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 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.
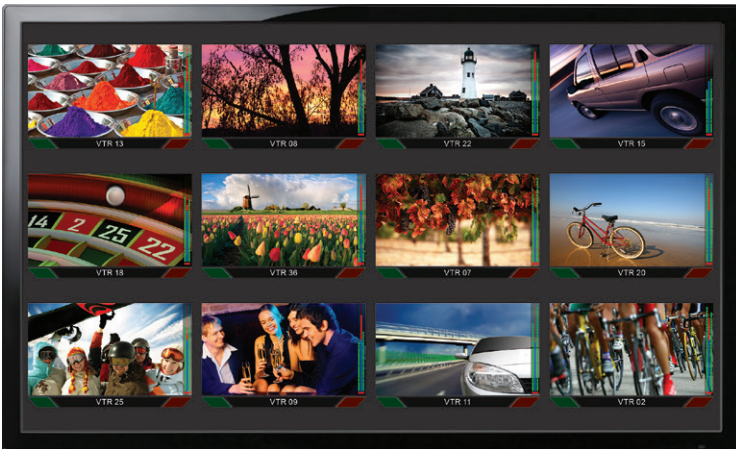
Kaleido-MX 1 RU
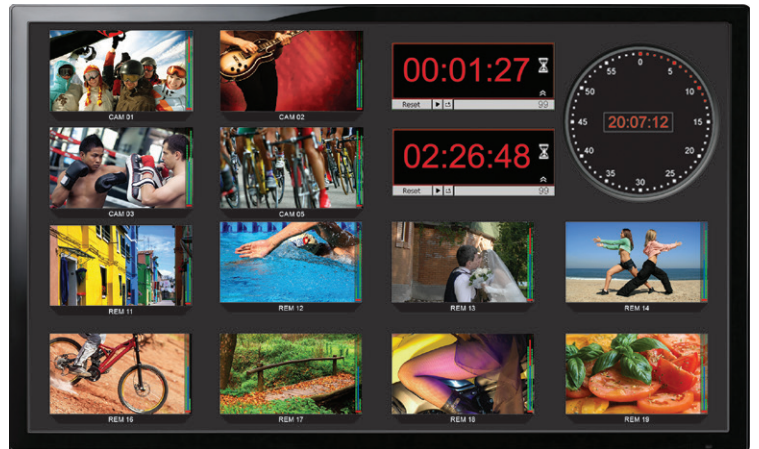
Kaleido-MX 3 RU

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 Sirius routers, 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 Sirius 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 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)
    150m (492 ft.) (Belden 1855A)

HD-SDI
Signal: 4:2:2 SMPTE ST 292-C (1.5 Gb/s)
Formats: 720p24/25/29.97/50/59.94,
1080PsF23.98p/24p/25i/29.97i, 1080i50/59.94,
1080p23.98/24/25/29.97
Audio: SMPTE ST 299
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 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:
    >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 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
Connector: DIN 1.0/2.3

Reference
External: 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
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 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

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 ST 207, 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

SPECIFICATIONS

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 inputs: 1 RU: 20 opto-isolated

3 RU: 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

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 3RU

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-128A
128 channel analog 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

KALEIDO-RCP2
Ethernet remote control panel and KM Gateway

DXF-4K
Display output extender via fiber optic with SC connector. Distance: 1 km (3,280 ft.). Fiber optic cable: multimode 50 or 62.5/125 SC

