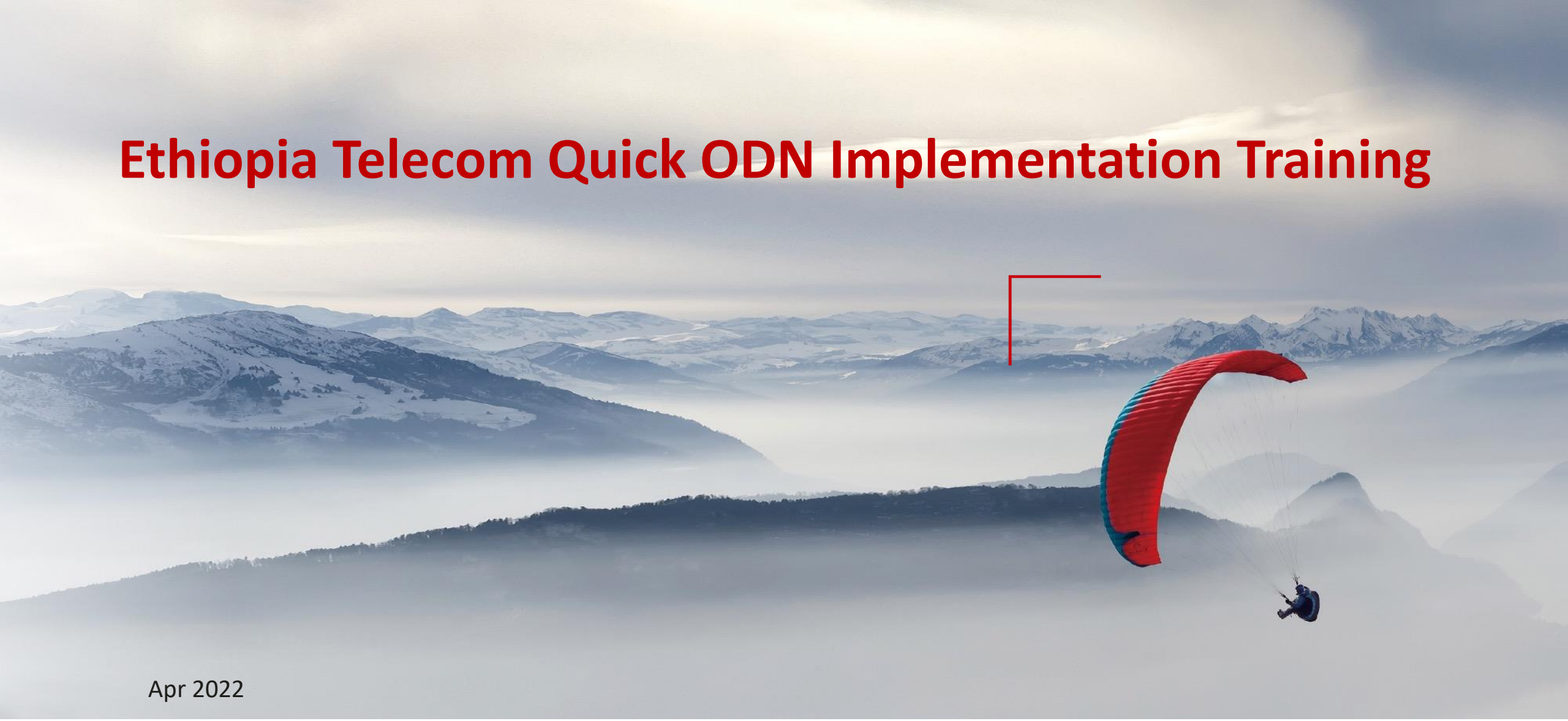
Ethiopia Telecom Quick ODN Implementation Training



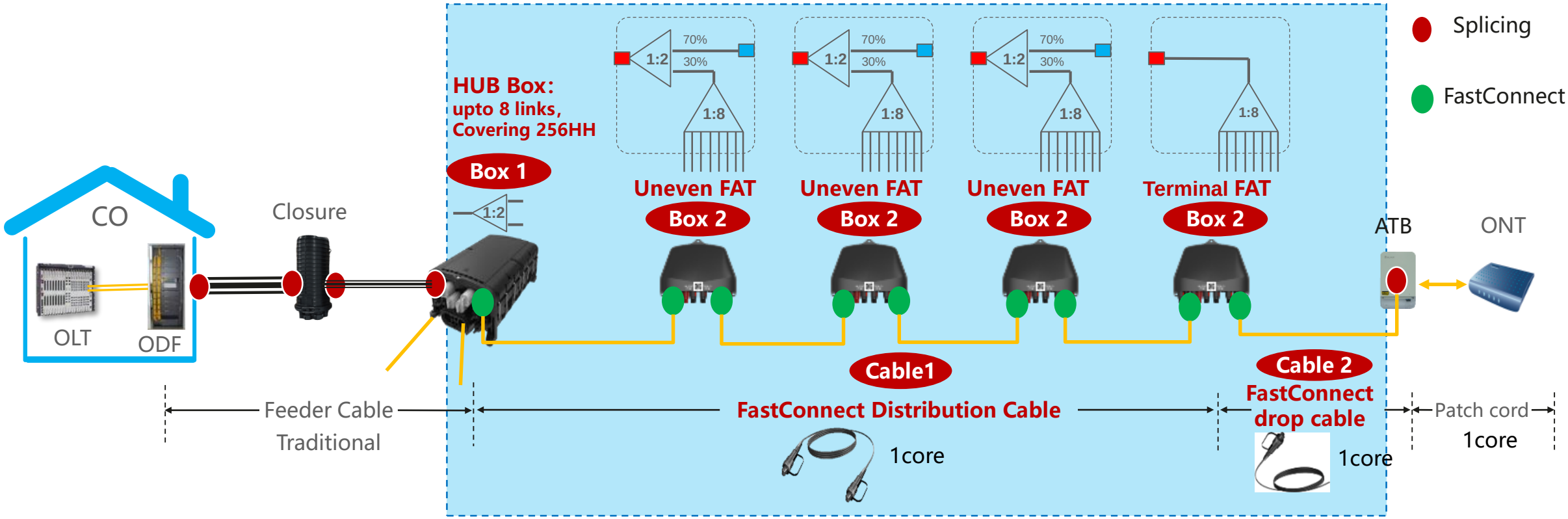
Apr 2022

Security Level:

HUAWEI

Contents

1.1 Quick ODN Network： Pre-connect Distribution and Drop Cable



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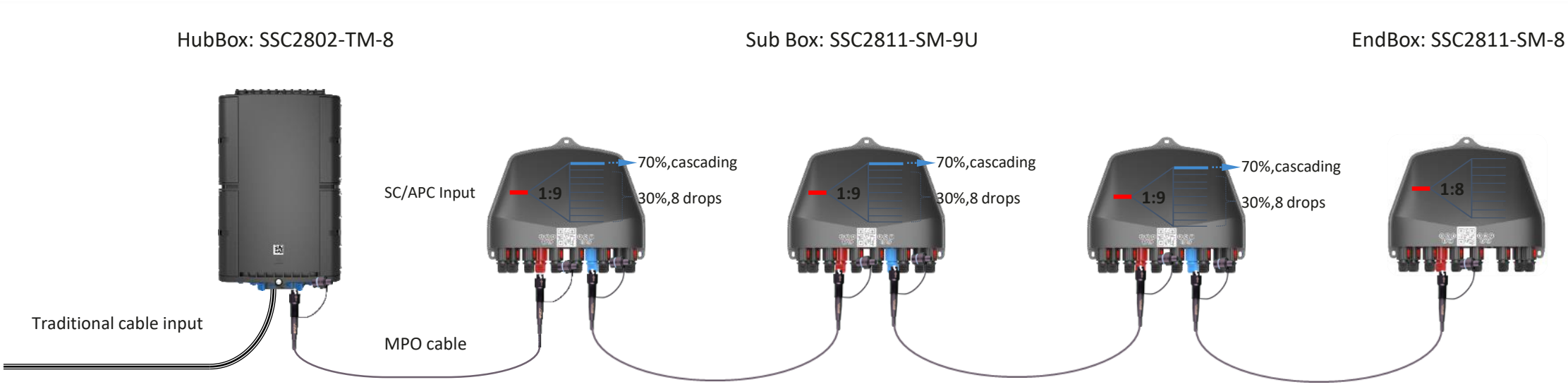
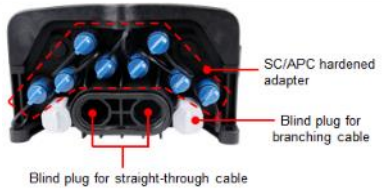
1.2 Quick ODN Solution Box Connection



Product Highlight

SSC2802-TM-8



Size: 367x209x127mm

Capacity:

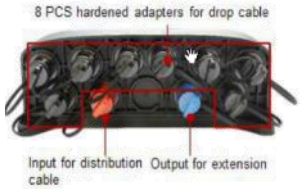
8 QuickConnect SC/APC output

1 Pass Through& 2 Branch

Protection level: IP68,IK10

Support 4pcs 1:2 splitter or 8 pigtails

SSC2811-S-9U



Size: 219x 156 x 78mm

Port Capacity:

1 input, 8 drops, 1 cascading

Protection level: IP68,IK10

Splitter： 1:9 Uneven 30/70 SPL9105

SSC2811-SM-8

Size: 219x 156 x 78mm

Port Capacity:

1 input, 8 drops

Protection level: IP68,IK10

Splitter： 1:8 PLC SPL9105

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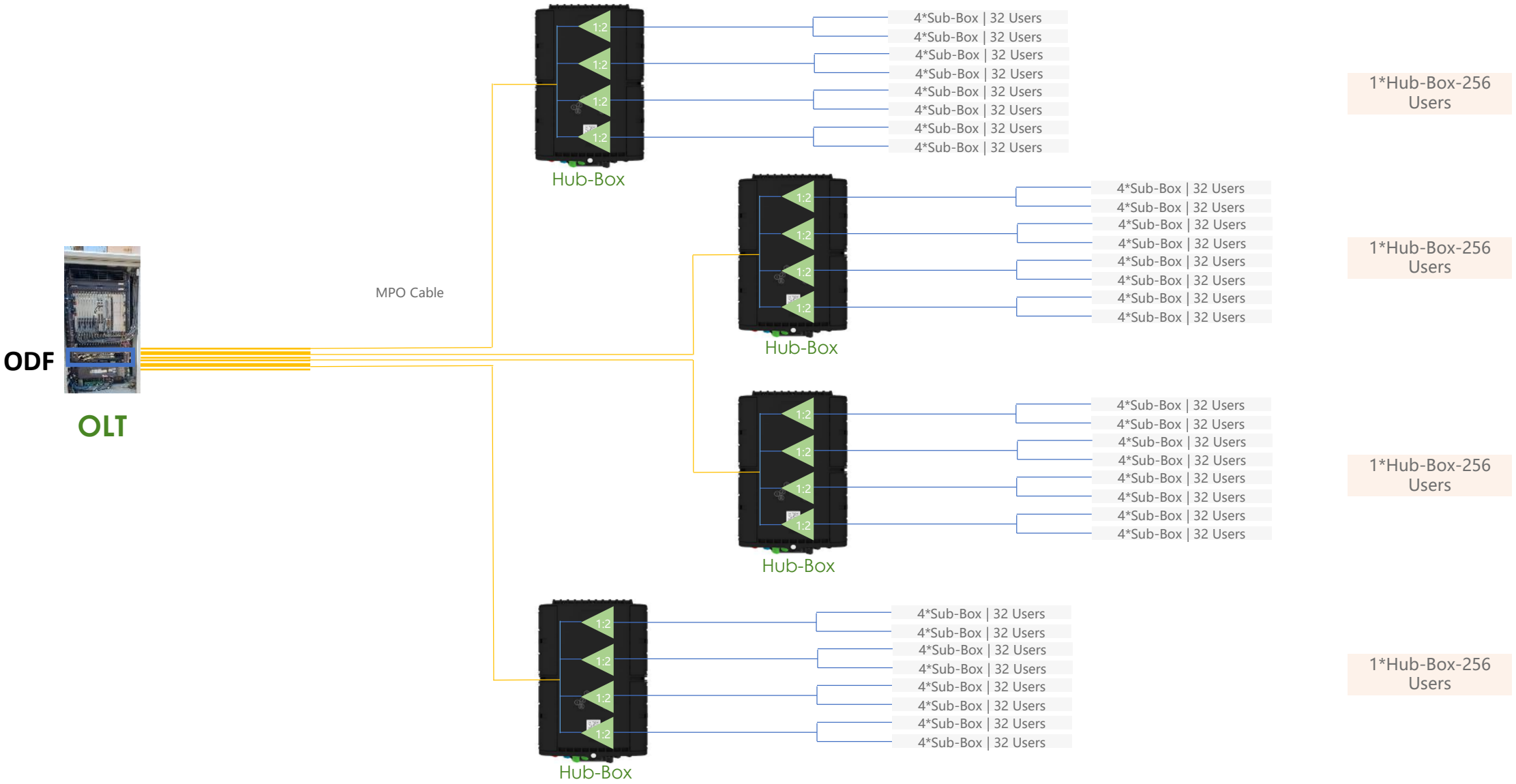
1.3 Quick ODN Solution Topologies (1:64 Split Ratio)



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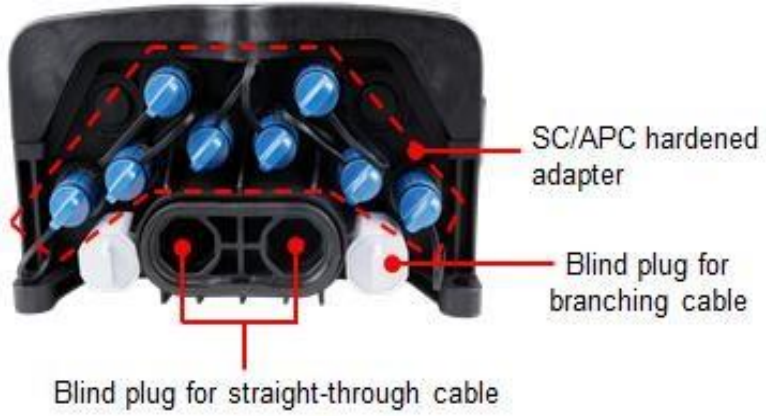
1.4 HubBox

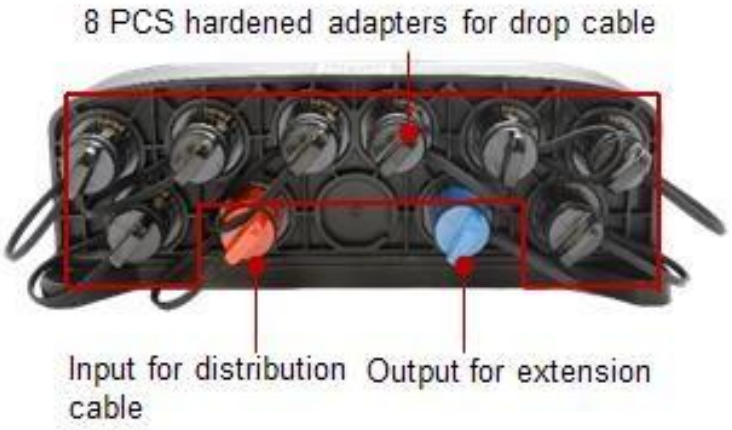


Model	SSC2802-TM-8
Termination capacity	8
Splicing capacity (unit: core)	48
Type of splicing tray	FSM2107-12
Max. tray qty.	4
Splicing capacity per tray (unit: core)	12

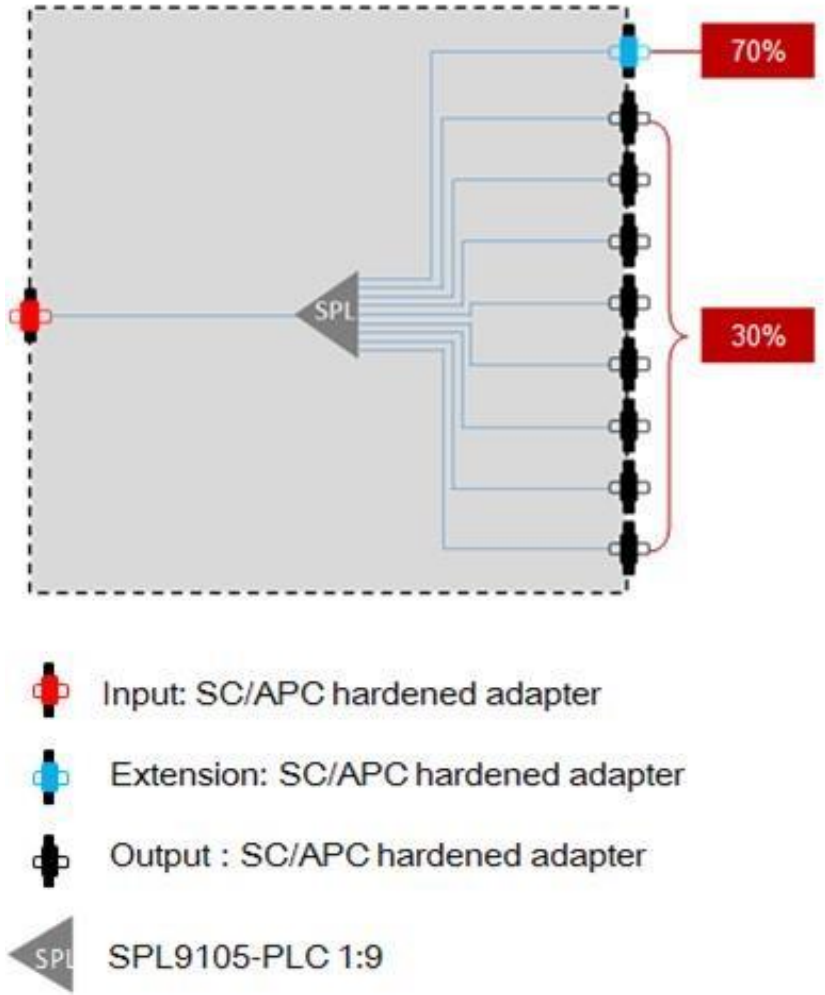
Splicing Tray:

1.5 SubBox

SSC2811-SM-9U



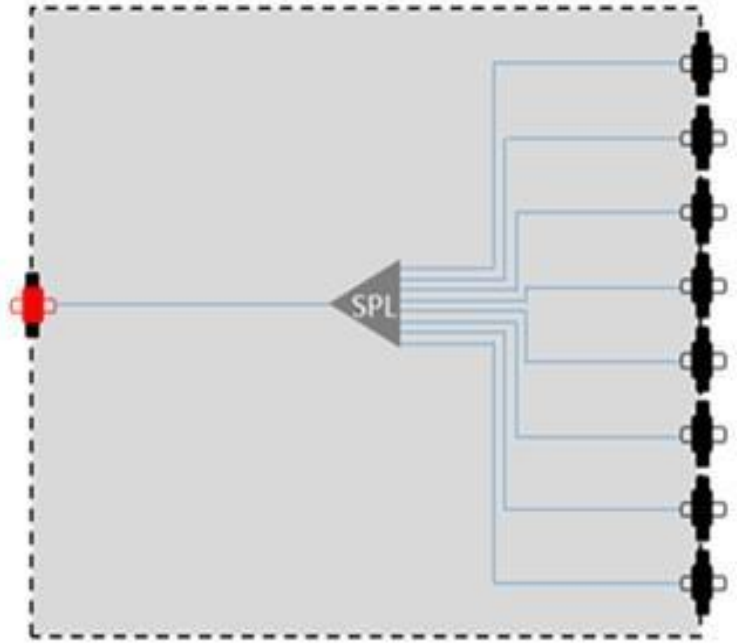
Model	SSC2811-SM-9U
Distribution capacity	1(Input) +1(Extension)+ 8(Drop)
Optical cable inlet	1 PCS SC/APC hardened adapter (red)
Optical cable outlet	1 PCS SC/APC hardened adapter (blue) 8 PCS SC/APC hardened adapters(black)
Splitter capacity	1 PCS 1:9 SPL9105 (30/70)



