Telecast Fiber Systems, Inc. CopperHead™

Camera-Mountable HD/SDI & Analog Fiber Optic ENG/SNG Transceiver

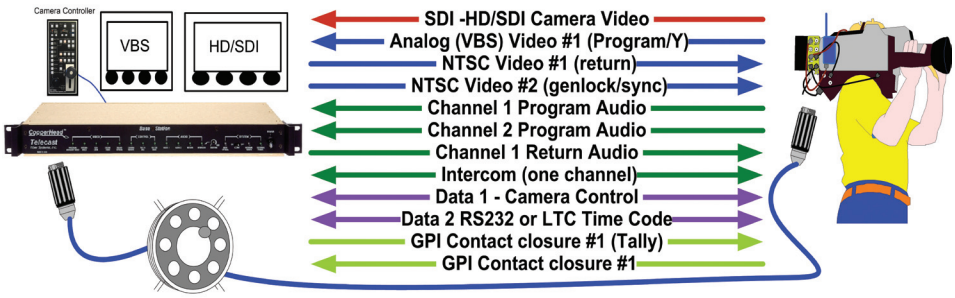
The Fiber Optic System that "Dual-Purposes" your Camcorder for Live News, Multi-Camera, and E-Cinema Production

The CopperHead G1 system provides a robust fiber optic link between any professional camera or camcorder and your truck, control room or "video village" position. The system simultaneously transports 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.

Since the CopperHead 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 CopperHead Camera Unit mounts directly to the camera's battery plate (V-Mount, Anton-Bauer or PAG) and provides for a variety of power options. The Base Station end is a lightweight 1RU frame located at the “video village” position, or in your truck or control room.

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



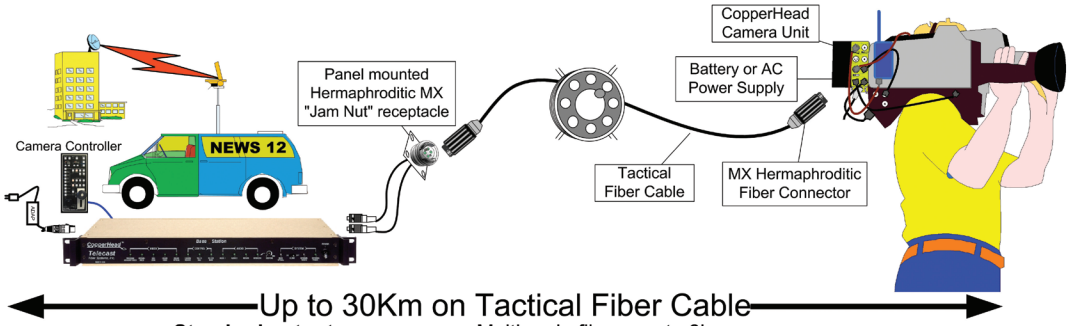
Features

- *All camera signals on lightweight fiber cable*
  - *Analog NTSC/PAL program video*
  - *Digital SDI or HD/SDI program video*
  - *Return color viewfinder/monitor video*
  - *Return black burst/genlock video*
  - *Camera program audio*
  - *Auxiliary program audio*
  - *Two-way headset intercom*
  - *Return IFB/audio channel*
  - *Tally/call closure circuit*
  - *Bi-directional camera control data*
  - *Bi-directional Time Code or RS232 data*
- *Broadcast quality video and audio*
- *Multi-kilometer distance capability*
- *Up to 30 dB optical range with DFB option*
- *Battery mount options for Anton/Bauer®, PAG™ & "V" Mount*
- *Wide temperature range*
- *Low power consumption*
- *Two Fiber Cable Options*
  - *Tactical Fiber*
    - *Military Spec and tough!*
    - *Requires local power at camera*
  - *SMPTE Hybrid Fiber*
    - *Delivers 150 W power to the camera*
- *Durable, high reliability design*
- *Battery back-up in Base Station unit*
- *Multimode or Single Mode versions available*
- *US Patent #7,327,959*

Applications

- *Electronic news gathering*
- *Satellite news gathering*
- *Multicamera Flypack Electronic Field Production*
- *Electronic Cinematography*
- *Sports production*
- *Teleconferencing*
- *Inter/Intra Campus Cameras*
- *CATV local origination*
- *Telemedicine*
- *Government video*

