



Broadcast quality HD/SD-SDI transmission over one single mode or multimode fiber. The 3150 Series offers two re-clocked and equalized outputs, SMPTE 297 compliance for interfacing with other devices, and the signal fidelity you have come to expect from Pure Digital Fiberlink®!

Pure Digital Fiberlink® 3150 Series

HD/SD-SDI Transmission over one single mode or multimode fiber.



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Welcome

Thank you for purchasing Artel Video Systems' Pure Digital Fiberlink® 3150 Series. The 3150 Series is used to transmit HD/SD-SDI with or without embedded audio and data over a single fiber optic core. Compatible with single mode or multimode fiber, the 3150 meets distance requirements up to 48 km. The 3150 is also compliant with SMPTE 297-2006 for seamless interoperability with other SMPTE 297-2006 devices. The system delivers noise-free transmission that retains all of the signals' initial parameters, regardless of fiber optic cable attenuation. The 3150 Series also provides immunity to video pathological signals over the entire link budget and operating temperature range.

Features

- Signal is equalized and re-clocked prior to fiber optic transmission
- Transmitter features an equalized and re-clocked SDI loop through
- Receiver features two equalized and re-clocked SDI outputs
- Designed for fiber optic interoperability with other SMPTE 297-2006 fiber optic compliant devices up to 1.485 Gbps
- Immunity to pathological signals over entire link budget and operating temperature range
- Compliant with SMPTE 259M-2006, 292-2006, 297-2006
- Supports transmission of SMPTE 305M-2005, 310M-2004, 344M-2000, DVB-ASI
- Supports both Single Mode and Multimode (62.5u & 50u) fiber types
- Supports HD/SD-SDI inputs with embedded audio and data
- 18db Optical Link Budget - 1.485 Gbps
- Wide operating temperature range: -10° C to +50° C
- Available in Box and Card versions
- Card version compatible with the Fiberlink® 6000A Rack Card Cage
- Designed and Manufactured in the USA by Artel

Package Contents

- One Pure Digital Fiberlink® 3150 or 3151
- This User's Manual

Technical Specifications

Model Part Number Specification

Unit Type	Part Number
Transmitter Box	3150-B7L
Transmitter Rack Card	3150-C7L
Receiver Box	3151-B7L
Receiver Rack Card	3151-C7L

General Specifications

Indicators	Power, HD data rate lock, SD/DVB-ASI data rate lock, Alarm (Card version)
Box Version Dimensions	5.21x3.50x1.15 (in) 133x89x30 (mm)
Weight	6.9 ounces, 196 grams
Number of slots in 6000A card cage	1
Power	9-24 Volts AC or DC 3150 - 3.2 Watts; 3151 - 1.8 Watts
Operating Temperature	-10°C to +50°C

3150 Transmitter Specifications:

Serial Video BNC Input

Number of inputs	1 BNC, 75 Ohms
Data Rate Range	19.4 Mbps to 1.485 Gbps
Standards Supported	SMPTE 259M, 292, 297, 305M, 344M, DVB-ASI
Re-clocked Data Rates	270 Mbps (SMPTE 259M, DVB-ASI-270) 1.485 Gbps (SMPTE 292)
Equalization	Automatic up to 200m of Belden 1694A at 1.485 Gbps and 350m at 270 Mbps
Return Loss	>15dB up to 1.485 Gbps

Technical Specifications

3150 Transmitter Specifications (cont.)

Serial Video BNC Loop Through Output

Number of outputs	1 BNC, 75 Ohms
Signal Level	800mv \pm 10%
DC Offset	0V \pm 0.5V
Rise/Fall Time	<270ps at 1.485 Gbps per SMPTE 292; 0.4 to 1.5ns at 270 Mbps per SMPTE 259M
Overshoot	<10% of Amplitude
Timing Jitter	<0.2UI at 270Mbps, <1.0UI at 1.485 Gbps with color bar signal applied
Alignment Jitter	<0.2UI at 270Mbps, <0.2UI at 1.485 Gbps with color bar signal applied
Re-clocking	At 270 Mbps and 1.485 Gbps

Optical Output

SMPTE 297-2006 Labeling	L-PC-ABC-1310
Connector	LC or ST receptacle, PC polish
Wavelength	1310nm (nominal)
Emitter Type	FP Laser
Output Power	-3.5 dBm \pm 0.5 dBm
Re-clocking	At 270 Mbps and 1.485 Gbps

3151 Receiver Specifications

Optical Input

SMPTE 297-2006 Labeling	PC-ABC-1310-1550
Connector	LC or ST receptacle, PC polish
Wavelength	1100-1620nm
Minimum Input Power	-24 dBm at 270 Mbps, -22 dBm at 1.485 Gbps
Maximum Input Power	0 dBm

Technical Specifications

3151 Receiver Specifications (cont.)

Serial Video BNC Outputs

Number of Outputs	2 BNC, 75 Ohms 1 non-inverted for DVB-ASI
Signal Level	800mv \pm 10%
DC Offset	0V \pm 0.5V
Rise/Fall Time	<270ps at 1.485 Gbps per SMPTE 292; 0.4 to 1.5ns at 270 Mbps per SMPTE 259M
Overshoot	<10% of Amplitude
Timing Jitter	<0.2UI at 270Mbps, <1.0UI at 1.485 Gbps with color bar signal applied
Alignment Jitter	<0.2UI at 270Mbps, <0.2UI at 1.485 Gbps with color bar signal applied
Re-clocking	At 270 Mbps and 1.485 Gbps

