050-117

PRODUCT BRIEF

Line Replaceable Unit (LRU) Copper to Fiber Media Converter, Single or Dual Channel, Flange Mount 10/100/1000BASE-T to Fiber Optic Ethernet (1000BASE-SX, 1000 BASE-LX10 or 100BASE-FX) 28VDC (DO-160 Audio Conducted Susceptibility Cat Z), Lightning Strike (DO-160 level 3 waveform 3/3) M38999 (ARINC801), M38999 (Quadrax), M38999 (Power)

REV	DESCRIPTION	DATE	APPROVED
19	Preliminary	01/07/2016	MF
20	Add ECCN	05/24/2016	RAS
21	Add new part number to have two different fiber channels	09/29/2016	GC
22	Corrected J1 Mating plot	12/08/2016	TC
23	Add Flow Control Option	03/31/2017	RAS/GC
24	Update Copyright date	05/26/2017	GC

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050-117 PRODUCT BRIEF
Line Replaceable Unit (LRU) Media Converter, Flange Mount
10/100/1000BASE-T to Fiber Optic Ethernet (SX, LX10 or FX)

10/100/1000BASE-T to 1000BASE-SX or 1000BASE-LX10



The Glenair 050-117 Flange Mount Copper to Fiber Media Converter can be configured as either Single Channel or Dual Channel and can convert 10/100/1000BASE-T to 1000BASE-SX, 1000BASE-LX or 100BASE-FX protocols. It is designed for harsh environments and incorporates electronics in an environmentally sealed enclosure that incorporates three environmental M38999 connectors. The power supply is designed to accept a wide DC input voltage range, 18V to 36V and dirty 28V power as defined in DO-160. Power is supplied through a 38999 with standard #22D contacts. Signal I/O passes through a 38999 with a combination of Quadrax and #22D contacts and Fiber Optics passes through a 38999 using ARINC 801 contacts which can be configured to support either single mode or multi-mode fiber applications.

KEY FEATURES/BENEFITS

- 1310nm FP Lasers for 1000BASE-LX10
- InGaAs PIN PD for 1000BASE-LX10
- 850nm Lasers for 1000BASE-SX
- GaAs PIN PD for 1000BASE-SX
- 1300nm LED for 100BASE-FX
- PIN PD for100BASE-FX
- Wide Input Voltage Range: 18-36V
- Electrical Interface compliant with IEEE 802.3 (10/100/1000BASE-T)
- Optical Interface compliant with IEEE 802.3 (1000BASE-LX10/-SX, 100BASE-FX)
- DO-160 – Compliant to Lightening Strike Category A3J3XX & Voltage Spike Category A
- DO-160 – Compliant to Audio Frequency Conducted Susceptibility input, Category Z
- Option to implement Flow Control
- Ethernet MDI/MDIX automatic crossover
- Magnetics on the electrical signal input side to support 10/100/1000BASE-T operation over 100m Cat 5E
- IP67 in mated condition
- M38999 Quadrax & pin for Signal, BIT and service port
- M38999 Power
- M38999 ARINC 801 for Fiber Optic
- Flange Mount
- Single or Dual Channel Configurations

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

How To Order

050-117	F	-	1	SX	-	M	0	0	N	N	N

Basic PN: 050-117

Flow Control Option: Blank = No Flow Control; F = Flow Control

Number of Channels: 1 = Single Channel, CH1; 2 = Dual Channel, CH 1 & CH2

Fiber Optic Protocol: LX = 1000BASE-LX10; SX = 1000BASE-SX; FX = 100BASE-FX; *Contact factory for specials

Material/Finish: M = Aluminum, Nickel; MT = Aluminum, Nickel-PTFE; NF = Aluminum, Cadmium Olive Drab; Other finishes available

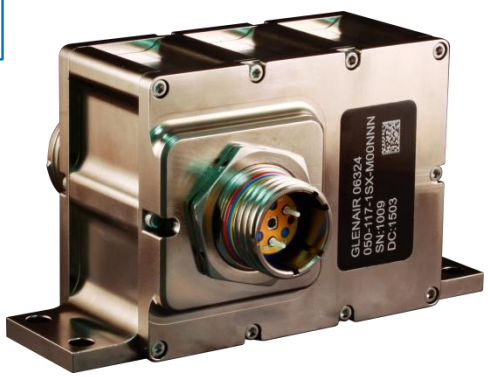
Dust Cap for J3: 0= None; 1 = Optical Port Dust cap with Lanyard

