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DATASHEET

VEGA
Superior Routing and Processing for any Budget

The Vega router family is a powerful suite of routers that delivers superior functionality at price points that suit broadcasters' and media organizations' budgets. 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®, 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.

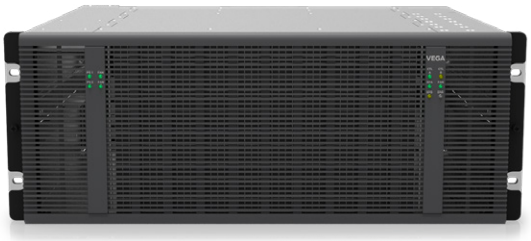
Vega 100 Series

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:

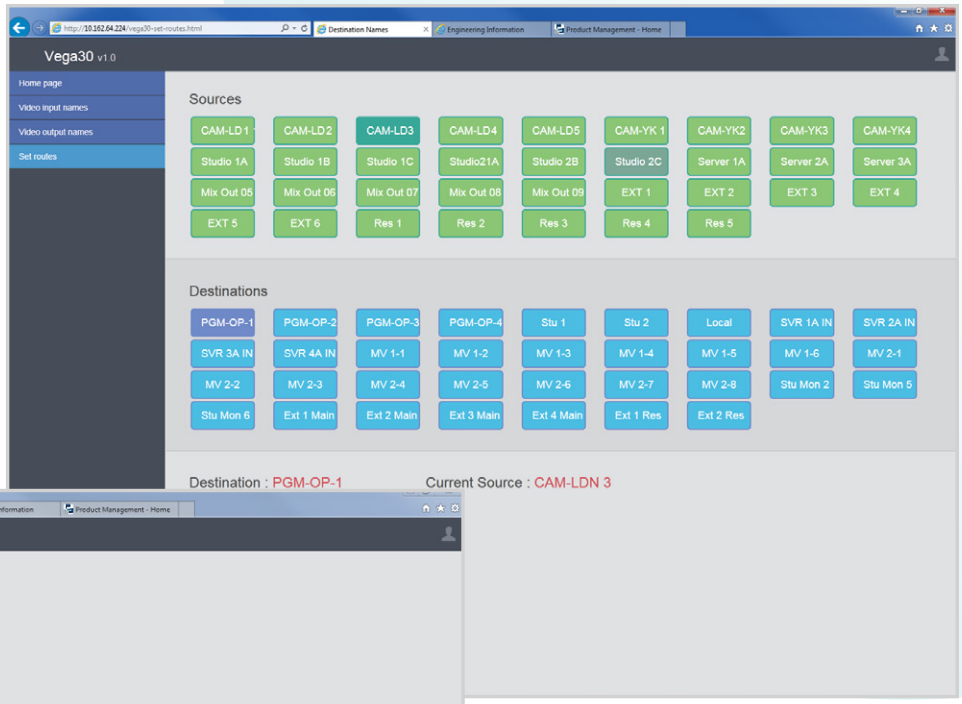
- Vega 200
- Vega 400
- Vega 700

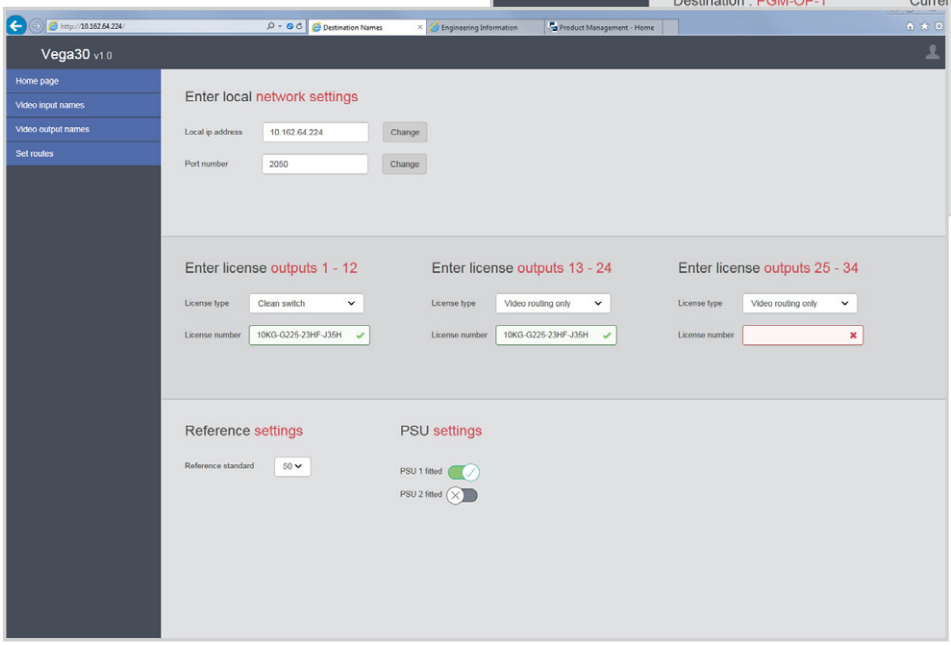
With such a broad range of matrix configurations, the Vega 100 Series is ideal for many small and mid-sized applications including medium and larger OB trucks, news studios, playout centers, theaters, rental & flyaway, houses of worship and studio complexes.



Control

The Vega 100 Series uses 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.





Web-based configuration and software control panels.

