Neptune Series

Ethernet Media Converter, Quad Port 1000Base-T/SX (850nm), M28876, +28VDC

Quad Port, Jam Nut Receptacles

M28876 / Optical to Electrical Media Converter

FEATURES

- Compliant with IEEE-802.3:2005 Ethernet
- Optical fiber link distances up to 550 Meters for GbE
- Maximum optical channel bit error rate less than $1x10^{-12}$
- Operating temperature range from -40°C to +85°C
- Black Zinc Nickel over Aluminum meets stringent EMI / RFI performance specifi cations
- M28876 and D38999 connectors are strong, durable and corrosion resistant
- M28876 compliant optical fiber connector interface

APPLICATIONS

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

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

The M28876 optical and D38999 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 quad rax copper conductors unacceptable.

DESCRIPTION

Neptune series Ethernet media converters consist of optoelectronic transmitter and receiver functions integrated along with 1000Base-T to 1000Base-SX optical media conversion circuitry into a wall mounted M28876 connector assembly.

Optical transmitters are high output 850nm VCSEL's. The optical receivers consist of GaAs PIN with preamplifier assemblies and InGaAs PIN with preamplifier assemblies.

The electrical interface to the Neptune series optical media converters is a D38999 connector enabling interconnection to a customer supplied cable assembly.

Neptune series 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

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 specifi cation. 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		100.0	V

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	T	-40		+85	°C
Supply Voltage	V_{CC}	+16.0	+28.0	+48.0	VDC

SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883	ESD	Class II	2200V
MIL-STD-810	Vibration	30.0g	18mS
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

MATERIALS

Item	Detail	Notes
M28876 Cylindrical Shells	Aluminum	
Plating	Black Zinc Nickel	ASTM B841 Type D
D38999 Inserts	Thermoplastic	
Interfacial Seals	Elastomer	
Optical Ferrules	Zirconia	
Printed Circuits	Polyimide / FR-4	Mil-P-31032 Type 4
Housing	Chem Film Aluminum	Mil-Dtl-5541 Type 1 Class 3

OPTICAL TRANSMITTERS T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power - GbE	P_o	-9.5		-3.0	dBm
Optical Output Wavelength - GbE	λ_{OUT}	830	850	860	nM
Spectral Width - GbE	$\Delta\lambda_{RMS}$			0.85	nM

OPTICAL RECEIVERS T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity - GbE	P_I	-17.0		-2.0	dBm
Optical Wavelength - GbE	λ_{IN}	830	850	860	nM

POWER SUPPLY CURRENT T_A = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current per Port @ 28VDC	I_{CCT}		100	150	mA