1.6 EndBox

SSC2811-SM-8

Model	SSC2811-SM-8
Distribution capacity	1(Input) + 8(Drop)
Optical cable inlet	1 PCS SC/APC hardened adapter (red)
Optical cable outlet	8 PCS SC/APC hardened adapters(black)
Splitter capacity	1 PCS 1:8 SPL9105



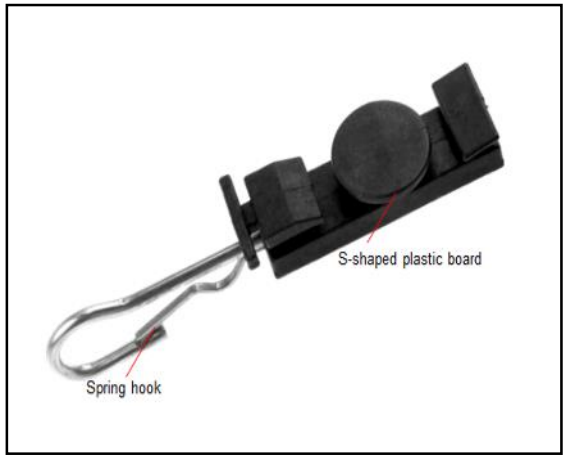
1.7 Accessories

Pole mounting assembly-For diameter 114~381mm

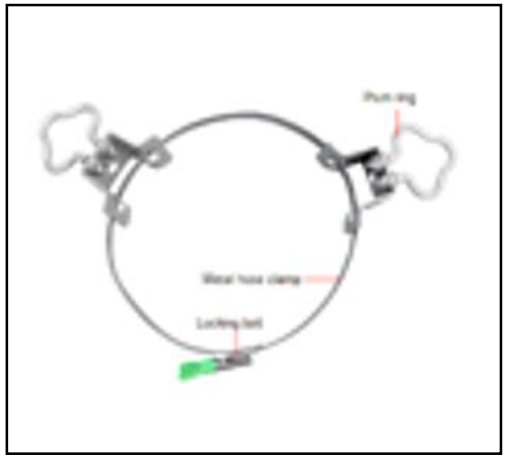
Plastic slack storage bracket,Pole/Wall/Aerial-mounting-Black-258*258*76 mm-ITC3105

Plastic wedge clamping tool,Installation accessory of optical cable

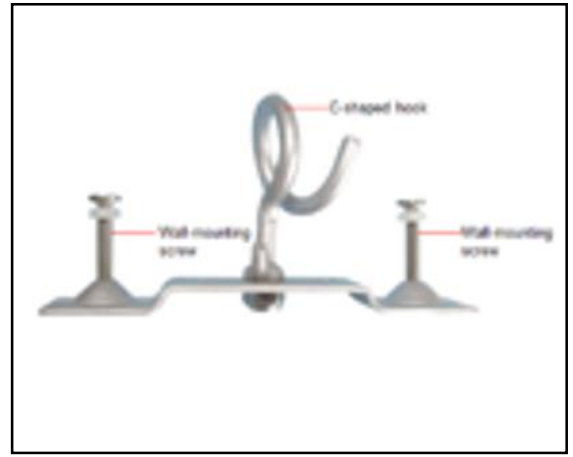
"S" type clamp for figure 8 bow type cable with steel messenger



Plum ring hook fixed tool for pole,with metal hoop,Suit for pole



"C" type clamp for wall fixed,Split ring-ITC3303-W1



Pole mounting assembly

Pole mounting assembly-For diameter 114~381mm;

At least two hose clamps are recommended for installing the product on the pole.

Slack storage bracket for Subbox, Endbox and blade HubBox

Plastic slack storage bracket, Pole/Wall/Aerial-mounting-Black-258*258*76 mm-ITC3105

A slack storage bracket is an auxiliary device used in an FTTH network to coil extra optical cables. A slack storage bracket can greatly save the storage space for extra optical cables. The slack storage bracket mainly used in the full pre-connection solution to store distribution cables

Used for
1, Subbox, Endbox,
2, Blade HubBox

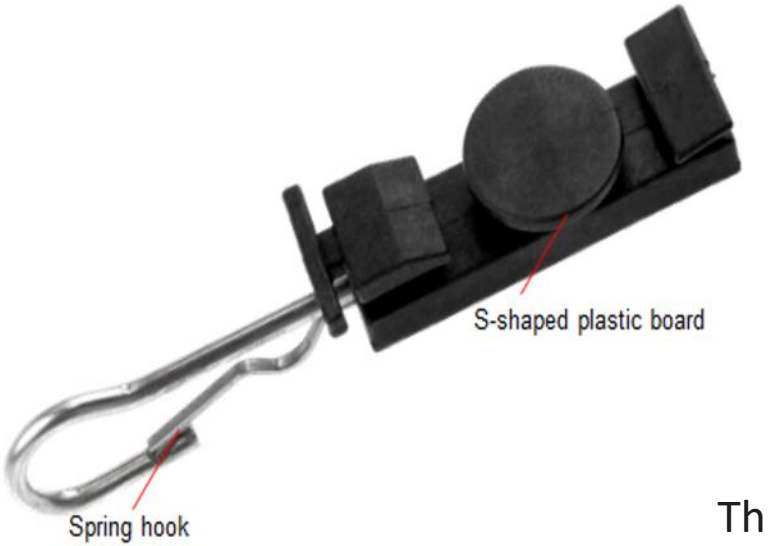
Plastic wedge clamping tool

Plastic wedge clamping tool,ITC3102-A1,Installation accessory of optical cable,Used for 5mm round cable &7.3*3.7 flat cable

The tool is used to straighten a self-supporting optical cable between two poles and secure the optical cable to the poles. The tool has a steel rope that can be opened, and can be installed on any pole anchor. It is widely used in the aerial cable routing scenario for FTTH networks.

“S” type clamp

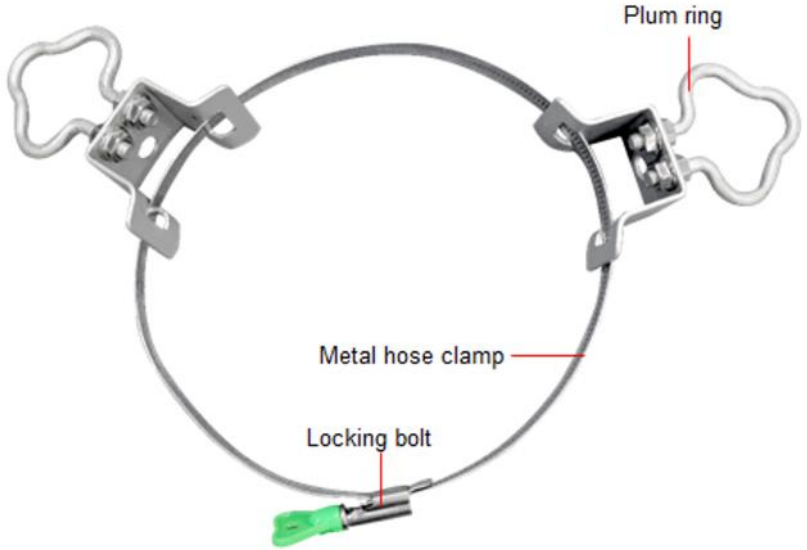
"S" type clamp for figure 8 bow type cable with steel messenger,ITC3103-A1



This tool is widely used to secure **drop cables** in the aerial mounting scenario for FTTH network construction. It is used to straighten optical cables between poles or towers. It has a spring hook, and can be installed on any anchor.

Plum ring hook with metal hoop

Plum ring hook fixed tool for pole,ITC3301-P1,with metal hoop,Suit for pole(D115~195mm)

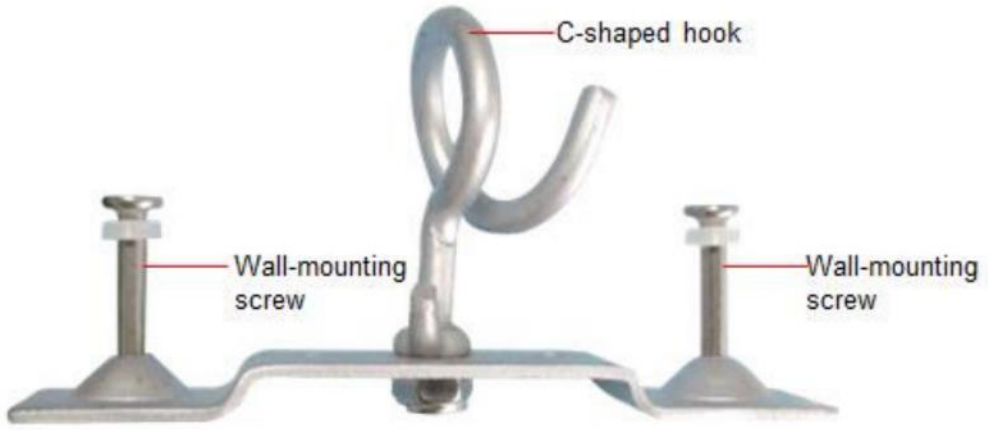


This tool is used to install optical cables on poles in the FTTH scenario. The tool is fixed on a pole using metal hose clamps to provide anchoring points for other components of aerial optical cables, such as optical cable clamps