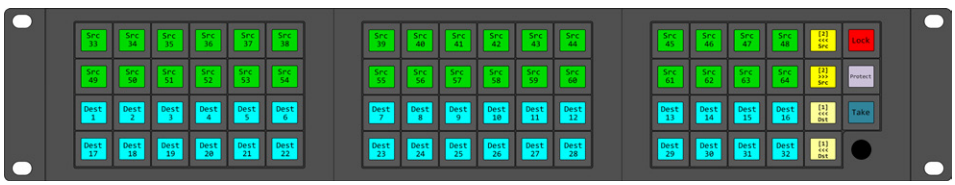
Hard Panels

A range of LED and LCD hard panels has been designed to make control of Vega routers easy and quick to configure.

Please refer to the respective control panel datasheets for more information.

7028251RCSB: 39-Key LCD X-Y/BPX + Rotary Control Knob

6026783RCSB: 2 RU Series 71-Key, X-YBPX + Rotary Control Knob



1RU32LCDBK-K: 32-Key LCD X-Y/BPX + Rotary Control Knob

Key Features

- Video routing with clean quiet switching technology, for smooth fade program transitions
- Vega 200 (2 RU) 1x95 to 95x1
- Vega 400 (4 RU) 1x191 to 191x1
- Vega 700 (7 RU) 144x288 to 288x144
- Configurable inputs and outputs
- Hybrid audio routing with de-embedding, embedding and discrete audio
- 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
- Versatile and fast configuration
- 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

The Vega Series is available with varying features and specifications.

	Vega 200	Vega 400	Vega 700
Mainframe	2 RU	4 RU	7 RU
Size Video	1x95 to 95x1	1x191 to 191x1	144x288 to 288x144
Size Audio	960x912		
Audio Routing	6x6 MADI		
Audio Interfaces			
MADI	6 in, 6 out, or dual 3 in with auto failover, dual 3 out		
AES	Up to 96 ports	Up to 192 ports	Up to 288 ports
Embedded	Up to 36 inputs and 33 outputs with 16 audio channels on each		
Processing			
Input Line Sync	✔	✔	✔
De-Embedding	✔	✔	✔
Output Embedding	✔	✔	✔
Output Line Sync	✔	✔	✔
Clean & Quiet Switching Outputs	✔	✔	✔

Vega 200

- 2 RU
- 1x95 to 95x1 video
- Square size: 48x48

Vega 400

- 4 RU
- 1x191 to 191x1 video
- Square size: 96x96

Vega 700

- 7 RU
- 144x288 to 288x144 video
- Square size: 216x216

The Vega 100 Series is available in three frame sizes from 1x95 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.

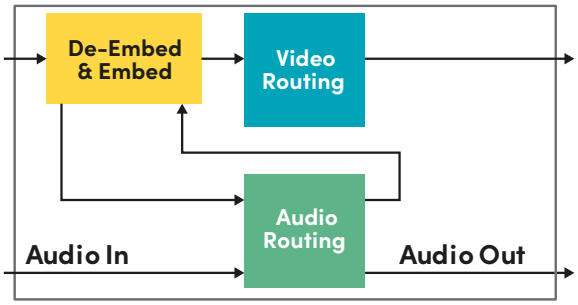
All inputs and outputs can be configured easily via the software setup menu, which allows multiformat, multilevel routing in any combination for both video and audio. All routing in a single chassis simplifies system design and saves on space, power and costs.

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 & Audio Routing



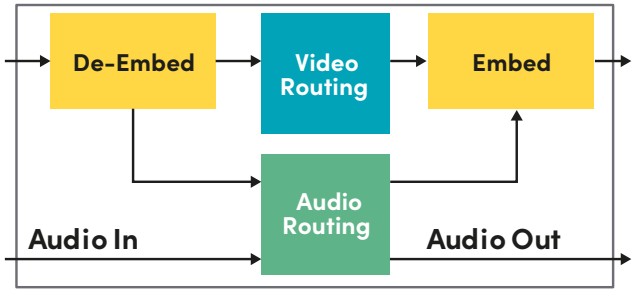
The Vega 100 Series can embed audio on both inputs and outputs, allowing for multiple feeds to be configured accordingly. Input embedding is a unique feature of both Vega and Sirius 800 router families. Programs with combinations of video and audio tracks can be created on a router input, rather than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

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 – Hybrid Video & Audio Routing



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.

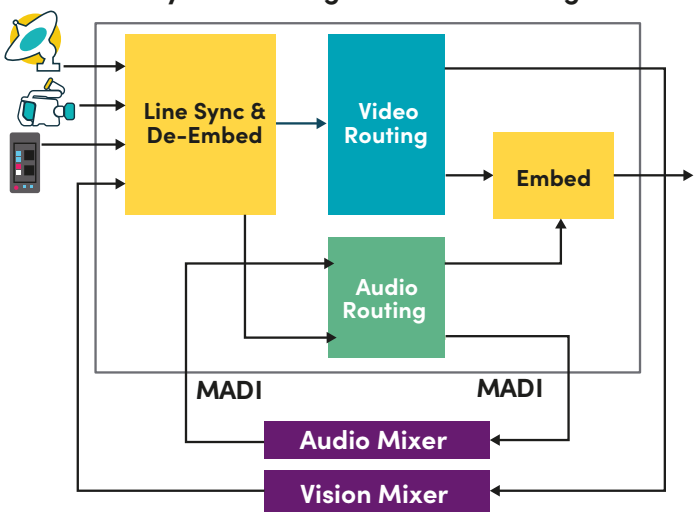
Flexible hybrid video and audio routing	
Video, AES, Embedded and MADI interconnects for maximum flexibility in multiple audio formats. Balanced and unbalanced AES connections.	Increased system design flexibility. Mixed signal routing in a compact frame. Ideal for small/medium live production in OBs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

