

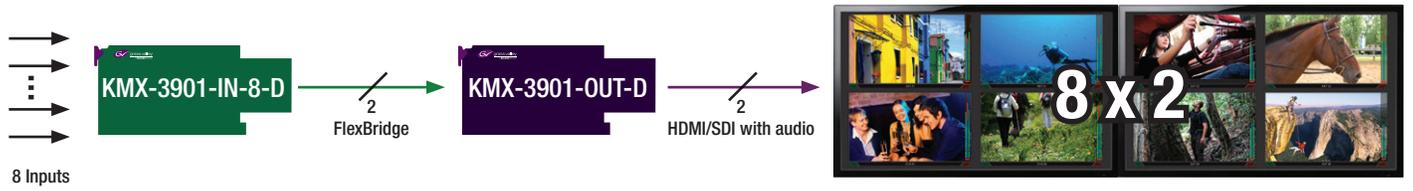
## FlexBridge Provides a Flexible Interconnection Solution Between the Input and Output Modules

Kaleido-Modular-X modules are interconnected using standard coax cables. FlexBridge connections are used to connect the input card to the output card, or to another input card as shown in the 32 x 4 configuration below. Up to four input and two output modules can be combined for multiviewer sizes of up to 64x4.

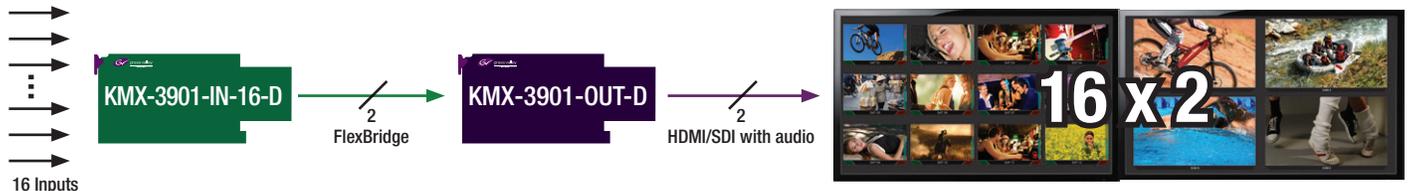
KMX-3901-IN modules are available with two or four FlexBridge connectors for bridging to one or two KMX-3901-OUT output modules: two FlexBridge connections per KMX-3901-OUT are required. Kaleido-Modular-X input and output modules can be housed in the same physical Densité frame or multiple frames allowing expansion beyond the number of slots available within a single frame.

### Sample Kaleido-Modular-X Configurations

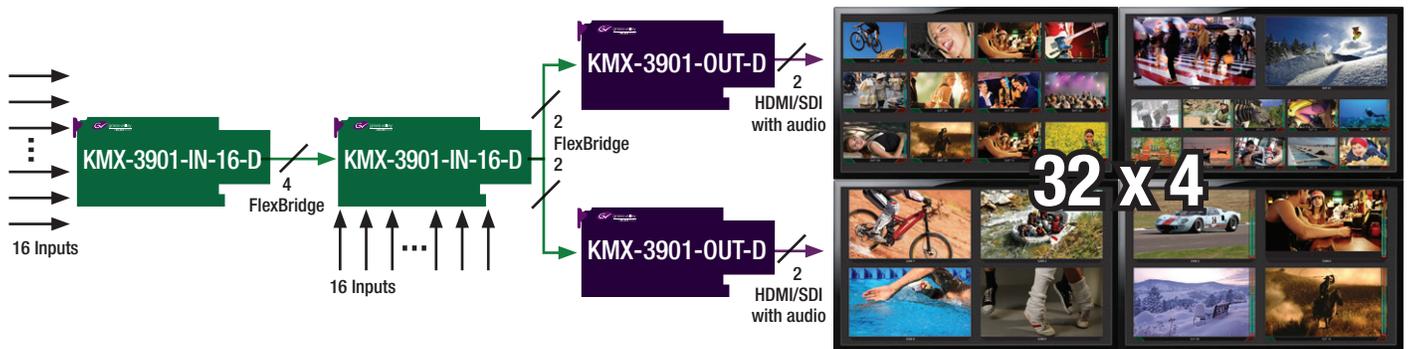
**8 x 2 configuration using one KMX-3901-IN-8-D and one KMX-3901-OUT-D**



