

GD71

LoRaWAN Gateway

Standardized Device Manual



VERSION
Current

DOCUMENT
Device Manual

Revision History

Version	Change Description
Current	Current published version

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1. Product Description

GD71 is an indoor, multi-channel, high-performance gateway designed by ManThink for LoRaWAN systems. It uses a high-performance processor, a Semtech SX1302 LoRa concentrator and an industrial-grade Wi-Fi module. It supports Ethernet, cellular, Wi-Fi access-point/client and Bluetooth Low Energy (BLE) connections. GD71 is suitable for campuses, offices, shopping malls, hotels, factories and other indoor IoT environments, and supports edge computing, protocol conversion, data buffering and local application extensions.

2. Main Features

- High-performance chipset, at least 512 MB DDR and at least 16 GB eMMC
- Semtech SX1302 LoRa concentrator with at least 8 LoRaWAN uplink channels, 8 frequency points and 16 demodulators
- -141 dBm LoRa receiver sensitivity at SF12/BW 125 kHz; maximum transmit power is 27 dBm for suffix -1 and 22 dBm for suffix -2, with a maximum-power tolerance of ± 2 dBm
- Standard LoRaWAN and AS923 regional parameters, plus regional configurations for CN470, EU433, EU868, AU915 and US915
- Industrial-grade Wi-Fi module supporting access-point and client modes
- 2.4 GHz or 5 GHz Wi-Fi, IEEE 802.11a/b/g/n, at least 100 Mbps download and at least 50 Mbps upload
- Bluetooth Low Energy (BLE)
- WPA2, AES and TLS
- PoE/PoE+ and USB Type-C power options
- Ethernet, 4G/LTE and Wi-Fi backhaul options, plus dual-gateway redundancy architecture
- GPS/BeiDou positioning and NTP clock synchronization
- MQTT, MQTTS, HTTP, HTTPS, SNMP, DHCP, static IP, NAT and ICMP
- Secure remote management, configuration and upgrades; supports Python and Node-RED for secondary development
- Automatic fault detection and recovery; reporting of CPU, memory, storage, network and LoRa communication-quality indicators
- Built-in indicators for LoRa, network, power/operation and faults
- Built-in TKL, including LoRaWAN network server and IoT platform, historical data, Thing Model and Dashboard
- Wall mounting or freestanding installation, with visual configuration and maintenance through gwTool7

3. Technical Specifications

Category	Parameter	GD71 Specification
COMPUTE AND STORAGE		
	SoC	High-performance multi-core processor
	Memory	DDR, ≥ 512 MB
	Storage	eMMC, ≥ 16 GB

Category	Parameter	GD71 Specification
SOFTWARE AND PLATFORM		
	Built-in platform	Built-in TKL LoRaWAN network server and IoT platform
	External platforms/ protocols	ThinkLink, ChirpStack, TTN, Basic Station and GWMP
	Data services	PostgreSQL, Redis, historical data storage, Thing Model, application data parsing and Dashboard
	Secondary development	Supports Python and Node-RED
	Remote operations	Remote management, configuration and upgrades over SSH
	Fault handling	Automatic fault detection and recovery
	Monitoring	Reporting of CPU, memory and storage usage, network status and LoRa communication quality

Category	Parameter	GD71 Specification
LORAWAN		
	Concentrator	Semtech SX1302
	Protocol	Standard LoRaWAN; compliant with LoRa Alliance™ LoRaWAN Specification v1.0.4 or a later version
	Operating bands	AS923: 920–928 MHz; regional configurations also include CN470, EU433, EU868, US915 (902–928 MHz) and AU915
	Channels/frequency points	At least 8 uplink channels; 8 frequency points at BW = 125 kHz
	Demodulators	16, processing up to 16 packets simultaneously
	Demodulator composition	8 × SF5–SF12 LoRa@demodulators; 8 × SF5–SF10 LoRa@demodulators
	Channel capacity	65 logical channels; each SF, bandwidth and frequency-point combination defines a channel
	Communication rate	292 bps to 15.625 kbps

Category	Parameter	GD71 Specification
	Spreading factors	SF5 to SF12
	Single-channel bandwidth	125 kHz or higher
	Operating mode	Half-duplex
	Transmit power	Suffix -1: 27 dBm maximum; suffix -2: 22 dBm maximum; maximum-power tolerance: ± 2 dBm
	Receiver sensitivity	-141 dBm at SF12/BW 125 kHz
	Antenna	Omnidirectional LoRa antenna

