CARLO GAVAZZI
Automation Components

CARLO GAVAZZI

UWP IDE

Configuration software

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User manual
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Contents

Introduction to UWP IDE

Content

This chapter includes the following sections:

Description

The UWP IDE user interface is the result of our experience in adapting user needs to specific use cases.

Being UWP 4.0 a solution for energy efficiency management, in the comprehensive realm of functions for energy monitoring, light control, remote actuation, data automation, user interaction, IoT integration, we have focused on finding the best way to make sure that simple things are simple and complex things are possible.

The interface has been built using a clear header, a body split into 3 sections according to a master / detail concept, so to guide users to the needed area.

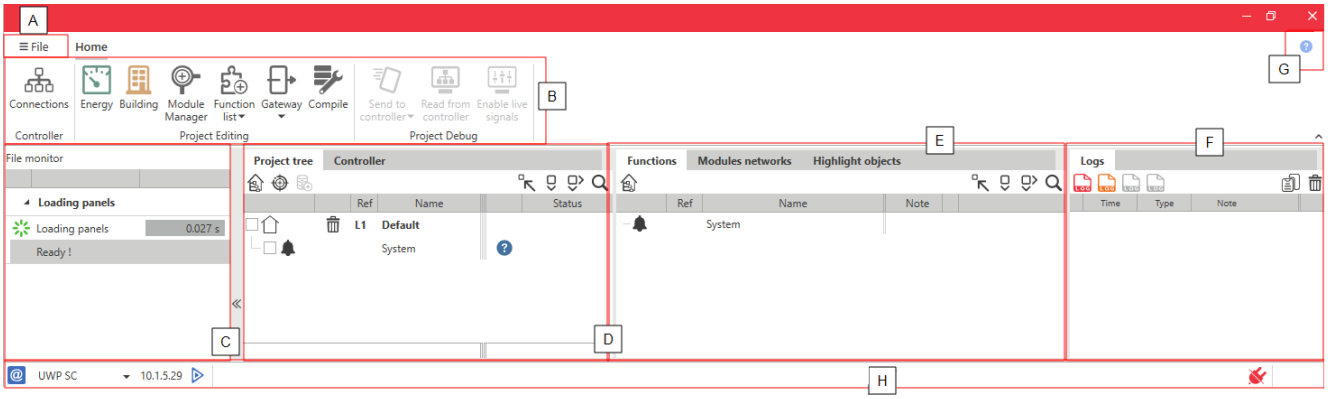
Each object (i.e., devices, functions, variables) is represented by an icon and the same icon with the same meaning is used in both UWP IDE and the UWP 4.0 Web-App, so to provide users with a consistent experience.

Main features

UWP IDE is the UWP 4.0 configuration software. It allows the user to:

- carry out the system commissioning
- define the automation and control logics
- set the measuring instruments and sensors monitoring.

Interface structure



Element	Description

A	File menu including:
	• Buttons for opening, creating or saving a project
	• Project, template and IDE settings
	• **Report manager.**
	From this window you can export PDF reports containing installation details. Following are the four types of report:
	  • The **Plant report** shows you the information about the part numbers you have in your project (subnet and address).
	  • The **Bill of materials** shows you the quantity of each part number you included into your project.
	  • The **Data logging report** shows you the logging details of each signal.
	  • The **Web API functions report** shows you all API commands.
	• General info about IDE

Element	Description
B	**Navigation bar** including: • **Controller menu.** This area contains the **Connections** menu that permits you to: • find the connected controllers • create predefined profiles • manage the controller connection profiles. See Connection profiles. • **Project editing menus.** This area contains the following menus: • **Function list**, depending on the application you select (**Building** or **Energy**). *Note: to enable the list you MUST select at least one of the two applications.* • **Module manager**, that permits you to: • find modules connected to your controller (automatically) • add manually modules (from **>> *Templates***) • create drivers (see Driver management) • create locations that you can also manage from ***Home page > Project*** • **Gateway**, that permits you to open the BACnet or Modbus configuration window. • **Compile**, that permits you to save your project to be sent to the controller. • **Project management menu** *When you connect to your controller, if there is an update available, a warning appears.* *These menus are available only if your controller is connected.* From this area you can perform the following actions: If you click ▾, you can set the options for sending your configuration to your controller Upload the configuration from the connected controller **Enable the live signals** to see the real time status of the system. It is available only when the IDE is connected to the controller. The user can check at any time the status of all analogue values coming from all the sensors in the installation. *Note: when the **Live signals** are activated, all the other actions are disabled (only saving the project is allowed).*

Element	Description
C	Progress of the project compiling, sending and of the reading from your controller.
D	Project and controller parameters. The **Project** tab permits you to manage (i.e., add, delete, move) the following project elements: • the locations. • the functions, and the relevant statuses • the modules, and the relevant signals The **Controller** tab permits you to set the controller parameters.
E	From this area you can see what you configure in the **Project** tab (see element D) and interact with the different elements. The tabs that compose it are the following: • **Functions** • **Modules networks**, containing the Modules and the relevant signals of your project • **Highlight objects**, containing pages that you can create to see the desired functions / modules / signals all together.
F	This area changes according to what you select from the central area (element D). The available tabs are the following: **Logs**, that shows the log errors (red icon, blocking the configuration), warnings (orange icon) or information (green icon) during the configuration compiling. **Function**, that is available if you select a function and if you enable the live signals. It shows the function properties and permits you to execute commands. **Device**, that is available if you select a device and shows the relevant properties. **Signals**, that is available if you select a module and shows the relevant variables.
G	Contextual **Help**
H	Right part: dynamic icons giving information about the controller Left part: dynamic icons giving information about running processes

Connection profiles

The **Connections** window manages the profiles to connect to UWP.

You can open it in two ways:

- from the **Home page** by clicking **Connections**
- from the bottom left part of the interface.

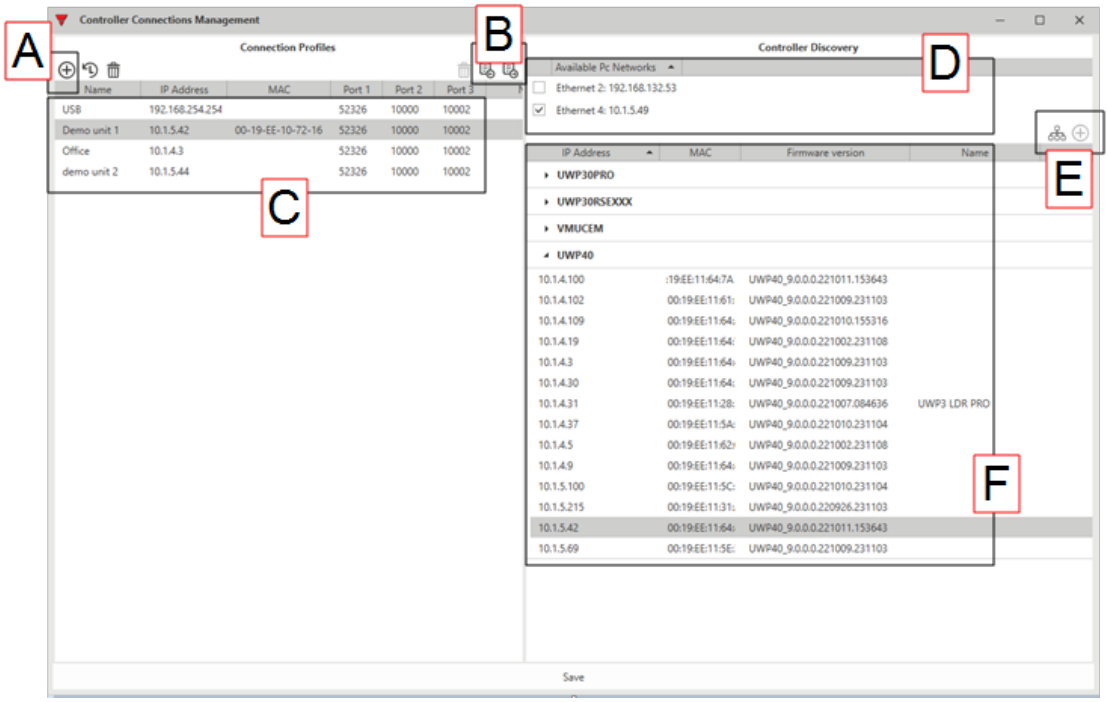
Two areas compose the window:

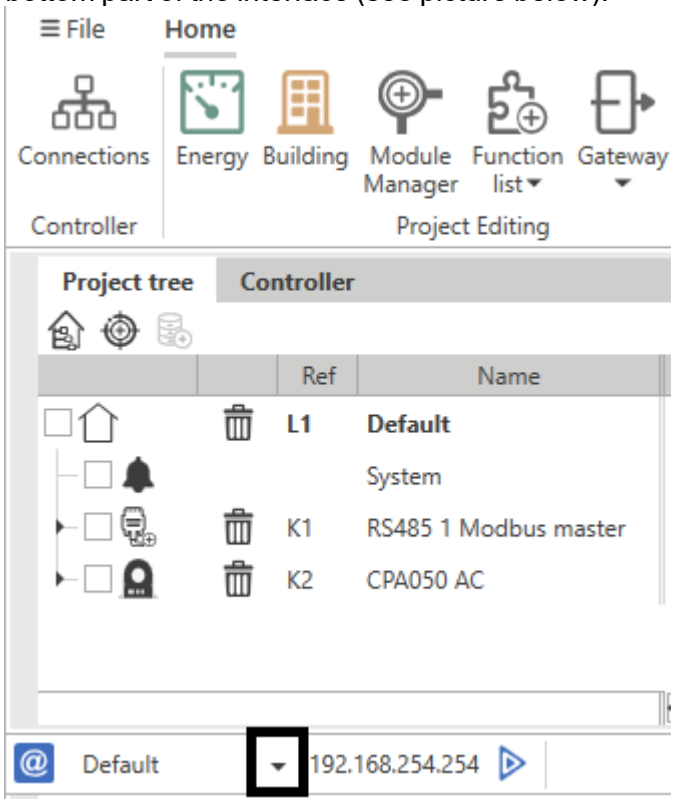
- the right area permits you to discover the controllers connected to a LAN network and to add them to your profile list
- the left area permits you to manually add a profile without using the **Discovery** function

For each profile you can edit the IP address and the ports that the UWP IDE uses for the controller programming.

The MAC address field is not mandatory and usually it is updated whenever you use the Discovery function for the LAN network controller (right area).

Please consider the picture below representing a discovery result:



Area	Description
A	Adds a new connection profile to your list. Once you have added and saved one, the software shows it in and permits to select it from the bottom part of the interface (see picture below). 
B	Imports an existing list and Exports a new list of profiles.
C	Shows the list of known connection profiles. *Note: the default one is set through micro-USB.*
D	Shows the list of available network interface(s): you can flag one and click to start the UWP 4.0 modules discovery. *Notice: UWP must be connected to the same network.*
E	Starts the UWPs discovery Adds the selected UWP to the list on the left
F	List of found modules you can add to your list on the left

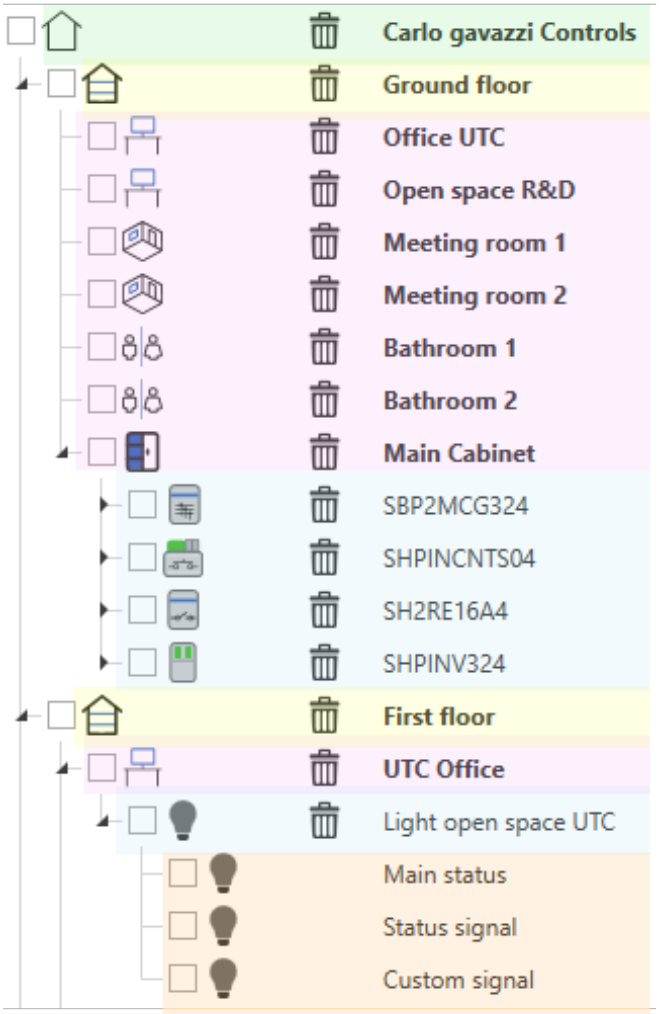
What are locations

Locations are containers of objects that can be modules, functions or other nested locations.

