



RAK7201V2 WisNode Button 4K User Guide

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RAK7201V2 WisNode Button 4K



Product Information

Specifications

- **Model:** RAK7201V2 WisNode Button 4K
- **Included Items:**
 - 1 pc RAK7201V2 WisNode Button 4K
 - 1 pc Micro USB cable
 - 1 pc Sticker for attaching the button to a flat surface
- **Compatibility:** Windows PC
- **Baud Rate:** 115200 bps (default)

FAQ

- **Q:** What items are included in the package?
 - **A:** The package includes:
 - 1 pc RAK7201V2 WisNode Button 4K
 - 1 pc Micro USB cable
 - 1 pc Sticker for attaching the button to a flat surface
- **Q:** What is the default baud rate of the WisNode Button 4K?
 - **A:** The default baud rate of the WisNode Button 4K is 115200 bps.

- **Q:** How can I check if my device is running the latest firmware version?
 - **A:** To check if the latest firmware version is in use, send the AT+VER=? command using the RAK Serial Port Tool.
- **Q:** How do I connect the RAK WisNode Button 4K to the built-in server?
 - **A:** Follow the instructions provided in the “Connecting to the Built-In Network Server” section of the user manual.

Product Usage Instructions

Prerequisites

To successfully install and use the RAK7201V2 WisNode Button, make sure you have the following items:

1. RAK7201V2 WisNode Button 4K
2. Micro USB cable
3. A gateway in range
4. Windows PC

Connecting to the Built-In Network Server

This section provides instructions on how to connect the RAK WisNode Button 4K to the built-in server that is part of all RAK WisGate Series gateways.

Creating an Application:

1. Login into the gateway via the Web UI and select the Application tab in the LoRa menu. (Refer to Figure 6: Application menu in the web UI of the gateway)
2. Click the Add application button and fill out the Application name. Select Unified Application key as Application Type and use the Autogenerate button to generate an Application Key and Application EUI. (Refer to Figure 7: Creating an application)

Adding the Device to the Application:

1. In the created application, click on the End device tab and then the Add end device button. (Refer to Figure 8: Application edit)
2. Fill out the End device name and the LoRaWAN MAC Version (V1.0.3 is the correct one for RAK7201V2). Click on the Add end devices. (Refer to Figure 9: Adding the device)
3. Input the End Device EUI of your device and then click Add to End Devices list. (Refer to Figure 10: Configuring the device's settings)

What Do You Need And What's Included

What Do You Need?

Before going through each and every step in the installation guide of the RAK7201V2 WisNode Button, make sure to prepare the necessary items listed below:

1. [RAK7201V2 WisNode Button 4K](#)
2. Micro USB cable
3. A gateway in range
4. Windows PC

What's Included in the Package

- 1 pc RAK7201V2 WisNode Button 4K
- 1 pc Micro USB cable
- 1 pc Sticker for attaching the button to a flat surface

Product Configuration

Interfacing With the RAK7201V2 WisNode Button 4K

For you to be able to interface with the RAK7201V2 WisNode Button 4K with your Windows machine, you need to download the [RAK Serial Port Tool](#).

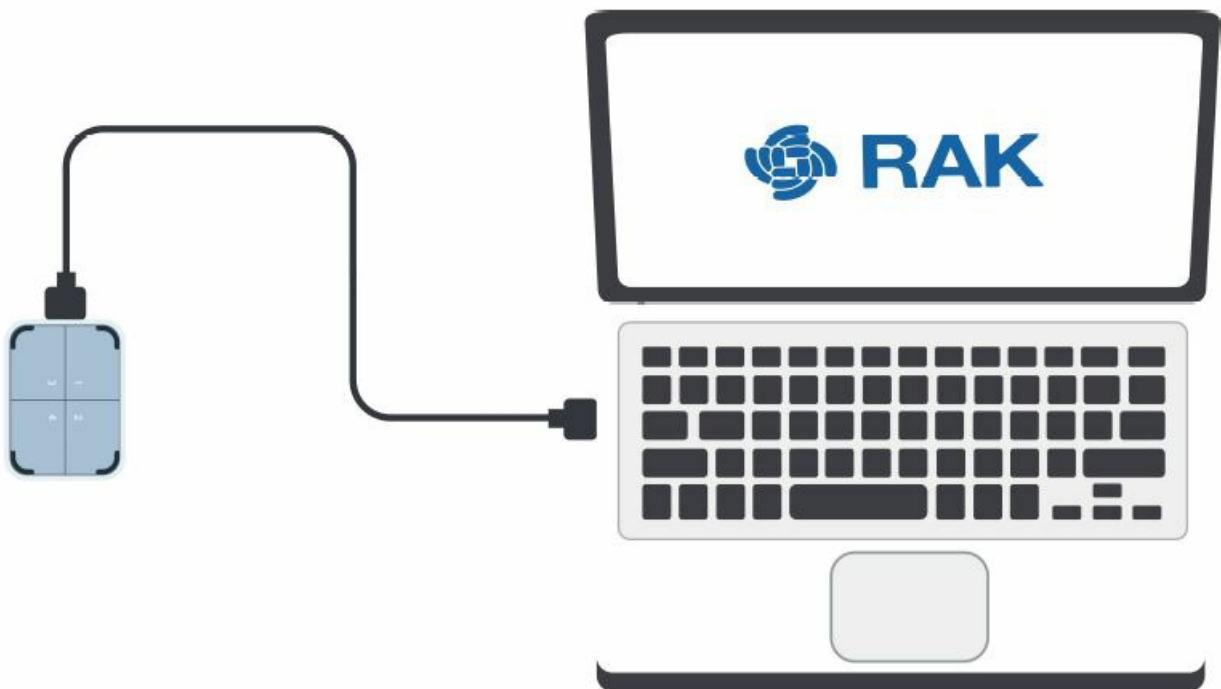


Figure 1: RAK7201V2 WisNode Button 4k to laptop connection

1. Connect your RAK7201V2 WisNode Button 4K to your Windows machine using the provided Micro USB cable.

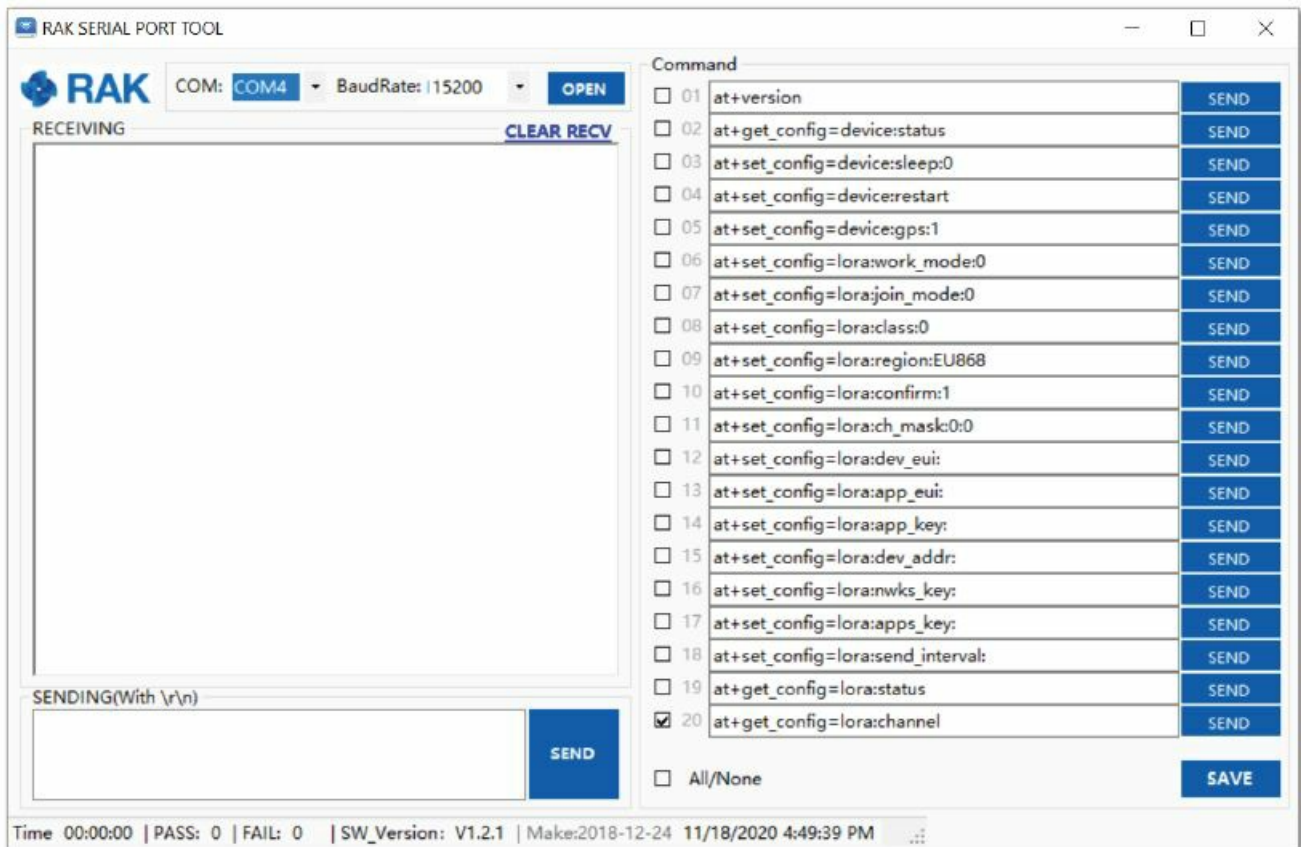


Figure 2: RAK Serial Port Tool

2. Open the RAK Serial Port Tool.
3. To choose the correct COM Port number for your device, go to your Device Manager by pressing the Windows key + R and type devmgmt.msc. You can also search for the Device Manager in the Start menu.

