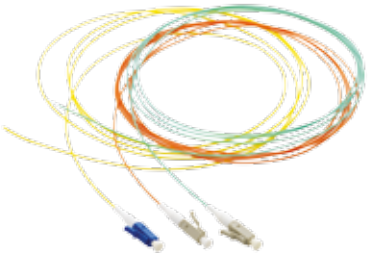
SUPERMOON
Powering modern work and life

Order at 訂貨熱線：
香港批發/分銷 T (852) 2781 2855
澳門批發/分銷 T (853) 2822 2751
工程/商業項目 T (852) 2691 9166
E enquiry@supermoon.hk
www.supermoon.hk

Nexans



FIBRE Solutions

Total Cost of Ownership
Applications / Solutions
Connectivity
Testing
Training
Warranty
Products

LANmark-OF

Nexans brings energy to life

Nexans brings energy to life through an extensive range of cables and cabling solutions that deliver increased performance for our customers worldwide.
Nexans' teams are committed to a partnership approach that supports customers in four main business areas: Power transmission and distribution (submarine and land), Energy resources (Oil & Gas, Mining and Renewables), Transportation (Road, Rail, Air, Sea) and Building (Commercial, Residential and Data Centers).
Nexans' strategy is founded on continuous innovation in products, solutions and services, employee development, customer training and the introduction of safe, low environmental impact industrial processes. In 2013, Nexans became the first cable player to create a Foundation to introduce sustained initiatives for access to energy for disadvantaged communities worldwide.
We have an industrial presence in 40 countries and commercial activities worldwide, employing close to 26,000 people and generating sales in 2014 of nearly 6.4 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.

In the field of LAN Cabling Systems, Nexans Cabling Solutions offer a complete range of products and value added services providing improved reliability and reduced cost of ownership for Network Managers, together with faster installation times for installers.

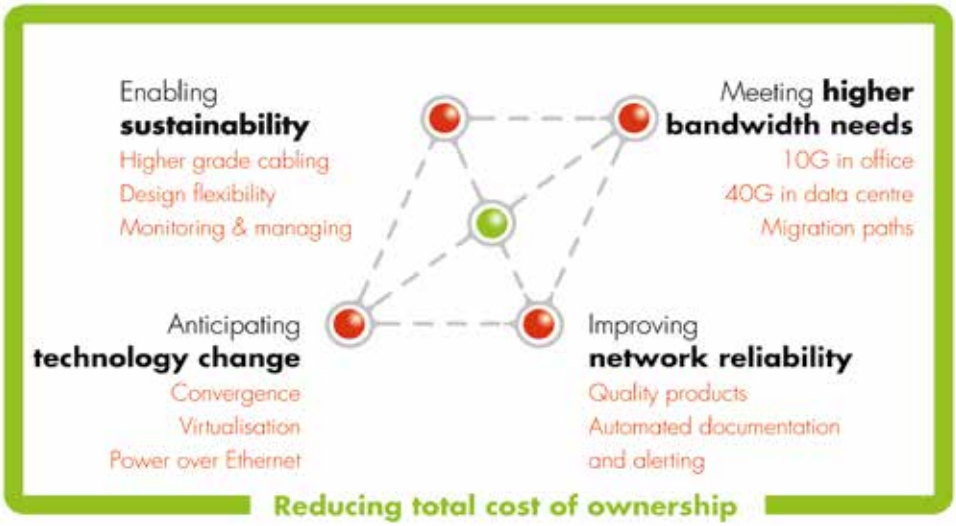
In addition to LANmark brand cabling systems and LANactive brand FTTO, Nexans also specialises in LANsense Automated Infrastructure Management (AIM) products including Environmental Monitoring and Access Control (EMAC) devices. Nexans offers an unrivalled choice of LAN infrastructure solutions to a global customer based through an extensive network of regional offices and Key Account Management team

Nexans Cabling Solutions
Alsembergsesteenweg 2, b3 - B-1501 Buizingen
Tel: +32 (0)2 363 38 00 - Fax: +32 (0)2 365 09 99
Nexans Cabling Solutions UK and Intelligent Enterprise Solutions Competence Centre
2 Faraday Office Park - Faraday Road - Basingstoke - Hampshire RG24 8QQ
Tel: +44 (0)1256 486640 - Fax: +44 (0)1256 486650

www.nexans.com/LANsystems - info.ncs@nexans.com

Table of Content

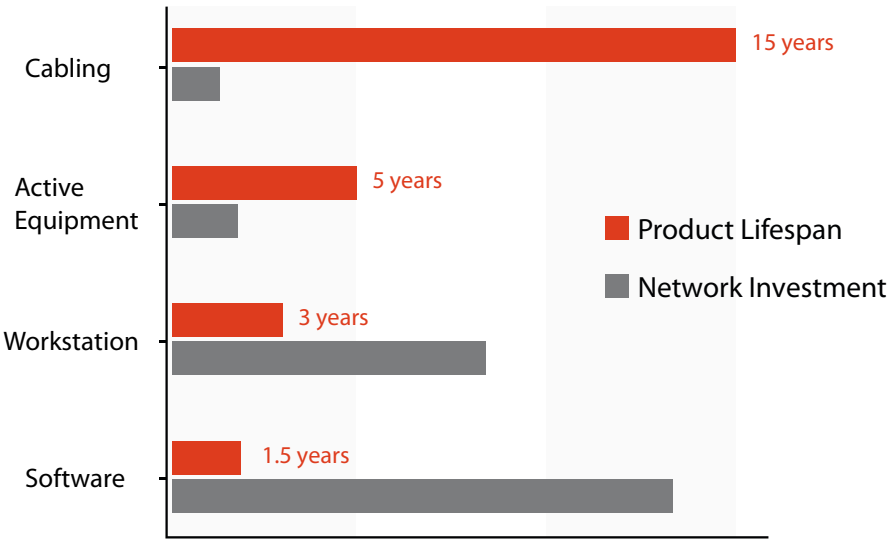
Good Cabling Reduces End-User's Total Cost of Ownership



The physical cabling infrastructure plays a critical role in key networking issues which has an impact on business performance.
Investing in the right solution and partner is not only an issue to consider during installation - the consequences will have a significant impact on the end-user's cost of ownership.

It is vital to plan for a cabling system that can support several generations of active equipment.

Lifetime of a good cabling system



Bandwidth Demand

Planning a smart migration path

"Traffic is expected to grow faster than Moore's Law, with a 10-fold increase in the next 4 years, a 100-fold increase in the next 8 years, making traffic in 2007 just 1% of the traffic expected in 2015!"
Deutsche Telekom

The global rate of growth of data is almost beyond comprehension. In 2010, 1,000 Exabytes of data (equivalent to around 250 billion DVDs) was produced; 75 percent by individuals and 25 percent by machines. The data produced by devices is set to increase due to the Internet of Things (IoT), as more and more devices will be connected to the Internet. In total, around 35 Zettabytes of data will be produced by 2020.

Reliability

Physical Security & Intelligent Monitoring & Management

"The ability to control change is without doubt the major contributor to business value"
British Computer Society (BCS)

Network reliability and security breaches can result in lengthy downtime and damage both business operations and reputation.
Reliability can be improved by adopting good quality products and using management systems which provide accurate and up-to-date knowledge of who and what is connected to the network at any specific time.

Technology Change

Anticipating & Managing IT Evolution

"Significant innovation continues in the field of IT driven by volume, velocity and variety of information"
IDC

Network cabling, whether in the office or data centre, has to be flexible to support changing technology trends:

- Virtualisation
- Cloud
- Top of Rack or End of Row
- Convergence
- Data Centre Ethernet

The choice of cabling will impact cost of ownership.

Sustainability

Cabling selection will impact energy consumption

"By 2020 IT will be more polluting than aviation"
The Economist

Increased demand for power caused by accelerating IT growth creates direct conflict for IT managers as environmental regulation intensifies and energy costs increase.
The need to plan data centre infrastructure to ensure that it is best equipped to maximise efficiency and reduce total cost of ownership has never been greater.

Applications

LAN/Enterprise

Today's LAN/Enterprise network manager must ensure that the network cabling system is prepared for the constant evolution of technology and user requirements. Nexans provides a whole range of excellent copper and fibre cables, connectors and pre-terminated products and suitable designs for the premises environment; from campus backbone infrastructure, to building entrance, to the desktop.

Data Centre/SAN's

Mission critical data centres and SANs require reliable, flexible and scalable fibre optic and copper cabling for their concentrated data storage areas. Nexans offers high density and bandwidth optical fibre cabling, addressing top-of-mind issues such as reliability and cooling. Pre-terminated and pre-tested cable assemblies reduce on-site installation time significantly. LANsense management system makes the maintenance easier after installation.

Education

Nexans offers a wide suite of cable products for educational institutions which take advantage of new converging technologies such as distance learning, distributed computing, interactive teaching tools and IP telephony.
From small schools to large university campuses, Nexans cable provides high-speed data and voice connections in classrooms, offices, labs and dorms, as well as in off-campus environments.

Finance

Financial institutions require 24/7 real-time networks that are fast, reliable and secure to keep the economy moving. From local banking to global online trading, financial transactions depend on constant connections. Detailed private records need to be accessible and secure. A high-speed, diverse cabling system that is scalable for this fast–paced environment is worth its weight in gold.

Healthcare

Trans-global research sharing allows life-saving remote diagnostics and proper patient treatment. This can only be achieved through a high–speed, high-bandwidth cabling system. From accessing patient records to transmitting extremely large bandwidth graphic files, such as RMI's and other high-resolution imaging, today's medical activities rely on their cable network. Galvanic isolation of medical network equipment is another specific requirement. As today's hospitals migrate to a paperless environment, file transfer and storage considerations have become a key factor in cable selection.

Retail

Retail communication requirements increase. Efficiency improvements to track sales and speed up PoS transactions require high quality LAN cabling.
Nexans can help you to identify the right type of infrastructure to meet the different needs of your headquarter, data centre, warehouse and stores. High performance and low maintenance cost are ensured. Our LANmark, LANactive & LANsense cabling and monitoring solutions offer the flexibility to make changes and deploy new technologies such as converged IP networks, including security cameras.

LANmark Fibre Optic Solutions

A fibre technology leader for more than 30 years, Nexans has the experience to take your business into the future with cables, accessories, and sophisticated network management systems that are ready today for tomorrow's innovations.

Cable structure

The cable structure is defined to protect optical fibres and is typically made of three elements:
- The optical fibres for the light transmission,
- Some reinforcement elements to support any tension applied on the cable,
- An outer sheath for a complete protection of the structure.

These elements have to meet specific parameters (mechanical, thermal, chemical) to cope with the environment constraints and the installation modes.

