

Fiber optic systems for television
broadcast production and other
high performance video and
audio communications

TELECAST SERIES

Telecast Series listing

Fiber optic systems for television broadcast production and other high performance video and audio communications

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Telecast Series overview

Miranda's Telecast Fiber Systems connectivity solutions are the industry standard for moving HD video from your cameras to your control room, through your or around a remote production site. Easy to deploy, and offering high-bandwidth connectivity, Miranda allows you to say goodbye to heavy, bulky, labor-intensive copper connections and say hello to lightweight, versatile and cost-effective fiber optics.



UNCOMPROMISED CAMERA CONNECTIVITY

Any camera or camcorder easily becomes fiber-connected with a CopperHead camera mounted transceiver. With lightweight fiber, setup and teardown is simplified, saving money and resources for mobile production and live on-sites. Our field-proven, modular systems provide two-way video, audio, intercom and data transport via efficient and versatile fiber optics. Miranda's range of fiber solutions delivers HD video and other signals long distances throughout a venue and back to a broadcast truck or fixed studio.

GET CLOSER WITH REMOTE CONTROLS

Bi-directional video and data controls are easily handled remotely using transceiver technology to control your high quality robotic cameras. Use these transceivers to lower your operational and production costs and get closer to the action with easy-to-mount Point Of View robotic cameras.



MANAGE YOUR FIBER WIRED FACILITY

Today's technical requirements inside sports arenas, entertainment parks and multi-venue college campuses demand future-proofed solutions for everything from HDTV production to in-house digital display networks. Miranda's fiber transport solutions leverage your fiber optic infrastructure and adapt to expanding bandwidth requirements using an advanced range of multiplexing transceiver platforms. Multiple signals from sound systems, radio booths, microphones and a virtually limitless number of cameras is easily managed through a single Miranda interface. Miranda's Telecast Series helps arena managers and sports teams enhance their in-house entertainment capabilities to keep fans in the game.

Cobra™ 2DT

Fiber optic camera interface for digital triax camera systems



DESCRIPTION

The Cobra™ 2DT system allows the extension of Sony's new HD digital triax camera chains, such as the HXC-100K and HSC-300K, over durable, lightweight tactical fiber or over an installed fiber optic infrastructure. Cameras can now be separated from their CCUs and be located around a building, across a campus, or even 20 km across town via metropolitan "dark fiber."

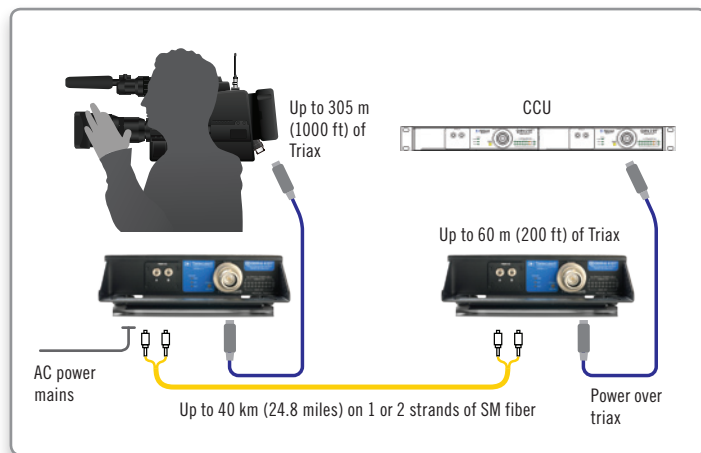
All of the signals carried on the camera chain's triax cable are extended on the fiber without any loss in signal or fidelity. These signals include:

- HD digital video
- Return video and genlock
- Audio, intercom and IFB
- Control data and tally

The lightweight portable Cobra™ 2DT units are rugged and robust, designed for the harshest outside broadcast environments. The Cobra™ 2DT camera module can power an additional 300 meter run of triax to the camera. Using the TelePort™ 3G systems, up to eight digital triax camera chains can be multiplexed over a long distance onto a pair of fibers, all at the lowest pricing Telecast Fiber Systems has ever been able to offer for our patented triax-to-fiber technology.

KEY FEATURES AND BENEFITS

- › Extends the reach of Sony's HD Digital Triax Camera Chains
 - HXC100
 - HSC300
- › Complete camera control
- › 13 dB optical budget
- › All 2-way triax signals
 - HD digital video
 - Return video and genlock
 - Audio, intercom and IFB
 - Control data and tally
- › Portable, lightweight units
- › Integrated bi-directional optical power measurement tools
- › Eliminates all EMF and RF interference, ground faults, hum
- › Provides camera power with advanced cable-check interlock, insuring user safety
- › Drives long triax runs
- › Fast, easy setup/teardown
- › Uses one or two strands of fiber
- › Multiplex up to eight camera chains onto a single fiber strand using the TelePort™ 3G system



TECHNICAL SPECIFICATIONS

TRANSMISSION		MECHANICAL/ENVIRONMENTAL	
Data rate:	2.7 Gbps	Throwdown Mussel Shell (W x H x D):	9 x 2.5 x 12 in
Optical source:	Laser diode	IRU (single or double (W x H x D)):	18 x 1.5 x 12 in
Fiber type:	Single-mode	Weight, camera end:	4.6 lb
Optical output power (min):	-7 dBm	Weight, base station end (throwdown):	3.6 lb
Optical sensitivity (typical):	>-20 dBm	Weight base station end IRU:	Single 4 lb Double 7 lb
Link margin/distance:	13 dB		
Wavelength (from camera/to camera) 1-fiber version:	1310/1550 nm		
I/O impedance:	75 ohm		

Note: Available in 1-fiber or 2-fiber versions

Connectors:	Triaxial connector: Kings Tri-Loc, Fischer	Triaxial range, Cobra to camera, typical, CCU dependant:	300 m
	Optical: ST single-mode (standard), ST (single), ST (dual), Neutrik OpticalCON	Power consumption:	Base unit: <10 W Camera unit (excluding camera power): <30 W
Input voltage:	100 VAC to 240 VAC	Temperature range, operating:	-40° to 55 °C
Output voltage to camera DC:	Standby: 36 VDC ±10 % Operate: 180 VDC ±10 %	Humidity range:	0 to 95 % non-condensing

ORDERING INFORMATION

CBR2-SON-CA-MS-1-ST2-F-#1-#2-#3-#4-#5 Cobra2D, Model S1 (Sony HSC/HXC chains), Camera end, single Mussel Shell enc., fiber: 2 ST connectors, Fischer triax con

USE THE VARIABLES IN GREEN BELOW TO BUILD YOUR ORDER CODE

#1 CAMERA OR CCU END	#3 UNITS	#4 FIBER CONNS	#5 TRIAX CONNS
CA Camera end	1 Single	ST2 2 ST connectors	F Fischer
BS CCU end (base)	2 Dual CCU end (rack mount only) 2 in BS-RM only	ST1 1 ST connector WDM	KG Kings
		NEU2 OpticalCON connector (dry)	

#2 ENCLOSURE

MS Mussel Shell
RM IRU rack mount, base only

CopperHead™ Pro

Fiber optic camera transceiver for I-MAG applications



DESCRIPTION

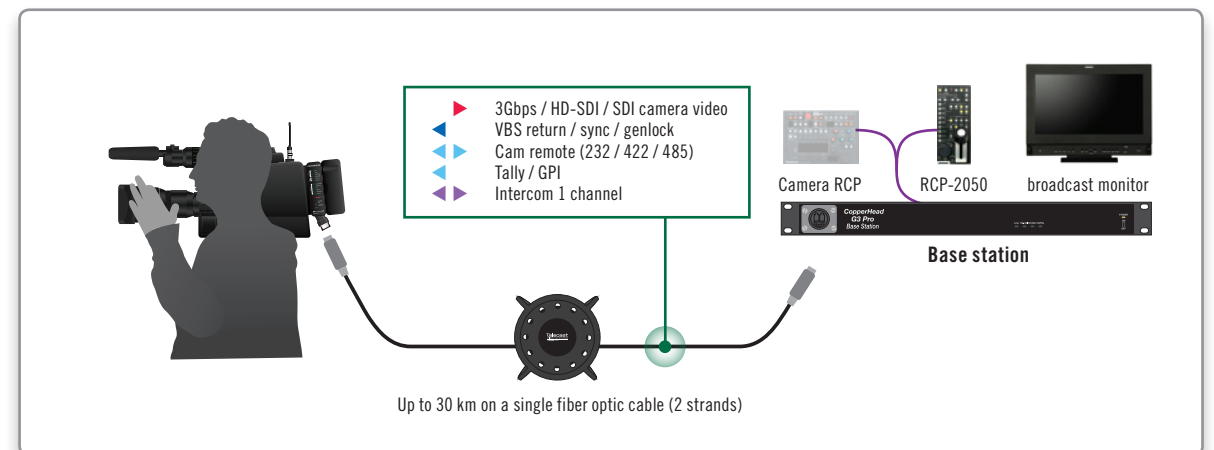
The CopperHead™ Pro is specifically designed for HD image magnification (I-MAG) applications in houses of worship, music venues, and corporate events. The CopperHead™ Pro offers a versatile and affordable solution that leverages the lightweight, high reliability, and superior quality of fiber cable for projecting high quality HD images.

Until now, churches and many other types of Audio/Video venues have not been able to take advantage of camera mounted fiber optic solutions for I-MAG because the cost has been prohibitive. At the same time, audience expectations for high quality projected video have increased, along with the quality of HD projectors and displays. The CopperHead™ Pro directly addresses these requirements with a solution that is specifically tailored to the I-MAG market, at a price that is affordable for any production team.

The compact CopperHead™ Pro camera unit sandwiches instantly between any HD-SDI video camera and a professional battery system such as Anton/Bauer or V-Mount, transporting uncompressed HD video signals from the camera to the control room via either tactical fiber or hybrid SMPTE Hybrid Cable. The system provides complete camera control as well as full bi-directional intercom and tally - all of the signals the producer and crew need for the highest-quality image magnification in venues ranging from the smallest church to the largest arena or stadium.

KEY FEATURES AND BENEFITS

- › All camera signals on 1 lightweight fiber cable
- › Thin, lightweight, modular design
- › Studio quality HD video and audio
- › 3Gbps/HD-SDI transport
- › Multikilometer distance capability
- › Anton/Bauer and V-Battery options
- › Wide temperature range, low power consumption
- › Two fiber cable options
 - Tactical fiber: military specification, battery/local power, 10+ km
 - SMPTE hybrid fiber: Low voltage camera mounted PowerWafer - 95 W to 300 m (984 ft)
- › Hi voltage camera mounted PowerPlus
 - 100 W to 2 km (1.2 miles)
- › Durable, high reliability design



CopperHead™ Pro

Fiber optic camera transceiver for I-MAG applications

TECHNICAL SPECIFICATIONS

VIDEO, DIGITAL (CAMERA-TO-BASE)

Interface: SMPTE 259M, 292M, 424M
 Data rate: 270 Mbps, 1.5 Gbps, 3 Gbps
 Input level: 800 mV ±10 % (p-p, max)
 Equalized cable lengths Belden 1694A:
 270 Mbps: 250 m
 1.5 Gbps: 230 m
 3 Gbps: 140 m

I/O impedance: 75 ohm
 Bit-error rate (pathological data) 10⁻¹²:
 270 Mbps: -24 dBm
 1.5 Gbps: -22 dBm
 3 Gbps: -20 dBm
 Jitter (SMPTE bars):
 270 Mbps, 1.5 Gbps: <0.2 UI
 3 Gbps: <0.3 UI
 Rise/fall times (20-80 % amplitude):
 270 Mbps: <1.5 ns to >0.4 ns
 1.5/3 Gbps: <135 ps

VIDEO, ANALOG (BASE-TO-CAMERA)

Interface: RS-170, NTSC, PAL
 Frequency response: Return VBS: 30 Hz - 4.2/8 MHz: ±0.15/-3 dB
 Tri-level sync: 4.2/8 MHz: -4/14 dB
 Video signal to noise ratio: ≥80 dB
 Differential gain / phase: <2 % / <1°

INTERCOM CHANNEL

Interface types (base):
 TW: RTS, Clear-Com® (switchable) XLR 3 female
 4-Wire: XLR 5 female

Frequency response (20 Hz - 20 kHz): 0.1/-3 dB
 Max distortion (THD+N): <0.1 %
 Signal/noise ratio: >80 dB

DATAS AND GPI/TALLY

Connector: DB15HD
 Data 1 camera control RS-232/422/485:
 Data rate - RS-422 or RS-485: 0 to 1 Mbps
 Data rate - RS-232: 0 to 100 kbps
 Jitter (sample asynchronous): 80 ns
 Data 2 RS-422: Data rate: 0 to 1 Mbps
 Jitter (sample asynchronous): 80 ns
 Tally/GPI inputs: ON: TTL low or short to GND
 OFF: TTL high or open

Tally outputs:
 Relay: 2 positions Form A, SPST, normally open
 Max switching voltage: 125 VDC, 150 VAC,
 Max relay current: 1 A
 12 VDC OUT: Max current 250 mA

ELECTRO-OPTICAL

Operating wavelengths:
 Camera to base (SDI): 1300 nm (Fiber A)
 Camera to base (data/comms): 1300 nm (Fiber B)
 Base to camera (VBS/data/comms): 1550 nm (Fiber B)

Note: Not compatible with Teleport
 TX laser output power: -6 dBm

RX sensitivity: 270 Mbps: -24 dBm
 1.5 Gbps: -22 dBm
 3 Gbps: -20 dBm

Fiber compatibility: Single-mode only
 Optical connector options - camera unit:
 Local power, PowerPlus: MX, OpticalCON, SMPTE 304M
 PowerWafer: SMPTE 304M or OpticalCON

Optical connector options - base station:
 Unpowered (TAC Cable): ST or OpticalCON
 Powered (PowerWafer/hybrid fiber): SMPTE 304M, OpticalCON, or ST/Molex

DISTANCE LIMIT *

TAC Cable (local power at camera):
 Dry fiber 1.5 Gbps: 16 db optical loss
 SMPTE 311M hybrid fiber:
 w/PowerWafer 240 m (787 ft): 95 W at 12 VDC *
 with HDX and PowerPlus 2 km (6562 ft): 100 W cont./150 W peak *

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D):
 Camera unit: 2.5 x 2.2 x 6.5 in
 Base station: 17.5 x 1.75 x 9 in
 PowerWafer: 5 x 2.2 x 6.12 in
 PowerPlus (LP 100W): 5 x 2.5 x 6 in (3.7 HP)
 HDX: 13 x 8.5 x 3.5 in
 MPS power supply: 9.7 x 4.5 x 2.5 in

Weight: Camera unit: 1.5 lb
 Base station: 5 lb
 PowerWafer: 1.5 lb
 PowerPlus: LP: 2.3 lb, HP: 2.5 lb
 HDX: 10.5 lb
 MPS power supply: 3 lb

Power consumption:
 Camera unit: 8 W at 10-18 VDC
 Base station (TAC Cable): Power consumption: 10 W at 10-18 VDC
 Power connector: 4-pin XLR

Base station (hybrid fiber): Power: 110-120 / 220-240 VAC, 50 to 60 Hz
 Power consumption: 250 W max at 120 VAC

Temperature range: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

COMPLIANCE

Laser safety: Class 1 laser 21 CFR 1040.10
 EMI/RFI: IEC/EN 60825-1
 Certifications: RoHS

* The maximum cable length varies due to optical loss that can depend on cable quality, dirt/dust/contamination on connectors, and number of fiber interconnects. When using hybrid cable for power, the size of the hybrid cable, as well as the power draw of the camera, lens, and accessories are also factors. See optical budget calculator page for optical distance limitations at <http://www.miranda.com/fiber-calculator>

ORDERING INFORMATION

CHG3-CAM-PRO1-#1-#2 Camera unit w/MX, OpticalCON or SMPTE 304M fiber connector
 CHG3-BS-PRO#3-NEU2-#5 Standard base station (can house 1 or 2 camera modules - 12 VDC only)
 Note: Requires PowerWafer at camera
 CH3-BS-PRO1-95VD-#4-#5 Base station w/internal power supply (single camera module only)
 ADAP-AC-04 110/220 VAC adaptor (XLR4) (for 12 VDC base station)

CHG3-PW-95V-EGG-#6 PowerWafer camera adaptor (for use with CH3-BS-PRO1-95VD)
 Note: Requires PowerWafer at camera
 CH3-MPS-95VD-#7-#8 External power supply for PowerWafer
 CHBR-PRO-#9-PIG2 Base station base remote cable
 CHCR-PRO-#9-PIG2 Camera unit remote cable. Specify camera model when ordering

USE THE VARIABLES IN GREEN BELOW TO BUILD YOUR ORDER CODE

#1 CAM UNIT FIBER CONNECTOR

MX2 MX
 NEU2 OpticalCON
 304M SMPTE 304M

#2 CAM UNIT BATT. INTERFACE PLATES

AB-AB Two gold mounts
 AB-V AB to cam, V to batt
 V-AB V to cam, AB to batt
 V-V V-Mount on both sides

#3 BASE STATION INTERNAL INTERFACES

1 Connect to single cam unit
 2 Connects to two cam units (12 VDC models only)

#4 BASE STATION FIBER CONNECTORS

NEU2 OpticalCON
 304M SMPTE 304M

#5 BASE STATION INTERCOM INTERFACES

4W 4-Wire
 2W-CC Clear-Com
 2W-RTS RTS

#6 POWER ADAPTOR INTERFACE PLATE

AB Gold mount
 V V-Mount

#7 POWER SUPPLY FIBER CONNS (DRY)

ST2 2 STs
 NEU2 OpticalCON

#8 HYBRID FIBER CONNS (WET)

NEU2 OpticalCON
 304M SMPTE 304M

#9 REMOTE CABLE MFG INTERFACE

HIT Hitachi
 HKE Ikegami
 JVC JVC
 PAN Panasonic
 SON Sony
 Others*

* Contact Miranda or your dealer for more information

CopperHead™ 3050

Fiber optic camera transceiver for ENG, SNG and EFP



DESCRIPTION

The CopperHead™ 3050 system provides a robust fiber optic link between a camcorder and your ENG or SNG news vehicle. The system simultaneously transports both digital (SDI or HD-SDI) and analog (NTSC or PAL) program video, plus audio, IFB, and intercom signals between the camera and the base station.

