



Specifications for

Indoor LoRa Gateway

WisDevice Series

RAK7258

Version 1.4 | July, 2019



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12 PAGES

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1 General Description

1.1 Product Description

RAK7258 is an indoor gateway based on low power LoRaWAN protocol. It supports PoE power supply and can connect the standard LoRaWAN terminals and carry out bidirectional communication. Gateway can connect the NS (network server) via standard Ethernet, and support network and firewall functions. RAK7258 also supports 2.4G WiFi and LTE (optional) uplink communication connections.

RAK7258 built-in OpenWRT operating system, users can flexibly configure network parameters and LoRaWAN protocol parameters through the Web management platform. RAK7258 supports MQTT Bridge function, can use the MQTT integrated to third-party platforms.

RAK7258 can connect the standard NS (network server) and the local NS. And it also supports the built-in NS (By default, a license that supports 128 terminals and 5 external gateways is embedded. If your demand exceeds the above limit, please contact the sales department for a new license). It does not need users to deploy NS in the cloud and locally. It is especially suitable for small and medium-sized scenarios in industry applications, saves the cost for server and R&D investment, and has the advantages of high execution efficiency and shorter delay. RAK7258 integrates the RAK2247 LoRa concentrator module, which supports eight uplink channels and one downlink transmission channel. For the heating problem of SX1301/8 centralized operation, RAK2247 uses the graphene, silicone grease to optimize the heat dissipation performance of chips and modules and ensure the stability of transmission.

1.2 Product Features

- LoRa supports 8RX 1TX channels
- Supports 2.4G WiFi
- 100Mbase-T Ethernet with POE
- Multi uplink backup with Ethernet, WiFi
- OpenWRT software supports LoRaWAN gateway and network configuration
- Heat sink to dissipate heat
- Can integrate with both private and public(TTN) Network Servers
- Supports TF card for storage
- Indoor operation temperature
- Supports optional for LTE Cat 4 network



Figure 1 | Network Architecture

2 Product Specifications

2.1 Main Specifications

Feature	Specifications
Computing	<ul style="list-style-type: none"> MT7628, DDR2RAM 128MB
WiFi Feature	<ul style="list-style-type: none"> Frequency: 2.400-2.4835GHz(802.11b/g/n) RX Sensitivity: -95dBm (Min), TX Power: 20dBm (Max) Operation Channels: 2.4GHz: 1-13
LoRa Feature	<ul style="list-style-type: none"> SX1301 Mini PCIe card 8 Channels RX Sensitivity: -142 dBm (Min) TX Power: 27 dBm (Max) Frequency: EU433 / CN470 / EU868 / US915 / AS923 / AU915 / IN865 / KR920
Cellular	<ul style="list-style-type: none"> Supports Quectel EG95-E / EG95-NA(IoT/M2M-optimized LTE Cat 4 Module), nonsupport by default EG95-E for EMEA Region LTE FDD: B1/B3/B7/B8/B20/B28A WCDMA: B1/B8 GSM/EDGE: B3/B8 EG95-NA for North America Region LTE FDD: B2/B4/B5/B12/B13 WCDMA: B2/B4/B5
Power Supply	<ul style="list-style-type: none"> DC 12V-1A POE (IEEE 802.3af), 42~57VDC
Power Consumption	<ul style="list-style-type: none"> 12W (typical)
ETH	<ul style="list-style-type: none"> RJ45(10/100M)
Console	<ul style="list-style-type: none"> RJ45 (RS232)
Antenna	<ul style="list-style-type: none"> LoRa: RP-SMA Female Connector WiFi: Internal Antenna



LEDs	<ul style="list-style-type: none"> LoRa LED(1), Cellular LED (2), POWER LED(1), ETH LED(1), WiFi LED(1)
Ingress Protection	<ul style="list-style-type: none"> IP30
Enclosure Material	<ul style="list-style-type: none"> Plastics
Weight	<ul style="list-style-type: none"> 0.3kg
Dimension	<ul style="list-style-type: none"> 180mm x 120mm x 43mm
Operating Temp.	<ul style="list-style-type: none"> -10 to 55 °C
Installation method	<ul style="list-style-type: none"> Wall mounting

