



Cables and ODN Products for FTTR (Fiber to the room) Solution

ZTT INTEGRATED OPTICAL TRANSMISSION SOLUTIONS

ZTT Company Profile



1992 ESTABLISHED

\$12.5 BILLION
REVENUE.2021







16,000
EMPLOYEES

76 GLOBAL PLANTS

5 OVERSEA PLANTS

ZTT Company Profile



 	 	 	 	 	 
TELECOM	POWER GRID	RENEWABLE ENERGY	MARINE SYSTEM	PRECISION EQUIPMENT	EPC
<ul style="list-style-type: none"> ■ Preform ■ Optical Fiber ■ Fiber Optic Cable ■ ODN Products ■ Antenna & FTTA System ■ 5G BTS Energy Solution ■ Coaxial Cable ■ Optical Transceiver &Active Optical Cable ■ Data Center ■ 	<ul style="list-style-type: none"> ■ Power Cable ■ Overhead Conductor ■ OPGW/OPPC ■ Insulator ■ Hardware ■ Transformer ■ Power Cabinet ■ 	<ul style="list-style-type: none"> ■ Photovoltaic support bracket ■ Photovoltaic cable ■ Lithium Battery ■ Mounting System ■ 	<ul style="list-style-type: none"> ■ Submarine Cable ■ Marine System ■ Marine Engineering ■ 	<ul style="list-style-type: none"> ■ Industry Cable ■ Machinery Manufacture ■ 	<ul style="list-style-type: none"> ■ Overhead Transmission Line ■ Underground Cable System ■ Submarine Cable System ■ Telecommunication Line & FTTH System ■ Smart Substation Solution ■ New Energy Power Generation ■ Optical Products-Optical Transceiver &Active Optical Cable ■

Contents



- **Background Information**
- **Relevant Cables and ODN Products**

Need a Better Network Especially After Covid-19 Crisis



- **Confinement brought pressure and opportunity to fibre network**
 - ✓ 50-70% average traffic increasing was recorded
 - ✓ FTTR network performed better than copper and coax network
 - ✓ According to analyst, bandwidth demand to work and study from home will NOT return to pre COVID-19 levels
- **Gaps between demand and network capacity were reported during confinement**
 - ✓ Network connection outages or quality degradation were reported from multiple countries;
 - ✓ EC officers called for measures to reduce network load: HD video to SD video and got support from ICPs
 - ✓ Upstream matters: copper network works in an asymmetrical manner with limited upstream bandwidth
- **Measures needed to improve network infrastructure to allow more applications during pandemic**
 - ✓ Innovation: to make infrastructure deployment easier, faster and cheaper
 - ✓ Standardization: to specify network features which bridge gaps reported and meet future demand
 - ✓ Regulations and policies: to stimulate investment to support fibre network deployment

Thierry's Twitter (European Commissioner)



Thierry Breton
@ThierryBreton

Important phone conversation with [@ReedHastings](#), CEO of [@Netflix](#)

To beat [#COVID19](#), we [#StayAtHome](#)

Teleworking & streaming help a lot but infrastructures might be in strain.

To secure Internet access for all, let's [#SwitchToStandard](#) definition when HD is not necessary.

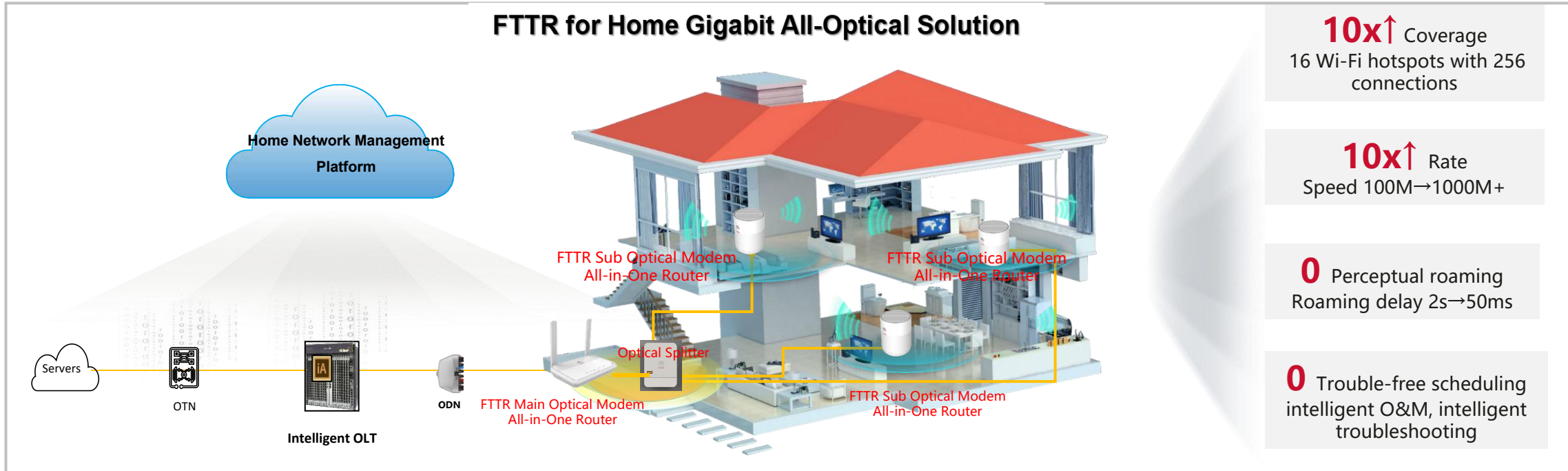
2020.3.18 Twitter for iPhone

All-optical fibre network is the key to support online life and work.
Improving network is more important than reducing demand.

