

## Clearfield® Training Programs



Speeding deployments reduces labor costs and helps the on-time delivery of your fiber optic project. Clearfield's training programs give you the knowledge needed to deploy faster.

Clearfield tailors training to suit customer deployments with the goal of simplifying and supporting your work in the field. In addition, certification and training boosts workforce satisfaction and improves first installation success.

#### **Clearfield College E-Learning Platform**

Self-guided courses offer an overview of Clearfield products and how they are utilized within a fiber network build.

- Clearfield product experts will guide you through the features and network applications of our integrated product platforms.
- Gain a greater understanding of how Clearfield product designs simplify, speed and save money on fiber installations.
- Download a Certification of Completion when you've finished.

#### **Clearfield Certified Partnership Training**

In-person training, presented by Clearfield's Senior Manager for Technical Support, is designed exclusively for contractors of fiber deployments and tailored to specific contracting needs.

 Clearfield's Certified Partnership Training Program provides extensive training of the proper installation techniques for Clearfield's "fiber to anywhere" product platform. Choose training on inside plant, outside plant or both. Product training = technical confidence for faster field deployments.

#### Why Get Certified?

- Learning new techniques and strategies using Clearfield's modular product platforms equips the contractor and the provider to experience faster connections, saving both time and money.
- BICSI Continuing Education Credits



#### **FOA Training Program**

FOA Training promotes professionalism in fiber optics through education, certification and standards. Clearfield is both a corporate member to the FOA and an approved FOA training school (#375). This 3 day classroom and hands-on training workshop offers a curriculum ranging from fiber basics to complex fiber technologies that will further expertise in the field. Whether for the inside plant, outside plant and/or the access network, Course #101 will offer the technician:



- Highly respected qualifications and certification in the field of fiber optics that stays with the technician regardless of the employer.
- Knowledge of the proper ways to prepare cables/fiber for termination, fiber management and fiber protection.
- Experience and skills with industry tools and test equipment, in addition to in-depth presentation of Clearfield products and applications.

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Clearview Black

Clearview xPAK

Clearview Blue Mounting Instructions

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#### **Inside Plant Solutions**

#### FieldSmart® Fiber Crossover High Density (FxHD)

**FxHD Frames** 

**FxHD Tie Panel** 

#### FieldSmart Fiber Crossover Distribution System (FxDS)

FxDS Frame Kit

FxDS Standard Frames

**FxDS** Accessories

Interbay Cable Management Panels

Isolation Pad

Crossover Troughs

Active Gear Troughs

Slack Management Troughs

Staging Plate Trough

FxMP Frame Clamp Kit and Splice Deck Clamp Kit

**DIN Rail Cassette Mounting Kit** 

#### FieldSmart and SmartRoute Panels

Fiber Crossover Multi Purpose (FxMP) Patch Panels

FxMP Tie Panels

FxMP Optical Component Chassis (OCC)

FxDS Optical Component Chassis (OCC) - LGX

SmartRoute Infinity Panel

#### FieldSmart® Specialty Panel Solutions

Small Count Delivery Panel - Rack

Small Count Delivery Panel - Cabinet

#### StreetSmart™ Specialty Panel Solutions

Fiber Entrance Cabinet (FEC) - 144

Fiber Entrance Cabinet (FEC) - 288

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## **Table of Contents - Outside Plant Products**



#### **Outside Plant Solutions**

#### FieldSmart Fiber Distribution Hub (FDH)

PON Cabinet (96-Port)

PON Cabinets (144, 288, 432, 576 and 1,152 Ports)

PON Cabinet (1152-Ports)

Cross-Connect Cabinets (432 and 864 Ports)

Cross-Connect Cabinet (1728-Ports)

**Accessories** 

Pole Mount Kit

Cabinet Entrance Expansion Kit

Deep Socket Wrenches

Mid-Span Opening Feed-Through Plate Kit

Cassette - Cabinet Adapter Brackets

LGX - Cabinet Adapter Brackets

Cable Protection Boot

Riser Kit

#### StreetSmart™ Pre-Assigned FDH Cabinet

#### **FieldSmart Fiber Active Cabinets (FAC)**

**FAC 400** 

**FAC 900** 

FAC 3200

FAC 5400

#### FieldSmart FiberFlex Cabinet

FiberFlex 2000

FiberFlex 3000

#### StreetSmart Aerial FDH

Aerial FDH - 144

Aerial FDH - 288

#### CraftSmart FiberFirst Pedestal

CraftSmart FiberFirst Metallic Pedestal

#### **Delivery Point (FDP) - Pedestals**

96 Port PON in Pedestal Insert Kit or Direct Bury

96 Port PON in Pedestal Insert Kit/Vault Mount

144 Port PON in Pedestal Insert Kit or Direct Bury

144 Port PON in Pedestal Insert Kit/Vault Mount

Splice Only Pedestal

#### **CraftSmart® Fiber Protection**

Fiber Protection Vaults (FPV)

Fiber Protection Boxes (FPB)

\* Clearfield Building Block Products

## **Table of Contents - Access Products**



#### **Access Products**

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Outdoor 24 Port Wall Box

Outdoor 48 Port Wall Box

Indoor 36 Port Wall Box

Indoor 96 Port Wall Box

Indoor 144 Port Wall Box

Indoor 144 Port PON Wall Box

Indoor 288 Port Wall Box

#### YOURx® Flex Box

FieldShield® StrongFiber Drop Wheel

**SmartRoute Plate** 

#### FieldSmart Fiber Delivery Point (FDP) - Wall Boxes

Small Wall Box for xPAK

Macro/Small Cell Wall Box

Large Wall Box for Cassette

StreetSmart Mini FEC Wall Box

Accessories

Strain Relief 1/2" Cable

Strain Relief 34" Cable

Sealcon Adapter 34"

Sealcon Adapter 1"

1" Grommet

Hole Plug

Velcro

Security Bit

Tape

#### StreetSmart™ Fiber Hand-Off Box

Fiber Hand-Off Box

Small Count Fiber Hand-Off Box

FieldSmart SCD TAP Box

FieldSmart Mini TAP Box

CraftSmart® Test Access Point (TAP) Box

**CraftSmart TAP Splice Box** 

CraftSmart Fiber Outlet

#### **Home Deployment Kits**

CraftSmart TAP-Splice Home Deployment Kit FieldSmart Mini TAP Home Deployment Kit FieldSmart SCD-TAP Home Deployment Kit

#### SeeChange Terminal

SeeChange Hardened Fiber Assemblies

#### **YOURx Multi-Purpose Terminal**

#### **YOURx-Terminal**

Accessories

Top Mount Bracket Kit for YOURx-Terminal Bottom Mount Bracket Kit for YOURx-Termina

Aerial/Strand Mounting Kit for YOURx-Termina,

YOURx FlexPort

Slack Storage Reel for YOURx-Terminal

YOURx FlexPort Filler Plug

YOURx Expansion Repair Kit

YOURx Pulling Tool

FieldShield Field Installable FlexConnector

Removal Tool

#### **YOURx-Aerial Terminal - Patch and Splice**

YOURx-Aerial Terminal Accessories

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## Table of Contents - FieldShield® Products



#### FieldShield Fiber, Drops and Microduct

#### FieldShield Fiber

Pushable Optical Fiber

SC and LC Pushable Assemblies

MPO Pushable Assemblies

Pushable 3 mm Optical Fiber with 900 µm Tight Buffer

Fiber

StrongFiber

StrongFiber Deploy Reel

Accessories

Pull Sock

YOURx Pulling Tools

Rotary Fiber Tube Cutter

#### CraftSmart® Splice-On Connector (SOC)

#### FieldShield® Drops

Pushable Optical Fiber

FLEXdrop<sup>™</sup> (UL Listed Plenum)

FLEXdrop SC and LC Pushable Assemblies

FLEXdrop Deploy Reel

D-ROP - Direct Bury 10/6 mm

D-ROP - Riser Rated 8.5/6 mm

D-ROP - 7/3.5 mm

**FLATdrop** 

#### FieldShield Field Installable FlexConnector™

#### **FieldShield Microduct**

Direct Bury 10/6 mm Microduct

Direct Bury 14/10 mm Microduct

Direct Bury 14/10 mm Black Microduct

Plenum 10/6 mm Microduct

Plenum 12.7/10 mm Microduct

Riser Rated 10/6 mm Microduct

Riser Rated 14/10 mm Microduct

Aerial 10/8 mm Microduct

Aerial 14/10 mm Microduct

Accessories

Rotary Duct Cutter

Duct Cutter

De-Burring Tool

Microduct Proofing Mandrel

Replacement Pull String

Airtight Coupler

Airtight Transition Coupler

End Cap

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Microduct Pulling Carrots

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Indoor Bend-Insensitive Fiber Jumper Cables

Indoor Traceable Fiber Jumper Cables

Outdoor Ruggedized Fiber Jumper Cables

Indoor-Outdoor Bend-Insensitive Fiber Jumper Cables

MPO Assemblies

**Outside Plant Fiber Assemblies** 

**Distribution Assemblies** 

**Breakout Assemblies** 

**Drop Node Assemblies** 

90 Degree Drop Node Assemblies

FTTH Drop Cable Assemblies

High Fiber Ribbon Breakout Kit

#### **WaveSmart® Optical Components**

**HD** Splitter

Premium Ruggedized Splitter

Industry Standard Splitter Module

**Splitters** 

Wave Division Multiplexing (WDM)

VOA and Patch Cord Splitter

1/2 Wide LGX Modular Optical

Components Build-Out Attenuators

#### **Copper Products**

**DS1** Copper Cables

Telco Copper Cables

CAT5e and CAT6 Patch Cords

#### **Engineering Standards/Technology Overview**

Inspect then Connect Cleaning Instructions

MSO Applications - Panels and Splitter Scenarios

**Grounding Recommendations** 

Optical Splitter Product Notes

WDM Product Notes

Fiber Optic Assemblies

**End-Face** 

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## Introduction to Clearview®

#### Cassettes and xPAK —



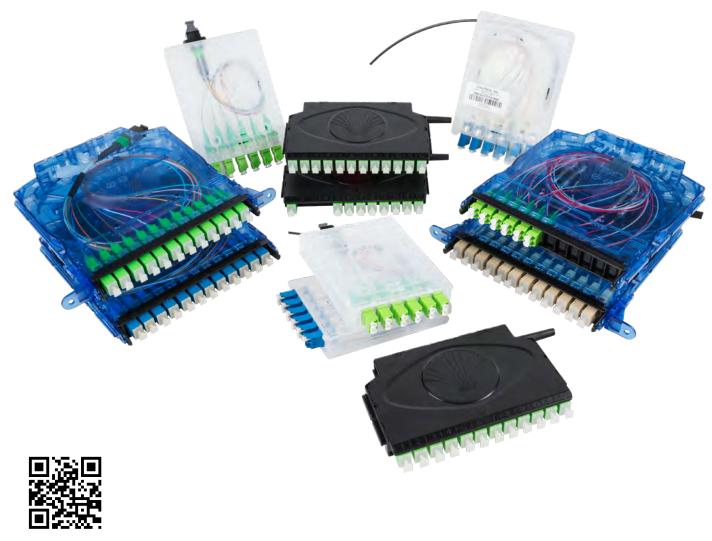
At the heart of everything we do is our patented Clearview Cassette. Clearview Cassette products offer a unique, single-architecture, modular fiber management platform designed to lower the cost of broadband deployment and maintenance. This is accomplished by consolidating, protecting and distributing incoming and outgoing fiber circuits, allowing our customers to scale their operations as their subscriber revenues increase.

Clearview Blue and Clearview Black, are the core building block of every product within the FieldSmart® fiber management system. At Clearfield®, we believe fiber management needs to be different. Rather than using a fixed approach, we take a modular approach. Utilizing the Clearview Cassette provides our customers a scalable and flexible architecture that can take you from the CO all the way to the demarc. To accomplish this objective, fiber management should be designed from "the inside out."

FieldSmart is the only fiber management platform designed around a single architecture - the Clearview Cassette family of products. FieldSmart supports a wide range of panel and cabinet configurations, densities, connectors and adapter options for the inside plant, outside plant and access network. Customers benefit from Clearfield's innovative, scalable and modular designs that allow you to "grow-as-you-go."

Clearfield's portfolio of cassette products can be configured for various applications. Patch only, patch and splice (Clearfield's in-cassette splicing solution), MPO, plug-and-play and passive optical components.

Delivering the most scalable fiber management platform in the industry, Clearfield ensures your investment in capital equipment grows alongside your take rates. With Clearfield, deployments are quicker, required inventories are reduced and technical training is virtually eliminated.



Clearview Cassettes

## Introduction to Clearview®

#### Cassettes and xPAK –



The Clearview Cassette building blocks are well suited for multiple applications in both inside plant, outside plant and access environments. For inside plant environments, high density solutions save floor space, which is always a goal in a central office, headend, data center and customer premise facility. In the outside plant environments, the Clearview Cassette can be deployed in OSP cabinets, pedestals, wall boxes and the FieldSmart® Makwa™.

Configurations are available that support patch and splice (Clearfield's in-cassette splicing solution), patch only, MPO and optical component scenarios, allowing many different engineering configurations to be met using a single platform. A common platform used in multiple applications helps with technician training, making them ready to perform their work regardless of the installation environment. This saves time during initial installation, turn-up of new services or in critical repair situations.

#### **Clearview Blue**

The small footprint of the Clearview Blue design minimizes space requirements thereby reducing the cost of deployment. Integrated slack management and cable routing provides for superior performance with minimal risk of fiber damage. It incorporates flexibility and scalability with configuration options supporting tool-less installation, in-cassette buffer tube/ribbon slack storage and front access only designs. Reducing the overall footprint of the fiber management element reduces real estate costs and improves density without compromising critical design elements of access, bendradius protection, physical fiber protection, and route-path diversity.



#### Clearview Black

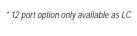
The Clearview Black Cassette is Clearfield's most compact building-block technology and retains the same cost saving features of Clearfield's current generation of cassettes, including modularity and scalability in increments of 12 fibers using industry standard SC and LC singlemode connectors. In addition, critical design elements of fiber access, bend-radius protection and route-path diversity have been maintained while occupying nearly 50% less overall size. The smaller packaging allows Clearview Black to be integrated into other Clearfield solutions like the below grade, FieldSmart Makwa. Clearview Black uses a tool free, snap-in-place mounting feature. With more and more non-specialized technicians being employed in the workforce, the scalable platform that provides the ability to "grow-as-you-go" without any installation tools is increasingly valuable.



#### **xPAK**

Engineered to land small port count fiber assemblies and optical components as conveniently and inexpensively as possible, the Clearview xPAK simplifies fiber management to the level of a consumable good. Clearview xPAK is single-piece element in which all required components for fiber protection are integrated. It is shipped flat and simply folds to shape.

The Clearview xPAK is a small footprint two, four, six or  $12^*$  port cassette. The kit comes equipped with a flat cassette, adapters, 2, 4, 6 or  $12^*$  fiber  $900 \,\mu\text{m}$  ½ meter assembly, splice sleeves, strain relief boot, grommet tape and zip ties.





## Clearview Blue



#### **Application**

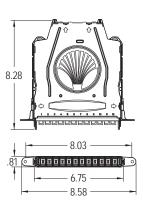
Based on the choice of adapter style, the Clearview Blue provides 12-24 ports of connectivity, scaling one cassette at a time.

• Deployed with SC or LC connectors for 12-24 ports of connectivity, a single the Clearview Blue Cassette provides for patch and splice (Clearfield's in-cassette splicing solution), patch only (stubbed) or plug-and-play (MPO/MTP) configurations in any network environment. A dual high 24 fiber Cassette offers additional splicing capacity for SC port count requirements greater than 12, utilizing the Clearview Expansion Ring to provide further flexibility and scalability within the same footprint. Dual MPO/MTP access is available on either side of the cassette. Additional optical components integrate into the cassette housing, supporting any input/output combination of splitting, mux, and demux strategies desired.

#### **Description**

Clearview Blue Cassettes are the core building block of nearly every product within the FieldSmart® fiber management system. Clearview Blue incorporates flexibility and scalability, within multiple configuration options, tool-less installation, in-cassette buffer tube/ribbon slack storage, and front access-only designs. Reducing the overall footprint of the fiber management element reduces real estate costs and improves density without compromising the critical design elements of access, bend-radius protection, physical fiber protection and route-path diversity.

Clearview Blue is a five component, tool-less system made up of a top cover, splice tray, buffer tube/ribbon slack storage, cable assembly tray and adapter plate. Parts snap together to support desired application requirements. All types of fiber cable construction can be integrated within the cassette to support in-cassette splicing, patch only, passive optical component hardware and plug-and-play scenarios.



#### **Features and Benefits**

#### Integrity

- · Termintions designed, tested and certified to GR-326 and GR-1435
- Cassette designed, tested & certified to GR-63 Flame Spread & Chemical
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Supports industry standard SC, LC and MPO/MTP singlemode and multimode connectors
- Supports all fiber construction types (distribution, tight-buffer, loose tube and ribbon)

#### **Protection**

- Designed to handle the toughest operating environments, provides flexibility and reliable performance
- · Slack stored, bend-radius protected and secured against accidental physical damage from handling
- Integrated buffer tube storage removes the need for traditional slack storage baskets, reels and troughs and aligns individual buffer tube to the cassette

#### Access

- · Tool-less, snap together design makes turn-up time even faster
- · Eight buffer tube/cable entry/exit paths allow the technician a high degree of flexibility in deployment
- Ability to store 10 feet (3.05 m) of exposed buffer tube in the in-cassette buffer tube location
- Translucent housing provides quick visual inspection, while removable adapter plate allows for easy front access for maintenance, cleaning and troubleshooting
- Front-access to pre-terminated assemblies with Clearview removable adapter plate
- Integrated in-cassette buffer tube slack storage aligns slack to individual cassettes maximizing density by reducing real estate requirements

#### Investment

- · "Grow-as-you-go"
- · Scalable building block to align capital expenditures to customer take rates
- · Modular design allows ports to be configured to user-defined application requirements
- · Patch and splice integrated splice tray removes the need for separate chassis space or a splice enclosure reducing the required real estate

## Clearview Blue



#### **Technical Specifications**

Clearview Blue Cassette			
Dimensions	Without Mounting Ears: 0.81" (20.57 mm) H x 6.03" (153.16 mm) W x 8.28" (210.30 mm) D		
Dimensions	With Mounting Ears: 0.81" (20.57 mm) H x 8.66" (219.96 mm) W x 8.28" (210.30 mm) D		
Ratings	Terminations are designed and tested to Telcordia GR-326; Tested to GR-63 NEBS 3 and UL 94 V-0; Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards.		
Backwards Compatible	Optional mounting ears for backwards compatible to FieldSmart® Inside plant (FxDS), OSP and access product lines		
Material Polycarbonate			
Operating Temperature	-40°C to +85°C (-40°F to +185°F)		
Storage Temperature	-40°C to +85°C (-40°F to +185°F)		
Connector Types	Supports industry standard SC, LC and MPO/MTP singlemode and multimode connectors		
Meters/Feet of Slack Storage	Up to 10 feet of buffer tube storage in the bottom of the cassette; one meter of 250 µm used for internal splicing for patch and splice (Clearfield's in-cassette splicing solution)		
Mounting Options Clearview Building Block or Clearview Mounting Ears			

#### **Cassette Configuration Options**

#### Patch and Splice

The Patch and Splice cassette has a splice tray that nests into the lower tray allowing integrated splicing directly in the cassette. The integrated splice tray eliminates the need for dedicated splice chassis space thus reducing real estate. The cassette provides 12 ports of connectivity with the ability to scale one cassette at a time. Utilizing the dual snapin splice chip option you add an additional 12 splices for a total of 24 splices in one cassette (LC connectors). The 24 port expansion cassette doubles the height and allows 24 splices in a 2 high cassette (SC connectors). Cassettes are pre-loaded with a one meter, 250 µm fiber assembly, loose tube or ribbon, which is pre-terminated and slack stored inside the cassette. For 24 fiber loose tube configurations, 40mm splices sleeves are required (60mm sleeves will not fit). Additionally, in the bottom of the cassette, there is an area to house up to 10 feet (3.05 m) of buffer tube storage with eight cable entry/exit locations for the maximum in flexibility.



#### Patch Only

Regardless of the industry standard adapters or cable construction, the Clearview Blue handles all patch only applications using the lower tray, top cover, built in radius limiter and removable adapter plate. A patch only cassette can be configured with most industry standard adapters and cable types.



#### **Optical Components**

Clearview Blue integrates optical components into the identical cassette, allowing service providers to mix and match fiber modules with optical components in the same chassis. The front faceplate is secured to reduce the chance of accidental damage to the optical component.



#### MPO Plug-and-Play

MPO to industry standard connector allows for plug-and-play by mating MPO to MPO with pre-terminated multi-fiber OSP or IFC. Also available in dual MPO 24-fiber configuration.

## Clearview Blue -



## **Pre-Configured Part Numbers**

Patch and Splice - 12 Port With Mounting Ears

Part Number	Description
EPZ-012-A1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 SC/UPC Adapters, Singlemode, Mounting Ears Included
EPZ-012-A2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded With 12 SC/UPC Adapters, Singlemode, Mounting Ears Included
EPZ-012-C1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 SC/APC Adapters, Singlemode, Mounting Ears Included
EPZ-012-C2F-SUB Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded with 12 SC/APC Adapters, Singlemode Mounting Ears Included	
EPZ-012-F1F-SUB  Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 LC/UPC Adapters, Sin Mounting Ears Included	
EPZ-012-F2F-SUB  Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded with 12 LC/UPC Adapters, Singlemon Mounting Ears Included	
EPZ-012-H1F-SUB  Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 LC/APC Adapters, Singlem Mounting Ears Included	
EPZ-012-H2F-SUB  Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded with 12 LC/APC Adapters, Singlen Mounting Ears Included	

#### Patch and Splice - 12 Port Without Mounting Ears

Part Number	Description			
EMZ-012-A1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, FxHD Frame System, Loaded With 12 SC/UPC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame			
EMZ-012-A2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, FxHD Frame System, Loaded With 12 SC/UPC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame			
EMZ-012-C1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, FxHD Frame System, Loaded With 12 SC/APC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame			
EMZ-012-C2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, FxHD Frame System, Loaded With 12 SC/APC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame			
EMZ-012-F1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, FxHD Frame System, Loaded With 12 LC/UPC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame			
EMZ-012-F2F-SUB  Clearview Blue Cassette, Ribbon, Patch and Splice, FxHD Frame System, Loaded With 12 LC/UP Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame  Clearview Blue Cassette, Loose Tube, Patch and Splice, FxHD Frame System, Loaded With 12 LC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame				
		EMZ-012-H2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, FxHD Frame System, Loaded With 12 LC/APC Adapters, Singlemode, No Mounting Ears Included, Used For HD Frame	

## Clearview Blue -



#### **Pre-Configured Part Numbers**

Patch and Splice - 12 Port With Universal Mounting Kit

Part Number	Description		
EYZ-012-A1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 SC/UPC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		
EYZ-012-A2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded With 12 SC/UPC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		
EYZ-012-C1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 SC/APC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		
EYZ-012-C2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded with 12 SC/APC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		
EYZ-012-F1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 LC/UPC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		
EYZ-012-F2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded with 12 LC/UPC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		
EYZ-012-H1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, Loaded with 12 LC/APC Adapters, Singlemode, Mounting Ears Included		
EYZ-012-H2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, Loaded with 12 LC/APC Adapters, Singlemode, 2 Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Fillister Screws		

#### **Mounting Ear Kit**

Part Number	Description
FMA-XXX-181	Kit, Mounting Tab, Clearview Blue Cassette, Includes 2 Tabs, 2 Screws and Push-Pull, Universal Mounting Options

#### Patch and Splice - 24 Port With Mounting Ears

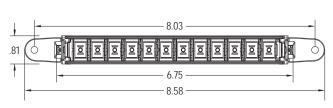
Part Number	Description	
EPZ-024-A1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, 2 High, Loaded With 24 SC/UPC Adapters, Singlemode, Mounting Ears Included	
EPZ-024-A2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, 2 High, Loaded With 24 SC/UPC Adapters, Singlemode, Mounting Ears Included	
EPZ-024-C1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, 2 High, Loaded With 24 SC/APC Adapters, Singlemode, Mounting Ears Included	
EPZ-024-C2F-SUB  Clearview Blue Cassette, Ribbon, Patch and Splice, 2 High, Loaded With 24 SC/APC Adapter Singlemode, Mounting Ears Included		
EPZ-024-F1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice High Density, 1 High, Loaded With 24 LC/ UPC Adapters, Singlemode, Mounting Ears Included	
EPZ-024-F2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, High Density, 1 High, Loaded With 24 LC/UPC Adapters, Singlemode, Mounting Ears Included	
EPZ-024-H1F-SUB  Clearview Blue Cassette, Patch and Splice, High Density, 1 High, Loaded With 24 LC/APC Singlemode, Mounting Ears Included		
EPZ-024-H2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, High Density, 1 High, Loaded With 24 LC/APC Adapters, Singlemode, Mounting Ears Included	

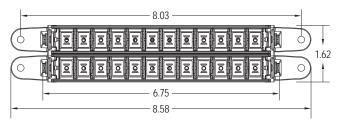
## Clearview Blue



#### Patch and Splice - 24 Port With Universal Mounting Ears

Part Number	Description			
EYZ-024-A1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, 2 High, Loaded With 24 SC/UPC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-A2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, 2 High, Loaded With 24 SC/UPC Adapters, Singlemode, 2 Universal Mounting Ears Included, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-C1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice, 2 High, Loaded With 24 SC/APC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-C2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, 2 High, Loaded With 24 SC/APC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-F1F-SUB	Clearview Blue Cassette, Loose Tube, Patch and Splice High Density, 1 High, Loaded With 24 LC/UPC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-F2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, High Density, 1 High, Loaded With 24 LC/UPC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-H1F-SUB	Clearview Blue Cassette, Patch and Splice, High Density, 1 High, Loaded With 24 LC/APC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			
EYZ-024-H2F-SUB	Clearview Blue Cassette, Ribbon, Patch and Splice, High Density, 1 High, Loaded With 24 LC/APC Adapters, Singlemode, 2 Universal Mounting Ears, 1 Push Pull Grommet and Plunger, 2 Filister Screws			



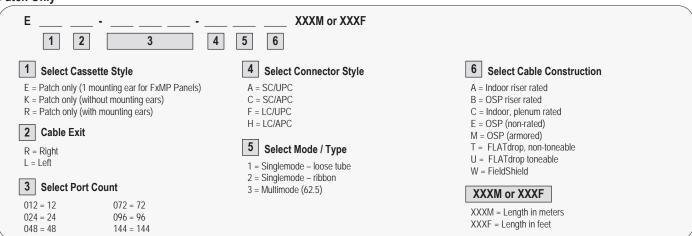


One Cassette High

Two Cassettes High

#### **Configured Part Numbers**

#### **Patch Only**

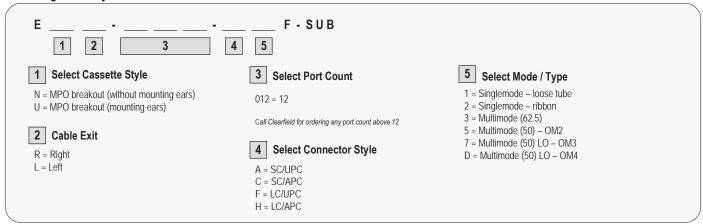


## Clearview Blue



#### **Configured Part Numbers**

MPO Plug-and-Play



#### **Pre-Configured Part Numbers - MPO**

Part Number	Description			
EQL-012-A1F-SUB	Clearview Blue Cassette, MPO, MPO (Male) to SC/UPC, MPO Rear Access and SC/UPC Front Access Adapters, Singlemode, Left Exit, Includes Kit of 2 Ears with Universal Mounting Options			
EQR-012-A1F-SUB	Clearview Blue Cassette, MPO, MPO (Male) to SC/UPC, MPO Rear Access and SC/UPC Front Access Adapters, Singlemode, Right Exit, Includes Kit of 2 Ears with Universal Mounting Options			
EQL-012-C1F-SUB	Clearview Blue Cassette, MPO, MPO (Male) to SC/APC, MPO Rear Access and SC/APC Front Access Adapters, Singlemode, Left Exit, Includes Kit of 2 Ears with Universal Mounting Options			
EQR-012-C1F-SUB	Clearview Blue Cassette, MPO, MPO (Male) to SC/APC, MPO Rear Access and SC/APC Front Access Adapters, Singlemode, Right Exit, Includes Kit of 2 Ears with Universal Mounting Options			
EQL-012-F1F-SUB  Clearview Blue Cassette, MPO, MPO (Male) to LC/UPC, MPO Rear Access and LC/UPC Front Access Adapters, Singlemode Right Exit, Includes Kit of 2 Ears with Universal Mounting Options  Clearview Blue Cassette, MPO, MPO (Male) to LC/APC, MPO Rear Access and LC/APC Front Access Adapters, Singlemode, Left Exit, Includes Kit of 2 Ears with Universal Mounting Options				
		EQR-012-H1F-SUB	Clearview Blue Cassette, MPO, MPO (Male) to LC/APC, MPO Rear Access and LC/APC Front Access Adapters, Singlemode, Right Exit, Includes Kit of 2 Ears with Universal Mounting Options	

### Clearview Black



#### **Application**

Clearview Black provides 12 to 24 ports of connectivity for patch and splice (Clearfield's in-cassette splicing solution), patch only and plug-and-play (MPO/MTP) configurations in any network environment. It scales and multiplies to meet your specific port density and application needs. Additionally, optical components integrate into the cassette, supporting any input/output combination of splitting or mux and demux strategy desired. The Clearview Black Cassette is available for ribbon only fiber.

#### Description

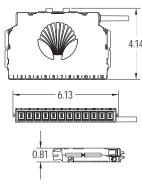
Clearview Black incorporates the same flexibility and scalability of the Clearview Blue, in a 50% smaller footprint. Decreasing the overall footprint of the fiber management element reduces real estate costs and improves density without compromising critical design elements of access, bend-radius protection, physical fiber protection and route-path diversity.

Clearview Black is a three component tool-less system made up of a top cover, base/splice tray and splice tray cover. Parts snap together to support the desired application requirements. All types of fiber cable construction can be integrated within the cassette to support all patch and splice, patch only, plug-and-play, and passive optical component hardware scenarios.

Each patch and splice cassette comes prepared for mass fusion splicing, with one meter of ribbonized 250 µm fiber preloaded and prepped to splice. Each ribbonizing tool aligns and secures the loose tube fibers into correct color code order, allowing ribbonizing to be completed guickly and easily.

For patch only configurations, the pre-terminated length of OSP or IFC cable is pre-loaded within the Clearview Black Cassette. The cassettes are then preloaded into the FieldSmart® product when shipped.





#### **Features and Benefits**

#### Integrity

- · Terminations designed, tested and certified to Telcordia GR-326
- · MPO Terminations designed, tested and certified to Telcordia GR-1435
- · Cassette is designed, tested & certified to GR-63 Flame Spread & Chemical
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Supports industry standard SC and LC singlemode and multimode connectors
- Supports all fiber construction types patch and splice must be ribbonized
- · Modular and scalable

#### Protection

- Designed to handle the toughest operating environments, provides flexibility and reliable performance
- Slack stored, bend-radius protected and secured against accidental physical damage from handling

#### Access

- Tool-less, snap together design makes turn-up time even faster
- Two buffer tube/cable entry/exit paths allow the technician a high degree of flexibility in deployment
- Front-access to pre-terminated assemblies with Clearview removable lid
- Ribbonizing allows quicker troubleshooting and restoration of affected fibers, as 12 fibers are ribbonized only where the splicing needs to
  occur, providing single-circuit access if necessary

#### Investment

- "Grow-as-you-go"
- Scalable (increments of 12 ports) building block to align capital expenditures to customer take rates
- Modular design allows ports to be configured to user-defined application requirements
- Patch and splice integrated splice tray removes the need for a separate splice enclosure/cases
- 50% smaller footprint than Clearview Blue allows for more density within all application environments
- · Patch and splice integrated splice tray removes need for a separate chassis space or splice enclosure reducing the required real estate
- Ribbonizing loose tube cable allows for mass-fusion of up to 12 fibers at a time, reducing installation time and costs
- Brackets for 19" and 23" (482.60 mm and 584.20 mm) frames

# Clearview Black ————



## **Cassette Configuration Options**



#### Patch Only

Regardless of the industry standard adapters or cable construction, the Clearview Black handles all patch only applications using the lower tray, top cover and built in radius limiter.



#### Patch and Splice (Clearfield's In-Cassette Splicing Solution)

The splice tray that is molded into the lower tray is all that is needed to deliver integrated patch and splice applications. Pre-loaded with up to one meter of ribbon, 250  $\mu$ m assemblies that are perterminated with slack stored inside the cassette for splicing.



#### **Optical Components**

Clearview integrates optical components into the identical cassette, allowing service providers to mix and match fiber modules with optical components in the same chassis.



#### MPO Plug and Play

MPO to industry standard connectors allows for plug-and-play by mating MPO to MPO with preterminated multi-fiber OSP or IFC.

## Clearview Black -



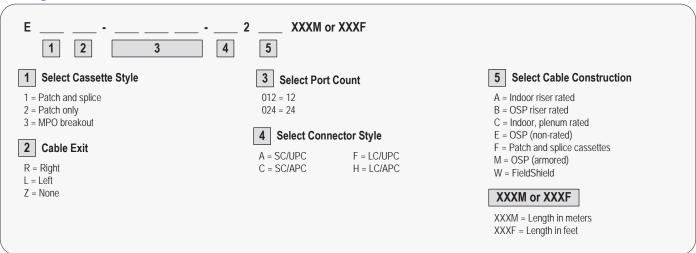
#### **Technical Specifications**

Clearview Black Cassette				
Dimensions	0.81" H x 6.13" W x 4.14" D (20.57 mm x 155.70 mm x 105.15 mm)			
Ratings	Terminations are designed and tested to Telcordia GR-326; Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards			
Backwards Compatible	N/A			
Material	Polycarbonate			
Connector Types	Supports industry standard SC and LC singlemode connectors			
Meters/Feet of Slack Storage	of Slack Storage 1 meter of 250 µm used for internal ribbon splicing only			
Mounting Options Used with FieldSmart® BLG Pivot Bracket				

#### **Pre-Configured Part Numbers**

Part Number	Description
E1Z-012-A2F-SUB	Clearview Black Cassette, Ribbon, Patch and Splice, Loaded With SC/UPC Adapters, Singlemode
E1Z-012-C2F-SUB	Clearview Black Cassette, Ribbon, Patch and Splice, Loaded With SC/APC Adapters, Singlemode
E1Z-012-F2F-SUB	Clearview Black Cassette, Ribbon, Patch and Splice, Loaded With LC/UPC Adapters, Singlemode
E1Z-012-H2F-SUB	Clearview Black Cassette, Ribbon, Patch and Splice, Loaded With LC/APC Adapters, Singlemode
E1Z-024-F2F-BLACK-SUB	Clearview Black Cassette, Ribbon, Patch and Splice, High Density, Loaded With 24 LC/UPC Adapters, Singlemode
E1Z-024-H2F-BLACK- SUB	Clearview Black Cassette, Ribbon, Patch and Splice, High Density, Loaded With 24 LC/APC Adapters, Singlemode

#### **Configured Part Numbers**



### Clearview xPAK -



#### **Application**

Engineered to land small port count fiber assemblies and optical components as conveniently and inexpensively as possible, the xPAK simplifies fiber management to the level of a consumable good. Clearview xPAK can be deployed as a stand-alone device, or with FieldSmart® Fiber Delivery Point (FDP) products for a wide range of network environments.

#### **Description**

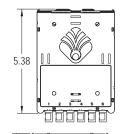
At first glance, Clearview xPAK looks like any other LGX compatible package, but upon closer inspection, technicians will see a new generation of innovation in the delivery of terminated fiber assemblies. Clearview xPAK is single-piece element in which all required components for fiber protection are integrated. It is shipped flat and simply folds to shape.

The Clearview xPAK supports two, four or six ports of patch and splice (Clearfield's in-cassette splicing solution) configurations. The compact 4" x 5" (101.60 mm x 127.00 mm) solution is perfect for landing small count terminations at the fiber delivery point. The kit comes with everything you'll need: flat cassette, adapters, 2, 4 or 6-fiber 900  $\mu$ m ½ meter assembly, splice sleeves, strain relief boot, grommet tape, zip ties and universal mounting bracket.

Priced to allow field personnel to carry quantities of Clearview xPAK Cassettes in the field, xPAK is shipped flat and unassembled. At the deployment site, the technician will take the xPAK device, and following pictorial user instructions, will assemble the device to match his field requirements. Integrated into the footprint of the device, is an industry-compatible splicing tray, which is then surrounded with fiber protection elements that support either a two, four or six port fiber assembly as well as a range of optical component devices.

Clearview xPAK is the ideal fiber management device when up to six fibers (or us to 12 LC) are landed or an optical component device is deployed in a remote location. Application environments include cell backhaul, business class service delivery, node segmentation, fiber exhaust in a field pedestal, sub-station turn-up or fiber-to-the-desk deployment.







#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Supports industry standard SC, LC and MPO/MTP singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- Radius protected storage for up to ½ meter of 900 µm jacketed fibers
- Durable polypropylene construction (impact plastic)
- Integrated fiber management protects fiber from micro-bend and macro-bend damage

#### Access

- · Small design facilitates ease of use in crowded environments
- · Easy assembly no tools required
- Front: 6 SC ports; Rear: 1 SC port or 1 MPO/MTP
- · 9 SC port faceplate available

#### Investment

- Pre-configured/factory loaded, patch only factory terminated assemblies
- · Patch and splice
- · LGX compatible flange mount
- · Wall mount capable
- · One piece construction with "living hinge"
- Supports optional component integration
- Plug-and-play with MPO configurations

#### Clearview xPAK -



#### **Technical Specifications**

Clearview xPAK		
Dimensions	1.14" H x 4" W x 5.38" D (28.96 mm x 101.60 mm x 136.52 mm)	
Ratings	Terminations are designed and tested to Telcordia GR-326; Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards	
Backwards Compatible	N/A	
Material	Durable polypropylene (impact plastic)	
Connector Types	Supports industry standard SC, LC and MPO singlemode and multimode connectors	
Meters/Feet of Slack Storage		
Mounting Options		

#### **Cassette Configuration Options**

#### Patch and Splice (Clearfield's In-Cassette Splicing Solution)

The 6-fiber splice tray molded into the xPAK tray is all that is needed to deliver an integrated patch and splice application. 2, 4 or 6-fiber 900  $\mu$ m ½ meter assemblies are pre-terminated, pre-loaded and slack stored inside the xPAK ready for splicing.



#### **Patch Only**

Regardless of the industry standard adapter or cable construction, the pre-terminated length of OSP or IFC cable is pre-loaded within Clearview xPAK for patch only configurations.



#### MPO Plug-and-Play

MPO to industry standard connectors allows for plug-and-play by mating MPO to MPO with preterminated multi-fiber OSP or IFC.



#### **Optical Components**

Optical components can be integrated into the Clearview xPAK.



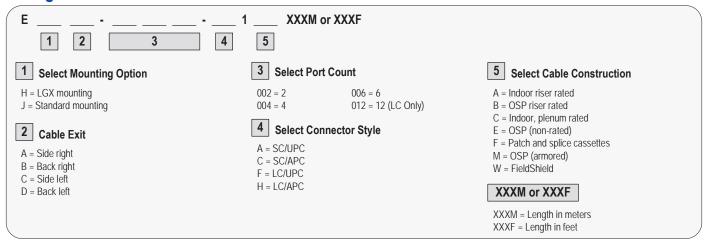
## Clearview xPAK -



#### **Pre-Configured Part Numbers**

Connector Type	2 Port	4 Port	6 Port	12 Port
SC/UPC	2PAK-SC	4PAK-SC	6PAK-SC	N/A
SC/APC	2PAK-SCA	4PAK-SCA	6PAK-SCA	N/A
LC/UPC	2PAK-LC	4PAK-LC	6PAK-LC	12PAK-LC-01 (Ribbon)
LC/APC	2PAK-LCA	4PAK-LCA	6PAK-LCA	12PAK-LCA-01 (Ribbon)

#### **Configured Part Numbers**



## Clearview Blue Mounting Ears Instructions



The Clearview Blue Cassette is able to mount into a number of Clearfield products using a flexible system of mounting ears and retaining screws or push/pull plungers. Below you will find instructions on how to install each mounting variation and a list of products in which each variation will be used.

#### **Installing Mounting Ears**

From the front of the cassette, slide the mounting ear's channel onto the t-rail on the side of the cassette. Push the mounting ear until it snaps into place.









Mounting Option	Products
No Mounting Ears	FxHD Frame System, Flex Box, KIS Box, NDP Wall Box, 5.5" Deep Indoor/Outdoor SCD Wall Box
One Mounting Ear	FxMP Panels, 144 PON Pedestal Insert
Two Mounting Ears	All other products (special cassette mounting instructions may be included with product)

#### **Installing Retaining Screws**

To mount cassettes into products utilizing retaining screws, insert the retaining screws into the holes in the mounting ears. Depending on the product, retaining screws will be inserted in either the front or the back of the mounting ear. Screw the cassette into place in the product using the retaining screws.

1	<b>Mounting Option</b>	Products
	Front Installed Retaining Screws	FxDS Panels, FxDS PON Insert, 96 & 144 PON Pedestal Inserts
	Back Installed Retaining Screws	FSC & FDH Cabinets, 24 & 48 Outdoor Wall Boxes, 36, 96 & 144 Indoor Wall Boxes





#### **Installing Push/Pull Plungers**

Push/pull plungers are used in FxMP Panels. Push the grommet piece through the hole in the mounting ear, then the plunger. Push the plunger until it clicks, then pull back to release the expansion. To install cassettes into the product, insert the push/pull plunger through the hole and push the plunger to expand the grommet and secure the cassette into place.





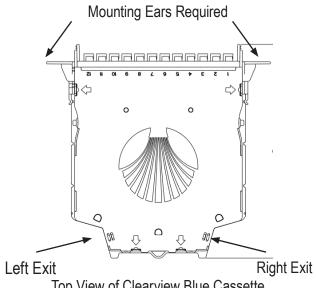






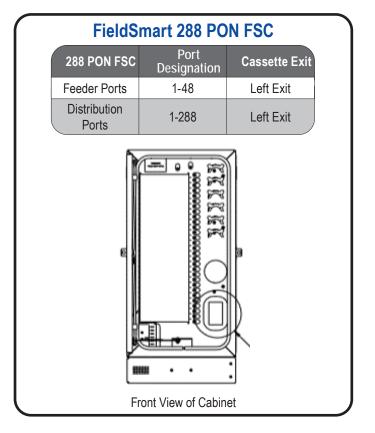
Adding Patch Only Cassettes to Partially Loaded FieldSmart Cabinets — CLEARFIELD

#### **Cassette Exit Diagram**



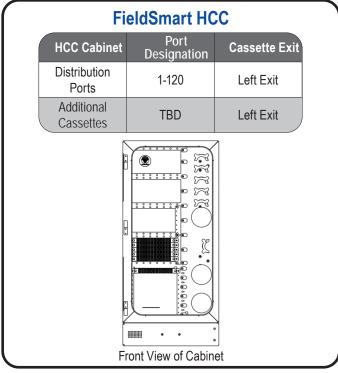
Top View of Clearview Blue Cassette

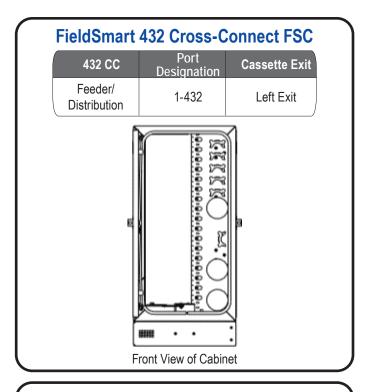
## FieldSmart 144 PON FDH Port Designation 144 PON FDH **Cassette Exit** Left Exit Feeder Ports 1-24 Distribution 1-144 Left Exit Ports Front View of Cabinet

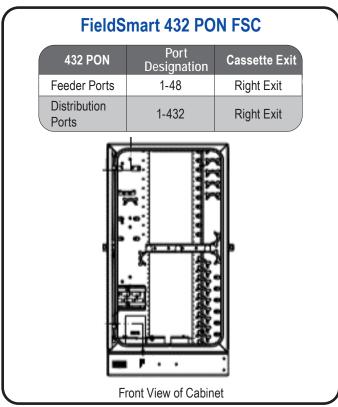


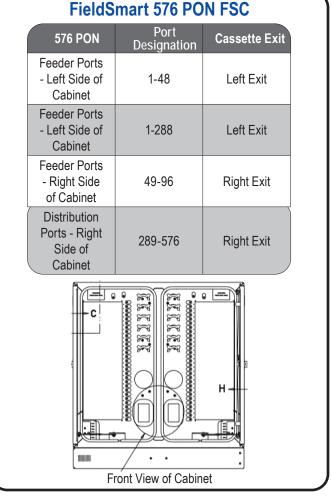


Adding Patch Only Cassettes to Partially Loaded FieldSmart Cabinets — CLEARFIELD



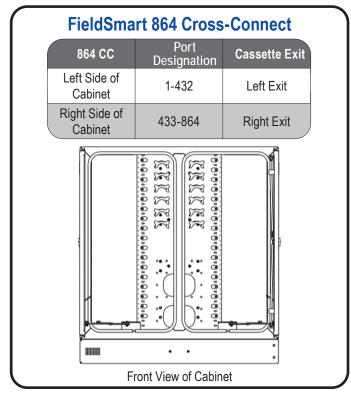




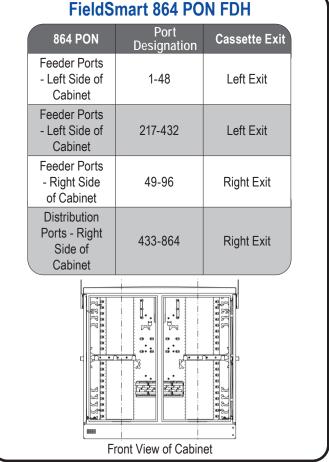




Adding Patch Only Cassettes to Partially Loaded FieldSmart Cabinets — CLEARFIELD



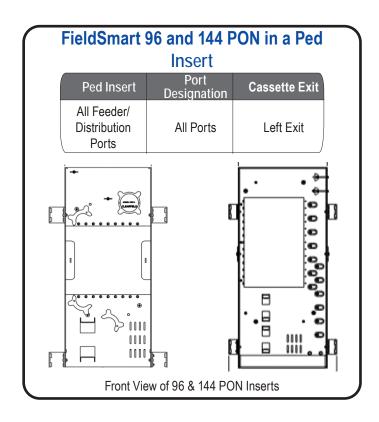
FieldSmart 1152 PON FSC		
1,152 PON	Port Designation	Cassette Exit
Left Side of Cabinet	All Feeder/ Distribution Ports	Left Exit
Right Side of Cabinet	All Feeder/ Distribution Ports	Right Exit
F	EXECUTE OF CABIN	et



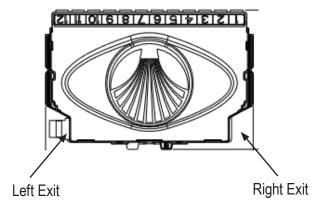
FieldSmart 1728 Cross-Connect		
1,728 CC	Port Designation	Cassette Exit
Left Side of Cabinet	All Feeder/ Distribution Ports	Left Exit
Right Side of Cabinet	All Feeder/ Distribution Ports	Right Exit
i iii Fr	EXECUTE CONTROL OF CABIN CONTROL OF CABI	et



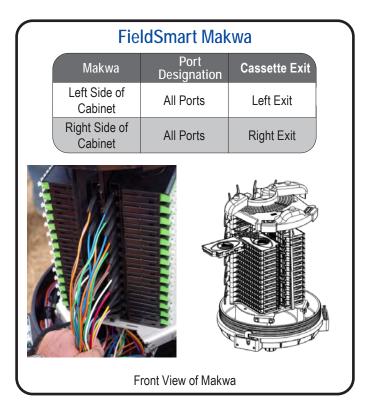
Adding Patch Only Cassettes to Partially Loaded FieldSmart Cabinets — CLEARFIELD



#### **Cassette Exit Diagram**

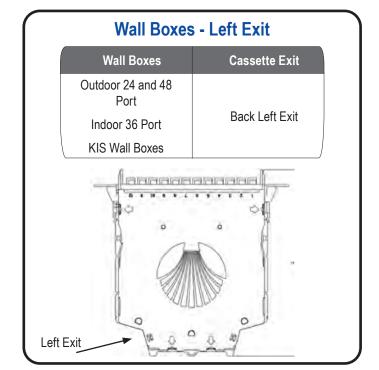


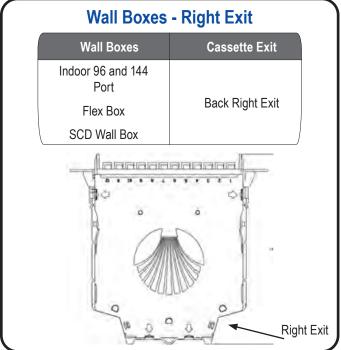
Top View of Clearview Black Cassette (Only use in the Makwa)





Addding Patch Only Cassettes to FieldSmart Wall Boxes





Top Views of Clearview Blue Cassette

## Introduction to Inside Plant Solutions

## FieldSmart® Products



FieldSmart is the only fiber management platform designed around a single architecture – the Clearview® Cassette and the small count Clearview xPAK – for inside plant networks. FieldSmart supports a wide range of panel configurations, densities, connector styles and adapter options.

Designed from the ground up with field-proven experience, the FieldSmart platform is a truly unique solution for today's rapid deployment demands. With FieldSmart, you control your capital cost, reduce operational costs and provide a consistent product platform throughout the network.

The flexibility in design and configuration of the Clearview Cassette is implemented into all of the FieldSmart products, which are well suited for multiple inside plant applications. The inside plant products provide a system of modular and scalable building blocks to configure a frame system that delivers industry-leading scalability and fiber protection without jeopardizing density or increasing cost.

The Telcordia-certified FieldSmart FxMP Panels are intelligently designed to provide the user with superior fiber access and craft-friendly, radius-protected fiber management for routing and deploying fiber jumpers. The panels fit in 19" or 23" standard frames.

The FieldSmart Fiber Crossover High Density (FxHD) System and the Fiber Crossover Distribution System (FxDS) Frame Kit are both flexible and scalable. Complete compatibility in footprint and route paths between the frames allow you to pick and choose the FxHD and FxDS for any application environment, with future migration built in. You can place a FxHD frame next to a FxDS frame and they will look the same in your lineup.









FieldSmart Panels

## Introduction to Inside Plant Solutions





#### FieldSmart Fiber Crossover High Density (FxHD) Distribution System

Designed for the ultimate in frame density and footprint, the FxHD maximizes your real estate investment providing for a lower total cost of ownership in high density environments. Lower cost of ownership is not only realized in real estate savings but also in installation and service turn-up time, trouble shooting and restoration and MAC (moves, adds and changes) work in interconnect and cross-connect environments.

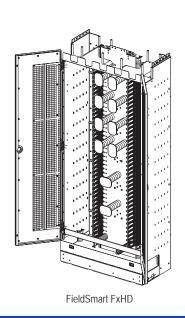
#### FieldSmart Fiber Crossover Distribution System (FxDS)

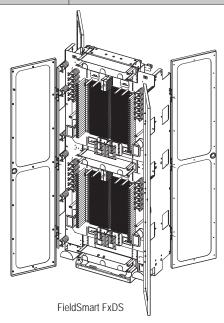
Designed for flexibility of configuration, the FxDS is a series of building blocks in which individual components of the system are configured to the environment in which they are placed. An industry standard 7' x 19" (2133.60 mm x 482.60 mm) seismic frame is factory kitted and assembled with a set of interbay vertical slack management panels, crossover troughs and removable doors to provide for uninhibited access to routed jumpers and incoming multi-fiber cables. The FxDS requires only 4 SKU's to configure initial deployment.

#### FxHD vs. FxDS Frame System Comparison

Clearfield® extends flexibility with your choice of FieldSmart frame systems. Complete compatibility in footprint and route paths between the frames allow you to pick and choose the FxHD and FxDS for the desired application environment with future migration built in.

	FxHD	FxDS
Dimensions	7' H x 36" W x 18" D (2133.60 mm x 914.40 mm x 457.20 mm)	7' H x 36" W x 18" D (2133.60 mm x 914.40 mm x 457.20 mm)
Recommended Applications	Large fiber count applications or any space constrained applications - highest fiber count solution available in the marketplace today	Medium to large fiber count applications
Description	Designed for density, the FxHD maximizes your real estate investment and is well suited for high density environments	Designed for flexibility of configuration, the FxDS system can be configured to multiple environments
Density Number of Terminations per Frame	2,016 SC; 4,032 (back-to-back mounting)	1,728 SC
All Front Access	Yes - can be deployed back to back	No - front and rear access
On-frame Splicing	Excellent - with no loss of density; splicing in Clearview® Blue Cassette	Excellent - with no loss of density; splicing in Clearview Blue Cassette
Off-frame Splicing	N/A	Excellent - using patch only Clearview Cassette
Slack Storage	Built into frame	Built into frame kit





## FieldSmart® Fiber Crossover High Density (FxHD)

#### Frame



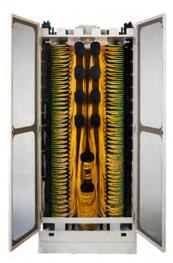
#### **Application**

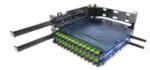
With the FieldSmart FxHD front access design, Clearview® Cassettes are shifted to the outside of the frame and away from a fixed panel configuration. Instead of traditional panel configurations, the frame is configured with a series of Clearview Blue cassettes teamed with building brackets built into user-defined building blocks. The FxHD Frame provides the ultimate in modularity and flexibility to scale from 12 to 2,016 ports in any fiber count optimizing your ability to maximize fiber investment and assets. Clearview Blue's in-cassette buffer tube storage allows the FxHD to reclaim the space used for traditional panels and mass buffer storage and to redeploy it by using building blocks of Clearview Blue Cassettes.

#### Description

The FieldSmart High Density Fiber Crossover Distribution System (FxHD) is the highest density fiber management frame solution available in the industry today, providing 2,016 SC terminations in a 7' (2133.60 mm) frame or when mounted back-to-back, FxHD supports a maximum density of 4,032 terminations in a space savings footprint of 9 square feet (36" x 36") (914.40 mm x 914.40 mm).

FieldSmart FxHD is an integrated fiber management solution utilizing the Clearview Blue Cassette. Designed around the same footprint as the FxDS fiber frame at 18" x 36" (457.20 mm x 914.40 mm) and utilizing the same full length doors for maximum physical fiber protection, the FxHD easily integrates alongside existing FieldSmart FxDS or other industry standard frame systems. Those deploying the FieldSmart FxHD can start with one Clearview Blue Cassette and add additional cassettes as additional capacity is needed, up to a total of 168 cassettes and 2016 ports of connectivity.





Cube Bracket

This port count represents an additional 288 ports in a standard 7' (2133.60 mm) frame – or a 17% increase in density over the FxDS frame solution. With instant access to all cassettes, adapters and jumpers, the frame is designed as a front access frame. This means that all of your installation, MAC (moves, adds and changes) work and routing of jumpers is done from one side of the frame providing you the option to reclaim the aisle space required for frame solutions that require rear access - and to use that space for other equipment or more frames. The FxHD can be placed against a wall, a cage in data center collocation environments or installed back to back. The FxHD frame solution provides a 40% reduction in floor space requirement while still meeting 30" (762.00 mm) aisle spacing requirements.

Designed in conjunction with Clearview Blue, the FxHD extends the Clearfield® commitment to modular and scalable solutions by introducing tech-friendly, tool-less deployment to standard building blocks. Individual components are configured to application requirements while providing bend-radius protection, physical fiber protection and route-path diversity for the consolidation and distribution of fiber.

User-defined Clearview building blocks configured to exact port count specifications can be deployed in seconds with Smart-Connect tool-less fasteners. Clearview Blue Cassettes simply slide into building block assemblies with a "hard-stop" feature ensuring perfect alignment every time. Additional buffer tube/ribbon slack is stored within each cassette eliminating buffer tube congestion, pile-up or identification miscues. The dedicated "w-shaped" intrabay route scheme ensures long term reliability of circuits by maximizing proper slack storage of any jumper length, greatly reducing the chance of jumper tie-in or weaving. Full length doors provide complete physical fiber protection when closed and instant visual and physical access to the entire frame when opened.

For scenarios where maximizing real estate is a premium, service providers may choose to deploy an FxHD front only access, allowing frames to be mounted back-to-back or against structures such as walls, existing frame equipment or building supports.

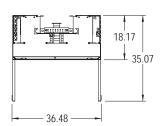
#### **Features and Benefits**

#### Integrity

- One frame size accommodates up to 2,016 ports or 4,032 ports when back-to-back
- · Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspection
- · Supports distribution, tight-buffer and ribbon fiber types for inside and outside plant constructions

#### Protection

- · Full length doors provide visual and physical access to the entire frame when opened and complete physical fiber protection when closed
- · Complete bend-radius protection throughout all routing schemes
- · Diverse route-paths minimize cable pile-up and ensure long term reliability of circuits



## FieldSmart® Fiber Crossover High Density (FxHD)



#### Frame

- Integrated "w-shaped" intrabay route scheme does not compete with adjacent frames and maximizes proper slack storage of any jumper length, greatly reducing the chance of jumper tie-in or weaving (4 meters suggested)
- Radius protected storage for up to 10 feet (3.04 M) of buffer tube slack provided in Clearview Blue Cassette

#### Access

- FxHD is front access only to ensure maximum accessibility to achieve 2016 SC terminations or 4032 in a back-to-back frame system
- · Top entry/exit through horizontal fiber trough and bottom entry through raised floors supported front and rear of frame
- Fold-down trough door allows complete access to interbay lay-in routing for 6,000 jumpers (3,000 left and 3,000 right) through the frame
  and adjacent frames
- A four meter jumper can get you from any port to any port
- Supports SmartRoute rear interbay troughing route-paths
- Uses Clearview® Blue Cassette front access with removable 12-pack adapter plate allowing quick and easy access to back of adapters for troubleshooting, maintenance and cleaning without disturbing live circuits in other cassettes

#### Investment

- · Fully loaded or "grow-as-you-go" integration allows the user choices to provide for cost containment as subscriber take-rates dictate
- Compatible alongside FxDS frame line up as well as traditional 19" (482.60 mm) or 23" (584.20 mm) frame solutions
- Pre-configured/pre-loaded factory terminated assemblies
- Custom configured with standard building blocks supporting all application environments
- · Patch and splice (Clearfield's in-cassette splicing solution), patch only and plug-and-play configurations supported

#### **Technical Specifications**

FieldSmart FxHD Frames	
Dimensions	7' H x 36" W x 18" D (2133.60 mm x 914.40 mm x 457.20 mm)
Ratings	Designed to comply to Telcordia GR-449
Port Density	2,016 SC or 4,032 LC (front access only, back-to-back mounting)
Cassette Types Supported	Clearview Blue
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO (additional options available upon request)
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	12-24 splices in each Clearview Cassette
Storage Capacity	One meter of 900 µm fiber and up to three meters of jacketed fiber
Cable Entry Compatibility	Top and bottom (floor) entry
Cable Entry Clamp Location	16 (eight left, eight right) Note: Center clamping compatible for left and right same sheath distribution of buffer tubes/sub units
Recommended Jumper Length	Four meters, plus two meters (13' + 6.6') for each additional frame
Material	Stainless steel with almond powder coating

#### **Pre-Configured Part Numbers**

Part Number	Description
014602-PATCH AND SPLICE	FxHD kit, patch and splice, front access only, maximum 2,016 ports (includes built in fiber management and cassette mounting brackets, doors, iso pad, floor mount kit)
014602-PATCH ONLY	FxHD kit, patch only, front access only, maximum 2,016 ports (includes built in fiber management, two doors, iso pad, floor mount kit)
014743	FxHD 576 port PON Insert (Select one of the following part numbers for feeder ports.)

## FieldSmart® Fiber Crossover High Density (FxHD)





#### **Application**

Provides an in the field configured interconnect or cross-connect environment for 12 to 2,016 ports of high density fiber in the central office and headend environments.

#### Description

The FieldSmart FxHD Tie Panel is a high density, low-maintenance fiber distribution system exclusively for the FxHD frame system. Tie panels are intelligently designed to provide the user with superior fiber access while using craft-friendly radius protected fiber management for routing and deploying fiber jumpers or multi-fiber cables, on both sides of the adapter plate for cross-connect environments.

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#### **Features and Benefits**

#### Integrity

- · Terminations designed, tested and certified to Telcordia GR-326
- · Supports all industry standard singlemode and multimode connectors and cabling

#### Protection

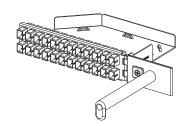
- · Ruggedized hinged bulkhead
- · Cable clamp protects against twisting and pistoning at the assembly breakout point

#### Access

- · Front access frame system
- · Front and rear access via hinged bulkhead

#### Investment

- · Panel sizes available in 24 ports
- "Grow-as-you-go" integration allows the user choices to provide for cost containment as subscriber take-rates dictate
- Industry-leading density, 2,016 ports in a 7' (2133.60 mm) FxHD frame system



#### **Technical Specifications**

FieldSmart FxHD Tie Panel	
Dimensions	1.6" H x 6.96" W x 5.39" D (40.64 mm x 176.78 mm x 136.91 mm)
Port Density	24
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO (additional options available upon request)
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Material	Aluminum with almond powder coating

# FieldSmart® Fiber Crossover High Density (FxHD) Tie Panel



#### **Pre-Configured Part Numbers**

Part Number	Description
FMA-XXX-68	FxHD Tie Panel Bulkhead - four 24 port - SC/UPC SM, two left and two right
FMA-XXX-69	FxHD Tie Panel Bulkhead - four 24 port - SC/APC SM, two left and two right
FMA-XXX-70	FxHD Tie Panel Bulkhead - four 24 port - LC/UPC SM, two left and two right
FMA-XXX-73	Left tie plate - looking from the front. 24 x LC/UPC singlemode
FMA-XXX-74	Left tie plate - looking from the front. 24 x SC/UPC singlemode
FMA-XXX-75	Left tie plate - looking from the front. 24 x SC/APC singlemode
FMA-XXX-76	Right tie plate - looking from the front. 24 x LC/UPC singlemode
FMA-XXX-77	Right tie plate - looking from the front. 24 x SC/UPC singlemode
FMA-XXX-78	Right tie plate - looking from the front. 24 x SC/APC singlemode

#### **Pre-Configured Part Numbers - Accessory**

Part Number	Description
008140	Frame Clamp Kit, includes 1/4, 1/4, 1/4, 1/4, 1/4 and 1" saddle clamps and grommet tape

## FieldSmart® Fiber Crossover Distribution System (FxDS)

#### Frame Kit-



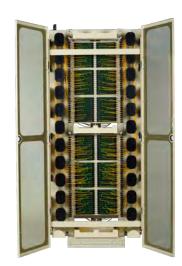
#### **Application**

The FxDS Frame Kit is a fully contained fiber management system for the inside plant. The seven foot seismic frame is provided along with full length front and rear doors that provide protection for termination fields, incoming distribution cables and interbay routed jumpers. When used in conjunction with the FxDS panels, ultimate density and protection is offered at "grow-as-you-go" cost.

#### Description

The FieldSmart Fiber Crossover Distribution System (FxDS) provides a system of modular and scalable building blocks to configure a frame system that delivers industry-leading scalability and fiber protection without jeopardizing density or increasing cost.

The FxDS system easily configures for panel placement and scales simply from 12 ports to a full rack of 1,728 ports as needed. The FieldSmart FxDS requires only four unique building blocks (SKUs) to configure initial deployment. The user then adds into the frame whatever is needed as subscriber take rates dictate. The FxDS Frame Kit is an industry standard 7' x 19" (2133.60 mm x 482.60 mm) seismic frame that is easily assembled with a



set of vertical interbay slack management panels, two upper and lower crossover troughs and a set of removable doors.

#### With SmartRoute Trough

SmartRoute Troughing builds upon the cable management functionality with a sleek method of providing a continuous channel for bay-to-bay routing in a safe and efficient manner without increasing jumper lengths. SmartRoute Troughing allows the service provider to carry the distance and weight of thousands of jumpers on a horizontal plane. This spreads the pile up and eliminates the risk of micro and macro bends. When used across multiple frames, up to three continuous channels are created allowing bay-to-any-bay routing in a safe and efficient manner.

#### With PON Kit

Front route troughs are available when the frame is deployed with a PON Kit or for environments where interbay routes are not anticipated.

#### **Features and Benefits**

#### Integrity

- Designed to comply to Telcordia GR-449
- · Zone 4 Seismic Rated
- · Scales easily from 12 ports to 1,728 ports on a full frame
- · Easily configured for initial placement

#### Protection

- · Complete bend-radius protection of all fiber cable throughout the routing schemes
- · Diverse route-paths minimize cable pile-up and ensure long term reliability of the circuits

#### Access

- Front and rear access
- · Interbay for each frame is not shared with adjacent frames. Minimizes cable crossover and tie-ins, allowing for easy identification
- Removable full length doors allow for superior access to routed jumpers and incoming distribution cables

#### Investment

- One frame size (7' x 19"; 2133.60 mm x 482.60 mm) accommodates up to 1,728 ports or 1,152 ports in a PON environment, with full horizontal and vertical slack management support
- Compatible with Clearview® optical component packaging that integrates into crossover bulkheads, eliminating the need to dedicate a separate chassis
- Fully loaded or "grow-as-you-go" integrations allow the user choices to provide for cost containment as subscriber take-rates dictate
- · Frame components are used throughout the network from inside plant to outside plant to access networks
- · Custom configured with common building blocks, it supports any and all applications

## 



## **Technical Specifications**

FieldSmart FxDS Frame Kit		
Dimensions	7' H x 36" W x 18" D (2133.60 mm x 914.40 mm x 457.20 mm)	
Ratings	Compliant to Telcordia GR-449	
Port Density	1,728 SC or 3,456 LC	
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO (additional options available upon request)	
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®	
Splice Capacity	12 splices in each Clearview Cassette	
Storage Capacity	One meter of 900 µm fiber	
Cable Entry Compatibility	Top and bottom (floor) entry	
Cable Entry Clamp Location	On-frame cable clamps Note: On-frame cable clamps included with FxDS Patch Panels	
Recommended Jumper Length Three meters, plus two meters (10' + 6.6') for each additional frame		
Material	Steel with almond powder coating	

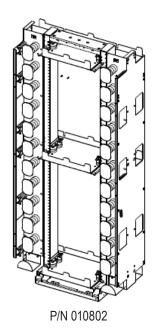
## **Pre-Configured Part Numbers**

Part Number	Description
010802	FxDS Frame kit (Includes 7' x 19" (2133.60 mm x 482.60 mm) frame, two doors - dual, two interbays, three traditional troughs, iso pad, floor mount kit)
010802-SR	FxDS SmartRoute Frame Kit (includes 7' x 19" (2133.60 mm x 482.60 mm) frame, two door sets - dual, two interbays, three SmartRoute troughs, iso pad and floor mount kit)
010802-PON INSERT ONLY	FxDS Frame kit (Includes 7' x 19" (2133.60 mm x 482.60 mm) frame, two doors - dual, two interbays with no spools, three traditional troughs, iso pad, floor mount kit. Note: Must order 010263 insert
010802-PON INSERT ONLY-SR	FxDS Frame kit (Includes 7' x 19" (2133.60 mm x 482.60 mm) frame, two doors - dual, two interbays with no spools, three SmartRoute troughs, iso pad, floor mount kit). Note: Must order 010263 insert
010263	FxDS 576 Port PON Insert (Select one of the following adapter plate tie kits for feeder ports. You will need to order a total of four of these per PON insert.)
FMA-XXX-57	Tie kit, adapter plate, 12 SC/UPC singlemode, trimmed to cassette height
FMA-XXX-64	Tie kit, adapter plate, 12 SC/APC singlemode, trimmed to cassette height
FMA-XXX-81	Tie kit, adapter plate, 12 LC/UPC singlemode, trimmed to cassette height
011236	Frame mounting kit for use with raised floors
009106	Floor mount hardware kit

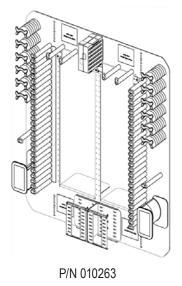


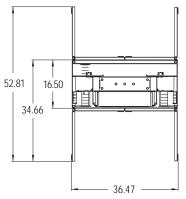


### Frame Kit

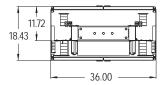


## **PON Insert**

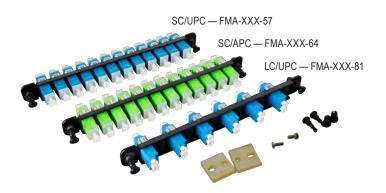




FxDS Frame Kit - Top View Doors Open



FxDS Frame Kit - Top View Doors Closed



Tie Adapter Plate Kit

# FieldSmart® Fiber Crossover Distribution System (FxDS) Standard Frames



## **Application**

Frames are used for mounting equipment in central office, head end or data center applications.

### **Description**

FieldSmart FxDS Standard Frames are available in 7' (2133.60 mm), 8' (2438.40 mm) or 9' (2743.20 mm) heights and in 19" or 23" (482.60 mm or 584.20 mm) widths. Frames are seismic-rated and come with an unequal flange. When used with FieldSmart FxDS Panels, they provide the highest port density in the industry - up to 1,728 ports in a 7' (2133.60 mm) frame.

### **Features and Benefits**

### Integrity

- Designed to comply to Telcordia GR-449; Seismic rated (Zone 4) GR-63-CORE, Issue 4
- Made from high-strength, low alloy steel that can accommodate up to up to 500 lbs. (226.80 kg)
- EIA mounting 1.75" (44.45 mm) and WECO mounting 1" (25.40 mm)
- Front and rear of upright tapped for 12-24 screws

#### Protection

- Frames can be ordered loaded with panels and cable management as a "rack and stack" solution
- Unequal flange
- · Isolation pads are used to provide electrical isolation for FxDS standard seismic frames
- · Interbay cable management panel optional

### Access

One frame size accommodates up to 1,728 or 1,152 ports in a PON environment, with full horizontal and vertical slack management support

### Investment

- · Fully loaded or "grow-as-you-go" integrations allow the user choices to provide for cost containment as subscriber take-rates dictate
- · Frame components are used throughout the network from inside plant to outside plant to access networks

## **Technical Specifications**

FieldSmart FxDS Standard Frames			
Dimensions Available in 7', 8' or 9' heights (2133.60 mm, 2438.40 mm or 2743.20 mm) and in either 19" or 23" (482 mm or 584.20 mm) widths; depth is 10" (254.00 mm) (5" frame + 5" guard box)			
Ratings	Compliant to Telcordia GR-449		
Cable Entry Clamp Location	On-frame (Note: Cable clamps included with FxDS Patch Panels)		
Material	Steel		

<sup>\*</sup> Mounting hardware not included. Order separately.







# **Pre-Configured Part Numbers**

### **EIA Spacing**

Part Number	Description		
FMA-A1A-E 19" (482.60 mm) seismic frame, 7' (2133.60 mm) high, CLSD, EIA Universal (5%" - 5%" - 1/2"; 15.88 mm mm - 12.70 mm) hole pattern, almond white			
FMA-A1C-E	19" (482.60 mm) seismic frame, 8' (2438.40 mm) high, CLSD, EIA Universal (5/6" - 5/6" - 1/2"; 15.88 mm - 15.88 mm - 12.70 mm) hole pattern, almond white		
FMA-A2A-E	23" (584.20 mm) seismic frame, 7' (2133.60 mm) high, CLSD, EIA Universal (5/6" - 5/6" - 1/2"; 15.88 mm - 15.88 mm - 12.70 mm) hole pattern, almond white		
FMA-A2C-E	23" (584.20 mm) seismic frame, 8' (2438.40 mm) high, CLSD, EIA Universal (¾" - ¾"; 15.88 mm - 15.88 mm - 12.70 mm) hole pattern, almond white		

### **WECO Spacing**

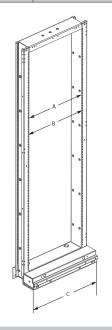
Part Number	Description
FMA-A1A	19" (482.60 mm) seismic frame, 7' (2133.60 mm) high with 1" (25.40 mm) WECO hole spacing, almond white
FMA-A1C-SUB	19" (482.60 mm) seismic frame, 8' (2438.40 mm) high with 1" (25.40 mm) WECO hole spacing, almond white
FMA-A2A	23" (584.20 mm) seismic frame, 7' (2133.60 mm) high with 1" (25.40 mm) WECO hole spacing, almond white
FMA-A2C	23" (584.20 mm) seismic frame, 8' (2438.40 mm) high with 1" (25.40 mm) WECO hole spacing, almond white

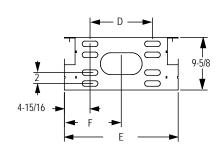
Accessory

Part Number	Description
009106	Floor Mounting Hardware Kit

# **Dimension Specifications**

Rack	А	В	С	D	Е	F
19"	17 ½"	18 <sup>5</sup> / <sub>16</sub> "	21 <sup>15</sup> / <sub>16</sub> "	12"	21 ½"	10 <sup>15</sup> / <sub>16</sub> "
(482.60 mm)	(444.50 mm)	(481.00 mm)	(557.20 mm)	(304.8 mm)	(555.60 mm)	(277.80 mm)
23"	21 ½"	22 <sup>5</sup> /16"	25 <sup>15</sup> / <sub>16</sub> "	16"	25 ½"	12 <sup>15</sup> / <sub>16</sub> "
(584.20 mm)	(546.10 mm)	(582.61 mm)	(658.80 mm)	(406.40 mm)	(657.20 mm)	(328.60 mm)









# **Interbay Cable Management Panels** -

## Description

Interbay cable management is part of an overall fiber management system that includes frames and troughs. In addition to incremental slack take-up, the interbay provides a route-path between frames. Interbay cable management panels are ordered to match the height of the frame and are available in 7' (2133.60 mm), 8' (2438.40 mm) and 9' (2743.20 mm) versions. End guards are available for the end of a line up to minimize potential damage to jumpers. Interbay cable management is suggested for all fiber applications. Clearfield's recommendation is to mount one interbay on both sides of each frame and place an interbay with end guard on each end of the lineup.

## **Configured Part Numbers**





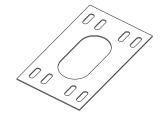
## **Pre-Configured Part Numbers**

Part Number	Description
FMA-EZA-PT	FxDS Interbay Cable Management Panel, 7' H x 5" W (2133.60 mm x 127.00 mm), without end guards, with 1" (25.4 mm) grommeted cable pass through holes
FMA-EZA-PT-3I	FxDS Interbay Cable Management Panel, 7' H x 3" W (2133.60 mm x 76.20 mm), without end guards, custom with 1" (25.40 mm) grommeted cable pass through holes
FMA-FZA-PT	FxDS Interbay Cable Management Panel, 7' H x 5" W (2133.60 mm x 127.00 mm), with end guards, custom with 1" (25.40 mm) grommet cable pass through holes
FMA-FZA-PT-3I	FxDS Interbay Cable Management Panel, 7' H x 3" W (2133.60 mm x 76.20 mm), with end guards, with 1" (25.40 mm) grommet cable pass through holes
FMA-XXX-119	Kit, mounting bracket for FxDS Interbay, non-seismic, front mount

## Isolation Pad -

# Description

The Isolation Pad provides isolation between the floor and the equipment rack.



# **Pre-Configured Part Numbers**

Part Number	Description
FMA-L1Z-SUB	Isolation Pad Kit, 19" (482.60 mm) frame, 9.5" D x 22" W (241.30 mm x 558.80 mm)
FMA-L2Z-SUB	Isolation Pad Kit, 23" (584.20 mm) frame, 9.5" D x 26" W (241.30 mm x 660.40 mm)

### Floor Mount Hardware Kit

Part Number	Description
009106	Floor Mounting Hardware Kit





# **Crossover Troughs**

## Description

Troughs are in integral part of the FieldSmart fiber management platform. When used properly, troughs provide a protected route path when running jumpers between equipment. Crossover Troughs are used when radius spools are not required. They are simply used to cross from one side of the frame to another or to reach another frame. They come standard with a front door for additional protection and improved appearance. Crossover Troughs are 3" or 5" high and available in 19" and 23" mounting.



## **Pre-Configured Part Numbers**

Part Number	Description
FMA-B13-SUB FxDS Crossover Trough, 3" x 19" (76.20 mm x 482.60 mm) (no spools)	
FMA-B15	FxDS Crossover Trough, 5" x 19" (127.00 mm x 482.60 mm) (no spools)
FMA-B23	FxDS Crossover Trough, 3" x 23" (76.20 mm x 584.20 mm) (no spools)
FMA-B25	FxDS Crossover Trough, 5" x 23" (127.00 mm x 584.20 mm) (no spools)

# **Active Gear Troughs**

## **Description**

Troughs are an integral part of the FieldSmart fiber management platform. When used properly, troughs provide a protected route path when running jumpers between equipment. Active Gear Troughs are equipped with nine radius fingers (19") and 11 radius fingers (23") on the open bottom. It is designed to be placed directly above or below an active gear chassis to manage slack and access of active gear cards and associated fiber ports. The Active Gear Troughs are 5" high and available in 19" and 23" mounting.



# **Pre-Configured Part Numbers**

Part Number	Description		
FMA-D15	FxDS Active Gear Trough, 5" x 19" (127.00 mm x 482.60 mm) (with management spools and fingers)		
FMA-D25	FxDS Active Gear Trough, 5" x 23" (127.00 mm x 584.20 mm) (with management spools and fingers)		

# Slack Management Troughs

## Description

Troughs are in integral part of the FieldSmart fiber management platform. When used properly, troughs provide a protected route path when running jumpers between equipment. Slack Management Troughs contain radius spools that add additional incremental slack take-up to the fiber management system. They come standard with a front door for additional protection and improved appearance. Slack Management Troughs are 5" deep and available in 5" and 7" heights and 19" and 23" mounting.



## **Pre-Configured Part Numbers**

Part Number	Description
FMA-C15	FxDS Slack Management Trough, 5" x 19" (127.00 mm x 482.60 mm) (with spools)
FMA-C25	FxDS Slack Management Trough, 5" x 23" (127.00 mm x 584.20 mm) (with spools)
FMA-C27	FxDS Slack Management Trough, 7" x 23" (177.80 mm x 584.20 mm) (with spools)

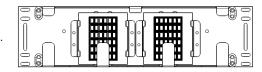




# Staging Plate Trough -

## **Description**

Troughs are an integral part of the FieldSmart fiber management platform. When used properly, troughs provide a protected route path then running jumpers between equipment. The Staging Plate Trough has two staging plates equipped with 36 positions each for "parking" optical splitter legs until they are ready to use.



**Pre-Configured Part Numbers** 

Part Number	Description
FMA-XXX-41	FieldSmart FxDS Staging Plate Trough, 5" x 19" (127.00 mm x 482.60 mm)



# Frame Clamp Kit and Splice Deck Clamp Kit -

## **Application**

For on-frame patch and splice applications, the desire to clamp onto the frame rather than a FieldSmart FxMP Panel may be required to address proper cable sweep from the frame into the panel. The frame clamp can also be used to manage incoming cable at an additional location on the frame, when a more robust and rigid capture is required due to the O.D. size of the cable and the number of incoming cables.

## Description

The FieldSmart FxMP Frame Clamp Kit comes with bracket for mounting onto the frame, clamp shells and mounting hardware. Mounts to 19" or 23" standing frames or cabinets.



### **Features and Benefits**

- · Can be used on any frame
- · Comes with multiple size clamps
- · Holds cable diameters up to 1" in diameter

## **Pre-Configured Part Numbers**

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Part Number	Description			
008140	Frame clamp kit, green polypropylene			
018513	Saddle clamp, 1" diameter, grey polymide, VO			
018514	Saddle clamp, ¾" diameter, grey polymide, VO			
018515	Saddle clamp, 1/8" diameter, grey polymide, VO			

# FieldSmart®

# DIN Rail Cassette Mounting Kit



## **Application**

The FieldSmart DIN Rail Cassette Mounting Kit easily mounts to any TS-35 (35 mm wide x 7.5 mm high or greater rail) industry standard DIN rail. The DIN rail clip "grips" the rail on both the top and bottom lips for tool-less installation. This is an ideal solution for applications requiring maximum system reliability and flexibility. It is perfectly suited for Transportation, Machine Building, Municipality, Oil and Gas Refinery, and Alternative Power Generation applications. It is also ideal for more general use in customer premise locations, enterprise networks and remote locations. Utilizing the Clearview® Blue Cassette, the new DIN Rail Mounting Kit allows you to bring fiber management to areas where it was not able to be installed before.

Each cassette will provide 12 ports of connectivity for patch and splice (Clearfield's incassette splicing solution), patch only (stubbed) or plug and play (MPO/MTP) configurations.

### Description

The DIN Rail Cassette Mounting Kit includes the cassette mounting tray, bracket and rail mount clip. DIN rail tray and cassettes can be mounted vertically, horizontally or with adapters facing out with no specialty bulkheads needed. Up to two Clearview Cassettes can be mounted on one bracket. Brackets can be mounted next to each other for future growth.

### **Features and Benefits**

### Integrity

- · Allows Clearview Cassettes to attach to DIN 35 mm slotted rail
- · Modular and scalable

### Protection

- · Durable steel plate
- Radius bend protection of all fiber cable within the blue cassettes

### Access

- Provides central location where external and internal wiring can be connected quickly and efficiently
- · Associated devices can be mounted adjacent to each other, thus reducing the length of interconnect wiring
- · 360° cassette mounting options

### Investment

- · Reduces installation time
- · Saves space no need to panel mount all components
- · Versatile mounting options
- · Easy snap on/snap off capability

# **Technical Specifications**

FieldSmart DIN Rail Cassette Mounting Kit			
Dimensions Cassette Tray: 1.72" H x 7.75" W x 6.96" D (43.69 mm x 196.85 mm x 176.78 mm) Rail Mount Clip: 2.68" H x 1.38" W x 0.32" D (68.07 mm x 35.05 mm x 8.13 mm)			
Port Density	12 or 24 ports		
Cassette Types Supported	Clearview® Blue		
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC		

## **Pre-Configured Part Number**

Part Number	Description
FMA-DIN RAIL	FieldSmart DIN Rail Cassette Mounting Kit

# FieldSmart® Fiber Crossover Multi Purpose (FxMP) Patch Panels



# CLEADEIEL

### **Application**

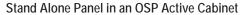
Provides an interconnect or cross-connect environment for up to 288 SC ports or 576 LC ports of high density fiber for inside plant environments and outside FDH deployments.

## **Description**

The FieldSmart FxMP Panel is a high density, low maintenance fiber distribution panel for use in a data style rack/cabinet, a 19" (482.60 mm) or a 23" (584.20 mm) frame. Utilizing the Clearview® Cassette, FieldSmart FxMP Panels are intelligently designed to provide the user with superior fiber access and craft-friendly, radius protected, fiber management for routing and deploying fiber jumpers.

### Stand Alone Panel in a 19" or 23" (482.60 mm or 584.20 mm) Frame

When you already have the frame and want to add just a panel or two of incremental fiber management, the FxMP is configured with front and rear protection blocks for complete slack storage and physical fiber protection.



Make the crossover into the OSP with the identical product. Patch only environments are supported without additional components, while a rear protection block enables patch and splice (Clearfield's in-cassette splicing solution) configurations. The common architecture saves you time and money in reducing inventory costs and shorter training period.

### Stand Alone Panel in a Data Rack/Cabinet

When you already have a data rack or cabinet and simply need to add fiber management, the FxMP is available to mount in this smaller footprint, providing all the fiber protection you need without the added cost. Available in black.



