

Nexans



**Enhanced FTTx solutions
Deploy faster and farther to increase your revenues**

Expanding your broadband service offer...

You are an Operator, with the strategy of widely delivering a new generation of triple-play broadband services to your subscribers. Increasingly, you foresee a further step: quadruple-play services via convergent broadband fixed line and mobile line services through a single phone number.

Or you are a Community Leader or Town Designer. You would like to use broadband to upgrade the quality of life, create new work opportunities, and develop local services. Above all, you would like to reduce the social divide by reducing the digital divide.

Thus, you need a futureproof infrastructure to meet all field configurations:

- **Business Center Areas** (high density)
- **Residential Areas** (dense and semi-dense)
- **Multi-dwellings**
- **Rural/Village**

Each of them has its own challenges, in terms of density, length, and structure, and each has its own options and solutions which are available from Nexans, a proven expert in FTTx.



...requires a wide selection of cables, components and global expertise

Nexans does not offer just one cabling concept to address the multiplicity of FTTx challenges, but offers a full family of products, network architectures, and field-proven end-to-end FTTx solutions, including:

- **Micro cable solution** for true optimization of existing infrastructure
- **Ribbon cable solution** for a high density network
- **Aerial cable solution** for fast service expansion and complementary broadband services delivered via the energy distribution network
- **Loose tube cable solution** for standard duct and direct buried installation

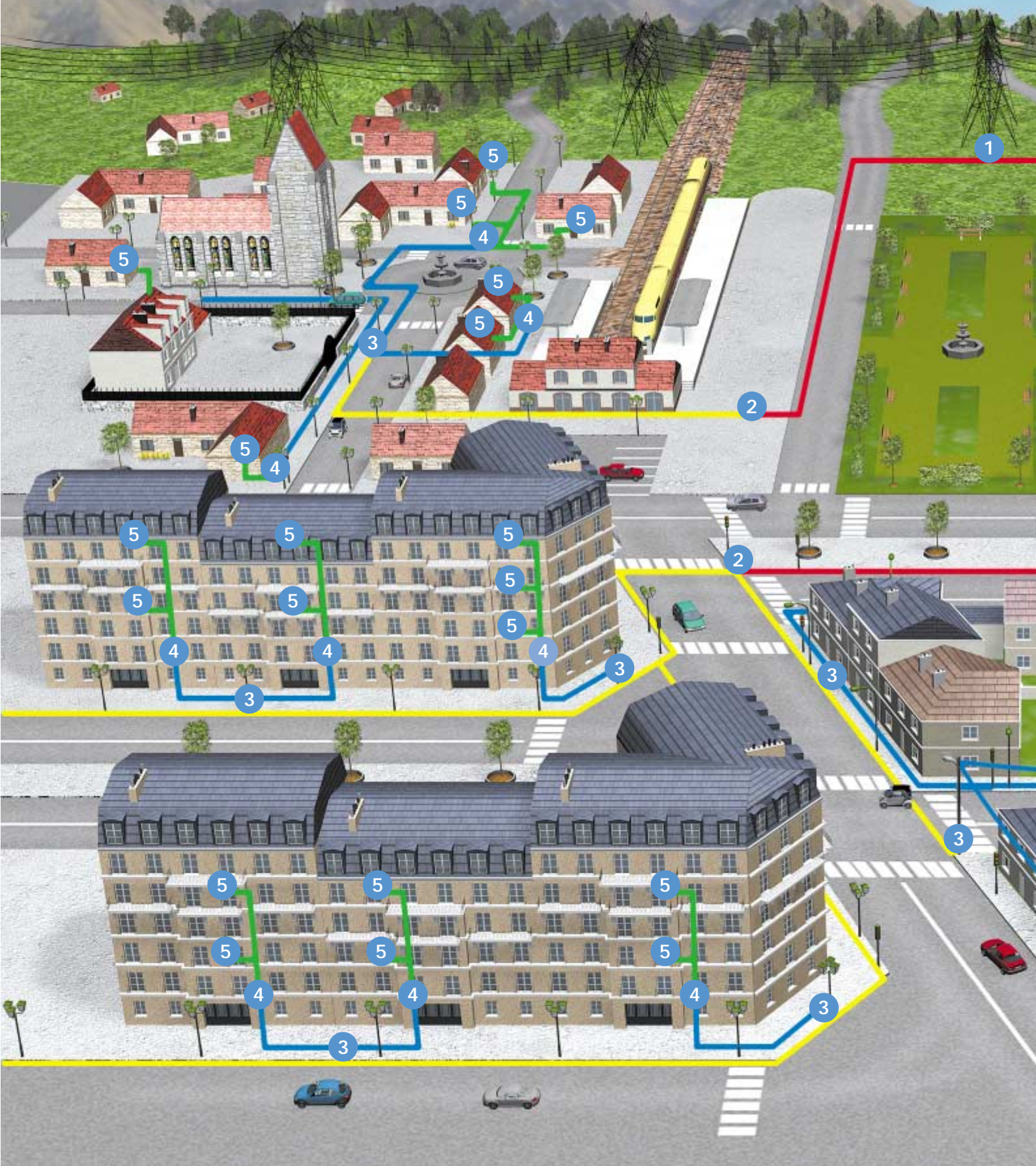
More than just producing the right cable for the right FTTx environment, Nexans offers you global expertise on a complete infrastructure, so that you can optimize your layout design, engineering and installation:

