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English

Operating manual

Cloud Platform

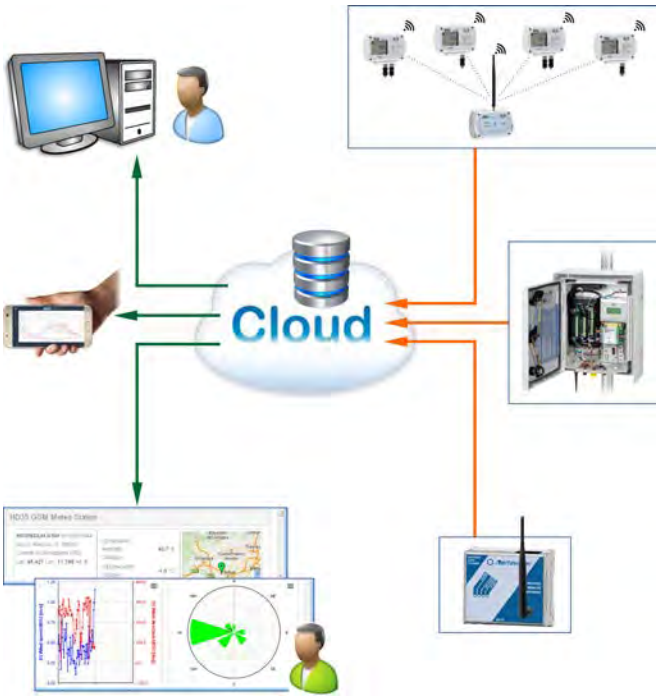

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TABLE OF CONTENTS

1 INTRODUCTION

This document is composed in order to describe the **DeltaOhm CLOUD Platform** to customers having experience with it: due to some still open issues (i.e. customers use conditions), the platform is naturally subject to further enhancement, likewise this Operating Manual is going to be simoultaneously updated.

DeltaOhm CLOUD Platform is a web application designed to:

- Collect measured data from activated loggers via HTTP or FTP through an Internet connection (e.g. 3G/GSM/GPRS modem or Wi-Fi/Ethernet LAN).
- Allow collected data access from anywhere in the world by web browsing (a default representation is available to immediately show received values).

DeltaOhm CLOUD Platform has been developed combining together different basilar elements:

- Standards from the market experience, such as HTTP/HTML5/JavaScript.
- Standard from the enterprise experience, such as Java Enterprise edition.
- Big Data structure, such as scalability, Virtual Server deployment, NoSQL (Cassandra, data storage) and MySQL (user profiles and network management) databases.
- Representational State Transfer (REST) protocol, easy to be implemented on embedded devices and provided with API to enable protocols extension for data collection purposes.
- Platform Services multi-tenancy.
- JSON meta-model, to easily define different devices data structure for measurements collection.

The highest level of flexibility in application accessibility is granted by:

- Compliance with desktop and mobile devices browser.
- Autonomous management of both activated devices assets and user permissions.
- Differentiated user authorization rules.
- Data Visualization Widget for customizable data layout.

Finally, collected data exportation is facilitated by:

- Sophisticated data collection algorithm to aggregate selected data into a standard CSV file format.
- Device and Data Visualization inclusion in external web application.

A great variety of devices can be configured to send their measurements data to the CLOUD Platform: HD35 series wireless datalogger, HD32MT series weather datalogger, sound level meters and any other field intruments connectable through HD61 gateway.

All gathered measurements values (e.g. temperature, relative humidity, dew point, atmospheric pressure, wind speed, direction and other physical quantities) can be displayed in a numerical form and in a graphical form as well (cartesian plots, histogram plots or wind rose plot) along a configurable time interval. Customer can easily aggregate them in subsets, in order to monitor and keep in evidence only the most interesting values.

Devices can be logically grouped to so called "Network", whose layout can show their relative position on a customized background picture or their absolute position on a geographical map. Moreover, a network of devices can be declared as public so that its measurements visualization can be linked in web pages and be accessed without specific permissions.

2 DESCRIPTION

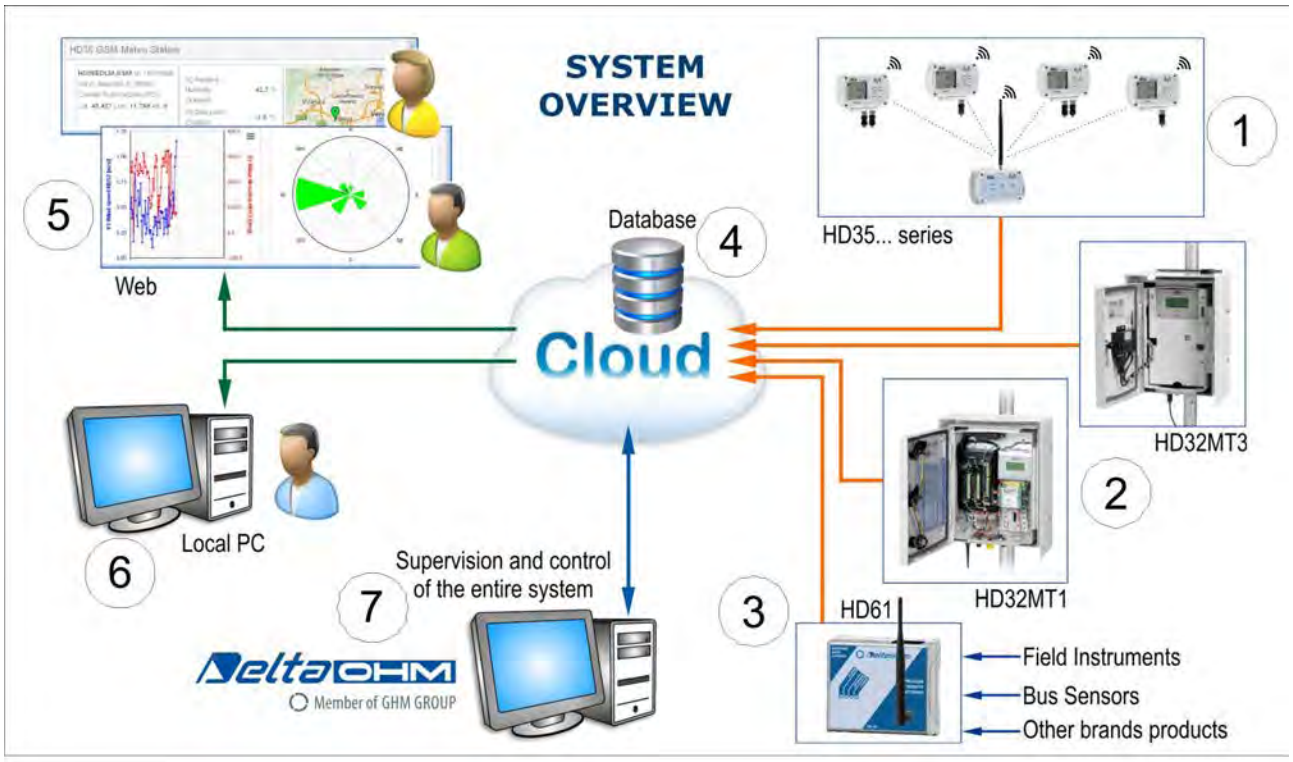


Fig. 1.1: CLOUD Platform description

1. **HD35 series**, wireless dataloggers (temperature, relative humidity, atmospheric and differential pressure, illuminance, irradiance, solar radiation, carbon monoxide, carbon dioxide, rainfall quantity, wind speed and direction, leaf wetness, WBGT index, acceleration, sensors with voltage free contact output or potentiometric output) with 3G/GPRS/Wi-Fi/Ethernet interface.

2. **HD32MT series**, wired datalogger (sensors with analog voltage output, sensors with analog current output, thermocouple temperature sensors, Pt100/Pt1000/NTC temperature sensors, sensors with digital or analog output for frequency and period counting, resistors and potentiometers, magnetic sensors, solar radiation sensors, open/close contact output sensors, sensors with RS485 output and MODBUS/RTU protocol, HD2003 and HD52 series anemometers) with GPRS/Ethernet interface.

3. **Field Instruments and Bus Sensors** with wired interface to a HD61 Gateway.

4. **Database**, designed to store measured data and devices information on one side, users accounts and allowed capabilities on the other.

5. **Web Interface**, it allows access to measured data visualization and measuring devices information both from desktop PC and mobile devices (i.e. tablet, smartphone, etc.).

6. **Local PC**, it allows users to operate on Web Interface according to their specific authorization level.

7. **Supervision and system control**,

3 PRELIMINARY OPERATIONS

3.1 CUSTOMER REGISTRATION

Once you received your first Cloud device, the following registration procedure needs to be fulfilled in order to be enabled to operate with Cloud platform.

1. Launch your browser and enter "**www.deltaohm.cloud**" in the navigation bar: the welcome page is shown.

Fig. 3.1.1: Cloud platform Welcome Page

2. Click on "Sign up here!": the registration form is shown.

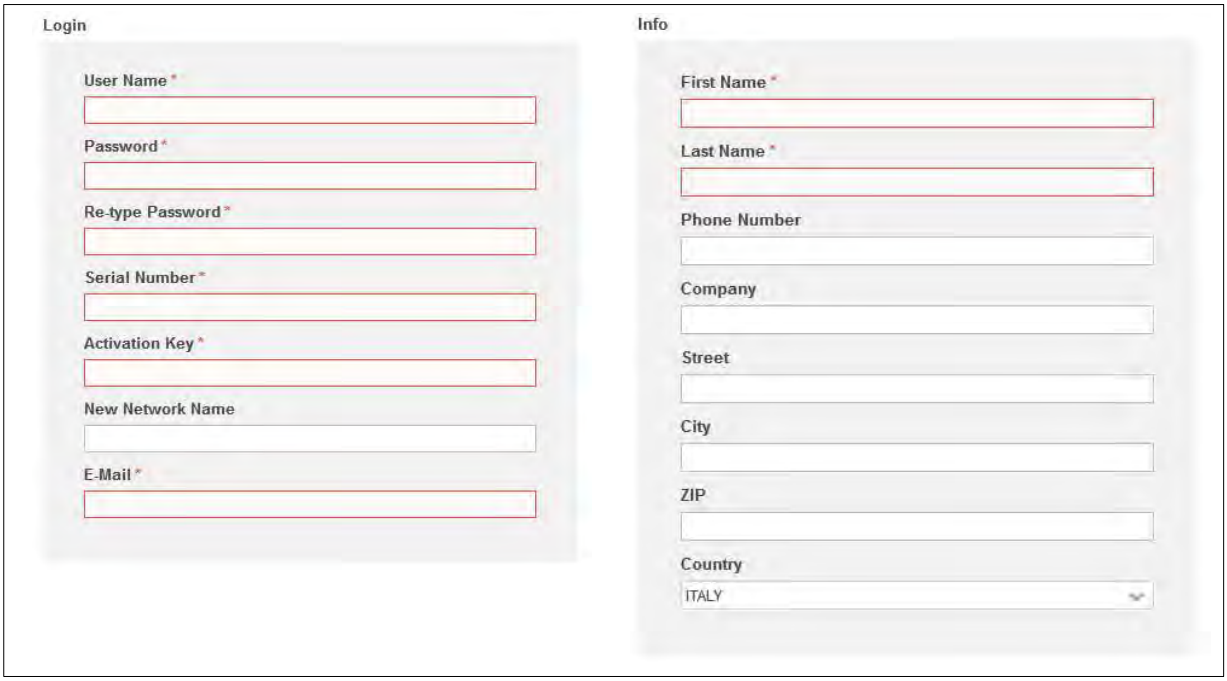


Fig. 3.1.2: Cloud platform Registration Form

3. Fill in the mandatory fields (red bordered) and define the User Name and Password to allow further accesses. The Serial Number can be read on the device identification sticker. The Activation Key has to be requested to Delta OHM.

4. Specify a valid email address and your job role, then select "Accept disclaimer" and click "Confirm".

Fig. 3.1.3: Cloud platform Registration Form

5. An email with an attached link will be sent to the specified address: once received, click on it to complete the registration.

6. The Administrator user account has been successfully created.

7. Go back to Welcome Page and enter Administrator User Name and Password: the opening Page is shown.

3.2 OPENING PAGE

The Cloud opening page is the Devices page, showing the list of all registered devices, described by Serial Number, Label, belonging Network and current operating Status.

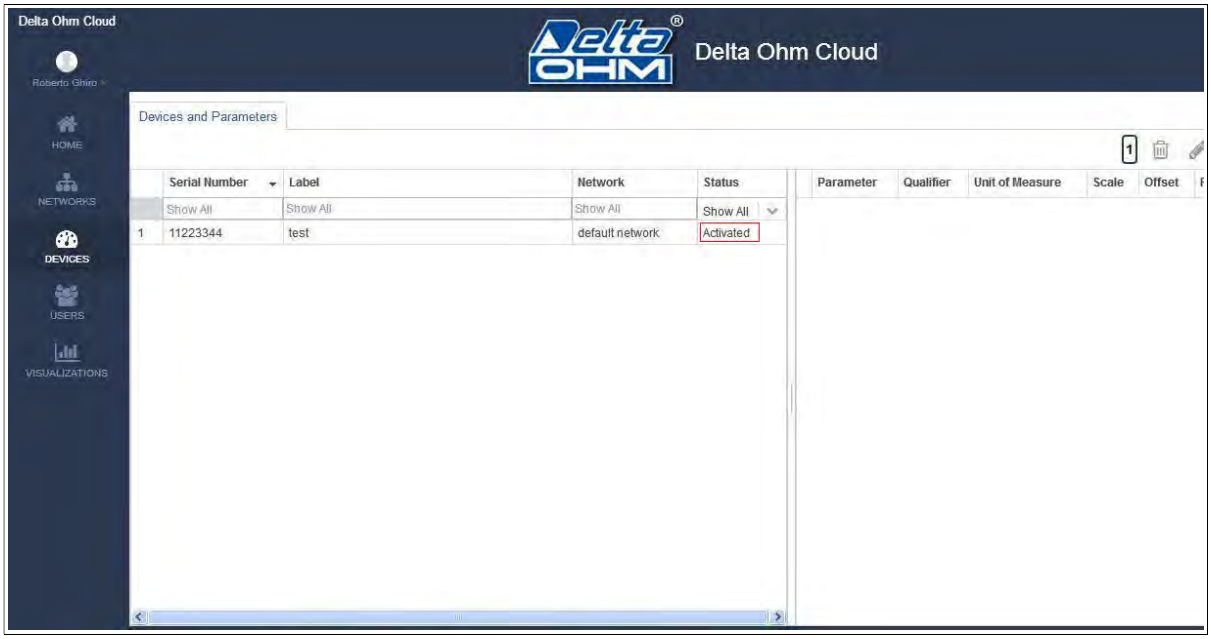


Fig. 3.2.1: Cloud platform Registration Form

When entering after Administrator user creation, the only Device in the list is the one whose Serial Number and Activation Key have been inserted along the registration:

- In the top right command bar the Counter label is set to "1".
- The just registerd device status turns from "Produced" to "Activated".

Once switched on, the registered Device sends its own configuration informations (name, type, measurements quantities list) to the Cloud portal: the Device status turns to "Connected".

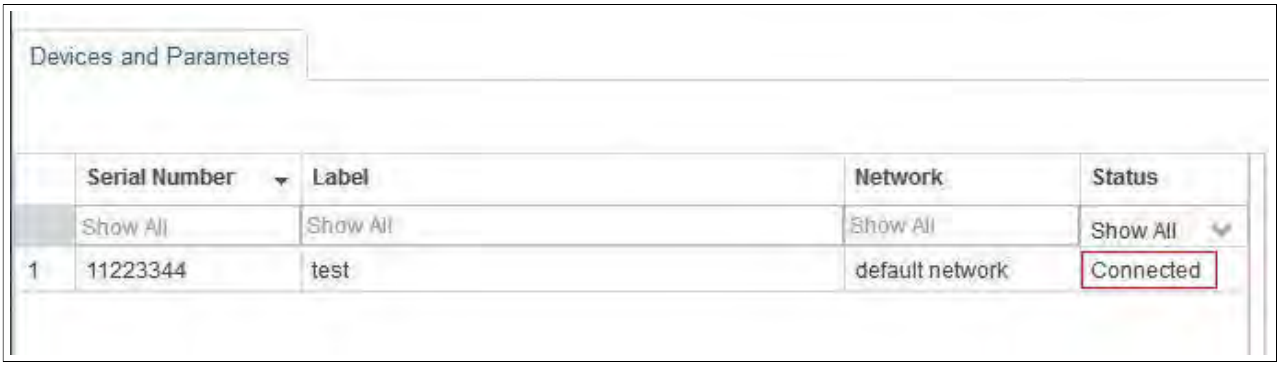


Fig. 3.2.2: Device "Connected" status

To avoid a sudden data traffic increase in the Cloud portal, by default the registered Device starts sending only first parameters measured values: no further settings are required to access the Device measured value default Visualization, with a single trace chart for each selected quantity.

1. Click on the Device row: the measured quantities list appears in the right panel.

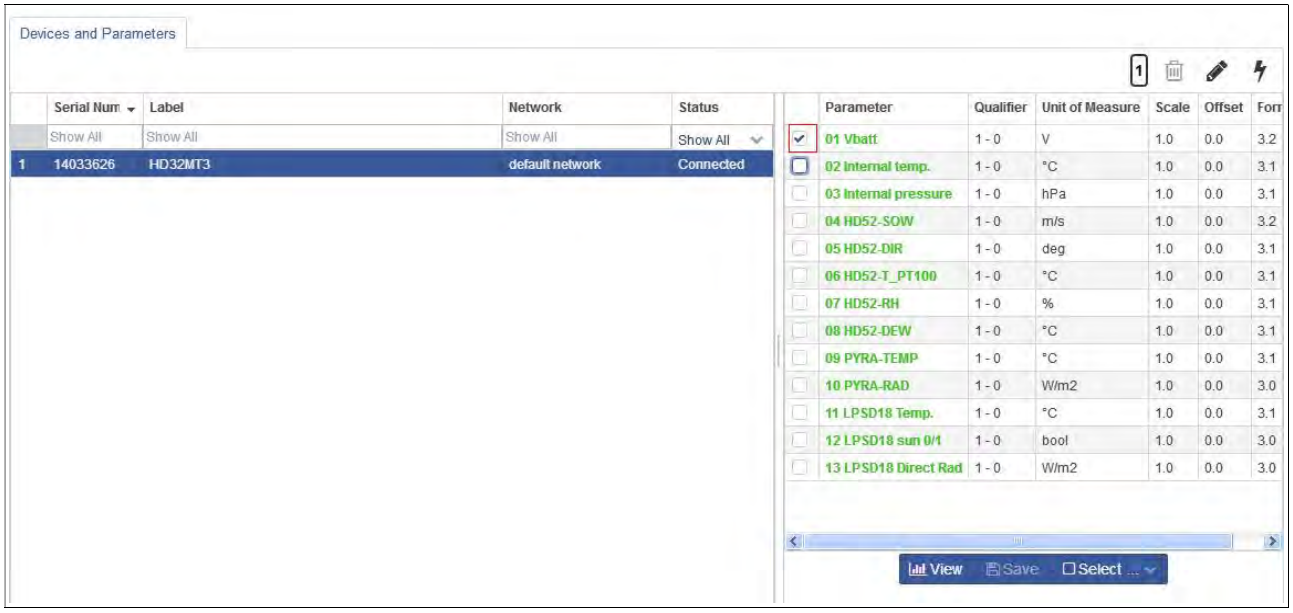


Fig. 3.2.3: Device parameters list

2. Click on "View" button at the bottom of the right panel: the Default Visualization window is shown.

Fig. 3.2.4: "View" button to open Default Visualization

3. The Default Visualization shows a linear graph for each selected measured quantity.

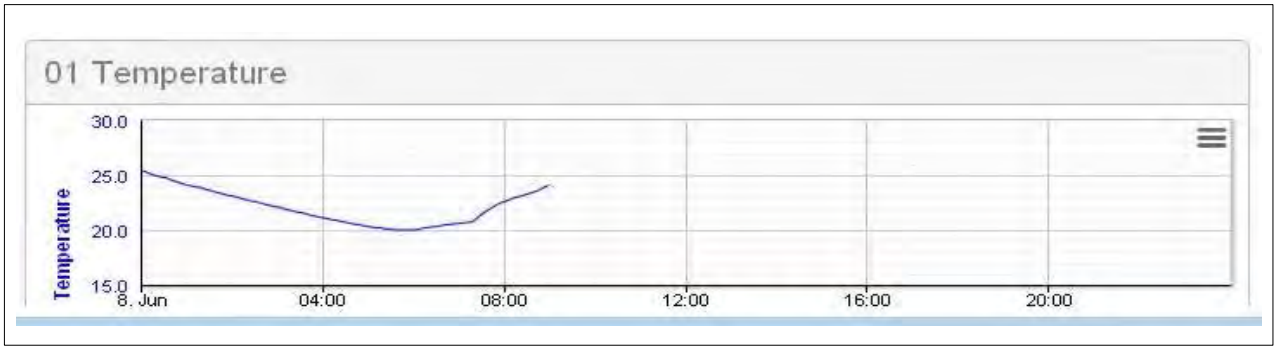


Fig. 3.2.5: Example of measured quantity graph

4. Pass the mouse pointer over the curve to get the sample value information.

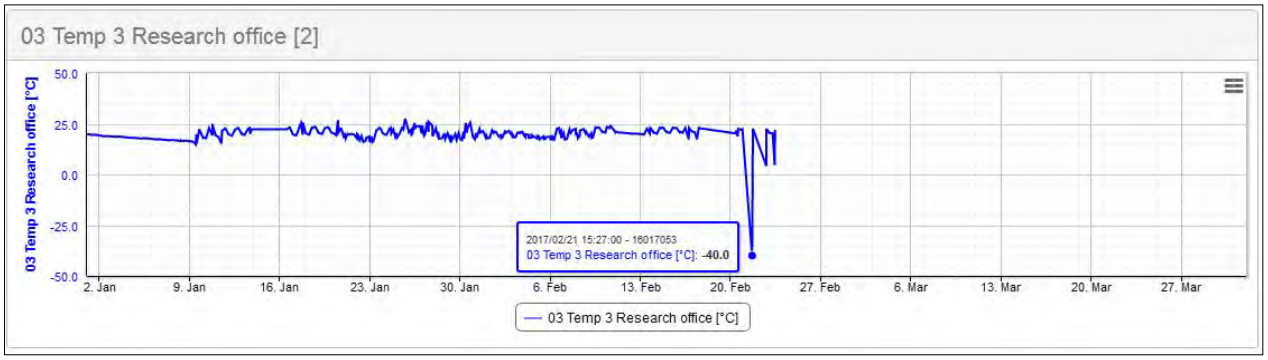


Fig. 3.2.6: Sample information frame

5. Default Visualization features are described in section 4.2.

3.2.1 MAIN PAGES BUTTONS

In the left column with blue colored background the main pages button are shown:

1. **Login** button: click on it to open the drop-down menu with "Sign out" item. Select this item to log out.
2. **Home** button:click on it to recall the Cloud Home Page (section 3.3).
3. **Networks** button: click on it to access the settings page for creation and management of Devices logical groups (section 6).
4. **Devices** button:click on it to access the cloud devices list and their measurements quantities default graphical visualization (section 4).
5. **Users** button: click on it to access the cloud users settings page for creation and management of different levels accounts (section 5).
6. **Visualizations** button: click on it to access the Custom Visualizations page for creation and management of desired measurements quantities graphical and numerical view (section 7).

3.3 HOME

The Cloud Home page shows a dashboard with:

1. **Network Data Usage**, a pie chart representing the received amount of data records for each connected Device (external ring) and for each Network (inner circle).
2. **Network User Access**, a pie chart representing the number of Cloud accesses for each registered User (external ring) and for each Network (inner circle).

Fig. 3.3.1: Cloud home page pie charts

3. **Device Logging**, a list of significant events described by "Action", "Device" and "Time Stamp" fields:
   - Point to the last position in the row header to make appear the "Gear" icon.
   - Click on it and the drop down menu appears
   - Select/Deselect the desired/undesired row fields by clicking on the corresponding menu item.

Fig. 3.3.2: Fields selection

4. **Active Sessions**, a list of all access events described by Login (User Name), Network, Start Date and Last Request.

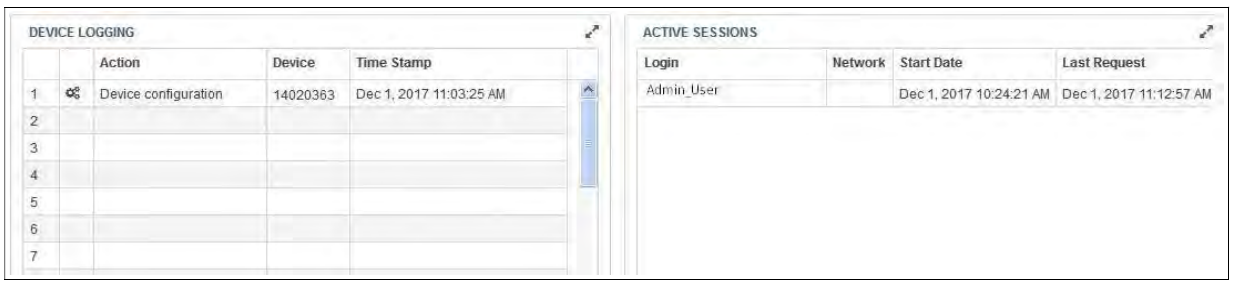


Fig. 3.3.3: Cloud home page lists

The column width in both Device Logging and Active Sessions lists can be easily adjusted by clicking on the vertical line and drag it to desired position.

Click on the "Expansion Arrows" icon in the top right corner of each frame to make it enlarge to full screen size.

Fig. 3.3.4: "Expansion Arrows" icon

4 DEVICES

At manufacturing time unique Serial Number and Activation Key are assigned to each CLOUD designed Device. Three Device states are provided:

1. Produced, when available in the portal list and ready to be shipped to customers.
2. Activated, when the customer adds it to its own Device list, by inserting Serial Number and Activation Key at First Registration Time or afterwards.
3. Connected, when its configuration has been received by the portal and it starts receiving the measurements data.

4.1 VIEW DEVICE PARAMETERS

1. If a different page is displayed, click on "Devices" button in the left blue column: "Devices and Parameters" tab is shown.

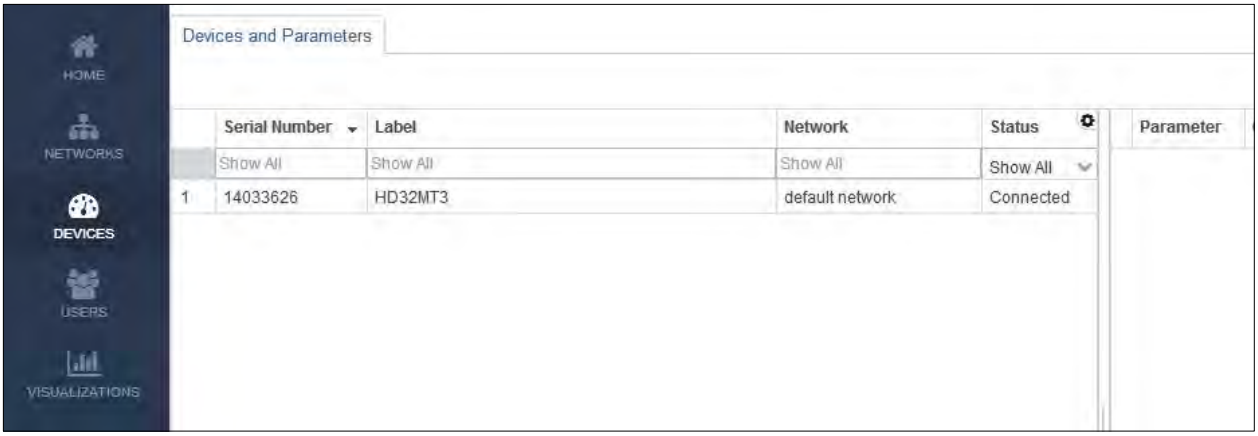


Fig. 4.1.1: Devices Main Page

2. Click on the Device row: its parameter list appears in the right table.

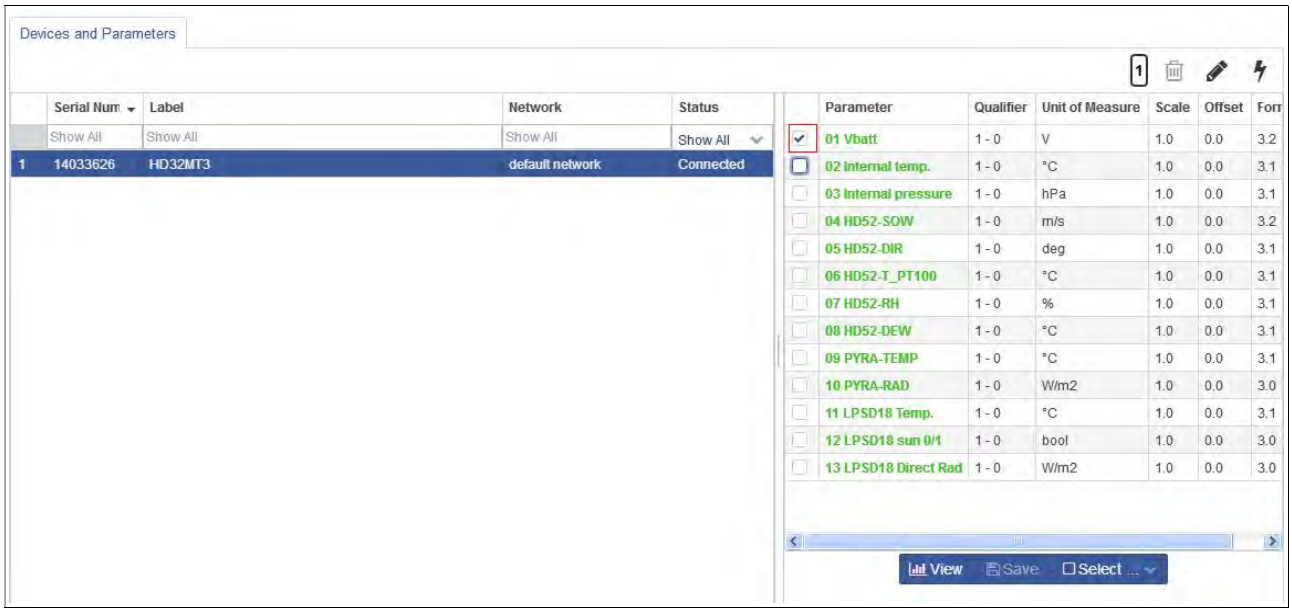


Fig. 4.1.2: Device parameters list

3. Select/Deselect the check box paired with the parameters to be included/excluded in the Default Visualization.

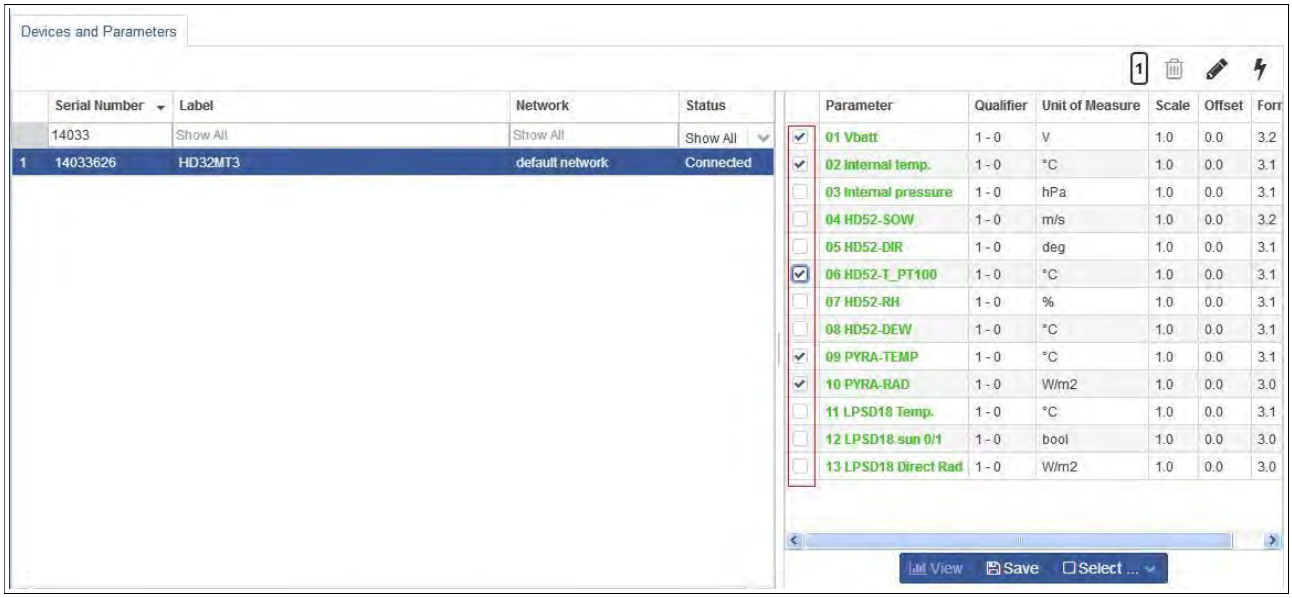


Fig. 4.1.3: Device parameters selection

4. Click on "Select" button for automatic parameters selection, available options are:

- "All", to select every parameter in the right column, independently from its being active (declared in current configuration) or not (declared in outdated configuration).
- "Only Active", to select parameters being active.
- "None", to deselect every parameter.

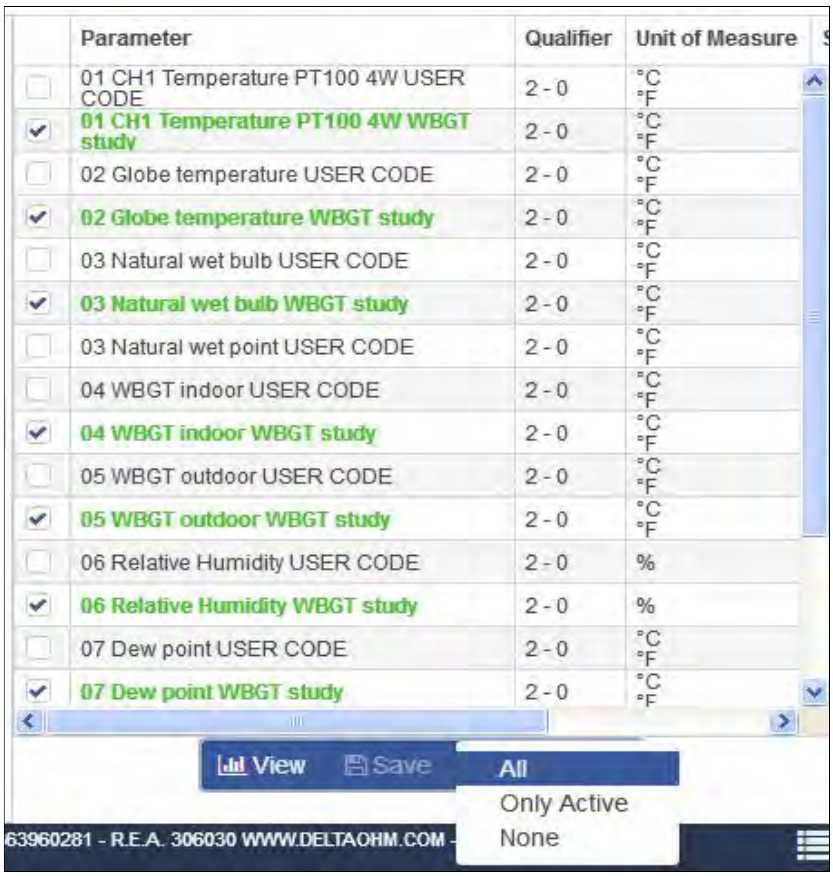


Fig. 4.1.2: Options for parameters automatic selection

***NOTE*:** Device parameters in the right column could be:

- Green colored, when declared in the current Device configuration.
- Grey colored, when declared in previous and outdated Device configuration.

5. When changing parameters check-boxes, the "View" button gets disabled and the "Save" button gets enabled: click on the "Save" button to apply changes.

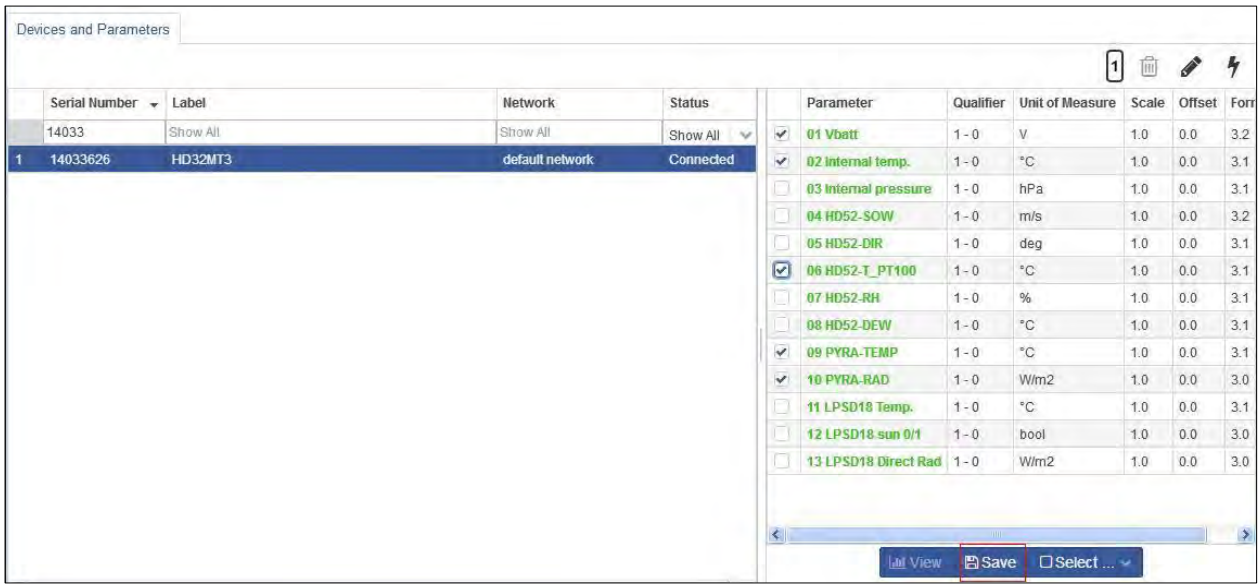


Fig. 4.1.3: Save changes to parameters selection

6. The "View" button gets enabled once again: click on it to the Default Visualization window is shown.

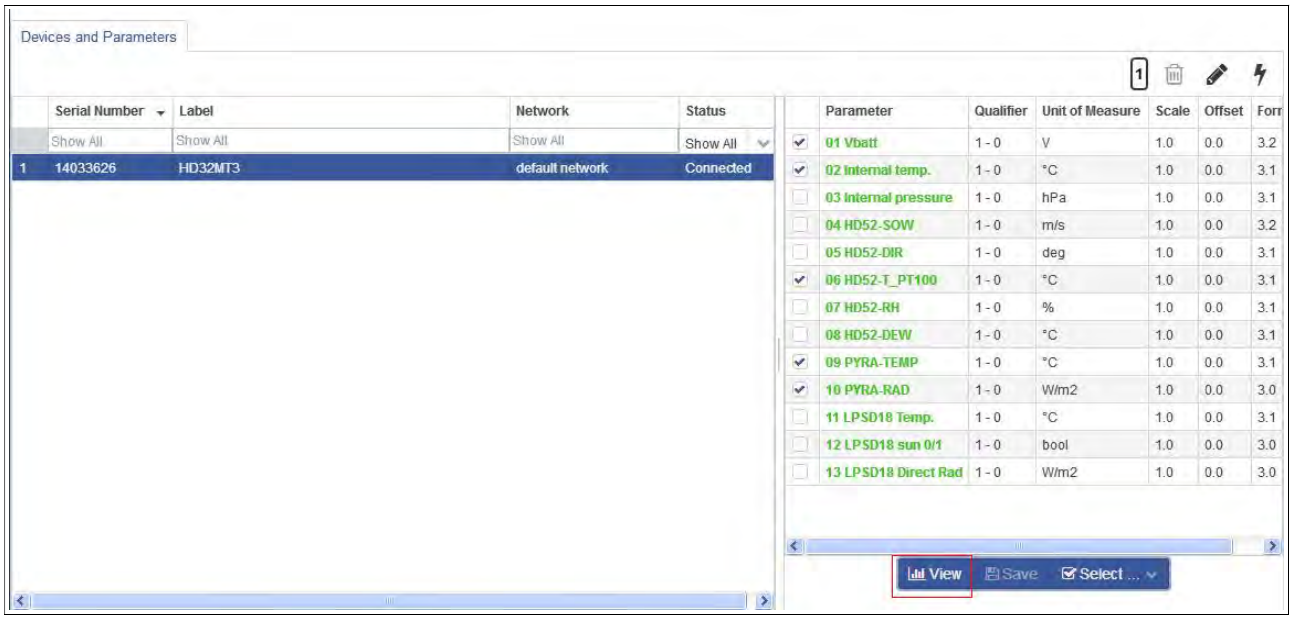


Fig. 4.1.4: Save changes to parameters selection

4.2 DEFAULT VISUALIZATION WINDOW

The Default View shows a graph for each selected measured quantity. Every time the Visualization window appears, the Start date and time are today at 00:00:00 for all the charts.

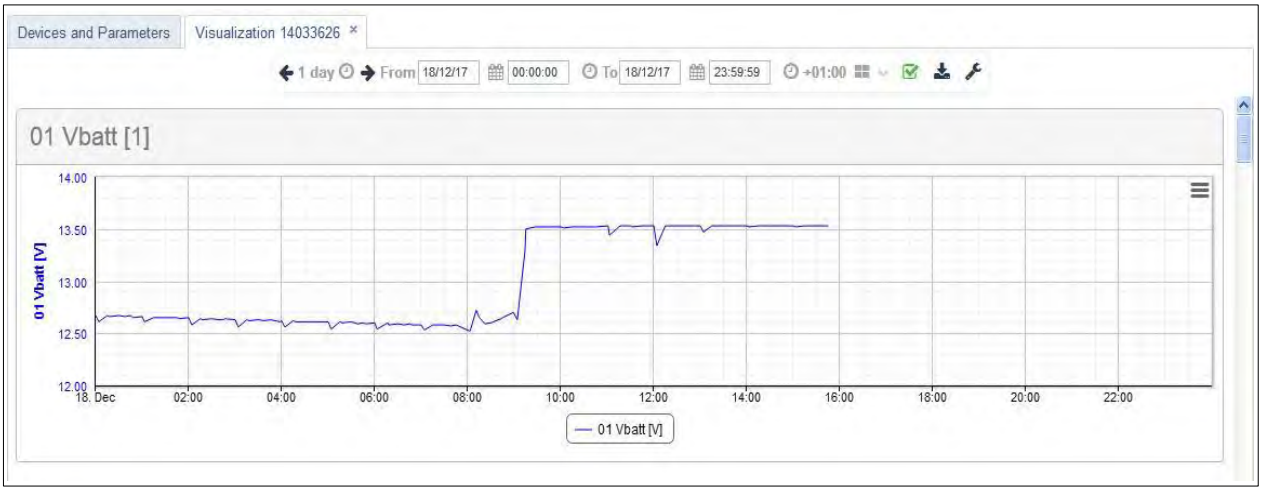


Fig. 4.2.1: Device parameters Visualisation

The top control bar allows adjusting and applying the following Visualization options to all graphs in the window:

1. Chart Start date and time, Stop date and time manual settings.
2. Chart time interval preset (starting from current hour, day, week, month, year beginning).
3. Chart time interval shift.
4. Chart download.
5. Chart grid, markers and scale.

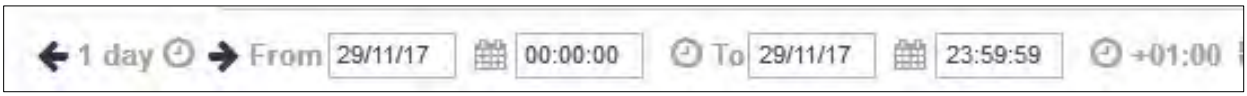


Fig. 4.2.2: Graph control bar

4.2.1 CHART START AND STOP MANUAL SETTINGS

Users can adjust the graph time window through the following steps.

1. Enter date and time to establish graph start ("From" text boxes) and stop ("To" text boxes), then click on the green checked box to apply.

Fig. 4.2.3: Start and Stop graph settings

2. Alternatively click on the "Calendar" icon: a monthly box appears to select the desired day.

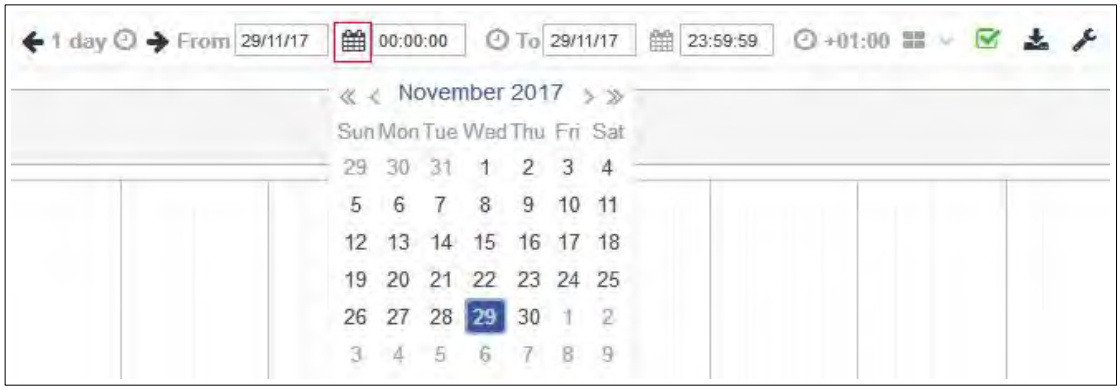


Fig. 4.2.4: Start date selection

3. Then click on the "Clock" icon": a three drop-down boxes frame appears to select the desired time. Confirm the selection by clicking on the check mark in the frame.

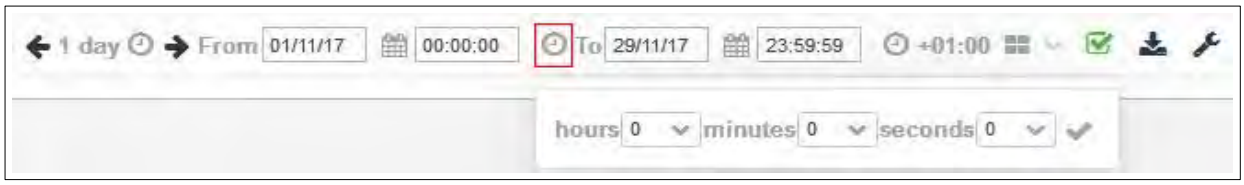


Fig. 4.2.5: Start time selection

4. Repeat steps 2 to 3 on "To" field icons.

Alternatively to manual settings, apply time interval preset as described in the following section.

4.2.2 CHART TIME INTERVAL PRESET

1. Click on the window icon in the right side of the top command bar: a drop-down menu opens to quickly arrange the graph interval.

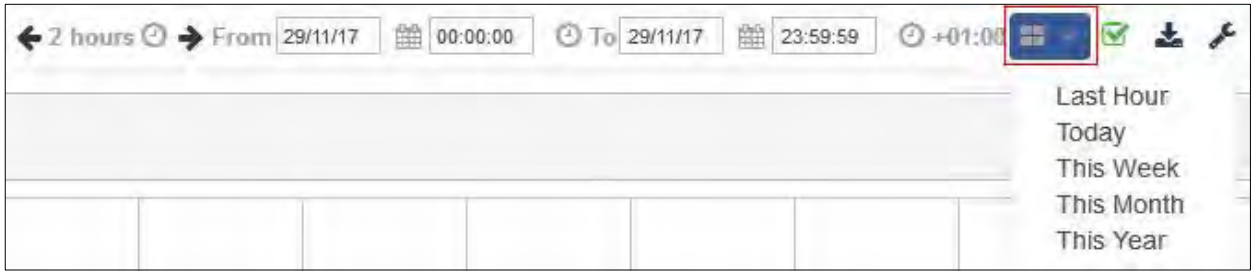


Fig. 4.2.6: Graph time interval preset

2. Select the desired item to set the time interval starting from the beginning of:

- The last hour (i.e. from "00" minutes and "00" seconds of current hour to now).
- Today (i.e. from 00:00:00 the current day to now).
- This week (i.e. from last Monday 00:00:00 to now).
- This month (i.e. from 00:00:00 of current month the 1st to now).
- This year (i.e. from 00:00:00 of current year January the 1st to now).

4.2.3 CHART TIME INTERVAL SHIFT

1. Click on the "clock" icon in the left side of the top command bar: the "Time Scroll" settings box appears.

Fig. 4.2.7: "Time Scroll" drop-down menu

2. Click on the drop-down box to choose the desired time unit.

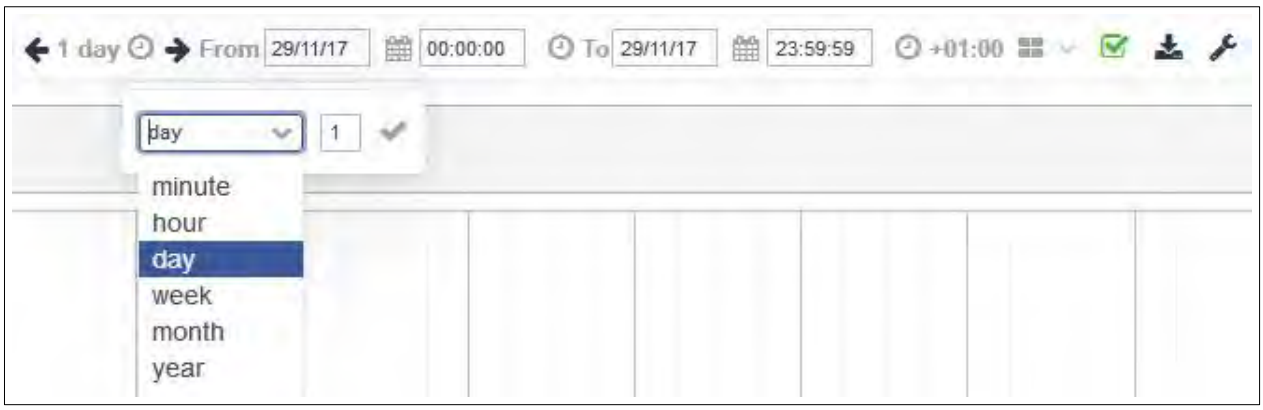


Fig. 4.2.8: "Time Scroll" unit drop-down box

3. Enter the desired number of selected time unit in the text-box.

Fig. 4.2.9: "Time Scroll" unit number text-box

4. Click on the check mark to confirm the selection: the Time Scroll interval is updated.

Fig. 4.2.10: "Time Scroll" interval

5. Click on the left or right arrow by the side of "Time Scroll size" to shift the previously set time interval back or forth along the horizontal axis.

