Cobra 2DT

Fiber Optic Camera Interface for Digital Triax Camera Systems

User Manual

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About this User Guide

The Cobra 2DT Fiber Optic Camera Interface for Digital Triax Camera Systems can be delivered in a number of configurations depending on the Fiber Optic Cable Connector or Camera/CCU connector options selected. This user guide is designed to cover all of the various options and so not every page in this guide will apply to your specific system.

Please see Appendix 1 for ordering and configuration information.

Throughout this guide a number of informational pointers are used to mark important or useful information.

	Caution – the information provided is important safety information and should be understood and followed in order to operate the Cobra 2DT Fiber Optic Camera Interface for Digital Triax Camera System safely and properly.
	Useful information regarding the User Guide and the Cobra 2DT Fiber Optic Camera Interface for Digital Triax Camera System. Reading and understanding this information will make using the manual and the product easier.

Chapter 1. Important Information

1.1. Warranty

LIMITED WARRANTY STATEMENT

Belden Inc. expressly warrants to Buyer that the Products supplied shall be free from defects in materials and workmanship for a period of 12 months following the date the Products are delivered to Buyer (the "Warranty Period"). Belden's liability under this limited warranty shall be limited, at its option, to providing refund of purchase price for Products, or replacing or repairing Products shown to be defective either in materials or workmanship. Buyer's sole and exclusive remedy for breach of warranty shall be such refund, replacement or repair.

A claim of defect in materials or workmanship in any Product shall be allowed only when it is submitted in writing to the Telecast Fiber Systems division of Belden Inc. within seven days after discovery of the defect, and in any event within the Warranty Period. No claim shall be allowed in respect of any Product which has been altered, neglected, damaged or stored in any manner which adversely affects it. In order to obtain service under the terms of this warranty, Distributor's customer or Distributor must notify the Telecast Fiber Systems division of Belden Inc. of the defect prior to the expiration of the applicable warranty period and obtain a Return Authorization Number from Belden. In no event may products be returned to Belden or to Distributor for warranty service without having obtained from Belden a Return Authorization Number.

This limited warranty applies only to new and unused Products delivered to Buyers located within the United States of America, or to international Buyers if sold through an authorized Distributor organization, and shall not extend to any equipment not manufactured by Belden Inc., even though such equipment may be sold or operated with the Products. In addition, this limited warranty shall be void and of no further force or effect whatsoever if the Product is repaired or modified by any person other than an authorized representative of Belden Inc. without the consent of Belden Inc. This warranty shall not apply to any defect, failure or damage caused by improper use or inadequate maintenance and care. Nor shall this warranty apply to any damage caused in whole or in part by attempts by personnel other than personnel, as approved in advance in accordance with the foregoing provisions, to open, install, repair, or service the Product; nor to damage resulting from improper connection with incompatible equipment; nor to damage to a unit which has been modified by personnel other than Belden personnel.

Products returned to the Telecast Fiber Systems division of Belden Inc. for warranty service shall be shipped, freight prepaid to the Telecast Fiber Systems division of Belden Inc. Belden will return the repaired product or ship a replacement, freight prepaid, to either Distributor or Distributor's customer, as requested by Distributor's customer, at a location within the United States or, at Belden's option, to Distributor's location in the case of international sales. This limited warranty shall also apply to Products that replace defective Products and Products that have been repaired by

authorized representatives of Belden only for the original Warranty Period. The Warranty Period shall not be extended by reason of defect, or any period of time during which the Product is not available to Buyer because of defects or repairs, without the express written consent of Belden Inc.

EXCEPT FOR THE EXPRESS LIMITED WARRANTY AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP CONTAINED HEREIN, BELDEN INC. MAKES NO WARRANTY OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, AND ALL WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND OTHER WARRANTIES OF WHATEVER KIND ARE HEREBY DISCLAIMED BY BELDEN, INC. THIS LIMITED WARRANTY SETS FORTH EXCLUSIVELY ALL OF BELDEN'S LIABILITY IN CONTRACT OR OTHERWISE IN THE EVENT OF A DEFECTIVE PRODUCT. WITHOUT LIMITATION ON THE FOREGOING, BELDEN, INC. EXPRESSLY DISCLAIMS ANY LIABILITY WHATSOEVER FOR ANY DAMAGES INCURRED DIRECTLY OR INDIRECTLY IN CONNECTION WITH THE SALE OR USE OF, OR OTHERWISE IN CONNECTION WITH, THE PRODUCT, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS AND SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER CAUSED BY NEGLIGENCE OR OTHERWISE, REGARDLESS WHETHER BELDEN INC. HAS BEEN GIVEN ADVANCE NOTICE OF THE POSSIBILITY THEREOF.

THIS WARRANTY IS GIVEN BY IN LIEU OF ANY OTHER WARRANTY EXPRESSED OR IMPLIED.

1.2. Safety and Fiber Optic Systems

Optical Fiber Safety

Never look directly into the end of the optic fiber while either end of the system is operating. Eye damage can result.

Always use cable connector caps when the cables are not connected. This protects the connector from damage and the unlikely event of exposure to an operating optical link. Keeping the caps in place when the connectors are not in use will prevent dirt and dust from entering the connector and degrading the performance of the optical link

Power Fuses

The Cobra 2DT Fiber Optic Camera Interface for Digital Triax Camera System Camera Unit with internal power is equipped with a single cartridge fuse located on the internal printed circuit board near the AC power input module. The fuse supplied is a fast acting 4 Ampere fuse – 5 x 20mm; Littlefuse series 217, 0217004.MXP or equivalent.

