

Universal IoT Gateway

Product Manual



PM_uGateway_E02B

Content

1	Introduction	8
1.1	Overview	8
1.2	Accessories / Informative Material Included	8
1.3	Symbols	9
1.4	Product References	9
2	Product	10
2.1	Technical Data	10
2.2	Technical Drawings	10
2.3	Connections	12
2.4	Reset Button.....	13
2.5	LED Indicators.....	13
2.6	Label	13
2.7	Web interface characteristics	14
2.7.1	Universal IoT Gateway Configuration	14
2.7.2	Data collection and Customized Visualization	14
2.7.3	Real-time monitoring.....	15
2.7.4	Data visualization and export	15
2.7.5	User Types	15
3	Updates.....	16
4	Initial Configuration	17
4.1	System Requirements	17
4.2	Wireless Network.....	17
5	Access	18
5.1	Login and Logout.....	19
6	Web Interface	22
6.1	User Management	22
6.2	Composting Menu.....	24
6.2.1	Batch Search	24
6.2.2	Create <i>Batch</i>	25
6.2.3	Create Feedstock List	26
6.2.4	Probe Selection	27
6.2.5	Edit Batch	29
6.2.6	Archive Batch	30
6.2.7	Delete Batch	31
6.2.8	Logbook	32
6.2.9	Report Export.....	34

6.2.10	Data Export.....	35
6.3	Dashboards Menu	36
6.3.1	Create Dashboard	36
6.3.2	Edit Dashboard	37
6.3.3	Add Widget	38
6.3.4	Clone Dashboard.....	50
6.3.5	Remove Dashboard.....	51
6.4	<i>Datasources</i> Menu	53
6.4.1	Home Page.....	53
6.4.2	Add new <i>datasource</i>	54
6.4.3	Data Visualization by Device.....	55
6.4.4	Sync Datasource to the Cloud.....	68
6.4.5	Delete <i>datasource</i>	69
6.5	Data Menu	70
6.6	Settings Menu	72
6.6.1	Device	73
6.6.2	Network	77
6.6.3	Cloud	82
6.6.4	Modbus.....	84
6.6.5	Modbus RTU Master (opcional).....	85
6.6.6	Modbus TCP/IP Client (Optional).....	87
6.6.7	Cellular (optional)	89
6.7	Alarm Menu (optional).....	89
6.7.1	Configuration	90
6.7.2	SMS Service.....	92
6.7.3	Email Service	93
7	Third-party platform integration	95
7.1	MQTT.....	95
7.2	Node-RED	95
8	Front display	98
9	Revision History	101

Table of Figures

Figure 1 - Dimensions of the Universal IoT Gateway with aluminum case.	10
Figure 2 - Dimensions of the Universal IoT Gateway with ABS case.	11
Figure 3 - Physical connections of the Universal IoT Gateway with aluminum case.	12
Figure 4 - Physical connections of the antennas of the Universal IoT Gateway with aluminum case.	12
Figure 5 - Physical connections of the Universal IoT Gateway with ABS case.	12
Figure 6 - Physical connections of the antenna of the Universal IoT Gateway with ABS case.	12
Figure 7 - RS485 connections (ABS case)	12
Figure 8 - Power and RS485 connections (aluminum case)	12
Figure 9 - Example of a Universal IoT Gateway label.	14
Figure 10 – Universal IoT Gateway Network.	18
Figure 11 – Login Page.	19
Figure 12 – Login Page with Incorrect Password or Username.	20
Figure 13 – Side Menu with logout option.	21
Figure 14 – Logout Confirmation Window.	21
Figure 15 - Sidebar Menu with user settings option.	22
Figure 16 – User creation section.	22
Figure 17 – User list section.	22
Figure 18 – User edit section - Administrator	23
Figure 19 – User deletion confirmation window.	23
Figure 20 – User edit window - Viewer	23
Figure 21 - Composting Menu	24
Figure 22 - Batch Search.	24
Figure 23 - Batch Creation.	25
Figure 24 - Batch Creation Window.	25
Figure 25 - Feedstock List Creation Window	26
Figure 26 - Text Box in the Feedstock List Creation Window.	26
Figure 27 - Text Entry in the Feedstock List Creation Window.	26
Figure 28 - Text Entered in the Feedstock List Creation Window.	26
Figure 29 - Feedstock List with New Item Added.	27
Figure 30 - Deleting Items from the Feedstock List	27
Figure 31 - List with no available datasources.	27
Figure 32 - Probe Selection Window.	28
Figure 33 - Adding a Probe to the Batch.	28
Figure 34 - Indication of Probe Added.	28
Figure 35 - Batch Edit Button.	29
Figure 36 - Alternative Batch Edit Button.	29
Figure 37 - Batch Editing Window.	29
Figure 38 - Archiving Batches in the “Batches” Column.	30
Figure 39 - Archiving Batches in the Workspace.	30
Figure 40 - Batch Archiving Window.	30
Figure 41 - Batch Archive Confirmation Window.	31
Figure 42 - Deleting Batches in the “Batches” Column.	31
Figure 43 - Deleting Batches in the Workspace.	31
Figure 44 - Batch Deletion Confirmation Window.	32
Figure 45 - Logbook Access Button.	32
Figure 46 - Logbook Window.	33
Figure 47 - Archived Batches in the Logbook.	33
Figure 48 - Report Export Button.	34
Figure 49 - Batch Report.	34
Figure 50 - Logbook Entries of a Report.	35

Figure 51 - Report Export Button in Different Formats.	35
Figure 52 – Dashboards Menu.	36
Figure 53 - Dashboard Creation.	36
Figure 54 - Dashboard Creation Window.	37
Figure 55 - Dashboard editing menu.	37
Figure 56 - Dashboard editing option.	37
Figure 57 - Dashboard editing.	38
Figure 58 – Add new widget on the dashboards menu.	38
Figure 59 - Add widget option.	39
Figure 60 – Add new widget.	39
Figure 61 – “Select Widget Type” window.	39
Figure 62 - Chart Data Selection window.	40
Figure 63 - Chart Data Selection variable list.	40
Figure 64 - Add to Selection button.	41
Figure 65 - Variables added.	41
Figure 66 - Time range.	42
Figure 67 – “Chart Data Selection” Apply Button.	42
Figure 68 - On-page graph updated with the selections made.	43
Figure 69 - Edit, clone and remove graph.	43
Figure 70 – “Value Data” window.	44
Figure 71 – “Value Data” variables.	45
Figure 72 - Apply Button on “Value Data” window.	45
Figure 73 – Widget example.	46
Figure 74 - Created widget editing.	46
Figure 75 - Gauge data selection.	47
Figure 76 - Gauge data selection variables.	47
Figure 77 – Color palette on Gauge Data Selection window.	48
Figure 78 – Choosing colors on Gauge Data Selection window.	49
Figure 79 - Costumized widget example.	49
Figure 80 - Edit, clone or remove customized widget.	50
Figure 81 - Clone Dashboard option.	50
Figure 82 - Clone Dashboard on the Dashboards menu.	51
Figure 83 - Created Dashboard example.	51
Figure 84 - Remove Dashboard option.	52
Figure 85 – Remove Dashboard on the Dashboard menu.	52
Figure 86 - Janela de confirmação Remove Dashboard.	52
Figure 87 - Dashboard deleted from the list.	52
Figure 88 – Home page (Datasources).	53
Figure 89 – Transmitter configuration page in the Tekon Configurator.	54
Figure 90 - Datasource Page with a selected datasource.	55
Figure 91 - Datasource configuration section (Settings).	56
Figure 92 - Datasource Measurements Section.	56
Figure 93 - Options for changing the graph scale.	57
Figure 94 - Datasource properties section in the Datasource page.	57
Figure 95 - Variable Adjustments Page.	58
Figure 96 - Filling in fields to create a conversion unit.	58
Figure 97 - Delete Conversion Unit.	59
Figure 98 - Formulas for float-type data outputs.	59
Figure 99 - Formulas for boolean-type data outputs.	60
Figure 100 - Approximation Function Options.	60
Figure 101 - No. of Decimal Places Field.	60
Figure 102 - Internal Temperature Variable of the datasource.	60

Figure 103 - Indication where to click as described in Step 1.	61
Figure 104 - Name Field.	61
Figure 105 - Units Field List.	62
Figure 106 - Add Formula Field.	62
Figure 107 - Formula to Be Chosen.	63
Figure 108 - Value to Enter in Gain.	63
Figure 109 - Value to Enter in Offset.	64
Figure 110 - Limit Decimal Places Option Selected.	64
Figure 111 - Approximation Function Options.	65
Figure 112 - Setting the Number of Decimal Places.	65
Figure 113 - Values after applying the conversion formula.	66
Figure 114 - Values to undo the conversion formula.	66
Figure 115 - Values without the applied conversion formula.	67
Figure 116 - Editing options in Datasource Settings.	67
Figure 117 - Datasource Settings section on the datasource page with Cloud sync.	68
Figure 118 - Datasources section on the Tekon IoT Platform.	68
Figure 119 - Creating a datasource on the Tekon IoT Platform.	69
Figure 120 - Datasource Settings section on the datasource page with Cloud sync and API key.	69
Figure 121 - Options to delete a Datasource on the selected Datasource page.	70
Figure 122 - Data Viewing and Export page.	70
Figure 123 - Section to select the Datasource for viewing and/or export.	70
Figure 124 - Section to select the variables for viewing and/or export.	71
Figure 125 - Section to select different variables for viewing and/or export.	71
Figure 126 - Section of variables added to the list on the Data Viewing and Export page.	71
Figure 127 - Section to define the data viewing/export period.	71
Figure 128 - Graphic for PNG and JPG export.	72
Figure 129 - Table for Export in PDF, XLSX, and CSV.	72
Figure 130 - Settings tab menu with the Modbus RTU Master and TCP/IP Client Pack inactive (left) and active (right).	72
Figure 131 - Device Settings page.	73
Figure 132 - Section to configure date and time with NTP disabled.	73
Figure 133 - Section to configure date and time with NTP enabled.	74
Figure 134 - Actions available on the Device Settings page.	74
Figure 135 - Page to activate advanced modules.	74
Figure 136 - Page to upload raucb file for device update.	75
Figure 137 - Pages to view update progress and completion.	75
Figure 138 - Device reboot confirmation page.	75
Figure 139 - Page to confirm settings reset.	76
Figure 140 - Page for Universal IoT Gateway reboot.	76
Figure 141 - Node-RED interface page.	77
Figure 142 - Page to configure the device network.	78
Figure 143 - Section to configure Ethernet 0 network with DHCP disabled.	78
Figure 144 - Section to configure Ethernet 0 network with DHCP enabled.	78
Figure 145 - Factory settings of the Wi-Fi module.	79
Figure 146 - Checkbox for the Wi-Fi On/Off field checked.	79
Figure 147 - Fields to be filled in to connect to a Wi-Fi network.	80
Figure 148 - uGateway display showing the Wi-Fi connection status.	80
Figure 149 - uGateway display showing the Wi-Fi connection IP.	80
Figure 150 - IP Address field showing the IP of the device connected to a Wi-Fi network.	81
Figure 151 - Section to configure DNS: disabled.	81
Figure 152 - Section to configure DNS: enabled.	81
Figure 153 - Section to configure HTTP Proxy: disabled.	81

Figure 154 – Section to configure HTTP and HTTPS Proxy: enabled.....	82
Figure 155 – Cloud Settings page.	82
Figure 156 – Cloud configuration section with Cloud Checkbox enabled.	82
Figure 157 - Settings tab menu on the Tekon IoT Platform.....	83
Figure 158 – Administration page on the Tekon IoT Platform.	83
Figure 159 – User creation section on the Tekon IoT Platform.	83
Figure 160 - Cloud Settings page with Cloud sync and API key.	83
Figure 161 – Modbus Settings page in the base version of the device.	84
Figure 162 – Modbus RTU section on the Modbus Settings page in the base version of the device.....	84
Figure 163 – Modbus TCP/IP section on the Modbus Settings page in the base version of the device.....	85
Figure 164 – Modbus RTU window section to configure Modbus RTU Master.	85
Figure 165 - Modbus RTU window section to configure the slave.	85
Figure 166 - Modbus RTU window section to configure Modbus RTU addressing.	86
Figure 167 – Modbus RTU window section for configuring slave requests.....	86
Figure 168 - Modbus TCP/IP window section to configure Modbus TCP/IP Client.	87
Figure 169 - Modbus TCP/IP window section to configure the server.	87
Figure 170 - Modbus TCP/IP window section to configure Modbus TCP/IP addressing.	88
Figure 171 - Modbus TCP/IP window section to configure server requests.....	88
Figure 172 – Cellular Settings Page.....	89
Figure 173 – Alarms tab Menu.	89
Figure 174 - Alarm Configuration Page.....	90
Figure 175 – List of comparison methods in value alarm configuration.	90
Figure 176 – Value alarm configuration section.	90
Figure 177 - Inactivity alarm configuration section.	91
Figure 178 – Configured alarms list section.....	91
Figure 179 - SMS service configuration page for alarm notifications with an external service.	92
Figure 180 - SMS service configuration page for alarm notifications with the device's GSM module.	92
Figure 181 – SMS service configuration test page.....	92
Figure 182 – Email service configuration page for alarm notifications.	93
Figure 183 - Email service configuration test page.....	93
Figure 184 – Example of a value alarm email notification.....	94
Figure 185 – Link to access the Node-RED page.	95
Figure 186 – Window to enter credentials to access the Node-RED page.	96
Figure 187 - MQTT Server configurations.....	96
Figure 188 - MQTT Server configurations.....	97
Figure 189 - MQTT Node configuration.	97
Figure 190 - Flow and Debug Message.	97
Figure 191 - Ethernet port 0 information.	98
Figure 192 - Ethernet port 1 information.	98
Figure 193 - GSM connection information.	99
Figure 194 - Wi-Fi connection information.....	99
Figure 195 - Wi-Fi connection IP address.	99
Figure 196 - DUOS devices slave information.....	99
Figure 197 - DUOS devices port information.....	100
Figure 198 - PLUS devices slave information.	100
Figure 199 - PLUS devices port information.	100

1 Introduction

1.1 Overview

The Universal IoT Gateway product is a device that enables communication between the transmitters of Tekon's DUOS and PLUS product family, as well as third-party transmitters, with IoT platforms through integration with REST API (Tekon IoT Platform) and MQTT (third-party platforms). The Universal IoT Gateway also uses Modbus TCP/IP and Ethernet communication protocols for sending and receiving data to clouds and the Modbus RTU protocol for communications in local networks.

This device features a web interface, the **Universal IoT Gateway Interface**, designed to assist in the configuration, integration of devices, visualization, data export, and alarm configuration. Additionally, it allows for data storage using an internal memory of 8 GB.

1.2 Accessories / Informative Material Included

Software Pack:

Modbus RTU Master and TCP/IP Client Pack;

Alarms and Notifications Pack;

Node-RED Pack.

Accessories:

Tinymesh protocol external RF antenna (included);

External GSM antenna (included in the aluminum case);

External Wi-Fi antenna (included in the aluminum case);

RS-485 converter cable (optional);

Power supply (optional);




ABS case mounting and fixing accessory (optional).

Informative Material:

Datasheet;

Product manual.

1.3 Symbols

	The Universal IoT Gateway complies with European legislation and harmonized European standards for electronic products, allowing free circulation within the internal market of the European Union.
	If the device becomes obsolete and unused, please do not dispose of it in traditional waste. Place the device in an appropriate electronic waste disposal bin.
	This symbol exhibits especially important guidelines regarding the installation and operation of the device. Carefully read any information related to this symbol. Failure to comply with the guidelines indicated by this symbol may cause accidents, damage, or equipment destruction.

1.4 Product References

Reference	Product
PA222410100	UNIVERSAL IOT GATEWAY TK-UGW-868-ABS
PA222410101	UNIVERSAL IOT GATEWAY TK-UGW-915-ABS
PA222410102	UNIVERSAL IOT GATEWAY TK-UGW-868-ABS-GSM
PA222410103	UNIVERSAL IOT GATEWAY TK-UGW-915-ABS-GSM
PA222410200	UNIVERSAL IOT GATEWAY TK-UGW-868-ALU
PA222410201	UNIVERSAL IOT GATEWAY TK-UGW-915-ALU
PA222410202	UNIVERSAL IOT GATEWAY TK-UGW-868-ALU-GSM
PA222410203	UNIVERSAL IOT GATEWAY TK-UGW-915-ALU-GSM

2 Product

This topic describes the technical and physical characteristics of the Universal IoT Gateway.

2.1 Technical Data

Processor	Arm Quad Core Cortex-A72 64-bit SoC
I/O	Wi-Fi LAN: 2.4 GHz Radio wireless interface 868/915MHz (used by Tekon transmitters) Mobile: 3G/4G cellular modem (optional) Serial: RS-485 Ethernet: 100/1000 Mbps
Memory	8 GB eMMC flash
Protocols	Modbus RTU, Modbus TCP/IP, MQTT
Display	128 x 160 color pixels
Power Supply	12 to 30 V DC
Operating Environment	-10 to 50°C
Dimensions	131×51×131 mm (ABS CASE) 151×61×150 mm (ALUMINIUM CASE)

2.2 Technical Drawings

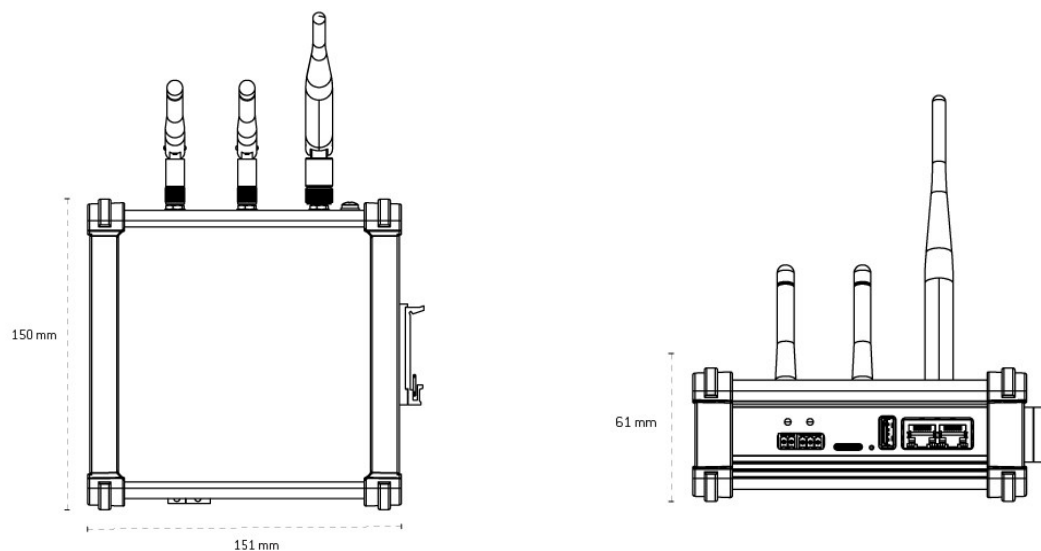


Figure 1 - Dimensions of the Universal IoT Gateway with aluminum case.

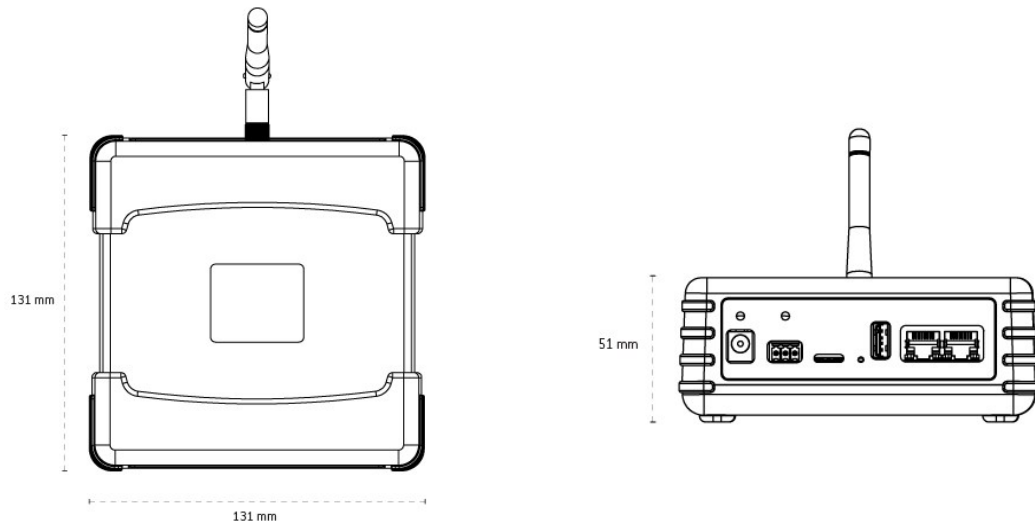


Figure 2 - Dimensions of the Universal IoT Gateway with ABS case.

2.3 Connections

The different versions of the Universal IoT Gateway have external connections characterized by communication interfaces.

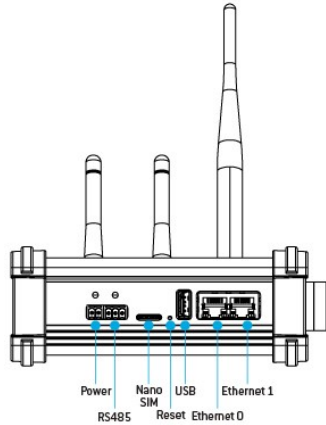


Figure 3 - Physical connections of the Universal IoT Gateway with aluminum case.

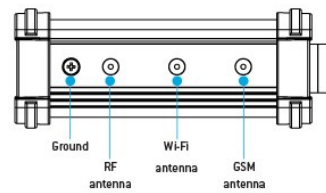


Figure 4 - Physical connections of the antennas of the Universal IoT Gateway with aluminum case.

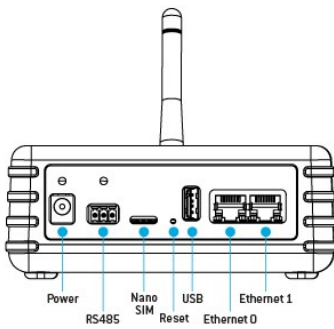


Figure 5 - Physical connections of the Universal IoT Gateway with ABS case.

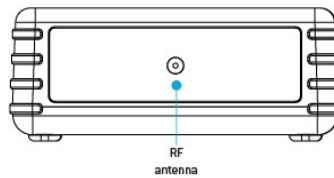


Figure 6 - Physical connections of the antenna of the Universal IoT Gateway with ABS case.

Modbus and Power

The RS485 port of the Universal IoT Gateway allows communication through the Modbus protocol.

A G B

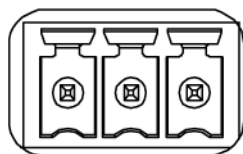


Figure 7 - RS485 connections (ABS case)

+ - A G B

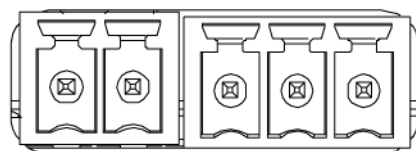


Figure 8 - Power and RS485 connections (aluminum case)

The 2-pin power connector is only available in the version with the aluminum case.

2.4 Reset Button

The Universal IoT Gateway has a reset button that resets the gateway to factory settings. To do this, press the button for 10 seconds, and information about the process will appear on the display. Once completed, the display will show the factory settings.

Additionally, the reset button allows you to change the information displayed on the screen with just one click.

2.5 LED Indicators

The Universal IoT Gateway has a set of LEDs that represent the various behaviors to which the device is exposed. The attached table describes the relationship of each LED, listed from left to right of the technical drawing.

Table 1 – LEDs color and description.

LED	Descrição
Red Power LED	Power connection OK.
Red RS485 LED	RS485 port communication - Transmitter
Green RS485 LED	RS485 port communication - Receiver

2.6 Label

The Universal IoT Gateway is identified with a label Figure 9, which contains information about the product's characteristics necessary for configuration purposes:

- Tekon's name and website;
- Product reference and serial number;
- Device designation;
- ID of the device's pre-configured network;
- Pre-configured wireless channel;
- Wi-Fi network ID;
- Wi-Fi network access password;
- Ethernet 0 port MAC address;
- Ethernet 1 port MAC address;
- Wi-Fi MAC address;
- Certification and safety symbols;
- Corporate group's name and address.

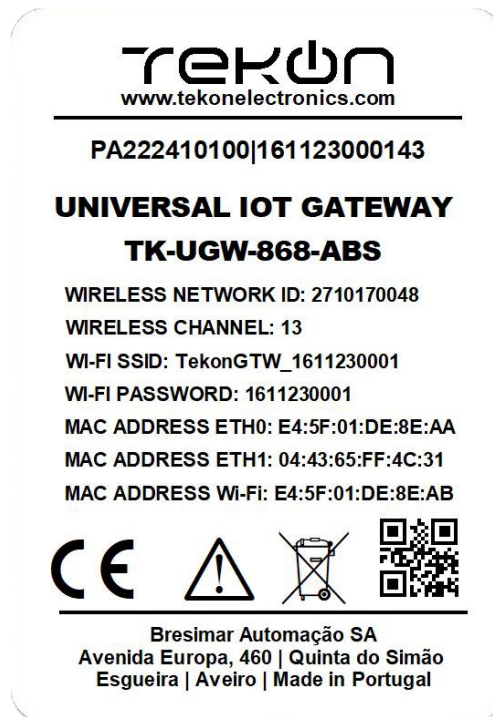


Figure 9 - Example of a Universal IoT Gateway label.

2.7 Web interface characteristics

The **Universal IoT Gateway Interface** is a platform designed to assist in the configuration, integration, and visualization of real-time monitoring data.

The interface provides users with the ability to adapt the Universal IoT Gateway to their needs, verify which datasources (e.g., transmitters and/or sensors) are connected, their characteristics and settings. It also allows to see data from the datasources, as well as exporting it in different formats.

2.7.1 Universal IoT Gateway Configuration

The interface includes, by default, four configuration pages for the gateway itself, where equipment characteristics can be consulted and customized to adapt to various conditions.

2.7.2 Data collection and Customized Visualization

Data collection and visualization are presented by datasource, allowing for quick consultation of their operation.

2.7.3 Real-time monitoring

Monitoring is performed in real-time, enabling integration with IoT platforms.

2.7.4 Data visualization and export

The Universal IoT Gateway Interface allows data selection and visualization, as well as exporting it in different formats (PNG, JPG, XLSX, CSV, and PDF).

2.7.5 User Types

The Universal IoT Gateway Interface allows the use of two types of users: an administrator profile with permission to use all interface features and a viewer profile, which allows viewing connected datasources and exporting data.

3 Updates

Firmware and software updates can be performed by the user or by Tekon Electronics and will be available to the customer on the Tekon Electronics website (see [Device Update](#)). In case of a severe error, contact technical support to evaluate the problem with your device.

4 Initial Configuration

4.1 System Requirements

The correct use of the Universal IoT Gateway depends on a set of requirements that must be ensured.

4.2 Wireless Network

The dedicated wireless network created by the Universal IoT Gateway allows direct access to the device for consultation and configuration. By connecting to the dedicated wireless network, you can access the device interface and navigate to IP address 192.168.128.1. If using mobile devices, make sure to turn off mobile data.

5 Access

Access to the Universal IoT Gateway Interface can be achieved in two different ways: Wi-Fi or Ethernet. Below are the two methods described for cases where the Universal IoT Gateway is set to factory default configurations:

1. **Wi-Fi Connection:** To connect via Wi-Fi, access the network defined on the device's label as Wi-Fi SSID (TekonGTW_XXXXXXXXX, Figure 10) using the corresponding password.

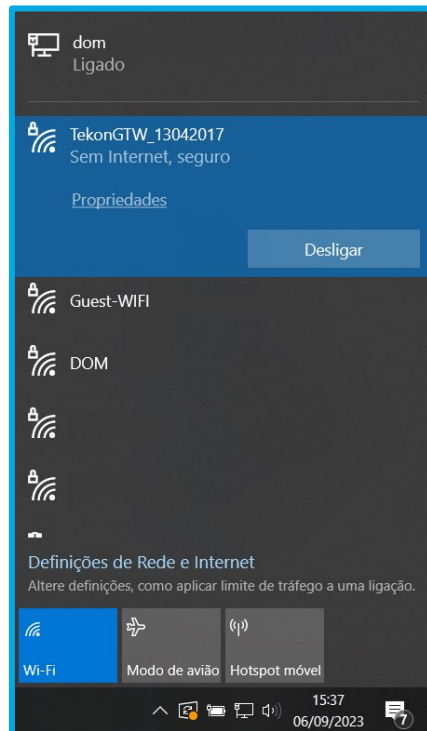


Figure 10 – Universal IoT Gateway Network.

2. **Ethernet Connection:** To connect via Ethernet, connect the Universal IoT Gateway to a local network using a network cable plugged into the ETH0 port of the Universal IoT Gateway.

5.1 Login and Logout

Logging in and out are very simple and quick processes. By accessing the Universal IoT Gateway Interface through the Wi-Fi network or via the IP address, the login page shown in Figure 11 should appear in the web browser.

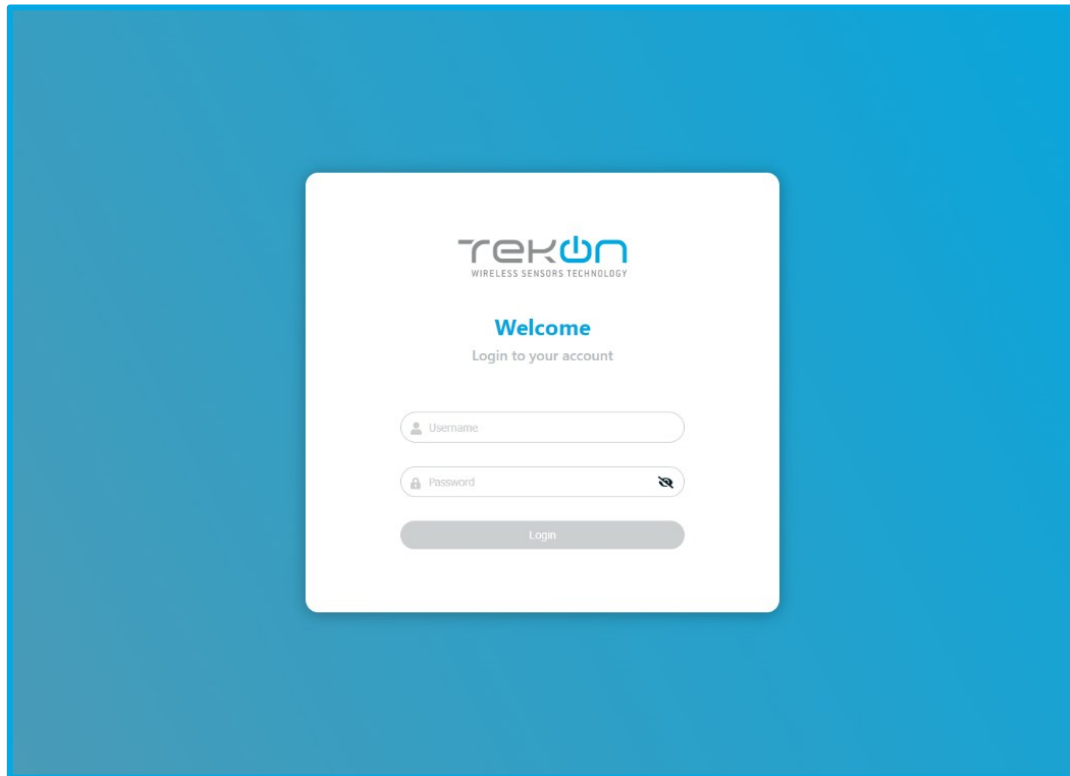


Figure 11 – Login Page.

The initial device credentials are as follow:

Administrator Profile	Viewer Profile
Username: admin Password: tekon	Username: viewer Password: viewer

Note: Credentials can be changed by following the steps described in the [User Management](#) chapter.

If the credentials are entered incorrectly, the error shown in Figure 12 will appear.



Figure 12 – Login Page with Incorrect Password or Username.

After logging in with the correct credentials, you will be directed to the *Datasources* page.

Note: The session has an expiration period of one hour, so it may be necessary to resume the session due to inactivity on the interface.

