

## Falcon Series

Dual Port DVI Fiber Optic Media Converter, D38999  
28VDC, Multimode, 850nM, Quadrax

### Dual DVI Port, Transmitter

#### FEATURES

- Optical fiber link distances up to 500 meters
- 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 plating meets stringent corrosion performance specifications
- Aluminum alloy enclosure and MIL-DTL-38999 shells are strong, durable, corrosion resistant and light weight
- MIL-T-29504 compliant optical fiber connector interface
- D38999 / Quadrax electrical interface provides robust interconnection to internal chassis wiring or backbone

#### APPLICATIONS

Falcon series bulkhead mounted DVI fiber optic media converters enable high speed video transmission over long distances in harsh environments.

- DVI link extension
- Remote display clusters
- Alternative display configurations

The MIL-DTL-38999, Series III shell provides a sealed optical interface that is 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.



D38999 to Quadrax / Optical to Electrical Media Converter

#### DESCRIPTION

Falcon series DVI fiber optic transmitter consist of optoelectronic transmitter functions integrated into a bulkhead mounted MIL-DTL-38999 connector assembly. The optical transmitters are high output 850nM VCSEL's.

The electrical interface to the Falcon series DVI fiber optic media converters is a D38999/19-18 Quadrax connector enabling interconnection to a standard DVI connector interface with a Quadrax cable adaptor.

Falcon series DVI fiber optic transmitter 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
Dual DVI Transmitter, 28VDC	M38R-8TAV-HW
See Appendix A4 for more part number options	

Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Transmitter,  
 Quadrax, Multimode, 28VDC, 850nm VCSEL'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

### 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	
Housing	Aluminum Alloy	

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**OPTICAL TRANSMITTERS  $T_A = \text{Operating Temperature Range, } V_{CC} = 18.0V \text{ to } 36.0V$**

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power (BER<10 <sup>-12</sup> )	$P_o$	-9.5		-3.0	dBm
Optical Output Wavelength	$\lambda_{OUT}$	830	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.85	nM
Extinction Ratio	ER	9.0			dB
Optical Rise, Fall Time (20% to 80%)	$t_{R,F}$			80	pS

**POWER SUPPLY CURRENT  $T_A = \text{Operating Temperature Range, } V_{CC} = 18.0V \text{ to } 36.0V$**

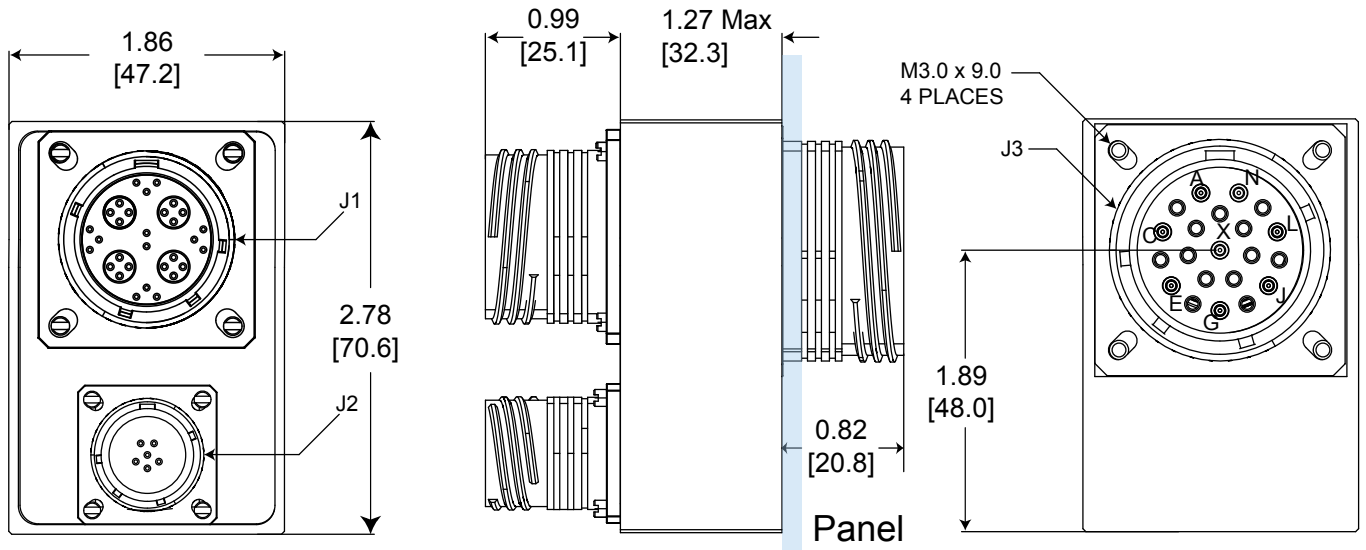
Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current	$I_{CCT}$		200	250	mA