- **Assistance for Network Engineering:** from feasibility studies to rules for deployment
- **Network Passive Infrastructure Layout Design:** give us a city plan and we provide the details for a physical infrastructure

- **Cost modeling:** we calculate the ultimate cost to subscribers according to the option chosen
- **Bill of Materials:** we provide a full list of all cables and components to simplify procurement
- **Wide range of fiber cables:** for aerial, underground and duct installation
- **All passive components:** interconnection technologies, such as splicing, cross-connecting and termination
- **Full choice of active equipment:** media converters, Customer Premises Equipment, and fiber switches
- **Field expertise** based on FTTx deployment in various configurations (FTTN, FTTC, FTTB, FTTH, FTTU), i.e. fiber to the node, curb, building, home and user



Nexans helps your network evolve



Regional Node

1

Regional Network

Network connecting all cities and municipalities in the region.

Urban Node

2

Urban Network

Network connecting major nodes within a city.

to deliver high speed broadband



Area Node

3

Property Area Node

4

Property Node

5

Area Network

Network connecting nodes within an area.

Property Area Network

Network connecting the end-users.

RURAL/VILLAGE: for a better quality of life.

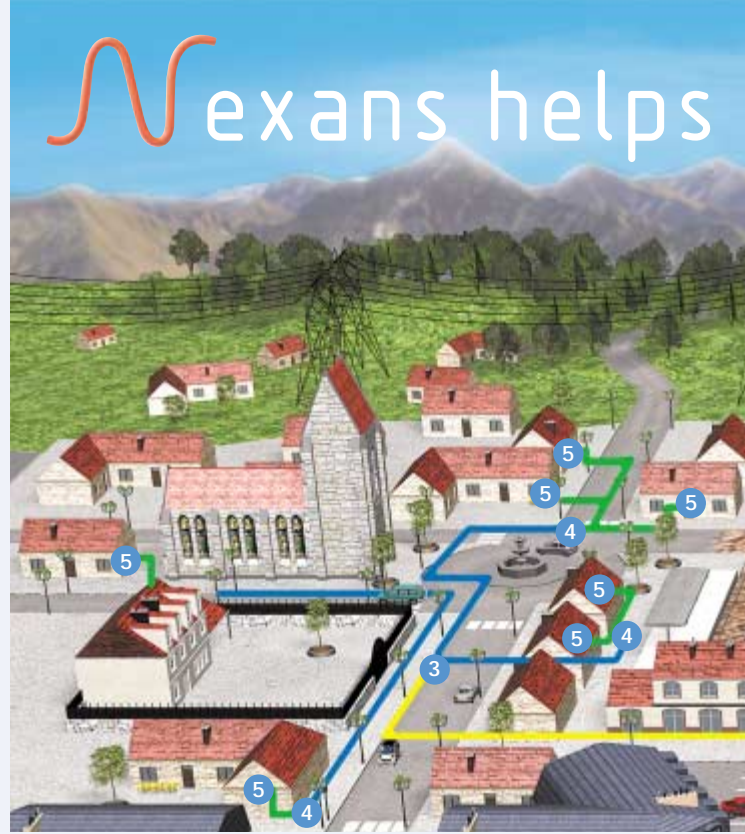
Rural end-users are entitled to broadband. CAPEX optimization is critical here because of low population density. Nexans offers:

- Blown micro cables
- Ribbon cables
- Interconnection solutions combining individual fiber management and mid-span access

BUSINESS CENTER AREA: for higher competitiveness and attractiveness.

True broadband access makes your local business area more attractive and productive. Metropolitan surroundings call for:

- Blown micro cables for re-use of existing ducting infrastructure
- High-density cabling to get maximum fibers in minimum space
- Structured vertical risers to the fiber switch



Regional Node



KLIMA fiber-optic outdoor cabinet: splicing and patching functions. Symmetrical branching for demarcation between backhaul carriers and local carriers. Pole-mounted or on street base. IP 55 and IK 10. *Secure regional node*

Regional Network

Underground installation



Ribbon cables: ribbon slotted-core cables with 4 fiber ribbons. The cables incorporate up to 96 fibers and are intended to be installed underground in ducts. Special designs are available for direct burial. *Excellent mechanical properties with cost- and time-saving splicing using ribbon technology*



Loose tube cables: loose tube cables can incorporate up to 96 fibers and are intended to be installed underground in ducts. *Traditional cable design*

Aerial installation in power lines



Loose tube in slotted-core cables (ADSS): loose tube in slotted-core cables can incorporate up to 96 fibers and are intended to be installed in aerial applications at maximum 52 kV. *Optimized ADSS cables for span lengths up to 150 meters*

Urban Node



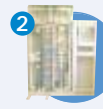
Optical Distribution Frame (ODF): pre-connectorized solution with optimized modularity to suit a variety of network configurations. Includes all types of subracks for patching, splicing, over-length coiling function. *Integrated modular distribution frame*



Universal Subracks POB (1U) for low-density areas and villages: small-capacity swiveling subracks (12 connectors) for cable clamping, fiber splicing, cross-connecting and housing, pigtails and patch cords. Exists in 19", 23" and ETSI format. Compatible with Opteastar concept. *User-friendly*

