

Kaleido-MX

High Quality, Pre-Configured Multiviewer (up to 64x4)



A clear view for any of your monitoring requirements.

Pre-configured for simple and easy installation, Kaleido-MX from Grass Valley, a Belden Brand, is available in a wide choice of configurations for both high-end in-studio TV production and outside broadcast trucks, as well as high quality playout facilities.

Kaleido-MX offers reduced power consumption and a lightweight, compact design that's ultra-quiet and runs cool.

With advanced probing features, which rapidly and clearly alert operators to on-air problems, the Kaleido-MX is perfect for ensuring a high quality of broadcast for master control playout.

Innovative scaling technology within Kaleido-MX offers the best video image quality as well as full layout flexibility to assign "any source, anywhere" with no bandwidth limitations. Kaleido-MX provides hot swappable modules and power supplies for robust performance in the harshest environments.



Kaleido-MX 1RU



Kaleido-MX 3RU

Kaleido-MX High Quality, Pre-Configured Multiviewer (up to 64x4)

KEY FEATURES

Unmatched image quality

- Unmatched multiviewer picture quality and superior on-screen graphics, for the most critical monitoring applications and high-end TV production requirements
- Simultaneous HDMI and SDI outputs at full 1080p50/60 Hz resolution on up to 4 multiviewer displays
- Input signal processing up to 3G signal formats

Robust and serviceable design

- Unique Auto-Recovery feature provides fast automated recovery after a “cold” spare is inserted into the frame
- Hot swappable modules and power supplies
- 1 RU and 3 RU frame models with quiet cooling

Multiroom, multiuser oriented

- A single Kaleido-MX 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 “mixed-and-matched” with others to create a seamless monitoring system across a facility
- Choice of multiple control options such as standalone RCP-2/RCP-200 panels, integrated with router control systems and panels, iControl and third-party control systems

Superior layout flexibility

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

Router and Switcher Integration

- Kaleido-MX offers rich integration with NVISION router family, and third-party routers and production switchers for tally and label/alias source management.

- Multiple multiviewers can be controlled from a single control panel

Scalable for the largest systems

- Virtually limitless multiviewer system expansion with upstream NVISION router
- Can create combined multiviewer/router system with 1,152 video inputs, 288 multiviewer outputs

Advanced Probing and Alarming

- Closed captioning and teletext subtitling display and alarming to ensure compliance with regulation, includes XDS and AFD
- Software licensable Dolby E metadata extraction for metering and content alarming without the need of expensive hardware decoders
- Sophisticated on-screen alarm displays for clear operator alerts. Supports multicolor and blinking statuses based on severity, latching and status message

SPECIFICATIONS

Video Inputs (8, 16, 24, 32, 48 or 64)

Connector: DIN 1.0/2.3

SD-SDI

Signal: 4:2:2 SMPTE 259M-C (270 Mb/s)

Formats: 525 and 625

Audio: SMPTE 274M-1994

Return loss: >15 dB up to 270 MHz

Jitter: <0.2 UI

Cable length:

– 250m (820 ft.) (Belden 1694A)

– 150m (492 ft.) (Belden 1855A)

HD-SDI

Signal: 4:2:2 SMPTE 292M-C (1.5 Gb/s)

Formats: 720p24/25/29.97/50/59.94,

1080p23.98p/24p/25i/29.97i,

1080i50/59.94, 1080p23.98/24/25/29.97

Audio: SMPTE 299M

Return loss: >15 dB up to 1.5 GHz

Jitter: <0.2 UI

Cable length:

– 100m (328 ft.) (Belden 1694A)

– 45m (148 ft.) (Belden 1855A)

3G-SDI

Signal: SMPTE 424M-2006 (2.97, 2.97/1.001 Gb/s) Level A and B

Formats: 1920x1080p60, 1920x1080p59.94, 1920x1080p50

Audio: SMPTE 299M

Return loss:

– >15 dB up to 1.5 GHz

– >10 dB from 1.5 GHz to 3 GHz

Jitter: <0.3 UI

Cable length:

– 100m (328 ft.) (Belden 1694A)

– 45m (148 ft.) (Belden 1855A)

