



050-210

PRODUCT BRIEF

Dual-DVI Copper to Fiber Media Converter,
28VDC

D38999 (Eye-Beam for Fiber Optic),
D38999 (Quadrax & Pin contacts for Signal and Service Port),
D38999 (Pin contacts for Power)

REV	DESCRIPTION	DATE	APPROVED
1	Preliminary	03/23/2017	NH/RAS
2	Changed Fiber Cable Contacts for MMF	11/3/2017	MT/MW
3	Clarify need for Shielded Power cable to meet EMI requirements	10/24/2018	RAS
4	Add UID Data Matrix specs in the Marking section, FO Inspection/Cleaning Tools. Update the PRBS	04/16/2019	YA/RAS
5	Add Inrush Current Specification	12/6/2019	RAS

BF17U2-8141

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050-210 PRODUCT BRIEF

Dual-DVI Copper to Fiber Media Converter

D38999 for Signal, Power and Expanded Beam Fiber Optics



Dual-DVI Copper to Fiber Media Converter with Expanded Beam Fiber Optics



The Glenair 050-210 Dual - Digital Visual Interface (DVI) Copper to Fiber Optic Media Converter increases DVI operational link distance in harsh environments. It allows both longer distance and more reliable communication on optical fibers in ruggedized systems using DVI protocol between graphics cards and remote displays. This media converter is configured as either transmitter, converting electrical DVI signals to fiber, or as a receiver, converting fiber optic signals into the electrical DVI signals. The media converter incorporates a power supply which has been designed to accept a wide DC input voltage range, 18V to 36V. The 050-210 is designed for harsh environments and incorporates electronics in an environmentally sealed enclosure that incorporates three environmental D38999 connectors. Signal I/O and BIT functionality is supplied through one D38999 connector and power is provide through its own dedicated D38999 connector. The Fiber Optics passes through D38999 using Eye-Beam contact which can be configured to support either single mode or multi-mode fiber applications.

KEY FEATURES/BENEFITS

- 1310nm FP Lasers for SMF 10km links
- InGaAs PIN PD for SMF 10km links
- 850nm Lasers for MMF up to 500m links
- GaAs PIN PD for MMF up to 500m Links
- Wide Input Voltage Range: 18-36V
- IP67 in mated condition
- D38999 with Quadrax and #22 Pin contacts for Signal and BIT I/O
- D38999 with #22 Pin contacts for Power
- D38999 with Eye-Beam contacts for Fiber Optic I/O
- Case Ground isolated from Signal Ground

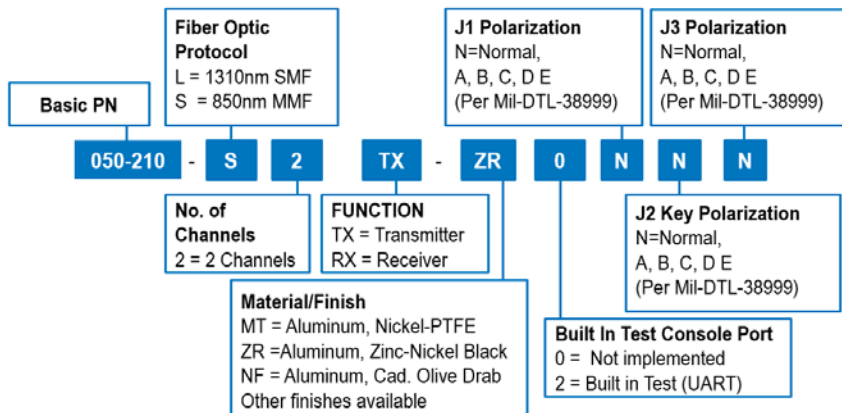
OPTIONAL FEATURES

- Built In Test Console Port accessible via USB2.0
- Built in Test Console Port accessible via UART (RS422)