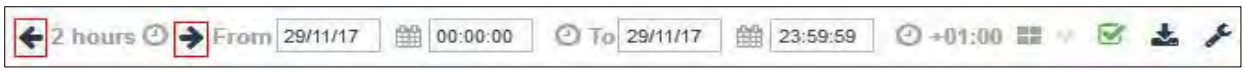


Fig. 4.2.11: Graph horizontal scroll application

4.2.4 CHART GRID, MARKERS AND SCALE

1. Click on "Wrench" icon to access Graph Options, select them, then click on the "tick" sign:

- Select the check box "Real Time", to have the graph automatically refreshed every time a new set of values is received.
- Select the check box "Show Grid", to have horizontal and vertical divisions depicted on the graph.
- Select the check box "Markers", to have the value points highlighted.
- Select the combo box "Scale" item, to set linear or logarithmic graph scale.

Fig. 4.2.12: Graph Options settings

4.2.5 DATA EXPORTATION

The measurements values shown in the graph can also be exported to file format through the following steps.

Fig. 4.2.13: Download icon in the top control bar

Click on the "Download" icon in the top control bar and the Exportation Window appears:

Fig. 4.2.14: Graph Exportation Window

1. Select "Single File" Export Mode to create one CSV file with all the displayed measurements; selecte "Multiple File" to create one CSV file for each displayed measurements.

2. Select the desired column and decimal separators from the corresponding combo boxes.

3. Open the "Time Interpolation" combo box and select how many values are to be exported ("All" for every saved value, "15 minutes" for 1 value every 15 minutes, "1 hour" for 1 value every hour).

4. Specify an email address to send exported data as attachment.

Each graph can also be printed or exported as PNG, JPEG, PDF or SVG file:

1. Click on the "List" icon in the top right corner of the interested graph.

2. Select the desired exported format in the drop-down menu.

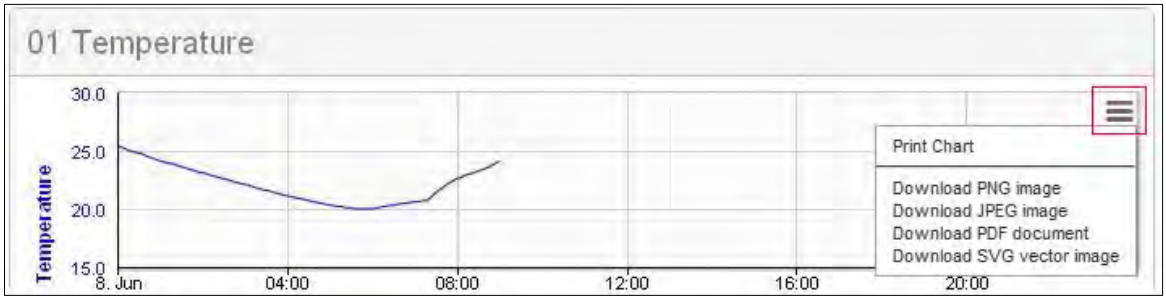


Fig. 4.2.15: Graph Exportation format

4.3 MODIFY DEVICE INFORMATIONS

Device information are displayed through 5 tabs in "Modify Device" window: Administrator User can read them all, but only some fields are changeable.

1. Click on the device row in the left table: its parameters list appears in the right table.

2. Click on the "Pencil" icon to modify Device information.

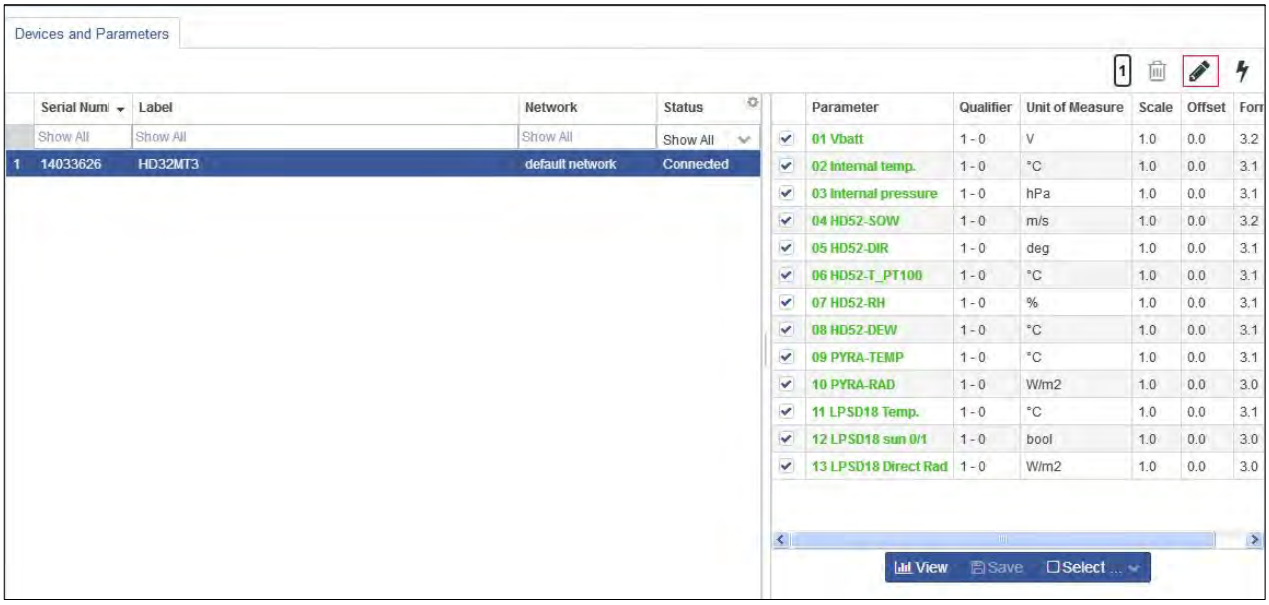


Fig. 4.3.1: "Device and Parameters" tab, "Pencil" icon

3. The "Modify Device" window appears.

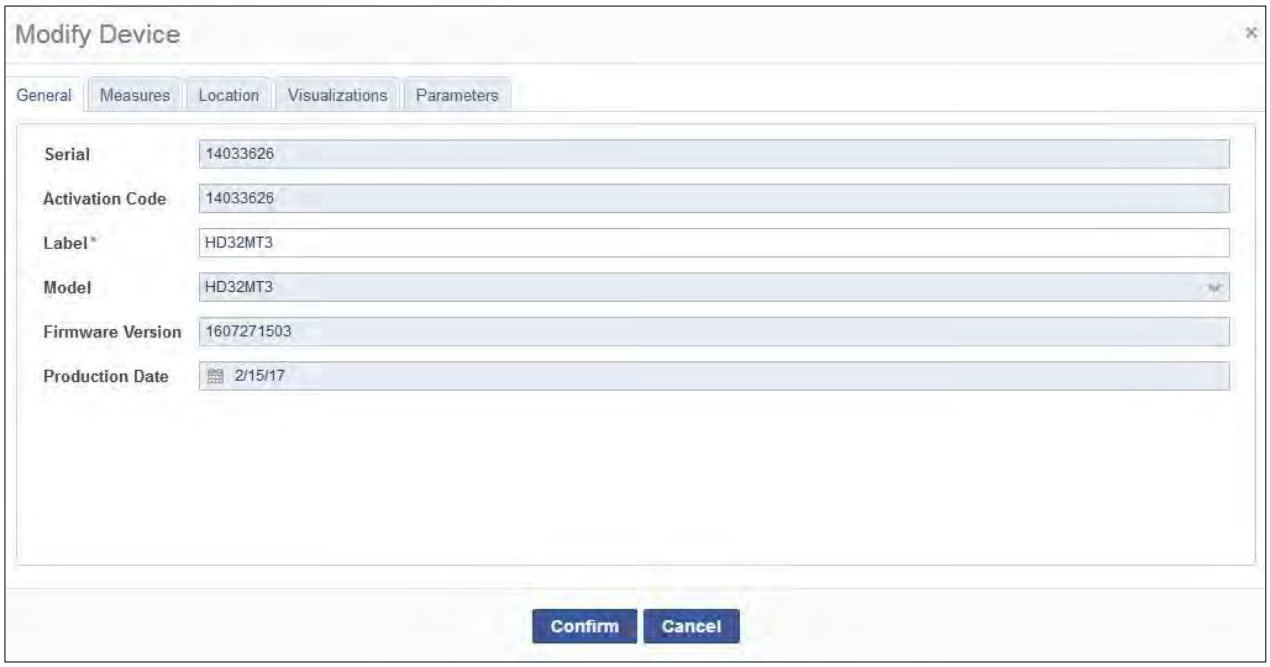


Fig. 4.3.2: "Modify Device" window, "General" tab

4. In the "General" tab there are 6 fields, as described in the following table.

	NAME	DESCRIPTION	STATUS
1	"Serial"	Device serial number	steady
2	"Activation Code"	Numerical sequence needed to take the Device from idle (Produced state) to communicate with CLOUD portal	steady
3	"Label"	String for Device brief description	changeable
4	"Model"	Device technical type identifier	steady
5	"Firmware Version"	Running firmware identifier	steady
6	"Production Date"	Date of Device being ready for shipping	steady

5. Click on "Measures" tab, there are 4 fields, as described in the followin table.

	NAME	DESCRIPTION	STATUS
1	"Status"	Selected Device current state	steady
2	"Last contact date"	Last received data timestamp	steady
3	"Read API Key"	Device identification code for reading operations	changeable
4	"Write API Key"	Device identification code for writing operations	steady

Fig. 4.3.3: "Modify Device" window, "Measures" tab

6. Click on "Location" tab, there are 4 fields, as described in the following table.

	NAME	DESCRIPTION	STATUS
1	"Address"	Location where selected device has been placed	changeable
2	"Latitude"	Geographical coordinates where selected device has been placed	changeable
3	"Longitude"	Geographical coordinates where selected device has been placed	changeable
4	"Elevation"	Mean Sea Level of selected device location	changeable

Fig. 4.3.4: "Modify Device" window, "Location" tab

7. Click on "Visualizations" tab, there are 2 fields, as described in the following table.

	NAME	DESCRIPTION	STATUS
1	"Network"	The subset selected Device belongs to	steady
2	"Visualizations"	Defined Visualizations involving selected Device measurements	steady

Fig. 4.3.5: "Modify Device" window, "Visualizations" tab

8. Click on "Parameters" tab, all measured quantities are listed by 8 fields, as described in the following table.

	NAME	DESCRIPTION	STATUS
1	"Identifier"	String describing the measured quantity	steady
2	"Qualifier"		steady
3	"Unit of Measure"	Measurement unit label	steady
4	"Scale"	Tilt factor potentially multipling the translated value (useful for measuring unit transformation, e.g. from Celsius to Fahrenheit degree)	steady
5	"Offset"	Translation Value potentially added to measured value (useful for measuring unit transformation, e.g. from Celsius to Fahrenheit degree)	steady
6	"Format"	Measured value integer digits number and fractional digits number	steady
7	"Activity Interval"	Timestamp of the first received data (last received data timestamp is recorded only in case of reception break)	steady
8	"Id"	Numerical input reference	steady

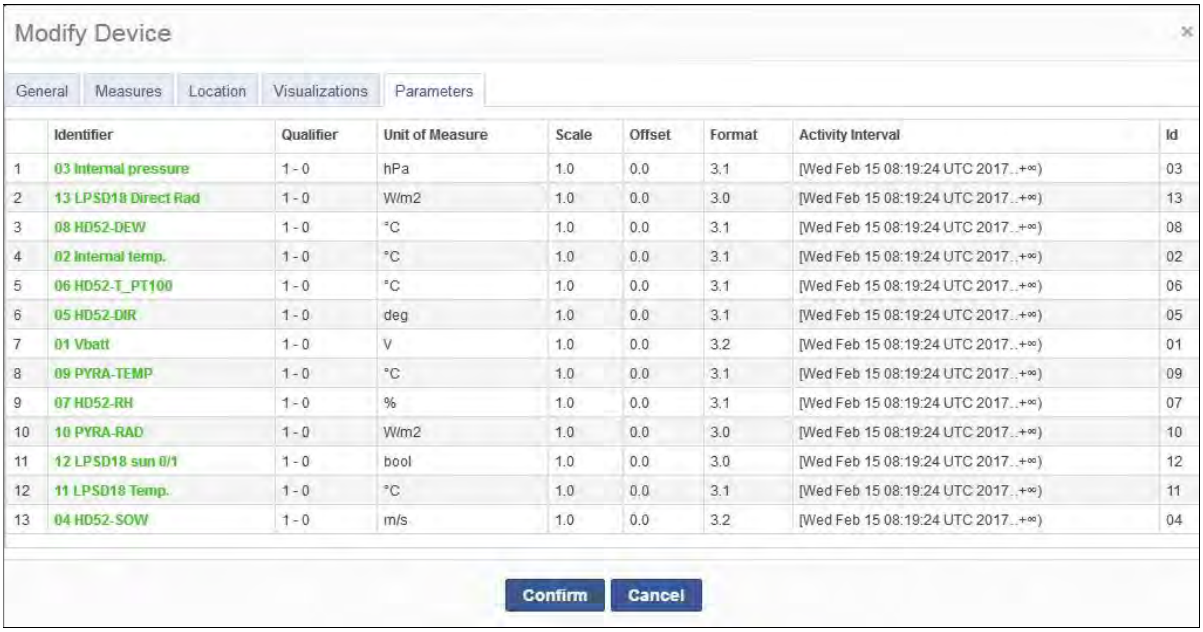


Fig. 4.3.6: "Modify Device" window, "Parameters" tab

Enter any desired changes, then apply by clicking on "Confirm" button or quit by clicking on "Cancel" button.

4.4 DELETE A DEVICE

Administrator User can delete a device, meaning that the deleted device is completely and definetively removed from the Portal. The "Waste basket" icon is disabled until the Device is associated to its Network.

1. Check the Network the Device belongs to.

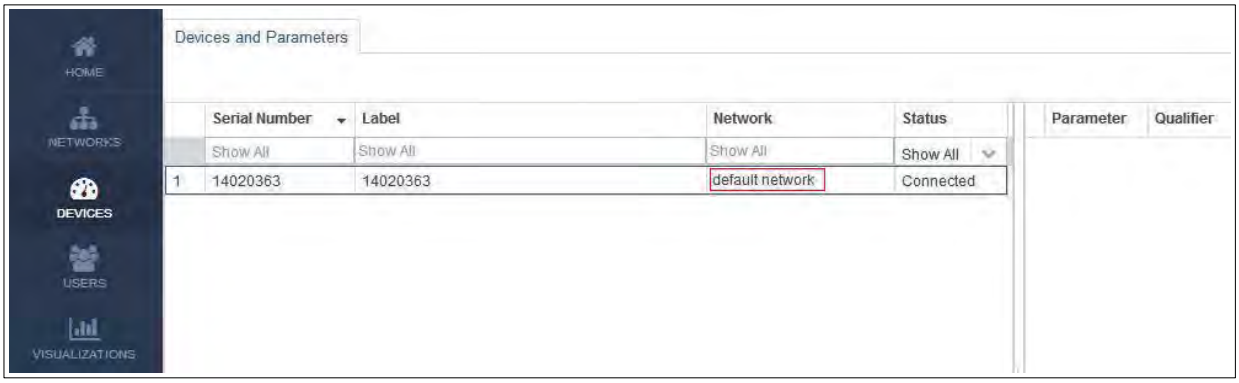


Fig. 4.4.1: Device Network identification

2. Click on "Networks" button in the left column: the "Networks" tab appears.

3. Select the Device Network, then click on the "Migration" icon.

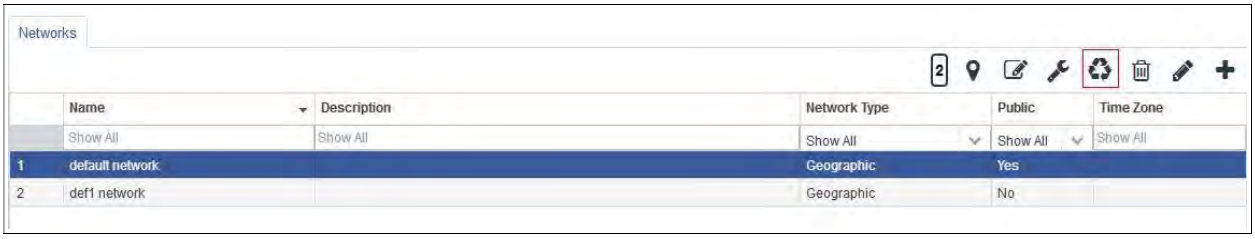


Fig. 4.4.2: Network Migration icon

4. Execute steps 2 to 3 from section 6.2 to disassociate the Device from the Network.

5. Click on "Devices" button in the left column to go back to "Devices and Parameters" tab: the field "Network" in the Device row is now empty.

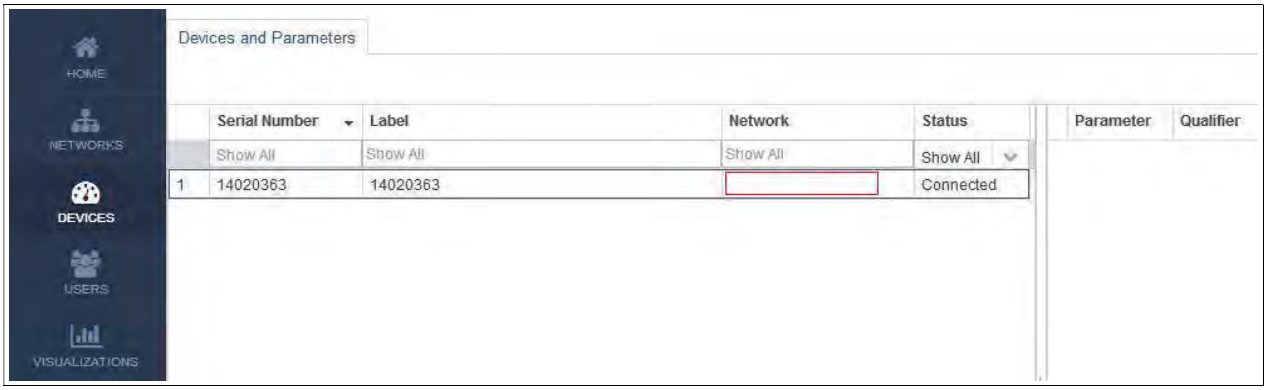


Fig. 4.4.2: Disassociated Device

6. Select the Device row: the "Waste basket" icon is now enabled in the top command bar.

Fig. 4.4.3: "Waste basket" icon

7. Click on it: a confirmation window appears.

Fig. 4.4.4: Confirmation window for Device deletion

8. Click on the "Yes" button to finally remove the Device from the Portal and erase all received measured data. Otherwise or click on "No" button to quit

WARNING: A removed Device can NOT be retrieved by the Administrator User. To get the Device in once again, the Administrator User MUST send a request to DeltaOhm Service for Device re-activation.

5 USERS

The Cloud Platform is provided for three users accounting level:

1. Administrator account is the one performing the first time registration to the portal; its privileges are:
   - Defining Super-User and User accounts.
   - Adding Devices to the system.
   - Aggregating Devices into Networks.
   - Assigning Networks management to Super-User.
   - Generating measurements Visualizations from all Networks.
   - Associate USER to Visualisations.
2. Super-User account is the supervisor of a single Network, being allowed to:
   - Generate measurement Visualisations from authorized Network.
   - Associate USER to Visualisations from authorized Network.
3. User account allows to:
   - Access to associated measurement Visualisations.

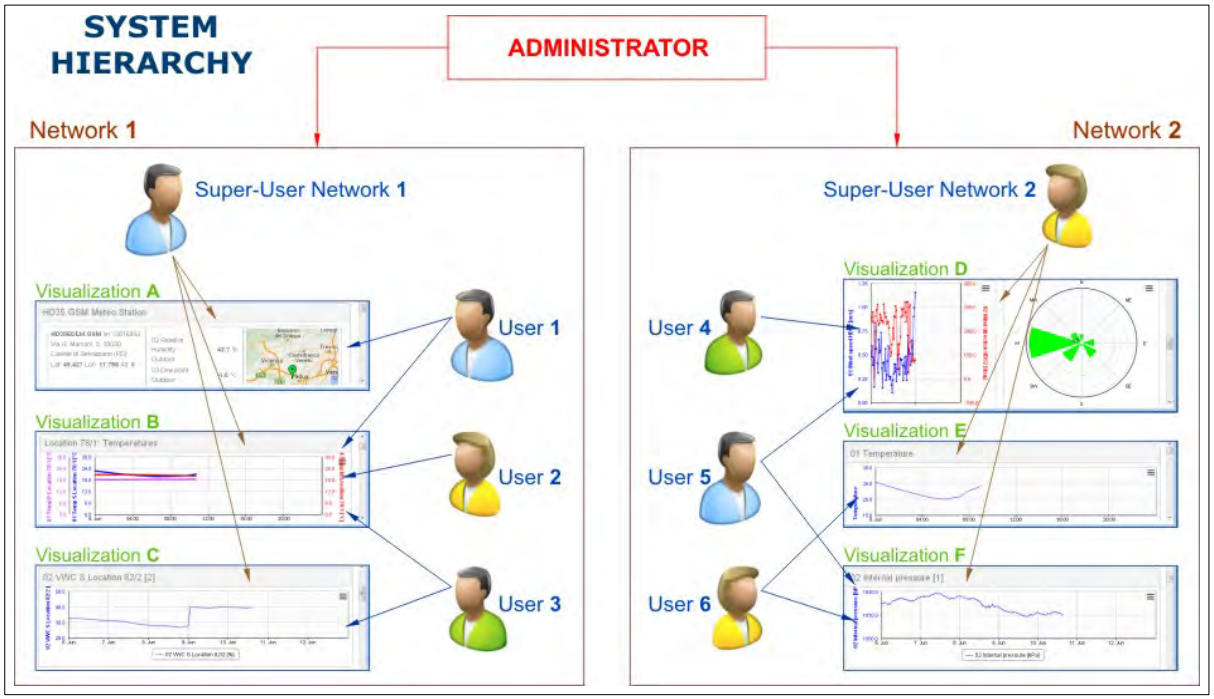


Fig. 5.1: Cloud User Accounts

5.1 ACCOUNTS DESCRIPTION

5.1.1 ADMINISTRATOR ACCOUNT

The Administrator account is created when completing the first time registration by inserting Serial Number and Activation Key of a device in "Produced" state: the device turns to "Activated" state and there is no way to take it back to "Produced".

Administrator user is the only one allowed to:

- Activate Devices and then modify their information and associate/disassociate them to only one Network of its own.
- Create Networks other than Default Network, modify or delete them.
- Create Super-User and User accounts, modify or delete them.
- Permanently associate Super-User and User accounts to one Network only (no way to associate them to a different Network afterwards).

5.1.2 SUPER-USER ACCOUNT

A Super-User account is permanently associated with one Network only when created. It is allowed to:

- Access to Devices, Visualisations and User accounts associated with its Network.
- Create, modify or delete Visualizations.
- Associate User accounts with Visualizations.

5.1.3 USER ACCOUNT

A User account is permanently associated with one Network only when created. It is allowed to:

- Access to Visualizations it is associated with.

5.2 CREATE AN ACCOUNT

1. Click on the "Users" button in the left column: the Users main page appears.

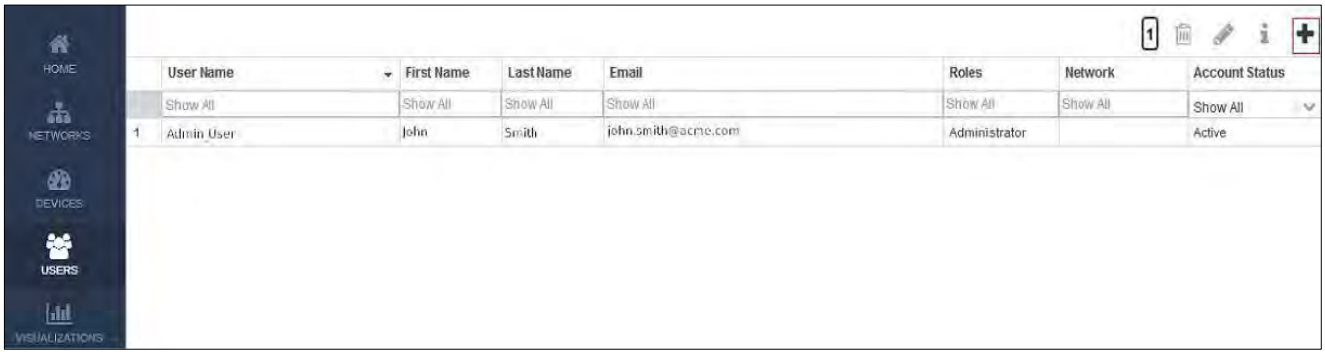


Fig. 5.2.1: Cloud User Accounts

2. Click on the "Plus" icon and the "New User" window appears: enter Username and Password in the "Login Info" tab.

Fig. 5.2.2: Username and Password definition

3. Click on "User Info" tab and enter user identity information ("E-Mail", "First Name" and "Last Name" mandatory fields).

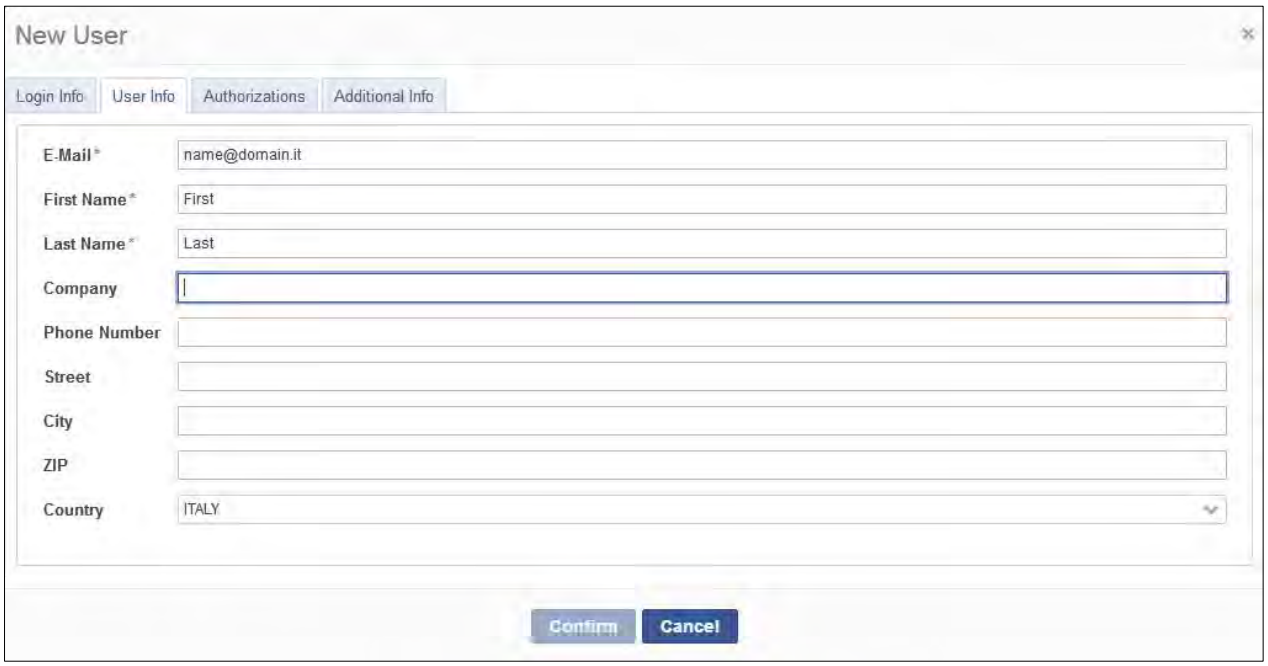


Fig. 5.2.3: User identity information

4. Click on "Authorizations" tab, click on "Role" drop-down box and assign account level (Super-User or User).

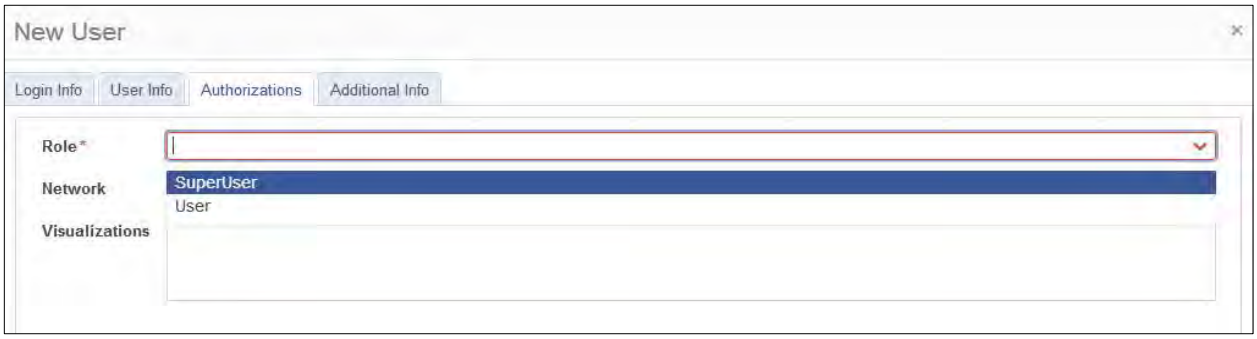


Fig. 5.2.4: User Role assignment

5. Click on "Network" drop-down box and assign an existing Network to allow user creation / access only for that Network Visualizations.

Fig. 5.2.5: User Network assignment

6. Click on "Additional Info" tab and click on radio buttons corresponding to user "Job Role" and "Areas of Interest". Then click on "Confirm" button to save the user profile.

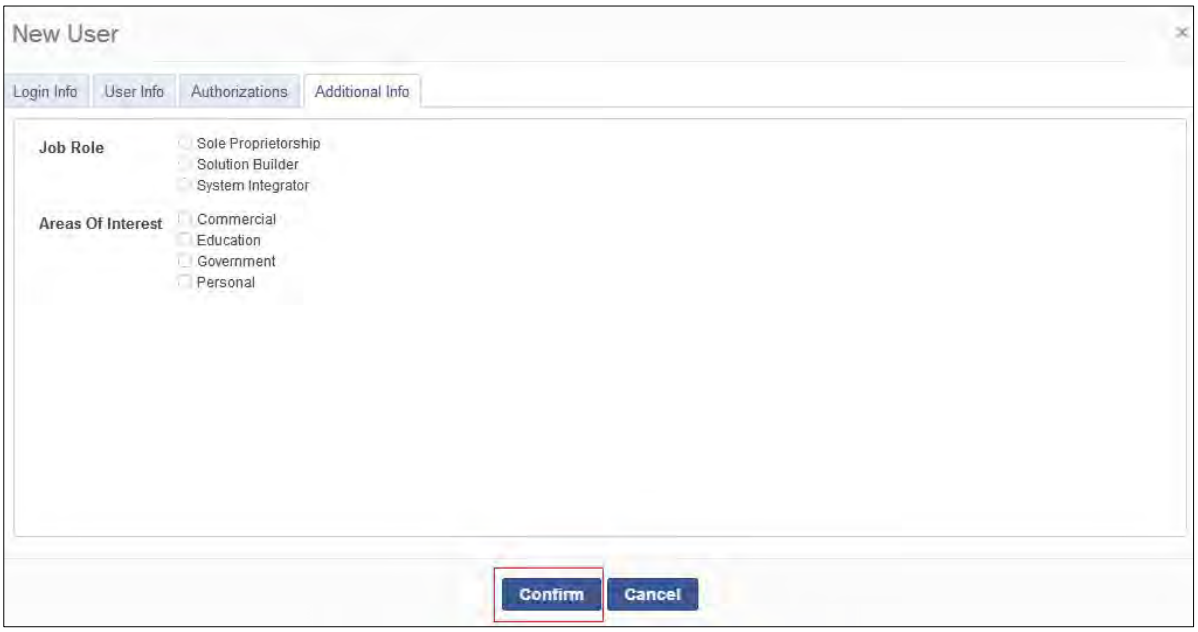


Fig. 5.2.6: User Additional Info completion

7. The defined user is now available in the User main page.

Fig. 5.2.7: User creation completed

8. Select the user row and click on the "Info" icon.

Fig. 5.2.8: User selection

9. The "User Details" window appears, displaying "First Name", "Last Name" and "Visualizations" fields (read only).

Fig. 5.2.9: "User Details" window

5.3 MODIFY AN ACCOUNT

1. Select the user row and click on the "Pencil" icon in the top command bar.

Fig. 5.3.1: "User Details" window

2. The "Modify User" window appears: click on the "Account Status" drop-down box to select the desired status ("Active", "Expired", "Locked", "Suspended").

Fig. 5.3.2: "Login Info" tab, "Account Status" drop-down menu

3. Change the User Password by typing it in "Password" and "Re-type Password" text boxes.

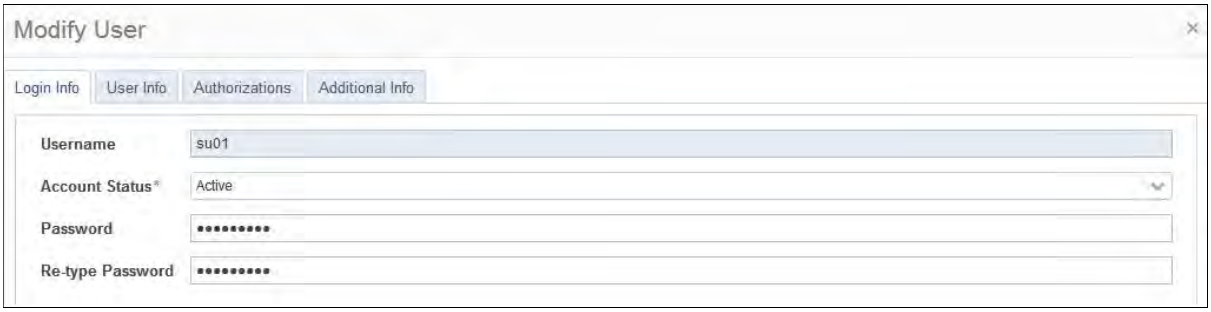


Fig. 5.3.3: "Login Info" tab, "Password" update

4. Click on "User Info" tab to update user identity information.

Fig. 5.3.4: "User Info" tab

5. Click on "Authorizations" tab to update the reference Network.

Fig. 5.3.5: "Authorizations" tab

6. Click on "Additional Info" tab to update user job and area of interest information.

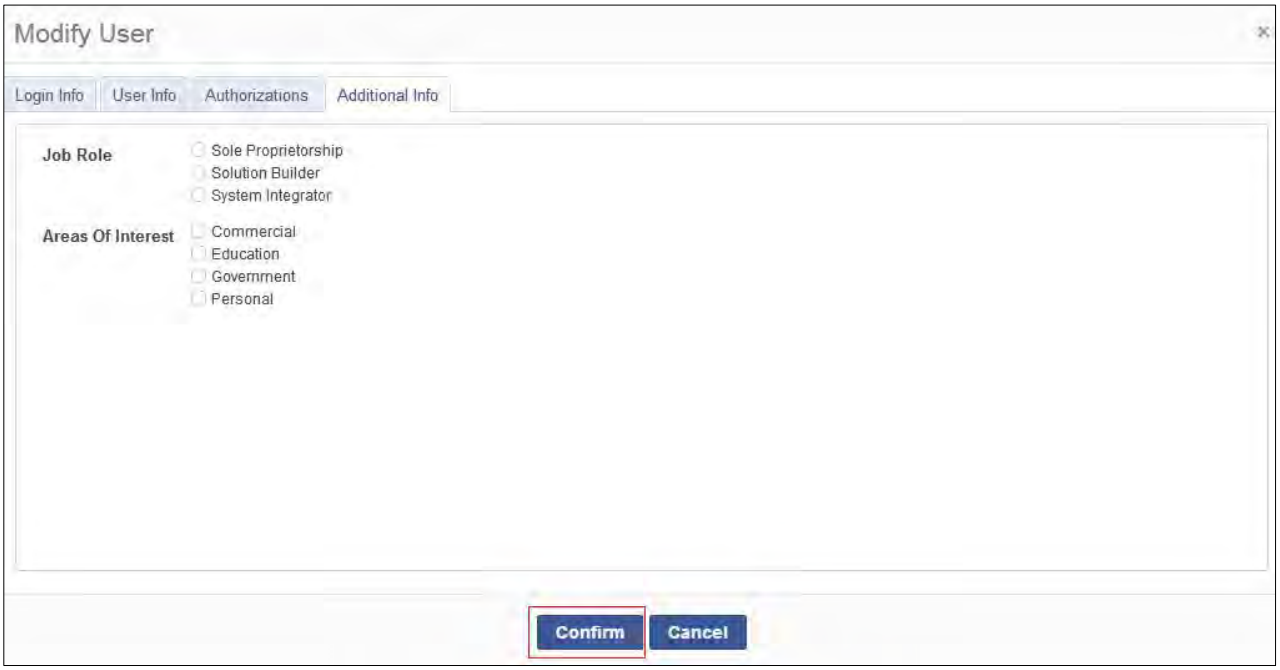


Fig. 5.3.6: "Additional Info" tab

7. Click on "Confirm" button to apply changes.

5.4 DELETE AN ACCOUNT

1. Select the user row and click on the "Waste basket" icon in the top command bar.

Fig. 5.4.1: User selection for deletion

2. The confirmation window appears: click on "Yes" button to delete the account or click on "No" button to quit.

Fig. 5.4.2: Confirmation window before deletion

WARNING: After deletion, the user is no more available.

6 NETWORK

When many devices have been registered to the Cloud, it could be useful to group them in subsets, so called "Network", according to some common characteristics (i.e. position, measurements, timing, etc.).

By clicking on "Network" button in the left column, the "Networks" tab shows the list of existing device groups. At the very beginning only the Default Networks appears in the list.

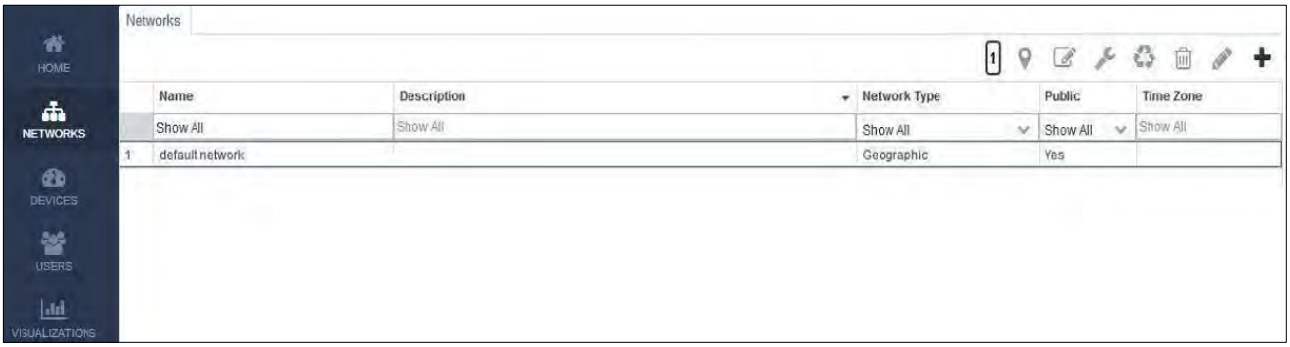


Fig. 6.1: "Networks" tab

Each network is described by "Name", "Description", "Network Type", "Public", "Time Zone" fields: column width can be easily adjusted by clicking on the first row vertical line and drag it to desired position.

In the top right position a command bar shows the number of defined Networks together with action icons.

At the very beginning only the Default Networks appears in the list, since every device joins the Default Network when activated.

6.1 CREATE A NETWORK

Authorized users can then create customized Networks according to the following steps.

1. In the top command bar click on the "Plus" icon: the "New Network" window appears.

Fig. 6.1.1: "Plus" icon to add a Network

2. In "General" tab, enter "Name" (mandatory field) and "Description" of the new Network.

Fig. 6.1.2: "Name" and "Description" fields

3. Scroll down and define the Network Type:

- Select "Geographic" radio button to display Network devices as positioned on an interactive geographical map, using their given latitude and longitude.
- Select "Custom" radio button to display Network devices as positioned on various custom images (layout of a building floor, map of a processing plant,…).
- Select "Public" check-box to allow Network Visualizations access without logging in on the Portal (useful to allow Visualisations being linked in web pages).

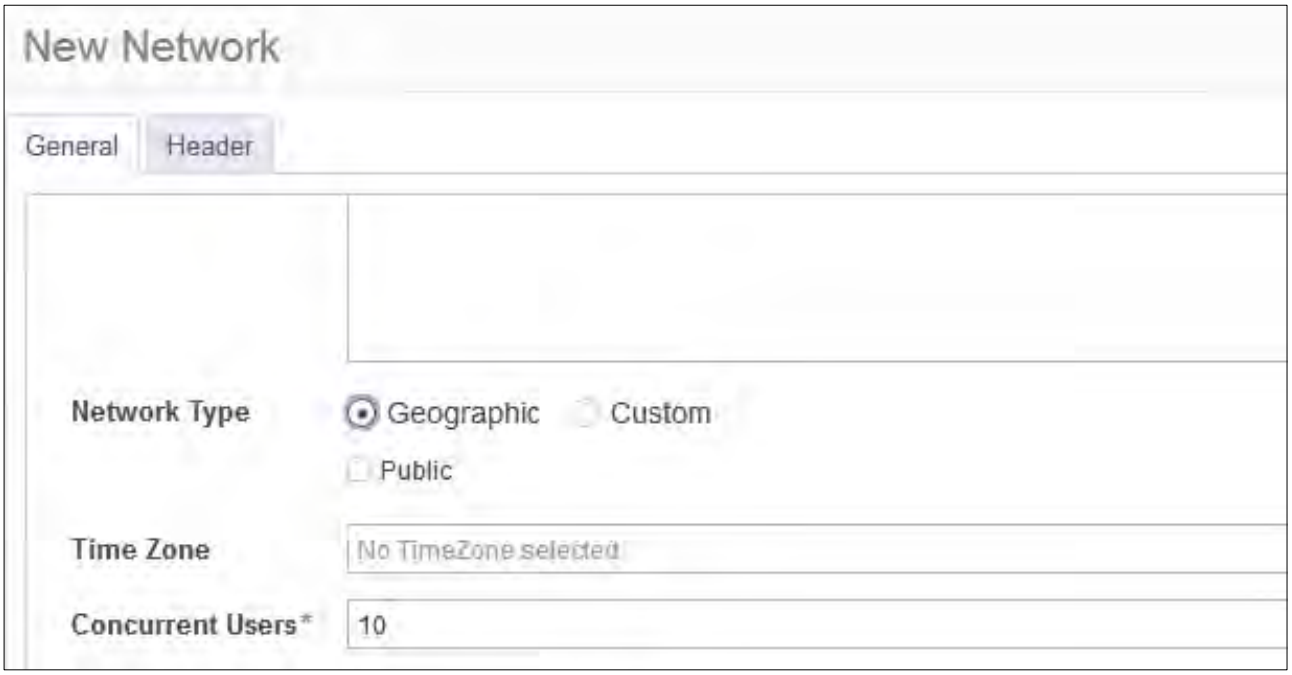


Fig. 6.1.3: "Networks Type", "Timezone" and "Concurrent Users" fields

4. Select the specific timing reference from the "Timezone" drop-down menu and set how many users can simultaneously access to the Network in the "Concurrent Users" field.

5. Click on "Confirm" button to apply: the new Network is now in the list.

Fig. 6.1.4: "def1 network" added to "Networks" tab

A new Network is an empty set: after its creation devices needs to be added.

Since a device can belong only to one network, there are two ways to associate a Device to a customized Network:

- At Device Activation time, as described in section 6.3.2.
- At any further time, when the Device is connected and already belongs to a Network (at least the Default one), as described below in section 6.2.

6.2 DEVICE MIGRATION BETWEEN NETWORKS

The selected device must be disassociated from the outgoing Network (e.g. Default Network) and then associated to the incoming Network.

NOTE: The migration procedure is designed to preserve the already received data.

1. Select the outgoing network from the list and click on the "Migration" icon in the top command bar.

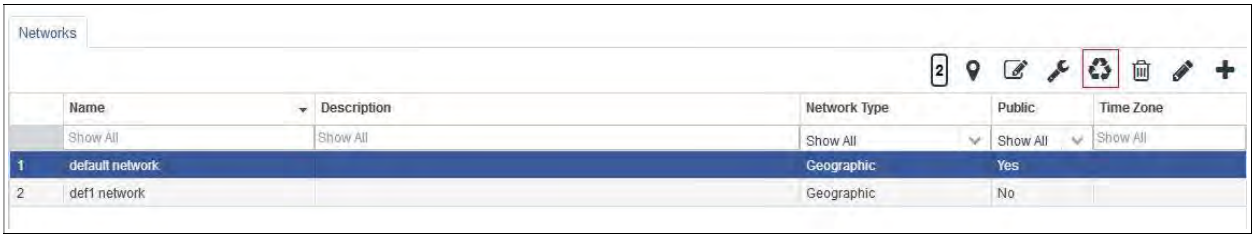


Fig. 6.2.1: "Migration" icon in the top command bar

2. The "Device Migration" window appears: select the device to be detached from the list in the right column "Devices associated with the Network default network".

Fig. 6.2.2: Migrating device selection

3. Click on the "Left arrow" icon and click on the "Yes" button in the confirmation window: the selected device is now available to be associated with the incoming Network.

Fig. 6.2.3: Device detached from Default Network

4. Click on the "Close" button to go back to "Networks" tab, select the destination network and click on the "Migration" icon again.

Fig. 6.2.4: Destination network selection

5. The "Device Migration" window appears: select the device to be associated from the list in the left column "Devices Not Associated", then click on the "Right arrow" icon.

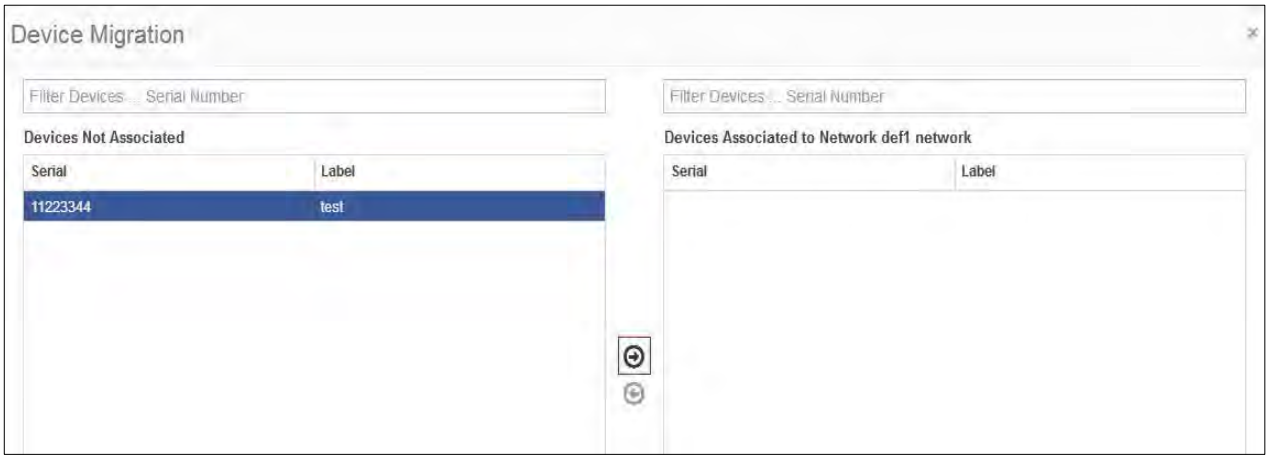


Fig. 6.2.5: Device ready for association

6. As appears in the right colum, the device is finally associated to the Network: click on "Close" button to go back to "Networks" tab.

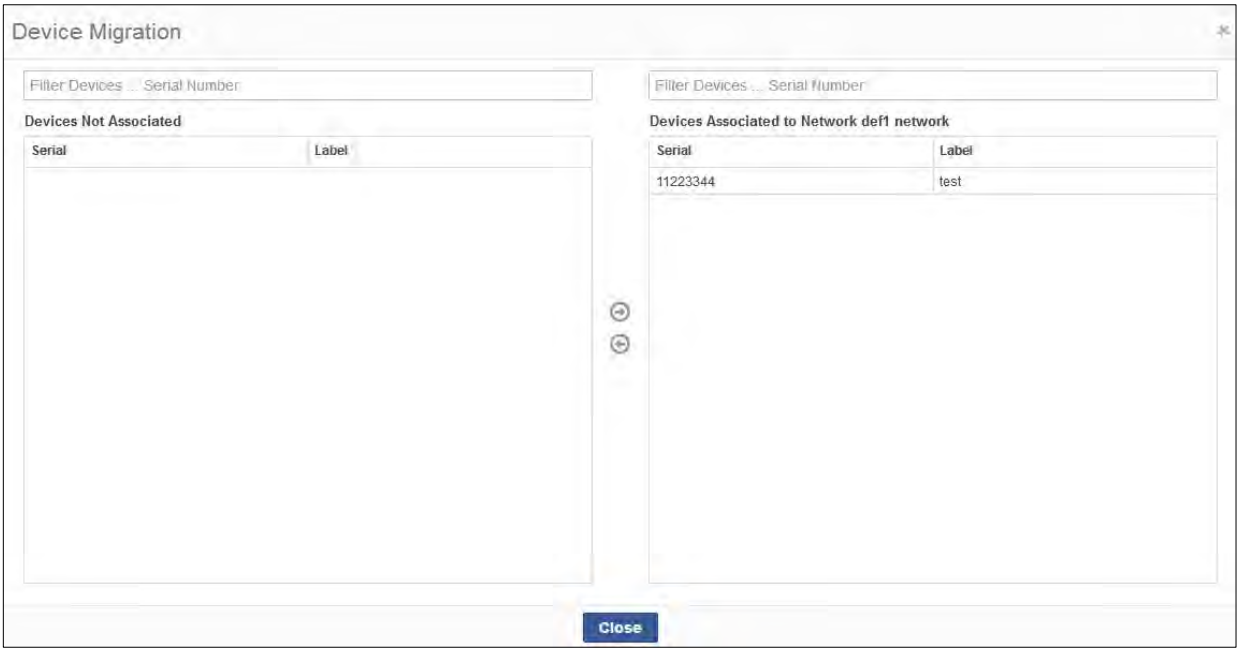


Fig. 6.2.6: Associated device

7. Repeat step 1 to 6 for each device to be associated.

6.3 NETWORK RELATIONS

For every defined Network it is possible to access and modify the enabled Users and Devices.