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**OUTLINE DRAWING**

Dimensions are shown as: inches (mm)

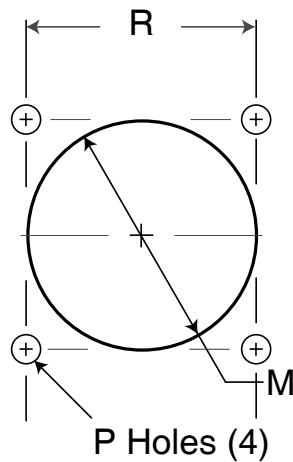
Weight = 8.3 oz / 235 grams



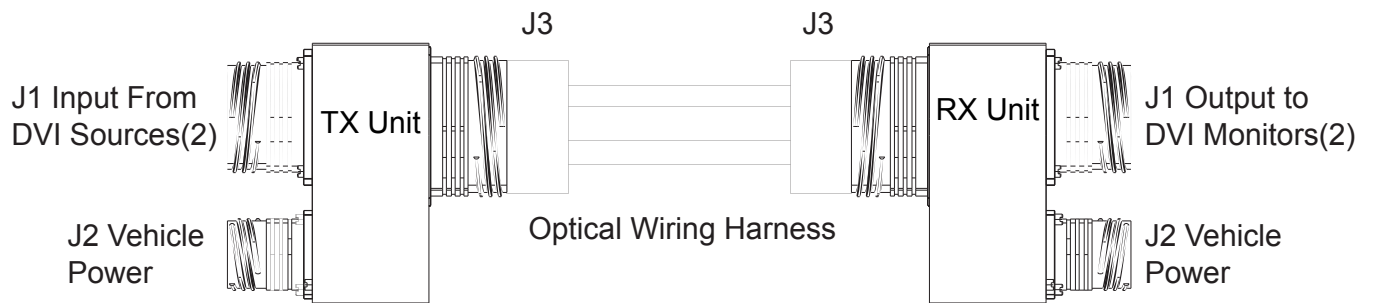
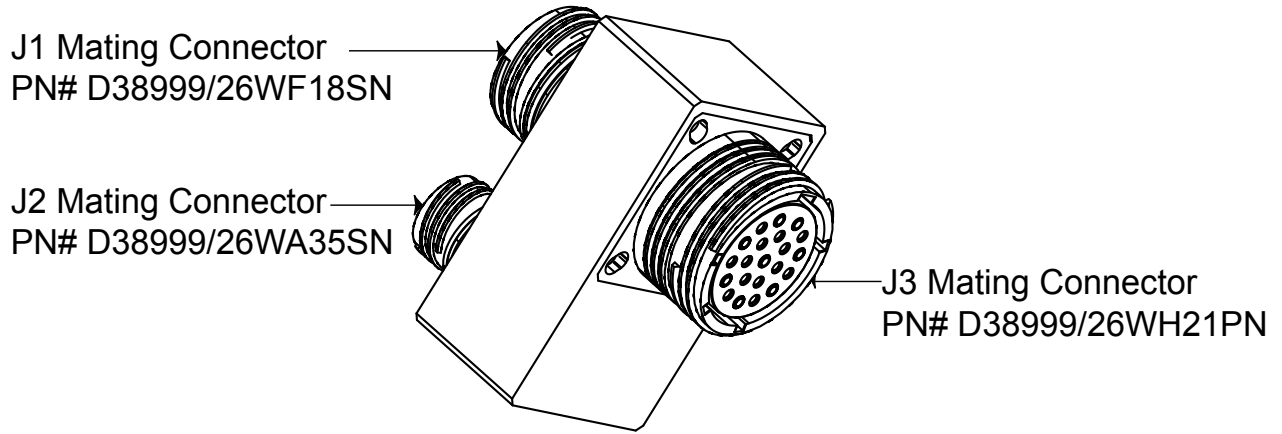
**Panel Cutout Dimensions**

