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The operational management structure of the **ARTIC FIBER** is based on a matrix organization consisting of six manufacturing divisions utilizing state-of-the-art technology and strong technical expertise to create the **ARTIC FIBER** product portfolio. This is coupled with regionally managed **ARTIC FIBER** facilities comprised of company branches and distribution outlets thus ensuring an active global distribution network to meet customer demand.

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Fiber to the Room Design Guide Redefining HOME Connectivity for the Future

FTTR is a crucial component of F5G (fifth-generation fixed networks). In the future, it will be further integrated with technologies like Wi-Fi 7 and 50G PON (passive optical network), advancing toward 10G access. Furthermore, the collaborative, intelligent, lossless, and user-friendly development of optical and Wi-Fi networks will become a key development direction, better supporting the extreme demands of home networks from cutting-edge applications like the metaverse and holographic communications.

FTTR fiber-to-the-room solutions deliver fiber directly to every room, utilize a single master and multiple slaves for seamless roaming, and provide a high-speed, stable, and fully covered home network experience. While initial investment and installation requirements are high, FTTR is a highly worthy, one-stop solution for users seeking high-quality connectivity, possessing numerous connected devices, or living in larger spaces.

FTTR (Fiber to the Room) Solution Analysis

Solution Core Advantages

The core idea of FTTR is to extend fiber optic cables to every room in your home or office, just like water and electricity, allowing you to enjoy high-speed, stable internet connections in every corner.

Whole-home Gigabit Coverage: Fiber optic cables are extended directly to every room, and then Wi-Fi or wired connections are provided by optical routers (also known as "optical modems"). This effectively avoids the severe attenuation of Wi-Fi signals after passing through walls in traditional solutions, ensuring high-speed and stable internet access in every room.

Low Latency and High Concurrency: Fiber optic transmission offers extremely low latency and can stably support a large number of devices simultaneously online. This is crucial for online education, remote work, 4K/8K ultra-high-definition video streaming, VR/AR experiences, cloud gaming, and the integration of smart home devices.

Large Potential for Future Upgrades: Fiber optic cables offer enormous bandwidth potential, with current technology already supporting 10Gbps per room. This means that with a single wiring installation, you can smoothly upgrade to higher speeds in the future, effectively protecting your investment.

Strong anti-interference capability: Fiber optic cables are unaffected by electromagnetic interference, providing a more stable and reliable network connection, less susceptible to network interruptions or speed drops due to external factors.

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Why Fiber to the Room (FTTR) is an Essential Amenity

In a world of ever-increasing bandwidth needs and guest expectations, your network should never limit what you are able to achieve. The incredible power of FTTR opens a host of new possibilities.

Robust Services, Efficiently Delivered

FTTR deployments enable fast, reliable connections for must-have amenities, such as in-room Wi-Fi, Internet Protocol television (IPTV), and voice over internet protocol (VoIP) phones.

Big Benefits with a Smaller Footprint

FTTR can eliminate the need for parallel network infrastructure and multiple intermediate distribution frame (IDF) closets and allows you to reclaim space for more revenue generation with a smaller cable footprint.

Flexibility to Meet Any Need

FTTR can help you deploy a passive optical network (PON) or an Active Ethernet network that's future-ready and can handle ever-evolving bandwidth needs.

Frustration-Free Upgrades

Because of its modular, scalable nature, FTTR eliminates the need for costly and disruptive "rip-and-replace" upgrades and infrastructure changes.

Savings Today and Tomorrow

With a streamlined network architecture, there's less equipment to install and maintain. Plus, you will save on valuable space, power, cooling, and ongoing tech support for day-to-day network maintenance and changes.

Total Peace of Mind

An FTTR approach can boost network security at your hotel while decreasing network complexity. Fiber is inherently more difficult to physically tap than legacy electric signals. Today's systems also have fewer physical access points, like computer ports, decreasing the opportunity for network intrusions.

