The Vega router family is a powerful suite of routers that delivers superior functionality at price points that suit broadcast-ers’ and media organizations’ budgets. The family is divided into the Vega 10 Series, the Vega MV Series and the Vega 100 Series. They offer different physical interfaces that are all simple to configure and because all the models are easy to install, choosing the appropriate model for your routing needs is never difficult.

Vega, from Grass Valley, a Belden Brand, is ideal for small to mid-size applications. It comes in a series of frame sizes, from simple fixed hardware for smaller budgets to flexible dynamic routing architecture for more complex productions. Even if you’re a novice in the field, Vega’s simple design makes the routers straightforward and easy to operate.

The Vega range has extensive redundancy options with dual redundant crosspoints, frame controllers, power supplies and fans. Future-proof and adaptable, the Vega suite is also equipped to handle 4K UHD as standard to give broadcasters a simple transition when moving to 4K UHD.

**Vega 10 Series**

A powerful fixed 3 RU mainframe with a fixed 34x34 video matrix. The 3 RU chassis measures at 65 mm (2.56 inches) deep which makes the Vega 10 the perfect router for projects where space is of concern.

The router in the Vega 10 series is the:

- Vega 30

With MADI interfaces, de-embedding and embedding, plus clean and quiet switching and line synchronization, the Vega 30 is ideal for small trucks and studios, headends, bay monitoring, houses of worship and theater.

**Vega MV Series**

Vega MV routers are flexible, cost-effective, small form factor routers with integrated multiviewer displays. Available in a 1 RU frame, the Vega MV range is offered as:

- Vega 16MV – 16x16 video matrix
- Vega 32MV – 32x32 video matrix

The Vega MV range is perfect for space-conscious setups. It provides routing capability and single or multiple displays with fully configurable screen layouts, comprehensive monitoring and alarm capability and simple, intuitive configuration. For those wanting to transition to 4K UHD, the Vega MV Series is 4K UHD-capable, offering 4K UHD inputs and outputs.

**Vega 100 Series**

For more complex video and audio routing needs, the Vega 100 Series offers modular and flexible software, configurable inputs and outputs for asymmetric routing for both coax and fiber I/O and is fully redundant for critical applications.

The Vega 100 Series consists of:

- Vega 200
- Vega 400
- Vega 700

With such a broad range of matrix configurations, the Vega 100 Series is ideal for many small and mid-sized applications including medium and larger OB trucks, news studios, playout centers, theaters, rental & flyaway, houses of worship and studio complexes.
### Key Features

**All Vega Family Routers**
- Video routing with clean quiet switching technology, for smooth fade program transitions
- Hybrid audio routing with de-embedding, embedding and discrete audio
- MADI audio inputs and outputs
- Unique input embedding capability
- Line synchronizers
- Integrated multiviewer
- Web configuration

**Vega A New Generation of Routing and Processing**

- Powerful processing
- Fast configuration
- 4K UHD ready
- Space saving, small form factor
- Cost-efficient

**Vega MV Series (16/32)**
- Powerful processing
- Fast configuration
- 4K UHD ready
- Space saving, small form factor
- Cost-efficient
- Integrated multiviewer for easy monitoring
- Excellent picture quality
- Alarm for fast error detection

**Vega 30 – Small Fixed**
- Powerful processing
- Fast configuration
- 4K UHD ready
- Space saving, small form factor
- Cost-efficient

**Vega 200 – Small Flexible / Vega 400 – Medium Flexible / Vega 700 – Large Flexible**
- Flexibility in small and medium sized routers
- Resilient and reliable
- Versatile and fast configuration
- Fully modular
- Smooth program transitions with clean & quiet switching
- 4K UHD ready

The Vega Series is available with varying features and specifications

<table>
<thead>
<tr>
<th></th>
<th>Vega 16MV</th>
<th>Vega 32MV</th>
<th>Vega 30</th>
<th>Vega 200</th>
<th>Vega 400</th>
<th>Vega 700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainframe</td>
<td>1 RU</td>
<td>1 RU</td>
<td>3 RU</td>
<td>2 RU</td>
<td>4 RU</td>
<td>7 RU</td>
</tr>
<tr>
<td>Size Video</td>
<td>16x16</td>
<td>32x32</td>
<td>34x34</td>
<td>1x95 to 95x1</td>
<td>1x191 to 191x1</td>
<td>144x288 to 288x144</td>
</tr>
<tr>
<td>Size Audio</td>
<td></td>
<td></td>
<td>736x928</td>
<td>960x912</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio Routing</td>
<td></td>
<td></td>
<td>3x6 MADI</td>
<td>6x6 MADI</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Audio Interfaces**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>3 in, 6 out</th>
<th>6 in, 6 out, or dual 3 in with auto failover, dual 3 out</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADI</td>
<td></td>
<td>—</td>
<td>Up to 96 ports</td>
</tr>
<tr>
<td>AES</td>
<td>—</td>
<td>—</td>
<td>Up to 192 ports, Up to 288 ports</td>
</tr>
<tr>
<td>Embedded</td>
<td></td>
<td>34 outputs with 16 audio channels on each</td>
<td>Up to 36 inputs and 33 outputs with 16 audio channels on each</td>
</tr>
</tbody>
</table>

**Processing**

<table>
<thead>
<tr>
<th></th>
<th>—</th>
<th>✔️</th>
<th>✔️</th>
<th>✔️</th>
<th>✔️</th>
<th>✔️</th>
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<tbody>
<tr>
<td>Input Line Sync</td>
<td></td>
<td>—</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>De-Embedding</td>
<td>✗</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Output Embedding</td>
<td>✗</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Output Line Sync</td>
<td>✗</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Clean &amp; Quiet Switching</td>
<td>✗</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

**Multiviewer**

<table>
<thead>
<tr>
<th></th>
<th>✔️</th>
<th>✔️</th>
</tr>
</thead>
<tbody>
<tr>
<td>4K UHD Output</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>4K UHD Input</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>UMD</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Tally</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Clock</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Alarms</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Dolby Metering</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>
Control

The Vega 10 and 100 Series use web-based control, softpanels and hardware panels to control each router function. A browser launched plug-and-play GUI provides intuitive configuration and control via a PC. In addition, 1 RU and 2 RU control panels are available for connection over fast Ethernet either directly or via standard hub and/or IP routing devices. Vega uses Grass Valley’s external control protocols, which means third-party control is easy.

