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Telecast Fiber Systems, Inc.

Viper™

Fiber Optic Video/Audio/Intercom/Data System

Now available with 1.5 gb/s high def digital video

The Viper is the world's most widely used fiber optic system for television production and distribution. It is modular and field reconfigurable for all your portable and fixed video, audio, intercom and data connections

The Viper is your solution

to the size, weight and transmission problems of copper cable. Your reach is extended, so now you can cover those previously impossible shots. Fiber also minimizes your need for microwave links, and problems of line of sight and frequency allocation.

You save costs right away

- Faster set up means greater productivity and labor savings.
- Smaller cables let you can use smaller vehicles more efficiently.
- Vehicle overweight penalties due to heavy cables are a thing of the past.
- Your shipping and transportation savings alone can pay back your investment.

Why do TV networks around the world select Telecast's Viper?

Because it is the only fiber optic system that:

- Puts all your signals on one cable—video, audio, intercom, tally, phone and CCU data.
- Provides the video/audio performance and quality necessary for television production.
- Gives you the modular upgrade path from analog to high definition digital production.
- Is packaged in durable, lightweight units that you can use in your studios and in the field.
- Operates efficiently in extended temperature environments without fans or heaters.
- Gives you the confidence of internal UPS emergency batteries, so you stay on the air.
- Has been field proven in the most rigorous events by the most demanding broadcasters.

Features

- Multichannel Video & Audio
- Serial Digital Video, including
  — ITU-R 601 (270 Mbps)
  — SMPTE-292M (Hi-Def)
- Wideband NTSC/PAL video
  Studio quality, RS250-C (SH)
- Mic/Line audio, 18-bit digital and AES/EBU digital audio
- Long distance, no repeaters
- Use outdoors or indoors
- Multimode or single mode fiber
- Convenient plug-in modules
- Intercom option includes RTS®, Clear-Com® or 4-wire
- 4 channels of duplex data incl. RS232, RS422, Sony CCU, tally
- Battery or AC operated
- Anton/Bauer Snap-On® option
- Alarmed UPS protection
- Extra-low power consumption
- Wide temperature range

Applications

- Studio and campus facilities
  Room to room
  Floor to floor
  Building to building
- Mobile Field Production
  News, Sports, Entertainment
  Vehicle to Camera, announce booth, RF tower, stadium/arena
- Pre-fibered Facilities
  Sports venues, airports, malls, government buildings, etc.
- Studio-Transmitter Links
- Mobile/Fixed Satellite Links
- CATV/Telco Video Backhaul
- Metropolitan Video Links

Faster set up in portable operations

The Viper consists of portable Mussel Shells

- Weather resistant, durable, modular enclosure
- Houses UPS plus up to 8 transmitter or receiver modules
- Mix & match analog or digital video & dual audio or AES/EBU

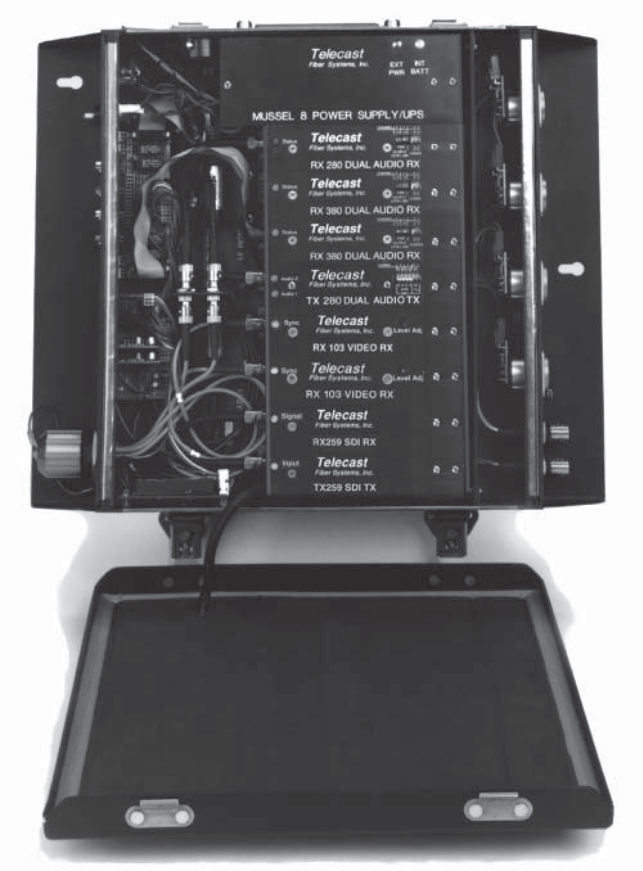
and/or 8-module 19" rack-mount units (2RU)

