050-214

PRODUCT BRIEF

DVI Copper to Fiber Media Converter,
28VDC
D38999 (ARINC801 for Fiber Optic),
D38999 (Quadrax & Pin contacts for Signal and Service Port),
D38999 (Pin contacts for Power)

REV	DESCRIPTION	DATE	APPROVED
1	Released	02/11/2019	BF/YA/RAS
2	Update the pin assignment for the J2 port	03/14/2019	YA/JLL/TA

DVI Copper to Fiber Media Converter

The Glenair 050-214 Flange Mount 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 050-214 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 ARINC 801 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 ARINC 801 for Fiber Optic I/O

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

Basic PN		Fiber Optic Protocol		J1 Polarization	J3 Polarization
050-214	-	S	TX	- NF	0 N N N

Fiber Optic Protocol
L = 1310nm SMF
S = 850nm MMF

J1 Polarization
N=Normal,
A, B, C, D E
(Per Mil-DTL-38999)

J3 Polarization
N=Normal,
A, B, C, D E
(Per Mil-DTL-38999)

FUNCTION
TX = Transmitter
RX = Receiver

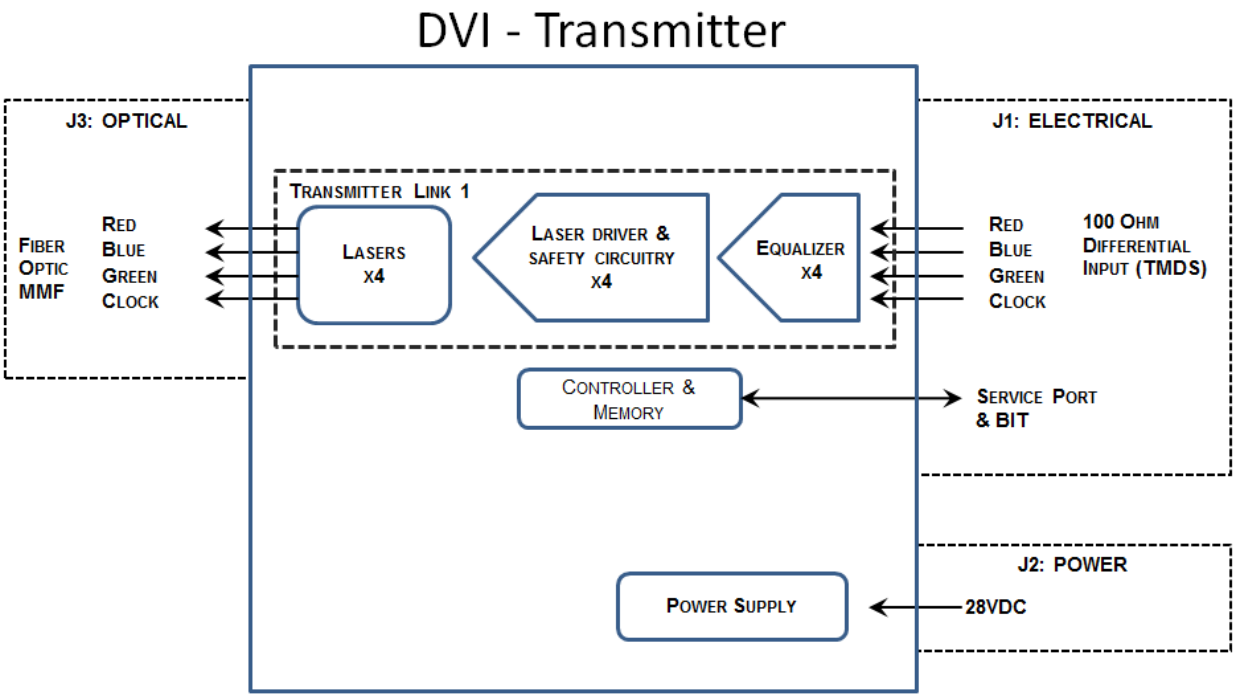
J2 Key Polarization
N=Normal,
A, B, C, D E
(Per Mil-DTL-38999)

