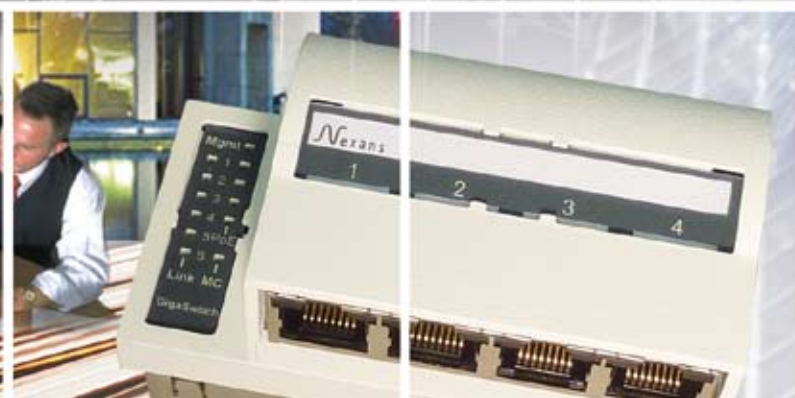


# LANactive

Switch to the future

Future Proof Fibre To The Office Solutions



## Future proof LAN Solutions based on fibre



The number of applications on a network increases from year to year. New applications are permanently in preparation. Server Virtualization, Cloud Computing, IP-telephony, video conferences, Blade servers are only some of the drivers for ever increasing bandwidth.

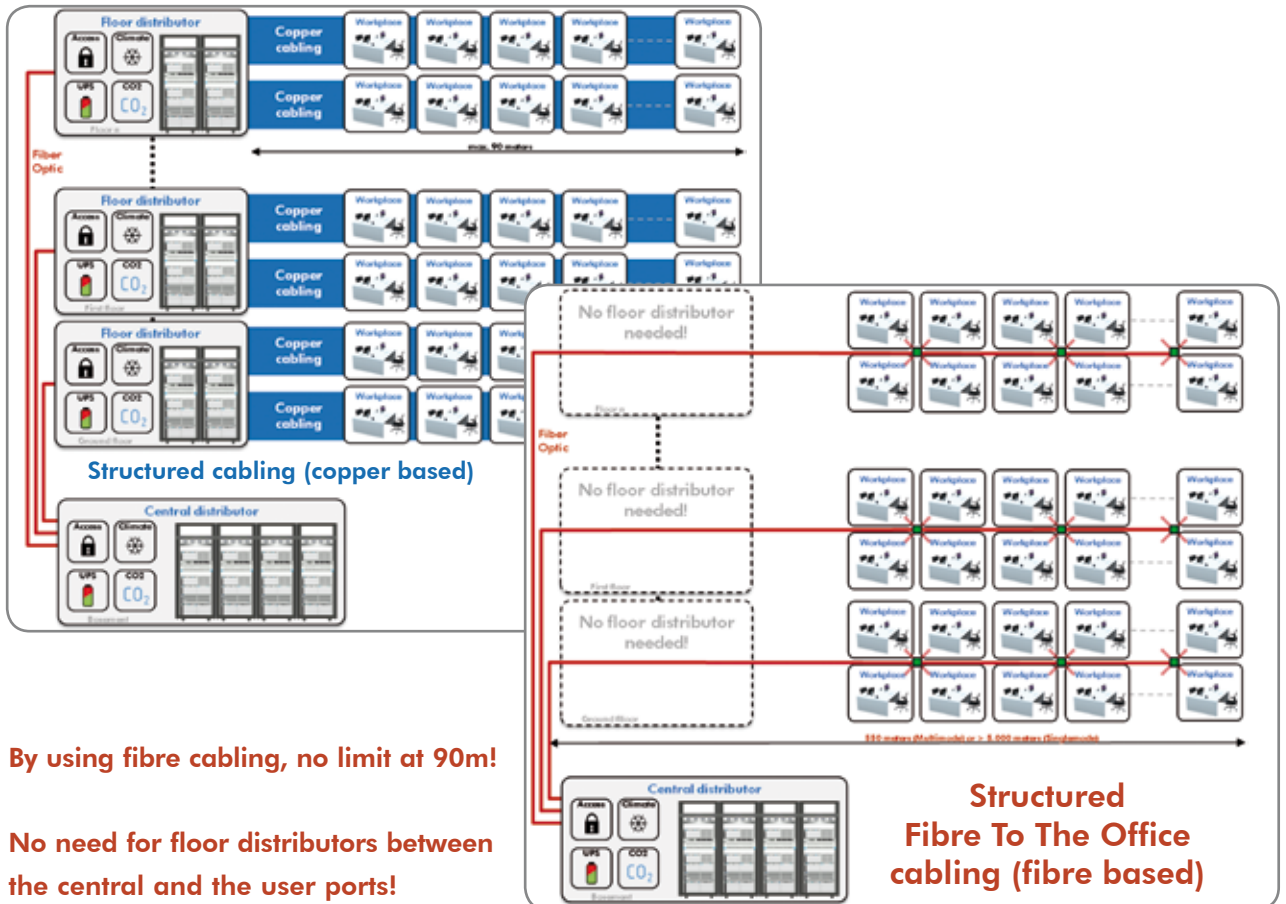
**A scalable infrastructure forms the basis to guarantee the network performance, for today's and tomorrow's applications.**

Due to the on demand scalability, fibre is the best medium. The Fibre To The Office (FTTO) concept combines the advantages of fibre with the requirements for flexibility, cost-efficiency and interoperability of modern enterprise networks.

