



# 050-211

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## PRODUCT BRIEF

### Copper to Fiber Media Converter SMF or MMF 4-Channel SMPTE HD-SDI

REV	DESCRIPTION	DATE	APPROVED
1	Preliminary	08/29/2017	RAS/GC
2	Add CWDM Wavelengths	08/30/2017	RAS/GC
3	Edit P/N nomenclature and add MMF option	10/30/2018	RAS/GC
4	Remove 3G-SDI option, add UID, add FO cleaning and inspection tools	02/12/2019	YA
5	Update the PRBS	04/18/2019	YA

BF17U2-9490

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**050-211 PRODUCT BRIEF**  
**SMF or MMF 4-Channel SMPTE HD-SDI**  
**Media Converter**



**4-Channel SMPTE HD-SDI Media Converter**



The Glenair 050-211 is a 4-Channel SMPTE Copper to Fiber Optic Media Converter, which extends the reach between a video source and sink. This media converter is configured either as a SMF/ MMF SMPTE CWDM optical transmitter, converting electrical SMPTE signals to fiber or as a SMF/MMF SMPTE CWDM optical receiver converting fiber optic signals into the electrical SMPTE signals.

The 050-211 is designed for harsh environments and incorporates electronics in an environmentally sealed enclosure that incorporates two (2) D38999 connectors to support Electrical connections and Glenair High Density (GHD) connector for the fiber optic interconnect. Signal I/O and BIT functionality connect through one D38999 connector and power is provide through a separate D38999 connector. The Fiber Optics passes through Glenair GHD connector.

**KEY FEATURES/BENEFITS**

- CWDM DFB Lasers to support HD-SDI
- SMPTE EG 34:2004
  - Compliant to Pathological Conditions CASE 1, CASE 2 and CASE 3
- SMPTE ST 297:2006 (HD-SDI)
- SMPTE 292/424 (HD-SDI)
  - HD-SDI: 16dB optical budget
- Wide Input Voltage Range
- IP67 in mated condition

- D38999 with 75 Ohm Coax and #22 Pin contacts
- GHD Fiber Optic connector
- Operates with either SMF or MMF

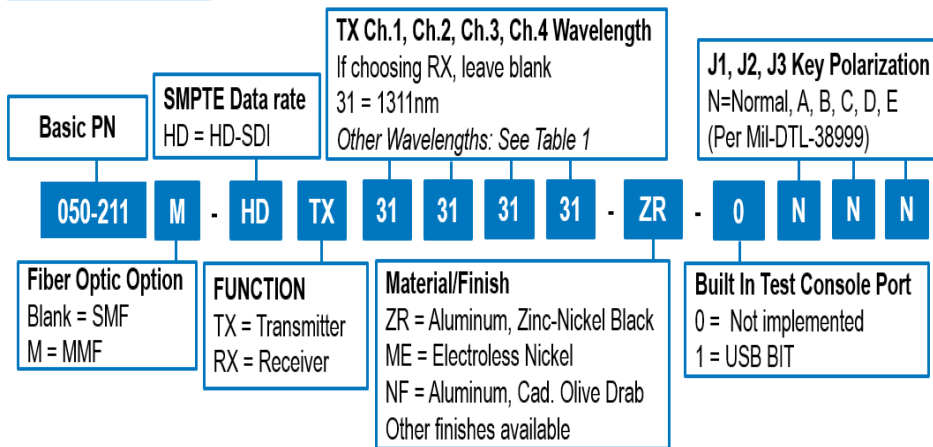
**OPTIONAL FEATURES**

- Built In Test Console Port accessible via USB2.0

**APPLICATIONS**

Harsh Environment such as: Airborne, Tactical, Railway, Industrial, Oil and Gas and Shipboard applications