The Cobra 2DT Fiber Optic Camera Interface for Digital Triax Camera System Base Unit is equipped with a single cartridge fuse located on the internal printed circuit board. The fuse supplied is a fast acting 1.25 Ampere fuse – 5 x 20mm; Littlefuse series 217, 02171.25MXP or equivalent

NEVER operate either Cobra 2DT Fiber Optic Camera Interface Base Unit or Camera Unit without a properly installed and rated fuse. Severe electrical and heat damage could result as well as personal injury or death.

For additional information regarding fuses or guidance regarding replacement of fuses please contact Telecast Fiber Systems service at (508) 754-4858.

1.3. Unpacking the Cobra 2DT Fiber Optic Camera Interface

Please consult your packing slip and purchase order to insure that you have received all of the expected Telecast Fiber Systems components.

Inspect all components for scratches and other mechanical damage, and inspect the electrical connectors for bent or damaged pins and latches. Report any missing or damaged components to Telecast Fiber Systems, Inc. See the following section regarding product returns.

Leave the protective caps on the optical connectors whenever the fiber is disconnected.

1.4. Product Returns

In the unlikely event of damage to your Cobra 2DT Fiber Optic Camera Interface during shipping or delivery please note the damage with the delivery or shipping service and document the packaging and product where you see damage. If any component does not work correctly out of the box please contact Telecast Fiber Systems service at (508) 754-4858.

If the problem cannot be remedied through a service telephone call an RMA (Return of Merchandise Authorization) will be issued and you will receive an RMA number. Please note this RMA number inside and outside of all shipping boxes and on all documentation provided with the items to be returned.

Chapter 2. – System Overview

This chapter covers the following:

1) Fiber Optic Cable Overview

2) Cobra 2DT Fiber Optic Camera Interface concepts

2.1. Fiber Cable Overview

Fiber Optics and Fiber Optic Cable are the core technologies at the heart of the Telecast Fiber Systems Cobra 2DT Fiber Optic Camera Interface System. The ability to multiplex and de-multiplex a variety of video, audio and data signals so that they can be carried over a thin strand of Fiber Optic cable for long distances enables the Cobra 2DT. The Cobra 2DT can be used with Single Mode Tactical Fiber with ST Connectors or with a variety of industry standard Fiber Optic connectors. The specific theory and operation of Fiber Optics is beyond the scope of this document.

Single Mode Fiber Optic Cable

The typical Cobra 2DT implementation will use Tactical Fiber Optic Cable containing two or more optical fiber stands. The following diagram is for purposes of illustration only.

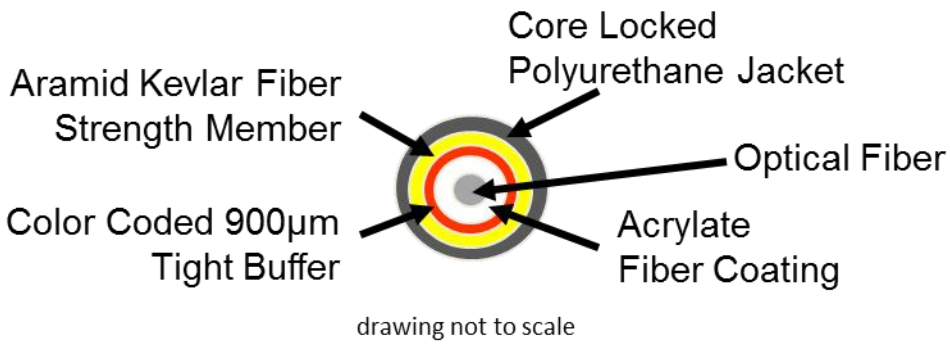


Figure 1 - Single Mode Fiber Optic Cable Cross-Section (Illustrative Only)

Fiber Optic Connector Types

The Cobra 2DT can be equipped with a variety of Fiber Optic Connectors and with a choice of three industry standard Triaxial connectors. The standard Cobra 2DT comes with two ST connectors. For other options see below and Appendix NNN for ordering information.

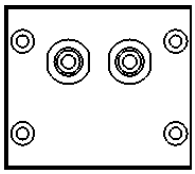
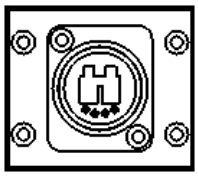
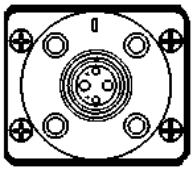
		The Fiber Optic Connector must be selected at time of order.		
ST Cable Connectors	ST Panel Connectors		OpticalCON Cable	OpticalCON Panel
				
LC Connectors	SMPTE 304M Cable	SMPTE 304M Panel	MX Expanded Beam Cable	MX Expanded Beam Panel

Figure 2 - Fiber Optic Connectors

Triaxial Connector Types

The Cobra 2DT should be ordered with Triax connectors that match your existing Camera/CCU.