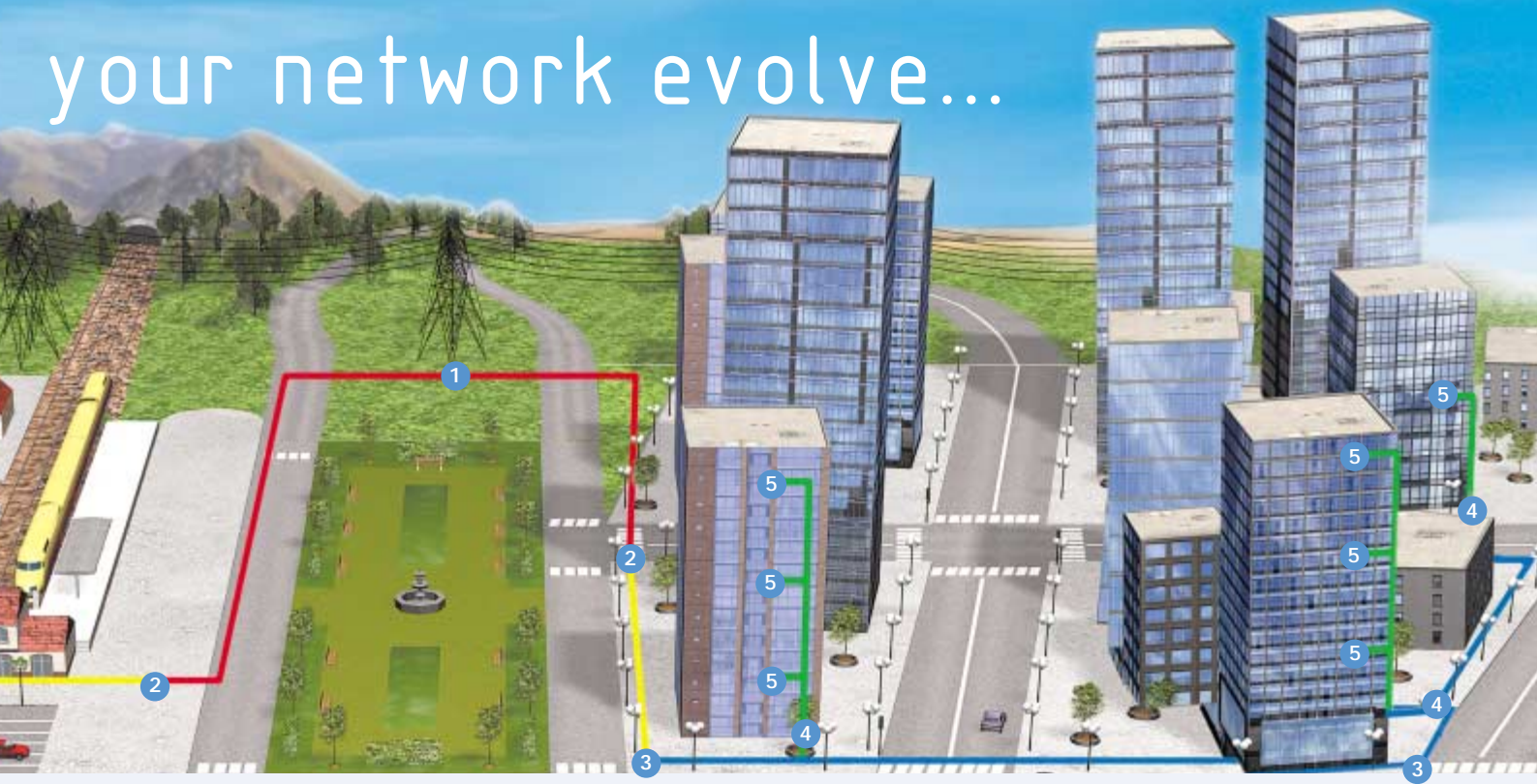


Universal Subracks MEB (3U) combined with MOS storage module for high-density areas: high-capacity swiveling subracks (72 connectors) for cable clamping, fiber splicing, cross-connecting and housing, pigtails and patchcords (MOS). Exists in 19", 23" and ETSI format. Compatible with Opteastar concept. *High-density and user-friendly*



High-density Optical Distribution Frame N3S: complete and optimized solution for cross-connections; high-density ODF with pre-connectorized subracks (capacity up to 1,536 fibers per rack with SC-connectors), jointing rack (capacity up to 7,680 fibers/rack), cable ladder and a system for handling harnesses and cables. *High-density, high-capacity, excellent reliability, and user-friendly*

your network evolve...



Urban Network

Underground installation

B-Lite MB fiber-optic micro cables:

for optimized blowing-ability in micro-ducts, up to 96 fibers. Cable construction with aramid yarns as well as HDPE waterproof and low-friction jacket for outdoor FTtx application. Multi-bundle with micro-sheath for mid-span access. *High flexibility and velocity for sinuous path*

Tunnel cables:

security cable for fiber deployment in underground stations and tunnels. Multi-bundle with micro-sheath for mid-span access. *Fire performance in critical environments*

Ribbon cables:

ribbon slotted-core cables with 4 or 8 fiber ribbons. The cables incorporate from 24 to 384 fibers and are intended to be installed underground in ducts. Fiber count ranges widely depending on location of active equipment.

