



## *Terrapin FTR-D6*

**3GB/s Fiber Transceiver with 6 – Output D.A.**

### **User Manual**

Telecast Fiber Systems, Inc.

324 Clark Street

Worcester, MA 01606

Tel: 508-754-4858

Fax: 508-752-1520

[www.telecast-fiber.com](http://www.telecast-fiber.com)

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## About this User Guide

This Terrapin FTR-D6 Fiber Transceiver is delivered in a single standard model. The one option is the addition of an external battery power capability. This manual covers standard operation as well as the installation and use of the external battery option.

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 Terrapin FTR-D6 Fiber Transceiver safely and properly.
	Useful information regarding the User Guide and the Terrapin FTR-D6 Fiber Transceiver. Reading and understanding this information will make using the manual and the product easier.

# Chapter 1. Important Information

## 1.1. Warranty

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

### **1.3. Unpacking and the Terrapin FTR-D6 Fiber Transceiver**

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 Terrapin FTR-D6 Fiber Transceiver 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.



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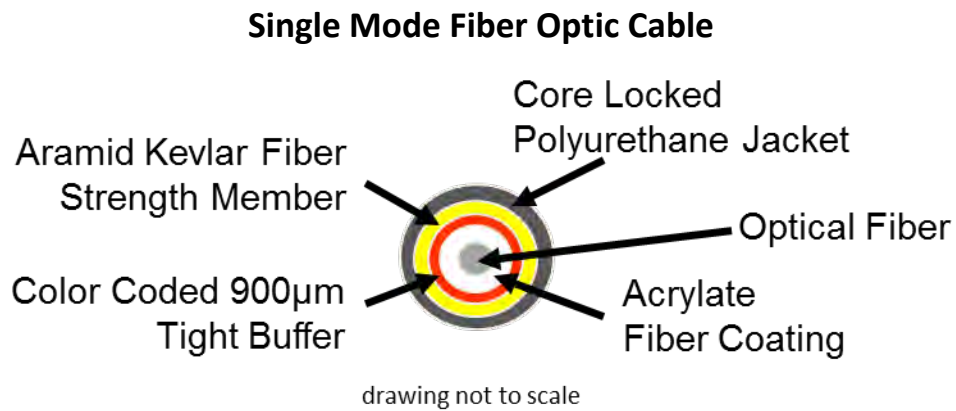
## Chapter 2. – System Overview

This chapter covers the following:

- 1) Fiber Optic Cable Overview
- 2) Terrapin FTR-D6 Fiber Transceiver concepts

### 2.1. Fiber Cable Overview

Fiber Optics and Fiber Optic Cable are the core technologies at the heart of the Telecast Fiber Systems Terrapin FTR-D6 Fiber Transceiver 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 Terrapin FTR-D6. The specific theory and operation of Fiber Optics is beyond the scope of this document.



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

## 2.2. Terrapin FTR-D6 Fiber Transceiver Concepts

The Terrapin FTR-D6 provides the features of a fiber optic digital video transmitter, a fiber optic digital video receiver, plus a six-output digital video distribution amplifier in a single unit.

The transceiver handles a wide range of digital video rates. Supported formats include:

- 3 Gb/s HD/SDI: SMPTE 424M (reclocked)
- 1.5 Gb/s HD/SDI: SMPTE 292M (reclocked)
- 540 Mb/s: SMPTE 344M
- 270 Mb/s DVB/ASI (reclocked)
- 143 Mb/s: SMPTE 259M
- 19.4 Mb/s ATSC: SMPTE 310M
- AES and MADI Audio
- Plus non-standard digital signals to 3 Gb/s

The unit is interoperable with industry standard optical HD/SDI signals to/from other equipment, such as Telecast Rattler™, Python™, TelePort™, Telethon™, and Viper™ series frames and modules, as well as other manufacturers' routers, DAs, etc.

The Terrapin FTR-D6 accepts a 75 ohm coaxial input on a BNC or an optical signal on an ST connector up to 3Gb/s, or both at the same time. The unit's output can also be applied to the BNC's, fiber on an ST connector, or both at the same time.

The Terrapin FTR-D6 operates in one of four modes. The mode is set by using a single push-button that allows the choice of the following:

1. Fiber optic transmitter with six BNC outputs of the digital video signal
2. Fiber optic repeater with six BNC outputs of the received digital video signal
3. Fiber optic receiver with six BNC outputs and Fiber optic transmitter of a separate digital video signal
4. Fiber optic repeater and local digital video D.A.

Colored LEDs on the top of the Terrapin FTR-D6 unit show the current mode with easy-to-understand arrows indicating signal flow of the copper and optical signals.

The Terrapin FTR-D6 can be used in “throw down” mode with an external AC power supply or with the optional external battery mounted to the Terrapin unit. Screw holes are provided on the unit to allow the Terrapin FTR-D6 to be attached to any suitable surface.

The following illustration shows one of a multitude of possible uses for the Terrapin FTR-D6. This example shows a remote truck operating at a stadium where a series of Terrapin FTR-D6 units are chained together by looping fiber feeds. Each Terrapin FTR-D6 is capable of providing a BNC signal to six destinations.

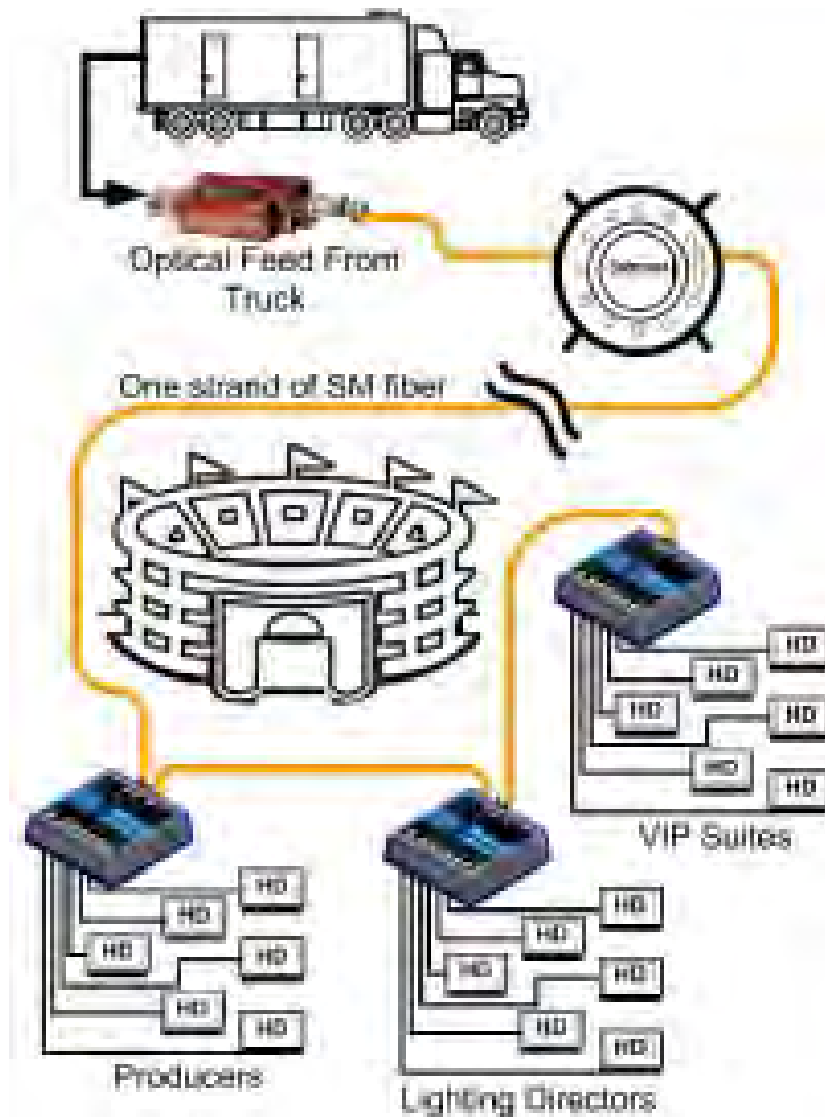


Figure 2 - Terrapin Usage Example [need replacement/update]