High Speed and invisible



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What Fiber to the Room Looks Like

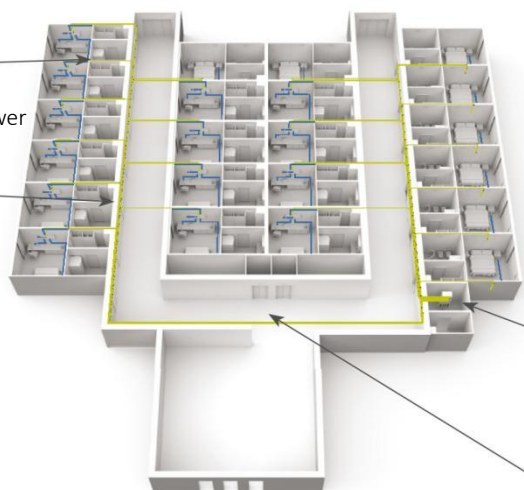
FTTR allows you to provide a sophisticated guest experience while freeing your building from excess wires. A typical FTTR approach can reduce your network infrastructure by 50%–80% with a simpler network design.

One Cable Per Room

Reduces space in the IDF, pathways, and conduit while delivering bandwidth and power to meet today's and tomorrow's needs

Composite Fiber

Has capacity to connect rooms thousands of feet away and far beyond the traditional network's 300-ft limitation



Consolidated IDF Closet

Houses all rack-mounted equipment in one location, freeing up space on each floor, and can service more floors than with traditional networks

Back-of-House Applications

Can be supported as required by the design



Five Considerations When Designing a Fiber-to-the-Room Experience

Once you have fully evaluated your needs and decide to move forward with an FTTR approach, these five considerations can help you design the blueprint that's right for your room/house.

Consideration 1: Planning for Higher Download Speeds at the Network's Edge

To realize its full potential, Wi-Fi 6 needs 10 Gbps for each wireless access point (WAP). Wi-Fi 7, expected to deploy in 2023 or 2024, is projected to need 40 Gbps for each WAP. Traditional networks will not be able to handle these requirements economically—to support 40 Gbps you may need to pull four CAT 6A copper cables to one WAP. FTTR networks, on the other hand, are designed to handle these demands with ease. Using composite fiber cables, which combine fiber for data with copper pairs for remote power in one sheath, you get the bandwidth you need plus the power to support 40+ Gbps to the edge of your network in a single flexible cable.

Consideration 2: Converging Existing Networks Across One Digital Backbone

Consolidating into one digital backbone reduces the number of networks you need to build and support, minimizing upfront and management costs over time. FTTR is an extremely flexible platform that can easily support traffic beyond voice, data, and video—including property management systems.

Consideration 3: Adding Partial or Complete Cellular Connectivity

Supplementing Wi-Fi with cellular connectivity can help ensure your guests and employees have a seamless experience no matter their device or connectivity source. That said, there are trade-offs when taking this approach. Providing complete connectivity across your hotel using a neutral host system for coverage across all carriers can be an expensive endeavor. Think about limiting the number of carriers or localizing coverage to specific areas such as the lobby if this is something you would like to pursue.

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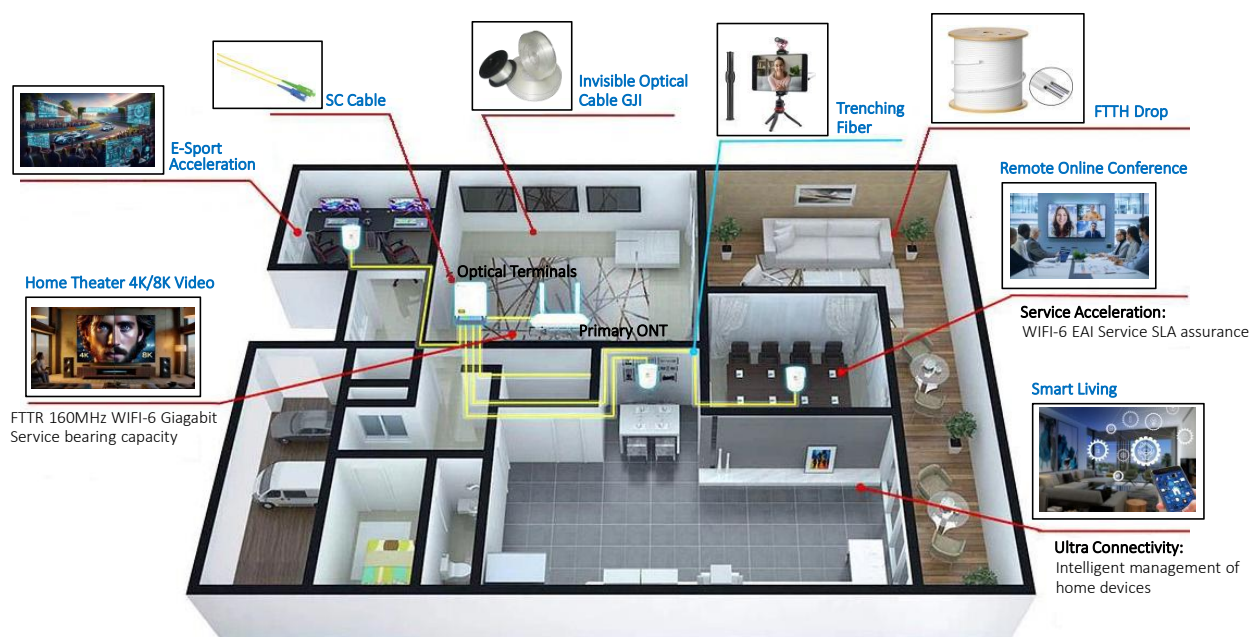
FTTR Solution (The Upgraded FTTH)