High fiber density, excellent mechanical properties with cost- and time-saving splicing using ribbon technology

Hybrid cables:

high pair-count (400 to 1,000 pairs) copper telecom cables fitted with empty tubes (12/9 and 10/8 mm) for blowing of fiber-optic micro cables. *To anticipate FTtx deployment at lower CAPEX based on optimum use of already deployed copper infrastructure*

Loose tube cables:

loose tube cables can incorporate from 24 to 288 fibers and are intended to be installed underground in ducts. Fiber count ranges widely dependant on location of active equipment. *Traditional cable design*

Aerial installation

Aerial cables:

all-dielectric self-supporting cables based on circular and figure-8 designs. Main cables for aerial deployment of 48 to 216 fibers for span length up to 70 m. *Capable of withstanding stress, high winds and harsh environments*

Area Node

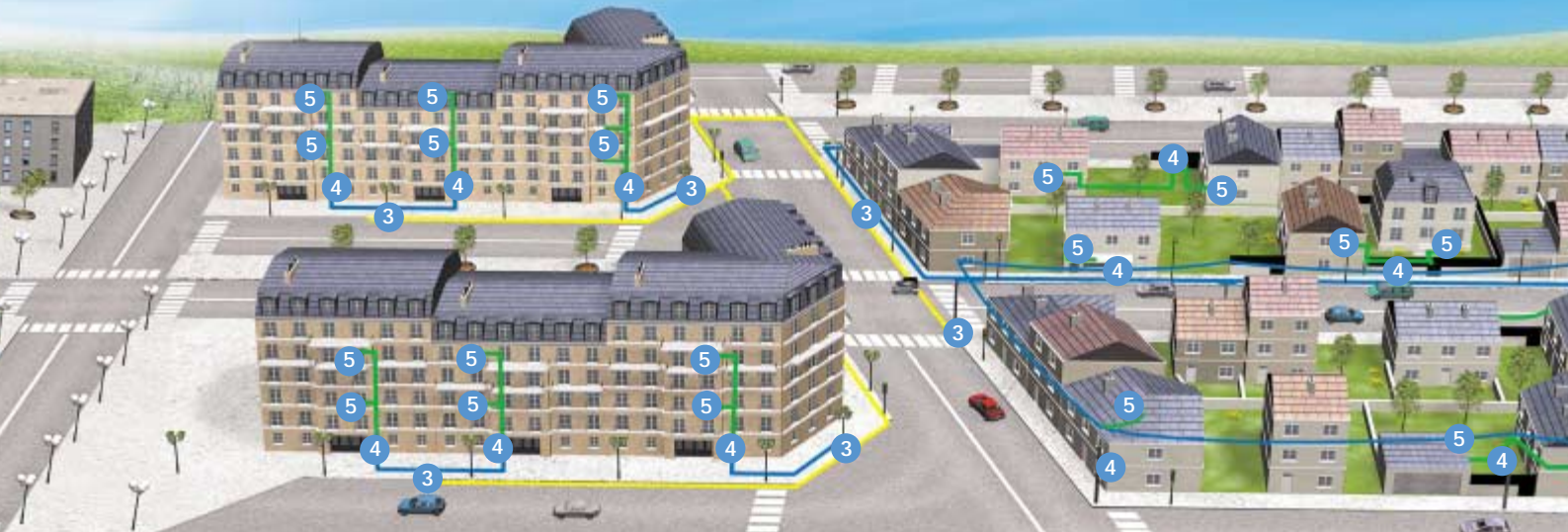
Splicing closures

WTC1 & 2: capacity up to 366 splices / 18 fiber-optic cables. Suitable for single fiber management (FiberArt™), mass splicing, or splitter integration for PON architecture. Fully mechanical watertight sealing system. Standard in-line configuration or mid-span access. *Re-accessibility, flexibility and reliability*

Splicing closures

DCS 1, 2, 3: capacity up to 576 splices / 48 fiber-optic cables. Suitable for single fiber management (FiberArt™), or mass splicing. Exists in 3 sizes. Fully mechanical or heat-shrink watertight sealing system. Standard dome straight splicing configuration or mid-span access. *High-density, re-accessibility and reliability*

...to deliver high speed broadband



Area Network

Underground installation



B-Lite UB fiber-optic micro cables:

for optimized blowing-ability in micro-ducts up to 24 fibers. Cable construction with aramid yarns as well as HDPE waterproof and low friction jacket for outdoor FTTH applications. *High flexibility and velocity for sinuous path*