Two versions—8 analog and/or video slots (V800), or
4 analog/digital video plus 4 dual audio slots (442) chassis

Batteries or AC — Uninterruptable power

- Operates on 12 to 24 VDC, such as camera or auto battery
- Anton/Bauer battery mount optional on Mussel Shell
- Alarmed rechargeable UPS included — 30 min. backup
- Consumes only about 10 watts fully loaded (4-module unit)
- LED indicators show signal status and power status

Auxiliary Intercom, Data/CCU and Tally

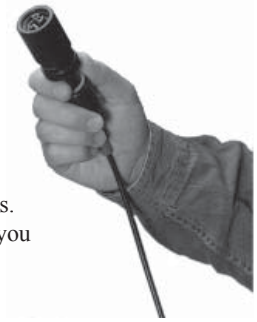


Optional on the 8-module Viper (rack or portable) are two channels of intercom (4-wire or 2-wire Clear-Com®) or one dual channel Telex RTS®, plus four channels of duplex, high speed data —RS422, RS232, Sony CCU, or switch closure interfaces for tally, call, etc.— digitally multiplexed onto your bidirectional TX/RX280 audio streams. User controls for 2-wire intercoms include input gain, output gain, null, termination and belt pack power on/off. The Viper also translates between intercom types, so your Clear-Com user can communicate with the RTS user. Or you can interface to your truck with 4-wire and drive 2-wire belt packs in the field.

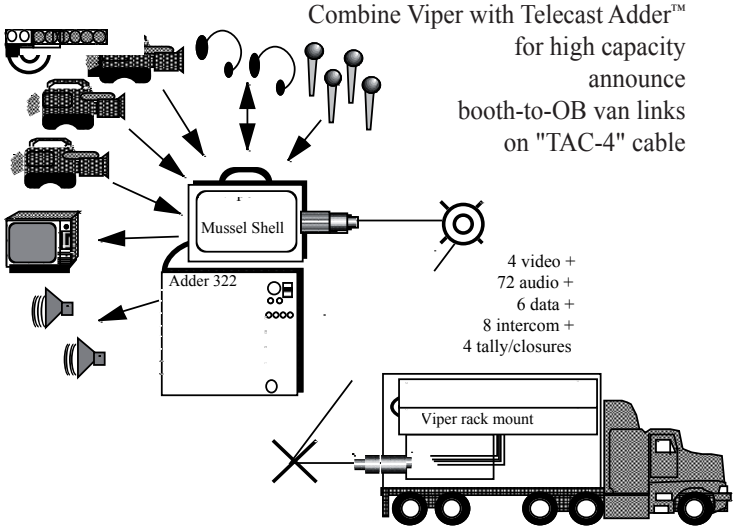
TAC-4 Cable Assemblies

Tougher than Coax

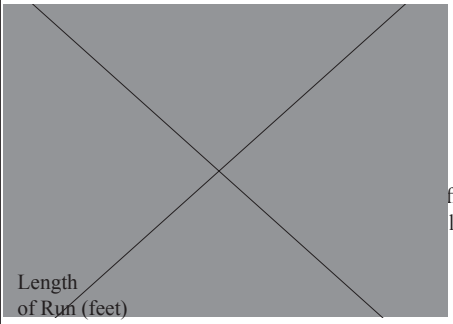
Telecast's TAC-series fiber cables and "hermaphroditic" connectors are designed for military battlefield use—and have become the standard in field teleproduction. They stand up to temperature extremes, vehicle traffic and flexing better than coaxial or wire cables. Three sizes of Telecast OX-Frame™ reels give you lengths of 150, 300 and 600 meters.



