Neptune Series

Fast Ethernet, External M28876, 10/100Base-TX / FX Media Converter, 28VdDC Multimode, 1310nm

Dual Port, Flange Receptacles

M28876 to D38999 / Optical to Electrical Media Converter

FEATURES

- Compliant with IEEE-802.3:2005 Fast Ethernet
- Optical fiber link distances up to 2.0 Kilometers
- Maximum optical channel bit error rate less than $1x10^{-12}$
- Operating temperature range from -40°C to +85°C
- Shock, vibration and immersion resistant per Mil-Std-810 and Mil-Std-1344
- Olive Drab Cadmium over Aluminum meets stringent EMI / RFI performance specifications
- Aluminum housing, M28876 and D38999 connectors are strong, durable and corrosion resistant
- M28876 compliant optical fiber connector interface
- D38999 electrical signal interfaces provide robust connection to vehicle or shelter cabling

APPLICATIONS

Neptune series bulkhead mounted Fast Ethernet media converters enable high speed network communications over long distances in harsh environments.

- Fast Ethernet switches and peripherals
- Telecom and datacom switch / router rack-to-rack links
- Storage or computation clusters

The M28876 optical and D38999 Series III electrical connectors provide sealed optical and electrical interfaces that are water-tight to Mil-Std-810 / IP67 / NEMA-4x when mated.

The multimode optical fiber interface supports applications where copper cable link distance, bandwidth, weight or bulk make the use of twisted pair, twinax or quadrax copper conductors unacceptable.

DESCRIPTION

Neptune series Fast Ethernet media converters consist of optoelectronic transmitter and receiver functions integrated along with the 10/100Base-TX Ethernet electrical to 100Base-FX optical media conversion circuitry into a wall mounted M28876 connector assembly.

The optical transmitters are high output 1310nm devices. The optical receivers consist of InGaAs PIN and preamplifier assemblies and limiting post-amplifiers.

The electrical signal interface to the Neptune series optical media converters is a D38999/19-35 connector enabling interconnection to an internal or external backbone cable interface. The electrical power interface to the Neptune series bulkhead optical media converters is a D38999/9-35 electrical connector enabling interconnection to a vehicle or shelter power supply.

Neptune series Fast Ethernet media converters are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

- Sealed against liquid and solid contaminants
- Shock and vibration resistant

ORDERING INFORMATION

Application	Item Number
10/100Base-TX to FX, 28Vdc	M73R-4LAU-FW

ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	T_S	-55		+100	°C
Supply Voltage	V_{CC}	-0.5		45.0	V
Data Input Voltage	V_I	-0.5		V_{CC}	V

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	T_A	-40		+85	°C
Supply Voltage	V_{CC}	+18.0	+28.0	+36.0	VDC
Power Supply Noise (p-p)	N_P			200	mV

SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883	ESD	Class II	2200V
MIL-STD-810	Vibration	$3.8g^2/Hz$	43G rms
MIL-STD-810	Shock	40.0g	6-9mS
MIL-STD-1344	Flame Resistance	Method 1012	30 Seconds
MIL-STD-1344	Damp Heat	10 Cycles	24 Hours
M28876	Mating Durability	2000 Cycles	EIA/TIA-455-21
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

MATERIALS

Item	Detail	Notes
D38999 & M28876 Cylindrical Shells	Aluminum	
Plating	OD / CD	
D38999 Inserts	Thermoplastic	
Interfacial Seals	Elastomer	
Optical Ferrules	Zirconia	
Printed Circuits	Polyimide / FR-4	Mil-P-31032 Type 4
Housing	Aluminum	

TRANSMITTERS T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power	P_o	-19.0		-14.0	dBm
Optical Output Wavelength	λ_{OUT}	1260	1310	1380	nM

RECEIVERS T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity	P_I	-31.5		-12.0	dBm
Optical Wavelength	λ_{IN}	1100		1590	nM

SUPPLY CURRENT T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current per Port	I_{CCT}		100	150	mA

OPTICAL FIBER LINK DISTANCES

Application	Fiber Specification	Distance
Fast Ethernet - IEEE 802.3u FDDI PMD ISO / IEC 9314-3	62.5/125µ - 500MHz*Km	2.0Km
	50/125µ - 500MHz*Km	2.0Km