Hard Panels

The Luna hard panel range has been designed to make control of Vega routers easy and quick. The Luna panel range offers:

**Destination/Source search keys**

Destination/Source search keys enable the user to define group or category keys and use for multiple drill down filters to specific source/destination. Only names in the selected groups will appear on the display for easy viewing.

**Numeric/function keypad**

Having numeric keys and group keys allow for specific name filtering. Function keys enable toggle source, destination selection, lock, take plus AHP (hybrid) specific controls, as well as clear all and select all function for fast audio track selection.

**Multifunction LCD display**

The multifunction LCD display enables video routing, audio track routing and processing enabling channel control using rotary controls or buttons.
The Vega 10 Series

34x34 Video Router with Audio Routing and Clean & Quiet Switching

Vega 30 offers the most advanced hybrid audio routing and processing available in a highly compact, lightweight chassis. Clean and quiet switching options on all outputs, with MADI and embedded audio routing options put Vega 30 routers in a class of their own.

Vega 10 Series Hybrid Video and Audio Routing

The Vega 10 Series is the ideal router solution for live production and OB facilities because it can interface with audio mixing desks, track swapping incoming feeds, route video and audio feeds all with clean and quiet switching.

Offering a simpler solution for video and audio routing, the Vega 10 Series has fixed inputs and outputs on a 3 RU mainframe. Each audio input (embedded or MADI) can be both routed simultaneously with video feeds. Audio can be embedded on the outputs without the need of external equipment. This makes for a cost-effective smaller router with a power level that most routers in its class can’t match.

Vega 10 Series Synchronizer and Clean Switching

The Vega series can be equipped with line synchronizer re-timing capability for inputs and outputs. On Vega 10 Series, this is on outputs. This automatically manages any timing differences present on incoming signals and allows timed signal switching in the router.

Clean and quiet switching is available throughout the entire Vega 10 Series to give you smooth nonvisible transitions, as well as to get rid of any noticeable audio clicks and pop interference that may occur on a router switch transition. It also ensures there is no disruption to the video data stream, therefore downstream equipment cannot be disturbed by the transition.

Shallow 3 RU chassis

Ultra lightweight — ideal for all mobile applications. Minimal depth allows mounting behind equipment if space is critical.

34x34 video routing

Simple video only routing for all SDI formats to 3 Gb/s and ASI.

3x6 MADI audio

Interfaces to audio mixing consoles, AES and analog breakout boxes, etc. for small production trucks.

Options for clean and quiet switching on all outputs

12, 24 or all 34 outputs with clean and quiet switching. Line synchronization cleans switch line disturbances, and fades give smooth audio transitions.

Audio routing MADI, embedded

Route embedded audio to and from MADI swap audio channels within a video stream, or add new audio to outgoing video signals.
Flexible Control
Control from a simple web browsers panel, hardware panels with LCD re-ledgendable panels and simple button per crosspoint panels and from industry standard open router control protocols, simultaneously.

Simple Configuration
Simple intuitive configuration. No external software to install.

Architecture and Options
Vega 10 Series is a fixed hardware platform which provides simple video routing by default.

Vega 30 Video Routing
Vega 30 router hardware with no license applied provides a 34x34 video router for all video signals between 270 Mb/s and 3 Gb/s, including DVB-ASI. Licensed options can be added (when purchased, or upgraded later) for additional capability.

Extra Options available for the Vega 10 Series are:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean and quiet switching on outputs 1 – 12</td>
<td>Video is re-timed to the reference input (see specifications for timing window.) When a route is changed, embedded audio is faded down, the video route is switched in the active picture area of the switching line as defined by SMPTE RP 168. The switch disturbance on video is removed and embedded audio from the new source is faded up.</td>
</tr>
<tr>
<td>Clean and quiet switching on outputs 13 – 24</td>
<td></td>
</tr>
<tr>
<td>Clean and quiet switching on outputs 25 – 34</td>
<td></td>
</tr>
<tr>
<td>Audio routing</td>
<td>Audio embedded on all video signals after the video crosspoint, plus 3 MADI inputs can be routed to any video output and to any MADI channel.</td>
</tr>
</tbody>
</table>

Simplified Configuration and Control
• The Vega 30 can be configured simply online via a web application
• When control is needed the Vega 30 offers:
  – Browser control panel for routing and processing,
  – RollCall interface for Luna panel control
  – General Switcher (SW-P-02) and General Remote (SW-P-08) protocols on Ethernet
  – SNMP control (crosspoint setting) and monitoring (simple PSU/fan fail)
**SPECIFICATIONS**

**General**
- **Router size:** 34x34 video
- 3x6 MADI
- **Connectors:** HD-BNC 75Ω

**Standards supported:**
- SMPTE ST 259 525 & 625 SD-SDI
- SMPTE ST 292 720p and 1080i HD-SDI
- SMPTE ST 424 1080p 3G-SD
- MADI AES-10

**Signals**

**Inputs – video**
- Return loss: >15 dB 10 MHz to 1.5 GHz, >10 dB 1.5 GHz to 3 GHz
- Input amplitude (nominal): 800 mV
- DC offset: <5V
- Cable equalization: automatic for Belden 1694A:
  - SD: 350m / 1150 ft.
  - HD: 200m / 650 ft.
  - 3G: 140m / 460 ft.

**Outputs – video**
- Return loss: >15 dB 10 MHz to 1.5 GHz, >10 dB 1.5 GHz to 3 GHz
- Amplitude: 800 mVp-p ±10%
- Rise/fall time: <180 ps @ HD, <650 ps @ SD, 90 ps @ 3G
- Timing jitter: <0.25 UI @ 1.5G and 3G, <0.15 UI @ SD
- Alignment jitter: <0.15 UI @ 1.5G and 3G, <0.1 UI @ SD
- DC offset: 0V ±0.5V

**Inputs – MADI audio**
- Return loss: >15 dB 10 MHz to 1.5 GHz, >10 dB 1.5 GHz to 3 GHz
- Input signal format: MADI to AES-10
  - 56- or 64-channel, 48 kHz sample rate
- Connector: HD-BNC

**Outputs – MADI audio**
- Output format:
  - MADI to AES-10
  - 64-channel, 48 kHz sample rate
- Connector: HD-BNC
- Amplitude: 800 mVp-p ±10%

