WIRELESS SENSORS TECHNOLOGY

Universal IoT Gateway

Product Manual

PM_uGateway_E02A

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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

CE	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

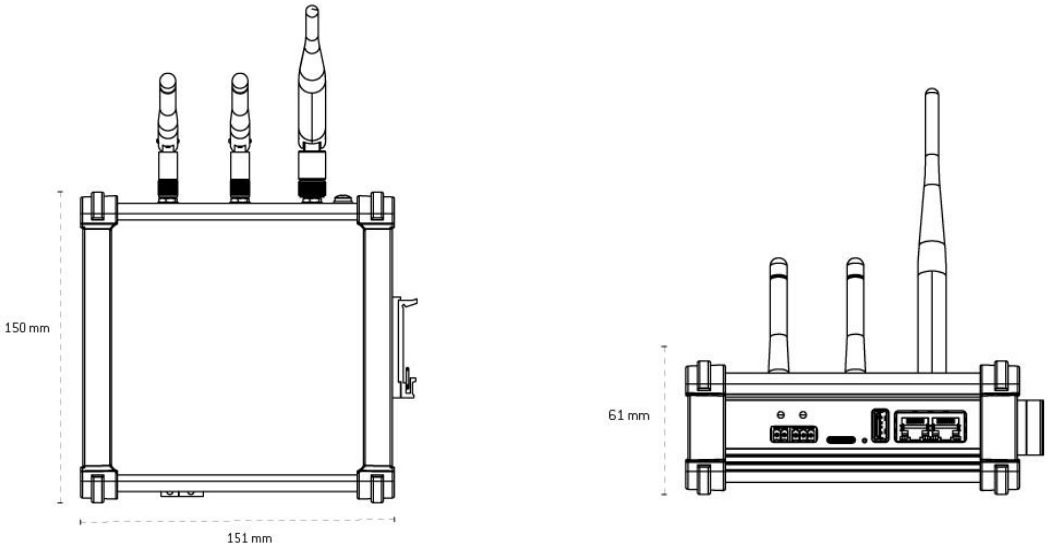


Figure 1 - Dimensions of the Universal IoT Gateway with aluminum case.

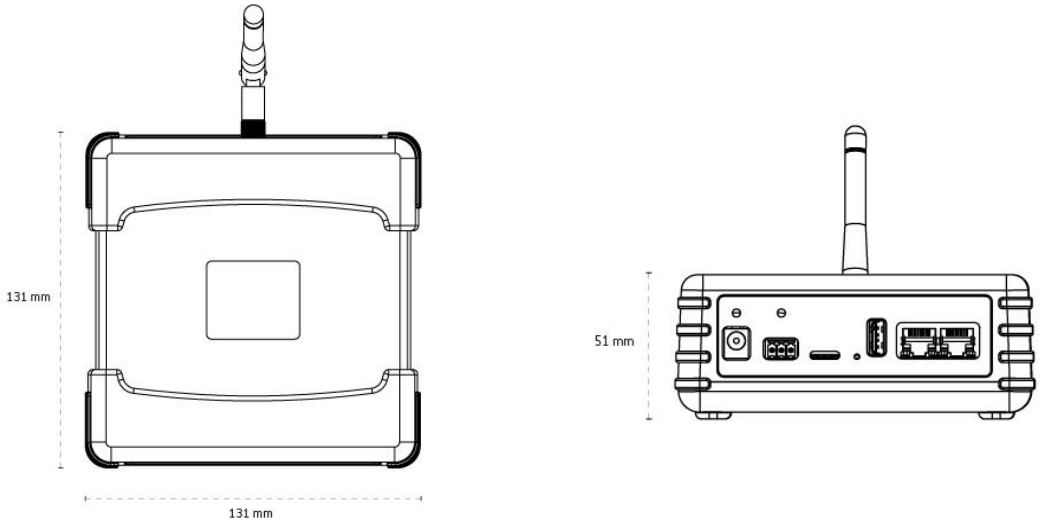


Figure 2 - Dimensions of the Universal IoT Gateway with ABS case.

2.3 Connections

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

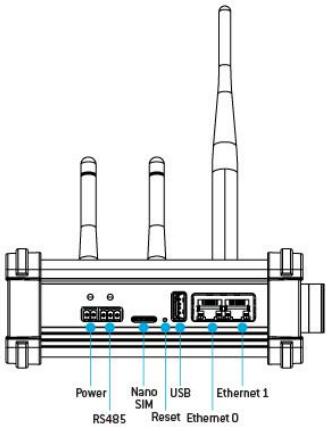


Figure 3 - Physical connections of the Universal IoT Gateway with aluminum case.

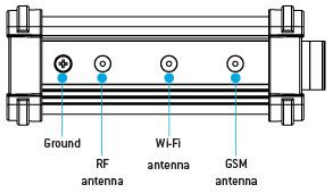


Figure 4 - Physical connections of the antennas of the Universal IoT Gateway with aluminum case.

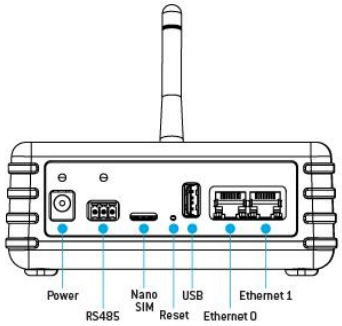


Figure 5 - Physical connections of the Universal IoT Gateway with ABS case.

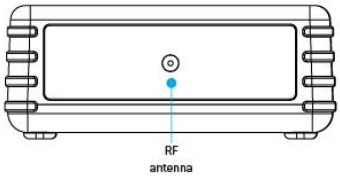


Figure 6 - Physical connections of the antenna of the Universal IoT Gateway with ABS case.

Modbus and Power

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

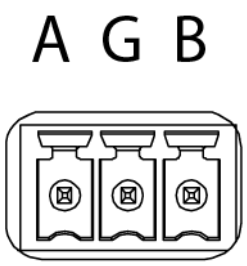


Figure 7 - RS485 connections (ABS case)

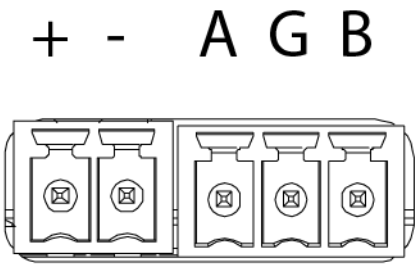


Figure 8 - Power and RS485 connections (aluminum case)

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.

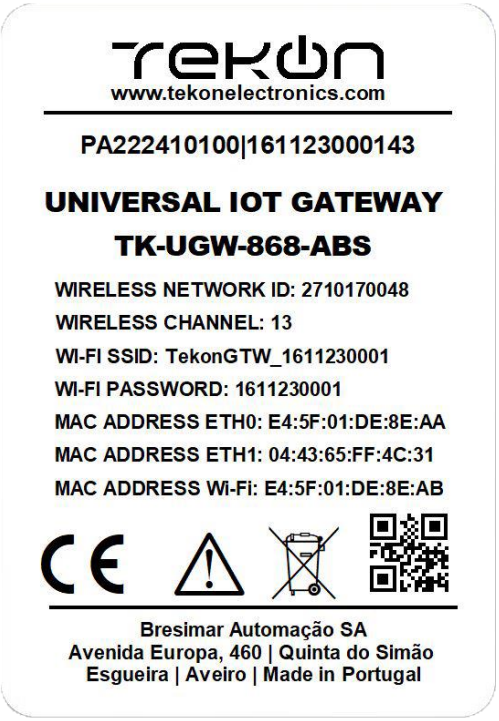


Figure 9 - Example of a Universal IoT Gateway label.

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_XXXXXXXXXX, 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.

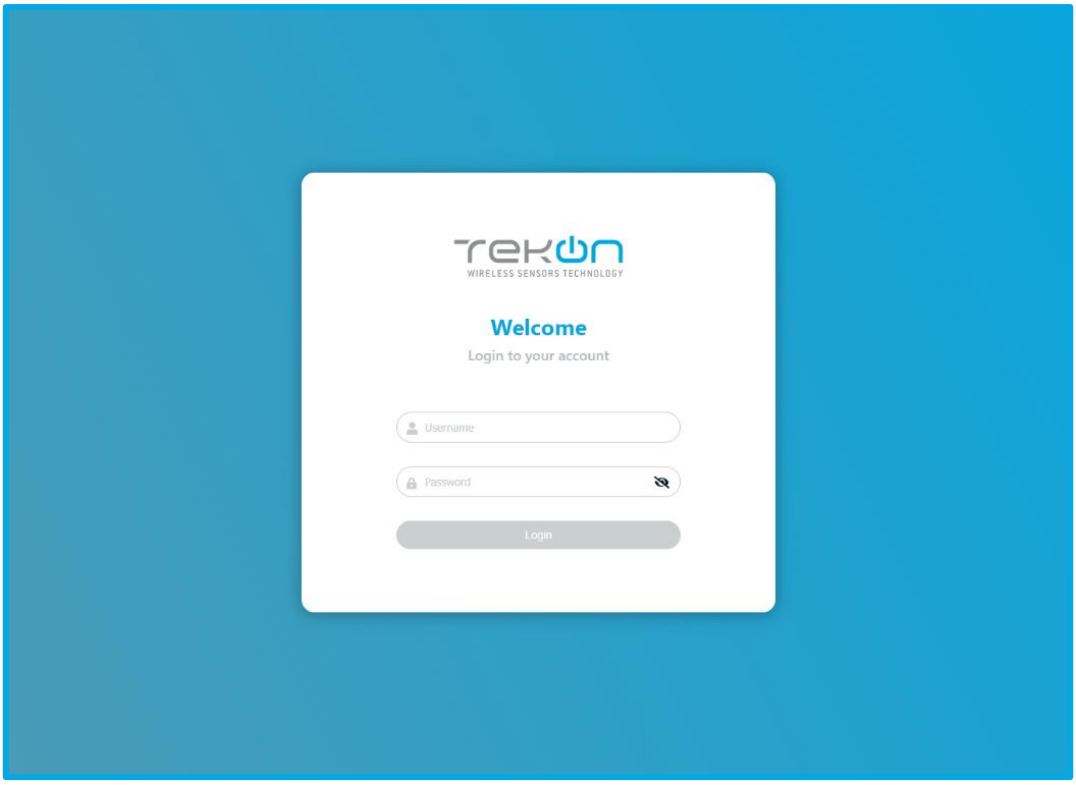


Figure 11 – Login Page.

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.

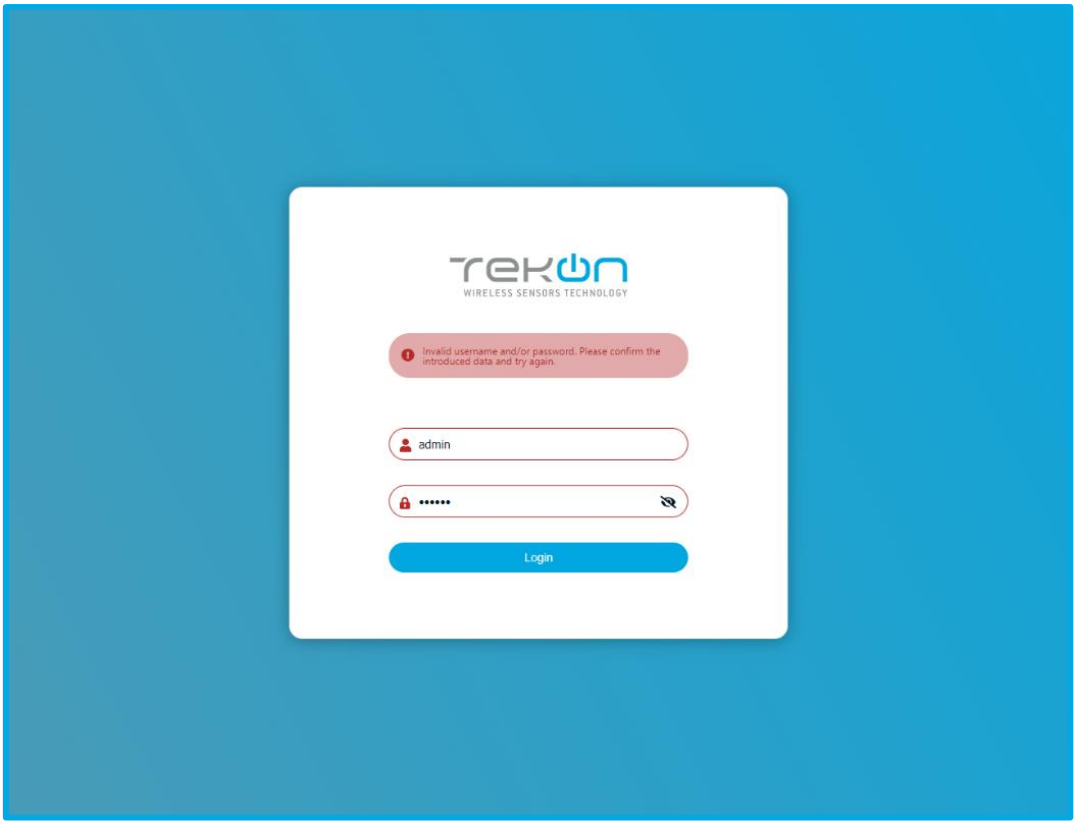


Figure 12 – Login Page with Incorrect Password or Username.

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.

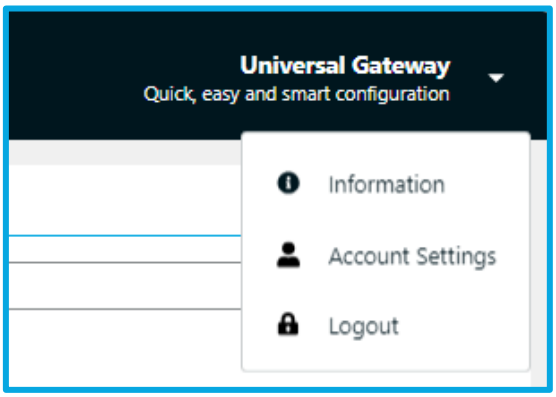


Figure 13 – Side Menu with logout option.

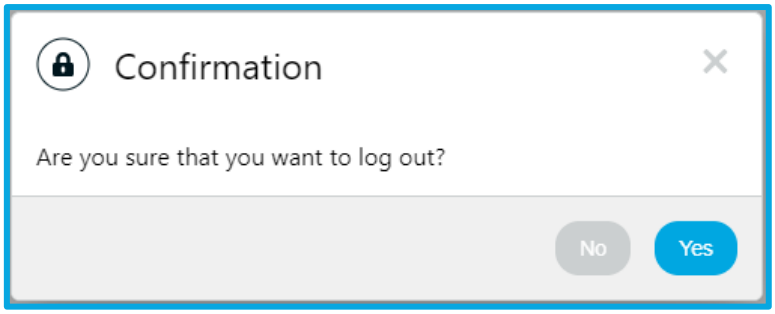


Figure 14 – Logout Confirmation Window.

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:

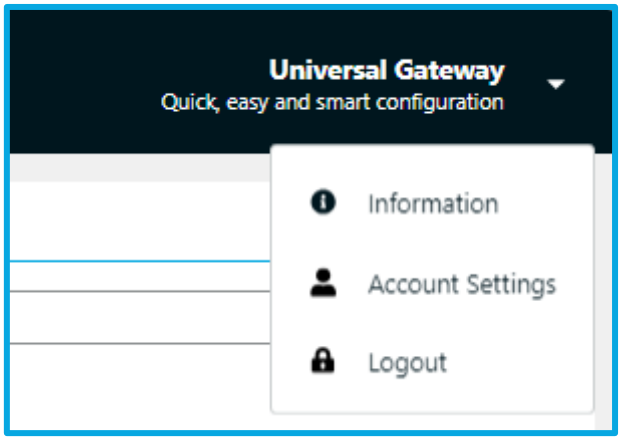


Figure 15 - Sidebar Menu with user settings option.

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.

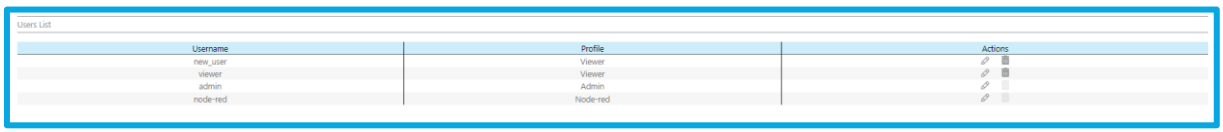


Figure 17 – User list section.

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

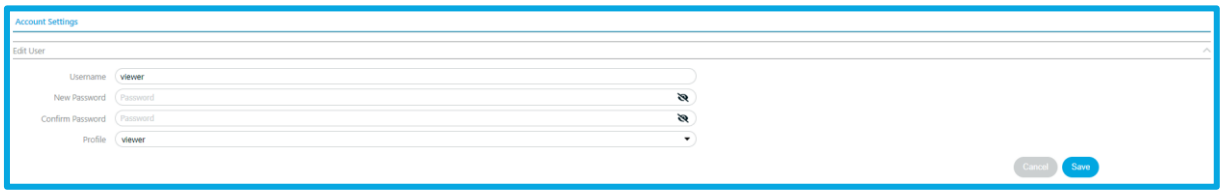


*Figure 18 – User edit section - **Administrator.***

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

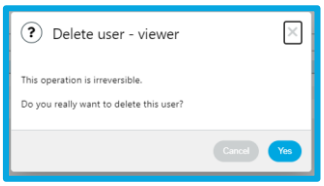


Figure 19 – User deletion confirmation window.

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

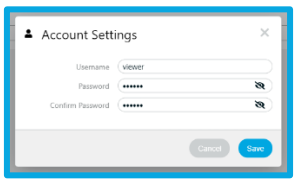


*Figure 20 – User edit window - **Viewer**.*

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 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.

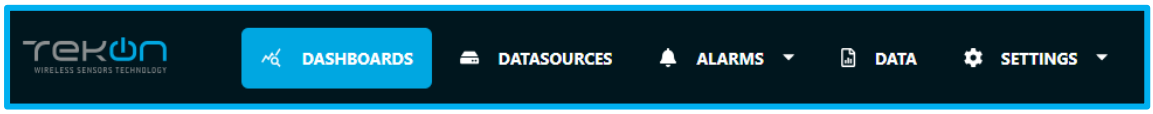


Figure 21 – Dashboards Menu.

6.2.1 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*".

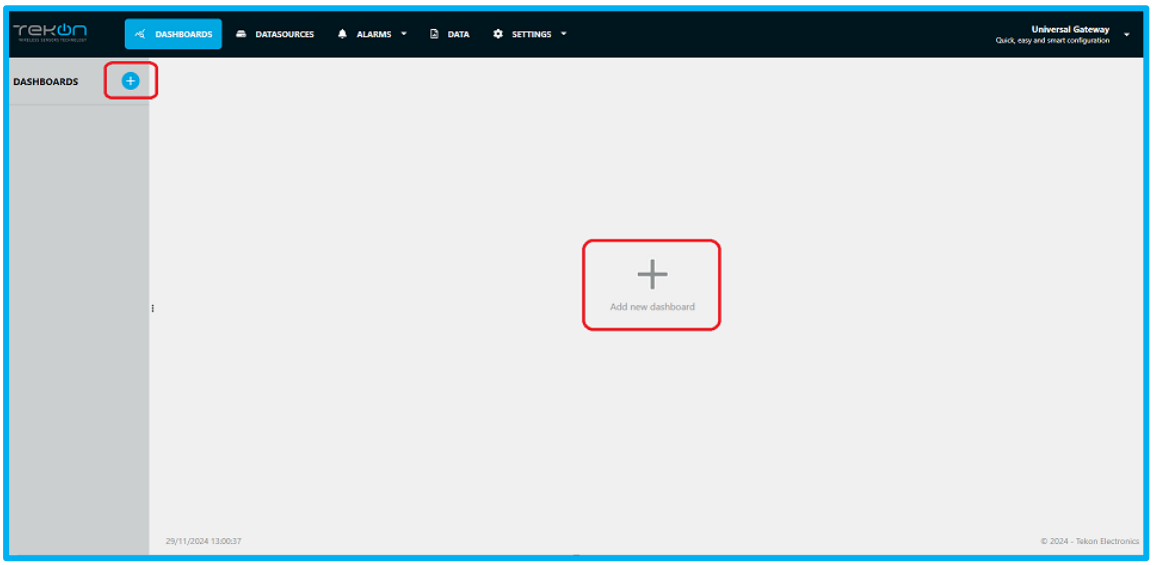


Figure 22 - Dashboard Creation.

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.

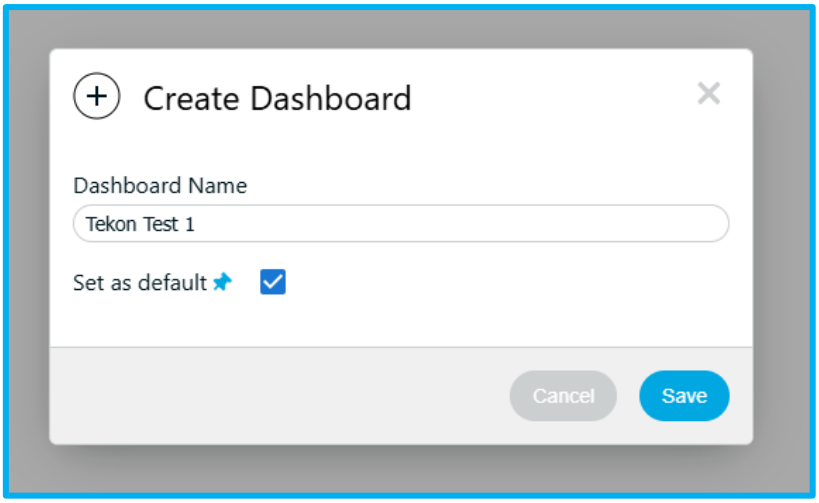


Figure 23 - Dashboard Creation Window.

6.2.2 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*".

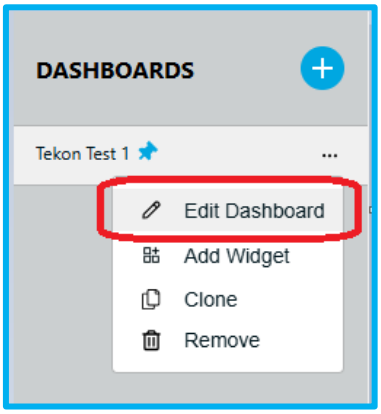


Figure 24 - Dashboard editing menu.

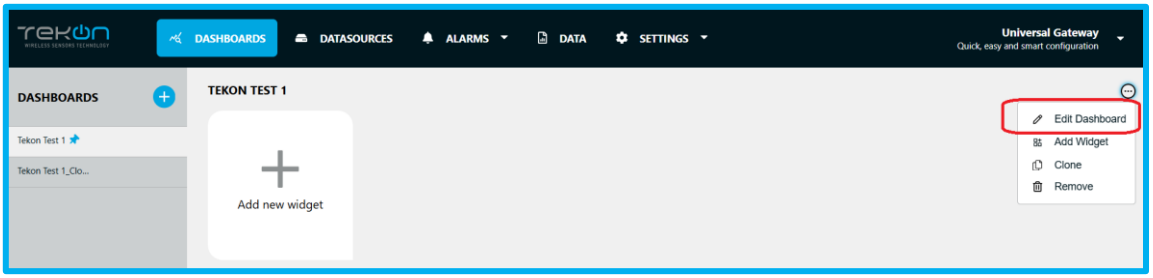


Figure 25 - Dashboard editing option.

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

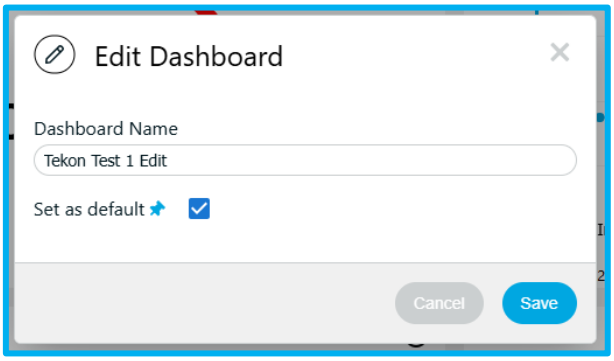


Figure 26 - Dashboard editing.

6.2.3 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*".