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## Chapter 3. Terrapin FTR-D6 Fiber Transceiver Components

The Terrapin FTR-D6 has three areas of operational interest:

1. The top panel – see below
2. The Fiber I/O and Power panel – see Page 17
3. The “Copper” BNC I/O panel – see Page 18

### Terrapin FTR-D6 Fiber Transceiver Top Panel

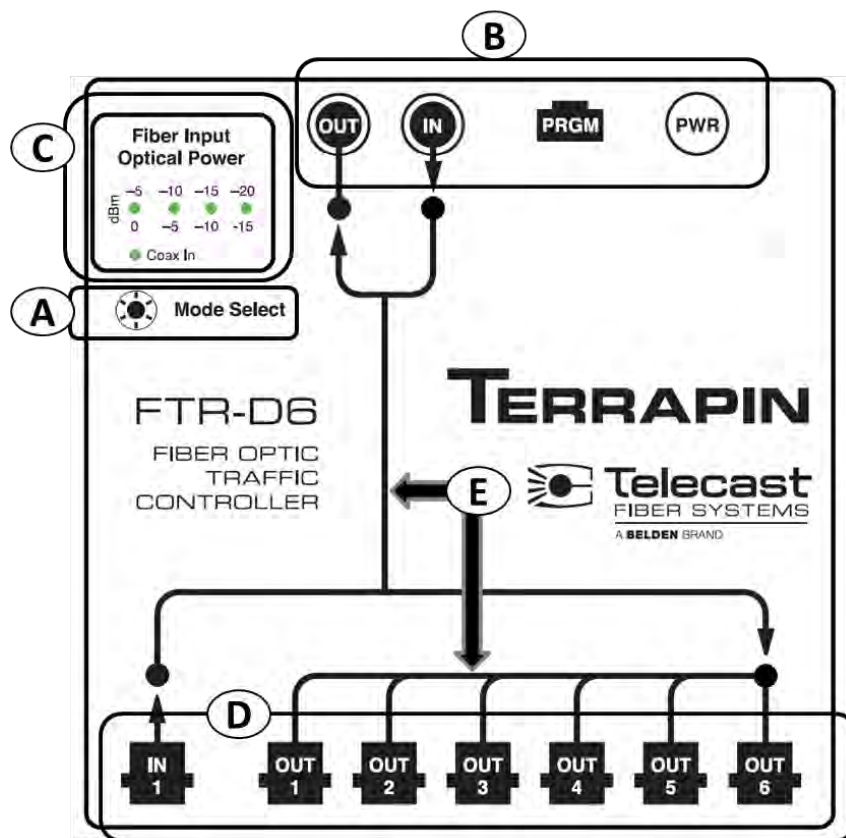


Figure 3 –Terrapin FTR-D6 Fiber Transceiver Top Panel

The Terrapin FTR-D6 Fiber Transceiver Top Panel has five areas of interest:

- A) Mode Select Switch - See Page 14
- B) The Fiber and Power labels – the fiber and power panel is not labeled so use these labels as your guide to the connectors - See Page 15
- C) Fiber Input Optical Power Meter - See Page 15
- D) The SDI BNC Connector labels – the BNC connector panel is not labeled so use these labels as your guide to the connectors - See Page 16
- E) The LED mode indicators - See Page 16

## Mode Select Switch Operation

The mode select switch allows the selection of one of the four operating modes available with the Terrapin FTR-D6.

To select a mode you must do the following:



### Mode Select

1. Hold the Mode Select switch down for four seconds.
2. Observe the flashing LED arrows to determine the current operating mode and if you want to change the mode, push the switch once. The Terrapin FTR-D6 will advance to the next mode. Keep pushing the switch until you reach the desired mode. As you cycle through the modes the LEDs will change to indicate the active signal path.
3. When the desired mode is reached release the switch and after four seconds the Terrapin FTR-D6 is programmed to the selected mode.

NOTE: If you pass by the desired mode you must cycle through the various modes until you get to the one you want. The Terrapin FTR-D6 will retain the last set mode when powered off.

For more information on the four modes please see Chapter 4.

## The Fiber and Power Labels



The Fiber and Power Labels serve two functions. These are the labels for the connectors directly below the labels on the end panel of the Terrapin FTR-D6. The In and Out labels also serve as indicators/end points for the LED signal path indicators.

The LED function is described on Page 16 and the physical connectors are described on Page 17.

## Fiber Input Optical Power Meter

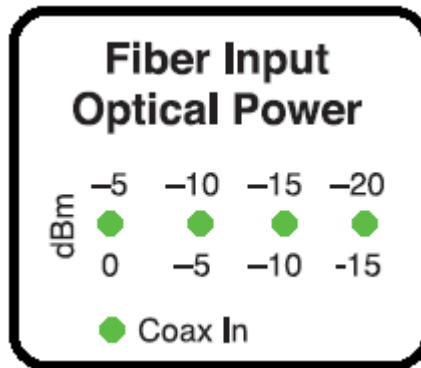


Figure 4 - Fiber Input Optical Power Meter

The Fiber Input Optical Power Meter serves two functions.

1. The dBm scale indicates the relative strength of any Fiber Optic signal connected to the Terrapin FTR-D6 unit. The meter covers a range of 0 dBm to -20dBm in 5 dBm increments. The strongest signal is 0 dBm. The Terrapin FTR-D6 is specified to work down to a signal strength of -20 dBm.

If these indicators fluctuate during operation the system will continue to work. However if there is a fall of signal strength below -20dBm the Terrapin FTR-D6 may not continue to pass the Fiber Optic signal.

2. The Coax In indicator is a simple on/off indication that an SDI signal has been connected to the BNC Input of the Terrapin FTR-D6.

## The SDI BNC Connector labels





The SDI BNC Power Labels serve two functions. These are the labels for the connectors directly below the labels on the BNC end panel of the Terrapin FTR-D6. The In and Out labels also serve as indicators/end points for the LED signal path indicators.

The physical connectors are described on Page NN.

