



## **Increasing Productivity & Minimizing Risk**

By Steve Killius and Dale Budenski

The careful selection of electrical infrastructure products has the potential to greatly improve productivity – not only for electrical trades, but for the entire project timeline – because an efficiently designed and implemented electrical infrastructure can affect other trades and the overall project.

Economic pressures, high labor costs, and compressed schedules have continued to mount on electrical contractors. In response to these pressures, contractors need improved means and methods to complete projects on-time and on-budget.

### **Products that contribute to higher productivity**

Electrical infrastructure products and systems, from the Main Switch Board to the Sub Panels to the point of use, that have productivity “designed in” can help address issues like schedule acceleration, new project delivery methods, a shortage of skilled craftspeople that results in a decline in productivity, and better coordination of trades. Although these products have the greatest positive impact on the electrical contractor (and also data/com and A/V), they also have the potential to make other trades more productive by streamlining the installation process and stages from rough-in to trim out.

Examples include:

- Prewired surface raceway
- MC cable
- Modular wiring systems
- Welded wire cable tray and pre-assembled pathway supports
- Commercial dimmers
- Plug-and-play wiring devices
- Pre-fabricated wiring systems
- Integrated systems that can include lighting and plug-load control, power monitoring, load shedding and transient voltage surge protection.

## Prewired raceway

Prewired surface raceway differs from conventional “component” surface raceway in that much of the time-consuming work is done at the factory, not on the job site. Whole raceway sections are manufactured to job specifications, complete with electrical wiring, receptacles and detailed shop drawings. Packaged to reduce jobsite handling, bases and covers arrive on the job in specified lengths, with all circuits and devices installed exactly as shown on the drawings. There is no on-site cutting of base or cover sections. Electricians simply mount the sections, connect the pre roughed-in circuits, and put the cover in place. (Figure 1) Multiple channels can also be provided for data/com, A/V and other low voltage systems which is installed at the same time by the same craftsman with the same supporting means. Time studies and field experience demonstrate that prewired raceway installs in about one-third the time required for component raceway. Contractors also report that supervisory time is sharply reduced when installing prewired raceway.



**Figure 1**

For even faster installation of prewired raceway, contractors can also choose prewired connectors. Each prewired connector takes less than five seconds to install versus as much as three minutes to manually strip wires and attach twist-on wire connectors. (see Figure 2) Prewired connectors are particularly well suited for large, repetitive installations, such as hotels, classrooms, laboratories, dormitories, and healthcare facilities.

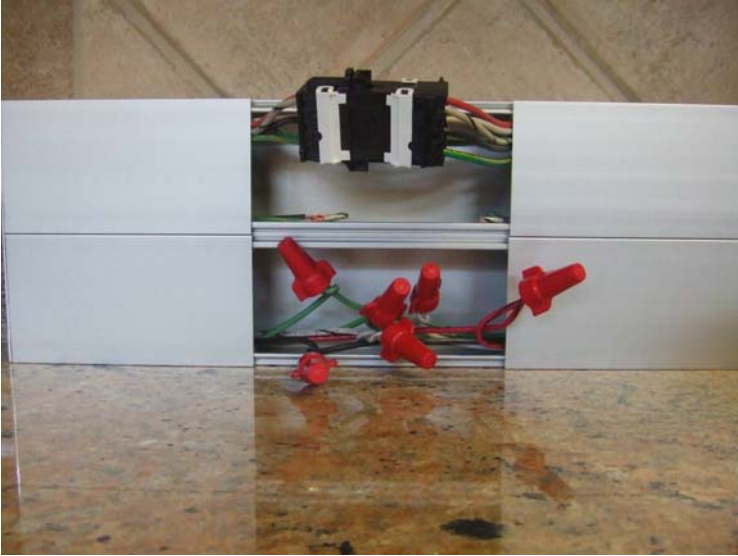


Figure 2

## MC Cable

The use of metal-clad cable for branch circuits has doubled in the past decade because it helps achieve faster job completions at a lower cost. When used in branch wiring, MC allows for unlimited bends without the use of a pull box, extreme flexibility when maneuvering around obstacles and uses fewer parts and pieces. By using MC cable as opposed to “pipe and box” an electrical contractor can lower the associated labor risk, and reduce installation time as well as cost. Today, Electrical contractors are seeing the value in converting to feeder and intermediate size MC cable for multiple applications and are experiencing the competitive advantage that goes to those who convert first.

## Modular wiring

Modular wiring systems combines improved flexibility with easier plug and play installation for both lighting and power. (Figure 3) Faster and more efficient than hard-wiring, modular wiring typically consists of stranded MC cables, configurable cable connectors, large-capacity distribution boxes, and home run cables. Modular wiring distribution boxes can be factory wired or shipped to the contractor for field wiring.

