## Ruggedized Fiber Optic Products

### Expanded Beam Products

- **PRO BEAM® Sr. Connector and PRO BEAM® Jr. Connector field deployable interconnects**
- **ARINC 600 and 404 connectors, with inserts/ holder blocks designed for Mini-Expanded Beam — up to 128 channels on size 3 ARINC 600**
- **MIL-C-38999 Series III shell size 11 style circular connectors — Cable assemblies up to 4 fibers**
- **Common insert for 1- through 4-channels**
- **Tactical cables, cable reels, backpacks**
- **Cable assembly and termination services**

### Product Facts

- **Non-contacting method of mating optical fibers**
- **Lenses expand, then focus and collimate light; Housed in high strength, high precision connectors**
- **No wear on fiber optic interface; Very vibration resistant**
- **Easy to handle, easy to clean. Durable connection that is highly resistant to dirt/debris**
- **Singlemode or multimode**
- **Common 850, 1300, 850/1300 Dual Wavelength, 1310, or 1550 nm wavelengths**
- **Easy alignment for low-loss, repeatable performance**
- **Consistent overall optical "link budget"**
- **Low sensitivity to thermal fluctuations and interface contamination**
- **Repeatable low-loss performance in harsh environments**

Fiber Optic interconnect/cable system using Expanded Beam technology, which physically expands and collimates the transmission signal into an optical beam over 14 times its original diameter (the cross sectional area of the light beam increases over 200 times for multimode optical signals.

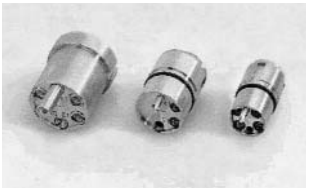
For singlemode signals, the collimated beam is over 45 times its original diameter and the cross-sectional area of the light beam increases over 2,000 times.). It is then refocused back down onto the core of the receiving fiber. This concept provides ease of alignment and low sensitivity to thermal changes and contamination. High strength, precision connector housings enhance a durable connection, optimizing low loss and repeatable performance.

Suitable for aerospace, avionics, field-deployable communications, marine ship-to-shore applications, security systems, mobile diagnostic units, oil and gas exploration and other harsh environment applications demanding strength, durability and reliable performance in conditions of multiple coupling/decouplings, blind-mate situations, and high vibration.

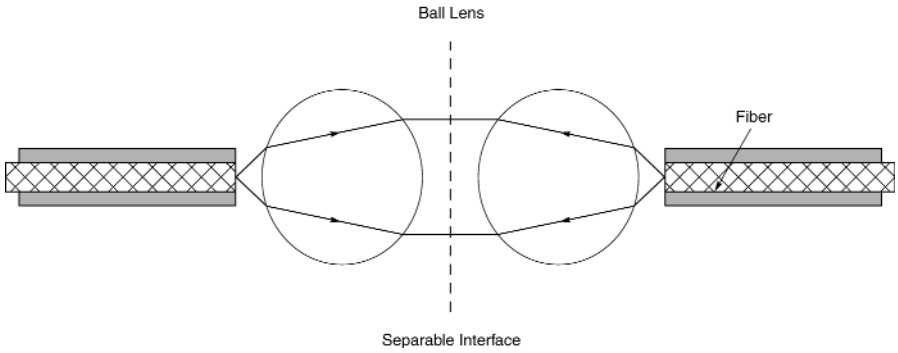
**Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics' Sales Representative for assistance.**

## Ruggedized Fiber Optic Products (Continued)

### Expanded Beam Principle



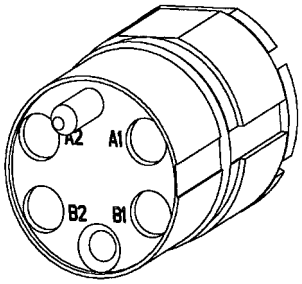
From left to right: PRO BEAM Sr., PRO BEAM Jr. & Mini-Expanded Beam inserts.




### Product Facts

- **Light is expanded, collimated, and transmitted across an air gap**
- **Ball lens expands cross-sectional area of light over 200 times for multimode and over 2000 times for singlemode**

### Expanded Beam Inserts




- **Unique patented Modular Design, for use with multi-mode and singlemode fiber**
- **Rugged hermaphroditic construction (i.e., same insert mates to each other)**
- **Three different insert sizes, up to four channels per insert**
- **Mini-Expanded Beam insert for multi-channel small form factor — the smallest expanded beam multi-channel insert in the industry, a Tyco Electronics exclusive**
- **Physically non-contacting mating conditions; no wear**
- **Easy to terminate and easy to clean**
- **Low transmission loss**

### Expanded Beam Avionics-Related Standards and Specifications for ARINC 763 and 664

#### ARINC 763 — Avionics Network Server System

Tyco Electronics' ARINC 600 Connectors are designed to meet/exceed 100 Base-FX Ethernet LAN applications

**Network Server Unit (NSU)** — can use ARINC 600 Size 1 connector with up to 8 Expanded Beam fiber optic channels (two Mini-Expanded Beam inserts in cavity C)

**Server Interface Unit (SIU)** — can use ARINC 600 Size 3 connector with up to 16 Expanded Beam fiber optic channels (four Mini-Expanded Beam inserts in cavity F)

**Integrated Network Server Unit (INSU)** — can use ARINC 600 Size 3 connector with up to 16 Expanded Beam fiber optic channels (four Mini-Expanded Beam inserts in cavity F)

#### ARINC 664 — Aircraft Data Network

Tyco Electronics' ARINC Connectors with Mini-Expanded Beam inserts will meet/exceed all 100 Base-FX Ethernet LAN applications

## Ruggedized Fiber Optic Products (Continued)

### PRO BEAM Sr. and PRO BEAM Jr. Connectors and Cable Assemblies

#### Product Facts

- PRO BEAM Sr. Connector and PRO BEAM Jr. Connectors are inter-mateable with other Expanded Beam Connectors in the market
- Singlemode and multimode connectors with proven high-performance during field use
- Easy termination suitable for field use
- Use 1 to 4 channel Expanded Beam inserts
- Cable connector plugs, standard bulkhead (d-hole cut out) and flange-mount bulkhead
- Cable connector plugs provide protection from harsh environments
- Cable adapter kits for bulkheads — standard, standard with boot, environmentally sealed with boot
- Descriptive nomenclature can be used to define connector and cable assembly requirements
- Spare parts are available

#### Material and Plating Options

- Shell Alloy:
  - Aluminum
  - Nickel Aluminum Bronze (High Saline Environment)
- Plating:
  (for aluminum shells only)
  - Clear Hard Anodized
  - Green Chromate Conversion Zinc (Jr. Bulkheads only)

PRO BEAM Jr. & Sr. Plugs

Bulkhead Mount Receptacle

Square Flange Receptacle Dual-mount (front or rear)

