

VISION. CLARITY. CLEARFIELD.



Making fiber work - with a unified fiber management, protection and delivery platform is the vision that drives Clearfield. Clarity in the fiber management architecture enables your capital equipment expenditure to match your subscriber take rates.

**Looking to Reduce the Cost of Gigabit Broadband?
See Clearfield.**



- *Why Clearfield?*
- **Clearfield is Changing the Way the Market**



When it comes to distribution, consolidation, management and protection of fiber, nothing comes close to **Clearfield's** stream-lined, practical approach. Rather than a fixed, up-front cost, Clearfield's unified fiber management, protection and delivery platform is designed for scalable deployment, craft-friendly operation and unsurpassed performance. Our simplicity in design protects your fiber investment along every point of the broadband network, allowing us to serve applications where fiber was not previously economically or environmentally viable.

FieldSmart is the only fiber management platform to be designed around a single architecture - the Clearview Cassette. FieldSmart supports a wide range of panel and cabinet configurations, densities, connectors and adapter options for the inside plant, outside plant and access network.



Looks at Fiber Deployments



FieldShield takes industry standard glass and makes it easier and less expensive to install. A series of pushable optical fibers and connectors, microducts and network access point (NAP) terminals and enclosures completes the broadband deployment.



Clearfield delivers unparalleled fiber performance with its **WaveSmart** Optical Components and superior fiber protection with **CraftSmart** pedestals and vaults.



FiberDeep cable assemblies guarantee .2dB or less insertion loss on every singlemode patchcord and 12-fiber assembly deployed. No longer considered a commodity in today's cable plant, 4G networks and Gigabit Broadband architecture require superior performance standards.



Clearfield, there's no better choice for fiber in the last mile - to premise, enterprise and tower.

:How is Clearfield Different?
:Clearview Cassette



Patch & Splice



Patch Only



Optical Components

Clearview is at the heart of every product within the FieldSmart fiber management system. With Clearview, the rules of fiber management have changed. No more does the service provider need 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 n' play scenarios. [The Clearview Cassette is supported in every FieldSmart solution.](#)



Engineered to land small port count fiber assemblies and optical components as conveniently and inexpensively as possible, the [Clearview xPAK](#) is ideal for: cell backhaul, business class service delivery, node segmentation, fiber exhaust scenarios, utility sub-stations or fiber-to-the-desk deployment. Deployed as a stand-alone unit or mounted inside a small enclosure, the Clearview xPAK simplifies fiber management to the level of a consumable good.



- *Modular Construction for Scalable Capacity*
- **FieldSmart Fiber Distribution System (FxDS)**



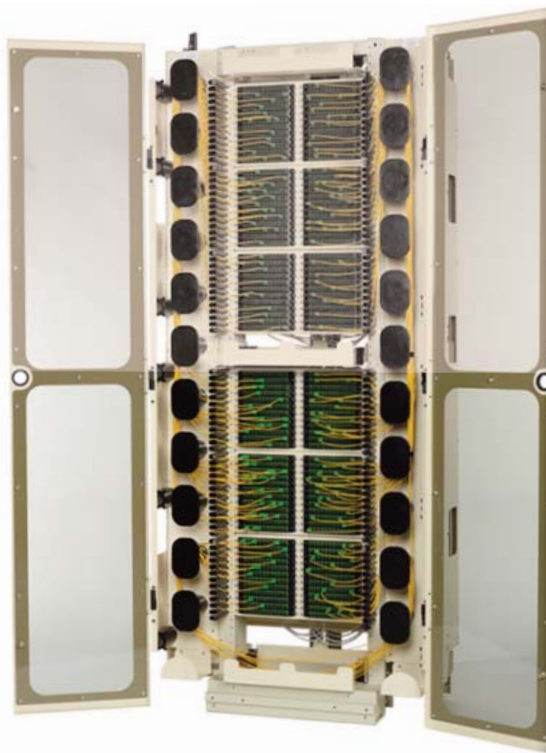
The FieldSmart Fiber Crossover Distribution System (FxDS) provides a series of modular and scalable fiber bulkhead panels that deliver industry-leading scalability and fiber protection without jeopardizing density or increasing cost. Scaling easily from 12 ports to a full rack of 1728 ports, the FieldSmart FxDS requires only 4 unique SKU's to configure initial deployment. The user then places into the frame what is needed as subscriber take rates dictate.