LTC Inputs

Signal: SMPTE 12M-1995 (EBU-3259-E), SMPTE 309M

Level: 500 mVp-p to 10 Vp-p

Impedance: >10 kΩ

Refresh rate: 50/59.94 Hz

Connector: DIN 1.0/2.3

Reference

External: SMPTE 170M, SMPTE 318M, ITU 624-4, BUT 470-6, PAL and NTSC composite sync, SMPTE 274M, SMPTE 296M, SMPTE 240M

Connector: DIN 1.0/2.3

Mosaic Outputs (video and graphic)

HDMI (1, 2, or 4)

Signal : HDMI V1.3

Format: 1280x1024 up to 1920x1200p configurable

Refresh rate supported (50 Hz and 59.94 Hz)

Cable length: 4.57m (15 ft.)

Connector: HDMI

Signal path: 8 bits output

HD-SDI (1, 2 or 4)

Signal: 3G/HD-SDI SMPTE 424M and 292M 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

DVI Inputs (optional)

Device: KXI-DVI-Bridge

Signal: DVI

Resolutions: Mode A: 1024x768, 1366x768, 1280x1024, 1680x1050, 1600x1200 at 60 Hz

Mode B: 1280x720 and 1920x1080 at 50/60 Hz

Communication Ethernet (1)

Signal: 10/100 BASE-T

Connector: RJ45

Serial Port (1)

Signal: RS-422 (SMPTE 207M, EBU-3245)

Connector: RJ45

Analog Audio Monitoring (1, 2 or 4)

Signals (2): Balanced analog stereo

Impedance: <600Ω

Level: +24 dBu maximum

Connector: WECO

Video Processing Performance

Signal path: 8-bit YCbCr to 24-bit RGB

Processing delay: 1 frame in genlock mode, 1-2 frame in non-genlock mode

Audio Processing Performance

Quantization: 20-24 bits

Sampling: 48 kHz

THD+N: 80 dB

SNR: 98 dB

Kaleido-MX (1 RU) Frame

Power supply: Hot swappable redundant power supplies

Input voltage: 100-240V

Frequency: 50/60 Hz

Power: 150W max

Dimensions: 1 RU x 485 mm (19 in.) x 286 mm (11.25 in.)

Full spec temperature range: 0-40° C (32-104° F) (ambient)

Weight: 4.2 kg (9.2 lbs.) for 16x2

Communication ports: Ethernet 10/100 BASE-T

Alarm: GPI contact

Kaleido-MX (3 RU) Frame

Power supply: Hot swappable redundant power supplies

Input voltage: 100-240V

Frequency: 50/60 Hz

Power: 350W max

Dimensions: 3 RU x 485 mm (19 in.) x 286 mm (11.25 in.)

Full spec temperature range: 0-40° C (32-104° F) (ambient)

Weight: 4.8 kg (10.6 lbs.) for 32x4

Communication ports: Ethernet 10/100 BASE-T

Alarm: GPI contact

Discrete Audio Inputs (optional)

Analog Audio

Device: ABT-64A or ABT-128A

Signals (64 or 128 mono channels): 20 kΩ balanced, 10 kΩ unbalanced

Maximum level: +24 dBu

Connectors: WECO

AES 110Ω

Device: ABT-64D-110 and ABT-128D-110

Signals (32 or 64 AES): AES3

Termination: 110Ω balanced

Sampling: 48 kHz

Connectors: WECO

AES 75Ω

Device: ABT-64D-75 and ABT-128D-75

Signals (32 or 64 AES): AES3

Termination: 75Ω unbalanced

Connectors: BNC

GPI IN

Connector: DB-44

Number of input: 1 RU: 20 opto-isolated

3RU: 20 or 40 (optional) opto-isolated

Pull-up voltage: 2.3V

Source current: 2 mA when input shorted

Low level activation: 0.8V max

Over voltage: 25V max

Pulse duration: 8 ms min

GPI Bidirectional

Connector: DB-44

Number of I/O:

– 1 RU: 8

– 3 RU: 8 or 16 (optional)

Input Mode

Pull-up voltage: 2.3V

Source current: 2 mA when input shorted

Low level activation: 0.8V max

Over voltage: 25V max

Pulse duration: 8 ms min

Output Mode

Contact closure current: 50 mA max

Reverse voltage: -15V max

Reverse current: -50 mA max

V OUT low: 0.6V at 1.5 mA

Kaleido-MX High Quality, Pre-Configured Multiviewer (up to 64x4)