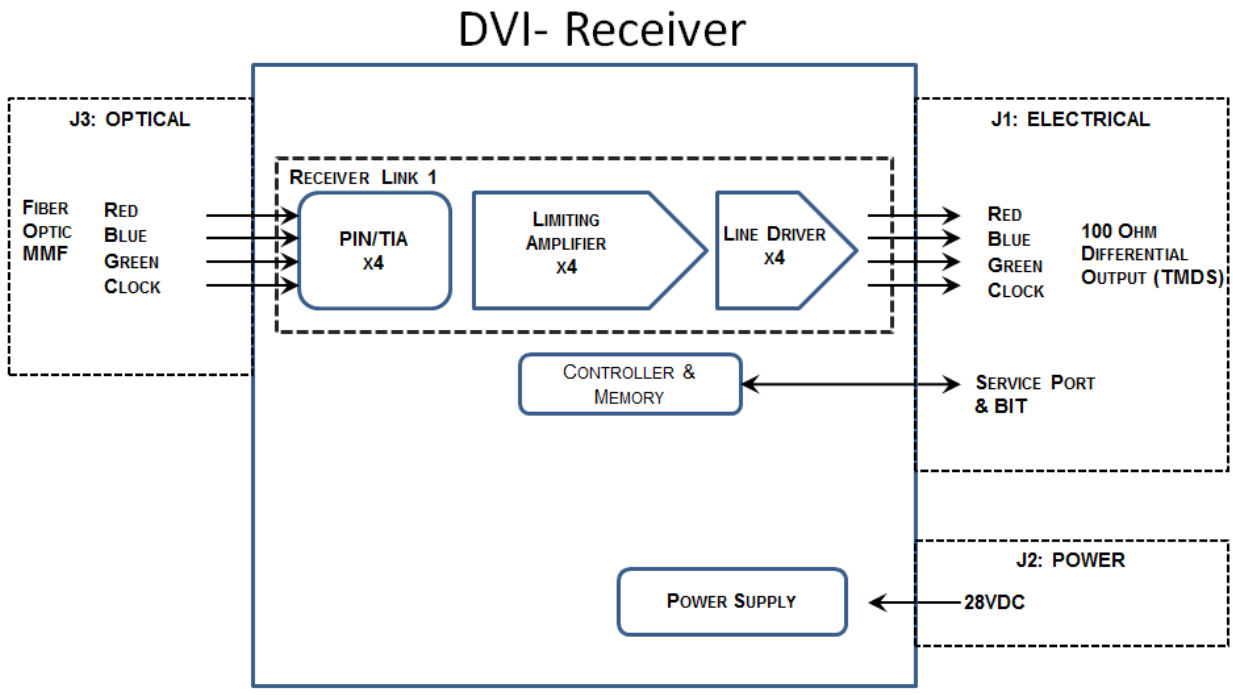
Material/Finish
NF = Aluminum, Cad. Olive Drab
Other finishes available

Built In Test Console Port
0 = Not implemented
2 = Built in Test (UART)

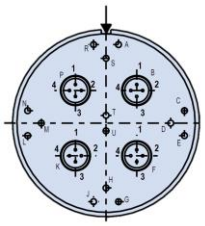
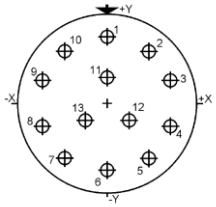
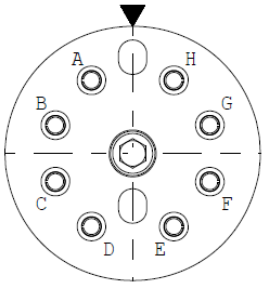
 REV: 2 US Cage Code 06324 Printed in USA