1. Select the interested Network from the list in the "Networks" tab, then click on the "Wrench" icon.

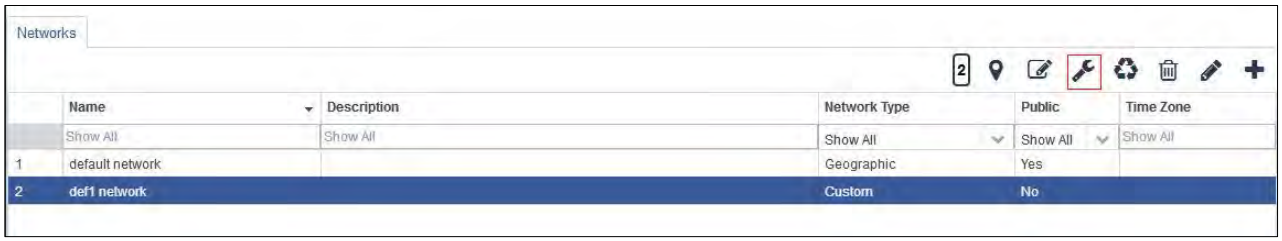


Fig. 6.3.1: Network list

2. The selected Network tab appears, with "Users" and "Devices" sub tabs.

Fig. 6.3.2: Network relations sub tabs

6.3.1 SUB TAB "USER"

The sub tab "Users" lists the user accounts allowed to access the current Network, described by "User Name", "First Name", "Last Name", "Email", "Role" and "Account Status".

In the right top command bar the counter label reports the associated User Accounts number, while the icons are linked to features described in section 5.

Fig. 6.3.3: "Plus" icon to create a new user account

1. Click on the "Plus" icon to create one more user account: the "New User" window appears.

2. Execute steps 2 to 6 from section 5.2: the new User account will join the list and will be able to create, modify and delete current Network Visualisations (if Super-User) or access current Network Visualisations (if plain User).

3. Select a User row and click on "Info" icon: the "User Details" window appears.

Fig. 6.3.4: "Info" icon to read selected User identity information

4. Execute step 9 in section 5.2 to view selected User account informations.

5. Select a User row and click on "Pencil" icon: the "Modify User" window appears.

Fig. 6.3.5: "Pencil" icon to modify User profile

6. Execute steps 1 to 7 from section 5.3 and the selected User profile will be updated.

7. Select the User row to be removed from the Portal.

8. Click on "Waste basket" icon: the confirmation window appears as described in step 2, section 5.4.

9. Click on "Yes" button to delete the account or click on "No" button to quit.

WARNING: After deletion, the user is no more available.

6.3.2 ASSOCIATE A NEW DEVICE

1. Click on "Devices" tab: the list of Network assigned Devices appears.

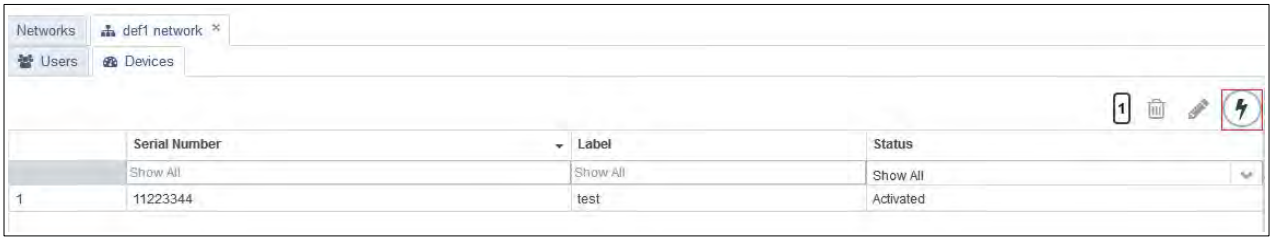


Fig. 6.3.5: Network "Devices" tab

2. Click on the "Lightning" icon: the "New Device" window appears.

Fig. 6.3.6: "New Devices" window

3. Enter Device Serial Number and Activation Key. Note that "Network" field is steady, since the new Device is implicitly associated to current Network.

4. Click on "Confirm" button to apply: the new Device will join the list.

6.3.3 MODIFY A DEVICE

1. Select a Device row and click on the "Pencil" icon: the "Modify Device" window appears.

Fig. 6.3.7: "Pencil" icon to modify Device properties

2. Execute steps 1 to 7 from section 4.3 and the selected Device properties will be updated.

NOTE: "Waste basket" icon is not available from this window, because a Device needs to be disassociated from its Network before being deleted.

6.4 MODIFY NETWORK DESCRIPTION

A Network description can be modified at any time.

1. Select the interested Network from the list in the "Networks" tab, then click on the "Pencil" icon.

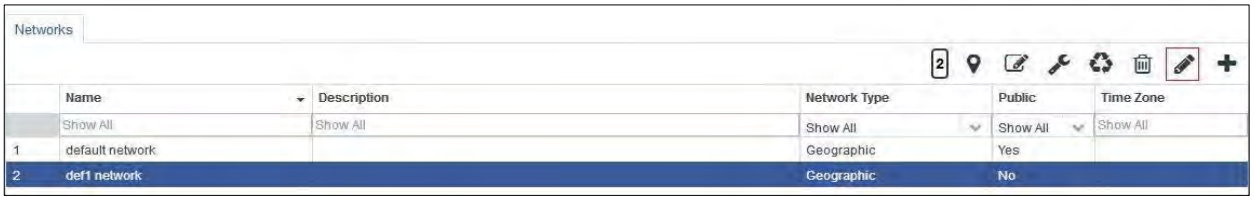


Fig. 6.4.1: Networks list

2. The "Modify Network" window appears: "Name", "Description", "Network Type", "Timezone" and "Concurrent Users" fields can be updated.

Fig. 6.4.2: "Modify Network" window

3. Click on "Confirm" button to apply or "Cancel" button to quit.

6.5 GEOGRAPHIC NETWORK SETTINGS

When a Network is defined as "Geographic" and geo-localized Devices are associated, a geographical map can be linked to Network properties.

1. Select the interested Network from the list in the "Networks" tab, then click on the "Modify Map" icon.

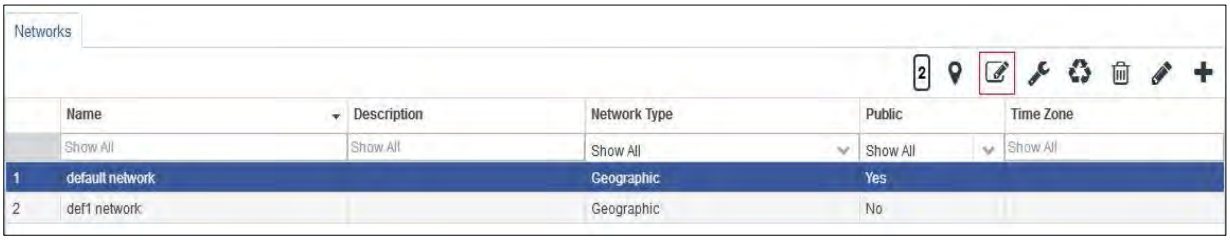


Fig. 6.5.1: Networks list

2. The "Devices' Geographic Map" tab appears: center the map as desired, zoom in or zoom out, select "Map" or "Satellite" view, then click on "Save" icon.The current tab disappears.

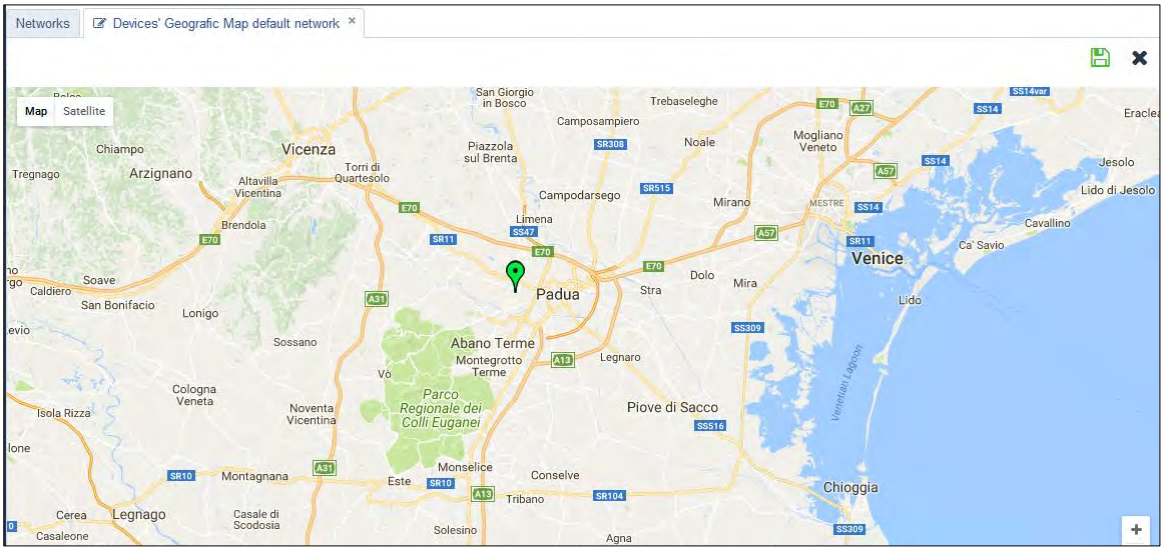


Fig. 6.5.2: Network map settings

3. In the "Network" tab click on the "View Map" icon.

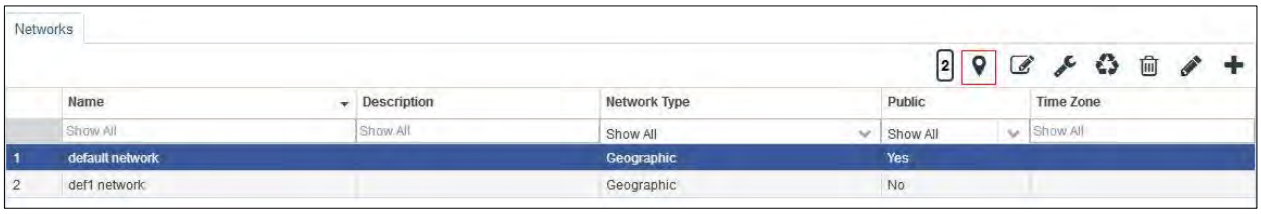


Fig. 6.5.3: Network map view

4. The associated "Devices" list appears.

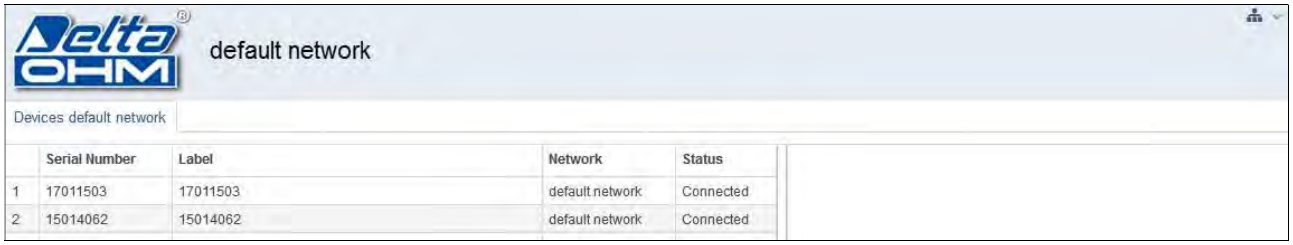


Fig. 6.5.4: Devices list

5. Click on the "Tree" icon in the top right corner and select the item "Map" from the drop-down menu.

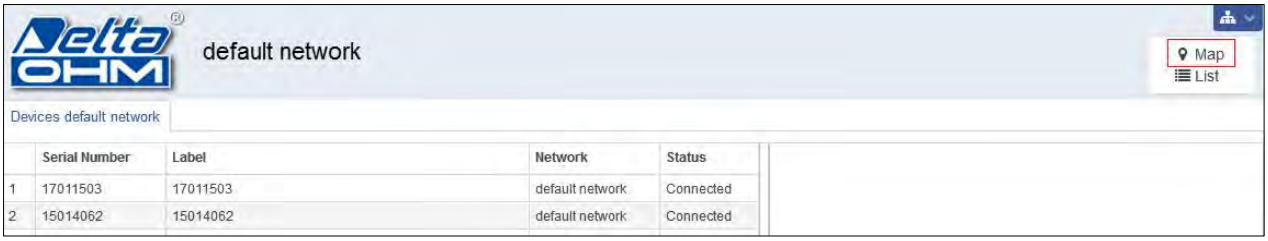


Fig. 6.5.5: Map view

6. The previously set map is shown (zoom-in and zoom-out commands are available, but result is not saved).

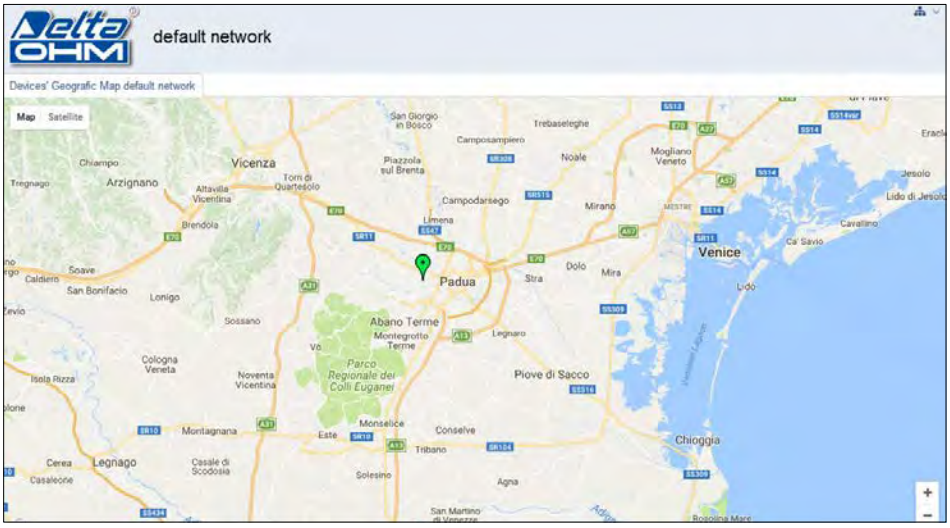


Fig. 6.5.6: Network map

7. Select the item "List" from the drop-down menu to go back to Devices list or click on "Networks" button in the left column to go back to "Networks" tab.

6.6 CUSTOM NETWORK SETTINGS

When a Network is defined as "Custom", any picture can be linked to Network properties and appear as background for Devices position.

1. Select the interested Network from the list in the "Networks" tab, then click on the "Modify Map" icon.

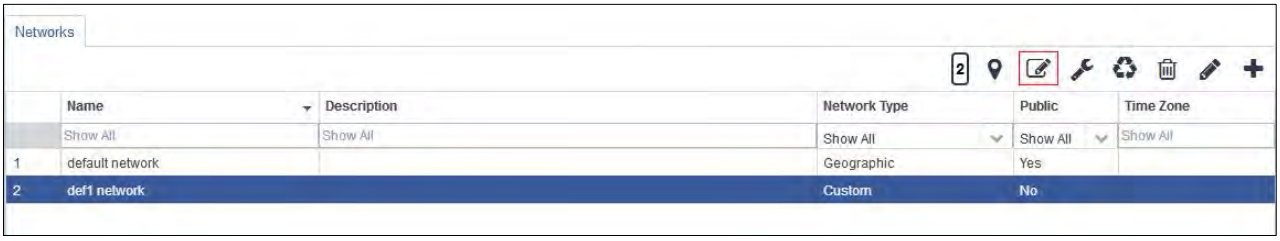


Fig. 6.6.1: Network list

2. The "Create Map" window appears.

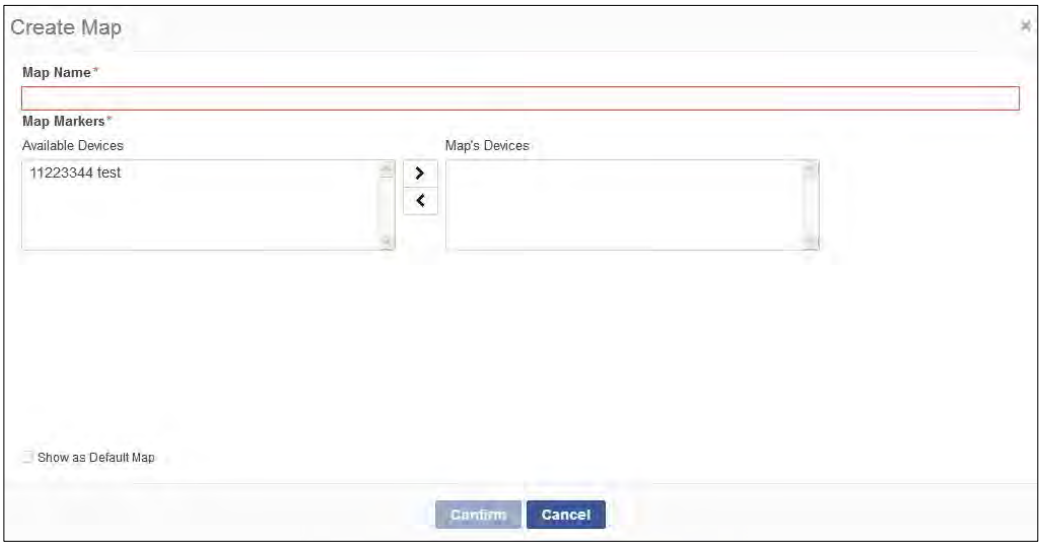


Fig. 6.6.2: "Create Map" window

3. Enter the map name in the "Map Name" text box, then select the Network Devices to be shown on the customized map from the "Available Devices" box and click on the "Right arrow" key.

Fig. 6.6.3: Device selection

4. Selected Devices appear in the "Map's Devices" box.

Fig. 6.6.4: Device included in the map

5. Select a Device in the "Map's Devices" box and click on "Left arrow" key to exclude them from the map.

6. Click on "Confirm" button to terminate: the "name network" tab and sub tab "Custom map" appear.

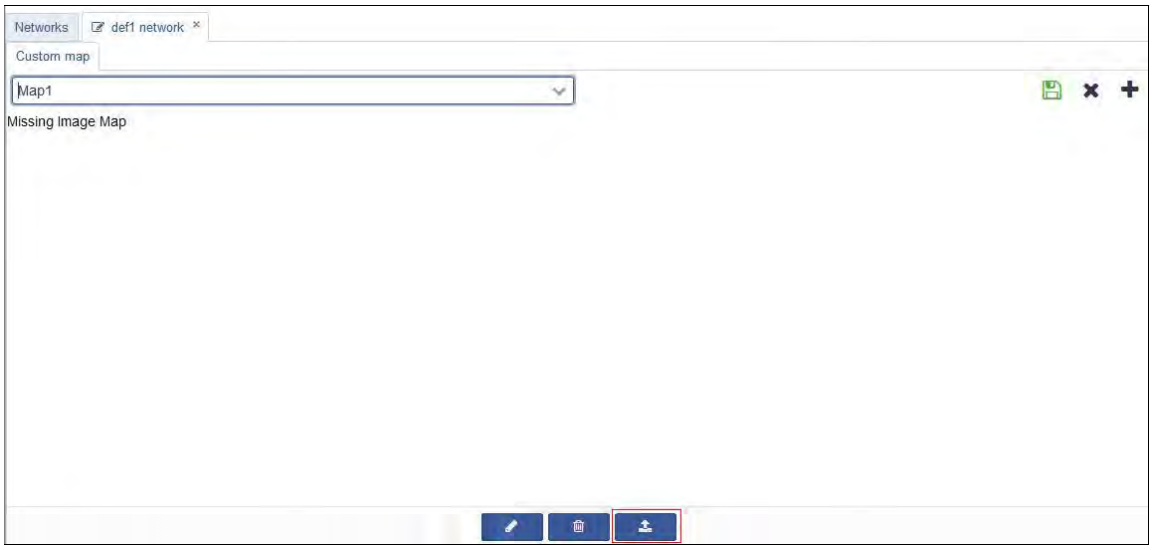


Fig. 6.6.5: "Custom map" sub tab

7. Click on the "Upload" button: the "Upload Map Image" window appears.

Fig. 6.6.6: "Upload Map Image" window

8. Click on the "Sfoglia" button: your File Manager window appears. Find the path to the file you want to use as map, select it and wait for its upload.

Fig. 6.6.7: Uploaded map

9. Click on "Disk" button to save the uploaded file.

Fig. 6.6.8: Saving button

10. In case of erroneous selection click on "Waste basket" button to remove the uploaded file.

Fig. 6.6.9: Deletion button

Fig. 6.6.10: Selected map

11. Click on the red position marker: the corresponding Device information summary appears. Click on the map to close the device information summary.

Fig. 6.6.11: Device Information

12. Drag the marker and drop it to the desired position on the map.

13. Click on the "Pencil" button when needing to adjust Network name and add more devices.

Fig. 6.6.12: "Pencil" button to modify the map

14. The "Modify Map" window appears: repeat steps 3 to 5 according to your requirement.

15. Finally click on the "Disk" icon in the top command bar to save the result and go back to "Networks" tab.

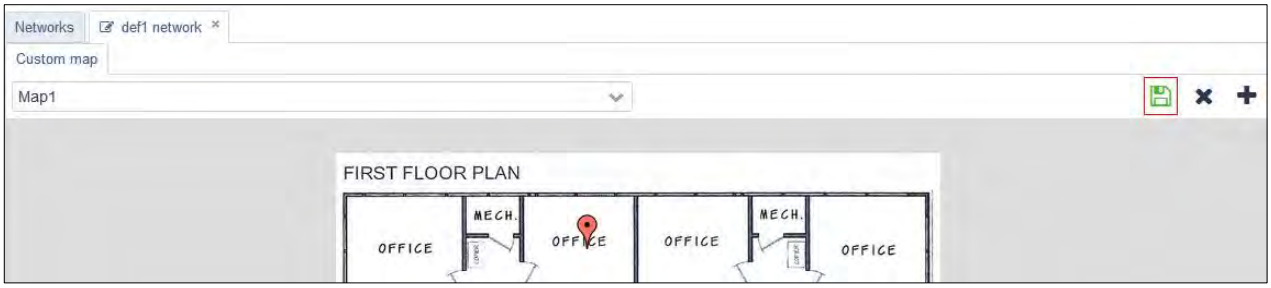


Fig. 6.6.13: Custom Map save

16. Click on the "Plus" icon in the top command bar of the "Custom Map" sub tab in order to add one more custom map: the "Create Map" window appears again, repeat steps 3 to 12.

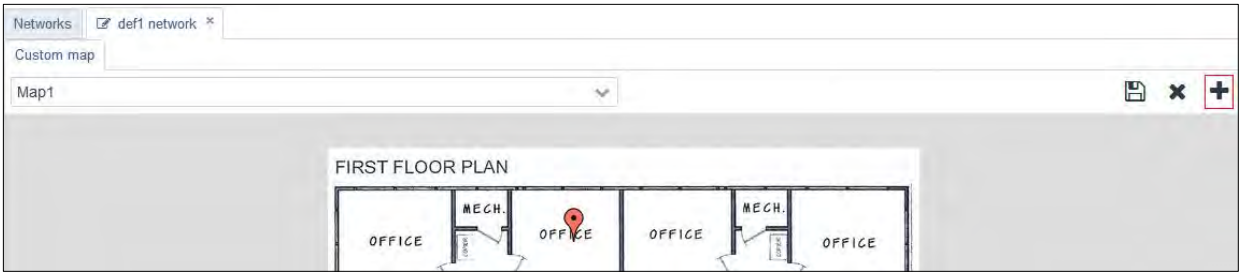


Fig. 6.6.14: "Plus" icon to add one more image

17. Click on the "Waste Basket" button to remove the current custom map: a confirmation window appears.

Fig. 6.6.15: Confirmation window for Map deletion

18. Click on "Yes" button to delete the selected map or click on "No" button to quit.

6.7 DELETE A NETWORK

When a Network is no more usefull or outmoded, it can be removed by the following steps.

1. Select the Network in the "Networks" tab, then click on the "Waste basket" icon.

Fig. 6.7.1: "Waste basket" icon to delete a Network

2. A confirmation window appears.

Fig. 6.7.2: Confirmation window for Network deletion

3. Click on "Yes" button to delete the selected Network or click on "No" button to quit.

7 VISUALIZATIONS

As described in section 4.2, a linear charts page is automatically created to plot measurements quantities from each Device turned to "Connected" state: this graphical grouping is named "default Visualization". It is identified by corresponding Device Serial Number.
In addition to this default Visualization Devices measured quantities can be flexibly aggregate in subsets, according to user preferences or needs:

- Administrator User can create, modify or remove Visualizations by all connected Devices.
- Super-User can create, modify or remove Visualizations by its own Network connected Devices.

By clicking on "Visualizations" button in the left column, the "All Visualizations" tab shows the list of existing charts group.

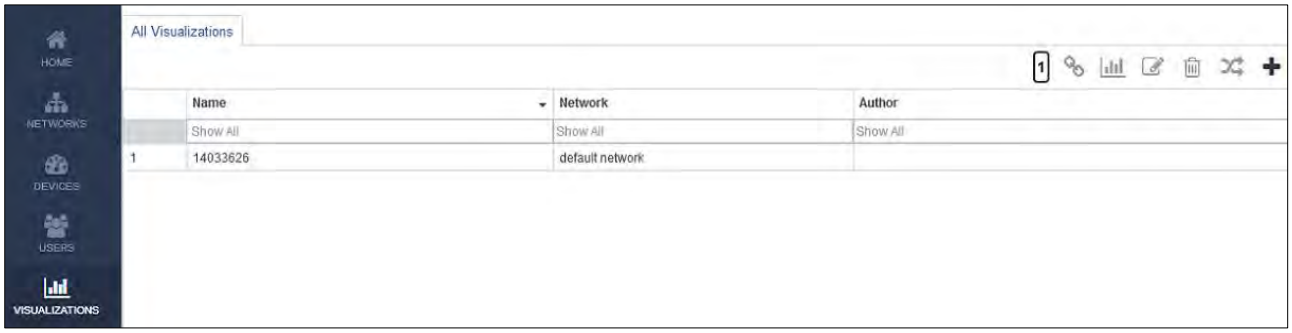


Fig. 7.1: "All Visualizations" tab

Each Visualization is described by "Name", "Network", "Author" fields: column width can be easily adjusted by clicking on the first row vertical line and drag it to desired position.

In the top right position a command bar shows the number of defined Visualisations together with action icons.

7.1 DEFAULT VISUALIZATION

To access a default Visualization follow the steps below:

1. Select the default Visualisation row and click on the "Graph" icon.

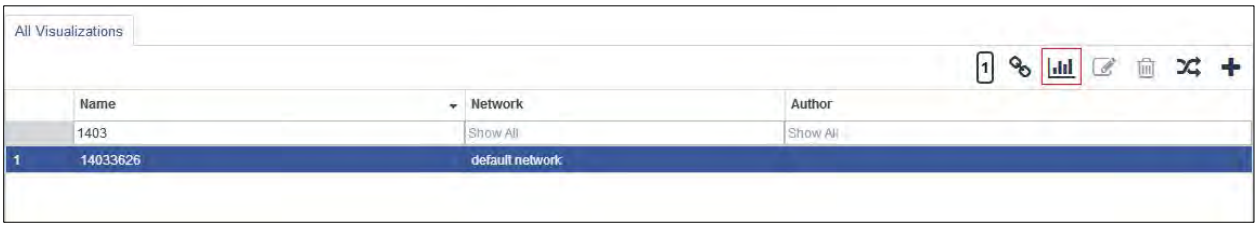


Fig. 7.1.1: default Visualisation selection

2. The selected Visualization tab appears. Refers to section 4.2 for a detailed description.

3. Close the tab and click on the "Crossed arrows" icon.

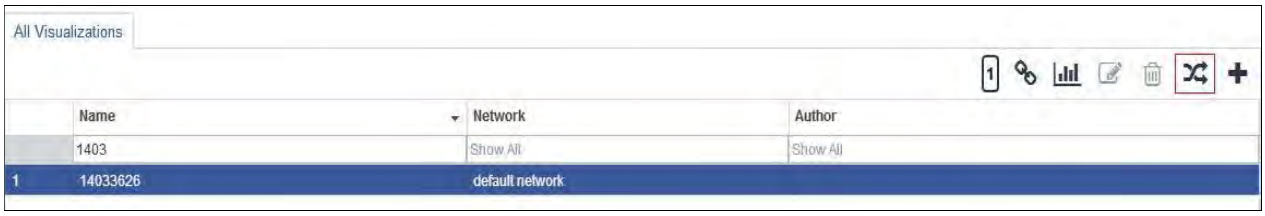


Fig. 7.1.2: default Visualisation bindings icon

4. The "Visualization Bindings" window appears, where Users can be authorized to access the current Visualization:

- In the left half of the window User accounts associated to default Network are shown.
- In the right half of the window User accounts choosen for accessing current Visualisation.
- In the bottom right the list of Super-User accounts associated to default Network.

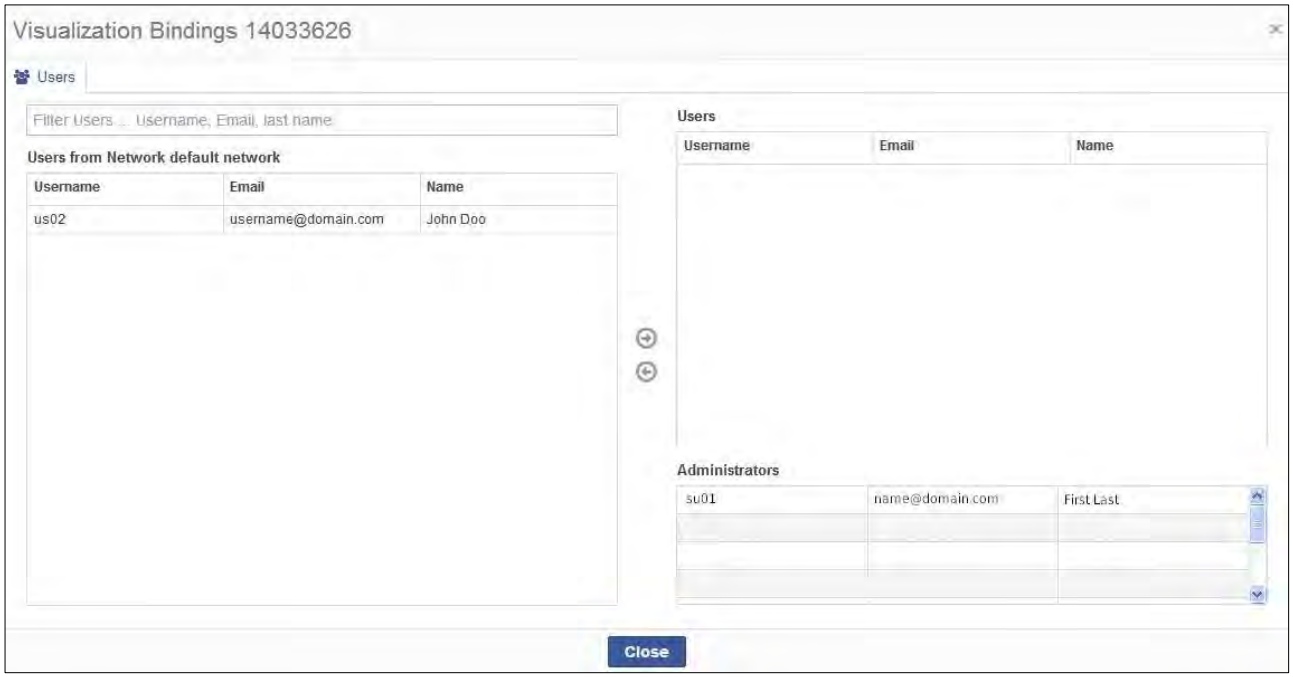


Fig. 7.1.3: Visualisation bindings window

5. Select User account row and click on "Right arrow" key to add it to authorized Users list.

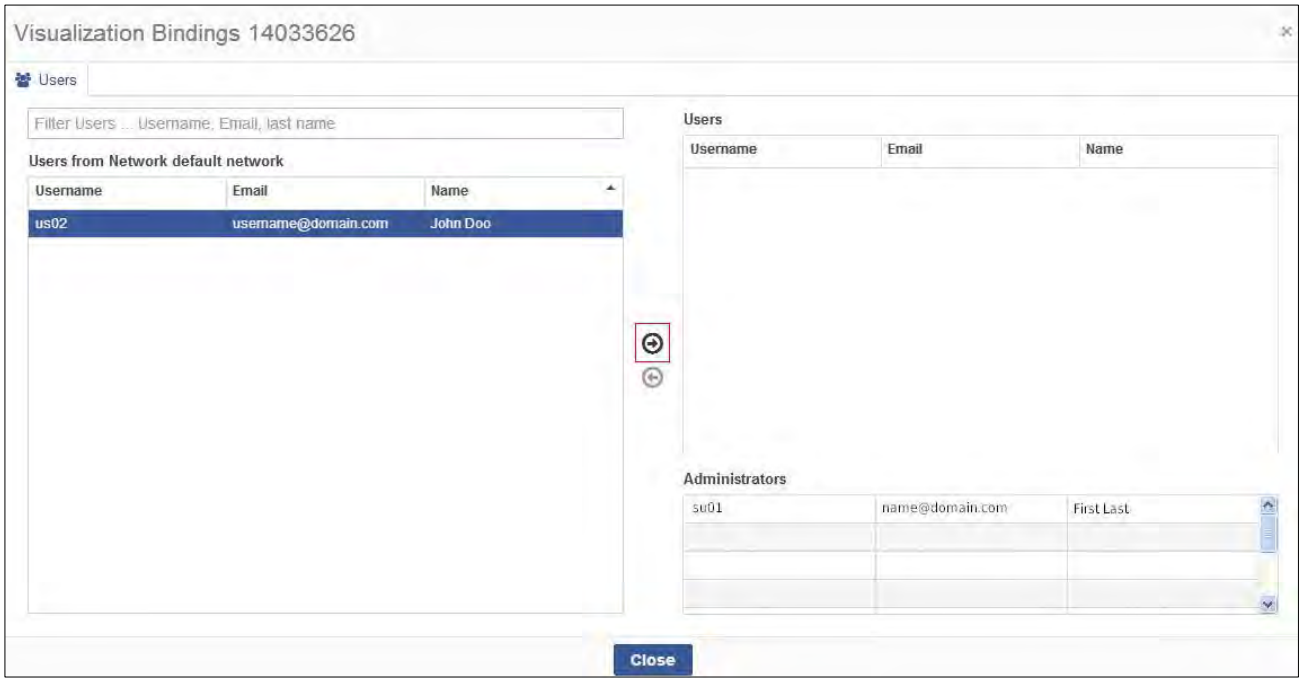


Fig. 7.1.4: Visualisation bindings window

6. The added User account is now in the authorized Users list.

Fig. 7.1.5: Authorized User account

7. Select the User account to be removed from the right section, then click on the "Left arrow" icon and the User account will be no more authorized to access the current Visualisation.

8. Click on the "Close" button when all desired User accounts have been authorized: the "Visualization Bindings" disappeared.

7.2 CUSTOMIZED VISUALIZATION

Administrator User can create an advanced Customized Visualization window, where selected measurements quantitites can be displayed in numerical and graphical form and can be accessed without authentication.
A Google map can also be inserted, in order to show the Device location.
In the following picture, an example of Customized Visualisation is shown, as included in the DeltaOhm official web site.

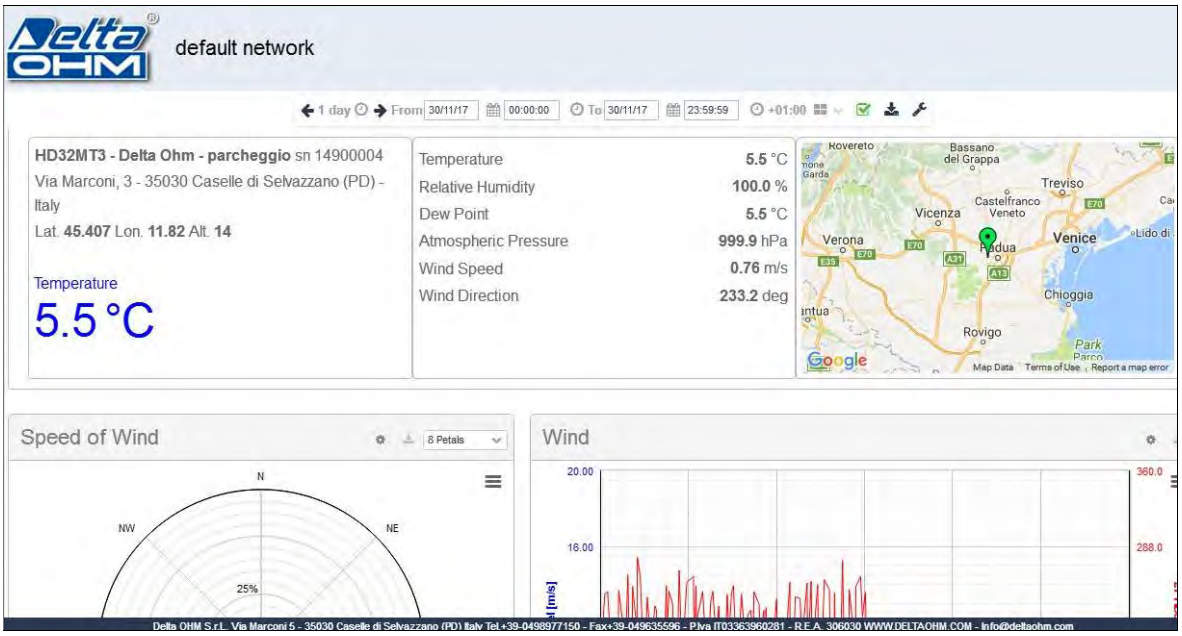


Fig. 7.2.1: DeltaOhm site Customized View

7.2.1 CREATE A CUSTOM VISUALIZATION

Administrator user can create a Custom Visualization Window by the following steps.

1. Click on the "Visualizations" button in the left blue column: "All Visualizations" tab is shown in the right section. When Custom Visualization has previously been defined, the right top command bar reports their number in the counter-label.

Fig. 7.2.2: Visualizations number in the right top bar

2. Click on the "Plus" icon in the right top command bar: the "New Visualization" window appears.

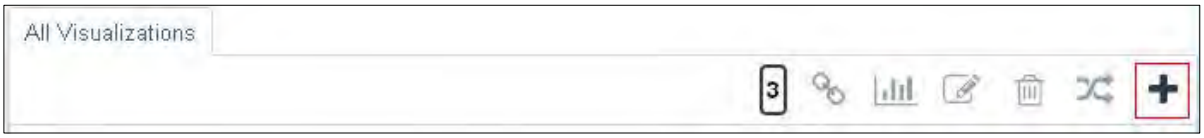


Fig. 7.2.3: "Plus" icon in the right top bar

3. Enter the Custom Visualisation name in the "Name" text box, select the paired Device Network from the "Network" drop box, then click on "Confirm" button.

Fig. 7.2.4: "New Visualization" window

4. The "Visualization Bindings" window appears: in the left half of the "Devices" tab, click on the device to be added to the Visualization, then click on the "Right arrow" key. Repeat until all the desired Devices has been binded.

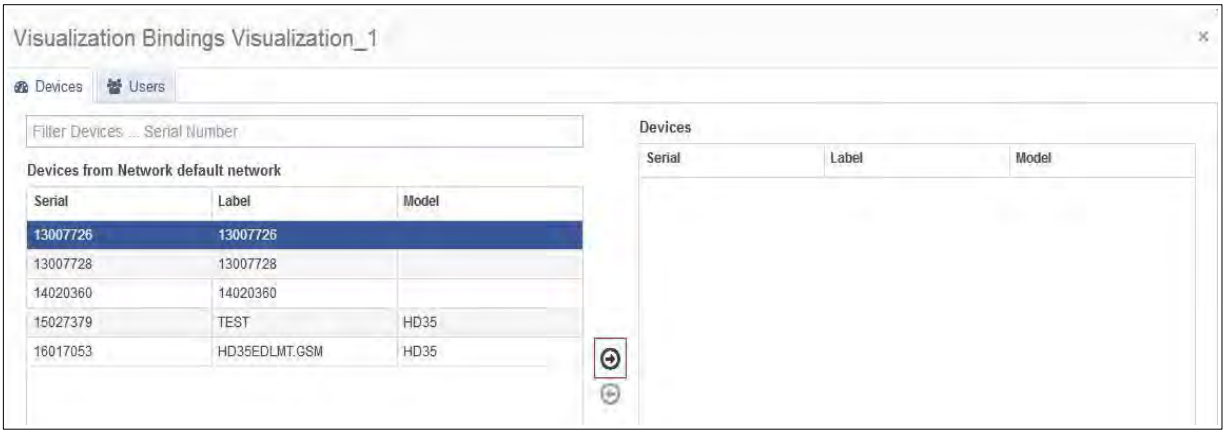


Fig. 7.2.5: "Visualization Bindings" window

5. To delete a Device from the binding list, click on its row in the right half and click on the "Left arrow" key.

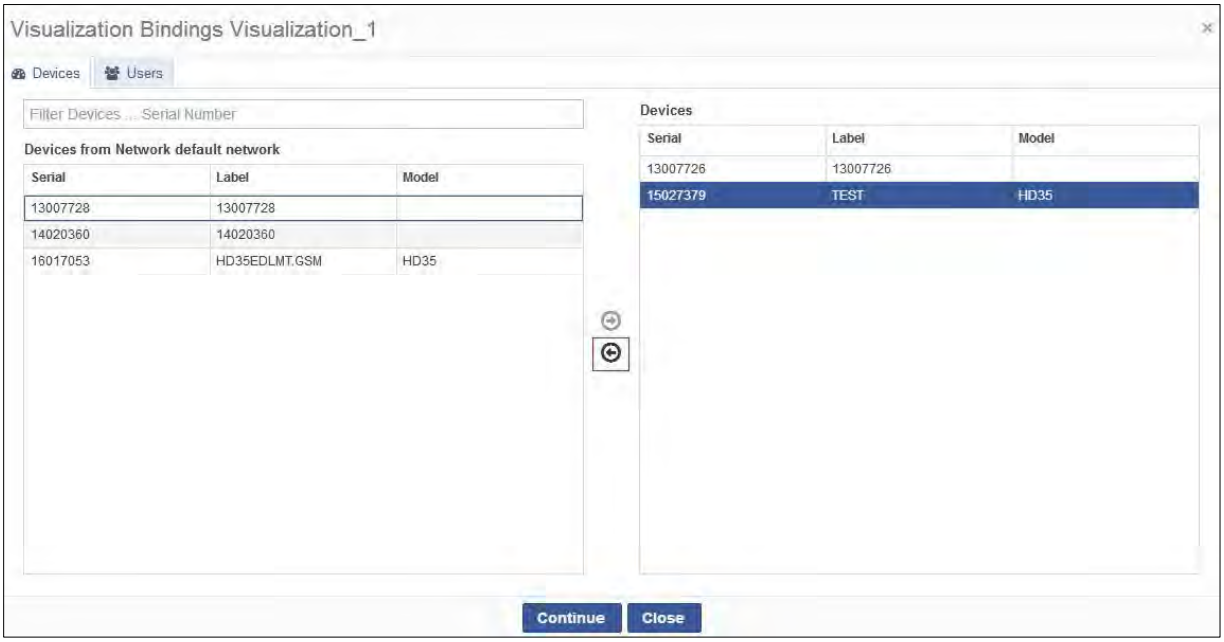


Fig. 7.2.6: Device deletion the from binding list

6. Click on "Continue" button: the "Add Graph" window appears.

Fig. 7.2.7: "Add Graph" window

7. Click on the desired graph model (i.e. "Histogram"): the "Add New Parameters" window appears.

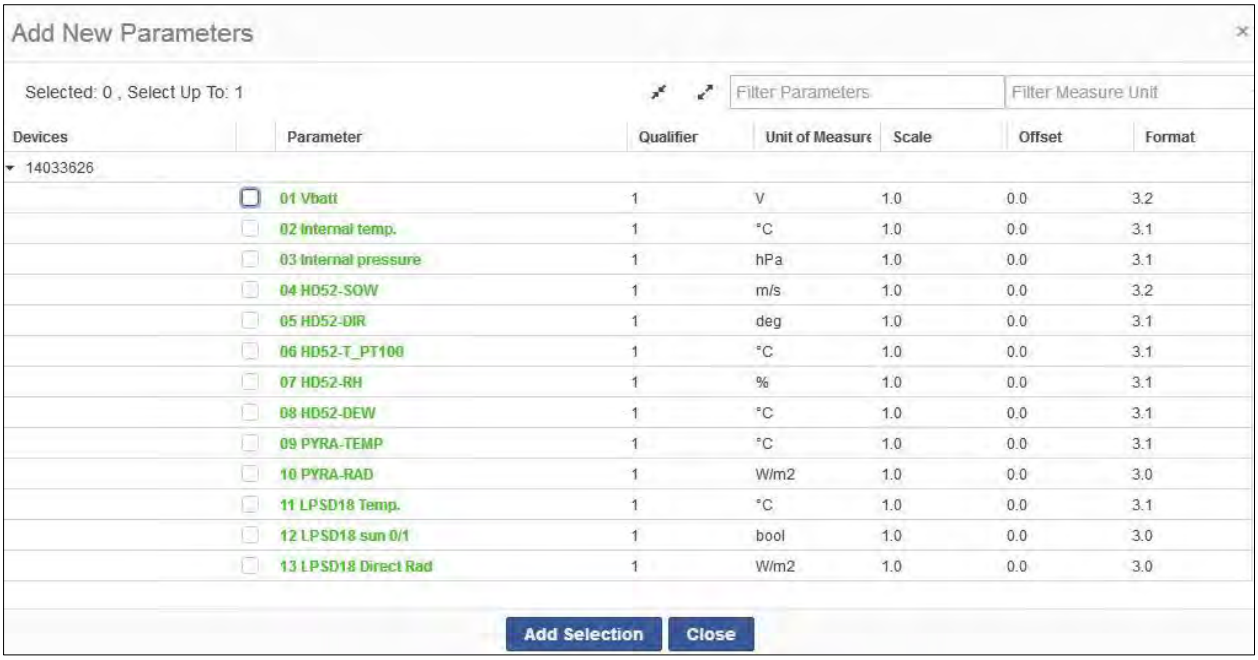


Fig. 7.2.8: "Add New Parameters" window

8. Click on the desired parameter check box, then click on "Add Selection" button.

Fig. 7.2.9: Parameter selection

9. When more than one Device have been selected, click on Device Serial Number to shrink its parameters list to just one row and simplify other Devices parameters selection.

Fig. 7.2.10: Shrinked parameter list

10. When parameters list is long, enter characters of desired Parameter or Measure Unit in "Filter Parameters" or "Filter Measure Unit" text-boxes: the list will be reduced to filter result.

Fig. 7.2.11: Filter text-boxes

11. When clicked on "Add selection" button, the "New Graph" window appears: enter the chart title in the "Label" text box.

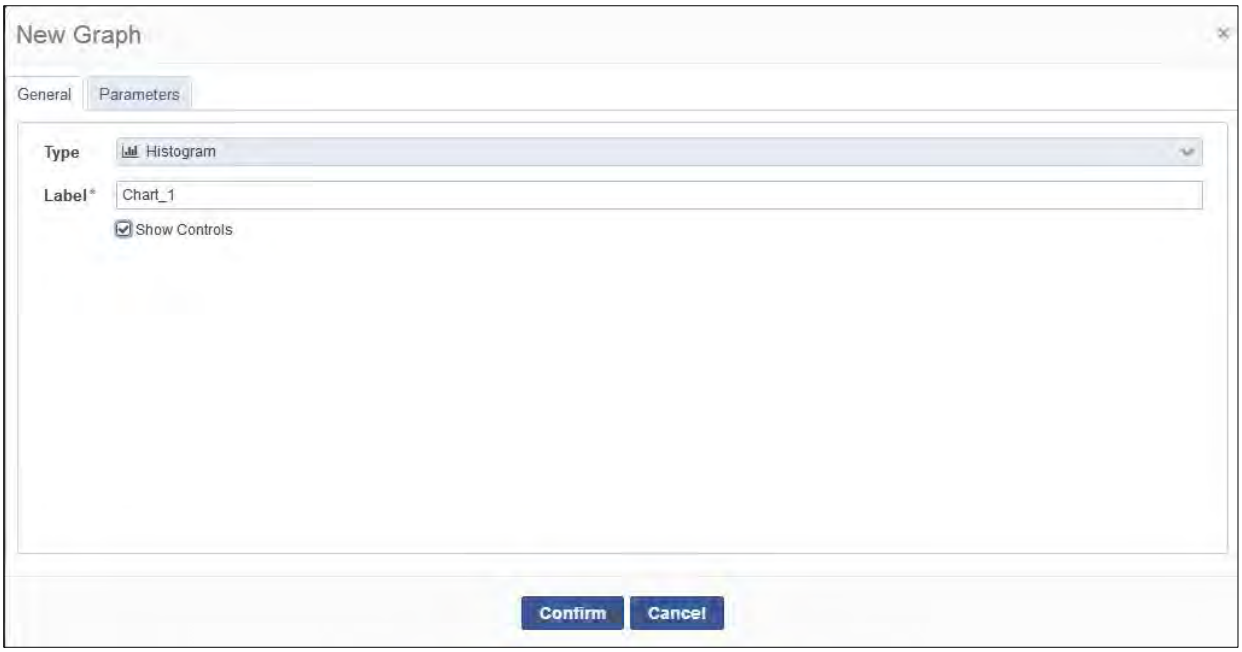


Fig. 7.2.12: "New Graph - General" window

12. Click on the "Show Controls" check box to allow graph local settings, enabled to override global controlsd, local controls can override global controls.

13. Click on "Parameters" tab: one row is shown for each selected parameter, their number being reported by the counter label. Selected parameters are described by "Device", "Parameter", "Measure unit" and "Color" column.