**16 x 2 configuration using one KMX-3901-IN-16-D and one KMX-3901-OUT-D**



**32 x 4 configuration using two KMX-3901-IN-16-Q and two KMX-3901-OUT-D**



## Using FlexBridge for Optimized Cable Management with Distributed I/O

FlexBridge coax I/O provides flexibility in multiviewer configurations for best optimization of cabling. For example, the first diagram below illustrates a typical 48x4 multiviewer configuration within a single Densité 3 frame. The second diagram highlights how the input modules can be

installed in a location next to the sources and the output modules in a different location next to the displays up to 50m (164 ft.) away. This configuration eliminates the risk associated with HDMI extenders and minimizes expensive HDMI cables.

### Comparison of Installations to Optimize Cable Management

Case #1: without using FlexBridge



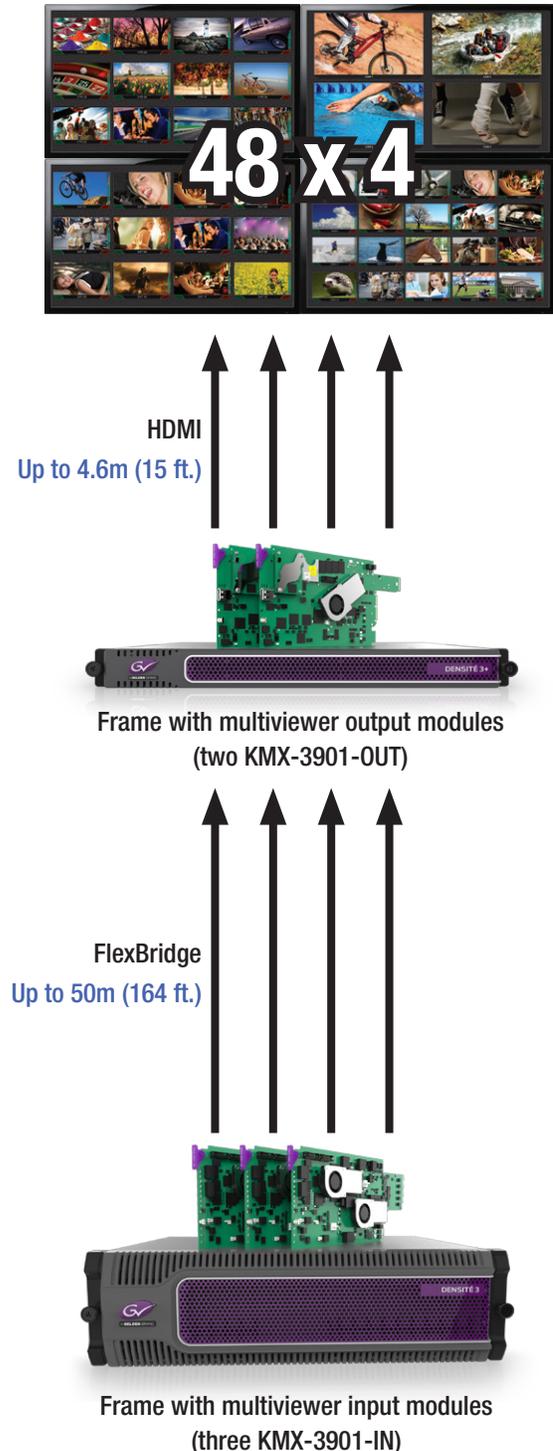
#### Case #1: Typical configuration with input and output modules in the same frame

The complete frame needs to be installed close to the displays because of restriction on HDMI cable lengths. This requires longer wiring to bring the sources inputs to the frame, or HDMI extenders need to be used.

