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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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LC SECURE Connectors

(See Connectors, Adapters, Tooling & Accessories Section 1, pages 8-10)

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MT-RJ SECURE Connectors

(See Connectors, Adapters, Tooling & Accessories Section 1, pages 8, 13)

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MPO Cable Assemblies

(See Cable Assemblies & Backplane Interconnects Section 2, pages 125-133)

MPO SECURE Connectors

(See Connectors, Adapters, Tooling & Accessories Section 1, pages 8, 11, 12)

LIGHTPLANE Connector System

(See Cable Assemblies & Backplane Interconnects Section 2, pages 136, 137)

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(See Cable Assemblies & Backplane Interconnects Section 2, pages 138-152)

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Expanded SECURE Connector Product Line Includes MPO and LC Interfaces

**Ten variants in ten colors
offered in two new
interfaces**



Tyco Electronics has expanded its SECURE connector product offering to include both MPO and LC interfaces. Through the use of ten different color/key variations, customers operating multiple networks in common areas can physically segregate their network throughout the system, from the backbone to the equipment panel.

Primary colors and keys are available in red, blue, yellow and green, with additional, secondary options for up to ten different color/keying configurations. Only connectors and adapters of the same color will intermate, and no standard product can plug into a secure adapter.

The LC SECURE product is compatible with both jack-

eted and buffered fiber. It is available in both LIGHTCRIMP PLUS and standard epoxy/polish styles for singlemode and multimode fibers. Each connector features a color-coded key that will only mate with like-colored adapters to minimize connection to the wrong networks. Standard colors include red, blue, green and yellow. An additional six colors are available as needed.

The MPO SECURE products are available in the same colors and are compatible with color-coded MPO SECURE cassettes. Standard MPO SECURE trunk cables are available in fiber counts to 72 fibers. MPO SECURE cassettes are available as twelve or

twenty-four fiber assemblies. Cables and cassettes are available with 50 μ m, Laser Optimized (10 Gig) and 62.5 μ m multimode fiber.

The success of the MT-RJ SECURE product line has fostered growing interest in the SECURE product concept. The addition of the LC and MPO interfaces to the AMP NETCONNECT SECURE product portfolio will allow a wider adoption of the concept and allow more customers to take advantage of the benefits the system offers.

A complete line of connectivity, cable assemblies, and cables are available for MT-RJ SECURE, LC SECURE and MPO SECURE. See pages 9-13 for details.



LC SECURE Product Offering

LIGHTCRIMP PLUS and Epoxy Style LC Product Facts

- **LIGHTCRIMP PLUS—**
No Epoxy/No Polish
- Strip, Cleave and Crimp
- LC small form factor design is half the size of SC
- 10 exclusive connector variants
- Color coded plugs & adapters match MT-RJ & MPO SECURE offerings
- **LIGHTCRIMP PLUS—**
Termination to 250 or 900 µm tight-buffered fiber, 1.6–2.0 mm jacketed fiber using standard tooling
- **Epoxy Style—**Termination to 250 or 900 µm tight-buffered fiber 1.6 – 2.0 mm jacketed fiber
- **Epoxy Style—**Suitable for use with heat-cured or anaerobic (quick cure) adhesives (See instruction sheet for recommended anaerobic adhesives)
- **Product qualification to TIA/EIA 568-B.3**
- **Field installable duplex clip (black) for polarity correction if needed**
- **Plug nose features can provide up to 70 mutually exclusive keying combinations**
- **Distinct keyway geometry on plug nose & color coding assures identifiable key-type**
- **Extended lugs on plug side-walls prevent SECURE connectors from mating with non-secure adapters**
- **Molded internal geometry produces tamper resistant system**
- **Key placement allows SECURE plugs to interface with standard 1.25 mm test equipment, inspection microscopes and application tooling**
- **Termination kits — same as standard product**



LIGHTCRIMP PLUS LC SECURE Kits

Color	Simplex 50/125 MM SECURE	Simplex 50/125 Laser Optimized (10 Gig) MM SECURE	Simplex 62.5/125 MM SECURE	Simplex SM SECURE	Notes
Red	1828853-1	1828854-1	1828855-1	1828856-1	Primary
Yellow	1828853-2	1828854-2	1828855-2	1828856-2	Primary
Green	1828853-3	1828854-3	1828855-3	1828856-3	Primary
Blue	1828853-4	1828854-4	1828855-4	1828856-4	Primary
Rose	1828853-5	1828854-5	1828855-5	1828856-5	
Aqua	1828853-6	1828854-6	1828855-6	1828856-6	
Brown	1828853-7	1828854-7	1828855-7	1828856-7	
Violet	1828853-8	1828854-8	1828855-8	1828856-8	
Orange	1828853-9	1828854-9	1828855-9	1828856-9	
Slate	1-1828853-0	1-1828854-0	1-1828855-0	1-1828856-0	

Highlighted Part Numbers are routinely stocked for shortest lead times.

Epoxy Style LC Kits

Color	Simplex Jumper Multimode	Simplex Buffer Multimode	Simplex Jumper Singlemode	Simplex Buffer Singlemode	Notes
Red	1828078-1	1828861-1	1828079-1	1828862-1	Primary
Yellow	1828078-2	1828861-2	1828079-2	1828862-2	Primary
Green	1828078-3	1828861-3	1828079-3	1828862-3	Primary
Blue	1828078-4	1828861-4	1828079-4	1828862-4	Primary
Rose	1828078-5	1828861-5	1828079-5	1828862-5	
Aqua	1828078-6	1828861-6	1828079-6	1828862-6	
Brown	1828078-7	1828861-7	1828079-7	1828862-7	
Violet	1828078-8	1828861-8	1828079-8	1828862-8	
Orange	1828078-9	1828861-9	1828079-9	1828862-9	
Slate	1-1828078-0	1-1828861-0	1-1828079-0	1-1828862-0	

Highlighted Part Numbers are routinely stocked for shortest lead times.

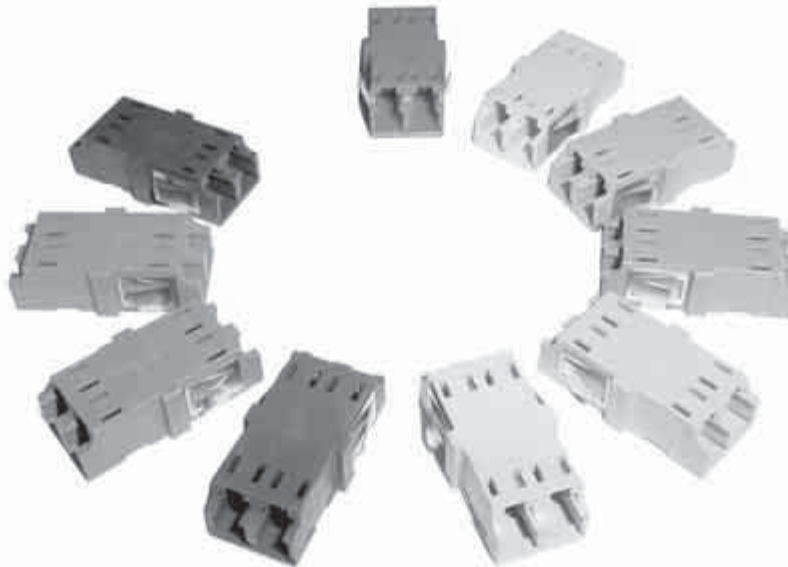
**Duplex Clip:
Part Number 1754371-1**

Note: All part numbers are RoHS compliant.

LC SECURE Product Offering (Continued)

LC Duplex Adapters Product Facts

- Flange mount, flangeless, and SL Series for use with AMP NETCONNECT SL panels
- High quality ceramic sleeves
- Suitable for singlemode and multimode
- Key and color compatible to Epoxy Style and LIGHTCRIMP PLUS Product



LC Duplex Adapters

Color	SECURE Adapter Flanged	SECURE Adapter Flangeless	SECURE Adapter SL	Notes
Red	1828073-1	1828074-1	1828075-1	Primary
Yellow	1828073-2	1828074-2	1828075-2	Primary
Green	1828073-3	1828074-3	1828075-3	Primary
Blue	1828073-4	1828074-4	1828075-4	Primary
Rose	1828073-5	1828074-5	1828075-5	
Aqua	1828073-6	1828074-6	1828075-6	
Brown	1828073-7	1828074-7	1828075-7	
Violet	1828073-8	1828074-8	1828075-8	
Orange	1828073-9	1828074-9	1828075-9	
Slate	1-1828073-0	1-1828074-0	1-1828075-0	

Highlighted Part Numbers are routinely stocked for shortest lead times.

