

GDI51

LoRaWAN Gateway

Standardized Device Manual



VERSION
2.01

DOCUMENT
Device Manual

Product Introduction

GDI51 is an indoor gateway designed by ManThink based on SX1302 for LoRaWAN system. It can efficiently process large amounts of data to ensure the stability and reliability of communication. It is suitable for indoor environments such as parks, buildings, and buildings. With its powerful processing capabilities and flexible configuration functions, it provides users with an ideal Internet of Things solution.

Product Features

- Supports built-in TKL (including LoRaWAN NS and IoT platform)
- Supports historical data storage
- Supports Thing Model
- Supports Dashboard
- Supports PoE and Type-C power supply
- Supports 4G, Wi-Fi, and Ethernet connectivity
- Supports ThinkLink, ChirpStack, TTN, and LoRaWAN NS compatible with Basic Station/GWMP protocol
- 8 frequency points (BW = 125 kHz)
- 16 demodulators capable of processing 16 packets concurrently (8 × SF5-SF12 LoRa®demodulators, 8 × SF5-SF10 LoRa®demodulators)
- 65 channels (different configurations of SF, BW, and frequency points count as separate channels; BW = 125 kHz, totaling 65 channels)
- Transmit power: 22 dBm (Max)
- Receive sensitivity: -141 dBm (SF=12, BW=125 kHz)
- Supports LoRaWAN standards: US902, AU915, AS923, EU868, EU433, CN470
- Supports remote maintenance and firmware upgrades
- Visual and user-friendly web-based configuration

Specifications

Category	Parameter	Specification
COMPUTE AND STORAGE		
	SOC	LS1012A 64-bit ARM Cortex-A53 800MHz 2W
	Memory type/rate	Support DDR3L 1066 MHz
	Memory capacity	Memory:512MB
	Storage	8GB EMMC

Category	Parameter	Specification
SOFTWARE		
	Platform	Built-in NS and IoT platform (with integrated TKL)
	Protocol/platform support	ThinkLink, ChirpStack, TTN, Basic Station, and GWMP protocols
	Databases	PostgreSQL and Redis
	Historical data	historical data storage
	Leaf mode	Leaf mode
	Thing Model	Thing Model
	Application data parsing	application data parsing
	Visualization	Dashboard

Category	Parameter	Specification
LORA		
	Operating frequency bands	CN470: 470–510 MHz EU868: 863–870 MHz EU433: 433–434 MHz AS923: 920–928 MHz US902: 902–928 MHz AU915: 915–928 MHz
	Communication rate	292bps to 15.625kbps
	Spreading factors	supports SF5 to SF12
	Transmit power	22dBm (Max)
	Receiver sensitivity	-141 dBm (SF = 12, BW = 125 kHz)
	Antenna type	Omnidirectional

Category	Parameter	Specification
	Frequency points	8 (BW = 125 kHz)
	Demodulators	16
	Concurrent packets	16 packets simultaneously
	Demodulator composition	8 × SF5-SF12 LoRa®demodulators; 8 × SF5-SF10 LoRa®demodulators
	Channels	65
	Channel definition/note	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

Category	Parameter	Specification
NETWORK AND BACKHAUL		
	Ethernet	1000M/100M
	4G uplink	The Gateway uses 4G uplink by default, CAT1 module
	LTE-FDD bands	B1/3/5/8
	LTE-TDD bands	B34/38/39/40/41
	4G deployment note	If the frequency band used by the planned regional operator is not in the above frequency band, please contact the technical personnel of ManThink to replace the applicable 4G module.