"C" type clamp for wall fixed

"C" type clamp for wall fixed,Split ring-

ITC3303-W1

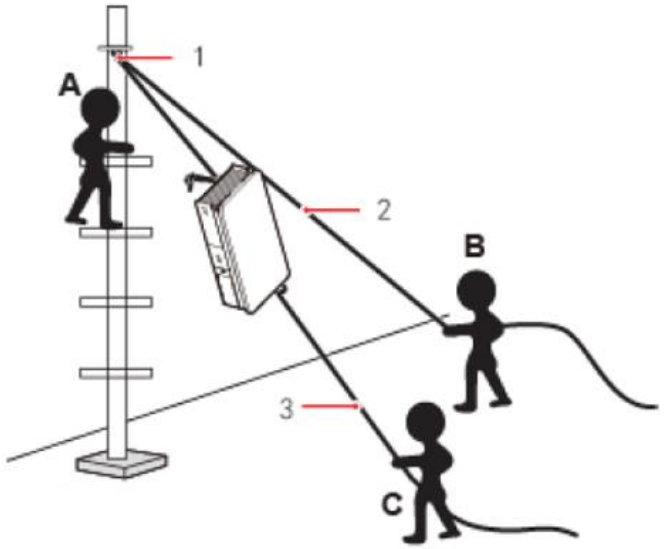


This tool is used to install optical cables on the wall in the FTTH scenario. The tool is fixed on a wall using screws to provide anchoring points for other components of aerial optical cables, such as optical cable clamps.

Contents

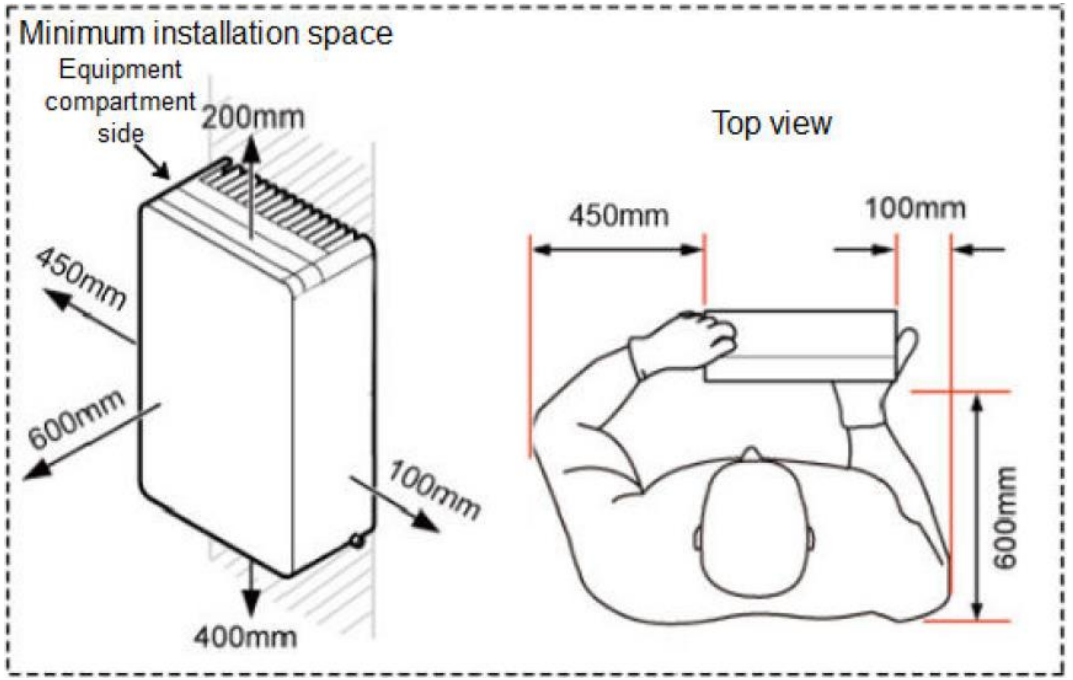
3.1 Blade OLT Installation Guide

Standard



(1) Fixed pulley (2) Lifting sling (3) Traction sling

Lifting Method



Minimum Installation Space

3.1 Blade OLT Installation Guide

Pole-mounted Kit

Blade OLT Fixation

Insulating tape for Power and grounding cable

Grounding cable connection

3.1 Blade OLT Installation Guide

Power Cable Preparation

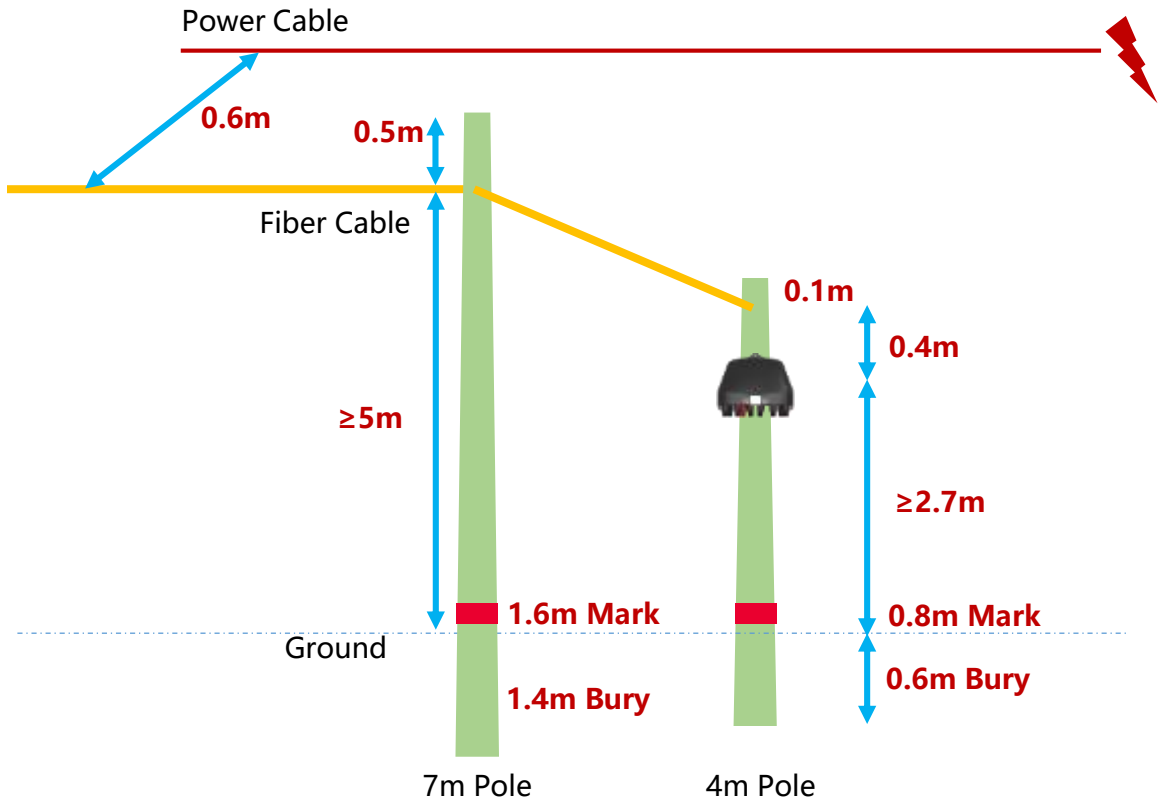
Power Cable Connection

Feeder Cable Connection

Uplink Fiber Cable Connection

3.2 Pole Installation Guide

Distance to other property



1. Pole buried depth: 1.4m for 7m pole, 1.5m for 8m pole, 1.6m for 9m pole, 0.6m for 4m pole
2. Make mark on 1.6m height for 7m pole, 0.8m mark for 4m pole, after burying, can check the depth based on the mark.
3. Pole line distance to other properties：

Other Facility	Minimum Horizontal Clear Distance (m)	Remarks
Fire hydrant	1.0	Distance between fire hydrant and overhead pole
Underground pipes and cables	0.5-1.0	include distance between communication pipe, line and overhead pole
Sidewalk edge stone	0.5	
Other existing poles on the ground	4/3 of the height of the ground pole	
Trees	0.5	
House construction	2.0	The distance can be reduced if necessary, but the normal functions of the house cannot be affected.
Power supply connection cable	0.6	
HV Power line below 10kV	2.0	
HV Power lines above 10kV	3.0	
Neon lamp and its iron frame	1.6	

3.3 Box Installation

X-Box Installation Preparation

Sub/End-Box Installation Preparation

Pole-mounted Assembly

Pole-mounted Installation

3.4 Fiber Cable Installation

① The minimum bending radius should be 20D (D is the diameter of O.F.C) in dynamic state and the minimum bending radius should be 10D in static state.

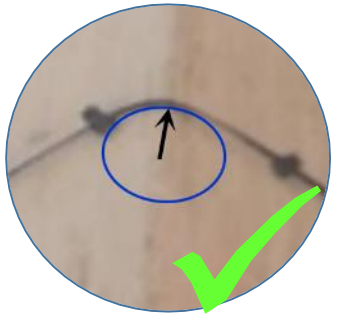
② No flattening, twisting, small circle, back buckle.

Do not step on

No twisting

No flattening

No small circle



Bend radius≥10cm

Lay cable in figure 8

3.4 Fiber Cable Installation

Fiber cable loop should be organized well
Should **be not too big loop**, if too big, need to check if need to reduce the cable length or move part of the loop to other pole.

