



Kaleido-X

High Picture Count Multiviewer with Advanced Alarming

A clear view for any of your monitoring requirements.

Kaleido-X multiviewers from Grass Valley offer the finest picture quality, unmatched display configuration flexibility and exceptional resilience. Ideal for applications demanding high picture counts per display and total non-blocking flexibility, Kaleido-X single frame solution offers up to 96 inputs and 8 outputs, and two frames can be connected together with the expansion option for up to 192 inputs and 12 outputs.

With its advanced metadata extraction, signal probing and alarming capabilities, Kaleido-X excels in master control and headend environments. When integrated with routers, Kaleido-X enables very large and versatile monitoring systems.

KEY FEATURES

Unmatched image quality

- Unmatched multiviewer picture quality and superior on-screen graphics, for the most critical monitoring applications

Highly resilient

- Frames designed to avoid a single point of failure, and include hot swappable cards and PSUs. Unique Auto-Recovery feature provides fast automated recovery after a “cold” spare card is inserted in the frame

Advanced metadata extraction, probing and alarming

- Integral metadata extraction, signal probing and on-screen alarms. Metadata extraction includes closed captioning/teletext and AFD/WSS, as well as Dolby E (dialnorm, program configuration and audio level meters)

Layout flexibility

- Ultimate level of layout flexibility, with unlimited signal repetition and sizing across all displays, without blocking or grouping restrictions

Multiroom oriented

- A single Kaleido-X multiviewer can be used to share sources across multiple rooms, with fully independent displays and control panels. Multiroom display layouts can be prepared easily with the XEdit software

Seamless control across multiple multiviewers

- Kaleido-X multiviewers can be “mixed-and-matched” with other Kaleido multiviewers to create a seamless monitoring system across a facility, and this can deliver exceptional cost, space, and power efficiency

Triple rate performance

- 3G/HD/SD/Composite performance

Router integration

- Kaleido-X offers rich integration with the Sirius router family, and third-party routers, to allow expansion up to 1,152 video inputs and 96 multiviewer outputs



SPECIFICATIONS

Inputs (16 per card)

Composite

Card: KXI-16HSV3 or KXI-16SV
Signal: NTSC (SMPTE ST 170), PAL, PAL-N, PAL-M, SECAM
Return loss: >25 dB up to 5.75 MHz
Quantization: 8 bits
Impedance: 75Ω

SD-SDI

Card: KXI-16HS3, KXI-16HSV3 or KXI-16SV
Signal: 4:2:2 SMPTE ST 259-C (270 Mb/s)
Formats: 525 and 625
Audio: SMPTE ST 274-1994
Return loss: >15 dB up to 270 MHz
Jitter: <0.2 UI

Cable length: 250m (820 ft.) Belden 1694A

HD-SDI

Card: KXI-16HS3 or KXI-16HSV3
Signal: 4:2:2 SMPTE ST 292-C (1.5 Gb/s)
Formats: 720p29.97 Hz, 720p25 Hz, 720p24 Hz, 720p59.94 Hz, 720p50 Hz, 1080i59.94 Hz / 29.97 Hz (PSF), 1080p29.97 Hz, 1080i50 Hz / 25 Hz (PSF), 1080p25 Hz, 1080p23.98 Hz / 24 Hz, 1080p23.98 (PSF) / 24PSF, 1080i50 Hz
Audio: SMPTE ST 299
Return loss: >12 dB up to 1.485 GHz
Jitter: <0.2 UI
Cable length: 100m (328 ft.) Belden 1694A

3G-SDI

Signal: SMPTE ST 424-2006 (2.97, 2.97/1.001 Gb/s) Level A and B
Formats: 1920x1080p60, 1920x1080p59.94, 1920x1080p50
Audio: SMPTE ST 299
Return loss: >10 dB up to 2.97 GHz
Jitter: <0.3 UI
Cable length: 100m (328 ft.) Belden 1694A

DVI Background Inputs

Inputs: KXO-DUAL3-B
Description: Each DVI background input is dedicated to one DVI output
Signal (2): DVI-D
Resolutions: No scaling available, must match the DVI output resolution

Mosaic Outputs (Video and Graphic)

DVI (2)
Card: KXO-DUAL3-B
Signal: DVI-D
Resolutions: Variable/autosensing from 800x600 to 1920x1200
H frequency: 37 kHz to 96 kHz
Refresh rate: 50/59.94 Hz
Processing delay: 1 frame total when signals and frame are genlocked
Scaling performance: High-quality adaptive filtering process providing best performance scaling for every image size
Connector: DVI-I

HD-SDI (2)

Signal: 3G/HD-SDI SMPTE ST 424 and SMPTE ST 292 compliant
 Supports data rates of 1483.5, 1485, 2967, 2970 Mb/s
Return loss:
 >15 dB up to 1.5 GHz
 >10 dB from 1.5 GHz to 3 GHz
Jitter (wideband):
 HD: <0.2 UI
 3 Gb/s: <0.3 UI

Reference

Reference input: KXO-GPI-GEN or KXO-GPI-GEN-R
Supported formats: SMPTE ST 170, SMPTE ST 318, ITU 624-4, BUT 470-6, PAL and NTSC composite sync, SMPTE ST 274, SMPTE ST 296, SMPTE ST 240

Analog Audio

Inputs: ABT-64A or ABT-128A
Signals (64 or 128 mono channels): 20kΩ balanced, 10kΩ unbalanced
Maximum level: +24 dBu
Connectors: WECO

Analog Audio Monitoring

Outputs: KXO-DUAL3-B
Signals (2): Balanced analog stereo
Impedance: <600Ω
Level: +24 dBu maximum
Connector: WECO

AES Audio Monitoring

Outputs: KXO-DUAL3-B
Signals (2): AES3
Impedance: <110Ω
Connector: WECO

LTC Inputs

Card: KXO-DUAL3-B
Signal (3): SMPTE ST 12-1995 (EBU-3259-E), SMPTE ST 309
Level: 500 mVp-p to 10 Vp-p
Impedance: >10 kΩ
Refresh rate: 50/59.94 Hz
Connectors: (2) WECO (www.weco.ca) plug-in screw connector system for printed circuit boards type 930-HFL (-DS), 930/931-HSL, (1) BNC

