

Embedded LNS Gateway Instruction

BSP 7.2.13

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1. Introduction

TEKTELIC Embedded LNS Gateways simplify the integration of LoRaWAN devices with industrial protocols such as MQTT, BACnet IP, and Modbus TCP/IP.

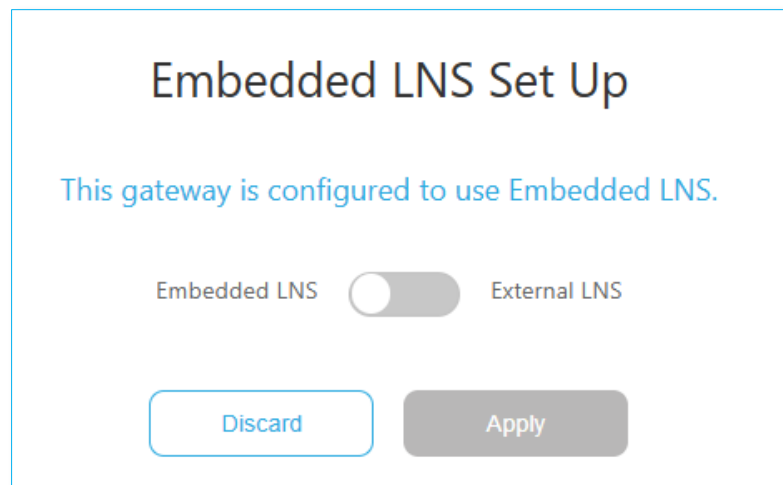
Depending on the intended use case, the configuration steps for these gateways may vary. To start, ensure that all components are correctly set up as follows:

1. Initial Setup:
 - Add LoRaWAN Device Profiles, and Devices using Kona Link. ([Section 2 & 3](#))
2. Protocol-Specific Configuration: Configure and manage the supported protocols:
 - BACnet/IP: Refer to [Section 4.1](#) for setup guidelines.
 - Modbus TCP/IP: Refer to [Section 4.2](#) for detailed steps.
 - MQTT: Refer to [Section 4.3](#) for configuration instructions.
3. Licensing process to retrieve fingerprint and to activate license ([Section 5](#))

You can see some troubleshooting tips specific for the use cases in [Section 6](#)

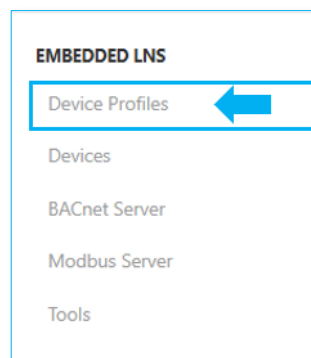
NOTE: Important note for Users

- The **Embedded LNS BSP version 7.2.13** now **requires a valid license**.
- Before proceeding, please ensure that you:
 - Have **obtained and activated** the **required license**.
 - Have **switched from External LNS to Embedded LNS** in your configuration, as shown below.



2. Manage Device Profiles

1. Login to Kona Link web page using “Host Name” or “IP Address”:
 - Using “Host Name”
Host Name URL: <https://kona-<GW variant>-<last 6 digit GW ID>.local/>
Eg: <https://kona-micro-0011ab.local/>
 - Using “IP Address”
IP Address URL: <https://<GW IP Address>/>
Eg: <https://192.0.2.111/>
2. Navigate to **Device Profile** section.



3. Click the '+' icon on the right side of the page to add a new Device Profile.



4. User has three options for Configuration of device profiles:
 - Select Device profile from existing list of Device profile template.
 - Configure Device profile Template using Vendor package
 - Add Device profile Manually.

2.1 Pre-Configured Device Profile Template

To Select a Device Profile from the existing list of **Device profile Templates**:

1. Click on **Select device-profile template**

Add Device Profile

GENERAL JOIN CLASS B CLASS C CODEC

Select device-profile template

Name*

Enter name

Description

Enter description

2. Select a **Vendor**.
3. Select from the **Device Profile Template**, from the dropdown menu

Select device profile template

Vendor*

Tektelic Communications Inc.

Device Profile Template*

Select template

- BREEZE-V Indoor Ambient Environment Monitoring
- BREEZE Indoor Ambient Environment Monitoring
- CLOVER Agriculture Sensor
- COMFORT Smart Room Sensor Base
- FINCH SafeAlert Indoor Sensor
- KIWI Agriculture Sensor
- ORCA Industrial GPS Asset Tracker
- PELICAN Enterprise Outdoor Tracker
- ROBIN Outdoor Panic Button
- SEAL Wearable Safety & GPS Tracker
- SPARROW Enterprise Asset Tracker
- TUNDRA Temperature Sensor
- VIVID Smart Room Sensor PIR

- Click on **Confirm**

Select device profile template

Vendor*

Tektelic Communications Inc.

Device Profile Template*

BREEZE Indoor Ambient Environment Monitoring

To see more device profile templates, go to the 'Device Profile Template' tab on the [Upgrade Firmware](#) page and install packages with additional vendor templates

Cancel Confirm

4. Click on **“Submit”** to save the Device profile

The screenshot shows the 'Add Device Profile' form with the following fields and values:

- Name***: BREEZE Indoor Ambient Environment M
- Description**: Sensor that efficiently monitors CO2 and occupancy
- MAC version***: LoRaWAN 1.0.4
- Regional parameters revision***: RP002-1.0.3
- Flush queue on activate
- Expected uplink interval (secs)***: 3600
- Device-status request frequency (req/day)**: Enter frequency

At the bottom, there are 'Discard' and 'Submit' buttons. A blue arrow points to the 'Submit' button.

2.2 Configure Vendor Device Profile Template

To Select a Device Profile from a different Vendor, add the corresponding package **Device profile Templates**:

Before we begin, the user has to

- a) Install packages with additional vendor templates
- b) And then Select the corresponding Vendor and Device profile Template.

1. Click on **Select device-profile template**

The screenshot shows the 'Add Device Profile' form with the following fields:

- Name***: Enter name
- Description**: Enter description

A blue arrow points to the 'Select device-profile template' button in the top right corner.

2. Click on **“Upgrade Firmware page”** hyperlink

✕

Select device profile template

Vendor*

Tektelic Communications Inc. ▾

Device Profile Template*

Select template ▾

To see more device profile templates, go to the 'Device Profile Template' tab on the [Upgrade Firmware page](#) and install packages with additional vendor templates

Cancel

Confirm

3. User is redirected to “**Upgrade Firmware**” page. Switch to “**FEED URL**” tab

Upgrade Firmware

BSP UPGRADE
FEED URL
DEVICE-PROFILE TEMPLATES

4. Click the “**+**” icon on the right side of the page to add a feed.

Upgrade Firmware

BSP UPGRADE
FEED URL
DEVICE-PROFILE TEMPLATES

NAME
ADDRESS

+

Add feed

5. Enter the **Name** and **Address**, then Click **Apply** to save the changes

Upgrade Firmware

BSP UPGRADE FEED URL DEVICE-PROFILE TEMPLATES

NAME ADDRESS

profiles http://10.7.7.122/ipk/er-test/device-profiles

Discard Apply

6. Once the URL is applied, switch to “**DEVICE PROFILE TEMPLATES**” tab to view the available packages to install.

Upgrade Firmware

BSP UPGRADE FEED URL DEVICE-PROFILE TEMPLATES

Installed Device-Profile Template Packages Available to install Device-Profile Template Packages

✓ device-profiles-tektelic device-profiles-samplevendor

Install

7. Select the **checkbox** for the applicable package and click “**Install**” to complete the installation of the Device-Profile Template package.

Upgrade Firmware

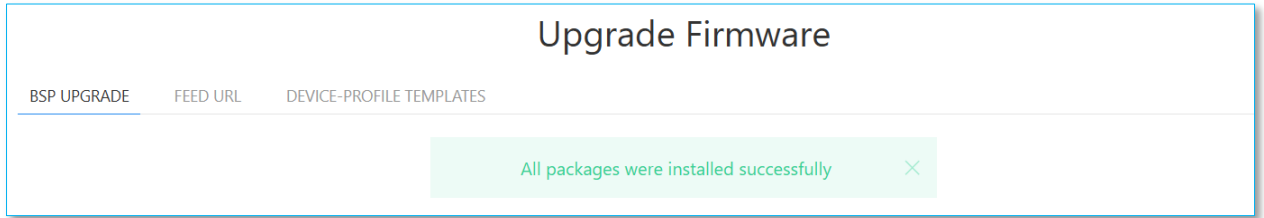
BSP UPGRADE FEED URL DEVICE-PROFILE TEMPLATES

Installed Device-Profile Template Packages Available to install Device-Profile Template Packages

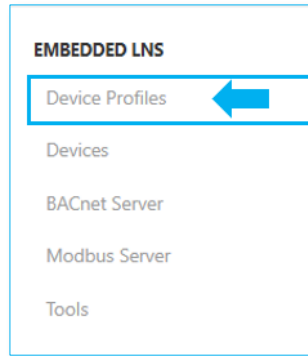
✓ device-profiles-tektelic device-profiles-samplevendor

Install

8. After the installation success message appears, proceed to the next step



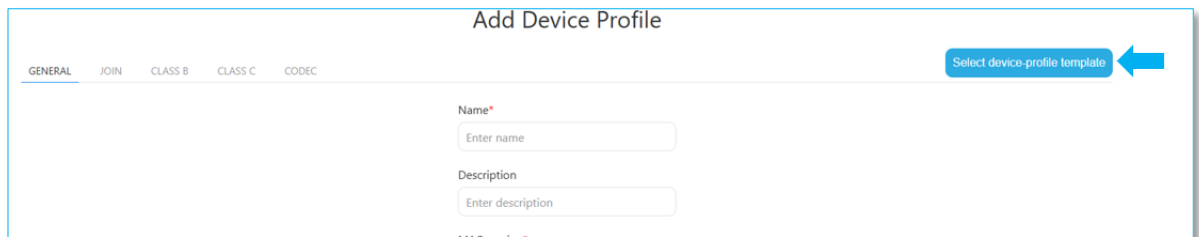
9. Navigate to **Device Profile** section



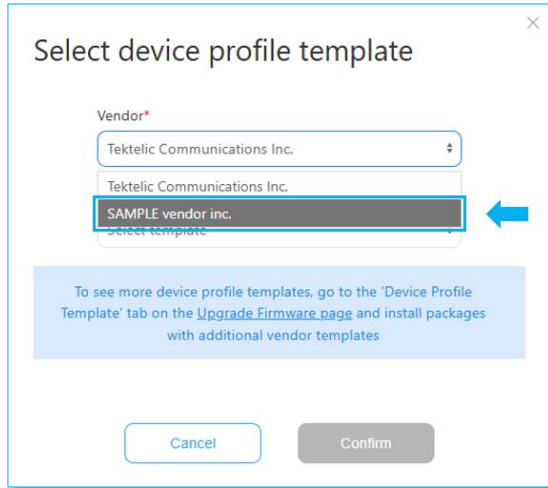
10. Click the '+' icon on the right side of the page to add a new Device Profile.



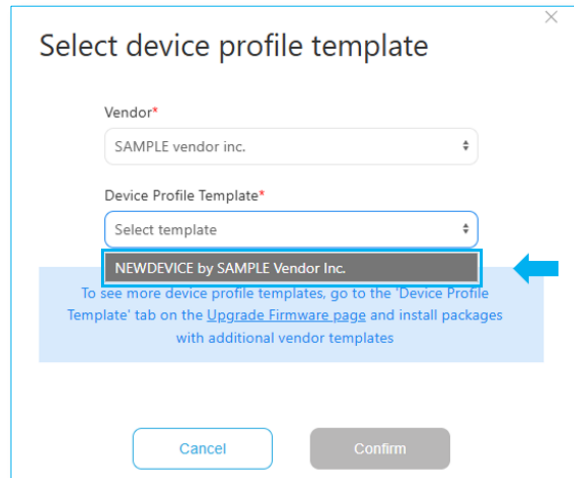
11. Click on **Select device profile template**



12. Select a **Vendor**.



13. Select from the **Device Profile Template**, from the dropdown menu



14. Click on **Confirm**

Select device profile template

Vendor*
SAMPLE vendor inc.

Device Profile Template*
NEWDEVICE by SAMPLE Vendor Inc.

To see more device profile templates, go to the 'Device Profile Template' tab on the [Upgrade Firmware page](#) and install packages with additional vendor templates

Cancel Confirm

15. Click on “**Submit**” to save the Device profile

Add Device Profile

GENERAL JOIN CLASS B CLASS C CODEC

Select device-profile template

Name*
NEWDEVICE by SAMPLE Vendor Inc.