**How To Order**



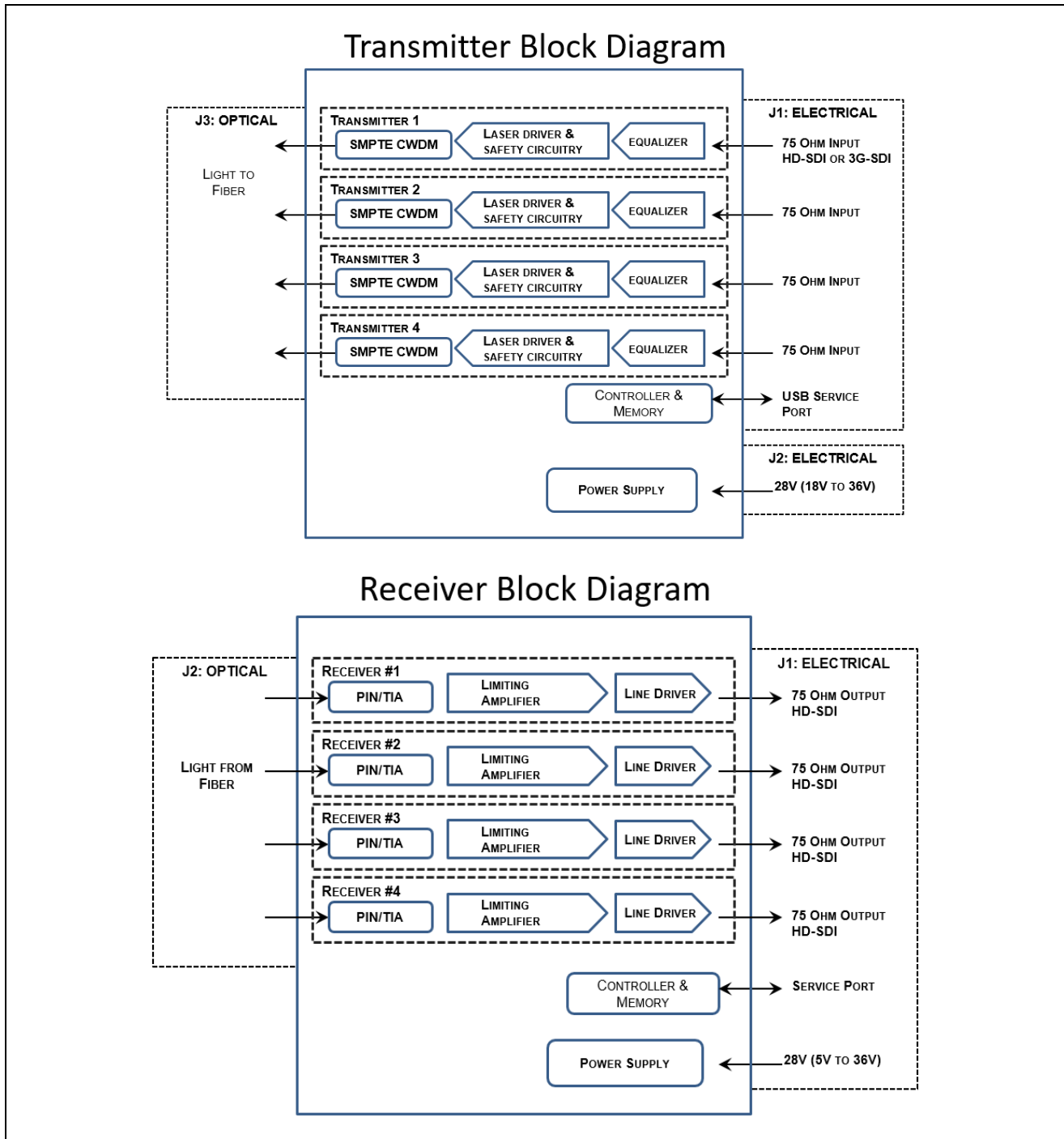
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**Table 1**

<i>P/N Options</i>	<i>CWDM Wavelengths</i>
27	1271nm
29	1291nm
31	1311nm
33	1331nm
35	1351nm
37	1371nm
39	1391nm
41	1411nm
43	1431nm
45	1451nm
47	1471nm
49	1491nm
51	1511nm
53	1531nm
55	1551nm
57	1571nm
59	1591nm
61	1611nm

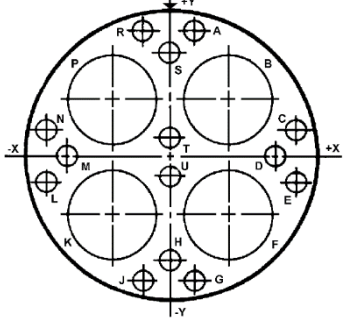
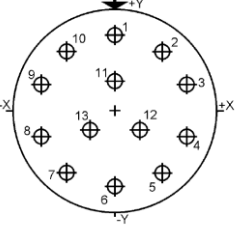
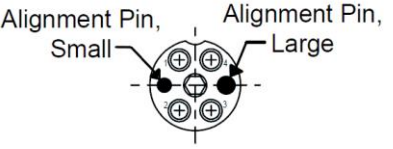
**Functional Block Diagram**