Fiber cable should be laid **without sharp bending**

3.4 Fiber Cable Installation

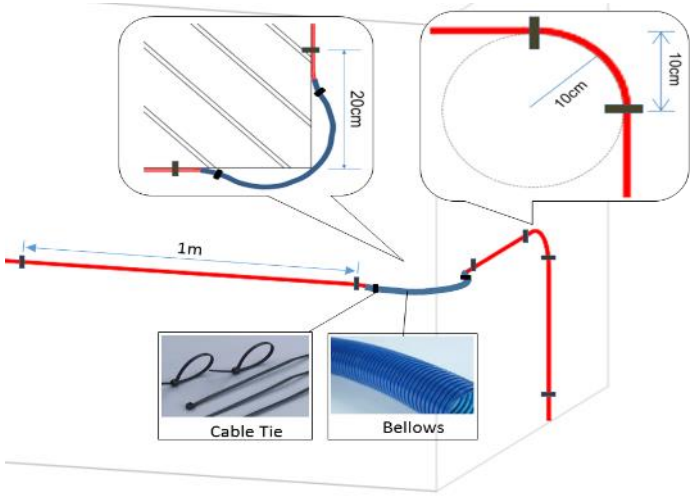
① The new cable should be 3cm away from the old cable and at least 2.5m above the ground

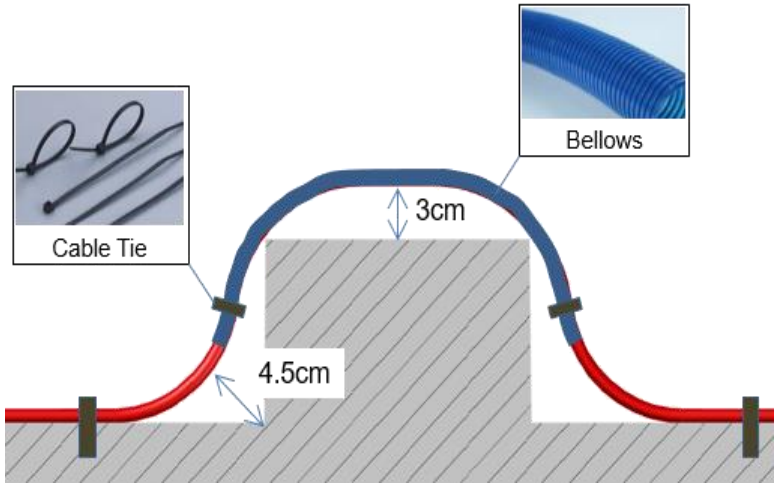
② When the optical cable turns 90 degrees on the wall, the nearest clip should be 10cm from the vertex of the right angle, and the cable bend radius should no less than 10cm.

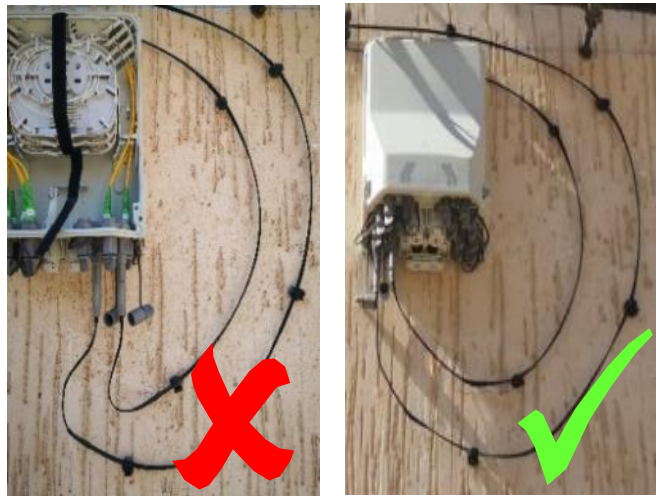
③ When the optical cable turns 90 degrees at the corner of the wall, the nearest clip should be 20cm away from the vertex of the corner to keep the bend radius no less than 10cm.

④ Cable crossing the raised column on the wall, the distance marked in left middle figure allows 5mm error.

⑤ It is recommended to **reserve 1 meter** to meet the bending radius requirement when install cable. Connection cable should keep bigger bending radius.





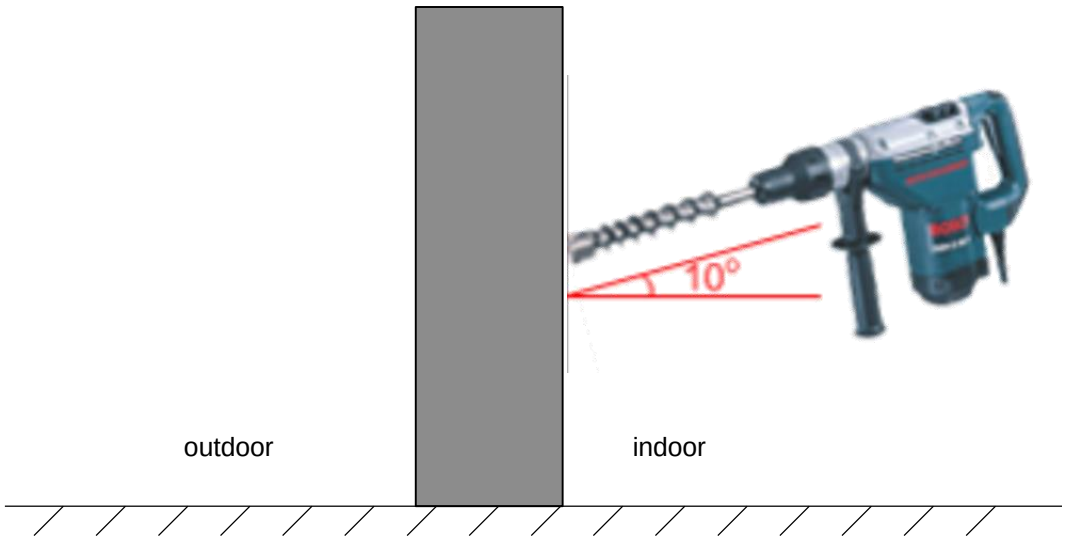


3.5 Other Installation

Drilling Hole on the Wall

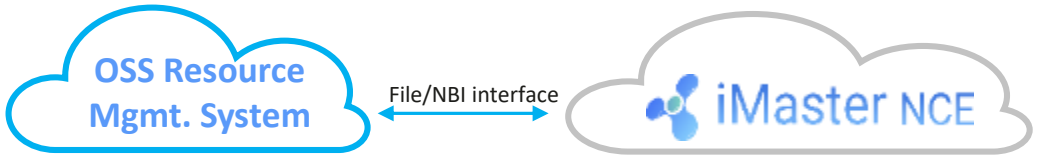
① **Reuse** the existing holes as much as possible;

② When drill a new hole, drill from indoor to outdoor with **0~10°** opening angle inclined downward.

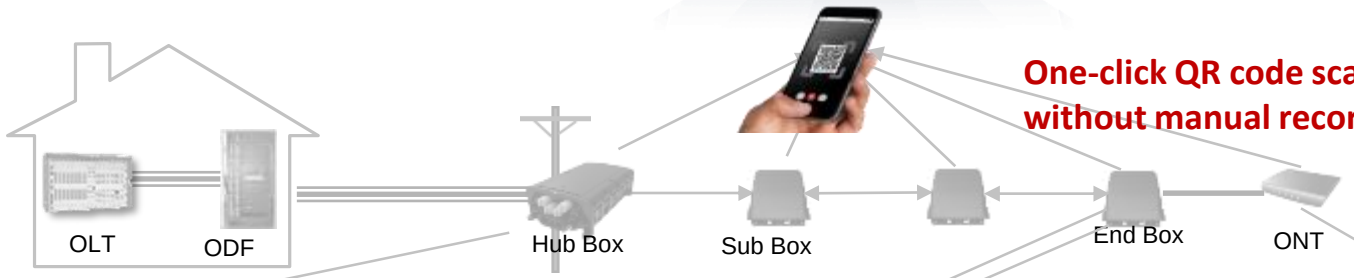


Contents

4.1 Digital QuickODN: Pre-connection + iMaster NCE



Dev Name， ID, Type, Ports, Address, Cable SN, ONT SN, installation port…



Accurate Inventory Information

Highlight

AI image recognition
100% Accuracy of Automatic Data Entry

Accurate Fault locating

Highlight

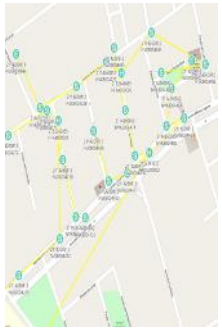
Visualized topology
enable precise fault locating

