***	SFP OUT 1	<u>ON</u> (ABSENT) OFF (ABSENT)
		SFP OUT 2	<u>ON</u> (ABSENT) OFF (ABSENT)
		SFP OUT 3	<u>ON</u> (ABSENT) OFF (ABSENT)

### KMX-49N1 local menu (*continued*)

SFP OUT 4	<u>ON</u> (ABSENT)
	OFF (ABSENT)

{CARD VERSION}\*\*

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

\*\*\* The SFP ports are not supported.

## Changing the Mosaic Output Resolution

### To change a display's resolution from the GV Node frame's local control panel

- 1 Press the icon representing the appropriate card on the GV Node frame's local control panel touch display.

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-49N1 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-49N1 card* to exit the control menu.

---

#### Notes

- If you do not touch any button on the GV Node frame local control panel, the 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 EDID Auto-Detection from the Monitor Wall

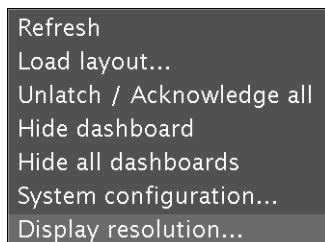
---

#### Notes

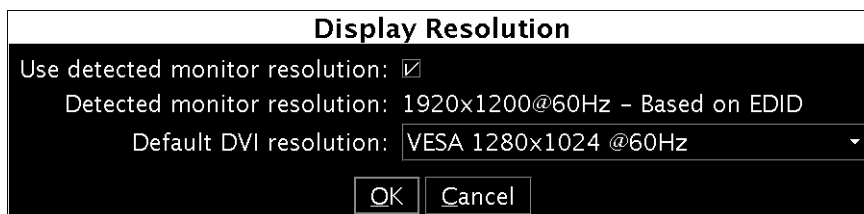
- The monitor EDID auto-detection feature is enabled by default in order to facilitate the initial setup of a Kaleido Software system. Setting an output head to a specific resolution, from a multiviewer service panel in iControl (if available), or from a Densité controller's local control panel disables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

#### To enable EDID auto-detect for a display

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



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



- 3 Click **OK**.

## Enabling the Frame Controller's Automatic Restore Feature

The frame's 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 *GV Node 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.
- A client workstation must be connected to the LAN or Ethernet switch to access the multiviewer by using XAdmin or XEdit.
- The Ethernet switch must support 100 Mbps full-duplex connections.
- The port on the Ethernet switch to which the multiviewer is connected should be configured to auto-negotiate. By default, multiviewers have their Ethernet ports set to auto-negotiate. If a switch does not support auto-negotiation, the recommended settings are 100 Mbps, full-duplex.

## Assigning an IP Address to Each Device in your System

Multiviewers and most peripheral devices that are part of a KMX-49N1 system communicate through a TCP/IP network. Configuring your system's network parameters includes the following:

- Assigning an IP address, and specifying the appropriate network mask, gateway address, and a system name for each multiviewer. Refer to [Setting the Multiviewer's IP addresses](#), on page 53.
- Assigning an IP address, and specifying the appropriate network mask, gateway address to the frame's controller. Refer to the *GV Node Quick Start Guide*. See [Related Documentation](#), on page 11.
- Configuring the RCP-200, if available. Refer to [Configuring the RCP-200](#), on page 107.
- Configuring the Kaleido-RCP2, if available. Refer to [Configuring the Kaleido-RCP2](#), on page 110.

## Setting the Multiviewer's IP addresses

For the KMX-49N1 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 62).

---

**Note:** If the system IP address of the multiviewer has been changed (for example, 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 120.

---

## Network Switch Considerations

The Densité 3+ FR4GV Node's **Control PortETH** Ethernet connection can present to the connected network switch more than one MAC address as Densité 3+ FR4GV Node 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-4911 multiviewer system. Each KMX-4911 multiviewer system (as defined by each installed KMX-4911 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+ FR4GV Node frame is connected to a network switch with such security enabled, network connectivity to all Densité 3+ FR4GV Node 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+ FR4GV Node frame to a number that reflects the current number of network interfaces used within Densité 3+ FR4GV Node. If the required number of network interfaces is undetermined, set the switch to allow 1721 network interfaces for the Densité 3+ FR4GV Node as this is the maximum number of network interfaces a Densité 3+ FR4GV Node 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 1721.

```
Switch(config-if)# switchport port-security maximum 1721
```

## Changing the Multiviewer's IP Address

---

**Note:** The multiviewer's IP address can also be remotely set through a the KMX-49N1's iControl service panel. See [Network Settings Panel](#), on page 97.

---

### To change the IP address of a KMX-49N1 multiviewer using the local control panel

- 1 Press the icon representing the appropriate card on the GV Node frame's local control panel touch display.

---

**Note:** You can configure a KMX-49N1 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-49N1 in a GV Node Frame](#), on page 25.

---

The Status LED on the selected card flashes orange, and the associated control menu appears on the display of the GV Node frame's local control panel.

---

**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-49N1 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-49N1 card to exit the control menu.

---

#### Notes

- If you do not touch any button on the GV Node frame local control panel, the 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 48.
- 12 Verify that the new IP address is effective, by referring to [Finding the Multiviewer's IP Address and Application Version](#), on page 120. 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-49N1 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, the workstation running XEdit):

Port	Used for	Transport	Notes
443	HTTPS	TCP	Used by XAdmin for secure access
7	HTTP	TCP	Used by XEdit for ping probing
80		TCP	Used by XEdit and XAdmin
5122		TCP	Used by XEdit for <i>keepalive</i> (heartbeat)
5432		TCP	Used by XEdit for export operations
7600		TCP	Used for troubleshooting the REST API (remote control)



Port	Used for	Transport	Notes
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 <sup>a</sup> 49152-65535 <sup>b</sup>	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
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. <sup>a</sup>
8910 <sup>b</sup>	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 57.

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 GV Node frame's network configuration.
- The GV Node frame's date and time settings or the Network Time Protocol (NTP) settings.
- Video sources have to be configured in the GV Node frame's fabric.
- Frame reference configuration if the multiviewer's output is to be referenced.

Frame configuration information is found in the GV Node frame's documentation. 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	
	Multiviewer model	Capacity
KMX-4911-9x2	KMX-49N1	9 × 2 or 9 × 1 system
KMX-4911-18x4	KMX-49N1	18 × 4, 18 × 3, 18 × 2, or 18 × 1 system
KMX-4911-27x4	KMX-49N1	27 × 4, 27 × 3, 27 × 2, or 27 × 1 system
KMX-4911-36x4	KMX-49N1	36 × 4, 36 × 3, 36 × 2, or 36 × 1 system
KMX-4911-54x4	KMX-49N1	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:

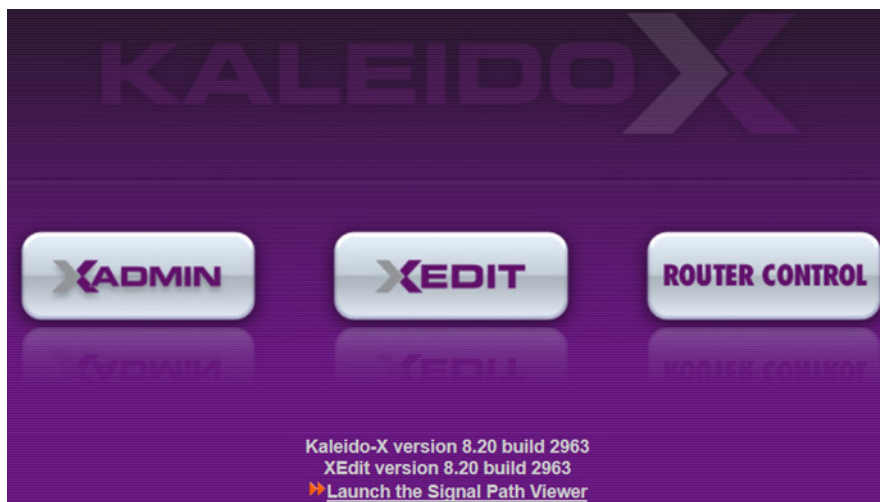
- XEdit is a client application used to create layouts for the monitor wall, and to configure your multiviewer system, from your PC. When this PC has network connectivity to the multiviewer, you can use XEdit to modify layouts and settings directly on the multiviewer, or you can work locally on the computer 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 62.
- 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 67.
- 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 70.

### 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.



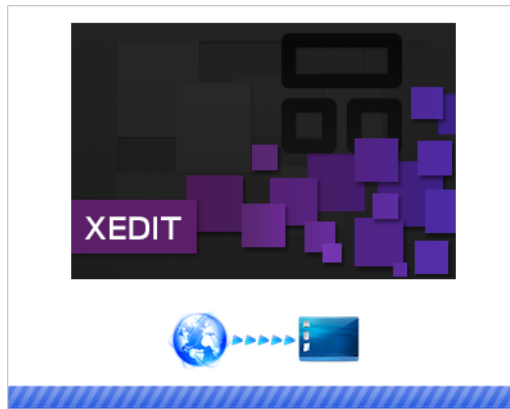
2 Click the **XEdit** button.

The browser prompts you to save an executable file to your hard drive (Kaleido-windows32-online.exe<sup>1</sup>). 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 were you saved the installer file and open it.

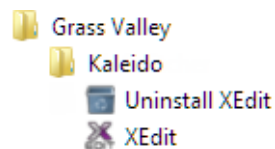
More security warnings or prompts may appear, which you may safely dismiss or accept.

A window appears, showing the download and installation progress.

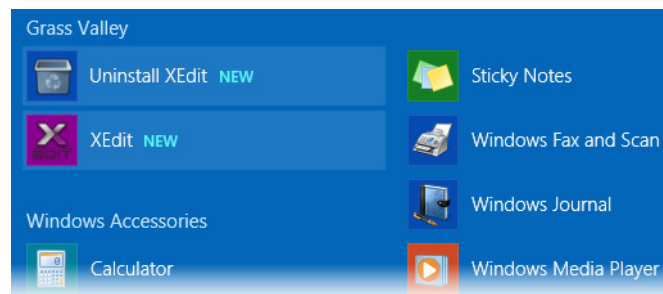


At the end of the installation process:

- If you have Windows 7, or Windows 10, shortcuts (XEDIT) 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).



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

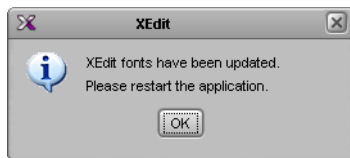
Once the installation has completed, the XEdit startup screen appears.



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

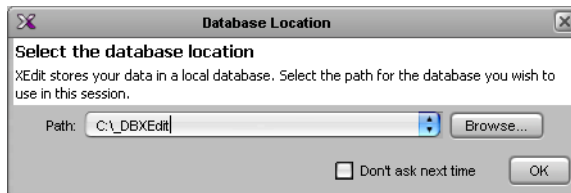
- Click **Allow access** to unblock the application.

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.



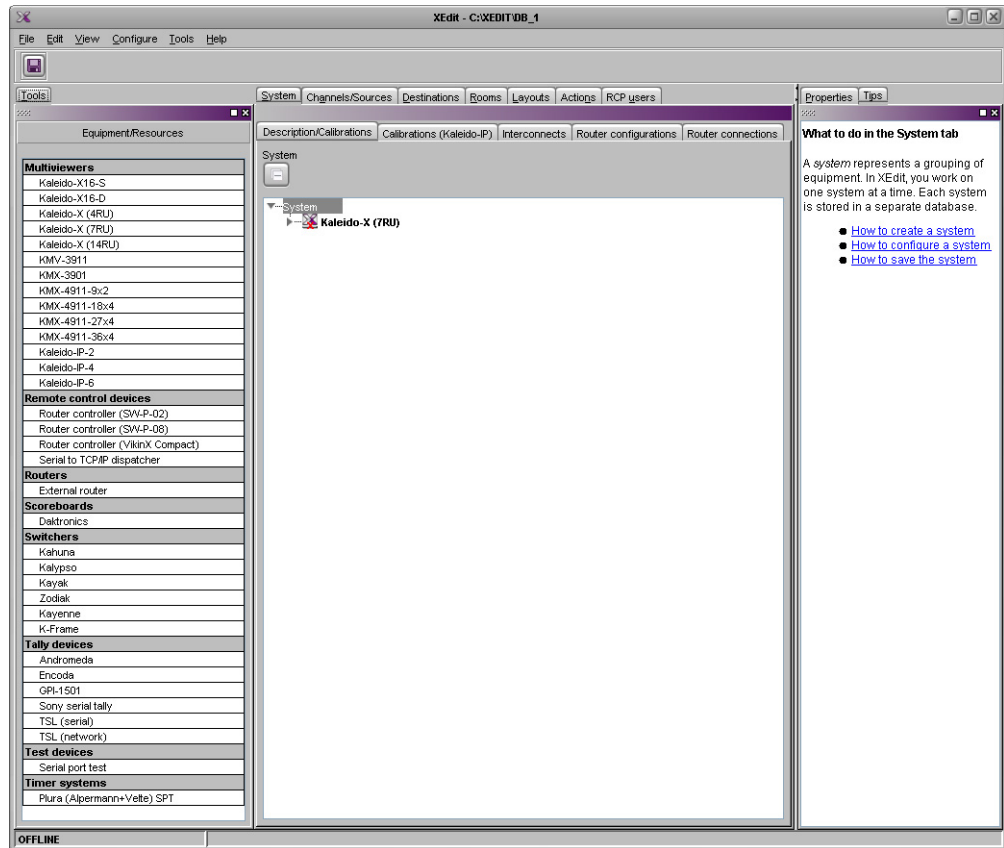
- Click **OK** to continue, and then open XEdit again, by using the shortcut on your desktop, in your Apps view (Windows 8.1) or Start screen (Windows 8), or from the Start menu (Windows 7, Windows 10).


- 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 63](#)), 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

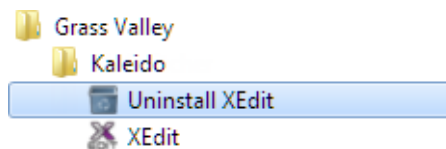
With recent versions of XEdit, an uninstall program is available from the Windows Start menu. If you installed XEdit from your multiviewer's home page, see [Uninstalling XEdit \(Dynamic Version 7.20 or Later\)](#), on page 66.

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 67.

### 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 Technologies<sup>2</sup>**) 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.exe<sup>3</sup>). 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.

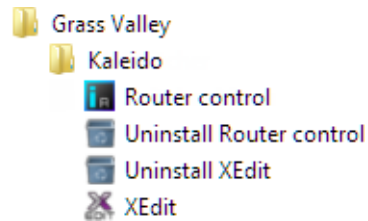


At the end of the installation process:

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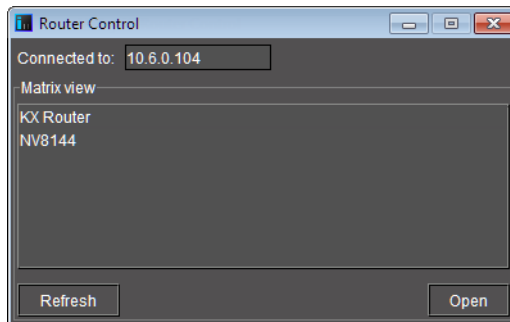
3. Installers for Linux or Mac OS X are not available.