Fig. 7.2.13: "New Graph - Parameters" window

14. Select the parameter row and the top command bar is enabled.

15. Click on the "Question mark" icon to access to parameter information.

Fig. 7.2.14: "Question mark" icon

16. The parameter information window appears.

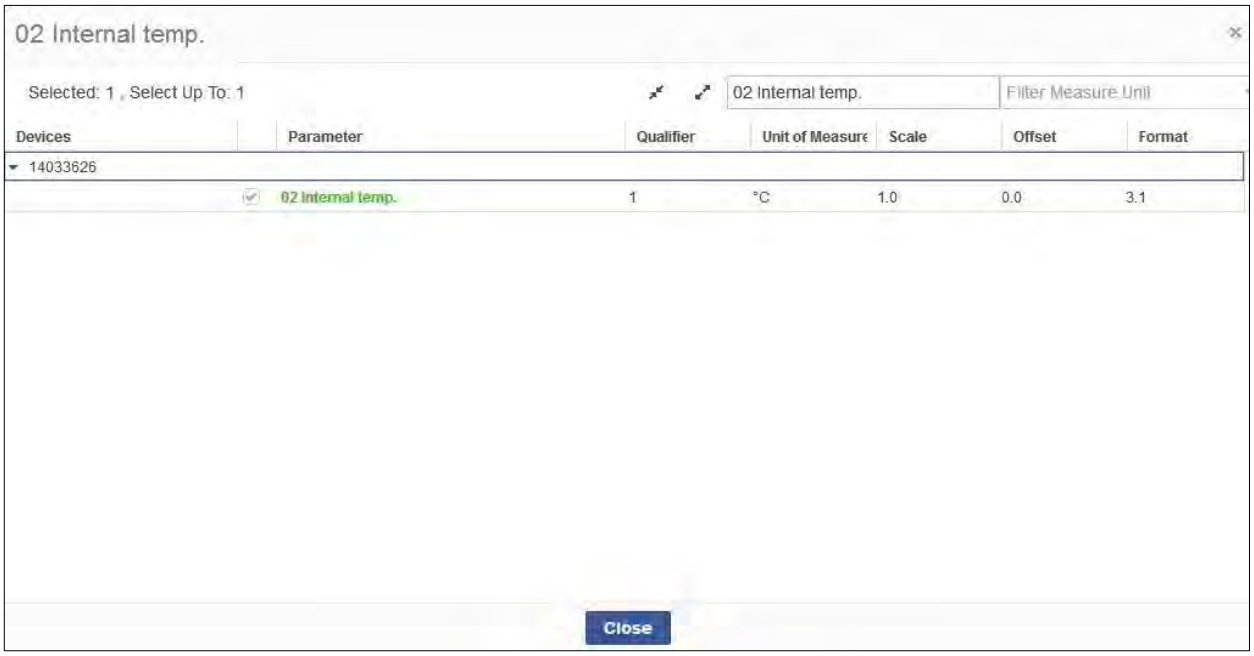


Fig. 7.2.15: Parameters information window

17. Click on "Close" button to go back to "New Graph" window.

18. Click on the "Pencil" icon to adjust parameter settings.

Fig. 7.2.16: "Pencil" icon

19. The "Modify Parameter" window appears.

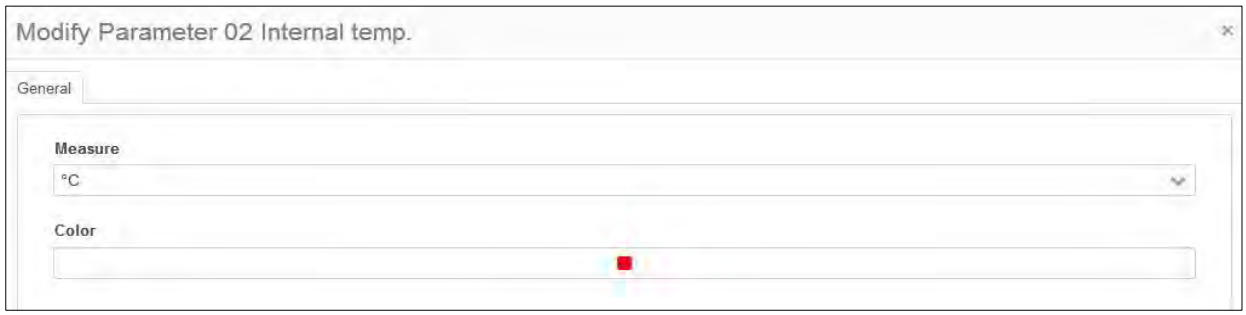


Fig. 7.2.17: "Modify Parameter" window

20. Click on the combo-box "Measure" to change the measure unit.

21. Click on the "Color" box to change the graph color.

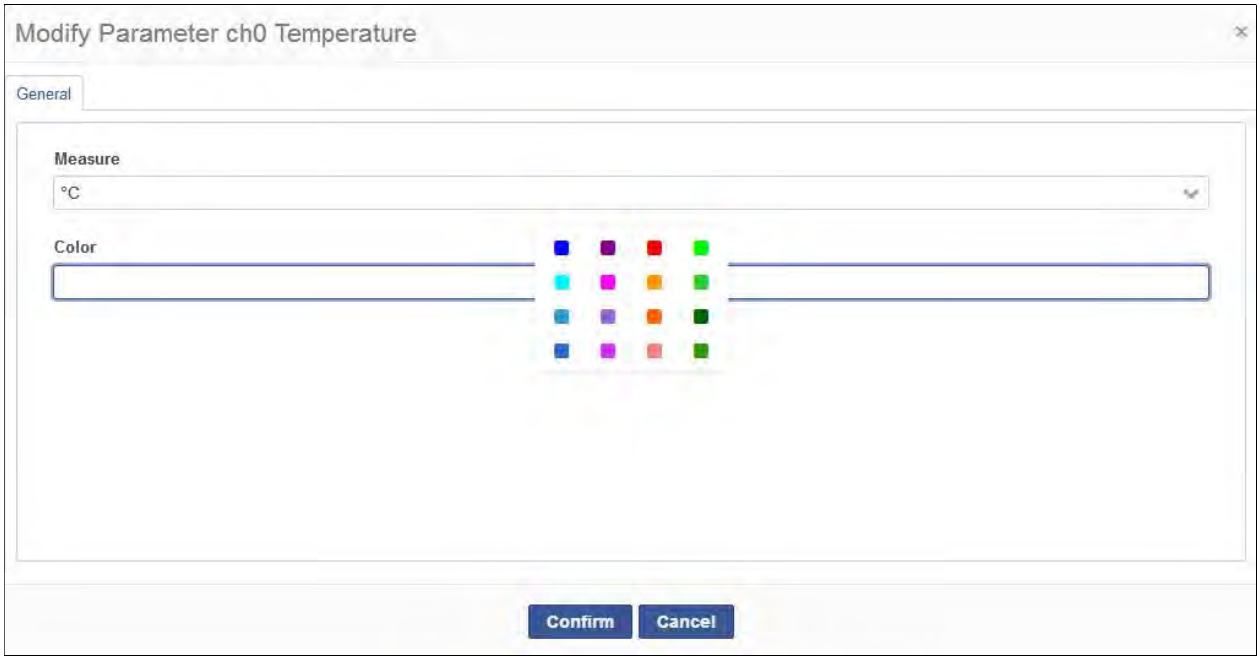


Fig. 7.2.18: "Modify Parameters" window

22. Click on "Confirm" button to save changes, otherwise click on "Cancel" button to discard them.

23. When back to "New Graph – Parameters" tab , according to the selected graph type, more quantities can be selected to be plotted in the same graph, allowing comparison also from different Devices measurements.

24. In case of erroneously inserted quantity, select it and click on "Waste basket" icon: it will be removed from the graph.

Fig. 7.2.19: "Parameters" tab, "Waste basket" icon

25. Click on "General" tab, then click on "Confirm" button to proceed or on "Cancel" button to give up.

26. When clicking on "Confirm" button, the "Modify Visualization" tab appears in the "Custom Visualization" window: click on the chart frame and drag it to the desired position.

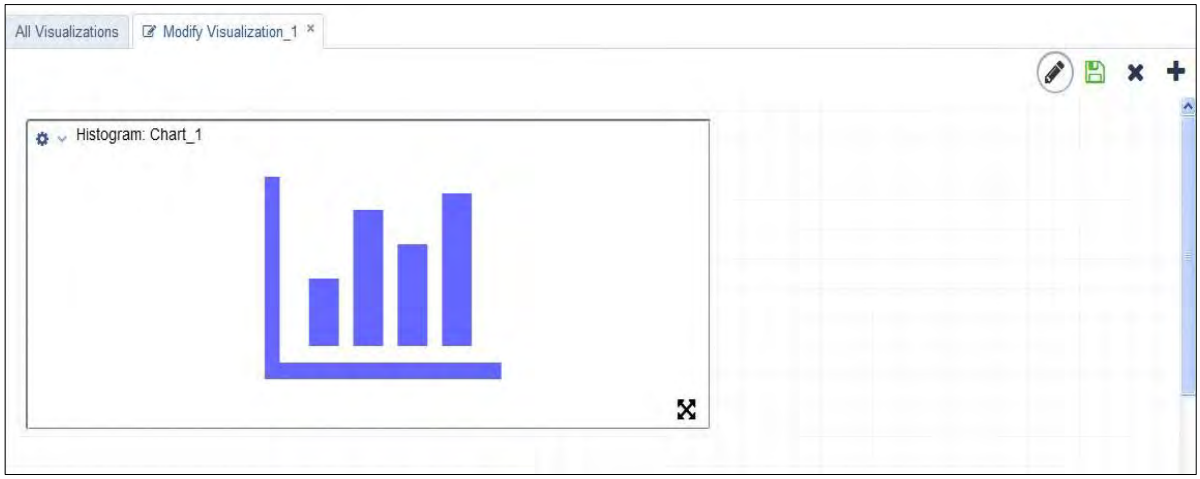


Fig. 7.2.20: "Modify Visualization" window

27. Click on the "Disk" icon: Visualisation is saved and "Modify Visualisation" tab is closed.

28. Click on the "Chart" icon in the right top command bar of the "All Visualization" tab to access the new Visualization.

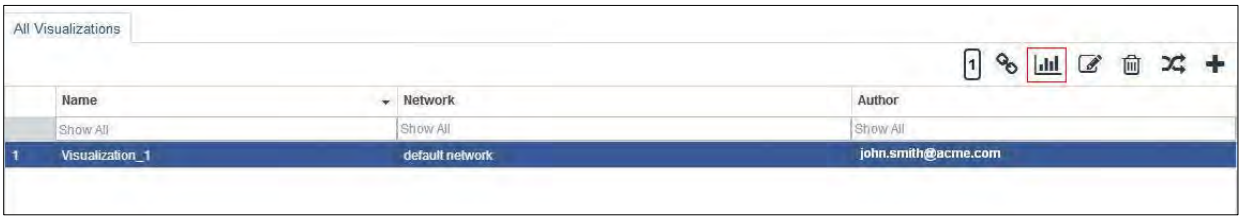


Fig. 7.2.21: New Visualization selection

29. The new Visualization is completed.

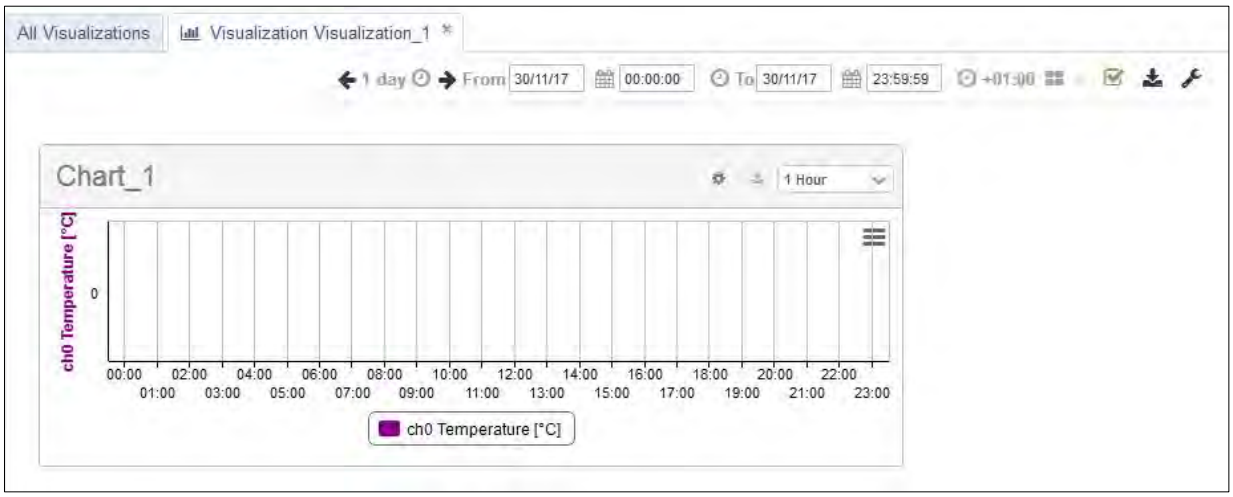


Fig. 7.2.22: New Visualization completed

7.2.2 MULTI TRACE CHART

The "Multi Trace" chart allows to create a graph displaying more than one parameter values.

1. Select "Multi Trace" item in the "Add Graph" window (step 6, section **7.2.1**): the "Add New Parameters" window appears.

2. Click on the desired parameters check-boxes, then click on "Add Selection" button.

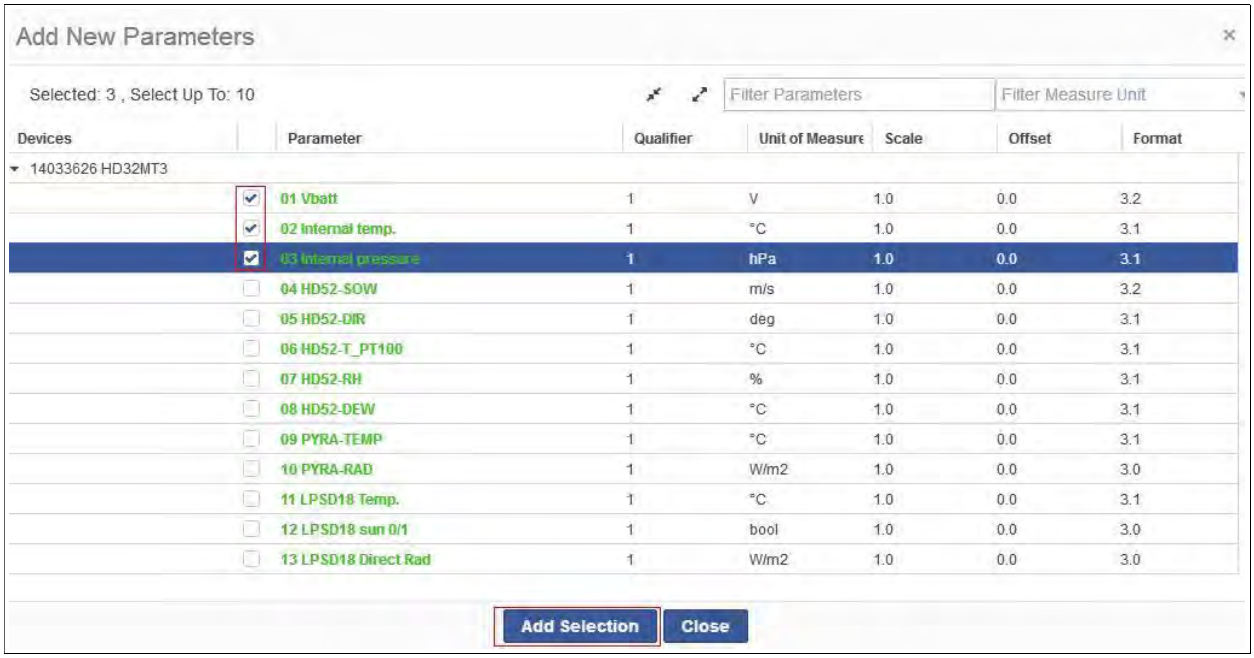


Fig. 7.2.23: Parameters selection for multi trace chart

3. The "New Graph" window appears: enter the graph name in the "Label" field, select "Linear" or "Logaritmic" item in the "Scale" drop-down menu and select optional check-boxes.

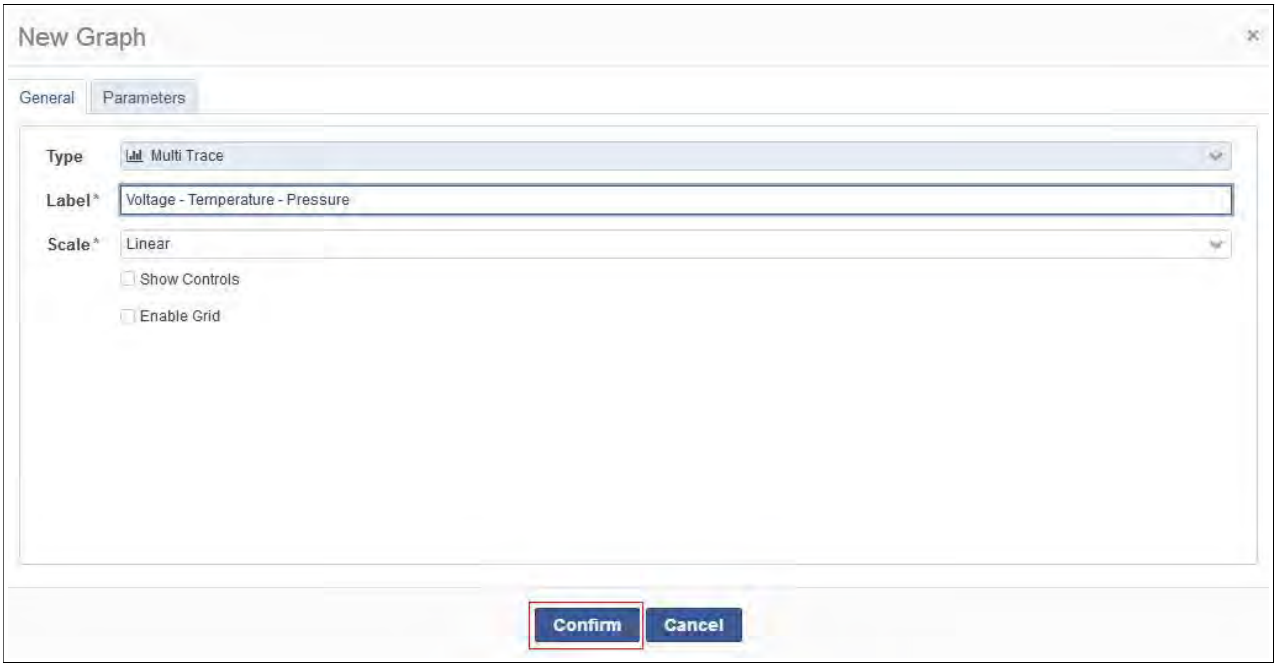


Fig. 7.2.24: Multi trace chart general informations

4. Click on "Parameters" tab: the selected parameters are listed by 9 fields as described in the following table.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameters belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.

	NAME	DESCRIPTION
4	"Color"	Square representing the color for parameter curve.
5	"Chart"	String describing the chart type.
6	"Marker"	String describing the figure used to highlight parameter samples.
7	"Dash Style"	String describing the line for parameter curve.
8	"Extremes"	String describing the vertical axis lower and upper values.
9	"Thresholds"	Sequence of defined threshold.

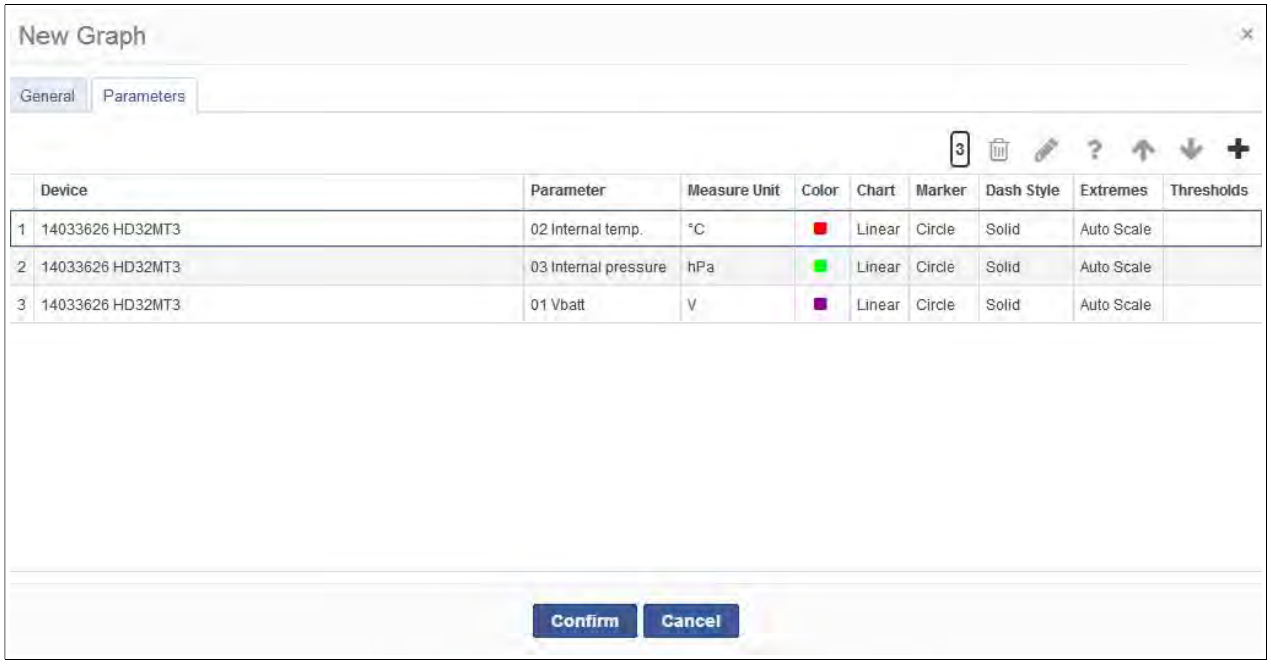


Fig. 7.2.25: Multi trace chart parameters list

5. Click on the "Plus" icon to go back to "Add New Parameters" window and add more parameters (step 2).

6. Click on a parameter row to select it: all the top command bar icons are enabled.

7. Click on the "Up arrow" or "Down arrow" icon to move the selected parameter up or down along the list.

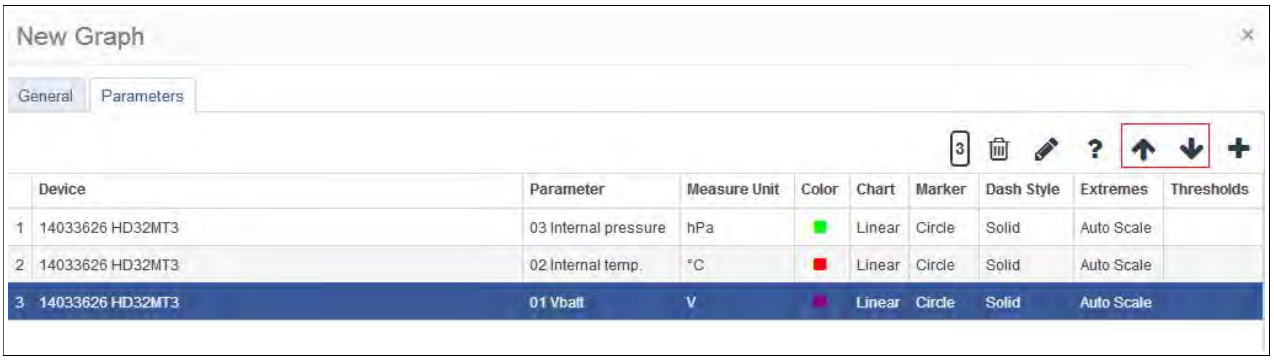


Fig. 7.2.26: "Move up" / "Move down" icons

8. Click on the "Question mark" icon: selected parameter properties appear in a dedicated window. Click on "Close" button to go back to "New Graph" window.

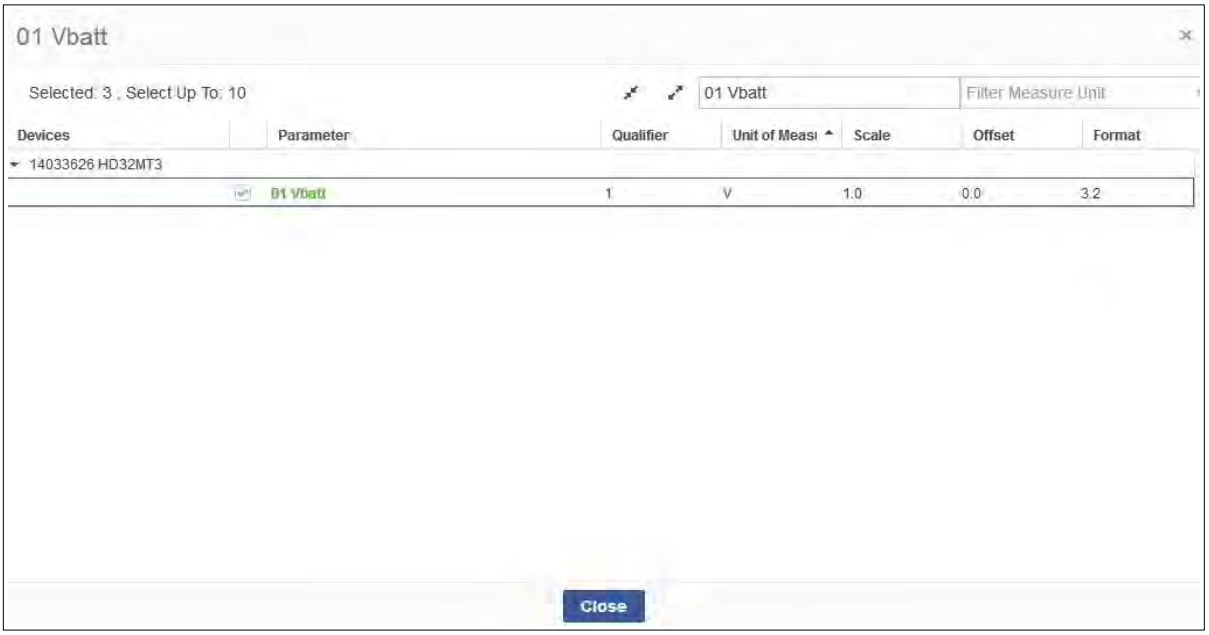


Fig. 7.2.27: Parameter description

9. Click on the "Pencil" icon to modify parameter graphical features.

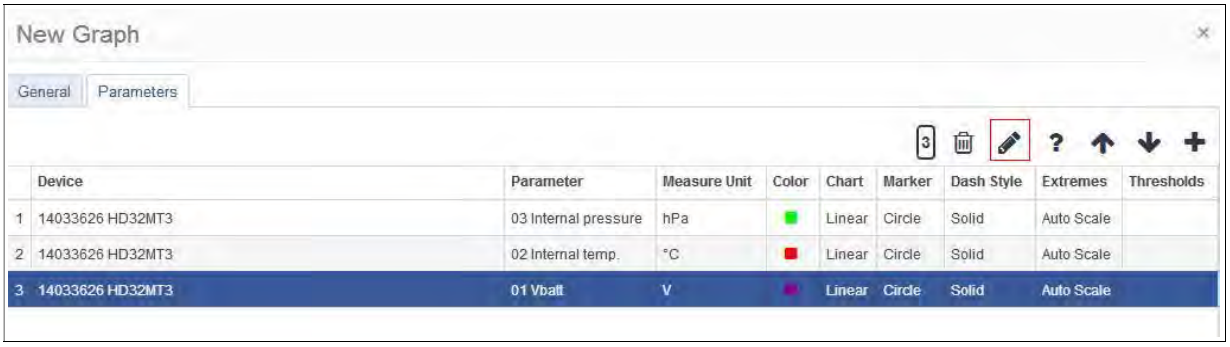


Fig. 7.2.28: "Pencil" icon

10. The "Modify Parameter" window appears.

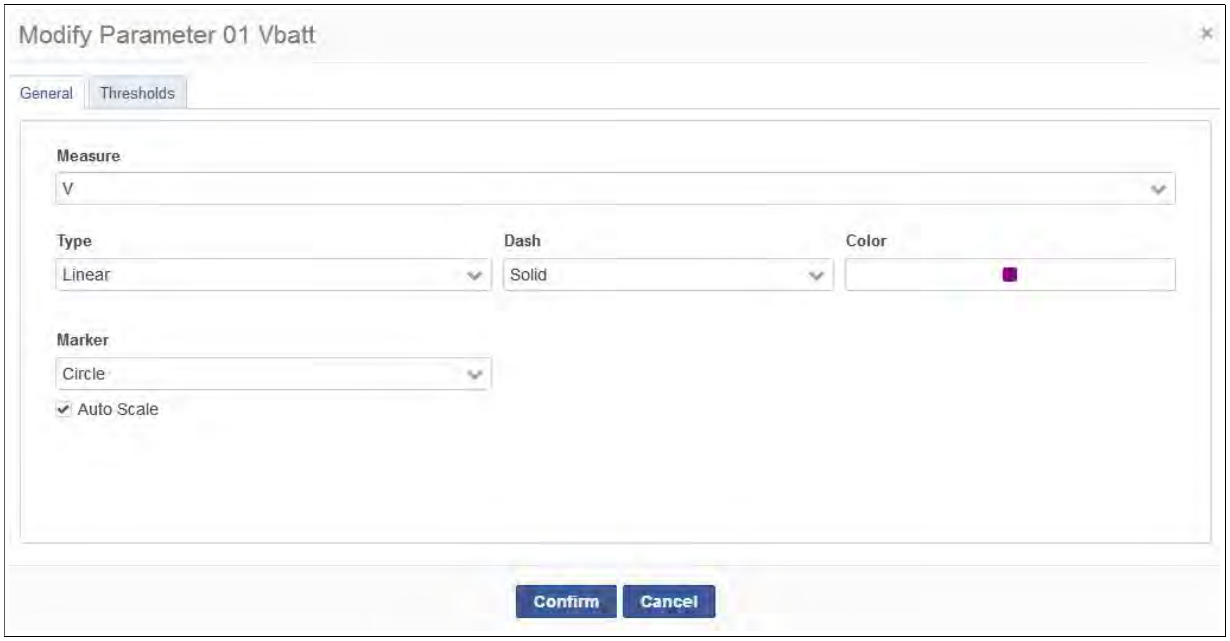


Fig. 7.2.29: "Modify Parameter" window

11. In the "General" tab:

- Click on "Measure" drop-down list to set a different parameter measure unit (if any).

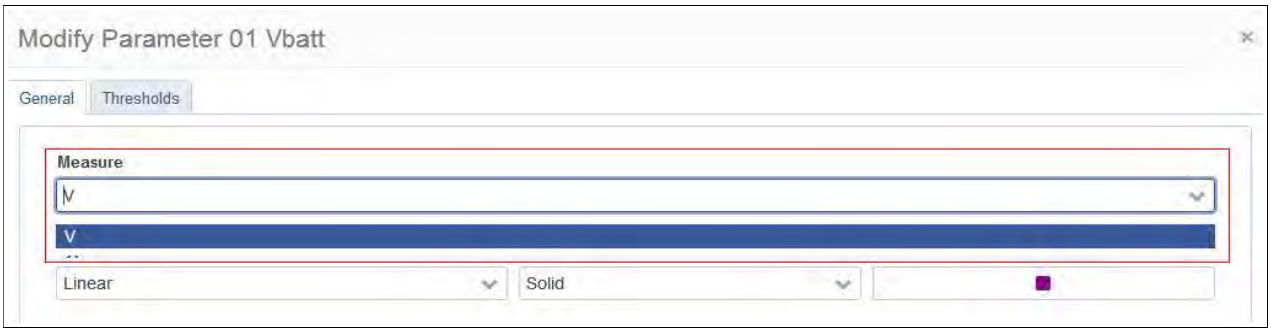


Fig. 7.2.30: "Measure" drop-down list

- Click on "Type" drop-down list to set chart feature among "Area", "Linear Smooth" or "Linear".

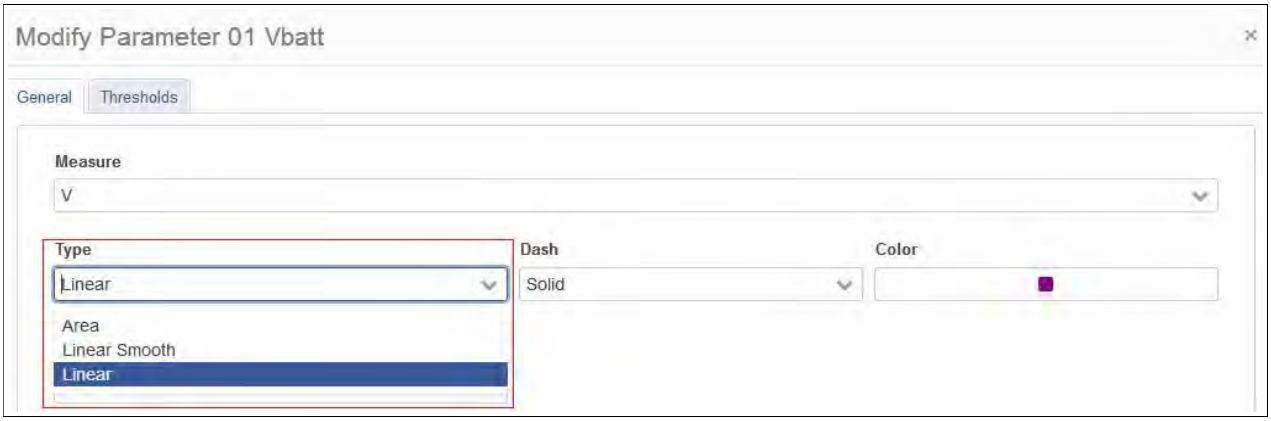


Fig. 7.2.31: "Type" drop-down list

- Click on "Dash" drop-down list to set the parameter curve style among "Solid", "Dash", "Dot", "Short Dash", "Long Dash", "Short Dash Dot" or "Long Dash Dot".

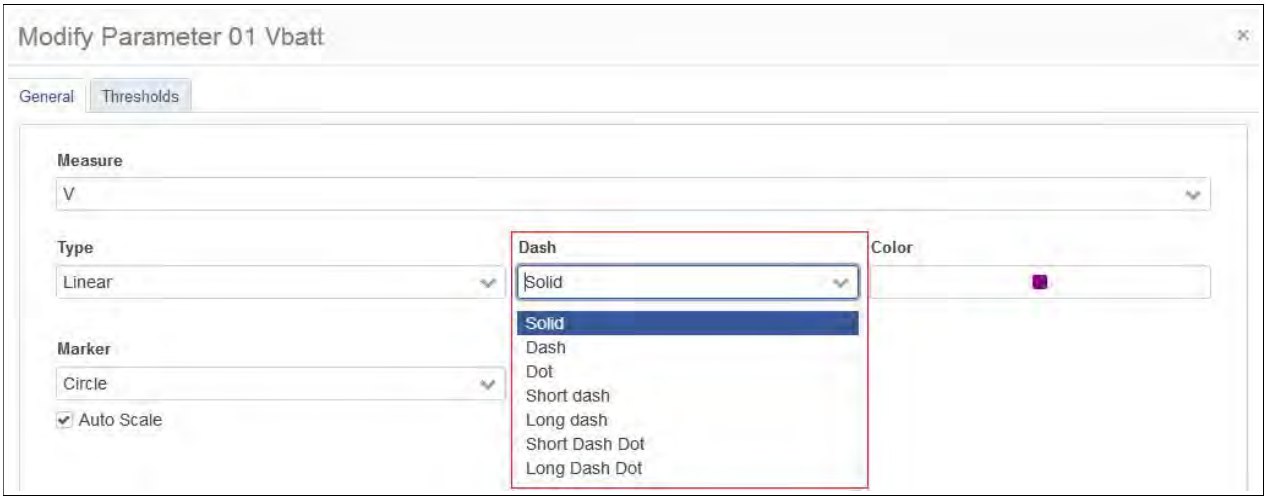


Fig. 7.2.32: "Dash" drop-down list

- Click on "Color" square to set a different curve color.

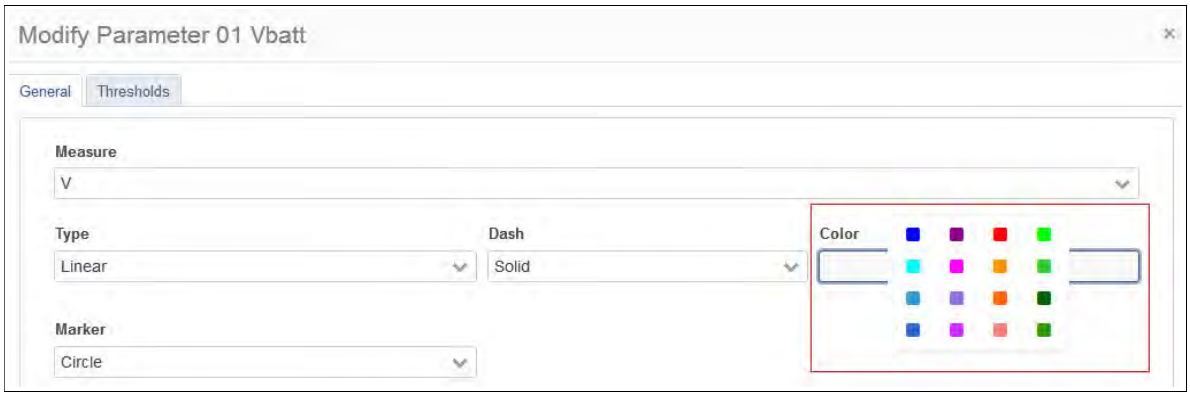


Fig. 7.2.33: "Color" drop-down list

- Click on "Marker" drop-down list to set the value marker shape among "Diamond", "Triangle", "Triangle Down", "Square", "Circle" or "Arrow".

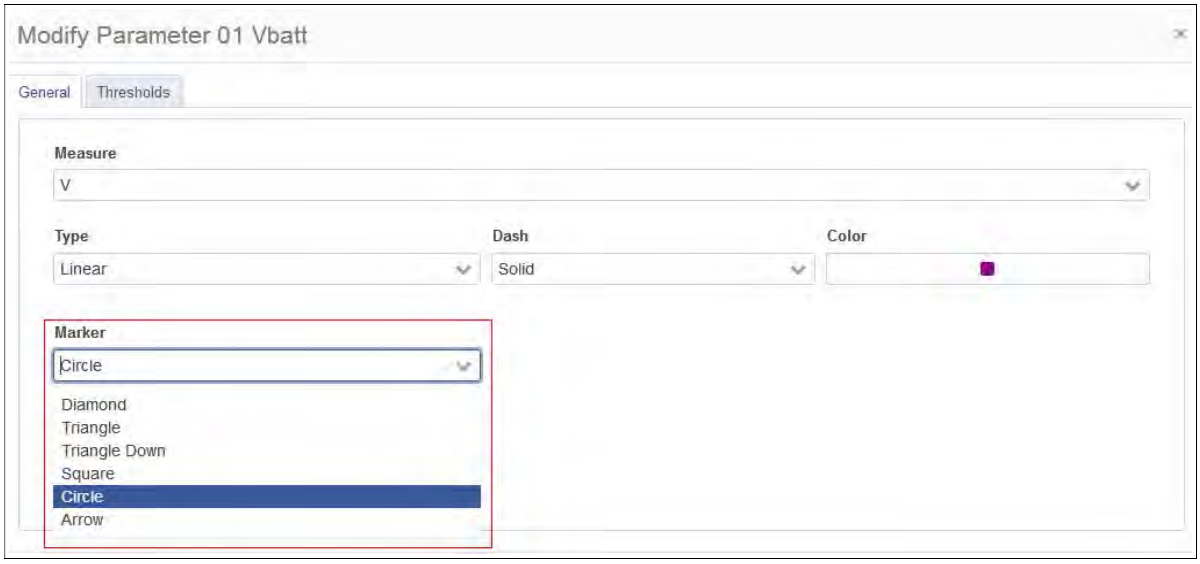


Fig. 7.2.34: "Marker" drop-down list

- Deselect the "Auto Scale" check-box to enter specific Upper and Lower Extremes in the corresponding text-boxes.

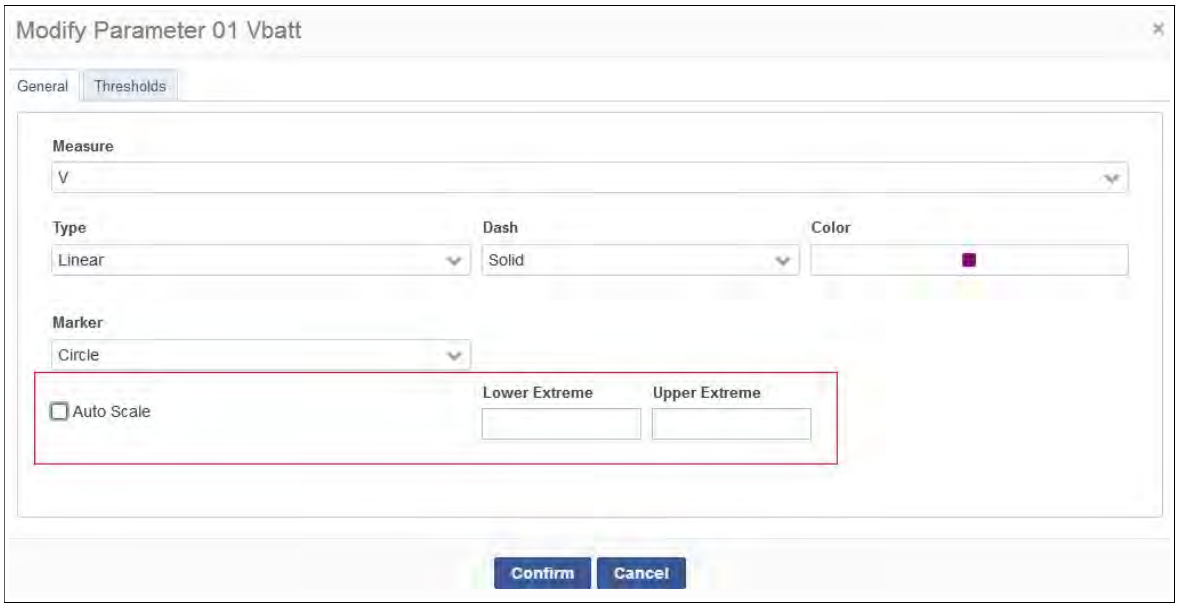


Fig. 7.2.35: "Lower Extreme" and "Upper Extreme" text-boxes

12. Click on "Thresholds" tab to create threshold values:

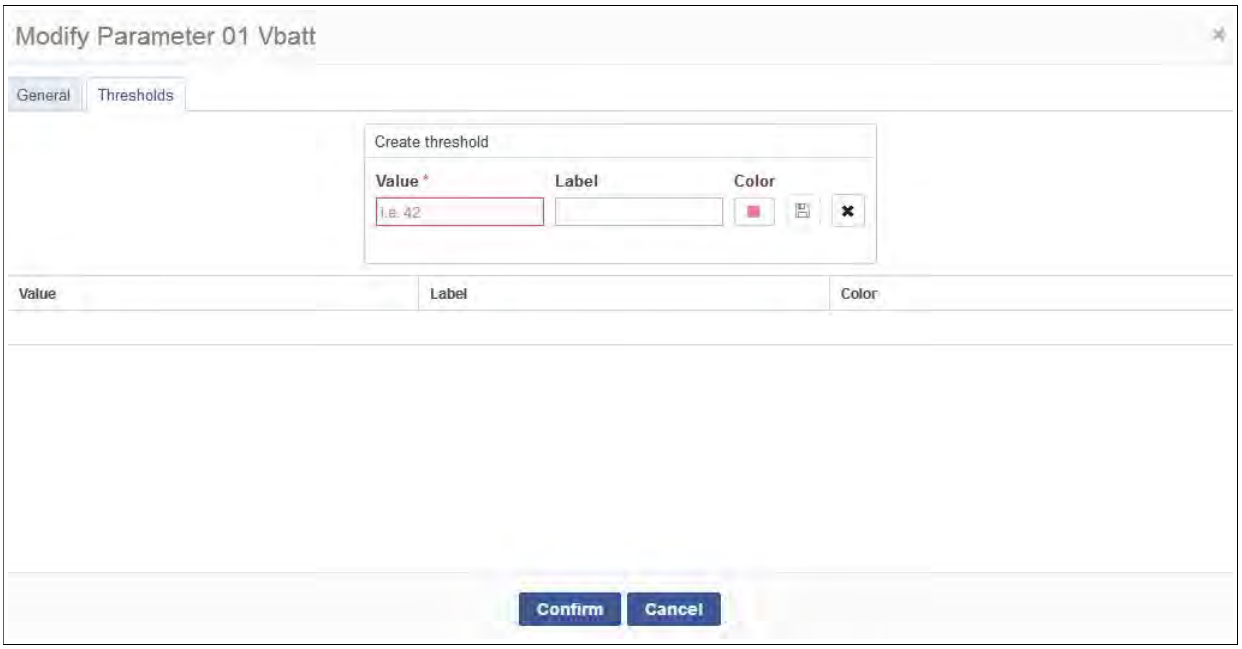


Fig. 7.2.36: "Thresholds" tab

- Enter the threshold value in the "Value" text-box, the threshold name in the "Label" text-box.
- Click on the "Color" box and select the desired color.
- Click on the "Cross" icon to quit threshold creation, otherwise click on the "Disk" icon to save the created threshold.

Fig. 7.2.37: "Save" icon for threshold creation

- The threshold appears in the list below.

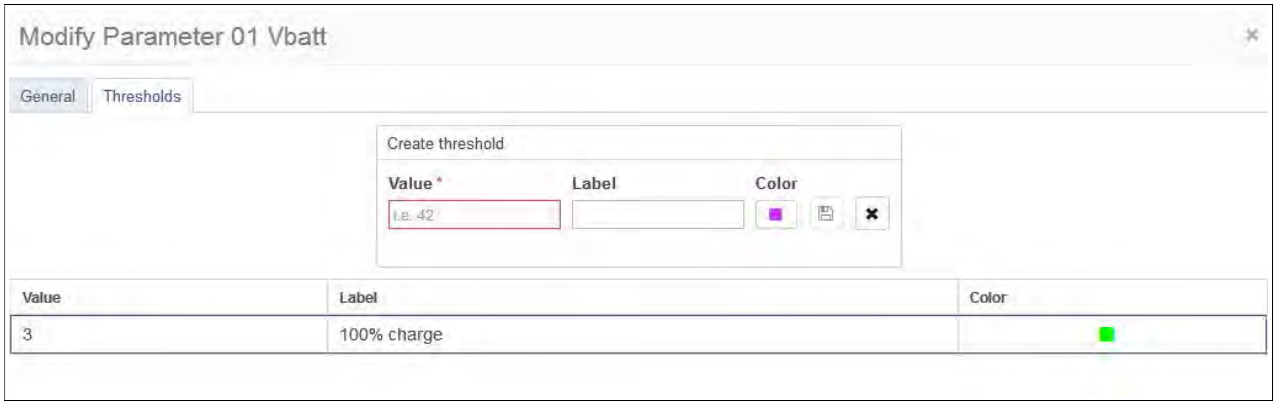


Fig. 7.2.38: Saved threshold

- Selected a defined threshold in the list to update properties ("Value", "Label", "Color") or to delete it (click on "Waste basket" icon).

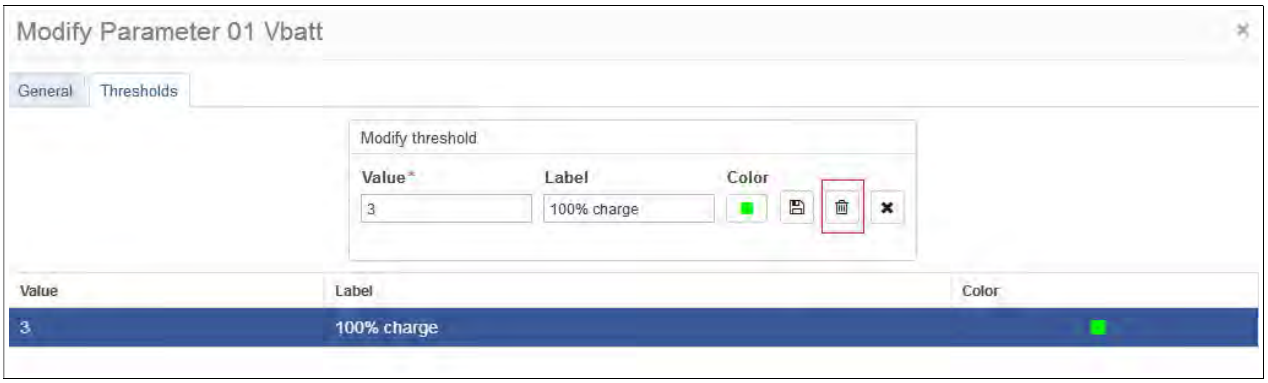


Fig. 7.2.39: "Waste basket" icon for threshold deletion

13. Click on "Confirm" button to apply changes and go back to "New Graph" window: changed features are updated in the selected parameter row.

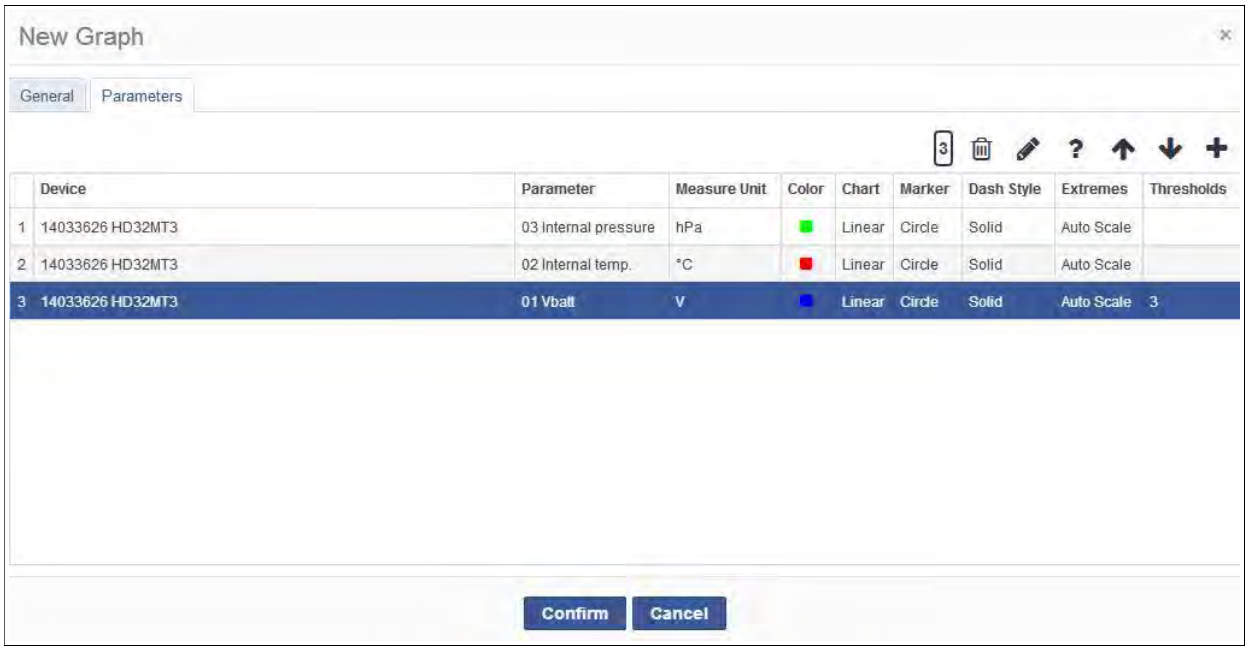


Fig. 7.2.40: "New Graph" window, updated parameter features

14. Click on the "Waste basket" icon to remove the selected parameter from the chart.

Fig. 7.2.41: "Waste basket" icon for parameter deletion

15. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.42: Confirmation window for parameter deletion

16. Click on the "Confirm" button in the "New Graph" window to terminate the chart.

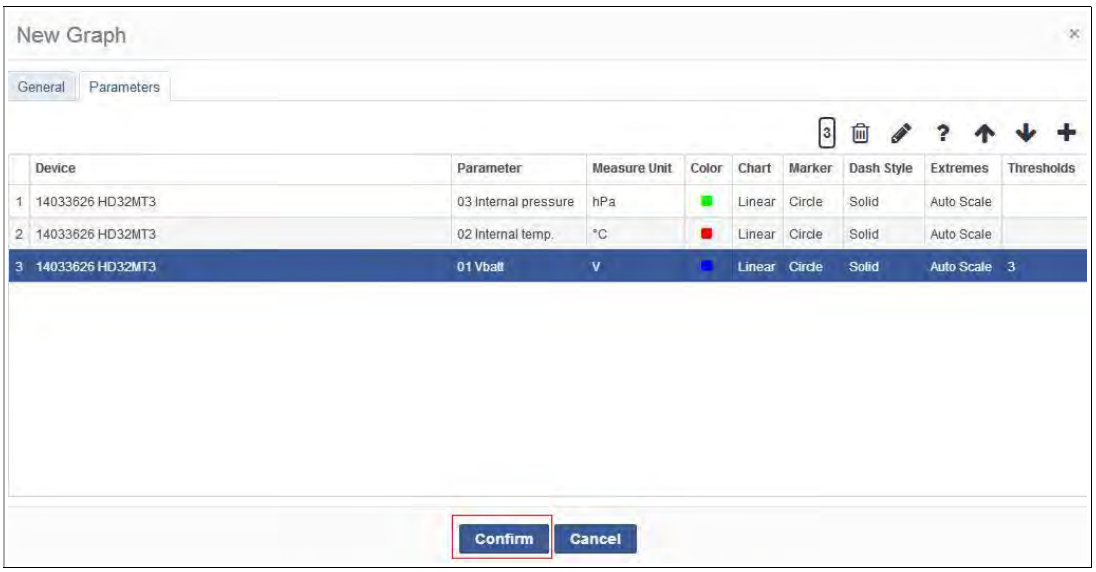


Fig. 7.2.43: "Confirm" button for chart termination

17. The Multi trace chart is included in the current Visualization: execute steps 26 to 28 from section 7.2.1 to save and check the result.