### The LED Mode Indicators

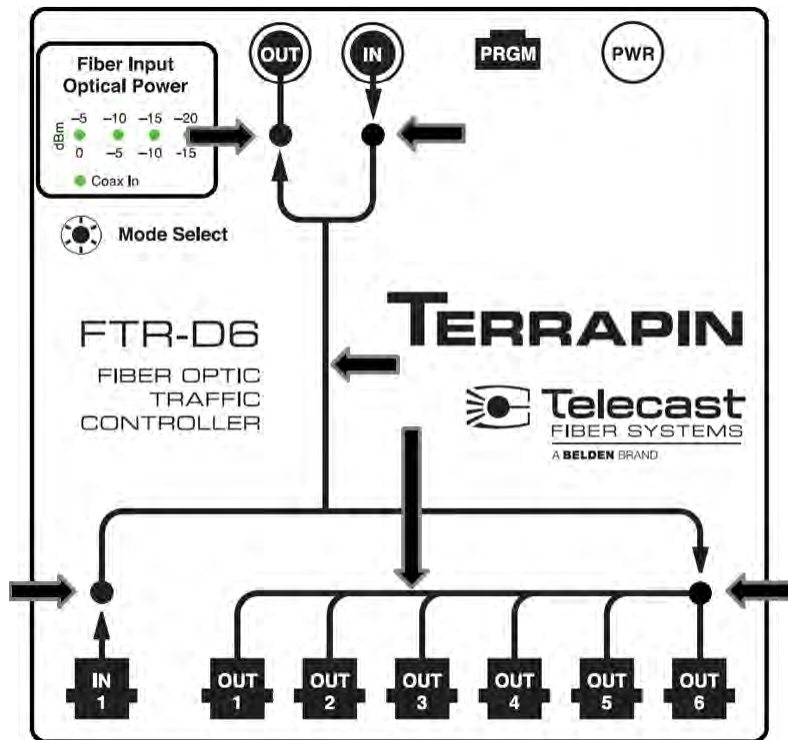
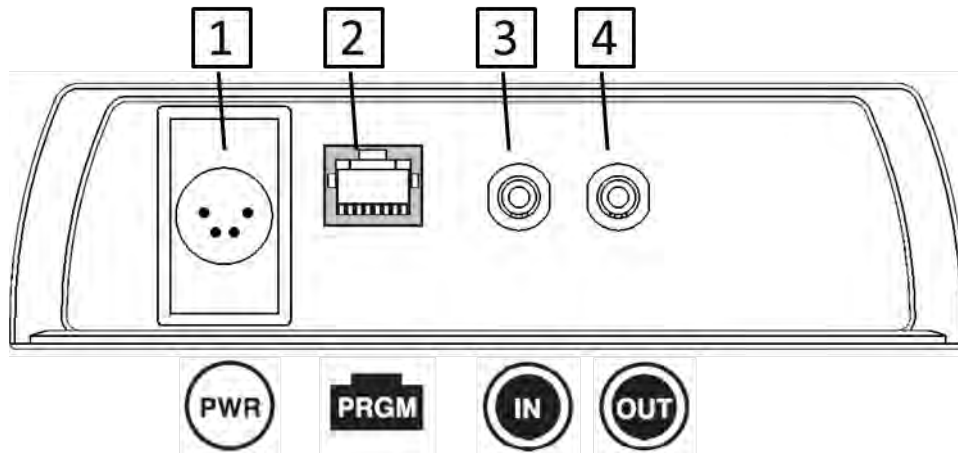


Figure 5 - LED Mode Indicators

The Terrapin FTR-D6 uses a two-color LED system to indicate the various operating modes of the system. The Fiber input and output and the SDI input and outputs each have an endpoint LED indicator and all signal paths are indicated by LEDs. The operation of the LED indicators is described beginning on Page 18.

### The Fiber I/O and Power panel

The Terrapin FTR-D6 Fiber I/O and Power panel has four connectors. Each function corresponds to the label indicated on the top panel of the unit.



**Figure 6 - Fiber I/O and Power Panel**

1. The Power Connector is a 4-pin XLR type connector that takes a nominal 12V power supply. The supplied power supply is the Telecast ADAP-AC-02-X with X being the specific geographic region covered. See Appendix 3 for ordering information.

The unit can also be powered by the optional External Battery option which allows the use of an Anton-Bauer or “V-Mount” type battery. This option is described in Appendix 1.

2. The Terrapin FTR-D6 is equipped with an RJ45 data connector. This allows for future firmware changes or upgrades. As of this printing this connector has only a maintenance function.
3. Fiber Optic ST Connector for Single Mode Fiber signal input.
4. Fiber Optic ST Connector for Single Mode Fiber signal output for transmitting the connected BNC input or for re-transmitting the Fiber Optic signal received on the Fiber signal input (connector #3).

Please see Appendix 2 for a list of all supported signal types.

## The “Copper” BNC I/O Panel

The Terrapin FTR-D6 BNC I/O end panel has seven connectors. Each function corresponds to the label indicated on the top panel of the unit.

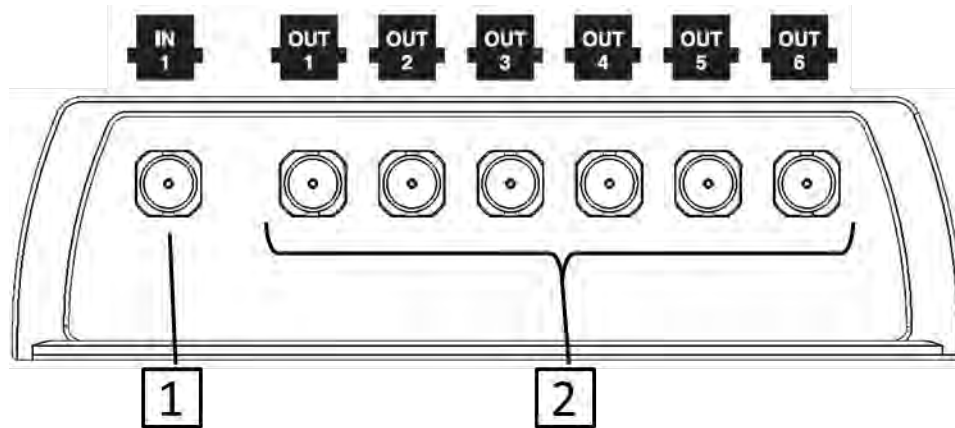


Figure 7 - BNC I/O Panel

1. Input BNC connector. The Terrapin FTR-D6 accepts any digital signal from 19.2 Mb/s to 3 Gb/s, including many non-standard. Please see Appendix 2 for a list of supported signal types.
2. Output BNC Connectors. Each output delivers an identical copy of the input signal whether from the BNC Input (connector #1) or from the Fiber Optic input connection – depending on the operating mode. Standard 270Mb/s, 1.5Gb/s & 3Gb/s signals are reclocked.

## Chapter 4. Terrapin FTR-D6 Operating Modes & LED Indicators

The Terrapin FTR-D6 has four operating modes as described above. To review these modes are:

1. Fiber optic transmitter with six BNC outputs of the digital video signal  
*The digital signal input to the BNC is distributed from the 6 digital signal (BNC) outputs and transmitted from the Fiber Optic output.*
2. Fiber optic repeater with six BNC outputs of the received digital video signal  
*The Fiber Optic input is re-transmitted out of the Fiber Optic output and also distributed from the 6 digital signal (BNC) outputs.*
3. Fiber optic receiver with six BNC outputs and Fiber optic transmitter of a separate digital video signal.  
*The Fiber Optic input is distributed from the 6 digital signal (BNC) outputs while a separate BNC input is sent to the Fiber optic output*
4. Fiber optic repeater and local digital video distribution  
*The Fiber Optic signal is re-transmitted and boosted out of the Fiber Optic Output while an input to the Digital signal BNC is distributed to the 6 digital signal outputs*

When the Terrapin FTR-D6 is set in a particular mode, LED indicators on the top panel show the signal type and direction. Digital signals input to the BNC connector are designated in Blue while Fiber Optic sourced signals are designated in Orange.

