# RAK7240V2/RAK7240CV2 WisGate Edge Prime Datasheet

## Overview

## Description

The RAK7240V2 WisGate Edge Prime is an ideal product for large-scale LPWAN deployment where cost is essential; however, there are no compromises to the quality. The gateway is available in 8 or 16-channel versions to help you utilize the maximum of the available LoRaWAN channels in your region. It supports multi-backhaul with Ethernet, Wi-Fi, and Cellular connectivity.

In addition, RAK7240V2 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.

Thus, the RAK7240V2 WisGate Edge Prime is suited for any use-case scenario, be it rapid deployment or customization of the UI and functionality.

## Features

### Hardware

- IP65 industrial-grade enclosure with cable glands
- PoE + Surge Protection
- Supports 9~24 $V_{DC}$ power supply (optional) and RAK Battery Plus
- Up to two (2) LoRa concentrators for 8 or 16-channel options
- Backhaul: Wi-Fi, LTE (optional, available with RAK7240CV2), and Ethernet
- GPS
- SD card slot

> 📝 **NOTE**
>
> For the 8-channel gateway an LTE option is possible while if you wish for 16 channels, no LTE option is available.

### Software

- WisGateOS 2
- WisGateOS2 Extensions: OpenVPN, Wireguard VPN, and others
- Remote management with WisDM Fleet Management
- Built-in Network Server (LoRaWAN support V 1.0.3)
- 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)

## Specifications

# Overview

The overview presents the RAK7240V2 block diagram that shows the internal architecture of the board.