Cable families

Cords

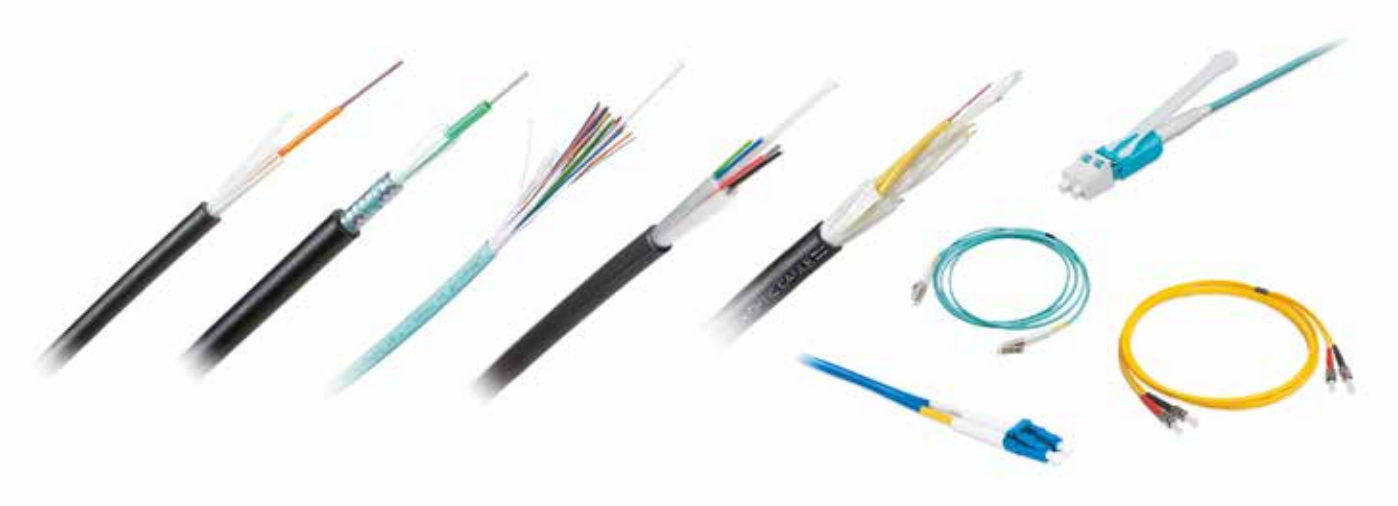
These cables are mainly used to make patch cords or pigtails and connect different optical devices, its 900 µm buffer structure being optimized for connectorization. Each fibre is individually protected to allow easy handling.

Distribution cables

These cables are made of several 900 µm tight-buffered structures for easy connectorization. This cable structure provides a global protection for all the fibres. Such cables are mostly used in vertical cabling or in locations where the cable is not frequently handled (i.e. outlets) - compared with cords.

Loose tube cables

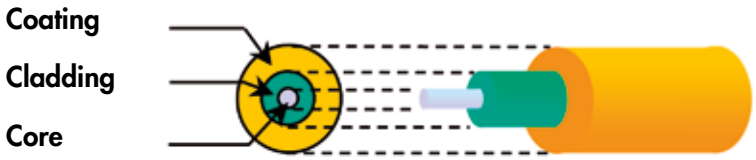
This traditional and robust structure is a good solution for access and distribution for campus. The fibres are placed within a jelly filled tube. For low fibre count, central unitube structure is available up to 24 fibres. For higher fibre count, multitube structure is made of an assembly of different tubes around a central strength element.



General overview on optical fibres

Optical fibres are used to transmit information over long distances and with high bit rates. Their benefits are numerous. First, the signal transmitted on the fibre is not disturbed by any electromagnetic wave created by power cables or electric machines. It also provides more security, as these cables can be fully dielectric. Besides, they provide a weight and space saving due to their small diameter, only 250 µm.

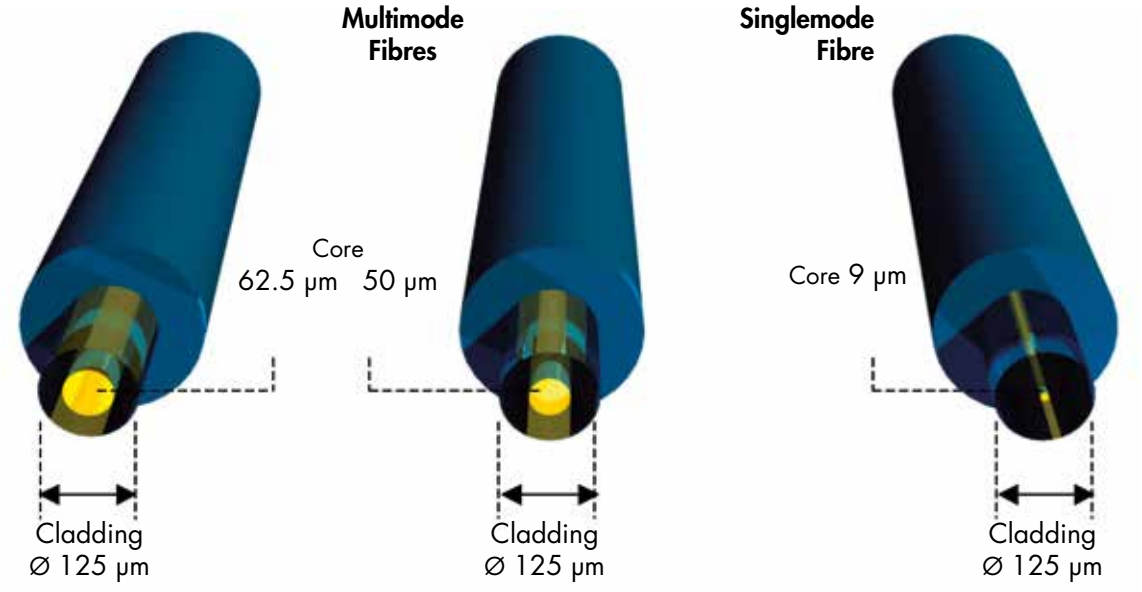
An optical fibre is made up of three main parts: the core, the cladding and the coating.
The center part, the core, is made of doped silica and is surrounded by the cladding, made of natural silica. The light signal propagates along the core and the signal is reflected on the surface between the core and the cladding. An acrylic coating, usually made out of two layers, is protecting the silica part against abrasion during the installation.



Different fibre types are available:

Multimode fibres are mainly used for Local Area Networks (LAN) where the networks links can be up to 2000 meters. Two standard sizes of core are offered: 62.5 µm and 50 µm (with better performances). Multimode fibres have a graded index profile to increase the bandwidth and consequently the authorized bit rate up to 100 Gbit/s. The high size of the core is interesting for easy connection and does not require high cost test equipment.

Singlemode fibres are able to transmit over longer distances. The installation requires more expertise as they have a smaller core of 9 µm. This implies more precise connectors.



On a global network point of view, although the cost of multimode fibre is more important than the singlemode's, the complete system is more economic. Indeed multimode fibres are used with cheap transmission components LED[1] or VCSEL[2] whilst singlemode fibre operates with more expensive laser.

[1] LED: Light Emitting Diode
[2] VCSEL: Vertical Cavity Surface Emitting Laser

Comprehensive fibre solutions

Vertical cabling

Also known by the name “backbone”, vertical cabling ensures the connection between floor distributors and the building’s central distributor. This cabling is composed of fibre optic cables for data transmission and copper multi-pair cables for telephony.

Nexans offers a complete fibre optic range which is selected depending on the application and the distance to be covered.

Drive distances (m) - MTP Low loss, 2 MTP modules

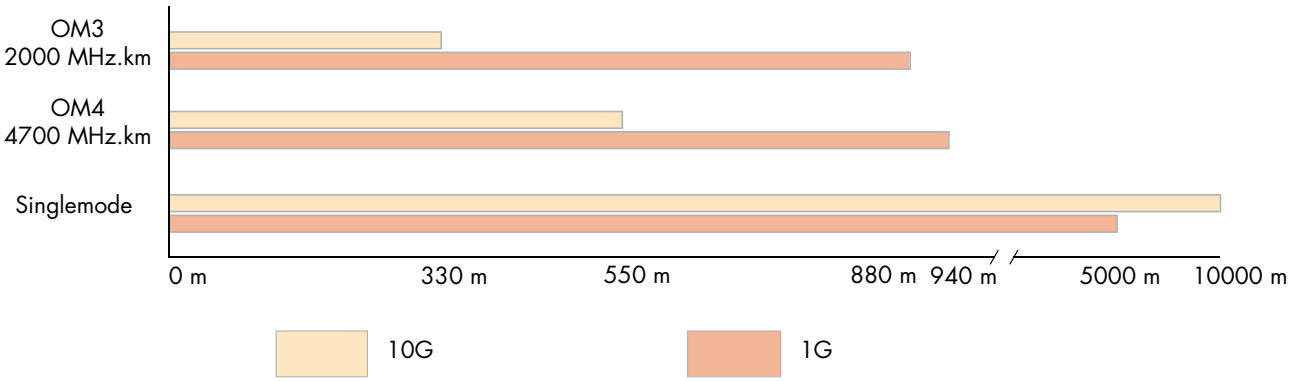
	OM3	OM4	SM
1Gbase SX (LX)*	880	900	5000
10GBaseSR (LR)*	330	520	9000
40GbaseSR4 (LR4)*	130	150	10000
100BaseSR10 (LR4)*	130	150	10000

Drive distances (m) LC-LC , 2 connectors

	OM3	OM4	SM
10GbaseSR (LR, SX)*	330	550	10000

**LR/LX = Standards for SM*
(For channels with more connections or extended drive distances pls check our Warranty Modules)

Extended distance support



FTTO Active & Passive Solutions

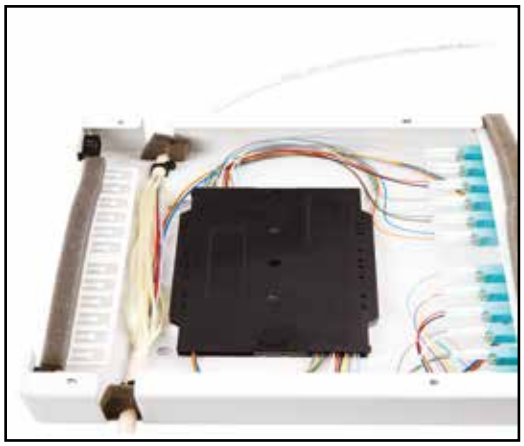
LANactive Fibre-To-The-Office switch

LANactive is an alternative approach to structured cabling using fibre-to-the-office (FTTO) topology and active switches to provide standard ethernet services to devices via standard copper based RJ45 technology.

The approach can provide significant cost benefits in specific types of environment such as:

- long distances within the building
- space restrictions for floor distributors or cable trays
- refurbishment with minimum disruption
- redundancy at user level

Extractable Bundles



The new Micro-Bundle technology from Nexans allows to manufacture a flexible and small tube. This Micro-Bundle is the central part of the new "LANmark-OF Micro-Bundle Extractable" cable design. The Micro-Bundle can be extracted over 6m from the cable. The cables are available with a bundle modularity of 4, 6 or 12 fibres. The Micro-Bundle contains fibres with a fibre diameter of 250 µm. Termination of these fibres is done with splicing with pigtails.

The Micro-Bundles are arranged around a central strength element. Aramid yarns provide additional strength and make the cable installer friendly. The combination of the Micro-Bundle technology, the central strength element and aramid yarns result in a mechanical robust, but also small and flexible cable. The small bending radius of the LANmark-OF Extractable Micro-Bundle makes the cable easy to arrange in patch panels, in cable trays and in ducts. The LANmark-OF Extractable Micro-Bundle complies with the indoor fire requirements. Since there is no drip effect of the very limited amount of gel the cable is optimized for both horizontal and vertical installations.

Reliable Fibre Optic Cables

Environment constraints

Indoor installation

An **indoor cable** is manufactured with materials that limits fire hazards. The sheath is described as LSZH-FR, which stands for:

- **LS (Low Smoke)**: Reduced emission of smoke when the cable is burning.
- **ZH (Zero Halogen)**: The material is halogen free and does not emit toxic or corrosive smokes when burning.
- **FR (Flame Retardant)**: Material does not propagate flame and is self-extinguishing when exposed to the flame.