Combine Viper with Telecast Adder™ for high capacity announce booth-to-OB van links on "TAC-4" cable



How much time and effort can you save?



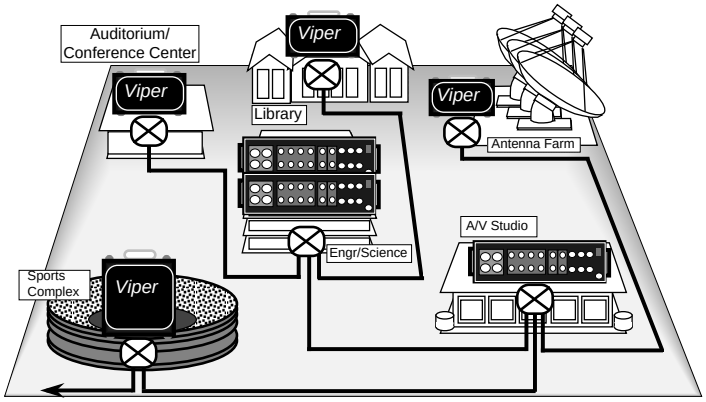
98% savings

Weight comparison of Telecast Tac-4 fiber cable (only 20 lbs/1,000 ft) versus coax and audio pairs for just four video plus eight audio channels

For each 3,000 ft., the Viper eliminates over a ton of copper cable.

Highest Quality in fixed installations

Distributing Video & Audio in Building & Campus Backbone Networks



The Perfect Video & Audio Connection for your Facilities or Venue

- Format independent —your seamless bridge to DTV/HDTV
  Long life—Will grow with your analog and digital needs
- Modular construction for configuration flexibility
  Add, change and upgrade—with easy plug-in modules
- Complies with EIA/TIA backbone fiber standards
  Use standard multi- or single mode cabling & connectors
- Low profile, wide temp units for versatile facility planning
  Rack-mount "442" frames and/or wall-mount Mussel Shells
  Move shells from location to location; require no fans
- Uninterruptable power supply (UPS) inside each Viper
  Keeps operating (and it alarms) if facility power is lost
  Operates on AC and/or 12 to 24 VDC

Facility Applications for the Viper

- College and University Campuses
- TV Broadcast and Production Facilities
- Pre-fibered Sports Venues—Arenas, Stadiums, etc.
- Government Buildings and Military Facilities
- Churches and Ministries
- Studio-Transmitter Links and Uplinks
- Hospital and Corporate Television
- Metropolitan City-Wide Backbone Networks
- Telco & CATV Urban Video/Audio Services

All the signals you need...on one cable

Digital and analog video, digital and analog audio, intercom, data, camera control, and tally. Change your signals by simply changing modules. Evolve to high definition at your own pace.

Flawless signals...instantly.

You don't have to spend your valuable set-up time tweaking and solving cable problems. The Viper replaces all your noisy coaxial and wire cables with noise-free fiber optic cable. No interference, no signal loss, no rolloff.

Today's Wideband PAL/NTSC Analog Video

You demand the highest quality for your video signals, and the Viper delivers it. We test every system to the comprehensive EIA/TIA-250-C (SH) standards for television transmission. Plug in your TX/RX103 set to get up to 10 MHz video with S/N ratio better than 70 dB.

"Future Proof" with Hi-Def Digital Video

Transition to serial digital video with Viper plug-in modules. Whether you need data rates as low as 19.4 Mb/s, 601 component video transmission at 270 Mb/s, or uncompressed HDTV at 1.5 Gb/s, our TX/RX292 laser module set handles them all.