FTTR for Home: Building A Ultimate All-optical Gigabit Experience



FTTR for Home Gigabit All-Optical Solution



Fiber Full Connection

- Fiber extends from the doorway to each room
- Whole-house fiber connection + optical network components

Full Gigabit Coverage

- Wi-Fi6 160MHz frequency bandwidth
- Measured speeds of over a gigabit in all rooms

Wi-Fi Full Roaming

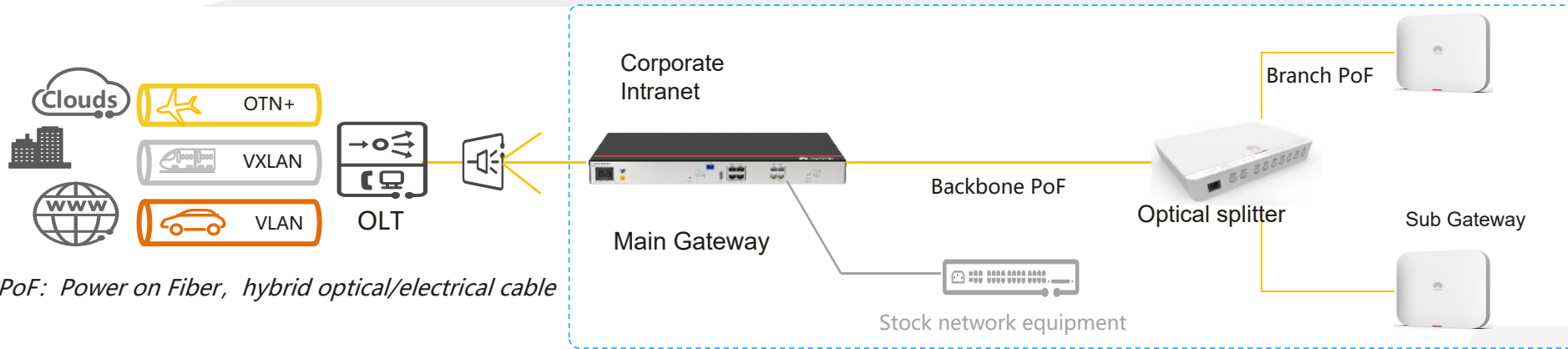
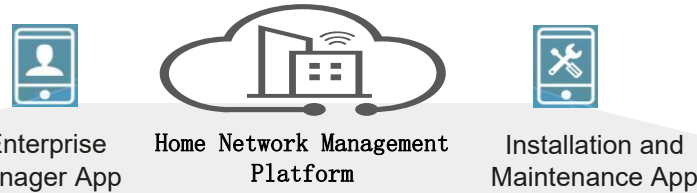
- AC+AP architecture for seamless roaming throughout the house
- Switching without perception, time delay <50ms

Total Intelligence for Troubleshooting

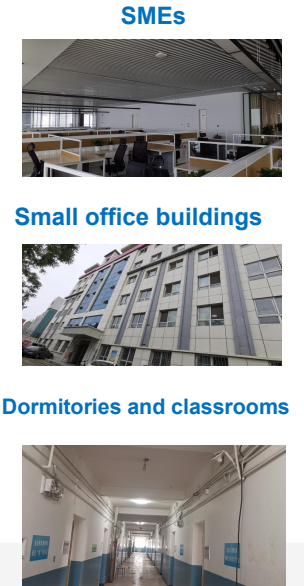
- Intelligent O&M platform, visible and manageable
- Automatic identification and analysis of network faults

Home FTTR network realizes an ultimate experience of true gigabit, low latency, and full coverage.

FTTR for Business: Re-create an Indoor Gigabit Optical Network to Build a Digital Base for the Enterprise



*PoF: Power on Fiber, hybrid optical/electrical cable



1 all-optical private network
1 50m optical composite cable
1 .2G Wi-Fi6 reachable rate makes an ultimate experience

2 2-tier PtMP minimalist architecture
2 0+ years life of optical fiber

3 300 users online

4 4-stage series connection, max. 32*AP

5 in 1, built-in AC+PoF
5 Mbps @ 64 ends with guaranteed bandwidth

Ultimate Experience

+ **X**

Exclusive butler: Government & Enterprise View / Intranet Visibility

Exclusive roaming: switching delay 100ms

Proprietary antennas: smart antennas, beamforming

Business FTTR network realizes a seamless experience of true gigabit, multiple connections and full coverage.

Development of the Industry

FTTR network based on the P2MP architecture is widely and rapidly developed all over the world, with mature technology and broad application prospects.

- ZTE launched the Room P2MP solution in July 2020. Based on P2MP technology, it realized point-to-multipoint (P2MP) transmission, and supported FTTR construction well.
- Fiberhome launches FTTR solution in 2020. Based on P2MP network architecture, FTTR products appeared.
- In early 2020, Huawei launched the FTTR solution based on the P2MP architecture, which is used in households and small and micro enterprises, and has been commercialized in large quantities.

