

## Titan Series

FastEthernet, M28876, 10/100Base-TX/FX Fiber Optic Media Converter, 110/220VAC, Multimode, 1310nm

### Single Port, Jam Nut Receptacles

#### FEATURES

- Compliant with IEEE-802.3u Fast Ethernet
- Optical fiber link distances up to 2.0 Kilometers
- Maximum optical channel bit error rate less than  $2.5 \times 10^{-10}$
- Operating temperature range from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$
- Shock, vibration and immersion resistant per Mil-Std-810 and Mil-Std-1344
- Olive Drab Cadmium plating meets stringent EMI / RFI performance specifications
- Composite chassis and Mil-Dtl-38999 housings are strong, durable, corrosion resistant and light weight
- M28876 fiber optic connector for excellent performance in extreme environments
- D38999 electrical interfaces provides robust interconnection to system wiring

#### APPLICATIONS

Titan series 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 D38999 / M28876 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.



M28876 to D38999 / Optical to Electrical Media Converter

#### DESCRIPTION

Titan 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 composite enclosure.

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

The electrical interface to the Titan series optical media converters is a Mil-Dtl-38999 connector enabling interconnection to an internal or external backbone cable interface.

Titan 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, 110/220VAC	T36R-2LEU-DW

## 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		+275.0	VAC
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 - Single Phase	$V_{CC}$	+90		+264	VAC
Input Frequency	$\omega$	47		63	Hz

## SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883	ESD	Class II	2200V
MIL-STD-810	Vibration	3.8g <sup>2</sup> /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
MIL-STD-38999	Mating Durability	500 Cycles	<0.5dB Change
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

## MATERIALS

Item	Detail	Notes
D38999 / M28876 Cylindrical Shells	Aluminum Alloy	
Plating	Olive Drab Cadmium	
Enclosure	Composite Polymer	
Enclosure Finish	Nickel plating - internal surfaces only	

Single Port Titan Series, M28876 / D38999, 10/100Base-TX to 100Base-FX,  
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**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	$\lambda_{OUT}$	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	$\lambda_{IN}$	1100		1590	nM

**SUPPLY CURRENT  $T_A$  = Operating Temperature Range**

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

**OPTICAL FIBER LINK DISTANCES**

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

**COPPER CABLE LINK DISTANCES**

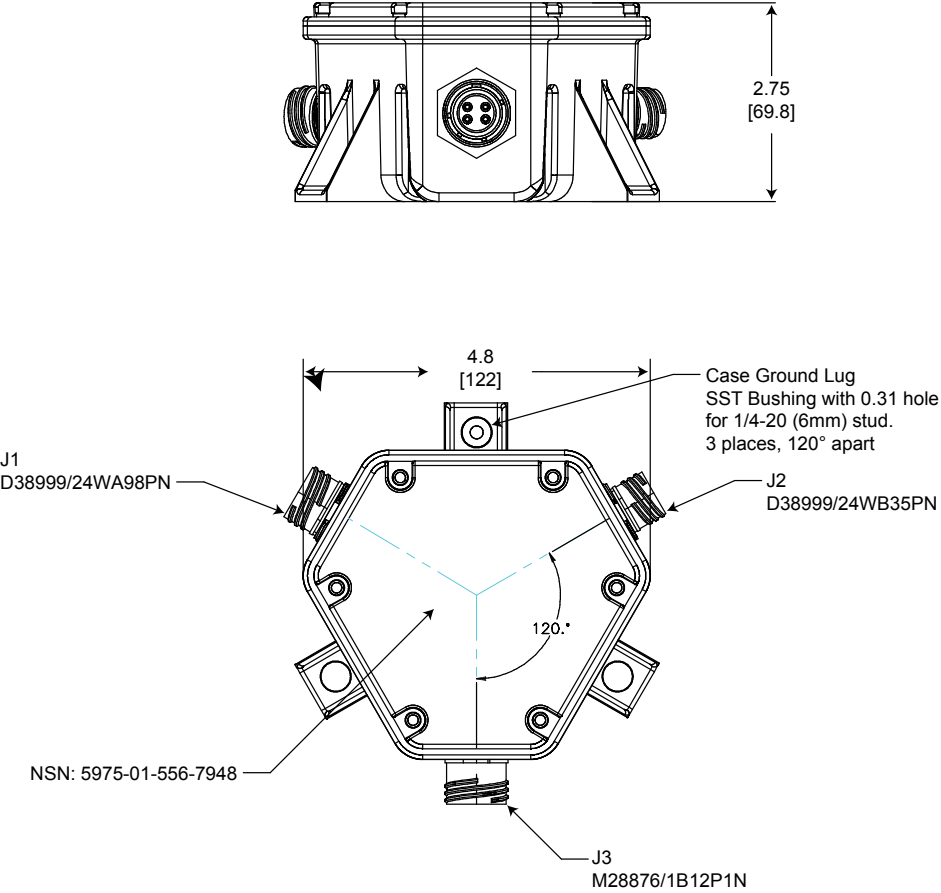
Application	Cable Specification	Distance
Fast Ethernet - IEEE 802.3u	TIA/EIA-568-B Cat 5*	100M