The finer habit of power using, remote control of home, security warning of multi places and suitable indoor environment designed by "Smart Life" have been chased by more and more people along with the higher level of living they have nowadays.

Slow speed, poor signal are the problems frequently occurred in the FTTH work, meanwhile, the terminal devices cannot reach the speed they should be caused by the single WIFI router without the strong ability to penetrate the wall.

Along with the arrival of 5G ALL-OPTICAL NETWORK in Digital Time, FTTR (Fiber to The Room) has been occurred, fiber deployment to the room design solution is based on FTTB (Fiber to the Building) and FTTH (Fiber to the Home), so that each room can reach more than a gigabit network speed, to achieve full coverage of the whole house wired and Wi-Fi dual gigabit.

FTTR Sample Site Orientation (First Floor): Giga to Every Room



The Fiber-To-The-Room Scenarios

Related FTTR Products Catalogue

- ☑ LC / SC Fiber Optical Field Assembly Connectors.....
- ☑ Quick-pullable Patch Cables.....
- ☑ Quick-deployment FTTR Pre-connected Pigtails.....P01
- ☑ Invisible Fiber Optical Cables.....
- ☑ Indoor Fiber Optical Terminal Boxes.....
- ☑ Flat Drop Optical Cables.....
- ☑ Dual Band Wireless Wi-Fi 6 GPON ONT



LC / SC Fiber Optical Field Assembly Connectors

Keyed Characteristics

- ✓ Quick and easy fiber termination;
- ✓ RoHS compliant;
- ✓ Reusable termination capability [Up to 10 times];
- ✓ Easy to deploy fiber solution;
- ✓ High success rate of connections;
- ✓ Low Insertion & Back Reflection;
- ✓ No special tools required.

Application

- ✓ All fiber interconnection;
- ✓ Telecom Distribution and Local Area Networks;
- ✓ FTTH and FTTx;
- ✓ Passive optical networks [ATM, WDM, Ethernet];
- ✓ Broadband, Cable TV (CATV).



Technical Parameter

Item	Parameter					
Insertion Loss	SM / UPC (LC / SC)		SM / APC (LC / SC)		MM / UPC (LC / SC)	
	Typical	Max	Typical	Max	Typical	Max
	≤ 0.30dB	≤ 0.50dB	≤ 0.30dB	≤ 0.50dB	≤ 0.30dB	≤ 0.50dB
Return Loss	Min.50dB		Min.60dB		Min.30dB	
Operating Wavelength	1310nm ~ 1550nm				850nm ~ 1300nm	
Test Wavelength	1310nm ~ 1550nm				850nm ~ 1300nm	
Durability	200 Cycles					
Cable Diameter Range	3.0mm/5.0mm round drop; 2x3mm/2x5mm butterfly					
Installation Temperature	-10℃ to +60℃					



Quick-pullable Patch Cables

Keyed Characteristics

- ✓ Innovative patchcord with patented factory terminated and polished connector with no need to use optical splicer;
- ✓ Superior mechanical and environmental performance, designed for indoor and outdoor installation;
- ✓ Pulling / pushing through a hole with diameter 4.5mm;
- ✓ No tool installation system reduces time and costs;
- ✓ Excellent geometrical and optical parameters;
- ✓ LSZH and UV resistant outer sheath;

Application

- ✓ All fiber interconnection;
- ✓ Telecom Distribution and Local Area Networks;
- ✓ FTTH and FTTx;
- ✓ Passive optical networks [ATM, WDM, Ethernet];
- ✓ Broadband, Cable TV (CATV).



