



FieldShield YOURx Platform:

Offering Ultimate Flexibility and Choice in the
Last Mile

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When designing a fiber network, there is no “one size fits all” approach. There are a great many factors to take into consideration that will shape the physical characteristics of the build – and most will be dependent on what is deemed the top defining priority.

- *Is it first build cost?*
- *Is it long term cost (ease of restoration)?*
- *Is it environmental concerns?*
- *Configuration flexibility?*

The FieldShield YOURx Platform and associated drop cable choices address all of these considerations. Consistent with Clearfield’s design methodology, the FieldShield YOURx-Terminal is a building block that becomes a foundation of choices that will align first build initiatives across multiple network architectures being deployed in above or below grade environments.

When designing your next fiber build, you will have a lot of important decisions to make. What kind of terminals will I be using and what will the counts be in each terminal? What kind of drops will I use? Will I use duct, microduct or just direct bury to the home? The new YOURx product line will address virtually every scenario that may be required. There are three main components of the YOURx solution: the YOURx-Terminal, the appropriate drop cable for your application and the FieldShield YOURx-TAP. In this white paper, we are going to take a look at each piece of the solution and the various ways they can be configured to meet your project design needs.

The YOURx-Terminal



The various ways the YOURx-Terminal can be configured is almost limitless. From a 10,000 foot level, the product can be described as a hardened, 16 port dome closure device that can be configured to handle virtually any fiber distribution task. The terminal uses an ingenious MPO-fed module that can be set up to do virtually any number of tasks including Drop terminal, Drop and Express Terminals, and Splitter/WDM varieties. The terminal accepts several types of fiber as well as microduct and CIC (Cable-In-Conduit). In this paper, we are going to explain some of the ways in which the terminal can be used.

Terminal Configurations

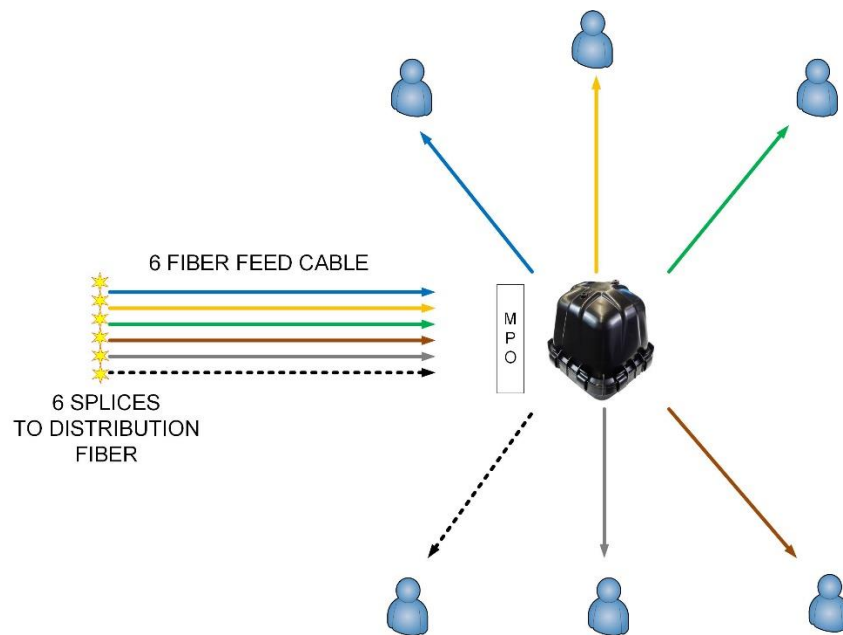
Let’s start off by discussing the simplest use for the YOURx-Terminal, which would be a **Drop Terminal** application (*Fig 1 example*). In this type of project, the terminal would be fed with up to 16 fibers and is optimized for MPO Feeder Cable connectivity into the module. The blunt end of the feeder cable assembly will be pulled back to a central splice point where it is spliced to the distribution fiber. Once the cable is pulled back to the central splice point, a pushable MPO connector is inserted into the YOURx-Terminal and the snap-on connector is installed and plugged into the MPO port in the module. Each of the fibers that enters the terminal is going to terminate to discrete single fiber connectors in the bottom section of the module inside the terminal. This is a patch field that we will use to attach the drop cables to the individual homes.

The MPO connectivity is helpful for a couple of reasons. Since the MPO feeder cable assembly is provided on a reel (separate from the terminal), the cable can be paid out using an A-frame or cable stand. In other product solutions, the feeder tail is hard spliced to the terminal. This makes paying the fiber tail out cumbersome because the cable needs to be pulled off the side of the fiber reel and the terminal head rotates with the cable reel, which can cause cable kinking and corkscrewing issues as it enters the duct. In the YOURx design, the blunt end of the MPO feeder pigtail assembly can be pulled directly off the top of the spool which prevents cork-screwing as it enters the microduct.