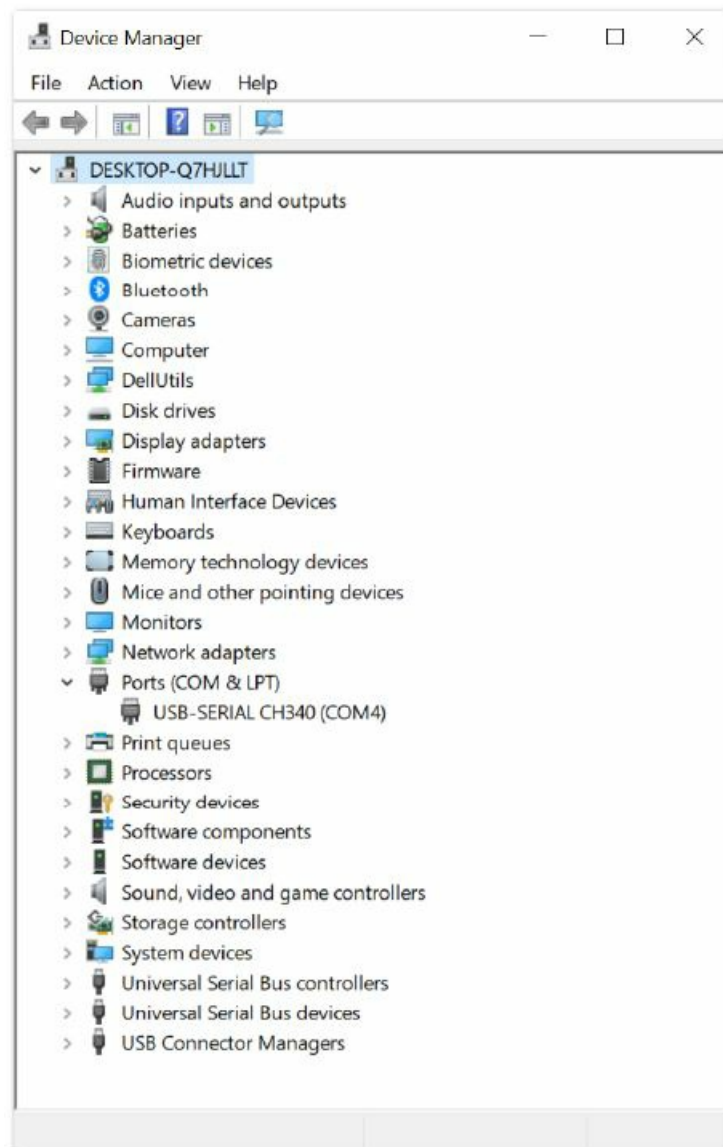


Figure 3: Device Manager

4. Once opened, look for Ports (COM & LPT) and find the name USB-SERIAL CH340. The COM Port Number differs, and in this guide, it is COM4.

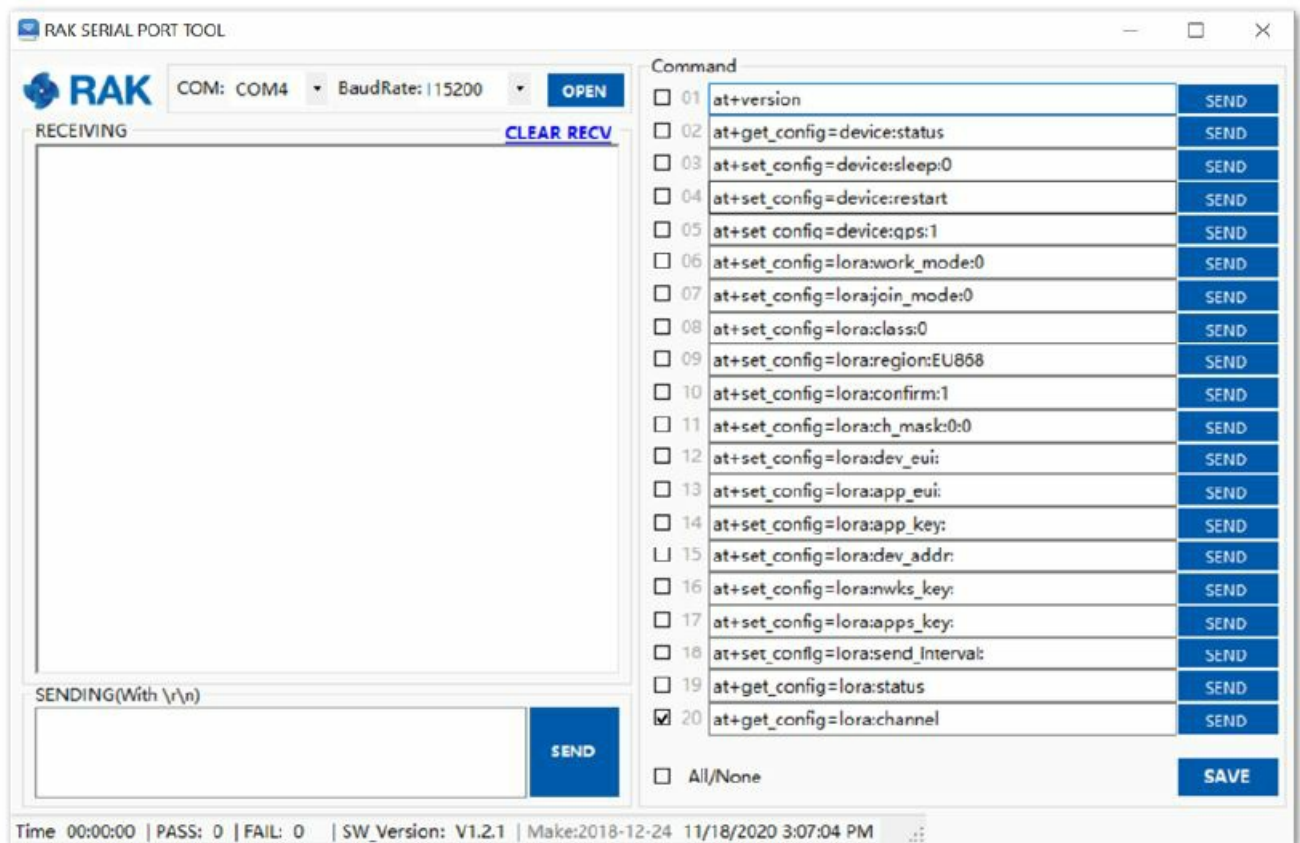


Figure 4: Correct COM port and baud rate are chosen

5. Choose the correct COM port number from the device manager and the correct baud rate, then click Open. The default baud rate of the WisNode Button 4K is 115200 bps.