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

OVERVIEW OF INPUT/OUTPUTS

OUTPUTS

High resolution HDMI outputs
with audio monitoring

High resolution 3G/HD/SD outputs
with audio monitoring

Analog stereo audio
monitoring outputs

CONTROL

RCP-200 advanced multiviewer /
router control panel

Kaleido-RCP2 multiviewer
remote panel

Sirius
router control panel

Keyboard and mouse
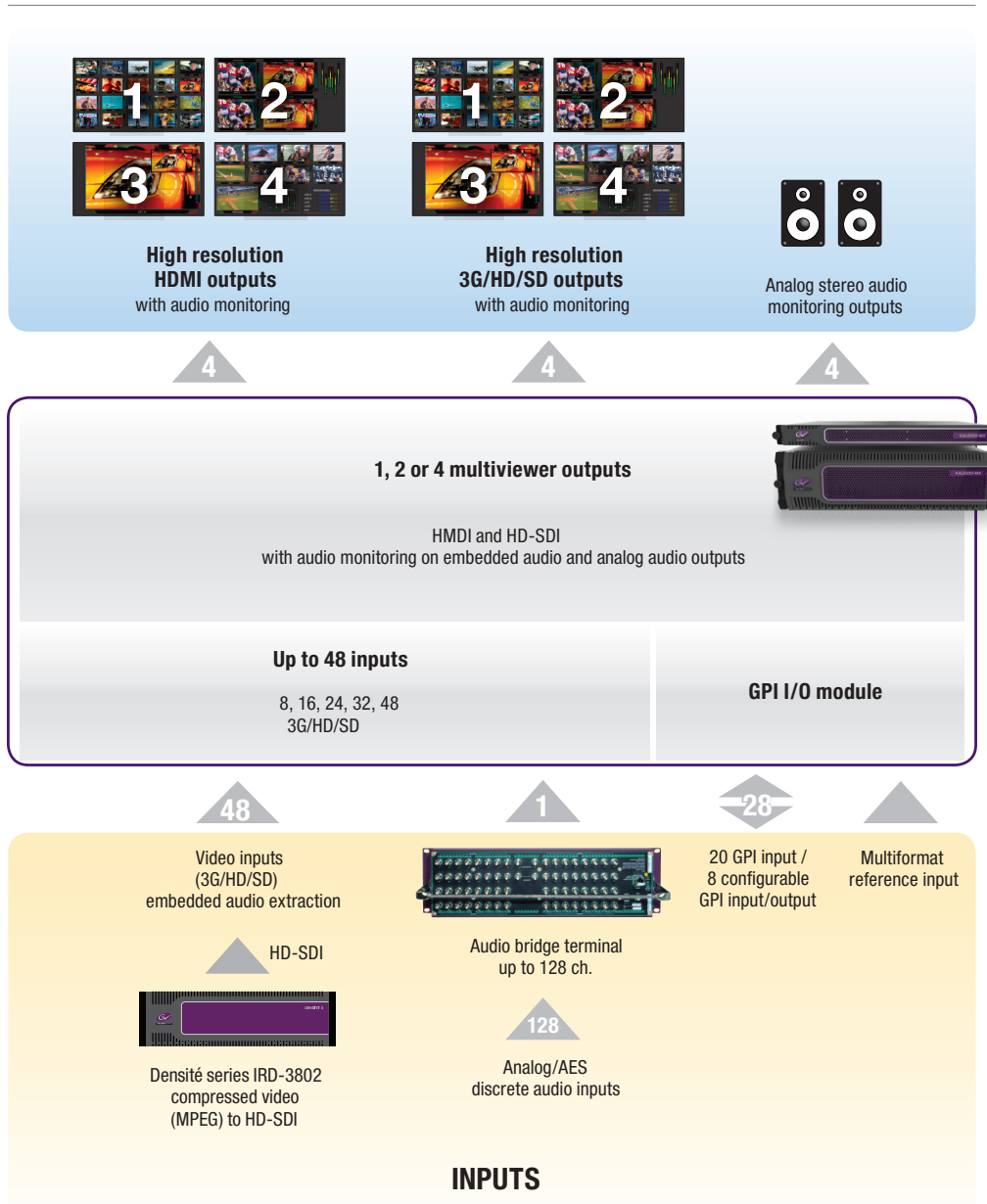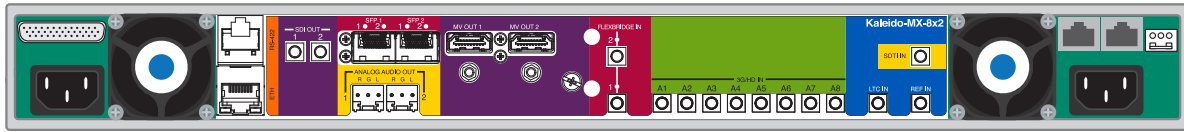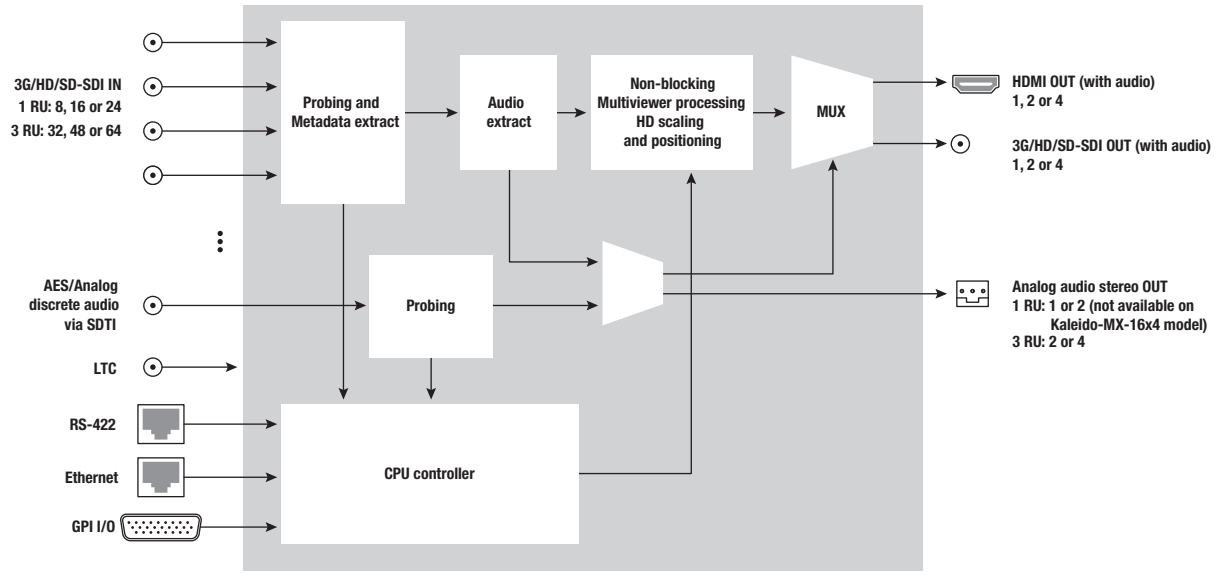
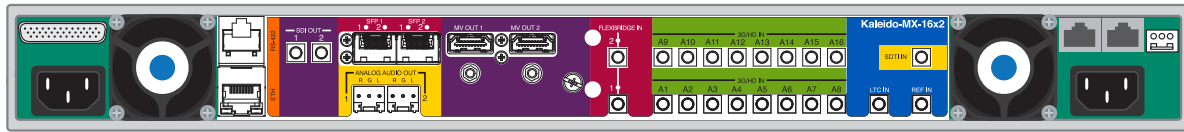XEDIT layout editor software