Built In Test Console Port: 0 = Not implemented; 1 = Built in Test (USB2.0); 2 = Built in Test (UART)

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

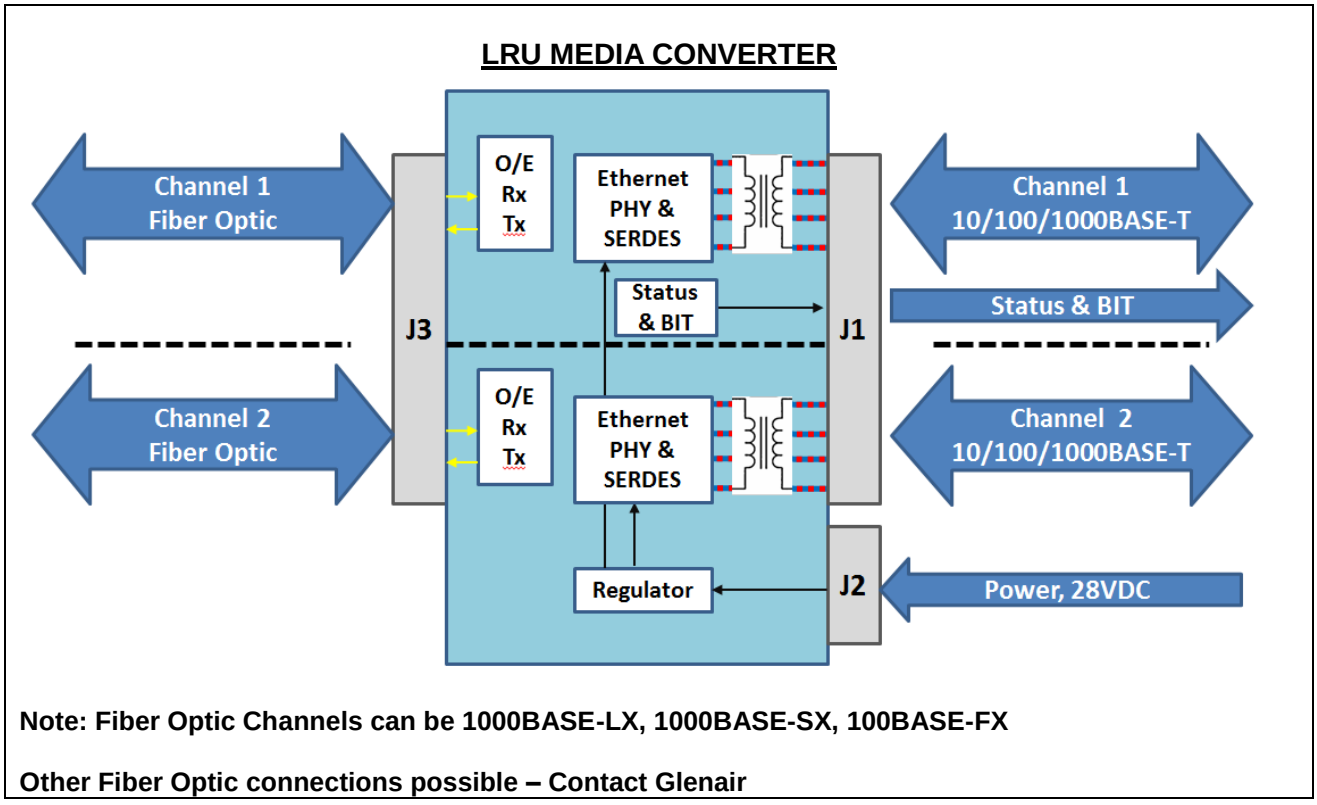
J2 Key Polarization: N=Normal, A, B, C, D E (Per Mil-DTL-38999)