### Low Profile PRO BEAM Jr. Bulkhead

#### Product Facts

- Has 14mm rear flange depth dimension versus standard bulkhead depth dimension of 40mm
- Excellent for dense packages and harsh environment equipment

## Ruggedized Fiber Optic Products (Continued)

**Connector Assembly**
1 Shell Kit
1 Insert Kit
1 Cable Adapter Kit*
X Ferrule Kits (X = No. of optical channels)

| PRO BEAM Jr. Connector Shell Kits | Part Number |
|---|---|
| Jr. Plug w/EPDM rubber | 1754436-1 |
| Jr. Plug w/Fluorosilicone rubber | 1754436-2 |
| Jr. D-Hole Low Profile, Buffered Fiber Bulkhead | 1693741-1 |
| Jr. D-Hole Standard Bulkhead | 1754437-1 |
| Jr. D-Hole Sealed Bulkhead | 1754438-1 |
| Jr. Square Flange Low Profile Buffered Fiber Bulkhead | 1754439-1 |
| Jr. Square Flange Standard Bulkhead | 1754440-1 |
| Jr. Square Flange Sealed Bulkhead | 1754441-1 |

| PRO BEAM Jr. Replacement for TFOCA-II® Panel Mount Connector Applications | Part Number |
|---|---|
| PB Jr. TFOCA-II Replacement D-Hole Low-Profile Buffered Fiber Bulkhead | 1754445-1 |
| PB Jr. TFOCA-II Replacement D-Hole Sealed Bulkhead | 1754446-1 |
| PB Jr. TFOCA-II Replacement Square-Flange Low-Profile Buffered Fiber Bulkhead | 1754447-1 |
| PB Jr. TFOCA-II Replacement Square-Flange Sealed Bulkhead | 1754448-1 |

**Part numbers listed are shell alloy, aluminum plating, hard anodized. Consult Tyco Electronics for other plating/material options.**

| PRO BEAM Jr. Insert Kits | Part Number |
|---|---|
| 1 x 850nm Multimode | 1588786-1 |
| 1 x 1300nm Multimode | 1515737-1 |
| 1 x 1310nm Singlemode | 1515738-1 |
| 1 x 1550nm Multimode | 1516039-1 |
| 2 x 850 / 1300nm Dual Multimode, optimized at 850nm | 1515743-1 |
| 2 x 850 / 1300nm Dual Multimode, optimized at 1300nm | 1515743-2 |
| 2 x 1300nm Multimode | 1515733-2 |
| 2 x 1310nm Singlemode | 1515739-1 |
| 2 x 1550nm Singlemode | 1516040-1 |
| 3 x 1300nm Multimode | 1515742-1 |
| 3 x 1310nm Singlemode | 1515741-1 |
| 3 x 1500nm Singlemode | 1588766-1 |
| 4 x 850nm Multimode | 1588574-2 |
| 4 x 850 / 1300nm Dual Multimode, optimized at 850nm | 1515747-1 |
| 4 x 850 / 1300nm Dual Multimode, optimized at 1300nm | 1515747-2 |
| 4 x 1300nm Multimode | 1515736-2 |
| 4 x 1310nm Singlemode | 1515740-1 |
| 4 x 1550nm Singlemode | 1516041-1 |

**Ferrule Kits**

| Fiber Hole Size | Sealed | Mode | PRO BEAM | Part Number |
|---|---|---|---|---|
| 125 µm | Yes | SM | Jr. | 1588908-2 |
| 125 µm | No | SM | Sr. | 1515941-1 |
| 126 µm | Yes | MM | Jr. | 1588700-1 |
| 126 µm | Yes | SM | Jr. | 1588908-1 |
| 126 µm | No | MM | Sr. | 1588801-1 |
| 126 µm | No | SM | Sr. | 1515941-2 |

**Use with PRO BEAM Jr. Connector and Cable Assemblies**

**PRO BEAM Jr. Connector Plug Cable Adapter Kits**

| Cable Dia. (Max.) | Part No. |
|---|---|
| **3.10** .122 | 1515814-1 |
| **3.60** .142 | 1515781-3 |
| **4.10** .161 | 1515848-2 |
| **4.60** .181 | 1516147-1 |
| **5.10** .201 | 1515834-2 |
| **5.65** .222 | 1515827-2 |
| **6.10** .240 | 1515859-3 |
| **6.70** .264 | 1588116-1 |

**PRO BEAM Jr. Connector Bulkhead Cable Adapter Kits***

| Cable Dia. (Max.) | Style | Part No. |
|---|---|---|
| **2.20** .087 | Standard Cable Adapter, with Boot | 1515878-1 |
| **3.10** .122 | Standard Cable Adapter | 1515791-2 |
| **3.20** .126 | Standard Cable Adapter, with Boot | 1515810-3 |
| **3.60** .142 | Standard Cable Adapter | 1515808-1 |
| **4.20** .165 | Standard Cable Adapter, with Boot | 1515839-2 |
| **5.10** .201 | Standard Cable Adapter | 1515835-2 |
| **5.65** .222 | Standard Cable Adapter | 1515829-1 |
| **6.10** .240 | Standard Cable Adapter | 1515796-2 |
| **4 x 3.00** 4 x .118 | Standard Cable Adapter | 1515749-1 |

* Not applicable for Low Profile

## Ruggedized Fiber Optic Products (Continued)

### PRO BEAM Sr. Connectors
### Performance Specifications

**Optical, Multimode**

**Insertion Loss, Typical** — 0.5 - 1.0 dB @ 1300 nm*

**Optical, Singlemode**

**Insertion Loss, Typical** — 0.5 - 1.0 dB @ 1310 nm*

**Return Loss** — > 34 dB @ 1310 nm or 1550 nm

* When tested with reference quality launch/receive cable assemblies.

