

Keep Those Cables Under Control

By Mike Edwards

Cable management is critical to the performance of the network and should be part of every system design. This applies to all areas of the network, including cables that are supported by ladder racks. Consider situations where vertical supports are added to both sides of the ladder rack to allow layers of cable. The resulting degradation of the cable performance, as it is pulled tightly over the sharp edge of a ladder stringer, can be significant. The same is true of cable that passes over a ladder rung that supports all of the weight from multiple cable layers above. The point is, though often overlooked, cables supported by ladder rack are a large part of the cabling infrastructure, and should conform to relevant standards for cable management.

A review of the standards indicates three primary areas of concern:

1. Bend Radius Control

- TIA/EIA-568-B

"The minimum bend radius, under no load conditions, for 4-pair unshielded twisted pair (UTP) cable shall be four times the cable diameter." This equates to 1.0" minimum bend radius for Category 6 cable.

- TIA/EIA-569-A

"Care should be exercised not to exceed the specified

bend radii of the cables."

- NEMA Standards Publication VE 2-2001

"The drop-outs and drop-out bushings provide a smooth surface to protect the cable insulation as it exits the cable tray."

Typical installations will have cables transitioning over the stringer of the ladder rack or between the rungs. In both scenarios, neither the edges of the stringer nor the rung conform to bend radius requirements of the standards. To insure full compliance, some type of "waterfall" product should be used.

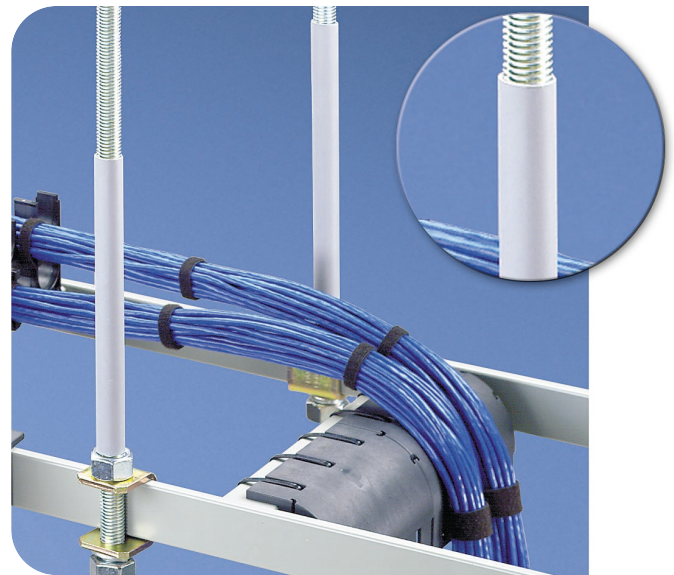
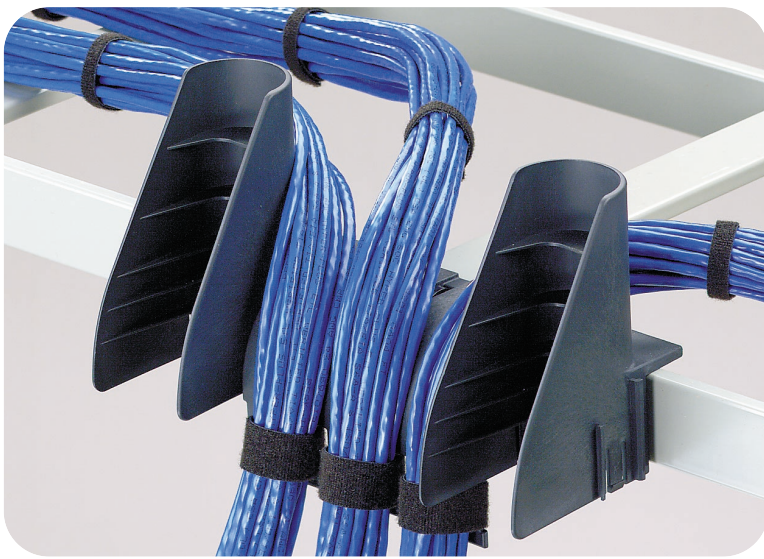
The optimum solution is to provide bend radius control in both the horizontal and vertical directions. In addition, the solution should be expandable to accommodate additional cables and be easy to install.

2. Cable Stress

- TIA/EIA-568-B.1

"Cable stress, such as that caused by tension in suspended cable runs and tightly cinched bundles should be minimized."

Just as over-tensioning cable will compromise cable integrity, insufficient tension will cause excessive sag between supports. With the additional weight from mul-



multiple cable layers, pinch points will occur that can degrade performance. However, these problems can be solved with the addition of layered cable supports.

The best product for this application should work with all typical ladder racks. It should support each cable or bundle individually, and

Eliminate sag and pinch points, caused by an overload of cable.

therefore eliminate sag and pinch points, caused by an overload of cable. In addition, these products should provide the ability to secure the cable or bundle. Another important feature of this product should be ease of use and installation.

3. Abrasion Protection

- TIA/EIA-569-A

“Abrasive supports (e.g. threaded rod) shall have the portion within the tray protected with a smooth covering so that cable can be pulled without physical damage.”

Threaded rods have a very abrasive surface that can cause damage to communications cable, if there is contact. Therefore, some type of protective cover should be used. Typically these are split sleeves that are quick and easy to install, and they must remain in place when cable is being pulled and makes contact. A soft and pliable material provides superior protection.

In Closing

In general, the performance of the network is dependent on the integrity of the cable infrastructure. Damage, as a result of mismanagement of cable, may not have an immediate impact. However, as time passes and additional cables are added, the problems may compound, resulting in reduced performance.

Designing a system utilizing proper cable management products will provide a standards-compliant installation that will prevent degradation of cable and network performance for the life of your network. ■

Mike Edwards is a Product Line

Make sure the cable can be pulled without damage.

Manager at PANDUIT® Corp. For more information contact PANDUIT® at 800-777-330 or go to www.panduit.com/lr01.

Note: All cable management products pictured in this article are PANDUIT® Ladder Rack Accessories, which are designed to comply with the standards referenced in this article.



Always provide a standards-compliant installation to prevent degradation of the cable.