



PURE DIGITAL  
**FIBERLINK**<sup>®</sup>

**RGBHV Video, Stereo Audio,  
2-Way Data and 2-Way Ethernet**

Models 7240 and 7241

# **USER'S MANUAL**



**CSI** Communications  
Specialties, Inc.

## **WORLD HEADQUARTERS**

55 Cabot Court

Hauppauge, N.Y. 11788 USA

Tel: (631) 273-0404 Fax: (631) 273-1638

[www.commspecial.com](http://www.commspecial.com)

Email: [info@commspecial.com](mailto:info@commspecial.com)

## **Communications Specialties Pte Ltd**

100 Beach Road

#22-09 Shaw Tower

Singapore 189702

Tel: +65 6391 8790 Fax: +65 6396 0138

Email: [csiasia@commspecial.com](mailto:csiasia@commspecial.com)

P/N: 123409 Rev. B

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## GENERAL INFORMATION

### Introduction

The Pure Digital Fiberlink® 7240/7241 transmitter/receiver pair transmits a single channel of RGBHV, stereo audio, bi-directional data and bi-directional ethernet signals all over one single mode or multimode fiber. The system's transparent 10Base-T support enables communication between a local device, such as a projector or media controller, and a local area network (LAN) server. The data channel supports RS-232, RS-422 and RS-485 protocols. Units are available in free-standing box versions or as card versions that fit within the rackmountable 6000A card cage.

### Technical Specifications

#### Model Part Number Configuration:

Receiver Type	Part Number
7240-BxS	Transmitter Box
7240-CxS	Transmitter Card
7241-BxS	Receiver Box
7241-CxS	Receiver Card

*ST Connectors are provided for use with single mode or multimode fiber*

X: 3 = MM fiber (1310 nm; 850 nm for return path)

7 = SM fiber (1310 nm; 1550 nm for return path)

#### Video:

Input Impedance ..... RGB: 75 Ohms; H&V: Hi-Z

Input Level ..... RGB: 714 mV p-p; H&V: 3 to 5 V p-p

H Sync Frequency Range ..... 31.5 to 60 kHz

V Sync Frequency Range ..... 30 to 85 Hz

Number of Video

Channels Supported ..... 1 RGBHV

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RGB Format Supported .....	RGB with separate H and V
External Signal Connectors .....	HD-15F
RGB Processing .....	24 bits, no compression or scaling

### **Audio:**

Number of Audio Channels Supported .....	2, unbalanced
Frequency Response .....	+0/-0.5 dB, 20 Hz to 20 kHz
Input Impedance .....	>24 k Ohms
Output Impedance .....	<1 Ohm
Maximum Audio Level .....	+10 dBu
THD+N .....	0.005%; 20 Hz - 20 kHz
SNR (A-Weighted) .....	95 dB
Channel Phase Differential .....	+/-0.1°
Crosstalk .....	Min. 95 dB (1 kHz)
Signal Connectors .....	3.5mm stereo jack
Audio to Video Differential Delay (skew) .....	<300 uS

### **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

### **Ethernet:**

Port .....	10Base-T, RJ-45 connector, Auto-MDIX
Speed .....	10 Mb/s Ethernet

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**Optical:**

Operating Wavelength .....	1310nm; 850nm on return path - MM 1310nm 1550nm on return path - SM
Optical Fiber .....	62.5/125 microns MM, 50/125 microns MM or 8-10/125 microns SM
Optical Connector .....	ST

*Class I Laser Product complies with FDA performance standard for laser products, Title 21, Code of Federal Regulations, Sub-Chapter J*

**Miscellaneous:**

Operating Temp. Range .....	-20 to +50 degrees C
Operating Power .....	9-24 Volts AC or DC@7.4watts (max.)

**Loss Budget and Maximum Transmission Distance:**

Wavelength	Loss Budget (in dB)	Distance
1310/850nm - MM	0-10	0-350 meters
1310/1550nm - SM	0-15	0-30 km

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

**DANGER! The transmitting element in the Pure Digital Fiberlink 7240 and 7241 units contains a solid state Laser Diode located within the optical connector. The laser 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.**

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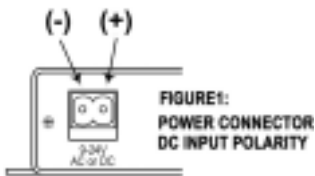
## INSTALLATION INSTRUCTIONS

### Installation Procedure:

The Pure Digital Fiberlink 7240 and 7241 come ready for immediate use. There are indicator LEDs on the units for monitoring purposes. The following instructions describe the typical installation procedure and the function of the LED indicators.