Another advantage of the MPO plug-and-play design is that each component in the system can be replaced individually. In other words, if the feeder cable assembly becomes damaged and the terminal is intact, the damaged feeder tail can be replaced and the intact terminal can be re-used. Conversely, if a port on the terminal is damaged and the feeder tail is intact, the feeder tail can remain in place and the terminal can be replaced with a new one. This cuts down on the labor and time needed to repair damaged items in the network.

The ability to terminate 16 drop cables in a single terminal gives fiber engineers the flexibility to scale from 2 to 16 fibers as needed. Typically, most terminals are configured to a maximum of eight drops to reduce the overall length of each drop. That being said, many times there may be a ninth home is a cul-de-sac or along a certain street. The flexibility to add a ninth, tenth or 11th port as needed, without adding a second terminal, will be an advantage.

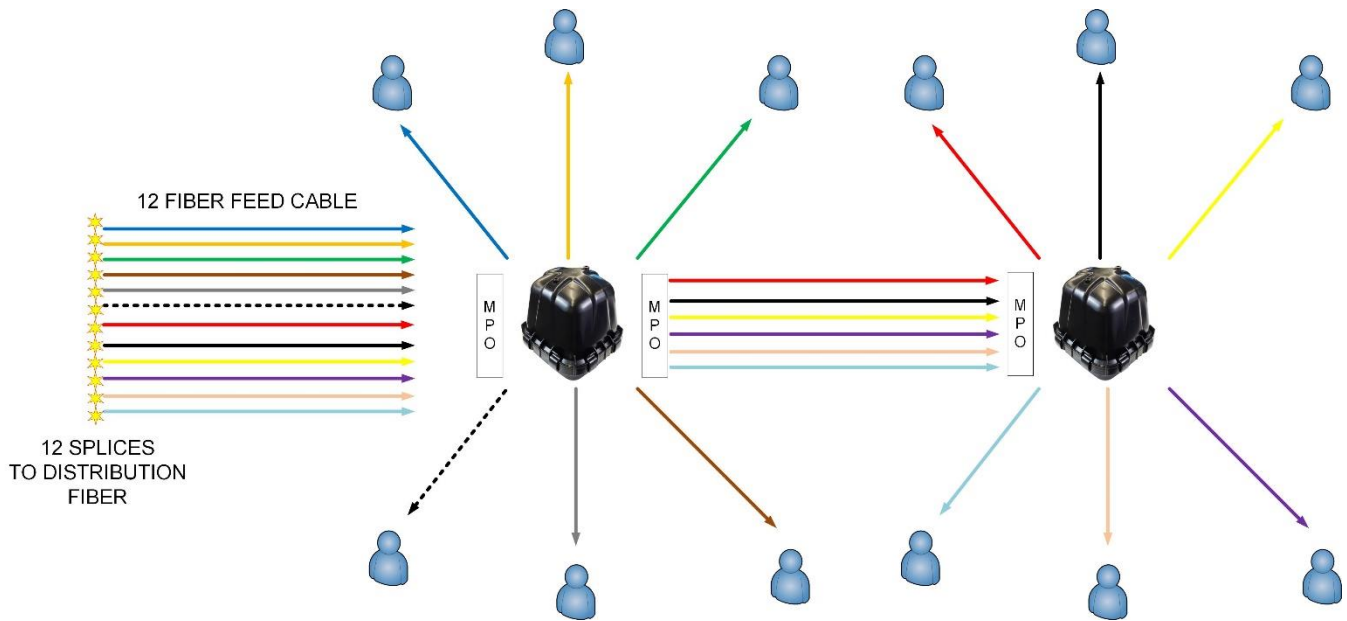
Fig. 1 Drop Terminal



Another option with the YOURx-Terminal is to configure it as a **Drop and Express Terminal** (Fig. 2 example). In these applications, the feeder tail or MPO cable assembly will enter the terminal, drop some fibers and express the unused fibers to a secondary terminal via an MPO to MPO pushable cable assembly. This reduces the number of cables that need to be pulled back to the central splice point and also reduces the size of the duct needed to a single 14/10mm microduct. The modules inside the terminal

