Kula Production Switcher Family

SD, HD, 3G and 4K UHD Production Power — All in One Low-cost Package

Kula is an entry-level production switcher designed for the professional broadcast and AV markets. It offers a powerful feature set in a compact system for easy installation and operation. Kula is available in several models: as a 1, 2 or 3 M/E switcher, with the capability of operating in SD, HD, 3G/1080p and 4K UHD, as well as a dedicated 12G-SDI or IP version. It has a 2 RU frame and a choice of seven control panels, including a convenient 19-inch wide panel ideal for mobile and flyaway productions. Because it is both highly-featured and cost-effective, Kula opens up a new range of professional-quality content creation options for operators who are required to work with small spaces and small budgets.

Kula from Grass Valley is the most powerful compact switcher in its class, with a revolutionary design for the live production market. Whatever the application — broadcast production, sports, house of worship, entertainment and conference/live events — Kula meets all your production needs with a simple path forward to higher production values.

Available as 1 M/E, 2 M/E or 3 M/E SD/HD/3G models, the 2 M/E version and 3 M/E version also can be switched to 1 M/E 4K UHD mode. Kula also has both a 1 M/E 12G-SDI model and a 2 or 3 M/E Kula IP model for easy entry into production using the latest video formats.

Kula panels are easy to operate with quickly understood graphical OLED buttons and functions that are simple to use for any operator or volunteer. For even more functionality, the Kula panel can be expanded with control modules from the Kahuna modular control panel. Up to eight control modules can be attached to a Kula panel from a range of 15 different types.

Whether your production is intricate or modest, Kula can make any operator confident in their work. The Kula production switcher family offers a robust feature set in a compact system for easy installation and professional quality operations.

The Kula M/E: Impressive Effects for Real-time Production

Each of Kula’s mix effect (M/E) banks boasts four feature-rich keyers with resize engines that offer Dual Tile mode to create eight key layers per M/E. The Dual Tile mode enables two live video tiles per key to be layered onto the background. Each independent key layer has X – Y positioning, squeeze and zoom functionality.

The M/Es also have a dedicated key + fill animated clip transition called a Mav Trans, along with an A/B background mixer. These impressive features enable you to build stunning effects for your productions. Simple to use, operators can quickly build creative effects for any production.

Adding even more consistency for quality production, operators will find it easy to create and recall effects memories and macros with assignable macro buttons that can include control of external devices. Built using Grass Valley’s high-end switcher design and technology, each operator’s shows are instantly recalled and available.
Kula Production Switcher Family SD, HD, 3G and 4K UHD Production Power

KEY FEATURES

- 1, 2 or 3 M/Es with 4 keyers per M/E
- 1 and 2 M/E systems offer 2 Sub M/Es consisting of A/B mix with 2 keyers and a 2.5D DVE resize engine per Sub M/E
- Up to 32 key layers
- Linear and luma key functionality on each M/E as standard
- High-quality chromakeys on each keyer per M/E and Sub M/E where applicable
- A dedicated animated clip transition on each M/E called a Mav Trans
- Powerful effects dissolve operation for quick and simple creation of high-end effects

Sub M/Es*2

Unique to Kula M/Es is an associated Sub M/E that provides an extra set of resources. Cascading Sub M/Es into the standard M/Es brings a new level in production values. The Sub M/E can be configured for any one of the following options:
- A/B background mix with 2 lin/luma or chroma keyers and a 2.5D DVE
- FormatFusion3
- FormatFusion4
- Full RGB, YUV, and Bleed color correction — ideal for IMAG displays

2.5D DVE Key*3

Kula offers a 2.5D DVE resizer capability on the Sub M/E keyer with X – Y positioning, squeeze, zoom and cropping in addition to perspective.

FormatFusion3 or FormatFusion4*4

Kula’s ground-breaking FormatFusion3 option lets you quickly adapt to the I/O requirements called for in different shows by simultaneously synchronizing, processing and manipulating in real time SD, HD, 3G and 4K UHD sources in the same mainframe, and even the same M/E bank.

FormatFusion4 technology raises the bar again, bringing seamless HDR capabilities to Kula. Kula I/O can independently handle HLG, PQ and S-Log3 for color spaced BT709 SDR and BT2020 HDR for workflows in 4K UHD and HD. The core of the switcher can also be set to the desired EOTF and WCG setting.

With the exception of the dedicated 12G-SDI and IP models, all BNCs on Kula systems accept SD/HD/1080p and 4K UHD using FormatFusion3 technology.

Optional FormatFusion4 for seamless HDR productions (4K UHD and HD)

- Large I/O with bidirectional ports for flexibility
- Input and bus frame synchronizers, for synchronizing all inputs
- Internal multiviewer with up to 4 heads and 16 tiles, capable of 8 heads and 28 tiles*1
- Wide range of control panels, expandable with modules from the Kahuna modular control range
- The 2 M/E and 3 M/E Kula support 4K UHD at the same specification as the 1 M/E 4K UHD Kula

*1 Option to reallocate M/E 2 as a second multiviewer with up to 12 tiles across 1-4 heads
*2 Available on 1 or 2 M/E systems
*3 Not available when using FormatFusion3
*4 Not available when using Sub M/E keyers
standard for mixing in any M/E. Alternatively, sources, M/E outputs or Sub M/E outputs can be routed to FormatFusion3 engines for conversion to an alternative output standard.

Automatic standard identification further simplifies set up for mixed format environments. FormatFusion3 also provides compensation for the latency inherent in IMAG applications.

A true multiformat video standard system able to meet today’s extensive requirements for midsized productions, Kula is designed with 3 Gb/s processing at its core to maintain high-quality signals.

**DSKs**

For channels that need their own branding during simultaneous broadcasting, Kula also offers four floating DSKs that are assignable to any output. The DSKs can offer up to eight key layers with the resize engine’s Dual Tile mode. Users can output DSKs downstream of the M/Es or assign each independent DSK to an aux output, which empowers more dynamic productions.

Kula is an extremely versatile production switcher. Whether it’s working with the M/Es and Sub M/Es, using the assignable DSKs, or working in multiple standards, Kula promises great functionality and flexibility from production to production.

**Scalable Input & Output Architecture**

While offering a good complement of 36 dedicated input and 12 dedicated output connectors, Kula also provides configuration flexibility through a pool of an additional six bidirectional ports that can be assigned as inputs or outputs as needed on an individual basis, creating I/O configurations ranging from 36x18 to 42x12.