OPTICAL LINK DISTANCES

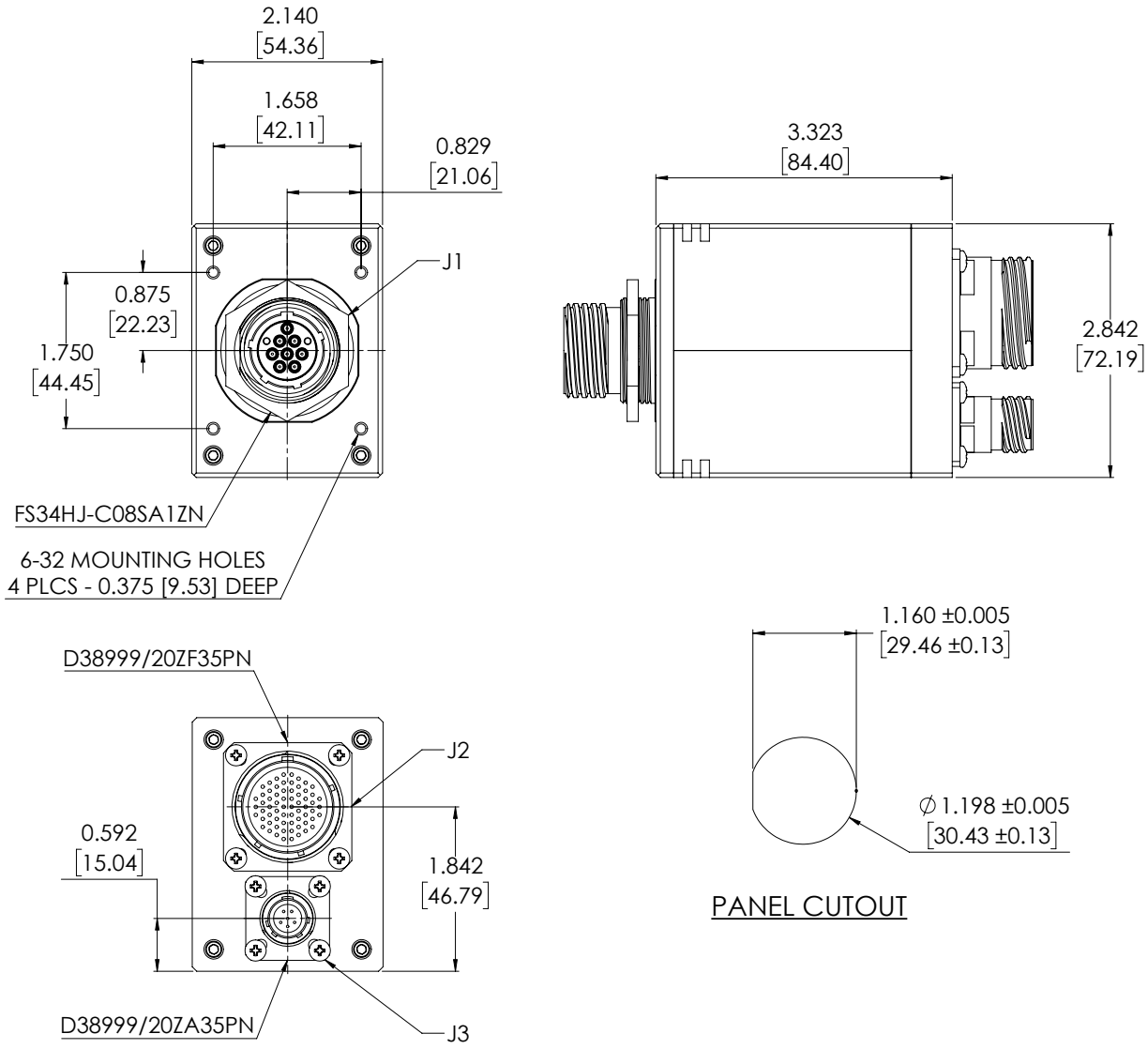
Protocol	Cable Specification	Distance
Gigabit Ethernet - IEEE-802.3:2005 - 1000BASE-SX	62.5/125µ 200MHz*Km	275M
	50/125µ 500MHz*Km	550M

COPPER LINK DISTANCES

Protocol	Cable Specification	Distance
Gigabit Ethernet - IEEE-802.3:2005 - 1000BASE-T	TIA/EIA-568-B Cat 5E - for other transmission media, please consult the factory	100M

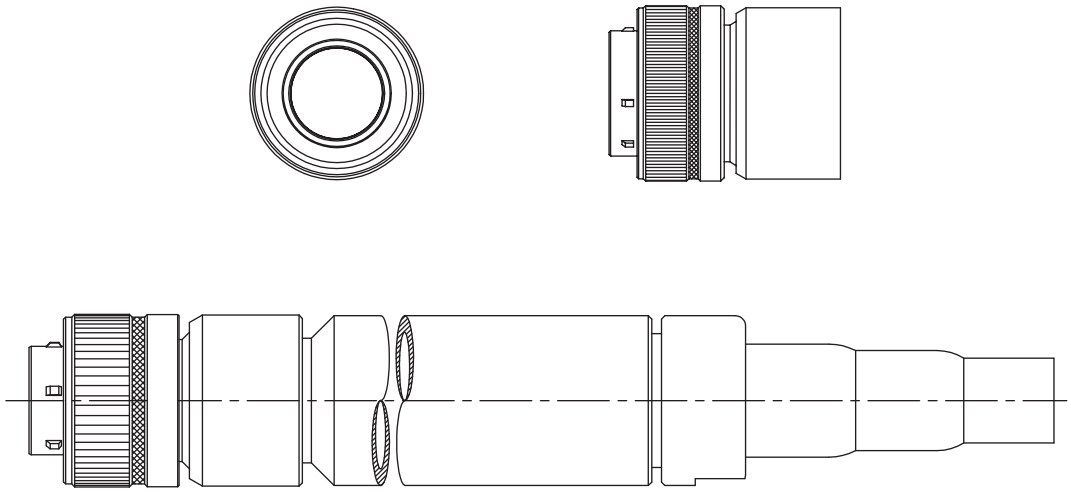
Neptune Series M28876 Connector, 1000Base-T to 1000Base-SX, Ethernet Media Converter, Multimode, 28VDC, 850nm