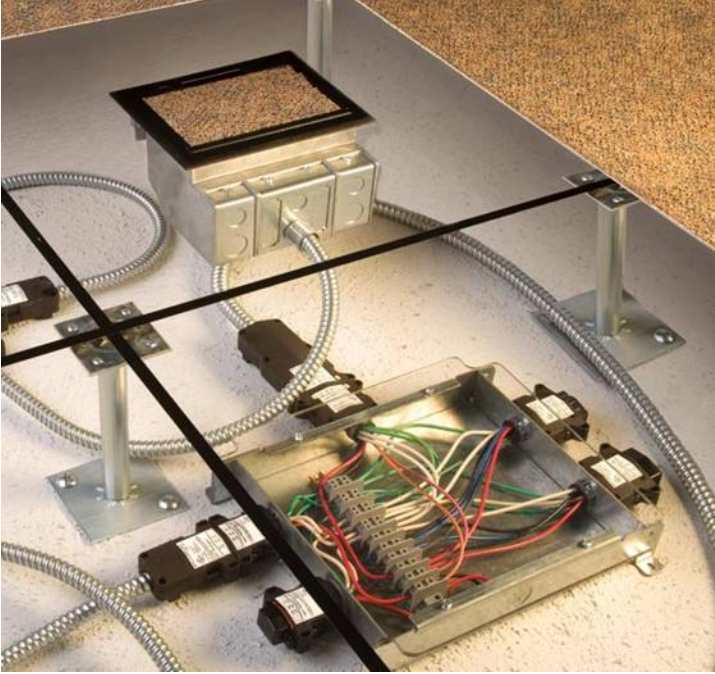


Figure 3

## Wire mesh tray

Many contractors have found that wire mesh tray combined with MC cable is a reliable and cost-effective alternative to conduit. Wire mesh tray adapts to the most complex configurations, and its structure gives maximum strength for minimum weight. The ease of creating fittings, carried out on site, as well as the wide range of unique and universal accessories gives complete freedom in routing combined with exceptionally fast installation. (Figure 4)

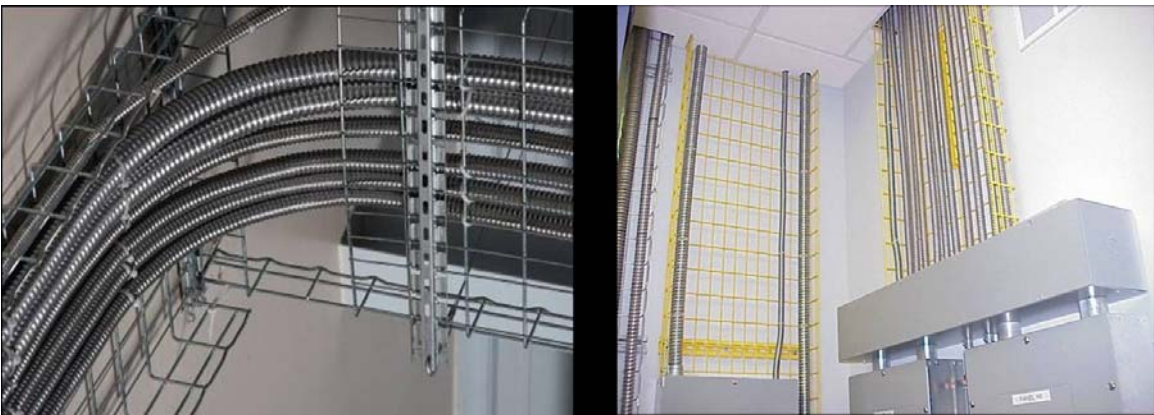


Figure 4

Productivity benefits extend beyond the tray itself. Support systems for wire mesh tray have been engineered for fast, secure installation with no screws, bolts or special tools. These support systems offer significant productivity benefits where the wiring project is substantial or repetitive, such as hospitals, condominiums, office buildings and hotels.

## Commercial Dimmers

Ganging conventional commercial dimmers used to require an expensive custom wall plate that couldn't be ordered until a configuration was final – a plate that usually took weeks to arrive. Not with P&S Titan Dimmers. Each comes with all the screwless wall plate components necessary for installing the dimmer in either a single- or multi-gang configuration. That means you can quickly and easily assemble a custom wall plate – to any configuration, on the spot, at no extra cost.



## Plug and Play

Plug and Play receptacles and switches offer labor-saving benefits compared to the repetitive and time consuming process of making pigtails and manually terminating the device. These units simplify device installation at rough-in as all taps can be completed when wire is pulled which makes trim out a snap. At rough in / wire pulling, Instead of making pigtails, simply connect the pre-stripped



connector leads. During device installation, electricians simply plug the connector into the device. (Figure 5) There is no preparing, stripping, or looping the conductors; no taping of terminals; and no mistakes resulting in rework or callbacks. The installation is three times faster than conventional device installation — saving the most time at the end of the project when deadlines are tight. With no exposed terminals, circuits can be powered up and tested at any time once the connectors are installed.