They permit you to hierarchically organise your project objects to be easily found.

Note that the use of locations is not mandatory but highly recommended.

Example of location hierarchy



*In this example, the **Carlo Gavazzi Controls** building is composed of two floors (**Ground** and **First**). For each floor, there are several rooms to be managed and controlled.*

*To do that, in the **Ground floor** seven locations have been added for each room: for controlling the **Main Cabinet**, four modules have been added.*

*In the **First floor**, the **UTC Office** location has been added to control the relevant light system.*

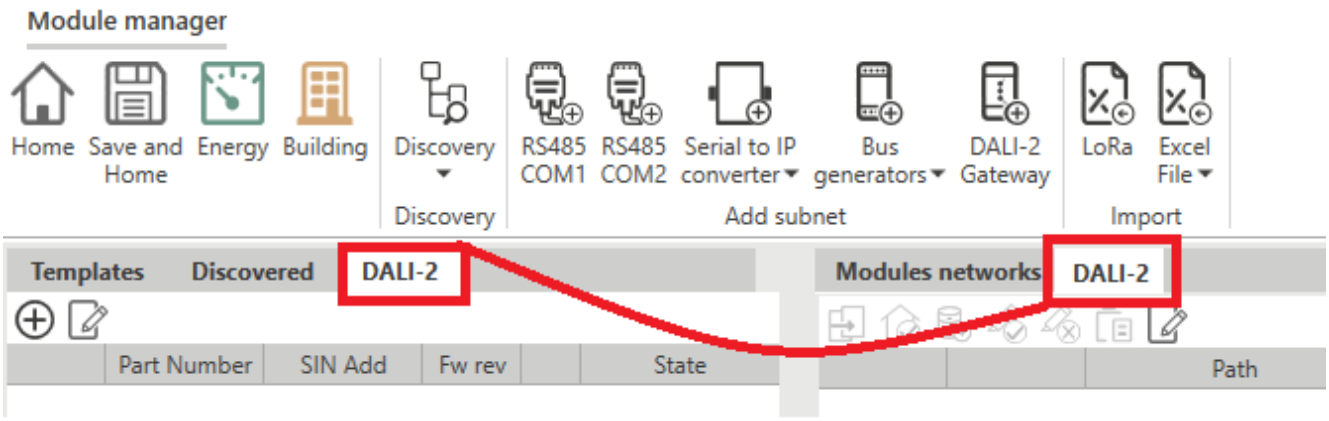
DALI-2 gateway

Content

This chapter includes the following sections:

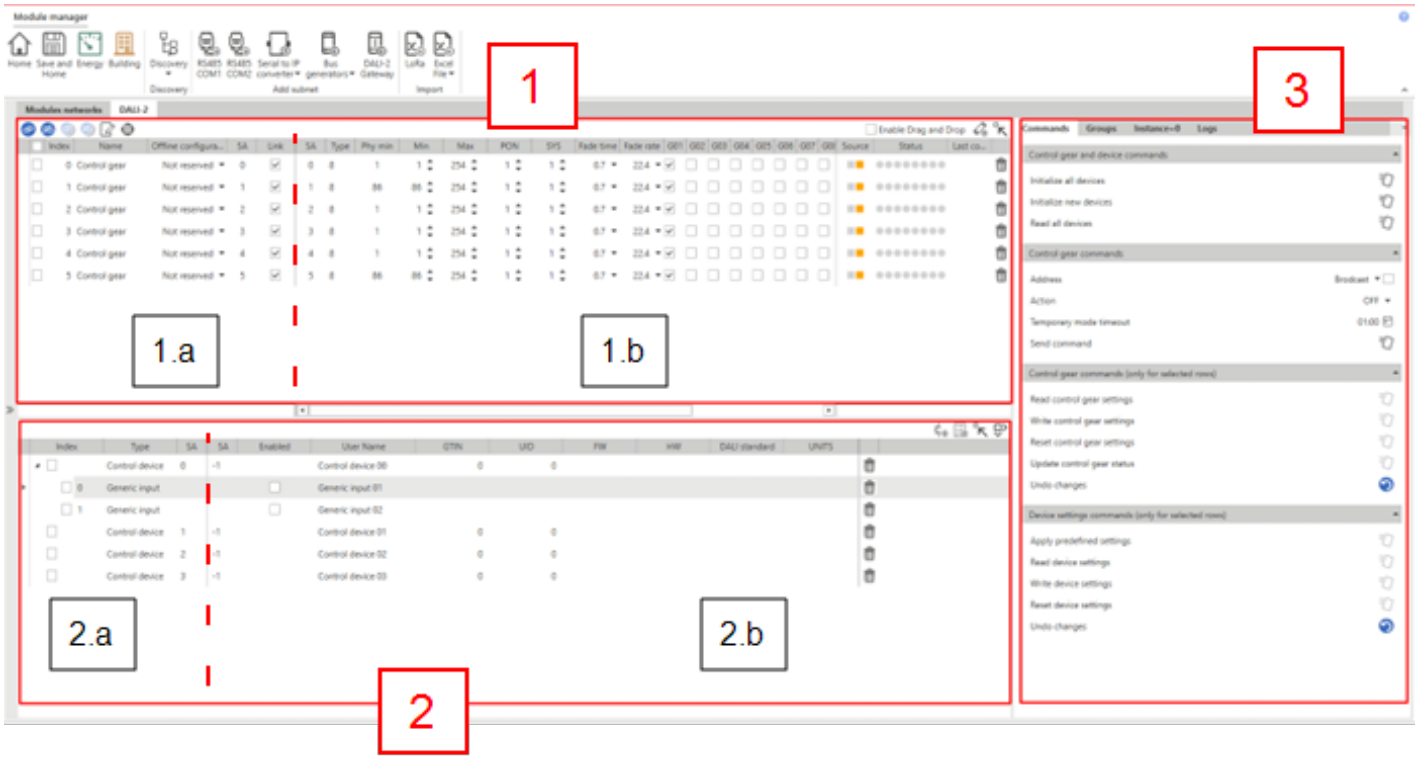
How to access the DALI-2 gateway settings

After you have added a DALI-2 device to your project (see how to add a control gear / control device automatically or manually), you can access the DALI network programming: click the **DALI-2** tab that appears if you select a DALI-2 device from the **Modules networks** tab.



Clicking the **DALI-2** tab will open the DALI network window that shows the related data (if available) loaded from the gateway memory.

DALI-2 gateway window



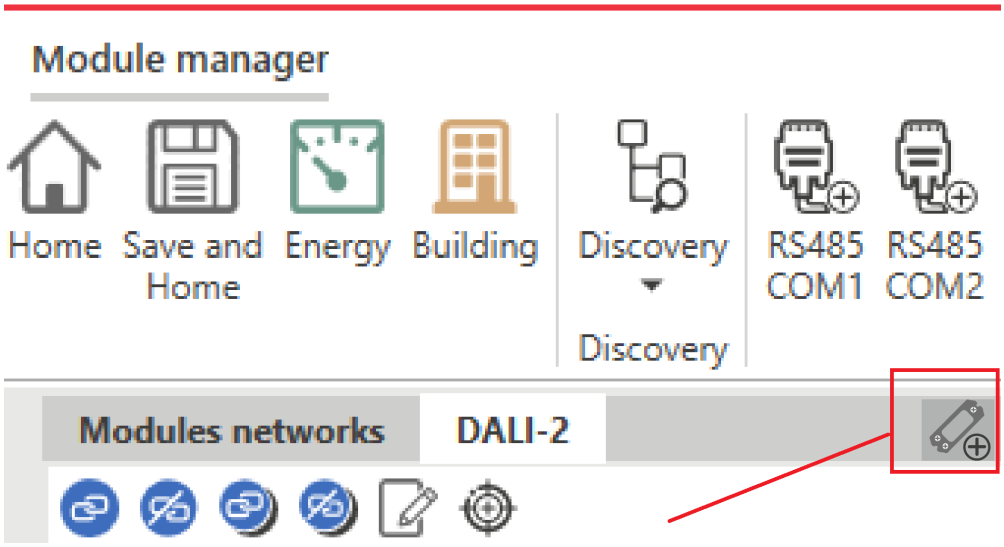
Three main sections compose the DALI-2 gateway programming window:

1. List of control gears (output devices). This section is also split into two areas:
   1.a. Project signals
   1.b. Information/settings read from field by the control gear
2. List of control devices (input devices). This section is also split into two areas:
   2.a. Project signals
   2.b. Information/settings read from field by the control device
3. Support right panel containing the following parts:
   - General **Commands**
   - Details of the control gear selected from the **Control gear** tab (section 1)
   - Details of DALI groups according to the subscriptions applied to the control gears from the **DALI groups** tab (section 1)
   - Details of the device or instance selected from the **Control gear** tab (section 1)

Control gears section

How to add control gears to the DALI-2 window

- Manually add a control gear by clicking  in the upper right (see the picture below): it opens a panel to select the signals with SA not yet used.

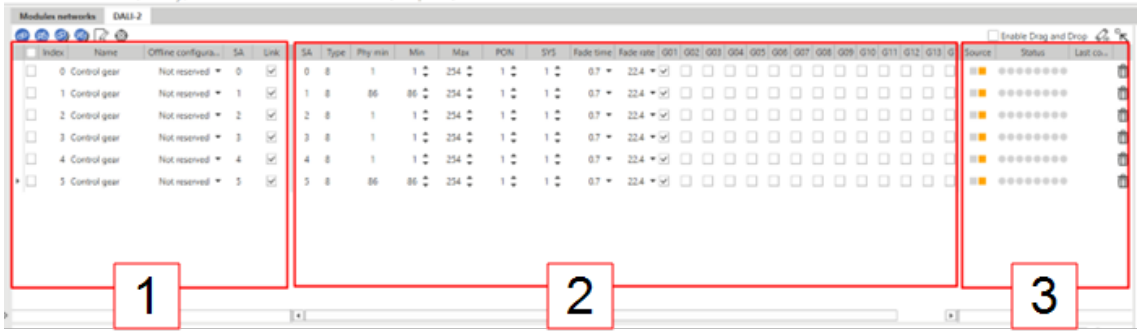


- Automatically add a control gear by using the discovery function (**Commands** tab on the right).

Once a control gear has been created it remains in the list, and can be removed using (on the right part of the row).