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



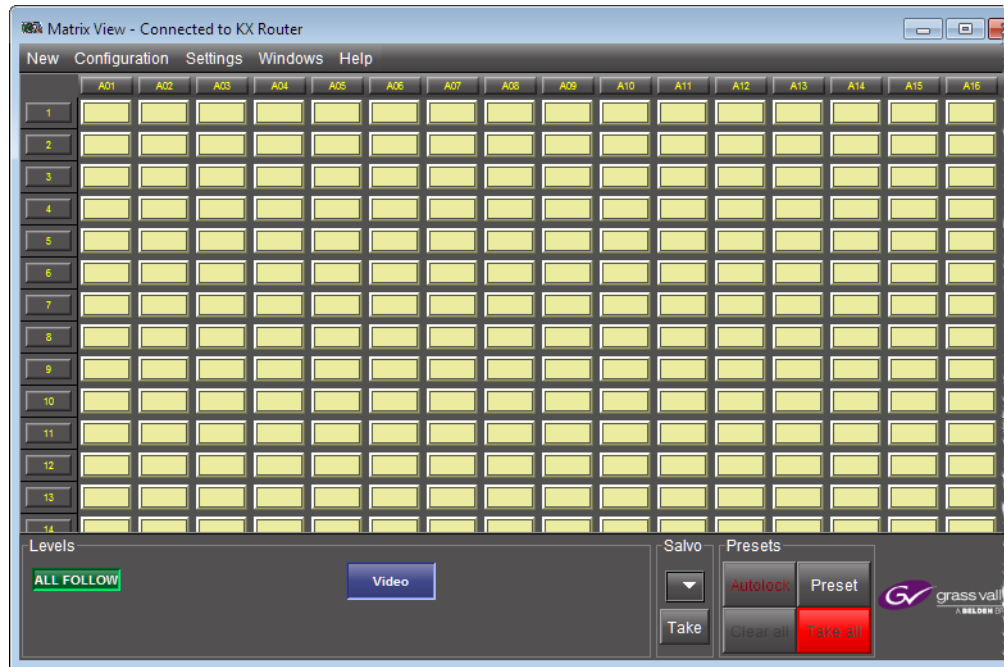
- If you have Windows 8.1, or Windows 8, Router Control will appear on your desktop, in the Apps view with all other installed applications on your PC (Windows 8.1), or in your Start screen (Windows 8).

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.

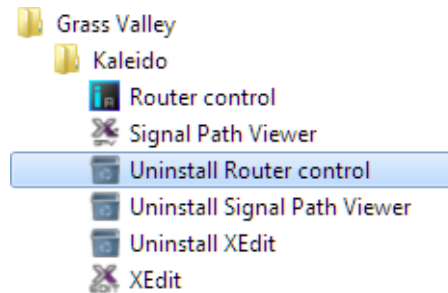
### Notes

- 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 67](#)), 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).

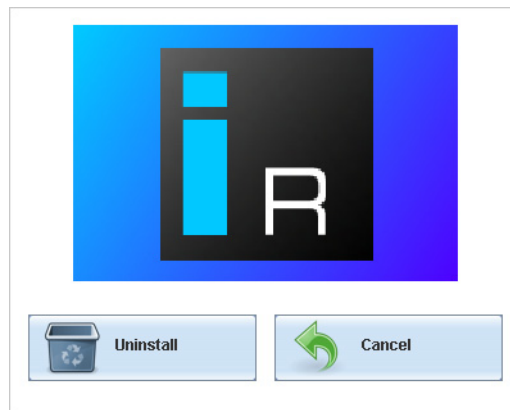
## Uninstalling Router Control

### 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.exe<sup>4</sup>). This file is an online

installer, which will download Signal Path Viewer from your multiviewer, and install it. Some browsers may allow you to run the file directly. Depending on your browser's security features, warnings may appear, which you may safely dismiss.

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

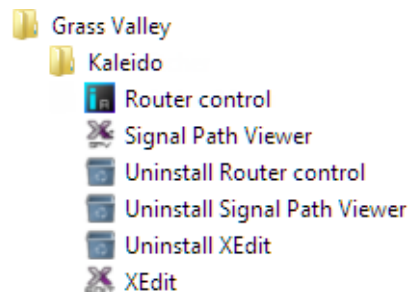
More security warnings or prompts may appear, which you may safely dismiss or accept.

A window appears, showing the download and installation progress.



At the end of the installation process:

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



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

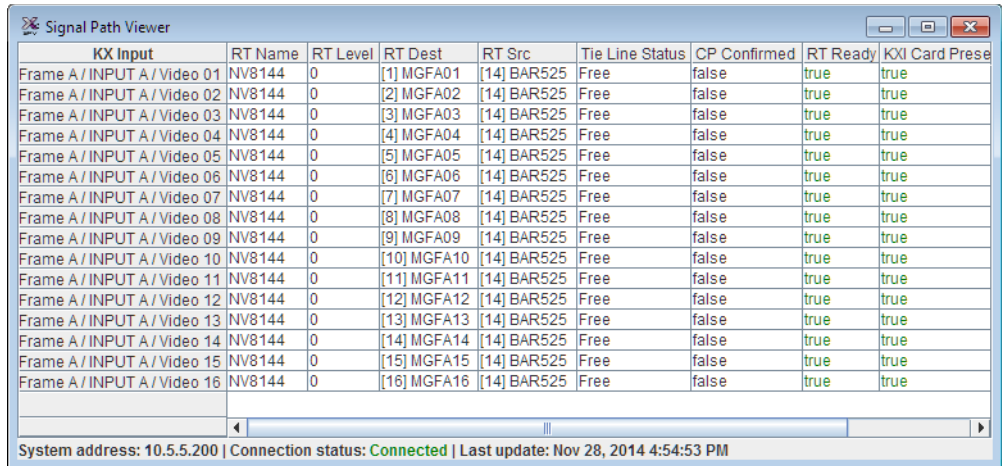
Once the installation has completed, the Signal Path Viewer panel appears. Depending on your Windows Firewall settings, a security alert may also appear.

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

---

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 Pres
Frame A / INPUT A / Video 01	NV8144	0	[1] MGFA01	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 02	NV8144	0	[2] MGFA02	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 03	NV8144	0	[3] MGFA03	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 04	NV8144	0	[4] MGFA04	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 05	NV8144	0	[5] MGFA05	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 06	NV8144	0	[6] MGFA06	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 07	NV8144	0	[7] MGFA07	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 08	NV8144	0	[8] MGFA08	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 09	NV8144	0	[9] MGFA09	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 10	NV8144	0	[10] MGFA10	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 11	NV8144	0	[11] MGFA11	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 12	NV8144	0	[12] MGFA12	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 13	NV8144	0	[13] MGFA13	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 14	NV8144	0	[14] MGFA14	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 15	NV8144	0	[15] MGFA15	[14] BAR525	Free	false	true	true
Frame A / INPUT A / Video 16	NV8144	0	[16] MGFA16	[14] BAR525	Free	false	true	true

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 71](#)), 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-49N1 in a GV Node Frame](#), on page 25.

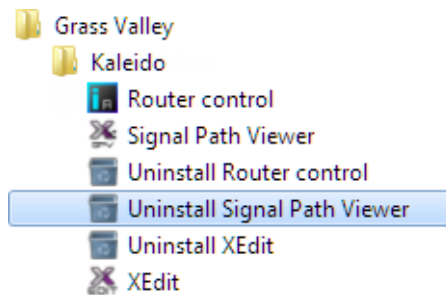
## Uninstalling Signal Path Viewer

### To uninstall Signal Path Viewer

- 1 Close all Signal Path Viewer windows you may have open.
- 2 Locate the **Uninstall Signal Path Viewer** shortcut.



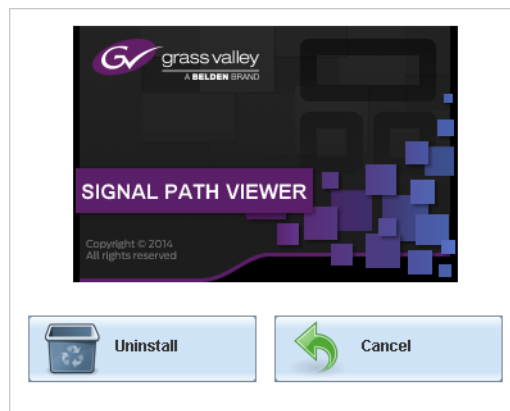
- If you have Windows 7, or Windows 10: Open the Start menu, click All Programs, scroll to the Grass Valley folder, and then expand the Kaleido folder.



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

3 Click **Uninstall Signal Path Viewer**.

An uninstall screen appears.



4 Click **Uninstall**.

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

## Opening XAdmin

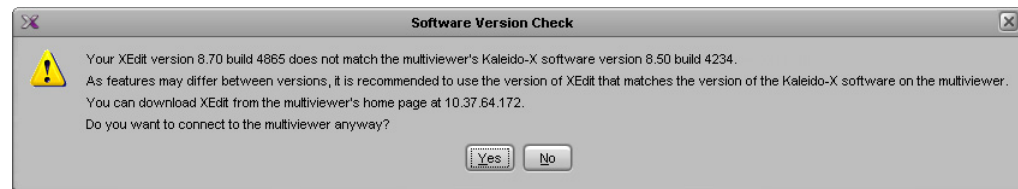
### Connecting to a Multiviewer with a Different XEdit Version from your PC's Version

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

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

Kaleido Software / XEdit Version Reference	Description
Version <i>M.mp</i>	<b>M</b> is the major revision number <b>m</b> is the minor revision number <b>p</b> 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 66).
  - Install XEdit from the multiviewer (see [Installing XEdit from your Multiviewer's Home Page](#), on page 62).

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 75),
- from **XEdit** (see [Opening XAdmin from XEdit](#) on page 75),
- from the multiviewer's control panel in **iControl** or **iControl Solo** (see [Opening XAdmin from iControl or iControl Solo](#) on page 77).

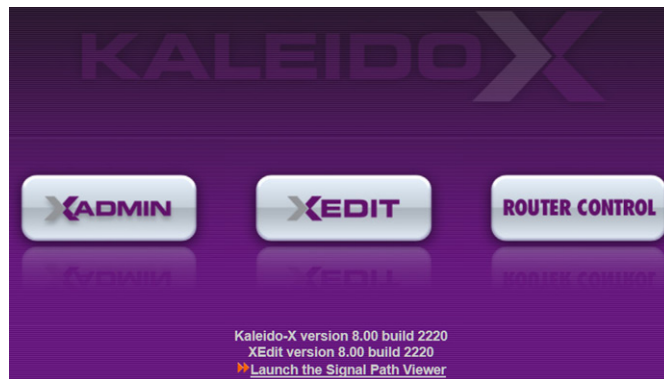
The first time you access XAdmin for a multiviewer (and every time the multiviewer's IP address has changed), you may see a security warning or a certificate error message. The procedures below include instructions on how to address these messages (see [Registering](#)

[your Multiviewer's Security Credentials with your Browser](#) on page 78). Internet Explorer users may also need to enable compatibility view (see [Enabling the Compatibility View in Internet Explorer](#) on page 86).

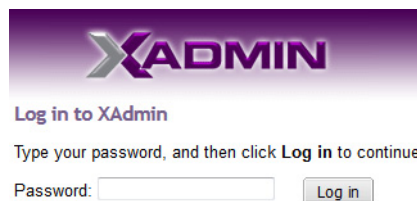
## Opening XAdmin from a Browser

### 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 78.
- 4 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.



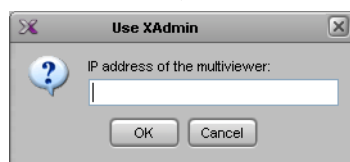
- 5 **Internet Explorer users:** If a blank page appears, then refer to [Enabling the Compatibility View in Internet Explorer](#), on page 86.

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

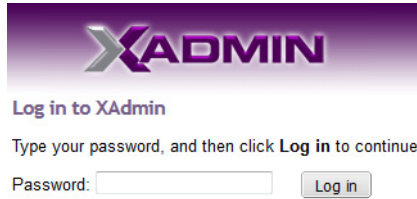
- 1 On the **Configure** menu, click **Use XAdmin**.  
XEdit prompts you for the IP address of the multiviewer you want to access.



- 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 78.
- 4 If the "Log in to XAdmin" page appears, type the password, and then click **Log in**.



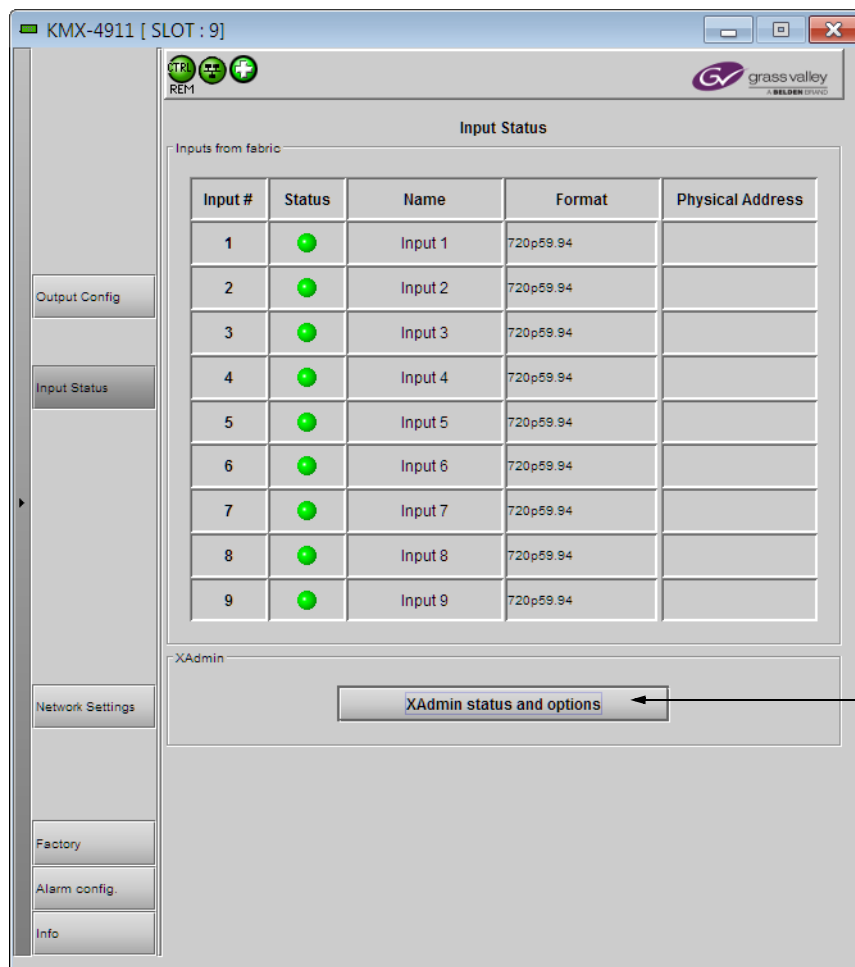
- 5 **Internet Explorer users:** If a blank page appears, then refer to [Enabling the Compatibility View in Internet Explorer](#), on page 86.

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

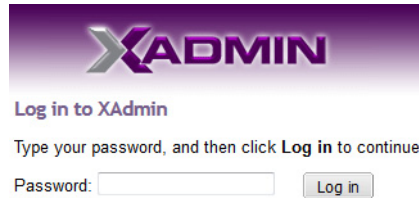
### To open XAdmin from iControl or iControl Solo

- 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 GV Node frame's name (refer to the iControl Solo User Guide, or to the iControl User Guide, for more information).
- 2 Open the KMX-49N1 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 78.

- 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 86.

