



**Why Let a Cat Have Your Network by the Tongue?**  
*FAOFC it!*

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Cat 5, Cat 6, Cat 7, Cat 8, Cat whatever! Why let a Cat dictate your cabling infrastructure when there is a future proof solution currently available? Why wouldn't you want to provide 100Mgb+ to your work areas or devices with ease and with virtually no distance limitations? I am starting to think that CCN in CCNA/E/P's stands for Certified Copper Network. There's a better way! PON, POL, POLAN, GPON, whatever terminology you prefer, is a no brainer. If you are planning the upgrade of your network, put the Cat out...of the back bone and the horizontal distribution. Copper Cat cables should be nothing more than a jumper from your Optical Network Terminal/Unit (ONT/U) to a device. Clearfield's family of products and the NEC's new category "Field Assembled Optical Fiber Cable" (FAOFC) make it simpler than ever.

POLAN has so many advantages over a traditional Ethernet LAN that most people are skeptical that it is true - yet it is. Advantages:

- Space savings of up to 80%
- Installation cost savings of 40 to 50%
- Reduced power consumption as much as 60%
- Greater inherent security (no EMI and difficulty to tap)
- Virtually no optical fiber cabling distance limitations
- No cooling or ventilation in TR/TE (passive)
- Five 9's of uptime or six 9's if protected

Despite what you may have been told, a PON supports the same applications as traditional switch-based LANs:

- End-to-end IEEE 802.3 ethernet interfaces for voice, data, video, Wi-Fi and security
- Up to 1000 megabits per second 10/100/1000BASE-T) bandwidth per user/device PoE
- Advanced quality of service (QoS) to prioritize traffic and deliver virtual LAN (VLAN) support

Why do I care about POL and what is FAOFC? It's my mission to educate the industry about Clearfield and how we have made deploying PON architectures simple and cost effective. Clearfield's game changing FieldShield Pushable Optical Fiber, StrongFiber and Microduct, paired with our Plug-n-Play concept, allow you to consolidate all splicing at your fiber meet me point. Clearfield's factory terminated, pushable connectors easily come together from point to point through our cassettes and fiber termination products. Clearfield's Labor Lite technologies reduce your engineering time by using FieldShield StrongFiber on the Deploy Reel or FieldShield Pushable Optical Fiber Cable with Pushable Connectors to provide tremendous flexibility when deploying to the work area, zone or device. Clearfield's FieldShield Pushable Optical Fiber and Microduct, paired with our family of distribution panels, wall boxes, and cabinets gives an ICT designer scalability, flexibility, security and easy implementation of a Passive optical network (PON) architecture.

#### ***Industries That Would Benefit From a PON:***

- Hotels •Dormitories •Hospitals •Sports venues •Conference centers •Cruise Ships •RV Parks •Campus buildings
- Office Buildings •Anywhere a consumer desires blazing hot bandwidth

#### ***A Traditional Deployment***

Remember that PON supports VoIP phones, IPTV, wireless access points and wired connections. When deploying in these scenarios using traditional BICSI best practices, there must be at least one Telecom Room (TR) located on the same floor of the work area outlets it serves. Every TR should be cabled via backbone cabling to a main cross-connect in the main equipment room. Each work area outlet should be cabled via horizontal cabling to a

horizontal cross-connect in the TR. No more than one consolidation point can exist within the horizontal cabling system. A minimum of two telecommunications outlets are required per work area. Application-specific devices, such as ONTs, must be external to the wall outlet.

### ***The PON Difference***

Keeping all that in mind, when you deploy PON you reduce the size of your TR, even eliminate the TR to a Telecom Enclosure (TE). The optical splitter can be housed in that TE in Clearfield's FieldSmart Fiber Delivery Point or ZoneBox. The ONT, depending on what flavor you purchase, can have multiple telecom outlets including PoE ports. In a PON topology you will need 1 single mode fiber per splitter for a 1:32 ratio. If your choice is to offer redundancy to protect that splitter, you can opt to deploy 2 single mode fibers (one is a back-up in case of damage) for a 2:32 splitter. Of course you can choose to split in 1:4, 1:8 or 1:16 ratios depending on the bandwidth requirements of the end user. All this is flexible and depends on the scale of the build. Considering there are virtually no length limitations, the splitters can be located in the main equipment room or pushed out to a zone distribution. In this, Cat cables can't compete.