Outdoor installation

An **outdoor cable** is not concerned by the fire behaviour. It is conceived with resistant outer sheath, generally made of polyethylene to resist to more severe environment constraints (abrasion, temperature variation, crush resistance, ...). It features a watertight conception, obtained by using jelly and/or swellable elements, to stop the water propagation within the cable in case of cable accident. This essential characteristic guarantees fibre and system performances.

Outdoor cables can be installed in ducts or **directly buried** if featuring an armouring resisting to crush and rodent aggressions. **Duct cables** do not need rodent protection, as the size of the duct is too large for the rodent jaws.

In some case, Indoor-Outdoor structures are required. They combine the watertightness characteristics and LSZH-FR sheath.

Dielectric structure

Optical fibre cables are mostly supplied with a **dielectric** (or metal free) structure**.**
It prevents any risk related to induced currents that can propagate on metallic structures and avoid electrocution risks.

Rodent protection

Cables can be damaged if located where rodents are present.
Different levels of protection are available:

- **Glass yarns** are the first level of protection and often considered as a rodent retardant.
- **Dielectric armouring** is a very efficient protection made of plastic reinforced by glass fibres (FRP - Fibre Reinforced Plastic).
- **Metallic steel armouring** is the most effective protection.

Apart from these categories of fibre optic cables, Nexans also offers various types of sheathing. The choice of external sheathing is determined by the environment in which the cable in question will be installed.
Internal cables and those to be installed in a temporary pipe are equipped with a LSZH (Low Smoke Zero Halogen) type external sheathing. Cables to be buried, in the ground for example, are provided with an external sheathing in PE (polyethylene).

Tight Buffer or Micro-Bundle – it's up to you

In addition to its well-known Tight Buffer fibre cables, Nexans now has a new alternative – the innovative Micro-Bundle. While Loose Tube remains a good construction, new Micro- Bundle technology offers many advantages in comparison.

Less space – smaller bending radius

The key of the new design is an advanced, flexible and smaller tube with thinner wall thickness. The diameter of Micro-Bundle tube filled with 12 fibres is roughly the same size as one Tight Buffer fibre. With this flexible construction the bending radius and the diameter of the cable is reduced by 50 % compared to traditional Loose Tube designs.

Optimised for horizontal and vertical installations

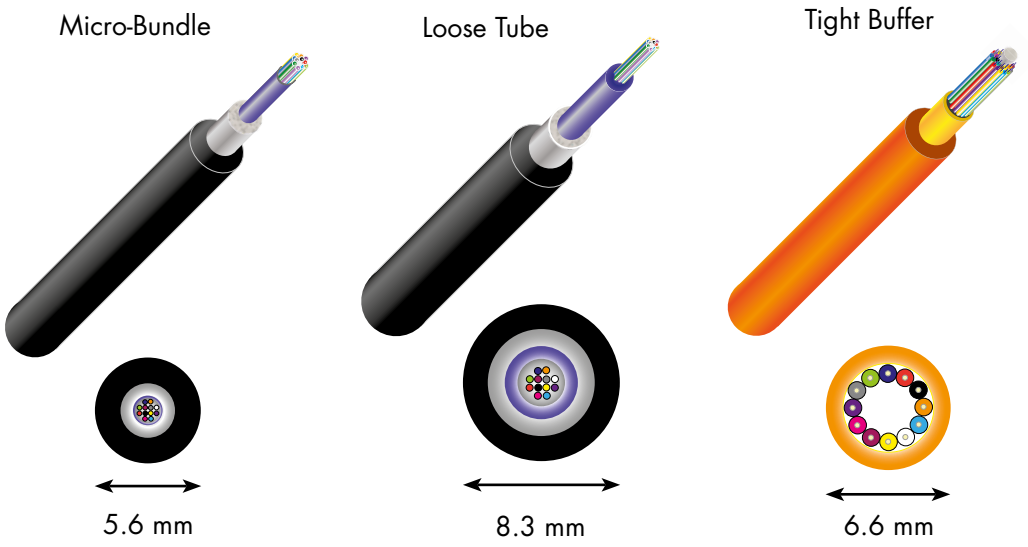
Micro-Bundle cables contain much less gel than traditional Loose Tube cables. Therefore, there is no drip-effect making it perfect for horizontal as well as vertical installations. And of course, almost no gel means Micro-Bundle cables are easier to clean.

Universal cables

Both versions – Tight Buffer and Micro-Bundle - are available as Universal cables. They are optimised for both indoor use as for outdoor installation in a duct.

Excellent fire and flame retardant properties

Both the Indoor and Universal versions of the Tight Buffer and Micro-Bundle range have excellent fire and flame retardant properties and comply with the standards IEC 60332-1 and -3.



	Tight Buffer	Micro-Bundle	Loose Tube
Universal (Indoor and outside in a duct)	Tight Buffer Universal	Micro-Bundle Universal	UC LSZH
Outdoor with corrugated steel			UC PE
Outdoor with dielectric armouring			UD PE

UC = Unitube Corrugated
UD = Unitube Dielectric

Reliable connectivity

An optical fibre connector terminates the end of an optical fibre. Termination can be done in the field or by splicing. The connectors mechanically couple and align the cores of fibres so light can pass.

LANmark-OF contains cutting edge connectivity products including connectors, couplers, pigtails, patch cords,…
Each product has been thoroughly developed to ensure best system offering while meeting stringent international standards.

Over the years many different fibre optic connectors have been introduced to the market. Nexans supports the most important ones:

ST

Straight Tip- or ST connectors have been very popular during the first half of the '90s and can be recognized by its half-twisted bayonet type of lock.

SC

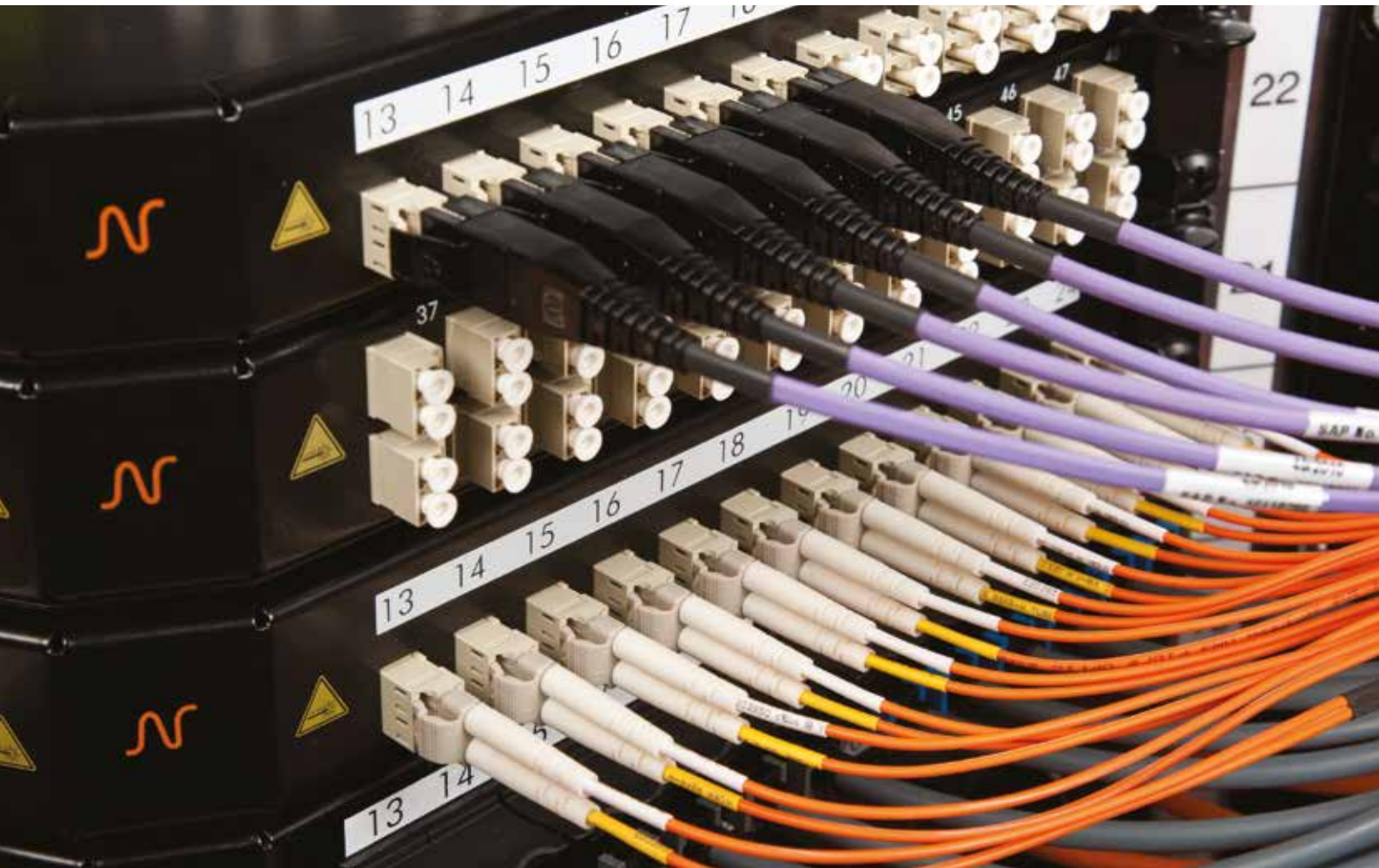
SC stands for "Square Connector" or "Subscriber Connector". This connector has been very popular well into the 21st century. It is famous as a push-pull connector.

LC

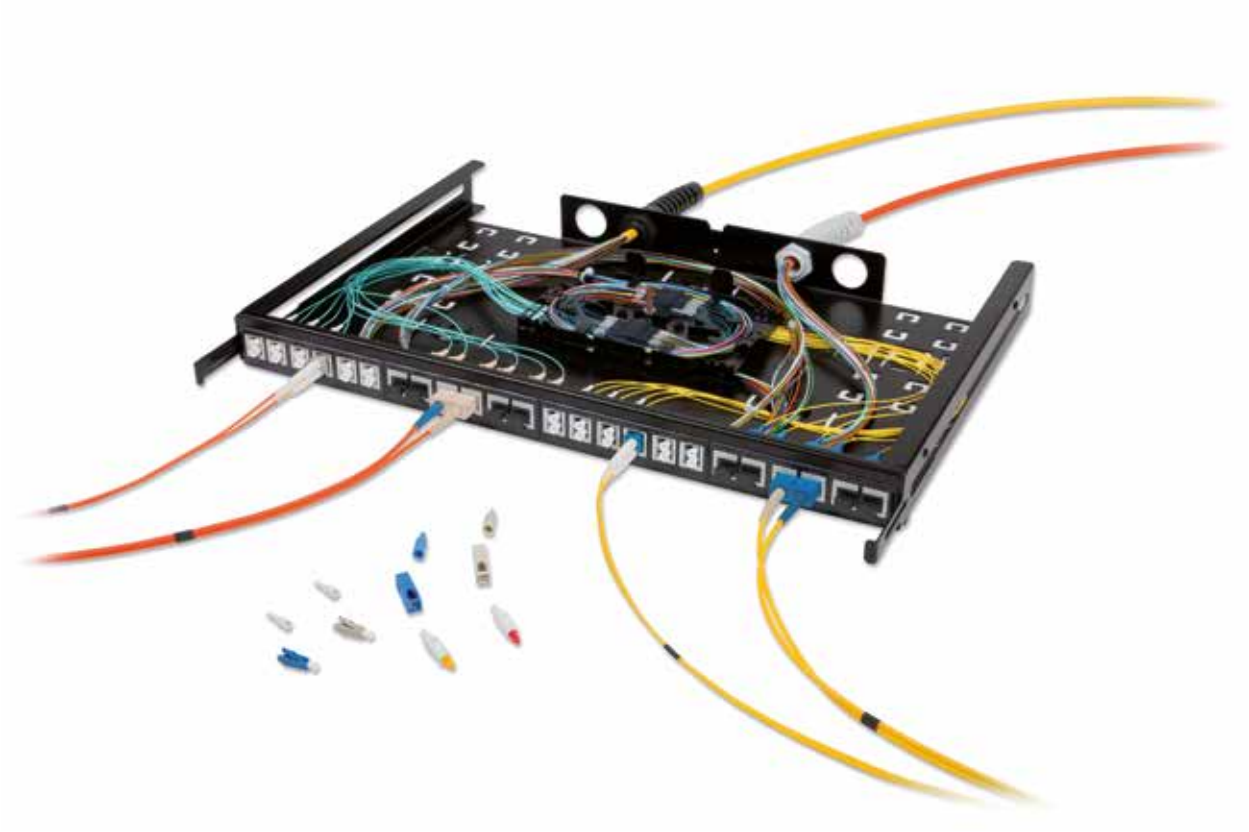
Over the last decade small-form factor (SFF) connectors have become popular, especially LC. LC stands for "Lightwave Connector", but is sometimes also referred to as "Little Connector", indicating its half the size of a SC connector.

