Taking Fiber to the Living Unit – Invisibly

Cost-effectively connecting fiber to in-room ONTs requires overcoming concerns about aesthetics, speed of installation, cost and flexibility.

By Kathleen Terryll / *TE Connectivity*

Optical fiber continues to gain popularity as the best broadband medium for future-proofing against higher and faster capacity requirements by end users. In fact, many market analysts and consulting groups have concluded that the existence of optical connectivity in multiple-dwelling-unit properties (MDUs), office buildings and even single-family homes increases property value. Although the telecommunications industry was quick to figure out new solutions to take fiber into office buildings and living units, it also identified a host of inefficiencies and concerns along the way.

As the old English proverb says, "Necessity is the mother of invention." Therefore, new innovations have cleared the way for optical fiber to reach end users at every desk and work station. These innovations include new feature-rich fiber distribution hubs (FDHs), fiber distribution terminals (FDTs), optical network terminals (ONTs) and other components designed specifically for indoor use. These designs are small and compact to accommodate tighter, less conspicuous spaces within MDUs and other buildings. Incorporating spooling technology within these indoor units, such as TE Connectivity's RapidReel fiber cable spool, allows installers to simply pay out the exact amount of fiber required; any excess remains on the reel.

Reduced-bend-radius fiber has played a tremendous role in making many indoor solutions simpler to implement between floors and units. Plug-and-play connectivity continues to improve flexibility and reduce installation times for deploying fiber in MDUs and large office complexes. Most of these innovations are the result of installation experience and of owner feedback falling on the listening ears of equipment manufacturers.

Some of the greatest challenges involve installing fiber in rooms and living areas in both greenfield and brownfield deployments. There are several new design and installation technologies for completing the final leg of optical fiber to end users that address the ongoing installation concerns of faster, smaller, simpler, less-disruptive and aesthetically pleasing solutions demanded by installers, building owners and residents.

INVISIBLE FIBER

A new technique has been developed for "invisibly" getting fiber from the faceplate, or the point at which fiber enters the living unit, to the final termination point of the indoor ONT. Known as thermal adhesive coated (TAC) fiber, this installation system enables fast, flexible, discreet deployment of fiber optic cable in indoor environments. A single installer uses a lightweight, portable, handheld tool to quickly and easily route the transparent 900-micron fiber around baseboards, windows and trim work. The fiber microcable passes through the tip of the handheld device, which is heated. The heat slightly melts the adhesive coating on the

Technician installing TAC fiber at job site

TAC fiber being installed on trim work

TAC fiber being installed on brick

TAC fiber being installed on marble

outer portion of the fiber cable. This allows the fiber to bond continuously to the surface area as it is applied.

The fact that the fiber cable itself readily bonds to common surface types in any indoor environment eliminates the need for unsightly, messy caulking, staples or brackets. The system employs reduced-bend-radius fiber that has minimal attenuation loss from tight bends and handling. Because clamps are not needed to hold the fiber in place, damage to the interior glass fiber is prevented.

This new in-room fiber installation system tackles the major concerns of both property owners and installers. First, to address the fact that property owners and their tenants are growing less tolerant of visible broadband cables in living spaces, this technology deploys fiber that is nearly invisible to the eye. The system is far less disruptive to tenants and homeowners as it requires only one technician and can be completed quickly and easily. This also makes the entire installation less costly.

In MDU and multi-office environments, the same tool and cabling can be used for multiple rooms and areas within the building. The microcable is compatible with most field-installable connectors or can be fusion spliced into a network. The handheld device, which is cordless and portable, travels anywhere and requires no electrical power.

MDU-APPROVED

The TAC fiber system constitutes the final leg of an end-to-end optical fiber deployment solution for MDU structures. Even though MDU architectures differ – and high-rise apartment buildings, garden-style condominiums and business offices with multiple workstations all present unique challenges – a flexible solution can still bring the benefits of lower cost, faster installation, and less disruption and can be aesthetically pleasing.

In greenfield MDU deployments, many of these challenges can be considered during construction. For instance, fiber can be hidden behind walls, much as electrical and plumbing components are. However, techniques such as employing fiber spooling to get from floor to floor still provide additional benefits. Plug-and-play connectorization also saves considerable installation time, reduces expensive splicing and requires less highly skilled labor. The faster installers can get in and out of the building, the faster owners can rent units and begin generating a return on their investment.

In brownfield deployments, however, the benefits of a truly agile MDU fiber deployment system are realized. Existing MDU structures challenge installers to maintain aesthetics, reduce the disruption caused by ripping out and replacing infrastructure and complete installations in minimal time. This is where network builders

The benefits of using TAC fiber are greatest in brownfield MDU applications.

> Someday, consumers may purchase DIY fiber kits to connect their own ONTs to wall plates.

should consider many of the new indoor deployment solutions.

It is estimated that more than one-third of U.S. households are located in shared MDU structures, so this is a significant market focus for broadband service providers. Therefore, any system that can be installed quickly throughout an MDU minimizes the impact on any number of tenant families.

FIBER TO THE ROOM

Years ago, an optical vendor used a slogan promoting optical fiber as the medium of choice in every living unit, predicting that one day we would all experience "fiber to the fridge."

Needless to say, this forecast generated ample skepticism and even outright criticism. Today, fiber inside the home or work space is a reality that is rapidly gaining momentum. It's not hard to imagine consumers heading to the hardware store to purchase do-it-yourself fiber kits to connect their own ONTs to wall plates.

In short, taking optical fiber into homes is now faster, easier and more consumer friendly than ever before. The fiber enters an indoor FDH from which it is distributed to FDTs throughout the building and then terminated to a faceplate at each residence. Built-in fiber spooling technology in each of

these components allows them to be preplaced and the fiber simply pulled back to the closest FDT or to the FDH.

All connections can be simply made using plug-and-play technology to connect everything. Once all that fiber is in place, the final fiber run can be made nearly invisibly with TAC fiber along the room walls to the termination point at the indoor ONT. Of course, there are walls, floors and other construction to pass through, but today's solutions for taking fiber to the room are easier, faster and more flexible than ever before. ❖

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