#### Case #2: Unique FlexBridge configuration separating the input and output modules

This configuration allows minimizing source input wiring by installing the input modules close to the sources (ex: routing switcher), and minimize HDMI cable length by installing output modules close to the displays, all of this without the need for any HDMI extenders.

Case #2: using FlexBridge



## Production Truck Application

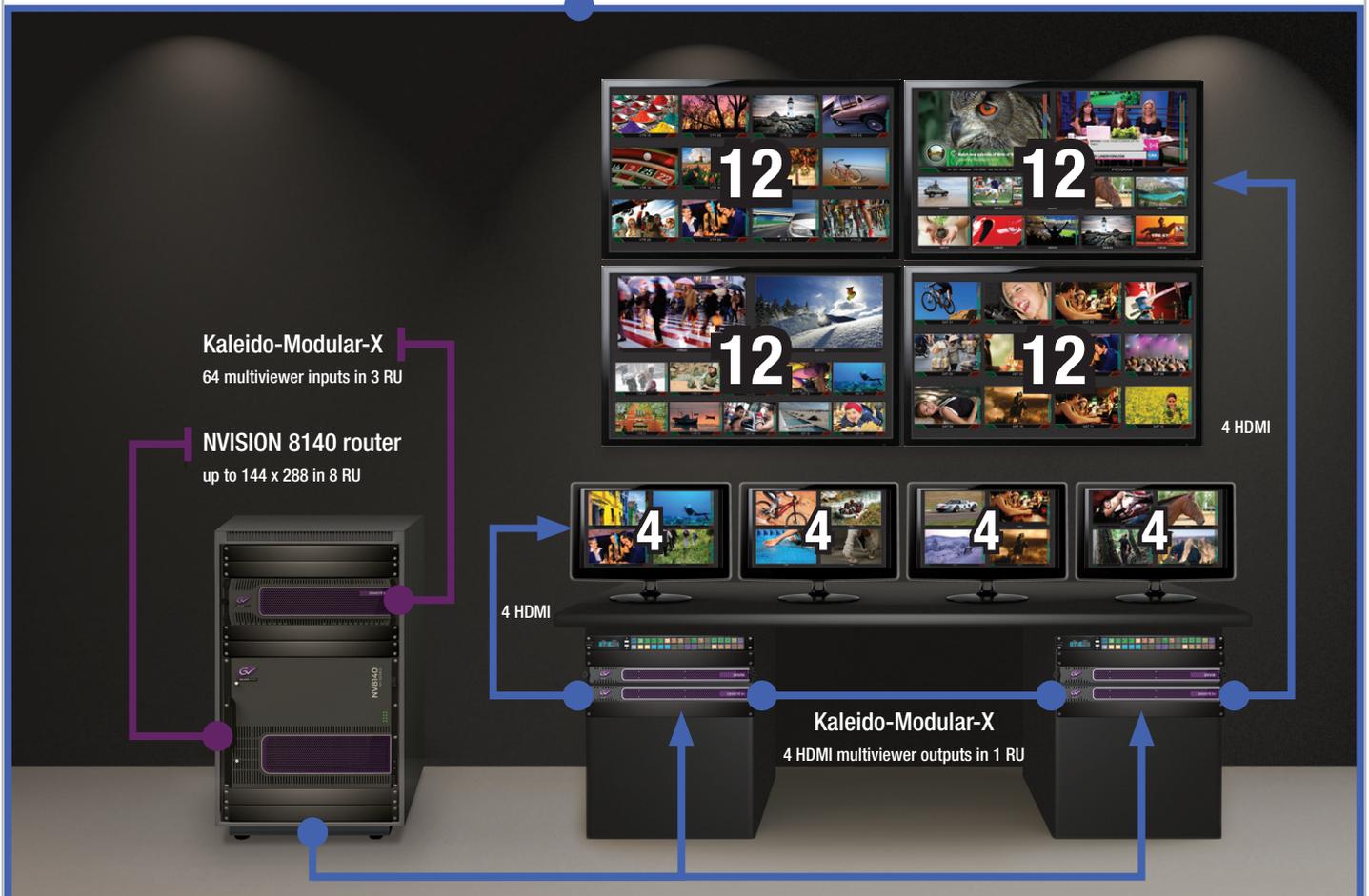
With space at a premium and the ever-present need to reduce overall weight in your production truck, Kaleido-Modular-X offers the ideal multiviewer solution.

