



PURE DIGITAL
FIBERLINK[®]

**Video with 2-Way Data
3800 Series**

USER'S MANUAL



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GENERAL INFORMATION

Introduction

The Pure Digital Fiberlink® 3800 series optical transmission system is a configurable, adjustment-free transceiver that employs digital processing and transmission techniques to convey 1-way video and bidirectional data signals. The system is available in both one fiber or two fiber versions.

The use of digital encoding assures high-quality noise-free transmissions that retain all of their initial parameters regardless of fiber optic cable attenuation. In addition, an integral indicator LED is provided on each unit to continuously signify the presence of an optical signal and thus, the proper operation of each side of the system.

Technical Specifications

Model Part Numbering Configurations:

Unit Type	1 Fiber Version	2 Fiber Version
Transmitter Box	3810-BXY	3820-BXY
Transmitter Card	3810-CXY	3820-CXY
Receiver Box	3811-BXY	3821-BXY
Receiver Card	3811-CXY	3821-CXY

X Values:

1 = 850 nm Multimode

3 = 1310 nm Multimode

7 = 1310 nm Single Mode

9 = 1550 nm Single Mode

Y Values:

S = ST connector

F = FCPC connector

Note: 850 nm one fiber version not available.

Data/PTZ:

Protocols Supported RS-232, RS-422, RS-485 2-wire, RS-485 4-wire

Data Rate DC to 115 Kb/s

Signal Connectors Removable terminal block

Video:

Bandwidth (-3 dB)	20 Hz to 8 MHz
Input/output Impedance	75 Ohms
Input/output Voltage	1 V p-p nom., 1.3Vp-p max.
Differential Phase	1° typical
Differential Gain	1.5% typical
Signal to Noise Ratio	60 dB CCIR weighted
Signal Connectors	BNC

Optical:

Operating Wavelength	850nm, 1310nm, 1550nm MM/SM
Optical Fiber	62.5/125microns MM or 8-10/125 microns SM
Optical Connectors	ST or FCPC

	1 Fiber	2 Fibers	1 Fiber	2 Fibers
Wavelength	Loss	Budget (in dB)	Distance* (in km)	
850 MM	N/A	0-18	N/A	0-2
1310 MM	0-10	0-15	0-5	0-15
1310 SM	0-19	0-20	0-45	0-50
1550 SM	11-26	11-28	40-65	35-90

**Note: Distance specifications are only approximate and are not guaranteed.
Operating loss budget must not be exceeded.*

Misc:

Operating Temperature Range	-35 to +75 degrees C
Operating Power	9 to 24 Volts AC or DC @ 8 watts (max)

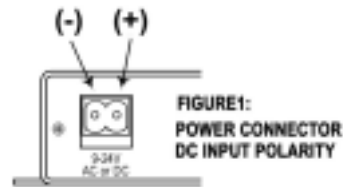
CAUTION! The transmitting element in some versions of the Pure Digital Fiber-link transceiver unit is a solid-state Laser Diode located in the optical connector on the unit. This device emits invisible infrared electromagnetic radiation which can be harmful to human eyes. The radiation from this optical connector, if viewed at close range without a fiber optic cable connected to the optical connector, may be of sufficient intensity to cause instantaneous damage to the retina of the eye. Direct viewing of this radiation should be avoided at all times.

INSTALLATION INSTRUCTIONS

Installation Procedure

The Pure Digital Fiberlink 3800 Series transmission systems are normally preset for immediate use with the data protocol set to RS-232. If a different protocol is desired, it can be easily selected using the flip switches located on the back panel of the unit. (See table on next page.) There are indicator LEDs on the units for monitoring purposes and various user selectable options for the various signals accommodated. The following instructions describe the typical installation procedure and the function of the LED indicators.