Home Pass

Hub, Sub, Distribution Cable Connect Relationship Auto-recognition

Scan QR code in APP

Automatic identify Box and cable connection status

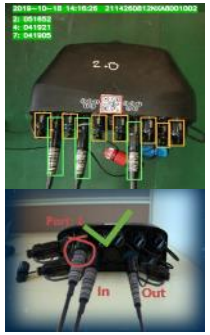


Automatic restore ODN topology on GIS map

Home Connection

Box, Drop Cable, ONT Connection relationship Auto-recognition

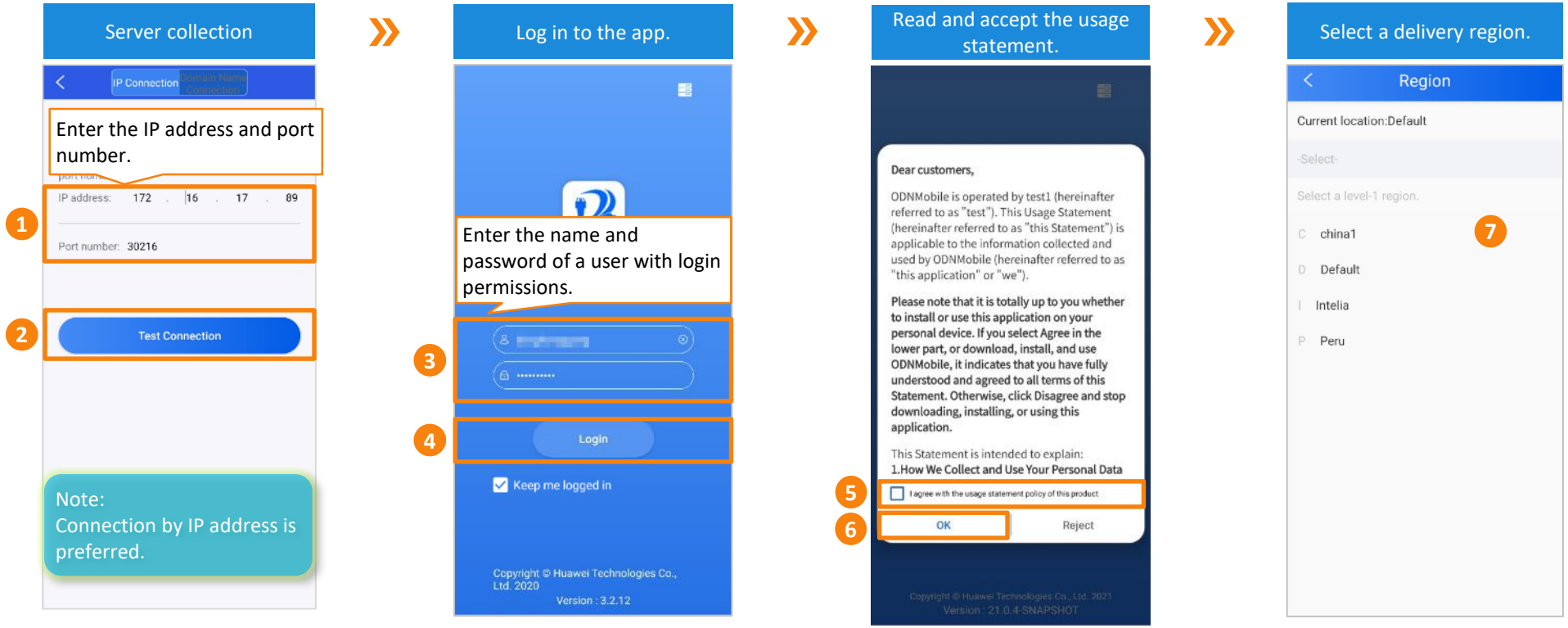
Deliver work order & allocate Box & ports



Install and verify Box & ports

Associate ONTs & upload HC topology data.

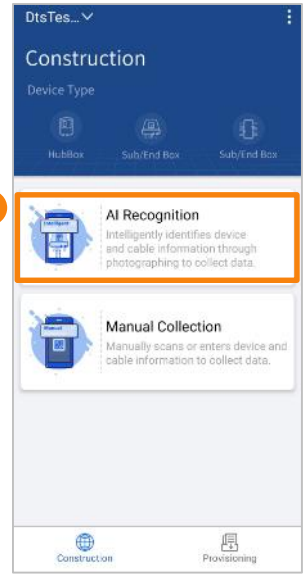
4.2 Logging In to ODNMobile



Need Smart Phone with internet

4.3 AI Photographing Data Collection

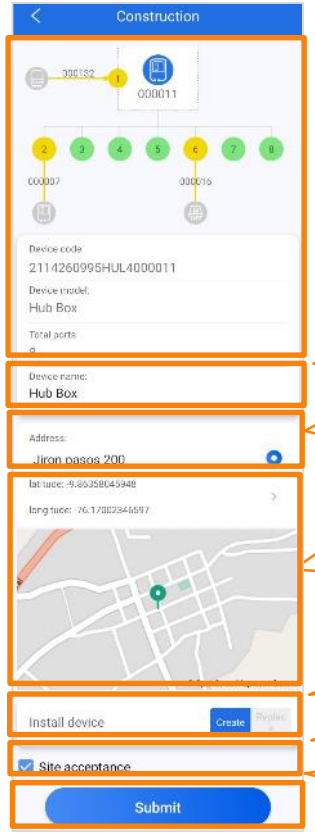
Tap **AI Recognition**. »



Scan the device (Hub Box) and its cables for recognition. »

Place the QR code, port IDs, and cable SNs of a Hub Box in the frame. The app automatically adjusts the focal length and captures information.

Confirm and submit the recognition result.



3 Confirm the Hub Box recognition result.

4 Enter the name of the Hub Box.

5 The app automatically obtains the GPS information of the mobile phone. If the current address is incorrect, you can relocate it. If the address description is inaccurate, tap the address to modify it.

6 View the longitude and latitude of the current location. If the current longitude and latitude are incorrect, you can click the longitude and latitude to go to the map page and drag the map to re-locate.

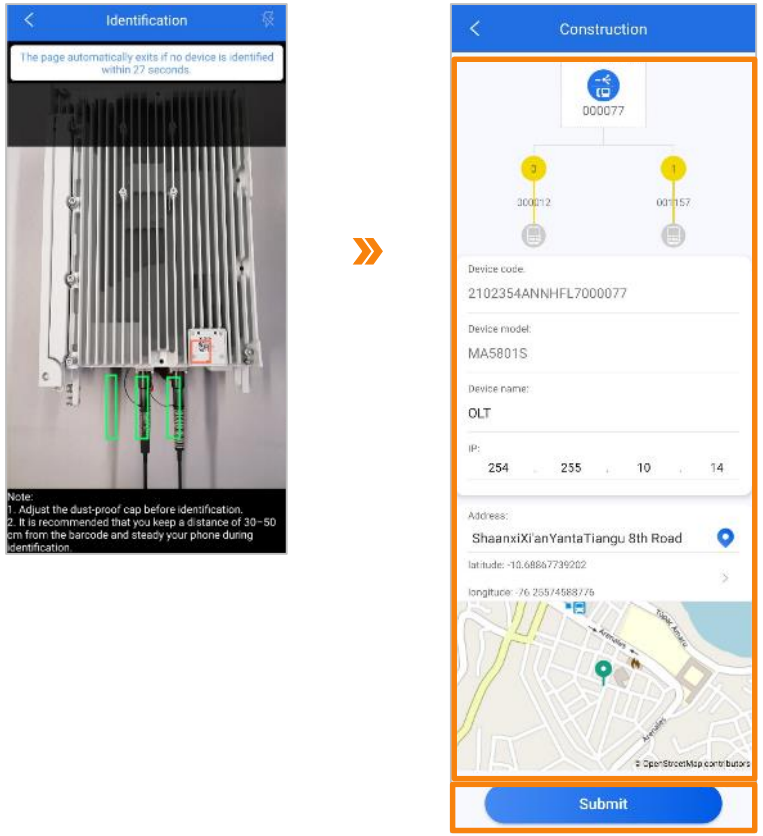
7 Set **Install device** to **Create**.

8 Select **site acceptance** as required.

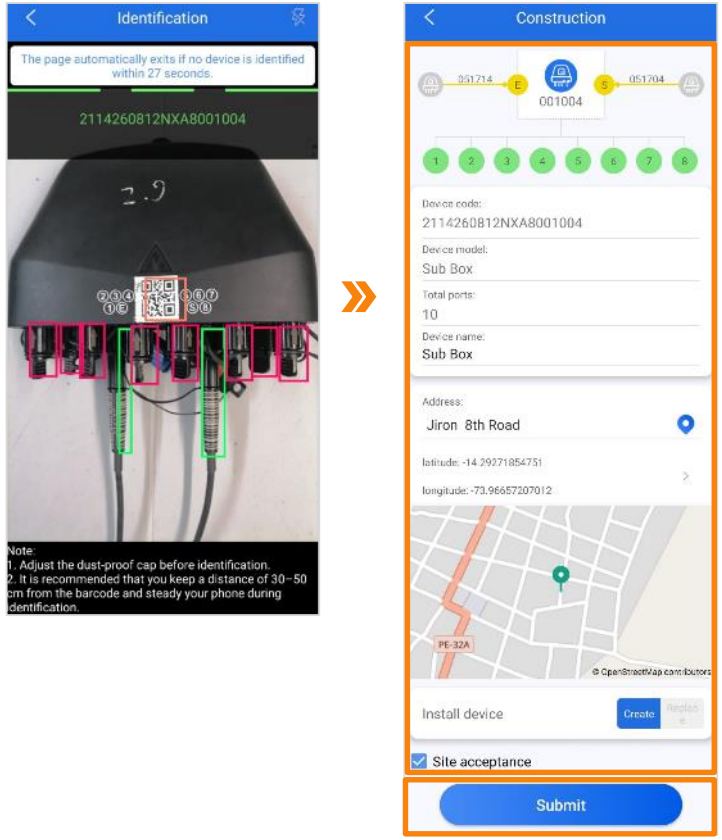
9 After confirming that the information is correct, tap **Submit** to upload it to NCE.