To log out, access the Menu on the right side of the page header, click on the arrow ▼ (Figure 13), and choose the Logout option. Then, a window (Figure 14) will appear to confirm the session termination.

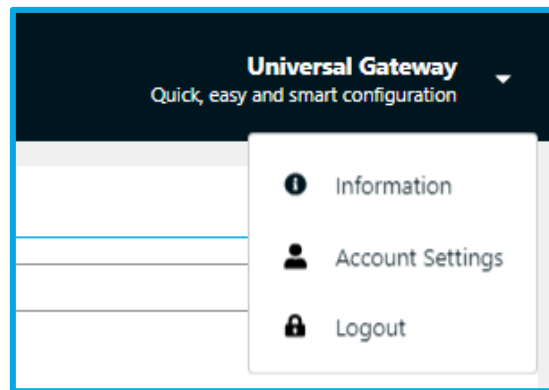


Figure 13 – Side Menu with logout option.

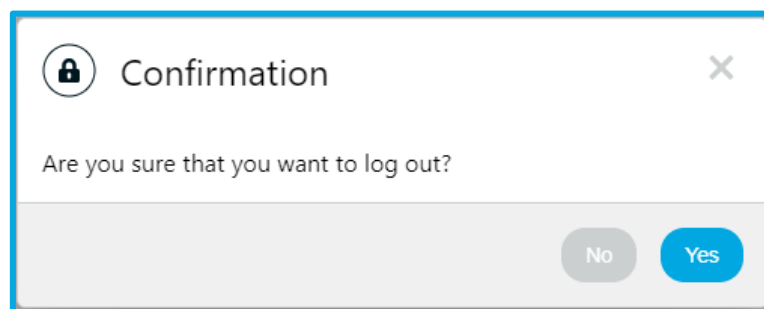


Figure 14 – Logout Confirmation Window.

6 Web Interface

6.1 User Management

It is possible to create users with different access permissions to the Universal IoT Gateway Web Interface. There are 2 available user profiles:

- **Administrator:** Permissions for device configuration, datasource configuration, alarm and notification settings, data export, and user configuration.
- **Viewer:** Permissions for data viewing and exportation.

To configure users, access the menu in the upper right corner and go to the Account Settings, Figure 15:

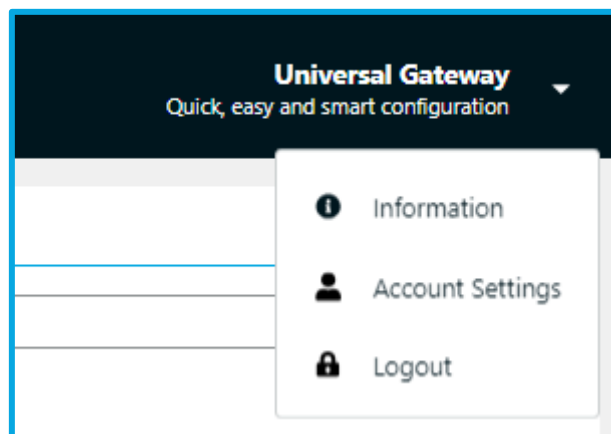


Figure 15 - Sidebar Menu with user settings option.

To create a user, the Administrator must define the username, password, and select the user profile, Figure 16.

Figure 16 – User creation section.

The defined users are presented in a user list (Figure 17), where the **Administrator** can edit (✎) and delete (🗑) all users, and the **Viewer** can edit (✎) their own profile.

Username	Profile	Actions
new_user	Viewer	✎ 🗑
viewer	Viewer	✎ 🗑
admin	Admin	✎ 🗑

Figure 17 – User list section.

The **Administrator** can edit (✎) the username, password, and select the user profile for all users available in the list (Figure 18).

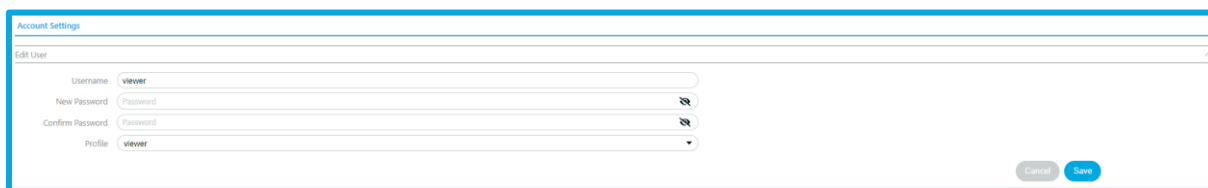
The screenshot shows a web interface titled 'Account Settings' with a sub-section 'Edit User'. It contains four input fields: 'Username' with the value 'viewer', 'New Password' with the value 'Password', 'Confirm Password' with the value 'Password', and a 'Profile' dropdown menu currently set to 'viewer'. At the bottom right of the form are two buttons: a grey 'Cancel' button and a blue 'Save' button.

Figure 18 – User edit section - **Administrator**.

The **Administrator** can also delete a user (🗑), where a window will appear to confirm the deletion (Figure 19).

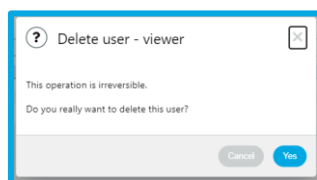


Figure 19 – User deletion confirmation window.

The **Viewer** can only edit their own username and password (Figure 20).

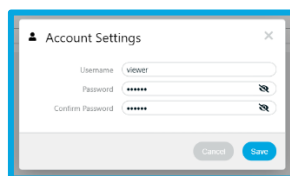
The screenshot shows a window titled 'Account Settings' with a close button (X) in the top right corner. It contains three input fields: 'Username' with the value 'viewer', 'Password' with masked characters (dots), and 'Confirm Password' with masked characters (dots). At the bottom right are two buttons: a grey 'Cancel' button and a blue 'Save' button.

Figure 20 – User edit window - **Viewer**.

If you have activated the Node-RED Pack module, there will be a node-red user that cannot be deleted. This user can be edited by the administrator to change the login password for the node-red platform (see Node-RED section).

A maximum of 2 users with the Administrator profile and 5 with the Viewer profile can be created.

6.2 Composting Menu

The Composting feature is dedicated to the composting process and allows data to be viewed in an intuitive and visual way, segmenting the data display by lot.

To use this function, the module must be activated, ensuring that all features are available to optimize your monitoring and data analysis experience in a composting process.

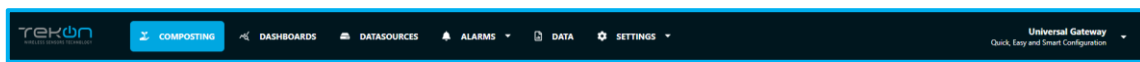


Figure 21 - Composting Menu

On the home page, it is possible to view the list of batches, segmented into active and archived, create batches, and search for a specific ID.

6.2.1 Batch Search

On the composting home page, it is possible to perform a batch search, which allows the user to look for the active or archived lot by its ID, more quickly than browsing through the list below.

The search is assisted by a dropdown and, by entering parts of the ID, lots that do not contain that text will automatically be excluded, making the search easier.

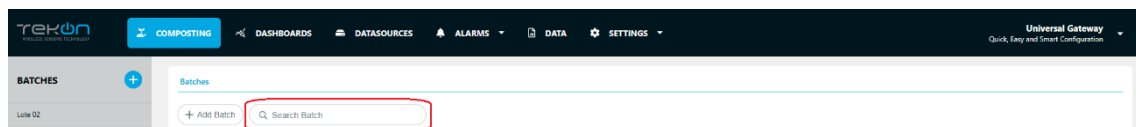



Figure 22 - Batch Search.

6.2.2 Create *Batch*

There are two ways to create a batch: the first is to click the button  next to “BATCHES” on the left-hand side. The second is to click the “Add Batch” button at the top of the central section.

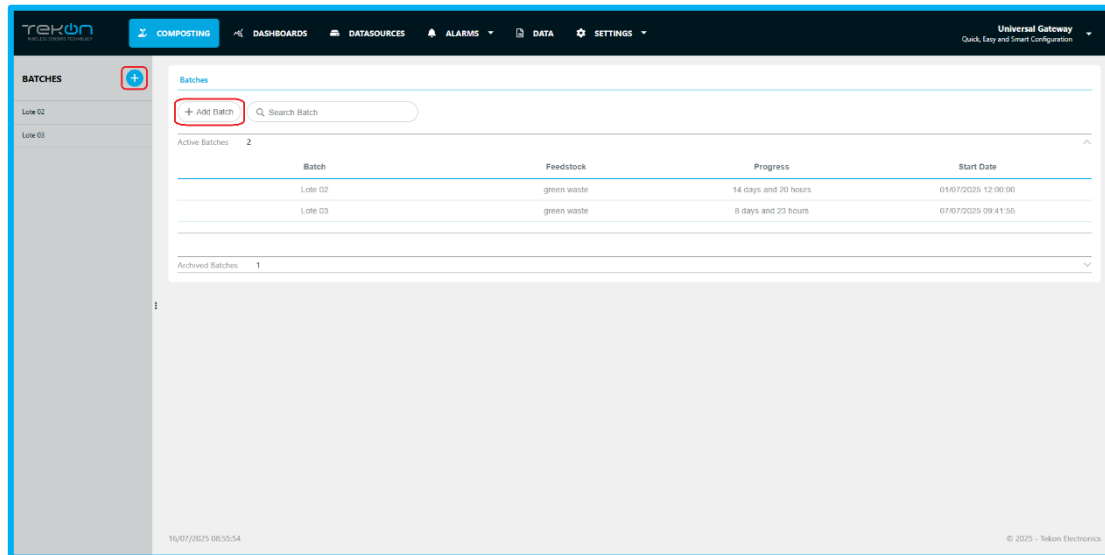
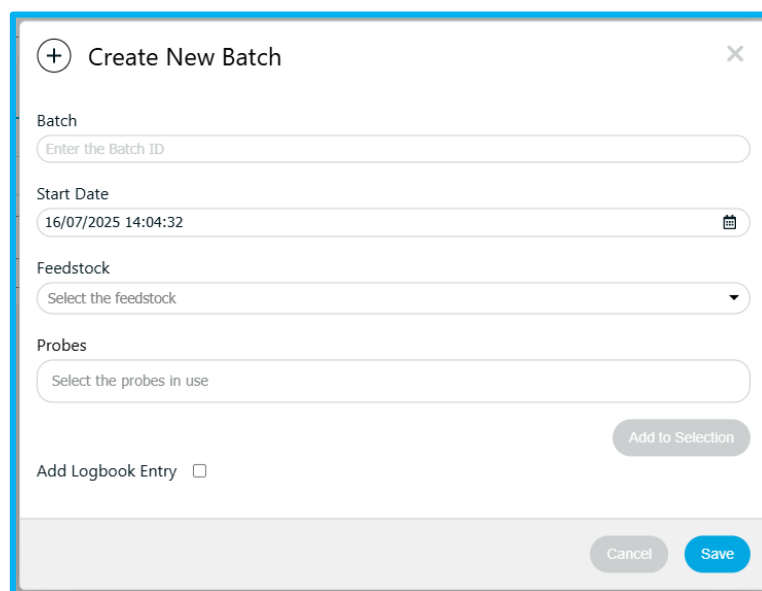


Figure 23 - Batch Creation.

After selecting one of the options above, a window will open (Figure 24) to identify the lot, the start date of the process, the raw material, and to select the probe(s). In addition, it is also possible to add entries to the logbook. After filling in the fields, you need to click “Save”.



Create New Batch

Batch
Enter the Batch ID

Start Date
16/07/2025 14:04:32

Feedstock
Select the feedstock

Probes
Select the probes in use

Add to Selection

Add Logbook Entry ☐

Cancel Save

Figure 24 - Batch Creation Window.

6.2.3 Create Feedstock List

Initially, the feedstock list will be empty so it can be fully customized. To create the list, items must be added one at a time. To do this, simply click the “Add Compost Type” option, type the desired text, and press “Enter”. This way, the new option will be automatically selected, and to add more options, just repeat the process. Figure 25 to Figure 28 show an example of adding an item to the list. Figure 29 shows the list with the new item added (in this example, the list already contains two items).

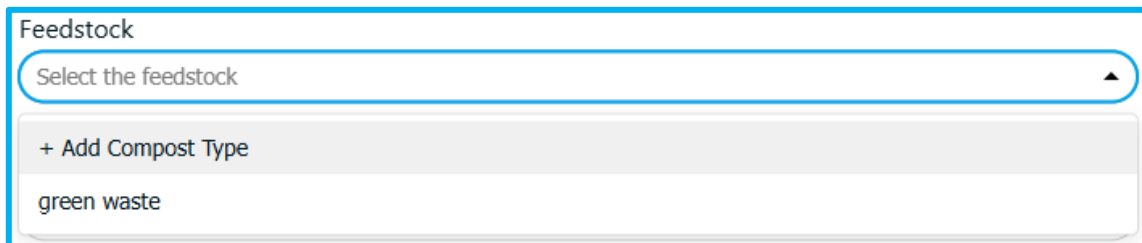


Figure 25 - Feedstock List Creation Window

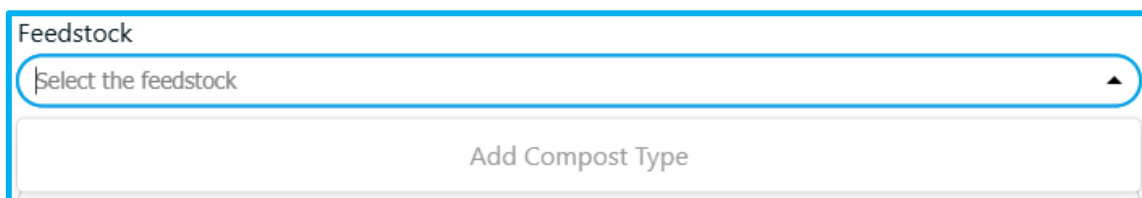


Figure 26 - Text Box in the Feedstock List Creation Window.

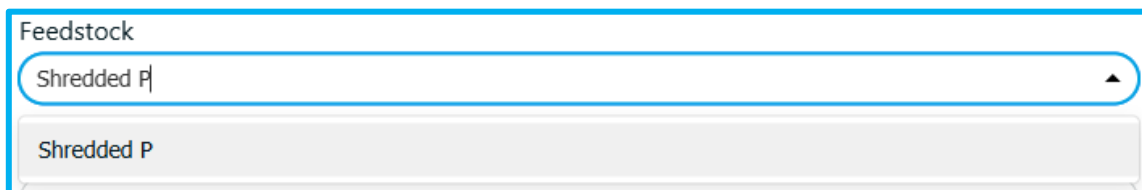


Figure 27 - Text Entry in the Feedstock List Creation Window.



Figure 28 - Text Entered in the Feedstock List Creation Window.

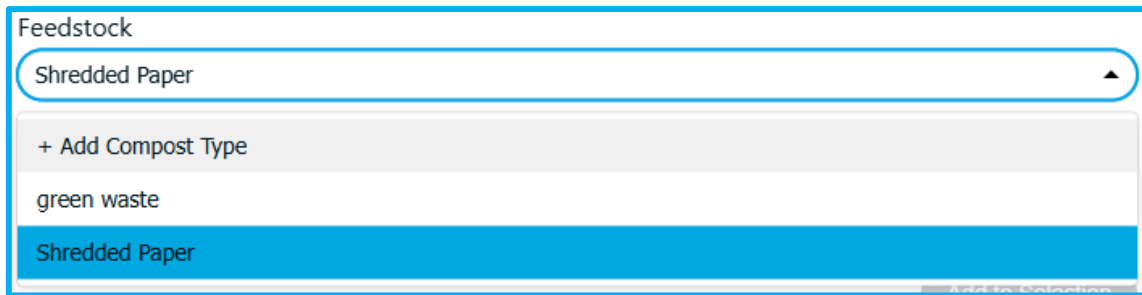


Figure 29 - Feedstock List with New Item Added.

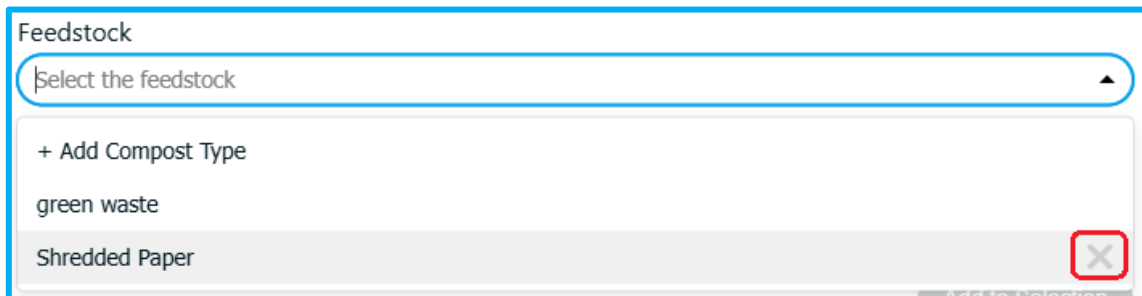


Figure 30 - Deleting Items from the Feedstock List

Note: As shown in Figure 30, it is also possible to delete items from the list created, provided they do not belong to any batch.

6.2.4 Probe Selection

To select one or more probes, simply choose in the *Probes* field which ones you want to allocate to the batch and click the “Add to Selection” button before saving.

Only datasources compatible with this module — PLUS 1/2UT and the BioT family — and that are not already in use in another batch will be visible. Below is an example of no available datasources.

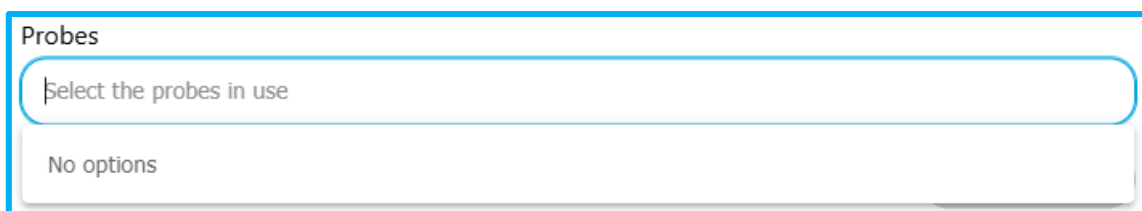
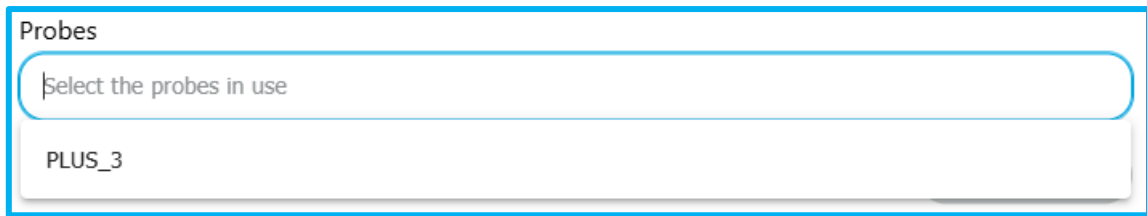


Figure 31 - List with no available datasources.

Figure 32 to Figure 34 show an example of the steps to follow to add a probe to the batch.



Probes

Select the probes in use

PLUS_3

This figure shows a window titled 'Probes'. It contains a text input field with the placeholder text 'Select the probes in use'. Below the input field, the text 'PLUS_3' is displayed, indicating a selected probe.

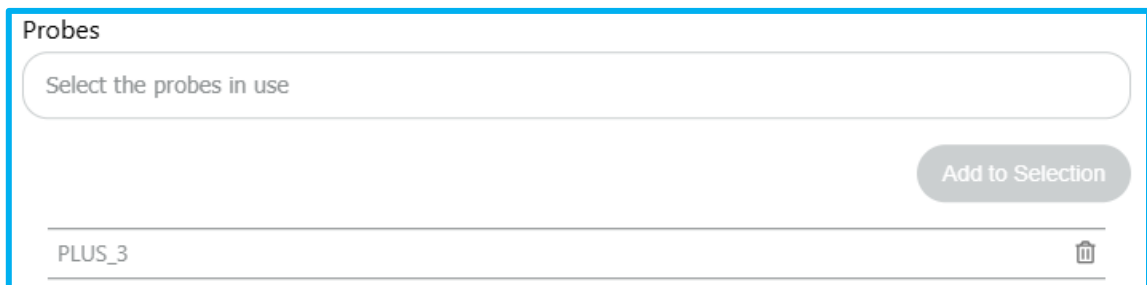
Figure 32 - Probe Selection Window.

Probes

PLUS_3 X Select the probes in use X

Add to Selection

This figure shows the same 'Probes' window. The input field now contains 'PLUS_3' followed by a close icon (X). A blue button labeled 'Add to Selection' is highlighted with a red rectangle, indicating the next step in the process.

Figure 33 - Adding a Probe to the Batch.

Probes

Select the probes in use



Add to Selection

PLUS_3

This figure shows the 'Probes' window after the probe has been added. The 'Add to Selection' button is now disabled (grayed out). The probe 'PLUS_3' is listed below the input field, with a trash icon to its right, indicating it has been successfully added to the batch.

Figure 34 - Indication of Probe Added.

6.2.5 Edit Batch

To edit a batch, place the mouse cursor over the batch you want to edit and click  (Figure 35). Another way is to access it by clicking  in the upper-right corner (Figure 36). In the menu, click “Edit Batch”.

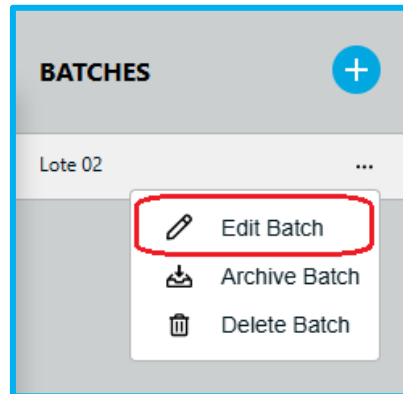


Figure 35 - Batch Edit Button

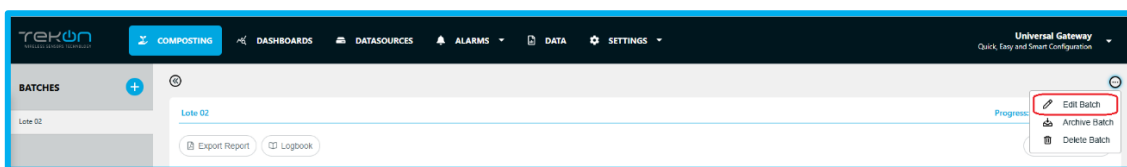




Figure 36 - Alternative Batch Edit Button.

In “Edit Batch” it is possible to edit the batch name, the feedstock, add or remove probes, and add entries to the logbook. To complete the operations, click “Save” (Figure 37).

Figure 37 - Batch Editing Window.

Note: It is not possible to have a batch without probes. This only happens when it is archived.

6.2.6 Archive Batch

As with editing, to archive a batch, place the mouse cursor over the batch you want to archive and click  (Figure 38). Another way is to access it by clicking  in the upper-right corner (Figure 39). In the menu, click “Archive Batch”.

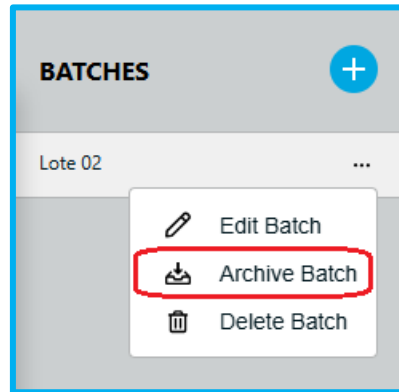


Figure 38 - Archiving Batches in the “Batches” Column.

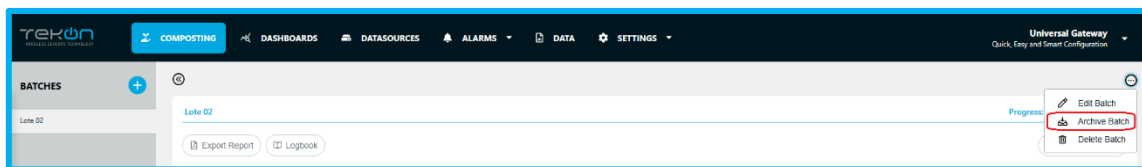


Figure 39 - Archiving Batches in the Workspace.

When archiving a batch, the end date and time of the composting process can be changed, and the action will be automatically recorded in the logbook. The batch will remain visible for consultation. Once a lot has been archived, it can only be viewed or permanently deleted. It cannot be restarted or edited, as indicated (Figure 41).

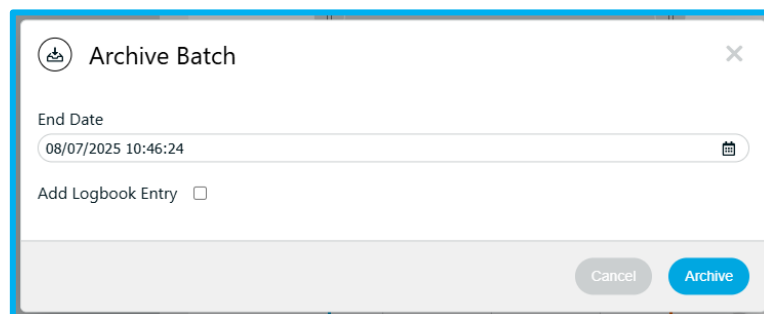


Figure 40 - Batch Archiving Window.

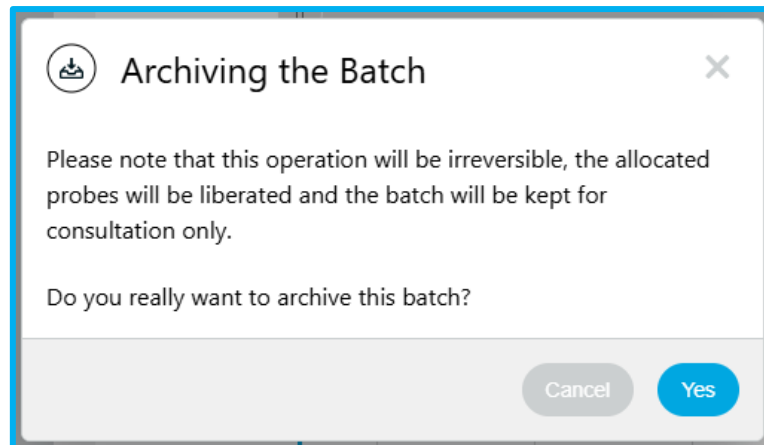


Figure 41 - Batch Archive Confirmation Window.

6.2.7 Delete Batch

With the batch created or archived, as with editing, to delete a batch, place the mouse cursor over the batch you want to delete and click **...** (Figure 42), Another way is to access it by clicking **⋮** in the upper-right corner (Figure 43). In the menu, click "Delete Batch".

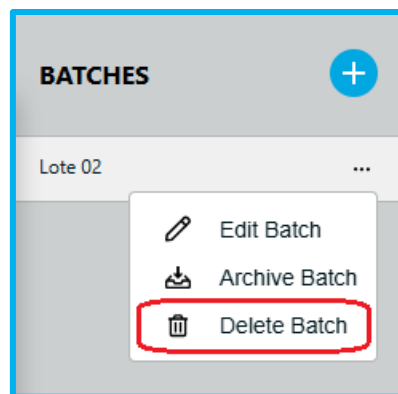


Figure 42 - Deleting Batches in the "Batches" Column.

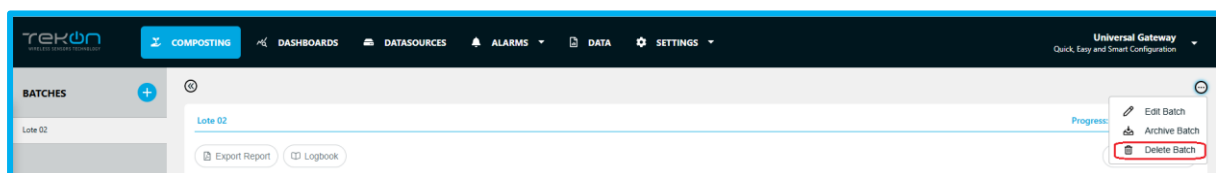


Figure 43 - Deleting Batches in the Workspace.

The batch deletion process is completely irreversible, so a confirmation window is displayed before any deletion to notify of this detail, as shown in Figure 44.

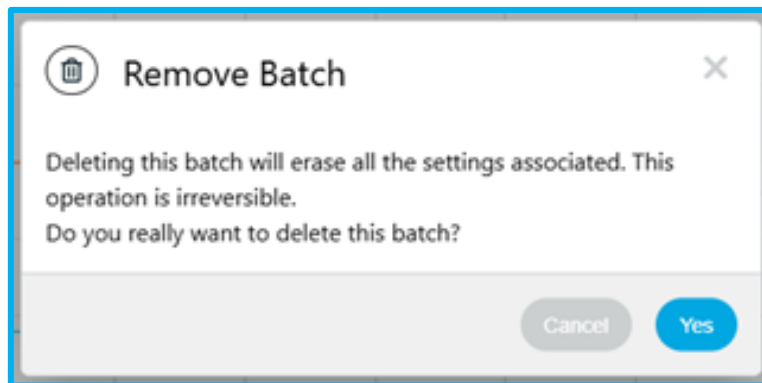


Figure 44 - Batch Deletion Confirmation Window

6.2.8 Logbook

The logbook allows you to record all actions taken during the process, for example, if it is necessary to turn the compost pile. After this action, you can access the logbook (Figure 45) and record it. To do this, simply enable the “Add Logbook Entry” checkbox (Figure 46), and two fields will appear to add the desired notes and the date (if you don’t change the date/time, the system will use the time of logbook access). Then, click “Save”.

Note: You can make multiple entries at once, with different notes and dates/times. To do this, click “Add New Entry”, write the records, and press “Save” to save and finish.

When you open the logbook again, you will see that it shows all entries, and only manually entered ones can be deleted. All automatic records cannot be deleted — that is, all changes made in the interface, from creation to probe allocation and archiving.

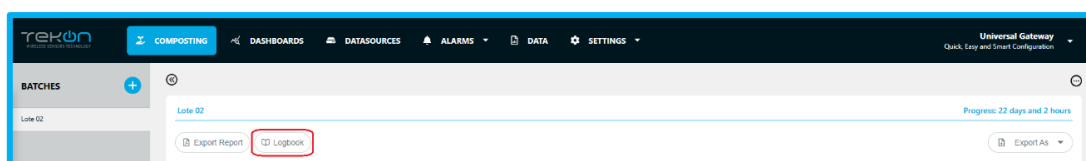
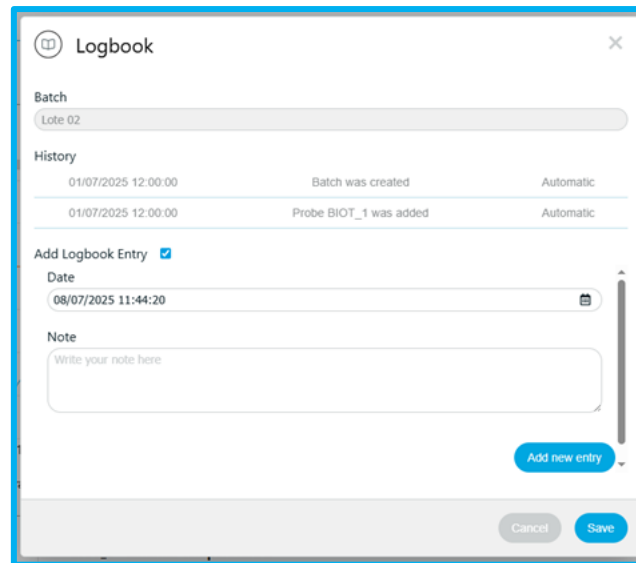


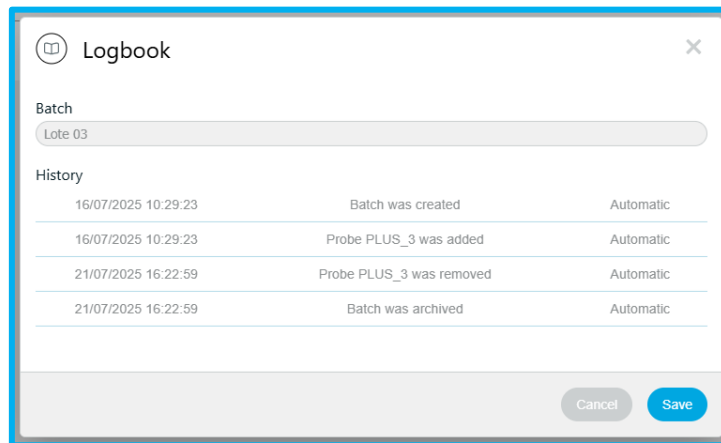
Figure 45 - Logbook Access Button.



