

[EN] GDO51 Outdoor gateway user guide

Contents

1. Product Introduction	3
1.1. Product Description	3
1.2. Main features	3
2. Product Parameters	4
2.1. Electrical parameters	4
2.3. Product Dimensions	7
2.4. Interface Description	7
2.5. Indicator Light Description	7
2.6. Product Model	9
3. Gateway Installation	9
3.1. Installation Direction	9
3.2. Backplane Installation	10
3.3. Network cable installation	11
3.5. Power connection	12
3.6. FRP antenna installation	12
3.7. Gateway fixed	13
3.7.1. Wall-mounted fixed	13
3.7.2. Holding Rod fixing	14
4. Precautions	15
4.1. Waterproof protection	15
4.2. Gateway waterproof	16
4.3. POE adapter waterproof installation	16
5. User Guide	17
5.1. Gateway Configuration	17
5.2. Using ThinkLink	17

5.3. Connecting to Chirp Stack	17
5.4. Connecting to TTN	17
6. Contact Us	17

1. Product Introduction



1.1. Product Description

GDO51 is an outdoor multi-channel high-performance gateway designed by ManThink for LoRaWAN systems. It is not only suitable for the construction of various low-power networks such as cities, factories, and parks, but also suitable for data collection and transmission in harsh environments such as deserts, grasslands, and Gobi. Due to its strong processing power and flexible secondary development environment, it can also play an important role in the next generation of technology waves such as edge computing, AI, and big data.

1.2. Main features

- Supports built-in TKL (including LoRaWAN NS and IoT platform)
- Supports historical data storage
- Supports Thing Model

- Supports Dashboard
- IP67 protection level
- Support POE, Type-C power supply
- 8 frequency bands (maximum support 16 frequency points)
- maximum support 32(default 16) demodulators capable of processing 32 packets simultaneously

(16 × SF5-SF12 LoRa® demodulators; 16 × SF5-SF10 LoRa® demodulators)

- maximum 130 (default 65) channels (each channel configuration includes distinct SF, BW, and frequency points; BW = 125 kHz, totaling 65 channels)
- Receiver sensitivity: -141 dBm (SF = 12, BW = 125 kHz)
- Maximum RF transmit power: 22 dBm
- Support US902, AU915, AS923, EU868, EU433, CN470 LoRaWAN standard
- External SIM card and debugging interface for easy maintenance and repair
- Seamless connection to LoRaWAN net servers such as TTN, ChirpStack, and Basicstation
- Supports remote maintenance and upgrades
- Web-based visualization and friendly configuration

2. Product Parameters

2.1. Electrical parameters

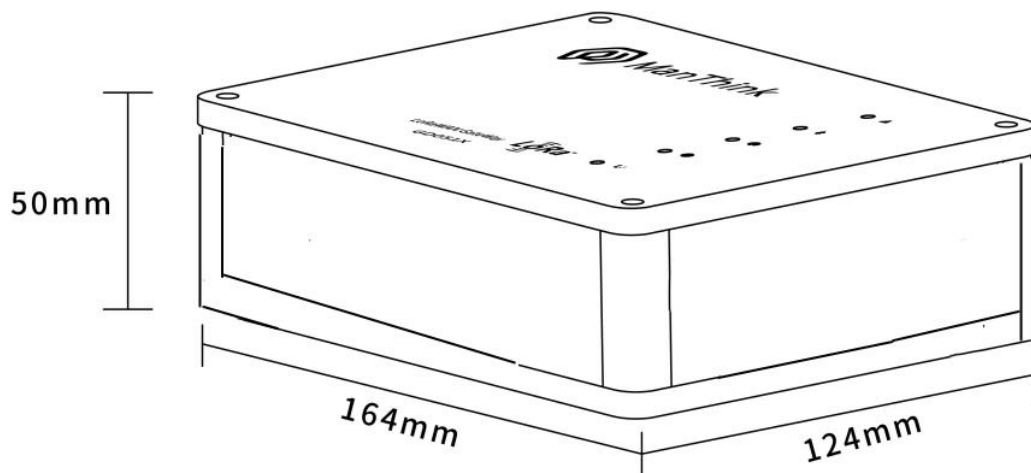
SOC	· LS1012A 64-bit ARM Cortex-A53 800MHz 2W
Memory	· Support DDR3L 1066 MHz