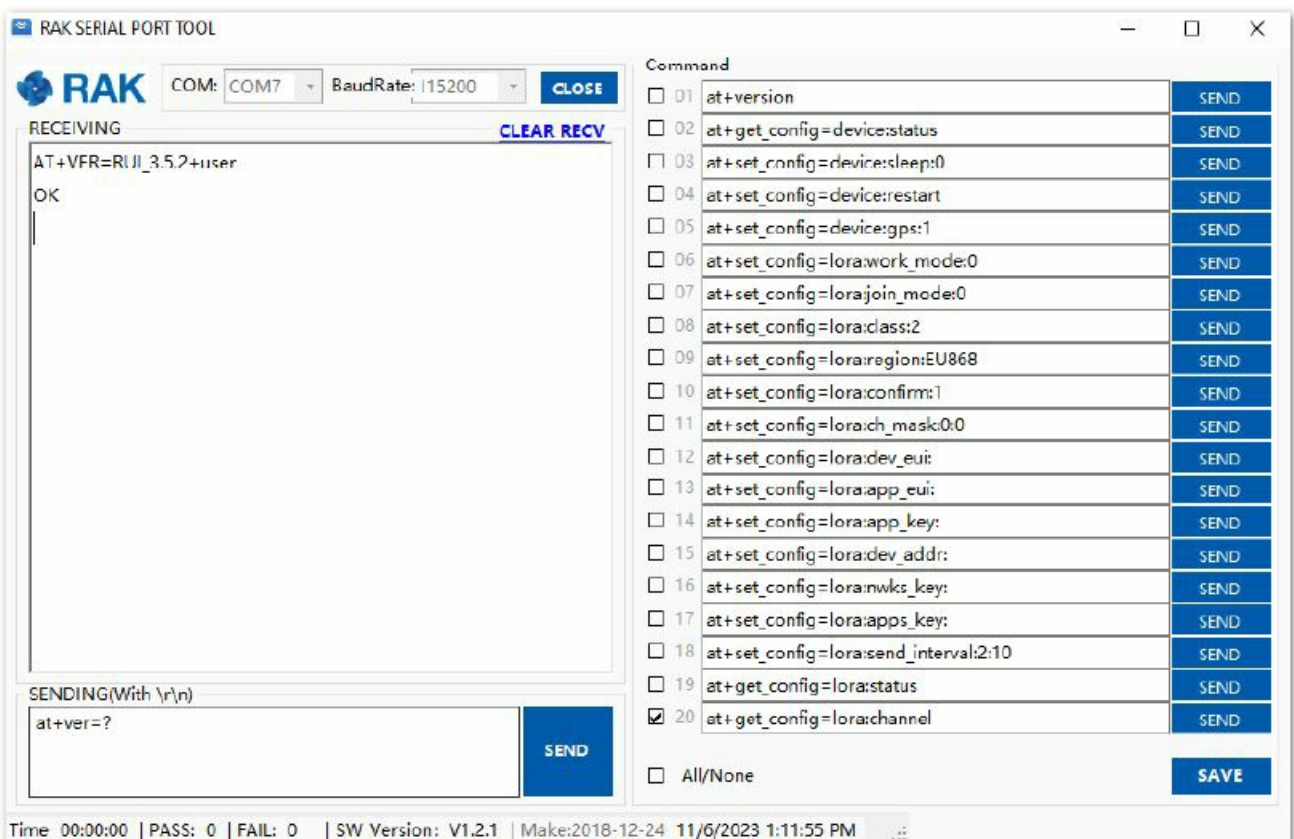


Figure 5: Checking the firmware version

6. To check if the latest firmware version is in use, send the AT+VER=? command. If your device is not running the latest firmware, you need to upgrade it, following the [Firmware Upgrade Guide](#).

Connecting to the Built-In Network Server

This section provides instructions on how to connect the RAK WisNode Button 4K to the built-in server that is part of all RAK WisGate Series gateways.

You can find more information about RAK's Edge gateways and how to use the built-in server here:

- [RAK7240](#)
- [RAK7240V2](#)
- [RAK7249](#)
- [RAK7258](#)
- [RAK7268V2](#)
- [RAK7289V2](#)
- [RAK7289](#)

NOTE: The following guide showcases the Web UI of WisGateOS 2 which is run by WisGate Edge Version 2 gateways.

Creating an Application And Adding the Device

Creating an Application

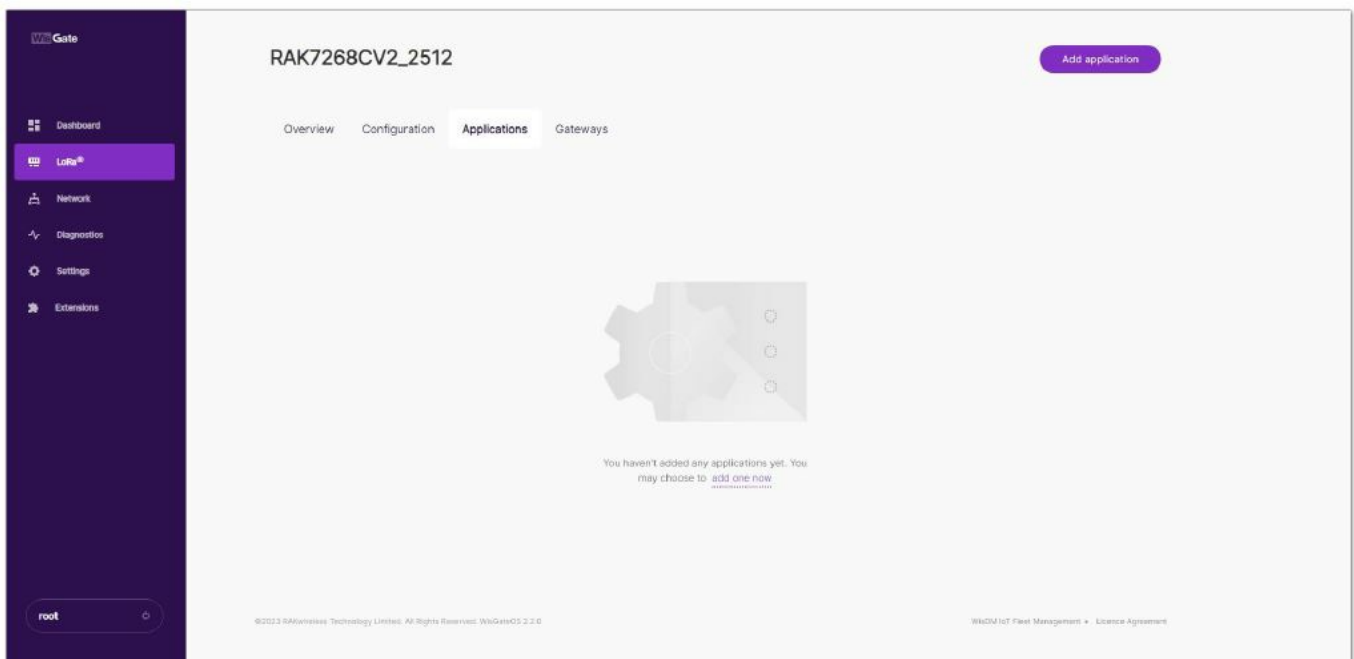


Figure 6: Application menu in the web UI of the gateway

1. Login into the gateway via the Web UI and select the Application tab in the LoRa menu.

New application

Applications are used for instructing how to collect data from your end devices.

Application settings

Application name:

Application description:

Application Type:

☒ Auto Add Device

Application Key:

Application EUI:

Payload format

Payload type:

☐ Only forward data object

Integration Parameters

Decode Type:

☒ Report LoRa Radio Information

☐ Enable HTTP/HTTPS integration Parameters

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Figure 7: Creating an application

2. Click the Add application button and fill out the Application name. Select Unified Application key as Application Type and use the Autogenerate button to generate an Application Key and Application EUI.

Adding the Device to the Application

add some now'. There is an 'Add end device' button in the top right corner. The footer contains copyright information and a license agreement link."/>

RAK_Button_application

Configuration > Applications > RAK_Button_application

End devices Configuration

You haven't added any end devices yet. You may choose to [add some now](#)

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Figure 8: Application edit

1. In the created application, click on the End device tab and then the Add end device button.

New end device

End devices can be uploaded from a CSV file or added manually in End device EUI input field.

1 End device information 2 Adding end devices

End device information

Activation Mode: **OTAA** (selected) ABP

End device (group) name:

End device description (optional):

☐ Enable LTPP

Class: **Class A** (dropdown)

Frame Counter Width: **32 bit** (dropdown) LoRaWAN MAC Version: **V1.0.3** (dropdown)

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Cancel Add end devices

Figure 9: Adding the device

- Fill out the End device name and the LoRaWAN MAC Version (V1.0.3 is the correct one for RAK7201V2). Click on the Add end devices.

New end device

End devices can be uploaded from a CSV file or added manually in End device EUI input field.

1 End device information 2 Adding end devices

Upload a list of end devices

Drop your CSV file here or [choose file](#)

MAXIMUM UPLOAD SIZE: 1 MB

[Save time with our OTAA, download it here.](#)

OR

Manually add new end devices

End Device EUI (Hex):

Step (Optional): Count (Optional):

[Add to "End Devices list"](#)

End devices list 1 of 1 devices are selected

Selected	EUI	STATUS
<input checked="" type="checkbox"/>	0000000000000000	OK

End devices with error 0 end devices

EUI	STATUS
-----	--------

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Skip adding Add end devices

Figure 10: Configuring the device's settings

- Input the End Device EUI of your device and then click Add to "End Devices list".