The Logbook window for 'Lote 02' displays a history of events. The 'Batch' field is set to 'Lote 02'. The 'History' table shows two entries: 'Batch was created' and 'Probe BIOT_1 was added', both dated '01/07/2025 12:00:00' and marked as 'Automatic'. Below the history, the 'Add Logbook Entry' checkbox is checked. The 'Date' field is set to '08/07/2025 11:44:20'. The 'Note' field contains the placeholder text 'Write your note here'. At the bottom right, there is an 'Add new entry' button, and at the bottom center, 'Cancel' and 'Save' buttons.

Date	Event	Action
01/07/2025 12:00:00	Batch was created	Automatic
01/07/2025 12:00:00	Probe BIOT_1 was added	Automatic

Figure 46 - Logbook Window.



The Logbook window for 'Lote 03' displays a history of events. The 'Batch' field is set to 'Lote 03'. The 'History' table shows four entries: 'Batch was created', 'Probe PLUS_3 was added', 'Probe PLUS_3 was removed', and 'Batch was archived', all dated '16/07/2025 10:29:23' or '21/07/2025 16:22:59' and marked as 'Automatic'. At the bottom center, there are 'Cancel' and 'Save' buttons.

Date	Event	Action
16/07/2025 10:29:23	Batch was created	Automatic
16/07/2025 10:29:23	Probe PLUS_3 was added	Automatic
21/07/2025 16:22:59	Probe PLUS_3 was removed	Automatic
21/07/2025 16:22:59	Batch was archived	Automatic

Figure 47 - Archived Batches in the Logbook.

When a batch is archived, the logbook is for consultation only, as shown in Figure 47.

6.2.9 Report Export

With an active or archived batch, it is possible to extract a report containing the defined parameters, graphs of the collected data, and all logbook entries. To do this, simply click the “Export Report” button (Figure 48).

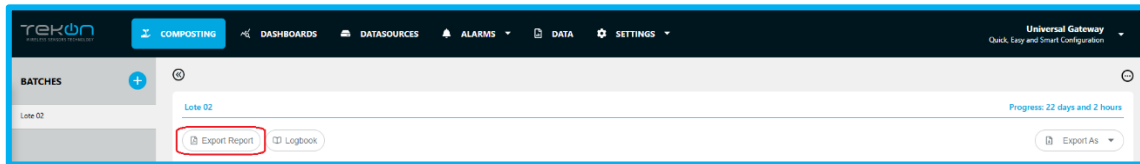


Figure 48 - Report Export Button.

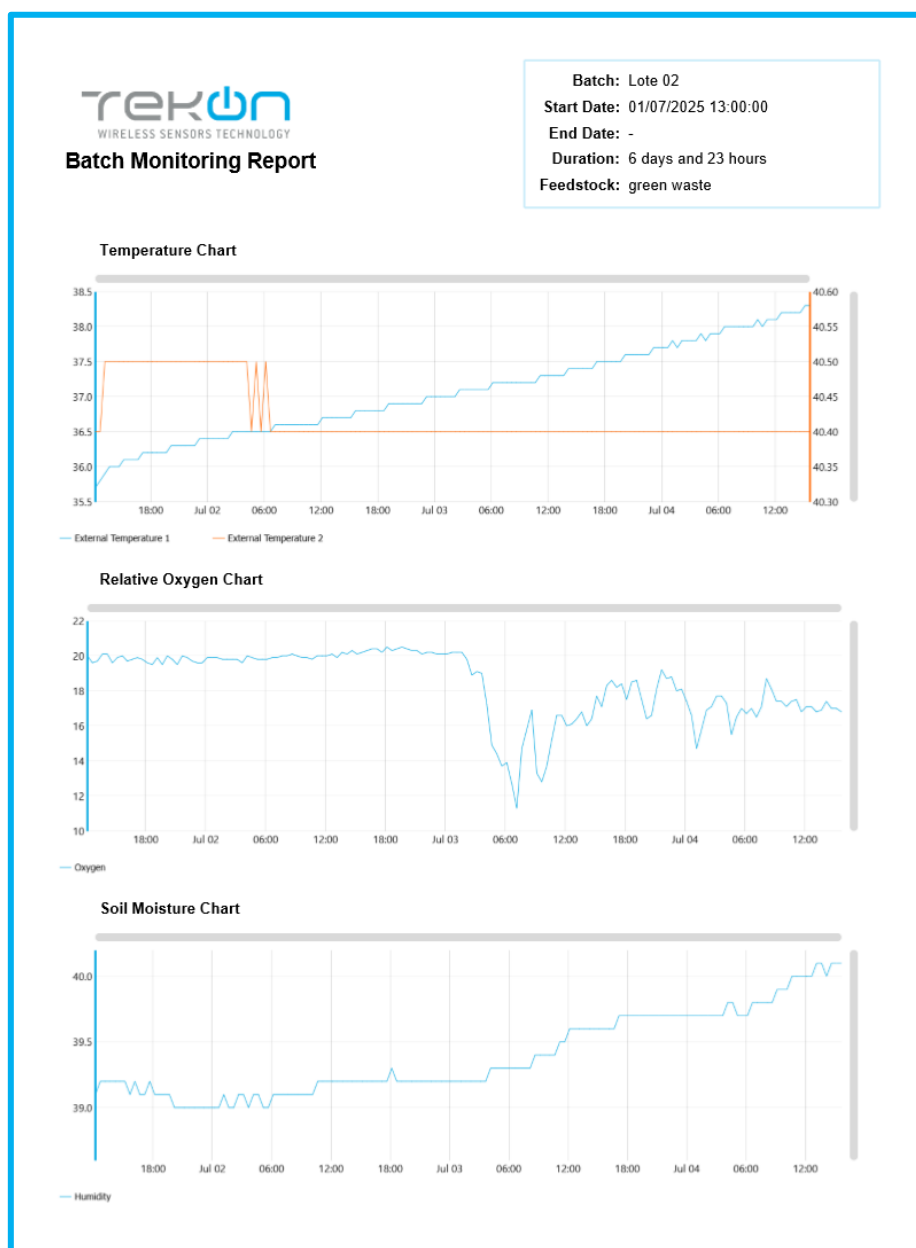
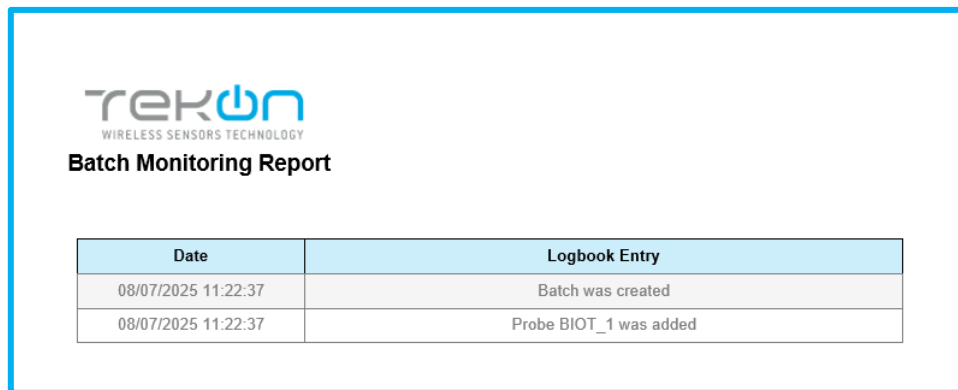


Figure 49 - Batch Report.

The screenshot shows a 'Batch Monitoring Report' from Tekon Wireless Sensors Technology. It features a table with two columns: 'Date' and 'Logbook Entry'. The table contains two entries, both dated 08/07/2025 at 11:22:37. The first entry states 'Batch was created' and the second states 'Probe BIOT_1 was added'.

Date	Logbook Entry
08/07/2025 11:22:37	Batch was created
08/07/2025 11:22:37	Probe BIOT_1 was added

Figure 50 - Logbook Entries of a Report.

Note: If, when exporting the report, you don't need it to include a certain variable, for example, External Temperature 2, just go to the Temperature section graph before exporting the report and deselect that variable.

6.2.10 Data Export

With an active or archived batch, it's also possible to extract the data in formats like xlsx and csv.

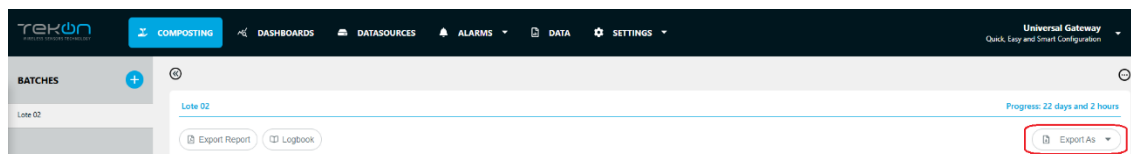


Figure 51 - Report Export Button in Different Formats.

6.3 Dashboards Menu

The *Dashboards* functionality allows for intuitive and visual data consultation through widgets such as *charts*, *values*, and *gauges*.

To use this feature, it is necessary to activate the module, ensuring that all functionalities are available to optimize your data monitoring and analysis experience. A maximum of 10 dashboards can be created, and for each dashboard, a maximum of 10 widgets is allowed.

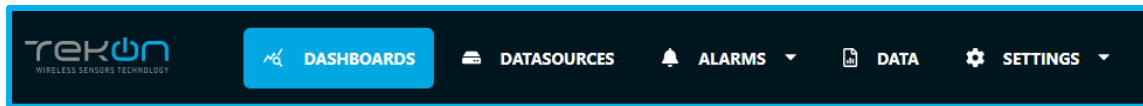



Figure 52 – Dashboards Menu.

6.3.1 Create Dashboard

There are two ways to create a *dashboard*: the first is by clicking the button  next to “DASHBOARDS” on the left side. The second option, possible only if no *dashboards* have been created, is by clicking “Add new dashboard”.

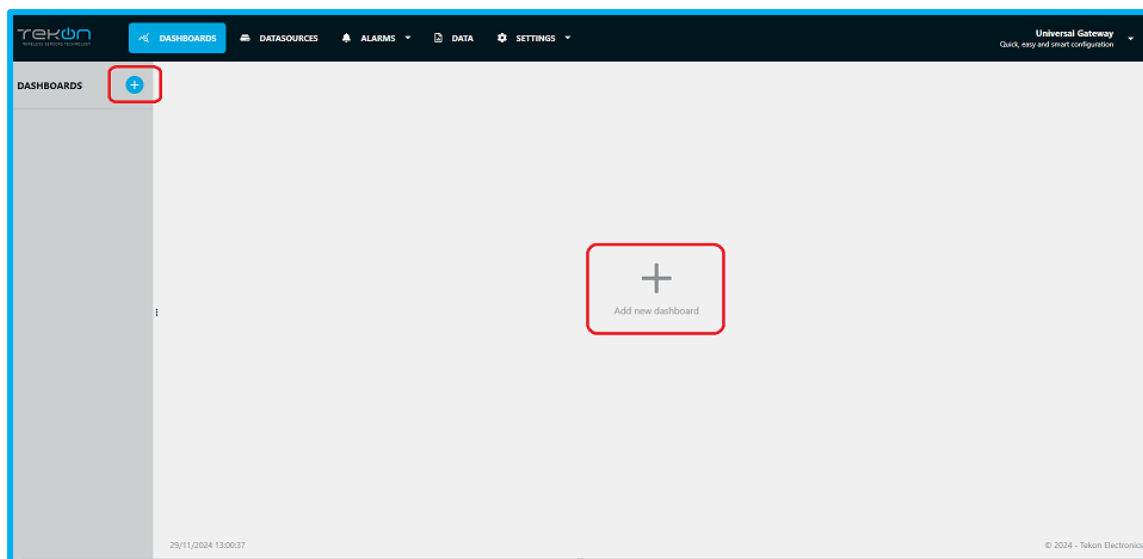


Figure 53 - Dashboard Creation.

After selecting one of the above options, a window will open to define the dashboard name with the option to set it as the default (“Set as default”), which will make the dashboard appear when the “Dashboard” menu is loaded. After completing the fields, click “Save”.

Note: Only one *dashboard* can be set as the default, which will be the last one defined as such.

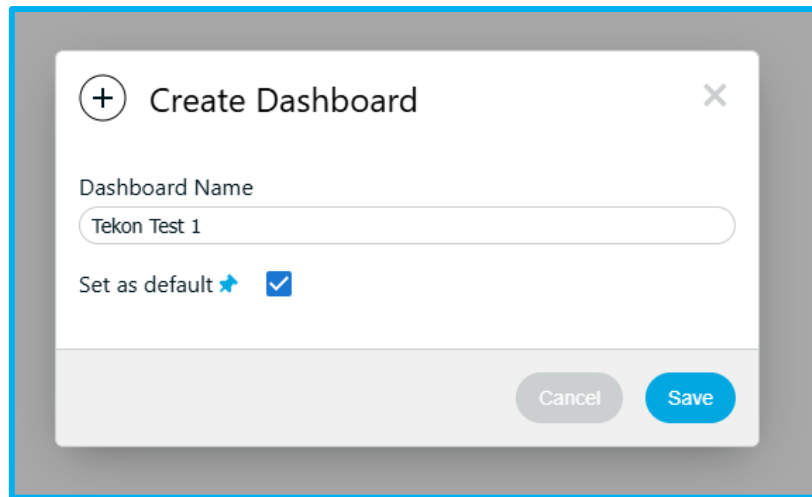



Figure 54 - Dashboard Creation Window.

6.3.2 Edit Dashboard

To edit a *dashboard*, place the mouse cursor over the *dashboard* you want to edit and click **...**. Another way to perform this action is to click  in the upper right corner. In the options, click “Edit Dashboard”.

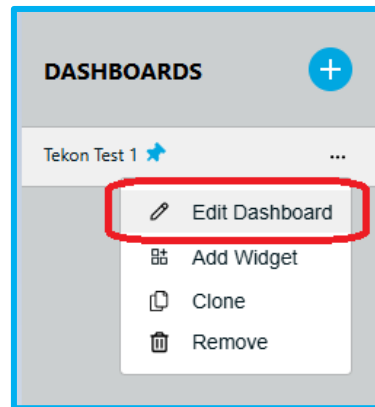


Figure 55 - Dashboard editing menu.

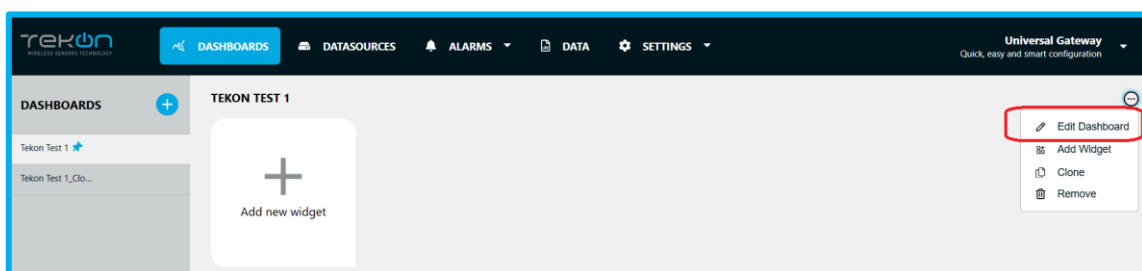


Figure 56 - Dashboard editing option.

In "Edit Dashboard," you can edit the *dashboard* name and change the default display option. To complete the operation, click "Save".

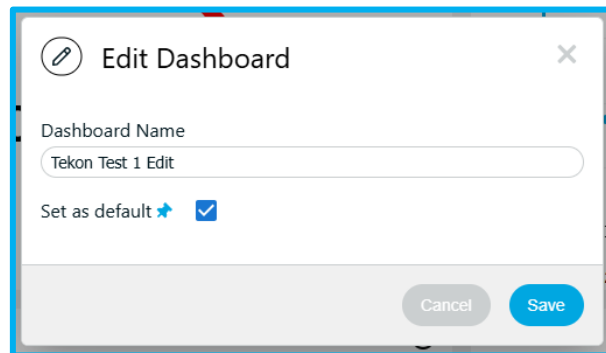




Figure 57 - Dashboard editing.

6.3.3 Add Widget

Once the dashboard is created, you can start adding widgets. To create a widget, click "Add new widget", place the mouse cursor over the *dashboard* where you want to create the widget, and click , or click  in the upper right corner. From the options, select "Add Widget".

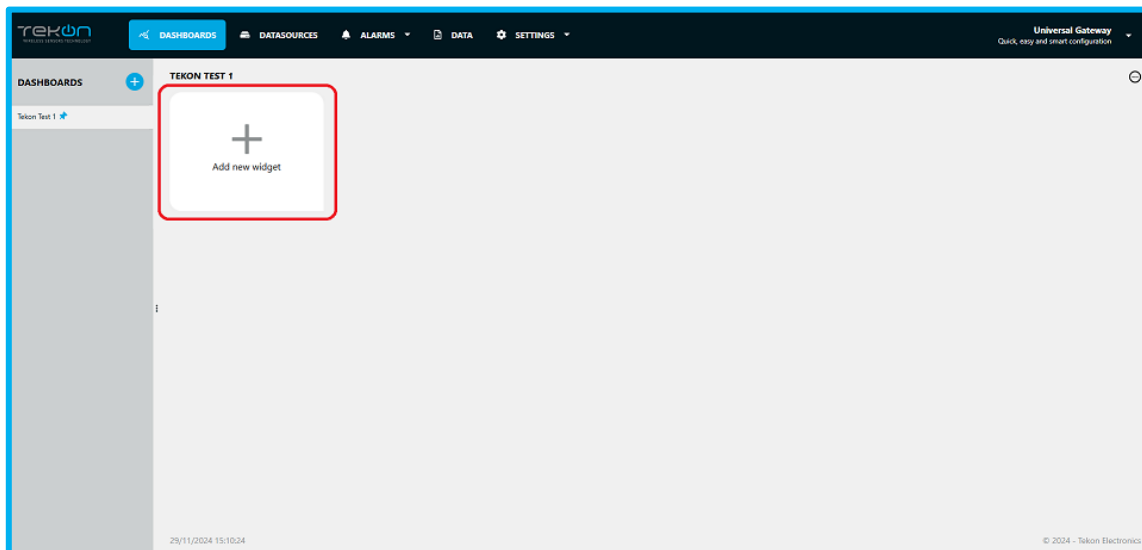


Figure 58 – Add new widget on the dashboards menu.

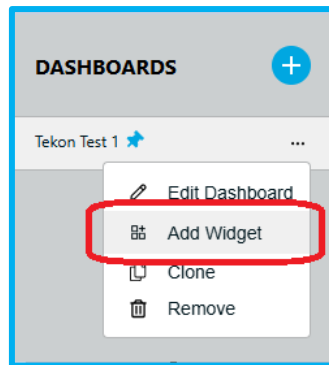


Figure 59 - Add widget option.

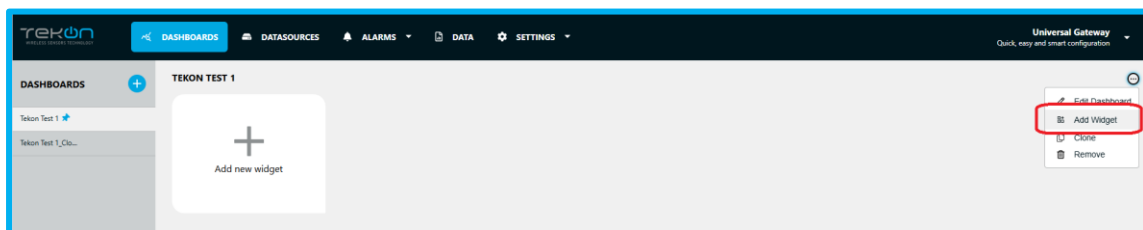


Figure 60 – Add new widget.

The *widget* options will be displayed in the "Select Widget Type" window. Select the desired option to open a new window and define the *widget* parameters.

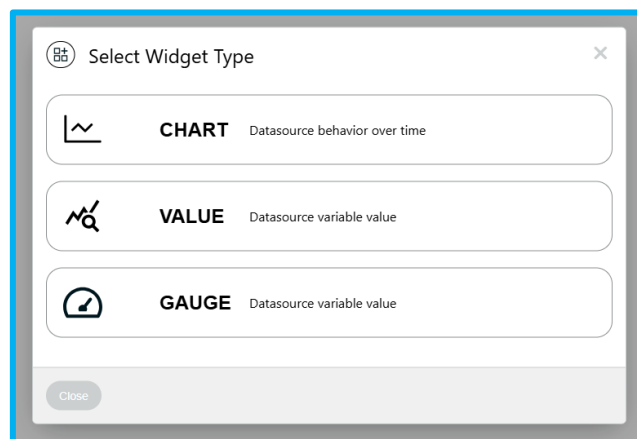


Figure 61 – "Select Widget Type" window.

Charts

To create a chart, you must fill out the fields in the "Chart Data Selection" window. All fields are mandatory.

Figure 62 - Chart Data Selection window.

The fields to be filled are as follows:

- **Title:** Chart name.
- **Datasource:** Select the *datasource* that will send data to the chart.
- **Variables:** Select the variables available in the selected *datasource* to display on the chart. The variable list will be loaded automatically.

Figure 63 - Chart Data Selection variable list.


The selection of variables is done one at a time, but you can add more than one simultaneously. Variables can also be removed by clicking . To complete the operation, click "ADD TO SELECTION".

Chart Data Selection

Title: Gráfico 1

Datasource: PLUS_10

Variables: Power Supply Voltage X External Temperature X RSSI X Select variable(s)

Time Range: Real Time Update ☒ N° of points: 20

Buttons: Back, Close, Apply, ADD TO SELECTION

Figure 64 - Add to Selection button.

Note: It is possible to add variables from more than one datasource to the same chart.


If the variables are successfully added, they will appear in a list, where the first value is the datasource identifier, and next to it is the added variable. Each variable can be removed through the icon  at the end of each row.

Chart Data Selection

Title: Gráfico 1

Datasource: Select a datasource

Variables: Select variable(s)

Time Range: Real Time Update ☒ N° of points: 20

Buttons: Back, Close, Apply, ADD TO SELECTION




PLUS_10	Power Supply Voltage	
PLUS_10	External Temperature	
PLUS_10	RSSI	

Figure 65 - Variables added.

- **Time Range:** Displays the allowed time range options.
 - **Real Time Update:** To receive data in real-time, this option must be selected; otherwise, you will need to define the time range in which the values will be displayed.
 - **Time range:**

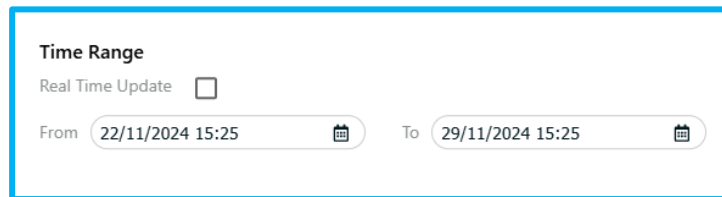


Figure 66 - Time range.

- **No. of points:** Defines the number of points displayed on the chart. The available options are: 10, 20, and 50. This option is only available if the "Real Time Update" option is enabled.

To create the chart, click "Apply".

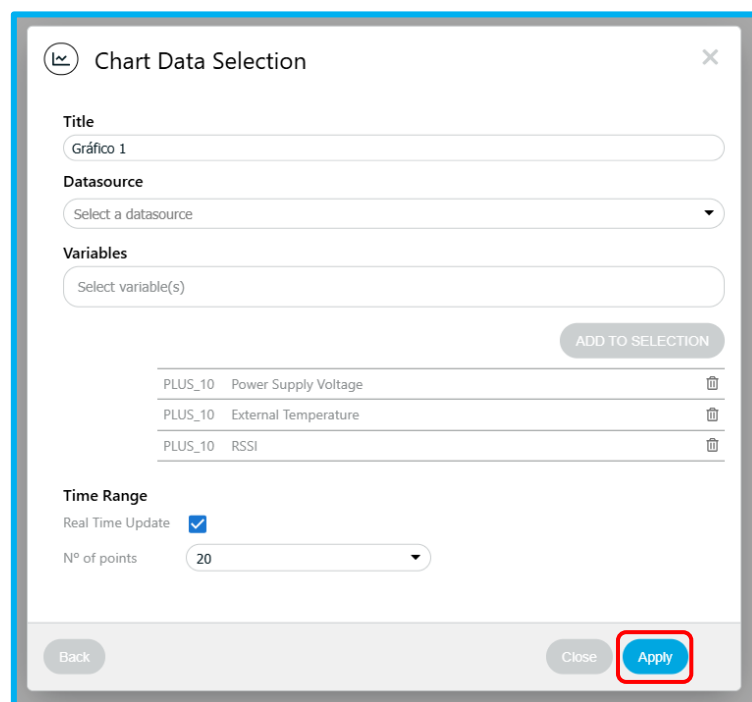


Figure 67 – "Chart Data Selection" Apply Button.

After clicking "Apply," the chart with the previously made selections will load on the page

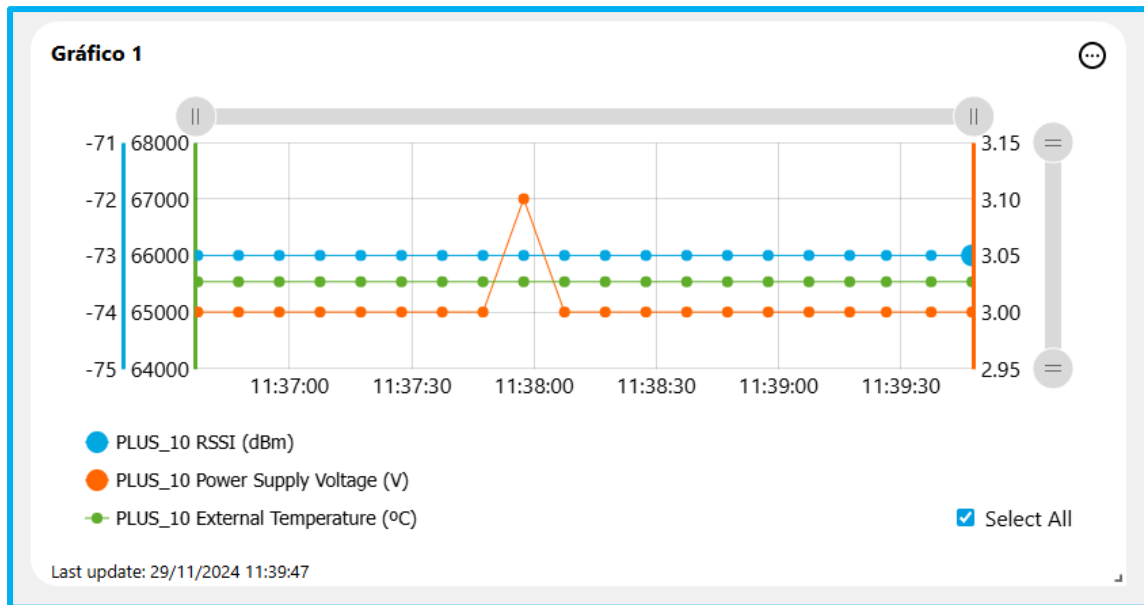


Figure 68 - On-page graph updated with the selections made.

To edit, clone (automatically create an identical one), or delete the chart, click , in the upper-right corner of the widget and select the desired option

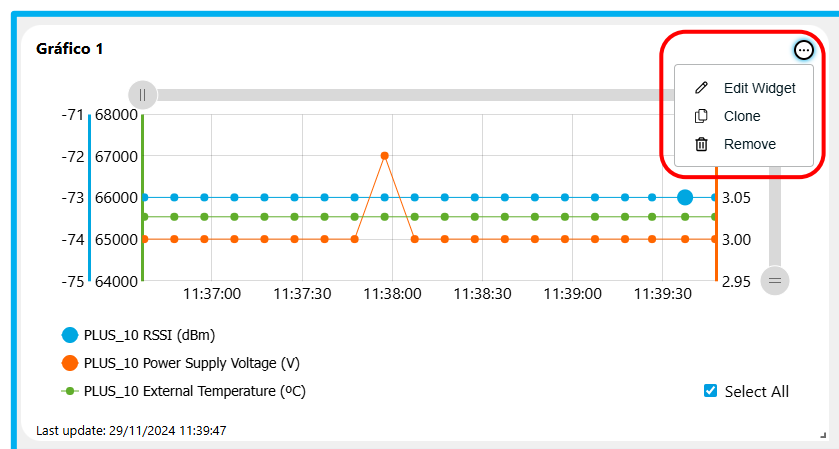
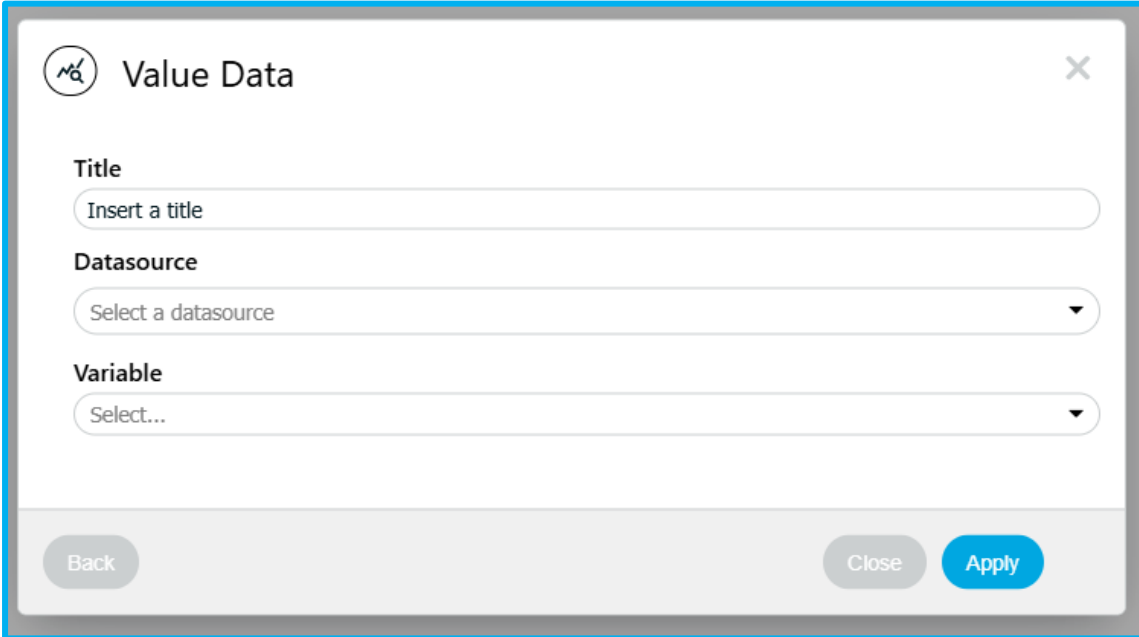


Figure 69 - Edit, clone and remove graph.

Values

The value-type *widget* allows monitoring the value of a variable from a data source ("*datasource*"). The displayed value will always be the last received data. All fields in the "*Value Data*" page must be completed to create the *widget*.