**If the following aspects are relevant for you in network planning, then fibre optic networks are ideal for you!**

- **Future-proof  
(Scalable, flexible, sustainable)**
- **Investment protection/life cycle**
- **Secure network**
- **Low maintenance cost/  
simple administration**
- **Low investment cost**
- **Quick and simple realization**
- **Low energy consumption**

## Comparison of the Cabling Structures



In fibre-based structured cabling, fibre is distributed to the workplace (connection point). By using fibre optic lengths of 550 meters and more can be bridged, avoiding floor distributors. At the workplace, the media conversion from copper to fibre occurs via intelligent Fibre To The Office (FTTO) microswitches, which are permanently installed in the cable channel or in the floor box. Up to four connected twisted pair devices such as PCs, laptops, IP phones can be connected with full Gigabit performance via the microswitch to one fibre port. The devices can also be supplied with Power over Ethernet (PoE) via the data ports of the microswitch.

- + Simple and flexible network structure
- + No need for floor distributors
- + Low cable volume and fire loading
- + Future-proof Fibre Optic Cabling with high bandwidth reserve
- + No grounding or problematic earthing
- + Simple redundancy up to the network outlet
- + Low TCO (Total Cost of Ownership)



# LANactive

Switch to the future

## Cost effectiveness

Save 30 % and more compared to an established network

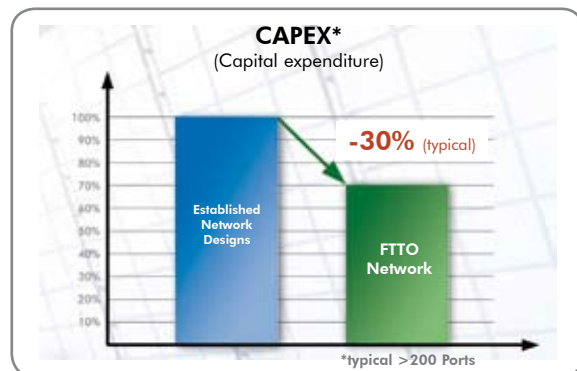
With Fibre To The Office concept, up to 4 users are connected to 1 central port: this 1 to 4 ratio increases the cost-efficiency of the network. That's why in most cases, FTTO is significantly less expensive than comparable established networks based on copper. This, combined with the significantly lower installation and operation costs makes the LANactive FTTO solution highly competitive.

### CAPEX (Capital expenditure)

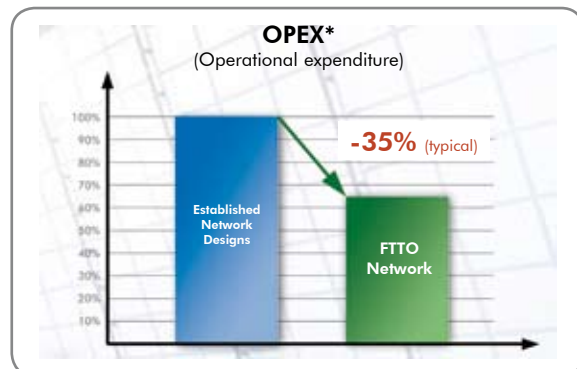
Due to the use of fibre as a medium, FTTO infrastructures mean future proof networks and the highest investment protection. Compared to a traditional copper cabling, the acquisition and installation costs are significantly lower. Fibre-based infrastructures with a real lifetime of more than 25 years are not uncommon.

### OPEX (Operational expenditure)

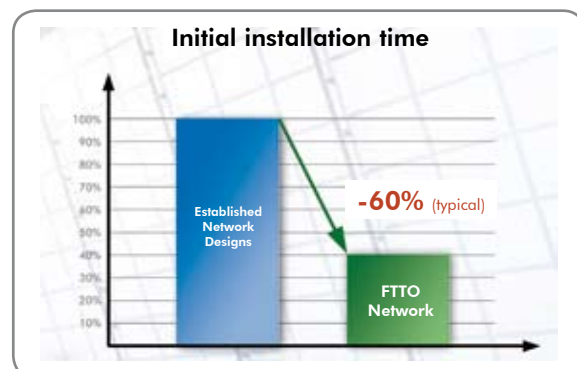
Thanks to the centralised structure of FTTO which makes the floor distributors unnecessary, the service of the network is greatly simplified and the service costs are significantly reduced. The service costs for the attendance and maintenance of air-conditioning, fire protection, uninterruptible power supplies etc. on the floors can be avoided.