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

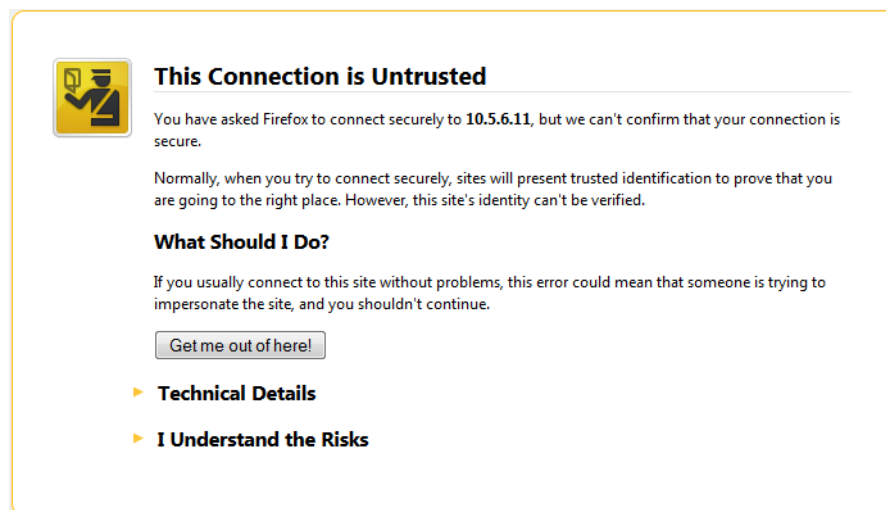
When you open your multiviewer's home page, or try to access XAdmin, your browser may report a certificate error (Internet Explorer), warn you about the site's security certificate (Chrome), or report an untrusted connection (Firefox). Follow the appropriate procedure below to register your multiviewer's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

- [Suppressing untrusted connection warning in Firefox](#), on page 78
- [Suppressing certificate error in Internet Explorer or Chrome](#), on page 80

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

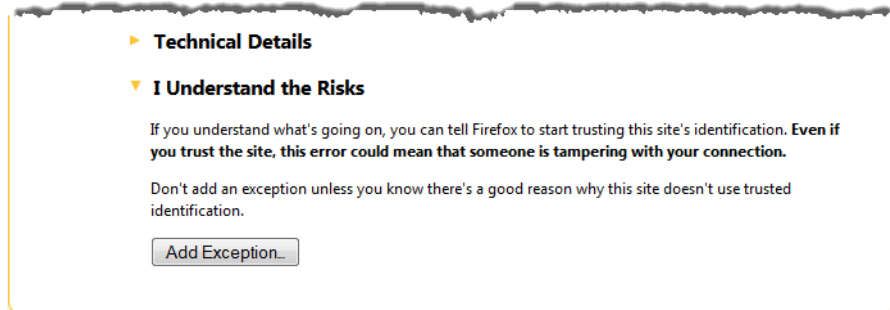
The first time you try to access XAdmin in Firefox, the browser may display the following page instead, prompting you to confirm the multiviewer's security credentials.



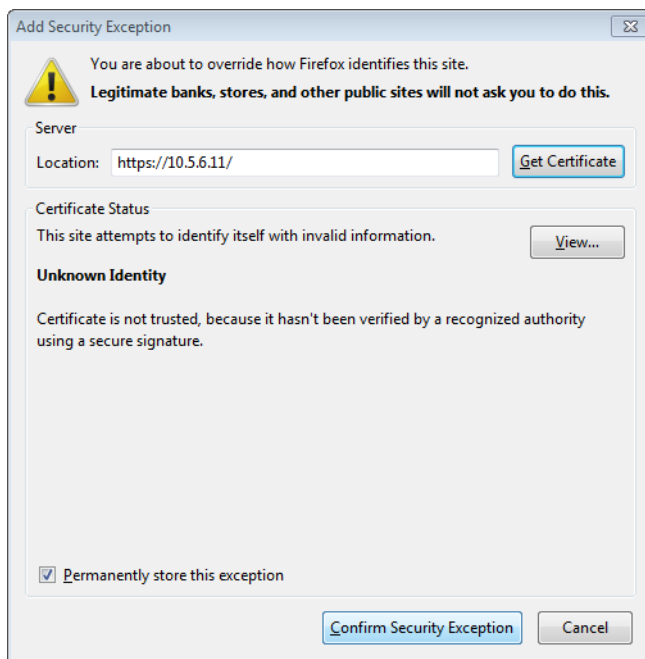
To register your multiviewer's security credentials with Firefox

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

The message expands.



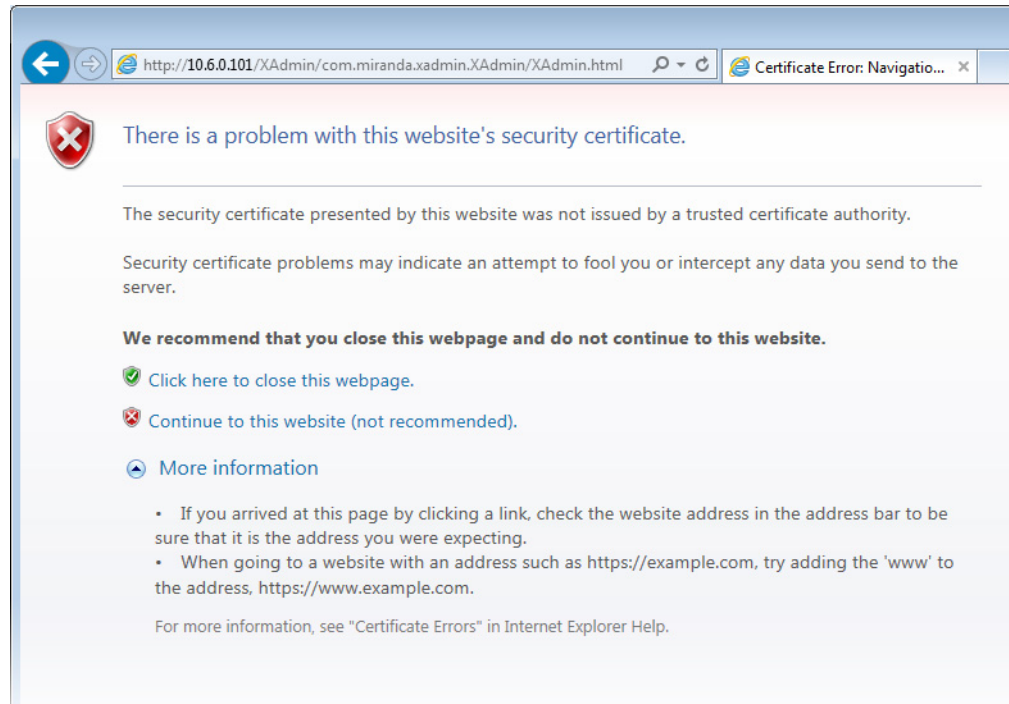
- 2 Click **Add Exception**.
- 3 In **Add Security Exception**, click **Confirm Security Exception**.



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.

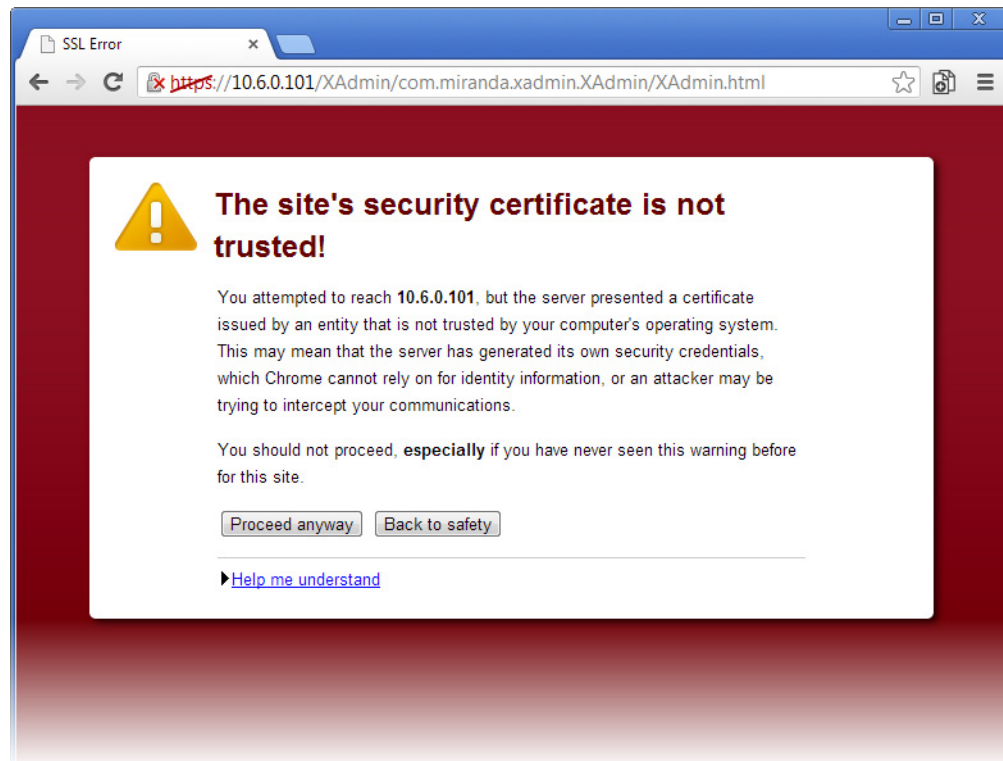
## Suppressing certificate error in Internet Explorer or Chrome

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.



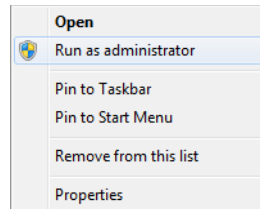
#### Special notes for Internet Explorer users

- 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 86.

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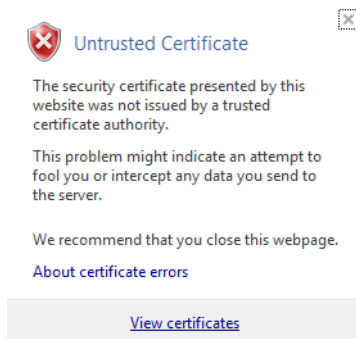
**Special notes for Internet Explorer users (*continued*)**

- 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**:

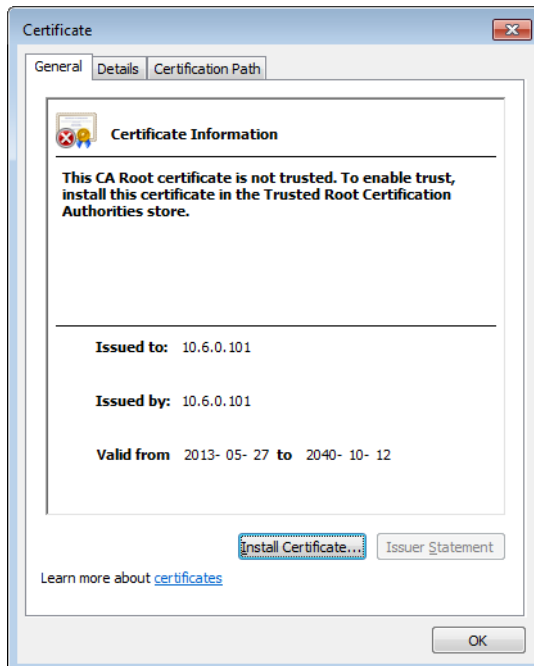


2 Click **Certificate error**.

3 In **Untrusted Certificate**, click **View certificates**.



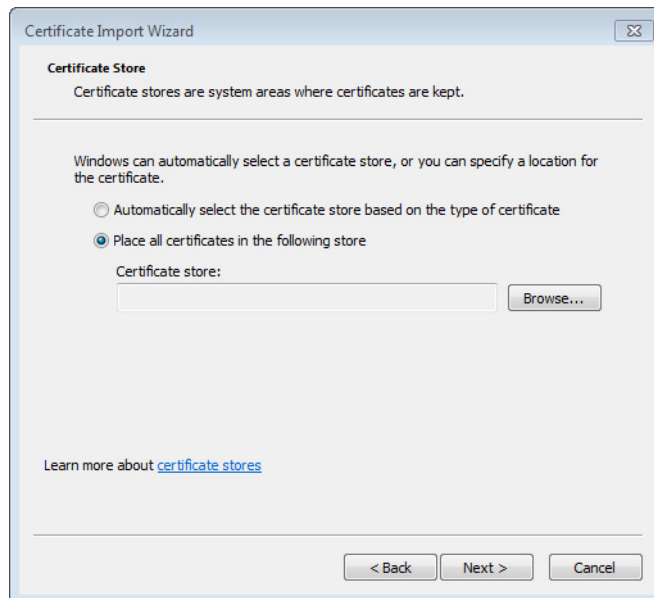
4 In **Certificate**, click **Install Certificate**.



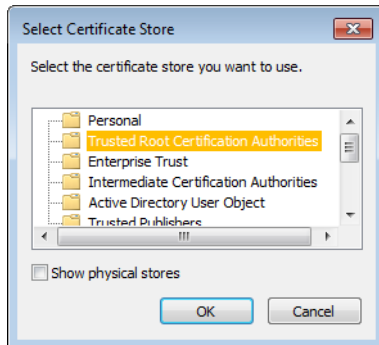
5 In **Certificate Import Wizard**, click **Next**.



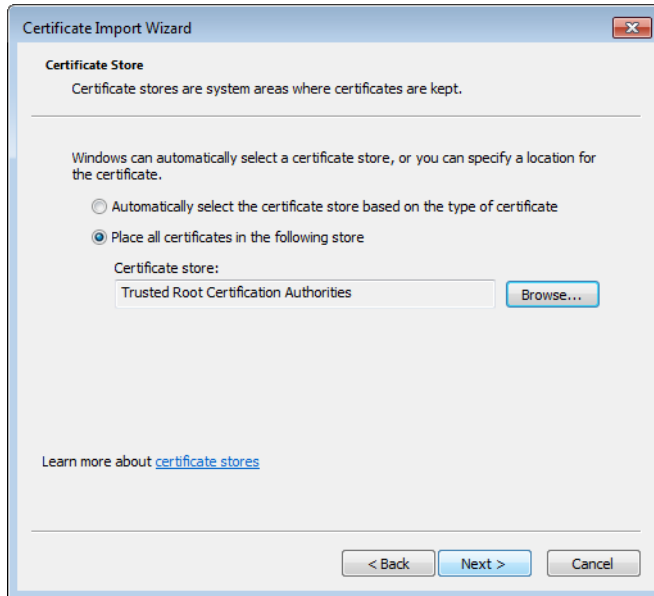
6 In **Certificate Import Wizard**, click **Place all certificates in the following store**, and then click **Browse**.



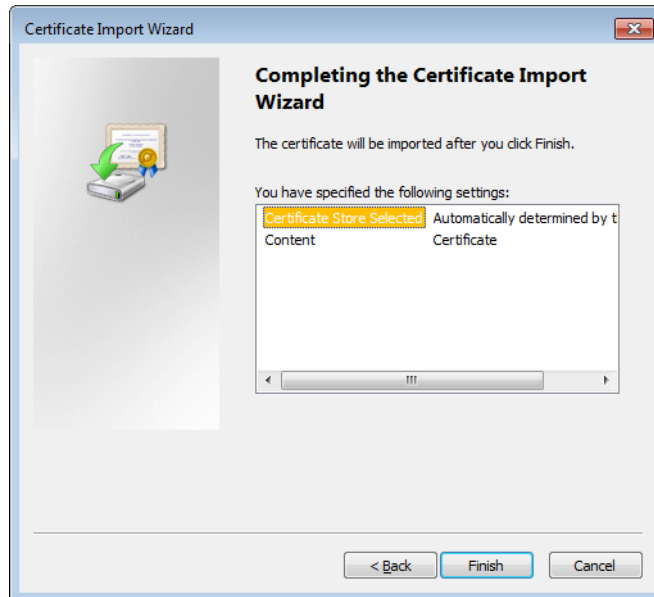
- 7 In **Select Certificate Store**, select **Trusted Root Certification Authorities**, and then click **OK**.



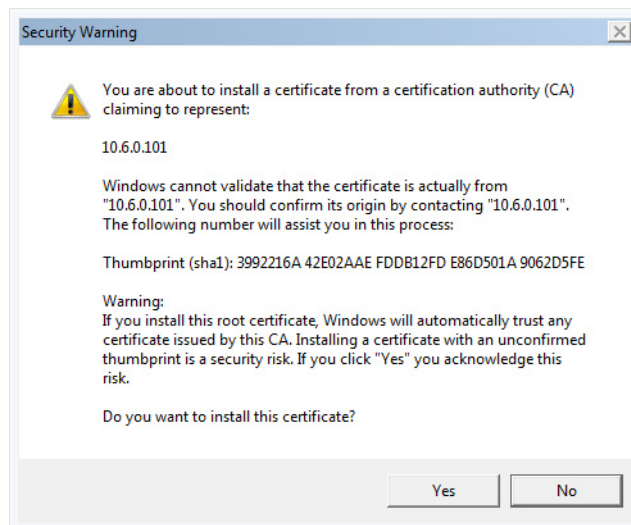
- 8 Back in **Certificate Import Wizard**, click **Next**.



