Bidirectional, broadcast quality 3G/HD/SD-SDI transmission over one single mode fiber. The 3352 Series provides a cost effective method to send two channels of 3G/HD/SD-SDI, with or without embedded audio, in opposite directions over one fiber.

Fiberlink®
3352 Series

Bidirectional 3G/HD/SD-SDI Transmission over one single mode fiber.

CSI Communications Specialties, Inc.

World Headquarters
55 Cabot Court
Hauppauge, New York 11788 USA
Tel: (631) 273-0404
Fax: (631) 273-1638
info@commspecial.com

commspecial.com

Contents

Welcome

Thank you for purchasing Communications Specialties, Inc.'s Fiberlink® 3352 Series. The 3352 Series is used to transmit two 3G/HD/SD-SDI signals, with or without embedded audio and data, in opposite directions over a single fiber optic core. The system delivers noise-free transmission that retains all of the signals' initial parameters, regardless of fiber optic cable attenuation. The 3352 Series also provides immunity to video pathological signals over the entire link budget and operating temperature range.

Features

- Transmit two channels of 3G/HD/SD-SDI – one upstream, one downstream.
- Signal is equalized and re-clocked prior to fiber optic transmission
- Features an equalized and re-clocked SDI loop through
- Features two equalized and re-clocked SDI outputs
- Immunity to pathological signals over entire link budget and operating temperature range
- Compliant with SMPTE 424M-2006, 259M-2006, 292-2006
- Supports transmission of SMPTE 305M-2005, 310M-2004, 344M-2000, DVB-ASI
- Supports 3G/HD/SD-SDI inputs with embedded audio and data and DVB-ASI.
- 8db Optical Link Budget - 2.97 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 CSI

Package Contents

- One Fiberlink® 3352 Transceiver
- This User's Manual

Technical Specifications

Model Part Number Specification

Unit Type	Part Number
Transceiver Box	3352-B7L (LC) 3352-B7S (ST)
Transceiver Rack Card	3352-C7L (LC) 3352-C7S (ST)

General Specifications

Indicators	Power, Data Rate lock (3G/HD, SD/DVB-ASI) Alarm (Card Version Only)
Box Version Dimensions	6.5 W x 1.15 H x 6 L (inches) 165 W x 29 H x 152 L (mm)
Weight	12.3 ounces, 382 grams
Slots in 6000A Card Cage	2
Power	9-24 volts, AC or DC, 3.25 watts, 11.08 BTU/Hr
Operating Temperature	-10° C to +50° C
MTBF	145,000 Hours

3352 Transmitter Specifications:

Serial Video BNC Input	
Number of Inputs	1
Data Rate Range	19.4 Mbps to 2.97 Gbps
Supported Standards	SMPTE 259M, 292, 424M-2006, 305M, 310M, 344M, DVB-ASI
Re-clocked Data Rates	270 Mbps (SMPTE 259M, DVB-ASI-270), 1.485 Gbps (SMPTE 292), 2.97 Gbps (SMPTE 424M-2006)
Equalization	Automatic up to 100m of Belden 1694A at 3.0 Gbps, 200m at 1.485 Gbps and 350m at 270 Mbps
Return Loss	>10dB up to 2.97 Gbps

Technical Specifications

3352 Transmitter Specifications (cont.)

Serial Video BNC Loop Through Output

Number of Loop-Throughs	1
Signal Level	800mV ± 10%
DC Offset	0V ± 0.5V
Rise/Fall Time	< 135 ps at 2.97 Gbps per SMPTE 424M-2006; < 270 ps at 1.485 Gbps per SMPTE 292; 0.4 ns to 1.5 ns at 270 Mbps per SMPTE 259M
Overshoot	< 10% of amplitude
Timing Jitter	< 0.2 UI at 270 Mbps; < 1.0 UI at 1.485 Gbps; < 2.0 UI at 2.97 Gbps with color bar signal
Alignment Jitter	< 0.2 UI at 270 Mbps; < 0.2 UI at 1.485 Gbps; < 0.3 UI at 2.97 Gbps with color bar signal
Re-clocking	At 270 Mbps, 1.485 Gbps & 2.97 Gbps

Optical Output

Connector	LC receptacle, PC polish or ST
Wavelength	1310nm (nominal)
Emmiter Type	FP Laser
Re-clocking	At 270 Mbps, 1.485 Gbps & 2.97 Gbps

Technical Specifications

3352 Receiver Specifications

Fiber Optic Input

Connector	LC receptacle, PC polish or ST
Wavelength	1100 - 1620 nm
Maximum Input Power	0 dBm

Serial Video BNC Outputs

Number of Outputs	2, Non-inverting, Independently Buffered
Signal Level	800mV ± 10%
DC Offset	0V ± 0.5V
Rise/Fall Time	< 135 ps at 2.97 Gbps per SMPTE 424M-2006; < 270 ps at 1.485 Gbps per SMPTE 292; 0.4 ns to 1.5 ns at 270 Mbps per SMPTE 259M
Overshoot	< 10% of amplitude
Timing Jitter	< 0.2 UI at 270 Mbps; < 1.0 UI at 1.485 Gbps; < 2.0 UI at 2.97 Gbps with color bar signal
Alignment Jitter	< 0.2 UI at 270 Mbps; < 0.2 UI at 1.485 Gbps; < 0.3 UI at 2.97 Gbps with color bar signal
Re-clocking	At 270 Mbps, 1.485 Gbps & 2.97 Gbps

