



050-110

Media Converter, Single Channel 1000BASE-T to
1000BASE-LX10, 5-36VDC, SMF, GFOCA (FO),
M38999 (Signal), M38999 (Power)

REV	DESCRIPTION	DATE	APPROVED
2		6/12/2014	MF

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10/100/1000BASE-T to 1000BASE-LX10, GFOCA, SMF, 5-36VDC



1000BASE-T to 1000BASE-LX10, GFOCA, SMF, 5-36VDC



The Glenair 050-110, Gigabit Ethernet media converter, communicates between 10/100/1000BASE-T and 1000BASE-LX10 protocols. It is designed for harsh environments and incorporates electronics in an environmentally sealed enclosure that incorporates three environmental connectors; M38999 connectors are utilized for power and for electrical signal and a GFOCA connector is used for the Fiber Optic signals.

KEY FEATURES/BENEFITS

- 1310nm FP Lasers to support 1000BASE-LX10
- InGaAs PIN PD to support 1000BASE-LX10
- Input Power Regulator to support 5-36V input power
- GFOCA Fiber Optic Connector inter-mates with TFOCA II®
- Electrical Interface compliant with IEEE 802.3 (10/100/1000BASE-T)
- Optical Interface compliant with IEEE 802.3 (1000BASE-LX10)
- Magnetics on the electrical signal input side to support the 1000BASE-T requirements for 100m cable length

- IP67 in mated condition

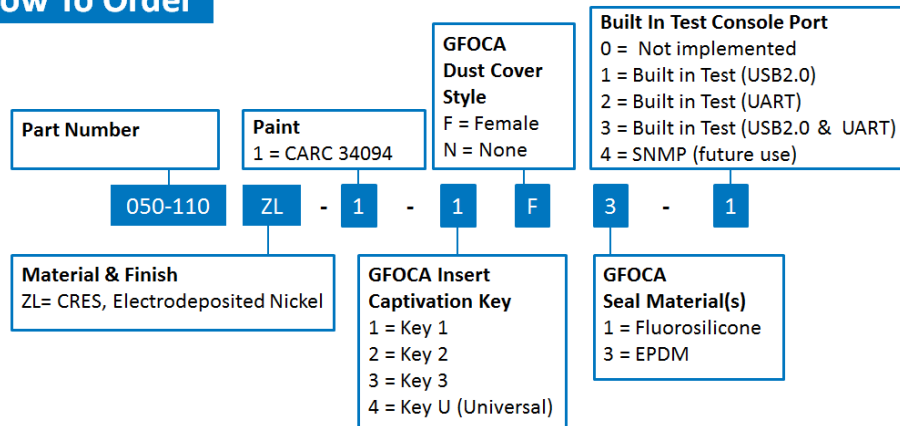
OPTIONAL FEATURES

- Built In Test Console Port accessible via USB2.0
- Built in Test Console Port accessible via UART

APPLICATIONS

- Harsh Environment Ethernet for Airborne, Tactical and Shipboard applications

How To Order



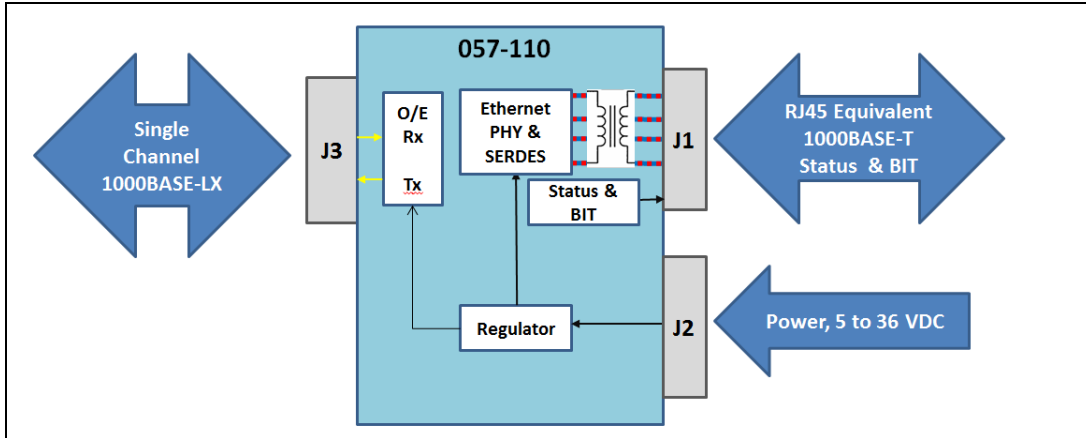
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Functional Block Diagram