All outputs may also be assigned to route any of the internal sources available to Kula. This includes any outputs supplied by each M/E — PGM, clean, PVW or a selection of outputs and keys. Up to four aux outputs can have their own separate key signal, which is great for multiple outputs to different customers wanting their own branding.

**Maximizing Constraints**

Kula has been designed to be robust and resilient, ideal for the road. With its 2 RU frame and 19-inch (1 M/E) panel, it is perfect for shipping to challenging sites and working in space constrained production environments.

With its 2 RU frame and choice of panel sizes, Kula is the ideal choice for flyaway packs, OB vehicles and events/conferences. To stand the rigors of transportation with constant teardown and setup cycles, Kula is built strong in both chassis and panel mechanics.

**Productivity**

Kula frees operators to focus on creative aspects of a job. Simple operation and easy setup enables operators to work quickly and efficiently, making more time to work on other elements within the live production environment and reducing costly setup times.

The large touchscreen menu provides easily accessible configuration and control without a separate control. Multiviewers, converters, syncs and a ClipStore for audio and video are integrated into the chassis, eliminating setup of support gear.
Built-in Multiviewer

A format-independent multiviewer provides great flexibility with preselected, user-defined layouts and is ideal for smaller productions. Also, it’s an excellent choice to supplement larger scale production monitoring requirements. The format-independent multiviewer is a standard feature in the Kula production switcher.

Multiviewer features:
- Up to 8 flexible output heads
- Up to 28 windows
- All external and internal sources selectable to all heads
- Instant preselect layouts
- Clear and follow-through labeling
- Red and green tallies
- Assign to any output
- Customizable layouts
- Memorize and recall layouts as part of a show setup

ClipStore

Kula’s ClipStore enables playing sequences of key and fill, or video and stills. It provides up to 32 GB of uncompressed HD content available across 10 channels. The ClipStore can play out and record video and key channels. Importing and exporting animations and video is performed via a LAN/WAN, USB device and K-Watch.

K-Watch software runs on a PC. The file conversion process is automatic, and converts from one format into the native Kula .SWS file format. The new K-Manager Pro software takes the converted file and transfers this directly into the relevant project on the Kula frame ready for the operator. The K-Manager Pro software runs on a PC that is networked to a Kula frame.

The ClipStore has a sophisticated editor for both audio and video (fill and key).
- Instant access to any content and selected on any bus
- Holds both audio and video
- Used for animated clip transitions
- On-board clip editor
- Use in any memory or macro recall
- Grab live incoming video or file via USB or network

In 4K UHD mode, the ClipStore operates as a core component of your production offering key and fill, video and still outputs with full 4K UHD resolution.

K-Manager utilities allow users to resize and change the still/clip standard whenever they need 525/59.94 or 1080i/59.94 or even 720p/60. K-Manager also enables offline crosspoint mapping for easy configuration.

Comprehensive Integration and Control Capabilities

For a single point of production control, Kula may be operated under Grass Valley Ignite automation. In addition to full support for other Grass Valley devices, Kula also features an extensive protocol list enabling third-party devices including:
- Production servers
- Audio mixers
- Robotic camera control
- Graphics engines
- Tally systems
- Multiviewers
### APPLICATIONS

**Kula Production Switcher Family**  
SD, HD, 3G and 4K UHD Production Power

Kula is perfect for a broad range of applications:
- Regional news and magazine programs
- In-house production for corporate, government & education
- Entertainment and concerts
- eSports
- Internet production
- Outside/remote broadcast
- Local sports venues
- House of worship
- Conferences and live events
- Flyaway/de-rigs for pop-up productions

### Kula 12G-SDI

Kula 12G-SDI is engineered with a single link 12G-SDI infrastructure. This means media organizations can focus on the future of their 4K UHD productions using less cabling while supporting their legacy equipment.

Kula 12G-SDI offers exceptional value for money in an entry-level package for either 12G-SDI or 3G/1080p operations. With 1 M/E, three keyers, DVE effects and features adopted from the powerful Kahuna switchers, Kula 12G-SDI offers a strong backbone for the most comprehensive productions.

### Kula IP

Kula IP is uniquely positioned for media companies that need full IP I/O yet want a more cost-effective route into the IP domain, maintaining a premium level of production capabilities in a smaller, more efficient form factor.

The Kula IP production switcher provides high-end effects and is available in 2 M/E and 3 M/E models, as well as a 1 M/E 4K UHD model.

---

### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Kula 3 M/E HD/4K*1</th>
<th>Kula 2 M/E HD/SD/4K*1</th>
<th>Kula 1 M/E 4K UHD</th>
<th>Kula 1 M/E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
<td>36</td>
<td>36</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Outputs</td>
<td>12 assignable</td>
<td>12 assignable</td>
<td>3</td>
<td>6 assignable</td>
</tr>
<tr>
<td>Bidirectional inputs/outputs</td>
<td>6 – Create I/O combinations ranging from 36x18 to 42x12</td>
<td>6 – Create I/O combinations ranging from 36x18 to 42x12</td>
<td>0</td>
<td>6 – Create I/O combinations ranging from 18x12 to 24x6</td>
</tr>
<tr>
<td>Total M/E key layers</td>
<td>32</td>
<td>32</td>
<td>6x 4K UHD</td>
<td>20</td>
</tr>
<tr>
<td>DSKs</td>
<td>4 floating (8 key layers)</td>
<td>4 floating (8 key layers)</td>
<td>1x 4K UHD DSK</td>
<td>4 floating (8 key layers)</td>
</tr>
<tr>
<td>2D DVE</td>
<td>24x 2D</td>
<td>24x 2D</td>
<td>6</td>
<td>16x 2D</td>
</tr>
<tr>
<td>2.5D DVE</td>
<td>2x 2.5 DVE</td>
<td>2x 2.5 DVE on Sub M/E keys</td>
<td>0</td>
<td>2x 2.5 DVE on Sub M/E keys</td>
</tr>
<tr>
<td>Sub M/E capability</td>
<td>0</td>
<td>2x Sub M/E*2 with 2 keyers each</td>
<td>0</td>
<td>1x Sub M/E*2 with 2 keyers</td>
</tr>
<tr>
<td>FormatFusion3/4 &amp; frame synchronizer</td>
<td>0</td>
<td>8</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>ClipStore output</td>
<td>10 channels 16 GB</td>
<td>10 channels 16 GB</td>
<td>4 channels 16 GB</td>
<td>10 channels 16 GB</td>
</tr>
<tr>
<td>Multiviewer</td>
<td>Up to 4 heads/16 tiles</td>
<td>Up to 4 heads/16 tiles. Option to reallocate M/E 2 as a 2nd multiviewer with up to 12 tiles across 1-4 heads</td>
<td>N/A</td>
<td>Up to 4 heads/16 tiles</td>
</tr>
<tr>
<td>4K quad link</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>4K 2SI</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*1 2 M/E and 3 M/E SD/HD/3G versions also operate as a 1 M/E 4K UHD specification production switcher.