9 Click **Finish**.

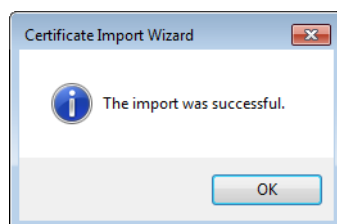


A security warning appears.



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.

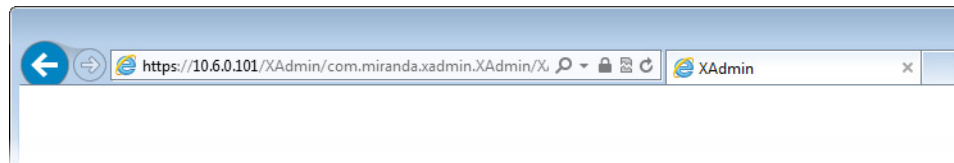
You should now be able to access XAdmin, from your multiviewer home page without ever seeing the security warning again, unless the multiviewer's IP address is changed, in which case you will want to repeat this procedure.

## Enabling the Compatibility View in Internet Explorer

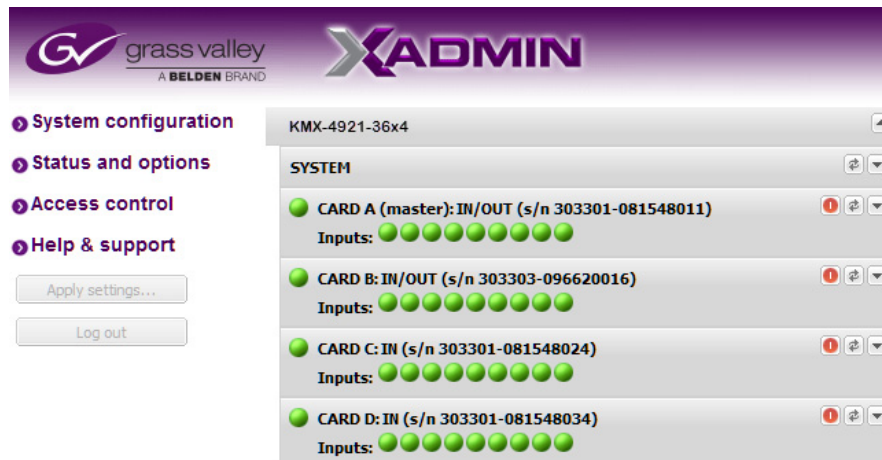
When you try to access XAdmin, from your multiviewer's home page, in *Internet Explorer 8, 9, or 10*, you may see a blank page instead of XAdmin's Status and Options page.<sup>5</sup>

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 73.
- 2 Click **Access control**, in the navigation area on the left side of the page.

<sup>5</sup>Should this happen with Internet Explorer 11, refer to *Fix site display problems with Compatibility View*, at <http://windows.microsoft.com/en-us/internet-explorer/use-compatibility-view#ie=ie-11>

The Access Control page appears.

**System configuration** Access Control

**Status and options** Type your new password twice, and then click **Save**.

**Access control** New password:   
Confirm:

**Physical connections**

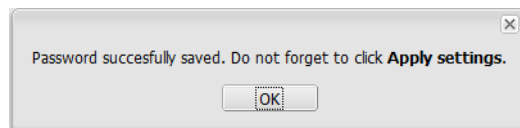
**Technical support** Click **Save** to save your settings and continue.   
Click **Disable access control** to allow unrestricted access to XAdmin.

- 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.

**System configuration**

**Status and options**

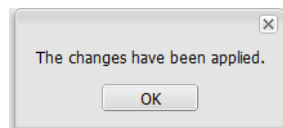
**Access control**

**Physical connections**

**Technical support**

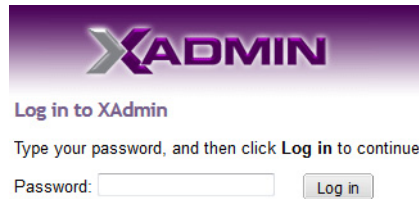
- 6 Click **Apply settings**.

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

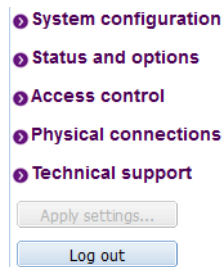


- 7 Click **OK**.

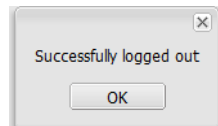
The Log in to XAdmin page appears. Other XAdmin sessions open against the same multiviewer are also redirected to the login page.



- 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.

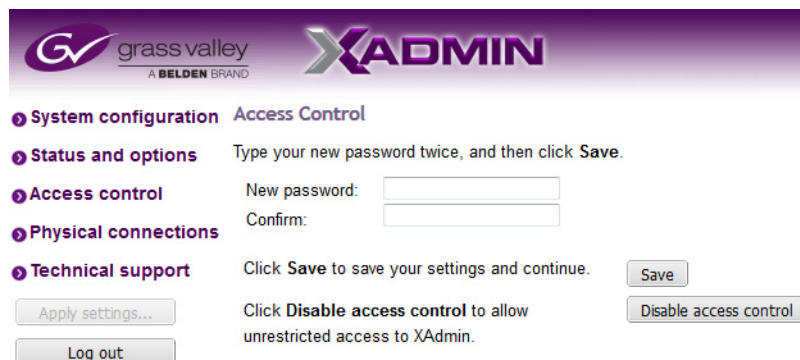


- 10 Click **OK**.  
The login page appears. Only authorized users have access to XAdmin.

## 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 73.
- 2 Click **Access control**, in the navigation area on the left side of the page.  
The Access Control page appears.



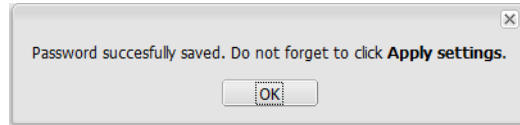
- 3 Type the new password you want to enforce in both the **New password** and the **Confirm** boxes.



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.

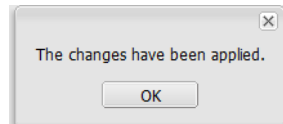
- ④ System configuration
- ④ Status and options
- ④ Access control
- ④ Physical connections
- ④ Technical support

Apply settings...

Log out

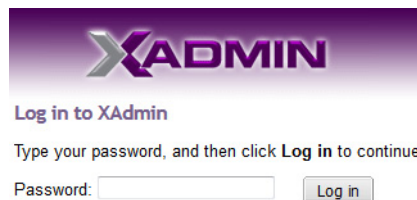
6 Click **Apply settings**.

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

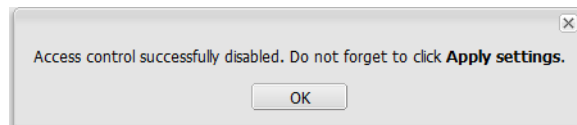
### To disable access control in XAdmin

- 1 Open XAdmin. See [Opening XAdmin](#) on page 73.
- 2 Click **Access control**, in the navigation area on the left side of the page.

The Access Control page appears.

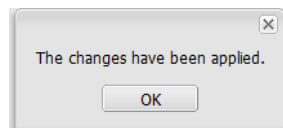
- 3 Click **Disable access control**.

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.



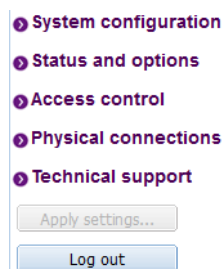
- 5 Click **OK**.

Unrestricted access to XAdmin is restored, for this multiviewer.

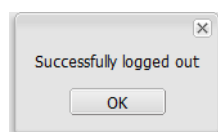
## Closing a Password-Protected XAdmin Session

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 70.

---

## 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 61.

### To change your system's IP address and other parameters

- 1 Open XAdmin. See [Opening XAdmin](#) on page 73.
- 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.

---

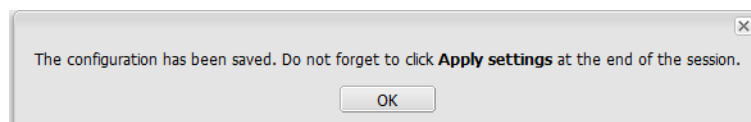
- 4 Enter the appropriate IP information: multiviewer card IP addresses, network mask, and default gateway.

---

Note: The date and time settings are configured in the frame. See [Frame Configuration Prerequisites](#), on page 61.

---

- 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.

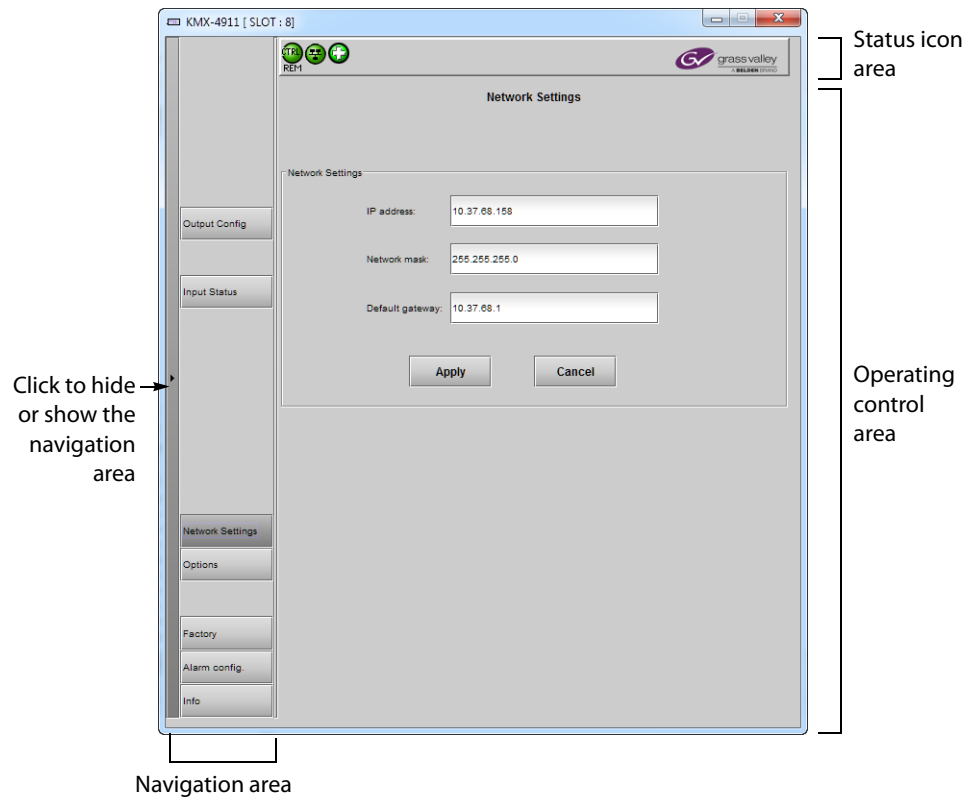
## Remote Control Using iControl

The KMX-49N1 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-49N1 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-49N1 card to open the associated control panel.








## KMX-49N1 Service Control Panels in iControl

The card label and the modular card slot number where the card is installed in the GV Node 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-49N1 card

The KMX-49N1 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 GV Node frame control panel, as described in <a href="#">Using the GV Node Frame Control Panel</a> , on page 49. 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.

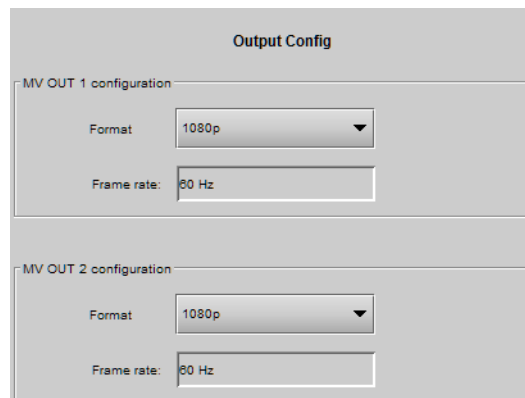
- Click a button to access the associated features.
- Click the left side border (identified by a small arrow icon) to show or hide this area.

The operating control area contains the main operating controls for managing the KMX-49N1 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 95
- [Input Status Panel](#), on page 96
- [Network Settings Panel](#), on page 97
- [Options Panel](#), on page 97
- [Factory Panel](#), on page 98
- [Alarm Configuration Panel](#), on page 100
- [Information Panel](#), on page 105

## 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-49N1 cards, this panel is not available for the third, fourth, and sixth cards.



The screenshot shows a web interface titled "Output Config". It contains two sections for configuration:

- MV OUT 1 configuration:**
  - Format: 1080p (dropdown menu)
  - Frame rate: 60 Hz (text input field)
- MV OUT 2 configuration:**
  - Format: 1080p (dropdown menu)
  - Frame rate: 60 Hz (text input field)

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

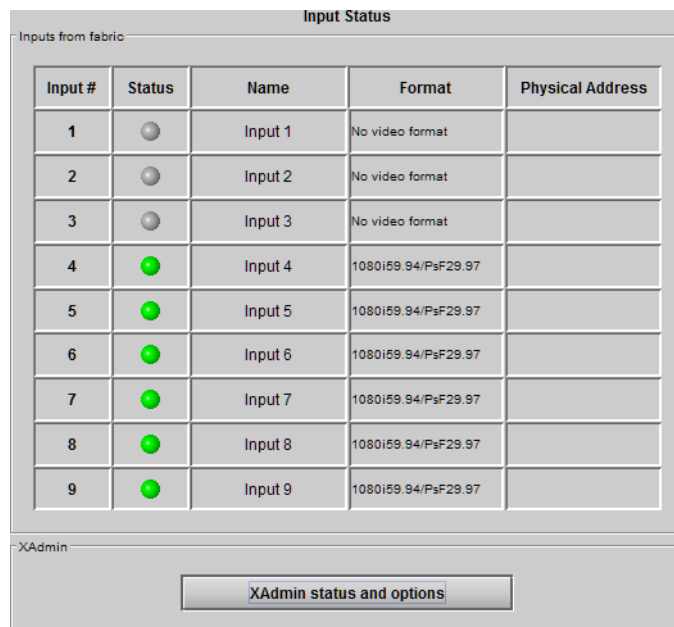
**KMX-49N1 mosaic output resolutions**

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

Note: The refresh rate is always determined by the reference signal connected to the GV Node frame.

## Input Status Panel

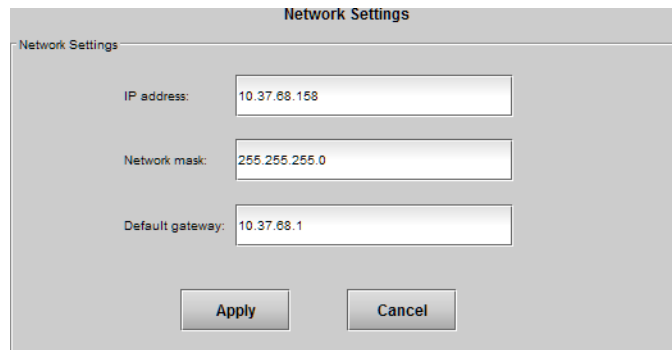
This screen shows the status of the current inputs assigned to the KMX-49N1 card's inputs from the GV Node's fabric. Click *XAdmin status and options* for direct access to the card's web interface that provides more detail about the card's operating status.





## Network Settings Panel

KMX-49N1 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-49N1 card so that it can work with your Ethernet network. For a multiviewer system that has three, four, or six KMX-49N1 cards, this panel is not available for the third, fourth, and sixth cards.



The screenshot shows a window titled "Network Settings". Inside the window, there are three text input fields. The first field is labeled "IP address:" and contains the value "10.37.68.158". The second field is labeled "Network mask:" and contains the value "255.255.255.0". The third field is labeled "Default gateway:" and contains the value "10.37.68.1". Below these 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 GV Node 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 GV Node frame can require more than one MAC address which could cause connectivity problems with certain network switch configurations. See [Network Switch Considerations](#), on page 54 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 113 for a list of available options and their corresponding part numbers.