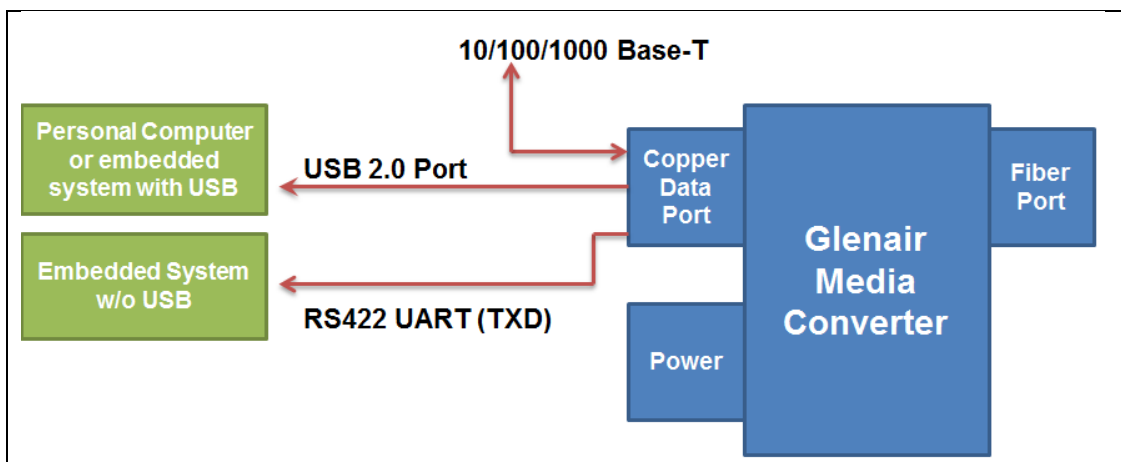


NAME	Insert Arrangement	Function	Media Converter	Mating PLUG Connector
J1		Electrical Signal, Status and Built In Test (BIT)	D38999 Series III type, 19Q-18 14X SIZE 22D Pins 4X SIZE 8 QUADRAX Pins	Generic PN D38999/26#F18SN Glenair PN 257-606-G6##19-18SN
J2		Power	D38999 Series III type, 9-35 6X SIZE 22D Pins	Generic PN D38999/26#A35SN Glenair PN 233-105-G6##09-35SN
J3		Fiber Optic Signal	GFOCA Receptacle Polarization Key 1 shown	TFOCA II® Plug Glenair PN Family 180-145 GFOCA Hermaphroditic Plug Connector MIL-DTL-83526/16 Type, 4 Channel

Note: # = Environmental Class (Material/Finish)

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 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.
- This interface may run concurrently with the RS422 UART

RS422 UART (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.
- This interface may run concurrently with the USB Port

ALARM STATUS MESSAGES

Fiber Side Alarm/Status

- Temperature
- Transmitter Disable 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