Connector Specification

Standard (SC)	Connector Type	Ferrule Type	Insertion Loss (dB)	Return Loss (dB)	Tensile Strength (N)	Operating Temp. (°C)
TIA/EIA 604-3	SC	APC / UPC	≤ 0.3dB	≥ 50 for UPC; ≥ 60 for APC	100	-40 to +60

Cable Specification

Standard	IEC794-1, EIA455	Cross-section	Round
Fiber Type	SM (G657A1, G657A2, G657B3)	Cable Diameter	3.0mm
Outer Sheath Colour	Black, Grey	Outer Sheath Thickness (mm)	0.4
Outer Sheath Type	LSZH, UV resistant	Unit Weight (kg/km)	8
Maximum Tensile Strength (N)	1000	Maximum Installation Length (m)	50
Bending Radius	20 x Cable Outer Diameter	Operating Temp. (°C)	-40 to +70



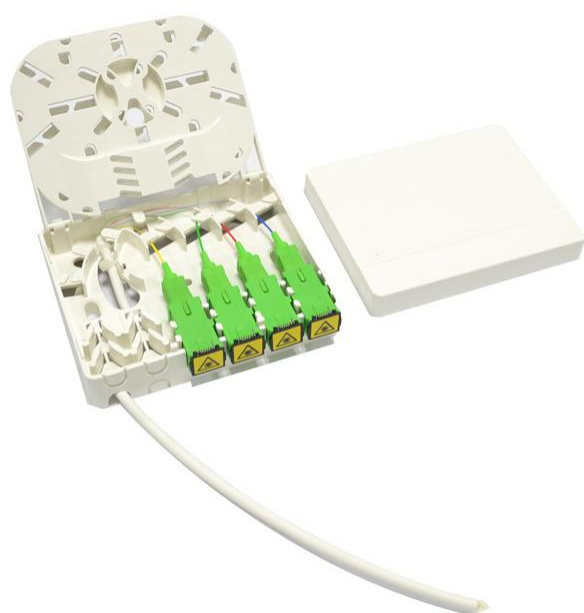
Quick-deployment FTTR Pre-connected Pigtail

Keyed Characteristics

- ✓ Carton Cable reel packing with Pizza Box;
- ✓ Max length of drop cable pigtail 100 meters;
- ✓ Max capacity of terminal box 4 SC/8 LC;
- ✓ Pigtails pre-termination in the box, no need fusion splice;
- ✓ Fast pulling out cable for installation;
- ✓ Shutter adapter for laser protection available;
- ✓ Wall mountable fiber terminal box;
- ✓ Connector IL<0.3dB, UPC RL>50dB, APC RL>60dB.

Application

- ✓ All fiber interconnection;
- ✓ Telecom Distribution and Local Area Networks;
- ✓ FTTH and FTTx;
- ✓ Passive optical networks [ATM, WDM, Ethernet];
- ✓ Broadband, Cable TV (CATV).



Technical Parameter

Fiber Type	SM (G657A1, G657A2)
Connector Type	LC / SC
Cable Type	3.0mm/5.0mm round drop
Adapter Type	SC / APC, SC / UPC, LC / APC, LC / UPC
Size (mm) W*D*L	100.5 x 80.5 x 29mm
Max Capacity of Splice	4 (Single Fiber) for SC, 8 Ports for LC
Material	PC+ABS



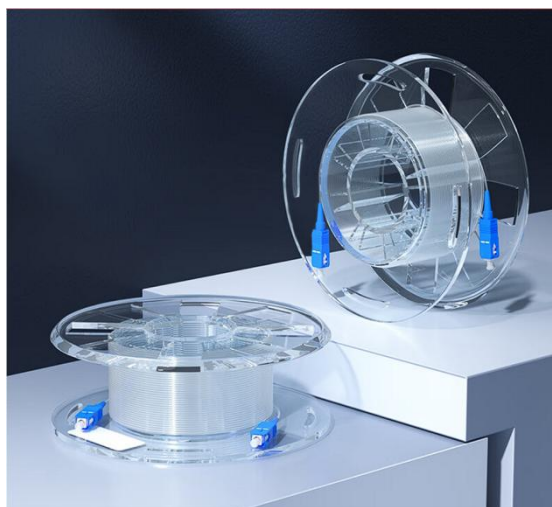
Invisible Fiber Optical Cables

Keyed Characteristics

- ✓ Compact and light-weight;
- ✓ Invisible and has no effect to interior decoration;
- ✓ Low-bend-sensitivity fiber provides excellent bendability performance;
- ✓ Transparent for seemly installation;
- ✓ Low bending Loss conforms to ITU G657A2;
- ✓ Up to 2.5mm bendable radius for up to 30 years;
- ✓ Can be used with standard connectors or quick assembly connectors;
- ✓ Good for FTTH and home theater applications;
- ✓ Easy to install.