MPO

Multiple Push-On connectors are designed to contain multiple (12) fibres that are required to support 40G and 100G Ethernet over multimode fibre optic. Nexans offers superior quality with its low-loss MTP connector.



Complete range of connectivity solutions



When quick connectivity is required, Nexans offers complete systems of cables and splice cassettes, metal and heat shrink splice protectors, pigtails and patch cords designed for easy use.

LANmark-OF splicing solutions

Splice cassettes are optimised for LANmark-OF pigtails and are easily integrated inside the LANmark-OF patch panels. Pigtails are available for all connector and fibre types.

LANmark modular Snap-In system

Nexans has designed a diverse assortment of outlets, distribution boxes and patch panels that use the same modular Snap-In adaptor.

The modular approach simplifies stock and logistics, and enables different connector or fibre types to be mixed in the same equipment.

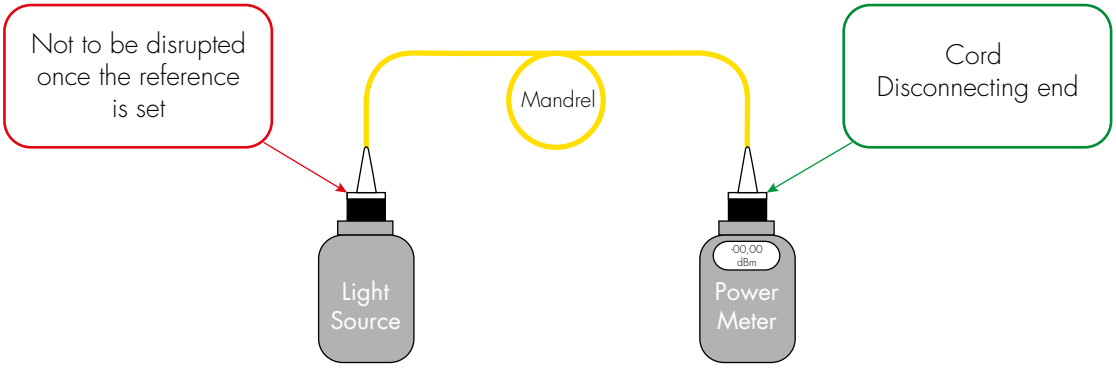
By eliminating traditional screwed adaptors, LANmark-OF Snap-In connectors save 1 to 2 minutes installation-time per adaptor, significantly reducing cost on site.

Testing

Two different methods are recognised and standardised to test optical fibre installations in the field:

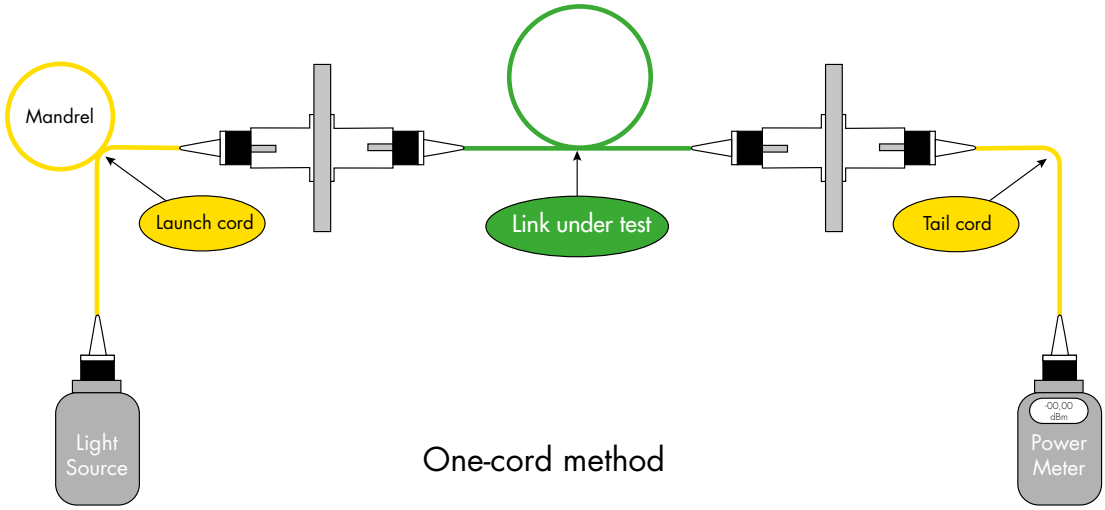
1. LSPM – An insertion loss test made with a Light Source and Power Meter; it is a simple test that places a light at one end of the cable and a power meter measures the optical loss at the other end. Nexans recommends one-cord test set-up (or two-cords in case adaptors of the LSPM head are not interchangeable). Nexans does not recommend a three-cord test set-up.

Reference power measurement



One-cord method

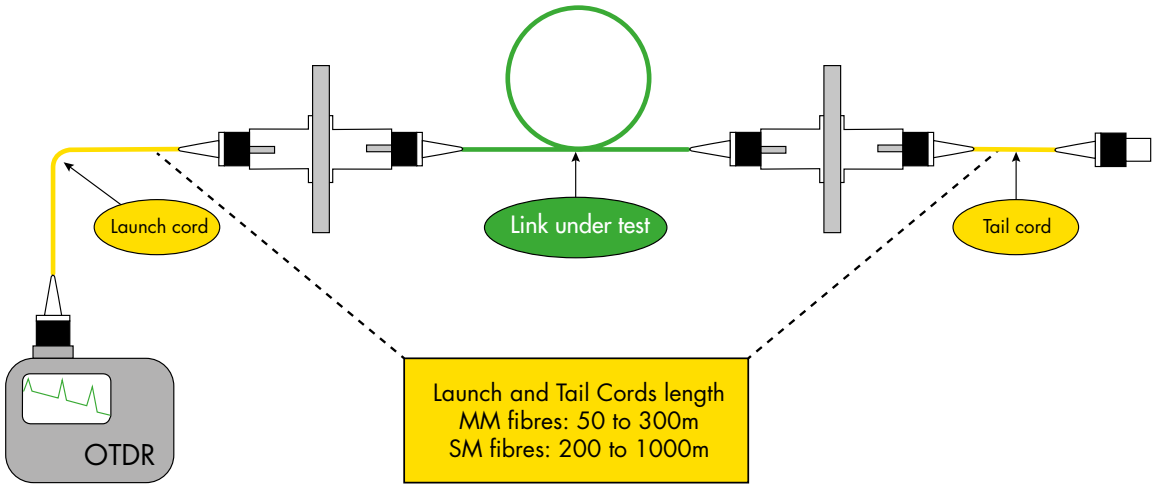
Test power measurement



One-cord method

2. OTDR – Optical Time Domain Reflectometer – works like a radar. It sends a pulse down the fibre and looks for a return signal from fibre backscatter and reflections from joints, creating a display called a "trace" from the measurement of the fibre. From this trace, the OTDR calculates fibre length, attenuation and joint loss. So it does not "measure" loss directly, it implies it from the trace. OTDR are mostly used to measure outside plant cables of long distances containing several splices to ensure that the cable has not been damaged during installation and each splice is properly made.[1]

OTDR characterisation using a launch cord and a tail cord



Cleaning

The cleaning of optical fibre connectors prior to the installation of patch cords etc has become a critical factor. Latest, fast speed applications such as 10G Ethernet, have stringent link loss requirements and in order to ensure that the required performance levels are achieved during commissioning and operation, the cleanliness of all fibre interfaces needs are vital.

[1] Courtesy: The Fiber Optic Association (FOA)

Training

In order to provide end users with maximum confidence, Nexans Certified Solutions Partners (CSP's) must pass training to ensure they are competent to install LANmark solutions to the required standard and able to offer the full Certified Solution Warranty.
Courses are typically based on the following formats although training may vary slightly by country depending on local requirements and needs. However the programmes are all based on a standardised Training Modules to ensure a minimum standard and consistency around the globe.
Contact us to get details of training courses in your region.

Training												
Qualification	**Modules**	1	2	3	4	5	6	7	8	9	10	11
Supervisor Cu & FO	3 day course	x	x	x	x	x		x	x	optional		x
Supervisor Cu	2 day course	x	x	x	x	x						
Supervisor FO	2 day course	x						x	x	optional		x
Supervisor Cu	1 day course	*NOTE		x	x	x						
Supervisor Cat.7A	2 1/2 day course	x	x	x	x	x	x					
		* Participants require existing knoledge of topics covered by Modules 1 & 2 which will be included as part of final assessment										
CSP warranty requirements												
Copper (Cat.5e - 6A)		x	x	x	x	x						
Cat.7A		x	x	x	x		x					
Fibre		x						x	x	optional		x

No matter what your level is, we'll find the best training program meeting all of your needs. The LAN technology evolution requires a wide and varied range of skills. No two projects are the same and our partner's position is important in this business. The aim is to find the synergy between your needs and our training program.

In order to make this "level training" program possible, the training has been divided into different modules to address different topics aimed at different people.

Installers, Project Managers, Designers, Consultants and Architects, Commercial Staff that would like to improve their sales techniques, End Users .Trainees can obtain a "Nexans Cabling Solutions Expert level certification" when they succeed in the 3-day Expert training.

Training Modules Overview

Commercial:

Nexans Copper Cabling Solutions - Module 3

Nexans Optical Fibre Cabling Solutions - Module 8

Data Centre Cabling Solutions - Module 12

Expert Knowledge:

Premises Cabling Standards - Module 1

Parameter for Copper Cabling - Module 2

Installation Rules and Guidelines - Module 4

Optical Fibre Theory and Principles - Module 7

Hands-on:

Installation Practice & Testing Class D-E-E_A Links - Module 5

Installation Practice & Testing Class F-F_A Links (GG45) - Module 6

Fibre Installation Practice with Direct Termination - Module 9

Fibre Installation Practice on Fusion Splicing - Module 10

Testing Optical Fibre Links - Module 11

Project support

Calculation Toolkit v1.3

Fibre Cable Selection Tool
Power Segregation Calculator
Horizontal Link Length Calculator
Cable Tray Fill Calculator
Stacking Height Calculator
NVP Effect
Length Accuracy

Nexans Visio Template 3.2 with NVT 3D

Create professional rack diagrams
Export BoM to XLS
includes LANmark, LANsense, essential & now EMAC
3D tool for schematics

Warranty Information

Fully Comprehensive or Self Certification options

What is included	Certified System Warranty
Brands covered: LANmark LANconnect Essential	 ✓ ✓ -
Copper categories covered: Cat5e Cat6 Cat6A Cat7A	 ✓ ✓ ✓ ✓
Fibre	✓
Parts	✓
Link performance	✓
Full end-to-end channel	✓ *
Application guarantee	✓ *
Extended distance support	✓ **
Installation liability	✓ ***
Nexans Checked & Validated	✓
Validity	25 years

* with Nexans Patch cords
** with specific products
*** when installed by Certified Solution Partner (CSP)

Certified Solution Warranty

Complete confidence

A complete package covering parts, channel performance, applications and labour.