	· Memory:512MB
Storage	·32GB EMMC
Software	• Built-in NS and IoT platform (with integrated TKL) • Supports ThinkLink, ChirpStack, TTN, Basic Station, and GWMP protocols • Supports PostgreSQL and Redis databases • Supports historical data storage and Leaf mode • Supports Thing Model and application data parsing • Supports Dashboard
LoRa	· Operating frequency bands: CN470 470M~510MHz EU868 863M~870MHz EU433 433M~434MHz AS923 920M~928MHz US902 902M-928 MHz AU915 915M-928 MHz · Communication Rate: 292bps to 15.625kbps, supports SF5 to SF12 · Transmit Power: 22dBm (Max) · Receiver sensitivity: -141 dBm (SF = 12, BW = 125 kHz) · Antenna Type: Omnidirectional

	· Frequency points: 8 (maximum 16)(BW = 125 kHz) · Demodulators: 16 (maximum 32), capable of processing 16 (maximum 32) packets simultaneously (8(maximum 16) × SF5-SF12 LoRa® demodulators; 8 (maximum 16) × SF5-SF10 LoRa® demodulators) · Channels: 65(maximum 130) (each channel is defined by a unique combination of SF, BW, and frequency point; BW = 125 kHz, totaling 65 channels) · Operating Mode: Half-duplex · Single Channel Bandwidth: 125KHz or higher
Data backhaul	· Ethernet: 1000M/100M
Timing	· GPS
Configuration ports	· USB-TypeC · Ethernet · WiFi
Power supply	· POE(48V)
Power consumption	· 5W
Environmental parameters	· Operating temperature: -40℃～70℃ · Operating humidity: 0%～95%RH · Water and dust resistance: IP67

Weight	· 1.2KG
Dimensions	· 164x124x50mm
Installation method	· Pole or wall mounting

2.2. Product Dimensions



2.3. Interface Description

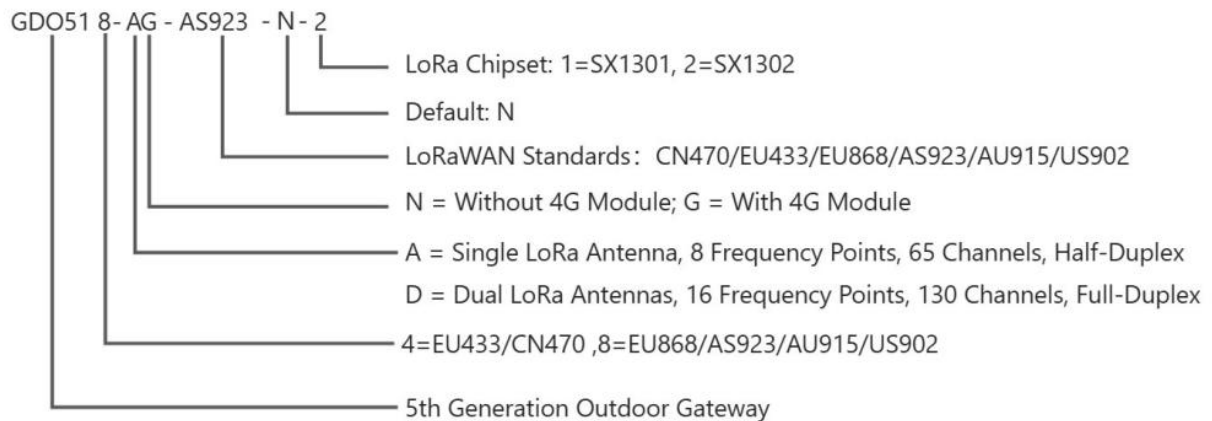
Interface Name	Description
RF	LoRa Antenna Interface
POE	POE Power Interface