A 10/100 Ethernet path is provided for a remote link between a reporter's laptop and the truck.

The "wet/dry" return audio/IFB output at the camera unit can be powered "wet" for direct connection to a reporter's IFB beltpack or switched to drive a "dry" audio line, such as one of the camcorder's audio inputs.

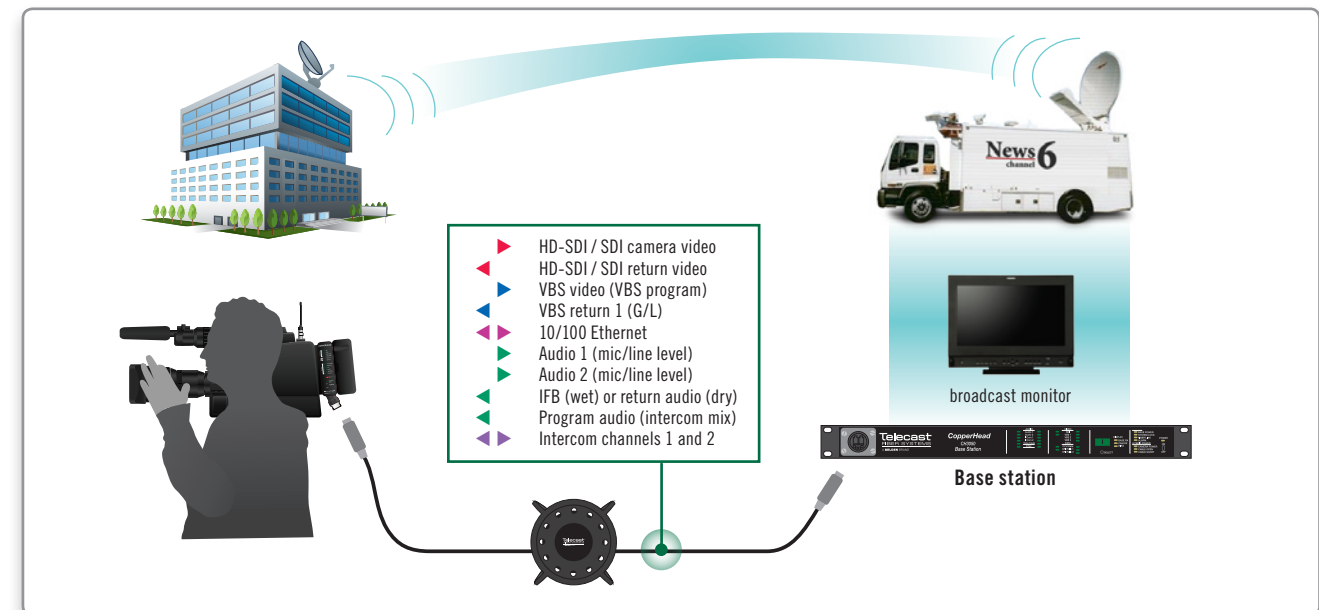
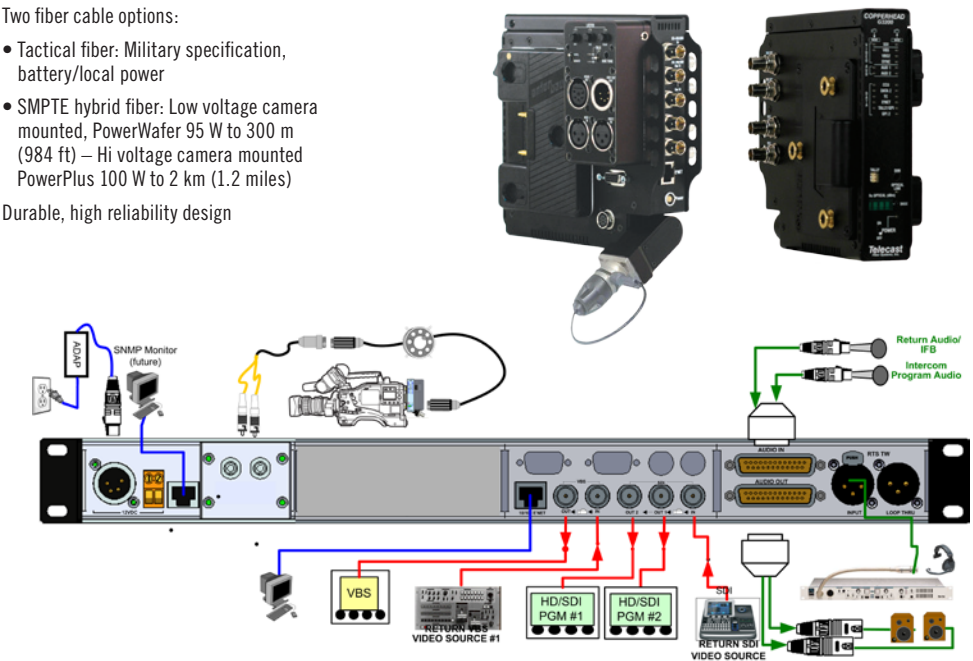
Since the CopperHead™ 3050 transmits all signals digitally and optically, you are assured of the highest quality video and audio - free from interference, grounding problems or drifting due to temperature variations.

The camera unit mounts directly to the camera's battery plate (Anton/Bauer or V-Mount) and provides for a variety of power options. The 3050 base station is a lightweight 1RU frame located in your truck.

CopperHead™ 3050 is your solution to the size, weight and transmission problems of ordinary bundles of copper coax and XLR audio cabling. You will save time and effort, and insure that your live shot or video production gets done fast, right, on time, and on budget.

KEY FEATURES AND BENEFITS

- All camera signals on 1 lightweight fiber cable
- Thin, lightweight, modular design
- 10/100 Ethernet, camera to base
- Studio quality HD video and audio
- Powered IFB output from the camera unit
- Multikilometer distance capability
- TDM multiplexing, wavelength simplicity, for up to 8 cameras per fiber pair via TelePort™ 3G
- Anton/Bauer and V-Battery options
- Wide temperature range, low power consumption
- Two fiber cable options:
 - Tactical fiber: Military specification, battery/local power
 - SMPTE hybrid fiber: Low voltage camera mounted, PowerWafer 95 W to 300 m (984 ft) – Hi voltage camera mounted PowerPlus 100 W to 2 km (1.2 miles)
- Durable, high reliability design



- ▶ HD-SDI / SDI camera video
- ▶ HD-SDI / SDI return video
- ▶ VBS video (VBS program)
- ▶ VBS return 1 (G/L)
- ▶ 10/100 Ethernet
- ▶ Audio 1 (mic/line level)
- ▶ Audio 2 (mic/line level)
- ▶ IFB (wet) or return audio (dry)
- ▶ Program audio (intercom mix)
- ▶ Intercom channels 1 and 2

CopperHead™ 3050

Fiber optic camera transceiver for ENG, SNG and EFP

TECHNICAL SPECIFICATIONS

VIDEO, DIGITAL (BI-DIRECTIONAL)

Interface: SMPTE 259M, 292M
 Data rate: 270 Mbps or 1.5 Gbps
 Input level: 800 mV p-p
 I/O impedance: 75 ohm
 Output impedance: 75 ohm
 Bit-error rate at -22 dBm: 10⁻¹²
 Jitter (pathological data): <0.2 UI
 Rise/fall times: <270 ps

VIDEO, ANALOG (BI-DIRECTIONAL)

Interface: RS 170, NTSC, PAL
 Frequency response: 30 Hz - 4.2 MHz: ±0.25 dB
 8 MHz: -3 dB

Video signal to noise ratio: ≥70 dB
 Differential gain: <2 %
 Differential phase: <2°

ETHERNET

Data support: 10BaseT/100BaseT
 Connector: Twisted pair RJ45
 Cable compatible: UTP 100 ohm Cat5
 I/O impedance: 10 kohm / 30 ohm

AUDIO, CAMERA TO BASE

Number of channels: 2
 Type: Balanced, line level
 Impedance: >15 kohm
 Maximum input level: 24 dBu
 Sampling: 24 bits, 128x (oversampled), 48 ks/s
 Frequency response: ±0.1 dB, 20 Hz to 20 kHz

AUDIO, BASE TO CAMERA (RETURN/IFB)

Number of channels: 1
 Input at base: Line level
 Output at camera unit: 30 VDC wet or line (switchable)

INTERCOM

Number of channels: 2
 Interface types (base): RTS, Clear-Com® or 4-Wire
 Frequency response: 200-18 kHz ±3 dB
 Max distortion: ≤0.5 %
 Noise: <-60 dBu
 Max gain (RTS or Clear-Com®): ≥24 dB
 Min gain (RTS or Clear-Com®): ≤-45 dB

ELECTRO-OPTICAL

Operating wavelength, standard: 1310 nm
 Nominal optical loss budget values: TX laser output power (std): -7 dBm
 RX sensitivity, HD-SDI: -22 dBm

Fiber compatibility: Single-mode
 Optical connector options - camera unit:
 Local power: MX or opticalCON
 Remote power: Short range power, SMPTE 304M or opticalCON
 Long range power, SMPTE 304M

Optical connector options - base station:
 Unpowered cable (TAC Cable): ST or opticalCON
 Remote power-carrying cable (hybrid fiber/wire): Standard power: SMPTE 304M, opticalCON, or STs+Molex

DISTANCE LIMIT *

TAC Cable (local power at camera): Standard laser: 15 dB optical loss (≥5 km *)
 SMPTE 311M hybrid fiber: Standard internal power supply w/PowerWafer, ~300 m (984 ft): 95 W at 12 VDC *
 Long range, HDX w/PowerPlus, LP, ~2 km (6562 ft): 100 W cont. / 150 W Peak *

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): Camera unit: 2.5 x 2.2 x 6.5 in
 Base station: 17.5 x 1.75 x 9 in
 PowerWafer: 5 x 2.2 x 6.12 in
 PowerPlus LP (100 W): 5 x 2.5 x 6 in
 PowerPlus HP (150 W): 5 x 3.7 x 6 in
 HDX: 13 x 8.5 x 3.5 in
 Camera unit: 1.5 lb
 Base station: 5 lb
 PowerWafer: 1.5 lb
 PowerPlus: LP: 2.3 lb, HP: 2.5 lb
 HDX: 10.5 lb

Weight:
 Power consumption: Camera unit: 8 W at 10-18 VDC
 Base station (TAC Cable): 10 W at 10-18 VDC

Temperature range: -25° to 45 °C
 Humidity range: 0 to 95 % RH, non-condensing

* The maximum cable length varies due to optical loss that can depend on cable quality, dirt/dust/contamination on connectors, and number of fiber interconnects. When using hybrid cable for power, the size of the hybrid cable, as well as the power draw of the camera, lens, and accessories are also factors.

ORDERING INFORMATION

CHG3-CAM-3050-#1-#2	Camera unit w/MX, opticalCON or SMPTE 304M fiber connector	CHG3-PW-95V-EGG-#5	PowerWafer camera adaptor (for use with CH3-BS-3050-95VD-BS-95VD)
CHG3-BS-3050-#3-#4	Standard base station 2 STs or opticalCON connector	CH3-MPS-95VD-#6-#7	External power supply for PowerWafer
CHG3-BS-3050-95VD-#3-#4	Base station w/internal power supply, opticalCON or 304M	CH3BAI-3050-D25-4XL3F	Base audio input breakout cable with coms
ADAP-AC-04	AC adaptor (for CHG3-BS-3050 base station)	CHBAO-D25-4XL3M	Base audio output breakout cable with coms

USE THE VARIABLES IN GREEN BELOW TO BUILD YOUR ORDER CODE

#1 CAM UNIT FIBER CONNECTOR

MX2 MX
 NEU2 OpticalCON
 304M SMPTE 304M

#3 BASE STATION FIBER CONNECTORS

NEU2 OpticalCON
 304M SMPTE 304M
 ST2 2 STs

#5 POWER ADAPTOR INTERFACE PLATE

AB Gold mount
 V V-Mount

#7 POWER SUPPLY FIBER CONNS (WET)

NEU2 OpticalCON
 304M SMPTE 304M

#2 CAM UNIT BATT. INTERFACE PLATES

AB-AB Two gold mounts
 AB-V Gold mount to cam, V-shoe to batt
 V-AB V-Mount to cam, gold mount to batt
 V-V V-Mount on both sides

#4 BASE STATION INTERCOM INTERFACES

4W 4-Wire
 CC Clear-Com
 RTS RTS 2-Wire

#6 POWER SUPPLY FIBER CONNS (DRY)

ST2 STs
 NEU2 OpticalCON

* Contact Miranda or your dealer for more information

CopperHead™ 3200

Fiber optic camera transceiver

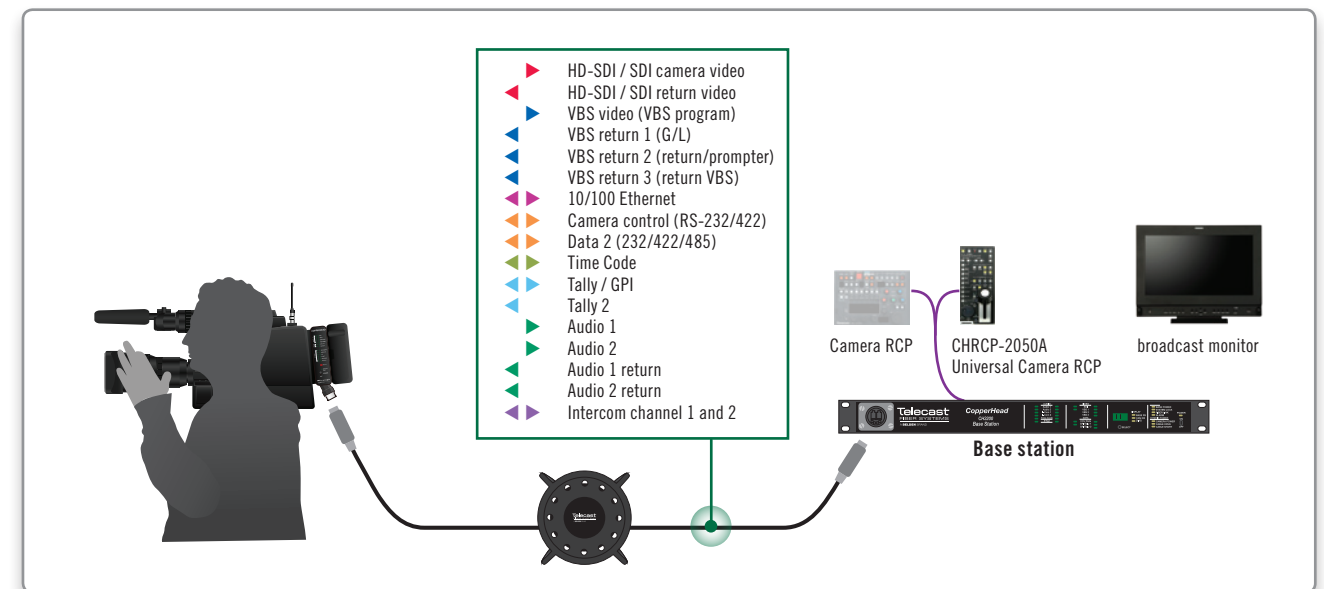


DESCRIPTION

The CopperHead™ 3200 system is a robust fiber optic link between your camcorder and your truck, control room or "video village" position. The system will simultaneously transport both digital (SDI or HD-SDI) and analog (NTSC or PAL) program video, as well as all two-way camera control, audio, video, data, tally/call and intercom signals between the camera and the base station.