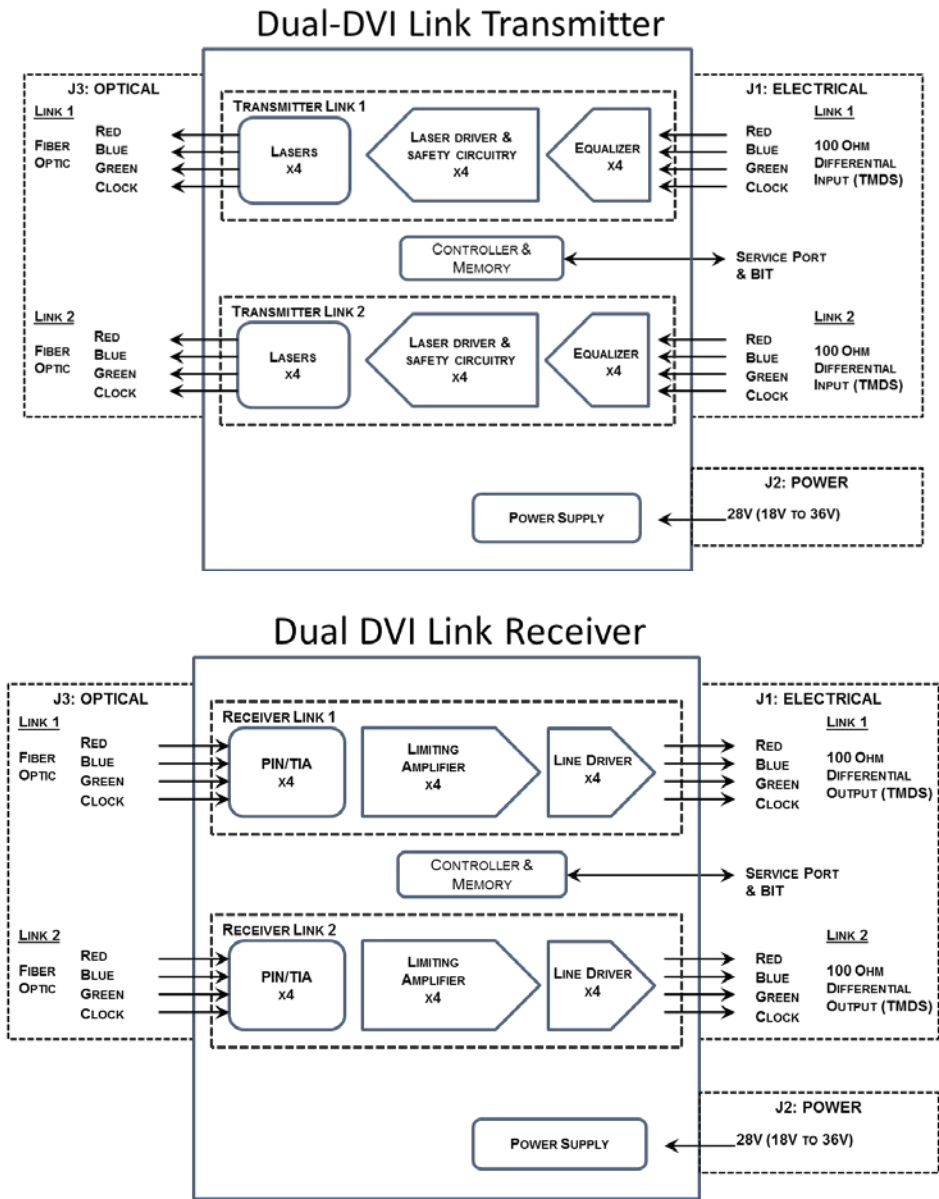
APPLICATIONS

- Harsh Environment such as: Airborne, Tactical, Railway, Industrial, Oil and Gas and Shipboard applications
- DVI EDID and hot-plug detection are not supported

How To Order



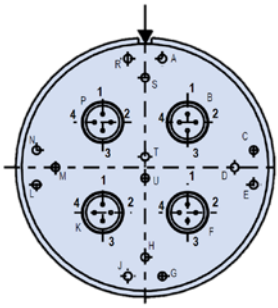
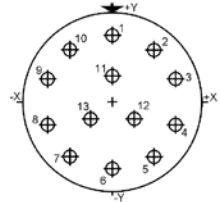
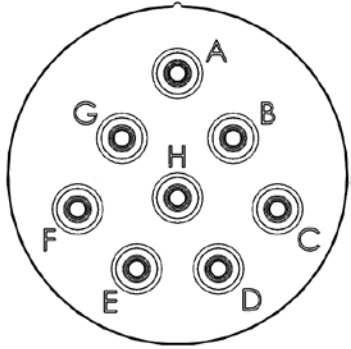
Functional Block Diagram