Category	Parameter	GD71 Specification
WI-FI AND BLUETOOTH		
	Wi-Fi module	Industrial-grade Wi-Fi module
	Operating modes	Access-point mode and client mode
	Bands/standards	2.4 GHz or 5 GHz; IEEE 802.11a/b/g/n
	Download/upload	Download ≥ 100 Mbps; upload ≥ 50 Mbps
	Security	WPA2, AES and TLS
	Bluetooth	Bluetooth Low Energy (BLE)

Category	Parameter	GD71 Specification
NETWORK AND TRANSPORT		
	Ethernet	1000M/100M; DHCP and static IP configuration
	Cellular uplink	CAT1 4G/LTE module by default; LTE-FDD B1/3/5/8 and LTE-TDD B34/38/39/40/41
	Data forwarding	MQTT, MQTTS, HTTP and HTTPS
	Network services	NTP, prevailing-version SNMP, NAT and ICMP diagnostics
	Network redundancy	Dual-gateway architecture for network redundancy

Category	Parameter	GD71 Specification
SECURITY AND AUTHENTICATION		
	Device identity	IMEI or device-feature-string authentication
	Access protection	Firewall and access control list (ACL)
	Transport security	Prevailing-version TLS; administrators can disable unsafe SSH/TLS cipher suites

Category	Parameter	GD71 Specification
PORTS AND TIMING		
	Configuration ports	USB Type-C, Ethernet and Wi-Fi
	SIM slot	One external nano-SIM slot supporting LTE/5G SIM cards; cellular standards are determined by the configured module
	Positioning/timing	GPS and BeiDou (BDS) positioning; NTP synchronization

Category	Parameter	GD71 Specification
POWER		
	PoE power	One PoE or PoE+ Ethernet port; nominal 48 V PoE
	USB power	USB Type-C, 5 V
	Power consumption	≤ 5 W in a typical configuration

Category	Parameter	GD71 Specification
ENVIRONMENT AND ENCLOSURE		
	Operating temperature	-20°C to 65°C
	Operating humidity	0% to 95% RH, non-condensing
	Ingress protection	IP53
	Radio-equipment requirement	Compliant with HKCA 1078 requirements
	Weight	0.3 kg
	Dimensions	151 × 125 × 30 mm
	Installation	Wall mounting or freestanding placement

Cellular deployment note: if local operator bands are outside the default module range, contact ManThink for a suitable cellular module.

4. Accessories

The product package includes the GD71 gateway, PoE power components, power adapter, Type-C cable, mounting backplate, LoRa antenna, LTE antenna, GPS antenna, Wi-Fi antenna, network cable and fasteners. Cellular-enabled versions include an LTE/5G SIM card.

5. Product Dimensions

The product outline and installation dimensions are shown below.

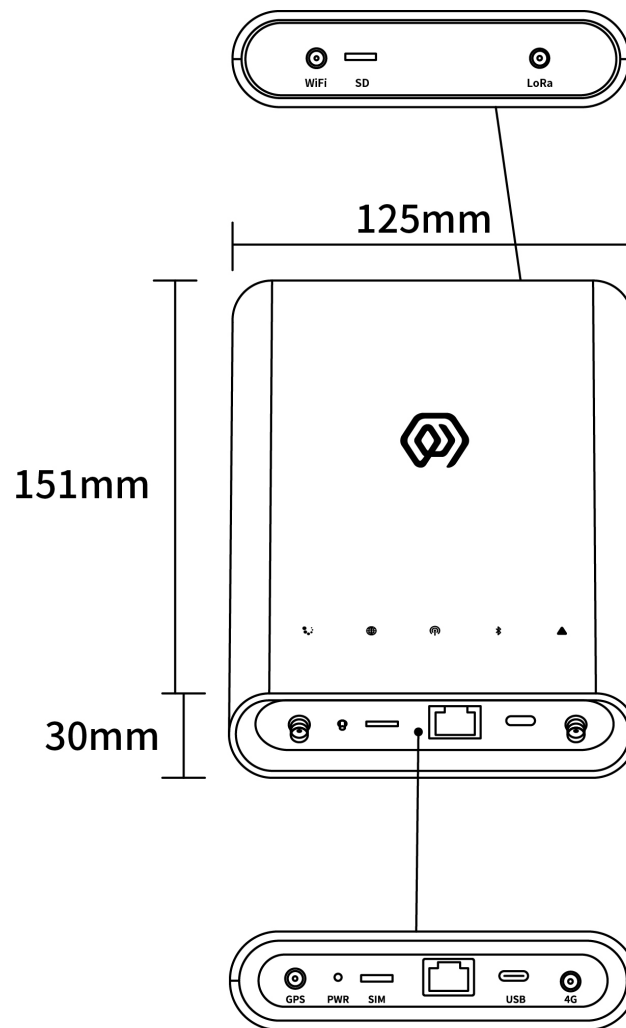


Figure GD71 product dimensions

6. Interface Description

Interface	Description
WiFi	Wi-Fi antenna interface
SD	Memory-card slot
LoRa	LoRa antenna interface
GPS	GPS/BeiDou antenna interface
PWR	Reset button
SIM	nano-SIM slot
RJ45	Ethernet and PoE/PoE+ power interface
USB	USB Type-C power, configuration and debugging interface
4G	LTE antenna interface