*2 Sub M/E's available if FormatFusion3 or FormatFusion4 is not being utilized.
3 M/E Kula Production Switcher

3 M/E 24 & 16 Crosspoint Panels, 2 RU Frame — Switchable to 1 M/E 4K UHD

KEY FEATURES

- 3 M/E (1 M/E / 2 M/E / program / preview) production switcher
- 2 RU frame supporting:
  - 36 inputs
  - 12 assignable outputs
  - 6 input or output bidirectional ports
- 4 keys per M/E:
  - 4 full effects keyers with lin/luma
  - 4 assignable DVE engines (will give 8 independent boxes)
  - Chromakeys available on all keys
  - Transition keyer with dedicated ClipStores for key & fill
  - Mask generator per keyer
  - Separate wipe generator
  - Matte generator
- Large internal ClipStore with 10 outputs holding 2 minutes of uncompressed HD video and audio content that is totally routable
- 4 floating resizing down stream keyers/mixing aux outputs without using M/E or Sub M/Es
- Fully flexible internal multiviewer with configurable 4 heads and 16 tiles
- Control:
  - 66 GPI/GPs
  - 2x RS-422 ports
  - 3 Ethernet ports for control panel and TCP/IP protocols
  - USB ports for user/clip/system files import, export and backup
- New control panel design with clear OLEDs, RGB push buttons and shaft encoders for quick and granular control
- Sophisticated macro recall and edit capability
- Clearly labeled control panel with separate mnemonics for source, key and macro names
- Instant delegation buttons for macros or key and aux bus control
- T-bar with direction strip indicators
- 16 and 24 crosspoint button panel models available for easy operation
- Can be expanded by connecting other Kahuna Maverik modules

SPECIFICATIONS

TV Standards

2.97 Gb/s Video Standards (3G/1080p)
1080p60 SMPTE ST 424
1080p60 SMPTE ST 425/Level A
1080p60 SMPTE ST 425/Level B
1080p59.94 SMPTE ST 424
1080p59.94 SMPTE ST 425/Level A
1080p59.94 SMPTE ST 425/Level B
1080p50 SMPTE ST 424
1080p50 SMPTE ST 425/Level A
1080p50 SMPTE ST 425/Level B
1080p29.97 SMPTE ST 425/Level A
1080p29.97 SMPTE ST 425/Level B
1080p25 SMPTE ST 425/Level A
1080p25 SMPTE ST 425/Level B
1.485 Gb/s Video Standards (HD)
1080p60 SMPTE ST 274(4), SMPTE ST 292(D)
1080p59.94 SMPTE ST 274(5), SMPTE ST 292(E)
1080p50 SMPTE ST 274(6), SMPTE ST 292(F)
105p59.94 SMPTE ST 292(A)
105p59.94 SMPTE ST 292(B)
1080pF30
1080pF25
1080pF24
1080pF23.96
270 Mb/s Video Standards (SD)
576i 16:9
576i 4:3
480i 16:9
480i 4:3

Reference
Analog genlock high-definition tri-level syncs signal or SD 1V blackburst

Frame

Video Signal Inputs
36, SD/HD/3G-SDI: HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601 / SMPTE ST 292 / SMPTE ST 424 via BNC connectors

Video Signal Outputs
12 SD/HD/3G-SDI: Assignable via BNC connectors

Video Bidirectional Ports
HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601/SMPTE ST 292/SMPTE ST 424 via BNC connectors
6 bidirectional ports

Genlock
Genlock reference 2 off analog sync via BNC connectors

Control Interfaces
66 GPI Tally/GPO outputs: Assignable GPI/GPO Isolated contact closures via 3x 25-way D-Type. Assignable as GPI or GPO
16 10/100/1000base-T: 3x RJ45 Ethernet connectors fixings
2 RS-422 control ports
2x USB

Power

Kula frame: Auto sensing 100-250 VAC Power supply 50/60 Hz nominal. Two fully independent hot swappable PSU modules, with separate mains power feeds via 2x 13A IEC - 320-C14 socket

Power consumption: <400W

Temp range: 5 to 40°C (41 to 104°F), noncondensing operating

Mechanical

Frame
2 RU
Height: 87 mm (3.42 in.)
Depth: 604.8 mm (23.81 in.)
Weight: Approx. 14 kg (30.3 lbs.)

Kula Control 3 M/E 16 Crosspoint Panel
Width: 834 mm (32.83 in.)
Depth: 419.1 mm (16.5 in.)
Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar
Weight: Approx. 11 kg (24.23 lbs.)

Kula Control 3 M/E 24 Crosspoint Panel
Width: 994 mm (39.13 in.)
Depth: 419.1 mm (16.5 in.)
Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar
Weight: Approx. 14.2 kg (31.29 lbs.)
2 M/E Kula Production Switcher

2 M/E 24 & 16 Crosspoint Panels, 2 RU Frame — Switchable to 1 M/E 4K UHD

KEY FEATURES

- 2 M/E (1 M/E / program / preview) production switcher
- 2 RU frame supporting:
  - 36 inputs
  - 12 assignable outputs
  - 6 input or output bidirectional ports
- 4 keys per M/E
  - 4 full effects keyers with lin/luma
  - Chromakeys available on all keys
- 4 assignable 2.5D DVE engine per Sub M/E
- Transition keyer with dedicated ClipStores for key & fill
- 4 floating resizing downstream keyers/mixing aux outputs without using M/E or Sub M/E
- 8 channels of FormatFusion3 or FormatFusion4 assignable of any input/output or bus*
- Fully flexible internal multiviewer with configurable 4 heads and 16 tiles
  - Option to reallocate M/E 2 as a second multiviewer with up to 12 tiles across 1-4 heads
- Control:
  - 66 GPI/Os
  - 2x RS-422 ports
  - 3 Ethernet ports for control panel and TCP/IP protocols
- USB ports for user/clip/system files import, export and 6 bidirectional ports
- 66 GPI Tally/GPO outputs: Assignable GPI/GPO Isolated contact closures via 3x 25-way D-Type. Assignable as GPI or GPO and 16 tiles across 1-4 heads
- Mask generator per keyer
- Use on any output or use within any M/E for more keying power
- Large internal ClipStore with 10 outputs holding 2 minutes of uncompressed HD video and audio content that is totally routable
- New control panel design with clear OLEDs, RGB push buttons and shaft encoders for quick and granular control. Sophisticated macro recall and edit capability
- Clearly labeled control panel with separate mnemonics for source, key and macro names
- Instant delegation buttons for macros or key and aux bus control
- T-bar with direction strip indicators
- 16 and 24 crosspoint button panel models available for easy operation
- Can be expanded by connecting other Kahuna Maverik modules
- * Sub M/E functionality shared to be either Sub M/E or FormatFusion3 or FormatFusion4 engines. The 2 M/E and 3 M/E Kula will support 4K UHD, however at the same feature specification as the 1 M/E 4K UHD Kula.

