

Vega is a totally new concept in multi-standard, multi-format SDI switching routers offering a number of key new benefits. Its unique architecture enables an 'advanced feature set' that provide much greater flexibility with some real advantages over traditional routing platforms.

Vega is the 'state of the art solution' for past, present and future broadcast and media installations. The **VG-MF096x** featured here has 96 signal ports housed in a lightweight 2RU chassis.

Full technical specifications are provided in the following pages.

A description of the concept behind Vega, including details of its unique functionality, are given in the brochure entitled:

Vega - A new generation of flexible routers

Vega

Technical Data Sheet



Asymmetric signal routing

Each signal port independently 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).

Coaxial copper and/or fiber connectivity

HD-BNC and/or DIN 1.0/2.3 and/or LC fiber SFP (Small Form-factor Pluggable) I/O modules.

Spans all coax and fiber physical layer boundaries.

No need for external fiber media converters greatly reducing cabling and equipment inventories.

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 simply more ports for future system expansion!

Entry level lower cost alternative

Dedicated 12-port 'electrical only' rear modules (fiber connectivity not required).

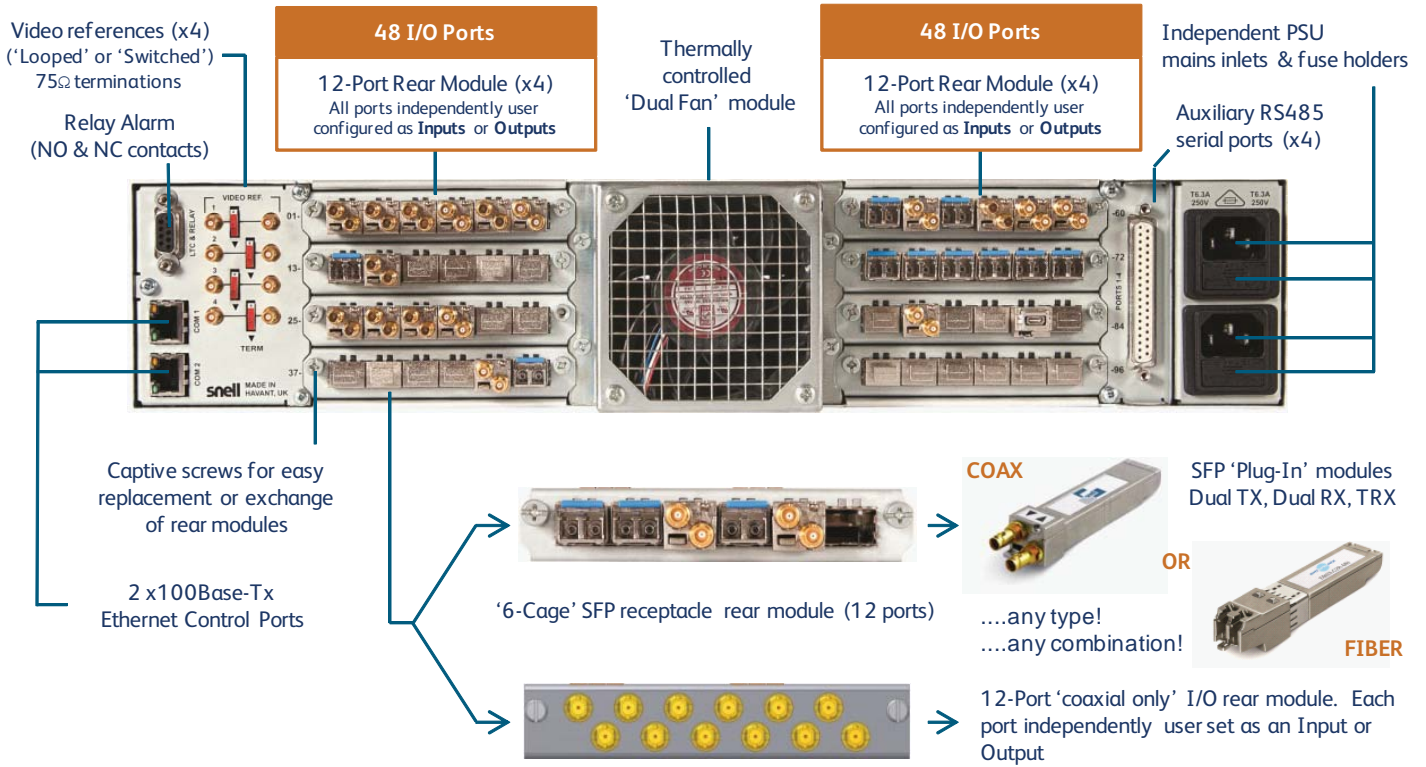
Minimizes outlay and complexity for 'all-coax' installations.

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

Intuitive 'plug-n-play' control software and/or 1RU and 2RU control panels.