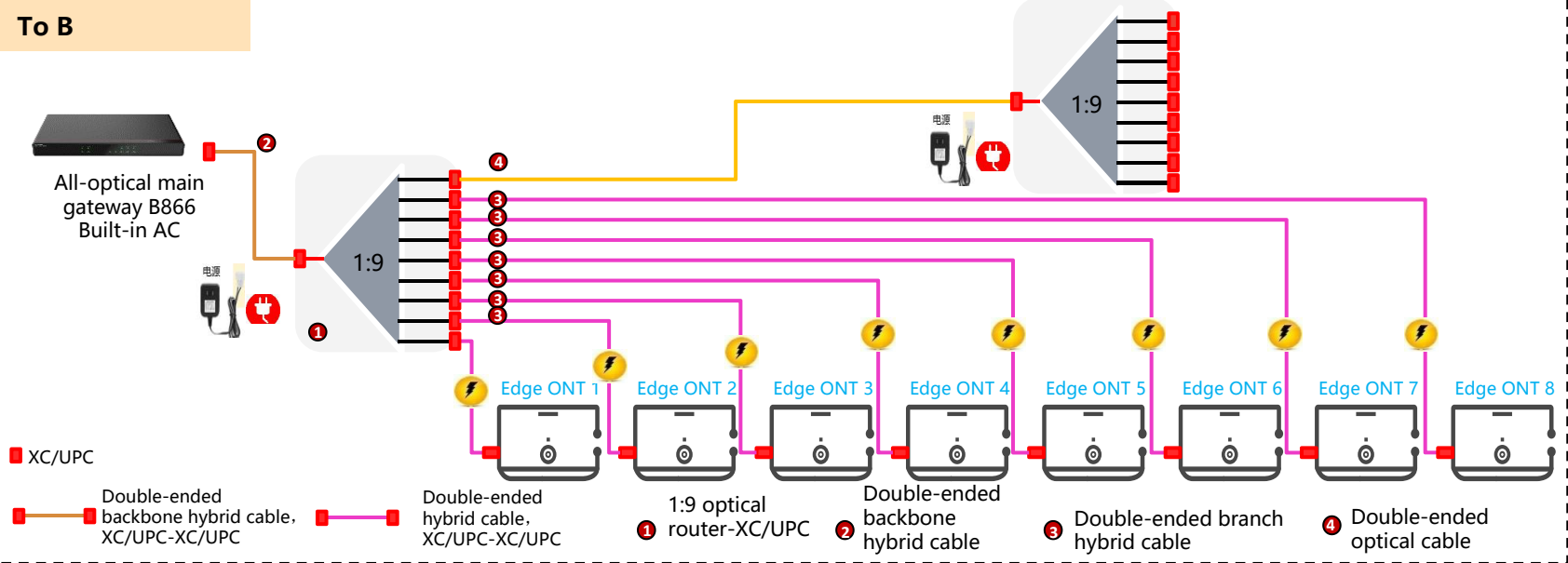
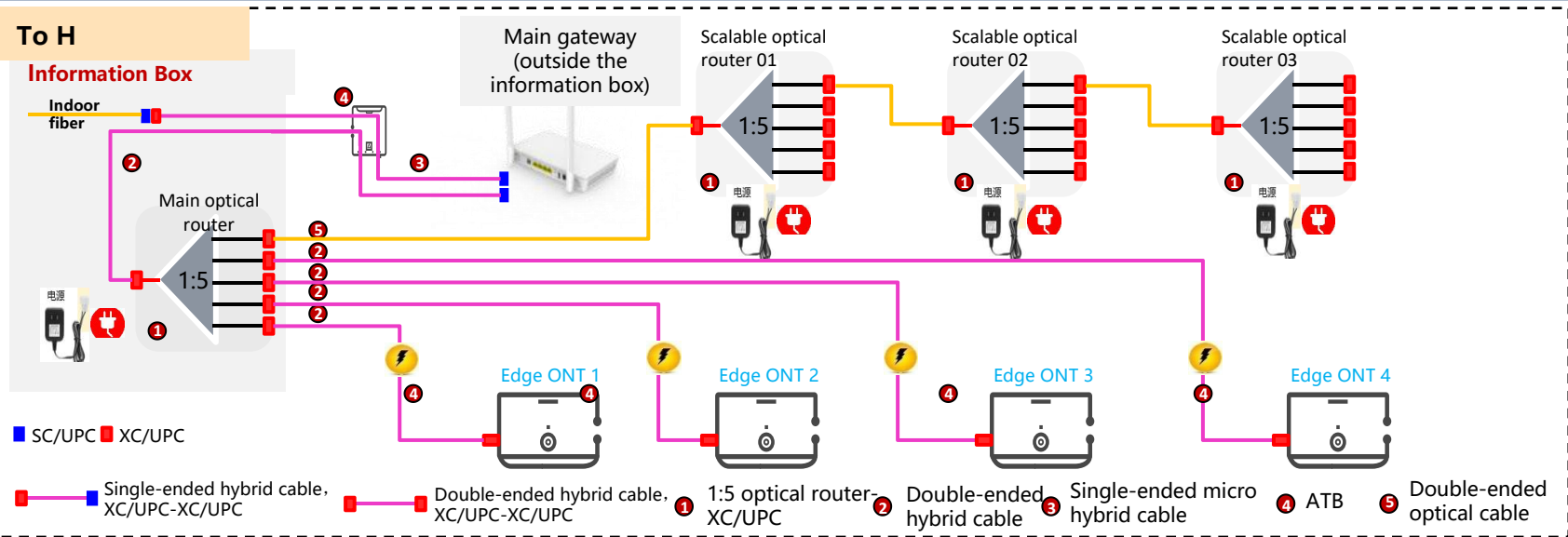


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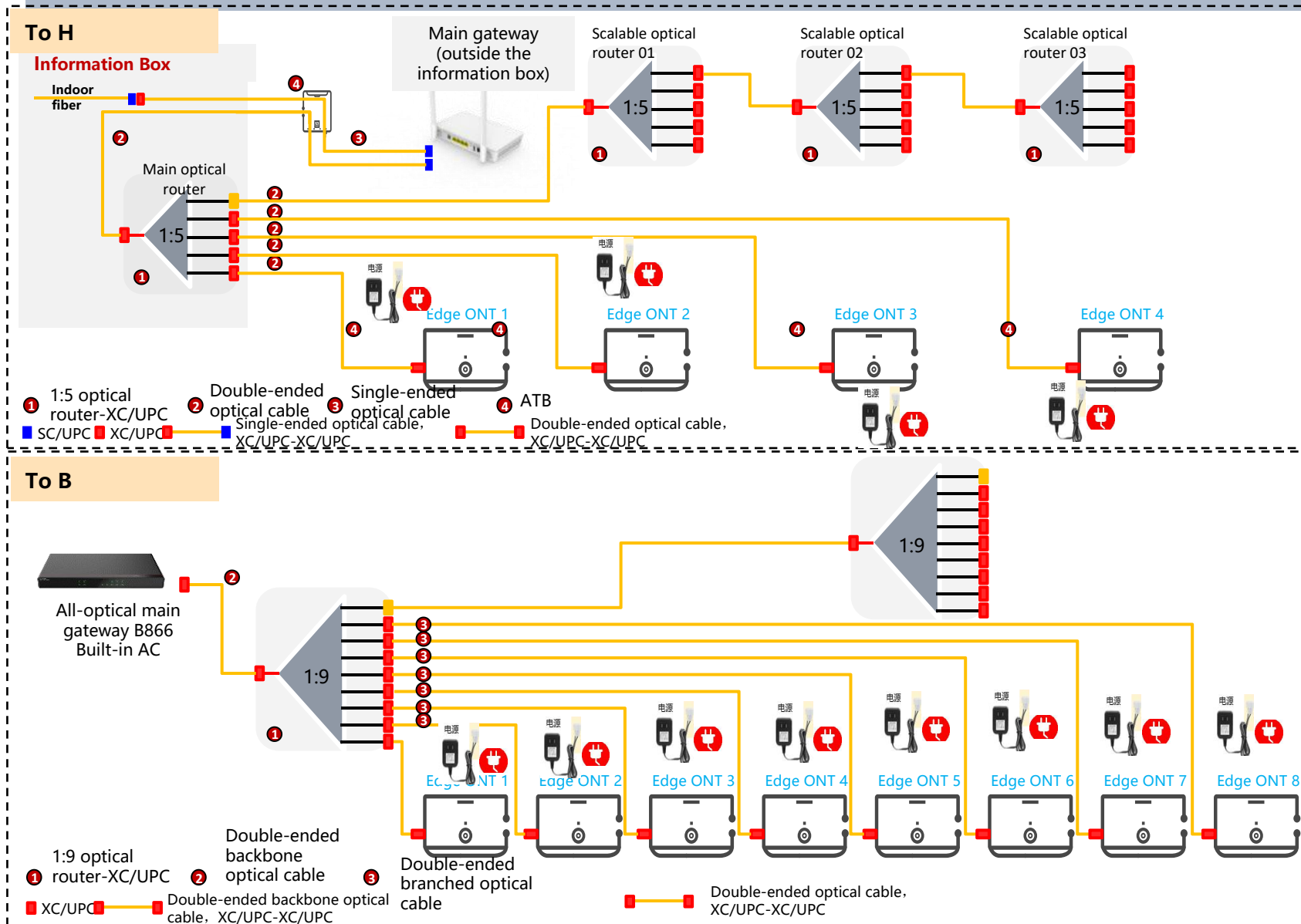
- **Background Information**
- **Relevant Cables and ODN Products**

