SMART CHOICES FOR DIGITAL INFRASTRUCTURE

THREE STEPS TO EMPOWER
YOUR LOCAL AREA NETWORK

People & devices

Building conditions

Network flexibility

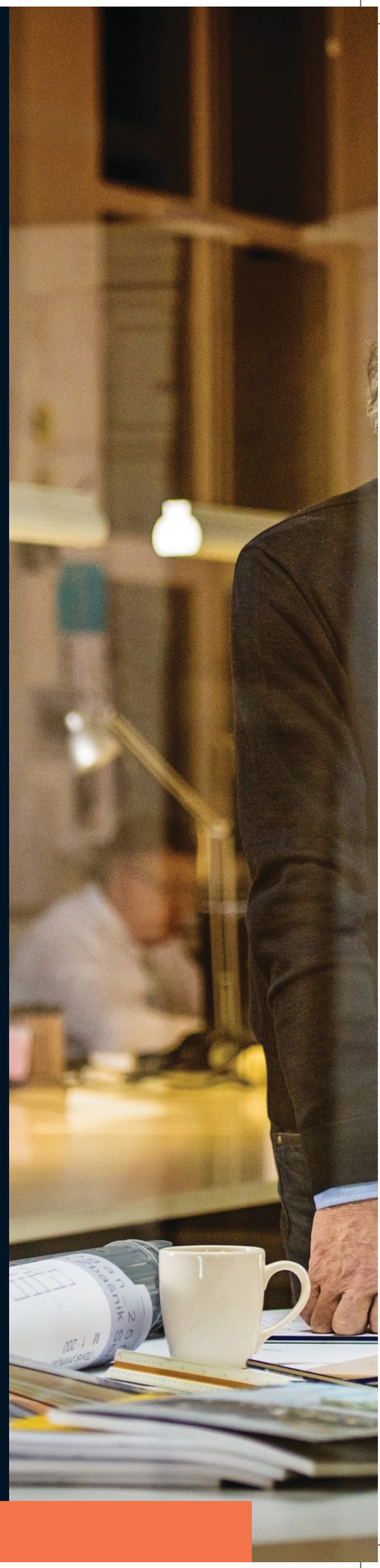
Nexans

Meeting today's rapidly rising demands

> ***Until recently, Internet Protocol (IP) addresses were exclusive to computers, network-related devices and VoIP telephones. If the total number of IPv4 addresses (4.3 billion) could fit in a golf ball, all IPv6 addresses (340 undecillion) would fit inside the sun.***

> ***More and more devices are being connected, controlled and powered over IP networks. Ericsson predicts there will be 50 billion IoT-enabled devices by 2020 and Analyst IDC estimates 212 billion.***

> ***Expanding data traffic growth is bringing new speed and power requirements for cabling… How do we accommodate increasing demands whilst bringing network traffic protection to the next level?***



Main growth areas

To arrive at specific, cost-effective and future-proof solutions, carefully mapping individual requirements and expectations is vital. Nexans has identified three key areas in which demand is rapidly rising today, and will expand exponentially in the near future.

BANDWIDTH

We need to accommodate more people, more devices and more data.

Requirements are up, driven by new technologies such as IoT, IP video and cloud. Infrastructure design and technology need to accommodate this. Failing to do so will affect productivity, competitive position and reputation.

WIRELESS

The content transmitted by an increasing number of connected devices keeps increasing exponentially. How do we offer enough access for years to come?

New standards and the proliferation of mobile devices are leading to the need for more and significantly faster Wireless Access Points and backbone connections. Wireless evolution is inevitable, with 24 billion web-connected devices, of which more than half are connected wirelessly and can transmit HD content.

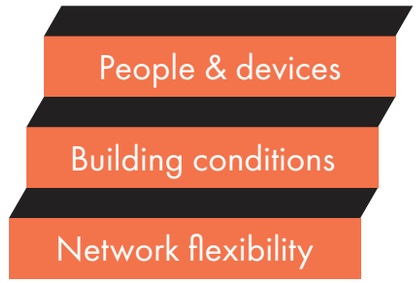
POWER

More and more network devices, often in hard-to-reach locations, need power – how do we supply it efficiently and cost-effectively?

Power delivered through new generations of Power over Ethernet will be more than triple what it is today, and more than six times the level of the initial PoE standard. If not delivered efficiently, this will significantly increase heat buildup inside cable bundles, which in turn may disrupt network IP traffic.