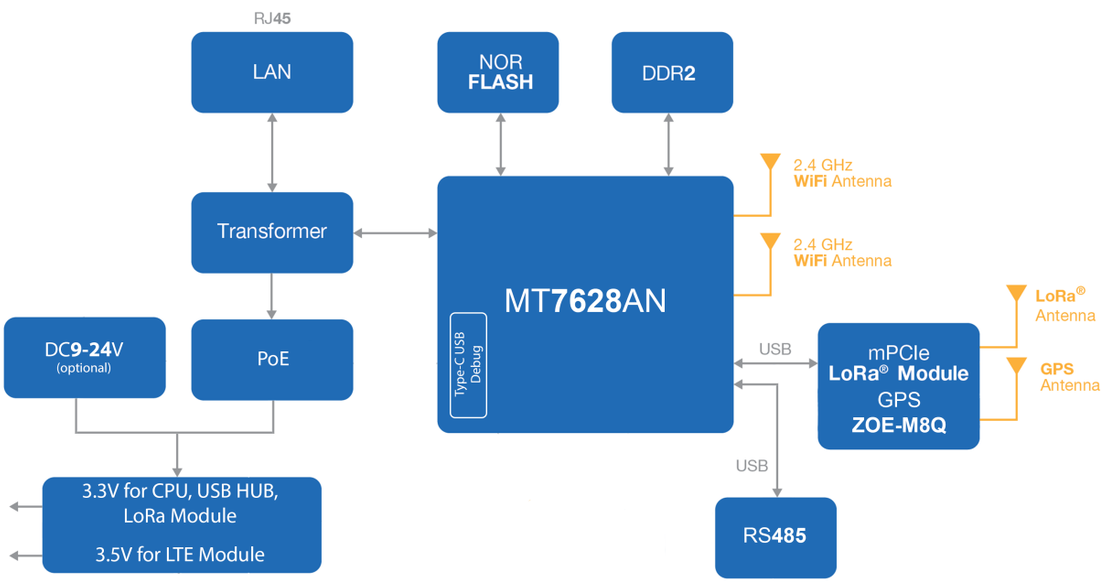


**Figure 1:** RAK7240V2 Block Diagram

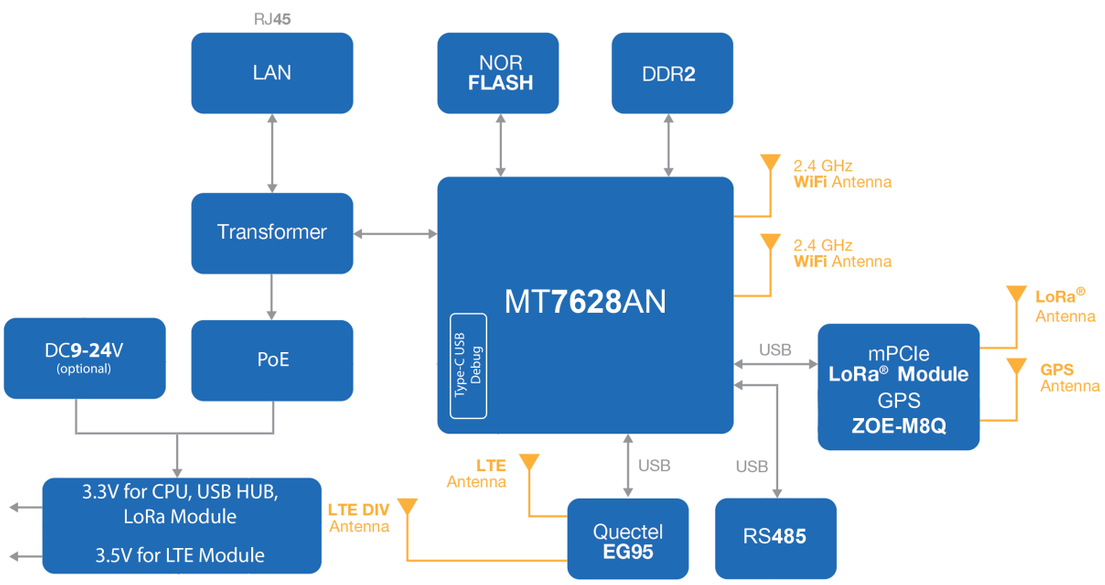


**Figure 2:** RAK7240CV2 Block Diagram

# Main Specifications

| Feature | Specifications |
| --- | --- |
| Computing | MT7628, DDR2RAM 128 MB |
| Wi-Fi Feature | Frequency: 2.400-2.4835 GHz (802.11b / g / n)<br>RX Sensitivity: ‐ 95 dBm (Min)<br>TX Power: 20 dBm (Max)<br>Operation Channels: 2.4 GHz: 1-13 |
| LoRa Feature | SX1303 mPCIe card (connects a maximum of two)<br>8 Channels (16 channels optional)<br>RX Sensitivity: ‐ 139 dBm (Min)<br>TX Power: 27 dBm (Max)<br>Frequency: EU868 / IN865 / RU864 / US915 / AU915 / KR920 / AS923-1-2-3-4 / EU433 / CN470 |
| Cellular Feature (available with RAK7240CV2, 8-channel option) | **Nano SIM Card:** 12.30 x 8.80 x 0.67 mm<br>Supports Quectel EG95-E / EG95-NA (IoT / M2M -optimized LTE Cat 4 Module)<br>**EG95-E for EMEA Region**<br>LTE FDD: B1 / B3 / B7 / B8 / B20 / B28A<br>WCDMA: B1 / B8<br>GSM: 900 / 1800 MHz<br>**EG95-NA for North America Region**<br>LTE FDD: B2 / B4 / B5 / B12 / B13<br>WCDMA: B2 / B4/ B5 |
| Power Supply | PoE (IEEE 802.3af) , 42~57 VDC<br>9~24 VDC from dedicated DC port (optional)<br>Compatible with RAK Solar Battery Kit (optional) |
| Power Consumption | 12 W (typical) |
| Ethernet (ETH) | RJ45 (10/100M) |
| Console | RJ45 (RS232) |
| Antenna | **LoRa**:<br>N-Type connector (one for the 8-channel gateway and two for the 16-channel gateway)<br>**GPS**:<br>One N-Type connector<br>**Wi-Fi**:<br>wo N-Type connectors<br>**LTE**:<br>Two N-Type connectors (only for RAK7240CV2, 8-channel option) |
| Ingress Protection | IP65 |
| Enclosure Material | Aluminum |
| Weight | 1.3 kg |
| Dimension | 224 x 121 x 42 mm Gateway only (no antenna, no bracket) |

| Feature | Specifications |
| --- | --- |
| 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 |