		
Kings Tri-Loc	Fischer	Damar-Hargen

Figure 3- Triaxial Connector Types

2.2. Cobra 2DT Fiber Optic Camera Interface Concepts

The Cobra 2DT Fiber Optic Camera Interface permits use of fiber cable to extend the link between a high definition "digital triax" camera and the associated camera control units (CCU's). The initial product release of the Cobra 2DT is compatible with the Sony HXC100 and HSC300.

The Cobra 2DT system uses a pair of fiber optic transceivers that convert the camera and CCU's digital RF signals to optical signals, transmitting them on a fiber cable, using one or two strands to deliver all of the bidirectional video, audio, intercom and camera control signals between the camera and base station. Signal strength meters provide real-time status at each end of the link.

The Cobra 2DT handles the following signals:

- High-Definition Digital Video
- Return video & Genlock
- Audio, intercom & IFB
- Control data & tally

The camera chain can be extended to over 40 kilometers (24.85 miles) using existing infrastructure or “dark fiber” fiber optic cable.

The Cobra 2DT Camera Interface Unit operates at 100-240VAC, 50/60Hz power and provides power to the camera by reinserting power up to 300 meters (1000’) of triax cable, depending on camera/CCU model. The Base Unit is powered from the camera chain's CCU. One or two of the base units can be configured into a single 1RU rack-mountable enclosure.

Optionally, up to eight camera chains can be multiplexed on to a single fiber strand using the Telecast TelePort System. Please contact Telecast Fiber or your local distributor for more information.

The following illustration shows one of a multitude of possible scenarios for the Cobra 2DT. This example shows a simple Camera to CCU extension using a set of Cobra 2DT units.

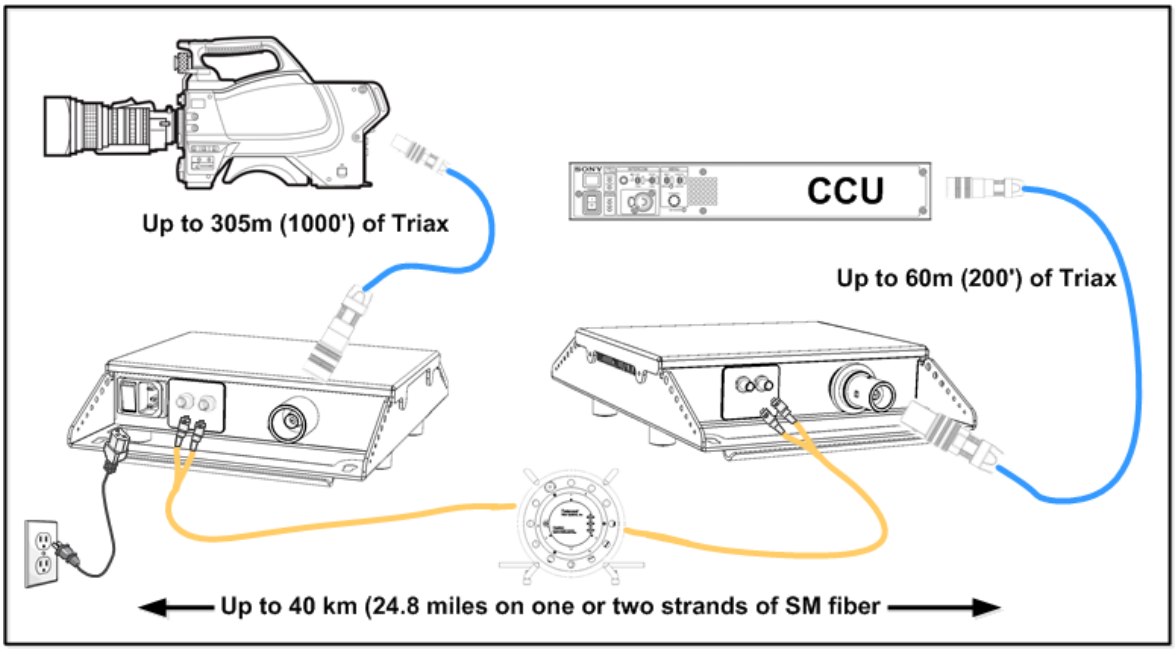


Figure 4 – Cobra 2DT Usage Example

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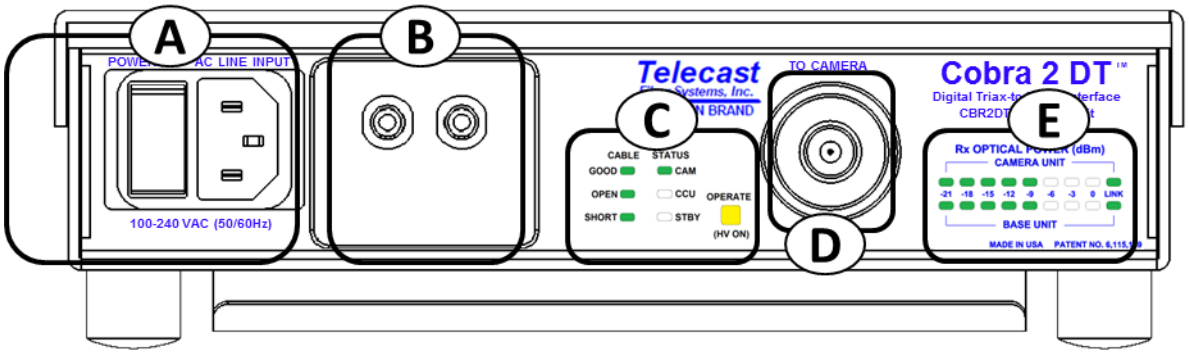
Chapter 3. Cobra 2DT Fiber Optic Camera Interface Components

The Cobra 2DT system consists of two units – the Camera Unit; the unit that is attached to the camera via triax cable and the Base Unit; the unit that is attached to the Camera Control Unit (CCU) via triax cable. All connections and system monitoring are on the front panel of both units. There are five areas of operational interest.