7. Indicator Description

Indicator	Color/network	States and meanings
Run indicator	—	Steady: System starting. Off: Base startup complete; applications are starting. 1 Hz flashing: Normal operation.
Network indicator	Green/wired Blue/cellular	Green, 1 Hz: Wired network normal. Green, every 500 ms: Wired network abnormal. Green, rapid: Network configuration in progress. Blue, off: No cellular module. Blue, steady: Module installed but no SIM. Blue, irregular: Cellular data activity.
LoRa transceiver indicator	Green Blue	Green flashing: Transmitting LoRa packets. Blue flashing: Receiving LoRa packets.
LAN status indicator	Red Blue	Red: System-control state. Blue: Wi-Fi connection state.
Fault indicator	—	Rapid flashing: Startup phase 2. Off: No fault. Flashing: Fault detected.

8. Product Model

8.1 Standard Model

The GD71 standard model is GD718–AG–AS923–N–2.

8.2 Model Components

- **GD718: series and RF band.** GD71 identifies the indoor LoRaWAN gateway series; 8 identifies the 800 MHz-and-above RF version.
- **-AG: LoRa architecture and cellular configuration.** A identifies one LoRa antenna, 8 frequency points, 65 channels and half-duplex operation; G identifies an integrated cellular module.
- **-AS923: LoRaWAN regional standard.** Identifies support for the AS923 regional parameters.
- **-N: version code.** N identifies the default version; other values are used for customized versions.
- **-1: transmit-power version.** Maximum transmit power is 27 dBm, with a maximum-power tolerance of ± 2 dBm.
- **-2: transmit-power version.** Maximum transmit power is 22 dBm, with a maximum-power tolerance of ± 2 dBm.

9. Gateway Installation

Do not open the gateway enclosure during installation. Disconnect power first and verify that antennas, PoE, grounding and cabling meet site requirements.

10. Accessory Connections

10.1 Antenna Connection

1. Connect the LoRa antenna to the LoRa interface.
2. Connect the LTE, GPS/BeiDou and Wi-Fi antennas to their matching labeled interfaces.
3. Tighten all antenna connectors evenly.

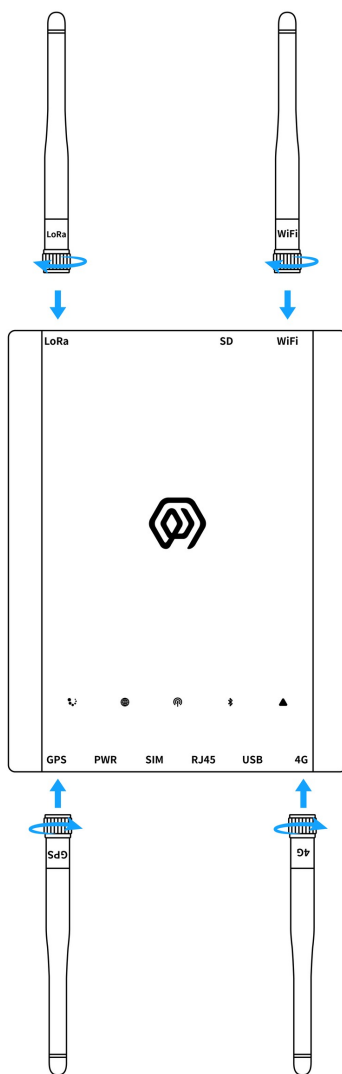


Figure GD71 antenna connection

10.2 Type-C Power Connection

1. The Type-C power cable is not required when PoE is used.
2. For USB power, connect the Type-C cable to the gateway USB interface.