Three steps to digitally empowering your enterprise

To meet explosive growth in demand for bandwidth and functionalities, and ensure cabling, connectivity and networks hold up in an increasingly demanding environment, a digital transformation is needed. Nexans' three-step approach makes it easier to find a solution, as there's no 'one size fits all' answer.



People & devices

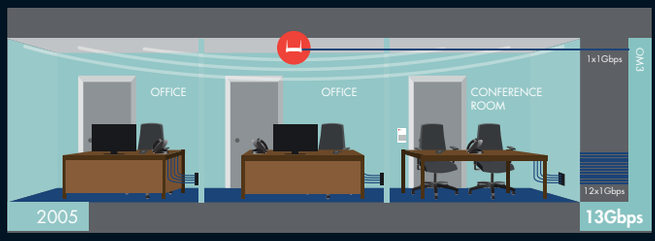
What type and level of performance do your organization's users and devices require? Not only right now, but also in the future.

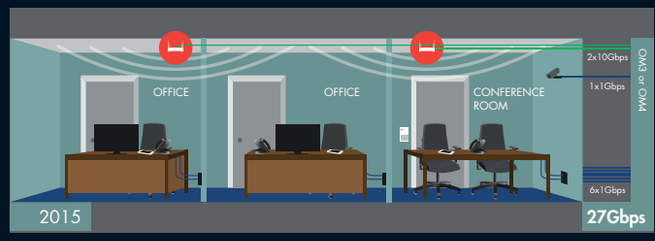
Building conditions

Which specific conditions exist in your building(s)? Which distances need to be bridged? Are there specific requirements with regard to functionality or uptime?

Network flexibility

How flexible does your network need to be to accommodate probable future requirements? How do you ensure this is the case?

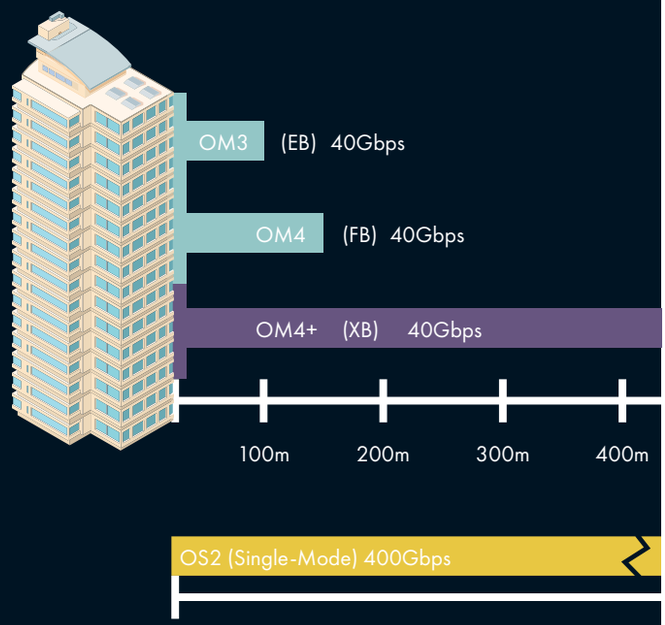




STEP 2

BUILDING CONDITIONS

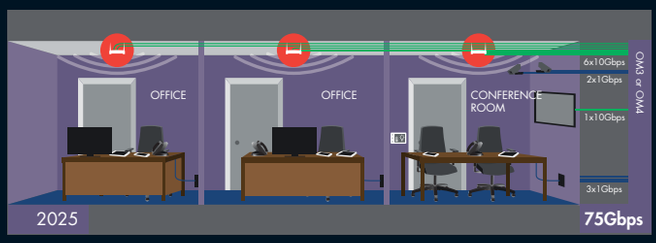
If distances are not factored in correctly and there is no clear understanding of the requirements for each section of cabling, there is a risk of underspecifying – which may result in poor performance and reliability – or overspecifying, which introduces unnecessary costs. When considering the environment into which cables will be installed, functional requirements must be taken into account, as well as a variety of practical aspects, such as converged applications and security.