To activate an option, see [Enabling Options](#), on page 114.

## 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

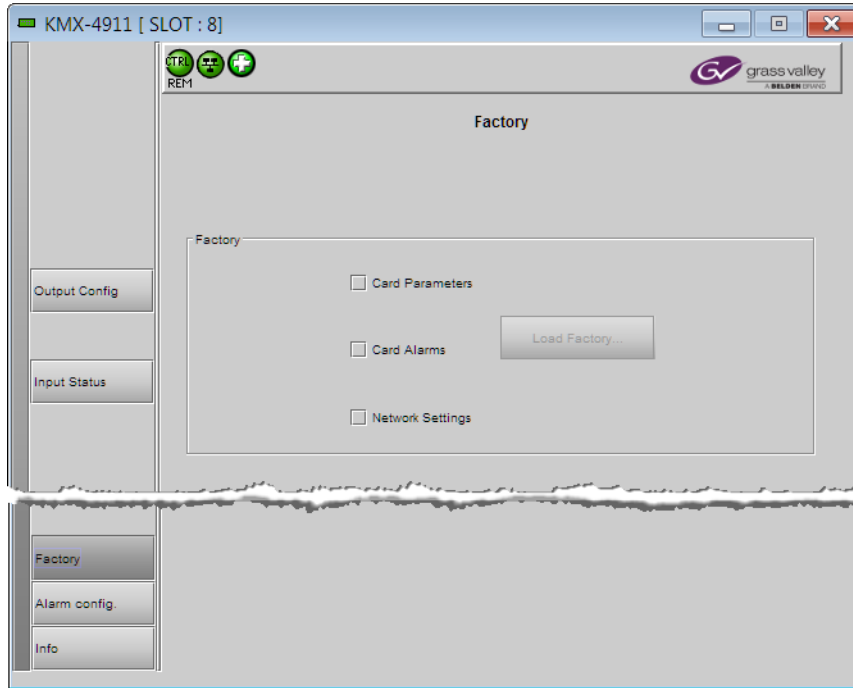
Status / Name	Card LED	Overall alarm	GSM contribution	Log eve...
KMX-4911	Set all	Set all	Set all	<input checked="" type="checkbox"/>
SYSTEM	Set all	Set all	Set all	<input checked="" type="checkbox"/>
Critical temperature	<span style="color: red;">●</span> Critical	<input type="radio"/> Disabled	<input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

### Resetting a KMX-49N1 Card to its Factory-Default Settings

To reset a KMX-49N1 card's settings to their factory-default values

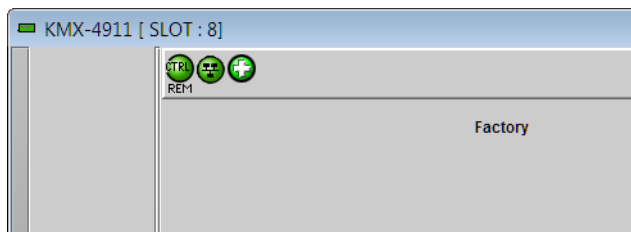
- 1 Open iControl Solo (or iControl Navigator, if you have an iControl application server), and locate the control panel for the KMX-49N1 card whose settings you want to reset, based on the slot number, and the GV Node frame's name (refer to the iControl Solo User Guide, or to the iControl User Guide, for more information).
- 2 Open the KMX-49N1 control panel.

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



**Note:** The **Factory** tab is currently available for a KMX-49N1 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-49N1 in a GV Node Frame](#), on page 25.

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



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

Select...	To...
<b>Card Alarms</b>	Reset all status LED alarm contributions from this card, to their default configuration.
<b>Network Settings</b>	Revert the KMX-49N1 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 <a href="#">Installation of the KMX-49N1 in a GV Node Frame</a> , on page 25.

- 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.


Alarm Configuration for KMX-4911 [ slot: 15 ]

Status / Name	Card LED	Overall alarm	GSM contribution	Log eve...
<b>KMX-4911</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<b>SYSTEM</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Critical temperature	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Duplicate IP	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> 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="radio"/> Fan error	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Hardware failure	<input checked="" type="radio"/> Critical	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Reference loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> SFP absent	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Reference format (60 Hz)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Refresh rate (60 Hz)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<b>INPUTS</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<b>Video_1</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video error	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video format (1080i59.94/P N/A)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<b>Video_2</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video error	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video format (1080i59.94/P N/A)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<b>Video_3</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video error	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video format (1080i59.94/P N/A)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<b>Video_4</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video error	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video format (1080i59.94/P N/A)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<b>Video_5</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video error	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video format (1080i59.94/P N/A)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<b>Video_6</b>	<b>Set all</b>	<b>Set all</b>	<b>Set all</b>	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video loss	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video error	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>
<input checked="" type="radio"/> Video format (1080i59.94/P N/A)	N/A	N/A	<input checked="" type="radio"/> Disabled	<input checked="" type="checkbox"/>

Overall alarm and GSM contribution follow card LED Copy to other cards

OK Apply Cancel Get alarm keys

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"> <li>• Each alarm name includes an icon that shows its current status.</li> <li>• Some alarms may be text-only and the alarm status is shown in the name and not by a status icon.</li> </ul> <p>The <b>Card LED, Overall Alarm and GSM Contribution</b> 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"> <li>• If the Overall alarm contribution is selected as Disabled, the GSM alarm contribution can be set to any available value</li> <li>• If the Overall alarm contribution is selected as any level other than disabled, the GSM contribution is forced to follow the Overall Alarm.</li> </ul>
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:

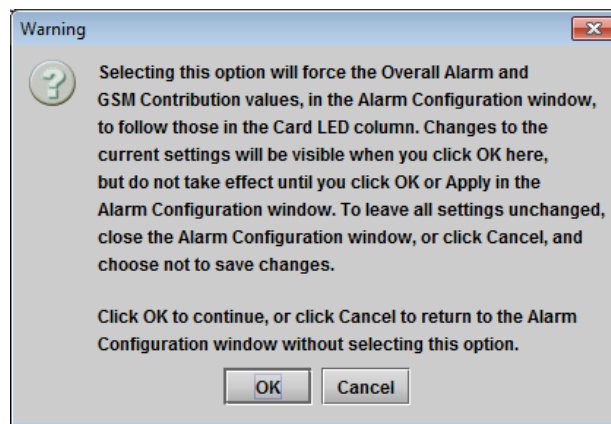
The pulldown lists may contain some or all of the following options:

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

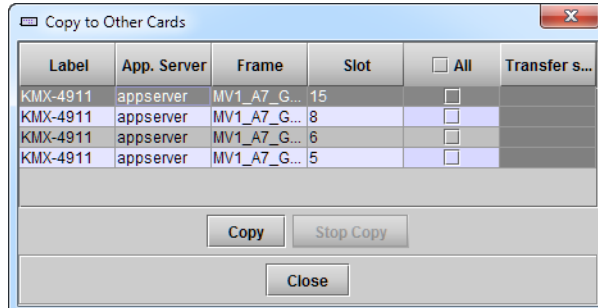
Click in this checkbox to force the Overall alarm and GSM contribution to be identical to the Card LED status

- 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.

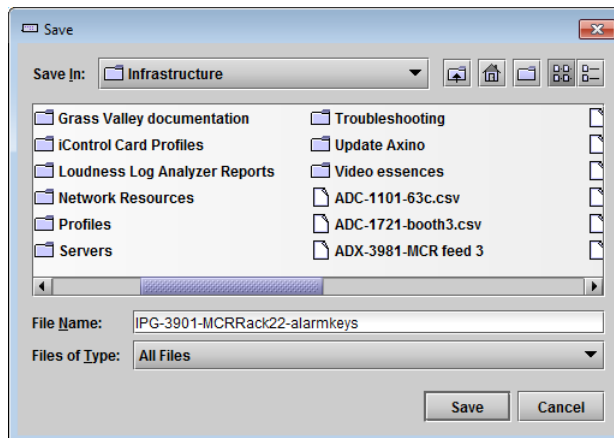
## Copy to other cards

Click this button to open a panel that allows the alarm configuration set for this card to be copied into another KMX-49N1 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-49N1 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.

The screenshot shows a window titled "Info" with a tab labeled "Info". The window contains a list of configuration fields, each with a label on the left and a text input field on the right. The fields and their values are:

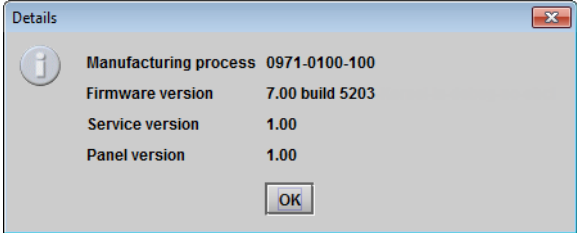
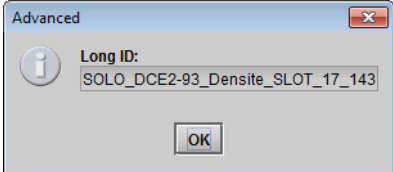
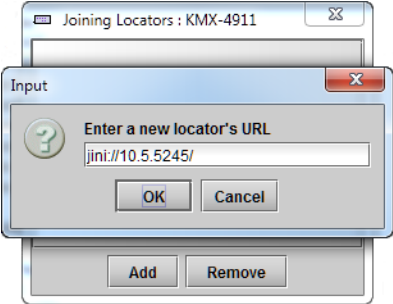
- Rear type: KMX-4911-36x4-4QRP
- KXS version: master build 4181
- SFP vendor:
- System name: GVMV1
- Position: Card A
- Label: KMX-4911
- Short label: GVMV1-A
- Source ID:
- Device type: KMX-4911
- Comments: KMX-4911
- Manufacturer: Grass Valley
- Vendor: Grass Valley
- Service version: 8.3.0.RC-4

At the bottom of the window, there are three buttons: "Advanced...", "Details...", and "Remote system administration...".

Parameter	Description
Label	Type a label to identify this KMX-49N1 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-49N1 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-49N1 card. The Long ID is the address of this card in the iControl network.</p> 
Remote system administration	<p>Opens the <b>Joining Locators</b> window, which lists remote lookup services to which this KMX-49N1 card is registered.</p>  <ul style="list-style-type: none"> <li>• Click <b>Add</b> to force the iControl service for this KMX-49N1 card to register itself on a lookup service, by using the following syntax in the <b>Input</b> window:             <pre>jini://&lt;ip_address&gt;</pre>             where <i>&lt;ip_address&gt;</i> is the IP address of the server running the lookup service.           </li> <li>• Select one of the services listed in the window by clicking on it, and then click <b>Remove</b> to remove it from the list.</li> </ul>

## 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 107). 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 107), and their respective *KX Router* logical routers (see [Specifying lookup servers for the RCP-200](#) on page 107). 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 108).

### 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 109. 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.

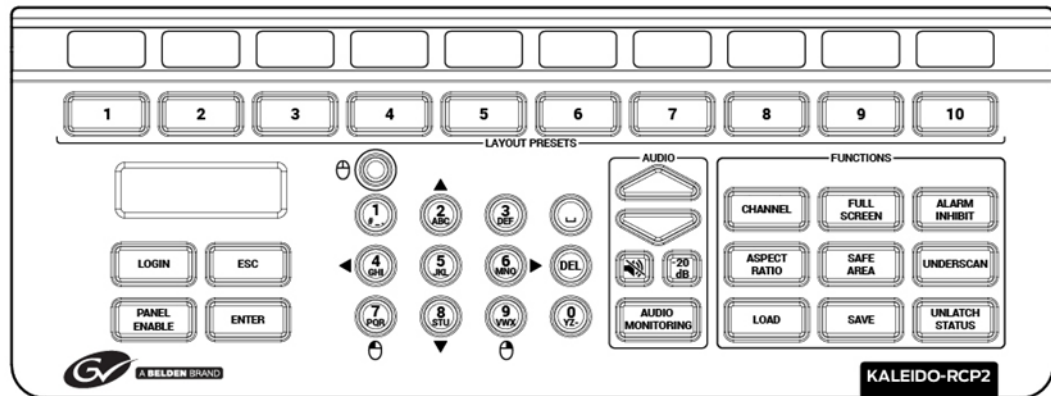
### To correlate a monitor wall destination in a layout and the corresponding KX Router logical router

- 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 112.

## 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 114).

Contact Technical Support to purchase a software option. See [Grass Valley Technical Support](#), on page 152.

### KMX-49N1 input option

Option	Part Number	Feature	Notes
CC/XDS	KMX-49N1-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-49N1-OPT-DOLBY	Dolby-E metadata extraction license	One Dolby-E option key is needed per card.
SCTE	KMX-49N1-OPT-SCTE	License for extraction of SCTE 104 metadata	One SCTE option key is needed per card.
Loudness	KMX-49N1-OPT-LOUD	Loudness level measurement license	One Loudness option key is needed per card.
High Dynamic Range and Wide Color Gamut	KMX-4921-OPT-HDR	Adds support for: <ul style="list-style-type: none"> <li>High Dynamic Range (HDR)</li> <li>Wide Color Gamut (WCG)</li> </ul> See <a href="#">Audio / Video Inputs</a> , on page 141 for supported formats.	One HDR option key is needed per KMX-4921 card. This option is unavailable for KMX-4911 cards.

### KMX-49N1 output option

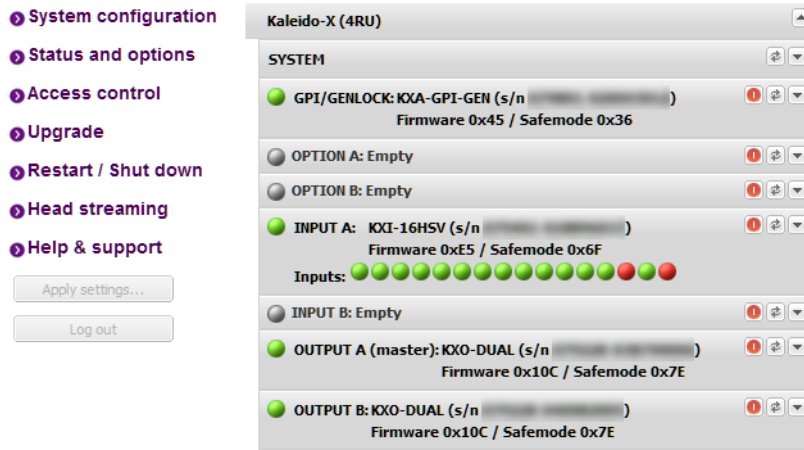
Option	Part Number	Feature	Notes
Additional Head Activation	KMX-49N1-OPT-OP2	Additional head output enable license. In a multi-card system, if a card <i>does not</i> have this option enabled, then the only available multiviewer output is MV OUT A1 (MV OUT 1, in the case of a KMX-49N1 9×2 system) for that card. There is no video output to the remaining heads. For more information about the rear panel nomenclature, see <a href="#">Multiviewer SFP Module Mosaic Output to Display Input Cable Connections</a> , on page 40.	One additional head output option key is needed per card. <ul style="list-style-type: none"> <li>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"> <li>Single fiber</li> <li>Single DIN</li> <li>HDMI</li> </ul> </li> <li>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"> <li>Two dual TX modules</li> <li>Two single TX modules</li> <li>One single TX, and one dual TX (in any order)</li> </ul> </li> </ul> For more information about the location of card A and B in the frame, see <a href="#">Installation of the KMX-49N1 in a GV Node Frame</a> , on page 25.
Display 90-Degree Rotation	KMX-49N1-OPT-ROT	Display rotation license	One Display 90-Degree Rotation option key is needed per card.

## Enabling Options

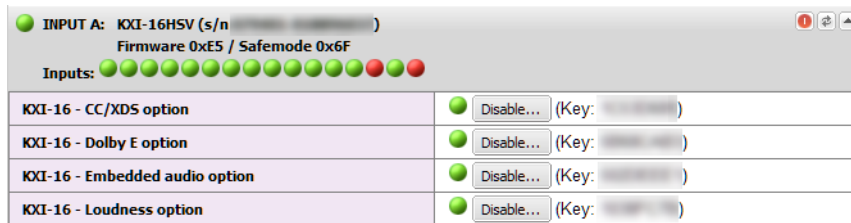
### To enable options on a multiviewer

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

The XAdmin Status and Options page appears.