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



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Functional Block Diagram



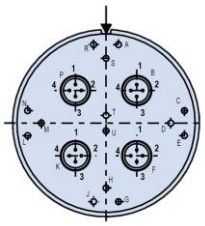
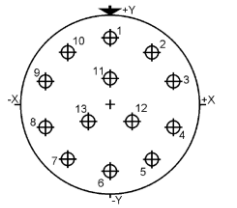
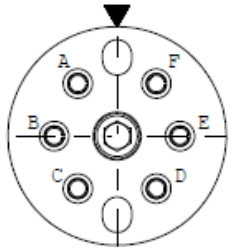
Note: Fiber Optic Channels can be 1000BASE-LX, 1000BASE-SX, 100BASE-FX

Other Fiber Optic connections possible – Contact Glenair

Flow Control

Ethernet flow control is a mechanism for temporarily stopping the transmission of data on Ethernet computer networks. If data flow between the two devices connected to the media converter will vary in rate, it is up to the end user to ensure their higher speed devices are throttled correctly to ensure loss of data does not occur over time. Flow control can be enabled at the factory if so desired. Contact the factory for more details.

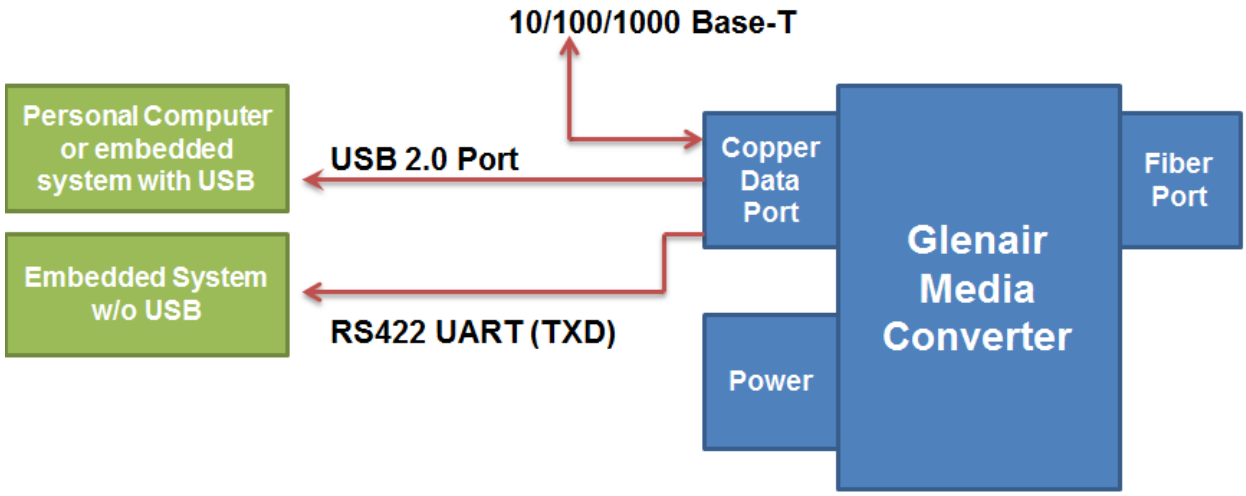
Connectors

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##G6-19-18BN**
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. 15-6 SHELL SIZE 15	Fiber Optic Signal	D38999 Series III Insert Arrangement per ARINC 801 <u>CONTACTS</u> ARINC 801 LX CONFIGURATION: SX CONFIGURATION: Contacts: Radiall pn F725003419	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)

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) or via RS422 UART (TXD) or both options can be made available. Functional block diagram for this is 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

