MANUAL



FiberLink 4040 Series

Four channels of audio over one single mode or multimode fiber.

Installation and Operations Manual

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Welcome

The FiberLink 4040 series optical transmission system is a configurable, adjustment-free transmitter/receiver pair that employs digital processing and transmission techniques to convey up to four 1-way channels of audio.

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, integral LED indicators are provided on each unit to continuously signify the presence of audio signals and, thus, the proper operation of each side of the system. .

Features

- Transmits over one multimode or single mode fiber at 850, 1310 or 1550 nm
- No adjustments; pure digital processing and transmission
- 24 bit/96 kHz sampling; maximum audio level +24 dBu
- 20 Hz to 20 kHz frequency response
- Line level, balanced or unbalanced audio operation
- Indicator LEDs monitor audio signals and power
- Wide range power supply allows operation from low voltage AC and DC sources
- Card version fills one slot in 6000A card cage
- System consists of transmitter and receiver unit; card or box version.
- RoHS Compliant

Package Contents

- One FiberLink 4040 or 4041
- This User's Manual

Technical Specifications

Model Part Number Specification

Unit Type	Part Number
Transmitter Box	4040-Bxy
Transmitter Rack Card	4040-Cxy
Receiver Box	4041-Bxy
Receiver Rack Card	4041-Cxy
(x)	1 - 850nm Multimode 3 - 1310nm Multimode 7 - 1310nm Single Mode 9 - 1510nm Single Mode
(y)	F - FCPC Connector S - ST Connector

General Specifications

LED Indicators	Power; Audio Present (per channel); Alarm LED (card version only)
Power Requirements*	9-24 volts AC or DC, 5 watts
Operating Temperature Range	-35o to +60o C
Relative Humidity	10%-90% (non-condensing)
Optical Connectors	ST or FCPC
Operating Wavelength	850, 1310 or 1550 nm
Physical Size	6.5 W x 1.15 H x 8 L (inches) 165 W x 29 H x 203 L (mm)
Weight	approx. 1 lb.; 0.45 kg
Slots Filled in 6000A Card Cage	1
MTBF	83,000 Hours

* For operation from 95-250VAC, 50/60Hz, a PDPS-1 plug-in adapter is required.

Technical Specifications

Audio Specifications:	
Number of Audio Channels	4, balanced or unbalanced
Frequency Response	+0/-0.5 dB, 20 Hz - 20 kHz
Bits-per-Sample/Sampling Rate	24 bits; 96 kHz
Maximum Audio Level	+24 dBu
SNR (A-Weighted)	95 dB
THD+N	0.002%, 20 Hz - 20 kHz
Channel Phase Differential	+0.1°
System Latency	200 uS + fiber cable propagation delay (typically 5 uS/km of fiber)
Crosstalk	Min. 95 dB (1 kHz)
Input Impedance	600 Ohms terminated; >24 k Ohms unterminated
Output Impedance	50 Ohms
Audio Connectors	Removable screw terminal
Switches	Dip switches to select input termination, balanced or unbalanced input/output. Selectable on a per-channel basis

Operating Loss Budget & Maximim Useable Distance		
850nm Multimode	0-20 dB	0-2 km
1310nm Multimode	0-25 dB	0-10 km
1310nm Single Mode	0-23 dB	0-55 km
1550nm Single Mode	0-25 dB	0-80 km

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

Installation Instructions

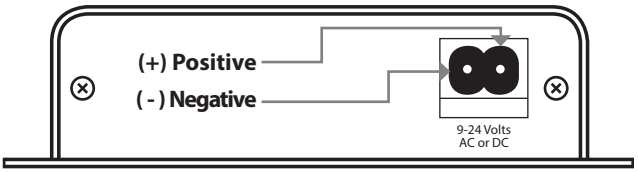
The Fiberlink 4040 Series transmission systems are normally preset for immediate use with audio input circuitry set for balanced 600 Ohm input impedance and output set for balanced audio. If a different protocol is desired, it can be easily selected using the flip switches located on the back panel of the unit. (See Page 7.) There are indicator LEDs on the units for monitoring purposes and several user selectable options for configuring audio inputs and outputs. The following instructions describe the typical installation procedure and the function of the LED indicators.

The following instructions describe the typical installation procedure:

1) The various options, as already mentioned, have been preset. If unbalanced high-input impedance or unbalanced output is desired, please refer to instructions on page 7.
2. Connect the fiber optic cable between the two Fiberlink units.
3. Apply power to both units. Refer to Figure 1 for DC power connections.
4. When power is applied, the green POWER LED will light, indicating the presence of operating power.
5. Connect the audio input signals to the proper positions on the removable terminal blocks. (See Page 8) Be certain to check all connections and assure that inputs and outputs are not intermixed.
6. The green audio LED indicators (one per channel) will give an indication as stated on page 9. Note that the rack card version also has a red LED for indicating the presence of an alarm condition.