Control gear table(s)

For each control gear you create a row appears in the table; each row is split into three parts:



<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>1</td><td>Signal(s) to be used in the project. The control gear signals appear in the project if the Link field is flagged or if from the Offline configuration column one of the options (i.e., Reserved (type 6) or Reserved (type 8)) is selected.
The table below describes each column of this section:
<table><tr><th>Column name</th><th>Description</th></tr><tr><td>Index</td><td>Signal index in the table</td></tr><tr><td>Name</td><td>Signal name in the project</td></tr><tr><td>Offline configuration</td><td>It allows to display a signal in the project even if you have not executed the DALI network discovery or the link is not active (offline configuration).
There are three options available:
1. Not reserved. The signal is visible in the project only if the information about the field control gear is available and if the Link column is flagged.
2. Reserved (type 6). The signal is visible in the project even if the information about the field control gear is not available, but the link is not active.
3. Reserved (type 8). The signal is visible in the project even if the information about the field control gear is not available, but the link is not active.</td></tr><tr><td>SA</td><td>The DALI short address of the project signal. It takes the field control gear value if it is available or changed.</td></tr><tr><td>Link</td><td>It allows to combine the project signal with the field control gear. If the check box is set to OFF, the field control gear is not linked to the project signal.
To use the project signal in the functions, there must be a link to a field signal.</td></tr></table></td></tr>
</table>

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>2</td><td>Information/settings read from the field by the control gear. The data shown in this section may have been read by field devices or downloaded from the configuration file. For this reason, it is useful to have information about the origin of the data and about the last command sent to each device.
The table below describes each column of this section:
<table>
<tr><th>Column name</th><th>Description</th></tr>
<tr><td>SA</td><td>DALI short address of the field signal</td></tr>
<tr><td>Type</td><td>DALI device type</td></tr>
<tr><td>Phy min</td><td>Physical minimum level of the control gear (value from 0 to 254)</td></tr>
<tr><td>Min / Max</td><td>Minimum/maximum applicable level.
Note: the minimum settable value is = Phy min level; the maximum is = 254.</td></tr>
<tr><td>PON</td><td>= Power on level.
It is the brightness value that the DALI driver assumes as soon as the power supply is turned on.
Note: if the value is set to 255, the luminaries should keep their current/last value.</td></tr>
<tr><td>SYS</td><td>= System failure level.
It is the brightness value that the DALI driver assumes when an error is detected in the DALI circuit (e.g., interruption or short-circuit on the DALI line).
Note: if the value is set to 255, the luminaries should keep their current/last value.</td></tr>
<tr><td>Fade time</td><td>Time in seconds for fading from the current brightness value to the new brightness value (for light level and scene commands).
Note: do not set to NULL because you will disable the fading.</td></tr>
<tr><td>Fade rate</td><td>Fade steps per second used during manual dimming (speed for dimming Up or Down)</td></tr>
<tr><td>G01..016</td><td>DALI group assignment of the DALI driver</td></tr>
<tr><td>S01..016</td><td>DALI level saved for the DALI scene</td></tr>
<tr><td>Phy CT min/max</td><td>Physical minimum/maximum colour temperature of the control gear</td></tr>
<tr><td>CT min/max</td><td>Minimum/maximum applicable colour temperature.
Note: the minimum settable value is = Phy CT min level; the maximum is = Phy CT max level.</td></tr>
<tr><td>CT PON</td><td>= Colour temperature Power on level.
It is the colour temperature value that the DALI driver assumes as soon as the power supply is turned on.</td></tr>
<tr><td>CT SYS</td><td>= Colour temperature System failure level.
It is the colour temperature value that the DALI driver assumes when an error is detected in the DALI circuit (e.g., interruption or short-circuit on the DALI line).</td></tr>
</table></td></tr>
<tr><td>3</td><td>User’s feedbacks.</td></tr>
</table>

Control devices section

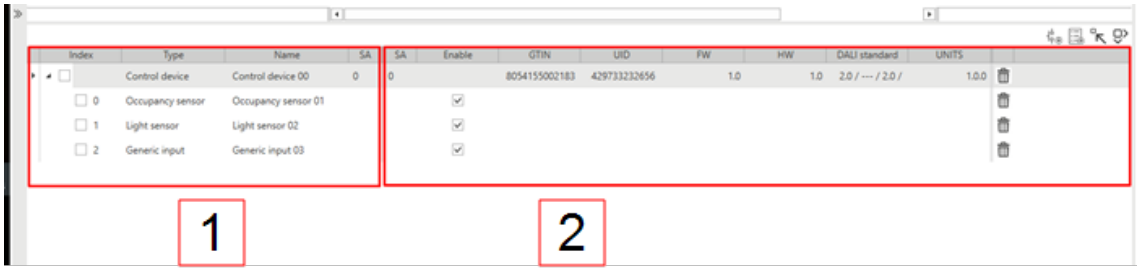
How to add control devices to the DALI-2 window

- Manually, by clicking the button in the upper right : it opens a panel to select the control devices (maximum controlled devices: 32).
- Automatically, by using the discovery function (**Commands** tab on the right).

Once a control device has been created it remains in the list, and can be removed using (on the right part of the row).

Control device table(s)

For each control device you create a row appears in the table; each row is split into two parts:



Element	Description
1	Signal(s) to be used in the project. The table below describes each column of this section:

Column name	Description
Index	Signal index in the table
Type	Object type
Project name	Signal name in the project
SA	The DALI short address of the project signal. It takes the field control device value if it is available or changed.

Element	Description
2	Information/settings read from the field by the control device. The table below describes each column of this section:

Column name	Description
SA	DALI short address of the field signal
Enable	Signal/instance enable status. Flag it to use it in the UWP function.
GTIN	Manufacturer GTIN number
UID	Manufacturer unique ID
FW	Manufacturer firmware version
HW	Manufacturer hardware version.
DALI standard	Notes about the supported standards

Commands section

Control gears and device commands

The table below describes each column of the Control gears and device commands section.

Command	Description
Initialize all devices	Searches for all control gears/devices connected to the DALI network. After that, each device connected to the network generates again its random address and the DALI-2 master assigns it new SA (short address). *Note: the SA assignment starts from 0 and increases for each device found randomly.*
Initialize new devices	Searches for new control gears/devices connected to the DALI network. After that, each device without a valid SA (usually the brand-new modules) generates again its random address and the DALI-2 master assigns it a new SA. *Note: the DALI devices with a valid SA are not changed.*
Read all devices	Searches for new control gears/devices connected to the DALI network by scanning all SAs. *Note: no device generates its random address and changes its SA.*

Control gears commands

The table below describes each column of the Control gears commands section.

Command	Description
Target address	Selects the command target among those available: • Broadcast = message to all devices on the DALI line • Group xx= only the control gears that belong to this group react • SA xx = only the control gear that has the SA reacts • Use SA of selected row = the command is sent to the selected control gear

Command	Description
Action	Action that the target will execute, among those available: • Off = turns off the light • Up= increments by one the output level (only if light is ON) • Down= decrements by one the output level (only if light is ON) • Recall min level= sets output level to minimum value • Recall max level= sets output level to maximum value • Step Up= increments by one the output level (if the light is OFF, the light is also turned ON automatically) • Step Down= decrements by one the output level (if the light is OFF, the light is also turned ON automatically) • On and step up= increments by one the output level (if the light is OFF, the light is also turned ON automatically) • Step down and off=decrements by one the output level (if the light is ON, the light is also turned OFF automatically) • Go to scene= sets the light level to the value selected in the field “Scene to activate” • Go to last active level= sets the light level to the last value saved before turning OFF. • Direct level= sets the light level to the value selected in the field “Direct level to be applied” • Identify command = makes the light flash by sending in sequence recall min/max commands.

Temporary mode

The **Temporary mode** is automatically activated when you access the DALI-2 programming window. This functionality locks the reception of commands coming from programmed functions, by giving priority to actions executed within the DALI-2 window.

Command	Description
Reload temporary mode timer	Reloads the temporary mode timer.
Exit temporary mode	Deactivates the temporary mode (control gears are driven by the functions in the configuration).
Update remaining timer	Retrieves the value of the temporary mode timer.

Control gear commands

After selecting a row from the **Control gears** table, you can send one of the commands described in the following table:

Command	Description
Read control gear settings	Reads all the settings/parameters saved in the control gear memory.
Write control gear settings	Writes new settings in the control gear memory. *Note: the software will notify the pending change by placing warning icons next to the modified fields.*
Reset control gear settings	Resets the control gear settings

Command	Description
Update control gear status	Updates the information inside the control gears table with the status
Undo changes	Deletes pending changes from the selected control gear

Control device commands

After selecting a row from the **Control devices** table, you can send one of the commands described in the following table:

Command	Description
Apply predefined settings	Applies the default values compatible with the **Light** function managed by UWP
Read control device settings	Reads all the settings/parameters saved in the control device memory.
Write control device settings	Writes new settings in the control device memory. *Note: the software will notify the pending change by placing warning icons next to the modified fields.*
Reset control device settings	Resets the control device settings
Undo changes	Deletes pending modifications from the selected control device

DALI-2 instances

Overview

Instances are used for integration in systems with a DALI-2 central control unit.

Each input device functionality can be a device instance itself.

Examples:

- *A DALI-2 switch has 4 push buttons. Each of them would be an instance (with type: pushbutton).*
- *DALI-2 Combi Sensor Module has the following sensors: light sensor, motion sensor, temperature sensor, etc. Each of them would be an instance of the module.*

There are different DALI -2 Instance types available (specified in the DALI-2 standard):

- Instance Type 1: push button (62386301)
- Instance Type 2: analogue input (62386302), used for all other inputs such as sliders, rotary buttons, temperature sensors, humidity sensors, air pressure sensors, air quality sensors, etc.
- Instance Type 3: motion detection measurement, i.e., PIR (62386-303)
- Instance Type 4: light intensity measurement (62386-304)

Functionality

DALI-2 input devices in instance mode do not send DALI control commands. The higher-level control units process the status of each instance in the system and send the necessary DALI control commands.

Each control device push button or any other input method (such as push button, rotary button, etc.) and each detectable sensor value (such as motion, light, temperature, etc.) is a separate DALI-2 instance of the DALI-2 input device.

Go to the next section to find details about the configuration options.

Instance settings: general

Notice: each instance can be configured individually.

The table below describes settings valid for all types of instance.

Instance setting	Description
Enable / Disable	Enables/Disables instances. *Note: if instances are not mandatory, they can be deactivated. In this case, event messages are not sent, and the measured values are not updated. However, they can still be requested via a "Query" command, and the DALI-2 configuration commands/queries can still be supported.*
Event Scheme	It determines what information is transferred with the event. This information permits enabling the recognition and/or filtering the events on the DALI bus. The following five options are available: • **Instance addressing** • **Device addressing** • **Device/Instance addressing** *Note: this option must be set so that UWP can properly manage the instance.* • **Device group addressing** • **Instance group addressing**
Instance group	There are 32 instance groups available: each instance of an input device can be assigned to up to three instance groups. *Notes:* • *the "primary group" is used for the event* • *the instances of different input devices can be assigned to the same instance group .*
Instance type	It defines the DALI-2 standard valid for the relevant instance. The different instance types are specified in the DALI-2 standard and each input device can include up to 32 different instance types.
Instance number	It is unique for each instance in a device and is assigned by the manufacturer.
Device group	The device can be assigned to up to 32 device groups (0...31). *Note: the lowest **Device group** is used for the event.*
Control Device address (SA)	After the DALI addressing, each device gets a DALI address. *Note: input devices have a DALI-2 control address 0[2]..63[2]. With this address the device can be clearly addressed. If needed, a different device address can be assigned.*
Event Priority	*Important: only for instance types 2, 3 and 4.* The **Event priority** determines the order in which events are sent when they occur simultaneously on the bus (priority 2 = the highest and 5 = the lowest).

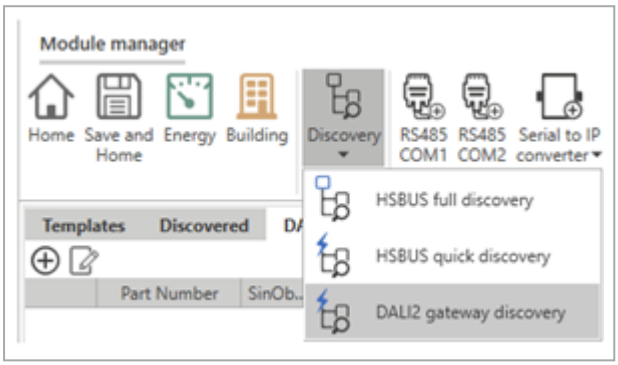
Instance setting	Description
Dead Timer	*Important: it can be set for each instance but only types 2, 3 and 4.* The **Dead timer**: • determines the time that must pass before an event can be sent again. • applies if the event information (e.g., measured value) changes. *Note: if no dead timer is required, it can be deactivated.*
Report Timer	*Important: it can be set for each instance but only types 2, 3 and 4.* The **Report timer**: • allows the value to be sent as a DALI-2 event regardless of the value changing. • determines the maximum time between an event sending and its resending. • schedules the cyclic event sending.
Hysteresis	*Important: it can be set for each instance but only types 3 and 4.* Hysteresis can be used to set the percentage of change necessary to trigger a new transmission. *Note: not all changes in value lead to the generation of an event.*
Minimum Hysteresis	*Important: it can be set for each instance but only types 3 and 4.* It is the minimum value below which it is not possible to go.
Hold timer	It is the time interval before the status **People in the room and no movement** changes to **Empty room**. If movement is detected during this interval, the status changes to: **People in the room and movement**.

