050-207

Data Sheet

4 Channel SMPTE
Copper to Fiber Media Converter
28VDC

REV	DESCRIPTION	DATE	APPROVED
2	Preliminary	8/21/2014	MF

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4 Channel SMPTE Copper to Fiber Media Converter



The Glenair 050-207 is a 4-Channel SMPTE Copper to Fiber Optic Media Converter which extends the reach between the camera and the video display or data recorder. This media converter is configured as either transmitter, converting electrical SMPTE signals to fiber, or as a receiver, converting fiber optic signals into the electrical SMPTE signals. The media converter incorporates a power supply which has been designed to accept a wide DC input voltage range, 18V to 36V. The 050-207 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 is supplied through one D38999 connector and power is provide through a separate D38999 connector. The Fiber Optics passes through Glenair GHD connector.

KEY FEATURES/BENEFITS

- 850nm Lasers for MMF up to 500m links
- GaAs PIN PD for MMF up to 500m Links
- SMPTE EG 34:2004 Compliant to Pathological Conditions CASE 1, CASE 2 and CASE 3.
- SMPTE ST 297:2006 (3G-SDI & HD-SDI)
- SMPTE 424 Compliant (3G-SDI)
- SMPTE 292 Compliant (HD-SDI)
- Electronic Circuitry
- 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
- GHD Fiber Optic connector

OPTIONAL FEATURES

- Built In Test Console Port accessible via USB2.0

APPLICATIONS

- Harsh Environment Ethernet for Airborne, Tactical and Shipboard applications

How To Order

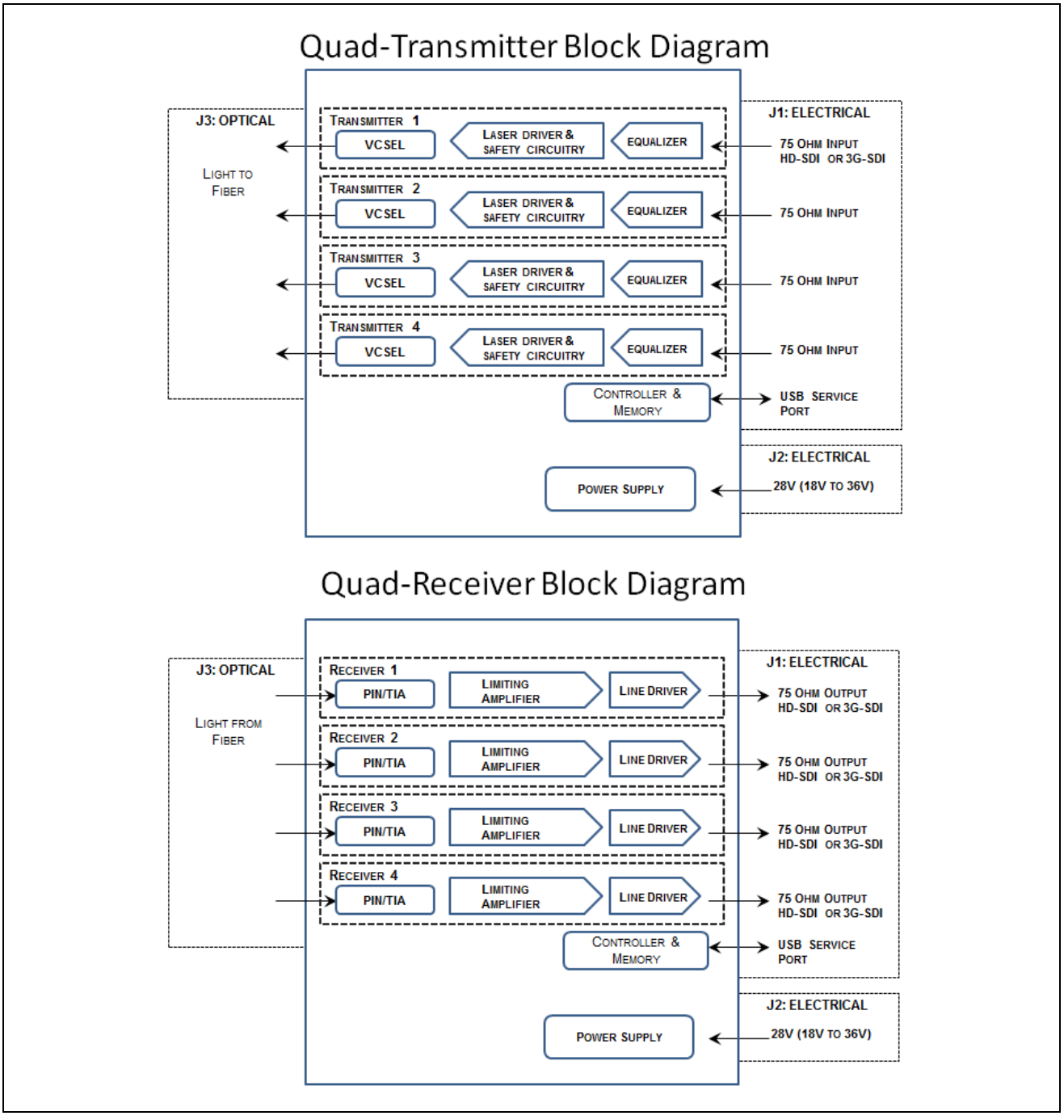
Basic PN			Built In Test Console Port		J1 Key Polarization		
050-207	TX	MT	0	N	N	N	
	FUNCTION: TX = Transmitter, RX = Receiver	Material/Finish: MT = Aluminum, Nickel-PTFE; NF = Aluminum, Cad. Olive Drab; Other finishes available		J2 Key Polarization: N=Normal, A, B, C, D E (Per Mil-DTL-38999)		J3 Key Polarization: N=Normal, A, B, C, D E (Per Mil-DTL-38999)	