TACTICAL FIBER



Standard output: Multimode fiber - up to 2km
Single Mode fiber - up to 5km

Optional high power DFB: Single Mode fiber : >30 km

Two ways to connect:

The CopperHead can utilize either of the two fiber optic cable styles found in the broadcast industry, depending on whether power is required at the camera. You can choose the lighter, more robust Mil-Spec Tactical Fiber and power the camera locally, or SMPTE Hybrid Fiber with its internal copper wires delivering power to the camera. Either way, connectivity is accomplished seemlessly and with no signal degradation:

1. Connect With Tactical Fiber

Tougher than Coax

Telecast's TAC-series fiber cables have become the standard in field teleproduction for news, sports and EFP. Lightweight and flexible, they are tougher than coax, triax or any other copper cables, and stand up better to temperature extremes, vehicle traffic and flexing. Three sizes of Telecast OX-Frame™ reels give you the length you need.

MX Connectors - Expanded Beam Technology

Telecast's miniature "hermaphroditic" MX connectors are designed for "harsh environment" use. They represent a major breakthrough for fiber in field production. Using advanced expanded beam technology, this is the most dependable, compact and easy-to-maintain multicore fiber optic connector available today.


MX plugs and receptacle

Add-on Extension Reels

Need longer lengths? Just add one or several reels of cable. Quick hermaphroditic MX connectors mean you don't have to worry about which direction to deploy the cables—they are always compatible from either end. Plugs mate directly with each other, without the need for coupling barrels.


OX-Frame reel with TAC cable and MX

2. Connect With Hybrid Fiber

SMPTE 311M Compatibility

When batteries or other local power supplies aren't practical, the CopperHead PowerPlus option permits use of industry-standard SMPTE hybrid fiber cables to provide power to the camera, CopperHead Camera Unit, and other accessories at the camera position.

PowerPlus and HDX

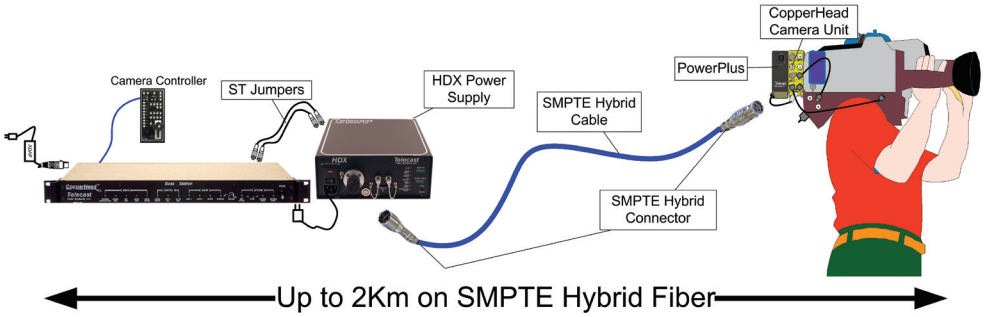
The PowerPlus unit is simply attached to the CopperHead Camera Unit in place of the battery. The "HDX" power supply is installed anywhere along the camera chain where AC power is available. The system's interlocking safeguard protection system insures that adaquate power is safely applied to the SMPTE Hybrid Cable, providing maximum possible power.

HDX Power Supply

150 Watts of Continuous Power

Up to 300m of hybrid cable can then be connected between the camera and the HDX power supply. In addition to providing power for the camera and the CopperHead, a 12 or 24 VDC power output (<100 watts) is provided on the PowerPlus for external accessories, such as viewfinders, prompters, or lights.