SPECIFICATIONS

TV Standards

2.97 Gb/s Video Standards (3G/1080p)

- 1080p60 SMPTE ST 424
- 1080p60 SMPTE ST 425/Level A
- 1080p60 SMPTE ST 425/Level B
- 1080p59.94 SMPTE ST 424
- 1080p59.94 SMPTE ST 425/Level A
- 1080p59.94 SMPTE ST 425/Level B
- 1080p50 SMPTE ST 424
- 1080p50 SMPTE ST 425/Level A
- 1080p50 SMPTE ST 425/Level B

1.485 Gb/s Video Standards (HD)

- 1080i60 SMPTE ST 274(4), SMPTE ST 292(D)
- 1080i59.94 SMPTE ST 274(5), SMPTE ST 292(E)
- 1080i59.94 SMPTE ST 274(6), SMPTE ST 292(F)
- 1035i60 SMPTE ST 260, SMPTE ST 292(A)
- 1035i59.94 SMPTE ST 260, SMPTE ST 292(B)
- 1080Pf30
- 1080Pf29.76
- 1080Pf25
- 1080Pf24
- 1080Pf23.976
- 1080Pf30 SMPTE ST 274(7), SMPTE ST 292(G)
- 1080Pf29.7 SMPTE ST 274(8), SMPTE ST 292(H)
- 1080Pf25 SMPTE ST 274(9), SMPTE ST 292(J)
- 1080Pf24 SMPTE ST 274(10), SMPTE ST 292(L)
- 1080Pf23.976 SMPTE ST 274(11), SMPTE ST 292(K)
- 720p60 SMPTE ST 296(1), SMPTE ST 293(L)
- 720p59.94 SMPTE ST 296(2), SMPTE ST 292(M)

270 Mb/s Video Standards (SD)

- 576i 16:9
- 480i 16:9
- 480i 4:3

Reference

Analog genlock high-definition tri-level syncs signal or SD 1V blackburst

Frame

Video Signal Inputs

36, SD/HD/3G-SDI/SD/HD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s) Serial digital interface: As REC601/ SMPTE ST 292 / SMPTE ST 424 via BNC connectors

Video Signal Outputs

12 SD/HD/3G-SDI: Assignable via BNC connectors

Video Bidirectional Ports

HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s) Serial digital interface: As REC601/ SMPTE ST 292/ SMPTE ST 424 via BNC connectors

6 bidirectional ports

Genlock

Genlock reference 2 off analog sync via BNC connectors

Control Interfaces

66 GPI Tally/GPO outputs: Assignable GPI/GPO Isolated contact closures via 3x 25-way D-Type. Assignable as GPI or GPO
16 10/100/1000base-T, 3x RJ45 Ethernet connectors fixings
2x RS-422 control ports
2x USB

Power

Kula frame: Auto sensing 100-250 VAC Power supply 50/60 Hz nominal. Two fully independent hot swappable PSU modules, with separate mains power feeds via 2x 13A IEC - 320-C14 socket

Power consumption: <400W

Temp range: 5 to 40°C (41 to 104°F), noncondensing operating

Mechanical

Frame

2 RU

Height: 87 mm (3.42 in.)

Depth: 604.8 mm (23.81 in.)

Weight: Approx. 14 kg (30.3 lbs.)

Kula Control 2 M/E 16 Crosspoint Panel

Width: 834 mm (32.83 in.)

Depth: 279.6 mm (11.0 in.)

Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar

Weight: Approx. 7.5 kg (16.5 lbs.)

Kula Control 2 M/E 24 Crosspoint Panel

Width: 994 mm (39.13 in.)

Depth: 279.6 mm (11.0 in.)

Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar

Weight: Approx. 9.2 kg (20.28 lbs.)

www.grassvalley.com
1 M/E Kula Production Switcher

19 in. Rackmount 1 M/E 16 Crosspoint Panel, 2 RU Frame with 1 M/E
1 M/E 16 & 24 Crosspoint Panels, 2 RU Frame with 1 M/E

KEY FEATURES

- 2 RU
- 6 assignable outputs and 6 bidirectional inputs or outputs
- M/E supports 4 full effects keyers with lin/luma, 4 assignable DVE engines (will give 8 independent boxes)
  - Transition keyer (Mav Trans) with dedicated ClipStores for key & fill
  - Mask generator per keyer
  - Separate wipe generator
  - Matte generator
- Sub M/E background with 2 keyers* both lin/luma key
  - 1 assignable 2.5D DVE engine (will give 2 independent boxes)
  - Chromakeys on any output or use with the M/E for more keying power
  - RGB, YUV, and Bleed color correction
- Large internal ClipStore with 10 outputs holding 2 minutes of uncompressed HD video and audio content that is totally routable
- 4 floating resizable downstream keyers for main or aux outputs
- 4 channels of FormatFusion3 or FormatFusion4 assignable to any input/output or bus*
- Fully flexible internal multiviewer with 4 heads and 16 tiles
- Control:
  - 66 GPI/Os, 2x RS-422 ports, 3 Ethernet ports for control panel and TCP/IP protocols
  - USB ports for user/clip/system files import, export and backup
- 1 M/E control panel with a choice of 16 or 24 crosspoint buttons. Designed with clear OLEDs, RGB push buttons and shaft encoders for quick and granular control
- Sophisticated macro recall and edit capability
- Clearly labeled control panel with separate mnemonics for source, key and macro names
- Instant delegation buttons for macros or key and aux bus control
- T-bar with direction strip indicators
- Can be expanded by connecting other Kahuna Maverik modules

* Sub M/E functionality shared to be either Sub M/E or FormatFusion3 or FormatFusion4 engines.
### SPECIFICATIONS