ORDERING

KALEIDO-MX-8X1

8 input single head multiviewer in 1 RU

KALEIDO-MX-8X2

8 input dual head multiviewer in 1 RU

KALEIDO-MX-16X1

16 input single head multiviewer in 1 RU

KALEIDO-MX-16X2

16 input dual head multiviewer in 1 RU

KALEIDO-MX-16X4

16 input quad head multiviewer in 1 RU

KALEIDO-MX-24X1

24 input single head multiviewer in 1 RU

KALEIDO-MX-24X2

24 input dual head multiviewer in 1 RU

KALEIDO-MX-32X2

32 input dual head multiviewer in 3 RU

KALEIDO-MX-32X4

32 input quad head multiviewer in 3 RU

KALEIDO-MX-48X2

48 input dual head multiviewer in 3 RU

KALEIDO-MX-48X4

48 input quad head multiviewer in 3 RU

KALEIDO-MX-64X2

64 input dual head multiviewer in 3 RU

KALEIDO-MX-64X4

64 input quad head multiviewer in 3 RU

OUTPUT OPTIONS

KMX-OUT-OPT-OP2

Second head output enable license for KALEIDO-MX-8X1, KALEIDO-MX-16X1 and KALEIDO-MX-24X1

KMX-OUT-ROTATOR-S

Single head rotation license for KALEIDO-MX-8X1, KALEIDO-MX-16X1 and KALEIDO-MX-24X1

KMX-OUT-ROTATOR-D

Dual head rotation license (1 license required for dual head units and 2 licenses required for quad head units.)

INPUT OPTIONS

Options for blocks of 8 or 16 inputs

KMX-IN-8-OPT-3GBPS

3 Gb/s signal format license (8 inputs)

KMX-IN-16-OPT-3GBPS

3 Gb/s signal format license (16 inputs)

KMX-IN-8-OPT-CSX

CC/Subtitling and XDS data license (8 inputs)

KMX-IN-16-OPT-CSX

CC/Subtitling and XDS data license (16 inputs)

KMX-IN-8-OPT-DOLBY

License for extraction of Dolby Metadata (8 inputs)

KMX-IN-16-OPT-DOLBY

License for extraction of Dolby Metadata (16 inputs)

AUDIO INPUT MODULES

ABT-64A

64 channel analog audio bridge terminal

ABT-64D-110

64 channel 110Ω AES audio bridge terminal

ABT-64D-75

64 channel 75Ω AES audio bridge terminal

ABT-128A

128 channel analog audio bridge terminal

ABT-128D-110

128 channel 110Ω AES audio bridge terminal

ABT-128D-75

128 channel 75Ω AES audio bridge terminal

POWER SUPPLIES

DENSITÉ 3+FR1-PSU-AC

Optional redundant power supply for KALEIDO-MX 1 RU models

DENSITÉ 3-PSU-AC

Optional redundant power supply for KALEIDO-MX 3 RU models

ACCESSORIES

KXI-DVI-BRIDGE

Dual channel DVI to HD bridge for DVI inputs

DXF-200-B

HDMI Optical extension system for all Kaleido-MX models except the KALEIDO-MX-16X4

DXF-200-C

HDMI Optical extension system for the KALEIDO-MX-16X4

DXF-200-PSU

DXF-200 power supply (1x sub-module)