Multiple solutions for all workflow environments.

Innovation in the Multi-Screen World



Control & Status

Network	
Physical Layer	Ethernet
Standards	100Base-TX Mb/s, 1000Base-T Mb/s autosense
Protocol	TCP-IP
Connector	RJ45 (x 2 – Dual redundant controllers)
Video References	
No. of inputs	4 looped or 2 looped
Connectors	HD-BNC or DIN 1.0/2.3 (x4), BNC (x2)
Impedance	75Ω +/-0.1% or Hi Z (switched on rear panel)
Return Loss	>35dB (0 - 10MHz)
Signals	1Vpk-pk 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

Auxiliary Ports	
Physical Layer	RS485 x 4 ports
Connector	37-way D/female/screw lock
Cable option	1 to 4 'breakout' cable (VG-CA37D9-4)

Front Panel Indicators					
A	PS1	FAN	B	CTL A	CTL B
	●	●		●	●
	PS2	FAN		XPA	FAN
	●	●		●	●
				XPB	ERR
				●	○

(Green = OK; Amber = Standby; Red = Fail/Error)

Physical

Mounting Height	2RU
Dimensions	See Figure 1
Weight	10kg (22lb) max. fully loaded (all options)

Power

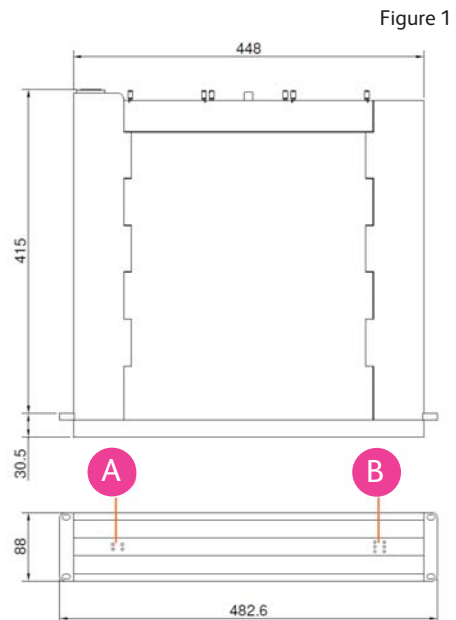
Connector	IEC (x 2 – dual redundant power supplies)
Voltage	85-264V AC, 47-63 Hz,
AC input power	150W max. (Includes all redundancy options)
Fusing	T6.5A (x 2, integrated with IEC connectors)

Environmental

Operating Temp.	0°C ≤ T _{AMB} ≤ 40°C
Maintained Spec.	0°C ≤ T _{SPEC} ≤ 30°C
Storage Temp.	-20°C ≤ T _{STORAGE} ≤ 80°C
Relative Humidity	5% - 95% non-condensing
Ventilation	Fan assisted - Front inlet, rear exhaust

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



Rear Module for SFP 'Plug-Ins'

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

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

VG-RM6SFP-SDI



Multi-color LED Indicators (12)

Blue	■ Output (Tx) = 'OK'	Green	■ Input (Rx) = 'OK' - Signal present	Flash Red	■ Error/Plug-in mismatch
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	2.970Gb/s, 2.970/1.001Gb/s, 1.485Gb/s, 1.485/1.001Gb/s, 270Mb/s	
Signal Standards	SMPTE 424M/292M/259M, ASI-DVB	

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



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

Specific data – Standard modules

TX - Transmitter(s)

RX - Receiver(s)

	SM-T31T31-3G / SM-T31R-3G	SM-T55T55-3G / SM-T55R-3G	SM-T31R-3G / SM-T55R-3G / SM-RR-3G
Laser(s)	FP*	DFB**	Receiver(s)
Wavelength	1310nm [± 30nm]	1550nm [± 30nm]	Wavelength
Power	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical - 5dBm min, 0dBm max	Sensitivity
Extinction Ratio	7dB min.	7dB min.	Overload
Link Distance	Up to 30km @2.97Gb/s	Up to 45km @2.97Gb/s	Link Distance
Worst case***	10km max. @2.97Gb/s	15km max. @ 2.97Gb/s	

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

Specific data – CWDM SFP modules

TX – Dual Transmitters

[Re: ITU-T-REC-G.642.2]

