

Viper Family

Bidirectional Fiber Optic Transmission System



Supports up to eight 3G cameras, including ancillary data and intercom.

The Viper product family line from Grass Valley, a Belden Brand, is a portable transmission system consisting of two identical end units, linked by fiber optic cable and designed to transport a variety of broadcast production signals bidirectionally between two locations.

Viper addresses the diverse needs of users ranging from news networks to sports coverage and even 4K UHD production. Viper simplifies preshow preparation as a plug-and-play device with the added ability to be rack mounted or used as a standalone chassis.

The system can simultaneously support up to eight 3G cameras with related audio and control data signals while also providing multichannel intercom capability and 100/1Gig Ethernet connectivity.

The larger version of Viper, Viper XXL, comes in a 14 RU JBT (junction box terminal) enclosure, including a 48-port network switch and spacing for breakout cable panels. It is designed for outdoor installation — mounted around the venue, feeding back to and from the production truck dock.

KEY FEATURES

- Economical 4 or 6 RU standalone and rack-mountable chassis
- 14 RU junction box terminal for outdoor installation
- 8x8 bidirectional SD/HD/3G SDI with 19.4 Mb/s to 3 Gb/s transport on coax I/O
- Compatible with digital TV standards:
 - SMPTE ST 292
 - SMPTE ST 259
 - SMPTE ST 424
- Supports DVB/ASI signals
- Immune to pathological data errors
- Equalizes coax up to 3 Gb/s
- Superior 8x8 bidirectional audio quality, available on XLRs or DT12
- Individual input gain control for each audio channel
- 4 or 6 channels of high quality 2-wire and 4-wire intercom support, including data for digital matrix systems
- Advanced automatic nulling for 2-wire intercom channels
- Internal 30V power supply to power up to 10 Clear-Com or RTS 2-wire belt packs
- Advanced hybrid circuitry to adapt two 2-wire intercom interface to 4-wire interface and vice-versa
- Compatible with most party line and digital matrix intercom systems
- 1 or 2 channels of 100/1Gig Ethernet port internet connectivity, remote controls or digital audio pass-through such as AES67 or Hydra2
- Wide optical budget
- High reliability, durable design
- Available with 1 universal fiber plate, supporting any connector type
- Available 2nd optional universal fiber plate, for pass-through feeds
- Front panel monitoring of all coax I/O, including local and remote (audio only) optical signal strength
- Redundant power supply inputs
- Fast setup with plug-and-play operation
- Compatible with other Grass Valley HD/SD SDI transport systems

Viper Family Bidirectional Fiber Optic Transmission System

SPECIFICATIONS

Video (coaxial I/O)

Transmission method: Digital

Input level: 800 mVp-p

I/O impedance: 75Ω

Return loss: >15 dB from 5 MHz to 1.5 GHz, >10 dB from 1.5 GHz to 3 GHz

Maximum data rate: 3 Gb/s

Input equalization, 3 Gb/s: ≥1201m (393 ft.) of Belden 1694A

Bit-error rate, -21 dBm receiver optical power: PRBS 2³¹ - 1, 1X10⁻¹²

Timing jitter (SMPTE color bars): <2 UI

Alignment Jitter (SMPTE color bars): <0.2 UI

Audio

Connector types:

Input, 3-pin XLR socket

Output, 3-pin XLR pins

Pin 1: Signal/chassis ground

Pin 2: "Hot," in phase input

Pin 3: "Cold," inverted phase input

Balanced Input Impedance @ 1 kHz, AC coupled: 6 kΩ, ±5%

Balanced Output Impedance @ 1 kHz, AC coupled: 33Ω, ±5%

Unity gain setting:

Maximum input level, unity gain setting, 20 Hz to 20 kHz: +24 dBu

Throughput amplitude deviation, @ 1 kHz: ±0.4 dB max.