STEP 3

NETWORK FLEXIBILITY

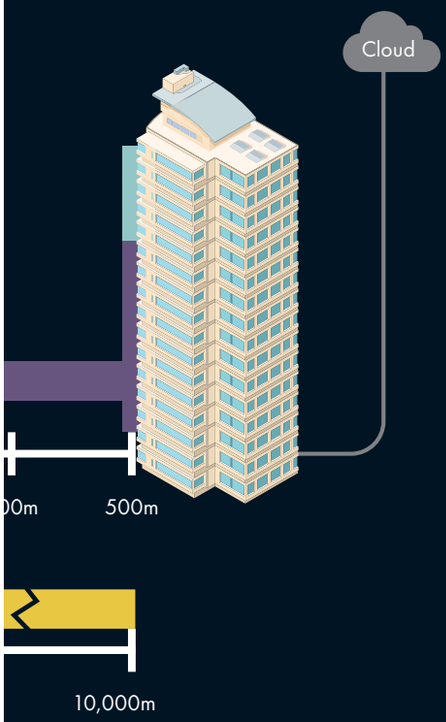
Defining the current and expected requirements of the building and its network, as well as related items such as energy consumption, maintenance, installation and administration, and deciding how much redundancy you need, makes it possible to design and build cost-effective digital infrastructures.

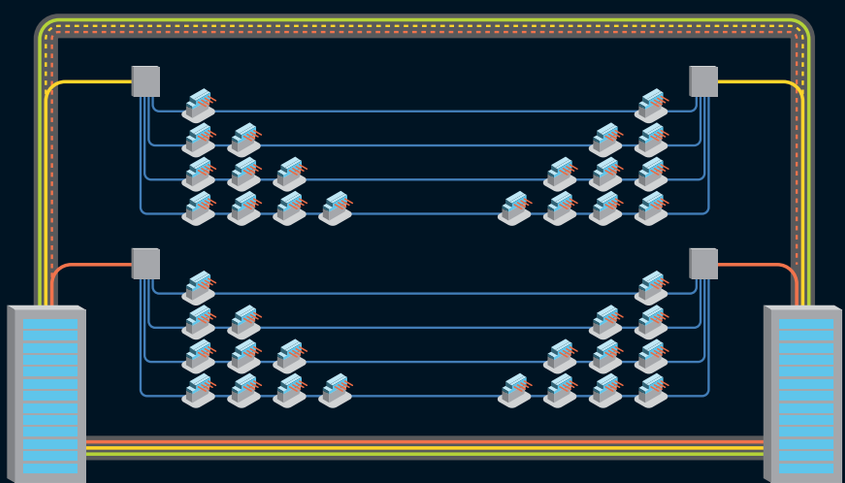


PEOPLE & DEVICES

Ten years ago, an office might have included a few desktop PCs, VoIP phones and low-bandwidth wireless devices. Even with everything switched on, one Gigabit Ethernet would be enough bandwidth for most typical requirements. Traffic is typically supported by 10Gbps bandwidth in the backbone. Today, bandwidth demand is being boosted by the proliferation of HD video, wireless devices, building control and automation systems. These systems are getting more and more integrated in the network with Internet of Things applications in the Cloud. In addition, PoE is becoming increasingly widespread, and supporting ever-higher levels of power to larger devices. This is no longer a 'nice to have' extra feature, but a standard part of more and more systems that needs to be taken into consideration from the outset.

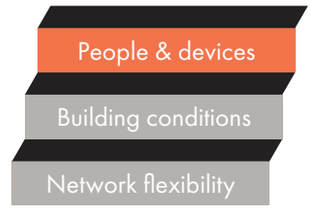
STEP 1





People & devices

Balancing data and power



New standards driving more data and power over the network

When selecting a cabling system, you need to consider the people and devices that will be relying on the network. The performance they need will depend on emerging standards, which in turn will act as a driver for increased bandwidth and power over the network. To meet current bandwidth requirements, using Category 6A for each Wireless Access Point (WAP) is recommended, making multimode OM4 fiber a likely minimum requirement for the backbone.

Wireless is an especially important contributor to today's increased demand. As speed and bandwidth go up, reach goes down. So you need more WAPs to cover the same surface area.

What's more, the next generation of PoE can provide up to 100 Watts, making it possible to power devices such as monitors or charge laptops. However, the associated elevated temperatures will significantly increase the amount of heat (and noise) that your network infrastructure will have to handle. Therefore, by introducing higher-grade cabling, it is possible to realize significant energy efficiency gains and reduce heat build up.