Application

- ✓ Fiber to the room Application;
- ✓ Fiber optic communications indoor environments.



Technical Parameter

Connector Type	SC
Capacity Ports	1FO, Simplex
Cable OD	0.6mm/0.9mm, Transparent
Fiber Mode	Singlemode, G657A2
Material	Nylon
Insertion Loss Standard type	SM / APC $\leq 0.35\text{dB}$
Insertion loss Elite type	SM / APC $\geq 0.30\text{dB}$
Return Loss	PC $> 50\text{dB}$, APC $> 60\text{dB}$
Durability (500 matings)	$\geq 0.2\text{dB}$
Working Temperature	$-20^{\circ}\text{C}\sim+70^{\circ}\text{C}$
Length	10, 15, 20, 25, 30, 35, 40, 50m or meet customized length



Indoor Fiber Optical Terminal Boxes

Keyed Characteristics

- ✓ Advanced structure design, Small size and reasonable structure.
- ✓ Material: PC+ABS.
- ✓ Dust-proof, anti-aging.
- ✓ Protection level up to IP20.
- ✓ The interior is equipped with 1x2 FTB splitter, 1x8 PLC splitter.
- ✓ Installation method: wall-mounted.

Application

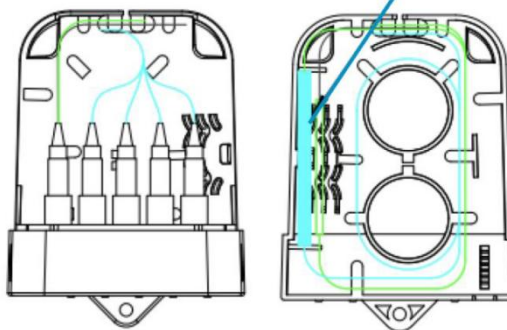
- ✓ CATV;
- ✓ Telecommunication networks;
- ✓ Wide Area Networks;
- ✓ Industrial, medical & military;
- ✓ Local Area Networks;

Port Color

● Red	● Blue	● Green
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Routing Diagram

1*2 FTB+1*8 PLC Splitter



Technical Parameter

Item	Specification	Notes
Material of housing	PC+ABS	
Material of metal accessory	High-quality stainless steel	
External dimension (mm)	102 x 84 x 55mm	
Color	White	
Number of adaptor (Max)	10P	
Splitter	1x2 FTB splitter + 1x8 PLC splitter	Default ratio of 1x2 FBT splitter is 70%/30%
IP grade	IP20	
Flammability	UL94-HB	Default
Neutral salt spray test (NSS)	48h	



Indoor Fiber Optical Terminal Boxes

Keyed Characteristics

- ✓ Total enclosed structure.
- ✓ Material: PC+ABS, wet-proof, water-proof, dust proof, antiaging, protection level up to IP65.
- ✓ Clamping for feeder cable and drop cable, fiber splicing, fixation, storage distribution ... etc all in one.
- ✓ Cable, pigtails, patch cords are running through own path without disturbing each other, cassette type SC adaptor, installation, easy maintenance.
- ✓ Distribution panel can be flipped up, feeder cable can be placed in a cup-joint way, easy for maintenance and installation.
- ✓ Cabinet can be installed lby the way of wall-mounted or poledmounted, suitable for both indoor and outdoor uses.

Application

- ✓ Wall mounting and pole mounting installtion;
- ✓ FTTH pre-installation and filed installation;
- ✓ 5-10mm cable ports suitable for 2x3mm indoor FTTH drop cable and outdoor figure 8 FTTH self-supporting drop cable.