Frequency response, @ R_{LOAD} ≥600Ω, 12 Hz to 100Hz; 100 Hz to 20 kHz: +0/-3 dB; +0/-0.07 dB

Signal-to-noise ratio, reference +24 dBu, A-weighted: ≥107 dB

Total harmonic distortion, @ +20 dBu, 1 kHz; 20 Hz to 20 kHz: ≤0.005%; ≤0.05%

Intermodulation distortion, @ +20 dBu, SMPTE DIN Method: ≤0.002%

Common Mode Rejection Ratio: ≥40 dB, 20 Hz to 20 kHz

Adjacent channel crosstalk, reference +24 dBu: ≥104 dB, 20 Hz to 20 kHz

+10 dB to +50 dB gain settings:

Maximum input level(s): -10 dB step from +24 dBu, for each 10 dB gain step

Throughput amplitude deviation, @ 1 kHz: ±0.4 dB max.

Frequency response, @ R_{LOAD} ≥600Ω, 12 Hz to 100 Hz; 100 Hz to 20 kHz: +0/-3 dB; +0/-0.07 dB

Signal-to-noise ratio, reference +24 dBu, A-weighted: ≥102 dB

Total harmonic distortion, @ +20 dBu, 1 kHz; 20 Hz to 20 kHz: ≤0.005%; ≤0.05%

Intermodulation distortion, @ +20 dBu, SMPTE DIN Method: ≤0.005%

Common Mode Rejection Ratio, @ 60 Hz: 10 dB gain, ≥40 dB; 20/30 dB gain, ≥60 dB; 40/50 dB gain, ≥80 dB

Adjacent channel crosstalk, reference +24 dBu: ≥100 dB, 20 Hz to 20 kHz

Phantom Power (switchable):

Input resistance, each leg to phantom bias point: 6.8 kΩ, ±1%

Output voltage: 48 VDC ±10%

Output current: 2 mA, ±10%, typical per input port

Output short circuit current: 10 mA per input port

Intercom

Available channels: 4, 4-wire; 4, 2-wire Clear-Com (1 each/3 pin XLR); 2, 2-wire RTS dual (2 each/3 pin XLR)

2-wire (TW/PL) mode:

Interface:

Clear-Com PL: XLR3M x 4 (1 audio channel per XLR)

RTS TW: XLR3M x 4 (2 audio channels per connector, XLRs 1 and 2 bussed, XLRs 3 and 4 bussed)

Maximum level @ 1 kHz, termination engaged: 2 Vp-p (equivalent to +18 dBu in 4-wire circuit)

Dynamic range, reference 2 Vp-p @ 1 kHz: >85 dB, A-weighted

Frequency response, reference 2 Vp-p: 70 Hz to 20 kHz, +1/-3 dB

Total harmonic distortion @ 2 VP-P: ≤1%

Port impedance, 100 Hz to 20 kHz:

Com line powered from internal 30V power supply, termination engaged: 220Ω ±10%

Com line powered from external 30V power supply, no termination: 4.7 kΩ ±5%

Nulling: Switch initiated automatic line reflection cancellation

4-wire (4W) mode:

Interface:

Clear-Com Matrix Plus/Eclipse: RJ-45 x 2

RTS ADAM/CRONUS/Zeus: RJ-11 x 2

Maximum level, 20 Hz to 20 kHz: +18 dBu (equivalent to 2 Vp-p in 2-wire circuit)

Dynamic range, reference, +18 dBu: >85 dB, A-weighted

Frequency response @ 0 dBu: 35 Hz to 20 kHz, +1/-3 dB

Total harmonic distortion @ 1 kHz, reference +17 dBu: ≤0.05%

Balanced input impedance @ 1 kHz, AC coupled: 14 kΩ

Balanced output impedance @ 1 kHz, AC coupled: 40Ω

Data formats:

Clear-Com mode: RS-422

RTS mode: RS-485

Adjacent channel crosstalk, reference +18 dBu: >85 dB

Ethernet

Standards compliance: IEEE 802.3ab 1000BASE-T

Interface, 10/100/1000BASE-T: RJ-45

Support: LLCF (Link Loss Carry Forward), LLR (Link Loss Return) for fiber port

Optical

Multiplexed operating wavelengths: 1271 nm to 1611 nm

Link operating margin: Up to 22 dB

Aggregate transmit output power: +0 dBm, ±2 dBm

Aggregate receiver sensitivity: -20 dBm

I/O receivers/transmitters: SFP modules

Maximum aggregate data rate: 25.3 Gb/s

Fiber Type: Single-mode

Connector options, UFPs (Universal Fiber Plates): LC/UPC, SC/UPC, SC/APC, ST/UPC, MX, Neutrik DualCon and QuadCon