The Cobra 2DT Camera Unit operational areas:

A) Power Connection

B) Fiber Optic Connection(s)

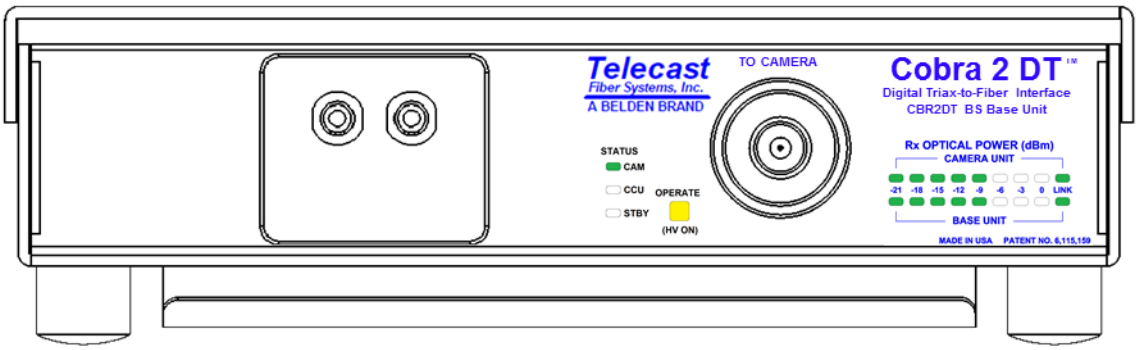
C) Cable and System Status Monitoring

D) Camera Connector

E) Optical Power/Link Monitoring

Each of these areas is described in detail below.

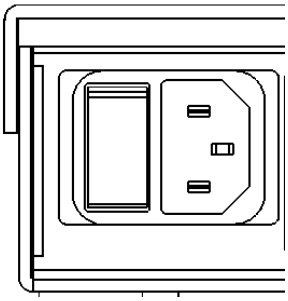
The Base Unit shares the same fiber and triax connectivity as well as status and optical monitoring indicators, but does not have a Power Connection and does not have Cable Status monitoring.



3.1. Cobra 2DT Fiber Optic Camera Interface Operational Areas

The Cobra 2DT Camera Interface has no user operated components. Once the units are connected and the Camera unit powered the user only has to monitor the various cable, system and Optical Power monitors provided by the system. All operational activity takes place at the Camera or the CCU.

Area A – Power Connection



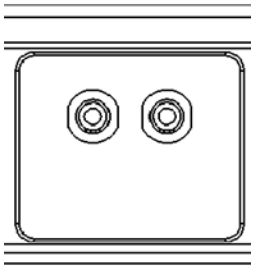
The Camera Unit requires 100-240VAC – 50/60Hz power.

A standard IEC power inlet receptacle is provided to connect the Camera Unit to AC line voltage.

The Cobra 2DT Camera Interface provides camera power with cable-check interlock which provides user safety. This means that the camera cable must be properly connected at both ends before power is applied.

Area B – Fiber Optic Connection

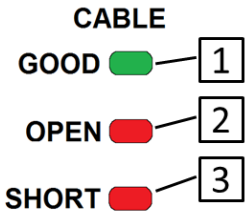
The Cobra 2DT Camera Interface can be supplied with a variety of five Fiber Optic Connector styles which must be specified at the time of order.



The example shown is a pair of ST connectors.

NEVER look into a powered Fiber Optic connection as eye damage could occur. Always keep the fiber optic connectors covered (regardless of type) when not in use. This is to prevent eye damage in case the laser is active and just as important to prevent dirt are damage to the connector which could degrade the signal quality.

Area C – Cable and System Status Monitoring

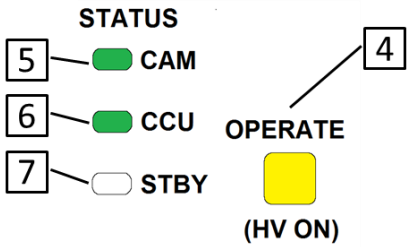


1) Indicator shows Green if Camera to Cobra 2DT Camera Interface cable connection is good

2) Indicator shows Red if there is any **open** condition in the Camera to Cobra 2DT Camera Interface cable. Under normal conditions this indicator is off

3) Indicator shows Red if there is any **short** condition in the Camera to Cobra 2DT Camera Interface cable. Under normal conditions this indicator is off.

Items 1 through 3 are only present on the Cobra 2DT Camera Interface Unit.