Description
Fake sensor that mimics the functionality of Breeze

MAC version*
LoRaWAN 1.0.4

Regional parameters revision*
RP002-1.0.3

Flush queue on activate

Expected uplink interval (secs)*
3600

Device-status request frequency (req/day)
Enter frequency

Discard Submit

2.3 Adding Device Profile Manually

1. Configure device profile based on the **documentation from your device vendor**:
 - ii. Assign a name for the device
 - iii. Enter the Description
 - iv. Enter MAC version and regional parameters revision appropriate for your device. Default MAC version is LoRaWAN 1.0.2 and Regional parameters revision as RP002-1.0.2.
 - v. Enter the Expected uplink interval in seconds

Add Device Profile

[Select device-profile template](#)

GENERAL JOIN CLASS B CLASS C **CODEC**

Name*
 ←

Description
 ←

MAC version*
 ←

Regional parameters revision*
 ←

Flush queue on activate

Expected uplink interval (secs)*
 ←

Device-status request frequency (req/day)

[Discard](#) [Submit](#)

2. Select **CODEC** tab, and enter the Decoder code here.

Add Device Profile

[Select device-profile template](#)

GENERAL JOIN CLASS B CLASS C **CODEC** ←

```

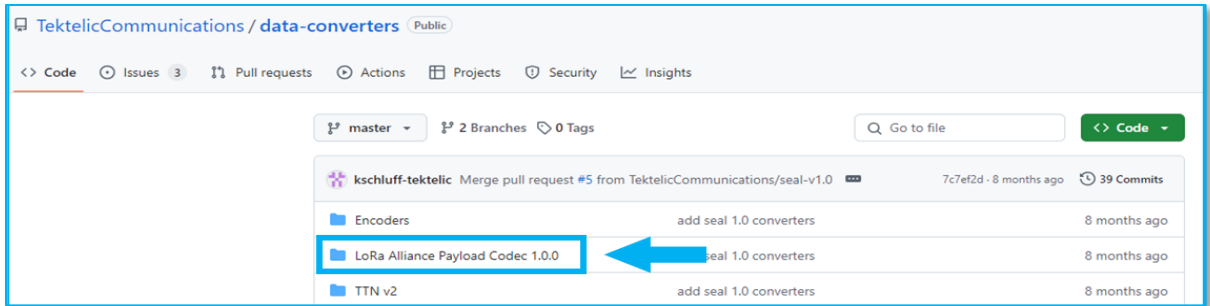
/**
 * Decode uplink function
 *
 * @param (object) input
 * @param (number[]) input.bytes Byte array containing the uplink payload, e.g. [255, 230, 255, 0]
 * @param (number) input.port Uplink port
 * @param (Record-string, string-) input.variables Object containing the configured device variables.
 *
 * @returns ((data: object)) Object representing the decoded payload.
 */
function decodeUplink(input) {
  return {
    data: [
      // temp: 22.5
    ],
  };
}
/**
 * Encode downlink function

```

[Discard](#) [Submit](#)

Please note, use the exact CODEC for your device model, if you are unsure which CODEC to use, contact your device vendor to obtain the decoder script.

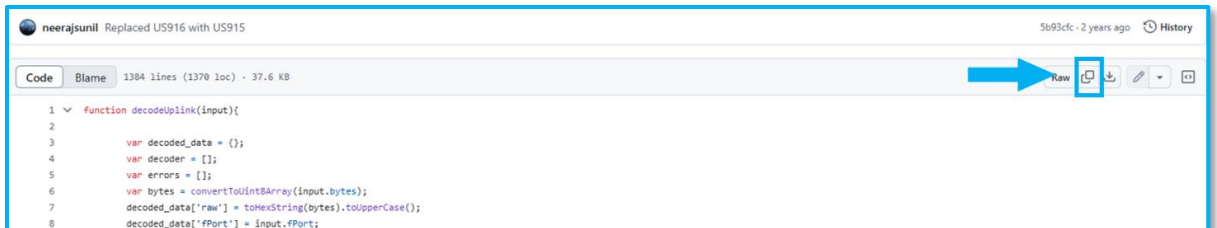
3. For Example: For Tektelic devices, official payload decoders are available on TEKTELIC's GitHub.
 - a. Go to [LoRa Alliance Payload Codec 1.0.0](#) folder in [Tektelic GitHub](#) (LoRa Alliance format).



b. Choose the folder named according to your device type

Name	Last commit message	Last commit date
..		
agro	Replaced US916 with US915	last year
aura-flux	Added separate folder for Tektelic v2	last year
breeze	Replaced US916 with US915	last year
comfort-vivid	Replaced US916 with US915	last year

c. Copy the code and insert into, Add Device Profile “Codec” tab



4. After successfully entering the CODEC, click on “Submit” to save the Device profile



3. Manage LoRaWAN Devices

1. Login to Kona Link web page using “Host Name” or “IP Address”:

- Using “Host Name”

Host Name URL: <https://kona-<GW variant>-<last 6 digit GW ID>.local/>

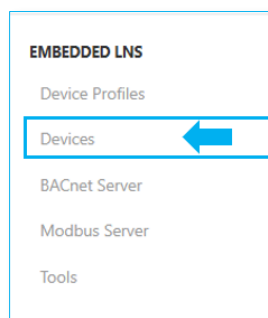
Eg: <https://kona-micro-0011ab.local/>

- Using “IP Address”

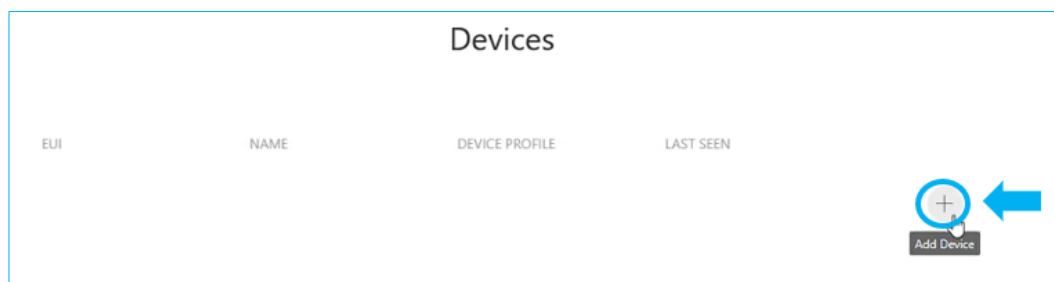
IP Address URL: <https://<GW IP Address>/>

Eg: <https://192.0.2.111/>

2. Navigate to Devices section.



3. Click the ‘+’ icon on the right side of the page to add a new Device.



4. Configure device parameters:

- DevEUI (Device Unique Identifier)
- Name
- Device profile (chose existing from the dropdown list)
- JoinEUI (Join Server Identifier)
- Application Key (on submit)

Devices

Add Device

Device EUI*
647fda00000caef ←

Name*
BREEZE-00CAEF ←

Description

Device profile*
Breeze-V Indoor Ambient Environmen ←

Join EUI*
647fda8010000000 ←

Application Key*
56218d7ca79c645304be8ad6b4671e39 ←

5. Click on **Submit**.

6. When first added, the device shows **“Never Seen.”** To update this, either **rejoin the device to the network** or **wait for the next uplink** to occur automatically.

Devices

Successfully Added Device

EUI	NAME	DEVICE PROFILE	LAST SEEN
647fda00000caef	BREEZE-00CAEF	Breeze-V Indoor Ambient Environment Monitoring	Never Seen ←

+

Devices

EUI	NAME	DEVICE PROFILE	LAST SEEN
647fda00000caef	BREEZE-00CAEF	Breeze-V Indoor Ambient Environment Monitoring	2025-06-10 16:46:50 ←

+

NOTE: After creating the device profiles and adding devices, the **Last Seen** field will update to confirm the devices are online. If the devices are not online, refer to the [Troubleshooting section](#).

4. Application Specific Configurations

4.1 Connecting to BACnet IP

1. Login to Kona Link web page using “Host Name” or “IP Address”:

- Using “Host Name”

Host Name URL: `https://kona-<GW variant>-<last 6 digit GW ID>.local/`

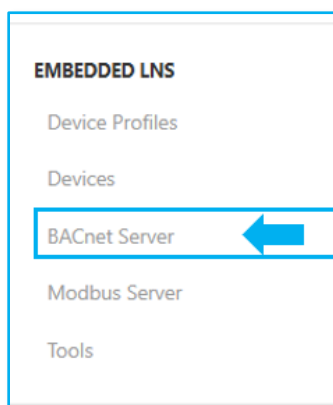
Eg: `https://kona-micro-0011ab.local/`

- Using “IP Address”

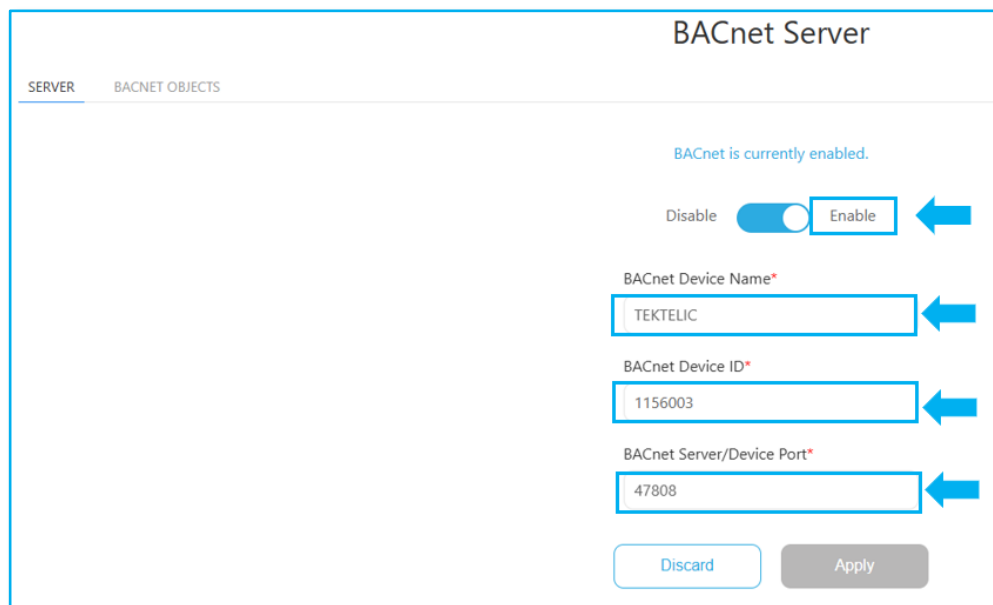
IP Address URL: `https://<GW IP Address>/`

Eg: `https://192.0.2.111/`

2. Navigate to **BACnet Server**



3. “**Enable**” the BACnet server, the default setting is “Disable”
4. Enter the details in Name, Device Id and Device Port fields



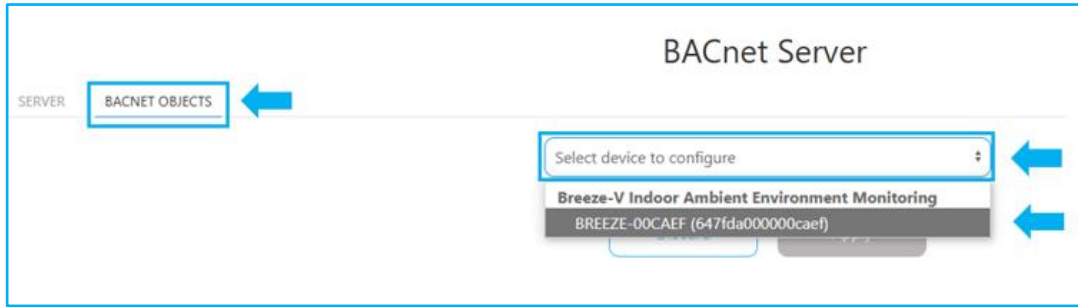
A screenshot of the "BACnet Server" configuration page. The page has two tabs: "SERVER" and "BACNET OBJECTS". The "SERVER" tab is active. The page displays the following configuration options:

- A status message: "BACnet is currently enabled."
- A toggle switch for "Disable" (off) and "Enable" (on). A blue arrow points to the "Enable" button.
- A text input field for "BACnet Device Name*" containing the value "TEKTELIC". A blue arrow points to the input field.
- A text input field for "BACnet Device ID*" containing the value "1156003". A blue arrow points to the input field.
- A text input field for "BACnet Server/Device Port*" containing the value "47808". A blue arrow points to the input field.
- Two buttons at the bottom: "Discard" and "Apply".