GPI I/O

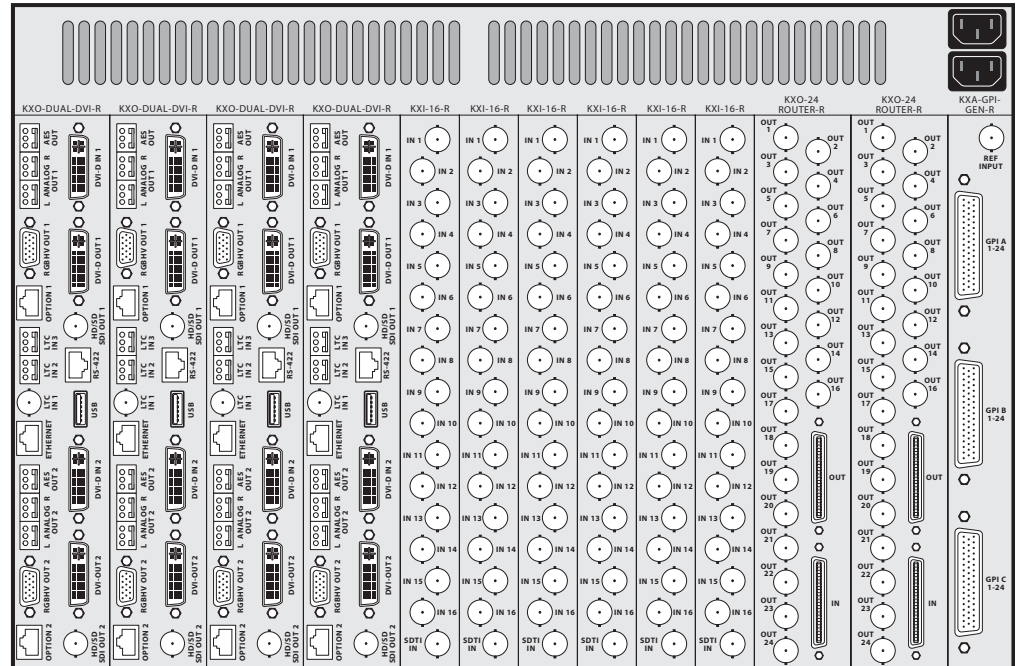
Card: KXO-GPI-GEN or KXO-GPI-GEN-R
Signals (72): Contact closure
Description: Bidirectional input or output by configuration
GPI input: Opto-isolated, active low with internal pull-ups to 5 VDC and up to 12 VDC
 Open collector 5 to 12 VDC

KALEIDO-X (7 RU) Frame

Power supply: Hot swappable redundant power supplies
Input voltage: 100-240V
Frequency: 50/60 Hz
Power: 1,500W
Max current: 15A
Dimensions:

- H: 309 mm (12.25 in.) (7 RU)
- W: 448 mm (17.6 in.)
- D: 527 mm (20.7 in.)

Full spec temperature range: 0 to 25° C (32 to 77° F) (ambient)
Weight: 27.43 kg (60.47 lbs.) fully loaded



Kaleido-X (7 RU) Rear Panel View

Increasing Video Inputs and Multiviewer Outputs



- Kaleido-X (7 RU)**
- 96 video inputs
 - 8 multiviewer outputs

- Two Kaleido-X (14 RU)**
- 192 video inputs
 - 12 multiviewer outputs

- Kaleido-X + Sirius router**
- Up to 1152 video inputs
 - Up to 96 multiviewer outputs

The Kaleido-X system can be configured to provide monitoring systems ranging from 32 inputs and 4 multiviewer outputs, all the way up to 1152 inputs and 96 multiviewer outputs when connected to a router.

ORDERING

Frame Selection

KXA-FR7-B

Kaleido-X multi-image microprocessor 7 RU frame

KXA-FR14-EXP

Kaleido-X with two FR7 frames and expansion

Note: 1 kit includes two KXA-FR7-Frame, two KXA-GPI-GEN-F, four KXA-PSU-7 and two KXO-EXP-K

Input Modules

KXI-16HS3

16 HD/SD-SDI and 3G input module (3 Gb/s license required)

KXI-16HSV3

16 Composite, HD/SD-SDI and 3 Gb/s input module

Video Input Options

KXS-CSX

CC/subtitling and XDS data license (1/input card)

KXS-DOLBY

License for extraction of Dolby metadata extraction license (1/input card)

KXS-LOUDNESS

Loudness level measurement license (1/input card)

KXS-3GBPS

3 Gb/s format license (1/input card)

Audio Input Modules

ABT-128A

128 channel analog audio bridge terminal

ABT-64A

64 channel analog audio bridge terminal

Output Module

KXO-DUAL3-B

Dual head output module with RGBHV/DVI

Output Options

KXO-HDM-B

Dual channel HD-SDI monitoring output mezzanine

KXS-ROTATOR

Display rotation license (1/output card)

DXF-4K-DVI

DVI extension system. Includes transmitter, DVI to HDMI adapter, receiver and PSUs. Distance: 1 km (3,280 ft.).

KXO-EXP-K

Kaleido-X expansion kit w/high bandwidth cables

Note 1: One KXO-EXP-K replaces one output card in each Kaleido-X frame

Note 2: For router control with physical control panel, use GV Orbit from Grass Valley.