Vega 100 Series – Synchronizing, Hybrid Routing & Clean Switching



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

Frame	Module Slots	Type	Port Input/Output Options
Vega 200	8	All ports can be configured as inputs or outputs	
Vega 400	16	All ports can be configured as inputs or outputs	
Vega 700	36	Video	144 input ports (12 slots) 144 output ports (12 slots) 144 configuration (input or output) ports (12 slots)
		Audio	144 output ports (12 slots) 144 configuration (input or output) ports (12 slots)

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

Type	No. of Channels	Input	Output
SDI coax	12	Yes	Yes
SDI SFP	12 (6 HDMI)	Yes	Yes
SDI Input Processing	9	Yes	No
SDI Output Processing	9	No	Yes
Audio Crosspoint & MADI I/O	6 in + 6 out	Yes	Yes
AES Balanced	24 pairs (takes 2 slots)	Yes	Yes
AES Unbalanced	24 pairs (takes 2 slots)	Yes	Yes

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.

Frame	Video (coax or SFP) Cards	AES Audio (balanced or unbalanced) Cards
Vega 200	Fit in any slot – max. 96 ports (Vega 200)/192 ports (Vega 400) – video or AES inputs or outputs in any combination	
Vega 400		
Vega 700	Fit in any slot. **Notes:** 12 input only slots (144 inputs) 12 output only slots (144 outputs) 12 bidirectional slots (144 ports configurable as inputs or outputs)	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)

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.

Frame	Video (coax or SFP) Inputs or Outputs	Clean & Quiet switching Video Outputs	
	Fit Into	Fit Into	Max no. of cards (video O/P)
Vega 200	Fit in any slot	Any slot	7 slots (63 outputs)
Vega 400	Fit in any slot	Any slot	15 slots (135 outputs)
Vega 700	Fit in any slot **Notes:** 12 input only slots (144 inputs) 12 output only slots (144 outputs) 12 bi-directional slots (144 ports configurable as inputs or outputs)	12 output slots (108 outputs and/ or bidirectional slots)	24 slots (216 outputs)

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.

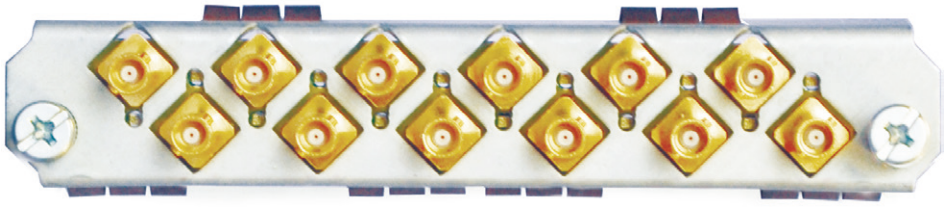
Processing modules have three Amuxes in and three Amuxes out (nine video signals, with 16 channels per video).

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:

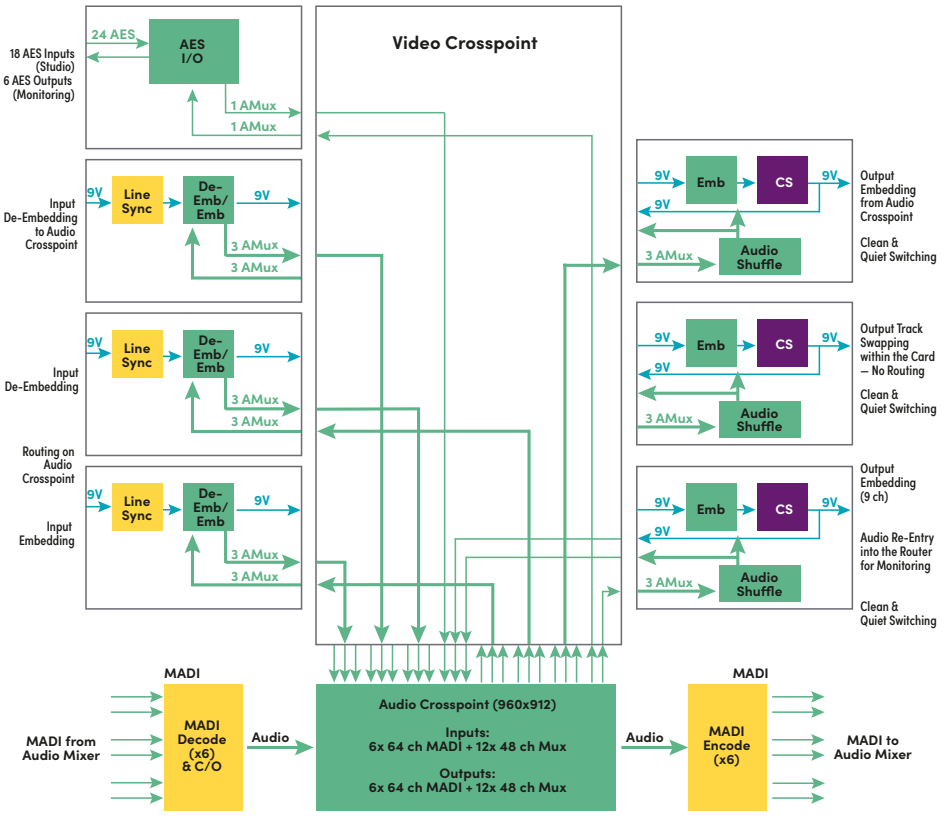
- MADI inputs and outputs – these are integral to the audio crosspoint module
- Line synchronization and clean switching functions
- Audio channel swapping within a video signal