5. Switch to “**BACnet Objects**” tab to configure BACnet objects.
6. Select from the devices already configured. (Please note the devices are organized by Device Type)
7. Device Selection and BACnet Object Configuration:

BACnet Object Configuration for TEKTELIC Devices

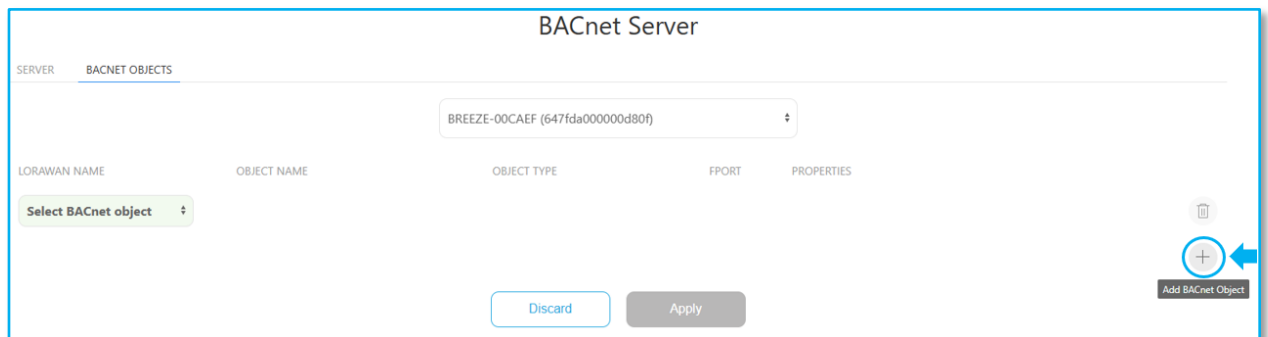
- 1) Click on “**Select device to configure**” and choose the Device.



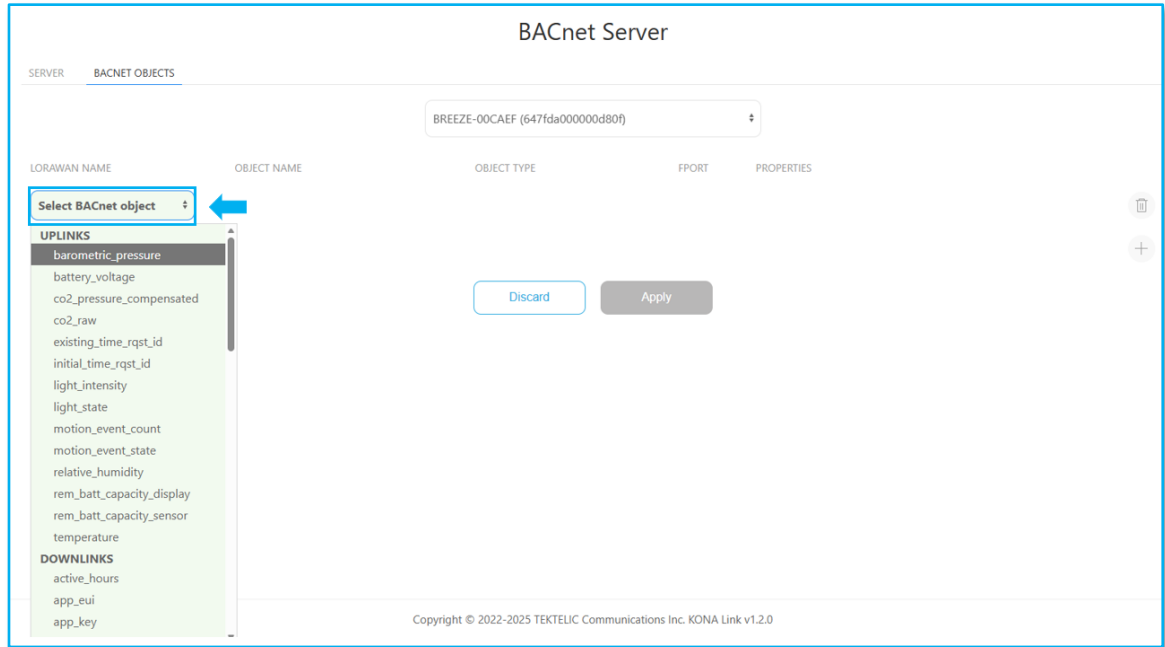
NOTE: BACnet objects are automatically be created upon receiving an LoRaWAN Uplink. Alternately, users may follow “Manual configuration of BACnet Objects” steps to setup BACnet objects.

NOTE: Only “Uplink” objects are created automatically, BACnet objects used to send LoRaWAN Downlinks must be configured manually by the user following the steps for

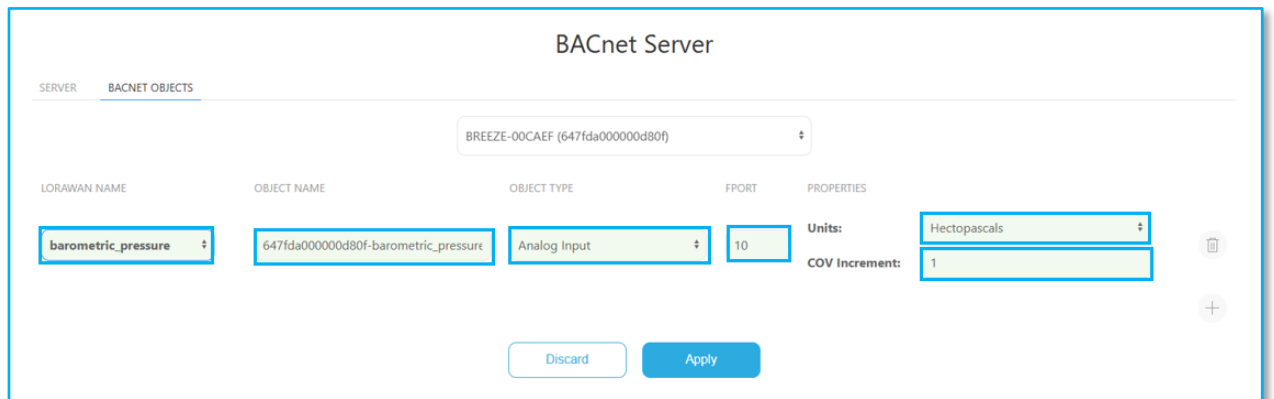
- 2) Click the ‘+’ icon on the right side of the page to add a BACnet object.



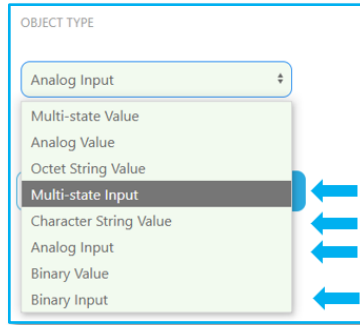
- 3) Select the **BACnet object**, i.e. the LoRaWAN parameter name from the drop down for an **Uplink**.



- The Object Name, Object Type, FPort and Properties (units and COV Increments) are populated automatically. User may modify these fields as needed.



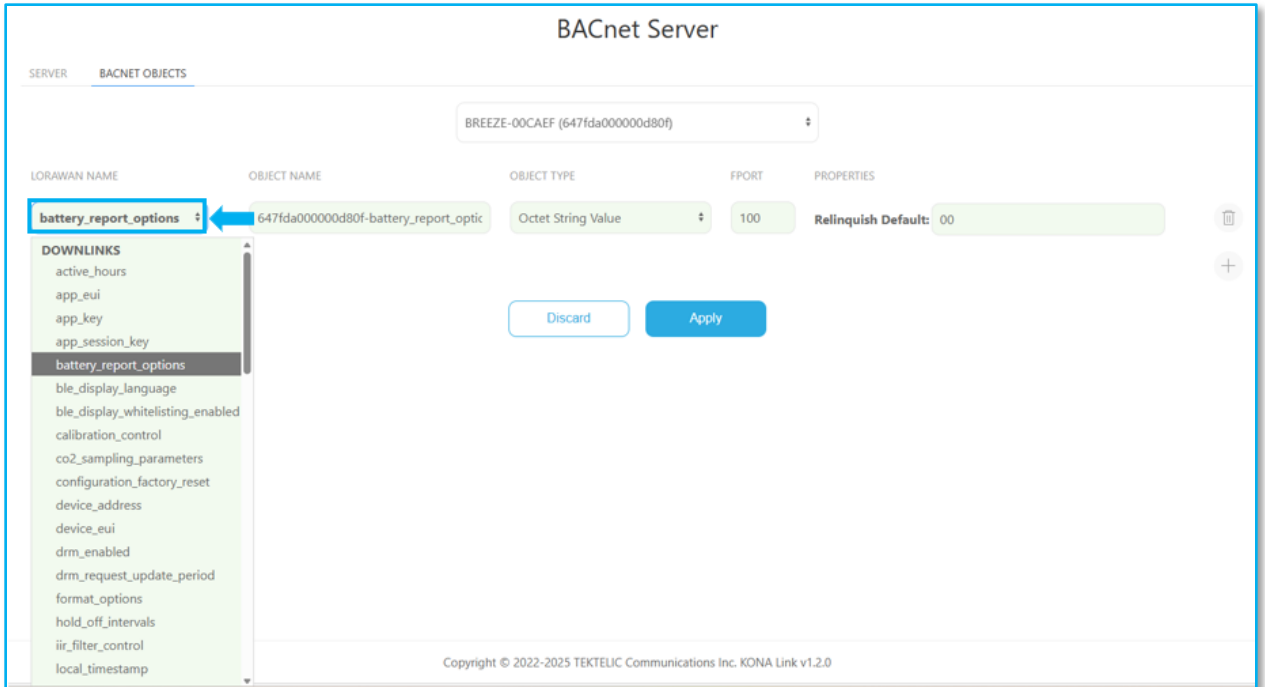
- The Object Type for Uplinks are typically Multi-state Input, Character string value, Analog Input, or Binary Input.



- When the user selects “Multi-state Input” from the Object Type dropdown menu, they can then proceed to specify the number of states.

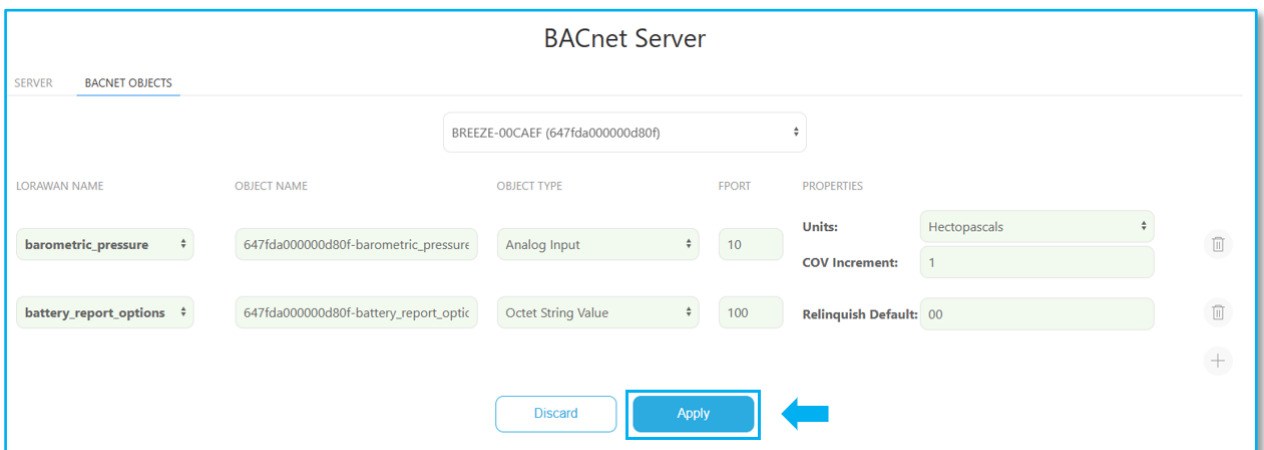
LORAWAN NAME	OBJECT NAME	OBJECT TYPE	FPORT	PROPERTIES
barometric_pressure	647fda00000d80f-barometric_pressure	Multi-state Input	10	Number of states: 2 State 1: state1 State 2: state2

- 4) Select the **BACnet object**, i.e. the LoRaWAN parameter name from the drop down for a **Downlink**.
 - Object types used for downlinks are typically Analog Value, Binary Value, Character String Value, or Octet String Value.



