

# RAK7289V2/RAK7289CV2 WisGate Edge Pro Datasheet

## Overview

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### Descriptions

RAK7289 V2 WisGate Edge Pro is the latest edition of the RAK Edge Series. It is an ideal product for IoT commercial deployment. With its industrial-grade components, it achieves a high standard of reliability. The new RAK7289 V2 supports up to 16 LoRa channels, multi-backhaul with Ethernet, Wi-Fi, and Cellular connectivity. Optionally, there is a dedicated port for different power options, solar panels, and batteries. Its new enclosure is designed to allow the LTE, Wi-Fi, and GPS antennas to be inside the enclosure.

The RAK7289 V2 supports WisGateOS 2, which is based on the latest OpenWRT kernel and accommodates the latest security updates like IPv6, OpenSSL 1.1 support, multiple accounts access, and more. The web UI has a fresh new look, with more user-friendly information tooltips.

Simply said, the RAK7289 is suited for any use case scenario, be it rapid deployment or customization with regard to UI and functionality.

### Product Features

#### Hardware

- IP67/NEMA-6 industrial-grade enclosure with cable glands
- PoE (802.3af) + Surge Protection
- Dual LoRa Concentrators for up to 16 channels
- Backhaul: Wi-Fi, Ethernet, LTE (optional, available with RAK7289C)
- GPS
- Supports DC 12 V or solar power supply with electricity monitoring (Solar Kit optional)
- Internal antenna for Wi-Fi, GPS, and LTE, external antenna for LoRa
- Dying-gasp (optional)

#### Software

- Built-in Network Server (full LoRaWAN support V 1.0.3)
- OpenVPN
- Software and UI sit on top of OpenWRT
- Full LoRaWAN Stack support with Semtech SX1303
- LoRa Frame filtering (node whitelisting)
- MQTT v3.1 bridging with TLS encryption
- Buffering of LoRa frames in Packet Forwarder mode in case of NS outage (no data loss)
- Full-duplex (optional)
- Listen Before Talk (optional)
- Fine timestamping (optional)

### Specifications

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#### Overview

The overview presents the block diagram for the RAK7289 V2 that shows the internal architecture of the board.