2.4. Indicator Light Description

Indicator	Function	Status	Description
	Running	Steady On	System starting up

	Indicator	Off		System running normally, entering process startup phase
		Flashing at 1Hz		System running normally
	Network Indicator	Red (Wired Network Status)	Flashing at 1Hz	Network connection normal
			Flashing at 500ms	Network connection abnormal
			Fast Flashing	Gateway is performing data interaction
	LoRa Data Transceiver Indicator	Red	Flashing	Gateway is sending a data packet
		Blue	Flashing	Gateway is receiving a data packet
	LAN Status Light	Red		System control
	Fault Indicator	Fast Flashing		Second phase of startup process
		Off		No fault
		Flashing		Fault

2.5. Product Model

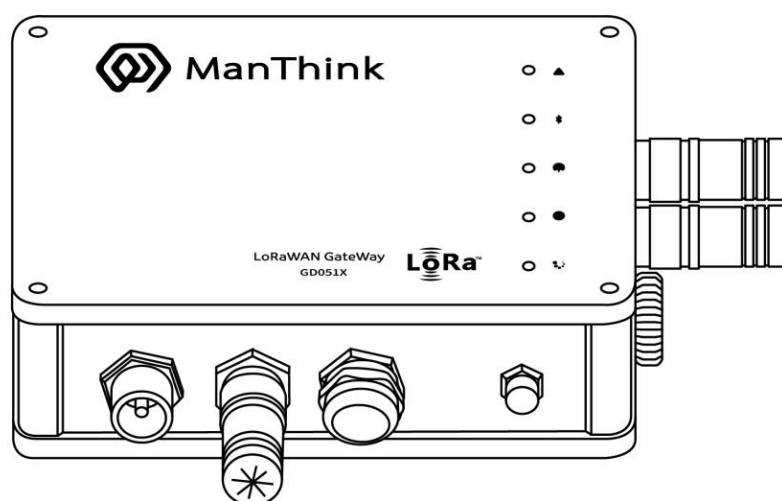


Example, GDO518-AG-AS923-N-2 is the 5th generation outdoor gateway, with 8 frequency points and 65 channels, supporting AS923 standards, and using SX1302 chipset

3. Gateway Installation

Note: It is not necessary to disassemble the Gateway shell during installation.

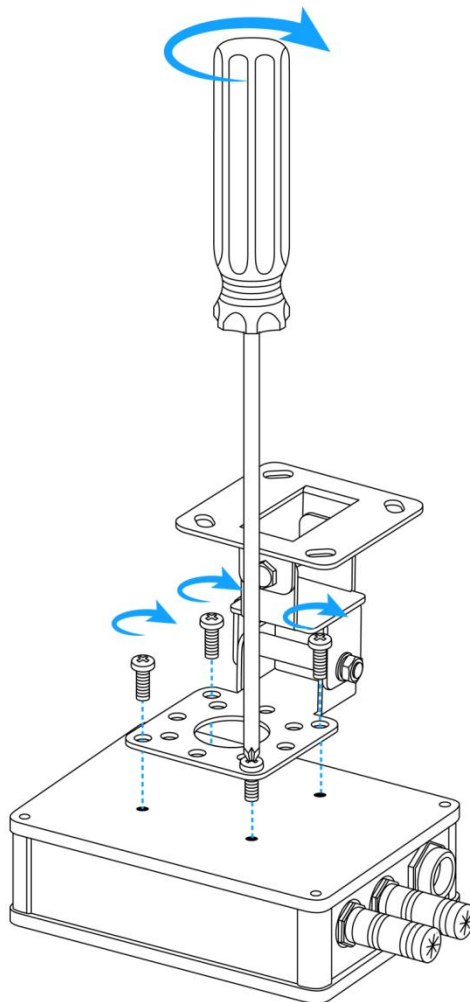
3.1. Installation Direction



Note: The front view of the product is shown in the picture above. During the installation process, please ensure that the product orientation is consistent with the above figure for correct installation.