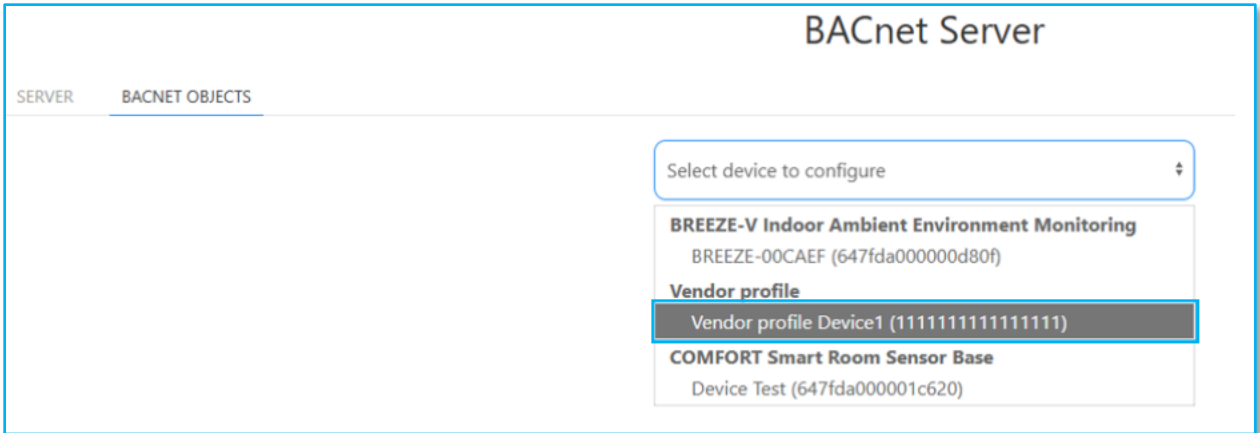
5) Repeat the steps above to add all required BACnet uplink and downlink objects.

6) Click on **“Apply”**

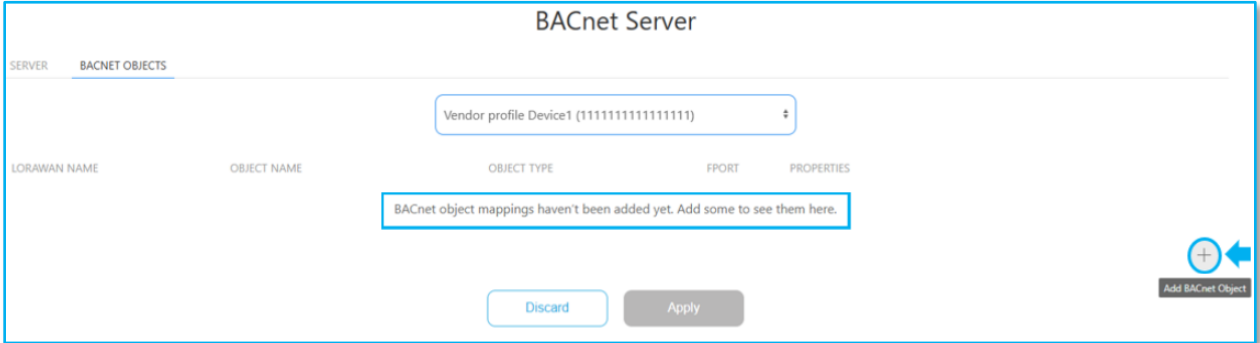


Steps for Manual Configuration of BACnet Objects

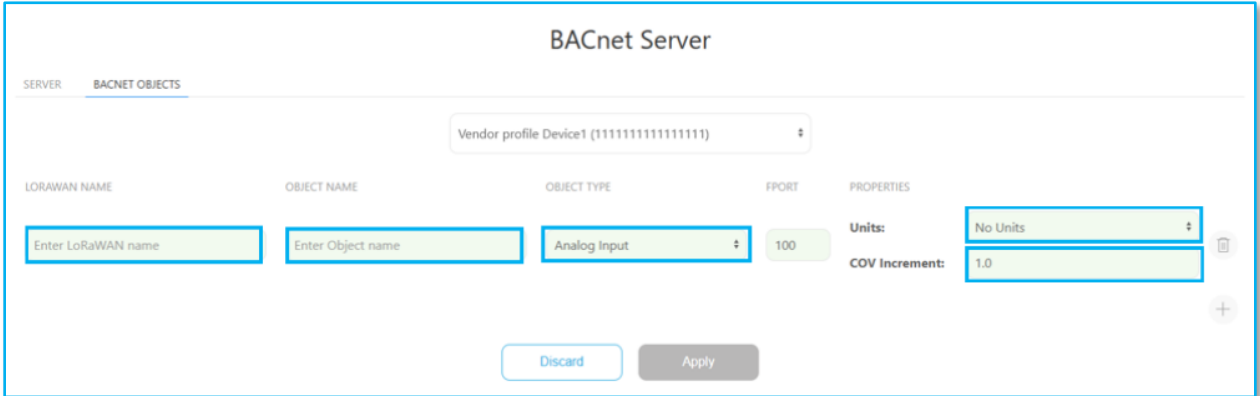
1) Click on **“Select device to configure”** and choose the Custom Device.



2) Click the '+' icon on the right side of the page to add a new BACnet object.



3) User can enter the LoRaWAN Name (ensuring it matches the parameter name used in the **LoRaWAN decoder**), along with the Object Name, Object Type, and Properties (units and COV Increment).



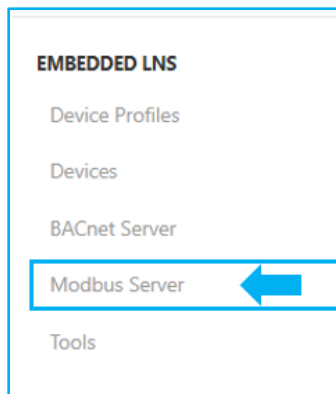
4) Repeat the steps above to add all required BACnet uplink and downlink objects.

5) Click on **“Apply”**



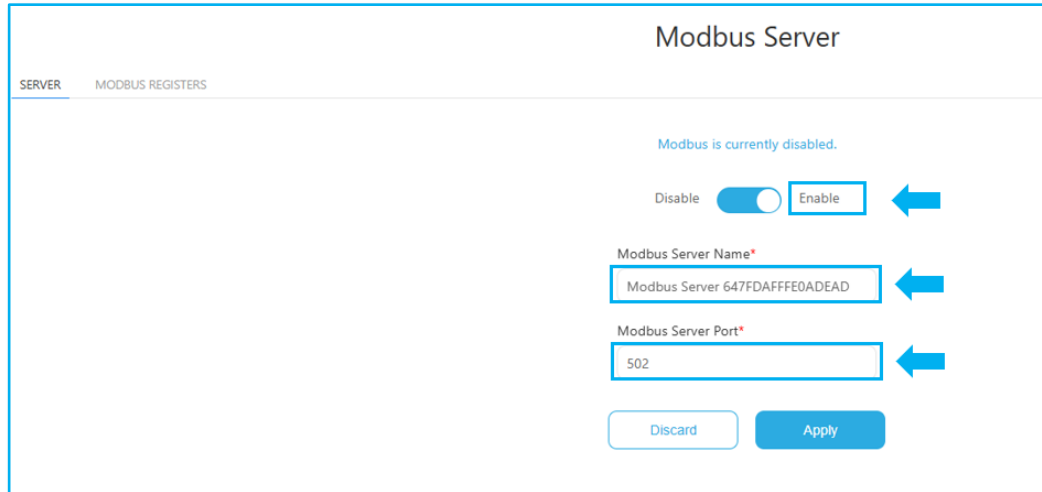
4.2 Connecting to Modbus TCP/IP

1. Login to Kona Link web page using “Host Name” or “IP Address”:
 - Using “Host Name”
Host Name URL: <https://kona-<GW variant>-<last 6 digit GW ID>.local/>
Eg: <https://kona-micro-0011ab.local/>
 - Using “IP Address”
IP Address URL: <https://<GW IP Address>/>
Eg: <https://192.0.2.111/>
2. Navigate to **Modbus Server**



3. **“Enable”** the Modbus Server, the default setting is “Disable”
4. Enter the details in **Modbus Server Name**, and **Modbus Server Port** fields and then click **“Apply”**.

Please note, the default port is **502**, but any port number **greater than or equal to 500** may be used.



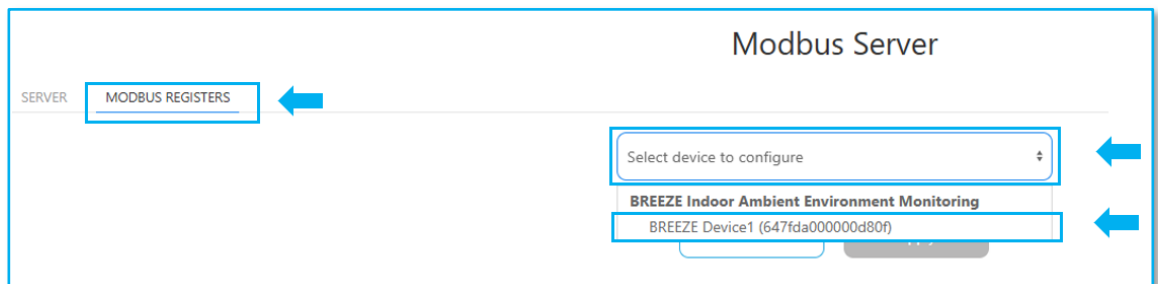
5. Switch to “**MODBUS REGISTERS**” tab to configure registers.

6. Device Selection and Modbus Registers Configuration:

MODBUS Register Configuration for TEKTELIC Devices

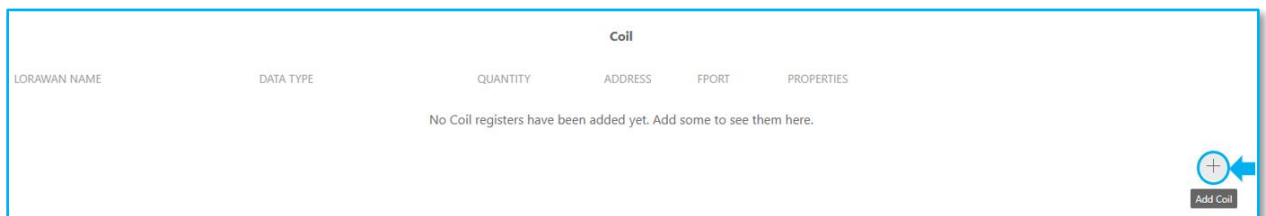
1) **Select the Device** for Modbus Register Configuration

- Select from the devices already configured. (Please note the devices are organized by Device Type)
- Click on Select device-profile template

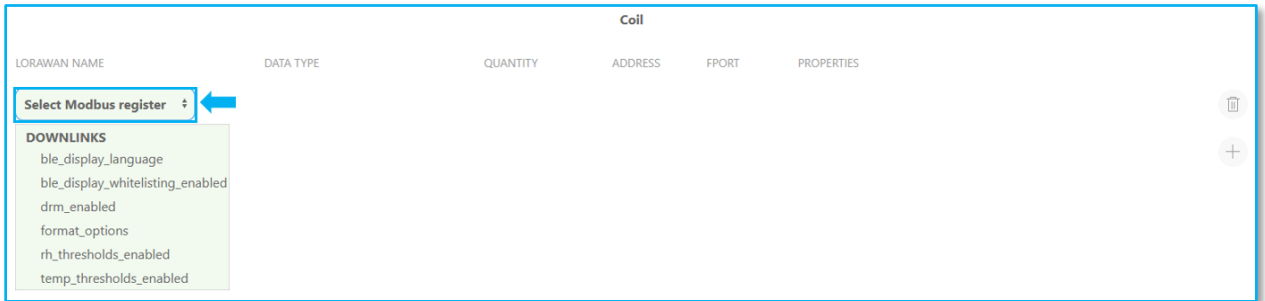


2) Configure **Downlinks** using “**Coil**” Register

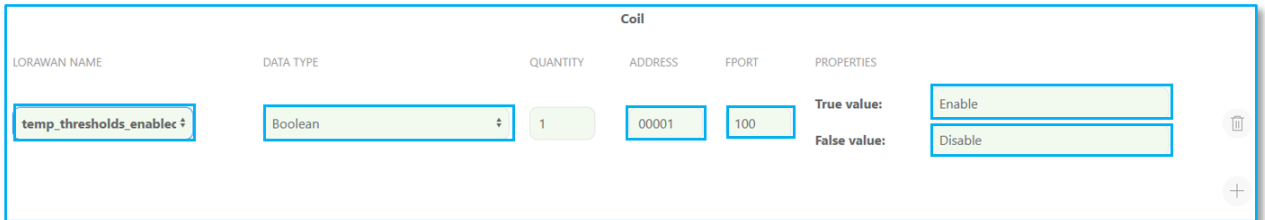
- Click the ‘+’ icon on the right side of the page to add a Coil.



- Select the **Modbus register**, i.e. the LoRaWAN parameter name from the drop down.