Digital from BNC



From Fiber Optic



### Terrapin FTR-D6 Input/Out Status Depends on Mode

Please see the diagrams following for a visual explanation of each Terrapin FTR-D6 operating mode.

Operating Mode	Fiber Optic Input	Fiber Optic Output	BNC Input	BNC Output
Mode 1	Inactive	Signal 1	Signal 1	Signal 1
Mode 2	Signal 1	Signal 1	Inactive	Signal 1
Mode 3	Signal 1	Signal 2	Signal 2	Signal 1
Mode 4	Signal 1	Signal 1	Signal 2	Signal 2

**Table 1 - Input/Output Status and Mode**

# Terrapin FTR-D6 Mode 1 - Fiber Optic Transmitter with Six BNC Outputs of the Digital Video Signal

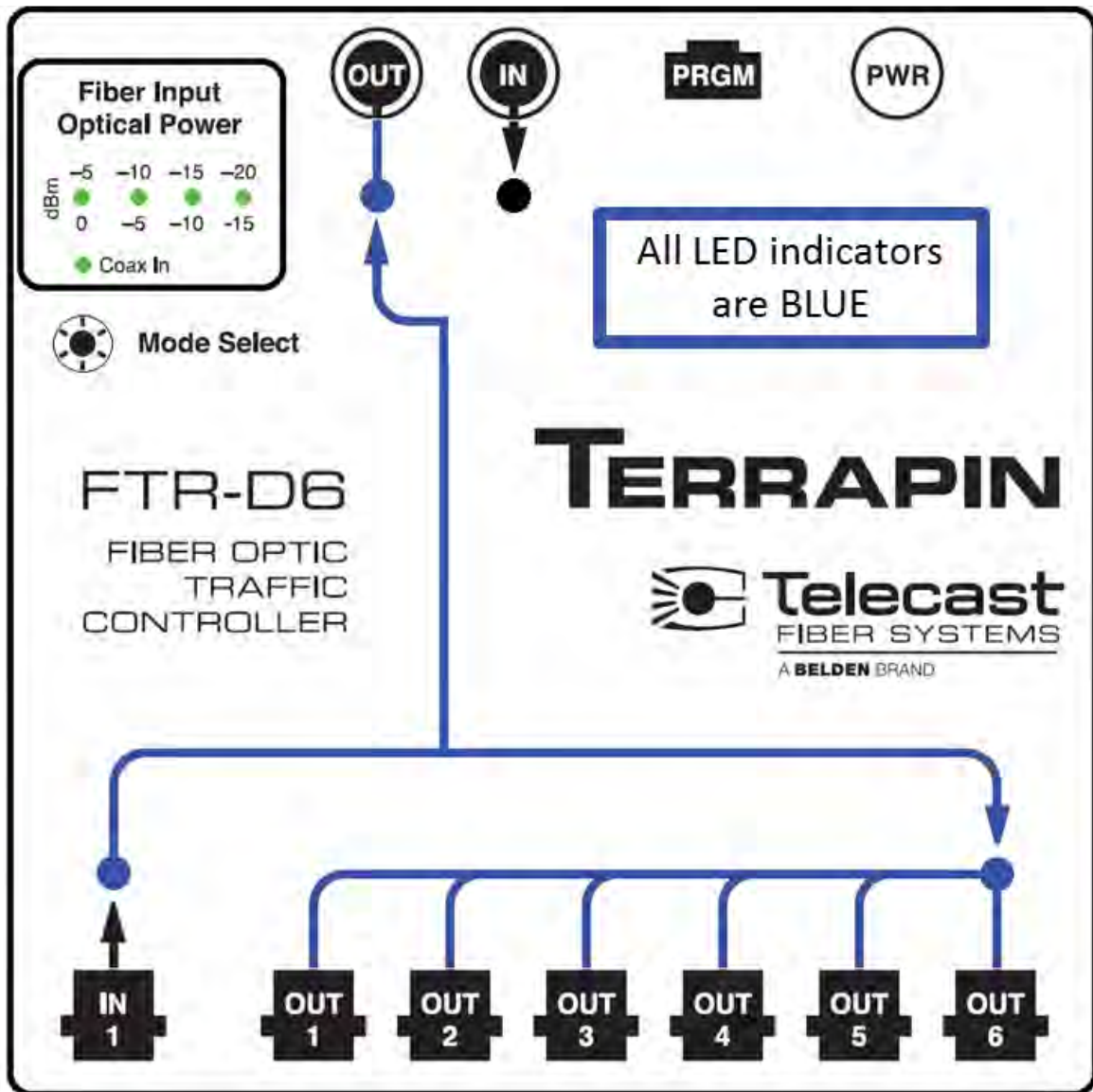
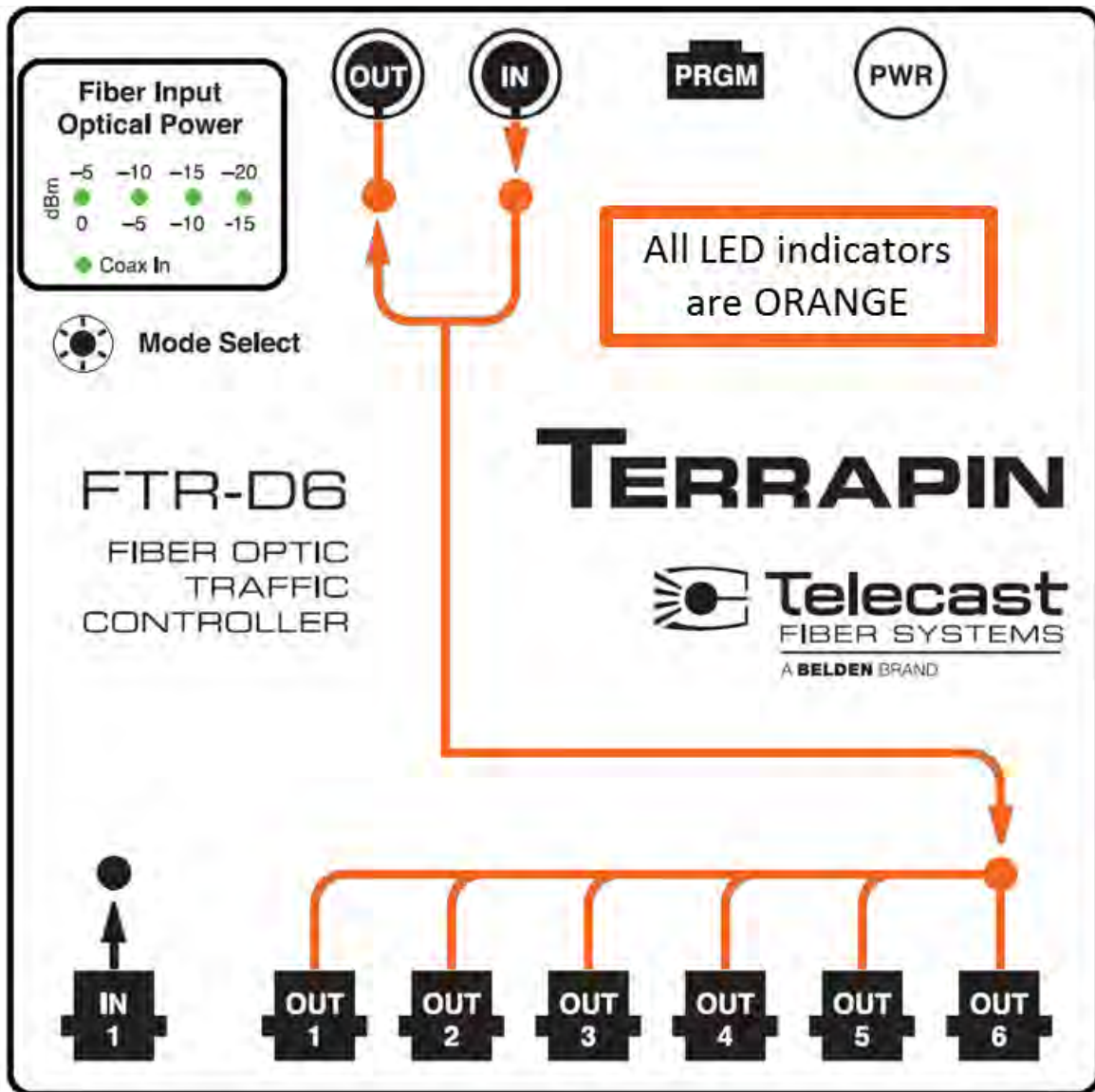