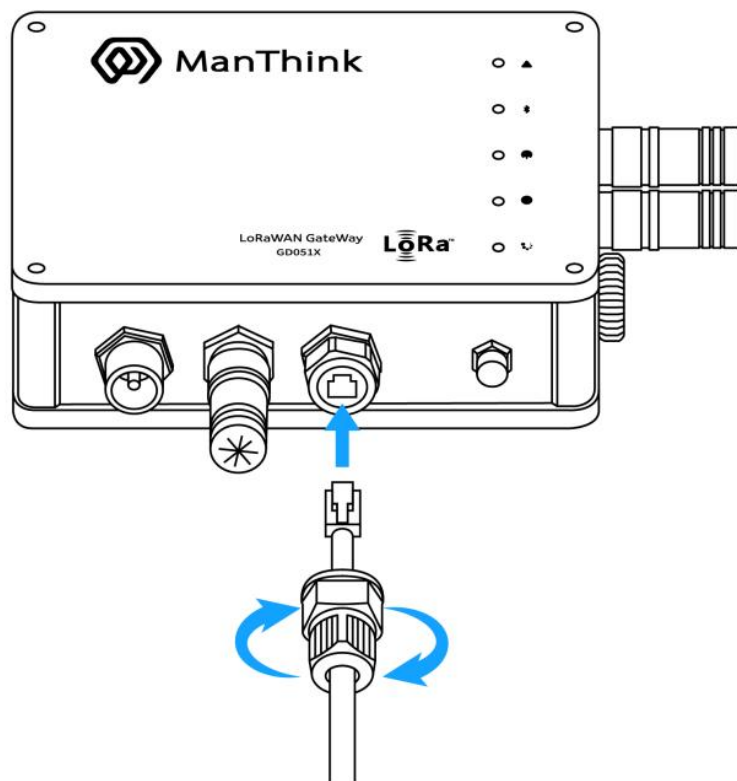
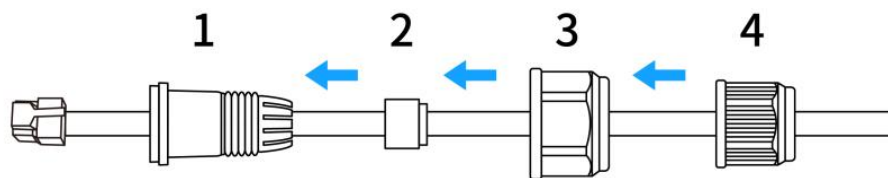
3.2. Backplane Installation

- Flip the gateway to the direction shown in the figure and confirm that the backplane is tightly connected to the Gateway.
- Align the screw with the screw hole and use a screwdriver to turn it clockwise until the screw cannot turn.