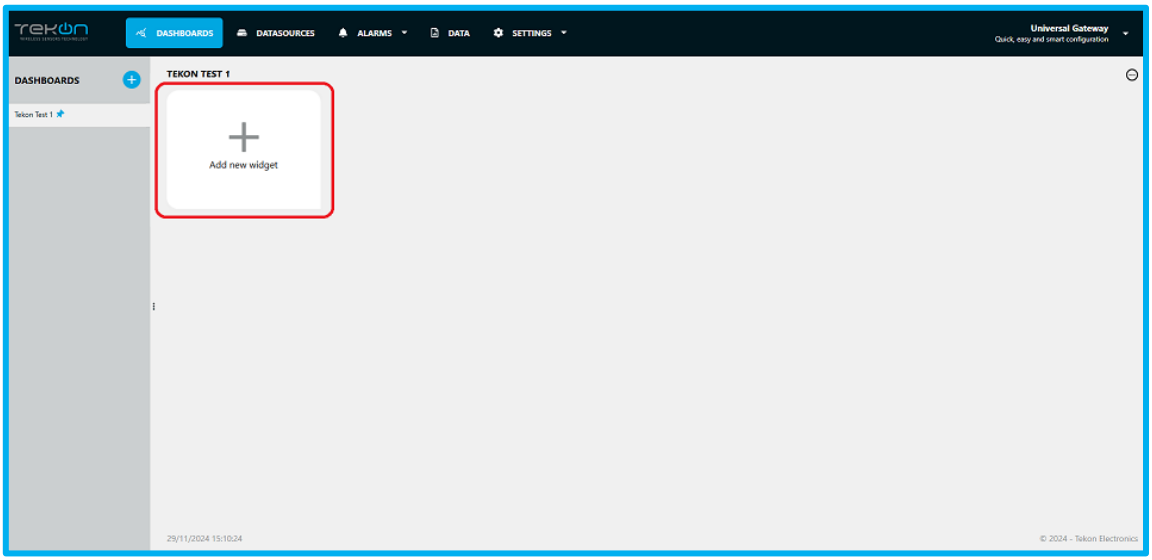


Figure 27 – Add new widget on the dashboards menu.

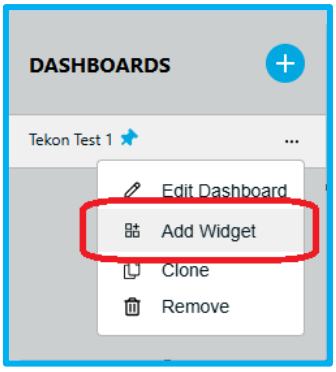


Figure 28 - Add widget option.

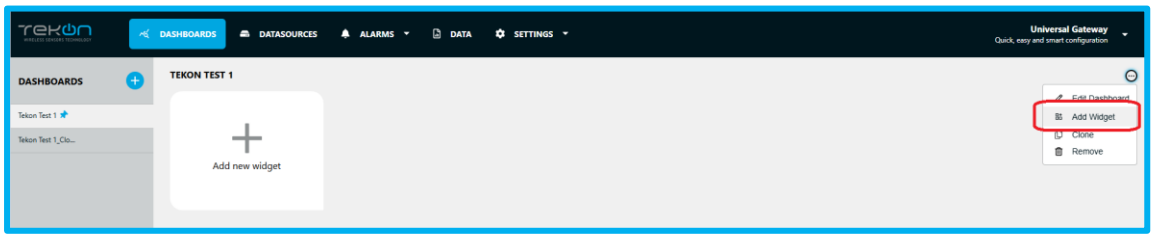


Figure 29 – Add new widget.

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.

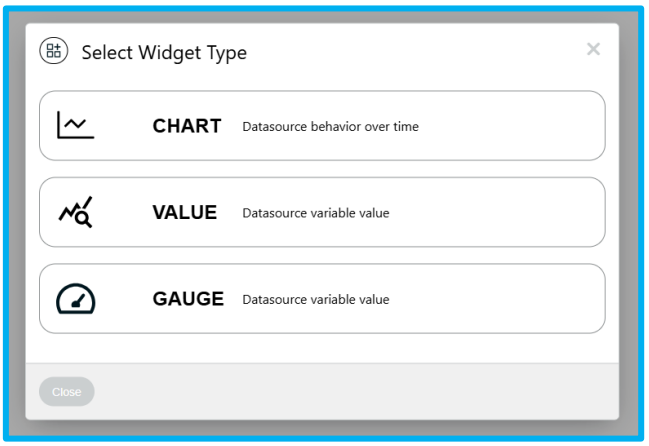


Figure 30 – "Select Widget Type" window.

Charts

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

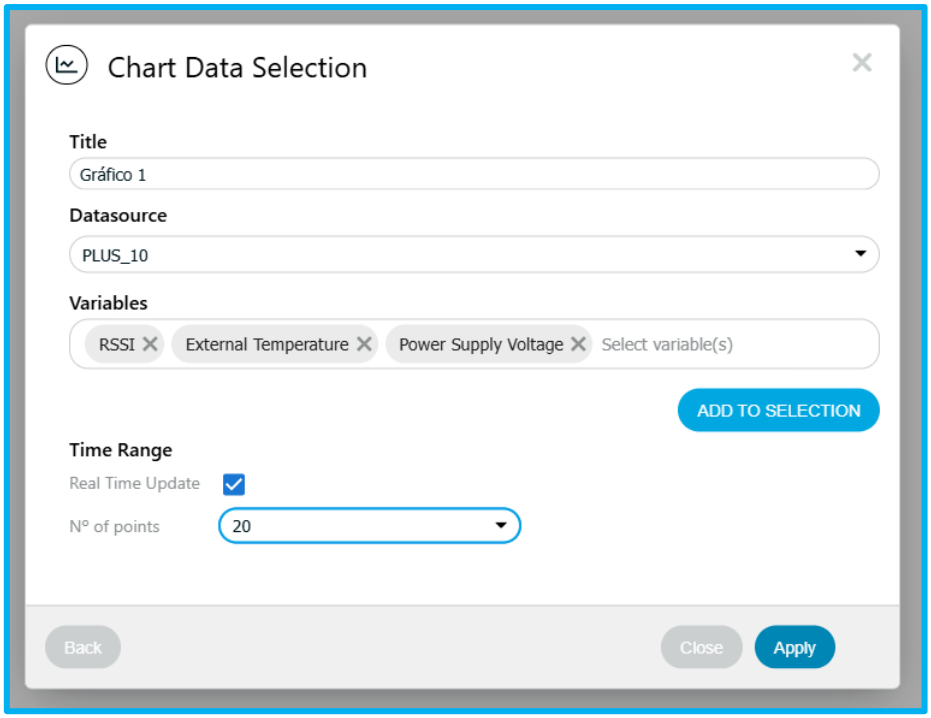


Figure 31 - Chart Data Selection window.

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.

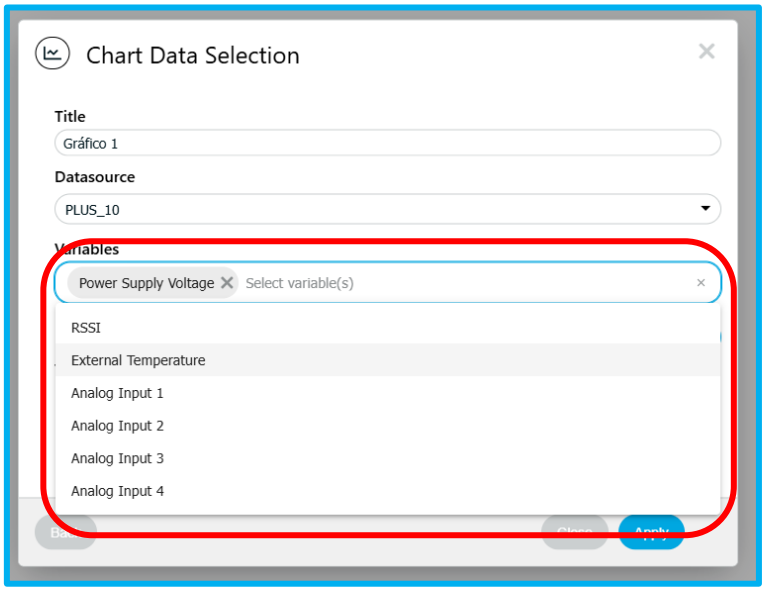


Figure 32 - Chart Data Selection variable list.

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*".

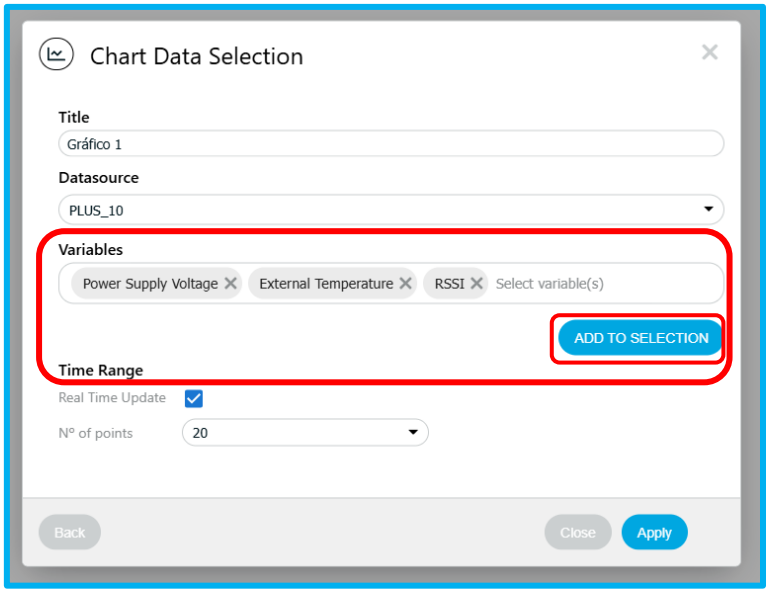


Figure 33 - Add to Selection button.

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.

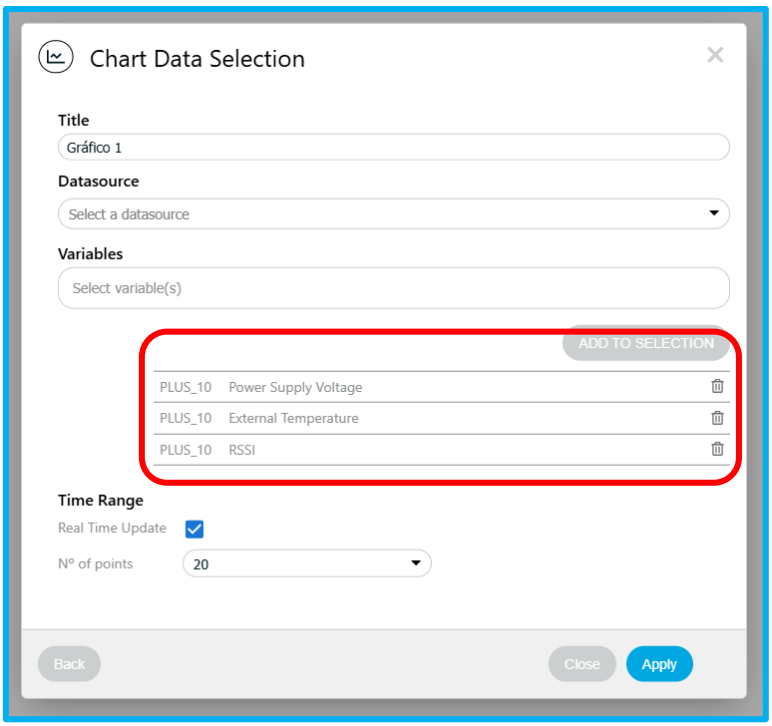


Figure 34 - Variables added.

- ***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:**

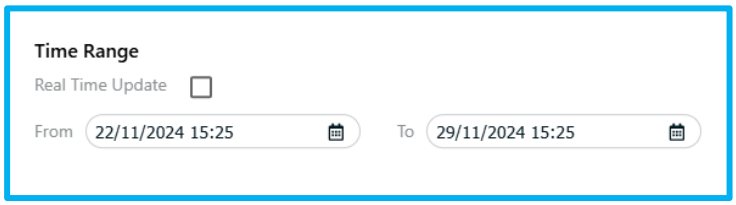


Figure 35 - Time range.

  - ***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*".

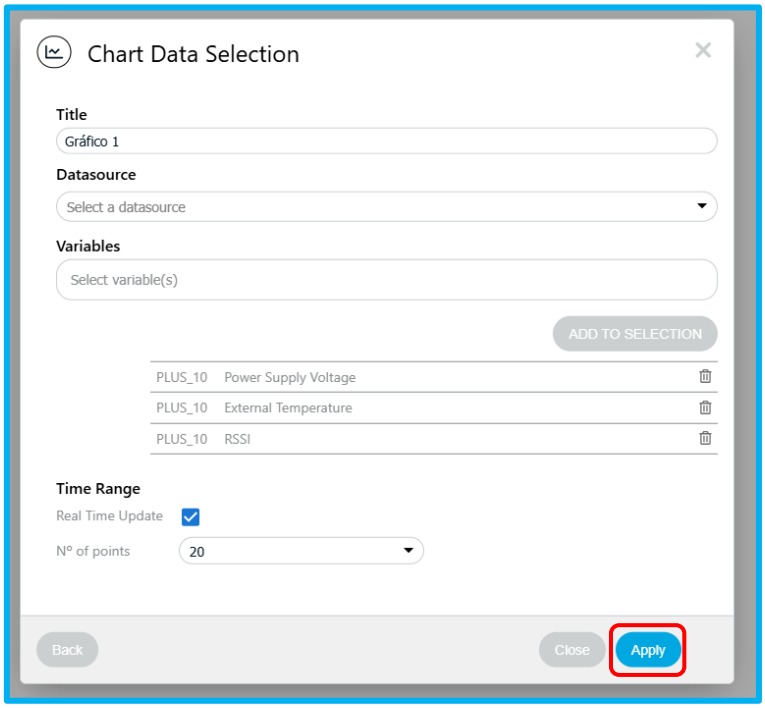


Figure 36 – "Chart Data Selection" Apply Button.

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

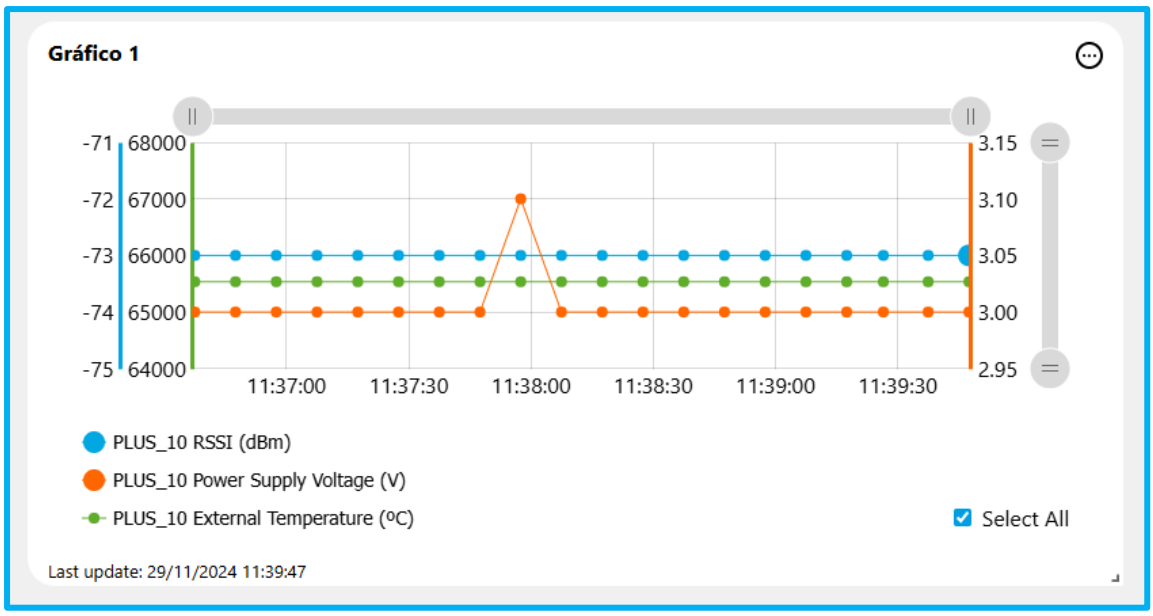


Figure 37 - On-page graph updated with the selections made.

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

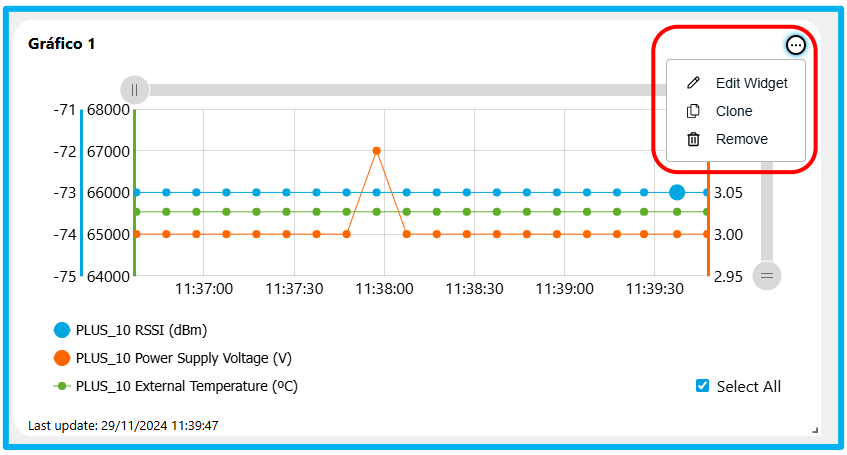


Figure 38 - Edit, clone and remove graph.

Valores (*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*.

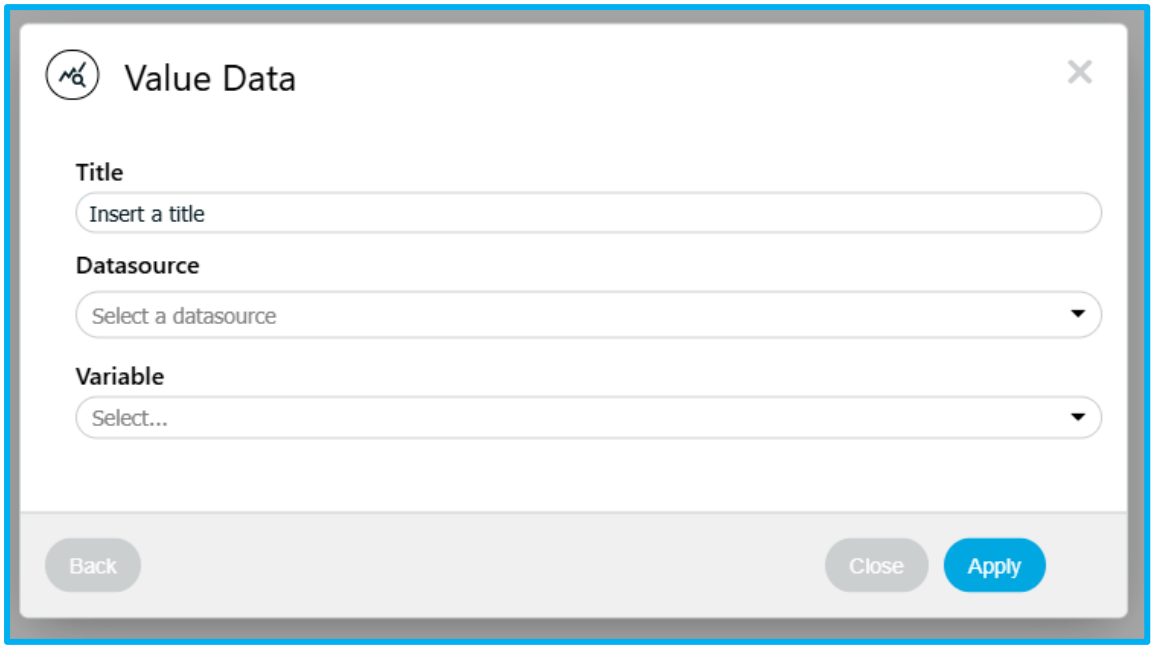


Figure 39 – "Value Data" window.

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.

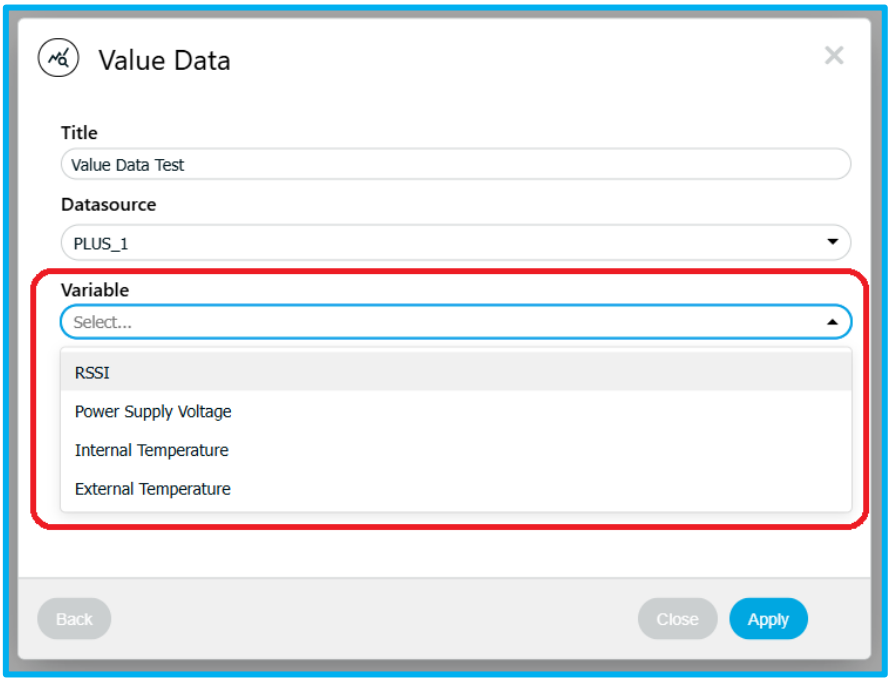


Figure 40 – "Value Data" variables.

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

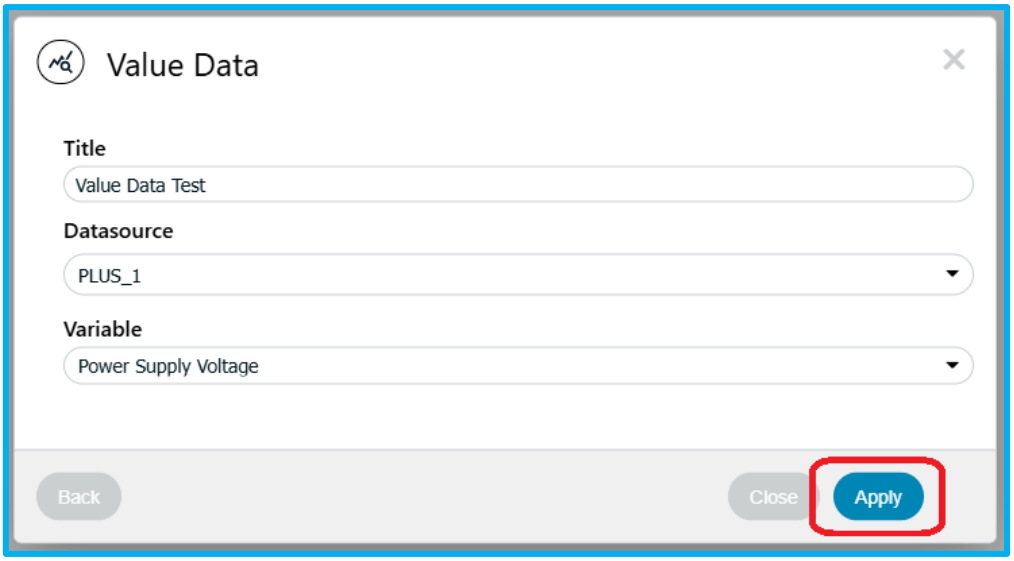


Figure 41 - Apply Button on "Value Data" window.

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.

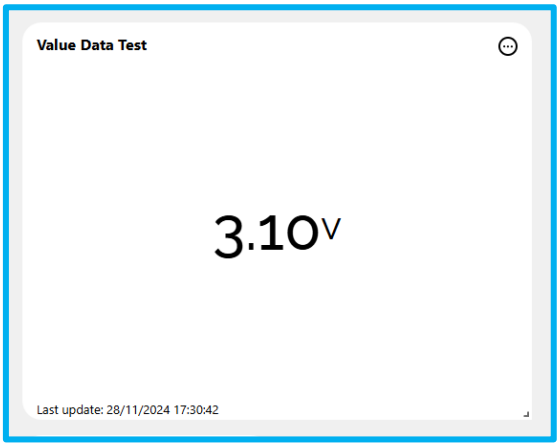


Figure 42 – Widget example.

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.