**TV Standards**
- 2.97 Gb/s Video Standards (3G/1080p)
  - 1080p60 SMPTE ST 424
  - 1080p60 SMPTE ST 425/Level A
  - 1080p60 SMPTE ST 425/Level B
  - 1080p59.94 SMPTE ST 424
  - 1080p59.94 SMPTE ST 425/Level A
  - 1080p59.94 SMPTE ST 425/Level B
  - 1080p50 SMPTE ST 424
  - 1080p50 SMPTE ST 425/Level A
  - 1080p50 SMPTE ST 425/Level B

**1.485 Gb/s Video Standards (HD)**
- 1080i60 SMPTE ST 274(4), SMPTE ST 292(D)
- 1080i59.94 SMPTE ST 274(5), SMPTE ST 292(E)
- 1080i50 SMPTE ST 274(6), SMPTE ST 292(F)
- 1035i60 SMPTE ST 260, SMPTE ST 292(A)
- 1035i59.94 SMPTE ST 260, SMPTE ST 292(B)
- 1080PsF30
- 1080PsF29.97
- 1080PsF25
- 1080PsF24
- 1080PsF23.976
- 1080p60 SMPTE ST 274(7), SMPTE ST 292(G)
- 1080p29.97 SMPTE ST 274(8), SMPTE ST 292(H)
- 1080p25 SMPTE ST 274(9), SMPTE ST 292(I)
- 1080p24 SMPTE ST 274(10), SMPTE ST 292(J)
- 1080p23.976 SMPTE ST 274(11), SMPTE ST 292(K)
- 720p60 SMPTE ST 296(1), SMPTE ST 292(L)
- 720p59.94 SMPTE ST 296(2), SMPTE ST 292(M)
- 720p50 SMPTE ST 296(2), SMPTE ST 292(M)

**270 Mb/s Video Standards (SD)**
- 576i 16:9
- 576i 4:3
- 480i 16:9
- 480i 4:3

**Reference**
- Analog genlock high-definition tri-level syncs signal or SD 1V blackburst

**Frame**

### Video Signal Inputs
- 18 SD/HD/3G-SDI HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
- Serial digital interface: As REC601/SMPTE ST 292/SMpte ST 424 via BNC connectors

### Video Signal Outputs
- 6 SD/HD/3G-SDI assignable via BNC connectors

### Video Bidirectional Ports
- HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
- Serial digital interface: As REC601/ SMPTE ST 292 / SMPTE ST 424 via BNC connectors
- 6 bidirectional ports

**Genlock**
- Genlock reference 2 off analog sync via BNC connectors

**Control Interfaces**
- 66 GPI tally/GPO outputs: Assignable GPI/GPO isolated contact closures via 3x 25-way D-Type. Assignable as GPI or GPO
- 16 10/100/1000base-T 3x RJ45 Ethernet connectors fixings
- 2x RS-422 control ports
- 2x USB

### Power

**Kula frame:** Auto sensing 100–250 VAC power supply: 50/60 Hz nominal. Two fully independent hot-swappable PSU modules, with separate mains power feeds via 2x 13A IEC – 320-C14

**Power consumption:** <400W

**Temp range:** 5 to 40°C (41 to 104°F), noncondensing operating

### Mechanical

- 2 RU
- Height: 87 mm (3.42 in.)
- Depth: 604.8 mm (23.81 in.)
- Weight: Approx. 14 kg (30.3 lbs.)

**Kula Control 1 M/E 16 Crosspoint Panel**
- Width: 834 mm (32.83 in.)
- Depth: 139.7 mm (5.5 in.)
- Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar
- Weight: Approx. 3.5 kg (7.72 lbs.)

**Kula Control 1 M/E 24 Crosspoint Panel**
- Width: 994 mm (39.13 in.)
- Depth: 139.7 mm (5.5 in.)
- Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar
- Weight: Approx. 5 kg (11.02 lbs.)

**Kula Control 1 M/E Panel (Rackmount)**
- Width: 482.6 mm (19 in.)
- Depth: 221.5 mm (8.72 in.)
- Height: 87.9 mm (3.46 in.), 146.5 mm (5.79 in.) total height including T-Bar
- Weight: Approx. 3.6 kg (7.14 lbs.)

**Connectors Kula 1 M/E and 1 M/E Rackmount**

### Frame Communications
- 2x 16 10/100/1000base-T 3x RJ45 Ethernet connectors fixings

**Internal Panel Connection**
- 6x RJ45 Ethernet connectors fixings. Connection to other MAV modules
- NOT Ethernet connections, must be direct to MAV modules. Do not use network switches or hubs
- CAT5 or above cables – crossover cables are NOT suitable
- 2x USB 2 ports

**1x monitor connection to local touchscreen**
- PSU: 2x fully independent external PSU modules with separate mains power feeds via 2x 10A IEC leads

**Output from each PSU:** 12V DC 100W via Kycon KPPX 4-pin or compatible connectors to the KPP control surface
- 2 supplied as standard, one PSU provides dual redundancy
1 M/E 4K UHD
Kula Production Switcher

1 M/E 16 Crosspoint Panel, 2 RU Frame with 1 4K UHD M/E

KEY FEATURES

- Large internal ClipStore with 4 outputs holding 30 seconds of uncompressed 4K UHD video and audio*
- 2 channels of FormatFusion3 or FormatFusion4 assignable to any input/output or bus
- 1 M/E control panel with a choice of 16 or 24 crosspoints and clear OLEDs
- RGB pushbuttons and shaft encoders for quick and granular control, sophisticated macro recall and edit capability
- Clearly labeled control panel with separate mnemonics for source, key and macro names, instant delegation buttons for macros or key and aux bus control