Standard Included Accessories

Heat shrink tubing, setscrew, screw



Technical Parameter

Material	Size	Max Capacity		Nos of Adapter	Weight	Color
Strengthen PC+ABS	A*B*C(mm) 185*123*48	Splice 8 Fibers (2trays,12 fiber/tray)	PLC Splitter 1pcs of 1x8	8pcs of SC (Max 16pcs LC)	0.44kg	White



Indoor Fiber Optical Terminal Boxes

Keyed Characteristics

- ✓ Applicable in the straight through or branch connection of indoor;
- ✓ Fibre optical cable;
- ✓ Small size ,Light Weight, Good appearance;
- ✓ Wall mounted with mechanical protection function;
- ✓ Maximum fibre Capacity 4 fibres adaptor output 4;
- ✓ Available for FC, SC, ST, LC adaptors;
- ✓ Hinge and convenient press-pull button Lock design.

Application

- ✓ Widely used in FTTH access Network;
- ✓ Telecommunication Network;
- ✓ CATV Networks;
- ✓ Data Communication Networks;
- ✓ Local Area Networks.



Technical Parameter

Mounting Type	Screw Fixing
Color	White
Material	ABS
Cable Port Max	SC Port (1 Fibers); LC Port (2 Fibers)
Environment Temperature	-45℃ -+80℃
Dimension (H) x (W) x (D)	115mm x 85 mm x 23 mm
Average Insertion Loss	< 0.3dB (Typically 0.3 dB)
Return Loss	≥ 45dB (PC type); ≥ 60dB (APC type)
Relative Humidity	≤ 85 %(+30℃)
Protection Level (EN60529)	IP53

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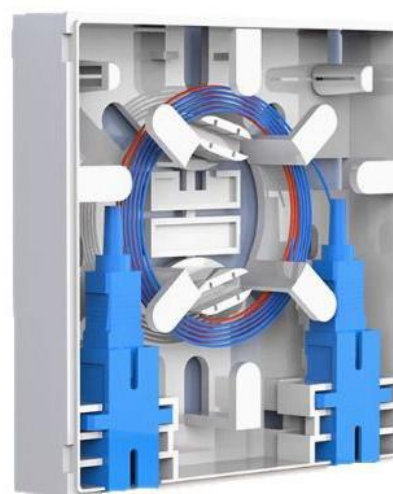
Indoor Fiber Optical Terminal Boxes

Keyed Characteristics

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Application

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- ✓ Telecommunication Network;
- ✓ CATV Networks;
- ✓ Data Communication Networks;
- ✓ Local Area Networks.



Technical Parameter

Mounting Type	Screw Fixing
Color	White
Material	ABS
Cable Port Max	SC Port (1 Fibers); LC Port (2 Fibers)
Environment Temperature	-45℃ -+80℃
Dimension (H) x (W) x (D)	86mm x 86 mm x 23mm
Average Insertion Loss	<0.3dB (Typically 0.3 dB)
Return Loss	≥ 45dB (PC type); ≥ 60dB (APC type)
Relative Humidity	≤ 85 %(+30℃)
Protection Level (EN60529)	IP53

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Indoor Fiber Optical Terminal Boxes

Keyed Characteristics

- ✓ Wide operating wavelength range:from 1260nm to 1650nm;
- ✓ Wide Operating Temperature: from -40°C to 85°C;
- ✓ Good channel-to-channel uniformity;
- ✓ High reliability and small size;
- ✓ Adopt high strength stainless steel, pass salt spray test;
- ✓ Adopt 100% new raw material, ROHS compliance;
- ✓ Low Insertion loss&Low PDL Compact Design.

Application

- ✓ FTTx;
- ✓ Cable television (CATV);
- ✓ Local area networks (LAN);
- ✓ Test equipment;
- ✓ Passive optical networks(PON).



Technical Parameter

Configuration Type	1x5 Un-balanced FTTR Terminals Boxes
Color	White
Material	ABS
Fiber Type	G657A2, or customized
Wavelength	1260nm ~ 1650nm
Dimension (H) x (W) x (D)	115mm x 86 mm x 23mm
Average Insertion Loss	<0.3dB (Typically 0.3 dB)
Return Loss	≥ 45dB (PC type); ≥ 60dB (APC type)
Relative Humidity	≤ 85 %(+30°C)
Protection Level (EN60529)	IP53