New standards for Power over Ethernet will place more strain on the network

	2003	2009	2017	2017
	PoE - Type 1 IEEE 802.3af	**PoE+ - Type 2** IEEE 802.3at	**PoE++ - Type 3** IEEE 802.3bt	**PoE++ - Type 4** IEEE 802.3bt
Power sent	15.4W	30W	60W	90W
Power delivered	12.95W	25.50W	51W	71W
Number of pairs	2	2	4	4

Emerging standards for wireless drive network speeds

	2009	2013	≈ 2020
	IEEE 802.11n	**IEEE 802.11ac**	**IEEE 802.11ax**
Antennas	**Access Points Peak Data Rates (theoretical maximum)**		
1x1 **2x2** **4x4** **8x8**	150 Mbps 300 Mbps 450 Mbps 600 Mbps	866 Mbps 1.7 Gbps 3.4 Gbps 6.9 Gbps	≈ 3.4 Gbps ≈ 6.8 Gbps ≈ 13.6 Gbps ≈ 27.6 Gbps
Reach	~ 70m	~ 35m	~ 10 - 20m

Converged Application (CA) score

To accommodate bandwidth expansion, you need cabling that offers the ideal balance between delivering data AND power. This requires a new way of testing and evaluating cabling performance.

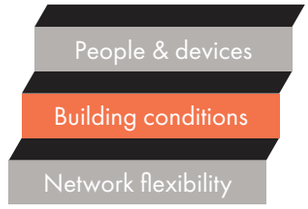
Nexans' Converged Application (CA) score defines how the cabling network's performance will affect the user's experience. Using realistic test scenarios, it measures how network infrastructure will perform against future demand and converging applications. The CA score is an indicator of IP traffic protection and cabling system performance with regard to energy efficiency in PoE testing.

Unlike traditional methods, Nexans' rigorous testing examines a systems' bandwidth capabilities, high-power PoE delivery efficiency and support for new networking speeds designed to enable evolving wireless technology. Simulated hotspots in cable pathways and electrical fast transient (EFT) voltage spikes from adjacent power cabling are included. Signal to Noise values and reach capability for 1, 2.5, 5, 10, and 25 Gbps Ethernet, and next generation PoE efficiency results are entered into a weighted algorithm. The better IP traffic is protected from the stress of multiple simultaneous applications, noise, and heat, the higher the score. This ranges from 1 – anything less would mean no signal – to 20 – a perfect score.

Nexans TEK Center

The TEK Center provides R&D and application performance testing capabilities. It also features a showcase for Nexans copper and fiber cabling products in common deployment scenarios and cutting-edge customer applications in data centers and enterprise networks. The TEK Center provides insight on how to solve network challenges by allowing visitors to experience latest technology, learn about emerging applications and witness world-class research and development. Visitors include IT network decision makers from market segments such as Education, Healthcare, Financial Institutions and Data Centers.

Building conditions



Keeping building-specific conditions in mind helps find optimum solutions for your enduring digital infrastructure.

Distances – need for extended reach?

Standards-based copper cabling system design has an inherent 100 meter length restriction, and higher speed fiber applications have shorter reach when transmitted over economical multimode fiber. But what happens when you can't reach that distant work area in 100 meters? And what if that campus has a building that is beyond the standard distance specifications for 40Gbps over MMF? Nexans has copper solutions for 1Gbps channel reach out to 116 meters, and for using economical MMF optics for 40Gbps transmission out to an amazing 500 meters.

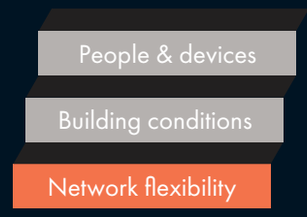
Indoors or Outdoors – simplifying your installation, saving you money

Connecting buildings through underground pipe, direct burial, or aerial lashing requires careful choice of cable constructions and attention to fire code requirements once the cable enters the building. Nexans Plenum Indoor/Outdoor (I/O) Fiber Cables are designed for installation in plenum or riser spaces, as well as for Inter-building Backbone connections with the water blocking technology and temperature range tolerances needed to survive in almost any environment. They connect buildings without the transition point needed when using traditional OSP cable. Consequently, they offer lower system loss and the flexible, small diameter, 900 µm tight buffered designs of these cables make them easy to install and terminate, saving time and money.

Your building's (probably) not a lab

The performance of the network equipment and applications that your business depends on can be affected by the cabling system's response to temperature variations, electromagnetic interference, and common installation forces. This may result in downtime or application performance that is unacceptable. Installing a structured cabling system that has been designed and tested for the most extreme conditions and demonstrates the ability to handle the convergence of voice, data, and power flawlessly will provide you with the peace of mind you need. The Converged Application (CA) score from Nexans Cabling Solutions provides a new, more realistic way of measuring the capabilities of a structured cabling system giving you a picture of how your business systems and applications will actually perform.

