

## Saturn Series

Fast Ethernet, Sealed RJ-45 / LC,  
10/100Base-TX/FX Media Converter,  
28VDC, Multimode, 1310nm

### Single Port, LC / RJ-45

#### 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 ESD resistant per IEC 60068
- Olive Drab Cadmium or Nickel plating meets stringent EMI / RFI performance specifications
- Aluminum alloy chassis and cylindrical connectors are strong, durable, corrosion resistant and light weight
- \*LC-Field® compliant optical fiber connector interface
- \*RJ-Field® electrical interface provides robust interconnection to vehicle wiring

#### APPLICATIONS

Saturn 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 Amphenol RJ-Field® and LC-Field® connectors provide sealed optical and electrical interfaces that are water-tight to 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.

\*RJ-Field® and LC-Field® are trademarks of Amphenol



Sealed LC to RJ-45 Optical to Electrical Media Converter

#### DESCRIPTION

Saturn series Fast Ethernet media converters consist of optoelectronic transmitter and receiver functions integrated along with the 10/100Base-TX Ethernet electrical to 100Base-FX Ethernet optical media conversion circuitry into an environmentally sealed unit.

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

The optical interface to the Saturn series optical media converters is an Amphenol LC-Field® connector enabling interconnection to preterminated LC based optical fiber cable assemblies.

The electrical interface to the Saturn series optical media converters is an Amphenol RJ-Field® connector enabling interconnection to preterminated RJ-45 Cat-5 patch cable assemblies.

Saturn series Fast Ethernet optical 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, OD-CD	M45L-2LAU-FW
10/100Base-TX to FX, NI	M45L-2LAU-FF

Single Port Saturn Series, Sealed RJ-45 / LC, 10/100Base-TX to 100Base-FX,  
Fast Ethernet Media Converter, Multimode, 28VDC, 1310nm LED's

### 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 <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 Cylindrical Shells	Aluminum Alloy	
Plating	Olive Drab Cadmium	
D38999 Inserts	Thermoplastic	
Interfacial Seals	Elastomer	
Optical Alignment Sleeves	Composite Polymer	
Printed Circuits	Polyimide / FR-4	Mil-P-31032 Type 4
Housing	Aluminum Alloy	
Weight	6.1oz/172.932 grams	

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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	$I_{CCT}$		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**

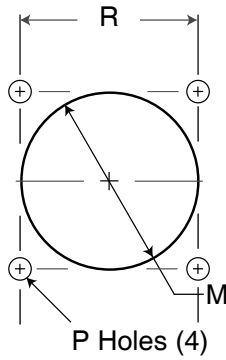
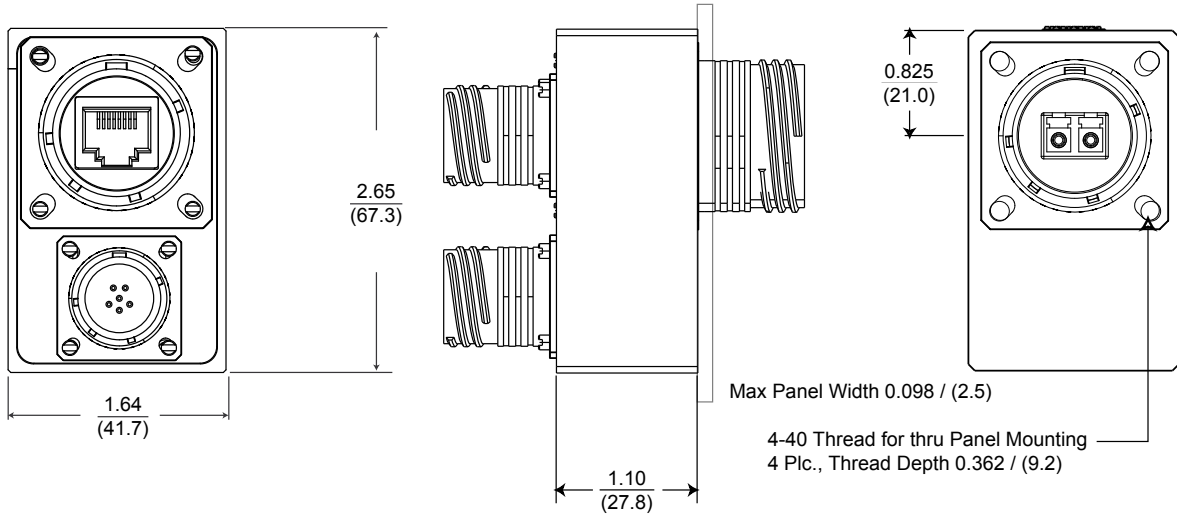
Application	Cable Specification	Distance
Fast Ethernet - IEEE 802.3u	TIA/EIA-568-B Cat 5*	100M