Control Panel Option

KALEIDO-RCP2

Ethernet remote control panel and KM Gateway

KRCP-RK2

Kaleido-RCP2 rack mount bracket

System Options

KXA-GPI-GEN-R

Kaleido-X GPI and genlock module option for FR7

KXA-TBA-G

GPI I/O terminal block adapter

Spares

KXA-PSU-7

KXA-FR7 replacement power supply module

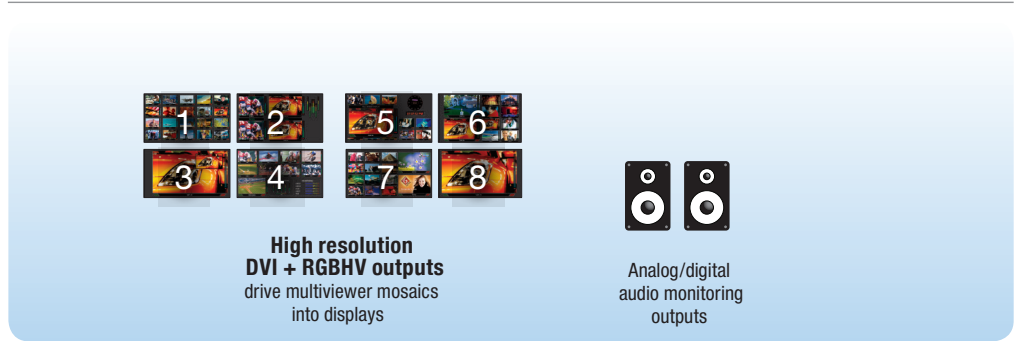
PSU-POE

Replacement power over Ethernet module

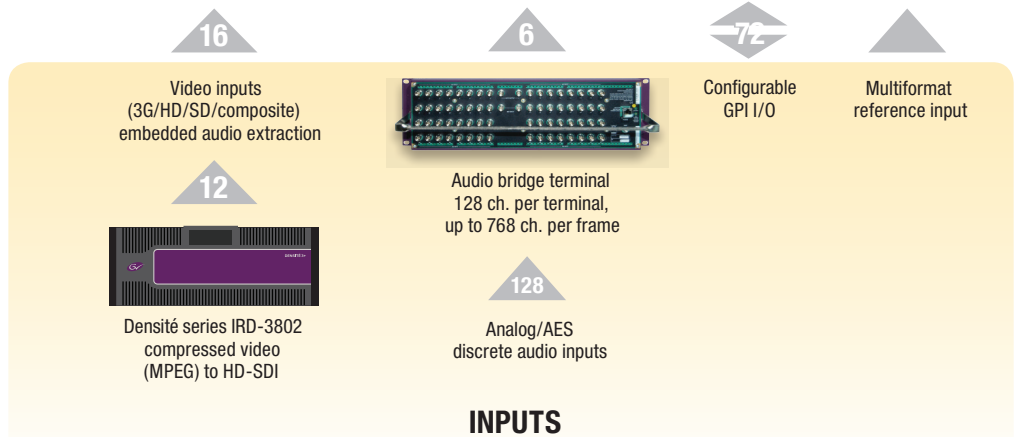
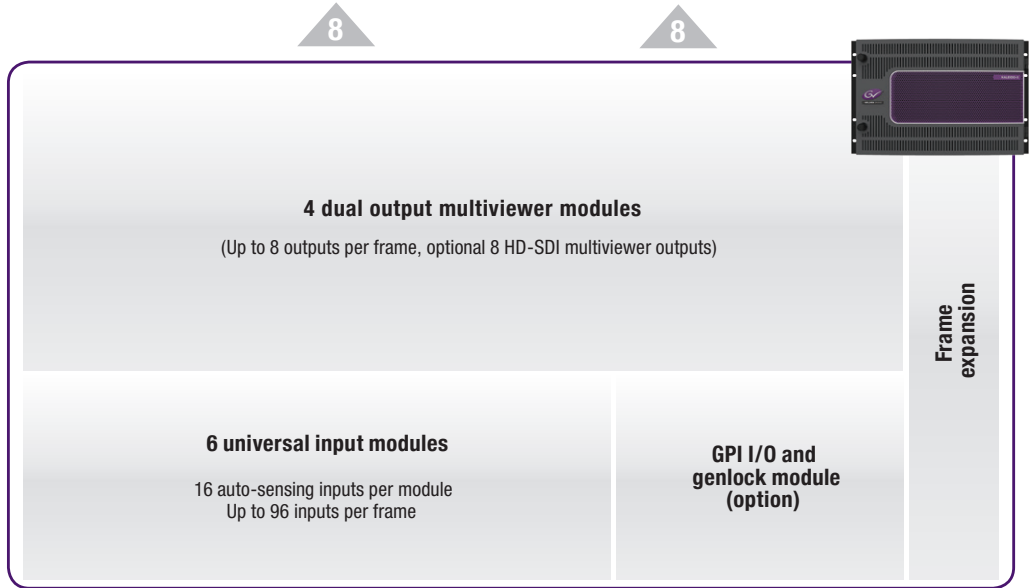
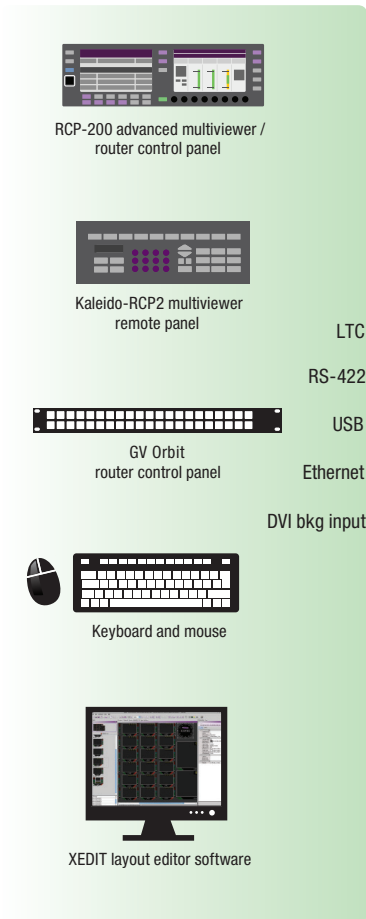
Kaleido-X (7 RU) 96 Inputs / 8 Multiviewer Outputs

- 7 RU modular frame
- Up to 96 video inputs, 8 independent multiviewer display outputs
- Modular configuration with 16 autosensing 3G/HD/SD/analog video input modules and dual multiviewer output cards
- Expansion by connecting a second 7 RU frame or by interfacing with a router
- 8 channel analog/digital audio monitoring outputs
- DVI and compressed (MPEG) video can be accepted with optional interfaces
- DXF-4K-DVI DVI extension system. Includes transmitter, DVI to HDMI adapter, receiver and PSUs. Distance: 1 km (3,280 ft.).
- Choice of multiviewer remote control panels: simple Kaleido-RCP2 and advanced RCP-200 with router control
- Internal router control by GV Orbit Control or third-party systems.