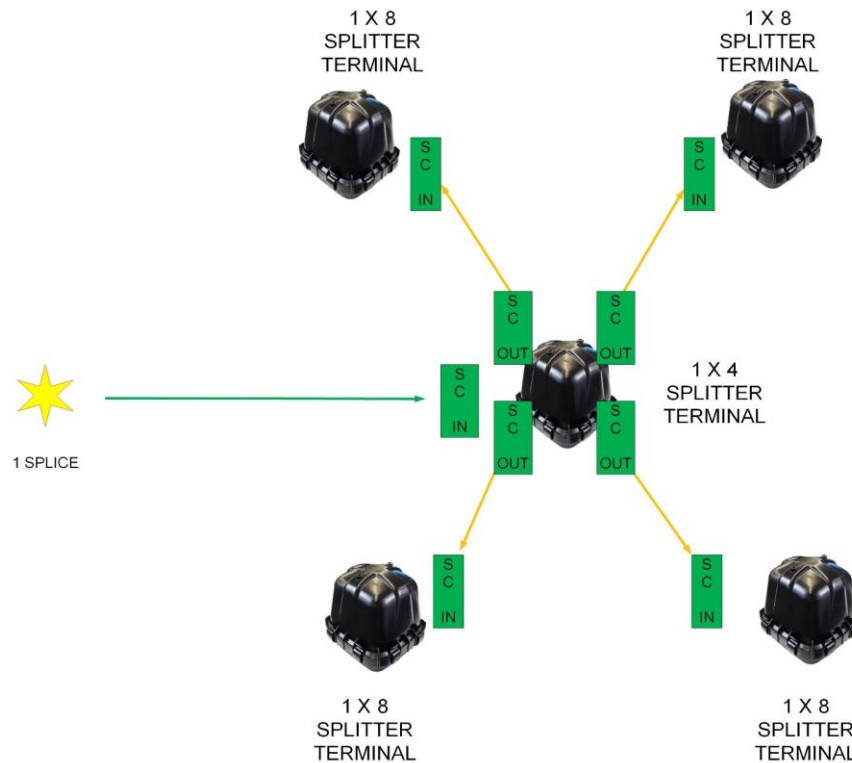
contains two feeder ports and 16 drop ports. This allows for an incoming MPO cable assembly to plug into the first feeder port in the module, drop the desired number of fibers (up to 16), and the remaining fibers will be shifted to the secondary feeder port and be fed to the next terminal in the series. Using low loss (.35 dB Max) MPO connectors and low loss SC/APC (.2 dB MAX), we can keep our loss budget at an acceptable level even with the inclusion of these extra mated pairs.

Fig. 2 DROP and EXPRESS TERMINAL



Splitter Terminals (fig. 3 example) are also an option if a distributed split architecture will be used. This type of design has been seeing a resurgence based on its reduced number of hard splices needed. The feeder tail in a typical distributed split model would be a discrete connector such as a SC/APC that would plug into the feeder port in the module. Inside the module would be housed an optical splitter with its output ports installed into the distribution ports in the module. We can now use single fiber cable assemblies such as an SC/APC to pushable SC/APC cable assembly to feed secondary splitters further out in the network. For example, we may have a 1:4 splitter in the primary position feeding four 1:8 splitters in a star topology. With 16 ports in the module, this opens up new possibilities such as a 1:2 feeding two 1:16 splitters. Also, if the split ratio needs to be changed at a future date, the module can be removed and we can add a different split ratio later on.

Fig. 3 DROP TERMINAL



Drop Cable Options

The YOURx-Terminal also provides a new level of flexibility because it allows you to use virtually any fiber drop method that is required. It uses a system of fittings in the bottom of the terminal base called the FieldShield FlexPort. This couple allows virtually any drop media to be installed into the terminal. Before the YOURx-Terminal, an engineer had to decide what type of drop cables they would be using in their network. In most projects, a “one size fits all” design is not practical. Microduct may be optimal for in-town applications, while an aerial or direct bury product is more ideal for rural areas. Now, an engineer can use the same terminal for both applications. The only thing that changes is the drop cable assembly.

The drop cable options include:

- Flat Drop (FieldShield Flat-SC)
- Cable-in-Conduit (FieldShield D-ROP)
- 10mm FieldShield Microduct with options for:
 - FieldShield StrongFiber
 - FieldShield FLEXdrop
 - FieldShield Pushable Fiber

An important aspect of the YOURx-Terminal is that it accepts Clearfield's flat drop cable called the **FieldShield Flat-SC**.

In certain situations such as rural, longer distance drops or in situations where a ducted solution is cost prohibitive, the flat drop cable is an economical solution. The FieldShield Flat-SC uses conventional flat drop cable with a fixture on the terminal end that mates with the FlexPort to provide a sealed solution. The cable assemblies can be provided as a double ended full plug-and-play solution or as a pigtail that can be cut to length and spliced at the home. Flat drop cable can be used in an aerial or direct bury application or even be used in conventional ducts.



In a CIC application, a conduit with a pre-installed cable is direct buried or used in a shared trench environment. The advantage of Clearfield's CIC solution, **FieldShield D-ROP (Restorable One Pass)**, is that it is a single pass solution.