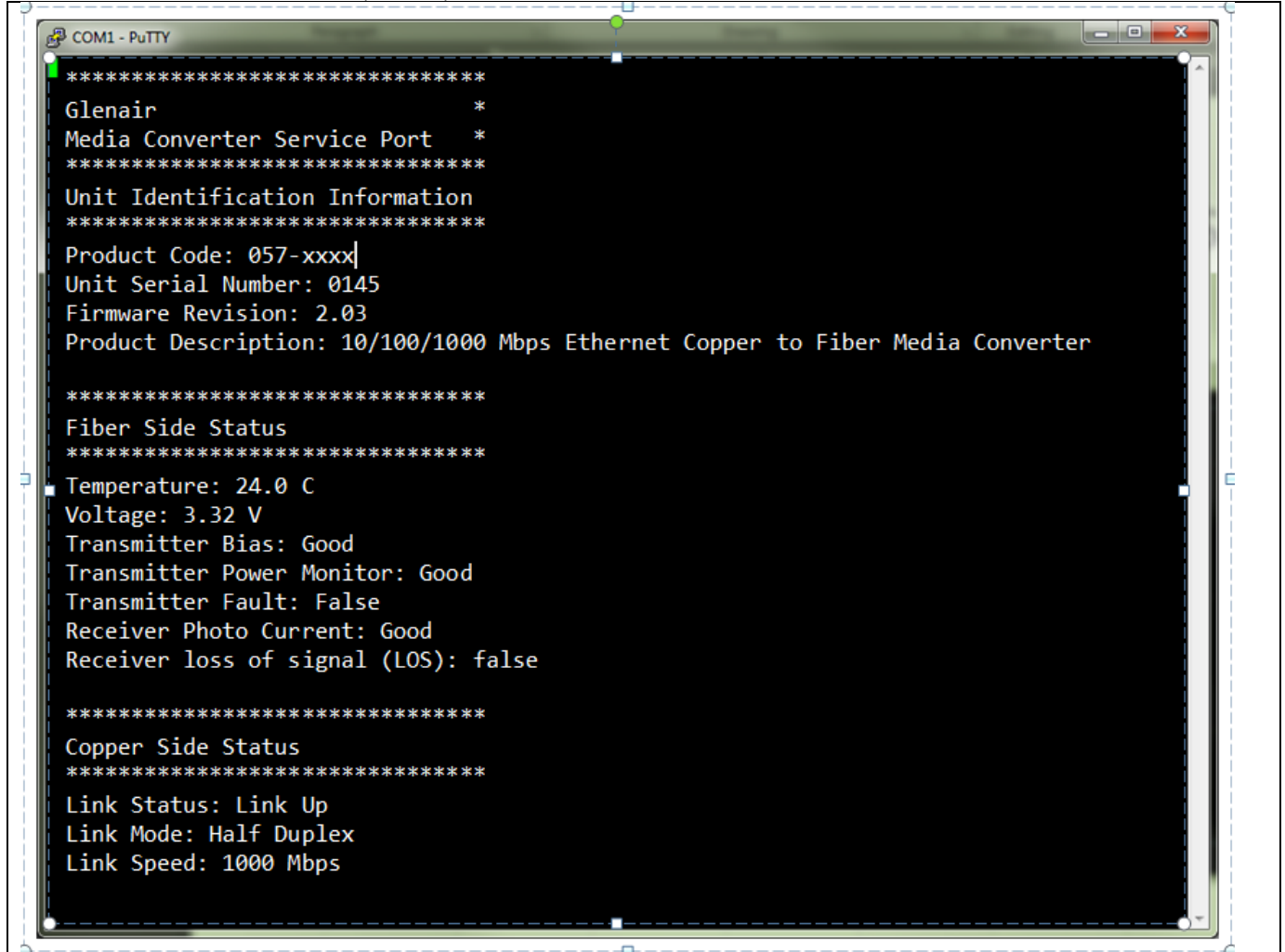
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TYPICAL CONSOLE PORT WINDOW (PuTTY)



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.

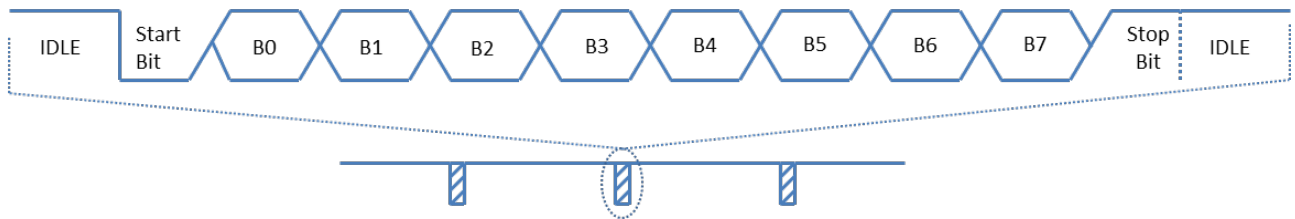
ALARM STATUS MESSAGES

- 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

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Ratings and Specifications

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	

OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Units	Notes
Operating Temperature	T _{op}	-40		+85	°C	
Supply Voltage	V _{cc}	5	28	36	V	
Supply Current	I _{cc}		100	150	mA	@28VDC
Power Supply Noise (Peak-Peak)	V _{cc_ripple}			200	mV	