OUTPUTS



CONTROL



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

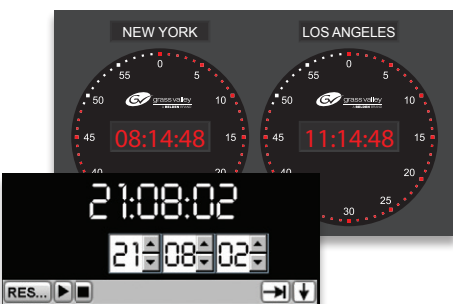
Aspect ratio and safe area markers can be positioned over video windows to simplify multiformat monitoring. Free form safe area markers, based on a user's bitmap, can be overlaid on top of each video window. This feature is useful to protect graphical content or branding that will be applied downstream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



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 output module features three independent LTC inputs.

Unmatched Picture Quality and Display Elements



Picture-in-Picture and Display Customization

Picture-in-picture displays can be generated for easy comparisons between playout and return feed signals or for the playout server's backup confidence monitoring. Main/backup comparison is also available via split-screen monitor configuration with both main and backup videos in one channel.

Bitmap images can be displayed to customize the display background with channel logos and other graphics.



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 GV Orbit systems:

Video Probing

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

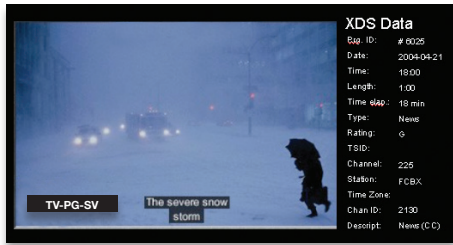
Audio Probing

- Audio silence
- Audio overload
- Audio mono
- AudioOUT of phase

Metadata Monitoring

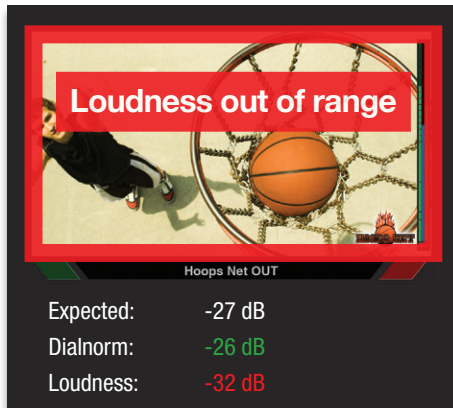
- XDS data including V-Chip rating
- Closed captioning and teletext (608, 708 and WST 42 and 47) is presented in the format seen by television viewers in their homes
- DVB Subtitling display and monitoring over IP inputs

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.



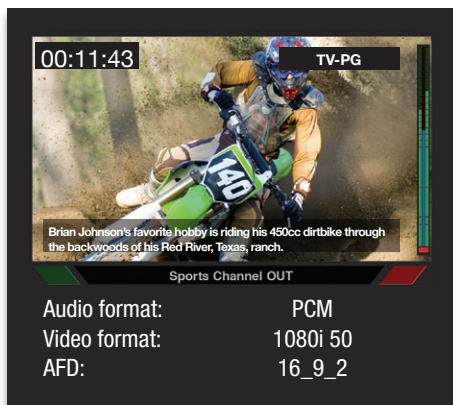
Loudness/Dolby Monitoring

In addition to displaying the Dialnorm value encoded in the video signal, Kaleido processors can also measure the perceived loudness of the audio signal and compare it to the encoded value. The system can alert operators when signals exceed thresholds, by comparing the Dialnorm and measured loudness against a target values. The loudness is measured using LEQ-A or ITU-R-BS-1770.



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

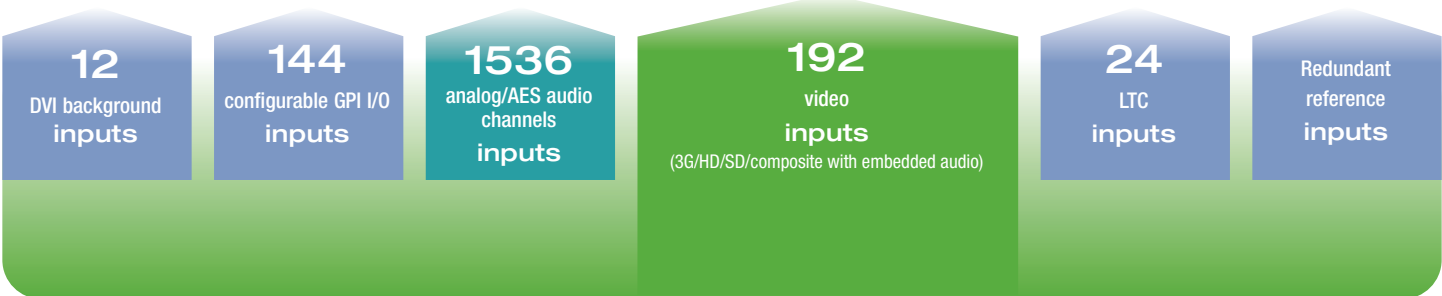
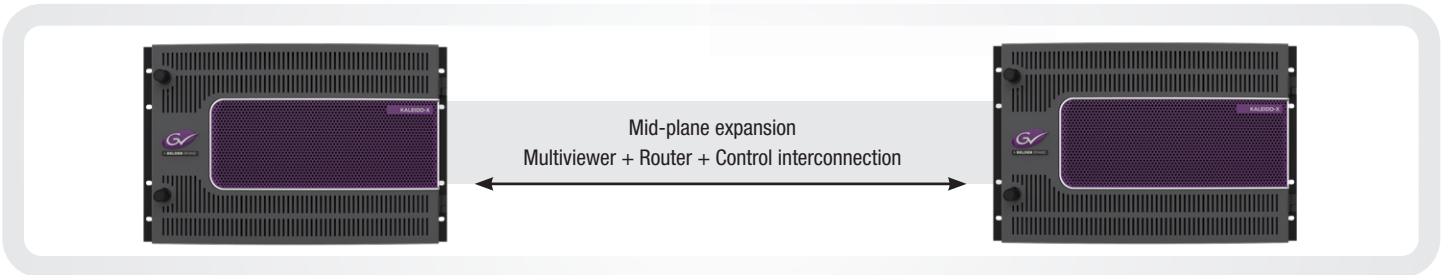
Closed captions and subtitles are presented in the format seen by television viewers in their homes. XDS data, including V-Chip information, can also be overlaid in each video window, along with the Dolby E metadata, AFD/WSS formats, and audio/video signal format. DVB subtitles display and monitoring over IP with unique multilanguage DVB subtitling monitor widget for efficient use of screen real estate.



