



Table of Contents

- RAK7289V2/RAK7289CV2 WisGate Edge Pro V2 Datasheet
 - Overview
 - Description
 - Features
 - Specifications
 - Overview
 - Hardware
 - Software
 - Firmware
 - Models/Bundles
 - Certification

RAK7289V2/RAK7289CV2 WisGate Edge Pro V2 Datasheet

Overview

Description

The RAK7289V2 WisGate Edge Pro is the flagship product of the RAK Edge Series. Featuring industrial-grade components, it ensures a high level of reliability.

It supports up to 16 LoRa channels and offers multi-backhaul options with Ethernet, Wi-Fi, and cellular connectivity. Additionally, it provides a dedicated port for various power options, including solar panels and batteries. Its redesigned enclosure accommodates LTE, Wi-Fi, and GPS antennas internally for enhanced aesthetics and functionality.

In addition, RAK7289V2 operates under [WisGateOS 2](#) [↗], which is built on the latest OpenWrt kernel. The OS Web UI features a new design and supports multiple extension installations, enabling remote management using [WisDM](#) [↗] for personalized gateway customization.



WARNING

This product is intended to be powered by 12 V_{DC} through a designated power port. The use of solar chargers is not recommended, as they may supply overvoltage, potentially damaging the device. We strongly discourage the use of such chargers with this product, and any damage incurred as a result will void the warranty.

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 RAK7289CV2)
- GPS
- Supports 12 V_{DC} or solar power supply with electricity monitoring (Solar Kit optional)
- Internal antennas for Wi-Fi, GPS, and LTE
- External antenna for LoRa
- Dying-gasp (optional)

Software

- [WisGateOS 2](#)
- **WisGateOS 2 Extensions:** Adds support for features such as OpenVPN, WireGuard VPN, and more. Use the appropriate installation guide based on your WisGateOS 2 version:
 - [For WisGateOS 2 version 2.2.x or later](#)
 - [For WisGateOS 2 versions 2.0.x and 2.1.x](#)
- Remote management with [WisDM](#) Fleet Management
- Built-in Network Server (full LoRaWAN support v1.0.3)
- Full LoRaWAN Stack support with Semtech SX1303
- LoRa Frame filtering (node whitelisting in Packet Forwarder mode)
- MQTT v3.1 bridging with TLS encryption
- Fine timestamping (optional)
- Buffering of LoRa frames in Packet Forwarder mode in case of NS outage (no data loss)
- Listen Before Talk (optional)

Specifications

Overview

The overview presents the block diagram for the RAK7289V2/RAK7289CV2 that shows the internal architecture of the hardware.