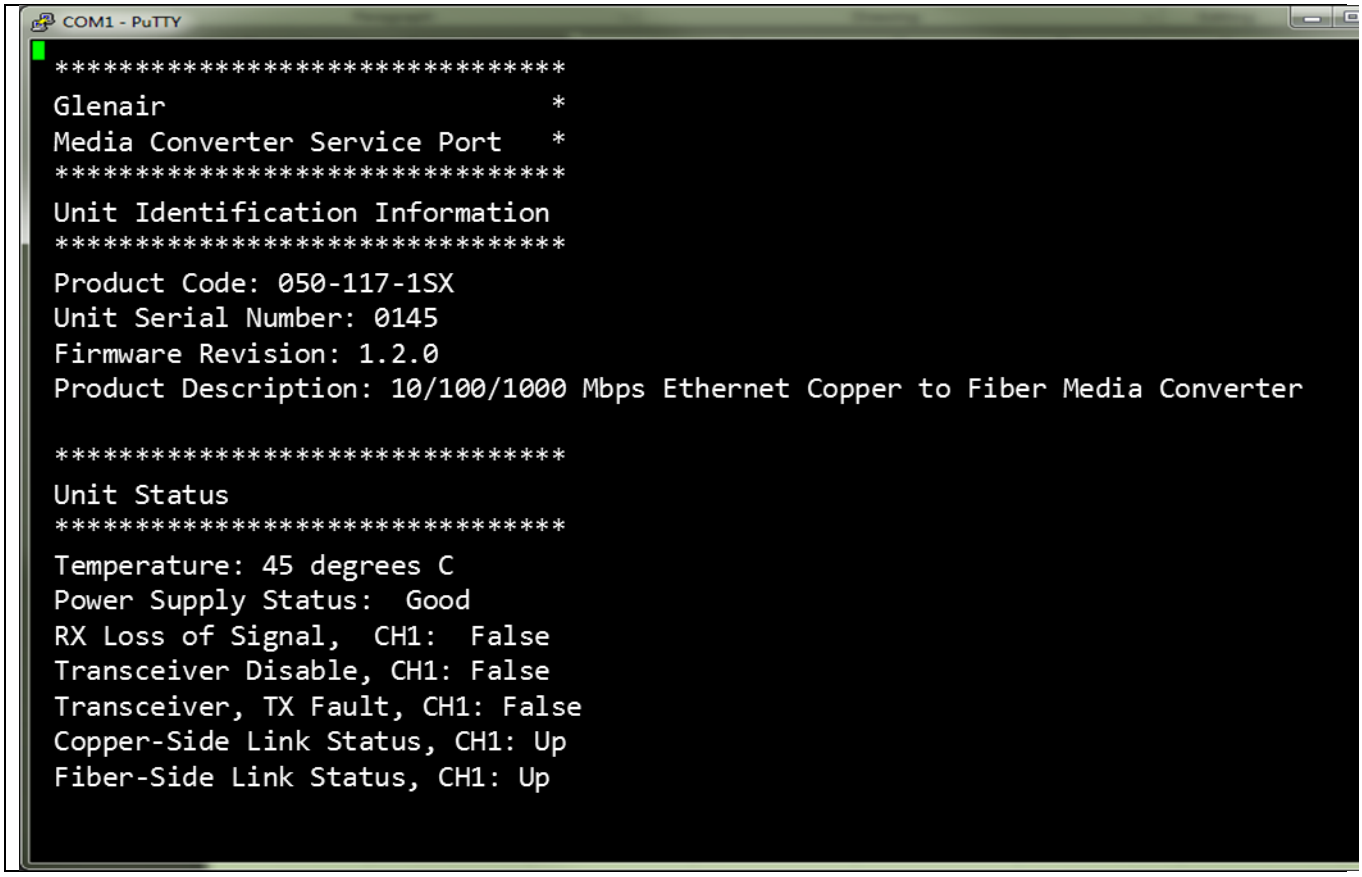
Fiber Side Alarm/Status

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

Copper Side Status

- Link Status (Up or Down)

TYPICAL CONSOLE PORT WINDOW (PuTTY)



Built In Test (BIT) Functionality – UART

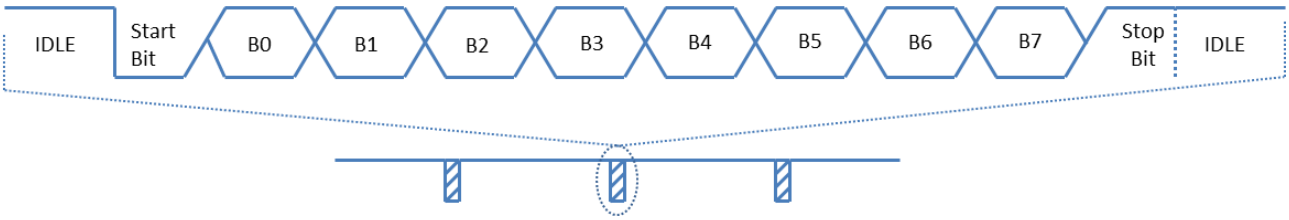
This media converter can be offered with built in test functionality accessible via an RS-422 Port. The UART Bit message is a 10 bit message with an update rate of 1 Hz. The message format can be seen below.