Network flexibility



Planning: a lifetime of adaptations

The way in which a building is used is likely to change over time. The number of people may increase or decrease and new applications may be introduced. Working with Service Consolidation Points (SCPs), mainly located above the ceiling, is widely considered a best practice. From here, devices such as WAPs and cameras can be connected, as well as workplaces. Adapting to changes in how the office space is used requires no more than a change of cabling from SCPs to the devices and workplaces.

Redundancy

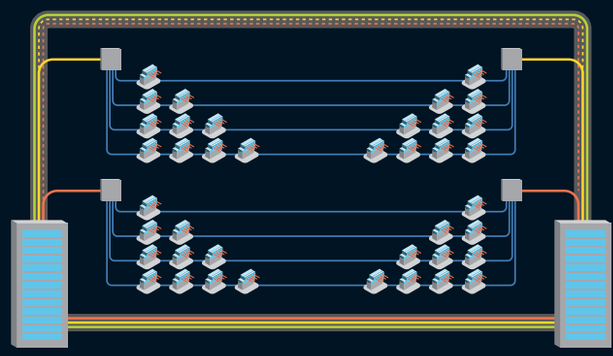
Connectivity is key to daily operations of businesses and institutions everywhere, making ample bandwidth reserves and redundancy essential. How much redundancy do you need to maximize availability at distributor level (with a redundant backbone)? What are your wireless access point deployment requirements going to look like tomorrow? Do you need a single cable or multiple cables for the next generation WAPs? Providing multiple Cat 6A cables to each potential access point location guarantees the bandwidth and power level requirements both today and well into the future.

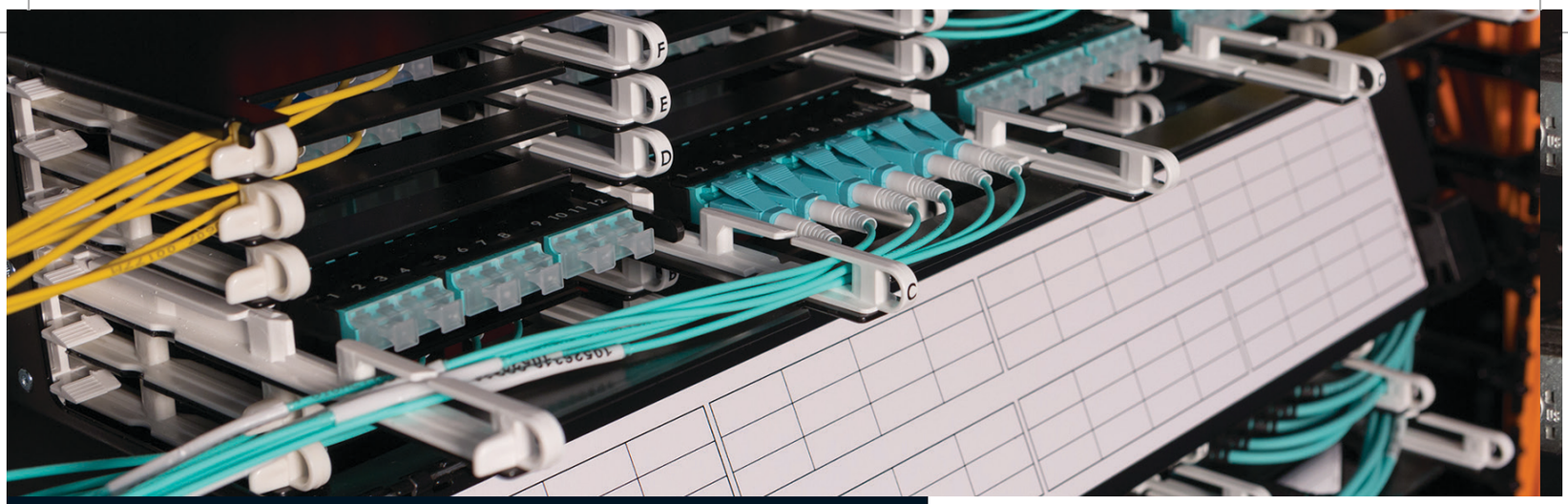
Lower carbon footprint – growth versus energy consumption

To date, enterprise buildings have always consumed a considerable portion of the world's energy, giving rise to 'Green Building' initiatives. There is a clear and growing demand for improved building energy efficiency and the technology to deliver it is built on intelligent networks. Properly planned and installed structured cabling systems can support not only voice and data networks, but also optimize the deployment of intelligent building controls for HVAC, lighting, access control, and surveillance systems that are essential to any sustainability efforts.