Category	Parameter	Specification
PORTS AND TIMING		
	USB Type-C configuration	USB-TypeC
	Ethernet configuration	Ethernet
	Wi-Fi configuration	WiFi

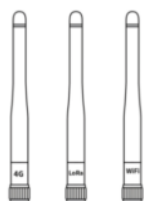
Category	Parameter	Specification
POWER		
	PoE power	POE(48V)
	USB power	USB TYPE-C(5V)
	Power consumption	5W

Category	Parameter	Specification
ENVIRONMENT AND ENCLOSURE		
	Working temperature	-20 °C ~ 65 °C
	Working humidity	0% ~ 95% RH
	Waterproof and dustproof	IP53
	Weight	0.3kg
	Dimensions	151mm x 125mm x 30mm
	Installation method	wall mounting or free placement

Accessories List



Gateway ×1

Antennas ×3
(4G、LoRa、WiFi)

Network cable ×1



Backplate×1



Power adapter×1



Type-C cable×1

Figure Accessories List

NOTE The Indoor Gateway GDI51x does not support GPS by default. If you need GPS function, please contact the technical personnel of ManThink

Product size

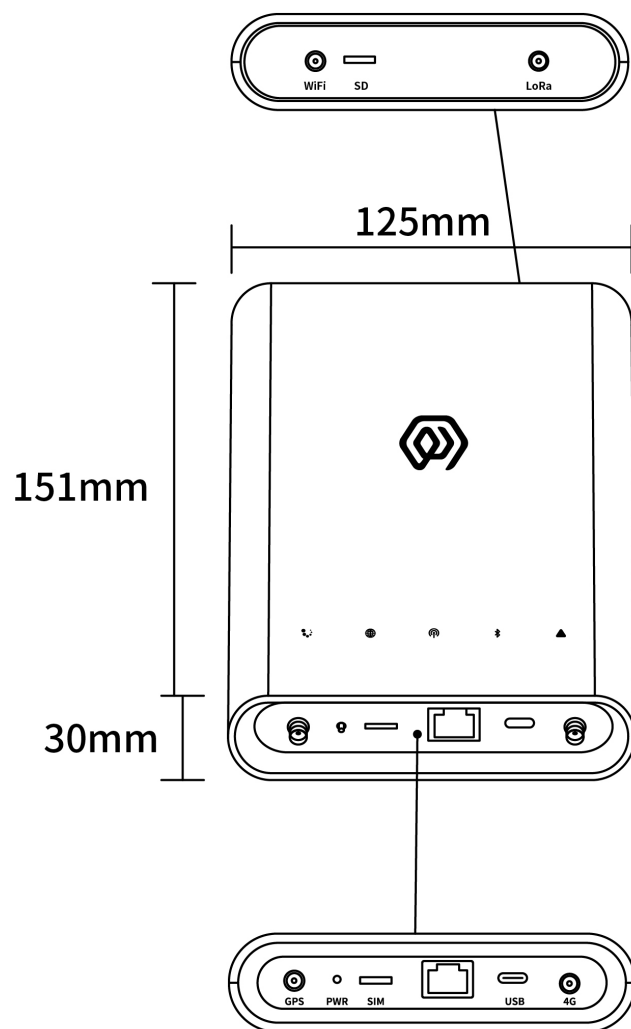


Figure Product size

Interface Description

Interface Name	Description
WiFi	WIFI antenna interface
SD	Memory card slot
LoRa	LoRa Antenna interface
GPS	GPS antenna interface
PWR	Reset key
SIM	SIM card slot
RJ45	Network cable interface (POE power supply)
USB	Type-C interface
4G	4G Antenna Interface

Indicator Description

Indicator	Color / network	Light states and meanings
Running indicator 	—	Steady on: The system is starting. Off: Basic system startup is complete and application processes are starting. Flashing at 1 Hz: The system is running normally.
Network indicator 	Green/wired network Blue/4G network	Green, flashing at 1 Hz: The wired network connection is normal. Green, flashing every 500 ms: The wired network connection is abnormal. Green, flashing rapidly: Network configuration is in progress. Blue, off: No 4G module is installed. Blue, steady on: A 4G module is installed, but no SIM card is inserted. Blue, flashing irregularly: Data is being exchanged over the 4G network.
LoRa data transceiver indicator 	Green Blue	Green, flashing: A LoRa data packet is being transmitted. Blue, flashing: A LoRa data packet is being received.
LAN status light 	Red Blue	Red: System control status. Blue: Wi-Fi connection status.
Fault indicator 	—	Flashing rapidly: The system is in the second startup phase. Off: No system fault is present.