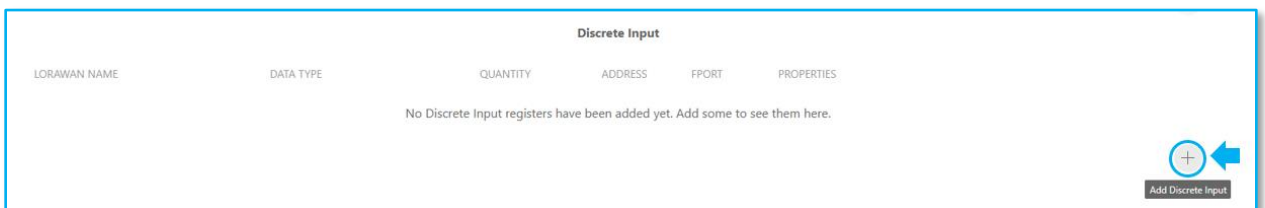


- The Register Name, Data Type, Address, FPort and Properties (True value, False value) are populated automatically. User may modify these fields as needed.



3) Configure **Uplinks** using “Discrete Input” Register

- Click the **‘+’ icon** on the right side of the page to add a Discrete Input.



- Select the **Modbus register**, i.e. the LoRaWAN parameter name from the drop down.



- The Register Name, Data Type, Address, FPort and Properties (True value, False value) are populated automatically. User may modify these fields as needed.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
light_state	Boolean	1	10001	10	True value: Bright False value: Dark

4) Configure Uplinks using “Input Register”

- Click the ‘+’ icon on the right side of the page to add an Input Register.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
No Input Register registers have been added yet. Add some to see them here.					

- Select the **Modbus register**, i.e. the LoRaWAN parameter name from the drop down.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
Select Modbus register					

- UPLINKS
 - barometric_pressure
 - battery_voltage
 - co2_pressure_compensated
 - co2_raw
 - existing_time_rqst_id
 - initial_time_rqst_id
 - light_intensity
 - motion_event_count
 - relative_humidity
 - rem_batt_capacity_display
 - rem_batt_capacity_sensor
 - temperature

- The Register Name, Data Type, Address, FPort and Properties (Scale) are populated automatically. User may modify these fields as needed.


Please note, for certain registers, the **Properties** field may not be populated. The **Scale** value represents a multiplier applied to the received register data. It is often used to convert between integer and floating-point values. For example, applying a scale factor of **0.1** to a received value of **101** results in **10.0**.

Input Register						
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES	
co2_pressure_compensat	Unsigned Integer (16-bit)	1	30001	10	Scale:	1

5) Configure **Uplinks and Downlinks** using “**Holding Register**”

- Click the ‘+’ icon on the right side of the page to add a Holding Register.

Holding Register						
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES	
No Holding Register registers have been added yet. Add some to see them here.						



- Select the **Modbus register**, i.e. the LoRaWAN parameter name from the drop down.

Holding Register						
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES	
<div style="border: 1px solid gray; padding: 5px;"> <p>UPLINKS</p> <ul style="list-style-type: none"> barometric_pressure battery_voltage co2_pressure_compensated co2_raw existing_time_rqst_id initial_time_rqst_id light_intensity motion_event_count relative_humidity rem_batt_capacity_display rem_batt_capacity_sensor temperature <p>DOWNLINKS</p> <ul style="list-style-type: none"> active_hours app_eui app_key app_session_key battery_report_options calibration_control </div>						
Select Modbus register						

- The Object Name, Object Type and Properties (units) are populated automatically. User may modify these fields as needed.

Please note, for certain registers, the “**Properties**” field may not be populated

Holding Register						
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES	
co2_pressure_compensat	Unsigned Integer (16-bit)	1	40001	10	Scale:	1

6) **Repeat** the steps above to add all required Modbus uplink and downlink registers.

7) Click on **“Apply”**

Discard
Apply
←

MODBUS Register Configuration for CUSTOM Devices

- 1) **Select the Custom Device** for Modbus Register Configuration
- 2) Click on “Select device to configure” and choose the Custom Device.
 - Select from the devices already configured. (Please note the devices are organized by Device Type)

Modbus Server

SERVER
MODBUS REGISTERS

Vendor profile Device1 (1111111111111111)

Vendor profile

Vendor profile Device1 (1111111111111111) ←

COMFORT Smart Room Sensor Base
Device Test (647fda000001c620)

BREEZE-V Indoor Ambient Environment Monitoring
BREEZE-00CAEF (647fda000000d80f)

3) Configure **Downlinks** using “Coil” Register

- Click the **‘+’ icon** on the right side of the page to add a Coil.

Coil

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
No Coil registers have been added yet. Add some to see them here.					

+
Add Coil
←

- User can enter the Register Name, Data Type, Address, Fport and Properties, ensuring it matches the parameter name used in the **LoRaWAN decoder**.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
Enter LoRaWAN name					

4) Configure Uplinks using “Discrete Input” Register

- Click the **‘+’ icon** on the right side of the page to add a Discrete Input.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
No Discrete Input registers have been added yet. Add some to see them here.					

- User can enter the Register Name, Data Type, Address, Fport and Properties, ensuring it matches the parameter name used in the **LoRaWAN decoder**.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
Enter LoRaWAN name					

5) Configure Uplinks using “Input Register”

- Click the **‘+’ icon** on the right side of the page to add an Input Register.

LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
No Input Register registers have been added yet. Add some to see them here.					

- User can enter the Register Name, Data Type, Address, Fport and Properties, ensuring it matches the parameter name used in the **LoRaWAN decoder**.

Input Register					
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
Enter LoRaWAN name					

6) **Configure Uplinks and Downlinks** using “Holding Register”

- Click the ‘+’ icon on the right side of the page to add a Holding Register.

Holding Register					
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
No Holding Register registers have been added yet. Add some to see them here.					

+ Add Holding Register

- User can enter the Register Name, Data Type, Address, Fport and Properties, ensuring it matches the parameter name used in the **LoRaWAN decoder**.

Holding Register					
LORAWAN NAME	DATA TYPE	QUANTITY	ADDRESS	FPORT	PROPERTIES
Enter LoRaWAN name					

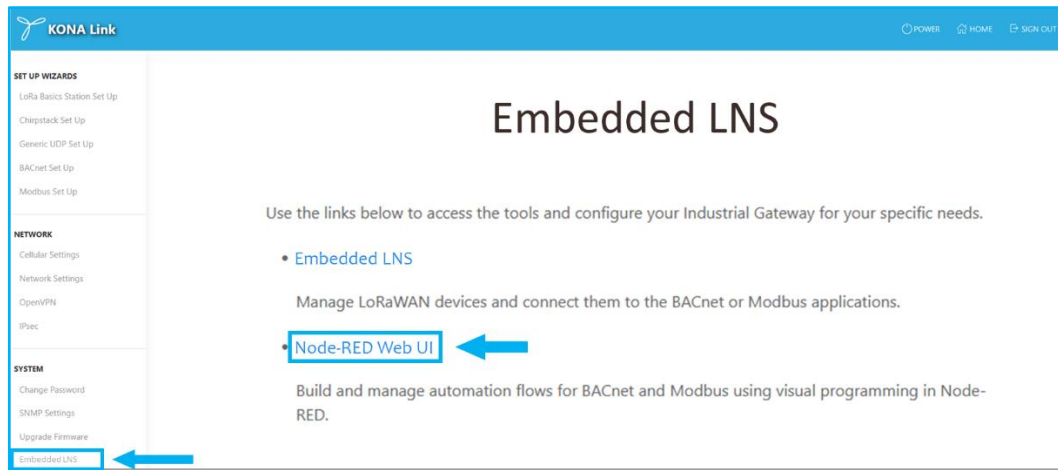
7) **Repeat** the steps above to add all required Modbus uplink and downlink registers.

8) Click on “**Apply**”

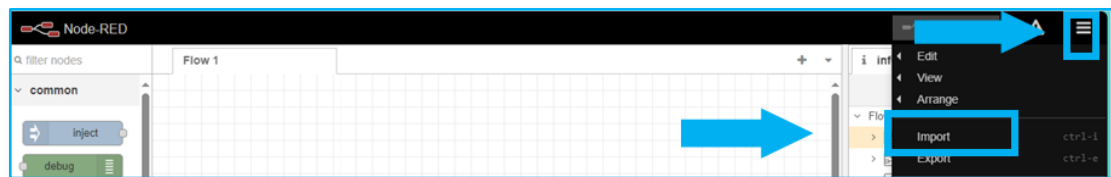
4.3 Send Decoded Uplink to External MQTT Broker

1. Login to Kona Link web page using “Host Name” or “IP Address”:
 - Using “Host Name”
Host Name URL: <https://kona-<GW variant>-<last 6 digit GW ID>.local/>
Eg: <https://kona-micro-0011ab.local/>
 - Using “IP Address”
IP Address URL: <https://<GW IP Address>/>
Eg: <https://192.0.2.111/>

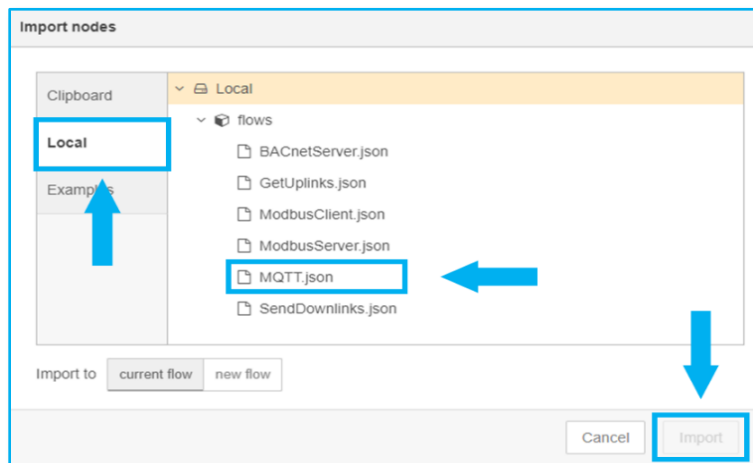
2. Follow the **Node-RED Web UI** link in Embedded LNS subsection in Kona Link



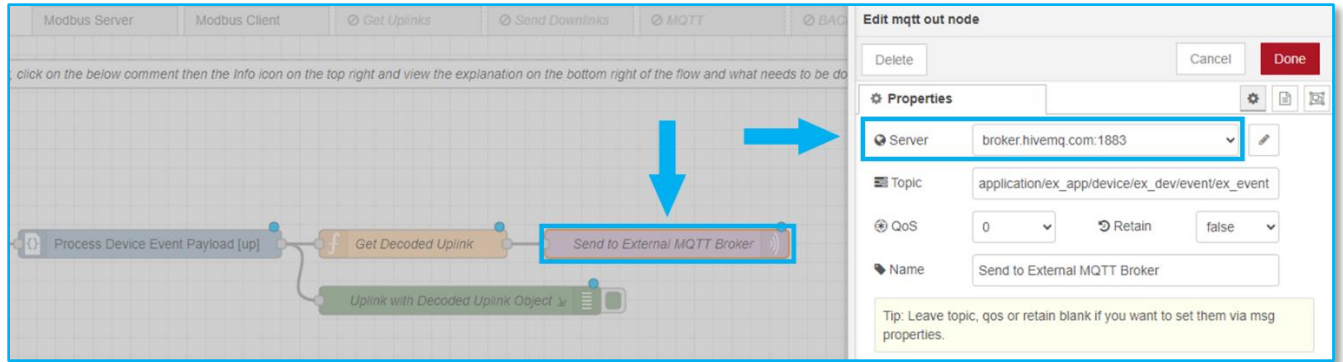
3. In a new flow go to menu and select **Import**



4. Go to section Local and select **MQTT.json** flow for your application:



5. In **Send External MQTT Broker** node in Server field enter the address of the MQTT broker you wish to use



6. Deploy the flow.

4.4 Get Decoded Uplinks from Chirpstack LNS to Node Red

1. Login to Kona Link web page using “Host Name” or “IP Address”:

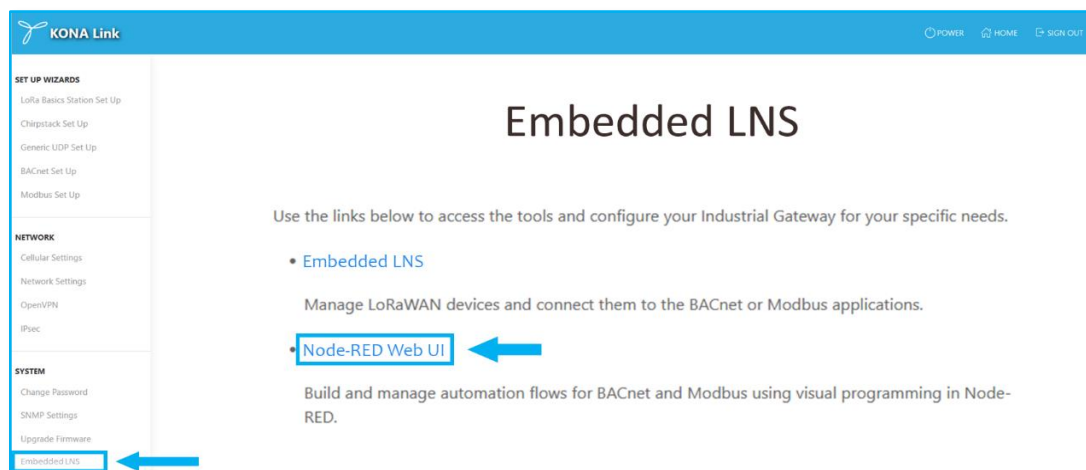
- Using “Host Name”

