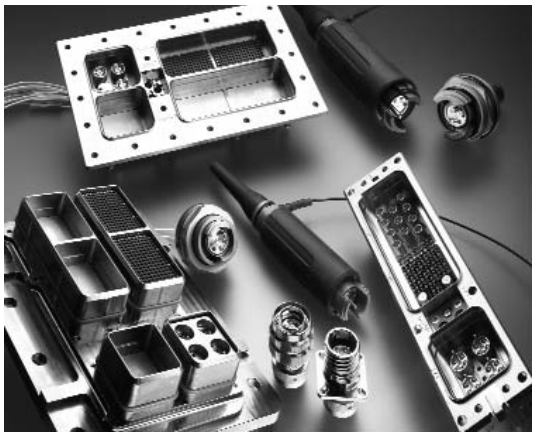
Rugged Fiber Optic Products

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



Expanded Beam Products

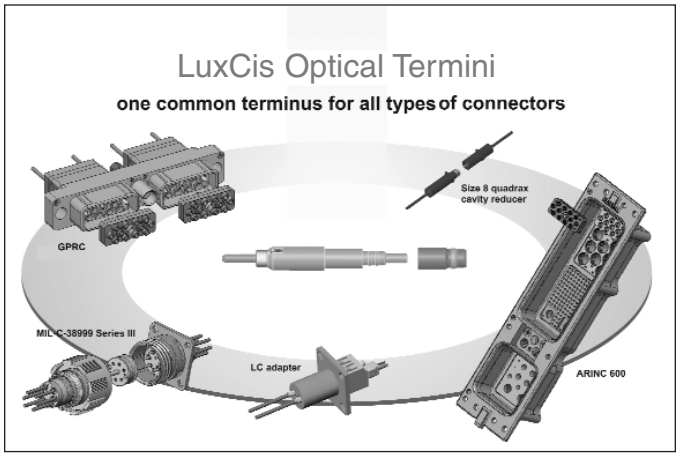


PRO BEAM Sr., Jr. & Mini Connectors

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, 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

Catalog 1307895
Revised 3-06

www.tycoelectronics.com

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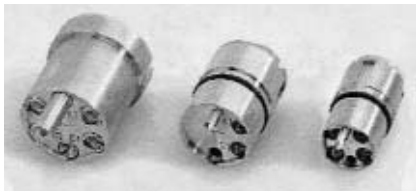
Rugged Fiber Optic Products (Continued)

Expanded Beam Products

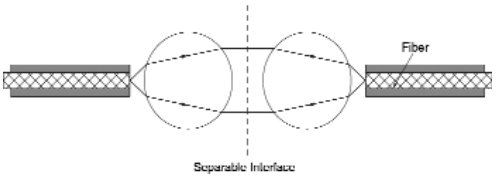
Product Facts

- 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
- Common insert for 1- through 4-channels
- 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

Expanded Beam Technology



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



Expanded Beam Principle

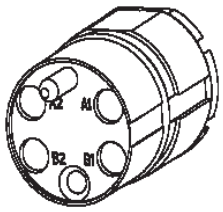
Fiber Optic Interconnect/ Cable System using Expanded Beam technology, which physically expands and collimates the transmission signal into an optical beam over 14 times its original diameter (the cross sectional area of the light beam increases over 200 times for multimode optical signals. For singlemode signals, the collimated beam is over 45 times its original diameter (the cross-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

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

Expanded Beam Inserts



- PRO BEAM Sr. — the original, larger format, Field Tactical, hermaphroditic Connector System
- PRO BEAM Jr. — 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

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UK: 44-208-420-8341

Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors

Performance Specifications

Optical, Multimode

Insertion Loss, Typical — 0.7 - 1.0 dB @ 1300 nm*

Optical, Singlemode Version

Insertion Loss, Typical — 0.8 - 1.0 dB @ 1310 nm*

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

*Against referenced lead

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 — 5 m depth (plug) - 2 m (Bulkhead)

Material and Finish

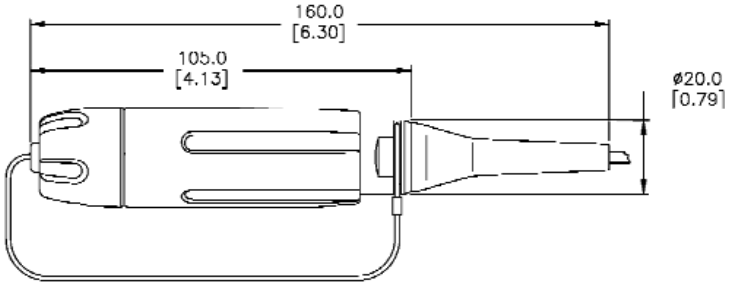
Shell Alloy — Aluminum; or nickel aluminum bronze (high saline environment)

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

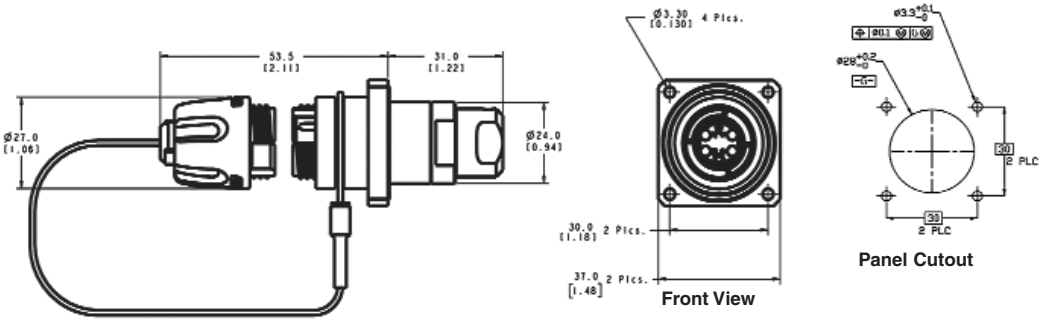
Bulkhead Connector Panel Thicknesses

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

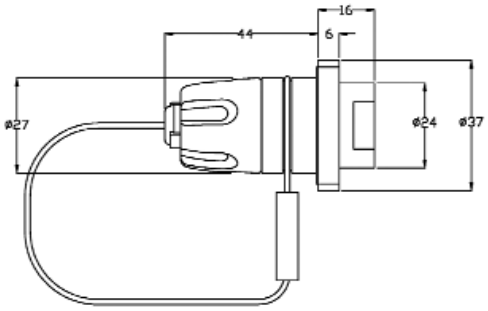
PRO BEAM Jr. Bulkhead Connector Square Flange — 6 mm max.



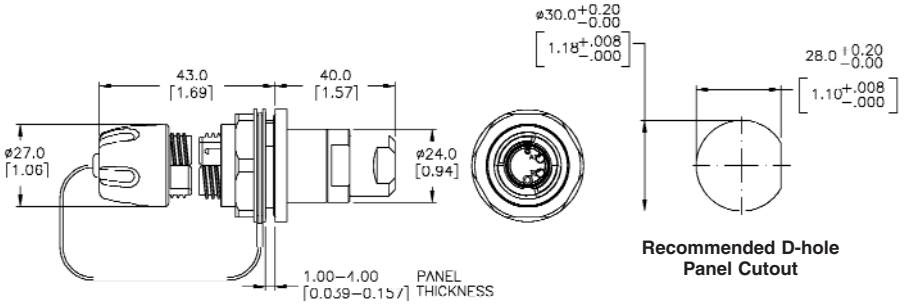
PRO BEAM Jr. Cable Connector, Plug



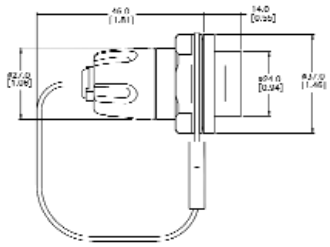
PRO BEAM Jr. Square Flange Mount Bulkhead