Indicators

Intercom Section:

"LINK" — Communication status between local and remote intercom sub-systems

"COM x&x POWER" — Power status of the intercom sub-system components

"AUTO NULL", CHx — Indicates a null procedure in progress

"AUDIO", CHx — Audio input activity for each of 4 intercom sub-system channels

"DATA", CHx — Data input activity for each of 4 intercom sub-system channels

Audio Section:

"AUDIO POWER" — Power status of the audio sub-system components

"OPT" — Input status of the audio sub-system fiber optic receivers

"IN1" — Primary SFP audio sub-system receiver status

"IN2" — Secondary SFP audio sub-system receiver status (unused in Viper XL)

"LINK" — Communication status between local and remote audio sub-systems

"DATA" — Data status of accessory audio sub-system data path (unused in Viper XL)

"Rx OPTICAL POWER (dBm)" — Audio sub-system optical receiver strength meters

"LOCAL" — Displays optical power of the unit being viewed

"REMOTE" — Displays optical power of the unit at the far end of the fiber cable

"AUDIO INPUT" — Audio input activity for each of 8 audio sub-system channels

"AUDIO OUTPUT" — Audio output activity for each of 8 audio sub-system channels

"PH/PWR", 0/1 — Phantom MIC power On/Off indicators for each of 8 audio sub-system channels

"GAIN", 0 to +50 — Gain (dB) indicators for each of 8 audio sub-system channels

SDI Transport Section:

"3G/HD/SD-SDI/DATA INPUT" — Input activity for each of 8 SDI sub-system channels

"3G/HD/SD-SDI/DATA OUTPUT" — Output activity for each of 8 SDI sub-system channels

Four character display — SDI sub-system optical receiver strength metering

Main system power "ON": Indicates Viper XL system power on

Mechanical/Environmental

Viper XL Dimensions: 482.6 mm (19 in.) W x 117.4 mm (6.85 in.) H x 361 mm (14.2 in.) D
Weight: 8.2 kg (18 lbs.)

Viper XXL Dimensions: 482.6 mm (19 in.) W x 263.6 mm (10.38 in.) H x 361 mm (14.2 in.) D
Weight: 10.8 kg (24 lbs.)

Viper JBT Dimensions: 558.8 mm (22 in.) W x 736.6 mm (29 in.) H x 548.6 mm (21.16 in.) D

Weight: Depends on customization (shipped on a pallet)

Operating temperature range: -20° to 45° C (-4° to 113° F)

Operating humidity range: 0 to 95% non-condensing

Power Requirements

Input voltage range: 11 VDC to 18 VDC

Power consumption (full configuration): 100W max.

ORDERING

Viper-XL

Viper XL, multicamera transceiver with 8x8 video & audio, 4 channels of intercom and 1G Ethernet

Viper-XXL

Viper XXL, multicamera transceiver with 8x8 video & audio with DT12, 6 channels of intercom and 2 channels of 1G Ethernet

Viper-JBT

Viper-JBT, multicamera transceiver with 8x8 video & audio (including DT12), 6 channels of intercom and 2 channels of 1G Ethernet inside a 14 RU junction box terminal outdoor enclosure. Includes 48 port HP network switch and power distribution panel

Minimum 1 Universal Fiber Plate must be chosen from the list below:

UFP-2LC	Universal fiber panel – Dual LC fiber, single mode, ultra polished
UFP-2SC	Universal fiber panel – Dual SC fiber, single mode, ultra polished
UFP-2SCA	Universal fiber panel – Dual SC fiber, single mode, angle polished
UFP-2STSM	Universal fiber panel – Dual ST fiber, single mode, ultra polished
UFP-MX2	Universal fiber panel – MX dual expended beam connector
UFP-NOC2	Universal fiber panel – Neutrik OpticalCon Duo (for tactical/unpowered fiber cables)
UFP-NOC4	Universal fiber panel – Neutrik OpticalCon Quad (for tactical/unpowered fiber cables)

Redundant Power Supply

ADAP-AC-10 AC Power Adapter (Indoor); 120/240 VAC in; 4-pin XLR; 10A; 15 VDC



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