

Falcon Series

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

Dual DVI Port, Receiver

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 a robust interconnection to platform cabling

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 receivers consist of optoelectronic receiver functions integrated into a bulkhead mounted MIL-DTL-38999 connector assembly. The optical receivers consist of GaAs PIN and preamplifier assemblies and limiting post-amplifiers.

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 receivers 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 Receiver, 28VDC | M38R-8RAV-HW |
| See Appendix A4 for more part number options | |

Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Receiver,
 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 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 |
| 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 RECEIVERS T_A = Operating Temperature Range, V_{CC} = 18.0V to 36.0V

| Parameter | Symbol | Minimum | Typical | Maximum | Unit |
|--|----------------|---------|---------|---------|------|
| Optical Sensitivity (BER<10 ⁻¹² , ER=9.0) | P_I | -19.0 | | 0.0 | dBm |
| Optical Wavelength | λ_{IN} | 830 | | 860 | nM |

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

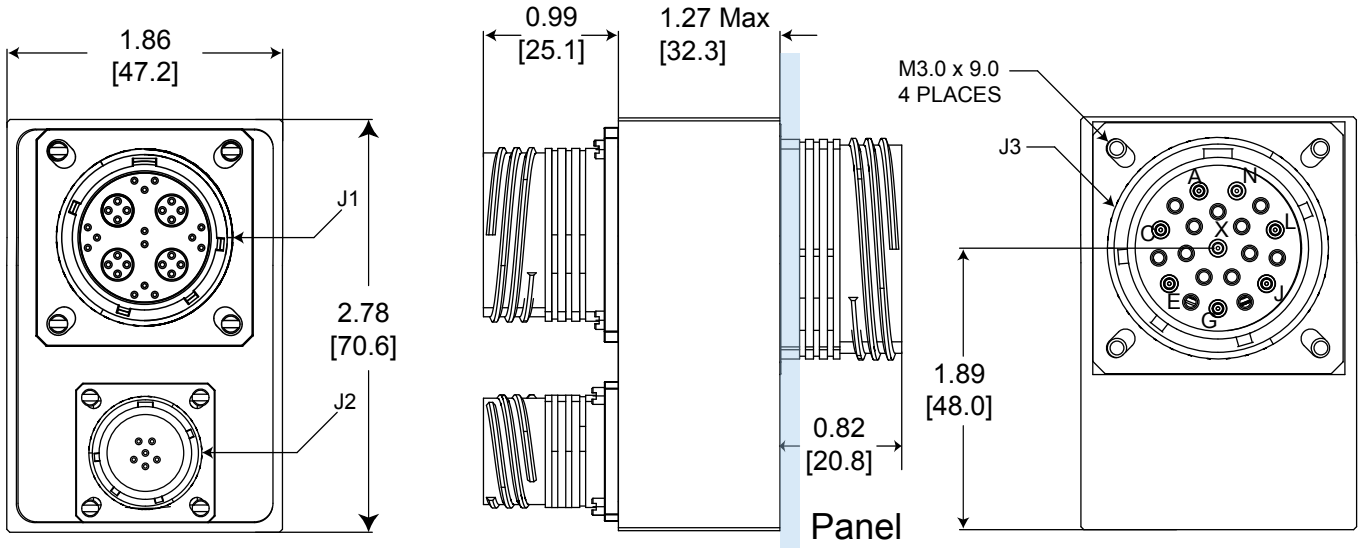
| Parameter | Symbol | Minimum | Typical | Maximum | Unit |
|----------------|-----------|---------|---------|---------|------|
| Supply Current | I_{CCT} | | 200 | 250 | mA |

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OUTLINE DRAWING

Dimensions are shown as: inches (mm)

