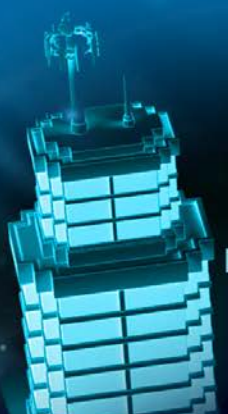


Fiber Built to Scale.

LOOKING FOR A BETTER WAY?

- **FieldSmart® + FieldShield® = Total Integration**
- SeeClearfield.com • 800-422-2537





Wind Farm

SEE CLEARFIELD®



Office Building



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Intelligently engineered and designed to dramatically reduce the cost of fiber deployment through lower labor costs, Clearfield's unique, single-architected, totally integrated fiber management, pathway and drop system meets the needs of the rapidly transitioning fiber market.

FieldSmart®, Clearfield's end-to-end fiber management platform, consolidates, distributes and protects fiber as it moves from the inside plant to the outside plant, and all the way to the home, business and cell site.

FieldShield® is a turn-key package 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. FieldShield ensures a quick-to-deploy, easy-to-restore solution for both OSP and in-building connectivity.

Used as an integrated solution, Clearfield's FieldSmart and FieldShield fiber management and delivery solutions for the central office, outside plant and access networks, deliver the industry's lowest total cost of ownership (TCO) solution.

Regardless of deployment need, [see Clearfield to solve your fiber network design challenge.](#)

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Clearview for FieldSmart

BUILDING BLOCK ARCHITECTURE

Clearview is at the heart of every product within the FieldSmart fiber management system.

With Clearview®, the rules of fiber management have changed. The service provider no longer needs to consider fiber management within the network layout - it's already built into the solution. This integrated, 12-fiber management system can be replicated whenever and wherever it is required in the network. Within the cassette, all fibers from the sub-assembly are slack stored, bend-radius protected and secured against accidental physical damage from handling. The transparent housing allows for quick and easy first step troubleshooting of unacceptable light conditions.

Designed to handle the toughest operating environments, Clearview provides flexibility, as well as reliable performance within the inside plant, outside plant and access networks.

The core building block of every product within the FieldSmart fiber management system, Clearview's configuration options support toolless installation, in-cassette buffer tube/ribbon slack storage, front access-only options and a small footprint that reduces real estate costs and improves density without compromising critical design elements of access, bend-radius protection, physical fiber protection and route path diversity.

All types of fiber cable construction can be integrated within the cassette to support all patch only, patch and splice, passive optical component hardware and plug-and-play scenarios.



- The Clearview Blue, Clearview Black and
- Clearview xPAK are available in patch and splice, patch only, MPO, optical component and plug-and-play configurations.



FieldSmart FxHD

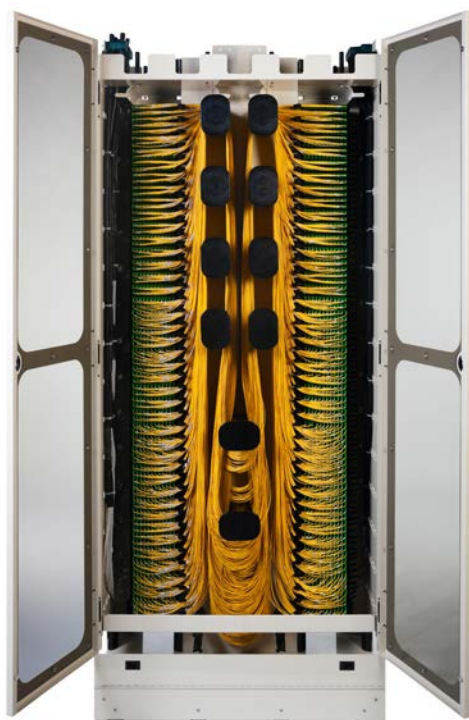
LOW TCO, HIGH DENSITY

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Designed for density on the frame and for the reduced footprint it provides on the floor, the FieldSmart FxHD maximizes your real estate investment, providing for lower total cost of ownership (TCO) in high density environments. Lower cost of ownership is realized not only in real estate savings, but also in installation and service turn-up time, troubleshooting and restoration. The frame is designed for front access, providing instant access to all cassettes, adapters and jumpers. While the FxHD provides for rear access, the front only access design allows for placement