FTTR@2H&2B Generic Cabling Solution-Hybrid Intergrated



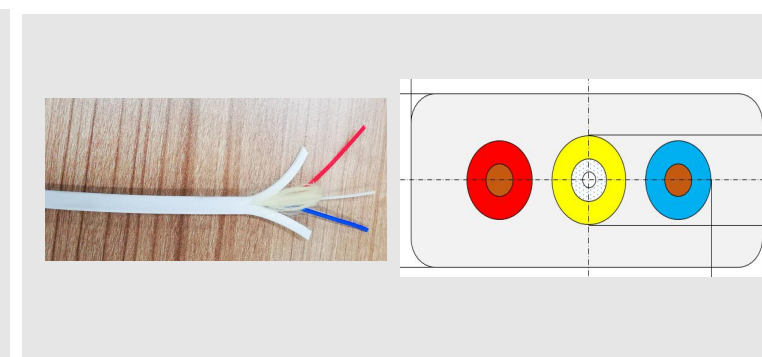
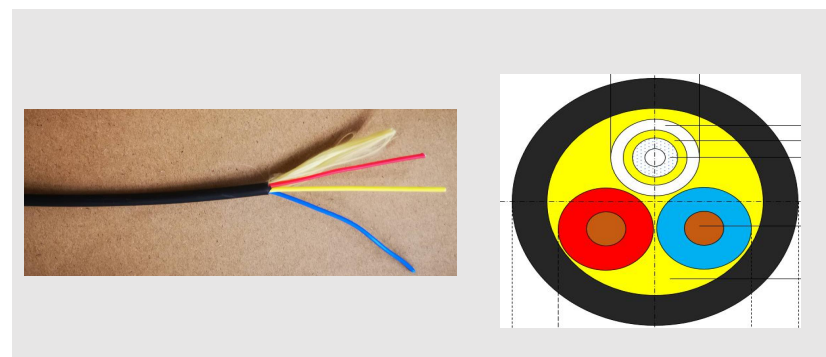
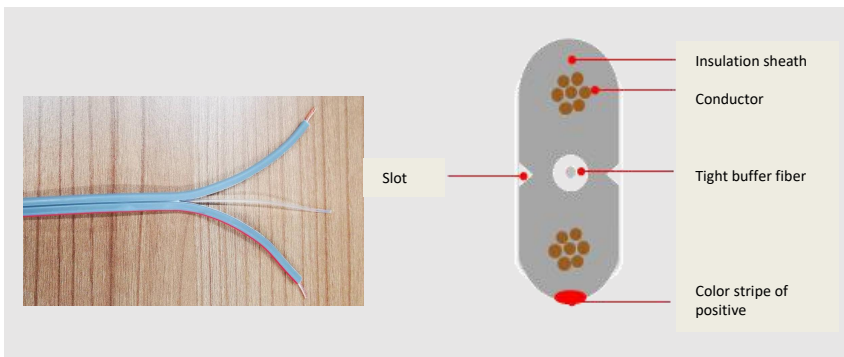
- **Indoor unequal networking**
 - Up to 16 APs
 - Single-core tandem networking, avoiding duplicate cabling and reducing construction difficulties.
 - Good scalability: each splitter supports 8 APs, 1:9 expandable splitter, maximum 32 APs
- **Hybrid cable intergrated solution, has optical transmission and power supply function meanwhile**
- **Easy to pass through pipe, no fusion**
 - Smallest photoelectric connector in the industry. Innovative process and design reduces the size of the small micro-connector by 50%, allowing for easy traction and fusion-free construction
 - Low friction, with a coefficient of 0.25 for optical cables, helping to improve passing pipe performance
- **Scalable and widely available, while ONT not require independent power connection**
 - Using the main gateway for remote power supply, the panel ONT does not require independent external power connection, greatly enhancing customer perception and satisfaction
- **The indoor cabling distance exceeds the 100m distance limit and can support up to km level cabling.**

FTTR@2H&2B Generic Cabling Solution-Power+Optical



- **Indoor unequal networking**
 - Up to 16 APs
 - Single-core tandem networking, avoiding duplicate cabling and reducing construction difficulties.
 - Good scalability: each splitter supports 8 APs, 1:9 expandable splitter, maximum 32 APs
- **Separate Power supply line + optical cable transmission line**
 - ONT require independent power connection
- **Easy to pass through pipe, no fusion**
 - Multi core cable for backbone and branch routing
 - Low friction horizontal cable, with a coefficient of 0.25 for optical cables, helping to improve passing pipe performance
- **Or Invisible Cable without passing through pipe, only installed outside along wall**
- **The indoor cabling distance exceeds the 100m distance limit and can support up to km level cabling.**

Typical FTTR Cable: Hybrid Optical/Electrical Cable

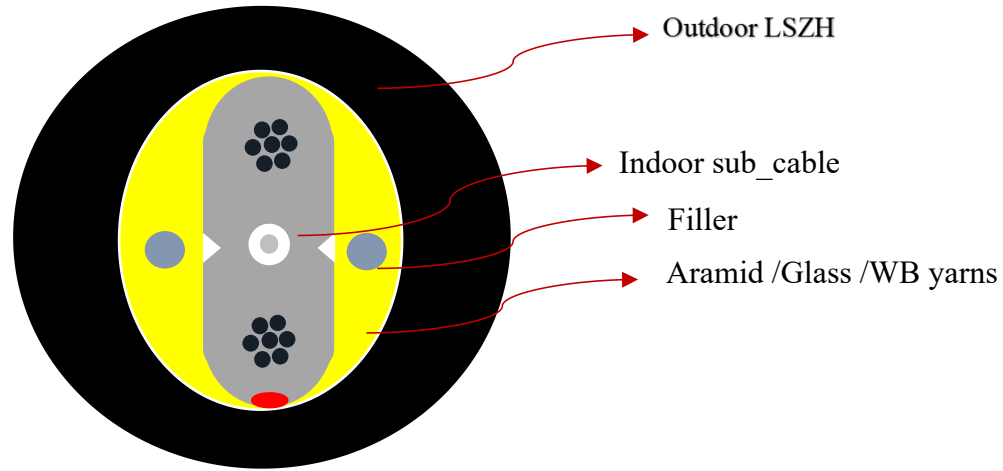


Characteristics:

- Indoor application and flame retardant
- Optical and electrical integration, providing both data transmission and remote power supply to the equipment
- Network side can be connected to Hybrid SC pigtail cable
- User side can be connected to SC/UPC connectors and wires with RJ45 crystal headers
- Small outer diameter, light weight and small space occupied
- Excellent bending performance and good flexibility, easy construction

Optica fiber	Number of fiber	1 core
	Type of fiber	G.657A2
Tight buffer	OD (unit: mm)	0.9±0.05
Conductor	Material	Bare or oxygen-free copper
	Quantity	2
Insulation sheath	Material	LSZH (Friction coefficient ≤ 0.25)
	Color	Pantone 430U grey or black
Color stripe of positive	Color	Red
Cable Size (H x L, unit: mm)		2.2(±0.2)x 5.3(±0.2)mm; Φ4.3mm; 4.2 x 1.8mm
Cable Weight (unit: kg/km)		approx 28
Cable length (Unit: m)		1km/drum
Max. transmission power		90W
Max. transmission voltage		60V
Max. transmission performance		POE: 800m POE+: 400m POE++: 200m

Typical FTTR Cable: Hybrid Optical/Electrical Cable



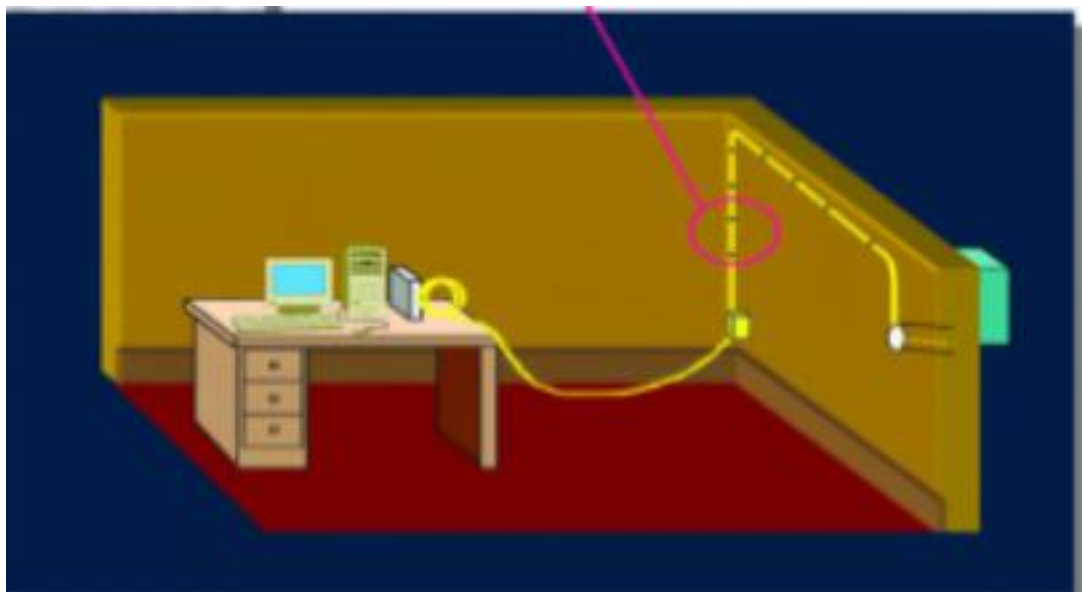
Characteristics:

- Outdoor and Indoor application
- Flame retardant structure, but meanwhile UV-proof applicable for outdoor conditions
- Optical and electrical integration, providing both data transmission and remote power supply to the equipment
- Network side can be connected to Hybrid SC pigtail cable
- User side can be connected to SC/UPC connectors and wires with RJ45 crystal headers
- Excellent bending performance and good flexibility, easy construction

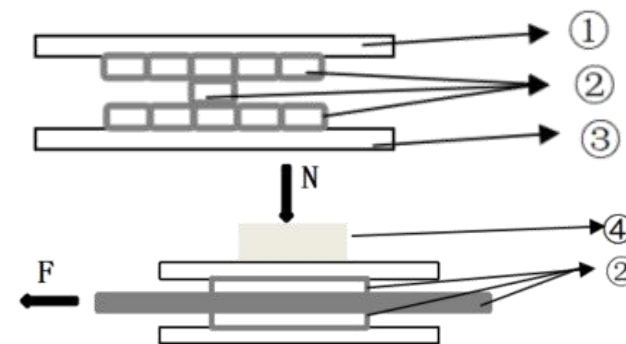
Optica fiber	Number of fiber	1 core
	Type of fiber	G.657A2
Tight buffer	OD (unit: mm)	0.9±0.05
Conductor	Material	oxygen-free copper
	Quantity	2
Insulation sheath	Material	LSZH (Friction coefficient ≤ 0.25)
	Color	Pantone 430U grey or black
Color stripe of positive	Color	Red
Cable Size (H x L, unit: mm)		Inner unit: 2.2(±0.2)x 5.3(±0.2)mm; Overall: 7.0±0.2mm
Cable length (Unit: m)		1km/drum
Max. transmission power		90W
Max. transmission voltage		60V
Max. transmission performance		POE: 800m POE+: 400m POE++: 200m

Typical FTTR Cable: Indoor Optical Cable

Low Friction Indoor Cable for Concealed Duct



Friction Coefficient Test



- ①&③: steel tape to fix cables
- ②: Cables
- ④: Load on cable

Characteristic

- Flat butterfly drop cable
- Parallel strength structure to provide mechanical protection.
- Special notch design to provide good stripping.
- Extremely low friction, about 80% smaller than the conventional drop cable, the friction coefficient can be as low as ≤ 0.25 , even ≤ 0.15 ;
- Small size normally 1.6*2.1mm, light weight(around 6kg/km), more easily through the pipeline.

Typical FTTR Cable: Indoor Optical Cable

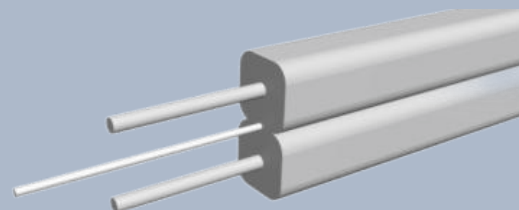


Stealth-tek® Invisible Cable for Exposed Installation

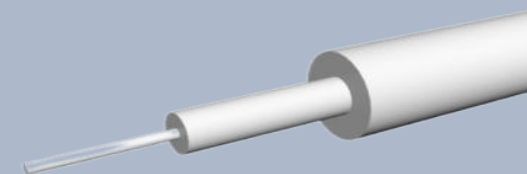


Typical Structure:

2*3mm



0.9mm



Characteristic

- Installed cable almost undetectable to the casual observer;
- Fast installation with adhesive glue;
- Apply to all kinds of indoor environment.