Block Diagram

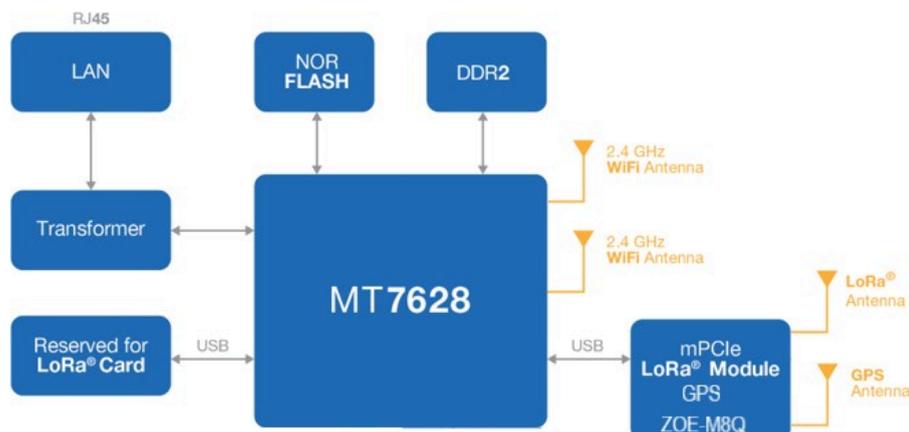


Figure 1: RAK7289V2 Block Diagram

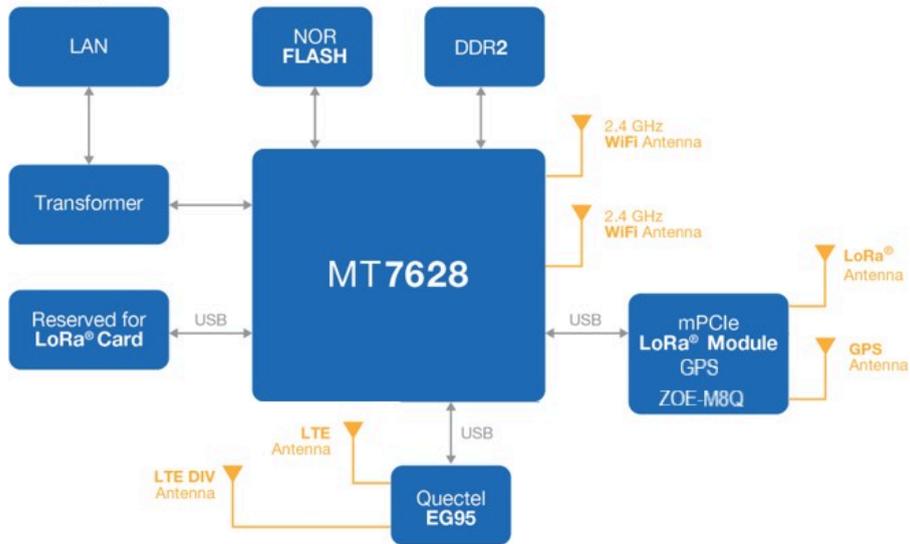


Figure 2: RAK7289CV2 Block Diagram



Main Specifications

Feature	Specifications
Computing	MT7628, 128 MB DDR2 RAM
LoRa Features	SX1303 mPCIe card (connects maximum of two)
	8 Channels (16 channels optional)
	Frequency: EU868 / IN865 / US915 / AU915 / KR920 / AS923-1/2/3/4 / EU433 / CN470
	Listen Before Talk
	LoRa Radio: Refer to the LoRa Radio Specifications  section for detailed information.
Wi-Fi Features	Frequency: 2.4 GHz (802.11b / g / n)
	Operation Channels: 1-13 (2.4 GHz)
	2×2 MIMO
	Wi-Fi Radio: Refer to the Wi-Fi Radio Specifications  section for detailed information.
Cellular Features (available with RAK7289CV2)	Nano SIM Card: 12 × 9 × 0.67 mm Supports Quectel EG95-E / EG95-NA / EC25-J / EC25-AU(IoT / M2M -optimized LTE Cat 4 Module)
	LTE Radio: Refer to the LTE Radio Specifications  section for detailed information.
Power Supply	PoE (IEEE 802.3af) - 37~57 V _{DC} 12 V _{DC} Compatible with RAK Battery Plus



Feature	Specifications
Antenna	LoRa: N-Type connector (one for the 8-channel gateway and two for the 16-channel gateway)
	Wi-Fi / GPS / LTE: Internal antenna
Ingress protection	IP67
Enclosure material	Aluminium and plastic
Dimensions	240 mm x 240 mm x 89.5 mm
Weight	4.6 kg gateway only
Operating Conditions	Operating temperature: - 40° C to + 70° C
	Storage Temperature: - 40° C to + 85° C
	Operating humidity: 0% to 95% (non-condensing)
	Storage Humidity: 0% to 95% (non-condensing)
	For environmental reliability test details: WisGate Edge Pro RAK7289V2/CV2 Environmental Reliability Test. 
Installation Method	Pole or wall mounting

Hardware

The hardware specification details the interfacing of the RAK7289V2/RAK7289CV2 and its corresponding functionalities. It also outlines the parameters and standard values of the gateway.

Interfaces



Figure 3: RAK7289V2/RAK7289CV2 Interfaces



Interface Description

Interface	Description	Function
LoRa1 / LoRa2	LoRa Antenna Connectors	N-Type connectors for external LoRa antennas. Required for LoRaWAN data transmission and reception.
ETH (PoE)	Ethernet Port (RJ45, 10/100 Mbps)	Provides network backhaul via Ethernet. PoE (Power over Ethernet) allows the gateway to receive both power and data through a single Ethernet cable.
Additional Power Input	Power Input	Accepts 12 V DC input . It is fully compatible with the RAK Battery Plus .
Reserved	Sealed Port (no function by default)	Reserved for future use.
Console	USB Type-C Port	Used for serial console access during debugging and firmware flashing.
Reset	Reset Key	- Short press : Reboot the device. - Long press (≥5 sec) : Factory reset.
NanoSIM	NanoSIM Slot	Used for LTE connectivity. Required when using cellular backhaul. Included in all versions, even if LTE is not supported.
TF Card	MicroSD (TF) Card Slot	Includes a 16 GB pre-installed SD card used for log storage and configuration. Do not remove during operation to avoid data loss.



Interface	Description	Function
LED Indicators	Status LEDs	<ul style="list-style-type: none">- Power (PWR)- Ethernet (ETH)- LoRa1 & LoRa2- WLAN- LTE (<i>for LTE version</i>)



LED Indicators Details

LEDs	Status Indication Description
LED 1 (PWR)	Power indicator: The LED is on when device power is on
LED 2 (ETH)	ON: Link is up
	OFF: Link is down
	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: <ul style="list-style-type: none">• ON: The AP is up• Flicker: Data receiving and sending
	STA Mode: <ul style="list-style-type: none">• Slow flicker (1 Hz): Disconnected• ON: Connected• Flicker: Data receiving and sending
LED 5 (LTE)	Slow Flicker (1800 ms bright / 200 ms dark): Network searching
	Slow flicker (200 ms bright / 1800 ms dark): Idle



LEDs	Status Indication Description
LED 6 (LoRa 2 for 16 channel)	ON: LoRa 2 is working
	OFF: LoRa 2 is not working
	Flicker: Indicate LoRa 2 Packet receiving and sending