options within a cage in data center COLO environments, back-to-back or against a wall. When against a wall, no back aisle space is needed. The result? Without sacrificing access, eliminating the need for rear access to the frame provides a 40% reduction in floor space requirements over a standard frame.

With the same 18 x 36" footprint, the FxHD easily integrates alongside existing FieldSmart FxDS or other industry-standard frame systems, yet with up to 2,016 ports of SC connectivity, it houses 17% more ports than any other frame in the market.



FieldSmart FxHD Frame



FieldSmart FxDS

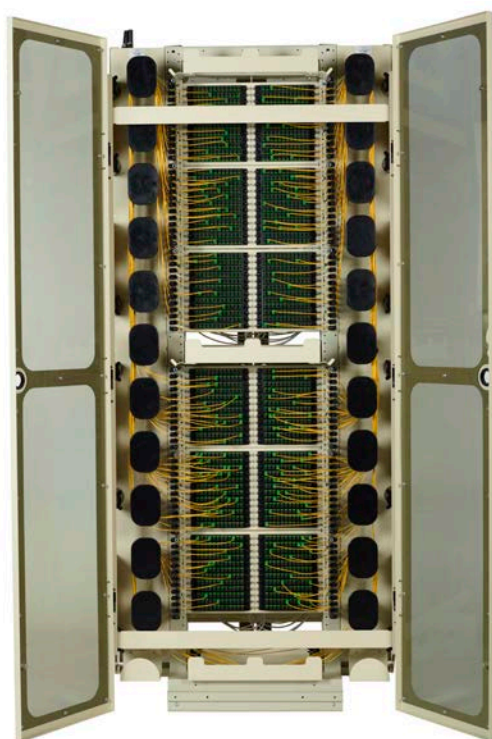
MODULAR, SCALABLE

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The FieldSmart Fiber Crossover Distribution System (FxDS) provides a series of modular and scalable fiber bulkhead panels that deliver industry-leading scalability and fiber protection without jeopardizing density or increasing cost. Scaling easily from 12 ports to a full rack of 1,728 SC ports, the FieldSmart FxDS requires only 4 unique SKU's to configure initial deployment. Bulkhead panels are available from 24 ports in a 1RU to an industry leading 288 ports in only 11" of rack space. Panels are also available in 48, 72 and 144 port options.

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.

Symmetrical in product design, route diversity is maximized, minimizing the risk of cable pile up. Port density does not come at the expense of slack storage as the rear cover of the panel doubles as a slack storage basket.



FieldSmart FxDS Frame Kit



- FieldSmart Fiber Scalability Center (FSC)

HARSH ENVIRONMENT RELIABILITY

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The FieldSmart FSC sets the bar for fiber access, protection and density among OSP cabinets – scaling from 288 to 1,728 SC ports in centralized split or cross-connect fiber networks. Ruggedized splitters ship with legs pre-parked for easy and rapid deployment in PON environments. Equally attractive in a cross-connect configuration, the

FieldSmart FSC supports a user-defined feeder-to-distribution ratio. With the Clearview Cassette at its foundation, the FieldSmart FSC uses the same components as the FieldSmart FxDS. This enables service providers to standardize on a single building block, allowing a single fiber management component to be deployed in both environments.

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In a PON configuration, the FSC provides up to 288 fibers in a compact 16 x 16 x 32" footprint or 1,152 fibers in a 64 x 33 x 16" design. In a cross-connect environment, a user-defined feeder-to-distribution ratio provides up to 1,728 ports without real estate penalty. The FieldSmart Hub Collapse Cabinet (HCC) reduces MAC costs and reduces the risk to electronics by isolating the passive connectivity.

