



# RG-02 Specification

## Low frequency

Version V1.1.0

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## Document resume

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## 1. Product Overview

RG-02 is an indoor LoRaWAN gateway. Supports Semtech data packet transponders and LoRaWAN base station functions, and is compatible with standard LoRaWAN protocols.

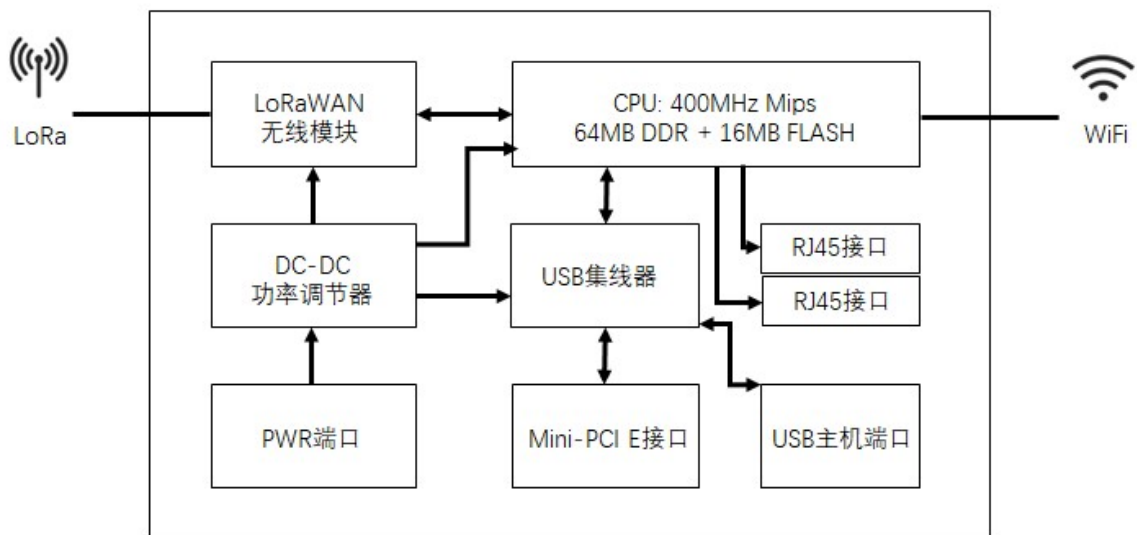
The low-frequency RG-02 gateway(470-510MHz) adopts the combination design of SX1302 LoRa RF baseband chip + 2x SX1250 RF front-end, supports 10 programmable parallel demodulator paths . The gateway supports Wi-Fi, Ethernet, 3G/4G cellular network access, and can be easily deployed to various application sites.

The RG-02 is preset with a variety of standard LoRaWAN frequency band options, which can adapt to different countries and regions. And it also supports user-defined frequency bands to build a private LoRa network. However, due to the design of the radio frequency filtering circuit, this device is only capable of operating within CN470 frequency band.

RG-02 can communicate with ABP LoRaWAN terminal nodes without LoRaWAN server, and the data parsing and forwarding functions are realized by the gateway itself. This lightweight deployment method is very convenient for system integrators to access existing IoT applications directly without building LoRaWAN servers or using third-party LoRaWAN services.

### 1.1. Characteristic

- Open-source OpenWrt system
- Web GUI and SSH are managed through LAN or WiFi
- Analog 49x LoRa demodulator
- 10 programmable parallel demodulator paths
- Pre-configured to support different LoRaWAN regional settings
- Allow custom region parameters
- Support different levels of logon
- Supports Semtech data packet transponders
- Support LoRaWAN base stations
- 3G/4G cellular connection



**Figure 1 RG-02 gateway architecture**

## 1.2. Specification parameter

### ■ Hardware system:

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

### ■ API:

- ✓ 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 SX1250

### ■ WiFi Specification:

- ✓ IEEE 802.11 b /g/n
- ✓ Band: 2.4~2.462GHz
- ✓ 11n transmit power: mcs7/15:11dBm mcs0:17dBm
- ✓ 11b transmit power: 18dBm
- ✓ 11g 54M transmit power: 12dBm
- ✓ 11g 6M transmit power: 18dBm
- ✓ 11g 54M sensitivity: -71dBm
- ✓ 11n 20M sensitivity: -67dBm

### ■ LoRa specifications:

- ✓ SX1250 Tx/Rx front-end sensitivity up to -142.5dBm
- ✓ Suppression of 70 dB continuous wave interference at 1 MHz offset
- ✓ Can work under the condition of negative SNR, CCR up to 9dB
- ✓ 8 x 8 channels LoRa packet detectors, 8 x SF5-SF12 LoRa demodulators, 8 x SF5-SF10 LoRa demodulators, 125/250/500 kHz LoRa demodulator and 1x (G)FSK demodulator

- ✓ Dual digital transceiver radio front-end interface
  - ✓ 10 programmable parallel demodulator paths
  - ✓ Dynamic data rate (ADR) adaptation
  - ✓ True antenna diversity or simultaneous dual-band operation
- 
- Cellular 4G LTE:
    - ✓ Quectel: EC25 LTE module
    - ✓ Standard Size SIM Slot
    - ✓ 2 x 4G Sticker Antenna.
    - ✓ Up to 150Mbps downlink and 50Mbps uplink data rates
    - ✓ Worldwide LTE,UMTS/HSPA+ and GSM/GPRS/EDGE coverage
    - ✓ MIMO technology meets demands for data rate and link reliability in modem wireless communication systems

## 2. Main parameters





**Table 1 main parameters**

<b>Model</b>	RG-02 low-frequency edition
<b>LoRa solution</b>	SX1302 +2 * SX1250
<b>Max. output power</b>	27dBm
<b>Sensitivity</b>	-142.5dBm
<b>CPU</b>	AR9331 400MHz
<b>Memory</b>	64MB DDR + 16MB FLASH
<b>Size</b>	12.0*8.5* 3.0(±0.2)cm
<b>Antenna</b>	Plastic rod antenna (LoRa) + PCB antenna(WiFi)
<b>Working Band</b>	CN470
<b>Frequency setting range</b>	470-510MHz
<b>Power supply</b>	12V @ 2A
<b>WiFi</b>	IEEE 802.11 B /g/n
<b>Ethernet network</b>	10m/100m



### 3. Indicator light and button description

**Table 5 indicator light status and key function table**

Indicator light or button	Network Status	LED status or button function	Remarks
 Heart-shaped indicator light	Not defined	Not defined	/
 System indicator light	LoRaWAN server is not connected	Lights off	/
	Connecting to LoRaWAN server	Red light flashing	
	Connected to LoRaWAN server	The red light is always on	
 Ethernet indicator light	Not connected	Lights off	/
	Connected	The red light is always on and flashing (data activity)	
 Power Indicator	No power supply	Lights off	/
	Powered	The red light is always on	
Restore factory settings	/	Reset key	Long press reset

## 4. Product Notes

RG-02 Gateway has built-in corresponding RF filters according to China CN470 frequency bands. When the gateway is configured to operate at frequencies other than this frequency band, there will be high attenuation and the communication distance will be affected.

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