**Clean and Quiet Switching**

**Switch line processing**
- Re-generation of switching line, line synchronized to reference signal. Video and audio V-fade around the crosspoint switch transition
- All clean switching signals must be the same format and synchronous to the reference

**V fade rate**
- 4, user selectable, cut to 0.5s V-fade

**Non-audio signals**
- Auto detect and cut

**Ancillary data handling in V-fade**
- VANC data passes transparently
- HANC non-audio passes transparently

**Audio V-faded**
- AES validity, user and channel status bits passed transparently

**ORDERING**

**VG30**
- Vega 30 – 34x34 video router with single PSU

**VG10-CSA**
- Vega 10 series license – clean quiet switching & line synchronizer license for outputs 1-12

**VG10-CSB**
- Vega 10 series license – clean quiet switching & line synchronizer license for outputs 13-24

**VG10-CSC**
- Vega 10 series license – clean quiet switching & line synchronizer license for outputs 25-34

**VG30-PSU**
- Vega 30 PSU (main or redundant)

**VG30-FAN**
- Vega 30 replacement fan assembly

**Vega 30 Packages**

**VG30-P2**
- Vega 30 – 34x34 video router with 12 clean quiet switching outputs

**Control**

There is a choice of options for router control for the Vega 10 Series.

![Web soft panel](image)

Web soft panel – a simple browser based X-Y panel

![Luna 1 RU and 2 RU control panel](image)

![Vega 30 control panel](image)
Vega 16MV & 32MV

SDI Routers with Integrated 4K UHD Multiviewer Capability

A cost-effective solution for video routing with 4K UHD multiviewer outputs.

The Vega 16MV and Vega 32MV are cost effective-solutions for routing and multi-image displays. Vega MV are standalone routers with integrated multiviewer, ideal for smaller applications such as ENG and small OB vans, small studios and live productions, or concert venues, houses of worship and conference centers.

Applications

Vega MV is ideal for use in:
- Studio galleries
- OB trucks
- ENG vans
- Post production suites

In fact any application that benefits from a single or multiple display(s).

Vega MV Capability

- Generate audio metering of individual channels from AES or Dolby E
- Auto detect Dolby E formats and adjust bars to suit, or show incorrect audio formats
- Display closed captioning
- Decode and use WSS (wide screen signaling for aspect ratio control)
- One or two rows of audio metering for efficient use of display space
- Audio phase indication
- UMD source names from external routers and production switchers
- Source tallies from tally systems
- Alarm indicators
- Safe area marker
- Real-time clocks or timers
- VITC or LTC timecode display
- Multiple clocks with timezone offsets
- Store and display graphics for on screen logos
- Alert message boxes containing text, updated from external systems

Control Integration

Vega MV can be operated standalone, or as part of a larger routing and monitoring system.

Support for SW-P-02 router control protocol allows control from any Grass Valley control system, or from many other manufacturer’s control systems.

SW-P-08 protocol support adds the ability to extract source and destination names, and for the Vega MV to take names from external routers and switchers, to display on screen.

RollCall protocol allows direct connection to control panels, and all can be used simultaneously.
As well as a 16x16 or 32x32 router, a separate router feeds the multiviewer scalers. This allows totally independent control of sources routed to each multiviewer tile. Alternatively, a “destination follow” mode forces a tile to automatically follow the source routed to a specified destination, giving confidence that the correct source has been routed.

**Outside Broadcast/Live Production**

Multichannel display with graphical background and channel logos for clear identification:
- 1 RU systems allow production switcher live operation
- Cue lights
- UMD tallies showing switcher and router source names
- Clock
- 4K UHD HDMI out for high-quality monitoring with SDI copy

The Vega MV can be configured simply online via a web application

When control is needed the Vega MV offers:
- Browser control panel for routing and configuration
- Hardware panel control for routing and layout recalls
- General Switcher (SW-P-02) and General Remote (SW-P-08) protocols on Ethernet
- SNMP control and monitoring

Simple web browser-based configuration means no software to install before configuration can begin.

Configuration tools include:
- Grouping
- Align to grid
- Auto scale to aspect ratio
- Multicolor indication of borders for different types of tile
- Auto-update of screens as changes are made, or push once layout is complete

Input setups (audio meter colors, over/under levels, and alarm settings) for any input can be applied to one or more selected inputs to speed configuration.
Monitoring and Alarms

- SDI auto detection from SD to 3G
- Multiple GPIs and GPOs for external tally and alarm triggers
- Content and metadata monitoring and alarms
- Clear indication of missing or incorrect metadata on-screen and via external alarm
- Audio bargraph (embedded and discrete AES) including Dolby E metering
- "Wrong audio format" detection gives simple indication on screen or via alarm
- Subtitle, AFD, WSS, VITC decoding and monitoring
- Subtitle/teletext monitoring:
  — WST/ITU-R BT.653-3, SD only
  — OP47 – SD, HD, 3G-A
- Closed captions:
  — CEA-608 NTSC
- AFD driving aspect ratio:
  — SMPTE ST 2016, SD, HD and 3G-A
- WSS driving aspect ratio
  — ETSI EN300294, composite
- D-VITC display
  — SMPTE ST 12 – SD-SDI only

Clear on-screen alarms

Video and audio alarms are displayed on each tile. Alarms can be set for each tile, and font size is fully configurable.

Incorrect audio format indicators and alarms

Expected audio formats can be defined for each channel — if this format is not present, a different colored bar is displayed. Alarm text can also be displayed.

Dolby Metering

Meter all Dolby E formats simply and clearly.

