


RAK2461
Wis Node
Bridge IO
Lite



RAK2461 Wis Node Bridge IO Lite User Guide

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RAK2461 Wis Node Bridge IO Lite



Product Specifications

- **Model:** RAK2461 WisNode Bridge IO Lite
- **Power Input:** 9-24 VDC / USB Type-C
- **Supported Devices:** Up to 32 RS485 devices
- **Communication Parameters:** 8-bit binary, 8-bit data bit, No parity, 1 stop bit, CRC error checking, Baud rate supports 2400, 4800, 9600 (default is 4800)

Product Usage Instructions

Installation

1. Wall Mounting:

1. Drill the wall corresponding to the device dimensions and insert the anchors in the holes.
2. Fix the device to the wall with two tapping screws.

2. DIN Rail Mounting:

1. Attach the DIN rail mounting clip on the device with two M3*6 countersink screws.
2. Mount the device to the DIN rail.

Product Configuration:

Connect the RAK2461 to the sensor using the appropriate power interface. For powering options, use either the 9-24 VDC input or the USB Type-C port for configuration only. The RS485 serial interface supports multiple devices, and the Vout pin can supply power to connected sensors.

Data Interface Connection:

When connecting to devices like the RS-FSXCS-N01-3 Ultrasonic Weather Station, ensure to match the communication parameters as specified in the product documentation. For other devices, refer to their specific manuals for accurate connection instructions.

Gateway Configuration:

To set up the Built-in Network Server on the gateway, follow the steps outlined in the WisGateOS V2 User Manual. Ensure proper configuration for seamless integration with the RAK2461 WisNode Bridge IO Lite.

FAQ

- **What is the power input range for the RAK2461 device?**

The RAK2461 device can be powered using a 9-24 VDC input or through the USB Type-C port for configuration purposes.

- **How many RS485 devices can be connected to the RAK2461?**

The RAK2461 supports connection to up to 32 RS485 devices through its serial interface.

Prerequisite

Before going through every step in the installation guide of the WisNode Bridge IO Lite, make sure to prepare the necessary items listed below:

Hardware Tools

1. RAK2461 WisNode Bridge IO Lite
2. USB configuration cable
3. Gateway in range, for Testing
4. A Windows/macOS/Linux Computer

Software Tools

IO. Box Desktop is a software application that will allow you to configure the devices from the RAK24XX series. You can download the application from here:

- [Windows](#)
- [Linux](#)
- [Mac](#)

Package Inclusions

Variant for Wall Mounting

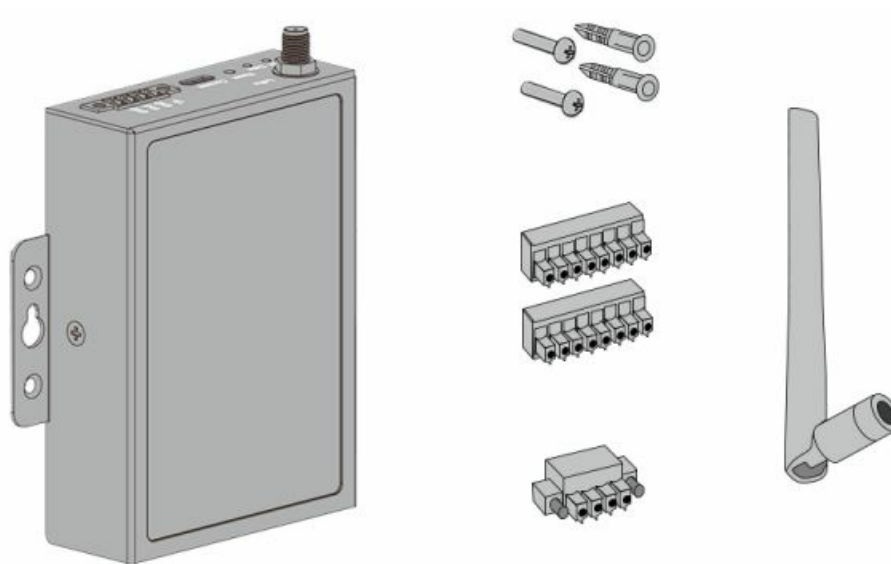


Figure 1: RAK2461 Package Inclusions 1

Variant for DIN Rail Mounting

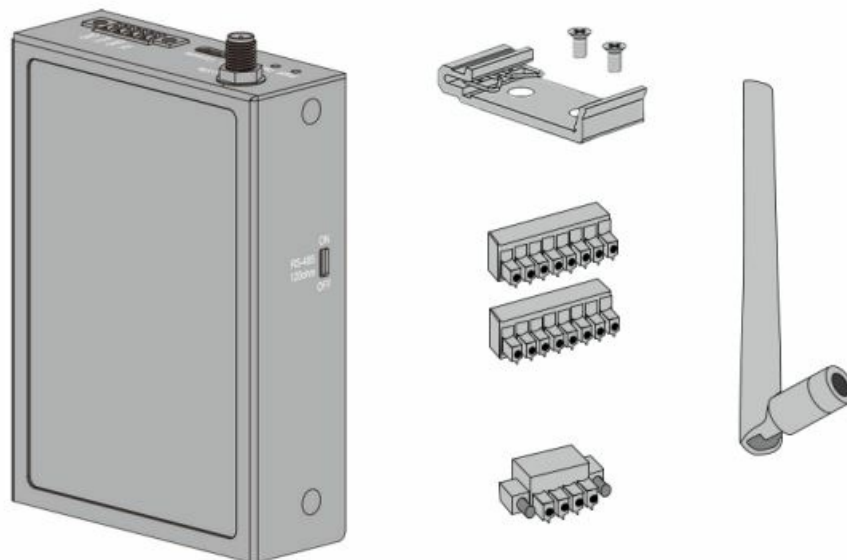


Figure 2: RAK2461 Package Inclusions 2

The package inclusions depend on the bundle you purchase.

Variant for Wall Mounting

- One (1) RAK2461 WisNode Bridge IO Lite (RS485-DIx4-DOx1 or RS485-DOx4)
- One (1) Screw Kit
- One (1) LoRa Antenna
- One (1) Power Adapter
- One (1) USB Cable (Type C to Type A)
- One (1) 4-Pin Terminal Block
- Two (2) 8-Pin Terminal Block

Variant for DIN Rail Mounting

- One (1) RAK2461 WisNode Bridge IO Lite (RS485-DIx4-DOx1 or RS485-DOx4)
- One (1) DIN rail Mounting Kit
- One (1) LoRa Antenna
- One (1) Power Adapter
- One (1) USB Cable (Type C to Type A)
- One (1) 4-Pin Terminal Block
- Two (2) 8-Pin Terminal Block

Installation

RAK2461 allows for two installation methods: wall mounting and DIN rail installation.

Wall Mounting

1. Drill the wall corresponding to the device dimensions and insert the anchors in the holes.

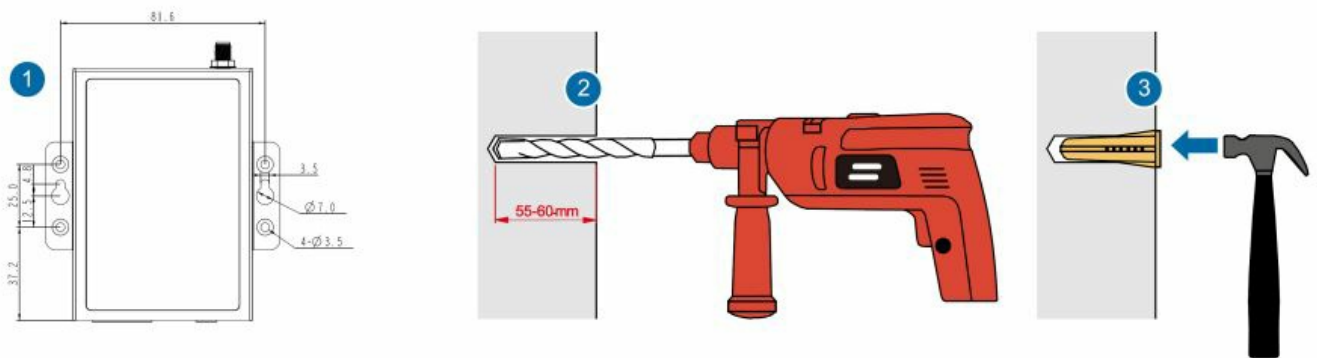


Figure 3: Hole drilling

2. Fix the device to the wall with two tapping screws.

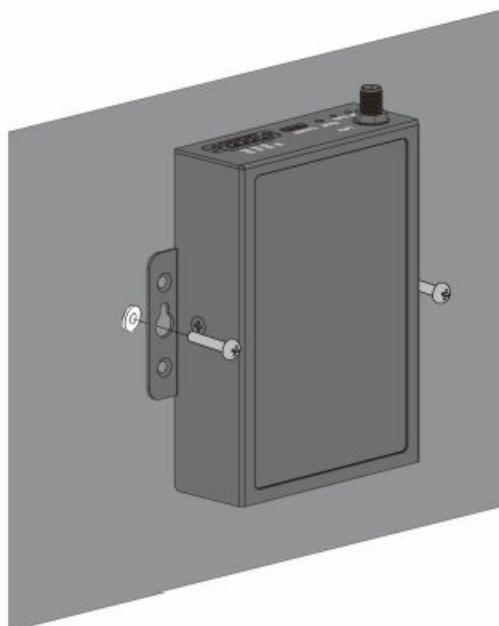


Figure 4: Wall mounting

DIN Rail Mounting

1. Attach the DIN rail mounting clip on the device with two M3*6 countersink screws.

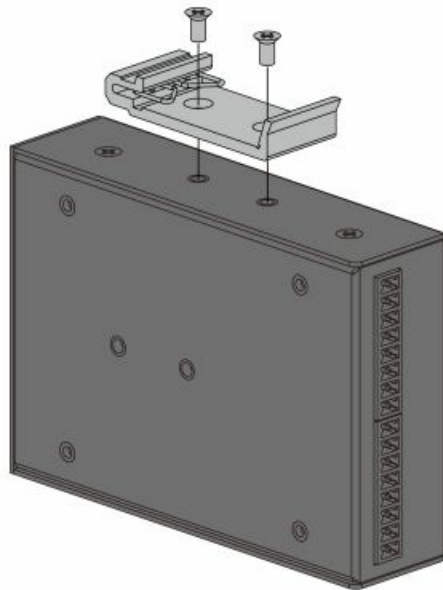


Figure 5: Attaching the clip

2. Mount the device to the DIN rail.

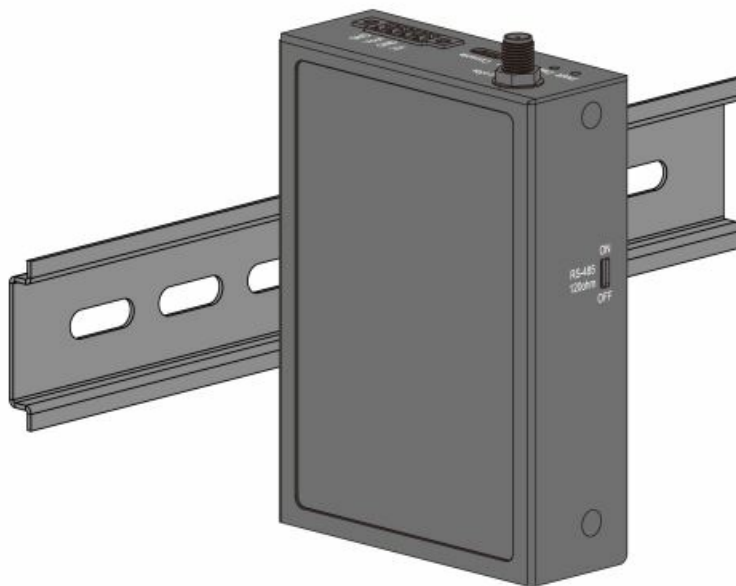


Figure 6: DIN rail mounting

Product Configuration

Typical Network Application

- RAK2461 WisNode Bridge IO Lite provides different Digital Inputs, Outputs (Relay), and RS485 communication. It can convert the data of the connected devices into LoRaWAN that can be sent to the cloud via a standard gateway. Cloud servers can also actively send data to RS485 terminals and control the DI/DO transmission to achieve two-way data transmission. Using RAK2461, what used to be a costly and time-consuming cable line network deployment can be transformed into a rapid and cost-efficient wireless network deployment.