In the truck application shown, a 48x4 multiviewer is used to drive the wall displays without any limitations on the number of sources per display. For the desktop displays, a 16x4 multiviewer configuration is used offering

flexible quad-splits with the ability to display all 16 sources on any screen. The complete installation requires a total of 5 RUs and provides 8 multiviewer displays with unique layout flexibility and best space usage. The Densité 3+ FR1 single RU frame are designed for quiet operations so that they can be installed close to people working in the truck.

### Kaleido-Modular-X Truck Application (Inside View)

- Simplify design and improve reliability by eliminating HDMI extenders
- Save space by regaining rack space under the console



## Unmatched Picture Quality and Display Elements

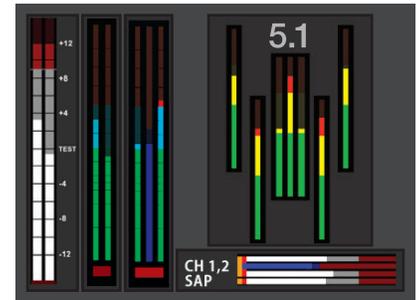
### Picture Quality

The Kaleido multiviewers system offers unmatched picture quality — irrespective of picture size — using Grass Valley’s polyphase scaling technology. Windows can be resized all the way from very small windows up to full screen display, without the loss of definition that is commonly associated with multiviewers. This high performance, combined with superior on-screen graphics, makes Kaleido ideal for the most critical monitoring applications.



### Audio Meters

Kaleido multiviewers can display four group, 16 channels, multichannel audio for multilingual and 5.1 applications. Audio level meters are extracted from analog, AES or embedded signals, and can be positioned inside the video window in transparency or outside. Ballistics and scales are configurable, and a phase correlation meter can be displayed with each pair. Dolby E audio can be extracted from an embedded audio signal for on-screen metering. An audio meter can readjust itself based on inserted Program Configuration metadata.



### Automatic Aspect Ratio Control and Safe Areas

Aspect ratio and safe area markers can be positioned over video windows to simplify multiformat monitoring. Free form safe area markers, based on a user’s bitmap, can be overlaid on top of each video window. This feature is useful to protect graphical content or branding that will be applied downstream after production.

The processor can automatically change a signal’s aspect ratio between 16:9 and 4:3, based on the Active Format Description (AFD), Wide Screen Signaling (WSS) or source resolution. Image formatting rules are followed during conversion, including letter/pillar boxing and resizing/cropping.



### Dynamically Updated UMDs

Text labels (UMDs) can be displayed inside or outside windows, and updated by a UMD controller. Dynamic text can be driven by NVISION and many third-party routers, and by some automation vendors. Kaleido multiviewers also offer a serial interface for leading production switchers, which provides tally updates as well as sources and destination labels. Text fonts are flexible and support UNICODE for multilingual text.



**Clocks and Timers**

Multiple analog and digital clocks/timers (with date) can be displayed with programmable offsets and configurable colors. The clocks/timers can be driven by LTC, referenced internally, or to an NTP server. Each input module features one LTC input.