Two rows of audio metering for efficient use of display space.
**Inputs and Outputs**

**Number of inputs/outputs:**
16 or 32, 3G/HD/SD, optionally quad link 4K UHD

**Input formats and standards supported:**
- PAL, PAL-M, NTSC, NTSC-4.43: 720x480i59.94, 720x576i50
- SD-SDI: 1920x1080p60, 1920x1080i59.94, 1920x1080p50, 1920x1080p30, 1920x1080p25
- HD-SDI: 1920x1080p25, 1920x1080p24, 1920x1080p23.98, 1280x720p50, 1280x720p59.94, 1280x720p50
- 3G-SDI: 1920x1080p60, 1920x1080p59.94, 1920x1080p50

**Metering capacity:**
- Dolby: up to 4 Dolby encoded pairs per input
- Mono Audio: a maximum of 32 mono audio channel meters can be displayed per video tile

**Dolby metering operation:**
- Auto-detect: audio meters adjust to incoming format
- Fixed: audio bars are set to defined format. Channels of different formats are shown in “alarm” color

**Multiviewer Outputs**

- 2x SDI outputs with 2x HDMI copies

**Output formats:**

<table>
<thead>
<tr>
<th>Format</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD 720p</td>
<td>1280x720, 50 Hz, 59.94/60 Hz</td>
</tr>
<tr>
<td>3G 1080p</td>
<td>1920x1080, 50 Hz, 59.94/60 Hz</td>
</tr>
<tr>
<td>4K UHD (HDMI only)</td>
<td>3840x2160, 50 Hz, 59.94/60 Hz</td>
</tr>
</tbody>
</table>

**Video processing delay:**
- Nominal delay with co-timed input signals is 1 frame
- Non-synchronous signals can add up to 1 frame of delay

**Image configuration:**
- Images can be continuously varied in size and position on screen or may be displayed in preconfigured layouts, positions and sizes. When the outputs are configured to feed two display devices the tiles may be assigned to one or both outputs. The system menu can be displayed on one or both video outputs

**Audio metering standards:**
- AES/EBU, BBC PPM, DIN PPM, Nordic PPM, VU and Extended VU

**Alarms:**
- Video: loss of sync, loss of luminance, freeze frame or motion
- Audio: loss of embedded or external audio, over level, out of phase, wrong format + Dolby E loss
- Other: loss of VITC, subtitles or V-chip, video non-sync detection

**Environmental**
- Depth: 426 mm (16.7 in.)
- Weight: 8 kg/18 lbs.
- Backup power: external 1 RU provides 24 VDC
- Power: 190W max.
- Supply voltage: 100-240 VAC, 50/60 Hz
- Cooling: Fan assisted, front to side

**ORDERING**

**Frames**
- VG-16MV: Vega 16MV. 1 RU 16x16 router with dual 4K UHD multiviewer outputs
- VG-32MV: Vega 32MV. 1 RU 32x32 router with dual 4K UHD multiviewer outputs

**PSUs**
- MV-EXTPSU3: External backup 1 RU chassis for 3 PSU modules (PSU not included)
- MV-1000PSU: PSU module for Vega 16MV and Vega 32MV, and external backup chassis

**Options**
- MV-EXTPSU3 + MV-1000PSU: A 1 RU backup power supply frame accommodating up to 3 backup power units provides power to the Vega MV in the event of an internal power supply failure. It also supports hot swapping of faulty power modules

**Support**
- Grass Valley provides a host of world-class customer services that take our clients from the inception of a project, through all of the key stages to successfully get on air, and throughout the system’s working life.
Vega 100 Series

Flexible Resilient Hybrid Routing and Processing

The Vega 100 Series is available in three frame sizes from 6x6 to 144x288 with an impressive feature set, including hybrid video and audio routing, powerful processing, input embedding, synchronizers and clean and quiet switching.

The Vega 100 Series is suited to more complex productions that demand the flexibility to manage many different feeds quickly and to route instantly in the event of last-minute changes.

With the Vega 100 Series, any port can be configured as input or output with a choice of coax, fiber or HDMI, which gives users the freedom to customize their router to specific needs.

All inputs and outputs can be configured easily via the software setup menu, which allows multiformat, multilevel routing in any combination for both video and audio. All routing in a single chassis simplifies system design and saves on space, power and costs.

**Vega 100 Series Input Embedding, Audio Routing and Clean Switching**

With these functions, the Vega 100 Series provides a powerful option that enables your baseband infrastructure to include a mix of dynamic configurations of mixed video, audio, copper and fiber for both inputs and outputs. There are three rack sizes in the Vega 100 Series, which means you can use the same modules throughout your application or you can standardize on one size throughout your facility.

**Vega 100 Series Input Embedding and Audio Routing**

The Vega 100 Series can be equipped with any combination of video and audio modules. It will route any format of video and AES, MADI, embedded or compressed audio in any combination in a single frame, allowing multiformat, multilevel routing. For users, this means a uniquely flexible architecture for varying applications, such as if they’re working in an OB environment, for example:

- De-embed audio on processing inputs
- MADI inputs (mixing desk interface)
- AES inputs and outputs
- Stereo routing with mono breakaway
- Input embedding

**Vega 100 Series Synchronizer and Clean Switching**

The Vega family can be equipped with line synchronizer re-timing capability for inputs and outputs. On the Vega 100 Series, both inputs and outputs can be synchronized. This automatically manages any timing differences present on incoming signals, and allows timed signal switching in the router.

Clean and quiet switching is available throughout the entire Vega 100 Series to give you smooth nonvisible transitions, as well as to get rid of any noticeable audio clicks and pop interference that may occur on a router switch transition. It also ensures there is no disruption to the video data stream, therefore downstream equipment cannot be disturbed by the transition.

The Vega 100 Series can embed audio on both inputs and outputs, allowing for multiple feeds to be configured accordingly. Input embedding is a unique feature of both Vega and Sirius 800 router families. Programs with combinations of video and audio tracks can be created on a router input, rather than the output and wrapping external cables back around to an input. This saves space, power and cost.

The Vega 100 Series allows audio to be embedded on both inputs and outputs and it can simultaneously route video and audio. Totally flexible routing of video and audio, together with input embedding, means any signal workflow can be accommodated within the Vega.
**Vega** A New Generation of Routing and Processing

**KEY FEATURES**

- Vega 200 (2 RU) 1x95 to 95x1 video
- Vega 400 (4 RU) 1x191 to 191x1 video
- Vega 700 (7 RU) 144x288 to 288x144 video
- Configurable inputs and outputs
- Hybrid video and audio routing
- Mixture of SDI, HD, 3G, coax, fiber and HDMI
- MADI & AES audio — balanced and unbalanced
  - Up to 6 MADI inputs and 6 MADI outputs
- De-embedding and embedding for full hybrid routing
- Ultra-resilient — redundant PSUs, controllers, crosspoints and fans
- A variety of control interfaces
- Fully modular with hot swappable cards, PSUs and fans
- SDI, ASI, 4K UHD capable
- Synchronizing inputs and outputs
- Clean and quiet switching for smooth program transitions on outputs
- Audio track shuffling
- Input embedding
- Clean and quiet switching