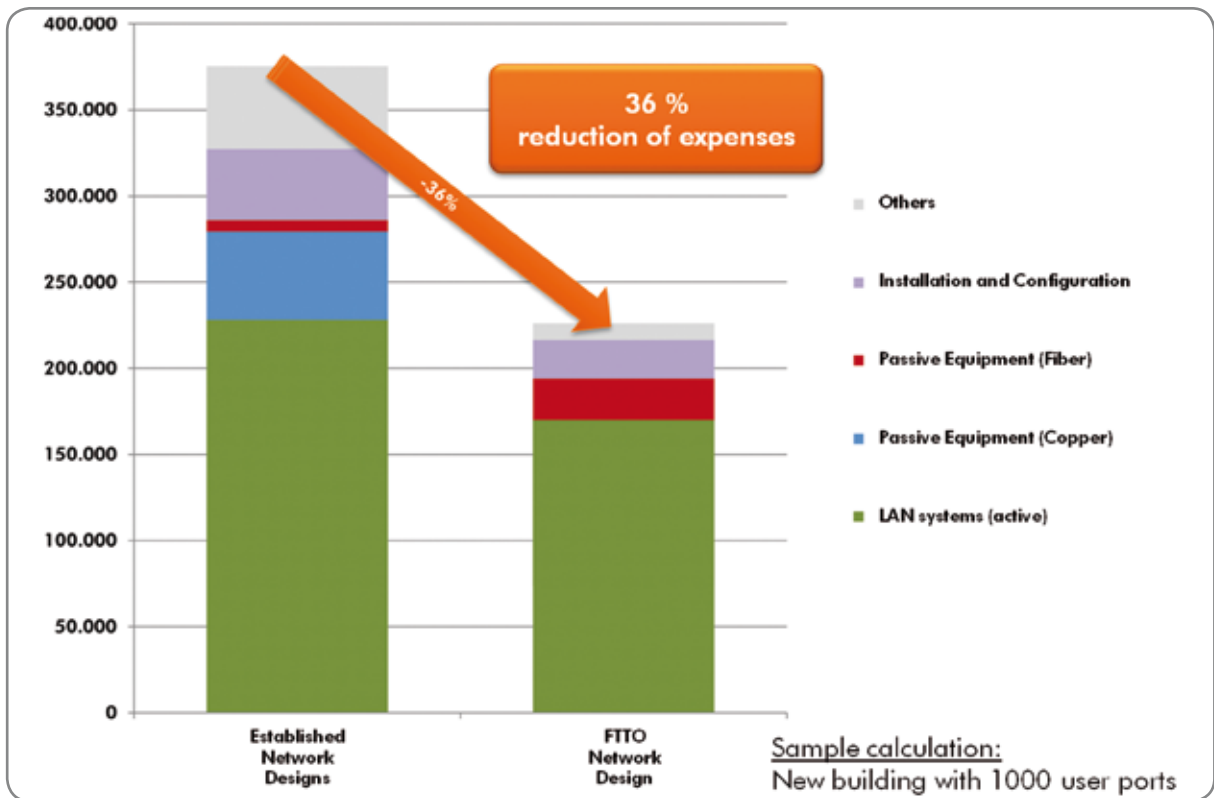
\* Includes: Active and passive components, installation services and building costs



\* Includes: Services for Infrastructure, Network Management Costs, Care Packs, Repair Services







In addition to the savings on the investment side, acquiring a fibre optic infrastructure brings many more benefits thanks to the cost-optimised service and handling of the network.

By including spare reserves of accessible fibre at low cost, network changes or new connection points can be added without disruption to existing services or users. This minimises any possible operation or production losses that can result while extending the network.

Regardless of all the advantages of a structured fibre-optic cabling, the decisive criterion often remains the cost of the complete infrastructure.

### **Fibre based infrastructure are 20-40% more cost effective**

During recent years the cost comparison has changed significantly. Infrastructures based on future-proof fibre optic are usually 20-40% cheaper than an established network design, whether it is a complete new construction or a network refurbishment.

**Accurate cost saving estimates for specific projects can be calculated after inspection of local conditions and requirements.**

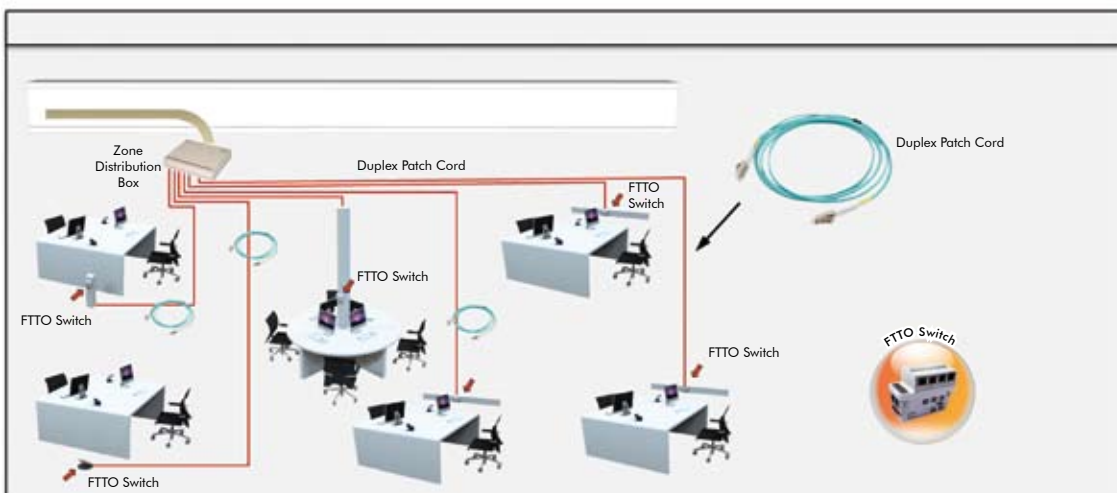
## FTTO Cabling Technologies by using pre-terminated assemblies

For large FTTO installations with a lot of fibre terminations pre-terminated solutions are often used to meet stringent project time requirements. The Pre-Term consists of a full dielectric round cable that has been terminated with LC connectors on both sides. The cable is waterproof, rodent retardant and UV stabilized. A high density fibre optic-cable is installed from the central distributor to a junction box on the floor. From here, the workplaces are connected via 2 or 4 fibres. The connection in the zone distribution box is spliced and the links to the workplaces use pre-assembled patch cords.