RF Specifications

LoRa Radio Specifications

Feature	Specifications
Operating Frequency	EU868 / IN865 / US915 / AU915 / KR920 / AS923-1/2/3/4 / EU433 / CN470
Transmit Power	27 dBm (Max)
Receiver Sensitivity	-141 dBm (Min)@SF12



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 GHz)
	18 dBm @MCS0 (HT20)
	16 dBm @MCS7 (HT20)
17 dBm @MCS0 (HT40)	
15 dBm @MCS7 (HT40)	



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



LTE Radio Specifications (Optional, Available with RAK7289CV2)

Feature	Specifications
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
EC25-J for Japan Region	LTE FDD: B1 / B3 / B8 / B18 / B19 / B26
	LTE TDD: B41
	WCDMA: B1 / B6 / B8 / B19
EC25-AU for Brazil Region	LTE-FDD: B1 / B2 / B3 / B4 / B5 / B7 / B8 / B28
	LTE-TDD: B40
	WCDMA: B1 / B2 / B5 / B8
	GSM/EDGE: B2 / B3 / B5 / B8

Power Supply Options

The RAK7289V2/RAK7289CV2 supports the following power supply methods:



- **PoE (Power over Ethernet):** Via included PoE injector, supports IEEE 802.3af standard (input: 37–57 V DC).
- **12 V DC Input:** Through the waterproof power connector, accepts 12 V regulated DC from an external power supply.

WARNING

Only use regulated 12 V DC power sources. Do not use solar chargers or non-certified adapters, as improper voltage may damage the device and void the warranty.

- [RAK9155 Battery Plus](#)  **(Optional):** Provides regulated 12 V DC output and is designed for off-grid or solar-powered deployments. Purchased separately.

NOTE

Only **one** power input should be used at a time.

Software

The RAK7289V2/RAK7289V2 gateway runs on WisGateOS 2, a robust software platform designed for efficient network management and integration. Below are the key software features and capabilities:

For more detailed information on software configurations and usage, refer to the [WisGateOS 2 User Guide](#)  .



Category	Feature	Description
LoRaWAN and Network Management	LoRaWAN Packet Forwarding	Supports Packet Forwarder and Basic Station configurations
	Built-in Server	Local LoRaWAN Network Server (LNS) integrated into the gateway for network management
	Frequency Band Setup	Configurable with different LoRaWAN frequency bands based on deployment region
	TX Power Setup	Adjustable transmit power for optimal network performance
	Automatic Data Recovery	Ensures reliable data transmission even during network disruptions
	Server Address and Port Setup	Custom configuration for LoRaWAN Network Server communication
	Supports LoRaWAN Classes A, B, and C	Fully compatible with LoRaWAN devices operating in Class A, B, and C
	Uplink Backup	Enables automatic switchover to a backup uplink (e.g., LTE or Wi-Fi) when the primary uplink fails. Requires Multi-WAN configuration.
	Location Setup	Manual or automatic setup of gateway location (e.g., GPS coordinates)
Connectivity and Network Services	Wi-Fi Client/AP Mode	Connect to existing network or act as an access point



Category	Feature	Description
	DHCP Server/Client	Dynamic IP address allocation for both server and client roles
	NAT and Router Module	Enables router functionality with Network Address Translation
	WireGuard / OpenVPN	Secure communication tunnel for remote access and management
	LTE APN Setup	Configures Access Point Name for LTE connectivity
Monitoring and Security	Statistics and Data Logger	Tracks performance metrics and logs operational data
	Firewall	Provides basic firewall functions for traffic control and security
	SSH2	Secure Shell access for remote troubleshooting and management
	Ping Watchdog	Monitors connectivity and triggers recovery if the connection fails
User Interface and Management	Web UI	Web-based interface for configuration and monitoring
	WisDM	Cloud platform for remote management and monitoring
	Gateway OTA management	Over-the-air firmware management for seamless updates
	MQTT Bridge	Integration with IoT platforms using MQTT protocol



Category	Feature	Description
	Firmware Updates	Over-the-air updates for easy firmware upgrades
	NTP	Synchronizes the gateway system time for accurate timestamp recording

Firmware

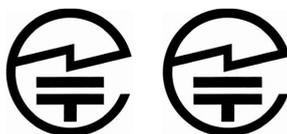
Model	Source
RAK7289V2/RAK7289CV2 WisGate Edge Pro	Download



Models/Bundles

Part Number	8 Channel SX1303	16 Channel SX1303	Cat4 Cellular	GPS	Wi- Fi	Dying gasp
RAK7289CV2- XYZ	✓		✓	✓	✓	
RAK7289CV2- XYZ		✓	✓	✓	✓	
RAK7289CV2- XYZ	✓		✓	✓	✓	✓
RAK7289CV2- XYZ		✓	✓	✓	✓	✓
RAK7289V2- XYZ	✓			✓	✓	
RAK7289V2- XYZ		✓		✓	✓	
RAK7289V2- XYZ	✓			✓	✓	✓
RAK7289V2- XYZ		✓		✓	✓	✓

Certification





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