COPPER CABLE LINK DISTANCES

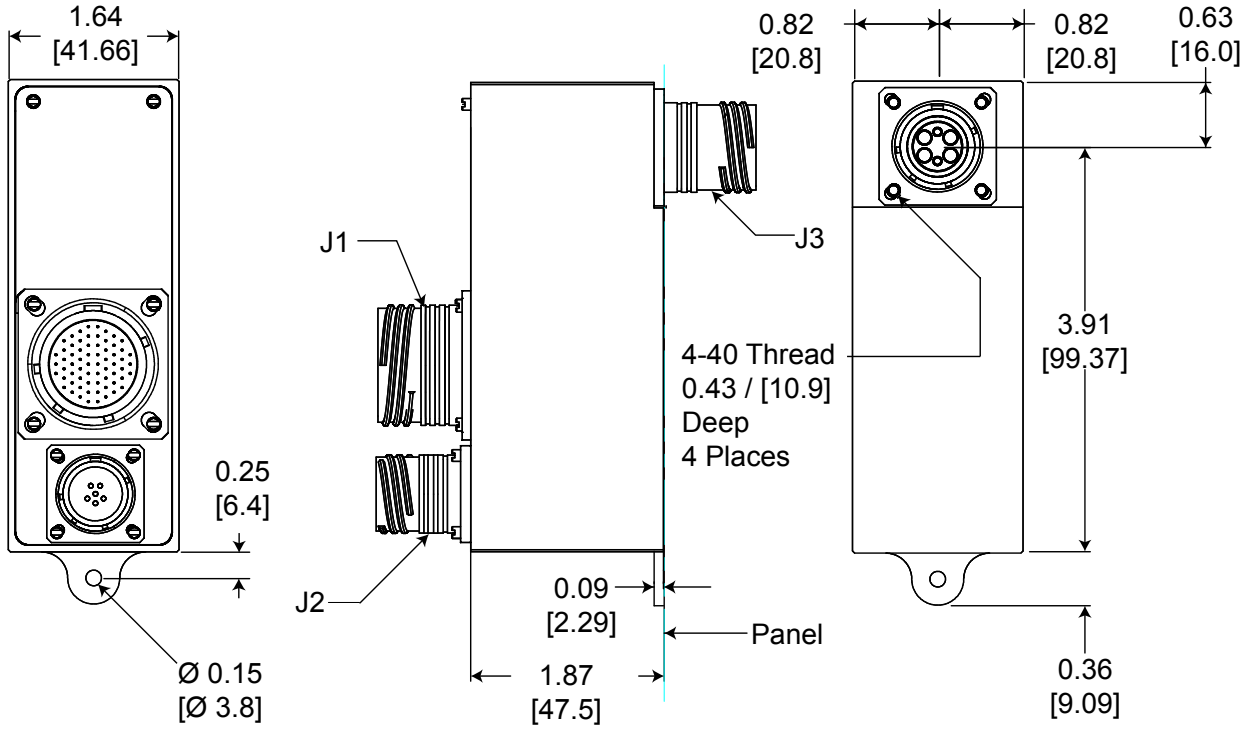
Application	Cable Specification	Distance
Fast Ethernet - IEEE 802.3u	TIA/EIA-568-B Cat 5*	100M

*for other transmission media, please consult the factory

Dual Port Neptune Series M28876, 10/100Base-TX to 100Base-FX,
Fast Ethernet Media Converter, Multimode, 28Vdc, 1310nm

OUTLINE DRAWING

Dimensions are shown as: inches [mm]

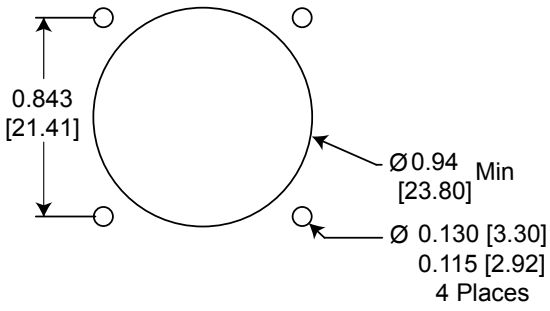


PORT / FUNCTION ASSIGNMENTS

Port #	Connector	Function
J1	D38999/20WF35PN	2x10/100Base-TX
J2	D38999/20WA35PN	+18-36VDC Power Supply
J3	M28876/1-B1S1	2x100Base-FX