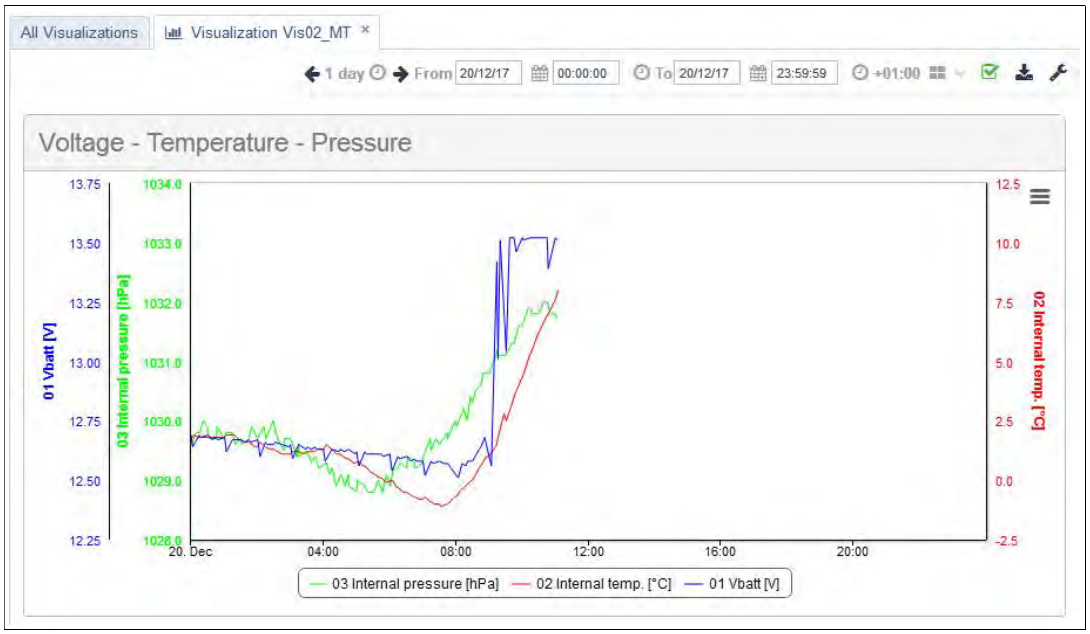


Fig. 7.2.44: Multi trace chart

7.2.3 WIND ROSE CHART

The "Wind Rose" chart allows creating a graph displaying wind speed and direction distribution.

1. Select "Wind Rose" item in the "Add Graph" window (step 6, section **7.2.1**): the "Add New Parameters" window appears, listing the congruent parameters from previously selected devices.

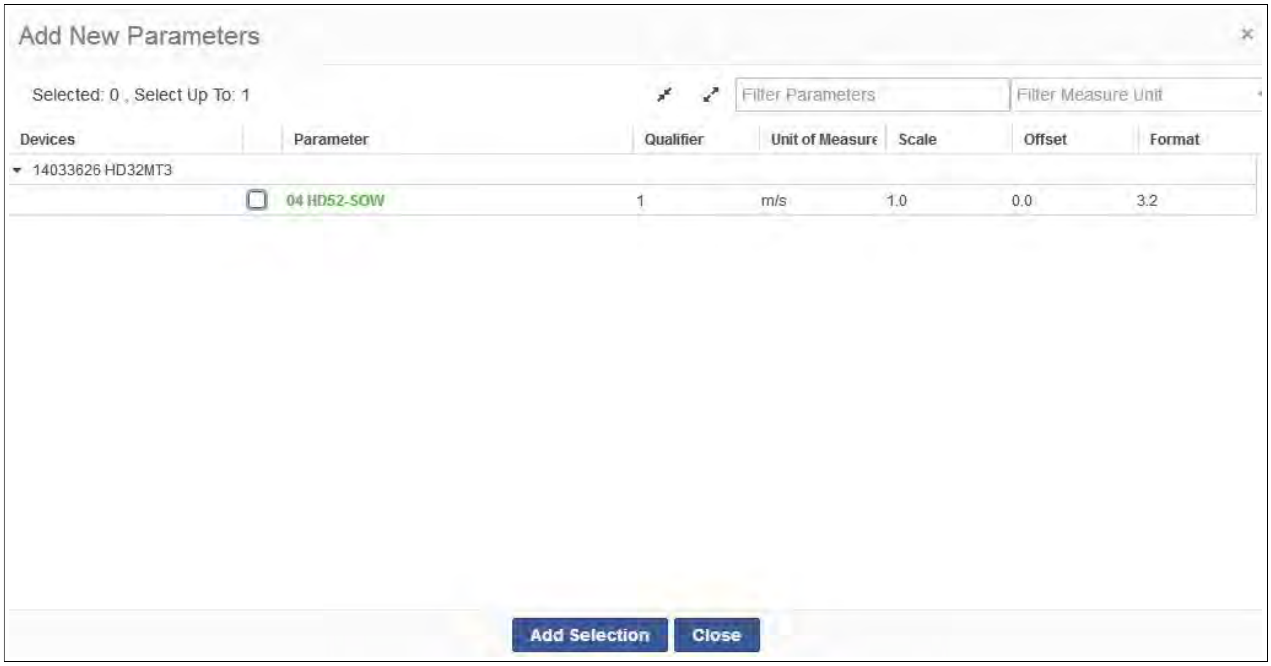


Fig. 7.2.45: "Add New Parameters" window

2. Click on the desired parameters check-boxes, then click on "Add Selection" button.

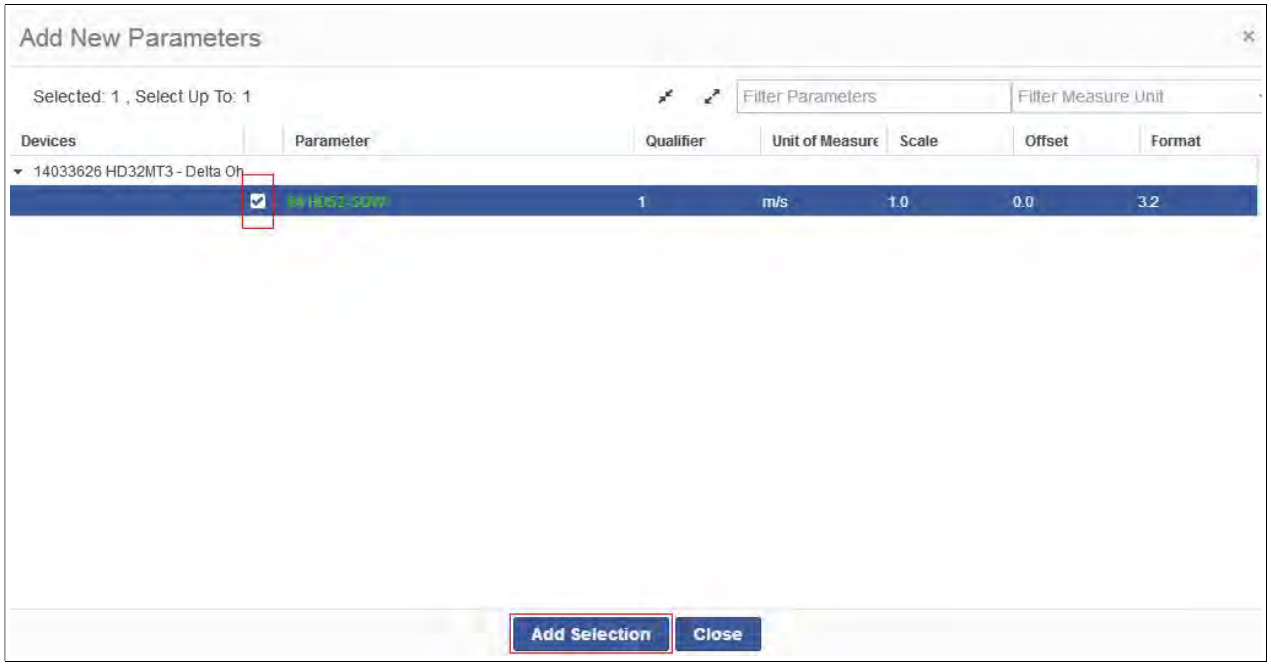


Fig. 7.2.46: Parameters selection for Wind Rose chart

3. The "New Graph" window appears: enter the graph name in the "Label" field, then select the "Show Controls" check-box to allow a local command bar.

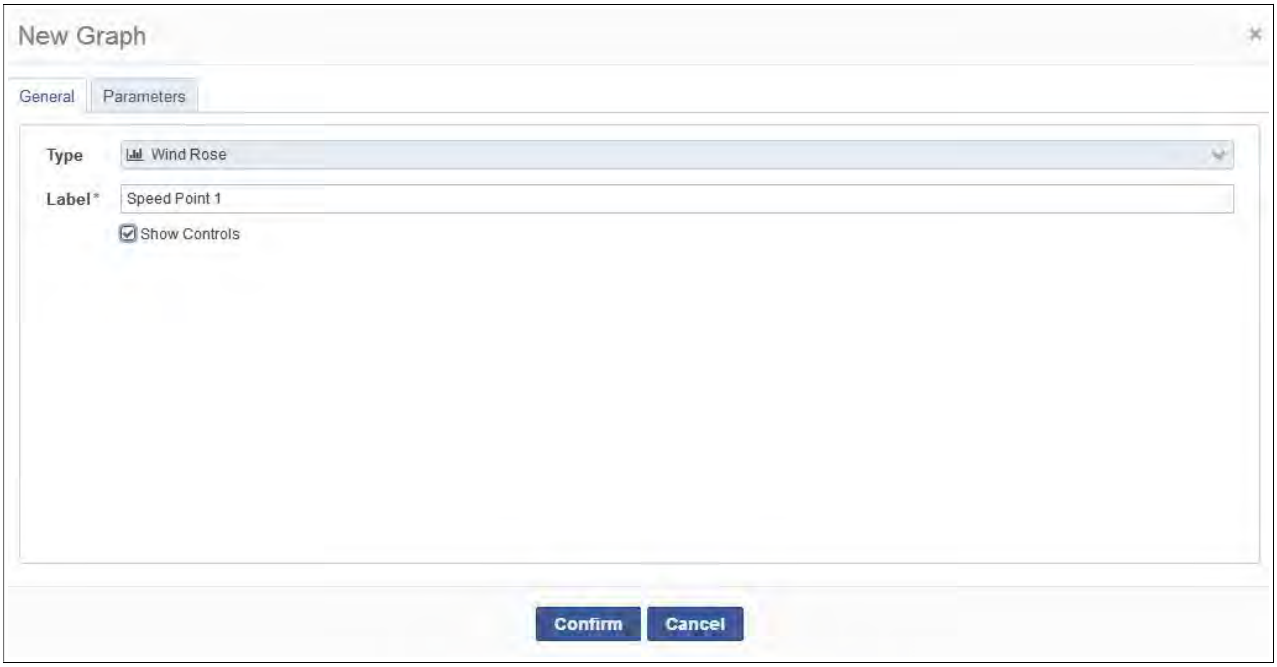


Fig. 7.2.47: "New Graph" window for Wind Rose chart

4. Click on "Parameters" tab: the selected Speed parameters are listed by 4 fields as described in the following table; the selected Direction parameters are listed only by 3 fields.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameters belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.
4	"Categories"	List of adjacent value intervals.

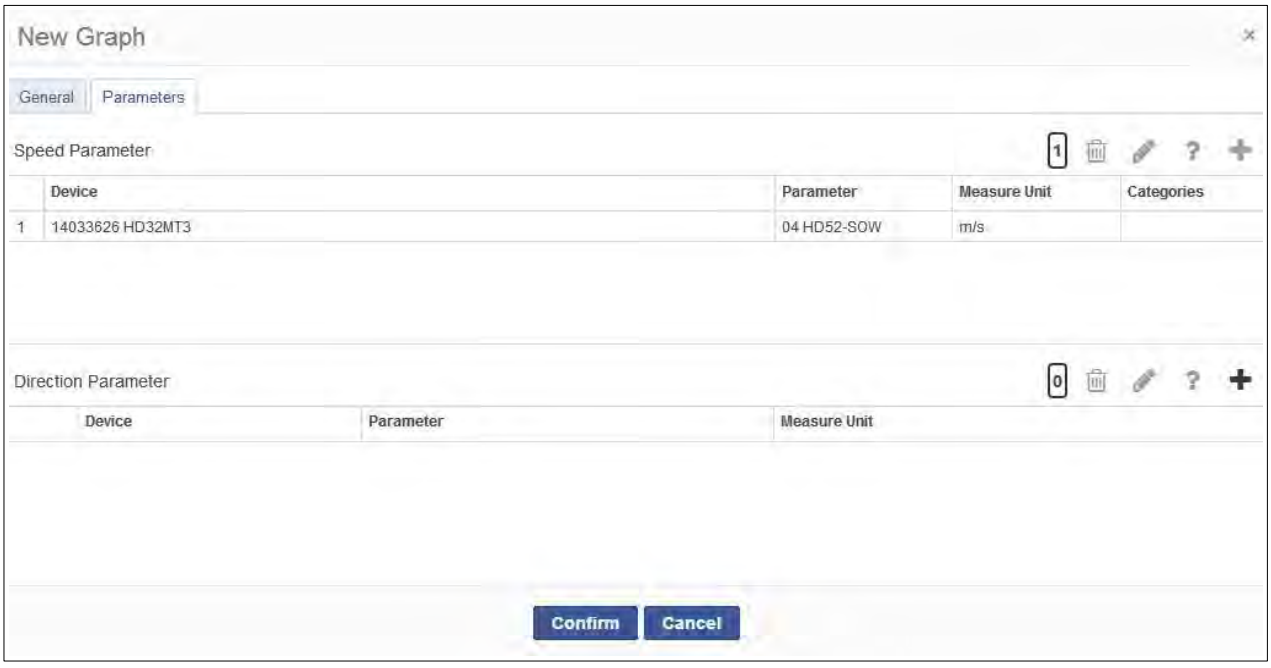


Fig. 7.2.48: "Parameters" tab for Wind Rose chart

5. The "Plus" icon is enabled in the command bar only if more parameters are available for selection: click on it to add them.

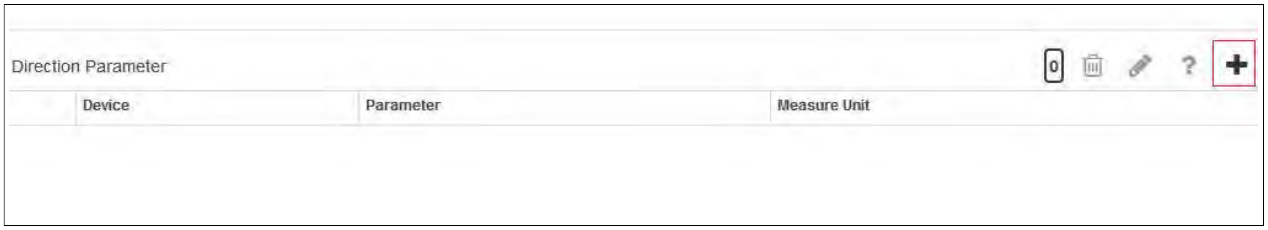


Fig. 7.2.49: Enabled "Plus" icon to add parameters

6. The "Add New Parameters" window appears, showing still unselected parameters.

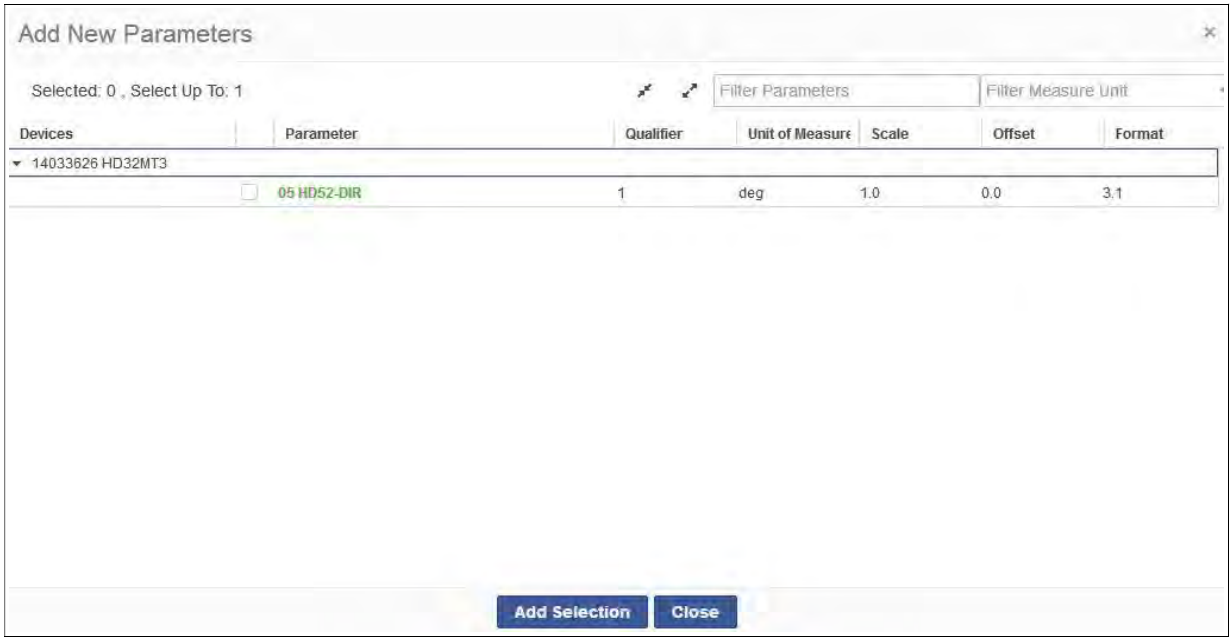


Fig. 7.2.50: Still unselected parameters list

7. Click on the parameter check-box, then click on the "Add Selection" button.

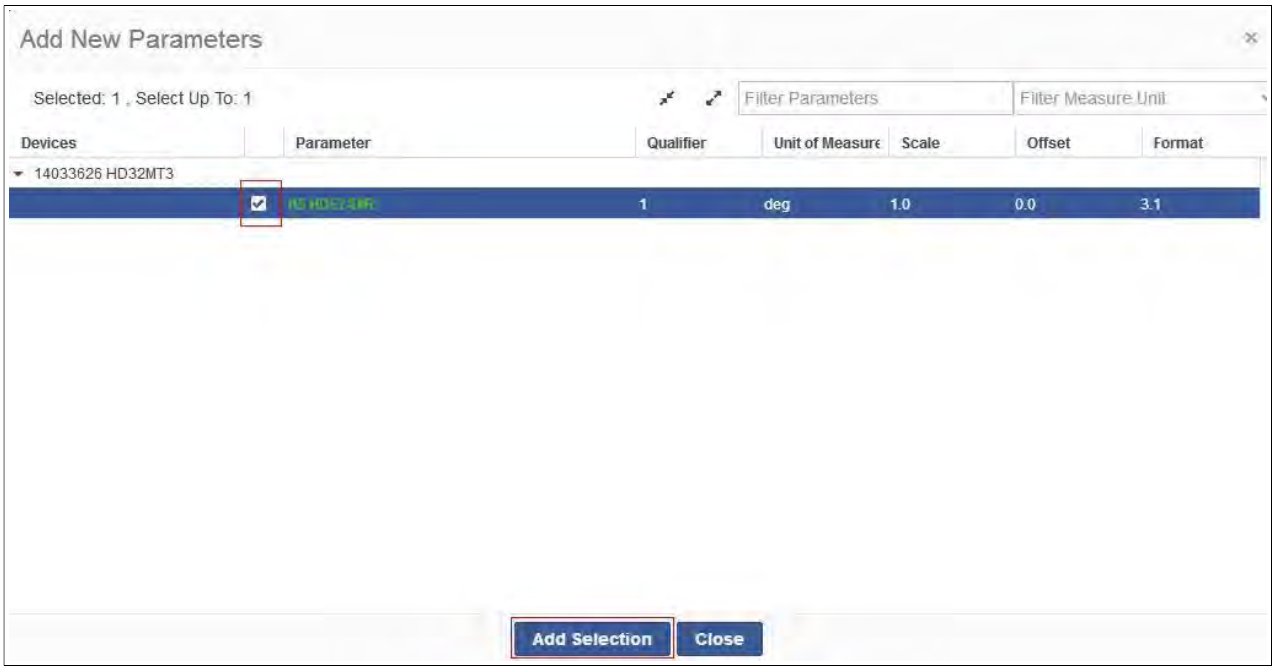


Fig. 7.2.51: Additional parameter selection

8. The "New Graph" window appears back: parameters list and counter label are updated.

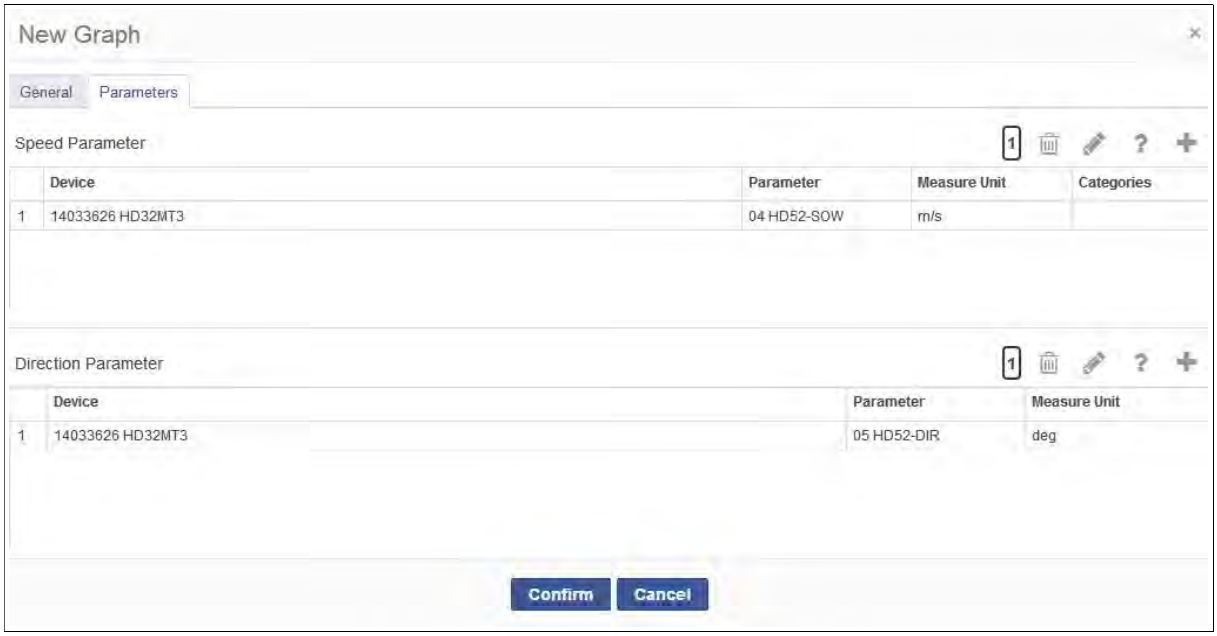


Fig. 7.2.52: Updated parameters list

9. Select a Speed or Direction parameter and click on the "Question mark" icon.

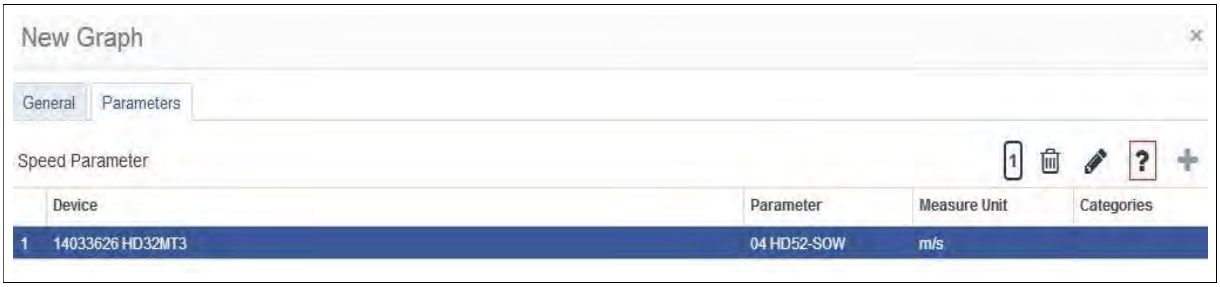


Fig. 7.2.53: "Question mark" icon

10. Selected parameter properties appear in a dedicated window. Click on "Close" button to go back to "New Graph" window.

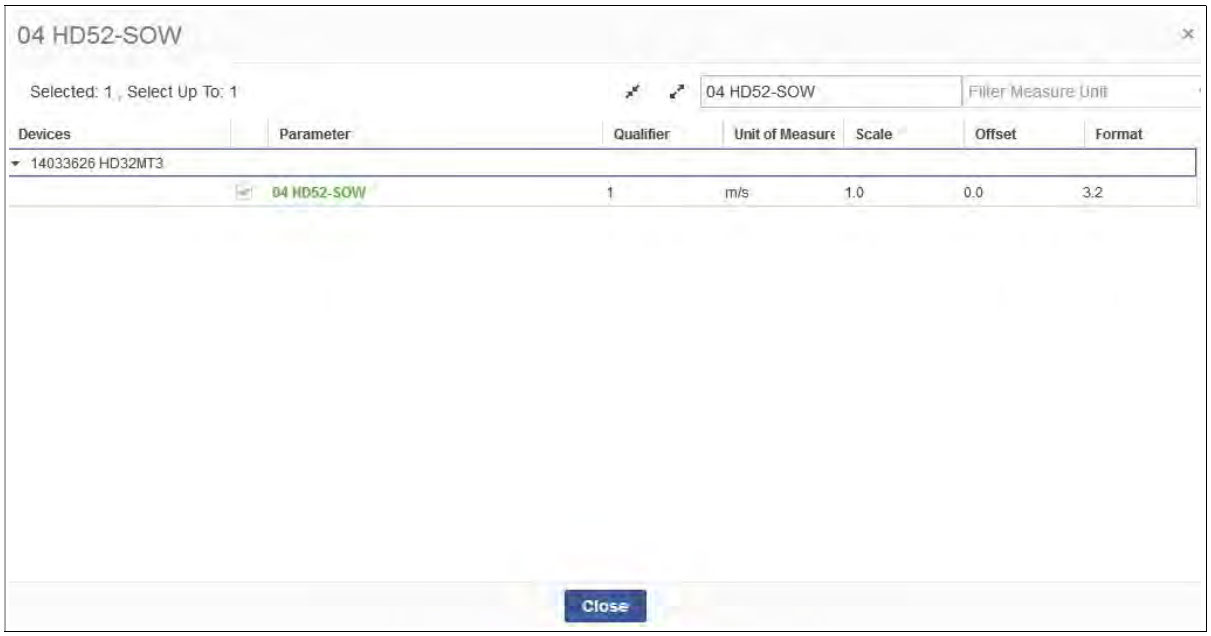


Fig. 7.2.54: Parameter description

11. Click on the "Pencil" icon to modify parameter graphical features.

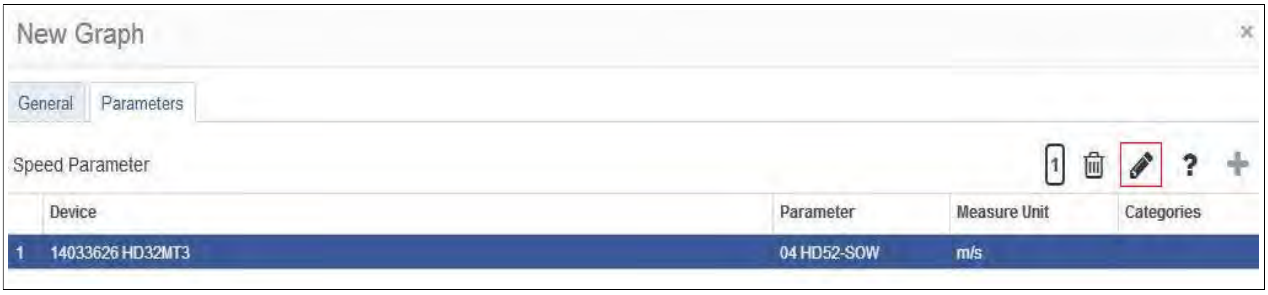


Fig. 7.2.55: "Pencil" icon

12. The "Modify Parameter" window appears.

Fig. 7.2.56: "Modify Parameter" window

13. In the "General" tab click on "Measure" drop-down list to set a different parameter measure unit (if any).

Fig. 7.2.57: "Measure" drop-down list

14. Click on "Categories" tab to define adjacent intervals where parameter values are to be mapped:

- Enter the category value in the "Value" text-box.
- Click on the "Color" box and select the desired color.
- Click on the "Cross" icon to quit category creation, otherwise click on the "Disk" icon to save the created category.

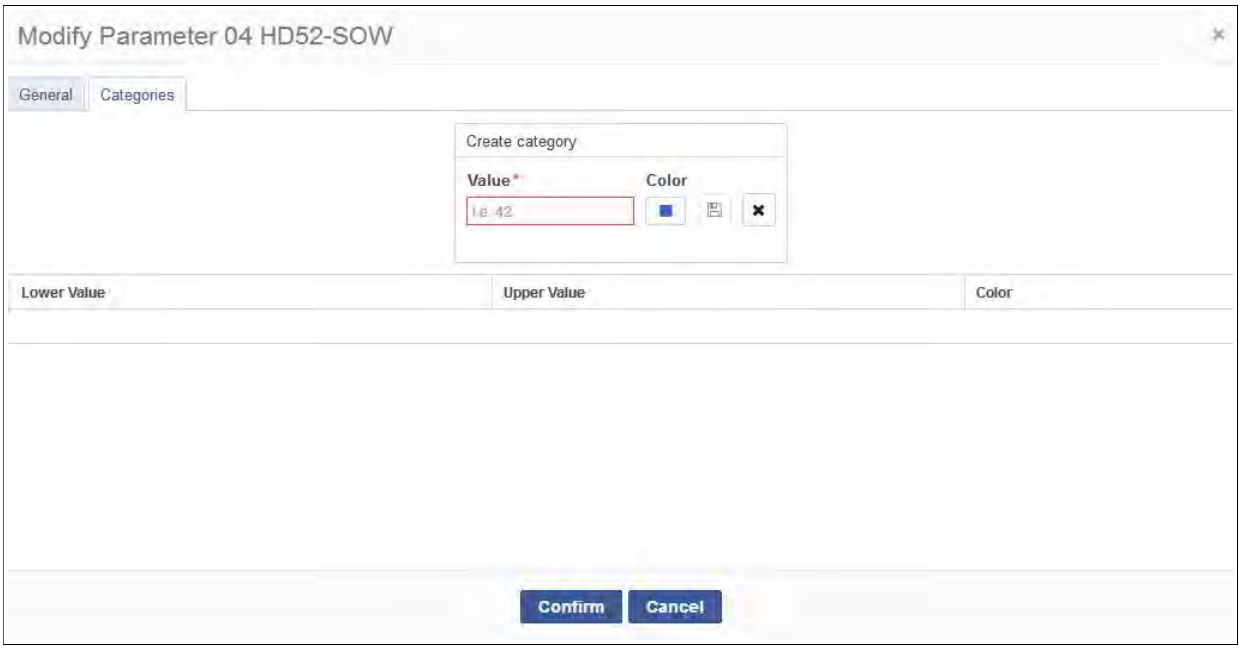


Fig. 7.2.58: "Categories" tab

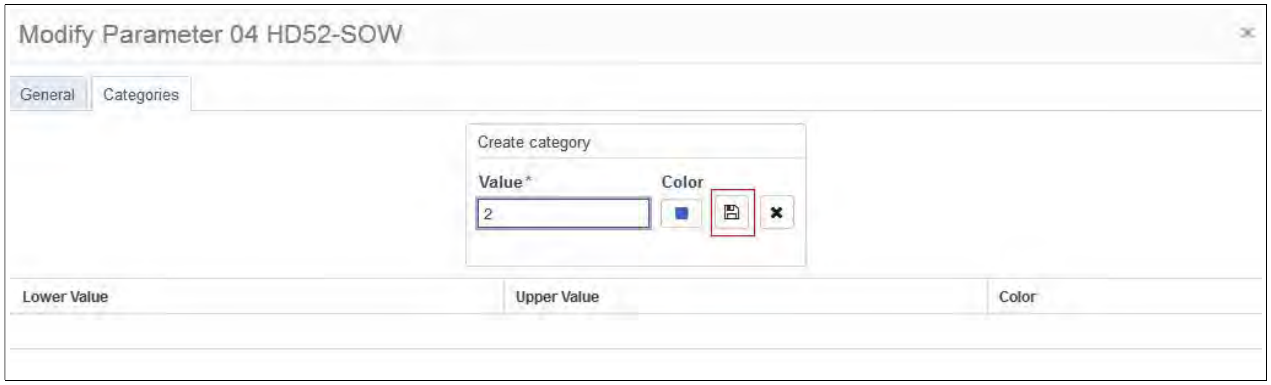


Fig. 7.2.59: "Save" icon for categories creation

15. The category appears in the list below as Lower Value.

Fig. 7.2.60: Saved category as Lower Value

16. Enter a second value, then click again on the "Disk" icon.

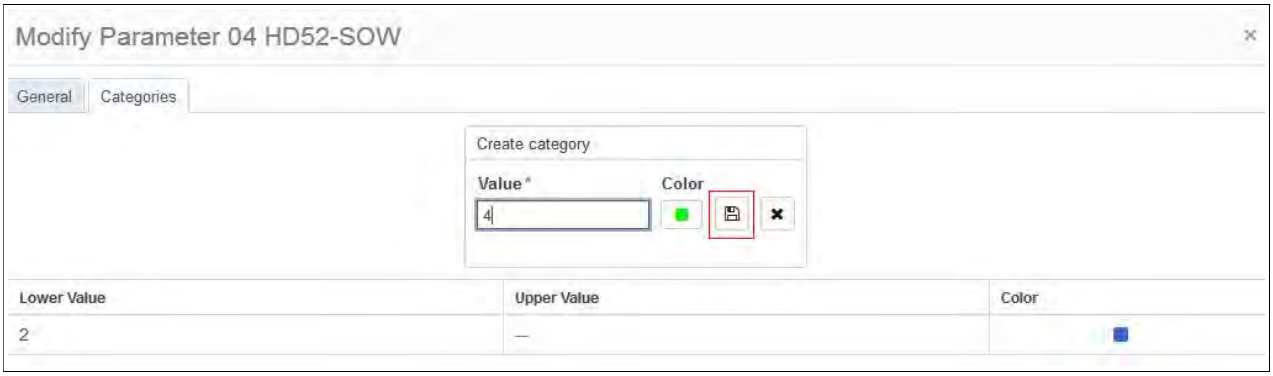


Fig. 7.2.61: "Save" icon for categories creation

17. The category appears in the list below as first interval Upper Value and second interval Lower Value. Repeat until all desired adjacent interval are created.

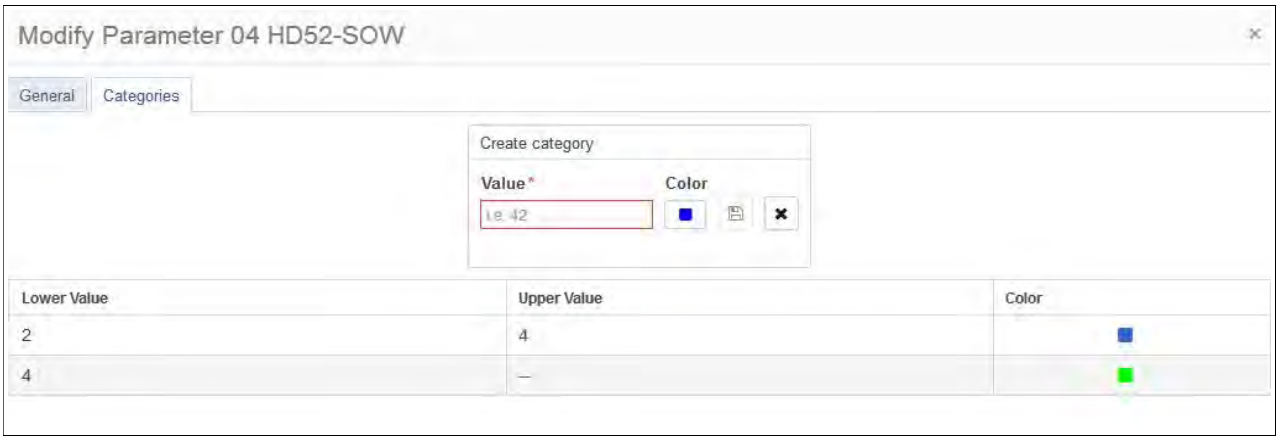


Fig. 7.2.62: Saved category as Upper Value

18. Selected a defined interval in the list to update properties ("Value", "Color") or to delete it (click on "Waste basket" icon).

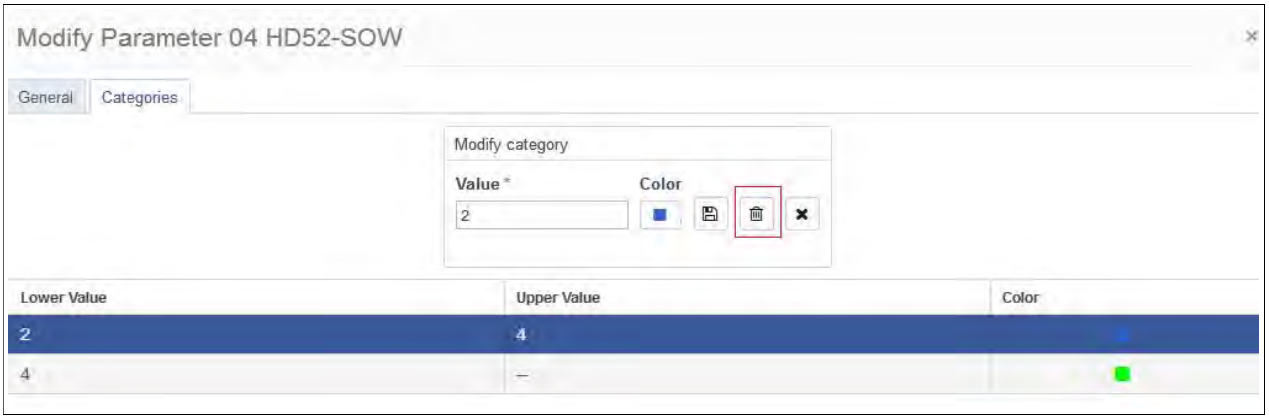


Fig. 7.2.63: "Waste basket" icon for interval deletion

19. Click on "Confirm" button to apply changes and go back to "New Graph" window: changed features are updated in the selected parameter row.

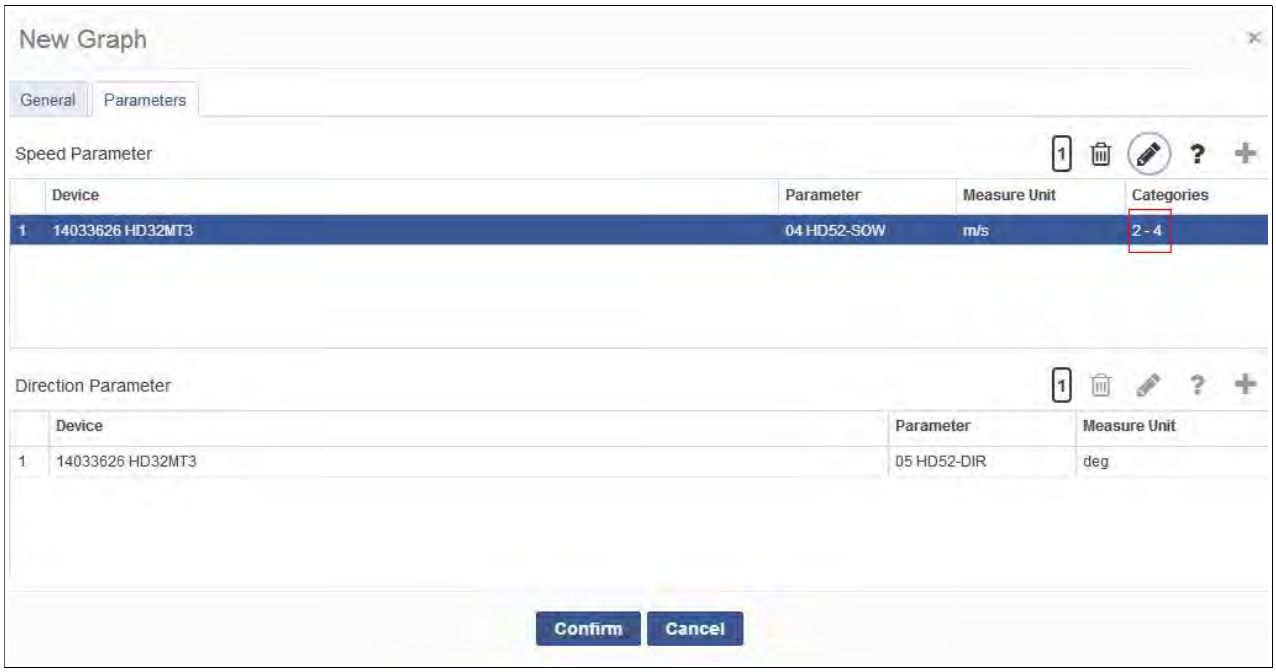


Fig. 7.2.64: "New Graph" window, updated parameter features

20. Click on the "Waste basket" icon to remove the selected parameter from the chart.

Fig. 7.2.65: "Waste basket" icon for parameter deletion

21. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.66: Confirmation window for parameter deletion

22. Click on the "Confirm" button in the "New Graph" window to terminate the chart.

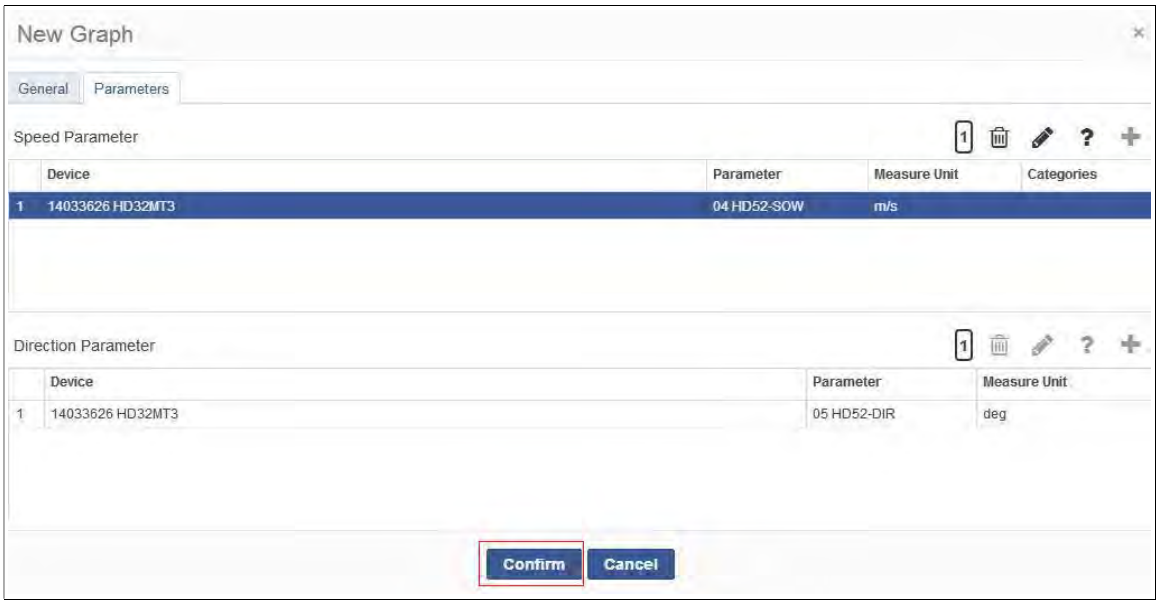


Fig. 7.2.67: "Confirm" button for chart termination

23. The Multi trace chart is included in the current Visualization: execute steps 26 to 28 from section 7.2.1 to save and check the result.

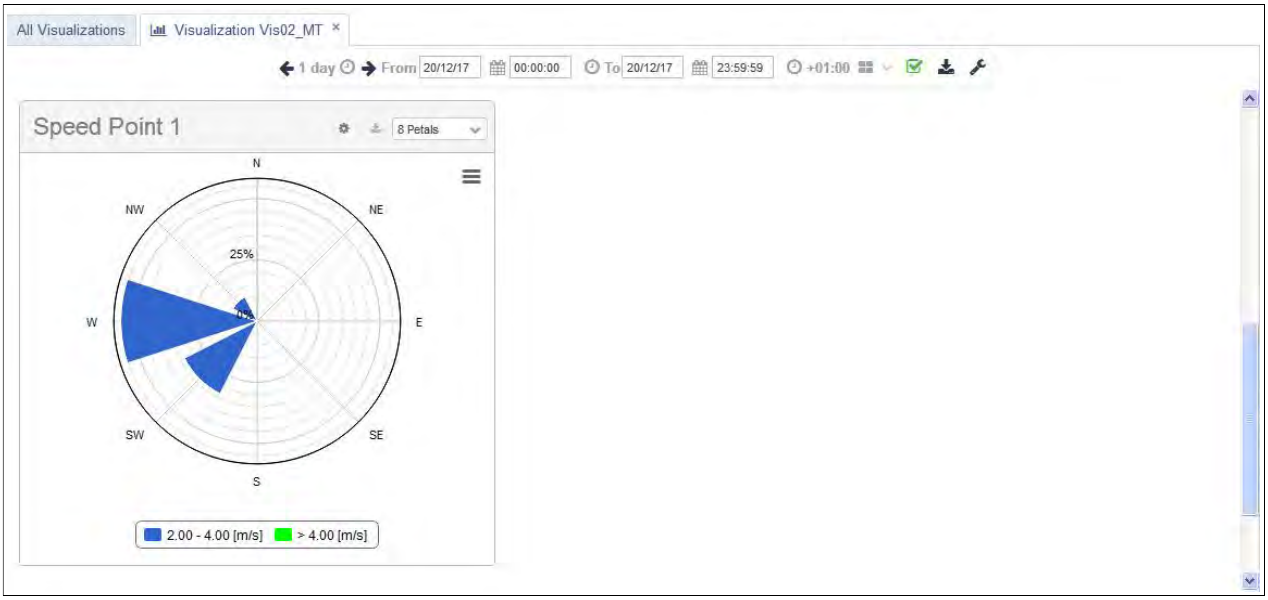


Fig. 7.2.68: "Wind Rose" chart

24. Click on the "Gear" icon in the graph box: the local command bar appears disabled.

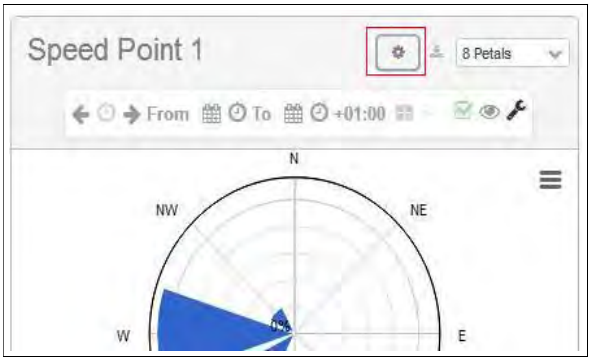


Fig. 7.2.69: "Wind Rose" chart

25. Click on the "Wrench" icon in the local command bar: a drop-down menu appears.

26. Select the "Local" check-box and click on the "Check" icon to enable the local command bar.

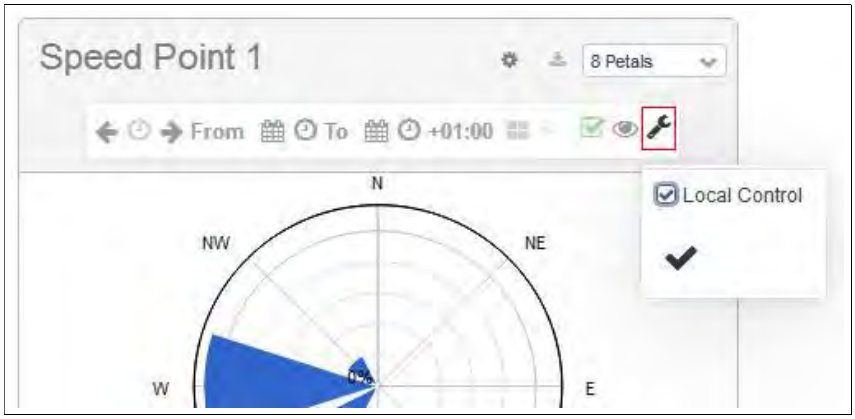


Fig. 7.2.70: "Wrench" icon and its drop-down menu

27. Find command icons description in sections 4.2.1 to 4.2.3

28. Click on the "Eye" icon to display the last received measures.

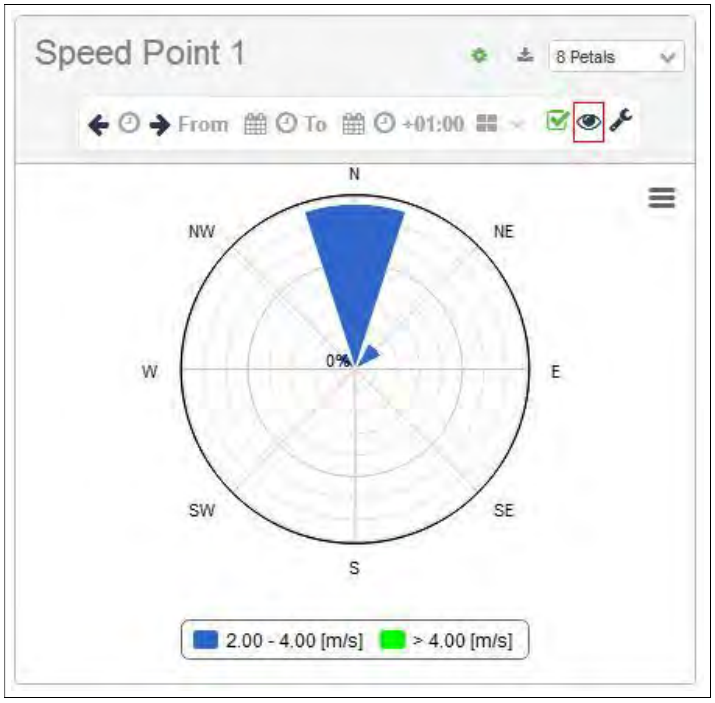


Fig. 7.2.71: "Eye" icon to display last measures

29. Click on the "Download" icon.

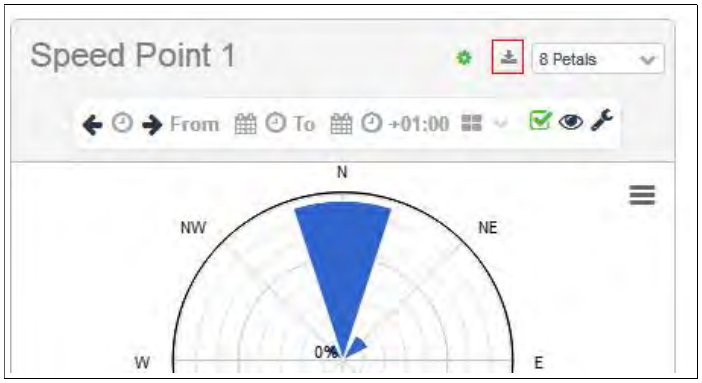


Fig. 7.2.72: "Download" icon for chart exportation to file

30. The "Exportation" window appears: fill the window fields as described in section 4.2.5 (steps 1 to 4), then click on the "Export" button.