### Benefits

- Short & reliable manufacturing lead-time
- Fast installation times
- No specialised termination training required
- No consumables, termination tool kits
- No cable preparation necessary
- No cable or connector scrap
- No termination errors on site
- Delivered fully tested, labelled and documented
- High performing connectors:  
Max IL 0.35dB



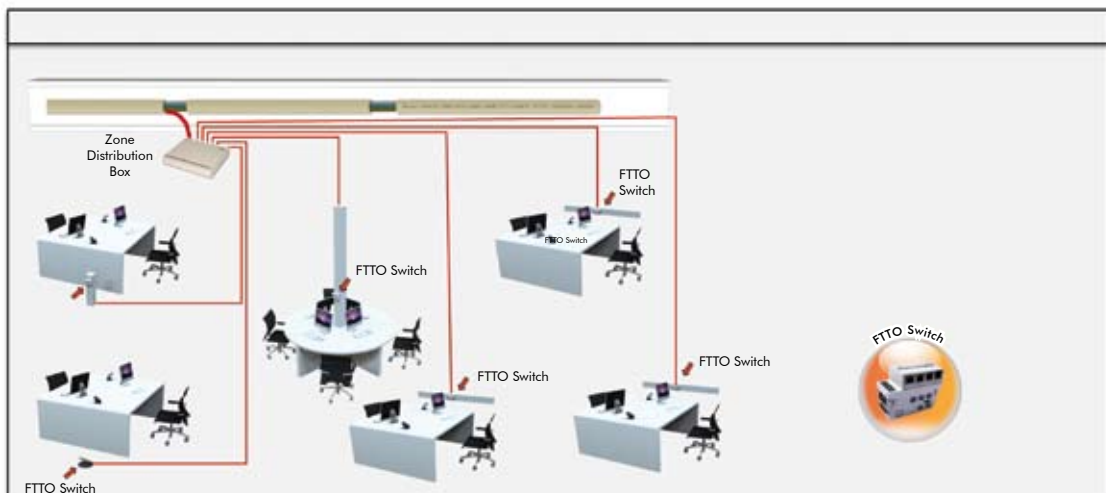
## FTTO Cabling Technologies

### Fibre Extraction

By using new cable solutions like high density fibre optic cables with extractable bundle technology, the required effort for the cable installation decreases considerably whilst providing redundancy. A high density fibre cable (up to 144 fibres) can be drawn in a loop through the selected parts of the building. At any location of the cable, future zone distribution points can be added allowing new outlets to be connected via pre-assembled fibre optic cables.

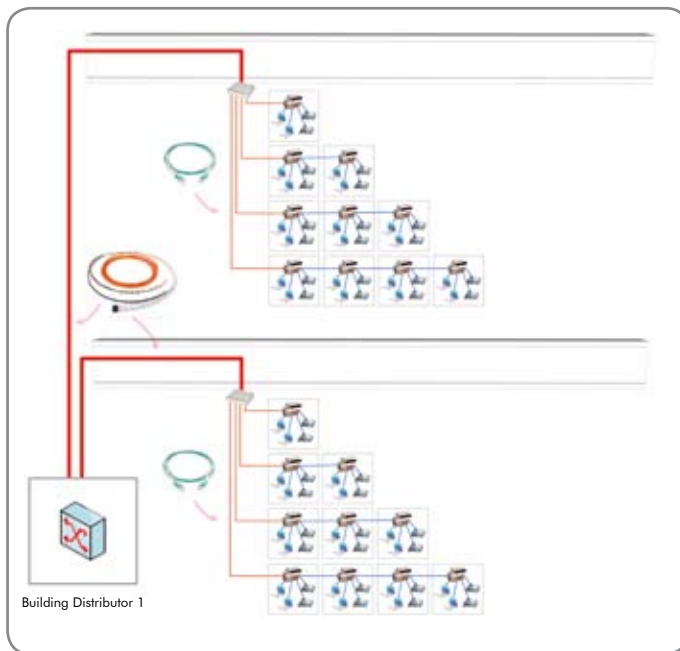
#### Benefits

- Maximum flexibility of the infrastructure
- Easy scalability
- Cost effective
- Minimum cable volume
- Maximum network availability by using ring topologies
- Highly cost effective solution



## FTTO Cabling Topologies without Redundancy

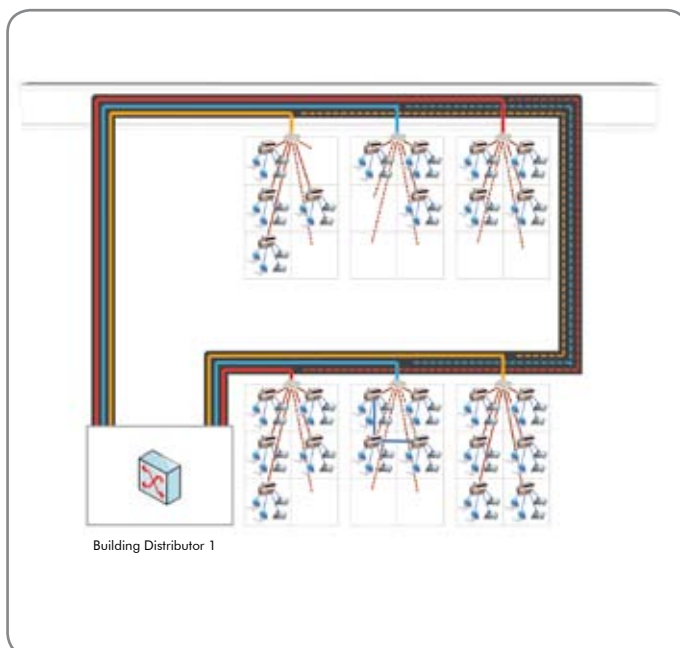
### Pre-Terminated - Physical Star Structure without Redundancy