Procedures

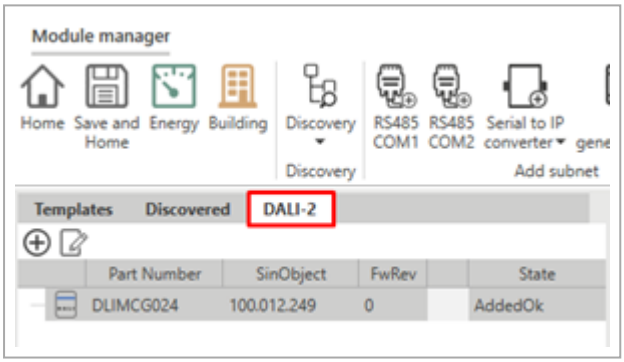
Add the DALI-2 Gateway by using automatic discovery

Note: an important prerequisite for managing the automatic discovery is that the UWP's serial port COM1 is not already in use. The project loaded in UWP must not have Modbus server and/or client functions active.

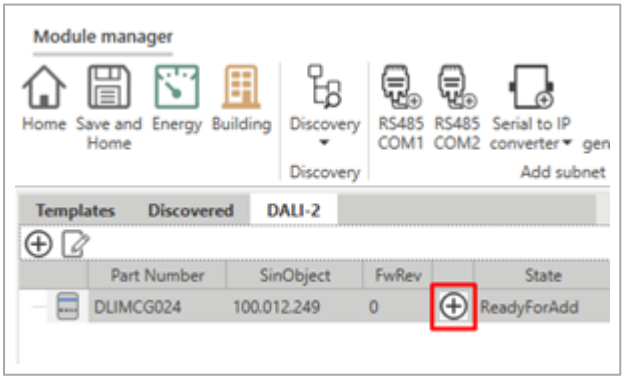
1. From the **Module manager** window, select ***Discovery > DALI-2 gateway discovery*** (see the picture below).



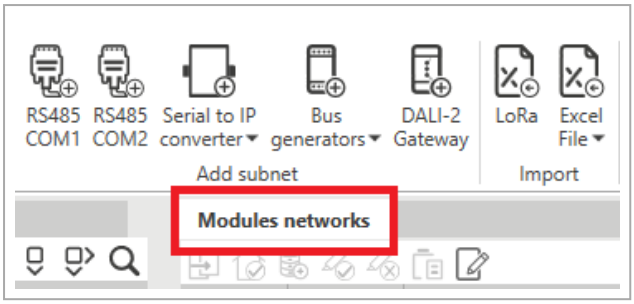
Note: the DALI-2 devices connected to the COM1 will be available in the left tab (see the picture below).



2. Click ⊕ to add the DALI-2 module to the project (see the picture below).

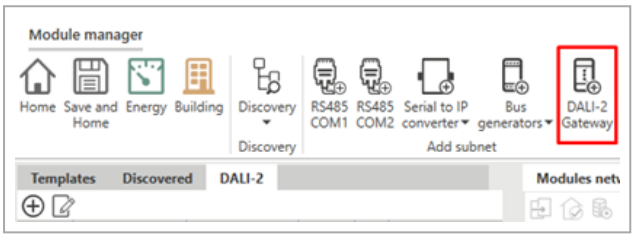


It will appear in the **Modules networks** tab in the middle (see the picture below).

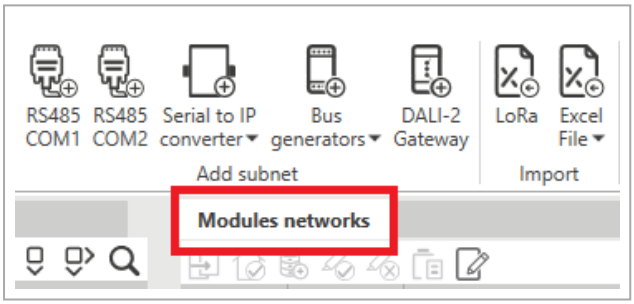


How to add manually a DALI-2 gateway

1. From the **Module manager** window, select **DALI-2 gateway** (see the picture below).



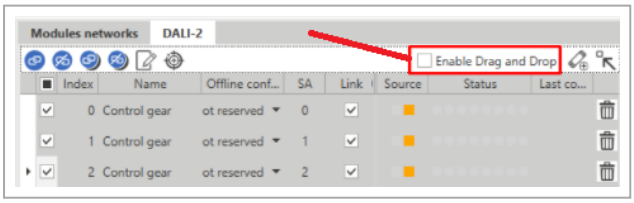
The DALI-2 device will be added to the **Modules networks** tab in the middle (see the picture below).



2. Click the device added to the **Module networks** tab.
3. In the ***Object*** tab > ***SIN address*** field, enter the SIN code.

How to apply same settings to multiple control gear/device signals

*Note: an important prerequisite for managing the multi-editing is to keep the **Drag-and-drop** option disabled (see the picture below).*



1. From the **Module networks** tab, click on the DALI-2 gateway module.
2. After you have selected the DALI-2 gateway, click the **DALI-2** tab to access the signal list.
3. If you want to apply the same changes to more control gears/devices, check the first column to mark the signal(s) to be edited (see the picture below).

   Making changes to the signals: the software will notify the pending change by placing warning icons  *next to the modified fields.*
4. Write the notifications in the devices from ***Control gear commands*** > ***Write control gear settings*** (only for the selected rows).

5. Save and exit.

   Note: if you change the signals name only, you can skip the step 5.

Offline project, add a control gear and match it with automatic discovery

1. Click  (**Add control gear(s)**) and set the number of devices to be added to the DALI-2 gateway.

   Note: the number of devices must match the number of devices that will be physically connected to the gateway.
2. Click **Add selected control gear(s)** to add the devices to the DALI-2 gateway.
3. After you have added the devices to the list, from the **Offline configuration** column select **Reserved** and the type of device to be installed.

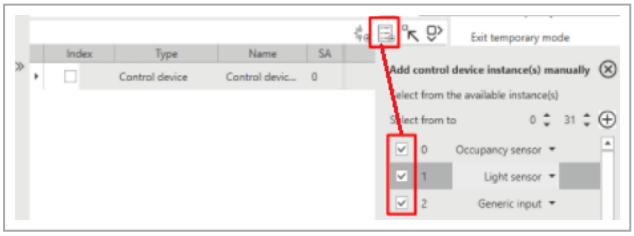
   *For example: if you install control gears - type 8, you must select **Reserved (type 8)**.*
4. Click **Save and home**.
5. Compile and save the project.

   After compiling, the signals created in steps 2 and 3 will be available for the project functions.
6. Create the **Light** functions and save the offline project (after compiling).
7. After you have connected the control gears to the DALI-2 gateway, load the project saved in step 7 and go back to the DALI-2 gateway signals.
8. From **Control gears and device commands**, select **Initialise all devices** and wait for the field devices table to be filled in with the values read from the field.
9. Select **Link all projects signals to field devices** to connect the signals used by the functions to the physical field devices.
10. Click **Save and home**.
11. Compile and write the project in the UWP.

Offline project, add a control device and match it with automatic discovery

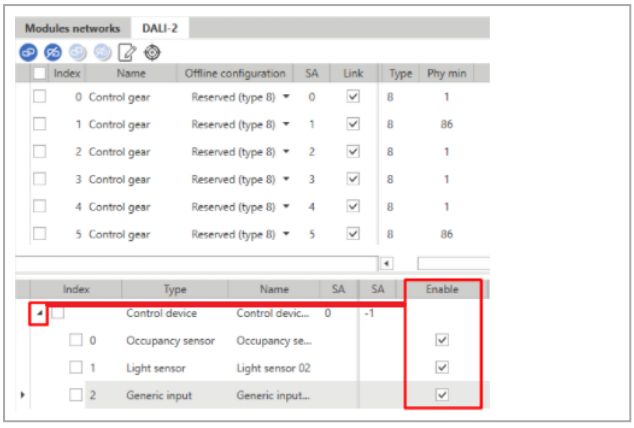
1. Click  (**Add control device(s)**) and set the number of devices to be added to the DALI-2 gateway.

   Note: the number of devices must match the number of devices that will be physically connected to the gateway.
2. Click **Add selected control device(s)** to add the devices to the DALI-2 gateway.
3. Select the control device and click  (**Add control device(s)**) to select the number/type of instance that the control device will manage (see the picture below).

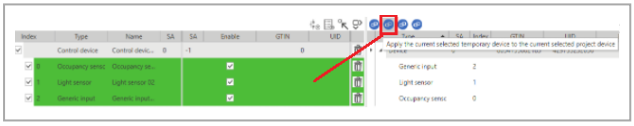


4. Select the control device to open the relevant added instances and check the **Enable** box (see the picture below).

   Note: this field is important to ensure that the system considers the instance.



5. Click **Save and home**.
6. After compiling the project, the signals created in steps 2, 3 and 4 will be available for the project functions.
7. Create the **Light** functions and save the offline project (after compiling).
8. After you have connected the control gears to the DALI-2 gateway, load the project saved in step 7 and go back to the DALI-2 gateway signals.
9. From **Control gears and device commands**, select **Initialise all devices** and wait for the field devices table to be filled in with the values read from the field (see the picture below).
10. Select the device added in step 4 and click **Apply the current selected temporary device to the current selected project device** (see the picture below).



11. Click **Save and home**.
12. Compile and write the project in the UWP.

How to replace a DALI-2 master

This procedure describes how to replace a faulty DALI-2 master on a configured DALI network.

1. Replace the faulty DALI-2 master with the new one by taking note of the new installed device SIN.
2. Discover all the DALI-2 modules and search for the new connected DALI-2 master SIN.
3. Access the **Module manager**, select the faulty DALI-2 master and replace the SIN with the new one's.
4. Click the **DALI-2** tab and read the information from the DALI network (***Command*** > ***Read all devices***).
5. Save and exit the **Module manager**.
6. Compile the project.
7. Download it.

How to replace a control gear

1. From the DALI-2 window, select the control gear to be deleted and click **Delete control gear SA** from the **Control gear** tab.

   Note: the control gear to be replaced will be deleted from the table.

2. Replace the field device.
3. From the **Control gear and device commands** tab, click **Initialize new devices**and wait for the devices to be updated.

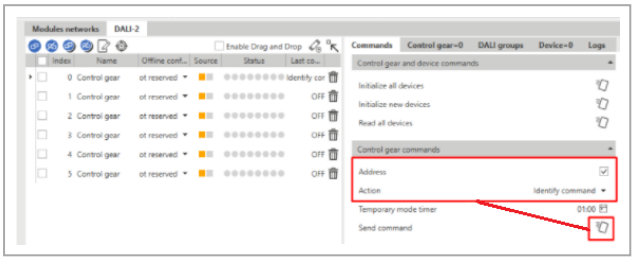
   Notes:

   - *the new device will be added to the list with the first available SA that should match the previous one.*
   - *if you skip the step 1, a new SA will be assigned in the step 3.*

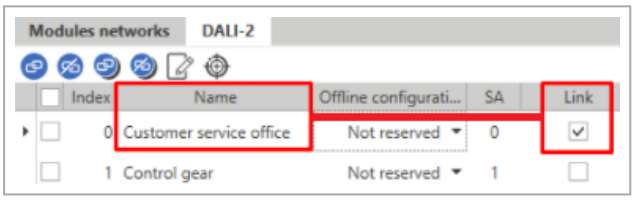
- *the previous device row will be in error because of missing responses so you will have to delete it (**Delete SA**).*
- *if the network has already 64 devices, you must first delete the existing device row.*

How to identify a control gear (new project)

1. From ***DALI-2*** > ***Control gear and device commands***, click **Initialize all devices** and wait for the devices to appear.
2. Switch off all ballasts using the OFF command in broadcast.
3. Click the first row from the control gears table and select **Identify** to make the field light flash.