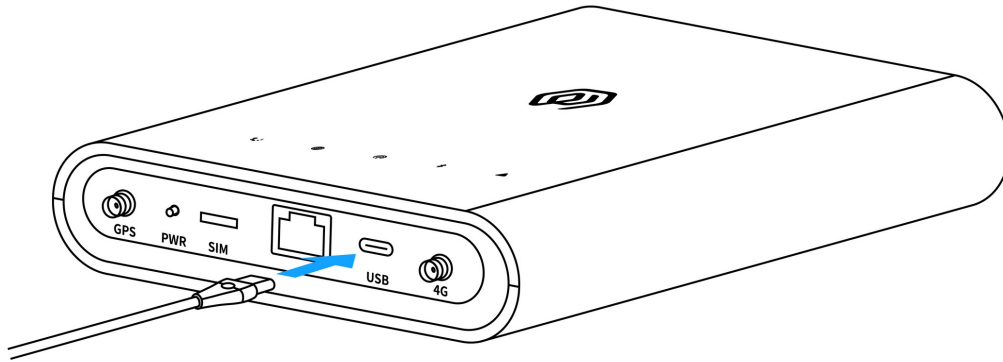


Figure GD71 Type-C power connection

10.3 Network Cable Connection

1. Connect the network cable to the gateway RJ45 interface.
2. When using PoE/PoE+ power, connect the other end to compliant PoE equipment.

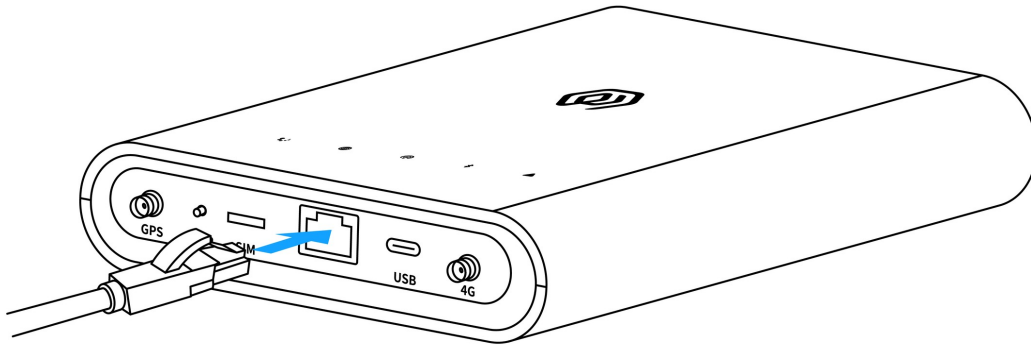


Figure GD71 network cable connection

10.4 SIM Card Installation

1. Before using cellular networking, insert a nano-SIM card into the gateway SIM slot.
2. Keep the SIM contacts facing down with the notch in the upper-left corner.

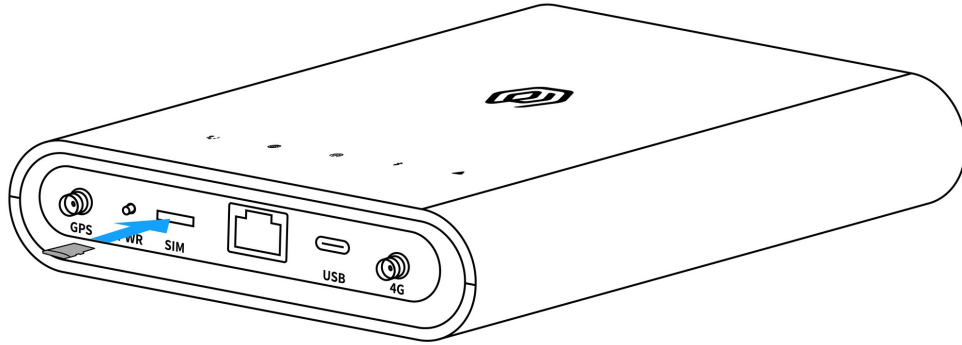


Figure GD71 SIM card installation



Figure GD71 SIM card orientation

11. Gateway Mounting

11.1 Wall Mounting

1. Mark and drill the wall using the backplate holes, then install anchors suitable for the wall material.
2. Fasten the mounting backplate to the wall and tighten the screws evenly.
3. Engage the gateway rear slots with the backplate and verify that the gateway is secure.

