User manual for

WisGate (RAK7268)
WisGate (RAK7268C)
WisGate (RAK7268 V2)
WisGate (RAK7268C V2)

WisGate Series RAK7268

Version V1.2 | April 2021

Part Number	8 Channel	Wi-Fi	LTE Cellular	WisGateOS	WisGateOS2
RAK7268	√	√		√	
RAK7268C	√	√	√	√	
RAK7268 V2	√	√			√
RAK7268C V2	√	√	√		√

1 Overview

This document helps customers quickly understand the hardware interface, RF, software, and electrical specifications of the RAK7268 series.

1.1 Description

Varieties of the device:

WisGate (RAK7268)

WisGate (RAK7268C)

WisGate (RAK7268 V2)

WisGate (RAK7268C V2)

The RAK7268 WisGate Edge Lite 2 (and all its varieties) is a full 8-channel indoor gateway, based on the LoRaWAN protocol, with built-in Ethernet connectivity for a straightforward setup. Additionally, there is an onboard Wi-Fi setup (supporting 2.4G Wi-Fi) that allows it to be easily configured via the default Wi-Fi AP mode. Additionally, the gateway supports LTE uplink communication connections (optional, available with RAK7268C and RAK7268C V2).

As with the other RAKwireless Industrial Gateways, it also supports MQTT Bridge mode, with the option for TLS authentication.

Power-over-Ethernet (PoE) is supported to serve cases where wall or ceiling mounting is required without the need to install additional power lines.

The open-source software for the management and configuration of this gateway device is based on OpenWRT. It has a built-in LoRa packet forwarder and a graphical user interface, allowing for a quick setup without giving up the freedom of a fully customized solution.

RAK7268/C/V2 also supports the MQTT Bridge function and can use the MQTT integrated into third-party platforms.

RAK7268/C/V2 is especially suitable for small and medium-sized deployment scenarios in industry applications, saving the additional cost for server and R&D investment, and has the advantages of high execution efficiency.

V2 models come with enhanced processing abilities given by the 32 MB NOR flash memory. This allows the devices to run the newest WisGateOS 2.

Previous models have 16 MB NOR flash memory and run WisGateOS(1).

1.2 Product Features

- Full LoRaWAN Stack support (V 1.0.3) in Built-In Server mode
- Supports 2.4 G Wi-Fi AP for configuration
- 100M Base-T Ethernet with PoE
- Multi back-haul with Ethernet, Wi-Fi, Cellular (optional, available with RAK7268C and RAK7268C V2)
- OpenWRT software supports Web UI for easy configuration and monitoring
- Can integrate with both private (e.g. ChirpStack) and public (e.g. TTN) network servers
- SD card for log backup
- Built-in Network Server for easy deployment of applications and integration of gateways
- LTE Cat 4 network (optional, available with RAK7268C and RAK7268C V2)

2 Specifications

2.1 Hardware Interfaces

The hardware interfaces of RAK7268 series gateways include DC 12V, ETH interface, Console interface, Reset key, SD Card slot, Status indicator LEDs, LoRa Antenna connector, etc. As shown in the following figure.

Figure 1: RAK7268 series Interfaces

The function of the Reset key is as follows:

Short press: Restart the Gateway.

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

The following table shows the LEDs status of the theRAK7268 series.

LEDs	Status Indication Description
PWR LED	Power indicator - The LED is on when device power is on
Breathing LED	Breathing after system up
ETH LED	ON - Linkup
	OFF – Link down
	Flicker - Data transmitting and receiving
LoRa LED	ON - LoRa is working
	OFF - LoRa is not working
	Flicker - Indicate LoRa Packet receiving and sending
WLAN LED	AP Mode:
	-ON - The AP is up
	-OFF - The AP is down
	-Flicker - Data receiving and sending
	STA Mode:
	-Slow flicker (1 Hz) - Disconnected
	-ON - Connected
	-Flicker - Data receiving and sending
LTE LED (functional only in RAK7268C and RAK7268C V2)	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

Table 1: LEDs Status Description

2.2 Main Specifications

Feature	Specifications
Computing	MT7628, DDR2 RAM 128 MB
Wi-Fi feature	Frequency: 2.4 GHz (802.11b/g/n)
	RX Sensitivity: -95 dBm (Min)
	TX Power: 20 dBm (Max)
	Operation channels: 2.4 GHz: 1-13
LoRa feature	mPCIe card
	8 Channels
	RX Sensitivity: -139 dBm (Min)
	TX Power: 27 dBm (Max)
	Frequency: EU433/CN470/EU868/US915/AS923/AU915/IN865/KR920
Cellular (optional, available with RAK7268C and RAK7268C V2)	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
	Optional supports other mPCIe LTE module for Global Region
Power supply	DC 12 V - 1 A
	PoE (IEEE 802.3 af), 36~57 VDC
Power consumption	12 W (typical)
ETH	RJ45 (10/100 M)
Feature	Specifications

Console	Type-C USB
Antenna	LoRa: RP-SMA female connector
	LTE: Internal antenna (optional, available with RAK7268C and RAK7268C V2)
	Wi-Fi: Internal antenna
LEDs	POWER LED
	Breathing LED (Top side)
	ETH LED (On ETH connector)
	LoRa LED
	WLAN LED
	LTE LED (functional only in RAK7268C and RAK7268C V2)
Ingress protection	IP30
Enclosure material	Plastic
Weight	0.3 kg
Dimension	166x127x36 mm
Operating temperature	-10 to 55˚ C
Installation method	Wall mounting

