

# CopperHead 3400

Fiber Optic Camera Transceiver for 3D Production and E-Cinema



Lightweight, easy-to-deploy fiber connectivity solutions.

Cutting-edge 3D and dual link production require multiple 3 Gb/s 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 from Grass Valley, a Belden Brand, 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 Gb/s HD-SDI signal from each camera, as well as providing an additional 1.5 Gb/s 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

- 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 Gb/s paths for dual link or 3D cameras
    - One 1.5 Gb/s 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 - 95W to 240m (787 ft.)
      - PowerPlus - high voltage - 100/150W to 2 km (1.2 mi.)

## SPECIFICATIONS

### Video, Digital (A-Link and B-Link)

**Interface:** SMPTE 424M, 292M, 259M  
**Data rate:** 3 Gbps, 1.5 Gb/s, or 270 Mb/s

### Video, Digital (bi-directional)

**Interface:** SMPTE 259M, 292M  
**Data rate:** 270 Mb/s or 1.5 Gb/s

### Video, Digital (all)

**Input level:** 800 mV p-p  
**I/O impedance:** 75Ω  
**Output impedance:** 75Ω  
**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 100Ω Cat5  
**I/O impedance:** 10 kΩ / 30Ω

### 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 kΩ

**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 or 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: ~ 300m (984 ft.), 95W at 12 VDC\*  
 Long range, HDX w/PowerPlus, LP: ~2 km (6,562 ft.), 100W cont. / 150W peak\*

### Mechanical/Environmental

#### Dimensions (W x H x D):

Camera unit: 63.5 x 55.9 x 165.1 mm (2.5 x 2.2 x 6.5 in.)  
 Base station: 444.5 x 44.5 x 228.6 mm (17.5 x 1.75 x 9 in.)  
 PowerWafer: 127 x 55.9 x 155.5 mm (5 x 2.2 x 6.12 in.)  
 PowerPlus LP (100W): 127 x 63.5 x 152.4 mm (5 x 2.5 x 6 in.)  
 PowerPlus HP (150W): 127 x 94 x 152.4 mm (5 x 3.7 x 6 in.)  
 HDX: 330.2 x 215.9 x 88.9 mm (13 x 8.5 x 3.5 in.)

#### Weight:

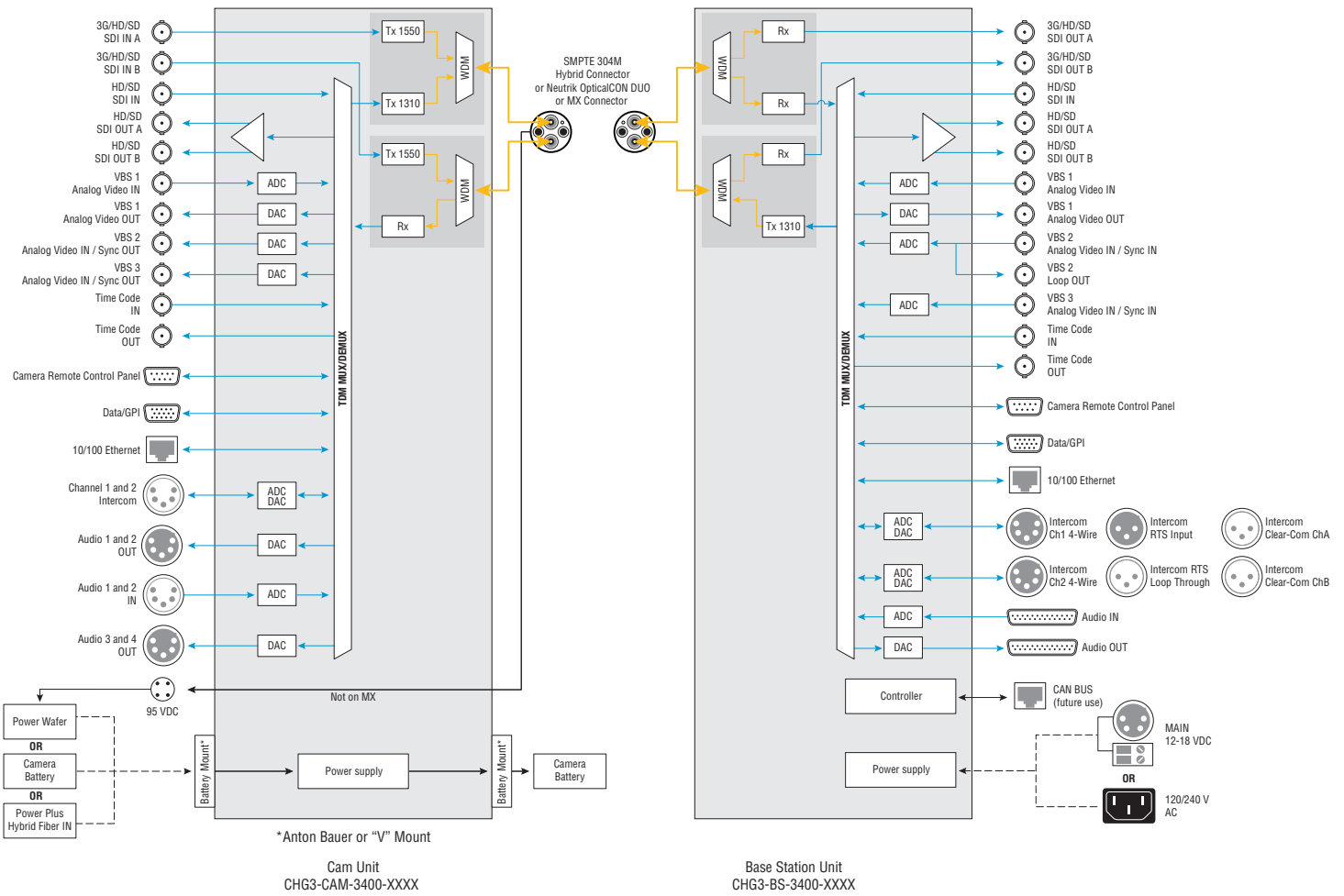
Camera unit: 0.68 kg (1.5 lbs.)  
 Base station: 2.27 kg (5 lbs.)  
 PowerWafer: 0.68 kg (1.5 lbs.)  
 PowerPlus: LP: 1.04 kg (2.3 lbs.), HP: 1.13 kg (2.5 lbs.)  
 HDX: 4.76 kg (10.5 lbs.)