**Benefits**

- Inherent flexibility in small & medium sized routing applications
- Zero compromise in resilience and redundancy
- Versatility and speed in system configuration

**Input/Output Options**

- Coax input/output — 12 channels
- Fiber, coax or HDMI SFP input/output — 12 channels
- AES balanced and unbalanced — 12 channels
- Input processing — 9 channels
- Output processing — 9 channels
- MADI and audio routing — 6x6

<table>
<thead>
<tr>
<th>Vega 200</th>
<th>Vega 400</th>
<th>Vega 700</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 RU</td>
<td>4 RU</td>
<td>7 RU</td>
</tr>
<tr>
<td>1x95 to 95x1 video</td>
<td>1x191 to 191x1 video</td>
<td>144x288 to 288x144 video</td>
</tr>
<tr>
<td>Square size: 48x48</td>
<td>Square size: 96x96</td>
<td>Square size: 216x216</td>
</tr>
</tbody>
</table>

**Flexible hybrid video and audio routing**

- Video, AES, Embedded and MADI interconnects for maximum flexibility in multiple audio formats. Balanced and unbalanced AES connections.
  - Increased system design flexibility. Mixed signal routing in a compact frame. Ideal for small/medium live production in OBs and studios.

**Clean & quiet switching**

- Clean switching line disturbances, and V-fade audio.
  - Disturbance-free on-air master control and switcher bypass applications.

**Asymmetric signal routing**

- Each signal port independently software configured for use as an input or an output.
  - No input or output port wastage! Can negate the need for the ‘next size up’ router (particularly for monitoring and distribution applications). Change the router size without hardware changes.

**Multiple video connection options**

- Coax, fiber SFP and HDMI I/O modules. Spans video physical layer boundaries. Simply route between SDI to HDMI.
  - No need for external fiber or HDMI converters. Reduced cabling, increased reliability. PC graphics and PC monitor routing.

**Extensive redundancy options**

- Dual redundant crosspoints, frame controllers, power supplies.
  - Full protection for critical or ‘live’ services. No loss of revenue from sub-assembly failure!

**Ultra compact frame**

- 50% more signal ports than conventional BNC electrical router for same rack height.
  - Greater efficiency with reduced racking space & costs. Or more ports for future expansion!

**Entry level lower cost alternative**

- Dedicated 12-port coax-only SDI rear modules.
  - Minimizes outlay and complexity for all-coax installations.

**Comprehensive set of soft and/or hard control options**

- Intuitive plug-and-play control software and/or 1 RU and 2 RU control panels.
  - Multiple solutions for all workflow environments. All can co-exist on one router.
Vega 100 Series Architecture

Input/Output Frame Types and Configuration

The Vega architecture allows for an individual channel on a rear panel to be configured as an input or an output. In the Vega 200 and 400 frames, this applies to all slots; in Vega 700 there is a mix of input, output and configurable bidirectional slots.

Vega 100 Series – Input/Output Port Configuration

<table>
<thead>
<tr>
<th>Frame</th>
<th>Module Slots</th>
<th>Type</th>
<th>Port Input/Output Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vega 200</td>
<td>8</td>
<td>Video</td>
<td>144 input ports (12 slots)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>144 output ports (12 slots)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>144 configuration (input or output) ports (12 slots)</td>
</tr>
<tr>
<td>Vega 400</td>
<td>16</td>
<td>Audio</td>
<td>144 output ports (12 slots)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>144 configuration (input or output) ports (12 slots)</td>
</tr>
</tbody>
</table>

Module Types and Configuration

Input cards can be fitted to any input or bidirectional slot.
Output cards can be fitted to any output or bidirectional slot.
The audio crosspoint MUST be fitted in a bidirectional slot.

Input/Output Module Types

<table>
<thead>
<tr>
<th>Type</th>
<th>No. of Channels</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDI coax</td>
<td>12</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SDI SFP</td>
<td>12 (6 HDMI)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SDI Input Processing</td>
<td>9</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>SDI Output Processing</td>
<td>9</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Audio Crosspoint &amp; MADI I/O</td>
<td>6 in + 6 out</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>AES Balanced</td>
<td>24 pairs (takes 2 slots)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>AES Unbalanced</td>
<td>24 pairs (takes 2 slots)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

SDI Coax and AES Modules

Each port is configured as an input or an output via the router controller configuration screen.

SDI SFP Module

Each port is an input or output dependent on the type of SFP module fitted (receiver or transmitter). Ports can be configured by the router controller as input or output (fixing the configuration even if no SFP is fitted), or automatically set as input or output when an SFP is inserted.

SDI Input and Output Processing Modules

Fixed input or output functionality.

Audio Crosspoint with MADI Inputs and Outputs

MADI fixed as six inputs and six outputs.

System Examples

Video Only, or Two-level Video and AES Routing

Video requires one or more of video SFP or video coax cards.
Discrete AES inputs and outputs require one or more balanced AES or unbalanced AES cards. In this scenario, routing audio does NOT need an audio crosspoint.

Cards can be fitted as shown in the table below.

<table>
<thead>
<tr>
<th>Frame</th>
<th>Video (coax or SFP) Cards</th>
<th>AES Audio (balanced or unbalanced) Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vega 200</td>
<td>Fit in any slot — max. 96 ports (Vega 200)/192 ports (Vega 400) — video or AES inputs or outputs in any combination</td>
<td></td>
</tr>
<tr>
<td>Vega 400</td>
<td>Fit in any slot</td>
<td>Inputs — fit in 12 bidirectional slots only (max 144 inputs) Outputs — fit in output or bi-directional slots (max 288 outputs) Audio router sizes — 1x287 to 144x144 (stereo AES sizes)</td>
</tr>
</tbody>
</table>

Video Routing with Clean and Quiet Switching on Outputs

Output processing modules provide clean and quiet switching on video outputs.
Clean and quiet switching does not require an audio crosspoint to be fitted.