4. After identifying the light, check the **Link** column to assign the field signal to the project signals and to modify the project name.



5. Repeat steps 3 and 4 for all lamps.
6. Save and home.
7. Compile the project.

How to add new control gears to an existing project

From ***DALI-2*** > ***Control gear and device commands***, click **Initialize new devices** and wait for the new devices to appear.

Note: the system will assign the new SA starting from the first available.

How to resolve conflicts by changing manually the SA

A conflict occurs among devices if they have the same SA and if you connect to the DALI network devices that had already been initialised or if you change a device SA manually.

You can remove or change a short address* using the devices **Random address** command.

**Note: the gateway only knows the SA of devices present in the table before the conflict.*

To solve this issue, you have to:

1. Delete the device SA (**Delete control gear** command).

   Note: only the SA of the control gear in the table will be removed, not the SA of the control gear added later.

2. Read the devices (**Read all devices** command).

   Note: after the reading, only the added device will appear in the table.

3. Initialise the devices without SA (**Initialize new devices** command).

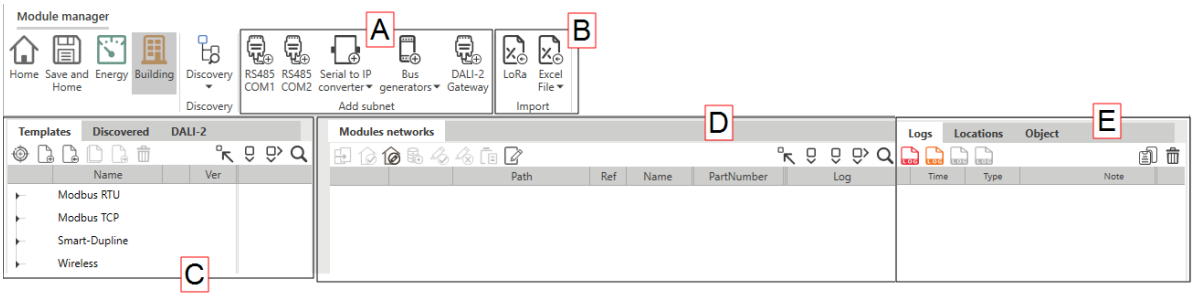
   Note: a new valid SA will be assigned to the device whose SA has been removed (see step 1).

Module manager

Content

This chapter includes the following sections:

Module manager menus



Element	Description
Discovery	You can select the type of discovery: • HS bus full discovery • HS bus quick discovery • DALI-2 gateway discovery
A	Adds subnets
B	Import options. *See Import module list from Template file*

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>C</td><td>From this area you can manage the modules discovered, the drivers and the DALI-2 modules. Three tabs compose it:
<table>
<tr><th>Tab</th><th>Description</th></tr>
<tr><td>Templates</td><td>• Module filter, opens the Filter options table.
•  New driver
•  Import driver
•  Copy driver
•  Export driver
• Modules. From each product category you can select () one or more (you can set the quantity) devices to be added to your configuration. You can also see the activation status:
  Activated and in use
  Activated but not in use</td></tr>
<tr><td>Discovered</td><td>Shows the modules discovered</td></tr>
<tr><td>DALI-2</td><td>Shows the DALI-2 modules discovered</td></tr>
</table></td></tr>
<tr><td>D</td><td>Shows the modules and the drivers (if available). Three tabs compose this area, depending on the modules you select:
<table>
<tr><th>Tab</th><th>Description</th></tr>
<tr><td>Modules network</td><td>  Clone
  Apply selected location
  Apply highlighted location
  Set log configuration
  Mark/Remove mark for copying rows
  Paste properties
  Modbus settings</td></tr>
<tr><td>Driver</td><td rowspan="2">See Driver management</td></tr>
<tr><td>Driver test</td></tr>
</table></td></tr>
</table>

Element	Description
E	This area shows info about the **Locations** where the modules are added and the properties of the object you select.

Driver management

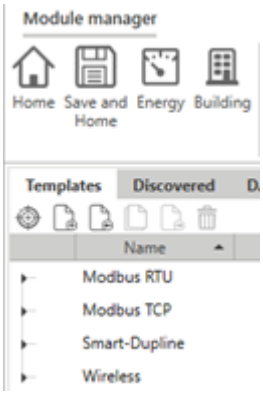
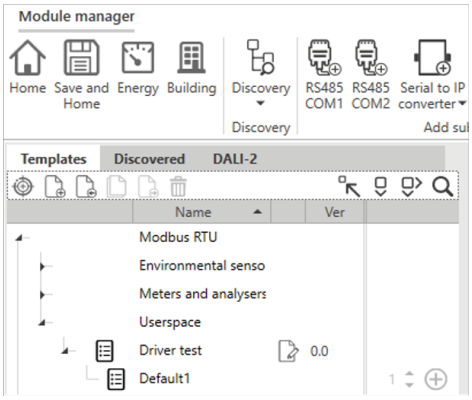
In the **Module manager** window, you can manage the Modbus TCP and RTU devices and the relevant drivers.

Thanks to the driver management functions, you can:

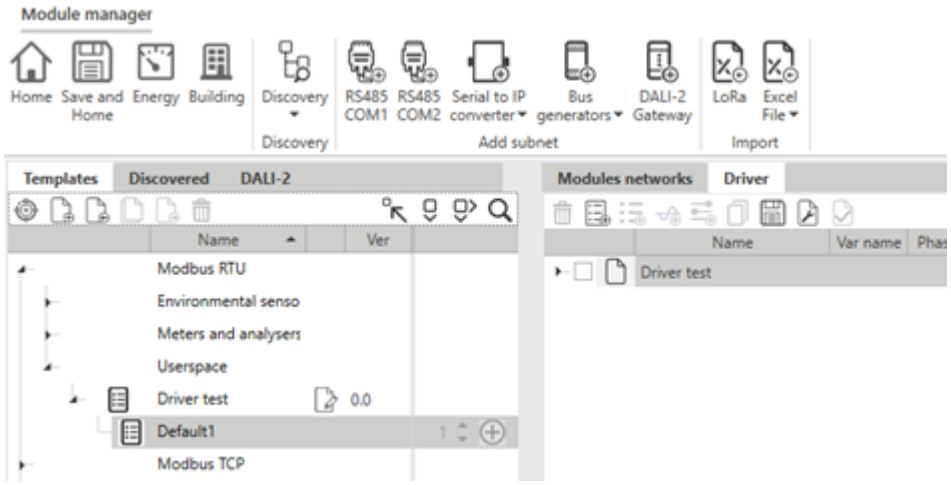
- Develop Modbus drivers to communicate with Modbus devices (Energy meters, energy analysers, etc..) in reading and writing modes
- Connect Modbus devices (meters, analysers, environmental sensors, etcetera.) either via RS485 or Ethernet
- Gather data from devices according to their Modbus protocol.

User interface

You can manage your drivers from the following IDE areas:

Tab	Description	
Templates	 *1. Templates tab*  *2. User space for RTU connection*	This tab shows the list of the available **Modbus drivers** for Modbus RTU and Modbus TCP devices. The official drivers are shown for the available Carlo Gavazzi meters, analysers and environmental sensors. You can find custom drivers in the **User space** folder for both RTU and TCP connections.

Tab	Description
Driver (in the central area)	*It appears only if you select or scan a Modbus TCP and/or a RTU device or if you create or import a driver.*

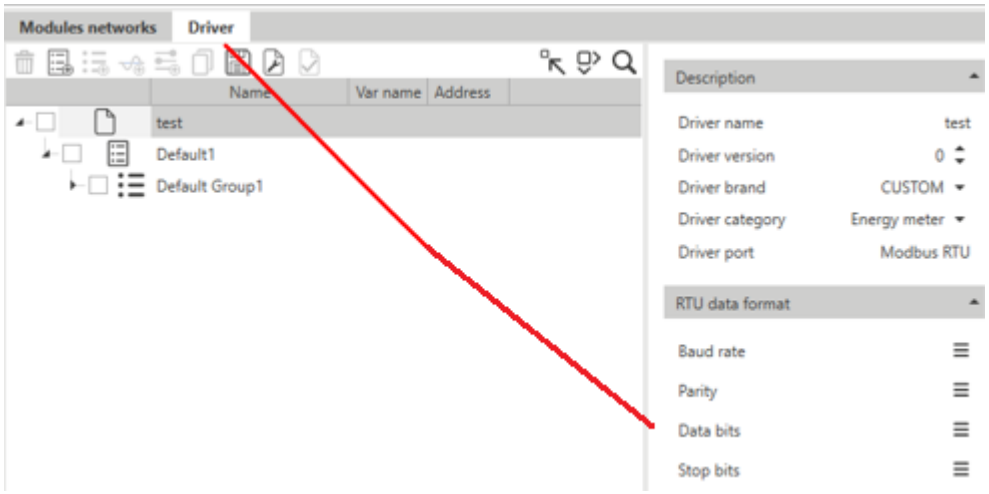


3. Driver tab

It shows:

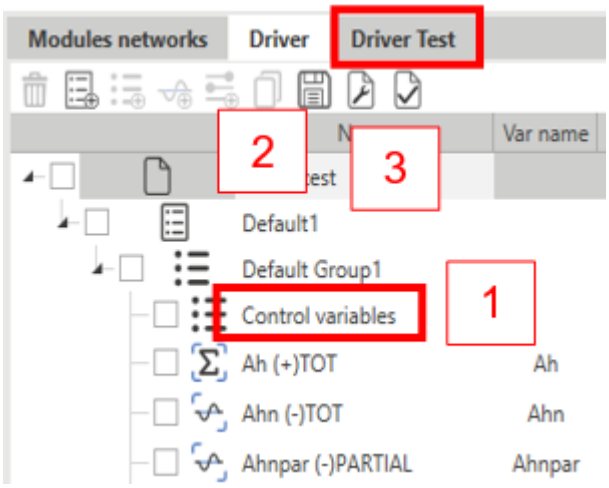
a. the inner hierarchy of a device Modbus driver and the relevant parameters (see **Driver tab**).

b. a panel on the right containing the parameters according to the driver level you select (see the picture below).

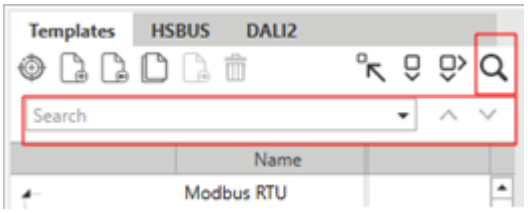


Notes:

- *the access to the different tabs depends on the **Modbus driver** status.*
- *if the driver is an original one, you can only see it in **Reading mode**.*

Tab	Description
Driver test (in the central area)	*It only appears if a driver has been configured, saved and built.* Shows the options to execute the **Driver test**, that is:  *Driver test options* 1. set the **Control variables** according to the needs 2. save 3. build *Note: the Driver test label will be available.*

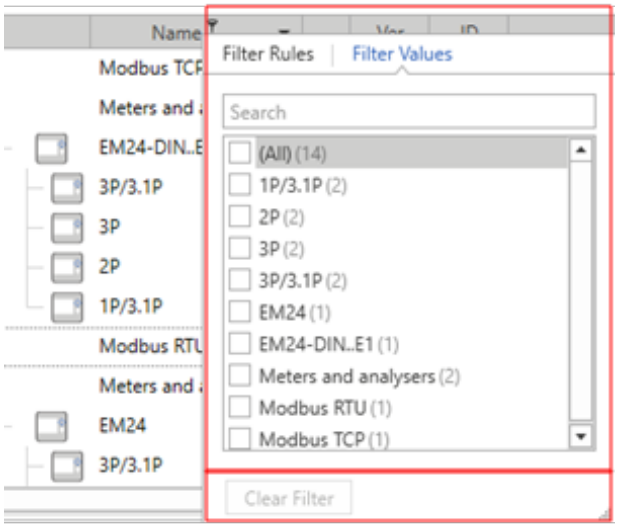
In the areas described above, you can also sort or filter the available **Modbus drivers** (see the picture below).



