RAK7249 WisGate Edge Max Datasheet

Overview

Description

RAK7249 WisGate Edge Max is an ideal product for IoT commercial deployment. Its modularity and customization options allow for flexibility when deploying a solution. With its industrial-grade components, it achieves a high standard of reliability.

The gateway provides for a solid out of the box experience for quick deployment. Additionally, since its software and UI sits on top of OpenWRT it is perfect for the development of custom applications (via the open SDK).

Thus the RAK7249 is suited for any use case scenario, be it rapid deployment or customization with regards to UI and functionality.

Features

Hardware

1. **IP67/NEMA-6** industrial grade enclosure with cable glands
2. **PoE (802.3 af)** + Surge Protection
3. Dual LoRa Concentrators for up to **16 channels**
4. **Backhaul:** Wi-Fi, LTE and Ethernet
5. **GPS**
6. Up to **5 hours of autonomous work** on battery (Battery + Solar Kit optional)

Software

1. Built-in LoRa Server
2. OpenVPN
3. Software and UI sit on top of **OpenWRT**
4. LoRaWAN 1.0.3
5. **LoRa Frame filtering** (node whitelisting)
6. **MQTT v3.1** Bridging with **TLS** encryption
7. **Buffering of LoRa frames** in case of NS outage (no data loss)

Specifications

Overview

The overview presents the circuit board of RAK7249 WisGate Edge Max and its block diagram that shows the board works with MT7628 chip as the core. It also lists the components and accessories of the RAK7249 WisGate Edge Max.
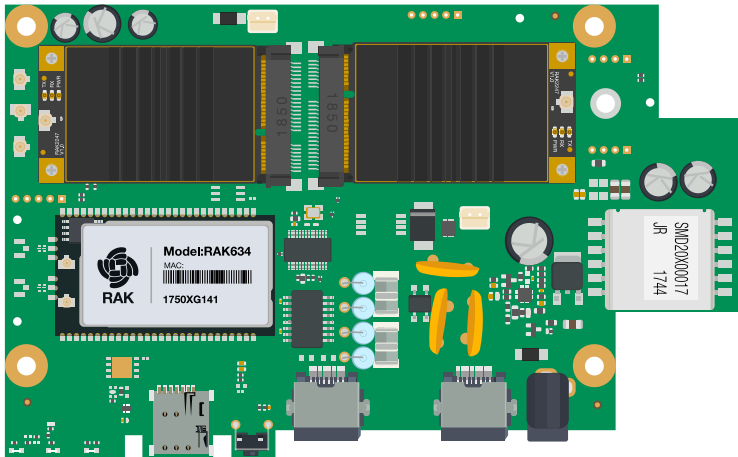
Circuit Board

Figure 1: Circuit Board Interface

Components and Accessories

Create your own RAK7249 WisGate Edge Max using the supplied building blocks:

- Main Board
- Enclosure
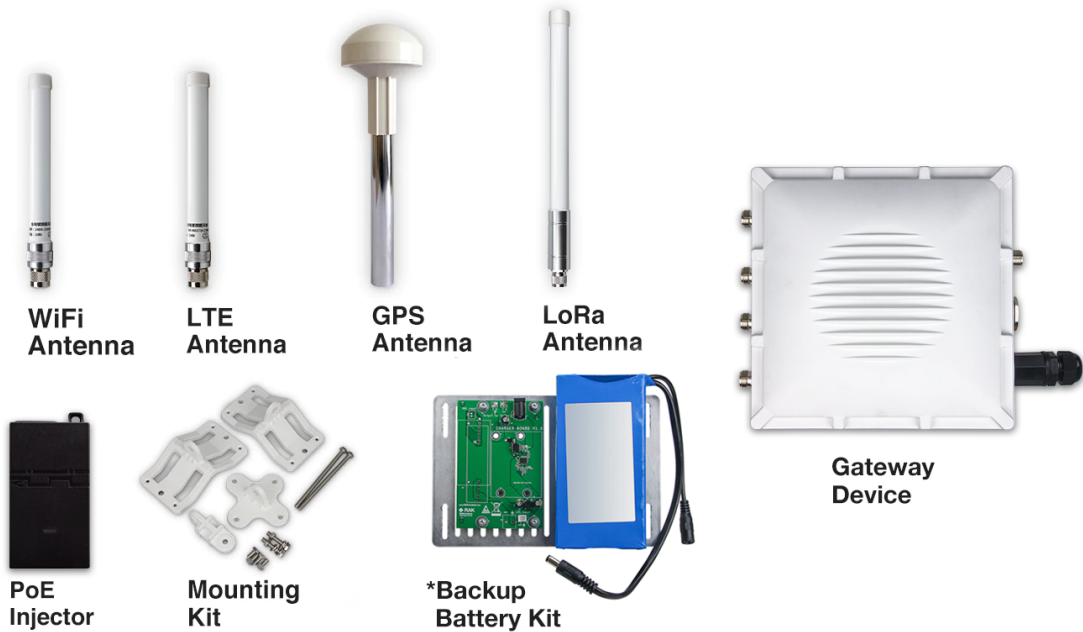- Backup Battery
- Accessories