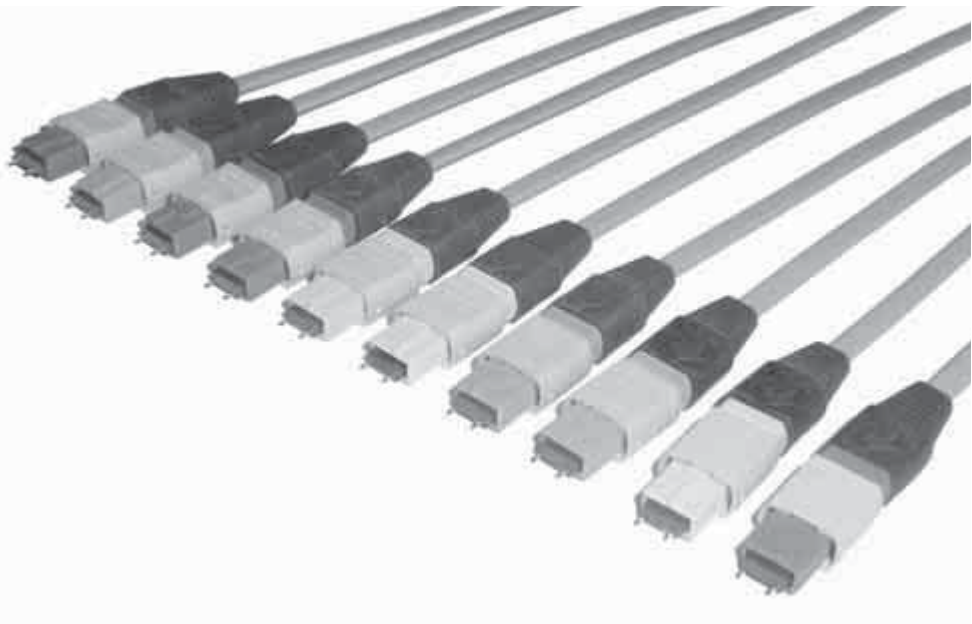
Note: All part numbers are RoHS compliant.

MPO SECURE Fiber Optic Products

MPO SECURE Trunk Cable Assemblies

Product Facts

- Feature color-coded, keyed designs to limit improper connections in segregated or SECURE networks
 - MPO SECURE plug only mates with same color MPO SECURE port
- Trunk cable fiber polarity is pair-flipped (AB/BA)
 - Trunk cables with straight-through polarity (AB/BA) are available
- Pulling socks protect MPO terminations during installation
- Twelve (12) fibers per MPO SECURE plug
- Additional counts and lengths are available
- Trunk cables come pre-tested and ready for immediate use
- MPO SECURE trunk cables are plenum cables
 - Plenum cables can be used in riser spaces
- For use with MPO SECURE Cassettes listed on page 12



Description	Fiber Type	SECURE Color/Keying	Part Number
12-Fiber	50/125 μm Multimode	Red	6754273-X
		Yellow	6754276-X
		Green	6754274-X
		Blue	6754275-X
	Laser Optimized (10 Gig) (850 nm LO 50/125 μm) Multimode	Red	6754420-X
		Yellow	6754421-X
		Green	6754422-X
		Blue	6754423-X
	62.5/125 μm Multimode	Red	6754269-X
		Yellow	6754272-X
		Green	6754270-X
	24-Fiber	50/125 μm Multimode	Blue
Red			6754281-X
Yellow			6754284-X
Laser Optimized (10 Gig) (850 nm LO 50/125 μm) Multimode		Green	6754282-X
		Blue	6754283-X
		Red	6754424-X
62.5/125 μm Multimode		Yellow	6754425-X
		Green	6754426-X
		Blue	6754427-X
62.5/125 μm Multimode		Red	6754277-X
		Yellow	6754280-X
		Green	6754278-X
		Blue	6754279-X

X denotes length in feet: -1 = 10, -2 = 20, -3 = 30, -4 = 40, -5 = 50, -6 = 60, -7 = 70, -8 = 80, -9 = 90, 1- -0 = 100, 1- -1 = 110, 1- -2 = 120, 1- -3 = 130, 1- -4 = 140, 1- -5 = 150, 1- -6 = 160, 1- -7 = 170, 1- -8 = 180, 1- -9 = 190, 2- -0 = 200, 2- -1 = 210, 2- -2 = 220, 2- -3 = 230, 2- -4 = 240, 2- -5 = 250, 2- -6 = 260, 2- -7 = 270, 2- -8 = 280, 2- -9 = 290, 3- -0 = 300

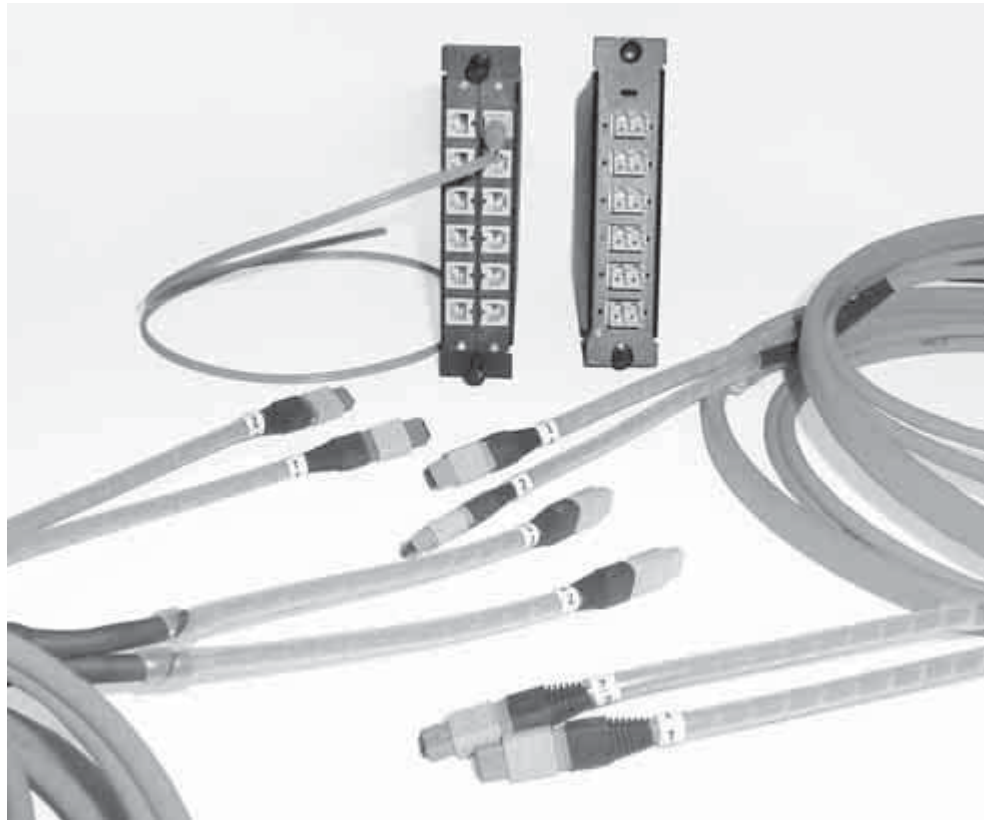
Note: All part numbers are RoHS compliant.

MPO SECURE Fiber Optic Products (Continued)

MPO SECURE Optical Fiber Cassettes

Product Facts

- **Cassette fiber polarity is pair-flipped (AB/BA)**
 - **Cassettes with straight-through polarity (AB/AB) are available**
- **Cassettes have one MPO connection (12-Fiber) or two MPO connections (24-Fiber) on the back of each cassette**
- **Cassettes house MPO one or two 12-fiber break-out assemblies**
- **Cassettes have same footprint as Snap-in Adapter Plates**
 - **Mount in all AMP NETCONNECT enclosures that accept Snap-in Adapter Plates**
- **Cassettes come pre-tested and ready for immediate use**
- **MPO SECURE cassettes accept one or two MPO SECURE connectors and transition to the same color MT-RJ SECURE connectors**
- **MPO SECURE plug only mates with same color MPO SECURE port**
- **For use only with MPO SECURE Trunk Cable Assemblies on this page**



Description	Fiber Count	Duplex Port Count	Part Number	
			MT-RJ	LC
50/125 μm Multimode	12	6	6754286-X	1918779-X
	24	12	6754288-X	1918780-X
62.5/125 μm Multimode	12	6	6754285-X	1918781-X
	24	12	6754287-X	1918782-X
Laser Optimized (10 Gig)	12	6	1918777-X	1918783-X
	24	12	1918778-X	1918784-X

X denotes color: -1 = Standard; -2 = Red; -3 = Green; -4 = Blue; -5 = Yellow; -6 = Orange; -7 = Brown; -8 = Violet; -9 = Rose; 1- -0 = Slate; 1- -1 = Aqua.

Note: All part numbers are RoHS compliant.