<table>
<thead>
<tr>
<th>Frame</th>
<th>Video (coax or SFP) Inputs or Outputs</th>
<th>Clean &amp; Quiet switching Video Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fit Into</td>
<td>Fit Into</td>
</tr>
<tr>
<td>Vega 200</td>
<td>Fit in any slot</td>
<td>Any slot</td>
</tr>
<tr>
<td>Vega 400</td>
<td>Fit in any slot</td>
<td>Any slot</td>
</tr>
<tr>
<td>Vega 700</td>
<td>Fit in any slot</td>
<td>12 output slots (108 outputs and/or bidirectional slots)</td>
</tr>
</tbody>
</table>
<pre><code>                    | Notes: |
                    | 12 input only slots (144 inputs) |
                    | 12 output only slots (144 outputs) |
                    | 12 bi-directional slots (144 ports configurable as inputs or outputs) | 24 slots (216 outputs) |
</code></pre>
Embedded Audio and MADI Routing

The audio crosspoint & MADI interface card has 6x MADI inputs and 6x MADI outputs. Each pair of MADI inputs and outputs can be configured as redundant inputs with auto-failover, and dual outputs.

For any embedded or MADI routing the audio crosspoint & MADI interface card must be fitted.

Once fitted, all audio routing is via the audio crosspoint.

Audio Routing with Embedded and MADI audio

Interconnections between the audio crosspoint, and processing and AES cards, use a 48-channel audio multiplex (Amux).

An Amux (audio multiplexer) supports:
- Up to 24 pairs on an AES module
- Up to 16 channels from/to 3 video signals on a processing module

AES modules have one Amux in and one Amux out.

Processing modules have three Amuxes in and three Amuxes out (nine video signals, with 16 channels per video).

Amux use is user configurable — for maximum flexibility, each Amux is individually enabled on the input/output modules.

Automatic configuration then connects up to 12 Amuxes in to the audio crosspoint, and up to 12 Amuxes out from the audio crosspoint.

Amuxes are not required for:
- MADI inputs and outputs – these are integral to the audio crosspoint module
- Line synchronization and clean switching functions
- Audio channel swapping within a video signal

### Audio crosspoint capacity

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADi (64 channels per MADi)</td>
<td>6 x 64 = 384</td>
</tr>
<tr>
<td>Internal busses to processing and AES cards (48 channels per bus)</td>
<td>12 x 48 = 576</td>
</tr>
<tr>
<td>Silence and test tones</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>—</strong></td>
</tr>
</tbody>
</table>

### Audio multiplex usage

<table>
<thead>
<tr>
<th>Crosspoint Inputs</th>
<th>Crosspoint Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input processing card</strong></td>
<td>3 (de-embedding and audio routing)</td>
</tr>
<tr>
<td><strong>Output processing card</strong></td>
<td>3 (embedding of routed audio from the crosspoint)</td>
</tr>
<tr>
<td><strong>AES input/output modules</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

**Vega Audio Routing & Processing**

Possible audio configurations. All channels are handled as mono audio on the crosspoint. Controller configuration allows audio to be set as stereo or surround signals containing multiple mono channels.
**Frames and Options**

**Vega 200**

**Special Specifications**

**48 I/O Ports**
- Rear module slot (x4)
- All ports independently user configured as Inputs or Outputs
- Accommodates 12 port SDI or 24 port AES I/O modules

**6-Cage SFP SDI video rear module (12 ports)**
- In the modules below, each port can be independently set as an Input or Output

**SDI video 12-port coaxial only I/O rear module**

**24-port balanced AES (37w D-type)**

**24-port unbalanced (HD-BNC)**

**Audio Crosspoint/MADI Input/Output**

**Vega 200**

**Frame Dimensions**

- Physical: 10 kg (22 lbs.) max. fully loaded (all options)
- Power: 100-240 VAC, 47-63 Hz
- AC Input Power: 230W max. (includes all redundancy options)
- Fusing: 15A fast blowing fuses (x2, on each PSU, not user replaceable)
Vega 400
16 module slots
All ports can be configured as inputs or outputs

Physical
Weight: 18 kg (40 lbs.) max. fully loaded (all options)

Power
Voltage: 100-240 VAC, 47-63 Hz
AC Input Power: 384W max. (includes all redundancy options)
Fusing: 15A fast blowing fuses (x2, on each PSU, not user replaceable)

Vega 700
36 module slots

Video
144 input ports (12 slots)
144 output ports (12 slots)
144 configurable ports (12 slots)

Audio
144 configurable ports (12 slots)
144 outputs (12 slots)

Physical
Weight: 31 kg (68 lbs.) max. fully loaded (all options)

Power
Voltage: 100-240 VAC, 47-63 Hz
AC Input Power: 540W max. (includes all redundancy options)
Fusing: Fuse 10A fast blow (on rear panel)

Compliance
EMC – Emissions: EN552103-1 (EU), FCC Part 15 (USA)
EMC – Immunity: EN552103-2 (EU)
Safety: EN60950 (EU), UL1419 (USA)
Hazardous Material: RoHS-6 (UK) – Complies with EU Directive

Auxiliary Ports:
Physical layer: RS-485 x 4 ports

Control & Status
Network
Physical layer: Ethernet 100Base-T RJ45

Video References
No. of inputs: 4 looped HD-BNC
Impedance: 75Ω ±0.1% or Hi Z (switched on rear panel)
Signals: 1 Vp-p analog video/syncs/tri-level HD syncs
Switching lines: Line 10 (525), Line 6 (625), Line 7 (HD)

Alarm Relay
Connector: 9-way D/ female/screw lock, NO & NC contacts

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SPECIFICATIONS (CONT.)

SDI & AES Input/Output Modules

SDI Rear Module for SFP Plug-Ins (VG-RM6SFP – SDI)

- No. of SFP ports: 6 (12x SDI signal ports)
- Data rates: 2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s
- Signal standards: SMPTE ST 424/SMPTE ST 292/SMPTE ST 259 (Reclocked – Bypass option). DVB-ASI (Non reclocked)

Note: SDI re-clocking circuitry is contained in VG-RM6SFP-SDI. All SFP modules are non-reclocking.