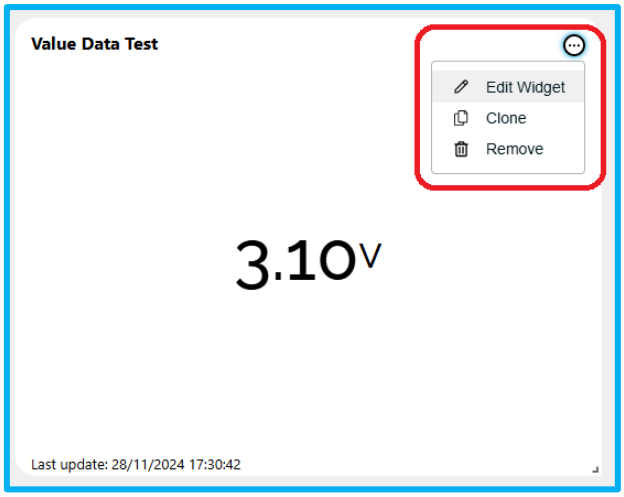


Figure 43 - Created widget editing.

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*.

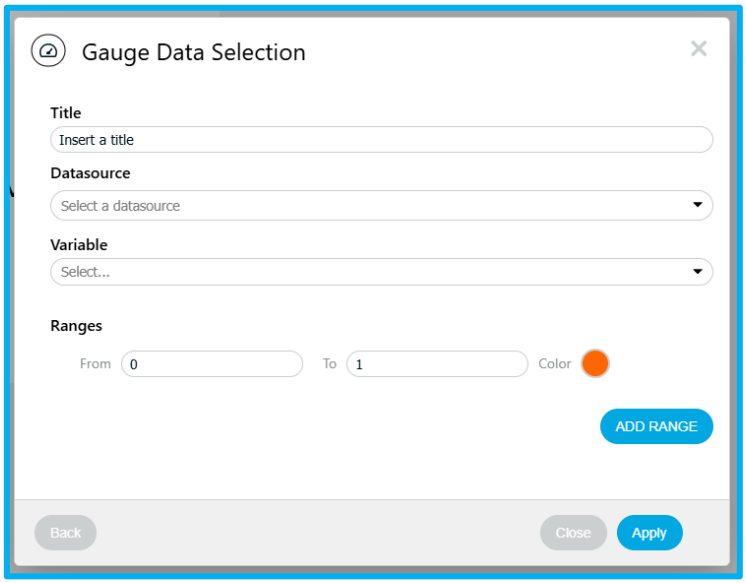


Figure 44 - Gauge data selection.

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*."

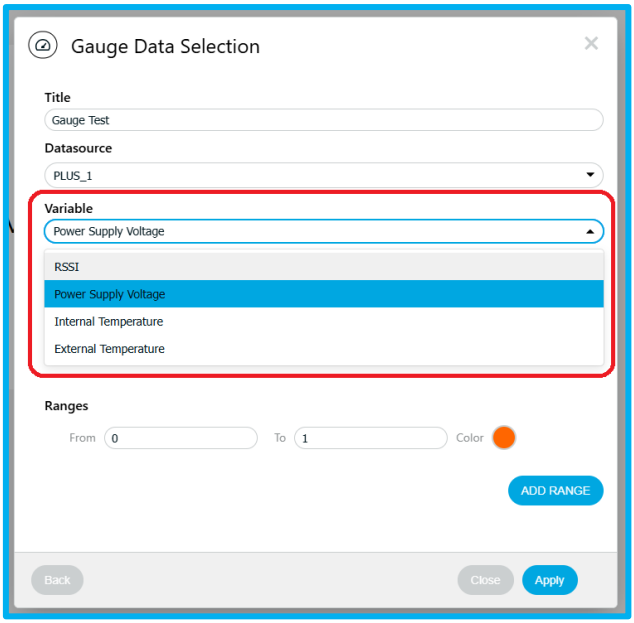


Figure 45 - Gauge data selection variables.

- ***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.

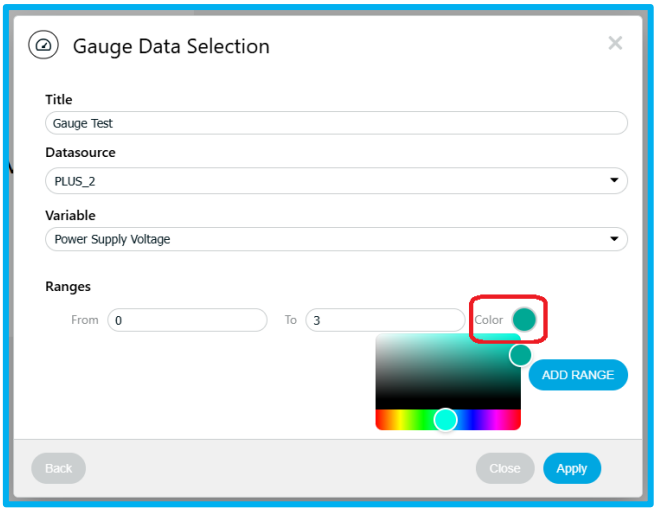


Figure 46 – Color palette on Gauge Data Selection window.

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

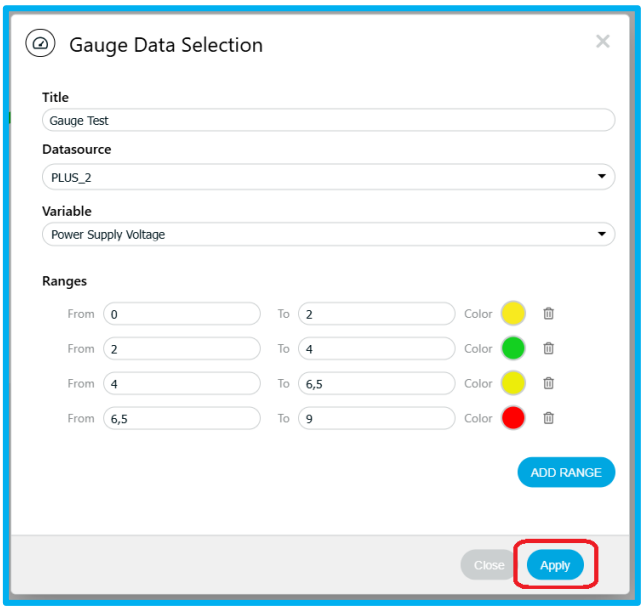


Figure 47 – Choosing colors on Gauge Data Selection window.

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

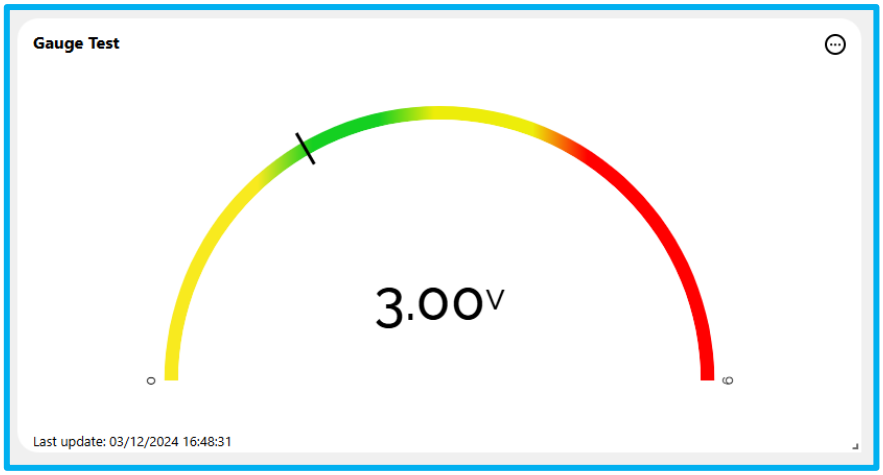


Figure 48 - Costumized widget example.

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.

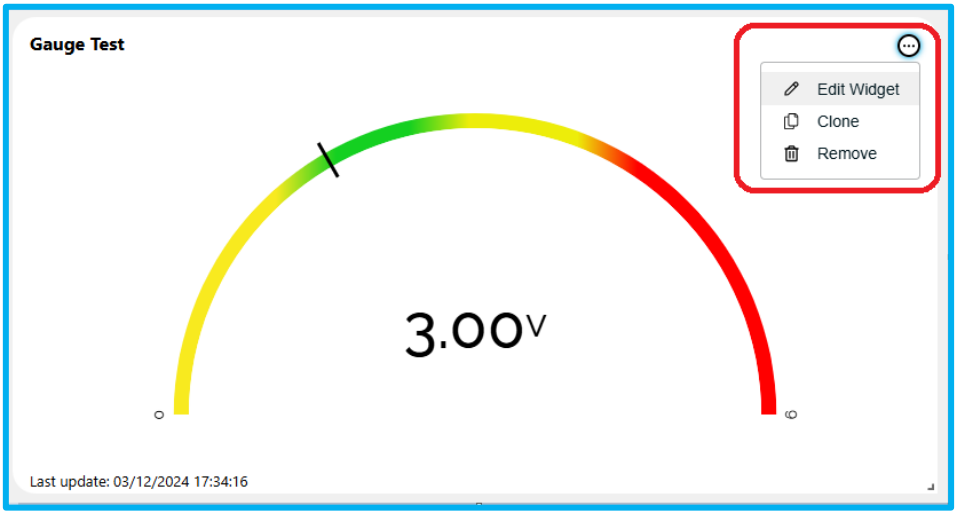


Figure 49 - Edit, clone or remove customized widget.

6.2.4 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*."

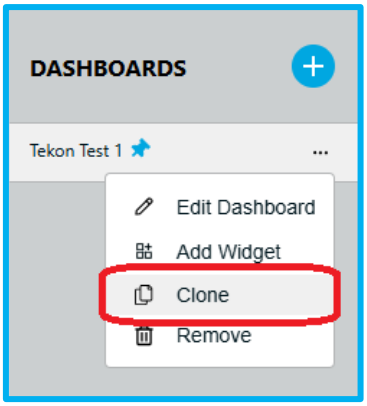


Figure 50 - Clone Dashboard option.

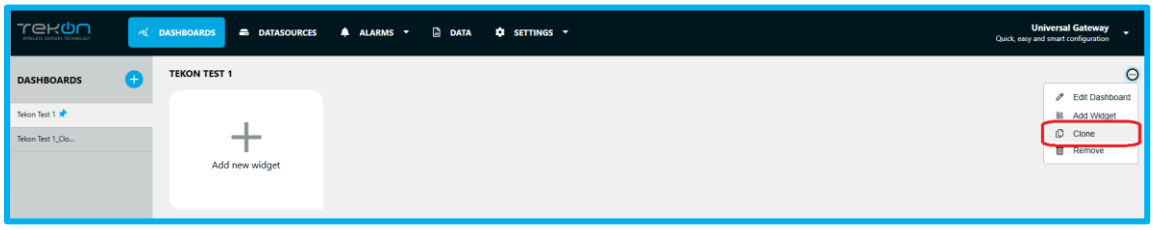


Figure 51 - Clone Dashboard on the Dashboards menu

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.

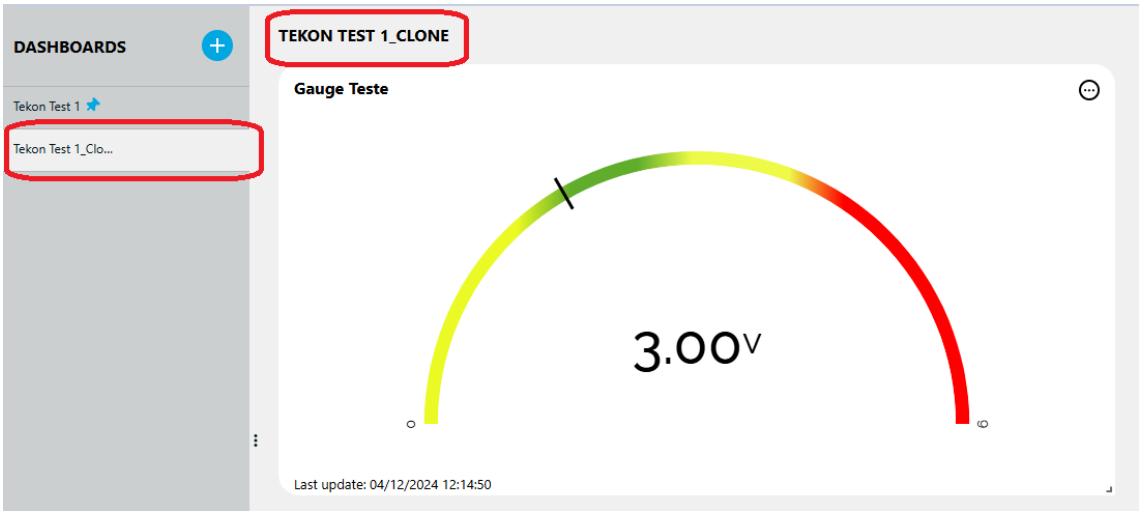


Figure 52 - Created Dashboard example.

6.2.5 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*."

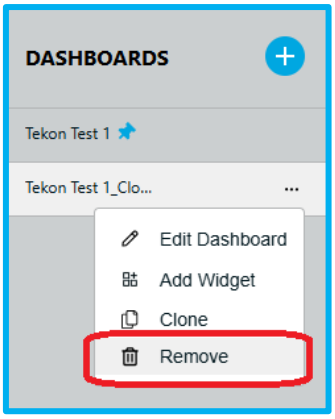


Figure 53 - Remove Dashboard option.

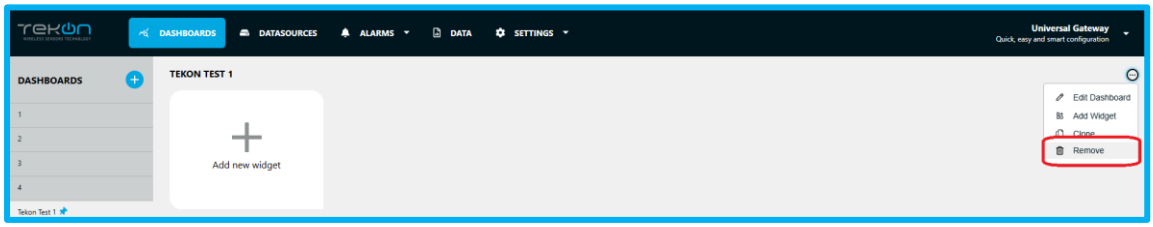


Figure 54 – Remove Dashboard on the Dashboard menu.

To confirm the removal operation, click "*Yes*" in the window.

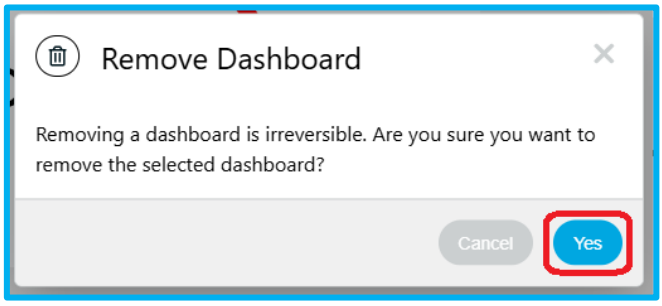


Figure 55 - Janela de confirmação Remove Dashboard.

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

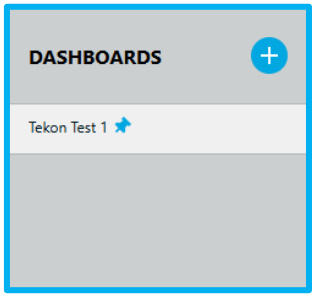


Figure 56 - Dashboard deleted from the list.

6.3 *Datasources* Menu

6.3.1 Home Page

After logging in, the page shown in Figure 57 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 v buttons.

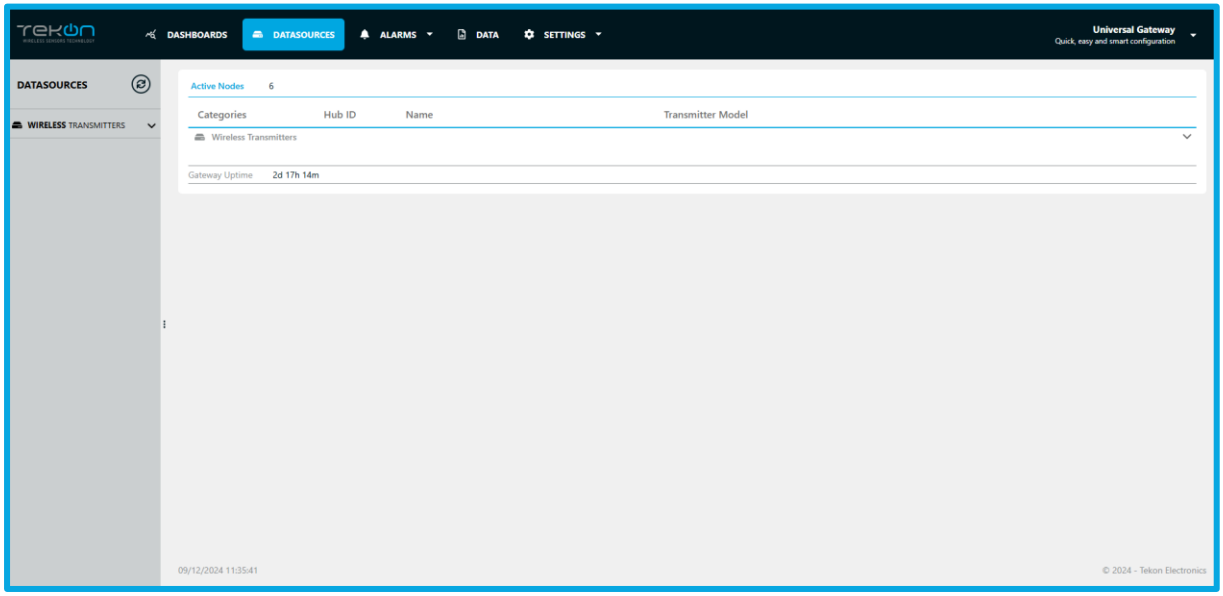


Figure 57 – Home page (Datasources).

6.3.2 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 58) with the wireless network and wireless channel defined on the Universal IoT Gateway label.

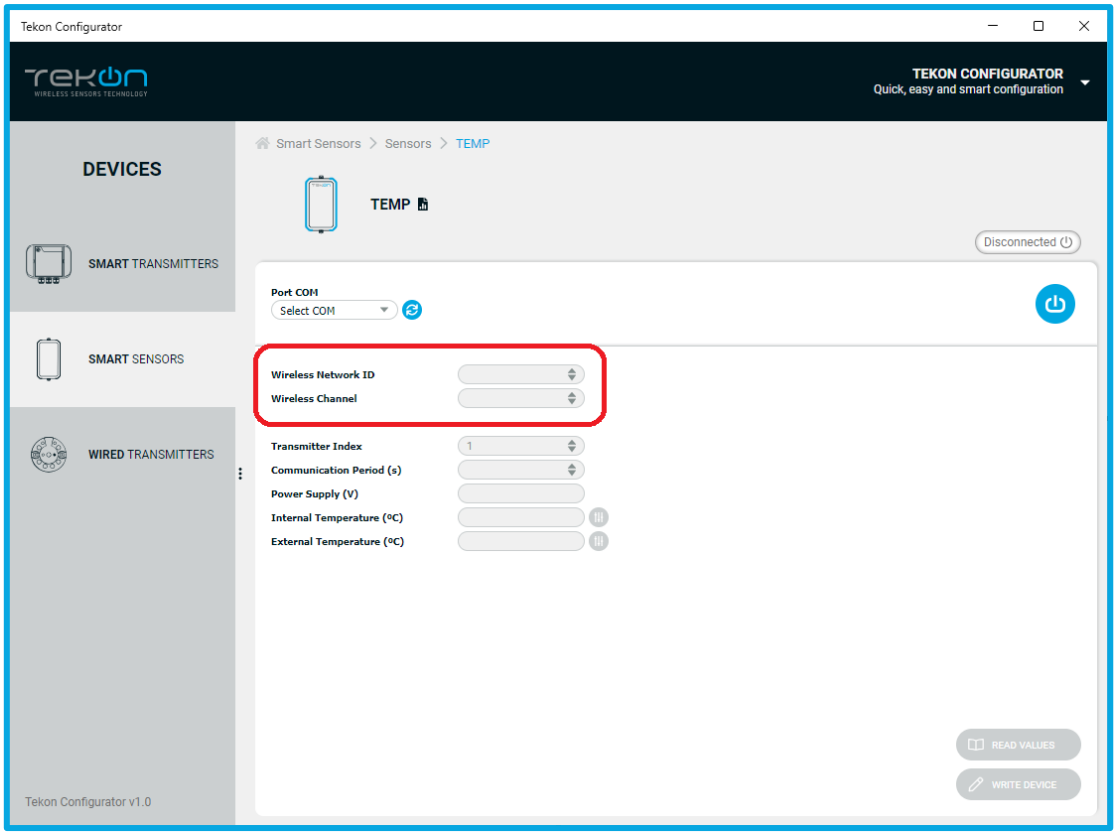


Figure 58 – Transmitter configuration page in the Tekon Configurator.

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).

6.3.3 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.

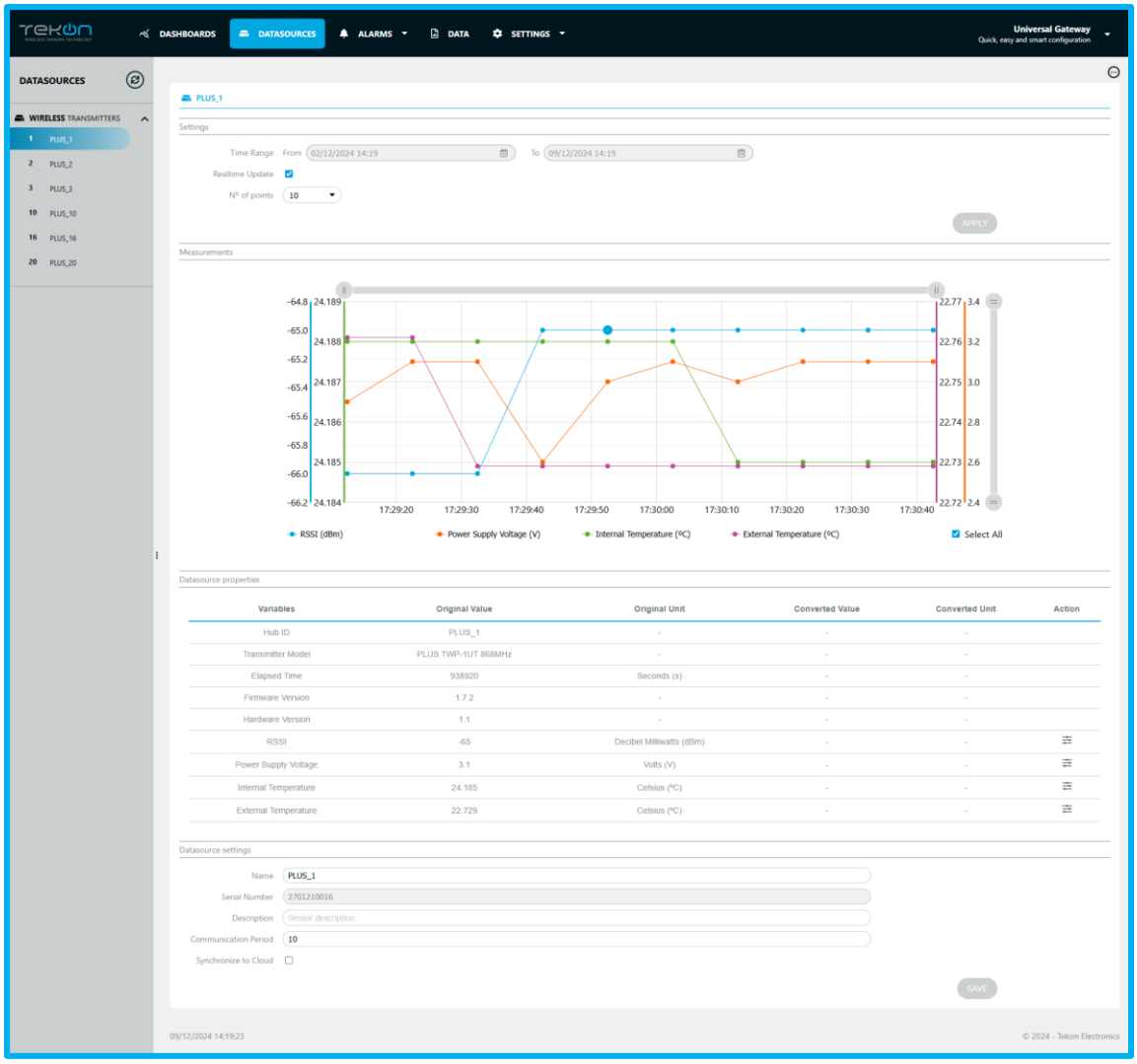


Figure 59 - Datasource Page with a selected datasource.