Optimizing Total Cost of Ownership (TCO)

Saving money by opting for 'just adequate' cabling performance today can actually cost more money down the line. As the needs of your business change, and the technology being deployed demands more from the cabling system, a minimally compliant Cat 5e or Cat 6 network may need to be upgraded, which means paying for installation labor a second time. Installing a high performance Cat 6A cabling system today can actually save money over the long run since the higher initial cost of the better performing cable and components is less than the price you'll pay for a complete system replacement. And a Cat 6A system has the ability to support just about any application or power level you can throw at it.





Nexans Smart Choices

Nexans' range of practical solutions offers the right performance for every business and environment. These exceed the requirements of all relevant standards, ensuring your network performs better and more reliably. Our expertise and far-reaching involvement in the development of standards means we always find the right solution.

Determining current and future requirements results in faster, more efficient roll-outs, solutions that perform exactly as specified, optimized TCO, enhanced energy efficiency and systems that will remain in business for years to come.

LANmark-5 Solutions

- For temporary space, a short-term lease, or small office applications
- Capable of supporting Fast and Gigabit Ethernet speeds
- Common commercial office applications
- Ideal for low bandwidth IoT deployments for many kinds of sensors and intelligent systems.

LANmark-6 Series Solutions

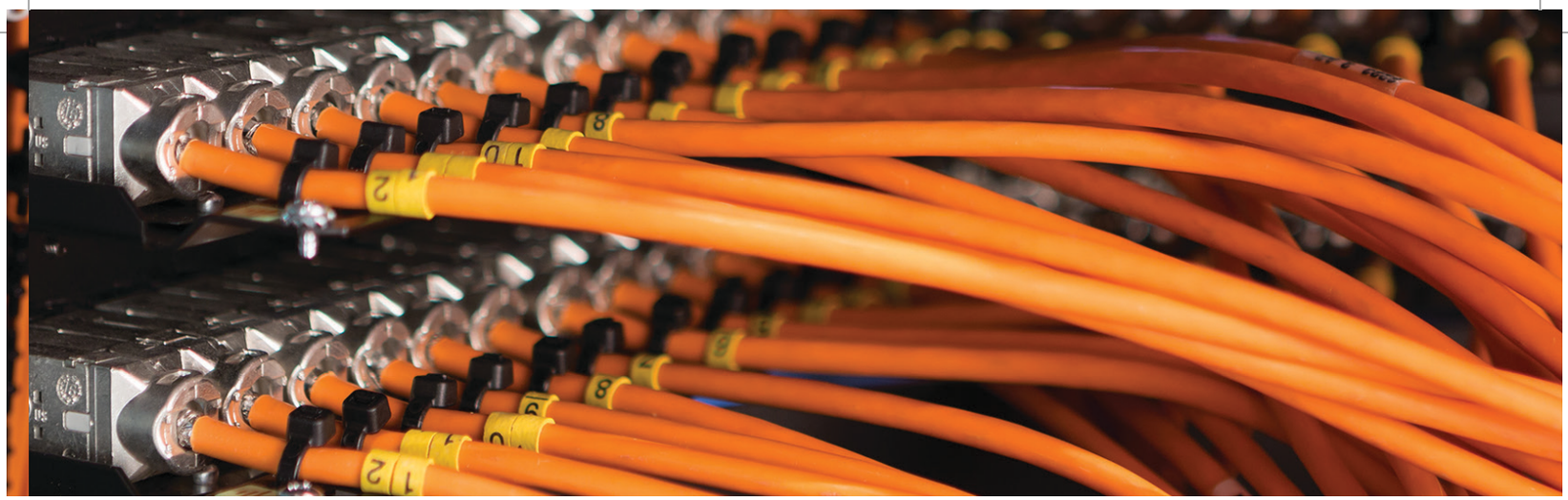
- LANmark-6 solution is good for most commercial office deployments.
- LANmark 6+ solution - headroom over Cat 6 channel requirements and support of emerging 2.5Gbps
- LANmark-6E solution is the highest performing Cat 6 channel available, suited to support emerging 5Gbps Ethernet speeds

LANmark-6A FTP Solution

- The right choice for long-term installations
- Ideal support for 10Gbps Ethernet
- Connecting high-speed, high-bandwidth wireless access points.
- Recommended system for Healthcare environments where cabling upgrades are difficult and costly.