KALEIDO-RCP2

Ethernet remote control panel and KM Gateway

PSU-POE

Replacement power over Ethernet module

KRCP-RK2

Kaleido-RCP2 rack mount bracket

GPI-1501-TBA

GPI I/O terminal block adapter

GPI-1501

Additional GPI I/O module for KALEIDO-MX 3 RU models

REF-1801

Redundant reference for KALEIDO-MX 3 RU models

THIRD-PARTY INTERFACE OPTIONS

KMX-OPT-RT-NVISION

Control and UMD support for NVISION routers

KMX-OPT-RT-DATATEK

Control and UMD support for Datatek routers

KMX-OPT-RT-ENCORE

Control and UMD support for Encore controllers

KMX-OPT-RT-EVERTZ

Control and UMD support for Evertz routers

KMX-OPT-RT-GVG7000

Control and UMD support for GV 7000 routers

KMX-OPT-RT-JUPITER

Control and UMD support for Jupiter routers

KMX-OPT-RT-HARRIS

Control and UMD support for Harris/Imagine Communications routers

KMX-OPT-RT-NETWORK

Control and UMD support for Network routers

KMX-OPT-RT-NVISION

Control and UMD support for NVISION routers

KMX-OPT-RT-SNELL

Control and UMD support for Snell routers

KMX-OPT-RT-PESA

Control and UMD support for PESA routers

KMX-OPT-RT-UTAH

Control and UMD support for Utah routers

KMX-OPT-TLY-KAHUNA

Tally Interface for Snell and Wilcox Kahuna switchers

KMX-OPT-TLY-KALYPSO

Tally Interface for Grass Valley Kalypso switchers

KMX-OPT-TLY-KAYAK

Tally Interface for Grass Valley Kayak switchers

KMX-OPT-TLY-SONY

Tally Interface for Sony switchers (serial protocol)