KEY FEATURES AND BENEFITS

- All camera signals on lightweight fiber cable
- Broadcast quality video and audio
- Return HD Video
- Two-channel intercom
- Multikilometer distance capability
- Battery mount options for Anton/Bauer or V-Mount
- Wide temperature range
- Low power consumption
- Multiple fiber connector options
- Two fiber cable options
- Tactical fiber
 - Military specification, battlefield proven
 - Requires local power at camera
- SMPTE hybrid fiber
 - Internal power supply delivers 95 W power to the camera up to 213 m (780 ft)
 - External PowerPlus delivers 100 W power to the camera up to 2 km (1.2 miles) 150 W opt.
- Use the TelePort™ 3G system to multiplex up to eight CopperHead™ 3200 systems onto a single strand of fiber
- Durable, high reliability design



CopperHead™ 3200

Fiber optic camera transceiver

TECHNICAL SPECIFICATIONS

VIDEO, DIGITAL (BI-DIRECTIONAL)

Interface: SMPTE 259M, 292M
 Data rate: 270 Mbps or 1.5 Gbps
 Input level: 800 mV p-p
 I/O impedance: 75 ohm
 Output impedance: 75 ohm
 Bit-error rate at -22 dBm: 10⁻¹²
 Jitter (pathological data): <0.2 UI
 Rise/fall times: <270 ps

VIDEO, ANALOG (BI-DIRECTIONAL)

Interface: RS-170, NTSC, PAL
 Frequency response: 30 Hz - 4.2 MHz: ±0.25 dB
 8 MHz: -3 dB
 Video signal to noise ratio: ≥70 dB
 Differential gain: <2 %
 Differential phase: <2°

ETHERNET

Data support: 10BaseT/100BaseT
 Connector: Twisted pair RJ45
 Cable compatible: UTP 100 ohm Cat5
 I/O impedance: 10 kohm / 30 ohm

AUDIO

Number of channels: 1 to 4
 Type: Balanced, line level
 Impedance: >15 kohm
 Maximum input level: 24 dBu
 Quantization: 24 bits, 128x (oversampled)
 Sample rate: 48 KS/s
 Frequency response: ±0.1 dB, 20 Hz to 20 kHz

INTERCOM

Number of channels: 2
 Interface types (base): RTS, Clear-Com® or 4-Wire
 Frequency response: 200-18 kHz, ±3dB
 Max distortion: ≤0.5 %
 Noise: <-60 dBu
 Max gain (RTS or Clear-Com®): ≥24 dB
 Min gain (RTS or Clear-Com®): ≤-45 dB

ELECTRO-OPTICAL

Operating wavelengths: 1310/1550 nm
 TX laser output power (std./opt): -6/0 dBm
 Impedance: >15 kohm
 RX sensitivity, HD-SDI: -22 dBm
 Fiber compatibility: Single-mode
 Optical connector options - camera unit:
 Local power: MX or opticalCON
 Remote power: Short range power, SMPTE 304M or opticalCON
 Long range power, SMPTE 304M

Optical connector options - base station:
 Unpowered (TAC Cable): ST or opticalCON
 Remote power (hybrid fiber): Standard power: SMPTE 304M, opticalCON, or STs and Molex

DISTANCE LIMIT *

TAC Cable (local power at camera): Standard laser: 15 dB optical loss (≥5 km *)
 Optional DFB laser: 19 dB optical loss (~30 km *)
 SMPTE 311M hybrid fiber: Standard internal power supply w/PowerWafer: ~300 m (984 ft), 95 W at 12 VDC*
 Long range: HDX w/PowerPlus, LP: ~2 km (6562 ft): 100 W cont. / 150 W peak *

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): Camera unit: 2.5 x 2.2 x 6.5 in
 Base station: 17.5 x 1.75 x 9 in
 PowerWafer: 5 x 2.2 x 6.12 in
 PowerPlus LP (100 W): 5 x 2.5 x 6 in
 PowerPlus HP (150 W): 5 x 3.7 x 6 in
 HDX: 13 x 8.5 x 3.5 in
 Weight: Camera unit: 1.5 lb
 Base station: 5 lb
 PowerWafer: 1.5 lb
 PowerPlus: LP: 2.3 lb, HP: 2.5 lb
 HDX: 10.5 lb

Power consumption: Camera unit: 8 W at 10-18 VDC
 Base station (TAC Cable): 10 W at 10-18 VDC

Temperature range: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

* The maximum cable length varies due to optical loss that can depend on cable quality, dirt/dust/contamination on connectors, and number of fiber interconnects. When using hybrid cable for power, the size of the hybrid cable, as well as the power draw of the camera, lens, and accessories are also factors.

ORDERING INFORMATION

CHG3-CAM-3200-#1-#2 Camera unit w/MX, opticalCON or SMPTE 304M fiber connector
 CHG3-BS-3200-#3-#4 Standard base station 2 STs or opticalCON connector
 CHG3-BS-3200-95VD-#3-#4 Base station w/internal power supply, opticalCON or 304M
 ADAP-AC-04 AC adaptor (for CHG3-BS-3050 base station)

CHG3-PW-95V-EGG-#5 PowerWafer camera adaptor (for use with CH3-BS-3050-95VD-BS-95VD)
 CH3-MPS-95VD-#6-#7 External power supply for PowerWafer
 CH3BAI-3200-D25-5XL3F Base audio input breakout cable with coms
 CH3BAO-D25-4XL3M Base audio output breakout cable with coms

USE THE VARIABLES IN GREEN BELOW TO BUILD YOUR ORDER CODE

#1 CAM UNIT FIBER CONNECTOR

MX2 MX
 NEU2 OpticalCON
 304M SMPTE 304M

#3 BASE STATION FIBER CONNECTORS

NEU2 OpticalCON
 304M SMPTE 304M
 ST2 2 Sts

#5 POWER ADAPTOR INTERFACE PLATE

AB Gold mount
 V V-Mount

#7 POWER SUPPLY FIBER CONNS (WET)

NEU2 OpticalCON
 304M SMPTE 304M

#2 CAM UNIT BATT. INTERFACE PLATES

AB-AB Two gold mounts
 AB-V Gold mount to cam, V-shoe to batt
 V-AB V-Mount to cam, gold mount to batt
 V-V V-Mount on both sides

#4 BASE STATION INTERCOM INTERFACES

4W 4-Wire
 CC Clear-Com
 RTS RTS 2-Wire

#6 POWER SUPPLY FIBER CONNS (DRY)

ST2 Sts
 NEU2 OpticalCON

* Contact Miranda or your dealer for more information

CopperHead™ 3400

Fiber optic camera transceiver for 3D production and e-cinematography



DESCRIPTION

Cutting-edge 3D and dual link production require multiple 3 Gbps video links between a camera location and its engineering station. Connecting with heavy, fragile copper cables can be distance-limiting and unreliable.

The CopperHead™ 3400 puts all of the signals needed for 3D or dual link production onto a single, robust lightweight fiber cable, eliminating the problems of copper on any studio or remote production.

3D RIGS

The CopperHead™ 3400 mounts to any two-camera 3D beam splitter or side-by-side rig, creating an easy, flexible link from your camera to a truck, control room or flypack.

The compact camera unit accepts a 1.5 or 3 Gbps HD-SDI signal from each camera, as well as providing an additional 1.5 Gbps HD-SDI path each way for monitoring and 3D return. Bi-directional data paths include two RS-422/485/232 paths for camera control, a separate RS-232 for 3D rig control. A 10/100 Ethernet path, genlock, intercom and bi-directional audio paths are also provided.

The entire system runs on tactical fiber cable or on a SMPTE hybrid fiber cable if local power is not available at the camera rig.

DUAL LINK E-CINEMA

The CopperHead™ 3400 is the easy way to extend the distance between the dual link camera on-set and Video Village.

Dual link HD-SDI, return HD-SDI and camera control are just some of the paths provided by the CopperHead™ 3400 for your high-end TV, movie or commercial production.

Since the CopperHead™ 3400 transmits all signals digitally and optically, you are assured of the highest quality signals - free from interference, grounding problems or drifting due to temperature variations.

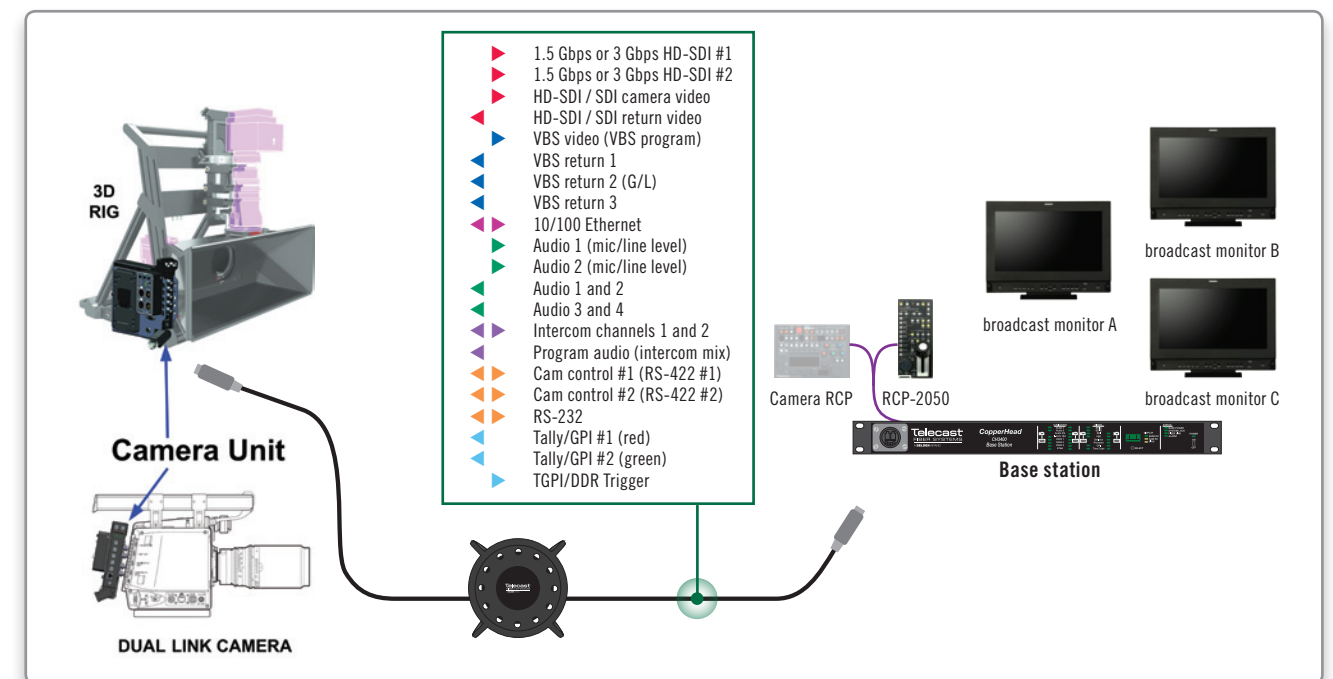
CopperHead™ 3400 is your solution to the size, weight and transmission problems of ordinary bundles of copper cabling. You will save time and effort, and insure that your production gets done fast, right, on time, and on budget.

KEY FEATURES AND BENEFITS

- All camera signals on one lightweight fiber cable
- Long distance range (multiple kilometers)
- Three uncompressed HD-SDI signals from camera to base:
 - Two 1.5 to 3 Gbps paths for dual link or 3D cameras
 - One 1.5 Gbps path for monitoring and/or menus
- Four bi-directional data streams
 - Two RS-422 paths
 - One RS-232 path
 - One 10/100 Ethernet path
- Genlock
- Two-way audio and intercom
- Anton/Bauer and V-Battery options
- Wide temperature range
- Low power consumption

Two fiber cable options

- Tactical fiber: military specification, battery/local power
- Hybrid fiber (SMPTE 311M):
 - PowerWafer - low voltage - 95 W to 240 m (787 ft)
 - PowerPlus - high voltage - 100/150 W to 2 km (1.2 miles)



CopperHead™ 3400

Fiber optic camera transceiver for 3D production and e-cinematography

TECHNICAL SPECIFICATIONS

VIDEO, DIGITAL (A-LINK AND B-LINK)

Interface: SMPTE 424M, 292M, 259M
Data rate: 3 Gbps, 1.5 Gbps, or 270 Mbps

VIDEO, DIGITAL (BI-DIRECTIONAL)

Interface: SMPTE 259M, 292M
Data rate: 270 Mbps or 1.5 Gbps

VIDEO, DIGITAL (ALL)

Input level: 800 mV p-p
I/O impedance: 75 ohm
Output impedance: 75 ohm
Bit-error rate at -22 dBm: 10⁻¹²
Jitter (pathological data): <0.2 UI
Rise/fall times: <270 ps

VIDEO, ANALOG (BI-DIRECTIONAL)

Interface: RS-170, NTSC, PAL
Frequency response: 30 Hz - 4.2 MHz: ±0.25 dB
8 MHz: -3 dB

Video signal to noise ratio: ≥70 dB
Differential gain: <2 %
Differential phase: <2°

ETHERNET

Data support: 10BaseT/100BaseT
Connector: Twisted pair RJ45
Cable compatible: UTP 100 ohm Cat5
I/O impedance: 10 kohm / 30 ohm

AUDIO, CAMERA TO BASE

Number of channels: 2
Input level at camera unit, switchable: Line: 4 dB
MIC: -60 dB or -10 dB
Impedance: >15 kohm

Maximum input level: 24 dBu
Sampling: 24 bits, 128x (oversampled), 48 kS/s

Frequency response: ±0.1 dB, 20 Hz to 20 kHz
Output at base station: Line level

AUDIO, BASE TO CAMERA (RETURN/IFB)

Number of channels: 4
Input level at base station: Line level
Output at camera unit: Line level

INTERCOM

Number of channels: 2
Interface types (base): RTS, Clear-Com® or 4-Wire
Frequency response: 200-18 kHz, ±3 dB
Max distortion: ≤0.5 %
Noise: <-60 dBu
Max gain (RTS or Clear-Com®): ≥24 dB
Min gain (RTS or Clear-Com®): ≤-45 dB

ELECTRO-OPTICAL

Operating wavelength, standard: 1310 nm
Nominal optical loss budget values: Tx laser output power (std): 0 dBm
Rx sensitivity, HD-SDI: -22 dBm

Fiber compatibility: Single-mode
Optical connector options - camera unit:
Local power: MX or opticalCON
Remote power: Short range power: SMPTE 304M or opticalCON
Long range power: SMPTE 304M

Optical connector options - base station:
Unpowered cable (TAC Cable): OpticalCON
Remote power - carrying cable (hybrid fiber/wire): Standard Power: SMPTE 304M, OpticalCON

DISTANCE LIMIT *

TAC Cable (local power at camera): Standard laser: 15 dB optical budget

SMPTE 311M hybrid fiber: Standard internal power supply w/PowerWafer: ~300 m (984 ft), 95 W at 12 VDC *
Long range, HDX w/PowerPlus, LP: ~2 km (6562 ft), 100 W cont. / 150 W peak *

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): Camera unit: 2.5 x 2.2 x 6.5 in
Base station: 17.5 x 1.75 x 9 in
PowerWafer: 5 x 2.2 x 6.12 in
PowerPlus LP (100 W): 5 x 2.5 x 6 in
PowerPlus HP (150 W): 5 x 3.7 x 6 in
HDX: 13 x 8.5 x 3.5 in
Camera unit: 1.5 lb
Base station: 5.0 lb
PowerWafer: 1.5 lb
PowerPlus: LP: 2.3 lb, HP: 2.5 lb
HDX: 10.5 lb

Weight:
Power consumption: Camera unit: 8 W at 10-18 VDC
Base station (TAC Cable): 10 W at 10-18 VDC

Temperature range: -25° to 55 °C (with internal fan enabled)
Humidity range: 0 to 95 % RH, non-condensing
Max noise level: 16 dBA (Fan on)

COMPLIANCE

Laser safety: Class 1 laser 21 CFR 1040.10
EMI/RFI: IEC/EN 60825-1
Certifications: RoHS

* Contact Miranda or your authorized CopperHead dealer for more information.

ORDERING INFORMATION

CHG3-CAM-3400-#1-#2	Camera unit w/MX, opticalCON or SMPTE 304M fiber connector	CHG3-PW-95V-EGG-#5	PowerWafer camera adaptor (for use with CH3-BS-3050-95VD-BS-95VD)
CHG3-BS-3400-#3-#4	Standard base station 2 STs or opticalCON connector	CH3-MPS-95VD-#6-#7	External power supply for PowerWafer
CHG3-BS-3400-95VD-#3-#4	Base station w/internal power supply, opticalCON or 304M	CH3BAI-3400-D25-7XL3F	Base audio input breakout cable with coms
ADAP-AC-04	AC adaptor (for CHG3-BS-3050 base station)	CH3BAO-3400-D25-6XL3M	Base audio output breakout cable with coms

USE THE VARIABLES IN GREEN BELOW TO BUILD YOUR ORDER CODE

#1 CAM UNIT FIBER CONNECTOR

MX2 MX
NEU2 OpticalCON
304M SMPTE 304M

#3 BASE STATION FIBER CONNECTORS

NEU2 OpticalCON
304M SMPTE 304M
ST2 2 STs

#5 POWER ADAPTOR INTERFACE PLATE

AB Gold mount
V V-Mount

#7 POWER SUPPLY FIBER CONNS (WET)

NEU2 OpticalCON
304M SMPTE 304M

#2 CAM UNIT BATT. INTERFACE PLATES

AB-AB Two gold mounts
AB-V Gold mount to cam, V-shoe to batt
V-AB V-Mount to cam, gold mount to batt
V-V V-Mount on both sides

#4 BASE STATION INTERCOM INTERFACES

4W 4-Wire
CC Clear-Com
RTS RTS 2-Wire

#6 POWER SUPPLY FIBER CONNS (DRY)

ST2 STs
NEU2 OpticalCON

* Contact Miranda or your dealer for more information

CopperHead™ RCP2050

Universal camera remote control panel with optional LCD monitor



DESCRIPTION

The CopperHead™ RCP2050A universal camera control panel provides remote control for a range of broadcast cameras/camcorders from most major camera manufacturers, providing perfect emulation of control units from Sony, Panasonic, JVC, Hitachi, and Ikegami. The unit can be used in place of remote control panels that do not provide functional joystick control of iris and pedestal.

The 2050A interfaces directly with the CopperHead™ fiber optic extension systems, or can be connected directly to a camera or a camcorder.

All camera control adjustments* can be adjusted via the intuitive control panel, with its tactile buttons, large rotary encoder and reliable, noise free, non-contact joystick which controls iris, pedestal and preview.

Multiple non-volatile storage and retrieval scene files are available both internally and via SD card access. The SD card allows scene file settings to be transported across multichannel systems as well as off-site backup.