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}	1285	1310	1345	nm	
Spectral Width	Δλ			3.5	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 (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
Mating Durability	MIL-DTL-38999/20	500 Cycles	
GFOCA (TFOCA II [®] equivalent)	MIL-DTL-83526 (Draft)	2000 cycles	
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	
Flame Resistance	EIA364-104		30 seconds
Damp Heat	EIA364-321		240 hours
Eye Safety	CDRH and IEC-825	Class 1 Laser Product	

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Materials/Finish

Item	Material	Notes
D38999 & GFOCA	Stainless Steel, Nickel plated (GFOCA only)	
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	
D38999 Inserts	Thermoplastics	
O-Ring Seals (GFOCA)	EPDM	

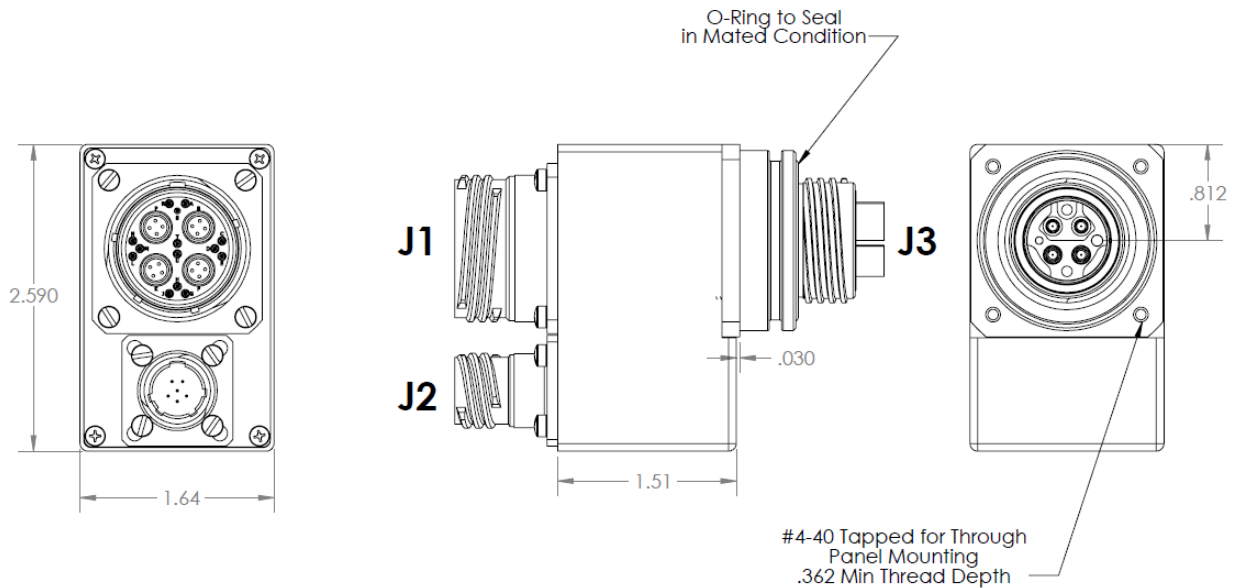
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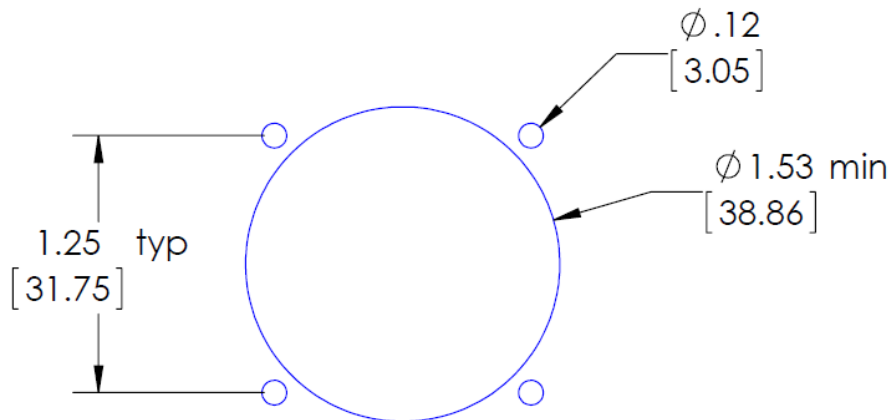
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OUTLINE DRAWING & PANEL CUT OUT