Host Name URL: <https://kona-<GW variant>-<last 6 digit GW ID>.local/>
 Eg: <https://kona-micro-0011ab.local/>

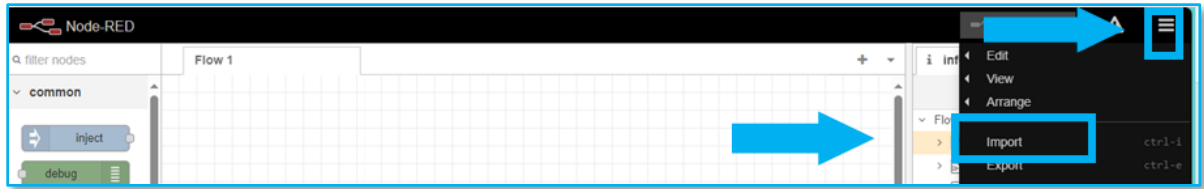
- Using “IP Address”

IP Address URL: <https://<GW IP Address>/>
 Eg: <https://192.0.2.111/>

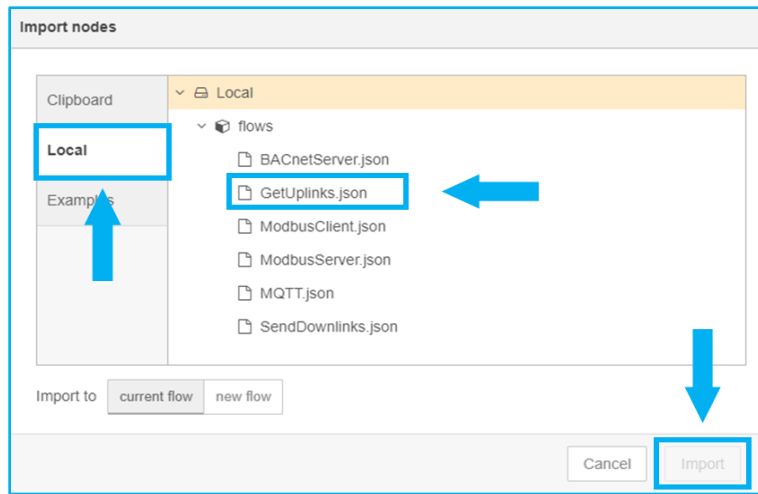
2. Follow the **Node-RED Web UI** link in Embedded LNS subsection in Kona Link



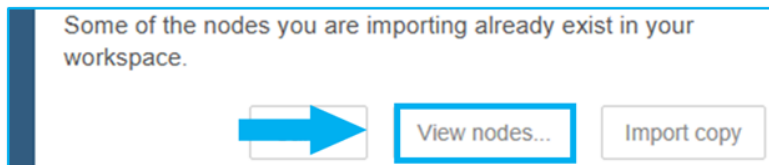
3. In a new flow go to menu and select **Import**



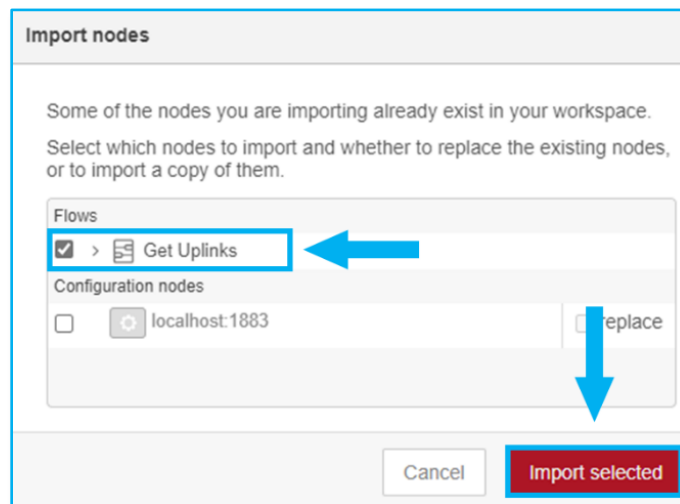
4. Go to section Local and select **GetUplinks** flow for your application:



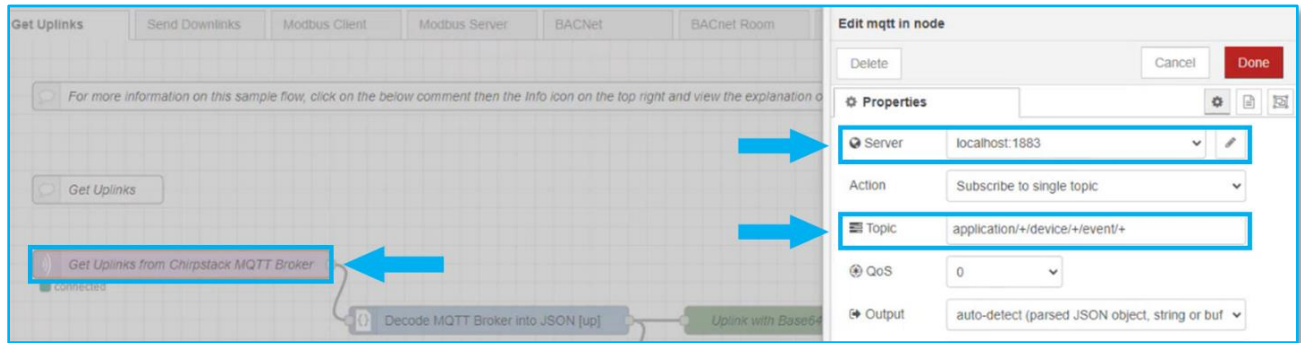
5. On the incoming warning message, click on **View nodes**.



6. On the Import nodes window, ensure that only Get Uplinks is checked, then click on **Import selected**.



7. In GetUplinks flow configure Get Uplinks from Embedded LNS MQTT Server input node:
 - 7.1. Server: localhost:1883 for Embedded LNS
 - 7.2. Topic: Set the subscription topic to match the topic of your LoRaWAN device (e.g., device uplink).



8. Once you receive the uplink data, use a function node to process it. You may need to decode the payload using a data converter if Embedded LNS is set up with the correct profiles.
9. After decoding the data, you can use it to trigger other actions, such as sending data to a database, displaying it on a dashboard, or forwarding it to other systems.
10. Deploy the flow.

5. Licensing Process

Gateways operating with Embedded LNS require a valid license. Each license is uniquely generated based on the gateway's fingerprint and **cannot be reused** on any other device.

To obtain this license, the gateway's **fingerprint** must first be retrieved and submitted to **TEKTELIC**. TEKTELIC will then generate and return a valid license file. Once received, the license must be **installed** on the gateway.

This section provides a detailed explanation of both steps:

1. **Retrieving the gateway fingerprint**
2. **Installing the license**

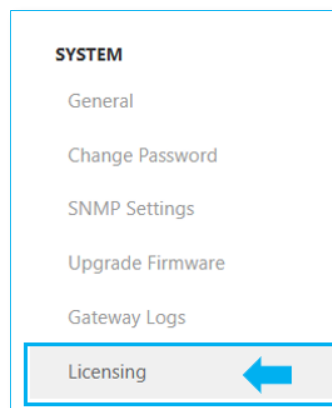
Please note, Licensing is supported only on **BSP version 7.2.13 and later**.

5.1 Retrieving the Gateway Fingerprint

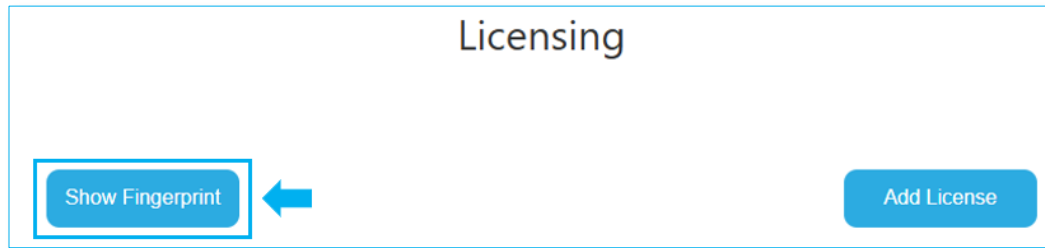
A gateway fingerprint is required before TEKTELIC can generate a license.

Steps to Retrieve Fingerprint in KONA Link:

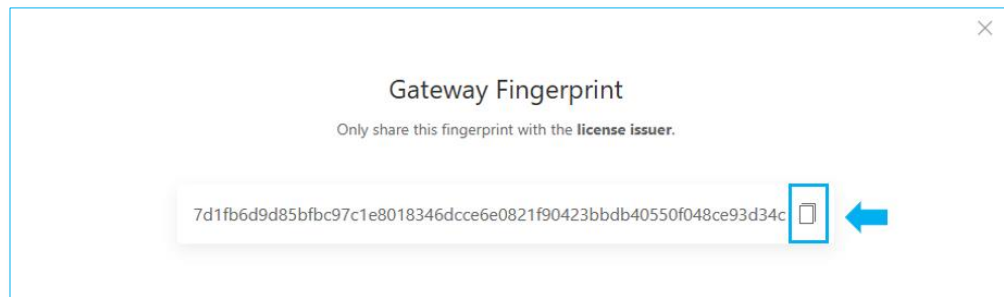
1. Login to Kona Link web page using "Host Name" or "IP Address":
 - Using "Host Name"
Host Name URL: `https://kona-<GW variant>-<last 6 digit GW ID>.local/`
Eg: `https://kona-micro-0011ab.local/`
 - Using "IP Address"
IP Address URL: `https://<GW IP Address>/`
Eg: <https://192.0.2.111/>
2. Navigate to "**Licensing**" under **System** section.



3. Select **Show Fingerprint**



4. **Copy** the displayed fingerprint for submission to TEKTELIC sales

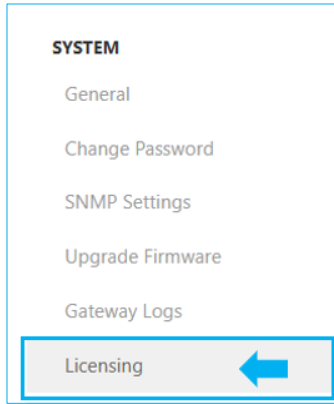


5. Share the "**Gateway Fingerprint**" with TEKTELIC Sales.

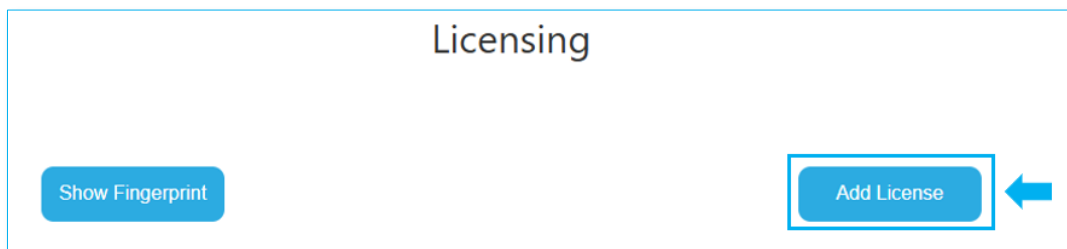
5.2 Activating the License

After receiving your license file from TEKTELIC:

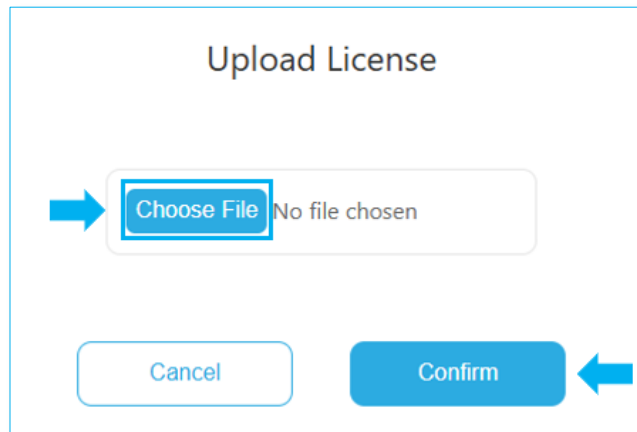
1. Login to Kona Link web page using "Host Name" or "IP Address":
 - Using "Host Name"
Host Name URL: <https://kona-<GW variant>-<last 6 digit GW ID>.local/>
Eg: <https://kona-micro-0011ab.local/>
 - Using "IP Address"
IP Address URL: <https://<GW IP Address>/>
Eg: <https://192.0.2.111/>
2. Navigate to "**Licensing**" under **System** section



3. Select **Add License**



4. A pop-up window will appear prompting the user to **Choose File**. Select the license file provided by TEKTELIC, then click **Confirm** to save the changes.