**Signal Validity Monitoring**

The following parameters can be detected and presented on-screen, or reported to SNMP-based signal and facility monitoring systems, including Grass Valley's iControl systems:

**Video Probing**

- Video black
- Video frozen
- Video level too high
- Loss of video
- EAV SAV error

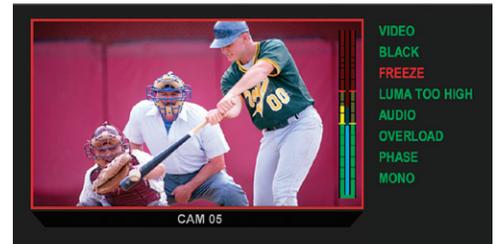
**Audio Probing**

- Audio silence
- Audio overload
- Audio mono
- Audio OUT of phase

**Metadata Monitoring**

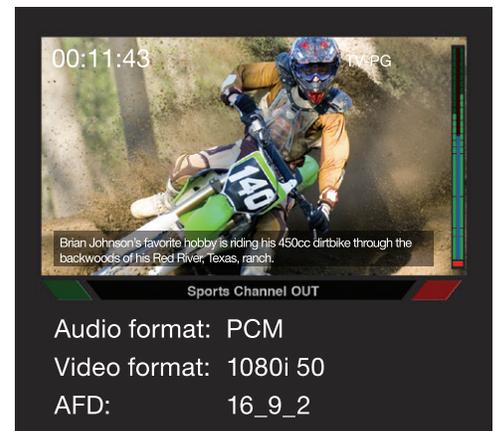
- XDS data including V-Chip rating
- Closed captioning and teletext (608, 708 and WST 42 and 47) is presented in the format seen by television viewers in their homes

Probing points can be configured with different thresholds, and a specific probing zone within the video can be configured for the freeze and black detection.



**Display of Closed Captions, Subtitles, XDS and Dolby E Metadata**

Closed captions and subtitles are presented in the format seen by television viewers in their homes. XDS data, including V-Chip information, can also be overlaid in each video window, along with the Dolby E metadata, AFD/WSS formats, and audio/video signal format.



## Superior Display Flexibility with Kaleido-Modular-X

Kaleido-Modular-X offers superior signal flexibility due to the system's high bandwidth performance. This allows an operator to focus on the ideal monitoring configuration, without worrying about system limitations.

### Any Source



### Any Resolution



Simultaneously display across monitors of different resolutions up to 1920 x 1200, and display across flat panels and projection cubes.

### Any Size



Signals can be displayed at any size up to full screen at full HD resolution.

### Any Repetition



Sources can be repeated across multiple displays.

### Any Position



Signals can be positioned anywhere across displays.

### Any Span



Signals can span across multiple displays.