**MT-RJ SECURE Product Expansion —
Now 10 Variants of the MT-RJ SECURE Products**



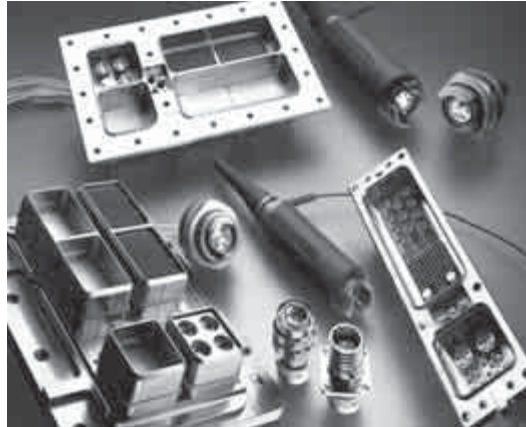
In response to several customers, the MT-RJ SECURE product line has been expanded with an additional six color/key versions. In addition to the original four colors (blue, green, red and yellow), the six new colors (brown, rose, aqua, violet, slate and orange) now make for ten variations. In keeping with the MT-RJ SECURE products features, only plugs and jacks of the same color will mate, and none of the MT-RJ SECURE products will mate with the standard versions. A complete line of jacks, cable assemblies and colored cables are available. For more information see pages 73, 74 and 121.



Rugged Fiber Optic Products

Product Facts

- Expanded Beam
 - PRO BEAM Sr.Connectors
 - PRO BEAM Jr.Connectors
 - PRO BEAM Mini Connectors
 - Mini 38999
 - Mini ARINC
 - Mini GPRC
- LuxCis Optical Termini
 - One common terminus for GPRC, 38999, ARINC, Quadrax Cavity Reducers
- Sealed Circular LC ODVA Conforming Connector



Expanded Beam Products



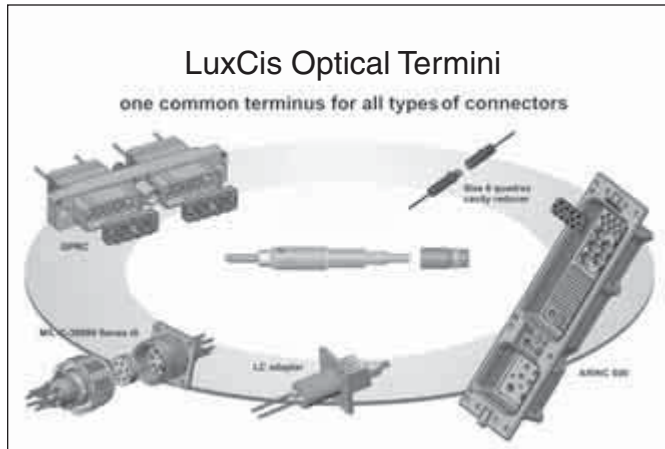
PRO BEAM Sr., Jr. & Mini Connectors

Tyco Electronics is proud to offer a full rugged fiberoptic product family.

With Tyco Electronics' Expanded Beam, LuxCis Optical Termini, and the

Sealed Circular LC ODVA Conforming Connector, the end user is guaranteed a complete choice that meets their cost and optical performance needs in multiple industries.

For specific information, please contact your local Tyco Electronics Sales Representative.



LuxCis Optical Termini

LuxCis is a trademark of Radiall, S.A. Product is manufactured under license from Radiall, S.A.

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



Sealed Circular LC ODVA Conforming Connector

Rugged Fiber Optic Products (Continued)

Expanded Beam Products

Product Facts

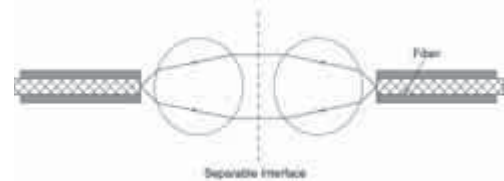
- PRO BEAM Sr., PRO BEAM Jr. and PRO BEAM Mini Connector field deployable interconnects
- ARINC 600 connectors, with inserts/holder blocks designed for Mini Expanded Beam — up to 128 channels on size 3 ARINC 600
- MIL-C-38999 Series III shell size 11 style circular connectors — Cable assemblies up to 4 fibers
- Unique Modular Design, for use with multimode and singlemode fiber
- Tactical cables, cable reels, backpacks
- Cable assembly and termination services
- Ball lens expands cross-sectional area of light over 200 times for multimode and over 2000 times for singlemode
- Rugged hermaphroditic construction (i.e., same insert mates to each other)
- Physically non-contacting mating conditions; no wear, installed fiber ferrule protected by ball lens



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

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 (the cross-

Expanded Beam Technology



Expanded Beam Principle

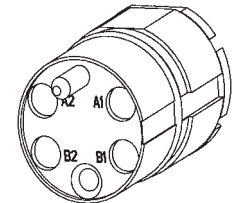
sectional area of the light beam increases over 2,000 times.). It is then refocused back down onto the core of the receiving fiber. This approach provides ease of alignment and low sensitivity to thermal changes and contamination. High strength, precision connector housings enhance a durable connection, 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, blindmate situations, and high vibration.

Product Facts

- 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 Dual Wavelength, 1310, or 1550 nm wavelengths
- Easy alignment for low-loss, repeatable performance
- Consistent overall optical "link budget" assured
- Low sensitivity to thermal fluctuations and interface contamination
- Repeatable low-loss performance in harsh environments

Expanded Beam Inserts



- PRO BEAM Sr. Insert — the original, larger format, Field Tactical, hermaphroditic Connector System
- PRO BEAM Jr. Insert — the second generation, reduced size, Field Tactical Connector System
- Mini Expanded Beam Insert for multi-channel small form factor — the smallest expanded beam multi-channel insert in the industry, a Tyco Electronics exclusive

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

Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors

Performance Specifications

Optical, Multimode Version

Insertion Loss, Typical —
0.7 dB @ 1300 nm*

Optical, Singlemode Version

Insertion Loss, Typical —
0.7 dB @ 1310 nm or 1500 nm*

Return Loss — > 34 dB @ 1310 nm
or 1500 nm**

*When tested with reference quality
launch/receive cable assemblies

**RL Tested Open Ended

Mechanical

Vibration, Sinusoidal —

10 - 500 Hz, 3 directions;
0.75 mm amplitude @ 10g acceleration

Bump — 4,000 Bumps, 6 directions
@ 50g 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

Humidity (Damp Heat) —95% RH

Immersion

Water — 15 m depth (plug) -
15 m (Bulkhead)

Material and Finish

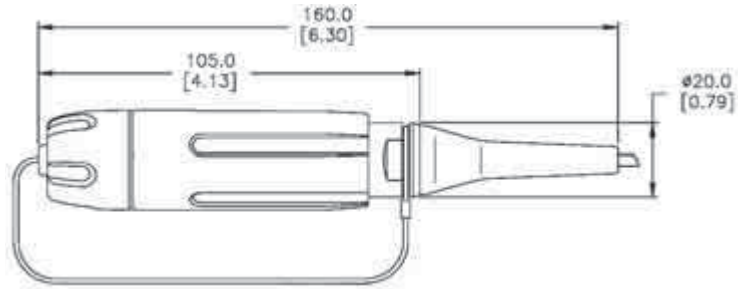
Shell Alloy — Aluminum; or nickel
aluminum bronze (high saline environ-
ment)

**Plating (For Aluminum Shells
Only)** — clear hard anodized; or green
chromate conversion zinc (PRO BEAM
Jr. Bulkheads only)

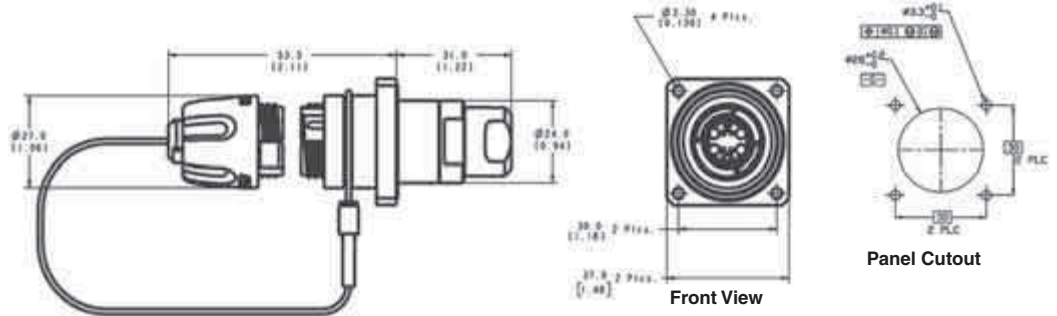
**Bulkhead Connector Panel
Thicknesses**

**PRO BEAM Jr. Bulkhead Connector
D-Hole** — 4 mm max.

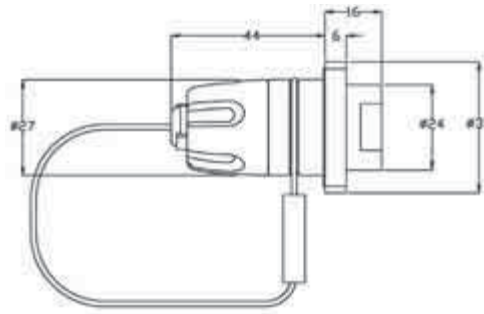
**PRO BEAM Jr. Bulkhead Connector
Square Flange** — 6 mm max.