\*for other transmission media, please consult the factory

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**OUTLINE DRAWING**

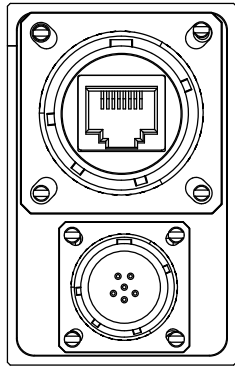
Dimensions are shown as: inches (mm)



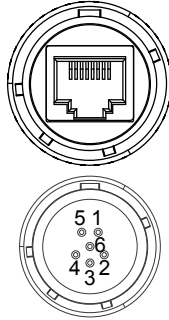
**Panel Cutout Dimensions**  
Rear Panel Mounting Only

Shell Size Code	Shell Size	M Min	P Holes	R Bsc
F	19	1.297 (32.94)	0.133 (3.4) 0.123 (3.1)	1.156 (29.4)

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**MEDIA CONVERTER INSERT ARRANGEMENTS**



**Media Converter  
 Insert Pin Numbers**



**Media Converter  
 Pin Functions**

**10/100Base-TX**  
 See Appendix A5

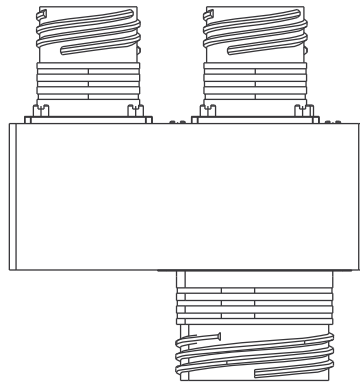
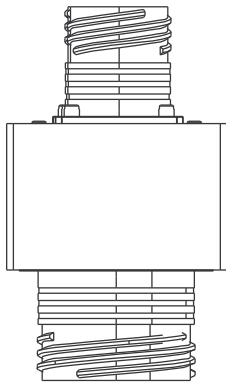
**Power Supply**  
 Pin 1 = Case Ground  
 Pin 2 = Case Ground  
 Pin 3 = Case Ground  
 Pin 4 = Case Ground  
 Pin 5 = VEE  
 Pin 6 = VCC

**Mating Cable Plug  
 Connector P/N**

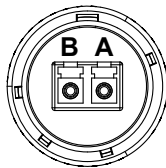
Cat-5 Twisted Pair Cable  
 Amphenol P/N RJF22G

20 Guage Copper Wire  
 D38999/26WA35SN

Media Converter Pin Numbers and Functions Shown - Mating Cable Plugs Opposite



**Media Converter  
 Optical Pin Numbers**

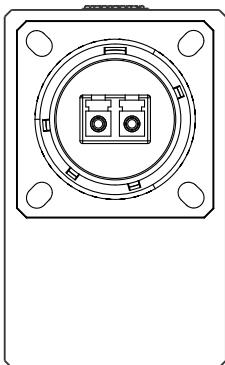


**Media Converter  
 Optical Functions**

**100Base-FX**  
 Position B = Optical TX  
 Position A = Optical RX

**Mating Cable Plug  
 Connector P/N**

62.5/125 Fiber Optic Cable  
 Amphenol P/N LCFTV6xxGN



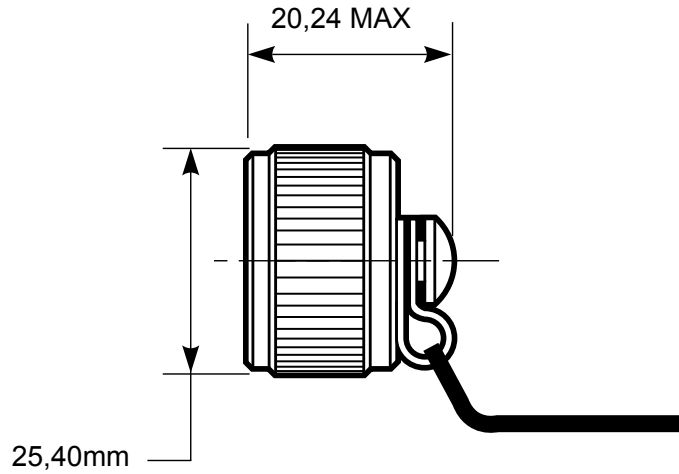
Media Converter Fiber Pin Numbers and Functions Shown - Mating Cable Plugs Opposite

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## APPENDIX A1

### AMPHENOL LC-FIELD® RECEPTACLE PROTECTIVE CAPS\*

PLATING	WIRE TYPE	PART NUMBER*
Olive Drab Cadmium	Nylon Cord	BFNTVW19
Olive Drab Cadmium	Metal Chain	BFTVW19
Nickel	Nylon Cord	BFNTVF19
Nickel	Metal Chain	BFTVF19