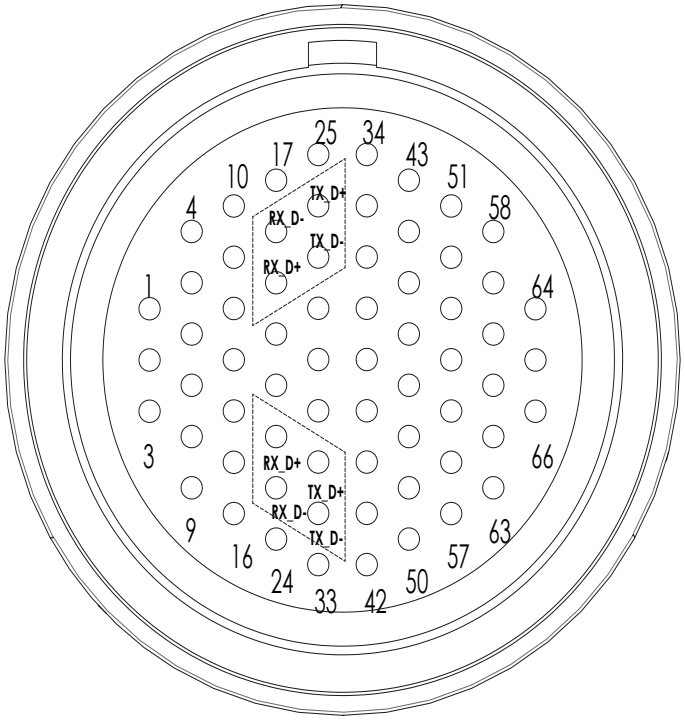
RECOMMENDED J3 PANEL CUTOUT

Dimensions are shown as: inches [mm]



J1 PIN FUNCTIONS
Connector P/N: D38999/20WF35PN
Ethernet Port and Pin Assignments

TOP



Front view of the J1 connector shown
- mating cable plug opposite

PORT #	PIN #	FUNCTION	RJ-45 Eq. Pin #	Logic Family
0	26	TX_D+	1	IEEE-802.3.2005 10/100Base-TX
	27	TX_D-	2	IEEE-802.3.2005 10/100Base-TX
	19	RX_D+	3	IEEE-802.3.2005 10/100Base-TX
	18	RX_D-	6	IEEE-802.3.2005 10/100Base-TX
1	31	TX_D+	1	IEEE-802.3.2005 10/100Base-TX
	32	TX_D-	2	IEEE-802.3.2005 10/100Base-TX
	22	RX_D+	3	IEEE-802.3.2005 10/100Base-TX
	23	RX_D-	6	IEEE-802.3.2005 10/100Base-TX

All other pins are N/C - no internal connection

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J2 PIN FUNCTIONS
Connector P/N: D38999/20WA35PN
Power Supply Connector

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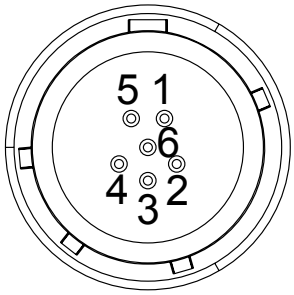

Pin	Pin Function
1	Isolated Case Ground
2	Isolated Case Ground
3	Isolated Case Ground
4	Isolated Case Ground
5	18 - 36 VDC
6	VDC Return

Mating Connector: D38999/26WA35SN

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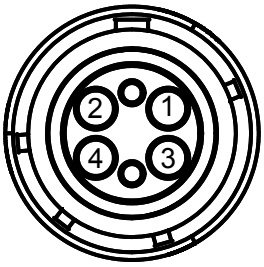
J3 PIN FUNCTIONS
Connector P/N: M28876/1-B1S1
Fiber Optic Connector Interface

Top



OPTICAL TRANSCEIVER PORT / FUNCTION ASSIGNMENTS

Fiber Optic Pin #	Port #	Function
1	0	TX
2	0	RX
3	1	TX
4	1	RX

MATING M28876 FIBER OPTIC CABLE PLUG

CONFIGURATION	GENERIC P/N
4 Fiber / Size 13 Shell / Pol 1	M28876/7-B12P1
Termini - Multimode	M29504/14-4131C

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