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

Catalog 1307895
Revised 3-06

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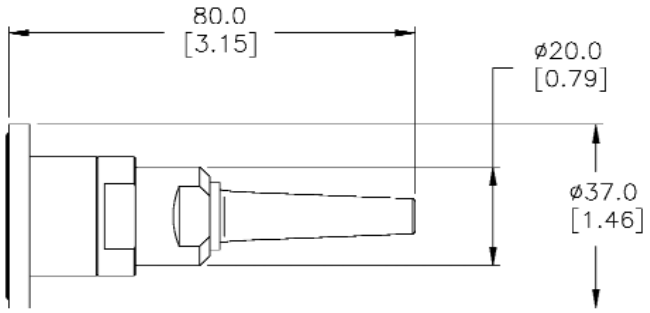
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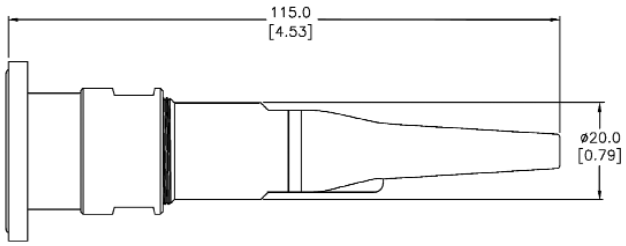
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Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors
(Continued)



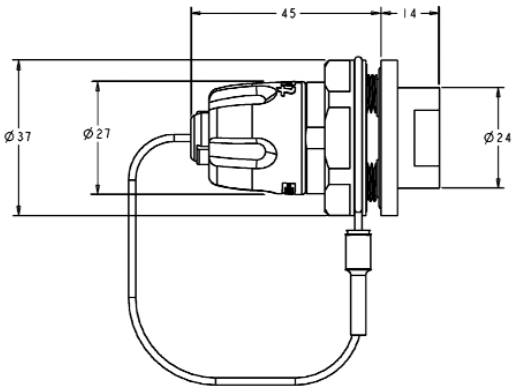
Standard Bulkhead Cable Adapter, with Boot

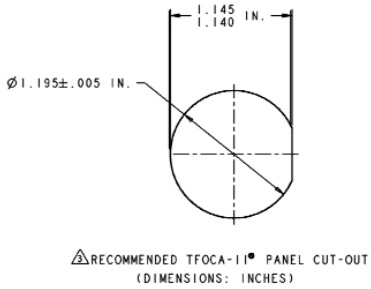


Environmentally Sealed Bulkhead Cable Adapter, with Boot

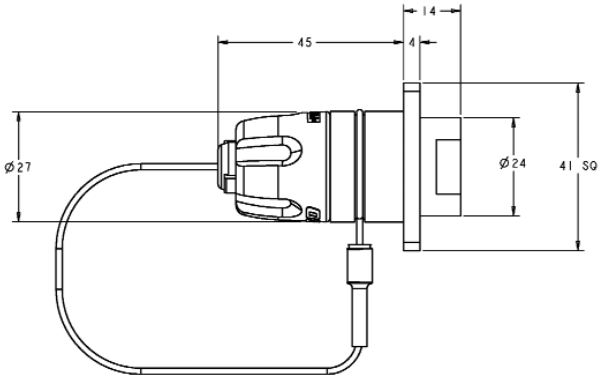
PRO BEAM Jr. Replacement Receptacles for TFOCA-II Panel Mount Connector Applications
(see page 18 for Part Numbers)

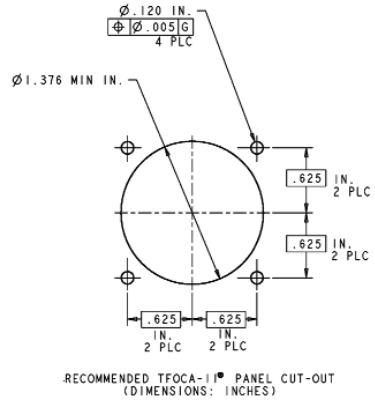
Panel Cutout Dimensions





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 registered trademark of Amphenol Fiber Systems International.

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Revised 3-06

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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.

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

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

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

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	1828168-1

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)	1515835-1
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.

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

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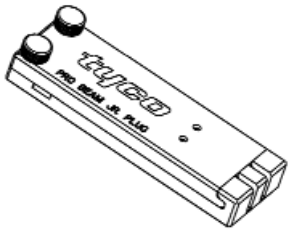
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Rugged Fiber Optic Products (Continued)

PRO BEAM Jr. Connectors
(Continued)

Spare Parts & Tools



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

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

Technical Documents

Product Specifications

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

Tooling Specifications

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

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

Rugged Fiber Optic Products (Continued)

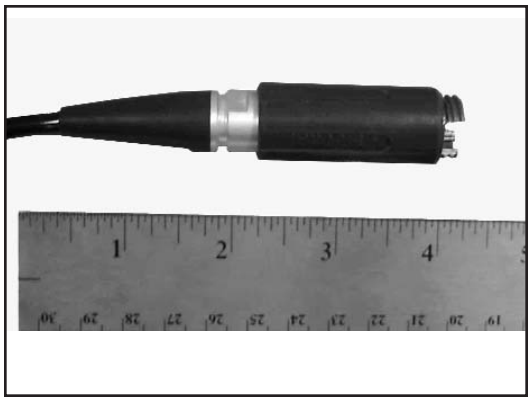
PRO BEAM Mini Connectors

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	Attributes	P/N (HA Alum)	P/N (OD Alum)	P/N (NiAlBz)
Plug			1828698-1	*	1828698-2
Bulkhead	D-Hole	Low Profile - Buffered Fiber	1828699-1	1828699-2◆	1828699-3
		Low Profile - 1.8mm Jacketed	*	*	*
		Sealed	1918185-1	*	1918185-2
	Sq-Flg	Low Profile - Buffered Fiber	1828826-1	*	*
		Low Profile - 1.8mm Jacketed	*	*	*
		Sealed	*	*	*

*Contact Tyco Electronics for availability.

PRO BEAM Mini Insert Kits

Description	Part Number
2 x 850 / 1300nm Dual Multimode	1754888-1
2 x 1310nm Singlemode	1588129-2
2 x 1550nm Singlemode	1588128-2
4 x 850 / 1300nm Dual Multimode	1754888-2
4 x 1310nm Singlemode	1588129-3
4 x 1550nm Singlemode	1588128-3

Ferrule Kits

Fiber Hole Size	Mode	PRO BEAM	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.