ALARM STATUS MESSAGES

- Fiber Link Status (Up or Down)
- Copper Link Status (Up or Down)
- Power Supply Status (In Range, or Fault)

Ethernet Media Converter Status Message Format

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	Channel 1 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
1	Channel 1 Ethernet copper Link UP (1 = Link Up, 0 = Link Down)
2	Channel 1 Power Supply Voltage “In Range” Fault (1 = Fault, 0 = No Fault)
3	Not used
4	Channel 2 Fiber Optic TX Fault (1 = Fault, 0 = No Fault)
5	Channel 2 Ethernet copper Link UP (1 = Link Up, 0 = Link Down)
6	Channel 2 Power Supply Voltage “In Range” Fault (1 = Fault, 0 = No Fault)
7	Not Used

Ratings and Specifications – LX10 VERSION

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	@28VDC PER CHANNEL
Power Supply Noise (Peak-Peak)	V_{cc_ripple}			**	V	** Per DO-160G, Table 18-3, Category Z for 28VDC

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P_{OUT}	-8.5	-4	-3	dBm	1310nm Fabry-Perot
Optical Wavelength	λ_{OUT}	1270	1310	1355	nm	
Spectral Width	$\Delta\lambda$			2.5	nm	

OPTICAL CHARACTERISTICS – RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Sensitivity (Input Power Range)	P_{IN_OP}	-20		0	dBm	
Min. Sensitivity, BER 10^{-12}, PRBS 2^{-7}-1	P_{IN_MIN}		-22	-20	dBm	PIN PD, LX10 source
Overload, BER 10^{-12}, PRBS 2^{-7}-1	P_{IN_MAX}	0			dBm	
Optical Wavelength	λ_{IN}	1100	1310	1590	nm	

ETHERNET COMPLIANCE

Parameter	Medium Type	Distance	Notes
Gigabit Ethernet, IEEE 802.3ab, 1000BASE-T	TIA/EIA-568-B Cat 5E	100m	
Gigabit Ethernet, IEEE 802.3z, 1000BASE-LX10	Single Mode Fiber (9/125µm)	10km	

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Ratings and Specifications – SX VERSION

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	@28VDC PER CHANNEL
Power Supply Noise (Peak-Peak)	V_{cc_ripple}			**	V	** Per DO-160G, Table 18-3, Category Z for 28VDC

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P_{OUT}	-9.5		-1	dBm	VCSEL, 62.5/125µm MM
Optical Wavelength	λ_{OUT}	830	850	860	nm	
Spectral Width	Δλ			0.85	nm	

OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Sensitivity (Input Power Range)	P_{IN_OP}	-17		-1	dBm	
Min. Sensitivity, BER 10^{-12}, PRBS 2^{-7}-1	P_{IN_MIN}		-19	-17	dBm	PIN PD
Overload, BER 10^{-12}, PRBS 2^{-7}-1	P_{IN_MAX}	-1	0		dBm	
Optical Wavelength	λ_{IN}	770	850	860	nm	

ETHERNET COMPLIANCE

Parameter	Medium Type	Distance	Notes
Gigabit Ethernet, IEEE 802.3ab, 1000BASE-T	TIA/EIA-568-B Cat 5E	100m	
Gigabit Ethernet, IEEE 802.3z, 1000BASE-SX	OM3 MMF (50/125µm) OM1 MMF (62.5/125µm)	550m 275m	850nm VCSEL

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Ratings and Specifications – FX VERSION

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	@28VDC, PER CHANNEL
Power Supply Noise (Peak-Peak)	V_{cc_ripple}			**	V	** Per DO-160G, Table 18-3, Category Z for 28VDC