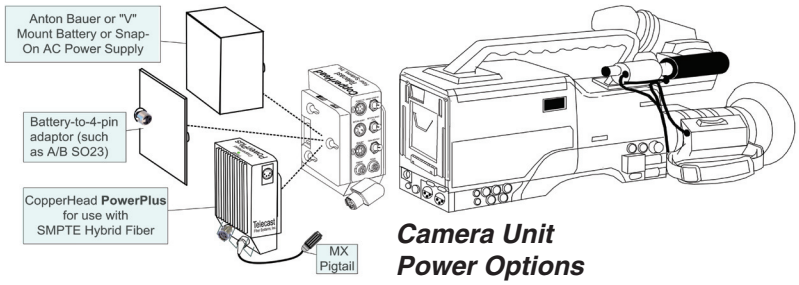
HYBRID FIBER



All HD, Video, Audio, and control signals,
plus up to 150 Watts of continuous 12VDC Power

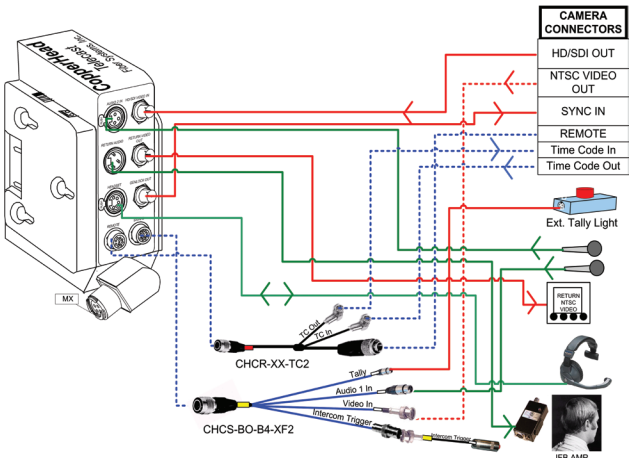
CopperHead Camera Unit

The CopperHead Camera Unit mounts to any professional camera utilizing the camera's battery interface system, sandwiching between the camera and the battery or other power supply solution (such at the CopperHead PowerPlus for use with SMPTE Hybrid fiber). Mounting plates are available for Anton-Bauer, V-Mount, and Pag battery systems.



Camera Unit Power Options

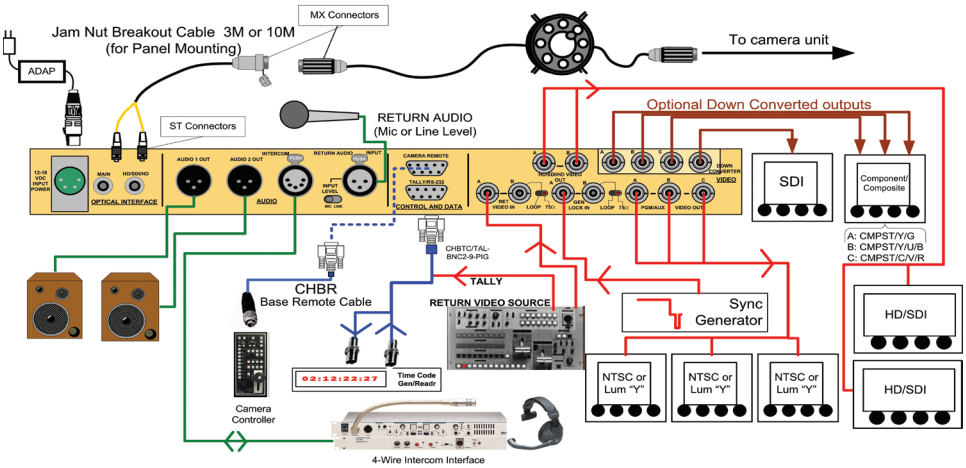
Standard BNCs and XLR connectors provide the interface for most signals required to and from the camera, camera operator and auxiliary equipment. Additional multipin connectors provide interfacing to the camera's remote control connector, time code inputs and outputs, and additional analog signals.



Camera Unit Configuration

CopperHead Base Station

The CopperHead Base Station is a lightweight 1RU frame located in your truck, control room, or "video village" position. Truly "plug-and-play," no front panel adjustments are required. Bi-color LEDs give easy-to-understand visual confirmation of link status with the CopperHead Camera Unit, as well as signal status of local input signals and signals coming down the fiber from the Camera Unit.



Base Station Configuration

On the rear panel, standard BNCs and XLRs carry all video, audio and intercom signals. A multipin DB9 interfaces to any manufacturer's Paint Box, Remote Control Panel (RCP) or Operational Control Panel (OCP) for full remote control of the camera. Another DB9 is provided for RS232, Timecode and Tally information to and from the camera.

In the event of power loss, a built-in rechargable battery will power the Base Station for approximately 30 minutes, ensuring your show's success.