Figure 2: DIY Enterprise Gateway Components and Accessories

> 📝 **NOTE**
>
> Actual Devices for RAK7249 WisGate Edge Max and accessories may differ from the image presented.
> For any discrepancies, please adhere to the actual product instead.

Main Board

- **CPU:** RAK634 Module (MT7628 inside)
- **RAM**:128MB DDR2
- **Flash**:16MB
- **WiFi**: 2x2 MIMO 802.11b/g/n
- **LoRa Concentrator:** up to 2 LoRa Concentrator modules for up to 16 LoRa channels
- **Tx Power**: up to 27dBm

- **Rx sensitivity**: down to -139dBm.
- **4G Cellular**: Quectel EG95 for CAT4 cellular network
- **GPS**: L70 GPS Module
- **Power-over-Ethernet (PoE)**: 100M base-T Ethernet with IEEE802.3af/at standard Power-over-Ethernet

Enclosure

- IP67 waterproof white color
- **Interface**: 5 x N-Type connectors for Antenna,1 PoE port and 1 reserve port.
- **Weight (with cable)**: approximately 70.54oz (2kg)
- **Dimensions**: 220mm x 220mm x 104mm
- **Wall thickness**: 2mm.
- **Support**: up to 70~100 mm diameter pole mount

Backup Battery

- The maximum space in the Enclosure can be placed 12V/10AH batteries for about 10 hours lifetime under typical operation
- Battery powered real time clock
- Battery Within 140 mm x 70 mm x 30 mm
- DC 5.5 x 2.1 circular joint with two interfaces, one male and one female

Accessories

- Mounting Kit
- PoE Injector
- WiFI Antenna
- GPS Antenna
- LoRa Antenna
- LTE Antenna

Block Diagram

The image below shows the block diagram for RAK7249 WisGate Edge Max with MT7628 chip as the core.
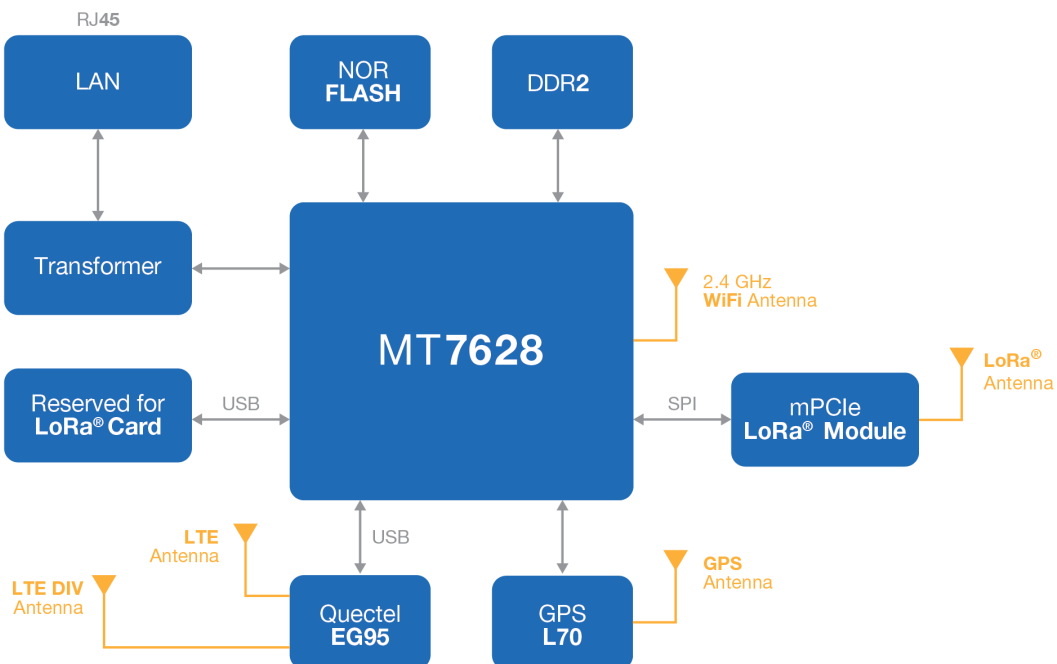
Figure 3: RAK7249 Block Diagram