- An example would be using the RAK7268V2 WisGate Edge Lite 2 LoRaWAN gateway coupled with the RAK WisDM cloud management platform, to realize an end-to-end industrial field data acquisition and control system. Using the built-in LoRa Server, which comes standard with any RAK LoRaWAN gateway, one could seamlessly achieve transmission of the end device data to any application server. Furthermore, the MQTT integration allows for high security and efficiency.

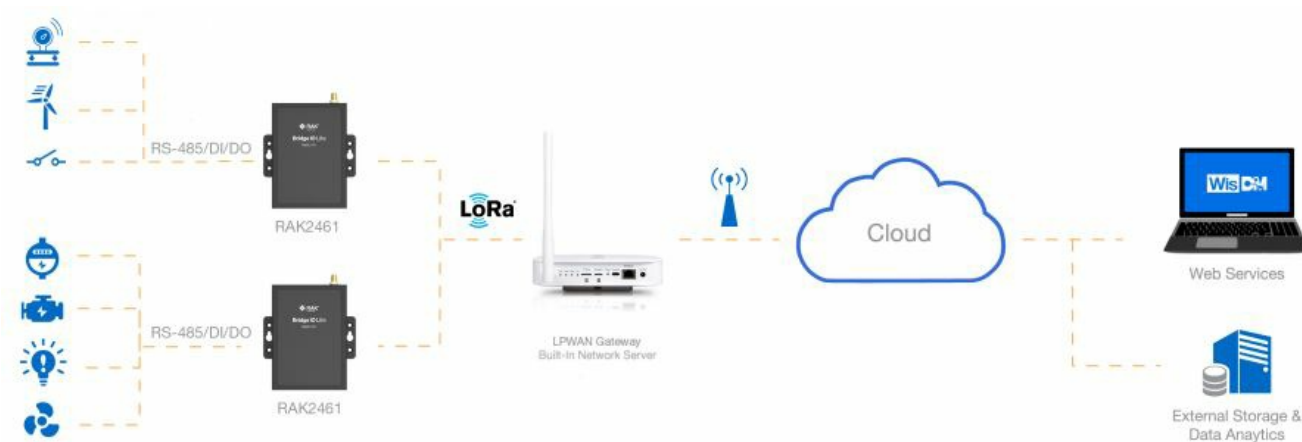


Figure 7: RAK2461 WisNode Bridge IO Lite network structure

Connect the RAK2461 to the Sensor

Power Interface Configuration

- The RAK2461 device can be powered either by:
 - 9-24 VDC input
 - USB type-C
- The USB type-C port of the device can be used for configuration. Powering the device from the type-C port will not provide power to the sensor but only to the device itself. To power the device and sensor, you should use the 9-24 VDC input of the RAK2461.
- The RS485 serial interface supports up to 32 RS485 devices. The Vout pin can supply the external power to the RS485 sensors connected to RAK2461.

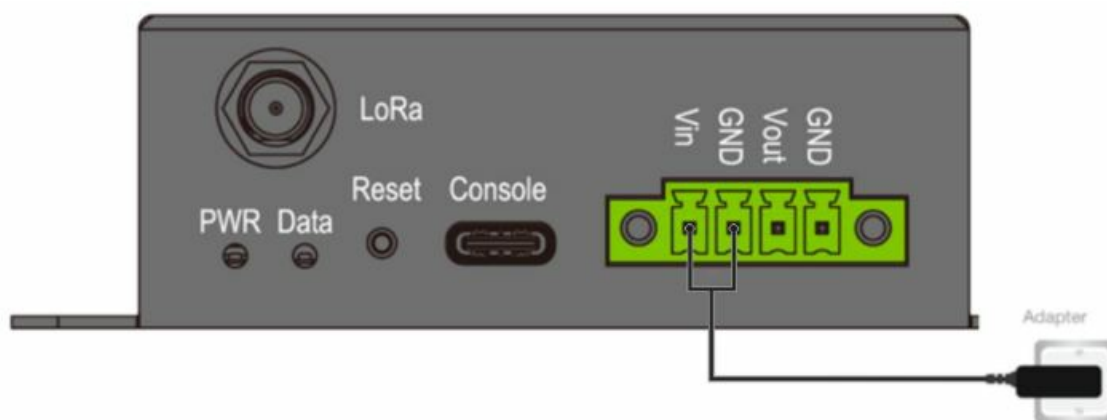


Figure 8: Power interface connection

Data Interface Connection

For this example, an RS-FSXCS-N01-3 Ultrasonic Weather Station is used. Here are the basic communication parameters of the sensor:

- **Format** 8-bit binary
- **Data** bit 8-bit
- **Parity** No
- **Stop** bit 1
- **Error checking** CRC
- **Baud rate** Supports: 2400, 4800, 9600 (default is 4800)

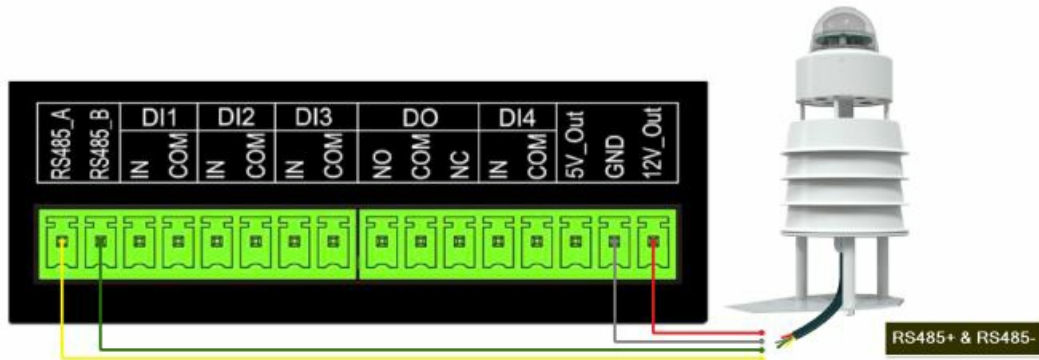


Figure 9: Data interface connection

NOTE

For connecting to other devices, read their specific documentation carefully and connect accordingly.

NOTE

For a demonstration, the RAK2461 Bridge Lite shall be connected to an RAK wireless gateway. For the gateway, the built-in LNS will be used. Listed below are the requisites for this section.

- [IOBox Desktop](#)
- [WisGateOS 2 User Manual](#) – a guide on how to configure the RAK7268 WisGate Edge Lite 2 V2
- [RS-FSXCS-N01-3 Manual](#) – guide for the Ultrasonic Integrated Weather Station

Gateway ConfigurationSet upp the Built-in Network Server

1. Start by accessing the gateway. You can see how to do it on the WisGateOS V2 user manual.

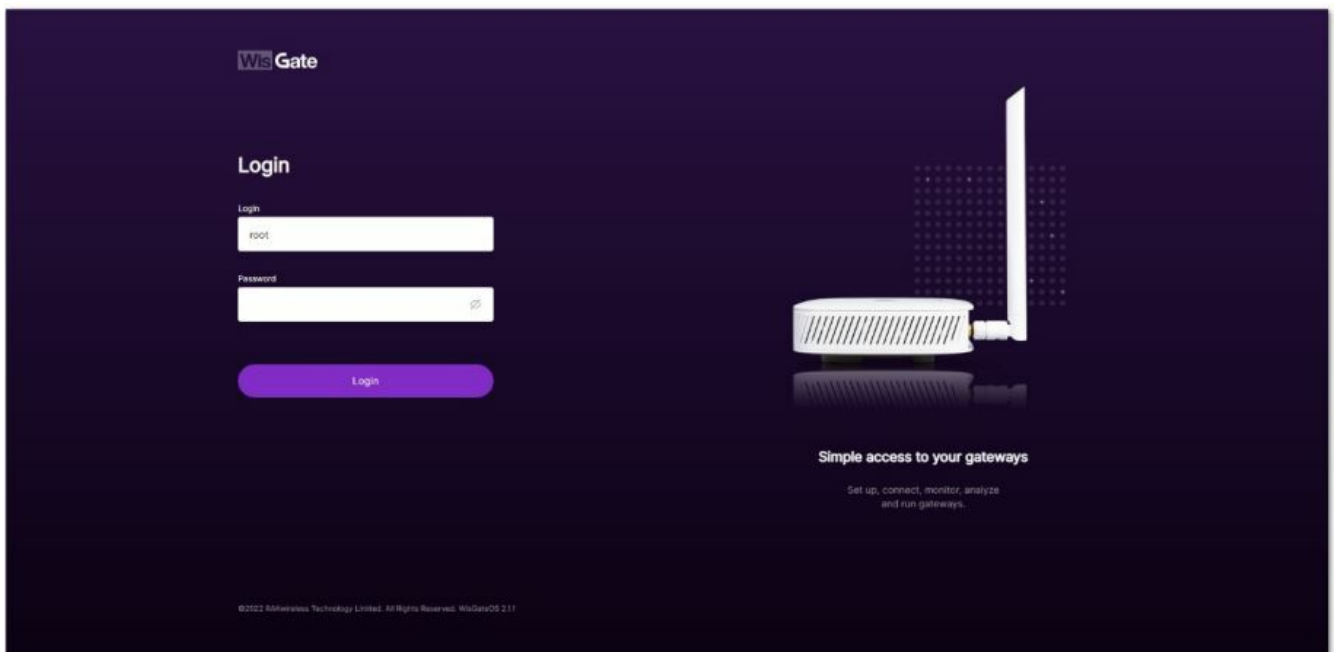


Figure 10: WisGateOS2 login page

2. Once logged in, head to the LoRa menu.

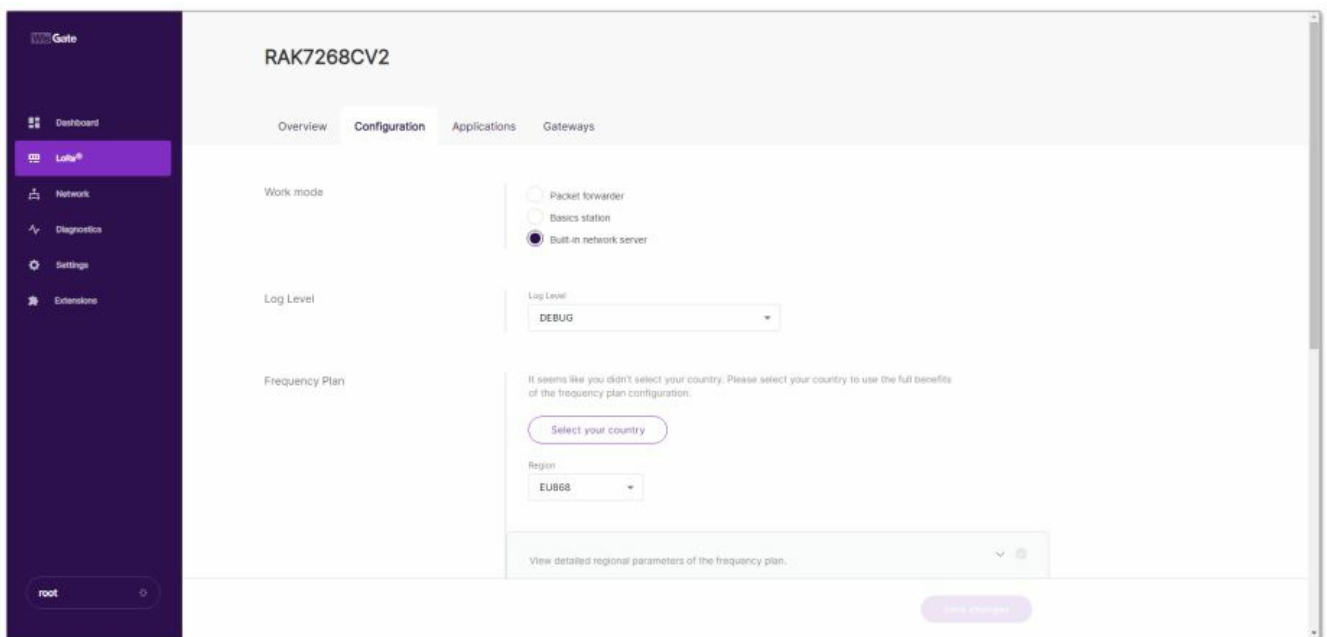


Figure 11: LoRa page

3. By default, the gateway works as a Built-In Network Server. If that is not the case, check the [Built-in Network Server Mode Settings](#) on the WisGateOS V2 User manual to switch the mode.