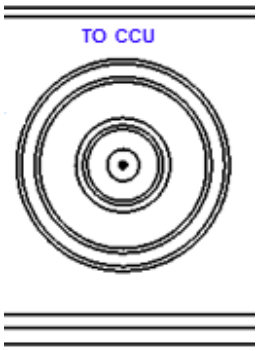
4) Indicator shows Yellow when the camera operating voltage is turned on and after all cable interconnect and camera communication conditions for both ends of the system have been properly established

5) Indicator shows Green if the Cobra 2DT Camera Interface Unit is connected to the camera and all cable interconnect and camera communication conditions have been properly established

6) Indicator shows Green if the Cobra 2DT Base Unit is connected to the CCU and all cable interconnect and CCU communication conditions have been properly established

7) Indicator shows Green only when the camera is switched to standby and all cable interconnect and camera communication conditions for both ends of the system have been properly established. turns off when camera power is switched on.

Area D – Camera or Camera Control Unit Connector



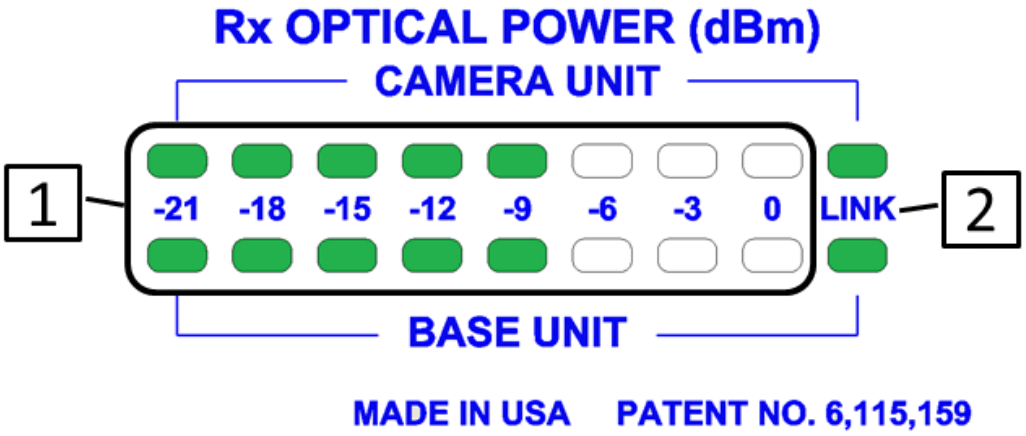
The Cobra 2DT Camera Interface can be equipped with one of three Triax connector types. The proper type for your system must be specified at time of order.

The Cobra 2DT Camera Interface Base unit comes with a Male Triax connector and the Cobra 2DT Camera Interface Camera Unit comes with a Female Triax connector.

The Cobra 2DT Camera Interface system requires two Triax cables – one between the Camera and the Cobra 2DT Camera Interface Camera Unit and one between the CCU and the Cobra 2DT Camera Interface Base Unit. Both of these cables are end-user supplied.

Area E – Optical Power Monitoring

Both the Cobra 2DT Camera Interface Camera Unit and the Base unit provide Optical Power monitoring for both the Camera unit and the Base unit. The metering uses Multi-Colored LEDs with indicators covering a range of -21dBm to 0 dBm. The Cobra 2DT Camera Interface is specified to operate at Optical Power levels above -22dBm.



1) The Optical Power level at the Camera Unit is measured on the top row of LEDs across a range of -21 dBm to 0 dBm.

   The bottom row measures the Optical Power level at the Base Unit

2) The quality of the Fiber Optic Link between the Cobra 2DT Camera Interface Camera Unit and Base Unit is indicated by the LINK LED

   All of the indicator LEDs are multi-color:

   GREEN – Good power

   YELLOW ORANGE – Marginal power

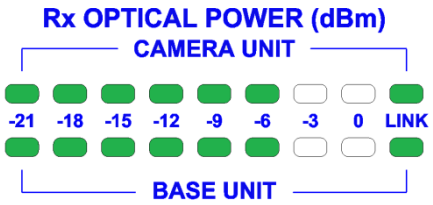
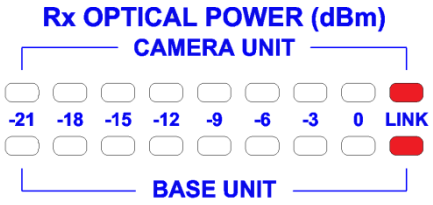
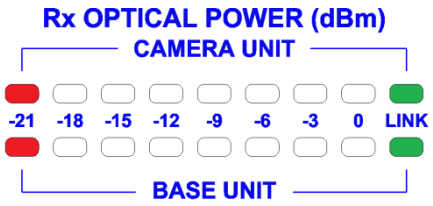
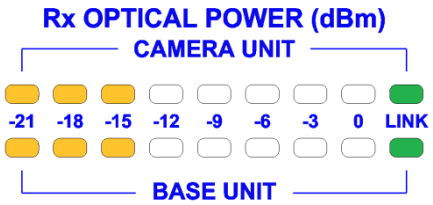
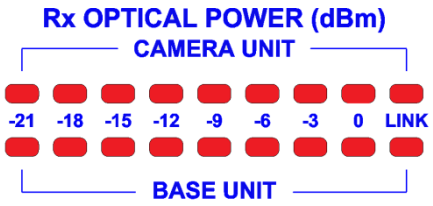
   RED – Insufficient power

   The practical application of these indicators is described on the next page.

NOTE: The Cobra 2DT is, of course, a digital system and therefore the link will operate properly at the lowest acceptable signal strength. If the signal strength dips below the minimum acceptable level the link will not operate.