4. Search bar

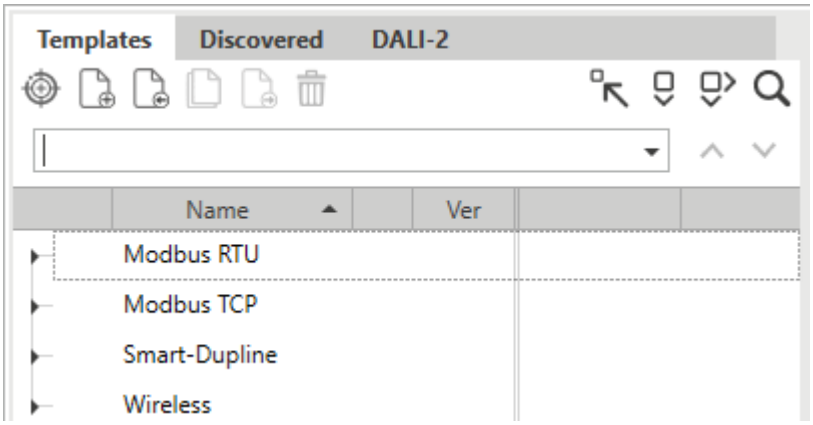
You can then sort the results in ascending or descending (^ / v) order clicking the column titles.

You can also access the advanced filter options (▼), available in each column title, or **Clear** them (see the picture below).



Templates tab

Note: the list may vary according to the UWP IDE release.



*5. **Templates** tab commands (see the table below)*

Option (Action)	Description	Notes
	Creates a driver that will be added to the **User space** folder.	*Always available, independently from where the user right-clicks.*
	Imports a driver (XML format) generated by the UWP 3.0 Tool, UWP IDE, the UCS or DUG software.	
	Creates a copy of an existing driver. *Note: you can copy a Carlo Gavazzi driver and edit it.*	*Available only if a driver in the **user space** folder is selected.*
	Exports a driver in XML format. Once exported, you can import the file into another UWP 3.0 Tool, UWP IDE or into the UCS software.	
	Deletes a driver from the list.	*You cannot delete the Carlo Gavazzi locked drivers.*

The following fields compose each **Modbus driver**:

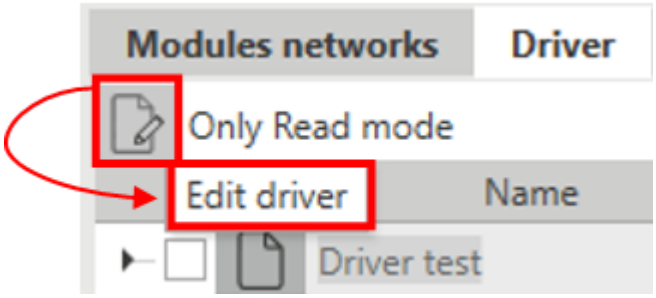
Field name	Description
Name	The device name (i.e., the part number) to which the Driver is associated. You can add (⊕) options to view the available devices to the configuration.
Status icon	The **Driver** status:

Icon	Status	Description
	Editing	The driver is being edited, but it has not been successfully compiled.
	Build OK, to be activated	The driver has been successfully compiled and is available to be tested. It is not available for connecting Modbus devices to the UWP 4.0 controller.
	Activated but not in use	The driver has been successfully compiled and activated. It is available for connecting Modbus devices to the UWP 4.0 controller.
	Activated and in use	The driver has been successfully compiled and activated. It is available for connecting Modbus devices to the UWP 4.0 controller.

Ver	Shows the **Driver** version of the relevant part number

Driver tab: edit function

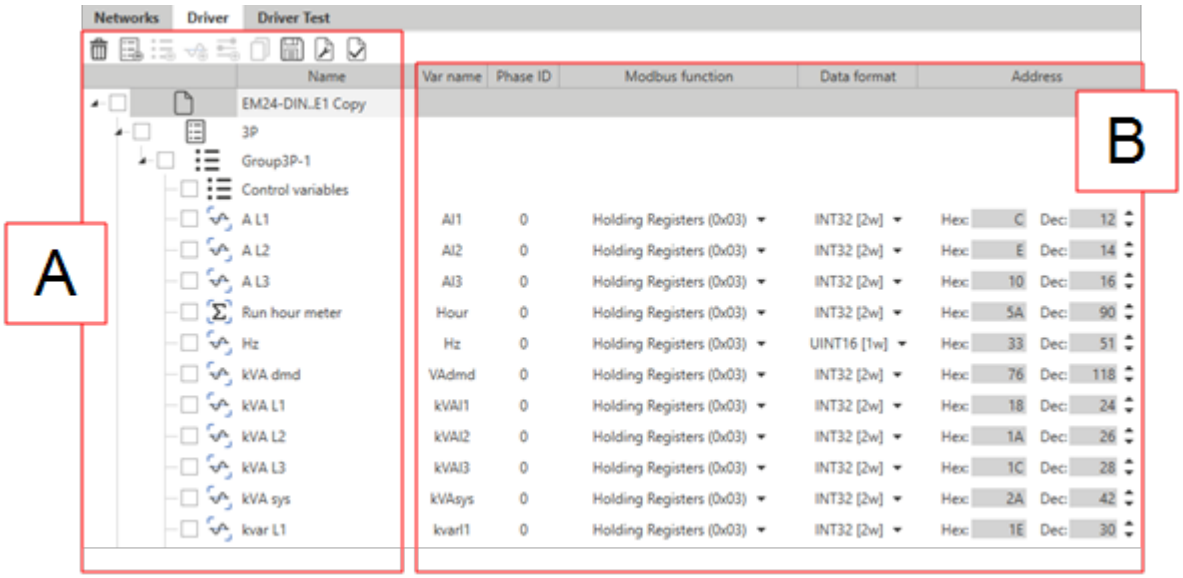
From the **Driver** tab, you can open the edit options to create and modify one of the available **Modbus drivers** (see the picture below).



6. Edit function

*Note: you can perform these actions only for drivers that belong to the **User space** folder (see User interface).*

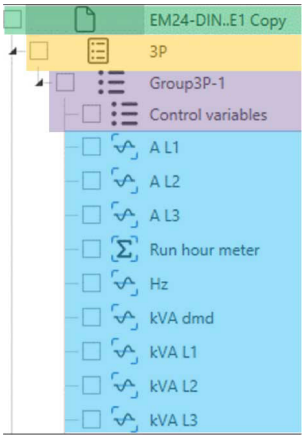
As soon as you click  , the following toolbar and details appear (see the table for the description):


Networks
Driver
Driver Test
Name
EM24-DIN..E1 Copy
3P
Group3P-1
Control variables
A L1
A L2
A L3
Run hour meter
Hz
kVA dmd
kVA L1
kVA L2
kVA L3
kVA sys
kvar L1
Var name
Phase ID
Modbus function
Data format
Address
AI1 0 Holding Registers (0x03) INT32 [2w] Hex: C Dec: 12
AI2 0 Holding Registers (0x03) INT32 [2w] Hex: E Dec: 14
AI3 0 Holding Registers (0x03) INT32 [2w] Hex: 10 Dec: 16
Hour 0 Holding Registers (0x03) INT32 [2w] Hex: 5A Dec: 90
Hz 0 Holding Registers (0x03) UINT16 [1w] Hex: 33 Dec: 51
VAdmd 0 Holding Registers (0x03) INT32 [2w] Hex: 76 Dec: 118
kVAl1 0 Holding Registers (0x03) INT32 [2w] Hex: 18 Dec: 24
kVAl2 0 Holding Registers (0x03) INT32 [2w] Hex: 1A Dec: 26
kVAl3 0 Holding Registers (0x03) INT32 [2w] Hex: 1C Dec: 28
kVAsys 0 Holding Registers (0x03) INT32 [2w] Hex: 2A Dec: 42
kvarl1 0 Holding Registers (0x03) INT32 [2w] Hex: 1E Dec: 30
A
B

<table>
<tr><th>Area</th><th>Description</th></tr>
<tr><td>A</td><td>Contains the edit toolbar and the hierarchical driver structure.
The toolbar permits you to do as follows:
<table>
<tr><th>Icon</th><th>Description</th></tr>
<tr><td>  </td><td>Deletes the selected items</td></tr>
<tr><td>  </td><td>Deletes the driver the device is designed for</td></tr>
<tr><td>  </td><td>Creates a new blank group</td></tr>
<tr><td>  </td><td>Creates a new variable to the selected group</td></tr>
<tr><td>  </td><td>Creates a new control variable to the selected group</td></tr>
<tr><td>  </td><td>Copies the selected items</td></tr>
<tr><td>  </td><td>Saves the changes</td></tr>
<tr><td>  </td><td>Builds the driver before using it in the configuration</td></tr>
<tr><td>  </td><td>Activates the driver before using it in the configuration</td></tr>
</table>
The driver levels are the following:
<table>
<tr><th colspan="2">Level</th><th>Description</th></tr>
<tr><td>DRIVER</td><td>A</td><td>Root level where you can define the parameters of the field bus connection.</td></tr>
<tr><td>DEVICE</td><td>B</td><td>Any pattern considered as a group of variables that identifies a specific operation mode of the target Modbus device.</td></tr>
<tr><td>GROUP</td><td>C</td><td>Any group of variables connected through a logical link.
Note: in the case of multi-meters, any single meter is considered as a group.</td></tr>
<tr><td>VARIABLE</td><td>D</td><td>Any single variable in a group.
Here you can define the Modbus register settings, scales, ranges and validation rules.</td></tr>
</table></td></tr>
<tr><td>B</td><td>Shows the parameters according to your selection.</td></tr>
</table>

Example of a Modbus driver hierarchy

The example below shows the hierarchy of a Modbus driver and the parent-child relationship:



Each level has a specific set of parameters that you have to provide according to the Modbus register map. According to the selected level, the available options change. Please consider the following table:

Option	Description	Availability for level
Build	Always available	A /B / C /D
Test	Tests a driver but only after a valid compilation. Go to the *Test driver* tab	A /B / C /D
Add device	Adds a configuration for the Modbus device	A
Add group	Adds a group for the selected device, that represents a Load of the Modbus device (e.g., Energy Meter)	B
Add variable	Adds a variable for the selected Group	C
Delete selection	Deletes the selected level. *Note: this operation affects also the sub-levels in the main level.*	B / C / D
Copy device	Copies the selected level and the entire hierarchy	B
Copy group	Copies the selected level and the entire hierarchy	C
Save	Saves all the changes and parameters. *Note: the rollover command is no longer available so you can close the window without saving the pending changes.*	A / B / C / D

Driver tab: communication parameters

From the **Driver** tab, if you select the very first driver level, the following parameters panel appears on the right:

7. Communication parameters

N.B.: not all the parameters are needed. Please refer to the Modbus register map of the device.