Ribbon cables – see Urban Network:

high fiber packing density, excellent mechanical properties with cost- and time-saving splicing using ribbon technology



Loose tube cables – see Urban Network:

traditional cable design



Outdoor hybrid optical/electrical cables:

low pair count copper cables, CAT3 or CAT5, fitted with a single loose tube with singlemode fibers. MDPE sheath for outdoor use. *For high-speed Internet access and Triple Play while maintaining POTS service*

Aerial installation



Aerial distribution cables:

all-dielectric self-supporting cables based on circular and figure-8 designs with 4, 8 or 12 fibers. Available with factory assembled connectors for pre-terminated drop access. *Reduced OPEX for progressive deployment of home connections*

Property Area Node



Splicing closure WTC0.5 for residential area:

final FTTH drop point for manhole or aerial distribution. Capacity up to 48 splices and up to 24 connectors (SFF). Fully mechanical watertight sealing system with up to 12 cable drops on a single side. *Compact and aesthetic final drop point*



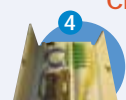
Indoor Transition Box ITB for multi-dwelling area:

splicing capacity up to 96. 2 Distribution cables – In; 3 Multi-cables ports – Out. Wall-Mounted, Protection Index IP54. *Compact transition point for building and floor distribution*



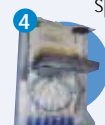
Cros Plus 1 & 2 for business center and multi-dwelling area:

secure indoor optical connection box. Capacity from 48 to 96 connectors. Equipped with standard cassettes or FiberArt™ for single fiber management. Cable entries either top or bottom. Tube and jumper excess-length management. Protection Index IP54. *Secure demarcation point*



Cros Premium for low density multi-dwelling area or floor distribution:

indoor final distribution point. Capacity up to 12 splices and 12 connectors. Cable entries either top or bottom. Protection Index IP30. A two-key security system for carrier and subscriber. Wall-mounted. *Secure, highly compact demarcation point*



Indoor distribution box DB:

splicing and patching functions. Capacity up to 12 connectors. Fully compatible with micro-ducts. Uncut micro-ducts and micro-cables in mid-span access. IP 30. *Compactness, flexibility*

Pre-terminated versatile subrack KB112:

complete 19" solution for cross-connection, housing factory assembled SC, LC, FC and ST connectors delivered with customer specific length (10 to 300 m) and appropriate cable. *Fast installation, excellent reliability and user-friendly*



MULTI-DWELLING AREA:
for triple-play capability
in high density areas
providing full comfort
and security.

To provide broadband to individual apartments, cabling has to optimize CAPEX, while meeting the highest standards for flame retardancy and toxicity via:

- Wide choice of cables for customized user installation
- Flexible micro cables
- High density ribbon fiber cables
- Enhanced mid-span access cables and connection design

RESIDENTIAL AREA:
for medium density
and broadband
service availability.

To bring a new generation of services; remote medical surveillance, distance learning, etc. while optimizing progressive CAPEX versus revenues, Nexans offers :

- Blown micro cables
- Aerial cabling on power lines
- Full home networking solutions, including active equipment

Property Area Network

Underground installation



B-Lite UT - fiber-optic micro cables:

drop cable up to 4 fibers with ultimate low diameter. Cable design with low friction jacket to be installed in micro ducts. *For blowing straight all the way to the end user*



Indoor/outdoor ribbon cables:

ribbon HFFR sheathed drop cables with 4 fiber ribbons. The cables incorporate up to 12 fibers and are intended to be installed underground in ducts. *Good mechanical properties and cost- and time- saving splicing with ribbon technology*



Indoor hybrid optical/electrical cables:

low pair count copper cables, CAT3 or CAT5, fitted with a single loose tube with single mode fibers. PVC or HFFR sheath for indoor use. *For high-speed Internet access and Triple Play while maintaining POTS service and guaranteeing security and environmental protection*

Aerial installation



Aerial drop cables:

all-dielectric self-supporting based on circular and figure-8 designs with 2 fibers. Available with factory assembled connectors for pre-terminated drop access. *Reduced OPEX for progressive deployment of home connections*