Functional Block Diagram





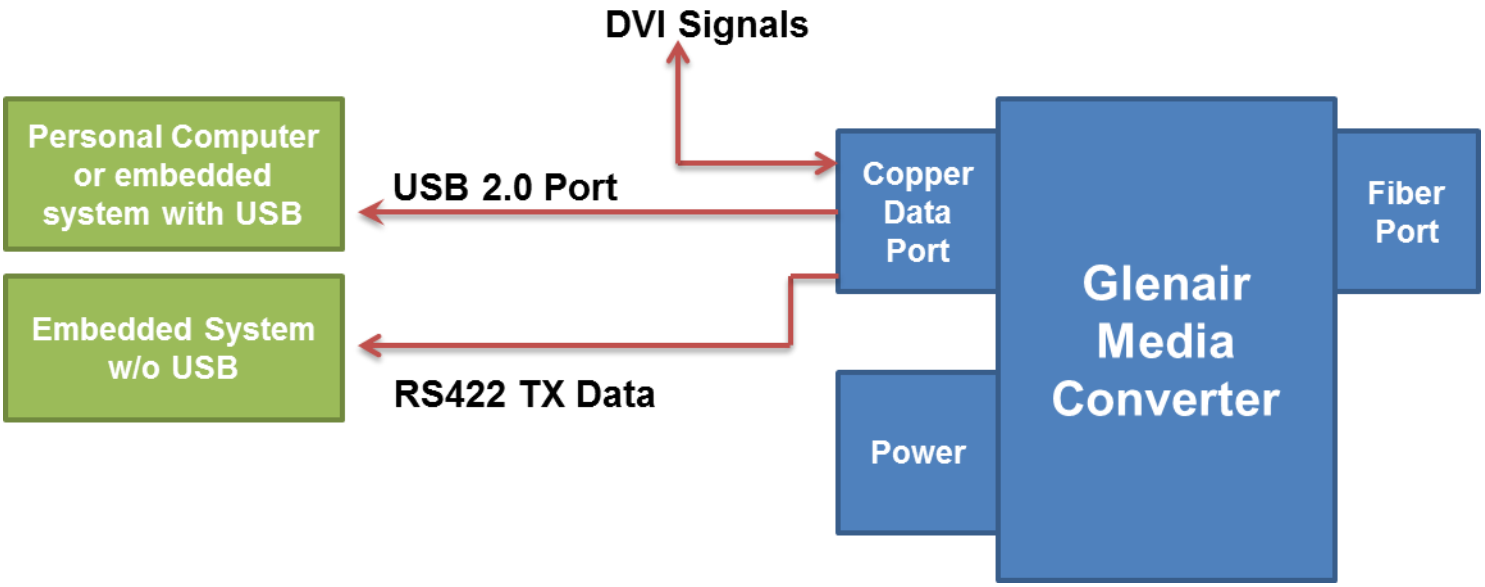
Connectors

NAME	Insert Arrangement	Function	Media Converter	Mating PLUG Connector
J1		Electrical Signal, Status 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##G6-19Q-18BN**
J2		Power	D38999 Series III type, 11-35 13X SIZE 22D Pins	Generic PN D38999/26#B35SN Glenair PN 233-105-G6##11-35SN
J3	 ARR. 17-8 SHELL SIZE 17	Fiber Optic Signal	D38999 Series III Insert Arrangement per ARINC 801 <u>CONTACTS</u> ARINC 801 LX CONFIGURATION: Glenair PN **181-076-P-126S** 126.0 micron, pull proof design, SMF SX CONFIGURATION: Contacts: Glenair PN **181-076-P-126** 126.0 micron, pull proof design, MMF	Glenair PN **180-159##06-15-6N-R** (D38999 Style Plug, ARINC 801 15-6 arrangement) <u>CONTACTS:</u> LX10 CONFIGURATION Glenair PN **181-076-P-126S** 126.0 micron, pull proof design, SMF SX or FX CONFIGURATION Glenair PN **181-076-P-126** 126.0 micron, pull proof design, MMF

Note: # = Environmental Class (Material/Finish)
Connector is supplied less contacts. Optional mode code 557 can be added to the end of the part number to include contacts (including spares), insertion/removal tool, and sealing plugs. Contact manufacturer for additional options.

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)

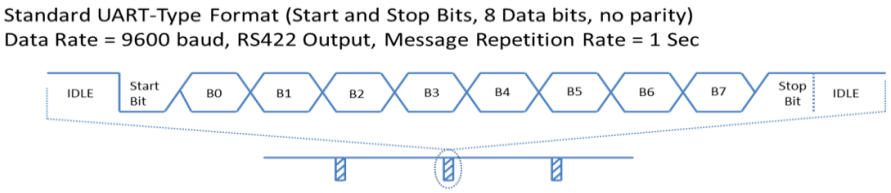
```
Glenair: Media Converter Service Port
Part Number: 050-214-TX
Serial Number: 000012
Main Board ID: A09819740
Firmware Revision: 1.0.1
Power Supply Status: PASS

Link 1 TX Fiber Fault, TX_Blue: FALSE
Link 1 TX Fiber Fault, TX_Green: FALSE
Link 1 TX Fiber Fault, TX_Red: FALSE
Link 1 TX Fiber Fault, TX_Clock: FALSE
```