Product Model

Model example

GDI518-AG-AS923-N-2

Model component breakdown

- **GDI518: product series and RF band.**
 - GDI51 identifies a fifth-generation indoor LoRaWAN gateway.
 - 8 identifies the 800 MHz-and-above RF version for EU868, AS923, AU915 and US902.
 - Other band option: 4 identifies the 400 MHz RF version for EU433 and CN470.
- **-AG: LoRa architecture and 4G configuration.**

- A identifies one LoRa antenna, 8 frequency points, 65 channels and half-duplex operation.
- Other LoRa architecture option: D identifies two LoRa antennas, 16 frequency points, 130 channels and full-duplex operation.
- G identifies an integrated 4G module.
- Other 4G option: N identifies a configuration without a 4G module.
- **-AS923: LoRaWAN regional standard.**
 - AS923 means that the gateway supports the LoRaWAN AS923 regional parameters.
 - Other regional codes are CN470, EU433, EU868, AU915 and US902; US902 denotes the LoRaWAN US915 (902–928 MHz) regional parameters.
- **-N: default version.**
 - N identifies the default version.
 - Other values are reserved for customized or special versions.
- **-2: LoRa concentrator chipset.**
 - 2 identifies the Semtech SX1302.
 - Other chipset option: 1 identifies the Semtech SX1301.

Complete model meaning

The complete meaning of GDI518-AG-AS923-N-2 is:

This is a fifth-generation indoor LoRaWAN gateway in the 800 MHz-and-above RF class. It uses one LoRa antenna, 8 frequency points, 65 channels and half-duplex operation, includes a 4G module, supports the LoRaWAN AS923 regional standard, uses the default version code N, and is equipped with a Semtech SX1302 concentrator.

Gateway Installation

Note:

- The gateway shell does not need to be disassembled for installation
- Te Indoor Gateway GDI51x does not support GPS by default. If you need GPS, please contact the technical personnel of ManThink.

Accessories connection

Antenna connection

- Will respectively the LoRa, WiFi, GPS and 4G antennas are tightened to the corresponding interfaces.

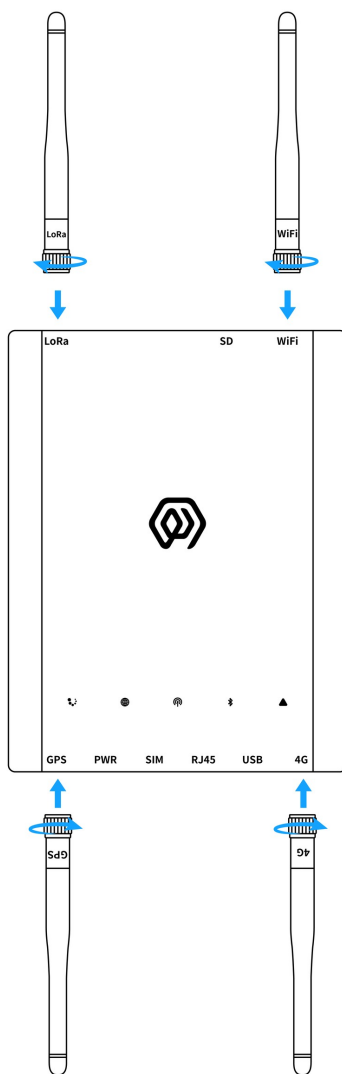


Figure Antenna connection

Type-C power cord connection

- When using POE power supply mode, the power cord does not need to be connected
- Will Type-C power cord connect to the Gateway USB interface (Type-C interface)

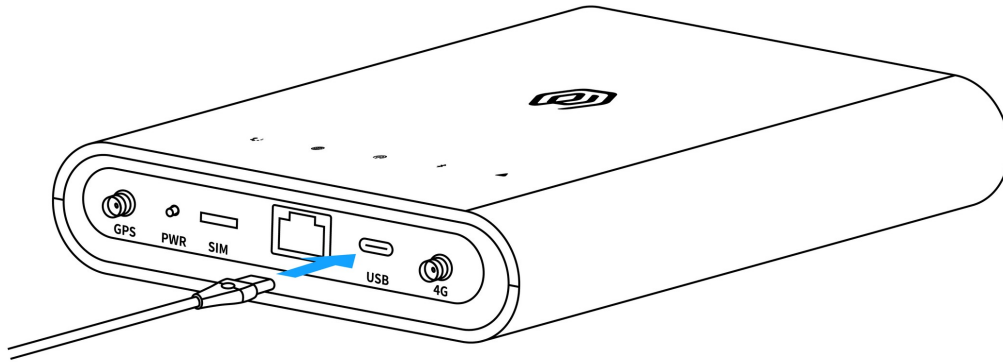


Figure Type-C power cord connection

Network cable connection

- Connect the network cable to the Gateway RJ45 interface
- This interface can accept POE power supply