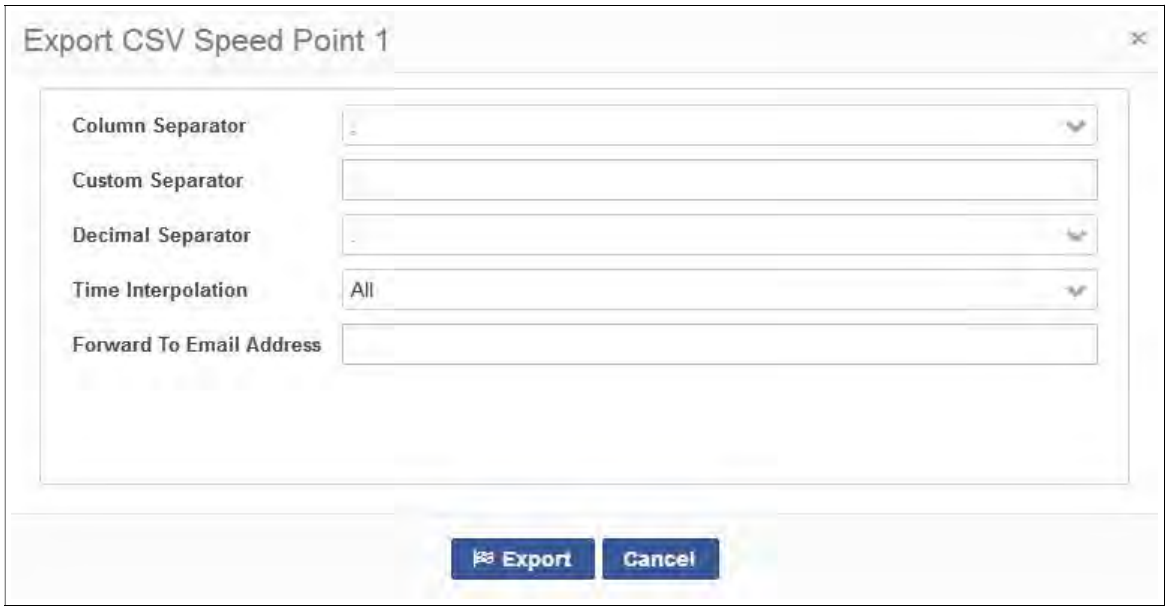


Fig. 7.2.73: "Exportation" window for chart values

31. When the CSV file with measured values is ready, a message window appears: click on the file link and save it on your local PC.

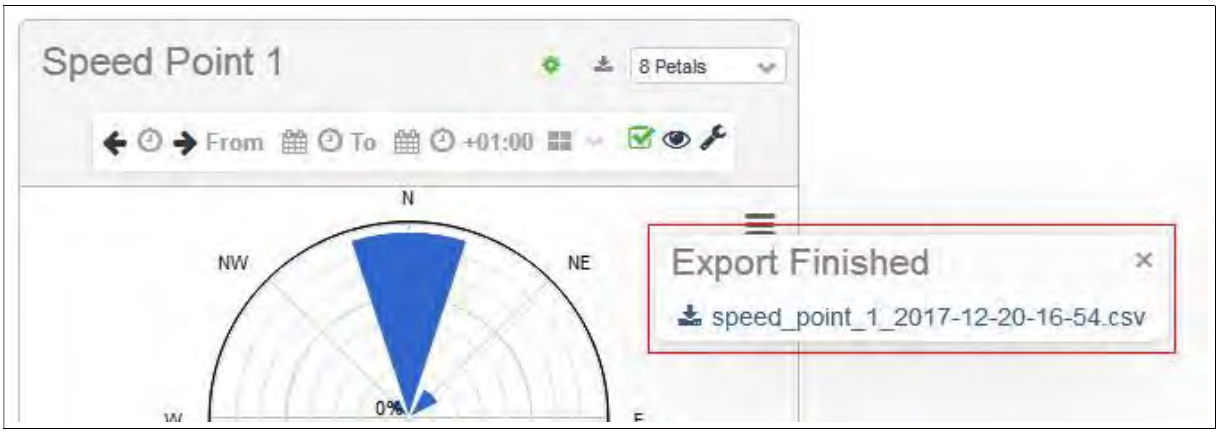


Fig. 7.2.74: Message window with file link

32. Click on the "Petals" box, the drop-down menu appears.

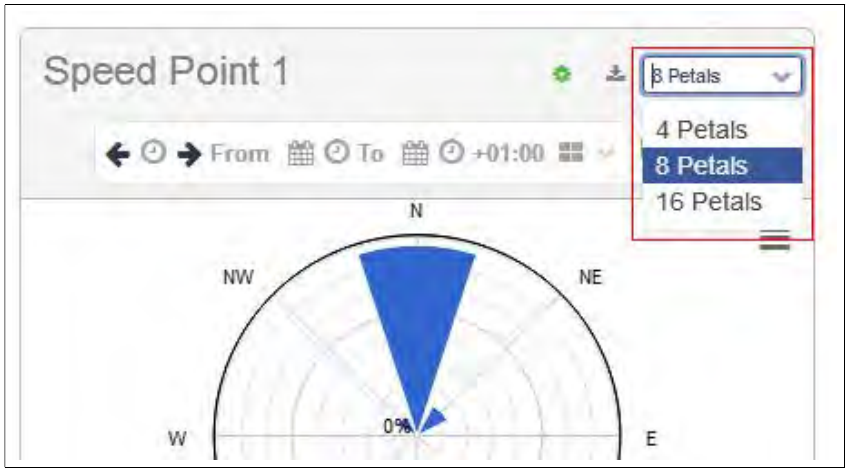


Fig. 7.2.75: "Petals" number drop-down menu

33. Select the desired petals number: the settings is applied to the chart.

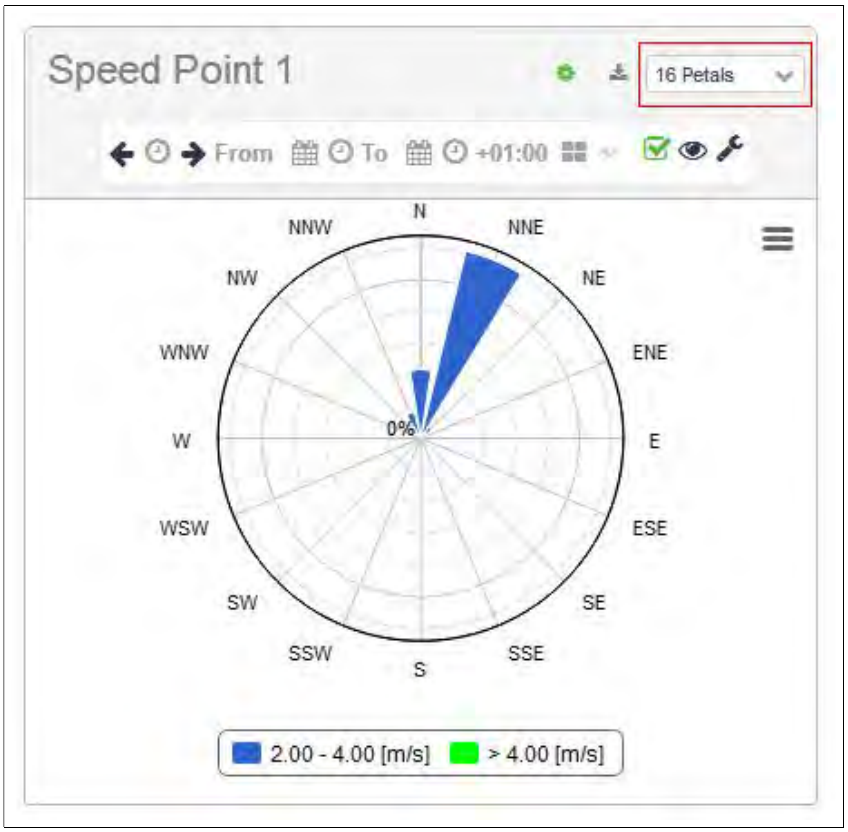


Fig. 7.2.76: "Wind Rose" chart updated

7.2.4 TABLE

The "Table" chart allows to create a window where selected parameters values are listed with their timestamp.

1. Select "Table" item in the "Add Graph" window (step 6, section **7.2.1**): the "Add New Parameters" window appears.

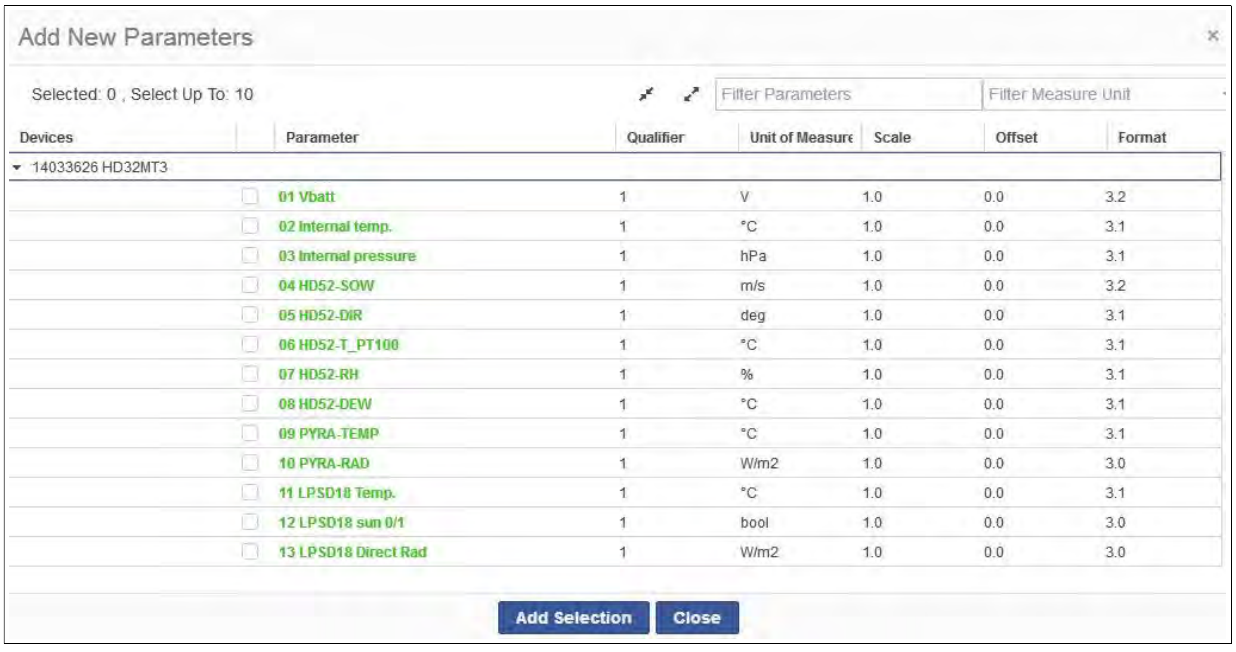


Fig. 7.2.77: "Add New Parameters" window

2. Click on the desired parameters check-boxes, then click on "Add Selection" button.

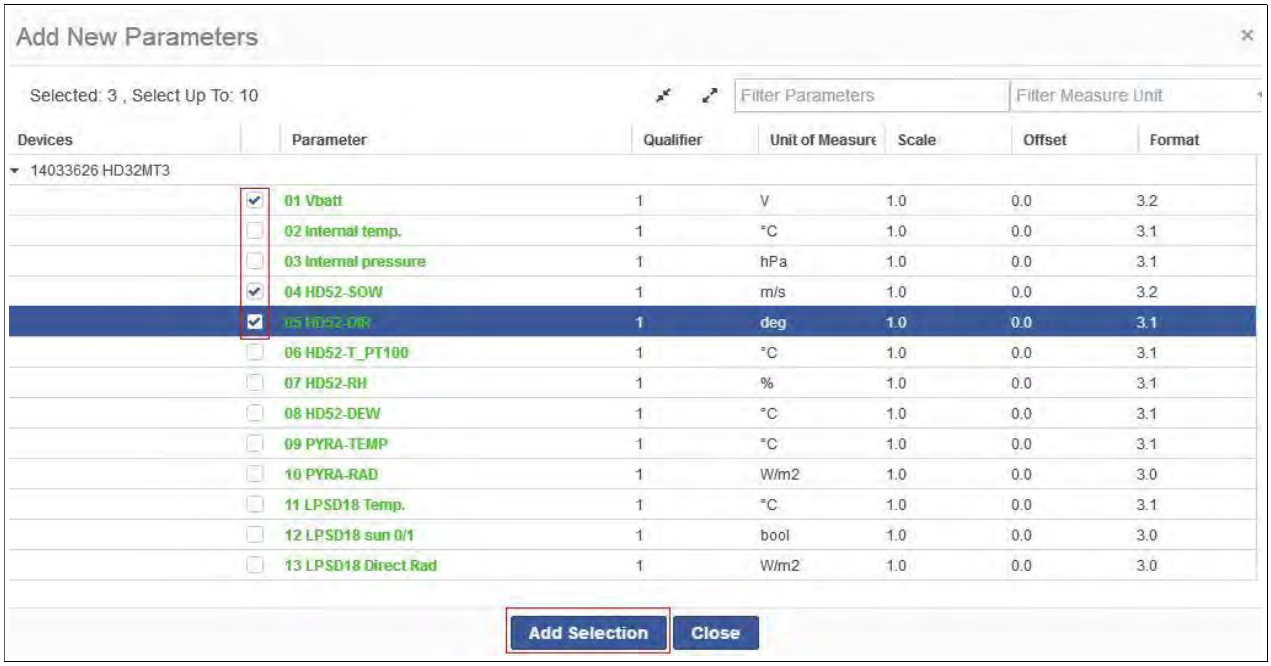


Fig. 7.2.78: Parameters selection for Table chart

3. The "New Graph" window appears: enter the table name in the "Label" field, then select the "Show Controls" check-box to allow a local command bar.

Fig. 7.2.79: "New Graph" window for Table chart

4. Click on "Parameters" tab: the selected parameters are listed by 3 fields.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameters belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.

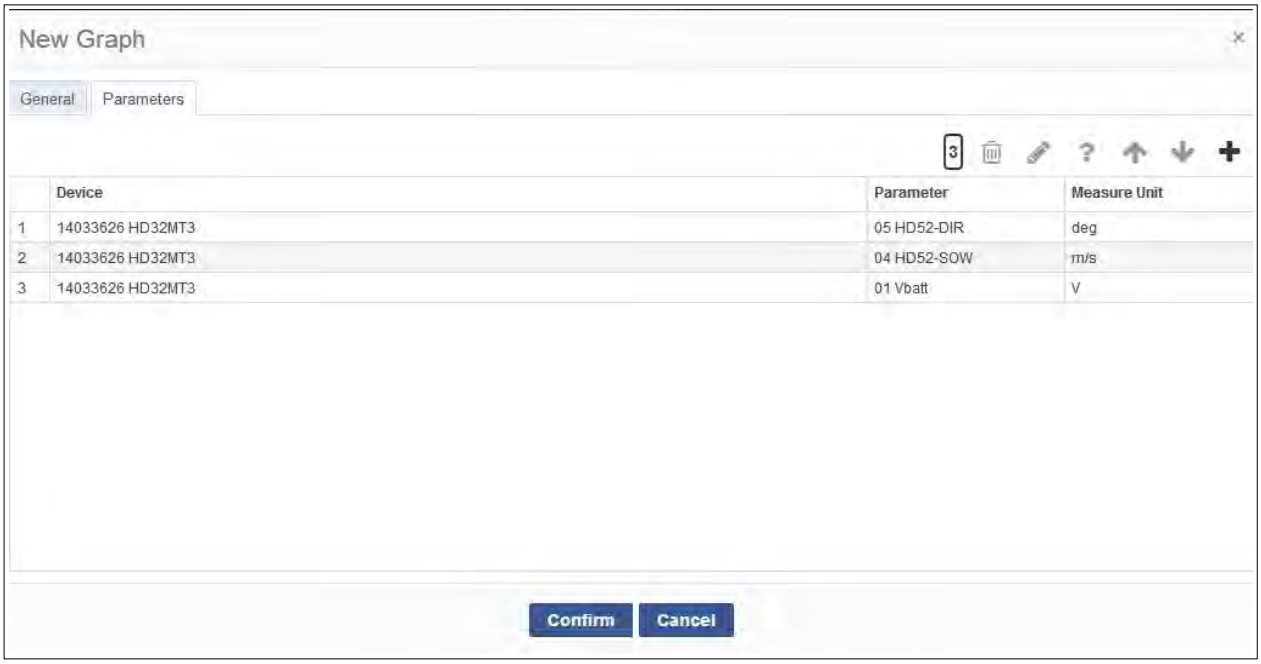


Fig. 7.2.80: "Parameters" tab for Table chart

5. Click on the "Plus" icon to go back to "Add New Parameters" window and add more parameters (step 2).

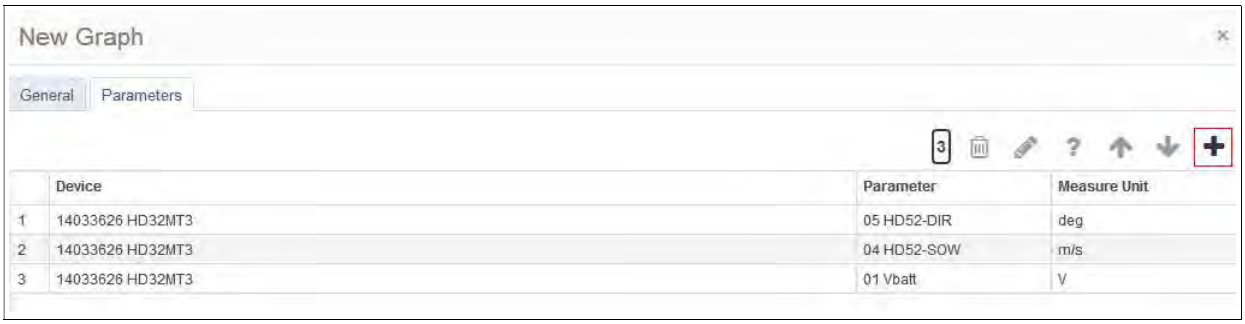


Fig. 7.2.81: "Plus" icon

6. Click on a parameter row to select it: all the top command bar icons are enabled.

7. Click on the "Up arrow" or "Down arrow" icon to move the selected parameter up or down along the list.

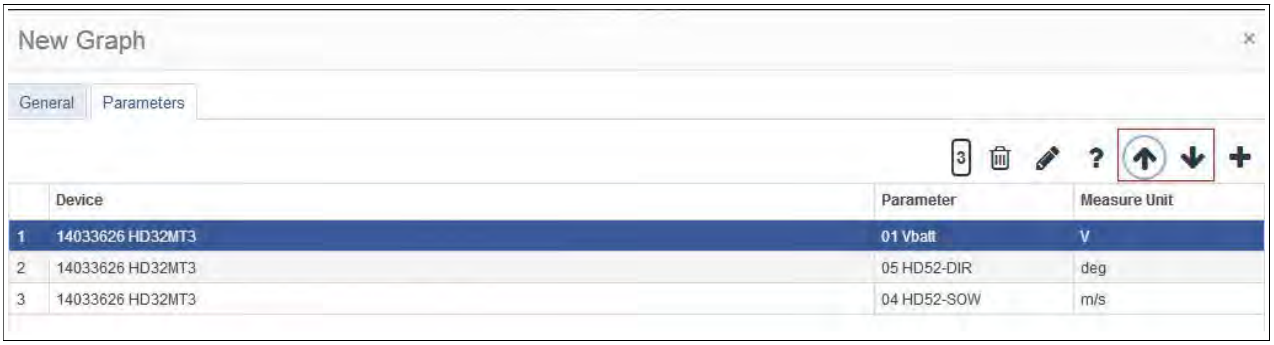


Fig. 7.2.82: "Move up" / "Move down" icons

8. Click on the "Question mark" icon: selected parameter properties appear in a dedicated window. Click on "Close" button to go back to "New Graph" window.

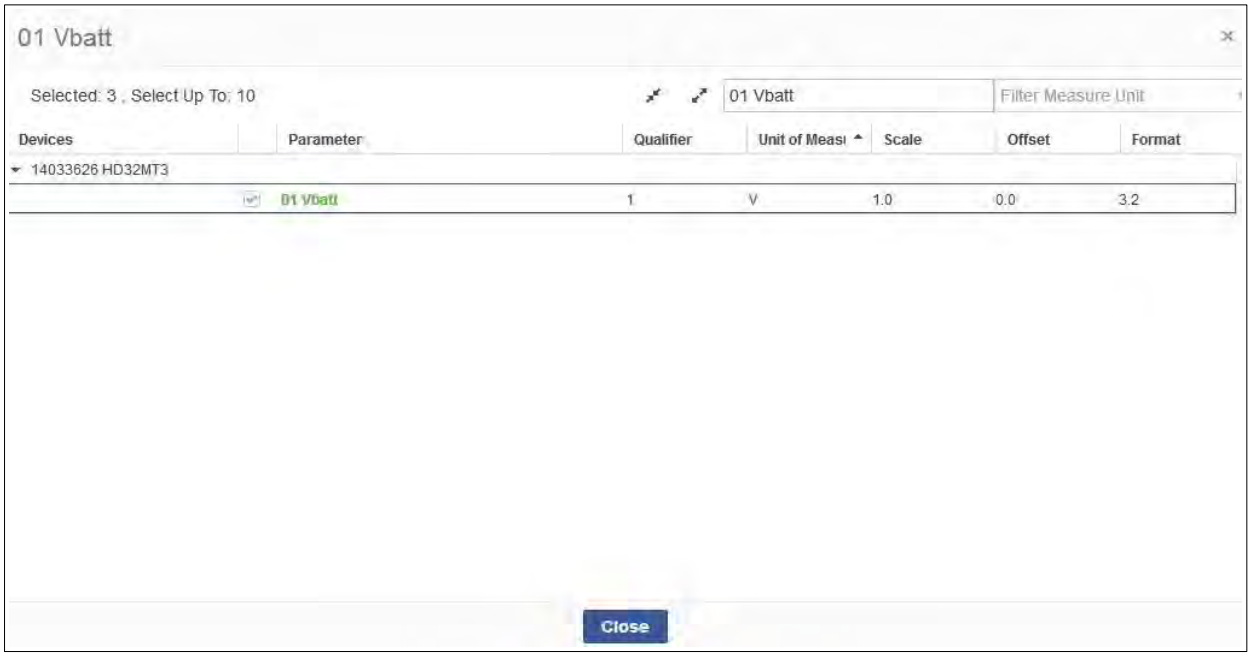


Fig. 7.2.83: Parameter description

9. Click on the "Pencil" icon to modify parameter graphical features.

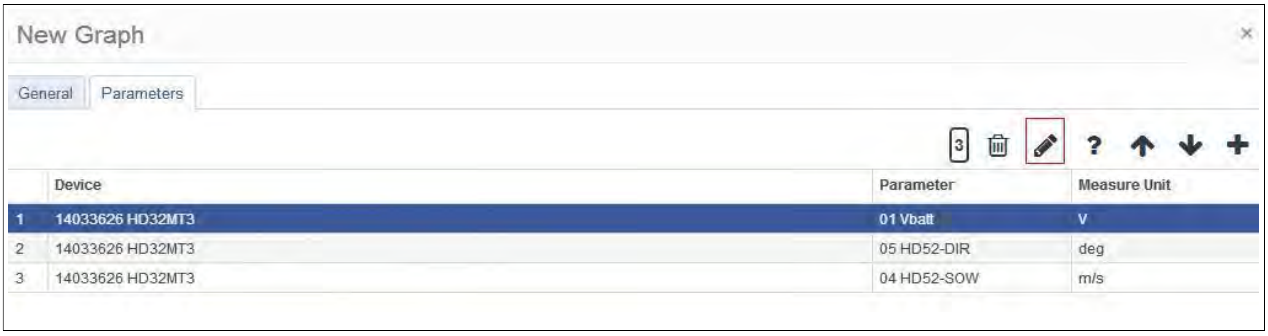


Fig. 7.2.84: "Pencil" icon

10. The "Modify Parameter" window appears.

Fig. 7.2.85: "Modify Parameter" window

11. Click on "Measure" drop-down list to set a different parameter measure unit (if any).

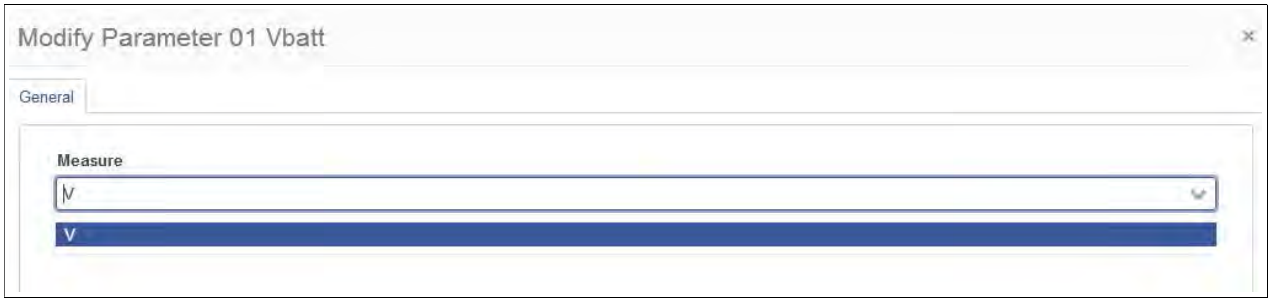


Fig. 7.2.86: "Measure" drop-down list

12. Click on "Confirm" button to apply changes and go back to "New Graph" window: possibly changed features are updated in the selected parameter row.

13. Click on the "Waste basket" icon to remove the selected parameter from the chart.

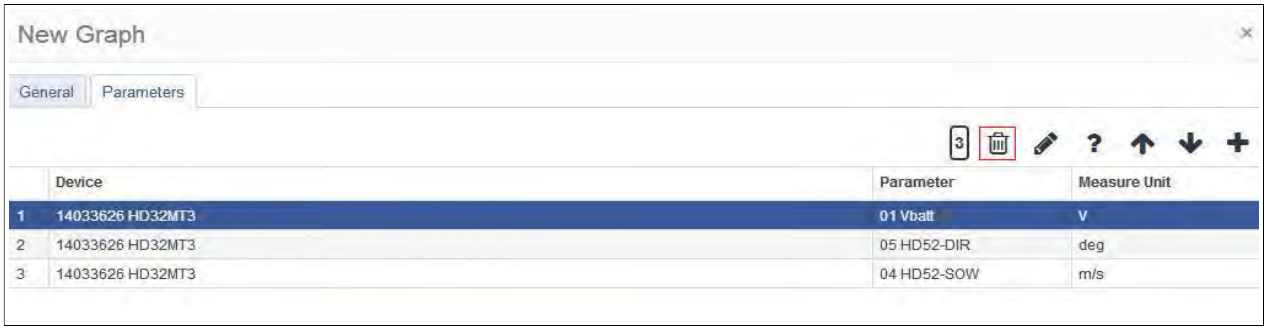


Fig. 7.2.87: "Waste basket" icon for parameter deletion

14. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.88: Confirmation window for parameter deletion

15. Click on the "Confirm" button in the "New Graph" window to terminate the chart.

Fig. 7.2.89: "Confirm" button for chart termination

16. The "Table" chart is included in the current Visualization: execute steps 26 to 28 from section 7.2.1 to save and check the result.

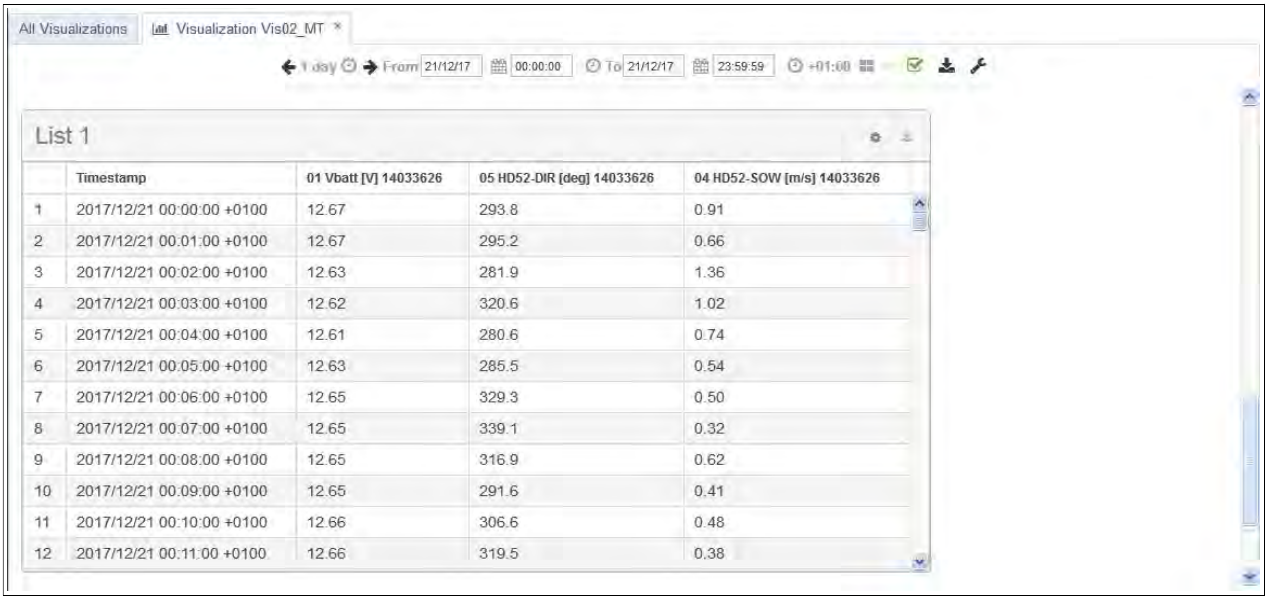


Fig. 7.2.90: "Table" chart

17. Click on the "Wrench" icon in the top right corner of Table box: the chart local command bar appears (icon disabled).

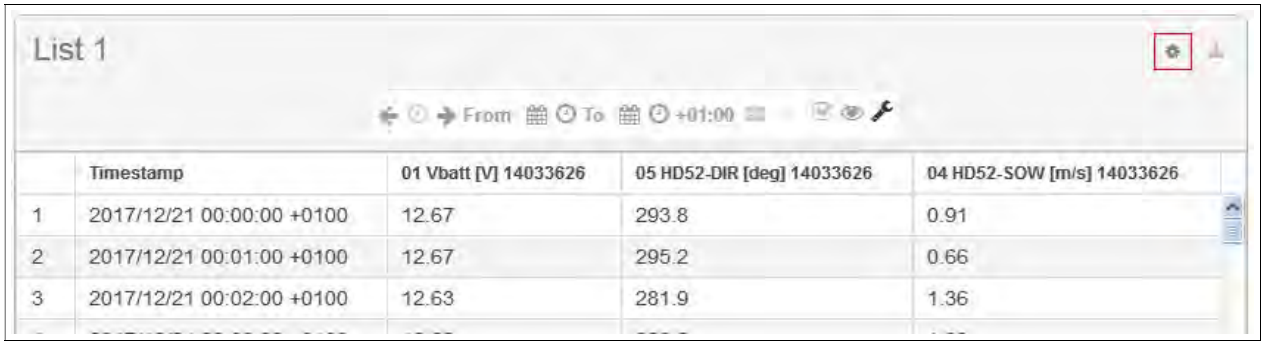


Fig. 7.2.91: "Wrench" icon

18. Execute steps 26 to 28 in section 7.2.3 to set Time Interval and Time Scroll.

19. Click on the "Download" icon: the "Exportation" window appears.

Fig. 7.2.92: "Download" icon

20. Execute steps 30 to 31 in section 7.2.3 to save listed values to CSV file.

7.2.5 NUMERIC VALUE

The "Numeric Value" chart allows creating a box displaying the selected parameter description and current value.

1. Select "Numeric Value" item in the "Add Graph" window (step 6, section **7.2.1**): the "Add New Parameters" window appears.

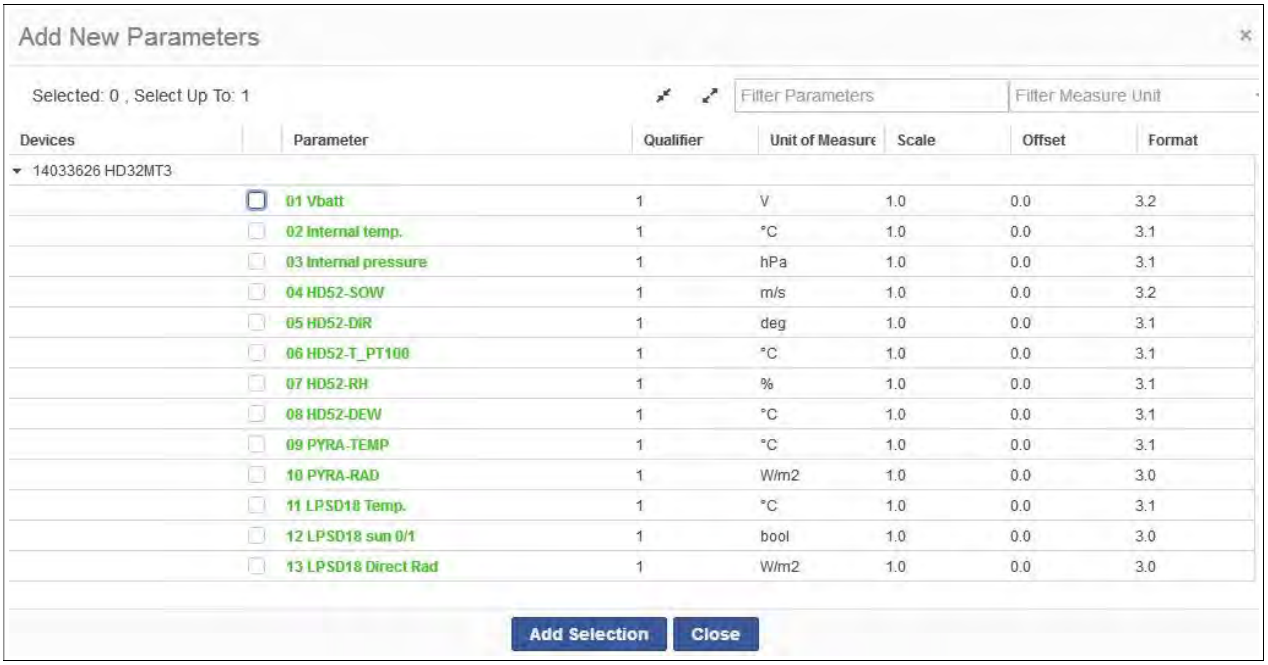


Fig. 7.2.93: "Add New Parameters" window

2. Click on the desired parameter check-box, then click on "Add Selection" button.

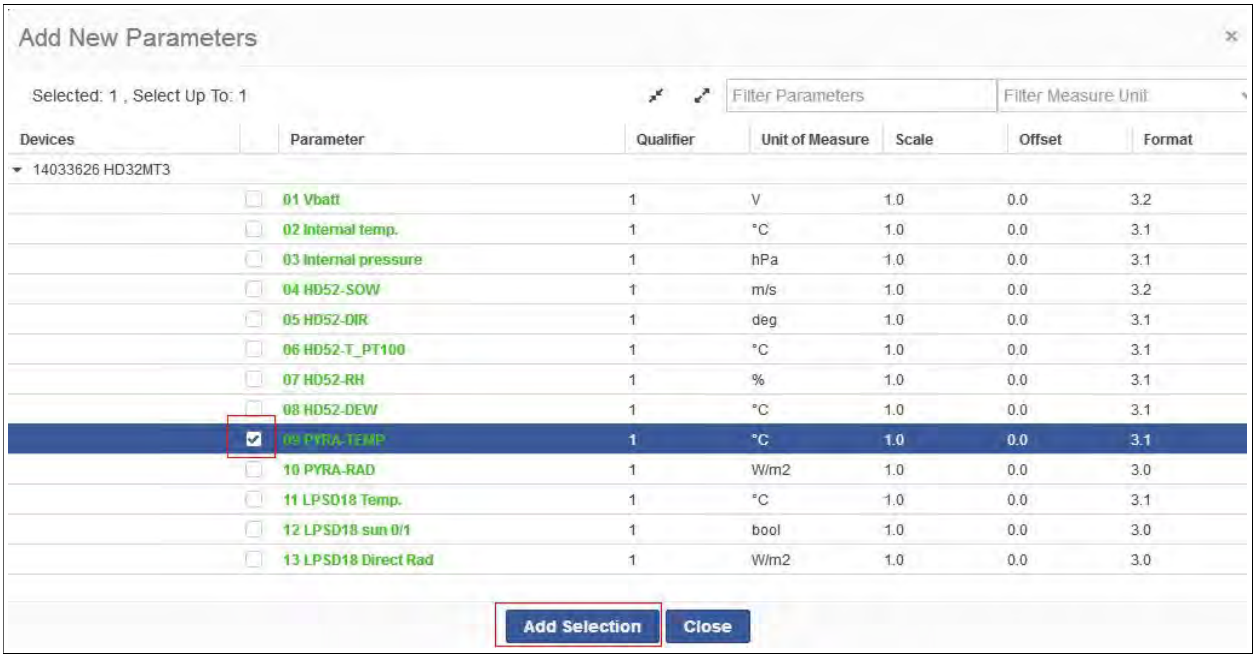


Fig. 7.2.94: Single parameter selection

3. As declared in the top left corner, only one parameter can be selected: a warning window appears, when clicking on more than one check-box.

Fig. 7.2.95: Warning window for excessive selection

4. The "New Graph" window appears: enter the box name in the "Label" field.

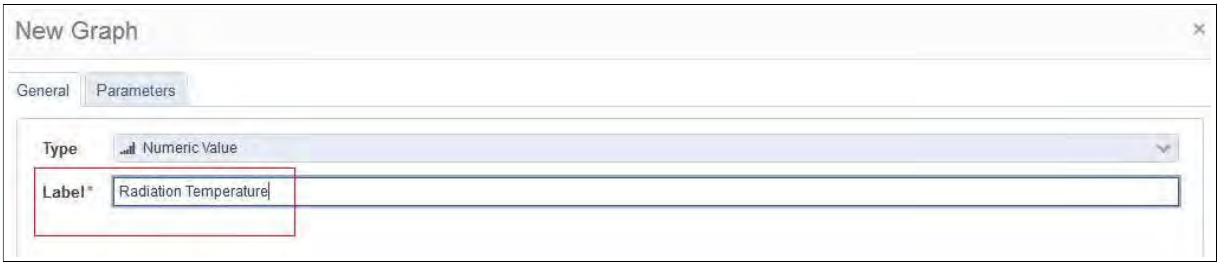


Fig. 7.2.96: "New Graph" window for Numeric Value chart

5. Click on "Parameters" tab: the selected parameter is listed by 4 fields, as described in the following table.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameters belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.
4	"Color"	Square representing the color for parameter curve.

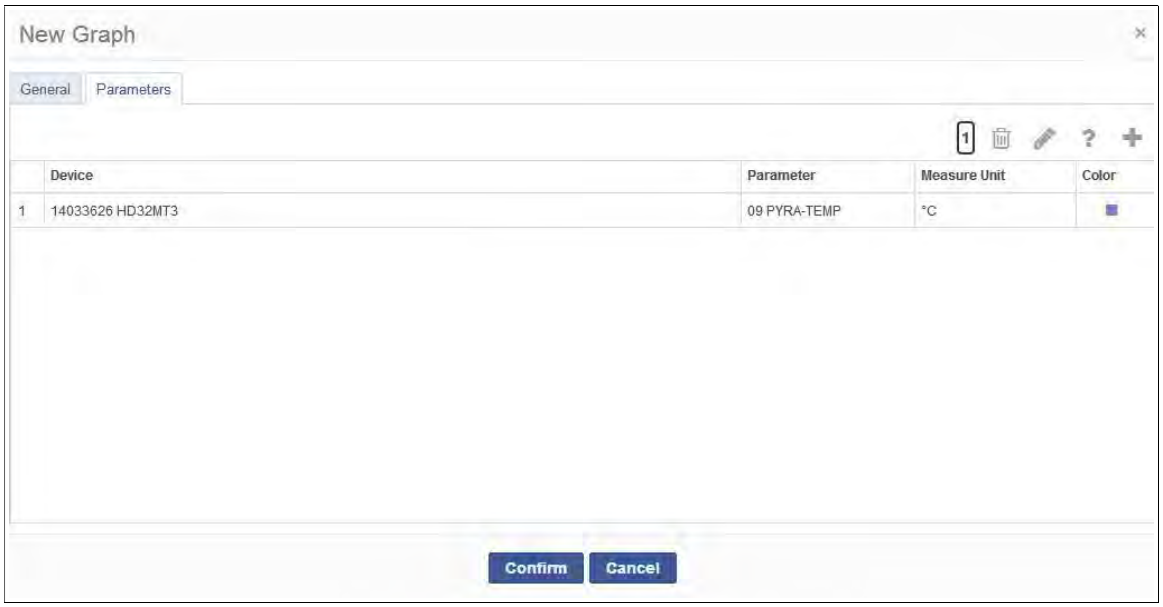


Fig. 7.2.97: "Parameters" tab for Numeric Value chart

6. Click on the parameter row to select it: all the top command bar icons are enabled, except for "Plus" icon (always disabled since only one parameter can be selected).

Fig. 7.2.98: "Plus" icon always disabled

7. Click on the "Question mark" icon: selected parameter properties appear in a dedicated window. Click on "Close" button to go back to "New Graph" window.

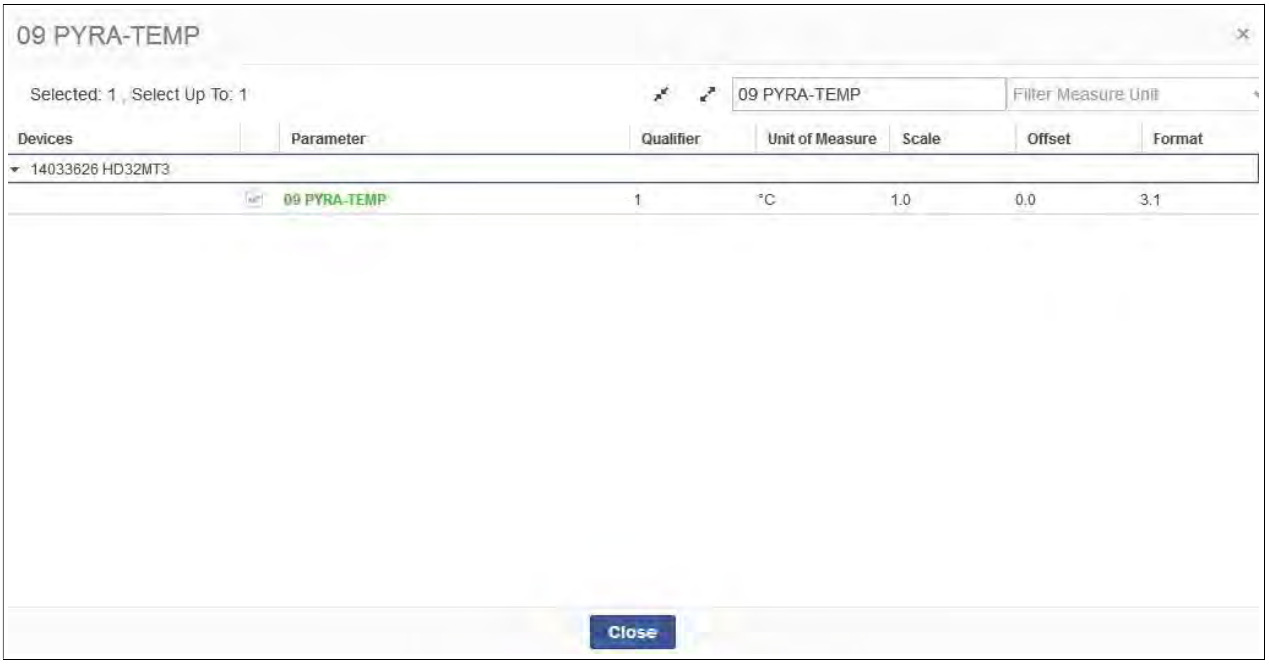


Fig. 7.2.99: Parameter description

8. Click on the "Pencil" icon to modify parameter graphical features.

Fig. 7.2.100: "Pencil" icon

9. The "Modify Parameter" window appears.

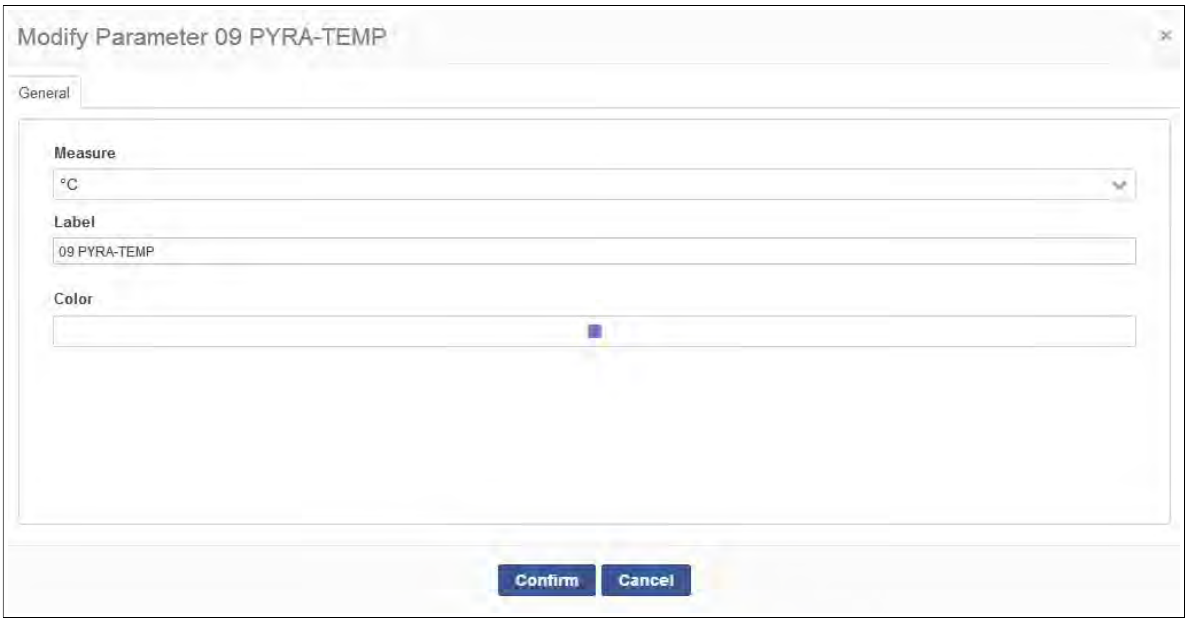


Fig. 7.2.101: "Modify Parameter" window

10. In the "General" tab:

- Click on "Measure" drop-down list to set a different parameter measure unit (if any).

Fig. 7.2.102: "Measure" drop-down list

- Click on "Label" text-box to modify the parameter description.

Fig. 7.2.103: "Label" text-box

- Click on "Color" square to set a different text color.

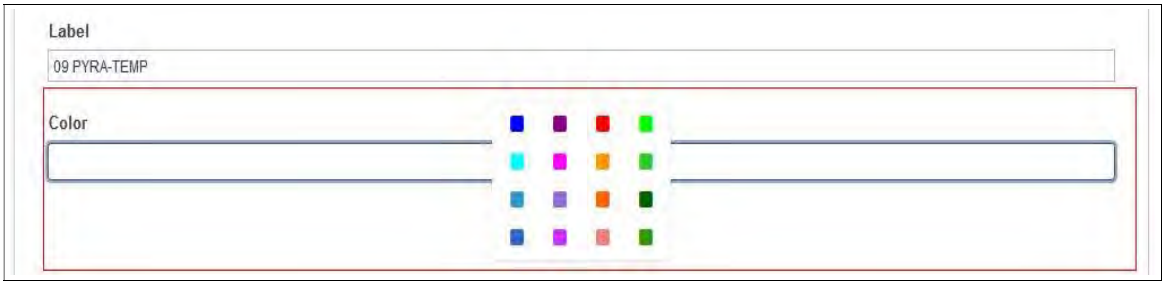


Fig. 7.2.104: "Color" drop-box

11. Click on "Confirm" button to apply changes and go back to "New Graph" window: possibly changed features are updated in the selected parameter row.