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
-



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 Channel 1 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
2	DVI Link1 Channel 2 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
3	DVI Link1 Channel 3 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
4	DVI Link1 Channel 0 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)
5	DVI Link1 Channel 1 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)
6	DVI Link1 Channel 2 Fiber Optic RX LOS (1 = Fault, 0 = No Fault)
7	DVI Link1 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	Ts	-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	Icc		100	150	mA	Measured at 28VDC

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P_{OUT}	-6	-3	-1	dBm	1310nm Fabry-Perot
Optical Wavelength	λ_{OUT}	1285	1310	1345	nm	
Spectral Width	$\Delta\lambda$			3.5	nm	

OPTICAL CHARACTERISTICS – RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Min. Sensitivity, BER 10^{-12}, PRBS 7, 1.65Gbps, Er=9dB	P_{IN_MIN}		-22	-20	dBm	
Overload, BER 10^{-12}, PRBS 7	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	Ts	-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	Icc		100	150	mA	Measured at 28VDC

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P_{OUT}	-7		-1	dBm	VCSEL, 50/125µm MMF
Optical Wavelength	λ_{OUT}	830	850	860	nm	
Spectral Width	$\Delta\lambda$			0.85	nm	

OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Min. Sensitivity, BER 10^{-12}, PRBS 7, 1.65Gbps, Er 9dB	P_{IN_MIN}		-22	-19	dBm	PIN PD
Overload, BER 10^{-12}, PRBS 7	P_{IN_MAX}	-2	-1		dBm	
Optical Wavelength	λ_{IN}	770	850	860	nm	

Ratings and Specifications - (Continued)