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.

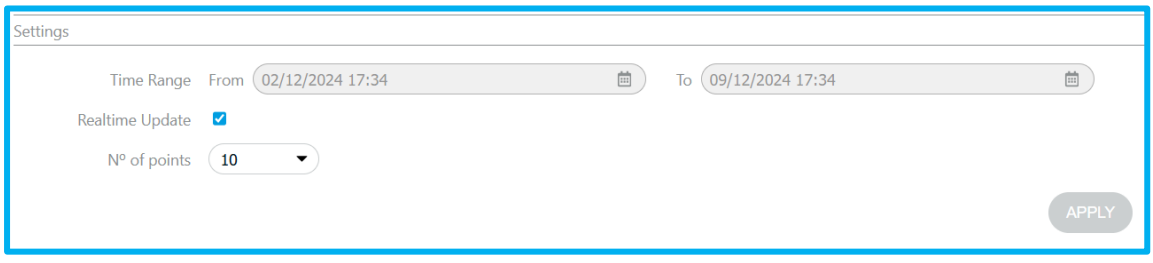


Figure 60 - Datasource configuration section (Settings).

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;
- ***Nº 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.

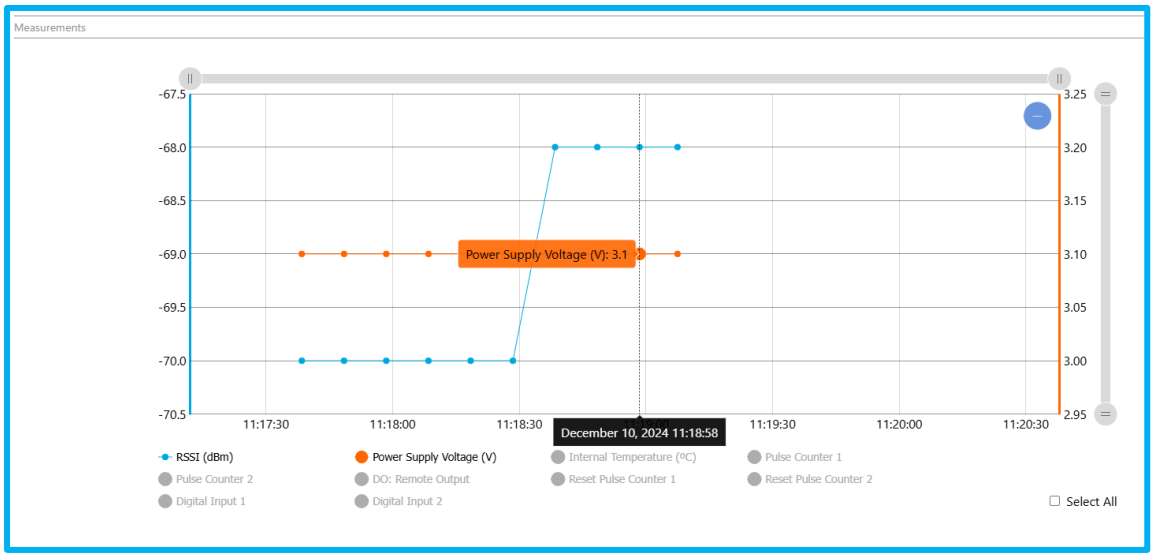


Figure 61 - Datasource Measurements Section.

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.

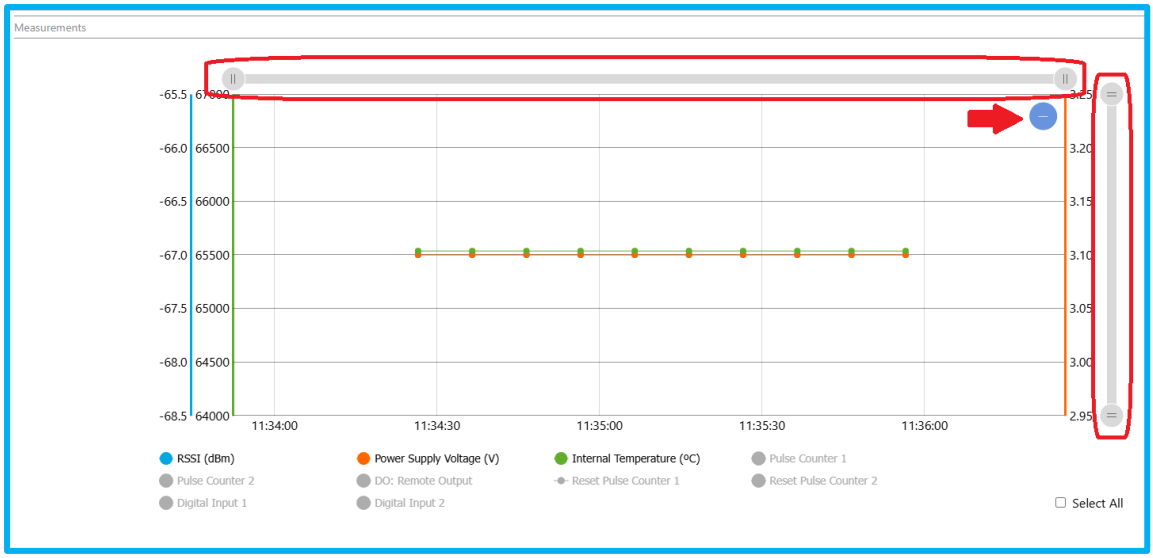
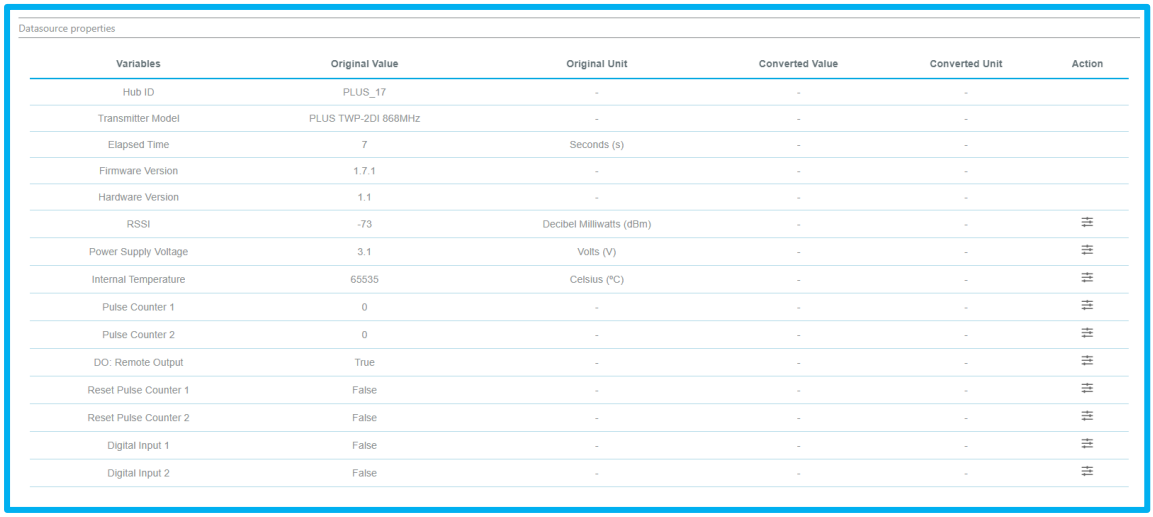


Figure 62 - Options for changing the graph scale.

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.



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 (ºC)	-	-	
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 63 - 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.

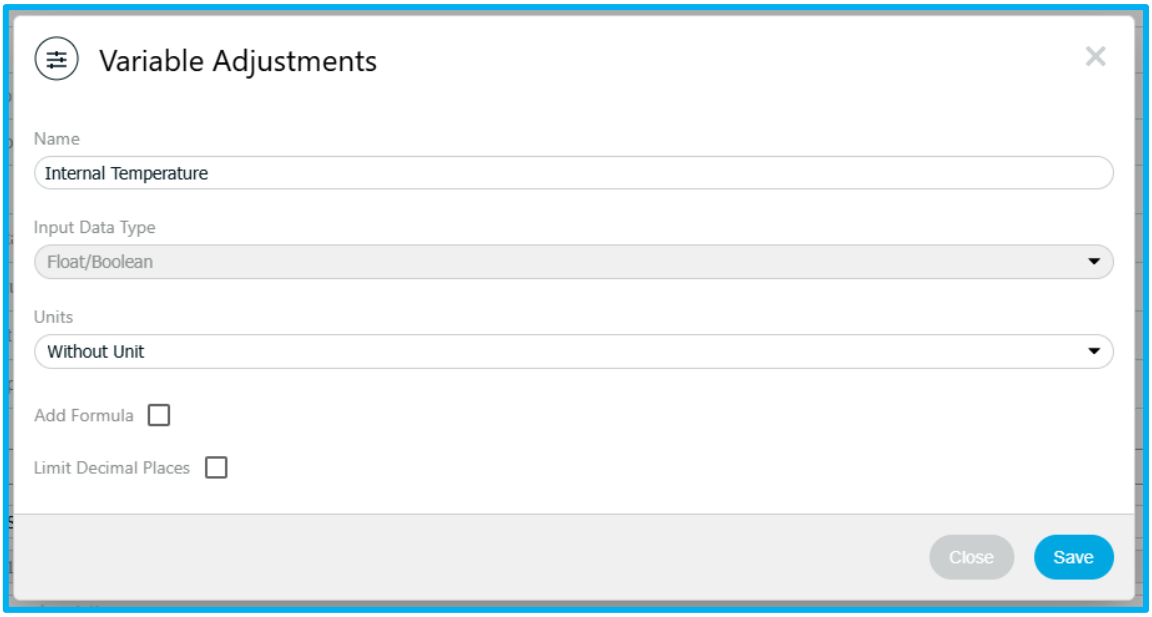


Figure 64 - Variable Adjustments Page.

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.

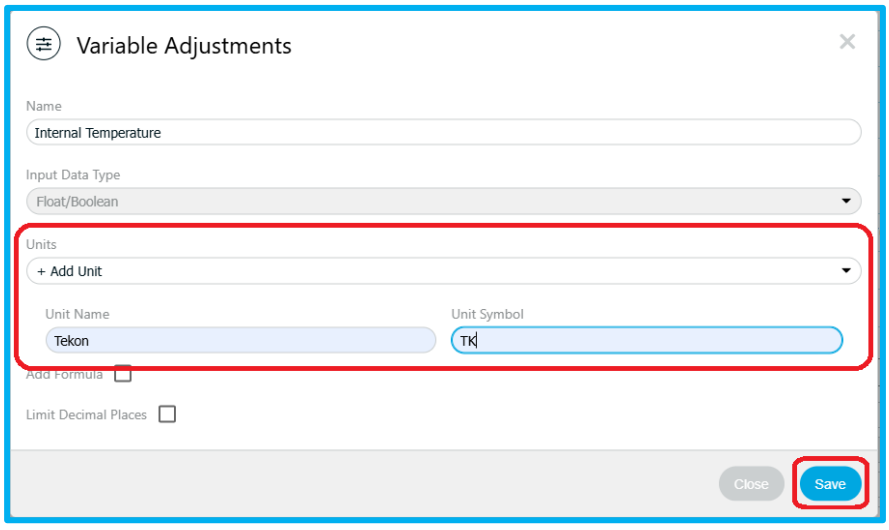


Figure 65 - Filling in fields to create a conversion unit.

- ***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 .

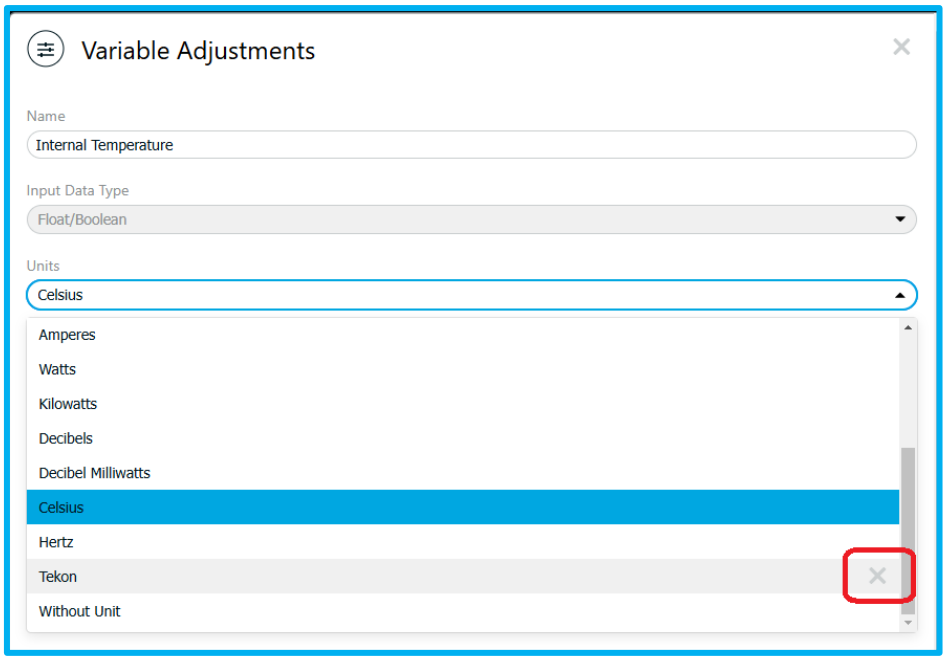


Figure 66 - Delete Conversion Unit.

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*.

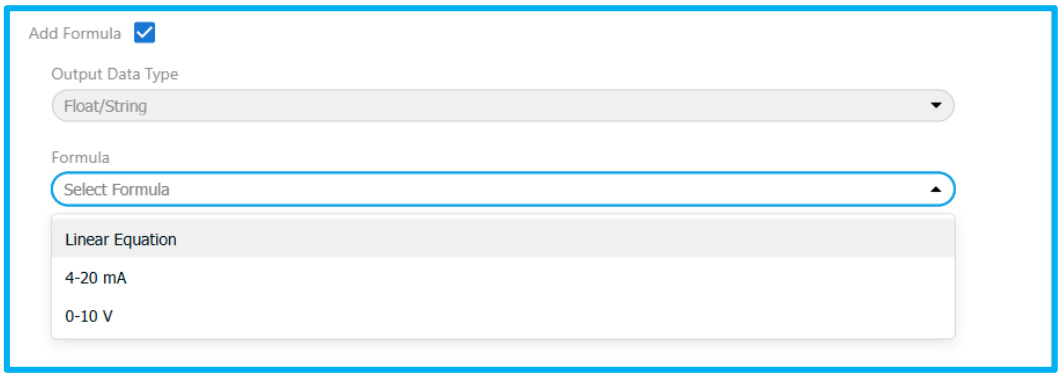


Figure 67 - Formulas for float-type data outputs.

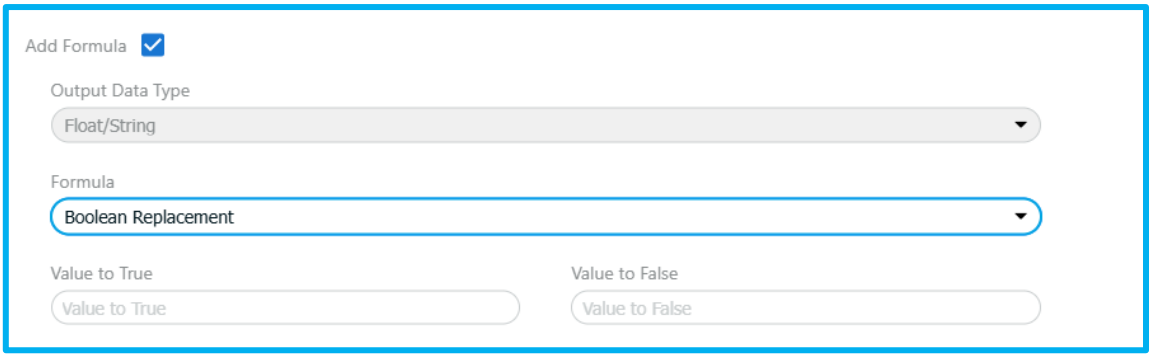


Figure 68 - Formulas for boolean-type data outputs.

- ***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 69 - Approximation Function Options.

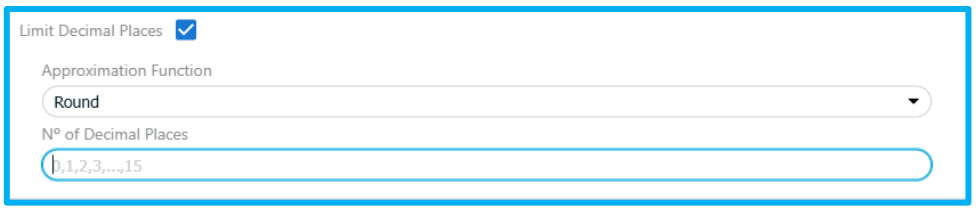


Figure 70 - No. of Decimal Places Field.

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 (ºC)** to **Fahrenheit (ºF)**.

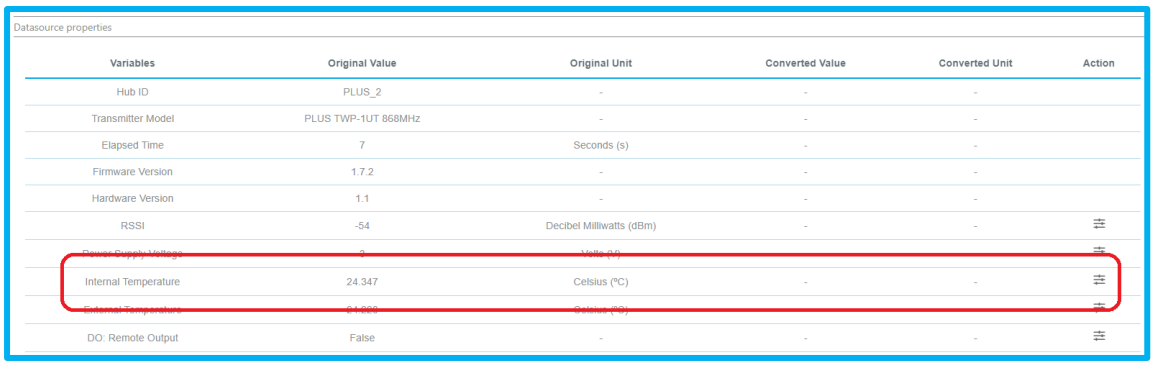


Figure 71 - Internal Temperature Variable of the datasource.

Linear Formula to Convert Celsius (ºC) to Fahrenheit (ºF):

$$°F = (°C \times 1.8) + 32$$

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

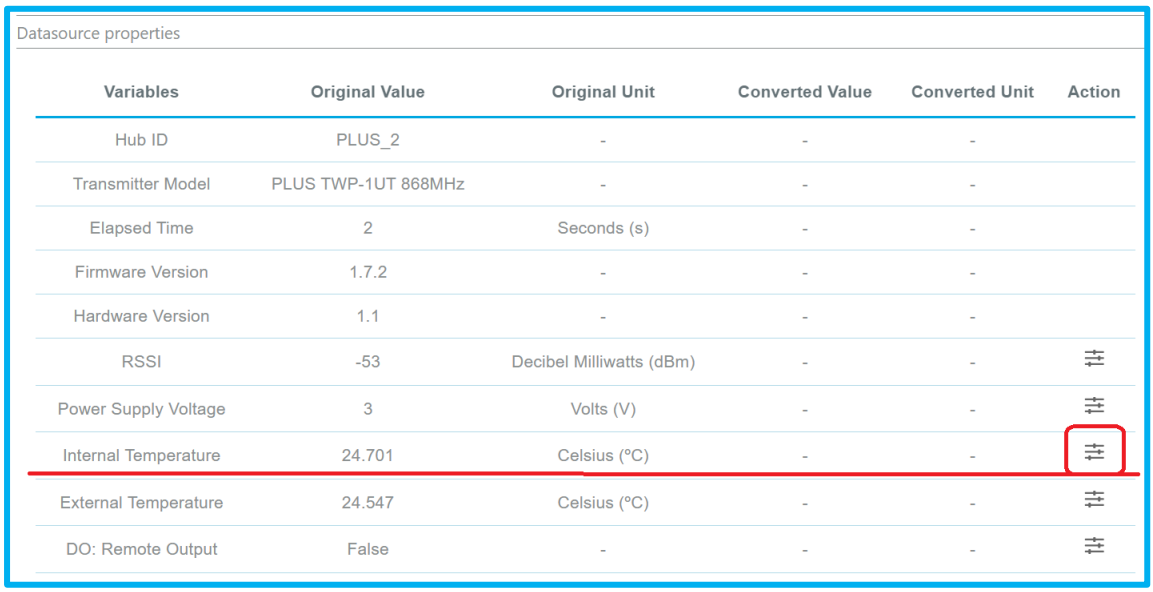


Figure 72 - Indication where to click as described in Step 1.

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

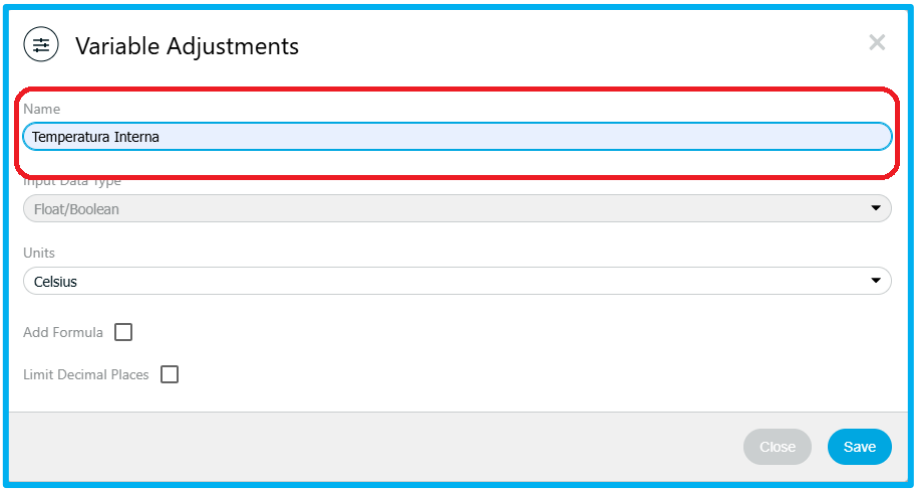


Figure 73 - Name Field.

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

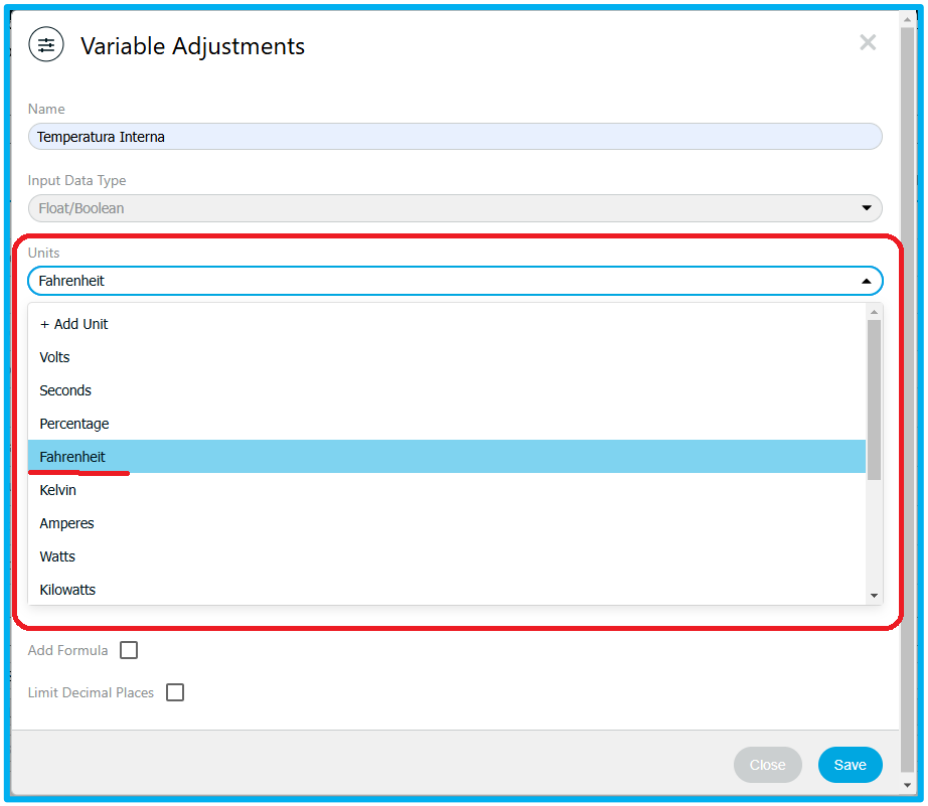


Figure 74 - Units Field List.