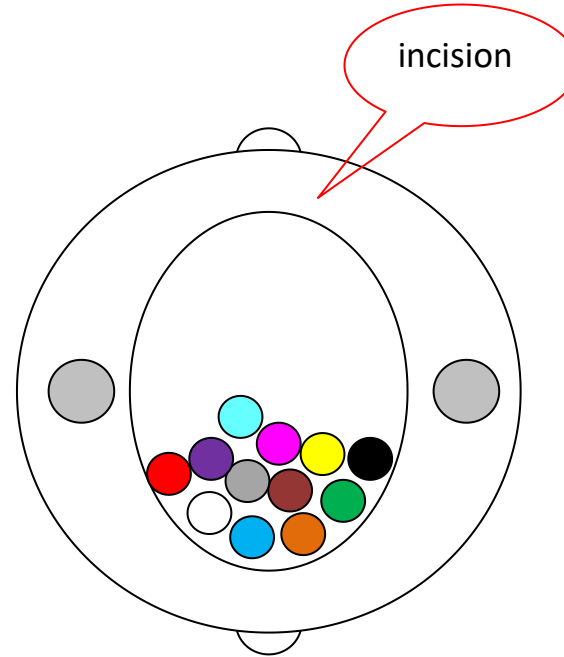


Corner Protector

Typical FTTR Cable: Indoor Optical Cable for Backbone and Branch



Mid Span Indoor Cable



- Stripping the outer sheath through the use of open window construction;
- FRP not only acts as a reinforcement, but also protects the fiber core when opening the skylight;
- Move cable core freely (easily drawn out of 50 meters), convenient and flexible for installation and connection;
- Soft outer sheath, excellent flame retardant property
- Applicable for horizontal and vertical distribution in building.

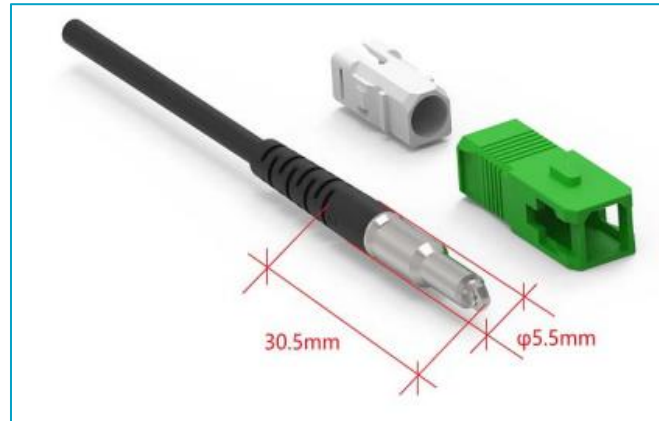
FTTR ODN Products: Splitter & Connector



Miniature Jumper



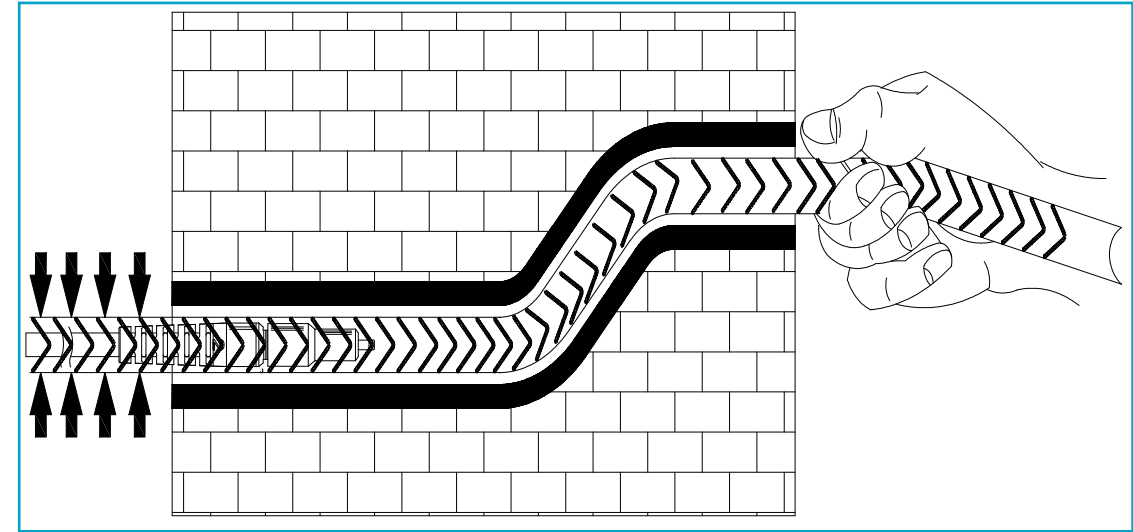
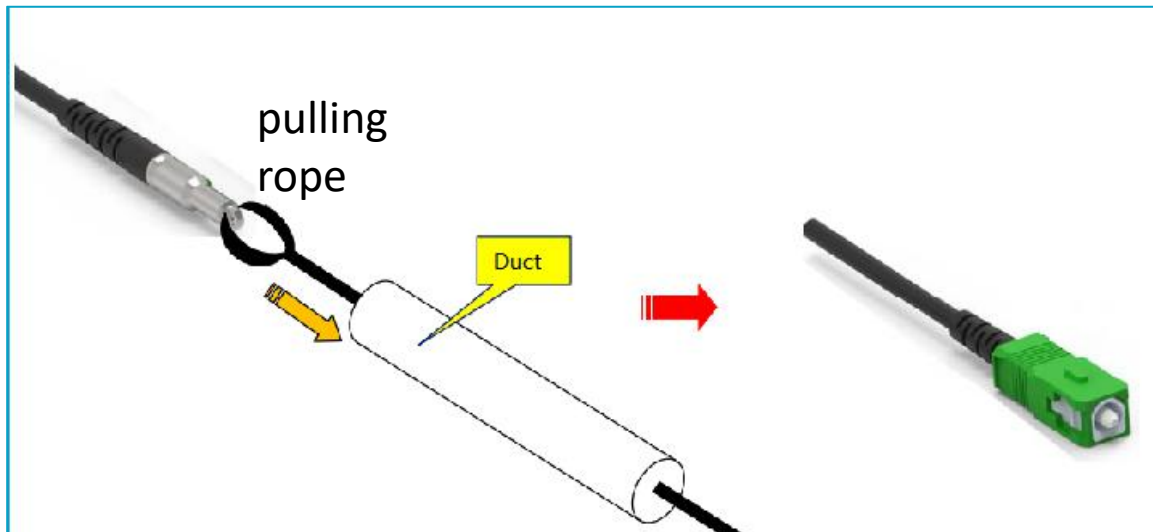
Dimension