Top Protection - Closed



Top Protection - Black

### **Features and Benefits**

### Integrity

- · RUS listed
- Designed, tested and certifed to Telcordia GR-63 & GR-1089 NEBS Level 3
- Fiber cable is certified to Telcordia GR-20 & GR-409
- · Terminations designed, tested and certified to Telcordia GR-326
- · Supports all industry standard singlemode and multimode connectors

### Protection

- · Front cover is easily removable and installation of cassettes is simple with no tools needed
- · Individual radius fingers provide organized and intuitively managed fiber jumpers and minimize pile-up
- Slide rails for cassettes provide a stable attachment utilizing the cassette T-rail, and are incorporated into the rear protection of panels
- Pre-terminated OSP buffer tubes are protected by bend-limited tubing and have their slack stored inside the panel to protect against environmental and human damage
- The top metal protective cover slides out for top protection over the fiber cables and can sit in 3 positions: closed, open 3.25" (82.55 mm) and open 4.77" (121.16 mm)

### Access

- · Front access to pre-terminated assemblies with removable adapter plates for testing, cleaning and maintenance
- The entire 12-fiber Clearview Cassette is removable for hot-swap changes
- Front and rear access to panel
- New larger designation cards provide greater writing area for standard and high density panels
- · Reversible Mounting Ears provide added flexibility

### Invoctmont

Using the Clearview Cassette, all fibers are deployed in increments of 12, allowing users to scale from 12 ports to full configuration without
additional equipment

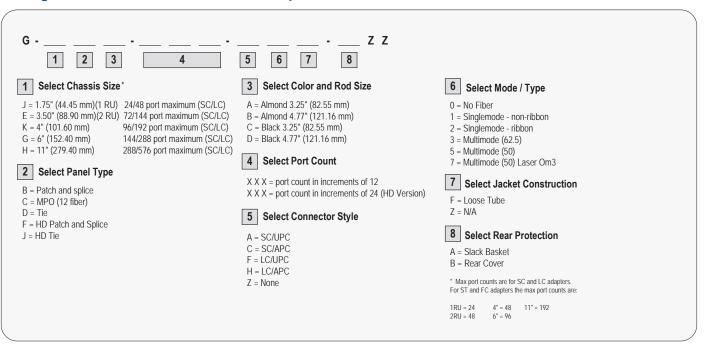
# FieldSmart® Fiber Crossover Multi Purpose (FxMP) Patch Panels



## **Technical Specifications**

FieldSmart FxMP Patch Panels						
Port Density	24/48	72/144	96/192	144/288	288/576	
Dimensions	1.75" H (44.45 mm)	3.5" H (88.90 mm)	4" H (101.60 mm)	6" H (152.40 mm)	11" H (279.40 mm)	
Ratings	Compliant to Telcore	dia GR-63, GR-1089,	GR-449, GR-20 and G	R-409		
Cassette Types Supported	Clearview® Blue wit	Clearview® Blue with 1 mounting tab				
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO					
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®					
Splice Capacity	12-24 splices in each Clearview Cassette					
Storage Capacity	One meter of 250 µm fiber					
Front Protection	3.25" (82.6 mm) or 4.77" (121.16 mm) radius fingers					
Color	Almond or black					
Material	Steel and aluminum with powder paint coating					

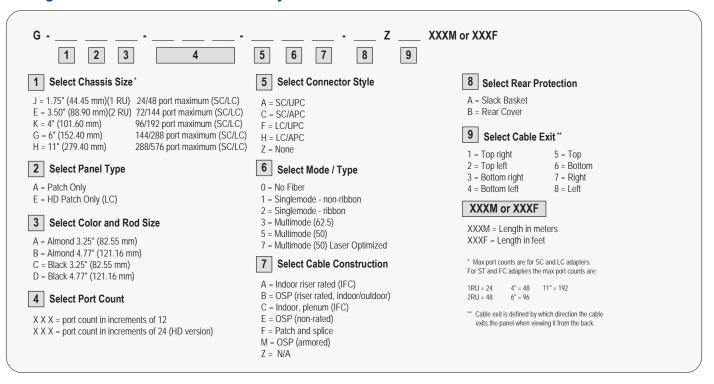
## **Configured Part Numbers - Patch and Splice**



# Patch Panels

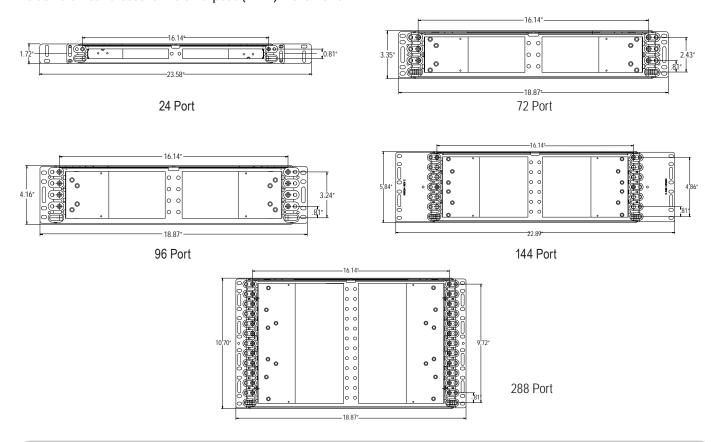


## **Configured Part Numbers - Patch Only**



## **Configurations**

FieldSmart Fiber Crossover Multi Purpose (FxMP) Front Views

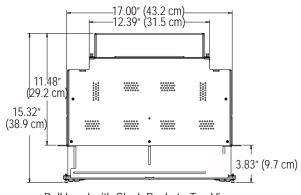


# Patch Panels -

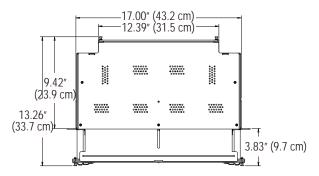


# **Configurations**

FieldSmart Fiber Crossover Multi Purpose (FxMP) Top Views

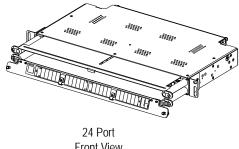


Bulkhead with Slack Basket - Top View Shown with Short Rods (3.25")

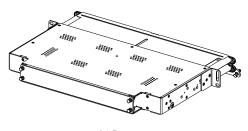


Bulkhead with Rear Door - Top View Shown with Short Rods (3.25")

### FieldSmart Fiber Crossover Multi Purpose (FxMP) 24 Port Fiber Panels

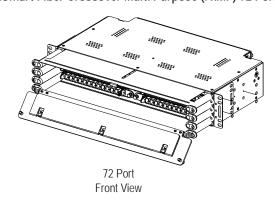


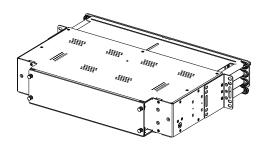
Front View



24 Port Rear View with Rear Protection

### FieldSmart Fiber Crossover Multi Purpose (FxMP) 72 Port Fiber Panels





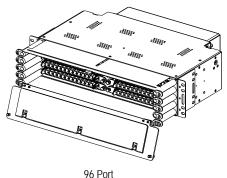
72 Port Rear View with Rear Protection

# Patch Panels -

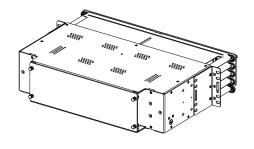


# **Configurations**

FieldSmart Fiber Crossover Multi Purpose (FxMP) 96 Port Fiber Panels

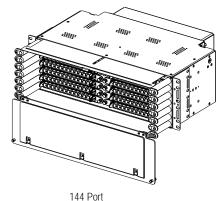


Front View with Slack Basket

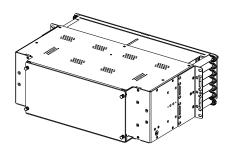


96 Port Rear View with Rear Protection

### FieldSmart Fiber Crossover Multi Purpose (FxMP) 144 Port Fiber Panels

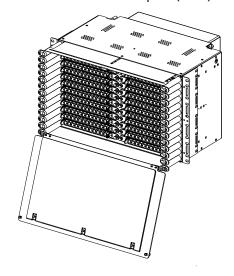


Front View with Slack Basket

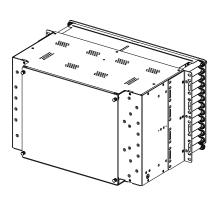


144 Port Rear View with Rear Protection

### FieldSmart Fiber Crossover Multi Purpose (FxMP) 288 Port Fiber Panels



288 Port Front View with Slack Basket



288 Port Rear View with Rear Protection

# Tie Panels



## **Application**

The FieldSmart FxMP Tie Panel provides an in the field configured interconnect or cross-connect environment for 12 to 288 ports of high density fiber in central office/headend environments.

### **Description**

The FieldSmart FxMP Tie Panel is a high density, low-maintenance fiber distribution panel for use in a 19" or 23" (482.60 mm or 584.20 mm) frame. Tie panels are intelligently designed to provide the user with superior fiber access, utilizing craft-friendly radius protected fiber management for routing and deploying fiber jumpers or multi-fiber cables, on both sides of the adapter plate for cross-connect environments. They use a removable adapter plate that mounts on the right side or left side of the panel.



Top Protection - Closed

### **Features and Benefits**

### Integrity

- · RUS listed
- · Designed, tested & certified to Telcordia GR-63 & GR-1089 NEBS Level 3
- · Designed to comply with Telcordia GR-449
- · Certified to Telcordia GR-20 & GR-409
- Optical component configurations use Telcordia GR 1221/1209 compliant devices
- · Terminations designed, tested and certified to Telcordia GR-326
- · Supports all industry standard singlemode and multimode connectors

### **Protection**

- · Front cover is easily removable with no tools needed
- · Cable clamp protects against twisting and pistoning at the assembly breakout point
- · Top metal protective cover slides out for top protection over the fiber cables

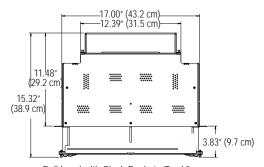
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  Front access with removable adapter plates for testing, cleaning and maintenance
- · Front and rear access to panel

### Investment

- Panel sizes available in 1.75" (44.45 mm) 1RU (24 ports), 3.50" (88.90 mm) 2RU (72 ports), 4" (101.60 mm) (96 ports), 6" (152.40 mm) (144 ports) and 11" (279.40 mm) (288 ports) (Note: all port counts based on SC adapter style)
- Industry-leading density, supporting 288 ports SC in 11" (279.40 mm)
- 19" and 23" (482.60 mm and 584.20 mm) reversible mounting brackets for flexibility



Bulkhead with Slack Basket - Top View Shown with Short Rods (3.25")

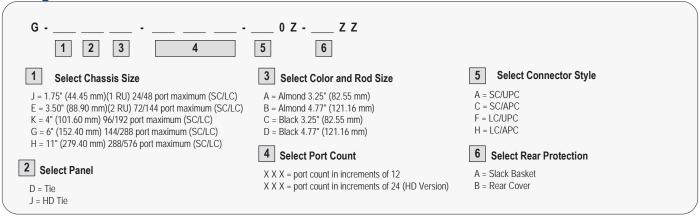




## **Technical Specifications**

FieldSmart FxMP Tie Panels						
Port Density	24	72	96	144	288	
Dimensions	1.75" H x 17.5" W x 14.40" D (44.45 mm x 444.50 mm x 365.76 mm)	3.5" H x 17.5" W x 14.40" D (44.45 mm x 444.50 mm x 365.76 mm)	4" H x 17.5" W x 14.40" D (44.45 mm x 444.50 mm x 365.76 mm)	6" H x 17.5" W x 14.40" D (44.45 mm x 444.50 mm x 365.76 mm)	11" H x 17.5" W x 14.40" D (44.45 mm x 444.50 mm x 365.76 mm)	
Ratings	Fully certified to Telcordia GR-63 and GR-1089 (NEBS 3), GR-449, GR-20 and GR-409					
Cassette Types Supported	N/A					
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC					
Splice Capacity	N/A					
Storage Capacity	N/A					
Front Protection	3.25" (82.55 mm) and 4.75" (120.65 mm) radius fingers					
Material	Steel and aluminum with almond or black powder coating					

## **Configured Part Numbers**



### **Tie Panel Plates**

Tie plates will attach to the panel in a similar manner to cassettes, except instead of sliding a T-rail into one of the panel's slide rails, the hook on the end of the tie plate will insert into the front of the slide rail. Press on the push/pull plunger to secure the tie plate.

Note: Images may not match product received. Fiber routing and protection will remain the same.







# FieldSmart® Fiber Crossover Multi Purpose (FxMP) Tie Plate Kit



# **Pre-Configured Part Numbers - Standard**

Part Number	Description
FMA-XXX-169-L	Adapter Plate, FxMP, SM, 12 x SC/UPC, Left Side
FMA-XXX-169-R	Adapter Plate, FxMP, SM, 12 x SC/UPC, Right Side
FMA-XXX-170-L	Adapter Plate, FxMP, SM, 12 x SC/APC, Left Side
FMA-XXX-170-R	Adapter Plate, FxMP, SM, 12 x SC/APC, Right Side
FMA-XXX-171-L	Adapter Plate, FxMP, SM, 12 x LC/UPC, Left Side
FMA-XXX-171-R	Adapter Plate, FxMP, SM, 12 x LC/UPC, Right Side
FMA-XXX-172-L	Adapter Plate, FxMP, SM, 12 x LC/APC, Left Side
FMA-XXX-172-R	Adapter Plate, FxMP, SM, 12 x LC/APC, Right Side

# **Pre-Configured Part Numbers - High Density**

Part Number	Description
FMA-XXX-173-L	Adapter Plate, FxMP, SM, 24 x High Density LC/UPC, Left Side
FMA-XXX-173-R	Adapter Plate, FxMP, SM, 24 x High Density LC/UPC, Right Side
FMA-XXX-174-L	Adapter Plate, FxMP, SM, 24 x High Density LC/APC, Left Side
FMA-XXX-174-R	Adapter Plate, FxMP, SM, 24 x High Density LC/APC, Right Side

# Optical Component Chassis (OCC)



## **Application**

The FieldSmart FxMP Optical Component Chassis (OCC) is used for housing optical component modules. The FxMP Optical Component Chassis is available for horizontally mounted modules. These products are needed when optical components are required. They are typically used in CATV headends and telephone company central offices.

## Description

An optical component chassis is mounted in a rack and holds optical components modules. Fiber jumper management is provided from the front of the optical component module to the interbay cable management panels. Optical components are splitters or WDM's that are housed in the flexible Clearview® Cassette. The FieldSmart® modules require an Optical Component Chassis to house the modules in a frame. The 1RU splitter/"pizza box" does not require a separate chassis and is available in 19" or 23" (482.60 mm or 584.20 mm) mounting versions. (See the WaveSmart® Splitters data sheet for additional ordering information)

This one rack unit "Pizza Box" module is a rack mountable (19" or 23") product with front female adapters. This solution may be suitable if a single optical component is needed in a frame and no future growth will be needed. Since the module has mounting ears, no separate chassis is needed for this solution. The optical component is housed within the rack mountable box.



Clearview Cassette
Horizontal Orientation



1RU "Pizza Box" Chassis

## **Features and Benefits**

### Integrity

- · RUS listed
- Panels designed, tested and certified to Telcordia GR-63 & GR-1089 NEBS Level 3
- Fiber cable is certified to GR-20 and GR-409
- Terminations designed, tested and certified to Telcordia GR-326
- · Supports all industry standard singlemode and multimode connectors

### Protection

VO-rated ruggedized Lexan front cover

### Access

· Front and rear access to panel

### Investment

- · Virtually any combination of split ratios and number of components can be achieved in one of the four Clearview Cassette sizes
- · An economical, dense and user-friendly solution for deploying splitters or WDM's in a central office design
- · 1RU optical components available for smaller, limited deployments
- Horizontal mounting versions of the FieldSmart FxMP OCC are available in five sizes to accommodate any size project
- Reversible mounting ears for 19" or 23" (482.60 mm or 584.20 mm) provide mounting flexibility (except in 1RU)
- Chassis incorporates the superior fiber management system of the FieldSmart FxMP panel line
- · Allows for a "grow-as-you-go" design to reserve rack space for future growth





# **Technical Specifications**

FieldSmart FxMP Optical Component Chassis					
	Clearview Cassette: 1 High	0.8" H x 8.75" W x 8" D (20.32 mm x 222.25 mm x 203.20 mm)			
	Clearview Cassette: 2 High	1.6" H x 8.6" W x 7.06" D (40.64 mm x 218.44 mm x 179.32 mm)			
Dimensions	Clearview Cassette: 3 High	2.41" H x 8.6" W x 7.06" D (61.21 mm x 218.44 mm x 179.32 mm)			
Difficusions	Clearview Cassette: 6 High	4.84" H x 8.6" W x 7.06" D (122.94 mm x 218.44 mm x 179.32 mm)			
	1RU (19")(482.60 mm)	1.75" H x 19" W x 15.02" D (44.45 mm x 482.60 mm x 381.51 mm)			
	1RU (23")(584.20 mm)	1.75" H x 23" W x 15.02" D (44.45 mm x 584.20 mm x 381.51 mm)			
Ratings	Fully certified to NEBS Level 3 Telcordia GR-63, GR-1089, GR-449, GR-20 and GR-409				
Cassette Types Supported	Clearview® Blue, Clearview xPAK				
Material	Steel and aluminum with almond powder coating. Also available in black.				

### FieldSmart Chassis Capacity - Number of Components

readmart diagons dapatity mainter of demponents					
Component Type	Horizontal 1.75'/1RU	Horizontal 3.5'/2RU	Horizontal 6"	Horizontal 11"	
FSAN WDM	8	24	48	96	
1 x 2	8	24	48	96	
1 x 3	6	18	36	72	
1 x 4	4	12	24	48	
1 x 8	2	6	12	24	
1 x 16	0	2	6	12	
1 x 32	0	2	4	8	
1 x 64	0	0	2	4	

# **Configured Part Numbers**

-000 - Z0Z - BZZ

2 3

Select Chassis Size

J = 1.75" (44.45 mm)(1 RU) 24/48 port maximum (SC/LC)

E = 3.50" (88.90 mm)(2 RU) 72/144 port maximum (SC/LC)

K = 4" (101.60 mm) 96/192 port maximum (SC/LC) G = 6" (152.40 mm) 144/288 port maximum (SC/LC)

H = 11" (279.40 mm) 288/576 port maximum (SC/LC)

2 | Select Style

K = Horizontal

Select Color and Rod Size

A = Almond 3.25" (82.55 mm)B = Almond 4.77" (121.16 mm)

C = Black 3.25" (82.55 mm) D = Black 4.77" (121.16 mm)

# FieldSmart<sup>®</sup> Fiber Crossover Multi Purpose (FxMP)





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## **Application**

The FieldSmart FxDS Optical Component Chassis (OCC) is used for housing optical component modules. The FxDS Optical Component Chassis is available for LGX vertically mounted modules. These products are needed when optical components are required. They are typically used in CATV headends and telephone company central offices.

## Description

An optical component chassis is mounted in a rack and holds optical components modules. Fiber jumper management is provided from the front of the optical component module to the interbay cable management panels. Optical components are splitters or WDM's that are metal LGX housing based. Optical components can be housed in the flexible Clearview® Cassette or in one of our four sizes of LGX style modules. The LGX modules require an Optical Component Chassis to house the m in a frame.



LGX Vertical Orientation

17.16

9.29

14.58

## **Features and Benefits**

### Integrity

- · RUS listed
- Designed to comply to Telcordia GR-449
- · Supports all industry standard singlemode and multimode connectors

### Protection

- · Optional ruggedized Lexan front cover
- Optional rear protection module available for additional protection
- · Non-removable adapter plates

### Access

· Front and rear access to panel

### Investment

- Virtually any combination of split ratios and number of components can be achieved in one of the four Clearview Cassette sizes
- An economical, dense and user-friendly solution for deploying splitters or WDM's in a central office design
- Clearfield supports legacy splitter deployments by offering optical components in an LGX footprint
- Available for both 19" or 23" (482.60 mm or 584.20 mm) mounting
- · Chassis incorporates the superior fiber management system of the FieldSmart FxDS panel line
- · Allows for a "grow-as-you-go" design to reserve rack space for future growth

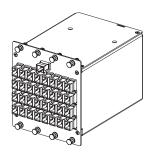
### Accessories

- · LGX/MOC
- Blank plates









4 Wide LGX

# FieldSmart® Fiber Crossover Multi Purpose (FxMP) Optical Component Chassis (OCC) - LGX



# **Technical Specifications**

FieldSmart FxDS Optical Component Chassis				
	LGX 1/2 Wide Module	0.56" H x 5.12" W x 6.72" D (14.22 mm x 130.05 mm x 170.69 mm)		
	LGX 1 Wide Module	1.15" H x 5.12" W x 6.25" D (29.21 mm x 130.05 mm x 158.75 mm)		
	LGX 2 Wide Module	2.27" H x 5.12" W x 6.25" D (57.66 mm x 130.05 mm x 158.75 mm)		
	LGX 4 Wide Module	4.55" H x 5.12" W x 6.25" D (115.57 mm x 130.05 mm x 158.75 mm)		
Ratings	Compliant to Telcordia GR-449			
Material	Steel and aluminum with almond powder coating			

### **LGX Footprint Chassis Capacity - Number Of Components**

Component Type	LGX 6"
FSAN WDM	28
1 x 2	28
1 x 3	14
1 x 4	14
1 x 8	14
1 x 16	3
1 x 32	3
1 x 64	0

## **Configured Part Numbers**

T ZZZZZ				
1 Frame Size and Chassis Type	2 Protection Modules	3 Number	of Slots	
M = 19" and 23" (482.60 mm and 584.20 mm) FxDS LGX vertical cassettes	<ul> <li>7 = No front load protection</li> <li>8 = Front protection only</li> <li>9 = Rear protection only</li> <li>A = Both front and rear protection</li> </ul>	A = 2 B = 4 C = 6 D = 8	E = 12 F = 16 G = 24 H = 14	,

# **SmartRoute Infinity Panel**

# 1RU Panel



## **Application**

The SmartRoute Infinity 1RU Panel is designed to simplify and speed up fiber installations when landing 24 to 48 fibers in any interconnect or cross-connect environment. Clearfield's SmartRoute Infinity Panel combines cable wrap technology and MPO connectorization in a single panel to help relieve cable congestion, simplify ordering and eliminate incorrect cable lengths for IFC cable assemblies while saving labor and installations costs.

The SmartRoute Infinity Panel combines two separate, but critical fiber connectivity elements: The intermediate fiber panel and the IFC fiber cable assembly into one easy-to-deploy unit. If your network is comprised of both singlemode and multimode fiber, the Infinity Panel can be configured with singlemode fiber on one rod assembly and multimode fiber on the other rod assembly.



## **Description**

The SmartRoute Infinity Panel combines micro-distribution cable, rod technology and MPO connectorization in a single panel to help relieve cable congestion, simplify ordering and eliminate incorrect cable lengths for IFC cable assemblies. It also provides savings on labor and installation costs. The Infinity Panel contains two internal rod assemblies that can hold up to 100 feet each of IFC cable. The panel can provide 24 SC or 48 LC connections in front and MPO, plug-and-play, SC/LC breakouts for pigtails on the cabled far end.



### Features and Benefits

### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- · Clearfield FiberDeep Guarantee: 0.2dB insertion loss or less, exceeding industry standards
- Supports all industry standard singlemode and multimode connectors

### Protection

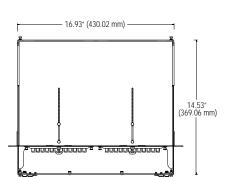
- Infinity Panel rod technology allows an installer to payout the exact amount of cable required from the panel, leaving the remaining slack safely stored within the panel
- · Individual radius fingers organize and intuitively manage fiber jumpers
- · Removable front protection provides physical fiber protection, reducing service interruptions

### Access

- · Straight forward, simple design means installation crews spend less time figuring out how to deploy
- · Dual rod assemblies can be utilized independently
- Removable front adapter plates provide access to preterminated assemblies for testing, cleaning and maintenance

### Investment

- · Pre-connectorized options eliminate splice labor and speed network construction
- Rod assemblies reduce upfront deployment costs by simplifying site survey inspections, reducing labor hours and streamlining cable deployment



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# **Technical Specifications**

SmartRoute Infinity Panel 1RU Panel	
Dimensions	1.70"H x 16.93"W x 14.53"D (43.18 mm x 430.02 mm x 369.06 mm)
Mounting Options	19" mounting ear with 23" extension
Front Protection	Polycarbonate front cover with attached designation card
Connector Types	SC and LC
Port Density	24 ports = SC/UPC or SC/APC; 48 ports = LC/UPC or LC/APC
Cabled End	SC and LC breakouts, MPO
Maximum Internal Cable Length	2 Rod Assemblies with 3mm 12-fiber micro cable = 100 feet per rod assembly/200 feet

# **Configured Part Numbers**

Front Panel Left Side or Single Module	Rear Connector Left Side or Front Panel R Single Module _	Rear Connector Right Side
1 2 3 4 5	6 7 8 9 10 11	12 13 14 15 16 17
1 Module Assembly	7 Left Rear Breakout	13 Right Port Count
2 = Dual Module Slots 3 = Single Module Slot  2 Left Front or Sing Assembly Module Connector Type A = SC/UPC C = SC/APC F = LC/UPC Duplex H = LC/APC Duplex  3 Left Mode & Type	B = 1 Meter C = ½ Meter P = Pulling Eye Z = None (MPO Only)  8     Left Rear Upjacketing A = 900 um B = 2 mm Z = None (MPO Only)  9     Left Side Length	1 = 12 2 = 24 (LC only) Z = None  14 Right Rear Connector Type  A = SC/UPC C = SC/APC E = LC/UPC Simplex G = LC/APC Simplex R = MPO Female 24 Port 6 = MPO Female 12 Port
1 = SM Stranded Non-ribbon 7 = MM OM3 Laser Optimized  4 Left Jacket Construction 5 = Indoor Riser Microcable (SM only) Y = Indoor Micro Distribution Cable (MM only)  5 Left Port Count 1 = 12 2 = 24 (SC-Single, LC-Dual) 4 = 48 (LC Single Module Only)  6 Left Rear Connector Type A = SC/UPC C = SC/APC E = LC/UPC simplex G = LC/APC simplex R = MPO female 24 port 6 = MPO female 12 port	2 = 50 Feet 4 = 100 Feet  10 Right Front Panel Connector Type  A = SC/UPC C = SC/APC F = LC/UPC Duplex H = LC/APC Duplex Z = None  11 Right Mode & Type  1 = SM Stranded Non-ribbon 7 = MM OM3 Laser Optimized Z = None  12 Right Jacket Construction 5 = Indoor Microcable (SM Only) Y = Indoor Micro Distribution Cable (MM Only)	B = 1 meter C = ½ meter P = Pulling Eye Z = None  16 Right Rear Upjacketing A= 900 um B = 2 mm Z = None  17 Rear Spool Right Side Length 2 = 50 feet 4 = 100 feet Z = None

# FieldSmart®

# Small Count Delivery (SCD) Panel - Rack Mount



## **Application**

The FieldSmart Small Count Delivery (SCD) Panel for a rack is a cost-effective way to provide fiber management protection in interconnect or cross-connect environments when landing a small number of fibers. It provides connectivity for Clearview® Blue Cassettes and xPAKs in a 1RU footprint.

## **Description**

The FieldSmart SCD Panel provides the ability to rack-mount Clearview devices in a single rack unit. The 2 slot panel version supports the 12 port Clearview Cassette or the two port, four port or six port Clearview xPAK in a single rack unit. The 3 slot panel version supports up to 3 Clearview xPAKs in a single rack unit. The product is available as either a 19" or 23" (482.60 mm or 584.20 mm) rack-mount unit. The FieldSmart SCD 1RU is intelligently designed to provide the user with superior fiber access while using craft-friendly radius protected fiber management for routing and deploying fiber jumpers.



Rack Mount SCD Panel with xPAK and Clearview Blue Cassette

### **Features and Benefits**

### Integrity

- · RUS listed
- Terminations designed, tested and certified to Telcordia GR-326
- · Designed to comply to Telcordia GR-449, GR-20, GR-409 anf GR-1209/1221
- · Clearview devices support all industry standard singlemode and multimode connectors

### Protection

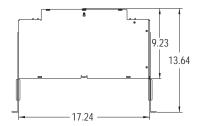
Individual radius fingers provide organized and intuitively managed fiber jumpers, minimizing pile up

### Access

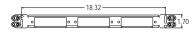
- · Clearview devices are removable for hot-swap changes
- Front and rear access to panel
- Splicing integrated within the cassette for optimal protection and space utilization

### Investment

- Fiber protection is optimized within the Clearview device
- FieldSmart SCD extends this protection with minimal added cost or overhead







SCD-X1RU-RM-3

# FieldSmart® Small Count Delivery (SCD) Panel - Rack Mount -



# **Technical Specifications**

FieldSmart 1RU Small Count Delivery Panel - Rack	
Dimensions	1.70" H x 17.24" W x 9.23" D (43.18 mm x 437.90 mm x 234.44 mm)
Ratings	Compliant to Telcordia GR-449
Port Density	24 SC or 48 LC (cassette version), 12 SC or 36 LC (xPAK version)
Cassette Types Supported	Clearview Blue, Clearview xPAK, or mix and match
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	12-24 splices in each Clearview Cassette
Storage Capacity	One meter of 900 µm fiber
Material	Steel and aluminum with almond powder coating

# **Pre-Configured Part Numbers**

Part Number	Description
SCD-X1RU-RM	FieldSmart SCD 1RU Rack Mount; 2 slots (cassette and xPAK compatible)
SCD-X1RU-RM-3	FieldSmart SCD 1RU Rack Mount, 3 slots (xPAK compatible only)
008145	Blank Plate for 2 Slot Panel (each)
FMA-XXX-189	Blank Plate Kit for xPAK 3 Slot Panel (each)

# FieldSmart®

# Small Count Delivery (SCD) Panel - Cabinet Mount



13.64

## **Application**

The Small Count Delivery Panel for a cabinet is a cost-effective way to provide fiber management protection in interconnect or cross-connect environments when landing a small number of fibers. It provides connectivity for Clearview® Blue Cassettes and xPAKs in a 1RU footprint.

## Description

The FieldSmart SCD Panel for a cabinet provides a cost-effective means to cabinet-mount up to two Clearview devices: the 12 port Clearview Cassette or the two port, four port or six port Clearview xPAK in a single rack unit. The product is available as either a 19" or 23" (482.60 mm or 584.20 mm) data cabinet-mount unit. The FieldSmart SCD 1RU is intelligently designed to provide the user with superior fiber access while using craft-friendly radius protected fiber management for routing and deploying fiber jumpers.



Cabinet Mount SCD Panel with xPAK and Clearview Blue Cassette

17.24

18.32

SCD-X1RU-CM

### **Features and Benefits**

### Integrity

- · RUS listed
- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Designed to comply to Telcordia GR-449, GR-20, GR-409 and GR-1221/1209
- Clearview devices support all industry standard singlemode and multimode connectors

· Individual radius fingers or pass-through radius routing provides organized and intuitively managed fiber jumpers, minimizing pile up

### Access

- Clearview devices are removable for hot-swap changes
- Front and rear access to panel
- Splicing integrated within the cassette for optimal protection and space utilization

### Investment

- · Fiber protection is optimized within the Clearview device
- · FieldSmart SCD extends this protection with minimal added cost or overhead

## **Technical Specifications**

FieldSmart 1RU Small Count Delivery Panel - Cabinet	
Dimensions	1.70" H x 17.24" W x 9.23" D (43.18 mm x 437.90 mm x 234.44 mm)
Ratings	Compliant to Telcordia GR-449
Port Density	24 SC or 48 LC
Cassette Types Supported	Clearview Blue and Clearview xPAK
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	12 splices in each Clearview Cassette
Storage Capacity	One meter of 900 µm fiber
Material	Steel and aluminum with almond powder coating

## **Pre-Configured Part Numbers**

Part Number	Description
SCD-X1RU-CM	FieldSmart SCD 1RU Cabinet Mount

# StreetSmart<sup>™™</sup>

# Indoor 144 Fiber Entrance Cabinet (FEC)



## **Application**

The wall-mountable StreetSmart® Indoor 144-Port Fiber Entrance Cabinet (FEC) provides off-frame splicing, storage and protection for the central office, headend or enterprise networks. Fiber Entrance Cabinets are typically placed in the fiber entrance room and used to transition OSP fiber sheaths to IFC cabling.

## Description

The StreetSmart FEC is built on a modular platform scaling 144 heat shrink fusion (HSF) or 432 mass fusion (ribbon) fiber splices at a time. Multiple entry/exit points allow for multiple distribution and OSP fiber sheaths to enter into the FEC from top or bottom and transition from conduit, overhead fiber tray or raised flooring. The cabinet holds six 24-fiber splice trays, allowing the user access and the ability to prep away from the cabinet. Intuitive buffer tube and sub-unit slack routing prevents cable tie-in with a clockwise routing scheme to allow quick and easy re-entry after initial deployment or to add additional capacity. Multiple cable entry/exit locations are provided on the top and bottom of the housing supporting cable diameters of up to one inch. A lockable door allows for easy access with minimal swing clearance needed for tight aisle clearances.



### **Features and Benefits**

### Integrity

- Industry standard splice tray
- · Sturdy construction using 18 gauge steel

### Protection

- · Hinged doors, with removable hinge pin provides extra stability
- Ruggedized cable clamps protect against twisting and pistoning at the assembly breakout point
- · Full bend-radius protection throughout cabinet

### Access

- Multiple entry/exit points allow distribution and OSP fiber sheaths to enter from top or bottom
- · Cable entrance plates support cable diameters up to one inch
- · Removable splice trays provide technicians access to prep outside of the cabinet
- Intuitive, clockwise fiber management routing scheme prevents cable tie-in
- Ability to store up to 20 feet total of 144 loose tube cable

### Investment

Splice trays support a maximum of up to 24 loose tube splices or six 12F mass fusion (72) fibers

# StreetSmart<sup>™™</sup>

# Indoor 144 Fiber Entrance Cabinet (FEC)



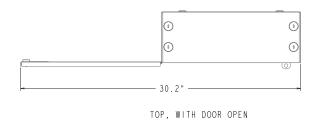
# **Technical Specifications**

StreetSmart Indoor 144 FEC	
Dimensions	10.4"H x 15.3"W x 6.3"D
Ratings	Compliant to GR-449
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	144 Heat Shrink Fusion (HSF) or 432 Mass Fusion (MF) Ribbon Splices
Storage Capacity	One meter of 900 um fiber and five meters of exposed buffer tube
Material	18 gauge cold rolled steel with almond powder coating

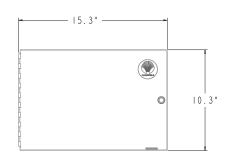
# **Pre-Configured Part Numbers**

1	Part Number	Description
	FEC-MINI-BOX-BLK	Fiber Entrance Cabinet, Mini, 144 Splice Capacity, Black (Splice Trays Not Included)
	019339	Splice Tray
(	010505	Clamp Kit (Note: (2) 7/8" saddle clamps come with the box)

### Top and Bottom View



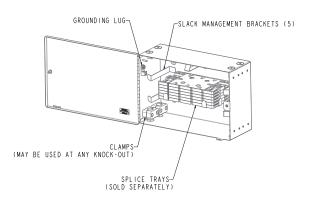
### Front View



### Side View



### Open View



# StreetSmart<sup>™</sup>

# Indoor 288 Fiber Entrance Cabinet (FEC)



## **Application**

The StreetSmart ™ Indoor 288-Port Fiber Entrance Cabinet (FEC) provides off-frame splicing for the central office, headend or remote hut. Fiber Entrance Cabinets are typically placed in the fiber entrance room and used to transition OSP fiber sheaths to IFC cabling.

## Description

The StreetSmart FEC is built on a modular platform scaling 288 heat shrink fusion (HSF) or 864 mass fusion (ribbon) fiber splices at a time. Multiple entry/exit points allow for multiple distribution and OSP fiber sheaths to enter into the FEC from top, bottom or sidewalls and transition from conduit, overhead fiber tray or raised flooring. A removable splice block, holding twelve 24-fiber or 48 (loose tube only) fiber splice trays allows the user access and the ability to prep away from the cabinet. Intuitive buffer tube and sub-unit slack routing prevents cable tie-in with a clockwise routing scheme to allow quick and easy re-entry after initial deployment or to add additional capacity. If vertical real estate is available, the FEC can be ganged together, in modular fashion, allowing scalability up to 864-fiber splices and beyond.



Each cable entrance plate will support cable diameters up to one inch. Lockable cupboard style doors allow for easy access with minimal swing clearance needed for tight aisle clearances.

### **Features and Benefits**

### Integrity

- · Industry standard splice tray
- · Sturdy construction using 16 gauge steel

### Protection

- · Piano hinged doors, with removable hinge pin provides extra stability
- · Ruggedized cable clamps protect against twisting and pistoning at the assembly breakout point
- Full bend-radius protection throughout cabinet

### Access

- · Multiple entry/exit points allow distribution and OSP fiber sheaths to enter from top, bottom or sidewalls
- · Cable entrance plates support cable diameters up to one inch
- Removable splice trays provide technicians access to prep outside of the cabinet
- · Intuitive, clockwise fiber management routing scheme prevents cable tie-in
- · Ability to store five meters of exposed buffer tubes
- · Removable hinge pin allows for easy door removal

### Investment

- · Splice trays supports both loose tube and ribbon constructions for single and mass fusion (ribbon) splicing
  - Maximum of 48 splice per tray LT (576)
  - Maximum of 72 splice per tray RB (864)
- FECs can be ganged together in a modular fashion when vertical real estate space permits



# $StreetSmart^{^{\text{\tiny TM}}}$

# Indoor 288 Fiber Entrance Cabinet (FEC)

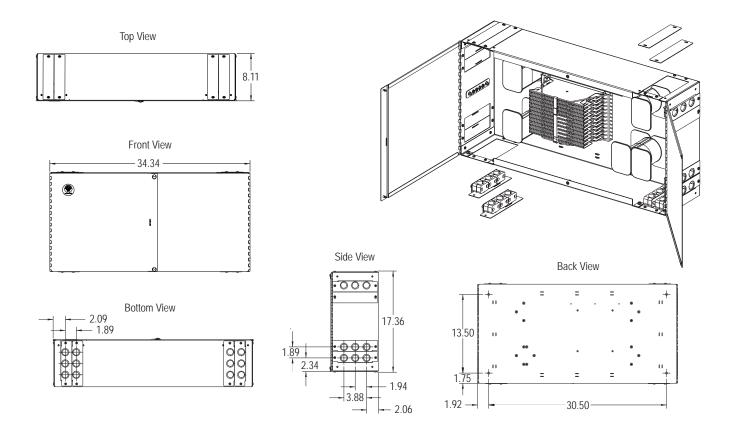


# **Technical Specifications**

StreetSmart Fiber Entrance Cabinet	
Dimensions	17.5" H x 34.5" W x 8.25" D (444.50 mm x 876.30 mm x 209.55 mm)
Ratings	Designed to comply to Telcordia GR-449
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	576 heat shrink fusion (HSF) loose tube or 864 mass fusion (MF) ribbon splices
Storage Capacity	One meter of 900 µm fiber and five meters of exposed buffer tube
Material	16 gauge cold rolled steel with almond powder coating

# **Pre-Configured Part Numbers**

Part Number	Description
009894	Fiber Entrance Cabinet - 288 (576 with the 48 fiber loose tube splice tray) splice capacity (Includes one clamp kit. No splice trays.)
010503	Locking Kit
010505	Clamp Kit (includes four clamp plates, four ½" (12.70 mm) clamps, four 1" (25.40 mm) clamp plugs and appropriate hardware)
019339	Splice Tray for FEC - 24 heat shrink fusion (HSF) or 72 MF mass fusion (MF), 5" x 9"
022432	Splice Tray for FEC - 48 heat shrink fusion loose tube fibers, 5" x 8.6"



# Introduction to Outside Plant Solutions

# FieldSmart® Products



The goal of today's outside plant deployment is to cost-effectively consolidate and distribute fiber deeper into the network.

At Clearfield®, Outside Plant FieldSmart products are designed from the ground up based on field-proven experience and offer truly unique solutions for today's FTTx rapid deployment demands. FieldSmart Fiber Scalability Center (FSC) Cabinets use the same modular components as FieldSmart FxDS Frame Kits deployed in the Inside Plant, allowing technicians the ease of working with a single fiber management platform regardless of Inside or Outside Plant deployment.

### FieldSmart Fiber Distribution Hub (FDH) Cabinets

The FieldSmart Fiber Distribution Hub (FDH) line of products sets the bar for fiber access, protection and density among outside plant cabinets for PON, cross-connect or hub collapse environments. With the Clearview® Cassette as its foundation, the FieldSmart FDH line uses the same components as the FieldSmart Frames and Panels deployed in the inside plant. This enables service providers to standardize on a single building block, allowing a single fiber management component to be deployed for both environments. This provides technicians the ease of working with a single fiber management platform regardless of inside or outside plant deployment - saving training and installation time.

- In a PON configuration, the FDH Cabinet is the complete solution for managing 144, 288, 432, 576 or 864 fibers for outside plant FTTx applications.
- In a cross-connect configuration, 432 or 864 feeder/distribution ports can be deployed and the cabinet supports a user defined feeder-to-distribution ratio without any real estate penalty.
- The FieldSmart Hub Collapse Cabinet (HCC) is designed for the cable operator looking to separate their passive infrastructure from the electronics without the need for standard hub architecture and it reduces operating costs associated with moves, adds and changes.

### FieldSmart Fiber Active Cabinets (FAC)

FieldSmart Fiber Active Cabinet (FAC) outdoor enclosure systems are specifically designed to complement the service delivery and network migration capabilities of advanced electronic systems. The FAC offers the wireline and wireless carriers the ultimate housing for Clearfield's unrivaled fiber management and the vendor's electronic equipment of your choice.

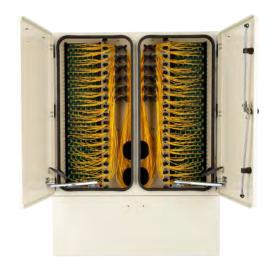
### **Splicing**

FieldSmart changes the rules of fiber management as splicing can be done inside of the Clearview Cassette - allowing service providers to enjoy the cost savings of patch and splice (Clearfield's in-cassette splicing solution) without the hassles of traditional field splicing.

# **Splitter Density**

Splitter density is maximized through the use of splitter modules that stack together in a top-loaded or side-by-side splitter cage that is easily accessed from the front of the cabinet. These ruggedized, outside plant-rated splitters ship with the individual legs "pre-staged" within a FieldSmart Staging Plate for easy and quick deployment.







# **Introduction to Outside Plant Solutions**

FieldSmart® Products -







# FieldSmart® 96-Port PON FDH Cabinet



## **Application**

Clearfield's FieldSmart PON Fiber Distribution Hub (FDH) Cabinet family provides an interconnect environment from the feeder network through the optical passive splitter to the distribution network. Designed for the outside plant environment, these cabinets provide a single distribution point to deploy FTTH and are ideal for residential, MDUs and business class environments. Providing distribution scalability from 12 to 96 ports, network architecture can be maximized for both existing subscribers as well as future growth opportunities.

## **Description**

The FieldSmart 96-Port PON FDH Cabinet is the smallest PON cabinet in the Clearfield product offering, measuring 24.2" H x 13.5" W x 10.7" D.

Designed for a pole or wall mounted deployment, this cabinet exterior was modeled after our existing FDH cabinet line, while the interior bulkhead was modeled after our pedestal mounted PON insert, offering up to 12 feeder/express ports and up to 96 distribution ports.

The 96-Port PON FDH Cabinet in available in the following options:

- · Empty Cabinet
- · Patch and Splice Cabinet
- · Patch Only Cabinet

Adding Clearfeld's Clearview® Blue Cassettes as needed allows the provider to align capital expenditures with their customer take-rates.

### **Features and Benefits**

### Integrity

- Terminations are designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable certified to Telcordia GR-20 and GR-409. Designed, tested and certified to Telcordia GR-3125
- · Cabinet constructed with 0.064 aluminum, powder coated for additional protection
- 300 series stainless steel fasteners used on all cabinets

### Protection

- 12-fiber Clearview Cassette protects fiber from environmental and human factors
- · WaveSmart® Ruggedized Splitters are built with ruggedized jacketing and bend-insensitive fiber for all input and output legs
- · Pyramid roof and venting provide additional protection in all environments

### Access

- · Clearview Cassette allows for quick visual troubleshooting without opening cassette
- · Front and rear access doors
- · Bottom exit/entrance for fiber cables
- · Compact design allows for quick and secure pole or wall mount installation and deployment

### Investment

- Fiber is deployed in increments of 12, providing the users the ability to scale from 12 ports to full capacity, aligning capital investment with network layout or subscriber revenue
- · Express ports allow for extensions or parallel networks through the cabinet
- Patch and splice configurations eliminate costs associated with additional hand-holes and splice cases



# FieldSmart®

# 96-Port PON FDH Cabinet -



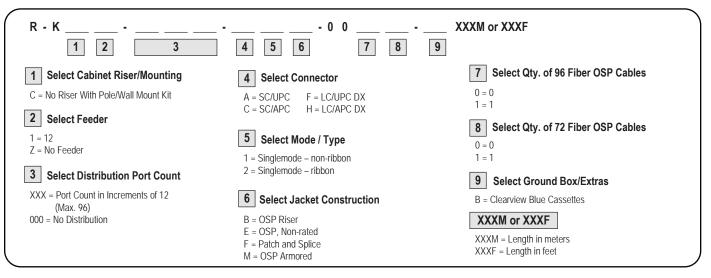
## **Technical Specifications**

FieldSmart 96-Port PON FDH Cabinet	
Dimensions	24.2" H x 13.5" W x 10.7" D (does not include pole/wall mount brackets)
Empty Cabinet Weight	Approx. 30 lbs.
Mounting Options	Pole/Wall Mount – brackets included with each cabinet; No riser available for this cabinet
Feeder/Express Capacity	12 – in a Clearview Blue Cassette
Distribution Capacity	Up to 96 in Clearview Blue Cassettes
Cable Entrance Ports	4
Access	Doors on both sides allow complete access to cabinet
Splitters Capacity	Up to 5 WaveSmart Ruggedized Splitters
Security	4 Quarter Turn Latches with Pin in Hex Key
Material/Thickness	.064" Aluminum with Almond Powder Coat Paint

# **Pre-Configured Part Numbers**

Part Number	Description
R-KCZ-000-ZZZ-0000- B-SUB	FieldSmart 96 Port FDH Cabinet with Pole/Wall Mount Brackets, Capacity-12 Feeder and 96 Distribution Ports, No Cassettes Included

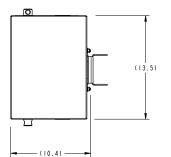
# **Configured Part Numbers**



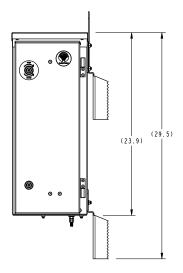
# FieldSmart®

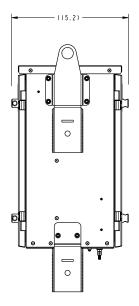
# 96-Port PON FDH Cabinet

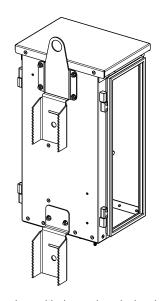




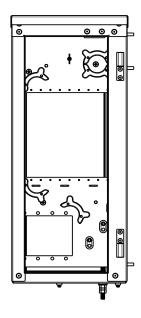
Top, front and side views with dimensions



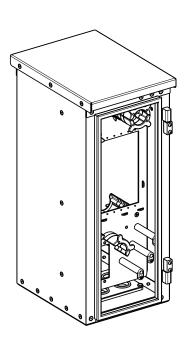




Side view, with doors closed, showing pole/wall mount brackets



Bulkhead Cable Management View - Inside the Cabinet



Side view with door open, showing bulkhead orientation

# FieldSmart® Fiber Distribution Hub (FDH)



144, 288, 432, 576 and 864-Port PON Cabinet -

## **Application**

Clearfield's FieldSmart Fiber Distribution Hub (FDH) PON Cabinet family provides an interconnect environment from the feeder network through the optical passive splitter to the distribution network. Designed for the outside plant environment, these cabinets provide a single distribution point to deploy FTTH in urban or dense neighborhoods. Providing distribution scalability from 12 to 864 ports, network architecture can be maximized for both existing subscribers as well as future growth opportunities.

### Description

The FieldSmart FDH PON Cabinet line is the complete solution for managing 12 to 864 port distribution fibers for an outside plant FTTx PON application. Integrated into the cabinet design is the 12 port Clearview® Cassette, providing multiple cabinet configurations and allowing the service provider to align the investment in capital equipment to the turn-up of revenue-generating circuits.



The FieldSmart FDH PON Cabinet family incorporates a new pyramid shaped roof/solar shield and a reusable/replacable venting feature, providing additional protection for deployed fiber. Mounting options include pad, pole or vault mounted with either a 4" or 12" riser. An optional exterior ground box is also available.

### **Features and Benefits**

### Integrity

- · Terminations are designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable certified to Telcordia GR-20 and GR-409. Designed, tested and certified to Telcordia GR-3125
- · Constructed with 0.090 aluminum
- Powder coated for additional protection
- · 300 series stainless steel fasteners used on all cabinets
- Optional 4" and 12" risers, can be stacked to raise cabinet if required

### Protection

- 12-fiber Clearview Cassette protects fiber from environmental and human factors
- Rugged cable clamps protect the OSP cable breakouts from twisting and pistoning
- Patch only buffer tubes are fully protected with ruggedized, bend-limiting tubing
- Snake skin sleeving provides additional buffer tube slack storage protection and manageability for patch and splice (Clearfield's incassette splicing solution) configurations
- · WaveSmart Ruggedized Splitters are built with ruggedized jacketing and bend-insensitive fiber for all input and output legs
- · Pyramid roof and venting provide additional protection in all environments

### Access

- Clearview Cassette allows for quick visual troubleshooting without opening cassette
- · Front access to pre-terminated assemblies with Clearview removable adapter plate
- · Two captive fasteners for quick removal of individual cassettes for trouble shooting, splicing or replacing
- · Front and rear access doors
- · Bottom exit/entrance for fiber cables

### Investment

- Fiber is deployed in increments of 12, providing the users the ability to scale from 12 ports to full capacity, aligning capital investment with network layout or subscriber revenue
- Express ports allow for extensions or parallel networks through the cabinet
- · Patch and splice configurations eliminate costs associated with additional hand-holes and splice cases

# FieldSmart<sup>®</sup> Fiber Distribution Hub (FDH) 144, 288, 432, 576 and 864-Port PON Cabinet



# **Technical Specifications**

FieldSmart FDH	144 Port	288 Port	432 Port	576 Port	864 Port
Cabinet Dimensions (Without Riser)	22.29" H x 16.96" W x 18.51" D (566.16 mm x 430.78mm x 470.15mm)	35.11" H x 18.5" W x 16.98" D (891.79 mm x 469.90 mm x 431.29 mm)	37.83" H x 21.25" W x 18.44" D (960.88 mm x 539.75 mm x 468.38 mm)	35.11" H x 33.20" W x 18.47" D (891.79 mm x 891.79 mm x 469.14 mm)	37.83" H x 42.05" W x 18.47" D (960.88 mm x 1068.07 mm x 469.14 mm)
Weight (Without Riser)	40 lbs. (18.14 kg)	54 lbs (24.49 kg)	66 lbs (29.94 kg)	86 lbs (39.01 kg)	95 lbs (43.09 kg)
Port Density	144	288	432	576	864
Max. Feeder/Express Ports	24	48	48	96	96
Cables Entrances	6	6	6	12	12
Mounting Options (Hoist kits included with each cabinet)	Vault mount; pole mount; pad mount	Vault mount; pole mount; pad mount	Vault mount; pole mount; pad mount	Vault mount; pad mount	Vault mount; pad mount
Standard Riser Base	4"; 6 lbs (101.60 mm; 2.72 kg)	4"; 6 lbs (101.60 mm; 2.72 kg)	4"; 6 lbs (101.60 mm; 2.72 kg)	4"; 8 lbs (101.60 mm; 3.63 kg)	4"; 8 lbs (101.60 mm; 3.63 kg)
Optional Riser Base	12"; 12 lbs (304.80 mm; 5.44 kg)	12"; 12 lbs (304.80 mm; 5.44 kg)	12"; 16 lbs (304.80 mm; 7.26 kg)	12"; 20 lbs (304.80 mm; 9.07 kg)	12"; 20 lbs (304.80 mm; 9.07 kg)
Splitters Slots	4	9	14	18	28
Splitter Staging Capacity	72			144	
Cassette Types Supported	Clearview® Blue				
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC				
Cable Types	Indoor/Outdoor, Outdoor Armored, Ribbon and Loose Tube				
Door Locks	2 per door				
Venting	Built-in Replaceable Roof Vent				
Splice Capacity	12 splices in each Clearview Cassette				
Material	0.125 (3.175 mm) aluminum with almond powder coating 0.90 (2.286 mm) aluminum with almond powder coating				

### **Accessories**

- Risers: 4" and 12" (101.60 mm or 304.80 mm)
- · Exterior Ground Box Available with 12" Riser Only, Located in Riser
- · WaveSmart Ruggedized Splitter
- · Mid-Span/Feed-Through Plate Kit
- · Pole Mount Kits
- · GoreTex Filter Replacement 020800

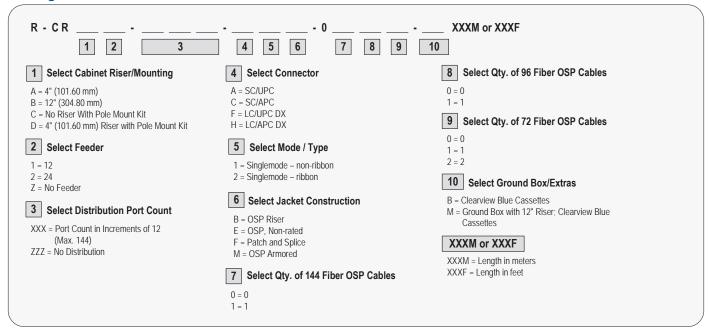


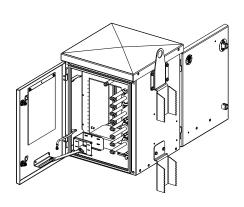
GoreTex Filter - 020800

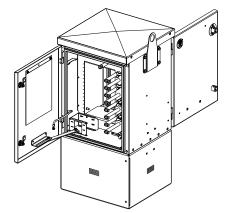


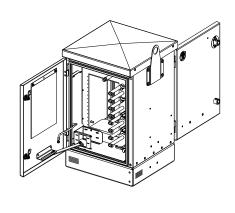
144, 288, 432, 576 and 864-Port PON Cabinet ———

### **Configured Part Numbers - 144 Port**









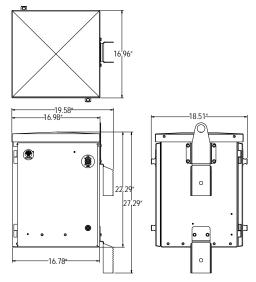
144 with Pole Mount Brackets

144 with 12" (304.80 mm) Riser

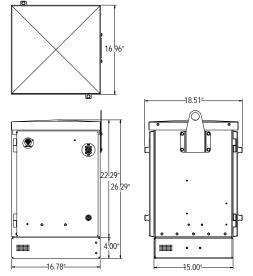
144 with 4" (101.60 mm) Riser



144, 288, 432, 576 and 864-Port PON Cabinet —



144 with Pole Mount Kit - Dimensions



144 with 4" (101.60 mm) Riser - Dimensions

### **Pre-Configured Part Numbers**

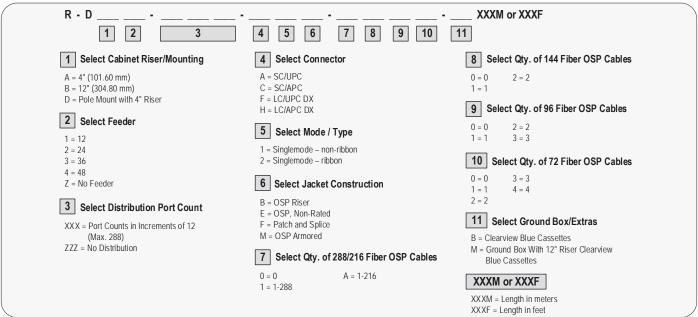
#### **Vault Options**

Part Number	Description
V6A-CZP	Vault, below grade Pencell, 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
V6B-CZP	Vault, below grade Pencell, 24" W x 36" L x 36" D (609.60 mm x 914.40 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
V6B-HZP	Vault, below grade Pencell, 24" W x 36" L x 36" D (609.60 mm x 914.40 mm x 914.40 mm), split PC lid, hex bolts, gray, with cut out for FieldSmart Cabinets, straight wall
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
FMA-H3Z-BC-SUB	Pole Mount Kit, for FieldSmart FDH cabinets, 144

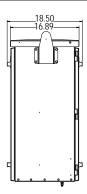


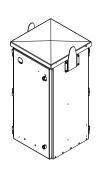
144, 288, 432, 576 and 864-Port PON Cabinet -

### **Configured Part Numbers - 288 Port**









### **Vault Options**

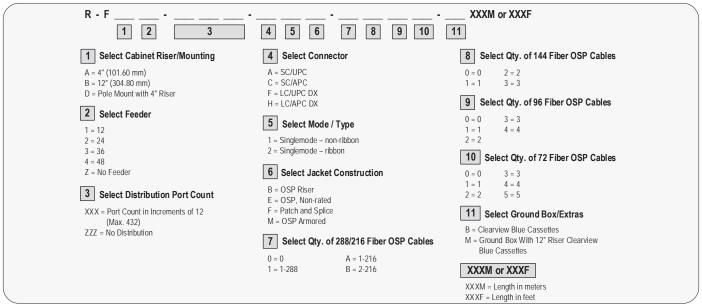
288 Port Cabinet

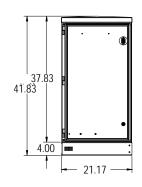
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Part Number	Description
V6A-CZP	Vault, below grade Pencell, 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V6B-CZP	Vault, below grade Pencell, 24" x 36" x 36", split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V6B-HZP	Vault, below grade Pencell, 24" x 36" x 36", split PC lid, hex bolts, gray, with cut out for FieldSmart cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, green, with knock out for FieldSmart cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
FMA-H3Z-SUB	Pole Mount Kit for FieldSmart cabinet

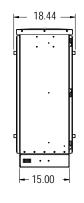


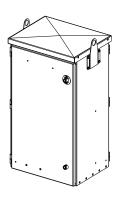
144, 288, 432, 576 and 864-Port PON Cabinet -

### **Configured Part Numbers - 432 Port**









### **Vault Options**

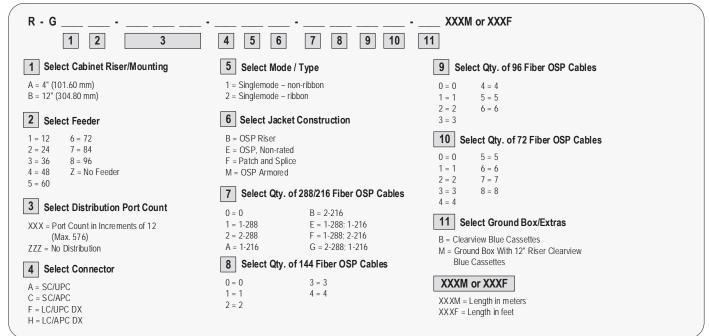
#### 432 Port Cabinet

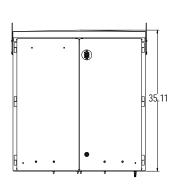
Part Number	Description
V6A-CZP	Vault, below grade Pencell, 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V6B-CZP	Vault, below grade Pencell, 24" x 36" x 36", split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V6B-HZP	Vault, below grade Pencell, 24" x 36" x 36", split PC lid, hex bolts, gray, with cut out for FieldSmart cabinets, straight wall, requires 020538 Bolt Kit -ordered separately
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, green, with knock out for FieldSmart cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
FMA-H3Z-SUB	Pole Mount Kit for FieldSmart cabinet

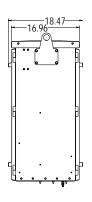


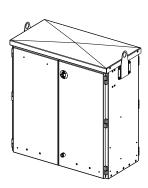
144, 288, 432, 576 and 864-Port PON Cabinet —

### **Configured Part Numbers - 576 Port**









### **Vault Options**

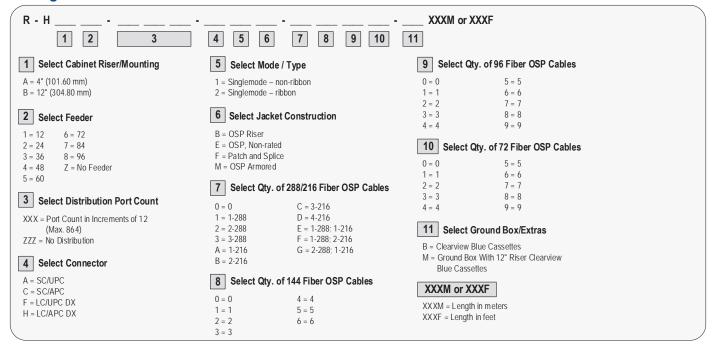
576 Port Cabinet

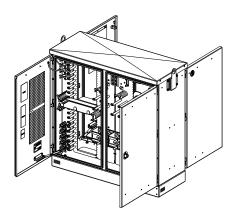
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Part Number	Description
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, gray, with knock-out for FieldSmart Cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
V8A-CZP-F	Vault, Pencell 36" x 60" x 24" (914.40 mm x 1524.00 mm x 609.60 mm), complete split lid with ½ cut out for FieldSmart cabinets - with bolt kit, flared wall
V8B-CZP-F	Vault, Pencell 36 x 60 x 36" (914.40 mm x 1524.00 mm x 914.40 mm), complete split lid, with $\frac{1}{2}$ cut out for FieldSmart cabinets - with bolt kit, flared wall
V9B-HZP-PC	Vault, Pencell 48 x 48 x 36" (1219.20 mm x 1219.20 mm x 914.40 mm), complete split polymer concrete lid, cut out for 864 cabinets, polymer concrete straight wall



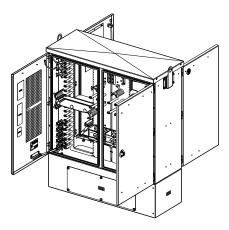
144, 288, 432, 576 and 864-Port PON Cabinet ———

### **Configured Part Numbers - 864 Port**





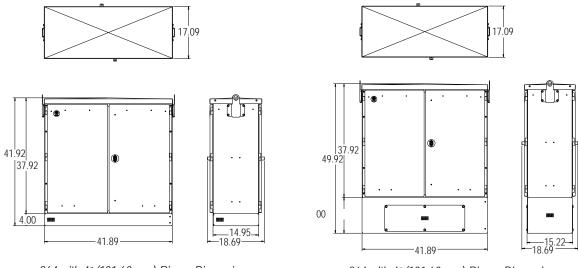
864 Interior View with 4" Riser



864 Interior View with 12" Riser

# FieldSmart<sup>®</sup> Fiber Distribution Hub (FDH) 144, 288, 432, 576 and 864-Port PON Cabinet





864 with 4" (101.60 mm) Riser - Dimensions

864 with 4" (101.60 mm) Riser - Dimensions

### **Pre-Configured Part Numbers**

**Vault Options** 

Part Number	Description
V9B-HZP-PC	Vault, Pencell 48 x 48 x 36" (1219.20 mm x 1219.20 mm x 914.40 mm), complete split polymer concrete lid, cut out for 864 cabinets, polymer concrete straight wall

# FieldSmart® Fiber Scalability Center (FSC) 1152-Port PON Cabinet



### **Application**

FieldSmart FSC PON Cabinets provide an interconnect environment from the feeder network through the optical passive splitter to the distribution network in an FTTH PON OSP cabinet. These different cabinet sizes provide scalability from 12 ports to 1,152 ports. Designed for the outside plant environment, these cabinets provide a single distribution point to distribute FTTH in urban or dense neighborhood.

### Description

The FieldSmart FSC PON is the complete solution for managing 12 to 1,152 port distribution fibers for an outside plant FTTx PON application. Through the incremental design of the Clearview® Cassette, user capacity can be scaled from as few as 12 ports to the maximum configuration of the cabinet, allowing the service provider to align the investment in capital equipment to the turn-up of revenue-generating circuits

#### **Features and Benefits**

#### Integrity

- Terminations are designed, tested and certified to Telcordia GR-326
- · Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Designed, tested and certified to Telcordia GR-3125
- Constructed with 0.125 (3.125 mm) aluminum
- · Powder coated for additional protection
- · 300 series stainless steel fasteners used on all cabinets
- Optional 4" and 12" risers, can be stacked to raise cabinet if required

#### Protection

- 12-fiber Clearview Cassette protects fiber from environmental and human factors
- Rugged cable clamps protect the OSP cable breakouts from twisting and pistoning
- Patch only buffer tubes are fully protected with ruggedized, bend-limiting tubing
- Snake skin sleeving provides additional buffer tube slack storage protection and manageability for patch and splice (Clearfield's incassette splicing solution) configurations
- · Splitters are built with ruggedized jacketing and bend-insensitive fiber for all input and output legs

#### Access

- Clearview Cassette allows for guick visual troubleshooting without opening cassette
- Front access to pre-terminated assemblies with Clearview removable adapter plate
- Easy two captive fasteners for quick removal of individual cassettes for troubleshooting, splicing or replacing

#### Investment

- Fiber is deployed in increments of 12, providing the users the ability to scale from 12 ports to full capacity, aligning capital investment with network layout or subscriber revenue
- · Express ports allow for extensions or parallel networks through the cabinet
- Patch and splice configurations eliminate costs associated with jacketed IFC cabling, hand-holes and splice cases.

#### Accessories

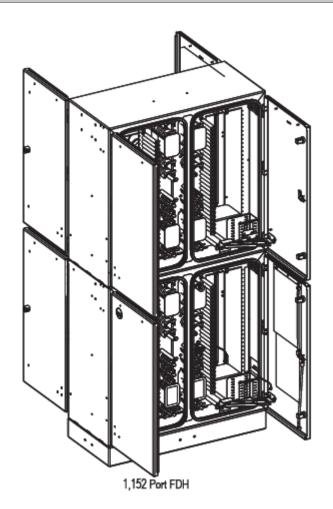
- · Risers: 4" (101.60 mm) and 12" (304.80 mm)
- Exterior Ground Box Available with 12" Riser Only
- · Ruggedized Splitter Bays
- Mid-Span/Feed-Through Plate Kit
- Optional LGX Adapter Bracket Kit (P/N 014380) available to accommodate 6 LGX style modules or 13, ½ wide LGX modules. Max port
  capacity decrease by 84 (7 cassettes) when used.

# FieldSmart® Fiber Scalability Center (FSC) 1152-Port PON Cabinet



### **Technical Specifications**

FieldSmart 1152-Port PON Cabinet	
Dimensions (without riser)	64" H x 33" W x 16.9" D (1625.60 mm x 838.20 mm x 429.26 mm)
Weight	172 lbs (78.02 kg)
Port Density	1,152
Feeder/Express Ports	192
Cable Entrances	12
Mounting Options (Hoist kits included with each cabinet)	Vault mount; pad mount
Standard Riser Base	4"; 8 lbs (101.60 mm; 3.63 kg)
Optional Riser Base	12"; 20 lbs (304.80 mm; 9.07 kg)
Splitter Slots	36
Cassette Types Supported	Clearview® Blue
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)
Splice Capacity	12 splices in each Clearview Cassette
Material	0.125 (3.175 mm) aluminum with almond powder coating



# FieldSmart® Fiber Scalability Center (FSC) 1152-Port PON Cabinet



### **Configured Part Numbers**

1,152-Port Cabinet

• Please contact your Clearfield® representative for more information on ordering this option.

### **Vault Options**

Part Number	Description
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, gray, with knock-out for FieldSmart Cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
V8A-CZP-F	Vault, Pencell 36" x 60" x 24" (914.40 mm x 1524.00 mm x 609.60 mm), complete split lid with ½ cut out for FieldSmart cabinets - with bolt kit, flared wall
V8B-CZP-F	Vault, Pencell 36 x 60 x 36" (914.40 mm x 1524.00 mm x 914.40 mm), complete split lid, with ½ cut out for FieldSmart cabinets - with bolt kit, flared wall





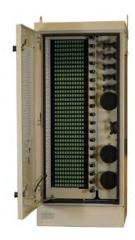


### **Application**

The FieldSmart FDH Cross-Connect Cabinet is the complete solution for managing up to 864 fibers in most any feeder/distribution ratio for an outside plant FTTx application. This solution provides an interconnect environment from the feeder network and the distribution field in a FTTH network.

### **Description**

With the Clearview® Cassette as its foundation, the FieldSmart FDH Cross-Connect Cabinet uses the same components as the FieldSmart Fiber Crossover Distribution System (FxDS) deployed in the central office. This enables service providers to standardize on a single building block, allowing them to stock a single fiber management component for either environment. Technicians also have the ease of working with a single fiber architecture for central office or outside plant deployment - saving training and installation time. Using Clearview, FieldSmart changes the rules of fiber management. Optimal access is ensured to all ports and superior fiber protection is integrated within



the Clearview Cassette. Through the incremental design of the Clearview Cassette, user capacity can be scaled from as few as 12 ports to the maximum configuration of the cabinet, allowing the service provider to align the investment in capital equipment to the turn-up of revenue-generating circuits. Further, labor and other field costs are minimized through this craft-friendly layout.

The FieldSmart FDH Cross Connect Cabinet family incorporates a new pyramid shaped roof/solar shield and a reusable/replaceable venting feature, providing additional protection for deployed fiber. Mounting options include pad, pole or vault mounted with either a 4" or 12" riser. An optional exterior ground box is also available.

#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Designed to comply to Telcordia GR-20, GR-409, GR-487 and GR-3125
- · Constructed with 0.090 (3.175 mm) aluminum
- · Powder coated for additional protection
- · 300 series stainless steel fasteners used on all cabinets
- Optional 4" and 12" risers, can be stacked to raise cabinet if required

#### Protection

- 12-fiber Clearview Cassette protects fiber from environmental and human factors
- Rugged cable clamps protect the OSP cable breakouts from twisting and pistoning
- · Patch only buffer tubes are fully protected with ruggedized, bend-limiting tubing
- Snake skin sleeving provides additional buffer tube slack storage protection and manageability for patch and splice (Clearfield's incassette splicing solution) configurations
- Pyramid roof and venting provide additional protection in all environments

#### Access

- Clearview Cassette allows for guick visual troubleshooting without opening cassette
- Front access to pre-terminated assemblies with Clearview removable adapter plate
- Two captive fasteners for quick removal of individual cassettes for trouble shooting, splicing or replacing
- · Front and rear access doors
- · Bottom exit/entrance for fiber cables

#### Investment

- Fiber is deployed in increments of 12, providing the users the ability to scale from 12 ports to full capacity, aligning capital investment with network layout or subscriber revenue
- Express ports allow for extensions or parallel networks through the cabinet
- · Patch and splice configurations eliminate costs associated with additional hand-holes and splice cases



## 432 and 864-Port Cross-Connect Cabinet -

### **Technical Specifications**

FieldSmart FDH Cross-Connect	432 Port	864 Port
Cabinet Dimensions (Without Riser)	35.11" H x 18.5" W x 16.98" D (891.79 mm x 469.90 mm x 431.29 mm)	35.11" H x 33.20" W x 18.47" D (891.79 mm x 843.28 mm x 469.14 mm)
Weight (Without Riser)	54 lbs (24.49 kg)	86 lbs (39.01 kg)
Port Density	432	864
Max. Feeder/Express Ports	48	96
Cables Entrances	6	12
Mounting Options (Hoist kits included with each cabinet)	Vault mount; pole mount; pad mount	Vault mount; pad mount
Standard Riser Base	4"; 6 lbs (101.60 mm; 2.72 kg)	4"; 8 lbs (101.60 mm; 3.63 kg)
Optional Riser Base	12"; 12 lbs (304.80 mm; 5.44 kg)	12"; 20 lbs (304.80 mm; 9.07 kg)
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC	
Cable Types	Indoor/Outdoor, Outdoor Armored, Ribbon	and Loose Tube
Door Locks	2 per door	
Venting	Built-in Replaceable Roof Vent	
Splice Capacity	12 Splices in Each Clearview Cassette	
Recommended Jumper Length	2 meters	
Material	0.900 (2.286 mm) aluminum with almond powder coa	ating

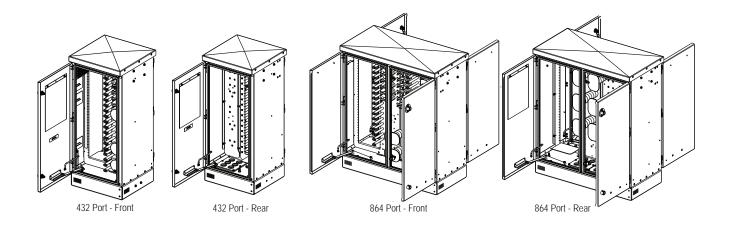
### **Accessories**

- Risers: 4" and 12" (101.60 mm or 304.80 mm)
- · Exterior Ground Box Available with 12" Riser Only, Located in Riser
- · Mid-Span/Feed-Through Plate Kit
- · Pole Mount Kits
- · GoreTex Filter Replacement 020800





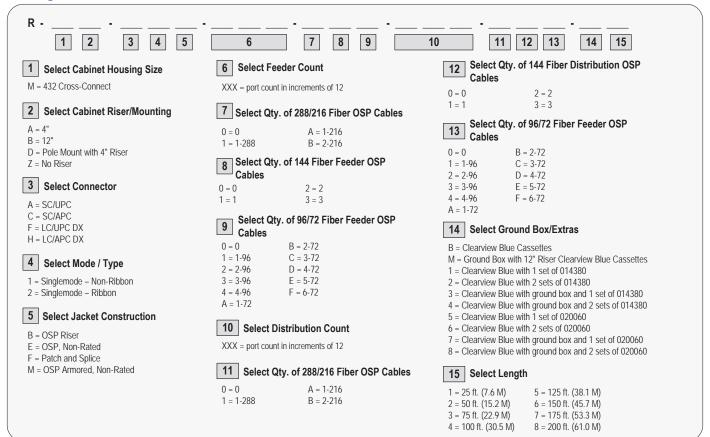
GoreTex Filter - 020800

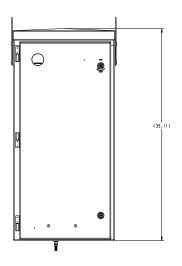


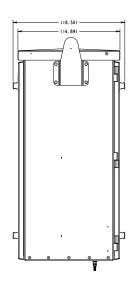


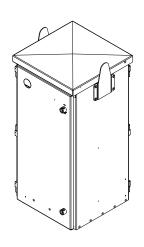
### 432 and 864-Port Cross-Connect Cabinet

### **Configured Part Numbers - 432 Port**











## 432 and 864-Port Cross-Connect Cabinet —

### **Vault Options**

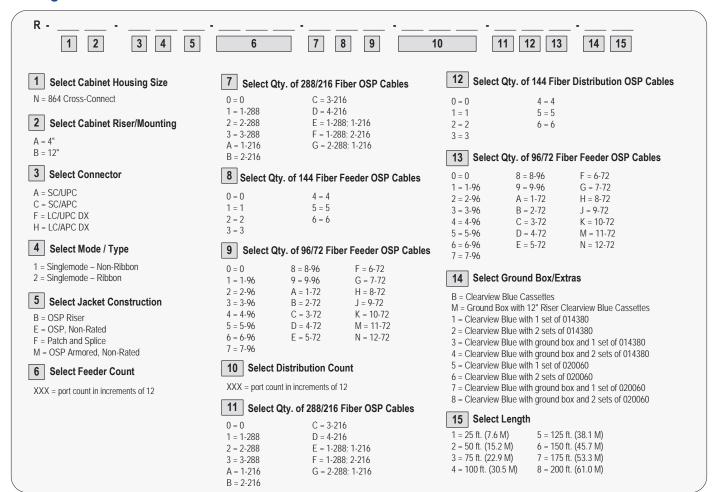
432 Port Cabinet

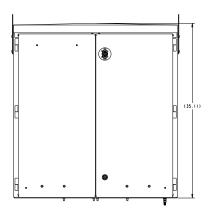
Part Number	Description
V6A-CZP	Vault, below grade Pencell, 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V6B-CZP	Vault, below grade Pencell, 24" x 36" x 36", split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V6B-HZP	Vault, below grade Pencell, 24" x 36" x 36", split PC lid, hex bolts, gray, with cut out for FieldSmart cabinets, straight wall, requires 020538 Bolt Kit -ordered separately
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, green, with knock out for FieldSmart cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
FMA-H3Z-SUB	Pole Mount Kit for FieldSmart cabinet

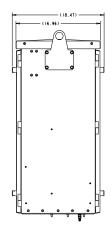


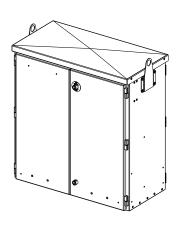
### 432 and 864-Port Cross-Connect Cabinet

### **Configured Part Numbers - 864 Port**









# FieldSmart® Fiber Distribution Hub (FDH) 432 and 864-Port Cross-Connect Cabinet



### **Vault Options**

864 Port Cabinet

Part Number	Description
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, gray, with knock-out for FieldSmart Cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
V8A-CZP-F	Vault, Pencell 36" x 60" x 24" (914.40 mm x 1524.00 mm x 609.60 mm), complete split lid with ½ cut out for FieldSmart cabinets - with bolt kit, flared wall
V8B-CZP-F	Vault, Pencell 36 x 60 x 36" (914.40 mm x 1524.00 mm x 914.40 mm), complete split lid, with $\frac{1}{2}$ cut out for FieldSmart cabinets - with bolt kit, flared wall
V9B-HZP-PC	Vault, Quazite 48 x 48 x 36" (1219.20 mm x 1219.20 mm x 914.40 mm), complete split polymer concrete lid, cut out for 864 cabinets, fiberglass straight wall, requires 020538 Bolt Kit - ordered separately

# FieldSmart® Fiber Scalability Center (FSC)

## 1728-Port Cross-Connect Cabinet



### **Application**

The FieldSmart 1728-Port Cross-Connect Cabinet is the complete solution for managing up to 1,728 fibers in most any feeder/distribution ratio for an outside plant FTTx application. This solution provides an interconnect environment from the feeder network and the distribution field in a FTTH network.

### Description

With the Clearview® Cassette as its foundation, the FieldSmart 1728-Port Cross-Connect Cabinet uses the same components as the FieldSmart Fiber Crossover Distribution System (FxDS) deployed in the central office. This enables service providers to standardize on a single building block, allowing them to stock a single fiber management component for either environment. Technicians also have the ease of working with a single fiber architecture for central office or outside plant deployment - saving training and installation time. Using Clearview, the FieldSmart changes the rules of fiber management.

Optimal access is ensured to all ports and superior fiber protection is integrated within the Clearview Cassette. Through the incremental design of the Clearview Cassette,

user capacity can be scaled from as few as 12 ports to the maximum configuration of the cabinet, allowing the service provider to align the investment in capital equipment to the turn-up of revenuegenerating circuits. Further, labor and other field costs are minimized through this craft-friendly layout.



#### Integrity

- Terminations are designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Designed, tested and certified to Telcordia GR-3125
- · Constructed with 0.125 (3.125 mm) aluminum
- Powder coated for additional protection
- · 300 series stainless steel fasteners used on all cabinets
- Optional 4" and 12" risers, can be stacked to raise cabinet if required

#### Protection

- 12-fiber Clearview Cassette protects fiber from environmental and human factors
- · Rugged cable clamps protect the OSP cable breakouts from twisting and pistoning
- Patch only buffer tubes are fully protected with ruggedized, bend-limiting tubing
- Snake skin sleeving provides additional buffer tube slack storage protection and manageability for patch and splice (Clearfield's incassette splicing solution) configurations
- · Splitters are built with ruggedized jacketing and bend-insensitive fiber for all input and output legs

#### Access

- Clearview Cassette allows for guick visual troubleshooting without opening cassette
- Front access to pre-terminated assemblies with Clearview removable adapter plate
- · Two captive fasteners for quick removal of individual cassettes for trouble shooting, splicing or replacing
- · Front and rear access doors
- · Bottom exit/entrance for fiber cables

#### Investment

- Fiber is deployed in increments of 12, providing the users the ability to scale from 12 ports to full capacity, aligning capital investment with network layout or subscriber revenue
- Express ports allow for extensions or parallel networks through the cabinet
- Patch and splice configurations eliminate costs associated with jacketed IFC cabling, hand-holes and splice cases.

# FieldSmart® Fiber Scalability Center (FSC) 1728-Port Cross-Connect Cabinet

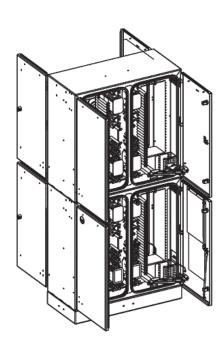


### **Technical Specifications**

FieldSmart 1152-Port PON Cabinet	
Dimensions (without riser)	64" H x 33" W x 16.9" D (1625.60 mm x 838.20 mm x 429.26 mm)
Weight	192 lbs
Port Density	1,728
Feeder/Express Ports	192
Cable Entrances	12
Mounting Options (Hoist kits included with each cabinet)	Vault mount; pad mount
Standard Riser Base	4"; 8 lbs (101.60 mm; 3.63 kg)
Optional Riser Base	12"; 20 lbs (304.80 mm; 9.07 kg)
Splitter Slots	36
Cassette Types Supported	Clearview® Blue
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)
Splice Capacity	12 splices in each Clearview Cassette
Material	0.125 (3.175 mm) aluminum with almond powder coating

### **Accessories**

- Risers: 4" and 12" (101.60 mm or 304.80 mm)
- · Exterior Ground Box Available with 12" Riser Only.
- · Mid-Span/Feed-Through Plate Kit



# FieldSmart® Fiber Scalability Center (FSC) 1728-Port Cross-Connect Cabinet



### **Configured Part Numbers**

1,728-Port Cabinet

· Please contact your Clearfield® representative for more information on ordering this option.

### **Vault Options**

Part Number	Description
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit
V7B-HZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split PC lid, hex bolts, gray, with knock-out for FieldSmart Cabinets, straight wall, requires 020538 Bolt Kit - ordered separately
V8A-CZP-F	Vault, Pencell 36" x 60" x 24" (914.40 mm x 1524.00 mm x 609.60 mm), complete split lid with ½ cut out for FieldSmart cabinets - with bolt kit, flared wall
V8B-CZP-F	Vault, Pencell 36 x 60 x 36" (914.40 mm x 1524.00 mm x 914.40 mm), complete split lid, with ½ cut out for FieldSmart cabinets - with bolt kit, flared wall



Accessories



### Pole Mount Kit -

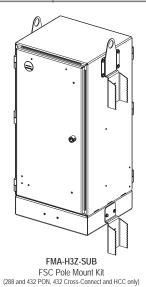
### **Description**

The FieldSmart Fiber Distribution Hub (FDH) Pole Mount Kit provides the ability to pole mount the 144 port, 288 port and 432 port PON, 432 port cross-connect, and Hub Collapse cabinets. Also available are the Pole Mount Under Plate Kits. It has an easy to install hook and tab design with a rugged thru-pole lag bolt for security.



### **Pre-Configured Part Numbers**

Part Number	Description	Application/Where Used
FMA-H3Z-BC-SUB	Pole mount kit only, for 144 FDH	144 FDH PON
FMA-H3Z-KIT-SUB	Kit, includes Pole Mount Kit and under plate kit	288 PON, 432 cross-connect, hub collapse
FMA-H3Z-KIT-SUB-144	Kit, includes Pole Mount Kit and under plate kit	144 FDH PON
FMA-H3Z-KIT-432-SUB	Kit, includes Pole Mount Kit and under plate kit	432 PON only
FMA-H3Z-PLT-STRG-SUB	Pole Mount Under Plate Kit, with security clamp	288 PON, 432 cross-connect, hub collapse
FMA-H3Z-PLT-SUB	Pole Mount Under Plate Kit	144 & 288 PON, 432 cross-connect, hub collapse
FMA-H3Z-SUB	Pole Mount Kit	288 PON, 432 PON, 432 cross-connect, hub collapse
015292	432-Port PON Pole Mount Under Plate Kit	432 PON Only







FSC Box Pole Mount Underplate Kit

**Cabinet Entrance Expansion Kit** 

### **Description**

The FieldSmart Cable Expansion Kit includes all the material to add up to 3 additional cables to any of our FieldSmart Cabinets. It includes sealcons, nuts, o-rings, grommets and strength member tie off clamps.



### **Pre-Configured Part Numbers**

Part Number	Description
FMA-XXX-14	Cabinet Entrance Expansion Kit, contains extra sealcon and grommets





### **Deep Socket Wrenches**

### **Description**

The handy, light weight Deep Socket Wrench is manufactured from alloy steel. In a patch and splice (Clearfield's in-cassette splicing solution) cabinet where the customer installs the incoming cable, the cable must go through the watertight fittings that are provided with each cabinet. Watertight fittings must then be installed into the FieldSmart Cabinet. These wrenches are designed to make tightening of the dome, thread and lock nuts more manageable. The wrench encloses the dome nut on five sides, giving the nut additional rigidity during tightening. This is especially important if a stiff cable is used.



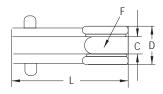
Note: Does not work with all Flex Fittings. One of each style wrench (40 mm and 42 mm) is needed to tighten the 1" watertight fitting used on all FieldSmart Cabinets.

### **Torque Recommendations for Strain Relief Fittings**

Torque in Inch Pounds - in Ib. (Newton Meters - Nm)

	Metal Strain Relief Fittings	Plastic Strain Relief Fittings
Dome Nuts	59.0 (6.67)	44.2 (5.00)
Thread and Lock Nuts	88.5 (10.0)	66.4 (7.50)

### **Pre-Configured Part Numbers**

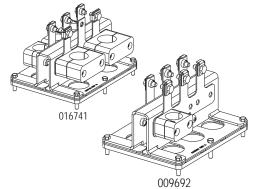


Part Number	Wrenching Flats (F)	Length (L)	Inner Diameter (C)	Outer Diameter (D)
013190	1.57" (40 mm)	3.94" (100 mm)	0.98" (25 mm)	2.07" (52.5 mm)
013191	1.65" (42 mm)	3.94" (100 mm)	1.06" (24.7 mm)	2.15" (54.5 mm)

## Mid-Span Opening Feed-Through Plate Kit

### **Description**

The Mid-Span Opening Feed-Through Plate Kit is specifically designed for Clearfield® FieldSmart Fiber Distribution Hubs (FDH). It provides the hardware components to confidently secure the ring cut/mid-span fiber optic cable in an OSP cabinet. This kit utilizes the existing cable entry/exit ports in the Clearfield OSP cabinets. It saves the customer time and money by allowing them to only splice the required fiber counts needed into the cabinet.



### **Pre-Configured Part Numbers**

Part Number	Description
009692	FieldSmart Mid-Span Opening Feed-Through Plate Kit for cables up to 1" (25.4 mm) O.D.; includes strength member tie off clamp
016741	FieldSmart Mid-Span Opening Feed-Through Plate Kit for cables up to 1.25" (31.75 mm) O.D.; includes strength member tie off clamp
016757	Strength member tie off kit - for retro fit or older version of 009692

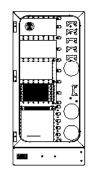
Accessories

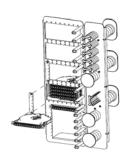


### **Cassette - Cabinet Adapter Brackets**

### Description

Vertical bracket kit for FieldSmart Hub Collapse Cabinets. These brackets mount vertically in one of the 4 LGX slots and will allow the customer to add up to 5 additional cassettes per slot. We are including one set of these brackets with every HCC that is sold – as part of the standard product offering. If the customer needs additional brackets, please have them order additional kits.





### **Pre-Configured Part Numbers**

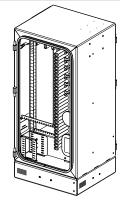
Part Number	Description
014375	Cassette - Cabinet Adapter Brackets

### **LGX - Cabinet Adapter Brackets**

### **Description**

Horizontal bracket kit for FieldSmart 144 PON, 288 PON, 432 PON, 576 PON, 864 PON, 1152 PON, 432 Cross-Connect, 864 Cross-Connect and 1728 Cross-Connect. These brackets mount horizontally within the cabinet and will allow the customer to mount up to 6 LGX style modules and 13 ½ wide LGX modules inside of the cabinet. The brackets will reduce the capacity of terminations within the cabinet by 84 ports (7 cassettes). These kits will be available as an optional item and should be ordered separately by the customers.





### **Pre-Configured Part Numbers**

Part Number	Description
014380	LGX - Cabinet Adapter Brackets





### **Cable Protection Boot** –

### **Description**

The FieldSmart Cable Protection Boot is a dark gray, vacuum-formed plastic, one piece boot that is attached to the pole and designed to provide additional cable protection where the cables enter/exit the pole mount cabinet. Designed to work in conjunction with a standard 2" U-Channell, it provides additional security and encases all incoming cables and conduit. Designed to fit any Clearfield pole mount FDH Cabinet, the FieldSmart Cable Protection Boot provides additional security and aesthetic appeal by encasing the incoming and outgoing fiber or conduit between the cabinet and the pole.



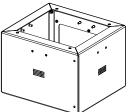
### **Pre-Configured Part Numbers**

Part No	umber	Description
014681		Pole Mount Protection Boot

# Riser Kits – Description

Specifically designed for FieldSmart Cabinets, these kits can be installed onto existing risers (included with each cabinet). Risers are available in 4" or 12". All 12" Riser Kits include an access panel, allowing for easy access to cable entrance area underneath the cabinet.





These riser kits can be stacked, allowing the cabinet to be raised to the required height depending on the individual application requirements. Each kit includes the riser and mounting bolt kit.