12. Click on the "Waste basket" icon to remove the selected parameter from the chart.

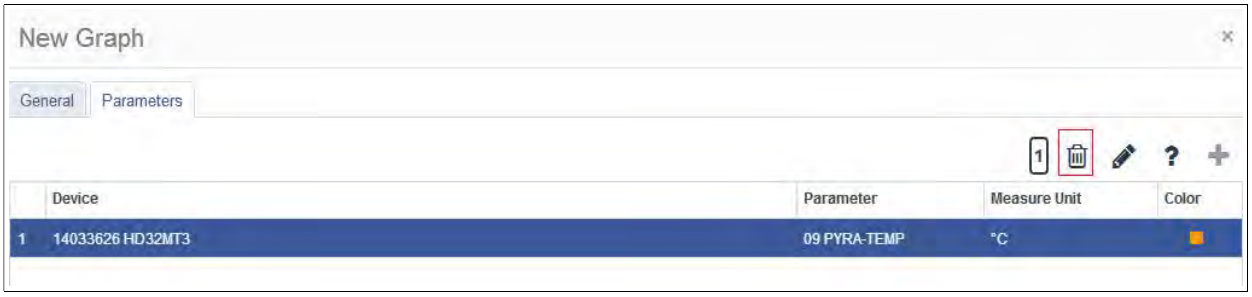


Fig. 7.2.105: "Waste basket" icon for parameter deletion

13. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.106: Confirmation window for parameter deletion

14. Click on the "Confirm" button in the "New Graph" window to terminate the chart.

Fig. 7.2.107: "Confirm" button for chart termination

15. The "Numeric Value" chart is included in the current Visualization: execute steps 26 to 28 from section 7.2.1 to save and check the result.

Fig. 7.2.108: "Numeric Value" box

7.2.6 NUMERIC TABLE

The "Numeric Table" chart allows creating a box displaying the selected parameters description and current value, extending the previous chart to more than one parameter.

1. Select "Numeric Table" item in the "Add Graph" window (step 6, section **7.2.1**): the "Add New Parameters" window appears.

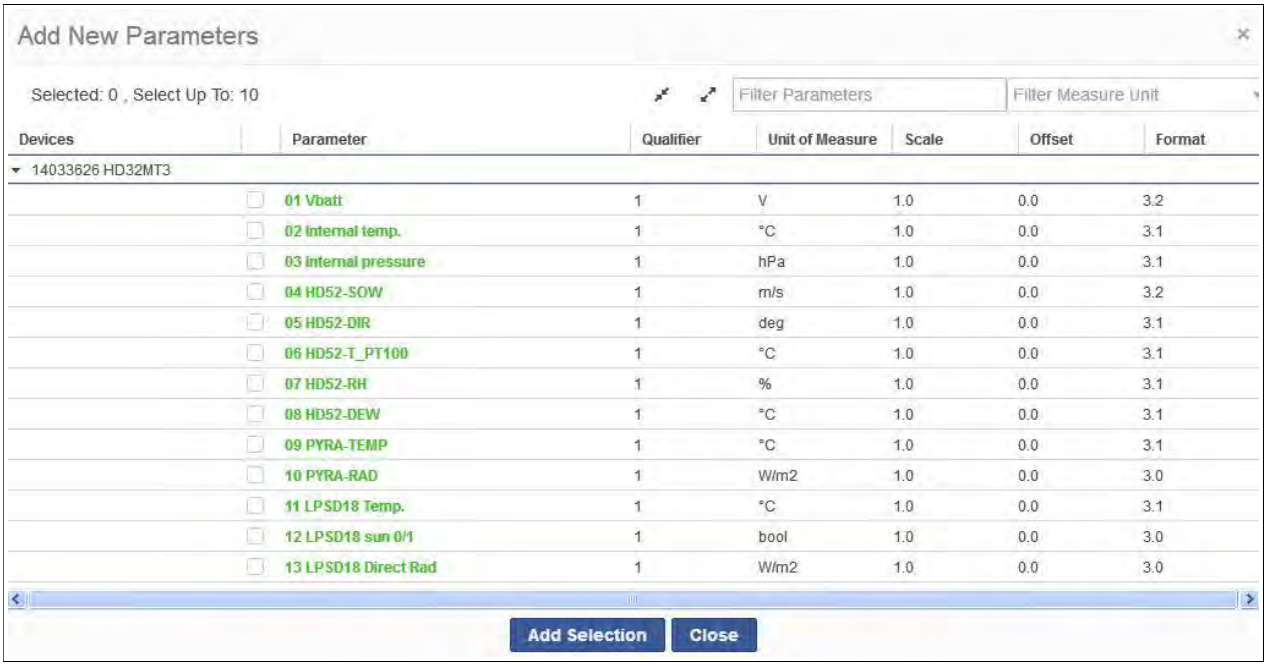


Fig. 7.2.109: "Add New Parameters" window

2. Click on the desired parameters check-box, then click on "Add Selection" button.

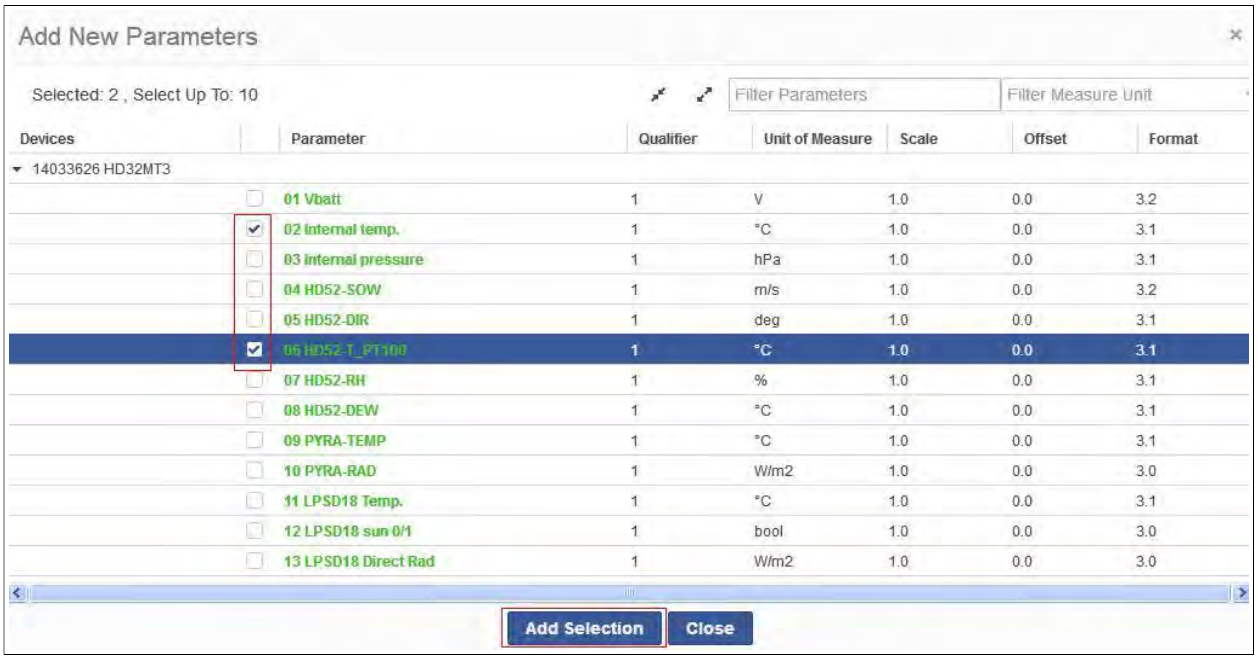


Fig. 7.2.110: Parameters selection

3. As declared in the top left corner, up to 10 parameters can be selected: a warning window appears, when clicking on more than 10 check-boxes.

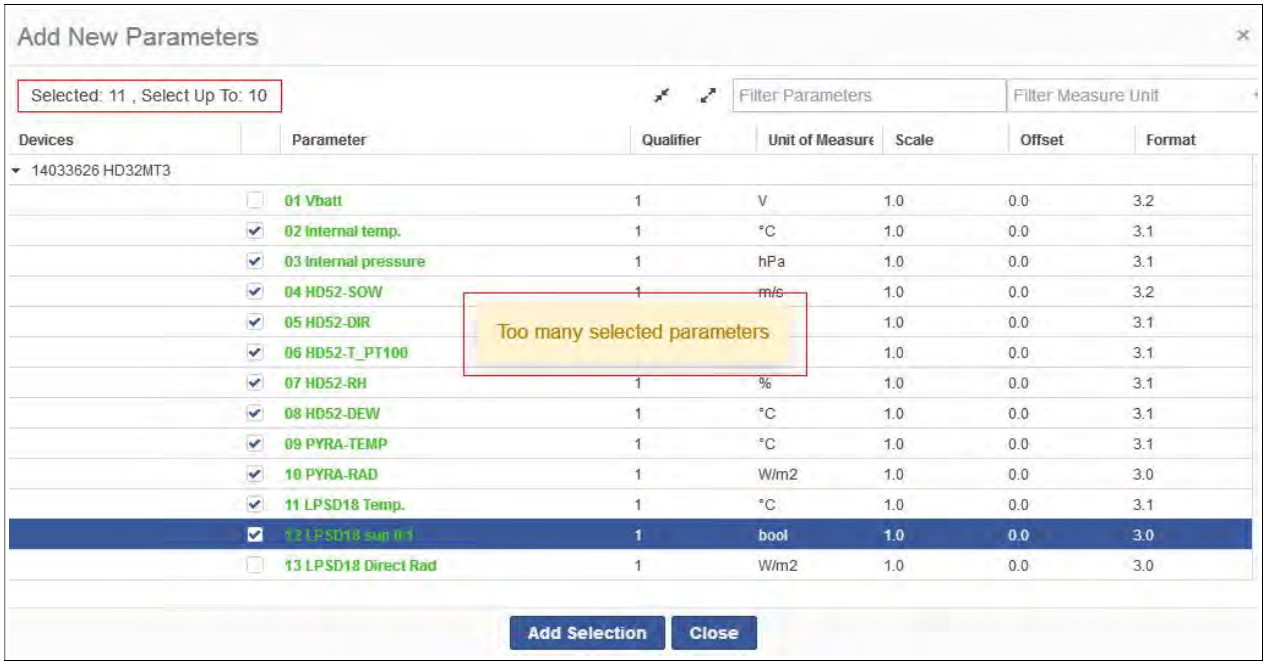


Fig. 7.2.111: Warning window for excessive selection

4. The "New Graph" window appears: enter the box name in the "Label" field.

Fig. 7.2.112: "New Graph" window for Numeric Table chart

5. Click on "Parameters" tab: the selected parameters are listed by 3 fields, as described in the following table.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameters belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.

Fig. 7.2.113: "Parameters" tab for Numeric Table chart

6. Click on the "Plus" icon to go back to "Add New Parameters" window and add more parameters (step 2).

Fig. 7.2.114: "Plus" icon

7. Click on a parameter row to select it: all the top command bar icons are enabled.

8. Click on the "Up arrow" or "Down arrow" icon to move the selected parameter up or down along the list.

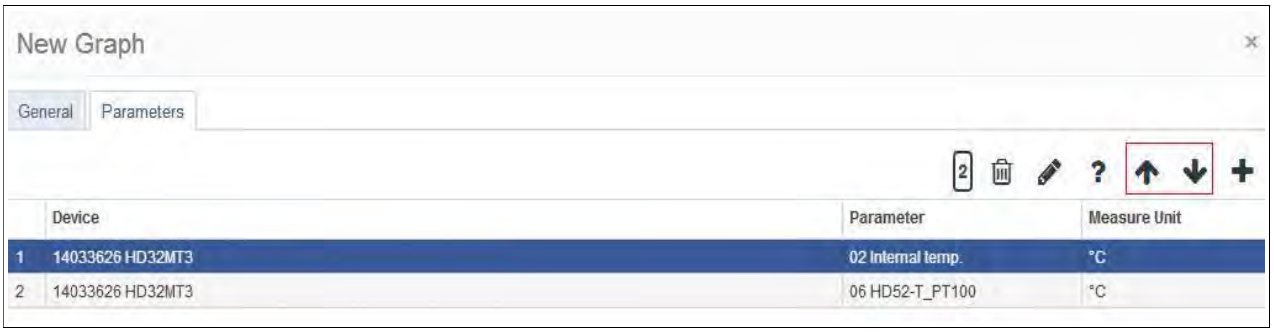


Fig. 7.2.115: "Move up" / "Move down" icons

9. Click on the "Question mark" icon: selected parameter properties appear in a dedicated window. Click on "Close" button to go back to "New Graph" window.

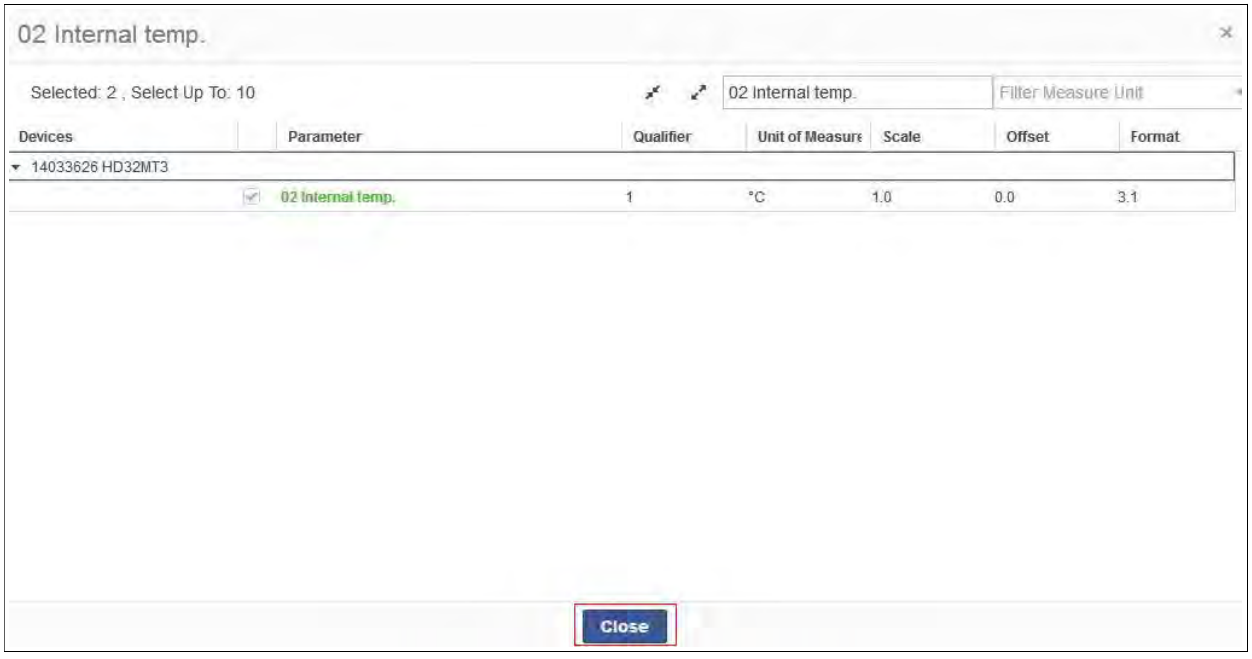


Fig. 7.2.116: Parameter description

10. Click on the "Pencil" icon to modify parameter graphical features.

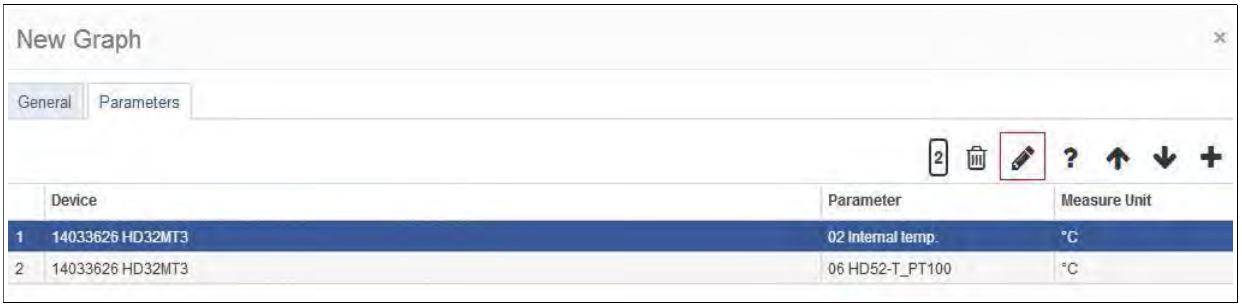


Fig. 7.2.117: "Pencil" icon

11. The "Modify Parameter" window appears.

Fig. 7.2.118: "Modify Parameter" window

12. In the "General" tab:

- Click on "Measure" drop-down list to set a different parameter measure unit (if any).

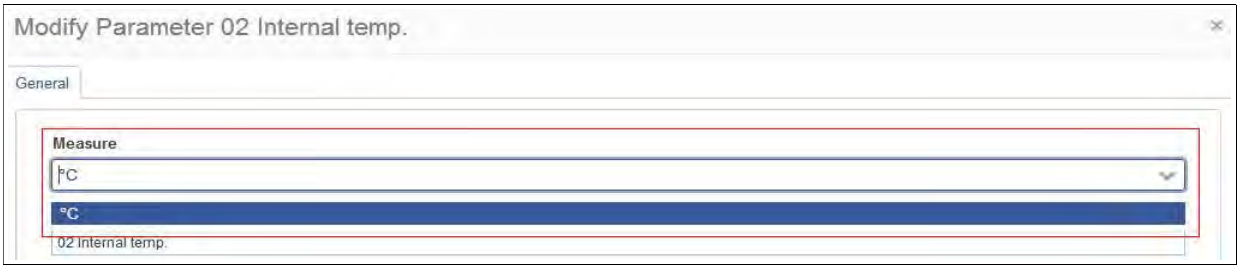


Fig. 7.2.119: "Measure" drop-down list

- Click on "Label" text-box to modify the parameter description.

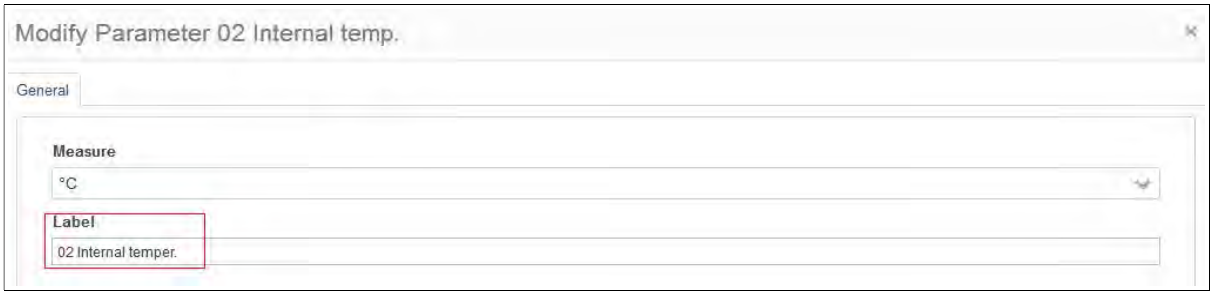


Fig. 7.2.120: "Label" text-box

13. Click on "Confirm" button to apply changes and go back to "New Graph" window: possibly changed features are updated in the selected parameter row.

14. Click on the "Waste basket" icon to remove the selected parameter from the chart.

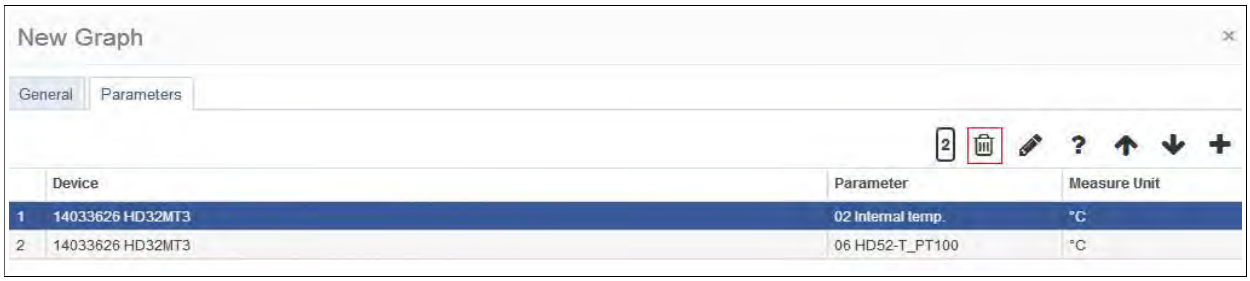


Fig. 7.2.121: "Waste basket" icon for parameter deletion

15. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.122: Confirmation window for parameter deletion

16. Click on the "Confirm" button in the "New Graph" window to terminate the chart.

Fig. 7.2.123: "Confirm" button for chart termination

17. The "Numeric Table" chart is included in the current Visualization: execute steps 26 to 28 from section 7.2.1 to save and check the result.

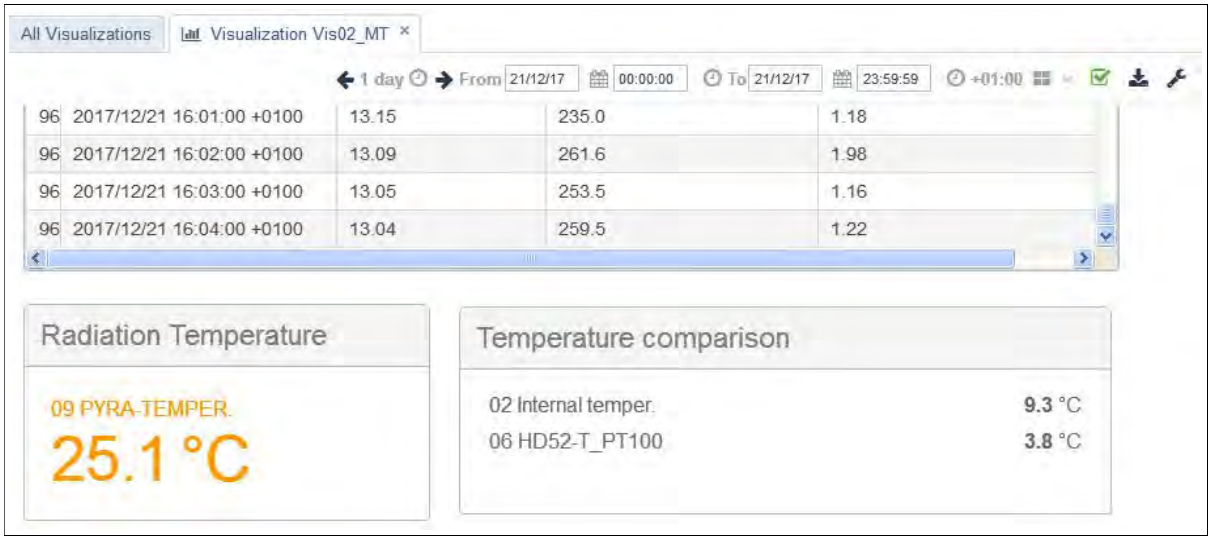


Fig. 7.2.124: "Numeric Table" chart

7.2.7 STATION

The "Station" chart allows creating am information box about a specific device Serial Number, description, position, main measured quantities and geolocalization on a map.

1. Select "Station" item in the "Add Graph" window (step 6, section **7.2.1**): the "New Graph" window appears.

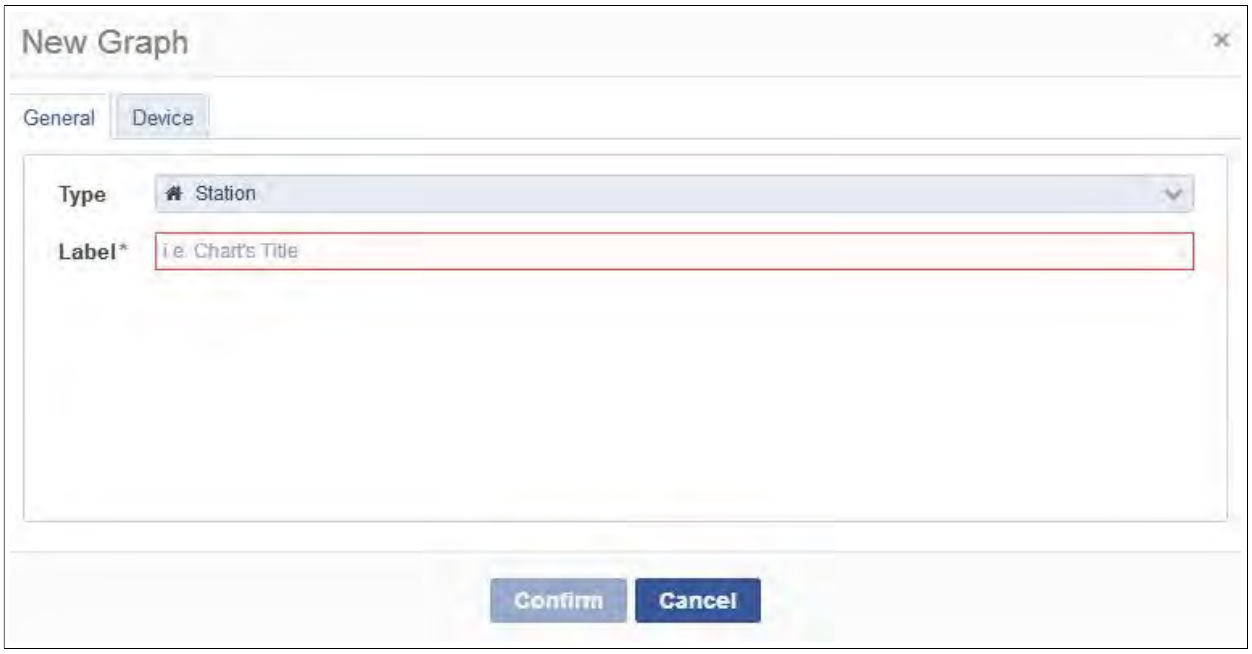


Fig. 7.2.125: "New Graph" window

2. In the "General" tab, click on the "Label" text-box and enter the chart name.

Fig. 7.2.126: "Label" text-box

3. In the "Device" tab:

- Click on the "Device" drop-down list to select the desired Device: "Latitude", "Longitude" and "Elevation" text-boxes are automatically filled, if known.

Fig. 7.2.127: "Device" drop-down list

- Click on the "Address" to enter or modify the selected Device civic address.

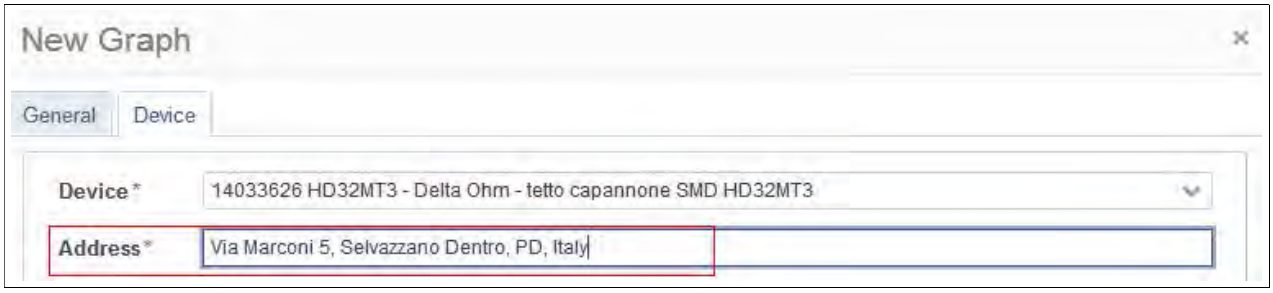


Fig. 7.2.128: "Address" text-box

- Click on "Latitude", "Longitude" and "Elevation" text-boxes to enter or modify the selected Device geographical coordinates.

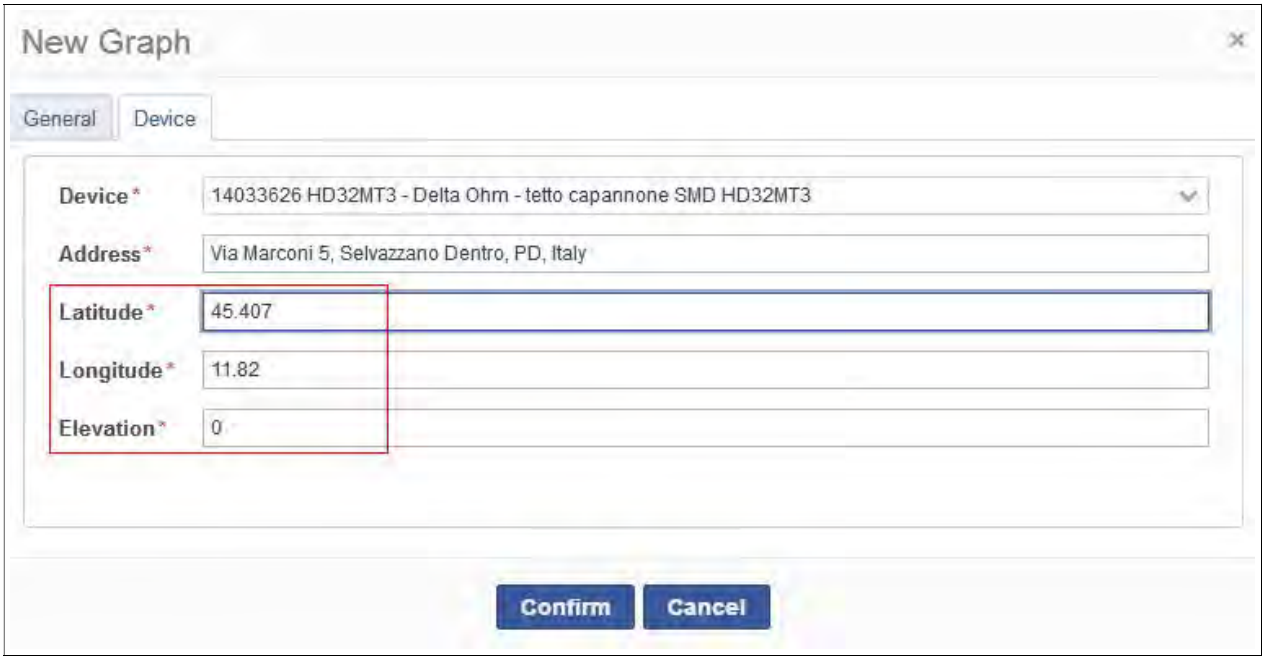


Fig. 7.2.129: "Latitude", "Longitude", "Elevation" text-boxes

4. Click on "Confirm" button: the "Numeric Table" chart is included in the current Visualization.

Fig. 7.2.130: "Latitude", "Longitude", "Elevation" text-boxes

5. Pass the pointer over the "Gear" icon: a drop-down menu appears.

Fig. 7.2.131: "Gear" icon drop-down menu

6. Click on "Configure" item: the "Modify Graph" window appears.

- In the "General" tab, click on the "Label" text-box to modify the box label.

Fig. 7.2.132: "Modify Graph" window, "General" tab

- In the "Device" tab the "Device" field is steady, while "Address", "Latitude", "Longitude" and "Elevation" fields are changeable.

Fig. 7.2.133: "Modify Graph" window, "Device" tab

- Click on the "Confirm" button to save possible changes.

7. Click on "Info" item: the "Device" parameters summary window appears, listing measured quantities by 8 fields, as described in the following table.

	NAME	DESCRIPTION	STATUS
1	"Identifier"	String describing the measured quantity	steady
2	"Qualifier"		steady
3	"Unit of Measure"	Measurement unit label	steady
4	"Scale"	Tilt factor potentially multipling the translated value (useful for measuring unit transformation, e.g. from Celsius to Fahrenheit degree)	steady
5	"Offset"	Translation Value potentially added to measured value (useful for measuring unit transformation, e.g. from Celsius to Fahrenheit degree)	steady
6	"Format"	Measured value integer digits number and fractional digits number	steady
7	"Activity Interval"	Timestamp of the first received data (last received data timestamp is recorded only in case of reception break)	steady
8	"Id"	Numerical input reference	steady

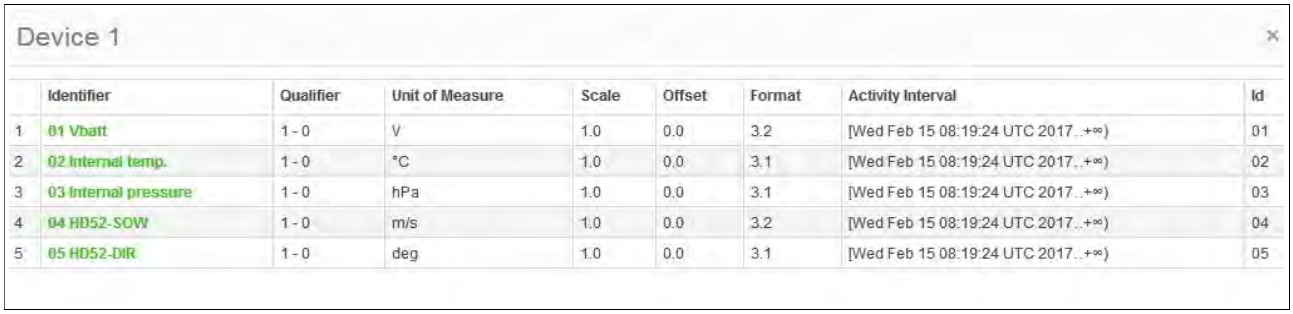


Fig. 7.2.134: "Device" parameters information summary

8. Click on "Remove" item: the "Remove Graph" window appears. Click on "Yes" button to delete the "Station" chart or click on "No" button to quit.

Fig. 7.2.135: "Remove Graph" window

9. Click on "Modify Position/Size" item to open the corresponding window:

- Click on the "Coord X" text-box to modify the chart horizontal offset.
- Click on the "Coord Y" text-box to modify the chart vertical offset.

- Click on the "Width" text-box to modify chart horizontal dimension.
- Click on the "Height" text-box to modify chart vertical dimension.
- Click on "Confirm" button to save changes or click on "Cancel" button to discard them.

Fig. 7.2.136: "Modify Position/Size" window

10. Click on "Configure Label" item, the "Modify Graph" window appears:

- Click on the "Label" text-box to modify the Device name.

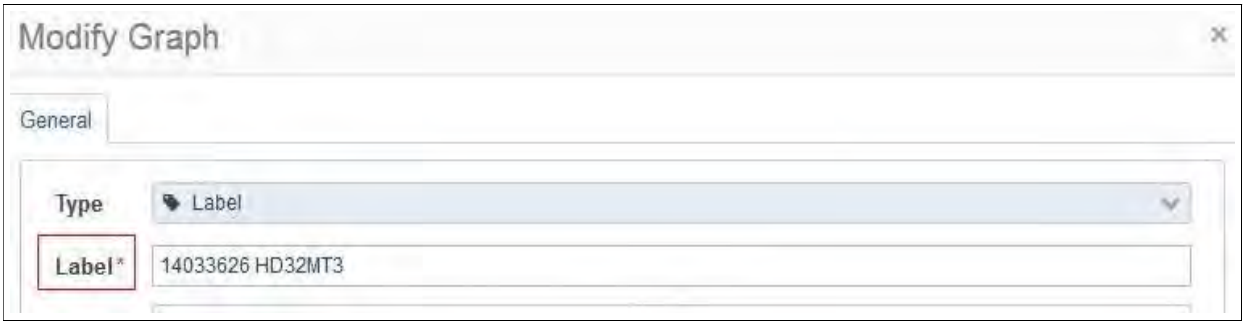


Fig. 7.2.137: "Modify Graph" window, "Label" text-box

- Click on the "Color" square to see a different text color.

Fig. 7.2.138: "Modify Graph" window, "Color" box

- Click on the "Confirm" button to save changes or click on the "Cancel" button to discard them.

Fig. 7.2.139: "Modify Graph" window, "Confirm" button

11. Click on the "Configure Numeric Value" item, the "Modify Graph" window appears.

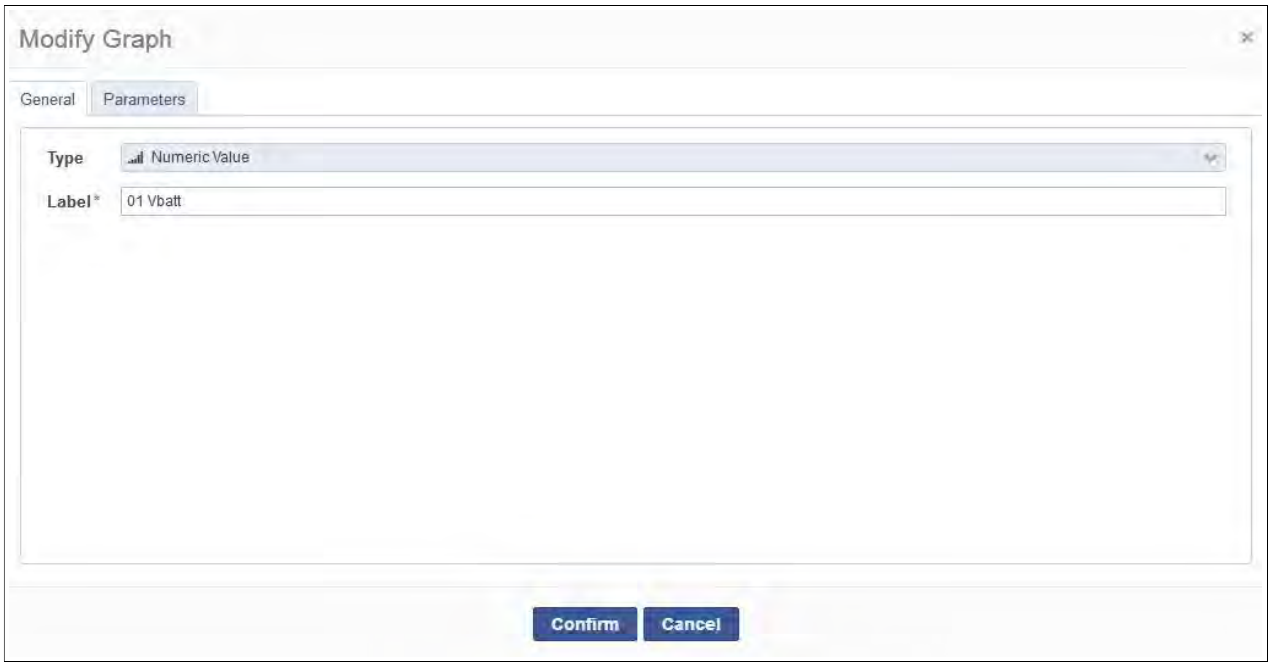


Fig. 7.2.140: "Modify Graph" window for Numeric Value item

12. In the "General" tab click on the "Label" text-box to modify the main parameter label.

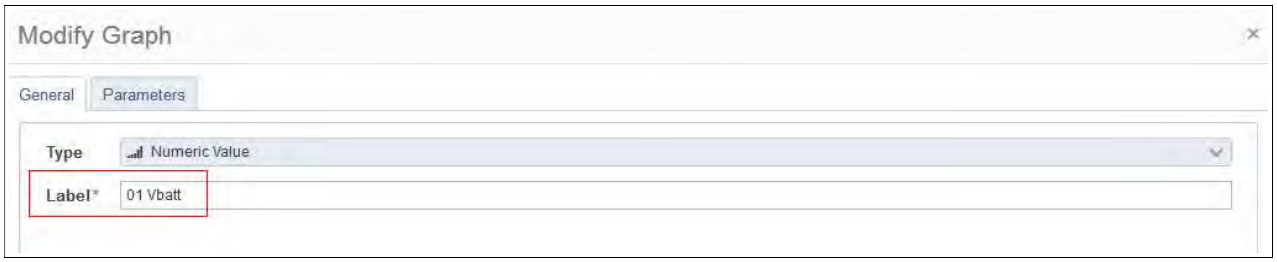


Fig. 7.2.141: "Modify Graph" window, "Label" text-box

13. In the "Parameters" tab the main parameter properties are listed by 4 fields, as described in the following table.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameter belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.
4	"Color"	Square representing the color for parameter value.

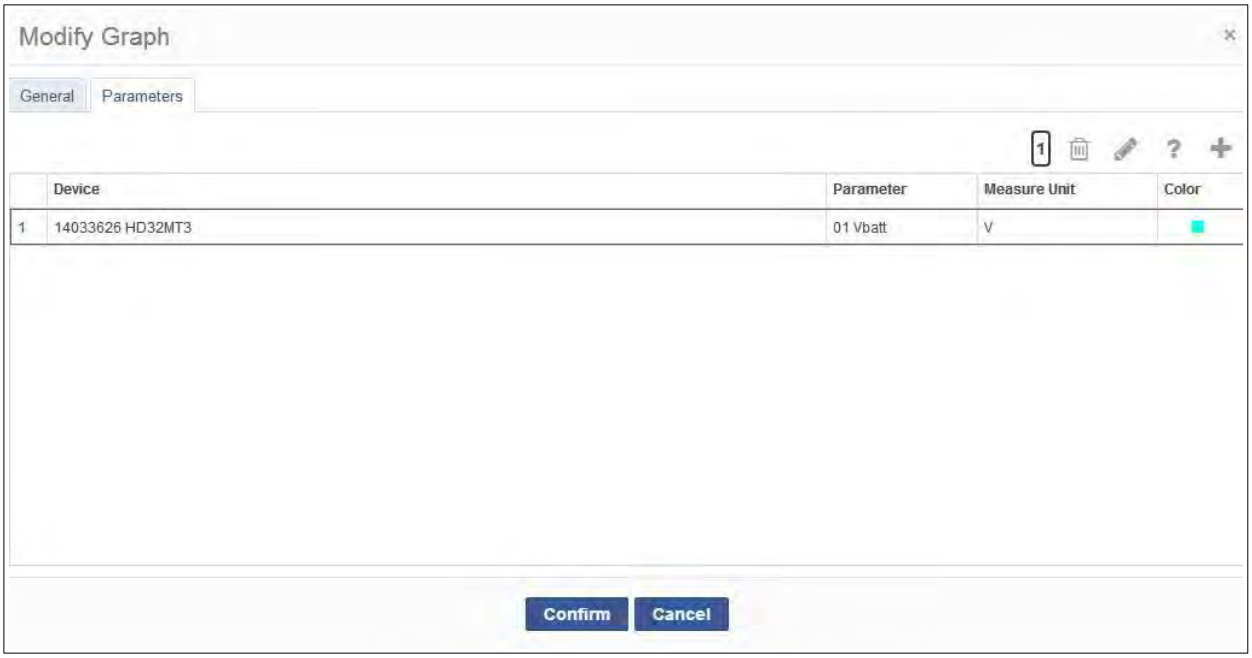


Fig. 7.2.142: "Modify Graph" window, "Parameters" tab

14. Click on the parameter row to select it: all the top command bar icons are enabled, except for "Plus" icon (always disabled).

Fig. 7.2.143: "Plus" icon always disabled

15. Click on the "Question mark" icon: main parameter properties appear in a dedicated window. Click on "Close" button to go back to "New Graph" window.

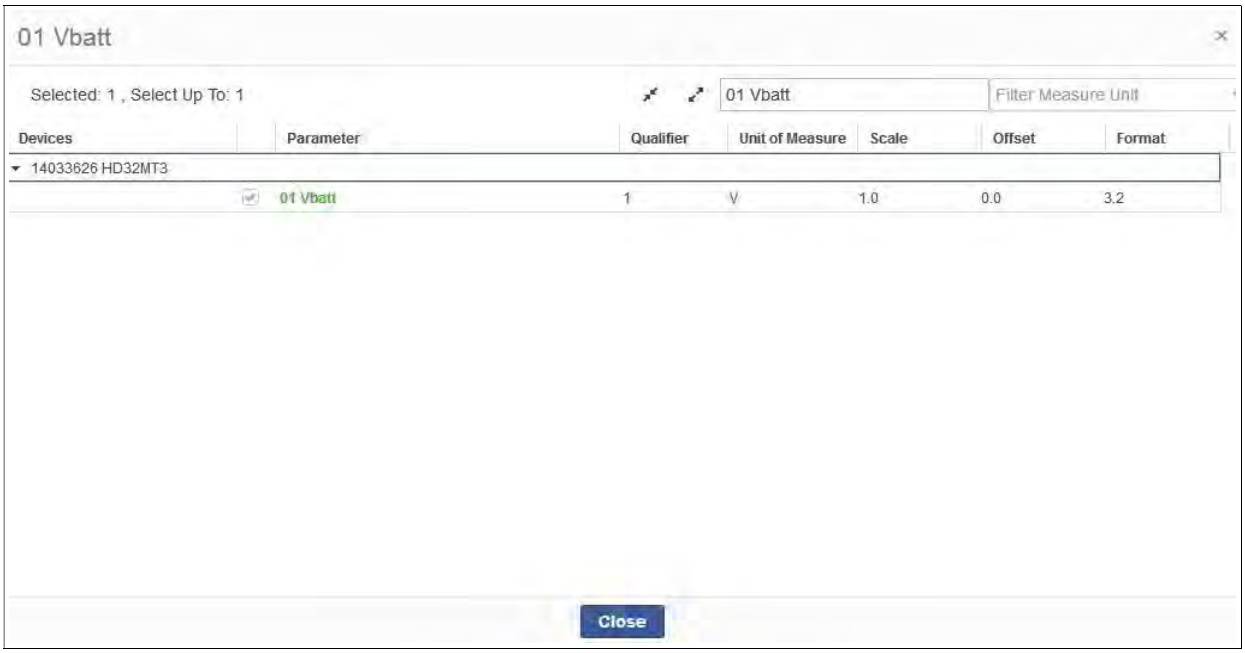


Fig. 7.2.144: Parameter description

16. Click on the "Pencil" icon to modify parameter graphical features.

Fig. 7.2.145: "Pencil" icon

17. The "Modify Parameter" window appears.

Fig. 7.2.146: "Modify Parameter" window

18. In the "General" tab:

- Click on "Measure" drop-down list to set a different parameter measure unit (if any).

Fig. 7.2.147: "Measure" drop-down list

- Click on "Label" text-box to modify the parameter description.

Fig. 7.2.148: "Label" text-box

- Click on "Color" square to set a different text color.

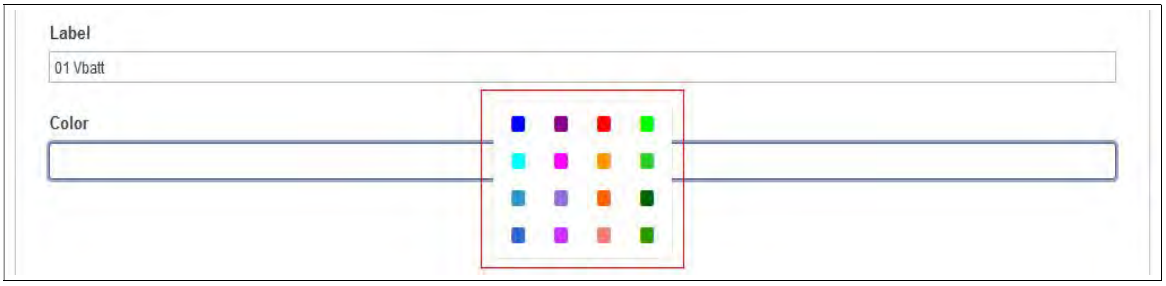


Fig. 7.2.149: "Color" drop-box

19. Click on "Confirm" button to apply changes and go back to "Modify Graph" window: possibly changed features are updated in the main parameter row.

20. Click on the "Waste basket" icon to remove the selected parameter from the chart.

Fig. 7.2.150: "Waste basket" icon for parameter deletion

21. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.151: Confirmation window for parameter deletion

22. Click on the "Confirm" button in the "Modify Graph" window to terminate the chart.

Fig. 7.2.152: "Confirm" button for chart termination

23. Click on the "Configure Numeric Table" item, the "Modify Graph" window appears.

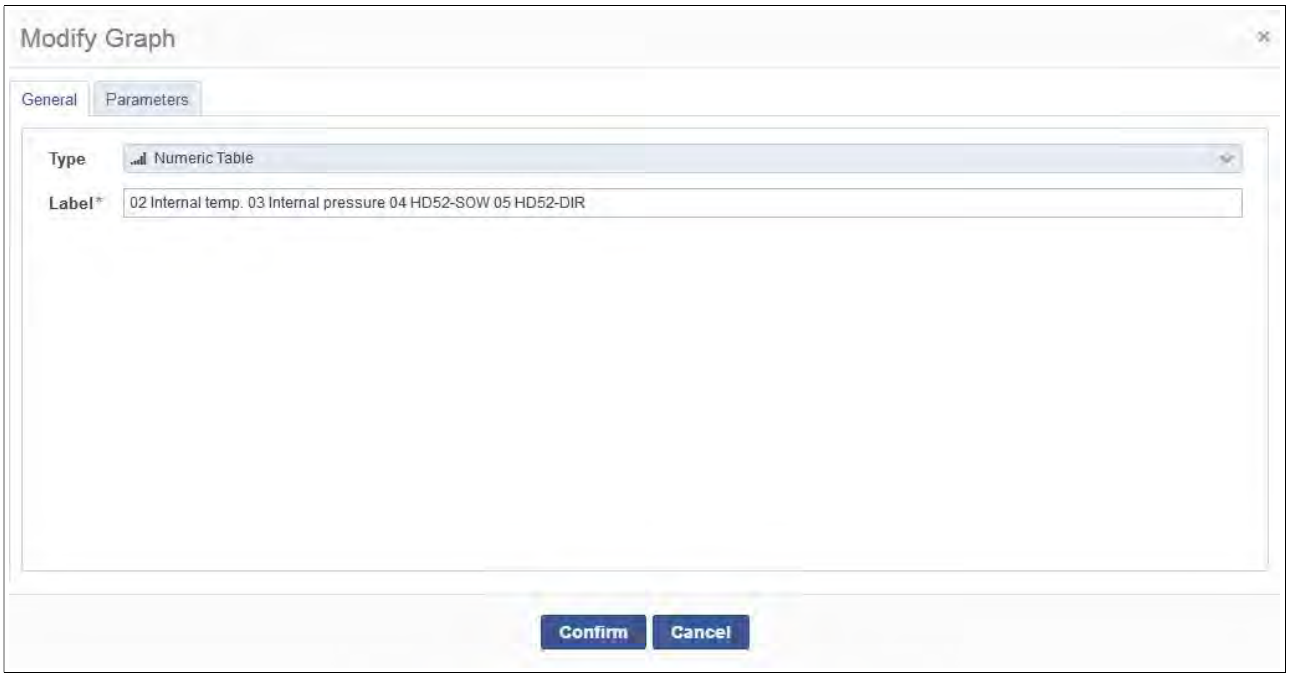


Fig. 7.2.153: "Modify Graph" window for Numeric Table item

24. In the "General" tab click on the "Label" text-box to modify the parameters denomination.

Fig. 7.2.154: "Modify Graph" window, "Label" text-box

25. In the "Parameters" tab the main parameter properties are listed by 3 fields, as described in the following table.

	NAME	DESCRIPTION
1	"Device"	String describing the device the listed parameter belong to.
2	"Parameter"	String describing the measured quantity.
3	"Measure Unit"	String describing the parameter measurement unit.