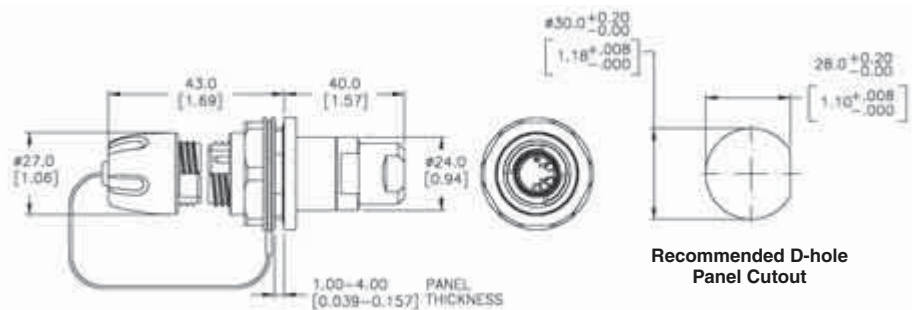
PRO BEAM Jr. Cable Connector, Plug



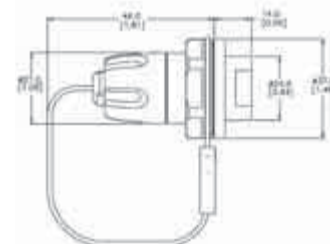
PRO BEAM Jr. Square Flange Mount Bulkhead



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



PRO BEAM Jr. D-Hole Bulkhead, Standard Cable Adapter

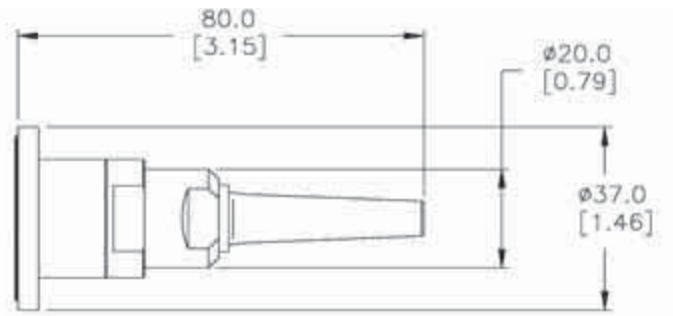


PRO BEAM Jr. Low Profile D-Hole Bulkhead

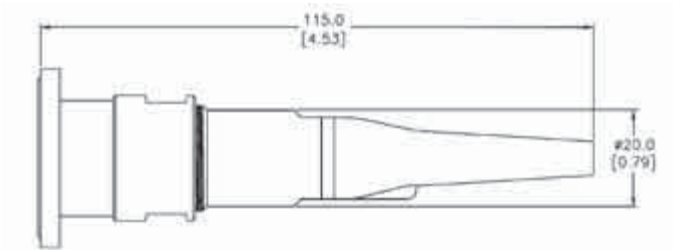
Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors

(Continued)



Standard Bulkhead Cable Adapter, with Boot

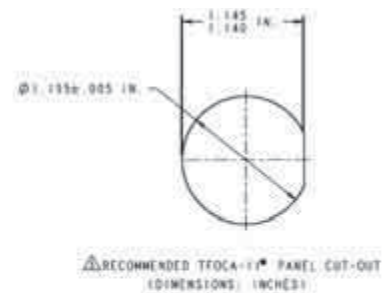
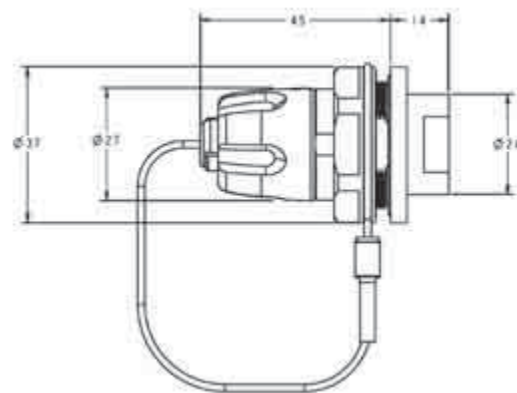


Environmentally Sealed Bulkhead Cable Adapter, with Boot

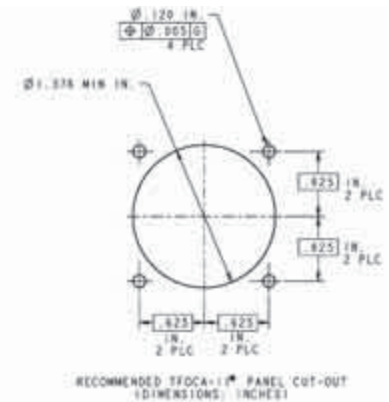
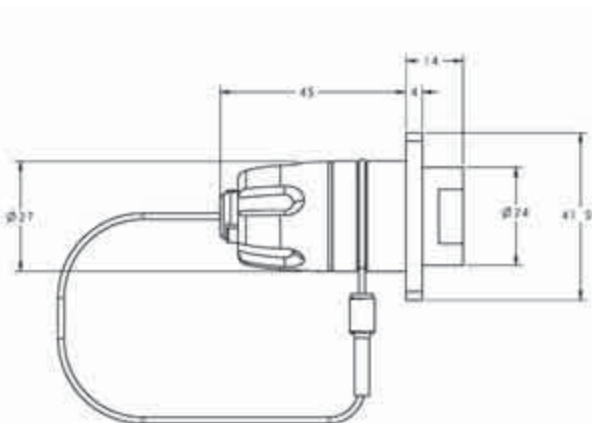
PRO BEAM Jr. Replacement Receptacles for TFOCA-II Panel Mount Connector Applications

(see page 18 for Part Numbers)

Panel Cutout Dimensions



PRO BEAM Jr. D-Hole Low Profile Buffered Fiber Bulkhead Replacement Connector for TFOCA-II Product



PRO BEAM Jr. Square Flange, Low Profile, Buffered Fiber Bulkhead Replacement for TFOCA-II Product

TFOCA-II is a trademark of Amphenol Fiber Systems International.

Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors

(Continued)

Connector Assembly

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

Part Numbers listed are Shell alloy = aluminum
Plating = hard anodized.
Consult Tyco Electronics for other plating/material options such as NiAlBz for Naval applications.



Technical Documents

Product Specification

108-2177 Design Objectives

Application Specification

114-13099

Instruction Sheets

408-8791 Grounding D-Hole Bulkhead

408-8797 Plug

408-8798 Standard D-Hole Bulkhead

408-8811 Sealed D-Hole Bulkhead

408-8834 Low Profile Square Flange Bulkhead

408-8840 Low Profile D-Hole Bulkhead

408-8841 Standard Square Flange Bulkhead

<http://www.tycoelectronics.com/documents>

PRO BEAM Jr. Connector Shell Kits

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

PRO BEAM Jr. Replacement Receptacles for TFOCA-II Panel Mount Connector Applications

Description	Part Number
PRO BEAM Jr. TFOCA-II Replacement D-Hole Low-Profile Buffered Fiber Bulkhead	1754445-1 ♦
PRO BEAM Jr. TFOCA-II Replacement D-Hole Sealed Bulkhead	1754446-1 ♦
PRO BEAM Jr. TFOCA-II Replacement Square Flange Low-Profile Buffered Fiber Bulkhead	1754447-1 ♦
PRO BEAM Jr. TFOCA-II Replacement Square Flange Sealed Bulkhead	1754448-1 ♦

PRO BEAM Jr. Insert Kits

Description	Part Number
2 x 850 / 1300 nm Multimode	1515743-1
2 x 1310 nm Singlemode	1515739-1
2 x 1550 nm Singlemode	1516040-1
4 x 850 / 1300 nm Multimode	1515747-1
4 x 1310 nm Singlemode	1515740-1
4 x 1550 nm Singlemode	1516041-1

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Jr.	1588908-2
126 µm	SM	Jr.	1588908-1
126 µm	MM	Jr.	1588700-1

PRO BEAM Jr. Connector Plug & Sealed Bulkhead Cable Adapter Kits

Cable Dia. (Max.)	Part Number
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
7.50 .295 (Breakout Cable Only)	1828168-1 (Plug)
7.50 .295	1754719-3 (Sealed Bulkhead)

PRO BEAM Jr. Connector Standard Bulkhead Cable Adapter Kits*

Cable Dia. (Max.)	Part Number
3.10 [.122]	1515791-2
3.60 [.142]	1515808-1
5.10 [.201]	1515835-2
5.65 [.222]	1515829-1
6.10 [.240]	1515796-2
4 x 3.00 [4 x .118]	1515749-1

*Standard Cable Adapter — Not applicable for Low Profile.