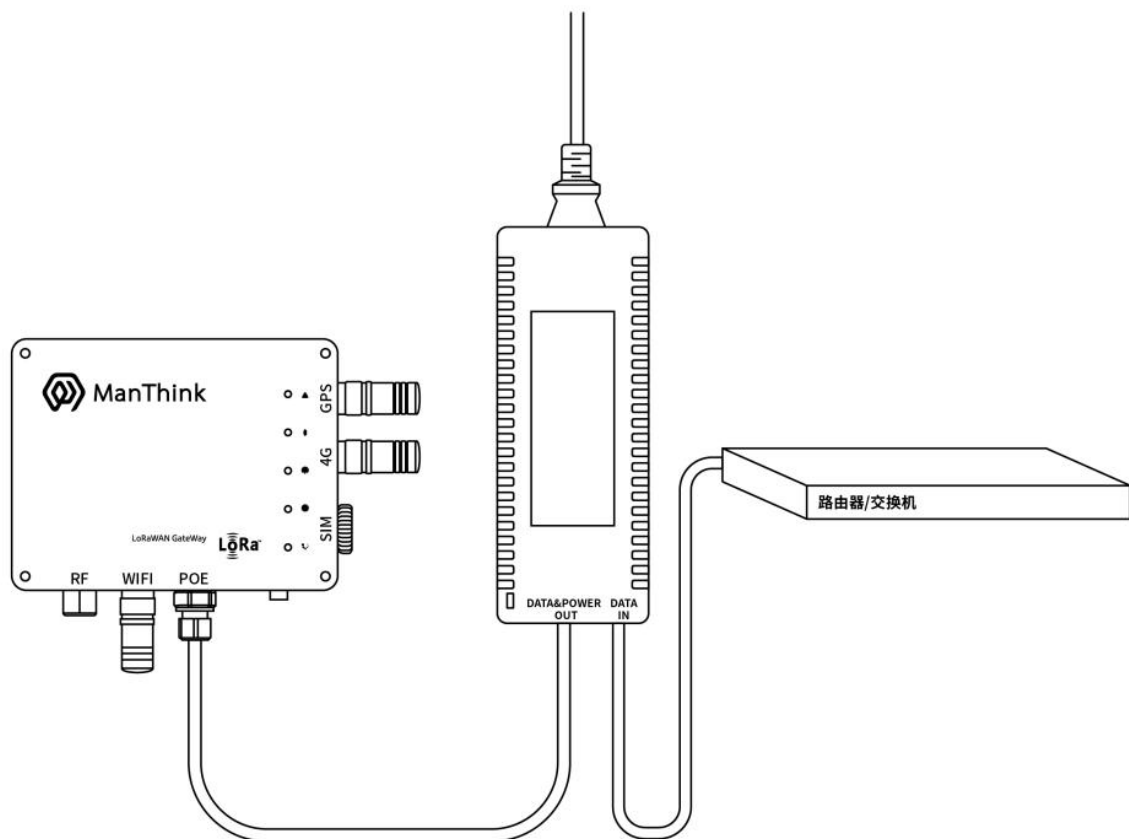
3.3. Network cable installation

- Thread the waterproof plug into the network cable from right to left in the following order, and assemble parts 1, 2, 3 and 4 tightly
- Insert one end of the network cable crystal head into the Gateway POE interface
- Move the assembled waterproof plug part to the direction of the Crystal Head, and screw it on the POE interface to ensure that the assembled waterproof plug is tightly connected with the POE interface.



3.4. Power connection

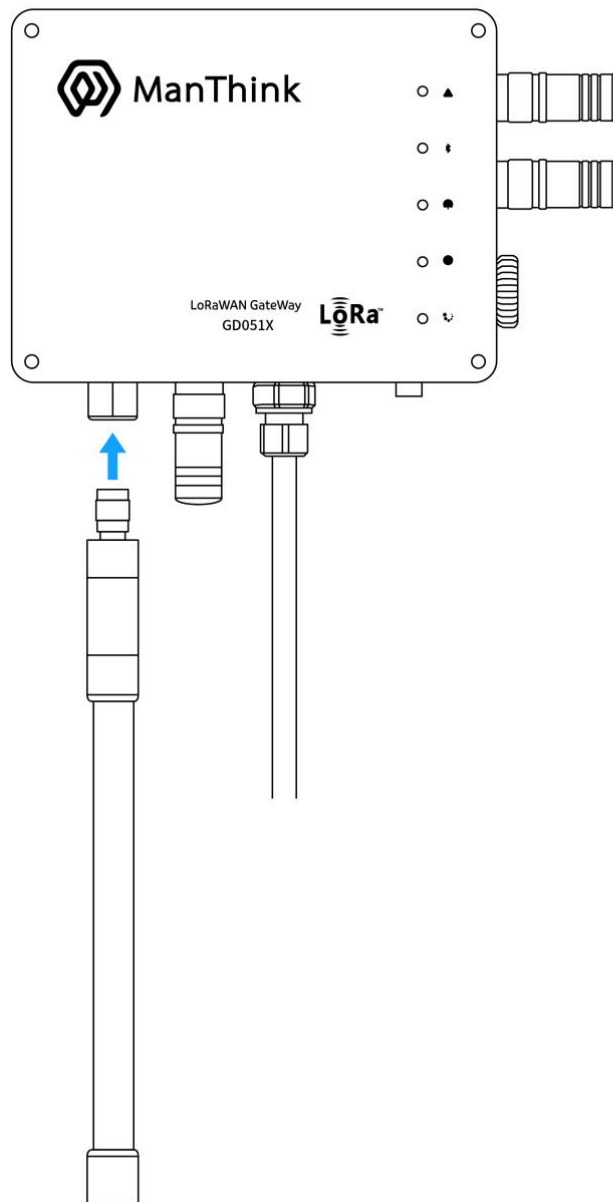
- OUT port connection gateway POE interface (power supply)
- The IN port is connected to a switch or router (network supply). If there is 4G, there is no need to connect the IN interface.