Charteristics

Insert Loss	≤0.2dB
Return Loss	UPC≥50dB APC≥60dB
Assembly Cycles	> 5 time
Cable OD	3.0mm Round Cable 2*3mm Drop cable
Duct ID	microtubes ID≥7mm, Min. bend radius ≥ 84mm

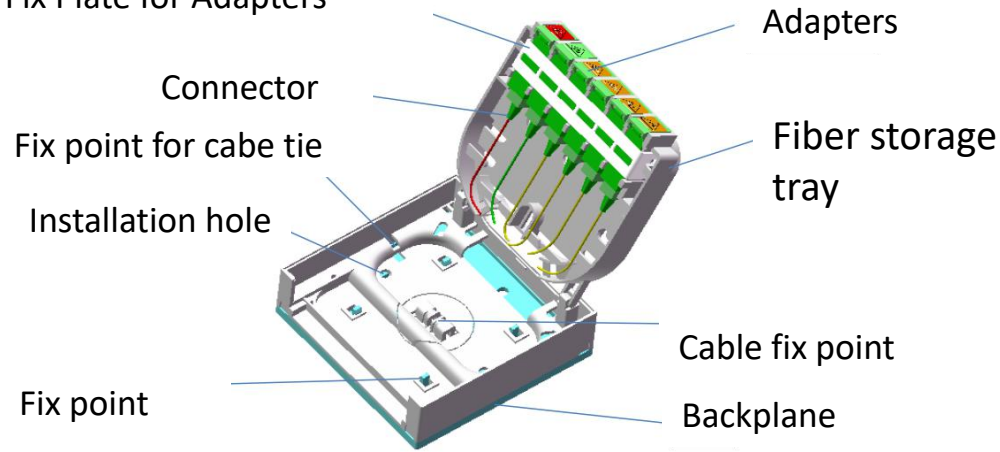
Installation Methods: Pulled by rope or sleeve



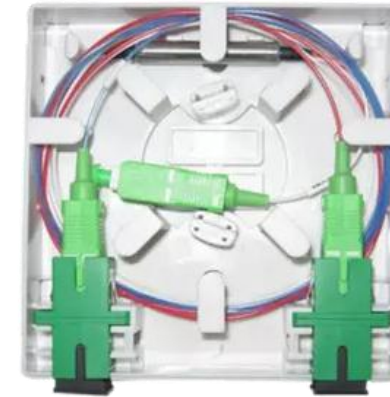
FTTR ODN Products: Splitter & Connector



Fix Plate for Adapters



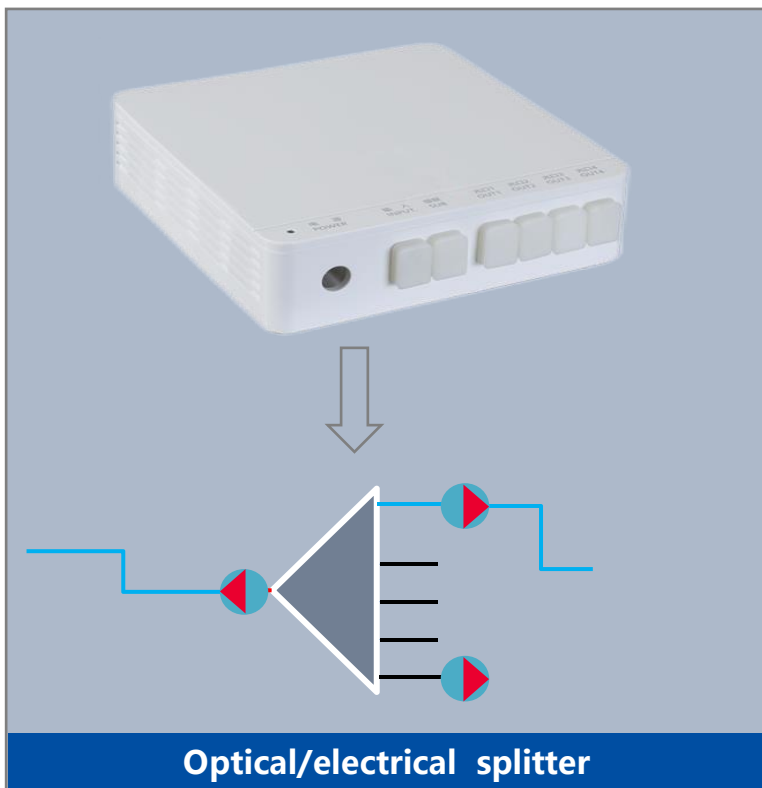
1. Supporting the installation of one 4×7×50mm and one φ3×50mm splitter and at least 2-core fusion;
2. Provide 6 installation slots for SC adapter;
3. The typical application scenario of 6 adapters is 4 outputs, 1 uplink, and 1 cascade. Different colors are used to distinguish them. It is recommended to use white for 4 outputs, red for uplink, and green for cascade (APC). end face) or blue (UPC end face).



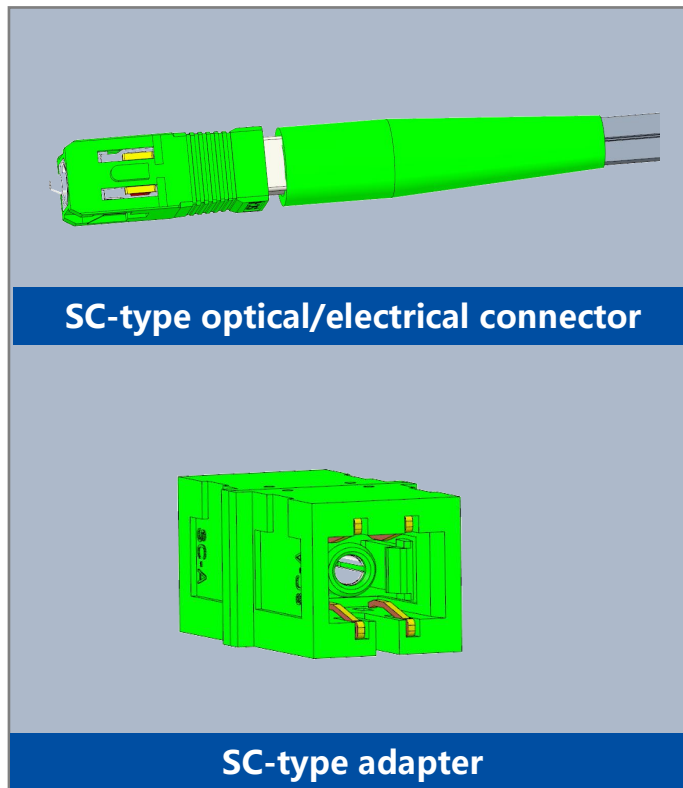
1. Connection type: SC, ST with common type adapters.
2. Using high-quality fire resistance PC material
3. With a dust-proof device to prevent dust from entering.
4. Equipped with identification strips, convenient for management and maintenance.