Audio crosspoint capacity	Inputs	Outputs
MADI (64 channels per MADI)	6 x 64 = 384	6 x 64 = 384
Internal busses to processing and AES cards (48 channels per bus)	12 x 48 = 576	12 x 48 = 576
Silence and test tones	6	–
Total	966	960

Audio multiplex usage	Crosspoint Inputs	Crosspoint Outputs
Input processing card	3 (de-embedding and audio routing)	3 (input embedding from the crosspoint)
Output processing card	3 (embedding of routed audio from the crosspoint)	3 (output embedding from the crosspoint)
AES input/output modules	1	1

Vega Audio Routing & Processing

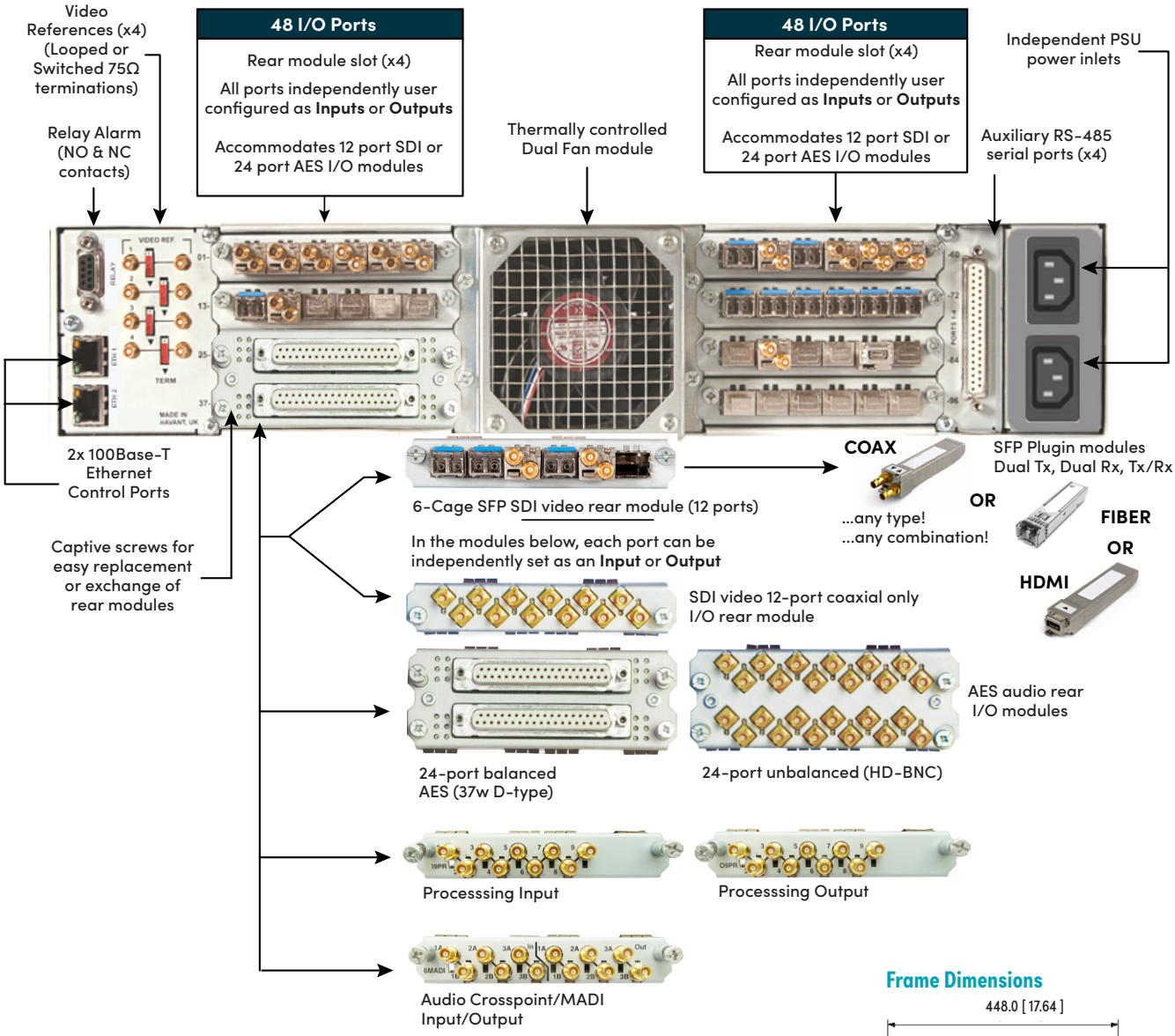


Possible audio configurations. All channels are handled as mono audio on the crosspoint. Controller configuration allows audio to be set as stereo or surround signals containing multiple mono channels.