Table 2: Main Specifications of the RAK7268 series

2.3 RF Specifications

2.3.1 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 (2.4G)
	-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 (2.4G)
	-89 dBm @MCS0 (HT20)
	-72 dBm @MCS7 (HT20)
	-86 dBm @MCS0 (HT40)
	-68 dBm @MCS7 (HT40)

Table 3: Wi-Fi Radio Specifications

2.3.2 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 4: LoRa Radio Specifications

Depending on the frequency range the included LoRa antenna will be as follows:
- Frequency Range 863~870 MHz RAKARJ15 868MHz Blade Antenna
- Frequency Range 902~928 MHz RAKARJ14 915MHz Blade Antenna

2.3.3 LTE Radio Specifications (optional, available with RAK7268C and RAK7268C V2)

Feature	Specification
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
	Optional supports other PCI-E LTE modules for Global Region

2.4 Software Specifications

The following table introduces the software specifications of the RAK7268 series indoor gateway. It includes LoRa, network, and management.

LoRa	Network	Management
- Supports class A, C - Supports LoRa package forward - Packet Forwarder - Basics™ Station - RAK Built-In Server - Supports country code setup - Supports TX power setup - Supports data logger - Supports statistic - Supports location setup - Supports server address & port setup	- Supports Wi-Fi AP mode - Supports uplink backup - Supports 802.1q - Supports DHCP Server/Client - Supports router module NAT - Supports firewall	- WisDM remote management platform - Supports WEB management - Supports SSH2 - Supports firmware update - Supports NTP - Supports configuring the LoRa Packet Forwarder - Supports Build-in LoRa Server - Supports OpenVPN, Ping Watch Dog - Supports MQTT Bridge

3 Models Bundles

Part Number	8 Channel	Wi-Fi	LTE Cellular	WisGateOS	WisGateOS2
RAK7268	√	√		√	
RAK7268C	√	√	√	√	
RAK7268 V2	√	√			√
RAK7268C V2	√	√	√		√

4 Configure the Gateway

You can log in to the WEB management page to overview the status of your gateway and configure it.

4.1 For WisGate Edge 2 and WisGate Edge 2+ based on the WisGateOS

By default, the gateway will work in Wi-Fi AP Mode, which means that you can find an SSID named *RAK7268_XXXX* on your PC's Wi-Fi Network List. XXXX is the last two bytes of the gateway's MAC address. No password is required to connect via Wi-Fi AP.

Using your preferred Web browser, access the gateway on the IP address shown below:

Browser Address: 192.168.230.1

Username: root

Password: root

4.2 For WisGate Edge 2v2 and WisGate Edge 2+v2 based on the WisGateOS2

By default, the gateway will work in Wi-Fi AP Mode, which means that you can find an SSID named *RAK7268_XXXX* on your PC's Wi-Fi Network List. XXXX is the last two bytes of the gateway's MAC address. No password is required to connect via Wi-Fi AP.

Using your preferred Web browser, access the gateway on the IP address shown below:

Browser Address: 192.168.230.1

Username: root

Password: For security reasons, upon the first login, the user must set a login password. This is done by filling in the desired password and confirming it in the provided fields. The password needs to comply with the following rules:

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

https://docs.rakwireless.com/Product-Categories/WisGate/RAK7268/Overview/

5 Contact Information

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

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

Documentation Center：https://doc.rakwireless.com/

Email us: info@rakwireless.com

6 Certification Information

CE

Operating frequency range:

Technology	Frequency band [MHz]	Maximum RF output power（dBm）
LoRa	863-870	14
WLAN 802.11 b/g/n	2400-2483.5	20
LTE	880-915，925-960，	33
	1710-1785，1805-1880	30
	1920-1980，2110-2170	24
	880-915，925-960	24
	1920-1980，2110-2170	23
	1710-1785，1805-1880	23
	2500-2570，2620-2690	23
	880-915，925-960	23
	832-862，791-821	23
	703-733，758-788	23

SIMPLIFIED EU DECLARATION OF CONFORMITY

Hereby, Shenzhen RAKwireless Technology Co.,Ltd. declares that the radio equipment type RAK7268/RAK7268V2 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: *****

the radio equipment type RAK7268C/RAK7268CV2 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:***

Economic operators for EU:

Company	Address
Allnet	Maistr. 2, Munich 82110 Germering, Germany
Marcom SRL (marcomweb)	Via della Metallurgia 11, 37139 Verona, Italy
Arduino SRL	Via Andrea Appiani 25, 20900 Monza MB Italy

Economic operators for UK:

Company	Address
Metavurt Ltd	1st Floor Tuspark Newcastle 27 Grainger Street NE1 5JE Newcastle upon Tyne UK

Correct Disposal of this product. This marking indicates that this product should not be disposed of with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTE:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, according to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used following the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 30cm between the radiator and any part of your body for RAK7268/ RAK7268V2， and 40cm for RAK7268C/ RAK7268CV2.

ISEDC：

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.

2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;

2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

The device complies with RF exposure guidelines, users can obtain Canadian information on RF exposure and compliance. The minimum distance from the body to use the device is 30cm for RAK7268/ RAK7268V2， and 40cm for RAK7268C/ RAK7268CV2.

Le présent appareil est conforme Après examen de ce matériel aux conformité ou aux limites d'intensité de champ RF, les utilisateurs peuvent sur l'exposition aux radiofréquences et la conformité et compliance d'acquérir les informations correspondantes. La distance minimale du corps pour utiliser l'appareil est de 30 cm pour RAK7268/ RAK7268V2， et de 40 cm pour RAK7268C/ RAK7268CV2.