Users first select the bulkhead panel of choice. Available in 24, 48, 72, 144 and 288-port count options, users can select the density that their application requires.



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.

If the frame is being used for applications that require optical component functionality, the Clearview Cassette integrates these components, allowing the user to mix and match optical components with connectivity or dedicating bulkheads as separate functional chassis'.



Full range of slack storage and other accessories including Clearfield's [Fiber Entrance Cabinet](#) with entry/exit points that allow for multiple distribution and OSP fiber sheaths to enter into the FEC from top, bottom or sidewalls transitioning from conduit, overhead fiber tray or raised flooring.



- : *Modular Construction for Highest Density*
- : **Clearview Building Bracket**



Service providers can use the Clearview Cassette in every panel, frame and cabinet enclosure in the FieldSmart line. The Clearview Cassette used in conjunction with the [Clearview Building Block \(BB\)](#) extends this functionality to the highest level of frame density.

A Clearview Building Bracket:

- Accepts two Clearview Blue Cassettes by its receiving rails and guides the cassettes to the rear of the bracket where a hard stop locks the cassette into perfect position.
- Symmetry in design allows for left or right orientation of your blocks, requiring only one building bracket and one cassette or combinations of each to populate any future fiber management device from Clearfield.
- Multiple Clearview Building Brackets can be “ganged” together until you reach your desired port count.
- Clearview’s multiple buffer tube route paths, increased from two to six for cable entry, allow the technician a high degree of flexibility in its deployment.
- Supporting patch only and patch & splice environments, the Clearview Building Brackets are used differently to support each of the methods and procedures.

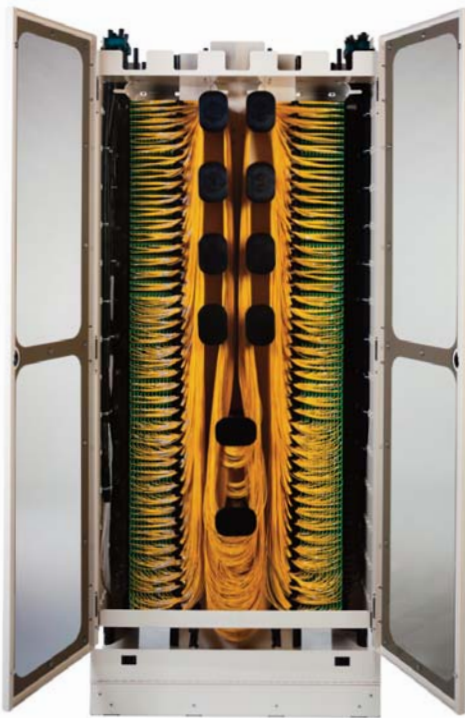


High Density Fiber Distribution: FieldSmart (FxHD):

Designed for density on the frame and for the footprint it requires on the floor, the FieldSmart FxHD maximizes your real estate investment, providing for lower total cost of ownership 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, trouble-shooting and restoration.

With instant access to all cassettes, adapters and jumpers, the frame is designed for front access - meaning all your installation, MAC work (moves, adds and changes), and routing of jumpers is done from one side of the frame. While the FxHD provides for rear access, the options to place it against a wall, within a cage in data center COLO environments or back-to-back results in a 40% reduction in floor space requirements.

- Start with one Clearview Blue Cassette and one Clearview Blue Building Bracket.
- Additional cassettes can be added for 2016 ports of connectivity.
- Fully loaded, the FxHD represents an additional 288 ports over a standard 7' frame - or a 17% increase over any other frame in the market.
- Yet, with the same 18 x 36" footprint of the FxDS fiber frame, the FxHD easily integrates alongside existing FieldSmart FxDS or other industry-standard frame systems.



- : *Engineered for Harsh Environment Reliability*
- : **FieldSmart Fiber Scalability Center (FSC)**

The FieldSmart FSC sets the bar for fiber access, protection and density among OSP cabinets - from 288 to 864 ports in distributed 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.



Engineered for Harsh Environment Reliability: **FSC Configurations:**

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 864 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.