Using the Cobra 2DT Camera Interface Optical Power Indicators

This section illustrates five operational scenarios in which the Optical Power Indicator LEDs and the Link LED provide a visual indication of the Cobra 2DT Camera Interface system status.

	This scenario is a good operational situation. The -6 dBm reflects typical signal strength across a Fiber Optic cable run. The Cobra 2DT Camera Interface will run perfectly at this signal strength.
	This scenario shows a bad Fiber Optic link and no Optical Power in either direction. Check to see if there is a problem with the Fiber Optic connection or cable.
	This scenario shows just enough Optical Power present to provide an operational link. Check the Fiber Optic cable run for possible damage or physical interference such as sharp bends in the cable. Also check the Fiber Optic connectors for dust, dirt or damage.
	This scenario shows low Optical Power but more than adequate for a usable link. Keep an eye on the reading to make sure it is consistent. Check the cable run as above and check the Fiber Optic connectors for dust, dirt or damage.
	This scenario indicates a signal overload and is applicable only to the high-power laser option available when ordering the Cobra 2DT. In this case the LEDs will flash red to indicate an overload condition. The unit may still function properly depending how severe the overload is, but operation is not guaranteed

Chapter 4. Cobra 2DT Fiber Optic Camera Interface Operation

This chapter describes in the operation of Cobra 2DT. Please keep in mind that once the system is properly set up and configured there is very little to do during normal operation.

The following topics are covered:

1) Managing and Connecting the Fiber Cable

2) Hints on Standard Operation

3) Troubleshooting

4.1. Managing and Connecting the Fiber Cable

This section provides an overview of managing and connecting the Fiber Optic Cable between the two Cobra 2DT units.

	**Never look directly into the end of the optic fiber while either end of the system is operating. Eye damage can result!**
	Always use cable connector caps when the cables are not connected. This protects the connector from damage and the unlikely event of exposure to an operating optical link. Keeping the caps in place when the connectors are not in use will prevent dirt and dust from entering the connector and degrading the performance of the optical link.

It is important that you do an initial setup and test of your Cobra 2DT Fiber Optic Camera Interface System as soon as you receive it in order to confirm proper operation and to provide training to you and your team prior to an actual production.

It is highly recommended that you do not attempt to power up the system until all connections are made and in particular the Fiber Optic Cable has been connected at both ends and the Camera has been connected to the Cobra 2DT Camera Interface Camera Unit. If you need to power up the Cobra 2DT unit make sure that the Fiber Connectors are securely capped. This will protect them from damage or dirt and protect you from eye damage.

Deploying the Fiber Cable

Successful connection and management of the Fiber Cable between the Cobra 2DT and other equipment requires you to perform four tasks:

1. Plan the route the Fiber Cable will take between the two Cobra 2DT units
2. Run the Fiber Cable along the planned route
3. Connect the Fiber Cable Connectors at each end
4. Power up the Cobra 2DT and check the Fiber Optic Cable Link by means of the Optical Power Meter. Check the Link at both the Camera and CCU locations.

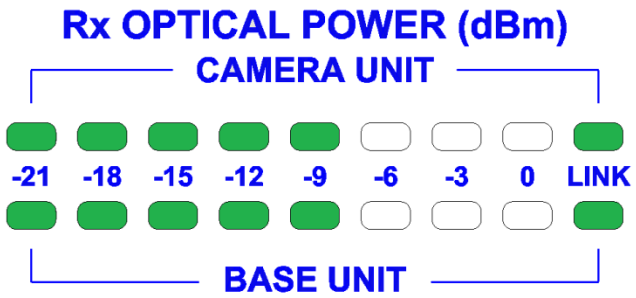


Figure 5 - Optical Power Indicator

Planning the Fiber Cable Route

Obviously the longer the planned cable run the more planning required. When planning your cable route take into the consideration the following:

1. Possible obstacles that might cause you to run short of cable – you may need to take a more indirect, but achievable route
2. Possible hazards to the cable – while tactical fiber is extremely durable it is not immune to damage. An obvious hazard is running the cable across a lawn scheduled to be cut during your live production. Make sure the empty roadway at 6AM will not be filled with heavy equipment when it comes time to retrieve your cable
3. Possible interference (physical) with the cable that might cause it to bend or kink to an extent that unacceptable signal loss occurs.
4. Safety hazards – make sure that the cable will not cause a tripping or tangling hazard with people, animals or vehicles.
5. Decide whether the Fiber Cable is to be unspooled from the Camera location or the CCU location. If one end of the cable may need to move during the production than it makes sense to place the spool at that location. Make sure there is enough free cable coming out of the stationary end of the cable reel to accommodate a well-managed connection to the first connection.

Planning the cable route requires common sense and the ability to foresee the unforeseen.

Running the Fiber Cable

Do the following when running your Fiber Cable:

1. Make sure that both ends of the Fiber Cable are securely capped. In this case the concern is dirt and damage. ANY dirt in the connector can adversely affect Fiber Optical performance and potentially cause you to lose the use of your camera while the problem is diagnosed and remedied.

2. If the cable run is long or if you will lose sight of the spooling out cable reel make sure you have appropriate assistance in running out the cable. When retrieving the cable, assistance to prevent the cable end from being caught or tangled up could be critical. Don't start reeling in the cable on your own and assume the Connector end will make it back to home base safely.