If the project is using contract labor, the contractor will typically charge a certain price per foot to bury the duct and another price per foot to install the fiber into the duct. In a CIC application, the fiber is already installed into the duct thus eliminating the need for the added labor cost. Placement of the CIC will be very important to make sure that the conduit remains a viable pathway in case repairs are necessary. If the conduit becomes pinched or there are too many turns, the pathway will not be a re-usable pathway.



If microduct is going to be used, there will be several options for what type of fiber we can install into it. The preferred method would be **FieldShield StrongFiber**. Since the microduct itself will provide an extreme amount of physical protection, the need for a thick jacketed cable is eliminated. The smaller signature 900µm cable can be pulled from the home through the microduct and into the YOURx-Terminal. The pathway will be protected all the way from the YOURx-TAP on the side of the home, all way to the terminal. Used in conjunction with the YOURx-TAP, the FieldShield StrongFiber Deploy Reel will hold up to 300 feet of fiber.

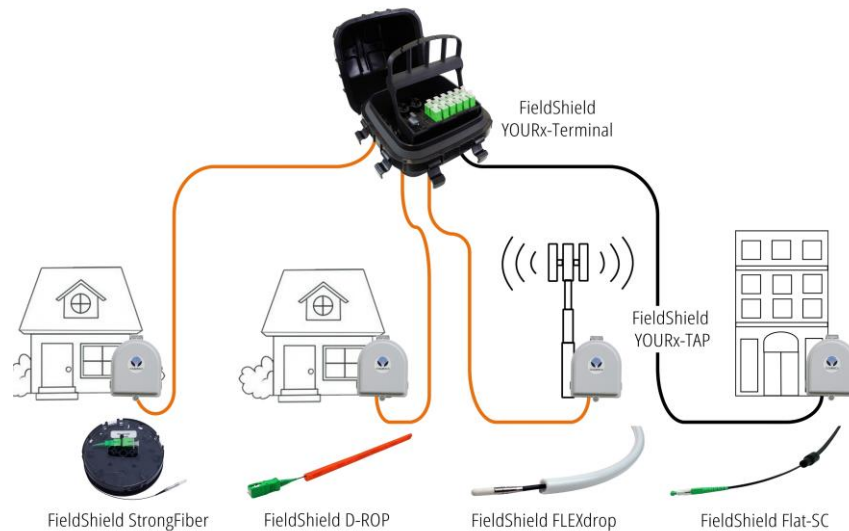


FieldShield FLEXdrop is another option if using a 10mm microduct solution. FieldShield FLEXdrop provides all the same characteristics as current 3mm pushable/pullable FieldShield Fiber, with increased flexibility and reduced jacket memory, providing better slack storage and routing while decreasing the risk of kinking. Cable can be routed, without protection of duct, into the inside premise through walls, stapled, and/or applied using local contractor accepted practices.



The YOURx-Terminal is also compatible with 10mm microduct and FieldShield Pushable Fiber that most are familiar with. 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.

YOURx-TAP



The last piece of the puzzle is the **FieldShield YOURx-TAP**. YOURx-TAP gives the network service provider both the ability to store slack fiber at the home as well as provide a test access point (TAP) for ease of deployment and network maintenance without having to have access to the interior of the customer premise. With the ability to accept a variety of drop cables, YOURx-TAP can be integrated into any network architecture and deployment.

Slack storage of excess fiber has always been an issue within network design and deployment. The FieldShield YOURx-TAP, with the smallest demarcation footprint in the industry, provides the ability to store up to 600 feet of slack fiber storage (300 feet per reel) using the FieldShield Deploy Reel with 900 μm FieldShield StrongFiber. This eliminates the need for having a large, bulky and unsightly box on the side of an SFU, MDU or business location, to store excess or unused fiber.

With its hinged cover design, YOURx-TAP is easily accessible for craft personnel to access the box during both initial service installation and ongoing maintenance. FieldShield Deploy Reels are easily installed into YOURx-TAP by simply snapping them onto the post bracket that is mounted inside the box. Each post bracket has a built-in feature that locks the Deploy Reel in place once the fiber has been pulled to the specified location.

Once mounted inside the box, the StrongFiber Deploy Reels are deployed by using a pull string to pull fiber from the first reel back through the 10mm FieldShield Duct and connect it to the distribution/access point. Bringing fiber to the inside of the customer location is accomplished by using the second reel and pulling it to the desired location. Either 900 μm StrongFiber (with a ducted pathway) or 3mm FLEXdrop fiber can be used for this internal application.

Summary

The YOURx-Terminal sets a new standard for flexibility in an FTTH build. The ability to configure the YOURx-Terminal for any topology, drop cable type of installation method makes this a product that will allow you to design the network the way YOU want to.