Figure 8 - Terrapin FTR-D6 Mode 1 - Fiber Optic Transmitter with Six BNC Outputs of the Digital Video Signal

**Terrapin FTR-D6 Mode 2 - Fiber Optic Repeater with Six BNC Outputs of the Received Digital Video Signal**



**Figure 9 - Terrapin FTR-D6 Mode 2 - Fiber Optic Repeater with Six BNC Outputs of the Received Digital Video Signal**

**Terrapin FTR-D6 Mode 3 - Fiber Optic Receiver with Six BNC Outputs & Fiber Optic Transmitter of A Separate Digital Video Signal**

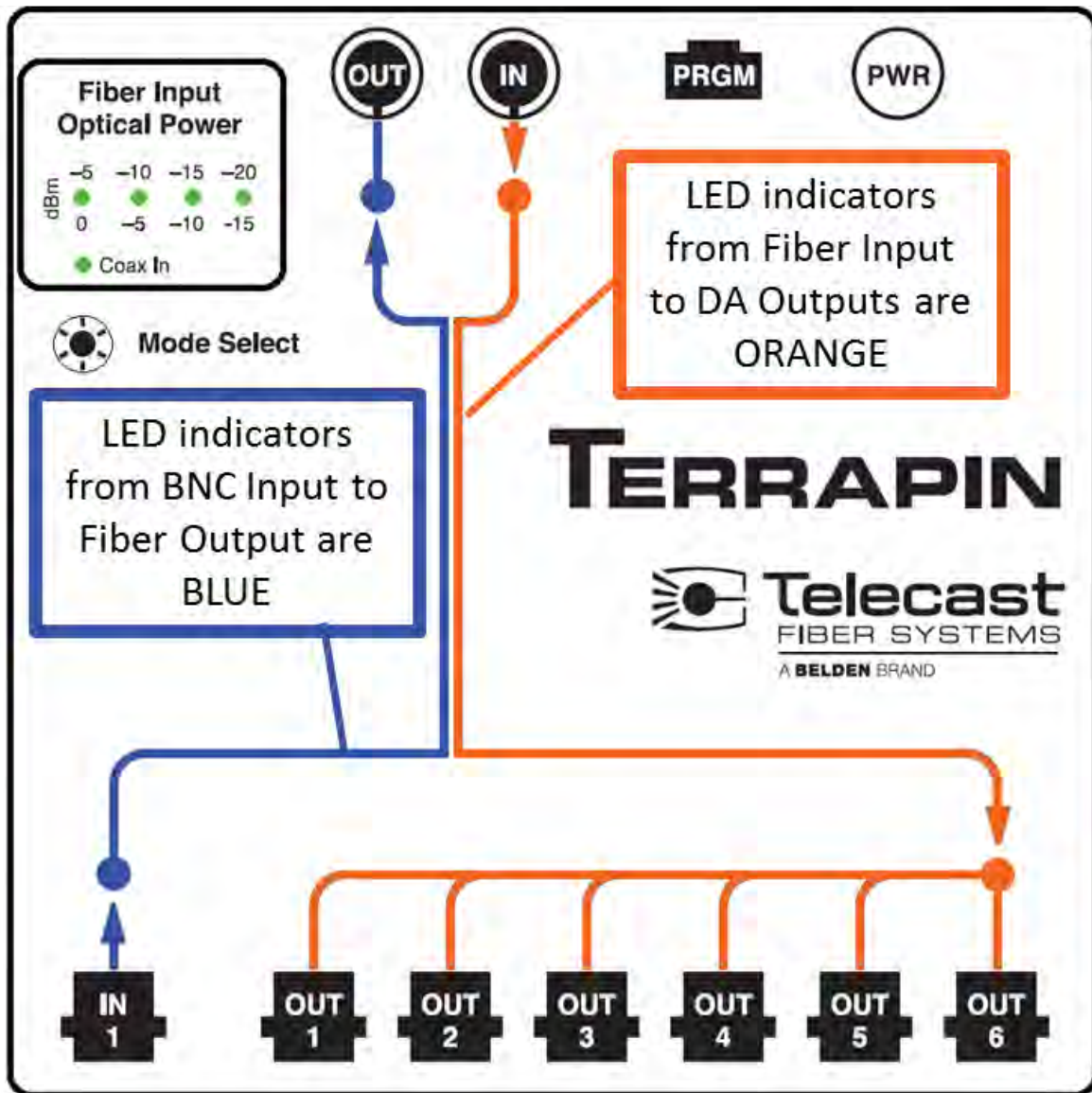


Figure 10 - Terrapin FTR-D6 Mode 3 - Fiber Optic Receiver with Six BNC Outputs & Fiber Optic Transmitter of A Separate Digital Video Signal

