



RG-02 Low Frequency Version Specifications

Version V1.0.2

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Document Resume

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1. Product Overview

The RG-02 is an indoor LoRaWAN gateway that supports Semtech packet forwarder and LoRaWAN base station functions and is compatible with the standard LoRaWAN protocol.

The RG-02 low-frequency gateway (470-510MHz) utilizes the SX1302 LoRa RF baseband chip and two SX1257 RF front-ends, supporting 10 programmable parallel demodulation paths. The gateway supports WiFi, Ethernet, and 3G/4G cellular network access, enabling easy deployment in a variety of application scenarios.

The RG-02 low-frequency gateway hardware pre-integrates parameters for multiple standard LoRaWAN regional frequency bands, adapting to communication regulations in different countries and regions. It also supports user-defined frequency points and band planning, facilitating the deployment of private LoRa networks. Due to limitations in the hardware RF front-end design and filter configuration, the RG-02 low-frequency gateway only guarantees RF performance and communication stability within the CN470 frequency band. If other frequency bands are enabled, RF performance and link reliability will not meet device design standards and are not officially supported.

The RG-02 low-frequency gateway can communicate with ABP LoRaWAN end nodes without a LoRaWAN server, with the gateway itself performing data parsing and forwarding. This lightweight deployment method makes it easy for system integrators to integrate it directly into existing IoT applications without having to build a LoRaWAN server or use third-party LoRaWAN services.

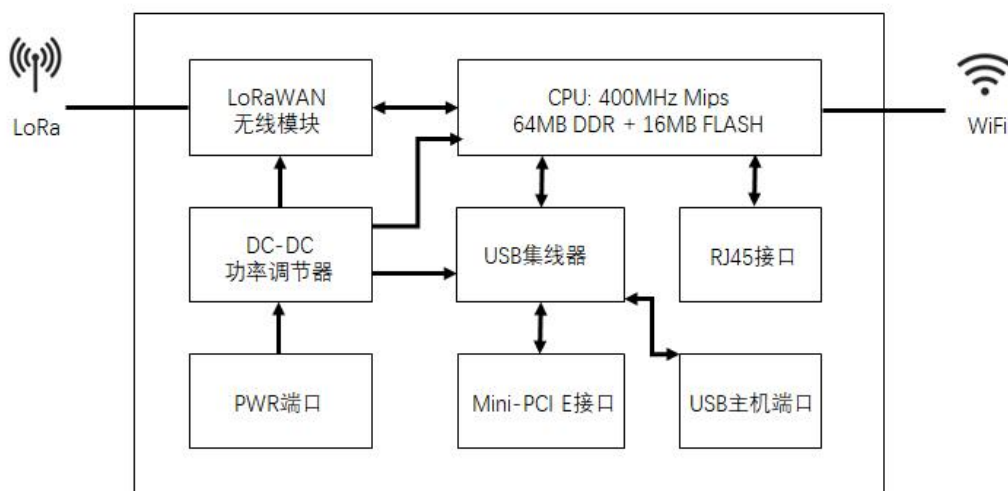


Figure 1 RG-02 gateway architecture

1.1. Characteristic

- Web GUI, SSH management via LAN or WiFi
- Simulation 49 x LoRa demodulator
- 10 programmable parallel demodulation paths
- Preconfigured to support different LoRaWAN locales
- Allow custom region parameters
- Support different levels of login ports
- Support for Semtech packet forwarders
- Support LoRaWAN base station
- 3G/4G cellular connection

1.2. Specifications

■ Hardware system

- ✓ AR9331 400MHz
- ✓ 64MB of RAM
- ✓ 16MB flash memory

■ interface

- ✓ 10M/100M RJ45 port x 2
- ✓ WiFi: 802.11 b/g/n
- ✓ LoRaWAN Wireless
- ✓ Power input: 12V DC, 2A, Type C
- ✓ USB 2.0 host connector x 1
- ✓ Mini PCI E connector x 1
- ✓ SX1302+2 x SX1257

■ WiFi Specifications

- ✓ IEEE 802.11 b/g/n
- ✓ Frequency band: 2400~2483.5MHz
- ✓ 11n transmit power:
 - mcs7: 11dbm
 - mcs0: 17dbm
- ✓ 11b transmission power: 18dBm
- ✓ 11g 54M transmission power: 12dBm
- ✓ 11g 6M transmission power: 18dBm
- ✓ 11g 54M Sensitivity: -71dbm
- ✓ 11n 20M sensitivity: -67dbm