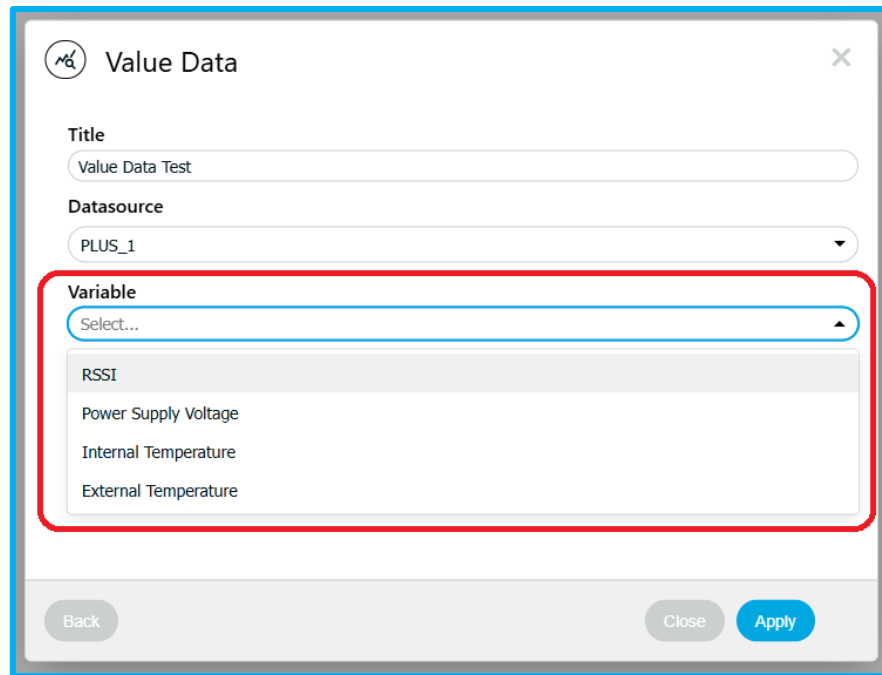


The screenshot shows a modal window titled "Value Data". It contains three form fields: "Title" (text input), "Datasource" (dropdown menu), and "Variable" (dropdown menu). The "Title" field has the placeholder text "Insert a title". The "Datasource" field has the placeholder text "Select a datasource". The "Variable" field has the placeholder text "Select...". At the bottom of the window, there are three buttons: "Back", "Close", and "Apply".

Figure 70 – "Value Data" window.

The fields to be filled are as follows:

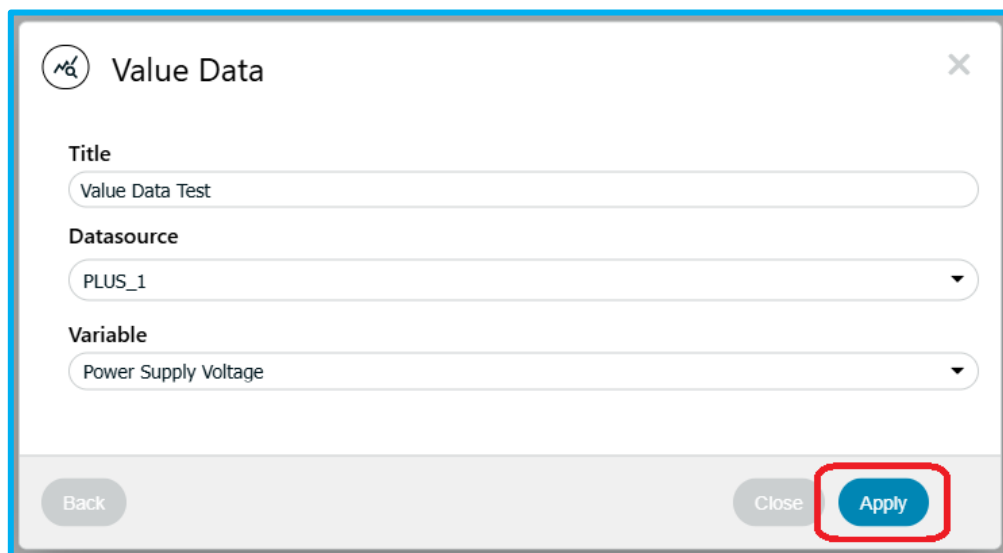
- **Title:** Name of the "*Value Data*" *widget*.
- **Datasource:** Select the *datasource* that will send the data to the *widget*.
- **Variable:** Select one of the variables available in the selected *datasource* to display in the *widget*. The variable list will load automatically.



The image shows a 'Value Data' configuration window. It has a title bar with a close button (X) and a title icon. The main area contains three fields: 'Title' with the value 'Value Data Test', 'Datasource' with a dropdown menu showing 'PLUS_1', and 'Variable' with a dropdown menu showing 'Select...'. A red rectangle highlights the 'Variable' dropdown menu, which is open, showing a list of variables: 'RSSI', 'Power Supply Voltage', 'Internal Temperature', and 'External Temperature'. At the bottom, there are three buttons: 'Back', 'Close', and 'Apply'.

Figure 71 – “Value Data” variables.

After defining the values, click “*Apply*” to create the *widget* as indicated in Figure 41.



The image shows the same 'Value Data' configuration window as in Figure 71, but now the 'Variable' dropdown menu is closed and shows 'Power Supply Voltage'. A red rectangle highlights the 'Apply' button at the bottom right of the window.

Figure 72 - Apply Button on “Value Data” window.

The *widget* created in the example displays the power supply voltage of the *datasource*. In Figure 42, you can see the value and the timestamp of the last received data.

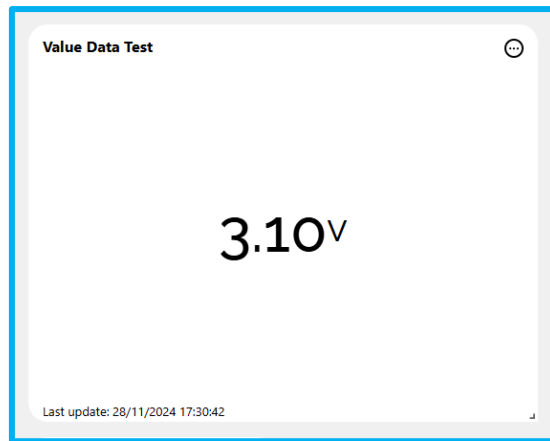


Figure 73 – Widget example.

To edit, clone (automatically create an identical one), or delete the *widget*, click in the upper-right corner of the *widget* and select the desired option.

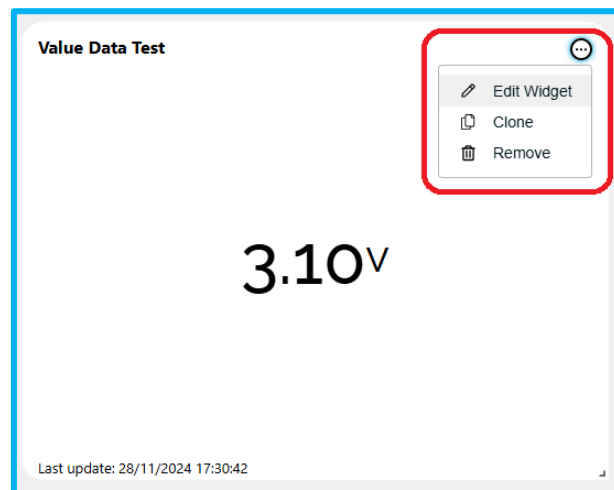


Figure 74 - Created widget editing.

Gauges

The *gauge widget* allows monitoring the value of a variable from a *datasource*, with the option to define ranges with different colors to aid in data visualization. The displayed value will always be the last data received by the device. All fields in the “*Gauge Data Selection*” page must be completed to create the *widget*.

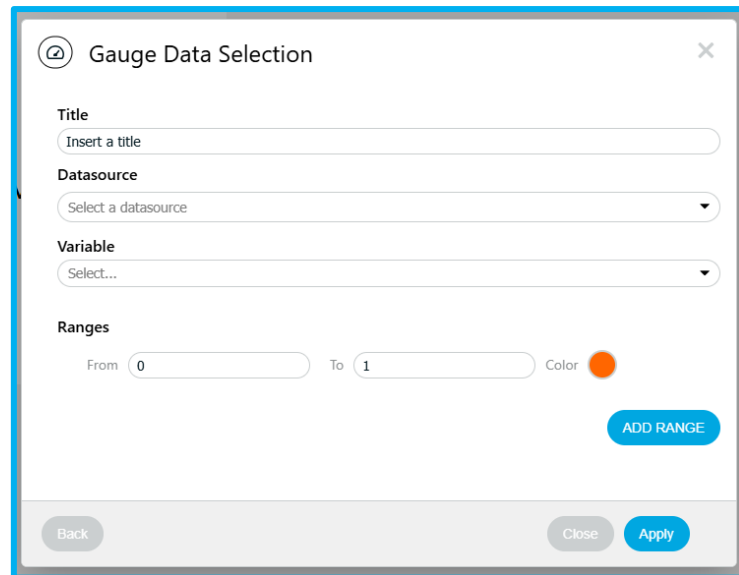


Figure 75 - Gauge data selection.

The fields to be filled are as follows:

- **Title:** Name of the widget.
- **Datasource:** Select the *datasource* that will send the data to the *widget*.
- **Variable:** Select one of the variables available in the selected *datasource* to display in the *widget*. The variable list will load automatically. For this example, we will use the variable “Power Supply Voltage.”

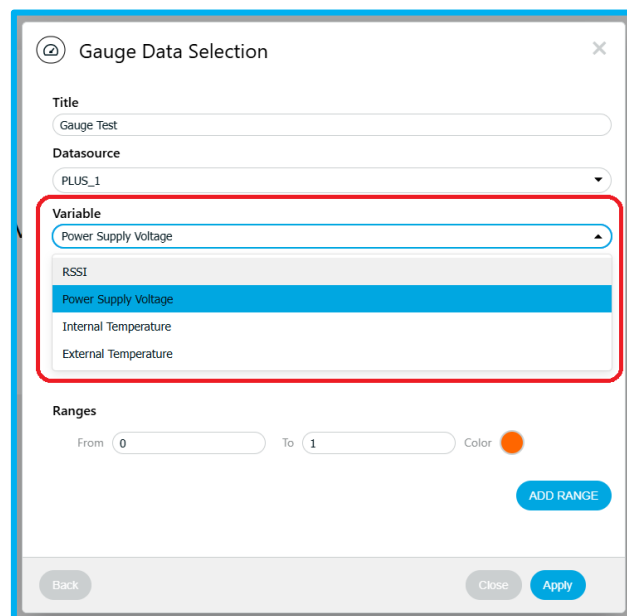



Figure 76 - Gauge data selection variables.

- **Ranges:** Define the ranges to be displayed in the *widget*. By default, the first range is defined as 0–1, and random colors are assigned, which can easily be changed if you want a specific color sequence. To add a range, define the values for “From” and “To” and click “Apply.” If more ranges are needed, click “ADD RANGE.” To delete a range, click , however, at least one range must always exist. There is no limit to the number of ranges.

Below is a practical example using the variable “*Power Supply Voltage*” (device power supply voltage in volts). The ranges will be defined with the following values:

Range	Color
From 0 to 2	Yellow
From 3 to 4	Green
From 4 to 6,5	Yellow
From 6,5 to 10	Red

Ranges table.

The color can be changed by clicking the circle next to “Color,” which will display the available color palette.

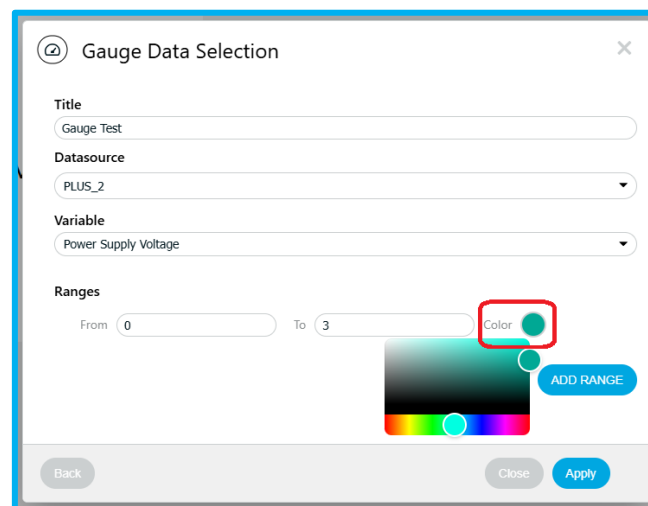
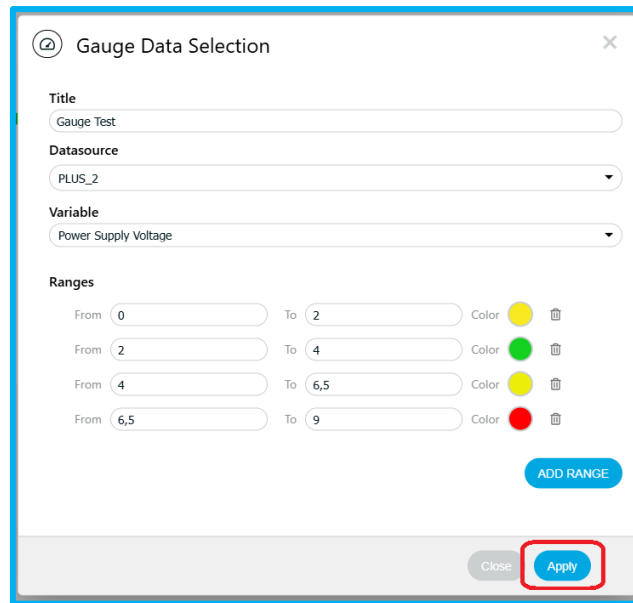


Figure 77 – Color palette on Gauge Data Selection window.

After defining the ranges according to the table above, click “*Apply*” to complete the operation.



The 'Gauge Data Selection' dialog box is shown. It has a title bar with a close button. The form contains the following fields:

- Title:** Gauge Test
- Datasource:** PLUS_2 (dropdown)
- Variable:** Power Supply Voltage (dropdown)
- Ranges:** A table with four rows for defining value ranges and their corresponding colors.

From	To	Color	Action
0	2	Yellow	Trash
2	4	Green	Trash
4	6,5	Yellow	Trash
6,5	9	Red	Trash

Buttons: ADD RANGE, Close, Apply (highlighted with a red box).

Figure 78 – Choosing colors on Gauge Data Selection window.

The created *widget* will be similar to the one in Figure 48.

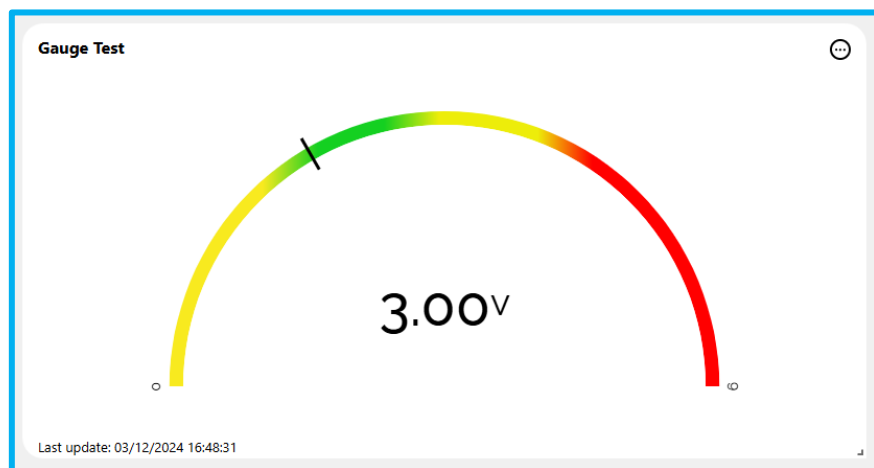



Figure 79 - Customized widget example.

To edit, clone (automatically create an identical one), or delete the widget, click , in the upper-right corner of the widget and select the desired option.

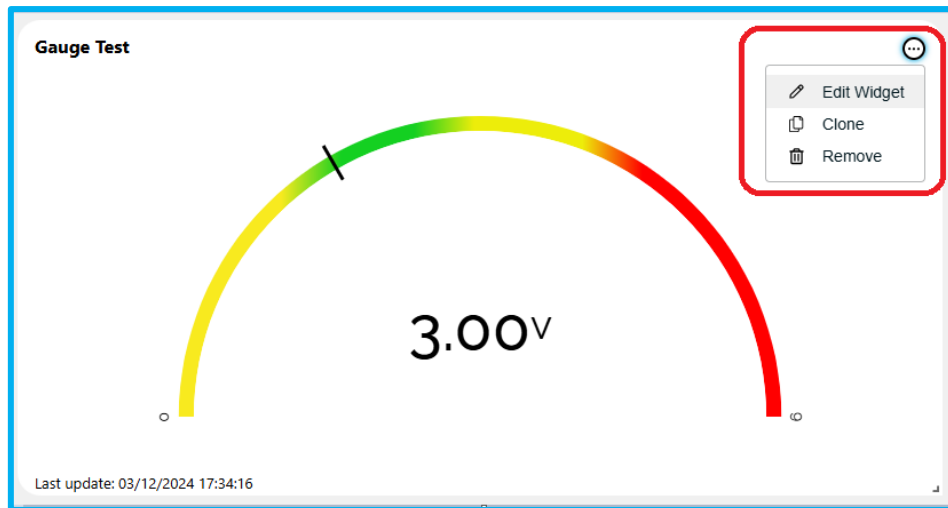




Figure 80 - Edit, clone or remove customized widget.

6.3.4 Clone Dashboard

The "Clone" functionality allows you to clone a *dashboard* and all its *widgets* automatically. The cloned dashboard will be renamed with the addition of "_CLONE" to the name for identification purposes. The name can be changed later.

To clone a dashboard, place the mouse cursor over the dashboard you want to edit and click  or in  the upper-right corner. From the options, click "Clone."

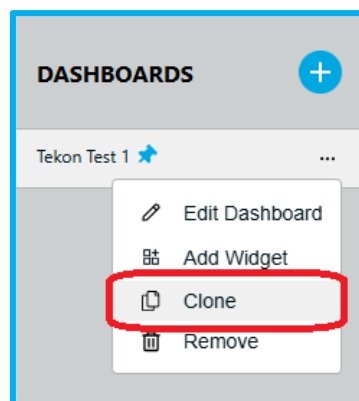


Figure 81 - Clone Dashboard option.

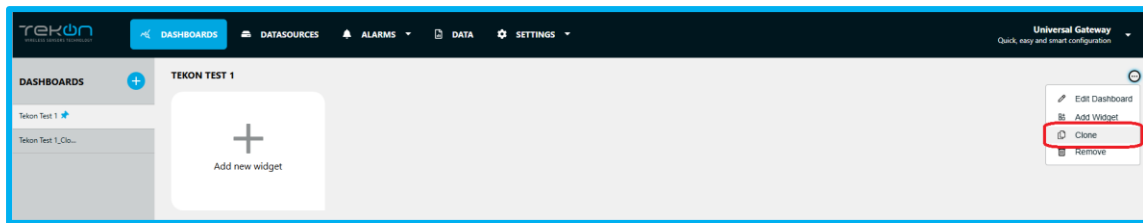


Figure 82 - Clone Dashboard on the Dashboards menu

The cloned *dashboard* will appear in the list of *dashboards* and can be identified by its name. New *widgets* can be added, and existing ones can be edited or removed.

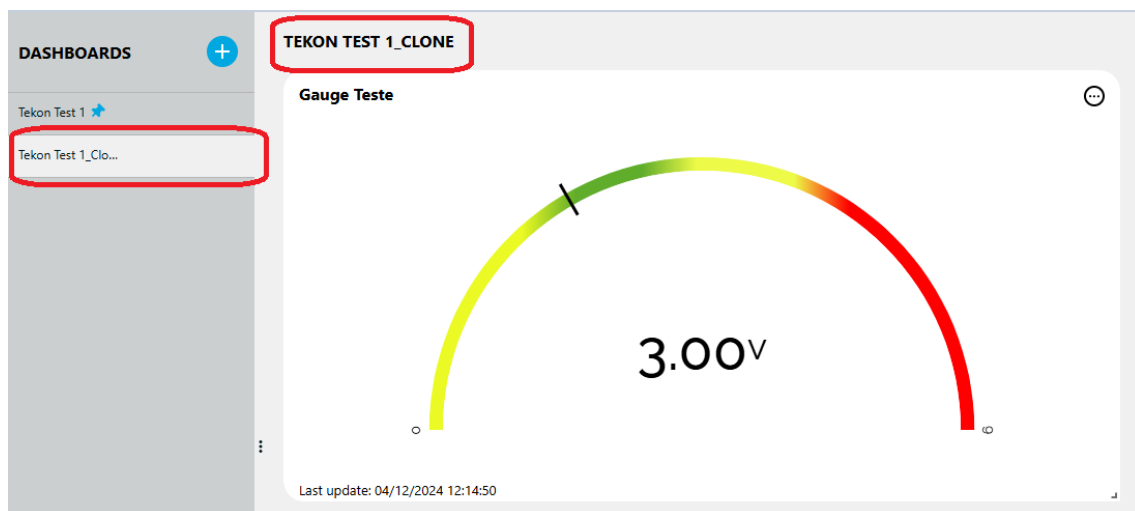




Figure 83 - Created Dashboard example.

6.3.5 Remove Dashboard

To remove a *dashboard*, place the mouse cursor over the *dashboard* you want to permanently delete and click  or in  the upper-right corner. From the options, click “Remove.”

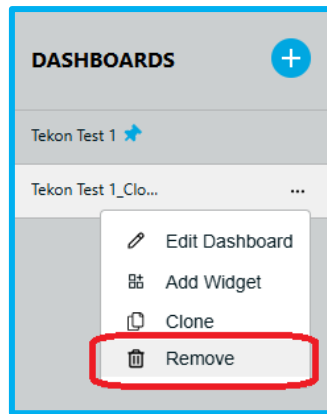


Figure 84 - Remove Dashboard option.

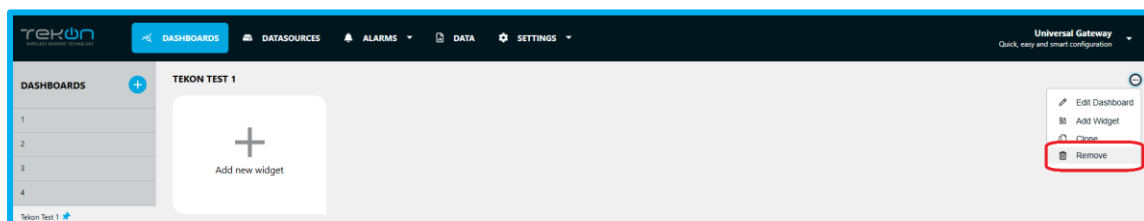


Figure 85 – Remove Dashboard on the Dashboard menu.

To confirm the removal operation, click “Yes” in the window.

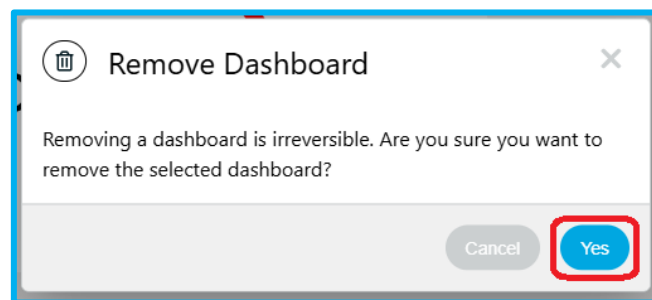


Figure 86 - Janela de confirmação Remove Dashboard.

After the operation, the *dashboard* will be deleted from the *dashboard* list.

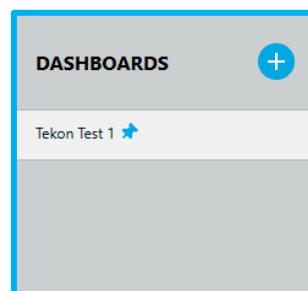




Figure 87 - Dashboard deleted from the list.

6.4 Datasources Menu

6.4.1 Home Page

After logging in, the page shown in Figure 88 appears. will appear. On the left side, the list of datasources connected to the Universal IoT Gateway will be displayed, categorized and sorted by ID (defined in the Tekon Configurator, see section [Add new datasource](#)). On the right side, additional information about the datasources will be shown. On both sides, it is possible to expand or hide information using the  or  buttons.

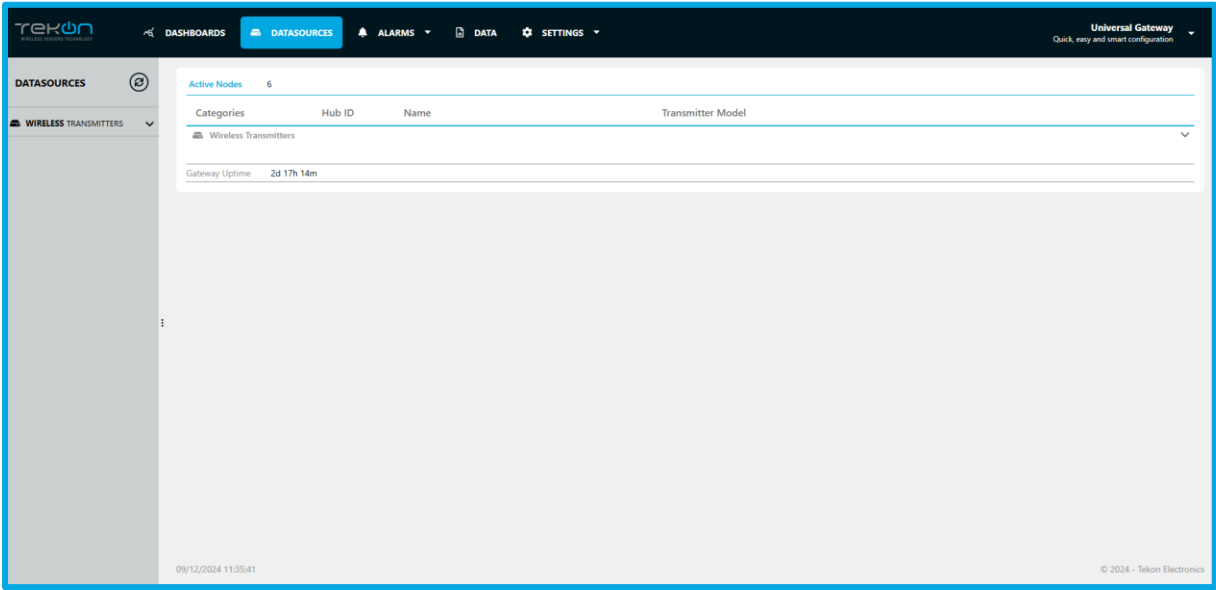


Figure 88 – Home page (Datasources).

6.4.2 Add new *datasource*

To add a new datasource from Tekon's DUOS and PLUS product family, simply configure the transmitter in the Tekon Configurator (Figure 89) with the wireless network and wireless channel defined on the Universal IoT Gateway label.

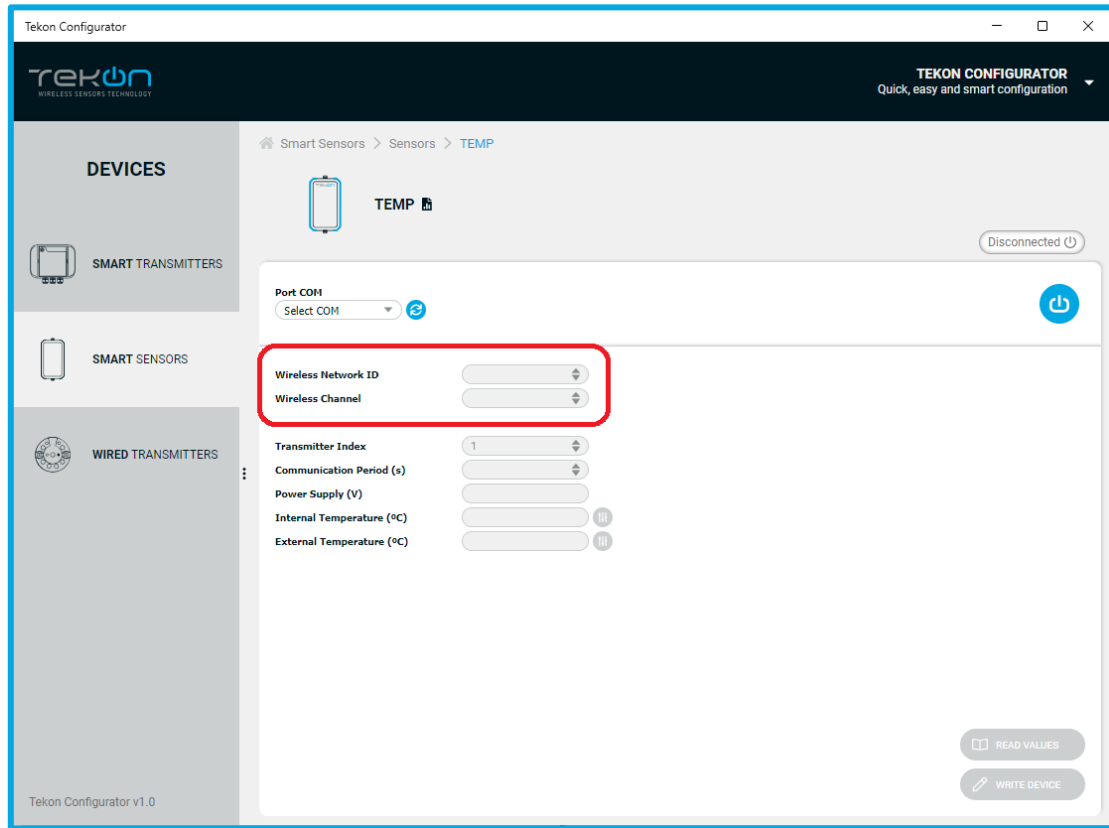


Figure 89 – Transmitter configuration page in the Tekon Configurator.

Once the configuration is complete and data transmission starts, the device will appear in the gateway interface. If this process is taking too long, refresh the interface page.

Note: It is possible to have devices with the same ID if they are from different families (DUOS and PLUS).

6.4.3 Data Visualization by Device

To access the data of a specific device, simply click on the corresponding datasource. A page similar to the one shown in *Figure 59* will then appear, divided into 4 sections:

- **Settings:** Configuration of the graphical data visualization;
- **Measurements:** Graphical presentation of real-time collected data;
- **Datasource Properties:** View of the editable and non-editable properties of the datasource;
- **Datasource Settings:** Display and configuration of the device’s properties.

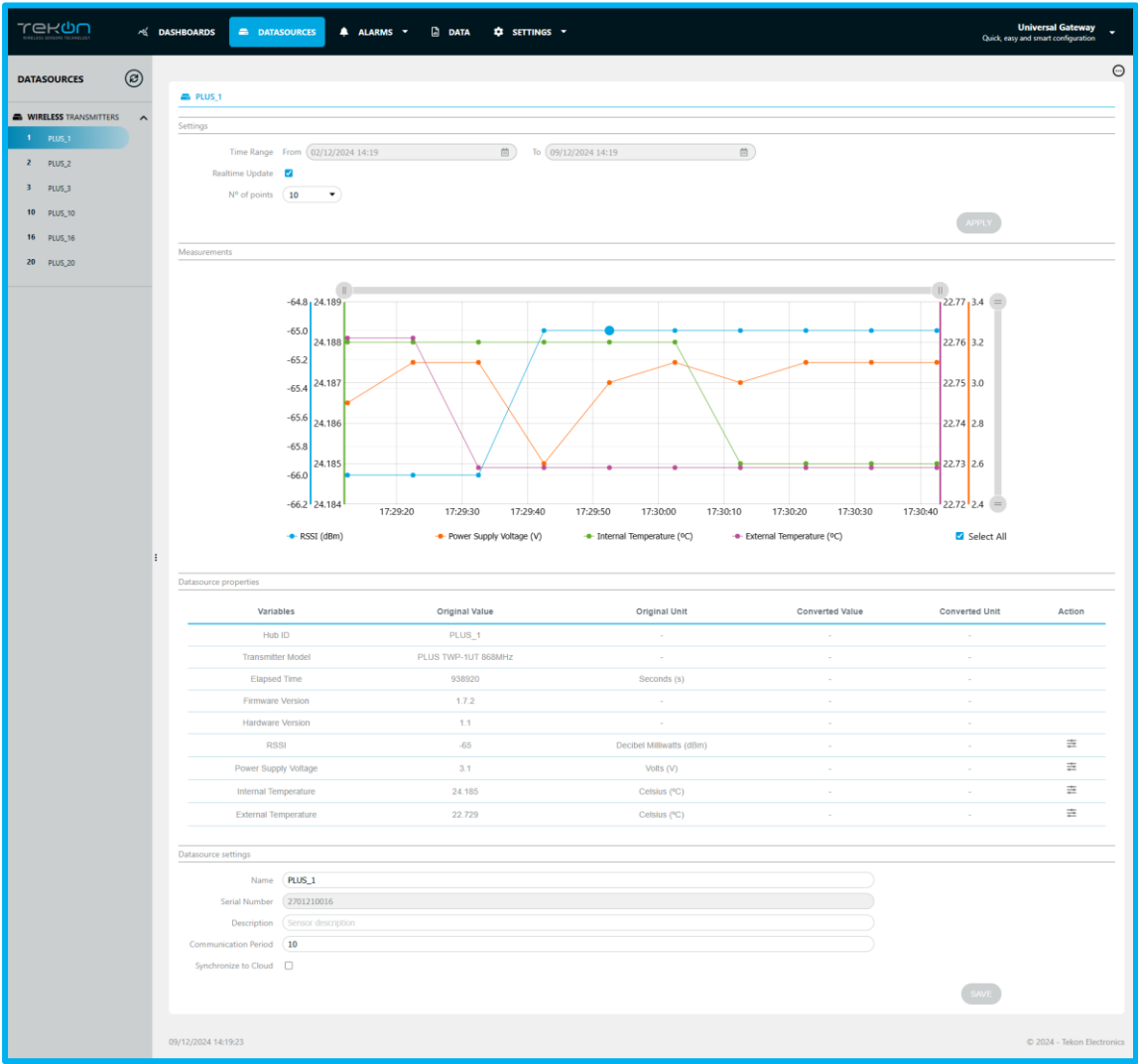


Figure 90 - Datasource Page with a selected datasource.