# Terrapin FTR-D6 Mode 4 - Fiber Optic Repeater & Local Digital Video DA

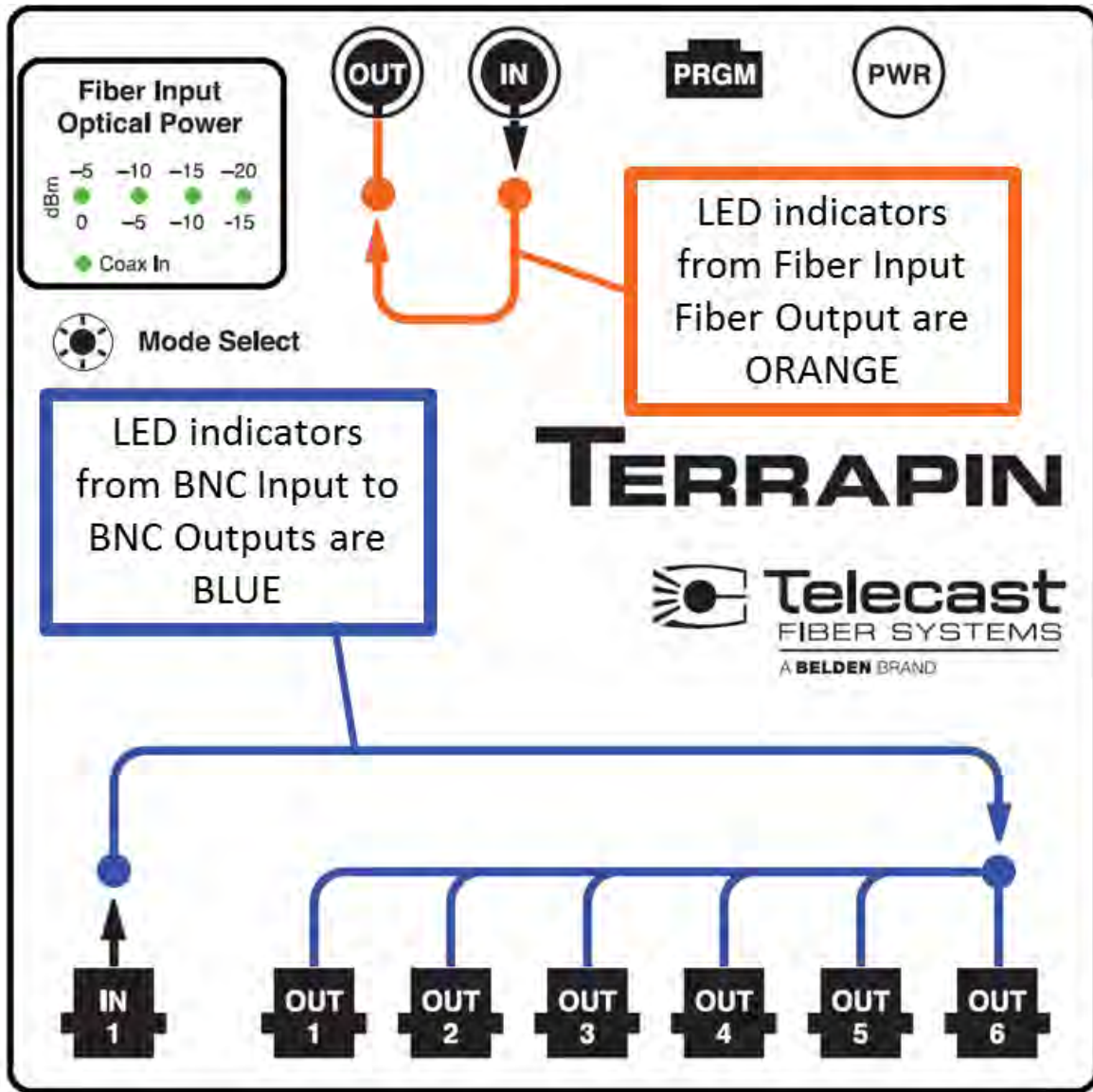


Figure 11 - Terrapin FTR-D6 Mode 4 - Fiber Optic Repeater & Local Digital Video DA



## Telecast Fiber ADAP Power Supplies

The Terrapin FTR--D6 Fiber Transceiver requires a power supply providing 5-16 volts at 1.5 Amps. The power supply shipped with the unit is the Telecast Fiber ADAP-AC-02 X (X being the specific geography required). Any power supply meeting the required specification and providing power through an XLR-4 Female connector can be used. [ is this correct?]



REPLACE PICTURE WITH THAT OF ADAP-AC-02

### Telecast Fiber Part Number ADAP-AC-04

Supplied with 4PIN XLR/A4F connector for power plug on Mussell Shell unit



Figure 12 - Telecast Power Supply

## Chapter 5. Terrapin FTR-D6 Fiber Transceiver Operation


This chapter describes the operation of the Terrapin FTR-D6. 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

### 5.1. Managing and Connecting the Fiber Cable

This section provides an overview of managing and connecting the Fiber Optic Cable between the Terrapin FTR-D6 and the Fiber Optic source and/or destination. Keep in mind that in all operating modes except for Mode 1 (Transmit a Digital Video Signal), you will have two Fiber Optic runs to manage.

	<b>Never look directly into the end of the optic fiber while either end of the system is operating. Eye damage can result!</b>
	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 Terrapin FTR-D6 Fiber Transceiver 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. If you need to power up the Terrapin FTR-D6 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 Terrapin FTR-D6 and other equipment requires you to perform four tasks:

1. Plan the route the Fiber Cable will take between the Terrapin FTR-D6 and the equipment to be connected
2. Run the Fiber Cable along the planned route
3. Connect the Fiber Cable Connectors at each end
4. Power up the Terrapin FTR-D6 and check the Fiber Optic Cable Link by means of the Fiber Input Optical Power Meter for the incoming Fiber Optic feed. For Fiber Optic output from the Terrapin FTR-D6 you will need to check link strength at the receiving end of the Fiber Optic cable.

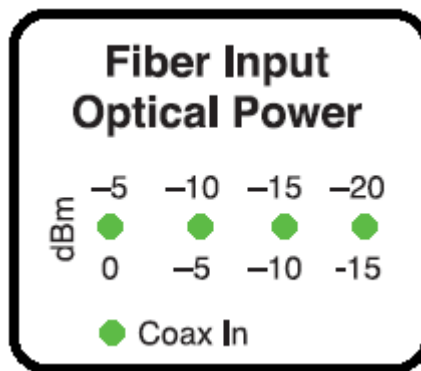


Figure 13 - Fiber Input Optical Power Indicator

## Planning the Fiber Cable Route

Obviously the longer the planned cable run the more planning required. When planning your cable route, give careful consideration to 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 physical interference 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 Signal Source of the Terrapin FTR-D6 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. Severe damage to the cable could occur due to extreme spiraling of the connected portion of the cable.