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Rugged Fiber Optic Products (Continued)

PRO BEAM Mini Connectors
(Continued)

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

*Against referenced lead

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

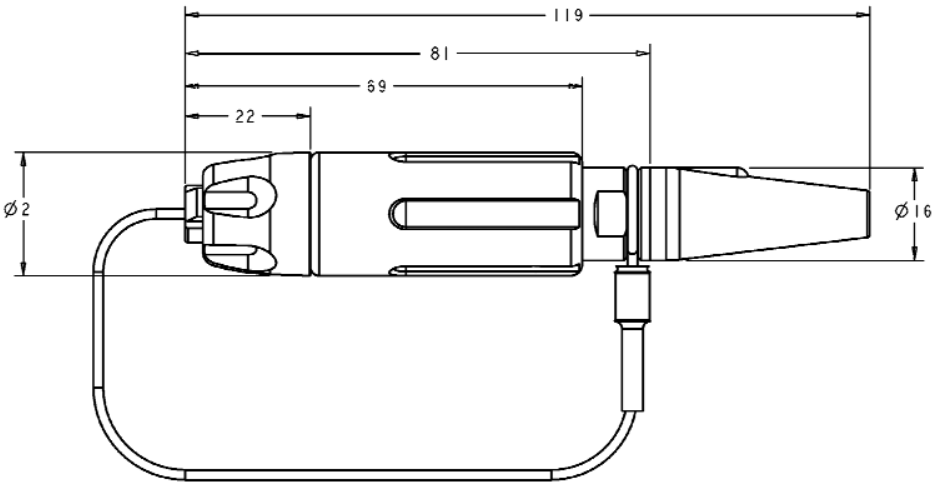
Humidity (Damp Heat) —95% RH

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

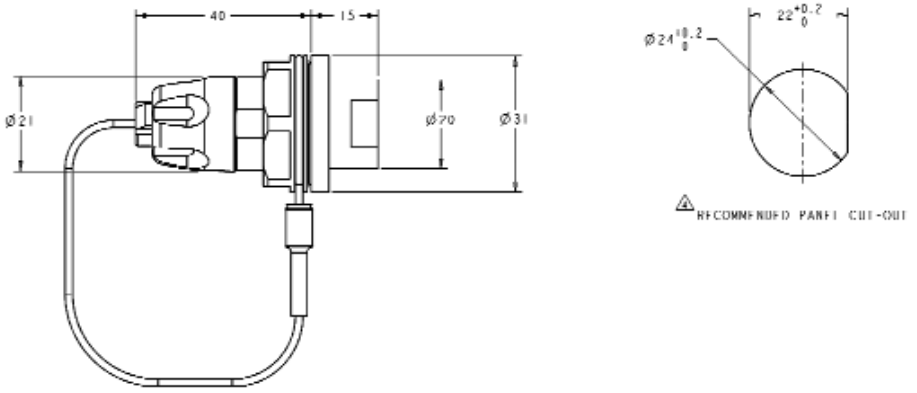
Pressure
Low Pressure — 25 kPa @ -55°C

Material and Finish
Shell Alloy — Aluminum; or nickel aluminum bronze (high saline environment)

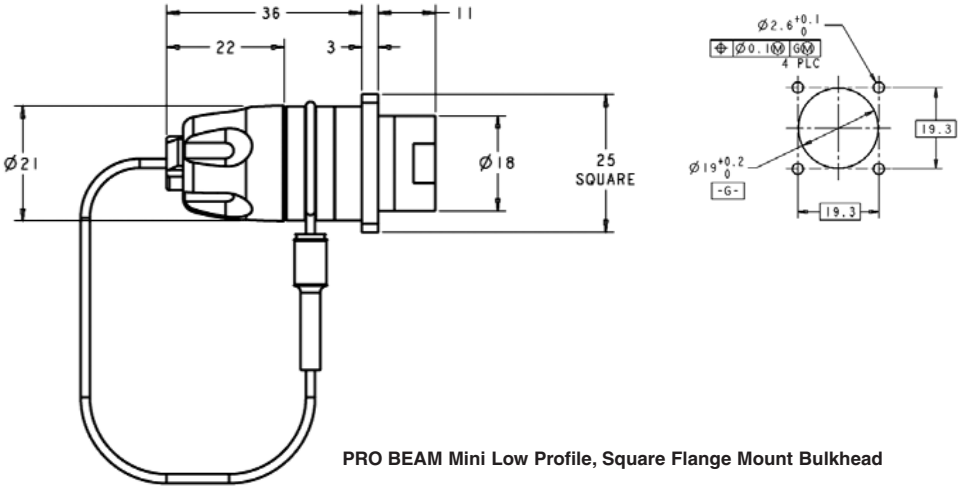
Plating (For Aluminum Shells Only) — clear hard anodized; or green chromate conversion zinc (PRO BEAM Jr. Bulkheads only)



PRO BEAM Mini Cable Connector, Plug



PRO BEAM Mini D-Hole Bulkhead



PRO BEAM Mini Low Profile, Square Flange Mount Bulkhead

Catalog 1307895
Revised 3-06

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USA: 1-800-522-6752
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UK: 44-208-420-8341

Rugged Fiber Optic Products (Continued)

PRO BEAM Sr. Connectors

Performance Specifications

Optical, Multimode

Insertion Loss, Typical — 0.7 - 1.0 dB @ 1300 nm*

Optical, Singlemode

Insertion Loss, Typical — 0.8 - 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, 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 environment)

Plating (For Aluminum Shells Only) — clear hard anodized

Bulkhead Connector Panel Thicknesses

PRO BEAM Sr. D-Hole — 6.5 mm max.

PRO BEAM Sr. Square Flange — 8.5 mm max.

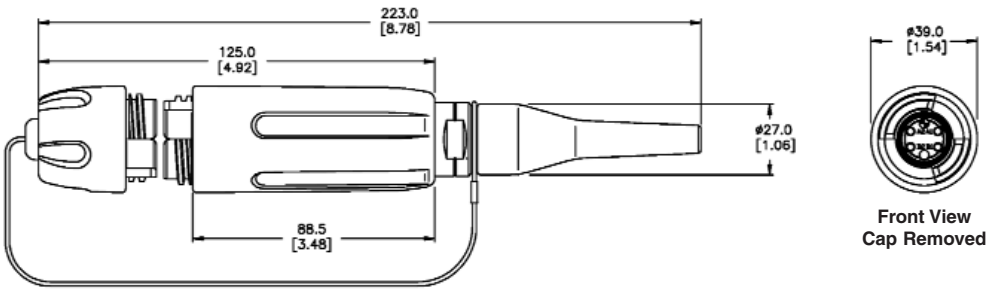
Technical Documents

Product Specifications

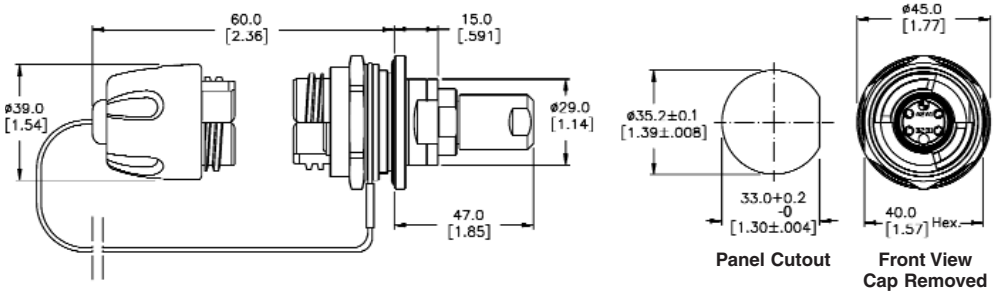
408-8799 Plug
408-8800 D-Hole Bulkhead
408-8877 Square Flange Bulkhead

Application Specification

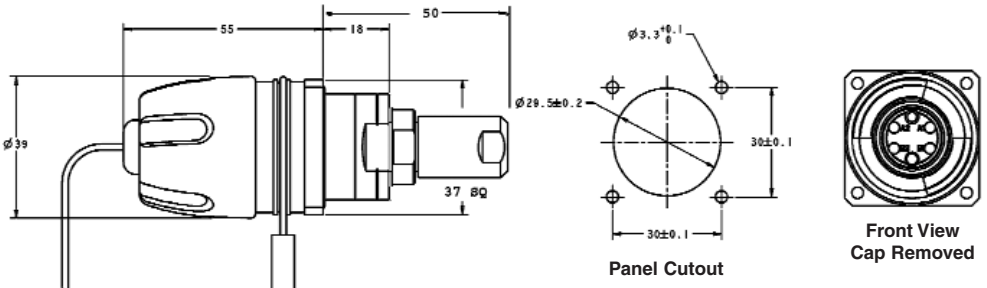
114-13122



PRO BEAM Sr. Cable Connector, Plug



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



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

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

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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 / 1300nm Multimode	1693001-1
2 x 1310nm Singlemode	1515734-2
4 x 850 / 1300nm Multimode	1693001-2
4 x 1310nm Singlemode	1515739-1