The FieldSmart Fiber Scalability Center (FSC) and Hub Collapse Cabinet (HCC) set the bar for fiber access, protection and density among outside plant cabinet for PON, cross-connect or hub collapse environments. In environments where pole-mounted, above grade or ground placement is prohibited, the FSC Below Grade Cabinet is also available. Water and air-tight, the OSP Below Grade Cabinet's swing-up locking mechanism provides ease of access from a below grade vault.

Available in both above and below-grade configurations, technicians also have the ease of working with a single fiber management platform regardless of inside or outside plant deployment - saving training and installation time.



288-port PON



864-port Cross-Connect



Hub Collapse

: FieldSmart Fiber Delivery Point Solutions
: FieldSmart FDP I/O Wall Mount Panels

The FieldSmart Fiber Delivery Point (FDP) Indoor and Outdoor Wall Mount Panels are for larger installations to allow the user to easily scale to 144 ports.

Utilizing Clearview Cassettes, the product is shipped and loaded with the industry standard adapter of your choice. The product is preloaded for patch only or patch & splice applications and supports all cable constructions for inside and outside plant.



Some configurations are mid-span/ring cut capable to reduce installation costs and deployment time with piano hinge doors for increased security.

The FieldSmart Fiber Distribution Point (FDP) - KIS

is a universal housing that can deliver fiber from a communications closet all the way to an antenna and everything in between. The FDP-KIS is optimized for pushable fiber and 10mm microduct, and will accommodate up to 48 ports of fiber terminations within a single, small package footprint. With a wide variety of mounting options (wall, pole, H-frame) and multiple cable entrance/exit ports on all four sides of the unit, the FDP-KIS provides maximum flexibility in your installation and deployment into the network.



FieldSmart Small Count Delivery Solutions: **FieldSmart SCD I/O Box for Cassette/xPAK:**

The FieldSmart Small Count Delivery (SCD) Wall Boxes are available for use with the Clearview Cassette or Clearview xPAK. Kitted with up to two Clearview Cassettes to land small port count fiber terminations and optical components as conveniently and inexpensively as possible, the Cassette Wall Box is ideally 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.



Ideal for any small-count “landed” fiber scenarios where 2, 4 or 6 fibers are required, the xPAK Wall Box is a discrete footprint without sacrificing fiber management.

PON-in-a-Ped

The FieldSmart FDP PON-in-a-PED allows broadband service providers to enjoy all of the fiber protection and scalability provided in the FieldSmart FSC Cabinet within a much smaller footprint.



- *Pushing Fiber to Your Desired Distribution Point*
- **FieldShield Optical Fiber Protection**



FieldShield is a new fiber delivery 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. By using only a 10mm microduct, fiber can be buried with the simplest and least invasive trenching techniques. In addition, fiber can be run directly to the antenna or radio head on 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.

: Improving Long-Term Reliability
: FieldShield Microduct

FieldShield starts with a ruggedized microduct designed to support all aerial, direct bury and inside plant “last mile” needs. Created from the most durable HDPE polymers, 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 micro-trenching.

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.



Lower Labor Costs by Eliminating Field Splicing: **FieldShield Fiber Cable and Connectors:**

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 OFS bend-insensitive glass, FieldShield Pushable Fiber Cable is available in a variety of fiber counts: 1 to 12 fibers in a 3 mm jacket and up to 24 fibers in a 4 mm 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 snaps together - all in seconds, providing the most cost-effective, tech-friendly means of installing optical fiber without jeopardizing fiber protection.

By collaborating with Senko to design these new connectors, Clearfield offers our customers the reliability of a proven connector teamed with Clearfield designed pushable fiber technology.



Simplex and Duplex
LC Connector



SC Connector

• *Environmentally Sealed Fiber Delivery Solution*
• **FieldShield Multiport SmarTerminal**



Designed to streamline the delivery of fiber to the home, business or premise, the FieldShield Multiport SmarTerminal is a compact environmentally sealed enclosure. Teamed with FieldShield Hardened Connectors, the solution provides maximum reliability and durability in the harshest of outdoor environments.

- Up to one meter of internal slack storage and virtually unlimited external slack storage dependent on SmarTerminal placement, the FieldShield Multiport SmarTerminal is easily configured for a wide variety of fiber to the x scenarios, include active, centralized split, distributed split, business class services or cell backhaul.
- Only multiport service terminal to offer patch only, patch & splice, as well as optical component integration options.
- Providing up to 16 ports of feeder and drop cable connectivity, the SmarTerminal is optimized for use with FieldShield optical cable and microduct.
- Round in circumference at only 6 inches in diameter and 4.7 inches in height
- Easily mounted above or below-grade within a pedestal, flower pot or vault using its Snap-on Toggle Head or universal L-Bracket or Z-Bracket.