Step 4 – Select the *Add Formula* field

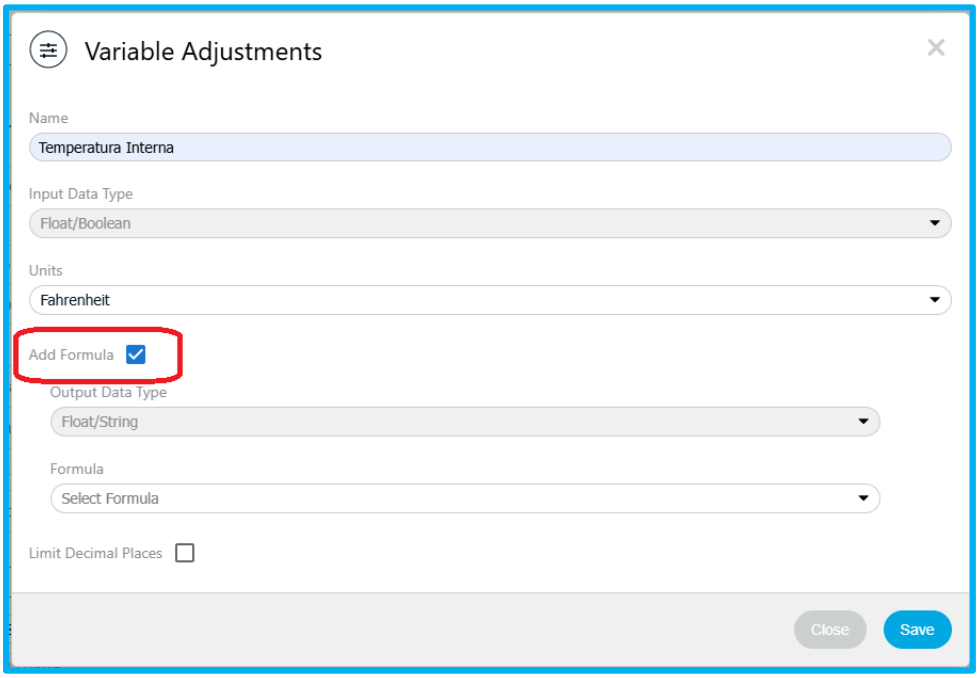


Figure 75 - Add Formula Field.

Step 5 – Choose *Linear Equation* in *Formula*.

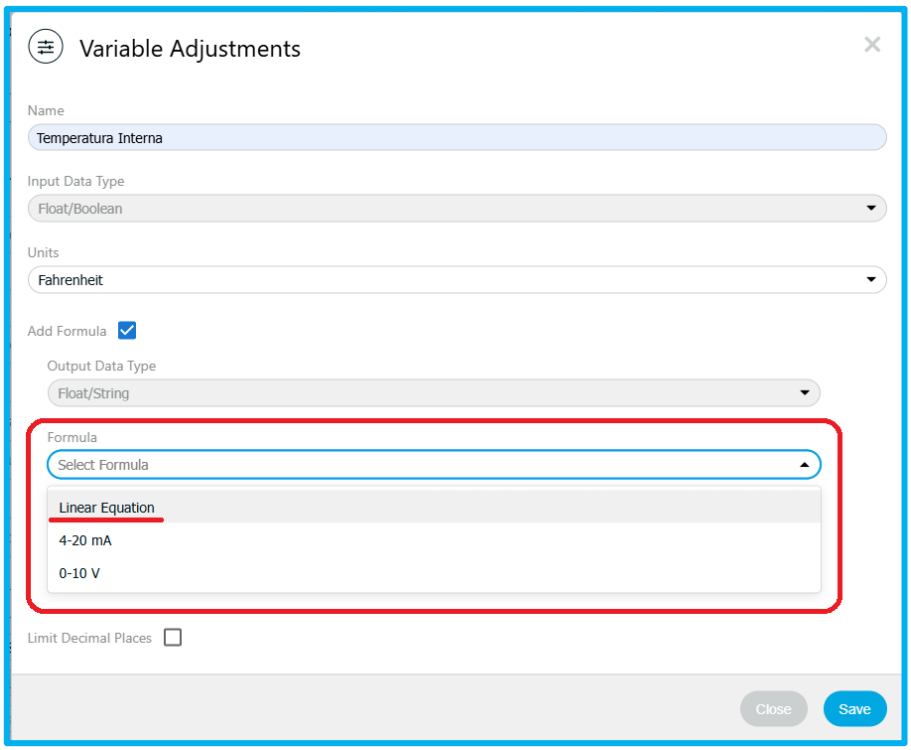


Figure 76 - Formula to Be Chosen.

Step 6 – In *Gain*, enter the value *1.8*, as defined by the linear formula.

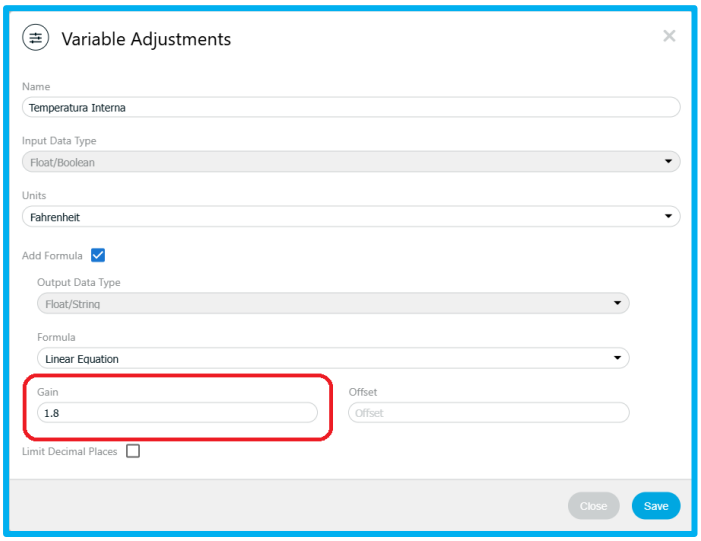


Figure 77 - Value to Enter in Gain.

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

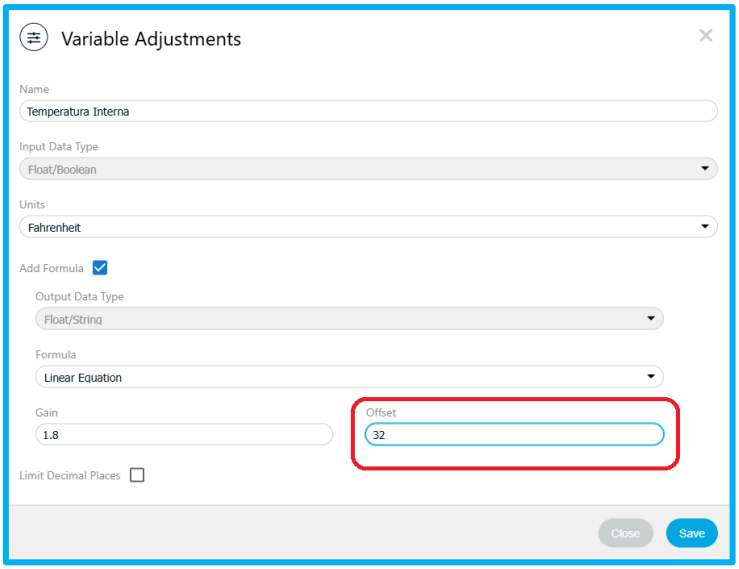


Figure 78 - Value to Enter in Offset.

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

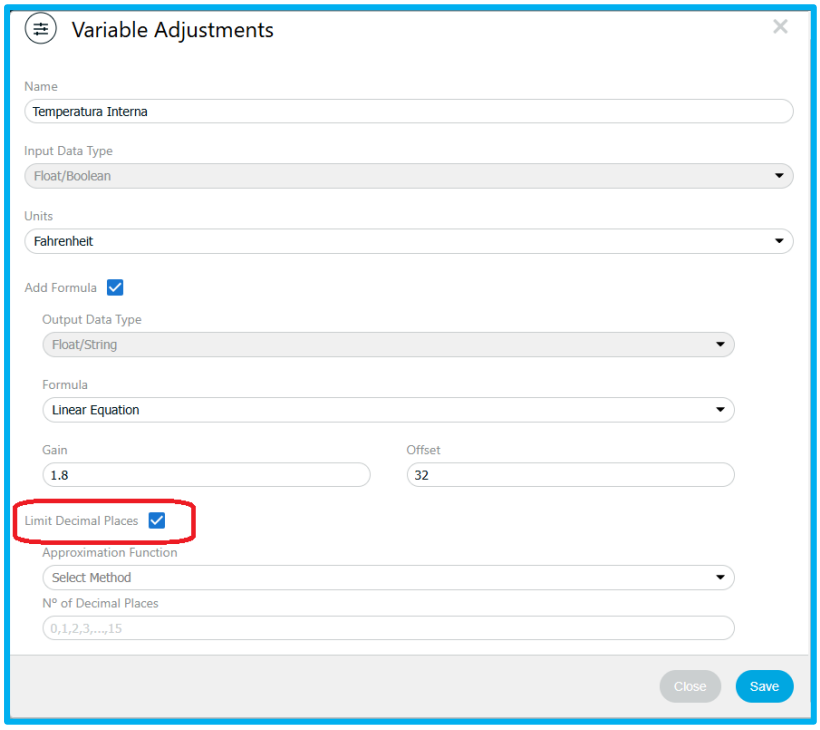


Figure 79 - Limit Decimal Places Option Selected.

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

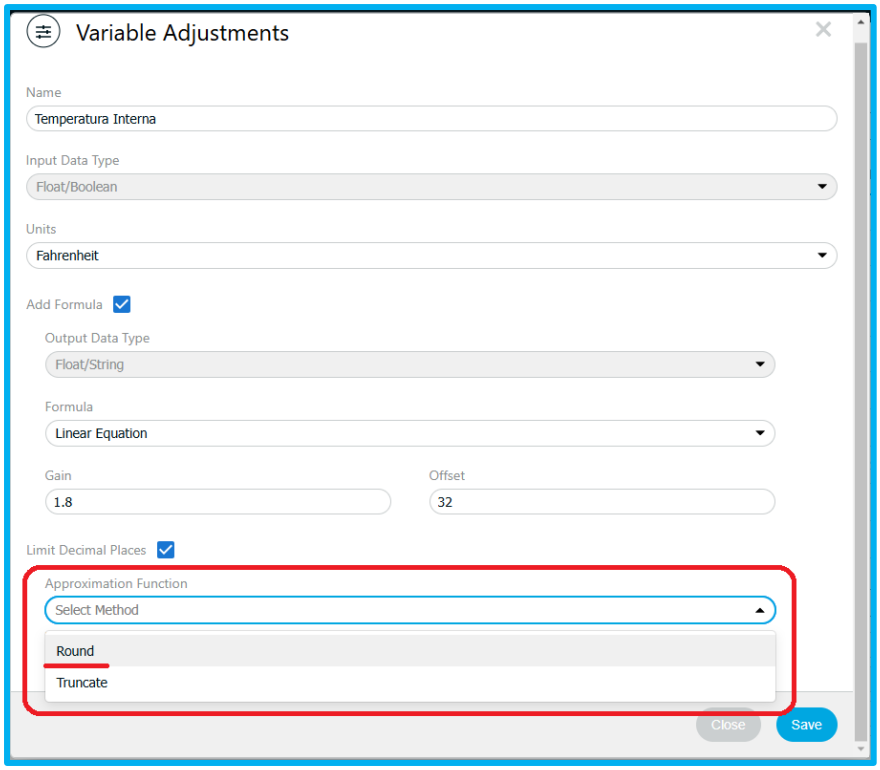


Figure 80 - Approximation Function Options.

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

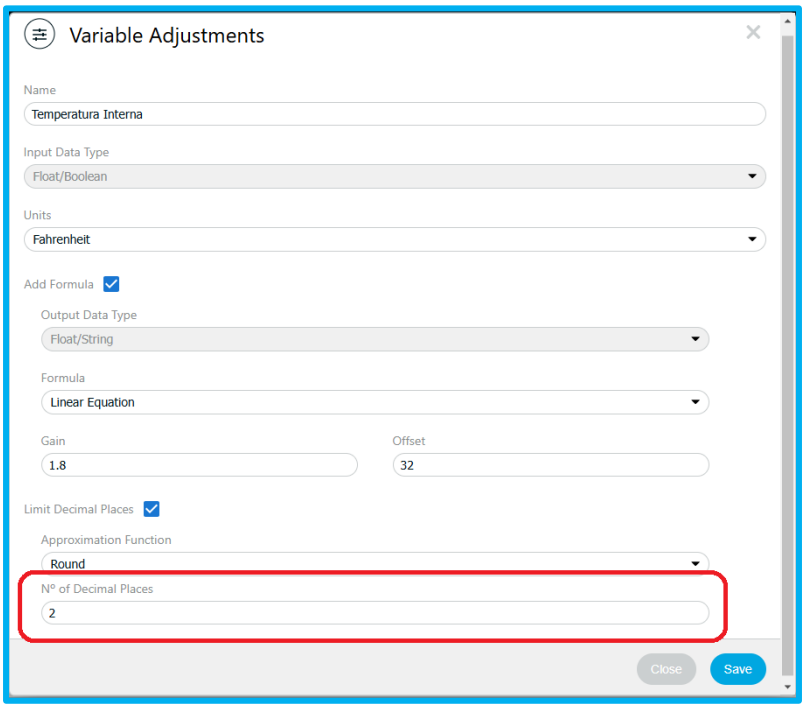


Figure 81 - Setting the Number of Decimal Places.

Step 11 – Click on Save 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.

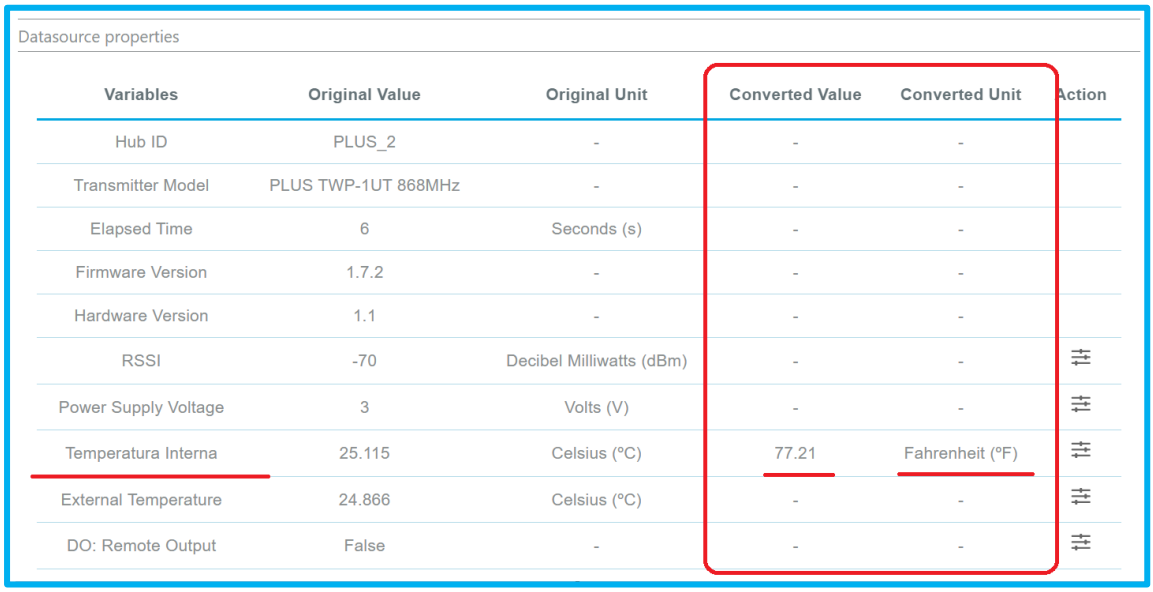


Figure 82 - Values after applying the conversion formula.

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.

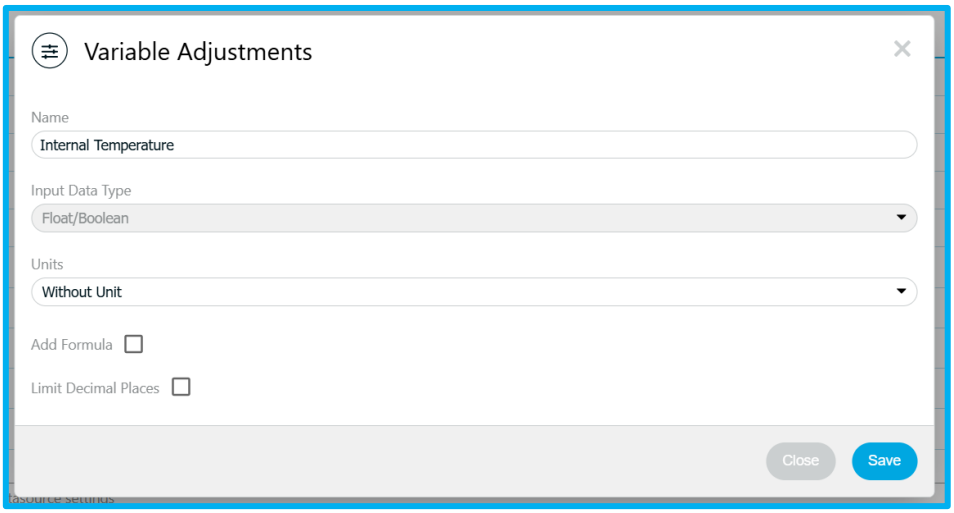


Figure 83 - Values to undo the conversion formula.

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 Save to apply the changes.

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

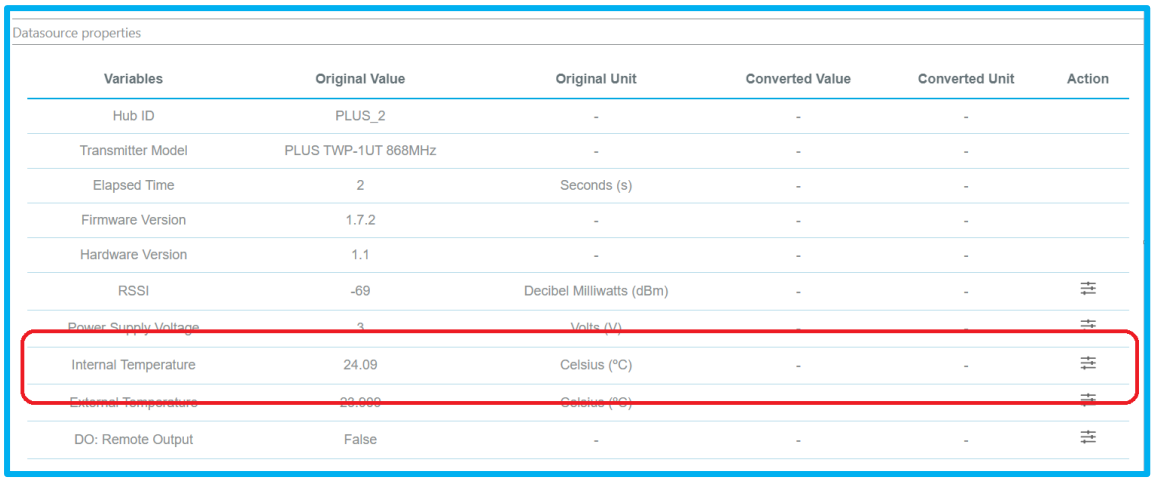


Figure 84 - Values without the applied conversion formula.

Datasource settings

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

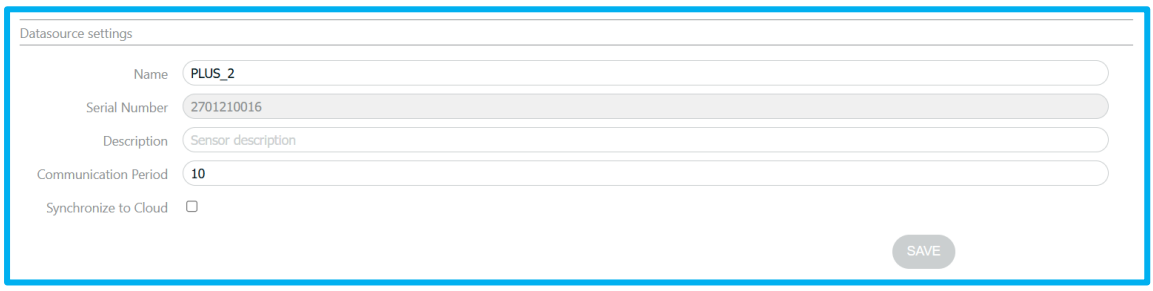


Figure 85 - Editing options in Datasource Settings.

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*".

6.3.4 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 86). However, you must first follow the steps in the Cloud section.

Figure 86 - 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.

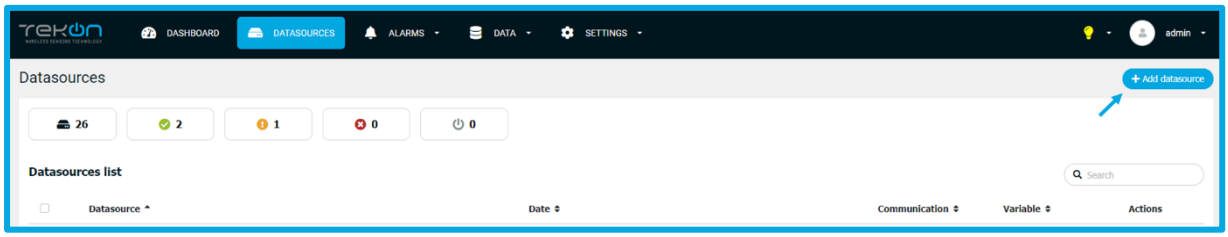


Figure 87 – Datasources section on the Tekon IoT Platform.

When creating the datasource, copy the API key by clicking on Copy, and complete the creation of the new datasource.

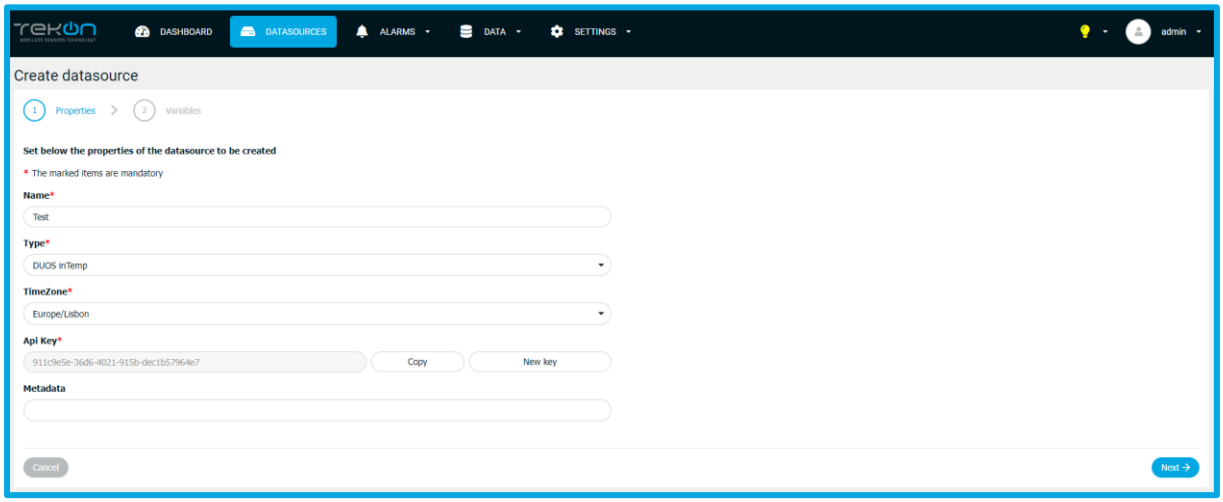


Figure 88 – Creating a datasource on the Tekon IoT Platform.

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.