Adding Application

1. Once the gateway is in Built-in network server mode, head to the Applications tab.

Figure 12: Create Application in the Built-In Network Server

2. Click the Add Application button or add one now link to add a new application. On the new page, fill in the following information:
 - **Application name** – type a name for the application.
 - **Application description** – optionally you can write a description of the application.
 - **Application Type** – from the drop-down menu select the type of application.
 - **Unified Application key** – all devices will use the same application key. Selecting this option pops up an
 - **Application Key field.** You can type your application key there or use the Autogenerate button to generate one.

Figure 13: Unified application key

The Auto Add Device switch activates the Application EUI field. The device will be automatically added to the application after the application EUI and key verification.

Figure 14: Auto add device

- **Separate Application keys** – each device will have its application key. The key is added when registering the device.

- **Payload type** – from the drop-down, select CayenneLPP payload type and turn on the Only Forward data object feature.

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

Figure 15: Adding application

3. Once set, click Save application to add the application.
4. After the application is added, head to the End Devices tab. The devices should automatically register upon join request if you are using the Auto Add Device feature.

RAK_Node

Configuration Applications RAK_Node

End devices Configuration

NAME	EUI	ACTIVATION	CLASS	LAST SEEN	END DEVICE ADDRESS	LINK MARGIN	BATTERY	PACKET LOSS
dev_a01e0e0e0e0e0e0e0e0e0e0e0e0e0e0e	a01e0e0e0e0e0e0e0e0e0e0e0e0e0e0e	otaa	CLASS A	4s ago	021f5525	0 dB	Charging	0%

Items per page: 10

Figure 16: Successfully added end device

If that's not the case, click the Add End Device button. On the End device information page fill in the following information:

- Activation Mode – choose the activation mode of your device:
 - OTAA
 - **ABP** – This mode pops up two additional fields:
 - Application Session Key
 - Network Session Key

The screenshot shows a web form titled 'Activation Mode'. At the top, there are two buttons: 'OTAA' (highlighted in light blue) and 'ABP' (highlighted in light purple). Below these are two text input fields: 'End device (group) name' and 'End device description (optional)'. A toggle switch labeled 'Enable LPTP' is currently turned off. Below that is a dropdown menu labeled 'class' with 'Class A' selected. At the bottom, there are two more text input fields: 'Application Session Key' and 'Network Session Key'. Each of these fields has a purple 'Autogenerate' button to its right.

Figure 17: Adding ABP device

- **End device (group) name** – the name of the device.
- **End device description (optional)** – optionally, you can add a description for the device.
- **Class** – the class of the device.
- **Frame Counter width** – the width of the frame counter. Leave it as default.
- **LoRaWAN MAC Version** – the LoRaWAN MAC version. V1.0.2 pops up a LoRaWAN Regional Parameters reversion field where you need to select the reversion of the device.

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** ABP

End device (group) name:

End device description (optional):

☐ Enable LPTP

Class: **Class A**

Frame Counter Width: **32 bit** LoRaWAN MAC Version: **V1.0.2**

LoRaWAN Regional Parameters revision: **A**

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Cancel Add end devices

Figure 18: Successfully created application

Adding the Device

1. Once everything is set, click Add End Devices to go to the page and add the device.

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 (Main):

Step (Optional): Count (Optional):

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

End devices list 1 of 1 devices are selected

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

End devices with error 0 end devices

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

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Skip adding Add end devices

Figure 19: Adding end device

2. On the Adding End Devices page, type the device EUI at the End Device EUI (main) and click Add to “End

Devices list”.

- If the EUI is correct, the device will show in the End devices list.
- If the EUI is not correct, the devices will show in the End devices with an error.

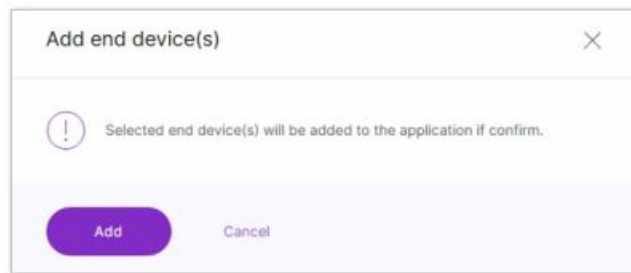


Figure 20: Confirmation message for adding a device

3. Once the device is added to the End devices list click Add End devices. Confirm you are adding the device.

RAK2461 Configuration

Connect the rak2461 to Your Network

1. Download and open the IO. Box application.
2. Connect the rak2461 to a computer using the USB type-C cable. Note that this will work for the LoRaWAN configuration, but when configuring the sensor you would need to connect the 9-24 VDC power supply to provide power to the sensor itself. Make sure that the USB type-C cable that you are using supports data transfer and that no other serial software is connected to the COM port that RAK2461 uses.
3. Click Connect Device in the IO. Box console.

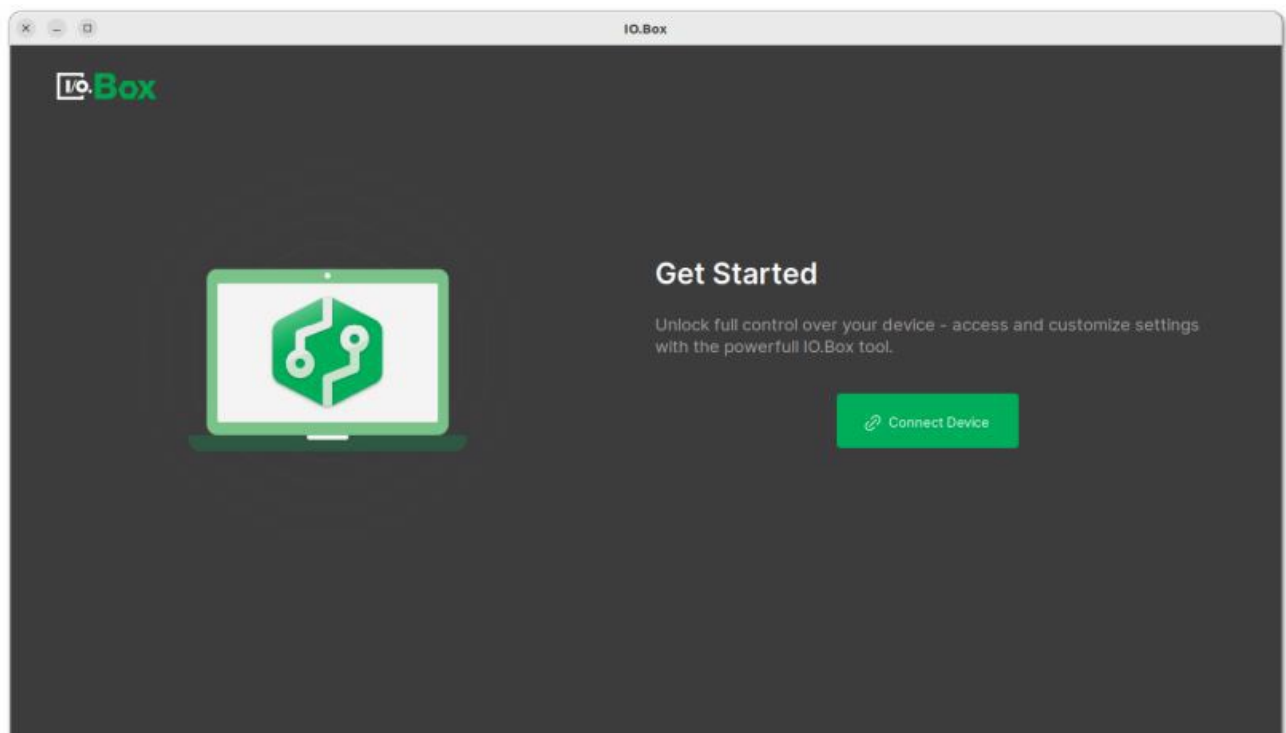


Figure 21: IOBox get started

If an error occurs that shows no device detected, here are some possible causes for that and how to fix it:

- Double-check the quality of the USB cable and if the correct COM port is used.
- Check if other terminal software is active and still connected to the RAK2461.

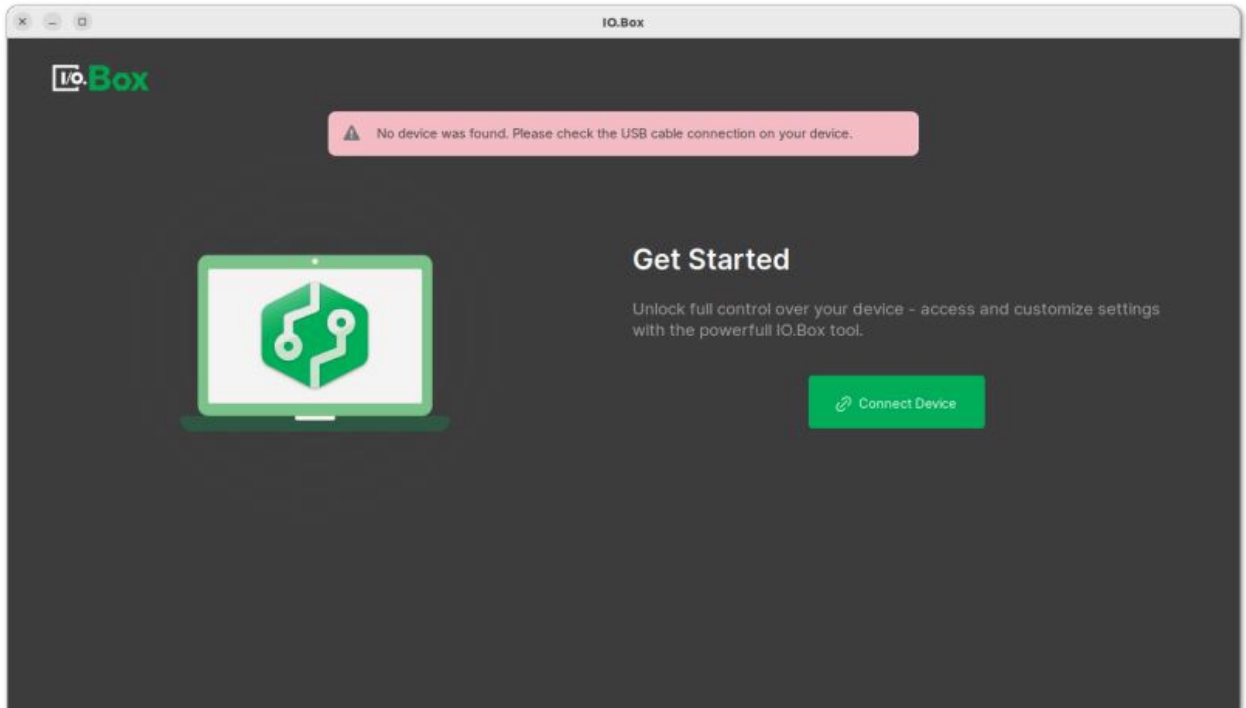


Figure 22: No device error

4. On the IO . Box dashboard screen, you can see information about the devices connected to the PC in the form of a list of connected devices with device models and EUIs. Choose the device that you wish to configure via the Connect button next to it.