The complete Certified Solution Warranty is the most comprehensive guarantee on the market covering:

- Copper and Fibre
- Channel Performance for Horizontal, Campus and Backbone
- Application support
- Labour(*)

(*) Nexans take liability for Labour when installation is made by a full Certified Solution Partner

LANsense Systems | Warranty Module

- **Products**
- **Applications & Performance**
  - LANmark-5
  - LANmark-6
  - LANmark-6A
  - LANmark-7A
  - LANmark-OF
- **Duration**
- **Exclusions**

edition 09.06.2009

Nexans

Nexans

Warranty

Certified System

Nexans Cabling Solutions

Optical Fibre
LANmark Patch Panel
for Snap-in adaptors

PRODUCT INSTALLATION GUIDE

November 2012

Nexans

Nexans

OF connector Inspection,
Cleaning & Testing
General Guidelines

White Paper
Nexans Cabling Solutions
September 2010

Nexans

Optical Fibre Cabling Sub-system
Field Testing Procedure
(NCS / November 2008 – Revision 3.00)
Summary Document

1. Introduction

In respect to warranty application, this document summarises the mandatory requirements for the testing of Nexans Cabling Solutions (NCS) optical fibres lines.

For further information, a more comprehensive NCS document is available at ….

This new procedure has been produced due to :

- the current evolution of the both relevant standards (ISO 14763-3 & ISO 61280-4-1)
- the discrepancies between the above two ISO documents.
- the lack of information about the practical use of some of the new requirements.

NCS has issued this new version of its testing procedure taking into account both legacy and new Standards requirements.

For warranty certification purposes, NCS will accept testing

- Performed with **either LSPM (Light Source & Power Meter) or Optical Time Domain Reflectometer (OTDR) test equipment**

and undertaken according to

- The legacy procedure as **per ISO11801**
  - Using standard grade test cords
  - ISO11801 attenuation limits

NCS requires the use of the one-cord method, or the two-cord setup 2 method (ISO 61280-4-1 draft 2008) if the connector on the LSPM test equipment is not inter-changeable and different to that of the ones on the OF link to be tested.

N.B. The use of the 3-cord method (LSPM testing) is not supported by NCS.

2. The NCS Certified System Warranty

For both LSPM and OTDR testing the analysis of the test results (Comparison of the measured attenuation against the standard limits) has to be performed by the operator.

NCS requires the submission of full test reports including the "Pass" margin. 100 % of the installed OF links have to be tested and must pass the acceptance criteria in order to apply for NCS LANmark warranty certification.

If your chosen tester does not deliver an automatic report, the updated Complementary OF Warranty Application Form (developed by NCS) has to be completed in order to provide NCS with the full data.

This form can be downloaded from the NCS website: http://www.nexans.com/lansystems

N.B. In the Certified Solution Warranty section, all warranty documentation can be downloaded.

December 2008
© Nexans Cabling Solutions 2008

Page 1/1

Installation Guide

OPTICAL FIBRE CABLE

January 2014

Nexans

Nexans

Recommendations to maintain
duplex OF channel polarity

Technical Paper
Nexans Cabling Solutions
October 2004 • Version 1.0

General
Installation
Guide

April 2014 v2.0

Nexans

LANmark-OF OM2 | Warranty Module

Fibre Systems for Campus, Risers & Horizontal

- **Products**
- **Applications and distance support**
- **Duration**
- **Exclusions**

edition 29.06.2012

Nexans

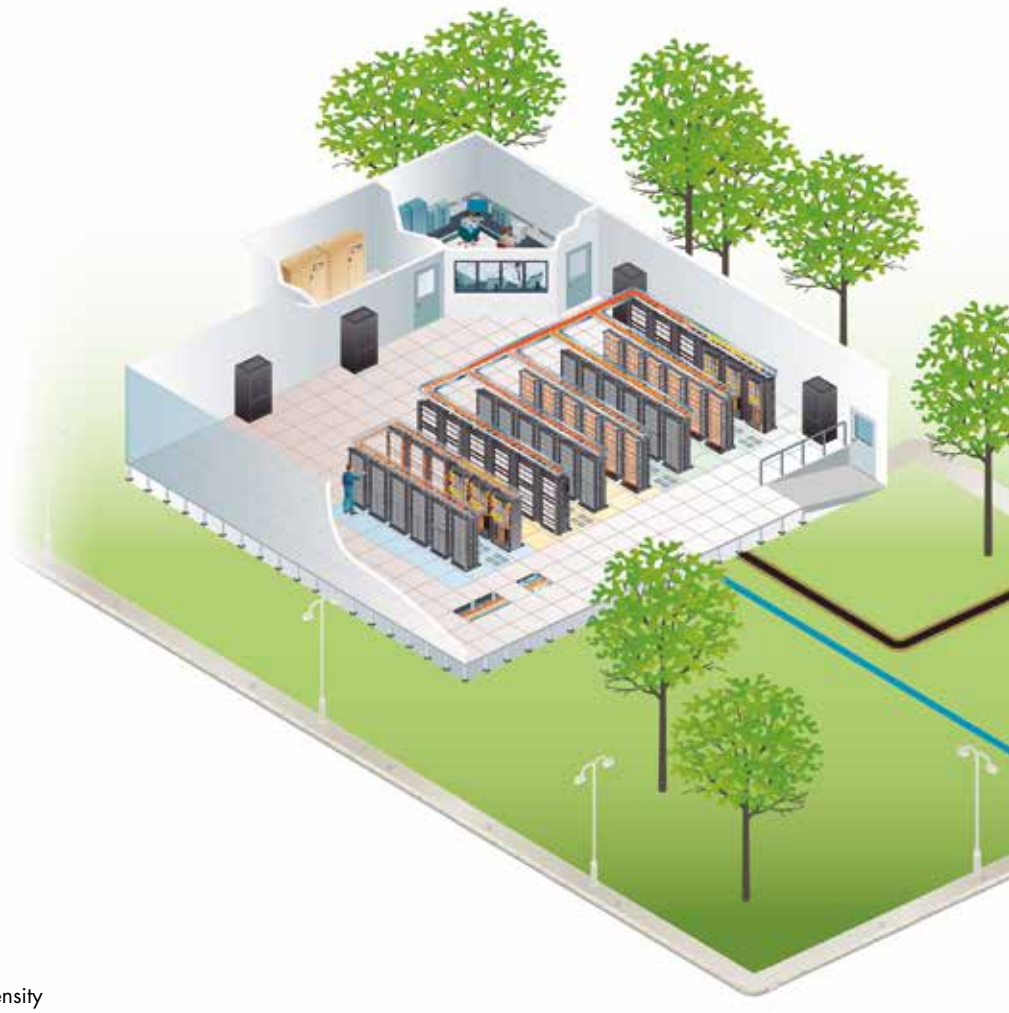
LANmark-OF Solutions fo

MTP Connectivity

- High density panel with 4 MTP modules
- Up to 48 duplex LC in 1U
- Integrated patch cord guide
- Low loss MTP connectivity available

Pre-Term Trunk MTP-MTP

- Up to 96 fibres in SM, OM3 and OM4
- Polarity maintained by its advanced design
- Small cable to reduce space requirements
- Flexible cable with small bending radius



Preloaded Straight Patch Panel

- High density: up to 96 LC
- Sliding tray for ease of installation
- Preloaded with adaptors
- Patch cords guided to the side for higher rack density

LC Pre-Term Cable

- Tight Buffer Universal cable
- OM3, OM4 and SM fibres, up to 24 cores
- 100 % tested, test report included with Pre-Term
- 900 µm fan-out for installation inside patch panel

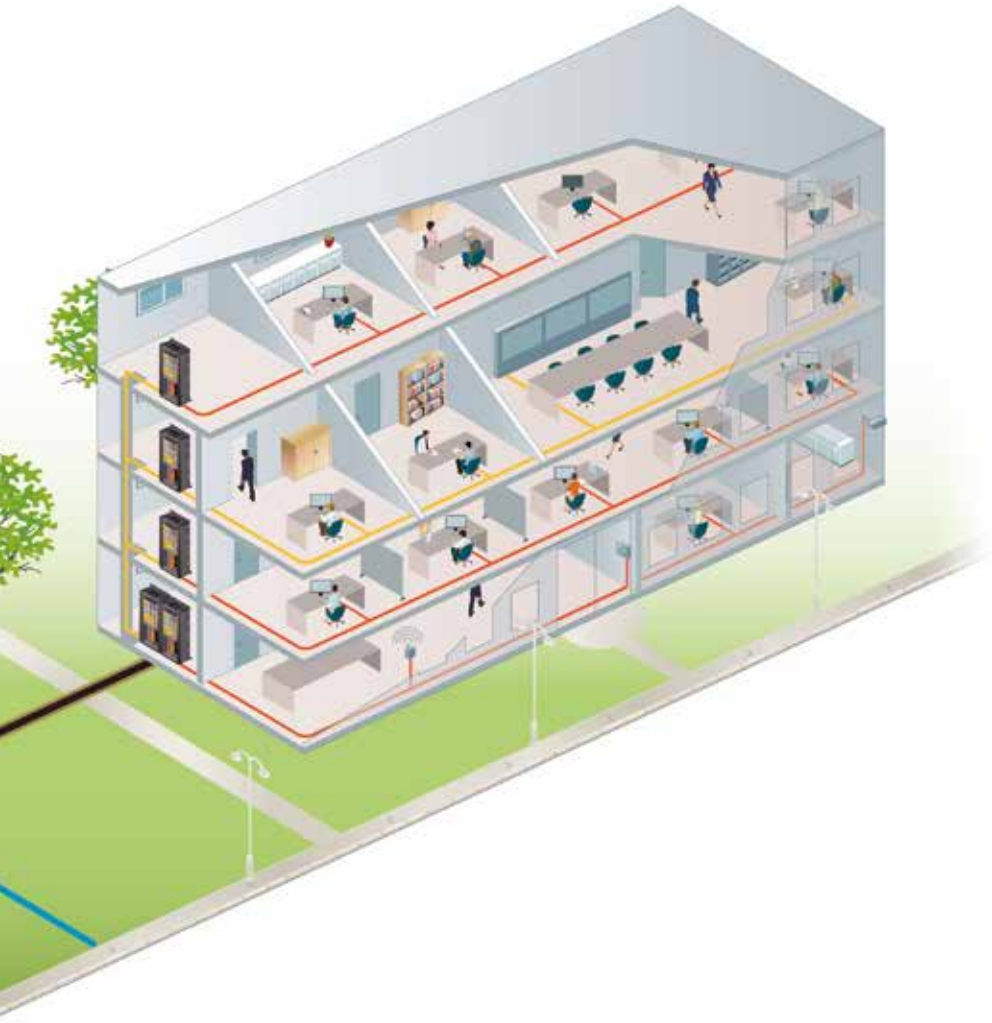
Slimflex Patch Cord

- Small bending radius of 7,5 mm
- Small and round patch cable
- Advanced flexible jacket less prone to damage
- Low loss patch cord for additional headroom