### **Pre-Configured Part Numbers**

Riser Kits	FDH 144, 288 PON, 432 CC or HCC	FDH 432 PON	FDH 576 PON, 864 CC	864 PON FDH	FDH 1152 PON, 1728 CC
4"	012873	014370	012875	020892	012875
12"	012874	014371	012876	020893	012876
12" with Ground Box	012874-G	014371-G	012876-G	020893-G	012876-G

# **StreetSmart**<sup>™</sup> **Pre-Assigned FDH Cabinet**



# 288-Port PON Cabinet with Pre-Installed Splitters -

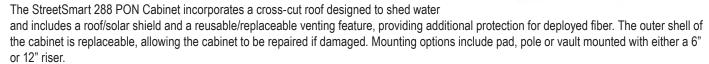
### **Application**

Clearfield's StreetSmart Pre-Assigned FDH PON Cabinet provides an interconnect environment from the feeder network through the passive optical splitter to the distribution network.

Designed for rapid PON Network deployments, these cabinets provide a single distribution point, making it the ideal solution for deploying FTTH (fiber-to-the-home) where high potential take rates are expected. Pre-Assigned WaveSmart High Density 1 x 32 Splitters are loaded into the cabinet with a pre-terminated fiber tail, making installation and deployment very cost and time effective.

### **Description**

The StreetSmart Pre-Assigned FDH PON Cabinet provides a turn-key solution for up to 288 distribution fibers for an outside plant FTTx PON application. WaveSmart High Density 1 x 32 Splitters are installed and pre-assigned into Clearfield's 12 pack SC/APC module adapters, allowing the service provider to instantly turn-up revenue-generating circuits.





#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable certified to Telcordia GR-20 and GR-409
- Cabinets are designed, tested and certified to GR-3125
- Constructed with 0.090 aluminum
- · Powder coated for additional protection
- · 300 series stainless steel fasteners used on all cabinets
- · Optional 6" and 12" risers

#### Protection

- 12 pack fiber modules protects fiber from environmental and human factors
- Rugged cable clamps protect the OSP cable breakouts from twisting and pistoning
- Patch only buffer tubes are fully protected with ruggedized, bend-limiting tubing
- · WaveSmart High Density Splitters are built with ruggedized jacketing and bend-insensitive 900 um fiber for all input and output legs
- Cross-cut roof and venting provide additional protection in all environments

#### **Access**

- 12 pack fiber modules snap into bulkhead from the front allowing for quick visual troubleshooting without opening
- · Front and side access doors
- · Bottom exit/entrance for fiber cables

#### Investment

- · Feeder and Distribution Fiber are pre-terminated into cabinet No additional splicing required
- · WaveSmart High Density Splitters are loaded and pre-assigned into cabinet
- · Deployment time is minimized, allowing revenue generating circuits to be turned up immediately



# StreetSmart<sup>™</sup> Pre-Assigned FDH Cabinet 288-Port PON Cabinet with Pre-Installed Splitters —



### **Technical Specifications**

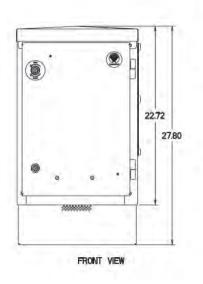
288-Port Cabinet		
Dimensions	22.72" T x 15.47" W x 14.18" D (577.08mm T x 393.94mm W x 360.17mm D) * Without Riser	
Weight	40 lbs. (18.14 kg)	
Dist. Port Density	144 or 288	
Max. Feeder/Express Ports	12 or 24	
Cable Entrances	4	
Mounting Options (Hoist kits included with each cabinet)	Vault mount; pole mount; pad mount	
Riser Base	6"; 8 lbs (127 mm; 2.72 kg) 12"; 12 lbs. (304.80 mm; 5.44 kg)	
Risei dase	Access door in rear of riser base on both the 6" and 12" risers	
Pre-loaded WaveSmart High Density Splitters with 900um Legs	4 or 8	
Splitter Staging Capacity	72	
Connector Modules	12 Pack Adapter Modules	
Connector Types	SC/UPC, SC/APC	
Cable Types	Indoor/Outdoor, Outdoor Armored, Ribbon and Loose Tube	
Door Locks	2 per door	
Venting	Built-in Replaceable Roof Vent	
Material	0.90 (2.286 mm) Aluminum with almond powder coating	

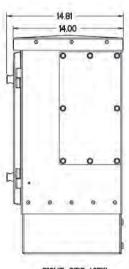
### **Accessories**

- Risers: 6" and 12" (127 mm or 304.80 mm)
- · WaveSmart High Density Splitter
- · Pole Mount Kits
- · Gore-Tex Filter Replacement





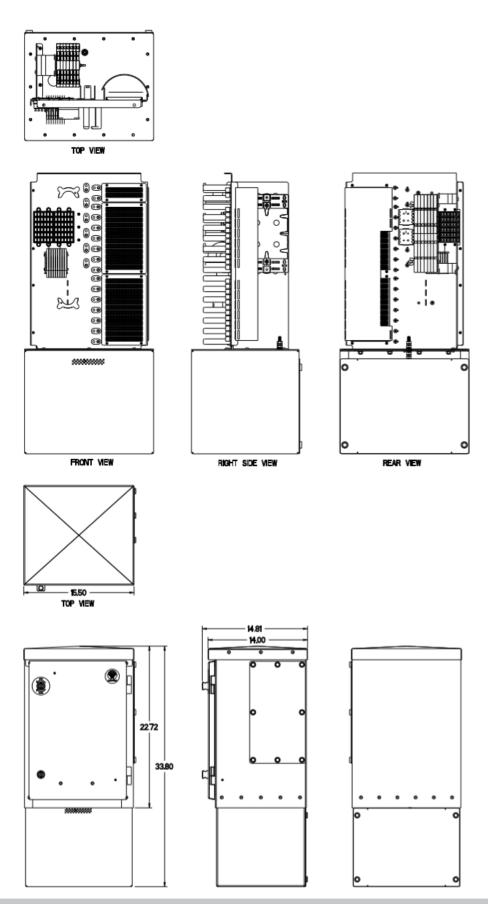




RIGHT SIDE VIEW

# StreetSmart<sup>™</sup> Pre-Assigned FDH Cabinet 288-Port PON Cabinet with Pre-Installed Splitters —

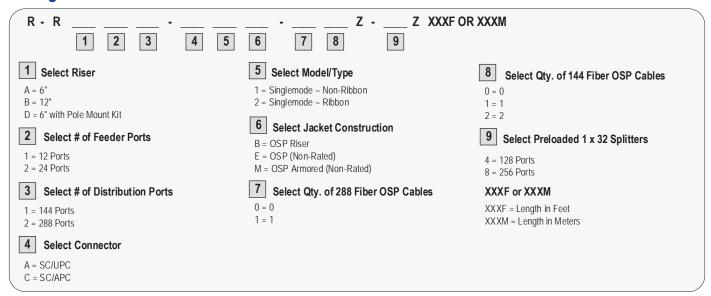




# StreetSmart<sup>™</sup> Pre-Assigned FDH Cabinet 288-Port PON Cabinet with Pre-Installed Splitters —



### **Configured Part Numbers**



### **Pre-Configured Part Numbers**

#### Vault

Part Number	Description
V6A-CZP	Vault, below grade Pencell, 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
V6B-CZP	Vault, below grade Pencell, 24" W x 36" L x 36" D (609.60 mm x 914.40 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
V7A-CZP	Vault, below grade Pencell, 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
V7B-CZP	Vault, below grade Pencell, 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm), split HDPE lid, hex bolts, green, with cut out for FieldSmart Cabinets, straight wall, with bolt kit
FMA-H3Z-BC-SUB	Pole Mount Kit, for FieldSmart FDH cabinets, 144

## Fiber Active Cabinet (FAC) 400



### **Application**

The FieldSmart Fiber Active Cabinet (FAC) 400 broadband enclosure has been designed with the philosophy of modularity and flexibility, while maintaining a maximum heat dissipation capability. The cabinet's small form factor design allows for speedy delivery of subscriber services in an assortment of deployment scenarios. Compliant with GR-487, the FAC 400 is the ideal outdoor cabinet solution for the harshest outdoor conditions, providing a sealed internal environment where external air and humidity are completely isolated from the electronic equipment.

### Description

The FAC 400 is an environmentally-controlled enclosure constructed of powder-coated aluminum. The FAC 400's equipment bay features a 19" vertical equipment rack, accommodating up to 4RU of active electronics equipment. The FAC 400 provides up to 192 internal fiber distribution ports for subscriber PON deployments, along with complementary splitter capacity. The FAC 400 accepts local AC power and uses a door mounted integrated air-to-air heat exchanger and DC-powered fans to cool the equipment inside the cabinet. A separate, vented, under-cabinet compartment houses optional batteries.



#### **Features and Benefits**

#### Integrity

- Designed to seamlessly integrate a variety of standard options that are expected in remote cabinets, such as the rectifier system, battery
  base, battery warmers and field configurable fiber or copper distribution frames
- Supports a variety of cabinet mounting options including pad, pole, wall and H-frame eliminating concern with right-of-way issues and problematic installation locations

#### **Protection**

- Telcordia GR-487 compliant and UL-60950/UL-50 spec
- Environmentally sealed design protects internal equipment investment from dust and rain
- Rated for deployments in harsh environments per GR-487: -40°F to +115°F (-40°C to +46°C)

#### Access

- · Provides front and side doors for full access to the equipment
- Designed to allow access to all complementary elements of a remote outdoor cabinet deployment such as the copper or fiber cables, fiber splicing and distribution modules, power and DC distribution systems, AC power and battery charge breakers, AC outlet, etc, in a compact form factor
- · Door security and hardware features designed to protect from vandalism and theft

#### Investment

- · Cabinet engineered features designed to ensure ease of maintenance and eliminate service interruptions
- Provides an ideal platform for the migration of copper access services to fiber access infrastructure and electronics

# Fiber Active Cabinet (FAC) 400 —



## **Technical Specifications**

FieldSmart FAC 400		
Dimensions	48"H (with battery base) x 24"W x 29"D	
Weight	Local AC power w/ single 60 Ah battery base: 156 lbs. Equipped with one 60 Ah battery string: 340 lbs. Local AC power w/ dual 60 Ah battery base: 184 lbs. Equipped with two 60 Ah battery strings: 525 lbs.	
Mounting Options	Pour-in-Place Template, Pole Mount, Wall Mount, Vault/Riser and Pre-Cast Pad (3rd party supplied)	
AC Power Center Options	Optional integrated AC load center, 110–240 VAC single phase, 30 Amp service with UL listed service disconnect, high power Joslyn AC surge protector	
	Alpha Cordex 1RU -48 VDC Rectifier System Two 25 Amp rectifier modules, auto-senses and adjusts for low and high AC input. CXCM1+ Controller	
AC/DC Rectifier Option	Low input (100–185 VAC): Max. total power output 1200 Watts; Max. total current 25 Amps (2 modules, non-redundant)	
	High input (185–264 VAC): Max. total power output 2400 Watts; Max. total current 50 Amps (2 modules, non-redundant)	
Cooling/Environmental	700 Watt cooling capacity with Dantherm door mount heat exchanger	
Cooling/Environmental	Ambient temperature per GR-487: –40° F to +115° F (-40°C to +46°C)	
Mirad Canacity	Fiber: Up to 192 subscriber fiber drops (SC connectors); (6) 1x32 PON splitters	
Wired Capacity	Copper: Up to 288 copper lines with MS2 or 710 splice options	
Fiber Management Options	12-position fiber splice tray (default), up to 192-position fiber distribution in 48- or 96-port increment assemblies; SC connector fiber spool and routing facilities. Integrated 1:16 or 1:32 GPON Splitters (option) LGX based 6-position cassette for fiber splicing or termination.	
Copper Protection Options	Standard 5-pin protection blocks — modular in 48-pair increments. Up to six 48-pair protection blocks	
Available Rack Units	4	
Safety and Compliance	UL-60950, Standard for Safety, Issue 1, April 1, 2003 CAN/CSA-C22.2 No. 60950 EMC FCC Part 15 Class A ICES-003 Class A	
Safety and Compliance	Telcordia, GR-63-CORE, NEBS Telcordia, GR-487, Generic Requirements for Electronic Equipment Cabinets	

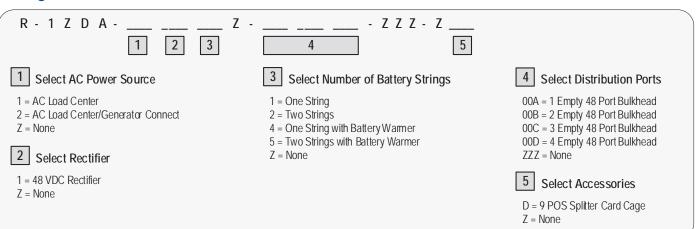
### **Pre-Configured Part Numbers**

Part Number	Description
R-1ZDA-ZZZZ-ZZZ-ZZZ	FieldSmart Fiber Active Cabinet, FAC 400 Enclosure, Vertical 19 Inch Equipment Rack, 300W Heat
ZZ	Exchanger, No Load Center, No Rectifier, No Battery String, No Bulkhead

# Fiber Active Cabinet (FAC) 400 -



### **Configured Part Numbers**



### **Mounting Options**

<b>Mounting Option</b>	Part Number	Description
Pad Mount	140-00022	Fiber Active Cabinet 400 Pour-in-Place Template
Pole Mount	140-00043	Fiber Active Cabinet 400 Pole/Wall Mount Kit for 60 AH Battery Base
Wall/H-Frame Mount	140-00043	Fiber Active Cabinet 400 Pole/Wall Mount Kit for 60 AH Battery Base

### **Battery Options**

Battery Option	Part Number	Description
60 AH Battery String	140-00042	Fiber Active Cabinet 400 60 AH Northstar NSB 60 Ft. Battery String
62 AH Battery String	140-00039	Fiber Active Cabinet 400 62 AH Enersys SBS B14 Battery String

## Fiber Active Cabinet (FAC) 900



### **Application**

The FieldSmart Fiber Active Cabinet (FAC) 900 has been designed to offer a low profile and compact size. It complies with a 36" height requirement that allows a minimum intrusive effect in urban, suburban and residential areas. Compliant with GR-487, the FAC 900 is the ideal outdoor cabinet solution for the harshest outdoor conditions, providing a sealed internal environment where external air and humidity are completely isolated from the electronic equipment.

### Description

The FAC 900 is an environmentally-controlled enclosure constructed of powder-coated aluminum. The FAC 900 cabinet's equipment compartment features a 19" swing frame front and rear, accommodating up to, 9RU of active electronics equipment. The FAC 900 provides up to 576 internal fiber distribution ports for subscriber PON deployments, along with complementary splitter capacity. The FAC 900 accepts local AC power and uses a door mounted integrated air-to-air heat exchanger and DC-powered fans to cool the equipment inside the cabinet. A separate, vented, internal compartment houses an optional battery string. In addition, an optional under-cabinet battery compartment can be ordered.



#### **Features and Benefits**

#### Integrity

- Designed to seamlessly integrate a variety of standard options that are expected in remote cabinets, such as the rectifier system, battery
  base, battery warmers and field configurable fiber or copper distribution frames
- Supports a variety of cabinet mounting options including pad, pole, wall and H-frame eliminating concern with right-of-way issues and problematic installation locations

#### Protection

- Telcordia GR-487 compliant and UL-60950/UL-50 spec
- Environmentally sealed design protects internal equipment investment from dust and rain
- Rated for deployments in harsh environments per GR-487: -40°F to +115°F (-40°C to +46°C)

#### Access

- · Provides front and side doors for full access to the equipment
- Designed to allow access to all complementary elements of a remote outdoor cabinet deployment such as the copper or fiber cables, fiber splicing and distribution modules, power and DC distribution systems, AC power and battery charge breakers, AC outlet, etc.
- Door security and hardware features designed to protect from vandalism and theft

#### Investment

- The FAC 900 is designed for modular expansion, allowing cost effective service deployment and scalability
- · Cabinet engineered features designed to ensure ease of maintenance and eliminate service interruptions
- · Provides an ideal platform for the migration of copper access services to fiber access infrastructure and electronics

# Fiber Active Cabinet (FAC) 900 —



## **Technical Specifications**

FieldSmart FAC 900		
Dimensions	Base cabinet: 36"H x 25"W x 57"D (battery box internal to cabinet)	
	Riser options for cabinet: 6", 12" or 16" H	
Weight	Local AC power w/ 100 Ah battery enclosure: 290 lbs. Equipped with one 100 Ah battery string: 575 lbs.	
Mounting Options	Pre-Cast or Pour-in-Place Pad Template, Wall/H-Frame Mount, Vault/Riser (3rd Party Supplied)	
AC Power Center Options	AC Power feed: 240 VAC single phase, 50/60HZ, 30 Amp service with UL listed service disconnect, high power Joslyn AC surge protector	
	Alpha Cordex 1RU -48 VDC Rectifier System Two 25 Amp rectifier modules, auto-senses and adjusts for low and high AC input. CXCM1+ Controller	
AC/DC Rectifier Option	Low input (100–185 VAC): Max. total power output 1200 Watts; Max. total current 25 Amps (2 modules, non-redundant)	
	High input (185–264 VAC): Max. total power output 2400 Watts; Max. total current 50 Amps (2 modules, non-redundant)	
Cooling/Environmental	1050 Watt cooling capacity with Dantherm door mount heat exchanger, as per GR-487 Generic Requirement	
	Ambient temperature (per GR-487): -40°F to +115°F (-40°C to +46°C)	
Wired Capacity	Fiber: Up to 576 subscriber fiber terminations with internal battery box in cabinet, up to 576 subscriber fiber terminations (with or without internal battery box in cabinet). Up to 18 integrated PON splitters.	
, ,	Copper: Up to 384 copper lines with MS2 or 710 splice options	
Fiber Management Options  12- or 24-position Clearfield Fiber Splice and distribution on 19/23" mount. Support for in-cabinet and ActiveE fiber management: Up to 576 position fiber distribution in 12-, 24-, 48-, or 96-port incassemblies; SC/APC connector, loose tube or ribbon. Up to eighteen integrated 1x2, 1x16, 1x32 (Splitters (optional).		
Copper Protection Options	Standard 5-pin protection blocks — modular in 48-pair increments, up to eight 48-pair protection blocks	
Available Rack Units	Up to 9RU in a 19" rack	
Safety and Compliance	UL-60950, Standard for Safety, Issue 1, April 1, 2003 CAN/CSA-C22.2 No. 60950 EMC FCC Part 15 Class A ICES-003 Class A	
Salety and Compliance	Telcordia, GR-63-CORE, NEBS Telcordia, GR-487, Generic Requirements for Electronic Equipment Cabinets	

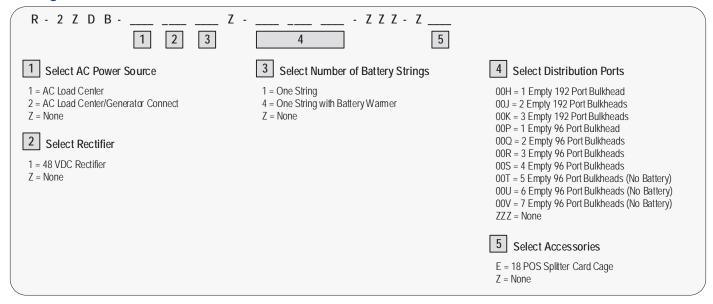
## **Pre-Configured Part Numbers**

Part Number	Description
R-2ZDB-ZZZZ-ZZZ-ZZZ-	FieldSmart Fiber Active Cabinet, FAC 900 Enclosure, Vertical 19 Inch Equipment Rack, 750W Heat
ZZ	Exchanger, No Load Center, No Rectifier, No Battery String, No Bulkhead

# Fiber Active Cabinet (FAC) 900 -



### **Configured Part Numbers**



### **Mounting Options**

<b>Mounting Option</b>	Part Number	Description
Pad Mount	140-00048	Fiber Active Cabinet 900 Pad Mount Kit With Pour in Place Template
Wall/H-Frame Mount	140-00049	Fiber Active Cabinet 900 Wall/H-Frame/Mount Kit

### **Battery Options**

Battery Option	Part Number	Description
100 Ah Battery String	140-00002	Fiber Active Cabinet Northstar Battery String Kit, 100 Ah - Front Access

## Fiber Active Cabinet (FAC) 3200



### **Application**

The FieldSmart Fiber Active Cabinet (FAC) 3200 has been designed with the philosophy of modularity and flexibility, while maintaining a maximum cooling capability for the active electronics investment. Compliant with GR-487, the FAC 3200 is the ideal outdoor cabinet solution for the harshest outdoor conditions, providing a sealed internal environment where external air and humidity are completely isolated from the electronic equipment.

### Description

The FAC 3200 outdoor cabinet is an environmentally-controlled enclosure constructed of powder-coated aluminum. The FAC 3200 cabinet's equipment compartment features a 23", 16RU equipment mounting rack front and rear, accommodating up to 32RU of active electronics equipment. The FAC 3200 provides up to 576 internal fiber distribution ports for subscriber PON deployments along with complementary splitter capacity. The FAC 3200 accepts local AC power and uses either a door mounted integrated air-to-air heat exchanger and DC-powered fans or an integrated DC-powered air conditioner to cool the equipment inside the cabinet. A vented, integrated-cabinet compartment below the equipment chamber houses optional batteries.



### **Features and Benefits**

#### Integrity

- The FAC 3200 can accommodate equipment in the front compartment, as well as auxiliary and complementary options in the rear
  compartment and the splice chamber. The 23" equipment racks in front, rear and splice compartments, allow for a variety of deployment
  options.
- Designed to seamlessly integrate a variety of standard options that are expected in remote cabinets, such as the rectifier system, battery
  warmers and field upgradeable fiber bulkheads
- Supports a variety of cabinet mounting options including pad, pole, wall or H-frame, eliminating concern with right-of-way issues and problematic installation locations

#### Protection

- Telcordia GR-487 compliant and UL-60950/UL-50 spec
- Environmentally sealed design protects internal equipment investment from dust and rain
- Rated for deployments in harsh environments per GR-487: -40°F to +115°F (-40°C to +46°C)

#### Access

- Provides 3-point latching doors for quick access to all three compartments
- Designed to allow access to all complementary elements of a remote outdoor cabinet deployment such as the copper or fiber cables, fiber splicing and distribution modules, power and DC distribution systems, AC power and battery charge breakers, AC outlet, etc.
- Door security and hardware features designed to protect from vandalism and theft

#### Investment

- The FAC 3200 is designed for modular expansion, allowing for cost effective expansion of services in the future
- Cabinet engineered features designed to ensure ease of maintenance and eliminate service interruptions
- · Provides an ideal platform for the migration of copper access services to fiber access infrastructure and electronics

# Fiber Active Cabinet (FAC) 3200 -



## **Technical Specifications**

FieldSmart FAC 3200			
Dimensions	38"W x 43"D x 55"H		
Weight	560 lbs. (Equipped with Northstar 170 Ah batteries: 1000 lbs.)		
Mounting Options	Pad, Pole, H-frame, Wall, 3 <sup>rd</sup> Party Pedestal		
AC Power Center Options	Power feed: 240 VAC single phase, 60-Amp service with UL listed service disconnect. Redundant AC feeds to rectifier. Redundant DC feeds to systems. Low voltage DC disconnect. (–42V), high-power Joslyn surge protector.		
AC/DC Rectifier Option	Eltek CC9S-ANL-VC Compact Power System 120 Amp max. total capacity (90A N+1). Rectifier modules: (4) 30 Amp modules supported (Configured part numbers include two modules).		
	Option 1: 1800 watt (6142 Btu/h) cooling capacity with Dantherm door mount heat exchanger, as per GR-487 generic requirement		
Cooling/Environmental	Option 2: 1800 watt (6000 Btu/h) Dantherm door mount air conditioner. Air conditioner module is not GR-487 rated.		
	Ambient temperature per GR-487: -40°F to +115°F (-40°C to +46°C)		
Wired Capacity	Fiber: Up to 576 subscriber fiber terminations utilizing bulkhead option. Up to 18 integrated PON splitters.		
	Copper: Up to 576 copper lines with MS2 or 710 splice options		
Fiber Management Options	12- or 24-position Clearfield fiber splice and distribution on 19/23" mount. Support for in-cabinet GPON and ActiveE fiber management: Up to 576 position fiber distribution in 48-, 96-, 144- or 288-port increment assemblies; SC/APC connector, loose tube or ribbon. Up to eighteen integrated 1x2, 1x16, 1x32 GPON Splitters (optional).		
Copper Protection Options	Standard 5-pin protection blocks — modular in 48-pair increments. Up to (12) 48-pair protection blocks.		
Available Rack Units	32 RU 23" rack with optional 19" vertical frames		
Safety and Compliance	UL-60950, Standard for Safety, Issue 1, April 1, 2003 CAN/CSA-C22.2 No. 60950 EMC FCC Part 15 Class A ICES-003 Class A		
Salety and Compliance	Telcordia, GR-63-CORE, NEBS Telcordia, GR-487, Generic Requirements for Electronic Equipment Cabinets		

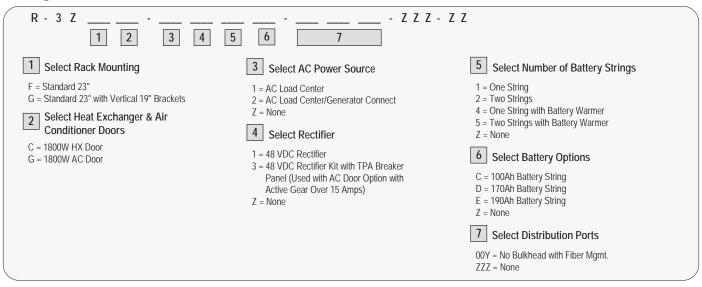
### **Pre-Configured Part Numbers**

Part Number	Description
R-3ZFC-ZZ1Z-ZZZ-ZZZ-ZZ	FieldSmart Fiber Active Cabinet, FAC 3200 Enclosure, Standard 23 Inch Equipment Rack, 1800 watt (6142 Btu/h) Heat Exchanger, No Load Center, No Rectifier, Supports 1 Battery String, No Bulkhead
R-3ZFE-ZZ1Z-ZZZ-ZZZ-ZZ	FieldSmart Fiber Active Cabinet, FAC 3200 Enclosure, Standard 23 Inch Equipment Rack, 1800 watt (6142 Btu/h) Air Conditioner, No Load Center, No Rectifier, Supports 2 Battery String, No Bulkhead

# Fiber Active Cabinet (FAC) 3200



### **Configured Part Numbers**



### **Mounting Options**

Mounting Option	Part Number	Description
Pad Mount	140-00007	Fiber Active Cabinet 3200 Pad Mount Kit With Pour in Place Template
Pole Mount	140-00008	Fiber Active Cabinet 3200 Wall/H-Frame/Pole Mount Kit
Wall/H-Frame Mount	140-00008	Fiber Active Cabinet 3200 Wall/H-Frame/Pole Mount Kit

### **Battery Options**

Battery Option	Part Number	Description
100 Ah Battery String	140-00002	Fiber Active Cabinet Northstar Battery String Kit, 100 Ah - Front Access
170 Ah Battery String	140-00010	Fiber Active Cabinet 3200 Northstar Battery String Kit, 170 Ah - Front Access
190 Ah Battery String	140-00038	Fiber Active Cabinet Enersys Battery String Kit, 190 Ah - Front Access

# Fiber Active Cabinet (FAC) 5400



#### **Application**

The FieldSmart Fiber Active Cabinet (FAC) 5400 is the largest cabinet offering from Clearfield. It has been designed with the philosophy of modularity and flexibility, while maintaining a maximum cooling capability for the active electronics. Compliant with GR-487, the FAC 5400 is the ideal outdoor cabinet solution for the harshest outdoor conditions, providing a sealed internal environment where external air and humidity are completely isolated from the electronic equipment.

#### Description

The FAC 5400 is an environmentally-controlled enclosure constructed of powder-coated aluminum. The FAC 5400 cabinet's equipment compartment features a 23", 27RU swing frame front and rear, accommodating up to 54RU of active electronics equipment. The FAC 5400 provides up to 1,152 internal fiber distribution ports for subscriber PON deployments along with complementary splitter capacity. The FAC 5400 accepts local AC power and uses either two door mounted integrated air-to-air heat exchangers and DC-powered fans or integrated DC-powered air conditioners to cool the equipment inside the cabinet. A vented, integrated-cabinet compartment below the equipment compartment houses optional batteries.



#### **Features and Benefits**

#### Integrity

- The FAC 5400 can accommodate equipment in the front compartment, as well as auxiliary and complementary options in the rear
  compartment and the splice compartment. The 23" equipment racks in front, rear and splice compartment, allow for a variety of deployment
  options.
- Designed to seamlessly integrate a variety of standard options that are expected in remote cabinets, such as the rectifier system, battery warmers and field upgradeable fiber bulkheads

#### Protection

- Telcordia GR-487 compliant and UL-60950/UL-50 spec
- · Environmentally sealed design protects internal equipment investment from dust and rain
- Rated for deployments in harsh environments per GR-487: -40°F to +115°F (-40°C to +46°C)

#### Access

- Equipment swing frames provide for front and rear access to the equipment within the cabinet
- Designed to allow access to all complementary elements of a remote outdoor cabinet deployment such as the copper or fiber cables, fiber splicing and distribution modules, power and DC distribution systems, AC power and battery charge breakers, AC outlet, etc.
- Door security and hardware features designed to protect from vandalism and theft

#### Investment

- The FAC 5400 is designed for modular expansion, allowing for cost effective expansion of services in the future
- · Cabinet engineered features designed to ensure ease of maintenance and eliminate service interruptions

# Fiber Active Cabinet (FAC) 5400 -



# **Technical Specifications**

FieldSmart FAC 5400		
Dimensions	49"W x 58"D x 74"H	
Weight	1,175 lbs. (Not including batteries)	
Mounting Options	Pad	
AC Power Center Options	Power feed: 240 VAC single phase, 60-Amp service with UL listed service disconnect. Redundant AC feeds to rectifier. Redundant DC feeds to C7 shelf. Low voltage DC disconnect. (–42V) High power AC surge protection (ABB).	
Optional AC/DC Rectifier Options	Eltek CC9S-ANL-VC Compact Power System 120 Amp max. total capacity (90A N+1). Rectifier modules: (4) 30 Amp modules supported (Configured part numbers include two default).	
	Option 1: Dantherm door mount heat exchanger options (1800 Watts/6000 Btu/h – up to two 3600 Watts/12,000 Btu/h total with front and rear door options).	
Cooling/Environmental	Option 2: Dantherm door mount air conditioner options (1800 Watts/6000 Btu/h – up to two 3600 Watts/12,000 Btu/h total with front and rear door options).	
	Ambient temperature per GR-487: -40° F to +115° F (-40°C to +46°C)	
Wired Capacity	Fiber: Up to 1152 subscriber fiber terminations utilizing bulkhead options. Up to 36 integrated PON splitters.	
	Copper: Up to 1152 copper lines with MS2 or 710 splice options	
Fiber Management Options	12- or 24-position Clearfield fiber splice and distribution on 19/23" mount. Support for in-cabinet GPON and ActiveE fiber management: Up to 1152 position fiber distribution in 48-, 96-, 144-, or 288-port increments assemblies; SC/APC connector, loose tube or ribbon. Up to 36 integrated 1x2, 1x16, 1x32 GPON Splitters (optional).	
Copper Protection Options Standard 5-pin protection blocks — modular in 48-pair increments, up to (24) 48-pair protection		
Available Rack Units	54RU 23" swing frame rack with optional 19" vertical frames	
Safaty and Camplianes	UL-60950, Standard for Safety, Issue 1, April 1, 2003 CAN/CSA-C22.2 No. 60950 EMC FCC Part 15 Class A ICES-003 Class A	
Safety and Compliance	Telcordia, GR-63-CORE, NEBS Telcordia, GR-487, generic requirements for electronic equipment cabinets	

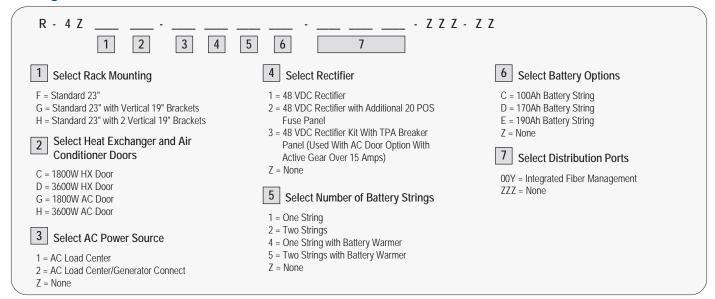
# **Pre-Configured Part Numbers**

Part Number	Description
R-4ZFC-ZZ1Z-ZZZ-ZZZ-ZZZ FieldSmart Fiber Active Cabinet, FAC 5400 Enclosure, Standard 23 Inch Equipment Rack, 1800 Btu/h) Heat Exchanger, No Load Center, No Rectifier, Supports 1 Battery String, No Bulkhead	
R-4ZFD-ZZ1Z-ZZZ-ZZZ-ZZ	FieldSmart Fiber Active Cabinet, FAC 5400 Enclosure, Standard 23 Inch Equipment Rack, 3600 watt (12,284 Btu/h) Heat Exchanger, No Load Center, No Rectifier, Supports 1 Battery String, No Bulkhead
R-4ZFE-ZZIZ-ZZZ-ZZZ-ZZ	FieldSmart Fiber Active Cabinet, FAC 5400 Enclosure, Standard 23 Inch Equipment Rack, 1800 watt (6,000 Btu/h) Air Conditioner, No Load Center, No Rectifier, Supports 1 Battery String, No Bulkhead
R-4ZFF-ZZ1Z-ZZZ-ZZZ-ZZ	FieldSmart Fiber Active Cabinet, FAC 5400 Enclosure, Standard 23 Inch Equipment Rack, 3600 watt (12,000 Btu/h) Air Conditioner, No Load Center, No Rectifier, Supports 1 Battery String, No Bulkhead

# Fiber Active Cabinet (FAC) 5400



#### **Configured Part Numbers**



#### **Mounting Option**

Mounting Option	Part Number	Description
Pad Mount	140-00013	Fiber Active Cabinet 5400 Pad Mount Kit With Pour in Place Template

#### **Battery Options**

Battery Option	Part Number	Description
100 Ah Battery String	140-00002	Fiber Active Cabinet Northstar Battery String Kit, 100 Ah - Front Access
170 Ah Battery String	140-00010	Fiber Active Cabinet 3200 Northstar Battery String Kit, 170 Ah - Front Access
190 Ah Battery String	140-00038	Fiber Active Cabinet Enersys Battery String Kit, 190 Ah - Front Access

# FieldSmart® FiberFlex 2000



#### **Application**

Clearfield's FieldSmart FiberFlex 2000 enclosure has been designed from the ground up for maximum flexibility, scalability and space utilization. Optimized for fiber service delivery from 144 to 576 fiber ports utilizing the compact patch only Clearview Black Cassette, the FiberFlex 2000 is a fiber-first design for a variety of powered cabinet deployment scenarios such as the network edge, wireless backhaul and active ethernet networks. The cabinet's small footprint makes it easy to drop into any application in any location. Designed to comply to GR-487, the FiberFlex 2000 is the ideal outdoor cabinet solution for the harshest outdoor conditions, providing a sealed internal environment where external air and humidity are completely isolated from the electronic equipment.

# Description

The FiberFlex 2000 is an environmentally-controlled enclosure constructed of powder-coated aluminum. The FiberFlex 2000's equipment bay features a 19" vertical equipment rack, accommodating up to 20RU of active electronics equipment. The FiberFlex 2000 provides up to 576 internal fiber distribution ports for subscriber PON deployments, along with complementary splitter capacity. The FiberFlex 2000 accepts local AC power and



features an external AC Load Center. A door mounted integrated air-to-air heat exchanger and DC-powered fans cool the equipment inside the cabinet. A separate, vented, under-cabinet compartment houses optional batteries. A second battery compartment can be added for additional backup capabilities.

#### **Features and Benefits**

#### Flexibility

- External load center Simplifies and separates AC connection on site
- Multiple fiber counts 144 to 576 fiber ports in a single cabinet (Clearview Black Cassette standard)
- Various mounting options Pad mount, Pole Mount, Wall/H-Frame Mount
- Stackable backup battery bays Add additional battery compartment to double available backup time

#### Space Utilization

- Only 54" x 24" x 35" to fit nearly any deployment scenario
- · Optimized internal space utilization for maximum equipment capabilities and fiber port count

#### Integrity

- Designed to comply to GR-487 and NEMA 4 for matchless protection in the harshest environments
- 750-watt air-to-air Heat Exchanger standard
- · Factory integration and testing of the AC Load Center, Rectifier, Backup Battery Harness and Heat Exchanger

#### Access

- · Provides front and rear doors for full access to internal equipment
- External AC Load Center for easy access and optimal interior space utilization
- Fiber-first design for access storage and routing of fiber (or copper) cables and accessories, such as splitters and WDMs
- Door security and hardware features designed to protect equipment from vandalism and theft.
- · Door integrity alarm standard.





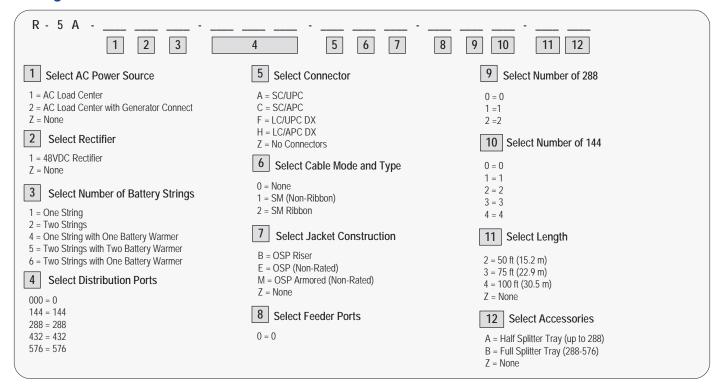
# **Technical Specifications**

FieldSmart FiberFlex 2000		
Disconsions	Base cabinet with Battery Compartment: 54"H x 24"W x 35"D	
Dimensions	Base Cabinet with 2nd Battery Compartment Option: 66"H x 24"W x 35"D	
Weight	Cabinet with Battery Compartment: 250 lbs. Equipped with one 155 Ah battery string: 650 lbs.	
Mounting Options	Pre-Cast or Pour-in-Place Pad Template, FUTURE: Wall/H-Frame Mount and Vault/Riser (3rd Party Supplied)	
AC Power Center Options	AC Power feed: 240 VAC single phase, 50/60HZ, 125 Amp service with UL listed service panel.	
AC Power Center Options	High power AC surge protection (Joslyn)	
	Eltek Flatpack S (FPS) 1RU -48vdc Rectifier System No-LVD, Two 20 Amp rectifier modules, autosenses and adjusts for low and high AC input	
AC/DC Rectifier Option	Smartpack S Controller.	
	Nominal Input Voltage Range: (185 - 270 VAC): Max. total power output 1000 Watts; Max. total current 40 Amps (2 modules) or 20 Amps (2 modules N+1)	
Battery Capacity	Designed to accommodate (2) strings of Northstar NSB 155FT RED batteries. One string support in the standard battery compartment. Dual battery string support using expanded backup option with second battery compartment orders. (Increases capacity to 310Ah total backup).	
	For all other battery types required, compartment space is as follows: 11.2"H x 5"W x 22"D	
Cooling/Environmental	1000-Watt cooling capacity with Dantherm door mount heat exchanger	
Cooling/Environmental	Ambient operating temperature range: -40°C to +46°C (-40°F to +115°F)	
	Up to 576 SC connector fiber terminations in a Clearview Black Cassette	
Wired Fiber Capacity	Up to 12 optional transport fiber terminations	
	Up to eighteen integrated PON splitters	
	Up to 576 position fiber distribution in 144 or 288-port increments, SC/APC connector, loose tube or ribbon	
Fiber Management Options	Up to eighteen integrated splitters in various ratios available	
	Configurable transport module for fiber separation of subscriber and active equipment transport	
Available Deals Haite	20RU in a standard 19" rack	
Available Rack Units	6RU with full 576 fiber distribution SC ports and rectifier option	
Safety and Compliance	Designed to Telcordia, GR-487, Generic Requirements for Electronic Equipment Cabinets, UL E-6294	

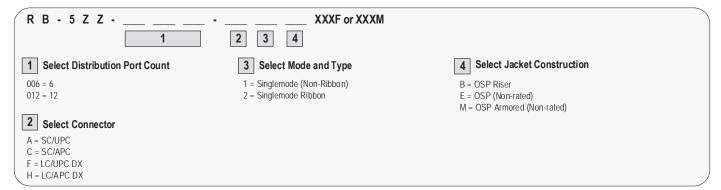




#### **Configured Part Numbers - Main Cabinet**



#### **Configured Part Numbers - Transport Module**



#### **Mounting Options**

Mounting Option	Part Number	Description
Pad	150-00010	FiberFlex 2000 Pour-in-Place Template

#### **Battery Options**

Battery Option	Part Number	Description
155 AH Battery String	150-00009	FiberFlex 2000 155 AH Northstar NSB155FT Red Battery String

#### **Splitter Options**

Part Number	Description
KE1-CAA	WaveSmart High Density (HD) Splitter, 1 x 32 SCA 85 x 35 x 6 mm

# FieldSmart® FiberFlex 3000



#### **Application**

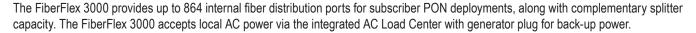
Clearfield's FieldSmart FiberFlex 3000 is optimized as a fiber-first design for a variety of powered cabinet deployment scenarios. The cabinet is designed to configure for numerous applications including remote OLTs with PON distribution, wireless base stations with fiber backhaul aggregation and active network equipment with back-up power needs, utilizing a flexible vertical layout and with a modular design allows for networks to scale for the future growth.

The cabinet's footprint makes it easy to drop into any application with a PAD or vault mount option. Designed to meet GR-487 requirements, the FiberFlex 3000 is the ideal outdoor cabinet solution for the harshest environments.

#### **Description**

The FiberFlex 3000 is an all-in-one design, capable of integrating fiber, power (AC & DC) and active equipment. This cabinet features flexible vertical options to meet a wide variety deployment environments and is scalable for future growth. The FiberFlex 3000 equipment bay features a 19" or 23" vertical equipment rack to provide options for

- · 36RU active electronics and passive equipment with no batteries
- 30RU with 1 string of batteries
- · 20RU with 2 strings of batteries



#### **Features and Benefits**

Flexibility (Optional Add Features)

- Environmental controls include HVAC, heat exchangers, direct air cooling. Configured to meet application and location needs.
- AC power system with main breaker 12 slot load center and surge protection
- · Generator Plug 30 amp for long run time back-up power
- DC power source sized to meet application and distribution needs
- · Batteries sized to meet power requirements and back-up power time
- LED light to provide better visual experience of equipment installed on the rack
- Door alarms dry contacts normal closed to provide intrusion alarm

#### Space Utilization

- Interior rack can be 19' or 23" EIA standard spacing
- Various mounting options Pad mount, Vault mount

#### Integrity

- · Door gasket is closed cell and attached to cabinet frame compliant with NEMA standards
- Stainless steel hardware to prevent corrosion
- Grounding provisions- with ground straps for doors and master ground bar mounted in cabinet
- · Convenience quad receptacle 15amp
- · Sunshield to reduce the effects of solar loading
- · Lifting eyes on four corners of the cabinet to enable ease of installation
- · GR-487 compliant powder coating of cabinet
- Designed to meet UL and NEMA 3R & 4 requirements

#### Access

- Fiber-first design for access storage, routing and protection of fiber
- Fiber from 144-864 with splitters or WDMs panel
- · Standard is Clearview Black Cassette (patch only)
- Cable entry ports with removable plate to facilitate ease of installation when using a vault or mounted on concrete pad
- Stainless steel door stays adjustable from 90 deg to 120 deg openings
- Front and Rear Door with security padlock hasp with 1/4 turn sealing mechanism
- Mounting plinth 3" to allow craft friendly installation







# **Technical Specifications**

FieldSmart FiberFlex 3000		
Dimensions	Base cabinet with Battery Compartment: 72"H x 30"W x 36"D	
Weight	Cabinet: 325 lbs.	
Mounting Options	Pour-in-Place Pad Template, or Split Lid Vault	
AC Dower Center Ontions	AC Power feed: 240 VAC single phase, 50/60HZ, 125 Amp service with UL listed service panel.	
AC Power Center Options	High power AC surge protection	
AC/DC Rectifier Option	Configured from 30 amps to 150 amps, consult Clearfield for systems great than 150 amps	
Dettem: Consolts	Designed to accommodate 80amp/hr to 200amp/hr front terminal batteries.	
Battery Capacity	For top terminal capacity see Clearfield for further information.	
Cooling/Environmental	Direct Air Cooling (DAC), Heat Exchanger (HEX), Air-Conditioning with Heat.	
Wired Fiber Capacity	Up to 864 Distribution; Standard cassette is Clearview Black for patch only.	
Fiber Management Options	Up to 864 position fiber distribution in 144 or 288-port increments, SC/APC connector, loose tube or ribbon. Splitters and WDM in various ratios available.	
	Configurable transport module for fiber separation of subscriber and active equipment transport	
Available Dack Unite	36RU, 30RU, 20RU, depending on configuration selected.	
Available Rack Units	Using the modular design, RU space to increase increments	
Safety and Compliance	GR-326, pending UL508a	

# **Configured Part Numbers - "Under Construction"**

# **Mounting Options**

Mounting Option	Part Number	Description
Pad	150-00027	TBD

# **Splitter Options**

Part Number	Description
KE1-CAA	WaveSmart High Density (HD) Splitter, 1 x 32 SCA 85 x 35 x 6 mm

# StreetSmart® Aerial FDH - 144



#### **Application**

When the network deployment plan calls out for an aerial application, Clearfield's StreetSmart Aerial FDH-144 provides an interconnect environment from the feeder network through the optical passive splitter to the distribution network. Designed specifically for aerial/strand mount applications in the outside plant environment, these enclosures provide a single distribution point to distribute FTTH in rural, urban or dense neighborhoods.

#### Description

The StreetSmart Aerial FDH-144 is the complete solution for managing up to 144 port distribution fibers for an outside plant FTTx PON application. Factory pre-terminated (1–144, 1–96 or 1–72) fiber cables eliminates splicing at the terminal and allows the service provider the ability to define and assign the feeder and distribution ports, customizing to each individual deployment.

The Aerial FDH has been designed for aerial or strand mount fiber deployment within the network architecture. The Aerial FDH includes 2 individual hinged covers with four side entrance cable access ports – two on each end.

The factory installed, pre-terminated OSP cable is spliced on the back side of the unit and is separated and secured from the craft accessible feeder and distribution connection ports, located in the front of the enclosure.

The compact design of the Aerial FDH incorporates individual blocks of 12 SC/APC adapters that are housed in multiple sized faceplates, providing maximum configuration capabilities. The symmetrical design of the unit incorporates fiber management and bend-radius protection for all fibers being deployed.

The Aerial FDH has room to hold up to 9 individual compact ruggedized splitter modules, allowing the service provider to add splitters as needed, growing as they go to minimize investment in capital equipment related to the turn-up of revenue-generating circuits. The Aerial FDH is a sealed, free breathing enclosure that provides protection in the harshest OSP environments.

#### **Features and Benefits**

#### Intearity

- Terminations designed, tested and certified to Telcordia GR-326
- · Fiber cable certified to GR-20 and GR-409
- Aerial FDH designed, tested and certified to GR-3125
- 100% performance tested for insertion loss, return loss and final mechanical inspection

#### Protection

- Black UV resistant thermoplastic designed to resist corrosion
- · Sealed-free breathing terminal provides durability and protection in the OSP environments
- · Separate secure splice chamber, provides protection and security of incoming and outgoing fibers

#### Access

- · Four individual secure compartments (2 each front and rear), separate splices from the drop ports, providing network security
- Hinged front covers allows easy access for installation and network maintenance
- 4 cable entrance/exit ports 2 on each end
- · Factory terminated single 144, 96 or 72 fiber cable allows provider to determine assignment of individual feeder and distribution ports
- · Factory installed fiber tail, available in multiple lengths
- · Will accept up to 9 individual compact ruggedized splitter modules
- · Designation card included













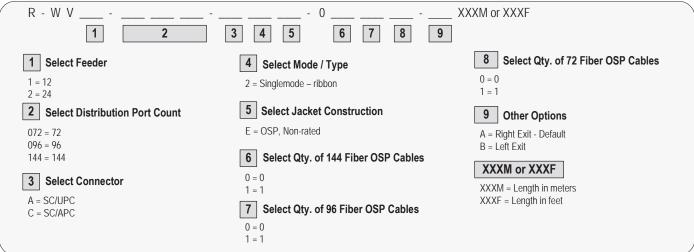
#### Investment

- · Customer defined configurations provides maximum scalability across multiple services classes
- "Grow-as-you-go" capabilities
- · Pre-terminated factory polished pigtail assembly ensures improved network operability when spliced onto the feeder cable

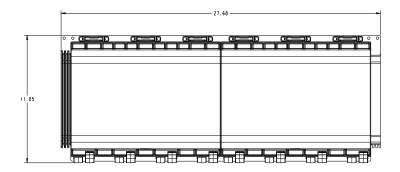
#### **Technical Specifications**

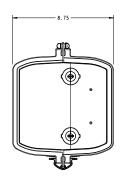
StreetSmart Aerial FDH - 144		
Dimensions	29.75" L x 11.97" H x 9.62" D (755.65 mm x 304.04 mm x 244.35 mm) * height includes strand bracket	
Material	Black UV Resistant Thermoplastic	
Weight	Approx. 30 lbs.	
Feeder/Express Ports	12 or 24 ports	
Distribution Ports	144 ports	
Cable Entrances	4 – 2 on the left, 2 on the right (Cables can exit on one side only)	
Mounting Options	Aerial or Strand Mount	
Splitter Slots for WaveSmart Ruggedized Splitters	9 Part Number - KE1-CAA - WaveSmart High Density Splitter Module, Loaded with (1) 1X32 Splitter, SC/APC Connectors, Front Pigtail Input(s) and Outputs, Bend Insensitive Fiber, 900um OSP Jacket	
Connector Types	SC/APC, SC/UPC	
Cable Types	144/96 OSP fiber Ribbon Outdoor (Non-Rated)	
Factory Terminated Fiber Tails 48 Fiber Feeder and 288 Fiber Distribution	Available from 100 to 500 Foot Lengths	
Staging Plates	Capacity 2 staging plates - will accept up to 48 unused splitter legs	
Splice Trays 5 Trays, 36 Per tray – 180 Max. Capacity		

### **Configured Part Numbers**

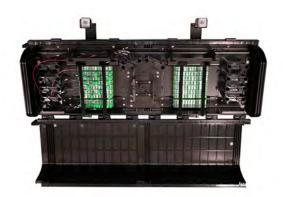








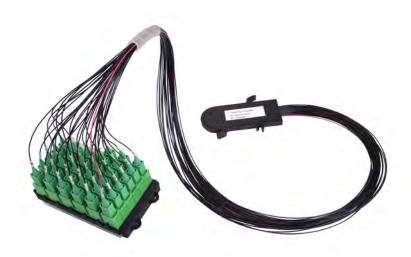




#### Ruggedized Splitter Module:

Part Number - KE1-CAA

WaveSmart High Density Splitter Module, Loaded with (1) 1X32 Splitter, SC/APC Connectors, Front Pigtail Input(s) and Outputs, Bend Insensitive Fiber, 900um OSP Jacket



# StreetSmart® Aerial FDH - 288



#### **Application**

When the network deployment plan calls out for an aerial application, Clearfield's StreetSmart Aerial FDH - 288 provides an interconnect environment from the feeder network through the optical passive splitter to the distribution network. Designed specifically for aerial/strand mount applications in the outside plant environment, these enclosures provide a single distribution point to distribute FTTH in rural, urban or dense neighborhoods.

#### Description

The StreetSmart Aerial FDH - 288 is the complete solution for managing up to 288 port distribution fibers for an outside plant FTTx PON application. Factory pre-terminated (1-288 or 1–144) fiber cables eliminates splicing at the terminal and allows the service provider the ability to define and assign the feeder and distribution ports, customizing to each individual deployment.

The Aerial FDH has been designed for aerial or strand mount fiber deployment within the network architecture. The Aerial FDH includes 2 individual hinged covers with four side entrance cable access ports – two on each end.

The factory installed, pre-terminated OSP cable is spliced on the back side of the unit and is separated and secured from the craft accessible feeder and distribution connection ports, located in the front of the enclosure.

The compact design of the Aerial FDH incorporates individual blocks of 12 LC/APC adapters that are housed in multiple sized faceplates, providing maximum configuration capabilities. The symmetrical design of the unit incorporates fiber management and bend-radius protection for all fibers being deployed.

The Aerial FDH has room to hold up to 9 individual compact ruggedized splitter modules, allowing the service provider to add splitters as needed, growing as they go to minimize investment in capital equipment related to the turn-up of revenue-generating circuits. The Aerial FDH is a sealed, free breathing enclosure that provides protection in the harshest OSP environments.







#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- · Fiber cable certified to GR-20 and GR-409
- Aerial FDH designed, tested and certified to GR-3125
- 100% performance tested for insertion loss, return loss and final mechanical inspection

#### Protection

- Black UV resistant thermoplastic designed to resist corrosion
- · Sealed-free breathing terminal provides durability and protection in the OSP environments
- · Separate secure splice chamber, provides protection and security of incoming and outgoing fibers

#### Access

- · Four individual secure compartments (2 each front and rear), separate splices from the drop ports, providing network security
- Hinged front covers allows easy access for installation and network maintenance
- 4 cable entrance/exit ports 2 on each end
- Factory terminated single 288 cable allows provider to determine assignment of individual feeder and distribution ports
- · Factory installed fiber tail, available in multiple lengths
- · Will accept up to 9 individual compact ruggedized splitter modules
- · Designation card included

#### Investment

# StreetSmart® Aerial FDH - 288

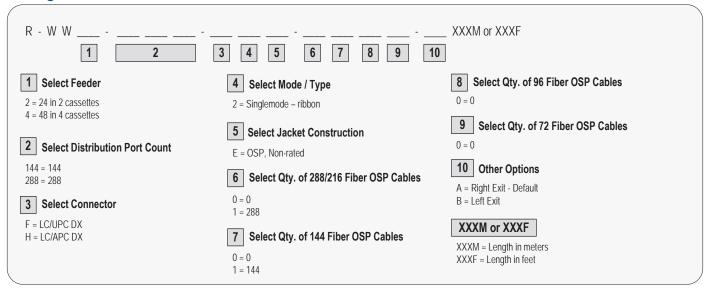


- · Customer defined configurations provides maximum scalability across multiple services classes
- · "Grow-as-you-go" capabilities
- · Pre-terminated factory polished pigtail assembly ensures improved network operability when spliced onto the feeder cable

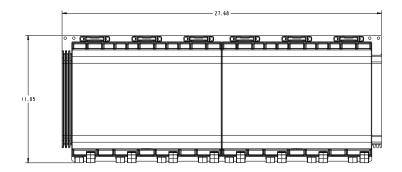
#### **Technical Specifications**

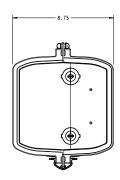
StreetSmart Aerial FDH - 288		
Dimensions	29.75" L x 11.97" H x 9.62" D (755.65 mm x 304.04 mm x 244.35 mm) * height includes strand bracket	
Material	Black UV Resistant Thermoplastic	
Weight	Approx. 30 lbs.	
Feeder/Express Ports	24-48 ports	
Distribution Ports	144-288 ports	
Cable Entrances	4 – 2 on the left, 2 on the right (Cables can exit on one side only)	
Mounting Options	Aerial or Strand Mount	
Splitter Slots for WaveSmart Ruggedized Splitters	9 Part Number KK1-GAA - Ruggedized Compact Splitter Module, One 1x32 Splitter, LC/APC Front Pigtail Input(s) and Outputs, Bend Insensitive Fiber, 1.2mm Legs, 125 x 58.4 x 10 mm	
Connector Types	LC/APC, LC/UPC	
Cable Types	144/288 OSP fiber Ribbon Outdoor (Non-Rated)	
Factory Terminated Fiber Tails 48 Fiber Feeder and 288 Fiber Distribution	Available from 100 to 500 Foot Lengths	
Staging Plates	Staging plate 021572, comes with splitter module. Capacity 2 staging plates - will accept up to 72 unused splitter legs	
Splice Trays	5 Trays, 72 Per Tray - 360 Max. Capacity	

#### **Configured Part Numbers**









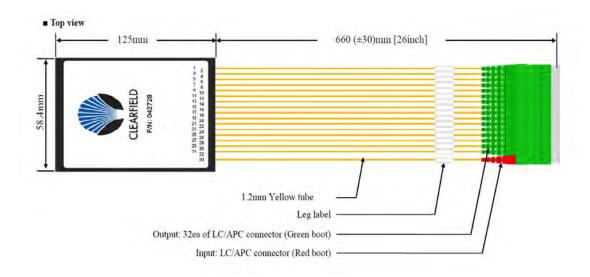




#### Ruggedized Splitter Module:

#### Part number - KK1-GAA

Ruggedized Compact Splitter Module, One 1x32 Splitter, LC/APC Front Pigtail Input(s) and Outputs, Bend Insensitive Fiber, 1.2mm OSP Yellow Jacket, 125 x 58.4 x 10 mm, includes staging plate - 021572



# CraftSmart® FiberFirst Pedestal



#### **Application**

The CraftSmart® FiberFirst Pedestal provides a secure, above-ground access point for fiber-to-the-home (FTTH) networks. The internal components of the pedestal are optimized for fiber-only deployments and offer configuration flexibility to suit the needs of the network. The unique "open canvas" design provides mounting options for a wide range of Clearfield® products, supporting PON and splice only applications and YOURx® and MPT access terminals. The unique interlocking cover is designed to be free breathing to minimize condensation and allow any internal moisture to dissipate.

#### **Description**

Clearfield's CraftSmart product line provides physical fiber protection for delivering a turn-key passive solution from the central office/headend to the customer premises. The CraftSmart FiberFirst Pedestal provides the most cost-effective non-metallic enclosure in the industry - meeting and exceeding the industry standards for strength, reliability and environmental concerns.

Designed and tested to withstand the harshest of environmental conditions, including UV, chemical and impact resistance, the FiberFirst Pedestal consists of a base and 2-part interlocking removable cover measuring 14"W x 12"D x 30"H. The rear wall of the cover includes built in multi-use backplane for mounting various products inside of the pedestal. Two industry standard telco security screws (216) are used to attach and lock the cover to the base. The base of the pedestal includes a built-in feature that allows the customer to add a ground stake to the pedestal.

The FiberFirst Pedestal is designed for maximum flexibility and can be deployed in multiple applications. One pedestal for all applications, eliminating the need for multiple pedestals and reducing the SKU's, allowing the customer to reduce costs.

#### **PON Option**

The CraftSmart FiberFirst Pedestal PON option provides a cost effective solution to service up to 144 homes. Each pedestal can be loaded with a single 12-fiber Clearfield feeder cassette and up to twelve cassettes for distribution ports. Splitter compartments give the flexibility to use up to five WaveSmart® Ruggedized or High Density style splitters. The PON pedestal option is ideal for applications where a larger PON cabinet is not desired or cost-effective.

The PON option is available fully loaded with conventional feeder and distribution cable stubs or with Clearfield's FastPass® approach utilizing in-cassette splicing. The FastPass approach significantly reduces installation times allowing for double the number of fiber homes passed in the same amount of time versus conventional cable stub options. The PON option pedestal is also available empty to be used where cassettes are ordered separately to scale to meet a network's evolving requirements.

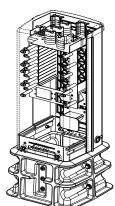
#### Splice Only Option

The CraftSmart FiberFirst Pedestal Splice Only option incorporates field—tested slack management for incoming and outgoing fiber cables and includes craft friendly universal splice trays. Each splice tray supports 12 individual fusion splices or a single mass fusion splice. Up to 12 splice trays can be installed per pedestal. The splice only pedestal option supports drop cable scenarios or mid-span and ring-cut functionality. A ground bar is included for securing armored style cables and toneable drops.

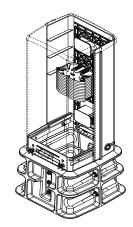
#### **Access Terminal Option**

The CraftSmart FiberFirst Pedestal Access Terminal Option is available to support the deployment of all Clearfield Access Terminals. A cable management and mounting bracket kit is available for both the YOURx and MPT (Multi-Purpose) style terminals. These kits are easily installed in the field into an empty FiberFirst Pedestal which is ordered separately.





PON Option



Splice Option



004834





#### **Features and Benefits**

#### Integrity

- · Constructed of durable, UV resistant material for maximum security and service life
- Two part system 2-part bolt together base and interlocking 2-part pedestal covers, all made with a high impact resistant Thermoplastic Material
- Designed to meet and exceed GR-13, the unique interlocking cover is designed to be free breathing to minimize condensation and allow any internal moisture to dissipate

#### Protection

- Two-part interlocking cover provides protection from the elements.
- Two industry standard telco security screws (216) attach cover to base
- Direct bury base provides a uniform and secure installation while reducing the chances of leaning or tilting

#### Access

- Removable front cover provides complete access to inside of pedestal
- Built in multi-use backplane integrated into rear cover provides multiple mounting options for a wide variety of equipment

#### Investment

- · High strength rigid construction ensures long term reliability in the harshest environments
- Multi-use pedestal can be used and deployed in multiple applications, eliminating the need for multiple specialty pedestals and reducing SKU's

#### **Technical Specifications**

CraftSmart FiberFirst Pedestal	
Cover Only Dimensions	14"W x 12"D x 30"H
Base Only Dimensions	16 ¾"W x 16 1⁄3"D x 11"H
Cover Material	High Impact Resistant Thermoplastic Material
Base Material	High Impact Resistant Thermoplastic Material
Mounting Options	Direct Buried
Security/Locking	2 – Cupped Telco Security (216) Screws Lock Cover to Base
Ground Bar	Included With Each Pedestal
Ground Stake	Bracket molded into base. Customer supplied ground stake.
Application	PON Option (up to 144 dist. ports), Splice Only Option, YOURx-Terminal, MPT Terminal

Splice Only Option	
Density	Up to 144 splices
Number of Splice Trays	Up to 12 single fusion
Splice Capacity	12 splices in each splice tray
Splice Tray Dimensions	10 mm H x 163 mm W x 126 mm D
Weight	30 lbs.



PON Option	
Port Density	Up to 144
Feeder/Express Ports	12
Cassettes Types Supported	Clearview Blue - Right Exit
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC
Cable Types	Indoor/Outdoor, Outdoor (Non-Rated), Outdoor Armored (Non-Rated)
Splice Capacity	12 splices in each Clearview Cassette for in-cassette splice option
Splitter Slots	5 - Accepts either Clearfield's WaveSmart Ruggedized or HD Splitter
Weight	50 lbs.

# **Configured Part Number**

J A	Z Z Z XX	XXM or XXXXF
1 Select Pedestal Type  A = Splice Only B = Patch Only C = Patch and Splice (In-cassette Splicing)  2 Select Feeder A = 12 Ports (1 Cassette) Z = 0 Feeders (Also Default for Splice Only)	3 Select # of Distribution Splices or Distribution Port Count  012 = 12	6 Select Cable Construction  B = OSP Riser E = OSP Non-Rated F = 900µm TB (FieldSmart Patch and Splice) M = Armored OSP Non-Rated Z = N/A  7 Select Cassette Type B = Clearview Blue Z = No Cassettes - Splice Only
	A = SC/UPC C = SC/APC T = N/A  Select Mode / Type  1 = Singlemode - non-ribbon 2 = Singlemode - ribbon T = None	XXXXM or XXXXF  XXXXM = Length of Pigtail in Meters XXXXF = Length of Pigtail in Feet

<sup>\*</sup> Not all configurations are visible. Ask your Clearfield Sales Representative for additional ordering options.

# **Pre-Configured Part Numbers**

Part Number	Description
CFP-121230-YOURX	Kit, FiberFirst Pedestal, 12 x 12 x 30" Telco Green with YOURx Bracket and Hardware
CFP-121230-MPT	Kit, FiberFirst Pedestal, 12 x 12 x 30" Telco Green with MPT Bracket and Hardware



# **Pre-Configured Part Numbers - Splitter/Splice Options**

Part Number	Description
KC Series	WaveSmart Ruggedized Splitters
KY Series	WaveSmart Industry Standard Splitters
KE Series	WaveSmart High Density Splitters
004834	12 Core Optical Fiber Splice Tray
023056	Kit, Splice Tray Kit for FiberFirst Pedestal. Includes 1 - splice tray bracket, 1- sacrificial splice tray, 2 - D-spool radius rods for cable management, mounting hardware



Front View



Rear View



Rear Cover with Built-In Backplane

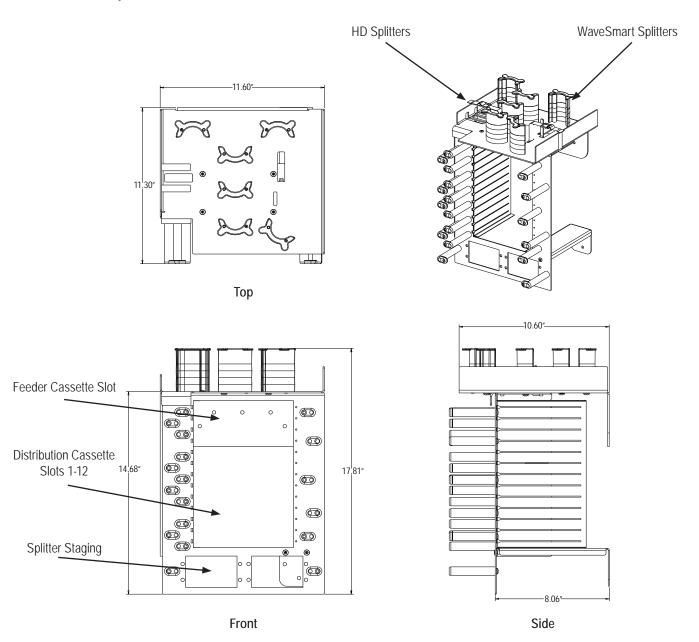


Inside Front Cover





# **PON Insert Option**



# FiberFirst Metallic Pedestal



#### **Application**

The CraftSmart FiberFirst Metallic Pedestal provides splice or interconnect connectivity at the access point for the last mile drop.

#### **Description**

The CraftSmart FiberFirst Metallic Pedestal is an empty pedestal that allows customers to deploy in a wide variety of applications, including field-tested slack management and fiber splice trays to provide a craft-friendly splice only access solution. The CraftSmart FiberFirst Metallic Pedestal can be configured to support the specific drop cable, multi-fiber and ring cut requirements. The solid surface back plane makes it possible for customers to integrate multiple products inside the pedestals.

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#### **Features and Benefits**

#### Integrity

- Designed to be a cost-effective fiber delivery point.
- Preconfigured drill points make it easy add fiber management, brackets and accessories.
- Made from 18 Gauge Galvanneal with powder coat paint.

#### Protection

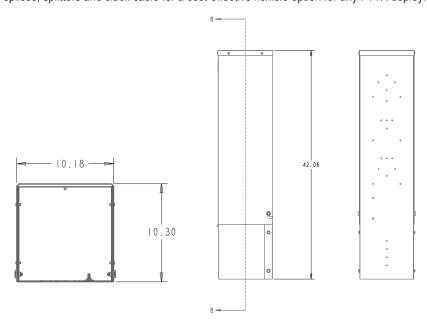
- · Open architecture
- · Strength, rigidity and security all in a high-performance powder coated galvanneal material.
- · Designed to Telcordia GR-13 and RUS PE-91 specifications.
- · Single point self-locking cover provides secure pedestal locking and eased craft access.

#### Access

- · Easy lift-off one piece front cover allows complete access to interior of pedestal.
- · Can wrench fasteners for securing/locking.
- Drill points included in backplane for Accessory mounting.

#### Investment

- · Cost effective delivery point solution.
- Up to 12 splice trays with Clearfield regular drop cable assembly or industry standard HFOC
- · Integrates distribution splices, splitters and slack cable for a cost-effective flexible option for any FTTX deployment.



# FiberFirst Metallic Pedestal



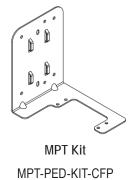
# **Technical Specifications**

CraftSmart FiberFirst Metallic Pedestal	
Dimensions	42.1" H x 10.3" W x 10.2" D (1098.55 mm x 266.70 mm x 266.70 mm)
Cover Height	31.25" (793.75 mm)
Base Height (Buried)	12" (304.80 mm)
Material	Powder coated Galvanized steel
Density	Up to 144 splices (288 with additional slice tray)
Number of Splice Trays	Up to 12 (24 with additional splice tray bracket)
Splice Capacity	12 splices in each splice tray
Splice Tray Dimensions	10 mm H x 163 mm W x 126 mm D
Weight/Shipping	28 lbs. per ped - 16 per pallet

# **Pedestal and Accessories Ordered Separately**

Part Number	Description	Image
023232	Pedestal, FiberFirst Empty Metallic, Includes Drill Points and Ground Bar	
010005	Pedestal Splice Kit (Shown with Multiple Splice Trays) Includes Splice Tray Bracket, Sacrificial Splice Tray, 2 Radius Rods and Mounting Hardware.	
004834	Tray, Splice, 12 Core Fiber Closure, Includes Splice Tray, 12 Splice Slots in Each Tray, Holds up to 12 Fibers. 10mm H x 163mm W x 126mm D	

#### **Access Terminal Brackets**







SeeChange/YOURx Kit 018123

# FieldSmart® Fiber Delivery Point (FDP)

# 96 Port PON in Pedestal Insert Kit or Direct Bury



#### **Application**

The FieldSmart Fiber Delivery Point (FDP) 96 Port PON in Pedestal Insert Kit or Direct Bury provides splice or interconnect functionality in industry standard pedestals for drops to the home in the last mile of the access network. Additionally, it provides up to 96-homes served in PON environments.

#### Description

The FieldSmart FDP 96 Port PON Pedestal Insert Kit or Direct Bury provides a cost-effective solution to service up to 96-homes within a Clearview® optimized design for PON applications. Accepting up to nine Clearview Cassettes and three WaveSmart® Ruggedized Splitters or WDMs, the PON Insert Kit scales to meet the network requirements when placing a larger PON cabinet is not desired or cost-effective. Providing the ultimate future-proof flexibility, the FDP Pedestal Insert can be deployed as a drop only pedestal, then easily converted to a distributed PON solution when required.

The FieldSmart Fiber Delivery Point (FDP) Pedestal Insert incorporates field-tested designs to provide a solution that is easily installed and modified. Whether your environment calls for splice only drops or demands the sophistication of a Clearview Cassette solution, a FieldSmart (FDP) Pedestal Insert can be configured to support any access point configuration. Compatible with a variety of RUS listed pedestals, the insert provides splicing and/or interconnect connectivity with slack-storage for drop cable scenarios or mid-span and ring-cut functionality for up to a 288 OSP fiber sheath.



#### Integrity

- · RUS listed
- · Terminations are designed, tested and certified to GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Inserted into RUS pedestals
- · Pedestal designed to comply with GR-13

#### Protection

- · RUS listed industry standard pedestals
- Clearview Cassette for physical fiber protection, bend-radius protection, access
- · Buffer tube slack storage fully bend-radius protected
- · Both metallic and non-metallic pedestals
- · Can wrench accessible designs

#### Access

- · Lift off dome covers are non-metallic
- Clearview Cassette for guick access to terminations
- · Cupboard style front and rear access-Metallic
- Fits into select Channell, Pencell, Emerson metallic BD7 and ProFORM 12

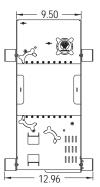
#### Investment

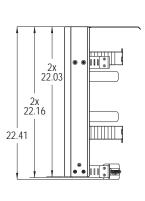
- · Low cost entry with RUS listed pedestals
- · Scalable with Clearview Multiplied design for cost alignment to subscriber revenue
- Future proof with drop only to PON distributed migration
- Patch only or patch and splice configurations supported
- · Flexible integration into a variety of RUS listed pedestals with simple bracket kits

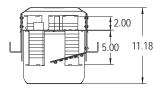
#### **Accessories**

· Ruggedized Splitter









# FieldSmart<sup>®</sup> Fiber Delivery Point (FDP) 96 Port PON in Pedestal Insert Kit or Direct Bury -



#### **Technical Specifications**

FieldSmart Fiber Delivery Point 96 Port PON in Pedestal Insert Kit or Direct Bury		
Dimensions (for insert only)	22.41" H x 12.96" W x 11.18" D (569.21 mm x 329.18 mm x 283.97 mm)	
Port Density	96	
Feeder/Express Ports	12	
Cassette Types Support	Clearview® Blue - Right Exit	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC	
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)	
Splice Capacity	12 splices in each Clearview Cassette	
Splitter Slots	3	
Material	14 gauge cold rolled steel with almond powder coating	

#### **Configured Part Numbers**

J \_\_\_ - \_ \_ - \_ \_ \_ - \_ \_ - Z Z Z - B XXXM or XXXF

#### 1 Select Pedestal Type

#### Insert With Pedestals

- 3 = PON, Patch and splice insert with non-metallic direct bury Pencell Pedestal
- 4 = PON, Patch only insert with non-metallic direct bury Pencell Pedestal
- 7 = PON, Patch and Splice insert with non-metallic direct bury Proform 12 Pedestal
- K = PON, Patch only insert with non-metallic direct bury Proform 12 Pedestal
- A = PON, Patch and Splice insert with metallic BD7 Pedestal
- M = PON, Patch only insert with metallic BD7

#### Inserts Only

- V = PON, Patch and Splice insert only for Pencell Pedestal – no pedestal included
- Y = PON, Patch Only insert only for Pencell Pedestal – no pedestal included
- B = PON, Patch and Splice insert only for Channell Pedestal – no pedestal included
- N = PON, Patch Only insert only for Channell Pedestal – no pedestal included
- C = PON, Patch and Splice 96 port insert only for Proform 12 Pedestal – no pedestal included
- P = PON, Patch Only 96 port insert only for Proform 12 Pedestal – no pedestal included
- D = PON, Patch and Splice 96 port insert only for BD7 Pedestal no pedestal included
- Q = PON, Patch Only 96 port insert only for BD7 Pedestal – no pedestal Included

#### 2 Select Feeder Port Count

- A = No feeders
- B = 12 ports (1 cassette)
- Z = N/A

#### 3 | Select Distribution Port Count

X X X = port count in increments of 12 Z Z Z = N/A

#### 4 Select Connector Style

 $A = SC/UPC & F = LC/UPC \\ C = SC/APC & H = LC/APC \\$ 

Z = N/A

#### 5 Select Mode / Type

- 1 = Singlemode non-ribbon
- 2 = Singlemode ribbon

#### 6 Select Cable Construction

- B = OSP Riser
- E = OSP Non-Rated
- F = Patch and splice
- Z = N/A

#### XXXM or XXXF

XXXM = Length of pigtails in meters XXXF = Length of pigtails in feet

\*200 feet maximum

# FieldSmart® Fiber Delivery Point (FDP)

# 96 Port PON in Pedestal Insert Kit/Vault Mount -



#### **Application**

The FieldSmart Fiber Delivery Point (FDP) 96 Port PON Pedestal Insert Kit/Vault Mount provides splice or interconnect functionality, in industry standard Channell or Pencell pedestals and vaults, for drops to the home in the last mile of the access network. Additionally, it provides for a maximum capacity of 96-homes served, and is configured for PON environments.

#### Description

The FieldSmart FDP 96 Port PON Pedestal Insert Kit/Vault Mount provides for a drop cable scenarios in the access network with splicing and/or interconnect connectivity with a Clearview® optimized design. Accepting up to nine Clearview Cassettes and three WaveSmart® Ruggedized Splitters or WDMs used throughout the Clearfield® FieldSmart product line, the insert will scale up to 96-homes served for PON applications.

#### **Features and Benefits**

#### Integrity

- · RUS listed
- Terminations are designed, tested and certified to GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Inserted into RUS pedestals
- · Pedestal designed to comply with GR-13

#### Protection

- Clearview Cassette for physical fiber protection, bend-radius protection, access
- · Buffer tube slack storage fully bend-radius protected
- Flood-proof non-metallic pedestals
- · Can wrench accessible designs

#### Access

- · Lift off flood-proof dome covers are non-metallic
- · Clearview Cassette for quick access to terminations
- · Cupboard style front and rear access-Metallic
- · Split lid Pencell vault

#### Investment

- Low cost entry with RUS listed pedestals
- · Scalable with Clearview Multiplied design for cost alignment to subscriber revenue
- Future proof with drop only to PON distributed migration
- · Patch only or patch and splice configurations supported
- Flexible integration into a variety of RUS listed pedestals with simple bracket kits

#### **Accessories**

· Ruggedized Splitter

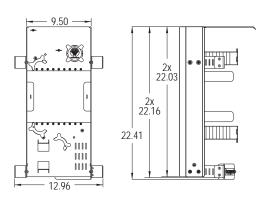
# Vault and Pedestal

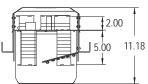
V6A-ZZZ-03-P - 24 x 36 x 24" (609.60 mm x 914.40 mm x 609.60 mm) with 12" (304.80 mm) cut out for Pencell 12" (304.80 mm) pedestal (includes pedestal)

VXZ-ZZZ-02-P - Vault Only

FPP-121230-LG - Pedestal for vault









# FieldSmart<sup>®</sup> Fiber Delivery Point (FDP) 96 Port PON in Pedestal Insert Kit/Vault Mount —





#### **Technical Specifications**

FieldSmart Fiber Delivery Point 96 Port PON in Pedestal Insert Kit/Vault Mount	
Dimensions (for insert only)	22.41" H x 12.96" W x 11.18" D (569.21 mm x 329.18 mm x 283.97 mm)
Port Density	96
Feeder/Express Ports	12
Cassette Types Support	Clearview® Blue - Right Exit
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)
Splice Capacity	12 splices in each Clearview Cassette
Splitter Slots	3
Material	14 gauge cold rolled steel with almond powder coating

#### **Configured Part Numbers**



- 1 96 Port Insert
- 8 = PON, Patch and splice insert with non-metallic direct bury Pencell Pedestal, vault included
- 9 = PON, Patch only insert with non-metallic direct bury Pencell Pedestal, vault included
- 2 | Select Feeder Port Count
- A = No feeders
- B = 12 ports (1 cassette)
- Z = N/A

3 | Select Distribution Port Count

- Z Z Z - B XXXM or XXXF

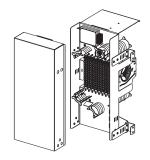
- X X X = port count in increments of 12ZZZ = N/A
- 4 | Select Connector Style
- A = SC/UPC C = SC/APC H = LC/APC
- Z = N/A

- 5 | Select Mode / Type
- 1 = Singlemode non-ribbon
- 2 = Singlemode ribbon
- 6 | Select Cable Construction
- E = OSP Non-Rated
- F = Patch and splice
- M = Armored OSP Non-Rated
- Z = N/A

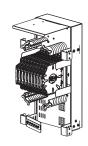
#### XXXM or XXXF

XXXM = Length of pigtails in meters XXXF = Length of pigtails in feet

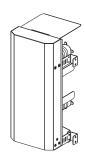
\*200 feet maximum



Cover for Emerson and Proform Pedestals



Back of PON PED Insert



Cover for Pencell Pedestals

# FieldSmart® Fiber Delivery Point (FDP)

# 144 Port PON in Pedestal Insert Kit or Direct Bury



#### **Application**

The FieldSmart Fiber Delivery Point (FDP) 144 Port in PON Pedestal Insert Kit or Direct Bury provides splice or interconnect functionality in industry standard pedestals for drops to the home in the last mile of the access network. Additionally, it provides up to 144 homes served in PON environments.

#### Description

The FieldSmart FDP 144 Port PON Pedestal Insert Kit or Direct Bury provides a cost-effective solution to service up to 144 homes within a Clearview® optimized design for PON applications. Accepting up to 13 Clearview Cassettes and five WaveSmart® High Density Splitters or WDMs, the PON Insert Kit scales to meet the network requirements when placing a larger PON cabinet is not desired or cost-effective. Providing the ultimate future-proof flexibility, the FDP Pedestal Insert can be deployed as a drop only pedestal, then easily converted to a distributed PON solution when required.

The FieldSmart Fiber Delivery Point (FDP) Pedestal Insert incorporates field-tested designs to provide a solution that is easily installed and modified. Whether your environment calls for splice only drops or demands the sophistication of a Clearview Cassette solution, a FieldSmart (FDP) Pedestal Insert can be configured to support any access point configuration. Compatible with a variety of RUS listed pedestals, the insert provides splicing and/or interconnect connectivity with slack-storage for drop cable scenarios or mid-span and ring-cut functionality for up to a 288 OSP fiber sheath.



#### Integrity

- · RUS listed
- Terminations are designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Inserted into RUS pedestals
- Fiber cable designed, tested and certified to Telcordia GR-20

#### Protection

- · RUS listed industry standard pedestals
- Clearview Cassette for physical fiber protection, bend-radius protection, access
- · Buffer tube slack storage fully bend-radius protected
- · Both metallic and non-metallic pedestals
- · Can wrench accessible designs

#### Access

- · Lift off dome covers are non-metallic
- · Clearview Cassette for guick access to terminations
- · Cupboard style front and rear access-Metallic
- · Fits into select Channell or Pencell pedestals

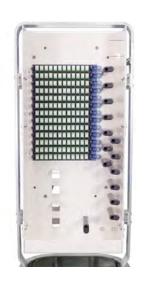
#### Investment

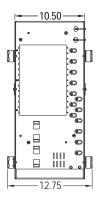
- · Low cost entry with RUS listed pedestals
- Scalable with Clearview Multiplied design for cost alignment to subscriber revenue
- Future proof with drop only to PON distributed migration
- Patch only or patch and splice configurations supported
- · Flexible integration into a variety of RUS listed pedestals with simple bracket kits

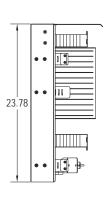
#### **Accessories**

· WaveSmart High Density Splitter











# FieldSmart® Fiber Delivery Point (FDP) 144 Port PON in Pedestal Insert Kit or Direct Bury



#### **Technical Specifications**

FieldSmart Fiber Deliver Point 144 Port PON in Pedestal Insert Kit or Direct Bury		
Dimensions (for insert only)	23.78" H x 12.75" W x 10.86 D (604.01 mm x 328.85 mm x 275.84 mm)	
Port Density	144	
Feeder/Express Ports	12	
Cassette Types Supported	Clearview® Blue - Left Exit	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC	
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)	
Splice Capacity	12 splices in each Clearview Cassette	
Storage Capacity	Up to 5 - with High Density Splitter (KE series)	
Material	14 gauge cold rolled steel with almond powder coating	

#### **Configured Part Numbers**

J \_\_\_\_ - \_\_\_ - \_\_\_ - \_\_\_ - A Z Z - B XXXXM or XXXXF

#### 1 Select Pedestal Type

#### Insert with Pedestal

- 3 = PON, Patch and splice insert with non-metallic direct bury Pencell Pedestal
- 4 = PON, Patch only insert with non-metallic direct bury Pencell Pedestal

#### Inserts Only

- V = PON, Patch and splice insert only for Pencell Pedestal – no pedestal included
- Y = PON, Patch only insert only for Pencell Pedestal no pedestal included
- B = PON, Patch and splice insert only for Channell Pedestal – no pedestal included
- N = PON, Patch only insert only for Channell Pedestal – no pedestal included

#### 2 Select Feeder Port Count

- A = No feeders
- B = 12 ports (1 cassette)
- Z = N/A

#### 3 Select Distribution Port Count

X X X = port count in increments of 12

#### 4 Select Connector Style

- Z = N/A

#### 5 | Select Mode / Type

- 1 = Singlemode non-ribbon
- 2 = Singlemode ribbon

#### 6 | Select Cable Construction

- B = OSP Riser
- E = OSP Non-Rated
- F = Patch and splice
- M = Armored OSP Non-Rated
- Z = N/A

#### XXXXM or XXXXF

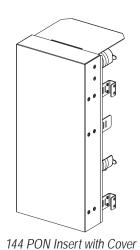
XXXXM = Length of Pigtail in Meter XXXXF = Length of Pigtail in Feet



144 PON Insert - Front



144 PON Insert - Back



www.SeeClearfield.com 1-800-422-2537

# FieldSmart® Fiber Delivery Point (FDP)

# 144 Port PON in Pedestal Insert Kit/Vault Mount-



#### **Application**

The FieldSmart Fiber Delivery Point (FDP) 144 Port PON Pedestal Insert Kit/Vault Mount provides splice or interconnect functionality, in industry standard Channell or Pencell pedestals and vaults, for drops to the home in the last mile of the access network. Additionally, it provides for a maximum capacity of 144 homes served, and is configured for PON environments.

#### Description

The FieldSmart FDP 144 Port PON Pedestal Insert Kit/Vault Mount provides for a drop cable scenarios in the access network with splicing and/or interconnect connectivity with a Clearview® optimized design. Accepting up to 13 Clearview Cassettes and five WaveSmart® High Density Splitters or WDMs, the insert will scale up to 144 homes served for PON applications.

#### **Features and Benefits**

#### Integrity

- · RUS listed
- Terminations are designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Inserted into RUS pedestals
- Optical cable designed, tested and certified to Telcordia GR-20

#### Protection

- · Clearview Cassette for physical fiber protection, bend-radius protection, access
- · Buffer tube slack storage fully bend-radius protected
- · Flood-proof non-metallic pedestals
- Can wrench accessible designs

#### Access

- · Lift off flood-proof dome covers are non-metallic
- · Clearview Cassette for quick access to terminations
- · Cupboard style front and rear access-Metallic
- Split lid Pencell vault

#### Investment

- Low cost entry with RUS listed pedestals
- · Scalable with Clearview Multiplied design for cost alignment to subscriber revenue
- · Future proof with drop only to PON distributed migration
- · Patch only or patch and splice configurations supported
- · Flexible integration into a variety of RUS listed pedestals with simple bracket kits

#### **Accessories**

· WaveSmart High Density Splitter



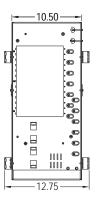
#### Vault and Pedestal

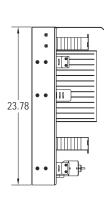
 $V6A-ZZZ-03-P-24 \times 36 \times 24" \ (609.60 \ mm \times 914.40 \\ mm \times 609.60 \ mm) \ with \ 12" \ (304.80 \ mm) \ cut \ out \ for \\ Pencell \ 12" \ (304.80 \ mm) \ pedestal \ (includes \ pedestal)$ 

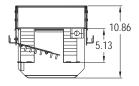
VXZ-ZZZ-02-P - Vault Only

FPP-121230-LG - Pedestal for vault











# FieldSmart<sup>®</sup> Fiber Delivery Point (FDP) 144 Port PON in Pedestal Insert Kit/Vault Mount—





#### **Technical Specifications**

FieldSmart Fiber Delivery Point 144 Port PON in Pedestal Insert Kit/Vault Mount				
Dimensions (for insert only)	23.78" H x 12.75" W x 10.86" D (604.01 mm x 328.85 mm x 275.84 mm) with brackets			
Port Density	144			
Feeder/Express Ports	12			
Cassette Types Support	Clearview® Blue - Left Exit			
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC			
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)			
Splice Capacity	12 splices in each Clearview Cassette			
Splitter Capacity	5 with High Density Splitter (KE series)			
Material	14 gauge cold rolled steel with almond powder coating			

#### **Configured Part Numbers**



- 1 144 Port Insert
- 8 = PON, Patch and splice insert with non-metallic direct bury Pencell Pedestal, vault included
- 9 = PON, Patch only insert with non-metallic direct bury Pencell Pedestal, vault included
- 2 Select Feeder Port Count
- A = No feeders
- B = 12 ports (1 cassette)
- Z = N/A

- 3 | Select Distribution Port Count
- X X X = port count in increments of 12 ZZZ = N/A
- 4 | Select Connector Style
- A = SC/UPCC = SC/APC
- Z = N/A
- F = LC/UPC H = LC/APC
- 5 | Select Mode / Type
- 1 = Singlemode non-ribbon
- 2 = Singlemode ribbon
- 6 Select Cable Construction
- B = OSP Riser
- E = OSP Non-Rated
- F = Patch and splice
- M = Armored OSP Non-Rated

#### XXXXM or XXXXF

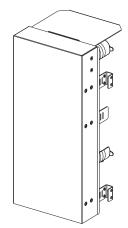
XXXXM = Length of Pigtail in Meter XXXXF = Length of Pigtail in Feet



144 PON Insert - Front



144 PON Insert - Back



144 PON Insert with Cover

# FieldSmart® Fiber Delivery Point (FDP)

# Splice Only Pedestal -



#### **Application**

The FieldSmart FDP Splice Only Pedestal provides splice or interconnect connectivity at the access point for the last mile drop.