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**SMF or MMF 4-Channel SMPTE HD-SDI**  
**Media Converter**



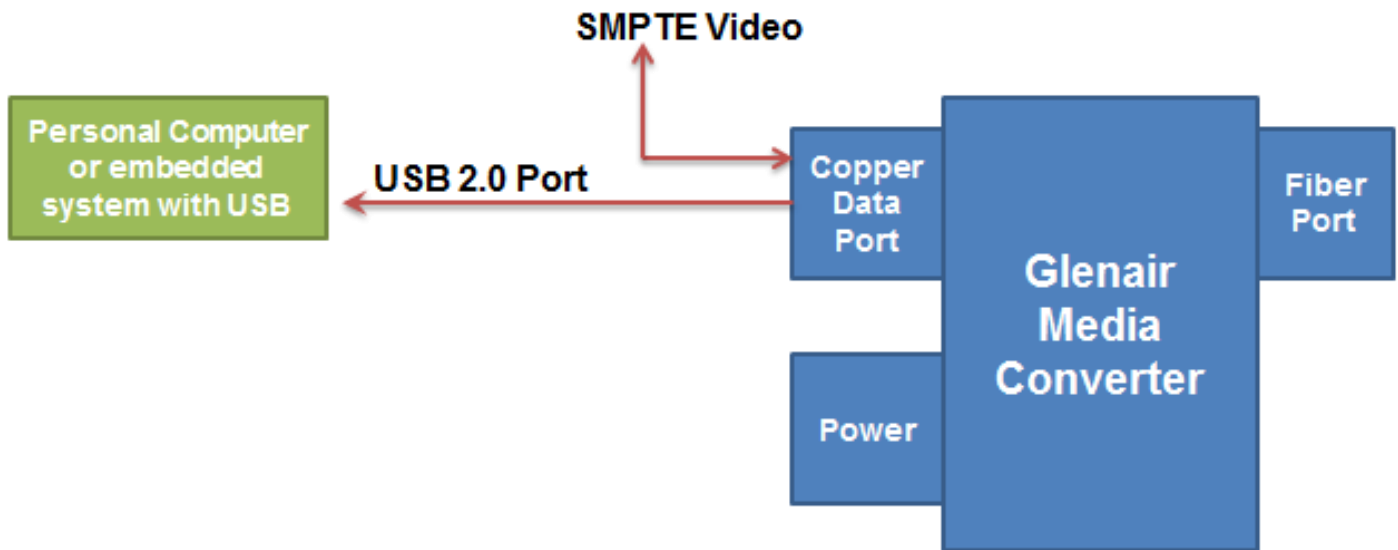
**Connectors**

NAME	Insert Arrangement	Function	Media Converter	Mating PLUG Connector
<p><b>J1</b></p>	 <p style="text-align: center;">Receptacle Interface Arrangement 19-18 14X Size 22D 4X Size 8 Coax</p>	<p>Electrical Signal, Power, and Built In Test (BIT)</p>	<p>D38999 Series III type, 19C-18</p> <p>14X SIZE 22D Pins 4X SIZE 8 Pins (AS39029/119)</p>	<p>Generic PN D38999/26#F18SN type</p> <p>Glenair PN <b>257-606-G6##19-18SN</b></p> <p>Coax Socket Contacts 852-083-01</p> <p>Socket Contacts M39029/56-348</p>
<p><b>J2</b></p>		<p>Power</p>	<p>D38999 Series III type, 11-35 13X SIZE 22D Pins</p>	<p>Generic PN D38999/26#B35SN</p> <p>Glenair PN <b>233-105-G6##11-35SN</b></p> <p>Socket Contacts M39029/56-348</p>
<p><b>J3</b></p>	 <p style="text-align: center;">Shell Size 11 Arrangement 4</p>	<p>Fiber Optic Signal</p>	<p>GHD Shell Size 11 Arrangement 4</p> <p><u>CONTACTS</u> 181-056</p>	<p>Glenair PN <b>180-122-#06-11-4N</b></p> <p><u>CONTACTS:</u> 181-056-1260C</p>

Note: # = Environmental Class (Material/Finish)

## Built In Test (BIT) Functionality – USB 2.0

This media converter can be configured with built in test and monitoring functionality accessible through a console port via Universal Serial Bus 2.0 (USB 2.0).