* 2 stores in UHD and 2 stores in 1080p

SPECIFICATIONS

TV Standards
2.97 Gb/s Video Standards (3G/1080p)
1080p60 SMPTE ST 424
1080p60 SMPTE ST 425/Level A
1080p60 SMPTE ST 425/Level B
1080p59.94 SMPTE ST 424
1080p59.94 SMPTE ST 425/Level A
1080p59.94 SMPTE ST 425/Level B
1080p50 SMPTE ST 424
1080p50 SMPTE ST 425/Level A
1080p50 SMPTE ST 425/Level B
1.485 Gb/s Video Standards (HD)
1080p60 SMPTE ST 274(4), SMPTE ST 292(D)
1080p59.94 SMPTE ST 274(5), SMPTE ST 292(E)
1080p50 SMPTE ST 274(6), SMPTE ST 292(F)
1035p60 SMPTE ST 260, SMPTE ST 292(A)
1035p59.94 SMPTE ST 260, SMPTE ST 292(B)
1080pS30
1080pS29.97
1080pS25
1080pS24
1080pS23.976
1080p30 SMPTE ST 274(7), SMPTE ST 292(G)
1080p29.97 SMPTE ST 274(8), SMPTE ST 292(H)
1080p25 SMPTE ST 274(9), SMPTE ST 292(I)
1080p24 SMPTE ST 274(10), SMPTE ST 292(J)
1080p23.976 SMPTE ST 274(11), SMPTE ST 292(K)
720p60 SMPTE ST 296(1), SMPTE ST 292(L)
720p59.94 SMPTE ST 296(2), SMPTE ST 292(M)
720p50 SMPTE ST 296(2), SMPTE ST 292(M)
270 Mb/s Video Standards (SD)
576 16:9
576 4:3
480 16:9
480 4:3

Reference
Analog genlock high-definition tri-level syncs signal or SD 1V blackburst

Frame
Video Signal Inputs
36, SD/HD/3G-SDI: HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601/SMPTE ST 292/SMPTE ST 424 via BNC connectors

Video Signal Outputs
12 SD/HD/3G-SDI: Assignable via BNC connectors

Video Bidirectional Ports
HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601/SMPTE ST 292/SMPTE ST 424 via BNC connectors
6 bidirectional ports

Genlock
Genlock reference 2 off analog sync via BNC connectors

Control Interfaces
66 GPI Tally/GPO outputs: Assignable GPI/GPO Isolated contact closures via 3x 25-way D-Type. Assignable as GPI or GPO
16 10/100/1000base-T: 3x RJ45 Ethernet connectors fixings
2x RS-422 control ports
2x USB

Power
Kula frame: Auto sensing 100-250 VAC Power supply 50/60 Hz nominal. Two fully independent hot swappable PSU modules, with separate mains power feeds via 2x 13A IEC - 320-C14 socket
Power consumption: <400W
Temp range: 5 to 40°C (41 to 104°F), noncondensing operating

Mechanical
Frame
2 RU
Height: 87 mm (3.42 in.)
Depth: 604.8 mm (23.81 in.)
Weight: Approx. 14 kg (30.3 lbs.)

Kula Control 1 M/E 16 Crosspoint Panel
Width: 834 mm (32.83 in.)
Depth: 139.7 mm (5.5 in.)
Height: 64.7 mm (2.55 in.), 123.3 mm (4.86 in.) total height including T-Bar
Weight: Approx. 3.5 kg (7.72 lbs.)
Kula 12G-SDI Production Switcher

In a space-saving, cost-effective package, the 12G-SDI Kula switcher is ideal for a variety of production environments including live events (flyaway packs, OB vans) sports, houses of worship and conferences and events.

Building on Grass Valley’s Kula range of multiformat production switchers is the Kula 12G-SDI, the world’s first dedicated 12G-SDI production switcher. This innovative technology aligns with Grass Valley’s business-transforming solutions across live playout and production, which are empowering the move to 4K UHD for broadcast and media organizations, especially within live sports where 4K UHD has significant momentum.

Kula 12G-SDI is engineered with a single link 12G-SDI infrastructure. This means media organizations can focus on the future of their 4K UHD productions using less cabling and supporting their legacy equipment. For those planning a future transition to 4K UHD, they can achieve it faster than normal using existing 3 Gb/s / 1080p SDI infrastructures before the move to 12G-SDI signal distribution. It can be easily integrated into existing 4K UHD applications.

Kula 12G-SDI offers exceptional value for money in an entry-level package for either 12G-SDI or 3G/1080p operations. With 1 M/E, three keyers, DVE effects and features adopted from the powerful Kahuna switchers, Kula 12G-SDI offers a strong backbone for the most comprehensive productions.

Powerful I/Os
Kula 12G-SDI offers 12G-SDI BNCs for 4K UHD connectivity, as well as 3G BNCs for quad link signals; HD sources are also available — all in a 2 RU frame.

Applications
With its space-saving frame, compact panel, feature-rich effects and the ability to work in hybrid or full 4K UHD workflows, it’s perfect for all of the different production environments that today’s media organizations manage.

Sports
With sports broadcasts embracing 4K UHD to give viewers a more immersive experience, Kula 12G-SDI enables live sports productions to maintain that 4K UHD workflow. Kula 12G-SDI is intuitive in that it allows operators to select multiple cameras quickly, integrate replay systems easily and create animated wipe transitions from the internal ClipStore effortlessly. These types of features are ideally suited for college sports productions.

In the Field
Being out in the field amidst the action is a crucial part of a broadcaster’s job, especially those operating small footprint OB vans in tight locations. Kula 12G-SDI, with its 19-inch panel, is ideal for these smaller OB trucks where space is a concern.

With the Kula, broadcasters can set up, shoot a production and move on to the next location quickly. Kula 12G-SDI has a smaller, lighter frame so it can effortlessly produce 4K UHD productions on location.

4K UHD Workflows
With the growth of 4K UHD sports channels and sports news programming, media organizations need a way to automate these productions as they become part of the 4K UHD workflow. The Kula 12G-SDI makes this possible.

The Kula 12G-SDI is easy to operate with simple macro functionality for fast recall, powerful processing and multiple outputs within a small frame — all in 4K UHD.

A 12G-SDI and a 4K UHD Solution
Kula 12G-SDI is part of Grass Valley’s portfolio offering 12 Gb/s single link routing, multiviewers, conversion and infrastructure technologies so that users can work in 4K UHD faster and more efficiently while benefiting from exceptional value for money.