System Components and Accessories

Analog Camera Unit
CHCAM

Digital Camera Unit
CHDCAM

Base Station
CHBS

Base Station AC Adaptor
ADAP-AC-02

Tactical Fiber on Reel
CASM/MD/XL

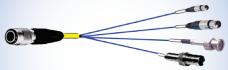
MX Receptacle Jam Nut Assembly - Breakout to STs
MXRV

MX Receptacle Flange Mount Assembly - Breakout to STs
MXRE

Tacical Fiber Assembly - MX Connectors at each end
CAXX-MX

Camera Remote Cable (specify camera model)
CHCR-XXX

Base Station Remote Cable (specify Remote model) - 10' long
CHBR-XXX



Camera Signal Cable Breakout
CHCS-BO-

Camera Signal Cable 26-pin Multicore
CHCS-26P

Base Station Time Code Cable
CHBTC-XXX

PowerPlus
PWRPLUS

SMPTE Hybrid Power Supply
HDX-2-ST

Rack-mount frame for 2 HDX units
HDX-FR-2

SMPTE Hybrid Fiber Cable Assembly
CAXX-SMPTE

Internal Base Station Down Converter
SDI to Component Analog
CH2BSQ-D2A-SD

Internal Base Station Down Converter
HD/SDI to SDI and Analog
CH2BSQ-DC-HD

Universal Camera Control Panel
CHRCP-2040

Ordering Tips

- **Only analog now, but planning for digital?** The CopperHead is factory upgradeable to SDI/HD digital later.
- **Need longer distance, up to/beyond 20 km?** For distances beyond 5 km, order the long haul option which includes high power lasers.
- **Single mode or multimode fiber?** Single Mode has more bandwidth and longer range, but Multimode takes more abuse. For HD/SDI, use single mode.
- **How many fibers?** One (TAC-1) for an analog CopperHead, but you will need two fibers (using TAC-4 yields two spares) to add SDI/HD capabilities.
- **SMPTE Hybrid cable?** Yes, we can supply that, too!
- **Camera signal and remote cables?** Interface Cables are available for a wide range of camera systems from Sony, Panasonic, JVC, Ikegami and Hitachi. Specify camera and RCP models at time with order.

Specifications

Program Video, Analog

Interface	RS170, NTSC, PAL
Frequency Response	
30Hz-5MHz	±0.15 dB
-3dB point	≥ 10 MHz
Video Signal to Noise Ratio	≥ 72 dB
Differential Gain	< 1%
Differential Phase	< 0.5°

Program Video, Digital (Optional)

Interface	SMPTE 259M, 292M
Data Rate	19.4 Mbits/sec to 1.5 Gbits/sec
Input Level	800 mV (peak to peak)
Input Impedance	75 Ohms
Output Impedance	75 Ohms
Bit-Error Rate (@ -22 dBm)	10^{-12}
Jitter (pathological data pattern)	< 0.2 UI
Rise/Fall Times	< 270 ps

Audio

Input/Output Impedance	10 kΩ/30 Ω
Frequency Response	±0.2 dB, 20Hz to 20kHz
Audio Signal to Noise Ratio	> 90 dB
Total Harm. Dist. (20Hz to 20kHz)	< 0.1%
Sampling Rate	24 bit

Electro-Optical

Operating Wavelengths	1300 nm/1550 nm
Trans Laser output power (std./opt)	-6 dBm/0 dBm
Receiver Sensitivity, main	-30 dBm
Receiver Sensitivity, HD/SDI	-22 dBm
Fiber Compatibility	Single Mode or Multimode
Optical Connector, Analog System	ST
Digital System	MX mini-eXpanded Beam
Distance Limit, Multimode (analog only)	2 km
Single mode	5 km
Optional single mode, DFB laser	> 30 km

Mechanical/Environmental

Dimensions	
Camera Unit (WxLxD)	5" x 6.12" x 2.2"
Base Station unit	16.7" x 9" x 1.75"
Weight	
Camera unit	1.5 lb
Base Station unit	5 lb
Power Consumption	
Camera unit	8 watts@10-18VDC
Base Station unit	10 watts@10-18VDC
Temperature Range	-25° to +55°C
Humidity Range	0 to 95% RH, Noncondensing

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