These cabinets set the bar for fiber access, protection and density in outside plant cabinets for PON, cross-connect and hub collapse environments. Technicians have the ease of working with a single fiber management platform regardless of inside or outside plant deployment – saving training and installation time.



864 Port Cross-Connect Cabinet



Hub Collapse Cabinet



288 Port PON Cabinet



1,152 Port Centralized Split Cabinet



FieldSmart PON-in-a-Ped

BRINGING FIBER TO SMALLER SERVING AREAS



Responding to industry calls for a cost-effective method to bring fiber to smaller serving areas, the FieldSmart PON-in-a-Ped is designed to reduce the number of access points and the distribution fiber needed to reach the home. Available in 96 and 144 Port PON Insert Kits, this solution offers choices in configuration and segmentation flexibility in a scale not matched by larger cabinets.

The PON Pedestal provides service providers an open architecture alternative resulting in a lower cost alternative than

a traditional, sheet metal cabinet. Choose from direct bury or vault-mounted options as well as an insert kit for placing into existing pedestals. All options provide splice or interconnect functionality for drops to the home in the last mile of the access network.

Scalability is delivered through the building block design of the Clearview Blue Cassette and the new WaveSmart® High Density Splitter that utilizes 900 micron fiber for ease of fiber management and greater slack storage.



144 Port PON-in-Ped



96 Port PON-in-Ped



FieldSmart Makwa FDH

ABOVE OR BELOW, HALF THE SIZE

Like the bear for which it is named, the FieldSmart Makwa FDH can go below grade, stand up at ground level or climb a pole. But unlike most bears, Makwa is half the size of a conventional FDH.

The FieldSmart Makwa FDH is environmentally protected, versatile, scalable, damage resistant, easily accessible and cost effective, allowing the broadband service provider the choice of where to deploy without sacrificing performance or access. Built from the ground up and inside a sealed closure, Clearfield has developed the smallest 288 port PON or 432 port Cross-Connect FDH in the industry. Enclosed in a black impact and UV

resistant Thermoplastic material, the product will withstand all OSP environments, above or below grade. With a removable top cover, all of the fibers are protected and fully accessible for service changes and maintenance.

Contrary to popular belief, bears do not need much room to hibernate and neither does the Makwa. With the ability to be housed in a 24 x 36 x 36" vault or hand-hole, FieldSmart Makwa can be placed in any below grade environment, including the boulevard or area between the curb and sidewalk. As this space is typically owned by the municipality, only a single permit is required, expediting the pre-construction engineering process.



- FieldSmart Makwa FDH can be aerial or
- pad mounted or buried below grade for your deployment environment.



FieldSmart Wall Boxes

A WALL BOX FOR
EVERY ENVIRONMENT

The FieldSmart Wall Box line is ideal for both business-class and residential environments. Choices range from plastic, lockable, NEMA 4 rated enclosures to swinging bulkheads for rear-access in the harshest of OSP environments.

Designed from conception to provide fast, easy fiber jumper routing and ease of access to all circuits, the FieldSmart Wall Boxes are craft-friendly, keeping the installer's needs for quick deployment, intuitive use and ease of maintenance a top priority.

Design features, such as field-deployed knock-outs on both the rear and bottom of some units for conduit entry, allow field personnel to reduce installation time without jeopardizing immediate or long-term reliability.

Whether you are looking for a small count enclosure for as little as two fibers, 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.



Outdoor 48 Port Wall Box (Metal)



Indoor 144 Port Wall Box (Metal)



FDP-KIS Enclosure



Wall Box with Clearview xPAK
(Plastic)



Indoor/Outdoor 12 Port Wall Box
(Plastic)



FieldShield Fiber Delivery System

NON-INTRUSIVE, FAST FIBER DELIVERY



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FieldShield is a fiber pathway and protection method aimed at reducing the cost of “last mile” broadband deployment with pushable fiber.