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors

(Continued)

Spare Parts & Tools

Technical Documents

Product Specifications

408-8857 Curing Fixtures for PRO BEAM Jr. and Sr. Connectors

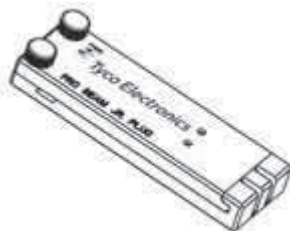
408-8828 Cleaning Procedure for EB C/A's

Tooling Specifications

408-8795 Crimp Tool with Die Set for PRO BEAM Jr. and Sr. Connectors

408-10022 Die Assembly for Mini and Jr. Circular Crimps

<http://www.tycoelectronics.com/documents>



Curing Fixtures

Connector	Part Number
PRO BEAM Jr. Cable Plug (having cable with KEVLAR strength member fiber)	1693797-1
PRO BEAM Jr. Sealed D-Hole Bulkhead	
PRO BEAM Jr. Standard D-Hole and Square Flange Bulkhead	1693800-1
PRO BEAM 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 PRO BEAM Jr. Connector 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	Mode	PRO BEAM	Part Number
125 μm	SM	Jr.	1588908-2
126 μm	SM	Jr.	1588908-1
126 μm	MM	Jr.	1588700-1

Protective Caps

Description	PRO BEAM	Part Number
Standard cap, for D-Hole Bulkhead	Jr.	1515868-1
Standard cap, for Flange Mount Bulkhead	Jr.	1515787-2
Standard cap, for connector plug	Jr.	1515867-1

KEVLAR is a trademark of E. I. du Pont de Nemours and Company.

Note: All part numbers are RoHS compliant.

Rugged Fiber Optic Products (Continued)

PRO BEAM Mini Connectors

Tyco Electronics is pleased to announce the natural extension from our PRO BEAM Sr. and Jr. Connector product lines.

The PRO BEAM Mini Connector saves space and weight and is perfect for high density applications. The product offers the same durability as its larger counterparts.



PRO BEAM Sr., Jr. & Mini Connectors



PRO BEAM Mini Plug Connector

Connector Assembly

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

*Not applicable for Low Profile

PRO BEAM Mini Connector Shell Kits

Type	Mount Style	Attribute Difference	Part Number		
			(HA Aluminum)	(OD Aluminum)	(NiAlBronze)
Plug		EPDM Grip	1828698-1	N/A	1828698-2
Bulkhead	D-Hole	Low Profile - Buffered Fiber	1828699-1	1828699-2 ♦	1828699-3
		Low Profile - 1.8 Jacketed	1985140-1	1985140-2	1985140-3
	Square Flange	Sealed	1918185-1	*	1918185-2
		Low Profile - Buffered Fiber	1828826-1	*	*
		Neutrik Cutout-Drop-In	1918603-1	*	*

* Contact Tyco Electronics for availability.

PRO BEAM Mini Insert Kits

Description	Part Number
2 x 850 / 1300 nm Dual Multimode	1374759-4
2 x 1310 nm Singlemode	1588129-2
2 x 1550 nm Singlemode	1588128-2
4 x 850 / 1300 nm Dual Multimode	1374759-2
4 x 1310 nm Singlemode	1588129-3
4 x 1550 nm Singlemode	1588128-3

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Mini	1754700-1
126 µm	SM	Mini	1754700-2
126 µm	MM	Mini	1754699-1

ASSEMBLY CAPABILITIES

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

PRO BEAM Mini Cable Adapter Kits For Plug

Cable Diameter	Part Number
5 mm	1828700-1
5.5 mm	1828700-2
6 mm	1828700-3

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

Rugged Fiber Optic Products (Continued)

PRO BEAM Mini Connectors

(Continued)

Performance Specifications

Optical, Multimode Version

Insertion Loss, Typical —
0.7 dB @ 1300 nm*

Optical, Singlemode Version

Insertion Loss, Typical —
0.8 dB @ 1310 nm*

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

*When tested with reference quality
launch/receive cable assemblies

**RL Tested Open Ended

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 — 50 grams, typical
D-Hole bulkhead — 39 grams, typical

Temperature

Operational Temperature —

-40°C/+85°C

Storage Temperature —

-55°C/+85°C

Temperature, Cyclic —

-55°C/+85°C

Humidity (Damp Heat) — 95% RH

Immersion

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

Pressure

Low Pressure — 25 kPa @ -55°C

Material and Finish

Shell Alloy — Aluminum; or nickel
aluminum bronze (high saline environ-
ment)

Plating (For Aluminum Shells

Only) — clear hard anodized; or green
chromate conversion zinc (PRO BEAM
Jr. Bulkheads only)

Technical Documents

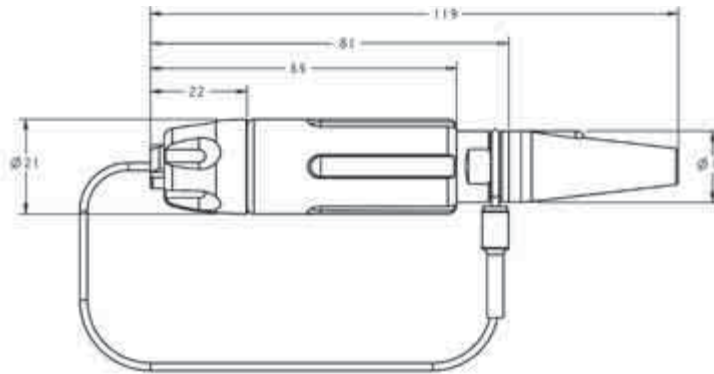
408-10065 Plug

408-10067 Square Flange Bulkhead

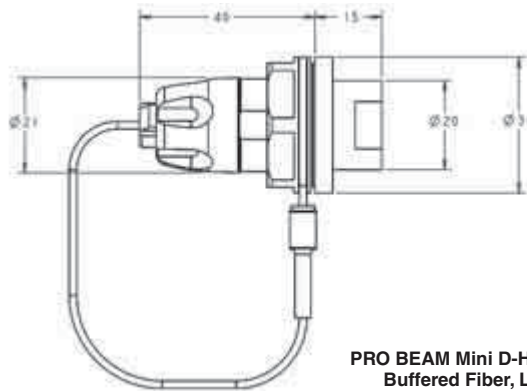
408-10069 Low Profile D-Hole Bulkhead

408-10076 Sealed D-Hole Bulkhead

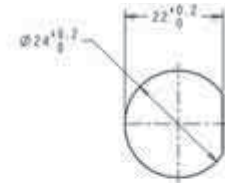
<http://www.tycoelectronics.com/documents>



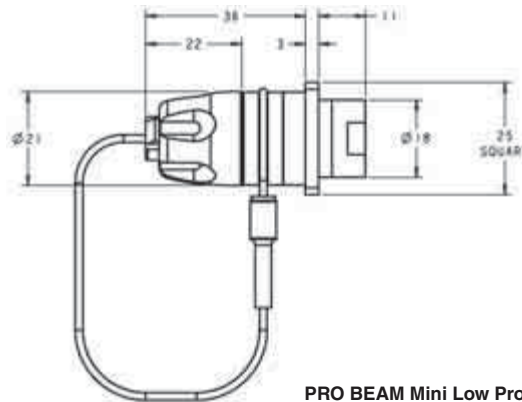
PRO BEAM Mini Cable Connector, Plug



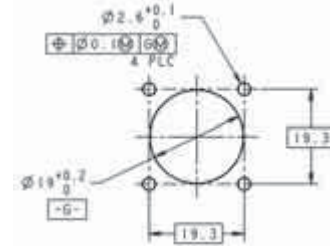
PRO BEAM Mini D-Hole Bulkhead,
Buffered Fiber, Low Profile



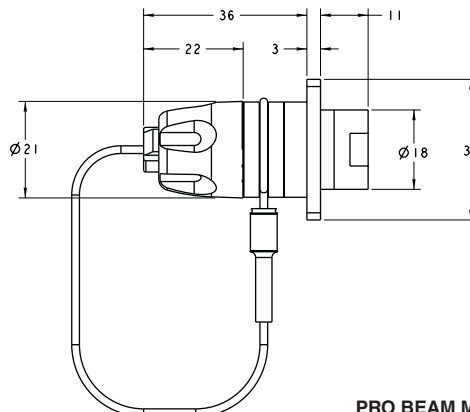
Recommended Panel Cutout



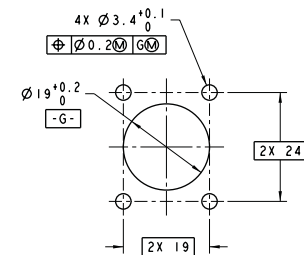
PRO BEAM Mini Low Profile, Square Flange Mount Bulkhead



