



050-111

PRODUCT BRIEF

Media Converter, Dual Channel
10/100/1000BASE-T to Fiber Optics
GFOCA (FO), M38999 (Signal), M38999 (Power)

REV	DESCRIPTION	DATE	APPROVED
1	Preliminary	08/17/2015	MF/RAS
2	Add ECCN	05/26/2016	RAS
3	Update Absolute Maximum Voltage	01/09/2017	RAS/GC
4	Add Flow Control Option	03/20/2017	RAS/GC
5	Update Copyright date	05/26/2017	GC
6	Update Quadrax Mating Connector PN	08/21/2018	GC
7	Add UID Data Matrix specs in the Marking section, FO Inspection/Cleaning Tools	01/24/2019	YA/RAS
8	Tolerance added to Outline Drawing	02/08/2019	DJM
9	Update the Part Number Development Instruction. Correct the PRBS	02/04/2019	RAS/YA

BF15U2-3577

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050-111 PRODUCT BRIEF

Media Converter, Dual Channel

10/100/1000BASE-TX to Fiber Optic Ethernet



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



The Glenair 050-111 is a Dual Channel 10/100/1000BASE-T to Fiber Optic Media converter that can be configured for SMF or MMF applications supporting conversion to 1000BASE-SX, 1000BASE-LX or 100BASE-FX protocols. This media converter is designed for harsh environments and incorporates electronics in an environmentally sealed enclosure that incorporates two environmental M38999 connectors and one GFOCA connector. One M38999 connector is utilized for power and 2nd M38999 connector is utilized for electrical signal and BIT. The GFOCA connector is used for the Fiber Optic signals and 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
- 1310nm FP for 100 BASE-FX** (16dB optical Link Budget)
- PIN PD for 100BASE-FX
- Wide Input Voltage Range: 18-36V
- GFOCA inter-mates with TFOCA II®
- Compliant IEEE 802.3 (10/100/1000BASE-T)
- Optical Interface compliant with IEEE 802.3 (1000BASE-LX10/-SX, 100BASE-FX)
- Contact Glenair if Flow Control is required