KEY FEATURES AND BENEFITS

- Works with the CopperHead™ systems
- Optional 3.5 in (89 mm) LCD video/OSD picture monitor, tiltable 0 - 45° (model CHRCP-LCD1)
- On screen display (OSD) video output is standard for LCD and external monitor (PAL or NTSC)
- SD card transportable scene file storage
- Internal scene file storage
- Low profile design - 40 mm deep excluding controls
- Provides external tally input to most cameras and camcorders
- Smooth full function joystick with built-in pedestal control
- Joystick Iris control uses non-contact technology for noise-free operation and reliability
- Joystick preview selector with solid state relay output

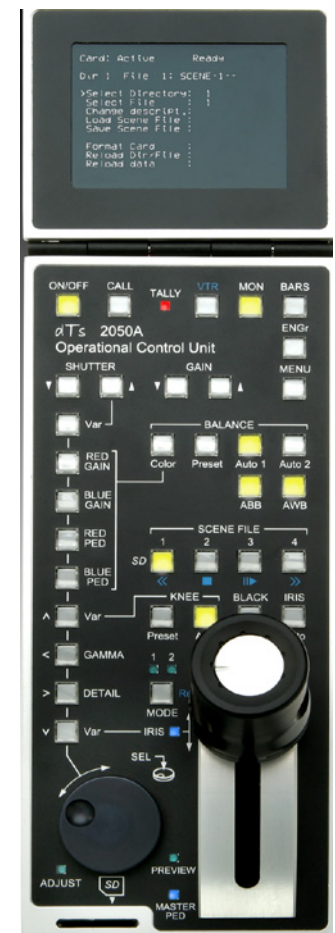
TECHNICAL SPECIFICATIONS

Power input, RCP:	8-50 VDC 1.5 W typical 3.5 W max	OCU /EN:	Level OFF + 5 V Level ON 0V
Power input, display:	10-14 VDC 5.5 W typical 7 W max	Preview contacts o/p:	Voltage 100 V max Current 120 mA AC max 250 mA DC max On resistance 25 ohm max Isolation 5000 Vrms max
Serial control types:	RS-422/232		
Tally input (red and green) *:	Level off 0 V (GND)*, CMOS Level on 5 V* levels Resistance 10 K		* Nominal sense - levels vary depending on panel emulation.

An On Screen Display (OSD) video output provides operational information and SD scene file access menus. This OSD output can be connected to an external standard definition composite VBS monitor or, optionally, a tiltable 3.5 in (89 mm) TFT-LCD unit is available (CHRCP-LCD1) which is ergonomically designed to match and fit the CopperHead™ RCP2050.

For flush mounting, the low profile design of only 40 mm below desktop surface gives maximum under desk clearance, using the included panel mounting brackets.

* As cameras and controllers differ considerably in the functionality they offer, not all functions are available with all cameras.



ORDERING INFORMATION

CHRCP-2050	Universal camera remote control panel with SD memory slot
CHRCP-2050-LCD1	Universal camera remote control panel with SD memory slot and LCD control panel
CHRCP-LCD1	Optional 3.5 in LCD panel for CHRCP-2050 (separate)
CHBR-OC2040-422	CHRCP base remote cable for CopperHead base stations (RS-422)
CHBR-OC2040-232	CHRCP base remote cable for CopperHead base stations (RS-232)

SHED™ -HDX™

SMPTE Hybrid Elimination Device adapter

DESCRIPTION

SHED™ stands for SMPTE Hybrid Elimination Device, and that is what it is. It is a small adapter that allows you to use ordinary single-mode optical fiber for your HD (and slow motion) camera links and in your venue/facility infrastructure, and eliminate bulky hybrid wire/fiber.

SHED™ adapter shown with HDX™ camera power unit cables. Use two small adapters - one at your base station and one at your camera - and locally power your camera, or use the HDX™ unit to power the camera through the hybrid tail cable. With the SHED™ units you can support several cameras on one lightweight fiber cable.

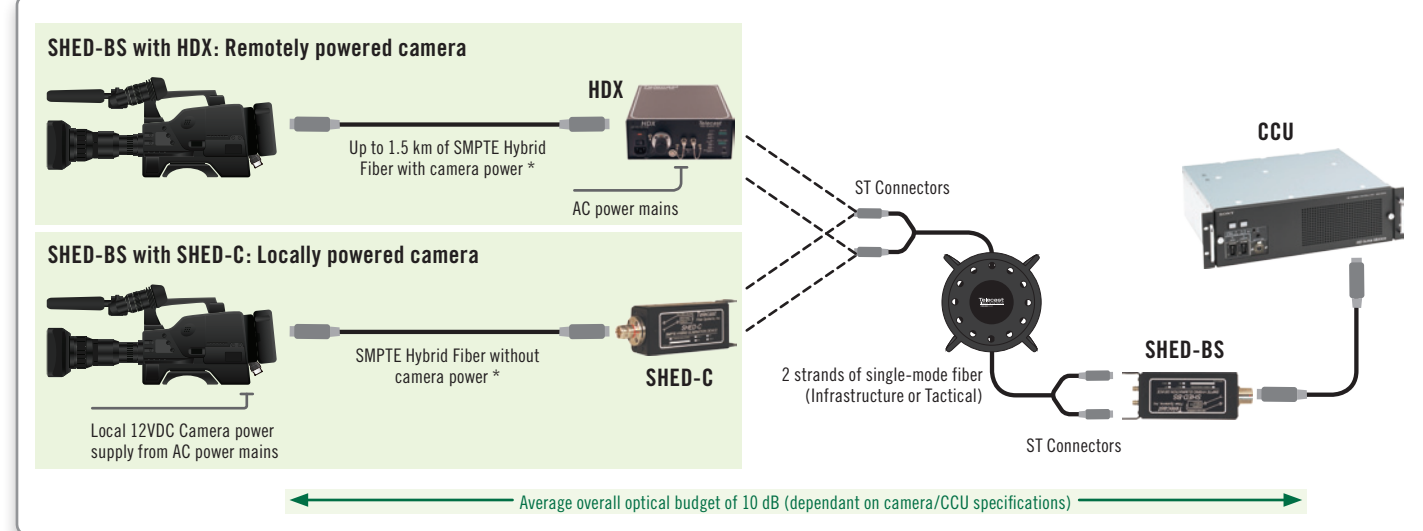


KEY FEATURES AND BENEFITS

- ▶ Allows the use of conventional single-mode fiber cable
 - Infrastructure fiber
 - Tactical fiber cable
- ▶ Extends distance limits of camera
 - ▶ Provides power to camera, or permits local powering
 - ▶ Small, lightweight adapters
 - ▶ Built-in optical power meter
 - ▶ Front panel status monitoring
- ▶ Safety interlock on HDX™
 - ▶ Remote shut-off of camera head (optional)
 - ▶ Fast plug and play operation
 - ▶ Can be used with TelePort™ 3G/TeleThon™ 3G for CWDM optical multiplexing
- ▶ All camera signals on lightweight fiber cable
 - ▶ Digital SDI or HD-SDI program video
 - ▶ HDX™ also supports CopperHead™ PowerPlus and powered POV Systems
- ▶ Uses common ST, SC, MX™ or OpticalCON connectors

TECHNICAL SPECIFICATIONS

ELECTRO-OPTICAL	MECHANICAL/ENVIRONMENTAL	Connector:	Electrical:	Power consumption:
Fiber type: Single-mode Note: SHEDs and HDXs are optically passive	Dimensions (W x H x D): HDX: 13 x 3.5 x 8.5 in SHED: 7.5 x 2 x 2.5 in SHED-6: 17.4 x 1.75 x 9 in Weight: HDX: 10.5 lb SHED: 1 lb SHED-6: 5 lb	Electrical: IEEE 3-pin (XLR-4 on SHED-6) Optical: LEMO, ST, SC, MX, OpticalCON	HDX input voltage: 115-230 VAC Output max load: 200 VA	<20 W Indicators: Power on, voltage indications, Optical power Temperature range: -20 to 55 °C Humidity range: 0 to 95 % non-condensing



* Maximum length of SMPTE cable with power varies with the camera system configuration, lens type, viewfinder type, size of the optical fiber cable, and the number of cable connectors.

ORDERING INFORMATION

Please see Miranda web site for detailed ordering information

T-POV Systems

Bi-directional HD video/audio/data robotic camera links



DESCRIPTION

The T-POV line offers significant improvements in bi-directional fiber optic video and data transceiver technology for robotic point of view HD television cameras. These devices are an outstanding choice for sports, remote broadcasting, security, education or military applications. Each is TelePort™ 3G and TeleThon™ 3G compatible with more flexible and affordable integrated SMPTE hybrid powering options and distributed power supplies. There's now an Ethernet option and the 324 model offers a return HD-SDI option.

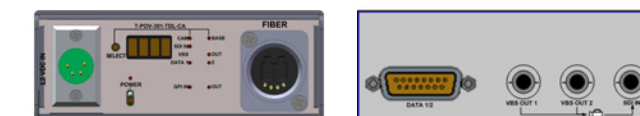
As a broadcast link, the T-POV modules have a wide range of applications, from goal cameras, beauty shots, flying viewpoints and long distance remote controlled cameras. With the new T-POV line, components can be mixed and matched to permit many configurations to suit virtually any requirement.

KEY FEATURES AND BENEFITS

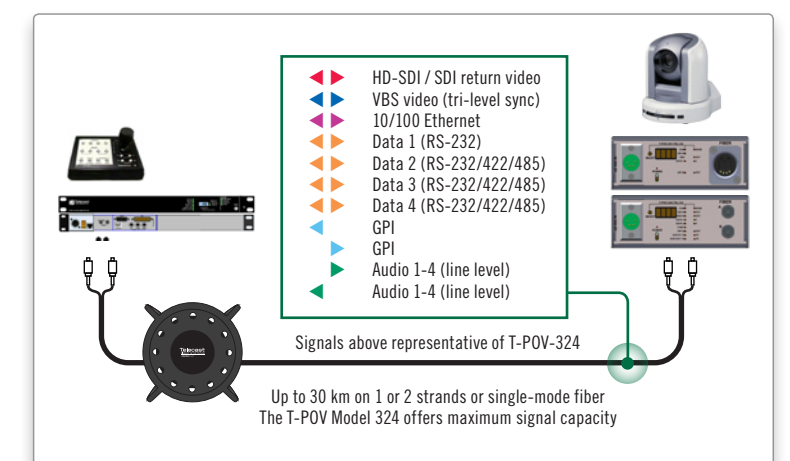
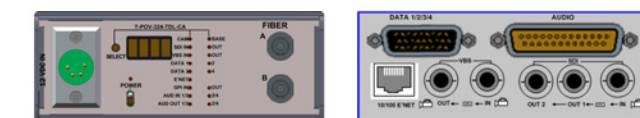
- ▶ Bi-directional on one or two fibers
 - ▶ Uncompressed HD-SDI up to 1.5 Gbps
 - ▶ Up to six* duplex RS-232/422/485 data channels for full camera control and pan/tilt/zoom
 - ▶ GPI relay closure circuits
 - ▶ Return genlock, or tri-level sync for HD
 - ▶ Four audio channels in each direction*
 - ▶ Use dry fiber or SMPTE Hybrid Cable
 - ▶ 10/100 Ethernet*
 - ▶ Three housings for various applications
 - Rack mount holds up to three units
 - Throwdown for single applications
 - Robust Mini-Mussel shell for harsh-environment applications
 - ▶ Wide temperature range
 - ▶ High reliability design
- * Features vary by model



T-POV-301



T-POV-324



T-POV Systems

Bi-directional HD video/audio/data robotic camera links

TECHNICAL SPECIFICATIONS

VIDEO, DIGITAL

Interface: SMPTE 259M, 292M
 Data rate: 270 Mbps or 1.5 Gbps
 Input level: 800 mV p-p
 Input impedance: 75 ohm
 Output impedance: 75 ohm
 Bit-error rate at -22 dBm: 10^{-12}
 Jitter measure w/color bars: <0.2 UI
 Rise/fall times: 0.4-1.5 ns SD
 <270 ps HD

VIDEO ANALOG

Interface: RS-170, NTSC, PAL, SECAM
 I/O level: 1 V p-p at 75 ohm
 Frequency response: 30 Hz-5 MHz, ± 0.2 dB
 -3 dB point min 8.6 MHz

Video signal to noise ratio: ≥ 67 dB, weighted
 Differential gain: ≤ 2.0 %
 Differential phase: $\leq 0.7^\circ$
 Line time distortion: ≤ 0.5 IRE
 Chrom-lum intermod: ≤ 1 IRE

ETHERNET **

Data support: 10BaseT/100BaseT
 Connector: Twisted pair RJ45
 Cable compatible: UTP 100 ohm Cat5e Cat6
 Input impedance: 100 ohm differential
 Output impedance: 100 ohm differential

AUDIO **

Number of channels: 4 I/O
 Type: Balanced, line level
 Impedance I/O: >10 Kohm / 30 ohm
 Maximum input level: 24 dBu
 Quantization: 24 bits, 12.8x (oversampled)
 Sample rate: 48 KS/s
 Frequency response: ± 0.1 dB, 20 Hz to 20 kHz
 Signal to noise ratio: <-95 dB (A-weighted)
 THD+N: 20 Hz - 20 kHz, ≤ 0.02 %
 Interface: DB25 (AES standard pinout)

DATA AUXILIARY

RS-422/485: 0 to 1 Mbaud
 RS-232: 0 to 150 Mbaud
 Number of channels: 2-6 **
 Sample: 80 ns
 GPI contacts: NO, form 1 SPST

ELECTRO-OPTICAL

Operating wavelengths: 1300 nm standard
 1550 nm, CWDM wavelengths available
 TX laser output power (std./opt): 6/0 dBm
 RX sensitivity, HD-SDI: -22 dBm
 Fiber compatibility: Single-mode

DISTANCE LIMIT * SEE NOTE BELOW

TAC Cable (local power at camera): Standard laser: 15 db optical loss (~30 km *)
 Optional DFB laser: 19 db optical loss (~38 km *)

SMPTE 311M hybrid fiber: ~240 m (787 ft), 95 W at 12 VDC *

Optical connector options: Local power: LC, ST, MX, OpticalCON
 Remote power: SMPTE 304M or OpticalCON

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): Rack mounted units (w/ears): 19 x 1.75 x 8 in
 Mini-Mussel low profile: 5.25 x 2.75 x 12.75 in
 Mini-Mussel high profile: 5.25 x 4 x 12.75 in
 Throwdown low profile: 4.5 x 1.75 x 9.75 in
 Throwdown, high profile: 4.5 x 3 x 9.75 in

Weight
 Rack mounted unit, 12 VDC: Single 5 lb
 Dual 5.75 lb
 Triple 6.25 lb

Rack mounted unit - AC for SMPTE Power: 6.5 lb
 Mini-Mussel low profile: 2 lb
 Mini-Mussel high profile: 3.5 lb
 Throwdown low profile: 1.5 lb
 Throwdown, high profile: 3 lb

Humidity: 0 to 95 % RH, non-condensing
 Certifications: FCC Part 15, RoHS, LEED, CE
 Temperature range: Operating -25° to 55 °C

** Available signal paths vary by model

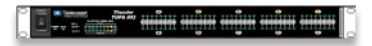
* The maximum cable length varies due to optical loss that can depend on cable quality, dirt/dust/contamination on connectors, and number of fiber interconnects. When using hybrid cable for power, the size of the hybrid cable, as well as the power draw of the camera, lens, and pan/tilt head are also factors.

ORDERING INFORMATION

See Miranda web site for detailed ordering information

Thunder

80-channel audio/data/intercom link



DESCRIPTION

Thunder is the newest generation high-volume audio/data/intercom transport link from Miranda fiber systems Thunder transports up to 80 audio, intercom, or data paths, configurable in 8-path groups (10 groups), all on one or two strands of fiber, at the lowest price and most compact size ever available.

Simply equip the compact 1RU Tupa frame with the appropriate ThunderBolt I/O cards to create a fiber optic audio/intercom/data link that can solve virtually any audio/intercom/data connectivity situation in the teleproduction environment.

You buy only the components that you need. Individual analog and AES TX and RX cards and breakout panels can be combined with data and intercom devices to create an audio system that is perfectly suited to your particular application.