5. The user should now be able to view the uploaded license, displaying the License ID, features, expiry date, and the associated Gateway ID.

Licensing

Show Fingerprint

Add License



License ID
L-1764008163

Features
Embedded LNS

Expiry
2025-12-01
18:16:03 UTC

Gateway
647FDAFFFE016BE6



6. Troubleshooting

6.1 Device Connectivity Issue - Check gateway Configuration

1. If the user has trouble connecting, check the gateway BSP version
2. If your Gateway was shipped with BSP version 7.2.13 or earlier, follow the below steps to check if the Gateway is listed.

- a. Login to Kona Link web page using “Host Name” or “IP Address”:

- Using “Host Name”

Host Name URL: `https://kona-<GW variant>-<last 6 digit GW ID>.local/`

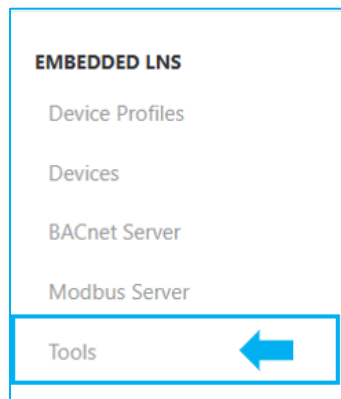
Eg: `https://kona-micro-0011ab.local/`

- Using “IP Address”

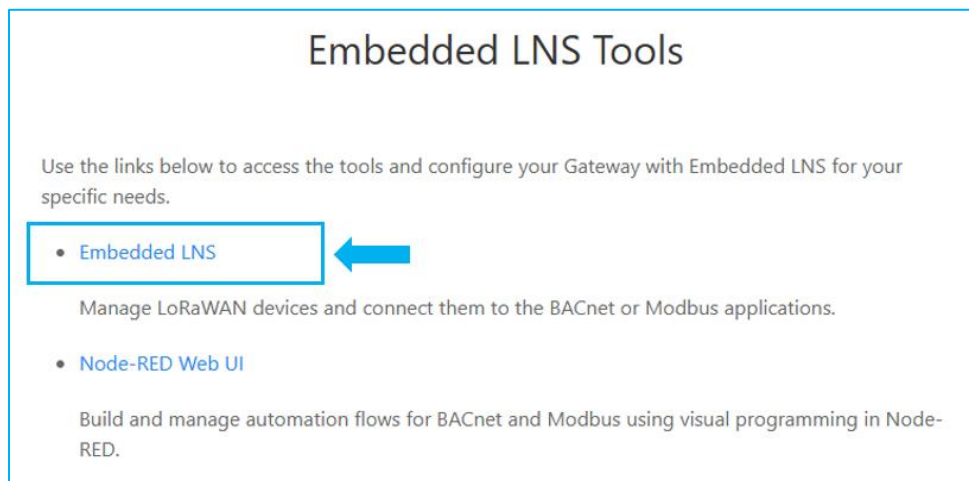
IP Address URL: `https://<GW IP Address>/`

Eg: `https://192.0.2.111/`

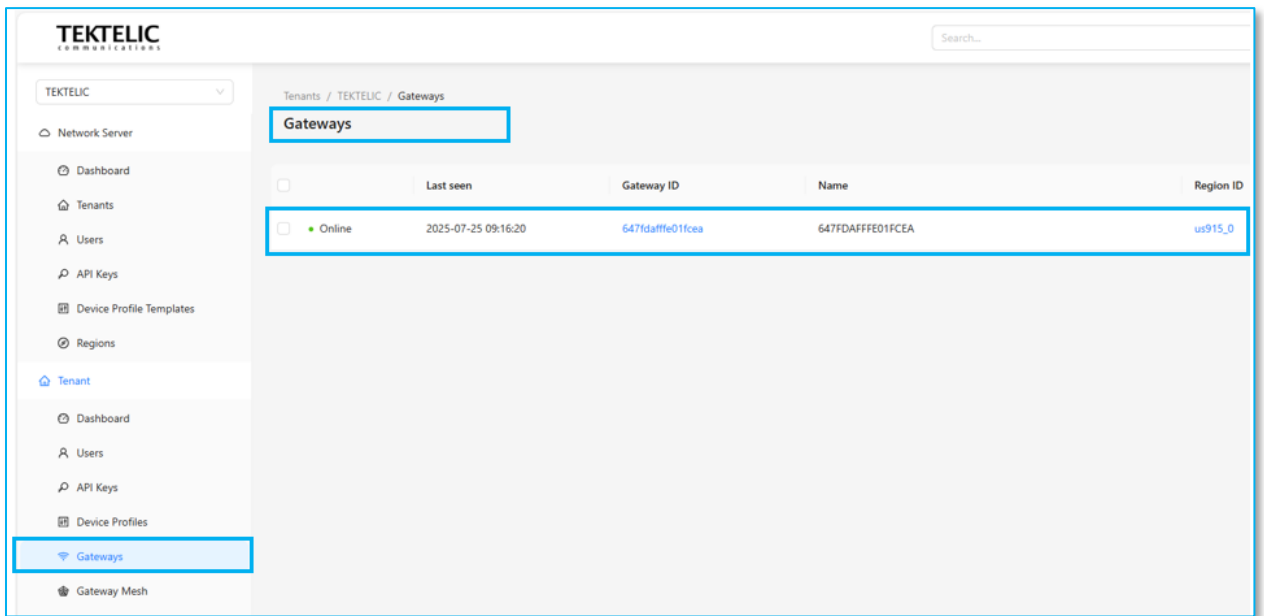
- b. Navigate to “**Tools**” under Embedded LNS



- c. Log into Embedded LNS Network Server by clicking on “**Embedded LNS**” link.

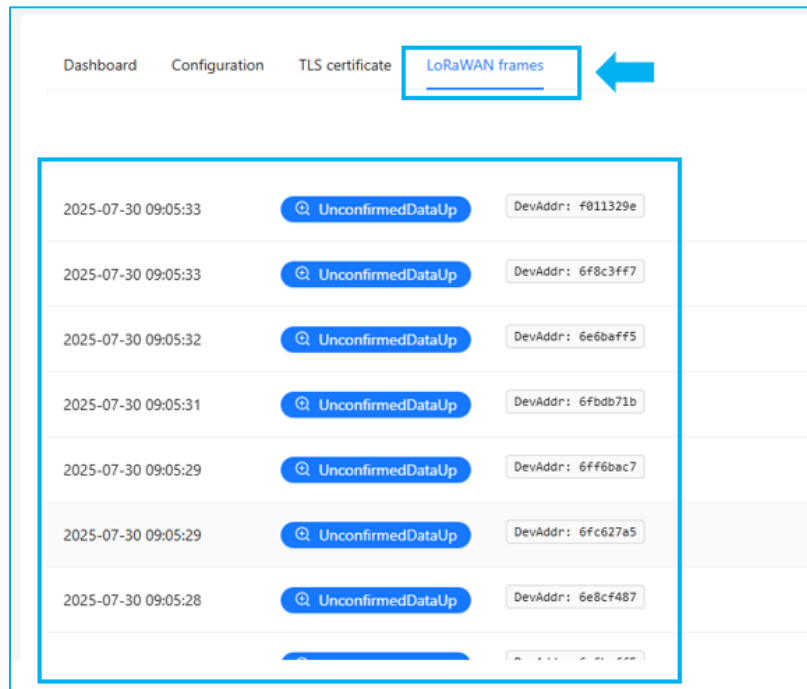


d. Navigate to Gateway section, and verify if a gateway is listed.



3. If the gateway is listed,

- a. Click on "Gateway ID"
- b. Select "LoRaWAN frames" tab
- c. Verify if the packets are being received



4. If the gateway is not listed,
 - a. Click on “Add gateway”, using the Gateway ID shown on the KONA Link home page.



6.2 Managing Modbus Server after upgrading BSP

If you are upgrading from **Embedded LNS BSP version 7.1.16.3 to BSP version 7.2.13** and were previously using **Node-RED** for managing Modbus registers, please review the following:

1. For Existing Node-RED Modbus Users

- b. You can **continue using your existing Modbus setup** in Node-RED after upgrading.
- c. However, **do NOT enable the new Modbus service** in **BSP version 7.2.13** while **Node-RED Modbus is still active**.
- d. Running both simultaneously may **cause configuration conflicts** and **affect system stability**.

2. Switching to the BSP version 7.2.13 Modbus

If you wish to adopt the **new Modbus functionality** included in **BSP version 7.2.13**:

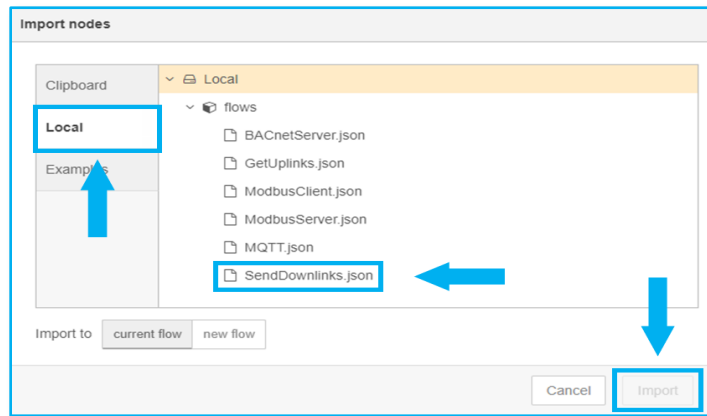
- **Disable** the existing Modbus configuration in **Node-RED** first.
- Then **re-populate all Modbus registers** manually in the **BSP version 7.2.13 Modbus interface** using the steps listed in this section.
- Verify that all registers and mappings are configured correctly before deployment.

6.3 Sending Downlinks to Embedded LNS

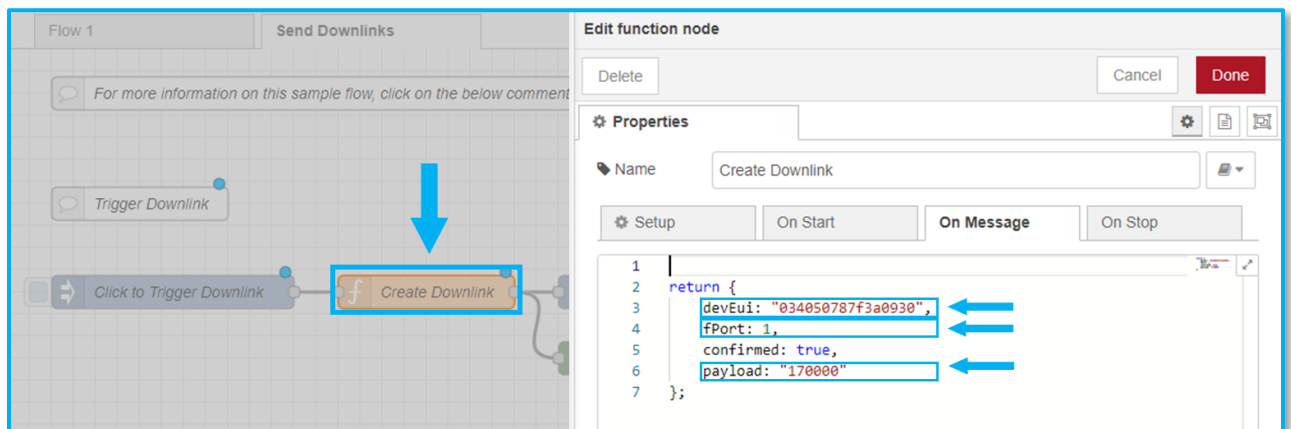
1. In a new flow go to menu and select **Import**



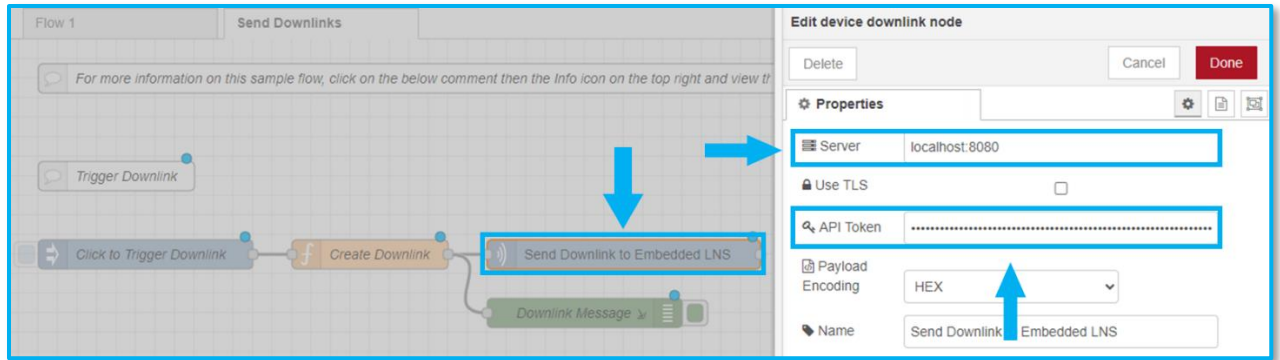
2. Go to section Local and select SendDownlinks flow for your application:



3. Click twice on **Send Downlink** and configure deveui, fPort and payload for your device according to the device documentation. For TEKTELIC devices, you can use the KONA Atlas tool to generate the payload.