Ferrule Kits

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

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

PRO BEAM Sr. Connector Plug & Sealed Bulkhead Cable 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.
408-8828 Cleaning Procedure for EB C/A's

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

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

*Not applicable for Low Profile

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

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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
- Reels available up to 2000 meters
- Options for 500 meter reels include special backpack harnesses, a separate reel stand, or a combination reel and reel stand

NEW

PRO BEAM Jr. Termination Kit 1828650-1

Cleaning Kit 1828335-2

Featured Cable Assemblies



TFOCA to PRO BEAM Jr. Cable Assy
1828536-1◆

LPBHD w/1.8mm cable
1828454-1◆

Plug to Plug (100 meters)
6754475-2

Typical Reels and Reel Stands for Field-Deployable Cable Assemblies



1515900-1



Tactical Reel/Drum Options

Cable Reels

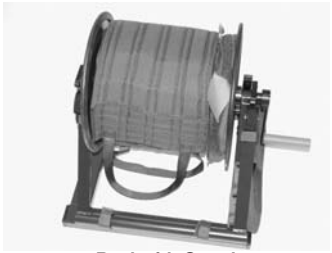
Reel Capacity (Random Lay)			
Cable Diameter		Notes/Description	Part Number
5.0mm	5.5mm		
225 M	186 M	Reel & Reel Stand Combination Reel can be detached from stand without tools	1515900-1
297 M	247 M	Reel*	1754515-1
570 M	462M	Reel*	1754515-2
998M	816M	Reel*	1754515-3
1271 M	1052 M	Reel*	1754515-4

* 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	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*

* 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 registered trademark of Amphenol Fiber Systems International.

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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
850nm 38999 III Size 11 Optical Test Kit	1918016-1
850/1300nm PRO BEAM Jr. Optical Test Kit	1918016-2

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

Protective Case
1918082-1

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

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Rugged Fiber Optic Products (Continued)

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



The Rochester Corporation

1- 4 Fiber Singlemode

Technical Data:

Attenuation	0.4 dB/km @ 1310 nm / 0.25 dB/km @ 1550 nm
Diameter	3.76 mm
Weight	24 kg/km
Recommended Bend Radius	13.2 cm
Breaking Strength	3.1 kN

1- 4 Fiber Multimode – 50 µm

Technical Data:

Attenuation	3.2 dB/km @ 850 nm / 1.0 dB/km @ 1300 nm
Diameter	3.76 mm
Weight	26 kg/km
Recommended Bend Radius	13.2 cm
Breaking Strength	3.3 kN

1- 4 Fiber Multimode – 62.5 µm

Technical Data:

Attenuation	3.0 dB/km @ 850 nm / 1.0 dB/km @ 1300 nm
Diameter	3.76 mm
Weight	26 kg/km
Recommended Bend Radius	13.2 cm
Breaking Strength	3.3 kN

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) and MILPRF 85045**
- **Flexible, water resistant, high crush resistant, and lightweight,**
- **Designs available to be resilient against radiation exposure**

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 and 62.5/125
Attenuation	≤ 3.0 dB/km @ 850nm / ≤ 1.0 dB/km @ 1300

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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**

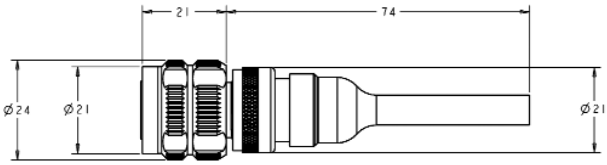
Standard Material and Finish

Shell Alloy — Aluminum

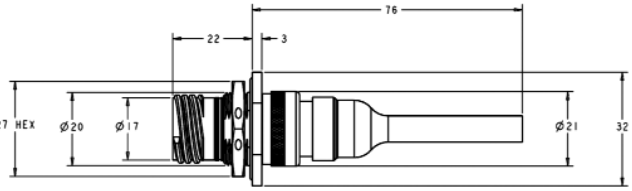
Plating — Nickel & green chromate

*Refer to customer drawing for dash number designation

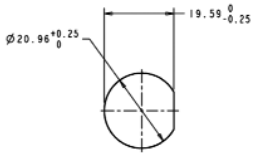
For part number details and plating options, contact your local Tyco Electronics Sales Representative.



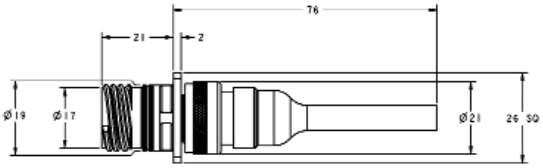
Plug Shell Kit

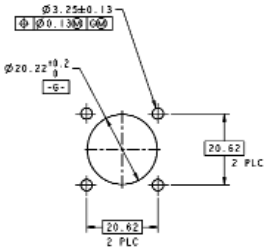


D-Hole Receptacle Shell Kit



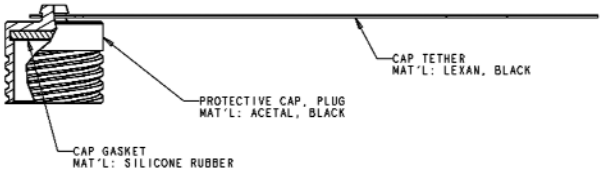
Receptacle Panel Cut-Out (shell size 11) per MIL-DTL-38999K, figure 11





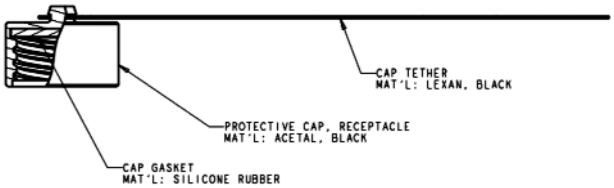
Square Flange Receptacle Shell Kit

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

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Rugged Fiber Optic Products (Continued)

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)

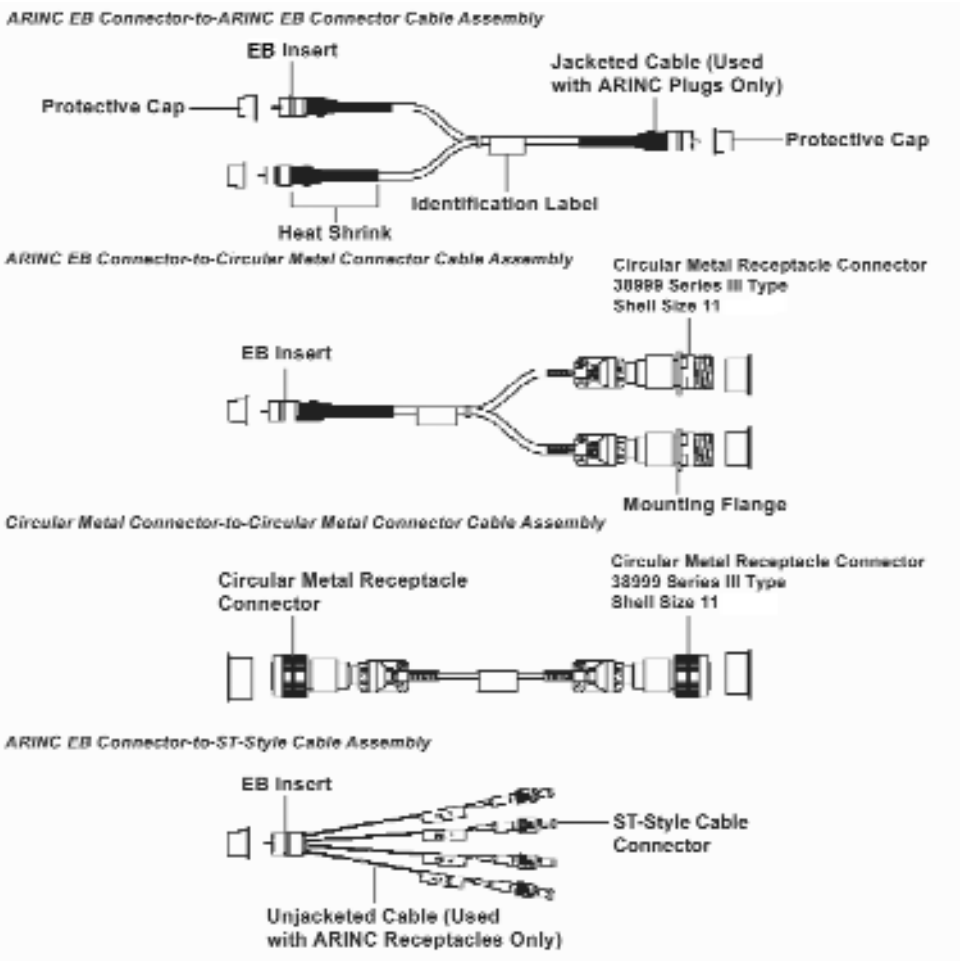
Server Interface Unit (SIU) — can use ARINC 600 Size 3 connector with up to 16 Expanded Beam fiber optic channels (four Mini-Expanded Beam inserts in cavity F)