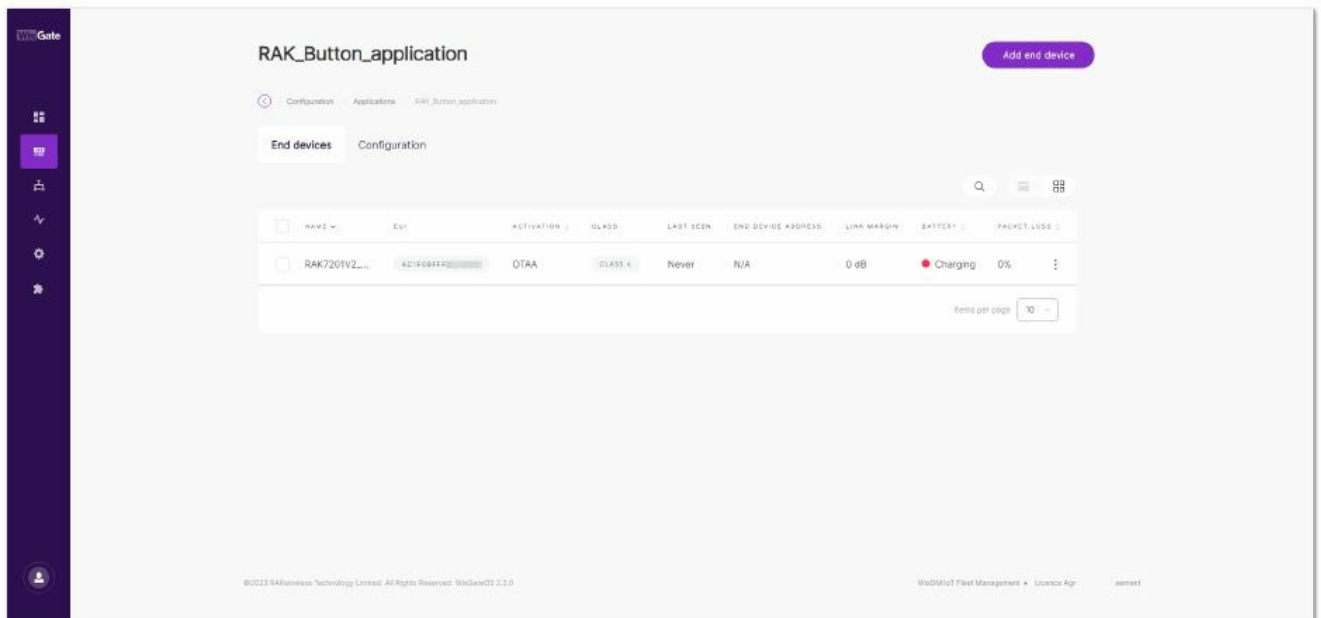


Figure 11: The device is registered

- You will see the device in the End devices list and the Add end devices button will allow you to register your end device in the application.

Configuring the Button in OTAA And ABP Mode

Configuring the Button in OTAA Mode

To use the RAK7201V2 in ABP mode, a change of the activation method is needed.

- Go to the Device Configuration in the gateway, and select the ABP Join mode.

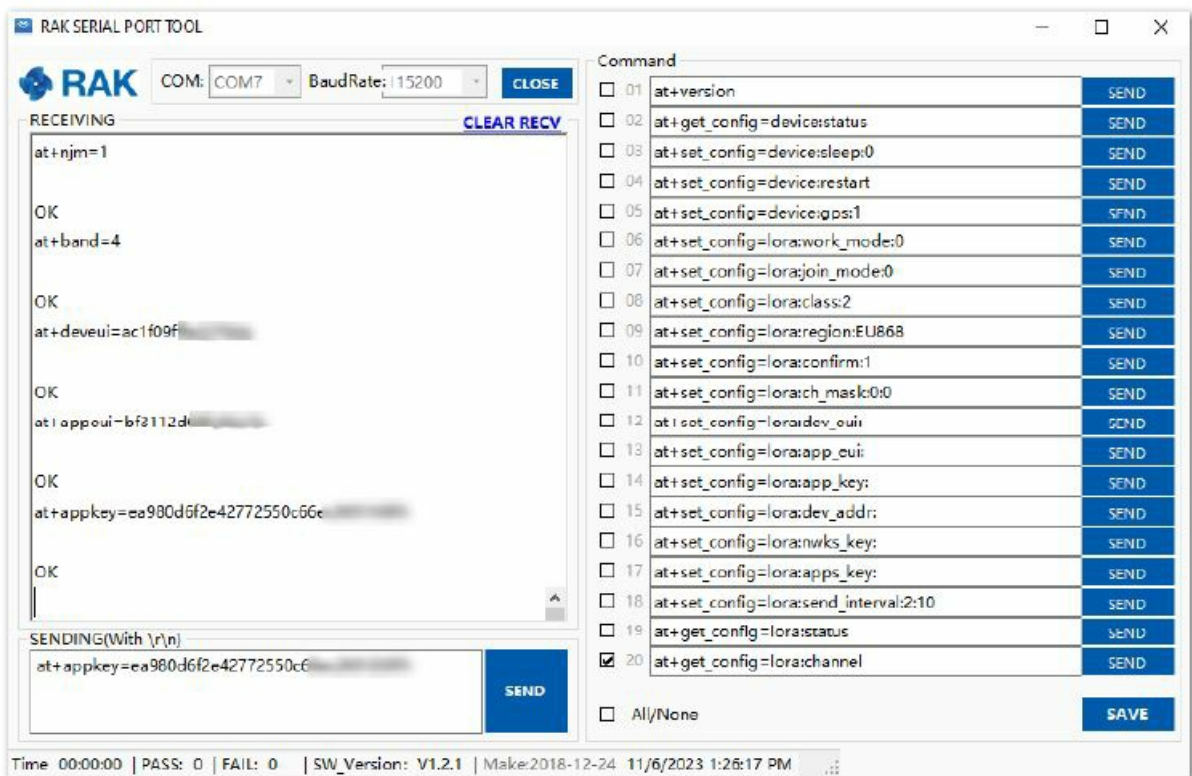


Figure 12: Configuring RAK7201V2 in OTAA mode

- Join Mode (OTAA)
 - at+njm=1

- Region (EU868 for this example)
 - at+band=2
 - Device EUI (on the sticker at the back of the device)
 - at+deveui=ac1f09fffexxxxxx
 - Application EUI (from the application configuration created previously in the gateway)
 - at+appeui=bf3112d69fxxxxxx
 - Application Key (from the application configuration created previously in the gateway)
 - at+appkey=ea980d6f2e42772550c66ec265xxxxxx
 - **NOTE:** The Keys and EUIs shown here are just examples, use the ones generated by your system or corresponding to your device.
2. To connect to the LoRaWAN Network after the configuration, the device must be restarted. The restart command is as follows:
- atz
3. After the restart, you need to issue at+join to join the LoRaWAN network. If all the settings are configured correctly, an +EVT:JOINED message will be displayed in the RAK Serial Port Tool.

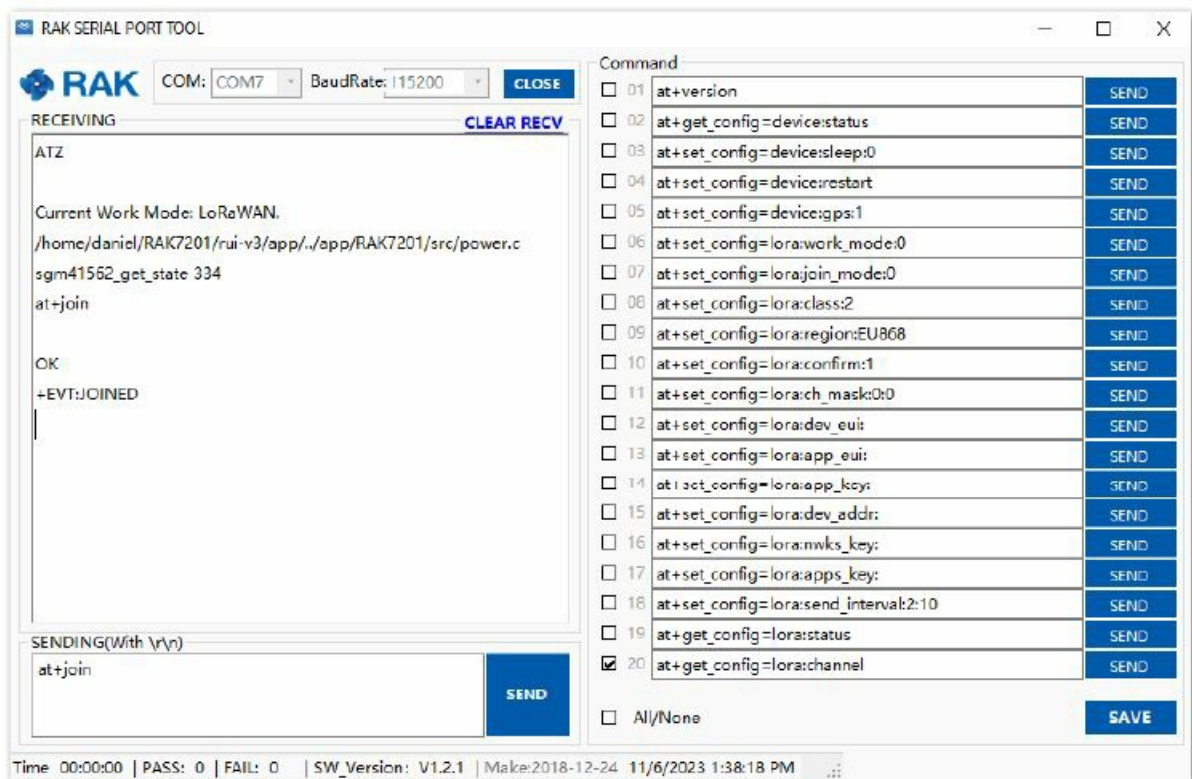


Figure 13: The device has restarted and connected to the LoRaWAN Network

4. After the successful connection, the data obtained from pressing the buttons will be transmitted to the application server of the gateway.