Settings

In **Settings**, it is possible to adjust the time range and the number of points for graphical data representation. A real-time update option is available, allowing data from the *datasource* to be viewed in real time. To apply the changes, you need to click on **APPLY**.

Settings

Time Range From 02/12/2024 17:34 To 09/12/2024 17:34

Realtime Update ☒

N° of points 10

APPLY

Figure 91 - Datasource configuration section (Settings).

The settings fields are as follows:

- **Time Range:** Allows selection of the time range, in hours and minutes, of the data to be displayed in the graphical representation. This option is only available if the *Realtime Update* field is unchecked;
- **Realtime Update:** Allows real-time viewing of the data received in the graphical representation. The data displayed are always the most recent ones received by the uGateway device;
- **N° of points:** Allows definition of the number of points (10, 20, or 50) to be displayed in the graphical representation.

Measurements

In the *Measurements* section, the graphical representation of the *datasource* data with all its variables is available. If you wish to view only one variable, you can hide the others by clicking on the legend. To view all variables again, select the checkbox *Select All* on the right side of the graph.

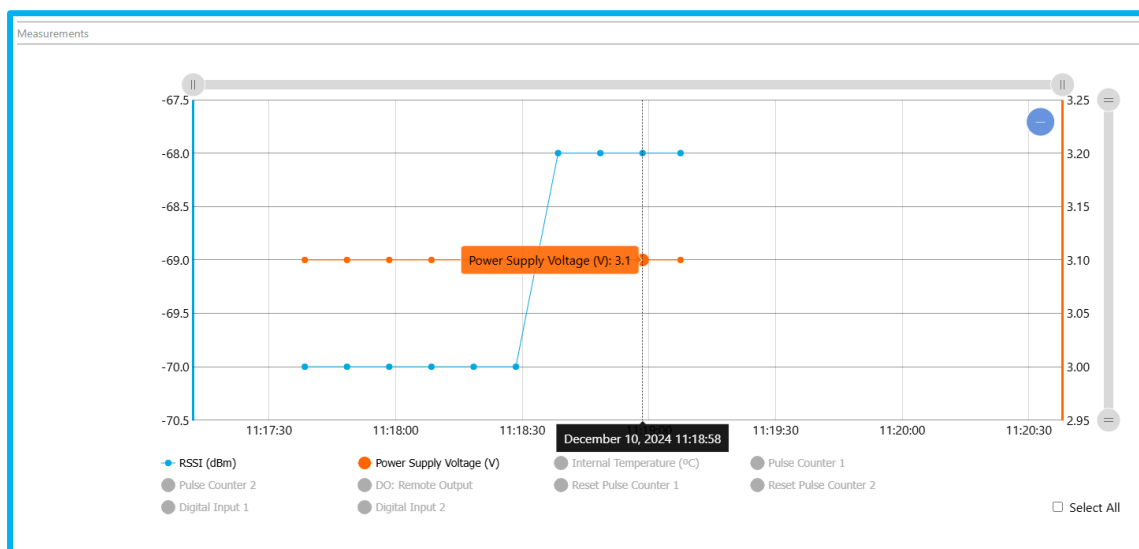


Figure 92 - Datasource Measurements Section.

For more detailed information, hovering the mouse over a point in the graphical representation will display the variable value along with the date and time the data was received. In *Figure 62*, you can see the details of the *Power Supply Voltage* variable.

You can also change the graph scale using the gray bars or the mouse *scroll*. To return to the initial scale, click the symbol in the upper-right corner of the graph.

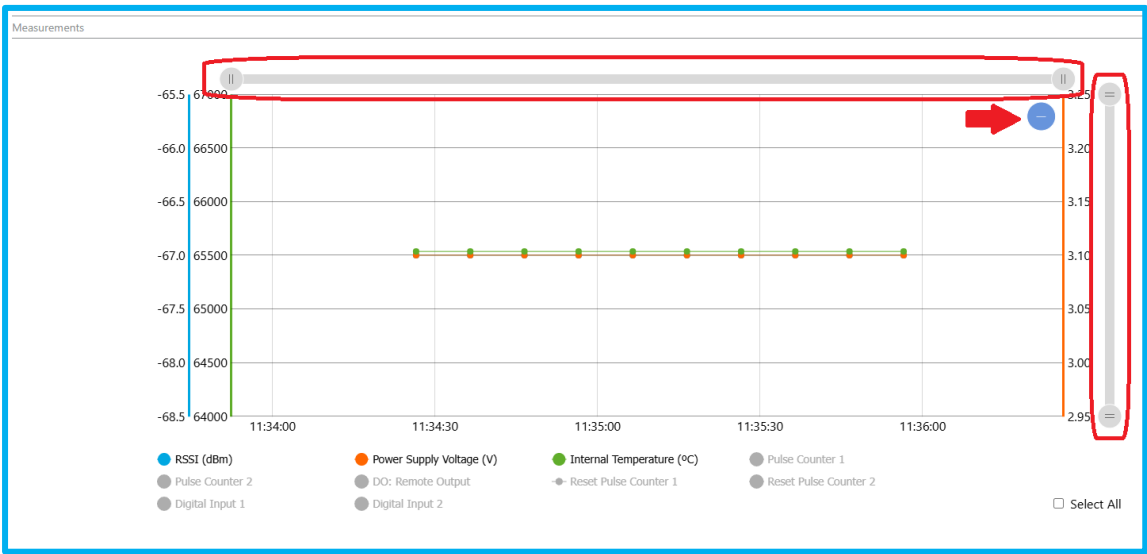




Figure 93 - Options for changing the graph scale.

Datasource properties

In *Datasource* properties, you can check the editable and non-editable properties of the *datasource* as shown in Figure 63. The *Elapsed Time* variable is constantly updated based on the defined communication period and indicates the time elapsed since the last data reception.

Datasource properties					
Variables	Original Value	Original Unit	Converted Value	Converted Unit	Action
Hub ID	PLUS_17	-	-	-	
Transmitter Model	PLUS TWP-2DI 868MHz	-	-	-	
Elapsed Time	7	Seconds (s)	-	-	
Firmware Version	1.7.1	-	-	-	
Hardware Version	1.1	-	-	-	
RSSI	-73	Decibel Milliwatts (dBm)	-	-	
Power Supply Voltage	3.1	Volts (V)	-	-	
Internal Temperature	65535	Celsius (°C)	-	-	
Pulse Counter 1	0	-	-	-	
Pulse Counter 2	0	-	-	-	
DO: Remote Output	True	-	-	-	
Reset Pulse Counter 1	False	-	-	-	
Reset Pulse Counter 2	False	-	-	-	
Digital Input 1	False	-	-	-	
Digital Input 2	False	-	-	-	

Figure 94 - Datasource properties section in the Datasource page.

Editable variables have the icon  in the *Action* column. Through variable editing, it is possible to apply conversion formulas. To edit a variable, after clicking on , the *Variable Adjustments* window will open, where the parameters for conversion can be added.

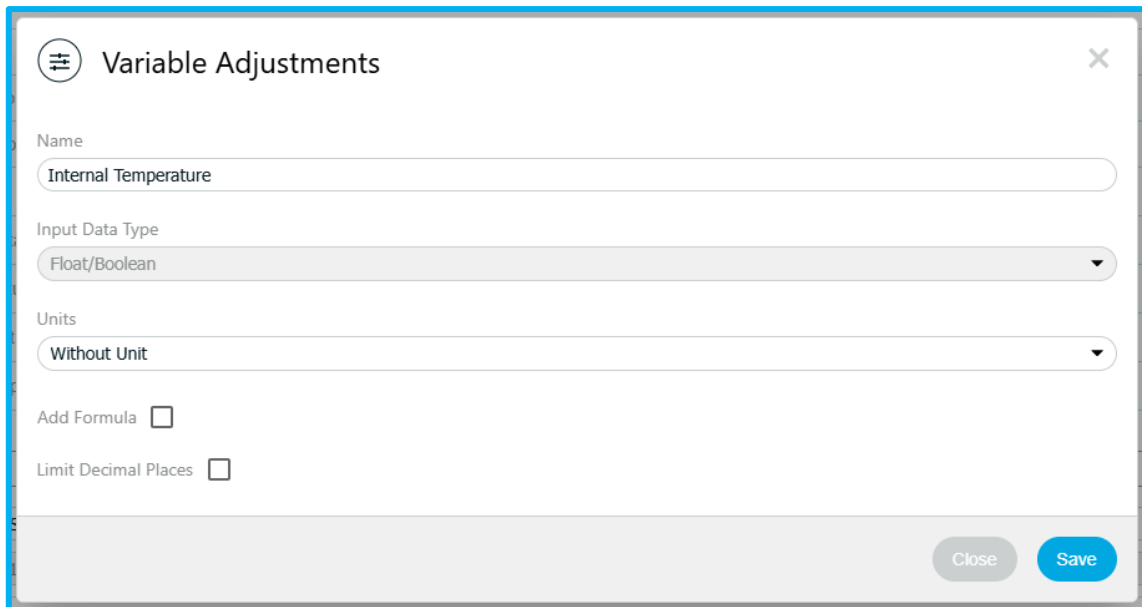
A screenshot of the 'Variable Adjustments' dialog box. It has a title bar with a menu icon and a close button. The main area contains four fields: 'Name' with the value 'Internal Temperature', 'Input Data Type' with a dropdown menu showing 'Float/Boolean', 'Units' with a dropdown menu showing 'Without Unit', and two checkboxes: 'Add Formula' and 'Limit Decimal Places', both of which are unchecked. At the bottom right, there are 'Close' and 'Save' buttons.

Figure 95 - Variable Adjustments Page.

The page contains the following fields to be completed:

- **Name:** Allows changing the variable name (optional);
- **Input Data Type:** Data output type. This field is non-editable and remains locked;
- **Units:** Displays the list of conversion unit types. You can add new conversion units and delete them. These will be available for use across all *datasources*.
 - **Add Unit:**
 - 1- Open the *Units* list and click on “+ Add Unit”.
 - 2- In **Unit Name**, type the name of the variable (*mandatory field*).
 - 3- In **Unit Symbol**, type the unit symbol (*mandatory field*).
 - 4- Click on **Save**.
 - 5- Upon reopening the variable list, the unit will be available.

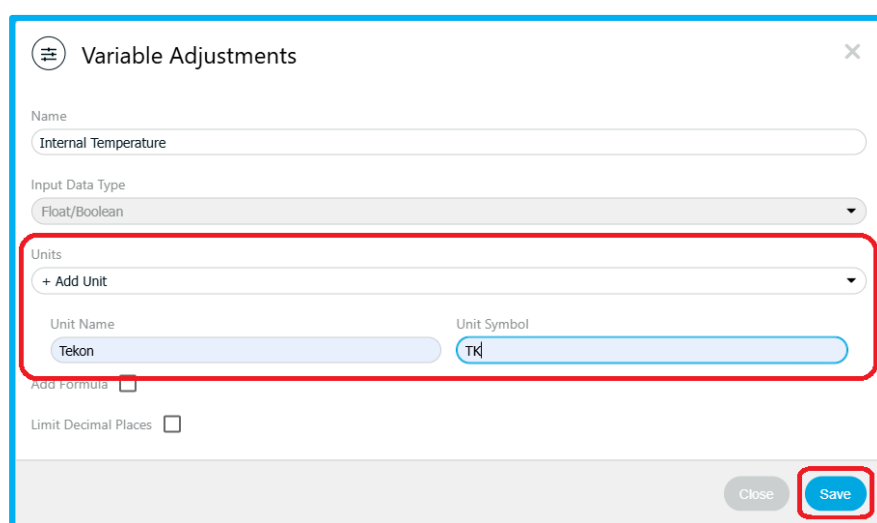

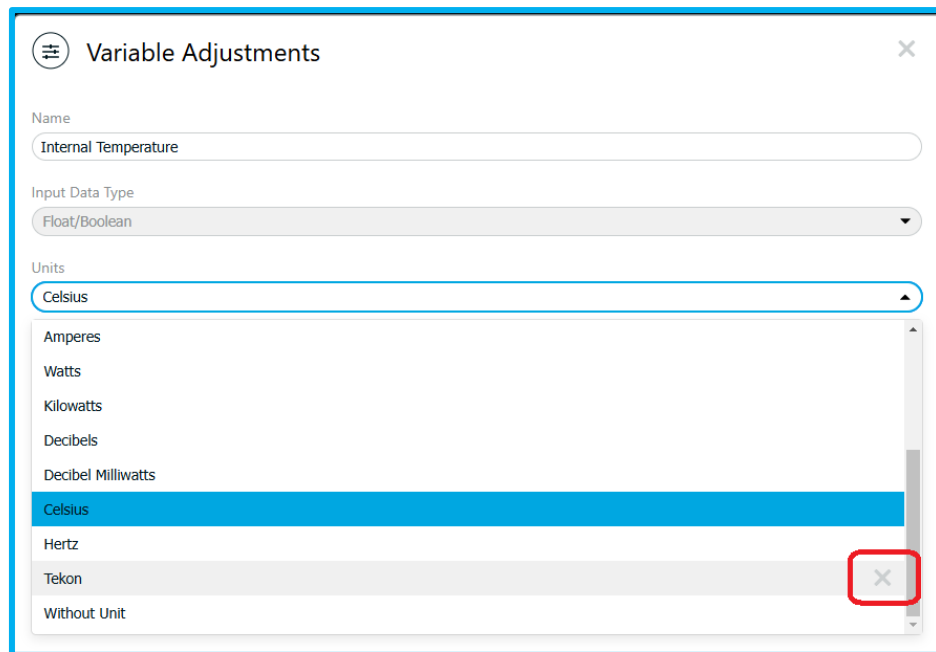
A screenshot of the 'Variable Adjustments' dialog box, similar to Figure 95, but with the 'Units' dropdown menu expanded. The expanded menu shows a '+ Add Unit' button and two input fields: 'Unit Name' with the value 'Tekon' and 'Unit Symbol' with the value 'TK'. The 'Save' button at the bottom right is highlighted with a red box. The 'Units' dropdown menu is also highlighted with a red box.

Figure 96 - Filling in fields to create a conversion unit.

- **Remove Unit:**
 - 1- Open the Units list.
 - 2- Locate the unit in the list (in the example above, it is Tekon). Only user-created units can be deleted.
 - 3- Hover the mouse cursor over the unit.
 - 4- Click on .

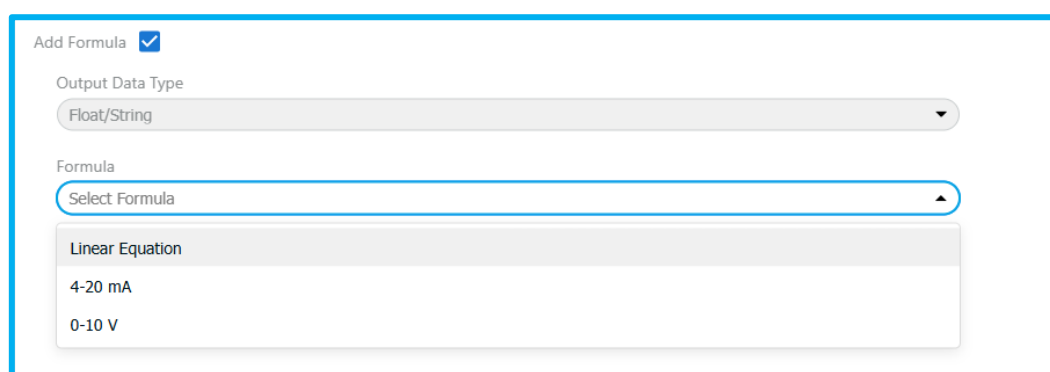


The screenshot shows the 'Variable Adjustments' window. The 'Name' field contains 'Internal Temperature'. The 'Input Data Type' is set to 'Float/Boolean'. The 'Units' dropdown is open, displaying a list of units. The 'Tekon' unit is highlighted with a red box, and a red 'X' icon is visible next to it, indicating the delete action.

Figure 97 - Delete Conversion Unit.

Note: It is only possible to delete conversion units that are not being used in any conversion formula.

- **Add Formula:** Select this option to add formulas that are predefined by the uGateway. If the output data type is float, the following options will be displayed: *Linear Equation*, *4-20 mA*, and *0-10V*. If the output data type is boolean, only the *Boolean Replacement* option will be shown, allowing you to assign values to be displayed when the output is *True* or *False*.



The screenshot shows the 'Add Formula' section. The 'Add Formula' checkbox is checked. The 'Output Data Type' is set to 'Float/String'. The 'Formula' dropdown is open, displaying a list of predefined formulas: 'Linear Equation', '4-20 mA', and '0-10 V'.

Figure 98 - Formulas for float-type data outputs.

Figure 99 - Formulas for boolean-type data outputs.

- Limit Decimal Places:** Selecting this option allows you to define in *Approximation Function* whether to round or truncate the formula's value. In the field *Nº of Decimal Places*, you can specify the number of decimal places for the formula value. These fields are mandatory.

Figure 100 - Approximation Function Options.

Figure 101 - No. of Decimal Places Field.

To better understand the use of conversion formulas, a practical example is provided below, describing how to convert the value of the **Internal Temperature** variable from a datasource from **Celsius (°C)** to **Fahrenheit (°F)**.

Datasource properties					
Variables	Original Value	Original Unit	Converted Value	Converted Unit	Action
Hub ID	PLUS_2	-	-	-	
Transmitter Model	PLUS TWP-1UT 868MHz	-	-	-	
Elapsed Time	7	Seconds (s)	-	-	
Firmware Version	1.7.2	-	-	-	
Hardware Version	1.1	-	-	-	
RSSI	-54	Decibel Milliwatts (dBm)	-	-	
Power Supply Voltage	3	Volts (V)	-	-	
Internal Temperature	24.347	Celsius (°C)	-	-	
External Temperature	24.985	Celsius (°C)	-	-	
DO: Remote Output	False	-	-	-	

Figure 102 - Internal Temperature Variable of the datasource.

Linear Formula to Convert Celsius (°C) to Fahrenheit (°F):

$$^{\circ}F = (^{\circ}C \times 1.8) + 32$$

Step 1 – In the *Internal Temperature* variable row, click on .







Variables	Original Value	Original Unit	Converted Value	Converted Unit	Action
Hub ID	PLUS_2	-	-	-	
Transmitter Model	PLUS TWP-1UT 868MHz	-	-	-	
Elapsed Time	2	Seconds (s)	-	-	
Firmware Version	1.7.2	-	-	-	
Hardware Version	1.1	-	-	-	
RSSI	-53	Decibel Milliwatts (dBm)	-	-	
Power Supply Voltage	3	Volts (V)	-	-	
Internal Temperature	24.701	Celsius (°C)	-	-	
External Temperature	24.547	Celsius (°C)	-	-	
DO: Remote Output	False	-	-	-	

Figure 103 - Indication where to click as described in Step 1.

Step 2 – In the field **Name**, change *Internal Temperature* to “*Temperatura Interna*”.

 Variable Adjustments

Name

Input Data type

Float/Boolean

Units

Celsius

Add Formula ☐

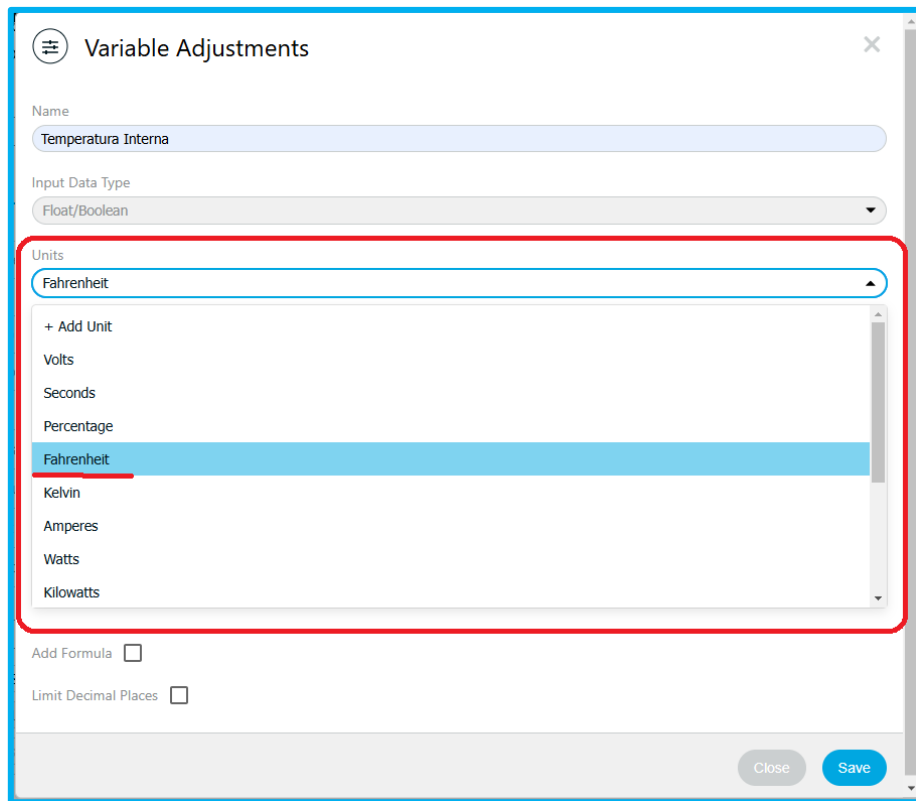
Limit Decimal Places ☐

Close

Save

Figure 104 - Name Field.

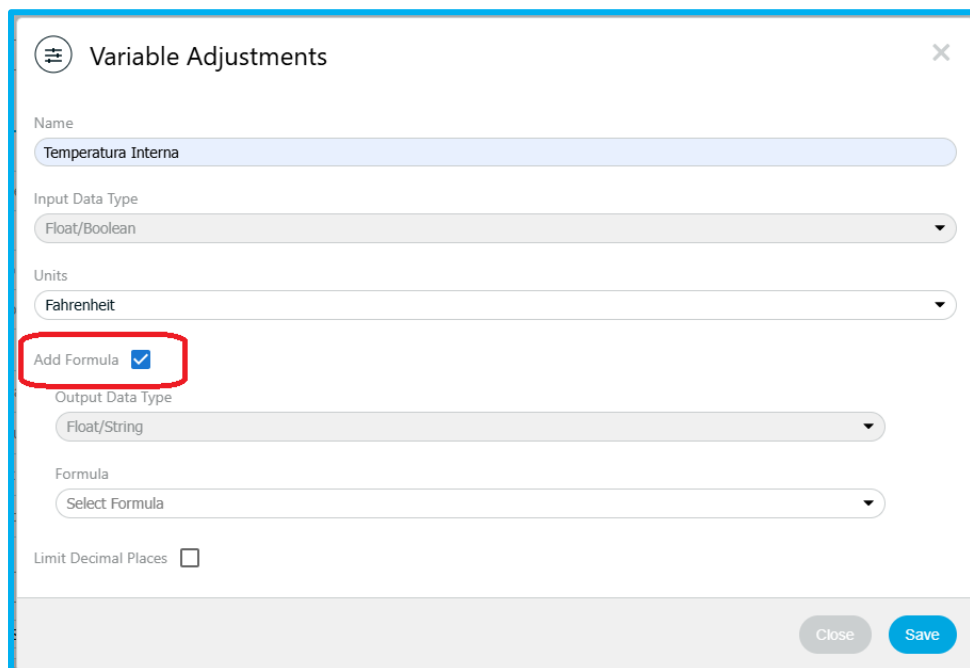
Step 3 – Open the *Units* list and choose *+ Add Unit*.



The image shows a 'Variable Adjustments' dialog box. The 'Name' field is 'Temperatura Interna'. The 'Input Data Type' is 'Float/Boolean'. The 'Units' dropdown is open, showing a list of units: '+ Add Unit', 'Volts', 'Seconds', 'Percentage', 'Fahrenheit' (highlighted), 'Kelvin', 'Amperes', 'Watts', and 'Kilowatts'. Below the units list, there are checkboxes for 'Add Formula' and 'Limit Decimal Places'. At the bottom right are 'Close' and 'Save' buttons.

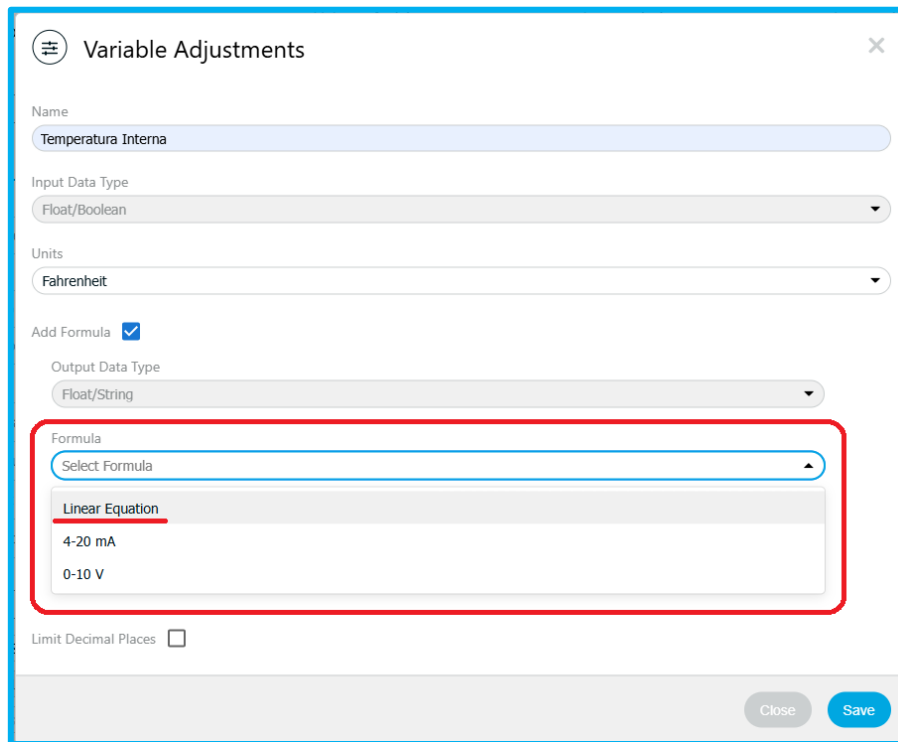
Figure 105 - Units Field List.

Step 4 – Select the *Add Formula* field

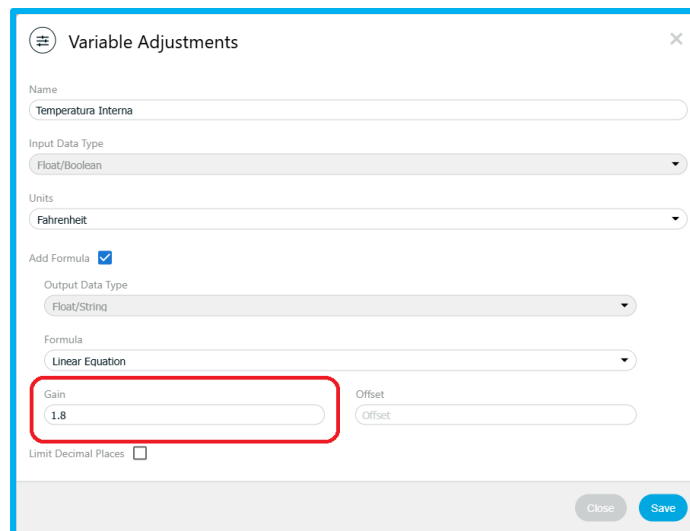


The image shows the 'Variable Adjustments' dialog box with the 'Add Formula' checkbox selected. The 'Name' field is 'Temperatura Interna'. The 'Input Data Type' is 'Float/Boolean'. The 'Units' dropdown is 'Fahrenheit'. The 'Add Formula' checkbox is checked. Below it, the 'Output Data Type' is 'Float/String'. The 'Formula' dropdown is 'Select Formula'. At the bottom right are 'Close' and 'Save' buttons.

Figure 106 - Add Formula Field.

Step 5 – Choose *Linear Equation* in Formula.

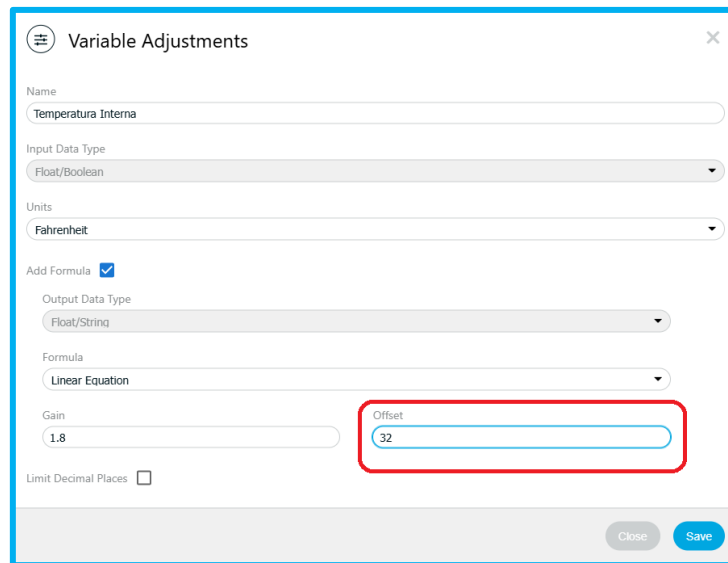
The image shows a 'Variable Adjustments' dialog box. The 'Name' field is 'Temperatura Interna'. The 'Input Data Type' is 'Float/Boolean'. The 'Units' are 'Fahrenheit'. The 'Add Formula' checkbox is checked. The 'Output Data Type' is 'Float/String'. The 'Formula' dropdown menu is open, showing 'Select Formula' at the top, followed by 'Linear Equation' (which is highlighted with a red box), '4-20 mA', and '0-10 V'. The 'Limit Decimal Places' checkbox is unchecked. At the bottom right are 'Close' and 'Save' buttons.

*Figure 107 - Formula to Be Chosen.***Step 6 – In *Gain*, enter the value 1.8, as defined by the linear formula.**

The image shows the same 'Variable Adjustments' dialog box. The 'Formula' dropdown is now set to 'Linear Equation'. The 'Gain' input field is highlighted with a red box and contains the value '1.8'. The 'Offset' input field is empty and labeled 'Offset'. The 'Limit Decimal Places' checkbox is unchecked. At the bottom right are 'Close' and 'Save' buttons.

Figure 108 - Value to Enter in Gain.