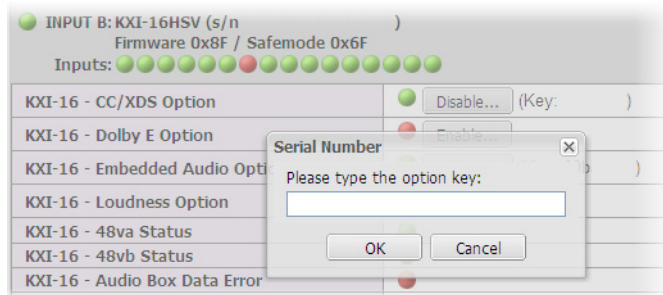


- 3 Click the arrow button at the end of the heading row that corresponds to the module for which you want to enable an option.



- 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

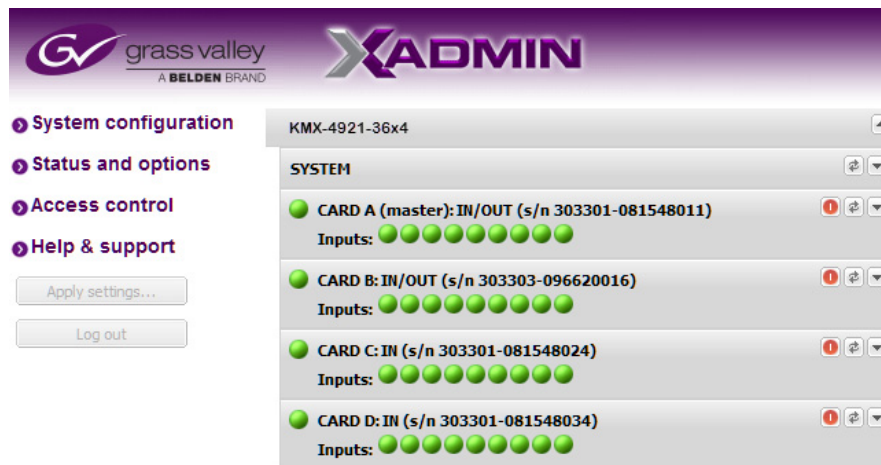
### Verifying the KMX-49N1 Multiviewer Status

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 61.

#### To view the status information for a multiviewer

- 1 Open XAdmin. See [Opening XAdmin](#) on page 73.

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



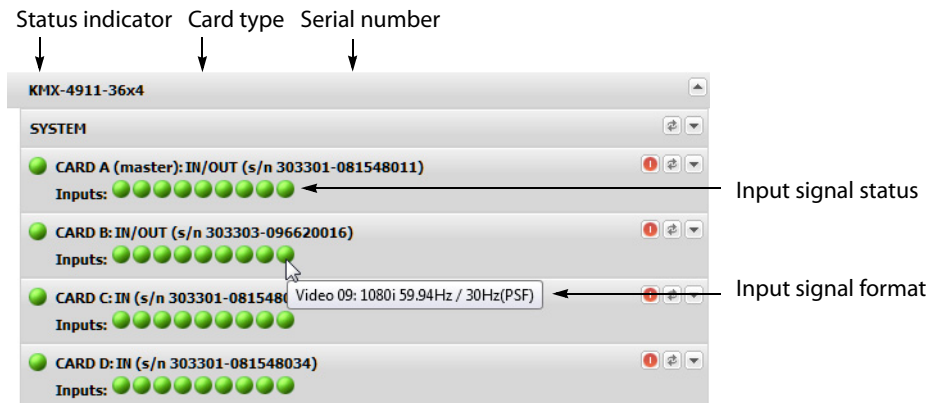
The module headings show the card type and serial number for the input and output cards, and a summary view of the input signals for each input card.

- 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-49N1 system without a master card. For more information about the location of card A in the frame, see [Installation of](#)

[the KMX-49N1 in a GV Node Frame](#), on page 25.

- 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.



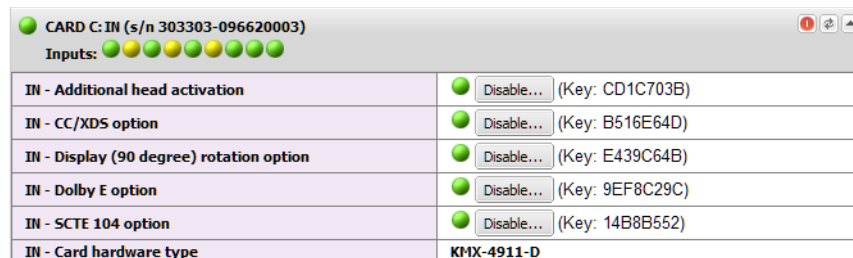
Note: The Kaleido Software does not distinguish neither between 1080PsF25 and 1080i50, nor between 1080PsF29.97 and 1080i59.94. Both 1080PsF25 and 1080i50 are reported as 1080i50, and both 1080PsF29.97 and 1080i59.94 are reported as 1080i59.94, on the monitor wall and in XAdmin's Status and Options page.

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 113.

- 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

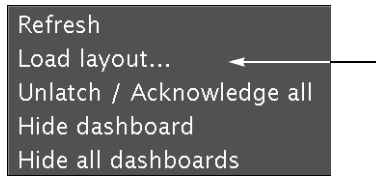
- Log on to the Kaleido-RCP2 (see [Logging on to the Kaleido-RCP2](#), on page 112), and then test various operations using the Kaleido-RCP2 keyboard and the mouse (for example, load a predefined layout).

## 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 112).  
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 137.

- 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 Elements

Refer to the *Kaleido Software User's Manual* to learn how to customize the Kaleido to suit your specific needs.

## Finding the Multiviewer's IP Address and Application Version

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**Note:** The multiviewer's IP address can also be remotely set through a the KMX-49N1's iControl service panel. See [Network Settings Panel](#), on page 97.

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### To find the system IP address and application version

- 1 Press the icon representing the appropriate card on the GV Node 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. "8.00 build 2220") appears on the display of the GV Node 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-49N1 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-49N1 Multiviewer Cards	See <a href="#">KMX-49N1 Multiviewer Cards</a> , on page 15
KMX-4911 Rear Panel	See <a href="#">KMX-49N1 Rear Panels</a> , on page 16
Optional SFP Module(s)	See <a href="#">Compatible SFP Modules</a> , on page 19

There are no user-serviceable parts within these components except for the KMX-49N1 multiviewer card in which the heatsink cooling fans can be replaced. See [Cooling Fan Replacement](#), on page 127.

Contact Technical Support to order an FRU. See [Grass Valley Technical Support](#), on page 152.

### Opening and Closing the Front Door

The front door of the GV Node 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.

Close the front door as follows:

- Swing the door shut and turn the thumbscrew clockwise until the door is secured shut.

## About Swapping KMX-49N1 Cards into a Multiviewer

The following instructions apply to a multiviewer that has two or more KMX-49N1 cards.

### Overview

When all multiviewer cards are the same model and 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, according multiviewer model, see [Features and Limitations](#), on page 13.

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 113. 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).

When performing maintenance on a multiviewer, it may be necessary to replace a KMX-49N1 card with another KMX-49N1 card. It is important to understand the requirements needed to restore multiviewer operation under different scenarios.

Scenario description	See
When you swap a KMX-4911 card into a multiviewer composed only of KMX-4911 cards, and the card's Kaleido Software version is not supported by the multiviewer's capacity (rear panel size), according to <a href="#">Kaleido Software Minimum Version Compatibility</a> , the card may not be recognized by the multiviewer.	<a href="#">Swapping a KMX-4911 Card into a KMX-4911 Multiviewer</a> , on page 122.
A KMX-4921 card can be used to replace a KMX-4911 card. However, mixing KMX-4911 and KMX-4921 cards in a multiviewer can result in some multiviewer video inputs having extra processing abilities or features that other video inputs lack. Before installing a KMX-4921 card in the multiviewer, the multiviewer's software must be upgraded to the <a href="#">Kaleido Software Minimum Version Compatibility</a> requirement for a KMX-4921 card.	<a href="#">Mixing KMX-4921 and KMX-4911 Cards Together in a Multiviewer</a> , on page 123
When you swap a KMX-4921 card into a multiviewer composed only of KMX-4921 cards, there are no specific recommendations to follow.	<a href="#">Replacing Cards</a> , on page 125

Once a KMX-49N1 card has been successfully swapped into the multiviewer, all multiviewer KMX-49N1 cards will have the same Kaleido Software version level and must meet the requirements of [Kaleido Software Minimum Version Compatibility](#) to be fully functional.

For the procedure to remove a card from the frame and to insert a card into the frame, see [Replacing Cards](#), on page 125.

### Swapping a KMX-4911 Card into a KMX-4911 Multiviewer

When you swap a KMX-4911 card into a KMX-4911 multiviewer, the Kaleido Software version that was loaded onto this card may be unknown. If the card's Kaleido Software

version is not supported by the multiviewer's capacity (rear panel size), according to the [Kaleido Software Minimum Version Compatibility](#) table, the card may not be recognized by the multiviewer. When this happens:

- The swapped-in KMX-49N1 card will not recognize the multiviewer's rear panel and will not communicate with other multiviewer cards.
- The swapped-in KMX-49N1 card will not automatically upgrade / downgrade to the Kaleido Software version used by other KMX-49N1 cards in the multiviewer.
- The multiviewer will not be fully functional. Signals that depend on the swapped-in card will not be available.

Under these circumstances, special upgrade procedures will be required for this card in order to make the multiviewer fully functional. See [KMX-49N1 Card Upgrade Options](#), on page 124.

If the swapped in KMX-4911 card's Kaleido Software version meets the minimum requirements of the [Kaleido Software Minimum Version Compatibility](#) table, then the multiviewer will live-update the multiviewer cards as necessary. See [Multiviewer Live-Update \(Auto-Upgrade\) Feature](#), on page 124.

To know the KMX-49N1 card's Kaleido Software current version, see [Finding a KMX-49N1 Card's Current Kaleido Software Version](#), on page 124.

### **Mixing KMX-4921 and KMX-4911 Cards Together in a Multiviewer**

When mixing KMX-4921 and KMX-4911 cards models and/or activated license options together in the same multiviewer, the following conditions and requirements will apply:

- A KMX-4921 card is backwards compatible for use in the place of a KMX-4911 card.
- A KMX-4911 card can be used in the place of a KMX-4921 card with degraded performance as advanced KMX-4921 card features will not be available.
- For the video input streams processed by an individual KMX-4911 / KMX-4921 card in a multiviewer, those video inputs will have all features available to this individual card (including licensed features). When KMX-4911 and KMX-4921 cards are mixed together in a multiviewer, this could result in a mosaic output that show signals with mixed abilities. For this reason, when mixing KMX-4911 cards with KMX-4921 cards, the KMX-4921 cards should be configured to only use features that are available with a KMX-4911 card so that the multiviewer behaves in a coherent manner for the multiviewer user.

For example, when a KMX-4911 card processes an HDR video input signal, this signal will look faded out in the mosaic.

- A KMX-4921 card requires Kaleido Software version 9.00 or higher to operate. The multiviewer will try to live-update the multiviewer cards so that all multiviewer cards use the same Kaleido Software version (see [Multiviewer Live-Update \(Auto-Upgrade\) Feature](#), on page 124). If the multiviewer is currently using Kaleido Software version 9.00 or higher, then the multiviewer will live-update the multiviewer cards so they all use the same Kaleido Software version.
- If the multiviewer is currently using Kaleido Software version 8.7x or lower, then the multiviewer must be updated to use Kaleido Software version 9.00 or higher.

If you are swapping a KMX-4921 card into the multiviewer's slot 'A' then all multiviewer KMX-49N1 cards will be updated automatically to the KMX-4921 card's Kaleido

Software version level. See [Installation of the KMX-49N1 in a GV Node Frame](#), on page 25 for the location of card 'A' in each multiviewer model.

If you are swapping a KMX-4921 card into a multiviewer slot other than the 'A' slot, then proceed as follows.

- 1 Remove the card that is to be swapped-out.
- 2 Remove the card located in the multiviewer's slot 'A' and then insert it into the slot where the card was swapped-out.
- 3 Insert the KMX-4921 card into the multiviewer's slot 'A'.

All multiviewer KMX-49N1 cards will be updated automatically to the KMX-4921 card's Kaleido Software version level.

### **Multiviewer Live-Update (Auto-Upgrade) Feature**

For a multiviewer that has two or more KMX-49N1 multiviewer cards, and all multiviewer cards meet the minimum version according to [Kaleido Software Minimum Version Compatibility](#), on page 20, 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-49N1 in a GV Node Frame](#), on page 25 for the location of card 'A' in each multiviewer model.

### **Finding a KMX-49N1 Card's Current Kaleido Software Version**

To know the KMX-49N1 card's Kaleido Software current version, insert the card into the GV Node frame and then find the card's Kaleido Software version through the frame's local control panel (see [Using the GV Node Frame Control Panel](#), on page 49) or through the Densité Upgrade Manager (launched from iControl Navigator, or iControl Solo). See [Information Panel](#), on page 105.

### **KMX-49N1 Card Upgrade Options**

If the card's Kaleido Software version is found to be too old, the card's Kaleido Software will have to be manually upgraded in order to make the multiviewer fully functional. The following options are available:

- Upgrade the KMX-49N1 card to use the same Kaleido Software version that the other multiviewer KMX-49N1 cards are currently using.
- Upgrade all multiviewer KMX-49N1 cards to the latest Kaleido Software version. See [Software and Firmware Updates](#), on page 12.

To upgrade the multiviewer, see [Installing a Kaleido Software Upgrade](#), on page 135.

## 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).

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### IMPORTANT

The rear panel must be installed before any KMX-49N1 cards are inserted into the frame.

All KMX-49N1 cards must be removed from the frame before the rear panel can be removed.

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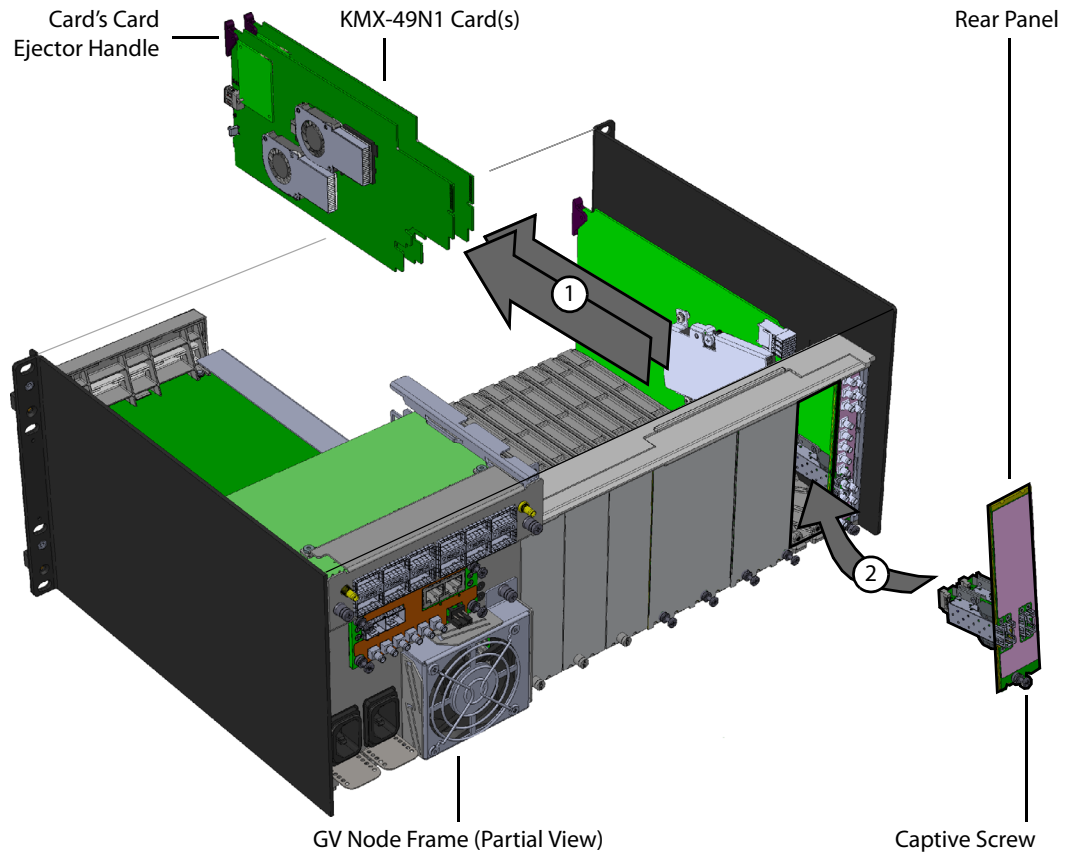
## Replacing a rear panel

### To replace a rear panel in a GV Node frame

- 1 If a card is already installed in a modular card slot served by the rear panel you are changing, remove it first (see [Removing a card](#), on page 126).
- 2 Remove the existing rear panel (either blank or belonging to an existing card) by releasing the captive screws at the bottom.