### Any Format

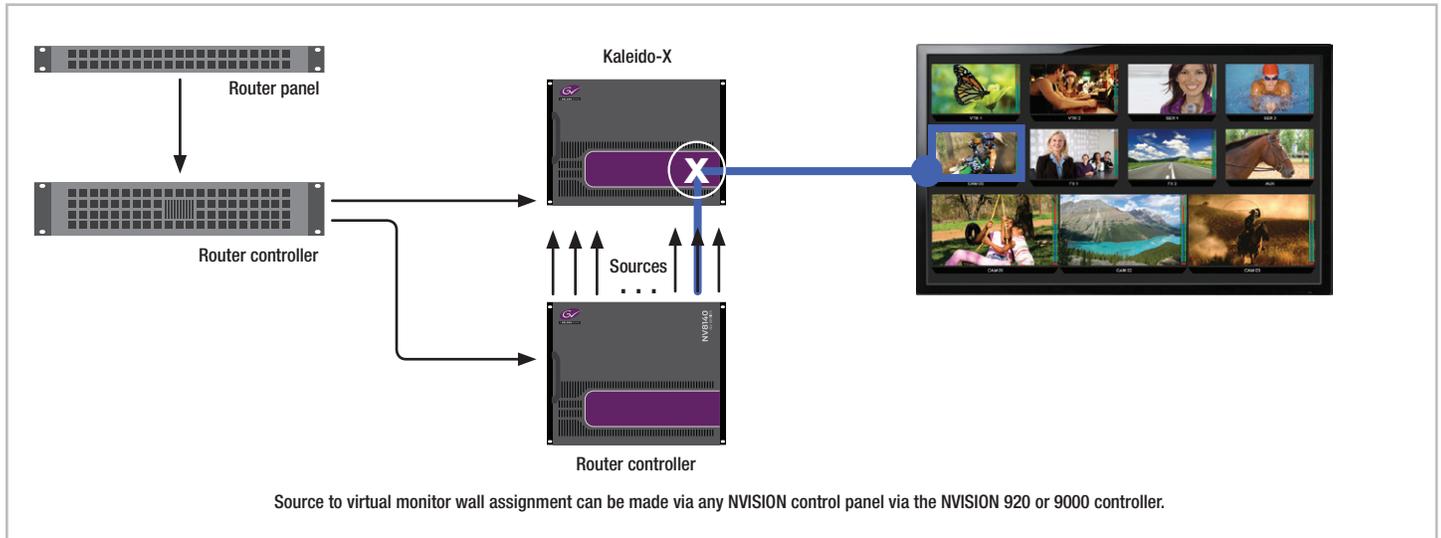


Signals of different aspect ratios can be displayed alongside each other, and the displays can be either landscape or portrait.

## Remote Control of Integrated Routing and Multiviewer Systems

Integrated multiviewer and routing systems can be controlled using a choice of remote control panels. One simple option is to use a traditional router control panel to assign any source, anywhere, any number of times on the monitor wall. This mimics what the router would do to a traditional monitor

wall, by allowing the user to assign any source to any destination. This type of control is available with the NVISION control panels (shown below), as well as third-party router control panels from Snell (Pro-bel) and Nevision.



### RCP-200

The highly graphical RCP-200 touchscreen remote panel offers more advanced control of combined multiviewer and routing systems. The panel provides multiviewer layout pre-set selection, and quick router source assignment control via a category/index graphical interface. The RCP-200 is a multifunctional panel, and can also be used for control of Densité Series interfaces.



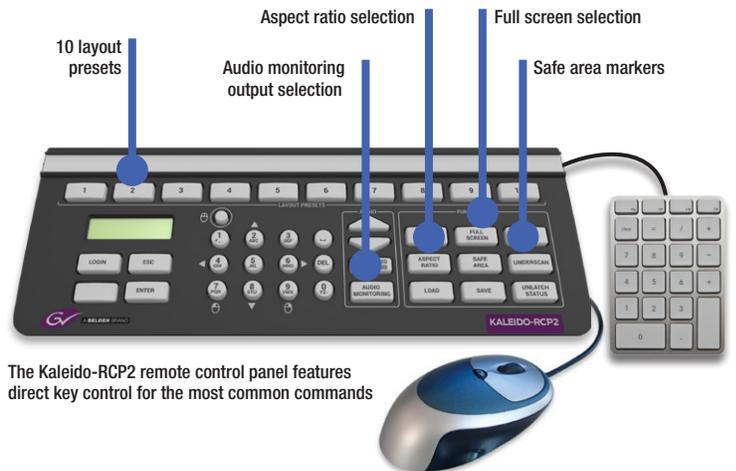
### Intuitive Control Across Multiviewers

Kaleido multiviewer systems can be easily controlled by one or more dedicated remote control panels, or by an on-screen mouse control.

Simple to use, on-screen mouse operated drop-down menus are contextual to speed operations, and offer numerous functions, such as changing aspect ratios, checking the safe area, assigning an input, and changing text in a UMD.

Users can also instantly change layout configurations, and dynamically zoom one source larger for quality control, or audio monitoring of an on-screen source.

The Kaleido-RCP2 remote panel exemplifies this simplicity, and provides easy multiroom, multioperator control over Ethernet, with local connections for a mouse and keyboard.



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