COMPLIANCE SPECIFICATIONS

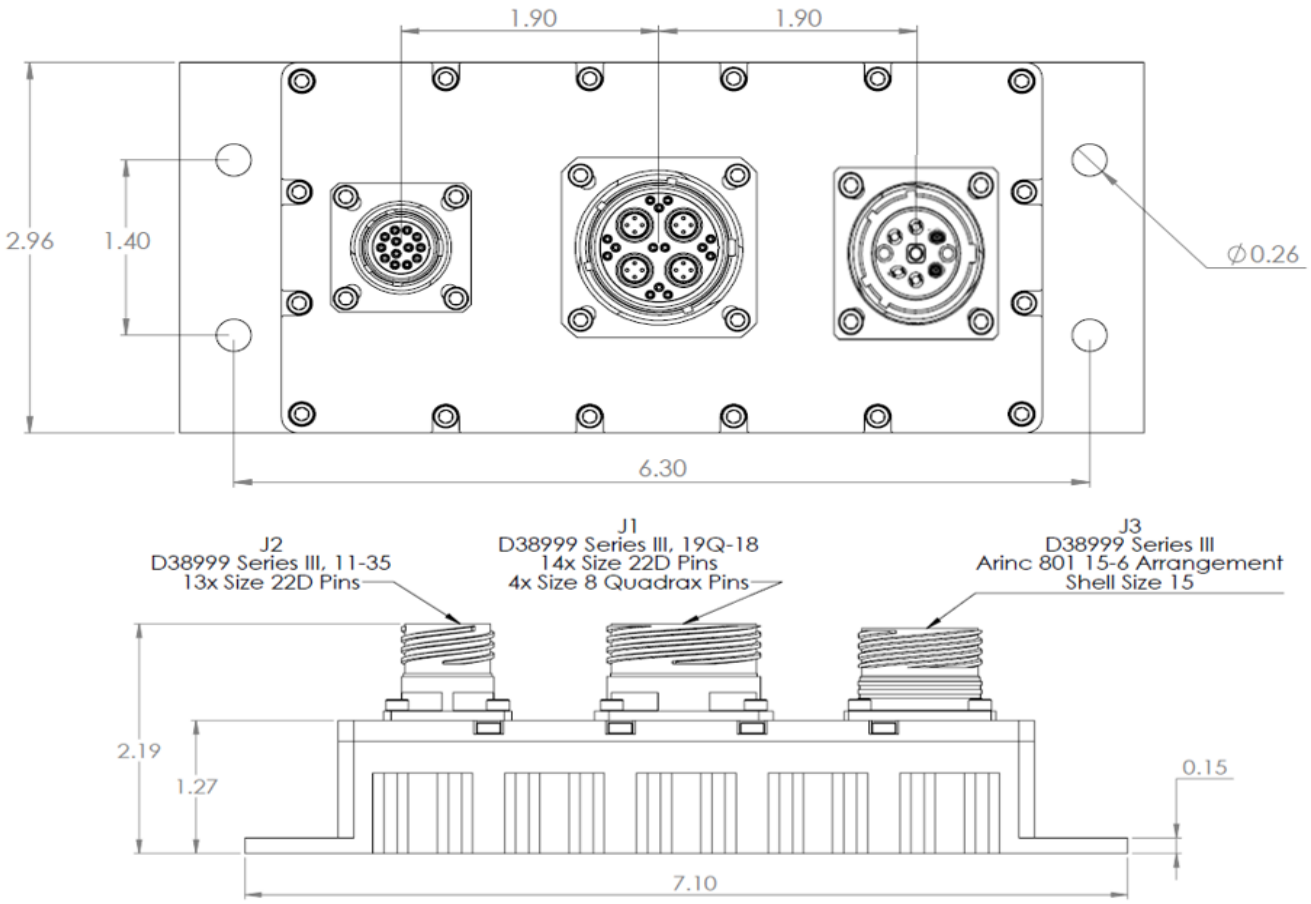
CHARACTERISTIC	Standard	Condition	Notes
Mechanical Shock	MIL-STD-810	40g	6-9 ms
Mechanical Vibration	MIL-STD-810	30g rms	
Vibration Profile	MIL-STD-810 ; MDC A3376	63.19g rms	Operational, 120 minutes per Axis, With Shock Mounts
ESD	MIL-STD-883	Class II	2200V HBM
Conducted Emissions, Power Leads, 30 Hz to 10 kHz	MIL-STD-461F	CE101	
Conducted Emissions, Power Leads, 10 kHz to 10 MHz	MIL-STD-461F	CE102	
Conducted Susceptibility, Power Leads, 30 Hz to 150KHz	MIL-STD-461F	CS101	
Conducted Susceptibility, Transients, Power Leads	MIL-STD-461F	CS106	
Conducted Susceptibility, Structure Current, 60 Hz to 100 kHz	MIL-STD-461F	CS109	
Conducted Susceptibility, Bulk Cable Injection, 10 kHz to 200 MHz	MIL-STD-461F	CS114	
Radiated Susceptibility, Magnetic Field, 30 Hz to 100 kHz	MIL-STD-461F	RS101	
Radiated Susceptibility, Electric Field, 2 MHz to 18 GHz	MIL-STD-461F	RS103	
Radiated Emissions, Magnetic Field, 30 Hz to 100 kHz	MIL-STD-461F	RE101	
Radiated Emissions, Electric Field, 10 kHz to 18 GHz	MIL-STD-461F	RE102	
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 or EPDM
Seal	Fluorosilicone or EPDM
Spring	Nickel-plated beryllium copper
PC tail contacts	Copper alloy/gold plated
PCB flex	FR4 & Polyimide
Solder type: Connector PC Tails to PCBA	Sn63Pb37 or Sn60Pb40
Encapsulant	HYSOL EE4215
Solder type	RoHS compliant Sn95/Sb5 (232°C melting temp) & RoHS compliant Sn96.5/Ag3.0/Cu0.5 (217° melting)

OUTLINE DRAWING & PANEL CUT OUT



Dimensional Tolerances Unless specified otherwise:
0.x ± 0.1”
0.xx ± 0.03”
0.xxx ± 0.015”

Marking:
Assembly is identified with a label containing Manufacture’s Name, Cage Code, Part Number, Date Code and Serial Number. The label also includes a UID to report the part number and the serial part number for tracing purposes. The UID is a Construct Number 2 MIL-STD-130N Data Matrix Symbol using ECC 200 encoding/decoding format.