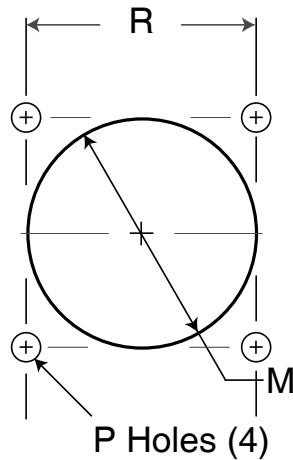
Weight = 8.3 oz / 235 grams



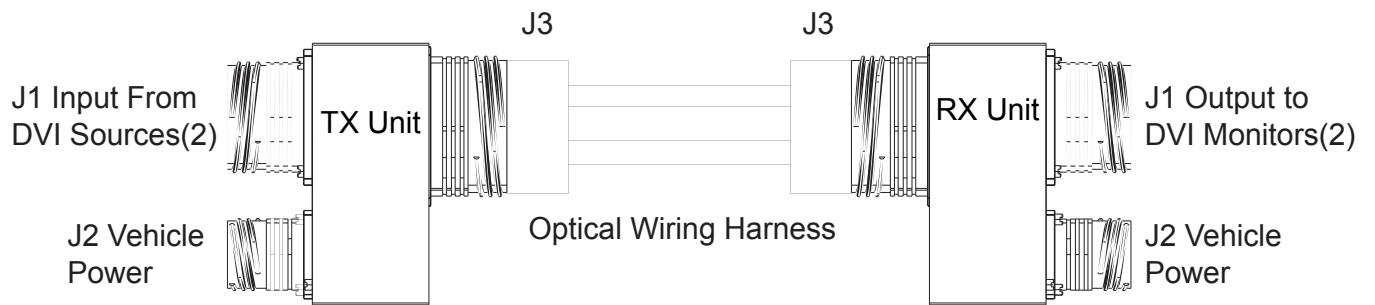
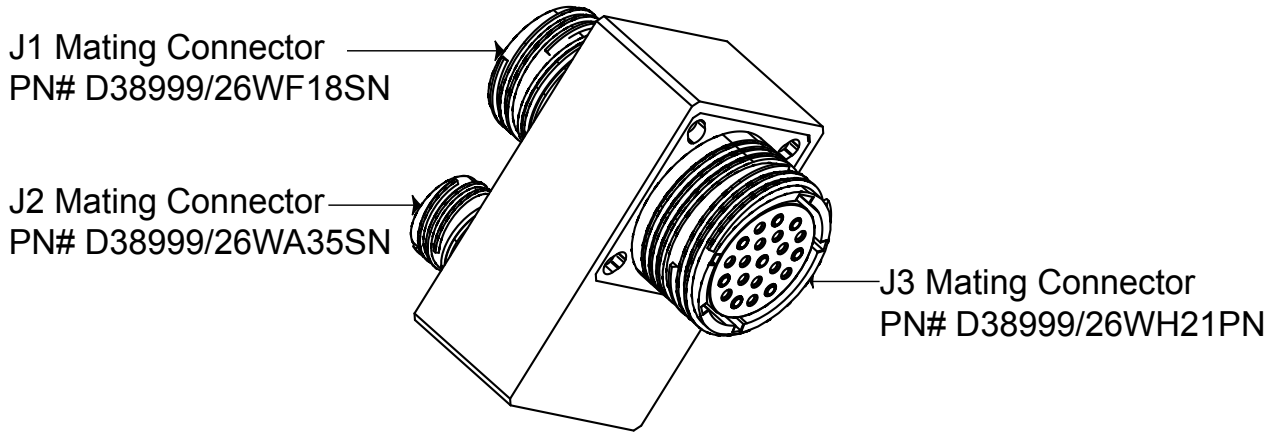
Panel Cutout Dimensions

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) |

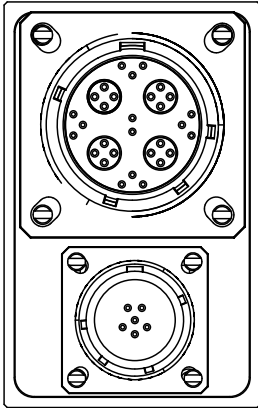


Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Receiver,
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CONNECTION REQUIREMENTS



| 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 |

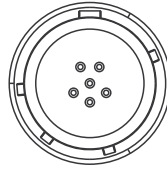
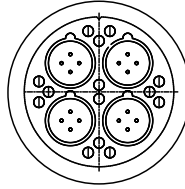
Falcon Series MIL-DTL-38999, Dual Port DVI Fiber Optic Receiver,
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MEDIA CONVERTER INSERT ARRANGEMENTS