KMX-OPT-TLY-SYNERGY

Tally Interface for Ross Synergy switchers

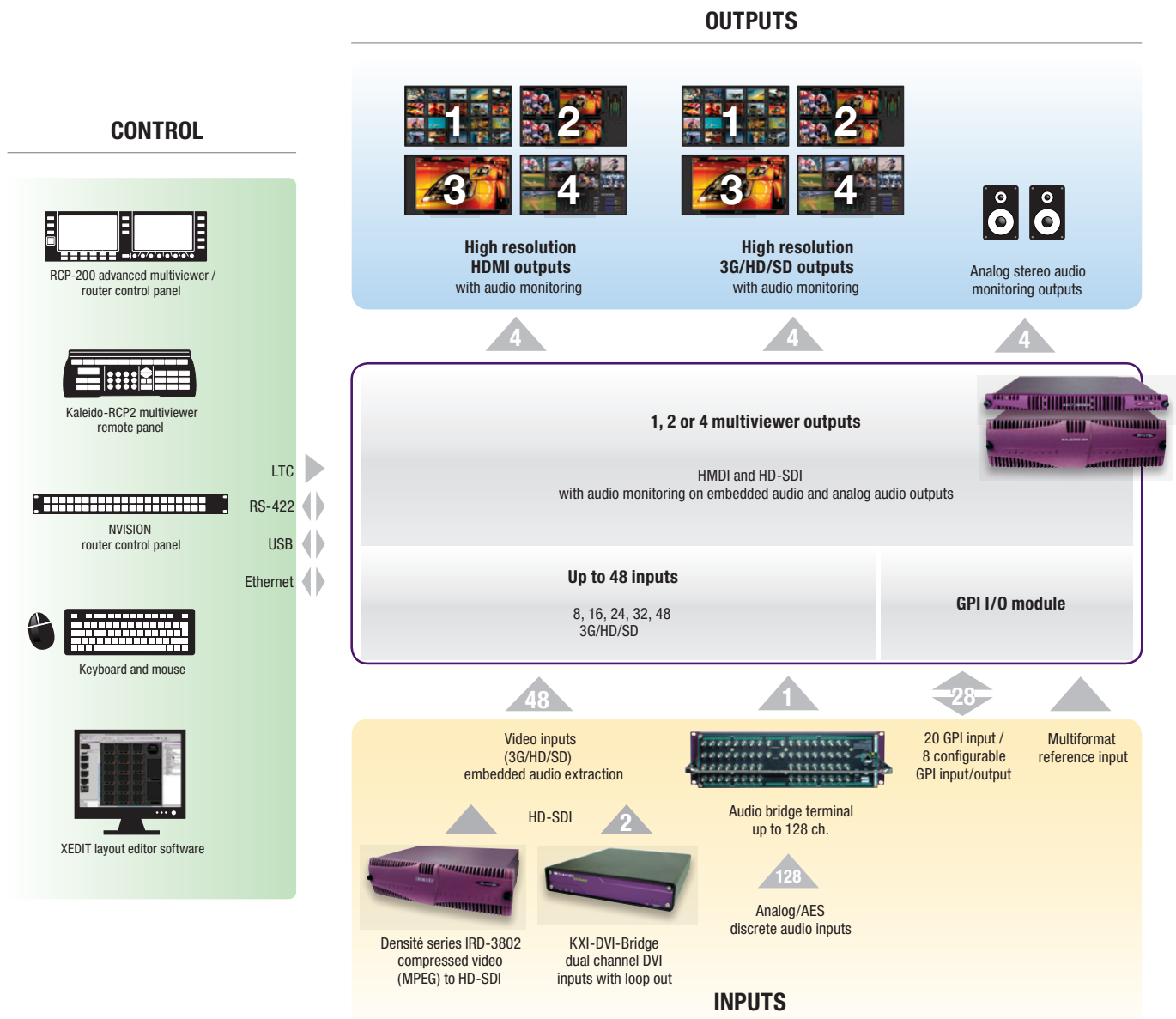
KMX-OPT-TLY-ZODIAK

Tally Interface for Grass Valley Zodiac switchers

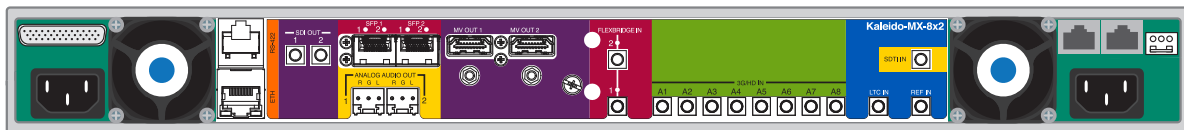
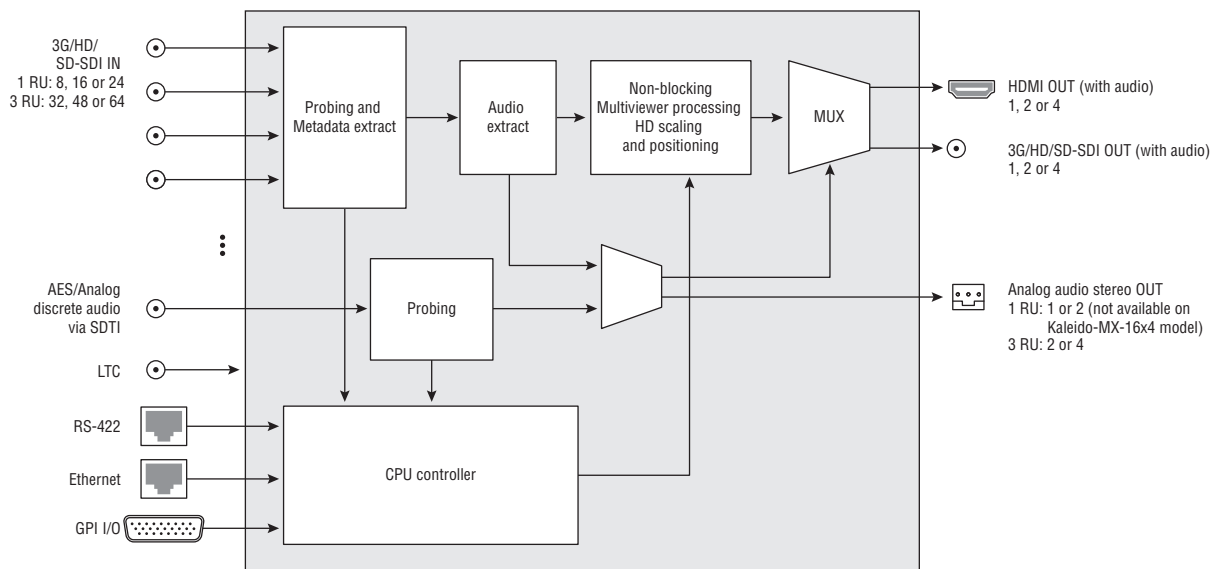
KMX-OPT-TLY-KAYENNE