	SM-T59T61-3G	SM-T55T57-3G	SM-T51T53-3G
Laser(s)	DFB**	DFB**	DFB**
Wavelength 1 – Clasp Color	1591nm ■ [± 6.5nm]	1551nm ■ [± 6.5nm]	1511nm ■ [± 6.5nm]
Wavelength 2	1611nm ■ [± 6.5nm]	1571nm ■ [± 6.5nm]	1531nm ■ [± 6.5nm]
Power (each laser)	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical -5dBm min, 0dBm max.
Extinction Ratio	7dB typ.	7dB typ.	7dB typ.
	SM-T47T49-3G	SM-T43T45-3G	SM-T39T41-3G
Laser(s)	DFB**	DFB**	DFB**
Wavelength 1 – Clasp Color	1471nm ■ [± 6.5nm]	1431nm ■ [± 6.5nm]	1391nm ■ [± 6.5nm]
Wavelength 2	1491nm ■ [± 6.5nm]	1451nm ■ [± 6.5nm]	1411nm ■ [± 6.5nm]
Power (each laser)	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical -5dBm min, 0dBm max.
Extinction Ratio	7dB typ.	7dB typ.	7dB typ.
	SM-T35T37-3G	SM-T31T33-3G	SM-T27T29-3G
Laser(s)	DFB**	DFB**	DFB**
Wavelength 1 – Clasp Color	1351nm ■ [± 6.5nm]	1311nm ■ [± 6.5nm]	1271nm ■ [± 6.5nm]
Wavelength 2	1371nm ■ [± 6.5nm]	1331nm ■ [± 6.5nm]	1291nm ■ [± 6.5nm]
Power (each laser)	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical -5dBm min, 0dBm max.	-2dBm typical -5dBm min, 0dBm max.
Extinction Ratio	7dB typ.	7dB typ.	7dB typ.

Note: CWDM link distance depends on MUX/DeMUX attenuations.

* FP = Fabry Pèrot

** DFB = Distributed Feedback

***Test Pattern: SDI Pathological Matrix

SFP Coaxial Modules

General data

SDI Signal Ports	2		
Connectors	Amphenol RF HD-BNC (Jack)	SMPTE 292M & 424M	H
or	Cannon DIN 1.0/2.3 (Jack)	DIN 47247 & CECC 22230	D
Impedance	75Ω [+/-0.1 %]		
Return Loss	<15dB 270MHz - 1.5GHz, <10dB @ 3GHz		
Data Rates	2.970Gb/s, 2.970/1.001Gb/s, 1.485Gb/s, 1.485/1.001Gb/s, 270Mb/s		
Signal Standards	SMPTE 424M/292M/259M, ASI-DVB		



Specific data –

TX - Transmitter(s)

RX - Receiver(s)

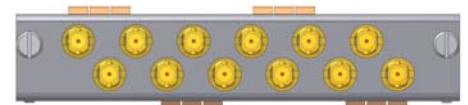
	CC-TTx-3G-N, CC-TRx-3G-N (x = H or D)	CC-TTx-3G-N, CC-TRx-3G-N (x = H or D)	
Signal Amplitude	800mV pk-pk [750mV min, 850mV max.]	Signal Amplitude	950mV pk-pk max.
Rise & Fall time	130ps max. @ 2.97Gb/s & 1.485Gb/s 800ps max. @270 Mb/s	Cable Equalization [Belden 1694A]	120m [365ft] @ 2.97Gb/s 200m [655ft] @ 1.485Gb/s 400m [1310ft] @ 270Mb/s
DC offset	0V +/- 0.5V		

Dedicated Coaxial Rear Modules

General data

SDI Signal ports	12 (Each port independently user settable as an input or an output)		
Connectors	Amphenol RF HD-BNC (Jack)	SMPTE 292M & 424M	H
or	Cannon DIN 1.0/2.3 (Jack)	DIN 47247 & CECC 22230	D
Impedance	75Ω [+/-0.1 %]		
Return Loss	<15dB 270MHz - 1.5GHz, <10dB @ 3GHz		
Data Rates	2.970Gb/s, 2.970/1.001Gb/s, 1.485Gb/s, 1.485/1.001Gb/s, 270Mb/s		
Signal Standards	SMPTE 424M/292M/259M (Reclocked – 'Bypass' option) ASI-DVB (Non reclocked)		
LED Indicators (12)	Same as VG-RM6SFP-SDI [see page 3]		

VG-RM12H-SDI / VG-RM12D-SDI



Specific data

TX - Transmit

RX - Receive

Signal Amplitude	800mV pk-pk [750mV min, 850mV max.]	Signal Amplitude	950mV pk-pk max.
Rise & Fall time	130ps max. @ 2.97Gb/s & 1.485Gb/s 800ps max. @270 Mb/s	Cable Equalization [Belden 1694A]	120m [365ft] @ 2.97Gb/s 200m [655ft] @ 1.485Gb/s 400m [1310ft] @ 270Mb/s
DC offset	0V +/- 0.5V		

Vega Ordering Information

Mainframes	Order code	Description
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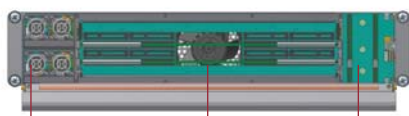


3 alternative control panels

- VG-MF096H** Main Frame, 96-Port I/O, HD BNC reference inputs (4)
- VG-MF096D** Main Frame, 96-Port I/O, DIN 1.0/2.3 reference inputs (4)
- VG-MF096B** Main Frame, 96-Port I/O, BNC reference inputs (2)

Note: There are 3 versions of the mainframe. These are identical except that they are supplied fitted with different Rear Control Panels. Each panel has an alternative type of coaxial connector for the reference inputs. These are given in the descriptions above. The Control Panel type can be changed at a later date by purchasing an alternative type...see order codes in 'Replacement Assemblies' on the next page.