Built In Test Console Port: 0 = Not implemented, 1 = USB BIT

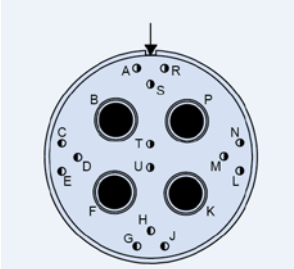
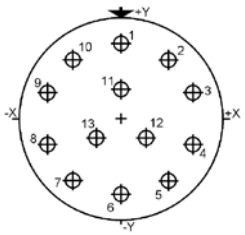
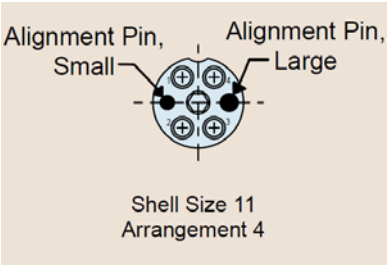
J1 Key Polarization: N=Normal, A, B, C, D E (Per Mil-DTL-38999)



Functional Block Diagram



Connectors

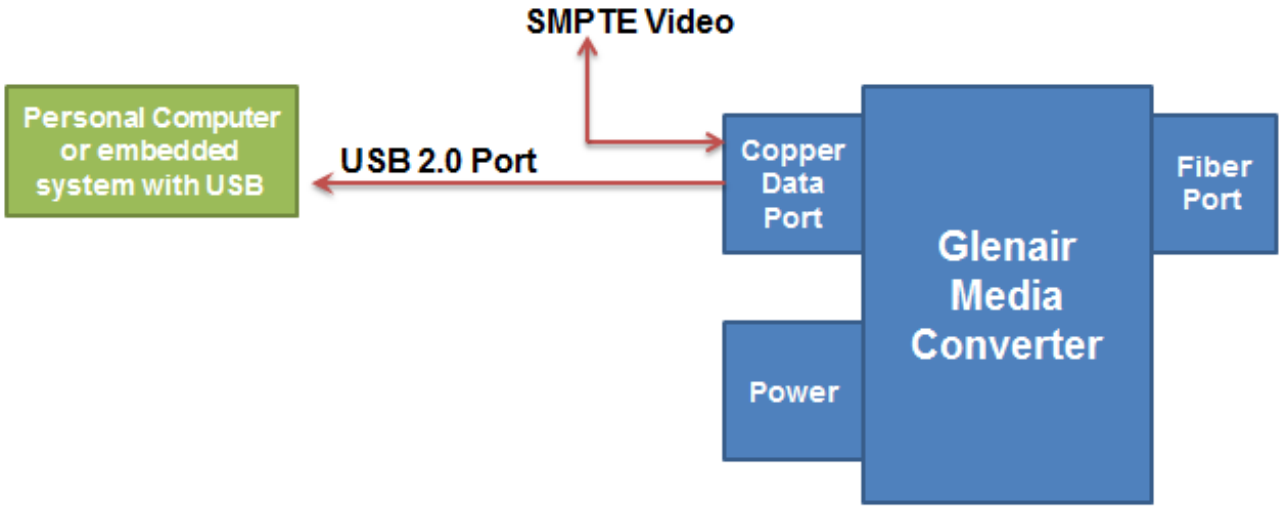
NAME	Insert Arrangement	Function	Media Converter	Mating PLUG Connector
J1	 ARRANGEMENT 19-18 14X SIZE 22D 4X SIZE 8 COAX	Electrical Signal, Power, and Built In Test (BIT)	D38999 Series III type, 19C-18 14X SIZE 22D Pins 4X SIZE 8 Pins (AS39029/119)	Generic PN D38999/26#F18SN type Glenair PN 257-606-G6##19-18SN Coax Socket Contacts 852-083-01 Socket Contacts M39029/56-348
J2		Power	D38999 Series III type, 11-35 13X SIZE 22D Pins	Generic PN D38999/26#B35SN Glenair PN 233-105-G6##11-35SN Socket Contacts M39029/56-348
J3	 Shell Size 11 Arrangement 4	Fiber Optic Signal	GHD Shell Size 11 Arrangement 4 CONTACTS 180-056	Glenair PN 180-122-#06-11-4N CONTACTS: 180-051-1260C

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)