Grass Valley’s portfolio makes it easy and cost-effective for you to transition to 4K UHD (single link or quad link) from HD/hybrid workflows.
KEY FEATURES
- 1 M/E with 3 keyers
- 4K UHD functionality
- HD, 3G and 4K UHD in the same frame
- SDI connectivity for 12G sources and 3G sources
- 10x 12G-SDI inputs / 40x HD inputs
- Transparent configuration for 4K UHD productions
- FormatFusion3 or FormatFusion4
- Internal ClipStore
- Easy operations in 4K UHD

SPECIFICATIONS

TV Standards
11.88 Gb/s Video Standards (4K UHD)
SMPTE ST 2082-10
3840 x 2160p 50 Hz
3840 x 2160p 59.9 Hz4
3840 x 2160p 60 Hz
2.97 Gb/s Video Standards (3G/1080p)
1080p59.94 SMPTE ST 424
1080p59.94 SMPTE ST 425/Level A
1080p59.94 SMPTE ST 425/Level B
1080p50 SMPTE ST 424
1080p50 SMPTE ST 425/Level A
1080p50 SMPTE ST 425/Level B
1.485 Gb/s Video Standards (HD)
1080p60 SMPTE ST 274(4), SMPTE ST 292(D)
1080p59.94 SMPTE ST 274(5), SMPTE ST 292(E)
1080p50 SMPTE ST 274(6), SMPTE ST 292(F)
1035p60 SMPTE ST 260, SMPTE ST 292(A)
1035p59.94 SMPTE ST 260, SMPTE ST 292(B)
1080PsF30
1080PsF25
1080PsF24
1080PsF23.976
1080p30 SMPTE ST 274(7), SMPTE ST 292(G)
1080p29.97 SMPTE ST 274(8), SMPTE ST 292(H)
1080p25 SMPTE ST 274(9), SMPTE ST 292(I)
1080p24 SMPTE ST 274(10), SMPTE ST 292(J)
1080p23.976 SMPTE ST 274(11), SMPTE ST 292(K)
720p60 SMPTE ST 296(1), SMPTE ST 292(L)
720p59.94 SMPTE ST 296(2), SMPTE ST 292(M)
720p50 SMPTE ST 296(2), SMPTE ST 292(M)

Reference
Analog genlock high-definition tri-level syncs signal or SD 1V blackburst

Frame
Video Signal Inputs
10x 12G-SDI (SMPTE ST 2082) single link BNC connectors
40x SD/HD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601/SMPTE ST 292/SMPTE ST 424 via BNC connectors
Genlock reference: 2 off analog sync (loop A and B through)

Video Signal Outputs
3x 12G-SDI (SMPTE ST 2082) single link BNC connectors
12x HD/SD/1080p (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601/SMPTE ST 292/SMPTE ST 424 via BNC connectors

Video Bidirectional Ports
HD/SD/3G (270 Mb/s / 1.485 Gb/s / 2.97 Gb/s)
Serial digital interface: As REC601/SMPTE ST 292/SMPTE ST 424 via BNC connectors
2 bidirectional ports

Control Interfaces
Standard
44 GPI tally/GPO outputs: Assignable GPI/GPO isolated contact closures via 2x 25-way D-Type. Assignable as GPI or GPO
10/100/1000base-T 3x RJ45 Ethernet connectors fixings
2 RS-422 control ports
2x USB

Power
Kula frame: Auto sensing 100-250 VAC power supply 50/60 Hz nominal. Two fully independent hot swappable PSU modules, with separate mains power feeds via 2x 13A IEC - 320-C14 socket
Consumption: <400W
Temp range: 5 to 40°C (41 to 104°F) noncondensing operating

Mechanical
2 RU
Height: 87 mm (3.42 in.)
Depth: 604.8 mm (23.81 in.)
Weight: Approx. 14 kg (30.3 lbs.)
Kula Production Switcher Family SD, HD, 3G and 4K UHD Production Power

Kula IP

Production Switcher

The move to IP, which is becoming a reality for broadcasters and media organizations, is a massive shift for our industry and also a huge opportunity.

We’re seeing our customers’ technology models changing: many of them are looking to work with real-time audio and video transport over 10 GbE, 40 GbE and 100 GbE IP networks. This has led to the development of several real-time protocols such as uncompressed SMPTE ST 2022-6, SMPTE ST 2022-7 and VSF TR03/SMPTE ST 2110 to stream and enable interoperability across equipment in the production chain.

Enter the Kula IP, a new smart production switcher from Grass Valley, that delivers massive amounts of power and seamlessly connects with today’s IP network infrastructures. Kula IP supports these real-time protocols for streaming video on inputs and outputs and works with networks switches of up to 100 GbE.

The Kula IP production switcher provides high-end effects and is available in 2 M/E and 3 M/E models, as well as a 1 M/E UHD model.

Applications

The new Kula IP is perfect for a broad range of applications within the IP environment:
- Sports
- Regional news
- Magazine programs
- Internet feeds
- Outside/remote broadcasts
- Flyaway

Kula IP is uniquely positioned for media companies that need full IP I/O yet want a more cost-effective route into the IP domain. Of course it’s crucial that customers still benefit from a premium level of production capabilities in a smaller, more efficient form factor.

Kula IP offers flexible M/E functionality and aux outputs, main program and in-vision outputs. Productions have never been so easy in IP.

Powerful M/Es

Kula IP offers the most powerful M/E on the market. Each M/E has four keyers with resize engines including Dual Tile mode offering eight key layers, a dedicated animated clip transition called a Mav Trans and an A/B background.

Additional Sub M/E Functionality

Kula IP provides additional Sub M/Es to the standard M/E functionality.* Each Sub M/E includes two linear/luminance/chroma keyers. One keyer can be assigned to a 2.5D DVE resize engine, offering an extra three key layers plus an A/B background for creative productions without burning M/E resources.

Assignable Downstream Keyers

Four floating DSKs are available within the Kula IP. They can be independently assigned to any output or used downstream of any M/E. They have resize engines and can create eight key layers.

Capability of Delivering Multiple Outputs

Kula IP can output multiple standards simultaneously using the Kahuna technology FormatFusion3*, opening up more functionality across the delivery of HD, 1080p and 4K.

Multiviewer Matching Kahuna’s High Performance

Kula IP’s internal multiviewer offers flexibility with configurable one to four heads and 16 tiles to build preview windows to prepare for professional live productions. When more monitoring is required, M/E 2 can be reallocated to become a 2nd configurable multiviewer with up to 12 tiles across one to four heads.

Largest ClipStore

The Kula production switcher has the largest internal ClipStore in its class: it provides ten ClipStore outputs with 16 GB of RAM, which gives up to two minutes of uncompressed HD video.

Large Input and Output

With 36 IP inputs and 12 IP outputs, the Kula IP is a practical production switcher. For more flexibility, Kula IP has an extra four SDI inputs and two extra bi-directional SDI ports assignable as an input or output.

Control Surface that Supports Direct Control and Macro Allocation

Kula IP has several panels in the one, two and three M/E range. It offers up to 16 or 24 crosspoint buttons, separate key control and transition operations and assignable macro buttons with OLED displays for crystal clear identification. Kula IP can connect to up to eight extra modules to the panel from the Kahuna Maverik modular panel range.