Specifications

Frames and Options

Vega 200



Physical

Weight: 10 kg (22 lbs.) max. fully loaded (all options)

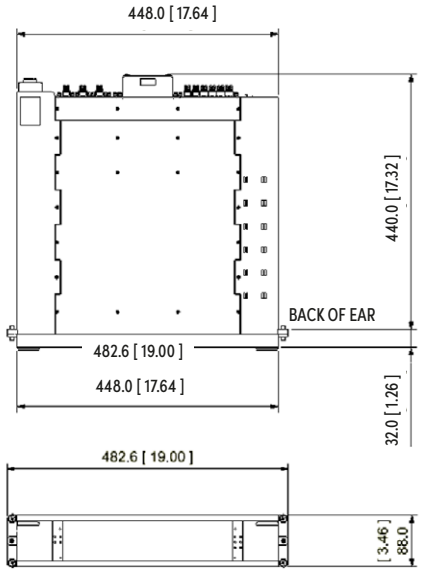
Power

Voltage: 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)

Frame Dimensions



Specifications (cont.)

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)

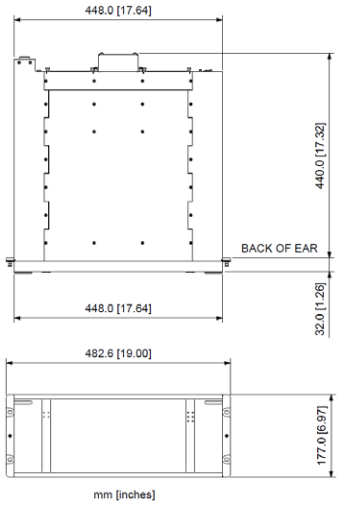
Power

Voltage: 100-240 VAC, 47-63 Hz

AC Input Power: 384W max. (includes all redundancy options)

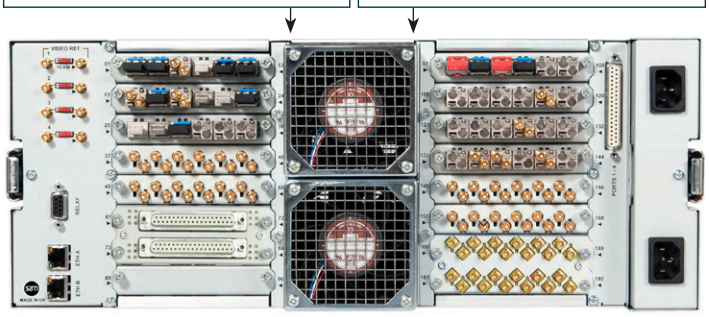
Fusing: 15A fast blowing fuses (x2, on each PSU, not user replaceable)

Frame Dimensions



Thermally controlled 'Dual Fan' modules

96 I/O Ports	96 I/O Ports
Rear module slot (x8). All ports independently user configured as Inputs or Outputs. Accommodates 12 port SDI or 24 port AES I/O modules.	Rear module slot (x8). All ports independently user configured as Inputs or Outputs. Accommodates 12 port SDI or 24 port AES I/O modules.



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)

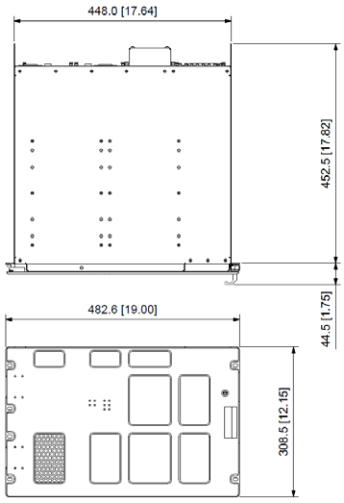
Power

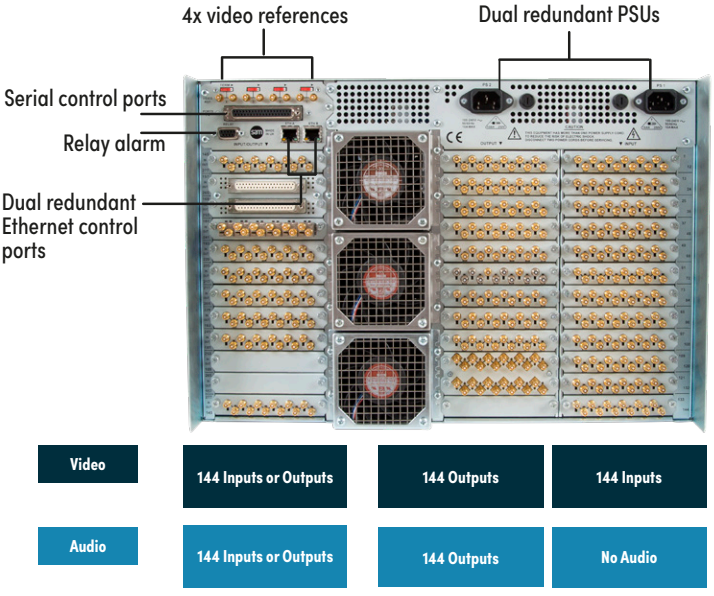
Voltage: 100-240 VAC, 47-63 Hz

AC Input Power: 540W max. (includes all redundancy options)

Fusing: Fuse 10A fast blow (on rear panel)

Frame Dimensions





Video	144 Inputs or Outputs	144 Outputs	144 Inputs
Audio	144 Inputs or Outputs	144 Outputs	No Audio