Environmentally Sealed Fiber Delivery Solution: **FieldShield Hardened Connectors:**

A field-installed, toolless housing slips over a FieldShield optical connector on the FieldShield assembly 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 handling 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.

Hardened pushable fiber drop cable systems integrated with the fiber-optimized, environmentally sealed FieldShield Multiport SmarTerminal enclosure brings fiber to your desired location in ways never seen before: faster, lighter and easier to deploy.



LC Connector with
Ruggedized Housing

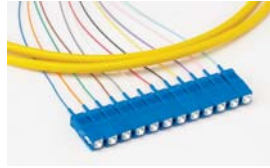


SC Connector with
Ruggedized Housing

: *Quality Second to None*
: **Clearfield Fiber Assemblies**



Indoor Jumpers



Distribution Assemblies



Hardened Fiber Optic Connectors (HFOC)

Clearfield's Fiber Deep cable assemblies **guarantees** .2dB or less insertion loss -- half that of the industry standard. Available on every singlemode patch cord and 12 fiber assembly deployed within the Clearview Cassette, Fiber Deep improves your fiber network's performance while reducing the cost of deployment. Clearfield offers cable assemblies for 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. Automated polishing processes ensure precise control of polish radius, apex offset and fiber undercut.



OSP Assemblies



Ruggedized Assemblies



Breakout Assemblies



Drop Node Assemblies



Turn-key Physical Protection: CraftSmart Optical Fiber Enclosures:

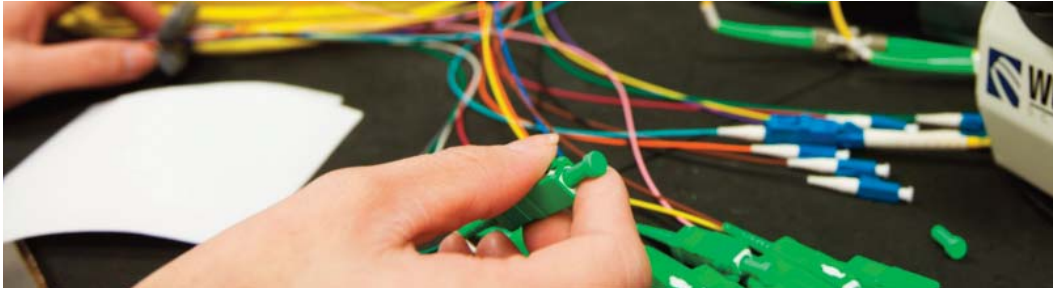


Rather than retrofitting legacy copper solutions in the field - which is expensive and time-consuming, the CraftSmart OSP environmental enclosure line reduces the cost of field deployment by providing complete hardware compatibility. CraftSmart Fiber Protection Pedestals (FPP) and CraftSmart Fiber Protection Vaults (FPV) are integrated solutions, optimized to support or house FieldSmart fiber management products at the last mile access point of the network in above or below-grade installations.



Go to ClearfieldConnection.com for information on CraftSmart Splice-on Connectors, Test Access Point (TAP) Boxes and other fiber protection devices.

- : *Custom Configured to Your Environment*
- : **WaveSmart Optical Components**



[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 optical component technologies for PON splitting, C/W division multiplexing and optical circulators. These products are custom built to your unique split ratios, light 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 within the Clearview Cassette. Clearfield provides modular optical components packaging within an LGX footprint as well as other space saving chassis enclosures.

[We specialize in the manufacturing, termination and packaging of optical components to custom-build configurations.](#) Our rapid turn-around time consistently beats the lead time quoted by our competitors for standard configuration. Clearfield design experts can consult with you on your optical component needs and specify a product line to solve your application requirements.

A wide range of optical component technologies are available, packaged as a terminated assembly, discrete device, within the Clearview Cassette as well as traditional LGX and other chassis styles.

Custom Configured to Your Environment: WaveSmart Optical Components:

Ruggedized Splitters

Clearfield's [FieldSmart 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.