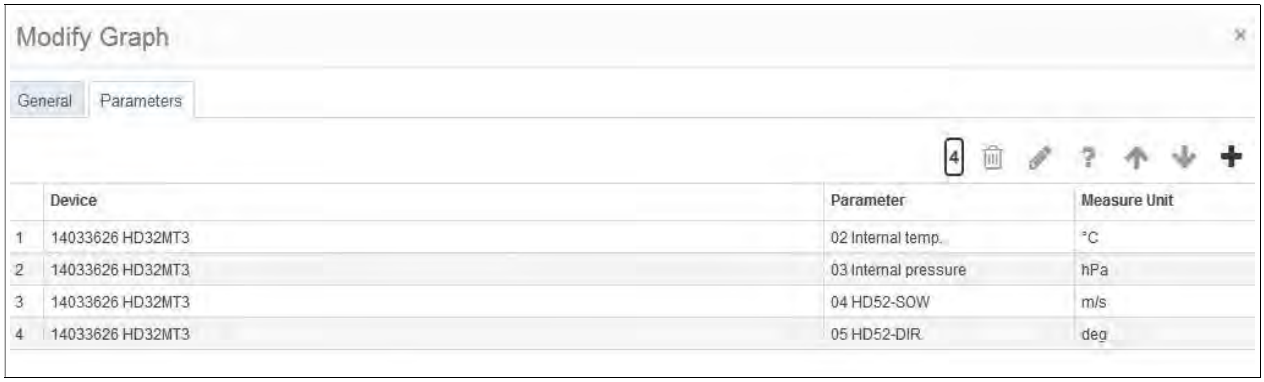


Fig. 7.2.155: "Modify Graph" window, "Parameter" tab

26. Click on the "Plus" icon to open the "Add New Parameters" window and add more parameters (step 2 in section 7.2.6).

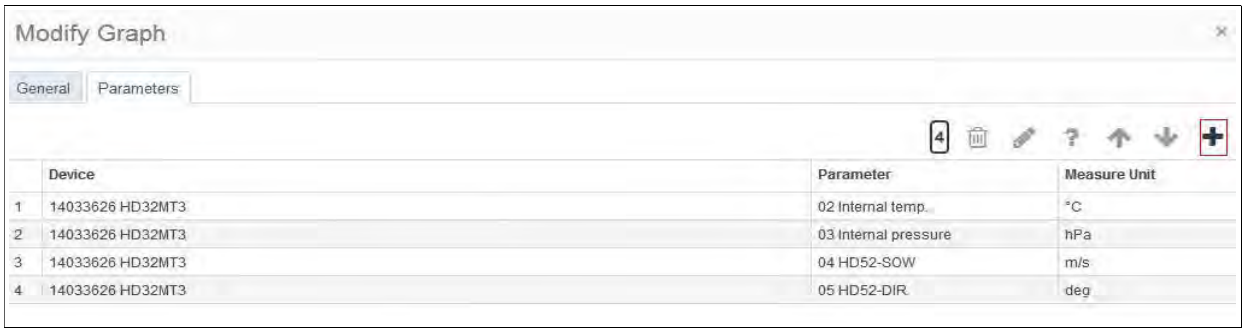


Fig. 7.2.156: "Plus" icon

27. Click on a parameter row to select it: all the top command bar icons are enabled.

28. Click on the "Up arrow" or "Down arrow" icon to move the selected parameter up or down along the list.

Fig. 7.2.157: "Move up" / "Move down" icons

29. Click on the "Question mark" icon: selected parameter properties appear in a dedicated window. Click on "Close" button to go back to "Modify Graph" window.

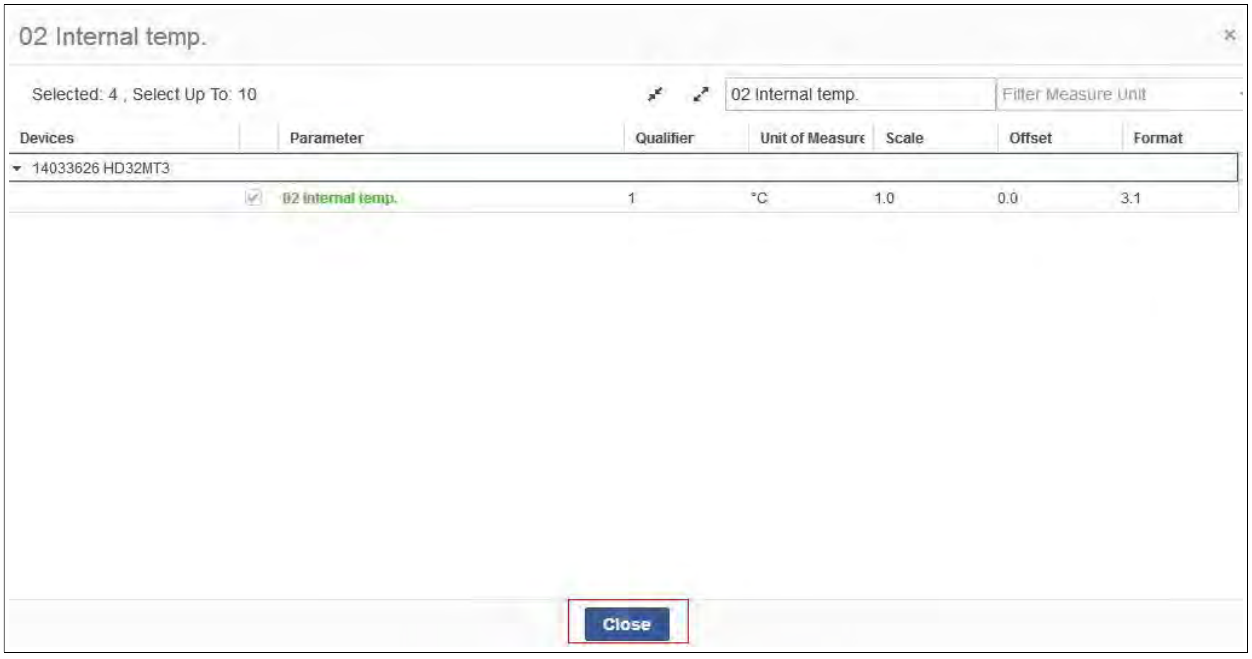


Fig. 7.2.158: Parameter description

30. Click on the "Pencil" icon to modify parameter graphical features.

Fig. 7.2.159: "Pencil" icon

31. The "Modify Parameter" window appears.

Fig. 7.2.160: "Modify Parameter" window

32. In the "General" tab:

- Click on the "Measure" drop-down list to set a different Measure Unit (if any)

Fig. 7.2.161: "Measure" drop-down list

- Click on the "Label" text-box to modify the parameter denomination.

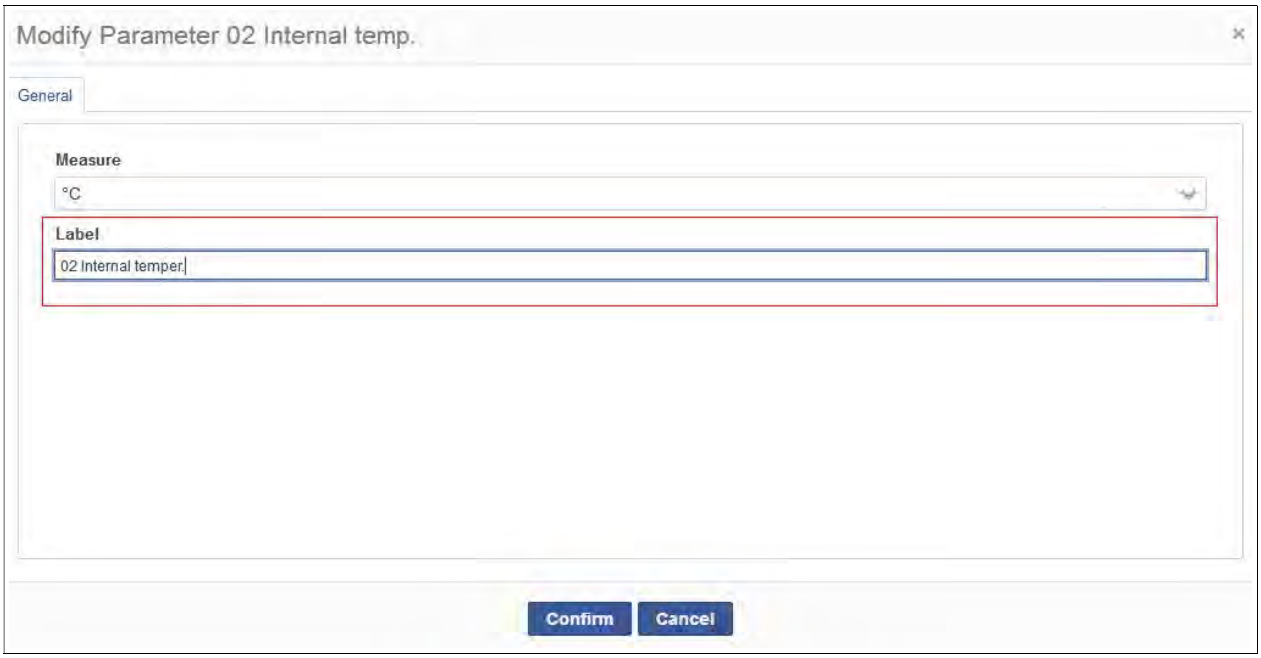


Fig. 7.2.162: "Label" text-box

- Click on "Confirm" button to save changes or click on "Cancel" button to discard them.

33. Click on the "Waste basket" icon to remove the selected parameter from the chart.

Fig. 7.2.163: "Waste basket" icon for parameter deletion

34. A confirmation window appears: click on "Yes" button to actually remove the selected parameter, otherwise click on "No" button to quit.

Fig. 7.2.164: Confirmation window for parameter deletion

35. Click on the "Confirm" button in the "Modify Graph" window to terminate the chart.

Fig. 7.2.165: "Confirm" button for chart termination

36. Click on the "Disk" icon: the "Modify Visualization" window closes.

Fig. 7.2.166: "Disk" icon for "Station" chart

37. The "Station" chart is included in the current Visualization: execute steps 26 to 28 from section 7.2.1 to save and check the result.

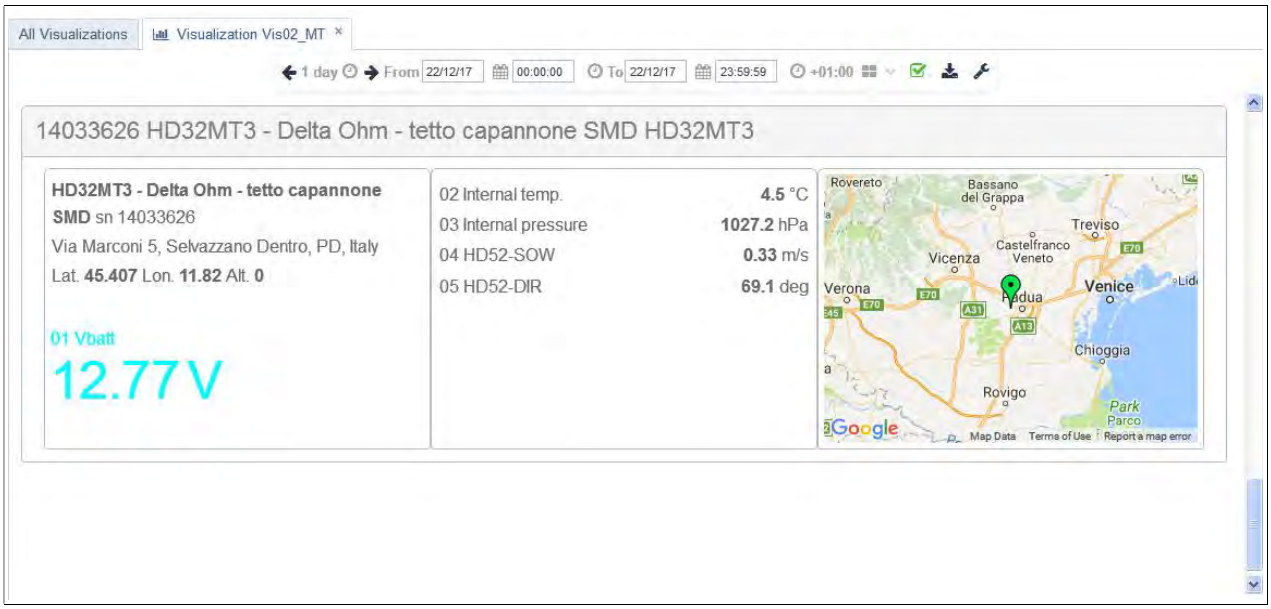


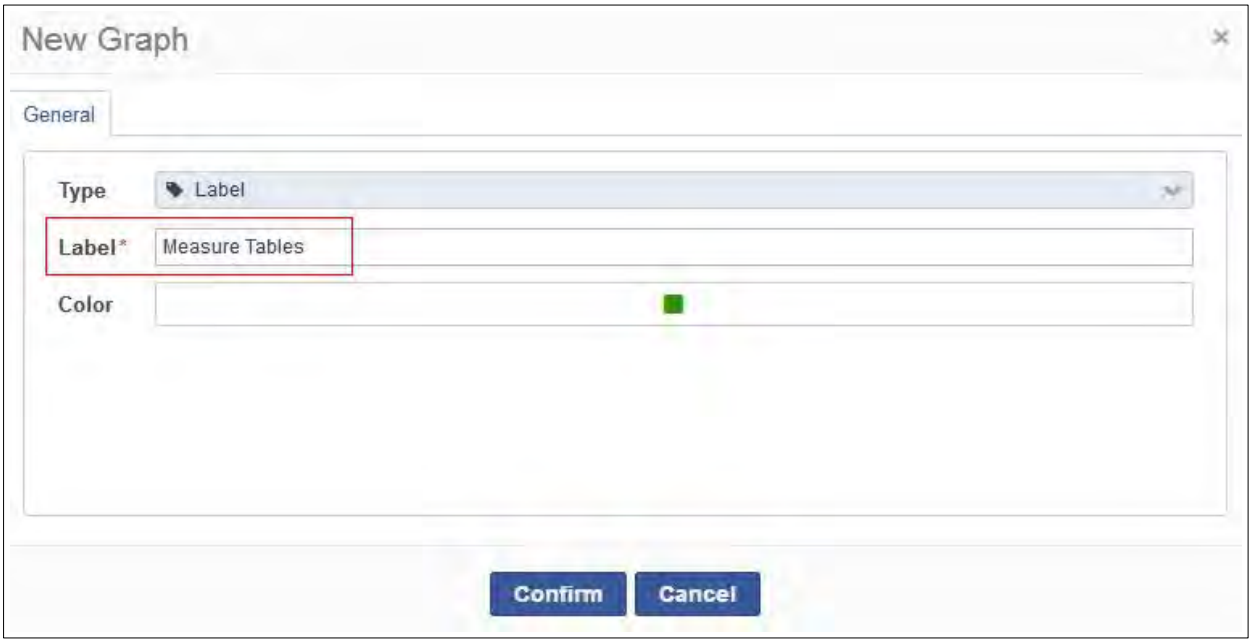
Fig. 7.2.167: "Station" chart

7.2.8 LABEL

The "Label" chart allows to create a text-box displaying a string.

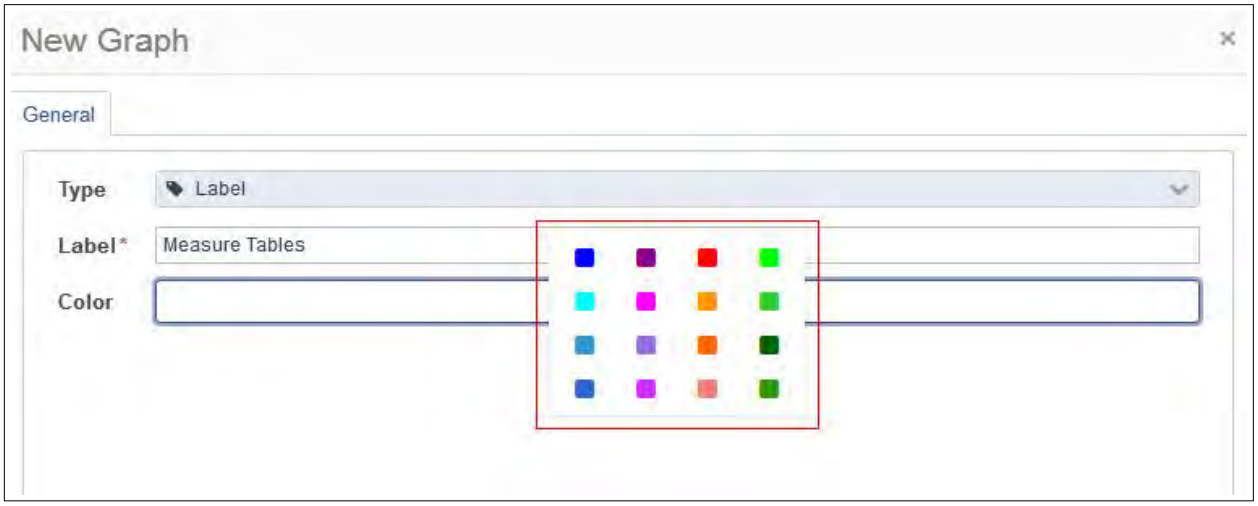
1. Select "Label" item in the "Add Graph" window (step 6, section **7.2.1**).

2. The "New Graph" window appears:



- Click on the "Label" text-box to enter the text.

Fig. 7.2.168: "Label" text-box



- Click on the "Color" square to set a different text color

Fig. 7.2.169: "Color" drop-box

3. Click on "Confirm" button, the "Modify Visualization" tab appears in the "Custom Visualization" window: click on the chart frame and drag it to the desired position.

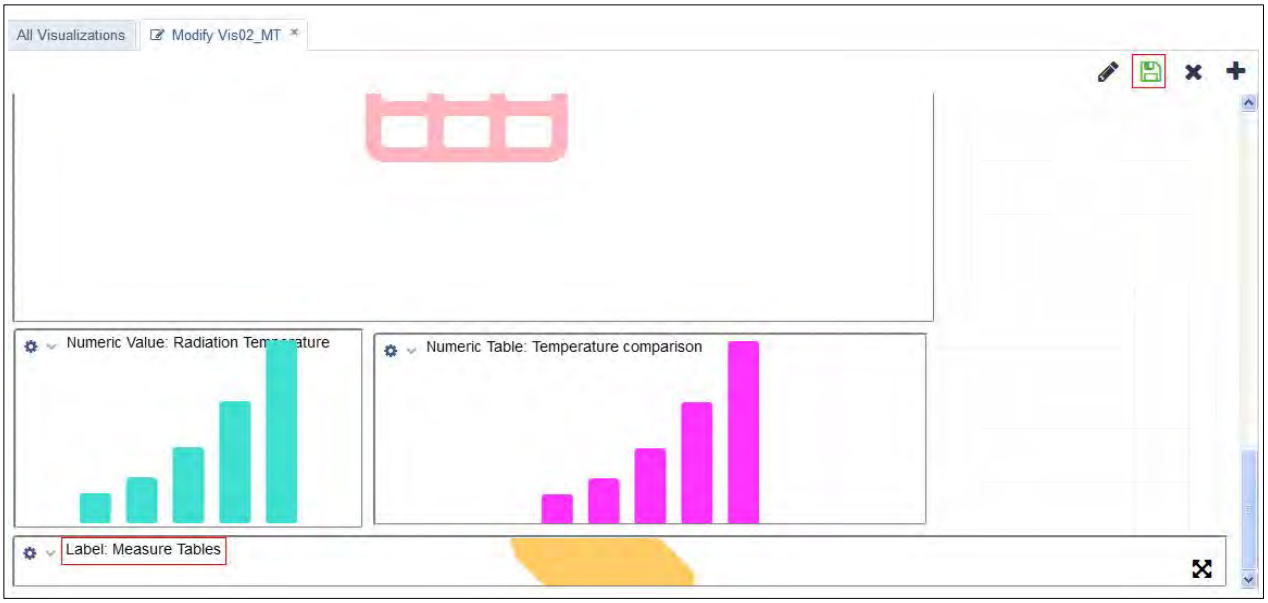


Fig. 7.2.170: "Modify" Visualization window

4. Click on the "Disk" icon: Visualisation is saved and "Modify Visualisation" tab is closed.

5. Click on the "Chart" icon in the right top command bar of the "All Visualization" tab to access the new Visualization.

Fig. 7.2.171: Visualization selection

6. The "Label" chart is included in the current Visualization.

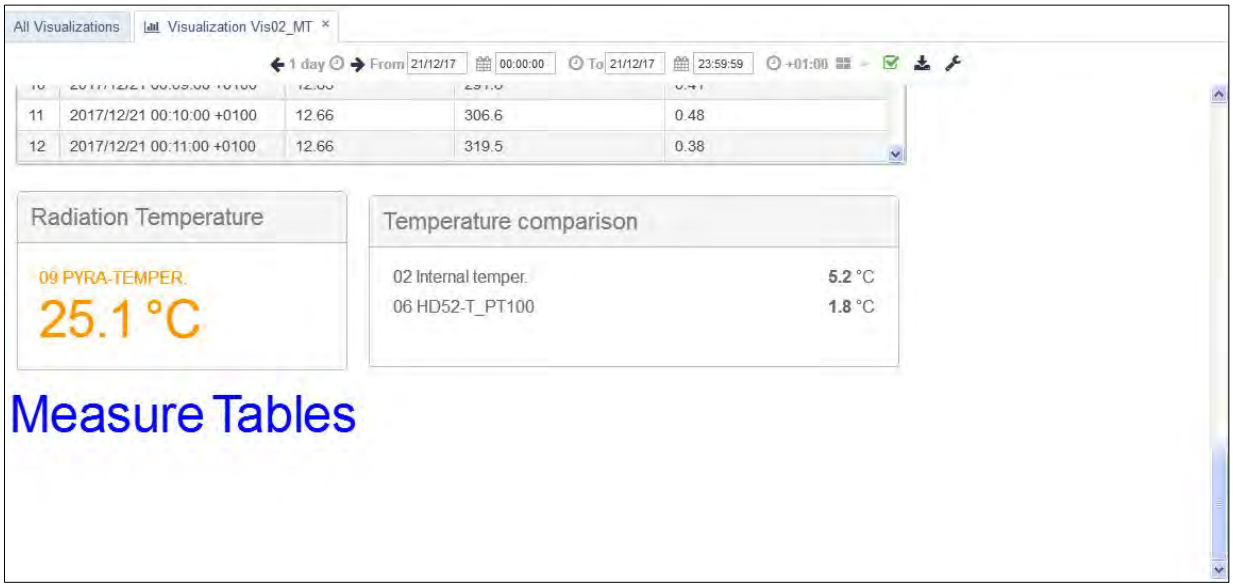


Fig. 7.2.172: "Label" chart in the Visualization view

7.2.9 MODIFY A CUSTOM VISUALIZATION

A Custom Visualization can be modified by its author User (Administrator or Super-user) through the following steps.

1. Click on the "Visualizations" button in the left blue column: "All Visualizations" tab is shown in the right section and the list of previously defined Visualizations appears (the counter label in the right top command bar reports their number).

2. Click on the row of the Visualization to be modified, then click on the "Pencil" icon in the right top command bar.

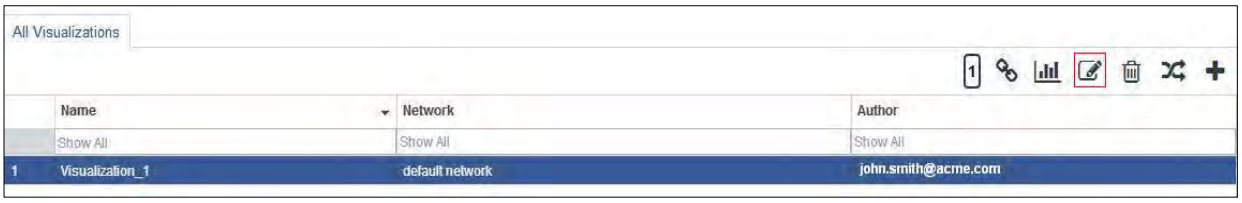


Fig. 7.2.173: Visualization selection to change appearance

3. The "Modify Visualization" tab appears in the window. Click on the "Gear" icon to open he drop down menu with available actions on the chart:

- Click on "Configure" item to open back the "Modify Graph" window.
- Click on "Info" item to access to Visualization and Devices quantities information.
- Click on "Remove" item to delete the chart from the Visualisation window.
- Click on "Modify Position/Size" to set graph coordinates, width and height.

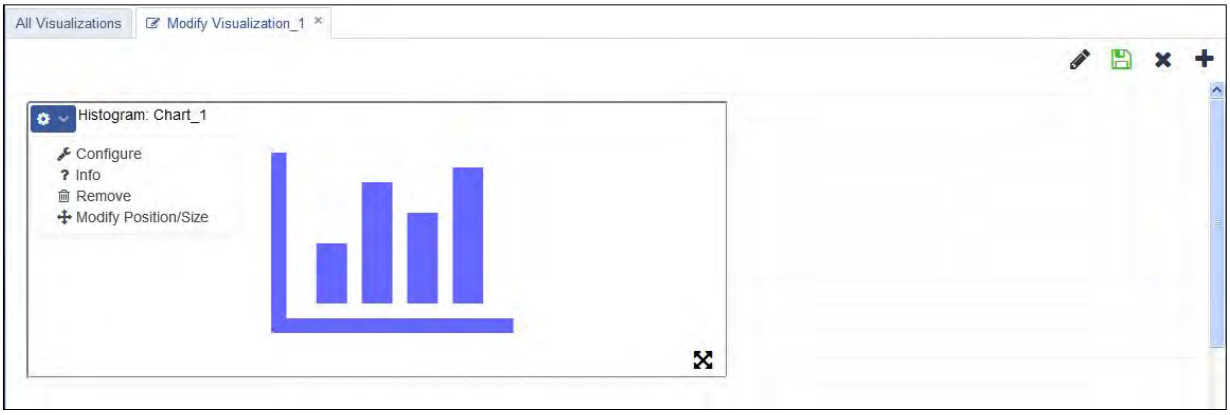


Fig. 7.2.174: Chart drop down menu

4. In the right top command bar click on:

- The "Pencil" icon to modify the current Visualization name.
- The "Plus" icon to add a new chart.
- The "Cross" icon to cancel the current Visualization.
- The "Disk" icon to save the current Visualization and close the "Modify" tab.

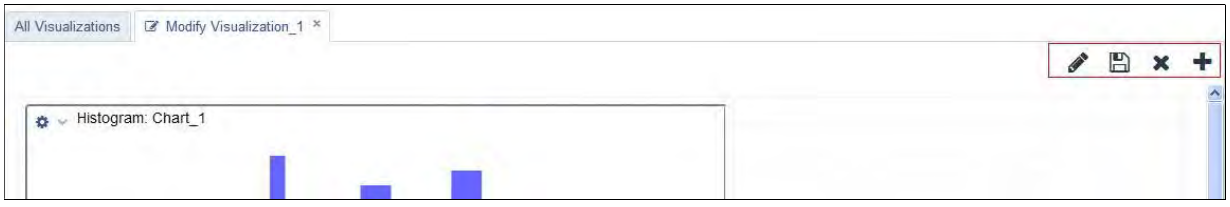


Fig. 7.2.175: Chart right top bar

5. The "All Visualizations" tab is back.

6. Click again on the row of the Visualization to be modified, then click on the "Twisted Arrows" icon in the right top command bar: the "Visualization Bindings" window appears.

Fig. 7.2.176: Visualization selection to change bindings

7. As detailed in section 7.2.1 (steps 4 to 6), Network devices can be joined to the current Visualization. Joined device can be removed as well.

8. Click on "Continue" button to enter "Modify Visualization" tab and save the applied changes.

7.2.10 DELETE A CUSTOM VISUALIZATION

Administrator user and associated Super-User can remove a Visualization as described below.

1. Select the Visualisation to be deleted, then click on the "Waste basket" icon in the right top command bar.

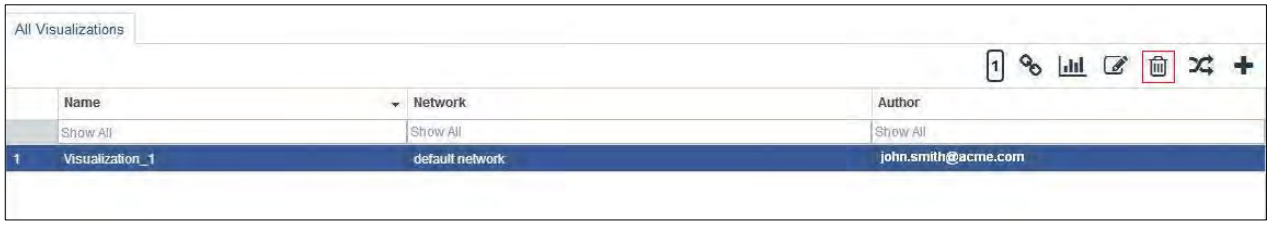


Fig. 7.2.177: Visualization selection for deletion

2. A confirmation window appears: click on "Yes" button to delete the selected Visualisation or click on "No" button to quit.

Fig. 7.2.178: Confirmation window for Visualization deletion

3. When clicked on "Yes" button, the deleted Visualisation disappeared from the list.

7.3 GENERATE VISUALISATION PUBLIC URL

A Visualisation window (either default or custom) can be viewed by a customer web page with no need for access permissions: its public URL can be generated through the following steps.

1. Select the desired Visualization row, than click on the "Glasses" icon in the right top command bar.

Fig. 7.3.1: Visualization selection to generate URL

2. The selected Visualization is displayed in the browser window: copy the URL from the address bar to the customized web page html code.

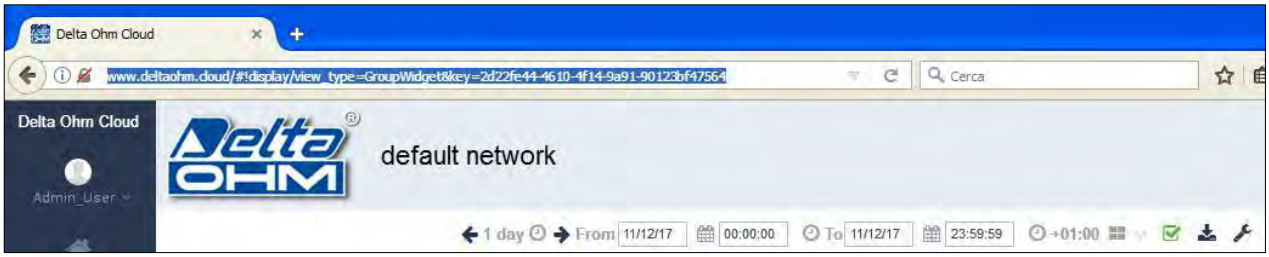
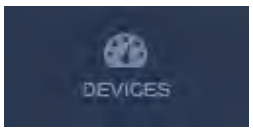
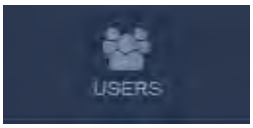
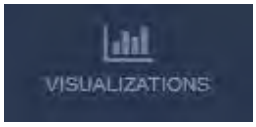


Fig. 7.3.2: URL to be pointed

8 COMMANDS SUMMARY

Icon	Command	Description
	HOME	Button in the left vertical menu: access to Portal Home Dashboard, where graphical information about Networks usage and access are painted and Devices logging and User sessions are listed.
	NETWORKS	Button in the left vertical menu: access to Networks list to add, modify, remove Networks, to change maps, to modify users authorizations.
	DEVICES	Button in the left vertical menu: access to Devices list to add, modify, remove registered Devices.
	USERS	Button in the left vertical menu: access to Users list to add, check, modify, remove profile informations.
	VISUALIZATIONS	Button in the left vertical menu: access to Visualizations list to add, view, modify, delete a Visualisation, to change Users and Devices bindings, to generate the public web link.
	COUNTER LABEL	Indicator in the top right command bar: number of elements in the curren list (Networks, Users, Devices, Visualisations).
	SHOW MAP	Icon in the top right command bar: access to selected Network list of Devices and their positioning on the map (if any).
	MODIFY	Icon in the top right command bar: access to selected Network map settings or to selected Visualization new element definition.
	RELATIONS	Icon in the top right command bar: access to Devices and Users list related to selected Network.
	MIGRATIONS	Icon in the top right command bar: access to selected Network Devices to associate/disassociate them.

Icon	Command	Description
	REMOVE	Icon in the top right command bar: remove selected Network, User or Visualization.
	MODIFY	Icon in the top right command bar: access to settings window for selected Network, Device or User.
	ADD	Icon in the top right command bar: define a new Network, User or Visualisation.
	ADD	Icon in the top right command bar: activate a new Device.
	SAVE	Icon in the top right command bar: save changes to Network map or Visualisation.
	CANCEL	Icon in the top right command bar: quit from Network map changes without saving.
	DETAILS	Icon in the top right command bar: access to User details window.
	VIEW	Icon in the top right command bar: generate a Visualisation window with public URL to be included in web pages.
	VIEW	Icon in the top right command bar: display Visualisation window.
	BINDINGS	Icon in the top right command bar: access to Devices and Users list to associate/disassociated them to selected Visualisation.
	CALENDAR	Icon in the graph top command bar: access to start/stop date selection.
	CLOCK	Icon in the graph top command bar: access to start/stop time o scroll time interval selection.

9 APPENDIX A

9.1 HD35… AND HD33… DEVICES COMMUNICATION

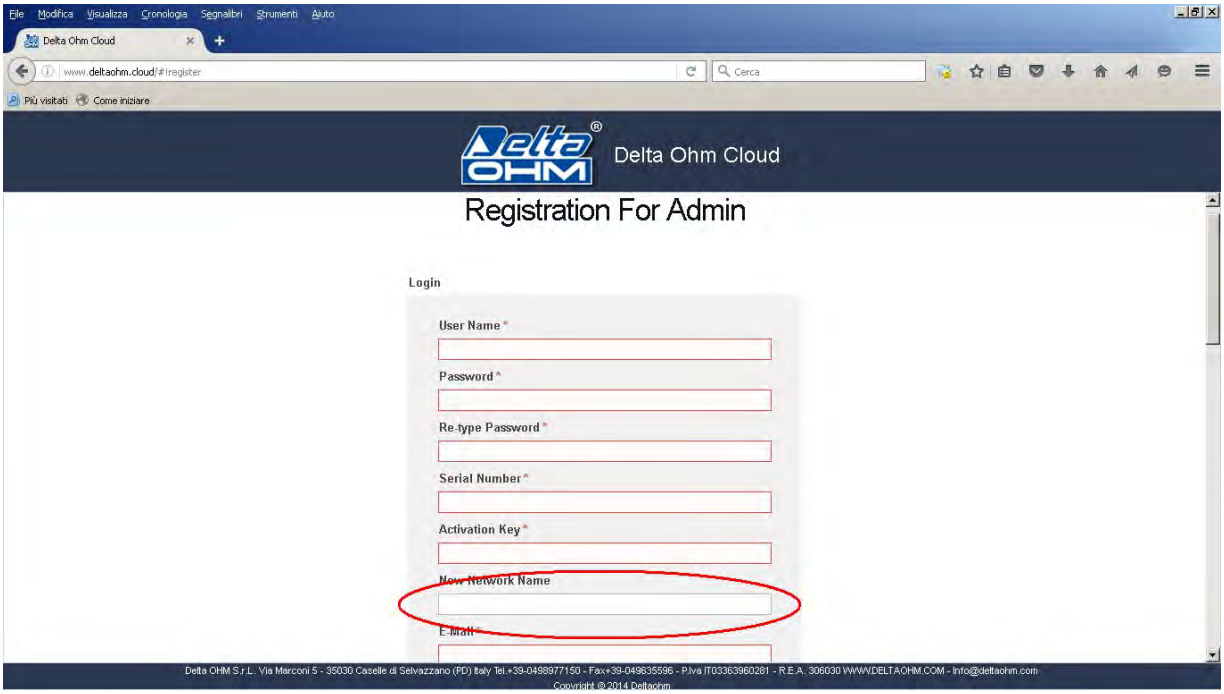
In this appendix we provide a short guide to allow communication of HD35… and HD33… devices with **www.deltaohm.cloud**. Please notice that communication with cloud application is available for the HD35… devices with Wi-Fi, Ethernet and 3G/GSM/GPRS connectivity and HD33… devices with 3G/GSM/GPRS connectivity:

Please notice that HD35AP… devices automatically handle the transmission of configurations and data measurements for all devices belonging to their wireless network.

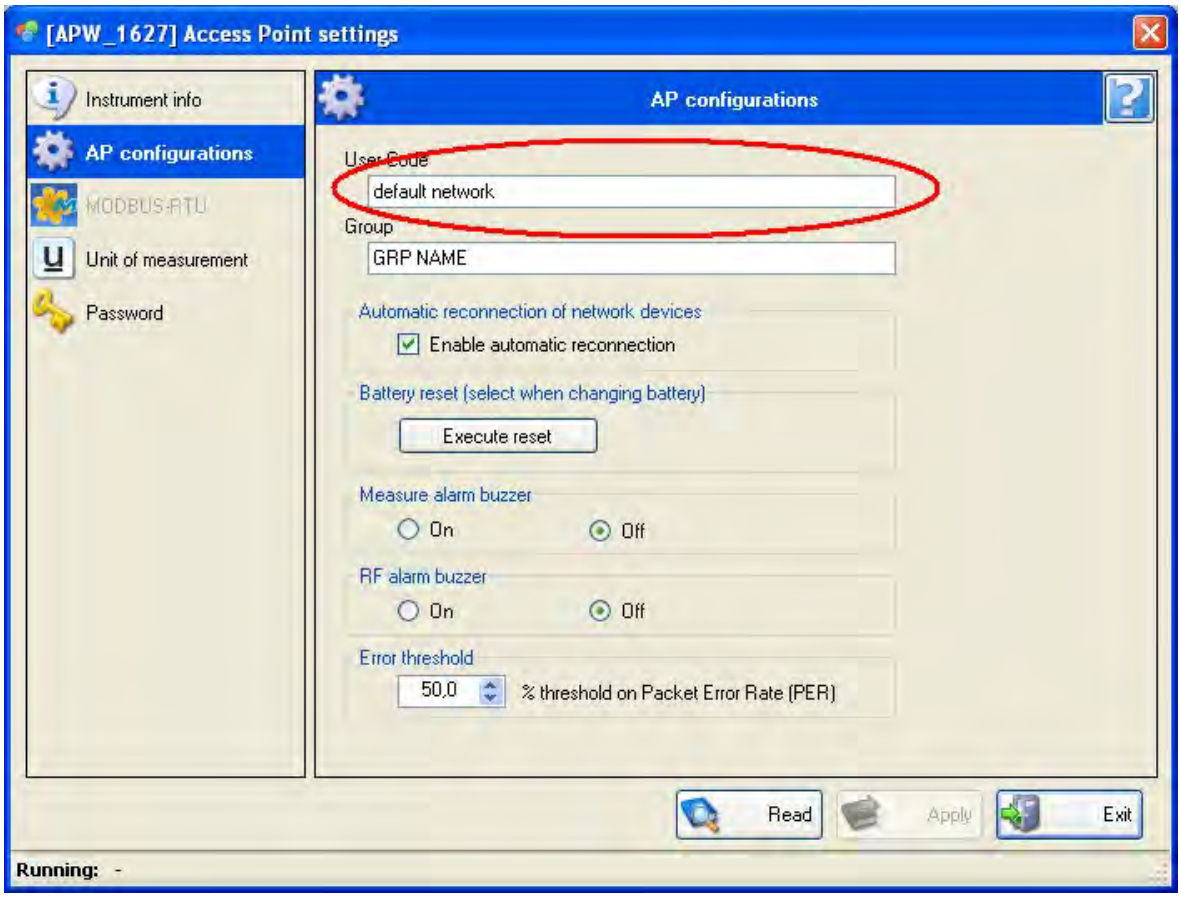
9.2 DEVICE PRELIMINARY SETTINGS

In this section we list the preliminary steps to allow communication of HD35 devices with **www.deltaohm.cloud** in case of first registration or creation of new administrator.

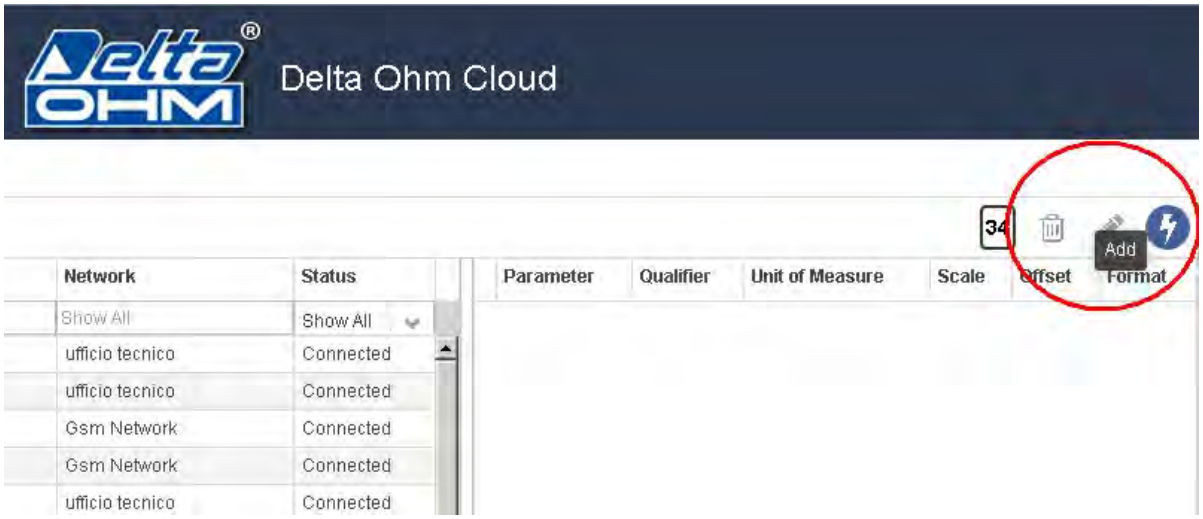
1. Update the firmware of the device in order to support HTTP client protocol. Please notice that communication with cloud application is supported starting from the following firmware versions:
   - HD35APW, HD35APG, HD35APR, HD35AP3G with firmware version greater than or equal to 0.181
   - HD33[L]M.GSM, HD33[L]T.GSM, HD33[L]MT.GSM with firmware version greater than or equal to 0.233
2. The cloud application allows the grouping of devices inside different "Networks". The specification of this parameter is also required when you try to activate a new device. When not specified the default value is "default network".
3. In case you first connect to Delta Ohm Cloud or you want to create a new administrator you have to fill in this web form where it is requested to insert the serial number, the activation key and the network name of the new device to add.



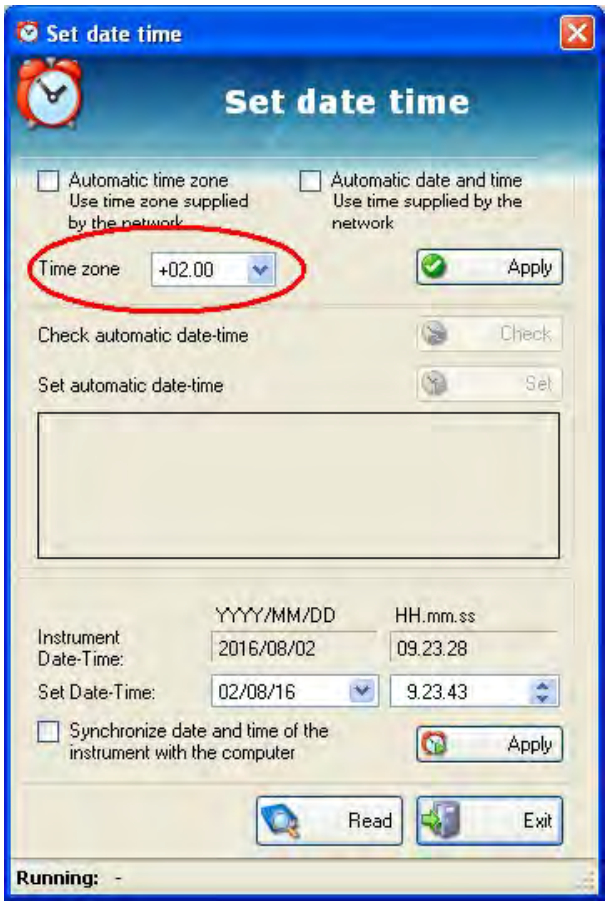
In case you are activating a new HD35 access point please configure its user code with the same network name used in device activation (e.g. default network). Please notice that when AP transmits its first configuration to the cloud application all devices belonging to its wireless network will be associated to the same network name (e.g. default network). In general AP user code should always be equal to its network name in cloud application. For AP user code configuration please follow: Instruments Setup-> Access point settings -> AP configurations -> User Code.



4. In case you already have an administrator account on **www.deltaohm.cloud** and you simply want to activate a new device, login on cloud application as administrator and activate a new device following "Add" button.



5. HD35 and HD33 devices use UTC time to send measurements data to cloud application. Please configure your device time zone properly following Instruments setup -> Setting of date and time -> Time Zone. Please notice that devices provided with 3G/GSM/GPRS modem (e.g. HD35APG…, HD35AP3G…, HD33[L]M.GSM, HD33[L]T.GSM, HD33[L]MT.GSM) support both "Automatic date and time" and "Automatic time zone"; differently, the devices with Ethernet/WiFi connectivity (e.g. HD35APW, HD35APR) support only "Automatic date and time" but not "Automatic time zone".



9.3 COMMUNICATION WITH CLOUD APPLICATION

This section describes a simple and standard procedure to activate HTTP client communication with **www.deltaohm.cloud**.

To set up a connection with an HD35AP… device via USB, proceed as follows:

1. The device is equipped with mini-USB connector on the housing side. Connect it to the PC by means of the **CP31** cable.

2. Start the HD35AP-S software and select the *Tools* >> *HID terminal* command.

3. Select *Setup* >> *Uart configuration*.

4. Set the Baud Rate to 115200. Press *Apply*.

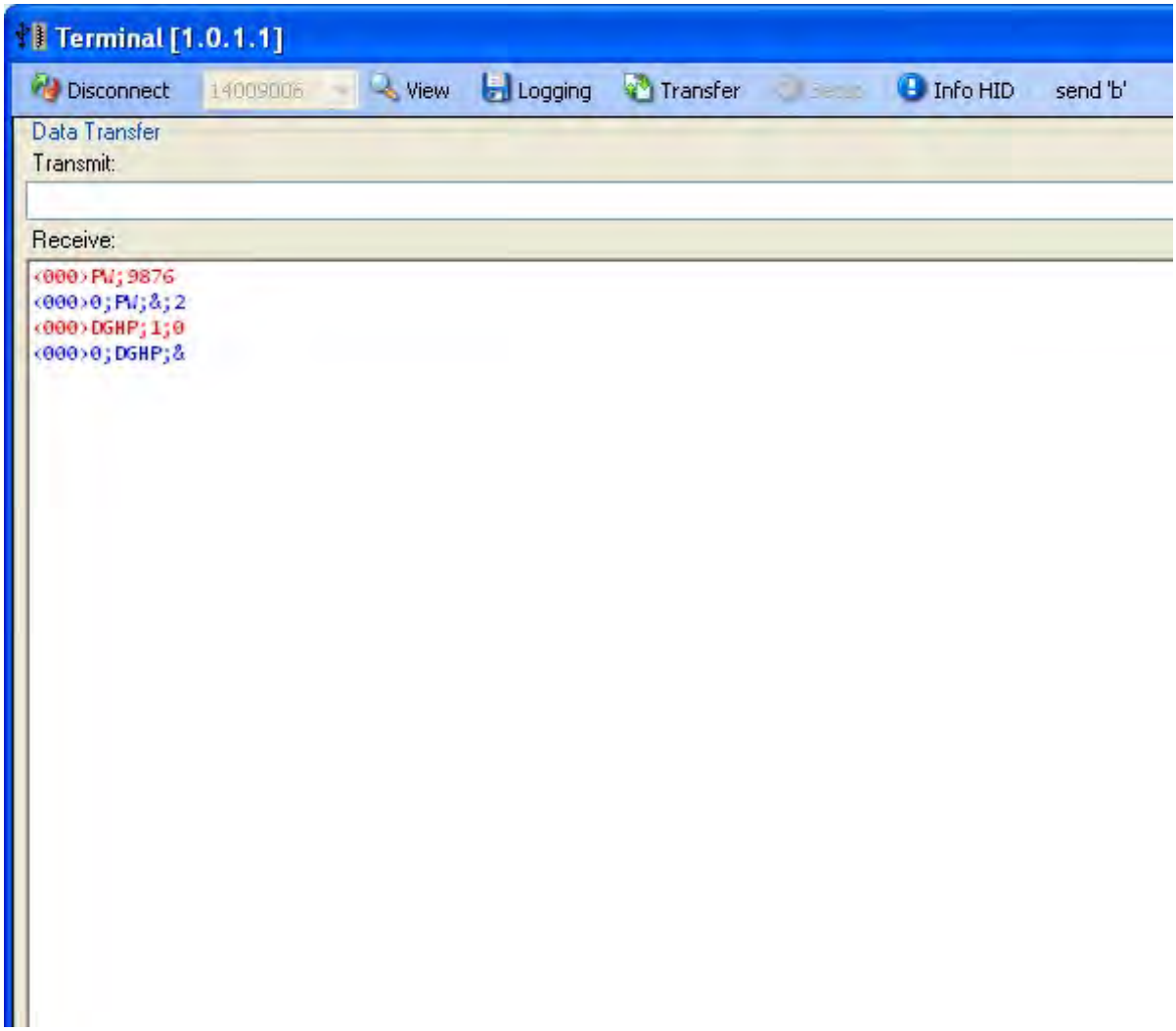
5. Select *Connect*.

6. Transmit the command **<000>PW;nnnn** with nnnn=administrator password. The waited ack is **<000>0;PW;&;2** and contains the command type "PW", the field "&" which specifies

that command has been accepted and the field "2" which specifies that the current password level is the administration password. In case the ack is different try to send it again.

7. It is now possible to send commands to the instrument. When transmitting a command, in case ack contains "?" or "$" after command type it means respectively that command is not valid or device is busy and not ready to receive this command type. Try to send it again. Differently if "#" is received, current password level is expired. In this case password command needs to be sent again.

8. Activate data transmission towards cloud application with command **<000>DGHP;1;0.** The waited ack is **<000>0;DGHP;&**.



9. After this configuration the device automatically sends its network configuration to cloud application and periodically sends measurements data every 15 minutes. Please notice that once communication with cloud application has been activated, device sends its network configuration at power up or after every significant network change.

After these steps the cloud application automatically creates a default visualization for each device. You can immediately see your data just logging in www.deltaohm.cloud.

NOTES

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