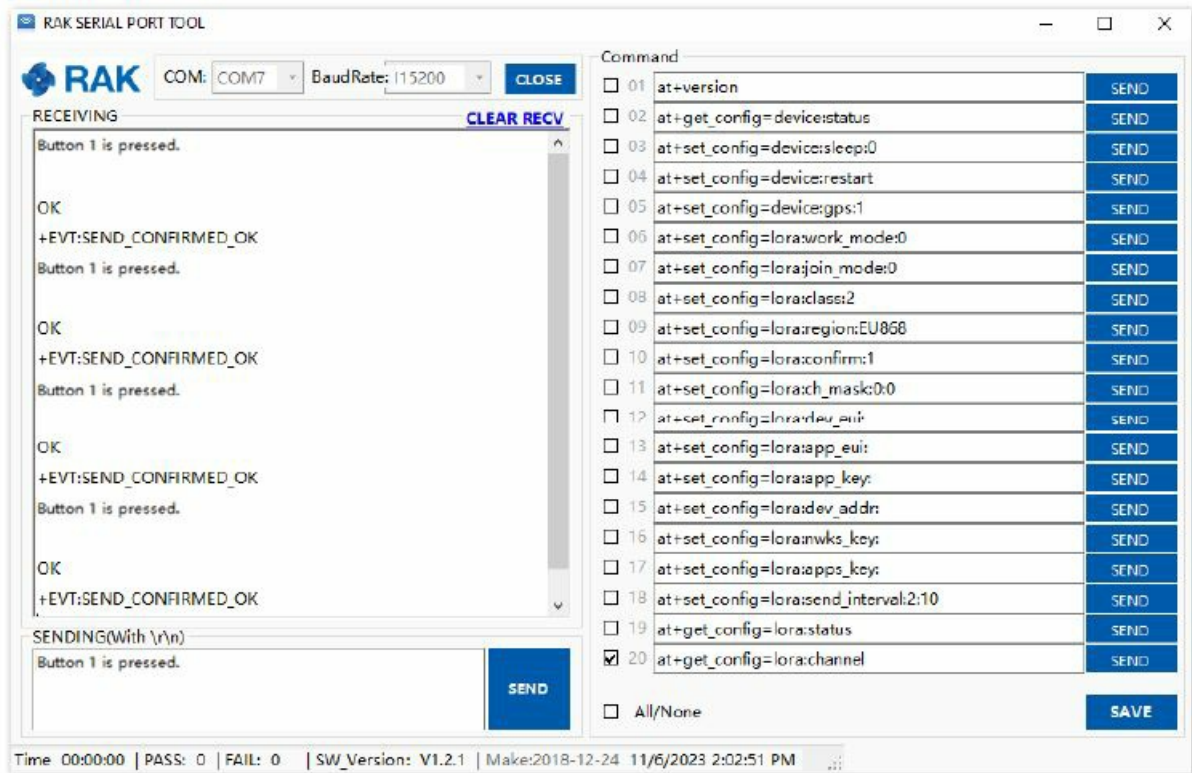


Figure 14: Successful operation of the buttons

- The received data from RAK7201V2 can be seen in the web UI of the gateway under Application > Device > Live Device Data.

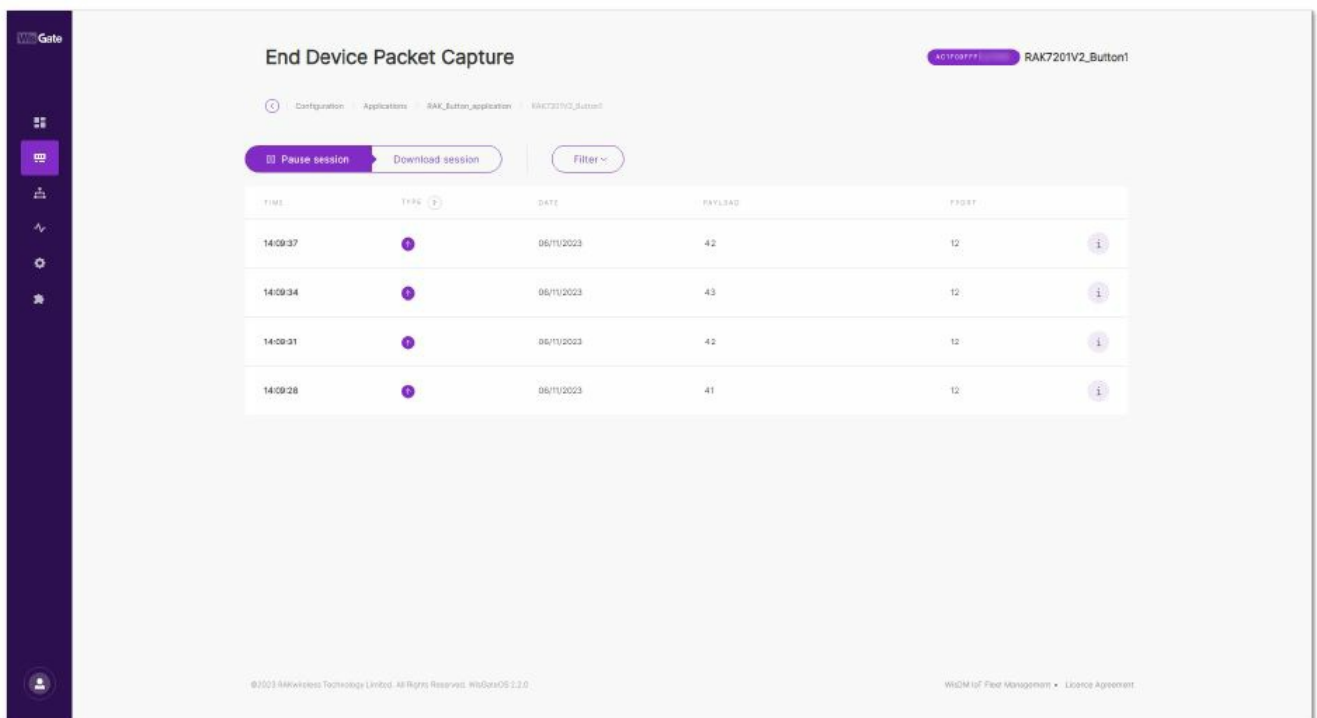


Figure 15: Received data

Configuring the Button in ABP Mode

To use the RAK7201V2 in ABP mode, a change of the activation method is needed.

WIS Gate

RAK7201V2_Button1

Configuration

Applications

RAK_ButtonApplication

RAK7201V2_Button1

Overview

Configuration

Downlink

End device information

End device EUI

AC1F06FFFF

End device address

Activation Mode

OTAA

ABP

End device (group) name

RAK7201V2_Button1

End device description (optional)

Enable LPTP

Class

Class A

Application Session Key

Autogenerate

Network Session Key

Autogenerate

Frame Counter Width

32 bit

LoRaWAN MAC Version

V1.0.2

LoRaWAN Regional Parameters (version)

A

Packet capture

Packet capture

View all data packets exchanged between end device and central gateway.

Delete end device

Delete end device

By deleting this end device, it will be removed from the application.

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Cancel

Save Changes

Figure 16: Changing the activation method

1. Go to the Device Configuration in the gateway, and select the ABP Join mode.

RAK7201V2_Button1

Configuration Applications RAK_Button_application RAK7201V2_Button1

Overview **Configuration** Downlink

End device information

End device EUI: ACT109FFF

End device address: 00000001

Activation Mode: ☐ OTAA ☒ ABP

End device (group) name: RAK7201V2_Button1

End device description (optional):

☐ Enable LTP

Class: Class A

Application Session Key: bfb050106b004e5a32d8

Network Session Key: 0a8139122e9e9011c04b

Frame Counter Width: 32 bit

LoRaWAN MAC Version: V10.3

Packet capture: View all data packets exchanged between end device and central gateway.

Delete end device: By deleting this end device, it will be removed from the application.