- 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

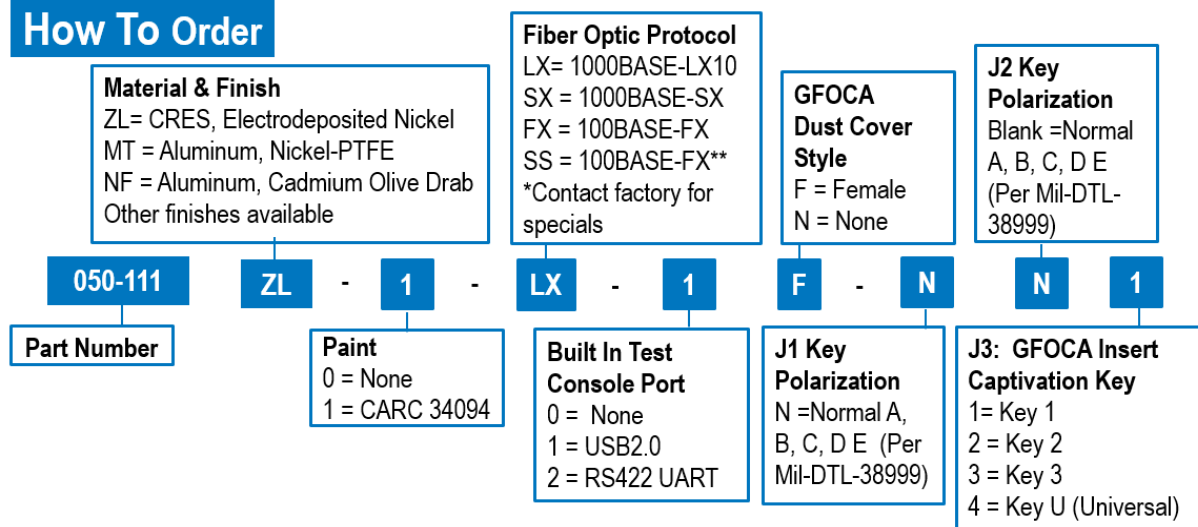
OPTIONAL FEATURES

- 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

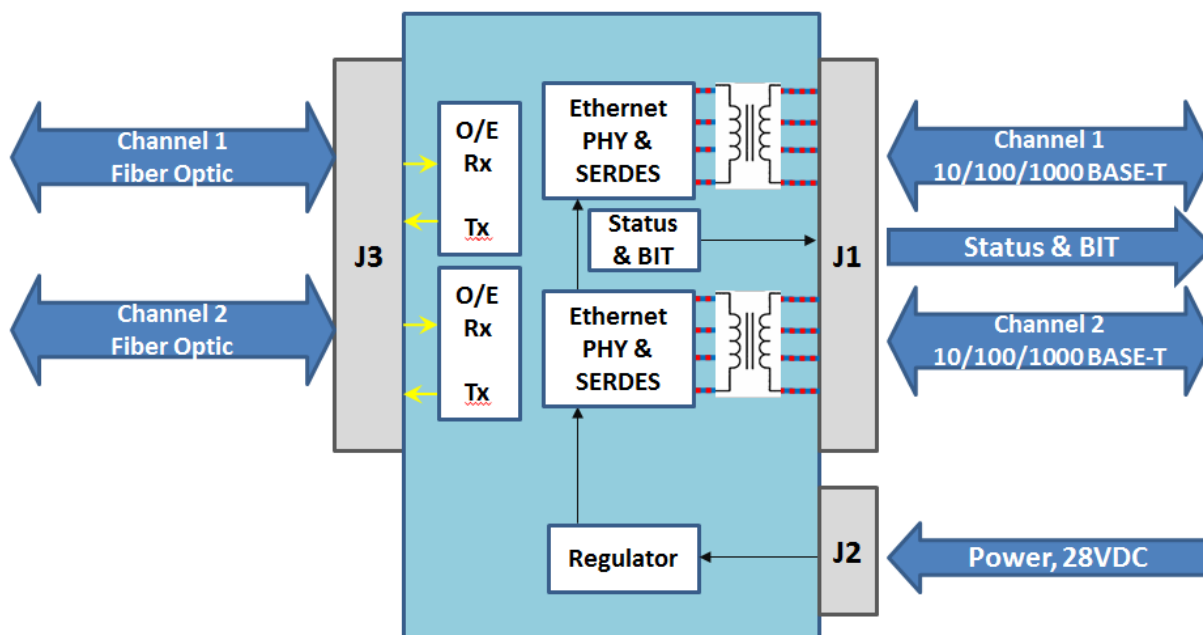
How To Order



050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Functional Block Diagram



Note: Fiber Optic Channels can be one of the following:

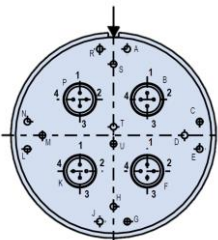
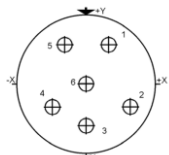
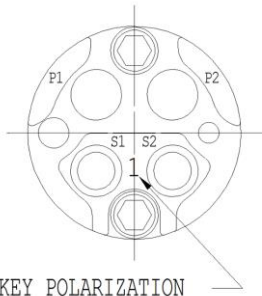
- 1000BASE-LX10,
- 1000BASE-SX,
- 100BASE-FX
- 100BASE-FX** (non-standard optical PMD supporting 16dB link budget)

Other Fiber Optic connections possible – Contact Glenair

050-111 PRODUCT BRIEF
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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	Generic PN D38999/26#F18SN **Glenair PN 257-606##G6-19Q-18BN
J2		Power, Return & Chassis Ground	D38999 Series III type, 9-35 6X SIZE 22D Pins	Generic PN D38999/26#A35SN Glenair PN 233-105-G6##09-35SN
J3	 KEY POLARIZATION	Fiber Optic Signal	GFOCA Receptacle Polarization Key 1	TFOCA II® Plug Glenair PN Family 180-145 GFOCA Hermaphroditic Plug Connector MIL-DTL-83526/16 Type, 4 Channel Suggested Test Cable Glenair PN FA04389-62-##-72-LC

Note: # = Environmental Class (Material/Finish)