Nylon Cord shown above

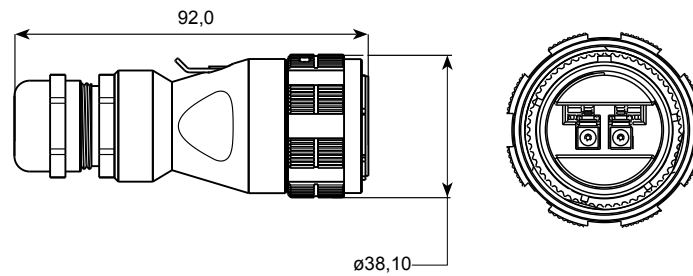
\*Contact your local Amphenol Sales Representative for more information about the  
Amphenol LC-Field® Protective Caps

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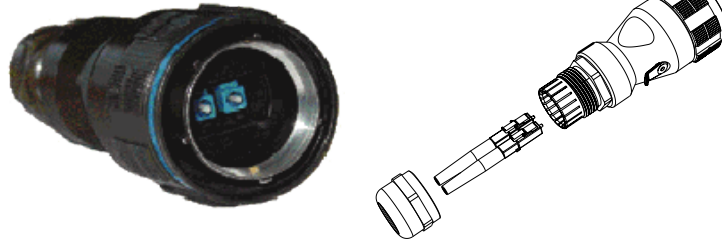
## APPENDIX A2

### AMPHENOL LC-FIELD® CABLE PLUGS\*

PLATING	AMPHENOL PART NUMBER*
Olive Drab Cadmium	LCFTV6MGN
Nickel	LCFTV6MNN



\*Contact your local Amphenol Sales Representative for more information about the Amphenol LC-Field® Cable Plugs

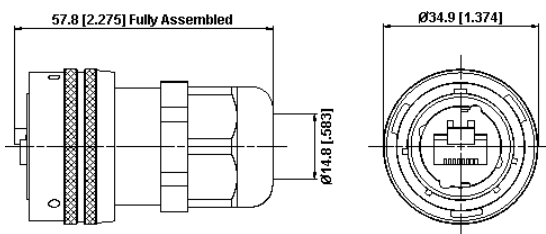


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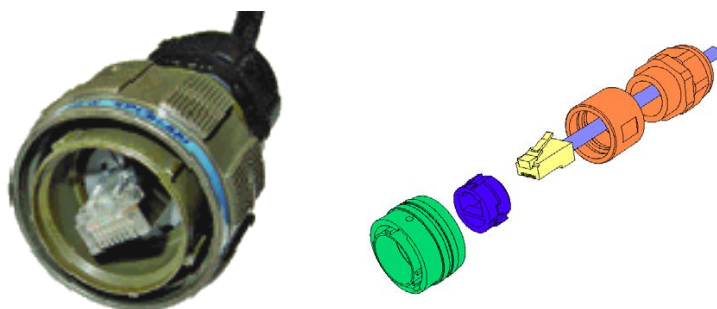
## APPENDIX A3

### AMPHENOL RJ-FIELD® CABLE PLUGS\*

PLATING	AMPHENOL PART NUMBER*
Olive Drab Cadmium	RJFTV6MG
Nickel	RJFTV6MN



\*Contact your local Amphenol Sales Representative for more information about the Amphenol RJ-Field® Cable Plugs





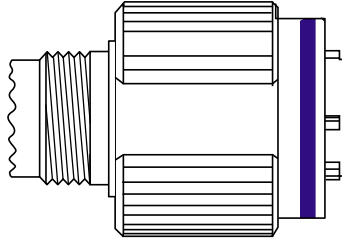
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## APPENDIX A4

### Power Cable - Plug Configuration

#### POWER CABLE PLUG - SOCKET INSERT\*

PLATING	GENERIC P/N	AMPHENOL P/N*
Olive Drab Cadmium	D38999/26WA35SN	TV06RW-9-35SN
Nickel	D38999/26FA35SN	TV06RF-9-35SN



#### POWER CABLE PLUG - SOCKET CONTACTS\*

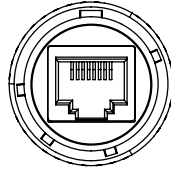
CONFIGURATION	GENERIC P/N	AMPHENOL P/N*
Size 22D	M39029/56-348	10-407035-725

\*Contact your local Amphenol Sales Representative for more information about the Amphenol D38999 power cable plugs

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## APPENDIX A5

### RJ-45 Electrical Data Cable - Connector Wiring Schematic



#### RJ-45 MDIX wiring for connection to switch, hub or router

RJ-45 Equivalent Pin #	Function
1	TX+
2	TX-
3	RX+
6	RX-

#### RJ-45 MDI wiring for connection to workstation, laptop or NIC

RJ-45 Equivalent Pin #	Function
3	TX+
6	TX-
1	RX+
2	RX-

TX functions are outputs, RX functions are inputs, all others are signal GND



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