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Figure 17: Changing the activation method

2. The following fields appear: Device Address, Application Session Key, and Network Session Key. Enter the Device Address manually, and it should be in HEX format and 8 digits long.
3. To generate the needed keys automatically, click the Autogenerate button next to the Application Session key and Network Session Key fields. Click Save & Apply.
4. To set the RAK7201V2 in ABP work mode, the following AT commands must be executed in the RAK Serial Port Tool:

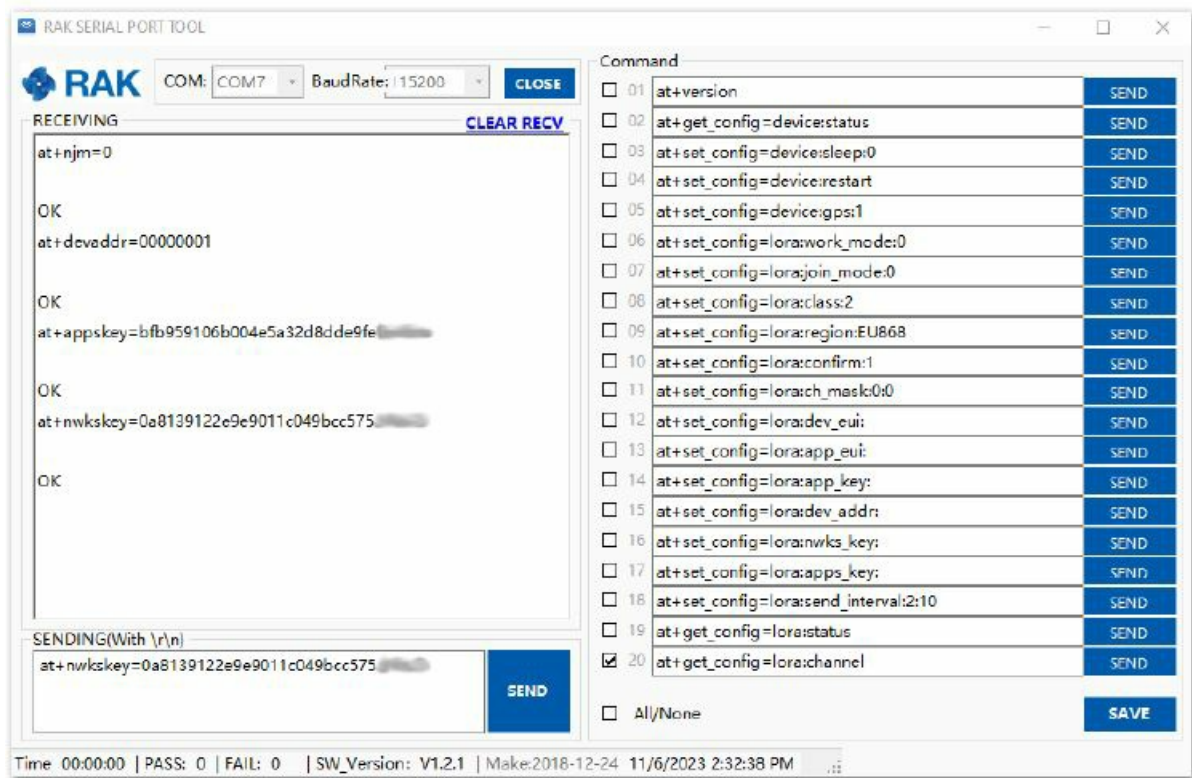


Figure 18: Configure the RAK7201V2 in ABP mode

- Join mode (ABP)
 - `at+njm=0`
 - Device Address (from the device configuration created previously in the gateway)
 - `at+devaddr=00000001`
 - Application Session Key (from the device configuration created previously in the gateway)
 - `at+appskey=bfb959106b004e5a32d8dde9fexxxxxx`
 - Network Session Key (from the device configuration created previously in the gateway)
 - `at+nwkskey=0a8139122e9e9011c049bcc575xxxxxx`
 - **NOTE:** The Keys and EUIs shown are just examples. Use the ones generated by your system or corresponding to your device.
5. To connect to the LoRaWAN Network after the configuration, the device must be restarted. The restart command is as follows:
- `atz`

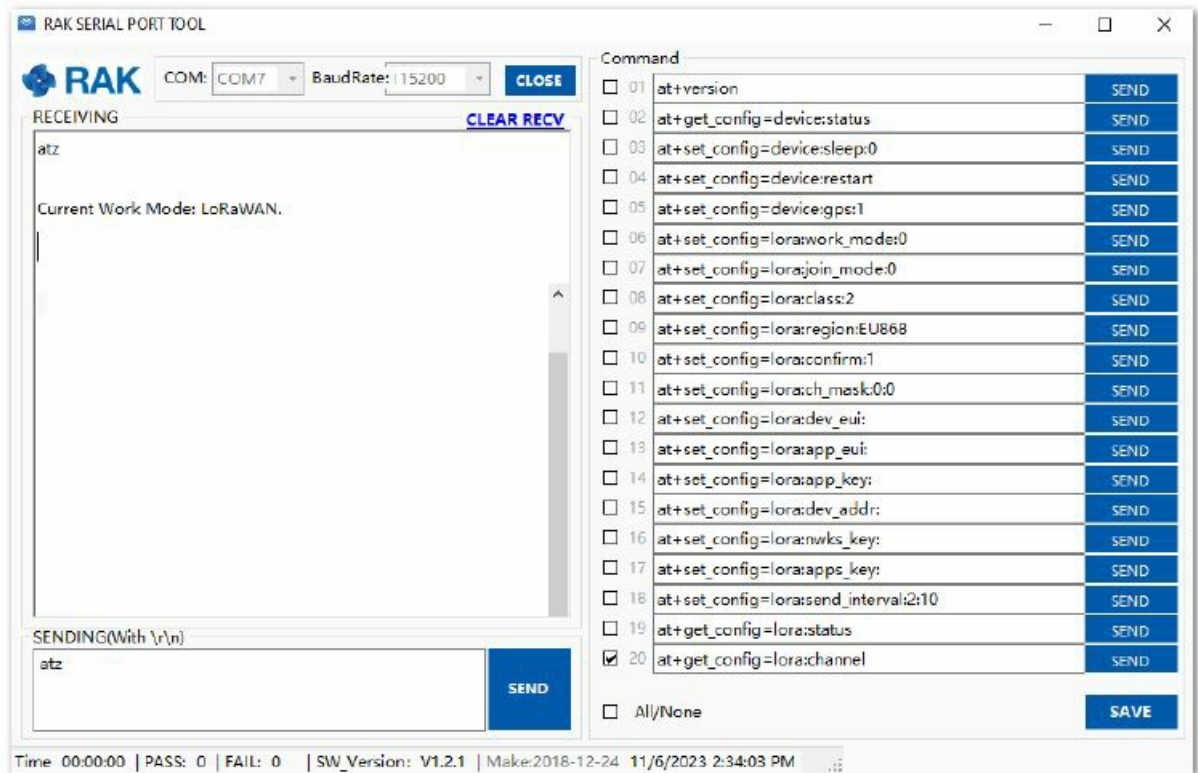


Figure 19: Configure the RAK7201V2 in ABP mode

6. After the restart, the device will be ready to send the information through the LoRaWAN Network.
 - **NOTE:** There is no Join procedure in ABP mode. To be sure that the Button can send data, you need to press the buttons and see if you have uplinks in the Live Device Data field of the device in the gateway.