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P_{OUT}	-19		-14	dBm	1300nm LED (IEC 9314-3)
Optical Wavelength	λ_{OUT}	1270	1310	1380	nm	
Spectral Width	$\Delta\lambda$		150		nm	

OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Sensitivity, BER 10^{-10}, PRBS 2^{-7}-1	P_{IN}			-32	dBm	PIN PD
Overload, BER 10^{-10}, PRBS 2^{-7}-1	P_{IN}	-14			dBm	
Optical Wavelength	λ_{IN}	1270	1310	1380	nm	

ETHERNET COMPLIANCE

Parameter	Medium Type	Distance	Notes
Fast Ethernet, IEEE 802.3u, 100BASE-T	TIA/EIA-568-B Cat 5E	100m	
Fast Ethernet, IEEE 802.3u, 100BASE-FX, IEC 9314-3	MMF (50/125µm) & (62.5/125µm)	2km	

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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	Per Addendum
Power Input	DO-160G, Section 16	28VDC, Category Z	No damage, Normal Operation (BER free) before and after test
Voltage Spike	DO-160G, Section 17	Category A	No damage, Normal Operation (BER free) before and after test
Power supply, Audio Frequency Conducted Susceptibility	DO-160G, Section 18	Category Z	Normal Operation (BER free) in the presence of “Dirty Power”
Induced Signal Susceptibility	DO-160G, Section 19	Category Z	No damage, Normal Operation (BER free) before and after test
RF Frequency Susceptibility Conducted Susceptibility	DO-160G Section 20.4	Category R	
RF Frequency Susceptibility Radiated Susceptibility	DO-160G Section 20.5	Category R	
Emission of Radio Frequency Energy Conducted Emissions	DO-160G, Section 21.4	Category M	
Emission of Radio Frequency Energy Radiated Emissions	DO-160G, Section 21.3	Category M	
Lightning Strike	DO-160G, Section 22	Category A3J3XX	No damage, Operate error free before and after application of the pin injection tests. Will operate error free during shielded cable bundle injection tests
ESD	IEC 61000-4-2		Min 8KV (contact) Min 15KV (Air)
Mating Durability	MIL-DTL--38999/20	500 Cycles	
Eye Safety	CDRH and IEC-825	Class 1 Laser Product	