#### Characteristics/Benefits

- 1 building distributor
- Connection in a Star pattern
- No redundancy
- Pre-terminated fibre assembly (up to 24 fibres) between building distributor and zone distribution boxes
- Short installation time
- High flexibility for future adds and changes
- Pre-assembled patch cords to the workplaces (microswitches)

### Fibre Extraction - Physical Ring Structure without Redundancy



#### Characteristics/Benefits

- 1 Building distributor
- Connection in a Star pattern
- No Redundancy
- Up to 576 active user ports with only one cable
- Short installation time
- High flexibility of the infrastructure
- Easy scalability
- Minimum cable volume
- Highly cost effective solution

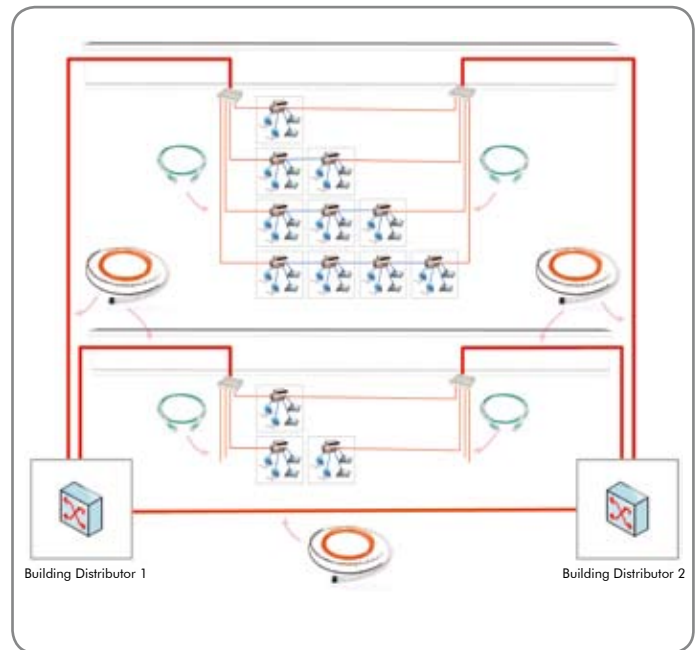


# FTTO Cabling Topologies with Redundancy

## Pre-Terminated - Physical Star Structure with Redundancy

### Characteristics/Benefits

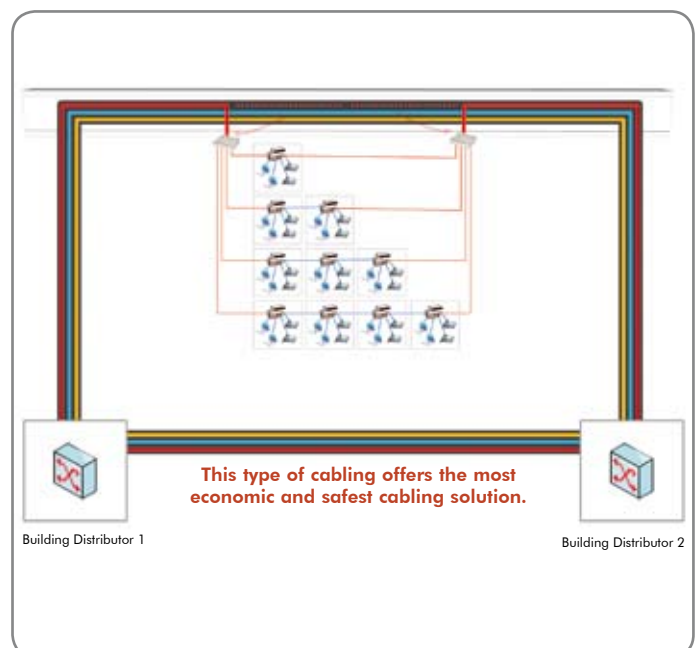
- 2 Building distributors
- Star connection with mini-rings of up to four microswitch systems
- Redundancy = high availability of the network
- Pre-terminated fibre assembly (up to 24 fibers) between building distributor and zone distribution boxes
- Short installation time
- High flexibility for future adds and changes
- Pre-assembled patch cords to the workplaces (microswitches)



## Fibre Extraction - Physical Ring Structure with Redundancy

### Characteristics/Benefits

- 2 Building distributors
- Redundancy (Building distributors and work places)
- Up to 1152 active user ports with fully redundancy could be realised with only one cable
- Star connection with mini-rings of up to four microswitch systems
- Maximum flexibility of the infrastructure
- Minimum cable volume
- Maximum network availability by using ring topologies and fully redundancy (RSTP/MSTP)
- Highly cost effective solution



# Green IT



## FTTO makes your network get green

The building sector in Europe is one of the major contributors to global warming and energy consumption. This is why Europe has implemented a “20-20-20” targets policy which aims at achieving by 2020 **20% reduction of EU greenhouse gas emissions, a share of 20 % of EU energy consumption produced from renewable resources and 20% improvement in EU energy efficiency.**

Sustainability is a big theme of society and is particularly relevant to business IT systems! In this field, a LANactive FTTO infrastructure provides a „green“ choice at both installation and operation and throughout subsequent future evolution. At installation, the removal of floor distribution immediately reduces the carbon footprint simply because there is less active and passive equipment required, therefore consuming fewer resources.