Digitally Transmitted Analog Audio

Telecast digitally delivers clean, clear audio signals, too. Each module multiplexes and transmits or receives two independent mic or line audio channels—flat from DC to 22 kHz. Start with the TX/RX280 master modules and expand to as many as 8 audio channels per fiber using TX/RX380 slave audio modules. Auxiliary intercom and data channels are also multiplexed onto the duplex TX/RX280 set.

AES/EBU Digital Audio, too

Support your digital AES/EBU audio needs with our TR260 transceiver module, which both trasmits and receives a dual channel AES/EBU digital audio stream. Fits into a Viper audio module slot.

Viper "442" frame combines all your video, audio, intercom, data and tally onto one cable.

Specifications

Video

TX/RX103 Module Set (NTSC/PAL) shown for 1300/1550nm

Interface	RS-170, NTSC, PAL
Input/Output impedance (Differential input, isolated from ground)	75 Ohms
Level, blanking level clamped to 0 V	1Vp-p
Freq. Response (30 Hz to 5.0 MHz)	±0.15 dB
(-3 dB point, min.)	9 MHz
Signal to Noise (weighted) Min/Typ	68 dB/71 dB
Differential Gain	< 2%
Differential Phase	< 0.5°
Luminance Nonlinearity	< 2%
Chrominance-Luminance Intermodulation Distortion	< 1.0%
Delay Inequalities	< 10 ns
Gain Inequalities	± 1 IRE
Line Time Distortion	< 0.5 IRE
Field Time Distortion	<2 IRE p-p
Short Time Distortion	< 3 IRE p-p
Long Time Distortion	< 1 IRE peak
Dynamic Gain, Picture & Sync	< 1%

TX/RX259 Module Set For 270 Mbps SDI Video
Conforms to SMPTE-259M specifications; see TX/RX259 data sheet

TX/RX292 Module Set For up to 1.5 Gbps HDTV SDI Video
Conforms to SMPTE-292M specifications; see TX/RX292 data sheet

Audio

TX/RX280 & TX/RX380 Module Sets

Digital Transmission	18-bit
Sampling Rate (samples/sec)	48k
Input Impedance (balanced)	5 kΩ & 600 Ω
Output Impedance (balanced)	30 Ω
Input Levels (max, Lo Z) dBm	-22, +8 and +18
(max, Hi Z) dBV	-24, +6 and +16
Output Level, line, max.	+ 18 dBm standard, +24 dBm optional
Frequency Response (@ +8 dBm), 20 Hz to 22 kHz	±0.2 dB
Total Harmonic Distortion + noise	
20 Hz to 20 kHz (@ +8 dBm)	<0.05%
1 kHz (@ +18 dBm)	<0.01%
Signal to Noise Ratio, unweighted, 20 Hz to 20 kHz, RMS	
(ref. to +18 dBm clip Reference)	>90 dB

Auxiliary (requires 2-way TX/RX280 audio paths in Viper)

Intercom

Interface	2 ch. 4-Wire (bal.) or 2-Wire (RTS or Clear-Com)
Signal to Noise Ratio (ref. to +10 dBm)	70 dB

CCU/Data

Interface	RS422, RS232, or Sony CCU (e.g., RM-M7, RM-P3)
Transmission Rate	0 to 150 kBits/sec

Contact Closure (2 ch in 8-module units; 1 ch in 4-module units)

Port Input	Normally High TTL level
Logic 1=open remote contacts; connect to ground (Logic 0) to actuate	
Output	Form 1A SPST, "Normally Open" isolated contacts

Electro-Optical (typ.)