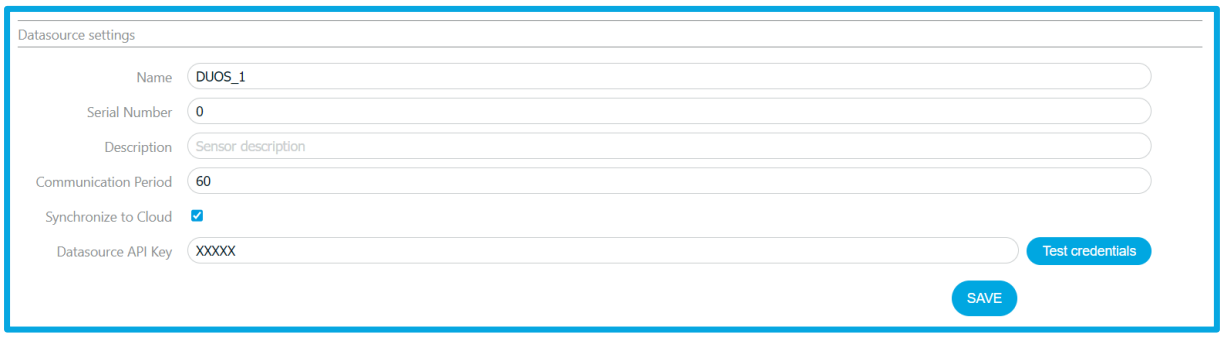


Figure 89 - Datasource Settings section on the datasource page with Cloud sync and API key.

6.3.5 Delete *datasource*

In the upper right corner, there is a symbol ⋯ (Figure 90), 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.

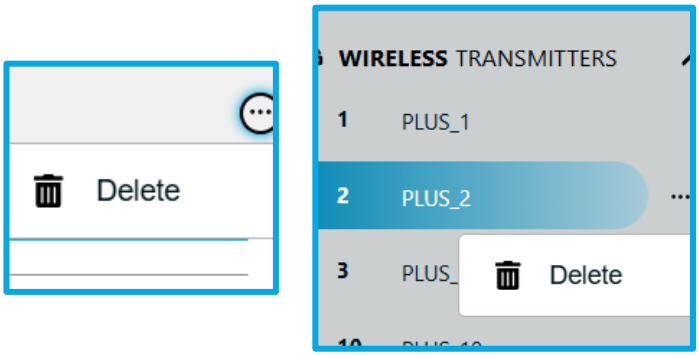


Figure 90 – Options to delete a Datasource on the selected Datasource page.

6.4 Data Menu

The Data page allows viewing different variables simultaneously from different datasources and exporting them in five different formats, Figure 91.

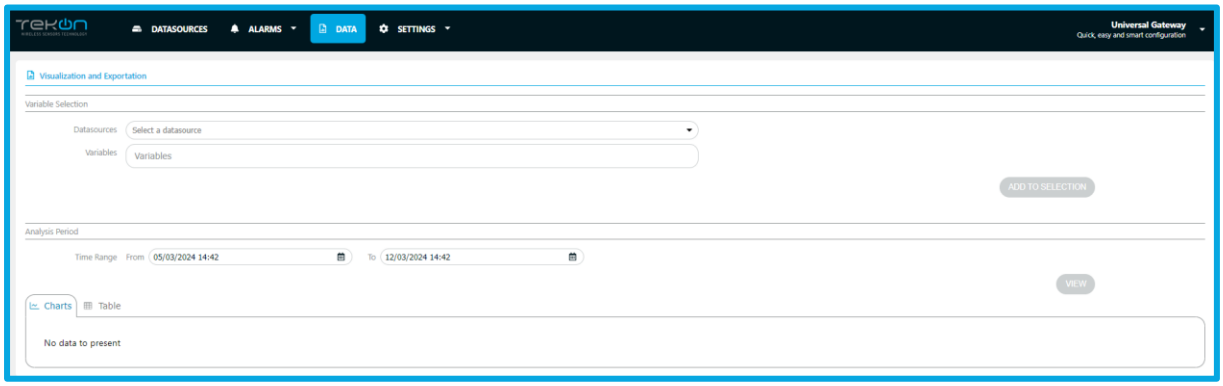


Figure 91 – Data Viewing and Export page.

To start the data viewing and export process, select the desired datasource, Figure 92, then select the respective variables, Figure 93 and Figure 94.

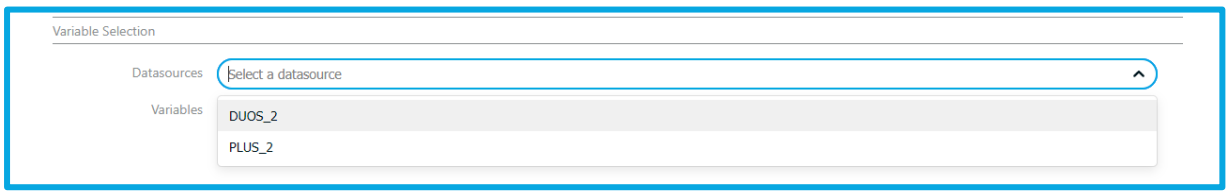


Figure 92 – Section to select the Datasource for viewing and/or export.

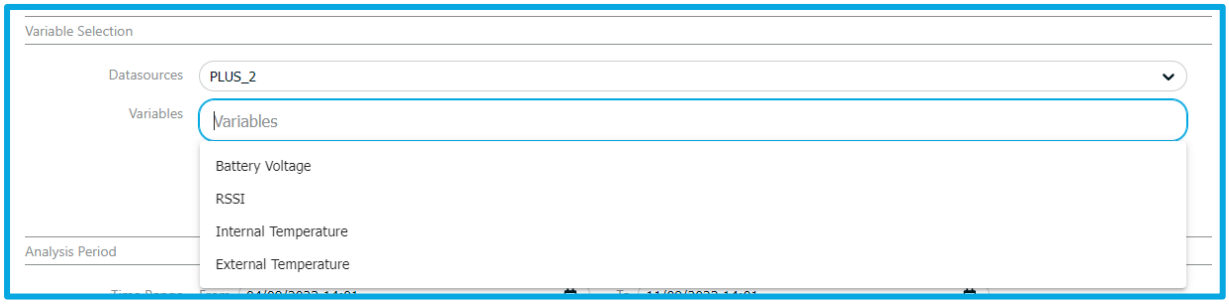


Figure 93 – Section to select the variables for viewing and/or export.

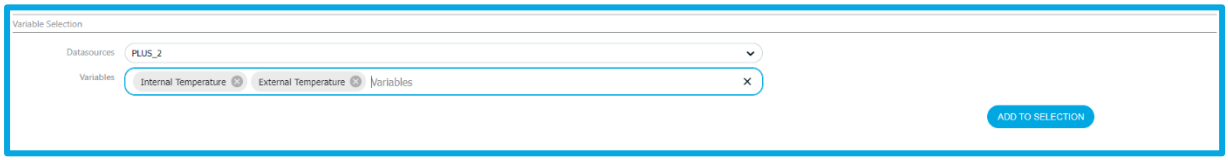


Figure 94 – Section to select different variables for viewing and/or export.

To add these variables to the data list for viewing, press the button ADD TO SELECTION, Figure 95. To continue adding variables from other datasources, repeat the previously described process as many times as necessary until all desired variables are obtained.

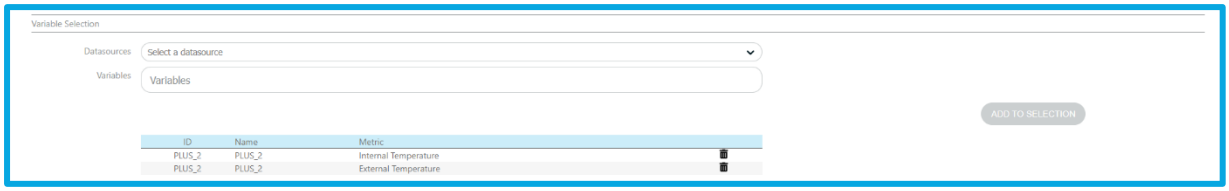


Figure 95 – Section of variables added to the list on the Data Viewing and Export page.

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 96 to Figure 98. 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.

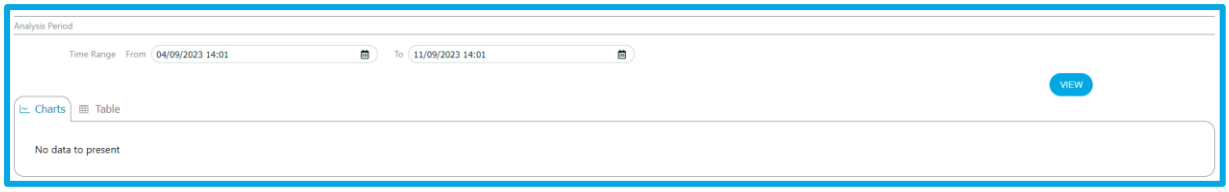


Figure 96 – Section to define the data viewing/export period.

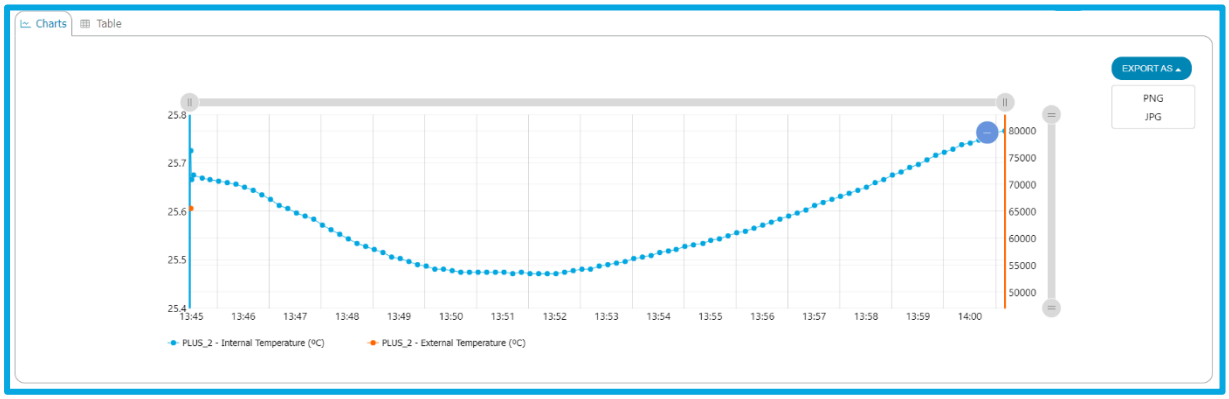


Figure 97 – Graphic for PNG and JPG export.

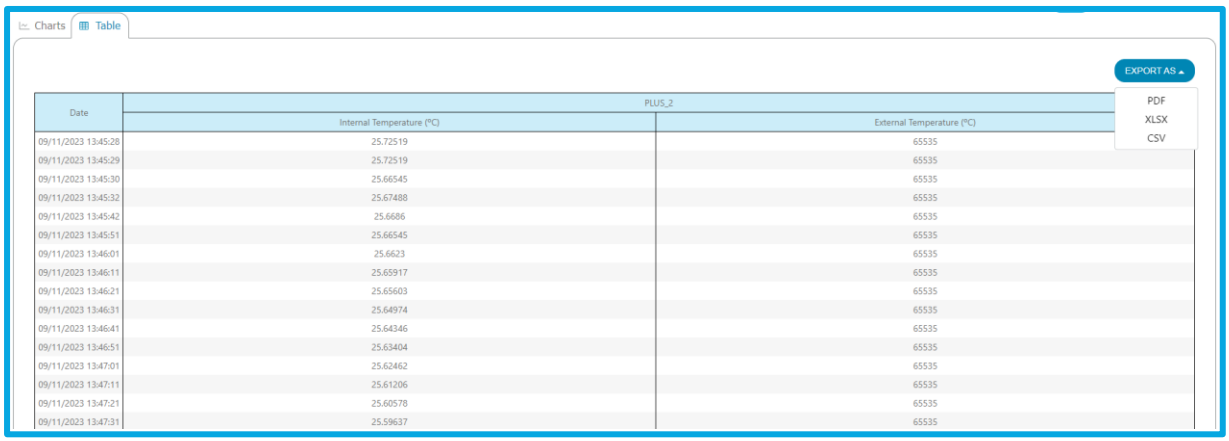


Figure 98 – Table for Export in PDF, XLSX, and CSV.

6.5 Settings Menu

In the Universal IoT Gateway interface, under the Settings tab, Figure 99, you can configure various equipment parameters according to the user's needs.

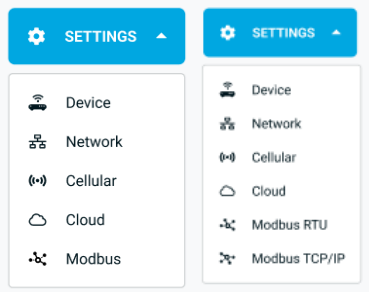


Figure 99 - Settings tab menu with the Modbus RTU Master and TCP/IP Client Pack inactive (left) and active (right).

6.5.1 Device

This settings page is divided into three sections, as shown in Figure 100:

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 101 e Figure 102, 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 SAVE.

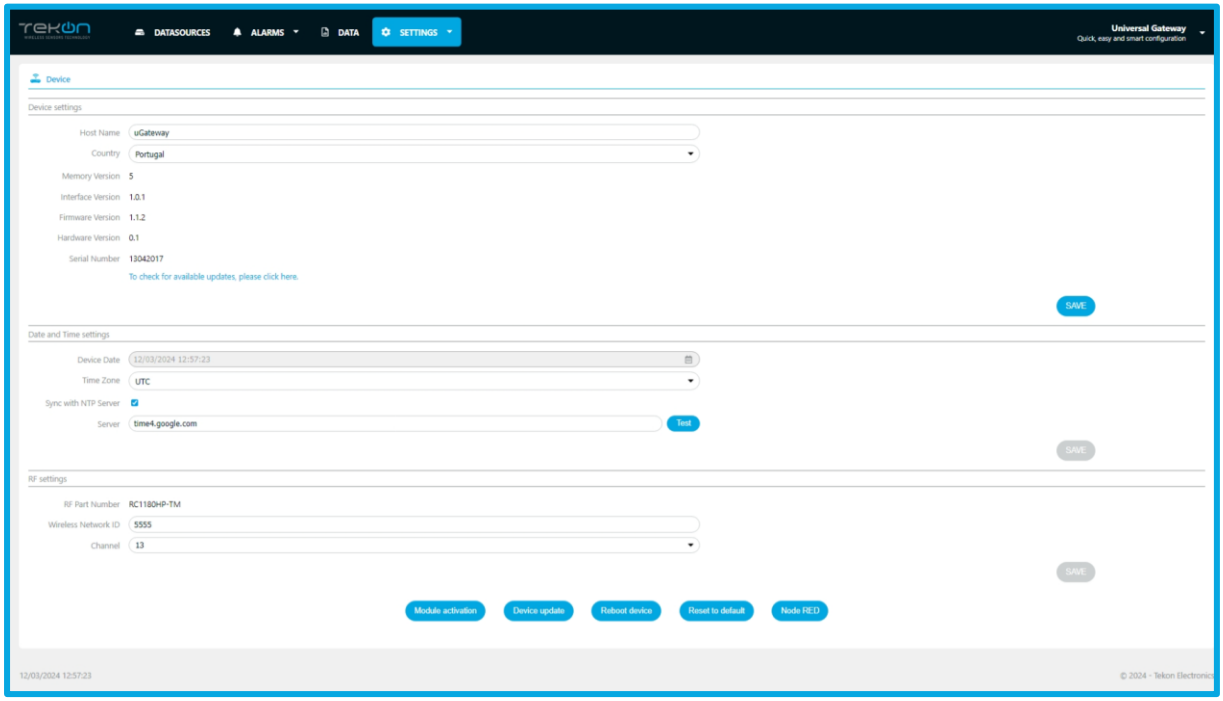


Figure 100 – Device Settings page.

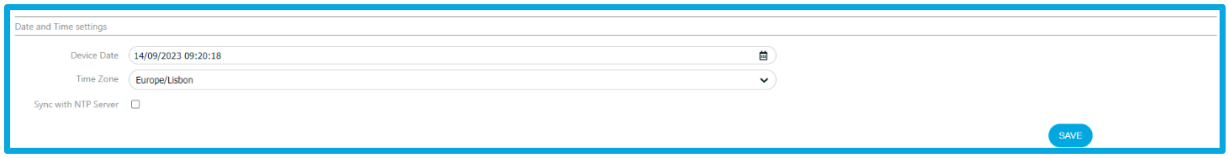


Figure 101 – Section to configure date and time with NTP disabled.

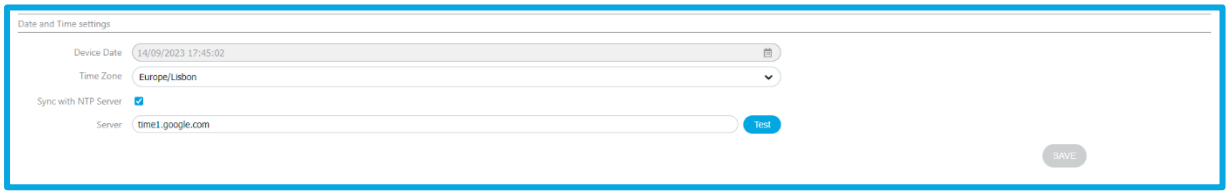


Figure 102 – Section to configure date and time with NTP enabled.

At the end of the device settings page, there are five buttons as shown in Figure 103.

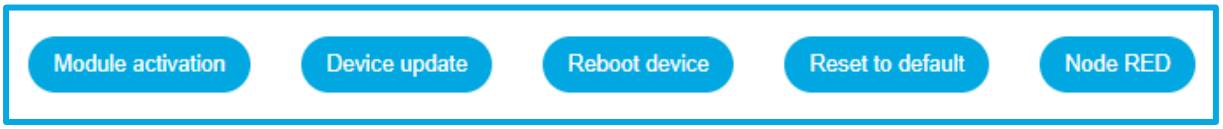


Figure 103 - Actions available on the Device Settings page.

6.5.1.1 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 104), 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.

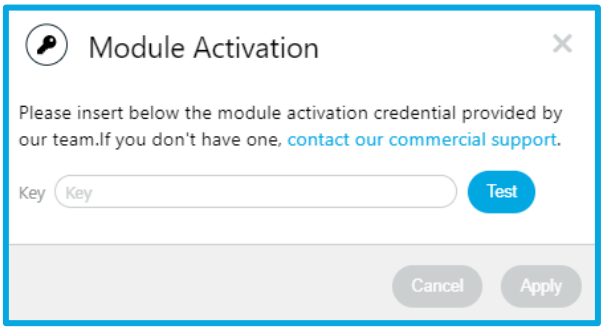


Figure 104 – Page to activate advanced modules.

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.

6.5.1.2 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 105), which can be downloaded at the following link: Download Center – Tekon Electronics. The user can view the update progress as shown in Figure 106.

To complete the device update, a reboot is required. To do this, the user must select the button Reboot, Figure 106. Then wait for the system to restart and log in.

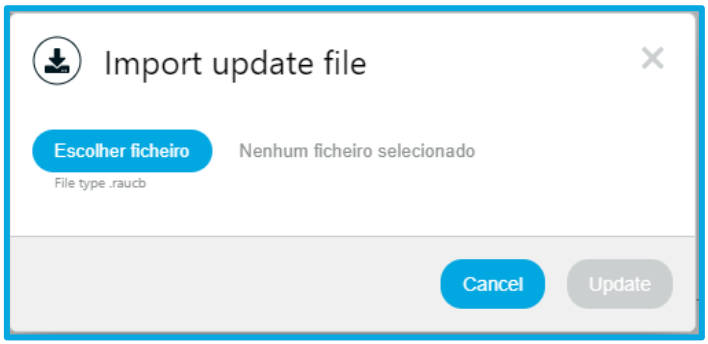


Figure 105 – Page to upload raucb file for device update.

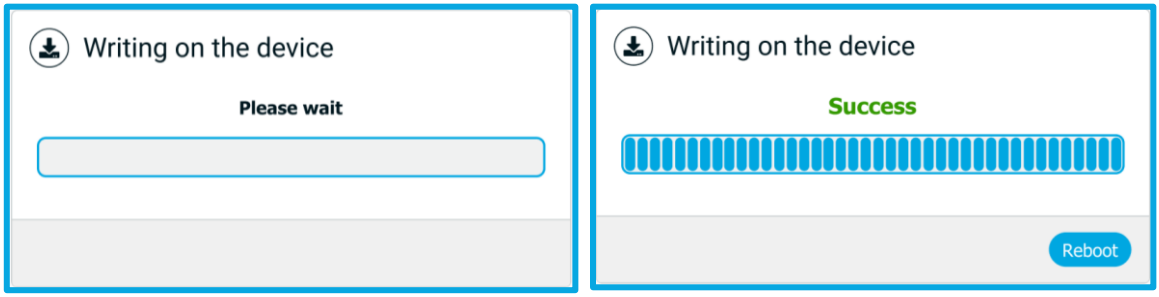


Figure 106 – Pages to view update progress and completion.

6.5.1.3 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.

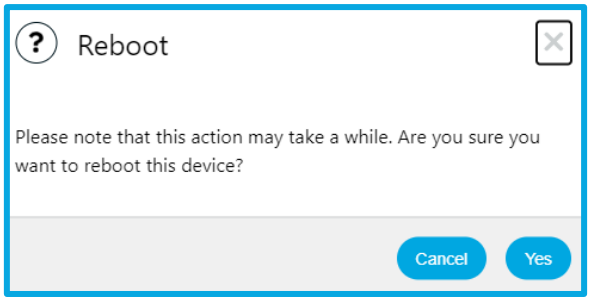


Figure 107 – Device reboot confirmation page.

6.5.1.4 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 108.

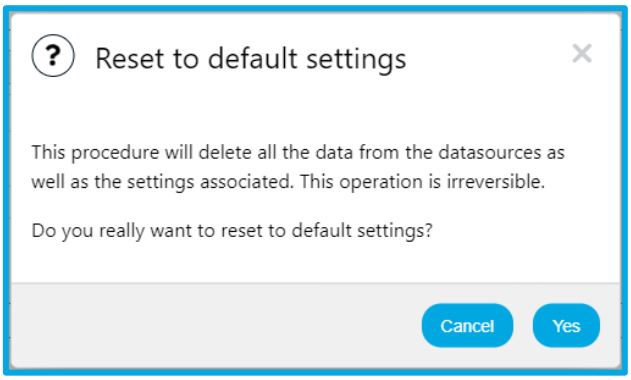


Figure 108 – Page to confirm settings reset.

Clicking Yes, to proceed with the reset, will redirect the user to a page (Figure 109) 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 109 – Page for Universal IoT Gateway reboot.

6.5.1.5 Node-RED (optional)

If you have activated the Node-RED Pack module, you will have access to the button Node RED. Clicking this button will direct you to the Node-RED interface where you can add flows and functions (Figure 110). See the Node-RED section for further steps on how to use Node-RED.

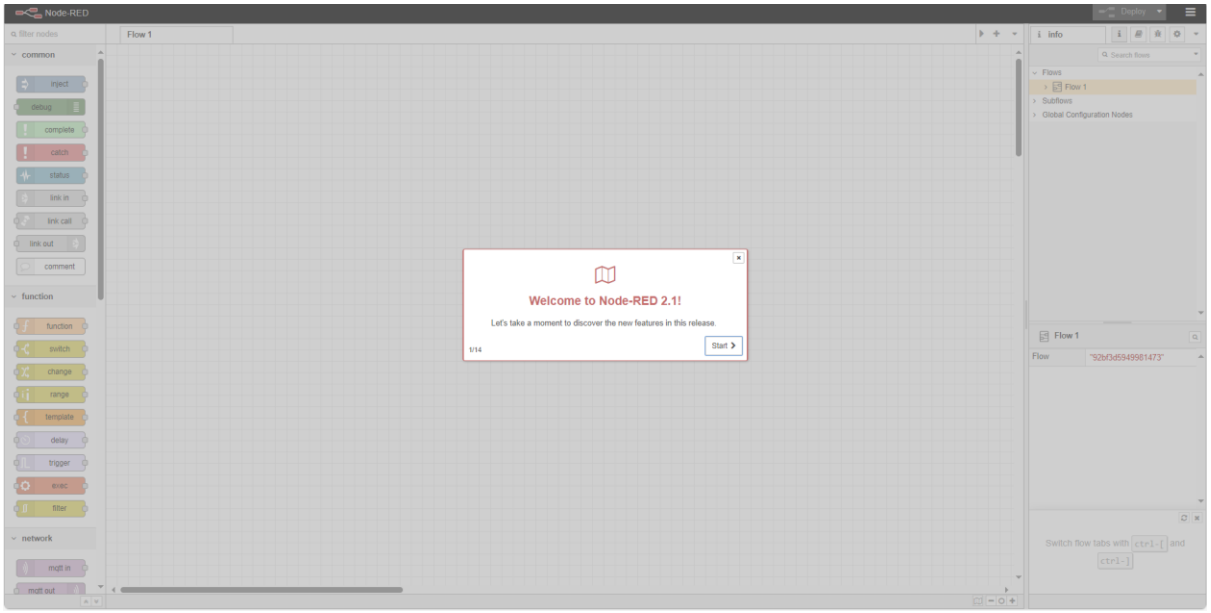


Figure 110 – Node-RED interface page.