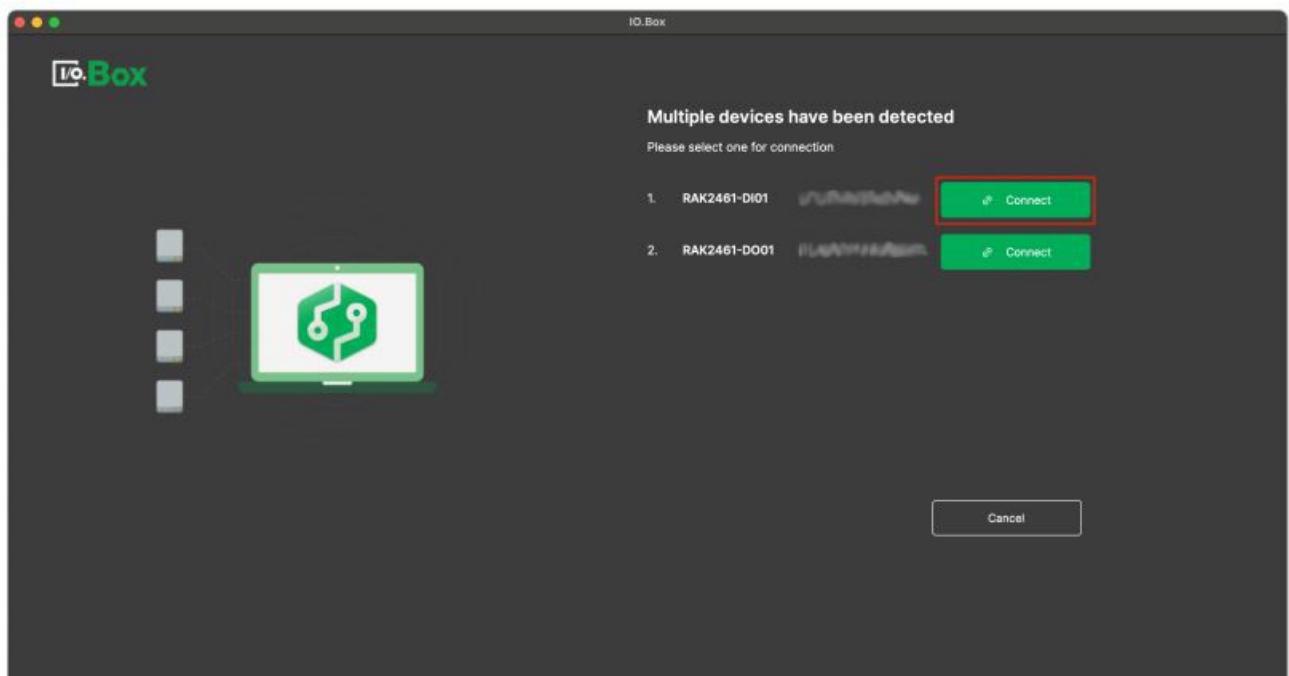


Figure 23: List of connected devices

5. On the main menu to the left, choose LoRaWAN to configure the LoRaWAN settings as needed. Do not forget to click Save below the changes.
 - **Device EUI** – This is the unique identifier provided by RAKwireless.
 - **Region** – The LoRaWAN region/band.

- **Class** – The LoRaWAN class (C).
- **Join Mode** – Choose between OTAA and ABP according to LoRaWAN protocol.
- **Application EUI** – Enter the unique identifier assigned by the application server.
- **Application Key** – Enter the unique secure key assigned by the application server.
- **Confirm Mode** – Activate to receive confirmation messages from the network server for each uplink.
- **ADR** – Enable Adaptive Data Rate allowing the network server to control the data rate for your device.
- **DataRate** – Manually set the data transmission rate. Lower rates extend coverage but increase transmission time and power usage. Choose based on the distance and signal quality to the gateway.
- **TX Power Level** – Adjust the transmission power level. The lower the number the higher the power. 0 is the maximum allowed in the selected region and each incrementation of 1 to the number reduces the power by 2 dBm.
- **Data Report Interval** – Set up the global data report period of the device. Range: 60–86400 in seconds.
- **LoRaWAN Status** – Indicates the activity of the device in the LoRaWAN network.
- To check the previously configured Application EUI and Key, run the commands:

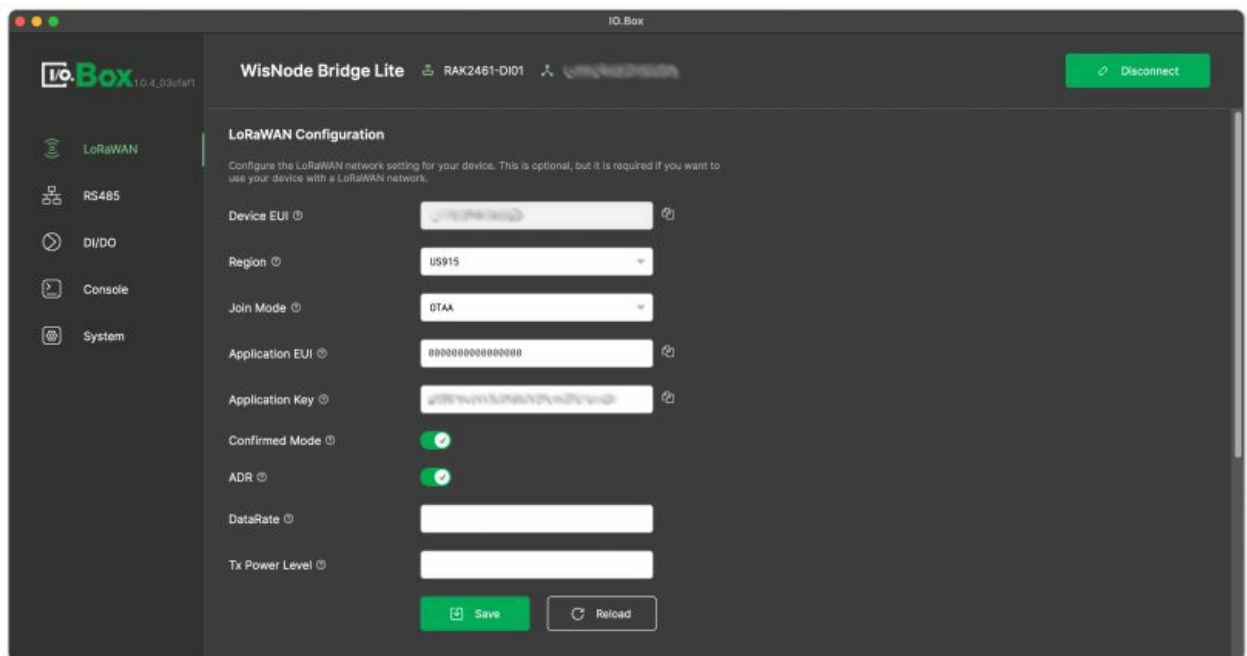


Figure 24: LoRaWAN tab

6. Make sure you've added the RAK2461 WisNode Bridge IO Lite to the LoRaWAN Network Server of choice (Built-in LNS in this example).
7. After the device has successfully joined the LNS, you will see the LoRaWAN status toggle as activated. You might need to refresh the page.

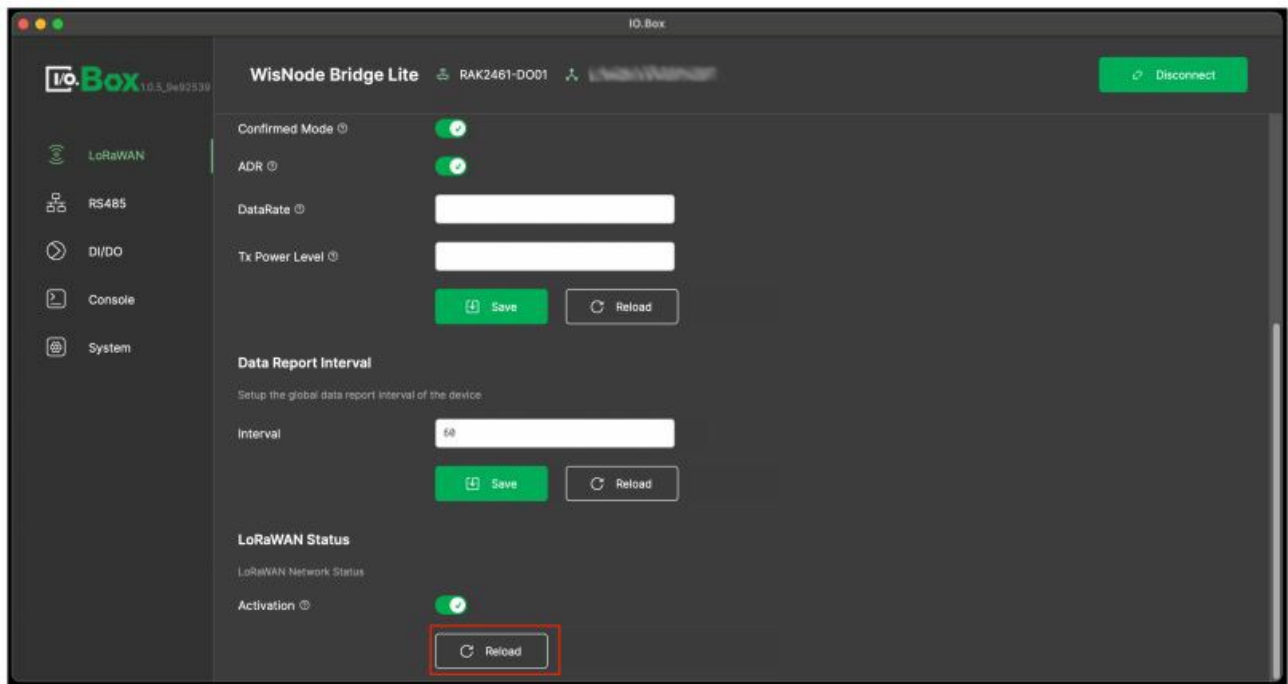


Figure 25: LoRaWAN status

RS485 Configuration

RS485 Interface Configuration

Go to the RS485 tab from the main menu and configure the interface according to the sensor/device you are connecting to. Do not forget to save your changes. In this tab you will find:

- **Baudrate** – Select the communication speed for the RS485 interface, measured in bits per second. Choose a rate that matches your device's requirements.
- **Databits** – Select the number of data bits for each character in the RS485 communication. Typically, options include 7 or 8 bits, depending on your device's protocol requirements.
- **Stopbits** – Select the number of stop bits used in the RS485 communication. Common options are 1 or 2, depending on your device's data transmission protocol.
- **Parity** – Select the parity setting for the RS485 interface. Options typically include None for no parity, Even for even parity, or Odd for odd parity. Choose based on your device's communication requirements.