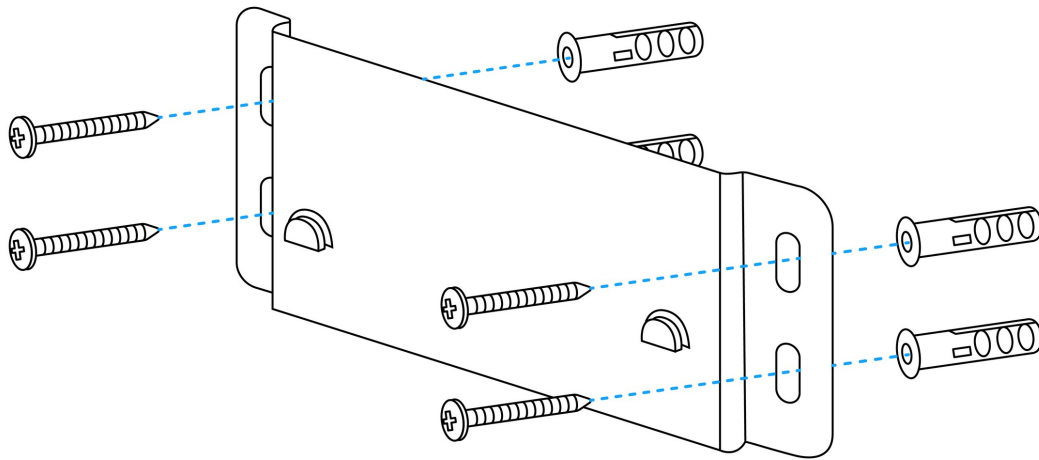


Figure GD71 mounting backplate

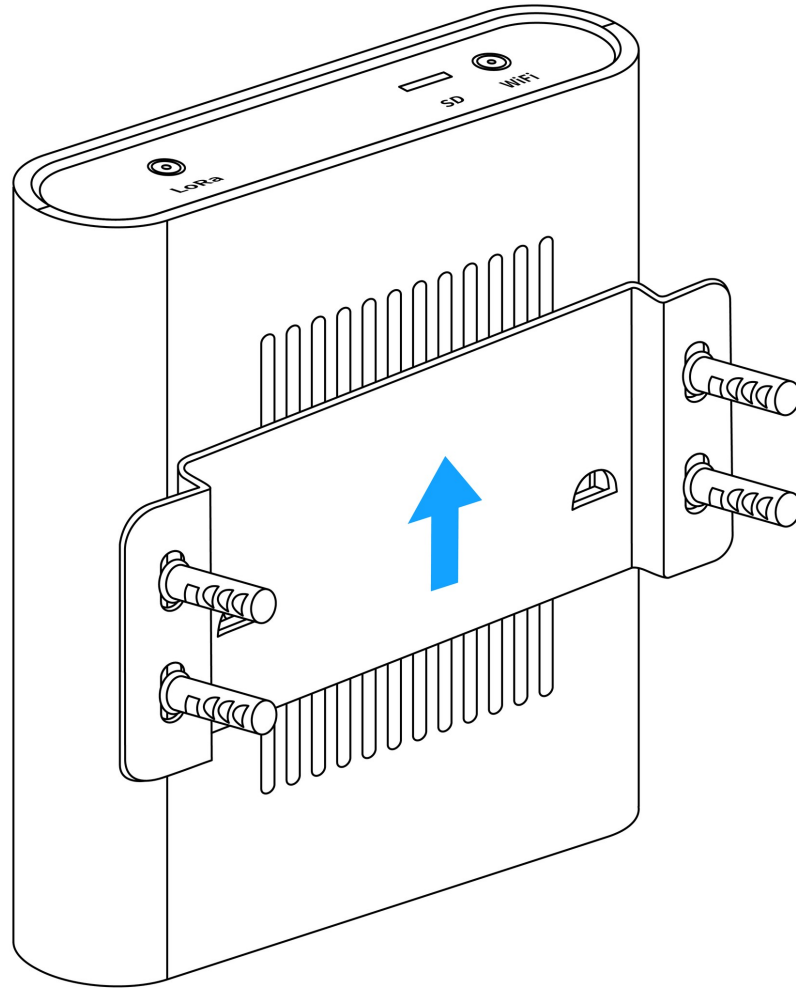


Figure GD71 wall mounting

12. Gateway Configuration

GD71 is configured and maintained with gwTool7. See the [gwTool7 Gateway Administrator Manual](#).

13. Platform Connections

- ThinkLink: [ThinkLink User Guide](#)
- ChirpStack: [Connect with Basic Station \(gwTool7\)](#)
- TTN: [Connect with Basic Station \(gwTool7\)](#)

14. Security Configuration Recommendations

- Change default administrative credentials during initial deployment and restrict management access to trusted networks.
- Enable the firewall or ACL and disable unnecessary services and ports.
- Use a prevailing TLS version and disable unsafe SSH/TLS cipher suites.
- Retain audit records for remote upgrades, configuration changes and administrator operations.
- Regularly review CPU, memory, storage, network and LoRa communication-quality alarms.

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