PANEL CUT OUT – J3



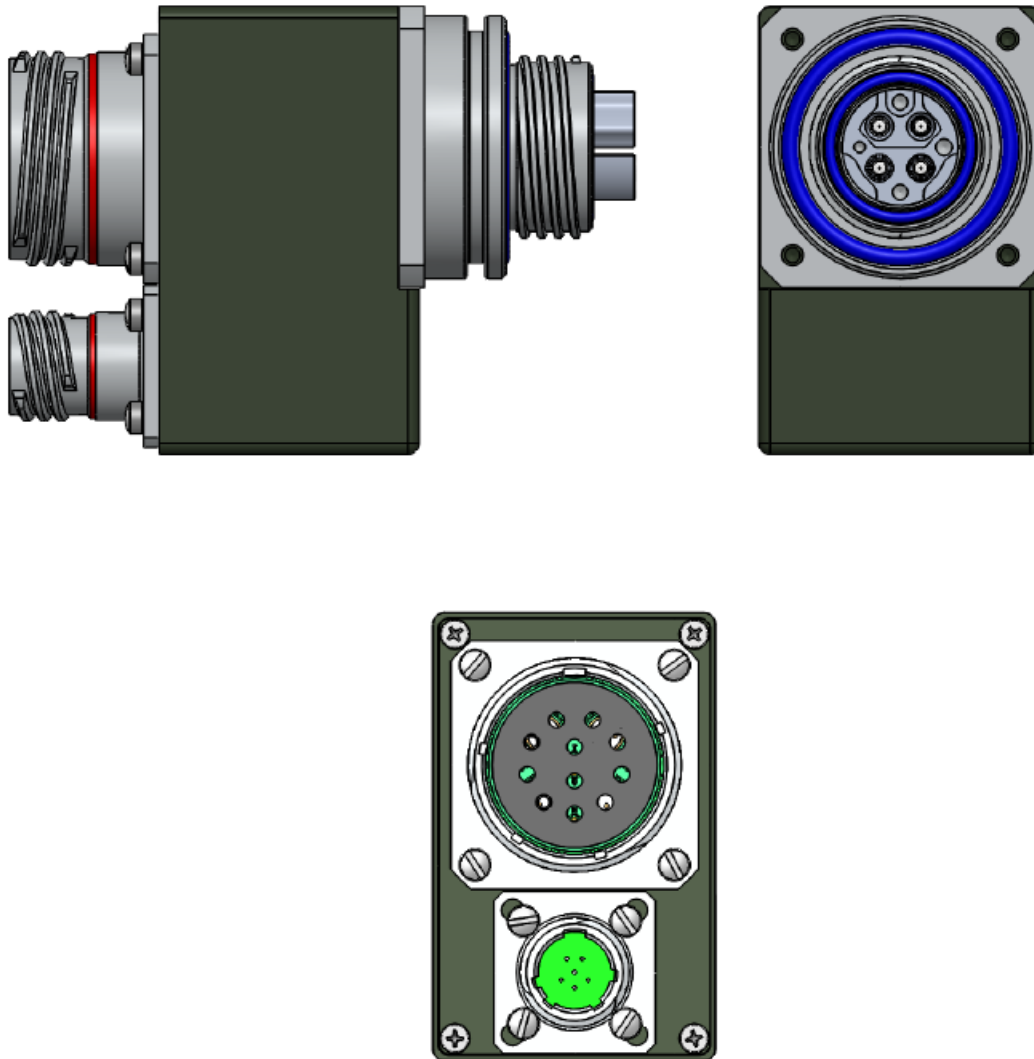
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CARC Paint Application and Masking



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

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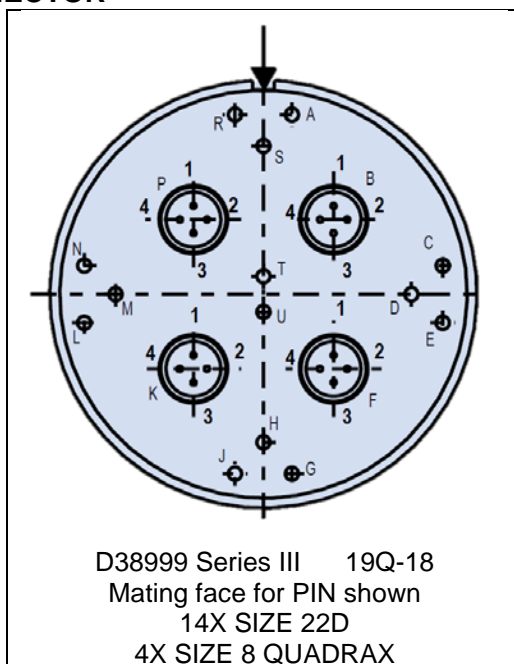
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Input/Output Definition