Table 1 | Main Specifications

2.2 RF Specifications

2.2.1 WiFi Radio Specifications

Feature	Specifications
Wireless Standard	<ul style="list-style-type: none"> IEEE 802.11b/g/n
Operating Frequency	<ul style="list-style-type: none"> ISM band: 2.412~2.472(GHz)
Operation Channels	<ul style="list-style-type: none"> 2.4GHz: 1-13
Transmit Power (The max. power may be different depending on local regulations) -per chain	<ul style="list-style-type: none"> 802.11b <ul style="list-style-type: none"> 19dBm@ 1Mbps 19dBm@ 11Mbps 802.11g <ul style="list-style-type: none"> 18dBm@ 6Mbps 16dBm@ 54Mbps 802.11n(2.4G) <ul style="list-style-type: none"> 18dBm@MCS0 (HT20) 16dBm@MCS7 (HT20) 17dBm@MCS0 (HT40) 15dBm@MCS7 (HT40)
Receiver Sensitivity (Typical)	<ul style="list-style-type: none"> 802.11b <ul style="list-style-type: none"> -95dBm@ 1Mbps -88dBm @11Mbps 802.11g <ul style="list-style-type: none"> -90dBm @6 Mbps -75dBm@54Mbps 802.11n(2.4G)

-89dBm@MCS0 (HT20)
-72dBm @MCS7(HT20)
-86dBm @MCS0(HT40)
-68dBm @MCS7(HT40)

Table 2 | WiFi Radio Specifications

2.2.2 LoRa Radio Specifications

Feature	Specifications
Operating Frequency	• EU433 / CN470 / EU868 / US915 / AS923 / AU915 / IN865 / KR920
Transmit Power	• 27 dBm (Max)
Receiver Sensitivity	• -142 dBm (Min)

Table 3 | LoRa Radio Specifications

2.3 Software Specifications

2.2.3 LoRa

- Supports class A, C
- Supports LoRa package forward
- Supports country code setup
- Supports TX power setup
- Supports data logger
- Supports statistic
- Supports location setup
- Supports server address & port setup

2.2.4 Network

- Supports WiFi AP mode
- Supports LTE APN setup
- Supports uplink backup
- Supports 802.1q
- Supports DHCP Server/Client
- Supports router module NAT
- Supports firewall

2.2.5 Management

- Supports WEB management
- Supports SSH2
- Supports firmware update
- Supports NTP

- Supports configure the LoRa Packet Forwarder
- Supports Build-in LoRa Server
- Supports OpenVPN, Ping Watch Dog
- Supports MQTT Bridge