Tally interface for Grass Valley Kayenne and Karrera switchers

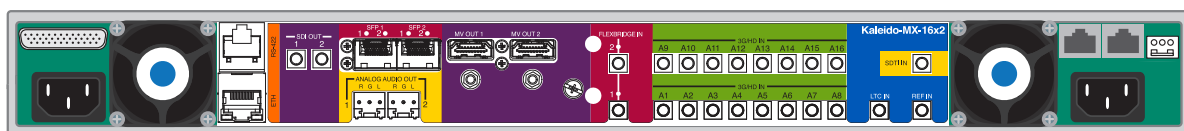
Overview of Input/Outputs



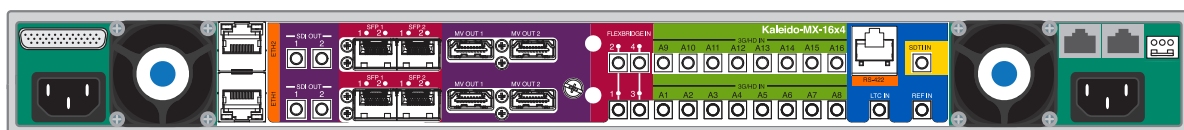
Functional Block Diagram, Rear Panel Views and Specifications



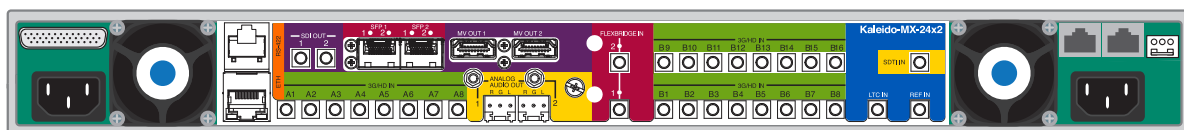
Kaleido-MX-8x2



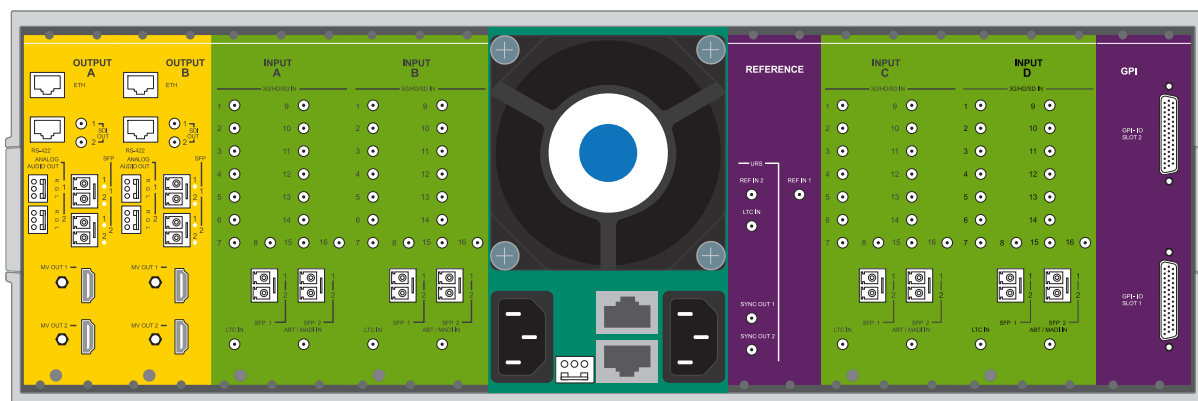
Kaleido-MX-16x2



Kaleido-MX-16x4



Kaleido-MX-24x2



Kaleido-MX-64x4

Unmatched picture quality and display elements

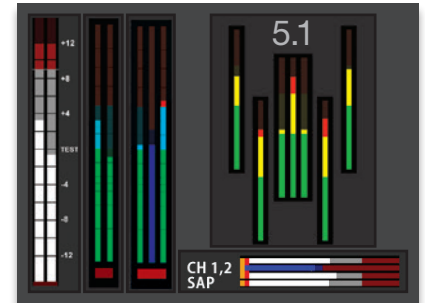
Picture Quality

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 multi-format 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.