#### Description

The FieldSmart FDP Splice Only Pedestal incorporates field-tested slack management and fiber splice trays to provide a craft-friendly splice only access solution. The splice only pedestal can be configured to support the specific drop cable, multi-fiber and ring cut requirements. The Clearfield® designed back plane makes it possible for the bulkheads to integrate into industry standard pedestals.

#### **Features and Benefits**

#### Integrity

- · RUS listed
- · Designed to comply to Telcordia GR-13

#### Protection

- · Open architecture
- Strength, rigidity and security all in a high-performance thermo-plastic or metallic material designed to Telcordia GR-13 and RUS PE-91 specifications
- Single point self-locking cover provides secure pedestal locking and eased craft access
- Available in metallic and non-metallic pedestals

#### Access

- · Removable front covers on metallic versions
- · Can wrench fasteners
- · Easy lift-off dome on thermo-plastic models allows for 360° access permits complete access to all wire work and equipment

#### Investment

- · Low cost entry with RUS listed pedestal
- · Utilizes cost effective
- Up to 16 splice trays with Clearfield regular drop cable assembly or industry standard HFOC
- Integrates distribution splices, splitters and slack cable for a cost-effective flexible option for any FTTP deployment

#### Accessories

Splice Tray - Each splice-slot holds up to 2 fibers. 12 splice-slots in each tray hold up to 24 fibers.
 10 mm H x 163 mm W x 126 mm D





# FieldSmart® Fiber Delivery Point (FDP) Splice Only Pedestal—





#### **Technical Specifications**

FieldSmart Splice Only Ped	Metallic BD5	Non-metallic ProFORM 12	Non-metallic Pencell 10x10		
Dimensions	43.25" H x 10.5" W x 10.5" D (1098.55 mm x 266.70 mm x 266.70 mm)	8.55 mm x 266.70 mm x (1143.00 mm x 266.70 mm x			
Cover Height	31.25" (793.75 mm)	30" (762.00 mm)	20" (508.00 mm)		
Base Height (Buried)	12" (304.80 mm)	15" (381.00 mm)	11.4" (289.56 mm)		
Material	Galvanized steel  High performance thermoplastic		HDPE/LDPE		
Density	Up to 144 splices				
Number of Splice Trays	Up to 16 Up to 6				
Splice Capacity	24 splices in each splice tray				
Splice Tray Dimensions	10 mm H x 163 mm W x 126 mm D				

#### **Configured Part Numbers**









Pencell

# Fiber Protection Vaults (FPV)



#### **Application**

CraftSmart Fiber Protection Vaults (FPV) can be used to securely mount a FieldSmart® Fiber Scalability Center (FSC) 288, 432, 576 or 1,152 port PON cabinet, a 432 or 864 port cross-connect cabinet or FieldSmart Fiber Delivery Point (FDP) pedestal for above grade deployment with below grade slack cable storage. FPVs are equally suited for drop cable, splicing, interconnect and mid-span scenarios, which allows for maximum flexibility and customization in the customers' network.

#### Description

The Clearfield® CraftSmart product line provides physical fiber protection for products. It completes and delivers a turn-key passive solution from the central office/headend to the customer premise. CraftSmart Fiber Protection Vaults (FPV) provide the most cost-effective thermoplastic enclosures in the industry - meeting and exceeding the industry standards for strength, reliability and environmental concerns.



Formed from a High Density Polyethylene (HDPE) Thermoplastic, these vaults provide a solid base and light-weight material alternative to traditional polymer concrete enclosures.

Multiple industry standard sizes can be ordered with solid covers or pre-cut covers to accommodate various FieldSmart cabinet solutions.

#### **Features and Benefits**

#### Integrity

- · RUS accepted
- · Designed to comply to Telcordia GR-902
- · Compliant to ANSI/SCTE 77 2010 as specified by N.E.C. ANSI C57 Enclosure Integrity
- · Compliant to Western Underground Guide 3.6
- · Stainless steel hardware

#### Protection

- · Hex head security bolts
- All boxes incorporate a unique "T" style overlapping cover design to reduce soil mitigation into box

#### Access

- Multiple cover options, including single piece solid thermoplastic, split thermoplastic, solid or split polymer concrete, provide ease of access and the ability to be used in multiple applications for the products
- Mounting bolts and templates are available for HDPE split lids for FieldSmart cabinet mounting
- · Custom split lids with cut outs for FieldSmart cabinets

#### Investment

- High strength rigid construction ensures long term reliability in the harshest environments
- · Lighter and easier to handle than concrete, which increases the overall safety factor

#### **Cover Options**



Polymer Concrete Cover Application: Sidewalk Static Load: 15,000 lbs



Split Thermoplastic Cover Application: Greenbelt Static Load: 5,000 lbs

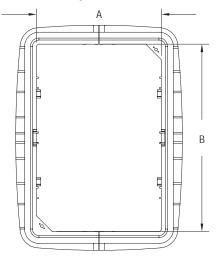


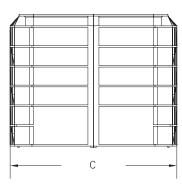
StandardThermoplastic Cover Application: Greenbelt Static Load: 5,000 lbs

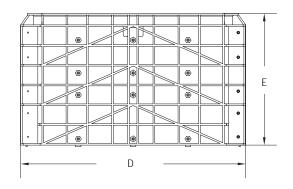
# Fiber Protection Vaults (FPV)



# **Technical Specifications**







Straight Wall	A Inside Dim. Width	B Inside Dim. Width	C Outside Dim. Width	D Outside Dim. Width	E Height	Approx. Weight with HDPE Cover	Recommended Clearfield® Product
17 x 30" (431.80 mm x 762.00 mm)	16½ <b>°</b> (407.99 mm)	29½e" (738.19 mm)	22½° (560.39 mm)	35 1/16" (890.59 mm)	24 ½" (622.30 mm)	40 lbs (18.14 kg)	YOURx-Terminal
24 x 36" (609.60 mm x 914.40 mm)	22¾" (577.85 mm)	341/s" (866.78 mm)	30%" (771.53 mm)	41" (1041.40 mm)	24" (609.60 mm)	83 lbs (37.65 kg)	YOURx-Terminal, FieldSmart® 144, 288 and 432 PON or 432 Cross-Connect Cabinet
30 x 48" (762.00 mm x 1219.20 mm)	28¾" (730.25 mm)	461/8" (1171.58 mm)	371/8" (942.98 mm)	53½" (1358.90 mm)	245%" (625.48 mm)	195 lbs (88.45 kg)	YOURx-Terminal, FieldSmart 576 or 1,152 PON or 864 or 1,727 Cross-Connect Cabinet

Flared Wall	A Inside Dim. Width	B Inside Dim. Width	C Outside Dim. Width	D Outside Dim. Width	E Height	Approx. Weight with HDPE Cover	Recommended Clearfield Product
36 x 48" (914.40 mm x 1219.20 mm)	361/s" (917.58 mm)	401/8" (1019.18 mm)	40%" - 46¾" (1038.23 mm - 1187.45 mm)		24" (609.60 mm)	155 lbs (70.31 kg)	YOURx-Terminal, FieldSmart 576 or 1,152 PON or 864 or 1,727 Cross-Connect Cabinet
36 x 60" (914.40 mm x 1524.00 mm)	36¼" (917.58 mm)	601/%" (1527.18 mm)	40%" - 46¾" (1038.23 mm - 1187.45 mm)	64½" - 70¾" (1647.83 mm - 1797.05 mm)	24" (609.60 mm) 36" (914.40 mm)	170 lbs (77.11 kg) 235 lbs (106.59 kg)	YOURx-Terminal, FieldSmart 576 or 1,152 PON or 864 or 1,727 Cross-Connect Cabinet

# Fiber Protection Vaults (FPV) -



# **Pre-Configured Part Numbers**

FieldSmart® Cabinets

	Application/Where Used				
Part Number	Description	Slack Storage	FDH 144, FDH/FSC 288 PON or 432 CC	FDH/FSC 432 PON	FDH/FSC 576 & 1152 PON or 864 & 1728 CC
	Vault Size – 17" x 30" (431.80 mm x 762	2.00 mm)			
V5A-AZP	Vault, below grade Pencell, solid HDPE lid, hex bolts, green, straight wall 17" W x 30" L x 24" D (431.80 mm x 762.00 mm x 609.60 mm)	<b>√</b>			
	Vault Size – 24" x 36" (609.60 mm x 914	l.40 mm)			
V6A-AZP	Vault, below grade Pencell, solid HDPE lid, hex bolts, green, straight wall 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm)	✓			
V6A-CZP	Vault, below grade Pencell, split HDPE Lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm)		Bolt Kit Included	Bolt Kit Included	
V6B-CZP	Vault, below grade Pencell, split HDPE Lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit 24" W x 36" L x 36" D (609.60 mm x 914.40 mm x 914.40 mm)		Bolt Kit Included	Bolt Kit	
V6B-HZP	Vault, below grade Pencell, split polymer concrete lid, hex bolts, gray, w/cut out for FieldSmart Cabinets, straight wall 24" W x 36" L x 36" D (609.60 mm x 914.40 mm x 914.40 mm)		020538 Bolt Kit Ordered Separately	020538 Bolt Kit Ordered Separately	
	Vault Size – 30" x 48" (762.00 mm x 121	9.20 mm)			
V7A-CZP	Vault, below grade Pencell, split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit 30" W x 48" L x 24" D (762.00 mm x 1219.20 mm x 609.60 mm)		Bolt Kit Included	Bolt Kit	Bolt Kit Included
V7B-CZP	Vault, below grade Pencell, split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, straight wall, with bolt kit 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm)		Bolt Kit Included	Bolt Kit	Bolt Kit
V7B-HZP	Vault, below grade Pencell, split polymer concrete lid, hex bolts, gray, with knock out for FieldSmart cabinets, straight wall 30" W x 48" L x 36" D (762.00 mm x 1219.20 mm x 914.40 mm)		020538 Bolt Kit Ordered Separately	020538 Bolt Kit Ordered Separately	020538 Bolt Kit Ordered Separately
	Vault Size: 36" x 48" (914.40 mm x 1219	).20 mm)			
V3A- CZP-F	Vault, below grade Pencell, split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, flared wall, with bolt kit 36" W x 48" L x 24" D (914.40 mm x 1219.20 mm x 609.60 mm)		Bolt Kit Included	Bolt Kit	Bolt Kit Included
V3B- CFP-F	Vault, below grade Pencell, split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, flared wall, with bolt kit 36" W x 48" L x 36" D (914.40 mm x 1219.20 mm x 914.40 mm)		Bolt Kit Included	Bolt Kit	Bolt Kit
	Vault Size: 36" x 60" (914.40 mm x 1524	l.00 mm)			
V8B-CZP-F	Vault, below grade Pencell, split HDPE lid, hex bolts, green, with cut out for FieldSmart cabinets, flared wall, with bolt kit 36" W x 60" L x 36" D (914.40 mm x 1524.00 mm x 914.40 mm)		Bolt Kit Included	Bolt Kit Included	Bolt Kit Included
	Vault Size: 48" x 48" (1219.20 mm x 121	9.20 mm)			
V9B-HZP- PC	Vault, Pencell, Complete Split Polymer Concrete Lid, Cut Out for 864 Cabinet, Polymer Concrete Straight Wall 48 x 48 x 36" (1219.20 mm x 1219.20 mm, 914.40 mm H)		864 PC 020538 Bolt Kit O		у

# Fiber Protection Vaults (FPV) -



# **Pre-Configured Part Numbers**

#### FieldSmart® PON in Pedestal

Part		Application/Where Used		
Number	Description	96 & 144 PON in Pedestal	YOURx-Terminal	
	Pedestal on Lid - Vault Size: 24" x 36" (609.60 mm x 914.	40 mm)		
VXZ-ZZZ-02-P	Below grade vault only, split lid, I-bolt, green, telecommunications, 12 x 12" (304.80 mm x 304.80 mm) hole for pedestal mount, straight wall 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm)	<b>√</b>	✓	
V6A-ZZZ-03-P	Below grade vault and pedestal cover with bracket split lid, I-bolt, green, telecom, 12 x 12" (304.80 mm x 304.80 mm) pedestal cover with bracket, straight wall 24" W x 36" L x 24" D (609.60 mm x 914.40 mm x 609.60 mm)	✓	<b>√</b>	

#### FieldSmart Electronics Cabinets (Active)

Part Number	Description	Application/Where Used Electronic Cabinet
V100-304836	PC Vault and Lid, ODC 100 - FAC 400, 30 x 48 x 36"	✓
V200D-367236	PC Vault and Lid, FiberFlex 2000, 36 x 72 x 36"	✓
V200-487236	PC Vault and Lid, ODC 200 - FAC 900, 48 x 72 x 36"	✓
V100D-367236	PC Vault and Lid, ODC 1000 - FAC 3200, 36 x 72 x 36"	<b>√</b>

#### **Bolt Kits**

Part Number	Description	Application/Where Used
009092	Bolt Kit for Vaults With HDPE Lids	All FSC/FDH Cabinets Mounted on HDPE Lid
020538	Bolt Kit for Vaults With Polymer Concrete Lids	All FSC/FDH Cabinets Mounted on PC Lid
FPP-BOLT KIT	Pedestal Bolts for mounting base to HDPE lid	All Pedestals Mounted on HDPE Lid

# Fiber Protection Boxes (FPB)



#### **Application**

The CraftSmart Fiber Protection Boxes (FPB) provide a place for below grade cable slack storage and access in greenbelt and light pedestrian traffic applications.

#### Description

The CraftSmart Fiber Protection Boxes are part of a full line of above and below grade field enclosures. They provide full optimization of a fiber deployment when used alongside a Clearfield® FieldSmart® platform of inside plant panels, outside plant cabinets and wall boxes.

Boxes are designed to meet a broad range of fiber, coax and copper needs of the broadband, telecommunications and utilities industries. The FPBs provide a place for below grade cable slack storage and are a good fit for access in greenbelt areas, places that are undeveloped, wild or agricultural areas and similar locations where there is light pedestrian traffic, such as a sidewalk.



The CraftSmart Fiber Protection Box is available in five different sizes. Functioning as a stand-alone, the FPB provides below grade slack storage for fiber or other media. The body is formed with a High Density Polyethylene (HDPE) Thermoplastic and a solid Thermoplastic lid that ensures strength and stability of the product.

#### **Features and Benefits**

#### Integrity

- · High-quality HDPE designed body distributes load evenly across sidewalls
- · Solid Thermoplastic lid ensures strength and stability

#### Protection

- · Universal bolt security system
- All boxes incorporate a unique "T" style overlapping cover design to reduce soil mitigation into box

#### Access

- Single piece solid thermoplastic cover provides ease of access into boxes
- All the plastic lids on these boxes are rated at light duty or greenbelt as listed with the SCTE77 specification: 5,000 lbs

#### Investment

- · High strength rigid construction ensures long term reliability in the harshest environments
- · Lighter and easier to handle than concrete, which increases the overall safety factor

#### Accessories

- · Grounding option
  - FST-GND-BAR-KIT: Kit, ground bar and mounting hardware for use in flowerpots and vaults. Includes ground bar, ground lug and mounting bolts.



FPB609
Bolt on Cover
Top Diameter: 7 %"
Bottom Diameter: 10"
Depth: 9"



FPB910
Bolt on Cover
Top Diameter: 9 1/4"
Bottom Diameter: 12 1/2"
Depth: 9"



FPB1019 Bolt on Cover Top Inside Diameter: 10 1/8" Depth: 18"



FPB1014

Bolt on Cover
Top Inside Dimensions: 10" W x 14" L

Bottom Outside Dimensions: 19" W x 23 ½" L

Depth: 12"



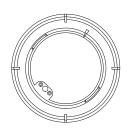
FPB1220
Bolt on Cover
Top Inside Dimensions: 16" W x 20" L
Bottom Outside Dimensions: 24" W x 30" L
Depth: 15 ¾"

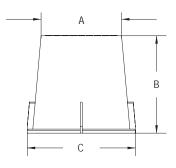
# **CraftSmart**®

# Fiber Protection Boxes (FPB)

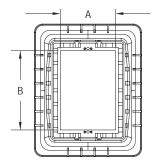


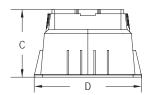
# **Technical Specifications**

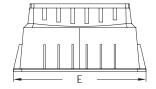




Part Number	A	В	С	Application
FPB609	7¾" (187.33 mm)	9" (228.60 mm)	10" (254.10 mm)	Slack cable storage
FPB910	9%" (250.83 mm)	9" (228.60 mm)	12½" (317.50 mm)	Slack cable storage
FPB1019	101/8" (257.18 mm)	18" (457.20 mm)	12 <sup>13</sup> /16" (325.44 mm)	Slack cable storage







Part Number	А	В	С	D	E	Application
FPB1014	10" (254.50 mm)	14" (355.60 mm)	12" (304.80 mm)	19" (482.60 mm)	23 ½" (596.90 mm)	YOURx-Terminal
FPB1220	12" (304.80 mm)	20" (508.00 mm)	15 ¾" (400.05 mm)	24" (609.60 mm)	30" (762.00 mm)	YOURx-Terminal

# **Pre-Configured Part Numbers**

Part Number	Description
FPB609	7¾" (187.33 mm) round top x 9" (228.60 mm) deep, green, bolt on cover
FPB910	91/8" (250.83 mm) round top x 9" (228.60 mm) deep, green, bolt on cover
FPB1019	10" W x 18" L (254.00 mm x 457.00 mm) round top, green, bolt on cover
FPB1014	10" W x 14" L (254.00 mm x 355.60 mm) rectangular top x 12" (304.80 mm) deep, green, bolt on cover
FPB1220	12" W x 20" L (304.80 mm x 508.00 mm) rectangular top x 15¾" (400.05 mm) deep, green, bolt on cover
FST-GND-BAR-KIT	Kit, ground bar and mounting hardware for use in flowerpots and vaults. Includes ground bar, ground lug and mounting bolts.

# FieldSmart®

# Cabinet and Vault Options





FieldSmart 144, 288 PON, 432 Cross-Connect, 432 PON or Hub Collapse Cabinet



Part Number	Description
V6A-CZP	Vault, Below Grade Pencell, 24 x 36 x 24", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V6B-CZP	Vault, Below Grade Pencell, 24 x 36 x 36", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V6B-HZP	Vault, Below Grade Pencell, 24 x 36 x 36", Split PC Lid, Hex Bolts, Gray, with Cut Out for FieldSmart FSC Cabinets, Straight Wall, Requires 020538 Bolt Kit - Ordered Separately
V7A-CZP	Vault, Below Grade Pencell, 30 x 48 x 24", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V7B-CZP	Vault, Below Grade Pencell, 30 x 48 x 36", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V7B-HZP	Vault, Below Grade Pencell, 30 x 48 x 36", Split PC Lid, Hex Bolts, Gray, With Knock Outs for FieldSmart Cabinets, Straight Wall, Requires 020538 Bolt Kit - Ordered Separately



FieldSmart 576 PON or 864 Cross-Connect Cabinet

Part Number	Description
V7A-CZP	Vault, Below Grade Pencell, 30 x 48 x 24", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V7B-CZP	Vault, Below Grade Pencell, 30 x 48 x 36", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V7B-HZP	Vault, Below Grade Pencell, 30 x 48 x 36", Split PC Lid, Hex Bolts, Gray, With Knock Outs for FieldSmart Cabinets, Straight Wall, Requires 020538 Bolt Kit - Ordered Separately
V8A-CZP-F	Vault, Below Grade Pencell, 36 x 60 x 24", Complete Split Lid, with 1/2 Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Flared Wall
V8B-CZP-F	Vault, Below Grade Pencell, 36 x 60 x 36", Complete Split Lid, with 1/2 Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Flared Wall
V9B-HZP-PC	Vault, Pencell 48 x 48 x 36", Complete Split Polymer Concrete Lid, Cut Out for 864 Cabinet, Polymer Concrete Straight Wall

# FieldSmart®

# Cabinet and Vault Options





FieldSmart 1152 PON or 1728 Cross-Connect Cabinet

Part Number	Description
V7B-CZP	Vault, Below Grade Pencell, 30 x 48 x 36", Split HDPE Lid, Hex Bolts, Green, with Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Straight Wall
V7B-HZP	Vault, Below Grade Pencell, 30 x 48 x 36", Split PC Lid, Hex Bolts, Gray, With Knock Outs for FieldSmart Cabinets, Straight Wall, Requires 020538 Bolt Kit - Ordered Separately
V8A-CZP-F	Vault, Below Grade Pencell, 36 x 60 x 24", Complete Split Lid, with 1/2 Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Flared Wall
V8B-CZP-F	Vault, Below Grade Pencell, 36 x 60 x 36", Complete Split Lid, with 1/2 Cut Out for FieldSmart FSC Cabinets, With Bolt Kit, Flared Wall
V9B-HZP-PC	Vault, Pencell 48 x 48 x 36", Complete Split Polymer Concrete Lid, Cut Out for 864 Cabinet, Polymer Concrete Straight Wall



FieldSmart 864 Port PON FDH Cabinet

Part Number	Description
V9B-HZP-PC	Vault, Pencell 48 x 48 x 36", Complete Split Polymer Concrete Lid, Cut Out for 864 Cabinet, Polymer Concrete Straight Wall

# Introduction to Access Products





Whether it's a pedestal, a vault or a wall box, we have the fiber management products to round out the last mile or access point of your network. FieldSmart® Fiber Delivery Point (FDP) products can be placed aerially in pole or strand-mount closures, in pedestals on the ground or below grade in small hand holes with closures that provide superior splicing or interconnect functionality.

The FieldSmart FDP Wall Box line has been optimized for both indoor and outdoor deployments. They are ideal for both business-class and residential environments. The OSP platform is designed for the harshest environment, supporting NEMA 4 performance requirements, while still allowing for conduit entry through field-deployed knock-outs on both the rear and bottom of the unit. Designed from conception to provide fast, easy fiber jumper routing and ease of access to all circuits, the FieldSmart FDP Wall Box system is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as our top priority.

With the Clearview® Cassette at its heart, the FieldSmart FDP Wall Box gives service providers plug-and-play integration based upon the configuration requirements of the application. With a choice of up to 48 ports for the outdoor model or up to 144 ports for the indoor model, users can easily scale their networks using the same consistent Clearview Cassette deployment strategy.

The YOURx® platform (TAP, wall box and terminals) ensures every provider has the freedom of choice to match drop cable technology with the needs of their environment and first-cost priorities. Designed around a single architecture—the YOURx FlexPort – YOURx is the only fiber delivery platform that eliminates the need for expensive proprietary connectors when deploying fiber in the distribution and drop portions of the network.









FieldSmart Wall Boxes - Metal

FieldSmart Wall Boxes - Plastic

YOURx-Terminals

# Outdoor 24-Port Wall Box

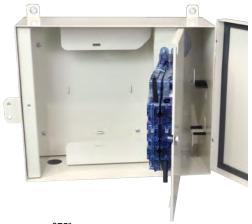


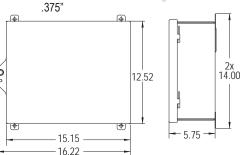
### **Application**

The FieldSmart FDP 24 Port Outdoor Wall Box is ideal for both residential MDUs and business-class environments. Configurable for either patch only, patch and splice (Clearfield's in-cassette splicing solution) or MPO plug-and-play, Outdoor Wall Boxes supports all cable scenarios for the outside plant. The OSP platform is designed for the harshest environments, supporting NEMA 4 performance requirements, while providing conduit entry through field-deployed knock-outs on both the rear and bottom of the unit. Additional applications include, fiber demarcations, entrance facilities and security systems (CCTV).

### Description

Designed from conception to provide fast and easy fiber jumper routing with ease of access to all circuits, the FieldSmart FDP Outdoor 24 Port Wall Box is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priorities. Utilizing the Clearview® Cassette, the boxes easily scale from 12 to 24 ports with the industry standard adapter of choice. Ring cut or mid-span capabilities allow distribution cables to be daisy-chained and for fiber hand-off through the riser, while a swinging bulkhead provides rear-access to cassettes and protects sub-unit slack storage. With lockable doors for added protection and a solid enclosure design to protect fiber terminations from damage, the FieldSmart Fiber Delivery Point (FDP) Wall Box product line provides superior fiber management for outdoor environments.





### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable certified to GR-20 and GR-409
- Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- Designed to comply with NEMA 4 requirements
- Zinc-plated for harsh environment reliability
- Radius protected storage for up to three meters of jacketed fiber or patch cord slack is provided (patch side)
- · Rugged steel construction with locking access doors provides security from tampering or inadvertent damage
- · Integrated fiber management protects fiber from micro-bend and macro-bend damage
- · Ability to padlock the outside door for increased security

#### Access

- Ships ready to install with cable clamp kit, locks and miscellaneous accessories
- · Multiple entry/exit points for feeder/customer premise cables
- · Larger design facilitates ease of access in the environments the product is deployed
- · Rear wall knockout for conduit entry
- · Accessible using a standard can wrench

#### Investment

- Scalable to 24 ports of fiber using Clearview® Cassettes loaded with the interface of your choice
- Pre-configured and pre-loaded factory terminated assemblies
- Patch only or patch and splice configurations supported
- Boxes can be configured as a tie box and later converted to patch only or patch and splice, utilizing the Clearview Cassette

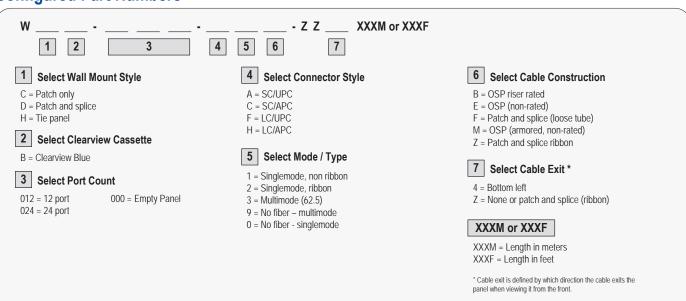
Outdoor 24-Port Wall Box -



### **Technical Specifications**

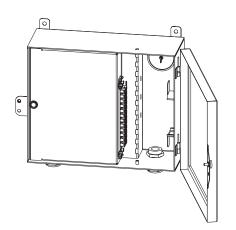
FieldSmart Outdoor 24 Port Wall Box		
Dimensions	12.52" H x 16.22" W x 5.75" D (318.01 mm x 411.98 mm x 146.05 mm)	
Port Density	Up to 24 ports	
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO	
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)	
Splice Capacity	12 or 24 splice configurations in each Clearview Cassette	
Storage Capacity	One meter of 900 µm fiber and up to 20 feet (6.10 m) buffer tube	
Material	16 gauge cold rolled steel (zinc chromate with almond powder coating)	

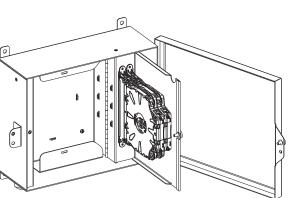
# **Configured Part Numbers**



#### **Accessories**

- Pole Mount Kit (FMA-H4Z-SUB)
- FieldSmart Outdoor Wall Box Accessory Kit (FMA-XXX-36)





FMA-H4Z-SUB FMA-XXX-36

# Outdoor 48-Port Wall Box



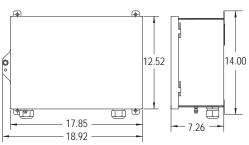
### **Application**

The FieldSmart FDP 48 Port Outdoor Wall Box is ideal for both residential MDUs and business-class environments. Configurable for either patch only, patch and splice (Clearfield's in-cassette splicing solution) or MPO plug-and-play, Outdoor Wall Boxes supports all cable scenarios for the outside plant. The OSP platform is designed for the harshest environments, supporting NEMA 4 performance requirements, while providing conduit entry through field-deployed knock-outs on both the rear and bottom of the unit. Additional applications include, fiber demarcations, entrance facilities and security systems (CCTV).

### **Description**

Designed from conception to provide fast and easy fiber jumper routing with ease of access to all circuits, the FieldSmart FDP Outdoor 48 Port Wall Box is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priorities. Utilizing the Clearview® Cassette, the box easily scale from 12 to 48 ports with the industry standard adapter of choice. Ring cut or mid-span capabilities allow distribution cables to be daisy-chained and for fiber hand-off through the riser, while a swinging bulkhead provides rear-access to cassettes and protects sub-unit slack storage. With lockable doors for added protection and a solid enclosure design to protect fiber terminations from damage, the FieldSmart Fiber Delivery Point (FDP) Wall Box product line provides superior fiber management for outdoor environments.





#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable certified to Telcordia GR-20 and GR-409
- · Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- Outdoor unit designed to comply with NEMA 4 requirements
- · Zinc-plated for harsh environment reliability
- · Radius protected storage for up to three meters of jacketed fiber or patch cord slack is provided (patch side)
- Rugged steel construction with locking access doors provides security from tampering or inadvertent damage
- · Integrated fiber management protects fiber from micro-bend and macro-bend damage
- Ability to padlock the outside door for increased security

#### Access

- Removable doors and non-angled connectors enable fast, easy fiber jumper routing
- · Ships ready to install with cable clamp kit, locks and miscellaneous accessories
- Multiple entry/exit points for feeder/customer premise cables
- · Larger design facilitates ease of access in the environments the product is deployed
- Rear wall knockout for conduit entry
- · Accessible using a standard can wrench

#### Investment

- Scalable to 48 ports of fiber using Clearview Cassettes loaded with the interface of your choice
- Pre-configured/pre-loaded factory terminated assemblies
- · Patch only or patch and splice configurations supported
- Box can be configured as a tie box and later converted to patch only or patch and splice, utilizing the Clearview Cassette

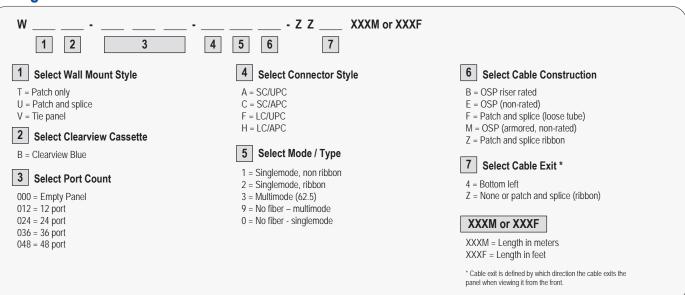




### **Technical Specifications**

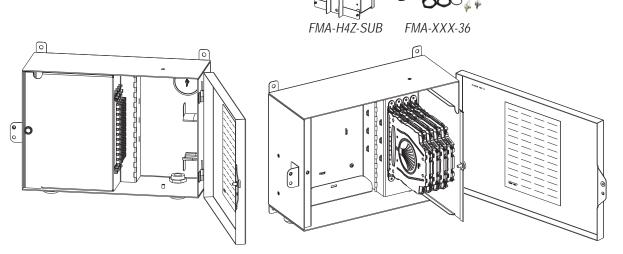
FieldSmart Outdoor 48 Port Wall Box		
Dimensions	12.52" H x 18.92" W x 7.26" D (318.01 mm x 480.56 x 184.40 mm)	
Port Density	Up to 48 ports	
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO	
Cable Types	Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)	
Splice Capacity	12 or 24 splice configurations in each Clearview Cassette	
Storage Capacity	One meter of 900 µm fiber and up to 3 meters of jacketed fiber	
Material	16 gauge cold rolled steel (zinc chromate with almond powder coating)	

### **Configured Part Numbers**



#### **Accessories**

- · Pole Mount Kit (FMA-H4Z-SUB)
- · FieldSmart Outdoor Wall Box Accessory Kit (FMA-XXX-36)



# Indoor 36-Port Wall Box -

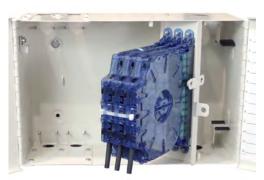


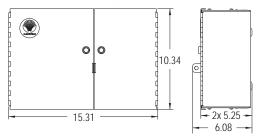
### **Application**

The FieldSmart Fiber Delivery Point (FDP) 36 Port Indoor Wall Box has been optimized for MDU (Multi Dwelling Unit) applications. With the Clearview® Cassette at its heart, the FieldSmart FDP Wall Box gives service providers plug-and-play integration based upon the configuration requirements of the application. With the ability to house a single 1 x 32 splitter, indoor wall boxes are perfect for the deployment of PON-based FTTH networks in an MDU environment. Additional applications include, fiber demarcations, entrance facilities and security systems (CCTV).

### Description

The FieldSmart Fiber Delivery Point (FDP) 36 Port Indoor Wall Box easily allows the user to scale from 12 to 36 ports. Utilizing Clearview Cassettes, the product is shipped loaded with the industry standard adapter of choice and can be configured for patch only, patch and splice (Clearfield's in-cassette splicing solution) and MPO plug-and-play applications, while supporting all cable constructions for the inside plant. It is ring cut or mid-span capable, allowing for the distribution cables to be daisy-chained and for fiber hand-off through the riser. The box has a swinging bulkhead for rear-access to the cassettes and protects sub-unit slack storage, security enabled doors for extra protection and a solid enclosure to protect fiber terminations from damage. Designed from conception to provide fast, easy fiber jumper routing and ease of access to all circuits, the Wall Box system is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priority.





#### **Features and Benefits**

#### Integrity

- · Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Fiber cable certified to Telcordia GR-20 & GR-409
- Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- · Radius protected storage for up to five meters of jacketed fiber or patch cord slack is provided (patch side)
- Rugged steel construction with security enabled doors provide protection from tampering or inadvertent damage with industry standard can wrench fasteners
- Integrated fiber management protects fiber from micro-bend and macro-bend damage
- · A grounding lug is included

#### Access

- Removable doors and non-angled connectors enable fast, easy fiber jumper routing, reducing the risk of fiber damage when cleaning or patching fibers
- · Ships ready to install with cable clamp kit and miscellaneous accessories
- Upper and lower entry/exit points for feeder/customer premise cables
- · Larger design facilitates ease of access in the environments product is deployed
- Accessible using a standard can wrench
- Pre-loaded for patch and splice or patch only applications

#### Investment

- Scalable to 36 ports of fiber using Clearview Cassettes loaded with the interface of your choice
- Pre-configured/pre-loaded factory terminated assemblies
- Box can be configured as a tie box and later converted to patch only or patch and splice, utilizing the Clearview Cassette

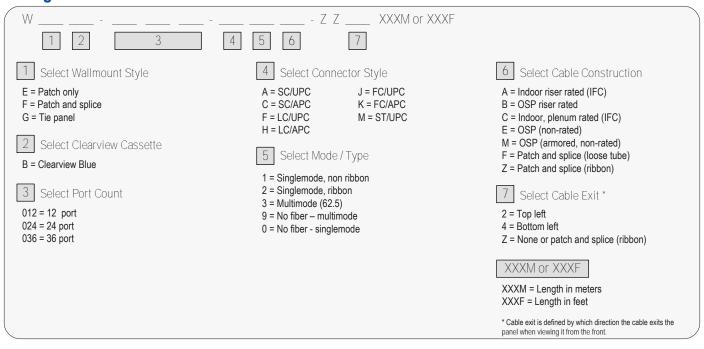


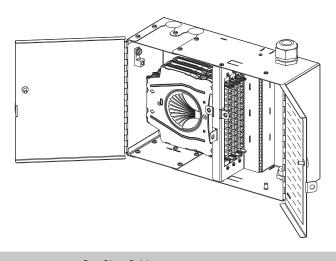


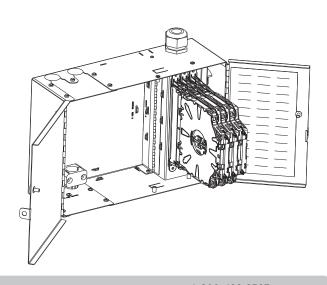
# **Technical Specifications**

FieldSmart Indoor 36 Port Wall Box		
Dimensions	10.34" H x 15.31" W x 5.25" D (262.63 mm x 388.87 mm x 133.35 mm)	
Port Density	Up to 36 ports	
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, FC/UPC, FC/APC, ST/UPC, MPO	
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor	
Splice Capacity	12 or 24 splice configurations in each Clearview Cassette	
Storage Capacity	One meter of 900 µm fiber and up to 5 meters of jacketed fiber	
Material	18 gauge cold rolled steel (almond powder coating)	

### **Configured Part Numbers**







# Indoor 96-Port PON Wall Box

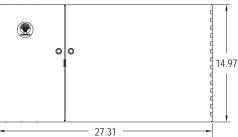


### **Application**

The FieldSmart Fiber Delivery Point (FDP) 96-Port PON Indoor Wall Box has been optimized for MDU applications. Configurable with up to 96 distributed ports and 12 feeder ports, users can easily scale their networks using the same consistent Clearview® Cassette deployment strategy. With the ability to house up to three 1 x 32 splitters, the Indoor Wall Box supports PON applications, as well as fiber demarcations, entrance facilities and security systems (CCTV).

### Description

In the middle of the FieldSmart Fiber Delivery Point (FDP) Indoor Wall Box line is the 96 Port, which allows the user to easily scale 12 to 96 distributed ports. Designed from conception to provide fast and easy fiber jumper routing with ease of access to all circuits, the FieldSmart FDP Wall Box system is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priorities. Utilizing Clearview Cassettes, the product is shipped loaded with the industry standard adapter of choice and can be configured for patch only, patch and splice (Clearfield's in-cassette splicing solution) and MPO plug-and-play applications, while supporting all cable constructions for the inside plant. It is ring cut or mid-span capable, allowing for the distribution cables to be daisy-chained and for fiber hand-off through the riser. The box has a swinging bulkhead for rear-access to the cassettes and protects sub-unit slack storage, security enabled doors for extra protection and a solid enclosure to protect fiber terminations from damage.



#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Fiber cable certified to Telcordia GR-20 and GR-409
- Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

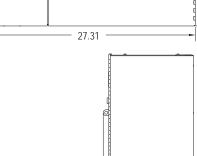
- · Radius protected storage for up to five meters of jacketed fiber or patch cord slack is provided (patch side)
- Rugged steel construction with security enabled doors provide protection from tampering or inadvertent damage with industry standard can wrench fasteners
- · Integrated fiber management protects fiber from micro-bend and macro-bend damage
- A grounding lug is included

#### Access

- Removable doors and non-angled connectors enable fast, easy fiber jumper routing, reducing the risk of fiber damage when cleaning or patching fibers
- · Ships ready to install with cable clamp kit and miscellaneous accessories
- Upper and lower entry/exit points for feeder/customer premise cables
- · Larger design facilitates ease of access in the environments product is deployed and is accessible using a standard can wrench
- Pre-loaded for patch and splice or patch only applications

#### Investment

- · Scalable to 96 distributed ports and 12 feeder ports of fiber using Clearview Cassettes loaded with the interface of your choice
- Pre-configured/pre-loaded factory terminated assemblies
- Box can be configured as a tie box and later converted to patch only or patch and splice, utilizing the Clearview Cassette



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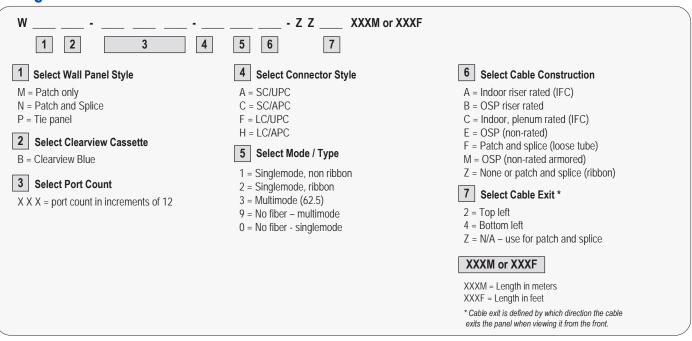


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# **Technical Specifications**

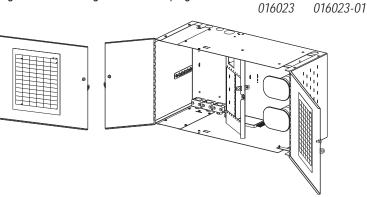
FieldSmart Indoor 96-Port PON Wall Box		
Dimensions	14.97" H x 27.31" W x 10.78" D (380.24 mm x 693.67 mm x 273.81 mm)	
Port Density	Up to 96 distributed ports and 12 feeder ports	
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO	
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor	
Splice Capacity	12 or 24 splice configurations in each Clearview Cassette	
Storage Capacity	One meter of 900 µm fiber and up to 5 meters of jacketed fiber	
Material	18 gauge cold rolled steel (almond powder coating)	

### **Configured Part Numbers**



#### **Accessories**

- · Ruggedized Splitter
- Dust Cover Plates (016023) plate kit includes two plates and eight screws
- Plate Kit (016023-01) plate kit includes two plates, eight screws and eight rubber hole plugs



# Indoor 144-Port Wall Box



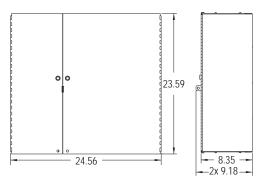
### **Application**

The 144 Port Indoor Wall Box has been optimized for MDU applications. With the Clearview® Cassette at its heart, the FieldSmart FDP 144 Port Wall Box gives service providers plug-and-play integration based upon the configuration requirements of their application. Starting from 12 ports, users can easily scale their networks using the same consistent Clearview Cassette deployment strategy. With a compact 24" x 26" x 8" (609.60 mm x 660.40 mm x 203.20 mm) footprint, this wall box is perfect for the deployment of FTTH networks in an MDU environment. With the ability to house up to six ruggedized splitters, the wall box supports PON applications, as well as fiber demarcations.

### Description

The FieldSmart Fiber Delivery Point (FDP) 144 Port Indoor Wall Box is Clearview optimized, allowing the user to easily scale from 12 to 144 distributed ports and 24 feeder ports. Utilizing Clearview Cassettes, the product is shipped and loaded with the industry standard adapters. It is preloaded for patch only, patch and splice (Clearfield's in-cassette splicing solution) and MPO plug-and-play applications and supports all cable constructions for the inside or outside plant. It is ring-cut or mid-span capable, allowing for the distribution cables to be daisy-chained and for fiber hand-off through the riser. The box has a swinging bulkhead for rear-access to the cassettes, security enabled doors for extra protection and a solid enclosure to protect fiber terminations from damage. Designed from conception to provide fast, easy fiber jumper routing and ease of access to all circuits, the wall box system is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priority.





#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- · Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable certified to Telcordia GR-20 & GR-409
- Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- Radius protected storage for up to five meters of jacketed fiber or patch cord slack is provided (patch side)
- Rugged steel construction with security enabled doors provide protection from tampering or inadvertent damage with industry standard can wrench fasteners
- Integrated fiber management protects fiber from micro-bend and macro-bend damage
- A grounding lug is included
- Secondary locking fasteners for optional padlock

#### Access

- · Removable doors and non-angled connectors enable easy fiber jumper routing, reducing the risk of fiber damage
- Upper and lower entry/exit points for feeder/customer premise cables
- · Larger design facilitates ease of access in the environments product is deployed and is accessible using a standard can wrench
- Pre-loaded for patch and splice or patch only applications

#### Investment

- Scalable to 144 distributed ports and 24 feeder ports of fiber using Clearview Cassettes loaded with the interface of your choice: userdefined feeder/distribution port counts
- Pre-configured/pre-loaded factory terminated assemblies
- Box can be configured as a tie box and later converted to patch only or patch and splice, utilizing the Clearview Cassette

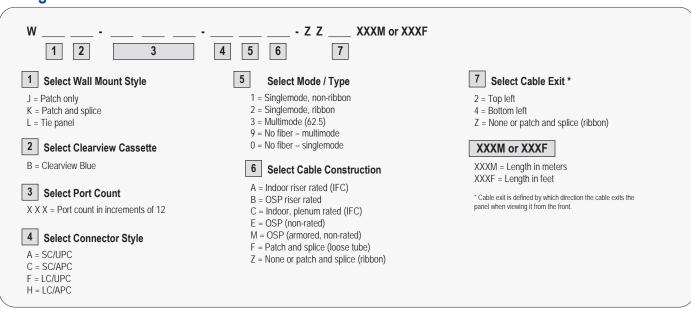




### **Technical Specifications**

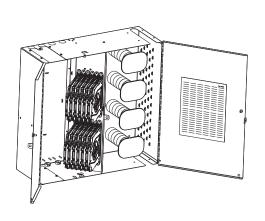
FieldSmart Indoor 144 Port Wall Box		
Dimensions	23.59" H x 24.56" W x 8.35" D (599.19 mm x 623.82 mm x 212.09 mm)	
Port Density	Up to 144 distributed ports and 24 feeder ports	
Cassette Types Supported	Clearview® Blue	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO	
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor	
Splice Capacity	12 or 24 splice configurations in each Clearview Cassette	
Storage Capacity	One meter of 900 µm fiber and up to 5 meters of jacketed fiber	
Material	18 gauge cold rolled steel (almond powder coating)	

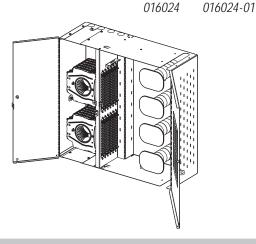
### **Configured Part Numbers**



#### **Accessories**

- · Ruggedized Splitter
- Dust Cover Plates (016024) plate kit includes two plates and eight screws
- Plate Kit (016024-01) plate kit includes two plates, eight screws and eight rubber hole plugs





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# Indoor 144-Port PON Wall Box -



### **Application**

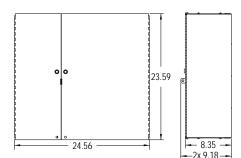
The 144 Port PON Indoor Wall Mount Panel has been optimized for MDU applications. With the Clearview® Cassette at its heart, the FieldSmart FDP 144 Port PON Wall Mount Panel gives service providers plug-and-play integration based upon the configuration requirements of their application. Starting from 12 ports, users can easily scale their networks using the same consistent Clearview Cassette deployment strategy. It is able to support six splitters in a compact 24" x 26" x 8" footprint, this wall mount panel is perfect for the deployment of FTTH networks in an MDU environment.

### **Description**

The FieldSmart Fiber Delivery Point (FDP) 144 Port Indoor Wall Mount Panel is Clearview optimized, allowing the user to easily scale from 12 to 144 ports. Utilizing Clearview Cassettes, the product is shipped and loaded with the industry standard adapters. It is preloaded for patch only, patch and splice and MPO plug-and-play applications and supports all cable constructions for the inside or outside plant. It is ring-cut or mid-span capable, allowing for the distribution cables to be daisy-chained and for fiber hand-off through the riser. The panel has a swinging bulkhead for rear-access to the cassettes,

security enabled doors for extra protection and a solid enclosure to protect fiber terminations from damage. Inner panel of bulkhead holds two cassettes for up to 24 feeder ports and dual cages hold up to 6 splitters. Designed from conception to provide fast, easy fiber jumper routing

and ease of access to all circuits, the Wall Mount Panel system is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priority.



#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Fiber cable compliant to Telcordia GR-20 and GR-409
- Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- · Radius protected storage for up to five meters of jacketed fiber or patch cord slack is provided (patch side)
- Rugged steel construction with security enabled doors provide protection from tampering or inadvertent damage with industry standard can wrench fasteners
- · Integrated fiber management protects fiber from micro-bend and macro-bend damage
- · A grounding lug is included
- Secondary locking fasteners for optional padlock

#### Access

- Removable doors and non-angled connectors enable easy fiber jumper routing, reducing the risk of fiber damage
- Upper and lower entry/exit points for feeder/customer premise cables
- Larger design facilitates ease of access in the environments product is deployed and is accessible using a standard can wrench
- Pre-loaded for patch and splice or patch only applications

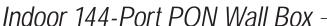
#### Investment

- · Scalable to 144 distribution ports of fiber using Clearview Cassettes loaded with the interface of your choice
- · Up to 24 feeder ports
- · Built in cages hold up to 6 splitters
- Pre-configured/pre-loaded factory terminated assemblies
- Panel can be configured as a tie panel and later converted to a patch only or a patch and splice panel, utilizing the Clearview Cassette





016024 - Plate Kit includes two plates and eight screws

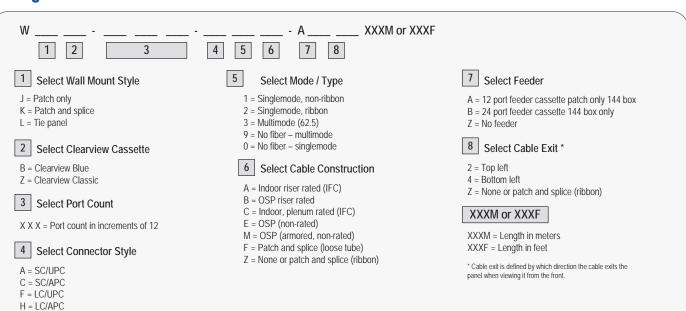


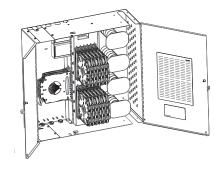


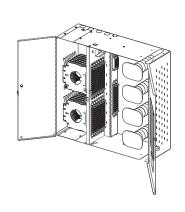
# **Technical Specifications**

FieldSmart Indoor 144 Port PON Wall Mount Panel	
Dimensions	23.59" H x 24.56" W x 8.35" D (599.19 mm x 623.82 mm x 212.09 mm)
Port Density	Distribution: Up to 144 ports
Full Delisity	Feeder: Up to 24 ports
Cassette Types Supported	Clearview® Blue and Clearview Classic
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor
Splice Capacity	12 splices in each Clearview Cassette
Storage Capacity	One meter of 900 µm fiber and up to 5 meters of jacketed fiber
Material	18 gauge cold rolled steel (almond powder coating)
Splitter Capacity	Up to 6 ruggedized splitters

### **Configured Part Numbers**







# Indoor 288-Port Wall Box-



### **Application**

The Indoor 288-Port Wall Box has been optimized for MDU applications. Utilizing the Clearview® Black Ribbon Cassette, the FieldSmart Fiber Delivery Point (FDP) gives service providers plug-and-play integration based upon the configuration requirements of their application. Feeder fibers, distribution fibers, splitter modules, splicing and unused splitter output storage are all contained within a single, rugged, wall-mountable enclosure. Housing a swing-out bulkhead in a compact footprint wall box, with the ability to house up to 9 WaveSmart® High Density 1 x 32 Splitters, provides for a flexible deployment of FTTH networks in an MDU environment as well as a variety of applications in carrier networks and CATV environments.

# **Description**

This indoor wall box is Clearview optimized, allowing the user to scale the bulkhead from 12 to 288 distributed ports and up to 24 feeder ports. This bulkhead accepts the Clearview Black Patch and Splice Cassettes (Clearfield's in-cassette splicing solution) utilizing ribbon cable. A side lock provides security enabled doors for extra protection and a solid enclosure to protect fiber terminations from damage.

Designed from conception to provide fast, easy fiber jumper routing and ease of access to all circuits, the wall box system is craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance as the top priority. Easily wall mounts with one person; the main body of the box attaches to the wall. The bulkhead swings open for easy access to the front and rear of the cassettes.





#### **Features and Benefits**

#### Integrity

- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Designed to comply with GR-3125
- · Supports all industry standard singlemode connectors
- 100% performance tested for final mechanical inspect

#### Protection

- · Radius protected storage of cabling
- · Integrated fiber management protects fiber from micro-bend and macro-bend damage
- Door locks via a 216 bolt with tab option for padlock

#### Access

- Removable left open front door with the ability to swing 90 degrees
- · Top and bottom entry/exit points for cables

#### Investment

- With user-defined feeder/distribution port counts, scalable to 288 distributed ports and 24 feeder ports of fiber using Clearview Black Cassettes
- · Utilizes the Clearview Black Cassettes with ribbon cable only



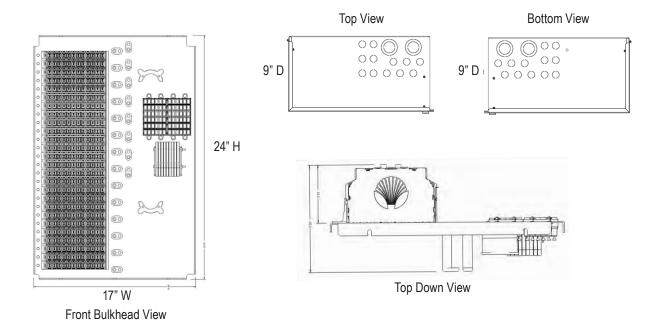


# **Technical Specifications**

FieldSmart 288-Port Wall Box	
Dimensions	17" W x 24" H x 9" D (431.8 mm x 609.6 mm x 228.6 mm)
Port Density	Up to 288 distributed ports and 24 feeder ports
Cassette Types Supported	Clearview® Black
Splitter	Up to 9 WaveSmart High Density 1 x 32 Splitter with 900 micron legs
Connector Types	SC/UPC, SC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor
Splice Capacity	12 splice configurations in each Clearview Cassette
Material	16 gauge cold rolled steel (almond powder coating)

# **Pre-Configured Part Numbers - Empty (No Cassettes)**

Part Number	Description
WB288-CFWM	FieldSmart Fiber Delivery Point Wall Box, 288 Max. Cap., Indoor Rated, For Black Cassettes and WaveSmart High-Density Splitters, No Fiber Loaded, CLFD







# **Configured Part Numbers - Indoor 288 In-Cassette Splicing**

- · Clearview Black Cassette
- · Only Supports Ribbon Splicing
- · Splitters are Not Installed



W - B B	2 Z - Z	Z		
1 Select Feeder Port Count	2 Select # of	Distribution Ports		Connector Type and Distribution)
1 = 12	000 = None	156 = 156	A = SC/UPC	,
2 = 24	012 = 12	168 = 168	C = SC/APC	
Z = No Feeder Ports	024 = 24	180 = 180	F = LC/UPC	
	036 = 36	192 = 192	H = LC/APC	
	048 = 48	204 = 204		
	060 = 60	216 = 216	4 Select #	of 1x32 Splitter
	072 = 72	228 = 228	00.000 #	oo_ opo.
	084 = 84	240 = 240	1 = 1	6 = 6
	096 = 96	252 = 252	2 = 2	7 = 7
	108 = 108	264 = 264	3 = 3	8 = 8
	120 = 120	276 = 276	4 = 4	9 = 9
	132 = 132	288 = 288	5 = 5	
	144 = 144	200 200		

# **Configured Part Numbers - Indoor 288 MPO Cassette**

- · Clearview Black Cassette with Rear 12F MPO
- · Complete Plug-and-Play
- · Splitters are Not Installed



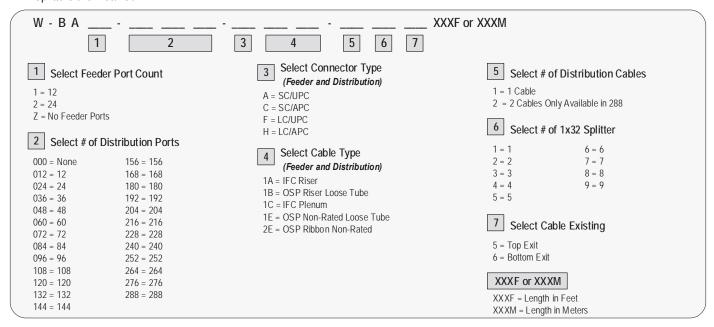
W - B C	1 Z - Z	Z			
1 Select Feeder Port Count	2 Select # of	Distribution Ports	•	connector Type and Distribution)	
1 = 12	000 = None	156 = 156	A = SC/UPC	,	
2 = 24	012 = 12	168 = 168	C = SC/APC		
Z = No Feeder Ports	024 = 24	180 = 180	F = LC/UPC		
	036 = 36	192 = 192	H = LC/APC		
	048 = 48	204 = 204			
	060 = 60	216 = 216	4 Select #	of 1x32 Splitter	
	072 = 72	228 = 228	00.000 #	oo_ op	
	084 = 84	240 = 240	1 = 1	6 = 6	
	096 = 96	252 = 252	2 = 2	7 = 7	
	108 = 108	264 = 264	3 = 3	8 = 8	
	120 = 120	276 = 276	4 = 4	9 = 9	
	132 = 132	288 = 288	5 = 5		
	144 = 144				



Indoor 288-Port Wall Box-

### **Configured Part Numbers - Indoor 288 Patch Only**

- · Supports (1) Feeder Cable and (2) Distribution Cables
- · Splitters are Installed



# FieldSmart<sup>®</sup> Fiber Delivery Point (FDP) Indoor 288-Port Wall Box





# **Accessories Pre-Configured Part Numbers**

Part Number	Description	Image
E1Z-012-C2F-SUB	Clearview Black in-cassette splicing with SC/APC. * Different connector types available, contact your Clearfield representative.	THERE
EL3-012-C1F-SUB	Clearview Black MPO Cassette with SC/APC. * Different connector types available, contact your Clearfield representative.	
KE1-CAA	High Density Splitter (1x32)	10
FMA-MZZ	Ribbon Fan-Out Kit	
FMA-XXX-235	Staging Plate; Protected Foam Block for Unterminated Splitter Legs	
FMA-XXX-162	Feeder Cable Strain Relief, 1/2" Sealcon	
005397 & 004117 (Order Both PNs)	Distribution Cable Strain Relief, 1" Sealcon	





### **Application**

Carriers are faced with many challenges when cabling MDUs in both existing (brownfield) and new construction (greenfield). One such challenge is how to manage incoming duct, while supporting varying number of subscribers in different configurations with slack management while also reducing installation time. Clearfield's YOURx Flex Box addresses these challenges with a flexible and scalable solution all within a single wall box.

### **Description**

The YOURx Flex Box is a secure, modular wall box with slide-in aggregator plate that supports multiple cable entries like, individual fiber cables, conduit and microduct in an organized manner. Installers simply push the microduct into the aggregator plate and they are ready to pull fiber. Slack storage is provided for both incoming and outgoing fiber in separate areas to reduce service interruptions when turning up additional subscribers. The drop wheel feature accommodates up to 16 individual drop wheel assemblies with each drop wheel supporting up to a 200' (60.96 m) of FieldShield® StrongFiber storage. The SmartRoute Plate can also be mounted in the Flex Box, providing spool technology and MPO connectorization. Using the Clearview® Cassette, Drop Wheel assembly or SmartRoute Plate allows for a plug-and-play concept which reduces installation time.



#### Integrity

- · Utilizes the Clearview Blue Cassette, Clearview xPAK and FieldShield Drop Wheel
- 1" inside mounting hole pattern for multiple applications
- · Dual snap ensures lid secures to box

#### **Protection**

- · Security screw with ability to secure with padlock
- Gasket seal
- · Grounding lug included

#### Access

- · Internal mounting holes for easy installation
- · Top and bottom entry/exit points
- Reversible door allows for dual direction mounting

#### Investment

- Scalable
- Slide-in aggregator plates eliminate the need for additional duct organizer
- · Clearview Cassette, Clearview xPAK, Drop Wheel or SmartRoute Plate



Flex Box with Clearview Blue



Flex Box with Pigtail Assembly



Flex Box with Drop Wheel

# **Technical Specifications**

YOURx Flex Box	
Dimensions	15.66" H x 12.00" W x 5.38" D (397.76 mm x 304.80 mm x 136.65 mm)
Material	UV rated, flame retardant, V0 rated
Port Density	Four cassettes (48 ports), up to 16 in drop wheel, SmartRoute Plate 24 port
Connectivity Types	Clearview® Blue, Drop Wheel, SmartRoute Plate
Aggregator Plate	Duct Plate supports (24) 10/6 mm and (2) 14/10 mm microduct. Combo Plate supports (24) 10/6 mm microduct. PON Plate supports (32) 10/6 mm microduct. Blank Plate supports 2 conduit.
Drop Wheel	Fiber type - FieldShield® StrongFiber
Drop Wheel Connector	Pullable SC/APC and SC/UPC to standard SC/APC and SC/UPC
Drop Wheel Cable Length	200 feet (60.96 m) FieldShield StrongFiber
Drop Wheel Material	Black Thermoplastic

YOURx® Flex Box



### **Modules**



Patch and Splice Cassette



MPO Cassette



Empty Cradle Assembly No Drop Wheels - MPO



Empty Cradle Assembly No Drop Wheels - Splitter



Cradle Assembly with Drop Wheels Installed

# **Plates**



Blank Plate Supports 2 % Hole



Universal Plate



Combo Plate With Universal Grommet Plate



Combo Plate Includes 3/4" Sealcon



Duct Plate



PON Plate Includes 1/2" Sealcon

# **Configured Part Numbers**

W Q

3

6

ΖZ

### 1 Select Module Type

- B = Cassette Customer Splice
- C = Empty Cradle Assembly Input Male MPO
- E = Empty Cradle Assembly with Splitter, Input SC/APC
- M = Loaded Cradle Assembly Input Male MPO
- N = Cassette Input Male MPO
- S = Loaded Cradle Assembly With Splitter, Input SC/APC

# 2 Select Output Port Count

#### If Cassette:

- 012 = 12 ports
- 024 = 24 ports
- 036 = 36 ports
- 048 = 48 ports

#### If Drop Wheel:

- 004 = 4 ports
- 008 = 8 ports
- 016 = 16 ports
- 012 = 12 ports

#### 3 | Select Output Connector Type

#### If Cassette:

- A = SC/UPC
- C = SC/APCF = LC/UPC
- H = LC/APC

#### If Drop Wheel:

- A = SC/UPC
- C = SC/APC

#### 4 Select Fiber Mode: Type Inside Module

- 1 = Cassette or Cradle SM Loose Tube
- 2 = Cassette SM Ribbon

# 5 | Select Jacket Construction

- F = Cassette Loose Tube
- S = Drop Wheel 900 µm StrongFiber
- Z = Cassette Ribbon

#### 6 | Select Aggregator Plate

- B = Blank Plate
- C = Combo Plate 10/6mm Microduct
- D = Duct Plate 10/6mm Microduct
- E = Combo No FlexPorts
- G = Duct No FlexPorts
- H = Universal Blank
- J = Combo Plate with Universal Grommet
- K = Combo Plate 8.5/6mm Microduct
- M = Duct Plate 8.5/6mm Microduct
- P = PON Plate



\* 10/6 mm or 8.5/6mm FlexPorts will match the port count selected in #2.

# Select Drop Wheel Length

200F = StrongFiber on Drop Wheel Leave Blank = If using Cassette or Drop Wheel Cradle

# Pre-Configured Part Numbers (Flex Box Empty With and Without FlexPort Fittings)

	•	. 17
1	Part Number	Description
	FDP-xWBF-BPLATE	Empty Flex Box with blank plate and cable management kit.
	FDP-xWBF-CPLATE	Empty Flex Box with combo plate and cable management kit. No FlexPort fittings.
	FDP-xWBF-CPLATE-24	Empty Flex Box with combo plate and cable management kit. Loaded with 24 10/6mm FlexPort fittings.
	FDP-xWBF- CPLATE-24-85	Empty Flex Box with combo plate and cable management kit. Loaded with 24 8.5/6mm FlexPort fittings.
	FDP-xWBF-DPLATE	Empty Flex Box with duct plate and cable management kit. No FlexPort fittings.
	FDP-xWBF-DPLATE-24	Empty Flex Box with duct plate and cable management kit. Loaded with 24 10/6mm FlexPort fittings.
	FDP-xWBF- DPLATE-24-85	Empty Flex Box with duct plate and cable management kit. Loaded with 24 8.5/6mm FlexPort fittings.
	FDP-xWBF-PPLATE-32	Empty Flex Box with PON plate and cable management kit. Loaded with 32 10/6mm FlexPort fittings.
	FDP-xWBF-UPLATE	Empty Flex Box with universal plate and cable management kit.
1	FDP-xWBF-UCPLATE	Empty Flex Box with universal grommet combo plate and cable management kit.





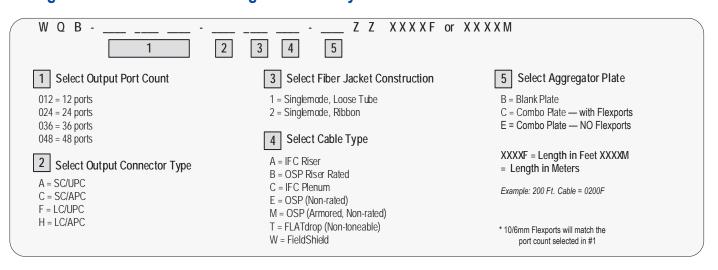
Individual Drop Wheel

1	Part Number	Description
	DW-001-SCU-SCU 200F	Drop wheel, loaded with loaded with 200 feet (60.96 m) FieldShield StrongFiber, terminated with pullable SC/UPC to SC/UPC connectors
	DW-001-SCA-SCA 200F	Drop wheel, loaded with loaded with 200 feet (60.96 m) FieldShield StrongFiber, terminated with pullable SC/APC to SC/APC connectors



Flex Box with Pigtail Assembly

# **Configured Part Numbers with Pigtail Assembly**









FlexPort Fitting for Duct Plate and Combo Plate 10 mm Qty: 1 P/N 016280



FlexPort Fitting 14mm for Duct Plate Qty: 1 P/N 018107



FlexPort Fitting for Blank Plate, 10 mm Qty: 1 (Requires Drilled 1/2 Hole) P/N 018835



Hole Plug

#### Accessories

Part Number	Description
016280-06	FlexPort Fitting for Combo and Duct Plate, 10 mm, Quantity - 6
016280-12	FlexPort Fitting for Combo and Duct Plate, 10 mm, Quantity - 12
018835	FlexPort Fitting for Blank Plate (Requires Drilled 1/2 Hole), 10 mm, Quantity - 1
018107-RW	FlexPort Fitting for Duct Plate, 14 mm, Quantity - 1
018664	Plug, FlexPort, 10 mm
018665	Plug, FlexPort, 14 mm

#### SmartRoute Plate - Fits Inside Flex Box

#### How to Order:

- 1. Order Empty Box
- 2. Order Configured SmartRoute Plate



SmartRoute Plate

# **Configured Part Numbers with Pigtail Assembly**

SRP-2 1 1 Select Front Connector Type A = SC/UPC C = SC/APC F = LC/UPC H = LC/APC 2 | Select Cable Type 1 = SM stranded non-ribbon, plenum rated 3 = MM stranded non-ribbon, plenum rated

3 | Select Cable Construction

Y = IFC Plenum W = FieldShield 4 | Select Number of Fibers

8

1 = 12 Fibers

3 = 6 Fibers

5 Select Rear Connector Type

A = SC/UPC

C = SC/APC

F = LC/UPC

H = LC/APC

N = MPO Male Pushable

P = MPO Female Pushable

Select Rear Breakout

B = 1 meter

C = 1/2 meter

Z = None

# 7 Select Rear Upjacketing

 $A = 900 \, \mu m$ 

B = 2mm

Z = None

# Select Length

1 = 25 feet (7.62 mm)

2 = 50 feet (15.24 mm)

3 = 75 feet (22.86 mm)

4 = 100 feet (30.48 mm)5 = 125 feet (38.10 mm)

6 = 150 feet (45.72 mm)

7 = 175 feet (53.34 mm)

8 = 200 feet (60.94 mm)

# FieldShield®

# StrongFiber Drop Wheel -

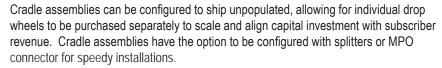


### **Application**

Carriers are faced with key challenges when cabling for both brownfield and greenfield MDU deployments. The challenges are varied and include how to install multiple drops from a single connection point when distances are unknown, accommodating slack storage and ensuring alignment of capital investment with customer take rates in a plug-and-play design.

### Description

FieldShield StrongFiber Drop Wheel assemblies address these key challenges with a compact, scalable and flexible quick-deploy platform. The end to end plug-and-play solution utilizes a spool concept with 200 feet (60.96 m) of StrongFiber that is preterminated with a pullable SC/APC or SC/UPC connector. The drop wheel is easily deployed by extending the wheel from the cradle and pulling the fiber through the microduct or conduit. Once the pullable connector reaches its destination, the connector is mated to an adapter or directly into an ONT, providing a complete plug-and-play solution. Any remaining slack is stored and managed on the Drop Wheel. The Drop Wheel reduces turn-up time by offering a faster, simplified and splice-free installation which can be performed by a general technician.





#### **Features and Benefits**

#### Integrity

- StrongFiber is designed, tested and certified to GR-20
- StrongFiber Deploy Reel has been designed, tested and certified to GR-63
- Terminations designed, tested and certified to Telcordia GR-326
- Clearfield FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Supports singlemode SC connectors

#### Protection

- · Craft friendly spool technology allows installers to pull the exact amount of cable required
- FieldShield StrongFiber bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation
- · Lightweight with low coefficient of friction to maximize pull distances

#### Access

- · Black in color
- Spooled with small form factor 900 µm
- · Indoor implementations

#### Investment

- Pre-terminated cable spools reduce upfront deployment costs by simplifying site survey inspections
- · Scalable, quick and easy deployment allows capital investment to align with customer take rates



# FieldShield®

# StrongFiber Drop Wheel -



# **Technical Specifications**

FieldShield StrongFiber Drop	Wheel
Drop Wheel Fiber Type	FieldShield StrongFiber
Connectors	Pullable SC/APC or SC/UPC to Standard SC/APC or SC/UPC
Cable Length	200 feet (60.96 m) per wheel
Drop Wheel Material	Black Thermoplastic
Drop Wheel Radius	4.55 inches (115.57 mm)
Drop Wheel Cradle Dimensions	4 Position: 5.3" H x 3.3" W (134.62 mm x 83.82 mm) 8 Position: 5.3" H x 5.6" W (134.62 mm x 142.24 mm) 12 Position: 5.3" H x 7.8" W (134.62 mm x 198.12 mm) 16 Position: 5.3" H x 10.1" W (134.62 mm x 256.54 mm)

# **Pre-Configured Part Numbers**

### **Empty Drop Wheel Cradle with Installed Splitter**

Part Number	Description
DWC-SCU4-Splitter	Empty 4 position Drop Wheel Cradle with 1 x 4 splitter installed with SC/UPC adapters, no Drop Wheels
DWC-SCA4-Splitter	Empty 4 position Drop Wheel Cradle with 1 x 4 splitter installed with SC/APC adapters, no Drop Wheels
DWC-SCU8-Splitter	Empty 8 position Drop Wheel Cradle with 1 x 8 splitter installed with SC/UPC adapters, no Drop Wheels
DWC-SCA8-Splitter	Empty 8 position Drop Wheel Cradle with 1 x 8 splitter installed with SC/APC adapters, no Drop Wheels
DWC-SCU12-Splitter	Empty 12 position Drop Wheel Cradle with 1 x 12 splitter installed with SC/UPC adapters, no Drop Wheels
DWC-SCA12-Splitter	Empty 12 position Drop Wheel Cradle with 1 x 12 splitter installed with SC/APC adapters, no Drop Wheels
DWC-SCU16-Splitter	Empty 16 position Drop Wheel Cradle with 1 x 16 splitter installed with SC/UPC adapters, no Drop Wheels
DWC-SCA16-Splitter	Empty 16 position Drop Wheel Cradle with 1 x 16 splitter installed with SC/APC adapters, no Drop Wheels

### **Empty Drop Wheel Cradle with MPO Installed**

Part Number	Description
DWC-SCU4-MPO	Empty 4 position Drop Wheel Cradle with male MPO installed with SC/UPC adapters, no Drop Wheels
DWC-SCA4-MPO	Empty 4 position Drop Wheel Cradle with male MPO installed with SC/APC adapters, no Drop Wheels
DWC-SCU8-MPO	Empty 8 position Drop Wheel Cradle with male MPO installed with SC/UPC adapters, no Drop Wheels
DWC-SCA8-MPO	Empty 8 position Drop Wheel Cradle with male MPO installed with SC/APC adapters, no Drop Wheels
DWC-SCU12-MPO	Empty 12 position Drop Wheel Cradle with male MPO installed with SC/UPC adapters, no Drop Wheels
DWC-SCA12-MPO	Empty 12 position Drop Wheel Cradle with male MPO installed with SC/APC adapters, no Drop Wheels
DWC-SCU16-MPO	Empty 16 position Drop Wheel Cradle with male MPO installed with SC/UPC adapters, no Drop Wheels
DWC-SCA16-MPO	Empty 16 position Drop Wheel Cradle with male MPO installed with SC/APC adapters, no Drop Wheels

#### Individual Drop Wheel - To Be Installed into Empty Cradle

Part Number	Description
DW-001-SCU-SCU 200F	Drop Wheel loaded with 200' (60.96 m) FieldShield StrongFiber SC/UPC
DW-001-SCA-SCA 200F	Drop Wheel loaded with 200' (60.96 m) FieldShield StrongFiber SC/APC

# **FieldShield**<sup>®</sup> StrongFiber Drop Wheel -



### **Loaded Drop Wheel Cradle with Installed Splitter**

Part Number	Description
DW-SCX4U-Splitter	Loaded 4 position Drop Wheel Cradle with 1 x 4 splitter installed with SC/UPC adapters, includes Drop Wheels
DW-SCX4-Splitter	Loaded 4 position Drop Wheel Cradle with 1 x 4 splitter installed with SC/APC adapters, includes Drop Wheels
DW-SCX8U-Splitter	Loaded 8 position Drop Wheel Cradle with 1 x 8 splitter installed with SC/UPC adapters, includes Drop Wheels
DW-SCX8-Splitter	Loaded 8 position Drop Wheel Cradle with 1 x 8 splitter installed with SC/APC adapters, includes Drop Wheels
DW-SCX12U-Splitter	Loaded 12 position Drop Wheel Cradle with 1 x 12 splitter installed with SC/UPC adapters, includes Drop Wheels
DW-SCX12-Splitter	Loaded 12 position Drop Wheel Cradle with 1 x 12 splitter installed with SC/APC adapters, includes Drop Wheels
DW-SCX16U-Splitter	Loaded 16 position Drop Wheel Cradle with 1 x 16 splitter installed with SC/UPC adapters, includes Drop Wheels
DW-SCX16-Splitter	Loaded 16 position Drop Wheel Cradle with 1 x 16 splitter installed with SC/APC adapters, includes Drop Wheels

#### **Loaded Drop Wheel Cradle with MPO Installed**

Part Number	Description
DW-SCU4-MPO	Loaded 4 position Drop Wheel Cradle with MPO installed with SC/UPC adapters, includes Drop Wheels
DW-SCA4-MPO	Loaded 4 position Drop Wheel Cradle with MPO installed with SC/APC adapters, includes Drop Wheels
DW-SCU8-MPO	Loaded 8 position Drop Wheel Cradle with MPO installed with SC/UPC adapters, includes Drop Wheels
DW-SCA8-MPO	Loaded 8 position Drop Wheel Cradle with MPO installed with SC/APC adapters, includes Drop Wheels
DW-SCU12-MPO	Loaded 12 position Drop Wheel Cradle with MPO installed with SC/UPC adapters, includes Drop Wheels
DW-SCA12-MPO	Loaded 12 position Drop Wheel Cradle with MPO installed with SC/APC adapters, includes Drop Wheels
DW-SCU16-MPO	Loaded 16 position Drop Wheel Cradle with MPO installed with SC/UPC adapters, includes Drop Wheels
DW-SCA16-MPO	Loaded 16 position Drop Wheel Cradle with MPO installed with SC/APC adapters, includes Drop Wheels

# **SmartRoute**

# Plate -



### **Application**

The SmartRoute Plate is designed to fast-track and simplify fiber installations when landing up to 12 fibers in any environment. Clearfield's SmartRoute Plate combines cable, spooling technology and MPO connectorization in a stand-alone wall plate design. This allows for maximum flexibility and efficient use of available space. The compact design can be pre-configured to terminate up to 12 fibers. This SmartRoute is an ideal solution for use in MDUs, SFUs, cell towers and business class services.

### Description

The SmartRoute Plate contains one internal spool that can hold up to 200 feet (60.96 m) of 3 mm, 12-fiber plenum micro-cable or 12-fiber FieldShield® Cable. The plate can provide up to 12 connections on the front of the spool with an MPO or pigtail breakouts on the back side of the spool.

#### **Features and Benefits**

#### Integrity

- Terminations are designed, tested and certified to Telcordia GR-326
- Clearfield FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- Supports all industry standard singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

 Craft-friendly SmartRoute spool technology allows the installer to pullout the exact amount of cable required, and leaving the remaining slack safely stored on the spool

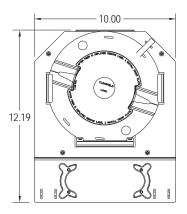
#### Access

- · Wall mount
- · Slack storage for drop cables

#### Investment

- · Pre-connectorized options eliminate labor and speed network construction
- · Scalable to 12 ports of fiber





# **SmartRoute**

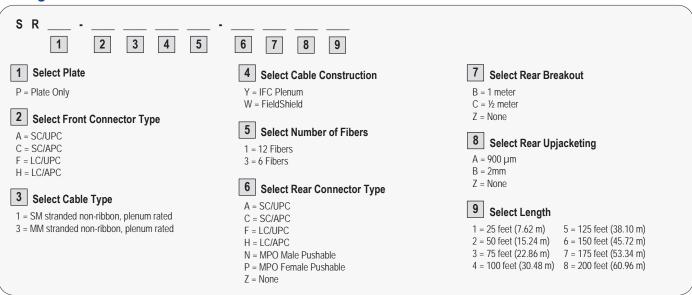
# Plate -



# **Technical Specifications**

SmartRoute Plate	
Dimensions	Plate: 12.1" H x 10" W x 2.8" D (304.80 mm x 254.00 mm x 71.12 mm)
Port Density	6 and 12 ports = SC, 6 ports = LC Duplex
Connector Types	SC/UPC, SC/APC, MPO, LC/UPC, LC/APC
Cable Types	Indoor Plenum Rated IFC/FieldShield®
Maximum Internal Spool Cable Length	200 feet (60.96 m)
Mounting Options	Wall Mount

### **Configured Part Numbers**



# Small Wall Box -



### **Application**

Engineered to land small port count fiber terminations and optical components as conveniently as possible, the FieldSmart FDP Small Wall Box is optimized for delivery of a single Clearview® xPAK with up to six fibers. The lockable, NEMA 4 rated enclosure is compact, making it ideal for a variety of applications, including harsh environment locations surrounding fiber demarcation, entrance facilities, FTTP drop boxes and cell backhaul. Additional applications include MDU, business class services, power and wind farms and DOT/Traffic monitoring.

### Description

The FieldSmart Small Wall Box was designed for the Clearview xPAK. The Clearview xPAK supports small fiber count scenarios of 2, 4 or 6 fibers in a discrete footprint. A craft-friendly design, using industry standard 216 as a locking method, no special tool is required. Four knockout ports, each supporting a ½ sealcon cable strain relief for incoming or outgoing cables for optimum cable retention. The backplane was designed with 1-inch hole spacing which allows maximum flexibility for mounting cable management rods or any additional hardware needed to support your fibers.



#### **Features and Benefits**

#### Integrity

- · RUS listed
- Utilizing the Clearview xPAK, it supports industry standard SC and LC singlemode connectors
- · Dual snap locks to ensure lid seals to base
- · Mounting hole pattern for multiple applications

#### Protection

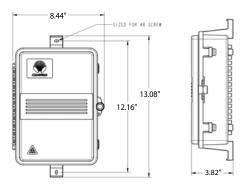
- · Radius protected storage for up to 15 feet of buffer tube
- NEMA 4 rated
- Security screw with ability to secure with padlock
- · Gasket seal
- · Ground lug included

#### Access

- · Small design facilitates ease of use in crowded environments
- · Easy to install with both internal and external mounting holes
- · Two bottom entry/exit points

#### Investment

- · Patch and splice (Clearfield's in-cassette splicing solution) or patch only
- · Surface or pole mount capable
- · Flame retardant PVC for durability





FDP-xAK1

# FieldSmart® Fiber Delivery Point (FDP) Small Wall Box



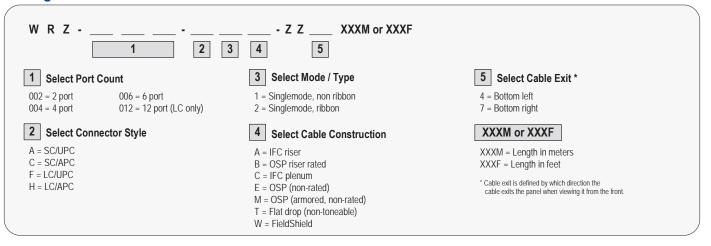
### **Technical Specifications**

FieldSmart Small Wall Box	
Dimensions	13.08" H x 8.44" W x 3.82 D (332.23 mm x 214.37 mm x 97.02 mm)
Port Density	Up to six ports
Cassette Types Supported	Clearview® xPAK
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	Six splices in each Clearview xPAK
Storage Capacity	One meter of 900 µm fiber and up to 5 meters of jacketed fiber
Material	UV stabilized, flame retardant polymer (PVC)

### **Pre-Configured Part Numbers**

Part Number	Description
FDP-xWB1	Wall box with ¾ in. Sealcon fitting
FDP-xAK1	Optional accessory kit (includes one fitting and two strength member clamps)

### **Configured Part Numbers**



# Macro/Small Cell Wall Box -



### **Application**

Engineered to land small to medium fiber terminations in a convenient wall box design, the FieldSmart FDP Macro/Small Cell Wall Box is ideal for a variety of applications, including harsh environment locations surrounding fiber demarcation, entrance facilities, FTTP drop boxes and cell backhaul.

# Description

The FieldSmart FDP Macro/Small Cell Wall Box comes with a factory-installed cable assembly, supporting up to 24 fibers. Factory-installed cable reduces the operating costs of fiber deployment by reducing installation times.

#### **Features and Benefits**

#### Integrity

- · RUS listed
- · Supports industry standard SC, LC and MPO singlemode connectors
- Dual snap locks to ensure lid seals to base
- · NEMA 4 rated

#### Protection

- · Slack storage clips for both incoming and outgoing fibers
- · Security screw with ability to secure with padlock
- · Gasket seal
- · Grounding lug included

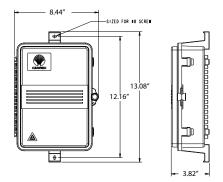
#### Access

- · Wall and pole mount
- · Easy to install with both internal and external mounting holes
- Two bottom ¾" (19.05 mm) entry/exit ports are supported with ship-along Sealcon connectors

#### Investment

- Pre-connectorized cable assemblies eliminate labor and speed network construction
- Patch only
- · One box for a variety of application uses





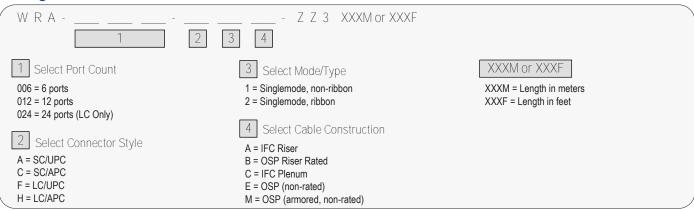
# FieldSmart® Fiber Delivery Point (FDP) Macro/Small Cell Wall Box



# **Technical Specifications**

FieldSmart FDP Macro/Small Cell Wall Box	
Dimensions	13.08" H x 8.44" W x 3.82" D (332.23 mm x 214.37 x 97.02mm)
Port Density	Supports 12 SC or 24 LC ports
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Outdoor (Riser/Non-Rated), FieldShield®
Material	UV stabilized, flame retardant polymer (PVC)
Mounting Options	Wall and Pole Mount

# **Configured Part Numbers**



# Large Wall Box



# **Application**

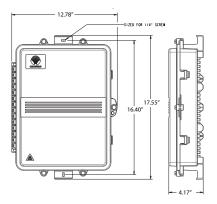
Ideal for any small count fiber scenario, the FieldSmart Large Wall Box accepts up to two Clearview® Cassettes, providing up to 24 fibers in a discrete footprint without sacrificing fiber management. Designed to land small port count fiber terminations and optical components as conveniently and inexpensively as possible, this flexible solution is perfectly suited for in-building needs, such as business class demarcations, MDU distribution points and IDF locations in enterprise networks as well as pole-mount applications in outside plant environments. When paired with a Clearview MPO Breakout Cassettes and a StrongFiber Deploy Reels, the FieldSmart Large Wall Box provides a complete plug-and-play solution for the MDU environment.

### Description

The FieldSmart Large Wall Box complements the FieldSmart Fiber Delivery Point (FDP) Wall Box line, which provides three unique wall box designs that deliver 36 to 144 ports of fiber management in a traditional sheet-metal configuration. As a lower cost alternative to sheet-metal designs, this lockable, NEMA 4 rated enclosure is consistent with Clearfield's long-standing reputation of delivering simple solutions for complex problems.

Designed around the Clearview Cassette, the FieldSmart Large Wall Box uses the same components as the other elements of the FieldSmart product platform. Slack storage is an integrated component of the solution with the Clearview U-Mount bracket accepting up to two Clearview Cassettes and providing up to 15 feet (4.57 m) of buffer tube slack storage. Unique to Clearfield® design is the ability to bring multiple fiber sheaths into the FieldSmart Large Wall Box. Each sheath will be protected within their own Clearview Cassette, providing service providers the ability to isolate one fiber sheath from another within the same enclosure.