Compliance

EMC – Emissions: EN55103-1 (EU), FCC Part 15 (USA)

EMC – Immunity: EN55103-2 (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

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)

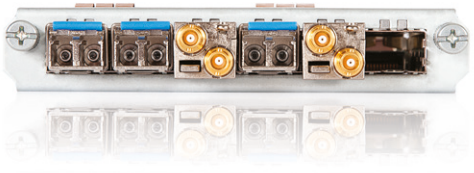
Data rates: 2.970 Gb/s, 2.970/1.001 Gb/s, 1.485 Gb/s, 1.485/1.001 Gb/s, 270 Mb/s

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 present	Input (Rx) = "OK" – Signal
Flash Red configuration	Error/Plug-in mismatch to
Amber disabled	Output (Tx) = OFF/Laser
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-T31T31-3G: Dual 1330 nm Tx

SM-T31R-3G: 1330 nm Tx & wideband Rx

SM-T55T55-3G: Dual 1550 nm Tx

SM-T55R-3G: 1550 nm TX & wideband Rx

SM-RR-3G: Dual wideband Rx

TX – Transmitter(s)

Laser(s)	FP*	DFB**
Wavelength	1310 nm [±30 nm]	1550 nm [±30 nm]
Power	-2 dBm typical, -5 dBm min, 0 dBm max.	-2 dBm typical, 5 dBm min, 0 dBm max.
Extinction Ratio	7 dB min.	7 dB min.
Link Distance	Up to 30 km @2.97 Gb/s	Up to 45 km @2.97 Gb/s

RX – Receiver(s)

Receiver(s): PIN + TIA

Wavelength: 1260 – 1620 nm

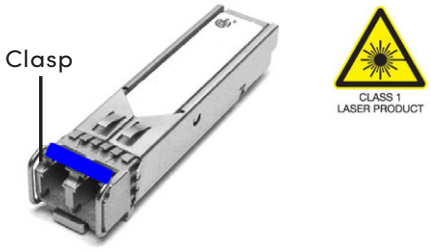
Sensitivity:

- -25 dBm typical
- -21 dBm max.

Overload: 0 dB max.

Link distance: See TX modules

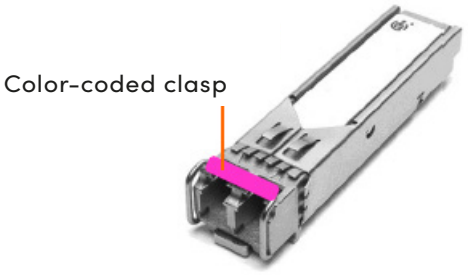
SM-RR-3G dual RX is also for use with dual CWDM TX below.



All single mode TX modules are Class 1 laser products. They comply with IEC-60825 and FDA 21 CFR 1040.10 and 1040.11

CWDM Fiber Modules

	CH1	CH2	CWDM Color Codes
SM-T59T61-3G	SM Fiber, 1591 nm Tx +	1611 nm Tx, 3 Gb/s SDI	Red/Brown
SM-T55T57-3G	SM Fiber, 1551 nm Tx +	1571 nm Tx, 3 Gb/s SDI	Yellow/Orange
SM-T51T53-3G	SM Fiber, 1511 nm Tx +	1531 nm Tx, 3 Gb/s SDI	Blue/Green
SM-T47T49-3G	SM Fiber, 1471 nm Tx +	1491 nm Tx, 3 Gb/s SDI	Grey/Violet
SM-T43T45-3G	SM Fiber, 1431 nm Tx +	1451 nm Tx, 3 Gb/s SDI	Black/Yellow Orange
SM-T39T41-3G	SM Fiber, 1391 nm Tx +	1411 nm Tx, 3 Gb/s SDI	White/Silver
SM-T35T37-3G	SM Fiber, 1351 nm Tx +	1371 nm Tx, 3 Gb/s SDI	Pink/Beige
SM-T31T33-3G	SM Fiber, 1311 nm Tx +	1331 nm Tx, 3 Gb/s SDI	Yellow Green/Yellow Ocher
SM-T27T29-3G	SM Fiber, 1271 nm Tx +	1291 nm Tx, 3 Gb/s SDI	Light Purple/Sky Blue



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.

* FP = Fabry Pérot

** DFB = Distributed Feedback

Specifications (cont.)

SFP HDMI Modules

	SR-HDMIA (Receiver)	ST-HDMIA (Transmitter)
HDMI Format	1.0	1.0
Signal Ports	1	1
Connector	HDMI D-Type plug with retention	HDMI D-Type plug with retention
Formats Supported	HDMI/DVI input: 24-bit (3x8 bit) in video formats 525, 625, 720p, 1080i (50/59.94/60 Hz), 1080p (23.98 /24/25/29.94/30/50/59.94/60 Hz)	SMPTE ST 424, SMPTE ST 292 and SMPTE ST 259 compliant video in 525/625, 720p/1080i (50/59.94/60 Hz), 1080p (23.98/24/15/29.97/30/5 0/59.94/60 Hz) formats. HDMI/DVI output 24-bit (3x8 bit)
Audio	2-channel PCM	2-channel PCM

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

HD-BNC

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 20]

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

VG-RM12H-SDI

Specifications (cont.)