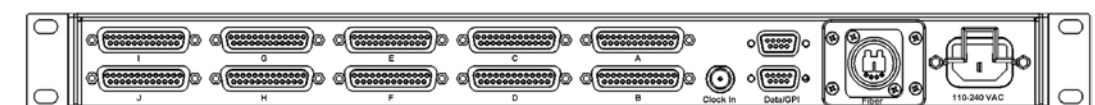
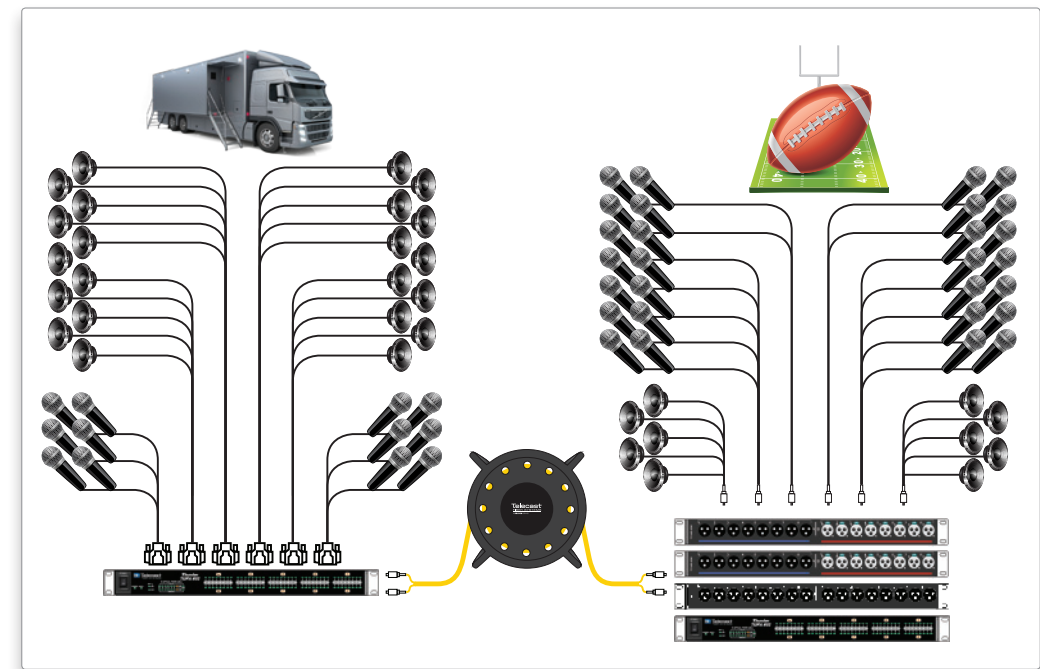
Whether you need 40 x 40 analog paths or 32 analog audios converted directly to 16 AES signals in just one direction, including data, with or without intercoms, Thunder gives you maximum flexibility and convenience.

Up to ten internal ThunderBolt I/O cards can be installed in Tupa frame, each of which can carry:

- 8 channels of analog audio IN or OUT
- 4 pairs of AES audio IN or OUT
- 4 bi-directional serial data (RS-232/422/485)
- 8 bi-directional GPI I/Os

KEY FEATURES AND BENEFITS

- > 40 km range (20 dB link budget) on one or two single-mode fiber strands
- > Excellent audio quality
- > 1RU master carries two channels of data (RS-232/422/485) plus 1 bi-directional GPI
- > Optional redundant fiber IN and OUT
- > Up to 80 audio or data paths, configurable in 8-path groups (10 groups)
- > 1RU Tupa master plus 1RU and 1.5RU breakout panels
- > Integral optical power monitoring for local and remote signal strength
- > Clock input for AES synchronization
- > 8 or 16 channels per breakout panel
- > Breakout panels can be mounted in front or behind master via DB25 cables (8 channels each)



Thunder rear view

Visit www.miranda.com for complete technical specifications and ordering information

CommLink™

Model TR6442i fiber optic intercom link



DESCRIPTION

The CommLink™ is a fiber optic transceiver system that carries two intercom channels seamlessly over a single strand of fiber spanning distances of more than 30 kilometers. With advanced digital noise elimination circuitry, users won't know that they aren't connected by traditional copper wires.

The system works with the industry's most common 2-Wire partyline intercom systems, as well as most digital matrix-style 4-Wire intercom systems. All functionality of each intercom system is transported over the fiber link, including

call signalling, matrix panel alphanumeric data, and remote station controls. With its advanced auto-nulling hybrid technology, the system acts as a noiseless hybrid between a 4-Wire matrix system and a 2-Wire partyline system.

The CommLink™ unit can be powered from the partyline system, or the CommLink™ unit can be powered with local 12 VDC and acts as a power supply for up to ten intercom belt packs.

KEY FEATURES AND BENEFITS

- Transports two intercom channels via one strand of single-mode fiber up to 30 km
 - Infrastructure fiber
 - TAC Cable
- Compatible with most partyline and digital matrix intercom systems
 - 2-Wire partyline: Clear-Com®, RTS 2-Wire
- Matrix
 - Clear-Com® MatrixPlus/Eclipse
 - RTS 2-Wire Adam/Cronus/Zeus
- Advanced automatic digital nulling
- Internal power supply can provide power for up to 10 Clear-Com® or RTS 2-Wire beltpacks
- Advanced hybrid interfaces two 2-Wire intercom lines to two 4-Wire lines
- Uses a single common ST connector
- Immune to RF interference and ground loops
- Front panel status monitoring
- Available in three mechanical configurations
 - Rack mountable in Viper™ II frame
 - Viper™ II throwdown
 - Mini-Mussel enclosure for harsh environment
- Acts as a standalone (non-fiber) dual-channel digital hybrid interface
- Made in U.S.A

TECHNICAL SPECIFICATIONS

INTERCOM	4-WIRE (4W) PORTS	ELECTRO-OPTICAL	MECHANICAL/ENVIRONMENTAL
Number of intercom channels: 2	Interface: Clear-Com® MatrixPlus/Eclipse: RJ45 x 2 RTS Adam/Cronus/Zeus: RJ11 x 2	Operating wavelength, standard: 1310/1550 nm (wave division multiplexed)	Dimensions (W x H x D): Rack mount: 2 x 5 x 10 in Throwdown: 2 x 4 x 10 in Mini-Mussel without feet: 4 x 2 x 10 in
2-WIRE (TW/PL)	Maximum level (I/O, unity gain): +18 dBu Dynamic range: >85 dB, ref. 18 dBu Frequency response: 1/-3 dB, 35 Hz - 22 kHz, ref. 0 dBu THD+N: <0.05 % at 17 dBu at 1 kHz Input impedance: 10 kohm balanced Output impedance: 30 ohm balanced Data: Clear-Com®: RS-422, RTS: RS-485 Crosstalk: >85 dB	Nominal optical loss budget values: TX laser output power: -7 dBm RX sensitivity, HD-SDI: -22 dBm Optical budget: 15 dB optical loss Fiber compatibility: Single-mode Optical connector: ST	Weight: Rack mount/throwdown: 1.375 lb Mini-Mussel: 2.8 lb Power consumption: 2 W with local power: 3 W at 10-18 VDC Powered from 2 W system: 6 W at 10-18 VDC 4 W system: 3 W at 10-18 VDC Temperature range: 25° to 55 °C Humidity range: 0 to 95 % RH, non-condensing
Interface: Clear-Com® PL: XLR3M x 2 RTS TW: XLR3M x 1 Max level: 2 Vp-p, at 1 kHz (equiv. to 18 dBu in 4 W) ** Dyn. range: >85 dB, ref. 2 Vp-p at 1 kHz ** Freq. response: 1/-3 dB, 70 Hz to 22 kHz, ref. 2 Vp-p ** THD+N: <1 % at 2 Vp-p ** I/O impedance (100 Hz to 20 kHz): Termination engaged (internal power): 220 ohm ±10 % Termination dis-engaged (external power): ≥10 kohm Nulling: Automatic DSP			COMPLIANCE Laser safety: Class 1 laser 21 CFR 1040.10 EMI/RFI: IEC/EN 60825-1 Certifications: RoHS ** Properly terminated (internal or external) * Maximum cable length varies due to optical cable quality, dirt/dust/contamination on connectors, and the number of inline connectors.

ORDERING INFORMATION

Each CommLink system requires a 1310 nm unit at one end and a 1550 nm unit at the other end

MINI-MUSSEL THROWDOWN	
MTR6442i-MML-13	Intercom transceiver and 4W/2W hybrid (w/autonull), RTS and C-C, Mini-Mussel, 1 SM fiber: int WDM at 1310 nm, ST conn. Reqs (M)TR64421-15
MTR6442i-MML-15	Intercom transceiver and 4W/2W hybrid (w/autonull), RTS and C-C, Mini-Mussel, 1 SM fiber: int WDM at 1550 nm, ST conn. Reqs (M)TR64421-13
ADAP-AC-04	AC Power Adapter for MML units; 120/240 VAC in; 4-pin XLR; 4A; 15 VDC not shown
VIPER II RACKMOUNT MODULE	
TR6442i-13	Intercom transceiver and 4W/2W hybrid (w/autonull), RTS and C-C, V2 rackmount, 1 SM fiber: int WDM at 1310 nm, ST conn. Reqs (M)TR64421-15
TR6442i-15	Intercom transceiver and 4W/2W hybrid (w/autonull), RTS and C-C, V2 rackmount, 1 SM fiber: int WDM at 1550 nm, ST conn. Reqs (M)TR64421-13

VIPER II THROWDOWN MODULE	
MTR6442i-13	Intercom transceiver and 4W/2W hybrid (w/autonull), RTS and C-C, throwdown, 1 SM fiber: int WDM at 1310 nm, ST conn. Reqs (M)TR64421-15
MTR6442i-15	Intercom transceiver and 4W/2W hybrid (w/autonull), RTS and C-C, throwdown, 1 SM fiber: int WDM at 1550 nm, ST conn. Reqs (M)TR64421-13
ADAP-AC-04LC	AC Power Adapter for ViperII units; 120/240 VAC in; 2.5 mm circ; 4 A; 15 VDC not shown

Python 3G

Multichannel fiber optic HD-SDI transport system with CWDM multiplexing



DESCRIPTION

The Python 3G is your answer to lowering the cost of digital video distribution, simplifying your cable plant and eliminating all concerns about distance, interference and grounding.

The Python 3G converts up to 2 groups of 8-channels of HD-SDI to fiber optic transport, all in a compact 1RU frame. Select a transmitter and a receiver frame for eight or sixteen channels, for example, in one direction. Select two transceiver frames for eight channels in each direction.

In addition, Python 3G uses CWDM optical multiplexing options to carry up to 16 HD signals on a single optical fiber.

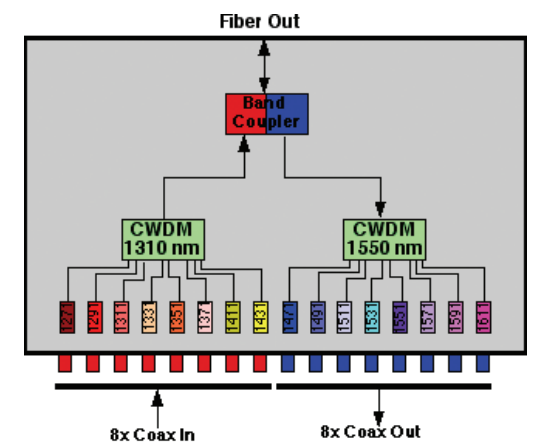
The Python 3G offers the industry's broadest range of digital transmission rates while maintaining the quality that broadcasters demand. It supports numerous interface standards, including applicable SMPTE, ATSC, and DVB recommendations.

No matter what your format, from 19.4 Mbps to 3 Gbps, the Python 3G allows you to implement it.

- 143 Mbps NTSC composite
- 177 Mbps PAL composite
- 270 Mbps serial component
- DVB/ASI
- 360 Mbps serial component and compressed HDTV
- 540 Mbps proprietary

KEY FEATURES AND BENEFITS

- Economical, low profile packaging
- 4 to 16 channels per 1RU
- Wide range of digital formats
- 19.4 Mbps to 3 Gbps transport
- Compatible with digital TV standards SMPTE 292M, 259M and 424M
- Handles DVB/ASI signals
- Immune to pathological data errors
- Equalizes coax up to 3 Gbps
- BNC I/O
- Wide optical budget
- Low system jitter
- Low power consumption
- High reliability, durable design
- CWDM multiplexing options
- Compatible with other Telecast Series HD/SD-SDI transport systems



TECHNICAL SPECIFICATIONS

VIDEO	ELECTRO-OPTICAL	MECHANICAL/ENVIRONMENTAL	COMPLIANCE
Transmission method: Digital Input level: 800 mV p-p I/O impedance: 75 ohm Return loss: >15 dB, 5 MHz - 1.5 GHz >10dB, 1.5GHz-3GHz Coaxial Input equalization: Maximum rate: 3 Gbps Equalization at 3 Gbps: 120 m of Belden 1694A Bit-error rate at -22 dBm Rx optical power: 10 ⁻¹² Jitter (using pathological data pattern): <0.2 UI	Operating wavelength: 1310 nm or 1550 nm, optional CWDM available Link margin: Up to 22 dB Transmitter output power options: -7 dBm Receiver sensitivity: -20 dBm Optical source: Laser diode Optical detector: PIN Fiber type: Single-mode	Dimensions (W x H x D): 10.5 x 1.75 x 16.7 in Weight, each end: 5 lb Connectors: Electrical: BNC Optical: ST Input voltage: 12-24 VDC Power consumption: <15 W Indicators: Power On, SDI data presence, optical power Temperature range: -20 to 55 °C Humidity range: 0 to 95 % non-condensing	Laser safety: Class 1 laser 21 CFR 1040.10 EMI/RFI: Complies with IEC/EN 60825-1 Certifications: RoHS

ORDERING INFORMATION

INTEGRATED CWDM MODELS	
PY3-GH-W8	8 channel transmitter, 1 fiber
PY3-RR-W8	8 channel receiver, 1 fiber
PY3-GHJK-W16	16 channel transmitter, 1 fiber
PY3-RRRR-W16	16 channel receiver, 1 fiber
PY3-GHRR-W8W8	8 channels each way, 2 fibers

BUNDLED SYSTEMS	
PY3-GHRR-W16	(used together with) 8 channels each way, 1 fiber
PY3-JKRR-W16	8 channels each way, 1 fiber
The above two units are used together to create a single transport system	

POWER SUPPLY (REQUIRED FOR ALL UNITS)	
ADAP-AC-04	120/240 V to 15 VDC, 4 A, 4-pin XLRF

Rattler™ 4

Ultra-miniature single link, dual link, and bi-directional fiber optic media converters



DESCRIPTION

The latest Rattler innovations

The Telecast Series' unique Rattler 4 miniature fiber optic serial digital video transmission modules offer the industry's broadest range of digital rates while maintaining the signal quality that broadcasters demand. No matter what your format, the Rattler 4 systems allow you to transmit one or two streams of:

- 3 Gbps SMPTE 424M HD-SDI
- 1.5 Gbps SMPTE 292M HD-SDI
- 19.4 Mbps SMPTE 310M
- 143 to 540 Mbps SMPTE 259M/344M
- DVB/ASI 270 Mbps
- AES and MAD1 audio
- plus non-standard digital signals to 3 Gbps

Singles, doubles and bi-directionals

At just three inches in length, these tiny modules can be deployed almost anywhere. They are available as single transmitters and receivers, dual transmitters (TX) and receivers (RX), and bi-directional transceivers (TR). Each Rattler 4 TX accepts one or two 75 ohm coaxial inputs and converts it into an optical stream via standard ST connectors. The RX units reconvert the uncompressed signal back to BNC outputs.

Ensure pristine trouble-free signals

The TX modules include equalization for long lengths of coaxial cable, so you can use them at nearly any point in your HD-SDI chain. The RX modules automatically reclock the incoming SMPTE standard signals at 270 Mbps, 1.5 Gbps, and 3 Gbps.

KEY FEATURES AND BENEFITS

- | | | | |
|---|--|---|--|
| <ul style="list-style-type: none"> ➤ Portable, lightweight devices ➤ Five models: <ul style="list-style-type: none"> - Single Tx - Single Rx - Dual Tx - Dual Rx - Bi-directional transceiver | <ul style="list-style-type: none"> ➤ 19.4 Mbps to 3 Gbps ➤ Compatible with SMPTE 310M, 292M, 259M, 297M, 424M ➤ Standard formats internally reclocked: 270 Mbps, 1.5 Gbps and 3 Gbps ➤ 16 CWDM wavelengths ➤ Up to 50 km distance | <ul style="list-style-type: none"> ➤ Cool, efficient, reliable ➤ Quick, easy installation ➤ LED indicators show you: <ul style="list-style-type: none"> - Power ON - HD-SDI data presence - Rx optical power levels ➤ Supports embedded audio | <ul style="list-style-type: none"> ➤ Power from 5-16 VDC ➤ Durable, reliable and serviceable ➤ Very low system Jitter ➤ >10 dB return loss at 3 GHz |
|---|--|---|--|

Universal inter-operability

Rattler 4 modules are inter-operable with industry standard optical HD-SDI signals to/from other Miranda equipment such as routers, DAs and fiber converters from the Densité Series, NVISION routers, picoLink converters and the Telecast Series Python, Viper I and Viper II products. They make it easy to expand the systems that you already have and create a wide variety of network topologies.

Intuitive displays with built-in metering

Each Rattler 4 unit includes LED indicators to display Power ON, HD-SDI signal presence and on the RX, received optical power level. This provides critical system diagnostic information without the need for additional test equipment, such as an optical power meter.

Calling all frequencies

The Rattler 4 transmitters are available in standard 1310 nm and 1550 nm wavelengths, as well as in all 16 CWDM wavelengths, so the possible combinations are astounding.

Secure power

The Rattlers use their own wall-wart power supplies or accept any DC voltage from 5 to 16 volts via a mini-XLR4 jack.