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

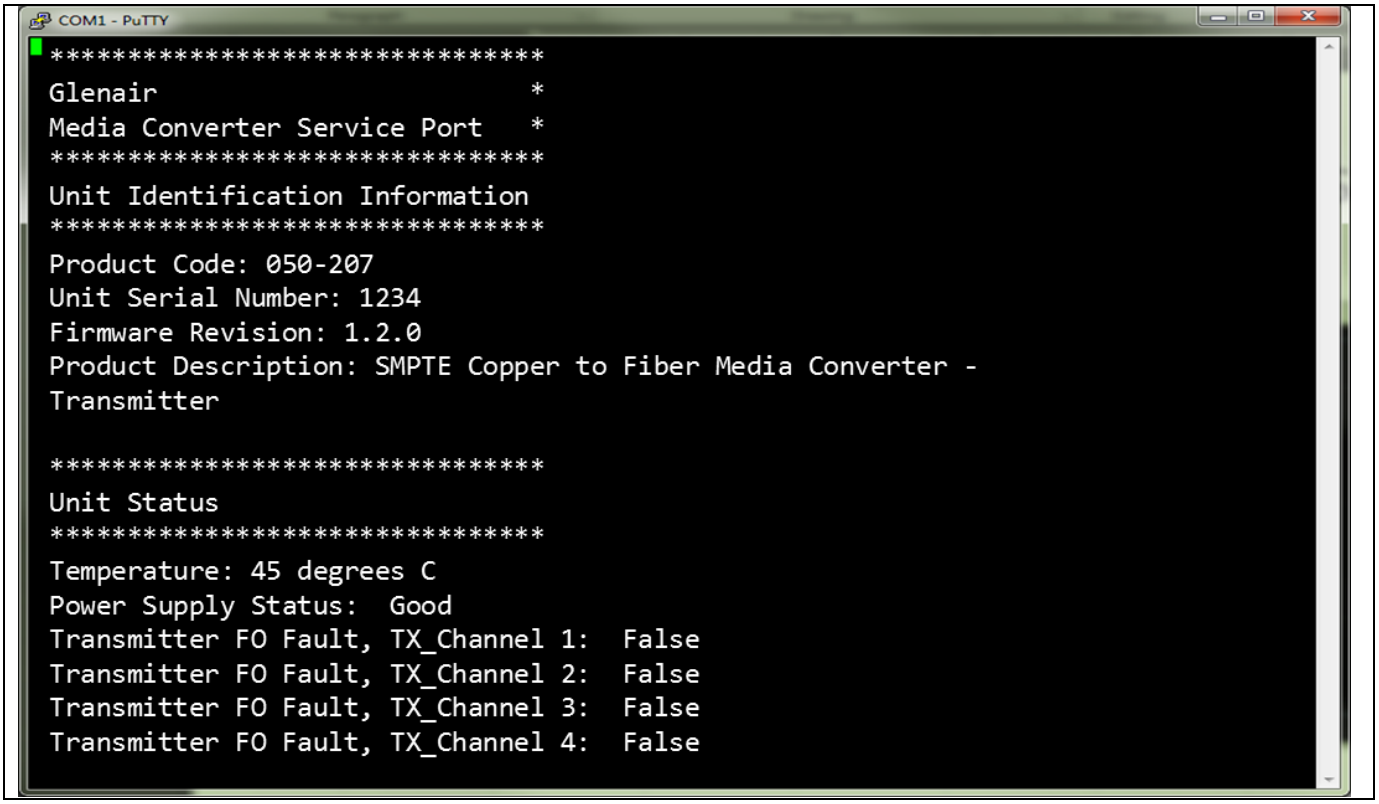
Unit Identification Information

- 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

TYPICAL CONSOLE PORT WINDOW (PuTTY)



Ratings and Specifications –

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	

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Typ	Max	Units	Notes
Storage Temperature	Ts	-55		+100	°C	
Supply Voltage	V_{cc}	-0.4		40	V	VccT may not differ by more than 0.5V

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	

ELECTRO-OPTICAL CHARACTERISTICS – TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Units	Notes
Optical Output Power	P_{OUT}	-8	-5	-3	dBm	850nm VCSEL, 1.5Gbps & 2.97Gbps
Extinction Ratio	Er	8	10		dB	1.5Gbps & 2.97Gbps
Optical Wavelength	λ_{OUT}	830	850	860	nm	
Spectral Width, rms	$\Delta\lambda$			0.85	nm	
Relative Intensity Noise	RIN			-117	dB/Hz	
Timing Jitter	TJ			1	UI	SMPTE 292, 1.5 Gbps, Color bar
Alignment Jitter	AJ			0.2	UI	SMPTE 292, 1.5 Gbps, Color bar