Rear Panel Mounting Only

Shell Size Code	Shell Size	M Min	P Holes	R Bsc
H	23	1.547 (39.29)	0.159 (4.0) 0.149 (3.8)	1.375 (34.9)

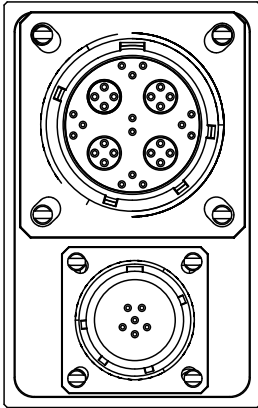


Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Transmitter,  
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**CONNECTION REQUIREMENTS**



J3 PIN #	DVI Port #	DVI Cable Color
J	0	Blue
L	1	Blue
N	0	Green
G	1	Green
X	0	Red
A	1	Red
E	0	Clock
C	1	Clock

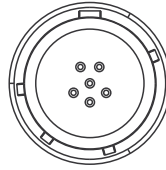
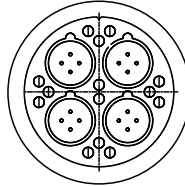
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**MEDIA CONVERTER INSERT ARRANGEMENTS**



**J1**

**J2**

**Media Converter  
 Insert Assignments**



**Media Converter  
 Pin Functions**

**Electrical Signal Interface**

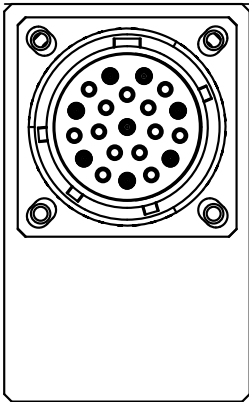
See Appendix A3

**Power Supply Interface**

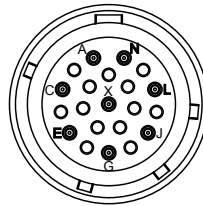
See Appendix A4

**Media Converter  
 Optical Pin Numbers**

**Media Converter  
 Optical Functions**



**J3**



**Optical Fiber Interface**

See Appendix A2

Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Transmitter,  
 Quadrax, Multimode, 28VDC, 850nm VCSEL's

## APPENDIX A1

### MIL-DTL-38999 FIBER OPTIC CABLE PLUG / MIL-T-29504 PIN TERMINI

\*See DSCC or SAE QPL for Approved Suppliers

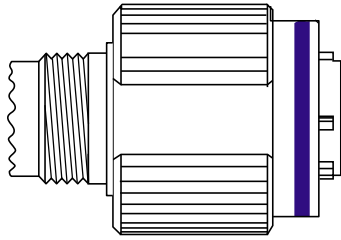
<http://www.dsccl.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=38999>

#### \*D38999 PLUG - PIN INSERT

##### MIL-DTL-38999 CABLE PLUG

MS PLUG P/N

\*D38999/26WH21PN

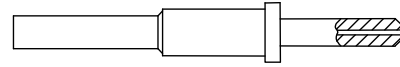


#### \*FIBER OPTIC PIN TERMINUS

##### MIL-T-29504 PIN TERMINUS

MS PIN TERMINUS P/N

\*M29504/04-xxxx\*\*



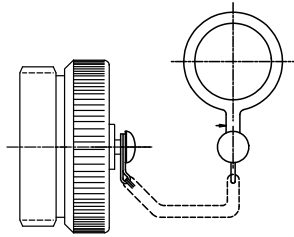
\*\*defined by fiber optic cable configuration

#### \*CABLE PROTECTION CAP

##### D38999/32 PLUG PROTECTION CAP

MS PLUG CAP P/N

\*D38999/32W23N

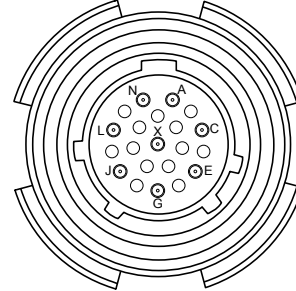


#### D38999 PLUG PORT FUNCTIONS

PORT NUMBER	0	1
Blue	J	L
Green	N	G
Red	X	A
Clock	E	C

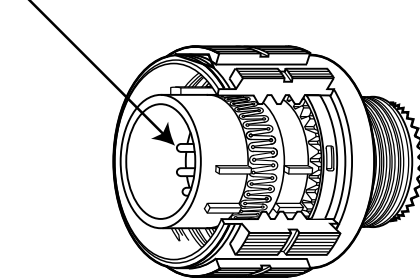
TOP

Optical Cable Plug Interface



Front face of the optical cable plug pin insert shown. Transceiver insert opposite.