Recommended Panel Cutout



PRO BEAM Mini Bulkhead with XLR Flange

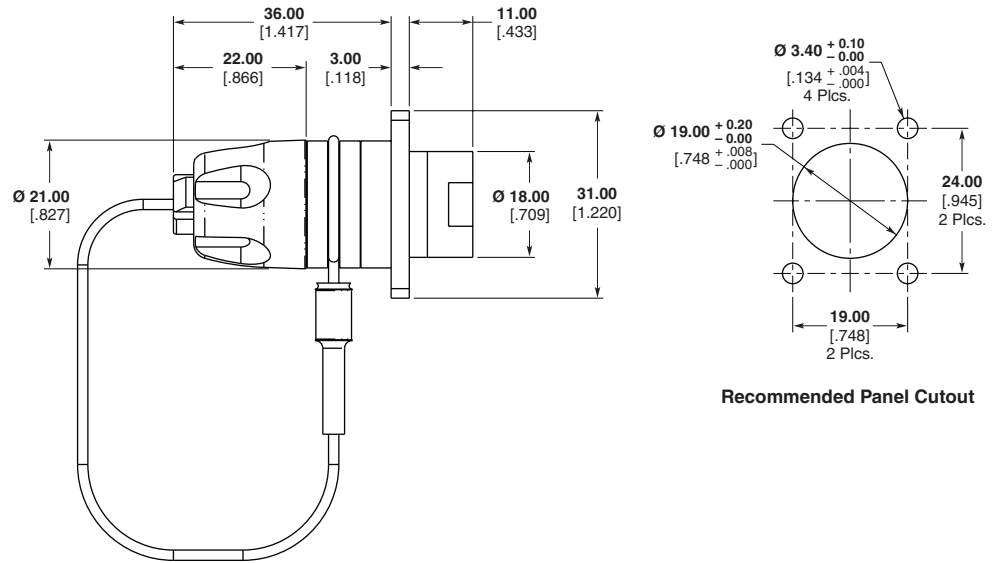


Recommended Panel Cutout

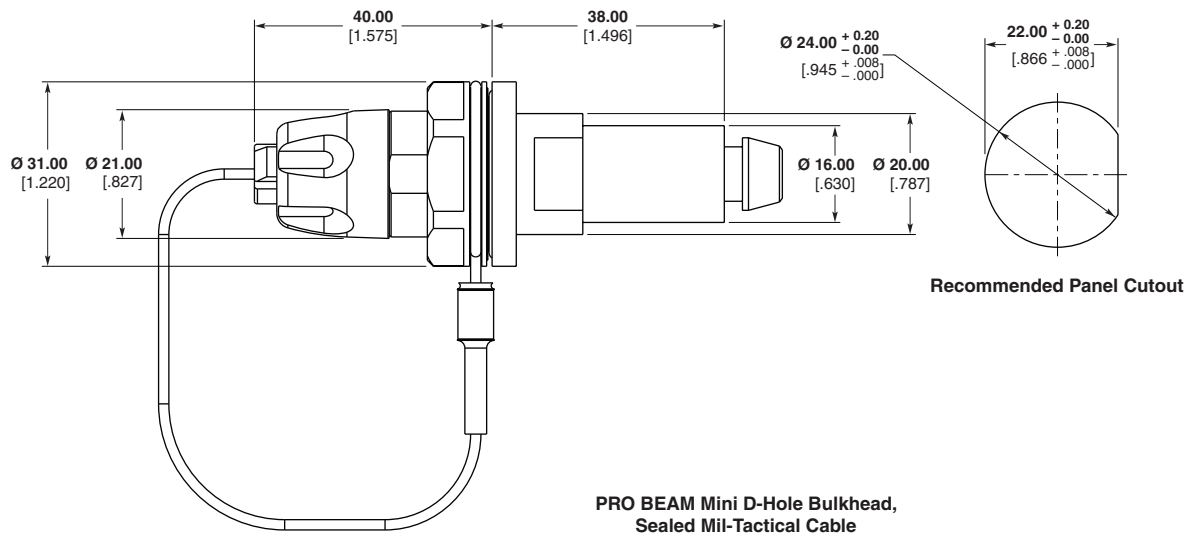
Rugged Fiber Optic Products (Continued)

PRO BEAM Mini Connectors

(Continued)



**PRO BEAM Mini Low Profile,
Alternate Square Flange Mount Bulkhead**



**PRO BEAM Mini D-Hole Bulkhead,
Sealed Mil-Tactical Cable**



Rugged Fiber Optic Products (Continued)

PRO BEAM Sr. Connectors

Performance Specifications

Optical, Multimode Version
Insertion Loss, Typical —
0.7 dB @ 1300 nm*

Optical, Singlemode Version
Insertion Loss, Typical —
0.7 dB @ 1310 nm*

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

*When tested with reference quality
launch/receive cable assemblies

**RL Tested Open Ended

Mechanical

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

Bump — 4,000 Bumps, 6 directions,
@ 50g 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, Cyclic —
-55°C/+85°C

Humidity (Damp Heat) — 95% RH

Immersion

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

Material and Finish

Shell Alloy — Aluminum; or nickel
aluminum bronze (high saline environ-
ment)

**Plating (For Aluminum Shells
Only)** — clear hard anodized

**Bulkhead Connector Panel
Thicknesses**

PRO BEAM Sr. D-Hole Connector —
6.5 mm max.

**PRO BEAM Sr. Square Flange
Connector** — 8.5 mm max.

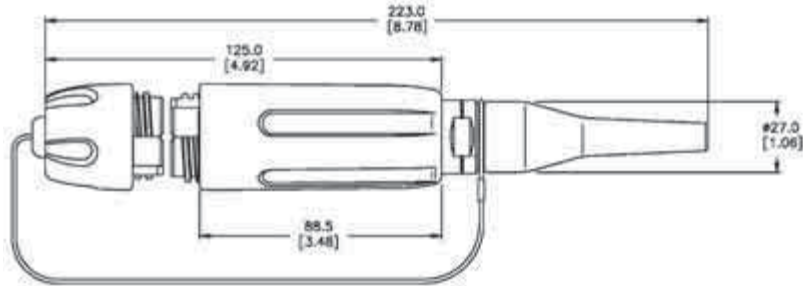
Technical Documents

Product Specifications

408-8799 Plug
408-8800 D-Hole Bulkhead
408-8877 Square Flange Bulkhead

Application Specification

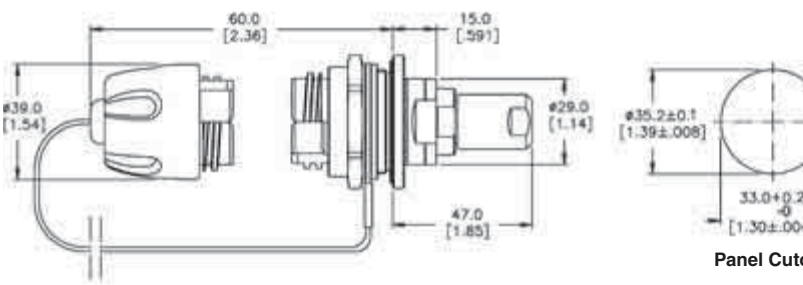
114-13122
<http://www.tycoelectronics.com/documents>



PRO BEAM Sr. Cable Connector, Plug



Front View
Cap Removed



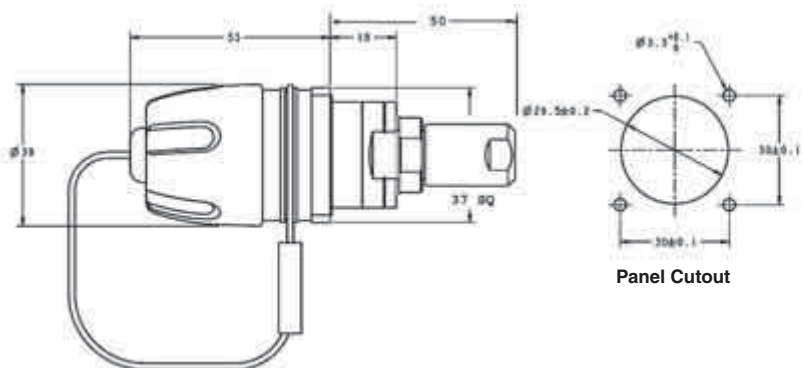
PRO BEAM Sr. D-Hole Bulkhead with Standard Cable Adapter



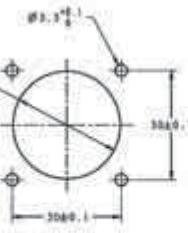
Panel Cutout



Front View
Cap Removed



PRO BEAM Sr. Square Flange Mount Bulkhead with Standard Cable Adapter



Panel Cutout



Front View
Cap Removed

**Please contact your local
Tyco Electronics
Sales Representative
for Part Numbers and
availability.**

Rugged Fiber Optic Products (Continued)

PRO BEAM Sr. Connectors

(Continued)

Connector Assembly

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

*Not applicable for Low Profile

Part numbers listed are Shell alloy = aluminum Plating = hard anodized. Consult Tyco Electronics for other plating/material options such as NiAlBz for Naval applications.