6.5.2 Network

In the Settings tab, you can customize various network configurations related to the **Universal IoT Gateway** (Figure 111):

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

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

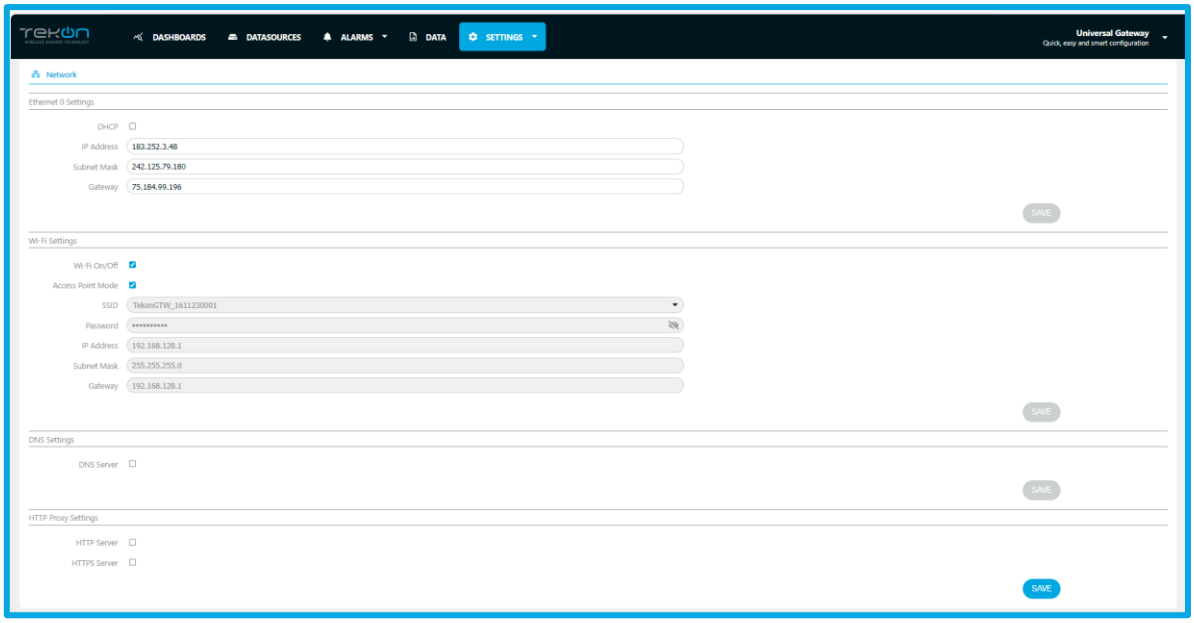


Figure 111 – Page to configure the device network.

6.5.2.1 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 112). With DHCP enabled, the above fields become non-editable, and the device automatically configures the respective settings (Figure 113). Whenever you make changes to these settings, you must save them by clicking the button SAVE.

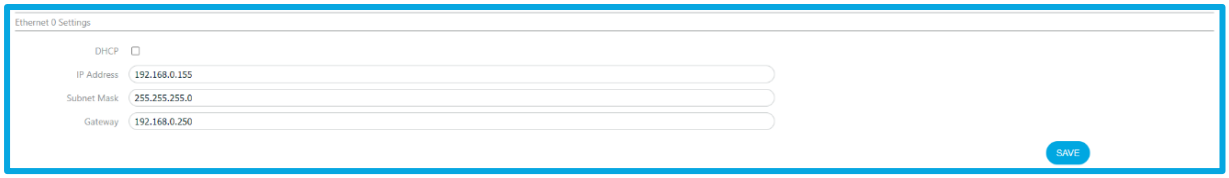


Figure 112 – Section to configure Ethernet 0 network with DHCP disabled.

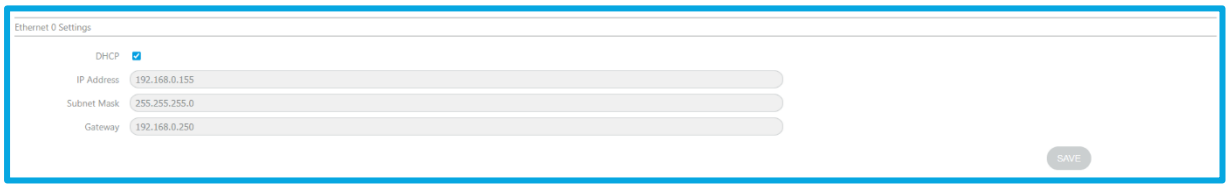


Figure 113 – Section to configure Ethernet 0 network with DHCP enabled.

6.5.2.2 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*).

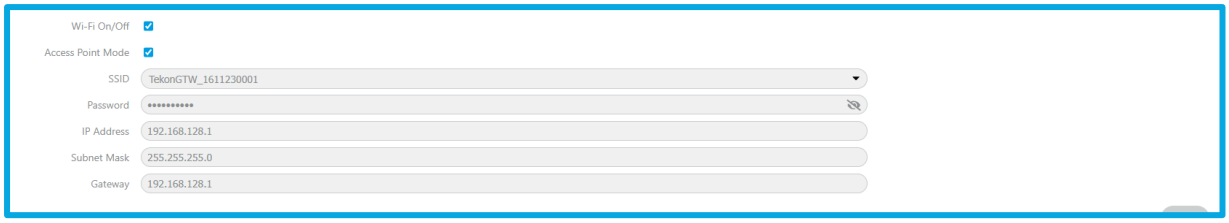


Figure 114 – Factory settings of the Wi-Fi module.

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 115 – 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.

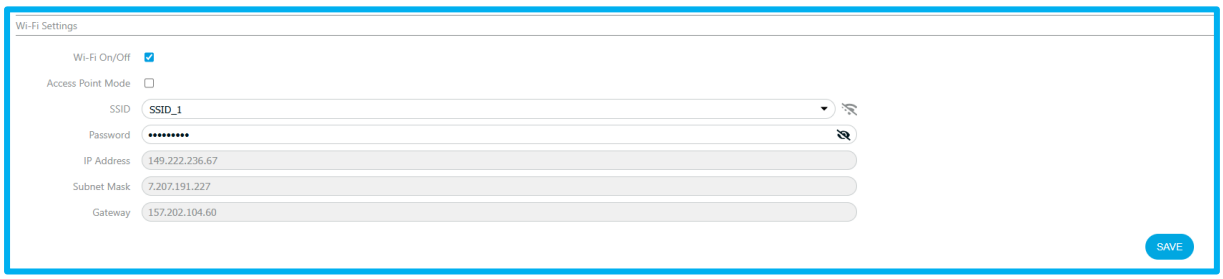


Figure 116 - Fields to be filled in to connect to a Wi-Fi network.

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 117 - 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 118 - uGateway display showing the Wi-Fi connection IP.

Figure 119 – 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.

6.5.2.3 DNS

The gateway also allows activating or deactivating the DNS (Domain Name System), optimizing interface performance and security, Figure 120. With DNS enabled, you can configure the address, Figure 121.

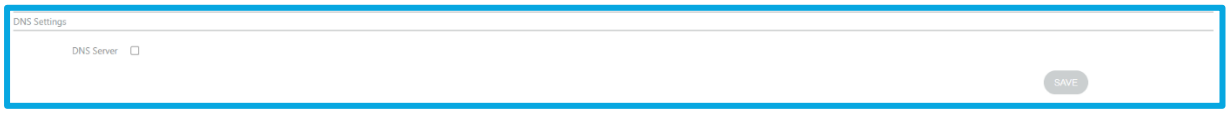


Figure 120 – Section to configure DNS: disabled.

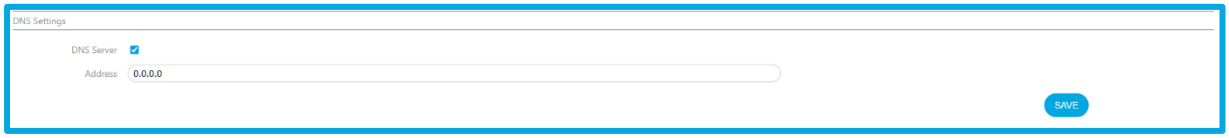


Figure 121 – Section to configure DNS: enabled.

6.5.2.4 HTTP Proxy

The gateway allows configuring the HTTP Proxy, which filters content in network traffic. This configuration can also be disabled, if necessary, Figure 122.

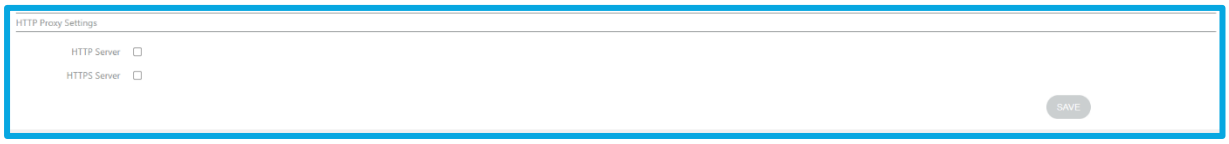


Figure 122 – Section to configure HTTP Proxy: disabled.

The device supports proxy for both HTTP and HTTPS servers, where you can configure their addresses and ports, Figure 123.

Figure 123 – Section to configure HTTP and HTTPS Proxy: enabled.

6.5.3 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 124. To do this, activate the cloud platform sync, edit the server URL fields, and enter the corresponding API key (Figure 125). Whenever you make changes to these settings, you must save them by clicking the button SAVE.

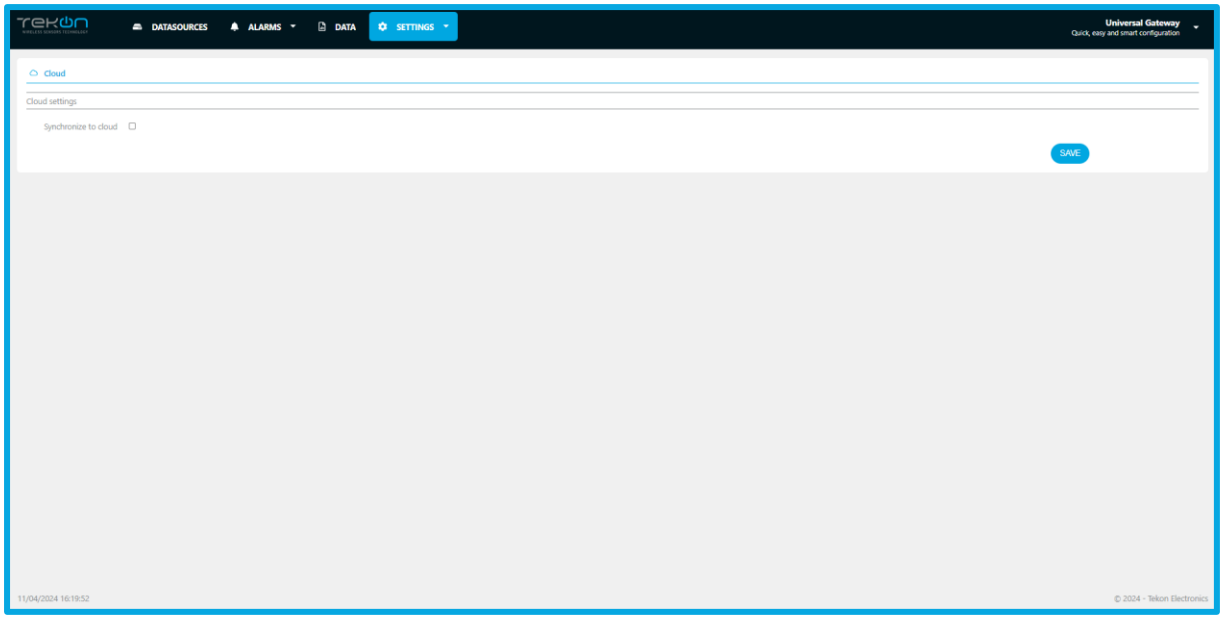


Figure 124 – Cloud Settings page.

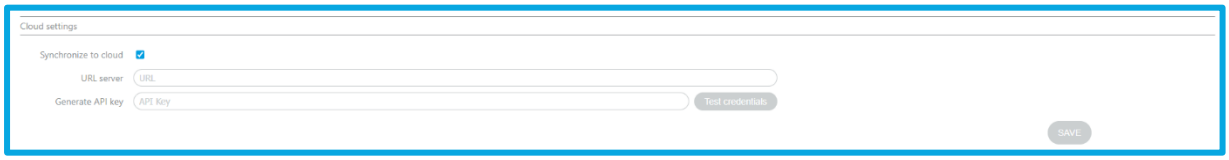


Figure 125 – Cloud configuration section with Cloud Checkbox enabled.

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 126), by clicking the button + Create User (Figure 127).

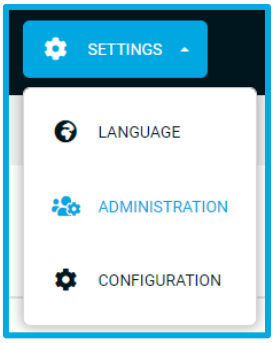


Figure 126 - Settings tab menu on the Tekon IoT Platform.

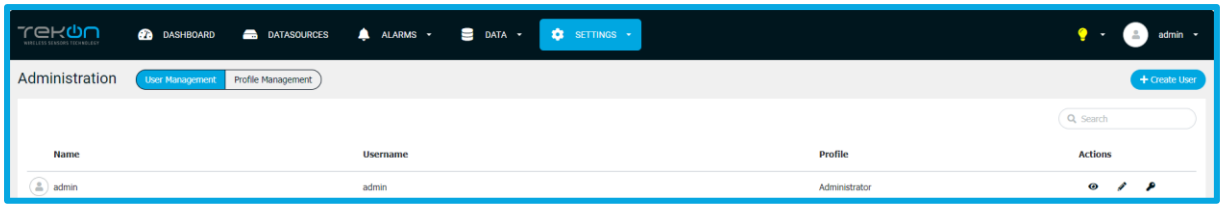


Figure 127 – Administration page on the Tekon IoT Platform.

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.

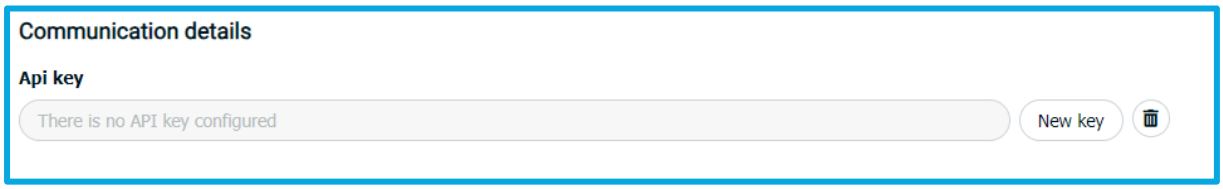


Figure 128 – User creation section on the Tekon IoT Platform.

After copying the API key, return to the Cloud Settings section of the gateway interface and paste the API key (Figure 129). Test these credentials by clicking Test credentials. If successful, a check symbol will appear, then save the changes by clicking SAVE.

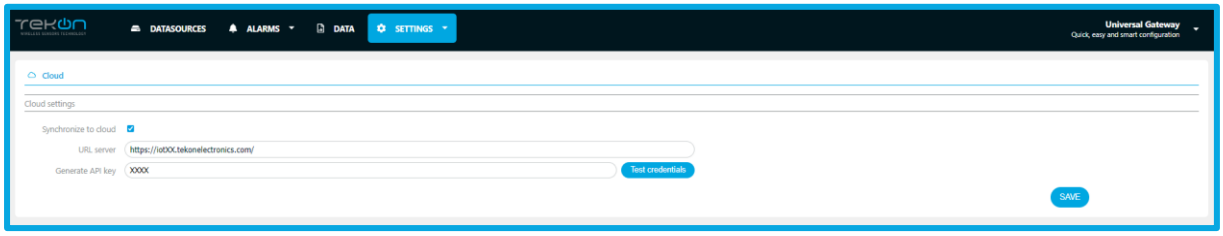


Figure 129 - Cloud Settings page with Cloud sync and API key.

6.5.4 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 130. In this case, the gateway receives requests to send data from the datasources of Tekon's DUOS and PLUS transmitters.

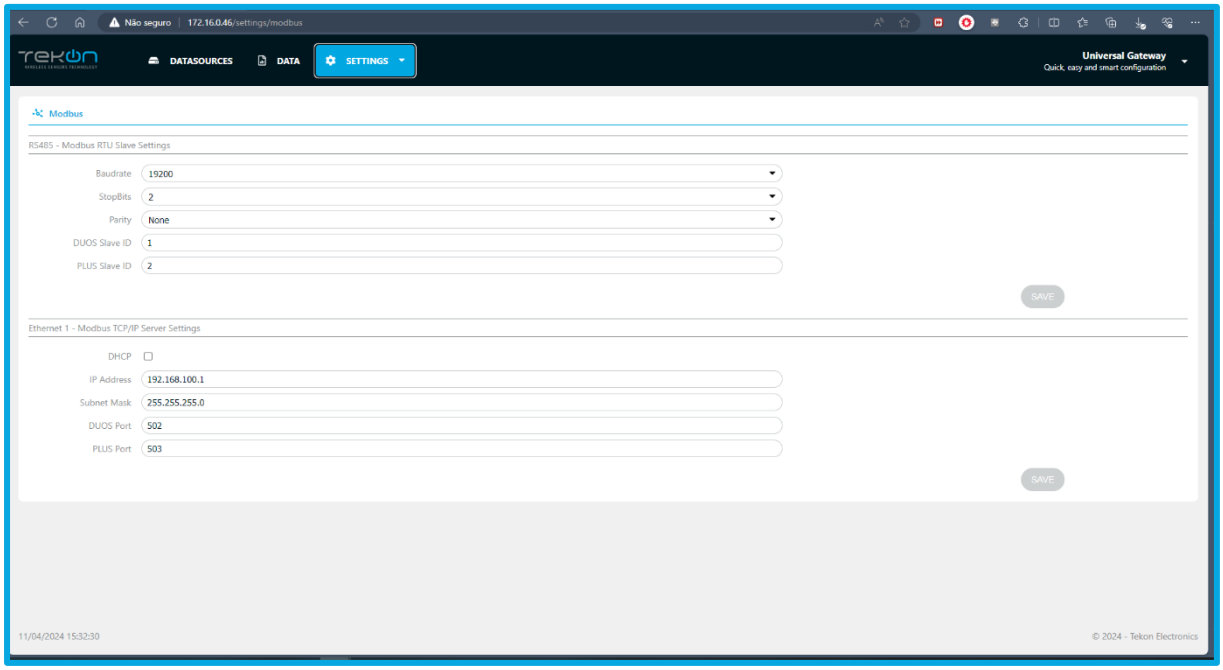


Figure 130 – Modbus Settings page in the base version of the device.

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

Figure 131 – 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 132. 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.

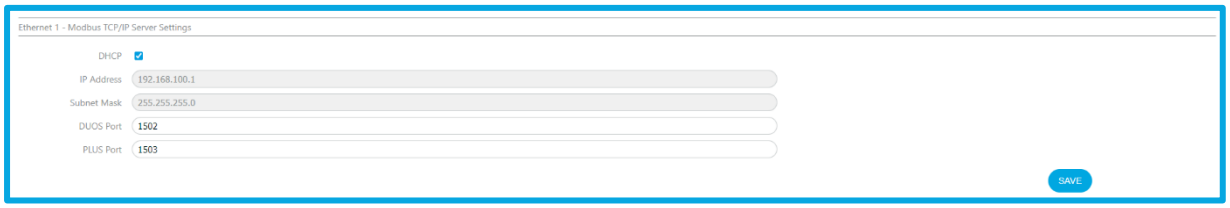


Figure 132 – Modbus TCP/IP section on the Modbus Settings page in the base version of the device.

6.5.5 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 133. After configuring, save the settings by clicking the button SAVE.

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

Figure 133 – Modbus RTU window section to configure Modbus RTU Master.

The next step is to add the slave by clicking the button ADD SLAVE and defining the Slave ID and Scan Rate (periodicity in seconds for reading data), Figure 134. After configuring, save the settings by clicking the button SAVE.

Figure 134 - 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 135. 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 135. 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.

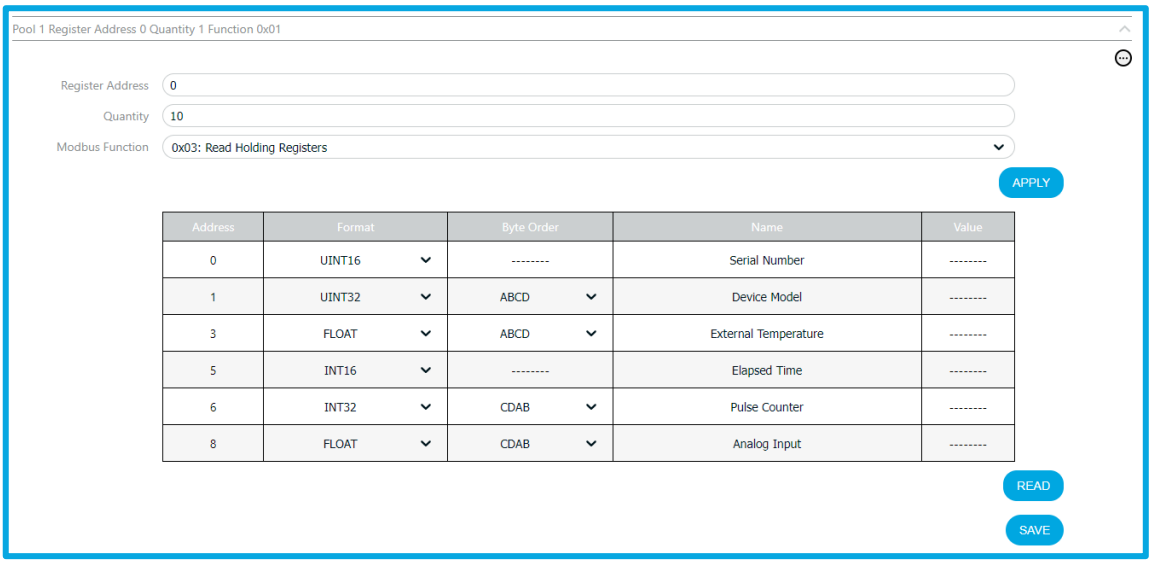


Figure 135 - Modbus RTU window section to configure Modbus RTU addressing.

Multiple requests with different parameters (pool) can be defined for each slave, Figure 136. 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.

Figure 136 – Modbus RTU window section for configuring slave requests.

6.5.6 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 137. 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.

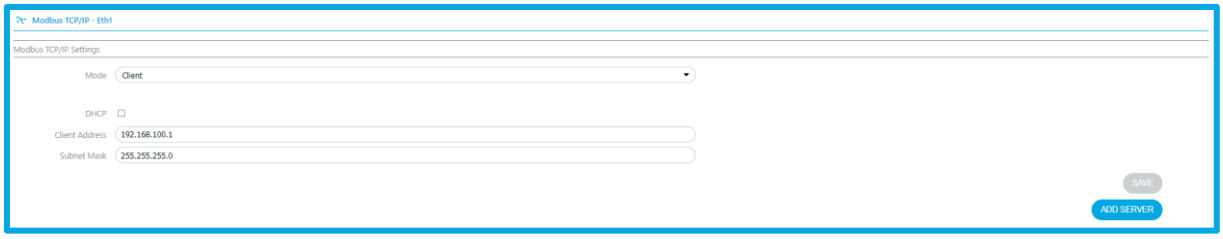


Figure 137 - Modbus TCP/IP window section to configure Modbus TCP/IP Client.

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 138. After configuring, save the settings by clicking the button SAVE.

Figure 138 - 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 139. 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 139. 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.