Creating A Larger System Using Two 7 RU Frames

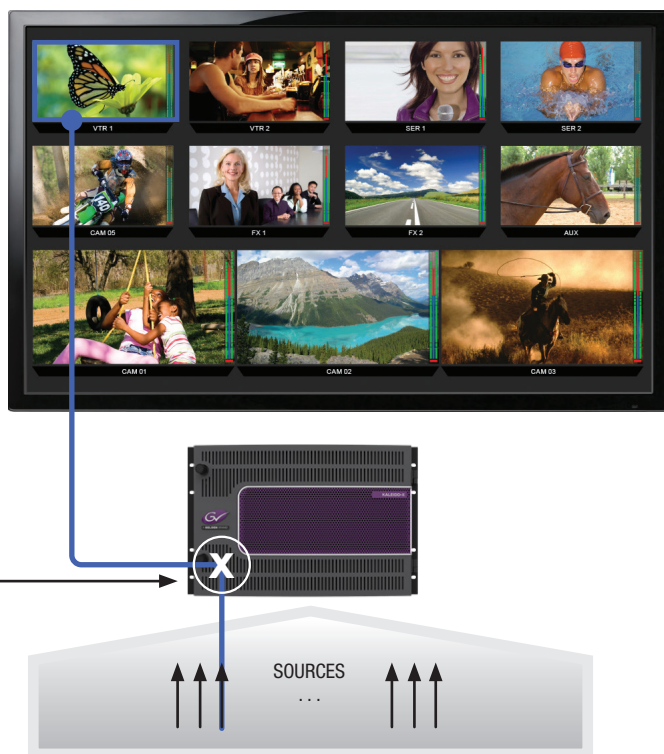
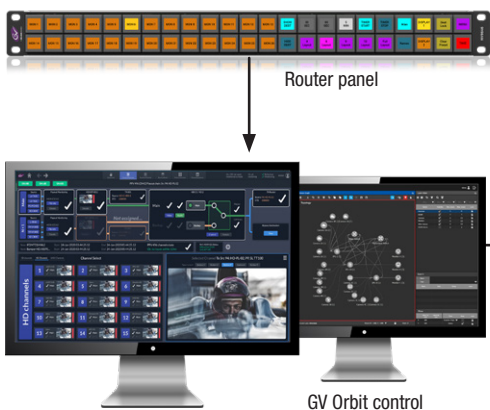
By using Kaleido-X's mid-plane expansion module, two Kaleido-X (7 RU) frames can be connected to display up to 192 video inputs over up to 12 displays. This configuration provides easy system expansion without losing any of Kaleido-X's extreme signal flexibility, due to the full interconnectivity of video, audio and metadata, as well as timecode and control signals.

12 independent multiviewer displays



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 GV Orbit control panels, as well as third-party router control panels.



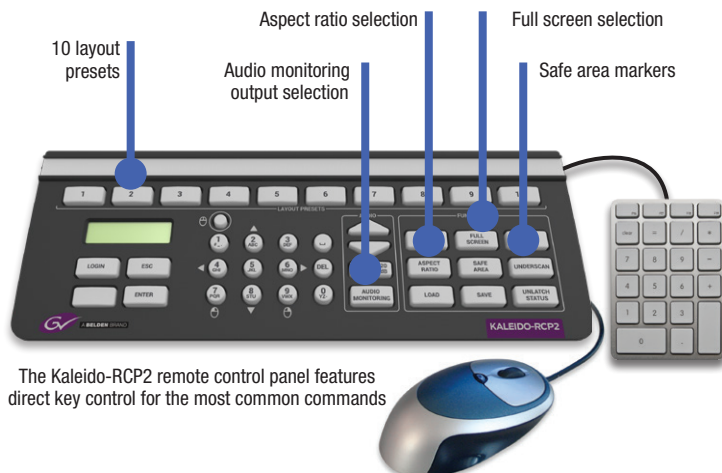
The highly graphical RCP-200 touchscreen remote panel offers more advanced control of combined multiviewer and routing systems. The panel provides multiviewer layout pre-set selection and quick router source assignment control via a category/index graphical interface. The RCP-200 is a multifunctional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

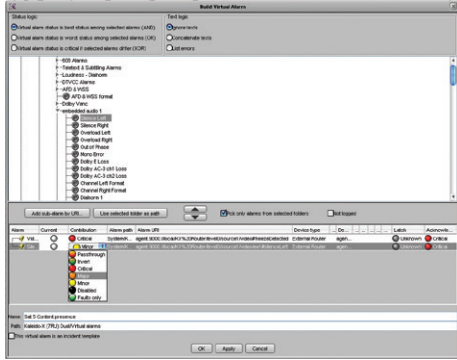
Users can also instantly change layout configurations, and dynamically zoom one source larger for quality control, or audio monitoring of an on-screen source. The Kaleido-RCP2 remote panel exemplifies this simplicity, and provides easy multiroom, multioperator control over Ethernet, with local connections for a mouse and keyboard.