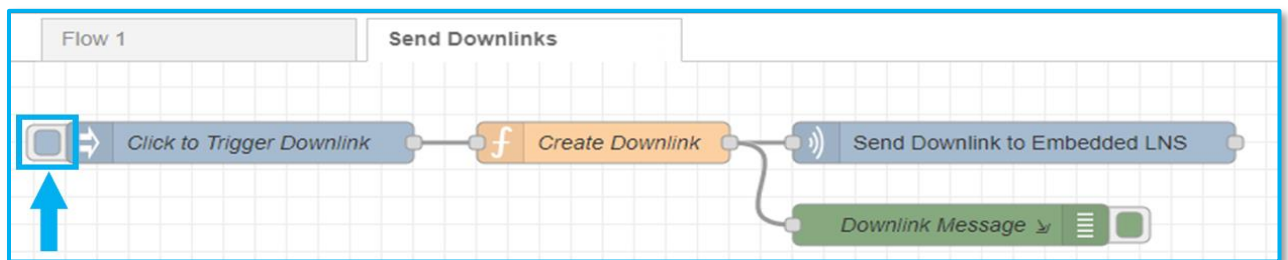
4. To get the DevEUI go to **Application** section in Embedded LNS and pick the application.
In Devices section pick the **DevEUI** of the Device.



8. Click on “**Deploy**”



9. Trigger downlink by pushing the activating button

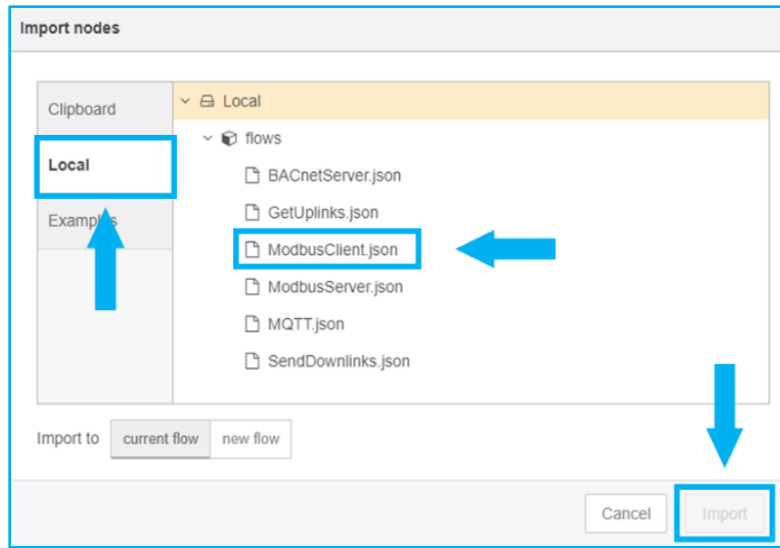


6.4 Configure a Modbus Client

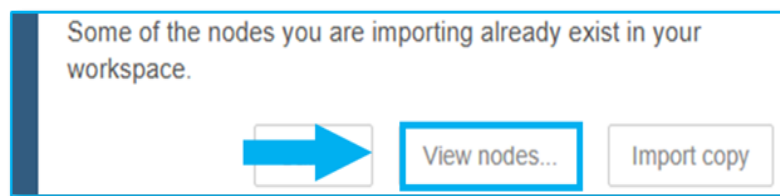
1. In a new flow go to menu and select **Import**



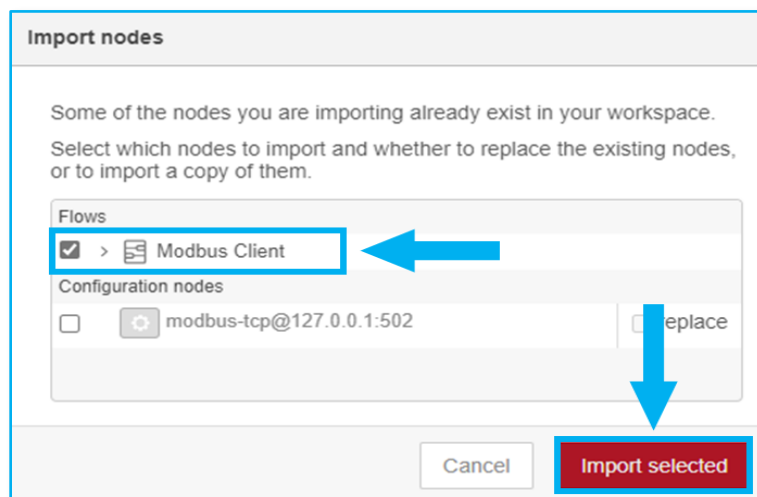
2. Go to section Local and select **Modbus Client** flow:



3. On the incoming warning message, click **View nodes**.



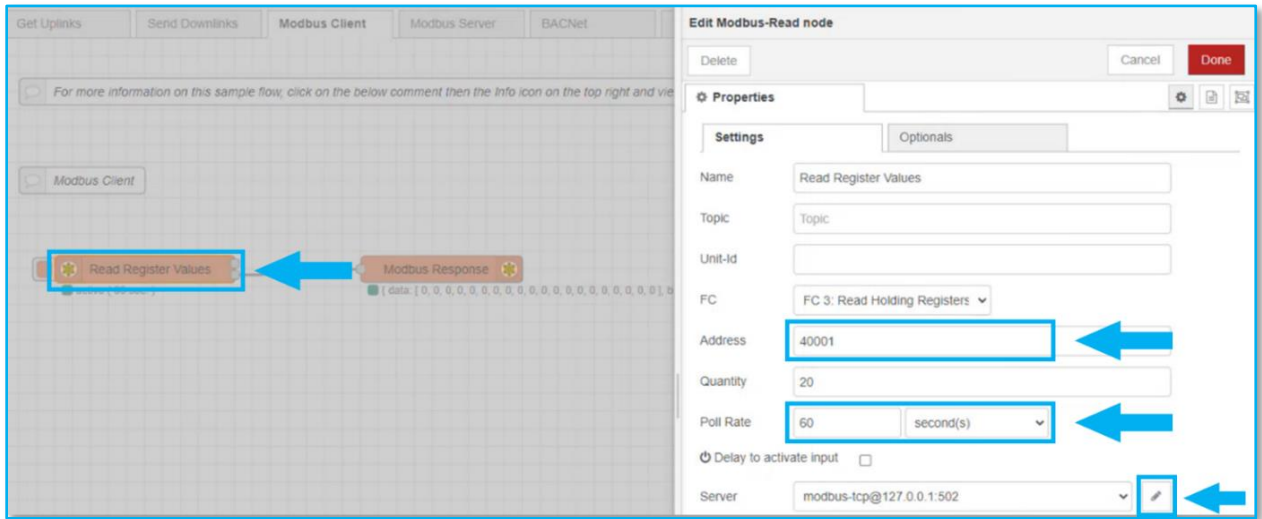
4. On the **Import nodes** window, ensure that only **Modbus Client** is checked, then click on **Import selected**.



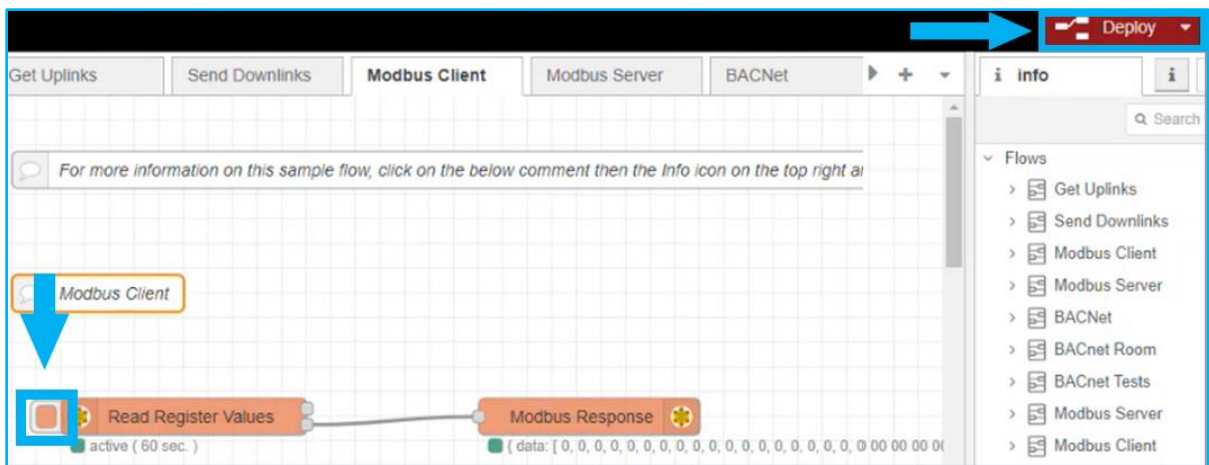
5. In Modbus Client flow in Read Register Values node:

- Address: 40001
- Quantity: 20 (means read 20 registers starting at the 40001 Modbus register address)

- Poll Rate: 60 seconds (value update time period)
- Update the server address

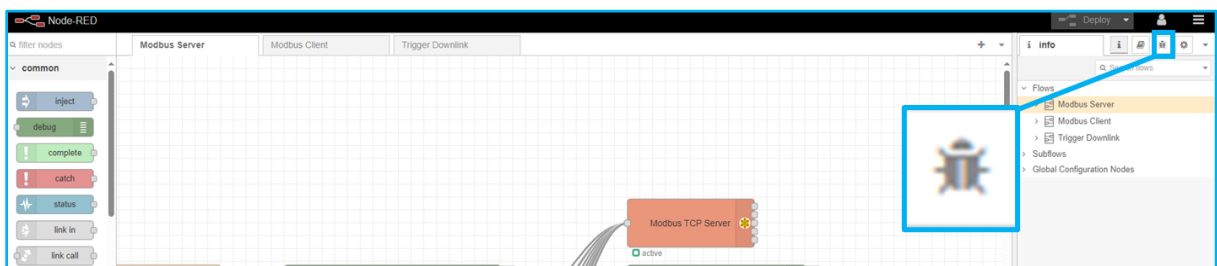


6. Deploy changes. After that you can activate push button to read the Modbus register values.

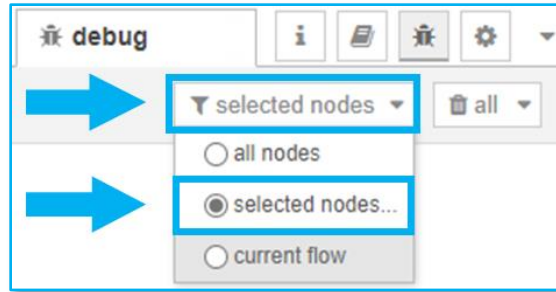


6.5 View Uplink Messages

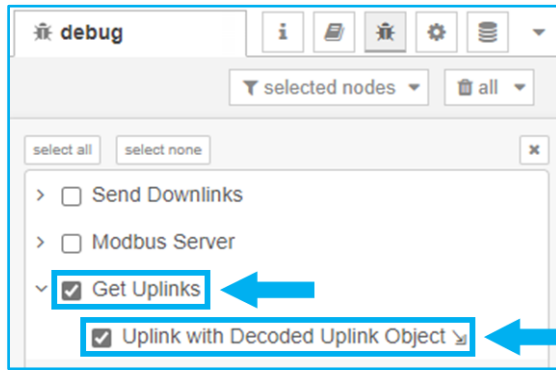
1. In a right panel select the debug icon represented by a bug.



2. In the nodes filter menu click on **selected nodes**



3. Select the flow you want to view uplinks for



4. You will be able to see decoded Uplink messages.

