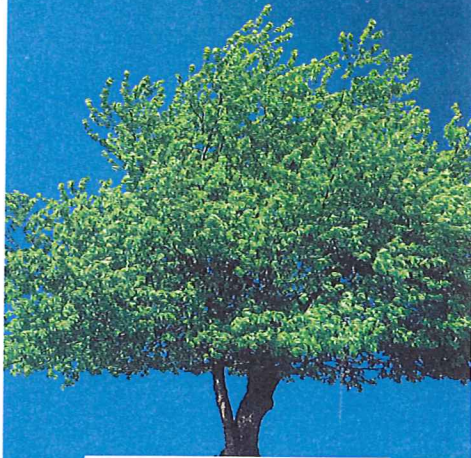


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THINK YOU KNOW JACK?

Networked cameras bring an entirely new set of installation standards

By Carol Everett Oliver

Moving from analog to IP creates new cabling challenges for security installers. With networked cameras comes a whole set of installation standards and rules, defined as structured cabling.

Structured cabling includes running Ethernet protocol over network cabling media, which is either twisted pair copper or optical fiber. In a defined structured cabling channel, the horizontal cable that runs from the IDF/telecom room terminates at a workstation outlet at the device end. From there, a patch cord connects to the front of the outlet into the RJ-45 connection on the camera.

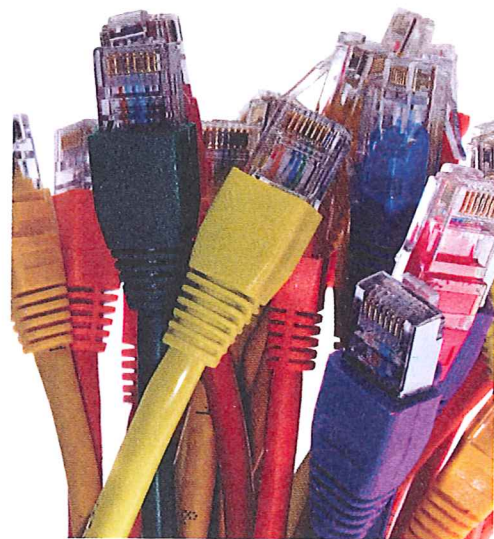
In some instances, it is not practical to have a workstation outlet and an exposed patch cord. So, similar to attaching a BNC connector at the end of a coax run, security installers are putting a plug on the end of Cat-5e or -6 cable, known as a direct attach to the camera. This "plug versus jack" quandary is among other differing cabling practices between data/voice and other electronic safety and security devices, and has created a debate between telecommunications cabling installers and security integrators.

KNOW THE RULES

Structured cabling standards, originally known as TIA-568-A (now "C"), were developed in the early 1980s for data and voice applications. The main premise was to provide consistency in media, connectors and topology to support multi-vendor equipment. Standards simplified troubleshooting, reduced network downtime and costs, and provided a cabling system that accepted future IP devices and applications. Ultimately, standards eliminated proprietary systems.

Cabling for the security market is taking similar steps in the data and voice evolution. Currently most camera systems are proprietary. The hardware and software differ between manufacturers, which contribute to costs and limits ease of use and scalability, since users are tied to their original manufacturers for upgrades and repairs.

Structured cabling standards are not mandatory, but they include recommended installation practices and define the different copper and fiber cable and connecting hardware performance, channel performance levels and governing cabling distances. These standards provide detailed information on installation procedures for all spaces, including the workstation area, TR and



equipment room, and cabling pathways.

Here are some highlights of the TIA-568 standards that security integrators will need to understand when handling copper network cable:

Maximum cable lengths: 90 meters for horizontal UTP or shielded twisted pair, 10 meters for patch cables.

Cable slack: Both ends of the horizontal cable should accommodate future cabling system changes, with 10 feet in the termination room and 12 inches (twisted pair) at the outlet.

Cable bend radius: Four times the cable diameter (or 1 inch) for UTP and 10x the cable diameter for 25-pair.

Cable Management and Pulling:

- Control tension in suspended cable runs by limiting spans between supports to 5 feet or less
- Avoid tightly cinched cable bundles
- Avoid kinking during installation
- Avoid changing the geometry of the cable
- Follow manufacturers' recommendations for loading of cable trays and j-hooks
- Avoid using tie wraps and staples

Termination:

- Horizontal cable should not be connected directly to the telecommunications equipment;

instead, suitable connector hardware (patch panels) and equipment cable (patch cords) should be used

– At the device/outlet end: Telecommunications outlets should be mounted securely at the work area

location, and a patch cord from the jack to the work area equipment should not be more than 5 feet

Because each security camera location is unique, these guidelines often can not be applied and must be ad-

dressed separately, which results in a direct attach.

BENDING THE RULES


What makes sense in a structured cabling design may not make sense in

the real world of security. For instance, when installing the standards-approved outlet/jack scenario, the biggest challenge is placing an outlet in a secure location and protecting the jack and patch cord so it cannot be accessed and unplugged. In many camera installations, a junction box is placed between the horizontal cable and the patch cord to the camera. If this is installed outside, the cable must run through protective conduit—or be rated for harsh environments—and the junction box must meet certain safety codes (e.g., IP-67 rating). Another instance where an outlet is not an option pertains to ceiling-mount cameras where the cable and termination is located in plenum spaces. Patch cords and outlets are not plenum-rated.

The alternative method to the outlet/jack termination is direct attach. But installers need to be aware that those runs may fall outside of cabling and connectivity warranties. Most structured cabling manufacturers, who are not aware of these unique circumstances, will not support this practice since it does not fall within the confines of the current TIA standards.

BEST OF BOTH WORLDS

Some manufacturers, such as Berk-Tek, have become entrenched in learning the differences in cabling practices in security versus data and voice. In looking at these outside-of-the-box scenes, they are taking a leadership role by engaging with security integrators to come up with special considerations. As a result, Berk-Tek offers certified security integrators training, certification and warranty through their OASIS program. Within this program, Berk-Tek has selected specific Cat-5e and -6 plugs that would be warranted, in the case of a direct-attach channel.

If a plug or direct attach must be used for a horizontal cable run to the camera, make sure to test each cable run with a verification tool. Because a plug-ended cable channel will eliminate the first connection (the plug) when tested, check with the test equipment or cable manufacturer for the proper steps. 

Carol Everett Oliver is a marketing analyst for Berk-Tek.



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