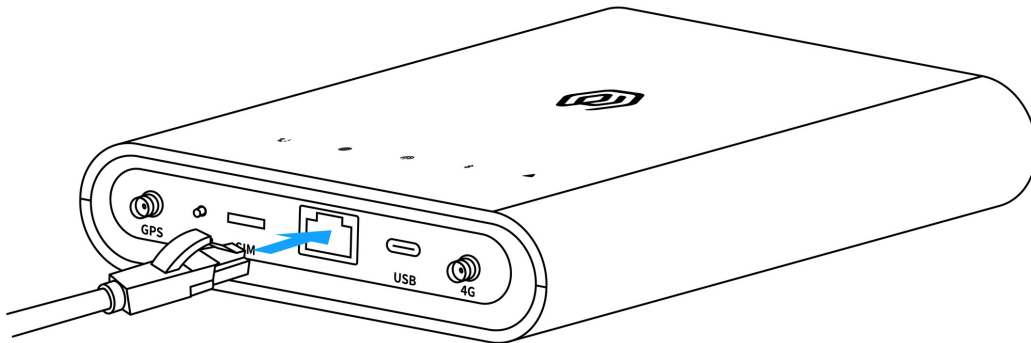


Figure Network cable connection

SIM card installation

- No need to insert a SIM card when connecting the network cable.
- Insert the SIM card into the gateway SIM interface.

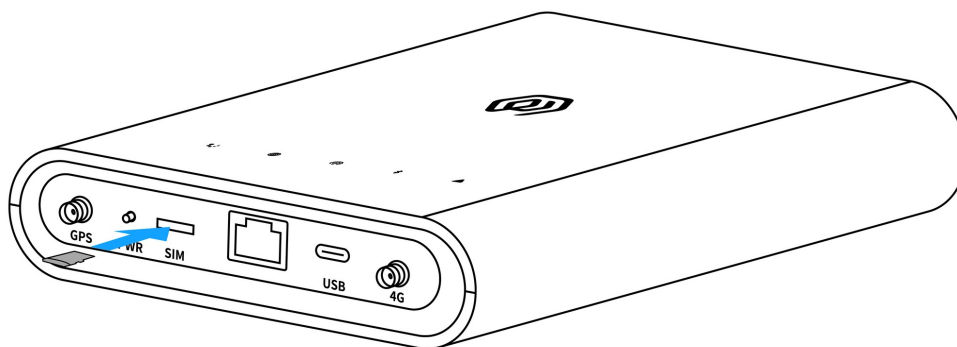


Figure SIM card installation

NOTE The correct orientation for inserting the SIM card is as shown in the figure below: **chip facing downward**, with the **notch in the upper-left corner**.