LTC
RS-422
USB
Ethernet

1, 2 or 4 multiviewer outputs

HMDI and HD-SDI
with audio monitoring on embedded audio and analog audio outputs

Up to 48 inputs

8, 16, 24, 32, 48
3G/HD/SD

GPI I/O module

48

1

28

Video inputs
(3G/HD/SD)
embedded audio extraction

20 GPI input /
8 configurable
GPI input/output

Multiformat
reference input

HD-SDI

Audio bridge terminal
up to 128 ch.

Densité series IRD-3802
compressed video
(MPEG) to HD-SDI

128

Analog/AES
discrete audio inputs

INPUTS

FUNCTIONAL BLOCK DIAGRAM, REAR PANEL VIEWS AND SPECIFICATIONS

Kaleido-MX-8x2

Kaleido-MX-16x2
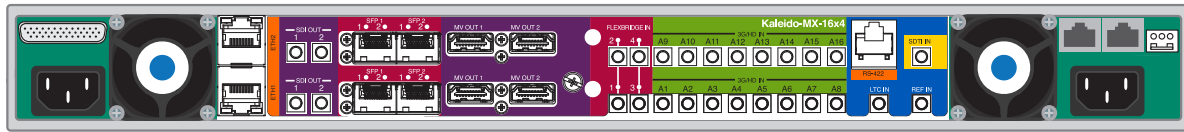
Kaleido-MX-16x4
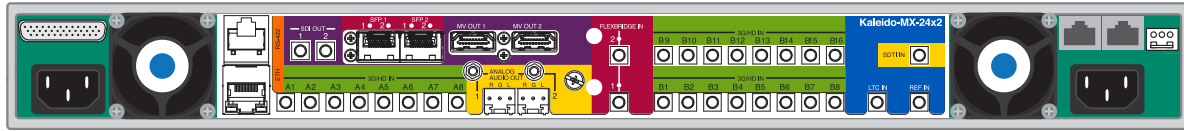
Kaleido-MX-24x2
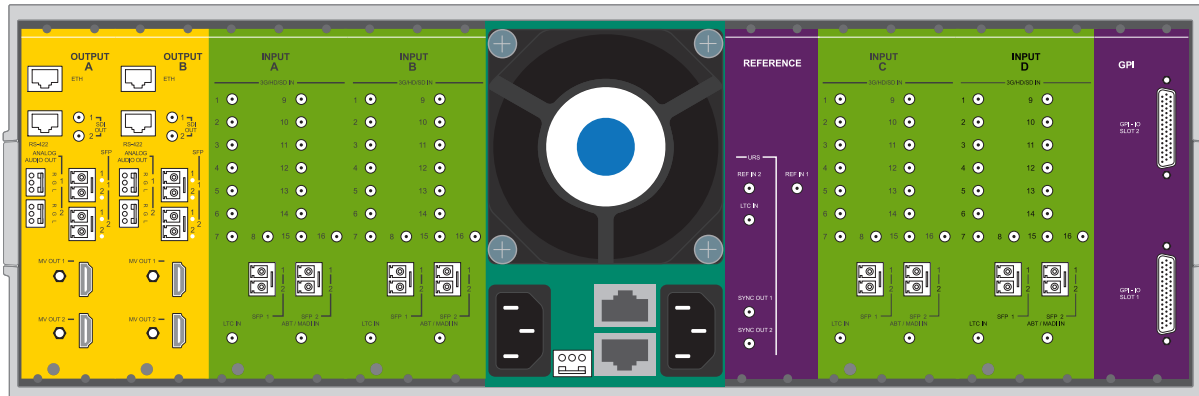
## UNMATCHED PICTURE QUALITY AND DISPLAY ELEMENTS

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.
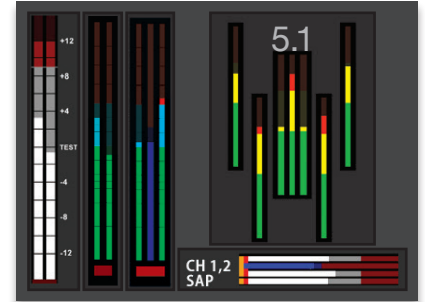
Automatic Aspect Ratio Control and Safe Areas

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 a Sirius router 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.
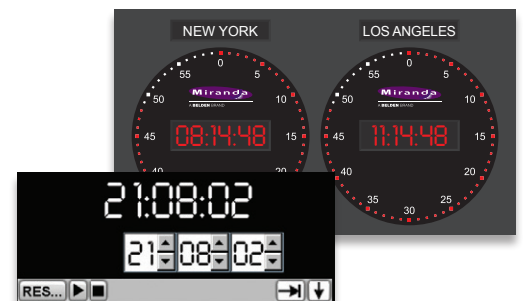
Signal Validity Monitoring

The following parameters can be detected and presented on-screen, or reported to SNMP-based signal and facility monitoring systems:

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.
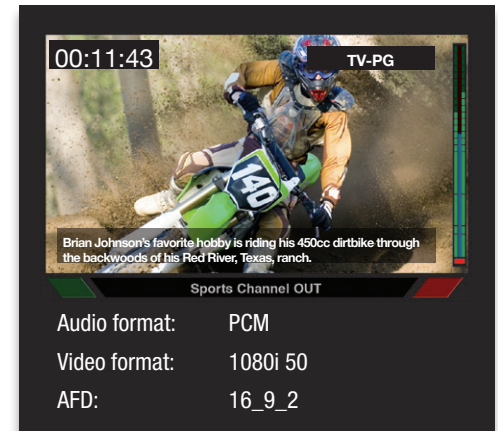
Remote Control of Integrated Routing and Multiviewer Systems

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 Sirius control panels (shown below), as well as third-party router control panels.