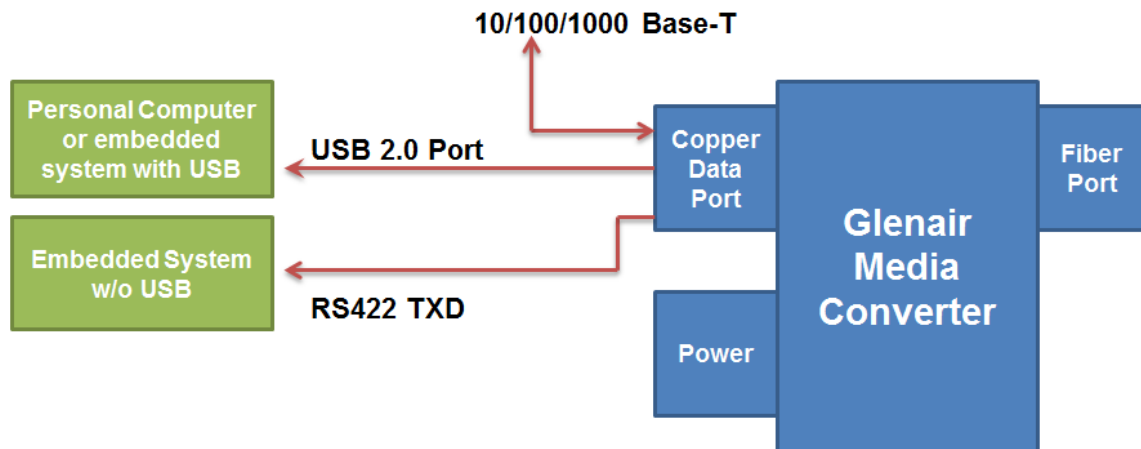
**Connector is supplied less contacts. Optional mode code 557 can be added to the end of the part number to include contacts (including spares), insertion/removal tool, and sealing plugs. Contact manufacturer for additional options.

050-111 PRODUCT BRIEF
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10/100/1000BASE-TX to Fiber Optic Ethernet



Built In Test (BIT) Functionality - Optional Features

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 TXD. 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.

RS422 TXD BIT

- Useful for when you are interfacing with a embedded microprocessor or micro controller.
- Status messages delimited to allow for easy parsing by embedded software.

ALARM STATUS MESSAGES

Fiber Side Alarm/Status

- Transmitter Fault Alarm Status
- Receiver loss of signal (LOS) or signal Detect (SD) Status

Copper Side Status

- Link Status (Up or Down)

Unit Identification Information

- Unit Serial Number
- Unit Product Code
- Unit Description

050-111 PRODUCT BRIEF
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10/100/1000BASE-TX to Fiber Optic Ethernet



TYPICAL CONSOLE PORT WINDOW (PuTTY)

```
COM1 - PuTTY
*****
Glenair *
Media Converter Service Port *
*****
Unit Identification Information
*****
Product Code: 050-111
Unit Serial Number: 0145
Firmware Revision: 2.03
Product Description: Dual Channel 10/100/1000 Ethernet Copper to Fiber Media
Converter

*****
Fiber Side Status
*****
Temperature: 24.0 C
Voltage: 3.32 V
Transmitter Bias: Good
Transmitter Power Monitor: Good
Transmitter Fault: False
Receiver Photo Current: Good
Receiver loss of signal (LOS): false

*****
Copper Side Status
*****
Link Status: Link Up
Link Mode: Half Duplex
Link Speed: 1000 Mbps
```

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Ratings and Specifications – LX10 VERSION

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	1 second maximum, 40V

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	@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	Δλ			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 7	P _{IN_MIN}		-22	-20	dBm	PIN PD, LX10 source
Overload, BER 10 ⁻¹² , PRBS 7	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	

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Ratings and Specifications – SX VERSION

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	1 second maximum, 40V

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	@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 7	P _{IN_MIN}		-19	-17	dBm	PIN PD
Overload, BER 10 ⁻¹² , PRBS 7	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

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Ratings and Specifications – FX VERSION

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	1 second maximum, 40V

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	@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	Δλ		150		nm	

OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Sensitivity, BER 10 ⁻¹⁰ , PRBS 7	P _{IN}			-32	dBm	PIN PD
Overload, BER 10 ⁻¹⁰ , PRBS 7	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	

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Ratings and Specifications – SS VERSION (16 dB Link Budget, MMF)

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	1 second maximum, 40V

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}		70	150	mA	@28VDC

OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P _{OUT}	-15		-8	dBm	1310nm FP, 62.5/125μm MM
Optical Wavelength	λ _{OUT}	1260	1310	1380	nm	
Spectral Width	Δλ		4		nm	

OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Sensitivity (Input Power Range)	P _{IN_OP}	-32		-6	dBm	
Min. Sensitivity, BER 10 ⁻¹² , PRBS 7	P _{IN_MIN}		-34	-32	dBm	PIN PD, 62.5/125μm MM
Overload, BER 10 ⁻¹² , PRBS 7	P _{IN_MAX}	-6			dBm	
Optical Wavelength	λ _{IN}	1100	1310	1590	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, Non-Standard Optical PMD supporting 16dB loss budget	MMF (50/125μm) & (62.5/125μm)	2km	100BASE-FX** with higher power transmitter to support 16dB optical loss budget