**Mechanical**

**Vibration, Sinusoidal** — 10 - 500 Hz, 3 directions; 0.75 mm amplitude @ 10g acceleration

**Bump** — 4,000 Bumps, 3 directions @ 40g acceleration

**Free Fall** — 500 falls on concrete; Severity 1.2 m

**Coupling Endurance** — 3,000 couplings

**Weight** — Plug — 290 grams, typical Chassis bulkhead — 150 grams, typical

**Temperature**

**Operational Temperature** — -40°C/+85°C

**Storage Temperature** — -55°C/+85°C

**Temperature, Cycle** — -55°C/+85°C

**Damp Heat, Cyclic** — +55°C

**Corrosion**

**Salt** — Conforms

**Acid** — Conforms

**Immersion**

**Water** — 5 m depth (plug), 2 m (Bulkhead)

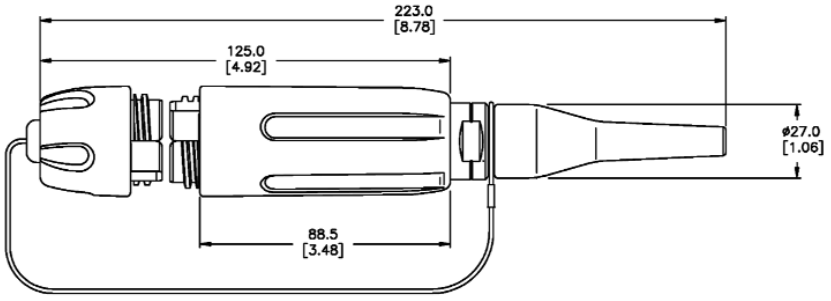
**Mud** — Conforms

**Pressure**

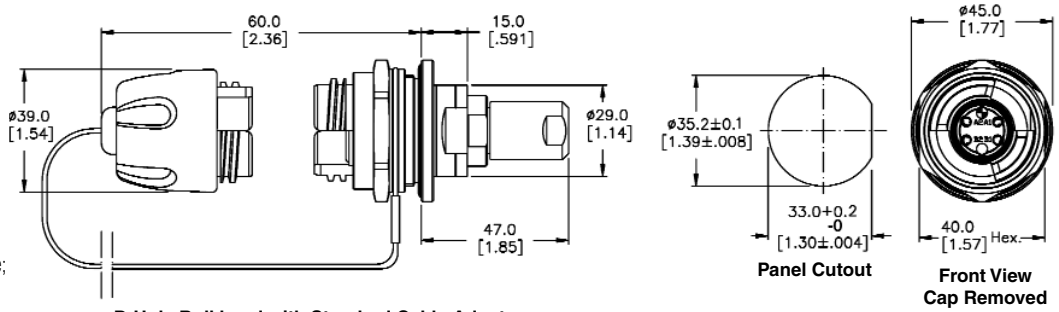
**Low Pressure** — 25 kPa @ -55°C

**Material and Plating Options**

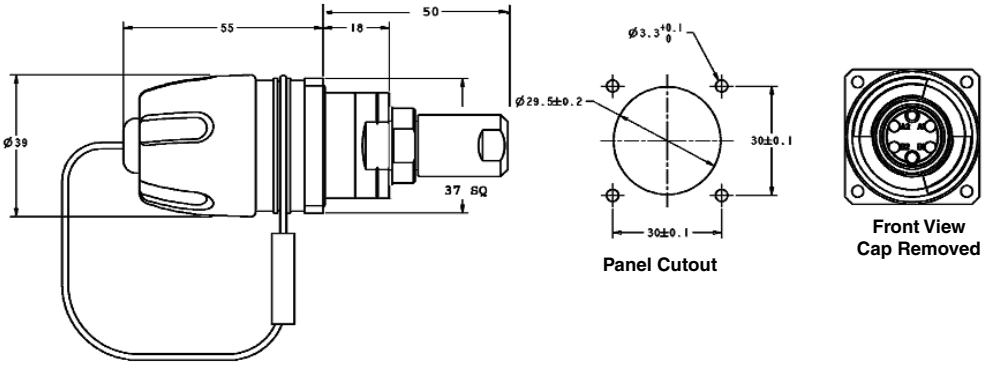
- **Shell Alloy:**
  - Aluminum
  - Nickel Aluminum Bronze (High Saline Environment)
- **Plating: (for aluminum shells only)**
  - Clear Hard Anodized




Cable Connector, Plug




D-Hole Bulkhead with Standard Cable Adapter




Square Flange Mount Bulkhead with Standard Cable Adapter

**PRO BEAM Sr. Connector Kit and Component Cross Reference (C18)**

| No of Channels | Mode | Type | Wavelength |
|---|---|---|---|
| 2 & 4 | MM & SM | Square Flange & D-Hole | 850, 1300, 850/1300, 1310, 1550 nm |
| 2 & 4 | MM & SM | Cable Plug | 850, 1300, 850/1300, 1310, 1550 nm |

**Note:** Contact your Tyco Electronics Sales Representative for part number detail and available styles.

### Cable Adapter Kits

(Use with PRO BEAM Sr. Connector and Cable Assemblies)

**PRO BEAM Sr. Connector Plug Cable Adapter Kits**

| Cable Dia. (Max.) | Part No. |
|---|---|
| 5.65 .222 | 1515801-1 |
| 5.10 2.01 | 1515940-1 |

**PRO BEAM Sr. Connector Bulkhead Cable Adapter Kits**

| Cable Dia. (Max.) | Style | Part No. |
|---|---|---|
| 5.65 .222 | Standard Cable Adapter | 1515724-2 |
| 5.10 .197 | Standard Cable Adapter | 1515847-1 |

**Bulkhead Connector Panel Thicknesses**

- **PRO BEAM Sr. D-Hole: 6.5 mm max.**
- **PRO BEAM Sr. Square Flange: 8.5 mm max.**