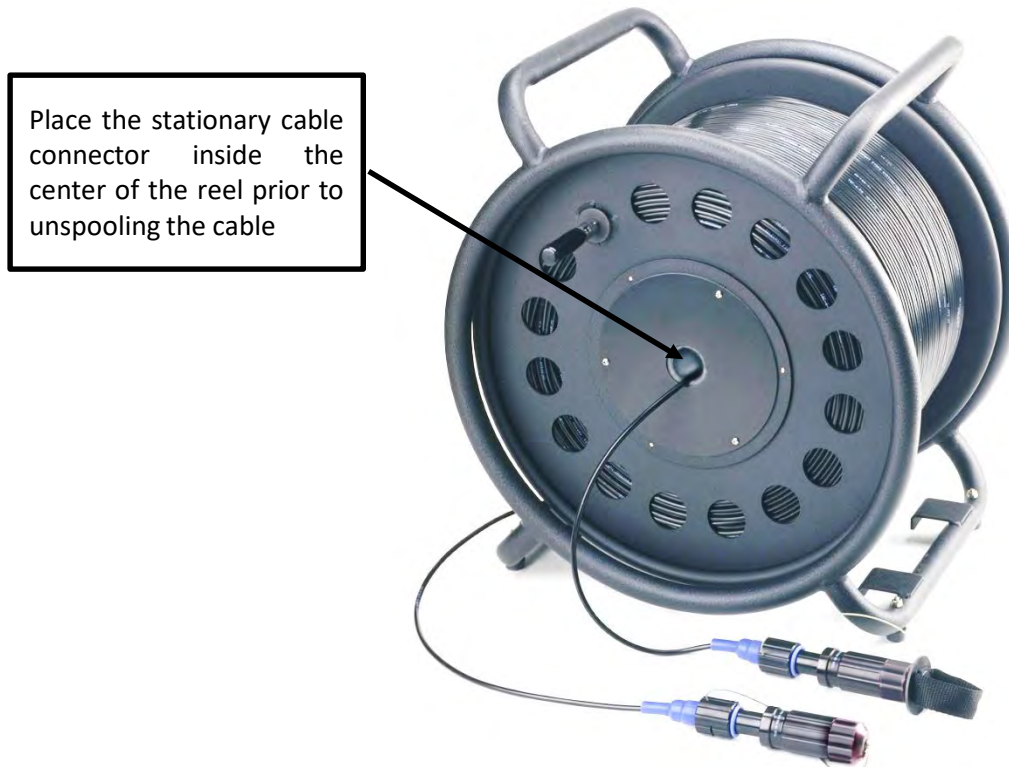


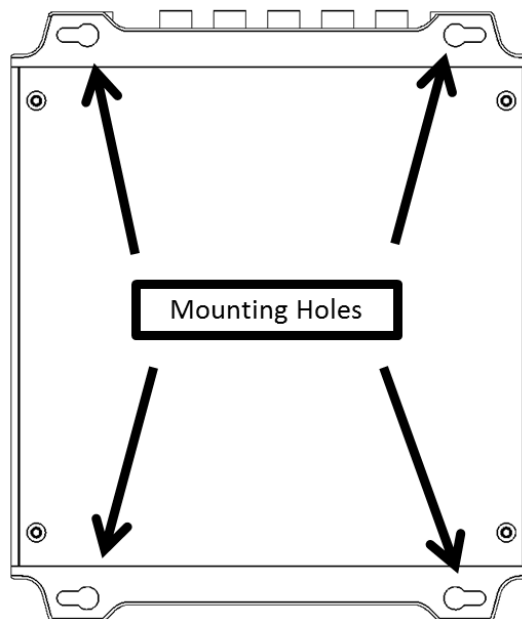
Figure 14 - Fiber Cable Reel

4. Prior to connecting the Fiber Connectors to the Terrapin FTR-D6 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.

## 5.2. Standard Operation

This section is devoted to a number of “Best Practices” for use of the Terrapin FTR-D6 Fiber Transceiver 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 there are being connected.
3. Read the section on planning the Fiber Run – it may come in handy – Page 28.
4. Make sure that the Terrapin FTR-D6 unit is secure and cannot be inadvertently moved or kicked about. Mounting the unit to a wall, the floor or simply a piece of plywood using the mounting holes on the unit can insure safe and continuous operation.



**Figure 15 - Terrapin FTR-D6 Bottom Plate with Mounting Holes**

5. Once the system is set up and running, do not ignore the Fiber Input Optical Power monitor on the Terrapin FTR-D6. 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.

### 5.3. Troubleshooting

Troubleshooting any technical issues with the Terrapin FTR-D6 Fiber Transceiver 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 all your cables – any broken connections or bad connectors?
2. Check your power – is the Power Supply working; or if using an external battery – is it charged?
3. If there is a power problem, check the fuses.
  1. Is the Terrapin FTR-D6 unit in the correct operating mode for the operation you need?
  2. The Terrapin FTR-D6 will indicate a fault by blinking LEDs in the Fiber Input Optical Power section of the top panel. The blinking will occur at one second intervals.

Faults indicated may be too high operating temperature or possibly that the reclocking function is not working correctly. The unit may continue to operate with too high a temperature, but you should do something to cool the unit. If the reclocking is not working properly, it will adversely affect the output.

3. If you cannot resolve the problem in the field please contact Telecast Fiber support at 508-754-4858



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## Appendix 1. Installing and Using the External Battery Operation

The Terrapin FTR-D6 can be operated using the optional external battery adaptor plate and battery mount. Please see Appendix 3 for ordering information. Contact your Telecast Fiber Dealer or Telecast Fiber, Inc. directly for more information.

The external power option consists of a replacement bottom plate for the Terrapin FTR-D6 and one of two external battery mounting units. When ordering the external battery option select between the Anton-Bauer battery mounting plate or the V-Mount battery mounting plate.

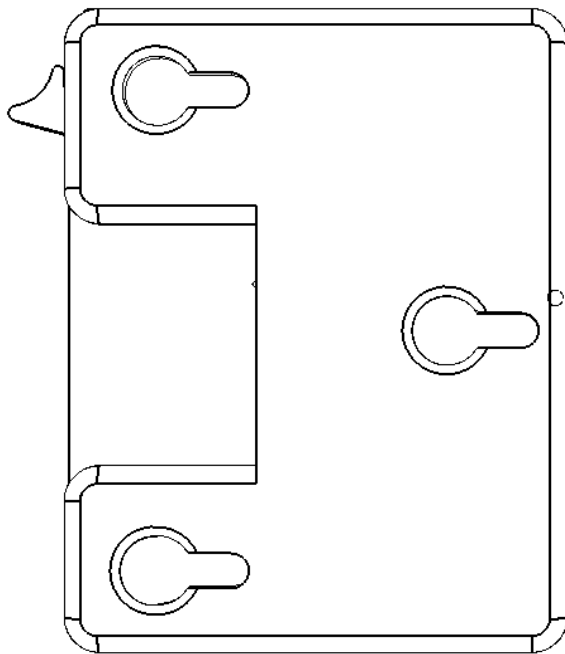


Figure 16 - Anton-Bauer Battery Mounting Plate  
[ADD PART #]