Cable type	3.0×2.0mm drop cable or indoor cable
Fiber OD	125μm(652 & 657) or 900um
Model type	SM or MM
Tensile load	>50N
Adapter type	SC & FC
Insert Loss	≤0.2dB(1310nm & 1550nm)
Output Number	2

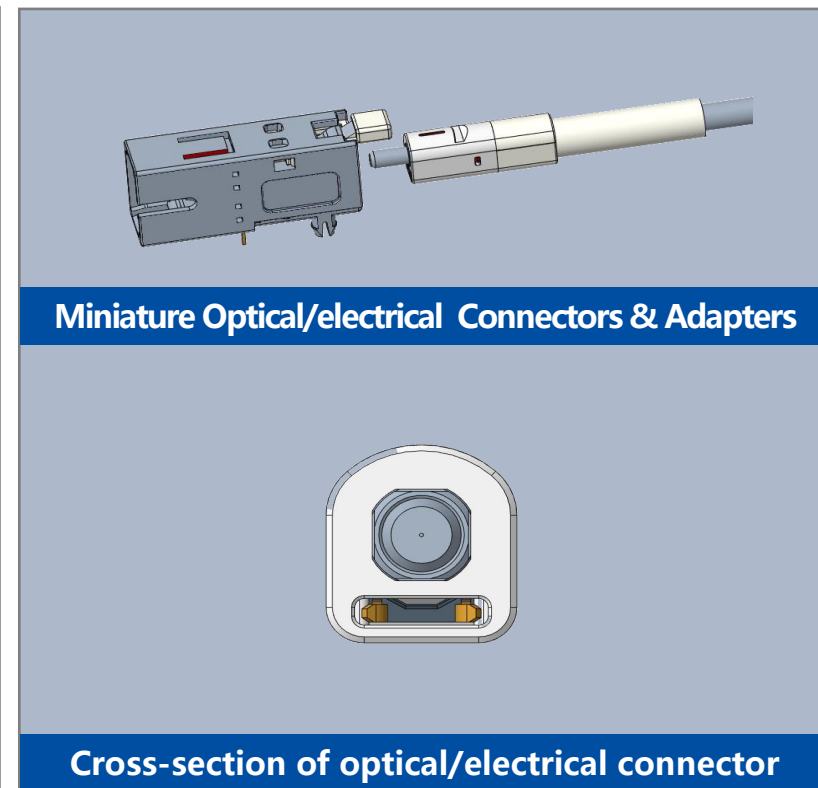
FTTR ODN Products: Splitter & Connector(Hybrid)



Input-cascade end insertion loss	≤2dB
Input-Loss of insertion at the entry end	≤16dB
Rated voltage	48~56V
Rated current	1A 0.25A /Port

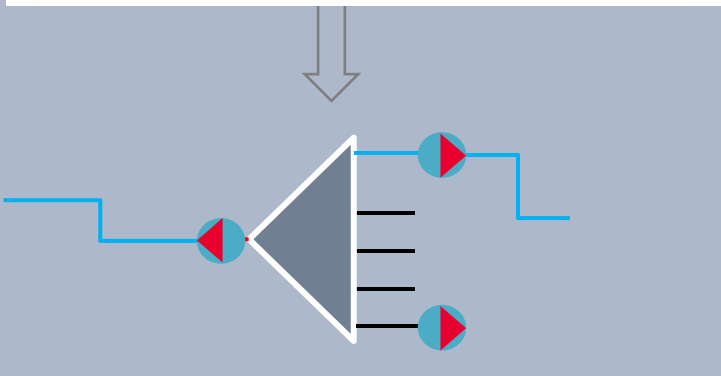
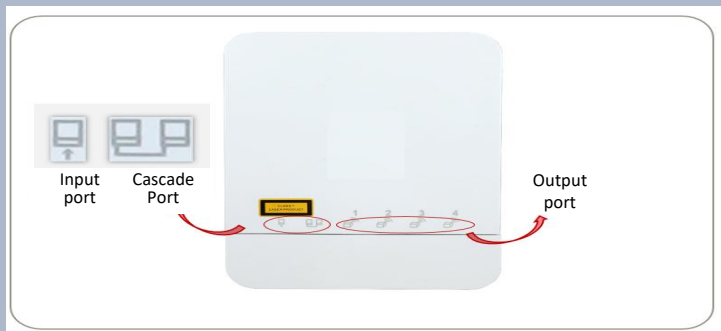


Typical insertion loss	≤0.3dB
Characteristics	Compatible with conventional SC adapters, low resistance



Typical insertion loss	≤0.5dB
Characteristics	Push to unlock, pipeable, extra short XC connector

FTTR ODN Products: Splitter & Connector(Optical)



Optical splitter

Input-cascade end insertion loss	≤2dB
Input-Loss of insertion at the entry end	≤16dB



SC-type optical connector

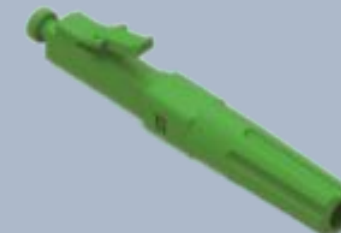


SC-type adapter

Typical insertion loss	≤0.3dB
Characteristics	Compatible with conventional SC adapters, low resistance



SC type fast connector



LC type fast connector

Typical insertion loss	≤0.3dB
Cable OD	2.0mm, 3.0mm, 2*3mm etc.

Conclusion



- 1. Hybrid electrical/optical cable:** transmit optical signal and electric energy at the same time, supply electricity for terminal active communication equipment, one-time laying, reduce line laying cost
- 2. Invisible cable:** use transparent or white sheath, go directly outside, and keep indoor beautiful and minimally disturb the household
- 3. Low-friction cable:** It has a friction coefficient that is 80% lower than conventional cables. When laying through a duct, it can effectively improve the efficiency and convenience of the installation.
- 4. ODN product:** provide accessories for the overall hybrid electrical and optical solution, and the miniature jumper can facilitate the laying of passing through duct.



Thank You!

www.zttcable.com