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Ratings and Specifications - (continued)

COMPLIANCE SPECIFICATIONS

CHARACTERISTIC	Standard	Condition	Notes
Mechanical Shock	MIL-STD-810F	Method 516.5 +40g, 11 ms	Half-sine, three (3) positive and three (3) negative pulses per axis while operational
Mechanical Vibration	MIL-STD-810F	Method 514.5 7.7 g rms	Category 24, Operational 1hr per axis
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	
Altitude, Operating and Non-operating	MIL-PRF-28800	Para 4.5.2.5,2 Class 2	Operating: -1000 ft & 10,000 ft Non-operating: -1000 ft & 40,000 ft
Water Immersion	MIL-STD-810F	Method 512.4	1 m immersion, 30 minutes
Salt Fog	MIL-PRF-28800	Para 4.5.6.2 & 4.5.6.1	5% solution, 48 hours, Class 1
Sand and Dust	MIL-STD-810F	Method 510.4 Para. 1.1a	At 25C and 71C, 30% RH, 8.9m/s air velocity, dust feed of 10.6 g/m ³
ESD	MIL-STD-883	Class II	2200V HBM
Mating Durability	MIL-STD-38999/20	500 Cycles	
Flame Resistance	MIL-STD-1344	Method 1012	30 seconds
Damp Heat	MIL-STD-1344	10 cycles	24 hours
GFOCA (TFOCA II® equivalent)	MIL-DTL-83526	2000 cycles	Tested to 4000 cycles
Eye Safety	CDRH and IEC-825	Class 1 Laser	IEC-825

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Ratings and Specifications - (continued)

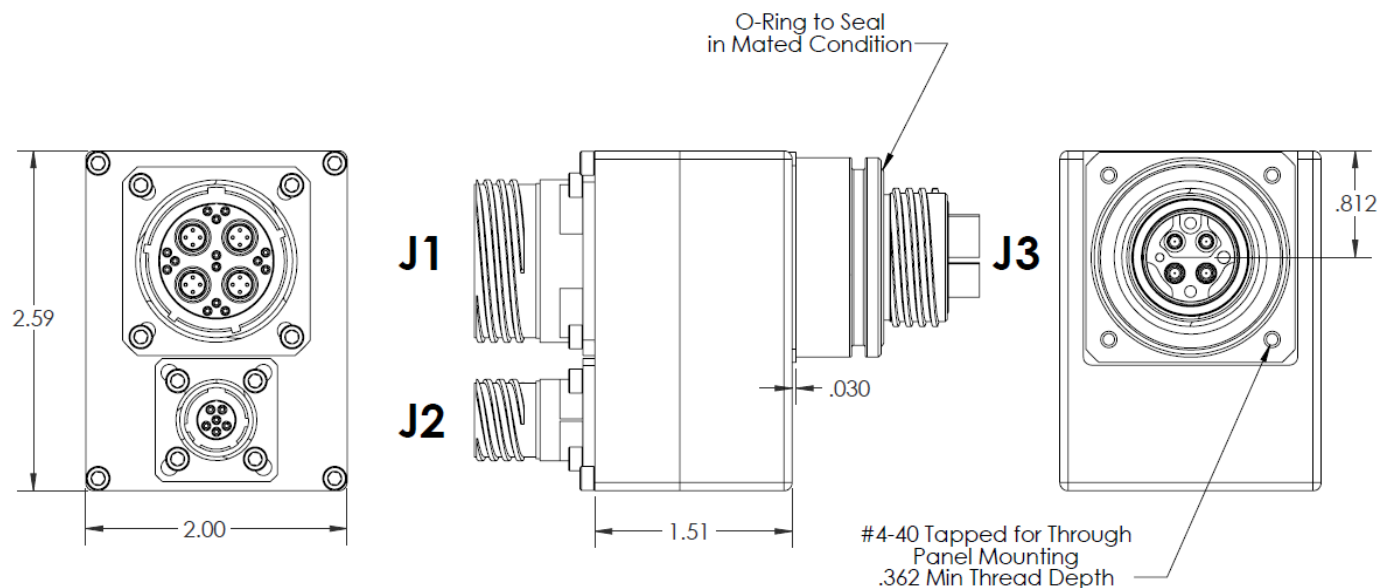
Material/Finish

Item	Material	Notes
D38999 & GFOCA	Stainless Steel	
D38999 Inserts	Thermoplastics	
Interfacial Seals, 38999 only	Elastomer, Fluorosilicon	
Optical Ferrules & Sleeves	Zirconia, Ceramic	
Printed Circuit Boards	FR4/Polyimide	
Housing	Stainless Steel, Nickel plated + CARC 34094 paint	
O-Ring Seals (GFOCA)	EPDM	