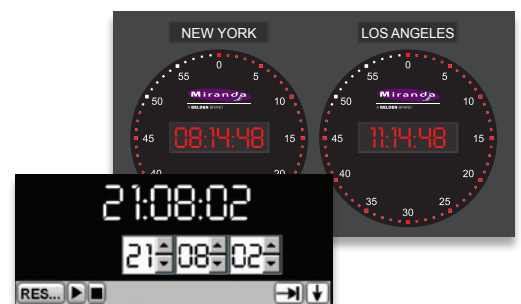
Dynamically Updated UMDs

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 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 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
- AudioOUT of phase

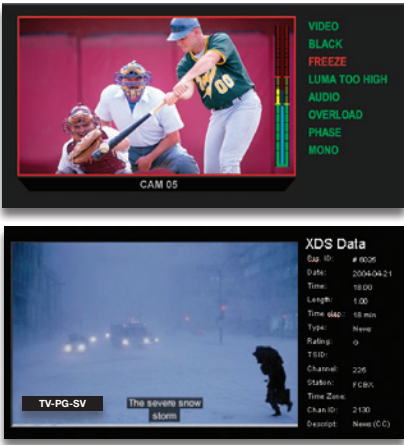
Metadata Monitoring

- 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

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

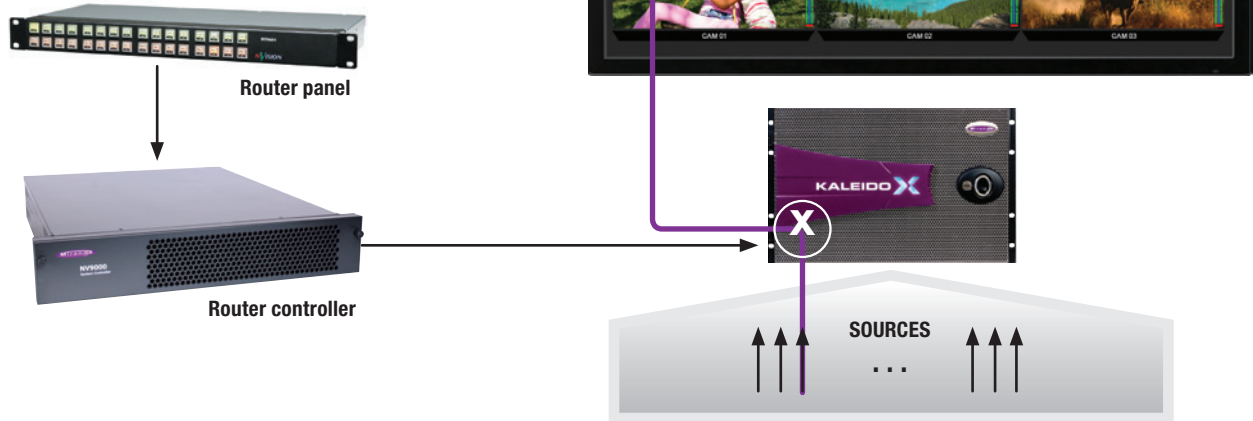
Closed captions and subtitles are presented in the format seen by television viewers in their homes. XDS data, including V-Chip information, can also be overlaid in each video window, along with the Dolby E metadata, AFD/WSS formats, and audio/video signal format.



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 Nevion.

Source to virtual monitor wall assignment can be made via any NVISION control panel via the NVISION 920 or 9000 controller.



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.



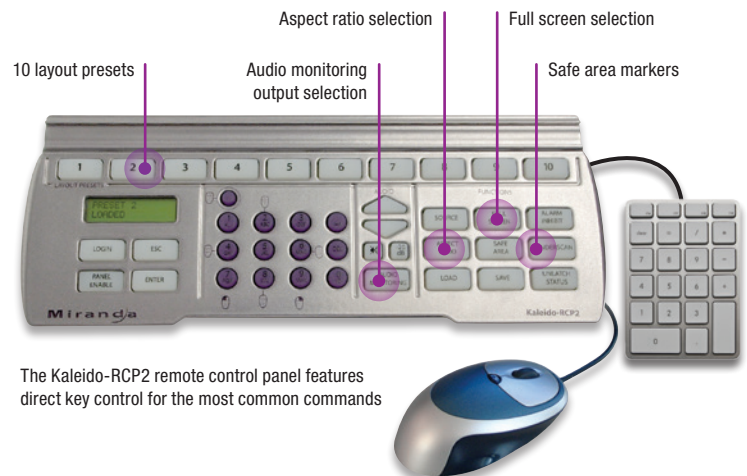
Intuitive control across multiviewers

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.



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