PRO BEAM Sr. Connector Shell Kits	Part Number
PRO BEAM Sr. Plug w/EPDM rubber	1754842-1
PRO BEAM Sr. D-Hole Standard Bulkhead	1754843-1
PRO BEAM Sr. Square Flange Standard Bulkhead	1754844-1

PRO BEAM Sr. Insert Kits	Part Number
2 x 850 / 1300 nm Multimode	1693001-1
2 x 1310 nm Singlemode	1515734-2
4 x 850 / 1300 nm Multimode	1693001-2
4 x 1310 nm Singlemode	1515735-1

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Sr.	1515941-1
126 µm	SM	Sr.	1515941-2
126 µm	MM	Sr.	1588801-1



PRO BEAM Sr. Connector Plug Adapter Kits

Cable Dia. (Max.)	Part Number
5.10 .201	1515940-1
5.65 .222	1515940-3
6.20 .244	1515940-5

Technical Documents

Product Specifications

- 408-8857 Curing Fixtures for PRO BEAM Jr. and Sr. Connectors
- 408-8828 Cleaning Procedure for EB C/A's

Tooling Specifications

- 408-8795 Crimp Tool with Die Set for PRO BEAM Jr. and Sr. Connectors
- 408-10022 Die Assembly for Mini and Jr. Circular Crimps

<http://www.tycoelectronics.com/documents>

PRO BEAM Sr. Connector Standard Bulkhead Cable Adapter Kits

Cable Dia. (Max.)	Style	Part Number
5.10 .201	Standard Cable Adapter	1515847-1
5.65 .222	Standard Cable Adapter	1515724-2
Buffered Fiber	Low Profile Adapter	1515299-2

Note: All part numbers are RoHS compliant.



Rugged 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
- Options for 500 meter reels include special backpack harnesses, a separate reel stand, or a combination reel and reel stand

Featured Cable Assemblies



TFOCA to PRO BEAM Jr. Plug Cable Assembly
1828536-1 ◆

LP D-Hole Bulkhead to 4 ST 62.5/125 on 1.8 mm cable
6828454-1 ◆

Plug to Plug (100 meters)
6754475-2

Typical Reels and Reel Stands for Field-Deployable Cable Assemblies



1918930-1



Tactical Reel/Drum Options

PRO BEAM Jr. Kits

**PRO BEAM Jr.
Termination Kit
1828650-1**

**Cleaning Kit
1828335-2**

Cable Reels

Reel Capacity (Random Lay)

Cable Diameter		Notes/Description	Flange Diameter	Part Number
5.0 mm	5.5 mm			
225 M	186 M	Reel & Reel Stand Combination Reel can be detached from stand without tools	310 mm	1918930-1
297 M	247 M	Reel*	310 mm	1754515-1
570 M	462 M	Reel*	370 mm	1754515-2
998 M	816 M	Reel*	460 mm	1754515-3
1271 M	1052 M	Reel*	510 mm	1754515-4

* See Accessories options below

ASSEMBLY CAPABILITIES
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"



Backpack Harness

Accessories

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

* Reel must be ordered separately.

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.

Note: Part Numbers are RoHS compliant except: ◆ Indicates non-RoHS compliant.

TFOCA-II is a trademark of Amphenol Fiber Systems International.

Rugged Fiber Optic Products (Continued)

**Tactical Field
Splice Repair Kit
Part Number 1985212-1**



Materials List

Quantity	Description
4	Flexible Splice Housings
10	Mechanical Splices
1	Cleaver
1	Cable Stripper
2	Buffer Stripper (sizes): 126 micron, 200 micron
1	Utility Knife with 3 Spare Blades
1	KEVLAR Shears
1	6 inch Metal Ruler, (units in metric)
1	Illuminated Microscope with Batteries
40	Alcohol (at least 70%) Pads
1	Wipes, 5 x 8 inch, 280 count box
1	Plastic Frame Safety Glasses (ANSI approved lenses)
1	Tweezers
1	Roll Tape
1	Fine Tip Marking Pen
1	Set of Instructions (illustrated) — Waterproof
1	Portable Field Storage Case. This case shall be ruggedized and house all components necessary to repair broken cable. Dimensions of the case shall not exceed 7.5" H x 20" W x 14" — Black in color.

KEVLAR is a trademark of E. I. du Pont de Nemours and Company.

Note: All part numbers are RoHS compliant.



Rugged Fiber Optic Products (Continued)

Optical Test Set for Fiber Optic Cables — Designed for harsh environments

Product Facts

- Especially designed to support the installation of optical links in the field
- Able to test both cable drums and entire links
- Powered by batteries with high autonomy
- Suitable for diagnostics and construction teams
- Easy to use, ergonomic, rugged design
- Suitable for cable length up to 10 km
- Supports up to 4 fibers per cable with various types of connectors



Diagnostic Features

Power Meter

The optical power from any source can easily be measured with the power meter function.

Optical Source

A continuous optical signal is generated and transmitted with selectable output power.

Drum Test / Cable Test

Test of an entire cable drum with automatic good/bad indication. The test of an entire cable is realized with a 2nd KPG-opt or a loop connector.

Test Frames (optional)

The KPG-opt can generate specific test frames as used in optical networks and LOS systems.

Optical Tester

Description	Part Number
850 nm 38999 III Size 11 Optical Test Kit	1918016-1
850/1300 nm PRO BEAM Jr. Optical Test Kit	1918016-2
1310 nm PRO BEAM Jr. Optical Test Kit	1985006-1

For additional wavelength testers, contact your local Tyco Electronics Sales Representative.

Protective Case
1918082-1

Note: All part numbers are RoHS compliant.

Rugged Fiber Optic Products (Continued)

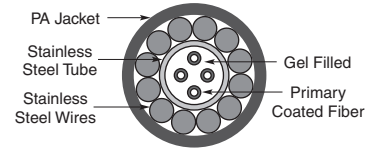
ARMOR-LIGHT Tactical Field Deployable Fiber Optic Cable for Extreme Environments (Metallic for Rodent Proof)



4-Color Optical Fiber Cable Specification for Armored Cable for Ruggedized Applications

Construction:

- 4-color coded fibers
- Fiber types 50/125/250 μm, 62.5/125/250 μm and 9/125/250 μm
- Stainless steel gel filled tube
- Stainless steel wire
- Jacket — Nylon, black



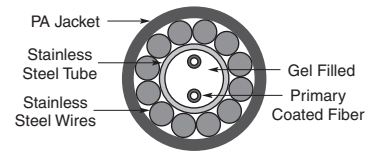
Fiber Type	Part Number	Outside Dia. (mm)	Weight kg/km	Max. Attenuation dB/km				Bandwidth MHz-km	
				850 nm	1300 nm	1310 nm	1550 nm	850 nm	1300 nm
62.5/125	1588957-1	3.8	24	3.5	1.0	X	X	160	500
50/125	1588957-2	3.8	24	2.7	0.9	X	X	400	1200
SM	1588957-4	3.8	24	X	X	0.40	0.25	X	X

Notes: 35 mm recommended bend radius.
3.1 kN breaking strength.

2-Color Optical Fiber Cable Specification for Armored Cable for Ruggedized Applications

Construction:

- 2-color coded fibers
- Fiber types 50/125/250 μm, 62.5/125/250 μm and 9/125/250 μm
- Stainless steel gel filled tube
- Stainless steel wire
- Jacket — Nylon, black



Fiber Type	Part Number	Outside Dia. (mm)	Weight kg/km	Max. Attenuation dB/km				Bandwidth MHz-km	
				850 nm	1300 nm	1310 nm	1550 nm	850 nm	1300 nm
62.5/125	1693808-1	3.8	24	3.5	1.0	X	X	160	500
50/125	1693808-2	3.8	24	2.7	0.9	X	X	400	1200
SM	1693808-4	3.8	24	X	X	0.40	0.25	X	X

Notes: 35 mm recommended bend radius.
3.1 kN breaking strength.

Note: All part numbers are RoHS compliant.