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.

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.

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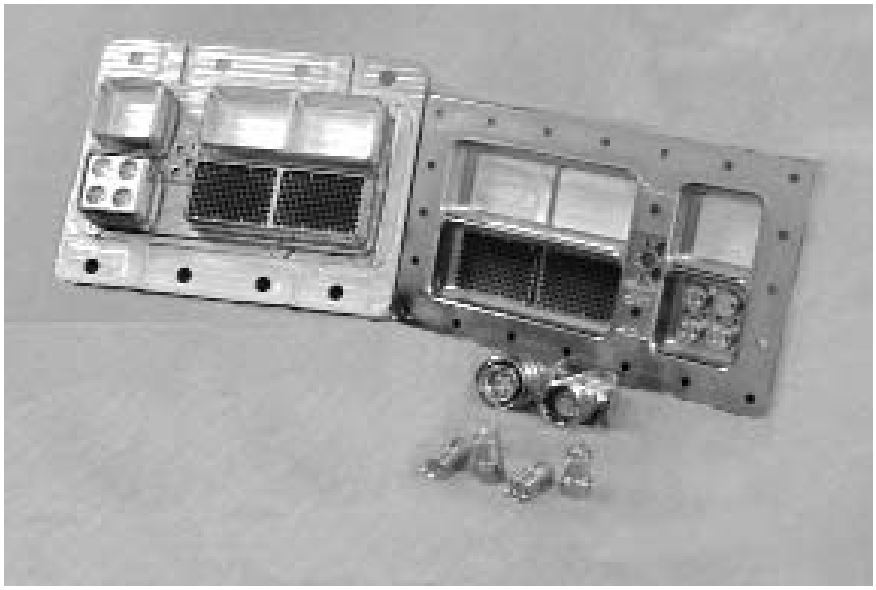
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Rugged Fiber Optic Products (Continued)

ARINC 600 AND 404

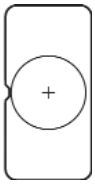
Product Facts

- For use in 100 base-FX Ethernet LAN applications per ARINC 664 and ARINC 763
- Insert holders designed to ARINC 600, Supplement 13 or to specific customer needs for Mini Expanded Beam inserts
- Drop-In Insert Holders utilize Standard ARINC 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

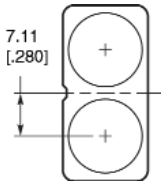


ARINC 600 Insert Holders for Mini-Expanded Beam Contacts

Size 1
Power Cavities

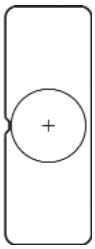


ARINC 600, 1 Position
1MP

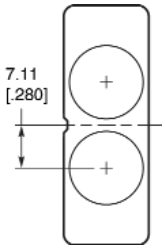


ARINC 600, 2 Position
2MP

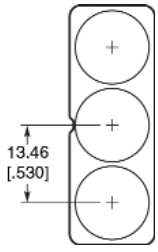
Size 1
Signal Cavities



ARINC 600, 1 Position
1MS



ARINC 600, 2 Position
2MS



ARINC 600, 3 Position
3MS

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

See next page (30) for Size 2 / 3 Power and Signal Cavities

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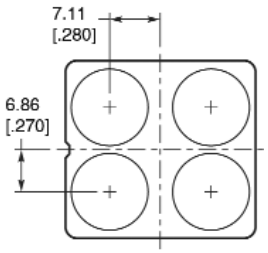
Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 52-55-1106-0800
C. America: 57-1-254-4444

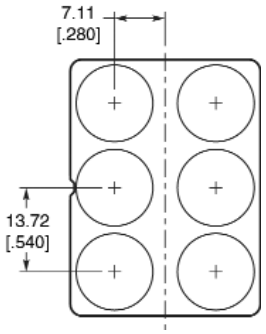
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Rugged Fiber Optic Products (Continued)

Size 2 / 3
Power and Signal Cavities

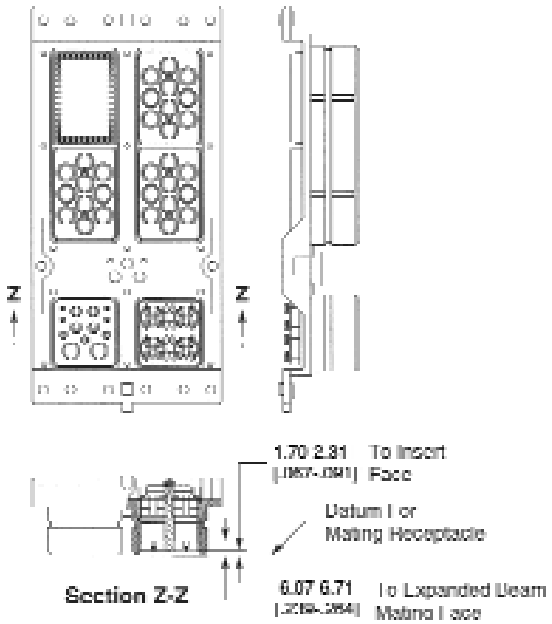


ARINC 600, 4 Position
4MP

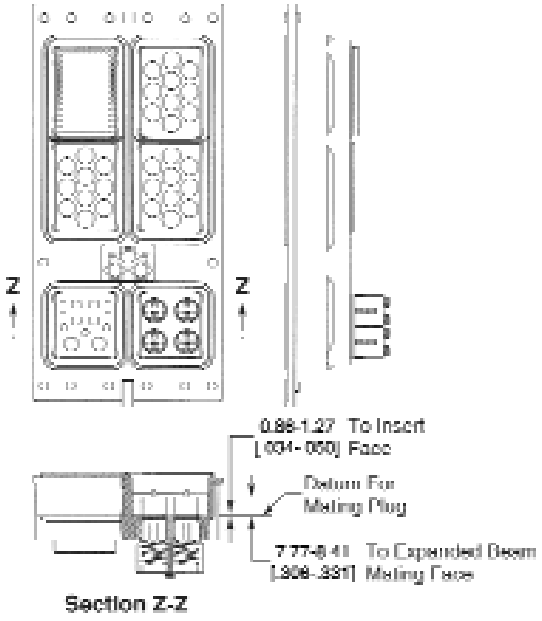


ARINC 600, 6 Position
6MS

ARINC 600 Insert Holders for Mini-Expanded Beam Contacts



Typical Layout for Plug



Typical Layout for Receptacle

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Rugged Fiber Optic Products (Continued)

Comparative on Expanded Beam Inserts

Comparative on Expanded Beam Inserts' weight and Insertion Forces 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. Connector insert set = @ 41.79 grams
- Insert mated pair PRO BEAM mini Connector 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.