Pigtails and Connect

- Maxistrip and Tight Buffer p
- Anaerobic connectors
- ST, SC and LC
- Single mode and multimode
- Bulk and individual packagi

or Office and Data Centre



Snap-In Patch Panel

- Snap-In adaptors for fast installation and flexibility
- Up to 12 duplex SC or 24 duplex LC Snap-In adaptors
- Sliding and removable tray
- Optimised for splicing, direct termination and Pre-Term

Outlet

- Suitable for all Snap-In adaptors
- 1 x duplex SC or 2 x duplex LC
- Optimised for direct termination or splicing

Extractable Micro-Bundle

- Optimized for horizontal & vertical installation
- Bundle of 4, 6 or 12 fibres
- Termination with splicing and pigtails
- Complies with indoor fire requirements

ors

igtails

ing for SC and LC connectors

Tight Buffer Universal Cable

- Rodent retardant, waterproof, UV resistant
- Indoor cable , outdoor in duct
- Excellent fire and flame retardant properties
- Designed for direct termination and splicing
- Up to 24 fibres and available in all fibre grades

Micro-Bundle Universal Cable

- Indoor cable and outdoor installation in a duct
- Fully waterproof, rodent and UV resistant
- Designed for splicing with pigtails
- Flame and fire non-propagation

Products

PANELS

LANmark-OF Sliding Panels:

General features:

- 19 inch empty rack mountable patch panel
- Sliding, removable tray for easy connector access
- Modular patch panel: mix of adaptor type and fibre type possible
- Suitable for direct termination with anaerobic connectors
- Suitable for splicing with pigtails:
  1. up to 4 optional splice trays with heat shrink protectors (N890.095) and one cover (N890.097)
  2. up to 4 optional splice trays with aluminium protectors (N890.096) and one cover (N890.097)
- Compatible for installation with LANmark-OF Pre-Term
- Strain relief: optional cable glands or tie wraps
- Marking strip to number and categorize ports

N441.203

LANmark-OF Sliding Snap-In Patch Panel:

N441.204 (Black) or N441.203 (White)

- Accommodates up to
  1. 24xDLC snap-in adaptors: Multimode (N205.617), Singlemode (N205.627), Singlemode APC (N205.628)
  2. 12xDSC snap-in adaptors: Multimode (N205.619), Singlemode (N205.624), Singlemode APC (N205.625)
- Fully painted in Black (N441.204) or White (N441.203)

N441.204

LANmark-OF Sliding ST Patch Panel: N441.201

- Accommodates up to 24X ST adaptors: Multimode (N205.123) or Singlemode (N205.153)
- Galvanised steel look

N441.201

ZONE DISTRIBUTION BOXES

LANmark-OF Zone Distribution Box 12x Snap-In White:

- Zone Distribution Box for optical fibre
- Modular design allowing 6x duplex SC or 12x duplex LC Snap-In adaptors
- Suitable for direct termination or splicing
- Printed numbering system on the cover
- Designed for the installation of zone wiring, fibre to the office and to the desk
- White

N521.630

LANmark Ruggedised Lockable Zone Distribution Box 12x Snap-In White: N521.612

- For use as consolidation point
- Compatible with all LANmark Snap-In connectors
- 12 numbered Snap-In ports with shutters
- Ruggedised design for industrial and secure environments
- Lockable with key (supplied)
- Designed to support installations with extractable fibre bundles
- White

N521.612

OUTLET

LANmark-OF 45 x 45 Splicing Outlet 2 Snap-In White: N420.035

- Can accommodate 2x duplex LC or 1x duplex SC Snap-In Adaptors
- Fits surface mount boxes, cover plates and ducts
- Optimised for anaerobic termination of Tight Buffer cables and patch cord cable
- Optimised for splicing with heat shrink or aluminium protectors
- Features strain relief for cables

N420.035

LANmark Angled Module

- Can accommodate 2x duplex LC or 1x duplex SC Snap-In Adaptors
- The Snap-In Adaptors easily clip in the shuttered front module without the need for any tools
- The minimum bend radius of the cables is maintained thanks to the angled position of the adaptors
- The inclined faceplate also protects the patch cords and prevents dust entry when the shutters are left open

N423.540N

SNAP-IN ADAPTORS

LANmark-OF Snap-In LC and SC Adaptors

- Designed for snapping into

1. LANmark-OF Snap-In Panel: N441.203 and N441.204
2. LANmark-OF Zone distribution boxes: N521.630 and N521.612
3. Modules: N420.035, N423.540N, N423.540N, N423.520

- Installation time is saved since the snap-in concept replaces the time consuming screwing of traditional adaptors.
- Available in duplex LC and duplex SC, multimode, singlemode and singlemode APC

LANmark-OF Duplex LC Snap-In Adaptor

- N205.617: LANmark-OF Duplex LC Snap-In Adaptor Multimode aqua
- N205.627: LANmark-OF Duplex LC Snap-In Adaptor Singlemode
- N206.628: LANmark-OF Duplex LC Snap-In Adaptor Singlemode APC

N205.617

N205.627

N206.628

LANmark-OF Duplex SC Snap-In Adaptor

- N205.619: LANmark-OF Duplex SC Snap-In Adaptor Multimode aqua
- N205.624: LANmark-OF Duplex SC Snap-In Adaptor Singlemode
- N205.625: LANmark-OF Duplex SC Snap-In Adaptor Singlemode APC

N205.619

N205.625

N205.624

LANmark-OF ST Adaptors

- Designed for LANmark-OF ST Patch Panel: N441.201
- Available in multimode and singlemode
- N205.123: LANmark-OF ST Adaptor Multimode
- N205.153: LANmark-OF ST Adaptor Singlemode

N205.123

N205.153

SPLICING ACCESSORIES FOR LANMARK-OF SNAP-IN PANELS AND ZONE DISTRIBUTION BOXES

LANmark-OF Splice Cassette 12 Heat Shrink Protection Small: N890.095

- Splice cassette for management of splices with heat shrink protectors
- Provides support for 2*6 heat shrink splice protectors
- Designed for use with both loose tube and tight buffer cables, i.e. 250 and 900 µm coated fibres
- Designed for use with both maxistrip and tight buffer pigtails

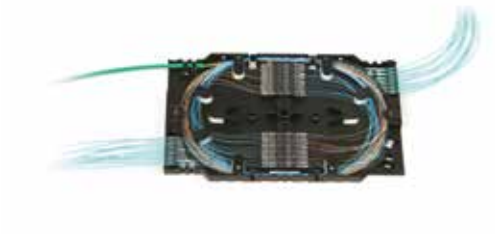
N890.095

LANmark-OF Fusion Splice Heat Shrink Protectors 45mm 100x: N890.021

- 100 pieces per bag
- Lenght: 45mm
- Compatible with tight buffer or loose tube cables, i.e. 250 and 900 µm coated fibres
- Compatible with tight buffer and maxistrip pigtails
- Designed for Nexans' splice cassettes for 12 heat shrink fusion splice protectors (N890.095 and N890.090)

LANmark-OF Splice Cassette 24 Aluminium Protection Small: N890.096

- Splice Cassette for management of splices with Aluminium protectors
- Provides support for 2*12 splices with Aluminium protectors
- Designed for use with loose tube cables (250 µm coated fibres)
- Designed for use with maxistrip pigtails



N890.096

LANmark-OF Fusion Splice Aluminium Protectors 150x: N890.003

- 150 pieces per bag
- Lenght: 30 mm
- Compatible with loose tube cables (250 um coated fibres)
- Compatible with maxistrip pigtails
- Designed for Nexans' splice cassette for 24 Aluminium fusion splice protectors (N890.096 and N890.091)

LANmark-OF Cover Splice Cassette Small: N890.097

- LANmark-OF splice cassette cover compatible with N890.095 and N890.096
- When the splice cassettes are stacked only the top splice cassette requires a cover

N890.097

Compatibility:

- For installation in patch panels: N441.201, N441.203 and N441.204
- For installation in zone distribution boxes: N521.630 and N521.612

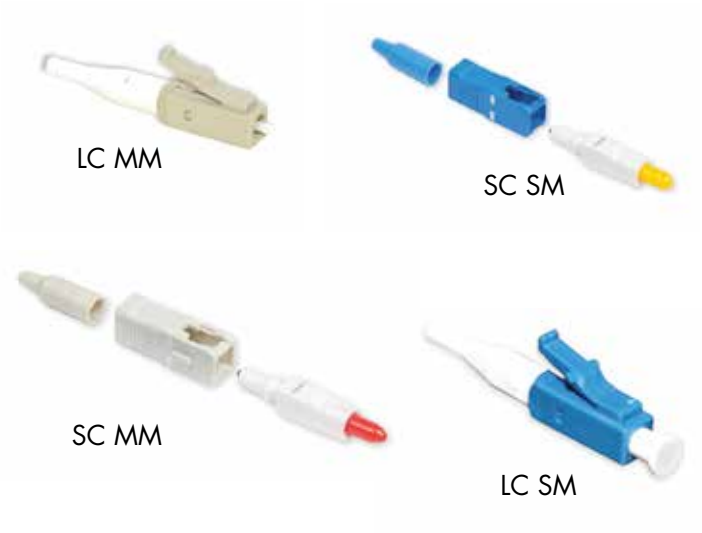
ANAEROBIC CONNECTORS

LANmark-OF Anaerobic Connectors

- Connectors for on-site terminations
- ST, SC and LC connectors
- Available in multimode and singlemode
- For termination of tight buffer cables and patch cable
- Fast anaerobic cure with adhesive and activator
- Installed with Nexans Anaerobic Toolkit (N102.230)

LANmark-OF Anaerobic Connectors Individually Packed

- N102.461: LANmark-OF ST Connector Multimode Anaerobic 900µm & 2.8mm
- N205.120: LANmark-OF SC Connector Multimode Anaerobic 900µm & 2.8mm
- N205.630: LANmark-OF LC Connector Multimode Anaerobic 900µm
- N205.631: LANmark-OF LC Connector Multimode Anaerobic 2.0mm



LANmark-OF Anaerobic Connectors Bulk Packaging

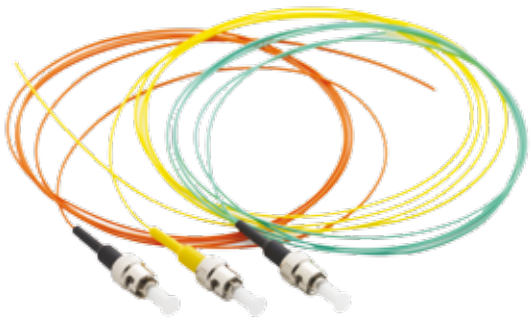
- Connector bodies, dust caps and boots all packed together in separate bags
- Less bags to open and waste is reduced

- N205.630bulk : LANmark-OF LC Connector Multimode Anaerobic 900µm 100X
- N205.635bulk: LANmark-OF LC Connector Singlemode Anaerobic 900µm 100X
- N205.640bulk: LANmark-OF SC Connector Multimode Anaerobic 900µm 100X
- N205.645bulk: LANmark-OF SC Connector Singlemode Anaerobic 900µm 100X