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 MIL-PRF-85045
- Flexible, water resistant, high crush resistant, and lightweight,
- Designs available to be resilient against radiation exposure

Technical Data

Mil-Standard Distribution Cable — 2 Fiber Singlemode

Attenuation — ≤ 0.5 dB/km @ 1310 nm / ≤ 0.5 dB/km @ 1550 nm

Diameter — 5.8 mm

Weight — 25 kg/km

Minimum Bending Radius — 29 mm

Crush Resistance — 2000 N/cm

Operating Temperature — -55° C to +85° C

Mil-Standard Distribution Cable — 4 Fiber Singlemode

Attenuation — ≤ 0.5 dB/km @ 1310 nm / ≤ 0.5 dB/km @ 1550 nm

Diameter — 5.8 mm

Weight — 27 kg/km

Minimum Bending Radius — 28 mm

Crush Resistance — 2000 N/cm

Operating Temperature — -55° C to +85° C

Mil-Standard Distribution Cable — 2 Fiber Multimode

Fiber Type — 50 μm/125 μm and 62.5/125

Attenuation — ≤ 3.5 dB/km @ 850 nm / ≤ 1.0 dB/km @ 1300 (62.5/125); ≤ 3.5 dB/km @ 850 nm / ≤ 1.5 dB/km @ 1300 (50/125)

Mil-Standard Distribution Cable — 4 Fiber Multimode

Fiber Type — 50 μm/125 μm and 62.5/125

Attenuation — ≤ 3.5 dB/km @ 850 nm / ≤ 1.0 dB/km @ 1300 (62.5/125); ≤ 3.5 dB/km @ 850 nm / ≤ 1.5 dB/km @ 1300 (80/125)

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.

Rugged Fiber Optic Products (Continued)

“Mini” Expanded Beam for Harsh Environments

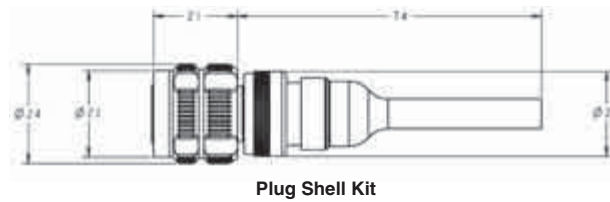
Product Facts

- 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
- Shell polarizations A through E available upon request

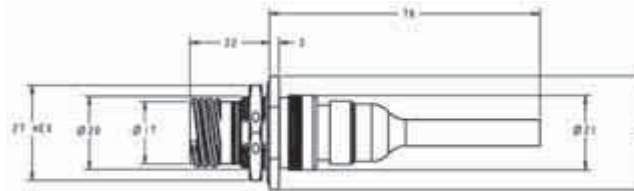
Standard Material and Finish
Shell Alloy — Aluminum
Plating — Nickel & green chromate

*Refer to customer drawing for dash number designation

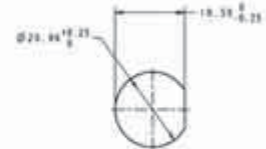
For part number details and plating options, contact your local Tyco Electronics Sales Representative.



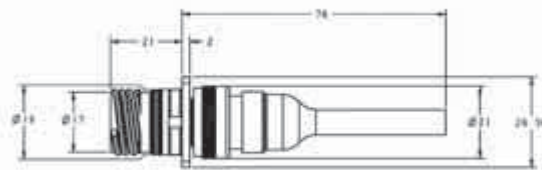
Plug Shell Kit



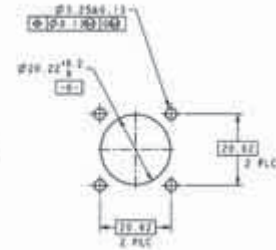
D-Hole Receptacle Shell Kit



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



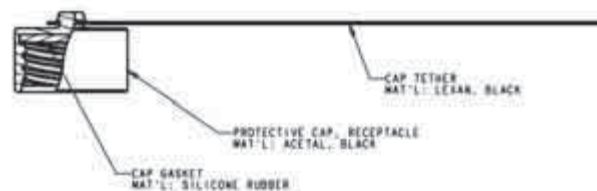
Square Flange Receptacle Shell Kit



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



38999 Plug Cap
1918024-1



38999 Receptacle Cap
 1918025-1 = Jam Nut Receptacle
 1918025-2 = Square Flange Receptacle



Note: All part numbers are RoHS compliant.

Rugged Fiber Optic Products (Continued)

“Mini” Expanded Beam for Harsh Environments

(Continued)

	Mini EB 38999 Connector Shell Kits (N-Key)					
	Ø1.8 mm Max Simplex Cable		MIL-Tactical Distribution Cable		Buffered Fiber Only	
	Electroless Ni Plate	OD Zn/Ni	Electroless Ni Plate	OD Zn/Ni	Electroless Ni Plate	OD Zn/Ni
Use with:						
Finish:						
Plug:	6754518-1	1754518-7 ♦	6828045-1	1828045-7 ♦	1918883-1	1918883-7 ♦
Jam-Nut Receptacle:	6754519-1	1754519-7 ♦	6828046-1	1828046-7 ♦	1918884-1	1918884-7 ♦
Flange-Mount Receptacle:	6754520-1	1754520-7 ♦	6828047-1	1828047-7 ♦	1918885-1	1918885-7 ♦

PRO BEAM Mini Insert Kits

Description	Part Number
2 x 850 / 1300 nm Dual Multimode	1374759-4
2 x 1310 nm Singlemode	1588129-2
2 x 1550 nm Singlemode	1588128-2
4 x 850 / 1300 nm Dual Multimode	1374759-2
4 x 1310 nm Singlemode	1588129-3
4 x 1550 nm Singlemode	1588128-3

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM Connector	Part Number
125 µm	SM	Mini	1754700-1
126 µm	SM	Mini	1754700-2
126 µm	MM	Mini	1754699-1

Note: Part Numbers are RoHS compliant except: ♦ Indicates non-RoHS compliant.

Expanded Beam Avionics-Related Standards and Specifications for ARINC 600, 664, 763 and 801

ARINC 664 — Aircraft Data Network

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

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)

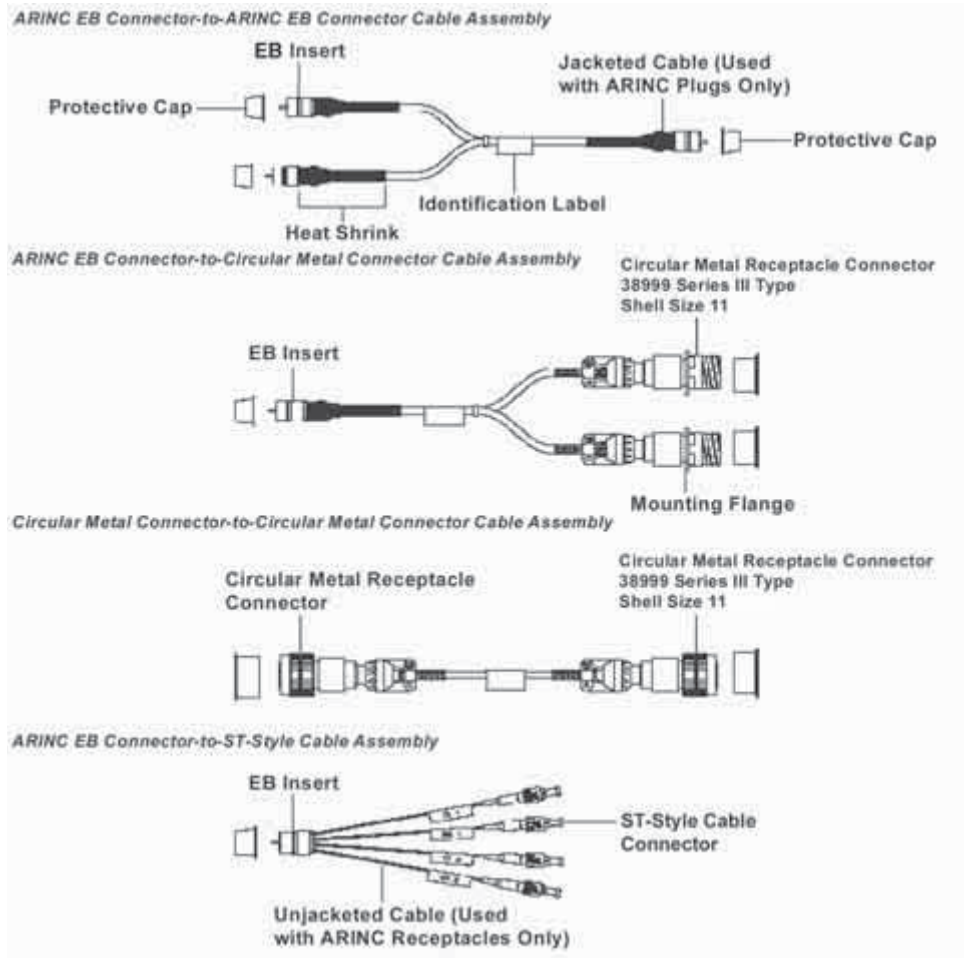
Integrated Network Server Unit (INSU) — can use ARINC 600 Size 3 connector with up to 16 Expanded Beam fiber optic channels (four Mini Expanded Beam inserts in cavity F)

ARINC 801 — Fiber Optics Working Group

Tyco Electronics provides a single reference point for Flight Level Optics that are multi-sourced.

Rugged Fiber Optic Products (Continued)

Typical Assemblies for In-Flight Network Applications



Typical Assemblies



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