### 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 State 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

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TYPICAL CONSOLE PORT WINDOW

```
COM1 - PuTTY
*****
Glenair *
Media Converter Service Port *
*****
Unit Identification Information
*****
Product Code: 050-211
Unit Serial Number: 1234
Firmware Revision: 1.2.0
Product Description: SMPTE Copper to Single Mode Fiber Media
Converter - Transmitter

*****
Unit Status
*****
Temperature: 45 degrees C
Power Supply Status: Good
Transmitter FO Fault, TX_Channel 1: False
Transmitter FO Fault, TX_Channel 2: False
Transmitter FO Fault, TX_Channel 3: False
Transmitter FO Fault, TX_Channel 4: False
```

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***Ratings and Specifications***

**ABSOLUTE MAXIMUM RATINGS**

Parameter	Min	Typ	Max	Units	Notes
Storage Temperature	-55		+100	°C	
Supply Voltage	-40		40	V	

**OPERATING CONDITIONS**

Parameter	Min	Typ	Max	Units	Notes
Operating Temperature	-40		+85	°C	
Supply Voltage	18	28	36	V	
Supply Current		100	150	mA	Measured at 28V



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**SMF or MMF 4-Channel SMPTE HD-SDI**  
**Media Converter**



**Ratings and Specifications - (Continued)**

**ELECTRO-OPTICAL CHARACTERISTICS – TRANSMITTER (SMF)**

Parameter	Min	Typ	Max	Units	Notes
Data Rate	125		2970	Mbps	
Optical Output Power	-1	1.5	+3.5	dBm	@ 1.485 Gbps
Optical Link Budget	19			dBm	
@ 1.485 Gbps	19			dBm	<i>Measured in combination with 050-211-HDRX (HD-SDI RX) and 050-211-HDTX (HD-SDI TX), Compliant with SMPTE 292</i>
Extinction Ratio	5	10		dB	@ 1.485 Gbps
Optical Wavelength, "31", 1311nm	1301	1311	1318.5	nm	
Optical Wavelength, "55", 1551nm	1541	1551	1558.5	nm	
Spectral Width, rms			1	nm	
Relative Intensity Noise			-117	dB/Hz	
Timing Jitter			1	UI	SMPTE 292, 1.485 Gbps, Color bar
Alignment Jitter			0.2	UI	SMPTE 292, 1.485 Gbps, Color bar
Input Impedance		75		Ohms	AC coupled Internally
Input Voltage Swing	720	800	950	mV <sub>p-p</sub>	75 Ohm Single Ended
Input Return Loss					
5 MHz - 1.5 GHz		15		dB	

**050-211 PRODUCT BRIEF**  
**SMF or MMF 4-Channel SMPTE HD-SDI**  
**Media Converter**



**Ratings and Specifications - (Continued)**

**ELECTRO-OPTICAL CHARACTERISTICS – TRANSMITTER (MMF)**

Parameter	Min	Typ	Max	Units	Notes
Data Rate	125		2970	Mbps	
Optical Output Power	-5		0	dBm	@ 1.485 Gbps, OM3 fiber
Optical Link Budget	19			dBm	
@ 1.485 Gbps	19			dBm	Measured in combination with 050-211-HDRX (HD-SDI RX) and 050-211-HDTX (HD-SDI TX), Compliant with SMPTE 292
Extinction Ratio	5	10		dB	@ 1.485 Gbps
Optical Wavelength, "31", 1311nm	1301	1311	1318.5	nm	
Optical Wavelength, "55", 1551nm	1541	1551	1558.5	nm	
Spectral Width, rms			0.85	nm	
Relative Intensity Noise			-117	dB/Hz	
Timing Jitter			1	UI	SMPTE 292, 1.485 Gbps, Color bar
Alignment Jitter			0.2	UI	SMPTE 292, 1.485 Gbps, Color bar
Input Impedance		75		Ohms	AC coupled Internally
Input Voltage Swing	720	800	950	mV <sub>p-p</sub>	75 Ohm Single Ended
Input Return Loss					
5 MHz - 1.5 GHz		15		dB	