PIGTAILS

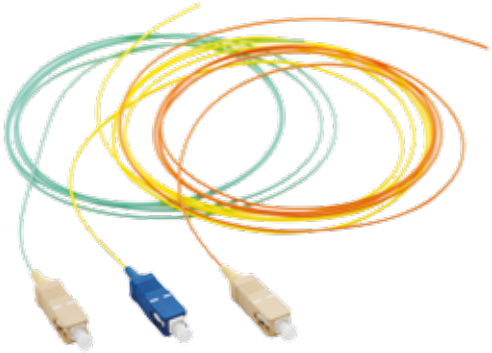
LANmark-OF Tight Buffer Pigtails

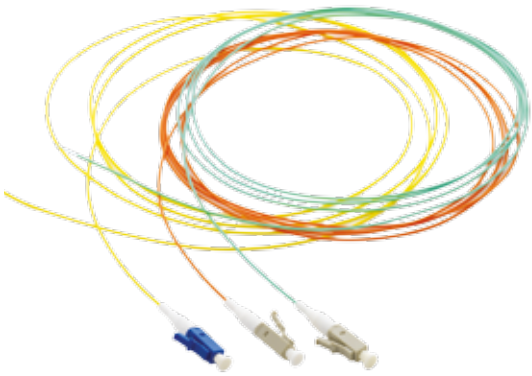
- Available in ST, SC and LC
- Fibre type: SM, SM/APC, OM2/OM3 and OM4
- Tight Buffer pigtails can be stripped over 1-2 cm in one action
- Compatible with heat shrink protectors (N890.021)



LANmark-OF Maxistrip Pigtails

- Available in ST, SC and LC
- Fibre type: SM, SM/APC, OM2/OM3 and OM4
- Tight Buffer pigtails can be stripped over 1m in one action
- Compatible with heat shrink (N890.021) and Aluminium protectors (N890.003)





LANmark-OF Pigtails Maxistrip or Tight Buffer Set of 12 Colours

- Colours: Blue, Orange, Green, Brown, Grey, White, Red, Black, Yellow, Violet, Pink, Aqua
- Same colours as fibres inside cables
- Easier identification of channels
- Packed on one card in one bubble wrap: less waste and less bags to open
- Available in Maxistrip and Tight Buffer versions

N120.5TLS

PATCH CORDS

LANmark-OF Patch Cords

- Duplex patch cords
- Available in SM, OM3 and OM4
- Available with ST, SC and LC connectors
- Hybrid patch cords available
- Aqua jacket for OM3 and OM4 patch cords, Yellow for singlemode patch cords
- "Cross-Over" wiring design in alignment with IEC 11801 and EN50174-1:2009

LANmark-OF Duplex LC Duplex LC Patch Cord

- N123.5LLAX: LANmark-OF Patch Cord Duplex LC Duplex LC OM3 LSZH Xm Aqua
- N123.7LLAX: LANmark-OF Patch Cord Duplex LC Duplex LC OM4 LSZH Xm Aqua
- N123.4LLYX: LANmark-OF Patch Cord Duplex LC Duplex LC Singlemode LSZH Xm Yellow

DLC-DLC MM

DLC-DLC SM

LANmark-OF Duplex SC Duplex SC Patch Cord

- N123.5CCAX: LANmark-OF Patch Cord Duplex SC Duplex SC OM3 LSZH Xm Aqua
- N123.7CCAX: LANmark-OF Patch Cord Duplex SC Duplex SC OM4 LSZH Xm Aqua
- N123.4CCYX: LANmark-OF Patch Cord Duplex SC Duplex SC Singlemode LSZH Xm Yellow

DSC-DSC MM

DSC-DSC SM

LANmark-OF Duplex ST Duplex ST Patch Cord

- N123.5TTAX: LANmark-OF Patch Cord Duplex ST Duplex ST OM3 LSZH Xm Aqua
- N123.7TTAX: LANmark-OF Patch Cord Duplex ST Duplex ST OM4 LSZH Xm Aqua
- N123.4TTYX: LANmark-OF Patch Cord Duplex ST Duplex ST Singlemode LSZH Xm Yellow

DST-DST MM

DST-DST SM

LANmark-OF Duplex LC Duplex SC Patch Cord

- N123.5CLAX: LANmark-OF Patch Cord Duplex LC Duplex SC OM3 LSZH Xm Aqua
- N123.7CLAX: LANmark-OF Patch Cord Duplex LC Duplex SC OM4 LSZH Xm Aqua
- N123.4CLYX: LANmark-OF Patch Cord Duplex LC Duplex SC Singlemode LSZH Xm Yellow

DLC-DSC MM

DLC-DSC SM

LANMARK-OF CLEANING TOOLS

- For unmated fibre connector and adaptors installed in a patch panel
- For single connectors: SC, ST and LC
- For male and female array connectors

- N890.122 LANmark-OF LC Cleaning Tool
- N890.120 LANmark-OF MPO Cleaning Tool
- N890.121 LANmark-OF SC/ST Cleaning Tool

LANmark-OF Toolkit SM & MM Anaerobic Connector (starter kit): N102.230

- A comprehensive set of tools and consumables for anaerobic connector termination
- Used in combination with Nexans Anaerobic connectors (SC-ST-LC)
- Includes microscope with a 400X magnification to inspect singlemode fibres
- Polishing jigs and microscope compatible with ST, SC and LC connectors

LANmark-OF LC Patch Cord Removal Tool: N890.130

- Patch cord removal tool for high density patching areas
- Improves access to latch of LC connectors

LANmark-OF Tight Buffer Universal LSZH

- Tight Buffer Universal optical fibre cable
- Indoor cable and outdoor installation in a duct
- Fully waterproof and rodent retardant
- Designed for direct termination and splicing
- Up to 24 fibres and available in all fibre grades

LANmark-OF Micro-Bundle Universal LSZH

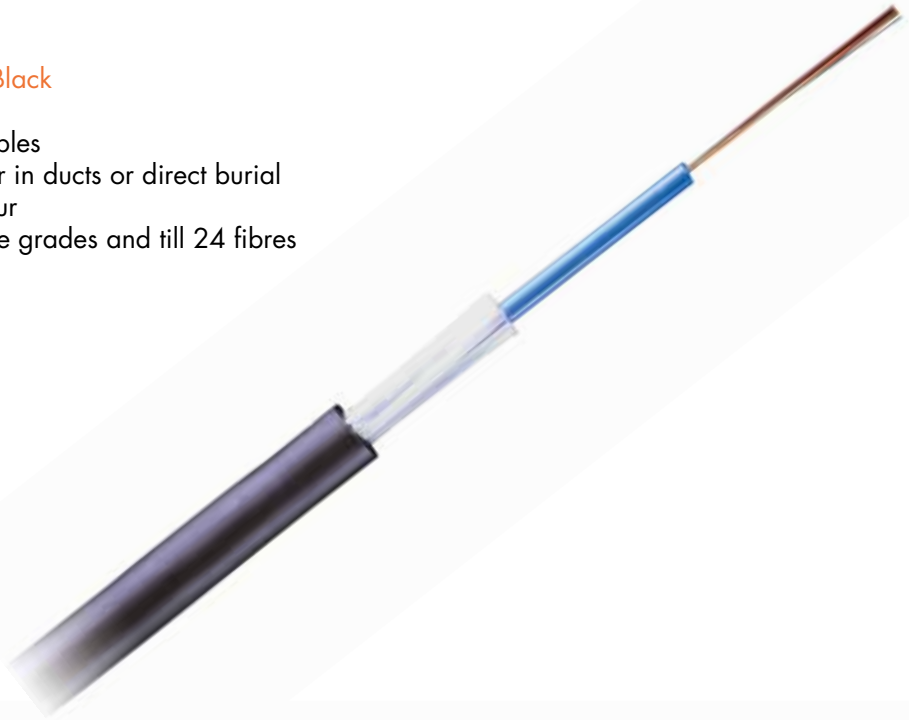
- Micro-Bundle Universal optical fibre cable
- Indoor cable and outdoor installation in a duct
- Fully waterproof and rodent retardant
- Designed for splicing with pigtails
- 4-96 fibres and available in all fibre grades

LANmark-OF UC LSZH

- Indoor/Outdoor cable
- Corrugated steel tape armour
- Gel filled tube
- All fibre grades
- Provides full rodent protection
- Low Smoke Zero Halogene (LSZH)

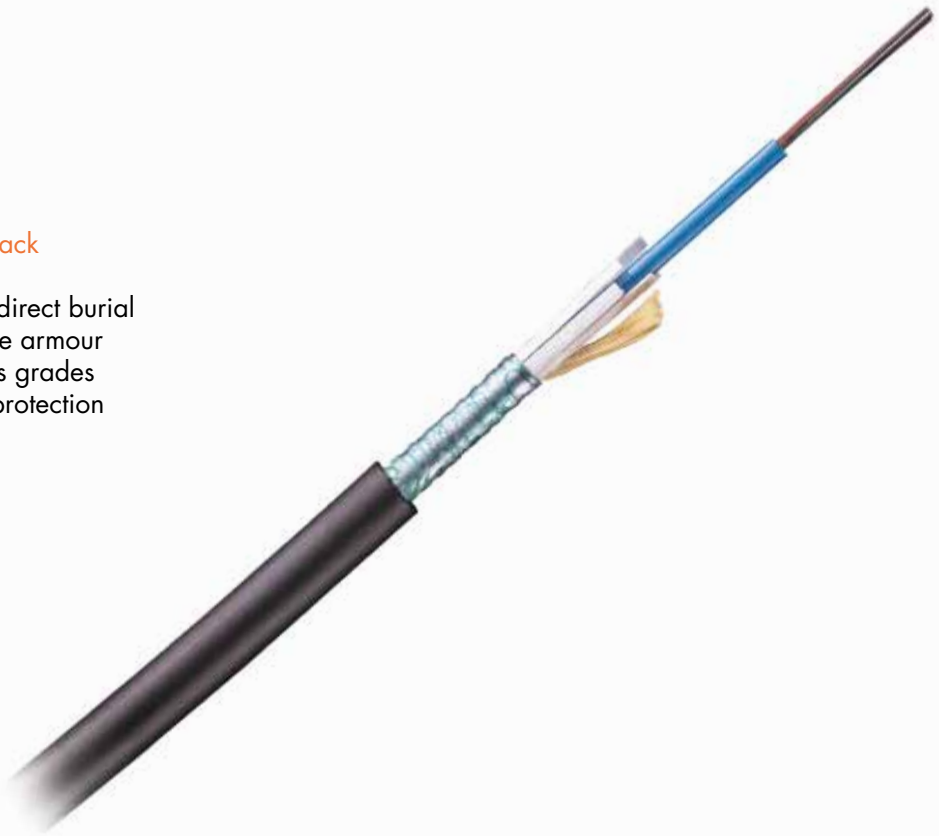
LANmark-OF UD PE Black

- UD optical fibre cables
- Suitable for outdoor in ducts or direct burial
- Full dielectric armour
- Available in all fibre grades and till 24 fibres
- Rodent resistance



LANmark-OF UC PE Black

- Outdoor in ducts or direct burial
- Corrugated steel tape armour
- Available in all fibres grades
- Provides full rodent protection



PRELOADED PATCH PANELS & PRE-TERMINATED FIBRE ASSEMBLIES

This added-value offer enables fast network deployment and removes the requirement for specialized termination training, consumables and toolkits. Every assembly is developed and manufactured by optical engineers to individual customer requirements: cable length, connector type, fibre grade, fanouts size, …

