WisGateOS 2 Basics Station to TTNv3

This guide shows how to configure and connect the RAK Edge Gateway V2 with WisGateOS 2 to a LoRaWAN Network Server using the Basics Station protocol.

For this example, the gateway will be connected to TTNv3.

📝 NOTE

LoRa Basics Station is an implementation of a LoRa packet forwarder. This protocol simplifies the management of large-scale LoRaWAN Networks. More information about Basics Station protocol can be found in the explanatory document 2 provided by Semtech.

Register the Gateway

1. To login into the TTNv3, head on to the TTN website 🖾 . If you already have a TTN account, you can use your **The Things ID** credentials to log in.



Figure 1: The Things Stack Home Page

NOTE

This guide is for the EU868 frequency band.

 To register a commercial gateway, choose Register a gateway (for new users that do not already have a registered gateway). Or, go to Gateways > + Add gateway (for users that have registered gateways before).

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				Welcome ba Walk right through to you Need help? Have a look at our @	ck, applications and/or gateways. Documentation ¹² or <u>Get support</u> ¹² .		
					°		
			Ge	o to applications	Go to gateways		

Figure 2: TTN console homepage

- 3. Fill in the needed information:
- Owner- Automatically filled by The Things Stack, based on the user's account or created Organization.
- Gateway ID This will be the unique ID of the user's gateway in the Network. Note that the ID must contain only lowercase letters, numbers, and dashes (-).
- **Gateway EUI** A 64 bit extended unique identifier for the gateway. The gateway's EUI can be found either on the sticker on the casing or by going to the Overview page in the Web UI. Instructions on how to access the gateway via Web UI can be found in the Quick Start Guide for each one.
- Gateway name A name for the gateway.
- Gateway description (optional) Optional description, can be used to save notes about the gateway.
- Gateway Server Address The address of the Gateway Server to connect to.
- Frequency plan The Frequency plan used by the gateway.

📝 NOTE

- This tutorial is based on using the EU868 Frequency band, so the server address is eu1.cloud.thethings.network .
- The Europe 863-870 MHz (SF12 for RX2 recommended) is used.
- The other settings are optional and can be changed to satisfy the user's requirements.

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Optional gateway description; can also be used to save notes about the gateway
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euLcloud.thethings.network
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chabled control whether this sateway may only connect if it uses an authenticated Basic Station or MOTT connection
The status of this gateway may be publicly displayed
Attributes
+ Add attributes
 Attributes can be used to set arbitrary information about the entity, to be used by scripts, or simply for your own organization

Figure 3: Adding a gateway

4. To register the gateway, scroll down and click **Create gateway**.

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Figure 4: Registering the gateway

TTNv3 supports **TLS Server Authentication** and **Client token**, which require a trust file and a key file to configure the gateway to successfully connect it to the network. You can connect your gateway to TTNv3 by using either LNS or CUPS Server.

Connect the Gateway via LNS Server Connecting the Gateway

1. To generate a key file, from the **Overview** page of the registered gateway, navigate to **API keys**.

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		Global configuration	Download global_conf.json		
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Figure 5: Overview page

2. On the API keys page, choose + Add API key.

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Figure 6: API key page

3. In the Name field, type the name of the key (for example - Ins_key). Choose Grant individual rights and select Link as Gateway to a Gateway for traffic exchange, i.e. read uplink and write downlink.

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Figure 7: Generating an API key

4. To generate the key, choose the **Create API key**. A window will pop up, prompting to copy the generated key.

Granted rights ✓ Link as Gateway to a Gateway Server for traffic exchange, i.e. write uplink and read downlink	Your API key has been created successfully. Note: After closing this window, the value of the key secret will not be accessible anymore. Make sure to copy and store it in a safe place now. API key

Figure 8: Copying the generated key

WARNING

Copy the key and save it in a .txt file (or other) because you won't be able to view or copy your key afterward.

5. Click I have copied the key to proceed.

Configuring the Gateway

- 1. To configure the gateway, access it via the Web UI. To learn how to do it, refer to the Quick Start Guide for each gateway.
- 2. Navigate to LoRa > Configuration > Work mode and select Basics station.

WS Gate	RAK7268C Overview Configuration Application:	5 Gateways	
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2	©2022 RAKwireless Technology Limited. All Rights Reserved. WisGateOS	20	Privacy Policy - Terms and Conditions

Figure 9: Changing the working mode

3. Expand the Basics Station settings by clicking Configure Basics Station server setup.

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Figure 10: Expanded Basics Station settings

- 4. To connect the gateway to TTNv3, configure the following parameters:
- Basics Station Server Type For server type, choose LNS Server.
- Server URL This is the link to The Things Stack server.

NOTE

For this tutorial, the gateway is connected to the European cluster. For Europe fill in the following:

wss://eu1.cloud.thethings.network

- Authentication Mode Choose TLS server authentication and Client token. When selected, the Trust (CA Certificate) and Client token fields will show up.
- Trust (CA Certificate) For trust, upload the Let's Encrypt ISRG ROOT X1 Trust certificate by clicking choose file. The file with the certificate can be downloaded directly □ .
- Client Token This is the generated API key. The key must start with Authorization:.