* Sub M/Es functionality is either Sub M/Es or FormatFusion3 or FormatFusion4 engines. The 2 M/E and 3 M/E Kula will support 4K UHD, however at the same feature specification as the 1 M/E 4K UHD Kula.
Kula Production Switcher Family SD, HD, 3G and 4K UHD Production Power

**Input/Output Tables with SMPTE ST 2022-6, SMPTE ST 2022-7 & VSF TR03/SMPTE ST 2110**

<table>
<thead>
<tr>
<th></th>
<th>Kula IP</th>
<th>3 M/E</th>
<th>2 M/E</th>
<th>1 M/E UHD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inputs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP over 4x 50 GbE QSFP28</td>
<td>36</td>
<td>36</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>3/1.5G or single-link 12G SDI inputs over BNC</td>
<td>4</td>
<td>4</td>
<td>1x 12G or 4x HD</td>
<td></td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP over 4x 50 GbE QSFP28</td>
<td>12</td>
<td>12</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Bidirectional I/O</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/1.5G assignable in or out BNC</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

**TV Standards**
- 2.97 Gb/s Video Standards (1080p)
  - 1080p59.94 SMPTE ST 424
  - 1080p59.94 SMPTE ST 425/Level A
  - 1080p59.94 SMPTE ST 425/Level B
  - 1080p50 SMPTE ST 424
  - 1080p50 SMPTE ST 425/Level A
  - 1080p50 SMPTE ST 425/Level B
- 1.485 Gb/s Video Standards (HD)
  - 1080p60 SMPTE ST 274(4), SMPTE ST 292(D)
  - 1080p59.94 SMPTE ST 274(5), SMPTE ST 292(E)
  - 1080p59.94 SMPTE ST 274(6), SMPTE ST 292(F)
  - 1035p60 SMPTE ST 260,SMPTE ST 292(A)
  - 1035p94 SMPTE ST 260, SMPTE ST 292(B)
  - 1080Pst30
  - 1080Pst30.97
  - 1080Pst25
  - 1080Pst24
  - 1080Pst23.976
  - 1080p30 SMPTE ST 274(7), SMPTE ST 292(G)
  - 1080p29.97 SMPTE ST 274(8), SMPTE ST 292(H)
  - 1080p25 SMPTE ST 274(9), SMPTE ST 292(I)
  - 1080p24 SMPTE ST 274(10), SMPTE ST 292(J)
  - 1080p23.976 SMPTE ST 274(11), SMPTE ST 292(K)
  - 720p60 SMPTE ST 296(1), SMPTE ST 292(L)
  - 720p59.94 SMPTE ST 296(2), SMPTE ST 292(M)
  - 720p50 SMPTE ST 296(2), SMPTE ST 292(M)
- 720p60 SMPTE ST 296(3), SMPTE ST 292(L)
- 720p59.94 SMPTE ST 296(4), SMPTE ST 292(M)
- 720p50 SMPTE ST 296(4), SMPTE ST 292(M)

**IP Connectivity**
- Duplex signals supported over RTP streams via 2x SFP+ 28 cages.
- **SMPTE ST 2022-6, SMPTE ST 2022-7, VSF TR03/SMPTE ST 2110**
  - 36 inputs – 1.485 Gb/s format sources
  - 36 inputs – 2.970 Gb/s format sources
  - 9 inputs 4K UHD in SMPTE ST 2110
  - 12 outputs – 1.485 Gb/s format sources
  - 12 outputs – 2.970 Gb/s format sources
  - 3 outputs 4K UHD in SMPTE ST 2110
- **Ethernet Signals**
  - QSFP28 optical x2
  - Conforms to IEEE 802.3ba – 100 GbE
- **SDI Signals**
  - 2x bidirectional
  - 4x SDI BNC Inputs – 1.485 Gb/s format sources and 2.970 Gb/s format sources OR 1x 12G-SDI (SMPTE ST 2082) single link BNC connector
- **Genlock**
  - Genlock reference 2 off analog sync via BNC connectors
- **Control Interfaces**
  - 66 GPI tally/GPO outputs assignable GPI/GPO isolated contact closures via 3x 25-way D-Type. Assignable as GPI or GPO
  - 16 10/100/1000base-T 3x RJ45 Ethernet connectors fixings.
  - 2x RS-422 control ports
  - 2x USB

**Power**
- **Kula IP Frame**
  - Auto sensing: 100-250 VAC power supply 50/60 Hz nominal
  - Two fully independent hot swappable PSU modules, with separate mains power feeds via 2x 13A IEC – 320-C14 socket
  - Power consumption: <400W
  - Temperature range: 5 to 40°C (41 to 104°F) noncondensing operating

**Mechanical**
- 2 RU
- **Height:** 87 mm (3.42 in.)
- **Depth:** 604.8 mm (23.81 in.)
- **Weight:** Approx. 14 kg (30.3 lbs.)

**KEY FEATURES**
- Up to 3 M/Es
- Up to 32 key layers
- Up to IP 50 GbE interface + 50 GbE packet redundancy
- Supports 36 inputs and 12 outputs over RTP streams
- SMPTE ST 2022-6, SMPTE ST 2022-7 & TR03 uncompressed video
- 6 x SDI BNCs
- Supports 1080i/720p/1080p & UHD
- FormatFusion3 or FormatFusion4
- Internal ClipStore
- Internal multiviewer up to 28 tiles
- Easy operation
Grass Valley Customer Care Services

Grass Valley’s customer service offers first class solutions for optimizing your operations, through world leading technical support and fast responsiveness.

Grass Valley Customer Care comes as standard for the first year of your purchase to give you absolute confidence in your investment. Extended GV Care agreements are available.

Grass Valley has expert support engineers, available to you 24 hours a day, 7 days a week, 365 days a year via telephone, email or live chat. When replacement parts are needed, we offer an advanced parts exchange, sending you either a new frame or panel in return for the faulty part as a one-time swap.

Replacements are dispatched immediately from Grass Valley locations worldwide. Our investment ensures speedy resolution of issues that might affect your operations.

Online Support Increases Access, Enhances Transparency

Through our online support portal you can monitor and track any support issue and even engage one-to-one with support engineers for fast answers to any question via our interactive live chat.

Grass Valley’s customer services are there to help and support you. For further information about GV Care contact your Grass Valley representative.

Training

To ensure that customers experience the full benefits of their switcher, Grass Valley is committed to providing the highest levels of training for Kula owners, operators and engineers.

Training before and after a system purchase is available worldwide at customer premises, Grass Valley offices or an alternative third-party location. The duration of these training sessions will depend on user requirements.