#### **Features and Benefits**

#### Integrity

- · Utilizing the Clearview Cassettes, it supports industry standard SC and LC singlemode connectors
- · Dual snap locks to ensure lid seals to base
- · Mounting hole pattern for multiple applications

#### Protection

- · Radius protected storage for up to 15 feet (4.57 m) of buffer tube
- NEMA 4 rated
- · Security screw with ability to secure with padlock
- · Gasket seal
- · Ground lug included

#### Access

- · Small design facilitates ease of use in crowded environments
- · Easy to install with both internal and external mounting holes
- · Two bottom entry/exit points

#### Investment

- · Patch and splice (Clearfield's in-cassette splicing solution) or patch only
- · Surface or pole mount capable
- Flame retardant PVC for durability





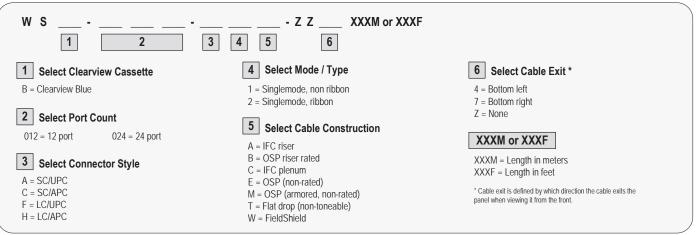
# **Technical Specifications**

FieldSmart Large Wall Box	
Dimensions	17.55" H x 12.78" W x 4.17" D (445.77 mm x 324.61 x 105.92mm)
Port Density	Up to 24 ports
Cassette Types Supported	Clearview® Blue
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Cable Types	Indoor Riser, Indoor Plenum, Indoor/Outdoor, Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated), FieldShield®
Splice Capacity	12 or 24 splice configurations in each Clearview Cassette
Storage Capacity	One meter of 900 µm fiber and up to 5 meters of jacketed fiber
Material	UV stabilized, flame retardant polymer (PVC)

# **Pre-Configured Part Numbers**

Part Number	Description
FDP-xWB2-12-SCA-B	Wall Box with (12) SC/APC ports in one Clearview® Cassette
FDP-xWB2-12-SC-B	Wall Box with (12) SC/UPC ports in one Clearview Cassette
FDP-xWB2-12-LC-B	Wall Box with (12) LC/UPC ports in one Clearview Cassette
FDP-xWB2-12-LCA-B	Wall Box with (12) LC/APC ports in one Clearview Cassette
FDP-xWB2-24-SCA-B	Wall Box with (24) SC/APC ports in two Clearview Cassette
FDP-xWB2-24-SC-B	Wall Box with (24) SC/UPC ports in two Clearview Cassette
FDP-xWB2-24-LC-B	Wall Box with (24) LC/UPC ports in two Clearview Cassette
FDP-xWB2-24-LCA-B	Wall Box with (24) LC/APC ports in two Clearview Cassette

# **Configured Part Numbers**



# StreetSmart® Mini FEC Wall Box

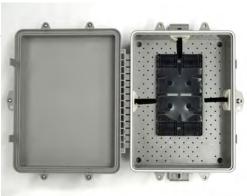


#### **Application**

When an application requires splicing IFC (intra-facility) cable to an OSP (outside plant) cable and space is a concern, the StreetSmart Mini FEC Wall Box is your product of choice. The Mini FEC is a scalable wall box that has a maximum capacity of 96 loose tube splices with cable management and slack storage. Each splice tray comes equipped with a 24-fiber heat shrink fusion splice chip. The Mini FEC is an ideal solution for use in MDUs, SFUs, cell towers and business class services.

#### Description

The Mini FEC Wall Box can support both indoor and outdoor environments. Each Mini FEC comes equipped with industry standard splice trays, cable management clips, a ground lug and two ship-along cable clamps. Each splice tray can support 24 splices with a maximum capacity of four splice trays per wall box or 96 splices. Slack storage is available for up to 5′ (1.52 m) per buffer tube and up to 5′ (1.52 m) per IFC micro-distribution cable.



#### **Features and Benefits**

#### Integrity

- · Industry standard splice tray
- · NEMA 4 rated
- Material is high impact flame retardant PVC3 with high column strength and lowcoefficient PBT

#### Protection

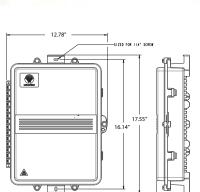
- Ruggedized storage clips
- · Security screw with ability to secure with padlock
- · Gasket seal

#### Access

- · Wall mount capable
- Two bottom ¾" (19.05 m) entry/exit ports
- Removable splice trays

#### Investment

- · Splice trays support both loose tube and ribbon constructions for single and mass fusion (ribbon) splicing
- Scalable with 24 splices per tray loose tube or 72 splices per tray ribbon
- · Complete cable management solution installed from the factory
- Two Sealcon connectors are included







# **Technical Specifications**

StreetSmart Mini FEC Wall Box	
Dimensions	17.55" H x 12.78" W x 4.17" D (445.77 mm x 324.61 x 105.92mm)
Splice Density	96 loose tube heat shrink
Storage Capacity Per Cable	5' (1.52 m) of 3 mm loose tube buffer OSP; 5' (1.52 m) of 3 mm micro-distribution IFC
Mounting Options	Wall mount, pole mount
Material	High impact and flame retardant PVC3/ high column strength and low-coefficient PBT

# **Pre-Configured Part Numbers**

Part Number	Splice Trays* Shipped	Splice Capacity
FDP-XWB2-24-FEC	1	24
FDP-XWB2-48-FEC	2	48
FDP-XWB2-72-FEC	3	72
FDP-XWB2-96-FEC	4	96

#### **Individual Splice Trays**

Part Number	Maximum Loose Tube Splice Capacity	Maximum Ribbon Splice Capacity
019339	24	72

# FieldSmart® Fiber Delivery Point (FDP)





#### Strain Relief ½" (12.70 mm) Cable –

#### Description

Strain relief that seals incoming or outgoing round, flat drop or 3mm cable assemblies. Requires 3/4" (19.05 mm) drilled hole.





#### **Pre-Configured Part Numbers**

Part Number	Description
020627	1/2" (12.70 mm) strain relief with grommet; works for securing 14 mm microduct

#### Strain Relief 3/4" (19.05 mm) Cable -

#### **Description**

Strain relief that seals incoming or outgoing round, flat drop or 3mm up to 3/4". Requires 1" (25.4 mm) drilled hole.



#### **Pre-Configured Part Numbers**

Part Number	Description
010907	<sup>3</sup> / <sub>4</sub> " (19.05 mm) strain relief with grommet
011984	<sup>3</sup> / <sub>4</sub> " (19.05 mm) nut for strain relief

#### Sealcon Adapter 3/4" (19.05 mm) -

#### **Description**

Kit for securing for cables. Kit includes strain relief, nut, O-ring, and two grommets. Requires 1" (25.40 mm) drilled hole.



#### **Pre-Configured Part Numbers**

Part Number	Description
FST-SEALCON-KIT	Strain relief grommet inserts for .24" to .63" (6.10 mm to 16.00 mm) cable diameter; includes an additional grommet for up to three flat drop cables

#### Sealcon Adapter 1" (25.40 mm) —

#### Description

Kit for securing for cables. Kit includes strain relief, nut, O-ring, and three grommets. Requires 1 1/4" (31.75 mm) drilled hole.



#### **Pre-Configured Part Numbers**

Part Number	Description
FST-SEALCON-KIT-1 INCH	Strain relief grommet inserts for .30" to .79" (7.62 mm to 20.07mm) cable diameter; includes an additional grommet for up to four flat drop cables

# FieldSmart® Fiber Delivery Point (FDP)

Wall Box Accessories ———



# 

#### **Description**

Grommet used to secure cables 10 mm microduct.



#### **Pre-Configured Part Numbers**

Part Number	Description
017360	1" (25.40 mm) grommet for securing four 10mm microduct

#### Hole Plug ————

#### **Description**

Rubber hole plug. Requires 1" (25.40 mm) drilled hole.



#### **Pre-Configured Part Numbers**

Part Number	Description
018834	Rubber hole plug with rubber membrane

#### Velcro ——————————

#### Description

Velcro square for attaching misc items into wall box.



#### **Pre-Configured Part Numbers**

Part Number	Description
011223	Velcro 2" x 2" (50.80 mm x 50.80 mm) square with hook and loop with adhesive

# Security Bit —

#### **Description**

Bit for securing the pin-in-hex screw on wall boxes.



#### **Pre-Configured Part Numbers**

Part Number	Description
015075	Single pin-in-hex bit insert

#### **Tape** ————

#### **Description**

Grommet tape to help secure cable assemblies into sealcon adapter.



#### **Pre-Configured Part Numbers**

Part Number	Description
003042	Grommet tape, 1" x 30" (25.40 mm x 762.00 mm) strip with adhesive backing

# StreetSmart<sup>™</sup> Fiber Hand-Off Box



#### **Application**

The StreetSmart Fiber Hand-Off Box serves as the demarcation point between the backhaul provider and the mobile network operator. Designed with a hinged plate and 216 locking mechanism, a secure separation is created between the wireless and wireline provider. The Fiber Hand-Off Box provides a single test access point to an angled adapter plate, designed to offer ease of cleaning and maintenance.

#### Description

The StreetSmart Fiber Hand-Off Box comes in plug-and-play and patch only configurations. The plug-and-play configuration utilizes a MPO adapter for easy installation. The patch only configuration is a factory-installed cable ranging in different cable construction and different lengths. With factory-installed cable management rods, removable door and no special tool requirement, the StreetSmart Fiber Hand-Off Box is extremely craft-friendly.

The Fiber Hand-Off Box supports up to two incoming cables and eight distribution cables using a split grommet design. Each distribution port is labeled for easy circuit identification.



#### Integrity

- · Designed, tested and certified to Telcordia GR-771
- Terminations designed, tested and certified to Telcordia GR-326
- MPO terminations designed, tested and certified to Telcordia GR-1435

#### Protection

- Sealcon fitting with multiple media grommets
- · Gasket cover for protection from the elements
- 216 locking feature (can wrench)

#### Access

- · Secure plate between backhaul provider and mobile operator
- · Removable tethered hinged door
- · Pole, wall and aerial mounting

#### Investment

- · Angled adapters for ease of cleaning
- · Multiple cable management guides
- · Two cable entry ports





MPO Assembly



#### **Technical Specifications**

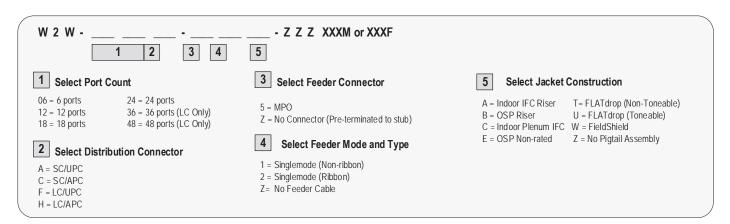
StreetSmart Fiber Hand-Off Box	
Dimensions	13" H x 8.0" W x 3.0" D
Box Options	Pre-Terminated Cable or MPO Fiber Assemblies
Connector Types	LC/APC, LC/UPC, SC/APC, SC/UPC or MPO
Cable Entrance	Two entry ports
Cables Exits	Eight flat drop with lay in design
Labeling	Designation label
Mounting Options	Pole, Wall and Aerial

#### **Configured Part Numbers**

#### **Mounting Options**

Part Number	Description
W2W-AER-02	Bracket Aerial Strand
W2W-PMM-01	Bracket Metal Pole Includes Two Hose Clamps
W2W-PMW-01	Bracket Wood Pole Includes Lag Screws
W2W-WMB-01	Bracket Wall Mount/Monopole (No Screws)

#### **Pre-Configured Part Numbers**





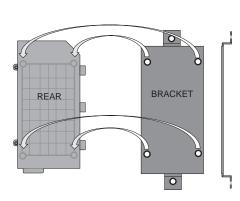


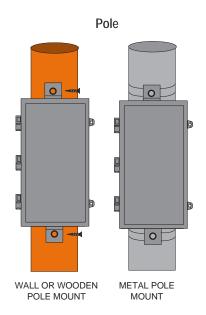
**Aerial** 



Strand Mount Bracket

Wall





Pole or Wall Bracket



# StreetSmart<sup>™</sup>

## Small Count Fiber Hand-Off Box



#### **Application**

The StreetSmart Small Count Fiber Hand-Off Box serves as a network demarcation point between the backhaul provider and the network operator or as a demarc point for small count MDUs. Designed with a hinged plate and 216 locking mechanism, access is secured between craft responsibilities. The craft-friendly GR-771 box can be mounted aerially, on a pole or on a wall. The compact design makes it ideally suited for inside a monopole.

#### **Description**

The StreetSmart Small Count Fiber Hand-Off Box can be configured in either 6 or 12 terminations in both SC or LC connections. The StreetSmart Small Count Hand-Off Box comes in two configurations. The plug-and-play option utilizes an MPO or HMFOC (hardened multifiber optical connector) connector or the patch only which comes with factory installed cable in length up to 3000°. Designed with a tethered removable door, lay in grommet, angled adapter for easy cleaning and testing, no special tool requirements makes the box extremely craft-friendly.

#### **Features and Benefits**

#### Integrity

- · Designed, tested & certified to GR-771
- Designed to comply with NEMA 4
- · Terminations designed, tested and certified to GR-326
- MPO terminations designed, tested and certified to Telcordia GR-1435

#### Protection

- 216 locking (can wrench)
- · Lay in grommet with cable retention clamp
- · Industrial grade door gasket

#### Access

- Secure plate between backhaul provider and mobile operator
- · Removeable tethered door
- · Angled adapter for easy testing and cleaning

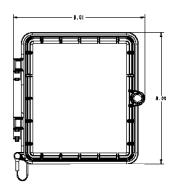
#### Investment

- · Cable management guides
- · Lay in grommet for both backhaul and network provider
- · Cable retention clamps









# **StreetSmart**<sup>™</sup>

# Small Count Fiber Hand-Off Box -

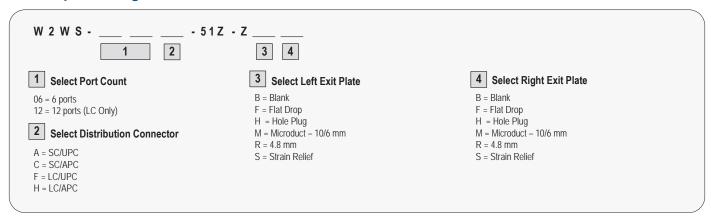


#### **Technical Specifications**

StreetSmart Small Count Fiber Hand-Off Box	
Dimensions	8" H x 8" W x 3" D
Box Option	Plug-and-play or patch only
Output Connector	SC/APC, SC/UPC, LC/UPC, LC/APC or HMFOC
Input Connector	MPO, HMFOC or Patch Only
Cable Entrance	Single entrance for both provider and network
Labeling	Designation label on door
Mounting Options	Pole, Wall or Aerial

# Plug-and-Play

#### **MPO-Input Configured Part Numbers**















Blank

Strain Relief

Hole Plug

Microduct

Flat Drop

4.8 mm

# StreetSmart<sup>™</sup>

## Small Count Fiber Hand-Off Box



# Patch Only

#### **Configured Part Numbers**



1 Select Port Count

06 = 6 ports

12 = 12 ports (LC Only)

2 Select Distribution Connector

A = SC/UPC C = SC/APC

F = LC/UPC H = LC/APC 3 Select Pigtail Assembly
A = IFC Riser

B = OSP Riser Non-Armored

C = IFC Plenum

M = OSP Non-Rated Armored T = Flat Drop Non-Toneable

U = Flat Drop Toneable

4 Select Right Exit Plate

B = Blank

F = Flat Drop

H = Hole Plug

M = Microduct - 10/6 mm

R = 4.8 mm

S = Strain Relief













Blank

Strain Relief

Hole Plug

Microduct

Flat Drop

4.8 mm

## HMFOC to LC/UPC

#### **Configured Part Numbers**

W 2 W S - 1 2 F - 7 1 Z - Z \_\_\_\_ Z XXXXM or XXXXF 1 Select Right Exit Plate 2 | Select Fiber Assembly Length Patch Only Options: XXXXF or XXXXM B = Blank HMFOC Options are Limited to: F = Flat Drop 0001F = 1 Foot H = Hole Plug 0050F = 50 Feet M = Microduct - 10/6 mm 0100F = 100 Feet R = 4.8 mm0200F = 200 Feet S = Strain Relief

#### **Pre-Configured Part Numbers - Mounting Brackets**

Part Number	Description
W2WS-AER-01	Bracket Aerial
W2WS-PMM-01	Bracket Metal Pole, Includes Two Hose Clamps, Supports up to 17.5 Diameter Pole
W2WS-PMW-01	Bracket Wood Pole, Wall Includes Lag Screws

# FieldSmart® SCD TAP Box –



#### **Application**

Engineered to land FTTH fiber terminations as conveniently as possible, the FieldSmart SCD TAP Box is optimized for delivery of FLEXdrop via a FLEXdrop Deploy Reel and Slack Storage Reel. The lockable enclosure is compact and sealed, making it ideal for a variety of applications, including harsh environment locations surrounding the fiber demarcation point. Additional applications include MDU and business class services.

#### Description

The FieldSmart SCD TAP Box offers single or dual count fiber deployment in a discrete footprint and without sacrificing proper fiber management. With the FieldSmart SCD TAP Box, enclosures are designed packaged to make FTTH more cost-effective and efficient than previously thought possible. Standardizing on a craft-friendly, building block architecture reduces the operating costs of fiber deployment by reducing installation times and inventory carrying requirements.

#### **Features and Benefits**

#### Integrity

- · UV Stabilized
- Utilizing the FLEXdrop Deploy Reel, it supports industry standard SC and LC singlemode connectors
- · Dual snap locks to ensure lid seals to base
- · Mounting hole pattern for multiple applications

#### **Protection**

- Designed to comply to GR-771 and NEMA-4
- · Gasket seal
- · Ground lug included

#### Access

- One-Inch on center holes for easy installation of deploy reel mounting pin
- · Easy to install with both internal and external mounting holes
- · Two bottom entry/exit points utilizing multi-purpose strain reliefs
- · Option for adapter mounting bracket

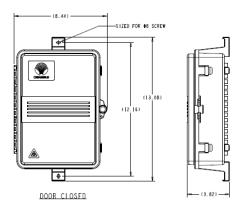
#### Investment

- · Holds up to 200 feet of FLEXdrop on Deploy Reel, with 100 feet of 3mm cable slack storage
- · Surface or pole mount capable
- · Flame retardant PVC for durability

#### **Pre-Configured Part Numbers**

Part Number	Description
FDRB-ZZZZ-MGLZ	Plastic, NEMA 4 SCD TAP Box, L-Bracket (No Adapter), 3/4" Adapter and Grommet
FDRB-ZZZZ-HHZH	Plastic, NEMA 4 SCD TAP Box, Deploy Reel Mounting Plate with No Adapters, Strain Relief and Strain Relief
FDRB-ZZZZ-HHLZ	Plastic, NEMA 4 SCD TAP Box, L-Bracket (No Adapter), Strain Relief and Strain Relief





# FieldSmart® Mini TAP Box —



#### **Application**

Engineered to land FTTH terminations as conveniently as possible, the FieldSmart Mini TAP Box is optimized for delivery of FieldShield® FLEXdrop® via a FLEXdrop Deploy Reel and Slack Storage Reel. The lockable enclosure is compact and sealed, making it ideal for a variety of applications, including harsh environment locations surrounding the fiber demarcation point.

#### **Description**

The FieldSmart Mini TAP Box offers single or dual count fiber deployment in a discrete footprint and without sacrificing proper fiber management. The FieldSmart Mini TAP Box is designed to make FTTH more cost-effective and efficient than previously thought possible. Standardizing on a craft-friendly, building block architecture reduces the operating costs of fiber deployments by reducing installation times and inventory carrying requirements.

#### **Features and Benefits**

#### Integrity

- · UV Stabilized
- Supports industry standard SC and LC singlemode connectors with the FLEXdrop Deploy Reel
- · Dual snap locks ensure lid seals to base
- · Mounting hole pattern for multiple applications

#### Protection

- · Designed to comply to GR-771 and NEMA-4
- Gasket seal
- · Ground lug included

#### Access

- · One-Inch on center holes for easy installation of deploy reel mounting pin
- Easy to install with both internal and external mounting holes
- Two bottom entry/exit points utilizing multi-purpose strain reliefs
- Option for adapter mounting bracket

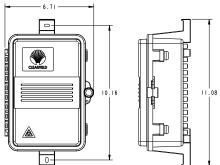
#### Investment

- · Holds up to 100 feet of FLEXdrop on Deploy Reel, with 50 feet of 3mm cable slack storage
- · Surface or pole mount capable
- · Flame retardant PVC for durability

#### **Pre-Configured Part Numbers**

Part Number	Description
FDRG-ZZZZ-MGLZ	Mini-TAP Box, L-Bracket (No Adapter), 3/4" Adapter and Grommet
FDRG-ZZZZ-HHZH	Mini-TAP Box, Deploy Reel Mounting Plate with No Adapters, Strain Relief and Strain Relief
FDRG-ZZZZ-HHLZ	Mini-TAP Box, L-Bracket (No Adapter), Strain Relief and Strain Relief





# Test Access Point (TAP) Box



#### **Application**

The CraftSmart Test Access Point (TAP) Box gives the service provider an accessible exterior access point to test fiber integrity before it enters the customer premise. This solution allows the service provider the ability to identify potential issues in conductivity from outside of the customer premise location.

#### Description

The CraftSmart TAP Box is a two part closure that will accommodate up to four fibers for test and access purposes. The base of the unit will allow up to four splices from the feeder cable to individual drops into the customer premise. Duplex SC adapters allow for installation of pre-terminated or field terminated fiber to be connectorized for test and access of the fiber - to determine feeder and drop issues.

Two grommeted in/out ports on the bottom of the unit provide easy installation of both feeder and drop cables. The unit is lockable to minimize customer tampering. There are grounding options available inside the TAP Box that will allow grounding of the feeder and drop cables. It also has built in access to exterior grounding built into the unit. Multiple mounting options are available to meet all applications. The TAP Box is available with private labeling on the front cover to easily identify service provider's identification.



#### **Features and Benefits**

#### Integrity

- · Fiber terminations are designed, tested and certified to Telcordia and RUS compliant
- · Supports industry standard SC singlemode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspections

#### Protection

- · Overlapping cover seals unit from environmental elements
- · Two rubber grommets provide sealing of feeder and drop cables
- · Lock hole provided for reduced tampering
- · Enclosure made of high-impact UV resistant thermal plastic material to resist and withstand corrosive environments
- · Designed to meet NEMA 3 criteria
- · Integrated fiber management protects fiber from micro and macro damage
- Special coupler available for use with FieldShield® Microduct

#### Access

- · Slide on cover allows for easy access to closure
- · Rubber grommets allow for easy installation of feeder and drop cables
- · Grounding bar inside of unit allows for grounding of feeder and drop cables, as well as built in accessibility to exterior grounding
- Dual SC adapters (one or two) allows for easy access for testing and troubleshooting
- · Available in SC/APC, SC/UPC, LC/APC or LC/UPC
- · Wall and pole mount applications available
- · Built in splice tray allows for maximum flexibility

#### Investment

- · Available with pre-terminated feeder and drop cables, which minimizes splicing and connectorization field costs
- Patch and splice (Clearfield's in-cassette splicing solution) compatible
- Available all hours of the day, without customer needing to be there to identify potential problems

# Test Access Point (TAP) Box -



#### **Technical Specifications**

CraftSmart Test Access Point (TAP) Boxes	
Dimensions	7.3" H x 8.57" W x 1.67" D (185.42 mm x 217.68 mm x 42.42 mm)
Connector Availability/ Capacity	Empty: No connector One dual SC/APC or SC/UPC; two dual SC/APC or SC/UPC; quad LC/UPC or LC/APC; two quad LC/UPC or LC/APC
Cable Support and Tie Off Options	Not included with TAP Box - MUST BE ORDERED SEPARATELY.  TAP-GL-KIT (one clamp per kit) Strength member tie off kit for flat drop and dielectric cable  TAP-ARM-GL-KIT (one clamp per kit) Ground lug bracket for armored cable - no strength member tie off
Splice Capacity	Four
Cable Entrance/Exit	One on each port (two total). If using FieldShield® Microduct, order one FS-CPLR-10MM-10MM-TAP per exit
Private Labeling	Standard: comes with Clearfield® logo. Private labeling available (500 piece minimum). Contact Clearfield sales representative for details
Pre-terminated Feeder and Drop Cable	Available: Please contact your Clearfield sales representative
Mounting Options	Wall Mount: Standard Vinyl Siding Mount: TAP-VS-KIT Pole Mount: TAP-PM-KIT

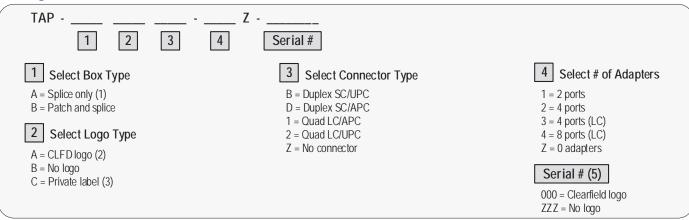






FS-CPLR-10MM-10MM-TAP

#### **Configured Part Numbers**



#### **Ordering Notes**

- 1. Splice only empty box
- 2. Standard product unless noted last three digits will be 000
- 3. 500 piece minimum in effect for custom logo customer must provide artwork to Clearfield®

For pre-terminated feeder and drop cable assemblies, please refer to Clearfield's application guide for ordering information. For custom configurations, please contact your Clearfield sales representative.

# CraftSmart® TAP Splice Box



#### **Description**

The CraftSmart TAP Splice Box supports up to 2 subscribers. It is used as a termination point for the feeder cable to connect with the drop cable in FTTx network system, integrating fiber splicing, distribution, storage and cable connection in one solid protection box.

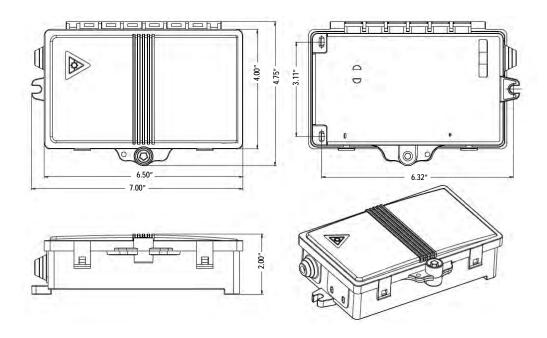
#### **Features and Benefits**

- Total enclosed structure: dust-proof, anti-aging, water-proof design with IP-66 protection level
- Enclosure includes clamping for feeder cable and drop cable, fiber splicing, fiber storage and distribution ports.
- Cable, pigtails, patch cords have distinct cable management route paths for fiber protection. Splice tray and SC adapters are designed for easy installation and maintenance
- Installation options for wall or pole mounting and suitable for both indoor and outdoor uses.
- · 2 ports cable entrance for drop cable.



#### **Technical Specifications**

CraftSmart TAP Splice Box	
Dimensions	4.00 x 6.50 x 1.75 Inches
Weight	2 lbs.
Max. Capacity	SC - 2 Ports, LC - 4 Ports, PLC - 1 x 2 (SC)
Installation Size	6.40 x 3.12 Inches
Material	PC+ ABS
Color	White or Gray



#### **Accessories**

Splice tray and cable management tool, protection sleeves, hose clamp, rubber seal for cable entrance, extra lock and latch key.





# **Pre-Configured Part Numbers**

Part Number	Description
022051	Tap Box, with Splice Tray, Removable Grommets Left and Right, 4 x 6.5 x 1.75", White, Indoor Use
TAPS-SCA	Tap Box, with Splice Tray, with SC/APC Adapter, Removable Grommets Left and Right, 4 x 6.5 x 1.75", White, Indoor Use
TAPS-SCU	Tap Box, with Splice Tray, with SC/UPC Adapter, Removable Grommets Left and Right, 4 x 6.5 x 1.75", White, Indoor Use
022051G	Tap Box, with Splice Tray, Removable Grommets Left and Right, 4 x 6.5 x 1.75", Gray, Outdoor Use
TAPS-SCA-G	Tap Box, with Splice Tray, with SC/APC Adapter, Removable Grommets Left and Right, 4 x 6.5 x 1.75", Gray, Outdoor Use
TAPS-SCU-G	Tap Box, with Splice Tray, with SC/UPC Adapter, Removable Grommets Left and Right, 4 x 6.5 x 1.75", Gray, Outdoor Use

## Fiber Outlet -



#### **Application**

The CraftSmart Fiber Outlet allows for easy demarcation inside the premise and cable management for incoming feeder cable.

#### **Description**

The CraftSmart Fiber Outlet can accommodate 4 entrance points for 3mm cable and up to 4 output of SC adapter ports. The splice cassette is hinged and easily removable for non-splicing applications. This small indoor enclosure provides both bend limiting protection and a secure termination point to connect the entrance fiber to the included equipment jumper.

# CLEARFIELD

#### **Features and Benefits**

#### Integrity

Supports industry standard SC adapters

#### **Protection**

· Snap-on cover for duct free protection

#### Access

- · Easy installation
- · Accommodates 4 adapter ports
- Four cable entrance points

#### Investment

- Cables can be connected without splicing
- · Hinged and detachable splice tray





#### **Technical Specifications**

CraftSmart Fiber Outlet	
Dimensions	3.9 x 3.2 x 1.25 inches (100 x 80 x 32 mm)
Color	White
Operating Temperature	-20°C to 60°C
Material	ABS
Adapter Style Receptacle	SC and LC
Adapter Slots	4 Slots
Accessores	Removable Storage Tray

#### **Pre-Configured Part Numbers**

Part Number	Description
021336	Fiber Outlet, 4 Ports, White
FS-FOB-SPLICEKIT-01	Fiber Outlet Box, SC/APC Prestripped Pigtail 2mm, SC/APC to SC/APC White FLEXdrop, 10 Foot, Splice Sleeve, SC/APC Adapter

# TAP-Splice Home Deployment Kit-



#### **Application**

A CraftSmart Home Deployment Kit (HDK) extends Clearfield's field-proven fiber management expertise and leading-edge fiber connectivity performance all the way into the home. Starting with the Test Access Point (TAP) solution of your choice, the Home Deployment Kit packages the required patch cords, fiber jack (Clearfield's CraftSmart Fiber Outlet) and necessary adapter and splice sleeve installation accessories in a single box. Truck rolls are minimized and customer turn-up is rapid. Choose the CraftSmart TAP-Splice HDK for environments where splicing or patch is needed and minimal slack storage is desired within the unit mounted outside the home.

#### CraftSmart TAP-Splice

The CraftSmart TAP-Splice is a IP-66 patch or splice drop termination point that allows for any type of fiber drop cable to be spliced to an included 1-meter fiber pigtail and plugged into the supplied coupler. This method allows the pre-terminated FLEXdrop entrance fiber to be easily plugged into the TAP-Splice and routed into the home. The 4.0 x 6.5 x 1.75 inch footprint of the CraftSmart TAP-Splice enables providers to discretely place the fiber termination on the side of the home.

#### Integrity

• ĭP-66

#### Protection

- · Clamping for feeder cable and drop cable
- Integrated splice tray

#### Access

- Accepts 10mm microduct and standard flat drop
- Removable rubber entrance/exit grommets

#### Investment

Access available without customer needing to be there to identify potential problems



#### CraftSmart Fiber Outlet

The CraftSmart Fiber Outlet can accommodate 4 entrance points for 3mm cable and up to 4 SC adapter ports. The splice tray is hinged and easily removable for non-splicing applications. This small indoor enclosure provides both bend limiting protection and a secure termination point to connect the entrance fiber to the included equipment jumper.

#### Integrity

- Supports industry standard SC adapters Protection
- Snap-on cover for dust free protection

#### Access

- Easy installation
- Accommodates 4 adapter ports
- · Four cable entrance points

#### Investment

- · Cables can be connected without splicing
- Hinged and detachable splice tray

#### FieldShield FLEXdrop

#### Integrity

- Available in singlemode
- Supports all industry standard connectors

#### Protection

· UL listed for plenum applications for single fiber only

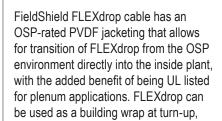
- Passed UV testing and measurement standards per ASTM G155 for UL 1581
- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- OSP rated PVDF jacketing provides ruggedized protection for the patchcord or pigtail
- Staple-ready for walls, joists and around corners, with Crown T-18 staples
- Swellable yarns for water blocking capabilities

#### Acces

- · Standard color is black with an option for off-white
- Suitable for all types of indoor and outdoor implementations (duct required for aerial and direct bury)

#### Investment

 Quick and easy deployment allows capital investment to be aligned to customer take rates



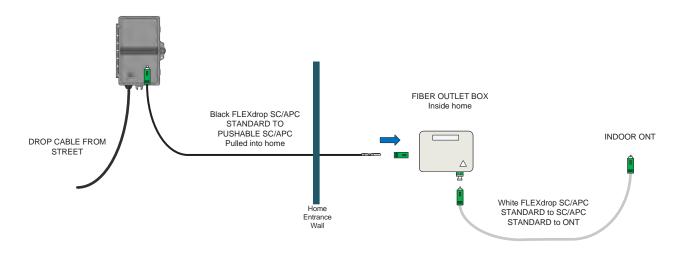
maximizing installation efficiency.



# TAP-Splice Home Deployment Kit-



# CraftSmart TAP-Splice ON EXTERIOR OF HOME



## **Technical Specifications**

CraftSmart TAP Splice Box	
Dimensions	4.00 x 6.50 x 1.75 Inches
Weight	2 lbs.
Rating	IP-66
Max. Capacity	SC - 2 Ports, LC - 4 Ports, PLC - 1 x 2 (SC)
Installation Size	6.40 x 3.12 Inches
Material	PC6710
Color	Gray

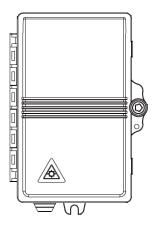
CraftSmart Fiber Outlet		
Dimensions	3.9 x 3.2 x 1.25 inches (100 x 80 x 32 mm)	
Color	White	
Operating Temperature	-20°C to 60°C	
Material	ABS	
Adapter Style Receptacle	SC and LC	
Adapter Slots	4 Slots	
Accessories	Removable Storage Tray	

# TAP-Splice Home Deployment Kit-



# **Configured Part Number**

HDK - EZ 3 4	F F W 8	
1 Select Adapter	3 Select Connector 1 for Entrance	6 Select Connector 1 for Equipment
A = SC/UPC C = SC/APC	A = SC/UPC C = SC/APC	A = SC/UPC C = SC/APC
2 Select Fiber Outlet Adapter A = SC/UPC C = SC/APC	4 Select Connector 2 for Entrance B = Pullable SC/UPC D = Pullable SC/APC	7 Select Connector 2 for Equipment A = SC/UPC C = SC/APC
	5 Select Length	8 Select Length
	2 = 15 ft. 5 = 75 ft. 3 = 25 ft. 6 = 100 ft. 4 = 50 ft.	1 = 10 ft. 2 = 15 ft. 3 = 25 ft.



CraftSmart TAP-Splice Front View



Open with Splice Tray

# Mini TAP Home Deployment Kit



#### **Application**

FieldSmart® Mini TAP Home Deployment Kit (HDK) extends Clearfield®'s field-proven fiber management expertise and leading-edge fiber connectivity performance all the way into the home. With the FleldSmart Mini TAP, the Home Deployment Kit packages the required patch cords, fiber jack (Clearfield's CraftSmart® Fiber Outlet) and necessary adapter installation accessories in a single box. Truck rolls are minimized and customer turn-up is rapid. Choose the FieldSmart Mini TAP HDK for environments where plug-and-play along with internal slack storage is desired within the unit mounted outside the home.

#### FieldSmart Mini TAP

The FieldSmart Mini TAP provides a secure demarcation point between the service provider network and SFU. Mini TAP gives the network service provider both the ability to store slack fiber as well as provide a test access point (TAP) for ease of deployment and network maintenance without needing to have access to the interior of the customer premise. FLEXdrop® Deploy Reel mounts easily on the supplied pin, allowing 50, 75 and 100 feet of pre-connectorized FLEXdrop to be deployed into the premise. With the ability to accept a variety of drop cables with up to 50' of incoming cable slack storage, Mini TAP can be wall or pole mounted, and can be integrated into any network architecture and deployment.

#### Integrity

Supports industry standard SC adapters



#### Protection

- · UV Stable Polycarbonate
- · Snap and screw latching system

#### Access

 Accepts 10mm microduct, 3mm cable, standard flat drop and Small Form Factor FLATdrop

#### Investment

Access available without customer needing to be there to identify potential problems

# The CraftSmart Fiber Outlet can accommodate 4 entrance points for 3mm cable and up to 4 SC adapter ports. The splice tray is hinged and easily removable for non-splicing applications. This small indoor enclosure provides both bend limiting protection and a secure termination point to connect the entrance fiber to the included equipment jumper.

#### **CraftSmart Fiber Outlet**

#### Integrity

 Supports industry standard SC adapters Protection

 Snap-on cover for dust free protection Access

- Easy installation
- Accommodates 4 adapter ports
- Four cable entrance points

#### Investment

- Cables can be connected without splicing
- Hinged and detachable splice tray

#### FieldShield FLEXdrop

#### Integrity

- Available in singlemode
- · Supports all industry standard connectors
- Terminations designed, tested and certified to GR-326
- · FLEXdrop fiber cable designed, tested and certified to GR-20

#### Protection

- UL listed for plenum applications for single fiber only
- Passed UV testing and measurement standards per ASTM G155 for UL 1581
- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- OSP rated PVDF jacketing provides ruggedized protection for the patchcord or pigtail
- Staple-ready for walls, joists and around corners, with Crown T-18 staples
- Swellable yarns for water blocking capabilities

#### Access

- · Standard color is black with an option for off-white
- Suitable for all types of indoor and outdoor implementations (duct required for aerial and direct bury)

#### Investment

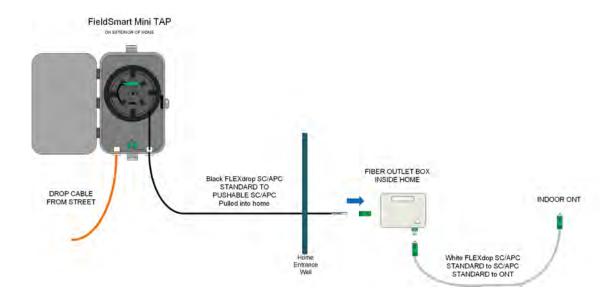
Easy deployment allows capital investment to be aligned to customer take rates



FieldShield® FLEXdrop cable has an OSP-rated PVDF jacketing that allows for transition of FLEXdrop from the OSP environment directly into the inside plant, with the added benefit of being UL listed for plenum applications. FLEXdrop can be used as a building wrap at turn-up, maximizing installation efficiency.

# Mini TAP Home Deployment Kit-





## **Technical Specifications**

FieldSmart Mini TAP		
Dimensions	9" H x 6" W x 3.91" D (228mm x 152mm x 99.31mm)	
Color	Gray	
Rating	GR-771 and Designed for NEMA-4	
Material	UV Stabilized, Flame Retardant Polycarbonate	
Adapter Style Receptacle	SC/APC and SC/UPC	
Port Count	1	
Seals	2 Split Seals for 3mm OD Cable	
Mounting Options	Wall or Pole Mount	

CraftSmart Fiber Outlet	
Dimensions	3.9 x 3.2 x 1.25 inches (100 x 80 x 32 mm)
Color	White
Operating Temperature	-20°C to 60°C
Material	ABS
Adapter Style Receptacle	SC and LC
Adapter Slots	4 Slots
Accessories	Removable Storage Tray

# Mini TAP Home Deployment Kit-



FieldShield FLEXdrop		
Fiber	Corning ClearCurve Optical Fiber or equivalent	
Clad Diameter	$125.0 \pm 0.7  \mu \text{m}$	
Coating Diameter (Uncolored)	235 - 245 μm	
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2	
Color Code	TIA/EIA 598 (US Standard)	
Fiber Count	Single and dual fiber	
Pushable Connectors	FieldShield SC/UPC and SC/APC	
Standard Connectors	SC/UPC and SC/APC	
Mode	Singlemode	
Internal Fiber Size	900 μm	
Outside Diameter	0.118" (3 mm)	
Color	Black or white	
Material	PVDF	
Bend-Radius	Standard to G.657.A2 specifications	
Installation Temperature	-22°F to 131°F (-30°C to 55°C)	
Operating Temperature	-40°F to 176°F (-40°C to 80°C)	
Installation Tension	20 lbf	
Markings	Part number, lot number and footage markers every two feet (609.60 mm)	
Cable Attenuation Spec	0.35 dB/km @ 1310 nm/0.25 dB/km @ 1550 nm	

#### Home Deployment Kits Include:

- FieldSmart Mini TAP
- · CraftSmart Fiber Outlet
- Black Entrance Cable: FLEXdrop Pushable Cable (Configurable adapter and lengths)
- White Equipment Cable: FLEXdrop Pushable Cable (Configurable adapter and lengths)

#### **Configured Part Number**

HDK - G	D FW 9	
1 Select Box Option	4 Select Connector 1 for Entrance	7 Select Connector 1 for Equipment
A = 50 Foot Storage Reel C = Deploy Reel – Adapter Reel	A = SC/UPC C = SC/APC	A = SC/UPC C = SC/APC
Z = None	5 Select Connector 2 for Entrance	8 Select Connector 2 for Equipment
2 Select Adapter A = SC/UPC	B = Pullable SC/UPC D = Pullable SC/APC	A = SC/UPC C = SC/APC
C = SC/APC	6 Select Length	9 Select Length
3 Select Fiber Outlet Adapter	4 = 50 ft. 5 = 75 ft.	A = 2 meters 1 = 10 ft.
A = SC/UPC C = SC/APC	6 = 100 ft.	2 = 15 ft.

# Mini TAP Home Deployment Kit-









Deploy Reel Mounting Plate

Multi-Purpose Strain Relief



Slack Storage Reel-50



FLEXdrop Deploy Reel

# SCD-TAP Home Deployment Kit



#### Application

FleldSmart SCD-TAP Home Deployment Kit (HDK) extends Clearfield's field-proven fiber management expertise and leading-edge fiber connectivity performance all the way into the home. With the FleldSmart SCD-TAP, the Home Deployment Kit packages the required patch cords, fiber jack (Clearfield's CraftSmart Fiber Outlet) and necessary adapter installation accessories in a single box. Truck rolls are minimized and customer turn-up is rapid. Choose the FieldSmart SCD-TAP HDK for environments where plug-and-play along with internal slack storage is desired within the unit mounted outside the home.

#### FieldSmart SCD-TAP

The FieldSmart SCD-TAP provides a secure demarcation point between the service provider network and SFU. SCD-TAP gives the network service provider both the ability to store slack fiber as well as provide a test access point (TAP) for ease of deployment and network maintenance without needing to have access to the interior of the customer premise. FLEXdrop Deploy Reel mounts easily on the supplied pin, allowing 100, 150 and 200 feet of pre-connectorized FLEXdrop to be deployed into the premise. With the ability to accept a variety of drop cables, SCD-TAP can be wall or pole mounted, and can be integrated into any network architecture and deployment.

The CraftSmart Fiber Outlet can

accommodate 4 entrance points for 3mm

cable and up to 4 SC adapter ports. The

splice tray is hinged and easily removable

limiting protection and a secure termination

point to connect the entrance fiber to the

for non-splicing applications. This small

indoor enclosure provides both bend

included equipment jumper.

#### Integrity

- Supports industry standard SC adapters
- Includes entrance points with multi-purpose strain reliefs

#### Protection

- UV Stable Polycarbonate
- Snap and screw latching system

#### Access

 Accepts 10mm microduct, 3mm cable and standard flat drop Investment

Access available without customer needing to be there to identify potential problems



#### CraftSmart Fiber Outlet

#### Integrity

Supports industry standard SC adapters

Protection

#### Protection

Snap-on cover for dust free protection

#### Access

- Easy installation
- Accommodates 4 adapter ports
- Four cable entrance points

#### Investment

- · Cables can be connected without splicing
- · Hinged and detachable splice tray

#### FieldShield FLEXdrop

#### Integrity

- Available in singlemode
- Supports all industry standard connectors
- · Terminations designed, tested and certified to GR-326
- FLEXdrop fiber cable designed, tested and certified to GR-20

#### Protection

- · UL listed for plenum applications for single fiber only
- Passed UV testing and measurement standards per ASTM G155 for UL 1581
- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- OSP rated PVDF jacketing provides ruggedized protection for the patchcord or pigtail
- Staple-ready for walls, joists and around corners, with Crown T-18 staples
- Swellable yarns for water blocking capabilities

#### Access

- Standard color is black with an option for off-white
- Suitable for all types of indoor and outdoor implementations (duct required for aerial and direct bury)

#### Investment

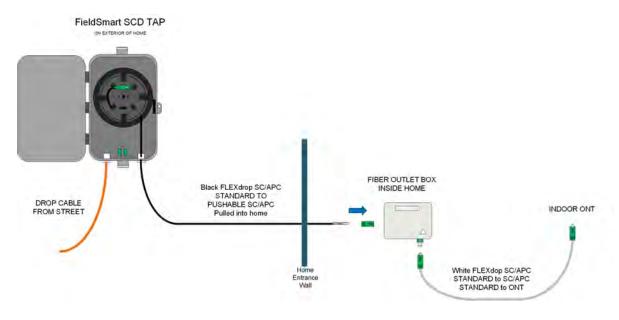
· Easy deployment allows capital investment to be aligned to customer take rates



FieldShield FLEXdrop cable has an OSP-rated PVDF jacketing that allows for transition of FLEXdrop from the OSP environment directly into the inside plant, with the added benefit of being UL listed for plenum applications. FLEXdrop can be used as a building wrap at turn-up, maximizing installation efficiency.

# SCD-TAP Home Deployment Kit-





## **Technical Specifications**

FieldSmart SCD-TAP		
Dimensions	12.17" H x 8.62" W x 3.91" D (309.12mm x 218.95mm x 99.31mm)	
Color	Gray	
Rating	GR-771 and Designed for NEMA-4	
Material	UV Stabilized, Flame Retardant Polycarbonate	
Adapter Style Receptacle	SC/APC and SC/UPC	
Port Count	1	
Seals	2 Split Seals for 3mm OD Cable	
Mounting Options	Wall or Pole Mount	

CraftSmart Fiber Outlet		
Dimensions	3.9 x 3.2 x 1.25 inches (100 x 80 x 32 mm)	
Color	White	
Operating Temperature	-20°C to 60°C	
Material	ABS	
Adapter Style Receptacle	SC and LC	
Adapter Slots	4 Slots	
Accessories	Removable Storage Tray	

# SCD-TAP Home Deployment Kit-



FieldShield FLEXdrop	
Fiber	Corning ClearCurve Optical Fiber or equivalent
Clad Diameter	125.0 ± 0.7 μm
Coating Diameter (Uncolored)	235 - 245 μm
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2
Color Code	TIA/EIA 598 (US Standard)
Fiber Count	Single and dual fiber
Pushable Connectors	FieldShield SC/UPC and SC/APC
Standard Connectors	SC/UPC and SC/APC
Mode	Singlemode
Internal Fiber Size	900 μm
Outside Diameter	0.118" (3 mm)
Color	Black or white
Material	PVDF
Bend-Radius	Standard to G.657.A2 specifications
Installation Temperature	-22°F to 131°F (-30°C to 55°C)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Tension	20 lbf
Markings	Part number, lot number and footage markers every two feet (609.60 mm)
Cable Attenuation Spec	0.35 dB/km @ 1310 nm/0.25 dB/km @ 1550 nm
Recommended Drop Length	150 feet (45.72 m) or less for normal installation conditions

#### Home Deployment Kit Includes:

- FieldSmart SCD-TAP
- · CraftSmart Fiber Outlet
- Black Entrance Cable: FLEXdrop Pushable Fiber (Configurable adapter and lengths)
- White Equipment Cable: FLEXdrop Pushable Fiber (Configurable adapter and lengths)

#### **Configured Part Number**

HDK - D	D FW	
1 Select Box Options  A = 50 Foot Storage Reel B = 100 Foot Storage Reel C = Deploy Reel – Adapter Only	A = SC/UPC C = SC/APC	7 Select Connector 1 for Equipment  A = SC/UPC C = SC/APC
Z = None  2 Select Adapter  A = SC/UPC	5 Select Connector 2 for Entrance  B = Pullable SC/UPC  D = Pullable SC/APC	8 Select Connector 2 for Equipment  A = SC/UPC C = SC/APC
C = SC/APC  3 Select Fiber Outlet Adapter A = SC/UPC C = SC/APC	6 Select Length 4 = 50 Ft. Reel 5 = 75 Ft. Reel 6 = 100 Ft. Reel 7 = 150 Ft. Reel	9 Select Length 1 = 10 ft. 2 = 15 ft. 3 = 25 ft.
	8 = 200 Ft. Reel	

# **FieldSmart**® *SCD-TAP Home Deployment Kit-*



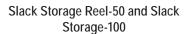




Multi-Purpose Strain Relief









FLEXdrop Deploy Reel

# SeeChange<sup>™</sup>



#### **Application**

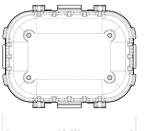
The SeeChange Terminal is Clearfield's small, carrier grade plug-and-play access terminal for use in FTTx applications, including Fiber to Home and Fiber to Business. It's small size also makes it an attractive choice to deliver fiber to cell towers and inside 5G decorative poles. The terminal provides an interface between incoming feeder fiber and single fiber drop cables.

#### Description

The SeeChange Terminal is fully sealed and includes a multifiber MPO input port, 2 or 4 single fiber drop ports and a multifiber MPO express output port. The MPO express output port is used to daisy chain to other SeeChange terminals deeper in the neighborhood. All connections to the terminal are made using SeeChange hardened connectors that can be installed with entry level technicians for quick deployment. SeeChange hardened connectors are ruggedized for OSP applications and meet Clearfield's FiberDeep performance levels for low insertion loss (0.2dB max IL for single fiber and 0.35dB max IL for MPO assemblies). Both centralized split and distributed split configurations are supported by the SeeChange Terminal. The terminal can be deployed below grade in vaults, handholes and flower pots, as well as above grade in pedestals or on a pole, and can be hung overhead on a strand for aerial applications.

# I John

# COC





#### **Features and Benefits**

#### Integrity

- SeeChange Terminal GR-771 Compliant
- · Hardened SeeChange Connectors GR-3120 and GR-3152 compliant
- Supports SeeChange MPO and SeeChange SC/APC connectors

#### Protection

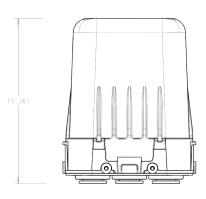
- Environmentally sealed for the harshest OSP environments
- Molded with UV resistant thermoplastic material
- · Above grade, below grade and aerial mounting options
- · Carrier grade GR compliant terminal and connectors

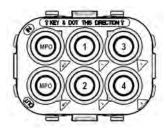
#### Access

- · 1 SeeChange MPO input port
- · 2 or 4 SeeChange SC APC drop ports
- · 1 SeeChange MPO express output port
- · Compact footprint reduces space in handholes and pedestals

#### Investment

- · Strategic configurations to reduce inventory and shorten lead times
- · Repeatable design reduces engineering time
- · Plug-and-play connections speed installations
- · Centralized and distributed split configurations available
- · Supports FTTx or 5G cellular application





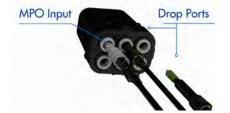




# **Technical Specifications**

SeeChange Terminal		
Dimensions	3 x 4 x 5.5" (83.8mm x 111.8mm x 139.7mm)	
Mounting Options	Below Grade: handhole or flowerpot, Above Grade: Pole or Pedestal with mounting bracket, Aerial: Strand mount with Deltec strap and spacers	
Material	Black UV Resistant Thermoplastic	
Input Port	(1) SeeChange 14 mm MPO	
Drop Ports	(2) or (4) SeeChange 14 mm SC/APC	
Output Express Port	(1) SeeChange 14 mm MPO	
Weight	13.3 ounces	









Below Grade vault, hand hole or flowerpot pedestal





Above grade pedestal and pole mount

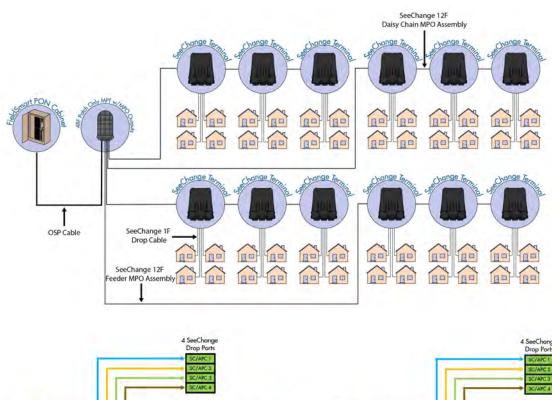


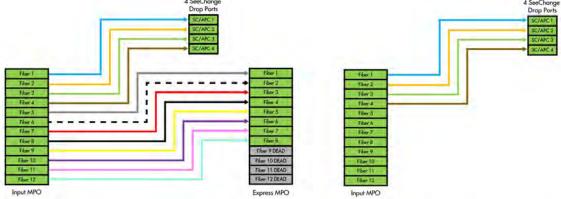
Aerial on a strand with Deltec strap



#### SeeChange Terminal - Centralized Split Applications

SeeChange Terminals can be configured to support centralized split Fiber to the Home (FTTH) architectures. To simplify engineering, the same 4 port SeeChange Terminal can be deployed in a daisy chain configuration where three terminals are combined in series to feed up to 12 homes. This simple to follow daisy chain practice can be repeated for all homes in a serving area.





MPO Drop and Express Terminal Wiring Diagram MPO Drop Terminal Wiring Diagram

#### **Configured Part Numbers**

Application	Description	2-Port Part Number	4-Port Part Number
MPO Drop and Express	SeeChange Terminal with (1) 12F SeeChange MPO input port, 4 SeeChange SC APC drop ports, (1) 12F SeeChange MPO express output port	SCT-M5-02C-105	SCT-M5-04C-085
MPO Drop*	SeeChange Terminal with (1) 12F SeeChange MPO input port, 4 SeeChange SC APC drop ports	SCT-M5-02C-ZZZ	SCT-M5-04C-ZZZ

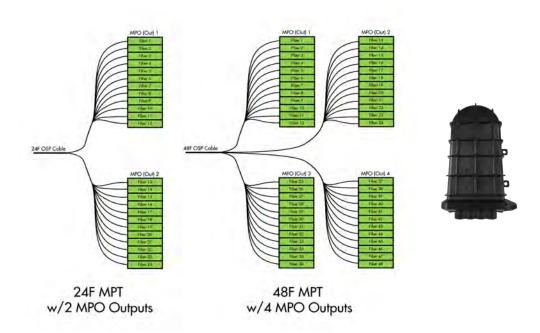
<sup>\*</sup> This configuration can be used as an end terminal in a daisy chain configuration or as a stand-alone drop terminal for Fiber to the Home, Business or 5G Smartpole applications





# MPT Terminal - Centralized Split Applications

In centralized split applications, the MPT Terminal can be deployed between the FDH splitter cabinet and SeeChange Terminals. Rather than home running SeeChange Terminals back to the FDH cabinet, the MPT acts as a consolidation point for clusters of SeeChange Terminals in a neighborhood. The MPT is configured with either a 24, 48, 72 or 96 fiber cable stub which is routed to the FDH cabinet.



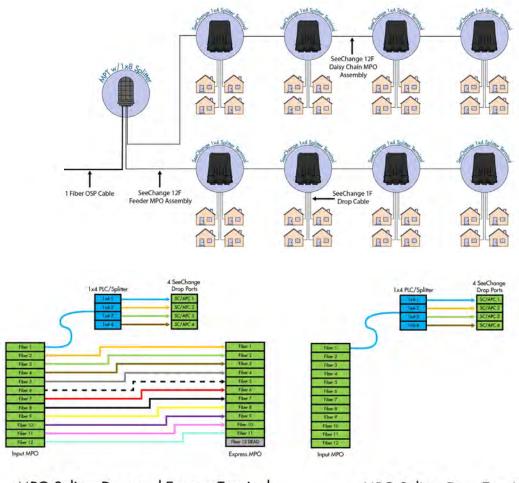
#### **Configured Part Numbers**

Description	Number of MPO Outputs	Armored Ribbon OSP	Non-Armored Ribbon OSP
24 MPT with 500 ft. Tail	2	MPT-245-Z2M-ZZH 0500F	MPT-245-Z2E-ZZH 0500F
24 MPT with 1,500 ft. Tail	2	MPT-245-Z2M-ZZH 1500F	MPT-245-Z2E-ZZH 1500F
48 MPT with 500 ft. Tail	4	MPT-485-Z2M-ZZH 0500F	MPT-485-Z2E-ZZH 0500F
48 MPT with 1,500 ft. Tail	4	MPT-485-Z2M-ZZH 1500F	MPT-485-Z2E-ZZH 1500F
72 MPT with 500 ft. Tail	6	MPT-725-Z2M-ZZH 0500F	MPT-725-Z2E-ZZH 0500F
72 MPT with 1,500 ft. Tail	6	MPT-725-Z2M-ZZH 1500F	MPT-725-Z2E-ZZH 1500F
96 MPT with 500 ft. Tail	8	MPT-965-Z2M-ZZH 0500F	MPT-0965-Z2E-ZZH 0500F
96 MPT with 1,500 ft. Tail	8	MPT-965-Z2M-ZZH 1500F	MPT-0965-Z2E-ZZH 1500F



#### **SeeChange Terminal - Distributed Split Applications**

SeeChange Terminals can be configured to support distributed split Fiber to the Home (FTTH) architectures. To simplify engineering, the same 4 port SeeChange terminal can be deployed in a daisy chain configuration where four terminals are combined in series to feed up to 16 homes. This simple to follow daisy chain practice can be repeated for all homes in a serving area.



MPO Splitter Drop and Express Terminal Wiring Diagram

MPO Splitter Drop Terminal Wiring Diagram

#### **Configured Part Numbers**

Application	Description	2-Port Part Number	4-Port Part Number
MPO Drop and Express	SeeChange Terminal with (1) 12F SeeChange MPO input port, 1x4 Splitter, 4 SeeChange SC APC drop ports, (1) 12F SeeChange MPO express output port	SCT-M5-02C- EZZ-115	SCT-M5-04C-8ZZ-115
MPO Drop*	SeeChange Terminal with (1) 12F SeeChange MPO input port, 1x4 Splitter, 4 SeeChange SC APC drop ports	SCT-M5-02C-EZZ	SCT-M5-04C-8ZZ

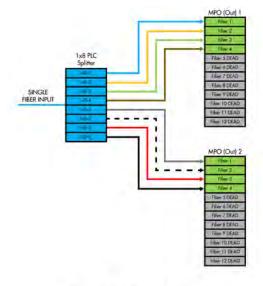


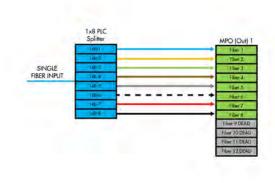
<sup>\*</sup> This configuration can be used as an end terminal in a daisy chain configuration or as a stand-alone drop terminal for Fiber to the Home, Business or 5G Smartpole applications.



#### **MPT Terminal - Distributed Split Applications**

In distributed split applications, the MPT Terminal can be deployed between the Central Office OLT and SeeChange terminals. A single fiber is routed to the input of the MPT where it is spliced to a 1x8 splitter. The outputs of the splitter are wired internally to MPO output ports. The MPT acts as a consolidation point for clusters of SeeChange Terminals in a neighborhood.







MPT w/1x8 Splitter and (2) MPO Output

MPT w/1x8 Splitter and (1) MPO Output

#### **Pre-Configured Part Numbers**

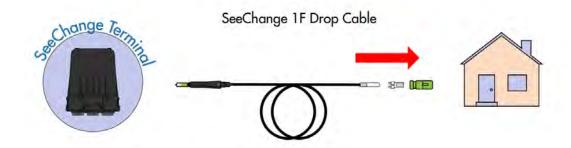
Part Number	Application	Description
MPT-085-Z1F-5ZS-01	Interface between Central Office OLT and SeeChange Terminals	MPT loaded with (1) 1 x 8 splitter. Single input fiber is spliced to internal splitter with (2) 4 fiber MPOs output ports
MPT-085-Z1F-5ZH-01	Interface between Central Office OLT and SeeChange Terminals	MPT loaded with (1) 1 x 8 splitter. Single input fiber is spliced to internal splitter with (1) 8 fiber MPO output port



#### **SeeChange Assemblies**

#### **SeeChange Hybrid Drop Assemblies**

Single Fiber SeeChange Hybrid Drop Assemblies are used between drop ports on the SeeChange Terminal and the NID (Network Interface Device) or TAP box at the home. One end of the assembly is terminated with the SeeChange SC APC connector. The opposite end is terminated with a FieldShield pushable SC APC connector which can be pulled inside a conduit direct buried or hung aerially. SeeChange Hybrid Drop Assemblies are available with FieldShield Small Form Factor (SFF) FLATdrop 900µm peelable cable. Standard lengths of 100, 150, 200, 250, 300, 350, 400, 450 and 500 feet long and can be ordered with or without a tone wire.



#### **Configured Part Numbers**

Cable Type	Connector at Terminal	Connector at House	Toneable Cable	Non-Toneable Cable
FieldShield Small Form Factor FLATdrop with 900 um Peelable Sub-unit	SeeChange SC/APC	Pushable SC/APC	SEE-41-001-C2ZZ-D3A xxxxF	SEE-31-001-C2ZZ-D3A xxxxF

SeeChange Drop Cables are available in standard lengths of 100, 150, 200, 250, 300, 350, 400, 450 and 500 feet.

#### SFF Pushable SC Pulling Bullet

The SC/APC end of the drop cable is protected during installation with a bullet case and eye loop with string. The pull string eye loop is rated for 50 lbs. maximum pull force. When using the FS-PUL-5-9-MM pulling sock accessory, the rated maximum force is 100 lbs. The minimum recommended conduit size for SeeChange Hybrid Drop Assemblies is ¾" diameter.



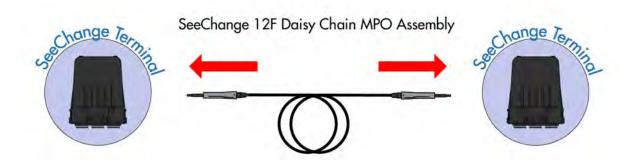


Scan for Pulling Bullet Video.



#### **SeeChange Daisy Chain Assemblies**

Twelve Fiber SeeChange Daisy Chain Assemblies are used between two SeeChange Terminals when expressing output fibers from one terminal to the input of the other terminal. Both ends of the assembly are terminated with SeeChange MPO connectors. SeeChange MPO Daisy Chain Assemblies are available with conventional 12 fiber flat drop cable. Standard lengths of 100, 150, 200, 250, 300, 400 and 500 feet long and can be ordered with or without a tone wire. The minimum recommended conduit size for SeeChange Daisy Chain Assemblies is 1 ½" diameter.



#### **Configured Part Numbers**

Cable Type	Connector at Terminal 1	Connector at Terminal 2	Toneable Cable	Non-Toneable Cable
Conventional 12F Flat Drop	SeeChange MPO	SeeChange MPO	SEE-U1-012-62ZZ-62ZZ xxxxF	SEE-T1-012-62ZZ-62ZZ xxxxF

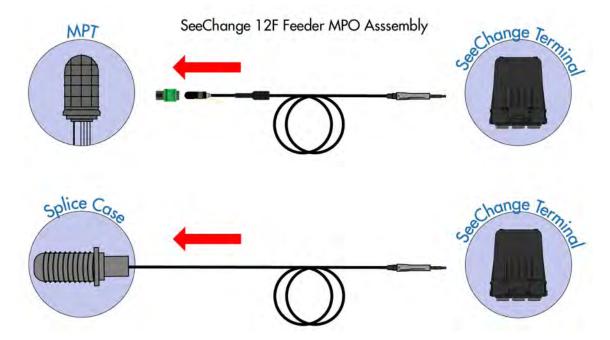
SeeChange MPO Daisy Chain Cable Assemblies are available in standard lengths of 10, 100, 150, 200, 250, 300, 400 and 500 feet



#### **SeeChange Hybrid MPO Feeder Assemblies**

12 Fiber SeeChange Hybrid MPO Feeder Assemblies are used between a YOURx Multi-Purpose Terminal (MPT) and a SeeChange Terminal. One end of the assembly is terminated with a SeeChange MPO connector. The opposite end is terminated with a 12 fiber pushable MPO to connect into the ports of the MPT terminal. SeeChange Hybrid MPO Feeder Assemblies are available with conventional 12 fiber flat drop cable. Standard lengths of 100, 150, 200, 250, 300, 400 and 500 feet long and can be ordered with or without a tone wire.

For some applications, the SeeChange Terminal feeder cable is spliced directly into the network in place of routing to an MPT terminal. In this situation, the SeeChange MPO feeder will be terminated with a SeeChange MPO connector on one end with no connector on the other end.



#### **Configured Part Numbers**

Cable Type	Connector at MPT or Splice Case	Connector at SeeChange Terminal	Toneable Cable	Non-Toneable Cable
Conventional 12F Flat Drop	Pushable MPO	SeeChange MPO	SEE-U1-012-62ZZ- PQD xxxxF	SEE-T1-012-62ZZ-PQD xxxxF
Conventional 12F Flat Drop	None/Blunt End	SeeChange MPO	SEE-U1-012-62ZZ-ZZZ xxxxF	SEE-T1-012-62ZZ-ZZZ xxxxF

Pushable MPO to SeeChange MPO Cables are available in standard lengths of 100, 150, 200, 250, 300, 400 and 500 feet

# SeeChange<sup>™</sup> Terminal - Accessories



Accessory	Part Number	Description	Picture
Terminal Mounting Bracket	SCT-MTG- BRACKET	Terminal L-Mounting Bracket, plate and wing nut for pole, wall or pedestal mount	
Aerial Mounting Clip	SCT-AER- BRACKET	Spacer clip for strand mounting using Deltec strap (not provided) and locking clip (not provided)	
SeeChange Connector Cleaning Kit	SCT-CLEANING- KIT	Includes click style SC and MPO cleaners and wash pen	See Kit Items Below:
SC Cleaner	SCT-SCAPC- CLEANER	Click style SC connector cleaner	
MPO Cleaner	SCT-MPO- CLEANER	Click style MPO connector cleaner	70-
Connector Wash Pen	SCT-WASH-PEN	Wash Pen	ELECTRO-WASH 42
SeeChange End- Face Inspection Kit	SCT-SCOPE-KIT	Includes LighTel scope, SC long neck tip and MPO long neck tip	See Kit Items Below:
Optical Scope	SCT-SCOPE	End Face Scope-LighTel	
Long Neck SC Inspection Tip	SCT-SCOPE-TIP- SCAPC	SC Long Neck end face inspection tip	
Long Neck MPO Inspection Tip	SCT-SCOPE-TIP- MPO	MPO Long Neck end face inspection tip	
Pull Sock Drop Cables	FS-PUL-5-9MM	Pulling Sock for pushable SC SFF drop cables, 100 lb. max. pull force	

# SeeChange<sup>™</sup> Terminal - Accessories



Accessory	Part Number	Description	Picture
Pull Sock MPO Cables	SEE-PULLING- SOCK	Pulling sock for SeeChange MPO connectors, 50 lb. max. pull force	
Protection Sleeve Kit	SEE-CONN- PROTECT-10	(10) reusable protective microduct sleeve to cover connector ends during installation	
SeeChange SC Test Cable	SEE-TEST- SCAPC- SEESCAPC-2F	Test cable, SeeChange SC/APC to standard SC/APC, 2 feet long	
SeeChange MPO Test Cable	SEE-TEST-MPO- SEEMPO-2F	Test cable, SeeChange MPO female to standard MPO Female, 2 feet long	
SeeChange MPO Breakout Test Cable	SEE-TEST-SCAPC- SEEMPO-2F	Test cable, SeeChange MPO female to 12 standard SC APC connectors, 2 feet long	

# **SeeChange**<sup>™</sup> *Hardened Fiber Assemblies*



#### **Application**

SeeChange Hardened Fiber Assemblies are used to make connections to Clearfield's SeeChange Access Terminals in FTTx applications including Fiber to the Home and Fiber to the Business. The assemblies provide a means of connecting multi-fiber cables between terminals or single fiber drop cables from a SeeChange Terminal to a home or business.

#### Description

SeeChange Hardened Fiber Assemblies are available with either a multi-fiber MPO connector or a single fiber SC APC connector. An integrated rear shell provides the feature that engages and fully seals a connection to a SeeChange Terminal FlexPort. The connection is ideal for harsh OSP environments and is rated for installations below grade or above grade including aerial installations on strands. Both connector styles are easily pushed into open terminal ports without any tools, making it a perfect for quick installations using entry level technicians. Single Fiber SeeChange Hardened Drop Cables are configured with a pushable SC APC connector on one end, allowing for placing and pushing through a conduit, in addition to the traditional deployments of direct bury or placing aerially.



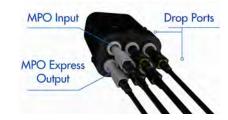
SeeChange Hardened Fiber Assemblies meet Clearfield's FiberDeep performance levels for low insertion loss (0.2dB max IL for single fiber and 0.35 max IL for MPO assemblies). Rigorous carrier grade testing has been performed on both connector styles ensuring optimal system performance long into the future.

SeeChange hardened single fiber drop assemblies are available with FieldShield Small Form Factor (SFF) FLATdrop 900µm peelable subunit. SeeChange MPO Assemblies are manufactured using industry standard multifiber flat drop cable. All SeeChange cable assemblies are available with or without a tone wire.

FieldShield Small Form Factor FLATdrop 900µm Peelable is a uniquely smaller footprint flat drop solution for the access portion of a FTTH or FTTB network. The small format handles more easily than traditional flat drop, allowing for less coiled storage space in outdoor storage. When the jacket is snipped and easily peeled away, the exposed 900µm subunit stores neatly on the compact FieldShield slack reel.







#### **Features and Benefits**

#### Integrity

- SeeChange Connectors are GR-3120 and GR-3150 compliant
- · SeeChange Cables are GR-20 compliant
- FiberDeep ensures low Insertion Loss (0.2 dB max SC APC, 0.35 max MPO)

#### Protection

- · SeeChange Assemblies provide an air-tight, water-tight connections when plugged into SeeChange terminal FlexPorts
- · Molded with UV resistant thermoplastic material
- · Connectors rated for above grade, below grade and aerial mounting conditions

#### Access

- Connectors are keyed for easy push on installation
- 8" SFF cable coil diameter reduces space in handholes and pedestals
- Toneable cable options provide for traceability





#### Investment

- · Strategic configurations to reduce inventory
- · Plug and Play connections speed installations
- SeeChange Hardened Cable Assemblies are carrier grade

#### **Technical Specifications**

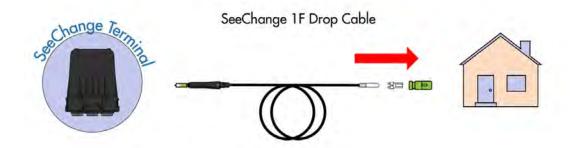
Cable Type	Single Fiber FieldShield Small Form Factor FLATdrop 900 µm Peelable	12 Fiber Conventional Flat Drop
Sheath Diameter	5.4 mm x 3 mm	8.3 mm x 4.7 mm
Coil Diameter	8"	12"
Sub-Unit Size	900 µm	N/A
Sub-Unit Slack Storage	Up to 100 Feet on Reel	N/A
Connector Styles	SeeChange SC/APC or Pushable SC/APC	SeeChange MPO or Stub/Pigtail
Aerial	Yes	Yes
Buried Environment	Yes	Yes
Conduit Size	3/4" minimum for SC/APC Bullet	1 1/4" minimum for SeeChange MPO Conn.
Recommended P-Clamp	022751	021716
Operating Temperatures	-40°F to 176°F (-40°C to 80°C)	-40°F to 176°F (-40°C to 80°C)



#### SeeChange Assemblies

#### SeeChange Hybrid Drop Assemblies

Single Fiber SeeChange Hybrid Drop Assemblies are used between drop ports on the SeeChange Terminal and the NID (Network Interface Device) or TAP box at the home. One end of the assembly is terminated with the SeeChange SC APC connector. The opposite end is terminated with a FieldShield pushable SC APC connector which can be pulled inside a conduit direct buried or hung aerially. SeeChange Hybrid Drop Assemblies are available with FieldShield Small Form Factor (SFF) FLATdrop 900µm peelable cable. Standard lengths of 100, 150, 200, 250, 300, 350, 400, 450 and 500 feet long and can be ordered with or without a tone wire.



#### **Configured Part Numbers**

Cable Type	Connector at Terminal	Connector at House	Toneable Cable	Non-Toneable Cable
FieldShield Small Form Factor FLATdrop with 900 um Peelable Sub-unit	SeeChange SC/APC	Pushable SC/APC	SEE-41-001-C2ZZ-D3A xxxxF	SEE-31-001-C2ZZ-D3A xxxxF

SeeChange Drop Cables are available in standard lengths of 100, 150, 200, 250, 300, 350, 400, 450 and 500 feet.

#### SFF Pushable SC Pulling Bullet

The SC/APC end of the drop cable is protected during installation with a bullet case and eye loop with string. The pull string eye loop is rated for 50 lbs. maximum pull force. When using the FS-PUL-5-9-MM pulling sock accessory, the rated maximum force is 100 lbs. The minimum recommended conduit size for SeeChange Hybrid Drop Assemblies is ¾" diameter.





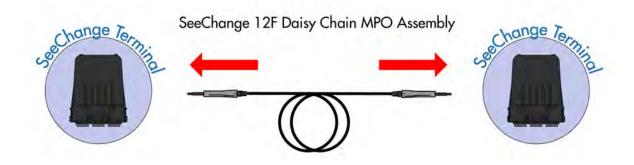
Scan for Pulling Bullet Video.





#### SeeChange Daisy Chain Assemblies

Twelve Fiber SeeChange Daisy Chain Assemblies are used between two SeeChange Terminals when expressing output fibers from one terminal to the input of the other terminal. Both ends of the assembly are terminated with SeeChange MPO connectors. SeeChange MPO Daisy Chain Assemblies are available with conventional 12 fiber flat drop cable. Standard lengths of 100, 150, 200, 250, 300, 400 and 500 feet long and can be ordered with or without a tone wire. The minimum recommended conduit size for SeeChange Daisy Chain Assemblies is 1 ½" diameter.



#### **Configured Part Numbers**

Cable Type	Connector at Terminal 1	Connector at Terminal 2	Toneable Cable	Non-Toneable Cable
Conventional 12F Flat Drop	SeeChange MPO	SeeChange MPO	SEE-U1-012-62ZZ-62ZZ xxxxF	SEE-T1-012-62ZZ-62ZZ xxxxF

SeeChange MPO Daisy Chain Cable Assemblies are available in standard lengths of 10, 100, 150, 200, 250, 300, 400 and 500 feet.

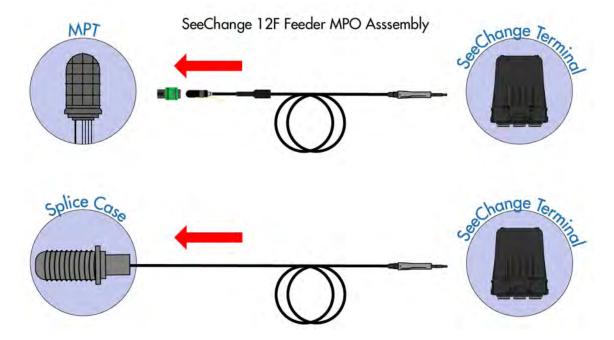
# **SeeChange**<sup>™</sup> Hardened Fiber Assemblies



#### SeeChange Hybrid MPO Feeder Assemblies

12 Fiber SeeChange Hybrid MPO Feeder Assemblies are used between a YOURx Multi-Purpose Terminal (MPT) and a SeeChange Terminal. One end of the assembly is terminated with a SeeChange MPO connector. The opposite end is terminated with a 12 fiber pushable MPO to connect into the ports of the MPT terminal. SeeChange Hybrid MPO Feeder Assemblies are available with conventional 12 fiber flat drop cable. Standard lengths of 100, 150, 200, 250, 300, 400 and 500 feet long and can be ordered with or without a tone wire.

For some applications, the SeeChange Terminal feeder cable is spliced directly into the network in place of routing to an MPT terminal. In this situation, the SeeChange MPO feeder will be terminated with a SeeChange MPO connector on one end with no connector on the other end.



#### **Configured Part Numbers**

Cable Type	Connector at MPT or Splice Case	Connector at SeeChange Terminal	Toneable Cable	Non-Toneable Cable
Conventional 12F Flat Drop	Pushable MPO	SeeChange MPO	SEE-U1-012-62ZZ- PQD xxxxF	SEE-T1-012-62ZZ-PQD xxxxF
Conventional 12F Flat Drop	None/Blunt End	SeeChange MPO	SEE-U1-012-62ZZ-ZZZ xxxxF	SEE-T1-012-62ZZ-ZZZ xxxxF

Pushable MPO to SeeChange MPO Cables are available in standard lengths of 100, 150, 200, 250, 300, 400 and 500 feet

# **SeeChange**<sup>™</sup> *Hardened Fiber Assemblies - Accessories*



Accessory	Part Number	Description	Picture
SeeChange Connector Cleaning Kit	SCT-CLEANING- KIT	Includes click style SC and MPO cleaners and wash pen	See Kit Items Below:
SC Cleaner	SCT-SCAPC- CLEANER	Click style SC connector cleaner	
MPO Cleaner	SCT-MPO- CLEANER	Click style MPO connector cleaner	
Connector Wash Pen	SCT-WASH-PEN	Wash Pen	CLECTRO-WASH 42
SeeChange End- Face Inspection Kit	SCT-SCOPE-KIT	Includes LighTel scope, SC long neck tip and MPO long neck tip	See Kit Items Below:
Optical Scope	SCT-SCOPE	End Face Scope-LighTel	
Long Neck SC Inspection Tip	SCT-SCOPE-TIP- SCAPC	SC Long Neck end face inspection tip	
Long Neck MPO Inspection Tip	SCT-SCOPE-TIP- MPO	MPO Long Neck end face inspection tip	
Pull Sock Drop Cables	FS-PUL-5-9MM	Pulling Sock for Pushable SC SFF drop cables, 100 lb. max. pull force	
Pull Sock MPO Cables	SEE-PULLING- SOCK	Pulling Sock for SeeChange MPO connectors, 50 lb. max. pull force	
Protection Sleeve Kit	SEE-CONN- PROTECT-10	(10) reusable protective microduct sleeve to cover connector ends during installation	

# **SeeChange**<sup>™</sup> *Hardened Fiber Assemblies - Accessories*



Accessory	Part Number	Description	Picture
SeeChange SC Test Cable	SEE-TEST- SCAPC- SEESCAPC-2F	Test Cable, SeeChange SC/APC to standard SC/APC, 2 feet long	
SeeChange MPO Test Cable	SEE-TEST-MPO- SEEMPO-2F	Test Cable, SeeChange MPO female to standard MPO Female, 2 feet long	
SeeChange MPO Breakout Test Cable	SEE-TEST-SCAPC- SEEMPO-2F	Test Cable, SeeChange MPO female to 12 standard SC APC connectors, 2 feet long	

# **YOURx**® *Multi-Purpose Terminal (MPT)*



#### **Application**

Designed for network design flexibility, Clearfield's YOURx Multi-Purpose Terminal (MPT) is optimized for deployments requiring mid-span, fiber drop, splitter or optical component capabilities.

#### Description

The YOURx Multi-Purpose Terminal is a sealed mid-span terminal that will accept cables with a diameter up to 0.7" (17.78mm). The terminal includes eight individual sealed distribution drops with removable tabs - all air and water-tight via YOURx FlexPort technology. The snap-in splice chip will support 12 loose tube splices or 3 mass fusion (36 fibers) splices, with the ability to store up to 8 feet per buffer tube. The terminal cable entry point uses a split sleeve grommet design for easy installation. The slide out adapter plate allows installers easy access for cleaning or testing connectors, if required. The bulkhead allows for mounting of optical components, splitters, WDMs and DWDMs. When accessing the terminal, a standard can wrench is the only tool required. The terminal can be deployed above grade, below grade, on a pole mount, or in an aerial mount.



#### **Features and Benefits**

#### Integrity

- Designed, tested and certified to Telcordia GR-771
- SC and LC Terminations designed, tested and certified to Telcordia GR-326
- MPO Terminations designed, tested and certified to Telcordia GR-1435
- Supports pre-terminated FieldShield FLATdrop, FLEXdrop, StrongFiber or Pushable Fiber assemblies for drops

#### Protection

- · Optimized for use with FieldShield Microduct or FlexConnector
- · FlexConnector provides bend-limiting, strain-relief protection and water-tight seal
- · Black UV resistant thermoplastic design to resist corrosion
- Environmentally sealed terminal providing maximum reliability and durability in the harshest OSP environments

#### Access

- · Fieldshield Pushable Fiber, FieldShield FLATdrop and round cable. (IMPORTANT Be sure to select the correct grommet!)
- Splicing or plug-and-play configuration
- · Optical component solution maximize existing architectures or relief from exhausted fiber scenarios

#### Investment

- · Modular design allows replacement of bulkhead or face plate in case where damage has occurred
- · Flexibility in configuration provides designing network easier, utilizing the same terminal
- Using the patch only stub design allows speed to deployment in plug-and-play design







Patch and Splice

Patch Only





# **Technical Specifications**

YOURx Multi-Purpose Termin	YOURx Multi-Purpose Terminal (MPT)		
Dimensions	12.44"L x 6.76"W x 5.49"H (315.97 mm x 171.70 mm x 139.44 mm)		
	Below Grade — Vaults - V5A-AZP (17" x 30" x 24") or V6A-AZP (24" x 36" x 24")		
Mounting Options  Above Ground — Pedestals - FPP-8820 (8" x 8" with 12" high base), FPP-101020 (10" x 10" whigh base) or FPP-121230 (12" x 12" with 30" high base)			
	Pole or Aerial/Strand		
Internal Slack 8' of 12 fiber buffer tube; Total 48' of 3 mm  Feeder Cable Accepts cable diameter of up to .70" (17.78 mm) IMPORTANT - Be sure to select correct gromm			
		Distribution Ports	Eight 14 mm ports; ports are designed to accept FieldShield FlexConnector
Connector Types SC/APC, SC/UPC, LC/APC, LC/UPC and MPO Duplex			
Material	Black UV Resistant Thermoplastic		
Weight	4 lbs.		

# **Application: Mid-Span with Spliced Drops (No Connectors, No Adapters)**



M P T Z - ZZZ - Z	2 3	
1 Select Z Distribution Port Count	2 Select Mounting Bracket	3 Select Grommet for Incoming Cable
00 = No Flex Ports 02 = 2 Port 04 = 4 Port 08 = 8 Port	A = Aerial (Included) P = Pole Mount (Included) S = Pedestal (Included) Z = No Bracket	H = Round Cable (0.45 to 0.70" diameter) S = FieldShield Pushable Fiber, FLATdrop, or round cable (.44" or less)
(		* IMPORTANT- Be sure to select correct grommet

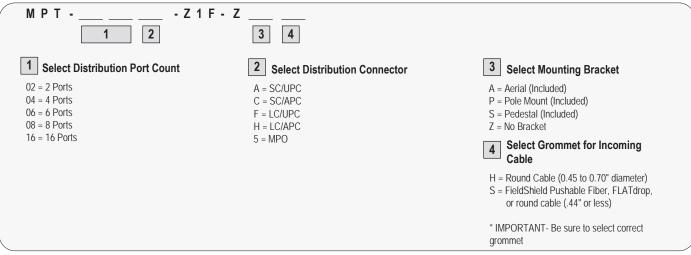
# **YOURx**®

# Multi-Purpose Terminal (MPT)



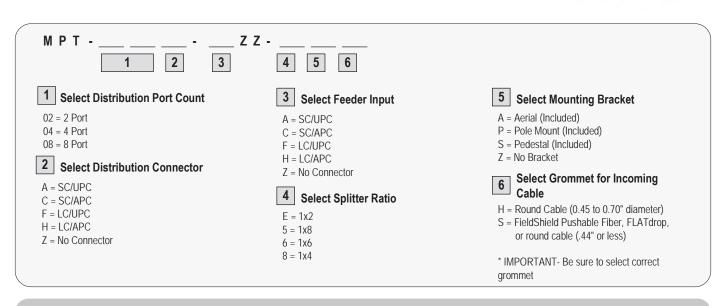
#### Application: Mid-Span With Patch and Splice Drops





#### **Application: Mid-Span Splitter Option with Connectorized Drops**





# YOURx®

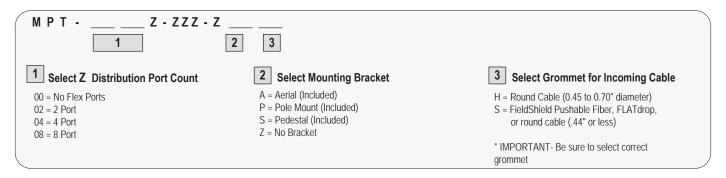
# Multi-Purpose Terminal (MPT)



Application: Mid-Span Splitter Option with Spliced Drops (No Connectors, No Adapters)



#### 1. Order Empty Terminal



#### 2. Order Splitter (Unterminated)

Splitter Ratio	Part Number
1 x 2	006529
1 x 4	040482
1 x 8	040252



#### Application: WDM or DWDM with Mid-Span — Business Class

WDM or DWDM = Contact Clearfield for correct configurations at 1-800-422-2537





Part Number	Description	Image
020996	Grommet for Round Cable OD 0.45 to 0.70"  IMPORTANT- Be sure to select correct grommet	
021263	Grommet for Flat, FieldShield or Round Cable with OD 0.44" or less IMPORTANT- Be sure to select correct grommet	
MPT-PED-BRACKET	Supports pedestal and vault mounting.  Pedestal Mounting: Will mount in FPP-8820, FPP-101020, FPP-121230	11
MPT-AER-BRACKET	Aerial Mounting: Bug nuts included. When assembled height is 10.00".	E <sub>m</sub>
MPT-PWD-BRACKET	Supports pole (wood and metal) and wall  * For metal pole applications, order Hose Clamp Straps (P/N 013034) sold separately	
FS-FIFC-103-6PAK	Field Installable FlexConnector, 10mm Port, 3mm Cable, Black Grommet, 6 Pack (FLEXdrop and FieldShield)	_
FS-FIFC-143-6PAK	Field Installable FlexConnector, 14mm Port, 3mm Cable, Black Grommet, 6 Pack, Required for Pushable MPO	
FSH-FIFC-4PAK	Field Installable FlexConnector, 10mm, 3mm Cable (FLATdrop)	
MPT-GROUNDING-01	Grounding Kit	
MPT-BONDING-01	Bonding Kit	





#### **Application**

The YOURx-Terminal improves the customer application and craft-experience by providing an access terminal capable of 16 drops, two feeder ports for mid-span and daisy-chaining scenarios, along with a fully protected and restorable pathway from the YOURx-Terminal to the YOURx-TAP using the Clearfield\* design methodology of a modular and flexible approach that scales across the application environment.