Timing Jitter	TJ			2	UI	SMPTE 424, 2.97Gbps, Color bar
Alignment Jitter	AJ			0.2	UI	SMPTE 424, 2.97Gbps, Color bar
Transmitter Differential Input Impedance	Zin		100		Ohms	AC coupled Internally
Differential Input Voltage	Vin_d	250		2200	mV_{p-p}	CML, 100 ohm

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Ratings and Specifications - (continued)

ELECTRO-OPTICAL CHARACTERISTICS - RECEIVER

Parameter	Symbol	Min	Typ	Max	Units	Notes
050-332-1						
Sensitivity, BER 10^{-12}, PRBS 2^{-7}-1, Er 10 dB	P_{IN}		-22	-20	dBm	PIN PD @ 1.485 Gbps
050-332-2						
Sensitivity, BER 10^{-12}, PRBS 2^{-7}-1, Er 10 dB	P_{IN}		--19	-17	dBm	PIN PD @ 2.970 Gbps
Overload, BER 10^{-12}, PRBS 2^{-7}-1	P_{IN}	-1			dBm	@1.485 Gbps or @ 2.970 Gbps
Optical Wavelength	λ_{IN}	830		860	nm	
Receiver Differential Output Impedance	Rout		100		Ohms	AC coupled internally
Differential Output Voltage Swing	Vout_d	600		1200	mV	CML, 100 ohm
LOS Assert Level	LOS		-23	-21	dBm	@1.485 Gbps or @ 2.970 Gbps
LOS Hysteresis	LOS_{HYS}	1.5	2.3		dB	@1.485 Gbps or @ 2.970 Gbps