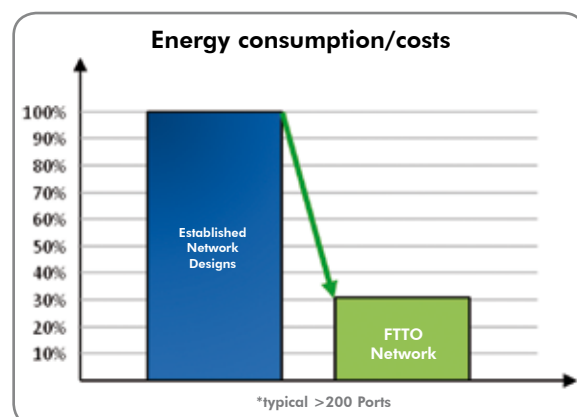
During operation, a LANactive FTTO solution presents numerous advantages and energy savings.

In the first place, energy hungry floor distribution rooms housing active equipment, air conditioning, and UPS systems are no longer required. Secondly, fibre transmission can half the energy required compared with equivalent copper

systems. The power consumption of a FTTO micro-switch is extremely low and FTTO networks tends to be better optimised in terms of installed active ports compared with the “unused ports” on floor distributor switches. In addition, the FTTO micro-switches support features like “eco mode” and Energy Efficient Ethernet (IEEE802.3az) which contribute to reduce power consumption by up to 30%.

Thirdly, because maintenance is facilitated, fewer staff are required to intervene on site for patching and diagnostics.

Finally, as a FTTO infrastructure is easily expandable, fewer additional resources are required when it becomes necessary to extend the network.



# LANactive

## Switch to the future

### All good reasons to switch to fibre - now!

#### **Fibre optic infrastructures are easy, economically priced and future proof**

Since there is no need for floor distribution in fibre optic networks, planning and installation is simple, cost-effective and flexible. Moreover, in the last few years, the prices for fibre based active and passive systems and the installation costs have significantly decreased.

At the same time, the performance of the FTTO microswitches has significantly increased.

As efficient energy management becomes more critical, a FTTO infrastructure provides managers with the flexibility to react to changing energy needs (i.e. increasing POE requirements).

#### **Fibre optic technology is established**

Use of fibre optic systems in the LAN is now standard. The technology has proven to be successful in operation and provides maximum operating reliability and a future-proof investment. The planning and installation of such fibre infrastructures is within the capabilities of any trained installer or contractor.

#### **New intelligent cabling solutions with minimal complexity and high redundancy**

Through the use of new cable technologies the complexity of the infrastructure can be minimised whilst redundancy can be created to increase network availability.

#### **Nexans LANactive FTTO solution is innovative whilst based on well-proven components**

With more than 30 years of experience in the production of optical fibre cables and over 25 years of experience in development and manufacture of Micro-Switches, Nexans has both the expertise and global presence to support your projects.

Furthermore, all elements of the LANactive solution are designed and manufactured by Nexans. This provides the confidence that comes from dealing with an established supplier with state-of-the-art R&D facilities to deliver continued development, consistent reliability and quality control to provide support and assistance with your FTTO projects.

## Nexans Micro-Switch for modern Fibre To The Office Infrastructures

The GigaSwitch V3 provides the ideal basis for the realisation of secure Gigabit Ethernet networks in FTTO environments. The modern design integrates seamlessly into the building environment. Devices such as PCs, notebooks or IP phones can be connected using standard twisted pair copper technology. Intelligent features help to increase the security of the network and minimise service costs.



Installation in cable duct



Installation in floor box



Installation in desk profile



## Nexans Micro-Switch for modern Fibre To The Office Infrastructures

### Reliability and durability

Nexans FTTO switch systems are used throughout the world and have proved their reliability and durability in many safety-relevant projects like hospitals, defence and public authorities. Products are manufactured by Nexans in Germany, using carefully selected components and permanent quality control according to current standards (ISO9001), to guarantee the durability of the systems.

### Horizontal and vertical installation with single 45mm design

The Twisted Pair switch module can be installed either vertically or horizontally. There is no need to order separate switch systems.

### Power Source Equipment (PSE+)

Thanks to the implemented Power-over-Ethernet Plus (PoE+) functionalities, VoIP-Phones, Wireless-Access-Points and IP-Cameras can be supplied with power according to IEEE802.3at from the switch directly.

### Memory Card with MAC Address

The optional Memory Card always stores the complete and latest configuration of the switch automatically. In case of a replacement you just need to take out the Memory Card from the old switch and insert it into the new switch.

### Powerful Management

Device management allows simple and secure configuration from a central location. Rapid Spanning Tree, Radius, prioritization, LLDP, IGMP, CDP, diagnostic functions and SNMP traps are some of the implemented features.

### Security

Nexans Switch systems support all relevant security mechanisms such as IEEE802.1x and MAC-based access control. In connection with a central authentication server, e.g. RADIUS, security in enterprise networks is considerably improved.

## I Features

- Adapted to many installation systems thanks to its 45x45 Snap In design
- Highest flexibility thanks to "Dual Mount Twisted Pair module" (only one type of switch for horizontal and vertical installation)
- Lowest power consumption thanks to Energy Efficient Ethernet (EEE) and ECO-Mode
- Full Gigabit Ethernet User Performance thanks to Backplane with 20 Gbit/s Performance
- Comprehensive Security functions (SCP, SSHv2, HTTPS, RADIUS, SNMPv3, IEEE802.1X etc.) and Integration in ARP Guard Secure Management
- Interoperability with all core switch vendors
- Power over Ethernet (PoE+) according to IEEE802.3at and af
- Memory card with MAC-Address (Backup of the switch configuration on the memory card)
- Free programmable function input with alarm functionality
- Constant monitoring of the optical parameters of the lines with threshold and alarm functions
- Cable Diagnostic for exact localization of errors on the twisted pair cable links