LANmark-OF LC Pre-Term

- Tight Buffer Universal cable
- LANmark-OF OM3, OM4 and SM fibres, up to 24 cores
- 100 % tested, test report included with Pre-Term
- 900 µm fan-out for installation inside patch panel
- Cable gland optimised for installation in LANmark-OF patch panels

Preloaded patch panel for high density areas

- Preloaded with adaptors
- Sliding and tilting tray
- Patch cords guided to the side with integrated patch guide
- Labelling facility on patch cord guide

Optimised for pre-terminated assemblies

- Fibre management in 4 different loops for easy installation
- Openings optimised for cable gland Pre-Term
- 24, 48 and 96 LC
- SM and MM

Optimised for termination with splicing of pigtails

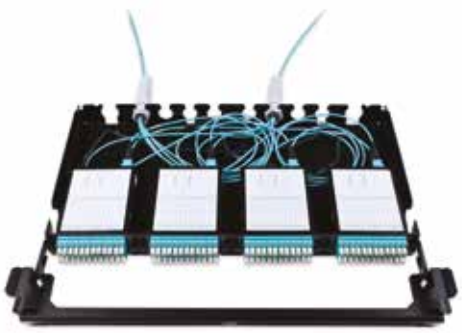
- 4 splice cassettes and 1 cover
- 48 fibres with heat shrink protection
- 96 fibres with mechanical/aluminium protection
- Cassettes can be lifted and tilted
- Larger splice cassettes for improved fibre management inside cassettes (N890.090, N890.091, N890.092)

PLUG & PLAY SYSTEM

The Nexans' Plug&Play concept is specially designed for the LAN and data centre environment. It facilitates a fast installation of a large number of fibre connections, a high density, quick changes with limited down time and an easy migration path to future applications.
The Plug&Play system consists of 3 subcomponents: the MTP-MTP Pre-Term, the Plug&Play modules and the Plug&Play patch panel.

LANmark-OF Plug&Play Patch Panel

- High density connectivity: up to 96 LC depending on module type
- Can hold up to 4 Plug&Play modules in 1U
- Sliding and tilting patch panel for ease of installation, upgrade and maintenance
- Labelling front for port identification and patch cord management within 1U



Plug&Play Modules

- Plug&Play module with12 LC or 24 LC connections
- Available with low loss LANmark-OF Plug&Play connectivity for OM4 and normal loss for SM
- Available in LANmark-OF OM4 multimode and LANmark-OF singlemode
- Module can be easily mounted into Nexans' Plug&Play patch panel
- High density: up to 96 LC into 1U
- 100 % factory tested

LANmark-OF MTP-MTP Pre-Term Trunk

- High fibre count up to 96 fibres in SM, OM3 and OM4
- Polarity maintained by its advanced design
- Micro-Bundle cable design
- Small cable (6.4 mm for 96 core) to reduce space requirements
- Flexible cable with small bending radius (65 mm)
- Flexible fan-out easy to arrange in patch panel
- Cable gland and protective tube

CABINETS AND ACCESSORIES

N340.003

Quick Mount III 42 U 800x800

- 19" cabinet 42 U
- Flat pack : easy and quick installation
- Exclusive automatic earthing system
- Security
- Complete range of accessories

N102.118

Wall Mountable

- 19" wallmount 18 U
- Easy installation

Overhead Patching Frame 4U

- 19-Inch 4U overhead frame
- Ideal in data centres
- Designed to host both copper and fibre cabling
- Metal construction
- Straight or angled position

N345.400

Pair of Patch Cord Management Hooks Black for Overhead Patching Frame 4U

- Required to guide patch cords on both sides of the frame
- Easy to mount with 2 screws and cage nuts
- Up to 3 hooks on each side
- Black flexible plastic

N345.401

Letterbox Patch Guide 1 U Black

- Allows storage and management of copper and fibre patch cords
- Open structure with rings for easy access
- 8 cm depth
- Central "letterbox" holes allow hiding excess of cords inside the rack
- Black paint finished metal

N102.115

Angled Blank Panel Black

- 19" Blank Panel to fill empty cabinet space

N521.672

Angled Panel Cover Black

- Used to close the triangular gap formed at the top of a stack of LANmark or LANsense Angled Panels to prevent items falling behind the panels and to enhance the appearance of the finished installation.

N521.673

Angled Pass-Through Black

The 2U Angled Pass Through is designed to match the LANmark and LANsense Angled Panels and to provide a means for patch cables to cross from side to side in a rack whilst maintaining rack aesthetics.

N521.678

1 U Universal Patch Guide with front cover, Black

- Allows storage and management of copper and fibre patch cords
- 8 cm depth
- Cover for tidy cabinet look
- Black paint finished metal

N102.117BK

1 U Patch Guide with rings, Black

- Allows storage and management of copper and fibre patch cords
- Open structure with rings for easy access
- 8 cm depth
- Black paint finished metal

N102.105BK

1 U Blank Panel, black

- 19" Blank Panel to fill empty cabinet space

N109.207BK

AUTOMATED INFRASTRUCTURE MANAGEMENT

LANsense AIM

A well-controlled, reliable LAN infrastructure is a critical business enabler. This need comes against a backdrop of increased complexity and accelerated change which is becoming almost impossible to manage manually.

LANsense is Nexans' Automated Infrastructure Management (AIM) solution.

Also referred to as Intelligent Infrastructure Management (IIM), the product suite also includes Power and Environmental Monitoring and Access Control (EMAC).

Why LANsense? Networks are becoming more complex : More need to control, more difficult to manage, maintenance costs increasing.

How does LANsense helps? It manages change, simplifies new service deployment, improves asset management and utilisation, delivers reduced operational cost.

LANsense

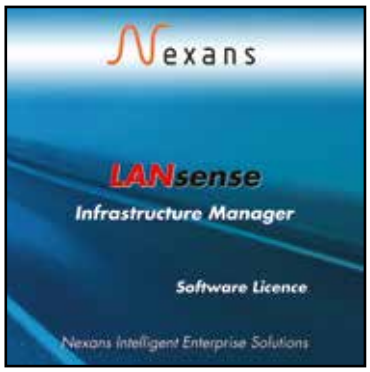
LANsense is Nexans Automated Infrastructure Management (AIM) solution. It is an internet enabled hardware and software package which can automatically discover and monitor network connectivity in real-time, to ensure network connections are secure and that connectivity documentation is always 100% accurate. LANsense is vendor independent and can be retro-fitted to existing systems.

Environmental Monitoring & Access Control (EMAC)

To optimise power consumption and energy use, Nexans intelligent offerings make it possible to meter actual power usage and produce trend data for any single or group of physical systems, enabling:

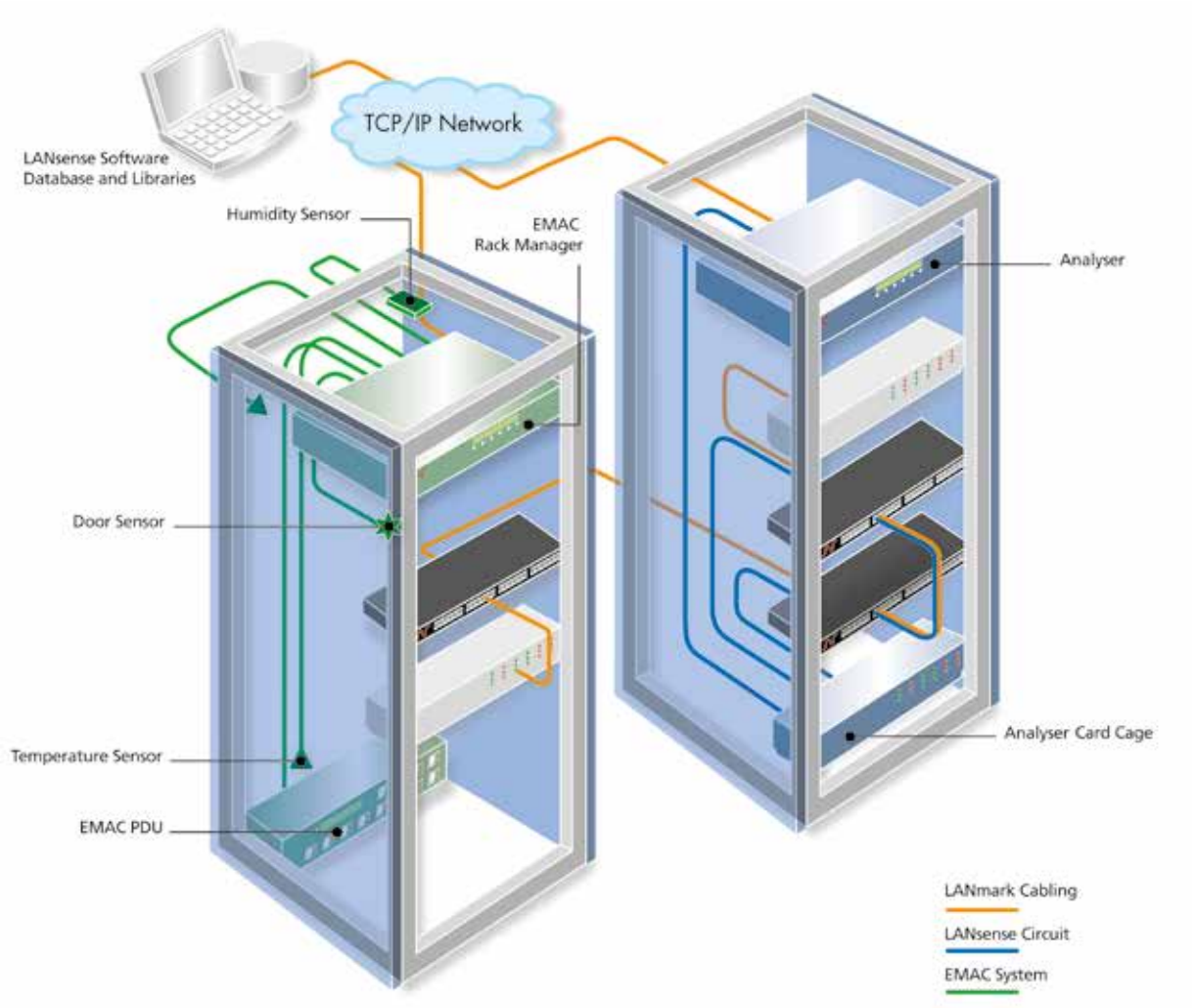
- Adequate capacity for existing & future needs
- Monitoring, measuring & reporting of power usage via multiple clients
- Billing stream capability for hosted clients
- Prevention of unauthorised use of power outlets / equipment deployment
- System load management (phase balancing, capacity planning etc)
- Recovery of locked servers via remote IP power cycling
- Alarming & trending of system, rack, powerstrip and outlet level overload conditions

LANsense Software



LANsense Analysers

A LANsense analyser is required to monitor all network ports, record changes in the events log, and continuously update and maintain the connectivity database. It connects to the equipment presentation panel or integration strip and the horizontal distribution panel using I/O cables, and is in turn connected to the LANsense cable management SQL database.



Enjoy your day at work

with innovative user-friendly products and solutions

Understanding your needs

In the field of LAN Cabling Systems, we offer a complete range of products and value added services providing improved reliability and reduced cost of ownership for Network Managers, together with faster installation times for installers.

Whether you are an installler, distributor or end-user – team up with a partner that lets you enjoy your day at work.

Nexans Cabling Solutions
Alsembergsesteenweg 2, b3
B - 1501 Buizingen
Tel: +32 2 363 38 00 • info.ncs@nexans.com
www.nexans.com/LANsystems

Nexans
Global expert in cables and cabling systems