Hardware

The hardware specification presents the interfacing of RAK7249 WisGate Edge Max both in hardware and board interfaces.

Interfaces

Hardware Interface

The images below shows the hardware interfaces at the front and rear of RAK7249 WisGate Edge Max.

Figure 4: Hardware Interfaces - Front

Figure 5: Hardware Interfaces - Rear
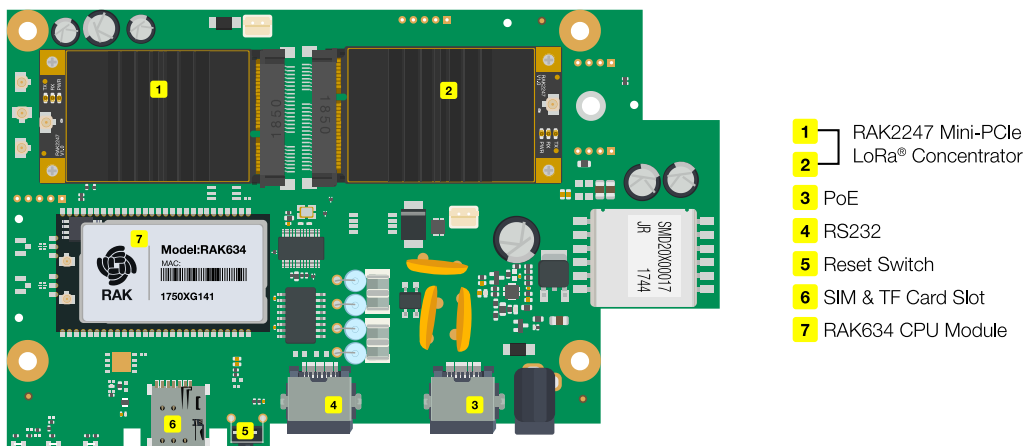
Board Interface

Figure 6: Circuit Board Interface

Reset Key Functions

The RAK7249 WisGate Edge Max's mainboard provides a Reset key and 6 x LEDs for status indication. The function of the Reset key is as follows:

- **Short press**: Restarts the Gateway
- **Long press (5s and above)**: Restore Factory Settings;

LED Indicators

The status of the LEDs is described as below. Please refer to the printing of the LEDs on the mainboard.

LEDs	Status Indication Description
LED1 (PWR)	Power Indicator, Led ON when device power on
LED2 (ETH)	• **ON** - linkup • **OFF** - linkdown • **Flash** - Data Transmitting and Receiving
LED3 (LoRa1)	• **ON** - LoRa1 is working • **OFF** - LoRa1 is not working • **Flash** - Indicate that LoRa1 Packet receiving and sending
LED4 (LTE)	• Slow Flash 1 (200ms Bright/1800ms Dark) • Unregistered network (in search) • Slow Flash 2 (200ms Dark/1800ms Bright) • Idle status (online) • Flash - Data Transmitting and Receiving • ON - Voice is working
LED5 (LoRa2 for 16 channel)	• **ON** - LoRa2 is working • **OFF** - LoRa2 is not working • **Flash** - Indicate that LoRa2 Packet receiving and sending
LED6 (WLAN)	**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