LANmark-OF Systems

- High-performance, high-bandwidth and extended distance capabilities
- Cable constructions for any environment
- Choices for enterprise or data center deployment



Product Selector

Copper Solutions		
System	**Description**	**Recommended Applications**
Category 5e		
LANmark-5e	Recommended for temporary space and short-term leases, small offices, and very basic desktop applications.	BASIC DESKTOP, BASIC VOIP
Category 6		
LANmark-6	Recommended for short-term installations, basic desktop and phone applications, and a low density of connected devices.	BASIC DESKTOP, BASIC VOIP, BASIC IP CAMERA, BUILDING AUTOMATION
LANmark-6+	A good choice for high-speed applications and to support a network with more devices using PoE.	ADVANCED DESKTOP, ADVANCED VOIP, ADVANCED IP CAMERA, BUILDING AUTOMATION, NURSE CALL, IPTV
LANmark-6E	A better choice for high-bandwidth applications and to support a network with even more devices using higher power PoE.	ADVANCED DESKTOP, ADVANCED VOIP, ADVANCED IP CAMERA, BUILDING AUTOMATION, NURSE CALL, IPTV
Category 6A		
LANmark-6A FTP	Best choice for high-bandwidth requirements, with excellent high power PoE performance, the only choice for HD Video and 802.11ac wireless.	IMAGING APPLICATION, IP TURRETS, PREMIUM IP CAMERA, BUILDING AUTOMATION, NURSE CALL, IP VIDEO (HD), VIDEO CONFERENCING, WIRELESS

Fiber Solutions		
System	**Description**	**Recommended Applications**
LANmark-OF OM3	Recommended for short-term backbone installations (~5 years) supporting horizontal networks with a limited number of 10Gbps network drops and a relatively low density of IP devices.	BASIC DESKTOP, BASIC TELEPHONE, ACCESS CONTROL, LOW SPEED WIRELESS
LANmark-OF OM4	A good choice for long-term backbone installations (5-10 years) supporting a sizable number of 10Gbps network drops and a medium density of IP devices.	ADVANCED DESKTOP, BASIC VOIP, ACCESS CONTROL, ADVANCED IP CAMERA, MEDIUM SPEED WIRELESS, CLOUD COMPUTING
LANmark-OF OM4+	A better choice for long-term backbone installations (10+ years) supporting predominately Cat 6A horizontal networks and allow for 40Gbps connections up to 500 meters using economical multimode optics.	IMAGING APPLICATION, IP TURRETS, IP VIDEO (HD), BUILDING AUTOMATION, VIDEO CONFERENCING, PREMIUM IP CAMERA, HIGH SPEED WIRELESS, CLOUD COMPUTING

Own the Link

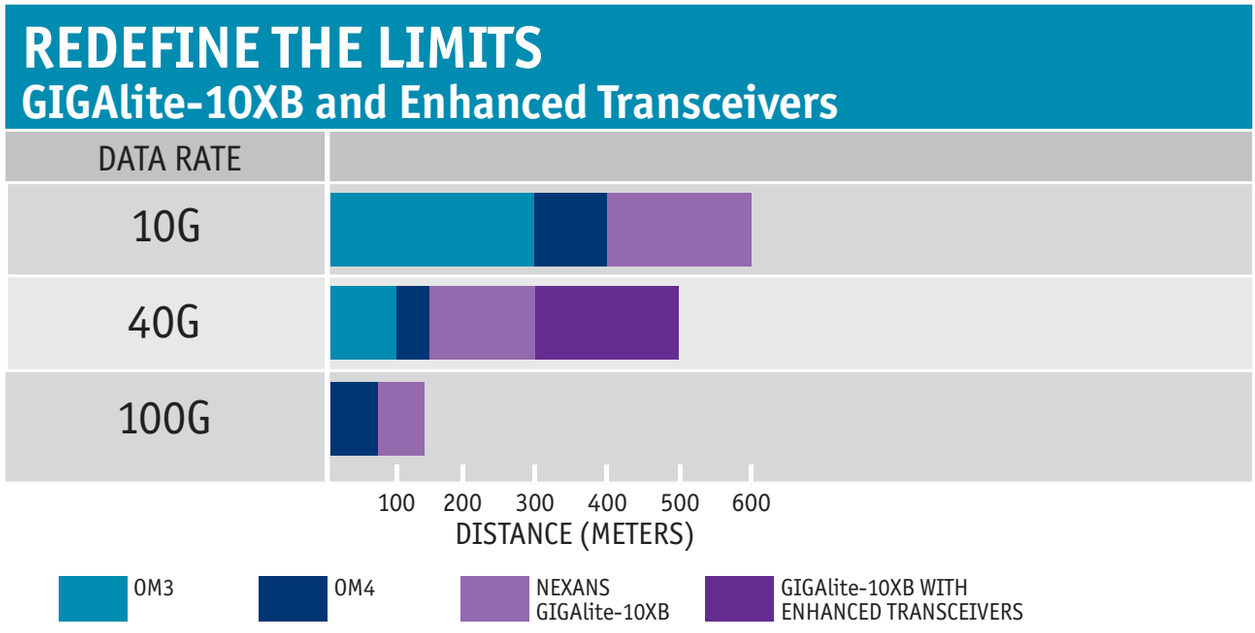
If you're a data center operations or facilities manager responsible for Layer 1, shouldn't you control all of Layer 1? We think so, and Nexans understands that the transceiver can have a tremendous effect on your Layer 1 performance. When you source your transceivers from a trusted Layer 1 partner like Nexans, you Own the Link. And when you pair Nexans' premium transceivers with our GIGAlite™-10XB optical fiber, you will see the difference when you need longer reach and/or more connections than the standards allow... GUARANTEED. Plus Nexans transceivers are backed by a five-year warranty.