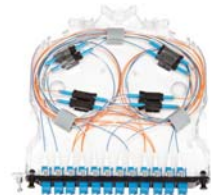
Circulators

The [Clearfield 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 in turn allows two of the same wavelength 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).



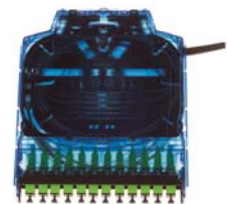
Inside Plant Splitters

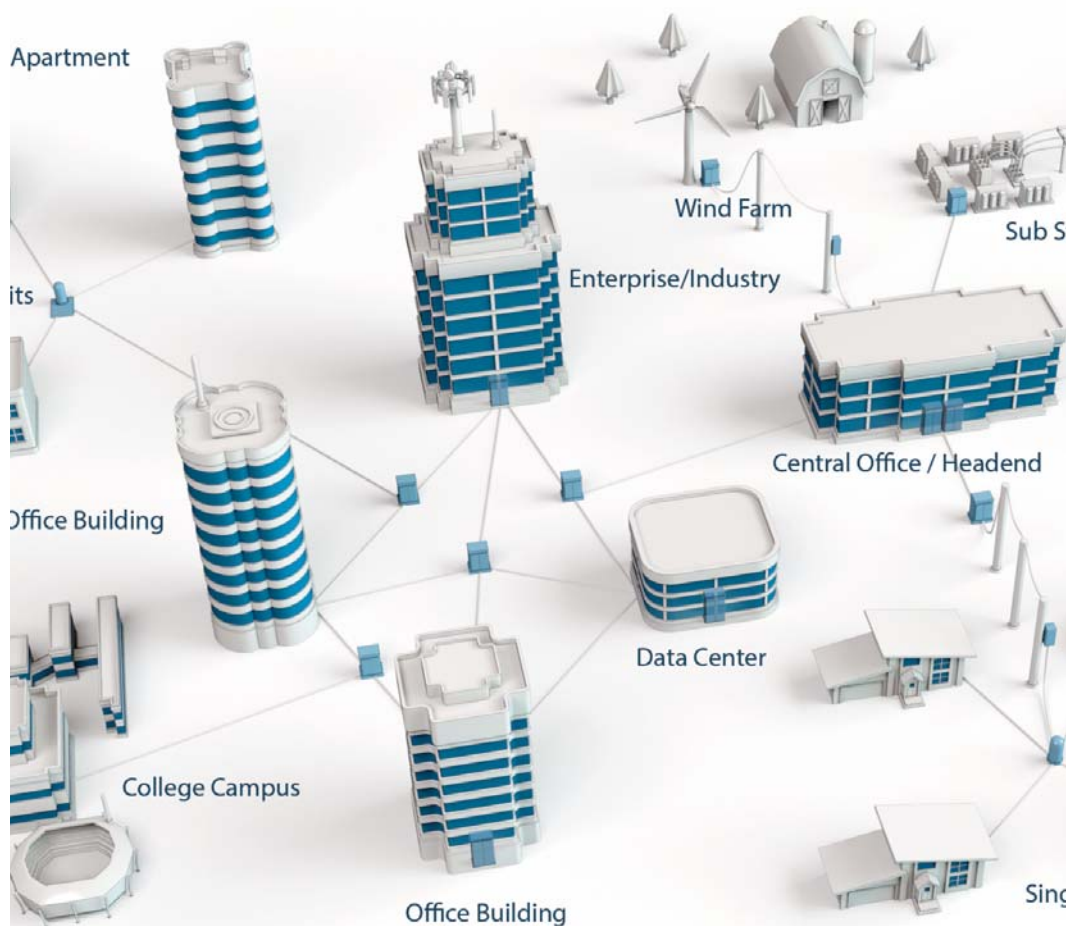
Clearfield provides [Planar Lightwave Circuit \(PLC\) and Fused Biconic Taper \(FBT\) Splitters](#) in a variety of optical component packages for the network and application needed, allowing carriers the ability to provide uniform, fully passive signal splitting to multiple premises.



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.





To learn how you can “**Make Fiber Work**”
for your network, visit us online at
www.ClearfieldConnection.com or call your local
Clearfield representative at 800-422-2537.



Looking to Reduce the Cost of Gigabit Broadband?
See Clearfield.