**Figure 5**

This same labor-saving technology has also been applied to switches. Simply connect the pre-stripped connector leads. At device installation just click in the connector and tighten the mounting screws. It takes less than a minute – three times faster than a conventional device.

### **Prefabricated wiring systems**

Prefabricated wiring systems take the productivity benefits of pre-wired devices one step further – offering complete assemblies that speed up installations with multiple switch and outlet combinations. Much of the electrical assembly is completed in advance, dramatically cutting project completion times and saving a minimum of 50% in labor costs. Units typically include quick-install brackets, boxes, tile rings and devices that are pre-wired to pre-cut and installed MC cable. (Figure 6) Prefabricated assemblies are well-suited for substantial or repetitive wiring projects in hospitals, condominium complexes, office buildings, or hotels.

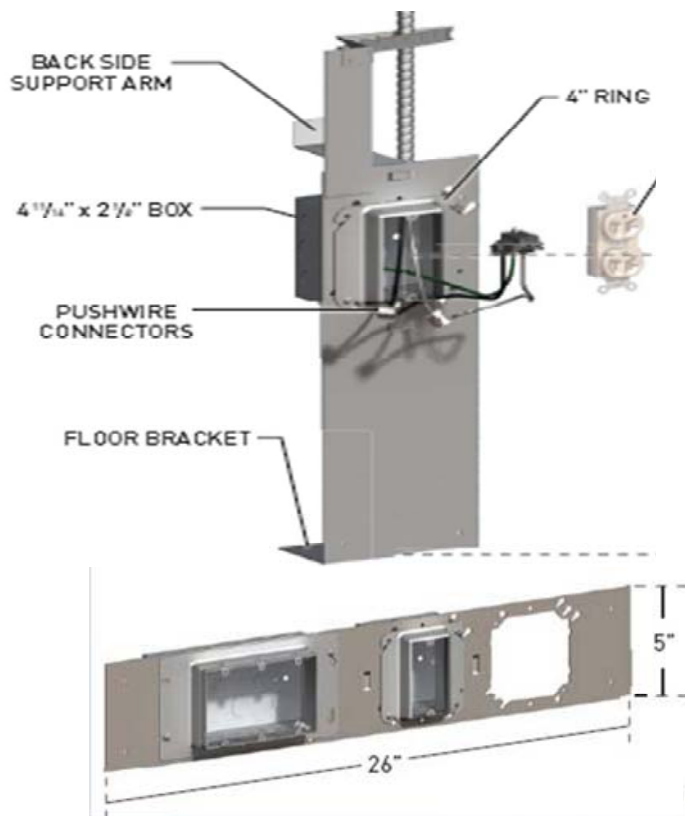


Figure 6

## Integrated energy management

Even seemingly complex systems, such as building energy management can be installed more productively if they are based on modular components. In these systems, a modular power infrastructure is combined with energy control and management hardware and software. All components are linked by low voltage cabling so that each relay dimmer and power module controls and monitors energy usage. The result is a system that can simultaneously execute multiple energy management strategies. For example, when someone enters a conference room, the occupancy sensor triggers daylight harvesting sensors to adjust the lights, turns on plug loads, and changes the thermostat set points.

## Conclusions

The use of products and systems that have “designed in” productivity offer numerous benefits throughout the life of a building project.

- Reduce design time. Products and integrated systems offer time savings in the design, assembly and installation of the electrical infrastructure as a whole, which is the most labor-intensive portion of a commercial electrical installation.

- Address labor skill issues: simplify the installation, which means that less-skilled labor can install the job correctly. This results in fewer errors and less rework.
- Improve project timelines: products reduce the time required for installation, both individually and as an integrated solution. In commercial applications with repeating floors and rooms a contractor may eliminate up to 50% of the installation labor for feeder and branch circuits. Labor savings equal cost-savings, which improves contractor profitability.
- Overall costs are reduced and profitability is improved.

In and of themselves, laborsaving products do not necessarily improve jobsite productivity, reduce risk and cost, improve timelines, or increase profitability. It requires partnering and collaboration with suppliers who can integrate innovative products and newer best practices to impact the project's overall installed cost and timelines.

As other system and building product suppliers – and the contractors and subcontractors they serve begin to do the same, additional productivity can result from everyone working together more closely. For example, erectors, plumbing and mechanical / HVAC contractors, and others are using pre-assembly and pre-fabrication of systems and sub-systems to speed installation, reduce coordination issues, eliminate errors and avoid risk.

# # #

*Steve Killius is Vice President, Contractor Resource Group for the Electrical Wiring Systems Division of Legrand North America. The EWS Division consists of Legrand/Cablofil, Legrand/Pass & Seymour, and Legrand/Wiremold.*

*Dale Budenski is a Contractor Productivity Consultant for the Contractor Resource Group, Legrand North America*