LuxCis Optical Termini Notes

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Sealed Circular LC ODVA Notes

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Rugged Fiber Optic Products (Continued)

LuxCis Optical Termini

Product Facts

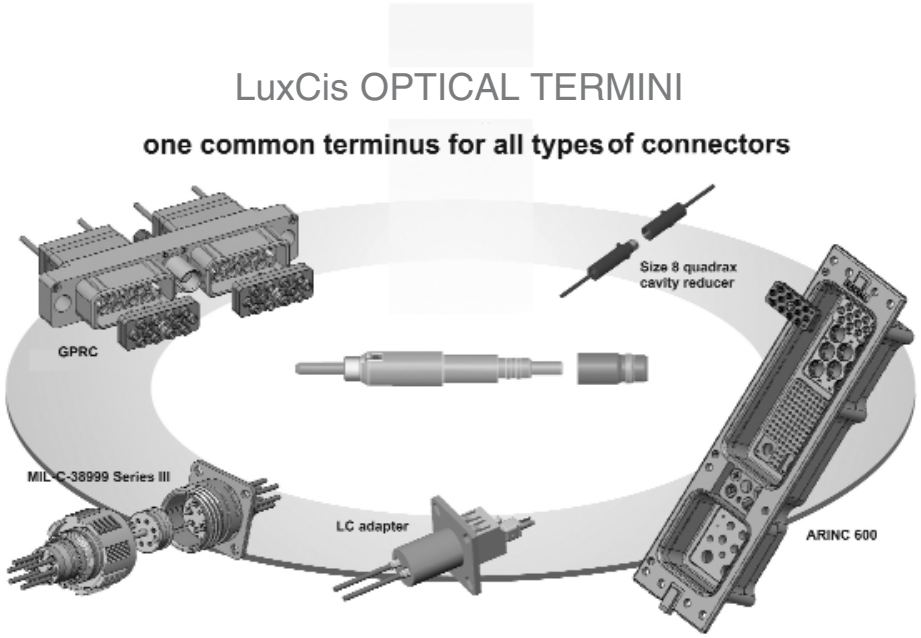
- **Optical termini for use with GPR, ARINC 600, circular MIL-DTL-38999 connectors.**
- **Industry Standard 1.25mm ceramic ferrule**
- **Compatible with 1.5-2.2mm Tight jacket and loose tube cable construction:**
  - **MT - Tight jacket cable**
  - **ML - Loose tube cable**
- **SM / MM versions**

Materials

Housings — Nickel Plated Copper
Ferrule — Zirconia
Spring — Stainless Steel
Crimp Sleeve — Nickel Plated Copper
Protective Cover — Silicone

Optical Performance

Singlemode, 1310nm/1550nm (UPC):
Attenuation, Mean — 0.15dB
Return Loss — > 50dB
Multimode, 850nm/1310nm:
Attenuation, Mean — 0.10dB
Return Loss — > 20dB



Mechanical / Environmental Performance

Test Description	Standard	HD 1.25mm Termini in GPR A & B Connector	HD 1.25mm Termini in 38999 Connector	HD 1.25mm Termini in ARINC 600 Connector
Thermal Shock	SAE-AS-13441 met 1003.1	-55C /+100C	-55C /+100C	-55C /+100C
Temperature Life	TIA/EIA 455-20A	500h @ +100C	500h @ +100C	500h @ +100C
Vibration	TIA/EIA 455-11	8h/axis 3.8g²/Hz 43 G rms	8h/axis 3.8g²/Hz 43 G rms	8h/axis 0.2g²/Hz 16.4 G rms
Shock	TIA/EIA 455-14A	300 G - 3ms	300 G - 3ms	50G - 11ms
Mate/Unmate (GPR/ARINC 600)	SAE-AS-13441 met 2016	100 Cycles	N/A	100 Cycles
Mate/Unmate (38999)	TIA/EIA 455-21A	N/A	500 Cycles	N/A
Maint. Aging	SAE-AS-13441 met 2002-1	10 Cycles	10 Cycles	10 Cycles
Salt Spray	SAE-AS-13441 met 1001.1 cond C	96 hr	500 hr	48 hr
Cable Ret. (1.8mm)	SAE-AS-13441 met 2009-1	68N	68N	68N
Humidity (GPR/38999)	TIA/EIA 455-5 met B7A	10 cycles / 24h 90% RH -25C/+65C	10 cycles / 24h 90% RH -25C/+65C	N/A
Humidity (ARINC 600)	TIA/EIA 455-5 met B	N/A	N/A	10 cycles / 24h 90% RH -25C/+65C
Altitude Imm.	TIA/EIA 455-15	10,000 ft (69.6kPa)	10,000 ft (69.6kPa)	10,000 ft (69.6kPa)

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

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Rugged Fiber Optic Products (Continued)

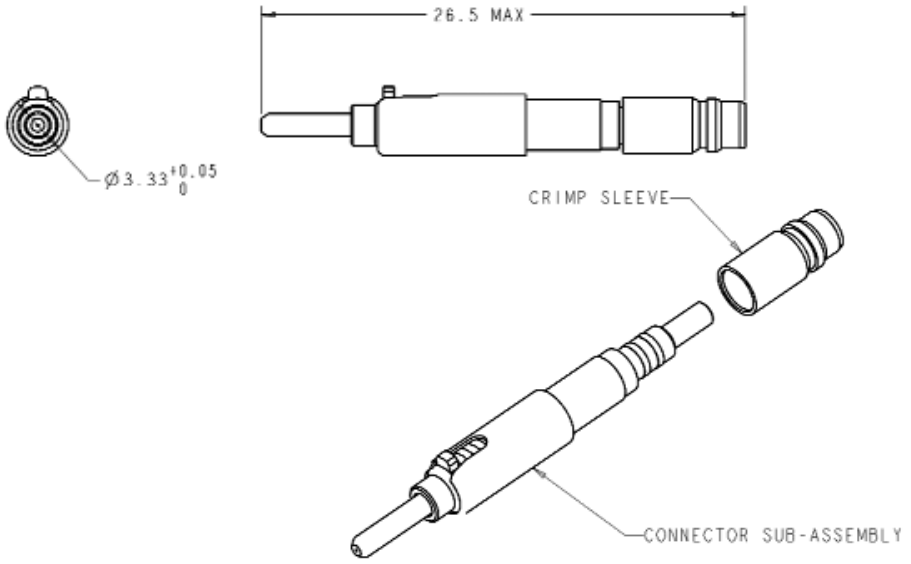
LuxCis Optical Termini

There are three types of LuxCis Optical Termini available dependent upon cable structure.

Tyco Electronics has multiple connector types/families available for the LuxCis Optical Termini System.

These are:

- **General Purpose Rectangular Connectors**
  - **F5 & F12 Inserts**
- **MIL-DTL-38999 connectors n 13-04, 15-06, 21-16**
- **ARINC 600**
  - **F12 combinations and F36**
- **Quadrax Cavity Reducers**
- **Motherboard & Daughtercard Solutions**



LuxCis Optical Termini Part Numbers

Cable Dia.	Cable Structure ML (loose & tight) MT (ultra tight)	S/M Fiber 125,3 µm PC/UPC	S/M Fiber 125,3 µm APC	M/M Fiber 128 µm PC
0.9mm Buffer	—	*	*	*
1.5 - 2.2mm	ML	*	*	1828199-1
1.5 - 2.2mm	MT	*	*	1828200-1

Consult your local Tyco Electronics Sales Representative for additional options.
* Contact Tyco Electronics for availability.