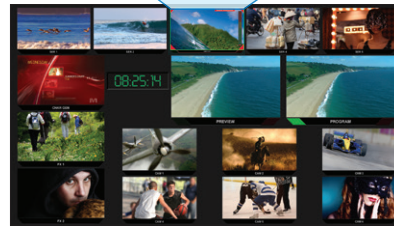
The Kaleido-RCP2 remote control panel features direct key control for the most common commands

Sophisticated Alarm Displays

The Kaleido-X offers very sophisticated alarm display elements, which are activated when video/audio, metadata or SNMP alarms are detected. Informative text and graphics alert operators at the monitor wall, with color coded on-screen alarm status indicators. These status indicators can be configured to latch the status, in case of sudden faults that cannot be intercepted by the operators. Acknowledgment mechanisms are available, with interaction by an on-screen mouse.



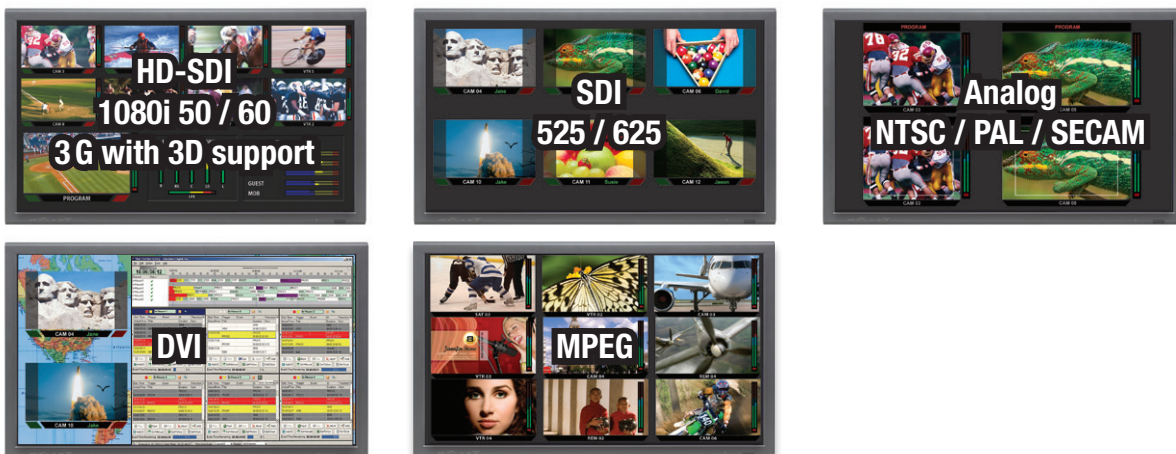
A new virtual alarm configuration tool allows grouping of alarm statuses to create a single "virtual" alarm. It also offers alarm severity configuration and logical operations like AND, OR, and XOR between alarms.



Superior Display Flexibility with Kaleido-X

Kaleido-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



Auto-sensing inputs allow multiple source formats to be combined. DVI and MPEG are input via external options.

Any Resolution



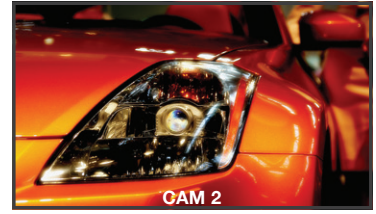
Simultaneously display across monitors of different resolutions up to 1920x1200, and display across flat panels and projection cubes.

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 two displays.

Any PIP



Sources can be repeated (picture in picture) across displays.

Any Format

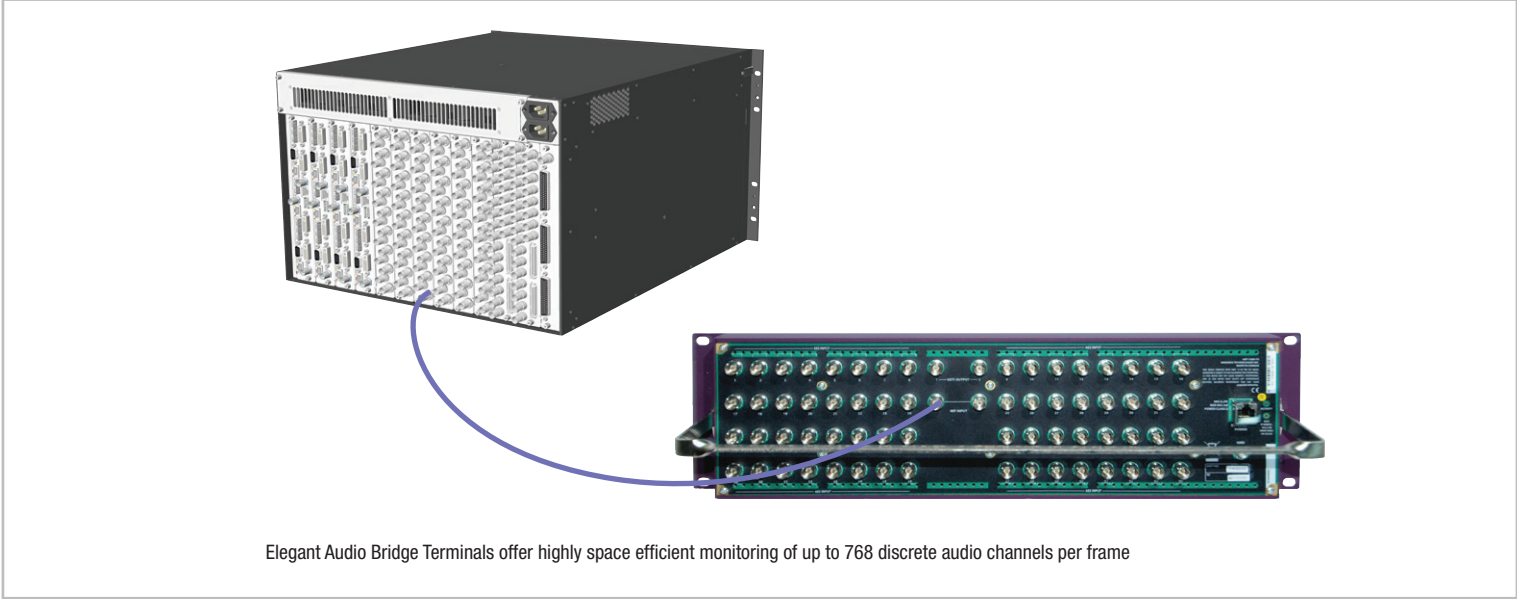


Signals of different aspect ratios can be displayed alongside each other, and the displays can be either landscape or portrait.