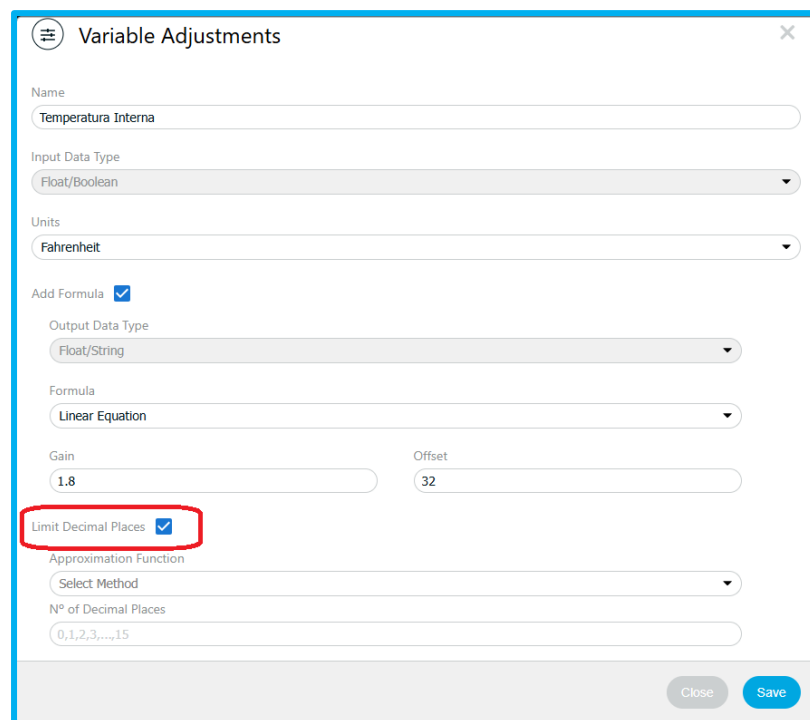
Step 7 – In *Offset*, enter the value 32, as defined by the linear formula.



The image shows a 'Variable Adjustments' dialog box. The 'Name' field is 'Temperatura Interna'. The 'Input Data Type' is 'Float/Boolean'. The 'Units' are 'Fahrenheit'. The 'Add Formula' checkbox is checked. The 'Output Data Type' is 'Float/String'. The 'Formula' is 'Linear Equation'. The 'Gain' is '1.8'. The 'Offset' is '32', which is highlighted with a red rectangle. The 'Limit Decimal Places' checkbox is unchecked. At the bottom right are 'Close' and 'Save' buttons.

Figure 109 - Value to Enter in Offset.

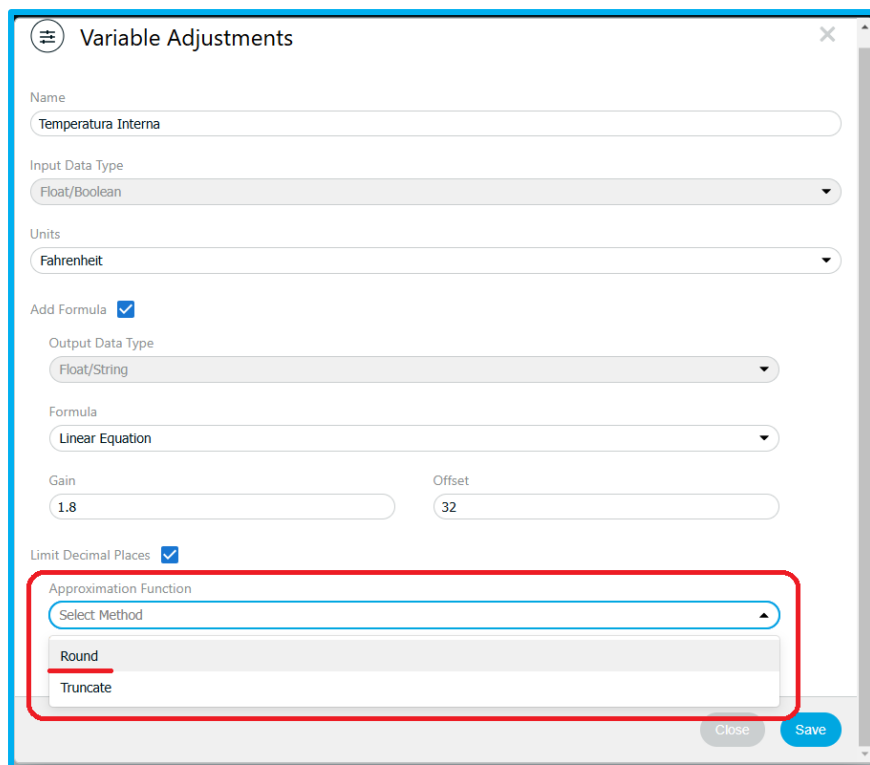
Step 8 – Select the Limit Decimal Places field to define decimal value rules.



The image shows the 'Variable Adjustments' dialog box with additional fields. The 'Limit Decimal Places' checkbox is checked and highlighted with a red rectangle. Below it, the 'Approximation Function' is 'Select Method' and the 'Nº of Decimal Places' is '0,1,2,3,...,15'. The 'Gain' is '1.8' and the 'Offset' is '32'. At the bottom right are 'Close' and 'Save' buttons.

Figure 110 - Limit Decimal Places Option Selected.

Step 9 – In *Approximation Function*, choose the *Round* option to round values.



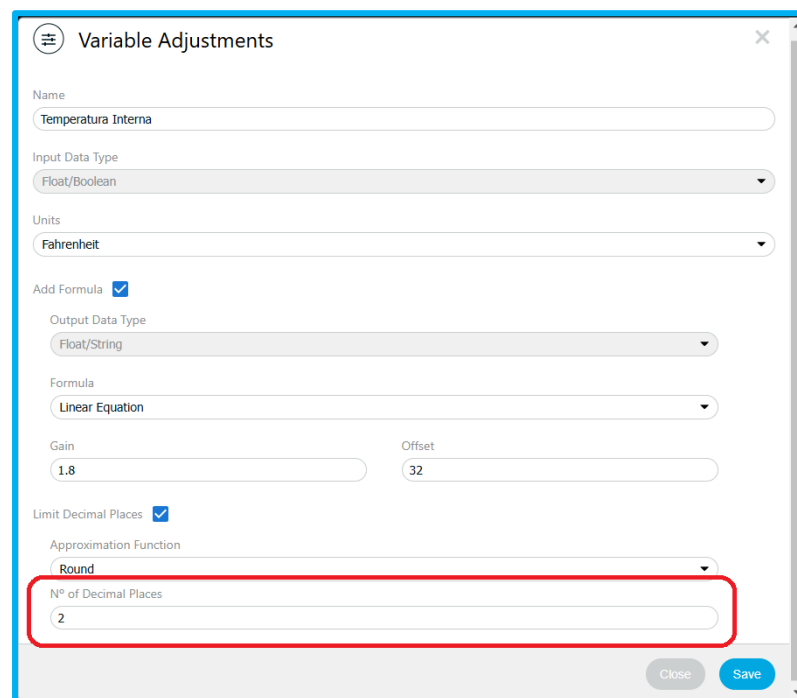
The 'Variable Adjustments' dialog box is shown with the following settings:

- Name: Temperatura Interna
- Input Data Type: Float/Boolean
- Units: Fahrenheit
- Add Formula: ☒
- Output Data Type: Float/String
- Formula: Linear Equation
- Gain: 1.8
- Offset: 32
- Limit Decimal Places: ☒
- Approximation Function: Select Method (dropdown menu open showing Round and Truncate options)

The 'Approximation Function' dropdown menu is highlighted with a red box, showing the 'Round' and 'Truncate' options.

Figure 111 - Approximation Function Options.

Step 10 – In *No. of Decimal Places*, set it to 2 to limit the value to two decimal places.




The 'Variable Adjustments' dialog box is shown with the following settings:

- Name: Temperatura Interna
- Input Data Type: Float/Boolean
- Units: Fahrenheit
- Add Formula: ☒
- Output Data Type: Float/String
- Formula: Linear Equation
- Gain: 1.8
- Offset: 32
- Limit Decimal Places: ☒
- Approximation Function: Round
- Nº of Decimal Places: 2

The 'Nº of Decimal Places' input field is highlighted with a red box, showing the value '2'.

Figure 112 - Setting the Number of Decimal Places.


Step 11 – Click on  to apply the formula.

In *Figure 46*, you can see that the formula was correctly applied. The variable name was changed to *Temperatura Interna*, the *Converted Value* column shows the converted value with two decimal places, and the *Converted Unit* column displays the converted unit.

Variables	Original Value	Original Unit	Converted Value	Converted Unit	Action
Hub ID	PLUS_2	-	-	-	
Transmitter Model	PLUS TWP-1UT 868MHz	-	-	-	
Elapsed Time	6	Seconds (s)	-	-	
Firmware Version	1.7.2	-	-	-	
Hardware Version	1.1	-	-	-	
RSSI	-70	Decibel Milliwatts (dBm)	-	-	⚙
Power Supply Voltage	3	Volts (V)	-	-	⚙
Temperatura Interna	25.115	Celsius (°C)	77.21	Fahrenheit (°F)	⚙
External Temperature	24.866	Celsius (°C)	-	-	⚙
DO: Remote Output	False	-	-	-	⚙

Figure 113 - Values after applying the conversion formula.

To undo the conversion formula, simply follow the reverse process of creating a formula. Follow the steps below to restore the values as shown in.


Variable Adjustments
✕

Name

Input Data Type

Units

Add Formula ☐

Limit Decimal Places ☐

Close

Save

Figure 114 - Values to undo the conversion formula.

Step 1 – Enter the original variable name: *Internal Temperature*.

Step 2 – In *Units*, choose the option: *Without Unit*.

Step 3 – Uncheck the option “*Add Formula*”.

Step 4 – Uncheck the option “*Limit Decimal Places*”.

Step 5 – Click on  to apply the changes.

After undoing the conversion formula, *Figure 84* shows the values without a conversion formula applied.

Variables	Original Value	Original Unit	Converted Value	Converted Unit	Action
Hub ID	PLUS_2	-	-	-	
Transmitter Model	PLUS TWP-1UT 868MHz	-	-	-	
Elapsed Time	2	Seconds (s)	-	-	
Firmware Version	1.7.2	-	-	-	
Hardware Version	1.1	-	-	-	
RSSI	-69	Decibel Milliwatts (dBm)	-	-	
Power Supply Voltage	3	Volts (V)	-	-	
Internal Temperature	24.09	Celsius (°C)	-	-	
External Temperature	23.000	Celsius (°C)	-	-	
DO: Remote Output	False	-	-	-	

Figure 115 - Values without the applied conversion formula.

Datasource settings

In the *Datasource Settings* section, you can view and edit some settings of the datasource.

Datasource settings	
Name	<input type="text" value="PLUS_2"/>
Serial Number	<input type="text" value="2701210016"/>
Description	<input type="text" value="Sensor description"/>
Communication Period	<input type="text" value="10"/>
Synchronize to Cloud	<input type="checkbox"/>
<input type="button" value="SAVE"/>	

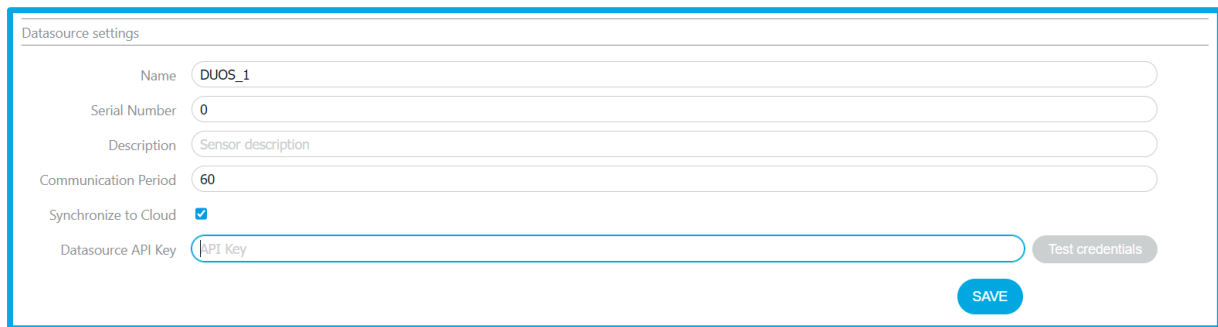
Figure 116 - Editing options in Datasource Settings.

The display fields are as follows:

- **Name:** Allows defining a name for the *datasource*.
- **Serial Number:** Displays the serial number of the *datasource* (non-editable field).
- **Communication Period:** Allows setting the communication period in seconds. The communication period change will only take effect after the next communication with the *datasource*.
- **Synchronize to Cloud:** See the section “[Sync datasource to the cloud](#)”.

6.4.4 Sync Datasource to the Cloud

In the Datasource Settings section, you can sync or not sync the datasources with the cloud. To sync and send data to the Tekon IoT Platform, you need to activate the sync checkbox and add the corresponding API key (Figure 117). However, you must first follow the steps in the Cloud section.



The screenshot shows the 'Datasource settings' form. The 'Name' field is 'DUOS_1', 'Serial Number' is '0', 'Description' is 'Sensor description', and 'Communication Period' is '60'. The 'Synchronize to Cloud' checkbox is checked. The 'Datasource API Key' field contains 'API Key'. There is a 'Test credentials' button and a 'SAVE' button.

Figure 117 - Datasource Settings section on the datasource page with Cloud sync.

The datasource API key is retrieved from the platform when the respective datasource is created. Create a datasource on the Datasources page of the Tekon IoT Platform by clicking on [+ Add datasource](#).

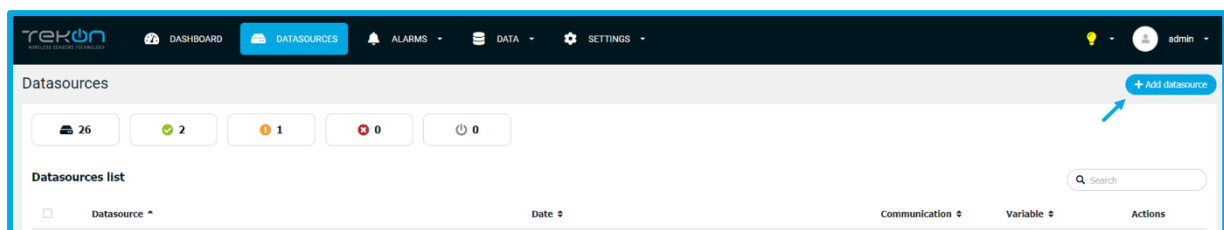


Figure 118 – Datasources section on the Tekon IoT Platform.

When creating the datasource, copy the API key by clicking on [Copy](#), and complete the creation of the new datasource.

tekon DASHBOARD DATASOURCES ALARMS DATA SETTINGS admin

Create datasource

1 Properties > 2 Variables

Set below the properties of the datasource to be created

* The marked items are mandatory

Name*
Test

Type*
DUOS inTemp

TimeZone*
Europe/Lisbon

Api Key*
911c9e5e-36d6-4021-915b-dec1b57964e7 Copy New key

Metadata

Cancel Next →

Figure 119 – Creating a datasource on the Tekon IoT Platform.

Then return to the Datasource Settings section on the datasource page and paste the API key. Test these credentials by clicking on **Test credentials**. If successful, a check symbol will appear, then save the changes by clicking on **SAVE**. If an error symbol appears, confirm the API key and the gateway internet connection.

Datasource settings

Name DUOS_1

Serial Number 0

Description Sensor description

Communication Period 60

Synchronize to Cloud ☒

Datasource API Key XXXXX Test credentials

SAVE

Figure 120 - Datasource Settings section on the datasource page with Cloud sync and API key.

6.4.5 Delete *datasource*

In the upper right corner, there is a symbol ☹️ (Figure 121), that allows you to delete the selected datasource. In the sidebar list of datasources, a similar symbol appears when hovering over the datasource, clicking on it performs the same function.

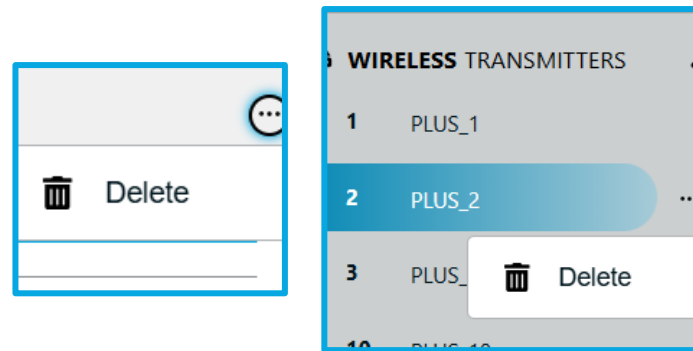


Figure 121 – Options to delete a Datasource on the selected Datasource page.

6.5 Data Menu

The Data page allows viewing different variables simultaneously from different datasources and exporting them in five different formats, Figure 122.

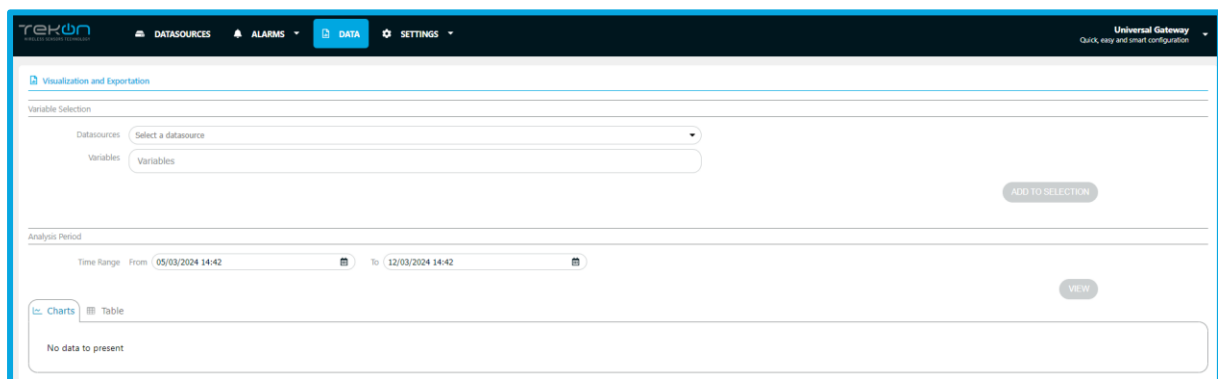


Figure 122 – Data Viewing and Export page.

To start the data viewing and export process, select the desired datasource, Figure 123, then select the respective variables, Figure 124 and Figure 125.

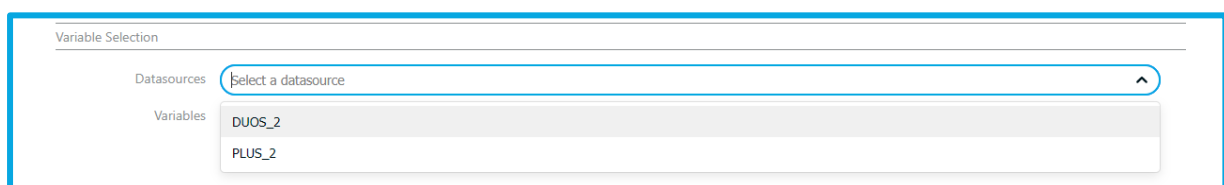


Figure 123 – Section to select the Datasource for viewing and/or export.

Variable Selection

Datasources: PLUS_2

Variables: Variables

Analysis Period: From 04/09/2023 14:01 To 11/09/2023 14:01

Variables list:

- Battery Voltage
- RSSI
- Internal Temperature
- External Temperature

Figure 124 – Section to select the variables for viewing and/or export.

Variable Selection

Datasources: PLUS_2

Variables: Internal Temperature External Temperature Variables

ADD TO SELECTION

Figure 125 – Section to select different variables for viewing and/or export.

To add these variables to the data list for viewing, press the button **ADD TO SELECTION**, Figure 126. To continue adding variables from other datasources, repeat the previously described process as many times as necessary until all desired variables are obtained.

Variable Selection

Datasources: Select a datasource

Variables: Variables

ADD TO SELECTION

ID	Name	Metric
PLUS_2	PLUS_2	Internal Temperature
PLUS_2	PLUS_2	External Temperature

Figure 126 – Section of variables added to the list on the Data Viewing and Export page.

After choosing the list of variables to be displayed, you need to select the time interval for which you want to view the data and click the button **VIEW** to generate the graph and table, as shown from Figure 127 to Figure 129. The graph can be exported in two formats, PNG and JPG, and the tabulated values can be saved in three types of files, XLSX, CSV, and PDF. To export, just click the button **EXPORT AS** and choose the export format. Note that the graphic only allows for a maximum of 100 points.

Analysis Period

Time Range: From 04/09/2023 14:01 To 11/09/2023 14:01

VIEW

Charts Table

No data to present

Figure 127 – Section to define the data viewing/export period.

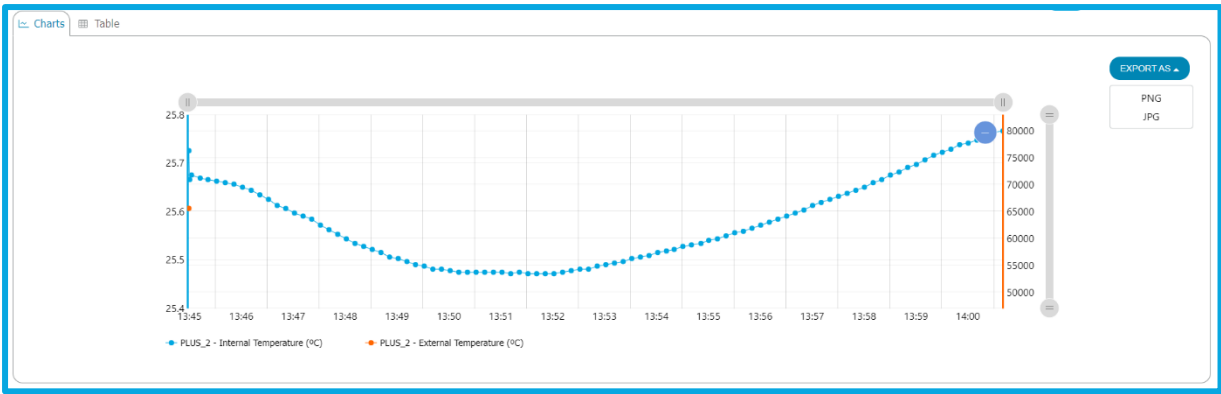


Figure 128 – Graphic for PNG and JPG export.

The table displays data for PLUS_2, with columns for Date, Internal Temperature (°C), and External Temperature (°C). The data is organized into three columns: Date, PLUS_2 Internal Temperature (°C), and PLUS_2 External Temperature (°C). An 'EXPORT AS' button is located in the top right corner, with options for PDF, XLSX, and CSV.

Date	PLUS_2 Internal Temperature (°C)	PLUS_2 External Temperature (°C)
09/11/2023 13:45:28	25.72519	65535
09/11/2023 13:45:29	25.72519	65535
09/11/2023 13:45:30	25.66545	65535
09/11/2023 13:45:32	25.67488	65535
09/11/2023 13:45:42	25.6686	65535
09/11/2023 13:45:51	25.66545	65535
09/11/2023 13:46:01	25.6623	65535
09/11/2023 13:46:11	25.65917	65535
09/11/2023 13:46:21	25.65603	65535
09/11/2023 13:46:31	25.64974	65535
09/11/2023 13:46:41	25.64346	65535
09/11/2023 13:46:51	25.63404	65535
09/11/2023 13:47:01	25.62462	65535
09/11/2023 13:47:11	25.61206	65535
09/11/2023 13:47:21	25.60578	65535
09/11/2023 13:47:31	25.59637	65535

Figure 129 – Table for Export in PDF, XLSX, and CSV.

6.6 Settings Menu

In the Universal IoT Gateway interface, under the Settings tab, Figure 130, you can configure various equipment parameters according to the user's needs.

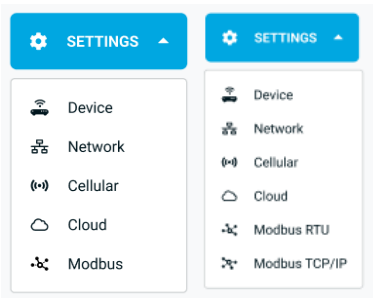



Figure 130 - Settings tab menu with the Modbus RTU Master and TCP/IP Client Pack inactive (left) and active (right).

6.6.1 Device

This settings page is divided into three sections, as shown in Figure 131:

1. **Device Settings:** view the Universal IoT Gateway settings (versions, serial number, country, and device name), the country and device name can be edited. To install new versions of the device, you can access the Tekon website from this page to download the update file ([Download Center - Tekon Electronics](#)). To perform the update, follow the steps in the [Device Update](#).
2. **Date and Time Settings:** set the device date and time, manually or based on the NTP protocol. When syncing with the NTP server, you can edit the server field, as shown in Figure 132 e Figure 133, and the user can test if the entered server is correct before saving the changes.
3. **RF Settings:** view the radio module's Part Number and edit the Wireless Network ID and channel to configure communications through the radio module with the wireless transmitters (for more details see [Add new datasource](#)).

Whenever you make changes to these settings, you must save them by clicking the button .

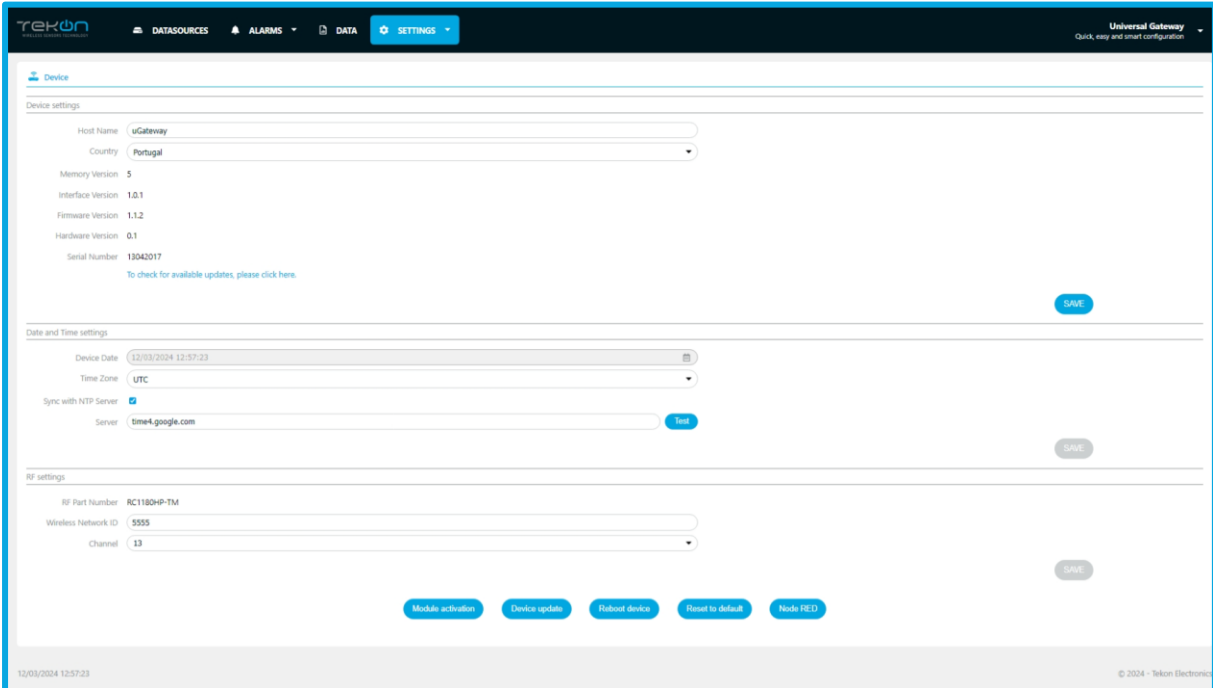


Figure 131 – Device Settings page.

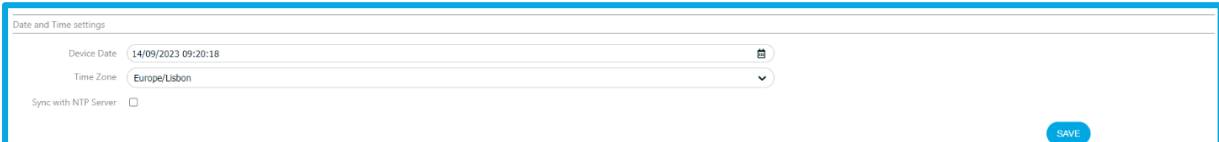


Figure 132 – Section to configure date and time with NTP disabled.

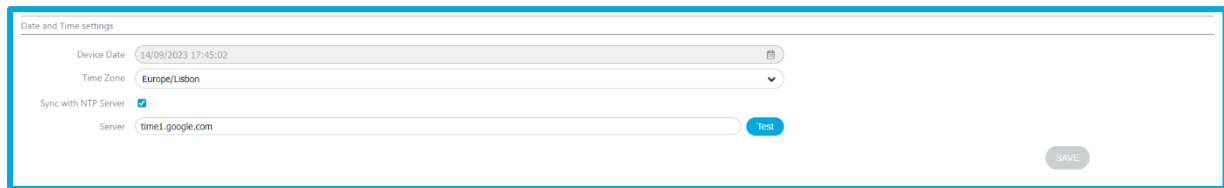


Figure 133 – Section to configure date and time with NTP enabled.

At the end of the device settings page, there are five buttons as shown in Figure 134.

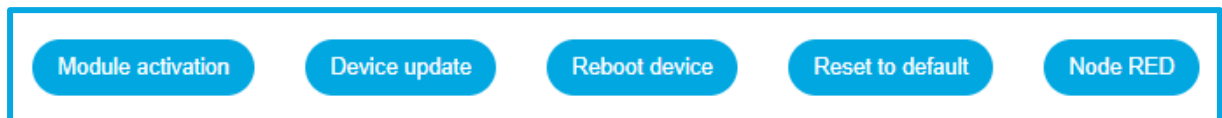


Figure 134 - Actions available on the Device Settings page.

6.6.1.1 Module Activation

The button **Module activation** allows the activation of advanced modules previously purchased by the user:

- Modbus RTU Master and TCP/IP Client Pack;
- Alarms and Notifications Pack;
- Node-RED Pack.

Upon purchasing an additional module, keys are provided to activate it. By clicking the button **Module activation** a window will appear (Figure 135), where you should enter the provided key, test it, and if valid, apply the key to unlock the module. You should then receive a success or failure message regarding the module unlock.

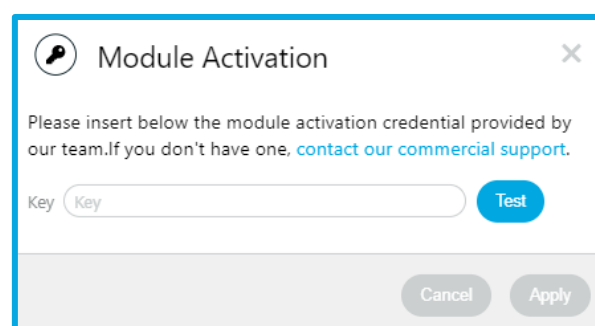


Figure 135 – Page to activate advanced modules.

If the message is unsuccessful and the key is valid, please contact Tekon technical support (support@tekonelectronics.com). If the message is successful, you can close the window or activate another module if desired. To ensure proper functionality, a reboot is required after activating the modules (see [Reboot](#) section). Then, wait for the system to restart and log in.

6.6.1.2 Device Update

The button **Device update** allows remote firmware and software updates when a new version is released. Pressing the button **Device update** opens a new window to upload a *raucb* file (Figure 136), which can be downloaded at the following link: [Download Center – Tekon Electronics](#). The user can view the update progress as shown in Figure 137.

To complete the device update, a reboot is required. To do this, the user must select the button **Reboot**, Figure 137. Then wait for the system to restart and log in.

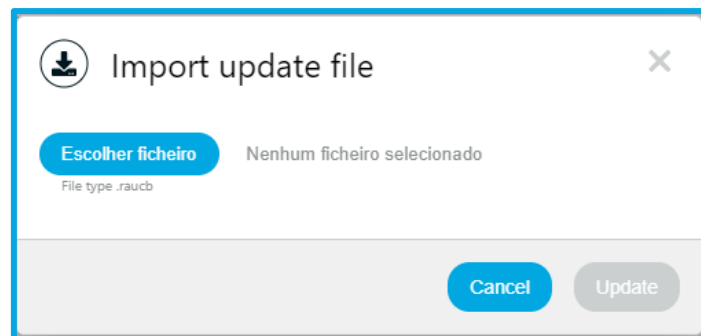


Figure 136 – Page to upload raucb file for device update.

