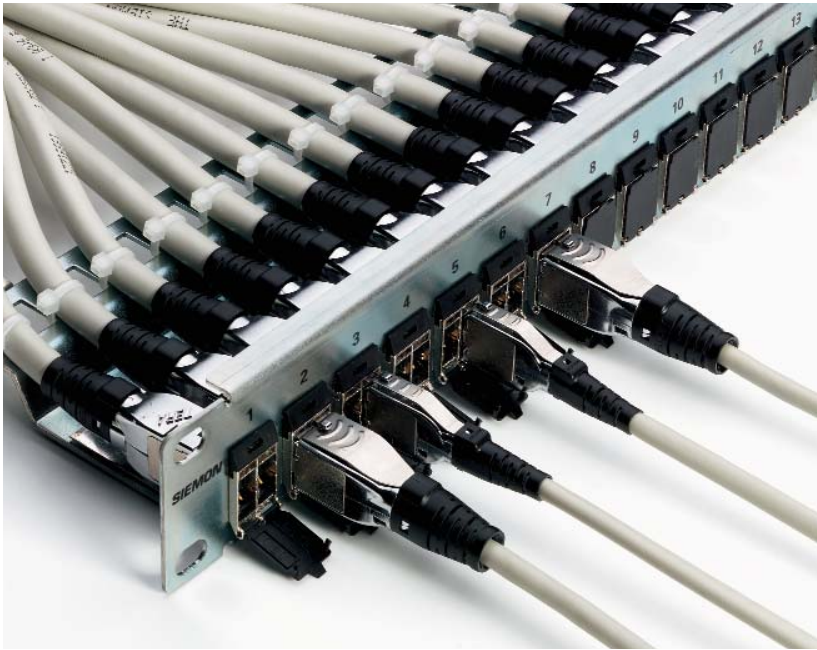


Bring on Cat 7/Class F

With the speed limitations of the last mile becoming extinct, applications will soon have more room to grow to a level that was not possible even a year ago. It's called next-generation flexibility.

The approval of edition 2 of ISO/IEC 11801, IEC 61076-3-104 and IEC 60603-7-7 means that a standard for Category 7/Class F systems and components is fully defined and complete. The standardized cabling is fully shielded meaning each pair is shielded and the overall cable is shielded. This provides a level of functionality that was not possible with UTP (Unshielded Twisted Pair) cabling. For example, each pair within the cable can run its own application without disruption to other pairs within the same cable.



The international standard IEC 61076-3-104, which covers the interface used, for example, in the Siemon TERA™ connector, was published and specified for class F cabling in ISO/IEC 11801 and for BCT cabling in draft ISO/IEC 15018.

One connector uses a quad design with one pair terminated in each internally isolated quadrant. This allows an end user a plethora of configuration options within the same cable due to the availability of existing and emerging applications. One pair is needed for phone

service. Two pairs are needed for 10/100 Mbps data transmission, leaving another pair which can be used for video or another application. Should a user plan on 1Gb/s or 10Gb/s data, all four pairs would be used.

Workstations are generally equipped with two cables, one traditionally for phone and one for data. The telecommunications outlet with all four pair on one cable terminated for use with 1Gb/s operation is expected to be forward compatible with 10Gb/s operation when the standard is drafted. A second 4-pair cable can provide a variety of other applications such as phone, powered Ethernet devices, video-conferencing, etc.

The shielding within an STP otherwise known as a Pimf (Pairs in metal foil) style cable virtually eliminates crosstalk between pairs allowing “noisy” applications to function without disturbing other services running on the same cable. This is particularly important in environments such as plant floors where equipment produces high levels of Electromagnetic Interference (EMI). In addition to preventing noise between pairs within the cable, the shielding around each pair and around the cable also keeps noise from entering the cable for better communications.



Emerging Applications Driving the Demand for Cat7/Class F

IP Video Applications

One relatively new application is xDSL television broadcasts. Phone companies are beginning to realize that VoIP (Voice over IP) services are causing a shift in their profit structure. The ability to provide television over xDSL lines provides service providers with an additional revenue stream. This may very well become a new teleconferencing and tele-learning application in the future. The broadcasts use a single cable pair. Broadcasts can be viewed on a PC or small television monitor depending on the implementation. The advantage of having a separate TV monitor is that the end-user does not have to share computing resources with the broadcast. This could ultimately provide a whole new dimension to collaboration products.

Video on Demand and Broadband Video are expected to be revolutionary for business. The ability to provide training to employees at their desktop on demand will maximize their training experience. Users will have the ability to stop and start training sessions, rewind and review or skip parts that are not pertinent or already known. With the savings from travel expenses and lost productivity during travel the ROI for these systems is relatively short.