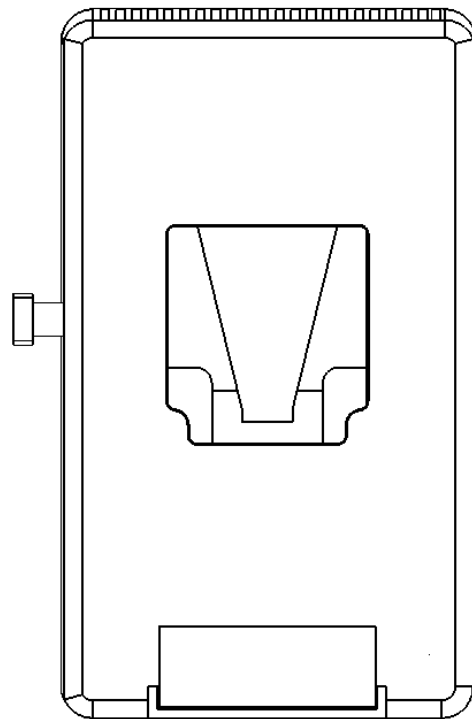
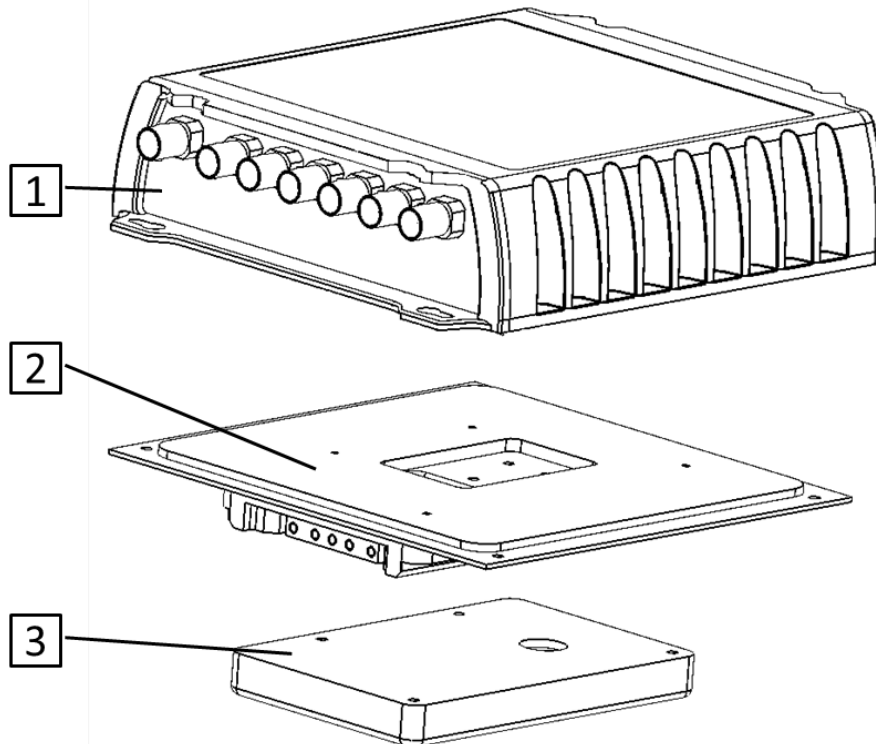


Figure 17 - V-Mount Battery Mounting Plate  
[ADD PART #]



**Figure 18 - External Battery Plate Components**

The external battery plate is a field installable option.

1. Unscrew the existing blank bottom plate from the Terrapin FTR-D6 unit (1). Retain the mounting screws for re-use.
2. Mount the Battery Mount (3) to the External Power bottom plate (2) making sure to pass the connector through the intended aperture and to not pinch the connector cable between the two pieces [do we need illustration of which aperture to use?]
3. Connect the Battery Mount connector to the plug indicated in the illustration below:

NEED PHOTO ILLUSTRATION OF INTERALS OF Terrapin FTR-D6 SHOWING CONNECTION POINT FOR EXTERNAL BATTERY MOUNTING PLATE

**Figure 19 - Connecting the External Battery Mounting Plate (PLACEHOLDER)**

4. Carefully position the now connected bottom plate on to the Terrapin FTR-D6 being careful not to pinch the cable between the Terrapin FTR-D6 and the bottom plate.

5. Attach the bottom plate to the Terrapin FTR-D6 unit using the retaining screws set aside in Step 1 above.

The External Battery option is now ready for use. Attach a charged battery to the unit and confirm that the Terrapin FTR-D6 operates correctly. The Terrapin FTR-D6 can be operated in the following power modes:

1. AC power connected to the XLR
2. External Battery attached to the unit
3. Both AC Power connected and an External Battery attached to the unit. In this mode the unit will take power from both sources. Consider this method a way of providing a backup power source to the unit in critical situations.

Note that there is no on-board battery power metering in the Terrapin FTR-D6. You will need to use other means to track battery life of the external battery [is this correct?].

## Appendix 2. Signal Types Supported by Terrapin FTR-D6

The Terrapin FTR-D6 supports the following signal types as of May 15, 2012.

DESCRIPTION	USED FOR	STANDARD
3 Gb/s SMPTE 424M HD/SDI	HD/SDI Video	SMPTE 424M HD/SDI
1.5 Gbps SMPTE 292M HD/SDI	HD/SDI Video	SMPTE 292M HD/SDI
19.4 Mbps SMPTE 310M	Digital Video	SMPTE 310M
143 to 540 Mbps SMPTE 259M/344M	Digital Video	SMPTE 259M/344M
DVB/ASI 270Mb/s	Digital Video	DVB/ASI 270Mbps
AES and MADI Audio	Digital Audio	AES and MADI
Non-standard digital signals to 3 Gb/s	Other	User must determine if signal quality is sufficient.

**Table 2 -Supported Signal Types**

### Appendix 3. Ordering Information

Part Number	Description

**Table 3 - Terrapin FTR-D6 Ordering Information**

## Appendix 4. Specification (review for correctness)

<p><b>Transmission</b></p> <p>Operating Wavelength.....  1310, or 1270-1610 (CWDM)</p> <p>Coaxial video connectors in/out.....BNC</p> <p>Optical Connectors (2).....ST</p> <p>Optical Source Laser Diode  .....(FP or CWDM DFB)</p> <p>Optical detector.....PIN-TIA Diode</p> <p>Transmitter output.....-7 to +3 dBm</p> <p>Receiver sensitivity.....-20 dBm @ 3Gb/s</p> <p>Link Margin/Distance.....15-25 dB/20-50 km</p> <p>Fiber type.....single-mode or multimode (distance limited.)</p> <p><b>Video</b></p> <p>Transmission method.....Digital</p> <p>Input level.....800 mV (peak to peak)</p> <p>Input Impedance.....75 ohms</p> <p>Coax Equalization.....@ 2.97 Gb/s 100 meters</p> <p>Output Impedance.....75 ohms (x6)</p> <p>Bit-Error Rate.....<math>10^{-4}</math>(-20 dBm @ 3Gb/s)</p> <p>Jitter ( color bars).....<math>\leq 0.3</math> UI @ 3G, <math>\leq 2</math> UI @ 1.5G</p> <p>Rise/Fall Times.....&lt; 120 ps @ 1.5Gb/s and 3Gb/s, <math>\approx 600</math>ps @ 270Mb/s</p>	<p><b>Mechanical/Environmental</b></p> <p>Dimensions: (LxWxH).....5.9" x 6.2" x 1.7"</p> <p>Weight, each end.....14.4 oz.</p> <p>Input Voltage.....5-16 VDC</p> <p>Power connector plug.....XLR-4 pin</p> <p>Power Consumption (typ.).....4.4 watts</p> <p>Indicators.....Power, Signal, Link, Optical Power</p> <p>Temperature Range.....  Operating -25° C to +60°C</p> <p>Humidity Range.....  0 to 95%RH, non-condensing</p> <p>Certifications.....  FCC Part 15, RoHS, LEED, CE</p>
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What does **Each End** mean in regards to weight (line two of mechanical list)

Is there a **POWER** indicator (line 6 of mechanical list)? – There is no mention of this in any of the documentation