Kaleido-X offers exceptional audio performance, with the ability to monitor up to 2,304 channels of audio per 7 RU frame (1,536 embedded audio channels plus 768 discrete audio channels), including embedded or discrete analog.

The amount of cabling needed for discrete (non embedded) audio is minimized by the Audio Bridge Terminals, which accept analog (balanced or unbalanced). The Audio Bridge Terminals can fit in the back of racks, and can be located up to 250m (800 ft.) away from a Kaleido-X frame, with connection over standard video coax. With this configuration, it is no longer necessary to route individual audio signals to the multi-image processor/router.

Audio Bridge Terminals offer two coaxial outputs which provide redundancy and allow audio inputs to be shared among multiple frames. Power for the Audio Bridge Terminals originates from external supply or from the Ethernet switch using Power over Ethernet (PoE).



Dolby E metadata can be extracted from an embedded audio signal to feed 5.1 audio level meters. Audio meter assignment is slaved from the Dolby E Program Configuration, and this allows precise monitoring of Dolby E audio without additional hardware.

Multiroom Production Monitoring with a Single Multiviewer

Kaleido-X offers highly effective, multiroom production monitoring, with fully independent display layouts and control panels in each room. The monitoring displays can be quickly reconfigured for different productions, with full flexibility over window positioning and sizing. The processor's high-quality multiviewer outputs also make it ideal for the most critical live monitoring applications.

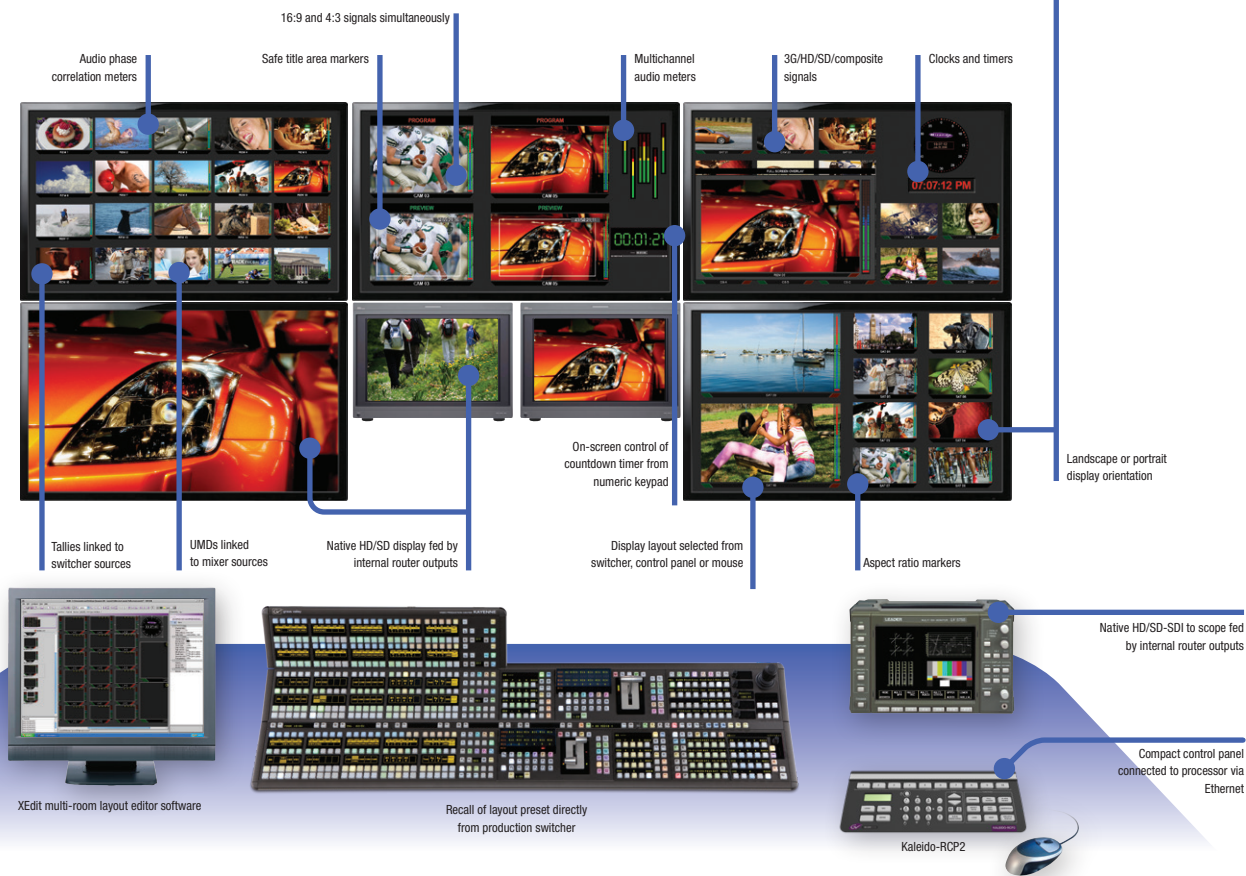
Room 1: Audio



Room 3: Camera shading / VTR



Room 2: Production control



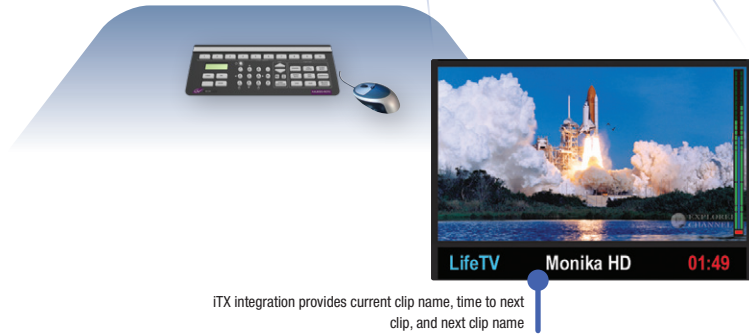
Multichannel Playout Monitoring with a Single Multiviewer

Kaleido-X's flexible architecture makes it highly suitable for multipod, playout monitoring applications. Each pod can have an independent display layout, with independent control using a dedicated remote panel. All sources can be shared across the pods, which allows easy pod layout changes to handle more or fewer channels, as commonly happens during night shifts with reduced operator crews.