## LANactive product range (extract)

### Active LAN systems for FTTO



#### FTTO Micro-Switch with PoE+

- Gigabit Ethernet Switch
- International 45 mm Form Factor
- horizontal or vertical installation
- 4x 10/100/1000 Mbps Twisted Pair User ports
- SC fibre optic uplink (Multimode or Singlemode) or
- TP and SFP Uplink or 2x SFP Uplink
- System Configuration Backup on Memory Card and boot up with Memory Card MAC address and Configuration
- 54 VDC supply for microswitch and PoE+



#### FTTO Micro-Switch without PoE+

- Gigabit Ethernet Switch
- International 45 mm Form Factor
- horizontal or vertical installation
- 4x 10/100/1000 Mbps Twisted Pair User ports
- SC fibre optic uplink (Multimode or Singlemode) or
- TP and SFP Uplink or 2x SFP Uplink
- System Configuration Backup on Memory Card and boot up with Memory Card MAC address and Configuration
- 230 VAC supply for microswitch



#### SFP Pluggable Transceiver

- Fast Ethernet or Gigabit Ethernet
- Fibre Optic LC Connector
- Digital Diagnostic Monitoring Interface

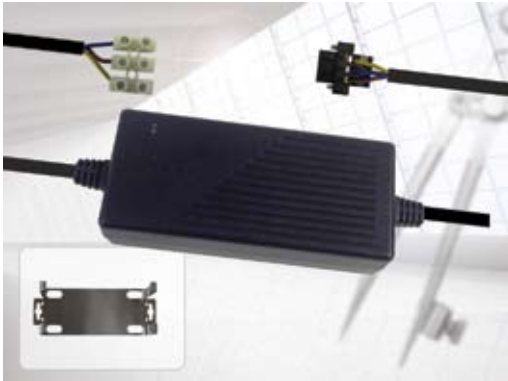


#### Accessories

- Cover sets for cable ducts
- Cover sets for floor boxes
- Installation kits
- Connectors for Power Supply Systems
- etc.

## LANactive product range (extract)

### Active LAN systems for FTTO



#### Installation Power Supply 54VDC/65W

- Power Supply for Installation Switch Systems with DC Input
- Dimensions: 120mm x 54mm x 32mm
- Output Power: 65 Watts
- Fanless System
- Control-LED, green
- Input voltage: 100-240 VAC
- Output voltage: 54 VDC
- mutual connection of function earth
- Low Voltage Directive „Protection Class II“



#### NexMan

#### Management and Configuration Tool

- Individual generation of master configurations (also single parameters selectable)
- Storage of configurations in a database (up to 100 history-entries)
- Layer 2 + 3 autodiscovery
- Time for the software update can be preset



#### Maintenance and Service Concept

This concept settles the type and content of services between Nexans Germany and the respective customer. Nexans Germany (Advanced Networking Solutions) offers the following service options:

- Repair Service
- Hardware Exchange Service
- Third-Level Support Service incl. Software updates
- Local support from Nexans product experts



#### Training

- Product Training Course (hardware and features of all ANS products and/or ANS products suitable to customer's application)
- Enhanced Network Management (configuration and management of the Nexans ANS products)
- individual „customer tailored“ trainings
- for 4 to 8 participants

## LANactive product range (extract)

### Passive LAN systems for FTTO



#### LANmark-OF Snap-In Panel

- Snap-In adaptors for fast installation and flexibility
- Up to 24 duplex LC snap-in adaptors
- Singlemode and multimode
- Sliding and removable tray for ease of installation, upgrade and maintenance
- Optimised for splicing and Pre-Term



#### LANmark Ruggedised Lockable ZD Box White

- Snap-In adaptors for fast installation and flexibility
- 12 numbered Snap-In ports with shutters.
- Singlemode and multimode
- Ruggedised design
- Lockable with key
- Designed to support installations with extractable fibre bundles
- White



#### LANmark-OF Micro-Bundle Extractible – up to 144 fibres

- Indoor cable for horizontal and vertical installations
- Flexible extractible bundle over 6 m
- Flame retardant (IEC 60332-1) and fire retardant (IEC 60332-3)
- Modularity of 12 fibres, 144 fibres/cables
- Designed for termination by splicing
- Dielectric design
- Round cable with maximum diameter of 8.8 mm
- Small bending radius of 100 mm



#### LANmark-OF Tight Buffer

- Indoor cable for horizontal and vertical installations
- Flame retardant (IEC 60332-1) and fire retardant (IEC 60332-3)
- Dielectric design with gentle glass yarns
- Fully waterproof, Rodent retardant, UV resistant
- Extended temperature range: -40°C to 70°C
- Available till 24 fibres

## **LANactive** product range (extract) Passive LAN systems for FTTO

### LANmark-OF Pre-Term

Factory Pre-terminated assemblies that combines ease of installation and outstanding performance.