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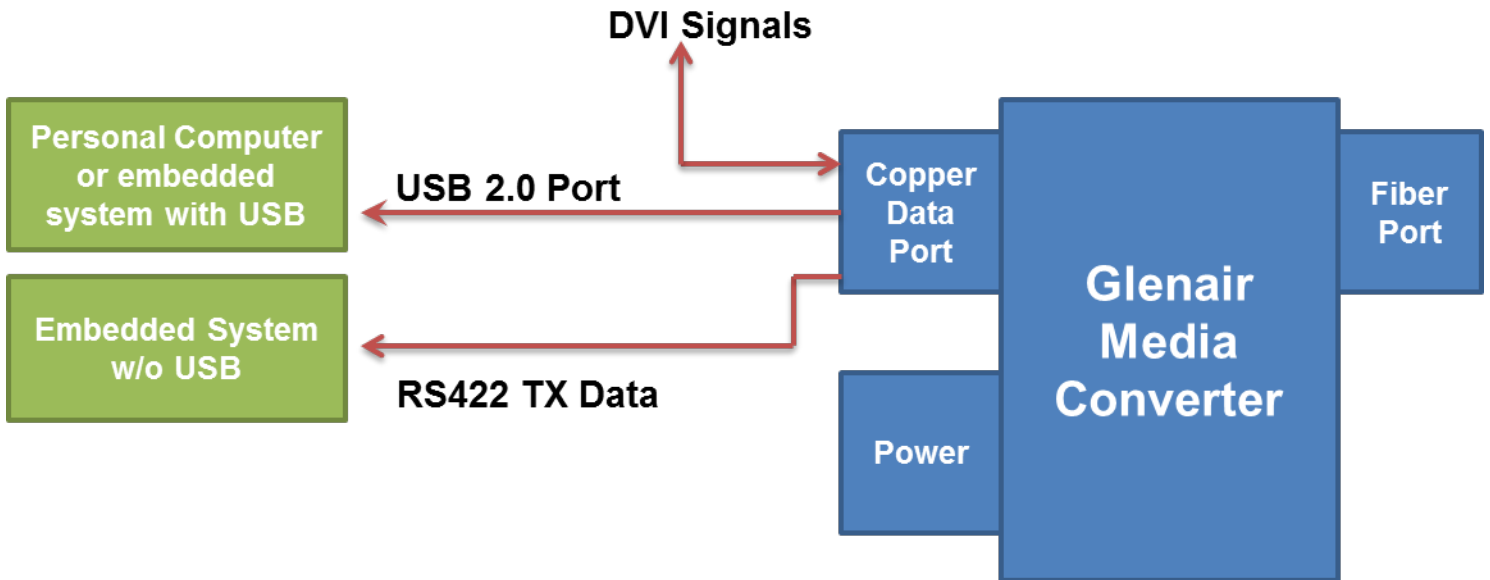
Connectors

NAME	Insert Arrangement	Function	Media Converter	Mating PLUG Connector
J1	 <p>19Q-18 Arrangement Pin Face Shown</p>	Electrical Signal, Power, and Built In Test (BIT)	D38999 Series III type, 19Q-18 14X SIZE 22D Pins 4X SIZE 8 QUADRAX Pins (AS39029/119)	Generic PN D38999/26#F18SN type with Quadrax polarization Glenair PN 257-606##G6-19Q18BN
J2	 <p>11-35 Arrangement Pin face Shown</p>	Power	D38999 Series III type, 11-35 13X SIZE 22D Pins	Generic PN D38999/26#B35SN Glenair PN 233-105-G6##11-35SN
J3	 <p>17-8 Arrangement Pin Face Shown</p>	Fiber Optic Signal	D38999 Series III Insert Arrangement per Eye-Beam <u>CONTACTS</u> 181-070 Eye-Beam	Glenair PN 180-091#06-17-8SN (D38999 Series III Style Plug, 17-8 arrangement) <u>CONTACTS:</u> L CONFIGURATION (SMF) Glenair PN 181-077-1255-130 S CONFIGURATION (MMF) Glenair PN 181-077-126-085

Note: # = Environmental Class (Material/Finish)

Built In Test (BIT) Functionality – USB 2.0

This media converter can be offered with built in test functionality accessible through a Console Port via Universal Serial Bus 2.0 (USB 2.0), via an RS422 output or both options can be made available. Functional block diagram for the BIT interface is illustrated shown below.



Universal Serial Bus (2.0) BIT

- Presents itself as a "Virtual" Communications Port
- Compatible with Microsoft Windows, Mac, and Linux OS's.
- On the computer side, open any terminal application (PuTTY, HyperTERM, TeraTERM, etc.) to communicate with the media converter hardware.
- Simple "Human Readable" status messages.