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	
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)

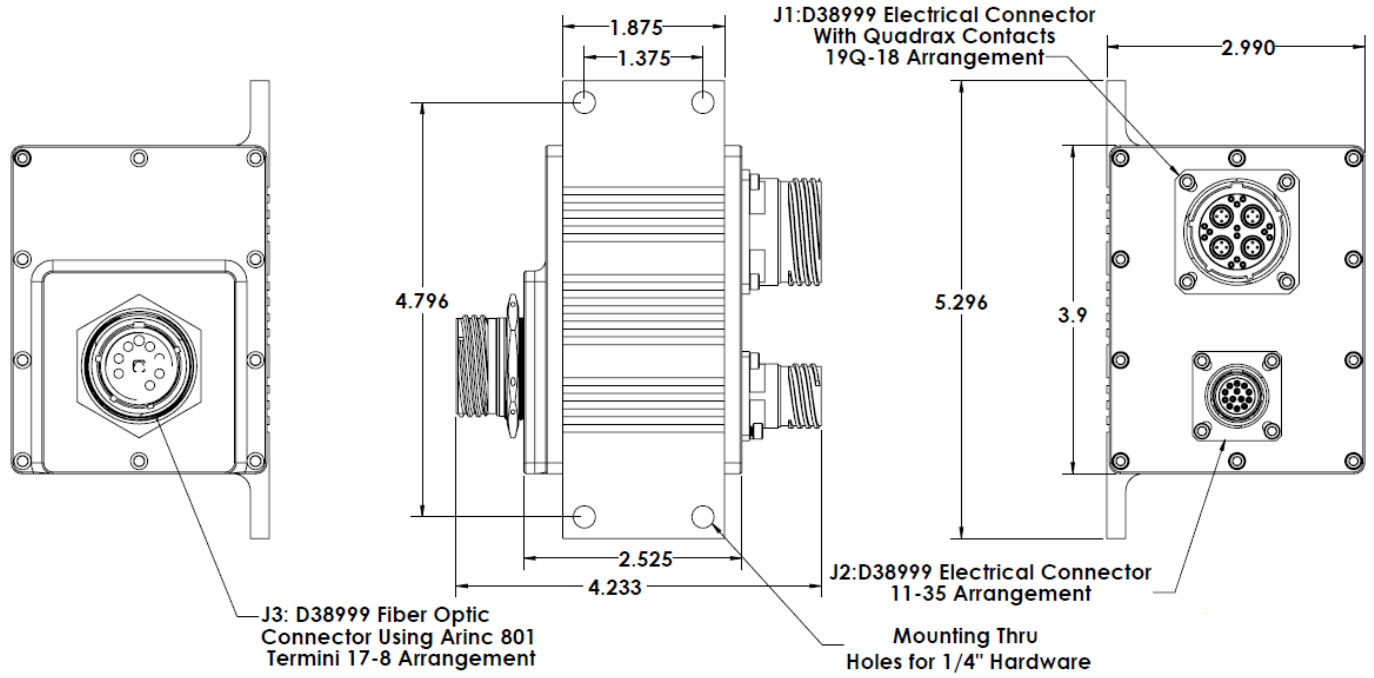
Material/Finish

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 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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OUTLINE DRAWING & PANEL CUT OUT

Outline Drawing



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

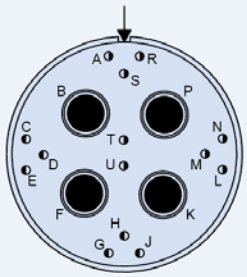
Please contact Factory for other configurations