TECHNICAL SPECIFICATIONS

VIDEO

Transmission method: Digital
 Input level: 800 mV p-p
 Input impedance: 75 ohm
 Coax equalization at 2.97 Gbps: 100 m
 Output impedance: 75 ohm
 Bit-error rate at -22 dBm: 10⁻¹¹
 Jitter (pathological data pattern): <0.2 UI
 Rise/fall times: <120 ps

TRANSMISSION

Operating wavelength: 1310, 1550, or 1270-1610 nm (CWDM)
 Coaxial video connector I/O: BNC
 Optical connector: ST
 Optical source: Laser diode (FP or CWDM DFB)
 Optical detector: PIN-TIA diode
 Transmitter output: -7 to +3 dBm
 Receiver sensitivity: -22 dBm
 Link margin/distance: 15-25 dB / 20-50 km
 Fiber type: Single-mode or multi-mode *

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D):
 Singles: 0.75 x 0.75 x 3.2 in
 Doubles: 0.75 x 1.5 x 3.2 in
 Weight, each end: 3 oz
 Input voltage: 5-16 VDC
 Power connector: plug replaceable, mini XLR
 Power consumption (typ.): 600 mW
 Indicators: Power, signal, link, optical power
 Temperature range, operating: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

COMPLIANCE

Laser safety: Class 1 laser
 EMI/RFI: Complies with IEC/EN 60825-1
 Certifications: RoHS

* Check for availability

ORDERING INFORMATION

SINGLE TRANSMITTERS AND RECEIVERS

RAT4-EO-A-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; 1310 nm, -7 dBm; EQ and reclocking; mini-XLR locking cord
 RAT4-OE-A-MXLR Rattler 4, optical (ST, -22 dBm) in to electrical (BNC) OUT; mini-XLR locking cord
 RAT4-KIT1-T-MXLR Rattler 4 kit, 1310 nm, Mini USB power in Pelican case: TX-RAT4-EO-A-UAF, RX: RAT4-OE-A-UAF, 2x GRPS-01-MXLR

DUAL TRANSMITTERS AND RECEIVERS

RAT4-EOEO-A-MXLR Rattler 4, dual electrical (BNC) in to optical (ST) OUT; 1310 nm, -7 dBm; EQ and reclocking; mini-XLR locking cord
 RAT4-EOEO-A-MXLR Rattler 4, dual optical (ST, -22 dBm) in to electrical (BNC) OUT; mini-XLR locking cord
 RAT4-KIT2-TT-MXLR Rattler 4 kit, 1310 nm, Mini USB power in Pelican case: Dual TX: RAT4-EOEO-A-UAF, Dual RX: RAT4-EOEO-A-UAF, 2x GRPS-01-MXLR

CWDM TRANSMITTERS

RAT4-EO-1271-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1271 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1291-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1291 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1311-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1311 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1331-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1331 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1351-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1351 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1371-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1371 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1391-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1391 nm; EQ and reclocking; mini-XLR locking cord (water peak)
 RAT4-EO-1411-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1411 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1431-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1431 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1451-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1451 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1471-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1471 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1491-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1491 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1511-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1511 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1531-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1531 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1551-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1551 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1571-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1571 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1591-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1591 nm; EQ and reclocking; mini-XLR locking cord
 RAT4-EO-1611-MXLR Rattler 4, electrical (BNC) in to optical (ST) OUT; CWDM laser, 0 dBm OUT, 1611 nm; EQ and reclocking; mini-XLR locking cord

BI-DIRECTIONAL TRANSCEIVERS

RAT4-EOEO-A-MXLR Rattler 4, transceiver. TX: electrical (BNC) in to optical (ST) OUT; 1310 nm, -7 dBm; EQ and reclocking; RX: optical (ST, -22 dBm) in to electrical (BNC) OUT. Reclocking; mini-XLR locking cord
 RAT4-KIT3-TR-MXLR Rattler 4 kit, bi-directional link, 1310 nm: 2x TR: RAT4-EOEO-A-UAF, 2x GRPS-01-MXLR in Pelican case

ACCESSORIES

GRPS-01-MXLR Rattler AC adaptor, mini-XLR locking cord
 10000-068 Mini Pelican travel cases for Rattler kits

TelePort™ 3G

Multichannel CWDM management system



DESCRIPTION

Reduce your cabling requirements by using fiber optic Coarse Wavelength Division Multiplexing (CWDM), in an easy-to-use, powerful wavelength-managing repeater.

Simplify multiplexing

The TelePort™ 3G multiplies the effectiveness of your fiber optic cables and solves your high bandwidth signal transport needs. The results are lower cable costs and simpler management of your broadcast facilities.

Coarse wavelength division multiplexing (CWDM) has become the preferred approach to optical multiplexing in digital video/audio communications because of its reliability and cost advantages. Designing systems around CWDM, however, can be a complex task. The TelePort™ 3G makes CWDM easy, flexible and economical.

Eliminate the spares hassle

The TelePort™ 3G accepts the optical output of virtually any digital transmitter, such as our Viper™, Thunder, Cobra™ 2DT, etc., and converts the signal into a specific CWDM wavelength. At the other end, a CWDM demultiplexer directs the signal to your standard receiver. There is no need to purchase customized wavelengths for each system, or to buy spares for each wavelength. The TelePort™ 3G handles it all easily and seamlessly.

KEY FEATURES AND BENEFITS

- Turns any optical signal into CWDM
- Multiplex up to 16 digital laser signals on 1 fiber
- Up to 3 Gbps on each channel
- Re-amplifies up to additional 25 km
- Re-amplifies up to 50 km with APD option
- Standard 1300 nm or 1550 nm inputs
- Available dual or single CWDM single fiber outputs
- Front panel monitoring of all I/O
- Redundant power supplies
- Fast plug and play operation



TECHNICAL SPECIFICATIONS

TRANSMITTER INPUTS

Interface: Digital optical
 Input wavelength range: 1250 to 1650 nm
 Input optical power range: -2 to -22 dBm
 Input optical connector: ST
 Maximum data rate, per channel: 3 Gbps

TRANSMITTER OUTPUT

Interface: Digital optical, CWDM
 Output wavelengths: 1300 nm range standard: 1271, 1291, 1311, 1331, 1351, 1371, 1411 and 1431 nm
 1500 nm range optional: 1471, 1491, 1511, 1531, 1551, 1571, 1591 and 1611 nm
 Output power, per channel, typical: -3 dBm (±3 dBm)

RECEIVER CWDM

Input wavelengths: 1300 nm range standard: 1271, 1291, 1311, 1331, 1351, 1371, 1411 and 1431 nm
 1500 nm range optional: 1471, 1491, 1511, 1531, 1551, 1571, 1591 and 1611 nm

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): 8 x 1.75 x 17.5 in
 Weight, each end: 5 lb
 Optical connectors: ST
 Input voltage: 12-24 VDC
 Power consumption: <25 W
 Indicators: Power ON, signal presence, optical power
 Temperature range: -20° to 55 °C
 Humidity range: 0 to 95 % non-condensing

COMPLIANCE

Laser safety: Class 1 laser
 EMI/RFI: Complies with IEC/EN 60825-1
 Certifications: RoHS

ORDERING INFORMATION

Order TelePort™ 3G as one-way or bi-directional systems. Bi-directional systems are identical on either end.

TP3-MNPP-W16 8 channel each way, 1 fiber, use with TP3-QUPP-W16
 TP3-QUPP-W16 8 channel each way, 1 fiber, use with TP3-MNPP-W16
 TP3-MNPP-W8W8 8 x 8 channel, 2 fibers, use in pairs

POWER SUPPLY (REQUIRED FOR ALL UNITS)

ADAP-AC-04 120/240 V to 15 VDC, 4 A, 4-pin XLRP

TeleThon™ 3G

Multichannel wavelength manager and HD-SDI transport



DESCRIPTION

The TeleThon™ 3G is the single optical and electrical multiplexer that simplifies all your cabling needs. It accepts electrical digital signals (via BNC), ranging from 19.4 Mbps up to 3 Gbps uncompressed HD-SDI and optical signals of up to 3 Gbps each, and multiplexes them for transmission in either or both directions. Up to 16 optical signals can be accommodated on one fiber, significantly increasing fiber capacity. The CWDM (coarse wavelength division multiplexing) capability of the TeleThon™ 3G system simplifies and multiplies the effectiveness of fiber optic cables, reducing operator costs and improving overall signal transmission capacity.

Huge savings

The TeleThon™ 3G is our latest tool to reduce the cost and complexity of moving large numbers of wideband signals through fixed or mobile infrastructures. With each fiber strand capable of moving up to 48 Gbps of data, fewer fibers are used, resulting in less expensive cable and connector costs, and lower overall life cycle costs for broadcasters.

The new TeleThon™ 3G system is a compact 1RU unit ideal for HD studio infrastructures, sports and field production, HDTV distribution on corporate and educational campus, and other facilities requiring reliable, efficient delivery of HD and other signals.

New life to old gear

The true value of the TeleThon™ 3G system comes from its ability to accept an optical signal and re-transmit it on a CWDM wavelength. By doing this, your optical signal is being amplified and repeated. The TeleThon™ 3G gives you a fresh optical budget and extends the usable life of older single wavelength fiber products. Now all of your existing fiber products are CWDM ready.

Simplify complex configurations

Since the TeleThon™ 3G accepts the optical output of virtually any digital transmitter and turns it into a specific CWDM wavelength, there is no need for “wavelength specific” devices in your system. This represents a huge savings not only in the costs of the spares but in the overall complexity of managing the individual wavelengths.

When you add the power and convenience of the TelePort™ 3G to the high density signal transport of the Python 3G, you end up with an ideal solution for handling your ever changing production requirements. Whether you need it in the studio or out on your mobile unit, the TeleThon™ 3G will fit seamlessly into your existing fiber inventory and dramatically increase your signal transport capabilities.

KEY FEATURES AND BENEFITS

TelePort™ 3G side

- Turns any single wavelength optical signal into CWDM
- Mux up to 8 optical signals on one fiber
- Up to 3 Gbps on each optical channel
- Optically repeats signals - extending range

Python 3G side

- Up to 8 channels per 1RU
- Wide range of digital formats
- 19.4 Mbps to 3 Gbps transport
- Compatible with digital TV standards SMPTE 292M, 259M and 424M
- Handles DVB/ASI signals
- Immune to pathological data errors
- Equalizes coax up to 3 Gbps

System

- Economical, low profile packaging
- Front panel monitoring of optics and signals
- Redundant power inputs
- Option for optical redundancy
- Wide optical budget
- Low system Jitter
- Low power consumption
- High reliability, durable design

TECHNICAL SPECIFICATIONS

VIDEO

Transmission method: Digital
 Input level: 800 mV p-p
 I/O impedance: 75 ohm
 Return loss: >15 db, 5 MHz to 1.5 GHz
 >10 dB, 1.5 GHz to 3 GHz
 Coaxial input equalization: Maximum rate 3 Gbps
 Equalization at 3 Gbps 300 m of Belden 1694A
 Bit-error rate at -22 dBm Rx optical power: 10⁻¹²
 Jitter (120 m 3 Gbps): <0.2 UI

ELECTRO-OPTICAL

Operating wavelength: 1310 nm or 1550 nm optical window
 Link margin: Up to 22 dB
 Transmitter output power options: 0 dBm
 Receiver sensitivity: -22 dBm / -20 at 3 Gbps
 Optical source: Laser diode
 Optical detector: PIN
 Fiber type: Single-mode

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): 17.5 x 1.75 x 7.5 in
 Weight, each end: 5 lb
 Connectors: Electrical: BNC
 Optical: ST
 Input voltage: 12-24 VDC
 Power consumption: <15 W
 Indicators: Power ON, SDI data presence, optical power
 Temperature range: -20° to 55 °C
 Humidity range: 0 to 95 % non-condensing

COMPLIANCE

Laser safety: Class 1 laser
 EMI/RFI: Complies with IEC/EN 60825-1
 Certifications: RoHS

ORDERING INFORMATION

TN3-GRNP-W8-W8 4 x 4 HD + 4 x 4 optical, 2 fibers
 ADAP-AC-04 12 V power supply, XLR-4F connector

Terrapin FTR-D6

3 Gbps fiber transceiver with integral distribution amplifier

DESCRIPTION

The Terrapin FTR-D6 combines the features of a fiber optic digital video transmitter, receiver, and a 6-output digital video distribution amplifier, providing unprecedented flexibility for any application where video must be simultaneously transmitted, received and viewed.

The compact transceiver transparently handles the entire range of digital video rates while maintaining the signal quality that broadcasters demand. No matter what the format, the Terrapin FTR-D6 allows you to transport and view:

- 3 Gbps HD-SDI SMPTE 424M (reclocked)
- 1.5 Gbps HD-SDI SMPTE 292M (reclocked)
- 540 Mbps SMPTE 344M
- 270 Mbps DVB/ASI (reclocked)
- 143 Mbps SMPTE 259M
- 19.4 Mbps ATSC: SMPTE 310M
- AES and MAD1 audio
- Non-standard digital signals to 3 Gbps



KEY FEATURES AND BENEFITS

- Fiber optic transmitter and receiver (transceiver)
- Integral 6-output digital distribution amplifier
- 4 user-selectable optical/electrical modes
- Intuitive LED indications and signal flow arrows
- Easy-to-read optical power meter for instant troubleshooting
- Mode setting stored in non-volatile memory
- Error-free pathological
- Standard formats internally reclocked: 270 Mbps, 1.5 Gbps and 3 Gbps
- Modular, flexible design
- Very low system jitter
- >10 dB Return Loss at 3 GHz
- 19.4 Mbps to 3 Gbps
- Compatible with SMPTE 310M, 292M, 259M, 297M, 424M
- Up to 50 km distance
- Cool, efficient, reliable
- Intuitive LED indicators show
 - Power
 - HD-SDI data presence
 - Signal paths
 - RX optical power levels
- Supports embedded audio
- Durable, reliable, serviceable

TECHNICAL SPECIFICATIONS

TRANSMISSION	VIDEO	MECHANICAL/ENVIRONMENTAL
Operating wavelength: 1310, or 1270-1610 (CWDM)	Transmission method: Digital	Dimensions (W x H x D): 6.2 x 1.7 x 5.9 in
Coaxial video connectors I/O: BNC	Input level: 800 mV p-p	Weight, each end: 14.4 oz
Optical connectors (2): ST	Input impedance: 75 ohm	Input voltage: 9-18 VDC
Optical source laser diode: FP or CWDM DFB	Coax equalization: At 2.97 Gbps 100 m	Power connector plug: 2.5 mm circular (locking)
Optical detector: PIN-TIA diode	Output impedance: 75 ohm (x6)	Power consumption (typ.): 4.4 W
Optical output power: -7 dBm	Bit-error rate: -20 dBm at 3 Gbps	Indicators: Power, signal, link, optical power
Receiver sensitivity: -20 dBm at 3 Gbps	Jitter (pathological data pattern): <0.2 UI	Temperature range: Operating -25° to 55 °C
Link margin/distance: 13 dB min	Rise/fall times: <120 ps at 3 Gbps	Humidity range: 0 to 95 % RH, non-condensing
Fiber type: Single-mode		Certifications: FCC Part 15, RoHS, LEED, CE

ORDERING INFORMATION

TRPN-FTR-D6-S2-13 Terrapin model FTR-D6 fiber optic transceiver with 6-output D.A., 2 ST connectors, 1310 nm *
 ADAP-AC-01LC 120 VAC to 12 VDC adaptor, circular locking connector (US)

* Available in WDM or CWDM wavelengths, contact dealer or Miranda for more info

Viper™ I

Portable fiber optic broadcast production systems

DESCRIPTION

The Viper™ I family, including our reel mounted Sidewinder™ system, handles all your signals on one lightweight fiber cable. Both systems are modular and provide two-way video (NTSC/PAL or HD-SDI), audio, intercom and data transport.

These flexible, interoperable systems let you create your own configuration of Mussel Shell, rack mounted "442" or reel mounted modular units. Use with our TAC Cable battlefield proven cables and connectors.