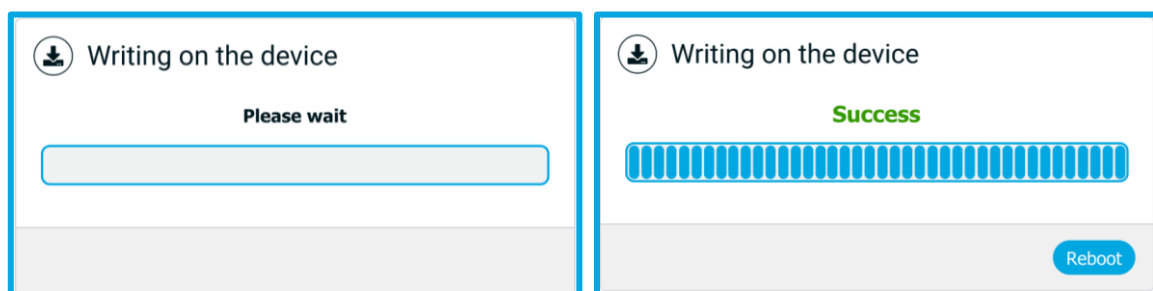


Figure 137 – Pages to view update progress and completion.

6.6.1.3 Reboot

Clicking the button **Reboot device**, will restart the device. The user will be redirected to a page to confirm the reboot. After confirming, wait for the system to restart and log in.

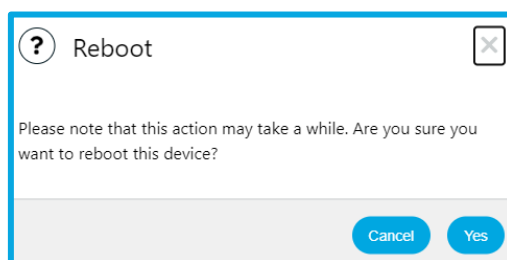


Figure 138 – Device reboot confirmation page.

6.6.1.4 Reset to Default

The button [Reset to default](#) allows resetting the device to factory settings. The user will be redirected to a page to confirm the reset, Figure 139.

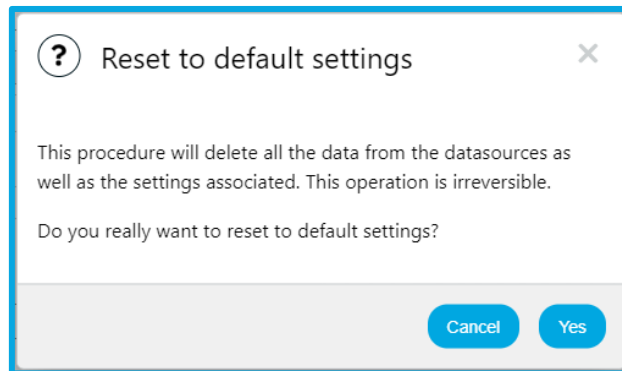



Figure 139 – Page to confirm settings reset.

Clicking [Yes](#), to proceed with the reset, will redirect the user to a page (Figure 140) to wait for the necessary changes and the subsequent device reboot. Once the reboot is complete, the user will be automatically redirected to the login page.



Figure 140 – Page for Universal IoT Gateway reboot.

6.6.1.5 Node-RED (optional)

If you have activated the Node-RED Pack module, you will have access to the button . Clicking this button will direct you to the Node-RED interface where you can add flows and functions (Figure 141). See the [Node-RED](#) section for further steps on how to use Node-RED.

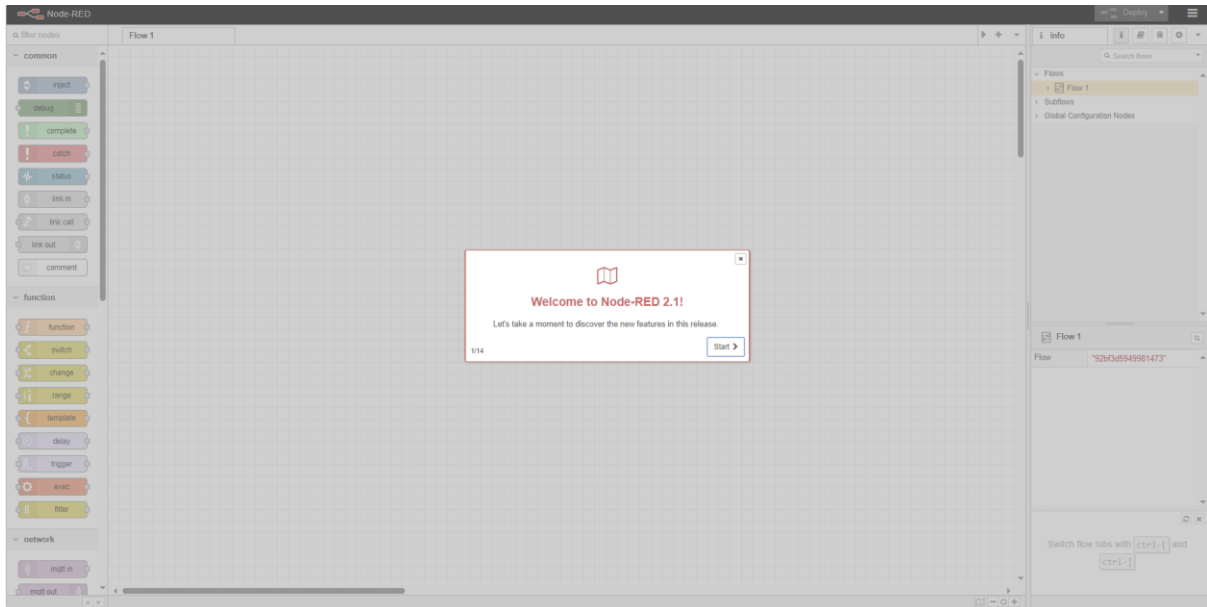


Figure 141 – Node-RED interface page.

6.6.2 Network

In the Settings tab, you can customize various network configurations related to the **Universal IoT Gateway** (Figure 142):

- *Ethernet 0*
- *Wi-Fi*
- *DNS*
- *HTTP Proxy*

Similar to other configurations, the checkbox generates, or blocks fields as needed, allowing for more secure configuration.

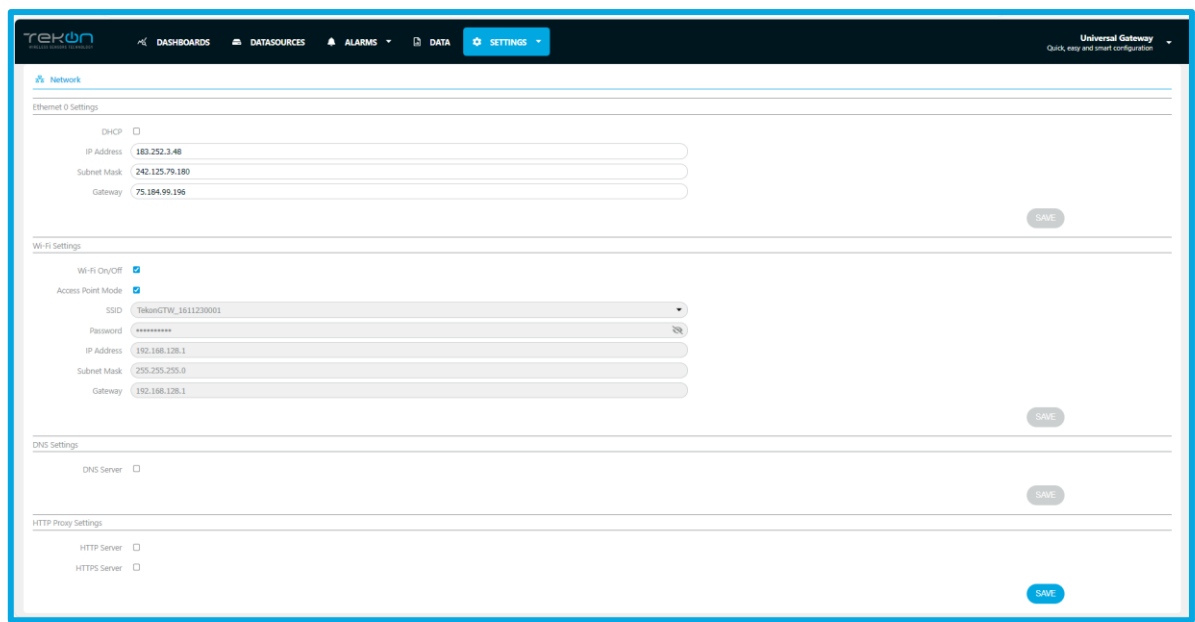


Figure 142 – Page to configure the device network.

6.6.2.1 Ethernet 0

Through the ETH0 port, you can access the Universal IoT Gateway. On this page, you can edit the IP Address, Subnet Mask, and gateway IP fields. This editing is only possible with DHCP (Dynamic Host Configuration Protocol) disabled (Figure 143). With DHCP enabled, the above fields become non-editable, and the device automatically configures the respective settings (Figure 144). Whenever you make changes to these settings, you must save them by clicking the **SAVE** button.

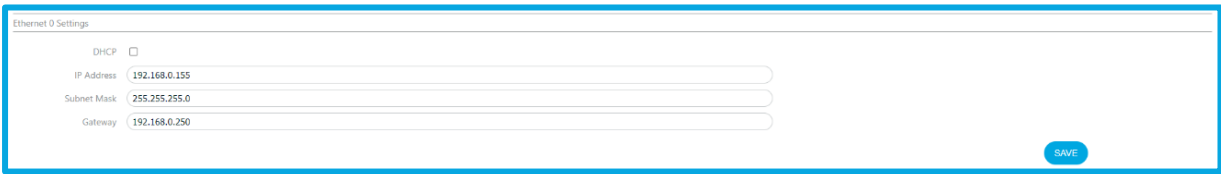


Figure 143 – Section to configure Ethernet 0 network with DHCP disabled.

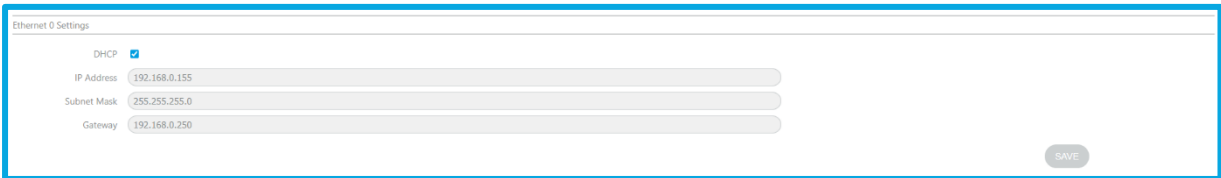


Figure 144 – Section to configure Ethernet 0 network with DHCP enabled.

6.6.2.2 Wi-Fi

In the **Wi-Fi Settings** section, it is possible to change the *Wi-Fi* module settings of the uGateway. By default, the *Wi-Fi* module is enabled, as well as the access point mode (*AP Mode*).

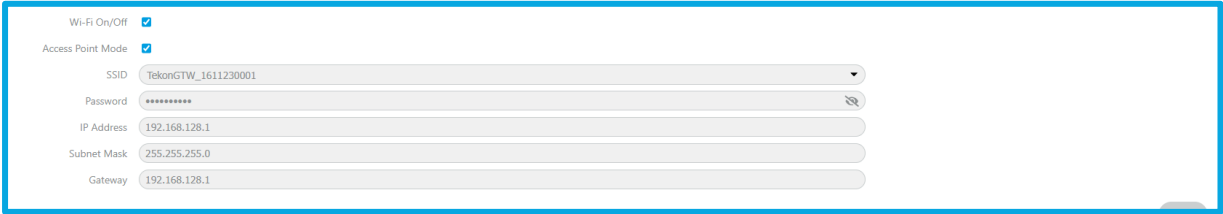
A screenshot of the Wi-Fi settings interface. At the top, there are two checkboxes: 'Wi-Fi On/Off' and 'Access Point Mode', both of which are checked. Below these are several input fields: 'SSID' with a dropdown menu showing 'TelonGTW_1611230001', 'Password' with a masked field (eight asterisks), 'IP Address' with '192.168.128.1', 'Subnet Mask' with '255.255.255.0', and 'Gateway' with '192.168.128.1'. Each input field has a small icon on the right side, likely for clearing or toggling visibility.

Figure 145 – Factory settings of the Wi-Fi module.

To enable or disable the Wi-Fi module, follow these steps:

1. **Locate the checkbox** next to the option "**Wi-Fi On/Off**".
2. **Check/uncheck the checkbox** to enable/disable Wi-Fi. If the box is unchecked, Wi-Fi will be disabled.
3. Click "**Save**" to save the settings.
4. **Wait for confirmation** that the operation was successfully completed.

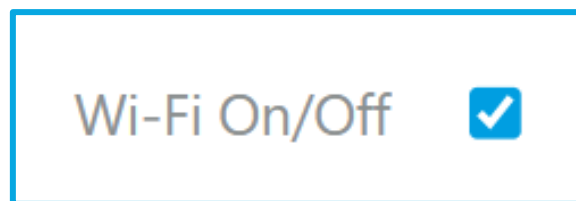
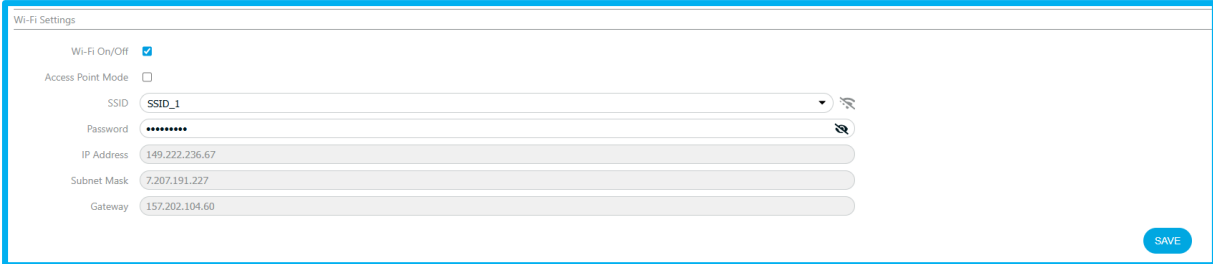


Figure 146 – Checkbox for the Wi-Fi On/Off field checked.

To connect the device to a *Wi-Fi* network, follow these steps:



1. **Disable access point mode (AP Mode)** on your device.
2. **Select the desired Wi-Fi** network from the list of available SSIDs.
3. **Enter the Wi-Fi network password.**
4. Click "**Save**" to save the settings.
5. **Wait for confirmation** that the operation was successfully completed.

A screenshot of the 'Wi-Fi Settings' configuration interface. It includes a 'Wi-Fi On/Off' toggle (checked), an 'Access Point Mode' checkbox (unchecked), and input fields for 'SSID' (SSID_1), 'Password' (masked with dots), 'IP Address' (149.222.236.67), 'Subnet Mask' (7.207.191.227), and 'Gateway' (157.202.104.60). A 'SAVE' button is located in the bottom right corner.

Wi-Fi On/Off	<input checked="" type="checkbox"/>
Access Point Mode	<input type="checkbox"/>
SSID	SSID_1
Password	*****
IP Address	149.222.236.67
Subnet Mask	7.207.191.227
Gateway	157.202.104.60

Figure 147 - Fields to be filled in to connect to a Wi-Fi network.

To manage your Wi-Fi connection, follow these instructions:

1. **To view the password**, click the  symbol.
2. **To check the signal strength**, observe the Wi-Fi signal symbol () when the connection is established.
3. **To check the connection status**, observe the device display.

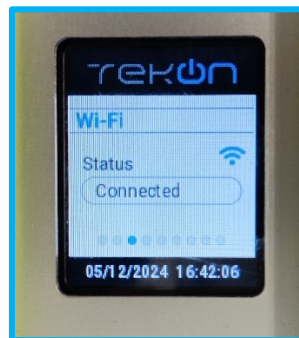


Figure 148 - uGateway display showing the Wi-Fi connection status.

4. **To check the assigned IP**, you can view the information directly on the device display (Figure 118) or in the IP Address field in Wi-Fi Settings.

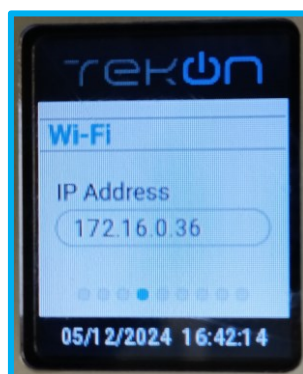


Figure 149 - uGateway display showing the Wi-Fi connection IP.

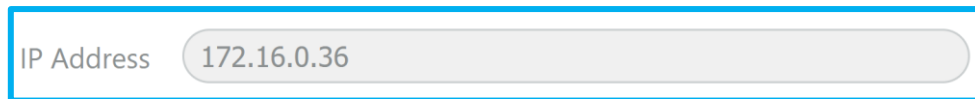
A screenshot of a web interface showing an 'IP Address' field. The field is a light gray rounded rectangle with a blue border. Inside the field, the text '172.16.0.36' is displayed in a dark gray font. The label 'IP Address' is positioned to the left of the field.

Figure 150 – IP Address field showing the IP of the device connected to a Wi-Fi network.

5. **Whenever you make changes** to the settings, make sure to click the **“Save”** button to save the changes.

6.6.2.3 DNS

The gateway also allows activating or deactivating the DNS (Domain Name System), optimizing interface performance and security, Figure 151. With DNS enabled, you can configure the address, Figure 152.

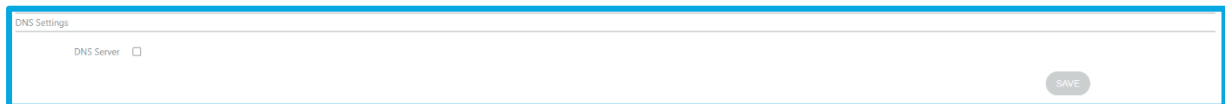
A screenshot of the 'DNS Settings' section in a web interface. It features a 'DNS Server' checkbox which is unchecked. A 'SAVE' button is located at the bottom right of the section.

Figure 151 – Section to configure DNS: disabled.

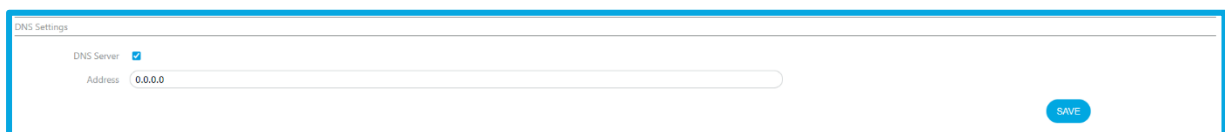
A screenshot of the 'DNS Settings' section in a web interface. The 'DNS Server' checkbox is checked. Below it, the 'Address' field contains the text '0.0.0.0'. A 'SAVE' button is located at the bottom right of the section.

Figure 152 – Section to configure DNS: enabled.

6.6.2.4 HTTP Proxy

The gateway allows configuring the HTTP Proxy, which filters content in network traffic. This configuration can also be disabled, if necessary, Figure 153.

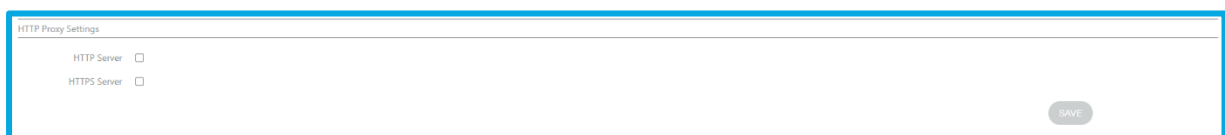
A screenshot of the 'HTTP Proxy Settings' section in a web interface. It features two checkboxes: 'HTTP Server' and 'HTTPS Server', both of which are unchecked. A 'SAVE' button is located at the bottom right of the section.

Figure 153 – Section to configure HTTP Proxy: disabled.

The device supports proxy for both HTTP and HTTPS servers, where you can configure their addresses and ports, Figure 154.

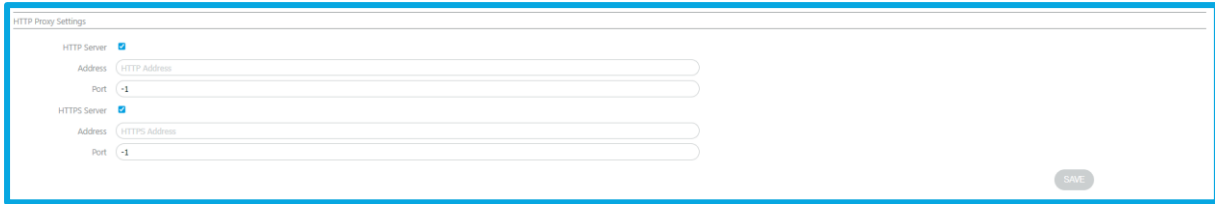


Figure 154 – Section to configure HTTP and HTTPS Proxy: enabled.

6.6.3 Cloud

On the Cloud page, you can configure the Universal IoT Gateway to communicate with the **Tekon IoT Platform** or third-party platforms via the REST protocol, Figure 155. To do this, activate the cloud platform sync, edit the server URL fields, and enter the corresponding API key (Figure 156). Whenever you make changes to these settings, you must save them by clicking the **SAVE** button.

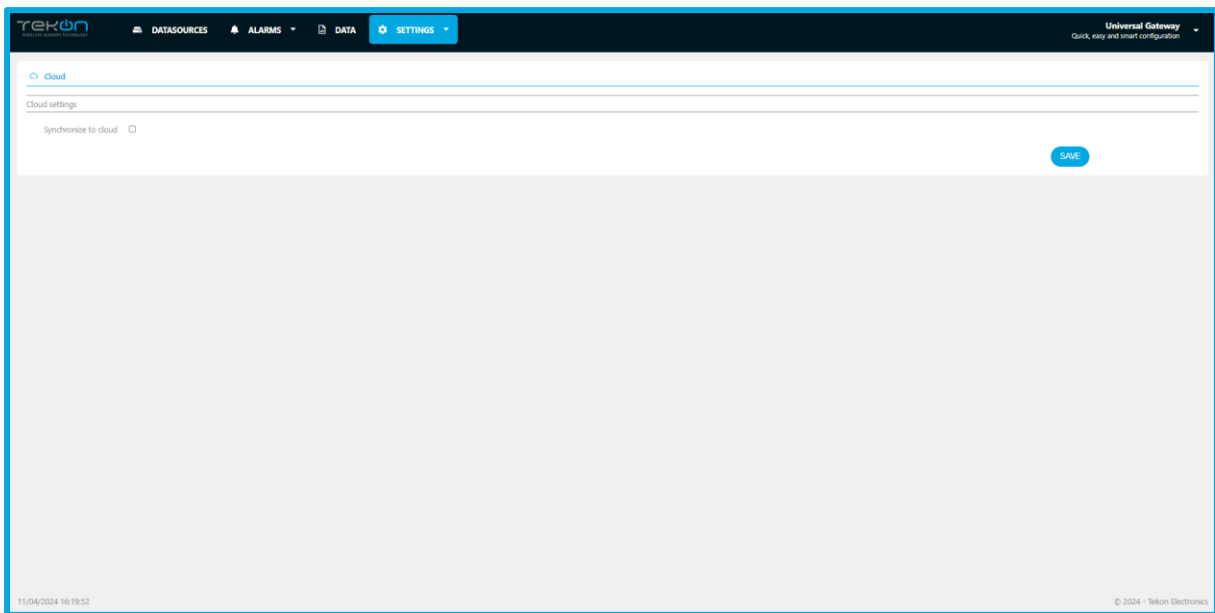


Figure 155 – Cloud Settings page.

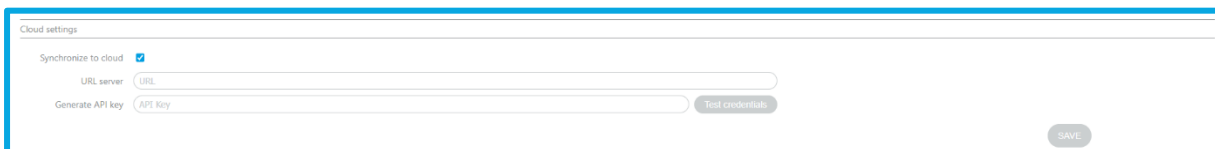


Figure 156 – Cloud configuration section with Cloud Checkbox enabled.

On the Tekon IoT Platform, the URL server is the link to the instance you purchased, and the API key is generated when you create the device user. On the Tekon IoT Platform, create the universal gateway user on the Administration page in the Settings menu (Figure 157), by clicking the button **+ Create User** (Figure 158).

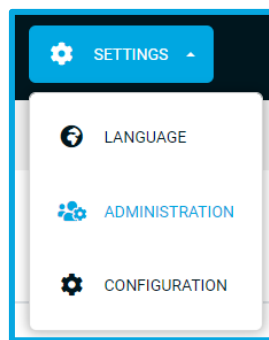


Figure 157 - Settings tab menu on the Tekon IoT Platform.

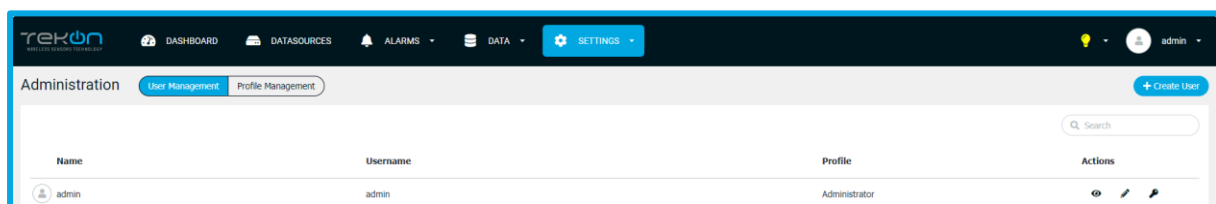



Figure 158 – Administration page on the Tekon IoT Platform.

You can edit the user parameters as desired, but the user profile should be Gateway. In the communication details, generate the API key by clicking **New key** and then copy the generated key by clicking **Copy**. If you want to generate a new key, discard the created key by clicking the symbol  and create the API key again.

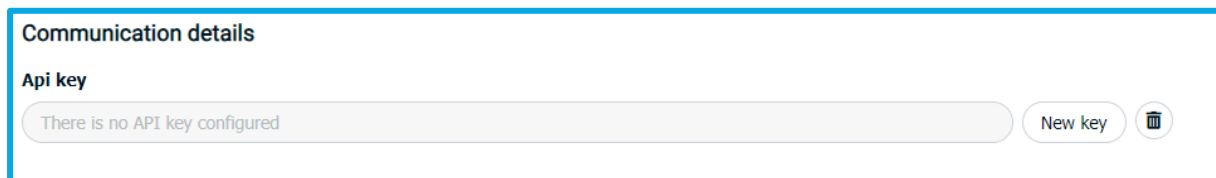


Figure 159 – User creation section on the Tekon IoT Platform.

After copying the API key, return to the Cloud Settings section of the gateway interface and paste the API key (Figure 160). Test these credentials by clicking **Test credentials**. If successful, a check symbol will appear, then save the changes by clicking **SAVE**.

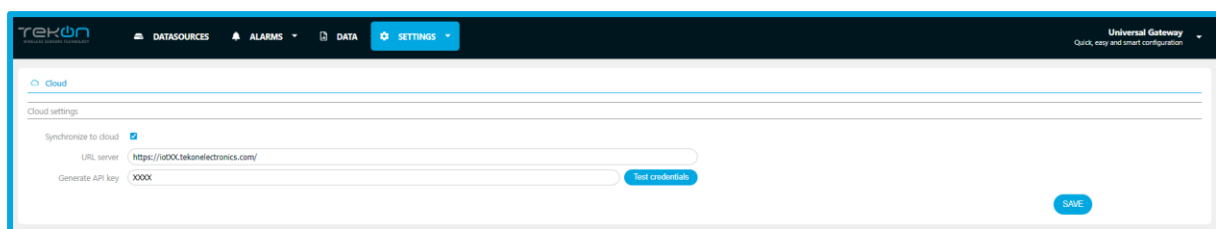


Figure 160 - Cloud Settings page with Cloud sync and API key.

6.6.4 Modbus

In the base version of the Universal IoT Gateway, the Modbus protocol is implemented in Slave mode (Modbus RTU) and Server mode (Modbus TCP/IP), Figure 161. In this case, the gateway receives requests to send data from the datasources of Tekon's DUOS and PLUS transmitters.

The screenshot shows the 'Modbus' settings page in a web browser. The browser's address bar shows '172.16.0.46/settings/modbus'. The page has a dark blue header with the 'Tekon' logo and navigation tabs for 'DATASOURCES', 'DATA', and 'SETTINGS'. The 'Modbus' section is titled 'Modbus' and contains two main settings areas: 'RS485 - Modbus RTU Slave Settings' and 'Ethernet 1 - Modbus TCP/IP Server Settings'. The RS485 section includes fields for Baudrate (19200), StopBits (2), Parity (None), DUOS Slave ID (1), and PLUS Slave ID (2), with a 'SAVE' button. The Ethernet 1 section includes a DHCP checkbox (unchecked), IP Address (192.168.100.1), Subnet Mask (255.255.255.0), DUOS Port (502), and PLUS Port (503), with a 'SAVE' button. The footer shows the date '11/04/2024 15:32:30' and copyright '© 2024 - Tekon Electronics'.

Figure 161 – Modbus Settings page in the base version of the device.

To connect Modbus RTU, you need to connect the Universal IoT Gateway to the master via the RS485 connector. In the interface, you can configure the baud rate (4800 to 115200 bps), parity (even or odd), stop bits (1 or 2), and the Slave IDs for the DUOS and PLUS product families, Figure 162. Whenever you make changes to these settings, you must save them by clicking the button **SAVE**.

This is a close-up of the 'RS485 - Modbus RTU Slave Settings' section from Figure 161. It shows five input fields: Baudrate (19200), StopBits (2), Parity (None), DUOS Slave ID (1), and PLUS Slave ID (2). Each field has a dropdown arrow on the right. A 'SAVE' button is located at the bottom right of this section.

Figure 162 – Modbus RTU section on the Modbus Settings page in the base version of the device.

To connect Modbus TCP/IP, you need to connect the Universal IoT Gateway to the client via the ETH1 connector. In the interface, you can define whether DHCP is enabled or disabled. If DHCP is disabled, the IP Address and Subnet Mask fields are editable, Figure 163. With DHCP enabled, the connection settings are defined automatically. The port fields for DUOS and PLUS are always editable. Whenever you make changes to these settings, you must save them by clicking the button **SAVE**.

Figure 163 – Modbus TCP/IP section on the Modbus Settings page in the base version of the device.

6.6.5 Modbus RTU Master (opcional)

With the Modbus RTU Master and TCP/IP Client Pack activated, you can define in the interface whether the Universal IoT Gateway will operate in master or slave mode in Modbus RTU communication. If slave mode is selected, the configuration is as described in the Modbus section.

If master mode is selected, the gateway will send requests to various devices (slaves), and you need to connect the gateway to these devices using the RS485 connector. In the interface, you can add and configure slaves, and their data will be stored as Generic Datasource. Configuring the Universal IoT Gateway as Modbus RTU Master begins by specifying the baud rate (4800 to 115200 bps), stop bits (1 or 2), parity (even or odd), and timeout, Figure 164. After configuring, save the settings by clicking the **SAVE** button.

Note: If you want to return to slave mode, change the mode in this section and save the change by clicking the **SAVE** button.

Figure 164 – Modbus RTU window section to configure Modbus RTU Master.

The next step is to add the slave by clicking the **ADD SLAVE** button and defining the Slave ID and Scan Rate (periodicity in seconds for reading data), Figure 165. After configuring, save the settings by clicking the **SAVE** button.

Figure 165 - Modbus RTU window section to configure the slave.

After saving the specifications, you must specify the request to the Slave by clicking the button **ADD POOL**. In the pool, you must define:

- starting address of the Modbus register;
- number of registers;
- Modbus function (Coils, Discrete Inputs, or Holding Registers).

After this initial configuration, click **APPLY** to apply the configuration in the representation of the registers below, Figure 166. When one of the three initial fields is changed, the table is updated by clicking **APPLY**.

Note: The Modbus register address uses Base 0 notation. If your equipment uses Base 1, you should subtract one unit from the address.

In the register table, you can edit the representation format, register grouping order, and the name of the Modbus field corresponding to the variable name in the created datasource, Figure 166. Figure 73. After configuring, you can test the settings by clicking the button **READ**. The Universal IoT Gateway will start requests to the Slave after saving the settings by clicking the button **SAVE** in the pool.