Accessories	Part Number
Dust Cap (bag of 10)	1828221-1

Connector Options:

For part numbers, details, and / or additional connector types and arrangements, contact your local Tyco Electronics Sales Representative.

Cable Structure

	Loose Structure	Tight Structure	Ultra Tight Structure
Movement between fiber & 900 µm buffer	Yes	No	No
Movement between 900 µm & cable jacket	Yes	Yes	No

Adapters

Type	Version	Alignment Sleeve	Part Number	Dim.
LuxCis Termini to LuxCis Termini	Simplex Bulkhead Feedthrough Type	Ceramic Zirconia	1828996-1	Fig. 1
LuxCis Termini to LuxCis Termini	Simplex Straight	Ceramic Zirconia	1828997-1	Fig. 2
LuxCis Termini to LC	Simplex LC Panel Cutout	Ceramic Zirconia	1828979-1	Fig. 3
LuxCis Termini to LC	Duplex LC Panel Cutout	Ceramic Zirconia	1828980-1	Fig. 4
LuxCis Termini to LC	Duplex MIL-DTL-38999 Panel Cutout	Ceramic Zirconia	1828995-1	Fig. 5

ASSEMBLY CAPABILITIES
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Tools

Description/Function	Part Number
Metal Extraction Tool (M81 969/1-03)	91066-3
Plastic Extraction Tool (M81 969/1403)	M81969/14-03
Daniels Right Angle Insertion Tool	DAK83-16*
Daniels Right Angle Removal Tool	DRK83-16*

* Contact Daniels Manufacturing

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

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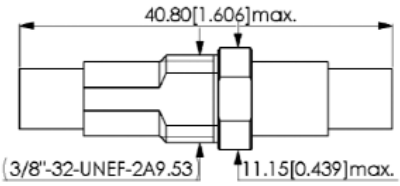
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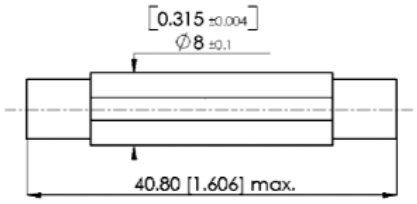
Rugged Fiber Optic Products (Continued)

NEW

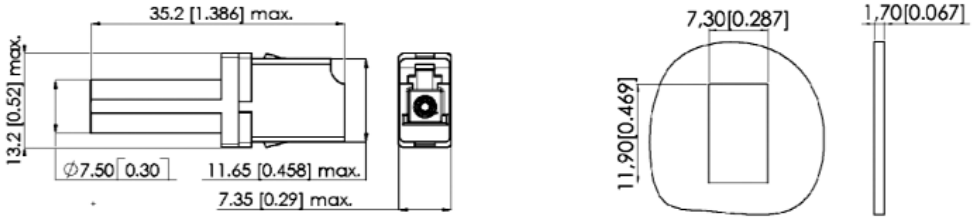
LuxCis Optical Termini Adapter Dimensions



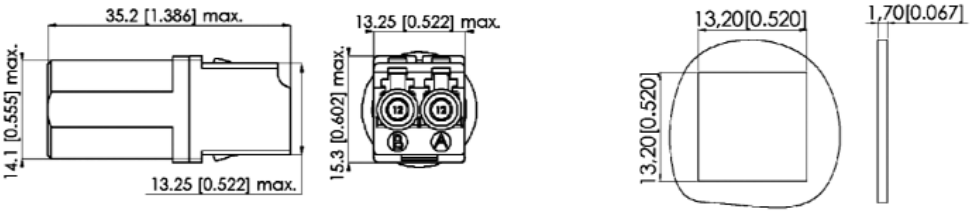
Terminus to Terminus Bulkhead Feedthrough



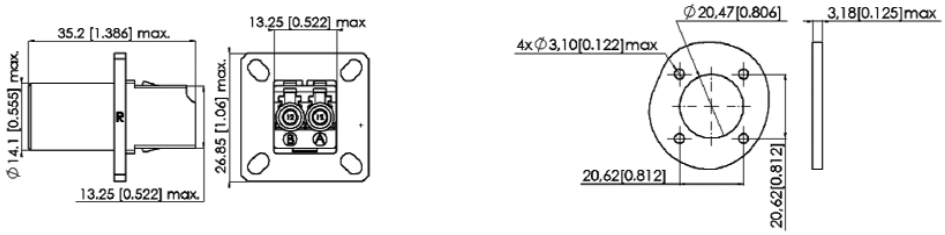
Terminus to Terminus Straight



Terminus to LC Simplex



Terminus to LC Duplex, LC Panel



Terminus to LC Duplex, MIL-DTL-38999 Panel Cutout

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Rugged Fiber Optic Products (Continued)

Most of the tools included in the Termination Kit are commonly used in the fiberoptic industry (strippers, cutting pliers and all accessories for fiber and cable preparation). The items in the table below are specially made for the LuxCis Optical Termini System. Their use is highly recommended to achieve mechanical and optical performances.

NEW

LuxCis Optical Termini Termination Kit

1828644-1

Description	Qty
Ceramic scissors	1
Cutting pliers for aramid members (HS 6000)	1
T-stripper outer jacket stripper	1
Miller primary stripper (for coating 900µm)	1
Waste container	1
Inner ferrule insertion and shaping tool	1
Alcohol dispenser	1
Bag of 6 353 ND epoxy resin	1
Resin injector	1
Pack for resin injector (capillaries)	1
Crimping tool	1
Curing oven	1
Scoring blade	1
Bag of 10 abrasive strips 12µm	1
Bag of 10 cleaning pipes 1.25 mm	1
Bag of 10 cleaning sticks 1.25 mm	1
Manual Polishing tool (standard LC)	1
Soft rubber polishing base	1
Bag of 10 polishing 3 µm films (Alumina)	1
Bag of 10 polishing 1 µm films (Alumina)	1
Bag of 10 polishing 0.3 µm films (Alumina)	1
Bag of 6 pockets cleaning papers	1
Microscope X100	1
Resin applicator	1
Metal insertion and extraction tool ((Mil M81 969/1 -03)	1
Plastic insertion and extraction tool (Mil M81 969/14-03	1
Hexagonal key 5/64 inch(2mm) / flats	1

Other accessories available include ruler, tweezers, cleaning tips, roller adhesive tape, moss cable support, goggles, thermometer, permanent ink markers. Necessary material not included in the kit: Alcohol, canned air, and clean cloth.