Video phones have been around for quite some time and the technology has advanced with better compression algorithms and streaming media. These phones operate over a single cabling pair. Newer versions are wireless, which frees up the phone cabling pair for other applications. It is likely that cabled or not, these phones will gain in popularity as new IP versions are introduced.

Future versions may include collaboration utilities, live digital recording of conversations, or even television broadcasts over the phone set.

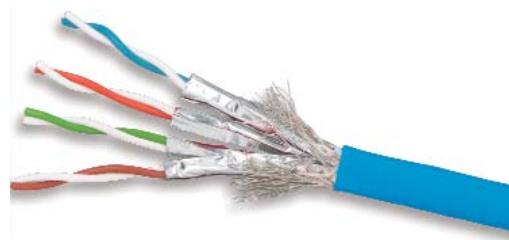
More IP Applications

Video surveillance is rapidly growing as companies work to protect their human assets as well as their physical and data assets. In addition to transmitting video signals, cameras can now be powered over Ethernet pairs. The ability to run multiple cameras over a single cabling channel provides multiple configuration options. It is possible to add audio to the surveillance through one of the cable pairs. In highly sensitive areas, this can provide an additional level of security that video alone cannot accomplish. An additional pair could also be used for biometric authentication (i.e. iris or fingerprint scanning) and access control.

Building Automation systems are now capable of being implemented over one structured cabling system and provide for a single integrated management solution as well. This allows for fire, life and safety systems, surveillance, HVAC systems and other building functions to be run over the same cabling channels that typically support voice and data.

In medical environments, Digital Imaging and Communications in Medicine (DICOM) standard was created by the National Electrical Manufacturers Association (NEMA) as a common denominator for the viewing of medical images. The days of x-rays are quickly coming to an end. Newer devices provide digital images, which can be viewed and manipulated via computers rather than being printed on film. These digital images will only grow larger in size as technology advances in this area requiring higher bandwidth and throughput.

The ability to provide a shielded solution in these environments allows an additional level of data protection by isolating the cabling channel from any noise emitted by the medical scanning equipment. Data centers and storage area networks are also becoming more sophisticated with numerous new equipment and applications being introduced. Protection and storage of data is not a luxury, rather it is a necessity as businesses cannot function without it. Live redundancy is mandated by some governments for key sectors and is readily being adopted by others. Data stores are growing exponentially in size and the first 10 Gb/s standard was due to be adopted last month by the IEEE providing 10 Gb/s transfer rates over twinax cabling for short distances. Work has already begun on a 10 Gb/s standard for twisted pair cabling.



Category 7/class F cabling already meets the need for these speeds today and is expected to be a recognized industry standard for supporting 10Gb/s over a full 100 meter, 4-conductor copper channel.

Being able to provide multiple services through a single cable channel saves labour and material cost by reducing the number of cables pulled, fewer outlets and patch panels needed, less rack space is needed therefore less real estate space is needed for telecommunications closets or data centers. This can add up quickly in large installations or densely populated areas such as call centers and customer service centers.

In one case study, a company realized a savings of 66 per cent in cabling materials, 50 per cent in labour, and gained 332m² of floor space because of the savings in racks and terminations in their equipment room. With these significant savings, there was plenty of money left over to run a dark fiber to every desktop for future expansion.

What about fiber?

With the bandwidth demands increasing, why not just run fiber to the desktop? Fiber certainly has its applications. One compelling reason for copper cabling is the ability to provide Power over Ethernet to network devices. Wireless Access Points (WAPs), phones and a myriad of other devices are either on the market or coming to the market allow for low voltage power to be supplied via a switch rather than a separate power outlet. The real advantage to this technology is provided through enhanced up-time during power outages. The switch, equipped with backup power, would still allow for communications even when the power to the building is out.

Another issue is cost. Application sharing over one cable/outlet is not capable with fiber electronics at the work area. Fiber devices and network cards remain more expensive than copper. While there are certainly applications where the cost can be justified, it is not typically the case. Fiber to the desktop does not eliminate the need for copper cabling for phones and other equipment that may be needed at the work-area. Some organizations are opting for the best of both worlds and while extending the life of their cable plant by providing one or two Category 7 cables and one dark fiber to each desktop. Certainly, whatever option a company decides upon will be based upon individual needs, budget constraints, and a look into a crystal ball to determine the future possibilities. With the speed limitations of the last mile becoming extinct, applications have more room to grow that was not possible even a year ago. Tomorrow's applications and the ways that companies use them will be something to behold.

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