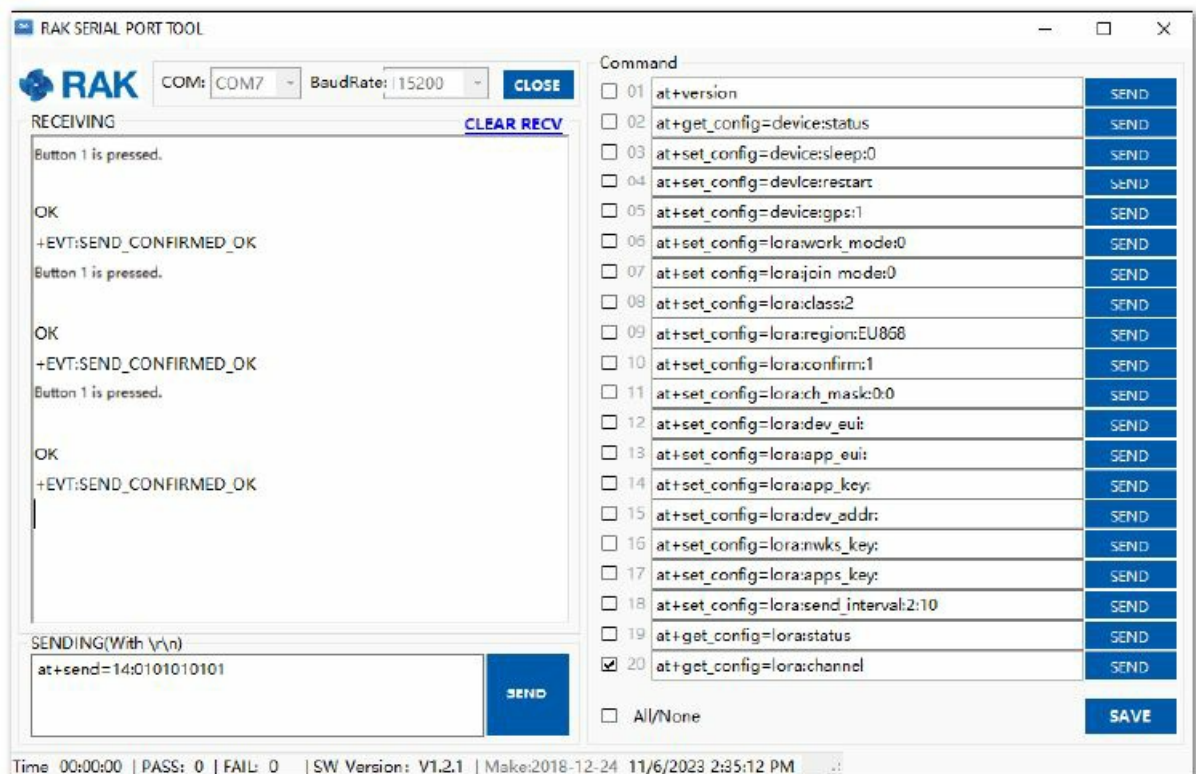


Figure 20: Testing the ABP mode

7. To test the ABP mode, press the buttons of the device.

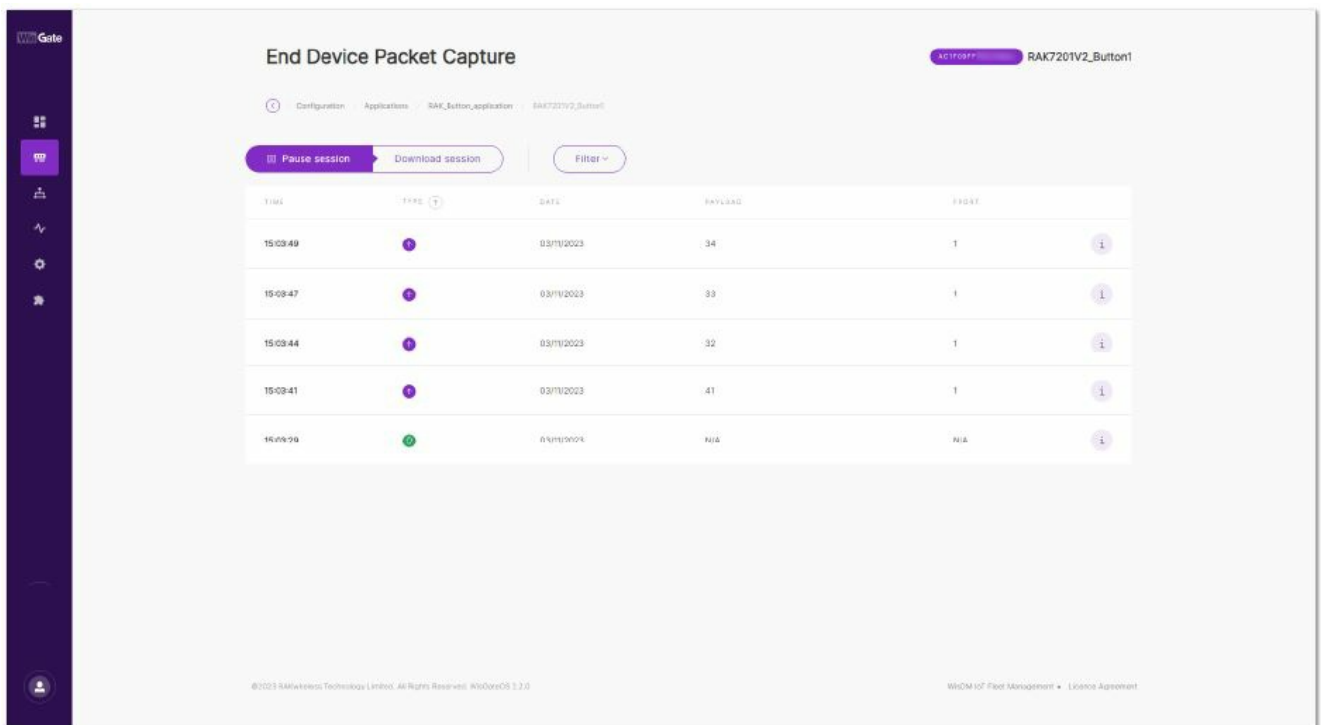


Figure 21: Received data

8. The received data from RAK7201V2 can be seen in the web UI of the gateway under Application > Device > Live Device Data.

Customized the Data Sent

This section addresses the main functionality of the different keys (buttons) of the device. The default payload data of the keys:

Key / Data

- Key 1 / A
- Key 2 / B
- Key 3 / C
- Key 4 / D

To customize the data sent by every button, follow the AT command:

- `at+button=<button>:<port>:<data>`

Where:

- `<button>` : the configured key (range 1-4)
- `<port>` : the configured port number (range 1-223)
- `<data>` : the sent data (max length is 10 characters)

Example:

- Change the data sent from the pressing of button 1 to HelloWorld using the command:

- at+button=1:1:HelloWorld

NOTE

- Refer to the [datasheet](#) to view the key functions of the button.

After the button is pressed, if the device is still sending, the user's subsequent key actions will be ignored until the device has finished sending.

Functions

LEDs Functions

- Refer to the [datasheet](#) to view the key functions of the button.

HeartBeat Functions

- The HeartBeat is used to monitor the network connection and to send the battery level information of the RAK7201V2.
- The device can send a HeartBeat packet according to the configured HeartBeat interval. The AT command for configuring the HeartBeat interval is as follows:
 - at+heartbeat=<interval>

Where:

- The interval range is 0-120 (in hours), 0 to turn off the function.

Example:

- Set the HeartBeat to one hour using the command:
 - at+heartbeat=1

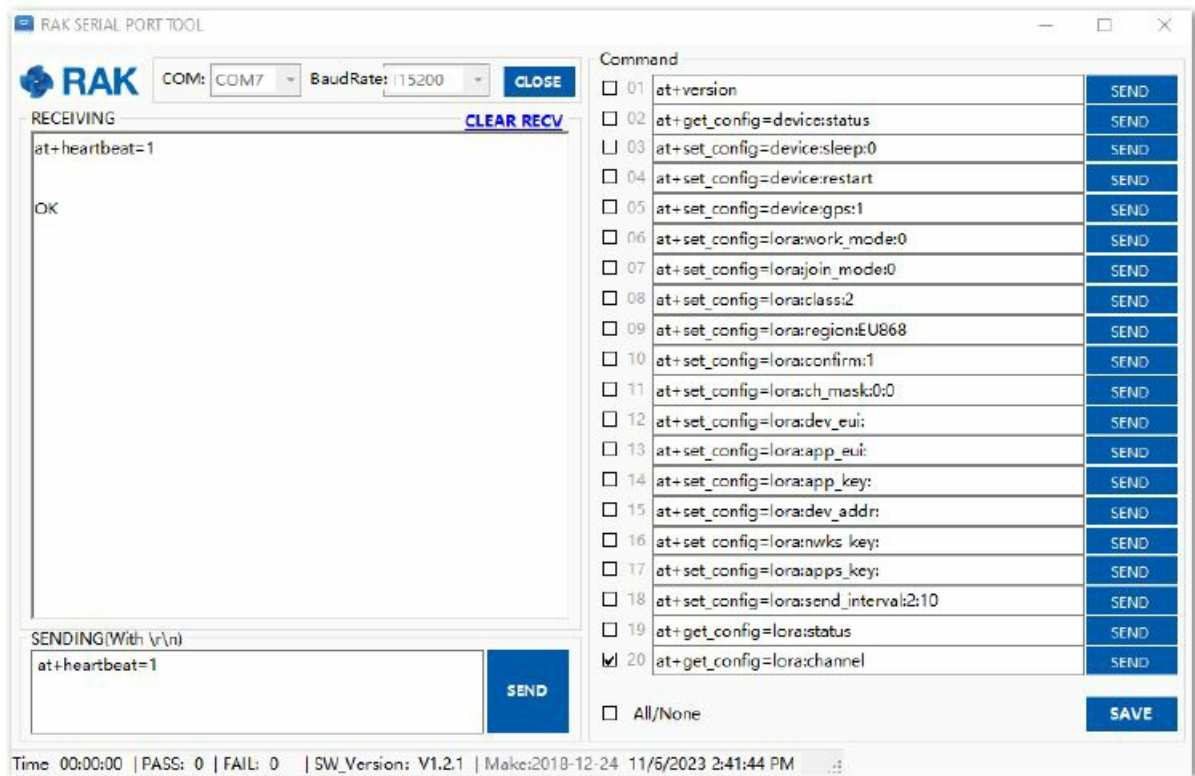


Figure 22: Set the HeartBeat interval

The HeartBeat message data format is as follows:

Headers / Payload

- 0X48 / Battery level in HEX

The battery level is represented in percentage form in hexadecimal format.