2.4 Block Diagram

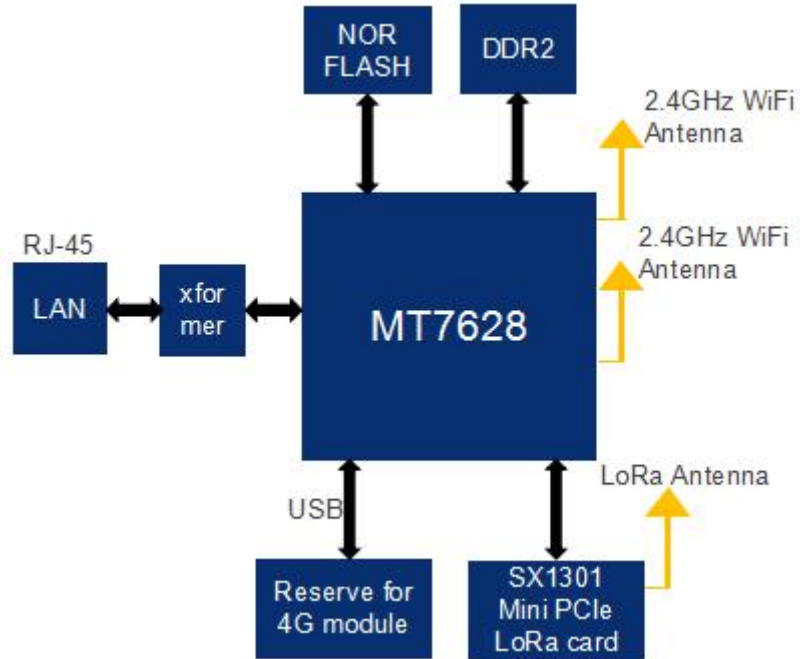


Figure 2 | Block Diagram

2.5 Main Electronic Circuit Board

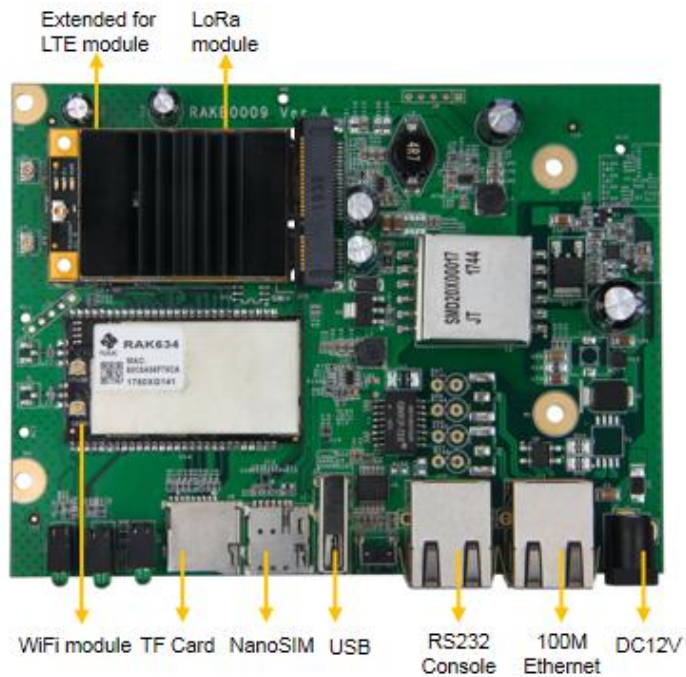


Figure 3 | Circuit Board

2.6 Hardware Interfaces

The hardware interfaces of RAK7258 gateway include DC 12V, ETH interface, Console interface, Reset key, USB port, Nano SIM slot, TF Card slot, Status indicator LEDs(6), LoRa Antenna connector etc. As shown in the following figure.

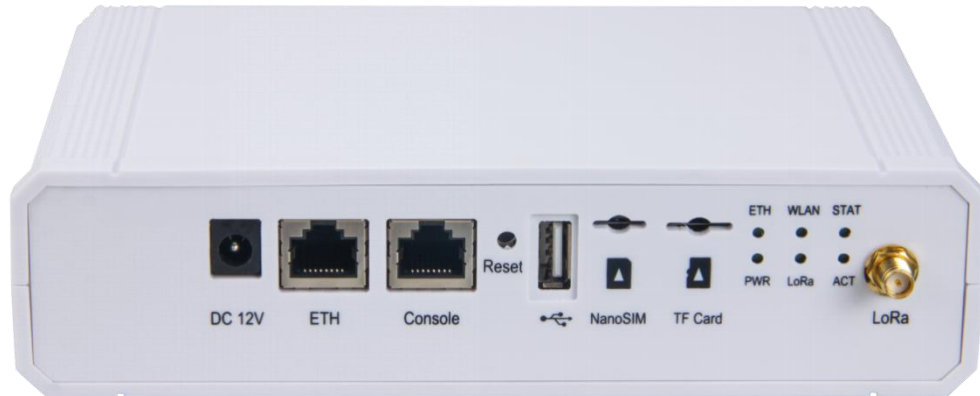


Figure 4 | Hardware Interfaces

The function of the Reset key is as follows:

Short press: Restart the Gateway;

Long press (5s and above): Restore Factory Settings;

The status of the LEDs is described as below:

LEDs	Status Indication Description
PWR	<ul style="list-style-type: none"> Power Indicator, Led on when device power on
ETH	<ul style="list-style-type: none"> ON - linkup OFF - linkdown Flash - Data Transmitting and Receiving
LoRa	<ul style="list-style-type: none"> ON - LoRa1 is working OFF - LoRa1 is not working Flash - Indicate that LoRa1 Packet receiving and sending
ACT	<ul style="list-style-type: none"> Expanded Led indicator, useless
STAT	<ul style="list-style-type: none"> Expanded Led indicator, useless



WLAN	<ul style="list-style-type: none">• AP Mode : ON - WLAN is working; Flash - Data Transmitting and Receiving• STA Mode : Slow Flash(1Hz) - Connection Disconnected; ON - Connection Successful;• Flash - Data Receiving and Sending;
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Table 4 | LEDs Status Description

3 **Configure the Gateway**

You can login to the WEB Management page to overview the status of your gateway and configure your gateway.

For more information about the WEB Management platform and the configuration guide of the gateway, please refer to this document:

[RAK_LoRaWAN_Industrial_Gateway_Configuration_Guide](#)

4 **Contact Information**

Please contact us if you need technical support or want to know more information.

Support center: <https://forum.rakwireless.com/>

Email us: info@rakwireless.com

5 Revision History

Revision	Description	Date
1.0	Initial Release	2018-12-20
1.1	Update the right context, photos	2019-01-10
1.2	Modify the WEB configuration guide chapter	2019-03-11
1.3	Add the LEDs Status Indication Description	2019-03-13
1.4	Modify the title	2019-07-10

6 Document Summary

Prepared by	Checked by	Approved by
Penn	Terry	



About RAKwireless:

RAKwireless is the pioneer in providing innovative and diverse cellular and LoRa connectivity solutions for IoT edge devices. It's easy and modular design can be used in different IoT applications and accelerate time-to-market.

For more information, please visit RAKwireless website at www.rakwireless.com.