J1

J2

**Media Converter
 Insert Assignments**



**Media Converter
 Pin Functions**

Electrical Signal Interface

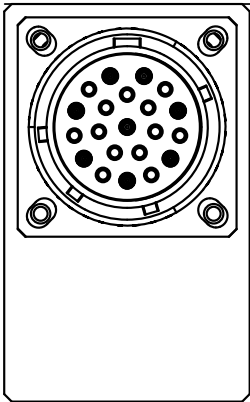
See Appendix A3

Power Supply Interface

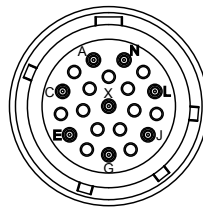
See Appendix A4

**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 Receiver,
 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

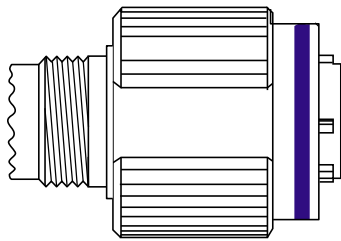
<http://www.dsccl.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=38999>

*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**



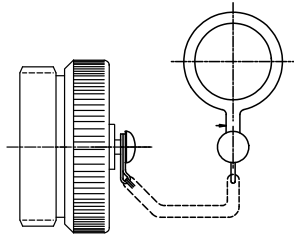
**defined by fiber optic cable configuration

*CABLE PROTECTION CAP

D38999/32 PLUG PROTECTION CAP

MS PLUG CAP P/N

*D38999/32W23N

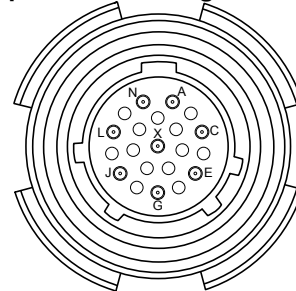


D38999 PLUG PORT FUNCTIONS

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

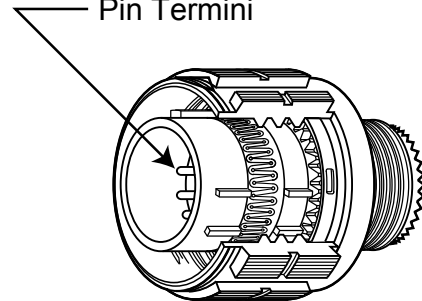
TOP

Optical Cable Plug Interface



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

Pin Termini

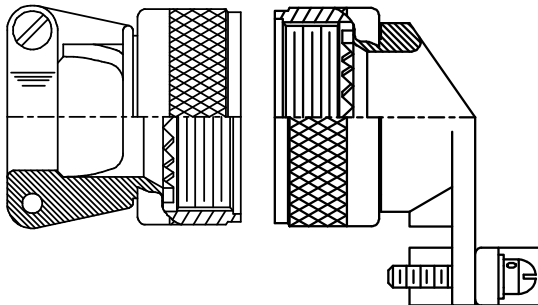


*CABLE BACKSHELL

MIL-C-85049 CABLE BACKSHELL

MS BACKSHELL P/N

*MS85049/xxxxxx**



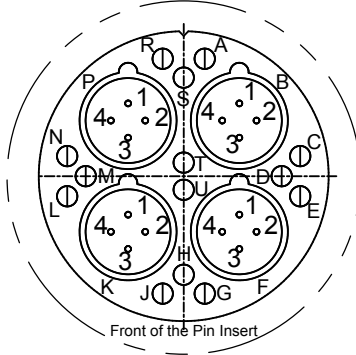
**Straight or angled backshell - defined by application / mounting configuration

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.

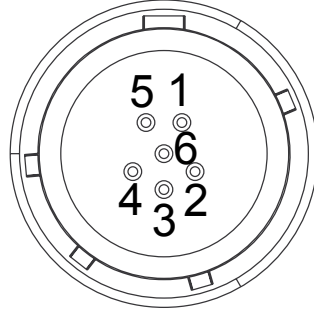
Dual Port DVI Media Converters

| 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 Receiver,
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 |

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APPENDIX A4

PART NUMBER OPTIONS

DVI Fiber Optic Receivers, 850nm

M38R - 8 RAV - H X X

Shell Configuration
M38R= 38999 Receptacle

Fiber Channels
8 = Eight

Fiber Optic Interface
R = 850nm MM RX

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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