1. Connect the video source to the video input HD connector on the transmitter unit.
2. Connect the video display device to the video output HD connector on the receiver unit.
3. Connect fiber optic cable between the 7240 transmitter and 7241 receiver.
4. Connect the audio input signals to the stereo jack on the transmitter unit and connect speakers or amplifiers to the stereo out jack on the receiver.
5. Connect 10Base-T ethernet cables into the RJ-45 connectors located on the transmitter and receiver units.
6. The data protocol has been preset as RS-232. If RS-422 or RS-485 (2 or 4-wire) are preferred, please refer to instructions beginning on page 10. If connecting more than one Pure Digital Fiberlink unit on one data 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.
7. Connect the data cables to the terminal blocks located on the 7240 and 7241 units.
8. Apply power to both Pure Digital Fiberlink units. For box versions using DC power connections, refer to Figure 1.

9. When power is applied, the green POWER LED will light, indicating the presence of operating power. The VIDEO LED will give an indication as described on Pages 11 and 12.



10. The green AUDIO LED will give an indication as stated on Page 11 and 12.

11. The green DATA LED will give an indication as stated on Page 12.

12. The RJ45 connector green and yellow LEDs will give indications as described on Page 11.

13. The system should now be operational.

*Note that the rack card version has an additional red LED for indicating the presence of an alarm condition (loss of signal). Refer to the table on Page 9 for alarm enables.*

### System Connections:

The input and output connections for the Pure Digital Fiberlink® 7240 and 7241 units are as follows:

Audio Connector Transmitter & Receiver: 3.5mm stereo jack

Video Connector Transmitter & Receiver: HD-15F connector

Video Pin Out:	Transmitter	Receiver
1	Red	Red
2	Green	Green
3	Blue	Blue
4	N/C	N/C
5	Ground	Ground

<b>Video Pin Out:</b>	<b>Transmitter</b>	<b>Receiver</b>
6	Ground	Ground
7	Ground	Ground
8	Ground	Ground
9	N/C	N/C
10	Ground	Ground
11	N/C	N/C
12	N/C	N/C
13	Hor. Sync. Out	Hor. Sync. Out
14	Vert. Sync Out	Vert. Sync Out
15	N/C	N/C

### **Data Input/Output Connector:**

Data terminal block positions 1 through 5 can be used as data inputs or outputs, depending on the protocol selected. Refer to the following chart:

<b>RS-232:</b>	
Position 1	Signal to be transmitted
Position 3	Signal being received
Position G	Signal Common

<b>RS-422/RS-485 4-wire (point-to-point or multidrop):</b>	
Position 1	Signal to be transmitted (+)
Position 2	Signal to be transmitted (-)
Position 3	Signal being received (+)
Position 4	Signal being received (-)
Position G	Shield Ground



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<b>RS-485 2-wire:</b>	
Position 1	Signal being transmitted or received (+)
Position 2	Signal being transmitted or received (-)
Position G	Shield Ground

### **Alarm Switch Settings (Transmitter; Card Version Only):**

<b>Switch Position</b>	<b>Alarm Indication</b>	<b>On</b>	<b>Off</b>
1	Loss of Video	Enabled	Disabled
2	Loss of Signal	Enabled	Disabled

### **Alarm Switch Settings (Receiver; Card Version Only):**

<b>Switch Position</b>	<b>Alarm Indication</b>	<b>On</b>	<b>Off</b>
1	Loss of Video	Enabled	Disabled
2	Loss of Signal	Enabled	Disabled

*Note: "Loss of Video" refers to either loss of horizontal or vertical sync. "Loss of Signal" refers to the absence of an optical signal.*

### **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 table on the following page:

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### Data Input/Output Plug-In:

Switches 1, 2, 6, 7, 8 and 9 are used to select the desired protocol. Positions for these are as follows:

<b>Protocol</b>	<b>1</b>	<b>2</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
RS-232	Off	Off	Off	Off	Off	Off
RS-422/485 (4-wire point-to point)	Off	On	Off	Off	On	On
RS-485 (4-wire multidrop)	On	On	Off	Off	On	On
RS-485 (2-wire auto xmit/receive)	On	Off	On	On	On	Off

Switches 3, 4 and 5 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).

The following table indicates switch positions for RS-485 protocol.