# Block Diagram

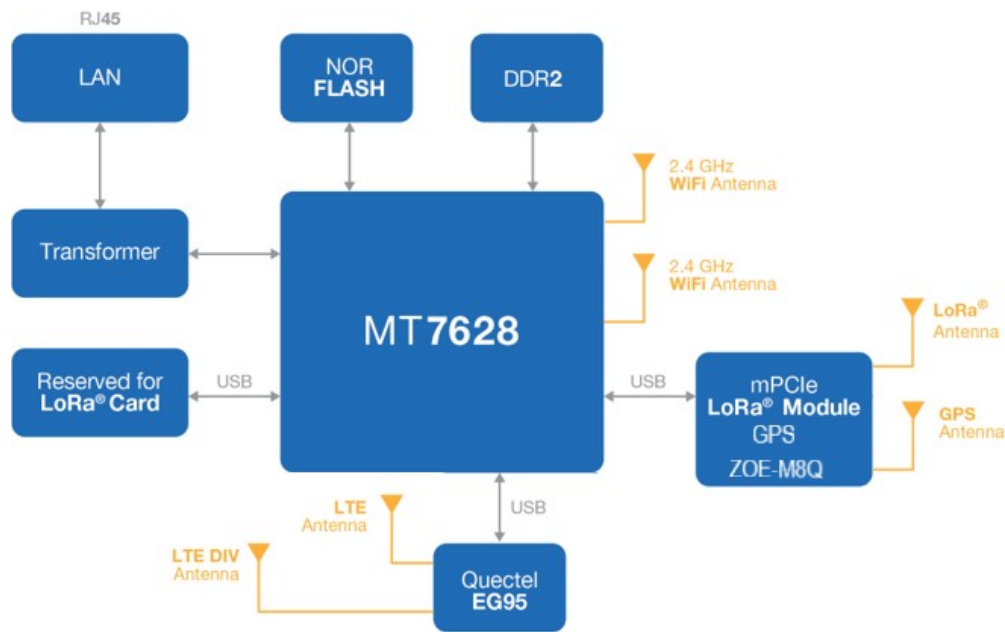


Figure 1: RAK7289 V2 WisGate Edge Pro V2 with LTE block diagram

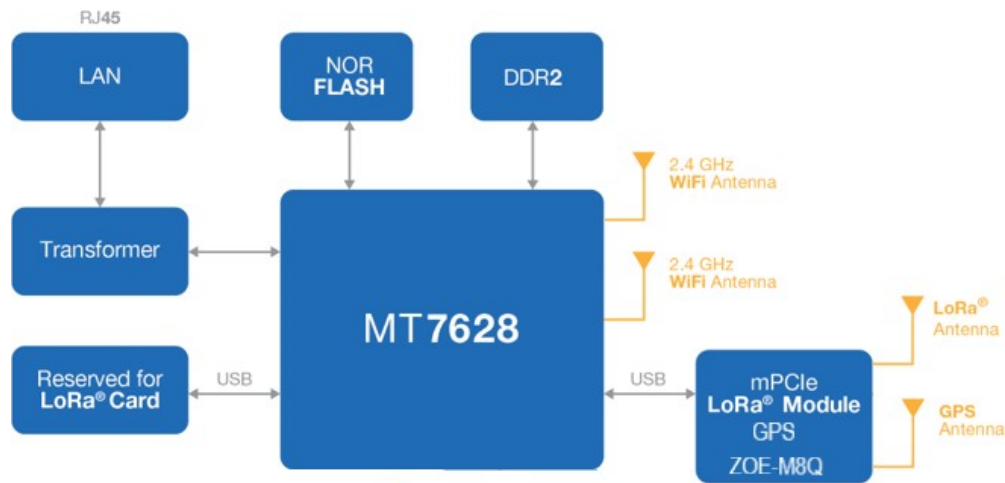


Figure 2: RAK7289 V2 WisGate Edge Pro V2 without LTE block diagram

## Main Specifications

Feature	Specifications
Computing	MT7628, DDR2 RAM 128 MB
Wi-Fi feature	Frequency: 2.4 GHz (802.11b/g/n)
	2x2 MIMO
	RX Sensitivity: -95 dBm (Min)
	TX Power: 20 dBm (Max)
LoRa feature	Operation channels: 2.4 GHz: 1-13
	SX1303 mPCle card (connects maximum of two)
	8 Channels (16 channels optional)

Feature	Specifications
	RX Sensitivity: -139 dBm (Min)
	TX Power: 17 dBm (Max)
	Listen Before Talk
Frequency	EU433/CN470/EU868/US915/AS923/AS923-1/AS923-2/AS923-3/AS923-4/AU915/IN865/KR920
Cellular Feature (available with RAK7289C V2)	Supports Quectel EG95-E/EG95-NA (IoT/M2M -optimized LTE Cat 4 Module)
	EG95-E for EMEA Region (Europe, Middle East and Africa)
	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) - 37~57 VDC
ETH	RJ45 (10/100 M)
Antenna	LoRa: 1 or 2 N-Type connectors
	LTE: Internal antenna
	Wi-Fi: Internal antenna
Ingress protection	IP67
Enclosure material	Aluminium and plastic
Operating temperature	-30 °C to +55 °C
Installation Method	Pole or wall mounting

## Hardware

The hardware specification covers the interfacing of the RAK7289 V2 and its corresponding functionalities. It also presents the parameters and the standard values of the gateway.

RF Specifications

Wi-Fi Radio Specifications

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

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

## LoRa Radio Specifications

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

## Interfaces



Figure 3: RAK7289 WisGate Edge Pro interfaces


- The function of the Reset key is as follows:
  - **Short press:** Restart the gateway.
  - **Long press** (5s and above): Restore factory settings.
- LEDs status description:


LEDs	Status Indication Description
LED 1 (PWR)	Power indicator - The LED is on when device power is on
LED 2 (ETH)	ON - Linkup
	OFF - Linkdown
	Flicker - Data transmitting and receiving
LED 3 (LoRa 1)	ON - LoRa 1 is working
	OFF - LoRa 1 is not working
	Flicker - Indicate LoRa 1 Packet receiving and sending
LED 4 (WLAN)	AP Mode:
	-ON - The AP is up
	-Flicker - Data receiving and sending
	STA Mode:
	-Slow flicker (1 Hz) - Disconnected
	-ON - Connected
LED 5 (LTE)	-Flicker - Data receiving and sending
	Slow Flicker (1800 ms High / 200 ms Low) - Network searching
	Slow flicker (200 ms High / 1800 ms Low) - Idle
	Fast flicker (125 ms High / 125 ms Low) - Ongoing data transfer
LED 6 (LoRa 2 for 16 channel)	ON - Voice is working
	ON - LoRa 2 is working
	OFF - LoRa 2 is not working
	Flicker - Indicate LoRa 2 Packet receiving and sending

## Software

## Firmware

The firmware sits on OpenWRT. There is a Web UI for easy configuration and management of the device, as well as the possibility for SSH2 management. The WisGateOS V2 supports the feature to install extensions

(WireGuard, Custom Logo, Breathing Light, and more to come). TThe extensions are available in [RAK download center](#) .

Model	Firmware Version	Source
RAK7289V2/RAK7289CV2 WisGate Edge Pro	WisGateOS 2	<a href="#">Download</a> 

## Software Features

LoRa	Network	Management
Gateway OTA management		WisDM
LoRa package forward (packet forwarder, Basics Station)	Wi-Fi Client mode	SSH2, NTP
Frequency Band Setup	LTE APN Setup	Firmware update
Country code setup	802.1q	Firmware update
TX Power Setup	Uplink backup	LoRa Packet Forwarder
Data logger	Support 802.1q	Built-in Network Server
Location setup	Firewall	MQTT Bridge
Statistic	DHCP Server/Client	OpenVPN, Ping Watch Dog
Supports class A, B, C	Wi-Fi AP mode	WEB UI
Server address and Port setup		

## Models/Bundles

Part Number	8 Channel SX1303	16 Channel SX1303	Cat4 Cellular	GPS	Wi-Fi	Dying gasp
RAK7289-XYZ	√		√	√	√	
RAK7289-XYZ		√	√	√	√	
RAK7289-XYZ	√		√	√	√	√
RAK7289-XYZ		√	√	√	√	√
RAK7289-XYZ	√			√	√	
RAK7289-XYZ		√		√	√	
RAK7289-XYZ	√			√	√	√
RAK7289-XYZ		√		√	√	√

## Certification