Pod 1: HD Channel Monitoring



Pod 3: HD Channel Monitoring



Pod 2: HD/SD Channel Monitoring



Kaleido-RCP2 Compact control panel connected to processor via Ethernet



Router Integration: High Picture Counts Per Display

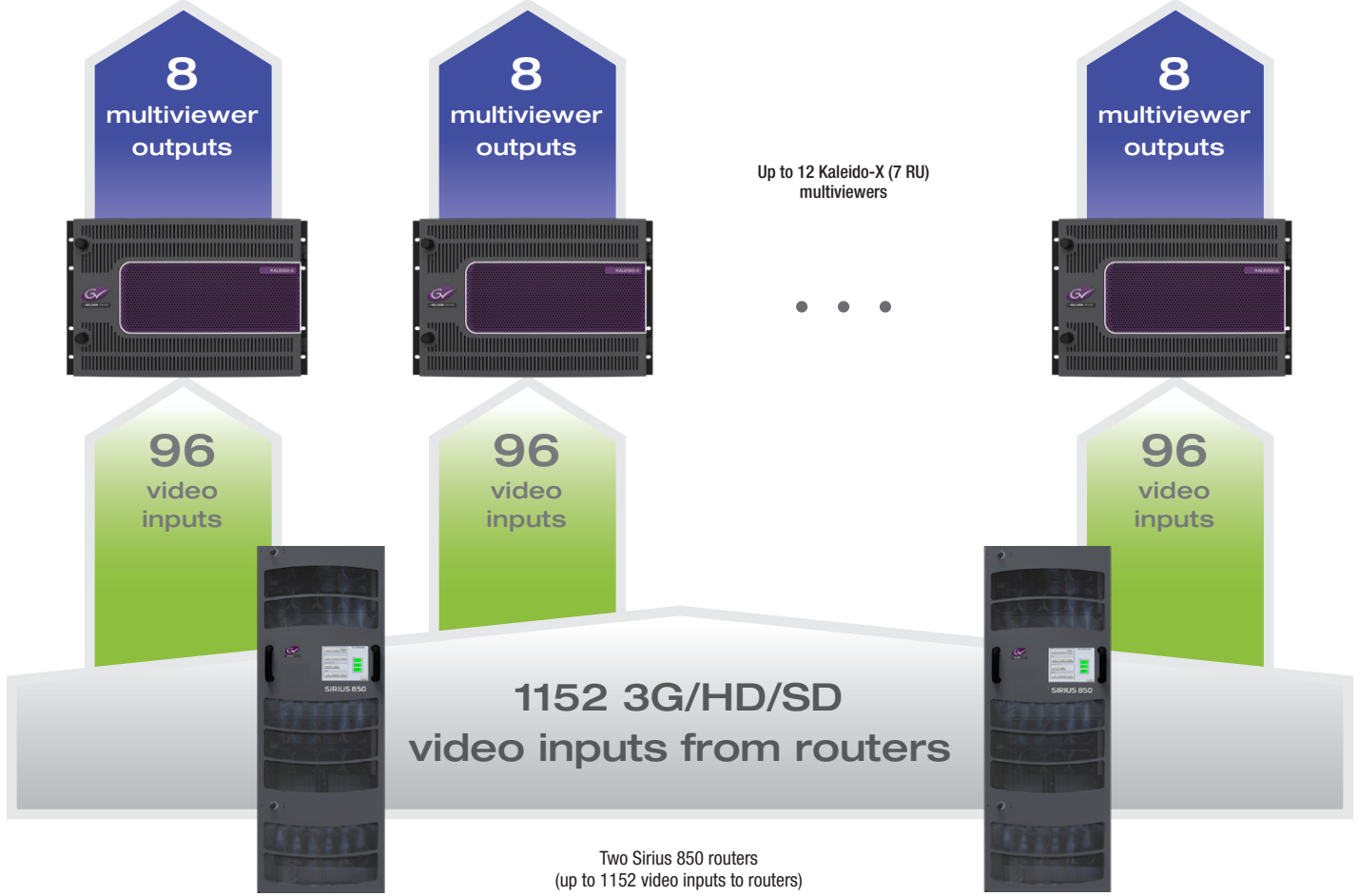
Kaleido-X offers rich integration with GV Orbit and third-party routers, to allow expansion up to 1,152 video inputs and 96 multiviewer outputs. Grass Valley's Cluster Feature enables multiple multiviewers to behave like a single system from an operator's perspective, with full layout flexibility.

Since the 7 RU Kaleido-X frame can accept up to 96 video inputs (3G/HD/SD/ analog), the number of video windows per monitor can be much higher than with the smaller Kaleido-Modular and Kaleido-X16 multiviewers.

This higher image density per screen can be beneficial for high channel count continuity monitoring applications, such as playout centers.

For example, two Sirius 850 routers are integrated with 12 Kaleido-X (96x8) multiviewers. Each Kaleido-X frame can process up to 96 video inputs and provide up to 512 instances of virtual video monitors over eight multiviewer outputs. The entire system is fully integrated to offer seamless control of the source assignments via on-screen mouse operation or by a router control panel.

96 independent multiviewer displays



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