Note: The Rack Card version has an additional red LED for indicating the presence of an alarm condition (loss of signal). Refer to Indicator LED's and Alarm Circuitry sections of this manual.

Figure 1:
Power Connector
DC Input Polarity



The transmitting element in the FiberLink 4040 transmitter unit contains a solid state Laser Diode located in the optical connector. 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 with no fiber optic cable connected to the optical connector, may be sufficient intensity to cause instantaneous damage to the retina of the eye. Direct viewing of this radiation should be avoided at all times!

Audio Switch Settings

The audio interface circuit used in this product has external switches that are used to configure the signal options. If you wish to make changes to the factory default settings, please refer that the charts below:

Audio Input (Transmitter) Settings

Audio Input Channel	Switch Postition	On	Off
1	1	600 Ohm	24K Ohm
	2	Unbalanced	Balanced
2	3	600 Ohm	24K Ohm
	4	Unbalanced	Balanced
3	5	600 Ohm	24K Ohm
	6	Unbalanced	Balanced
4	7	600 Ohm	24K Ohm
	8	Unbalanced	Balanced

Audio Output (Receiver) Settings

Audio Input Channel	Switch Postition	On	Off
1	1	Unbalanced	Balanced
2	2	Unbalanced	Balanced
3	3	Unbalanced	Balanced
4	4	Unbalanced	Balanced

Note: Switches 5,6,7 and 8 are not used on the 4041-Bxy (Receiver) and should be left in the off position.

System Terminal Block Connections

The input and output connections for the Pure Digital Fiberlink 4040 Series system are as follows:

Audio Connector - Transmitter

Position	Balanced	Unbalanced
Position 1-	Channel 1 Input (-)	Channel 1 Ground
Postition 1+	Channel 1 Input (+)	Channel 1 Signal
Position G	Ground	
Position 2-	Channel 2 Input (-)	Channel 2 Ground
Position 2+	Channel 2 Input (+)	Channel 2 Signal
Position 3-	Channel 3 Input (-)	Channel 3 Ground
Position 3+	Channel 3 Input (+)	Channel 3 Signal
Position G	Ground	
Position 4-	Channel 4 Input (-)	Channel 4 Ground
Position 4+	Channel 4 Input (+)	Channel 4 Signal

Audio Connector - Receiver

Position	Balanced	Unbalanced
Position 1-	Channel 1 Output (-)	Channel 1 Ground
Postition 1+	Channel 1 Output (+)	Channel 1 Signal
Position G	Ground	
Position 2-	Channel 2 Output (-)	Channel 2 Ground
Position 2+	Channel 2 Output (+)	Channel 2 Signal
Position 3-	Channel 3 Output (-)	Channel 3 Ground
Position 3+	Channel 3 Output (+)	Channel 3 Signal
Position G	Ground	
Position 4-	Channel 4 Output (-)	Channel 4 Ground
Position 4+	Channel 4 Output (+)	Channel 4 Signal

Indicator LEDs

The FiberLink 4040 Series has indicator LEDs that are used to monitor the state of the unit. Card versions have an additional Alarm LED.

Transmitter LEDs

LED	Status	Definition
Power	On	Indicates that correct power has been applied.
Audio (1-4)	Off Blinking	Indicates no audio input detected Indicates audio input detected
Alarm	On	Loss of audio data (card version only)

Receiver LEDs

LED	Status	Definition
Power	On	Indicates that correct power has been applied.
Audio (1-4)	Off Blinking	Indicates no audio detected on the fiber Indicates audio detected on the fiber
Alarm	On	Loss of audio data (card version only)

Operating Pointers

Remember to check attenuation 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 when ever 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 LEDs should provide the first clue as to the origin of any 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.

An optical power meter, such as the FiberLink 6650, a visible light source, such as the FiberLink 6656, and a Three Wavelength Light Source, such as the FiberLink 6652, can greatly assist and expedite troubleshooting of fiber optic transmission systems and are recommended tools all installers should have available.

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. It should be noted that some of our fiber optic products support both single mode and multimode fiber in the same unit.

If, after reviewing the above possibilities, the system is still not operating, please contact the Customer Service Department for further assistance. If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

Maintenance and Repairs

The FiberLink 4040 Series has 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, Artel Video Systems 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. Please see the Troubleshooting section of this manual for additional information.

An optical power meter, such as the FiberLink 6650, a visible light source, such as the FiberLink 6656, and a Three Wavelength Light Source, such as the FiberLink 6652, can greatly assist and expedite troubleshooting of fiber optic transmission systems and are recommended tools all installers should have available.

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.

If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

Certifications

Proven Products, Unrivaled Service, and Great Support

- High performance plug and play products
- Stand alone and card cage versions available
- Solutions for most video, audio, and data formats
- Multimode and single mode versions
- Designed and manufactured in the USA
- Training and installation support available
- 24x7x365 technical support available

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