## Ruggedized Fiber Optic Products (Continued)

### PRO BEAM Jr. Connectors

#### Performance Specifications

#### Optical, Multimode

**Insertion Loss, Typical —** 0.5 - 1.0 dB @ 1300 nm

#### Optical, Singlemode Version

**Insertion Loss, Typical** — 0.5 - 1.0 dB @ 1310 nm

**Return Loss** — > 34 dB @ 1310 nm or 1550 nm

#### Mechanical

**Vibration, Sinusoidal** — 10 - 500 Hz, 3 directions; 0.75 mm amplitude @ 10g acceleration

**Bump** — 4,000 Bumps, 3 directions @ 40g acceleration

**Free Fall** — 500 falls on concrete; Severity 1.2 m

**Coupling Endurance** — 3,000 couplings

**Weight** — Plug — 123 grams, typical D-Hole bulkhead — 102 grams, typical

#### Temperature

**Operational Temperature** — -40°C/+85°C

**Storage Temperature** — -55°C/+85°C

**Temperature, Cyclic** — -55°C/+85°C

**Damp Heat, Cyclic** — +55°C

#### Corrosion

**Salt** — Conforms

**Acid** — Conforms

#### Immersion

**Water** — 5 m depth (plug) - 2 m (Bulkhead)

**Mud** — Conforms

#### Pressure

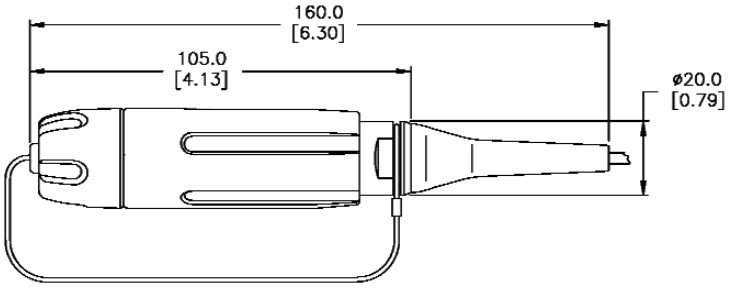
**Low Pressure** — 25 kPa @ -55°C

### Material and Plating Options

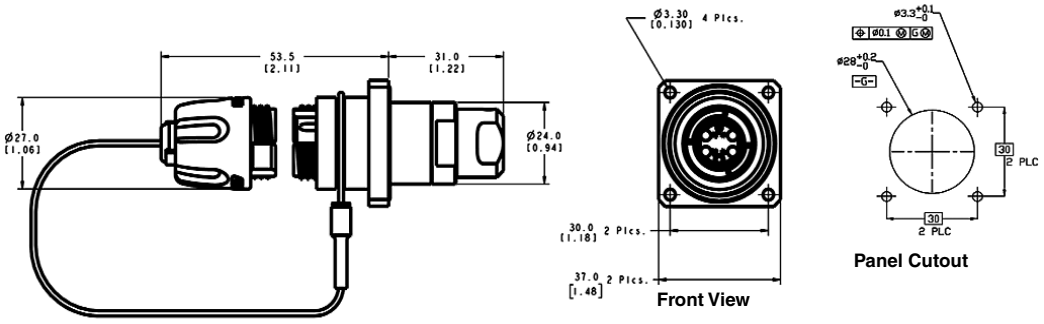
- **Shell Alloy:**
  - Aluminum
  - Nickel Aluminum Bronze (High Saline Environment)
- **Plating:** **(for aluminum shells only)**
  - Clear Hard Anodized
  - Green Chromate Conversion Zinc (Jr. Bulkheads only)

### Bulkhead Connector Panel Thicknesses

- **PRO BEAM Jr. D-Hole: 4 mm max.**
- **PRO BEAM Jr. Square Flange: 6 mm max.**



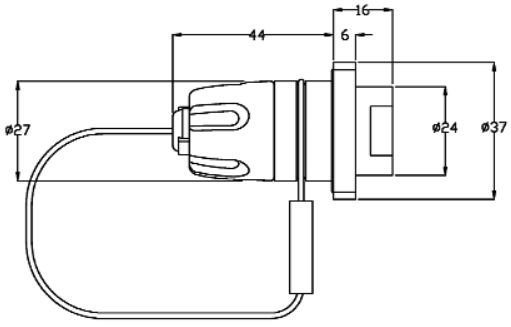

**Cable Connector, Plug**



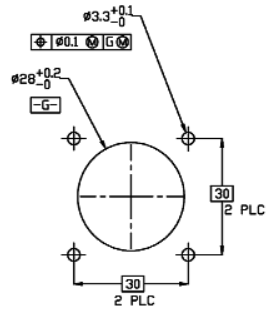

**Front View**

**Panel Cutout**

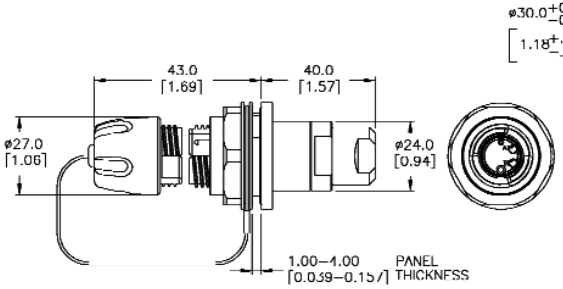
**Square Flange Mount Bulkhead, Standard Cable Adapter**

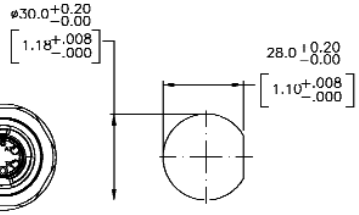



**Square Flange Mount Bulkhead, Low Profile PRO BEAM Jr..**



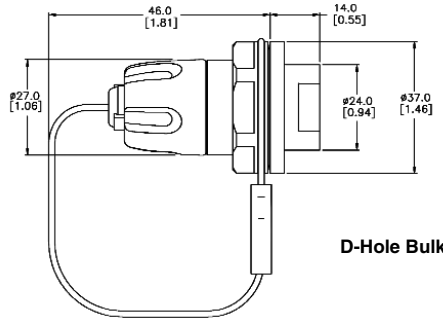

**Recommended Square Flange Panel Cutout**

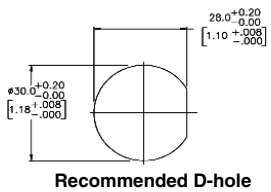



**Recommended D-hole Panel Cutout**

**D-Hole Bulkhead, Standard Cable Adapter**



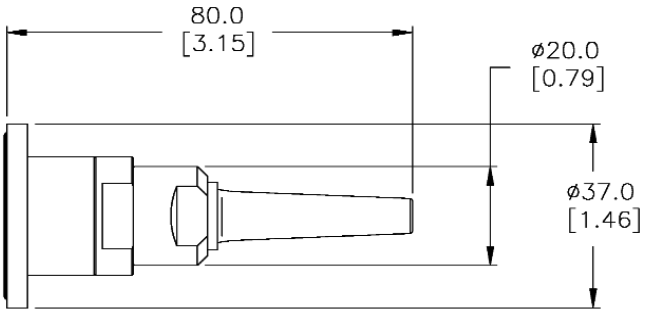




**Recommended D-hole Panel Cutout**

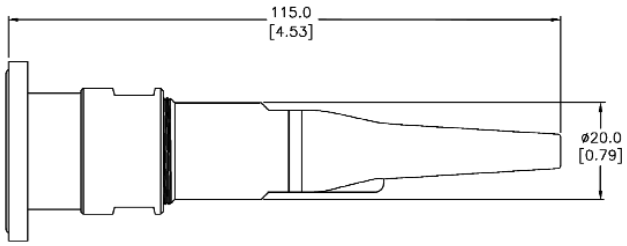
**D-Hole Bulkhead, Low Profile PRO BEAM Jr.**