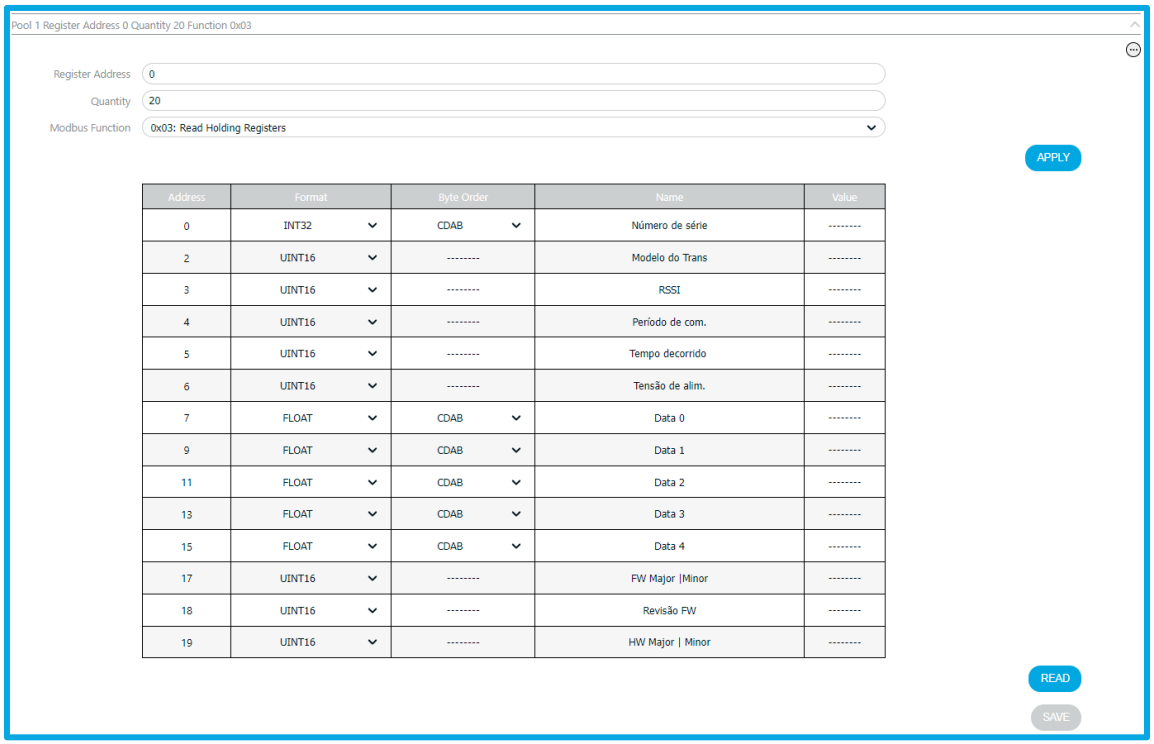


Figure 139 - Modbus TCP/IP window section to configure Modbus TCP/IP addressing.

Multiple requests with different parameters (pool) can be defined for each server, Figure 140. 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.

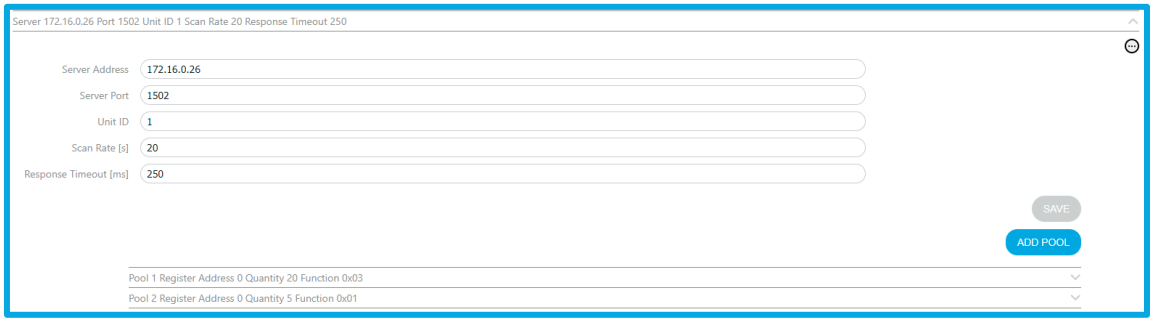


Figure 140 - Modbus TCP/IP window section to configure server requests.

6.5.7 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 141.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.

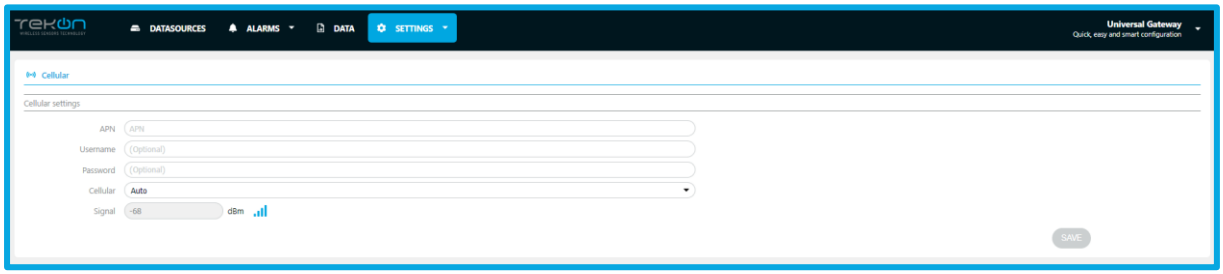


Figure 141 – Cellular Settings Page.

6.6 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 142).

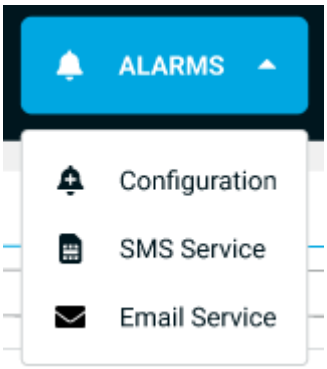


Figure 142 – Alarms tab Menu.

6.6.1 Configuration

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

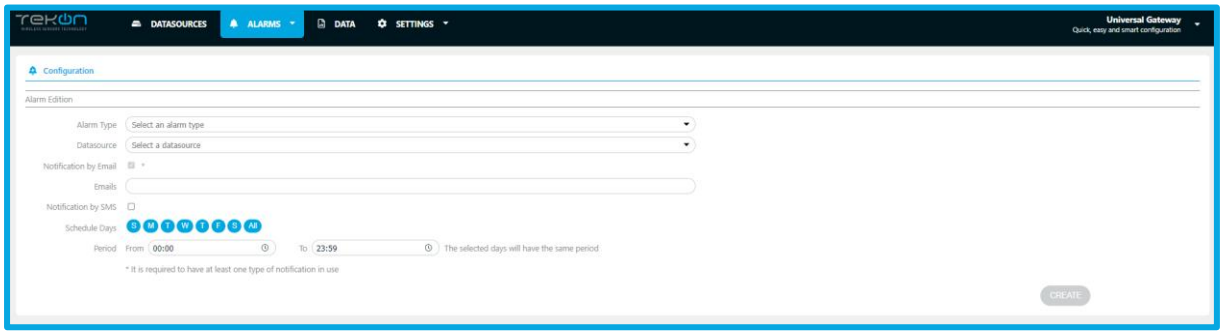


Figure 143 - Alarm Configuration Page.

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 144. 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 145.

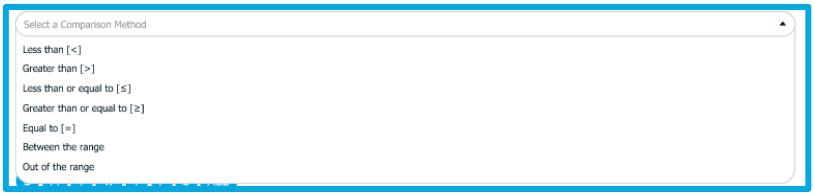


Figure 144 – List of comparison methods in value alarm configuration.

Figure 145 – 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 146. At the end of the configuration, click on CREATE to save the alarm.

Figure 146 - 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 147. 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 .

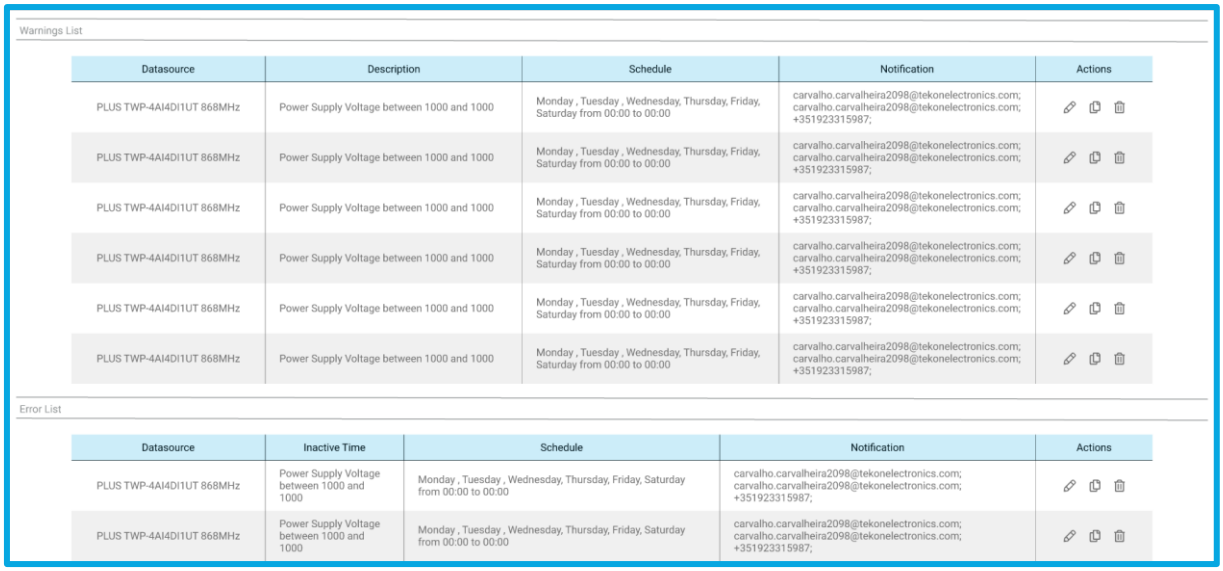


Figure 147 – Configured alarms list section.

6.6.2 SMS Service

SMS notifications can be made using an external service selected by the user, Figure 148. In this case, you only need to configure the service provider, account name, API key, and the SMS sender name.

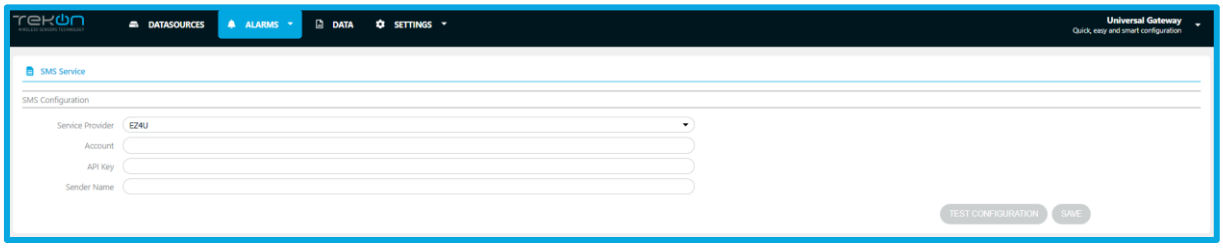


Figure 148 - SMS service configuration page for alarm notifications with an external service.

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 149.

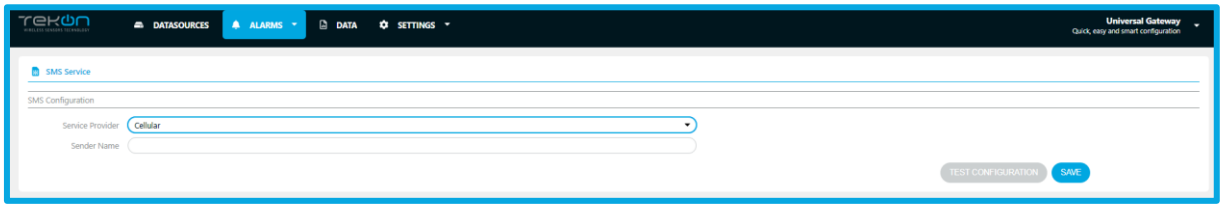


Figure 149 - SMS service configuration page for alarm notifications with the device's GSM module.

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.

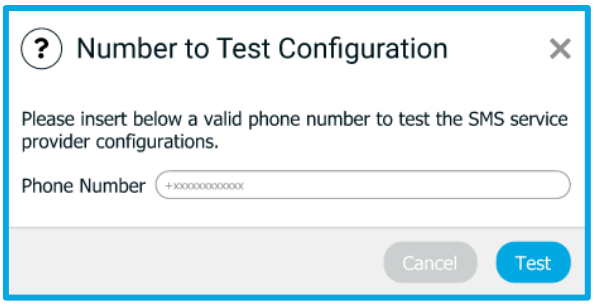


Figure 150 – SMS service configuration test page.

6.6.3 Email Service

The email service for receiving alarm notifications can be configured on the page shown in Figure 151. You can configure the email sending server (e.g., smtp.gmail.com), email service port, server access username, sender address, and server access password.

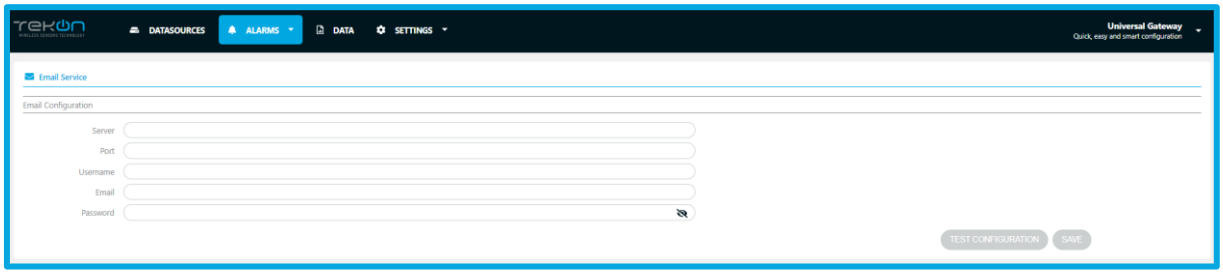


Figure 151 – Email service configuration page for alarm notifications.

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.

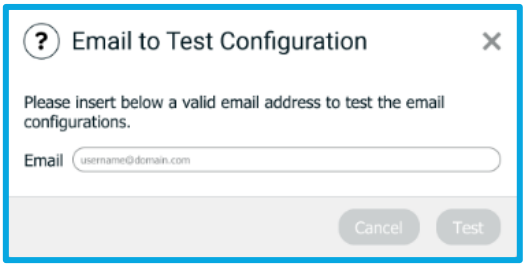


Figure 152 - Email service configuration test page.

The alarm notification email sent by the Universal IoT Gateway is exemplified in Figure 153.

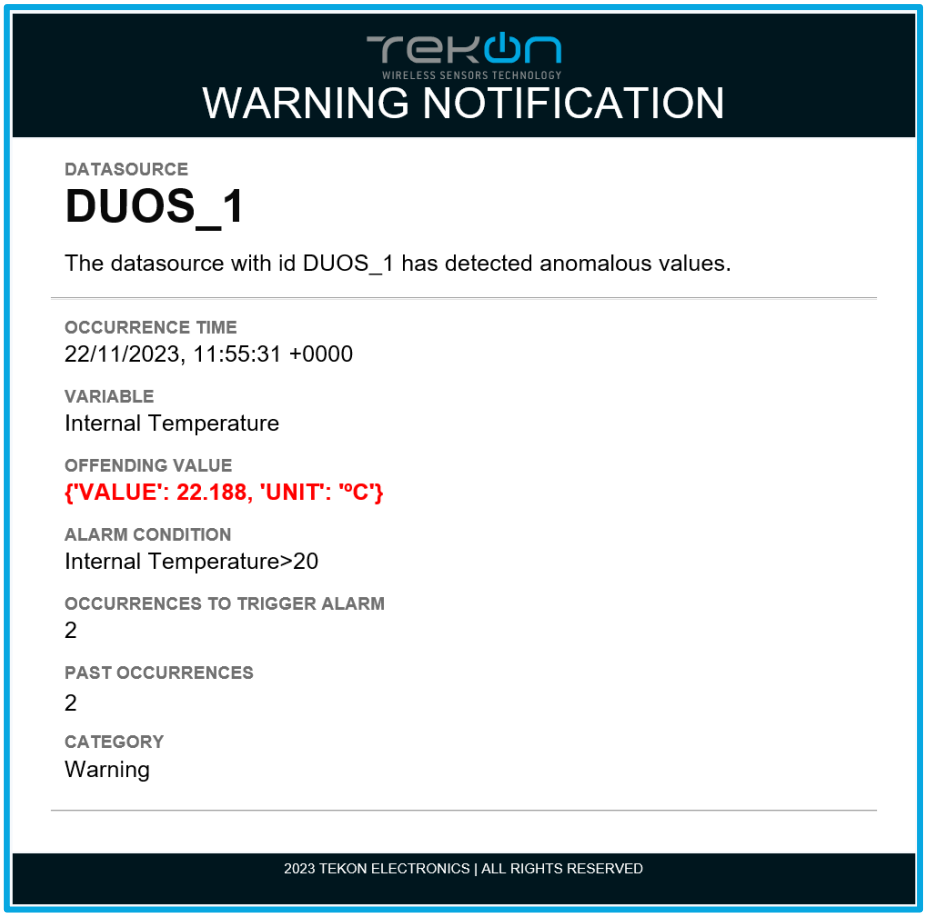


Figure 153 – Example of a value alarm email notification.

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 154.

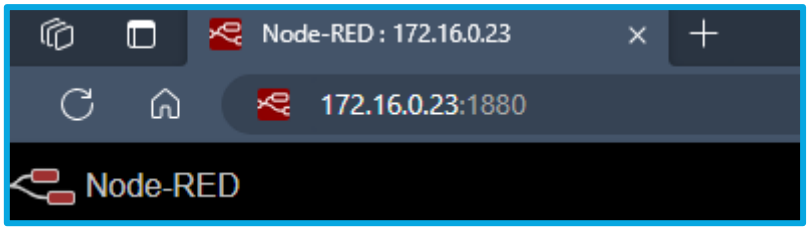


Figure 154 – Link to access the Node-RED page.

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

Figure 155 – 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/#*

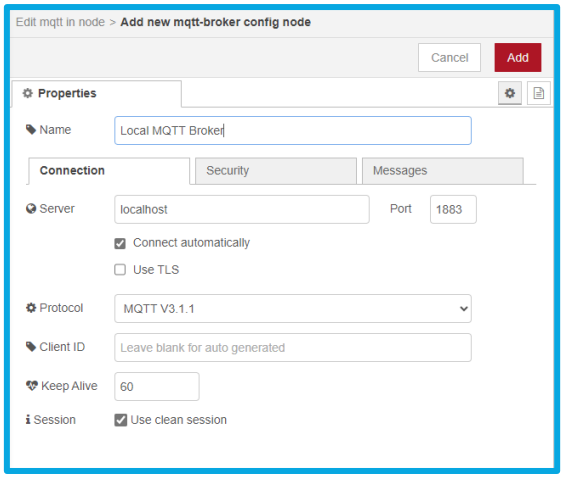


Figure 156 - MQTT Server configurations.

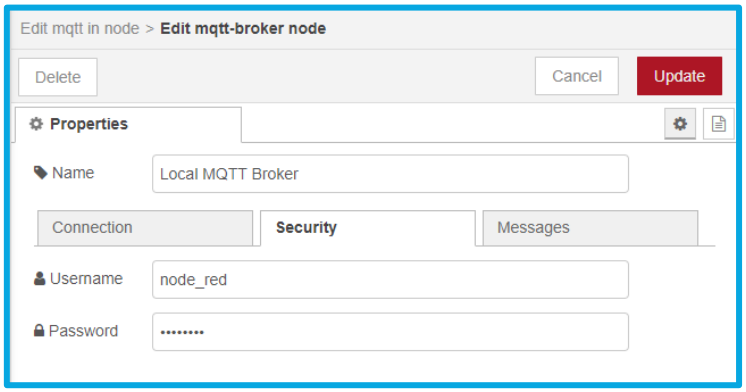


Figure 157 - MQTT Server configurations.

2. Click on Done;

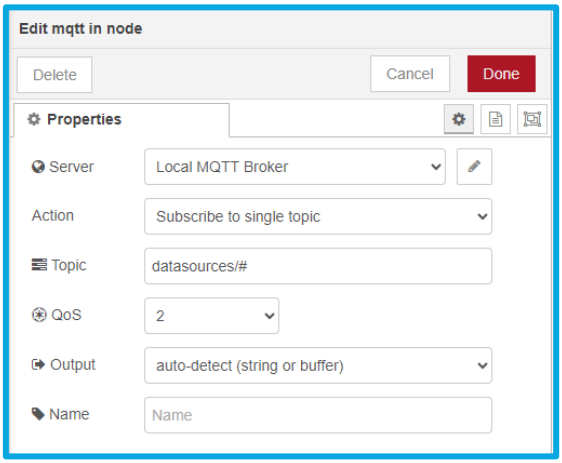


Figure 158 - MQTT Node configuration.

3. Add the Debug node and connect the nodes to each other;

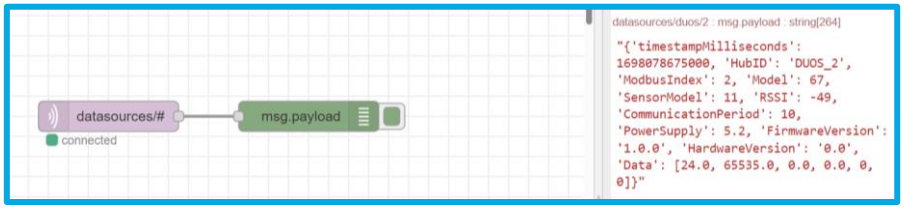


Figure 159 - Flow and Debug Message.

4. Click on *Deploy*;
5. 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 160 to Figure 168.

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 160 - Ethernet port 0 information.

Figure 161 - Ethernet port 1 information.

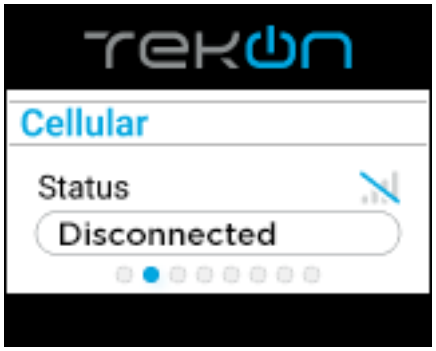


Figure 162 - GSM connection information.

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

Figure 163 - 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 164 - 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.

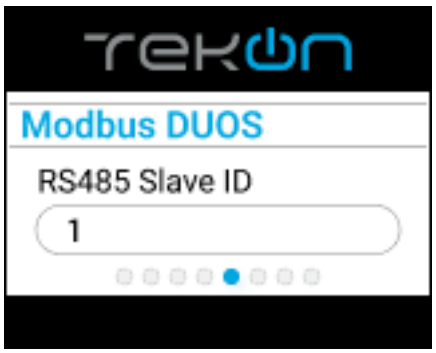
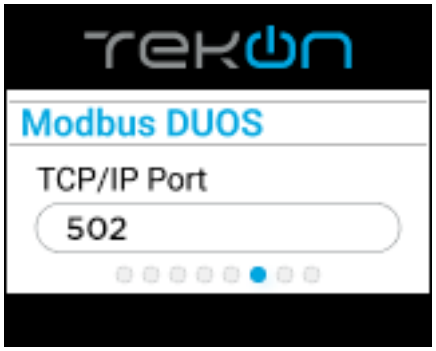


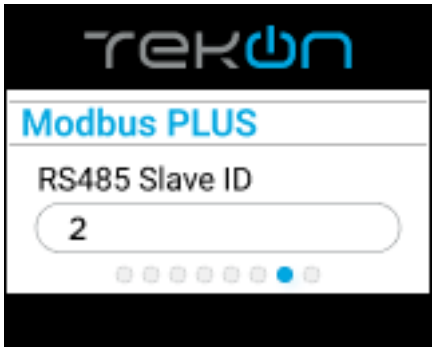
Figure 165 - DUOS devices slave information.

Slave address for connecting to DUOS devices.	Default: 1 (configurable) Disabled (Modbus RTU in Master mode).



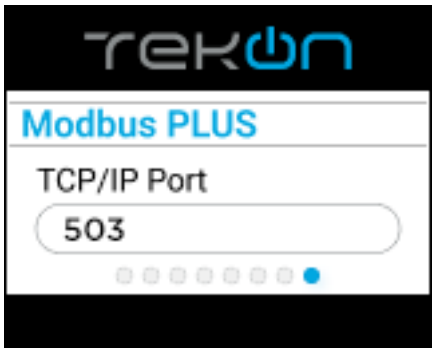
Access port for DUOS devices.	Default: 502 (configurable) Disabled (Modbus TCP/IP in Client mode).

Figure 166 - DUOS devices port information.



Slave address for connecting to PLUS devices.	Default: 2 (configurable) Disabled (Modbus RTU in Master mode).

Figure 167 - PLUS devices slave information.



Access port for PLUS devices.	Default: 503 (configurable) Disabled (Modbus TCP/IP in Client mode).

Figure 168 - PLUS devices port information.

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.

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