Figure SIM card installation

Gateway Installation

Wall-mounted fixed

- Screw the Gateway backboard to the wall

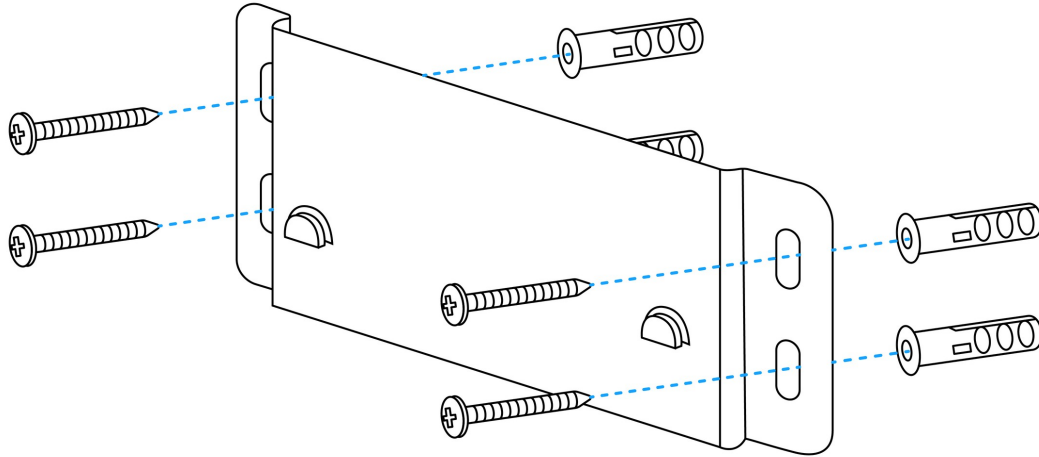


Figure Wall-mounted fixed

- Mount the gateway back hanging slot on the backboard

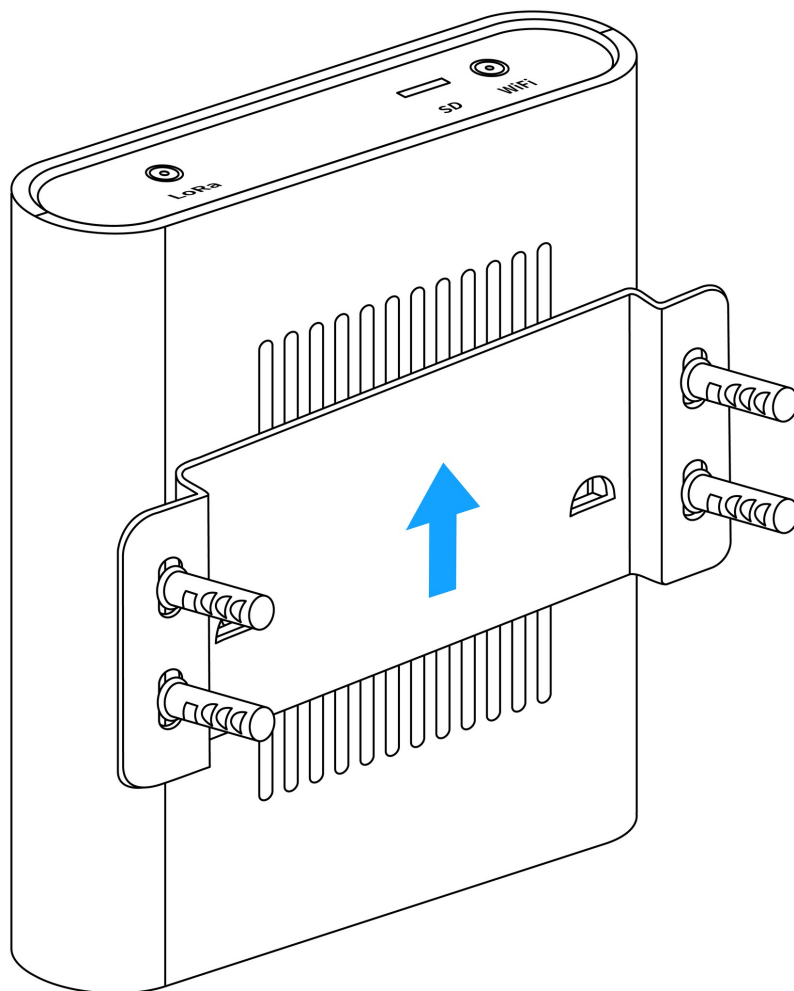


Figure Wall-mounted fixed

User Guide

Gateway Configuration

[AN-25100108 Gateway User Guide](#)

Using ThinkLink

\ThinkLink User Guide

Connecting to Chirp Stack

[GW-AN08: Connecting to ChirpStack through Basic Station LNS \(with TLS\)](#)

Connecting to TTN

[GW-AN09: Connecting to TTN through Basic Station](#)

Contact Us

Website: www.manthink.cn

Email: info@manthink.cn

Tel: +86 15810684257