3. When unspooling the cable ALWAYS make sure the stationary end is securely contained within the reel. A loose Connector can bang around and be damaged and NEVER connect the stationary end of the Fiber Cable to the local equipment and then start unspooling the Fiber Cable. Servere damage to the cable could occur due to extreme spiraling of the connected portion of the cable.

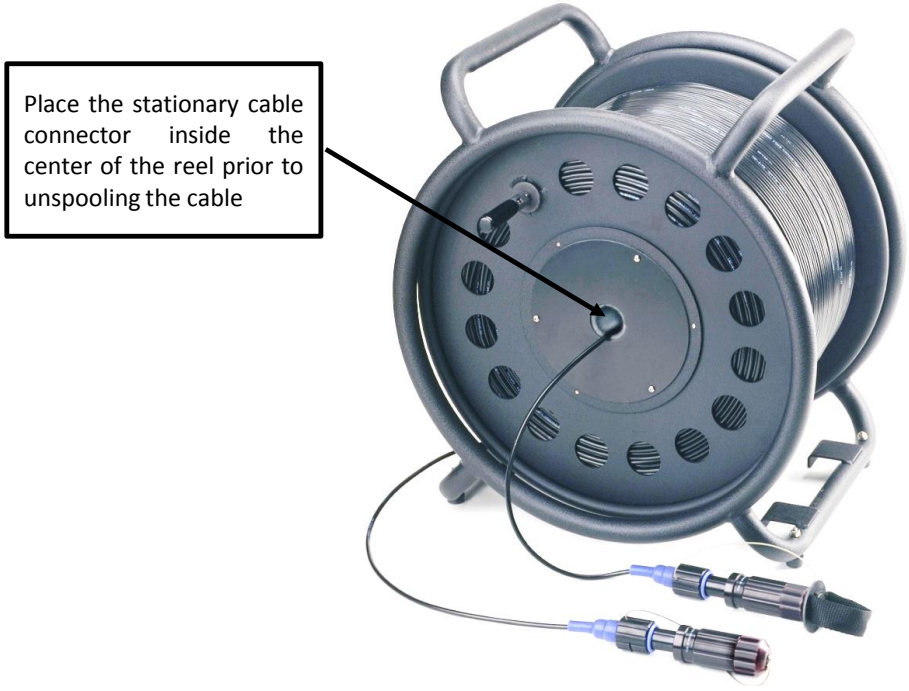


Figure 6 - Fiber Cable Reel

4. Prior to connecting the Fiber Connectors to the Cobra 2DT, inspect both the Input and output Connectors. If required, clean with dry compressed air or with technical wipes that have been moistened with isopropyl alcohol. Fingerprints or other dirt on the optical connector end surfaces will reduce the optical signal level on the fiber. If the connectors have been properly capped during storage and movement you will not likely have a problem. However if a connector has been dropped or dragged through dirt or exposed to dust cleaning is recommended.

5. Once the Fiber Cable has been connected it is time to secure the Fiber Cable run. Make sure there are no cable hazards in the run. Secure the cable with Cable Guards and/or Gaffers tape to insure safety.

6. Now the system can be powered on. Plugging in Fiber Cable connectors with the power on will not damage the system but is not recommended because of the chance of possible eye damage.

7. When re-spooling the Fiber Cable on to the spool guide it across the entire width of the spool so that it winds evenly and the possibility of cinching or kinks is greatly reduced.

4.2. Standard Operation

The section is devoted to a number of "Best Practices" for use of the Cobra 2DT Fiber Optic Camera Interface System. Specific information on how to operate the system has been presented in the sections above.

1. Take the possibility of Laser Eye damage seriously. It is not likely but you don't want to be the one-in-a-million case.
2. Protect the Fiber Optic Cable and the Fiber Optic Connectors. **Always** keep these capped unless they are being connected.
3. Read the section on planning the Fiber Run – it may come in handy – Page 21.
4. Make sure that the Cobra 2DT unit is secure and cannot be inadvertently moved or kicked about. Mounting the unit to a wall, the floor, a nearby pole or simply a piece of plywood using the mounting holes on the unit can insure safe and continuous operation.

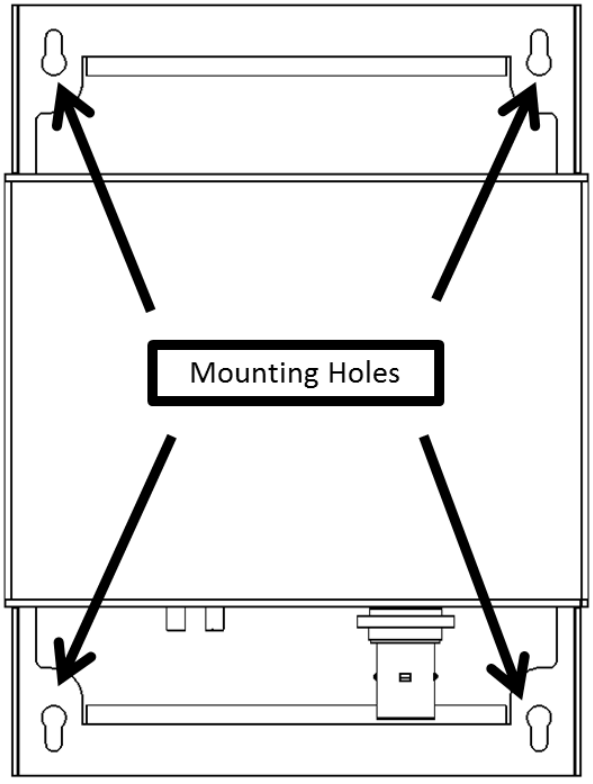


Figure 7 - Cobra 2DT Bottom Place with Mounting Holes

5. Once the system is set up and running, do not ignore the Optical Power monitor on the Cobra 2DT. The system is, of course, digital and so the Signal Strength is either just good enough or usually much better than that. When it is no longer strong enough the signal stops.
6. Be as careful during System tear down as during setup.