Example:

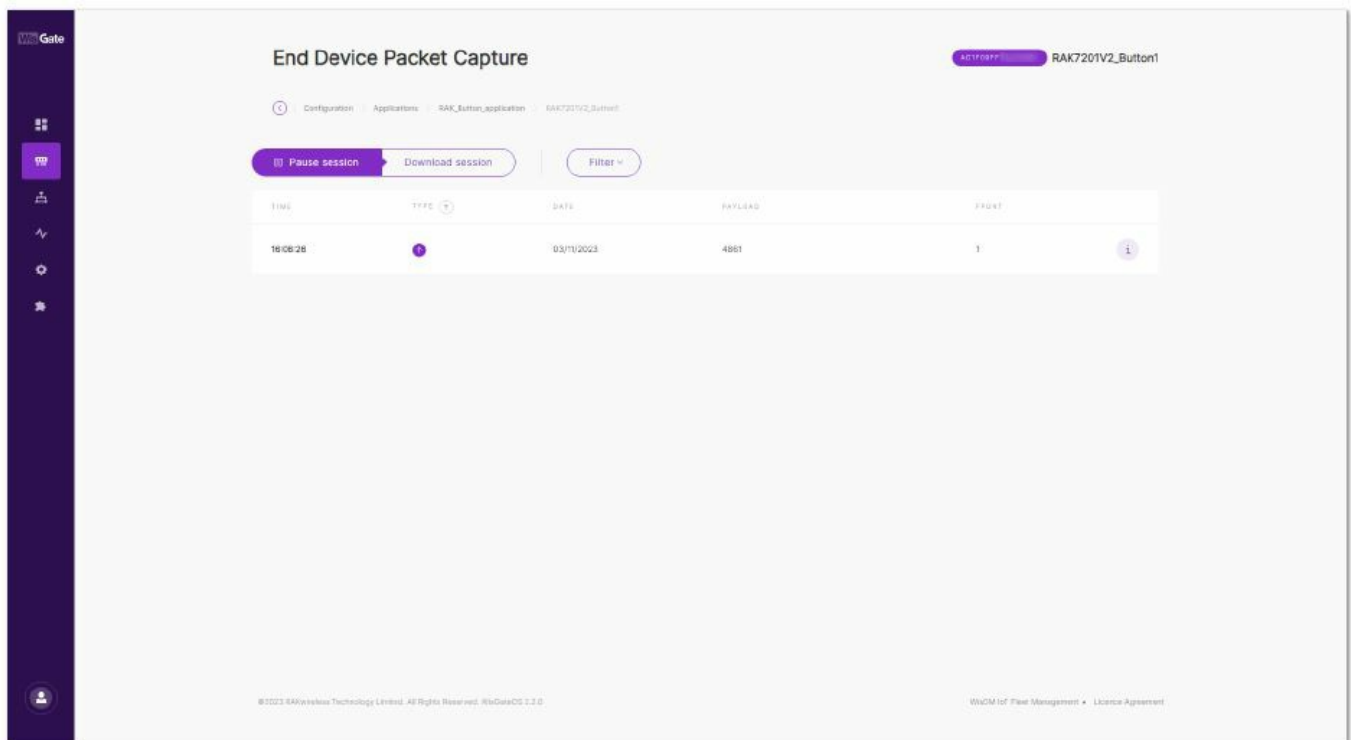


Figure 23: HeartBeat message in the Live Device Data

- If the payload message of the HeartBeat is 48 61, it represents 96% battery level.
- The device will automatically send a low-voltage alarm signal when the battery power is below 20% and again when it is below 10%.

Battery power warning signal:

Battery Power / Warning Signal

- Power is less than 20%. / 57 14
- Power is less than 10%. / 57 0a

Device Restart

Two restart options are available:

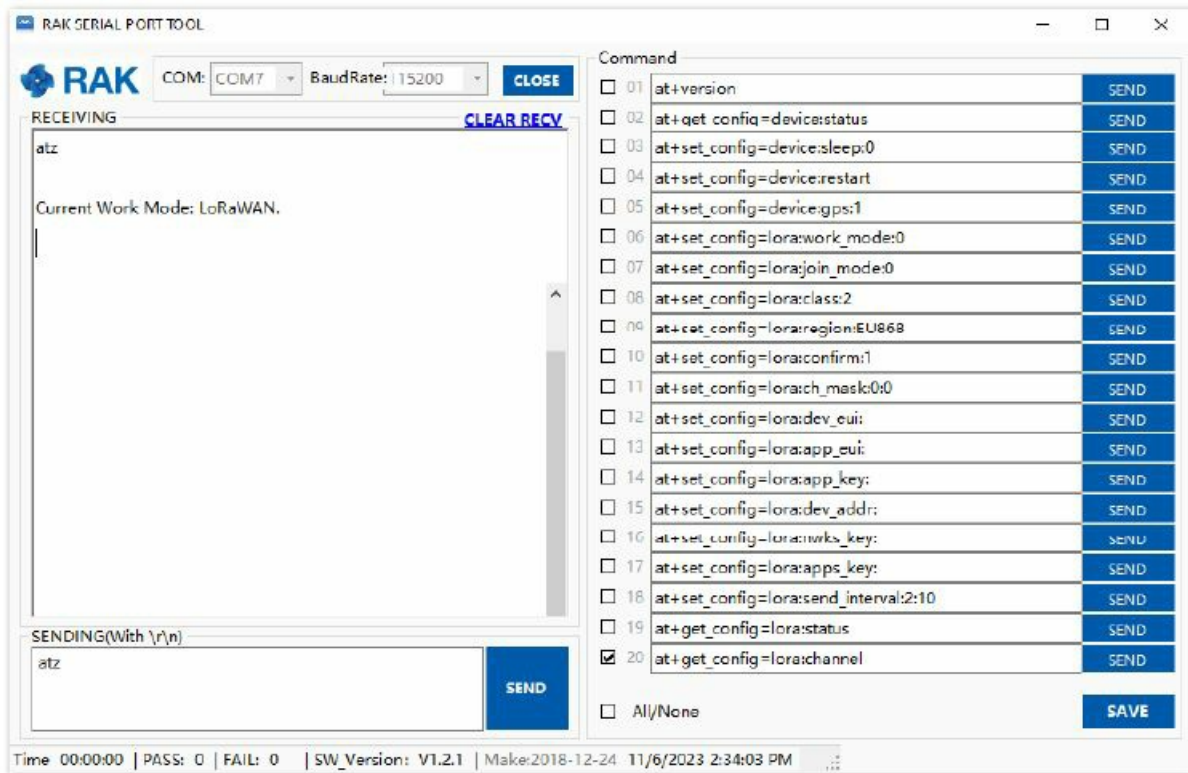


Figure 24: Restarting with an AT command

1. Using an AT command:

- atz

2. Hold Key 2 for three (3) seconds. When held, the blue LED will stay lit. It will turn off when the device is restarted.

NOTE

After restarting the device either manually or through the AT command, the RAK7201V2 will attempt to automatically join the network if the OTAA method is configured. You can identify this process through the four blue LEDs that will flash clockwise. The device will make three attempts to join the network. If the first three attempts fail, the red LED on button 4 will flash for a second. If all three attempts are unsuccessful, the device must be restarted either manually or through the AT command to make a new attempt.

Documents / Resources

	<p>RAK RAK7201V2 WisNode Button 4K [pdf] User Guide</p> <p>RAK7201V2 WisNode Button 4K, RAK7201V2, WisNode Button 4K, Button 4K</p>
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References

- [!\[\]\(6841ca9b0e023296428e7c9e683b9367_img.jpg\) RAK7240V2/RAK7240CV2 Quick Start Guide | RAKwireless Documentation Center](#)
- [!\[\]\(e258e347e7683f87061f627f84598eb5_img.jpg\) RAK7240 Quick Start Guide | RAKwireless Documentation Center](#)
- [!\[\]\(1233990ad3f0b7475c568d7bf16af31f_img.jpg\) RAK7249 Quick Start Guide | RAKwireless Documentation Center](#)
- [!\[\]\(18570b67a4686b081406cd3de636c1c3_img.jpg\) RAK7258 Quick Start Guide | RAKwireless Documentation Center](#)
- [!\[\]\(411af059a517db12f1097bc63c4fbe36_img.jpg\) RAK7268V2/RAK7268CV2 Quick Start Guide | RAKwireless Documentation Center](#)
- [!\[\]\(ed2b7fb1e3bd6514676d2ab3c70d5776_img.jpg\) RAK7289 Quick Start Guide | RAKwireless Documentation Center](#)
- [!\[\]\(63f22f364560f085b88206f094473649_img.jpg\) RAK7201V2 Firmware Upgrade Guide | RAKwireless Documentation Center](#)
- [!\[\]\(1167d0d640d4660b041f4c30896eb62c_img.jpg\) RAK7201v2 Button 4K | LoRa Smart Button | LoRa Push Button – RAKwireless Store](#)
- [User Manual](#)