

Cleaning Up the FTTH Neighborhood

Corning shows the way for downsizing pedestals to enhance curb appeal

By C. Mark Turner ■ *Corning Cable Systems*

Existing telecom infrastructure – the overhead lines, cross-connect cabinets and pedestals used to provide fiber-to-the-home (FTTH) services to residential subscribers – often clutters neighborhoods. Placing optical fiber cable to each home underground is a great start toward minimizing that clutter and enhancing curb appeal.

Now developers can go further, by using smaller connection hardware, without sacrificing network capacity. FTTH innovation in local convergence point (LCP) cabinet technology now makes this critical element easier to accommodate, as shown in Figure 1. These cabinets are the heart of any centralized split, passive optical network (PON). In addition to alleviating the frequently expressed not-in-my-yard complaints over large telecom lawn furniture, the smaller cabinets can be cheaper.

Big HDTV via Reduced-Size LCP

In many communications technologies, reducing size involves an inevitable tradeoff in order to achieve the desired gain. For example, smaller phones generally have smaller buttons. With wireless telephone innovation, you can now receive video on the go, but the small screen and poor resolution may make you yearn for your full-size, flat-screen HDTV. The reduced-size LCP cabinet's innards, shown in Figure 2, are an exception due to key advances in single-mode fiber technology along with common and intuitive design features.

It is easy to see that its use of space and common footprint size results in har-



Figure 1 - Reduced-size local convergence point cabinet (right), full-size LCP (left).



Figure 2 – Inside the reduced-size local convergence point cabinet - 144, 288, 432 (left to right) home capacities.

mony with many neighborhoods. The cabinet still functions like its reliable, full-size predecessor with the following, labor-saving features: Factory pre-terminated feeder and distribution ports, factory pre-terminated splitter modules, a parking dock for standby splitter output

leads, routing instructions and intuitive splitter output lead management.

Reduced-Size Splitter Module

Standardized (ITU-T G.652.D), bend-optimized single-mode fiber is the key technological innovation that

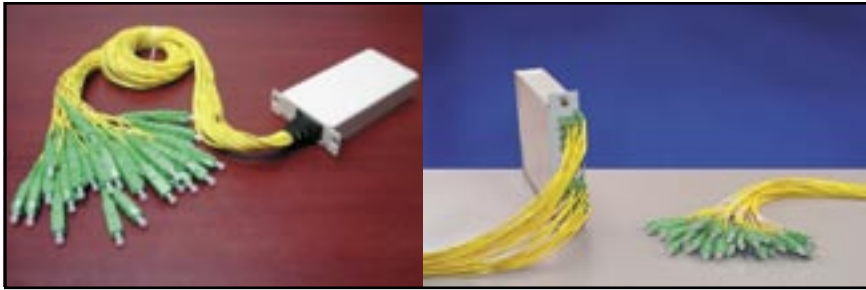


Figure 3 – Reduced-size splitter module (left) and full-size module (right).

enables the pre-terminated splitter module, shown in Figure 3, to be reduced by about 80 percent without any change in its reliable optical performance.

The reduced-size module is now available in the popular 1x32 configuration that reduces the equipment cost to connect subscribers. It is available in the 1x16 configuration for extended reach while also offering more customer bandwidth (fewer homes share the bandwidth of the common fiber back to the central office). Both of these module configurations feature the same small housing, with either a single 1x32 or two 1x16 splitters having standard-length pigtail outputs that have been pre-terminated at the factory with SC APC connectors and identified with intuitive labeling.

There is no sacrifice in PON bandwidth or line capacity by using the reduced-size module. Just like its full-size predecessor, all three reduced-size LCP cabinets support their specified maximum number of residential network interface devices using a 1x32 or 1x16 split ratio, or a combination of both. This flexibility allows the service provider to quickly scale the PON bandwidth in order to optimize the cost of the active equipment in the central office.

Lower Construction Cost

In addition to enhancing curb appeal, the smaller cabinet adds bottom-line value to the network operator. A significant amount of once-overlooked FTTH deployment cost, associated with LCP shipping, storage, installation, and public rights-of-way permits, is now being eliminated. For example, freight charges, based on weight and size, for the reduced-size 432-fiber LCP cabinet are about 22 percent less than its function-

ally equivalent, full-size predecessor, and the storage cost is about 21 percent less.

Additionally, the reduced-size LCP can save up to 40 percent during installation because of its small and efficient footprint, which reduces both labor cost and the capital cost for installation equipment. A standard pickup truck, as opposed to a more costly truck equipped with a hydraulic lifting system, can transport the cabinet from the warehouse to the field. Then two people can easily install the cabinet, without needing a boom truck to lift and place it.

A key requirement for the reduced-size LCP cabinet was that there would be no change in the simplicity and speed of working inside the cabinet, which could affect technician productivity. In order

to meet this design requirement, sophisticated simulation software was used to extensively model a wide range of installation technicians and worker positioning. Working space, posture, reach and vision are all key parameters that impact the ability of a technician to connect subscribers, to clean connectors, or to re-route splitter leads and add splitter modules. This modeling influenced the final dimensions of the cabinet.

Relaxing the Tension of the Opposites

In summation, all FTTH stakeholders receive what they want. The network operator gets a comparably priced asset that can serve the same number of customers as its full-sized counterpart. The operator also realizes a substantial cost savings related to cabinet installation, up to \$800 each. The residential subscriber gets more choice and value via an almost invisible FTTH network that delivers time-sensitive voice, bandwidth-intensive video and ultra high-speed and reliable Internet connections. **BBP**

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