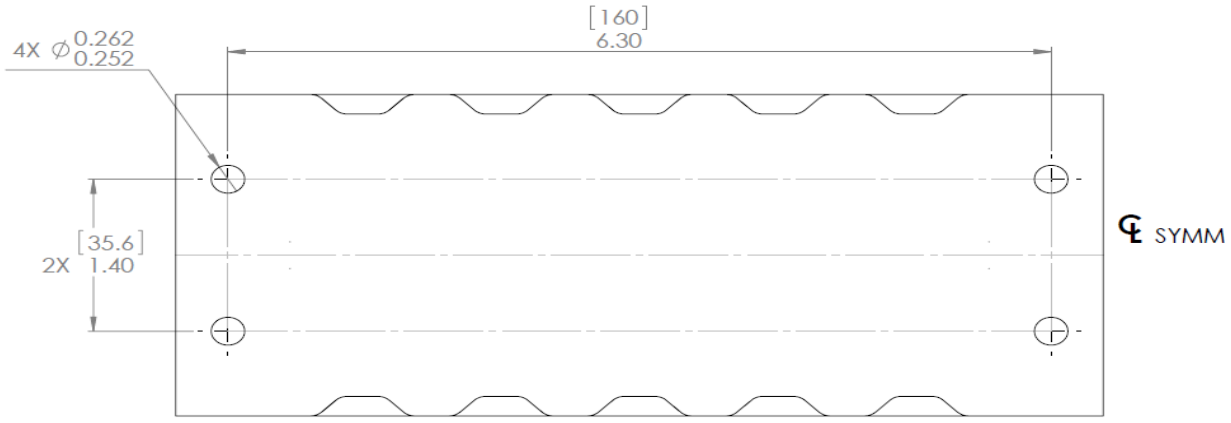
Connectors will be covered with protective caps at time of shipment

Please contact Glenair for other configurations

Weight:

Description	Weight	Comments
050-130-1 Single Channel Media Converter	1.42 lbs Max.	exclude dust caps
050-130-2 Dual Channel Media Converter	1.45 lbs Max.	

MOUNTING HOLE LOCATIONS



RECOMMENDED MOUNTING HOLES FOR BASEPLATE
¼" HARWARE REQUIRED FOR MOUNTING

Dimensional Tolerances Unless specified otherwise:
0.x ± 0.1" 0.xx ± 0.03" 0.xxx ± 0.015"

Interface Definition

Recommended Inspection & Cleaning Tools/Kits

The following recommendations are suggested for the 050-214 DVI Copper to Fiber Media Converter:

- ***GBS-1001 Inspection Kit which includes GIT-003 tip for ARINC 801 fiber contacts.***
- ***GCLT-H125 or GCLT-HA125 cleaning tool for ARINC 801 system.***

GBS1001 Inspection Probe with USB Adapter and Fiber Chek 2 Software

How To Order

GBS1001

Basic Part Number Includes:
- *Inspection probe with USB adapter*
- *Fiber Chek 2 Software*

Comes with
(installed on the probe):
GIT-003 Universal 1.25mm patch cord

The GBS1001 is the only inspection probe today with a high resolution, all digital sensor and USB2 video stream which delivers high-resolution uncompressed images directly to your personal computer.

GBS1001 Specifications	
Weight	.11 Kg / .25 lb
Resolution	Better than 1.5 Microns
Cable	Integrated USB 2.0 coil cable 2.5' relaxed, 10.5' fully extended
Certification	CE
Warranty	1 year

Fiber Chek Software
Fiber Optic Analysis Program

Fiber Chek is an integrated hardware/software package engineered with the single purpose of critically and consistently grading fiber end-faces. Works hand in hand with the Quick Capture Analog Probe for visual inspection, taking pictures and testing fibers.

- Automatic debris and defect detection, including fine scratches
- Measures epoxy ring for out-of-tolerance conditions
- Inspection results, including image data, can be printed or archived
- Utilizes industry standards or user defined threshold settings

Recommended Inspection & Cleaning Tools/Kits – (Continued)

Dry action cleaning tool for ARINC 801 systems

Dry action cleaning tool for ARINC 801 test adapters

- **A simple push motion engages tool**
- **Audible click when tool is fully engaged**
- **Durable — over 525 engagements per tool**
- **Crush resistant to over 250N**
- **Impact resistant to survive drops over 1.5M**