#### Description

The YOURx-Terminal provides up to sixteen drops ports along with two 10mm feeder ports and two 14mm feeder ports – all air/water tight via YOURx FlexPort technology and accepting all industry standard connectors. The modular approach of the YOURx-Terminal comes in the removable, configurable FlexCartridge. Configure the fiber ports to meet the deployment application, then if future requirements change, remove the FlexCartridge and snap in a replacement – without any disruption to the base unit.



Ducts are simply brought to the YOURx-Terminal, trimmed to length and pushed into the YOURx FlexPorts on the base of the terminal - completing the protected pathway. Fiber is now pulled or pushed from the customer premise to the "inside" of the YOURx-Terminal, where the connector assembly is completed and mated.

#### **Features and Benefits**

#### Integrity

- · Designed, tested and certified to GR-771
- Terminations designed, tested and certified to GR-326 and GR-1435
- Supports FieldShield Pushable/Pullable SC Connectors for drop applications
- Supports pre-terminated FieldShield FLATdrop, FieldShield FLEXdrop,
   FieldShield StrongFiber or FieldShield Pushable Fiber assemblies for individual drop applications
- 100% performance tested for insertion loss, return loss and final mechanical inspection

#### Protection

- Optimized for use with FieldShield Microduct and Pushable Fiber solutions
- Designed using black UV resistant thermoplastic material
- · Environmentally sealed terminal providing maximum reliability and durability in the harshest OSP environments
- FieldShield FlexConnector provides bend-limiting, strain-relief protection and water-tight seal for FieldShield Cables

#### Access

- Accepts up to sixteen 10 mm distribution ports (for 10 mm FieldShield Microduct or FieldShield FLATdrop)
- Accepts up to two 14 mm feeder ports (for 14 mm FieldShield Microduct)
- Accepts up to two 10 mm feeder ports (for 10 mm FieldShield Microduct or FieldShield FLATdrop)
- · Compact sealed design allows placement above or below grade
- · Plug-and-play configurations accept both FieldShield FLATdrop and FieldShield Cable Assemblies
- · Optical component solutions maximize existing architectures and relief for fiber exhaust scenarios

#### Investment

- Modular cartridge for upgrade or repair
- · Flexibility in configuration provides maximum scalability across multiple services classes and network applications
- Compatible with all of FieldShield drop cable options, which reduces installation time and labor costs by removing expensive splicing labor from the YOURx-Terminal to customer premise
- Pre-terminated factory polished drop cables improve network operability across multiple network access points



MPO Terminal



Patch Only Terminal



7.31

**Express Terminal** 



**Splitter Terminal** 

1-800-422-2537





#### **Technical Specifications**

YOURx-Terminal	
Dimensions	7.14"W x 6.74" D x 7.31" H (181.36 mm x 171.20 mm x 185.67 mm)
Weight	2.35 lbs.
Material	Black UV resistant Thermoplastic
Mounting Options (Brackets ordered separately. See accessories for options)	Below Grade: vault ( part number: FPB1220) Above Grade: pedestal, pole mount or aerial/strand
External Slack Storage	Virtually unlimited - depends on vault size or mounting application
Feeder Ports	Two 14 mm FlexPorts and two 10 mm FlexPorts
Distribution Ports	16, 10 mm FlexPorts
Connector Types	SC/APC, SC/UPC, LC/APC, LC/UPC

#### YOURx-Terminal - MPO

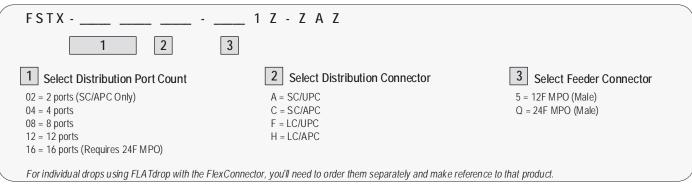
#### **Application: MPO Feeder with Drops**



Example Above: 12 fiber MPO feeder with 4 SC/APC drops.

Terminal Part Number: FSTX-04C-51Z-ZAZ

#### **YOURx-Terminal - MPO Configured Part Number**



Mounting Brackets sold separately. See Accessory section.





## YOURx-Terminal - Patch Only

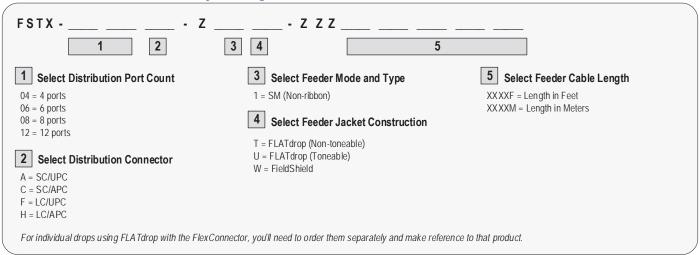
#### **Application: Pre-terminated Patch Only and Drops**



Example Above: Factory installed 150' 12 fiber flat drop toneable feeder with 4 SC/APC drops.

Terminal Part Number: FSTX-04C-Z1U-ZZZ 0150F

#### **YOURx-Terminal - Patch Only Configured Terminal**







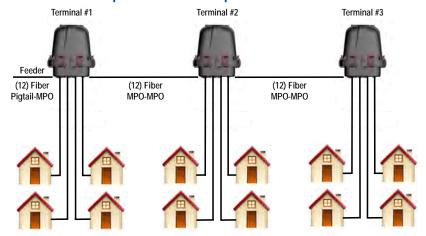
\* 12 Fiber MPO-MPO

Assemblies between

Terminals simplifies installation.

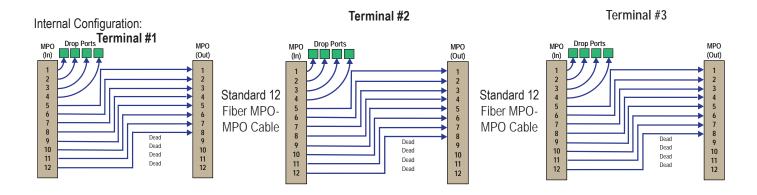
#### YOURx-Terminal — Expressed/Daisy Chain

#### Application: MPO Feeder with Drops and MPO Expressed Out



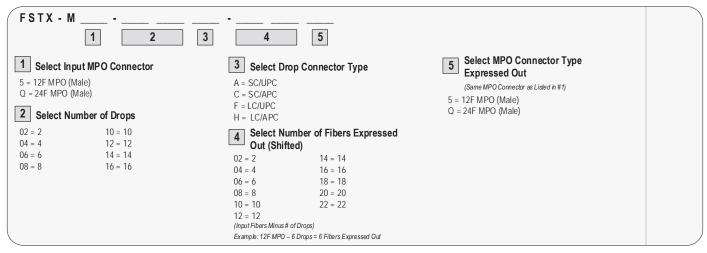
Example above: 12 fiber MPO feeder with 4 SC/APC drops and remaining fibers expressed out

Terminals Part Numbers: FSTX-12X-51Z-ZZZ-03



Advantage: Same terminal, only one part number to maintain, simplifying the installation.

## **YOURx-Terminal - Expressed Configured Terminal With 12F MPO Input**

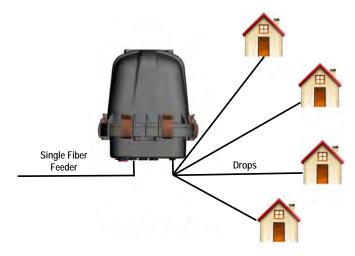






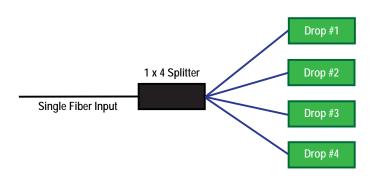
## YOURx-Terminal - Splitter

#### **Application: Single Fiber Feeder with Drops**



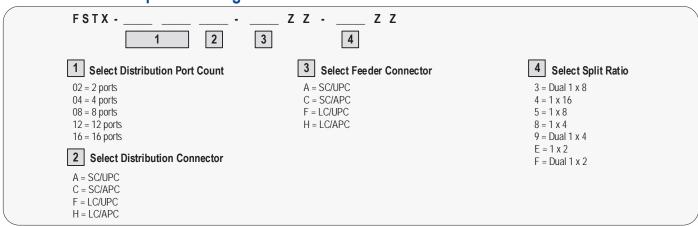
Example Above: Single fiber feeder with SC/APC 1x4 splitter and 4 SC/APC drops.

Terminal Part Number: FSTX-04C-CZZ-8ZZ



Internal Cabling in YOURx-Terminal.

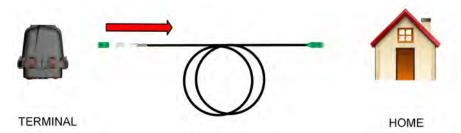
#### **YOURx-Terminal - Splitter Configured Terminal**





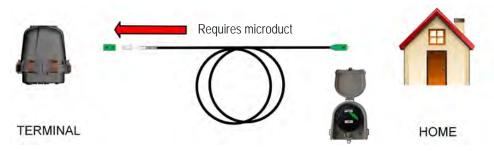


#### **Drop Assemblies**



Connector in Terminal	Connector to House	FieldShield (requires microduct)	Flat Drop Toneable (does not require microduct)	Flat Drop Non-toneable (does not require microduct)
SCA	SCA	FS-AA1-001-CQZ-DZZ XXXXF	FSH-U1-001-D1K-CQK XXXXF	FSH-T1-001-D1K-CQK XXXXF
SCU	SCU	FS-AA1-001-AQZ-BZZ XXXXF	FSH-U1-001-B1K-AQK XXXXF	FSH-T1-001-B1K-AQK XXXXF

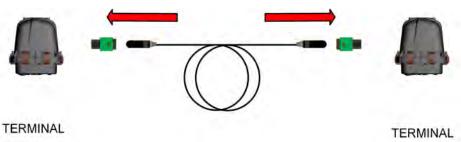
#### Drop Options Using YOURx-TAP with Deploy Reel



Part Number	Description
TAPX-ABA-CDS4-ZZZ	YOURx-TAP, loaded with 1 fiber SC/APC to pullable SC/APC, 100' blank and dual plate, no logo
TAPX-ABA-CDS8-ZZZ	YOURx-TAP, loaded with 1 fiber SC/APC to pullable SC/APC, 200' blank and dual plate, no logo
TAPX-ABA-CDSC-ZZZ	YOURx-TAP, loaded with 1 fiber SC/APC to pullable SC/APC, 300' blank and dual plate, no logo

<sup>\*</sup> Additional TAP options are available. See Clearfield website under Test Access Products.

#### MPO - MPO Feeder Cable Assemblies Between Terminals



Part Number	Description
FS-AA1-012-PZZ-PZZ XXXXF	FieldShield Pushable Fiber, Singlemode, 12 Fiber, 1 x 12 Pushable MPO Female to Pushable MPO Female

<sup>\*</sup> FLATdrop Toneable and Non-Toneable 12 Fiber MPO-MPO are available. Contact Clearfield for more information.





## **Terminal Mounting Options**

Application: Pole, Wall, Pedestal (Min. 10" Pedestal, Vault)



Part Number 018123 — Connector access by removing base



Part Number 018249 — Connector access by removing top

#### **Application: Aerial Strand Mount**



Part Number 018456 — Connector access by removing top

# Application: Required for sealing in terminal when field-installing connectors or using pushable FieldShield Connector.



Part Number	Description
FS-FIFC-103-6PAK	Field installable FlexConnector, 10 mm Port, 3 mm Cable, Black Grommet, 6 Pack (FLEXdrop and FieldShield)
FS-FIFC-143-6PAK	Field installable FlexConnector, 14 mm Port, 3 mm Cable, Gray Grommet, 6 Pack, Required for Pushable MPO
FS-FIFC-144-6PAK	Field installable FlexConnector, 14 mm Port, 4 mm Cable, Red Grommet, 6 Pack, Required for 24 fiber applications
FSH-FIFC-4PAK	Field installable FLATdrop FlexConnector with pieces for 4 terminations



#### Top Mount Bracket Kit for YOURx-Terminal -

#### Description

Bracket mounts to cover, allowing the YOURx-Terminal to be removed by loosening a wing nut. Includes the top bracket, plate, wing nut and screws. Applications: Pole mount, wall mount, pedestal mount (minimum 10" (254.00 mm) pedestal) or vault mount.





#### **Pre-Configured Part Numbers**

Part Number	Description
018123	Kit, Top Mount Bracket, YOURx-Terminal

#### Bottom Mount Bracket Kit for YOURx-Terminal

#### **Description**

Terminal is bolted to bracket from the bottom. Terminal is accessed by removing the cover. Includes the bracket and screws. Applications: Pole mount, wall mount, pedestal mount (minimum 10" (254.00 mm) pedestal) or vault mount.



#### **Pre-Configured Part Numbers**

Part Number	Description
018249	Kit, Pole/Wall Mount Bracket, YOURx-Terminal

## **Aerial/Strand Mounting Kit for YOURx-Terminal**

#### Description

Bracket mounts to strand with two clamps. Terminal is accessed by removing the cover. Includes the top bracket, bottom bracket with wire cable support, lanyard and screws. Applications: Aerial/strand mount.





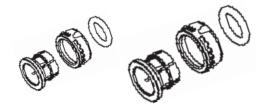
#### **Pre-Configured Part Numbers**

Part Number	Description
018456	Kit, Aerial/Strand Bracket for YOURx-Terminal, includes clamps, screws and lanyard

#### YOURx FlexPort —————

#### Description

Individual YOURx FlexPort for securing 10 mm or 14 mm microduct into the YOURx-Terminal or YOURx-TAP. Includes the outer coupler, inner housing and O-ring.



#### **Pre-Configured Part Numbers**

Part Number	Description
016280	YOURx FlexPort, push to connect, 10 mm
018107-RW	YOURx FlexPort, push to connect, 14 mm
FSX-10MM EXPANSION KIT	Bag of four 10 mm YOURx FlexPorts and 10 mm FlexPort Plugs

## YOURx-Terminal Accessories-



#### Slack Storage Reel for YOURx-Terminal -

#### **Description**

Reel is stored on the inside of the YOURx-Terminal, between the base and the FlexCartridge<sup>™</sup>. The reel will hold up to 10 feet (254.00 mm) of FieldShield® fiber slack.



#### **Pre-Configured Part Numbers**

Part Number	Description
FSTX-SLACK-REEL	Real, slack storage for YOURx-Terminal, holds 10 feed of FieldShield

#### YOURx FlexPort Filler Plug -

#### **Description**

YOURx FlexPort Filler Plug for 10 mm or 14 mm ports into the YOURx-Terminal or YOURx-TAP. Application: Used for sealing YOURx FlexPort holes if plug on the inside is removed.





#### **Pre-Configured Part Numbers**

Part Number	Description
018664	YOURx FlexPort Plug, filler for 10 mm cartridges
018665	YOURx FlexPort Plug, filler for 14 mm cartridges

#### YOURx Expansion Repair Kit ————

#### Description

Used to expand or add-drop feeder ports for YOURx-Terminal or YOURx-TAP.

#### **Pre-Configured Part Numbers**

Part Number Description	
FSX-EXPANSION REPAIR	Expansion, Repair Kit for YOURx-Terminal and YOURx-TAP, Includes four 10 mm YOURx FlexPorts, four 10
KIT	mm YOURx FlexPort Plugs, one 14 mm YOURx FlexPort and one 14 mm YOURx FlexPort Plug

## YOURx Pulling Tool —



#### **Pre-Configured Part Numbers**

Part Number		Description
	FS-PUL-YOURX	Pulling tool for 10mm FieldShield FlexPort. Maximum pulling force 50 lb.
	FS-PUL-YOURX-14MM	Pulling tool for 14mm FieldShield FlexPort. Maximum pulling force 50 lb.





#### FieldShield Field Installable FlexConnector

#### **Description**

For field installed applications, these three kits allow a water-tight transition from 3mm and 4mm cable, into the FieldShield FlexPort. The kits include enough parts for six tool-less installations.



#### **Pre-Configured Part Numbers**

Part Number Description	
FS-FIFC-103-6PAK	Field installable FlexConnector, 10 mm Port, 3 mm Cable, Black Grommet, 6 Pack
FS-FIFC-143-6PAK	Field installable FlexConnector, 14 mm Port, 3 mm Cable, Gray Grommet, 6 Pack
FS-FIFC-144-6PAK	Field installable FlexConnector, 14 mm Port, 4 mm Cable, Red Grommet, 6 Pack

#### YOURx Removal Tool ————



#### **Pre-Configured Part Numbers**

Part Number	Description
FS-FLEXPORT-REMOVAL- TOOL-10	Tool for removing YOURx Breakout from FlexPort in 10 pack

# **YOURx**®

# YOURx-Aerial Terminal - Patch and Splice



#### **Application**

When the network deployment plan calls out for an aerial application, Clearfield's YOURx-Aerial Terminal application allows for the flexibility to terminate a feeder fiber, directly into revenue generating drops and has the capability to accommodate a fiber cable mid-span, allowing cables to be fully utilized while feeding multiple terminals and access points.

#### Description

Designed with many of the same features as the YOURx-Terminal, the YOURx-Aerial Terminal allows for aerial or strand mount fiber deployment within the network architecture.

The YOURx-Aerial Terminal can accept the "hand-off" of fiber and distribute up to 24 individual service drops and has the capability to mid-span a larger count fiber cable, allowing the service provider to deploy multiple terminal/access points along the same cable run, maximizing the investment in fiber deployment.

Designed for easy, craft accessibility, the YOURx-Aerial Terminal application has an upward hinging, kickstand supported cover with four side entrance cable access ports. Two individual compartments separate the incoming splices from the drop ports for network security. The backplane of the unit has the capacity to hold up to three splice trays, incorporating fiber management and bend-radius protection into the design. Each splice tray supports 24 loose tube or 72 ribbon splices. With up to 24 individual drops terminated to SC of LC connectors, the YOURx-Aerial Terminal can accept all of the FieldShield® drop options, as well as other cable drop options.



#### Integrity

- Desgined to comply to Telcordia GR-771
- Terminations designed, tested and certified to Telcordia GR-326
- Supports FieldShield Pushable Duct and pushable/pullable fiber solution with SC connectors for drop applications
- · Supports pre-terminated FieldShield FLATdrop cable assemblies for individual drop applications
- 100% performance tested for insertion loss, return loss and final mechanical inspection

#### Protection

- · Optimized for use with FieldShield Microduct and Pushable Fiber, as well as FieldShield FLATdrop cable assemblies
- Black UV resistant thermoplastic designed to resist corrosion
- Free breathing terminal provides durability and protection in the OSP environments
- 10 mm YOURx FlexPort provide duct/fiber protection as well as strain relief for drop cables

#### Access

- Four side entrance holes accept multiple cable types up to 144 fiber count not to exceed 3/4" (19.05 mm) O.D.
- Mid-span capabilities
- Two secure compartments, separate splices from the drop ports, providing network security
- Up to 24 drops
- Up to 72 ribbon splices or 24 loose tube splices per tray (maximum of three trays)
- · Hinged cover allows easy access for installation and network maintenance
- Patch and splice (Clearfield's in-terminal splicing solution)
- Optical component solutions maximize existing architectures and eliminate fiber exhaust scenarios
- · Designation card included

#### Investment

- · Customer defined configurations provides maximum scalability across multiple services classes
- · "Grow-as-you-go" capabilities
- · Pre-terminated factory polished pigtail assembly insures improved network operability when spliced onto the feeder cable





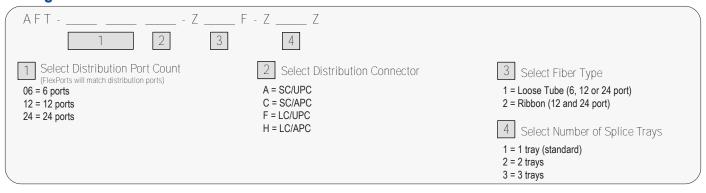
# YOURx-Aerial Terminal - Patch and Splice

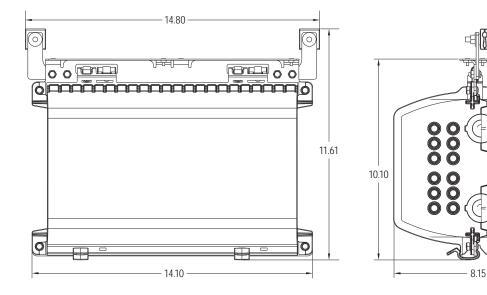


## **Technical Specifications**

YOURx-Aerial Terminal - Patch and Splice		
Dimensions 14.80" W x 11.61" H x 8.15" D (375.92 mm x 294.89 mm x 207.01 mm) (height includes strand brace		
Material Black UV resistant Thermoplastic		
Mounting Options Aerial or Strand Mount		
Internal Slack Storage Up to 8 feet of ribbon; up to 8 feet of loose tube		
Feeder Ports Four silicone sealed ports on ends of unit; two on each end		
Distribution Ports Up to 24 - 10 mm YOURx FlexPorts that accept FieldShield® Microduct or FLATdrop connectors		
Connector Types SC/APC, SC/UPC, LC/APC, LC/UPC		
Splicing Capabilities 24 loose tube or 72 ribbon splices per tray; three splice trays per terminal		

#### **Configured Part Numbers**







# YOURx-Aerial Terminal - Patch and Splice



# **Pre-Configured Part Numbers**

Part Number	Description	Image
AFT-HANGER-01	Adjustable aerial hanger bracket for YOURx-Aerial Terminal; allows terminal to be installed over existing utilities; shipped in pairs. Includes brackets for mounting to terminal.	
019501	Ribbon retention grommet and clip to secure ribbon into splice tray of YOURx-Aerial Terminal. Includes 6 pieces of each.	
019527	Grounding kit for YOURx-Aerial Terminal, kit includes ground wire and two clamps	
019007	Silicon grommet for incoming cables on YOURx-Aerial Terminal, one grommet (two pieces)	
016280-06	YOURx FlexPort, push to connect, 10 mm, 6 pack	
016280-12	YOURx FlexPort, push to connect, 10 mm, 12 pack	
018664	YOURx FlexPort Plug, filler for 10 mm	
017957	Cover latch (sold individually)	





Part Number	Description	Image
FSH-FIFC-4PAK	Field installable FlexConnector™ with pieces for 4 terminations	
FSH-FIFC-SCA-4PAK	Field installable FlexConnector with splice-on SCA connectors and pieces for 4 terminations	SANDSECORE

# Introduction to FieldShield®

# FieldShield Fiber, Drops and Microduct



Installing fiber where you want it, when you want it and cost-effectively is the promise of the FieldShield Optical Fiber Protection System. FieldShield is a turn-key system to take fiber through the fields and streets to the home or business, up the tower to the antenna or throughout the riser to the data center or desk. Used in conjunction with Clearfield® FieldSmart® fiber management solutions for the CO, Outside Plant and access network, FieldShield delivers and protects fiber through every distribution point of the network.

#### Components of the FieldShield System include:

- · FieldShield Microduct
- · FieldShield Pushable Optical Fiber and Connectors
- · FieldShield Drop Cables
- · FieldShield Assist Module and Accessories

#### FieldShield Microduct

FieldShield starts with a ruggedized microduct in a 10 mm or 14 mm outer diameter space-saving footprint across all deployment environments to support your aerial, direct-bury and inside plant last mile needs. FieldShield Microducts can be placed using traditional placement methods allowing you to leverage your existing conduit placement equipment of boring or plowing methods. FieldShield Microducts can also be placed using newer, less disruptive technologies such as saw cutting or micro-trenching. Due to the column strength of the FieldShield Microduct, occupied duct that was thought to be exhausted, can almost always accommodate FieldShield duct as the product can be deployed as a rod directly within the larger duct. Optional pulling carrots make installation of microduct inside a larger occupied duct a simple operation.

Available for aerial and buried environments in the outside plant as well as in a plenum configuration or riser environment, FieldShield Microduct provides the pathway to quickly deliver a crush-resistant FieldShield pushable fiber assembly.

#### FieldShield Pushable Optical Fiber and Connectors

Manufactured with bend-insensitive fiber, FieldShield Pushable Optical Fiber is strong enough to be stapled to walls and offers a built-in, bend-limiting function to prevent damage to fiber during installation. Available in bulk reels, FieldShield offers total installation flexibility. Terminated with a FieldShield Pushable Fiber Connector, the polymer properties unique to FieldShield Pushable Optical Fiber allow the assembly to be pushed or pulled through the FieldShield Microduct.

Terminating a FieldShield Pushable Fiber Connector onto FieldShield Fiber Cable allows it to be pulled or pushed through the FieldShield Microduct. Various connector styles are available including singlemode simplex SC/APC or SC/UPC, simplex or duplex LC/APC or LC/UPC and singlemode MPO. FieldShield Fiber Connectors are factory polished to achieve consistent high performance optical parameters. With a small profile, they can easily be pushed through FieldShield Microduct. The inner and outer housings are easily snapped in place by the technician in the field after the connector is pulled through the microduct. This factory pre-connectorized approach lowers installation costs by reducing costly labor in the field. Additionally, it presents a more reliable and consistent performance level compared to field installed connectors or field splices. Whether you choose to push or pull the fiber into the FieldShield Microduct, the PBT jacketing of the Clearfield FieldShield Pushable Fiber easily slips through the microducts smooth inner wall.



# Introduction to FieldShield®

# FieldShield Fiber, Drops and Microduct



#### FieldShield Drop Cables

Recognizing that no two networks are alike, Clearfield has developed the industry's widest choice of drop cable solutions – giving you the flexibility of configuration that best suits your network environment, network design and drop cable needs.

- FieldShield FLATdrop lowest initial capital expenditure
- FieldShield D-ROP flat drop functionality plus one-pass installation and easy restorability
- FieldShield FLEXdrop increased flexibility for turns and bends. UL Listed for Plenum applications and UV stabilized for outdoor use as building wrap
- FieldShield Pushable Optical Fiber increased rigidity for pushing/pulling extended distances through a ducted pathway
- FieldShield StrongFiber –innovative, spool-based technology offers craft-friendly deployment and simplified, small footprint slack storage

Utilizing factory terminated connectors, all FieldShield Drop Cables provide plug-and-play connectivity. When the assembly is equipped with a FieldShield FlexConnector, gone are the days of proprietary connections. The FlexConnector allows multiple size and type of last mile drop cables to interconnect the YOURx-Terminal and the YOURx-TAP.

#### FieldShield Assist Module and Other Accessories

Clearfield offers a number of FieldShield Microduct and Fiber Cable accessories to help install and complete a project. The FieldShield Assist Module can be used to enhance the pull/push experience by providing a continuous force on the FieldShield Fiber Cable being pushed into the FieldShield Microduct. Compared to hand push installation, the Assist Module can extend installations to 500 feet (152.40 meters) or more. The Assist Module also has an integrated clutch mechanism that releases the installation force should there be an unexpected resistance caused by too many corners passed or an excessively sharp bend of the microduct. Other accessories range from couplers and end caps to pulling eyes/carrots and socks for FieldShield Microduct and Fiber Cable.









FieldShield Microduct

# Pushable Optical Fiber



#### **Application**

Designed to simplify the placement of fiber, FieldShield Pushable Optical Fiber reduces the cost of any fiber deployment, while providing industry leading protection when mated with FieldShield Microducts. Pushable Optical Fiber is either pulled or pushed through microduct at turn-up, maximizing installation efficiency. In the event of a later fiber cut, the fiber can be easily pulled from the microduct. The duct is then repaired and a new FieldShield Pushable Assembly is pushed or pulled through the microduct for a fast and cost-effective restoration.

#### Description

FieldShield Pushable Optical Fiber is a durable and crush resistant product that is suitable for most indoor or outdoor environments. Manufactured using PBT jacketing, pushable optical fiber offers flexibility as well as resistance to chemicals. FieldShield Pushable Optical Fiber is typically recommended to be used in conjunction with FieldShield Microduct.

# Gode Start Footage FIELD SHIELD Feed It As You Need It

Available in 1, 2, 6, 12, 24 and 48 fiber counts

#### **Features and Benefits**

#### Integrity

- FieldShield fiber cable designed, tested and certified to Telcordia GR-20
- · Available in singlemode
- · Supports all industry standard connectors

#### Protection

- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- · Tough PBT jacketing provides high column strength and low coefficient of friction to maximize push and pull distances
- · Lightweight and high crush resistance
- · One and two fiber drops protected by water blocking Kevlar strength member
- 6 to 48-fiber utilize water blocking gel

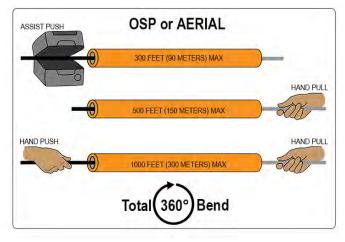
#### Access

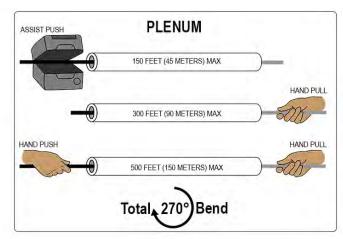
- Standard color is black
- Tech-friendly 250 µm fiber inside the outer jacket reduces splicing steps and installation costs
- · Suitable for all types of indoor and outdoor implementations within a microduct

#### Investment

- Pushes directly into a Clearview® Cassette, FieldShield is optimized for placement alongside Clearfield® FieldSmart® fiber management platforms
- Quick and easy deployment allows capital investment to be aligned to customer take rates
- · Available in multiple fiber counts up to 48 fibers

#### Recommended Push/Pull





# FieldShield® Pushable Optical Fiber –



# **Technical Specifications**

FieldShield Pushable Optical Fiber				
Fiber	Corning ClearCurve Optical Fiber or equivalent			
Water Peak	ZWP (Zero Water Peak)			
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2			
Color Code	TIA/EIA 598 (US Standard)			
Fiber Count	Any fiber count up to 48 fibers			
Pushable Connectors	FieldShield SC/UPC, SC/APC, Simplex and Duplex LC/UPC, Simplex and Duplex LC/APC, MPO			
Standard Connectors	SC/UPC, SC/APC, LC/UPC, LC/APC, HFOC SC/APC, MPO			
Internal Fiber Size 250 µm				
Outside Diameter	1 to 12-fiber: 0.118" (3.0 mm); 24-fiber: 0.156" (3.96 mm); 48-fiber: 0.217" (5.51 mm)			
Color Black				
Material	PBT			
Bend-Radius	10 mm minimum			
High Temperature Aging	$(-40^{\circ}\text{C} + 85^{\circ}\text{C}) \le 0.05 \text{ dB/km}$			
Temperature & Humidity Cycling ≤ 0.05 dB/km (at -10°C to 85°C and 95% RH)				
Water Immersion (23 ± 2°C)	≤ 0.05 dB/km			
Operating Temperature	-40°F to 176°F (-40°C to 80°C)			
Installation Temperature	-14°F to 158°F (-26°C to 70°C)			
Installation Tension	20 lbf for 3 mm; 20 lbf for 4 mm			
Markings Part number, lot number and footage markers every two feet (609.60 mm)				

# **Pre-Configured Part Numbers**

Part Number	Description
FS-CA1-001-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-001-8ZD-B 02000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 2000 feet (610 m)
FS-CA1-001-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-001-8ZD-B 05000F	FieldShield boxed Pushable Optical Fiber, 1-fiber (250 µm), singlemode, 3 mm jacket, 5000 feet (1,524 m)
FS-CA1-002-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 2-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-002-8ZD-B 02000F	FieldShield boxed Pushable Optical Fiber, 2-fiber (250 µm), singlemode, 3 mm jacket, 2000 feet (610 m)
FS-CA1-002-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 2-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-006-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 6-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-006-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 6-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-012-8ZD-B 01000F	FieldShield boxed Pushable Optical Fiber, 12-fiber (250 µm), singlemode, 3 mm jacket, 1000 feet (305 m)
FS-CA1-012-8ZD-B 03000F	FieldShield boxed Pushable Optical Fiber, 12-fiber (250 µm), singlemode, 3 mm jacket, 3000 feet (914 m)
FS-CA1-024-8ZE-B 01000F	FieldShield boxed Pushable Optical Fiber, 24-fiber (250 µm), singlemode, 4 mm jacket, 1000 feet (305 m)
FS-CA1-024-8ZE-B 02000F	FieldShield boxed Pushable Optical Fiber, 24-fiber (250 µm), singlemode, 4 mm jacket, 2000 feet (610 m)
FS-CA1-024-8ZE-B 05000F	FieldShield boxed Pushable Optical Fiber, 24-fiber (250 µm), singlemode, 4 mm jacket, 5000 feet (1,524 m)
FS-CA1-048-8ZF-B 01500F	FieldShield boxed Pushable Optical Fiber, 48-fiber (250 µm), singlemode, 5.5 mm jacket, 1500 feet (457 m)
FS-CA1-048-8ZF-B 02500F	FieldShield boxed Pushable Optical Fiber, 48-fiber (250 μm), singlemode, 5.5 mm jacket, 2500 feet (762 m)

# SC and LC Pushable Assemblies



#### **Application**

Designed to simplify the deployment of fiber where one or two fibers are required, FieldShield SC and LC Pushable Assemblies provide a tech-friendly field assembled connector that snaps together in seconds without jeopardizing fiber protection or optical reliability. FieldShield Pushable Assemblies greatly reduce installation costs for Fiber to the Home (FTTH) installations, business class services, cell backhaul or any other small count delivery application.

#### Description

FieldShield Pushable Assemblies are factory terminated and polished SC and LC connectors designed to be terminated on simplex and duplex FieldShield Pushable Optical Fiber Assemblies. After being pushed or pulled through FieldShield Microduct, the smooth wall protective sleeve is easily removed and an outer housing is snapped into place. This creates an industry standard connector without mechanical or fusion splicing. All SC and LC FieldShield Pushable Assemblies styles can be pushed/pulled in all FieldShield Microducts.

#### **Features and Benefits**

#### Integrity

- · FieldShield fiber cable designed, tested and certified to GR-20
- · Terminations are designed, tested and certified to Telcordia GR-326 and GR-1435
- · Available in singlemode SC/UPC, SC/APC, Simplex and Duplex LC/UPC, Simplex and Duplex LC/APC

#### Protection

- Smooth wall protective sleeve is easily removed and an outer housing is snapped into place
- · Option for FlexConnector in YOURx applications

#### Access

- Zirconia ceramic ferrule measuring 1.25 mm O.D.
- · Tool-less installation

#### Investment

- Tech-friendly pre-terminated pushable connectors rapidly decrease deployment times and reduce installation costs by eliminating in-field splicing
- Pushed directly into a Clearview® Cassette, FieldShield is optimized for placement alongside Clearfield's FieldSmart® fiber management platforms

#### **Packaging**



Lengths up to 32' (9.75 m)



Lengths from 32' to 350' (9.75 m to 106.68 m)



Lengths greater than 350' (106.68 m)

# SC and LC Pushable Assemblies



#### **Technical Specifications**

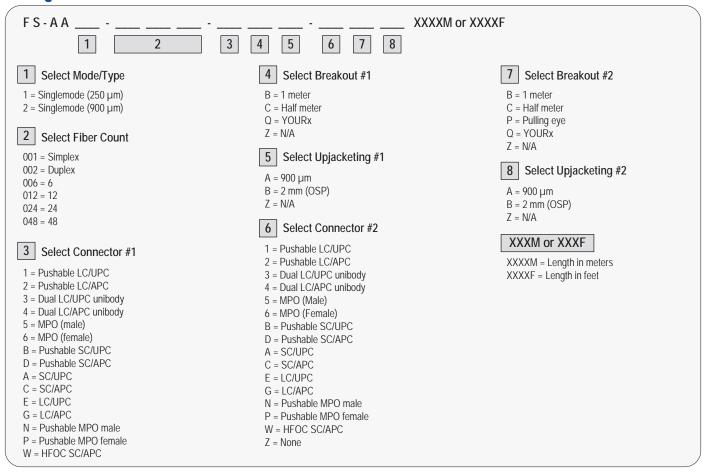
Minimum Performance Specifications for Terminated Singlemode Connectors

1	Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
	SC or LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
	SC or LC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB

#### **Pre-Configured Part Numbers**

Part Number	Connector Type	Description
FS-AA1-001-AZZ-BZZ XXXXF	SC FieldShield pushable patch cord, singlemode, 1-fiber (250 μm), 3 SC/UPC to pushable SC/UPC , XXXX feet	
FS-AA1-001-CZZ-DZZ XXXXF	SC	FieldShield pushable patch cord, singlemode, 1-fiber (250 $\mu$ m), 3 mm jacket standard SC/APC to pushable SC/APC , XXXX feet
FS-AA1-002-1ZZ-3ZZ XXXXF	LC	FieldShield pushable patch cord, singlemode, 2-fiber (250 μm), 3 mm jacket duplex LC/UPC to pushable duplex LC/UPC , XXXX feet
FS-AA1-002-2ZZ-4ZZ XXXXF	LC	FieldShield pushable patch cord, singlemode, 2-fiber (250 μm), 3 mm jacket duplex LC/APC to pushable duplex LC/APC , XXXX feet

#### **Configured Part Numbers**



# SC and LC Pushable Assemblies



#### **Accessories**

#### Field Installable FlexConnector (FIFC)

 Once the cable has been prepped with the FlexConnector, the 3 mm cable is sandwiched between the two retainer clips. The FlexConnector is then pushed and snapped together with the retainer clips, pinching the grommet seal for a water-tight assembly.



#### Field Installable FlexConnector Pre-Configured Part Numbers

Part Number	Description	
FS-FIFC-103-6PAK	Field installable FlexConnector, 10 mm Port, 3 mm Cable, Black Grommet, 6 Pack	
FS-FIFC-143-6PAK	Field installable FlexConnector, 14 mm Port, 3 mm Cable, Gray Grommet, 6 Pack	
FS-FIFC-144-6PAK	Field installable FlexConnector, 14 mm Port, 4 mm Cable, Red Grommet, 6 Pack	

#### **Description**

For field installed applications, these three kits allow a water-tight transition from 3 mm and 4 mm cable, into the FlexPort. The kits include enough parts for six tool-less installations.

# MPO Pushable Assemblies



### **Application**

Designed to simplify the deployment of fiber where multiple fibers are required, FieldShield MPO Pushable Assemblies provide a tech-friendly, field-assembled connector that snaps together in seconds without jeopardizing fiber protection or optical reliability. FieldShield Pushable Assemblies greatly reduce installation costs for Fiber to the Home installations, business class services, cell backhaul or any other small count delivery application.

### **Description**

FieldShield Pushable Assemblies are factory terminated and polished. MPO Assemblies are designed to be terminated on 6, 12 or 24-fiber FieldShield Pushable Optical Fiber Assemblies. After being pushed or pulled through FieldShield Microduct, the black protective sleeve is easily removed and the green MPO outer housing is snapped into place creating an industry standard connector without mechanical or fusion splicing. FieldShield Pushable MPO Assemblies can be pulled/pushed in 14/10 mm FieldShield Microduct.

MPO Pushable Fiber in duct

### **Features and Benefits**

### Integrity

- Singlemode terminations are designed, tested and certified to Telcordia GR-326
- Available in singlemode 4, 6, 8, 12 and 24-fiber terminations
- FieldShield MPO Pushable Assemblies use high-quality components that keep the connector insertion loss to a maximum of 0.35 dB (1.00 dB 24 fiber)

#### Protection

Smooth wall protective sleeve is easily removed and an outer housing is snapped into place

#### Access

- · Thermoplastic high-precision ferrules
- · Tool-less installation

#### Investment

- Tech-friendly, pre-terminated pushable assemblies decrease deployment times and reduce installation costs by eliminating in-field splicing
- Pushed directly up to a Clearview® Cassette, FieldShield is optimized for placement alongside FieldSmart® fiber management platforms

### **Technical Specifications**

FieldShield MPO Pushable Assemblies		
Connector Type	MPO	
Ferrule Material	Thermoplastic	
Polish Type	APC	
Insertion Loss Typical	0.25 dB (12 fiber) 0.75 dB (24 fiber)	
Maximum Insertion Loss	0.35 dB (12 fiber) 1.00 dB (24 fiber)	
Minimum Return Loss	55.00 dB (12 and 24 fiber)	

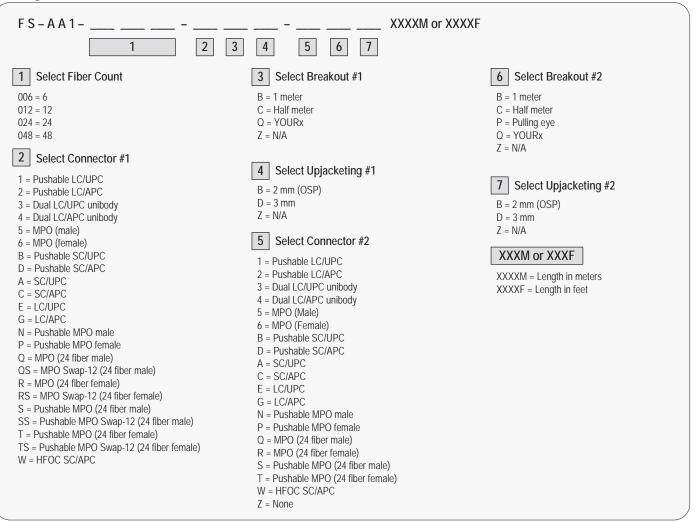
# MPO Pushable Assemblies



# **Pre-Configured Part Numbers**

Part Number	Description
FS-AA1-006-PZZ-ZZZ XXXXF	FieldShield pushable pigtail, singlemode, 6-fiber (250 µm) 3 mm jacket 1 x 6 pushable MPO female to pigtail, XXXX feet
FS-AA1-008-PZZ-6ZZ XXXXF	FieldShield pushable patch cord, singlemode, 8-fiber (250 µm), 3 mm jacket 1 x 8 pushable MPO female to standard 1 x 8 MPO female, XXXX feet
FS-AA1-012-PQZ-ZZZ XXXXF	FieldShield Fiber Pigtail, Singlemode, 12 Fiber, 1 x 12 Pushable MPO Female With YOURx Connector Installed to Pigtail
FS-AA1-012-PQZ-PZZ XXXXF	FieldShield Fiber Patchcord, Singlemode, 12 Fiber, 1 x 12 Pushable MPO Female With YOURx Connector Installed to Pushable MPO Female
FS-AA1-012-PZZ-ZZZ XXXXF	FieldShield pushable pigtail, singlemode, 12-fiber (250 µm), 3 mm jacket 1 x 12 pushable MPO female to pigtail, XXXX feet

### **Configured Part Numbers**



# Pushable 3 mm Optical Fiber with 900 µm Tight Buffer Fiber



### **Application**

Designed to simplify the placement of fiber, FieldShield Pushable Optical Cable with 900 µm Tight Buffer Fiber reduces the cost of any fiber deployment while providing industry leading protection when mated with FieldShield Microducts. Pushable Fiber is either pushed or pulled through the microduct at turn-up, maximizing installation efficiency. Once deployed, the cable is cut to the specific application length and terminated with a CraftSmart® 900 µm Splice-On Connector.

### Description

FieldShield Pushable Optical Cable is a durable and crush resistant product that is suitable for most indoor or outdoor environments. Manufactured using PBT jacketing, pushable optical fiber offers flexibility as well as resistance to chemicals. FieldShield Pushable Optical Fiber is typically recommended to be used in conjunction with FieldShield Microduct.



### **Features and Benefits**

#### Integrity

- · Available in singlemode
- · Supports all industry standard connectors
- Only solution approved for use with FieldShield Pre-terminated Pushable Connectors

#### Protection

- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- Tough PBT jacketing provides high column strength and low coefficient of friction to maximize push and pull distances
- Lightweight and high crush resistance makes Pushable Optical Fiber strong enough to be stapled directly to walls studs, joists and around corners

#### Access

- · Standard color is black
- Tech-friendly 900 µm fiber inside the outer jacket for applications where CraftSmart® Splice-On Connectors are used
- Suitable for all types of indoor and outdoor implementations

#### Investment

- Pushes directly into a Clearview<sup>®</sup> Cassette, FieldShield is optimized for placement alongside Clearfield<sup>®</sup> FieldSmart<sup>®</sup> fiber management platforms
- Quick and easy deployment allows capital investment to be aligned to customer take rates



# Pushable 3 mm Optical Fiber with 900 $\mu$ m Tight Buffer Fiber -

# **Technical Specifications**

FieldShield Pushable 3 mm Optical Fiber with 900 μm Tight Buffer Fiber		
Fiber	OFS All Wave Flex Fiber or equivalent	
Water Peak	ZWP (Zero Water Peak)	
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2	
Color Code	TIA/EIA 598 (US Standard)	
Fiber Count	1 fiber	
Pushable Connectors	FieldShield SC/UPC, SC/APC, LC/UPC, LC/APC	
Standard Connectors	SC/UPC, SC/APC, LC/UPC, LC/APC, HFOC SC/APC	
Mode	Singlemode	
Internal Fiber Size	900 μm Tight Buffer	
Color	Black	
Outside Diameter	0.118" (3 mm)	
Material	PBT	
Bend-Radius	10 mm minimum	
Operating Temperature	-40°F to 176°F (-40°C to 80°C)	
Installation Temperature	-14°F to 158°F (-26°C to 70°C)	
Markings	Part number, lot number and footage markers every two feet (609.60 mm)	

### **Physical Characteristics**

FieldShield Pushable 3 mm Optical Fiber with 900 μm Tight Buffer Fiber		
Clad Diameter	$125.0 \pm 0.7 \ \mu m$	
Clad Non-circularity	≤1 %	
Core/Clad Concentricity Error (Offset)	≤ 0.5 µm maximum, < 0.2 µm typically	
Coating Diameter (Uncolored)	900 µm Tight Buffer	
Coating-Clad Concentricity Error	(Offset) ≤ 12 μm	
Tensile Proof Test	100 kpsi (0.69 GPa)	
Coating Strip Force Range	≥ 0.3 lbf < 2.0 lbf (≥ 1.3 N < 8.9 N)	

# **Pre-Configured Part Numbers**

Part Number	Description
FS-CC1-001-8ZD-B 01000F	FieldShield pushable optical fiber, one fiber (900 µm), singlemode, 3 mm jacket, 1000 feet (304.80 m)
FS-CC1-001-8ZD-B 02000F	FieldShield pushable optical fiber, one fiber (900 µm), singlemode, 3 mm jacket, 2000 feet (609.60 m)

# StrongFiber



## **Application**

Designed to simplify the placement of fiber, FieldShield StrongFiber reduces the cost of any fiber deployment while providing industry leading protection when combined with FieldShield Microducts. StrongFiber is pulled through microduct at turn-up maximizing installation efficiency. In the event of a duct or fiber being damaged or for future upgrades, the fiber can be easily pulled from the microduct. The duct is then repaired and a new FieldShield StrongFiber assembly is pushed or pulled through the microduct for a fast and cost-effective restoration or upgrade.

StrongFiber may be used in place of a traditional patch cord for reduced cable pileup within the route-path of new or traditionally oversubscribed frames within a central office, headend, data center or remote hut. StrongFiber is 85% smaller than traditional 3 mm patch cords and 69% smaller than 1.2 mm patch cords. The reduced size and weight makes the fiber less susceptible to micro-bends and makes it much easier to store using any fiber management element.



### Description

FieldShield StrongFiber is a durable high tensile strength fiber when compared to other fibers of its size. It is suitable for both indoor and outdoor environments when used in FieldShield Microduct. Manufactured with premium bend-insensitive fiber, FieldShield StrongFiber offers high tensile strength to resist damage to the fiber during installation in the FieldShield Microducts. When terminated with a FieldShield Pullable Connector, the FieldShield StrongFiber can be quickly deployed in FieldShield Microduct, reducing installation time drastically.

### **Features and Benefits**

### Integrity

- StrongFiber fiber cable designed, tested and certified to Telcordia GR-20
- Available in singlemode
- · Supports all SC and LC connectors

#### Protection

- · Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation
- · Lightweight with low coefficient of friction to maximize pull distances

#### Access

- · Standard color is black
- · Tech-friendly 900 um fiber
- Suitable for all types of indoor implementations

#### Investment

· Quick and easy deployment allows capital investment to be aligned to customer take rates

### **Technical Specifications**

FieldShield StrongFiber - Physical Glass Characteristics	
Fiber Size	250 μm
Clad Diameter	125.0 ± 0.7 μm
Clad Non-circularity	≤ 1 %
Core/Clad Concentricity Error (Offset)	≤ 0.5 µm maximum, < 0.2 µm typically
Coating Diameter (Uncolored)	235 - 245 μm
Coating-Clad Concentricity Error	(Offset) ≤ 12 μm
Tensile Proof Test	100 kpsi (0.69 GPa)
Coating Strip Force Range	≥ 0.3 lbf < 2.0 lbf (≥ 1.3 N < 8.9 N)







FieldShield StrongFiber	
Fiber	OFS All Wave Flex + Fiber or equivalent
Water Peak	ZWP (Zero Water Peak)
Bend-Insensitive	Meets G.657 A2
Color	Black
Length	Up to 300 feet (91.44 m)
Fiber Count	Single Fiber
Pullable Connectors	FieldShield SC/UPC, SC/APC
Standard Connectors	SC/UPC, SC/APC, LC/UPC, LC/APC
Mode	Singlemode
Outside Diameter	900 μm
Material	Thermoplastic Blend, Low Smoke/Fume, Non-Halogen Flame Retardant
Rating	OSP Temperature Rated
Bend-Radius	10 mm minimum
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Installation Tension	18 lbs (8.16 kg)

### **Performance Specifications**

Connector Type	Ferrule Material	Polish Type	Ins. Loss Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	APC	0.18 dB	0.20 dB	65.00 dB
LC	Ceramic	APC	0.18 dB	0.20 dB	65.00 dB

# **Configured Part Numbers**



# FieldShield® StrongFiber Deploy Reel



# **Application**

Due to the high variability of MDU architectures, extensive engineering has been required to ensure proper cable lengths for Fiber to the Premises deployments. The 4.5" (114.30 mm) FieldShield StrongFiber Deploy Reel minimizes pre-engineering because is allows StrongFiber to be pulled from the reel directly to the access point. Once the pullable connector has reached its destination, the connector assembly is completed with the supplied connector housings and the connector is mated to the adapter. The remaining slack on the reel is pre-tested with no further slack management required. The terminated end on the reel is pre-tested, cleaned and mated in a Clearfield® factory environment, leaving the technician to simply mate the patch cord to the adapter on the reel. The small form factor of the cable assembly and Deploy Reel allows the StrongFiber to be pulled and slack stored from the customer demarcation point. As an ISP Cable, StrongFiber reduces pre-engineering and on-site installation time for MDU and riser deployments.



### Description

The FieldShield StrongFiber Deploy Reel is a 4.5" x 1.5" (114.30 mm x 38.00 mm) spool designed to hold up to 300 feet (91.44 m) of FieldShield StrongFiber. It has a pre-mated

adapter that can easily be mounted into a small form factor fiber management element. The small form factor of the 900 µm fiber makes slack storage minimal and easy to accommodate, while the exceptional pull strength of StrongFiber makes it craft-friendly and easy for the technician to handle without fear of fiber damage. Less cable weight means reduced co-efficient of friction (COF). This results in quicker installations because there is minimal friction as the cable is pulled through bends and turns throughout the microduct route-path. Reducing the size requirements of the access point (above or below grade) provides a more aesthetically pleasing solution.

### **Features and Benefits**

#### Integrity

- StrongFiber is designed, tested and certified to GR-20
- Terminations are designed, tested and certified to GR-326
- StrongFiber Deploy Reel has been designed, tested and certified to GR-63
- Supports singlemode SC connectors

#### **Protection**

- Deploying StrongFiber with a FieldShield StrongFiber Deploy Reel allows the installer to payout the exact amount of cable required and leave the remaining slack safely stored on the reel
- Exceptional pull strength makes it easier for the technician to handle without fear of fiber damage

#### Access

- Small form factor 900 µm fiber makes slack storage minimal and easy to accommodate
- Straight forward, simple design means installation crews spend less time figuring out how to deploy
- Low co-efficient of friction (COF) allows StrongFiber to be pulled through bends and turns throughout the microduct route path with minimal friction, reducing deployment times

#### Investment

 Pre-terminated cable spools reduce upfront deployment costs by simplifying site survey inspections, reducing labor hours and streamlining cable deployment for MDU and Riser deployments

# StrongFiber Deploy Reel -



# **Technical Specifications**

FieldShield StrongFiber Deploy Reel		
Dimensions	4.55" W x 1.5" H (114.30 mm x 38.00 mm)	
Material	Black Thermoplastic	
Storage Temperature	-40°F to 150°F (-40°C to 65°C)	
Pullable Connectors	FieldShield® SC/APC and SC/UPC	
Standard Connectors	SC/APC, SC/UPC	
Fiber	FieldShield StrongFiber 900 µm	
Cable Length	Up to 300 feet (91.44 m)	

## **Configured Part Numbers**

SRD 1SA ZZ 1		
1 Select Bulkhead Connector	2 Select Pullable Connector	3 Select Cable Length
A = SC/UPC C = SC/APC	B = Pullable SC/UPC D = Pullable SC/APC Z = Pigtail	4 = 100 feet (30.48 m) 8 = 200 feet (60.96 m) C = 300 feet (91.44 m)
		<i>)</i>

# FieldShield StrongFiber Deploy Reel Wall Box Description

The FieldSmart Mini-TAP Wall Box provides NEMA-4 rated enclosure to distribute StrongFiber Deploy Reel drop cables to the indoor NID in a compact  $9 \times 12^{\circ}$  design.



# **Pre-Configured Part Numbers**

Part Number	Description
FDRG-CDS4-HHLZ	Wall box, plastic, Mini-TAP for FieldShield StrongFiber Deploy Reel includes 2 multi-purpose strain relief, adapter bracket, StrongFiber Deploy Reel, 100 ft.

# Fiber Accessories -



### Pull Sock -

### Description

The FieldShield Pull Sock provides a pulling eye to install pre-terminated SC pushable assemblies and blunt drops using the integrated pull string that comes standard in all FieldShield Microducts. The pull sock grips the outer jacket of FieldShield Optical Cables by compressing while under tension.

### YOURx Tools —

# **Description**

The YOURx Pulling Tool and protection tool provide a safe and reusable way to protect and pull the YOURx breakout. The FS-PROTECT-YOURX will protect during the deployment of cable. Easily remove from the coupler by pushing the locking ring when ready to make the fiber connection. The FS-PUL-YOURX allows for up to 75 pounds of pulling force when using the stainless-steel pulling bullet on the tip of the assembly. Once completed pulling your FieldShield FLATdrop assembly, easily remove from tool by releasing the locking ring.

# **Pre-Configured Part Numbers**

Part Number	Description
FS-PUL-3-4MM	FieldShield Pull Sock, for 3 to 5.5 mm FieldShield Pushable Fiber
FS-PUL-5-9MM	FieldShield Pull Sock, for 5 to 9 mm FieldShield Pushable Fiber
FS-PROTECT-YOURX	YOURx Protective Sleeve, 10 mm, without Pulling Carrot, Used During Deployment, Reusable
FS-PUL-YOURX	YOURx Pulling Tool, 10 mm, with Stainless Steel Pulling Carrot, Reusable







Pull Sock

FS-PROTECT-YOURX

# Rotary Fiber Tube Cutter ————

# **Description**

Rotary Fiber Tube Cutter are designed to strip away the outer jacket from FieldShield Optical Fiber without damaging the fibers inside.



# **Pre-Configured Part Numbers**

1	Part Number	Description
(	FS-TCUT-3-4MM	FieldShield Rotary Fiber Tube Cutter, for 3 mm to 5.5 mm jacket

# CraftSmart® Splice-On Connector (SOC)



## **Application**

Fiber assemblies are used in a variety of carrier networks and private network environments. In some applications, the fiber assembly cannot be deployed with factory terminated connectors. In other instances, there may be a need for quick fiber restoration in the field. CraftSmart Splice-On Connectors are designed for these applications.

### Description

In situations where a factory terminated fiber assembly isn't possible, the CraftSmart Splice-On Connector provides the solution for consistent performance. Common applications include field restoration of a broken fiber or when the customer is using media that is expensive and/or difficult to store. In these cases, the customer prefers to cut the media to exact length for his purposes and then use the CraftSmart Splice-On Connector. The Clearfield® advantage is that the protection splice sleeve is directly under the boot, making the routing of the terminated end easier.



The CraftSmart Splice-On Connector is available in all industry standard connectors, including SC/UPC, SC/APC and LC/UPC. The Splice-On Connector meets, and even exceeds industry standard insertion and return loss. Pre-polished and pre-cleaved, the CraftSmart Splice-On Connector is packaged with all required connector components needed to splice a connector onto a 900 µm fiber in the field. CraftSmart Splice-on Connectors require the use of a fusion splicer with removable splice holders.

### **Features and Benefits**

#### Integrity

- · CraftSmart Splice-On Connector is available in all industry standard connectors
- · Utilizes a fusion splice for minimal loss and long lasting dependability in any environment
- Meets or exceeds industry standard insertion loss and return loss

#### Protection

- Individually packaged to protect pre-stripped and cleaved fiber during storage
- Fusion splice is protected by a fusion splice sleeve under a color coded boot
- · Ferrules are made of durable Zirconia

#### Access

- Compact 900 µm fusion splice design that reduces the overall footprint
- Pre-polished fiber end face and pre-stripped, pre-cleaved fiber ready to splice

#### Investment

- Singlemode, multimode (62.5 μm and 50 μm) and laser optimized available
- · Universal holder works with common industry fusion splice machines

# CraftSmart® Splice-On Connector (SOC) -



# **Technical Specifications**

CraftSmart Splice-On Conne	ctor (SOC)				
Mode Type	Singlemode/APC	Singlemode/UPC	Multimode/62.5 µm	Multimode/50 µm	Multimode/LO
Insertion Loss (maximum)	0.3 dB	0.3 dB	0.4 dB	0.4 dB	0.4 dB
Optical Return Loss	> 65 dB	> 55 dB	35 dB (typical)	35 dB (typical)	35 dB (typical)
Ferrule Type	Zirconica Pre-Polished Ferrules				
Color Code	Green	Blue	Beige	Black	Aqua
Operating Temperature	-40°C to 80°C	-40°C to 80°C	-40°C to 80°C	-40°C to 80°C	-40°C to 80°C
Industry Standards	RoHS Compliant, Compliant to Telcordia GR-326				

**Compatible Splice Machines** 

Manufacturer	Splicer Model	Plastic Holder Compatibility	Plastic Holder Part Number	Universal Holder Compatibility
FIS	Super Cougar	All Versions	CSM-SOC-FIBER HOLDER-01	All Versions
	FSM-11(S/M)	All Versions	SM-SOC-FIBER HOLDER-02	All Versions
AFL/Fujikura	FSM-12S FSM-19S FSM-70S	All Versions	0014 000 51757	All Versions
•	FSM-17S/R	SC and LC Only	CSM-SOC-FIBER HOLDER-03	
	FSM-18S FSM-41S FSM-60 (S/R)	SC, LC and ST Only	- HOLDLIN-03	N/A
Furukawa/Fitel	S122 (A/C/M) S121 (A/M) S123 (C/M) S153 S177 S178A	All Versions	CSM-SOC-FIBER HOLDER-04	All Versions
	S179, Ninja	All Versions	CSM-SOC-FIBER HOLDER-08	N/A
	Type-25e (U/S/M)			All Versions
Sumitomo	Type-39FH Type-46 Type-65 Type-66 Quantum (Q101-CA)	All Versions	CSM-SOC-FIBER HOLDER-05	N/A
INNO	IFS 10 IFS 15	All Versions	SM-SOC-FIBER HOLDER-06	N/A
Greenlee	910FS	All Versions	CSM-SOC-FIBER HOLDER-07	N/A

# CraftSmart® Splice-On Connector (SOC) -



# **Pre-Configured Part Numbers**

Part Number	Description
CSM-LCU-SM-6PAK	CraftSmart Splice-On Connectors, LC/UPC, singlemode, 6 pack
CSM-SCA-SM-6PAK	CraftSmart Splice-On Connectors, SC/APC, singlemode, 6 pack
CSM-SCU-SM-6PAK	CraftSmart Splice-On Connectors, SC/UPC, singlemode, 6 pack

# FieldShield<sup>®</sup>

# Pushable Optical Fiber



### **Application**

Designed to simplify the placement of fiber, FieldShield Pushable Optical Fiber reduces the cost of any fiber deployment, while providing industry leading protection when mated with FieldShield Microducts. Pushable Optical Fiber is either pulled or pushed through microduct at turn-up, maximizing installation efficiency. In the event of a later fiber cut, the fiber can be easily pulled from the microduct. The duct is then repaired and a new FieldShield Pushable Assembly is pushed or pulled through the microduct for a fast and cost-effective restoration.

### Description

FieldShield Pushable Optical Fiber is a durable and crush resistant product that is suitable for most indoor or outdoor environments. Manufactured using PBT jacketing, pushable optical fiber offers flexibility as well as resistance to chemicals. FieldShield Pushable Optical Fiber is typically recommended to be used in conjunction with FieldShield Microduct.



Available in 1, 2, 6, 12, 24 and 48 fiber counts

### **Features and Benefits**

### Integrity

- · Available in singlemode
- · Supports all industry standard connectors

#### Protection

- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- · Tough PBT jacketing provides high column strength and low coefficient of friction to maximize push and pull distances
- · Lightweight and high crush resistance
- · One and two fiber drops protected by water blocking Kevlar strength member
- 6 to 48-fiber utilize water blocking gel

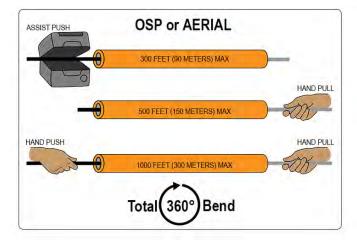
#### Access

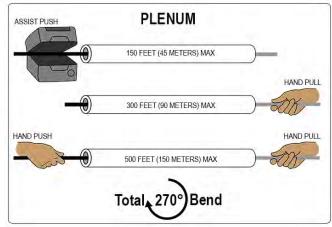
- · Standard color is black
- Tech-friendly 250 µm fiber inside the outer jacket reduces splicing steps and installation costs
- · Suitable for all types of indoor and outdoor implementations within a microduct

#### Investment

- Pushes directly into a Clearview<sup>®</sup> Cassette, FieldShield is optimized for placement alongside Clearfield<sup>®</sup> FieldSmart<sup>®</sup> fiber management platforms
- · Quick and easy deployment allows capital investment to be aligned to customer take rates
- · Available in multiple fiber counts up to 48 fibers

### Recommended Push/Pull





# FieldShield® Pushable Optical Fiber –



# **Technical Specifications**

FieldShield Pushable Optical Fiber	
Fiber	Corning ClearCurve Optical Fiber or equivalent
Water Peak	ZWP (Zero Water Peak)
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2
Color Code	TIA/EIA 598 (US Standard)
Fiber Count	Any fiber count up to 48 fibers
Pushable Connectors	FieldShield SC/UPC, SC/APC, Simplex and Duplex LC/UPC, Simplex and Duplex LC/APC, MPO
Standard Connectors	SC/UPC, SC/APC, LC/UPC, LC/APC, HFOC SC/APC, MPO
Internal Fiber Size	250 μm
Outside Diameter	1 to 12-fiber : 0.118" (3 mm); 24-fiber: 0.156" (3.96 mm); 48-fiber :0.217" (5.51 mm)
Color	Black
Material	PBT
Bend-Radius	10 mm minimum
High Temperature Aging	$(-40^{\circ}\text{C} + 85^{\circ}\text{C}) \le 0.05 \text{ dB/km}$
Temperature & Humidity Cycling	≤ 0.05 dB/km (at -10°C to 85°C and 95% RH)
Water Immersion (23 ± 2°C)	≤ 0.05 dB/km
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature -14°F to 158°F (-26°C to 70°C)	
Installation Tension	20 lbf for 3 mm; 20 lbf for 4 mm
Markings	Part number, lot number and footage markers every two feet (609.60 mm)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-CA1-001-8ZD-B XXXX	FieldShield pushable optical fiber, 1-fiber (250 μm), singlemode, 3 mm jacket
FS-CA1-002-8ZD-B XXXX	FieldShield pushable optical fiber, 2-fiber (250 μm), singlemode, 3 mm jacket
FS-CA1-006-8ZD-B XXXX	FieldShield pushable optical fiber, 6-fiber (250 μm), singlemode, 3 mm jacket
FS-CA1-012-8ZD-B XXXX	FieldShield pushable optical fiber, 12-fiber (250 µm), singlemode, 3 mm jacket
FS-CA1-024-8ZE-B XXXX	FieldShield pushable optical fiber, 24-fiber (250 μm), singlemode, 4 mm jacket
FS-CA1-048-8ZF-B XXXX	FieldShield pushable optical fiber, 48-fiber (250 µm), singlemode, 5.5 mm jacket

# FLEXdrop (UL Listed Plenum and Riser)



## **Application**

Clearfield's FieldShield FLEXdrop cable provides the most flexible option of our FieldShield product line. The OSP-rated PVDF jacketing allows for transition of FLEXdrop from the OSP environment directly into the inside plant, with the added benefit of being UL listed for plenum applications. FLEXdrop is either pulled or pushed through microduct at turn-up, maximizing installation efficiency. In the event of a later fiber cut, the fiber can be easily pulled from microduct. The duct is then repaired and a new FieldShield Pushable Assembly is pushed or pulled through the microduct for a fast and cost-effective restoration. Options for riser rated applications are also available.

### Description

FieldShield FLEXdrop has more flexibility than standard FieldShield Optical Cable making it ideal for shorter drops where more handling and slack storage may be required. Whether it's used indoor or outdoor, the flexibility of the jacket allows for deployment with reduced jacket memory and decreases the risk of kinking. While FLEXdrop is typically used in conjunction with FieldShield Microduct solutions, in some applications, it can be stapled directly to walls and ceilings or used on building wrap applications securing with crown T18 staples.



Available in single fiber count



### **Features and Benefits**

#### Integrity

- · Designed, tested and certified to Telcordia GR-20
- · Available in singlemode
- · Supports all industry standard connectors

### Protection

- UL listed for plenum and riser applications for single fiber only
- · Passed UV testing and measurement standards per ASTM G155 for UL 1581
- Bend-insensitive (G.657.A2) fiber protects optical signal with minimal to zero attenuation down to a 10 mm radius
- Staple-ready for walls, joists and around corners, with Crown T-18 staples
- · Swellable yarns for water blocking capabilities

### Access

- · Standard color is black with an option for off-white
- Suitable for all types of indoor and outdoor implementations (duct required for aerial and direct bury)

#### Investment

· Quick and easy deployment allows capital investment to be aligned to customer take rates

# FLEXdrop (UL Listed Plenum and Riser) -



# **Technical Specifications**

FieldShield FLEXdrop	
Fiber	Corning ClearCurve Optical Fiber or equivalent
Clad Diameter	125.0 ± 0.7 μm
Coating Diameter (Uncolored)	235 - 245 μm
Bend-Insensitive	Bend-Insensitive Fiber G.657.A2
Color Code	TIA/EIA 598 (US Standard)
Fiber Count	Single fiber
Pushable Connectors	FieldShield SC/UPC, SC/APC, Simplex LC/UPC
Standard Connectors	SC/UPC, SC/APC, LC/UPC, HFOC SC/APC
Mode	Singlemode
Internal Fiber Size	900 μm - Plenum; 250 μm - Riser
Outside Diameter	0.118" (3 mm)
Color	Black or white
Material	PVDF (Plenum) and LSZH (Riser)
Bend-Radius	Standard to G.657.A2 specifications
Installation Temperature	-22°F to 131°F (-30°C to 55°C)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Tension	20 lbf
Markings	Part number, lot number and footage markers every two feet (609.60 mm)
Cable Attenuation Spec	0.35 dB/km @ 1310 nm/0.25 dB/km @ 1550 nm
Recommended Drop Length	150 feet (45.72 m) or less for normal installation conditions (200 feet max.)

# **Pre-Configure Part Numbers**

Part Number	Description
FS-CP1-001-6ZD-B 01000F	FieldShield FLEXdrop Optical Cable, Plenum, 1 Fiber, 900um Singlemode, 3mm, White Jacket
FS-CP1-001-8ZD-B 01000F	FieldShield FLEXdrop Optical Cable, Plenum, 1 Fiber, 900um Singlemode, 3mm, Black Jacket

# FLEXdrop SC and LC Pushable Assemblies (UL Listed Plenum/Riser) -



### **Application**

Designed to simplify the deployment of fiber, FieldShield FLEXdrop SC and LC Pushable Assemblies provide a tech-friendly field assembled connector that snaps together in seconds without jeopardizing fiber protection or optical reliability. FieldShield Pushable Assemblies greatly reduce installation costs for Fiber to the Home (FTTH) installations, business class services, cell backhaul or any other small count delivery application.

### Description

FieldShield FLEXdrop SC and LC Pushable Assemblies are factory terminated and polished SC and LC connectors designed to be terminated on simplex FieldShield Pushable Optical Fiber Assemblies. After being pushed or pulled through FieldShield Microduct, the smooth wall protective sleeve is easily removed and an outer housing is snapped into place. This creates an industry standard connector without mechanical or fusion splicing. All SC and LC FieldShield Pushable Assemblies styles can be pushed/pulled in all FieldShield Microducts.



### **Features and Benefits**

### Integrity

- FLEXdrop fiber cable designed, tested and certified to Telcordia GR-20
- Terminations are designed, tested and certified to Telcordia GR-326
- · Available in singlemode SC/UPC, SC/APC, Simplex LC/UPC and Simplex LC/APC

#### Protection

- UL Listed for plenum and riser applications
- Smooth wall protective sleeve is easily removed and an outer housing is snapped into place
- Passed UV testing and measurements standards per ASTM G155 for UL 1581
- Option for FlexConnector in YOURx applications

#### Access

- Zirconia ceramic ferrule measuring 1.25 mm O.D.
- · Tool-less installation

#### Investment

- Tech-friendly pre-terminated pushable connectors rapidly decrease deployment times and reduce installation costs by eliminating in-field splicing
- Pushed directly into a Clearview Cassette, FieldShield is optimized for placement alongside Clearfield's FieldSmart® fiber management platforms

### **Packaging**

- · FLEXdrop Plenum available in spools 75' to 200'
- · Zip-bag option
- FLEXdrop Riser only available in zip-bag



Lengths up to 50' (9.75 m)



Lengths from 75' to 200' (22.86 m to 61 m)



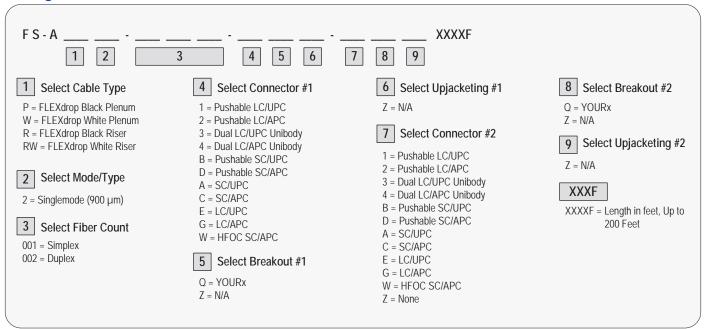
# FLEXdrop SC and LC Pushable Assemblies (UL Listed Plenum/Riser) -

### **Technical Specifications**

Minimum Performance Specifications for Terminated Singlemode Connectors

(	Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
	SC or LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
	SC or LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

### **Configured Part Numbers**



### **Accessories**

### Field Installable FlexConnector (FIFC)

 Once the cable has been prepped with the FlexConnector, the 3 mm cable is sandwiched between the two retainer clips. The FlexConnector is then pushed and snapped together with the retainer clips, pinching the grommet seal for a water-tight assembly.



# Field Installable FlexConnector Pre-Configured Part Numbers

Part Number	Description
FS-FIFC-103-6PAK	Field installable FlexConnector, 10 mm Port, 3 mm Cable, Black Grommet, 6 Pack
FS-FIFC-143-6PAK	Field installable FlexConnector, 14 mm Port, 3 mm Cable, Gray Grommet, 6 Pack
FS-FIFC-144-6PAK	Field installable FlexConnector, 14 mm Port, 4 mm Cable, Red Grommet, 6 Pack

### Description

For field installed applications, these three kits allow a water-tight transition from 3 mm and 4 mm cable, into the FlexPort. The kits include enough parts for six tool-less installations.

# FieldShield® FLEXdrop Deploy Reel



### **Application**

Due to the high variability of MDU architectures, extensive engineering has been required to ensure proper cable lengths for Fiber-to-the-Premise deployments. The 4.5" (114.30 mm) FieldShield FLEXdrop Deploy Reel minimizes pre-engineering because it allows FLEXdrop to be pulled from the reel directly to the access point. Once the pushable connector has reached its destination, the connector assembly is completed with the supplied connector housings and the connector is mated to the adapter. The remaining slack on the reel is pre-stored with no further slack management required. The terminated end on the reel is pre-tested, cleaned and mated in a Clearfield® factory environment, leaving the technician to simply mate the patch cord to the adapter on the reel. The small form factor of the cable assembly and Deploy Reel allows the FLEXdrop to be pulled and slack stored from the customer demarcation point. As an ISP Cable, FLEXdrop reduces pre-engineering and onsite installation time for MDU and riser deployments.



### Description

The FieldShield FLEXdrop Deploy Reel is a 4.5" x 2.125" (114.30 mm x 54.02 mm) spool designed to hold up to 100 feet (30.48 mm) of FieldShield FLEXdrop. The FLEXdrop 3mm fiber makes slack storage minimal and easy to accommodate, while the exceptional pull strength of FLEXdrop makes it craft-friendly and easy for the technician to handle without fear of fiber damage.

### **Features and Benefits**

### Integrity

- FLEXdrop fiber cable designed, tested and certified to Telcordia GR-20
- Terminations are designed, tested and certified to Telcordia GR-326
- Supports singlemode SC connectors

#### Protection

 Deploying FLEXdrop with a FieldShield FLEXdrop Deploy Reel allows the installer to payout the exact amount of cable required and leave the remaining slack safely stored on the reel

### Access

- Straight forward, simple design means installation crews spend less time figuring out how to deploy
- Available in 50 and 100 foot lengths

#### Investment

 Pre-terminated cable spools reduce upfront deployment costs by simplifying site survey inspections, reducing labor hours and streamlining cable deployment for SFU and MDU deployments

# FieldShield® FLEXdrop Deploy Reel -



# **Technical Specifications**

FieldShield FLEXdrop Deploy Reel		
Dimensions 5.8" W x 2.125" H (147.30 mm x 54.02 mm)		
Material	Black Thermoplastic	
Storage Temperature	-40°F to 150°F (-40°C to 65°C)	
Pullable Connectors	FieldShield® SC/APC and SC/UPC	
Standard Connectors	SC/APC, SC/UPC	
Fiber	FieldShield FLEXdrop 3mm, black and white	
Cable Length	50 and 100 foot lengths (15.24 m and 30.48 m)	

# **Pre-Configured Part Numbers**

# **Pre-Configured Part Numbers**

Part Number	Description
FDR-C1FA-DZZ2  FLEXdrop Deploy Reel, with SC/APC Adapter, Simplex SC/APC to Pushable SC/APC, Single mm FLEXdrop Patchcord	
FDR-C1FA-DZZ4-R	FLEXdrop Deploy Reel, Opposite Spooling with SC/APC Adapter, Simplex SC/APC to Pushable SC/APC, Singlemode, 100 Feet, 3 mm FLEXdrop Patchcord



# FLEXdrop Deploy Reel With Extension Flanges



# **Technical Specifications**

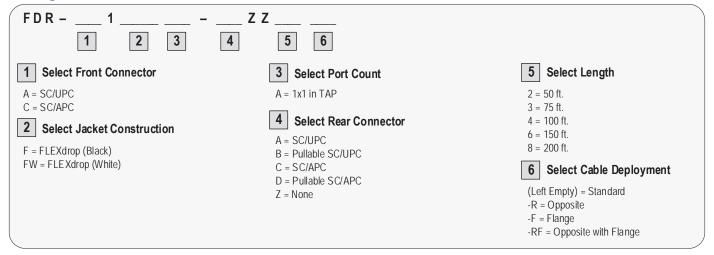
FieldShield FLEXdrop Deploy Reel	
Dimensions	5.8" W x 2.125" H (147.30 mm x 54.02 mm)
Material	Black Thermoplastic
Storage Temperature	-40°F to 150°F (-40°C to 65°C)
Pullable Connectors	FieldShield® SC/APC and SC/UPC
Standard Connectors	SC/APC, SC/UPC
Fiber	FieldShield FLEXdrop 3mm
Cable Length	100, 150 and 200' lengths (30.48 m, 45.72 m and 60.96 m)



# **Pre-Configured Part Numbers**

Part Number	Description
FDR-C1FA-DZZ4-F	FLEXdrop Deploy Reel, with SC/APC Adapter, Simplex SC/APC to Pushable SC/APC, Singlemode, 100 Feet, 3 mm FLEXdrop Patchcord
FDR-C1FA-DZZ8-F	FLEXdrop Deploy Reel, with SC/APC Adapter, Simplex SC/APC to Pushable SC/APC, Singlemode, 200 Feet, 3 mm FLEXdrop Patchcord

# **Configured Part Numbers**



# FLEXdrop Deploy Reel and Mini TAP Box -



### **Description**

The FieldSmart Mini TAP Box offers single or dual count fiber deployment in a discrete footprint and without sacrificing proper fiber management. The FieldSmart Mini TAP Box is designed to make FTTH more cost-effective and efficient than previously thought possible. Standardizing on a craft-friendly, building block architecture reduces the operating costs of fiber deployments by reducing installation times and inventory carrying requirements.

### **Technical Specifications**

FieldSmart Mini TAP	
Dimensions	9" H x 6" W x 3.91" D (228mm x 152mm x 99.31mm)
Material	UV Stabilized, Flame Retardant Polymer (PVC)
Mounting Option	Two exterior mounting ears
Rating	NEMA 4, when combined with closure screws
Latching	Two snap locks to ensure lid seals to base with integrated seal
Security	Security screw with ability to secure padlock
Access	Two multi-purpose entry/exit strain reliefs. 5 lb. max. retention force with flat drop down to 3mm cable.
Storage	50 feet of 3 mm cable (from flat drop) and 100 feet of FLEXdrop on Deploy Reel



# **Pre-Configured Part Numbers**

Part Number	Description
FDRG-CDSC-HHLZ	Deploy Reel Kit, Includes: Mini TAP Wall Box, StrongFiber Deploy Reel, Loaded with SC/APC Adapter and Simplex SC/APC to Pullable SC/APC 300 Feet, L-Bracket (No Adapter), Strain Relief
FDRG-CDF2-HHLZ	Deploy Reel Kit, Includes: Mini TAP Wall Box, FLEXdrop Deploy Reel, Loaded with SC/APC Adapter and Simplex SC/APC to Pullable SC/APC 50 Feet, L-Bracket (No Adapter), Strain Relief

# FLEXdrop Deploy Reel and SCD TAP Box



# **Description**

The lockable, NEMA-4 rated enclosure is compact with two bottom entry/exit points, making it ideal for a variety of applications. This enclosure can utilize the larger format FLEXdrop Deploy Reel with extension flanges for 100 and 200 feet applications.





# **Technical Specifications**

FieldSmart SCD Wall Box	
Dimensions	12.17" H x 8.62" W x 3.91" D (309.12 mm x 218.95 mm x 99.31 mm)
Material	UV Stabilized, Flame Retardant Polymer (PVC)
Mounting Option	Two exterior mounting ears
Rating	NEMA 4, when combined with closure screws
Latching	Two snap locks to ensure lid seals to base with integrated seal
Security	Security screw with ability to secure padlock
Access	Two multi-purpose entry/exit strain reliefs. 5 lb. max. retention force with flat drop down to 3mm cable.
Storage	100 feet of 3 mm cable (from flat drop) and 200 feet of FLEXdrop on Deploy Reel



# **Pre-Configured Part Numbers**

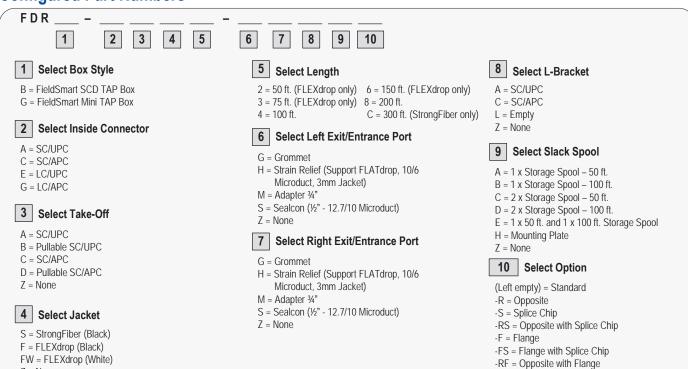
(	Part Number	Description
	FDRB-CDF4-HHLB-F	FLEXdrop Deploy Reel, Opposite Spooling with SC/APC Adapter, Simplex SC/APC to Pushable SC/APC, Singlemode, 100 Feet, 3 mm FLEXdrop Patchcord
	FDRB-CDF8-HHLB-F	Deploy Reel Kit with SCD TAP Box, includes two strain reliefs, with 200 ft. FLEXdrop Deploy Reel, 100 foot cable storage reel, SC/APC connectors and SC/APC adapter and L bracket

# Deploy Reel Kits for Mini TAP and SCD TAP-



### **Configured Part Numbers**

Z = None





-RFS = Opposite with Flange and Splice Chip

Home Deployment Kit - 021311





- · Designed for fast and easy installations
- Stores up to 100 feet of 3mm cable
- · Mounts to backplane with deploy reel mounting pin
- · Allows rotation when coiling slack from FieldShield drop options
  - FLATdrop (peel-and-play)
  - D-ROP (pre-connectorized CIC)
  - FLEXdrop











Deploy Reel Mounting Plate

FS-SLACK-REEL-50

FS-SLACK-REEL-100

Mini TAP

SCD TAP

### **Accessories Pre-Configured Part Numbers**

Part Number	Description
FS-SLACK-REEL-50	Slack Reel With Mounting Pin, Stores 50 Ft. of 3mm Cable
FS-SLACK-REEL-100	Reel, Slack Reel for 100 Feet of 3MM Cable, Includes Pilot Holes for Mounting Pin, Includes Pin and Screws
FS-DRP-KIT	Mounting Plate for Deploy Reel with 2 Mounting Screws, Mounting Locations for SC Adapter and 2 Splice Sleeves (Not Included)
FS-DRP-KIT-SCAPC	Mounting Plate for Deploy Reel with 2 Mounting Screws, SC/APC Adapter Included and Mounting Location for 2 Splice Sleeves (Not Included)
SC-DRP-KIT-SCUPC	Mounting Plate for Deploy Reel with 2 Mounting Screws, SC/UPC Adapter Included and Mounting Location for 2 Splice Sleeves (Not Included)

# Mini TAP Box Only Pre-Configured Part Numbers

Part Number	Description
FDRG-ZZZZ-HHLA	Deploy Reel Kit, Includes Mini TAP Box, 1 x 50 Ft. Storage Spool, L-Bracket (No Adapter), Strain Relief
FDRG-ZZZZ-HHLZ	Deploy Reel Kit, Includes Mini TAP Box, L-Bracket (No Adapter), Strain Relief

# **SCD TAP Box Only Pre-Configured Part Numbers**

Part Number	Description
FDRB-ZZZZ-HHLZ	FieldSmart SCD TAP, Plastic, Designed to Meet NEMA 4, Includes 2 Multi-Purpose Strain Reliefs, and L-Bracket for SC Adapter
FDRB-ZZZZ-HHLB	Plastic FieldSmart SCD TAP, Designed to Meet NEMA 4 With 2 Multi-Purpose Strain Reliefs and Adapter Bracket Includes Slack Reel With Pin, Stores 100 Ft. of 3MM Cable

# FieldShield® D-ROP - Direct Bury 10/6 mm



### **Application**

Building upon the restoration promise of FieldShield Pushable Fiber, FieldShield D-ROP is a pre-connectorized drop cable delivered to market pre-placed in microduct. The microduct plugs directly into the FieldShield FlexPort, providing an air-tight, water-tight connection between the YOURx-TAP and the YOURx-Terminal.

Installed as a single-pass deployment, FieldShield D-ROP provides ease of restoration. In the event of a future fiber cut, a field technician easily identifies the cut area, and utilizes a simple coupler and a FieldShield Fiber Assembly to restore service.

### Description

D-ROP cable presents the same footprint as a flat drop cable with the added advantage of being restorable. As with all FieldShield ducted solutions, fiber cuts are located and microduct is repaired with repair kit. A new pushable assembly is installed, minimizing costs and time to restore the service outage. It provides a completely protected pathway from the access point directly to the premise, business or antenna with the option for restoration after accidental fiber cut.



D-ROP does not have the slack storage challenges that a flat drop presents because the duct slack can be ring cut and removed leaving only the fiber assembly.

### **Features and Benefits**

#### Integrity

- Terminations are designed, tested and certified to Telcordia GR-326
- Fiber cable certified to Telcordia GR-20 and GR-409
- Duct is compliant to Telcordia GR-3155
- · Available with singlemode fiber

#### Protection

- FieldShield FlexConnector provides an air-tight, water-tight connection
- FieldShield Direct Bury Microduct has high tensile strength and crush resistance that withstands all types of implementations including open trenching, vibratory plowing and directional boring
- · Duct is constructed from HDPE to prevent degradation

#### Access

- Available pre-terminated with SC and LC
- Includes bend-insensitive fiber
- Microduct pushes directly into a YOURx-Terminal or YOURx-TAP
- Integrated tone wire simplifies ground locating in direct bury applications
- · Industry standard orange provides high visibility for direct bury applications

#### Investment

Pre-connectorized for a labor-lite, plug-and-play installation

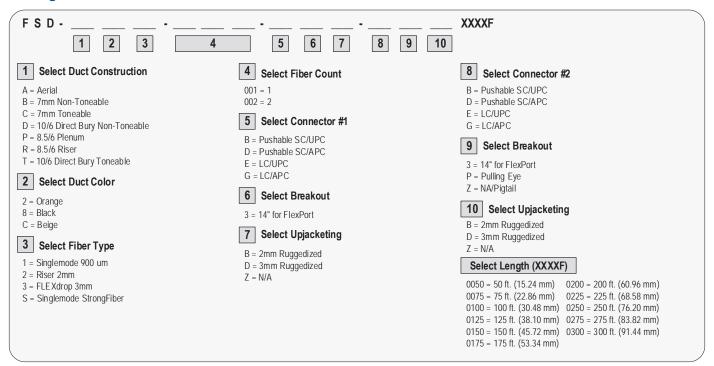
# D-ROP - Direct Bury 10/6 mm



# **Technical Specifications**

FieldShield D-ROP - Direct Bury	
Outside Diameter	0.394" (10.01 mm); Oversheathed Toneable 0.50" (12.70 mm)
Inside Diameter	0.246" (6.25 mm)
Installation Tension	340 lbf
Bend Radius	Non-toneable: 6" (152.40 mm) Radius Minimum; Toneable: 7" (177.80 mm) Radius Minimum
Material	High Density Polyethylene (HDPE)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	Orange
Tone Wire	Insulated Copper (Tone Only)
Tone Wire Diameter	0.032" (0.813 mm)/20 AWG (Tone Only)

# **Configured Part Numbers**



# FieldShield® D-ROP - Riser Rated 8.5/6 mm



### **Application**

Building upon the restoration promise of FieldShield Pushable Fiber, FieldShield D-ROP is a pre-connectorized drop cable delivered to market pre-placed in microduct. The microduct plugs directly into the FieldShield FlexPort, providing an air-tight, water-tight connection between the YOURx-TAP and the YOURx-Terminal.