KEY FEATURES AND BENEFITS

- Multichannel video and audio
- HD-SDI and/or NTSC/PAL video
- Mic/line analog and/or AES audio
- RTS 2-Wire, Clear-Com® or 4-Wire intercom
- RS-232/422 and CCU data + GPI paths
- Ethernet 10/100 or Gigabit for VoIP and laptop connections (Viper™ only)
- Reel, Mussel Shell and 442 rack mount
- Multi-mode or single-mode fiber
- Convenient plug-in modules
- Battery or AC operated
- Anton/Bauer Snap-On® option
- Alarmed UPS protection
- Extra-low power consumption
- Wide temperature range
- Military tactical cable and connectors

TECHNICAL SPECIFICATIONS

VIDEO TX/RX103 MODULE SET (NTSC/PAL)

Interface: RS-170, NTSC, PAL
 I/O impedance (differential input, isolated from ground): 75 ohm
 Level, blanking level clamped to 0 V: 1 Vp-p
 Freq. response: (30 Hz to 5.0 MHz): ±0.15 dB (-3 dB point, min.): 9 MHz
 Signal to noise (weighted) min/typ: 68/71 dB
 Differential gain: <2 %
 Differential phase: <1°
 Luminance nonlinearity: <2 %
 Chrominance-luminance intermodulation distortion: <1 %
 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 and sync: <1 %

VIDEO Tx/Rx259 MODULE SET

For 270 Mbps SDI Video, conforms to SMPTE-259M specifications, see Tx/Rx259 datasheet

VIDEO Tx/Rx292 MODULE SET

For SDI and up to 1.5 Gbps HD-SDI video, conforms to SMPTE-292M specifications, see Tx/Rx292 datasheet

AUDIO TX/RX280 AND TX/RX380 MODULE SETS

Digital transmission: 18-bit
 Sampling rate (samples/s): 48 KS/s
 Input impedance (balanced): 5 kohm and 600 ohm
 Output impedance (balanced): 30 ohm
 Input levels: (max, low Z) dBm: -22, 8 and 18 (max, high Z) dBV: -24, 6 and 16
 Output level, line, max: 18 dBm standard, 24 dBm optional
 Frequency response at 8 dBm, 20 Hz to 22 kHz: ±0.2 dB
 Total harmonic distortion + noise: 20 Hz to 20 kHz at 8 dBm: <0.05 %
 1 kHz at 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)

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: RS-422, RS-232, or Sony CCU (e.g., RM-M7, RM-P3)

Transmission rate: 0 to 150 kbps
 Contact closure: Normally high TTL level
 Port Input: 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: 1310 NM
 Transmitter (Tx) output into cable (dBm)
 TX103, TX280: -14 (-10 W / CWDM)
 TX259: -8 (0 W / CWDM)
 TX292: -7.5 (0 W / CWDM)
 Receiver (Rx) sensitivity (dBm)
 RX103, RX259: -25
 RX292: -22
 RX280: -30

OPERATING WAVELENGTH: 1550 NM
 Transmitter (Tx) output into cable (dBm)
 TX103, TX280: -12
 TX259: -8 (0 with CWDM)
 TX292: 0 *

Receiver (Rx) sensitivity (dBm)
 RX103, RX259: -27
 RX292: -22 *
 RX280: -30
 * for HD-SDI over distance at 1550 nm, requires single-mode fiber and DFB/CWDM laser

MECHANICAL/ELECTRICAL/ENVIRONMENTAL

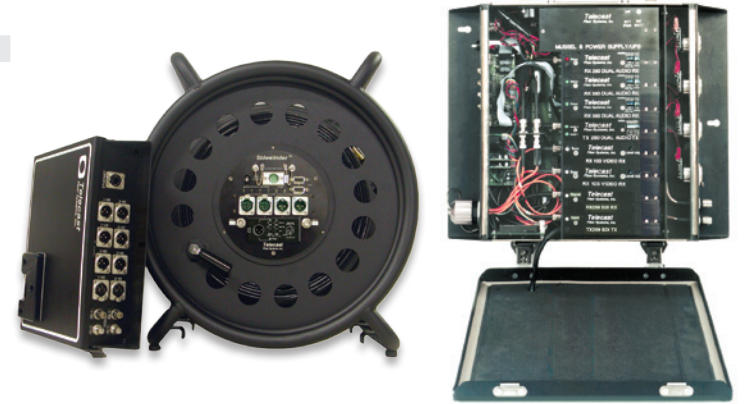
Reel (incl. Sidewinder):
 Dimensions (W x H x D): S: 12 x 12 x 12 in
 M: 15 x 16 x 13 in
 L: 18 x 21 x 14 in
 Weight, empty: S: 12 lb
 M: 15 lb
 L: 28 lb
 Mussel Shell: 8-module
 Dimensions (W x H x D): 14.5 x 14 x 3 in
 Weight (nominal, loaded): 10 lb

442 rack mount chassis:
 Dimensions, w/o mounting ears (W x H x D): 16.7 x 3.5 x 10.5 in
 Weight: 8 lb
 Power consumption, nominal (loaded with 4/8 modules): 10/20 W
 No. of video module slots available (Mussel/442/Sidewinder): 4/4/2

No. of dual audio module slots available (Mussel/442/Sidewinder): 4/4/2
 Video connectors (NTSC and HD-SDI): BNC
 Audio connectors (analog and AES): 3-pin XLR, male or female
 Intercom connectors (duplex, on intercom module): RTS module (one dual channel) one 3-pin XLR, male
 Clear-Com® module (2 channels) two 3-pin XLR, male
 4-Wire module (2 channels) two 5-pin XLR, male

Optical connectors/attachment: Inside Mussel Shell or Sidewinder reel hub - to modules: ST-type
 Cable Plug End: 4-pin military hermaphroditic plug (MX or Delphi)
 Mussel Shell: 4-pin military hermaphroditic receptacle (MX or Delphi)
 Rack mount 442 Enclosure (see MCRV breakout below): ST-type

Power connector: 4-pin XLR
 Battery mount (optional): PAG or 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



ORDERING INFORMATION

See www.miranda.com for complete details and ordering information

Viper™ II

Modular fiber optic platform for digital production



DESCRIPTION

The Viper™ II system is based on a 3RU modular frame that houses a variety of Viper™ II “plug and play” modular fiber optic transmitters, receivers and transceivers. Modules are available for transporting digital HD-SDI video, audio, and intercom communications over fiber.

Each frame has 16 slots that can be used to accommodate both single and double-slot modules and power supplies. Functionality modules can be hot-swapped at any time.

The frame ships ready-to-use. Simply insert a PS6000 Power Supply Unit into any available slots (auto-sensing for 110/220 VAC). The frame can accommodate additional Power Supplies for redundancy.

KEY FEATURES AND BENEFITS

- Universal 16-slot card cage
- Rack modules or standalone
- Multichannel video and audio
- Serial digital video, including
 - ITU-R 601 (270 Mbps)
 - SMPTE-292M HD
- Wideband NTSC/PAL video
- Studio quality, RS-250-C (SH)
- 24-bit digitally transmitted audio
- RS-232 and RS-422 data
- GPI closures, including tally/call
- Redundant power supplies
- Alarmed UPS protection
- Low power consumption
- Cool operation, no fans
- Wide temperature range

TECHNICAL SPECIFICATIONS

VIPER II FRAME

ELECTRICAL

Input voltage range: 100 to 240 VAC
 Output voltage range: 10 to 18 VDC
 Power consumption per module: 5 W
 Power consumption (max): 70 W (max)

ENVIRONMENTAL

Temperature range: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

MECHANICAL

Dimensions (W x H x D): 5.25 x 11 x 17.25 in
 Weight: Frame: 9 lb
 PS6000: 1.5 lb
 Capacity: 16 single card slots
 Max of 14 modules plus power supply

PS6000

ELECTRICAL

AC input: 100-240 VAC
 DC output: 12-18 VDC
 Output current: <11 A
 AUX VDC output: 12-18 VDC
 AUX VDC input: 12-18 VDC

ENVIRONMENTAL

Temperature range: -15° to 65 °C
 Humidity range: 0 to 95 % RH, non-condensing

MECHANICAL

Dimensions (W x H x D): 3.9 x 8.7 x 2 in
 Weight: 1.5 lb
 Certifications: FCC part 15, RoHS, LEED, CE

PS5000

ENVIRONMENTAL

Temperature range: -15° to 65 °C
 Humidity range: 0 to 95 % RH, non-condensing

MECHANICAL

Dimensions (W x H x D): 3.9 x 8.7 x 2 in
 Weight: 4.5 lb
 Certifications: FCC part 15 class A, CE

ORDERING INFORMATION

V2Frame-1	3RU Viper II frame, 16 slots, requires power supply
PS6000	Power supply, RoHS, standalone, 12 VDC input for backup
BP5001	One-wide filler panel
BP5002	Two-wide filler panel

Viper™ II 6080

8-channel audio multiplexer modules for the Viper™ II



DESCRIPTION

The Viper™ II 6080 fiber optic audio transmitter and receiver module set efficiently multiplexes and transmits 8 channels of your analog audio on one fiber, with a signal to noise level greater than 100 dB. The module set supports line level audio input and output, and provides more than 20 kHz of audio frequency response with extremely low distortion.

Eight line level audio inputs are digitized by the Tx6080, using 24-bit sampling, digitally multiplexed and transmitted via Telecast’s advanced laser technology. The Rx6080 faithfully reconverts these signals into the original analog audio channels.

Durable and flexible

The module set is available as standalone throwdown modules (MTX6080 and MRX6080), or as rack mount (Tx6080 and Rx6080) modules to fit our Viper™ II 16-slot frame.

KEY FEATURES AND BENEFITS

- Rack modules or standalone
- Broadcast quality audio
- S/N ratio > 100 dB
- 24 dBm maximum audio level
- 20 Hz to 20 kHz at full level
- Digitally transmitted, 24 bit
- AC coupled I/O
- Up to 30 dB optical link budget
- Durable construction
- Easy rack mount module conversion
- Battery backup option in Viper™ II frame
- Wide temperature range
- Low power consumption
- High reliability design
- WDM/CWDM multiplexing optional
- TelePort™ 3G / TeleThon™ 3G compatible

TECHNICAL SPECIFICATIONS

AUDIO

Transmission method: Digital, TDM
 Digital sampling: 48 kS/s at 24-bits
 Input impedance: 10 kohm
 Output impedance: <100 ohm
 Freq. response, at 24 dBm: ±0.2 dB, 20 Hz to 20 kHz
 Signal to noise ratio: >100 dB
 Total harmonic distortion: <0.02 %, 20 Hz to 10 kHz
 <0.1 %, 10 kHz to 22 kHz
 Intermod distortion (60 Hz + 3 kHz mixed 4:1): <0.04 %

ELECTRO-OPTICAL

Operating wavelength: Standard 1300 nm
 Transmitter output power: Standard -10 dBm
 Receiver sensitivity range: -4 to -30 dBm
 Optical source/detector type: Laser diode/PIN
 Fiber compatibility: Single-mode or multi-mode

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): 3.35 x 7.65 x 0.94 in
 Weight (per standalone module): 10 oz
 Audio connectors: DB25 female
 Optical connector: ST type
 Power req. (typ., per module): 3 W at 10 to 18 VDC
 Temperature range: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

ORDERING INFORMATION

(M)Tx6080-A	1300 nm laser output
(M)Rx6080	-4 to -30 dBm receiver
ADAP-AC-01LC	Viper™ II “Wall-wart” AC adapter for standalone “throwdown” modules

Note: The “M” in front of part number denotes “throwdown”

Viper™ II TX-RX6292

Single channel HD-SDI-SDI modules for the Viper™ II



DESCRIPTION

The Viper™ II Tx/Rx6292 fiber optic serial digital video module set offers the industry's broadest range of digital transmission rates while maintaining the quality of transmission that broadcasters demand. No matter what your format, the 6292 set allows you to implement:

- 19.4 Mbps ATSC
- 143 Mbps NTSC composite
- 177 Mbps PAL composite
- 270 Mbps serial component
- 360 Mbps serial component video and compressed HDTV
- 540 Mbps proprietary
- 1.2 and 1.5 Gbps HDTV
- DVB/ASI

And most any other digital signal including our Adder data paths.

Durable and flexible

The Viper™ II Tx/Rx6292 module set is available as standalone throwdown modules (MTX6292 and MRX6292), or as rack mount (Tx6292 and Rx6292) modules to fit our Viper™ II 16-slot frame.



KEY FEATURES AND BENEFITS

- Rack modules or standalone
- Up to 16 HD-SDI per fiber via TelePort™ 3G
- Compatible with TV standards
- SMPTE 292M, 259M and 244M
- 19.4 Mbps to 1.5 Gbps transport
- No pathological data problems
- 3 loop outputs on Tx, 4 outputs on Rx
- Front panel monitoring
- Up to 15 dB optical link budget for HD
- Equalized coax up to 1.5 Gbps
- DA option for 4 more outputs
- Reclocking ON/OFF switch on Rx
- Durable, high reliability construction
- RoHS compliant
- Wide temperature range
- Low power consumption
- WDM and CWDM multiplexing optional

TECHNICAL SPECIFICATIONS

VIDEO

Transmission method: Digital
 Input level: 800 mV p-p
 Input impedance: 75 ohm
 Output impedance: 75 ohm
 Bit-error rate at -22 dBm: 10⁻¹²
 Jitter (pathological test pattern): <0.2 UI
 Rise/fall times: <270 ps
 Input coax EQ (1505 or better): 100 m

OPTICAL

Operating wavelength: 1300 nm
 Transmitter output options: -7 dBm
 Receiver input range: -2 to -22 dBm
 Optical source/detector type: Laser diode/PIN
 Fiber type <540 Mbps: Single-mode or multi-mode
 Fiber type HDTV: Single-mode

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): 5 x 11 x 1 in
 Weight (per stand alone module): 10 oz
 Video connectors: BNC
 Power req. (typ., per module): 10 to 18 VDC
 Power consumption (typ., per module): 5 W
 Temperature range: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

ORDERING INFORMATION

(M)TX6292-A -7 dBm at 1300 nm fp laser output *
 (M)RX6292 -2 to -22 dBm received optical power at 1.5 Gbps *
 ADAP-AC-01LC Wall-wart power supply for throwdowns (110 V AC input, 500 mA, US plug type)

* Adding an "M" to the beginning of the part number (MTX) indicates "Standalone" modules.

Viper™ II TR6292

Bi-directional SDI-HD-SDI modules for the Viper™ II



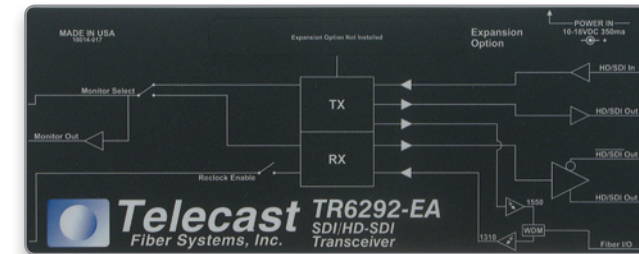
DESCRIPTION

The Viper™ II TR6292 bi-directional fiber optic serial digital video transceiver offers Telecast performance in the space-saving Viper™ II form factor. The TR6292 uses only one fiber to transmit and receive any format of HD-SDI in two directions, using WDM muxing.

A front panel BNC is available to monitor incoming or outgoing video, plus an essential received optical power meter.

Using the optional expansion card, the TR6292 can convert into a 2-slot transceiver, with 6 HD-SDI BNC rear panel outputs.

TR6292 set will support any standard format SDI video, from 19.4 Mbps ATSC to 1.5 Gbps HDTV, as well as other digital signals.



KEY FEATURES AND BENEFITS

- Rack modules or standalone
- One HD-SDI each way on 1 fiber, WDM
- DA plug-in option for 4 more HD-SDI outputs
- Loop through Tx video input
- Dual Rx video outputs
- Front panel monitoring
- Reclocking ON/OFF front panel switch
- Equalized coax up to 1.5 Gbps
- Compatible with TV standards SMPTE 292M, 259M and 244M
- 19.4 Mbps to 1.5 Gbps transport
- Up to 22 dB optical link budget for HD
- Durable, high reliability construction
- No pathological data problems
- RoHS compliant
- Wide temperature range
- Low power consumption

TECHNICAL SPECIFICATIONS

VIDEO

Transmission method: Digital
 Input level: 800 mV p-p
 Input impedance: 75 ohm
 Output impedance: 75 ohm
 Bit-error rate at -22 dBm: 10⁻¹²
 Jitter (pathological test patten): <0.2 UI
 Rise/fall time: <270 ps
 Input coax EQ (1505 at 1.5 Gbps): 100 m

OPTICAL

Operating wavelengths: 1300 nm and 1550 nm
 Transmitter output: -7 dBm
 Receiver input range: -2 to -22 dBm
 Optical source: Laser diode
 Detector type: PIN
 Fiber type: Single-mode

MECHANICAL/ENVIRONMENTAL

Dimensions (W x H x D): 5 x 11 x 1 in
 Weight (per standalone module): 10 oz
 Video connectors: BNC
 Power req. (typ., per module): 10 to 18 VDC
 Power consumption (typical per module): 5 W
 Temperature range: -25° to 55 °C
 Humidity range: 0 to 95 % RH, non-condensing

ORDERING INFORMATION

TR6292-AE Rack mount, -7 dBm at 1300 nm fp laser output
 TR6292-EA Rack mount, 0 dBm at 1550 nm DFB laser output
 MTR6292-AE Standalone, -7 dBm at 1300 nm fp laser output
 MTR6292-EA Standalone, 0 dBm at 1550 nm DFB laser output
 ADAP-AC-01LC Wall-wart power supply for standalone modules (110 V AC input, 500 mA, US plug type)

MX™

Mini-eXpanded beam optical connectors



DESCRIPTION

The new MX™ connector series represents a major breakthrough for fiber in field production. Using advanced expanded beam technology, this is the most dependable, easiest to maintain fiber connector available.

Reliability by design

Unlike conventional pin-and-socket butt-joint connectors, the MX™ mating interface consists of easy to clean lenses. There are no recesses to trap dirt or interfere with signal transfer. Cleaning is simply a matter of wiping off the lenses with a lint-free cloth. Fiber ends are protected from the elements and each other.

There is no physical contact between fibers or between mating lenses. Similarly, there are no fragile sleeves or alignment mechanisms to break.

Reliability means dependability, and you can depend on a more predictable, repeatable mating every time, thanks to expanded beam technology.



KEY FEATURES AND BENEFITS

- Expanded beam technology
- High reliability design
- Shell kits, cable adapter kits and inserts available for flexibility in design
- Small and lightweight
- Easy cleaning
- Two or four fiber versions
- Non-contacting design of mating fibers
- Single-mode or multi-mode
- Hermaphroditic operation
- Durable construction
- Proven in harsh environments
- Jam nut or flange mount receptacles
- Protective rubber plug grip
- Integral threaded dust covers

TECHNICAL SPECIFICATIONS

OPTICAL PERFORMANCE

Insertion loss, typical: 1 dB, single-mode
0.8 dB, multi-mode

Insertion loss, max: 1.5 dB, single-mode
1 dB, multi-mode

MECHANICAL

Durability: Per IEC 61300-2-2, 3000 cycles, mate and unmate

Storage temp: -55° to 95 °C

Operating temp: -40° to 85 °C

Salt spray: Per IEC 60068-2-52, severity 1, 40 °C, 93 % RH, 4 cycles of 2 hrs spraying followed by storage

Sealing immersion: Per IEC 60529, IPX8, 5 m, 24 hrs

Dust: Per IEC 60529, IP6X, 4 hrs

Rain: Per IEC 60529, IPX4, 10 liters/min, 1 hr

Bump: Per IEC 60068-2-29, EB, half sinusoidal, 50 Gbps, 4000 bumps, 6 directions

Vibration: Per TIA/EIA-455-11C, test cond. II, 10G, 10-500 Hz, 12 sweeps, 15 min each

Retention: Per TIA/EIA-455-6B, Meth 1,1000N, 10 min

Flex: Per TIA/EIA-455-1B, ±90°, 15 cycles/min for 10 minutes

Twist: Per TIA/EIA-455-36B, ±90°, 15 cycles/min for 1000 cycles, 4 kg load

Free fall: Per IEC 60068-2-32, procedure 1, 1200 mm height, 500 drops on concrete

ORDERING INFORMATION

See page xx for cable assemblies with MX expanded beam connectors

OX-Frame Reels

Unique, rugged tactical fiber optic reels

DESCRIPTION

The OX-Frame Reels have become familiar sights wherever fiber optic cables are used in remote events and operations. Virtually all high profile sports broadcasts, from the Olympics to the Super Bowl, take advantage of these reels. So do important news events and award shows. You may also find them in military operations around the world. That's because these reels have proven themselves for carrying and protecting fiber optic cables in extremely demanding environments from the desert to the South Pole to Mount Everest.