Pushable fiber technology continues Clearfield’s commitment to user-defined configurability, enabling users to push or pull specially designed hardened fiber cable assemblies through a series of ruggedized microducts, delivering fiber to even the hardest to reach environments. Fiber can be buried with the simplest and least invasive trenching techniques, as well as run directly up a cell tower, while

being fully protected from the harshest elements. Ease of field restoration is ensured regardless of installation method or environment in which it is installed. Should the microduct be cut for whatever reason, the fiber is easily removed, the duct repaired with a simple coupler, and fiber pushed back into place with limited interruption or inconvenience.

Installing fiber where you want it, when you want it, cost effectively is the promise of the FieldShield optical fiber protection system.



FieldShield starts with a ruggedized microduct in 8mm (aerial), 10mm or 14mm outer diameter space-saving footprint across all deployment environments to support your aerial, direct bury and inside plant “last mile” needs. FieldShield Microduct is strong enough to be placed using traditional methods of boring and plowing, allowing you to leverage your existing conduit placement equipment, as well as newer, less disruptive technologies, such as microtrenching.

What's more, due to its high column strength, FieldShield Microducts can

be deployed as a rod directly within a larger occupied duct that was previously thought exhausted. The lack of space and the costs associated with constructing new pathways through the riser space can be just as prohibitive as digging up city streets.

Available for aerial and buried environments in the OSP as well as plenum and riser-rated configurations for inside plant environments, FieldShield provides the pathway to quickly deliver a crush-resistant FieldShield Pushable Fiber Assembly.



Whether you choose to push, pull or pre-place fiber into the FieldShield Microduct, the PBT jacket of Clearfield's FieldShield Pushable Fiber Cable easily slips through the microduct's smooth inner wall to your desired end-point. Utilizing G.657.A2 bend-insensitive glass, FieldShield Pushable Fiber Cable is available in a variety of fiber counts: 1 to 12 fibers in a 3mm jacket, up to 24 fibers in a 4mm jacket and 48 fibers in a 5.5mm jacket.

A factory pre-connectorized approach eliminates costly labor in the field and presents a reliable, consistent and

guaranteed performance along with lower installation costs. After being installed in the microduct, the slip-resistant protective housing is removed and the SC connector or the Dual or Simplex LC connector snaps together – all in seconds, providing the most cost-effective, tech-friendly means of installing optical fiber without jeopardizing fiber protection.

Clearfield offers our customers the reliability of a proven connector teamed with Clearfield designed pushable fiber technology.



- Simplex and Duplex LC Connector



- MPO Connector



- SC Connector



- MPO Pushable Fiber in Duct



FieldShield Multiport SmarTerminal

HARDENED ENVIRONMENT OSP DEPLOYMENT



Designed to streamline the delivery of fiber to the home, business or premise, the FieldShield Multiport SmarTerminal is a compact environmentally sealed enclosure. The SmarTerminal is the only multiport service terminal in the industry to offer patch only, patch and splice, as well as optical component integration options.

Teamed with FieldShield Hardened Connectors, the solution provides maximum reliability and durability in the harshest of outdoor environments.

The field-installed, toolless hardened connector housing slips over a

FieldShield optical connector to provide a water tight seal when easily mated to each port of the FieldShield Multiport SmarTerminal. FieldShield pushable fiber connectors slide into the housing and are weather protected by a two-grommet system. Working together to seal the connection to the enclosure, the FieldShield ruggedized housing provides bend limiting strain relief while routing the cables. When used in conjunction with FieldShield Microduct, the FieldShield Drop Cable has been tested to meet GR-771 and GR-3120 standards for robust environmental performance.

• FieldShield SmarTerminal



• LC Connector with
• Ruggedized Housing



• MPO Connector with
• Ruggedized Housing



• SC Connector with
• Ruggedized Housing



FieldShield StrongFiber and Deploy Reel

NON-INTRUSIVE, FAST FIBER DELIVERY

Now taking it even smaller...