**050-211 PRODUCT BRIEF**  
**SMF or MMF 4-Channel SMPTE HD-SDI**  
**Media Converter**



***Ratings and Specifications - (Continued)***

**ELECTRO-OPTICAL CHARACTERISTICS – RECEIVER (SMF)**

Parameter	Min	Typ	Max	Units	Notes
Data Rate	125		2970	Mbps	
RX Sensitivity					
BER 10 <sup>-12</sup> , PRBS 2 <sup>7</sup> -1, Er 10 dB		-23	-20	dBm	PIN PD @ 1.485 Gbps
RX Overload					
1.485 Gbps, BER 10 <sup>-12</sup> , PRBS 2 <sup>7</sup> -1	-1			dBm	
2.970 Gbps, BER 10 <sup>-12</sup> , PRBS 2 <sup>7</sup> -1	-1			dBm	
Optical Wavelength	1200		1600	nm	
LOS Assert Level		-25	-22	dBm	@ 1.485 Gbps
Additive Jitter:					
1.485 Gbps		18		PSp-p	
Output Impedance		75		Ohms	AC coupled Internally
Output Voltage Swing	720	800	880	mV <sub>p-p</sub>	75 Ohm Single Ended
Output Return Loss					
5 MHz - 1.5 GHz		15		dB	

**050-211 PRODUCT BRIEF**  
**SMF or MMF 4-Channel SMPTE HD-SDI**  
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**Ratings and Specifications - (Continued)**

**ELECTRO-OPTICAL CHARACTERISTICS – RECEIVER (MMF)**

Parameter	Min	Typ	Max	Units	Notes
Data Rate	125		2970	Mbps	
RX Sensitivity					
BER 10 <sup>-12</sup> , PRBS 2 <sup>7</sup> -1, Er 10 dB		-22	-20	dBm	PIN PD @ 1.485 Gbps, OM3 fiber
RX Overload					
1.485 Gbps, BER 10 <sup>-12</sup> , PRBS 2 <sup>7</sup> -1	-1			dBm	
2.970 Gbps, BER 10 <sup>-12</sup> , PRBS 2 <sup>7</sup> -1	-1			dBm	
Optical Wavelength	1200		1600	nm	
LOS Assert Level		-23	-21	dBm	@ 1.485 Gbps
LOS Hysteresis	1.25	2.3		dB	@ 1.485 Gbps
Additive Jitter:					
1.485 Gbps		18		PSp-p	
Output Impedance		75		Ohms	AC coupled Internally
Output Voltage Swing	720	800	880	mV <sub>p-p</sub>	75 Ohm Single Ended
Output Return Loss					
5 MHz - 1.5 GHz		15		dB	



**Ratings and Specifications - (Continued)**

**COMPLIANCE SPECIFICATIONS**

Characteristics	Standard	Condition	Notes
Mechanical Shock	MIL-STD-810G	Method 516.6	40g, 6-9 ms
Mechanical Vibration	MIL-STD-810G	Method 514.6	30 Grms
ESD	MIL-STD-883	Class II	2200V HBM
Conducted Emissions -- 30 Hz to 10 kHz	MIL-STD-461F	CE101	Power Leads
Conducted Emissions -- 10 kHz to 10 MHz	MIL-STD-461F	CE102	Power Leads
Conducted Susceptibility -- 30 Hz to 150KHz	MIL-STD-461F	CS101	Power Leads
Conducted Susceptibility -- Transients	MIL-STD-461F	CS106	Power Leads
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
Humidity	MIL-STD-810G	Method 507.5	Procedure I
Aircraft Electrical Power Characteristics	MIL-STD-704F		28V DC Systems
Military Vehicle Electrical Power Characteristics	MIL-STD-1275		28V DC Systems
Eye Safety	CDRH and IEC-825	Class 1 Laser	