Input/Output Definition

J1 – ELECTRICAL SIGNAL CONNECTOR

J1- Transmitter Configuration

PIN	NAME	DESCRIPTION	I/O	*
A	NC			
B	Channel 1	SMPTE HD-SDI or 3G-SDI	Input	
C	USB Service Port, D+	USB Data Positive	Input / Output	
D	USB Service Port, D-	USB Data Negative	Input/Output	
E	NC			
F	Channel 2	SMPTE HD-SDI or 3G-SDI	Input	
G	NC			
H	USB Service Port, Ground	USB, Ground	---	
J	Reset_F		Input	
K	Channel 3	SMPTE HD-SDI or 3G-SDI	Input	
L, M,N	NC			
P	Channel 4	SMPTE HD-SDI or 3G-SDI	Input	
R, S	NC			
T	Ground	Signal Ground	---	
U	USB Service Port, VBUS	5V	Input	

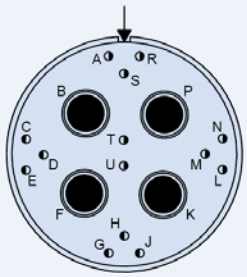


ARRANGEMENT 19-18
14X SIZE 22D
4X SIZE 8 COAX

38999 Series III
Mating face for PIN shown

J1- Receiver Configuration

PIN	NAME	DESCRIPTION	I/O	*
A	NC			
B	Channel 1	SMPTE HD-SDI or 3G-SDI	Input	
C	USB Service Port, D+	USB Data Positive	Input / Output	
D	USB Service Port, D-	USB Data Negative	Input/Output	
E	NC			
F	Channel 2	SMPTE HD-SDI or 3G-SDI	Output	
G	NC			
H	USB Service Port, Ground	USB, Ground	---	
J	Reset_F		Input	
K	Channel 3	SMPTE HD-SDI or 3G-SDI	Output	
L, M,N	NC			
P	Channel 4	SMPTE HD-SDI or 3G-SDI	Output	
R, S	NC			
T	Ground	Signal Ground	---	
U	USB Service Port, VBUS	5V	Input	



ARRANGEMENT 19-18
14X SIZE 22D
4X SIZE 8 COAX

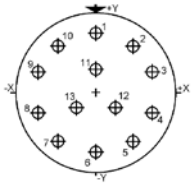
38999 Series III
Mating face for PIN shown

Input/Output Definition (continued)

J2 – POWER CONNECTOR

J2 PIN FUNCTION ASSIGNMENTS

PIN	NAME	DESCRIPTION	NOTES
1-10	No Connect		
12	No Connect		
11	Vcc	18-36VDC	
13	VDC Return		

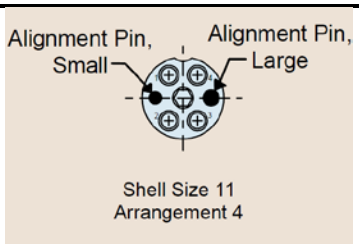


38999 Series III, 11-35 Mating face for PIN shown 11X SIZE 22D

J3 – OPTICAL CONNECTOR

J3- Transmitter Configuration

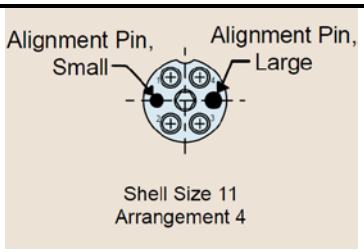
PIN	NAME	DESCRIPTION	INPUT / OUTPUT
1	TX1	Channel 1 SMPTE HD-SDI or 3GSDI	Input
2	TX2	Channel 2 SMPTE HD-SDI or 3GSDI	Input
3	TX3	Channel 3 SMPTE HD-SDI or 3GSDI	Input
4	TX4	Channel 4 SMPTE HD-SDI or 3GSDI	Input



GHD

J3- Receiver Configuration

PIN	NAME	DESCRIPTION	INPUT / OUTPUT
1	RX1	Channel 1 SMPTE HD-SDI or 3GSDI	Output
2	RX2	Channel 2 SMPTE HD-SDI or 3GSDI	Output
3	RX3	Channel 3 SMPTE HD-SDI or 3GSDI	Output
4	RX4	Channel 4 SMPTE HD-SDI or 3GSDI	Output



GHD

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