3.5. FRP antenna installation

Connect the LoRa antenna to the Gateway RF interface

Note: This step is required for the optional lora antenna.

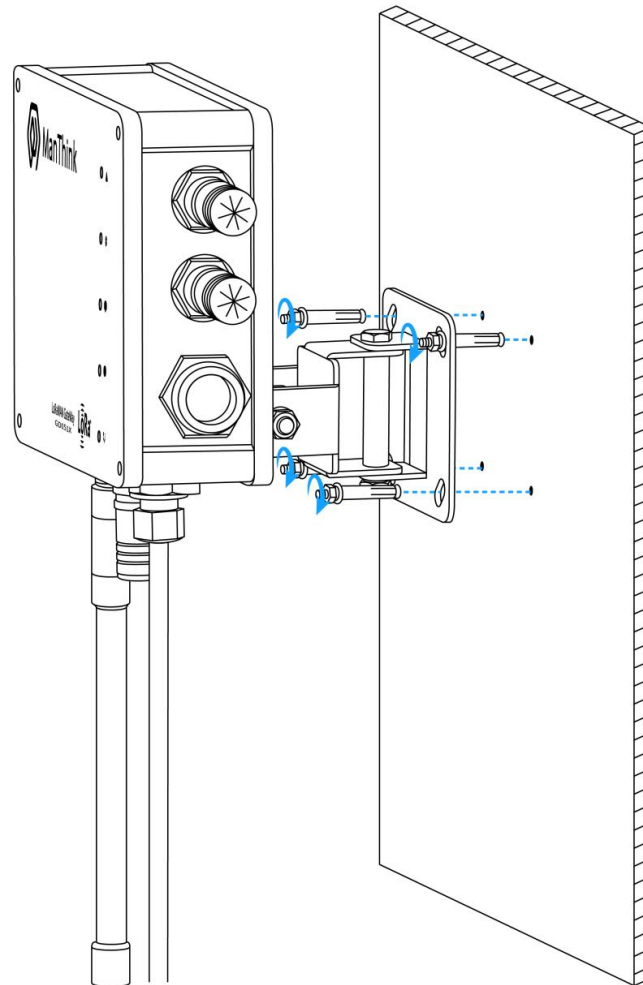


3.6. Gateway fixed

3.6.1. Wall-mounted fixed

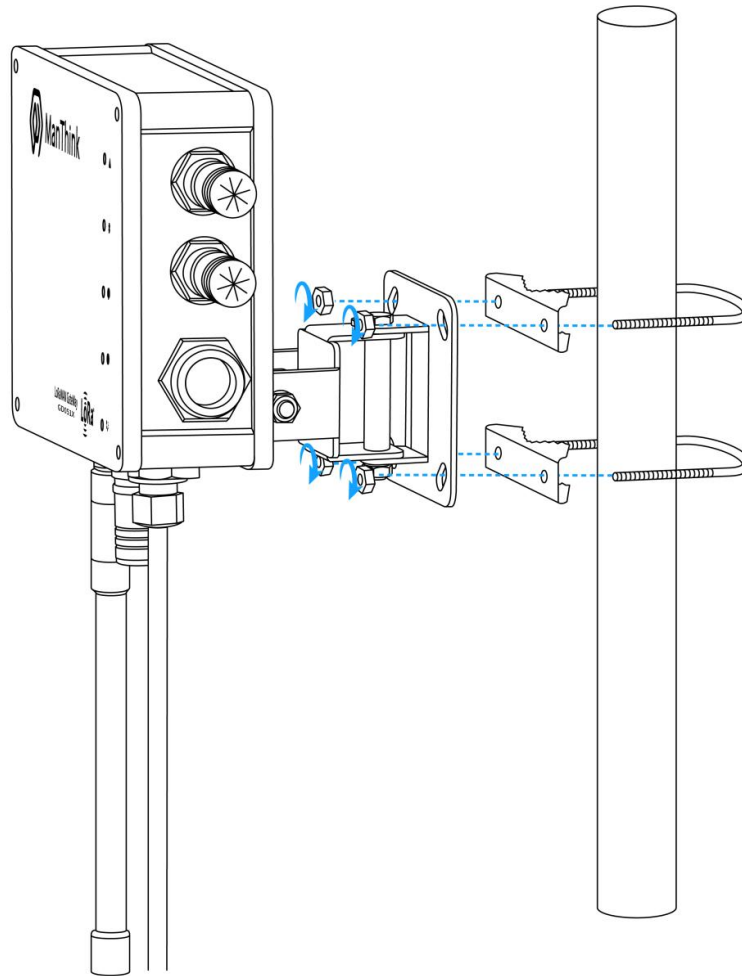
- Install with the Gateway face up (Figure 1)
- Four holes corresponding to the holes of the back plate bracket are made in the wall, and then the expansion bolts are driven in (the positions of the four holes of the back plate bracket can be marked on the wall first)

- Pass the expansion screw through the back bracket and screw in the expansion screw with a tool.



3.6.2. Holding Rod fixing

- Install with the Gateway face up (Figure 2)
- Confirm that the pole diameter is between 30mm-52mm
- Combine the holding Rod clamps according to the position shown in the figure, and tighten the screws.



4. Precautions

4.1. Waterproof protection

- Use insulating tape or waterproof material to wrap and seal the connection to ensure that it is not penetrated by moisture and moisture.
- Pay special attention to areas where moisture can easily enter, such as outdoor installations or areas exposed to rain or high humidity.
- The insulating tape is tightly wrapped around the connection, completely covered, and forms a waterproof barrier.

- Check the waterproof condition regularly, and re-coat or replace the insulating tape as needed to maintain effective protection.
- Ensure that all connections and cables are properly sealed and protected to prevent moisture damage and maintain the integrity of the installation.

4.2. Gateway waterproof

- Ensure all cable entry points and connectors on the Gateway are properly sealed following the installation steps