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OUTLINE DRAWING & PANEL CUT OUT



Dimensional Tolerances Unless specified otherwise:

0.x ± 0.1"

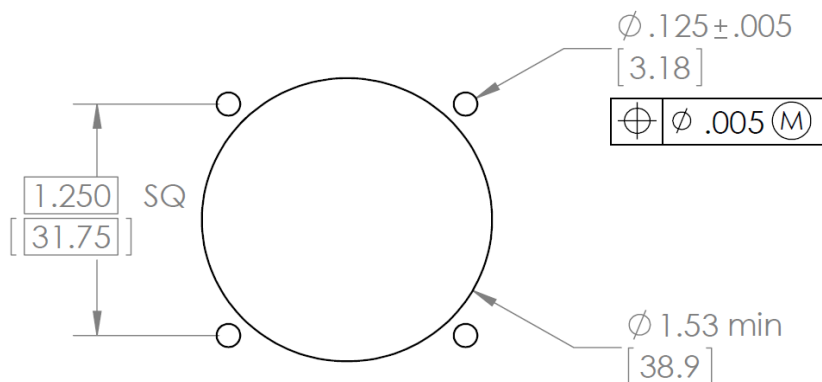
0.xx ± 0.03"

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.

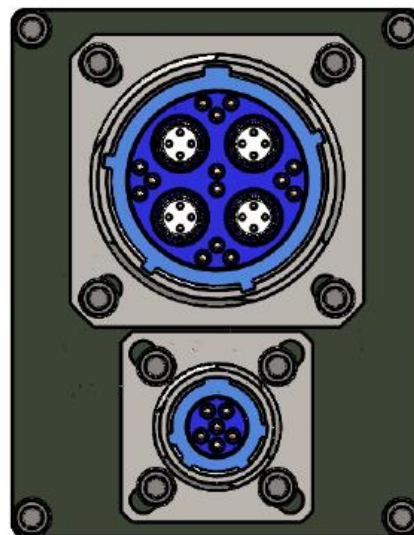
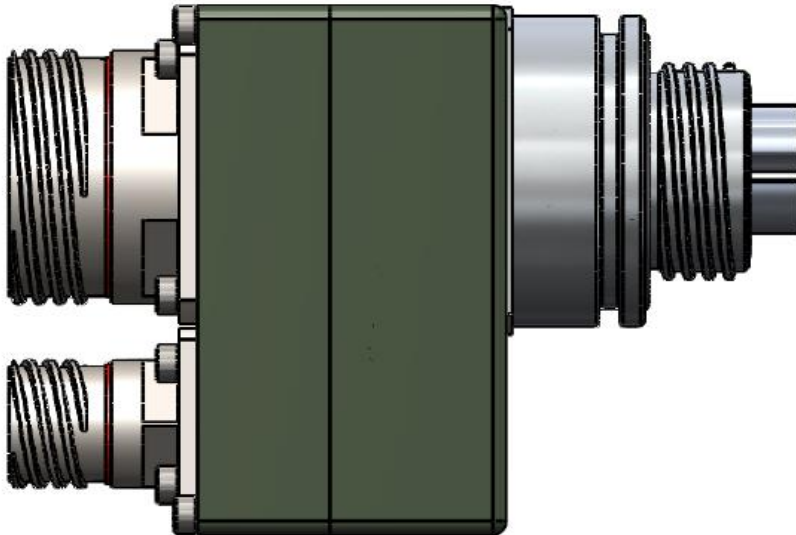
PANEL CUT OUT – J3



050-111 PRODUCT BRIEF
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10/100/1000BASE-TX to Fiber Optic Ethernet



CARC Paint Application and Masking (when applicable)



**Paint CARC 34094 (Green 383) per MIL-DTL-53072
except as shown above**



Input/Output Definition

050-111 PRODUCT BRIEF
Media Converter, Dual Channel
10/100/1000BASE-TX to Fiber Optic Ethernet



Recommended Inspection & Cleaning Tools/Kits

The following recommendations are suggested for the 050-111 Copper to Fiber Media Converter:

- *GBS-1001 Inspection Kit (Includes GIT-003 tip for Arinc 801 & GHD systems)*
- *GIT-010 (FBPT-TFOCA2) tip for GFOCA system.*
- *GCLT-HC250 cleaning tool for GFOCA 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 GFOCA System



GCLT - HC250

- 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