CATSII Multi-Color LED Indicators (12)

- Blue: Output (Tx) = "OK"
- Green: Input (Rx) = "OK" – Signal present
- Flash Red: Error/Plug-in mismatch to configuration
- Amber: Output (Tx) = OFF/Laser disabled
- Red: Input (Rx) = No Signal detected
- OFF: EMI-Dust SFP/No Plug-in

SFP Fiber Modules

General data
- Receptacle: LC Duplex Port FOCIS-10-A-2-1-2
- Mating plugs: LC/PC Simplex (x 2) FOCIS-3P-0-1-1-1-0 [Single mode] – or – LC/PC Duplex FOCIS-10-P-2-2-1-1-0 [Single mode]

Data rates: 2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s
- Signal standards: SMPTE ST 424/SMPTE ST 292/SMPTE ST 259, DVB-ASI

Note: FOCIS = Fiber Optic Connector Intermateability Standard. Re: ANSI/TIA/EIA 604-10 (FOCIS 10)

Standard and Long Range Fiber Modules

- SM-T31T33-3G: Dual 1330 nm Tx
- SM-T31R-3G: 1330 nm Tx & wideband Rx
- SM-T59T51-3G: Dual 1550 nm Tx
- SM-T55R-3G: 1550 nm Tx & wideband Rx
- SM-RR-3G: Dual wideband Rx

CWDM Fiber Modules

<table>
<thead>
<tr>
<th>CH1</th>
<th>CH2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM-T5F61-3G</td>
<td>SM Fiber, 1591 nm ‖ Tx + 1611 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T5F75-3G</td>
<td>SM Fiber, 1551 nm ‖ Tx + 1571 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T5T53-3G</td>
<td>SM Fiber, 1511 nm ‖ Tx + 1531 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T4T49-3G</td>
<td>SM Fiber, 1471 nm ‖ Tx + 1491 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T3T45-3G</td>
<td>SM Fiber, 1431 nm ‖ Tx + 1451 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T3T41-3G</td>
<td>SM Fiber, 1391 nm ‖ Tx + 1411 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T3T37-3G</td>
<td>SM Fiber, 1351 nm ‖ Tx + 1371 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T3T33-3G</td>
<td>SM Fiber, 1311 nm ‖ Tx + 1331 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
<tr>
<td>SM-T7T29-3G</td>
<td>SM Fiber, 1271 nm ‖ Tx + 1291 nm ‖ Tx, 3 Gb/s SDI</td>
</tr>
</tbody>
</table>

Laser output power: +2.5 dBm typical. 0 dBm to +5 dBm
- Extinction ratio: 9 dB min.

Note: 18 CWDM Tx wavelengths available in 9 dual SFP modules conforming to ITU-T-REC-G.642.2. Clasp (Latch) Color Code is for Channel 1 CWDM wavelength.

Note: CWDM link distance depends on mux/demux attenuations.

SFP HDMI Modules

<table>
<thead>
<tr>
<th>SR-HDMIA (Receiver)</th>
<th>ST-HDMIA (Transmitter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDMI Format</td>
<td>1.0</td>
</tr>
<tr>
<td>Signal Ports</td>
<td>1</td>
</tr>
<tr>
<td>Connector</td>
<td>HDMI D-Type plug with retention</td>
</tr>
<tr>
<td>Formats Supported</td>
<td>HDMI/DVI input: 24-bit (3x8 bit) in video formats 525, 625, 720p, 1080i (50/59.94/60 Hz), 1080p (23.98/24/25/29.97/30/50/59.94/60 Hz)</td>
</tr>
<tr>
<td>Audio</td>
<td>2-channel PCM</td>
</tr>
</tbody>
</table>

* FP = Fabry Pérot  ** DFB = Distributed Feedback
SPECIFICATIONS (CONT.)

SFP Coaxial Modules

CC-RRH-3G-N (Dual RX), CC-TRH-3G-N (TX/RX), CC-TTH-3G-N (Dual TX)

SDI Signal Ports: 2

Connectors:
- Amphenol RF HD-BNC (Jack)
- SMPTE ST 292 & SMPTE ST 424

Impedance: 75Ω ±0.1%

Return Loss: <15 dB @ 270 MHz – 1.5 GHz, <10 dB @ 3 GHz

Data Rates: 2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s

Signal standards: SMPTE ST 424/SMPTE ST 292/SMPTE ST 259, DVB-ASI

Options: Available as Dual Input (RX), Dual Output (TX), or 1x Input, 1x Output (TX/RX)

Transmitter Specification
- Signal amplitude: 800 mVp-p [750 mV min., 850 mV max.]
- Rise & fall time: 130 ps max. @ 2.97 Gb/s & 1.485 Gb/s
  800 ps max. @ 270 Mb/s
- DC offset: 0V ±0.5V

Receiver Specification
- Signal Amplitude: 950 mVp-p max.
- Cable Equalization (Belden 1694A):
  120m (365 ft.) @ 2.97 Gb/s
  200m (655 ft.) @ 1.485 Gb/s
  400m (1310 ft.) @ 270 Mb/s

SDI Dedicated Coaxial Rear Modules (VG-RM12H-SDI)

SDI signal ports: 12 (each port independently user settable as an input or an output)

Connectors:
- Amphenol RF HD-BNC (Jack)
- SMPTE ST 292 & SMPTE ST 424

Impedance: 75Ω ±0.1%

Return loss: <15 dB @ 270 MHz – 1.5 GHz, <10 dB @ 3 GHz

Data rates: 2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s

Signal standards: SMPTE ST 424/SMPTE ST 292/SMPTE ST 259 (Reclocked – "Bypass" option)
- DVB-ASI (Non reclocked)
- CATSII LED indicators (12): same as VG-RM6SFP-SDI [see page 17]

Transmitter Specification
- Signal amplitude: 800 mVp-p (750 mV min., 850 mV max.)
- Rise & fall time: 130 ps max. @ 2.97 Gb/s & 1.485 Gb/s
  800 ps max. @ 270 Mb/s
- DC offset: 0V ±0.5V
- Timing jitter: <0.25 UI @ 1.5G & 3G, <0.15 UI @ SD
- Alignment jitter: <0.15 UI @ 1.5G & 3G, <0.10 UI @ SD

Receiver Specification
- Signal amplitude: 950 mVp-p max.
- Cable equalization (Belden 1694A):
  120m (365 ft.) @ 2.97 Gb/s
  200m (655 ft.) @ 1.485 Gb/s
  400m (1310 ft.) @ 270 Mb/s

AES Audio Input/Output Modules

AES Balanced – VG-RM24D-AES

AES ports: 24, balanced
- Impedance: 110Ω ±20%
- Connectors: 37W D-type socket
- Signal standards: AES3-2009

Formats Supported (both types):
- Synchronous AES & Dolby E – fully transparent
- Asynchronous AES – sample rate converted on inputs
- Asynchronous Dolby E – not supported

AES Unbalanced – VG-RM24H-AES

AES ports: 24, unbalanced
- Impedance: 75Ω ±2Ω
- Connectors: HD-BNC
- Signal standards: AES3-2009

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Vega 100 Input Processing Module
The Vega 100 series now has a frame sync input card available. It has all the features of the Vega 100 Input Processing Module, but frame sync instead of line sync.