**Ratings and Specifications - (Continued)**

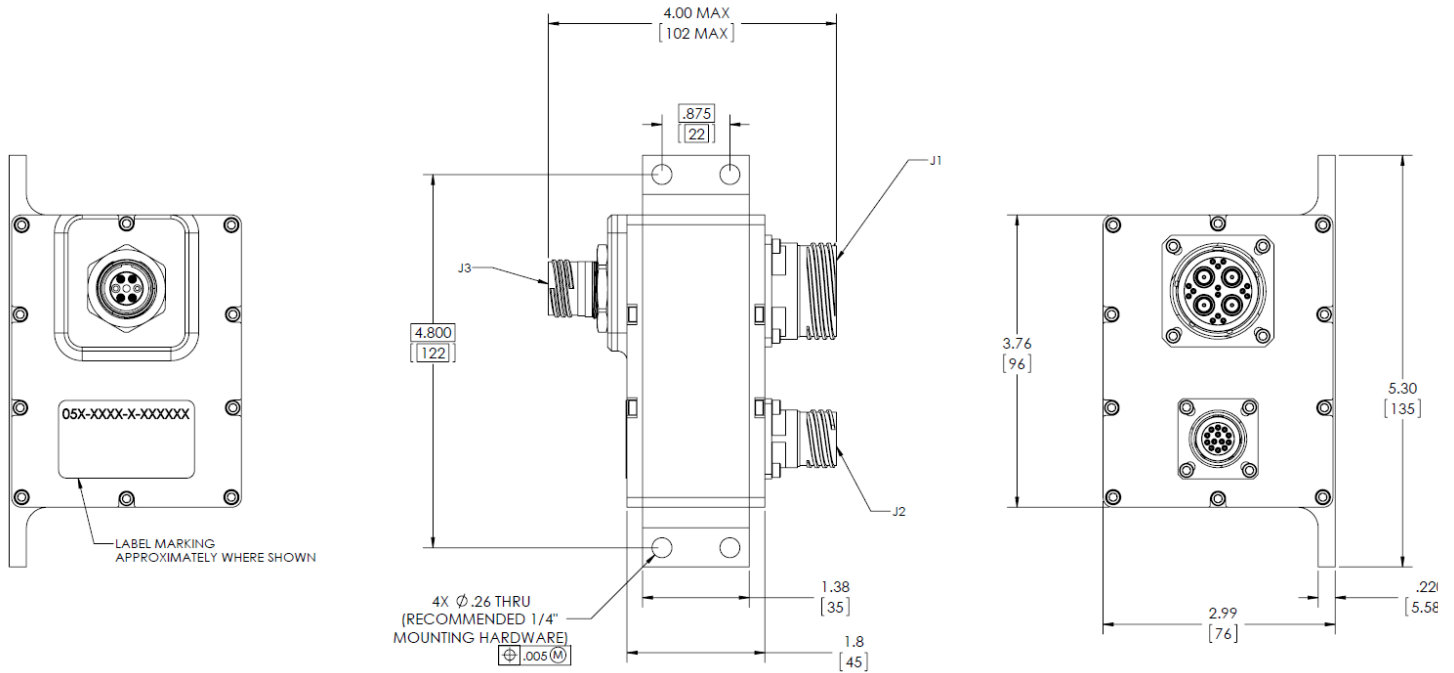
**MATERIAL/FINISH**

Item	Material/Finish
Housing & Connector Shell	Aluminum
Plating Finish: ME	Electroless Nickel
Plating Finish: ZR	Aluminum, Zinc-Nickel Black
Plating Finish: NF	Olive Drab Cadmium
Contacts	Copper alloy, 50 µInch gold plated
D38999 Inserts	Thermoplastics
Interfacial Seals, 38999 only	Elastomer, Fluorosilicone
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)

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**Mechanical Outline Drawing**



**Dimensions inches**  
*x.x ± 0.1"*  
*x.xx ± 0.03"*  
*x.xxx ± 0.0015"*

**Marking:**

Assembly is identified with a label in the approximate location shown. The label contains Manufacturer'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



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***Interface Definition***



## Recommended Inspection & Cleaning Tools/Kits

The following recommendations are suggested for the 050-211 SMF 4-Channel SMPTE HD-SDI Copper to Fiber Media Converter:

- **GBS-1001 Inspection Kit which includes GIT-003 tip for GHD & Arinc 801 fiber contacts.**
- **GCLT-H125 or GCLT-HA125 cleaning tool for GHD & Arinc 801 fiber 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 Cleaning tool for GHD systems***



- 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