## Ruggedized Fiber Optic Products (Continued)

**PRO BEAM Jr. Connectors** (Continued)




**Standard Cable Adapter, with Boot**

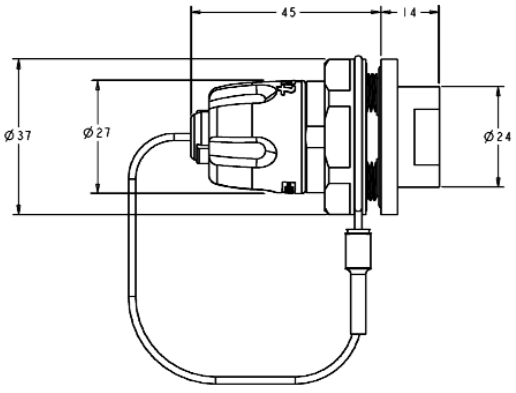


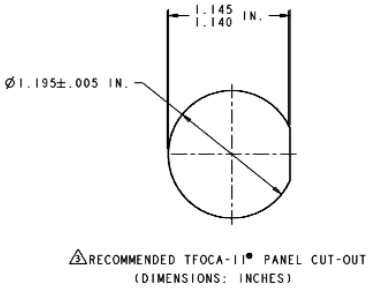

**Environmentally Sealed Cable Adapter, with Boot**

NEW

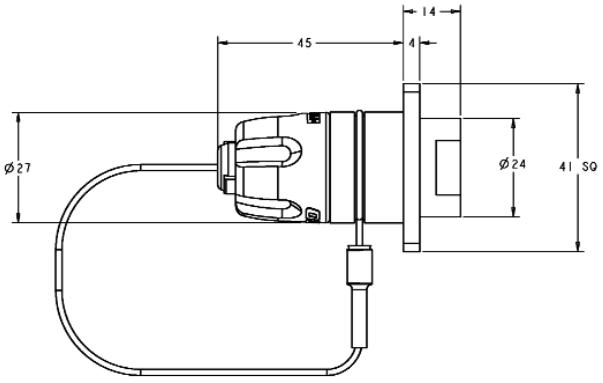
**"NEW" PRO BEAM Jr. replacement for TFOCA-II® Panel Mount Connector Applications**
(see page 39 for part numbers)

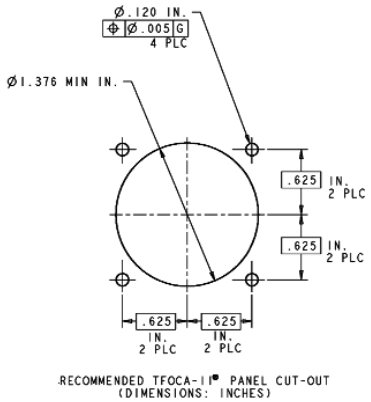
### Panel Cutout Dimensions




**PB Jr. TFOCA-II Replacement - D-Hole Low Profile Buffered Fiber Bulkhead**

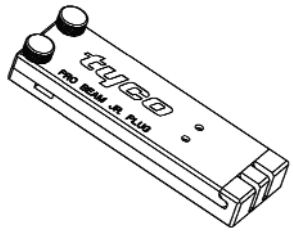



**PB Jr. TFOCA-II Replacement - Square-Flange Low-Profile Buffered Fiber Bulkhead**

## Ruggedized Fiber Optic Products (Continued)

### Spare Parts




#### Curing Fixtures

| Connector | Part Number |
|---|---|
| PB Jr. Cable Plug (having cable with Kevlar® Strength Members) | 1693797-1 |
| PB Jr. Sealed D-Hole Bulkhead | |
| PB Jr. Standard D-Hole and Square Flange Bulkhead | 1693800-1 |
| PB Jr. Low Profile Buffered Fiber Bulkhead | 1754122-1 |

Instruction Sheet 408-8857. Available at www.tycoelectronics.com

#### Cable Crimp Components

| Description | Part Number |
|---|---|
| Crimp Sleeve (use with all Jr. Crimp Support sizes) | 1515269-2 |
| 2.2 mm Crimp Support | 1515567-1 |
| 3.1 mm Crimp Support | 1515568-1 |
| 3.6 mm Crimp Support | 1515569-1 |
| 3.8 mm Crimp Support | 1515570-1 |
| 4.1 mm Crimp Support | 2-1515270-0 |
| 4.6 mm Crimp Support | 1516142-1 |
| 5.1 mm Crimp Support | 1515571-1 |
| 5.65 mm Crimp Support | 1515572-1 |
| 6.1 mm Crimp Support | 1515573-1 |
| 6.5 mm Crimp Support | 1515574-1 |
| 6.7 mm Crimp Support | 1515575-1 |
| Square Crimp Support for (4) 3 mm Cables | 1515632-1 |

#### Ferrule Kits

| Fiber Hole Size | Sealed | Mode | PRO BEAM | Part Number |
|---|---|---|---|---|
| 125 µm | Yes | SM | Jr. | 1588908-2 |
| 125 µm | No | SM | Sr. | 1515941-1 |
| 126 µm | Yes | MM | Jr. | 1588700-1 |
| 126 µm | Yes | SM | Jr. | 1588908-1 |
| 126 µm | No | MM | Sr. | 1588801-1 |
| 126 µm | No | SM | Sr. | 1515941-2 |

#### Protective Caps

| Description | Connectors | Part Number |
|---|---|---|
| Standard cap, for D-Hole Bulkhead | PRO BEAM Jr. | 1515868-1 |
| Standard cap, for Flange-mount Bulkhead | PRO BEAM Jr. | 1515787-2 |
| Standard cap, for connector plug | PRO BEAM Jr. | 1515867-1 |
| Standard cap, for D-Hole Bulkhead | PRO BEAM Sr. | 1515726-2 |
| Standard cap, for connector plug | PRO BEAM Sr. | 1515799-1 |
| Standard cap, for Flange-mount Bulkhead | PRO BEAM Sr. | 1515769-1 |

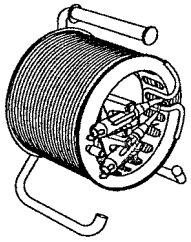
## Ruggedized Fiber Optic Products (Continued)

### Cable Assemblies and Accessories

### Product Facts

- Ruggedized cable assemblies custom tailored for field use in harsh environments
- Heavy-duty light-weight cable reel organizes and protects connectors and cable for easy pay-out and safe storage
- Reels available in 500 meter and 2000 meter versions
- Options for 500 meter reels include special backpack harnesses, a separate reel stand, or a combination reel and reel stand

### Typical Reels and Reel Stands for Field-Deployable Cable Assemblies



Part Number 1515900-1

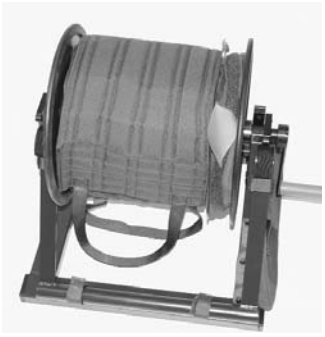
Tactical Reel/Drum Options

### Cable Reels

| Reel Capacity (2-fiber) | Notes/Description | Part Number |
|---|---|---|
| 500 meters | Reel & Reel Stand Combination<br>Reel can be detached from stand without tools | 1515900-1 |
| | | 1754515-1 |
| | | 1754515-2 |
| | | 1754515-3 |
| | | 1754515-4 |

**Tyco Electronics has extensive Rugged Optic Harness capabilities. Please consult your local Tyco Electronics' Sales Representative for assistance.**

Backpack with Reel



Reel with Stand
"Static Frame"
Part Number 1515758-1

Backpack Harness
Part Number 1515759-1

### Accessories

| Description | Reel Diameter | Part Number |
|---|---|---|
| Backpack | 370mm Dia. Reel | 1754516-1 |
| Backpack | 460mm Dia. Reel | 1754516-2 |
| Backpack | 510mm Dia. Reel | 1754516-3 |
| Static Frame | 500mm Dia. Max | 1754517-1 |
| Static Frame | 700mm Dia. Max | 1754517-2 |

**Note:** For lower cost alternative options. Please contact your local Tyco Electronics' Sales Representative or Tyco Electronics Product Information Center at 1-800-522-6752.