# Hardware

The hardware specification is categorized into three parts. It discusses the interfaces and the parameters of the RAK7240V2. It also covers the LoRa and Wi-Fi specifications of the board.

# Interfaces

The hardware interfaces of the WisGate Edge Prime includes:

- five (5) antenna ports
  - LoRa
  - LTE-DIV
  - LTE-MAIN
  - Wi-Fi
  - GPS
- five (5) status indicator LEDs
- TF Card and nano-SIM sockets
- console port
- Ethernet Port (PoE)
- ground pad

The device comes with a dedicated DC power port that you can use to power it up. This power port is optional and supports a range of 9~24 $V_{DC}$. It is designed to be compatible with the RAK Battery Plus, providing the device with an additional power source.

> 📝 **NOTE**
>
> The DC port is only available if selected during your purchase.


**Figure 3:** RAK7240V2 Interface

The antenna ports are not all open, it depends on the bundle you purchased. For example, if you purchased an 8-channel gateway without cellular connectivity, the LTE antenna ports will be sealed.

The DC Input port is available only for the RAK7240V2 / RAK7240V2CV2 version with DC and Battery Plus support. This power port supports a range of 9~24 VDC. It is designed to be compatible with the RAK Battery Plus, providing the device with an additional power source.

> 📝 **NOTE**
>
> The DC Input port is only available if selected during your purchase.

## Reset Key Functions

The functions of the Reset key are as follows:

- **Short press**: Restart the gateway.
- **Long press** (5 sec and above): Restore factory settings.

## LED Indicators

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

| LEDs | Status Indication Description |
|---|---|
| PWR | Power indicator - The LED is on when device power is on |
| ETH | ON – Link is up<br>OFF – Link is down<br>Flicker – Data is being transferred |
| LoRa | ON - LoRa module 1 status is up<br>OFF – LoRa module 1 status is down<br>Flicker – LoRa module 1 data is being transferred |
| ACT (LTE) | Slow flicker (200 ms bright / 1800 ms dark) - Searching for network<br>Slow flicker (200 ms dark / 1800 ms bright) - Idle status (online)<br>Fast flicker - Data is being transferred |
| STAT<br>*(16 channels only)* | ON - LoRa module 2 status is up<br>OFF – LoRa module 2 status is down<br>Flashing – LoRa module 2 data is being transferred |
| WLAN | **AP Mode**<br>ON - WLAN status is up<br>Flicker - Data is being transferred<br>**STA Mode**<br>Slow flicker (1 Hz) - Disconnected<br>ON - Connected<br>Flicker - Data is being transferred |

# RF Specifications

## LoRa Radio Specifications

| Feature | Specifications |
|---|---|
| Operating frequency | EU868 / IN865 / RU864 / US915 / AU915 / KR920 / AS923-1-2-3-4 / EU433 / CN470 |
| Transmit power | 27 dBm (Max) |
| Receiver sensitivity | ‑139 dBm (Min) |

## 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 - per chain (The max. power may be different depending on local regulations) | **802.11b**<br>1 Mbps: 19 dBm<br>11 Mbps: 19 dBm<br>**802.11g**<br>6 Mbps: 18 dBm<br>54 Mbps: 16 dBm<br>**802.11n (2.4 GHz)**<br>MCS0 (HT20): 18 dBm<br>MCS7 (HT20): 16 dBm<br>MCS0 (HT40): 17 dBm<br>MCS7 (HT40): 15dBm |
| Receiver sensitivity (Typical) | **802.11b**<br>1 Mbps: 95 dBm<br>11 Mbps: 88 dBm<br>**802.11g**<br>6 Mbps: 90 dBm<br>54 Mbps: 75 dBm<br>**802.11n (2.4 GHz)**<br>MCS0 (HT20): 89 dBm<br>MCS7 (HT20): 72 dBm<br>MCS0 (HT40): 86 dBm<br>MCS7 (HT40): 68 dBm |

# Electrical Characteristics

The gateway supports multiple power supply options.