Installed as a single-pass deployment, FieldShield D-ROP provides ease of restoration. In the event of a future fiber cut, a field technician easily identifies the cut area, and utilizes a simple coupler and a FieldShield Fiber Assembly to restore service.

### Description

D-ROP cable presents the same footprint as a flat drop cable with the added advantage of being restorable. As with all FieldShield ducted solutions, fiber cuts are located and microduct is repaired with repair kit. A new pushable assembly is installed, minimizing costs and time to restore the service outage. It provides a completely protected pathway from the access point directly to the premise, business or antenna with the option for restoration after accidental fiber cut.



D-ROP does not have the slack storage challenges that a flat drop presents because the duct slack can be ring cut and removed leaving only the fiber assembly.

### **Features and Benefits**

#### Integrity

- Terminations are designed, tested and certified to Telcordia GR-326
- · Fiber cable certified to Telcordia GR-20 and GR-409
- · Duct is compliant to Telcordia GR-3155
- UL-2024 Listed

#### Protection

- Riser Rated 8.5/6 mm Microduct has high tensile strength and crush resistance
- · Designed for applications designated as riser air space

#### Access

· Industry standard beige provides high visibility for indoor installation applications in existing conduit and by itself

#### Investment

· Pre-connectorized for a labor-lite, plug-and-play installation

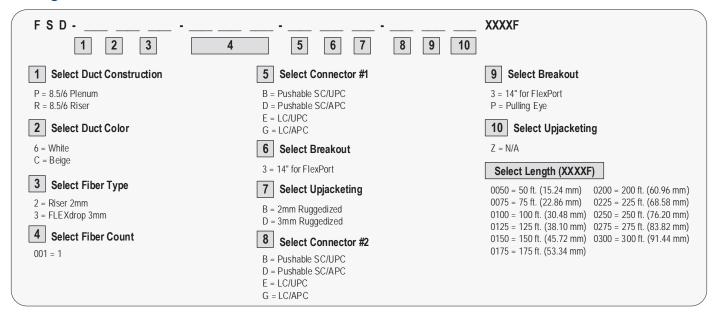
# D-ROP - Riser Rated 8.5/6 mm



# **Technical Specifications**

FieldShield D-ROP - Riser Rated	
Outside Diameter	0.33" (8.5 mm)
Inside Diameter	0.23" (5.9 mm)
Installation Tension	96 lbf
Min. Bend Radius	76.2 mm/3 mm
Material	Thermoplastic
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	Beige
Tone Wire	N/A

# **Configured Part Numbers**



# FieldShield® D-ROP 7/3.5 mm



### **Application**

Building upon the restoration promise of FieldShield Pushable Fiber, FieldShield D-ROP is a pre-connectorized drop cable delivered to market pre-placed in a 7 mm microduct. The FieldShield FlexConnector snaps into the FieldShield FlexPort, providing an air-tight, water-tight connection between the YOURx-TAP and the YOURx-Terminal.

Installed as a single-pass deployment, FieldShield D-ROP provides ease of restoration. In the event of a future fiber cut, a field technician easily identifies the cut area, and utilizes a simple coupler and a FieldShield Fiber Assembly to restore service.

### Description

D-ROP cable presents the same footprint as a flat drop cable with the added advantage of being restorable. As with all FieldShield ducted solutions, fiber cuts are located and microduct is repaired with repair kit. Blunt fiber is then pulled and terminated with a splice-on connector, minimizing costs and time to restore the service outage. The pre-installed FlexConnector is plugged directly into the FlexPort opening of the YOURx-Terminal or YOURx-TAP, providing a completely protected pathway from the access point directly to the premise, business or antenna with the option for restoration after accidental fiber cut.



D-ROP does not have the slack storage challenges that a flat drop presents because the duct slack can be peeled or removed leaving only the fiber assembly.

### FlexConnector Options

- · Factory Installed: the connector is shipped permanently installed on the pre-connectorized cable.
- Field Installable: the connector is shipped separately to be installed in the field. This is an ideal solution for eliminating excess slack storage when standard cable lengths are used for custom drop distances. The FlexConnector can be field installed on the preconnectorized cable (full plug-and-play) or blunt cable followed by a splice-on connector.

### **Features and Benefits**

#### Integrity

- · Duct is compliant to Telcordia GR-3155
- · Available with singlemode fiber

#### Protection

- FieldShield FlexConnector provides an air-tight, water-tight connection
- FieldShield Direct Bury Microduct has high tensile strength and crush resistance that withstands all types of implementations including open trenching, vibratory plowing and directional boring
- Duct is constructed from HDPE to prevent degradation

### Access

- · Available pre-terminated with SC and LC or bulk for field installation
- Option for splice-on connector (utilizing fiber matrix 850 µm)
- · Includes bend-insensitive fiber
- The FlexConnector installed onto microduct pushes directly into a YOURx-Terminal or YOURx-TAP
- Integrated tone wire simplifies ground locating in direct bury applications
- Industry standard orange provides high visibility for direct bury applications
- Available for aerial applications

#### Investment

- Available in bulk or pre-connectorized for a labor-lite, plug-and-play installation
- FieldShield FlexConnector available in 4 packs for field installations









Bulk D-ROP Spool

1-800-422-2537

# FieldShield® D-ROP 7/3.5 mm



### **Technical Specifications**

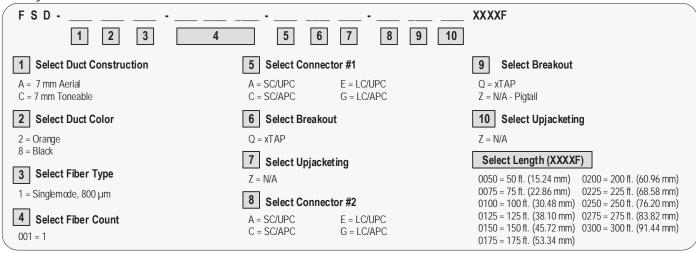
FieldShield D-ROP	
Outside Diameter	0.276" (7.01 mm)
Inside Diameter	0.146" (3.71 mm)
Material	HDPE
Connector Style	SC and LC
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Stringing Tension	To local regulations. Recommended not to exceed 0.2 KN
Min. Bend Radius	4.72" (119.89 mm)
Rated Cable Load	270 lbf (1.2 KN)
Duct Color	Orange (Direct Bury with tone) or Black (Aerial)
Tone Wire	Copper coated steel wire (Direct Bury only)
Markings	Part number, lot number, footage markers every foot
Breakout Length	12 inches (304.80 mm)

### Accessories

- Field Installable FlexConnector (FSD-FIFC-4PAK)
  - Installer cuts duct to desired length in the field using a rotary cutter, then snaps on the FlexConnector. After fusing on the standard connector and passing through the FlexPort, the outer housing is attached and connected to the adapter.
- D-ROP Opener: splitter tool with 7 mm OD (FS-DUCT-OPENER)
- D-ROP Deadend (FS-DEADEND-LG7)

### **Configured Part Numbers**

**Factory Installed Connectors** 



### **Pre-Configured Part Numbers**

Field-Installed Connectors

Part Number	Description
FS-MED-001-T-207-3280F	Bulk D-ROP, direct bury, toneable, orange, 7 mm O.D., 3280 foot (999.75 m) spool
FS-MEA-001-NT-807-3280F	Bulk D-ROP, aerial, black, 7 mm O.D., 3280 foot (999.75 m) spool
FSD-FIFC-4PAK	Field installable FlexConnector in 4 pack
FSD-FIFC-SCA-4PAK	Field installable FlexConnector with splice-on SC/APC connectors, 4 pack

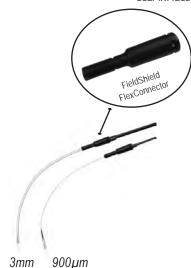
# CLEARFIELD

### **Application**

In addition to our industry standard fiber flat drop, Clearfield offers additional FieldShield FLATdrop options designed to save contractors and installers time and space in almost any deployment environment. The peelable outer sheath of FieldShield FLATdrops allow for easy access to the inner fiber elements (either 3mm or 900um) and each offer a large selection of connector types in a pre-connectorized solution while allowing for up to 100 feet of compact fiber slack storage.

Clearfield's suite of flat drop solutions effectively meet the unique needs of your network deployment.

 FieldShield Small Form Factor FLATdrop 900µm Peelable is a uniquely smaller footprint flat drop solution for the access portion of a FTTH or FTTB network. The small format handles more easily than traditional flat drop, allowing for less coiled storage space in outdoor storage. When the jacket is snipped and easily peeled away, the exposed 900µm subunit stores neatly on the compact FieldShield slack reel.



This small form factor FLATdrop is enabled with a pushable SC connector, allowing for placing and pushing through an existing pathway, in addition to the traditional deployments of direct bury or placing aerially.

• FieldShield FLATdrop 3mm Peelable is a drop cable solution for the access network such as FTTH and FTTB. By simply peeling back the outer jacket to expose the 3mm sub-unit, storage of excess cable is easily managed and stored on FieldShield slack reels.

All FieldShield FLATdrop cables are factory preconnectorized for fast terminal connection. At the access point, when utilizing YOURx-Terminal, simple plug-and play connectivity is achieved by incorporating a 10mm FieldShield FlexConnector. For use with standard TAP Boxes, FLATdrop breakouts secure into multi-purpose strain relief access points.

Suite of products options includes:

- jacket construction in either toneable or non-toneable
- up-jacketing with or without a rip cord (in 3mm version)

		Drop 1	ypes	
		Standard Flat Drop	FieldShield Peelable FLATdrop (With and Without Rip Cords)	FieldShield Peelable Small Form Factor FLATdrop
Coil Diameter		12"	12"	8"
Slack Footprint of Sheath Jacket	Sub-Unit	N/A	100+ ft.	100+ ft.
	Dims	8.3 mm x 4.7 mm	8.3 mm x 4.7 mm	5.4 mm x 3 mm
Sub-Unit		250µm	3mm	900µm
Recommended P-Clamp		021716	021716	022751
Connector Types	SC/APC SC/UPC	X	X	X
Connector Types	HFOC	Х	Х	X
	Pushable		Х	Х
	Aerial	X	Х	Х
Deployment Environment	Buried	Χ	Х	Х
	Conduit	Х	X	X

# FieldShield® FLATdrop——



### **Description**

The FieldShield FLATdrop suite offers the first pre-connectorized flat drop style cable to provide hardened environmental performance on a peelable flat drop style cable without the added cost or dependency on the market's existing bulky connector. Connectivity to access terminals is achieved through the innovative FlexConnector, which snaps into the YOURx-Terminal, providing an air-tight and water-tight connection.

#### FlexConnector Options

- Factory Installed: the FlexConnector is shipped permanently installed on the pre-connectorized cable.
- Field Installable: the FlexConnector is shipped separately to be installed in the field over a Pushable SC. This is an ideal solution for eliminating excess slack storage when standard cable lengths are used for custom drop distances. The FlexConnector can be field installed on the pre-connectorized cable (full plug-and-play) or blunt cable followed by a splice-on connector.

### **Features and Benefits**

### Integrity

- Available in singlemode
- FlexConnector is designed, tested and certified to GR-771
- · Terminations are designed, tested and certified to GR-326

#### Protection

- FlexConnector provides an air-tight, water-tight connection
- FLATdrop peelable cable allows for the outer jacket to be stripped back to expose the more flexible 3mm sub-unit or 900um sub-unit, easing storage of terminated ends

#### Access

- Flat drop cable construction allows for installation in direct bury and aerial applications
- Pre-terminated with an SC, LC or MPO connector or with pigtail for customer choice application
- Toneable cables allow for traceability

#### Investment

- · Leveraging the low cost of a traditional optical flat drop cable with option for plug-and-play field terminations
- · Quick and easy deployment allows capital investment to be aligned to customer take rates
- FieldShield FlexConnector available in bulk packs for field installations

### **Technical Specifications**

FieldShield FLATdrop	
Core Size and Type	Singlemode G652.D/G657.A1
Inner Cable Jacket OD	3.0 mm Ruggedized or Small Footprint 900 µm Subunit
Cable Types	Flat Drop Cable (Dielectric/Toneable)
Connector Type	SC, LC or MPO (only for Standard Flat Drop multi-fiber configuration)
Breakout Length	12 inches (304.80 mm)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Color	Black Jacket and White Sub-unit
Markings	Part number, lot number, footage markers every two feet (609.60 mm)





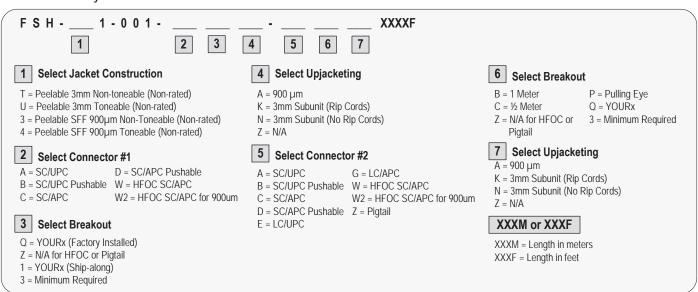
# **Technical Specifications - Pole to Pole Span**

Er	Environmental Loading Condition for Drop Application		
	Heavy	Medium	Light
1% Installation Sag Maximum Span Distance ft. (m)	150 (46)	250 (76)	325 (99)

<sup>\*</sup> Max pulling force on connector "W2" is 70 lbs. To obtain 100 lbs., pull on opposite end with pull sock.

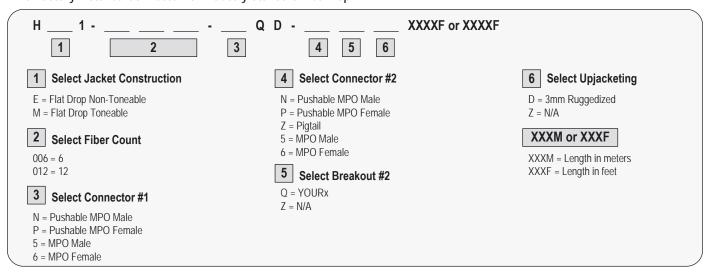
### **Configured Part Numbers**

SC and LC Factory Installed Connector



### **Configured Part Numbers**

MPO Factory Installed Connector for Industry Standard Flat Drop







### Accessories

Part Number	Description
FSH-FIFC-4PAK	Field installable FlexConnector for peelable 3mm, for 4 terminations
FSP-FIFC-6PAK	Field installable FlexConnector for peelable 900 µm, for 6 terminations
FS-PUL-YOURX	YOURx Pulling Tool, 10 mm, with Stainless Steel Pulling Carrot, Reusable
FS-PUL-5-9MM	Pull Sock, 5-9mm, cable, small format cable, reusable
FS-PROTECT-YOURX	YOURx Protective Sleeve, 10 mm, without Pulling Carrot, Used During Deployment, Reusable

- Field Installable FlexConnector (FSH-FIFC-4PAK) and FSP-FIFC-4PAK for 900 µm assembly
  - Once the cable has been prepped, the flat cable is sandwiched between the two retainer clips, pinched into place and then the FlexConnector is pushed and snapped together with the retaining clips
- When using FS-PUL-5-9MM on pushable connector end on small format FLATdrop:
  - Pulling Eye Loop = 50 lb. max.
  - Pull Sock = 100 lb. pull force
  - See QR code for installation method video



Scan for FieldShield Small Form Factor Video.



Pulling Bullet FLATdrop 900um Peelable



Scan for Pulling Bullet Video.

# Field Installable FlexConnector (FIFC)



### **Application**

The FieldShield Field Installable FlexConnector (FIFC) is an easy, tool-less way to create a water-tight seal when connecting FieldShield drop cable assemblies to the FieldShield FlexPorts in the YOURx-Terminal and YOURx-TAP in the OSP or building demarc.

### **Features and Benefits**

#### Integrity

FlexConnector designed and tested using FieldShield Drop Cables

#### Protection

FieldShield FlexConnector provides an air-tight, water-tight connection

#### Access

• Suitable for all types of indoor and outdoor implementations utilizing the FlexPort

#### Investment

· Quick and easy deployment allows capital investment to be aligned to customer take-rates



### FieldShield 3mm and 4mm Cable

### Description

The Field Installable FlexConnector for FieldShield 3 and 4 mm cables completes the field installation options for FieldShield drop cable assemblies. Available for 3 mm cable with either a 10 or 14 mm FlexConnector or a 4 mm cable with a 14 mm FlexConnector, the simple design allows for installation in the field, without the need for heat shrink or specialized tools. Preconnectorized, pushable SC or MPO connectors, as well as pullable LC connectors, will easily pass through the FlexConnector.

### **Pre-Configured Part Numbers**

1	Part Number	Description
	FS-FIFC-103-6PAK	Field installable FlexConnector, 10 mm Port, 3 mm Cable, Black Grommet, 6 Pack
	FS-FIFC-143-6PAK	Field installable FlexConnector, 14 mm Port, 3 mm Cable, Gray Grommet, 6 Pack
(	FS-FIFC-144-6PAK	Field installable FlexConnector, 14 mm Port, 4 mm Cable, Red Grommet, 6 Pack

# FieldShield FLATdrop

### Description

FieldShield FLATdrop is the first pre-connectorized flat drop style cable to provide hardened environmental performance on a flat drop style cable without the added cost or dependency on the market's existing bulky connector. Connectivity to access terminals is achieved through the innovative FlexConnector, which snaps into the YOURx-Terminal and YOURx-TAP, providing an air-tight and water-tight connection.



# **Pre-Configured Part Numbers**

	Part Number	Description
	FSH-FIFC-4PAK	Field installable FlexConnector 3mm with pieces for 4 terminations
	FSH-FIFC-SCA-4PAK	Field installable FlexConnector splice-on SCA connectors and pieces for 4 terminations
	FSP-FIFC-6PAK	Field installable FlexConnector, 900 um, 6 Pack

# Direct Bury 10/6 mm Microduct



# **Application**

Simplifying the placement of fiber, while providing protection from harsh environmental elements, FieldShield Direct Bury 10/6 mm Microduct is specifically designed for applications requiring a small heavy duty drop feed. Rugged crush resistance protects FieldShield Direct Bury Microduct from the rigors of all industry standard ground deployment methods, while rigid column strength allows microducts to be deployed through occupied duct previously thought exhausted. Direct Bury 10/6 mm Microduct has an outer diameter of 10 mm and an inner diameter of 6 mm.

# Description

FieldShield Direct Bury 10/6 mm Microduct is a durable and crush resistant micro-conduit designed to increase the protection of fiber while decreasing installation and maintenance expenses. Manufactured using high density polyethylene (HDPE), FieldShield Direct Bury Microduct offers superior durability and protection.



#### **Features and Benefits**

#### Integrity

Compliant to Telcordia GR-3155

#### Protection

- · Quick and easy to install
- Direct Bury Microduct has high tensile strength and crush resistance that withstands all types of ground implementations including open trenching, vibratory plowing, micro-trenching and directional boring
- · Made from HDPE to prevent degradation

#### Access

- · Optional external tone wire simplifies ground locating
- Industry standard orange provides high visibility for direct bury applications
- · Standard nylon pull string simplifies deployment of fiber
- · Smooth core slip lining reduces drag co-efficient enabling fiber to be pushed or pulled with minimal resistance
- Optional black color available to couple direct bury orange to a more aesthetically pleasing black color as it transitions above ground on the side of a living unit

#### Investment

- Maximizes capacity of existing conduit previously considered exhausted
- · Provides industry leading protection for "last mile" feeds

# Direct Bury 10/6 mm Microduct -



# **Technical Specifications**

FieldShield Direct Bury 10/6 mm Microduct	
Length	2,000 feet (609.60 m) per spool (-0 / +5%)
Outside Diameter	0.394" (10.01 mm); Oversheathed Toneable 0.50" (12.70 mm)
Inside Diameter	0.246" (6.25 mm)
Wall Thickness	0.074" (1.88 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Installation Tension	340 lbf
Bend-Radius	Non-toneable: 6" (152.40 mm) radius minimum; Toneable: 7" (177.80 mm) radius minimum
Material	High Density Polyethylene (HDPE)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	Orange and Black
Tone Wire	Insulated Copper
Tone Wire Diameter	0.032" (0.813 mm) / 20 AWG
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 20" W (304.80 mm x 609.60 mm x 508.00 mm)
Weight	Non-toneable: 71 lbs (32.21 kg); Toneable: 78 lbs (35.38 kg)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-DED-NT-210-PS-2000F	FieldShield Microduct, 10 mm, direct bury, non-toneable, orange, 2000 feet (609.60 m)
FS-MEO-T-210-2000F	FieldShield Microduct, 10 mm, direct bury, oversheathed toneable, orange, 2000 feet (609.60 m)
FS-MED-NT-810-2000F	FieldShield Microduct, 10 mm, direct bury, non-toneable, black, 2000 feet (609.60 m)

# FieldShield<sup>®</sup>

# Direct Bury 14/10 mm Microduct



# **Application**

Simplifying the placement of fiber, while providing protection from harsh environmental elements, FieldShield Direct Bury 14/10 mm Microduct is specifically designed for applications requiring a small heavy duty drop feed. Rugged crush resistance protects FieldShield Direct Bury Microduct from the rigors of all industry standard ground deployment methods, while rigid column strength allows microducts to be deployed through occupied duct previously thought exhausted. Direct Bury 14/10 mm Microduct has an outer diameter of 14 mm and an inner diameter of 10 mm.

# Description

FieldShield Direct Bury 14/10 mm Microduct is a durable and crush resistant micro-conduit designed to increase the protection of fiber while decreasing installation and maintenance expenses. Manufactured using high density polyethylene (HDPE), FieldShield Direct Bury 14/10 mm Microduct offers superior durability and protection.



#### **Features and Benefits**

#### Integrity

Compliant to Telcordia GR-3155

#### Protection

- · Quick and easy to install
- Direct Bury Microduct has high tensile strength and crush resistance that withstands all types of ground implementations including open trenching, vibratory plowing, micro-trenching and directional boring
- · Made from HDPE to prevent degradation

#### Access

- · Optional external tone wire simplifies ground locating
- Industry standard orange provides high visibility for direct bury applications
- · Standard nylon pull string simplifies deployment of fiber
- Smooth core slip lining reduces drag co-efficient enabling fiber to be pushed or pulled with minimal resistance

#### Investment

- Maximizes capacity of existing conduit previously considered exhausted
- · Provides industry leading protection for "last mile" feeds

# FieldShield® Direct Bury 14/10 mm Microduct -



# **Technical Specifications**

FieldShield Direct Bury 14/10 mm Microduct	
Length	Non-toneable: 1,500 feet (457.20 m) per spool; Toneable: 1,250 feet (381.00 m) per spool
Outside Diameter	Non-toneable: 0.551" (14.00 mm); Toneable: 0.66" (16.76 mm)
Inside Diameter	0.390" (9.91 mm)
Wall Thickness	0.079" (2.01 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Installation Tension	Non-toneable: 264 lbf; Toneable: 346 lbf
Bend-Radius	Non-toneable: 8" (203.20 mm) radius minimum; Toneable: 10" (254.00 mm) radius minimum
Material	High Density Polyethylene (HDPE)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	Orange
Tone Wire	Insulated Stranded Copper
Tone Wire Diameter	0.032" (0.813 mm) / 20 AWG
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 20" W (304.80 mm x 609.60 mm x 508.00 mm)
Weight	Non-toneable: 72 lb (32.66 kg); Toneable: 95 lbs (43.09 kg)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-DED-NT-214-PS-1500F	FieldShield microduct, 14 mm, direct bury, non-toneable, orange, 1500 feet (457.20 m)
FS-DEO-T-214-PS-1250F	FieldShield microduct, 14 mm, direct bury, oversheathed toneable, orange, 1250 feet (381.00 m)

# Direct Bury 14/10 mm Black Microduct



# **Application**

Simplifying the placement of fiber, while providing protection from harsh environmental elements, FieldShield Direct Bury 14/10 mm Black Microduct is specifically designed for applications requiring a small heavy duty drop feed. Rugged crush resistance protects FieldShield Direct Bury Microduct from the rigors of all industry standard ground deployment methods, while rigid column strength allows microducts to be deployed through occupied duct previously thought exhausted. Direct Bury 14/10 mm Black Microduct has an outer diameter of 14 mm and an inner diameter of 10 mm.

# Description

FieldShield Direct Bury 14/10 mm Black Microduct is a durable and crush resistant microconduit designed to increase the protection of fiber while decreasing installation and maintenance expenses. Manufactured using high density polyethylene (HDPE), FieldShield Direct Bury 14/10 mm Microduct offers superior durability and protection.



#### **Features and Benefits**

#### Integrity

• Compliant to Telcordia GR-3155

#### Protection

- · Quick and easy to install
- Direct Bury Microduct has high tensile strength and crush resistance that withstands all types of ground implementations including open trenching, vibratory plowing, micro-trenching and directional boring
- · Made from HDPE to prevent degradation

#### Access

- · Standard nylon pull string simplifies deployment of fiber
- · Ribbed core slip lining reduces drag co-efficient enabling fiber to be pushed or pulled with minimal resistance

#### Investment

- Maximizes capacity of existing conduit previously considered exhausted
- Provides industry leading protection for "last mile" feeds

# Direct Bury 14/10 mm Black Microduct —



# **Technical Specifications**

FieldShield Direct Bury 14/10 mm Black Microduct	
Length	4,922 feet (1500.23 m) per spool
Outside Diameter	0.551" (14 mm +/- 0.2 mm)
Inside Diameter	0.390" (9.91 mm)
Wall Thickness	0.079" (2 mm +/- 0.2 mm)
Installation Tension	Non-toneable: 264 lbf; Toneable: 346 lbf
Bend-Radius	8" (203.20 mm) radius minimum
Material	High Density Polyethylene (HDPE)
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	Black
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	40" OD x 24" W (1016.00 mm x 609.60 mm)
Weight	375 lbs (170.10 kg)

# **Configured Part Numbers**

Part Number	Description
FS-MED-NT-814-PS-1500F	FieldShield microduct, 14 mm, Direct Bury, non-toneable, black, 1,500 feet (457 m)

# Plenum 10/6 mm Microduct



# **Application**

Plenum rated microducts provide a self extinguishing raceway to protect and deploy optical fiber in airspaces, raised floors and other indoor applications designated as plenum air spaces. Plenum 10/6 mm Microduct has an outer diameter of 10 mm and an inner diameter of 6.9 mm.

# Description

FieldShield Plenum 10/6 mm Microduct is a durable, polyvinylidene difluoride (PVDF) crush resistant microduct suitable for protecting fiber in any indoor application. Easily mated with an airtight and waterproof coupler, FieldShield Plenum Microducts integrate with direct bury and aerial microducts creating a single and continuous pathway from outside plant to inside plant environments.

#### Features and Benefits

#### Integrity

- Compliant to Telcordia GR-3155
- · Conforms to UL-2024. ETL listed.

#### Protection

- Plenum rated material self-extinguishes flame and does not reignite
- High tension and crush resistance allows microduct to be pushed through existing conduit and around tight corners without degrading microduct

#### Access

- · Quick and easy to install
- Small 10 mm footprint makes FieldShield ideal for all types of indoor implementations maximizing space in ladder racks, raised floors and air handling elevator shafts
- · Smooth core enables fiber to be pushed or pulled with minimal resistance
- · White color for easy identification

#### Investment

Extends the capacity of existing conduit previously considered exhausted

# Plenum 10/6 mm Microduct -



# **Technical Specifications**

FieldShield Plenum 10/6 mm Microducts	
Length	2,000 feet (609.60 m) per spool (-0 / +5%)
Outside Diameter	0.394" (10.01 mm)
Inside Diameter	0.272" (6.91 mm)
Wall Thickness	0.059" (1.50 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Minimum Bend-Radius	6" (152.40 mm) radius, supported 4" (101.60 mm), unsupported 8" (203.20 mm)
Material	Polyvinylidene Difluoride (PVDF)
Rating	Plenum rated
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	White
Tone Wire	N/A
Tone Wire Diameter	N/A
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 15" W (304.80 mm x 609.60 mm x 381.00 mm)
Weight	104 lbs (47 kg)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-MCP-NT-610-2000F	FieldShield Microduct, 10 mm, Indoor Plenum, non-toneable, white, 2000 feet (609.60 m)

# Plenum 12.7/10 mm Microduct



# **Application**

Plenum rated microducts provide a self extinguishing raceway to protect and deploy optical fiber in airspaces, raised floors and other indoor applications designated as plenum air spaces. Plenum 12.7/10 mm Microduct has an outer diameter of 12.7 mm and an inner diameter of 10 mm.

# Description

FieldShield Plenum 12.7/10 mm Microduct is a durable, polyvinylidene difluoride (PVDF) crush resistant microduct suitable for protecting fiber in any indoor application. Easily mated with an airtight and waterproof coupler, FieldShield Plenum Microducts integrate with direct bury and aerial microducts creating a single and continuous pathway from outside plant to inside plant environments.



#### **Features and Benefits**

#### Integrity

- Compliant to Telcordia GR-3155
- · Conforms to UL-2024. ETL listed.

#### Protection

- Plenum rated material self-extinguishes flame and does not reignite
- High tension and crush resistance allows microduct to be pushed through existing conduit and around tight corners without degrading microduct

#### Access

- Quick and easy to install
- Small 10 mm footprint makes FieldShield ideal for all types of indoor implementations maximizing space in ladder racks, raised floors and air handling elevator shafts
- Straight ribs with silicone lining enables fiber to be pushed or pulled with minimal resistance
- · White color for easy identification

#### Investment

Extends the capacity of existing conduit previously considered exhausted

# Plenum 12.7/10 mm Microduct -



# **Technical Specifications**

FieldShield Plenum 12.7/10 m	m Microducts
Length	1,500 feet (457.20 m) per spool (-0 / +5%)
Outside Diameter	0.500" (12.70 mm)
Inside Diameter	0.408" (10.36 mm)
Wall Thickness	0.042" (1.07 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Minimum Bend-Radius	8" (203.20 mm) radius
Material	Polyvinylidene Difluoride (PVDF)
Rating	Plenum rated
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	White
Tone Wire	N/A
Tone Wire Diameter	N/A
Markings	Part number, date code, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 20" W (304.80 mm x 609.60 mm x 508.00 mm)
Weight	125 lbs (57.00 kg)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-DCP-NT-612.7-PS-1500F	FieldShield Microduct, 12.7 mm, Indoor Plenum, non-toneable, white, 1500 feet (457.20 m)

# Riser Rated 10/6 mm Microduct



# **Application**

Simplifying the placement of fiber, while providing protection for all indoor elements, FieldShield Riser Rated 10/6 mm Microduct is specifically designed for applications requiring small pathways in confined spaces. Rugged crush resistance protects FieldShield Riser Rated 10/6 mm Microduct from the rigors of all industry standard deployment methods, while the rigid column strength allows microducts to be deployed through occupied duct previously thought to be exhausted. Riser Rated 10/6 mm Microduct has an outer diameter of 10 mm and an inner diameter of 6 mm.

# Description

FieldShield Riser Rated 10/6 mm Microduct is a durable, crush resistant micro-conduit designed to increase the protection of fiber while decreasing installation and maintenance expenses. Manufactured using high density thermoplastic, FieldShield Riser Rated Microduct offers superior durability and protection.

#### **Features and Benefits**

#### Integrity

- · Compliant to Telcordia GR-3155
- UL-2024 listed

#### Protection

- · Quick and easy to install
- Riser Rated 10/6 mm Microduct has high tensile strength and crush resistance
- · Designed for applications designated as riser air space

#### Access

- · Industry standard beige provides high visibility for indoor installation applications in existing conduit and by itself
- · Standard nylon pull string simplifies deployment of fiber
- · Smooth core slip lining reduces drag co-efficient enabling fiber to be pushed or pulled with minimal resistance

#### Investment

- Maximizes capacity of existing conduit previously considered exhausted
- Provides industry leading protection for any indoor riser rated application

# Riser Rated 10/6 mm Microduct -



# **Technical Specifications**

FieldShield Riser Rated 10/6 mm Microducts	
Length	2,000 feet (609.60 m) per spool (-0 / +5%)
Outside Diameter	0.394" (10.01 mm)
Inside Diameter	0.246" (6.25 mm)
Wall Thickness	0.074" (1.88 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Installation Tension	340 lbf
Minimum Bend-Radius	132.08 mm/5.2" radius
Material	Thermoplastic
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	White
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 14" W (304.80 mm x 609.60 mm x 355.60 mm)
Weight	84 lbs

# **Pre-Configured Part Numbers**

Part Number	Description
FS-DCR-NT-610-PS-2000F	FieldShield Microduct, 10 mm, riser, non-toneable, white, 2,000 foot (609.60 m) spool

# Riser Rated 14/10 mm Microduct



# **Application**

Simplifying the placement of fiber, while providing protection for all indoor elements, FieldShield Riser Rated 14/10 mm Microduct is specifically designed for applications requiring small pathways in confined spaces. Rugged crush resistance protects FieldShield Riser Rated 14/10 mm Microduct from the rigors of all industry standard deployment methods, while the rigid column strength allows microducts to be deployed through occupied duct previously thought to be exhausted. Riser Rated 14/10 mm Microduct has an outer diameter of 14 mm and an inner diameter of 10 mm.

# Description

FieldShield Riser Rated 14/10 mm Microduct is a durable, crush resistant micro-conduit designed to increase the protection of fiber while decreasing installation and maintenance expenses. Manufactured using high density thermoplastic, FieldShield Riser Rated Microduct offers superior durability and protection.

#### **Features and Benefits**

#### Integrity

- · Compliant to Telcordia GR-3155
- UL-2024 listed

#### Protection

- · Quick and easy to install
- · Riser Rated 10/6 mm Microduct has high tensile strength and crush resistance
- Designed for applications designated as riser air space

#### Access

- · Industry standard beige provides high visibility for indoor installation applications in existing conduit and by itself
- · Standard nylon pull string simplifies deployment of fiber
- · Smooth core slip lining reduces drag co-efficient enabling fiber to be pushed or pulled with minimal resistance

#### Investment

- Maximizes capacity of existing conduit previously considered exhausted
- Provides industry leading protection for any indoor riser rated application

# Riser Rated 14/10 mm Microduct -



# **Technical Specifications**

FieldShield Riser Rated 14/10 mm Microducts	
Length	1,500 feet (457.20 m) per spool (-0 / +5%)
Outside Diameter	0.551" (14 mm)
Inside Diameter	0.390" (9.90 mm)
Wall Thickness	0.079" (2.01 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Ovality	≤ 5%
Installation Tension	340 lbf
Minimum Bend-Radius	8" (203.20 mm) radius
Material	Thermoplastic
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	White
Markings	Part number, lot number, footage markers every two feet (609.60 mm)
Spool Size	12" ID x 24" OD x 20" W (304.80 mm x 609.60 mm x 508.00 mm)
Weight	96 lbs (43.54 kg)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-DCR-NT-614-PS-1500F	FieldShield Microduct, 14 mm, riser, non-toneable, white, 1,500 foot (457.20 mm) spool

# Aerial 10/8 mm Microduct



# **Application**

Designed to simplify the placement of fiber, FieldShield Aerial 10/8 mm Microduct is a durable 10/8 solution, protecting fiber from exposed outdoor environments. FieldShield Aerial Microduct easily integrates into pole mounted distribution terminals providing an aerial pole to pole distribution and "last mile" drop to the customer premise.

# Description

FieldShield Aerial 10/8 mm Microduct is a 10 mm diameter, self-supporting (figure-8 style) microduct intended to deploy fiber the same way an aerial drop is installed. Designed to comply with North American storm and ice loading standards, the strength member makes FieldShield Aerial 10/8 mm Microduct the solution for spanning up to 500 feet (152.40 m). The FieldShield Aerial 10/8 mm Microduct supports FieldShield Pushable Optical Fiber up to 3 mm in diameter.



7 strands of 1.6 mm galvanized steel (twisted)

#### **Features and Benefits**

#### Integrity

· Compliant to Telcordia GR-3155

#### Protection

- · High crush and tension resistance protects duct from harshest environmental conditions
- Made with MDPE to prevent degradation from sun and elements

#### Access

- · Industry standard black for high visibility in aerial applications
- External aerial strength support requires Clearfield FS-DEADEND-AD10 for dead end application
- · Quick and easy to install in self-supporting aerial applications
- · Smooth core with additional slip lining enables fiber to be pushed or pulled with minimal resistance
- Standard nylon pull string simplifies deployment of fiber when pulling or using a push/pull combo

#### Investment

· Tech-friendly deployment methods reduce installation expenses

# Aerial 10/8 mm Microduct



# **Technical Specifications**

FieldShield Aerial 10/8 mm Microduct	
Outside Diameter	0.394" (9.8mm +/-0.2mm)
Inside Diameter	0.315" (8 mm)
Minimum Bend Radius	8" (203.20 mm) radius
Maximum Tensile Load	2,900 lbs (1315.42 kg)
Rating Length	500 foot (152.40 m) span in North America heavy zone
Material	MDPE
Color	Black
Figure 8 Strength Wire Material	7 x 1.6 mm stranded galvanized
Markings	Part number, lot number, footage markers every foot
Spool Size	32" OD x 24" W (812.80 mm x 609.60 mm)

# **Pre-Configured Part Numbers**

Part Number	Description
FS-MEA-T-810-PS-1300F	FieldShield Microduct, Aerial 10/8, figure 8, black, 1,300 foot (396.24 m) spool

# Large Aerial Microduct Attachment -

# **Description**

FieldShield Large Aerial Microduct Attachment provides the quickest and easiest way to attach FieldShield Large 14/10 and 10/8 Figure-8 Microducts. Simply strip away the jacket from the support strand on the microduct to accommodate the dead end and place the attachment over the strand.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-DEADEND-AD10	Microduct, Aerial 14/10 and 10/8 Dead End, Large Cable

# Aerial 14/10 mm Microduct



# **Application**

Designed to simplify the placement of fiber, FieldShield Aerial 14/10 mm Microduct is a durable 14/10 solution, protecting fiber from exposed outdoor environments. FieldShield Aerial Microduct easily integrates into pole mounted distribution terminals providing an aerial pole to pole distribution and "last mile" drop to the customer premise.

# Description

FieldShield Aerial 14/10 mm Microduct is a 14 mm diameter, self-supporting (figure-8 style) microduct intended to deploy fiber the same way an aerial drop is installed. Designed to comply with North American storm and ice loading standards, the strength member makes FieldShield Aerial 14/10 mm Microduct the solution for spanning up to 500 feet (152.40 m). The FieldShield Aerial 14/10 mm Microduct supports FieldShield Pushable Optical Fiber up to 5.5 mm in diameter.



7 strands of 1.6 mm galvanized steel (twisted)

#### **Features and Benefits**

#### Integrity

· Compliant to Telcordia GR-3155

#### Protection

- · High crush and tension resistance protects duct from harshest environmental conditions
- Made with HDPE to prevent degradation from sun and elements

#### Access

- · Industry standard black for high visibility in aerial applications
- External aerial strength support requires Clearfield FS-DEADEND-AD10 for dead end application
- · Quick and easy to install in self-supporting aerial applications
- · Smooth core with additional slip lining enables fiber to be pushed or pulled with minimal resistance
- Standard nylon pull string simplifies deployment of fiber when pulling or using a push/pull combo

#### Investment

· Tech-friendly deployment methods reduce installation expenses

# Aerial 14/10 mm Microduct -



# **Technical Specifications**

FieldShield Aerial 14/10 mm	Microduct
Length	1,250 feet (381 m) per spool (-0 / +5%)
Outside Diameter	0.551" (14 mm +/- 0.2 mm)
Inside Diameter	0.390" (9.91 mm)
Wall Thickness	0.079" (2 mm +/- 0.2 mm)
Slip Layer	Minimum 0.004" (0.102 mm)
Max. Tensile Load	2,900 lbs. (1315.42 kg)
Ovality	≤5%
Crush Resistance	900 psi
Rating Length	500 foot (152.40 m) span in North America heavy zone
Minimum Bend-Radius	12" (304.80 mm) radius
Material	HDPE
Operating Temperature	-40°F to 176°F (-40°C to 80°C)
Installation Temperature	-14°F to 158°F (-26°C to 70°C)
Color	Black
Figure 8 Strength Wire Material	7 x 1.6 mm stranded galvanized
Markings	Part number, lot number, footage markers every foot
Spool Size	35" (889 .00 mm) No OD Reel
Weight (3,281 feet on spool)	394 lbs. (178 kg)

# **Configured Part Numbers**

Part Number	Description
FS-MEA-T-814-PS-1250F	FieldShield Microduct, aerial 14/10, figure-8, black, 1,250 feet (381.00 m)

# Large Aerial Microduct Attachment -

# **Description**

FieldShield Large Aerial Microduct Attachment provides the quickest and easiest way to attach FieldShield Large 14/10 and 10/8 Figure-8 Microducts. Simply strip away the jacket from the support strand on the microduct to accommodate the dead end and place the attachment over the strand.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-DEADEND-AD10	Microduct, Aerial 14/10 and 10/8 Dead End, Large Cable

# 



# Rotary Duct Cutter –

# Description

Rotary Duct Cutters are designed to make cutting all standard microducts as simple as possible without cutting the pull string inside.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-TCUT-8-10MM	FieldShield Rotary Duct Cutter, 8 to 14 mm microducts

# Duct Cutter —

# **Description**

The Duct Cutter is used to make a clean, flat cut on any Clearfield® microduct products. It resembles a cigar cutter in that it has a fixed blade that is attached to a hinged mechanism to "cleave" the duct. This provides a clean cut that is suitable for insertion into a coupler. Care should be taken when handling the cutter as the blade is very sharp.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-DCUT-8-10MM	FieldShield Duct Cutter, 8 mm to 14 mm microducts

# 

# Description

Microduct De-Burring Tools are designed to make chamfering the inside of microducts simple, helping to ensure pushing and pulling are smooth operations. It is used after a cut has been made to the microduct and prior to inserting a cut microduct into a coupler. The purpose of the de-burring tool is to form a conical shape on the inside surface of the microduct that, after insertion into a coupler, allows the fiber to glide between microducts with ease.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-MD-DBR-TOOL	FieldShield Microduct De-Burring Tool, 8 mm to 10 mm, blue

# 

# Description

The FieldShield Microduct Proofing Mandrels allow the installer to proof duct installation prior to push/pull the drop.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-DUCT-PROOFING-KIT	Proofing Mandrel for 6 mm and 10 mm duct, which includes 2000F spool of pull string
FS-DUCT-PROOFING- TOOL	Proofing Mandrel for 6 mm and 10 mm duct

# Duct Accessories -



# Replacement Pull String-

# **Description**

The FieldShield Replacement Pull String allows the installer to replace string in microduct or blow sting into unoccupied duct.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-PUL-STRING-2000F	Replacement Pull String, 50 lb., 2000 Foot Spool
FS-PUL-YOURX Pulling Tool, YOURx Breakout, for 50 lb. Maximum Pulling Force, 10mm FlexPort	

# 

# Description

Airtight Couplers are designed to provide simple, 2-click plug-and-play joining of microducts, enabling longer runs and safe pushing and pulling performance.



# **Pre-Configured Part Numbers**

(	Part Number	Description
FS-CPLR-7MM-7MM-10 FieldShield Microduct Airtight Coupler, 7 mm to 7 mm, 10 pack		FieldShield Microduct Airtight Coupler, 7 mm to 7 mm, 10 pack
FS-CPLR-8MM-8MM-10 FieldShield Microduct Airtight Coupler, 8 mm to 8 mm, 10 pack		FieldShield Microduct Airtight Coupler, 8 mm to 8 mm, 10 pack
FS-CPLR-10MM-10MM-10 FieldShield Microduct Airtight Coupler, 10 mm to 10 mm, 10 pack		FieldShield Microduct Airtight Coupler, 10 mm to 10 mm, 10 pack
FS-CPLR-12.7MM-12.7MM-10 FieldShield Microduct Airtight Coupler, 12.7 mm to 12.7 mm, 10 pack		FieldShield Microduct Airtight Coupler, 12.7 mm to 12.7 mm, 10 pack
	FS-CPLR-14MM-14MM-10	FieldShield Microduct Airtight Coupler, 14 mm to 14 mm, 10 pack

# **Airtight Transition Coupler -**

# **Description**

Airtight Transition Couplers are used to join two different sizes of microduct.



# **Pre-Configured Part Numbers**

Part Number Description		Description
F	S-CPLR-8MM-10MM-10	FieldShield Microduct Airtight Transition Coupler, 8 mm to 10 mm, 10 pack
FS-CPLR-10MM-12.7MM-10 FieldShield Microduct Airtight Transition Coupler, 10 mm to 12.7 m		FieldShield Microduct Airtight Transition Coupler, 10 mm to 12.7 mm, 10 pack
F	S-CPLR-12.7MM-14MM-10	FieldShield Microduct Airtight Transition Coupler,12.7 mm to 14 mm, 10 pack

# Duct Accessories



# End Cap -

# **Description**

End caps are airtight caps used to keep debris out of the end of the microduct when pulling duct through existing conduit and plowed holes, sealing the end of the conduit temporarily. The end cap is a clear cap that installs much like the couplers providing an airtight seal.



# **Pre-Configured Part Numbers**

Part Number	Description	
FS-END-STP-10MM-10 FieldShield Microduct End Caps, 10 mm, 10 pack		
FS-END-STP-12.7MM-10	FieldShield Microduct End Caps, 12.7 mm, 10 pack	
FS-END-STP-14MM-10	FieldShield Microduct End Caps, 14 mm, 10 pack	

# Microduct Field Repair Kit ——

# **Description**

There are many situations where two microducts need to be coupled together to continue the conduit pathway. Regardless of whether the microduct was cut after initial installation or if the duct pathway simply needs to be continued, the FieldShield Microduct Repair Kit provides all the components to properly couple two microducts. For toneable duct, the kit includes components to ensure tone wire circuit integrity for ground locating.



# **Pre-Configured Part Numbers**

	Part Number	Description
FS-MD-FLD-RPR-KIT-7MM FieldShield Microduct Field Repair Kit, 7 mm		FieldShield Microduct Field Repair Kit, 7 mm
FS-MD-FLD-RPR-KIT FieldShield Microduct Field Repair Kit, 10 mm		FieldShield Microduct Field Repair Kit, 10 mm
	FS-MD-FLD-RPR-KIT-14MM	FieldShield Microduct Field Repair Kit, 14 mm

# Microduct Pulling Carrots -

# **Description**

The FieldShield Microduct Pulling Carrot screws into the inner bore of the duct and provides an attachment point to direct bury FieldShield Microducts to pull them through existing conduit systems.



# **Pre-Configured Part Numbers**

Part Number	Description
FS-PUL-CRT-6MM-M	FieldShield Microduct Pulling Carrot, 6 mm ID, metal, with string tie on
FS-PUL-CRT-10MM-M	FieldShield Microduct Pulling Carrot, 10 mm ID, metal, with string tie on

# FieldShield® Duct Accessories



# **Aerial Microduct Attachment**

# **Description**

The Aerial Microduct Attachments provide a quick and easy way to attach FieldShield Aerial figure-8 style microducts. Strip away the jacket from the support strand on the microduct to accommodate the dead end or aerial splice and wrap the attachment onto the strand for a secure and permanent installation.



# **Pre-Configured Part Numbers**

Part Number	Description		
FS-DEADEND FieldShield Aerial Microduct Attachment, dead end			
FS-DEADEND-AD10 FieldShield Aerial Microduct Attachment, large cable			
FS-AERIAL-SPLICE	FieldShield Aerial Microduct Attachment, open wire splice, galvanized, BWG-10 0.134" x 14" (3.40 mm x 355.60 mm)		

# Introduction to Fiber Cable Assemblies



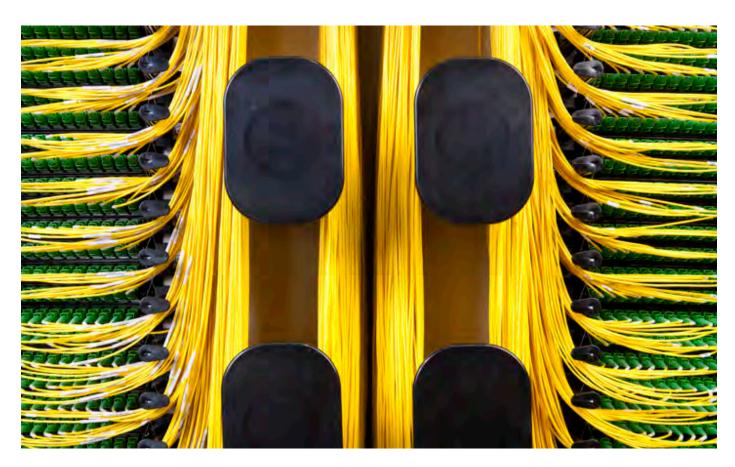
# FiberDeep® and Cable Assemblies

Combining 40+ years of experience from its founding members, Clearfield® designs and manufactures fiber optic cable assemblies for virtually any application. Our connectivity expertise, coupled with a personalized approach, gives our customers a level of service and quality that out performs all other manufactures.

FiberDeep®, a guaranteed 0.2 dB loss, half that of the industry standard, is available on every singlemode simplex and duplex fiber optic patch cord and ribbon fan-outs deployed within the Clearview® Cassette. Our FiberDeep cable assemblies improve your fiber network's performance while reducing the cost of deployment. No matter what kind of traffic your network carries, the success of your business comes down to the quality of your cable plant.

Simply the best patch cords around, Clearfield offers cable assemblies in custom and standard lengths, ranging from simple multimode and singlemode patch cords, to some of the most complex assemblies for inside and outside plant environments, including distribution cable, OSP breakout-style, drop cable and drop node assemblies. Automated polishing processes ensure precise control of polish radius, apex offset and fiber undercut. Our process engineers have perfected termination techniques for all types of specialty cable designs, including ribbon fiber, high-fiber counts and ruggedized cables. We support all industry standard connector types, including the industry's latest hardened fiber optic connectors (HFOC).

Clearfield cable assemblies are used in the most demanding environments, from global manufacturing to emerging communications. Clearfield fiber optic cable assemblies exceed industry standards for insertion loss and return loss performance. Our controlled design processes pay strict attention to cable prep, termination and epoxy curing along with tight end-face geometries. Our cleanliness is second to none. We can design and manufacture fiber optic cable assemblies for almost any application, meeting your requirements for cost, performance, reliability and rapid delivery.









Assemblies

# Indoor Fiber Jumper Cables

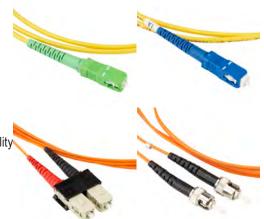


# **Application**

A fiber jumper, sometimes called a fiber patch cord, is a length of fiber cabling fitted with connectors at each end. They are used to connect end devices or network hardware.

# **Description**

Clearfield® offers singlemode and multimode, simplex and duplex Indoor Fiber Jumper Cables manufactured to tight internal specifications that exceed industry-accepted standards. Fiber assemblies are used in a variety of carrier networks and private network environments. The key to manufacturing high-performance fiber assemblies is controlling polish radius, apex offset and fiber undercut. Clearfield monitors its automated polishing process to exceed industry specifications for insertion and return loss, ensuring a top-quality product.



#### **Features and Benefits**

#### Integrity

- Terminations are designed and tested to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Supports industry standard singlemode and multimode connectors
- · Singlemode and multimode and hybrid cables available

#### Protection

- · Each fiber is individually covered with an outer jacket for added protection
- Wide variety of jacket sizes for all applications, 3 mm, 2 mm, 1.6 mm, 1.2 mm, 900 μm
- · Riser and Plenum rated jacket options available
- · Available in simplex, dual-round and dual zip-cord configurations

#### Access

- · Compact jacket design minimizes cable pile up
- · Industry standard terminations include SC and LC (ask a Clearfield representative for other connector availability)

#### Investment

- Indoor Jumper Assemblies offer an economical solution for deploying fiber in any optical network
- Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

# **Technical Specifications**

Indoor Fiber Jumper Cables			
Core Size and Type	Singlemode and multimode		
Fiber Count Simplex (1-fiber) and duplex (2-fiber)			
Jacket O.D.	900 μm, 1.6 mm, 2.0 mm, 3.0 mm		
Cable Types Indoor Riser, Indoor Plenum			
Connector Types SC/UPC, SC/APC, LC/UPC, LC/APC			
Operating Temperature -40°C to 85°C (-40°F to 185°F)			



# Indoor Fiber Jumper Cables



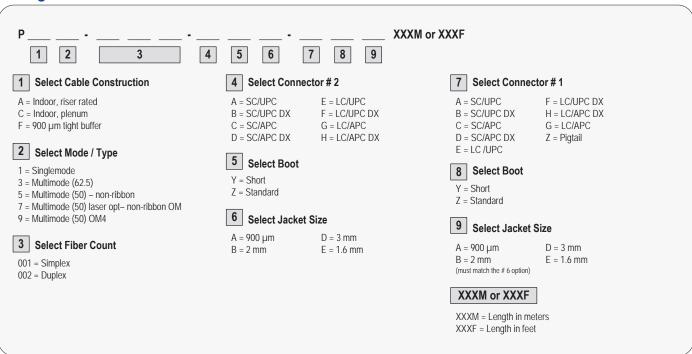
#### Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB
LC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB

#### Minimum Performance Specifications for Terminated Multimode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss
SC	Ceramic	PC	0.25 dB	≤ 0.50 dB
LC	Ceramic	PC	0.25 dB	≤ 0.50 dB

# **Configured Part Numbers**





# Indoor Bend-Insensitive Fiber Jumper Cables



# **Application**

A fiber jumper, sometimes called a fiber patch cord, is a length of fiber cabling fitted with connectors at each end. They are used to connect end devices or network hardware.

# **Description**

Indoor Bend-Insensitive Fiber Jumper Cables are used in a variety of carrier networks and private network environments. The key to manufacturing high-performance fiber assemblies is controlling polish radius, apex offset and fiber undercut. Clearfield® monitors its automated polishing process to exceed industry specifications for insertion and return loss, ensuring a top-quality product.

# 

#### **Features and Benefits**

#### Integrity

- Terminations are designed and tested to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Supports industry standard singlemode connectors
- Singlemode G.657.A1 and A2 bend-insensitive glass fiber

#### Protection

- · Riser and Plenum rated bend-insensitive jacket options available
- · Available in simplex, dual-round and dual zip-cord configurations

#### Access

- · Compact jacket design minimizes cable pile up
- · Industry standard terminations include SC and LC (ask a Clearfield representative for other connector availability)

#### Investment

- · Indoor Bend-Insensitive Fiber Jumper Cables offer an economical solution for deploying fiber in any optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested



# Indoor Bend-Insensitive Fiber Jumper Cables -



# **Technical Specifications**

Indoor Bend-Insensitive Fiber Jumper Cables			
Core Size and Type Singlemode (G.657.A1 and G.657.A2)			
Fiber Count Simplex (1-fiber) and duplex (2-fiber)			
Jacket O.D. 2.0 mm			
Cable Types Indoor Riser			
Connector Types SC/UPC, SC/APC, LC/UPC, LC/APC			
Operating Temperature -40°C to 85°C (-40°F to 185°F)			

#### **Minimum Performance Specifications for Terminated Singlemode Connectors**

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB
LC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB

# **Configured Part Numbers**

P A A	XXXM or XXXF	
Select Fiber Count  001 = Simplex  002 = Duplex	3 Select Boot Length Y = Short boot Z = Standard boot	6 Select Boot Length Y = Short boot Z = Standard boot or piqtail
2 Select Connector # 1 A = SC/UPC	4 Select Jacket Size B = 2 mm	7 Select Jacket Size* B = 2 mm
C = SC/APC E = LC/UPC G = LC/APC	5 Select Connector # 2 A = SC/UPC	XXXM or XXXF  XXXM = Length in meters
	C = SC/APC E = LC/UPC G = LC/APC Z = Pigtail	XXXF = Length in feet * must match the # 4 option



# Indoor Traceable Fiber Jumper Cables



# **Application**

The Indoor Traceable Fiber Jumper Cable is an effective solution for eliminating interconnect errors in dense interconnect environments. The traceable light identification will eliminate accidentally unplugging or moving the wrong jumper. Whether it is coming from the back of the equipment rack to the front or from one cross-connect panel to another, the Traceable Jumper Cable uses a positive light indication to quickly identify the opposite end of the assembly. The added value of eliminating the outages, due to incorrectly identifying jumpers and the time saved being able to quickly find the correct jumper, is important in today's demanding market.

# **Description**

The traceability of the jumper gives a value-add functionality for simple fiber patch cord jumpers. Having the ability to trace the other end of the assembly with an easy to find highly visible red LED eliminates the chance of accidentally unplugging or moving the wrong jumper. This is a must in high density environments like central offices, CATV head ends, and cellular sites, anywhere cable congestion can create a challenge when identifying and tracing patch cords.



#### **Features and Benefits**

#### Integrity

- Terminations are designed to Telcordia GR-326
- · Insertion loss and back reflection meets or exceeds industry standards
- Supports industry standard Singlemode and Multimode connectors
- Available for Singlemode and Multimode Simplex and Duplex Cables

#### **Protection**

- Each fiber is individually covered with an outer jacket for added protection
- · Wide variety of jacket sizes for all applications: 2 mm
- · Riser and plenum rated jacket options available
- · Individually packaged and labeled

#### Access

- · Compact jacket design minimizes cable pile up
- · Industry standard terminations include SC and LC
- · High intensity red LED light source used for identification

#### Investment

- Offers a sound solution for reducing unexpected outages due to human error and reduces labor costs by quickly identifying the correct assembly right away the first time
- · Environmentally stable, low-insertion loss, minimal back reflection
- All assemblies are tested 100%





# **Technical Specifications**

Indoor Traceable Fiber Jumper Cables			
Core Size	Singlemode, Multimode		
Fiber Count	Simplex (1-fiber) and Duplex (2-fiber)		
Jacket Outer Diameter	2.0 mm		
Cable Types	Indoor Riser, Indoor Plenum		
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC		
Operating Temperature	-20°C to 70°C (-4°F to 158°F)		

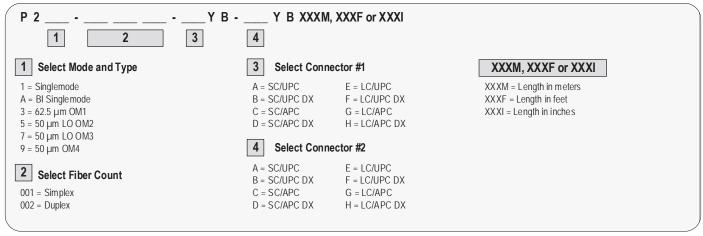
#### Minimum Performance Specifications for Terminated Singlemode Traceable Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB
LC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB

#### Minimum Performance Specifications for Terminated Multimode Traceable Connectors

	Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss
ſ	SC	Ceramic	UPC	0.25 dB	0.50 dB
	LC	Ceramic	UPC	0.25 dB	0.50 dB

# **Configured Part Numbers**



A TRACE-LITE-02 power source is required to power the LED traceable lights. Power source can be used for all Traceable jumpers. Power source is sold separately.

# **Pre-Configured Part Numbers**

Part Number	Description
TRACE-LITE-02	Power lite source with extension cord for traceable fiber patchcords

# Outdoor Ruggedized Fiber Jumper Cables



# **Application**

These jumpers are ideal when splicing FTTH drops in the ONT/NID. Indoor cordage stiffens and retains cable memory in cold weather. These jumpers remain flexible even in extreme conditions. These assemblies use bend-insensitive fiber to help eliminate bend-radius issues inside the NID. These patch cords also work well in outside plant cross-connect cabinets.

# Description

Clearfield® Outdoor Ruggedized Fiber Jumper Cables can be ordered in any industry standard connector type. Any length in feet or meters is available.

#### **Features and Benefits**

#### Integrity

- · Terminations are designed and tested to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Supports industry standard singlemode connectors
- Singlemode bend-insensitive ITU standard G.657.A glass fiber

#### Protection

- Uses Ruggedized OSP rated 2 mm black jacketed cable
- Patch cords remain flexible and durable in extreme temperatures of -55°C to 85°C (-67°F to 185°F)

#### Access

- · Compact jacket design minimizes cable pile up
- · Industry standard terminations include ST, SC, FC, LC (ask a Clearfield representative for other available connectors)

#### Investment

- · Outdoor Ruggedized Fiber Jumper Cables offer an economical solution for deploying fiber in any OSP optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

#### Recommendation

Clearfield recommends the use of Ruggedized Outside Plant Jumpers when splicing in the NID or ONT. We also suggest two meter jumpers for use in FieldSmart® cabinet applications. Clearfield stocks common length SC/APC Ruggedized Jumpers for customer convenience. For non-standard lengths, lead times will apply.





# Outdoor Ruggedized Fiber Jumper Cables



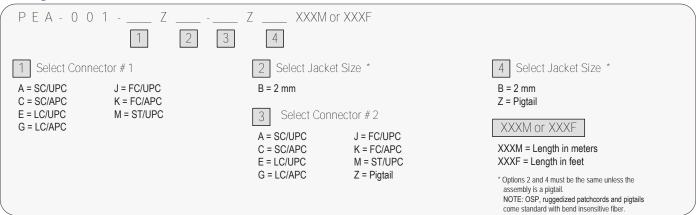
# **Technical Specifications**

Outdoor Ruggedized Fiber Jumper Cables			
Core Size and Type Singlemode (G.657.A1)			
Fiber Count	Simplex (1-fiber)		
Jacket O.D.	2.0 mm		
Cable Types	Outdoor - Ruggedized Polyurethane		
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, FC/UPC, FC/APC, ST/UPC		
Operating Temperature	-40°C to 85°C (-40°F to 185°F)		

#### Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
ST	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
FC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB
FC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB
LC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB

# **Configured Part Numbers**





# Indoor-Outdoor Bend-Insensitive Fiber Jumper Cables



# **Application**

A fiber jumper, sometimes called a fiber patch cord, is a length of fiber cabling fitted with connectors at each end. They are used to connect end devices or network hardware.

# **Description**

Indoor-Outdoor Bend-Insensitive Fiber Jumper Cables are used in a variety of carrier networks and private network environments. The key to manufacturing high-performance fiber assemblies is using high quality connector components and controlling the termination and polishing process. Clearfield® monitors its automated polishing process to exceed industry specifications for insertion and return loss, ensuring a top-quality product.

#### **Features and Benefits**

#### Integrity

- · Terminations are designed and tested to Telcordia GR-326
- Clearfield® FiberDeep® Guarantee: 0.2 dB insertion loss or less, exceeding industry standards
- · Supports industry standard singlemode connectors
- · Singlemode G.657.B3 bend-insensitive glass fiber

#### Protection

- · Indoor-Outdoor rated bend-insensitive jacket options available
- Available in simplex 3mm and 4.8mm jacket

#### Access

- · Compact jacket design minimizes cable pile up
- Industry standard terminations include SC and LC for 3mm and SC only for 4.8mm

#### Investment

- Indoor Bend-Insensitive Fiber Jumper Cables offer an economical solution for deploying fiber in any optical network
- Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested



3mm



4.8mm





# Indoor-Outdoor Bend-Insensitive Fiber Jumper Cables

# **Technical Specifications**

Indoor-Outdoor Bend-Insensitive Fiber Jumper Cables			
Core Size and Type	Singlemode G.657.B		
Fiber Count	Simplex Fiber Only		
Jacket O.D.	3mm, 4.8mm		
Cable Types	Indoor/Outdoor Riser		
Connector Types	3mm = SC/UPC, SC/APC, LC/UPC, LC/APC; 4.8mm = SC/UPC, SC/APC		
Operating Temperature	-40°C to 85°C (-40°F to 185°F)		

#### **Minimum Performance Specifications for Terminated Singlemode Connectors**

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.20 dB	55.00 dB
SC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB
LC	Ceramic	APC	0.15 dB	0.20 dB	65.00 dB

# **Configured Part Numbers**

P A - 0 0 1 Z _	Z XXXM or XXXF	
1 2	3 4 5	
1 Select Cable Construction	3 Select Jacket Size #1	5 Select Jacket Size #2
K = Indoor/Outdoor G657.B3 Black KW = Indoor/Outdoor G657.B3 White	D = 3mm P = 4.8mm	D = 3mm P = 4.8mm
2 Select Connector #1	4 Select Connector #2	XXXM or XXXF
A = SC/UPC C = SC/APC	A = SC/UPC C = SC/APC	XXXM = Length in meters XXXF = Length in feet
E = LC/UPC G = LC/APC	E = LC/UPC G = LC/APC	AAAI – Lengurin leet
G - LOINI G	Z = Pigtail	

# MPO Assemblies



# **Application**

MPO Assemblies are multi-fiber cables terminated into multi-fiber connectors. These cables can be used in indoor or outdoor applications. MPO terminations offer great plug-and-play solutions. Using MPO multi-fiber assemblies can eliminate termination and splicing in the field, which in turn reduces the expense of deployment. MPO assemblies offer a very high density solution that reduces your network's overall footprint, which is especially beneficial in central office, headend and data center locations.

# Description

Clearfield® offers singlemode and multimode MPO fiber assemblies that are manufactured to tight specifications that exceed industry standards. MPO Assemblies are used in a variety of carrier networks, private networks and data center environments. Clearfield's manufacturing process and quality control ensures a top-quality product for insertion loss and return loss.



#### **Features and Benefits**

#### Integrity

- Terminations are designed and tested to meet TIA/EIA and IEC intermateability standards
- MPO cable assemblies designed, tested and certified to GR-1435
- · Supports Singlemode and Multimode cables and connectors
- 4, 8, 12 and 24 fiber terminations available (custom configurations available)
- Assemblies terminated MPO to MPO, MPO to non-terminated stub and MPO to multi-fiber breakout terminated with industry standard SC and LC
- · RoHS compliant

#### **Protection**

- Using outdoor and indoor plenum and riser rated fiber cables MPO assemblies can be installed just about anywhere
- · MPO connectors can be terminated directly to bare fiber ribbon, loose-tube and up-jacketed cable
- Pulling-eye kits available to protect the terminated ends and will reduce deployment time and cost

#### Access

- · Compact multi-fiber connectors reduce cabinet and panel size
- · Factory terminated MPO assemblies eliminate the need for termination and splicing in the field
- · Custom fiber pin-out configurations available upon request

#### Investment

- MPO Assemblies offer an economical solution for deploying fiber in any optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

# MPO Assemblies



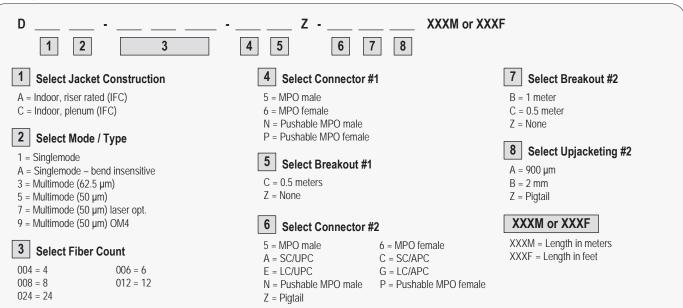
# **Technical Specifications**

MPO Assemblies	
Core Size and Type	Singlemode and multimode
Fiber Count	4, 6, 8, 12 and 24-fiber MPO terminations on multi-fiber cables
Jacket O.D.	Bare ribbon, flat and round jacketed ribbon or loose tube
Cable Types	Indoor (Riser/Plenum), Outdoor (Riser/Non-Rated)
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO (male and female)
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Breakout Length	Half meter, one meter, pulling eye, custom

#### Minimum Performance Specifications for Terminated MPO Connectors

Fiber	Connector Type	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
Singlemode	MPO 12 Fiber	Angled	0.25 dB	0.35 dB	55.00 dB
Singlemode	MPO 24 Fiber	Angled	0.75 dB	1.00 dB	55.00 dB
Multimode	MPO 12 Fiber	Flat	0.40 dB	0.50 dB	25.00 dB
Multimode	MPO 24 Fiber	Flat	0.75 dB	1.00 dB	25.00 dB

# **Configured Part Numbers**



# Outside Plant Fiber Assemblies

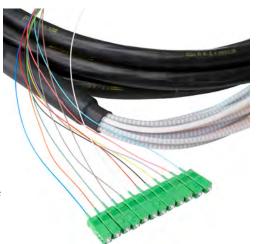


# **Application**

Clearfield® Outside Plant Fiber Assemblies are used in a variety of applications including DLC cabinets, PON cabinets, cross-connect cabinets and fiber termination panels. Standard OSP cable is used and the terminated end of the assembly is up-jacketed with either 900 µm or 2 mm tubing. The assembly is then terminated with the required connectors. Fiber counts can be from 2 to 288 fibers.

# Description

Clearfield OSP Fiber Assemblies are designed to perform flawlessly in even the most harsh environments. Our process and design directly addresses failure prone areas such as the transition (where the fiber is broken out into individual units) and at the termination. We use a patented process in the fiber transition that not only protects the fiber but also ensures that no lateral movement occurs due to temperature variations. Standard breakouts are half meter and one meter. Clearfield can also do custom breakouts to meet your unique panel needs.



#### **Features and Benefits**

#### Integrity

- Cable and terminations are designed, tested and certified to GR-20, GR-326 and GR-1435
- Specialty cable designs available including ribbon fiber, loose-tube and ADSS (All-Dielectric Self-Supporting)
- · Supports industry standard singlemode and multimode fiber

#### Protection

- · Rugged cable design protects against harsh outdoor environment
- Wide variety of up-jacket sizes for all applications, ruggedized 3 mm, 2 mm, 1.6 mm and 900 µm
- · Loose tube available in a gel-filled design for full water-block or gel-free
- All dielectric design (except armored cable)
- Pulling-eye available to ease installation and for added protection

#### Access

- Industry standard terminations include SC and LC (ask a Clearfield representative for other connector availability)
- · Versatile cable designs well suited for in-conduit, lashed aerial and direct buried applications
- Fiber counts from two to 288 in loose tube or ribbon cables (higher fiber counts available)

#### Investment

- Outside Plant Fiber Assemblies offer a rugged solution for deploying fiber in any OSP optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

#### Recommendation

When designing a patch cord (double-ended assembly) that will be pulled through conduit a pulling eye may be a good solution. Any assembly with 24 fibers or less can be fitted with a pulling eye.

# **Technical Specifications**

Outside Plant Fiber Assemblies	
Core Size and Type	Singlemode and multimode
Fiber Count	2-fiber to 288-fiber
Jacket O.D.	900 µm, 2.0 mm (48-fiber max), 3mm (for MPO terminations only)
Cable Types	Outdoor (Riser/Non-Rated), Outdoor Armored (Riser/Non-Rated)
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Breakout Length	Half meter, one meter, pulling eye, custom

# Outside Plant Fiber Assemblies



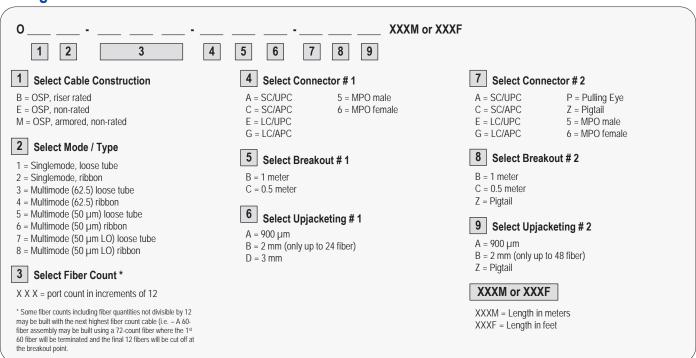
### Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

### **Minimum Performance Specifications for Terminated Multimode Connectors**

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss
SC	Ceramic	PC	0.25 dB	≤ 0.50 dB
LC	Ceramic	PC	0.25 dB	≤ 0.50 dB

# **Configured Part Numbers**



# Distribution Assemblies

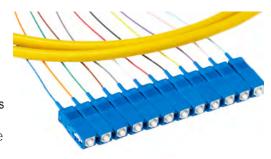


## **Application**

Distribution assemblies are used for applications inside buildings and central offices. These cables utilize a 900  $\mu$ m tight buffer jacket and are available in plenum and riser versions.

### Description

Clearfield® Distribution Assemblies are used where multi-fiber tight buffered constructions are required for density. These assemblies combine the bandwidth capacity of individual cable assemblies in one easy-to-use assembly, and can be used in OSP patch and splice (Clearfield's in-cassette splicing solution) applications.



### **Features and Benefits**

### Integrity

- Terminations are designed and tested to Telcordia GR-326
- Supports Industry standard singlemode and multimode connectors
- · Singlemode and multimode and hybrid cables available

#### Protection

- Each fiber is individually jacketed then covered with an outer jacket for added protection
- · All fibers are color coded using industry fiber color code
- · Pulling-eye kits available to speed installation

#### Access

- · Compact jacket design keeps cable pile up minimal
- Industry standard terminations include SC and LC (Ask a Clearfield representative for other connector availability)

### Investment

- · Distribution Assemblies offer an economical solution for deploying fiber in any optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

# **Technical Specifications**

Distribution Assemblies	
Core Size and Type	Singlemode and multimode
Fiber Count	2-fiber to 144-fiber
Jacket O.D.	900 μm
Cable Types	Indoor Riser, Indoor Plenum
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, MPO
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Breakout Length	Half meter, one meter, pulling eye, custom

# Distribution Assemblies



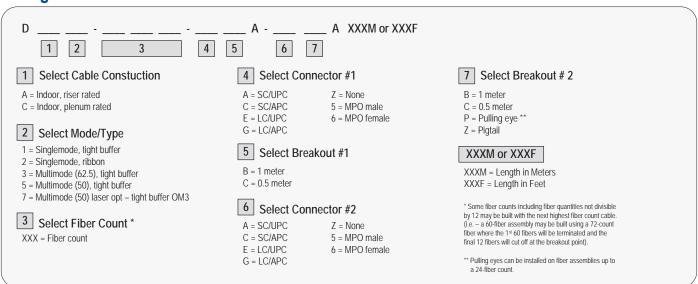
### Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

### **Minimum Performance Specifications for Terminated Multimode Connectors**

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss
SC	Ceramic	PC	0.25 dB	≤ 0.50 dB
LC	Ceramic	PC	0.25 dB	≤ 0.50 dB

# **Configured Part Numbers**



# Breakout Assemblies



### **Application**

Breakout Assemblies are appropriate for low to mid-fiber count applications in demanding indoor and outdoor environments. Common uses include manufacturing areas, unprotected communication closets and small central offices.

### Description

Breakout style assemblies are easy to install and simple to terminate without the need for fan-out kits. The indoor/outdoor version of this cable is durable and OFNR rated. While it can be used indoors, it also has a -40°C to 85°C operating temperature range and the benefits of fungus, water and UV protection making it perfect for outdoor applications. The indoor/outdoor versions come standard with 2.5 mm sub units. The indoor only cable is standard with 2 mm sub units.



### **Features and Benefits**

### Integrity

- Terminations are designed and tested to Telcordia GR-326
- · Specialty rugged cable designs
- · Supports industry standard singlemode and multimode fiber

#### Protection

- Rugged cable design protects against harsh indoor and outdoor environments
- · Wide variety of jacket sizes for all applications, ruggedized 3 mm, 2.5 mm and 2 mm
- · Riser and Plenum and fire retardant rated cable jackets available
- · Pulling-eye available to ease installation and for added protection

#### Access

- Industry standard terminations include SC and LC (Ask a Clearfield® representative for other available connectors)
- · Versatile cable designs well suited for in-conduit, lashed aerial and direct buried applications
- · Fiber counts from 2 to 48

#### Investment

- Breakout Fiber Assemblies offer a rugged solution for deploying fiber in any indoor/outdoor optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

### Recommendation

Consider using indoor/outdoor versions for use in DLC cabinets or outside plant electronic cabinets as a "tip" cable. The blunt end will be spliced in a splice vault and the other end will be plugged into the electronics inside the cabinet.

The 2 mm indoor version is ideal for use in cross-connect solutions. One end is loaded into the rear of a patch panel and the other end can be staggered to match any active gear blade.

# **Technical Specifications**

Breakout Assemblies	
Core Size and Type	Singlemode and multimode
Fiber Count	2-fiber to 48-fiber
Jacket O.D.	2.0 mm (indoor), 2.5 mm (indoor/outdoor)
Cable Types	Indoor Riser, Indoor/Outdoor (Riser)
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Breakout Length	Half meter, one meter, pulling eye, custom

# Breakout Assemblies



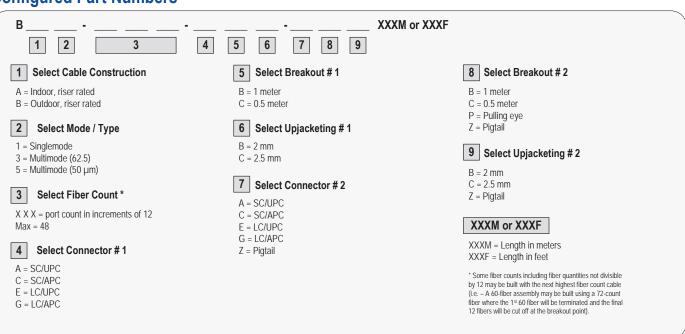
### Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

### **Minimum Performance Specifications for Terminated Multimode Connectors**

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss
SC	Ceramic	PC	0.25 dB	≤ 0.50 dB
LC	Ceramic	PC	0.25 dB	≤ 0.50 dB

# **Configured Part Numbers**



# Drop Node Assemblies

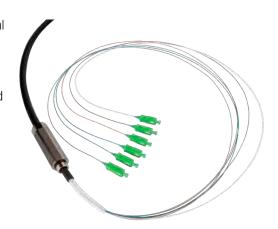


## **Application**

Drop Node Assemblies are designed to connect the optical distribution node to the optical drop cable in a CATV network.

# Description

Clearfield® ensures the quality of its Drop Node Assemblies by utilizing factory terminated connectors, a fully water-blocked entry connector, loose tube, gel-filled cable (on most assemblies) and a GR-326 compliant 900 µm fiber termination process. This provides exceptional performance and stability over a full range of outdoor temperatures and environmental conditions. The end-user gains complete control over drop access and reconfiguration.



### **Features and Benefits**

### Integrity

- Terminations are designed and tested to Telcordia GR-326
- · Drop Node Assemblies make ease of installation into Optical Distribution Node (ODN)
- · Supports industry standard singlemode fiber

### **Protection**

- · Rugged cable design protects against harsh outdoor environments
- Fibers up-jacketed using materials which can endure temperatures from -40°C to 200°C
- · Cables using loose tube gel-filled OSP cable are sealed to eliminate water penetration
- · Feed Through Fitting (FTF) strain relief guarantees that movement does not occur at the transition into the ODN
- · Strain relief matches cable load rating

#### Access

- · Industry standard terminations include SC and LC (ask a Clearfield representative for other available connectors)
- Provides maximum cable management inside ODN using 900 µm or 2 mm up-jacket

### Investment

- · Drop Node Assemblies offer a rugged solution for deploying fiber in any outdoor optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

# Drop Node Assemblies



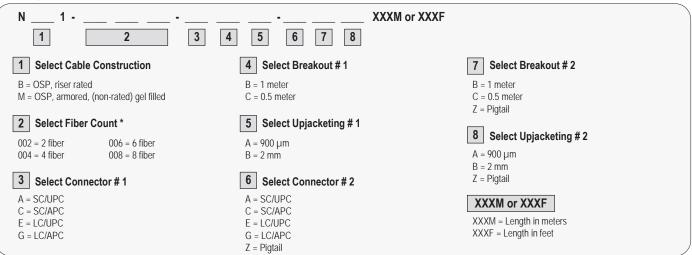
# **Technical Specifications**

Drop Node Assemblies	
Core Size and Type	Singlemode
Fiber Count	2-fiber, 4-fiber, 6-fiber (Riser) 4-fiber, 6-fiber (Armored)
Jacket O.D.	900 μm, 2.0 mm
Cable Types	Outdoor (Riser), Outdoor Armored (Non-Rated)
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC,
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Breakout Length	Half meter, one meter, pulling eye, custom

**Minimum Performance Specifications for Terminated Singlemode Connectors** 

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

# **Configured Part Numbers**



# 90 Degree Drop Node Assemblies



# **Application**

The 90 Degree Drop Node Assembly provides a 90 degree pathway and fiber optical connection from a distribution node to the optical drop cable in a Cable TV network. It is ideal for space limited environments such as pedestals and below grade fiber node installations.

## Description

Clearfield® ensures the quality of its 90 Degree Drop Node Assemblies by utilizing factory-terminated connectors, a fully water-blocked entry connector, loose tube, gel-filled cable (on most assemblies) and a GR-326 complaint 900 µm fiber termination process. This provides exceptional performance and stability over a full range of outdoor temperatures and environmental conditions. The end-user gains complete control over drop access and reconfiguration.



### **Features and Benefits**

### Integrity

- · Terminations are designed and tested to Telcordia GR-326
- 90 Degree Drop Node Assemblies make ease of installation into Optical Distribution Node (ODN)
- · Supports industry standard singlemode fiber

#### Protection

- · Rugged cable design protects against harsh outdoor environments
- Fibers up-jacketed using materials which can endure temperatures from -40°C to 200°C
- · Cables using loose tube gel-filled OSP cable are sealed to eliminate water penetration
- · Feed Through Fitting (FTF) strain relief guarantees that movement does not occur at the transition into the ODN
- · Strain relief matches cable load rating

#### Access

- Industry standard terminations include SC or LC (ask a Clearfield representative for other available connectors)
- Provides maximum cable management inside ODN using 900 µm or 2 mm up-jacket
- The 90 degree water-tight fitting allows for a better fit in close quarters

#### Investment

- 90 Degree Drop Node Assemblies offer a rugged solution for deploying fiber in any outdoor optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

# 90 Degree Drop Node Assemblies



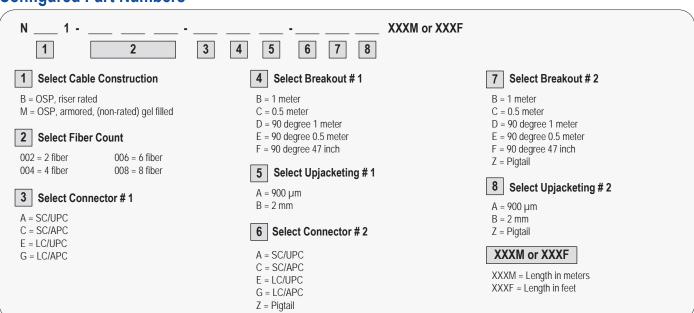
# **Technical Specifications**

90 Degree Drop Node Asse	90 Degree Drop Node Assemblies			
Core Size and Type	Singlemode ITU-T G.652 D			
Fiber Count	6-fiber, 8-fiber, 12-fiber			
Jacket OD	900 µm up-jacketed			
Cable Types	Outdoor (Riser), Outdoor Armored (Non-Rated)			
Connector Types	SC/APC, LC/UPC			
Operating Temperature	-40°C to 85°C (-40°F to 185°F)			

Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

# **Configured Part Numbers**



# FTTH Drop Cable Assemblies



## **Application**

Our FTTH Drop Cable Assemblies are designed to connect the fiber access point (hand hole, pedestal or aerial) to the ONT on the home in a FTTH network.

# Description

Clearfield's proven ruggedized drop cable solutions include HFOC, ruggedized flat drop and ruggedized pigtail for splicing.

### **Features and Benefits**

### Integrity

- Terminations are designed and tested to Telcordia GR-326
- · Supports industry standard singlemode connectors
- · Singlemode and multimode cable available

### **Protection**

- · Uses ruggedized OSP rated flat drop cable
- Single loose-tube is gel-filled for ultimate water blocking protection
- FLATdrop peel-and-play cable allows for the outer jacket to be stripped back to expose the more flexible 3mm sub-unit, easing storage of terminated ends
- · Rugged black UV resistant jacket with two fiberglass strength members gives it the strength needed for all harsh environments
- All-dielectric option allows deployment near power lines and utilities

#### Access

- · Flat drop cable construction allows for installation in buried or aerial applications
- Industry standard terminations include SC and LC (ask a Clearfield® representative for other available connectors)
- · Toneable cables allow for traceability throughout the network

#### Investment

- · Ruggedized flat drop assemblies offer an economical solution for deploying fiber in any OSP optical network
- · Environmentally stable, low-insertion loss, minimal back reflection
- · All assemblies are 100% tested

# FTTH Drop Cable Assemblies



# **Technical Specifications**

FTTH Drop Cable Assembli	es
Core Size and Type	Singlemode
Fiber Count	Single Fiber
Jacket O.D.	2.0 mm Ruggedized, 3.0 mm Peel-and-Play
Cable Types	Flat Drop Loose Tube Cable, Flat Drop Peel-and-Play 3 mm (Dielectric/Toneable)
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC, HFOC/APC
Operating Temperature	-40°C to 85°C (-40°F to 185°F)
Breakout Length	Half meter, One Meter, Custom

Minimum Performance Specifications for Terminated Singlemode Connectors

Connector Type	Ferrule Material	Polish Type	Ins. Loss, Typical	Max. Ins. Loss	Min. Ret. Loss
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB

# **Configured Part Numbers**



### 1 Select Cable

E = OSP, non-toneable, non-rated

M = OSP, toneable, non-rated

T = Peelable FLATdrop Non-Toneable (Non-rated)

U = Peelable FLATdrop Toneable (Non-rated)

### 2 | Select Connector # 1

 $A = SC/UPC & G = LC/APC \\ C = SC/APC & W = HFOC SC/APC \\$ 

E = LC/UPC

## 3 Select Breakout # 1

B = 1 Meter C = 0.5 Meter

Z = Use if a HFOC

# 4 Select Upjacketing # 1

B = 2 mm Ruggedized

K = 3mm Peel-and-Play

Z = Use if a HFOC

### 5 | Select Connector # 2

 $\begin{array}{lll} A = SC \mbox{/UPC} & G = LC/APC \\ C = SC/APC & W = HF \mbox{OC SC/APC} \\ E = LC/UPC & Z = Pigtail \end{array}$ 

### 6 Select Breakout # 2

B = 1 Meter

C = 0.5 Meter

Z = Use if a HFOC or pigtail

### 7 Select Upjacketing # 2

B = 2 mm Ruggedized

K = 3 mm Peel-and-Play

Z = Use if a HFOC or Pigtail

### XXXM or XXXF

XXXM = Length in meters XXXF = Length in feet

# High Fiber Ribbon Breakout Kit-



## **Application**

A High Fiber Ribbon Breakout Kit is used for fiber management and routing for fusion and mechanical splicing field termination of multi-fiber ribbon cable applications in both inside and outside plant environments.

### Description

Clearfield® FieldSmart® Ribbon Fan Out Kits are designed to breakout and manage high fiber count ribbon cables. Each 12-fiber ribbon in cable is routed into individual color-coded tubes for protection and transport into Clearview® optimized products. The kit includes the cable body, breakout body and adhesive shrink tubing.