## Ruggedized Fiber Optic Products (Continued)

### BRUmil™ Tactical Field Deployable Fiber Optic Cable for Extreme Environments (Metallic for Rodent Resistance)

- NATO approved TL 6020-003

**BRUmil™ 1 Fiber Singlemode and Multimode**

| Technical Data: | |
|---|---|
| Attenuation | ≤ 0.4 dB/km @ 1310nm / ≤ 0.25 dB/km @ 1550nm |
| Diameter | 3.4mm |
| Weight | 18 kg/km |
| Minimum Bending Radius | 30mm |
| Breaking Load | 2000N |
| Crush Resistance | 2500N/cm |
| Operating Temperature | -55° C to +85° C (Short -65° C to +160° C) |

**BRUmil™ 2 and 4 Fiber Singlemode and Multimode**

| Technical Data: | |
|---|---|
| Attenuation | ≤ 0.4 dB/km @ 1310nm / ≤ 0.25 dB/km @ 1550nm |
| Diameter | 3.8mm |
| Weight | 21 kg/km |
| Minimum Bending Radius | 35mm |
| Breaking Load | 3000N |
| Crush Resistance | 2 fiber = 1400N/cm  4 fiber = 1200N/cm |
| Operating Temperature | -55° C to +85° C (Short -65° C to +160° C) |

**Dielectric Fitting for BRUmil 1-4F**

Army approved. Use to properly attach BRUmil Cable tension points.
Adjustable, with easy, one-handed usage. Securely grips cable without damage.

### Non-Metallic Tactical Field Deployable Fiber Optic Cable

#### Product Facts

- All terrain field deployable cable, up to 4 fibers, singlemode or multimode
- Developed for deployment under the most demanding conditions
- Tight buffered fibers are protected by Aramid yarns and a tough ruggedized polyurethane sheath
- Tested in accordance with DEF STAN 60-1 (PART 0)
- Flexible, water resistant, high crush resistant, lightweight, and nuclear proof

**Other fibers (i.e. Polyimide, Silicon buffer, Carbon coated, radiation hardened, etc.) are available upon request.**

**Contact Tyco Electronics or your local Tyco Electronics Sales Representative for part numbers, pricing, and availability.**

**Mil-Standard Distribution Cable - 1 Fiber Singlemode and Multimode**

| Technical Data: | |
|---|---|
| Attenuation | ≤ 0.5 dB/km @ 1310nm / ≤ 0.5 dB/km @ 1550nm |
| Diameter | 43.0mm - 4.0mm |
| Weight | 15 kg/km |
| Minimum Bending Radius | 32mm |
| Crush Resistance | 440N/cm |
| Operating Temperature | -55° C to +85° C |

**Mil-Standard Distribution Cable - 2 Fiber Singlemode**

| Technical Data: | |
|---|---|
| Attenuation | ≤ 0.5 dB/km @ 1310nm / ≤ 0.5 dB/km @ 1550nm |
| Diameter | 5.0mm |
| Weight | 31 kg/km |
| Minimum Bending Radius | 40mm |
| Crush Resistance | 440N/cm |
| Operating Temperature | -55° C to +85° C |

**Mil-Standard Distribution Cable - 4 Fiber Singlemode**

| Technical Data: | |
|---|---|
| Attenuation | ≤ 0.5 dB/km @ 1310nm / ≤ 0.5 dB/km @ 1550nm |
| Diameter | 5.5mm |
| Weight | 42 kg/km |
| Minimum Bending Radius | 44mm |
| Crush Resistance | 440N/cm |
| Operating Temperature | -55° C to +85° C |

**Mil-Standard Distribution Cable - 2 Fiber Multimode**

| | |
|---|---|
| Fiber Type | 50µm/125µm and 62.5/125 |
| Attenuation | ≤ 3.0 dB/km @ 850nm / ≤ 1.0 dB/km @ 1300 |

**Mil-Standard Distribution Cable - 4 Fiber Multimode**

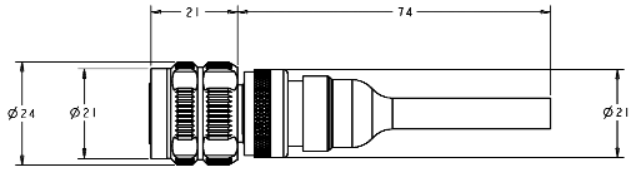
| | |
|---|---|
| Fiber Type | 50µm/125µm |
| Attenuation | ≤ 3.0 dB/km @ 850nm / ≤ 1.0 dB/km @ 1300 |

## Ruggedized Fiber Optic Products (Continued)

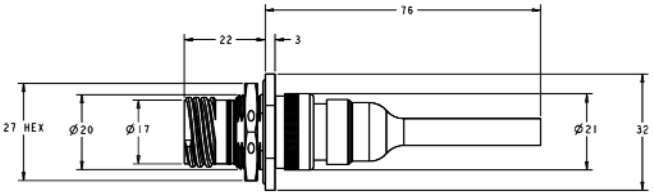
### "Mini" Expanded Beam for Harsh Environments

### Product Facts

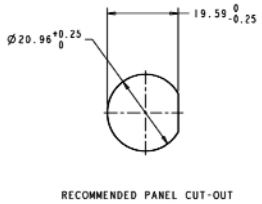
- Available in shell size 11, housed on D38999 Series III style shells for harness applications
- Multiple options available for backshells. Consult your local Tyco Electronics' Sales Representative




Plug Shell Kit
1754518-X



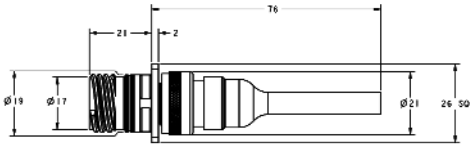

Jam Nut Receptacle Shell Kit
1754519-X

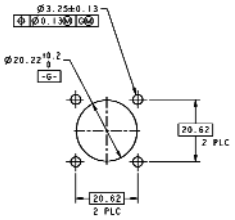



Receptacle Panel Cut-Out
(shell size 11)
per MIL-DTL-38999K, figure 11

### Panel Cut-Out Dimensions

| Shell Size | A Dia. Min. Back Panel | R1 |
|---|---|---|
| 10-11 | **20.22** .796 | **20.62** .812 |



