MEETING NETWORK DEMAND WITH ANIXTER IPASSURED℠

Anixter Infrastructure Solutions Lab Pushes the Limits of Performance Testing

It is no longer a question if the network will have a role in physical security applications. The question now centers on how integrated physical security applications will perform with building, communications and data systems.

The ubiquitous deployment of standards-based structured cabling systems and the accepted practices of the information technology sector have revolutionized the capturing, storing, sharing and analyzing of video images, which makes video surveillance more practical, manageable and cost effective.

However, as more physical security applications migrate to the network, the network will encounter significant demands from the increasing number of users and devices. High-bandwidth requirements (and in some cases power requirements) can quickly bring attention to any deficiencies in the cabling infrastructure. These deficiencies can degrade video quality through errors in data transmission, which can hamper productivity and security.

Through a series of tests conducted in its Infrastructure Solutions Lab, Anixter assessed the ability of twisted-pair cabling systems to support error-free transmission at less than ideal conditions. The tests examined the ability of these cabling systems to support the higher levels of power delivery needed with recent Power over Ethernet (PoE) advancements. Anixter uncovered some potential limitations in cabling channels running security-oriented applications.

The Lab used industry standards, which calls for testing twisted-pair cable at a room ambient temperature of 68°F (20°C), as a baseline for the testing. Anixter ran its tests by successively increasing the external ambient temperature by 5°F increments and measuring the resulting performance. In one test on a minimally compliant Category 5e cabling system, link status was intermittent at 113°F and 100 percent error-free transmission could not be achieved to an IP-based camera.

Blurred, unusable video over minimallyw compliant Category 5e cable*

Crystal clear video over ipAssure IP-ClassSM 10+ cable

The ANSI-TIA-568-C.2 standard specifies that a 1°C rise in external temperature increases the signal loss (insertion loss formerly known as attenuation) by 0.6 percent. When The Lab looked at the elevated temperatures for the tested cables, the results showed that higher grades of cabling perform better under increased temperature conditions. Even though failure was shown to happen on minimally compliant Category 5e cables at 113°F, errors may start to occur earlier than this failure point. Real-time applications such as video surveillance and Voice-over-IP will be adversely impacted by any such failures in transmission.

In addition to the temperature testing, The Lab also looked at the impact that low- watt power applications such as PoE have on large bundled cables typically found in installations of multiple drops. To test the power handling capability on a cable in a large multicable bundle, technicians in The Lab created two test bundles using Category 5e and Category 6 cables where 36 cables were bundled around one. Each test bundle was energized with 750 milliamps of current (the maximum allowed by the Federal Communications Commission on twisted-pair cable) through each pair of conductors. The Lab measured the temperature rise of the copper conductors on both of the Category 5e and Category 6 cables used in the center of each test bundle.

The temperature rise observed on the center cable of the Category 5e cable bundle contributed to a 25 percent increase in signal loss when compared with the Category 6 cable bundle. The larger gauge size of the Category 6 cable (23 AWG) helped to mitigate the effects of increased power on the copper conductors.

Based on the results of the testing, Anixter's Infrastructure Solutions Lab created an infrastructure assurance specification that takes into consideration application lifecycles and installation environments.

Divided into IP-ClassSM 1+, IP-Class 5+ and IP-Class 10+ corresponding to a building's infrastructure lifespan, the Anixter Infrastructure Solutions Lab created the specifications to simplify the choice of matching cabling infrastructures to a physical security system.

The goal of the ipAssured program is to make infrastructure life-cycle choices easier for planners and implementers. It categorizes choices based on current application requirements and future advancements expected in these applications. Specifically, it covers analog and networked Ethernet/IP video surveillance; considers the addition and integration of other systems or applications such as access control and Power over Ethernet, which promises to be a much more practical and widespread application of the utility infrastructure in the near future.

*Test conducted at elevated ambient temperature.

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