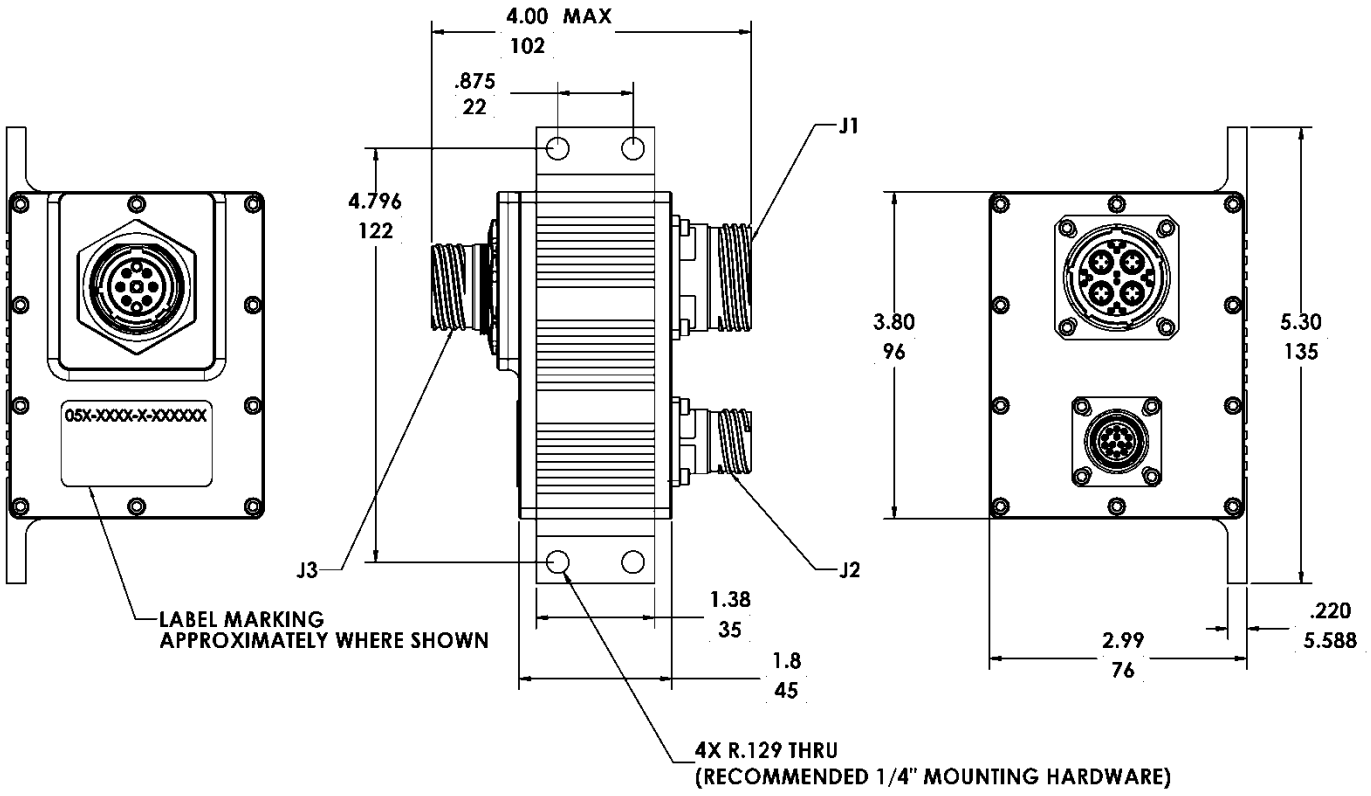
Ratings and Specifications - (continued)

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)

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OUTLINE DRAWING



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

Marking
Assembly is identified with Manufacture's Name, Cage Code, Part Number, Date Code and Serial Number in approximate location shown

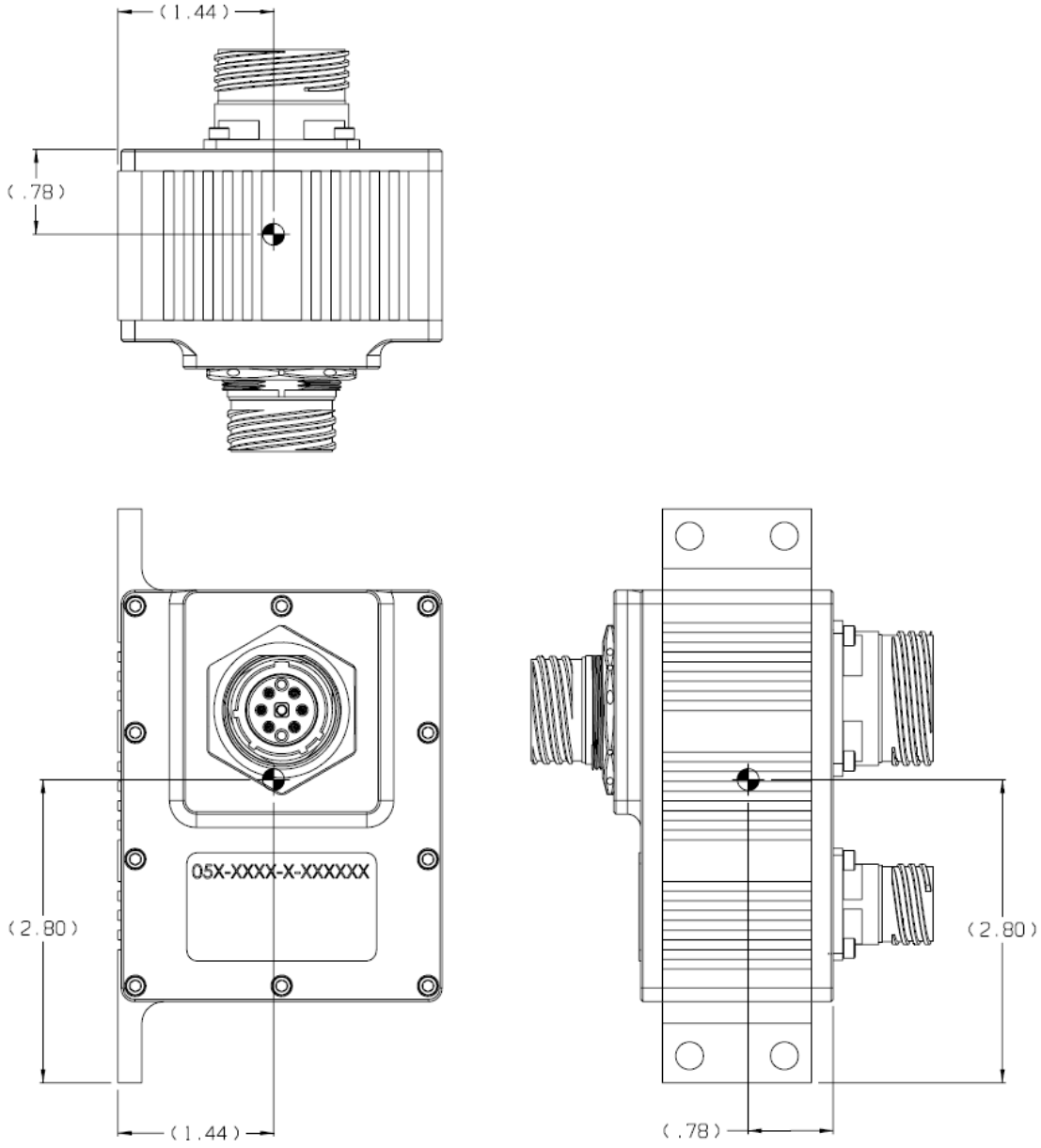
Weight:

Description	Weight	Comments
050-117-1 **Single Channel Media Converter**	**1.42 lbs Max.**	**exclude dust caps**
050-117-2 **Dual Channel Media Converter**	**1.45 lbs Max.**	

Connectors will be covered with protective caps at time of shipment

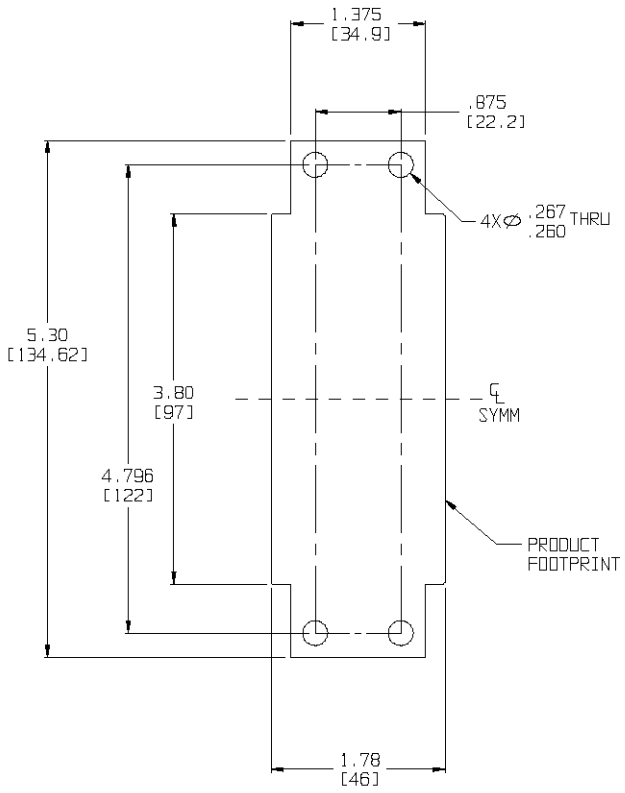
Please contact Glenair for other configurations

Center of Gravity (Preliminary Calculation)



******Center of Gravity dimensions are calculated on preliminary 3D models and are for reference only.******

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"

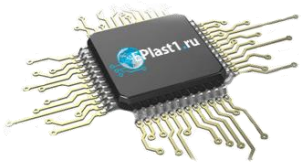
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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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