Main Specifications

Feature	Specifications
Computing	MT7628, DDR2RAM 128MB
Wi-Fi Feature	• **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	• **Card**: SX1301 Mini PCIe Card (connects maximum of two) • **Channels**: 8 Channels (Optional: 16 channels) • **RX Sensitivity**: -139dBm (Min) • **TX Power**: 27dBm (Max) • **Frequency**: EU433, CN470, EU868, US915 , AS923, AU915, KR920, IN865
Cellular Feature	• Supports Quectel EG95-E / EG95-NA(IoT/M2M-optimized LTE Cat 4 Module) • 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	PoE(IEEE 802.3af/at-Compliant) - 42~57VDC; Power Jack - 12V DC
Power Consumption	12W (Typical)
ETH	RJ45 (10/100Mbps)
Antenna	5 N-Type Connectors
Ingress Protection	IP67
Enclosure Material	Aluminum
Weight	Approximately 111.11oz (3.15kg)
Dimension	220mm x 220mm x 104mm
Operating Temperature	-30˚C to +55 ˚C
Storage Temperature	-40˚C to +85 ˚C
Operating Humidity	0% to 95% (non-condensing)
Storage Humidity	0% to 95% (non-condensing)
Installation method	Pole or Wall mounting

RF Specifications

LoRa

Feature	Specifications
Operating Frequency	• EU433, CN470, EU868, US915 • AS923, AU915, KR920, IN865
Transmit Power	27dBm (Max)
Receiver Sensitivity	-139dBm (Min)

Wi-Fi

Features	Specifications
Wireless Standard	IEEE 802.11b/g/n
Operating Frequency	**ISM band**: 2.412~2.472(GHz)
Operation Channels	2.4GHz: 1-13
Transmit Power (The max. power may be different depending on local regulations) -per chain	**802.11b** • 1Mbps : 19dBm • 11Mbps : 19dBm **802.11g** • 6Mbps : 18dBm • 54Mbps : 16dBm **802.11n (2.4G)** • MCS0 (HT20) : 18dBm • MCS7 (HT20) : 16dBm • MCS0 (HT40) : 17dBm • MCS7 (HT40) :15dBm
Receiver Sensitivity (Typical)	**802.11b** • 1Mbps : -95dBm • 11Mbps : -88dBm **802.11g** • 6Mbps : -90dBm • 54Mbps : -75dBm **802.11n (2.4G)** • MCS0 (HT20) : -89dBm • MCS7(HT20) : -72dBm • MCS0(HT40) : -86dBm • MCS7(HT40) : -68dBm

Firmware

RAK7249 supports software in LoRa, Network and Management. Supported features are shown in the table below.

Model	Firmware Version	Source
RAK7249 WisGate Edge Max	WisGateOS V1.3.9	Download⧉

Software

Supported Software

LoRa	Network	Management
Supports class A, C	WiFi AP mode	WEB Management
LoRa package forward	LTE APN setup	Supports SSH2 , NTP
Country code setup	Uplink backup	Firmware update
TX power up setup	Supports 802.1q	Supports configure the LoRa Packet Forwarder
Datalogger	DHCP Server/Client	Supports Build-in LoRa Server
Statistic	Router module NAT	Supports OpenVPN, Ping Watch Dog
Location setup	Firewall	Supports MQTT Bridge
Server address and port setup		

Models / Bundles

The table below shows the main board configurations of the Macro outdoor.

Part Number	8 Channel SX1301	16 Channel SX1301	Cat4 Cellular	GPS	WiFi	Battery Backup
RAK7249-0x-14x	√		√	√	√	
RAK7249-1x-14x		√	√	√	√	
RAK7249-2x-14x	√		√	√	√	√
RAK7249-3x-14x		√	√	√	√	√
RAK7249-0x	√			√	√	
RAK7249-1x		√		√	√	
RAK7249-2x	√			√	√	√
RAK7249-3x		√		√	√	√

Certification

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