4.3 AI Photographing Data Collection

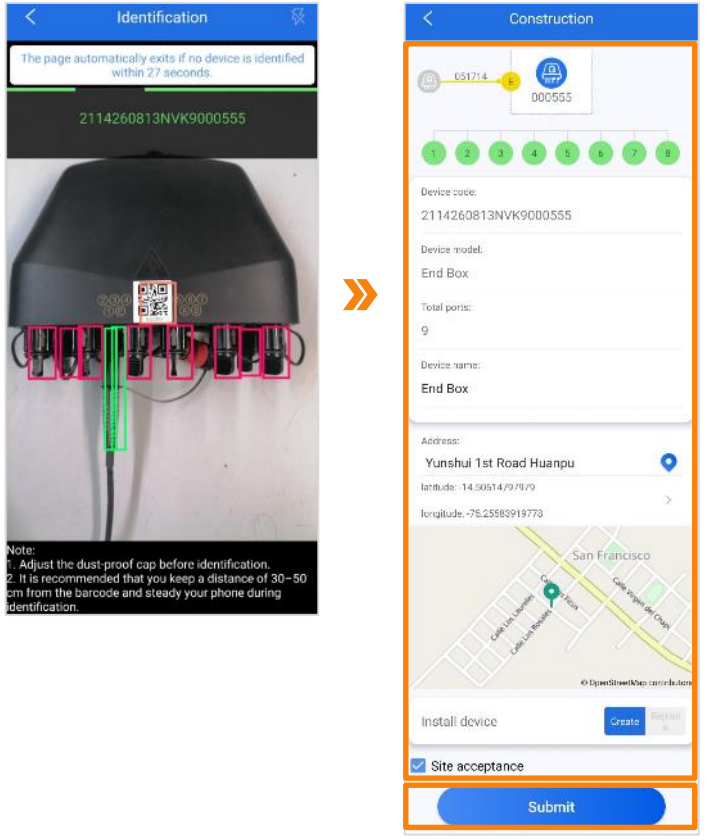
Recognition result of an OLT



Recognition result of a Sub Box

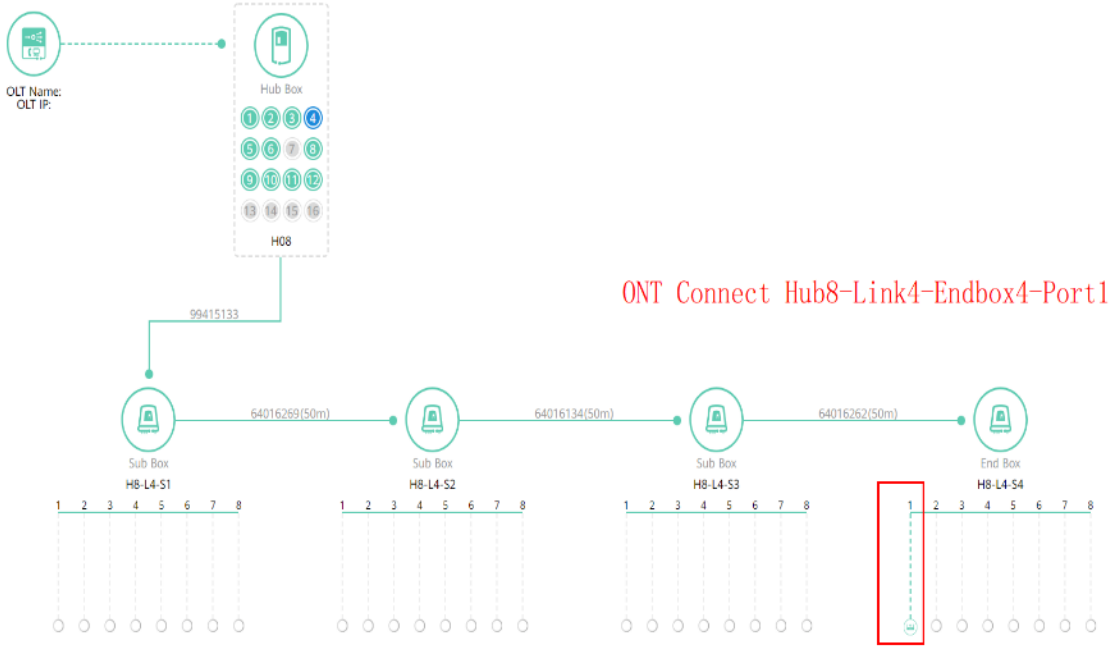


Recognition result of an End Box



4.4 NCE Scanning Result

Physical Topology



Logical Topology
(With Port Information)

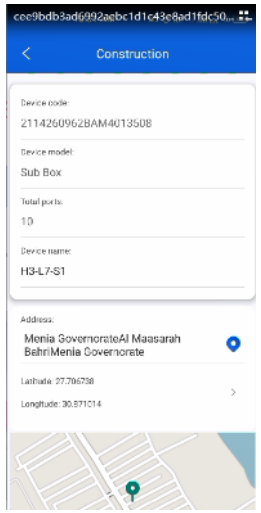
4.5 NCE Scanning Major Issues

Construction & NCE Scanning

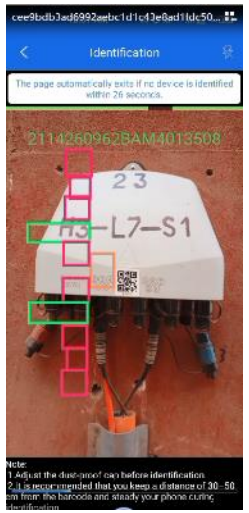
1. NCE scanning **during construction**, avoid duplicated site visit

2. **QR code should be facing front and clear**. If not clear, need to clean first

3. **Hold cellphone stable**, don't shake, for smart phone calculation



4. **GPS location checking**, should be accurate. Name input should be accurate also.



5. Direction should be correct, code circle should be matched.

Contents

5.1 The Significance of Safe Production

Installation and maintenance is a high-risk task in the telecom industry because of its large mobility、complex working environment. Therefore, safe production is the *top priority* of installation and maintenance management.

EHS: Environment、Health、Safety

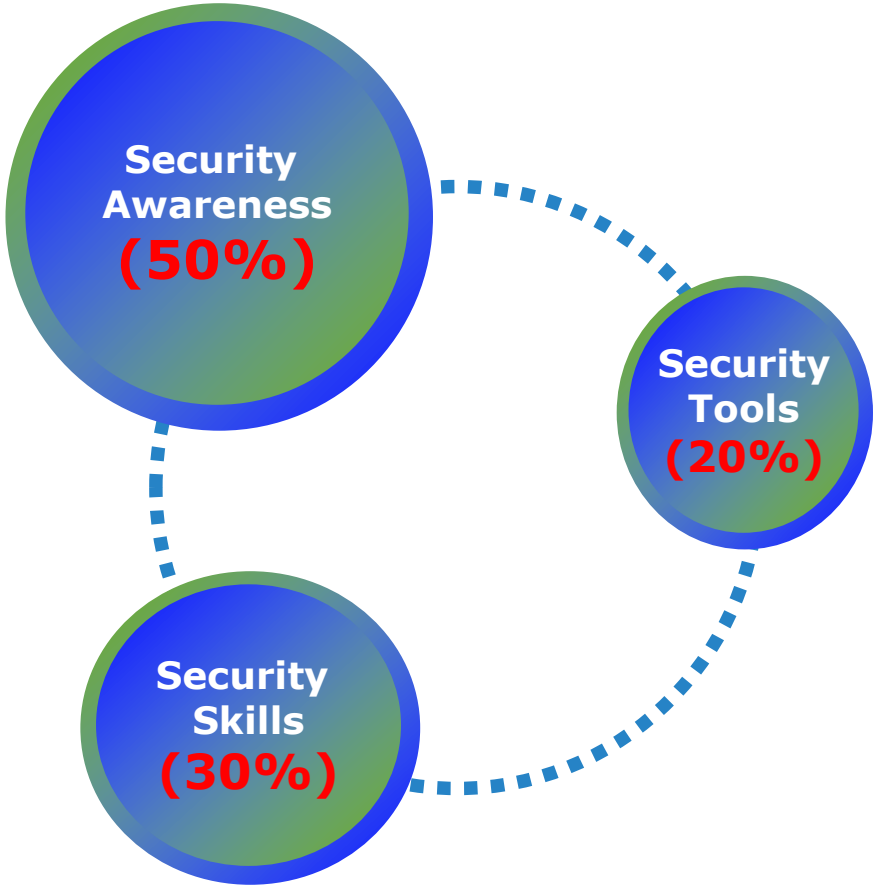
5.2 Cause of the accident

- Generally, there are four main aspects:

1. One is the operation personnel's peccancy risk behavior
2. The second is the operation personnel's negligence behavior
3. The third is the equipment, tools and components in the process of objective existence hidden trouble
4. Four is the operating environment, the poor condition.

In general, the occurrence of accidents depends on three factors: Human, material, and environment.

5.3 Major Factors Affecting Security



5.4 Working on Heights PPE

Position Lanyard

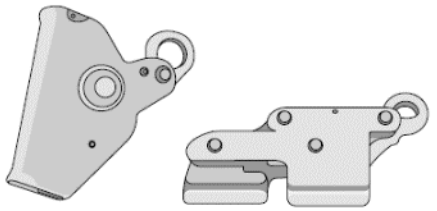
Double Lanyard

Full Body Harness

- Full integrated harness instead of combined components
- Protect life when working at height
- Adjust to be comfortable and safe

Arrestor

- Fall protector automatically
- Used for tower climbing and ladder climbing (with lifeline design)
- Check lock function, replace double lanyard for tower climbing (must have lifeline design)



Lifeline

Arrestor

Self-Retracting Arrestor

- Arrestor for fall protection
- Fall protection when working at height
- Fixed at a higher location, fall protection rapidly

Safety Helmet

- 2 types: helmet for working at height, helmet for working on the ground
- With ventilation holes design for helmet working at height, without brim design or small size of brim
- Protect head from being hit

Helmet for working at height

Helmet for working on the ground

Safety Shoes

- Different functions: protect instep and toes to avoid being injured by a crashing objects, prevent corrosion, slippery , insulation, cold-proof, etc
- Most of importance is slippery protection for Safety shoes when working at height
- Key function for Safety shoes working on ground is prevent foot from being injured by crashing object

Fluorescent Vest

Function for wearing fluorescent vest：

- Wherever working at height or work faraway, vest can be found obviously by light reflection for safety reminding
- Avoid incidents happening especial for work in the night or under dark weather condition

Safety Gloves

- Prevent hands from being slippery, especial for tower climbing, etc
- Wear proper size needed

Tool Bag for Riggers

- Tool bag for workers is for hand free, prevent tools from being dropped down

- Most of importance is for working at height

Appendix：EHS Requirements for Working at Height

- ✓ Working at height must take certificates, especial for riggers
- ✓ Workers for working at height must wear proper PPE

Full body harness	Double lanyard	Position lanyard	Safety helmet	Safety gloves	Safety shoes	Need use arrestor if there is no double lanyard
						