ALARM STATUS MESSAGES

Unit Identification Information

- Unit Serial Number
- Unit Product Code

Fiber Side Alarm/Status

- Temperature
- Transmitter TX Fault
- Transmitter Disable Status
- Receiver loss of signal (LOS) or signal Detect (SD) Status



TYPICAL CONSOLE PORT WINDOW (PuTTY)

```
COM1 - PuTTY
*****
Glenair *
Media Converter Service Port *
*****
Unit Identification Information
*****
Product Code: 050-210-S2TX
Unit Serial Number: 1234
Firmware Revision: 1.2.0
Product Description: DVI Copper to Fiber Media Converter -
Transmitter

*****
Unit Status
*****
Temperature: 45 degrees C
Power Supply Status: Good
Transmitter FO Fault, TX1_Red: False
Transmitter FO Fault, TX1_Blue: False
Transmitter FO Fault, TX1_Green: False
Transmitter FO Fault, TX1_Clock: False
Transmitter FO Fault, TX2_Red: False
Transmitter FO Fault, TX2_Blue: False
Transmitter FO Fault, TX2_Green: False
Transmitter FO Fault, TX2_Clock: False
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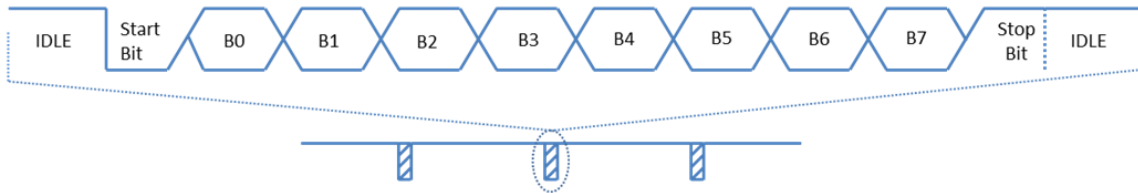
Built In Test (BIT) Functionality – UART

This media converter can be offered with built in test functionality accessible via an RS-422 Port. Functional block diagram for this function is illustrated in the figure below. The UART Bit message is a 10 bit message with an update rate of 1 Hz. The message format can be seen below.

ALARM STATUS MESSAGES

- Fiber Transmitter Fault Status
- Fiber Receiver Los of Signal (LOS) Status

Standard UART-Type Format (Start and Stop Bits, 8 Data bits, no parity)
 Data Rate = 9600 baud, RS422 Output, Message Repetition Rate = 1 Sec



SERIAL STATUS MESSAGE BIT MAPPING

Bit	Description
0	DVI Link1 or Link 2 Channel 0 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
1	DVI Link1 or Link 2 Channel 1 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
2	DVI Link1 or Link 2 Channel 2 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
3	DVI Link1 or Link 2 Channel 3 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
4	DVI Link1 or Link 2 Channel 0 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)
5	DVI Link1 or Link 2 Channel 1 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)
6	DVI Link1 or Link 2 Channel 2 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)
7	DVI Link1 or Link 2 Channel 3 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)



Ratings and Specifications – L Version (Long Wavelength)

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Typ	Max	Units	Notes
Storage Temperature	T _s	-55		+100	°C	
Supply Voltage	V _{cc}	-0.5		40	V	

OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Units	Notes
Operating Temperature	T _{op}	-40		+85	°C	
Supply Voltage	V _{cc}	18	28	36	V	
Supply Current, steady state	I _{cc}		100	150	mA	Measured at 28VDC
Inrush Current, 1.5ms	I _{cc_inrush_1.5}			1.9	A	
Inrush Current, 3 ms	I _{cc_inrush_3}			1	A	

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P _{OUT}	-6.5	-3	-1	dBm	1310nm Fabry-Perot
Optical Wavelength	λ _{OUT}	1285	1310	1345	nm	
Spectral Width	Δλ			3.5	nm	

OPTICAL CHARACTERISTICS – RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Min. Sensitivity, BER 10 ⁻¹² , PRBS 2 ⁷ -1, 1.65Gbps, Er=9dB	P _{IN_MIN}		-21.5	-19.5	dBm	
Overload, BER 10 ⁻¹² , PRBS 2 ⁷ -1	P _{IN_MAX}	0			dBm	
Optical Wavelength	λ _{IN}	1100	1310	1590	nm	



Ratings and Specifications – S Version (Short Wavelength)

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Typ	Max	Units	Notes