There may be several captive screws, depending on the card type.

3 Position the new panel and secure it in place with the captive screw(s) at the bottom.



GV Node Frame (Partial View)      Captive Screw  
*Example installation of a KMX-49N1-18x4-4DRP Rear Panel in slots 2 and 3 in a GV Node Frame (partial view)*

## Removing a card

### To remove a card

- 1 Open the front door of the frame (see [Opening and Closing the Front Door](#), on page 121).
- 2 Lift up the card ejector handle on the front of the card you want to remove, to lever the connectors apart, and then use the handle to pull the card straight out of the modular card slot.
- 3 Close the front door of the frame (see [Opening and Closing the Front Door](#), on page 121).

## Installing a Card

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Note: The rear panel must be installed before the card. See [Replacing a rear panel](#) on page 125.

---

### To install a card

The rear panel occupies between 1 and 6 modular card slots in the frame. One KMX-49N1 card must be installed in each modular card slot covered by the rear panel.

- 1 Open the frame's front door. See [Opening and Closing the Front Door](#), on page 121.
- 2 Orient the card such that the card is up right with the card ejector handle located at the top edge of the card.
- 3 While holding the card by its card ejector handle, slide the KMX-49N1 card into the slot and gently push on the card ejector handle to seat the connectors.
- 4 Insert any remaining cards into the frame in the same manner.
- 5 Close the frame's front door. See [Opening and Closing the Front Door](#), on page 121.

## 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-49N1 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-49N1 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 100 for more information.
- A KMX-49N1 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 GV Node's operating temperature range specification. If necessary, take corrective actions by, for example, increasing the amount of air conditioning made available to the GV Node frame.
- 2 Confirm that air flow around the GV Node's frame is not obstructed. If necessary, take corrective actions by, for example, removing obstructions or rerouting cables around and away from the GV Node frame.
- 3 When the previous corrective actions do not eliminate a critical temperature alarm, verify that the KMX-49N1'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 GV Node 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 GV Node 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.

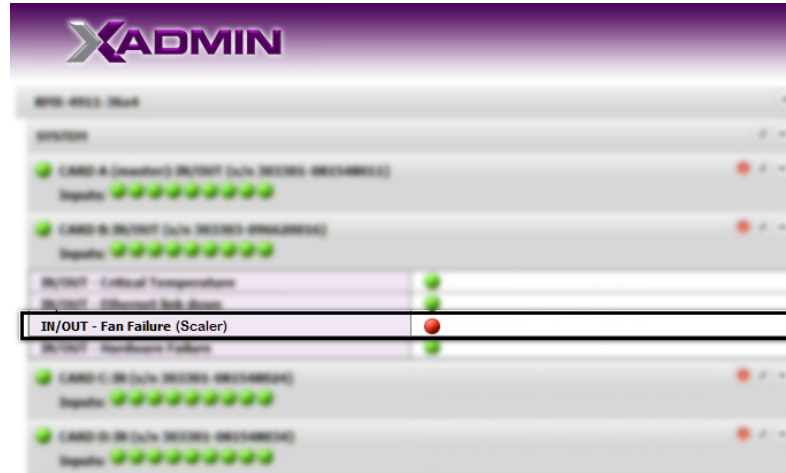
The card's onboard circuitry monitors the fan motor's rotational speed to detect that the fan is rotating fast enough to provide sufficient cooling; it raises a fan alarm when the fan's rotational speed has gone below a factory-set threshold.

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.



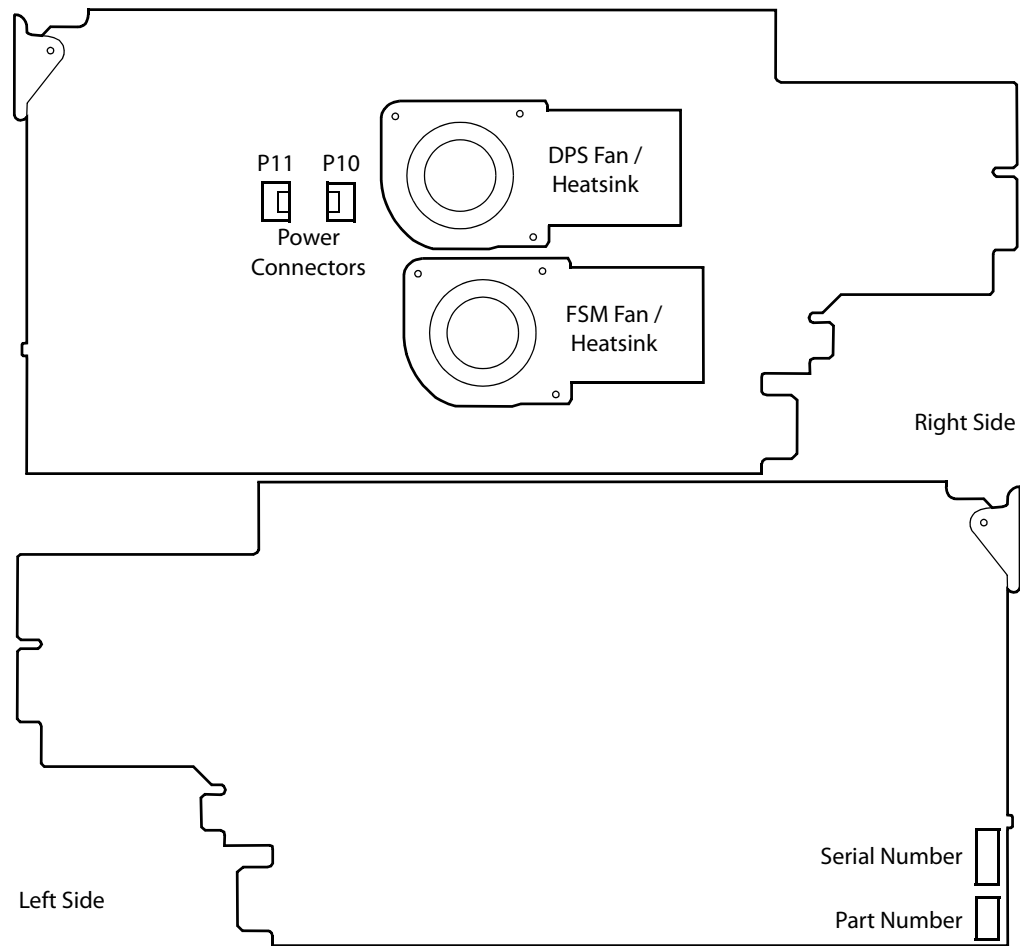
Fans are located on certain cards and within the multiviewer's frame. To replace a fan:

- on a card, see [Replacing KMX-49N1 Card Fans](#), on page 130.
- within the multiviewer's frame, see the *GV Node IP Aggregation, Processing and Edge Routing Platform User Manual*.

## Replacing KMX-49N1 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

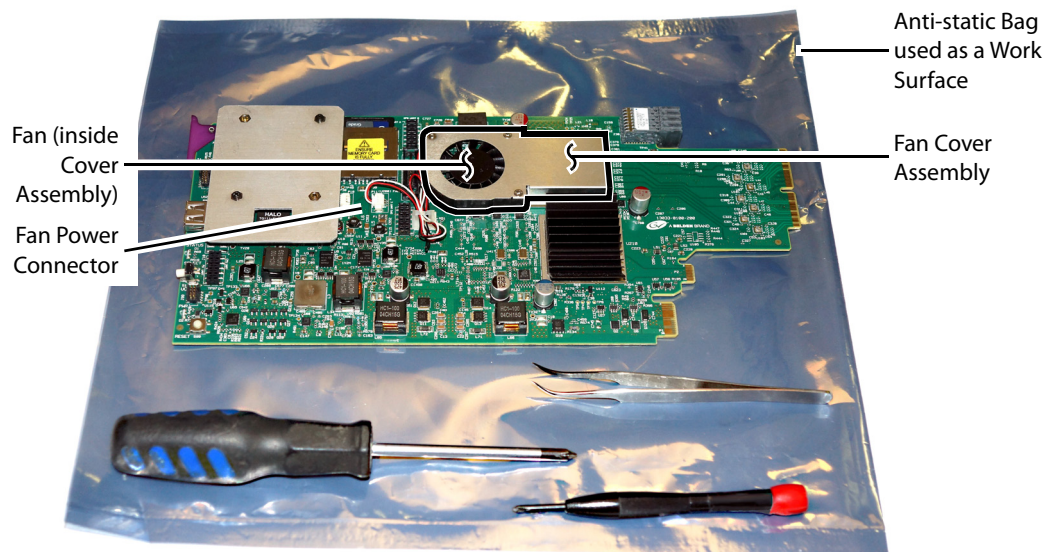
### Fan Replacement Kit

The replacement fan kit is available by contacting Technical Support. See [Grass Valley Technical Support](#), on page 152. 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-49N1 card.
- Anti-static bag or anti-static work surface to reduce the possibility of electrostatic discharge damage to the card.

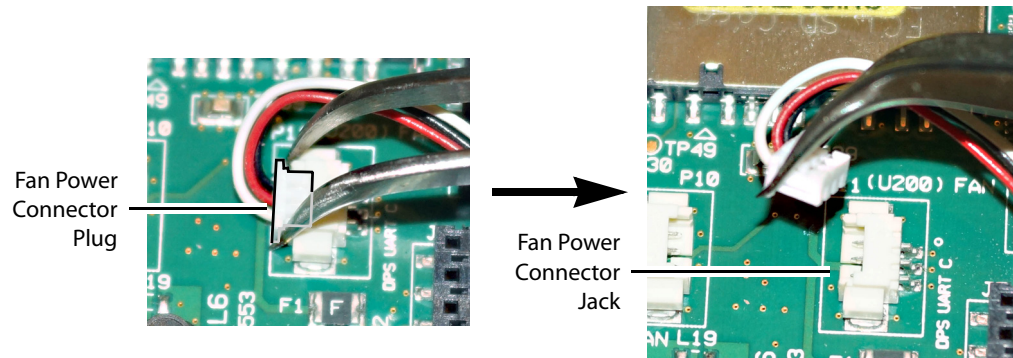


*Typical card with onboard fan, screwdrivers, tweezers, and anti-static bag*

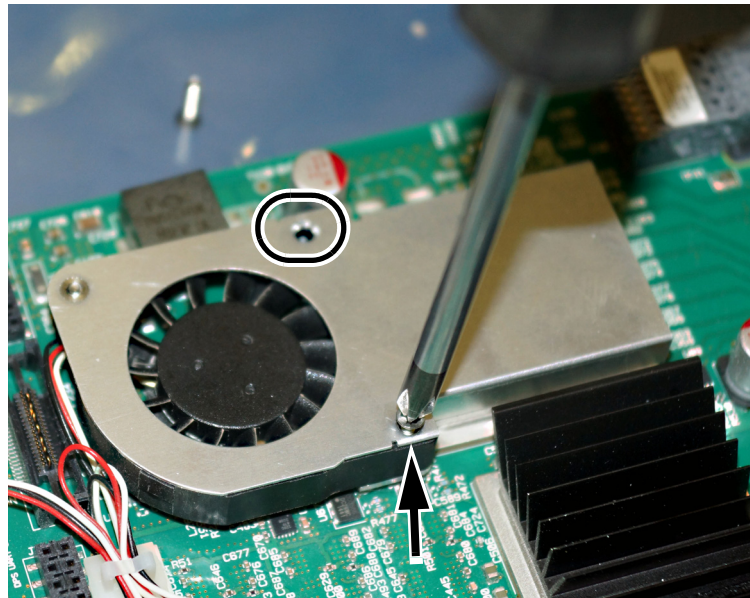
## To replace a fan

- 1 During off hours when the system is not in use, eject the card from the GV Node frame. See [Removing a card](#), on page 126.
- 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

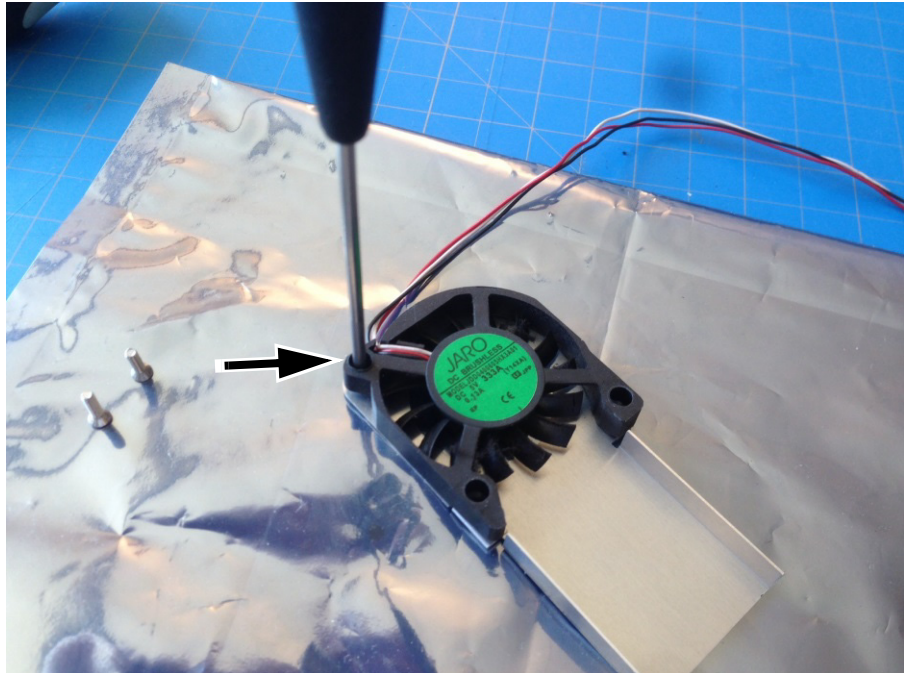
are routed through wire holders, remove the wires from the holders first, before disconnecting.



- 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 GV Node frame. See [Installing a Card](#), on page 126.

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

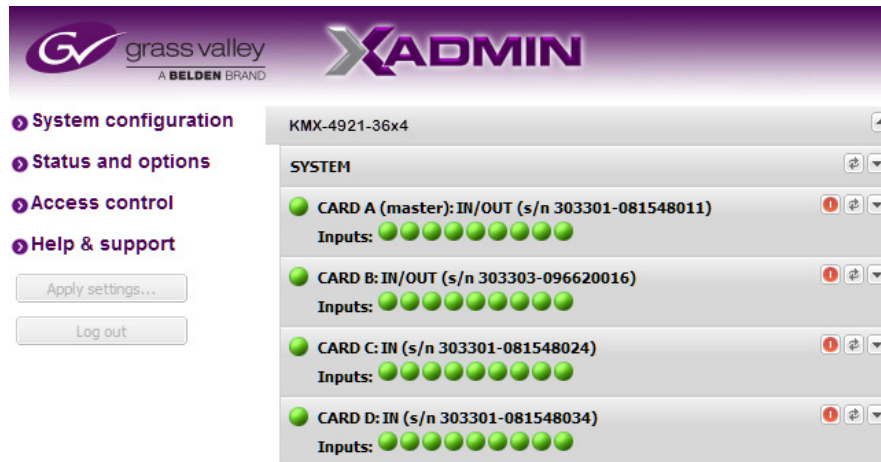
## Generating a System Snapshot

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 73.