4.3. Troubleshooting

Troubleshooting any technical issues with the Cobra 2DT Fiber Optic Camera Interface System is similar to any piece of television production gear with the obvious exception of the core Fiber Optic technology. Here is a list of things to look out for and check – some of them obvious but sometimes forgotten.

1. Check the camera chain itself without the Cobra DT2 system to ensure it is operating normally.
2. Check all your cables – and broken connections or bad connectors?
3. Check your power – is the Power Supply working or if using an external battery – is it charged?
4. If there is a power problem, check the fuses.
5. If you cannot resolve the problem in the field please contact Telecast Fiber support at 508-754-4858

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Appendix 1. Ordering Information

The Cobra 2DT unit must be order with a part number specifying the following parameters:

1 – Overall Product Series

2 – Camera Make

3 – Camera or CCU Version

4 – Enclosure Type – Mini-Mussell Shell or Rack Unit

5 – Number of Units – Mini-Mussell Shell is always 1 unit, Rack Unit can be 1 or 2

6 – Fiber Connector Type

7 – Triax Connector Type

The following table lists the choices for each part number parameter:

Item	Parameter	Designation	Description
1	Series	CBR2	Cobra 2D Triax-to-Fiber
2	Camera Make	S1	Sony HSC/HXC
3	Camera or CCU	CA	Camera End
		BS	CCU End
4	Enclosure	MS	Mussell Shell
		RM	1 RU Rack Mount
5	Number of Units	1	Single
		2	Dual CCU End (Rack Mount Only) 2 in BS-RM only)
6	Fiber Connector	S2	2 ST Connectors
		S1	1 ST Connector (WDM)
		L2	2 LC Connectors
		OC2	OpticalCON Connector (Dry)
		MX	MX Connector
		304	SMPTE 204M Connector (Dry)
7	Triax Connector	F	Fischer
		KG	Kings
		DH	Damar-Hagen

Table 1 - Cobra 2DT Part Parameter Ordering Information

Typical Model Part Numbers

Model Number	Model Description
CBR2-S1-CA-MS-1-S2-F	Cobra2D, Model S1 (Sony HSC/HXC chains), Camera End, single Mussel Shell enc., fiber: 2 ST connectors, Fischer triax con.
CBR2-S1-BS-MS-1-S2-F	Cobra2D, Model S1 (Sony HSC/HXC chains), CCU end, single Mussel Shell enc., fiber: 2 ST connectors, Fischer triax con.
CBR2-S1-BS-RM-1-S2-F	Cobra2D, Model S1 (Sony HSC/HXC chains), CCU end, single 1 RU rack mount enc., fiber: 2 ST connectors, Fischer triax con.
CBR2-S1-BS-RM-2-S2-F	Cobra2D, Model S1 (Sony HSC/HXC chains), CCU end, dual CCU 1 RU rack mount enc., fiber: 2 ST connectors, Fischer triax con.

Appendix 2. Specifications

Transmission

Data Rate.....2.97 Gb/s
Optical Source.....Laser Diode
Fiber Type.....Single Mode
Optical Output Power (typical).....-7 dBm
Optional High Power Version……..…..0dBm
Optical Sensitivity (typical).....>-21 dBm
Link Margin/Distance (typical).....20 dB/40 km (typ.)

Wavelength (from camera/to camera)
2-fiber version……1310/1310nm
1-fiber version……...1310/1550 nm
Input/Output Impedance.....75 Ω
Available in 1-fiber or 2-fiber versions

Mechanical/Environmental

Throw Down Mussel Shell:
(LxWxH).....12" x 9" x 2.5"

1 RU Base Unit:
(single or double (LxWxH)).....12" x 18" x 1.5"

Weight, Camera End.....4.6 lbs.
Weight, Base Station End (throwdown).....3.6 lbs.
Weight Base Station End (1RU unit):
single/double.....4 lbs./7 lbs.

Mechanical/Environmental (continued)

Connectors:

Triaxial connector.....Kings Tri-Loc, Fischer, Damar Hagen

Optical.....ST Single Mode (standard), ST(Single), ST(Dual), 304M(Dry), MX, Neutrik. OpticalCON, LC

Input Voltage.....100 VAC to 240 VAC, 45-65Hz

Output Voltage to Camera:

Standby.....36VDC+/-10%

Operate.....180VDC+/-10%

Triaxial range, Cobra DT2 Camera Unit to Camera, typical.....300 meters

Cobra DT2 Base Unit to CCU typical…..……60 meters

Power Consumption :

Base Unit.....<10 Watts

Camera Unit:

(excluding camera power).....<30 Watts

Temperature Range, operating.....-40 C to +55 C

Humidity Range.....0 to 95% non-condensing

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