Property Node



Customer Premises Equipment (CPE) for residential and multidwelling areas:

WAN connection 100Base FX built-in O/E converter MT-RJ, SC or LC. Home-networking connection with 4 ports, each 100 Mbit/s for Triple Play and 2 analogue telephone lines. V-LAN and QoS for real-time services support. *Symmetrical 100Mbit/s Fast Ethernet connection*



Passive wall-mounted fiber outlet:

up to 4 fibers terminated with SC or LC. Available with factory assembled connectors as pre-terminated solution. *Fast installation and high performance*



FiberSwitch for business center area:

fiber-optic uplink according to IEEE802.3u 100BASE-FX with SC, ST, MT-RJ or VF45 dual fiber or single fiber connection. 4 RJ45 User ports. Supports VoIP telephone, wireless access points and terminal equipment connected via RJ45. Power over Ethernet option. *Optimum for FTT Office connection*

The time has come to move beyond the backbone



Whether you call it the first or last kilometer/mile, the local loop, or the access network, the last part of the telecom network is its most primitive link. However, it must be spanned if you are to:

- **deliver true broadband** to residential and business customers who are clamoring for triple-play services (broadband, telephone, TV), in addition to wireless access (quadruple play)
- **reduce the social divide** by closing the digital divide, thus giving individuals, businesses and communities a chance to expand opportunities for work and leisure.

The time has come to cost-effectively reach the individual customer or company by bridging that last critical gap.

Nexans FTTx cables and solutions give you a number of benefits:

- One point of contact for all of your needs
- Fully terrain-tested cables and components
- Broader range of services over fewer connections, with less equipment
- State-of-the-art nodes and networks optimized for speed
- Future-proof fiber, the ultimate broadband solution
- Infrastructure to perfectly match your topography
- Local presence for better services
- Research Centers for new materials, designs, installation techniques
- Mastery of European and world standards
- Halogen-Free Fire-Resistant (HFFR) material for fire safety



Acronym/Glossary

B-PON	Broadband PON, allows additional services to APON, such as broadcast video or additional data
CAPEX	Capital expenditures
CLEC	Competitive Local Exchange Carrier
CPE	Customer Premises Equipment
DWDM	Dense WDM
EPON	Ethernet PON
Ethernet	An IEEE data communications protocol originally developed for premises and local access network (IEEE 802.3)
FITL	Fiber in the Loop, deployment of fiber on class 5 telephone switches
FTF	Fiber to the Feeder
FTTC	Fiber to the Curb
FTTCab	Fiber to the cabinet
FTTH	Fiber to the Home
FTTN	Fiber to the Node
FTTU	Fiber to the Unit
HFC	Hybrid Fiber Coax
ILEC	Incumbent Local Exchange Carrier
MAN	Metropolitan Area Network
MDU	Multi Dwelling Unit
Mid-span joint	A cable is stripped in the middle of a length, where only selected fibers are cut and joined
Micro cable	Cables intended to be blown through micro ducts
Micro duct	Small, light, flexible tube with outer diameter less than 16 mm
MTU	Multiple Tenant Unit
ODF	Optical Distribution Frame
OLT	Optical Line Termination. Network-side interface
ONU	Optical Network Unit. User-side interface
OPEX	Operational expenditures
P2MP	Point-To-Multi-Point
P2P	Point-To-Point
PON	Passive Optical Network
RBOC	Regional Bell Operating Company
Redundancy	Several alternative communication paths
WDM	Wavelength Division Multiplexing



Global expert in cables and cabling systems

Nexans is the worldwide leader in the cable industry, with an industrial presence in 29 countries and commercial activities in 65. The Group employs 20,000 people. Its sales amount to 4.9 billion Euros. Nexans brings an extensive range of advanced copper and optical fiber cable solutions to the infrastructure, industry and building markets. Its cables and systems can be found in every area of people's lives, from telecommunications and energy networks, to aeronautics, aerospace, automobiles, railways, buildings, petrochemicals, medical applications, etc.

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