Clearfield's family of products give an ICT designer freedom to easily deliver fiber at the device, work area, zone, horizontal floor distribution point and back bone. Begin by installing FieldShield Microduct and then only deploy Pushable Optical Fiber or StrongFiber when service is requested. Let me say that again! With Clearfield's FieldShield Microduct you establish a pathway to your work area or device but you do not have to populate that pathway until service is needed. That means no ladders, no crawling in confined spaces, no opening and closing of fire stop and/or pulling floor/ceiling tiles. Just simply push/pull FieldShield Pushable Optical Fiber and StrongFiber thru the microduct from or to your horizontal distribution point. When you need additional fiber in the backbone, 1 technician can quickly and easily install FieldShield Pushable Optical Fiber to connect the main distribution area to the desired floor distribution point via the established Microduct pathway. All this with no splicing using Clearfield's FieldShield Pushable Connectors.

### ***The Impact of FAOFC / FieldShield***

Clearfield's FieldShield Pushable Connectors factory terminated and polished SC, DXLC, and MPO connectors are designed to be terminated on simplex, duplex, MPO-12, and MPO-24 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, DXLC, MPO-12, and MPO-24 FieldShield Pushable Connector styles can be pushed/pulled through FieldShield Microduct.

Clearfield's FieldShield Microduct radically changes the way an ICT designer lays out a fiber cable pathway. The NEC created "Field Assembled Optical Fiber Cable" (FAOFC) - a new category defined in Article 770.2.

**NEC 2014 New Category of Optical Fiber Cable**  
**"Article 770.2 Definitions – Optical Fiber Cable"**  
**Field-Assembled Optical Fiber Cable**

*"An assembly of one or more optical fibers within a jacket. The jacket, without optical fibers, is installed in a manner similar to conduit or raceway. Once the jacket is installed, the optical fibers are inserted into the jacket, completing the cable assembly."*

Jacket = Microduct

Optical Fibers = Pushable Optical Fibers

The impact of FAOFC comes in that you no longer need to transition the fiber at the entrance facility. There is no more need for cable racking, b-line raceways, trough, RMC, IMC, PVC, or EMT to distribute optical fiber cabling throughout a facility, be it an office complex, data center, hospital, and campus. NEC 2014 Article 770.179(F).1 allows for the testing of the combination of the jacket (microduct) and optical fiber (micro fiber). Clearfield's OFNR and OFNP Microduct can be seamlessly transitioned with a coupler, connecting FieldShield Aerial or Buried Microduct to OFNR or OFNP Microduct and the FieldShield Pushable Optical Fiber and installed in a continuous run from your carrier's demarcation point (manhole/pole) or your facility's main distribution room to anywhere in the building as a standalone pathway. Depending on how your access provider hands off your service, you may only need 1 splice point in the entire facility, if that! FieldShield Pushable Optical Fiber via Microduct can be push/pulled by hand 300 to 1000 feet, no blowing equipment or jetting equipment required - only the installer's hands!

**“770.179(F) Field-Assembled Optical Fiber Cable”**

Field-assembled optical fibers shall comply with 770.179(F)(1) through (4)

- (1) The specific combination of jacket and optical fibers intended to be installed as a field-assembled optical fiber cable shall be listed in accordance with 770.179(A), (B), or (D) and shall be marked in accordance with Table 770.179.
- (2) The jacket of a field-assembled optical fiber cable shall have a surface marking indicating the specific optical fibers with which it is listed for use.
- (3) The optical fibers shall have a permanent marking, such as marker tape, indicating the jacket with which they are listed for use.
- (4) The jacket without fibers shall meet the listing requirements for communications raceways in 800.182(A), (B) or (C) in accordance with the cable marking.

Who needs Field Assembled Optical Fiber Cables (FAOFC)? - data centers, hotels, dormitories, hospitals, sports venues, conference centers, cruise ships, RV parks, campus buildings, office buildings...essentially anywhere that needs distributed fiber. Imagine a fiber pathway system that, from one easily accessible point, a data center or maintenance technician, not a splicer, can deliver 1, 2, 6, 12, 24 connectorized fibers as service is needed. No longer do you need to pre-build high count fiber routes in anticipation of growth. You can now truly align your capital spend with revenue growth as service and MAC requests roll in.