Storage Temperature	T _s	-55		+100	°C	
Supply Voltage	V _{cc}	-0.5		40	V	

OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Units	Notes
Operating Temperature	T _{op}	-40		+85	°C	
Supply Voltage	V _{cc}	18	28	36	V	
Supply Current	I _{cc}		100	150	mA	Measured at 28VDC
Inrush Current, 1.5ms	I _{cc_inrush_1.5}			1.9	A	
Inrush Current, 3 ms	I _{cc_inrush_3}			1	A	

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P _{OUT}	-7.5		-1	dBm	VCSEL, 50/125µm MMF
Optical Wavelength	λ _{OUT}	830	850	860	nm	
Spectral Width	Δλ			0.85	nm	

OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Min. Sensitivity, BER 10 ⁻¹² , PRBS 2 ⁷ -1, 1.65Gbps, Er 9dB	P _{IN_MIN}		-21.5	-18.5	dBm	PIN PD
Overload, BER 10 ⁻¹² , PRBS 2 ⁷ -1	P _{IN_MAX}	-2	-1		dBm	
Optical Wavelength	λ _{IN}	770	850	860	nm	



Ratings and Specifications - (Continued)

COMPLIANCE SPECIFICATIONS

CHARACTERISTIC	Standard	Condition	Notes
Mechanical Shock	MIL-STD-810	40g	6-9rms
Mechanical Vibration	MIL-STD-810	30g rms	
ESD	MIL-STD-883	Class II	2200V HBM
Conducted Emissions, Power Leads, 30 Hz to 10 kHz	MIL-STD-461F	CE101	Shielded power cable
Conducted Emissions, Power Leads, 10 kHz to 10 MHz	MIL-STD-461F	CE102	Shielded power cable
Conducted Susceptibility, Power Leads, 30 Hz to 150KHz	MIL-STD-461F	CS101	Shielded power cable
Conducted Susceptibility, Transients, Power Leads	MIL-STD-461F	CS106	Shielded power cable
Conducted Susceptibility, Structure Current, 60 Hz to 100 kHz	MIL-STD-461F	CS109	Shielded power cable
Conducted Susceptibility, Bulk Cable Injection, 10 kHz to 200 MHz	MIL-STD-461F	CS114	Shielded power cable
Radiated Susceptibility, Magnetic Field, 30 Hz to 100 kHz	MIL-STD-461F	RS101	Shielded power cable
Radiated Susceptibility, Electric Field, 2 MHz to 18 GHz	MIL-STD-461F	RS103	Shielded power cable
Radiated Emissions, Magnetic Field, 30 Hz to 100 kHz	MIL-STD-461F	RE101	Shielded power cable
Radiated Emissions, Electric Field, 10 kHz to 18 GHz	MIL-STD-461F	RE102	Shielded power cable
Mating Durability	MIL-DTL-38999/20	500 Cycles	
Flame Resistance	EIA364-104		30 seconds
Damp Heat	EIA364-321		240 hours
Aircraft Electrical Power Characteristics	MIL-STD-704F		28V DC Systems
Eye Safety	CDRH and IEC-825	Class 1 Laser Product	



Ratings and Specifications - (Continued)

Material/Finish

Item	Material/Finish
Housing & Connector Shell	Aluminum
Plating Finish: M	Nickel
Plating Finish: MT	Nickel PTFE
Plating Finish: NF	Olive Drab Cadmium
Contacts	Copper alloy, 50 µInch gold plated
D38999 Inserts	Thermoplastics
Interfacial Seals, 38999 only	Elastomer, Fluorosilicon
Optical Ferrules & Sleeves	Zirconia, Ceramic
Insulators	Liquid crystal polymer (LCP)
Contact retention clip	Beryllium copper alloy
Seal, O-rings	Fluorosilicone rubber
Seal	Silicone elastomer
Spring	Nickel-plated beryllium copper
PC tail contacts	Copper alloy/gold plated
PCB flex	FR4 & Polyimide
Encapsulant	HYSOL EE4215
Solder type	RoHS compliant Sn95/Sb5 (232°C melting temp) & RoHS compliant Sn96.5/Ag3.0/Cu0.5 (217° melting)



Interface Definition

Recommended Inspection & Cleaning Tools/Kits

GCK0054 Fiber Optic Inspection and Cleaning Kit is recommended for the 050-210 Dual-DVI Copper to Fiber Media Converter. The kit includes:

- Eye Beam Inspection Probe
- 2 × SMX-T-MIL-1.6-S Inspection Tip for Eye Beam Socket Terminus
- 2 × SMX-T-MIL-1.6-P Inspection Tip for Eye Beam Pin Terminus
- Eye Beam Terminus Cleaning Swabs; 1.0 MM; (20 PK)
- Case