WisNode Bridge Lite RAK2461-DO01

RS485 Interface Configuration

Configure devices to communicate over RS485.

Baudrate ② 9600

Databits ② 8

Stopbits ② 1

Parity ② None

Save **Reload**

Figure 26: RS485 interface configuration

Add Modbus Poll Task

In the Modbus Poll Task menu click + Add for a new poll. You will see the Polling Task parameters that need to be configured.

Modbus Poll Task

Configure LoRaWAN poll tasks to collect data from devices.

Search

Export **Import**

Task ID	Address	Function	Register	Quantity	Data Type	Scale	Sensor Type	Remark	Enabled	Value
1										

< PREV 1 NEXT > Items Per Page 100

+ Add **- Delete** **Reload**

Figure 27: Add poll task

- **Task ID** – Enter the identifier for the polling task. This ID is included in the device's uplink data to indicate the task.
- **Device Address** – The Modbus slave address in decimal format. Range: 1-254.
- **Function Code** – The Modbus function code defines this poll's operation.
- **Register Addr** – The address of the register that you wish to access in hexadecimal format.
- **Quantity** – The number of registered addresses that you want to access.
- **Data Type** – The data type of the Modbus response.
- **Scale** – To adjust the raw data from the Modbus response to the desired units. For example, to convert kilograms to grams set the scale to X1000.
- **Remark** – Length: 15 characters.
- **Enable** – Enable or disable this polling task.
- **Sensor Type** – Choose the unit of the data obtained from the Modbus slave device. If no exact match is available, select Generic X as a default option.

- **Modbus Request** – Displays the Modbus command generated based on the settings you've selected above. This command will be used to communicate with the Modbus device.
- **Modbus Response** – Displays the response received from the Modbus slave device.
- **Value** – This shows the data extracted from the Modbus Response is parsed according to the above configuration.
- **Uplink Data** – Displays the data payload format that will be sent to the server, based on the configuration above.
- **Check** – Modbus CRC check. Before saving the task click Check for automatic validation.
- **Save** – Save the polling task.

The screenshot shows a window titled "Add New Polling Task" with a dark background. It contains two main sections: "Polling Task parameters" and "Check the polling task".

Polling Task parameters:

- Task ID: Input field with value "1".
- Function Code: Dropdown menu showing "03 - Read Holding Register".
- Quantity: Input field with value "1".
- Scale: Input field with value "1".
- Enable: Toggle switch, currently turned on (green).
- Sensor Type: Dropdown menu showing "Generic Integer (32bit), Min:-2147483648, MAX:2147483647".
- Device Address: Input field with value "1".
- Register Addr: Input field with value "0001".
- Data Type: Dropdown menu showing "INT16_BE - Integer (16bit)".
- Remark: Empty input field.

Check the polling task:

- Modbus Request: Empty input field.
- Modbus Response: Empty input field.
- Value: Empty input field.
- Uplink Data: Empty input field.

At the bottom, there are two buttons: "Check" (with a circular arrow icon) and "Save" (with a floppy disk icon).

Figure 28: Polling task parameters

Creating a Raw Data in Binary Poll Task

- Fill in the registered address and other relevant fields according to the specific sensor's datasheet, then after clicking the Check button, you will see the Reply Frame on the IO. Box.

Polling Task parameters

Task ID

1

Device Address

1

Function Code

03 - Read Holding Register

Register Addr

01F4

Quantity

1

Data Type

Modbus RTU

Scale

Enable

☒

Remark

Sensor Type

Raw Data in Binary

Check the polling task

Modbus Request

010301F40001C404

Modbus Response

010302007D7865

Value

010302007D7865

Uplink Data

01F107010302007D7865

Check

Save

Communication protocol example and explanation

Example: Read the real-time wind speed value of the value of the transmitter device (address 0x01)

Integration frame

Address code	Function code	Starting address	Data length	Check code low byte	Check code high byte
0x01	0x03	0x01 0xF4	0x00 0x01	0xC4	0x04

Reply frame

Address code	Function code	Starting address	Data length	Check code low byte	Check code high byte
0x01	0x03	0x02	0x00 0x7D	0x78	0x65

Real-time wind speed calculation:
Wind speed: 007D (hexadecimal) = 125 → wind speed = **1.25 m/s**

Figure 29: Fill-in sensor specific data

- After saving the polling task, wait awhile and you will see the uplink data from the LoRaWAN network. The format of the uplink message would be as follows: TaskID + Sensor Type + Length + Value

```
01 + f1(Raw Data in Binary) + 07 + 010302007d7865
```

sh

Gate

End Device Packet Capture

Configuration

Applications

example

example

Pause session

Download session

Filter

TIME	TYPE	DATA	DEPLDAS	FDDET
15:32:48		01052024	010302007d7865	1

Figure 30: Uplink data

Creating a Wind Speed Poll Task – Example

- Fill in the relevant fields according to the specific sensor's datasheet, then after clicking the Check button, you will see the Reply Frame on the IO. Box.

Edit Polling Task

Polling Task parameters

Task ID ②: 2

Device Address ②: 1

Function Code ②: 03 - Read Holding Register

Register Addr ②: 01f4

Quantity ②: 1

Data Type ②: UINT16_BE - Unsigned integer (=6b)

Scale ②: 0.01

Enable ②: ☒

Remark:

Sensor Type ②: Wind Speed, m/s, Resolution:0.01m/s, Min:0.0, MAX:655.35

Check the polling task

Modbus Request ②: 010301f40001c404

Modbus Response ②: 010302007d7865

Value ②: 1.25m/s

Uplink Data ②: 0292007d

Figure 31: Fill in sensor specific data

- After saving the polling task wait awhile and you will see the uplink data from the LoRaWAN network in the gateway Web UI. The format of the uplink message would be as follows: TaskID + Sensor type + Value

```
02 + 92(Wind Speed) + 007D(Hex) 125(Dec) 1.25m Wind Speed
```

End Device Packet Capture

Configuration Applications example example

TIME	TYPE	DATE	PAYLOAD	PPSID
10:38:21	Uplink	2024/05/10	0292007d	1

Figure 32: Uplink data

Click Reload to Fetch the Latest Uplink Data

Modbus Poll Task

Configure LoRaWAN poll tasks to collect data from devices.

Search

Export Import

<input type="checkbox"/>	Task ID	<input type="checkbox"/>	Address	<input type="checkbox"/>	Function	<input type="checkbox"/>	Register	<input type="checkbox"/>	Quantity	<input type="checkbox"/>	Data Type	<input type="checkbox"/>	Scale	<input type="checkbox"/>	Sensor Type	<input type="checkbox"/>	Remark	<input type="checkbox"/>	Enabled	<input type="checkbox"/>	Value
<input type="checkbox"/>	1		1		03		01f4		1		Modbus ADU		1.0		Raw Data in Binary (Mo				<input checked="" type="checkbox"/>		010302007d7865
<input type="checkbox"/>	2		1		03		01f4		1		UINT16_BE - Unsigne		0.01		Wind Speed, m/s, Resol				<input checked="" type="checkbox"/>		1.25m/s

Figure 33: Fetching latest uplink

Search Task

Modbus Poll Task

Configure LoRaWAN poll tasks to collect data from devices.

Search

Export Import

<input type="checkbox"/>	Task ID	<input type="checkbox"/>	Address	<input type="checkbox"/>	Function	<input type="checkbox"/>	Register	<input type="checkbox"/>	Quantity	<input type="checkbox"/>	Data Type	<input type="checkbox"/>	Scale	<input type="checkbox"/>	Sensor Type	<input type="checkbox"/>	Remark	<input type="checkbox"/>	Enabled	<input type="checkbox"/>	Value
<input type="checkbox"/>	2		1		03		01f4		1		UINT16_BE - Unsigne		0.01		Wind Speed, m/s, Resol				<input checked="" type="checkbox"/>		1.25m/s

Figure 34: Search task

Sorttasks based on the Task ID, Address, Function Code, Register Address, Data Type, Sensor T, type or Remark

Modbus Poll Task

Configure LoRaWAN poll tasks to collect data from devices.

Search

Export Import

<input type="checkbox"/>	Task ID	<input type="checkbox"/>	Address	<input type="checkbox"/>	Function	<input type="checkbox"/>	Register	<input type="checkbox"/>	Quantity	<input type="checkbox"/>	Data Type	<input type="checkbox"/>	Scale	<input type="checkbox"/>	Sensor Type	<input type="checkbox"/>	Remark	<input type="checkbox"/>	Enabled	<input type="checkbox"/>	Value
--------------------------	---------	--------------------------	---------	--------------------------	----------	--------------------------	----------	--------------------------	----------	--------------------------	-----------	--------------------------	-------	--------------------------	-------------	--------------------------	--------	--------------------------	---------	--------------------------	-------

Figure 35: Sort task

Export an Existing Task List and Import it into Another. Node

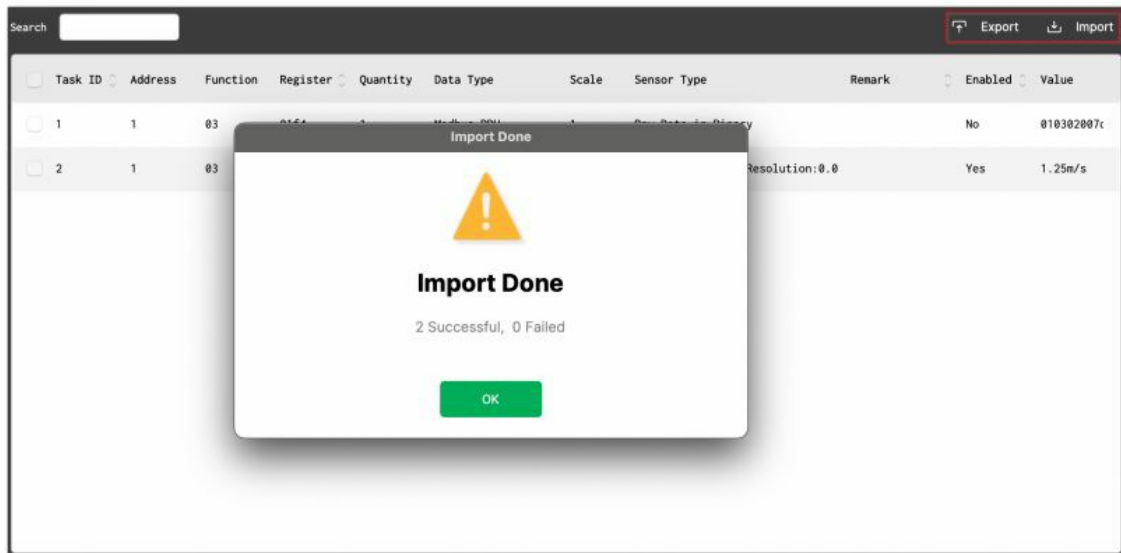


Figure 36: Export/Import task

Digital Input/Output Configuration

From the main menu off IO. Box, go to the DI/DO tab and configure the interface according to the sensor/device you are connecting to. Do not forget to save your changes. In this tab you will find:

- **Port ID** – The identifier of the digital input port. You can find the port ID on the device's enclosure label.
- **Task ID** – An identifier of the polling task. The ID will be included in the uplink data to indicate the source of the data.
- **Debounce** – Set a delay (Range: 50-2000 ms) to stabilize the signal from a switch or button, ensuring only a single action is registered and eliminating false triggers due to contact bounce.
- **Input State** – Displays this digital input port's status (active or inactive).
- **Output State** – Toggle to change this digital output port's current state (active or inactive).
- **Enable** – Toggle to activate the polling task for this port, allowing it to report the port's state.