The following table describes the communication parameters above:

Parameter	Description	TCP /RTU
Driver name	Identifies the device in the list.	Both
Driver version	Automatically updated whenever a change is applied or you can change it manually.	
Driver brand	Identifies the device manufacturer in the list.	
Driver category	Identifies the type of driver. *Note: if you click the **Device** type, you group the drivers by type.*	
Driver port	The communication port (RTU for Modbus RTU communication via RS485 port or TCP for Modbus TCP/IP communication via Ethernet port). *Note: you cannot change it since it depends on what you select at the driver creation. So, if the selection is wrong, the only way to change it is to create the driver from the beginning.*	
RTU data format		

<table>
<tr><th>Parameter</th><th>Description</th><th>TCP /RTU</th></tr>
<tr><td>Baud rate</td><td>Range of allowed baud rate values
<table>
<tr><th>Type</th><th>Default</th><th colspan="2">Values</th></tr>
<tr><td rowspan="13">int16</td><td rowspan="13">7 [9600bps]</td><td>0</td><td>110</td></tr>
<tr><td>1</td><td>150</td></tr>
<tr><td>2</td><td>300</td></tr>
<tr><td>3</td><td>600</td></tr>
<tr><td>4</td><td>1200</td></tr>
<tr><td>5</td><td>2400</td></tr>
<tr><td>6</td><td>4800</td></tr>
<tr><td>7</td><td>9600</td></tr>
<tr><td>8</td><td>19200</td></tr>
<tr><td>9</td><td>38400</td></tr>
<tr><td>10</td><td>57600</td></tr>
<tr><td>11</td><td>115200</td></tr>
<tr><td>12</td><td>256000</td></tr>
</table></td><td></td></tr>
<tr><td>Parity</td><td>Range of allowed parity</td><td>RTU</td></tr>
<tr><td>Data bits</td><td>Range of allowed data bits</td><td>RTU</td></tr>
<tr><td>Stop bits</td><td>Range of allowed stop bits</td><td>RTU</td></tr>
<tr><td>Default port configuration</td><td>For each port, you can select the default communication value that will be shown during the device configuration.</td><td>RTU</td></tr>
<tr><th colspan="3">Slave min./max. limits</th></tr>
<tr><td>Slave min. address</td><td>Minimum value available for Modbus addresses.
Note: some Modbus devices accept a restricted set of addresses.</td><td>Both</td></tr>
<tr><td>Slave max. address</td><td>Maximum value available for Modbus addresses.
Note: some Modbus devices accept a restricted set of addresses.</td><td></td></tr>
<tr><th colspan="3">Timings</th></tr>
<tr><td>Interframe Rate (ms)</td><td>Time interval between two Modbus frame readings.
Note: 10 ms is the default value that corresponds to standard 3.5 chars.</td><td>Both</td></tr>
<tr><td>Frame response timeout</td><td>The maximum time interval during which a response to a command (set in the target Modbus slave) is expected.
Note: 500 ms is the default value.</td><td>Both</td></tr>
</table>

Parameter	Description	TCP /RTU
Delay before frame retry	The software provides an explanatory diagram illustrating the meaning of the parameter	Both
Delay on slave change (ms)		Both
TCP timeout		TCP
TCP reconnection		TCP
Frame rules		
Frame max. dimension (word)	The number of words identifying the frame size. *Note: according to this value, the tool splits the map into frames.*	Both
Enable multi-group frame	Disabled by default. You can group according to the other parameters.	Both
Number of retries	If the master interrogates the device but an error occurs, you can set the maximum number of attempts.	
Address mapping mode	Defines the variable register size: 1 Byte or 1 Word (default value)	Both

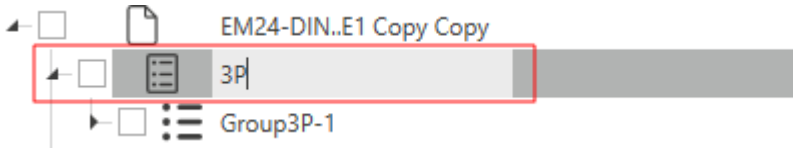
Driver tab: device level

Devices are different working modes in the same Modbus device.

Note: some meters may have different working modes, which allow them to work in 3-phase or 1-phase systems. For this reason, a Modbus driver of a Modbus device may contain different devices/applications.

You can add, edit and delete a configuration by using the available commands in the **Edit** mode.

Whenever you select a device level, you can only change the device name (see the picture below).



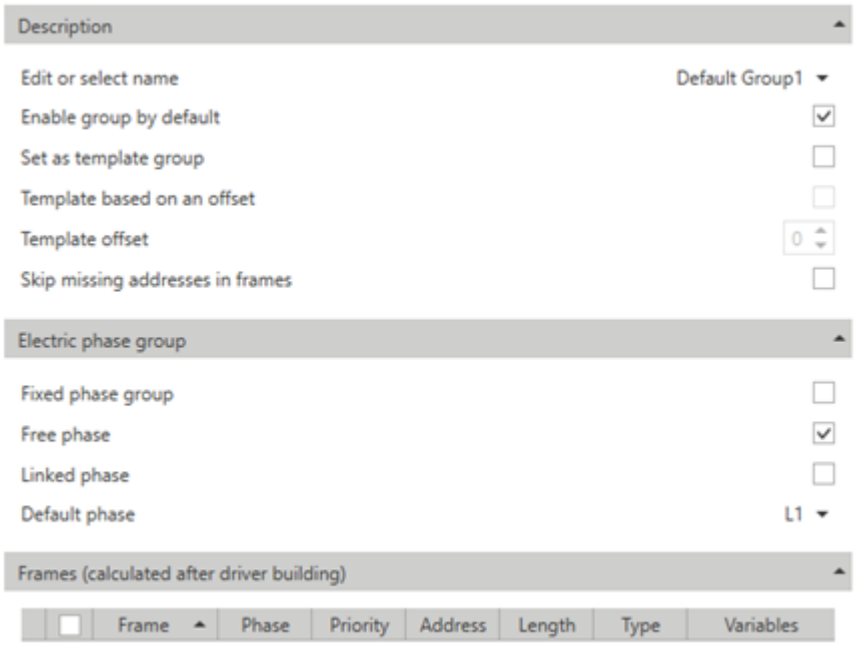
8. Device name

Driver tab: group level

When you create a driver, it will be empty and will contain only a variable control group that you cannot delete because otherwise you cannot re-add it but you can check if you can add / remove the control variable group.

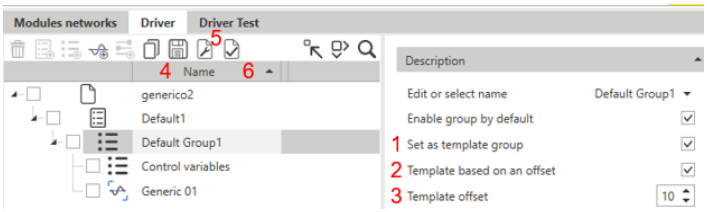
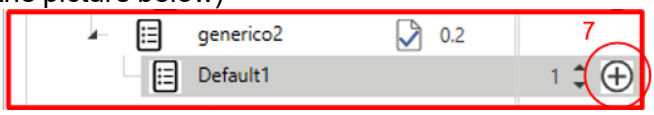
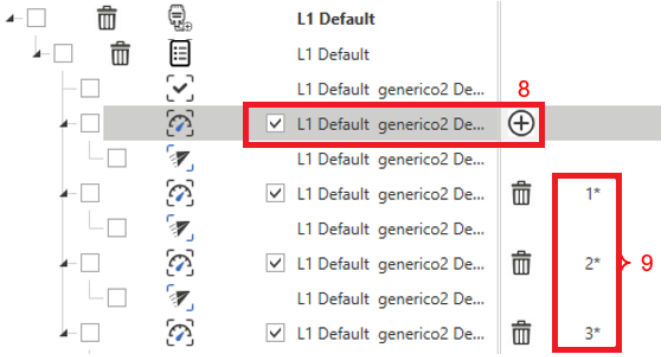
Groups are set of variables belonging to the same configuration. Some devices may have different groups in the same device/application, usually corresponding to a sub-meter. In this section, you can add, edit, save and delete a **Group**.

To add a group, click . Once you have added one, you can edit the right panel parameters (see the picture and table below):

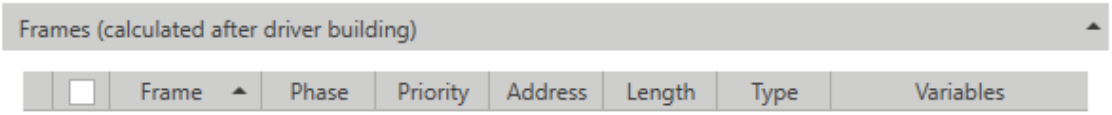


9. Right panel parameters

Parameter	Description
Edit or select name	Identifies the group in the relevant configuration.
Enable group by default	Shows if the group has been enabled after adding the device.
Set as template group	Sets a template for the slave addresses or for addressing individual signals.
Template based on an offset	Sets a template for signal addresses that considers an offset specified in the following label.

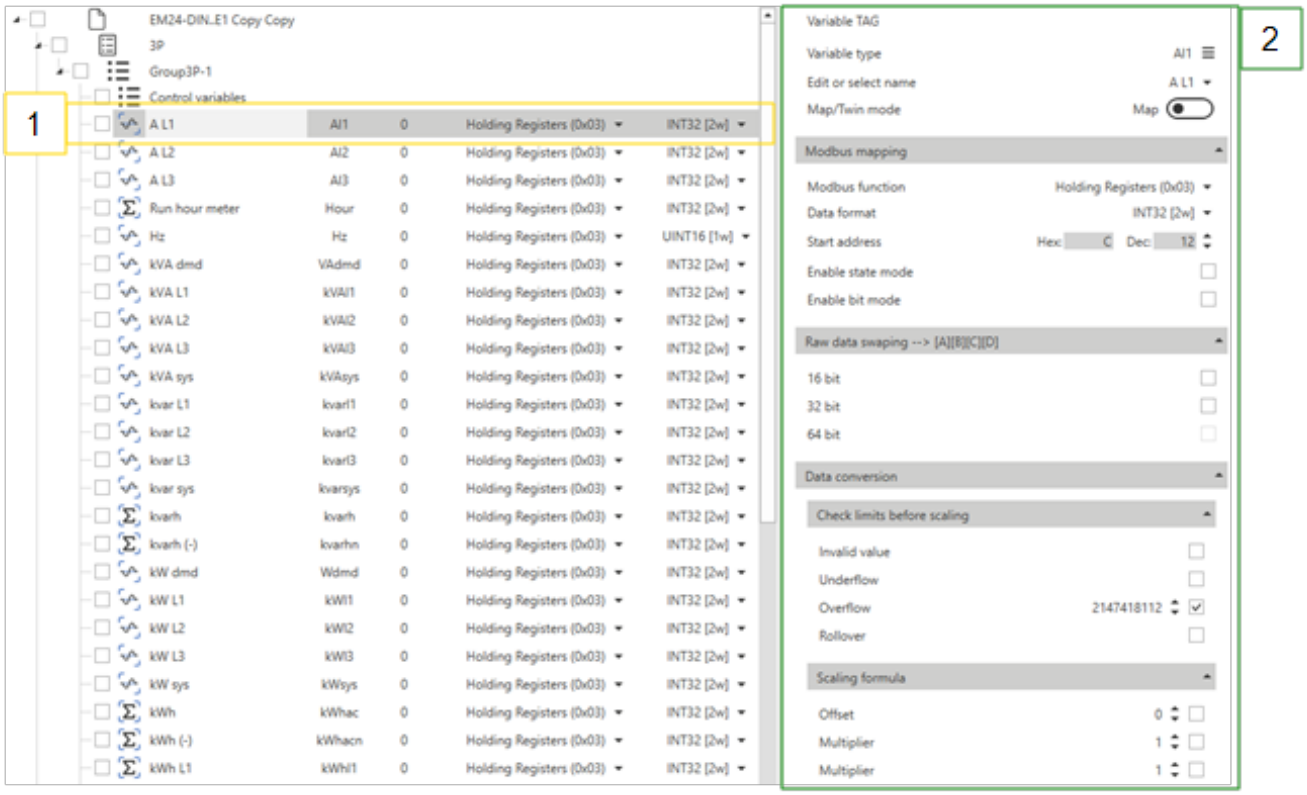
Parameter	Description
Template offset	*It is available only if the **Set as a template group** parameter is enabled.* You can set the offset (see the picture and the procedure below):  1. Enable the group as a template 2. Select this check box to be able to set the offset 3. Set the offset 4. Save the driver 5. Build the driver 6. Activate the driver 7. Select and add the driver to the configuration (see the picture below)  8. Clicking on this icon, you can create another group based on the first you set as a template. 9. Here you can calculate the offset set in this group. *Note: the number indicated in this column is multiplied for the offset we decided at the point 3.* *Considering the picture below:* *the first group offset will be* *1 * 10 = 10* *the second group offset will be* *2 * 10 = 20* *the third group offset will be* *3 * 10 = 30* *Therefore, if in the original group taken as template a variable had address 100, in the created offset groups, it will have address 110, 120, 130 respectively.* 
Skip missing addresses in frames	It does not include not declared registers during the frame creation.