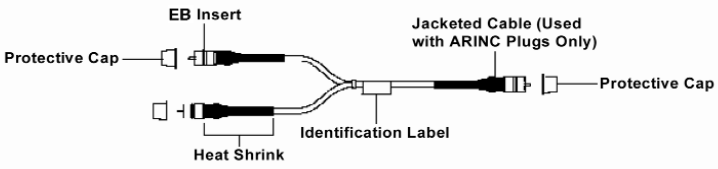

Square Flange Receptacle Shell Kit
1754520-X

### Standard material and plating:
Shell Alloy = Aluminum
Plating = Nickel

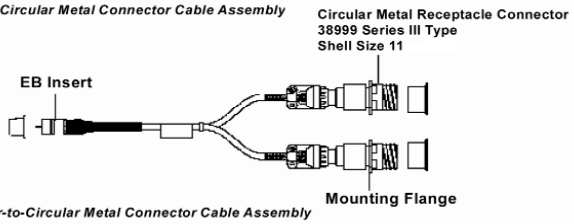
### For part number details and plating options, contact your local Tyco Electronics' Sales Representative.

## Typical Assemblies for In-Flight Network Applications

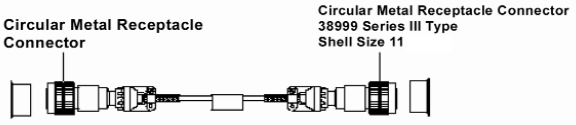
*ARINC EB Connector-to-ARINC EB Connector Cable Assembly*



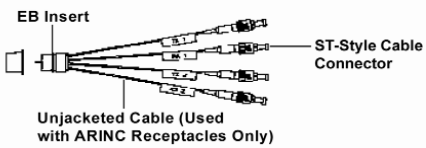

*ARINC EB Connector-to-Circular Metal Connector Cable Assembly*




*Circular Metal Connector-to-Circular Metal Connector Cable Assembly*




*ARINC EB Connector-to-ST-Style Cable Assembly*

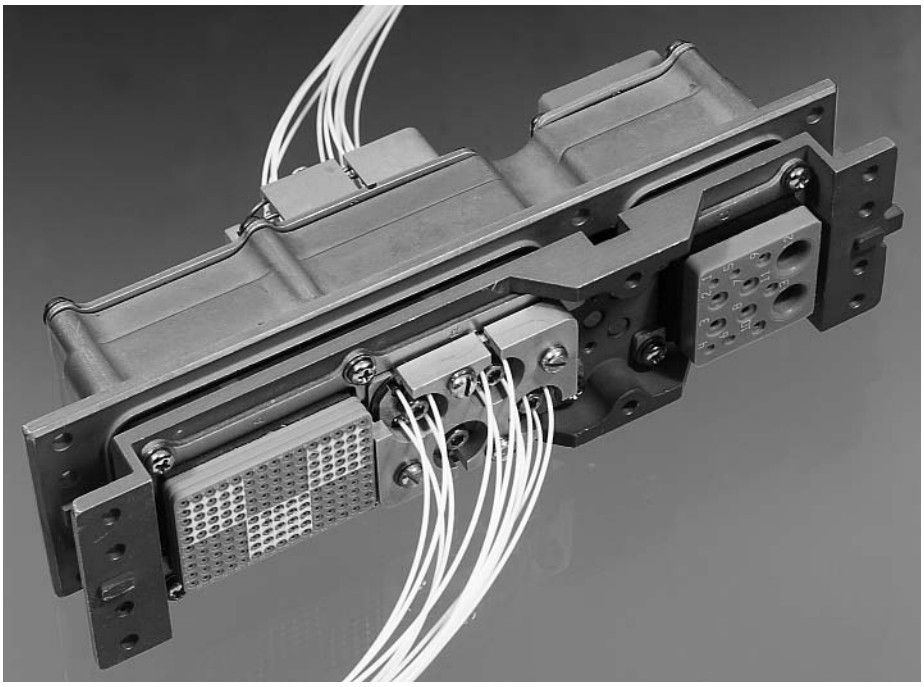


## Ruggedized Fiber Optic Products (Continued)

### ARINC 600 AND 404

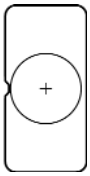
#### Product Facts

- For use in 100 base-FX Ethernet LAN applications per ARINC 664 and ARINC 763
- For Mini-Expanded Beam inserts
- Insert holders designed to ARINC 600, Supplement 13 or to specific customer needs
- Drop-In Insert Holders utilize Standard ARINC 404 and 600 Retainers
  - Hard Stop on Plug Side
  - Spring-Loaded Stop on Receptacle Side
  - Captive Hardware
- Facial Sealing — Optional
  - Bonded to Receptacle Block Mating Face
  - Raised Collar Seal around Optics Insert compresses against Chamfer on Plug Block Mating Face

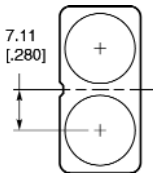


### ARINC 600 Insert Holders for Mini-Expanded Beam Contacts

**Size 1**
**Power Cavities**

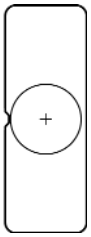


ARINC 600, 1 Position
1MP

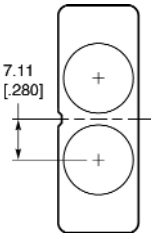



ARINC 600, 2 Position
2MP

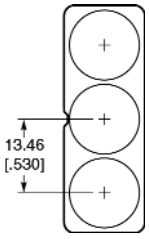
**Size 1**
**Signal Cavities**



ARINC 600, 1 Position
1MS

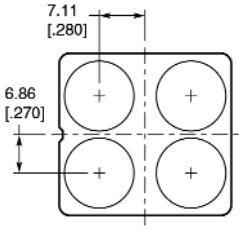



ARINC 600, 2 Position
2MS

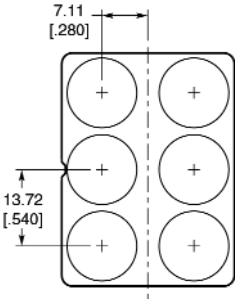



ARINC 600, 3 Position
3MS

**Size 2 / 3**
**Power and Signal Cavities**



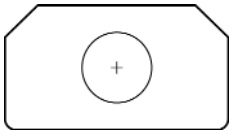

ARINC 600, 4 Position
4MP



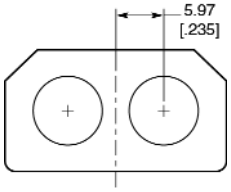

ARINC 600, 6 Position
6MS

## Ruggedized Fiber Optic Products (Continued)

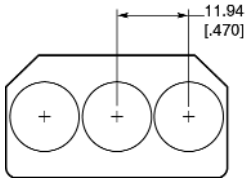
### ARINC 404 Insert Holders for Mini-Expanded Beam Contacts