- **Power Cord + PoE Adapter:** The gateway is powered via PoE. PoE (IEEE 802.3af), 42~57 VDC.
- **Cable for RAK Battery Plus:** Only available for gateways with DC Input interface. For outdoor deployment scenarios, it is recommended to use RAK9155 Battery Plus as its power supply. This cable is dedicated to RAK9155 Battery Plus.

> 📝 **NOTE**
>
> RAK9155 Battery Plus is not included in the bundle, it needs to be purchased separately.

# Mechanical Characteristics

| Parameter | Value |
| --- | --- |
| Dimensions | 224 x 121 x 42 mm Gateway only (no antenna, no bracket) |
| Weight | 1.3 kg |
| Enclosure Material | Aluminum |
| Ingress protection | IP65 |

# Environmental Requirements

| Parameter | Value |
| --- | --- |
| Operating Conditions | Operating Temperature: - 30 ˚C to + 55 ˚C<br>Storage Temperature: - 40 ˚C to + 85 ˚C<br>Operating Humidity: 0~95 % RH non-condensing<br>Storage Humidity: 0~95 % RH non-condensing |

# Software

RAK7240V2 supports different software features such as LoRa, Network, and Management.

# Supported Features

| LoRa | Network | Management |
| --- | --- | --- |
| Gateway OTA management | Wi-Fi AP mode | 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 | | WEB UI |
| Server address and Port setup | | |

# Firmware

| Model | Firmware Version | Source |
| --- | --- | --- |
| RAK7240V2 / RAK7240CV2 WisGate Edge Prime | v2.2.8 | Download |

# Models / Bundles

| Models | Variants | Packing list |
| --- | --- | --- |
| RAK7240V2 | 8 Channels without 4G | 1x 8-channel device<br>1x GPS Antenna<br>1x 2.4G WiFi Antenna<br>1x PoE Injector<br>1x Mounting Kit<br>1x Manual |
| | 8 Channels without 4G DC and Battery Plus support | 1x 8-channel device with DC Input interface<br>1x GPS Antenna<br>1x 2.4G WiFi Antenna<br>1x PoE Injector<br>1x Mounting Kit<br>1x Cable for RAK Battery Plus<br>1x Manual |
| RAK7240V2 | 16 Channels without 4G | 1x 16-channel device<br>1x GPS Antenna<br>1x 2.4G WiFi Antenna<br>1x PoE Injector<br>1x Mounting Kit<br>1x Manual |
| | 16 Channels without 4G DC and Battery Plus support | 1x 16-channel device with DC Input interface<br>1x GPS Antenna<br>1x 2.4G WiFi Antenna<br>1x PoE Injector<br>1x Mounting Kit<br>1x Cable for RAK Battery Plus<br>1x Manual |
| RAK7240CV2 | 8 Channels with 4G | 1x 8-channel device with LTE module<br>2x LTE Antenna<br>1x GPS Antenna<br>1x 2.4G WiFi Antenna<br>1x PoE Injector<br>1x Mounting Kit<br>1x Manual |
| | 8 Channels with 4G DC and Battery Plus support | 1x 8-channel device with LTE module and DC Input interface<br>2x LTE Antenna<br>1x GPS Antenna<br>1x 2.4G WiFi Antenna<br>1x PoE Injector<br>1x Mounting Kit<br>1x Cable for RAK Battery Plus<br>1x Manual |

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