- Pay particular attention to areas where moisture may enter, such as cable connections, antenna interfaces, and power input ports.
- Apply a layer of waterproof material around the cable entry point and connector, completely covering to prevent moisture penetration.
- Check the waterproof condition regularly, and re-coat or replace the waterproof material as needed to maintain effective protection.

4.3. POE adapter waterproof installation

- Choose a suitable location to install the POE Adapter, making sure it is away from direct water sources or areas that may splash water.
- Make sure that the POE Adapter is installed vertically with the connection port down to prevent water from entering.
- Use a waterproof material, such as insulating tape or waterproof casing, to cover and seal the connection of the POE Adapter.
- Pay attention to the entry points of the cables and make sure they are properly sealed to prevent water from entering.
- Check waterproofing measures regularly and re-coat or replace any damaged or aged materials.

Please note that waterproofing requirements may vary depending on the specific environment and installation conditions. To ensure effective waterproofing, follow best practices and consult a professional if needed.

5. User Guide

5.1. Gateway Configuration

[\[EN\] AN-25100108 Gateway Configuration](#)

5.2. Using ThinkLink

[\[EN\] ThinkLink User Guide](#)

5.3. Connecting to Chirp Stack

[\[EN\] GW-AN08 Connection to ChirpStack Basic Station LNS Protocol \(with TLS\) Guide](#)

5.4. Connecting to TTN

[\[EN\] GW-AN09 connect TTN by basicstation](#)

6. Contact Us

Website: www.manthink.cn

Email: info@manthink.cn

Tel: +86-15810684257

FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.