J1, J2 and J3 connector master keyway at 12:00 ('N')



PANEL CUTOUT

APPENDIX A1
M28876/7 8 Channel Fiber Optic Cable Plug



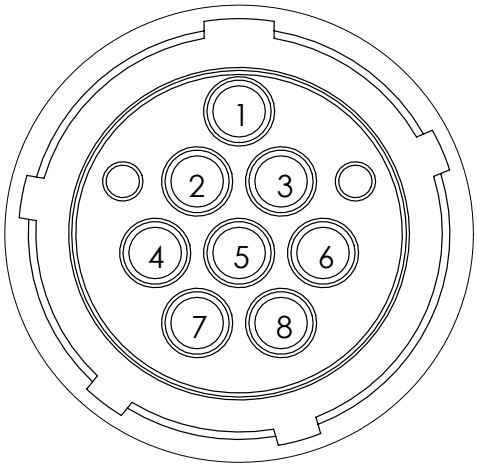
*M28876 FIBER OPTIC CABLE PLUG

CONFIGURATION	GENERIC P/N	
8 Fiber / Size 15 Shell / Pol 1	M28876/7-C12P1	
Termini - Multimode	M29504/14-4131C	

APPENDIX A2

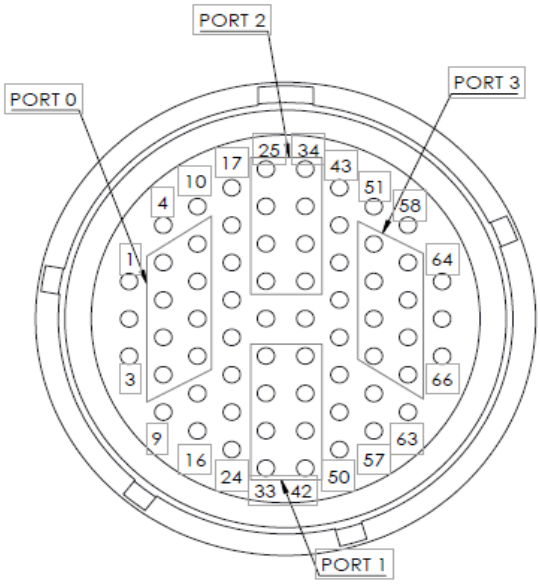
J1 Socket Functions

Electrical Data Connector Wiring Schematic

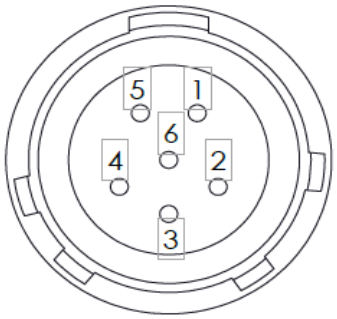


J1				
PIN	PORT	FUNCTION	INPUT / OUTPUT	LOGIC FAMILY
1	1	TX	OUTPUT	1000BASE-SX
2	1	RX	INPUT	1000BASE-SX
3	0	TX	OUTPUT	1000BASE-SX
4	2	RX	INPUT	1000BASE-SX
5	2	TX	OUTPUT	1000BASE-SX
6	0	RX	INPUT	1000BASE-SX
7	3	RX	INPUT	1000BASE-SX
8	3	TX	OUTPUT	1000BASE-SX

