The Copperlink 2353 Series converts broadcast quality 3G/HD/SD-SDI with or without embedded audio to HDMI.

Copperlink™ 2353 Series

3G/HD/SD-SDI to HDMI Converter

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Welcome

Thank you for purchasing Communications Specialties, Inc.'s Copperlink™ 2353 Series. The 2353 Series is used to convert 3G/HD/SD-SDI with or without embedded audio to HDMI. The 2353 Series also provides immunity to video pathological signals over the entire operating temperature range.

Features

- Convert 3G/HD/SD-SDI with embedded audio to HDMI with audio pair selection
- Supports all SD and HD resolutions to 1080p/60
- HDMI embedded and stereo line level outputs (if audio present in SDI stream)
- Re-clocked SDI BNC output allows for continuous 3G/HD/SD-SDI signal distribution
- User selection from up to 8 audio channel pairs for multilingual or multimessage support
- Automatic selection of output resolution - no scaling
- Small compact design

Package Contents

- One Copperlink™ 2353
- This User's Manual

Technical Specifications

General Specifications	
Indicators	Power, Alarm, Data Rate Lock (3G, HD, SD)
Box Version Dimensions	6.5 W x 1.15 H x 6 L (inches) 165 W x 29 H x 152 L (mm)
Weight	16 ounces, 453.5 grams
Power	9-24 volts, AC or DC, 5.5 watts, 18.8 BTU/Hr
Operating Temperature	-10° C to +50° C
MTBF:	37,000 Hours
Serial Video BNC Input	
Number of Inputs	1
Data Rate Range	270 Mbps to 2.97 Gbps
Supported Standards	SMPTE 259M, 292, 424M-2006
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 2.97 Gbps, 200m at 1.485 Gbps and 350m at 270 Mbps
Return Loss	>10dB up to 2.97 Gbps
Video Output	
Number of Outputs	1
Connector Type	HDMI Female
Signal Format	Single link HDMI with embedded audio, RGB or YCrCb as negotiated with display
Resolutions Supported	All 3G/HD/SD-SDI formats from standard definition to 1080p/60
3G/HD/SD-SDI Output	Standard BNC, Follows SDI input
HDCP Compliant	Yes. SDI signals, by definition, are not encrypted

Technical Specifications

3G/HD/SD-SDI Output	
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
Compliance	SMPTE 259M, 292, 424M-2006

Audio Output	
Number of Audio Channels	2 channels, unbalanced, line level 2 channels embedded in HDMI signal
Audio Connector	RCA Jacks
Switches	Front panel selection of one of 8 audio channel pairs on SDI signal to output

NOTE: Audio on HDMI and line level are available simultaneoulsy and extracted from audio embedded within SDI signal in accordance with SMPTE standards.

Installation Instructions

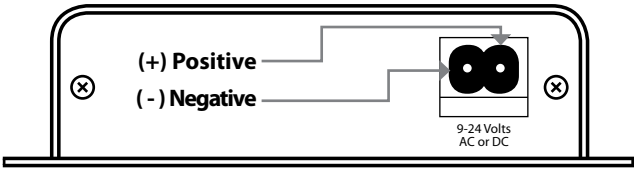
The Copperlink™ 2353 Series of 3G/HD/SD-SDI converters are ready for immediate use and do not require any special tools.

The following procedure presumes you have followed the instructions for installing your converter unit.

The following instructions describe the typical installation procedure:

1) Connect the SDI coax cable to the SDI input BNC connector of the converter unit.
2) Connect the video output cable (HDMI) to the video output HDMI connector on the converter.
3) Optionally connect any audio cables and using the channel pair rotary selector, choose your desired audio output channel. Audio is also embedded on the HDMI cable.
4) Terminate any unused BNC output connector at 75 Ohms.
5) Connect the Universal Power Supply to the converter. 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.

Figure 1:
Power Connector
DC Input Polarity



Audio Pair Selection

The Copperlink™ 2353 Series has a rotary dial switch that allows you to select which audio pair to output. The chart below describes the operation of the rotary switch positions:

Rotary Switch Positions

Position	Function
0	Will mute the audio output
1 through 8	Will output the respective audio channel pair on the HDMI cable and the audio output connectors
9	Not used

Indicator LEDs

The Copperlink™ 2353 Series has six integral indicator LEDs that are used to monitor the state of the unit.

Indicator LEDs

LED	Status	Definition
Power	On	Indicates that correct power has been applied.
3G Rate	Off On	Indicates no 3G-SDI data rate lock Indicates 3G-SDI data rate lock at 2.97 Gbps or 2.97/1.001 Gbps
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
ED Rate	Off On	Indicates no ED resolution data rate lock Indicates ED resolution data rate lock at 540 Mbps
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	No input signal

Note: The 3G, HD, ED and SD LEDs indicators are off when a non-standard signal is applied.

Maintenance and Repairs

The Copperlink™ 2353 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.

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.

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
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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.

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