NEW

LuxCis Optical Termini Service Tool Kit (Inspection, testing & cleaning)
1828335-1

LuxCis Optical Termini Service Tool Kit (Cleaning only)
1828335-2

LuxCis Optical Termini Service Tool Kit (Testing only)
1828335-3

LuxCis Optical Termini Service Tool Kit (Hand Held Digital Probe Kit)
1828335-4

Tool Kit Contents

Item #	Comp Part Number	Description	-1	-2	-3	-4
1	1278540-1	Soft Carry Bag	1	—	—	—
2	1754767-1	200x Microscope	1	—	—	—
3	1754765-1	LC Microscope adapter	1	—	—	—
4	6374613-5	LC - SC 50/125 cable assembly	2	—	—	—
5	6374615-5	LC - SC 62.5/125 cable assembly	2	—	—	—
6	1828355-1	1.25mm swab	2	2	—	—
7	1828354-1	Connector Cleaning Pad	2	5	—	—
8	1828349-1	Optical Loss Test Set	1	—	1	—
9	1828350-1	OLTS 1.25 mm detector cap	1	—	1	—
10	1828352-1	Visual Fault Locator	1	—	1	—
11	1828353-1	VFL 1.25 mm Adapter	1	—	1	—
12	1828465-1	Label, Service Kit	1	—	1	—
13	1918222-1	Inspection, Hand Held Digital Probe Kit	—	—	—	1
14	1918223-1	1.25 mm Adapter, Digital Probe	—	—	—	1

-1 inspection, cleaning & testing
-2 cleaning
-3 testing
-4 Hand Held Digital Probe Kit

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

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Rugged Fiber Optic Products (Continued)

Sealed Circular LC ODVA

Product Facts

- IP67 rated to ensure protection from dust and water immersion
- LC connector qualified to Telcordia GR-326 and TIA/EIA 568B.3
- Temperature range of –408C to 858C
- Bayonet-style mechanical lock
- Flame retardant materials per UL 94 V-0
- Dual mounting bulkhead design
- Singlemode and multimode fiber
- LC to LC internal to the box Jumpers
- ODVA Compliant Plug to X interface on tactical with break out
- ODVA Compliant Plug to Plug on tactical cable
- Build to customer need

Applications

The LC ODVA Compliant is ideal for:

- Harsh environments where chemicals, corrosive gases and liquids are commonplace
- Inside and outside industrial plant and equipment that interface with industrial Ethernet networks
- Remote interface applications such as towers and antennae as well as FTTX in PON and at the home applications
- Mobile routers and internet hardware

ASSEMBLY CAPABILITIES
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Plug Part Numbers:
1828618-1 (Multimode)
1828618-2 (Singlemode)

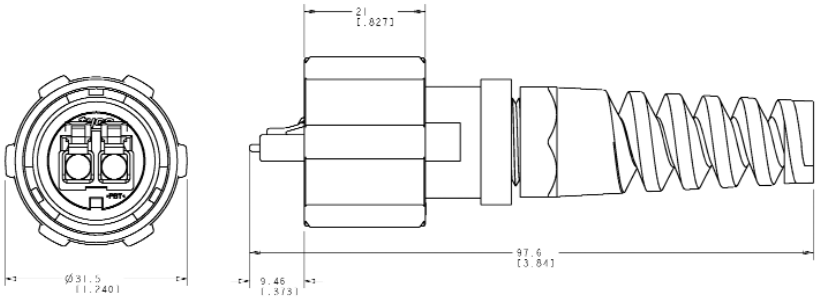
Receptacle Part Numbers:
1828619-1 (Multimode)
1828619-2 (Singlemode)

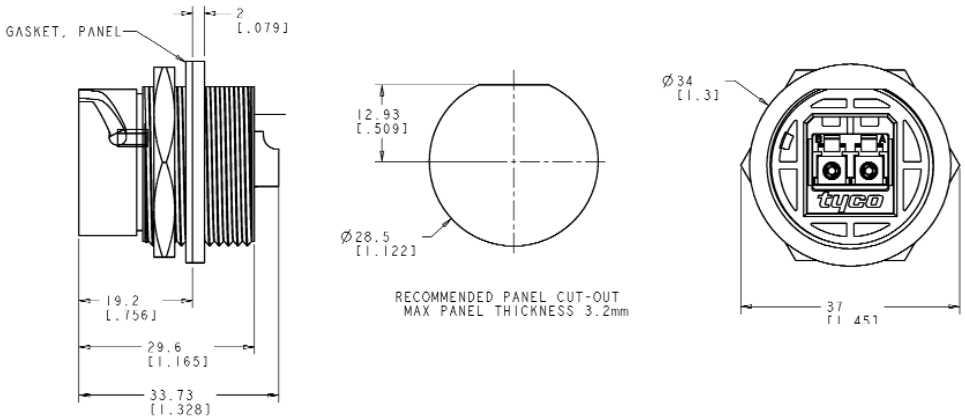
Featured Assembly Base Part Numbers:

1828708◆	1828709◆
1828710◆	1878711◆

Plug & Receptacle Cap Part Numbers:

Plug Cap	1828740-1
Receptacle Cap	1918177-1





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Rugged Fiber Optic Products (Continued)

Rugged Media Converter & Ethernet Link Extender Solutions

NEW

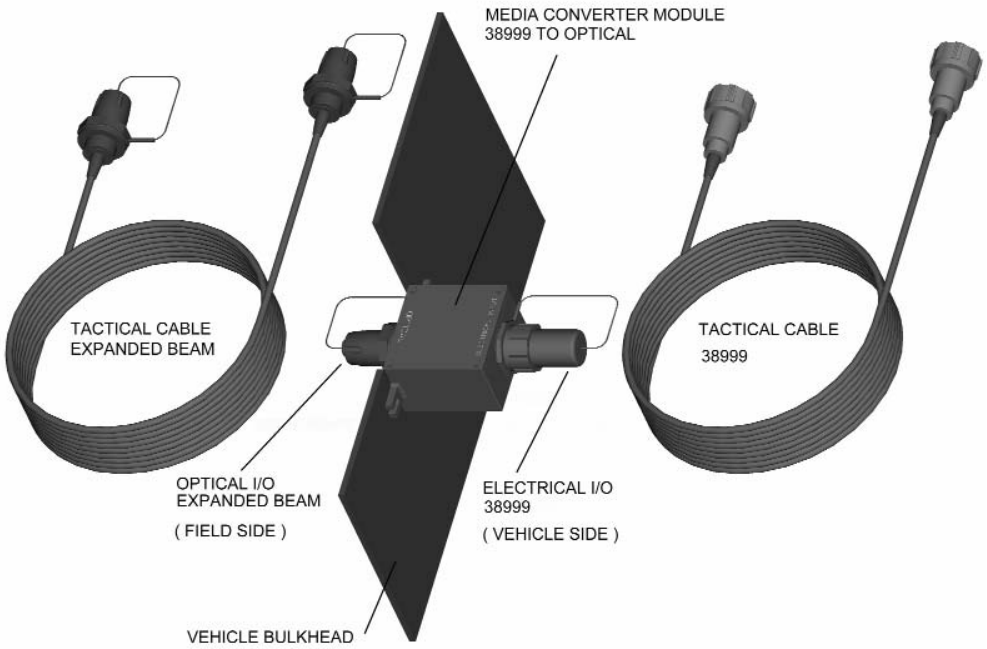
Harsh Environment Optical Media Converter Assemblies allowing blind mate field applications over one, two, or four fibers

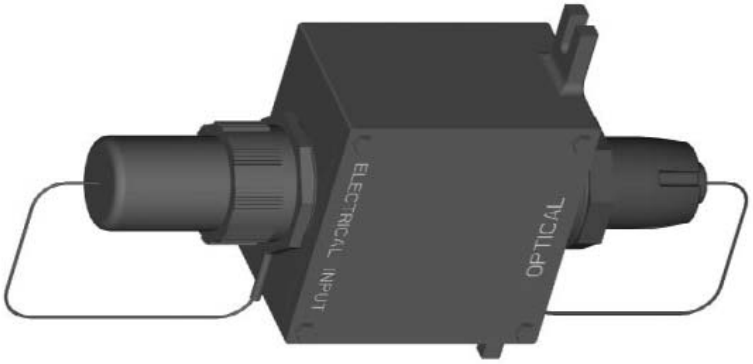
Tyco Electronics offers solutions for Harsh Environment applications of Ethernet Media Converters.

This page demonstrates Tyco Electronics' capabilities for Advanced Optical Modules. These include Fast, Gigabit, and Ethernet Link Extenders.

For additional Advanced Optical Modules, see Fiber Management & Packaged Solutions, Catalog 1307895, Section 3.

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 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

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Email: n@nsistems.ru

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