When ribbon fiber in excess of 144 is required, the High Fiber Ribbon Breakout Box is used in conjunction with the Ribbon Fan Out Kit for up to 864 fibers.



010475

### **Features and Benefits**

### Integrity

· Fits any manufacturer's cable

#### Protection

· Furcation tubing protects and manages bare ribbon fiber

#### Access

- · No special tools required
- · Simple and easy breakout installs in minutes
- · Easily identified individual color-coded tubing

• Fan Out Kit provides protected transport path for ribbon cable to Clearview Cassettes

# **Technical Specifications**

High Fiber Ribbon Breakout	Kit
Fan Out Kit Diameter	144-Fiber Fan Out Kit: 19.10 mm (0.75")
Fan Out Kit Length	Cable Body: 76.32 mm (3") Breakout Body: 31.80 mm (1.25") Combined: 108.12 mm (4.25")
Fan Out Tubing Length	2 meters (78.60"); Custom Lengths Available
Maximum Tube Diameter	144-Fiber Fan Out Kit: 2.59 mm (0.495")
Breakout Box Dimensions	6.25" H x 4.75" W x 2.25" D

# **Pre-Configured Part Numbers**

Part Number	Description	Quantity Needed of Each Part Number Per Fiber Count					
Part Nulliber	Description	144	288	432	576	720	864
FMA-MZZ	Ribbon Fan Out Kit, for up to 144 fibers	1	2	3	4	5	6
FMA-MZZ-SB	Ribbon Fan Out Kit, for up to 144 fibers, for use with slack basket applications	1	2	3	4	5	6
010475	High Density Ribbon Breakout Box	0	1	1	1	1	1



FMA-MZZ

# Introduction to WaveSmart® Optical Components



Clearfield® delivers unparalleled fiber performance with its WaveSmart optical components - custom built for the unique light requirements and interoperability needs of passive optical network splitting, fiber exhaust scenarios and coarse and dense wavelength division multiplexing. Key to the success of a fiber deployment is the performance and precision of the optical components deployed in the inside and outside plant environment. Clearfield leads the way with WaveSmart optical component technologies for PON splitting, wavelength division multiplexing and optical circulators. These products are custom built to your unique split ratios, wavelength requirements and interoperability needs.

Clearfield's expertise in the termination of fiber ensures these components are connectorized to optimize their performance potential. Teamed with Clearfield's experience in bend radius protection, the optimal packaging for these components is found within all Clearview® Cassettes. In addition, Clearfield provides modular optical components packaging within an LGX footprint as well as other space saving chassis enclosures and custom discrete packages.

Specializing in the manufacturing, termination and packaging of optical components for custom-built configurations, our rapid turn-around time consistently beats the lead time quoted by our competitors for standard and custom configuration. Clearfield's design experts can consult with you on your optical component needs and specify a solution to solve your application requirements.

By utilizing fiber optic splitters and wave division multiplexing, Clearfield's WaveSmart optical components will save money while increasing your network's capacity and bandwidth by creating virtual fiber without the expense of design, construction and deployment of more fiber optic cables. Splitting the light signal or separating multiple wavelengths over a single fiber allows you to increase the number of pathways within your existing fiber cable network reducing upgrade or new deployment costs. Combining Clearfield's WaveSmart products with the FieldSmart\*, CraftSmart\* and FieldShield\* product lines, we can provide you a solution for all your applications.





# WaveSmart® HD Splitter ——



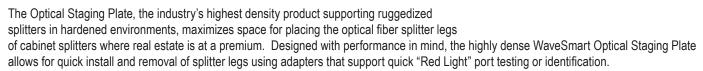
# **Application**

The Clearfield® WaveSmart High Density Splitter is a compact splitter used in its line of FieldSmart Indoor and Outdoor Cabinets and Terminals.

# Description

The WaveSmart High Density (HD) Splitter is designed to work with the FieldSmart Indoor and Outdoor Cabinets and Terminals platform. Consistent with a simple yet innovative design methodology, the WaveSmart High Density (HD) Splitter utilizes a 75% smaller package over earlier designed splitter packages.

The WaveSmart High Density Splitter uses 900 µm jacketed legs and offers superb fiber management. Clearfield® utilizes a special outdoor rated material that not only helps control thermal expansion and contraction, but goes one step further and remains flexible at extreme temperatures down to -40°F. By making it easier to handle, there is less chance that the fiber will be routed incorrectly or that damage will occur during this process.





### Integrity

- · Terminations are designed and tested to Telcordia GR-326
- 100% performance tested for insertion loss/return loss and final mechanical inspection
- Optical component configuration uses devices that are compliant to Telcordia GR-1221/1209

### Protection

- WaveSmart's High Density Splitter package protects the Planar Lightwave Circuit in all environments
- Inputs and outputs protected using high quality 900 µm up-jacket

#### Access

- · Individual splitters come preloaded in staging plate for easy access and turn-up
- · Each leg is 27" (685.80 mm) to reach anywhere in the Makwa
- · Each leg labeled for easy identification
- · Red jacket on input leg

#### Investment

- Splitter package supports one 1 x 32, two 1 x 16 or four 1 x 8 configurations without penalty in real estate or port counts
- "Grow-as-you-go" only buy splitters as customer take rates increase
- · SC/UPC or SC/APC connectors







# **Technical Specifications**

WaveSmart HD Splitters	
Dimensions	85 mm L x 35 mm W x 6 mm H
Core Size and Type	Singlemode (G.657.A)
Leg Length	27" (685.80 mm)
Jacket O.D.	900um
Connector Types	SC/UPC, SC/APC
Splitter Types	1 x 32, 1 x 16, 1 x 8, 1 x 4
Operating / Storage Temp	-40°C to 85 (-40°F to 185°F)

### **Performance Specifications**

Splitter Type	1 x 32	1 x 16	1 x 8	1 x 4
Insertion Loss	< 16.8 dB	< 13.8 dB	< 10.8 dB	< 7.5 dB
Return Loss	> 50 dB	> 50 dB	> 50 dB	> 50 dB
PDL	< 0.3 dB	< 0.3 dB	< 0.3 dB	< 0.3 dB
Uniformity	< 1.7 dB	< 1.2 dB	< 0.8 dB	< 0.3 dB
Directivity	> 55 dB	> 55 dB	> 55 dB	> 55 dB
Wavelength Range (nm)	1260 – 1650	1260 - 1650	1260 - 1650	1260 - 1650

# **Configured Part Numbers**



# WaveSmart®

# Premium Ruggedized Splitter



# **Application**

Ruggedized Splitter for outside plant cabinet environments.

# **Description**

The Clearfield® WaveSmart Premium Ruggedized Splitter is the standard splitter component in its line of FieldSmart® FSC OSP Cabinets. The splitter addresses environmental and human handling issues that other standard splitters in the industry cannot combat. It provides improved fiber protection, management and maintenance in OSP FTTx deployments.

The Optical Staging Plate, the industry's highest density product supporting ruggedized splitters in hardened environments, maximizes space for placing the optical fiber splitter legs of cabinet splitters where real estate is at a premium. Designed with performance in mind, the highly dense WaveSmart Optical Staging Plate allows for quick install and removal of splitter legs using adapters that support quick "Red Light" port testing or identification.



### **Features and Benefits**

### Integrity

- Terminations are designed and tested to Telcordia GR-326
- 100% performance tested for insertion loss, return loss and final mechanical inspection
- Optical component configuration uses devices that are compliant to Telcordia GR 1221/1209

#### Protection

- Ruggedized jacket material of input and output legs provide superior flexibility in temperatures ranging from -55°C to 85°C (-67°F to 185°F)
- · Legs will not sag or wilt at extreme temperatures or during extreme temperature cycles
- 20 year warranty

#### Access

- Splitters legs come preloaded in staging plate for easy access and turn-up
- Fiber separators every 17" (431.80 mm) to easily recognize and prevent twisting of fiber legs
- Each leg is 51" (1295.40 mm) long and able to reach any port
- · Each leg labeled for easy identification
- · Red boot on input leg

#### Investment

- Splitter package supports one 1 x 64, 1 x 32, two 1 x 16 or four 1 x 8 configurations without penalty in real estate or port counts
- · Splitters can be used in:
  - FieldSmart 288, 432, 576 and 1,152 PON Cabinets
  - FieldSmart Wall Boxes
  - FieldSmart 96 port PON-in-Ped
  - FieldSmart Inside Plant PON Insert
- "Grow-as-you-go" only buy splitters as customer take rates increase
- · SC/UPC, SC/APC, LC/UPC or LC/APC connectors

# **WaveSmart**®

# Premium Ruggedized Splitter -



# **Technical Specifications**

WaveSmart Premium Ruggedized Splitters				
Dimensions	100 mm L x 80 mm W x 10 mm H			
Core Size and Type	Singlemode (G.657.A)			
Leg Length	51" (1295.40 mm)			
Jacket O.D.	2.0mm			
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC			
Splitter Types	1 x 64, 1 x 32, 1 x 16, 1 x 8, 1 x 4, 1 x 2			
Operating / Storage Temp	-40°C to 85 (-40°F to 185°F)			

### **Performance Specifications**

Splitter Type	1 x 64	1 x 32	1 x 16	1 x 8	1 x 4	1 x 2
Insertion Loss	< 20.6dB	< 16.8 dB	< 13.8 dB	< 10.8 dB	< 7.5 dB	< 3.6 dB
Return Loss	> 50 dB					
PDL	< 0.3dB	< 0.3 dB				
Uniformity	< 1.8dB	< 1.7 dB	< 1.2 dB	< 0.8 dB	< 0.6 dB	< 0.6 dB
Directivity	> 55dB	> 55 dB				
Wavelength Range (nm)	1260 – 1650	1260 – 1650	1260 - 1650	1260 - 1650	1260 - 1650	1260 - 1650

# **Configured Part Numbers**

K C A A
1 Select (Oty) / Split Ratio 1 = (1) 1 x 32

# WaveSmart® Industry Standard Splitter Module



# **Application**

Upjacketed splitter for indoor and outdoor plant cabinet environments.

# **Description**

Clearfield®'s WaveSmart Industry Standard Splitter is a proven component in Clearfield's line of optical components. The splitter addresses human handling issues that other splitters in the industry cannot combat. It provides improved fiber protection, management and maintenance in FTTx deployments.

The Optical Staging Plate maximizes space for placing the optical fiber splitter legs of cabinet splitters where real estate is at a premium. Designed with performance in mind, the highly dense WaveSmart Optical Staging Plate allows for quick install and removal of splitter legs using adapters that support "Red Light" port testing for quick identification.



### **Features and Benefits**

### Integrity

- Terminations are designed to Telcordia GR-326
- 100% performance tested for insertion loss, return loss and final mechanical inspection
- Optical component configuration uses devices that are designed to Telcordia GR 1221/1209

#### Protection

- Splitter module package protects the discrete component while providing superior strain relief on the inputs and outputs
- 2mm jacket material of input and output legs provide protection in temperatures ranging from -40°C to 85°C (-40°F to 185°F)
- 5 year warranty

#### Access

- Splitters legs come preloaded in staging plate for easy access and turn-up
- Fiber separators every 17" (431.80 mm) to easily recognize and prevent twisting of fiber legs
- Each leg is 51" (1295.40 mm) long and able to reach any port
- · Each leg labeled for easy identification
- · Red boot on input leg

#### Investment

- Splitter package supports one 1 x 64, 1 x 32, two 1 x 16 or four 1 x 8 configurations without penalty in real estate or port counts
- · Splitters can be used in:
  - FieldSmart 288, 432, 576 and 1,152 PON Cabinets
  - FieldSmart Wall Boxes
  - FieldSmart 96 port PON-in-Ped
  - · FieldSmart Inside Plant PON Insert
- "Grow-as-you-go" only buy splitters as customer take rates increase
- · SC/UPC, SC/APC, LC/UPC or LC/APC connectors

# **WaveSmart®**

# Industry Standard Splitter Module -



# **Technical Specifications**

WaveSmart Industry Standard Splitter				
Dimensions	100 mm L x 80 mm W x 10 mm H			
Core Size and Type	Singlemode (G.657.A)			
Leg Length	51" (1295.40 mm)			
Jacket O.D.	2.0mm Yellow Riser Rated			
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC			
Splitter Types	1 x 64, 1 x 32, 1 x 16, 1 x 8, 1 x 4, 1 x 2			
Operating / Storage Temp	-40°C to 85°C (-40°F to 185°F)			

### **Performance Specifications**

Splitter Type	1 x 64	1 x 32	1 x 16	1 x 8	1 x 4	1 x 2
Insertion Loss	< 20.6dB	< 16.8 dB	< 13.8 dB	< 10.8 dB	< 7.5 dB	< 3.6 dB
Return Loss	> 50 dB					
PDL	< 0.3dB	< 0.3 dB				
Uniformity	< 1.8dB	< 1.7 dB	< 1.2 dB	< 0.8 dB	< 0.6 dB	< 0.6 dB
Directivity	> 55dB	> 55 dB				
Wavelength Range (nm)	1260 – 1650	1260 – 1650	1260 - 1650	1260 - 1650	1260 - 1650	1260 - 1650

(Results do not include terminations)

# **Configured Part Numbers**

K Y	A A		
1 Select (Qty) / S	Split Ratio	2 Select Connector Style	
1 = (1) 1 x 32 2 = (2) 1 x 16 3 = (2) 1 x 8 4 = (1) 1 x 16 5 = (1) 1 x 8 6 = (3) 1 x 8	7 = (4) 1 x 8 8 = (1) 1 x 4 9 = (2) 1 x 4 A = (4) 1 x 4 D = (1) 1 x 64 G = (1) 1 x 2	A = SC/UPC C = SC/APC E = LC/UPC G = LC/APC	

# WaveSmart® Splitters -



# **Application**

These products are needed when an optical splitter or combiner is required in a central office environment. They are used in CATV headends and telephone company central offices.

## Description

Clearfield® provides Planar Lightwave Circuit (PLC) and Fused Biconic Taper (FBT) Splitters in a variety of optical component packages for the network and application need allowing carriers the ability to provide uniform fully passive signal splitting to multiple premises.

### Planar Lightwave Circuit (PLC or Planar)

A light circuit on an 'optical chip' is mounted on a carrier and fibers, usually in ribbon form, are bonded to the edges of the chip. The assembly is encapsulated in a protective enclosure. PLC devices support direct split counts up to 64. In planar fabrication technology, devices are made using ion-exchange or photo-lithography techniques that replicate solid-state circuit methods. Ultimately, the per-unit cost for the expected high volumes will become advantageous for planar technology, especially for higher port devices. A difficult manufacturing problem involves a low-loss method for attaching the optical fibers to the chip and then passing the market's qualification and reliability requirements.

### Fused Biconic Taper (FBT)

Two or more fibers are twisted together, heated and drawn to bring the optical cores into near contact. The combined fibers are mounted on a low-expansion carrier and encapsulated in a low expansion tube. FBT devices allow direct splitting up to 32 ways. Higher split counts are achieved by splicing multiple devices to form multi-stage, concatenated splitters. Concatenated





1RU Splitter/Pizza Box

splitters are also called tree splitters. The fused biconic tapered technology directly bonds or melts the fibers together so that the final splitter can be mounted in small diameter (approximately 3-millimeter) stainless-steel tubes. This technology produces small, low-cost, highperformance devices. A tough fabrication obstacle involves the small and delicate final coupling region. However, when properly mounted and packaged, these devices meet long-term stability and reliability requirements.

# Packaging Options

- · Clearview® Cassette
- Clearview xPAK
- · Discrete (unpackaged solution)
- 1 RU Splitter/Pizza Box
- LGX

### **Features and Benefits**

#### Integrity

- Terminations are designed and tested to Telcordia GR-326
- Supports industry standard SC and LC singlemode and multimode connectors
- 100% performance tested for insertion loss, return loss and final mechanical inspect

#### Protection

- · Ruggedized, secure packaging
- Non-removable adapter plates

#### Access

· Front and rear access to panel

#### Investment

- FieldSmart® Optical Components offer an economical, dense and user-friendly solution for deploying splitters or WDMs in a central office
- Virtually any combination of split ratios and number of components can be achieved in one of the four Clearview Cassette sizes
- Clearfield supports legacy splitter deployments by offering optical components in LGX footprint
- 1 RU optical components available for smaller, limited deployments
- · Environmentally stable, high isolation, low insertion loss
- Compliant to Telcordia GR-1221 and GR-1209

# WaveSmart®





# **Technical Specifications**

Planar Lightwave Circuit Splitters

Туре	Insertion Loss	Return Loss	PDL	Uniformity	Directivity	Operating/ Storage Temperature	Wavelength Range
1 x 64	< 20.6dB	> 50 dB	< 0.3dB	< 1.8dB	> 55dB	-40°C to 85°C	1260 to 1650nm
1 x 32	< 16.8 dB	> 50 dB	< 0.3 dB	< 1.7 dB	> 55 dB	-40°C to 85°C	1260 to 1650nm
1 x 16	< 13.8 dB	> 50 dB	< 0.3 dB	< 1.2 dB	> 55 dB	-40°C to 85°C	1260 to 1650nm
1 x 8	< 10.8 dB	> 50 dB	< 0.3 dB	< 0.8 dB	> 55 dB	-40°C to 85°C	1260 to 1650nm
1 x 4	< 7.5 dB	> 50 dB	< 0.3 dB	< 0.6 dB	> 55 dB	-40°C to 85°C	1260 to 1650nm

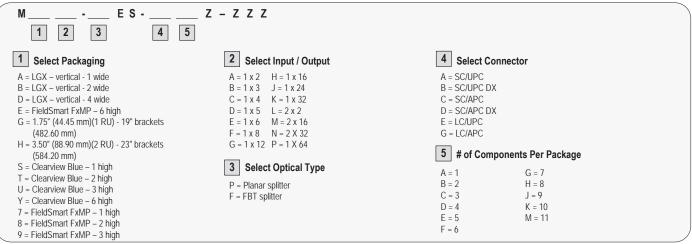
### **Fused Biconic Taper Splitters**

Dual Window - Wavelength Flattened (Terminated Specs)	1 x 2	1 x 4	1 x 8	1 x 16	1 x 32
Maximum Insertion Loss	3.6 dB	7.2 dB	10.7 dB	14 dB	17.6 dB
Maximum Uniformity	0.8 dB	1 dB	1.3 dB	1.6 dB	1.9 dB
Maximum PDL	0.2 dB	0.3 dB	0.4 dB	0.5 dB	0.6 dB

### **Packaging Dimensions**

Optical Component Type	Dimensions
One High Clearview Blue Cassette	0.8" H x 8.6" W x 7.06" D (20.32 mm x 218.44 mm x 179.32 mm)
Two High Clearview Blue Cassette	1.6" H x 8.6" W x 7.06" D (40.64 mm x 218.44 mm x 179.32 mm)
Three High Clearview Blue Cassette	2.41" H x 8.6" W x 7.06" D (61.21 mm x 218.44 mm x 179.32 mm)
Six High Clearview Blue Cassette	4.84" H x 8.6" W x 7.06" D (122.94 mm x 218.44 mm x 179.32 mm)
LGX One Wide Box	1.15" H x 5.12" W x 6.25" D (29.21 mm x 130.05 mm x 158.75 mm)
LGX Two Wide Box	2.27" H x 5.12" W x 6.25" D (57.66 mm x 130.05 mm x 158.75 mm)
LGX Four Wide Box	4.55" H x 5.12" W x 6.25" D (115.57 mm x 130.05 mm x 158.75 mm)
One Rack Unit (19")	1.75" H x 19" W x 15.02" D (44.45 mm x 482.60 mm x 381.50 mm)
One Rack Unit (23")	1.75" H x 23" W x 15.02" D (44.45 mm x 584.20 mm x 381.51 mm)

# **Configured Part Numbers**





# **Application**

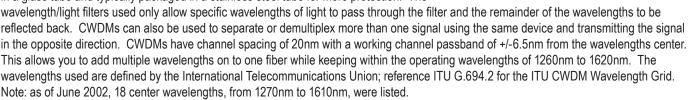
These products are needed when a passive multiplexing or demultiplexing unit is required in a central office environment. They are used in CATV headends and telephone company central offices.

### **Description**

Wavelength Division Multiplexing increases fiber capacity by combining (mux) and separating (demux) multiple input channels over a single fiber output. Wavelength division multiplexers let you expand the bandwidth of optical communication networks and can be used at several locations within each network. Clearfield® provides WDMs for singlemode fiber applications.

### Coarse Wavelength Division Multiplexing

CWDMs combine or multiplex more than one wavelength over one fiber. This is done by using fiber pigtail collimators and wavelength/light filters that are aligned and mounted in a glass tube and typically packaged in a stainless steel tube for more protection. The



### **Dense Wavelength Division Multiplexing**

Dense Wavelength Division Multiplexing or DWDM is a technology which multiplexes or demultiplexes a number of optical carrier signals onto a single optical fiber by using different wavelengths (i.e. colors) of laser light. This technique enables bidirectional communications over one strand of fiber, as well as multiplication of capacity. DWDM signals within the 1550nm band which are wavelengths between approximately 1530–1565nm (C band) and/or 1570–1625nm (L band) adhering to the DWDM ITU-T G.694.1 frequency grid. DWDMs allow you to increase your wavelength capacity. DWDM products can offer multiplexing of multiple channels using 200 GHz and 100 GHz spacing with the option to have an added Expansion port and/or Monitor port. All of the Clearfield Passive Products are Telcordia GR-1209 and GR-1221 certified.

# **Packaging Options**

- · Clearview® Cassette
- Clearview xPAK
- Discrete (unpackaged solution)
- Pizza Box
- LGX

### **Features and Benefits**

### Integrity

- Compliant to Telcordia GR-1221
- Consistent performance

### Protection

- · Wide operating temperature range
- · Low polarization sensitivity
- · No epoxy in optical path

### Access

- · Transport protocol independent
- · Low insertion loss
- · Minimal optical loss

### Investment

- Wide bandwidth (CWDM/DWDM)
- · Mux, demux and universal options available
- PDL = < 0.2 dB
- Return Loss = > 45 dB



# **Technical Specifications**

WaveSmart Wave Division Multiplexing	Channel Spacing	Wavelength Range	ITU Starting Wavelength	Start Channel
CWDM	20nm	1260 – 1650	1471nm 1491nm 1611nm	N/A
DWDM	100 GHz	1520 to 1560	N/A	ITU – T GRID
DWDM	200 GHz	1520 to 1560	N/A	ITU – T GRID

### **FSAN WDM Specifications**

Parameter	Ports	Specifications
Daca Channal Wayalanath	P1 to P3	1260nm to 1360nm
Pass Channel Wavelength	P1 (0 P3	1480nm to 1500nm
Reflect Channel Wavelength	P1 to P2	1540 dB to 1565 dB
Insertion Loss	P1 to P3	< 0.8 dB
IIISEI IIOII LOSS	P1 to P2	< 0.5 dB
Isolation	N/A	> 25 dB
isolation	IV/A	> 18 dB/ °C
PDL	N/A	< 0.1 dB
Ripple	N/A	< 0.3 dB
Return Loss	N/A	> 45 dB
Operating Temperature Range	N/A	-40°C to 85°C
Storage Temperature Range	N/A	-40°C to 85°C
Maximum Input Power	N/A	500 mW
Mechanical Dimension	N/A	5 mm x 34 mm



### 200 GHz DWDM

Daramatar		Value				
Parameter	Add/Drop	4 CH	8 CH	16 CH	20 CH	
Wavelength Range	1520 to 1560nm	1520 to 1560nm	1520 to 1560nm	1520 to 1560nm	1520 to 1560nm	
Central Wavelength	ITU-T G.694.1	ITU-T G.694.1	ITU-T G.694.1	ITU-T G.694.1	ITU-T G.694.1	
Bandwidth	C ± 0.25nm	C ± 0.25nm	C ± 0.25nm	C ± 0.25nm	C ± 0.25nm	
Insertion Loss	< 0.8 dB	< 2.4 dB	< 3.4 dB	< 5.8 dB	< 6.5 dB	
Insertion Loss - Reflection	< 0.4 dB	N/A	N/A	N/A	N/A	
Isolation	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	
Isolation - Reflection	> 12 dB	N/A	N/A	N/A	N/A	
PDL	< 0.2 dB	< 0.2 dB	< 0.2 dB	< 0.2 dB	< 0.2 dB	
Return Loss	> 45 dB	> 45 dB	> 45 dB	> 45 dB	> 45 dB	
Operation Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	
Storage Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	
Maximum Input Power	500 mW	500 mW	500 mW	500 mW	500 mW	
Mechanical Dimensions	5 mm x 34 mm	100 mm x 80 mm x 10 mm	100 mm x 80 mm x 10 mm	100 mm x 80 mm x 10 mm	100 mm x 80 mm x 10 mm	

### 100 GHz DWDM

Parameter	Value				
Parameter	Add/Drop	4 CH	8 CH	16 CH	40 CH
Wavelength Range	1520 to 1560nm	1520 to 1560nm	1520 to 1560nm	1520 to 1560nm	1520 to 1560nm
Central Wavelength	ITU-T G.694.1	ITU-T G.694.1	ITU-T G.694.1	ITU-T G.694.1	ITU-T G.694.1
Bandwidth	C ± 0.11nm	C ± 0.11nm	C ± 0.11nm	C ± 0.11nm	C ± 0.11nm
Insertion Loss	< 0.8 dB	< 2.4 dB	< 3.4 dB	< 5.8 dB	< 6.5 dB
Insertion Loss - Reflection	< 0.4 dB	N/A	N/A	N/A	N/A
Isolation	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Isolation - Reflection	> 12 dB	N/A	N/A	N/A	N/A
PDL	< 0.2 dB	< 0.2 dB	< 0.2 dB	< 0.2 dB	< 0.2 dB
Return Loss	> 45 dB	> 45 dB	> 45 dB	> 45 dB	> 45 dB
Operation Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Storage Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
Maximum Input Power	500 mW	500 mW	500 mW	500 mW	500 mW
Mechanical Dimensions	5 mm x 34 mm	100 mm x 80 mm x 10 mm	100 mm x 80 mm x 10 mm	100 mm x 80 mm x 10 mm	120 mm x 75 mm x 13.5 mm



### **CWDM**

Parameter		Value			
raiailietei	Add/Drop	4 CH	8 CH		
Wavelength Range	1260 to 1650nm	1260 to 1650nm	1260 to 1650nm		
Central Wavelength	ITU-T G.694.2	ITU-T G.694.2	ITU-T G.694.2		
Bandwidth	C ± 6.5nm	C ± 6.5nm	C ± 6.5nm		
Insertion Loss	< 0.8 dB	< 2.0 dB	< 3.0 dB		
Insertion Loss - Reflection	< 0.4 dB	N/A	N/A		
Isolation	> 30 dB	> 30 dB	> 30 dB		
Isolation - Reflection	> 12 dB	N/A	N/A		
PDL	< 0.2 dB	< 0.2 dB	< 0.2 dB		
Return Loss	> 45 dB	> 45 dB	> 45 dB		
Operation Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C		
Storage Temperature	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C		
Maximum Input Power	500 mW	500 mW	500 mW		
Mechanical Dimensions	5 mm x 34 mm	100 mm x 80 mm x 10 mm	100 mm x 80 mm x 10 mm		

# Coarse Wavelength Division Multiplexing (CWDM)

# ITU Channel/Wavelength Chart

ITU Channel (xx or yy)	Wavelength
27	1270nm
29	1290nm
31	1310nm
33	1330nm
35	1350nm
37	1370nm
39	1390nm

ITU Channel (xx or yy)	Wavelength
41	1410nm
43	1430nm
45	1450nm
47	1470nm
49	1490nm
51	1510nm
53	1530nm

ITU Channel (xx or yy)	Wavelength
55	1550nm
57	1570nm
59	1590nm
61	1610nm
63	1630nm
65	1650nm



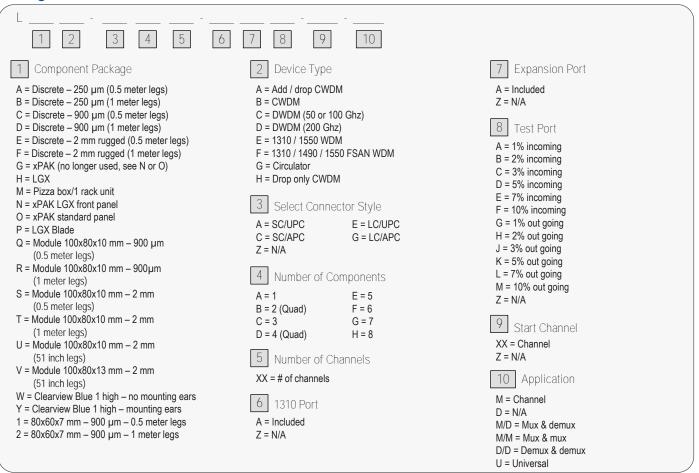
Dense Wavelength Division Multiplexing (DWDM) ITU Grid: C-Band, 100 GHz Spacing

Channel (#)	Frequency (GHz)	Wavelength (NM)
1	190100	1577.03
2	190200	1576.20
3	190300	1575.37
4	190400	1574.54
5	190500	1573.71
6	190600	1572.89
7	190700	1572.06
8	190800	1571.24
9	190900	1570.42
10	191000	1569.59
11	191100	1568.11
12	191200	1567.95
13	191300	1567.13
14	191400	1566.31
15	191500	1565.50
16	191600	1564.68
17	191700	1563.86
18	191800	1563.05
19	191900	1562.23
20	192000	1561.42
21	192100	1560.61
22	192200	1559.79
23	192300	1558.98
24	192400	1558.17
25	192500	1557.36
26	192600	1556.56
27	192700	1555.75
28	192800	1554.94
29	192900	1554.13
30	193000	1553.33
31	193100	1552.52
32	193200	1551.72
33	193300	1550.92
34	193400	1550.12
35	193500	1549.32
36	193600	1548.52
_		

Channel (#)	Frequency (GHz)	Wavelength (NM)
37	193700	1547.72
38	193800	1546.92
39	193900	1546.12
40	194000	1545.32
41	194100	1544.53
42	194200	1543.73
43	194300	1542.94
44	194400	1542.14
45	194500	1541.35
46	194600	1540.56
47	194700	1539.77
48	194800	1538.98
49	194900	1538.19
50	195000	1537.40
51	195100	1536.61
52	195200	1535.82
53	195300	1535.04
54	195400	1534.25
55	195500	1533.47
56	195600	1532.68
57	195700	1531.90
58	195800	1531.12
59	195900	1530.33
60	196000	1529.55
61	196100	1528.77
62	196200	1527.99
63	196300	1527.22
64	196400	1526.44
65	196500	1525.66
66	196600	1524.89
67	196700	1524.11
68	196800	1523.34
69	196900	1522.56
70	197000	1521.79
71	197100	1521.02
72	197200	1520.25



# **Configured Part Numbers**



# WaveSmart® VOA and Patch Cord Splitter



## **Application**

A variable optical attenuator (VOA) is a device designed to attenuate an intensity or power level of an input optical beam in a controlled manner to produce an output optical beam with different attenuated intensities. Variable optical attenuators play an important role in the implementation of modern information networks having optical interconnects. In fiber optic communication systems, variable optical attenuators are broadly employed to regulate the optical power levels to prevent damages to the optical receivers caused by irregular optical power variations.

Fiber optic patch cord splitters are optical devices that connect three or more fiber ends, dividing one input between two or more outputs or combining two or more inputs into one output



### Description

Clearfield® VOA and Patch Cord Splitters are optical components that are up-jacketed to 3 mm and terminated with any industry standard connectors.

### **Features and Benefits**

### Integrity

- · Compliant to Telcordia GR-1221 and GR-1209
- · Supports Industry standard Singlemode and Multimode fibers and connectors
- Outside plant hardened components

#### Protection

- · Ruggedized fiber up-jacket and packages available for superior protection
- · Multi-component custom packages available

#### Access

- Compact tube style and discrete components offered for direct splice in options
- VOA input available with up to one meter and output leg up to 30 meters
- Up to 80 dB attenuation on VOA
- Patch Cord Splitters available with up to one meter for input and nine meters on the outputs

#### Investment

- · WaveSmart VOA and Patch Cord Splitters offer an economical, dense and user-friendly solution for deploying fiber in any optical network
- · Environmentally stable, high-isolation, low-insertion loss
- All components tested 100% and include test documentation

# **Technical Specifications**

WaveSmart VOA and Patch Cord Splitter		
VOA	12 mm round x 15 mm L	
Patch Cord Splitter	90 mm L x 20 mm D x 10 mm H	

#### **Environmental Reliability Tests**

- Complies with Telcordia requirement TR-NWT-0012 21 and TR-NW T-00 1209
  - Optical characteristics
  - Thermal Cycling
  - Vibration Test
  - Salt Spray Erosion
  - Thermal Aging
  - Humidity Resistance

# WaveSmart® VOA and Patch Cord Splitter



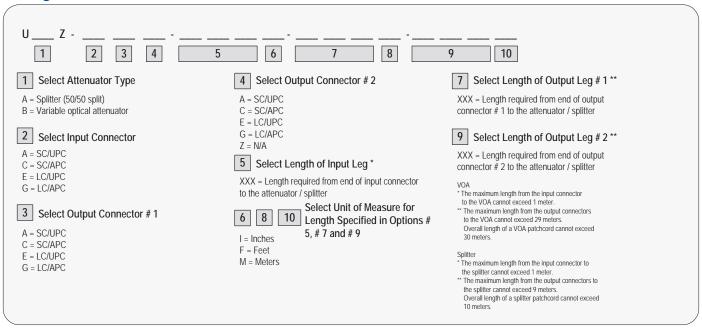
VOA and Patch Cord Splitter - Environmental Reliability Tests	
High Temperature Storage Test	85°C for 2,500 hours
Low Temperature Storage Test	-40°C for 2,500 hours
Thermal Cycling Test	-40°C/75°C for 500 cycles
Fiber Pulling Test	0.25 Kg for 250 μm fiber and 900 μm loose tube
Water Immersion Test	43°C, PH=5.5, for 340 hours
Vibration Test	10~2,000 Hz Random, 20 g, three axes
Impact Test	8 Drops, 1.8 meters high
Thermal Shock Test	100°C

### **Variable Optical Attenuator Specifications**

These attenuators are designed to meet Telcordia standards. These attenuators can be used for 1300nm and 1550nm, as well as for C (1520-1570nm), L (1570-1620nm) and S (1470-1520nm) bands, with minimal changes in the insertion loss. Mounting holes provide easy attachment to PC boards and patch panels.

The attenuators consist of two base plates. Each base plate contains a fiber followed by a collimating lens. The attenuator is pre-aligned for optimum coupling efficiency using a patented tilt alignment technique. A threaded radial screw is used to block the collimated beam between the two lenses. Because the attenuator works by directly blocking the beam, it is polarization insensitive. A seal cap is used to seal the junction against temperature and humidity effects. The attenuator can even withstand immersion in water for extended periods of time. Attenuators are offered with singlemode, multimode or polarization maintaining fibers.

### **Configured Part Numbers**



# WaveSmart®

# 1/2 Wide LGX Modular Optical Components



# **Application**

This product is needed when an optical splitter or WDM is required in a central office environment. They are used in CATV headends and telephone company central offices.

# Description

Modular optical components are splitters or WDMs that are packaged inside this metal housing with three duplex SC adapters or three quad LC female adapters for a total of 12 ports. The LGX modules utilizes a 6" (152.40 mm) high Optical Component Chassis to house the modules in a frame and can hold up to 29, ½ wide LGX.



### **Features and Benefits**

### Integrity

- · Compliant to Telcordia GR-449
- Supports industry standard LC adapters

#### Protection

· Ruggedized, secure packaging

#### Access

· Front inputs and outputs

#### Investment

- FieldSmart® Optical Components offer an economical, dense and user-friendly solution for deploying splitters or WDMs in a central office design
- Any combination of split ratios and number of components up to 12 ports
- Clearfield® supports legacy splitter deployments by offering optical components in LGX footprint
- Environmentally stable, high-isolation, low-insertion loss
- Compliant to Telcordia GR-1221 and GR-1209

# **Technical Specifications**

WaveSmart 1/2 Wide LGX Modular Optical Components		
Dimensions	0.56" H x 5.12" W x 6.72" D (14.22 mm x 130.04 mm x 170.69 mm)	
Port Density	SC: 6 (3 dual SC adapters); LC: 12 (3 quad LC adapters)	
Connector Types	SC/UPC, SC/APC, LC/UPC, LC/APC	
Optical Component Types	WDMs, FSAN-WDMs, CWDMs, Splitters	
Splitter Types	1 x 8, 1 x 4	
Panel Type	6" (152.40 mm) LGX Optical Component Chassis	
Material	16 gauge cold rolled steel with almond powder coating	

# WaveSmart® Build-Out Attenuators



## **Application**

Fiber optic attenuators are designed to introduce a specific amount of signal loss into an optical circuit. These products provide attenuation at a mated pair connection and are used for signal budgeting and power equalization.

# Description

Clearfield® provides both build-out and in-line attenuators in all industry standard interface and attenuation values.



### **Features and Benefits**

### Integrity

- · Compliant to Telcordia GR-910 and GR-1221
- · Supports Industry standard Singlemode connectors
- · Outside Plant hardened components

#### Protection

- Male and female ends all have protective dust cap
- · Individually packaged for protection and to eliminate product mix up

#### Access

- · Compact style fits in most cabinets and panels
- · Connector interface includes SC, SC/APC, LC, LC/APC
- 1 dB through 20 dB, 25 dB and 30 dB attenuation
- · Dual Bandwidth 1310/1550nm Supported
- · Attenuation levels clearly marked for easy identification

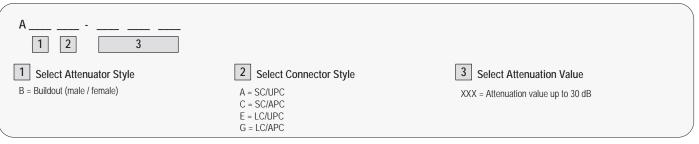
### Investment

- · WaveSmart Attenuators offer an economical, dense and user-friendly solution for deploying fiber in any optical network
- · Environmentally stable, high-isolation, low-insertion loss
- · All components are tested 100%

# **Technical Specifications**

WaveSmart Build-Out-Attenuators		
Return Loss	UPC: 55 dB; APC: 65 dB	
Attenuation Tolerance	1 to 10 db: ± 0.5 dB 11 to 30 dB: ± 5%	
Operational Wavelength	1260nm to 1650nm	
Operating Temperature	-40°C to 85°C (-40°F to 185°F)	
Max Power	500mW	

# **Configured Part Numbers**



# Introduction to Copper Products

# Copper Cable Assemblies



A copper cable assembly is only as good as its parts and at Clearfield\*, we only use the best parts available.

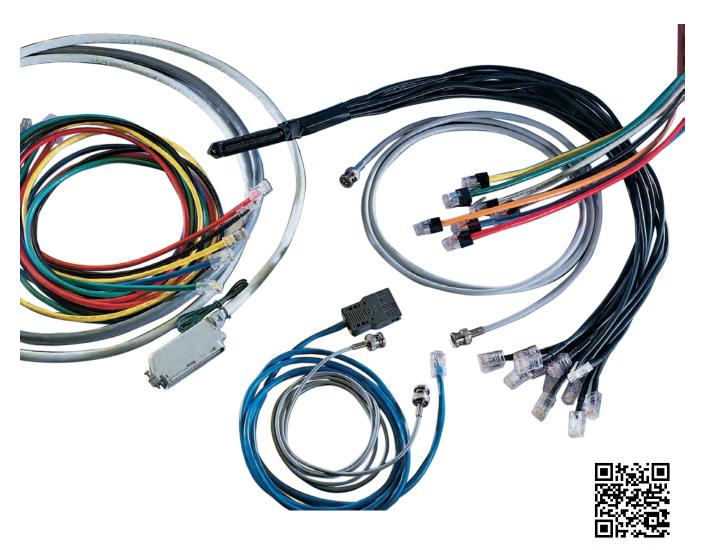
Whether it's a custom cabling solution that integrates with technologies for the world's most demanding semiconductor manufacturer or the data center for one of the Internet's top search engine companies, Clearfield takes your copper cabling requirements seriously. Combining 40+ years of experience, we can design and manufacture DS1, Telco, CAT5e and CAT6 patch cords and cable assemblies for just about any application.

We've earned a reputation for product quality and customer service by producing value-priced, high-quality product delivered to your schedule. From concept, to production floor, to your doorstep, our in-house engineering and design staff will work with you to tailor-engineer a solution that matches both your performance and cost requirements. Clearfield's connectivity expertise, combined with a personalized approach, gives our customers the highest level of service and quality.

### Copper Termination Manufacturing Capabilities

All manufacturing is carried out under controlled conditions based on documented workmanship standards, product specifications, work instructions and QA inspection criteria. At Clearfield, we use the latest manufacturing processes combined with hands-on expertise and craftsmanship for each assembly we build.

Soldering, crimping and IDC termination can be performed on all types of cables, wire harnesses and electromechanical assemblies for a variety of high technology industries, such as telecommunication, computer, medical, military, automotive and industrial electronics. Electromechanical assembly capabilities include electronic sub-assemblies and complete product assemblies and test, using available inhouse or customer-supplied fixtures and test equipment. We invite short run projects, as well as, high volume production runs.



Copper Products

# Copper DS1 Copper Cables



# **Application**

Copper DS1 assemblies connect a variety of equipment.

### Description

DS1 assemblies are typically constructed using 28 or 32 pair cable and 64 position connectors.

### **Features and Benefits**

### Integrity

- Meets or exceeds EIA/TIA standards for data transmission
- Meets UL, CSA, and NEC standards
- · RoHS and WEEE compliant
- 100% visually and mechanically inspected
- 100% electrically tested

#### Protection

- Custom lengths MP 10/15/15 to minimize cable pile up
- · Optional PVC and Plenum jackets available

### Access

• 90°, 120°, and 180° male and female interfaces available

### Investment

- · CAT 5e available through special order
- · Stock and custom serialization and labeling
- · Stock and custom lengths available
- · Custom pin outs available



# Copper DS1 Copper Cables



# **Configured Part Numbers**

D 1 \_\_\_ R \_\_\_ - \_\_ \_\_ \_\_ - XXXM or XXXF

## 1 Select Cable Type

- 1 = 28 pr, 24 ga, shielded, solid
- 3 = 32 pr, 24 ga, shielded, solid
- 4 = 28 pr, 22 ga, shielded, solid
- 5 = 28 pr, 26 ga, shielded, solid
- 6 = 32 pr, 26 ga, shielded, solid
- 7 = 32 pr, 22 ga, shielded, solid
- 9 = 32 pr, 26 ga, shielded, solid, cat5, VDSL

# 2 Select Wiring Configuration

- 6 = Straight through
- X = Custom

## 3 Select Connector # 1

- A = 64 pos, male, 24-26 ga, 180 deg
- B = 64 pos, female, 24-26 ga, 180 deg
- C = 64 pos, male, 24-26 ga, 180 deg, bail lock
- E = 64 pos, male, 24-26 ga, 90/270 deg
- F = 64 pos, female, 24-26 ga, 90/270 deg
- G = 64 pos, male, 24-26 ga, 90/270 deg, bail lock
- I = 64 pos, male, 22 ga, 90/270 deg
- J = 64 pos, male, 22 ga, 180 deg
- K = 64 pos, female, 22 ga, 90/270 deg
- L = 64 pos, female, 22 ga, 180 deg

# 4 Select Cable Exit Connector # 1

- 1 = Pins 1 33
- 2 = Pins 32 64
- Z = Exit not required (180 degree connector)

### 5 Select Connector # 2

- A = 64 pos, male, 24-26 ga, 180 deg
- B = 64 pos, female, 24-26 ga, 180 deg
- C = 64 pos, male, 24-26 ga, 180 deg, bail lock
- E = 64 pos, male, 24-26 ga, 90/270 deg
- F = 64 pos, female, 24-26 ga, 90/270 deg
- G = 64 pos, male, 24-26 ga, 90/270 deg, bail lock
- I = 64 pos, male, 22 ga, 90/270 deg
- J = 64 pos, male, 22 ga, 180 deg
- K = 64 pos, female, 22 ga, 90/270 deg
- L = 64 pos, female, 22 ga, 180 deg
- Z = Pigtail/Blunt

# 6 Select Cable Exit Connector # 2

- 1 = Pins 1 33
- 2 = Pins 32 64
- Z = Exit not required (180 degree connector)

### 7 Select 24" Drain Wire

- 1 = Connector 1 drain wire
- 2 = Connector 2 drain wire
- 3 = Drain wire both connectors
- 0 = No drain wires

### XXXM or XXXF

XXXM = Length in meters XXXF = Length in feet

# Copper Telco Copper Cables



# **Application**

Copper telco assemblies connect a variety of equipment interfaces in carrier networks, private networks and customer premise environments. They are used to transmit analog or digital data for a variety of communication applications. Our high-quality cables ensure the integrity of your data path.

# Description

Clearfield® 25/32-pair cables, terminated to 50/64-position RJ connectors, are manufactured to EIA/TIA standards. Our 25-pair Category 5e assemblies meet standards for data transmission up to 100 mbps.

25 pair 50 pin assemblies plug into many types of gear. Please specify when ordering what gear, if known, the connectorized ends will be plugging into to ensure the proper screws are included with the assembly.

Clearfield maintains a copper connectivity library for various manufacturing of active equipment and can provide assembly information specific to your connectivity needs.

### **Features and Benefits**

### Integrity

- Meets or exceeds EIA/TIA standards for data transmission
- Meets UL, CSA, and NEC standards
- RoHS and WEEE compliant
- · 100% visually and mechanically inspected
- 100% electrically tested

### Protection

- Custom lengths MP 10/15/15 to minimize cable pile up
- · Optional PVC and Plenum jackets available

### Access

- 90°, 120°, and 180° male and female interfaces available
- · Octopus/Hydra assemblies available

### Investment

- MP 10/15/15
- · Stock and custom serialization and labeling
- · Custom pin outs available



# Copper Telco Copper Cables



# **Configured Part Numbers**

 XXXXM or XXXXF 9 Α 1 2 5 6 | 7 | 8

## 1 Select Cable Type

- 1 = Cat 5, 25 pr, 24 ga, PVC
- 2 = Cat 3, 25 pr, 24 ga, PVC, BC
- 3 = Cat 1, 25 pr, 24 ga, PVC, TC
- 5 = Cat 3, 25 pr, 24 ga, plenum, shielded
- 6 = Cat 3, 25 pr, 24 ga, plenum
- 7 = Cat 1, 25pr, 24 ga, PVC, shielded
- 8 = Cat 5, 25 pr, 24 ga, PVC, shielded
- 9 = Cat 5e, 25 pr, 24 ga, PVC
- A = Cat 5e, 25 pr, 24 ga, plenum
- B = Cat 5e, 25 pr, 24 ga, plenum, shielded
- D = Cat 5, 25 pr, 24 ga, PVC, blue

## 2 | Select Wiring Configuration

- 4 = 10 / 100 Base T
- 6 = Straight through
- 9 = Custom

### 3 7 Select Connectors \*

- A = Cat 5, male, 180 deg
- B = Cat 5, male, 90 deg
- C = Cat 3, female, 180 deg
- D = Cat 5, female, 90 deg
- E = Cat 5, male, 110 deg
- F = Cat 3, male, 90 / 270 deg
- G = Cat 3, male, 180 degree
- H = Cat 3, female, 90 / 270
- I = Cat 3, male, 90 deg, shielded
- J = Cat 3, female, 90 deg, shielded
- K = Cat 5, Champ Sys 5, male, 90 / 270 deg
- Z = Blunt

# 4 | 8 | Select Cable Exits \*\*

- 1 = 1 26 exit
- 2 = 25 50 exit
- Z = Not required

# A Select Screw Length \*\*\*\*

- 1 = Standard screw
- 2 = 1.00' screw
- 3 = 1.25" screw
- 4 = 1.50" screw
- 5 = 0.75" screw
- 6 = 0.425" screw
- 7 = 1.75" screw
- 8 = 0.875" screw B = Bail locks
- Z = Not required

# 9 | Select Drain Wire \*\*\*

- 1 = Yes need drain wire
- 0 = No do not need drain wire
- Z = N/A

### XXXM or XXXF

XXXM = Length in meters XXXF = Length in feet

Cat 5 female connectors only come in 90 degree. The cable exit for must be 25-50.

Cat 5 male connectors come in 90, 110 and 180 degree. The cable exit for the 90 degree must be 1-26. The 110 degree must be specified, 1-26 or 25-50.

Cat 3 male and female connectors mainly come in 90 and 180 degrees. Standard cable exit for male 90 degree is 1-26. For a male 270 degree cable the exit needs to be 25-50. Standard cable exit for female 90 degree is 25-50. For a female 270 degree cable the exit needs to be 1-26.

<sup>\*</sup> Cat 3 and Cat 5 connector notes:

 $<sup>^{**}</sup>$  Use option Z for 180 degree connectors. For additional cable exit details see above.

<sup>\*\*\*</sup> Drain are only required for shielded connectors. For non-shielded connectors use option Z

<sup>\*\*\*\*25</sup> pr / 50 pin assemblies plug into many types of gear. Please specify when order what gear, if known, the connectorized ends will be plugging into to ensure the proper screws are included with the assembly

# Copper CAT5e and CAT6 Patch Cords



### **Application**

Category 5e and 6 copper patch cords connect a variety of equipment interfaces in both carrier and private networks, as well as customer premise environments.

### Description

These patch cords provide physical mated connections between components in 10BASE-T, 100BASE-T and 155 Mbps ATM networks. Clearfield® offers Category 5e and 6 copper patch cords with UTP cable and 8-conductor connectors manufactured to EIA/TIA standards.

### **Features and Benefits**

#### Integrity

- Meets or exceeds EIA/TIA 568 B.2 MP 10/15/15
- · RoHS and WEEE compliant
- · ETL verified
- · UL Listed
- · 100% tested for continuity and performance

#### **Protection**

· Strain relief boots

#### Access

- · Latch guards with easy thumb depression
- · Nine stocked colors with custom configurations available

#### Investment

- · Stock and custom serialization and labeling
- · Stock and custom lengths available





# Copper

## CAT5e and CAT6 Patch Cords



## **Configured Part Numbers**

CAT5e Patch Cords



- 0 = Black (PVC) 1 = White (PVC) 2 = Purple (PVC) 4 = Red (PVC) 5 = Green (PVC)
- 6 = Blue (PVC) 7 = Gray (PVC) 8 = Orange (PVC) 9 = Yellow (PVC) A = Light gray (plenum) B = Dark gray (plenum)
- C = Black (plenum) D = White (plenum) E = Red (plenum) F = Yellow (plenum) G = Green (plenum) H = Blue (plenum)

## 2 3 Select Boot Colors

0 = Black 1 = White 2 = Purple 3 = Pink 4 = Red5 = Green 6 = Blue 7 = Gray 8 = Orange 9 = Yellow N = No boot

### 4 | Select Wiring Configuration

1 = 568A 3 = Crossover

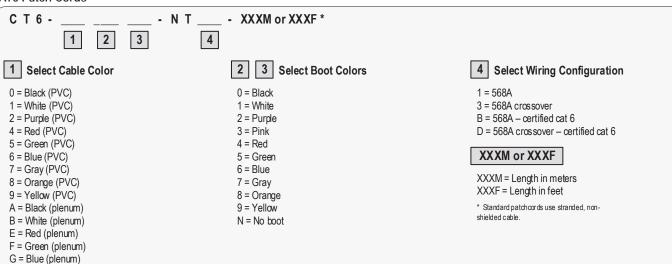
#### XXXM or XXXF

XXXM = Length in meters XXXF = Length in feet

\* Standard patchcords use stranded, nonshielded cable.

#### CAT6 Patch Cords

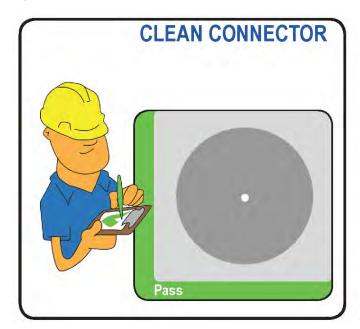
H = Light gray (plenum) K = Yellow (plenum)







Inspect and clean EVERY connector before inserting into adapter.





Product	Clearfield Part Number	Contents			
LC Cleaning Kit	CleanKit-LC-01	<ul> <li>Ferrule and V-groove cleaning swab 50/tube</li> <li>SFF Connector Flat Swab 500/bag</li> <li>1.25mm ferrule swab (LC) 50/tube</li> <li>Portable platform 400perforated/box</li> <li>Fiber Wash MX Precision Cleaner Pen</li> </ul>			
SC Cleaning Kit	Ferrule and V-groove cleaning swab     SFF Connector Flat Swab 500/bag     CleanKit-SC-01     Portable platform 400perforated/box     Fiber Wash MX Precision Cleaner Per				
MPO Cleaning Swab	CleanMPO-01	MPO Chamois Swab 25/tube			
Replacement V-groove Swab	018886	Ferrule and V-groove cleaning swab 50 per tube			
Replacement Flat Swab	018887	SFF Connector flat swab 500 per bag			
Replacement 2.5mm Swab	018888	2.5mm foam swab SC only 50 per tube			
Replacement 1.25mm Swab	018889	1.25mm ferrule swab LC only 50 per tube			
Replacement Platform	018891	Portable platform perforated 400 per box			
Replacement Cleaning Pen	018892	Cleaning Pen, MX Precision ordered separately			
Replacement Nylon Bag	018932	Nylon bag, empty, blue			
MPO Swiping Tool	016558	Tool for cleaning through MPO adapter			
SC Swiping Tool	016313	Tool for cleaning through SC adapter			
LC Swiping Tool	016312	Tool for cleaning through LC adapter			



### **Connector Cleaning Procedure**

Whether factory terminated or field spliced, clean connectors are essential for proper system operation. Even the smallest dust particle can cause transmission problems, so for optimal network performance inspect, and if necessary, clean connectors and adapters prior to mating.

### **Inspect Then Connect**

These are Clearfield recommended products/applications. Use the product you feel will complete your cleaning procedures. Create a "best practice" for your company and follow those procedures.

The use of Chemtronics end face and bulkhead cleaning products and techniques ensures a clean end face, no matter the type of contamination.

Before cleaning any connector, be sure you know what type of contaminate you are cleaning (dry, fluidic, or combination). All the available products are good, it's the process that you need to be aware of. Using a dry cleaning method to clean "dirt" can lead to scratching of the end face. Learn the process of cleaning properly.

**Note:** It is **NOT** recommended to use isopropyl alcohol to clean the end face.



Figure 1

### Cleaning an SC/LC Connector

Cleaning the End Face

- Place one wiping paper on QbE-2 FiberSafe™ Cleaning Platen. (Figure 1)
- · Apply small amount of precision cleaner (about 1" in diameter) with Electro-Wash MX pen on to one end of the wipe. (Figure 2)
- Hold end face at a 90 degree angle. For APC connection, adjust by slightly tilting the container or end face. Angle is correct when no drag is felt on the end face. (Figure 3)
- · Draw end face from wet to dry part of the wipe 3 times. Use just enough pressure to ensure complete contact between end face and the wipe.

Note: DO NOT retrace previous step.



Figure 2



Figure 3



### Cleaning the Ferrule

• Lightly moisten the fiber optic swab (2.5mm/38542F or 1.25mm/38040) by spotting a small amount (about 1") of Electro-Wash PX or Electro-Wash MX pen onto the QbE. Hold the swab, 1 side down to the wetted area and hold for a count of 1-2-3-4-5. (Figure 4)

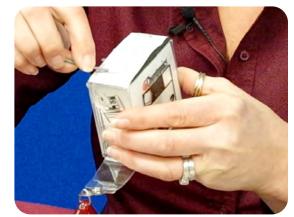


Figure 4

· Insert swab into side of ferrule, wet side to the ceramic ferrule and circle around 2-3 times and remove. Turn swab to dry side and repeat. (Figure 5)



Figure 5

## Cleaning the Mate Through an Adapter AND the **Adapter Itself**

- Lightly moisten the fiber optic swab (2.5mm/38542F or 1.25mm/38040) by spotting a small amount (about 1") of Electro-Wash PX or Electro-Wash MX pen onto the QbE. Hold the tip of the swab onto the wetted area and hold for a count of 1-2-3-4-5.
- · Insert the swab into the adapter to the connector, press lightly against the connector, twist 2-3 times, remove and discard.
- Dry with a second dry swab.
- · Inspect, repeat cleaning if necessary, and test for signal strength.
- · Use additional swabs to clean inside the actual adapter. Moisten swab, like above, and insert through hole and remove while twisting. (Figure 6)



Figure 6



## Cleaning an MPO/MTP Connector

#### Male Connector

• Use of Chemtronics MTP Connector Cleaning Swabs (CC505F) is recommended. Even after cleaning with a probe cleaner, you should always clean the pins with this (or an equivalent) type swab. Cleans ALL MTP/MPO connector end faces. This swab also cleans the "pins" of the male connector



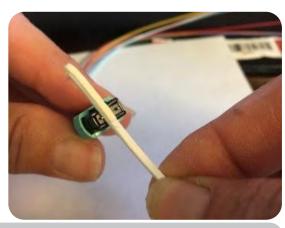
· Lightly "spot" a QbE-2 wipe on the platen with Electro-Wash PX Fiber Optic Cleaner, the FiberWash or MX Pen.



· Lightly touch short side of the MTP/MPO Connector Swab to the wetted area (3-5 secs) to absorb some cleaning solution (DO NOT over saturate the swab).



· Wipe connector areas to be cleaned, sliding pad from bottom of pad across and forward to tip of swab, from 1 side to the other, turn over and use long side to dry in same movement.





- Use the hole on end of pad to clean one alignment pin, then press the end of the swab into the other pin to clean.
- · Check your work with a fiber scope. This can take several attempts to get the endface clean.





#### Female Connector (without pins)

- · Cleaned like a single fiber connector, using a cleaning platform. The receptacles will be cleaned as long as you are using a combination cleaning process as recommended.
- · Again, using a platen, moisten the platen with cleaning solvent on one end to accommodate 3 swipes of the MPO female endface.



- · Holding the connector (If APC, slightly at an angle to accommodate for 8° angle) swiping with medium pressure, from the wet area into the dry area 3 times, without wiping over previous area.
- · Inspect, and if clean, make the connection. If NOT, repeat above steps until clean or if determined that the end face is damaged (based on standards of 5 cleanings per connection), replace.



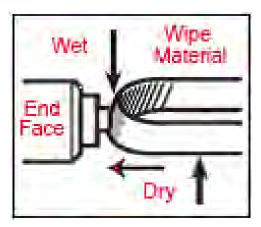




## Cleaning Using a Probe-Style Cleaning Tool

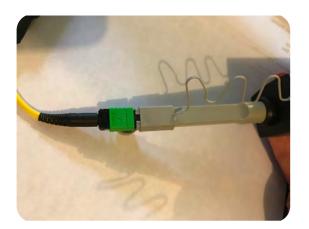
- · The probe style cleaning tools are capable of cleaning a connector end face separately or through the adapter.
- · Slightly engage probe by pulling back but do not allow to click. Lightly "spot" a QbE-2 wipe on the platen with Electro-Wash PX Fiber Optic Cleaner, this will help alleviate "over saturation" of the material.
- · Lightly touch the tip of probe and release.





Insert connector or insert probe though adapter and click 2-3 times to move past the wet area and allow material to dry wipe.

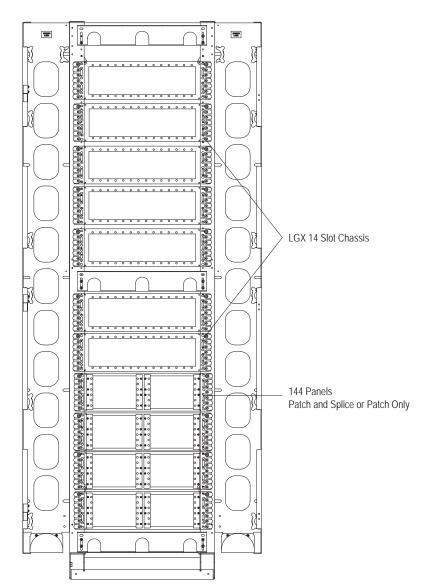


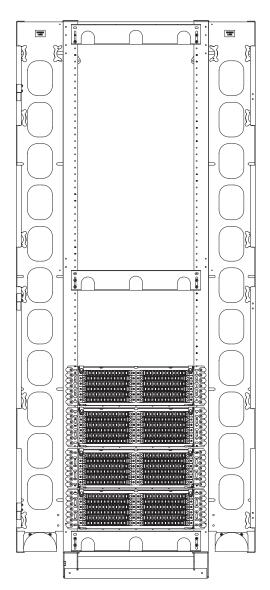


- · Inspect connector, repeat if necessary (following standards)
- If cleaning a male connector, clean the pins (see above)

# Engineering Standards and Technology MSO Applications - Panels and Splitter Scenarios —







# Engineering Standards and Technology Grounding Recommendations



#### **Panels**

Patch only panels with an IFC cable, containing no metallic materials, does not need the cable grounded at the panel.

If the panel itself needs to be grounded, scrape some paint from the panel and the frame at the point of contact where a ground wire running from the frame to the panel makes contact. If an isolation kit was used when the frame was mounted to the floor, the frame will need a ground wire from the frame to a common ground. NOTE: If bonding/grounding is needed for the FxMP panel, a threaded screw hole is available to address this need.

Patch and splice panels with an OSP armored cable, where the metallic armoring (shield) is entering from the exterior of the building to the panel, will need to be grounded at the panel.

After the shielding has been removed back to the green cable clamp used for mounting the cable to the panel, install a shield bonding clamp to the metallic shield. Then, connect a ground wire from the bonding clamp to the appropriate building ground.

No metallic material should make contact with the panel when not grounding to the frame.

#### **Cabinets**

Patch only cabinets, with a non-armored cable being spliced outside the cabinet, the cabinet will need to be the only thing grounded.

Using the ground bar mounted in the cabinet, install a ground wire from the ground bar to a ground rod. The ground rod will also be used to ground any metallic armored (shielded) cable that will be spliced to the terminated cable coming from the cabinet.

Patch and splice cabinet, with an OSP armored cable where the metallic armoring (shield) is continuous entering into the cabinet will need to be grounded to the cabinet ground bar.

After the shielding has been removed from the cable entering the cabinet back to the liquid tight strain relief fitting, attach a shield bond to the metallic shield and install a ground wire from the bond to the cabinet ground bar. The ground bar will need to be installed with a ground wire connecting the ground bar to the ground rod.

Patch and splice cabinet with ground box will be grounded the same as the path and splice cabinet, with an additional ground wire being installed from the cabinet ground bar to the ground box ground bar.

#### Wall Boxes

Exterior and interior wall boxes can be grounded using the wall box ground lug.

A ground wire will need to be installed from the lug to the appropriate ground; this could be a ground rod, building steel, water pipe or the buildings common ground. If armored cable enters the panel, it will need to be grounded using the same steps as OSP cabinets.

Clearfield's ground bonding kit part number is FMA-JZZ.

# Engineering Standards and Technology Optical Splitter Product Notes



Optical Splitters are used in PON (Passive Optical Network) architectures.

#### **PON (Passive Optical Networks)**

There are two common types of systems that make up fiber networks: Active Optical Networks and Passive Optical Networks. Each offer ways to separate data and route it to multiple locations, and each have advantages and disadvantages as compared to the other. An active optical system uses electrically powered switching equipment, such as routers or switch aggregators, to manage signal distribution and direct signals to specific locations. A passive optical network, on the other hand, does not include electrically powered switching equipment and instead uses optical splitters to separate and collect optical signals as they move through the network. A passive optical network shares fiber optic strands for portions of the network and are then split to feed the signal to multiple locations. Powered equipment is required only at the source and receiving ends of the signal.

A Passive Optical Network (PON) is a point-to-multi-point fiber to the premise network architecture. This type of network uses unpowered Optical Splitters along with WDM/CWDM/DWDM to enable a single optical fiber to be split into many separate fibers to serve multiple locations. A PON consists of an optical line terminal (OLT) at the service provider's central office and optical network units (ONUs) near or at the end users location. A PON reduces the amount of fibers and central office equipment required in the network, especially when compared to typical point-to-point architecture. A passive optical network is one form of a fiber-optic access network.

Passive optical networks or PONs have some distinct advantages. They are efficient in that each fiber optic strand can be split many times and can serve many users. The majority of the existing networks are splitting the signal 32 times, while newer systems have gone even further by splitting 64 times. There are even some networks pushing the envelope even further by splitting a signal 128 times. PONs have a low building cost relative to active optical networks along with lower maintenance costs. Because there are few moving or electrical parts, there's simply less that can go wrong in a PON.

Splitters play an important role in Fiber to the Home (FTTH) networks by allowing a single PON network interface to be shared among many subscribers. They are the network element that put the passive in Passive Optical Network. In some cases, FTTH systems may combine elements of both passive and active architectures to form a hybrid system.

### Technologies used to fabricate splitters and couplers.

#### Planar Lightwave Circuit (PLC or Planar)

PLC splitters are used to separate or combine optical signals. A PLC is a micro-optical component based on planar lightwave circuit technology and provides a low cost light distribution solution with small form factor and high reliability. PLCs are manufactured using silica glass waveguide circuits that are aligned with a V-groove fiber array chip that uses ribbon fiber. Once everything is aligned and bonded, it is then packaged inside a miniature housing. PLC Splitters have high quality performance, such as low insertion loss, low PDL, high return loss and excellent uniformity over a wide wavelength range from 1,260 nm to 1,620 nm and have an operating temperature -40 C to 85 C. Clearfield® products meet or exceed Telcordia GR-1209 and GR-1221 certifications.

#### **FBT Splitter Specifications**

FBT is the traditional technology in which two fibers are placed closely together, typically twisted around each other and fused together by applying heat while the assembly is being elongated and tapered. A signal source controls the desired coupling ratio. The fused fibers are protected by a glass substrate and then protected by a stainless steel tube, typically 3 mm diameter by 54 mm long. As this technology has developed over time, the quality of FBT splitters has improved and they can be deployed in a cost-effective manner. FBT splitters are widely accepted and used in passive optical networks, especially for instances where the split configuration is not more than 1x4. The slight drawback of this technology is when larger split configurations such as 1x16, 1x32 and 1x64 are needed. FBT technology is limited to the number of splits that can be achieved with one coupling. If more than four splits are required, multiple FBT splitters can be spliced together in concatenation to multiply the amount of splits available. This is also known as a tree splitter or coupler. When using this design, the package size increases due to multiple FBT splitters and splices needed to concatenate. The insertion loss also increases with the additional splitters and splices used. When high split counts are needed and small package size and low insertion loss is critical, a PLC splitter is more ideal.

# Engineering Standards and Technology Optical Splitter Product Notes



## Planar Lightwave Circuit (PLC) Optical Splitter Specifications

Туре	IL	RL	PDL	Uniformity	Directivity	Operating-Temp	Storage-Temp
1 x 32	< 16.8 dB	> 50 dB	< 0.3 dB	< 1.7 dB	> 55 dB	-40°C to 85°C	-40°C to 85°C
2 x 32	< 17.8 dB	> 50 dB	< 0.3 dB	< 1.8 dB	> 55 dB	-40°C to 85°C	-40°C to 85°C
1 x 16	< 13.8 dB	> 50 dB	< 0.3 dB	< 1.2 dB	> 55 dB	-40°C to 85°C	-40°C to 85°C
1 x 8	< 10.8 dB	> 50 dB	< 0.3 dB	< 0.8 dB	> 55 dB	-40°C to 85°C	-40°C to 85°C
1 x 4	< 7.5 dB	> 50 dB	< 0.3 dB	< 0.6 dB	> 55 dB	-40°C to 85°C	-40°C to 85°C

## Fused Biconic Taper (FBT) Dual Window - Wavelength Flattened (Terminated Specifications)

	1 x 2	1 x 4	1 x 8	1 x 16	1 x 32
Maximum Insertion Loss (dB)	3.6	7.2	10.7	14.0	17.6
Maximum Uniformity (dB)	0.8	1.0	1.3	1.6	1.9
Maximum PDL (dB)	0.2	0.3	0.4	0.5	0.6
Center Wavelengths (nm)	1,310 and 1,550				

# Engineering Standards and Technology WDM Product Notes



In the field of fiber-optics, WDM stands for Wavelength Division Multiplexing. This is a technology which combines many optical signals onto one fiber by using different light wavelengths (i.e. colors) of laser light. This technique also enables bi-directional communications over one strand of fiber, as well as multiplying the capacity of fibers used in fiber optic networks. The concept was first published in 1970. By 1978, WDM systems were being tested in the laboratory. Most WDM systems operate on single mode fiber optic cables. Some forms of WDMs are made to work with multimode fiber cables.

WDMs combine or multiplex (Mux) more than one wavelength onto one fiber. This is done by a discrete device, using fiber pigtail collimators and wavelength/light filters that are aligned and mounted in a glass sub-straight and typically packaged in a stainless steel tube for increased protection. The optical filtering devices used are typically solid-state, single-frequency Fabry–P rot interferometers in the form of thin-film-coated optical glass filters. The wavelength/light filters only allow specific wavelengths of light to pass through the filter and the remainder of the wavelengths to be reflected back. WDMs can also be used to separate or demultiplex (demux) more than one signal using the same device and transmitting the signal in the opposite direction. Wideband WDMs typically are 1,310 nm and 1,550 nm devices with an operating window of ± 50 nm of each specific wavelength. The 1,310 nm port will have an actual operating wavelength window of 1,270 nm to 1,360 nm. The 1,550 nm port will have an operating wavelength window of 1,500 nm to 1,600 nm.

Fiber Optic WDMs are used to increase the amount of information that can be transmitted over a single fiber. A typical two channel WDM will be used to multiplex (Mux) two different wavelengths onto one fiber. This allows you to simultaneously transmit two different networks/ systems over the same fiber. If you are using a WDM multiplexer at the beginning of your network, you will most likely need to use a WDM Demultiplexer (Demux) at the opposite end to separate (or demultiplex) the wavelengths to allow them to be directed to the correct receivers. Using a simple two wavelength WDM can increase the service capacity by two times for the same number of fibers. If you are currently using four fibers, you will be able to double your capacity and free up fibers for other use.

Today's WDM systems can handle as many as 160 signals and can transmit a basic 10 Gbit/s system on a single fiber, to over 1.6 Tbit/s on a single fiber. This is achieved by using Course Wave Division Multiplexing (CWDM) and Dense Wave Division Multiplexing (DWDM) - other forms of WDMs. Course Wave Division Multiplexing (CWDM) works very similarly to the WDMs mentioned earlier, however CWDMs offer more channels using wavelength/channel spacing of 20 nm with a working passband of ± 6.5 nm from the wavelength's center. This allows you to add multiple wavelengths onto one fiber and gives us the ability to use 2, 4 or 8 channels and even up to 16 or 18 channels, depending on the actual classification of the glass fiber being used. In 2002, the ITU standardized a channel spacing grid for use with CWDM (ITU-T G.694.2), using the wavelengths from 1,270 nm through 1,610 nm with a channel spacing of 20 nm. (G.694.2 was revised in 2003 to shift the actual channel centers by 1, so that strictly speaking, the center wavelengths are 1,271 to 1,611 nm, but are still typically referred to by 1,270 nm to 1,610 nm). Depending on the optical glass fiber used, many CWDM wavelengths below 1,470 nm are considered "unusable" on older G.652 specification fibers, due to the increased attenuation in the high water peak band of 1,360 nm to 1,460 nm. Improved fibers which conform to the G.652.C and G.652.D standards nearly eliminate the "water peak" attenuation and allow for full operation of all 18 ITU CWDM channels. CWDM is popular with the Cable TV networks, where different wavelengths are used for the downstream and upstream signals. In these networks, the wavelengths used are often widely separated. For example, the downstream signal might be in the 1,470 nm to 1,610 nm range, while the upstream signal is typically the 1,310 nm wavelength.

Dense Wavelength Division Multiplexing (DWDM) takes the WDM and CWDM one step further by narrowing the channel spacing in the C and L Band range. DWDM signals within the ITU C Band, are wavelengths between 1,530 nm and 1,565 nm (C band) and 1,570 nm to 1,625 nm (L band) adhering to the DWDM ITU-T G.694.1 frequency grid. DWDMs allow you to increase your wavelength capacity even further by offering more channels in these bands. DWDM offers multiplexing of multiple channels using 200 GHz, 100 GHz and 50 GHz spacing with the option to have an added Expansion port and/or Monitor port. Some technologies are capable of 12.5 GHz spacing (sometimes called ultra dense WDM). Such spacing is only achieved by free-space optics technology. New amplification options enable the extension of the usable wavelengths to the L-band, more or less doubling the number of channels. Early DWDM systems contained 4 or 8 wavelength converting transponders in the mid 1990s. By the year 2000, commercial systems capable of carrying 128 signals were introduced. There have been even more advancements in DWDM technology where they are starting to test over 1,000 channels, but this is in its early developmental stages and is not yet ready for commercial use.

WDM systems are popular with Telecommunication, Cable TV and Internet providers because they allow them to expand the capacity of the network without laying more fiber. By using WDM technology and optical amplifiers, they can accommodate several generations of technology in their optical infrastructure without having to overhaul the fiber optic backbone network. Capacity of any fiber network can be multiplied simply by upgrading to WDM, CWDM or DWDM technology.

WDM, CWDM and DWDM are all based on the same concept of adding multiple wavelengths of light onto a single fiber, but differ in their spacing of wavelengths, number of channels and the ability to amplify the multiplexed signals. EDFAs provide an efficient means of amplification for the DWDM wavelengths. However, CWDM optical amplification is not available, limiting the CWDM optical spans to several tens of kilometer.

# **Engineering Standards and Technology**



# Fiber Optic Assemblies

### Scope

This Engineering Specification is written to provide a summary of the performance criteria for terminated optical fiber connectors on optical fiber cable. This document will summarize product performance requirements based on the following established criteria: EIA/TIA-455, Fiber Optic Test Procedures (FOTP), and parts of Telcordia GR-326. This document may be revised, without notice, in accordance with standard Clearfield® document change procedures.

Note: Information in this document is proprietary to Clearfield and shall not be used, copied reproduced or disclosed in whole or in part without prior written permission of Clearfield.

### **General Product Descriptions**

#### Optical Fiber:

- Singlemode full Spectrum fiber meets ITU-T G.652.D (06/05) specification. Reduced Water Peak (RWP) fibers are considered. Full Spectrum because the reduction of loss in the water absorption spectral region (the E band)
- Singlemode Bending Loss Insensitive optical fiber meets ITU-T G.657 Class A (12/06). Fully compliant with the G.652 singlemode fibers specification
- Multimode 50/125 μm Graded Index Optical Fiber meets ITU-T G.651 (02/98). Multimode 50/125 μm Graded Index Optical Fiber for the optical access network meets ITU-T G.651.1 (07/07)
- Optical fiber cable for the optical access network recommends a quartz multimode fiber to be used for the access network in specific environments
- Color Coding of Fiber Optic Cable must be in accordance with TIA/EIA 598-A

#### Fiber Optic Jacketing:

All riser and plenum cables will meet requirements described in TR-NWT-000409. Fiber optic cable for plenum environments shall be
NEC type OFNP and listed as UL 910. Fiber optic cable for riser environments shall be listed as NEC type OFNR and listed as UL 1666.
Fiber optic cable for outside plant environments shall meet Telcordia GR-20 requirements

#### **Connectors Optical Fiber:**

GR-326: Generic Requirements for Singlemode Optical Connectors and Jumper Assemblies

### Performance Requirements

The following specifications refer to terminated optical fiber connectors on optical fiber cable. All measurements performed using standard procedures with a non-contacting interferometer. Insertion Loss and Return Loss figures are measured using a launch cable meeting the criteria specified in WIO 900.

### **Applicable Documents**

The following documents form a part of this specification to the extent defined herein. In the event of a conflict, this document shall govern:

Applicable Documents	
GR-326-CORE	Generic requirements for singlemode optical connectors and jumper assemblies, Issue 4
EIA/TIA-455	Fiber optic test procedures (FOTP), EIA/TIA
Clearfield® Drawing #17012	Connector end-face polish geometry, Clearfield®
Clearfield Drawing #17010	Specification for multimode connector end-face visual inspection criteria
Clearfield Drawing #17011	Specification for multimode connector end-face visual inspection criteria
ITU-T G.652.D (06/05)	Characteristics of singlemode optical fiber and cable
ITU-T G.657 Class A (12/2006)	Characteristics of a bending loss insensitive singlemode optical fiber and cable for the access network

# Engineering Standards and Technology Fiber Optic Assemblies



# **Minimum Performance Specifications for Terminated Singlemode Connectors**

Connector Type	Ferrule Material	Polish Type	Ins. Loss Typical	Max. Ins. Loss	Min. Ret. Loss	Polish Radius (mm)	Fiber Height, Max.	Fiber Height Typlical	Apex Offset	Polish Angle
ST	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB	7 - 25	±50 nm	±30 nm	< 50 µm	N/A
SC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB	7 - 25	±50 nm	±30 nm	< 50 µm	N/A
FC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB	7 - 25	±50 nm	±30 nm	< 50 µm	N/A
LC	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB	7 - 25	±50 nm	±30 nm	< 50 µm	N/A
D4	Ceramic	UPC	0.15 dB	0.30 dB	55.00 dB	7 - 25	±50 nm	±30 nm	< 50 µm	N/A
SC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB	5 - 12	±50 nm	±30 nm	< 50 µm	$8.0^{\circ} \pm 0.3^{\circ}$
FC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB	5 - 12	±50 nm	±30 nm	< 50 µm	$8.0^{\circ} \pm 0.3^{\circ}$
LC	Ceramic	APC	0.20 dB	0.30 dB	65.00 dB	5 - 12	±50 nm	±30 nm	< 50 µm	$8.0^{\circ} \pm 0.3^{\circ}$
MPO/MTP*	Thermoplastic	APC	0.20 dB	0.35 dB	60.00 dB	N/A	N/A	N/M	N/A	N/A

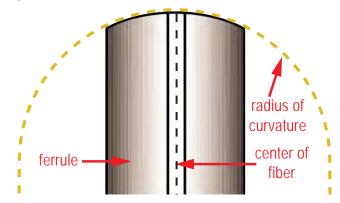
\*MPO/MTP Connector Specifications are for 12 fiber cable assembly connectors

Note: All Clearfield® fiber optic patch cords are designed and tested to operate between -40°C and 85°C.

# Engineering Standards and Technology Fiber Optic Assemblies

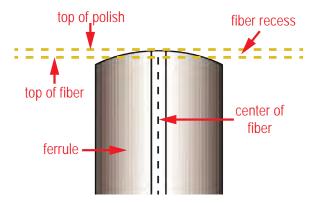


## **Specifications**



#### 1.0 POLISH RADIUS

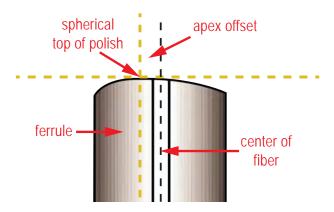
The radius of curvature is defined as the radius of the end-face surface as measured from the ferrule axis.



#### 2.0 FIBER UNDERCUT / PROTRUSION

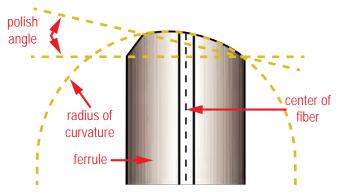
Fiber undercut or protrusion is defined as the distance between the top of the glass fiber as measured against the surrounding material in a spherical plane.

Undercut = -.02R3 + 1.3R2 - 31R + 325.



#### 3.0 APEX OFFSET

Apex offset is measured as the distance between the spherical center of the polished end-face and the center of the fiber.



#### 4.0 ANGLED POLISH

The end face is polished at an angle relative to the axis perpendicular to the ferrule axis.

# **Engineering Standards and Technology End-Face**



#### What is IL?

Insertion loss (IL) is the loss of signal power resulting from the insertion of a device in a transmission line or optical fiber. Usually expressed as a ratio in dB relative to the transmitted signal power, it can also be referred to as attenuation.

#### What is RL?

Return loss or reflection loss (RL) is the reflection of signal power resulting from the insertion of a device in a transmission line or optical fiber. It is usually expressed as a ratio in dB relative to the transmitted signal power.

#### Test and Measurement

Your minimum requirements should include data that meets insertion loss and return loss (reflectance). Insertion loss should meet the 326-Core minimum of 0.4 dB, with reflectance meeting 55 dB for UPC connectors and 65 dB for APC. Asking the typical performance measures of a manufacturer's process can save you on link loss budgets over a long fiber run through a FTTH network.

Apex offset, the measurement for how well the center core of the fiber is centered in relationship to the spherical apex of the polished tip, minimizes lateral offset between two fibers and maintains a better physical contact. Apex offset describes a physical condition of the polished fiber, rather than a performance parameter. It is also an acceptance criteria for Telcordia. An excessive apex offset contributes to high insertion loss and high back reflection readings.

Fiber undercut or protrusion affects the physical contact zone. This metric measures, in nanometers, the height of the fiber under or below the ceramic end-face. Too much undercut minimizes the chance of a good physical contact, while too much protrusion causes excessive fiber deformation when mating occurs resulting in degradation of signal. When two connectors are mated, the ceramic compresses around the fiber core which allows the fibers to squeeze up and make good contact with each other. When they do not touch (because of too much undercut), an air gap is created and loss happens. If the fiber is protruding too far (beyond 50nm), chipping and cracking can occur during the mate.

Radius of curvature is the measurement of the connector end-face spherical condition. The radius generated affects the performance because the radius, when mated with another connector, should be compressing most of the material surrounding the core (ceramic ferrule). A proper radius, 5 to 12 micron, allows for the right compression and max performance. Too tight of a radius will put too much compression on the glass and too loose will put too much on the surrounding ferrule with not enough glass compression. Too much or too little radius can cause light scatter or inadequate physical contact for optimal signal transfer.

Apex offset, fiber undercut/protrusion, and radius of curvature are the main ingredients that work in concert to deliver good IL and RL performance. Processes that drift out of this geometry range can still yield acceptable IL/RL, but sensitive traffic will be affected (such as video) and long term performance of the connector will be compromised.

Your vendor should be able to provide these geometry test reports with on-hand interferometer testing. While you may not require this data for each and every connector, you should require that random testing is being performed to ensure the process is capable and not drifting out of spec. "Garage shops" will not be able to deliver this test data on demand.

Your test reports should account for each connector independently and not a total report that summarizes both ends.

### **End-face Quality & Cleanliness**

Currently, there is not an industry standard for this topic. To be sure, end-face and cleanliness has a direct impact on the performance of the connector.

Several organizations (most notably, NEMI) have studied the impact of end-face defects and cleanliness. The influence of the contamination/ scratches becomes more evident if they are located in the core/cladding areas. Particle contamination can cause a significant increase in IL (up to 10 times) and decrease in RL (up to three times). Scratches applied to the fiber contact zones 1a and 1b, which is an area from the core out to the cladding (125 µm), decreased RL by up to 25%. On the other hand, scratches located in the cladding layer showed little effect on IL and RL. Multiple heavy scratches passing through the core caused severe performance degradation in IL/RL and can be catastrophic.

Connectors with particle contamination will pass on contamination to mated connectors. Contaminant can prevent direct physical contact, creating an air gap. Multiply this by the number of re-mates over time and the problem spreads. Pits and scratches, in the critical contact zone 1a, will collect particulates over time and the same contamination-spread occurs. Long term reliability in dynamic circuits is severely reduced as opposed to those that are static. Scratches and polishing marks outside of critical contact areas are acceptable and do not have any impact on signal performance.

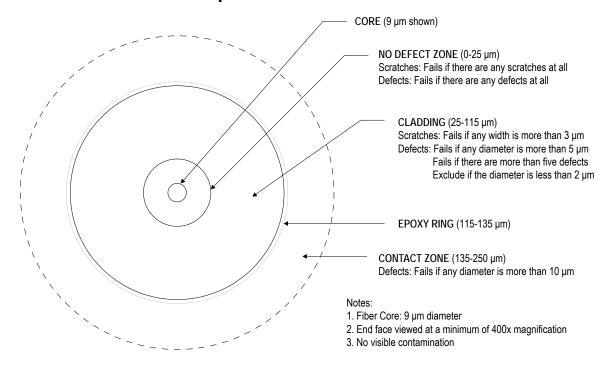
The quality fiber assembly manufacturers and OEMs will have their own inspection criteria. However, these specifications differ from company to company and the differences can cause materials to be "non-conforming" at user/customer sites.

# **Engineering Standards and Technology End-Face**



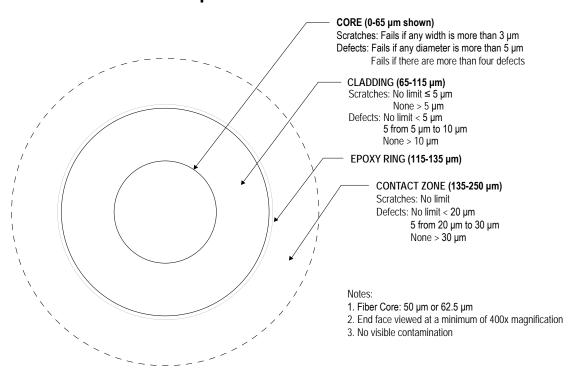
## Singlemode

# Acceptable Fiber End Face

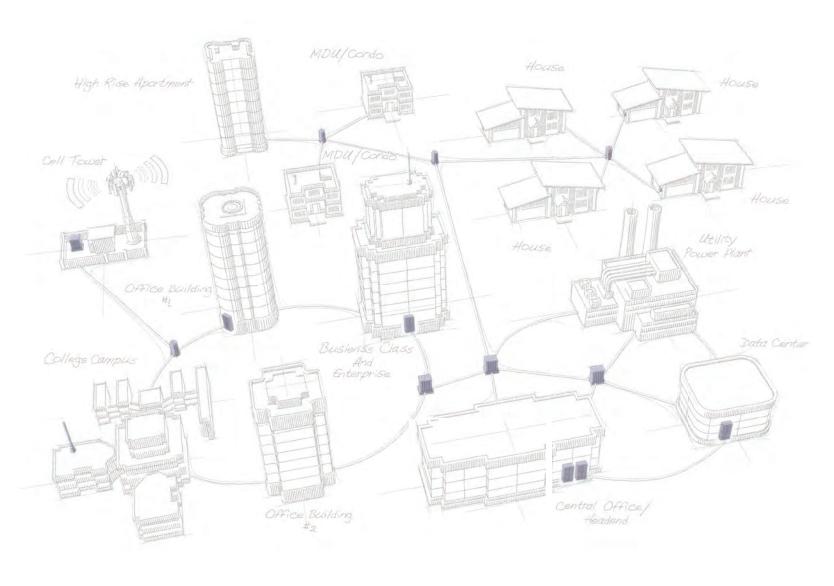


### Multimode

# Acceptable Fiber End Face







Visit Clearfield College to get Fiber Smart with our E-Learning fiber curriculum or to register for our hands-on Certified Partner Training or FOA Certification Course: www.SeeClearfield.com/Clearfield-College