- Pre-terminated solution for fast installation
- Indoor backbones for Local Area Network (LAN) applications.
- 100% customized with lengths available with 1m increments to avoid overlengths
- Full dielectric solution with round cable design for ease of installation
- Fully waterproof, Rodent retardant , UV resistant
- Fibre count: 6-12-24



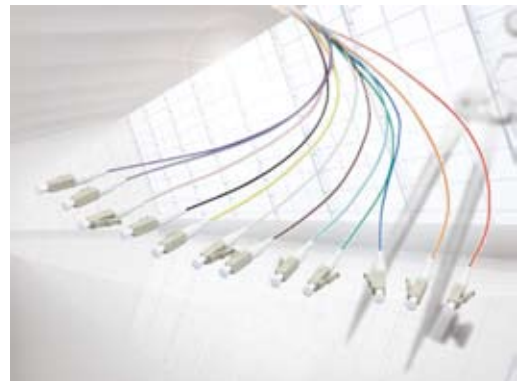
### LANmark-OF Duplex Patch cords

- Duplex LC-Duplex LC patch cords
- Available in OM3, OM4 and SM
- Aqua jacket for OM3, OM4
- Yellow jacket for SM
- For longer lengths: made to order with 1 m increments



### LANmark-OF Pigtails

- Tight Buffer Pigtails for splicing with Tight Buffer cables
- Maxistrip pigtails for splicing with Extractible Bundles
- Available in SM, OM3 and OM4
- Individually packed or as set of 12 different colours



### LANmark-OF Snap-In Adaptor

- Adaptor for Snap-In patch panel and ZD-box
- Fast and robust installation, no screws required
- Singlemode and multimode





## Success Story

### Johann Wolfgang Goethe University Frankfurt

#### Project characteristics and requirements:

- more than 5.000 FTTO Switches in use
- Four large university areas with large distances
- Only one patch room per building
- Very high safety requirements
- Power over Ethernet for VoIP Phones and WLAN Access Points needed
- High availability
- Different mounting requirements (cable duct, floor tanks, Labortische)
- 3 Data Ports per user in the average

The Johann Wolfgang Goethe University in Frankfurt am Main was founded in 1912 and opened in 1914. Since 1st of June 2008 it appears under the name Goethe University Frankfurt am Main. With around 41,000 students, the University is one of the five largest German universities by number of students. At the university more than 500 professors teach and research, 16 specialist divisions offer 170 degree programs.

The University is spread over four large university areas:

- Campus Bockenheim and Campus Riedberg
- Campus Westend with the House of Finance and the auditorium centrum
- Campus Niederrad

The university datacenter (HRZ) is the competence and service center for the University of Frankfurt. It operates the network for voice and data communications as well as the central IT services (eg e-mail, Internet services, e-learning, file and compute services), and public computer systems in computer pool rooms.

Due to the very large distances and the high safety requirements fibre optic in conjunction with intelligent Fibre To The Office systems technology was selected as preferred LAN infrastructure. Connected VoIP phones are powered directly with Power over Ethernet via the FTTO switch.

After extensive testing, the university choose Nexans as manufacturer and supplier for the FTTO microswitch systems. In addition to the reliability of the systems, the security features and the support played a significant role in the choice of the manufacturer.

**Meanwhile, over 5,000 FTTO systems are in use.**





**midt**  
regionmidtjylland

## Success Story

### Danish hospitals choose Nexans as partner for next generation fibre optic networks

#### Project characteristics and requirements:

- more than 10.000 FTTO Switches required
- 187,000 m2 of new construction and Integration of 57,000 m2 existing hospital buildings
- Four hospital locations will be merged and moved to one location
- Only two data center

The Danish Region Midtjylland has awarded Nexans a multi-year frame agreement for the delivery of 10.000 Ethernet microswitch devices. These access switches are the key component in an innovative fibre based Local Area Network (LAN) cabling concept called "Fibre-To-The-Office (FTTO)". The microswitches of the type "GigaSwitch V3" will be provided by Nexans Advanced Networking Solutions, a unit of Nexans Deutschland and the market leader for FTTO solutions internationally.

Within the scope of the contract signed by Kenneth Becker (Region Midtjylland) and Ole Nielsen (Managing Director at Nexans Jydske Danmark) Region Midtjylland will first deploy the innovative technology to upgrade the existing hospital in Viborg as well as equip the upcoming new hospital campuses in Aarhus (The New University Hospital, DNU) and Gødstrup (DNU). At a later stage it is planned to supply 20

smaller hospitals and other public institutions in the region.

"THE NEW CONCEPT PROVIDES US WITH THE BEST POSSIBLE FLEXIBILITY TO DESIGN OUR NEW BUILDINGS TO RESPOND TO CHALLENGING REQUIREMENTS OF MODERN HEALTH CARE INSTITUTIONS – AND THIS AT AN OUTSTANDING COST ADVANTAGE COMPARED TO MORE TRADITIONAL INFRASTRUCTURES. NEXANS HAS CONVINCED US WITH THE BEST IN-CLASS OFFERING RELATED TO BOTH PRODUCT PERFORMANCE AND VALUE" manifests Kenneth Becker.

In deploying fibre optic cables all the way to the outlets, the FTTO concept overcomes the constraints of legacy copper based structured cabling, thus eliminating the need for cost intensive local distribution rooms and providing an unmatched level of redundancy and network availability. Ole Nielsen is convinced that: "Region Midtjylland's visionary decision to become the first large scale FTTO user in Denmark is a major breakthrough for this concept on the Danish market. The decision for this fibre optic-based network will open new perspectives beyond hospital areas for future use in other building sites like airports, banks and offices in Denmark."



**N**exans network solutions are used throughout the world and have proved their reliability in many different ways. Our customers and references include leading companies in the world, power utilities, railway companies, airports, industrial properties, harbours and waterways. A LAN System which can grow with the needs of its users has to be designed right from the very start with such a level of flexibility to ensure that support is provided in particularly with frequent moves, adds and changes.

**With more than 25 years experience in the  
development and production of optical solutions,  
the systems from Nexans provide the reliability  
and the security you expect  
from your network.**

**LANactive**  
Switch to the future

**LANmark**  
Connect to tomorrow

**LANsense**  
Take control of your network

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