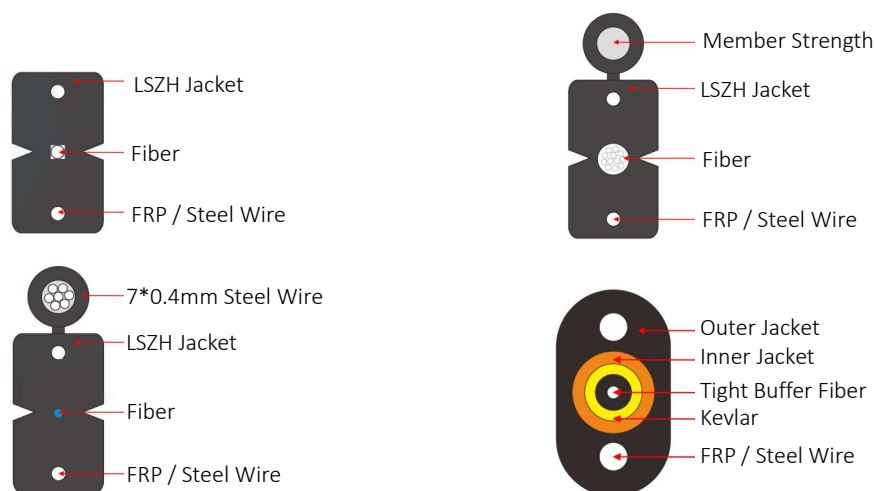
Flat Drop Optical Cables

Keyed Characteristics

- ✓ Cost effective solution for in house termination;
- ✓ Low insertion loss;
- ✓ The material in the patch cord is UV-resistant;
- ✓ Mechanical performance:IEC 61754-4 standard;
- ✓ RoHS and REACH materials compliant.

Application

- ✓ FTTH network for indoor and outdoor;
- ✓ Local area network and building cabling network;
- ✓ Interconnect between instruments, terminal box and communication.



Technical Parameter

Item	Parameter					
Insertion Loss	SM / UPC		SM / APC		MM / UPC	
	Typical	Max	Typical	Max	Typical	Max
	≤ 0.15dB	≤ 0.30dB	≤ 0.15dB	≤ 0.30dB	≤ 0.15dB	≤ 0.30dB
Return Loss	Min.50dB		Min.60dB		Min.50dB	
Operating Wavelength	1310nm ~ 1550nm				850nm ~ 1300nm	
Test Wavelength	1310nm ~ 1550nm				850nm ~ 1300nm	
Durability	200 Cycles					
Installaton Temp.	-20℃ ~ +70℃					
Cable Diameter	3.0mm/5.0mm round drop; 2x3mm/2x5mm butterfly; 4mmx7mm flat drop					
Assembly						
Insertion Loss	Max.0.3dB+0.35dB/km*L		Max.0.3dB+0.30dB/km*L			
Return Loss	Min.50dB		Min.60dB		Min.30dB	

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Dual Band Wireless Wi-Fi 6 GPON ONT

Keyed Characteristics

- ✓ Router ONT XPON Gigabit Mesh Wi-Fi Router 6 AX3000;
- ✓ 1X PON 4x LAN RJ45 10/100/1000Mbps 1x USB3.0;
- ✓ Compatible with 802.11a/b/g/n/ax dual-band 2,4 and 5 GHz;
- ✓ Wi-Fi capacity up to 3000Mbps;
- ✓ MU-MIMO technology with 2x2 integrated omnidirectional antennas;
- ✓ FTTH home and business;
- ✓ Mesh compatible;
- ✓ Multi-SSID.

Application

- ✓ 1X PON 4x LAN RJ45 10/100/1000Mbps 1x USB3.0;
- ✓ 802.11ac 2x2 double band 2.4 and 5GHz;
- ✓ Ideal for home and business FTTH / FTTR;
- ✓ Designed to create a complete Mesh network.



Technical Parameter

PON Interface	• 1XPON port(EPON PX20+ and GPON Class B+) • SC single mode, SC/APC connector • TX optical power: 0~+4dBm • RX sensitivity: -27dBm • Overload optical power: -3dBm(EPON) or - 8dBm(GPON) • Transmission distance: 20KM • Wavelength: TX 1310nm, RX1490nm
Interface	1XPON+4GE+1USB3.0+CATV+WiFi6
Power Adapter	DC 12V, 1.5A, external AC-DC power adaptor
Antenna	4 x5dBi external antennas
Firewall	Anti-DDOS, Filtering Based on ACL/MAC /URL



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