### Power consumption:

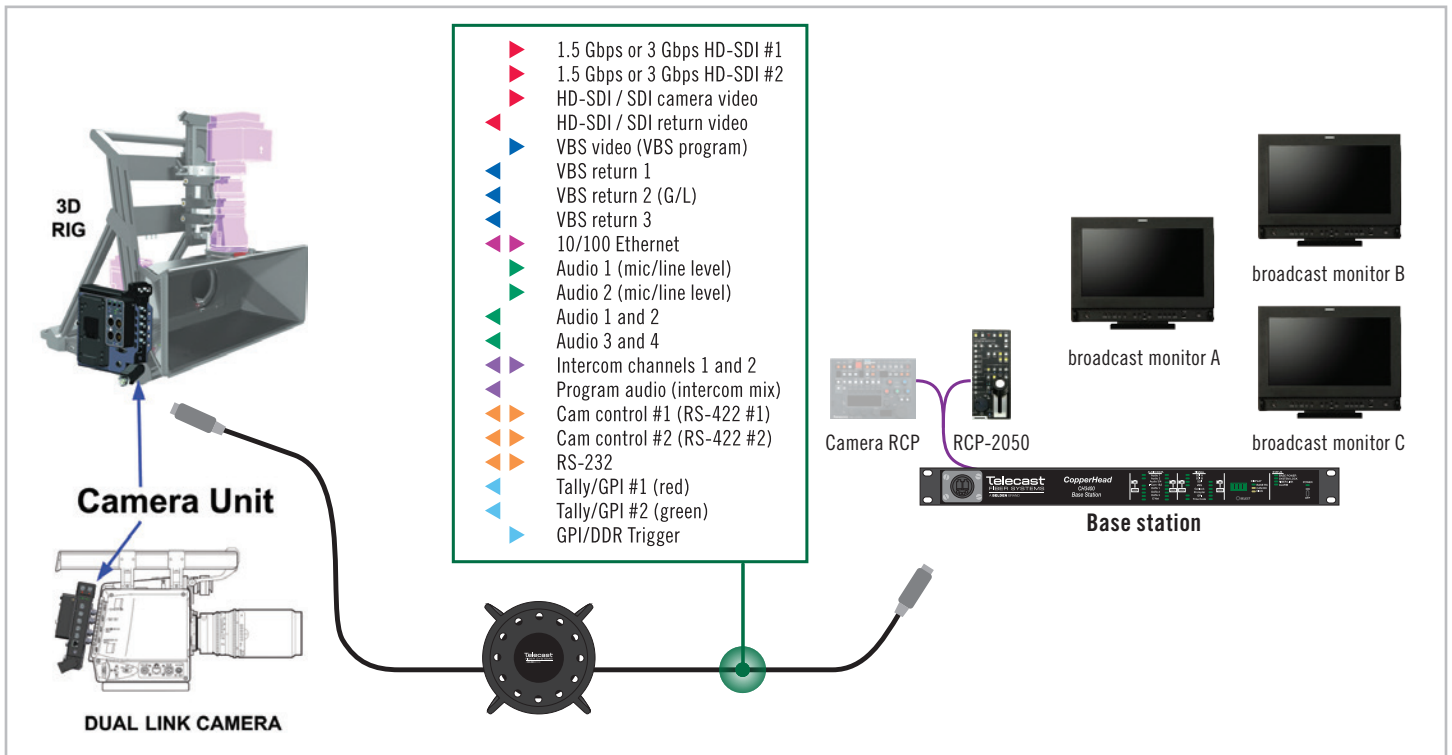
**Camera unit:** 8 W at 10-18 VDC  
**Base station (TAC Cable):** 10W at 10-18 VDC  
**Temperature range:** -25° to 55° C (with internal fan enabled)  
**Humidity range:** 0 to 95% RH, non-condensing  
**Max noise level:** 16 dBA (fan ON)