The Vega Input Processing module can be used for the following functions:
- Audio de-embedding (16 channels)
- Line synchronization
- Audio track shuffling within each video channel
- Silence or test tone insertion

When an audio crosspoint is fitted to the Vega router:
- Input embedding of routed audio channels from any input

Key Features:
- Embed any combination of audio from the incoming video, any audio source via the audio crosspoint, silence or test tones
- Embed shuffled audio channels before the video crosspoint
- HANC and VANC data re-inserted on the same line
- Audio embedding bypass path

Number of inputs: 9
Connector: HD-BNC (Gold Plated) 75Ω

Audio Embedding from any audio input (16 channels per video)

Vega 100 Output Processing Module
The Vega Output Processing module can be used for the following functions:
- Clean and Quiet Switching
  - Line synchronization with switch line disturbance clean-up
  - Audio V-fade
- Audio track shuffling within each video channel
- Re-entering video with embedded audio into the video matrix
- Re-entering shuffled audio channels to the audio matrix
- Silence or test tone insertion
- Line synchronization

When an audio crosspoint is fitted to the Vega router:
- Audio embedding from any audio input (16 channels per video)

Key Features:
- Embed any combination of audio from the incoming video, any audio source, silence or test tones
- Embed shuffled audio channels after the video crosspoint
- HANC and VANC data re-inserted on the same line
- Audio embedding bypass path

Number of outputs: 9
Connector: HD-BNC (Gold Plated) 75Ω

Vega A New Generation of Routing and Processing

<table>
<thead>
<tr>
<th>Delay (card input to output)</th>
<th>Minimum (µs)</th>
<th>Maximum (lines)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD 525</td>
<td>11.9</td>
<td>19</td>
</tr>
<tr>
<td>SD 625</td>
<td>11.9</td>
<td>18</td>
</tr>
<tr>
<td>HD 720p/50</td>
<td>4.4</td>
<td>16</td>
</tr>
<tr>
<td>HD 720p/59.94</td>
<td>4.4</td>
<td>19</td>
</tr>
<tr>
<td>HD 720p/60</td>
<td>4.4</td>
<td>19</td>
</tr>
<tr>
<td>HD 1080i/50</td>
<td>4.4</td>
<td>12</td>
</tr>
<tr>
<td>HD 1080i/59.94</td>
<td>4.4</td>
<td>14</td>
</tr>
<tr>
<td>HD 1080i/60</td>
<td>4.4</td>
<td>14</td>
</tr>
<tr>
<td>3G-A 1080p/50</td>
<td>2.2</td>
<td>12</td>
</tr>
<tr>
<td>3G-A 1080p/59.94</td>
<td>2.2</td>
<td>14</td>
</tr>
<tr>
<td>3G-A 1080p/60</td>
<td>2.2</td>
<td>14</td>
</tr>
</tbody>
</table>

3G-B 0.04 (serial domain bypass) N/A
DVB-ASI 0.04 (serial domain bypass) N/A

DVB-ASI: Transparent to VUC bits. Parity regenerated on outputs.
Dolby E: Transparent to Dolby E
Power consumption: 12W

Vega 100 Input Processing Module

Vega 100 Output Processing Module
Vega 100 Audio Crosspoint and MADI Input/Output Module

The Vega audio crosspoint also has 6 MADI inputs and 6 MADI outputs. Together with internal audio connections to and from processing and AES cards, it routes signals from any MADI, AES or embedded input to any MADI, AES or embedded output. The audio router card must be installed when routing audio to or from any video channel on a processing card. Routing between AES inputs and outputs only does not require an audio crosspoint.

Key Features:
- MADI inputs configurable as 6 in or redundant 3 in with auto failover
- MADI outputs configurable as 6 out or dual 3 out
- Audio routing between any MADI, AES or embedded input to any MADI, AES or embedded output
- Synchronous 48 kHz operation
- Transparent to Dolby E
- Transparent to AES validity, user and channel status bits
- Silence and test tone insertion

VG-RM6MADI

Inputs
- Number and type:
  - 6/3 dual redundant with auto-failover
  - HD-BNC (Gold Plated) 75Ω
- Signal: MADI (64- or 64-channel, 48 kHz)
- Return loss: <15 dB to 125 MHz
- Maximum cable length: 100m (328 ft.) Belden 1855 (from 600 mV source)

Outputs
- Output amplitude: 600 mVp-p ±10%
- Rise/fall time: <650 ns
- Signal path delay (MADI in to MADI out): minimum (µs)

Audio Routing
- AES: transparent to VUC bits. Parity regenerated on outputs.
- Dolby E: transparent to Dolby E

Vega Rear Fan Unit for VG-MF400, 700, 192 & 432 frames
VG-FAN2

Vega Controller & Buffer Card Set for 400, 700, 192H & 432H
VG-CTLBUF

Vega Buffer Card for 400, 700, 192 & 432 frames
VG-BUF

Vega Controller Card for VG-MF200 and VG-MF096 mainframes
VG-CTL6464

Vega Crosspoint for VG-MF700 & VG-MF432H 7U frame
VG-XPT700

Vega Rear Fan Unit for VG-MF400, 700, 192 & 432 frames
VG-FAN2

Vega Power Supply Unit for VG-MF 200, 400, 096H and 192H frames
VG-PSU1

Vega Crosspoint for VG-MF200 & VG-MF096H 2 RU frame
VG-XPT200

Vega Controller Card for VG-MF200 and VG-MF096 mainframes
VG-CTL6464

Vega Rear Fan Unit for VG-MF200 & VG-MF096H 2 RU frames
VG-FAN1

Vega 200 Dual Redundant Options and Spares
VG-PSU1

Vega Power Supply Unit for VG-MF 200, 400, 096H and 192H frames
VG-XPT200

Vega Controller Card for VG-MF200 and VG-MF096 mainframes
VG-CTL6464

Vega Rear Fan Unit for VG-MF200 & VG-MF096H 2 RU frames
VG-XPT200

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VG-PSU1

Vega Power Supply Unit for VG-MF 200, 400, 096H and 192H frames
VG-XPT200

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VG-CTL6464