Loss Budget & Maximum Useable Distance

Operating Loss Budget

Single Mode Fiber	0-8 dB at 2.97 Gbps 0-11 dB at 270 Mbps	0-11 dB at 1.485 Gbps

Maximum Useable Distance*

Single Mode Fiber	20 km at 2.97 Gbps 30 km at 270 Mbps	25 km at 1.485 Gbps

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

Installation Instructions

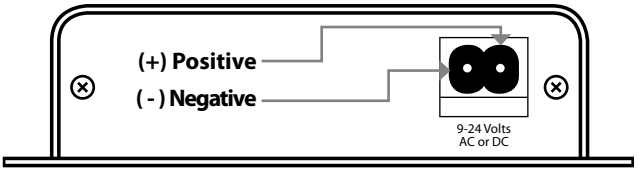
The Fiberlink® 3352 Series of fiber optic transmission systems are ready for immediate use and do not require any special tools or equipment. However, an Optical Power Meter, such as the Fiberlink® 6615, can be useful in determining optical loss budgets during your systems design and maintenance.

The following instructions describe the typical installation procedure:

1) Connect the video source to the video input BNC connectors on each transceiver unit.
2) Connect the video output cable to one of the two video output BNC connectors on each transceiver unit.
3) Terminate any unused BNC output connectors at 75 Ohms.
4) Connect the fiber optic cable to each transceiver unit.
5) Connect the Universal Power Supply to each transceiver unit.
   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 3G/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.

Note: The Rack Card version has an additional LEDs for indicating the presence of an alarm condition and loss of signals. 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® 3352 transceiver 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!

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 transmit signal	Enabled	Disabled
2	Loss of receive signal	Enabled	Disabled

Indicator LEDs

The Fiberlink® 3352 Series has four integral indicator LEDs that are used to monitor the state of the unit. Card versions have an additional Alarm LED.

Indicator LEDs

LED	Status	Definition
Power	On	Indicates that correct power has been applied.
3G/HD	Off On	Indicates no 3G-SDI or HD-SDI data rate lock Indicates 3G-SDI or HD-SDI data rate lock at 2.97 Gbps or 2.97/1.001 Gbps or 1.485 Gbps or 1.485/1.001
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 transmit and/or receive signal (card version only)
Transmit LOS	On	Loss of transmit signal (card version only)
Receive LOS	On	Loss of receive signal (card version only)

Note: The 3G/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.

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 Fiberlink® 3352 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, 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. 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

Communications Specialties, Inc. (CSI) warrants that, for a period of three years after purchase by the Buyer, this product 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 materials 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:

Communications Specialties, Inc.
55 Cabot Court
Hauppauge, NY 11788 USA
Tel: (631) 273-0404
Fax: (631) 273-1638

RMA numbers can also be obtained from our web site: **commspecial.com**

Please have your serial number available.

Fiberlink® 6610 Visible Light Source

The Fiberlink® Visible Light Source provides a visible 650 nm laser output that can be used for identifying fiber breaks and individual fibers within fiber bundles, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures.

Fiberlink® 6615 Optical Power Meter

The Fiberlink® Optical Power Meter measures the power of optical signals at 850, 980, 1310 and 1550 nm wavelengths, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures. It can be used to measure the power of an optical signal reaching the receiving end of a fiber optic cable, as generated either by a transmitter unit or by a light source such as the 6620.

Fiberlink® 6620 Three Wavelength Light Source

The Fiberlink® Three Wavelength Light Source offers a laser output at wavelengths of 1310 and 1550 nm and VCSEL output at 850 nm, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures.

Fiberlink® 3360 3G/HD/SD-SDI & 4 Pair AES Audio Series

The Fiberlink® 3360 Series allows you to transmit 3G, HD or SD-SDI as per SMPTE 424M-2006, 292 and 259 with the ability to embed up to 8 channels (4 pairs) of AES/EBU digital audio. Convenient switches on the 3360 Series transmitter allow the operator to embed each of the four pairs of audio independently, to strip previously serialized audio, or to pass it through without modification. At the receive end of the fiber optic link, the operator can decide which audio pairs they need de-embedded.

Audio signals are not required to operate the Fiberlink® 3360 link and it can be used as a stand-alone 3G/HD/SD-SDI optical link. Previously serialized data is left intact throughout the entire transmission process and the 3360 Series is immune to pathological signals over the entire budget link and operating temperature range.

Signals are equalized and re-clocked prior to fiber optic transmission and the 3361 receiver features a re-clocked SDI output.

The 3360 Series is compliant with SMPTE 297-2006 and has the ability to operate seamlessly with Fiberlink® Matrix and other SMPTE 297-2006 fiber optic compliant devices.

Available in card versions and a small footprint box version, it is ideal for broadcast or corporate studios, OB vans, rental and staging, auditoriums, stadiums and theaters, airport or transportation hubs, distance learning, surgical or medical imaging and more

Learn more at commspecial.com

Fiberlink®
3352 Series

Bidirectional 3G/HD/SD-SDI Transmission over one single mode fiber.

World Headquarters
55 Cabot Court
Hauppauge, New York 11788 USA
Tel: (631) 273-0404
Fax: (631) 273-1638
info@commspecial.com

commspecial.com

P/N 129215 Rev. B