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Port ID ⓘ	Task ID ⓘ	Debounce ⓘ	Input State ⓘ	Enable ⓘ
DI1	201	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>
DI2	202	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>
DI3	203	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>
DI4	204	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>

Save

Reload

Digital Output

Set up and manage the digital output signals, including configuring polling tasks to monitor their states.

Port ID ⓘ	Task ID ⓘ	Output State ⓘ	Enable ⓘ
DO1	209	<input type="checkbox"/>	<input type="checkbox"/>

Save

Reload

Figure 37: DI/DO parameters

Connecting a PIR Motion Sensor With Digital Input

For this example, a DH-ARD631-50 Outdoor active PIR sensor is used in the following way:

1. Have two devices, one transmitter and one receiver.
2. The transmitter's POWER(1/2) is connected to the Vout and GND of the bridge.
3. The receiver's POWER(2/3) is connected to the 12V_Out and GND of the bridge.
4. The receiver's ALARM(5/6) is connected to the DI4 COM and DI4 IN of the bridge.

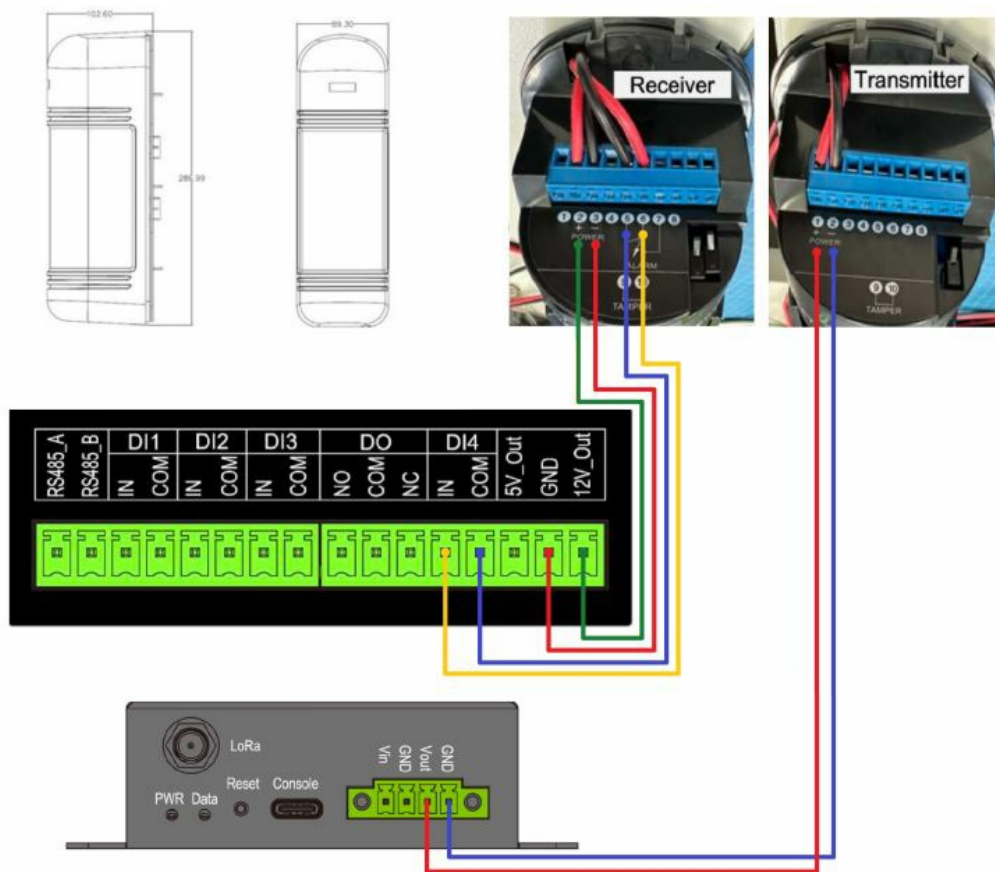


Figure 38: Sensor to Bridge wiring

5. Enable the DC Vout and the 12 VDC power outputs in the IO. Box console, located in the System tab.

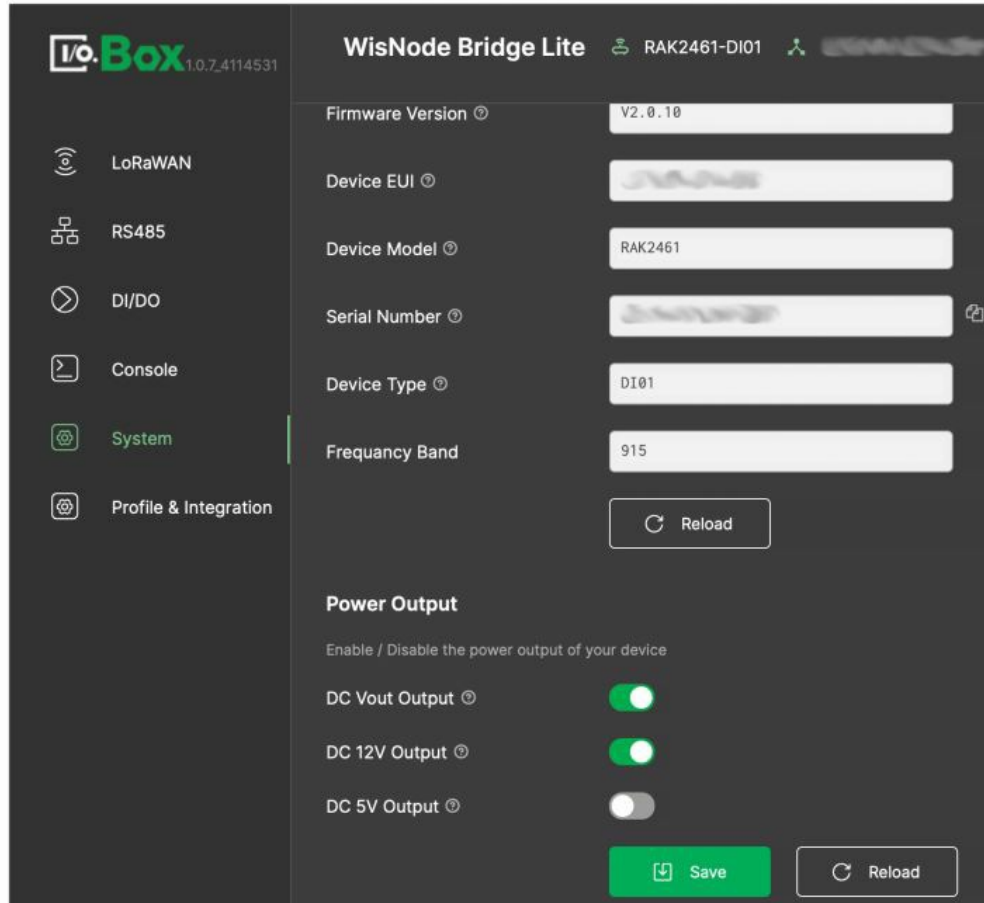


Figure 39: Enabling power outputs

6. After enabling DI4 and reloading, you will see the input state enabled.

Digital Input

Set up polling tasks to monitor and read the status of digital inputs

Port ID ⓘ	Task ID ⓘ	Debounce ⓘ	Input State ⓘ	Enable ⓘ
DI1	201	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>
DI2	202	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>
DI3	203	<input type="text" value="50"/>	<input type="checkbox"/>	<input type="checkbox"/>
DI4	204	<input type="text" value="50"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 40: Enabling DI4

7. When triggered, the LNS will receive the packet after the debounce time or a periodic uplink.

Digital Output for Switching Applications

1. You can connect any module or device to the port of the Digital Output as long as it operates on the recommended voltage rating.

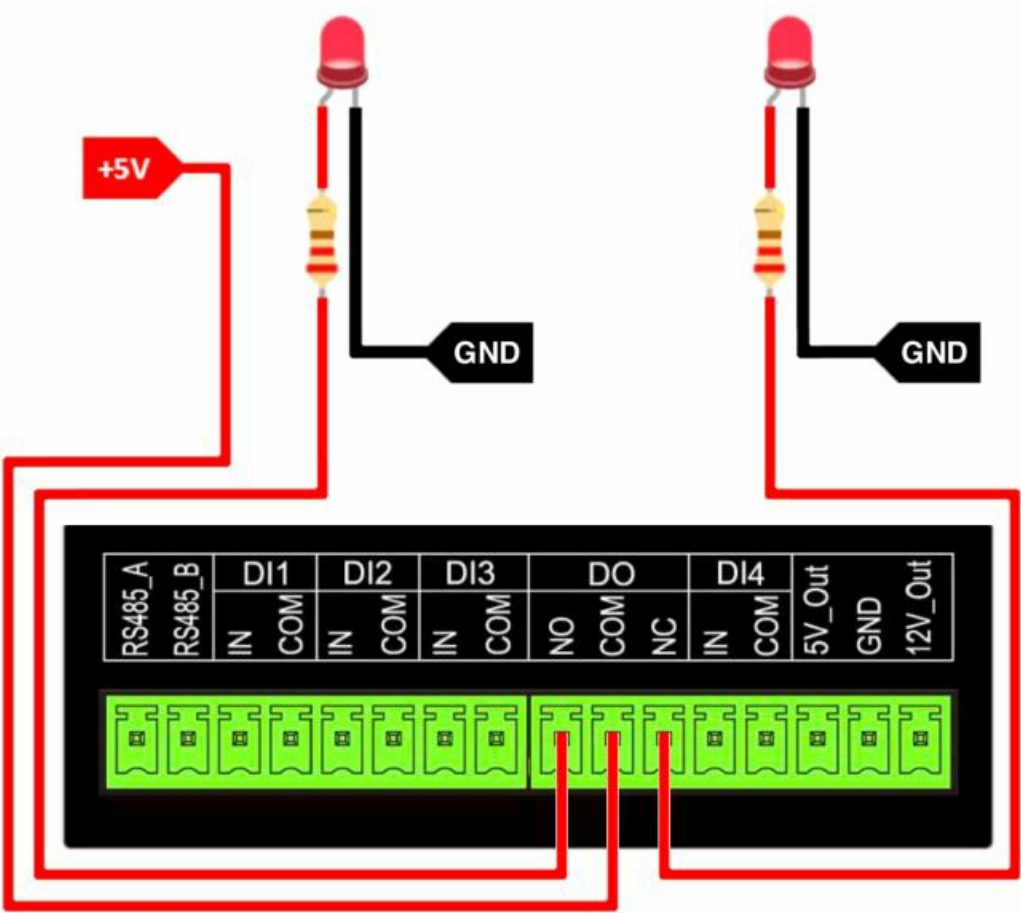


Figure 41: Wiring

2. When the output is enabled enable it in the IO. Box console, the left bulb is supplied, when it is disabled, the right bulb is supplied.