ARINC 404, 1 Position
M1

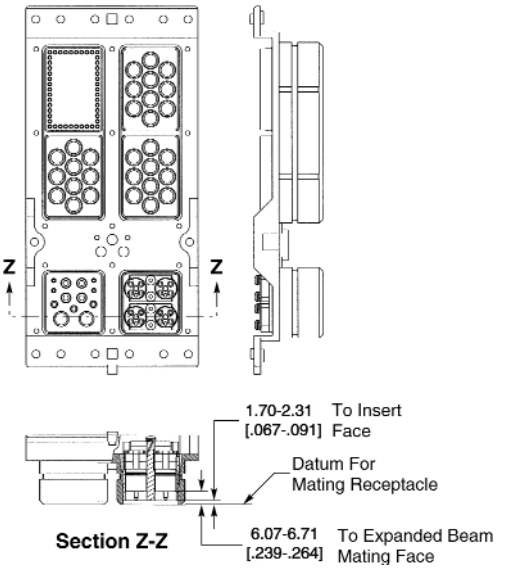



ARINC 404, 2 Position
M2

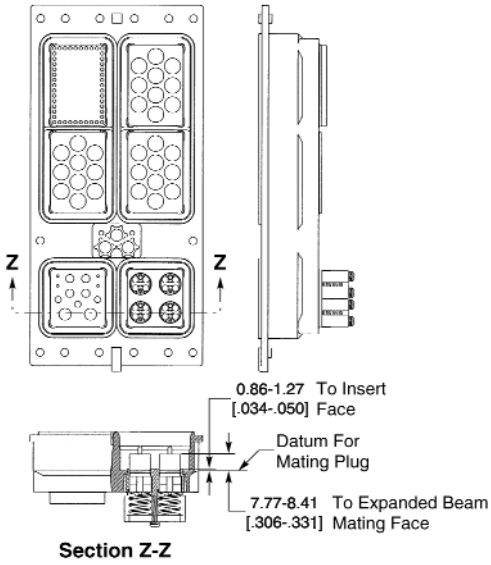



ARINC 404, 3 Position
M3

### ARINC 600 Insert Holders for Mini-Expanded Beam Contacts




Typical Layout for Plug




Typical Layout for Receptacle

### Comparative on Expanded Beam Inserts' weight when applied to an ARINC housing

- ARINC 600 connector mated pair size 2 = 440 grams (without copper contacts)
- ARINC style Mini and Junior size Expanded Beam inserts = 5 pounds insertion force each when applied to the Rack and Panel ARINC Connector inserts
- Signal Cavity Optical Holder insert (i.e.: holds up to six mini inserts with four fiber ball lenses each or up to 24 fibers each insert set) = @ 30 grams
- Power Cavity Optical Holder insert (i.e.: holds up to four mini inserts with four fiber ball lenses each or up to 16 fibers each insert set) = @ 20 grams
- Insert mated pair PRO BEAM Jr. insert set = @ 41.79 grams
- Insert mated pair PRO BEAM mini insert set = @ 16.17 grams
- Fiber = single fiber ≤ 4 kg / km
- Fiber = four fiber jacketed with a support member ≤ 24 kg / km
- Static spring force per mated Expanded Beam insert pair = 5 lbs.

**Ruggedized Fiber Optic Products** (Continued)

# RUGGED MEDIA CONVERTER SOLUTIONS

NEW

**Harsh Environment Optical Media Converter Assemblies allowing blind mate field applications over one, two, or four fibers.**

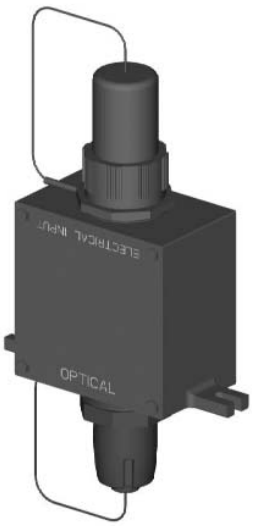
Tyco Electronics' offers solutions for Harsh Environment applications of Ethernet Media Converters.

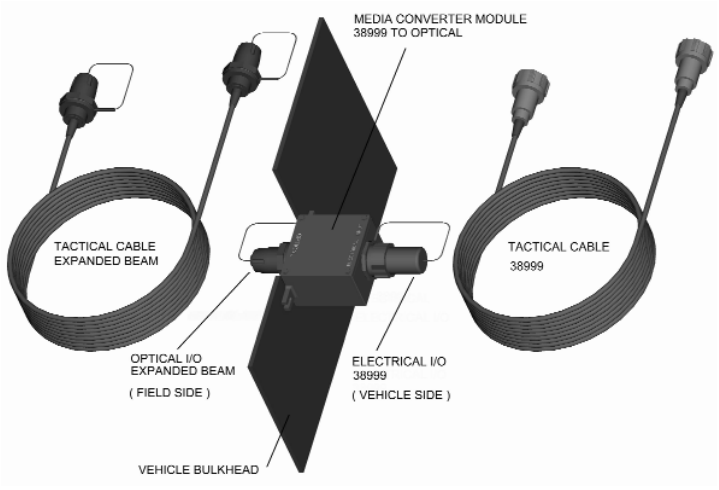
Shown on this page is one proposed solution for a complete electrical to optical extension for Ethernet to Optical links.

The proposed solution(s) support data rates from 10 to 100 Mb/s in full or half duplex modes.

For additional Advanced Optical Modules, see Fiber Management & Packaged Solutions, Section 3, pages 117-119.

Contact your local Tyco Electronics' Sales Representative with your specific design needs.






**Design Objectives**

| Specifications | Results |
|---|---|
| Standard | IEEE802.3, IEEE802.3u Ethernet @ 10/100 Mb/s |
| Data Rates | 10 and 100 Mb/s auto negotiation (option to force 10 Mb/s for legacy systems |
| Duplex Mode | Full or half-duplex auto-negotiation and N-Way support |
| Max. Forward Rate | 14,880 packets per second (pps) @ 10 Mb/s, 148,800 pps @ 100 Mb/s |
| Fiber Connector | Multimode |
| Fiber Working Range | TBD |
| Optical Budget | TBD |
| Optical Wavelength | Multimode |
| Emissions | Complies with FCC Class A and CE Class A |
| Safety | UL, CE |
| Temperature Range | -40° - 85°C with humidity 10% to 90% non-condensing |
| Dimensions | Ø 2.0" (51mm) X 7.7" (195mm) from cap to cap<br>Ø 2.0" (51mm) X 6.6" (168mm) X 7.6" (194mm) for 90 assembly |
| Power Consumption | TBD |
| Power | 5VDC |
| Qualification | Complies with MIL-STD-810D environmental requirements |