Pool 1 Register Address 0 Quantity 10 Function 0x01

Register Address: 0

Quantity: 10

Modbus Function: 0x03: Read Holding Registers

APPLY

Address	Format	Byte Order	Name	Value
0	UINT16	-----	Serial Number	-----
1	UINT32	ABCD	Device Model	-----
3	FLOAT	ABCD	External Temperature	-----
5	INT16	-----	Elapsed Time	-----
6	INT32	CDAB	Pulse Counter	-----
8	FLOAT	CDAB	Analog Input	-----

READ

SAVE

Figure 166 - Modbus RTU window section to configure Modbus RTU addressing.

Multiple requests with different parameters (pool) can be defined for each slave, Figure 167. If you have multiple devices with identical parameters, you can clone the slave to avoid configuring all pools again. To clone, click the symbol ☺ in the slave tab and select **Clone**.

Slave 1 Scan Rate 5

Slave ID: 1

Scan Rate [s]: 5

SAVE

ADD POOL

Pool 1 Register Address 0 Quantity 10 Function 0x03

Pool 2 Register Address 0 Quantity 3 Function 0x01

Pool 3 Register Address 15 Quantity 4 Function 0x03

Figure 167 – Modbus RTU window section for configuring slave requests.

6.6.6 Modbus TCP/IP Client (Optional)

With the Modbus RTU Master and TCP/IP Client Pack activated, you can define in the interface whether the Universal IoT Gateway will operate in client or server mode in Modbus TCP/IP communication. If server mode is selected, the configuration is as described in the Modbus section.

If client mode is selected, the gateway will send requests to various devices (servers), and you need to connect the gateway to these devices using the ETH1 connector. In the interface, you can add and configure servers, and their data will be stored as Generic Datasource. Configuring the Universal IoT Gateway as Modbus TCP/IP Client begins by specifying the IP of the ETH1 interface with either a fixed IP or DHCP assignment, Figure 168. After configuring, save the settings by clicking the button **SAVE**.

Note: If you want to return to server mode, change the mode in this section and save the change by clicking the button **SAVE**.

The screenshot shows the 'Modbus TCP/IP - Eth1' window. Under 'Modbus TCP/IP Settings', the 'Mode' is set to 'Client'. There is a 'DHCP' checkbox which is unchecked. Below it, 'Client Address' is set to '192.168.100.1' and 'Subnet Mask' is set to '255.255.255.0'. At the bottom right, there are 'SAVE' and 'ADD SERVER' buttons.

Figure 168 - Modbus TCP/IP window section to configure Modbus TCP/IP Client.

The next step is to add the server by clicking the button **ADD SERVER** and defining the Server Address, port, Unit ID, Scan Rate (periodicity in seconds for reading the Server data), and the Response Timeout in milliseconds, Figure 169. After configuring, save the settings by clicking the button **SAVE**.

The screenshot shows the 'Server 172.16.0.26 Port 1502 Unit ID 1 Scan Rate 20 Response Timeout 250' window. It contains input fields for: 'Server Address' (172.16.0.26), 'Server Port' (1502), 'Unit ID' (1), 'Scan Rate [s]' (20), and 'Response Timeout [ms]' (250). At the bottom right, there are 'SAVE' and 'ADD POOL' buttons.

Figure 169 - Modbus TCP/IP window section to configure the server.

After saving the specifications, you must specify the request to the server by clicking the button **ADD POOL**. In the pool, you must define:

- starting address of the Modbus register;
- number of registers;
- Modbus function (Coils, Discrete Inputs, or Holding Registers).

After this initial configuration, click **APPLY** to apply the configuration in the representation of the registers below, Figure 170. When one of the three initial fields is changed, the table is updated by clicking **APPLY**.

In the register table, you can edit the representation format, register grouping order, and the name of the Modbus field corresponding to the variable name in the created datasource, Figure 170. After configuring, you

can test the settings by clicking the button **READ**. The Universal IoT Gateway will start requests to the servers after saving the settings by clicking the button **SAVE** in the pool.

Pool 1 Register Address 0 Quantity 20 Function 0x03

Register Address: 0

Quantity: 20

Modbus Function: 0x03: Read Holding Registers


APPLY

Address	Format	Byte Order	Name	Value
0	INT32	CDAB	Número de série	.....
2	UINT16	.....	Modelo do Trans	.....
3	UINT16	.....	RSSI	.....
4	UINT16	.....	Período de com.	.....
5	UINT16	.....	Tempo decorrido	.....
6	UINT16	.....	Tensão de alim.	.....
7	FLOAT	CDAB	Data 0	.....
9	FLOAT	CDAB	Data 1	.....
11	FLOAT	CDAB	Data 2	.....
13	FLOAT	CDAB	Data 3	.....
15	FLOAT	CDAB	Data 4	.....
17	UINT16	.....	FW Major | Minor	.....
18	UINT16	.....	Revisão FW	.....
19	UINT16	.....	HW Major | Minor	.....

READ

SAVE

Figure 170 - Modbus TCP/IP window section to configure Modbus TCP/IP addressing.

Multiple requests with different parameters (pool) can be defined for each server, Figure 171. If you have multiple devices with identical parameters, you can clone the server to avoid configuring all pools again. To clone, click the symbol  in the server tab and select **Clone**.

Server 172.16.0.26 Port 1502 Unit ID 1 Scan Rate 20 Response Timeout 250

Server Address: 172.16.0.26

Server Port: 1502

Unit ID: 1

Scan Rate [s]: 20

Response Timeout [ms]: 250

SAVE

ADD POOL

Pool 1 Register Address 0 Quantity 20 Function 0x03

Pool 2 Register Address 0 Quantity 5 Function 0x01

Figure 171 - Modbus TCP/IP window section to configure server requests.

6.6.7 Cellular (optional)

If the Universal IoT Gateway is the version with 3G/4G GSM, this page is unlocked. On this page, you can configure the 3G/4G GSM module and view the signal strength in dBm, as shown in Figure 172.i In the settings, you can change the APN (Access Point Name), Username, and Password of your 3G/4G GSM service, i.e., the service of the SIM card placed in the Universal IoT Gateway. Whenever you change the settings, save them by clicking on **SAVE**. Once the connection is established, you can see the signal strength in dBm on this page and on the device's display.

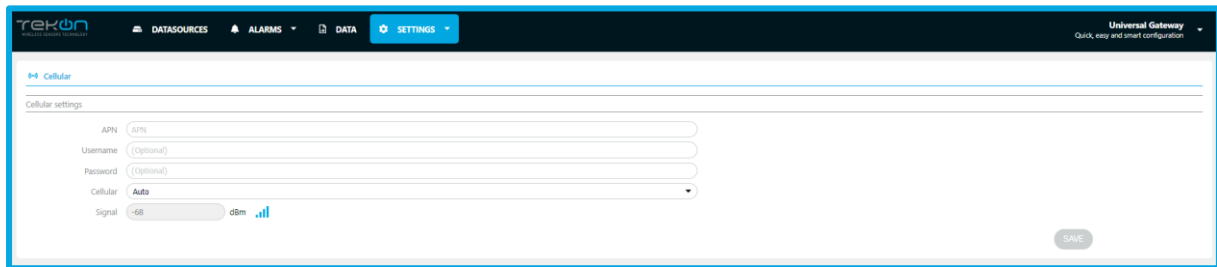


Figure 172 – Cellular Settings Page.

6.7 Alarm Menu (optional)

If the Universal IoT Gateway has the Alarms and Notifications Pack unlocked, the ALARMS tab will appear in the page header, allowing you to configure value or inactivity alarms for any of the data sources, as well as send notifications via email and/or SMS. In the alarm's menu, you will have the configuration of alarms, email service, and SMS service (Figure 173).

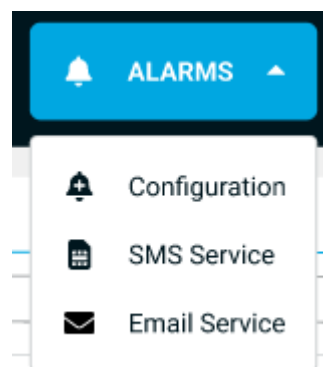


Figure 173 – Alarms tab Menu.

6.7.1 Configuration

In the alarm configuration, you can choose the type of alarm (**Value** or **Inactivity**) and the data source you want to monitor.

The screenshot shows the 'Alarm Edition' configuration page. It includes dropdown menus for 'Alarm Type' and 'Datasource'. There are input fields for 'Notification by Email' (with an email icon) and 'Emails'. A checkbox for 'Notification by SMS' is present. The 'Schedule Days' are represented by a row of buttons for each day of the week, with 'M' through 'F' highlighted. Below this, a 'Period' section shows 'From 00:00' and 'To 23:59'. A note states: '* It is required to have at least one type of notification in use'. A 'CREATE' button is located at the bottom right.

Figure 174 - Alarm Configuration Page.

For a value alarm (Warning), it is necessary to define the variable, the comparison method, and the value to compare. The options for the comparison method are shown in Figure 175. The inactivity alarm (*Error*) occurs when the data source is not receiving data. For all types of alarms, it is also necessary to configure the number of occurrences to trigger the alarm and specify the days of the week and the hours when the alarm is active, Figure 176.

The screenshot shows a dropdown menu titled 'Select a Comparison Method'. The list of options includes: 'Less than [<]', 'Greater than [>]', 'Less than or equal to [<=]', 'Greater than or equal to [>=]', 'Equal to [=]', 'Between the range', and 'Out of the range'.

Figure 175 – List of comparison methods in value alarm configuration.

The screenshot shows the 'Alarms Configuration' page. It includes dropdown menus for 'Alarm Type' (set to 'Value'), 'Category' (set to 'Warning'), 'Datasource', and 'Comparison Method' (set to 'Greater than [>]'). There are input fields for 'Variables', 'Value', and 'N° of Occurrences'. There are checkboxes for 'Notification by Email' and 'Notification by SMS'. The 'Schedule Days' are represented by a row of buttons for each day of the week, with 'ALL' highlighted. Below this, a 'Period' section shows 'From h:mm' and 'To h:mm'. A note states: 'The selected days will have the same period.'. A 'CREATE' button is located at the bottom right.

Figure 176 – Value alarm configuration section.

Configuring an alarm requires defining a method for sending notifications. By default, the email sending method is selected, and it is necessary to define the recipients of the alarm notifications. Alternatively, or

additionally, SMS sending can be configured, and it is necessary to specify the contacts for the notifications, Figure 177. At the end of the configuration, click on **CREATE** to save the alarm.

Alarms Configuration

Alarm Type: Inactivity

Category: Warning

Datasource: Select an datasource

Inactivity Time:

Notification by Email: ☐




Notification by SMS: ☐

Schedule Days: S M T W T F S ALL

Period: From: h:mm To: h:mm The selected days will have the same period.

CREATE

Figure 177 - Inactivity alarm configuration section.

Configured alarms are displayed in two lists, Warnings List and Errors List. The Warnings list includes configured value alarms, and the Errors list includes inactivity alarms, Figure 178. In this list, you can view the monitored data source, alarm description, alarm schedule, and notification contacts. The administrator can edit the alarm by clicking on , copy the settings to create a similar alarm by clicking on , and delete the alarm by clicking on .





















Warnings List				
Datasource	Description	Schedule	Notification	Actions
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
Error List				
Datasource	Inactive Time	Schedule	Notification	Actions
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  
PLUS TWP-4AI4D11UT 868MHz	Power Supply Voltage between 1000 and 1000	Monday , Tuesday , Wednesday, Thursday, Friday, Saturday from 00:00 to 00:00	carvalho.carvalho2098@tekonelectronics.com; carvalho.carvalho2098@tekonelectronics.com; +351923315987;	  

Figure 178 – Configured alarms list section.

6.7.2 SMS Service

SMS notifications can be made using an external service selected by the user, Figure 179. In this case, you only need to configure the service provider, account name, API key, and the SMS sender name.

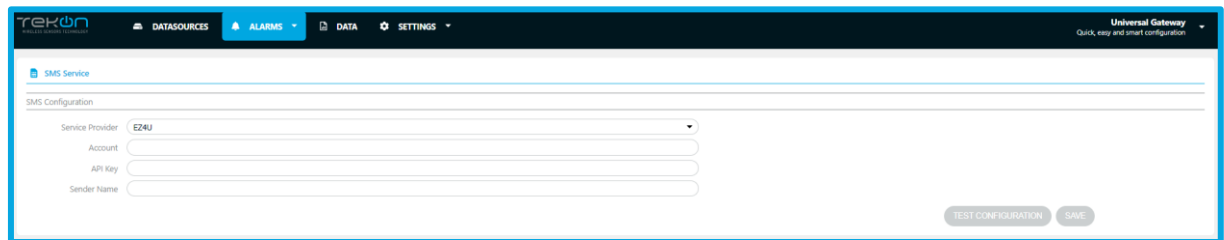
The screenshot shows the 'SMS Service' configuration page in the 'Universal Gateway' interface. The page has a dark blue header with navigation tabs: 'DATASOURCES', 'ALARMS', 'DATA', and 'SETTINGS'. The 'ALARMS' tab is active. Below the header, the 'SMS Service' section is titled. Under 'SMS Configuration', there are four input fields: 'Service Provider' (a dropdown menu with 'EZ4U' selected), 'Account', 'API Key', and 'Sender Name'. At the bottom right of the configuration area, there are two buttons: 'TEST CONFIGURATION' and 'SAVE'.

Figure 179 - SMS service configuration page for alarm notifications with an external service.

With the gateway version with GSM, the SMS service for alarm notifications can be done using the SIM card provided by the user. In this case, you only need to configure the SMS sender name, Figure 180.

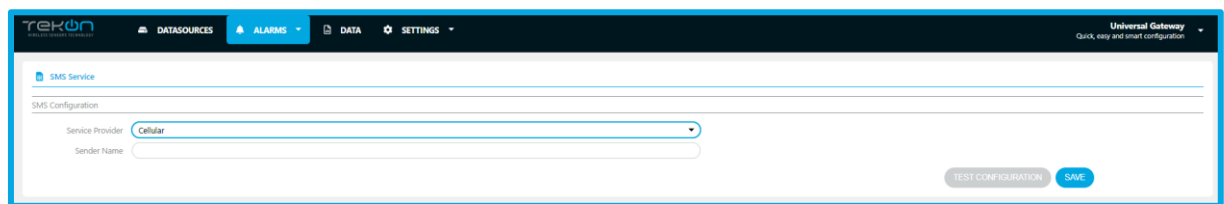
The screenshot shows the 'SMS Service' configuration page in the 'Universal Gateway' interface, similar to Figure 179. However, the 'Service Provider' dropdown menu is set to 'Cellular'. Only the 'Sender Name' input field is visible below it. The 'TEST CONFIGURATION' and 'SAVE' buttons are still present at the bottom right.

Figure 180 - SMS service configuration page for alarm notifications with the device's GSM module.

In both cases, after configuring or making any changes, perform the corresponding test to ensure that this service is operational. To perform the test, click on **TEST CONFIGURATION**. A window will appear to enter the phone number to verify if the SMS service is functional. After testing, save all changes by clicking on the button **SAVE**.

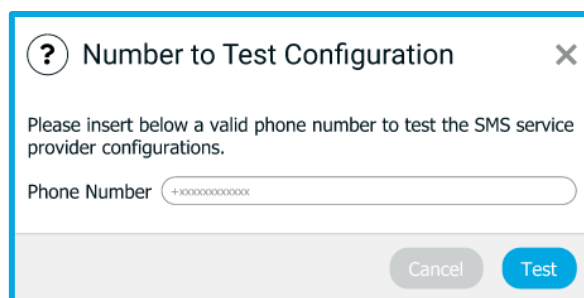
The screenshot shows a modal window titled 'Number to Test Configuration'. It contains a question mark icon and a close button (X). The text inside says: 'Please insert below a valid phone number to test the SMS service provider configurations.' Below this text is a 'Phone Number' input field with a placeholder '+xxxxxxxxxxxx'. At the bottom of the modal, there are two buttons: 'Cancel' and 'Test'.

Figure 181 – SMS service configuration test page.

6.7.3 Email Service

The email service for receiving alarm notifications can be configured on the page shown in Figure 182. You can configure the email sending server (e.g., smtp.gmail.com), email service port, server access username, sender address, and server access password.

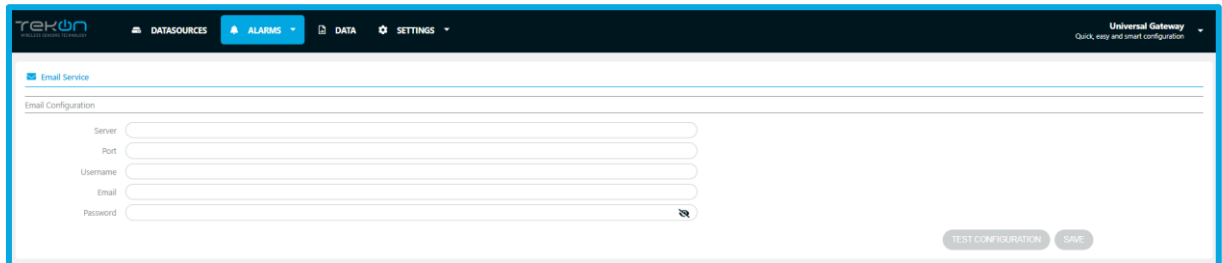
The screenshot shows the 'Email Service' configuration page within the 'Universal Gateway' web interface. The top navigation bar includes 'DATASOURCES', 'ALARMS', 'DATA', and 'SETTINGS'. The 'Email Service' section is active, displaying an 'Email Configuration' form with fields for 'Server', 'Port', 'Username', 'Email', and 'Password'. The 'Password' field has a toggle for visibility. At the bottom right of the form are 'TEST CONFIGURATION' and 'SAVE' buttons.

Figure 182 – Email service configuration page for alarm notifications.

To validate the email sending through the configured server, click on **TEST CONFIGURATION**. A window will appear to enter the email to verify if the email service is functional. After testing, save all changes by clicking on the button **SAVE**.

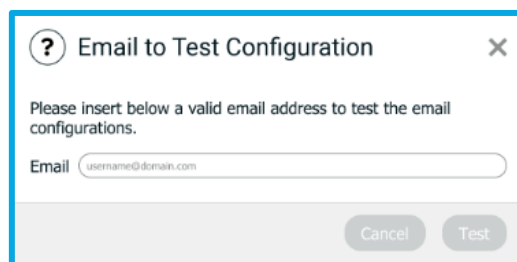
The screenshot shows a modal dialog box titled 'Email to Test Configuration'. It contains the instruction 'Please insert below a valid email address to test the email configurations.' and a text input field labeled 'Email' with the placeholder 'username@domain.com'. At the bottom right of the dialog are 'Cancel' and 'Test' buttons.

Figure 183 - Email service configuration test page.

The alarm notification email sent by the Universal IoT Gateway is exemplified in Figure 184.

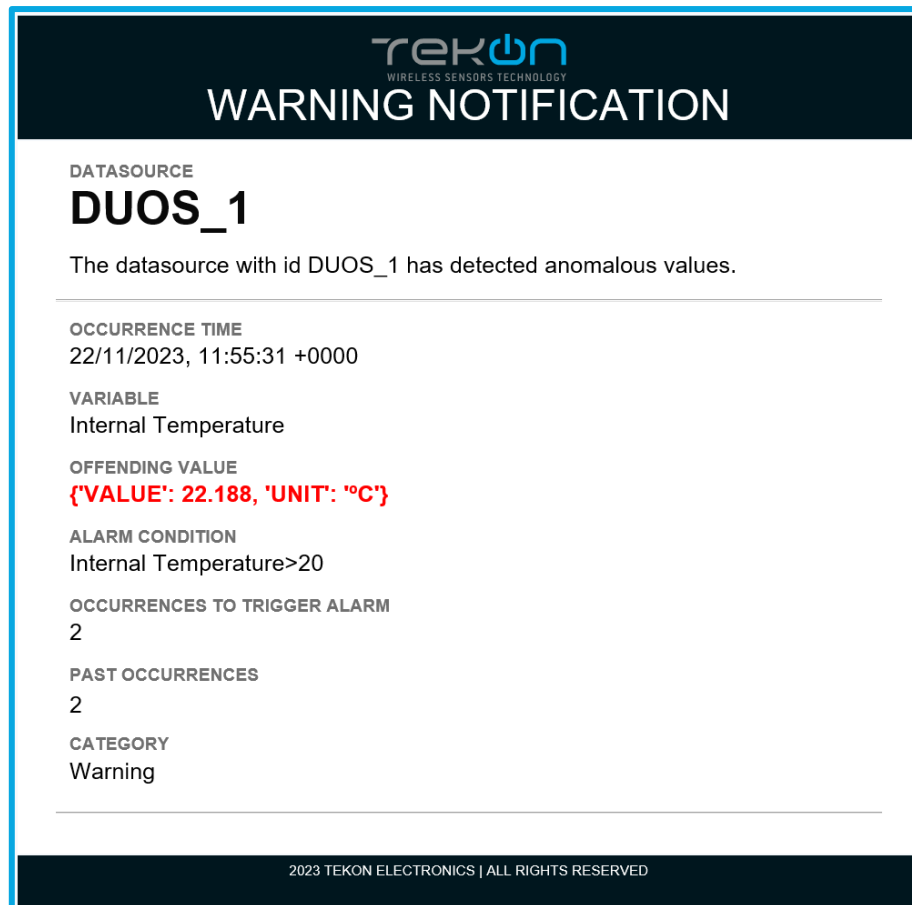


Figure 184 – Example of a value alarm email notification.

7 Third-party platform integration

7.1 MQTT

The Universal IoT Gateway allows access to the MQTT Broker and subscription to data source topics. The MQTT Broker starts with the device, and manual activation is not necessary.

The available data in the various MQTT Broker topics are the data from the PLUS and DUOS transmitters. If the device has the Modbus Master/Client unlocked, you can also access data from Modbus RTU Slave or TCP/IP Server devices designated with GENERIC datasource.

The credentials to access the MQTT Broker are as follows:

- **IP Address:** Address of the Eth0 or Wi-Fi interface in Client mode
- **Port:** 1883
- **User:** tekon_gtw_subscriber
- **Password:** tekon_gtw_mqtt

To access data sources, here are some examples of MQTT subscriptions:

- datasources/#
- datasources/plus/#
- datasources/plus/2
- datasources/duos/#
- datasources/duos/3
- datasources/generic/#
- datasources/generic/6
- datasources/generic/192.168.1.123

7.2 Node-RED

To access the Node-RED interface, you can follow the settings page ([Node-RED \(optional\) section](#)), or you can open the web browser and enter the device's IP address followed by port 1880, Figure 185.

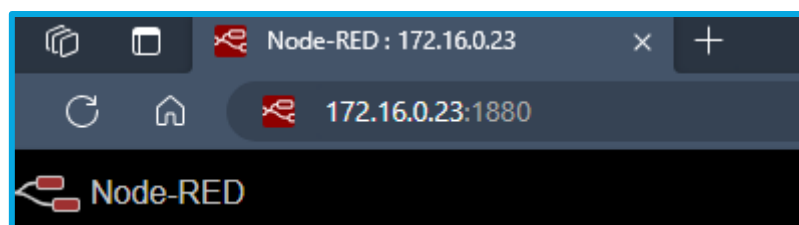


Figure 185 – Link to access the Node-RED page.

You will need to enter the user credentials that can be found on the user management page ([User Management](#) section).

A screenshot of the Node-RED login interface. On the left is the Node-RED logo, which consists of a red square with a white circuit-like pattern and the text "Node-RED" in red below it. To the right of the logo are two input fields: "Username:" and "Password:". Below the password field is a "Login" button.

Figure 186 – Window to enter credentials to access the Node-RED page.

To access the MQTT Broker via Node-RED, follow these steps:

1. Add the mqtt in node to the Flow and configure the node with the values and parameters from the figures and click on Add, and:
 - **Server:** *localhost*
 - **Port:** *1883*
 - **Username:** *node_red*
 - **Password:** *node_red*
 - **Topic:** *datasources/#*

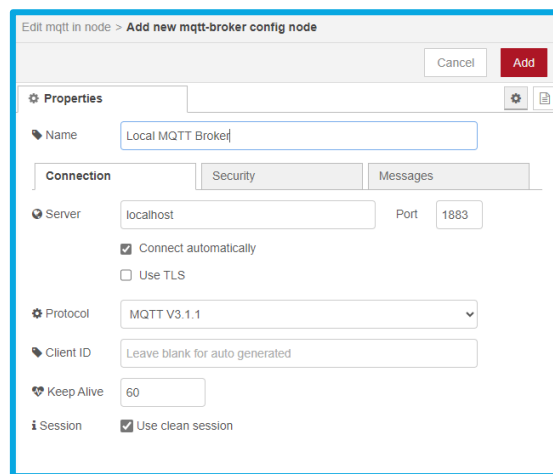
A screenshot of the "Add new mqtt-broker config node" dialog in Node-RED. The dialog has a title bar "Edit mqtt in node > Add new mqtt-broker config node" and "Cancel" and "Add" buttons. It has tabs for "Properties", "Connection", "Security", and "Messages". The "Properties" tab is active, showing fields for "Name" (set to "Local MQTT Broker"), "Server" (set to "localhost"), "Port" (set to "1883"), "Protocol" (set to "MQTT V3.1.1"), "Client ID" (set to "Leave blank for auto generated"), "Keep Alive" (set to "60"), and "Session" (with "Use clean session" checked). There are also checkboxes for "Connect automatically" and "Use TLS".

Figure 187 - MQTT Server configurations.

Figure 188 - MQTT Server configurations.

- Click on **Done**;

Figure 189 - MQTT Node configuration.

- Add the Debug node and connect the nodes to each other;

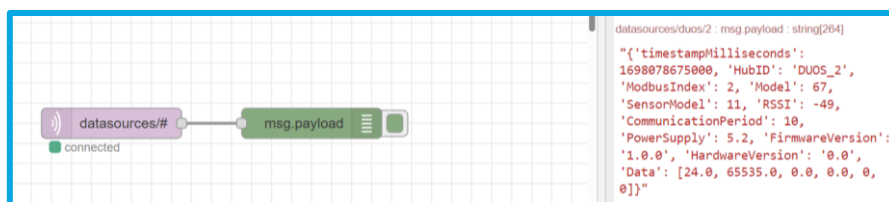


Figure 190 - Flow and Debug Message.

- Click on **Deploy**;
- After a few seconds, with a DUOS transmitter communicating with the Gateway, data reception should start.

8 Front display

The display on the **Universal IoT Gateway** is used to display information about various functions and connections enabled by the hardware and software. Every 5 seconds, a new informative window is displayed, Figure 191 to Figure 199.



Display window	Description	Possible values
	IP address of Ethernet port 0.	IP address created by the network
	IP address of Ethernet port 1.	Modbus TCP/IP address

Figure 191 - Ethernet port 0 information.

Figure 192 - Ethernet port 1 information.

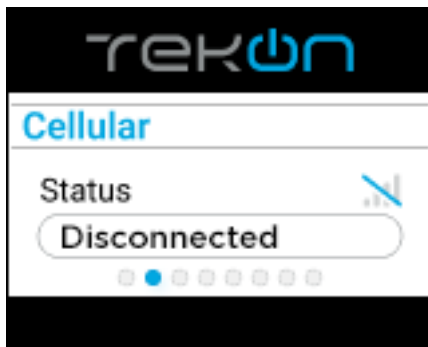


Figure 193 - GSM connection information.

Information about the 3G/4G GSM communication

1. Unavailable (not available on the device)
2. Disconnected
3. 3G/4G
4. Signal strength

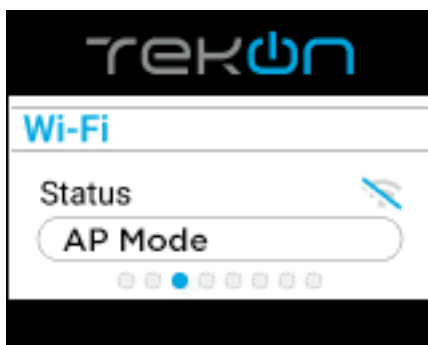


Figure 194 - Wi-Fi connection information.

Wi-Fi connection status.

1. Disconnected
2. Connected (client mode)
3. AP Mode (connected in AP mode)
4. Signal strength



Figure 195 - Wi-Fi connection IP address.

Wi-Fi connection IP address. Through this IP, you can access the device's web interface.

IP address created by the network.

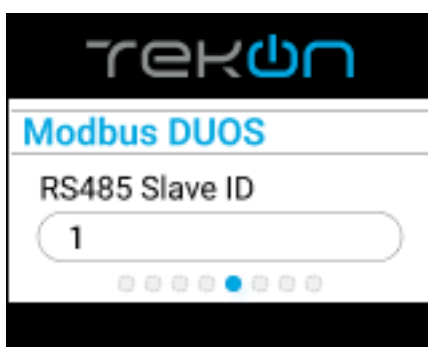


Figure 196 - DUOS devices slave information.

Slave address for connecting to DUOS devices.

Default: 1 (configurable)
Disabled (Modbus RTU in Master mode).

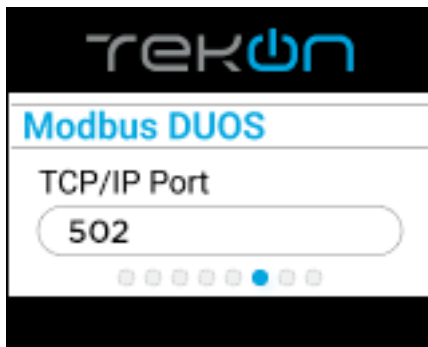


Figure 197 - DUOS devices port information.

Access port for DUOS devices.

Default: 502 (configurable)
Disabled (Modbus TCP/IP in Client mode).

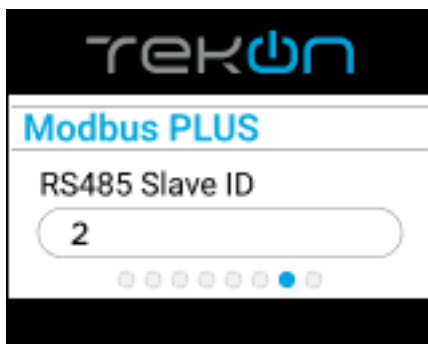


Figure 198 - PLUS devices slave information.

Slave address for connecting to PLUS devices.

Default: 2 (configurable)
Disabled (Modbus RTU in Master mode).

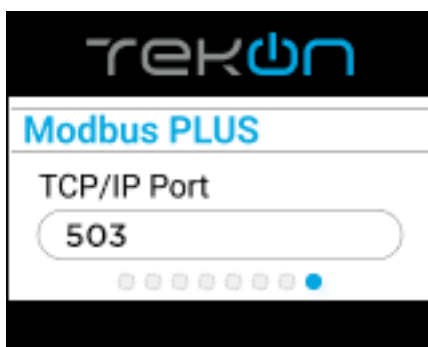


Figure 199 - PLUS devices port information.

Access port for PLUS devices.

Default: 503 (configurable)
Disabled (Modbus TCP/IP in Client mode).

9 Revision History

VERSION	DATE (MM.YY)	CHANGES
E01B	06.24	Review of the device configuration process. Information about the firmware update process.
E02A	02.25	Added a section on the new optional feature "Dashboards." Added information about the new feature "Datasource Editing" in "Datasource Properties." New option to enable/disable the WiFi interface. Clarification of the "Access" chapter.
E02B	08.25	Added a section on the new optional feature "Composting."

© BRESIMAR AUTOMAÇÃO, S.A.

All rights reserved.

The contents of this document (texts, images, brands, corporate image, trade name, designs, methodological and product descriptions, among others), as well as its structure and design, are owned by Bresimar Automação, SA (herein in referred to as Bresimar) or, it has legitimacy for its use, being strictly prohibited the modification, exploitation, reproduction, communication to third parties or distribution of all or part of the contents of this document, without the prior express written consent of Bresimar .

Bresimar will not be liable for any claim, loss or damages resulting from or arising from a cause over which Bresimar has no control, whether by acts or omissions, breach of contract or non-compliance with applicable laws by the Supplier , as well as incidents caused by the client's systems.



Tekon Electronics

Quinta do Simão

EN109 – Esgueira

3800-230 Aveiro – Portugal

T. +351 234 303 320

M. +351 937 270 062

support@tekonelectronics.com

www.tekonelectronics.com