Source to virtual monitor wall assignment can be made via any Sirius router control panel.

Router panel

GV Orbit control

SOURCES

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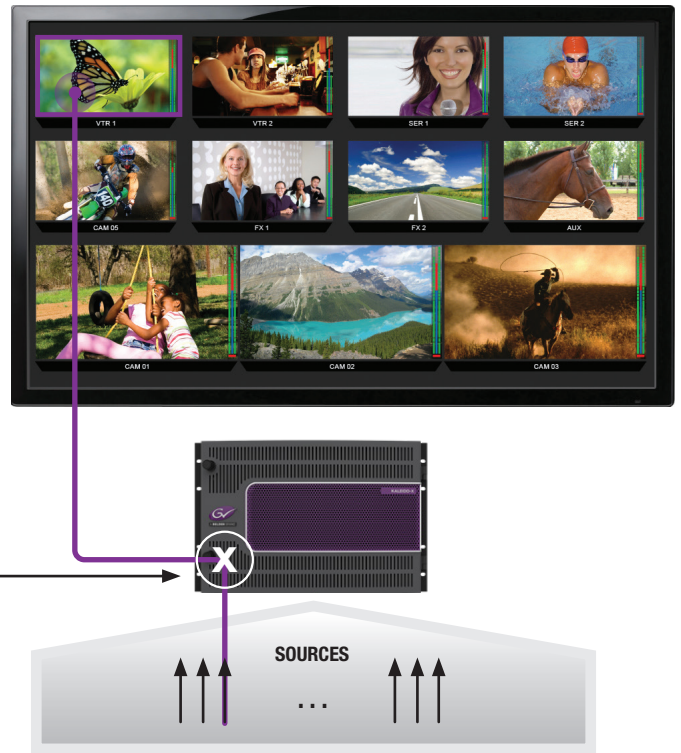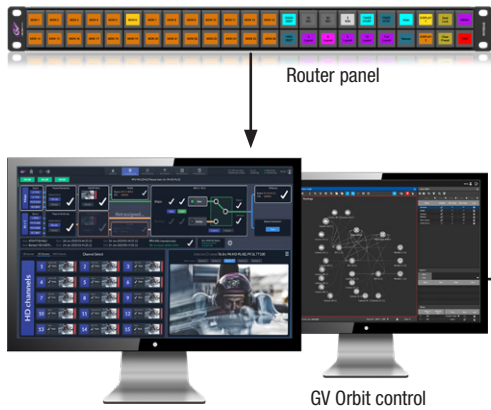
The highly graphical RCP-200 touchscreen remote panel offers more advanced control of combined multiviewer and routing systems. The panel provides multiviewer layout pre-set selection, and quick router source assignment control via a category/index graphical interface. The RCP-200 is a multifunctional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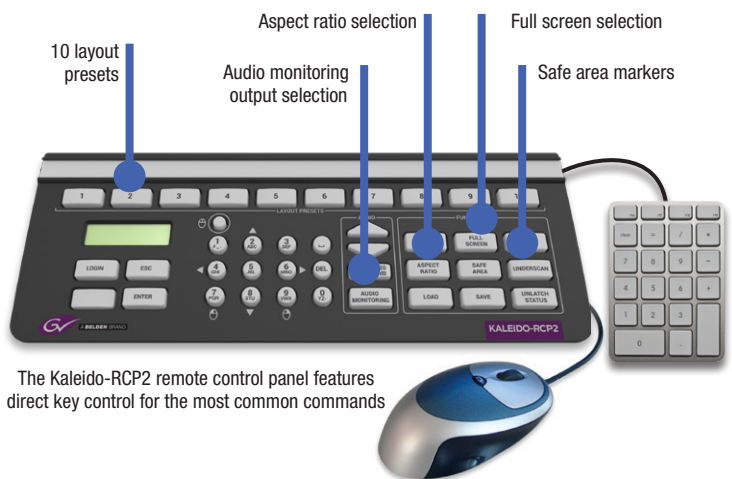
Intuitive control across multiviewers

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.

10 layout presets

Aspect ratio selection

Full screen selection

Audio monitoring output selection

Safe area markers

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

DS-PUB-2-0135A-EN