\* 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.

# CopperHead 3400 Fiber Optic Camera Transceiver for 3D Production and E-Cinema



CopperHead 3400 System Functional Block Diagram



# CopperHead 3400 Fiber Optic Camera Transceiver for 3D Production and E-Cinema

## ORDERING

|                                |   |
|--------------------------------|---|
| <b>CHG3-CAM-3400-#1-#2</b>     | Camera unit w/MX, opticalCON or SMPTE 304M fiber connector        |
| <b>CHG3-BS-3400-#3-#4</b>      | Standard base station 2 STs or opticalCON connector               |
| <b>CHG3-BS-3400-95VD-#3-#4</b> | Base station w/internal power supply, opticalCON or 304M          |
| <b>ADAP-AC-04</b>              | AC adaptor (for CHG3-BS-3050 base station)                        |
| <b>CHG3-PW-95V-EGG-#5</b>      | PowerWafer camera adaptor (for use with CH3-BS-3050-95VD-BS-95VD) |
| <b>CH3-MPS-95VD-#6-#7</b>      | External power supply for PowerWafer                              |
| <b>CH3BAI-3400-D25-7XL3F</b>   | Base audio input breakout cable with coms                         |
| <b>CH3BAO-3400-D25-6XL3M</b>   | Base audio output breakout cable with coms                        |
| <b>CHBR-#8</b>                 | Base remote cable   |
| <b>CHCR-#8</b>                 | Camera remote cable   |
| <b>CH3BS-#8</b>                | Base data/tally breakout cable                                    |
| <b>CH3CS-#8</b>                | Camera signal cable   |

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  | 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              |

### #3 Base Station Fiber Connectors

|      |            |
|------|------------|
| NEU2 | OpticalCON |
| 304M | SMPTE 304M |
| ST2  | 2 Sts      |

### #4 Base Station Intercom Interfaces

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

### #5 Power Adaptor Interface Plate

|    |            |
|----|------------|
| AB | Gold mount |
| V  | V-Mount    |

### #6 Power Supply Fiber Conns (Dry)

|      |            |
|------|------------|
| ST2  | Sts        |
| NEU2 | OpticalCON |

### #7 Power Supply Fiber Conns (Wet)

|      |            |
|------|------------|
| NEU2 | OpticalCON |
| 304M | SMPTE 304M |

### #8 Interface Cables

Visit [www.grassvalley.com](http://www.grassvalley.com) for interface cables to match your specific camera, controller and tally configuration.

### Example 1

#### **CHG3-CAM-3400-304M-AB-AB**

CopperHead 3400 camera unit, SMPTE 304M cam unit fiber connector, two gold mounts cam unit batt. interface plates

### Example 2

#### **CH3-MPS-95VD-NEU2-304M**

External power supply for PowerWafer, OpticalCON power supply fiber conns (dry), SMPTE 304M power supply fiber conns (wet)



GVB-1-0223A-EN-DS

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