KEY FEATURES AND BENEFITS

- High durability construction
- Available in 3 sizes; S, M, L
- Axle-less design for cable protection
- Hub compartment safely stores cable
- Optional military cable feed-thru or plate mounted ST or SC receptacles
- Lightweight design, aluminum drums
- Steel frame protects drum flanges
- Stacking feet, rubber tips
- Flip handle, adjustable brake

3 SIZES

Reels are available in three convenient capacities. While the 1,000 ft (305 m) medium (MD) reel is by far the most popular, the small (SM) holds about half as much cable, and the XL holds about twice as much cable (based on 6 mm OD Tac-4 calculations).

Dimensions (in)	SM	MD	XL
Height	11.85	16.53	19.88
Length	11.68	15.41	18.38
Width	12.72	12.94	14.4
Drum diameter	6	6	6
Traverse	8.7	9	9.62
Flange diameter	11	14	17.25
Weight (lb)	11	15	26

ORDERING INFORMATION

See page xx for cable assemblies on OX-Frame Reels

SMPTE Hybrid Cable

SMPTE heavy duty stainless steel assemblies for HDTV broadcast



DESCRIPTION

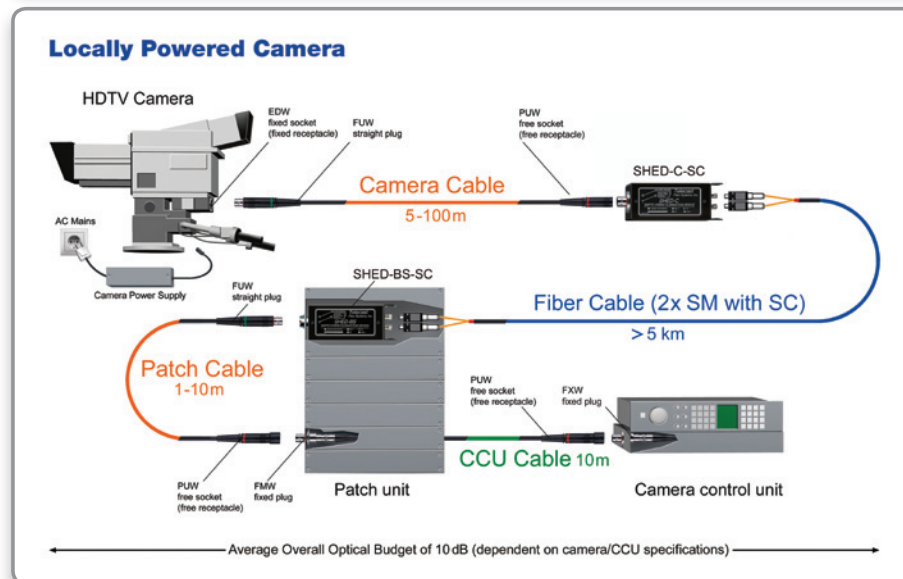
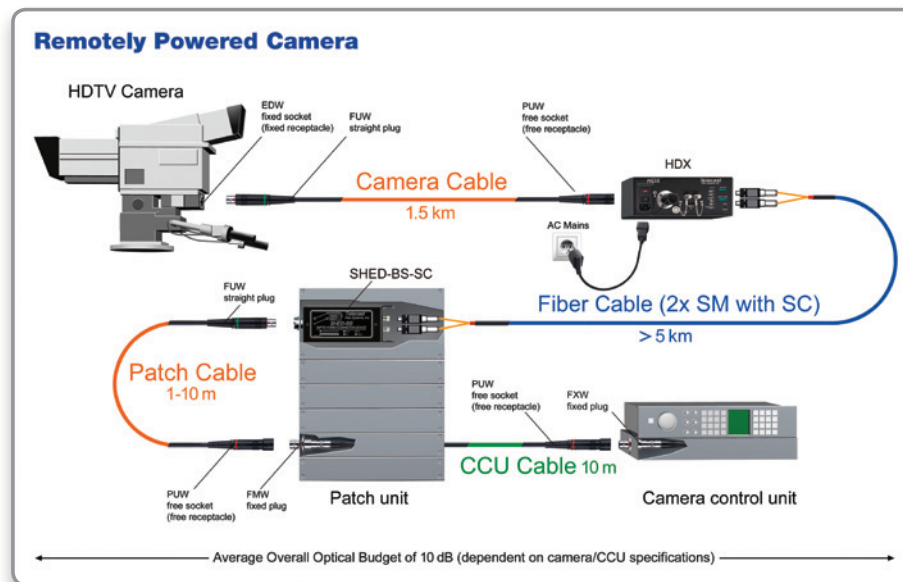
Telecast Fiber Systems is pleased to offer a solid stainless steel shell with full-length rubber protective boot for all LEMO assemblies. These enhanced connectors coupled with the exceptional workmanship and outstanding quality that Miranda brings to its SMPTE Hybrid Cable makes Miranda the clear leader in the field.

This evolution in connector material, which is fully backward compatible with the triple plated brass, is designed to offer superior performance and reliability. LEMO stainless steel connectors will be a standard offering on all Telecast assemblies and provides over 20 000 mating cycles: over 50 % more than previous connectors.

The full-length rubber strain relief boot will ensure the connector stays in like new condition and prevents damage during the rigors of (OB) Outside Broadcasting. For industry leading durability, resilience and long life in harsh environments; insist on Telecast Series polyurethane jacketed cable, LEMO stainless steel heavy duty connectors and superior OEM approved factory terminations. All Telecast Series broadcast assemblies are backed by our 1 year factory warranty due to any defect in material or workmanship. In addition to custom assemblies Miranda offers a repair service and will repair any fiber assemblies regardless of the manufacturer.

KEY FEATURES AND BENEFITS

- SMPTE 311M and 304M compliant
- Stainless steel assemblies
- Rubber dust caps
- Heat resistant insulation
- 19.4 Mbps to 3 Gbps transport
- Machine polished fiber contacts
- Low insertion and return loss
- High reliability, durable design
- Compatible with other Telecast Series HD/SD-SDI transport systems

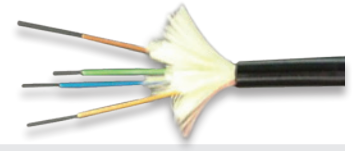


ORDERING INFORMATION

See page xx for SMPTE hybrid cable assemblies

TAC Cable

Tactical fiber optic cable



DESCRIPTION

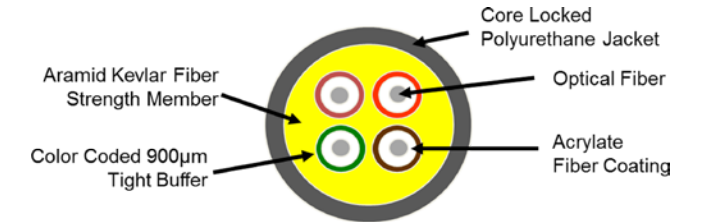
These battlefield-proven TAC Cable are the standard in mobile television production, as well as in the military. Available in core counts from 1 to 12 fibers in one cable, they offer tremendous capacity and reliable durability.

Cable assemblies use our OX-Frame Reels

There is no better reel in the broadcast industry, and it is only available with TAC Cable. See why this is the reel that is recognized around the world as Telecast Fiber in action. Available only with the TAC Cable assemblies, not sold separately.

Hermaphroditic military connectors

Multipin fiber connectors simplify your job in the field. Miranda offers proven and emerging connector technologies as part of your TAC Cable system.



KEY FEATURES AND BENEFITS

- Crush-resistant and resilient with a thick layer of aramid strength members
- Round cable design for easy installation and survivability
- Polyurethane jacketed for abrasion, cut and chemical resistance
- Operating temperature of -55° to 85 °C
- 500 mm acrylate primary buffer coating over each optical fiber
- 900 mm diameter hard elastomeric secondary tight buffer protection on each optical fiber
- Available with core counts of 1, 2, 4, 6 and 12, other core counts available as special orders
- Available in multi-mode (50 µm and 62.5 µm) and single-mode (8 µm)
- Compatible with Delphi Military Hermaphroditic connectors
- Compatible with Stratos HDLC Harsh Environment Hermaphroditic connectors

TECHNICAL SPECIFICATIONS

TAC1	Core count 1, 4.5 mm diameter, 18 kg/km (tensile load rating: shot term, 385 lb; long term, 130 lb)
TAC2	Core count 2, 5.0 mm diameter, 23 kg/km (tensile load rating: shot term, 400 lb; long term, 140 lb)
TAC4	Core count 4, 5.5 mm diameter, 28 kg/km (tensile load rating: shot term, 400 lb; long term, 140 lb)
TAC6	Core count 6, 6.0 mm diameter, 28 kg/km (tensile load rating: shot term, 400 lb; long term, 140 lb)
TAC12	Core count 12, 6.5 mm diameter, 51 kg/km (tensile load rating: shot term, 475 lb; long term, 160 lb)

ORDERING INFORMATION

See page xx for Tactical fiber cable assemblies

Telecast Series cable assemblies

Pre-configured fiber cable assemblies



FIBER OPTIC CABLES

Miranda manufactures a wide range of pre-configured fiber cable assemblies for field and permanent installation applications. The standard configurations shown below are available for rapid delivery. Our cables are built to the highest standards. You can trust your television production to Miranda's Telecast Series cables.

SMPTE HYBRID CABLE ASSEMBLIES

SMPTE Hybrid fiber cable assemblies on Telecast OX-Frame reels with center door.

SMPTE hybrid cable assembly with SMPTE 304M plug on one end and inline receptacle on other end.	
CASMD-100-311M-304MIP-304MIR	Small reel with door, 100 ft SMPTE hybrid cable
CASMD-200-311M-304MIP-304MIR	Small Reel with door, 200 ft SMPTE hybrid cable
CAMDD-350-311M-304MIP-304MIR	Medium reel with door, 350 ft SMPTE hybrid cable
CAXLD-500-311M-304MIP-304MIR	Large reel with door, 500 ft SMPTE hybrid cable
CAXLD-750-311M-304MIP-304MIR	Large reel with door, 750 ft SMPTE hybrid cable

SMPTE hybrid cable assembly with Neutrik OpticalCon powered connectors on both ends.	
CASMM-100-311M-NOC2P-NOC2P	Small reel with door, 100 ft SMPTE hybrid cable
CASMM-200-311M-NOC2P-NOC2P	Small reel with door, 200 ft SMPTE hybrid cable
CAMDM-350-311M-NOC2P-NOC2P	Medium reel with door, 350 ft SMPTE hybrid cable
CAXLM-500-311M-NOC2P-NOC2P	Large reel with door, 500 ft SMPTE hybrid cable
CAXLM-750-311M-NOC2P-NOC2P	Large reel with door, 750 ft SMPTE hybrid cable

SMPTE Hybrid fiber cable assemblies without reels

SMPTE hybrid cable assembly with SMPTE 304M plug on one end and inline receptacle on other end	
CASXXX-#1-311M-304MIP-304MIR	SMPTE hybrid cable with SMPTE 304M connectors
SMPTE hybrid cable assembly with Neutrik OpticalCon powered connectors on both ends	
CASXXX-#1-311M-NOC2P-NOC2P	SMPTE hybrid cable with OpticalCon connectors

#1: Standard lengths available: 3, 10, 25, 50, 100, 200, 350, 500 and 750 feet

SMPTE Hybrid fiber bulkhead cable assemblies (without reels)

CAXXX-10-311M-304MPP-304MIR	10 ft, 304M panel plug to 304M inline RECEPT
CAXXX-30-311M-304MPP-304MIR	30 ft, 304M panel plug to 304M inline RECEPT
CAXXX-10-311M-NOC2P-NOC2R	10 ft, Neutrik OpticalCon Duo Plug to OpticalCon Chassis
CAXXX-30-311M-NOC2P-NOC2R	30 ft, Neutrik OpticalCon Duo Plug to OpticalCon Chassis

SMPTE HYBRID CABLE ASSEMBLIES

Tactical fiber short cable assemblies, multi-fiber connectors on one end to single fiber connectors

Ordering information: CA-XXX-#1-#2-#3-#4

#1 Length (no reel)	
3	3 ft cable assembly
15	15 ft cable assembly

#2 Tactical cable Type	
T2S	2-fiber strands single-mode Tactical Cable
T4S	4-fiber strands single-mode Tactical Cable

#3 Connector type, multi-fiber connectors	
MX2P	MX Mini Expanded Beam Plug 2 fiber for use with T2S cable
MX4P	MX Mini Expanded Beam Plug 4 fiber for use with T4S cable
NOC2P	Neutrik OpticalCon Duo Plug: 2 strands (unpowered)
NOC4P	Neutrik OpticalCon Quad Plug: 4 strands (unpowered)

#4 Connector type, breakout to individual fiber connectors	
ST2	2 ST fiber connectors for use with T2S cable
ST4	4 ST fiber connectors for use with T4S cable
LC2	2 LC fiber connectors for use with T2S cable
LC4	4 LC fiber connectors for use with T4S cable

Example: CA-XXX-15-T4S-MX4P-LC4
Cable breakout, 15 feet of 4-strand tactical fiber, MX expanded beam connector on one end and 4 LC connectors on breakout end.

Custom cable assemblies are also available using any of the components shown below; contact your Miranda sales representative or dealer to order custom configurations.

LONG TACTICAL CABLE ASSEMBLIES - ON TELECAST OX-FRAME REELS

Our OX-Frame reels are the best in the industry. Exclusive to Miranda, the Telecast-series OX-Frame reels are solid and strong, with an easy to use folding handle for winding and an adjustable brake for unspooling and locking during storage. Our OX-Frame reels may be the last cable reel you will ever need.

Tactical fiber cable assemblies on OX-Frame Reels with center door

Ordering Information: CA-#1-#2-#3-#4

#1 Reel Type and length of tactical fiber cable included	
SMD-500	Small reel with door for ST connectors, 500 ft
MDD-1000	Medium reel with door for ST connectors, 1000 ft
XLD-2000	Large reel with door for ST connectors, 2000 ft
SMM-500	Small reel with door for MX or OpticalCon connectors, 500 ft
MDM-1000	Medium reel with door for MX or OpticalCon connectors, 1000 ft
XLM-2000	Large reel with door for MX or OpticalCon connectors, 2000 ft

#2 Tactical Cable Type	
T2S	2-fiber strands single-mode Tactical Cable
T4S	4-fiber strands single-mode Tactical Cable
T12S	12-fiber strands single-mode Tactical Cable

#3, #4 Connector type. For standard configurations, same type of connector is used on both ends

ST2	2 ST fiber connectors for use with T2S cable
ST4	4 ST fiber connectors for use with T4S cable
ST12	12 ST fiber connectors for use with T12S cable
MX2P	MX Mini Expanded Beam Plug 2 fiber for use with T2S cable
MX4P	MX Mini Expanded Beam Plug 4 fiber for use with T4S cable
NOC2P	Neutrik OpticalCon Duo Plug: 2 strands (unpowered)
NOC4P	Neutrik OpticalCon Quad Plug: 4 strands (unpowered)

Example: CA-MDM-1000-T2S-NOC2P-NOC2P
Cable Assembly on Medium size OX-Frame reel with 1000 feet of 2-strand tactical fiber cable and Neutrik OpticalCon dual-fiber connectors on each end.

TACTICAL FIBER CABLE ASSEMBLIES – COILS (WITHOUT REELS)

Tactical fiber cable assemblies without reels

Ordering information: CA-XXX-#1-#2-#3-#4

#1 Length (no reel)	
50	50 ft cable assembly
100	100 ft cable assembly
200	200 ft cable assembly

#2 Tactical Cable Type	
T2S	2-fiber strands single-mode Tactical Cable
T4S	4-fiber strands single-mode Tactical Cable
T12S	12-fiber strands single-mode Tactical Cable

#3, #4 Connector type. For standard configurations, same type of connector is used on both ends

ST2	2 ST fiber connectors for use with T2S cable
ST4	4 ST fiber connectors for use with T4S cable
ST12	12 ST fiber connectors for use with T12S cable
MX2P	MX Mini Expanded Beam Plug 2 fiber for use with T2S cable
MX4P	MX Mini Expanded Beam Plug 4 fiber for use with T4S cable
NOC2P	Neutrik OpticalCon Duo Plug: 2 strands (unpowered)
NOC4P	Neutrik OpticalCon Quad Plug: 4 strands (unpowered)

Example: CA-XXX-100-T12S-ST12-ST12
Cable assembly, no reel, with 100 feet of 12-strand tactical fiber cable and 12 ST connectors on each end.