\*for other transmission media, please consult the factory

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**OUTLINE DRAWING**

Dimensions are shown as: inches (mm)



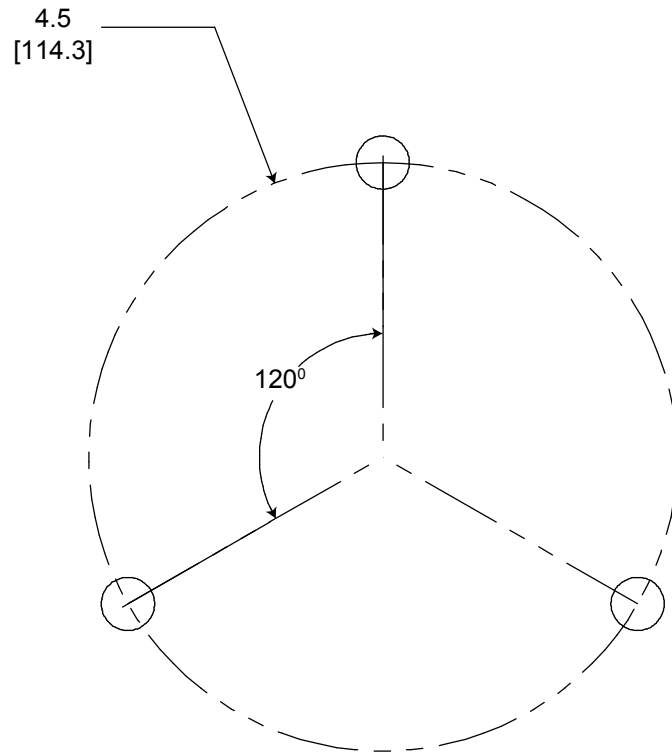
**PORT / FUNCTION ASSIGNMENTS**

Port #	Function	Appendix
J1	Power Supply Input	A1
J2	10/100Base-TX	A2
J3	100Base-FX	A3

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### MOUNTING HOLE PATTERN

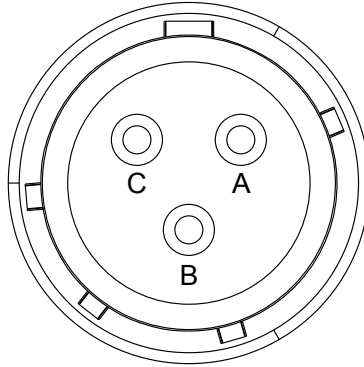
Dimensions are shown as: inches (mm)



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## APPENDIX A1

### J1 Pin Functions - Power Supply Connector



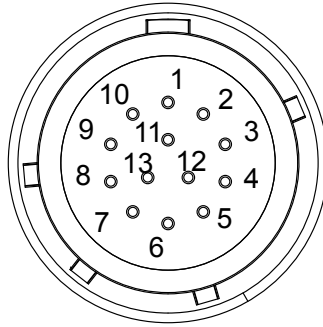
**J1 =D38999/24WA98PN**

Pin	Pin Function
A	90-264 VAC Hot
B	90-264 VAC Neutral
C	Isolated Case Ground

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## APPENDIX A2

### J2 Electrical Data Cable - Connector Wiring Schematic



J2 = D38999/24WB35PN

#### J2 MDIx wiring for connection to switch, hub or router

Pin Number	Function	RJ-45 Equivalent Pin #
2	TX+	1
5	TX-	2
7	RX+	3
10	RX-	6

#### J2 MDI wiring for connection to workstation, laptop or NIC

Pin Number	Function	RJ-45 Equivalent Pin #
2	TX+	3
5	TX-	6
7	RX+	1
10	RX-	2

TX functions are outputs, RX functions are inputs, all others are N/C

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## APPENDIX A3

### 4 Channel Fiber Optic Cable Interface



J3 = M28876/1-B12P1

#### OPTICAL TRANSCEIVER PORT / FUNCTION ASSIGNMENTS

Port #	Function
1	TX
2	RX
3	N/C
4	N/C

#### MATING M28876 FIBER OPTIC CABLE PLUG

CONFIGURATION	GENERIC P/N
4 Fiber / Size 13 Shell / Pol 1	M28876/7-B12S1
Termini - Multimode	M29504/15-4131C



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