The high variability of MDU architectures has made FTTp deployments within those structures a challenge. Extensive engineering has been required to ensure proper cable lengths. With FieldShield StrongFiber, pre-engineering is minimal because the 4.5" StrongFiber Deploy Reel, upon which up to 250 feet of StrongFiber is shipped, can be mounted at the destination site and the desired length simply pulled from the wheel to the access point.

OSP hardened for unconditioned environments, StrongFiber can be pulled through FieldShield 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.

When terminated with a FieldShield Connector, the small form factor of the connector and the 900 μ m fiber makes installation quick, and slack storage minimal and easy to accommodate. The exceptional pull strength of StrongFiber makes it craft-friendly and easy for the technician to handle without fear of fiber damage.



FieldShield StrongFiber



FieldShield StrongFiber Deploy Reel



WaveSmart Optical Components

CUSTOM CONFIGURED

Key to the success of a fiber deployment is the performance and precision of the optical components deployed in the inside and outside plant environments. Clearfield leads the way with optical component technologies for PON splitting, coarse and dense wave division multiplexing and optical circulators. These products are custom built to your unique split ratios, light requirements and interoperability needs.

In addition to our termination expertise, Clearfield designs optical component packaging with the appropriate materials to meet the performance needed in the uncontrolled environments of the OSP. We specialize in the manufacturing, termination and packaging of optical components to custom-build configurations.

A wide range of packaging options are available:

- Terminated assembly
- A discrete device
- Within a Clearview Cassette
- Traditional LGX
- Other chassis styles

Ruggedized Splitters

The WaveSmart Ruggedized Splitter is the standard splitter component of the FieldSmart FSC OSP Cabinets. The splitter addresses environmental and human handling issues that other standard splitters in the industry cannot combat.



Circulators

The WaveSmart Circulator allows the user to reroute the traffic that traditionally required two fibers (one for each direction of travel) onto a single fiber with bidirectional traffic. This allows two of the same wavelengths to co-exist on the same fiber, allowing the user to gain virtual fibers in a 2 or 4 fiber legacy transport system (1310/1550).



Inside Plant Splitters

Clearfield provides Planar Lightwave Circuit (PLC) and Fused Biconic Taper (FBT) Splitters in a variety of optical component packages for the network and application needed, allowing carriers the ability to provide uniform, fully passive signal splitting to multiple premises.



Wave Division Multiplexing (WDM)

Wavelength Division Multiplexing increases fiber capacity by combining (mux) and separating (demux) multiple input channels over a single fiber output. Clearfield provides WDMs for both singlemode fiber and multimode fiber applications.



HD Splitter

The WaveSmart High Density (HD) Splitter is designed to work with the FieldSmart Makwa platform and the FDP 96 Port PON-in-a-PED. Consistent with a simple yet innovative design methodology, the HD Splitter utilizes a 75% smaller package over earlier designed splitter packages.



UNMATCHED PERFORMANCE

Clearfield's fiber termination process is Telcordia GR-326 certified. What's more, cable assemblies carrying Clearfield's FiberDeep® label are guaranteed .2dB or less insertion loss — half that of the industry standard. FiberDeep improves your fiber network's performance while reducing the cost of deployment.

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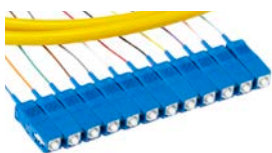
• Bend Insensitive Fiber Jumpers



• Indoor Ruggedized Jumper Cable



• Ruggedized Assembly



• Distribution Assemblies



• Drop Node Assemblies



• Breakout Assemblies



• Hardened Fiber Optic Connector (HFOC)

For more information on other Clearfield products, including Clearfield's CraftSmart® Fiber Protection Pedestals (FPP) and CraftSmart Fiber Protection Vaults (FPV), as well as the Company's Splice-on Connectors (SOC), Test Access Point (TAP) Boxes and other fiber protection devices, please go to our website SeeClearfield.com.