Pin Termini

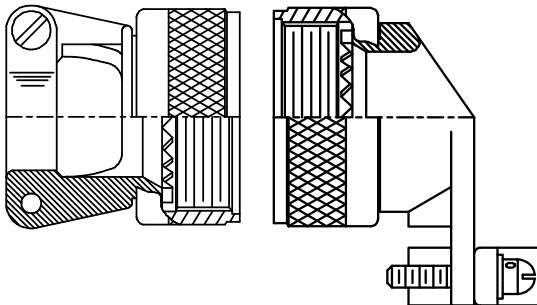


#### \*CABLE BACKSHELL

##### MIL-C-85049 CABLE BACKSHELL

MS BACKSHELL P/N

\*MS85049/xxxxxx\*\*



\*\*Straight or angled backshell - defined by application / mounting configuration

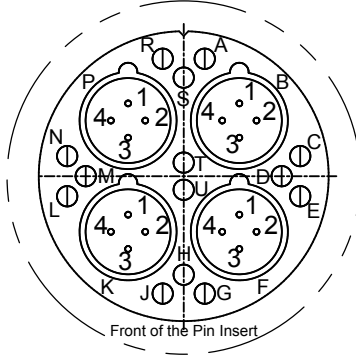
Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Transmitter,  
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## APPENDIX A2

### J1 Pin Functions

#### Electrical Data Connector Wiring Schematic

Top



Front view of the D38999/19-18 electrical insert shown,  
 mating electrical cable plug opposite.

#### Dual Port DVI Media Converters

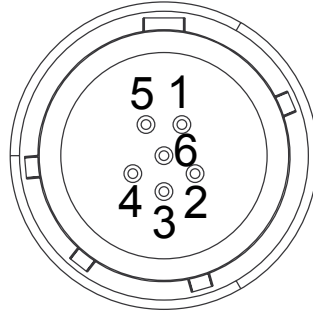
Pin	Channel	Function	+/-	Pin	Channel	Function	+/-
A	N/A	No Connect	N/A	K1	0	TMDS - Red	-
B1	0	TMDS - Blue	-	K2	0	TMDS - Red	+
B2	0	TMDS - Blue	+	K3	1	TMDS - Red	-
B3	1	TMDS - Blue	-	K4	1	TMDS - Red	+
B4	1	TMDS - Blue	+	L	N/A	No Connect	N/A
C	N/A	No Connect	N/A	M	N/A	No Connect	N/A
D	N/A	No Connect	N/A	N	N/A	No Connect	N/A
E	N/A	No Connect	N/A	P1	0	TMDS - Clock	-
F1	0	TMDS - Green	-	P2	0	TMDS - Clock	+
F2	0	TMDS - Green	+	P3	1	TMDS - Clock	-
F3	1	TMDS - Green	-	P4	1	TMDS - Clock	+
F4	1	TMDS - Green	+	R	N/A	No Connect	N/A
G	N/A	No Connect	N/A	S	N/A	No Connect	N/A
H	N/A	No Connect	N/A	T	N/A	No Connect	N/A
J	N/A	No Connect	N/A	U	N/A	No Connect	N/A



Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Transmitter,  
QuadraX, Multimode, 28VDC, 850nm VCSEL's

## APPENDIX A3

### J2 Pin Functions - Power Supply Connector Electrical Power Cable - Connector Wiring Schematic Top



Front view of the D38999/09-06 electrical insert shown,  
mating electrical cable plug opposite.

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

Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Transmitter,  
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## APPENDIX A4

### PART NUMBER OPTIONS

DVI Fiber Optic Transmitters, 850nm

**M38R - 8 TAV - H X X**

Shell Configuration  
M38R= 38999 Receptacle

# Fiber Channels  
8 = Eight

Fiber Optic Interface  
T = 850nm MM TX

Power Supply Voltage  
A= 28.0VDC

Electrical Interface  
V = DVI

Shell Size Code  
H = 23 - 21

Shell Plating  
F = NI  
W = OD CD / NI  
Z = ZN / NI

Shell Polarization  
(leave blank) \_ = N  
A = A  
B = B  
C = C  
D = D



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