For example:

Authorization: YOUR_API_KEY

NOTE

• Replace YOUR_API_KEY with the key generated previously. Have in mind that there should be a "space" between Authorization: and YOUR_API_KEY, as shown in the example.

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Figure 11: Basics Station settings

4. To save the changes, click **Save Changes**.

Now, the gateway is connected to TTNv3 as Basics Station.

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Figure 12: Successful connection

Connect the Gateway via CUPS Server

Connecting the Gateway

 Since CUPS automatically configures LNS, you need to generate two API keys - one for CUPS and one for LNS. To generate the key files, from the Overview page (in the TTN console) of the registered gateway, navigate to API keys.

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		Created at	Mar 8, 2022 12:39:23		
		Last updated at	Mar 8, 2022 12:39:23		
		Calendy Server address		Location	Change location settings →
		LoRaWAN information	EU_863_870		
		Global configuration	Download global_conf.json		
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Figure 13: Overview page

2. On the API keys page, choose + Add API key.

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Figure 14: API key page

3. In the Name field, type the name for the LNS key (for example - Ins_key). Choose Grant individual rights and select Link as Gateway to a Gateway for traffic exchange, i.e. read uplink and write downlink.

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Figure 15: Generating an API key

4. To generate the key, click **Create API key**. The following window will pop up, prompting to copy the generated key.

Granted rights Link as Gateway to a Gateway Server for traffic exchange, i.e. write uplink and read downlink	Your API key has been created successfully. Note: After closing this window, the value of the key secret will not be accessible anymore. Make sure to copy and store it in a safe place now. API key
	•••••• 🖺 📀

Figure 16: Copying the generated key

Copy the key and save it in a .txt file (or other) because you won't be able to view or copy your key afterward.

- 5. Click I have copied the key to proceed to generate the LNS key.
- 6. Click again on the **+Add API key**. In the **Name field**, type the name for the CUPS key (for example CUPS_key). Choose **Grant individual rights** and select the following rights:
 - View gateway information
 - Retrieve secrets associated with a gateway
 - Edit basic gateway settings

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		View gateway location								
		Retrieve secrets associated with a gateway								
		View and edit gateway API keys								
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Figure 17: Generating a CUPS key

7. Click on the Create API key.

Your API key has been created
successfully. Note: After closing this window, the value of the key secret will not be accessible anymore. Make sure to copy and store it in a safe place now. API key

Figure 18: Copying CUPS key

- 8. Click I have copied the key to proceed.
- 9. Click on **General settings** and scroll down to **LoRa Basics Station LNS Authentication Key**. Paste the copied **LNS** key there.

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Or API keys	The address of the Gateway Server to connect to
General settings	Require authenticated connection \odot
- Concist Settings	Enabled
	Controls whether this gateway may only connect if it uses an authenticated Basic Station or MQTT connection
	LoRa Basics Station LNS Authentication Key
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	The Authentication Key for Lora Basics Station LNS connections. This field is ignored for other gateways.
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	🧹 Make status public
	The status of this gateway may be visible to other users
	Gateway location 🗇
	✓ Make location public
	When set to public, the gateway location may be visible to other users of the network
	Attributes ⊕
	+ Add attributes
	Attributes can be used to set arbitrary information about the entity, to be used by scripts, or simply for your own organization
	Automatic updates
	Enabled
	Gateway can be updated automatically
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Figure 19: Configuring the LNS authentication keys

10. Scroll down and click **Save changes** to save the settings.

Configuring the Gateway

- 1. To configure the gateway, access it via the Web UI. To learn how to do that, refer to the Quick Start Guide for each product.
- 2. Navigate toLoRa > Configuration > Work mode and select Basics station.

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Figure 20: Changing the working mode

3. Expand the Basics Station settings by clicking on **Configure Basics Station server setup.**

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	@2022 BAKwineless Technology Limited. All Rights Reserved. WisGateOS 2.0	Privacy Policy · Terms and Canditions

Figure 21: Expand Basics Station settings

- 4. To connect the gateway to TTNv3 with CUPS Server, configure the following parameters:
- Basics Station Server Type- For server type, choose CUPS Server.
- Server URL This is the link to The Things Stack server.

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For this tutorial, the gateway is connected to the European cluster. For Europe fill in the following:

https://eu1.cloud.thethings.network

- Server Port The LNS Server uses port 443. Type in 443.
- Authentication Mode Choose TLS server authentication and Client token. When selected, the Trust (CA Certificate) and Client token field will show up.
- Trust (CA Certificate) For trust upload the Let's Encrypt ISRG ROOT X1 Trust certificate by clicking choose file. The file with the certificate can be downloaded directly △.
- Client Token This is the generated CUPS key. The key must start with Authorization:.

For example:

Authorization: YOUR_API_KEY

NOTE

Replace YOUR_API_KEY with the key generated previously. Have in mind that there should be a "space" between Authorization: and YOUR_API_KEY, as shown in the example.

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Figure 22: Basic Station settings

5. To save the changes, click **Save Changes.**

Now, the gateway is connected to TTNv3 as Basics Station.

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			Frequency plan	EU_863_870			
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