1. The various options, as already mentioned, have been preset, with data protocol set as RS-232. If RS-422 or RS-485 (2 or 4 wire) protocol is desired instead, please refer to instructions on the following page.
2. If connecting more than one Fiberlink unit on one line (daisy chaining) while in either RS-422 or RS-485 4-wire modes, you must set the unit to the RS-485 4-wire multidrop mode.
3. Connect the video source to the video input BNC connector on the transmitter unit.
4. Connect the video output BNC on the receiver unit to the coax cable BNC connector.
5. Connect the fiber optic cable or cables between the two units.
6. Apply power to both Pure Digital Fiberlink units. Refer to Figure 1 for DC power connections.
7. When power is applied, the green POWER LED will light, indicating the presence of operating power. The green LINK LED should also light, indicating the presence of a received optical signal. Note that the card-cage version will have a third red LED for indicating the presence of an alarm condition.



8. Connect the various input signals to the proper positions on the removable terminal blocks. Be certain to check all connections and assure that inputs and outputs are not intermixed. Refer to the next section for the various connections.
9. The system should now be operational.

NOTE: 3820 Card Only:

Optical 1 = Video/Data

Optical 2 = Data

System Switch Settings

The data interface circuit used in this product has external switches that are used to configure the various signal options. These are preset to RS-232 at the time of shipment. If changes are required, the positions of these switches must be changed in accordance with the following table.

Data Input/Output Plug-in

Switches 1,2,3,7,8,9 and 10 are used to select the desired protocol. Positions for these are as follows:

Protocol	1	2	3	7	8	9	10
RS-232	Off	Off	Off	Off	Off	Off	Off
RS-422/485 4-wire point-to-point	Off	On	Off	Off	Off	On	On
RS-485 2-wire auto xmit/receive	Off	On	On	On	On	On	Off
RS-485 4-wire multidrop	On	On	On	Off	Off	On	Off
RS-485 2-Wire Zero xmit/receive	On	On	Off	On	On	On	Off

Switches 4, 5 and 6 are used only in the RS-485 configurations to select the auto time interval that the unit will wait before switching back to the receive mode (tri-state). Refer to the table on the following page for switch positions.

This table refers only to RS-485 protocol.

Baud Rate	Time	4	5	6
2400	4.73 mS	On	Off	Off
4800	2.20 mS	On	On	Off
9600	1.10 mS	On	On	On
19.2K	620 uS	Off	On	Off
38.4K	300 uS	Off	On	On
57.6K	180 uS	Off	Off	On
76.8K	150 uS	Off	Off	Off

Switch position 9: When switch is on, then 120 Ohm termination is applied to data input.

Switch position 10: When switch is on, then 120 Ohm termination is applied to data output.

Note: Switch positions 11 and 12 are not used and should be left in the off position.

Alarm Switch	Position 1	Position 2	
(Rack card only)	On	not used	Alarm Enabled
	Off	not used	Alarm Disabled

System Terminal Block Connections

The various input and output connections for the Pure Digital Fiberlink 3800 Series system are as follows:

Video Input or Output: BNC Connectors

Data Input/Output Connector:

Data terminal block positions 1 through 6 can be used as data inputs or outputs, depending on the protocol selected.

RS-232

Position 2 Signal to be transmitted out over fiber

Position 4 Signal being received in from fiber

Position 1 Signal Common

RS-422

Position 2 Signal to be transmitted (+) out over fiber

Position 3 Signal to be transmitted (-) out over fiber

Position 4 Signal being received (+) in from fiber

Position 5 Signal being received (-) in from fiber

Position 1 Shield Ground

RS-485 4-Wire

Position 2 Signal to be transmitted (+) out over fiber

Position 3 Signal to be transmitted (-) out over fiber

Position 4 Signal being received (+) in over fiber

Position 5 Signal being received (-) in over fiber

Position 1 Shield Ground

RS-485 2-Wire

Position 2 Signal being transmitted or received (+) over fiber

Position 3 Signal being transmitted or received (-) over fiber

Position 1 Shield Ground

Indicator LEDs and Alarm Circuitry

The Pure Digital Fiberlink 3800 Series transmitters and receivers have integral indicator LEDs that monitor the state of the unit. Their status is as follows:

POWER (Tx & Rx): (Green) Indicates that correct power has been applied.