Dual Redundant Options



DR PSU DR Crosspoint DR Controller

- VG-PSU096-A** Power Supply Unit for VG-MF096x series mainframes, Type A
- VG-XPT096-A** X(Cross)-Point card for VG-MF096x series mainframes, Type A
- VG-CTL6462-A** Controller card for VG-MF096x series mainframes, Type A

Note: All 3 mainframe versions are supplied with one PSU, one cross-point 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 'live' install at a later date or simply for spares/replacements.

Rear Module for SFP 'Plug-ins'



- VG-RM6SFP-SDI** Rear Module, 6-Cage (12-Port) I/O, Serial Digital Interface

Note: All rear modules and 'Plug-Ins' (see below) are purchased separately. International 'EMC' regulations necessitate that all vacant cage ports are plugged/closed using 'dummy' SFP modules (Type SFPBLANKsee below). Risk of non-compliance remains with 'the user' if not fitted.

SFP Plug-in Modules for VG-MF6SFP-SDI

Fiber Modules



- SM-T31T31-3G** SM Fiber, 1310nm Tx + 1310nm Tx, 3Gb/s SDI
- SM-T55T55-3G** SM Fiber, 1550nm Tx + 1550nm Tx, 3Gb/s SDI
- SM-T31R-3G** SM Fiber, 1310nm Tx + 1260-1620nm Rx, 3Gb/s SDI
- SM-T55R-3G** SM Fiber, 1550nm Tx + 1260-1620nm Rx, 3Gb/s SDI
- SM-RR-3G** SM Fiber, 1260-1620nm Rx + 1260-1620nm Rx, 3Gb/s SDI

Note: SM = Singlemode. For Multimode (MM) fiber applications please consult sales office.

CWDM Fiber Modules

color coded clasp



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

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

Coaxial Copper Modules



HD-BNC

DIN 1.0/2.3

- CC-TTH-3G-N** Coaxial, Tx + Tx, HD-BNC, 3Gb/s SDI, Non-reclocking
- CC-TRH-3G-N** Coaxial, Tx + Rx, HD-BNC, 3Gb/s SDI, Non-reclocking
- CC-RRH-3G-N** Coaxial, Rx + Rx, HD-BNC, 3Gb/s SDI, Non-reclocking
- CC-TTD-3G-N** Coaxial, Tx + Tx, DIN 1.0/2.3, 3Gb/s SDI, Non-reclocking
- CC-TRD-3G-N** Coaxial, Tx + Rx, DIN 1.0/2.3, 3Gb/s SDI, Non-reclocking
- CC-RRD-3G-N** Coaxial, Rx + Rx, DIN 1.0/2.3, 3Gb/s SDI, Non-reclocking

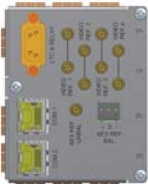

Note: Coax 'Plug-Ins' are 'non-reclocking'.
Reclocking circuitry is included in rear module VG-RM6SFP-SDI

- SFP-BLANK** Small Form-factor Pluggable EMI & dust Blanking module

Dedicated / Other Rear Modules



Order code	Description
VG-RM12H-SDI	Rear Module, 12-Port I/O HD-BNC, Serial Digital Interface
VG-RM12D-SDI	Rear Module, 12-Port I/O DIN 1.0/2.3, Serial Digital Interface
VG-RMBP	Rear Module, Blanking Panel

Replacement Assemblies

	VG-RPCTLH-4	Rear Panel Control I/O, HD BNC reference inputs (4)
	VG-RPCTLD-4	Rear Panel Control I/O, DIN 1.0/2.3 reference inputs (4)
	VG-RPCTLB-2	Rear Panel Control I/O, BNC reference inputs (2)
	VG-RMFU	Rear Module Fan Unit

Note: Panels are for changing mainframe type. See 'Note' under mainframe options on previous page!

Connectors & Cabling

	VG-MC37D	Mating Connector & Shell, 37-way D, solder bucket, screw lock
	VG-CA37D9-4	Cable Assembly, 37-way D to 9-way x 4 (Auxiliary serial ports)

Notes: VG-MC37D is supplied free with main frame. Order code is given for reference/spares purposes only. VG-CA37D9-4 must be purchased separately if required.