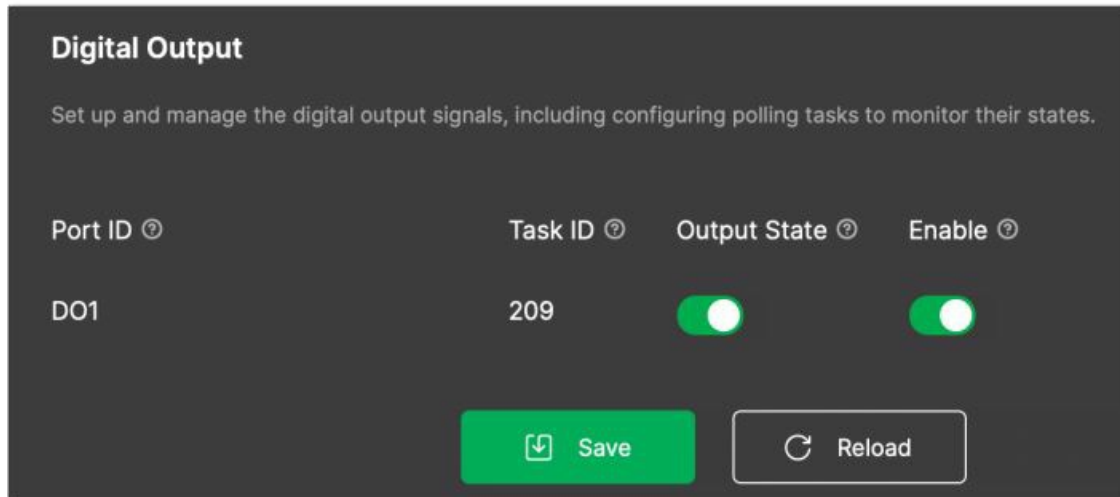


Figure 42: Output state

3. Additionally, modifications can be made through a Downlink message.

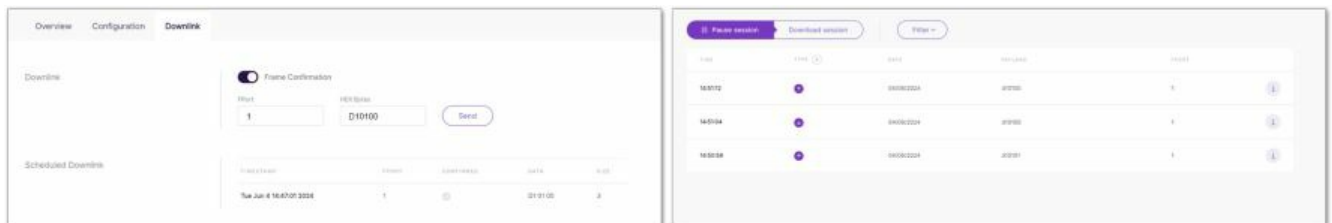


Figure 43: Downlink

System

From the main menu of IO.Box, go to the System tab to find device information for the RAK2461 as well as power output toggles and firmware update options. Do not forget to save your changes. In this tab you will find:

- **Hardware Version** – Displays the specific version of the device's hardware.
- **Firmware Version** – Displays the device's firmware version.
- **Device EUI** – Displays the unique identifier assigned by the manufacturer.
- **Device Model** – Displays the specific model name or number of the device.
- **Serial Number** – Displays the device's serial number of the device.
- **Device Type** – Indicates the category or classification of the device, defining its interface types and functionalities. For detailed specifications refer to the device's model information.
- **Frequency Band** – The device's frequency band.
- **DC Vout Output** – Toggle to enable or disable the Vout power output. When enabled, Vout passes through the same voltage as the Vin input.
- **DC 12V Output** – Toggle to enable or disable the 12V_Out power output. When enabled, it provides a 12 V / 0.5 A power output.
- **DC 5V Output** – Toggle to enable or disable the 5V_Out power output. When enabled, it provides a 5 V / 0.5 A power output.

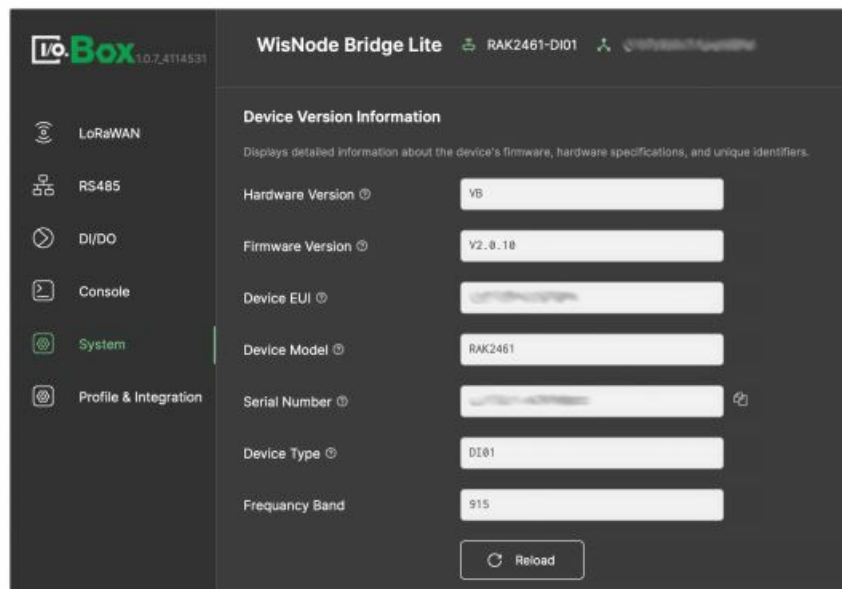


Figure 44: System information overview

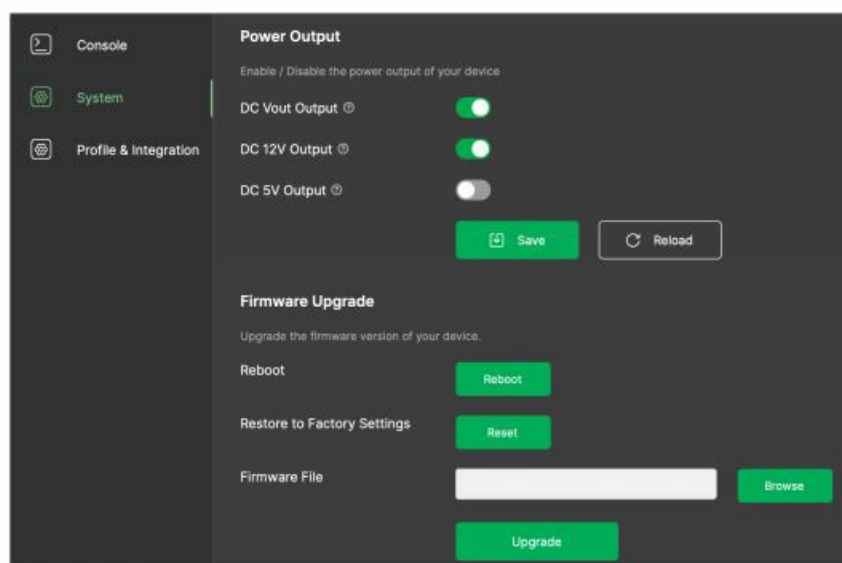


Figure 45: System information overview

Reboot

Simply press the Reboot button under the Firmware Upgrade section.

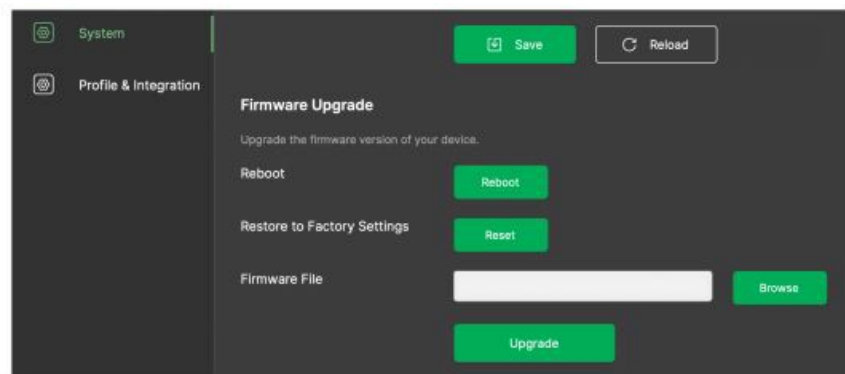


Figure 46: Reboot button

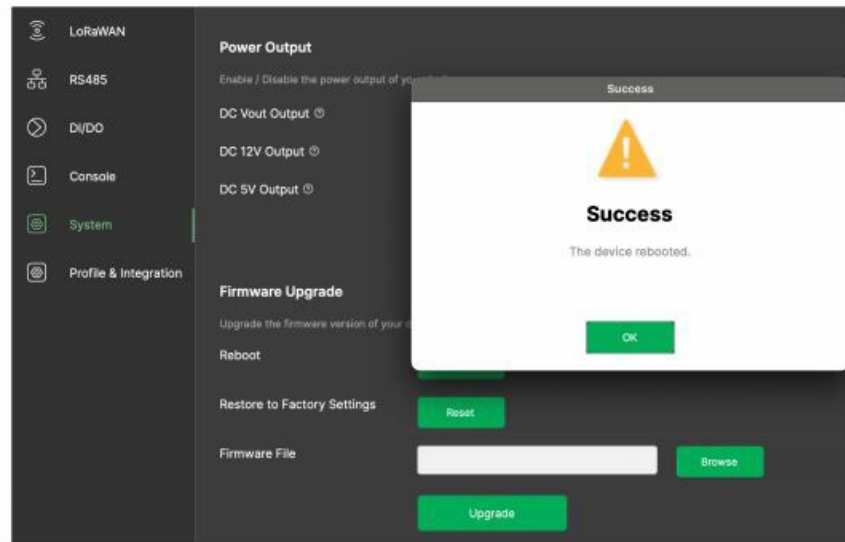


Figure 47: Successful reboot

Factory Reset

To restore the device to factory settings, press the Reset button under the Firmware Upgrade section and wait for the process to be completed.