As the person responsible for making the connection between a switch and a server, or two switches, you have the knowledge of the cable route and distance, and how many connection points may be used between devices. Nexans transceivers and high performance OM4+ GIGAlite-10XB multimode fiber provide an enhanced loss budget not possible with standard OEM transceivers and OM3 or OM4 optical fiber. Having the ability to manage the total loss budget between the end points to make these connections means more flexibility, extended lengths, optimized system management, and lowers the total cost of ownership by allowing the use of economical multimode optics.

The Nexans transceiver family includes SFP, SFP+, QSFP+, form factors for 1, 10, and 40Gbps Ethernet and 8 &16Gbps Fiber Channel, and are available for both MMF and SMF. These transceivers are completely compatible with Arista, Brocade, Cisco, Dell, HP, and Juniper equipment and will not trigger warning messages from the switch that they are not approved devices.

Nexans Transceivers will NOT invalidate your warranty with the switch manufacturer either, even though they may strongly encourage you to buy only their accessories. It is not a technical requirement to purchase MSA industry standard accessories only from the switch manufacturer. The bottom line is that buying transceivers from a high quality vendor such as Nexans will not invalidate the equipment warranty, but will provide you with consistent reliable support, and maximum flexibility and scalability, all from a partner that you know and trust.

Nexans transceivers are also extremely economical when compared to OEM devices supplied by the switch manufacturers. So why not Own the Link and manage the cost, power budget, distance, and routing the way that makes the most sense for you and your organization?



A world of Nexans smart solutions

Keep up today and be ready for tomorrow

Nexans offers a complete range of products and value-added services providing improved reliability and reduced cost of ownership for data centers, offices and campus networks.

Our comprehensive program delivers LAN infrastructure solutions to a global customer base, through all stages of even the most complex projects. Key Account Managers act as a single point of contact, enabling instant access to an extensive network of regional offices, experts, advisors and partners. Nexans offers valuable support right across the board – from planning and design optimization to logistics and on-site technical support.

We offer faster, more efficient roll-outs, solutions that perform exactly as specified, optimized TCO, enhanced energy efficiency and systems that will remain in business for years to come.

Cable the future with Nexans.
Your global expert in LAN cabling solutions.

Leading auto manufacturer, USA

Nexans provided a complete cabling solution, including 100,000m of LANmark-6 copper cabling and 15,000m of LANmark-OF OM4 fiber optic cabling, for a brand new 27m² warehouse and manufacturing facility.

HQ major aircraft manufacturer, UK

Nexans provided a future-proof network for a new £400m plant. LANmark ensures 10G transmission capability in an electrically noisy environment, supporting applications for voice, data and video.

Ministry, France

More than 160 km of LANmark-6A cables and over 12,000 RJ45 connectors were installed without disrupting work in 5,000m² of office space, occupied 24 hours a day, all year round.

Global european / Asian tv news channel

A major broadcaster opted for a solution combining LANmark copper and fiber for its new studio complex incorporating offices, studios, news rooms, storage facilities and two data centers.

Leading film studio, UK

LANmark-6A cabling provides a high-speed backbone protected against external interference and LANmark-OF OM3 fiber cables were installed in the world-famous facility's central equipment room and galleries.

Regional office for health insurance, France

A 45,000m² building was provided with a scalable LAN featuring 220 Zone Distribution boxes 1,500 switches and 21 km of fiber. Installation took place without any interruption to normal service.

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