Operating Wavelength	850 nm	1300 nm	1550 nm
TX Output into cable (dBm)			
TX103, TX280	-17	-14 & -10	-12
TX259	----	-6 & +3	-6 & +3
TX292	----	-7.5 & -2	----
RX Sensitivity, RX103 (dBm)	-22	-25	-27
RX Sensitivity, RX259 (dBm)	----	-25	-27
RX Sensitivity, RX292 (dBm)	----	-22	----

Mechanical/Electrical/Environmental

Mussel Shell Viper	4-module	8-module
Dimensions: (WxHxD)	14.5"x8.3"x3"	14.5"x14"x3"
Weight (nominal, loaded)	6 lbs	10 lbs
Power Consumption (per end, loaded)	10 watts	18 watts
Number of Video Slots	2	4
Number of Dual Audio Slots	2	4
Video Connectors	BNC	
Audio Connectors	3-pin XLR, male or female	
Intercom Connectors (duplex, on intercom module)		
RTS module (one dual channel)	one 3-pin XLR, male	
Clear-Com modulle (two channels)	two 3-pin XLR, male	
4-wire module (two channels)	two 5-pin XLR, male	
Optical Connectors/attachment		
standard	ST-type/Kellems grip opening	
optional	4-pin military hermaphroditic receptacle	
Power Connector	4-pin XLR	
Battery Mount (optional)	Anton/Bauer Snap-on™ Gold Mount	
Input Voltage Range	12 to 24 VDC (30 VDC max.)	
Operating Temperature Range	-40° to +70°C	
Humidity Range	0 to 95% non-condensing	

Rack Mount Viper (V800 or 442)	
Dimensions: w/o mounting ears (WxLxD)	16.7" x10.5" x 3.5"
Weight	8 pounds
Power Consumption (per end, loaded)	18 watts
Video Connectors	BNC
Audio Connectors (442 only)	3-pin XLR, male or female
Intercom/Data Connectors (442 only)	see Intercom Connectors, above
Optical Connectors/attachment	ST-type
Power Connector	4-pin XLR
Input Voltage Range	12 to 24 VDC (30 VDC max.)
Operating Temperature Range	-40° to +70°C
Humidity Range	0 to 95% non-condensing

ORDERING INFORMATION

The modular Viper™ System can be configured in portable "Mussel Shell" and/or 2RU rack mount enclosures, and includes Uninterruptible Power Supply (UPS).

Fiber optic cables sold separately, see Tac-Series. Viper components include:

Enclosures—portable or rack mount, incl. alarmed UPS NiCad backup

- V4—4-module portable; std: 2 video slots; 2 dual audio slots; 1 aux. optional
- V8—8-module portable; std: 4 video slots; 4 dual audio slots; 2 aux optional
- V800-D—8-module rack mount; std: 8 video slots; no audio slots; no auxiliary
- VR—"442" 8-module rack mount; std. 4 video slots; 4 dual audio slots; 2 aux opt.

Video and Audio Transmitter (TX) & Receiver (RX) Module Sets

- TX/RX103—NTSC/PAL analog video module set; FM-based; RS250-C-SH
- TX/RX259—ITU-R 601 serial digital video interface module set; 270 Mbps
- TX/RX292—Wideband serial digital video interface; 19.4 Mbps to 1.5 Gbps
- TX/RX280—dual 18-bit audio module set; mic/line analog in; line out; aux ready
- TX/RX380—dual 18-bit expansion modules augment TX/RX280; add up to 3 sets
- TR260—AES/EBU 2-way transceiver module; digital audio in and out

Power Accessories

SNAP-AB-1C Anton/Bauer Snap-On® Battery mount on V4 or V8 Mussel Shell
ADAP-AC-02 AC/DC power cube adapter
FEL-4 Rack mount 4-port universal AC/DC Power Supply

Also see: our ultra portable Sidewinder™ video/audio ENG/OB snake (interoperable with the Viper), the Adder™ series of digital audio snakes, the Cobra™ fiber triaxial camera link, the DiamondBack™ 8-channel analog video multiplexer, and the 8-channel Python™ SDTV/HDTV link.

For performance details, please see individual module data sheets.
Specifications verified with Tektronix VM700A Video Analyzer, Tektronix 1910 Digital Video Signal Generator and Audio Precision System One

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