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

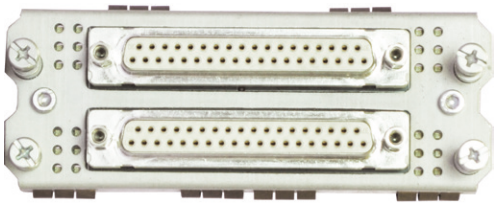
AES Unbalanced – VG-RM24H-AES

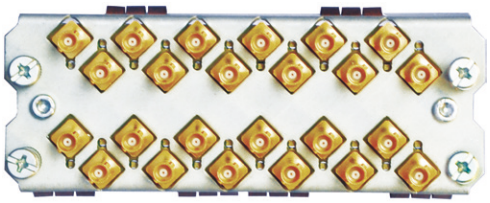
AES ports: 24, unbalanced

Impedance: 75Ω ±2Ω

Connectors: HD-BNC

Signal standards: AES3-2009





Vega 100 Input Processing Module

The Vega 100 series now has a fame 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
- Transparent to all ancillary data (HANC and VANC)
- HANC and VANC data re-inserted on the same line
- Audio embedding bypass path

Number of inputs: 9

Connector: HD-BNC (Gold Plated) 75Ω

Data rates: SD-SDI to ST259, HD-SDI to ST292, 3G-SDI to ST424, DVB-ASI to ETSI TR101 891

Return loss: T <15 dB to 1.5 GHz, <10 dB to 3 GHz

Cable Equalization (Belden 1694A):

- 350m @ 270 Mb/s
- 200m @ 1.5 Gb/s
- 140m @ 3 Gb/s

Cable Equalization (Belden 1855ENH):

- 230m @ 270 Mb/s
- 110m @ 1.5 Gb/s
- 60m @ 3 Gb/s

Embedded Audio Formats Supported:

- ST272 SD-SDI (20-bit audio)
- ST299 HD-SDI 720p 50/59.94/60 frames/s ST299 HD-SDI 1080i 50/59.94/60 frames/s
- ST299 3G-SDI 1080p 50/59.94/60 frames/s level A

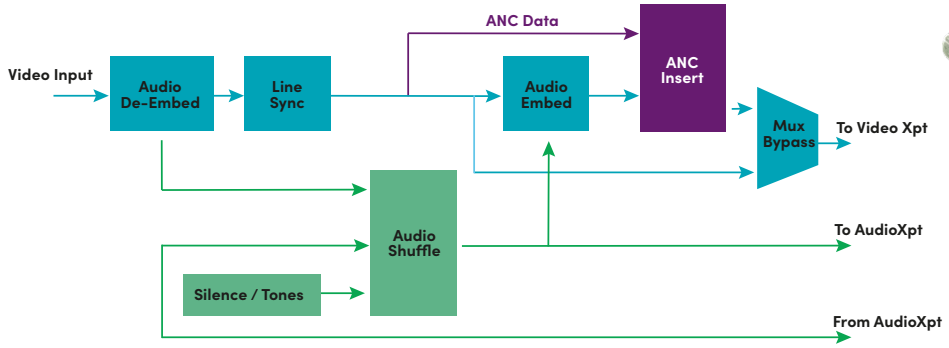
Audio Processing:

AES: Transparent to VUC bits. Parity regenerated on outputs.

Dolby E: Transparent to Dolby E

Power Consumption: 12W

Delay (card input to output)	Minimum (µs)	Maximum (lines)
SD 525	11.9	19
SD 625	11.9	18
HD 720p/50	4.4	16
HD 720p/59.94	4.4	19
HD 720p/60	4.4	19
HD 1080i/50	4.4	12
HD 1080i/59.94	4.4	14
HD 1080i/60	4.4	14
3G-A 1080p/50	2.2	12
3G-A 1080p/59.94	2.2	14
3G-A 1080p/60	2.2	14
3G-B	0.04 (serial doman bypass)	N/A
DVB-ASI	0.04 (serial doman bypass)	N/A



VG-RMI9PR

Specifications (cont.)

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
- Transparent to all ancillary data (HANC and VANC)
- HANC and VANC data re-inserted on the same line
- Audio embedding bypass path

Number of outputs: 9

Connector: HD-BNC (Gold Plated) 75Ω

Data rates: SD-SDI to ST259, HD-SDI to ST292, 3G-SDI to ST424, DVB-ASI to ETSI TR101 891

Return loss: T <15 dB to 1.5 GHz, <10 dB to 3 GHz

Output amplitude: 800 mVp-p ±10%

Rise/fall time: <90 ps @ 3G, <180 ps @ HD, <650 ps @ SD

Timing jitter: <0.25 UI @ 1.5G and 3G, <0.15 UI @ SD

Alignment jitter: <0.15 UI @ 1.5G and 3G, <0.10 UI @ SD

Embedded Audio Formats Supported:

- ST272 SD-SDI (20-bit audio)
- ST299 HD-SDI 720p 50/59.94/60 frames/s
- ST299 HD-SDI 1080i 50/59.94/60 frames/s
- ST299 3G-SDI 1080p 50/59.94/60 frames/s level A