J1 – ELECTRICAL SIGNAL CONNECTOR



J1 PIN FUNCTION ASSIGNMENTS

PIN	NAME	DESCRIPTION	NOTES	PIN	NAME	DESCRIPTION	NOTES
A	PSS	Power Supply Status	1	K1	NC	No connect	
B1	Ch1-MDA+	Channel 1, MDA+	2	K2	NC	No connect	
B2	Ch1-MDB+	Channel 1, MDB+	2	K3	NC	No connect	
B3	Ch1-MDA-	Channel 1, MDA-	2	K4	NC	No connect	
B4	Ch1-MDB-	Channel 1, MDB-	2	L	UART_P	BIT UART	4
C	D+	USB D+, BIT	3	M	UART_GND	BIT UART Ground	4
D	D-	USB D-, BIT	3	N	UART_N	BIT UART	4
E	NC	No connect		P1	NC	No connect	
F1	Ch1-MDC+	Channel 1, MDC+	2	P2	NC	No connect	
F2	Ch1-MDC+	Channel 1, MDD+	2	P3	NC	No connect	
F3	Ch1-MDC-	Channel 1, MDC-	2	P4	NC	No connect	
F4	Ch1-MDC-	Channel 1, MDD-	2	R	Ground	DC Return	
G	NC	No connect		S	NC	No connect	
H	NC	No connect		T	USB_GND	USB Ground	3
J	NC	No connect		U	USB_VBUS	5V, USB supply	3

Notes

1. Power Supply Status indicator is high, referenced to 3.3VDC, when power supply is working correctly and low for fault or warning condition.
2. IEEE-802.3 1000BASE-T compliant
- 3 Built In Test Port, USB2.0
- 4 Built In Test Port, RS422 UART (TXD)

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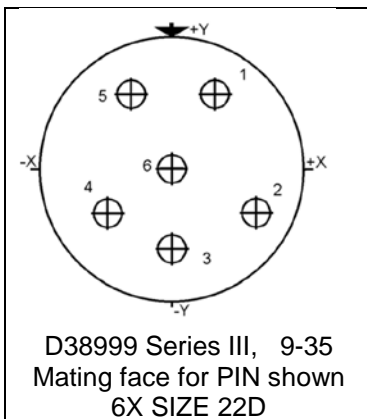
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Input/Output Definition (continued)

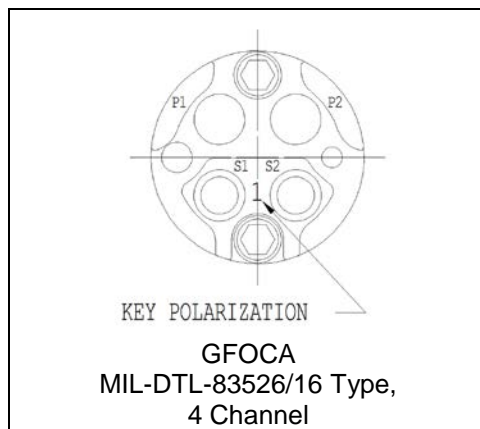
J2 – POWER CONNECTOR



J2 PIN FUNCTION ASSIGNMENTS

PIN	NAME	DESCRIPTION	NOTES
1	Isolated Case Ground		
2	Isolated Case Ground		
3	Isolated Case Ground		
4	Isolated Case Ground		
5	Vcc	18-36VDC	
6	VDC Return		

J3 – OPTICAL CONNECTOR



J3 PIN FUNCTION ASSIGNMENTS

PIN	NAME	DESCRIPTION	NOTES
S1	NC	No Connect	
S2	TX1	Channel 1 Transmitter	
P1	NC	No Connect	
P2	RX1	Channel 1 Receiver	