

TECHbrief

SELECTING THE RIGHT SECURITY CABLING INFRASTRUCTURE: COPPER TWISTED-PAIR RECOMMENDATIONS

When it comes to a modern physical security network, it is important to look at each camera or access door controller as a data port and not just a security node on the network. Using network cabling allows a range of devices from IP-based systems to serial devices to be interconnected. For example, a camera connected to an equipment outlet can be easily replaced with a wireless access point or intelligent lighting as the application requirements of an organization change over time. By reconfiguring the physical security network for data points instead of specific applications, users can create a network infrastructure with a longer life cycle, more flexibility and greater scalability to meet shifting demands and to accommodate new technologies. Likewise, designers for wireless data networks, DAS systems, voice systems and other IP-based systems look to create infrastructure networks that could support IP security devices.

To have a fully supportable Internet Protocol (IP) network solution, it is becoming increasingly important to make the right choices upfront when considering the network cabling and components. Users can protect network investments by matching the cabling infrastructure to its components based on the organizations technical and life-cycle requirements to support current and future applications. The two primary choices for cabling infrastructure to support an IP-based system are copper twisted-pair and fiber optic cabling. Some recommendations for designing a robust copper twisted-pair infrastructure follow.

Cabling Requirements

Over time, the cost of replacing electronic hardware increases with technology advancements whereas high-quality, existing cabling infrastructures can be expected to support these future changes. The right cabling installation can be expected to last up to 20 years; however, many security products last for only up to five years through either obsolescence or feature revision preferences from the end-user as needs

change. It's therefore recommended to install at least a Category 6 cabling infrastructure to meet any future requirements.

Unshielded Twisted-Pair and Shielded Twisted-Pair Options

Due to its affordability and ease of installation, twisted-pair cabling is often the choice for security cabling infrastructure today. Unshielded twisted-pair (UTP) cabling is by definition manufactured without a shield on either the outer jacket or wire insulation. UTP uses a balanced pair design to reject noise that affects data transmission. In contrast to UTP, shielded twisted-pair cabling (F/UTP or S/FTP) has a different set of installation and maintenance rules due to the foil and/or braid shield used in its design. In a shielded solution, all cables, patch cords and connecting hardware are manufactured with an added metal shield to further reduce potential electromagnetic interference (EMI) that could get coupled onto the transmission line. The metal shield must be grounded to the telecommunications grounding system, which requires additional installation materials, tools and procedures. However, in areas that have high levels of EMI, such as a manufacturing floor, this is the recommended solution because of the high prevalence and risk of EMI.

Backward Compatibility

All standards compliant cabling to the Telecommunications Industry Association (TIA) or International Organization for Standardization (ISO) standards is backward compatible with the lowest component dictating the performance. An end-to-end channel is only as good as its weakest link. Mixing the performance ratings, known as Category, of cables, connectivity and patch cords can negatively affect network performance by increasing the potential of IP equipment transmission errors, resulting in video quality degradation. This is largely due to the fact that IP-based video depends on best effort

delivery protocol (UDP) for delivery of the video data throughout the network and is very sensitive to transmission errors that manifest themselves on the network. Because information is dropped if data are received in error, this could cause significant degradation in the video that is viewed on the network.

Power over Ethernet Support

The supplying of DC power over twisted-pair cable using the Ethernet protocol, also known as Power over Ethernet or PoE, is supported over the same copper cable infrastructure that carries network data. When looking to use PoE, there are important factors to consider:

- Today, up to 30 watts of power can be delivered on Category 5e and above cables using IEEE 802.3at compliant equipment.
- Higher power over a bundle of cables can generate greater heat dissipation in the bundled cables. Heat will attenuate a data signal, and in some cases, it can degrade the signal enough to cause network errors and therefore degrade video quality.
- A new version of PoE over twisted-pair cabling is being developed by the IEEE and is expected to deliver up to 70 watts to compatible equipment. With the increase in available power, it becomes even more important to specify cable constructions with a larger conductor such as Category 6 to mitigate potential heat effects on bundled cables.

Anixter has made choosing infrastructure simple through Anixter's ipAssuredSM Program for Security Infrastructure. Just tell Anixter the types of technologies and applications needed for the network—from IP and analog cameras to Power over Ethernet and other security-related applications—and Anixter will recommend an IP infrastructure solution that provides the best performance today and in the future.

For details on security cabling infrastructure and Anixter's ipAssured program contact your local Anixter sales representative, visit anixter.com or call 1.800.ANIXTER.

1.800.ANIXTER | anixter.com

Products. Technology. Services. Delivered Globally.

At Anixter, we enable the connected world. From securer facilities and communities, to more efficient networks and industrial environments, we deliver the infrastructure solutions—and intelligence—that sustain your business. Through our unmatched global distribution network, supply chain management expertise and technical know-how, we drive efficiency and effectiveness to benefit your bottom line.