APPENDIX A3



J3 Connector



J3		
PIN	FUNCTION	LOGIC FAMILY
1	CASE GROUND	-
2	CASE GROUND	-
3	CASE GROUND	-
4	CASE GROUND	-
5	VEE	28VDC RETURN
6	VCC	28VDC SUPPLY

APPENDIX A4

J2 Socket Functions

J2					
PIN	PORT	FUNCTION	INPUT / OUTPUT	RJ-45 PIN	LOGIC FAMILY
5	0	DA+	INPUT / OUTPUT	1	IEEE 802.1 1000 BASE-T
6	0	DB+	INPUT / OUTPUT	3	IEEE 802.1 1000 BASE-T
7	0	DC+	INPUT / OUTPUT	4	IEEE 802.1 1000 BASE-T
8	0	DD+	INPUT / OUTPUT	7	IEEE 802.1 1000 BASE-T
11	0	DA-	INPUT / OUTPUT	2	IEEE 802.1 1000 BASE-T
12	0	DB-	INPUT / OUTPUT	6	IEEE 802.1 1000 BASE-T
13	0	DC-	INPUT / OUTPUT	5	IEEE 802.1 1000 BASE-T
14	0	DD-	INPUT / OUTPUT	8	IEEE 802.1 1000 BASE-T
25	2	DA+	INPUT / OUTPUT	1	IEEE 802.1 1000 BASE-T
26	2	DB+	INPUT / OUTPUT	3	IEEE 802.1 1000 BASE-T
27	2	DC+	INPUT / OUTPUT	4	IEEE 802.1 1000 BASE-T
28	2	DD+	INPUT / OUTPUT	7	IEEE 802.1 1000 BASE-T
34	2	DA-	INPUT / OUTPUT	2	IEEE 802.1 1000 BASE-T
35	2	DB-	INPUT / OUTPUT	6	IEEE 802.1 1000 BASE-T
36	2	DC-	INPUT / OUTPUT	5	IEEE 802.1 1000 BASE-T
37	2	DD-	INPUT / OUTPUT	8	IEEE 802.1 1000 BASE-T
30	1	DA+	INPUT / OUTPUT	1	IEEE 802.1 1000 BASE-T
31	1	DB+	INPUT / OUTPUT	3	IEEE 802.1 1000 BASE-T
32	1	DC+	INPUT / OUTPUT	4	IEEE 802.1 1000 BASE-T
33	1	DD+	INPUT / OUTPUT	7	IEEE 802.1 1000 BASE-T
39	1	DA-	INPUT / OUTPUT	2	IEEE 802.1 1000 BASE-T
40	1	DB-	INPUT / OUTPUT	6	IEEE 802.1 1000 BASE-T
41	1	DC-	INPUT / OUTPUT	5	IEEE 802.1 1000 BASE-T
42	1	DD-	INPUT / OUTPUT	8	IEEE 802.1 1000 BASE-T
52	3	DD+	INPUT / OUTPUT	7	IEEE 802.1 1000 BASE-T
53	3	DC+	INPUT / OUTPUT	4	IEEE 802.1 1000 BASE-T
54	3	DB+	INPUT / OUTPUT	3	IEEE 802.1 1000 BASE-T
55	3	DA+	INPUT / OUTPUT	1	IEEE 802.1 1000 BASE-T
59	3	DD-	INPUT / OUTPUT	8	IEEE 802.1 1000 BASE-T
60	3	DC-	INPUT / OUTPUT	5	IEEE 802.1 1000 BASE-T
61	3	DB-	INPUT / OUTPUT	6	IEEE 802.1 1000 BASE-T
62	3	DA-	INPUT / OUTPUT	2	IEEE 802.1 1000 BASE-T

MOOG PROTOKRAFT

192 Bob Fitz Road, Johnson City, TN 37615
salesmp@moog.com
moogprotokraft.com