Audio Processing

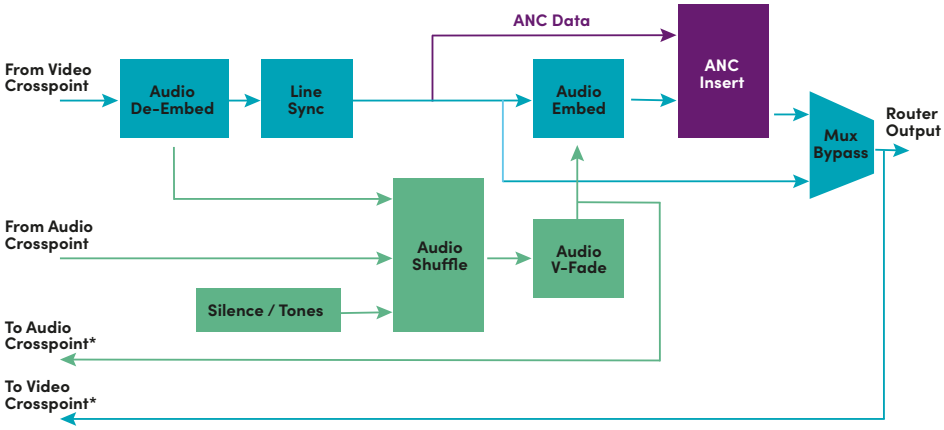
AES: transparent to VUC bits. Parity regenerated on outputs

Dolby E: Transparent to Dolby E

Audio fade duration: Off (cut), fast (80 ms), medium (200 ms), slow (500 ms)

Power consumption: 12W

Delay (card input to output)	Minimum (µs)	Maximum (lines)
SD 525	11.9	19
SD 625	11.9	18
HD 720p/50	4.4	16
HD 720p/59.94	4.4	19
HD 720p/60	4.4	19
HD 1080i/50	4.4	12
HD 1080i/59.94	4.4	14
HD 1080i/60	4.4	14
3G-A 1080p/50	2.2	12
3G-A 1080p/59.94	2.2	14
3G-A 1080p/60	2.2	14
3G-B	0.04 (serial doman bypass)	N/A
DVB-ASI	0.04 (serial doman bypass)	N/A



* Not available in V700 Output only slots

VG-RMO9PR

Specifications (cont.)

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 (56- 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%

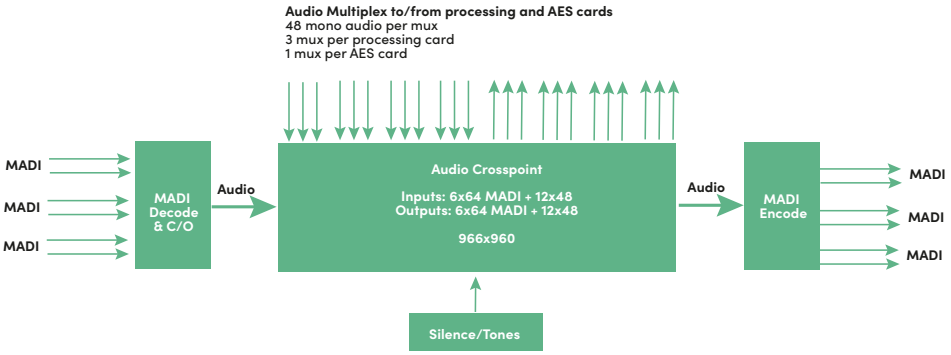
Rise/fall time: <650 ns

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



Ordering

Mainframes

VG-MF200

Vega 200 Frame. Includes 2 RU chassis, single PSU, single controller, single crosspoint, and cooling fans

VG-MF400

Vega 400 Frame. Includes 4 RU chassis, single PSU, single controller, single crosspoint, and cooling fans

VG-MF700

Vega 700 Frame. Includes 7 RU chassis, single PSU, single controller, single crosspoint, and cooling fans

Note: The mainframe is supplied with one PSU, one crosspoint card and one controller card.

Dual redundant PSUs and/or cards are purchased separately and fitted prior to system test and dispatch. Either none, one, two or all three options should be purchased (per mainframe) depending on the level of redundancy thought to be appropriate. For critical 'Live' applications, all three DR options are recommended. Alternatively any option can be purchased for upgrade on site at a later date or simply for spares/replacements.

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 crosspoint for VG-MF200 & VG-MF096H 2 RU frame

VG-CTL6464

Vega Controller Card for VG-MF 200, 400, 700 and VG-MF 096H, 192H, 432H mainframes

VG-FAN1

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

Vega 400 Dual Redundant Options and Spares

VG-PSU1

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

VG-XPT400

Vega Crosspoint for GV-MF400 & VG-MF192H 4 RU frame

VG-CTL6464

Vega Controller Card for VG-MF 200, 400, 700 and VG-MF 096H, 192H, 432H mainframes

VG-BUF

Vega Buffer Card for 400, 700, 192 & 432 frames

VG-CTLBUF

Vega Controller & Buffer Card Set for 400, 700, 192H & 432H frames. Consists of VG-CTL6464 and VG-BUF

VG-FAN2

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

Vega 700 Dual Redundant Options and Spares

VG-PSU2

Vega Power Supply Unit for VG-MF700 & VG-MF432H frame

VG-XPT700

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

VG-CTL6464

Vega Controller Card for VG-MF 200, 400, 700 and VG-MF 096H, 192H, 432H mainframes

VG-BUF

Vega Buffer Card for 400, 700, 192 & 432 frames

VG-CTLBUF

Vega Controller & Buffer Card Set for 400, 700, 192H & 432H frames. Consists of VG-CTL6464 and VG-BUF

VG-FAN2

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

DS-PUB-3-0722A-EN