■ LoRa Specifications

- ✓ SX1257 Tx/Rx front-end sensitivity up to -142.5dBm
- ✓ 70 dB CW interference rejection at 1 MHz offset
- ✓ Can operate under negative signal-to-noise ratio conditions, with a CCR of up to 9dB

- ✓ 8-way 8-channel LoRa packet detector, 8-way SF5 - SF12 LoRa demodulator, 8-way SF5 - SF10 LoRa demodulator, 125/250/500KHz LoRa demodulator and 1-way (G)FSK demodulator
 - ✓ Dual digital transmit and receive radio front-end interface
 - ✓ 10 programmable parallel demodulation paths
 - ✓ Dynamic Adaptive Data Rate (ADR)
 - ✓ True antenna diversity or simultaneous dual-band operation
-
- Cellular 4G LTE
 - ✓ Quectel: EC25 LTE module
 - ✓ 1 4G port
 - ✓ Supports LTE, UMTS/HSPA+ and GSM/GPRS/EDGE
 - ✓ Standard SIM card slot
 - ✓ LTE CAT4 maximum downlink speed 150 Mbps
 - ✓ LTE CAT4 maximum uplink speed: 50 Mbps
 - ✓ MIMO technology meets the data rate and link reliability requirements of modern wireless communication systems.
 - ✓ Recommended region: China

2. Main parameters

Table 1 Description of main parameters

Model	RG-02 low frequency version
LoRa Solution	SX1302+2*SX1257
Maximum output power	27dBm
Sensitivity	-142.5dBm
processor	AR9331 400MHz
Memory combination	64MB DDR + 16MB FLASH
Equipment size	12.0*8.5*3.0(±0.2)cm
Antenna type	LoRa glue stick antenna, WiFi onboard antenna, 4G suction cup antenna
Operating frequency band	CN470
Frequency setting range	470-510MHz
Power supply range	12V@2A
WiFi	IEEE 802.11 b/g/n
Ethernet	10M/100M

3. Dimensions

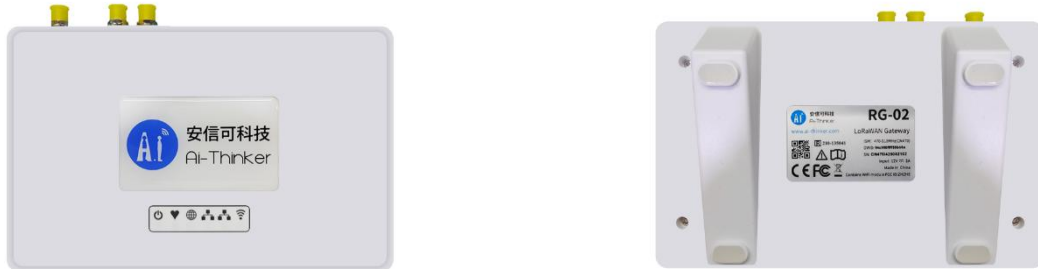


Figure 2: Front view of RG-02 gateway Figure 3: Back view of RG-02 gateway

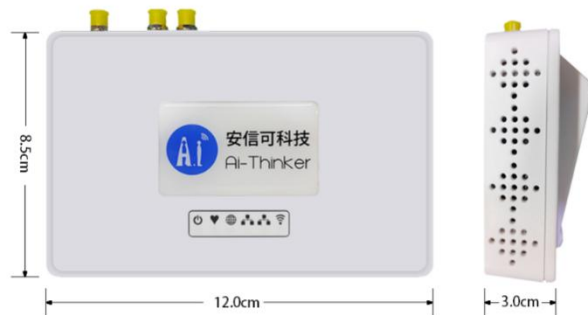






Figure 4 RG-02 Gateway Dimensions

4. Indicator lights and button instructions

Table 2 Indicator light status and button functions

Indicator light or button	Network Status	LED status or button function	Remark
 Heart-shaped indicator light	Undefined	Undefined	/
 System indicator light	Not connected to the LoRaWAN server	Lights out	/
	Connecting to LoRaWAN server	Flashing red light	
	Connected to LoRaWAN server	Red light is on	
 Ethernet indicator light	Not connected	Lights out	/
	Connected	Red light is on and flashing (data activity)	
 Power indicator	No power supply	Lights out	/
	Powered	Red light is on	
Restore factory settings	/	Reset button	Long press to reset

5. Product Notes

It's important to note that due to limitations in the hardware's RF front-end design and filter configuration, the RG-02 low-frequency version of this gateway only guarantees RF performance and communication stability within the CN470 frequency band. If other frequency bands are enabled, RF performance and link reliability will not meet device design standards and are not covered by official technical support. We recommend strictly complying with local radio regulations and confirming frequency band compliance before deployment.

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