- ✓ Ensure at least one lanyard to be fixed onto tower for tower climbing
- ✓ Ensure to have 2 riggers to work on the site
- ✓ Avoid to work with influence of alcohol and drugs
- ✓ Ensure to have safety supervision for safety reminding
- ✓ Forbid to work or stay inside of unsafe construction areas
- ✓ Total weight of slingers must be 2 to 3 times of loadings weight




Appendix：Site Visitors need to have following PPE

Appendix： PPE Standards & Scenarios

General Requirements									
		Safety Helmet	Safety Shoes	Visibility Vest	Safety Gloves	Safety Harness	Double fall arrest Lanyard	Work Positioning Lanyard	Eye Protection
		EN 397	EN20345	EN471	EN388	EN 361 EN 358 or EN 813	EN 355 EN 354 EN 362	EN 358	EN 166
Scope of Work									
Service	Excavation	✓	✓						
	Trenching	✓	✓	✓	✓				
	Lifing	✓	✓		✓				
	Using Power Tools	✓	✓		✓				✓
	Work at Height	✓	✓		✓	✓	✓	✓	
	Cabling	✓	✓		✓				✓
	Moving Equipment	✓	✓		✓				
	Loading&Unloading Material	✓	✓	✓	✓				
	Working in warehouse	✓	✓	✓	✓				
	Other	✓	✓	✓					

Appendix：Delivery EHS Absolute Rules

Do not use a handset when driving （N'utilisez pas votre téléphone En conduisant）

Driving over the regulated speed is prohibited （Conduire sur le réglementé la vitesse est interdite）

Do not work under the influence of alcohol or drugs （Ne travaillez pas sous l'influence de l'alcool ou de drogues）

Never drive whilst fatigued （Ne conduisez jamais si vous êtes fatigué）

Do not drop tools or other objects from height （Ne laissez pas tomber d'outils ou d'autres objets de hauteur）

Unlicensed staffs are prohibited from electrical work （Les personnels non licenciés sont interdits de travaux électriques）

Do not walk or stay under construction areas （Ne marchez pas et ne restez pas sous les zones de construction）

Use proper PPE correctly for working at height （Utiliser correctement les EPI appropriés pour travailler en hauteur）

Fasten seat belt when driving or inside of vehicle （Attachez la ceinture de sécurité en conduisant ou à l'intérieur du véhicule）

Any person for working at height must be trained and qualified （Toute personne travaillant en hauteur doit être formée et qualifiée）

Safety specifications for working at heights

➢Ladders are important climbing tools in high-altitude operations. The main types of ladders are as follows:

Straight ladder

Telescopic ladder

Step ladder

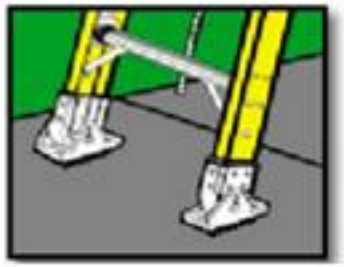
Combination ladder

Safety specifications for working at heights

Anyone should check the ladder before using it.

- Is the length of the ladder suitable for the work?

- Check whether the ladder is broken. Is there any bent deformation? Are there any gaps? Is there any serious wear or tear on the feet?:



Safety specifications for working at heights

Anyone should check the ladder before using it.

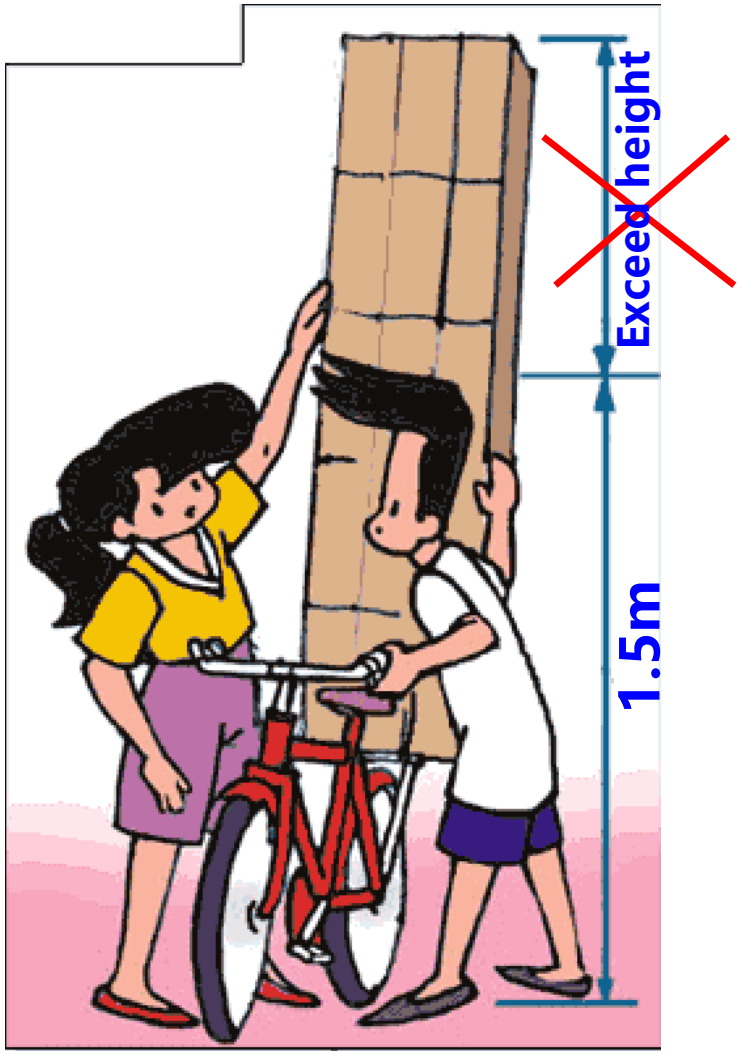
- Check whether the ladder is broken. Is there any bent deformation? Are there any gaps? Is there any serious wear or tear on the feet?

- Check whether there are bolts ,loose connections, or poor soldering.

Safety specification for electrician operation

Electric current , its characteristics are “invisible, can not be heared, can not be touched, can not be smelled”, often in a very short time to cause serious consequences. If the structure or device of electrical equipment is imperfect, or improper used will cause electric shock accident, which will endanger personal safety and affect production。

Traffic safety



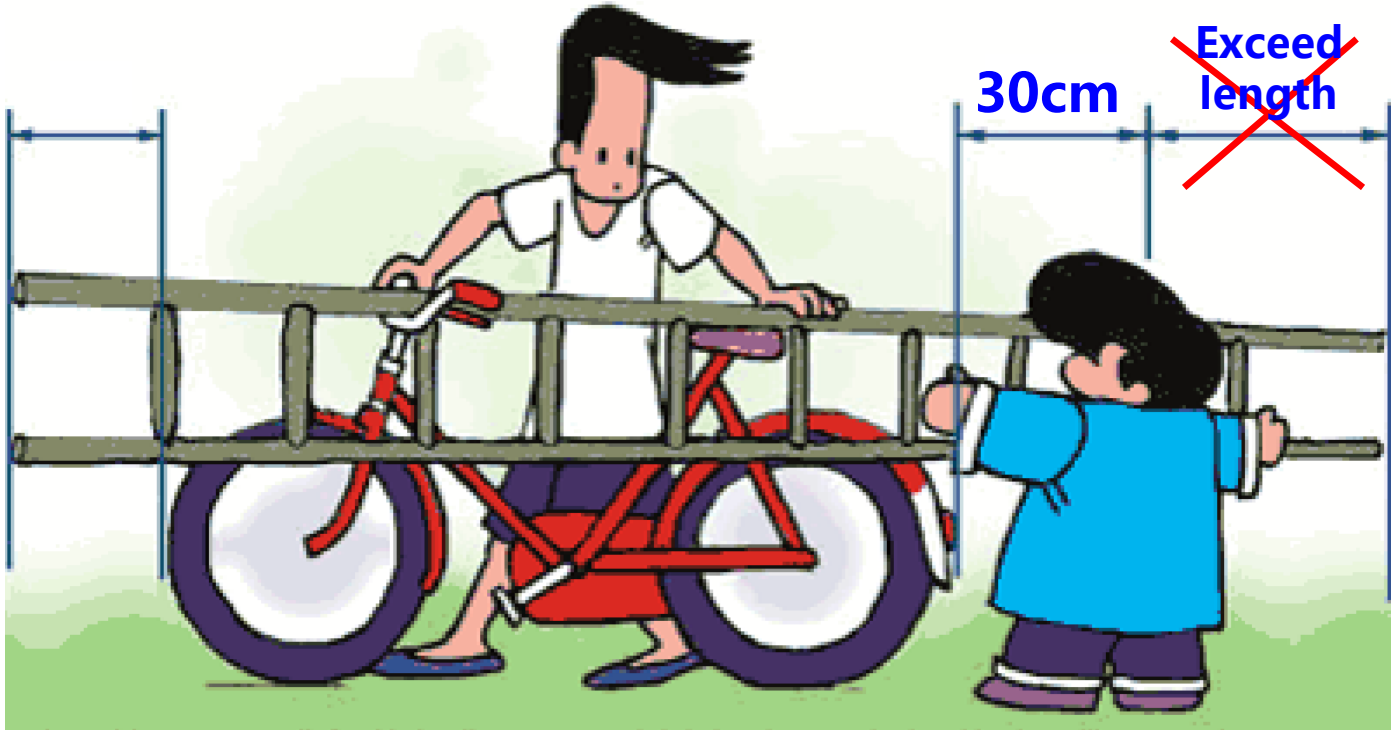
Non-motor vehicle loading regulations (limit height)

The height cannot exceed 1.5 m from the ground.

Data from China

Traffic safety

Non-motor vehicle loading regulations (length limit)



Do not attach a ladder or other ultra-long tools to an electric bicycle. !! !

Data from China

Thank you.

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每个组织，构建万物互联的智能世界。

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