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

The Kaleido Software version currently loaded into a KMX-49N1 card must meet the minimum Kaleido Software version number required by the multiviewer into which the KMX-49N1 card is going to be installed. Otherwise, a the card will have to be individually upgraded (see [About Swapping KMX-49N1 Cards into a Multiviewer](#), on page 122). The minimum Kaleido Software version number varies according to the multiviewer's capacity. For more information, see [Kaleido Software Minimum Version Compatibility](#), on page 20.

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.

#### Cluster systems

All multiviewers that are part of a cluster system must use the same Kaleido Software version. For cluster systems, Kaleido Software versions 8.70 and 6.50 introduce a hard compatibility break with previous Kaleido Software versions.

Cluster backups you create with version 8.70 and 6.50 (or higher), cannot be restored by using an earlier version of XEdit. Grass Valley recommends you make a backup of the individual databases for every cluster member, *before upgrading* from a pre-8.70 or pre-6.50 version, to version 8.70 or 6.50 (or higher) respectively.

## 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 12.

## 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 12. The upgrade package contains:

- the Kaleido Software Upgrade Manager application is required to upgrade the KMX-49N1 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 152).

### 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 - 9.00_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-49N1 multiviewer

When upgrading a multi-card KMX-49N1 multiviewer system (for example, a multiviewer with more than one KMX-49N1 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-49N1 card(s) that belong to the multiviewer system you are upgrading.

---

#### TIP

If you have more than one KMX-49N1 multiviewer system in the GV Node frame, click the **Physical view** tab, where you can locate the multiviewer cards by their slot number.

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- 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 135) 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-49N1 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 - 9.00_build_5294.os`

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## 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 <a href="#">Card Interface and Troubleshooting</a> , on page 48.
	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 <a href="#">Enabling Options</a> , on page 114. Valid licenses have a green dot.	Purchase and install a license for each card as required. Contact Technical Support for more information and see <a href="#">Available Hardware and Software Options</a> , on page 113. See <a href="#">Grass Valley Technical Support</a> , on page 152.
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 <a href="#">Kaleido Software Minimum Version Compatibility</a> , on page 20. See <a href="#">Related Documentation</a> , 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 GV Node frame's documentation. See <a href="#">Related Documentation</a> , 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 <a href="#">Using the GV Node Frame Control Panel</a> , on page 49.
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 <a href="#">step 3</a> in procedure <a href="#">Verifying the KMX-49N1 Multiviewer Status</a> , on page 117.
The mosaic image of one of more HDR video streams appear: <ul style="list-style-type: none"> <li>faded-out (low-contrast image)</li> <li>have poor color rendering</li> </ul>	KMX-4911 cards do not support HDR/WCG video streams	Swap a KMX-4921 card licensed for HDR/WCG into the KMX-4911 card’s slot.	Replace all KMX-4911 card(s) with KMX-4921 card(s) that are licensed for HDR/WCG
	A KMX-4921 card is not licensed for HDR/WCG	Swap a KMX-4921 card licensed for HDR/WCG into the unlicensed KMX-4921 card’s slot. See also <a href="#">About Swapping KMX-49N1 Cards into a Multiviewer</a> , on page 122.	Purchase and enable HDR/WCG licenses for all KMX-4921 cards. To see and enable an individual card’s licensing, see <a href="#">Enabling Options</a> , on page 114.
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 <sup>2</sup> ) or thicker), or both. Replace the HDMI cable with a display extender such as a Grass Valley DXF-4K.

Should you need further assistance, see [Grass Valley Technical Support](#), on page 152.

### 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 152.

### **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 152.

# 7 Specifications

This chapter lists equipment specifications for the KMX-49N1 input, output, and companion cards, and their rear panels.

## KMX-49N1 Multiviewer Cards

### Video

#### Audio / Video Inputs

Parameters	Value
Signal inputs	9 per KMX-49N1 card
Formats (auto-detected)	<ul style="list-style-type: none"> <li>• 525i59.94</li> <li>• 625i50</li> <li>• 720p50</li> <li>• 720p59.94</li> <li>• 1080i50</li> <li>• 1080p50</li> <li>• 1080i59.94</li> <li>• 1080p59.94</li> </ul> <p>Note: ASI and TICO formats are not supported by the KMX-49N1.</p>
High Dynamic Range (HDR) and Wide Color Gamut (WCG) support. Note: A multiviewer will fully support HDR/WCG on all inputs when KMX-4921 cards are exclusively used to create the multiviewer and one HDR option key has been enabled for each KMX-4921 card. See <a href="#">Available Hardware and Software Options</a> , on page 113.	<ul style="list-style-type: none"> <li>• HLG BT.2020</li> <li>• HLG with BT.709 colors</li> <li>• PQ BT.2020 (ITU BT.2100)</li> <li>• PQ with BT.709 colors (SMPTE ST 2084)</li> <li>• S-LOG3 BT.2020</li> <li>• S-LOG3 with BT.709 colors</li> <li>• S-LOG3 S-Gamut3</li> </ul>

### Mosaic Outputs

Parameters	Value
Delay, with display(s) in landscape orientation (non-rotated display(s))	Referenced: <ul style="list-style-type: none"> <li>• 16.7 ms @ 59.94 Hz</li> <li>• 20 ms @ 50 Hz</li> </ul> Free running: <ul style="list-style-type: none"> <li>• Maximum 33.4 ms @ 59.94 Hz</li> <li>• Maximum 40 ms @ 50 Hz</li> </ul>
Delay, with display(s) in portrait orientation (display(s) rotated 90°)	Referenced: <ul style="list-style-type: none"> <li>• 33.4 ms @ 59.94 Hz</li> <li>• 40 ms @ 50 Hz</li> </ul> Free running: <ul style="list-style-type: none"> <li>• Maximum 50.1 ms @ 59.94 Hz</li> <li>• Maximum 60 ms @ 50 Hz</li> </ul>
Formats	<ul style="list-style-type: none"> <li>• 1080p59.94 (level A)</li> <li>• 1080p50 (level A)</li> <li>• 1080i59.94</li> <li>• 1080i50</li> <li>• 2160p59.94 Square Division Quad Split (SDQS) over quad-link 3G</li> <li>• 2160p50 Square Division Quad Split (SDQS) over quad-link 3G</li> <li>• HDMI 2.0 2160p59.94 through an external quad-link 3G to HDMI converter</li> <li>• HDMI 2.0 2160p50 through an external quad-link 3G to HDMI converter</li> </ul>
Dynamic Range	Standard Dynamic Range (SDR) and colors ITU Rec. 709
Audio Monitoring	Embedded on mosaic outputs

### HDMI SFP (optional)

Parameters	Value
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)

Parameters	Value
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)

**SDI Coaxial SFP (optional) (continued)**

Parameters	Value
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)**

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

**GV Node Frame**

See [GV Node webpage](#) for full specifications.

**Electrical**

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

**KMX-49N1 Power consumption (without SFP Module)**

Multiviewer Capacity	Multiviewer Cards	KMX-49N1 rear panel	Total power consumption
9 × 1	1 × KMX-49N1-9X1	KMX-49N1-9x2-4SRP	28.5 W
9 × 2	1 × KMX-49N1-9X2	KMX-49N1-9x2-4SRP	28.5 W
18 × 1	2 × KMX-49N1-9X1	KMX-49N1-18x4-4DRP	57.0 W
18 × 2	2 × KMX-49N1-9X2	KMX-49N1-18x4-4DRP	57.0 W
18 × 4	2 × KMX-49N1-9X2	KMX-49N1-18x4-4DRP	57.0 W
27 × 1	3 × KMX-49N1-9X1	KMX-49N1-27x4-4TRP	87.0 W
27 × 2	3 × KMX-49N1-9X2	KMX-49N1-27x4-4TRP	87.0 W
27 × 4	3 × KMX-49N1-9X2	KMX-49N1-27x4-4TRP	87.0 W
36 × 1	4 × KMX-49N1-9X1	KMX-49N1-36x4-4QRP	117.0 W
36 × 2	4 × KMX-49N1-9X2	KMX-49N1-36x4-4QRP	117.0 W
36 × 4	4 × KMX-49N1-9X2	KMX-49N1-36x4-4QRP	117.0 W
54 × 1	6 × KMX-49N1-9X1	KMX-49N1-54x4-4HRP	147.0 W
54 × 2	6 × KMX-49N1-9X2	KMX-49N1-54x4-4HRP	147.0 W
54 × 4	6 × KMX-49N1-9X2	KMX-49N1-54x4-4HRP	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-49N1 Weight (without SFP Module)

Multiviewer Capacity	Multiviewer Cards	KMX-49N1 rear panel	Total weight
9 × 1	1 × KMX-49N1-9X1	KMX-49N1-9x2-4SRP	305.1 g
9 × 2	1 × KMX-49N1-9X2	KMX-49N1-9x2-4SRP	305.1 g
18 × 1	2 × KMX-49N1-9X1	KMX-49N1-18x4-4DRP	612.6 g
18 × 2	2 × KMX-49N1-9X2	KMX-49N1-18x4-4DRP	612.6 g
18 × 4	2 × KMX-49N1-9X2	KMX-49N1-18x4-4DRP	612.6 g
27 × 1	3 × KMX-49N1-9X1	KMX-49N1-27x4-4TRP	899.4 g
27 × 2	3 × KMX-49N1-9X2	KMX-49N1-27x4-4TRP	899.4 g
27 × 4	3 × KMX-49N1-9X2	KMX-49N1-27x4-4TRP	899.4 g
36 × 1	4 × KMX-49N1-9X1	KMX-49N1-36x4-4QRP	1186.2 g
36 × 2	4 × KMX-49N1-9X2	KMX-49N1-36x4-4QRP	1186.2 g
36 × 4	4 × KMX-49N1-9X2	KMX-49N1-36x4-4QRP	1186.2 g
54 × 1	6 × KMX-49N1-9X1	KMX-49N1-54x4-4HRP	1759.9 g
54 × 2	6 × KMX-49N1-9X2	KMX-49N1-54x4-4HRP	1759.9 g
54 × 4	6 × KMX-49N1-9X2	KMX-49N1-54x4-4HRP	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) <sup>a</sup>	Yes	NV9000 system controllers
	NVEP NV9000 – Port Takes (NP0017) <sup>b</sup>	Yes	
	NVEP NV9000 – Device Takes (NP0017) <sup>c</sup>	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 <sup>d</sup>	Yes	Concerto-series routers, Encore-series control panels
Grass Valley (Thomson/Philips) <sup>e</sup>	Jupiter ASCII communications protocol	No	Venus-series and Trinix-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 152).
- 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:

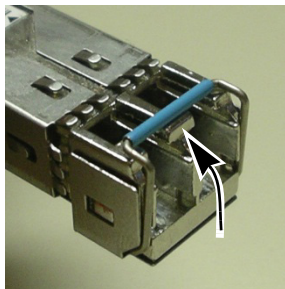
- A socket on the rear panel into which an SFP interface module is plugged
- An SFP (Small Form-factor Pluggable) module that performs output medium translation to which connections are made for optical fibers, coaxial copper, and so on.

### CAUTION

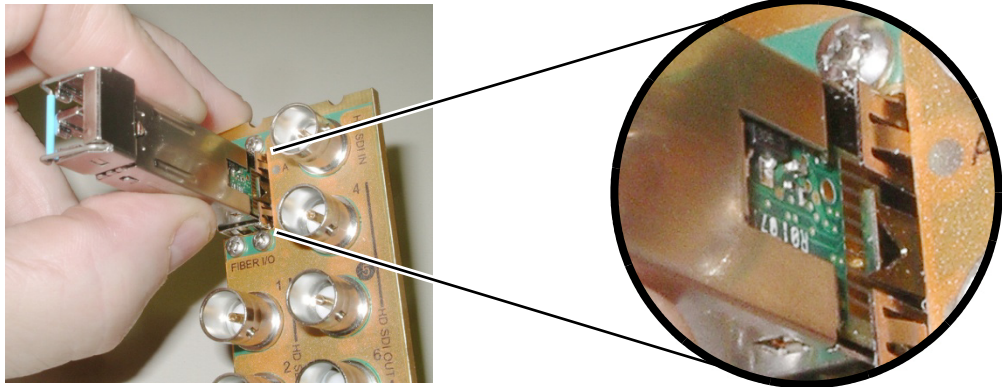
- SFP fiber Transmitter modules contain a class 1 laser, which emits invisible radiation whenever the module is powered up. Because the SFP is hot-swappable, the module may be powered up as soon as it is installed.
- DO NOT LOOK INTO AN OPERATING SFP FIBER MODULE'S CONNECTORS, AS EYE DAMAGE MAY RESULT.
- The SFP module is sensitive to electrostatic discharge (ESD). It is recommended that you use an ESD-preventive wrist strap grounded to the GV Node 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

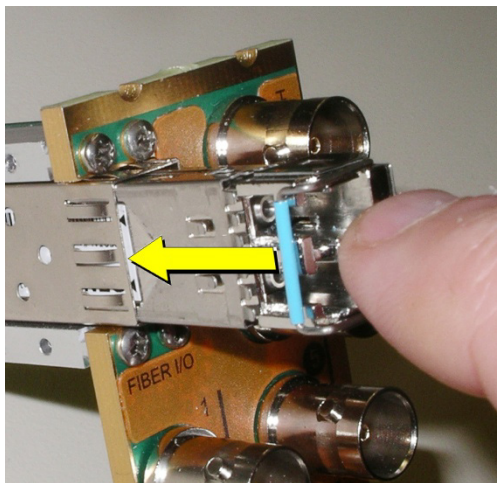
- 1 Make sure that the bale clasp lever is in the closed position.



- 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

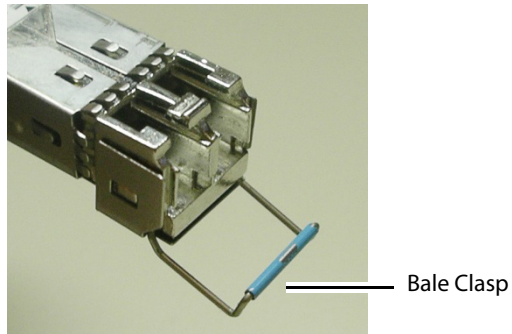
- 1 Remove the dust plug from the SFP module if present
- 2 Verify that the exposed end of the optical fiber in the LC connector is clean
  - Carefully remove any debris if necessary.
- 3 Plug the LC-terminated fiber optic cable into the SFP module

## Removing the fiber optic cables

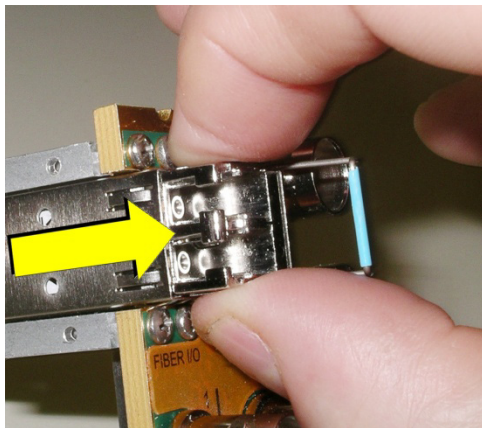
- 1 Grasp the LC fiber optic connector that is plugged into the SFP module, and pull it straight out to disengage the optical fiber from the SFP.
  - Never pull the fiber optic cable itself, as irreversible damage may occur.
- 2 Insert a dust plug into the SFP module.

## 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](http://www.grassvalley.com)).

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

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