3150 Transmitter - 3151 Receiver System Specifications

Operating Loss Budget

Single Mode Fiber	18 dB at 1.485 Gbps 20 dB at 270 Mbps
Multimode Fiber (62.5u)	18 dB at 1.485 Gbps 20 dB at 270 Mbps
Multimode Fiber (50u)	18 dB at 1.485 Gbps 20 dB at 270 Mbps

Maximum Useable Distance*

Single Mode Fiber	48 km at 1.485 Gbps 48 km at 270 Mbps
Multimode Fiber (62.5u)	800 meters at 1.485 Gbps 5 km at 270 Mbps
Multimode Fiber (50u)	1.2 km at 1.485 Gbps 7.5 km at 270 Mbps

*Distance specifications are approximate, based upon connecting a 3150 Transmitter to a 3150 Receiver, and are not guaranteed. Artel cannot estimate or guarantee operating loss budgets when the 3150 Series is used with other, non-Fiberlink devices. Operating loss budget must not be exceeded.

Installation Instructions

The Pure Digital Fiberlink® 3150 Series of fiber optic transmission systems are ready for immediate use and do not require any special tools or equipment. However, an Optical Power Meter, such as the Fiberlink® 6615, can be useful in determining optical loss budgets during your systems design and maintenance.

The following instructions describe the typical installation procedure:

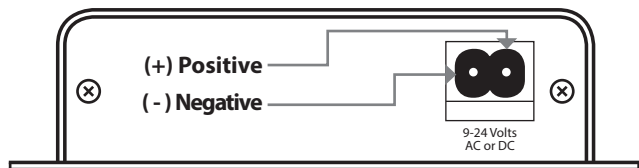
- 1) Connect the video source to the video input BNC connector on the transmitter unit.
- 2) Connect the video output cable to one of the two video output BNC connectors on the receiver unit.
- 3) Terminate any unused BNC output connector at 75 Ohms.
- 4) Connect the fiber optic cable to the transmitter and receiver units.
- 5) Connect the Universal Power Supply to the transmitter and receiver units.
For box versions using DC power, please refer to figure 1.
- 6) When power is applied, the green POWER LED should illuminate, indicating the presence of operating power. The HD/SD RATE LED will give an indication as described in the Indicator LED's and Alarm Circuitry section of this manual.
- 7) The system should now be operational.

The following should be noted if transmitting DVB-ASI:

- 1) On the 3151 Receiver **Box version**, only **Output 2** is non-inverting and should be used with DVB-ASI signal transmissions.
- 2) On the 3151 Receiver **Card version**, only **Output 1** is non-inverting and should be used with DVB-ASI signal transmissions.

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 Pure Digital Fiberlink® 3150 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!

DANGER!

Alarm Switch Settings & Options

The Rack Card version of this product has an additional red indicator LED that illuminates when an alarm condition exists.

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

Alarm Switch Settings for the Transmitter Card

Switch Position	Alarm Indication	On	Off
1	Loss of Input Video	Enabled	Disabled
2	N/A	N/A	N/A

Alarm Switch Settings for the Receiver Card

Switch Position	Alarm Indication	On	Off
1	Loss of Optical Signal	Enabled	Disabled
2	N/A	N/A	N/A

Indicator LEDs

The Pure Digital Fiberlink® 3150 Series has three integral 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.
HD Rate	Off On	Indicates no HD-SDI data rate lock Indicates HD-SDI data rate lock at 1.485 Gbps or 1.485/1.001 Gbps
SD Rate	Off On	Indicates no SD-SDI or DVB-ASI data rate lock Indicates SD-SDI or DVB-ASI data rate lock at 270 Mbps
Alarm	On	Loss of input video (card version only)

Note: Both the HD and SD LEDs indicators are off when a non-standard signal is applied.

Receiver LEDs

LED	Status	Definition
Power	On	Indicates that correct power has been applied.
HD Rate	Off On	Indicates no HD-SDI data rate lock Indicates HD-SDI data rate lock and re-clocked video available on outputs
SD Rate	Off On	Indicates no SD-SDI or DVB-ASI data rate lock Indicates SD-SDI or DVB-ASI data rate lock and re-clocked video available on outputs
Alarm	On	Loss of optical signal (card version only)

Note: Both the HD and SD LEDs indicators are off when a non-standard signal is applied.

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.

Note: If no signal is applied to the 3150 Transmitter, no optical power will be present on the 3150 Transmitter's output.

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® 6615, a visible light source, such as the Fiberlink® 6610, and a Three Wavelength Light Source, such as the Fiberlink® 6620, 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 Pure Digital Fiberlink® 3150 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® 6615, a visible light source, such as the Fiberlink® 6610, and a Three Wavelength Light Source, such as the Fiberlink® 6620, 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





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