LINK (Tx):

- OFF:** Indicates no video detected on input BNC and no active data detected to or from transmitter unit.
- STEADY GREEN:** Indicates video detected on input BNC and no active data detected to or from transmitter unit
- ON BLINKING OFF:** Indicates video detected on input BNC and active data detected to or from transmitter unit.
- OFF BLINKING ON:** Indicates no video detected on input BNC and active data detected to or from transmitter unit.

LINK (Rx):

- OFF:** Indicates no video detected over fiber and, as a result, no video present on output BNC. No active data detected to or from receiver unit.
- STEADY GREEN:** Indicates video detected over fiber and, as a result, video present on output BNC. No active data detected to or from receiver unit.
- ON BLINKING OFF:** Indicates video detected over fiber and, as a result, video present on output BNC. Active data detected to or from receiver unit.
- OFF BLINKING ON:** Indicates no video detected over fiber and, as a result, no video present on output BNC. Active data detected to or from receiver unit.

ALARM (Tx & Rx): **ON:** Video present (Only on rack card version)
OFF: Video not present (Only on rack card version)

The card cage unit also provides an output to drive a model 6020 Alarm Sensing Module which provides an audible tone and activates a set of contacts for external signaling purposes.

OPERATING POINTERS AND TROUBLESHOOTING

OPTICAL FIBER: Versions of the Pure Digital Transmission System are available to operate with most multimode (MM) and single-mode (SM) optical fibers. Be certain that the correct size fiber is being used for the particular transmitter/receiver combination.

Also be certain that the attenuation and bandwidth of the fiber optic cable being used is within the range of the system's loss budget specifications.

GENERAL: The status of any of the LINK indicator LED should provide the first clue as to the origin of any operation failure. If this LED is off it usually means that the fiber is broken or has too much attenuation.

Next, be certain that the input and output signal connections are proper. Due to the number of positions, it is possible that there may be wrong connections.

Finally, although multimode and single mode devices may look the same, they will not operate properly together. Using the wrong device or fiber can easily add more attenuation than specified, resulting in poor overall performance.

DATA CIRCUIT: Even when installed exactly as directed, it is possible that the data function may fail to operate properly when using the Fiberlink units in either the RS-485 2-wire auto xmit/receive mode or the RS-485 4-wire

multidrop mode. If this problem occurs, it may be that your units are attempting to interface with other manufacturers' products that have resting states opposite to the way in which the Fiberlink units are programmed. (No standard exists.) You can compensate for this condition by simply switching the polarities of the (+) and (-) pins. To do this, first swap the Tx (+) and Tx (-) pins with one another and then do the same for the Rx (+) and Rx (-) pins. Make sure to do this on both the transmitter and receiver units.

If, after reviewing the above possibilities, the system is still not operating, please contact the Customer Service Department for further assistance

MAINTENANCE

The Pure Digital Fiberlink 3800 Series transmission units have been manufactured using the latest semiconductor devices and techniques that electronic technology has to offer. They have been designed for long, reliable, and trouble free service and are not normally field repairable. Should difficulty be encountered, Communications Specialties maintains a complete service facility to render accurate, timely and reliable service of all products.

The only maintenance that can be provided by the user is to ascertain that optical connectors are free of dust or dirt that could interfere with light transmission and that electrical connections are secure and accurate.

All other questions or comments should be directed to our Customer Service Department. It should be noted that many "problems" can easily be solved by a simple telephone call.

WARRANTY

Communications Specialties, Inc. (CSI) warrants that for a period of three years after purchase by the Buyer, the Pure Digital Fiberlink 3800 Series Transmission System will be free from defects in material and workmanship under normal use and service. A Return Material Authorization (RMA) number must be obtained from CSI before any equipment is returned by the Buyer. All material must be shipped to CSI at the expense and risk of the Buyer. CSI's obligation under this warranty will be limited, at its option, to either the repair or replacement of defective units, including free materials and labor. In no event shall CSI be responsible for any incidental or consequential damages or loss of profits or goodwill. CSI shall not be obligated to replace or repair equipment that has been damaged by fire, war, acts of God, or similar causes, or equipment that has been serviced by unauthorized personnel, altered, improperly installed or abused.

RMA numbers and repairs can be obtained from:

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Please have your serial number (located on the top label of the unit) available when contacting us.