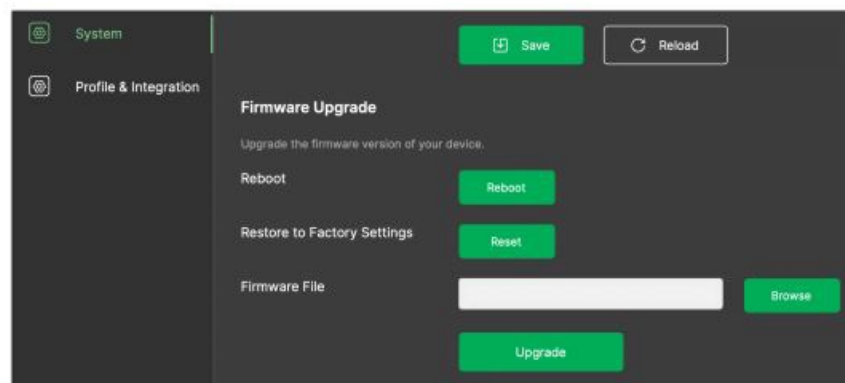


Figure 48: Reset Button

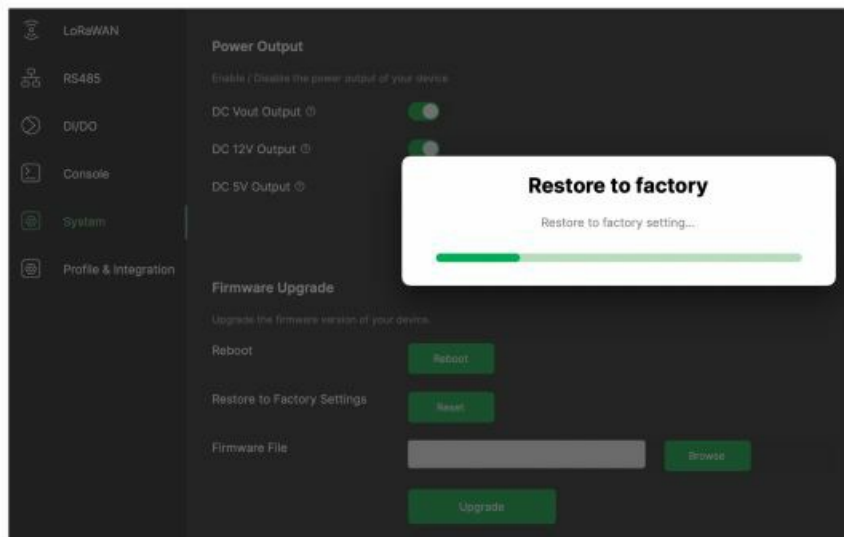


Figure 49: Reset progress

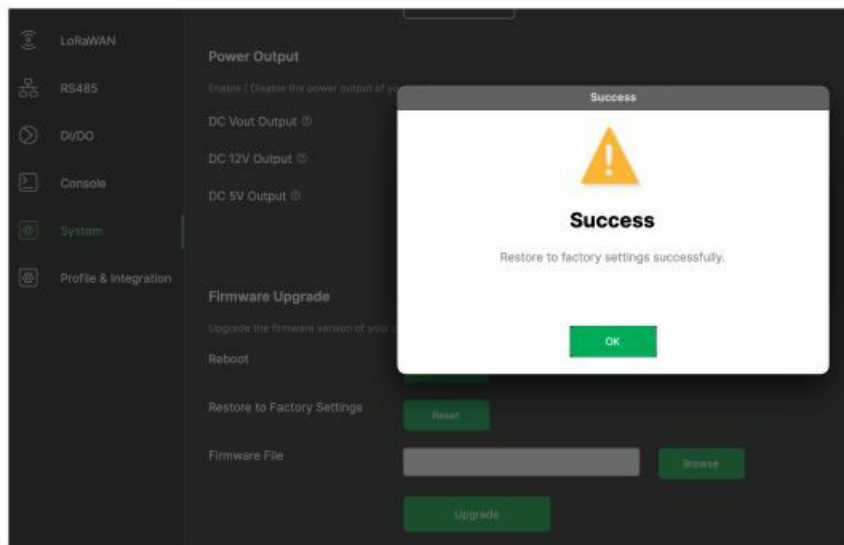


Figure 50: Successful reset

Firmware Update

Normal Firmware Update

1. After downloading the latest firmware, click Browse.

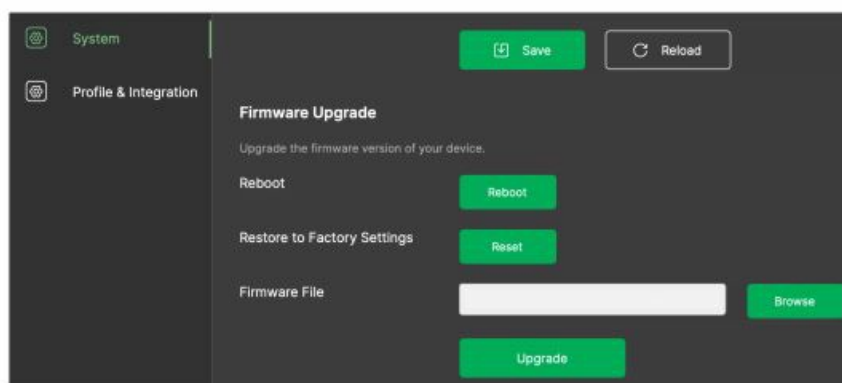


Figure 51: Browse button

2. Select the correct file.

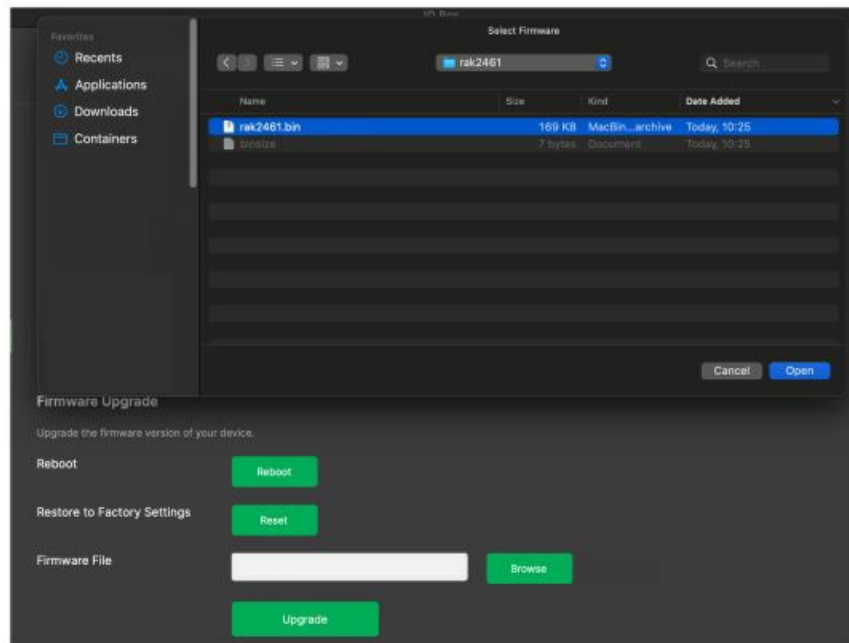


Figure 52: Selecting the file

3. Click Upgrade and wait for the procedure to finish.

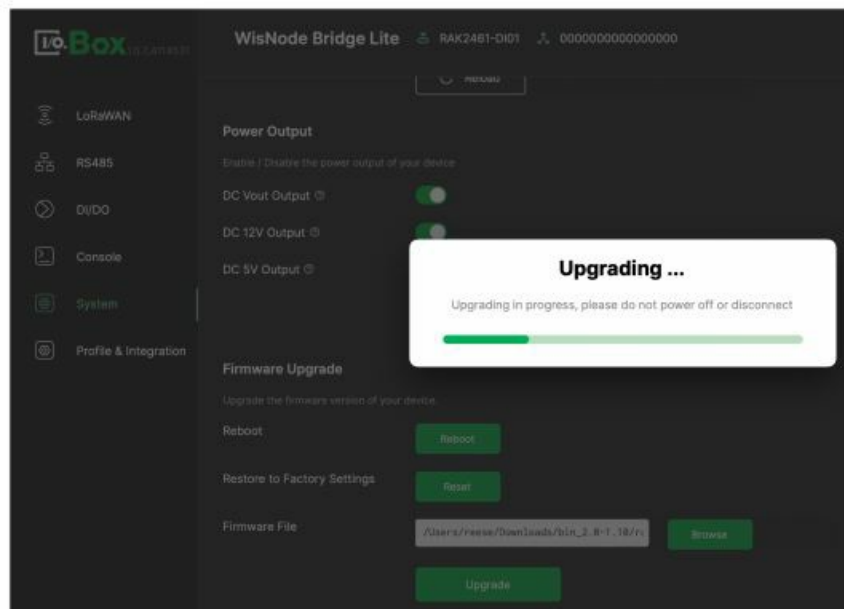


Figure 53: Upgrading procedure



Figure 54: Successful upgrade

Manual Firmware Update

Follow this procedure if the upgrade process fails unexpectedly, or if the damaged device is in boot mode.



Figure 55: upgrade fail

1. Open the IO. Box the application and click Connect Device.

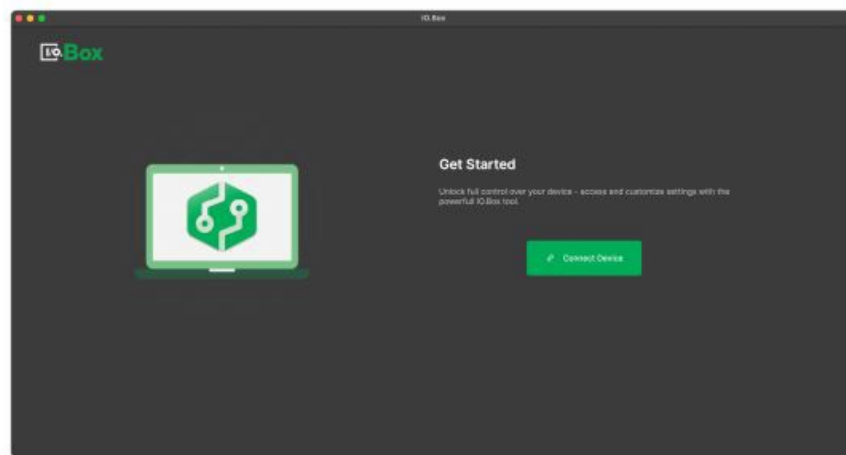


Figure 56: IOBox application

2. Select Connect Manually.



Figure 57: No device found

3. Manually input the port and device model.

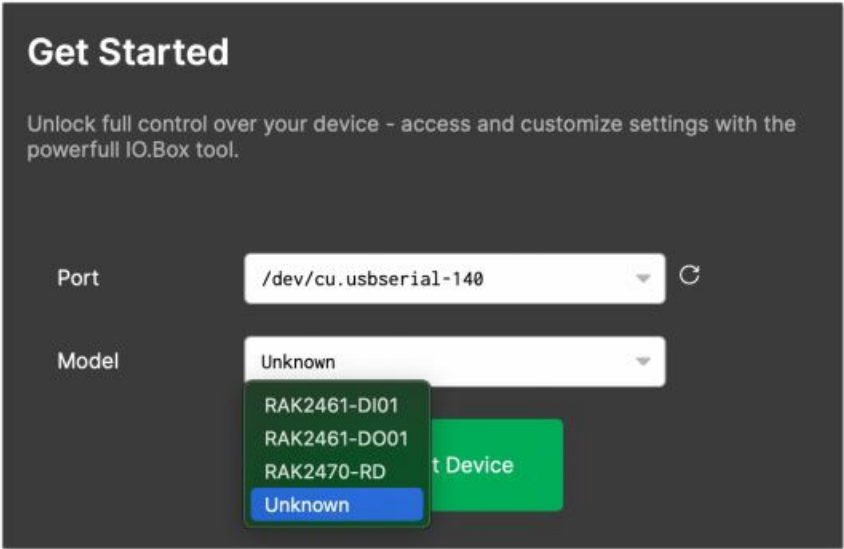


Figure 58: Manually selecting the device

4. Follow the steps of the normal upgrade procedure above by browsing and selecting the firmware file and so on.

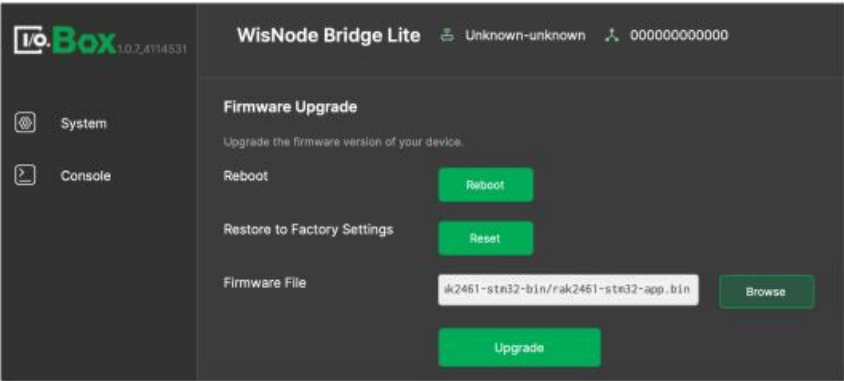


Figure 59: Normal upgrade procedure

Documents / Resources

	<p>RAK RAK2461 Wis Node Bridge IO Lite [pdf] User Guide</p> <p>RAK2461, RAK2461 Wis Node Bridge IO Lite, RAK2461, Wis Node Bridge IO Lite, Node Bridge IO Lite, Bridge IO Lite, IO Lite, Lite</p>
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References

- [WisGateOS2 User Manual | RAKwireless Documentation Center](#)
- [WisGateOS2 User Manual | RAKwireless Documentation Center](#)
- [downloads.rakwireless.com/#WisIO/](#)
- [RAK2461 WisNode Bridge IO Lite | Advanced LoRaWAN Integration for Indu](#)
- [Indoor LoRaWAN gateway - 8 Channel SX1302 LoRa Gateway](#)
- [User Manual](#)

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