<b>Baud Rate</b>	<b>Time</b>	<b>3</b>	<b>4</b>	<b>5</b>
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 8:* When switch is on, then 120 Ohm termination is applied to data input.

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

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## Indicator LEDs and Alarm Circuitry:

The stand-alone box versions of the Pure Digital Fiberlink 7240 and 7241 units have four integral indicator LEDs that are used to monitor the state of the units.

The rack card versions of these products have an additional red indicator LED that lights when an alarm condition exists. The rack card 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.

The status of the LEDs are as follows:

### TRANSMITTER and RECEIVER:

**Power:** ON: Indicates that correct power has been applied.

**RJ45 Green** ON: Ethernet link connection established

**LED:** OFF: No ethernet link detected

**RJ45 Yellow** BLINKING: 10Base-T activity detected

**LED:** OFF or ON: No activity

### TRANSMITTER:

**Video:** OFF: Indicates no video detected on the input.

BLINKING: Indicates either H or V sync detected at the input, but not both.

STEADY: Indicates both H and V sync detected on the input.

**Audio** OFF: Indicates no audio detected by the transmitter unit.

BLINKING: Audio detected by the transmitter unit.

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## **TRANSMITTER CONTINUED:**

- Data:** BLINKING: Indicates active data detected to or from the transmitter unit.  
OFF: No data detected to or from the transmitter unit.
- Alarm:** ON: Loss of video (rack card only).

## **RECEIVER:**

- Video:** OFF: Indicates no video detected over fiber and, as a result, no video present on the output.  
BLINKING: Indicates either H or V sync detected over the fiber, but not both.  
STEADY: Indicates both H and V sync detected over the fiber and, as a result, video present on the output.
- Audio** OFF: Indicates no audio detected over fiber and, as a result, no active audio detected by the receiver unit.  
BLINKING: Indicates audio detected over fiber and, as a result, active audio detected by the receiver unit.
- Data:** BLINKING: Indicates active data detected to or from the receiver unit.  
OFF: No data detected to or from the receiver unit.
- Alarm:** ON: Loss of video or optical signal (rack card only).

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## OPERATING POINTERS AND TROUBLESHOOTING

### **Optical Fiber:**

The 7240 and 7241 transmitter/receiver pair is available in versions that 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, remember to check the attenuation and bandwidth of the fiber optic cable. The system will only operate properly if these specifications fall within the range of the system's loss budget.

### **Troubleshooting:**

Multimode fiber optic cable contains an optical fiber with a light carrying "core" that is only .0025 inches (62.5 microns) in diameter. Single mode fiber optic cable has an even smaller "core," only .00032 to .0004 inches (8-10 microns). This is smaller than a human hair! Therefore, any minute particles of dirt or dust can easily block the fiber from accepting or radiating light. To prevent this from happening, always use the provided dust caps whenever optical connectors are exposed to air. It is also a good idea to gently clean the tip of an optical connector with a lint-free cloth moistened with alcohol whenever dust is suspected.

The status of the VIDEO and AUDIO indicator LEDs should provide the first clue as to the origin of an operational failure. If these are 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 correct.

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**Data Circuit:**

Even when installed exactly as directed, it is possible that the data function may fail to operate properly when using the Pure Digital Fiberlink 7240/7241 units in the RS-485 2-wire auto transmit/receive 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 your Pure Digital Fiberlink units have been 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.

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## MAINTENANCE AND REPAIRS

The Pure Digital Fiberlink® 7240 and 7241 have been manufactured using the latest semiconductor devices and techniques that electronic technology has to offer. The units 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 the optical connectors are free of dust or dirt that could interfere with light transmission and that electrical connections are secure and accurate. **DANGER!** *Always turn off the power to the 7240/7241 transmitter and receiver before removing the optical fiber from either unit!*

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 phone call.

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## LIMITED WARRANTY

Communications Specialties, Inc. (CSI) warrants that for a period of three years after purchase by the Buyer, the Pure Digital Fiberlink® 7240 and 7241 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. 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:

**Communications Specialties, Inc.**

**55 Cabot Court**

**Hauppauge, NY 11788 USA**

**Tel: (631) 273-0404 Fax: (631) 273-1638**

**www.commspecial.com Email: info@commspecial.com**

Or, in the Asia Pacific Region:

**Communications Specialties Pte Ltd**

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**Singapore 189702**

**Tel: +65 6391 8790 Fax: +65 6396 0138**

**Email: csiasia@commspecial.com**

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