Parameter	Description
Electric Phase Group	
Fixed phase group	For standard 1-phase energy meters or power analysers that have to be linked to a specific phase during the set-up process; the phase is defined at the configuration level.
Free phase	For standard 1-phase energy meters or power analysers that must be linked to a specific phase during the set-up process; the phase is defined at the group level.
Linked phase	For standard 1-phase energy meters or power analysers linked to a specific phase (L1, L2 or L3).
Frames (calculated after driver building)	



Driver tab: variable level

In this section, you can add/edit/save/delete a variable (always contained in a group). A predefined set of variables is automatically created according to the **Group Type** (see picture below).



If you select a variable (1), the following parameters open (2):

Parameter	Description
Variable TAG	Information about the selected variable. It allows to select the desired variable TAG (if not defined as default)
Variable type	Defines the **Data Type** of the target variable, as shown in the Modbus map
Edit or select name	Shows the variable name. You can fill it in manually only for a **Generic** variable. Otherwise, the value is automatically set according to the **Group** (Load).
Map/twin mode	You can associate a signal to another signal. This will be considered a copy of the reference signal. When the reference signal changes, the linked signal will automatically change too. The label can be changed individually.
Modbus function	The data types for Modbus are divided into variables that monitor, control, and carry out other functions. *Note: see the Modbus protocol documentation of the Modbus device that matches each logical code.*

Function code	Description
Read coil Status (0x01)	The UWP 4.0 reads the Coils using Modbus function 01
Read/Write coil Status (0x01)	The UWP 4.0 reads/writes the Coils using Modbus function 01
Read Input Status (0x02)	The UWP 4.0 reads the Register using Modbus function 02
Holding Register (0x03)	The UWP 4.0 reads the Register using Modbus function 03
Read/Write Holding Register (0x03)	The UWP 4.0 reads/writes the Register using Modbus function 03
Input register (0x04)	The UWP 4.0 reads the Register using Modbus function 04
Read SD2DUG24 (0x64)	The UWP 4.0 reads the SD2DUG24 addresses using FC 64
Write/Read SD2DUG24 (0x64)	The UWP 4.0 reads/writes the SD2DUG24 addresses using FC 64

Data Format	Check the **Bit description** in the **Raw Data Swapping** sections below.
Starting Address	It defines the **Initial hex address** of the target variable, as shown in the Modbus map.
Enable State Mode	Flag it to enable the **State mode** and manage all signals that can be used as Multi-state signals, assigning a label to every value the signal can assume.
Enable Bit Mode	Flag it to enable the **Bit mode** and manage all signals where a single bit can assume a specific meaning, assigning a label to every needed bit.

Raw Data Swapping - - > [A][B]

Swap conversion: an operation that converts the Modbus address. Depending on the selected data type, it allows to properly order all the data bytes of the frame and read the data.

Request Frame	[01h][03h][00h][00h][00h][02h][C4h][0Bh]
Reply Frame	[01h][03h][04h][08h][FCh][12h][00h][38h][63h]
Data Bytes	[08h][FCh][12h][00h] ↓ [A] [B] [C] [D]

Bit	Description
16	SWAP16 can be used to swap the nibbles of a byte: [B][A] [D][C] > [FCh] [08h] [00h] [12h]
32	SWAP32 can be used to swap bytes of a Word: [C][D] [A][B] > [12h] [00h] [08h] [FCh]
64	In the case of registers that are 4-word long, also the SWAP 64 can be used: [A][B] [C][D] [E][F] [G][H] [G][H] [E][F] [C][D] [A][B]

Data conversion

From the **Data conversion** menu you can set the parameters to apply mathematical operations to the target variable.

Three sub-menus compose it:

1. **Check limits before scaling**. In this menu, you can enter the value to reject invalid read values. This operation can be done before and/or after having read the registers that contain the raw values.

Invalid value	Special decimal value indicating invalid reading
Underflow	Special decimal value indicating Underflow
Overflow	Special decimal value indicating Overflow
Rollover	Decimal value indicating Rollover value

2. **Scaling formula***. Here you can enter the value to reject invalid read values. This operation can be done before and/or after reading the registers that contain the raw values. Enter a divisor or factor to adjust the applied value to the current value (e.g., correct positioning of the decimal point).

```
*[(Value + Offset1) x (M1 x M2) / D1 x D2) x 10^Exp] + Offset2
```

Offset(1)	Scaling formula: it allows to define whatever combination of registers to calculate a variable based on different registers (e.g., reading + scaling).
Multiplier	
Multiplier	
Divisor	
Divisor	
Exponent	
Offset(2)	

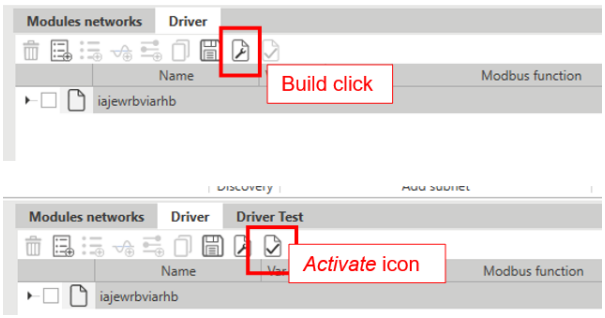
3. **Check min/max limits**. If the read value exceeds these limits, that value will be not considered.

   In the **Rules** sub-menu, the user can enter the value aimed at rejecting invalid read values. This operation can be done before and/or after reading the registers that contains the raw values.

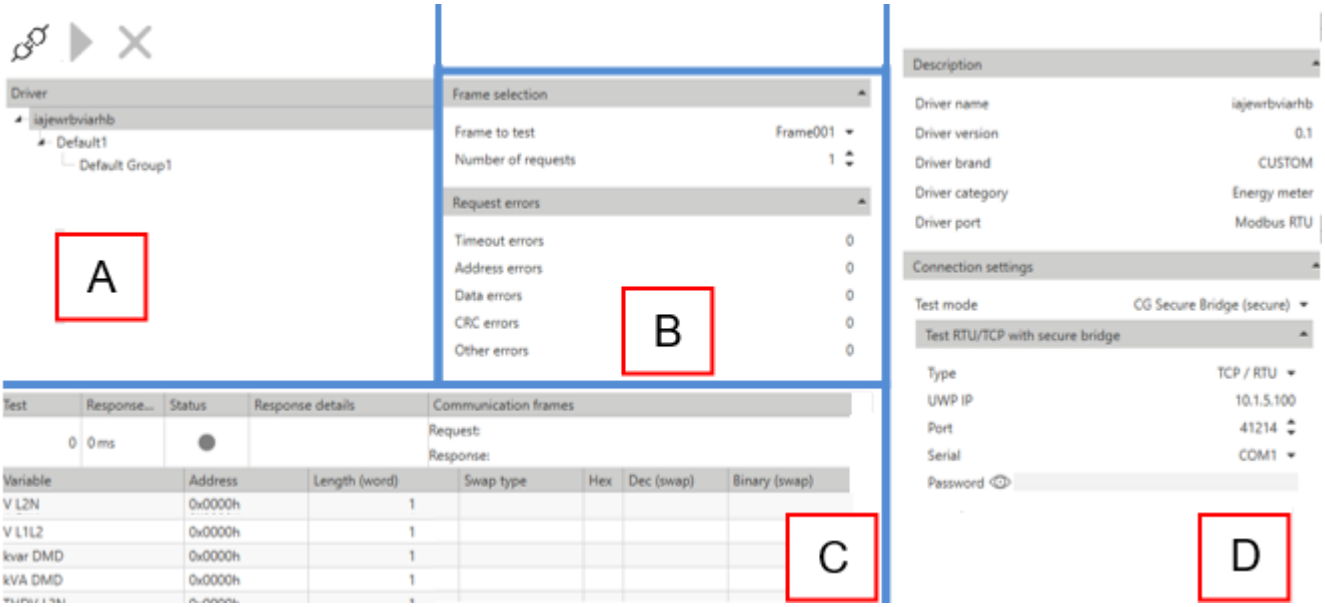
If VALUE is	Operator used to evaluate the condition
To/Than	Value to be checked
If VALUE is	Operator to evaluate the condition
To/Than	Value to be checked
Then convert to	Result of the evaluation

Driver Test tab

This tab appears when the driver is built (see the picture below).



Once you have built the driver, the tab shows what follows:



Area	Description
A	Connection icon. This connection works only if a password is set (check ***Connection Settings > Test RTU/TCP with secure bridge >*** Password ****).
	Play the test.
	Quit the test.
	Then the driver hierarchy tree appears.

Area	Description	
B	**Frame selection**	
	Frame to test	Number of frames requested
	Number of requests	Number of requests
	Request errors	
	Timeout errors	Number of Timeout errors
	Address errors	Number of Address errors
	Data errors	Number of Data errors
	CRC errors	Number of CRC errors
	Other errors	Number of other errors
C	**Response Panel**	
	Test	In the previous section, you can set the number of tests to perform. In this box, all the tests are listed and numbered.
	Response time	The test response time.
	Status	Icon that confirms if the test was successful or not.
	Response details communication frames	The request the system sent to test the driver
		The response you received back
	Variable Information	All the information related to the variable we are testing

Area	Description	
D	**Description**	
	Driver Name	Identifies the device.
	Driver Version	Automatically updated whenever a change is applied or you can change it manually.
	Driver Brand	Identifies the device manufacturer in the list.
	Driver Category	Identifies at a glance the type of driver.
	Driver Port	The communication port (RTU for Modbus RTU communication via RS485 port or TCP for Modbus TCP/IP communication via Ethernet port).
	Connection Settings	
	Test Mode	• RTU PC COM • TCP IP • UWP Gateway (unsecure) • CG Secure Bridge (unsecure)
	Test RTU/TCP with secure bridge	
	Type	Type of connection TCP/RTU
	UWP IP	IP of the UWP
	Port	Port selected for the connection
	Serial	COM1/COM2
	Password	Web app password – Secure bridge
	Baud Rate	Transmission speed
	Data Bits	Range of allowed data bits
	Parity	Range of allowed parity
	Stop Bit	Range of allowed stop bits
	Communication parameters	
	Modbus Address	Modbus address of the driver you are testing
	Timeout	Maximum response time from a slave
	Interframe rate (ms)	Time between two consecutive frame requests.

Things to know

Modbus Data Types

The identification of the data type is necessary to develop the Modbus driver. Depending on the device documentation, the data type may be determined according to any of the above criteria.

The variables are represented by integers or floating numbers, with 2 complement notations in case of “signed” format. See the following table:

Type Format	Description	Bits	Range
INT16	Integer	16	-32768 .. 32767
UINT16	Unsigned integer	16	0 .. 65535
INT32	Double integer	32	-231 .. 231
UINT32	Unsigned double integer	32	0 .. 232-1
UINT64	Unsigned long integer	64	0 .. 264-1
INT64	Long Integer	64	
FLOAT	IEEE754 SP Single-precision floating-point	32	-(1+[1 –2-23])x2127 .. 2128
Hour		32	
UByteLow	Unsigned Low Byte *Note: it will be used the low Byte of the Word*	8	
UByteHigh	Unsigned High Byte *Note: it will be used the high Byte of the Word*	8	
ByteLow	Unsigned Low Byte *Note: it will be used the low Byte of the Word*	8	
ByteHigh	Unsigned High Byte *Note: it will be used the high Byte of the Word*	8	
DOUBLE	IEEE754 DP Double-precision floating-point	64	2.2e-308 ... 1.79e308

SWAP conversion

The swap is an operation that converts the Modbus address.

Depending on the selected data type, it allows to properly order all the data bytes of the frame to read correctly the data.

Request frame: [01h] [03h] [00h] [00h] [00h] [02h] [C4h] [0Bh]

Reply frame: [01h] [03h] [04h] [08h] [FCh] [12h] [00h] [38h] [63h]

Data bytes: [08h] [FCh] [12h] [00h]

[A] [B] [C] [D]

The following table provides different examples of conversion:

Conversion	Result
SWAP 16	SWAP16 can be used to swap the nibbles of a byte: [B][A] [D][C] > [FCh] [08h] [00h] [12h]

Conversion	Result
SWAP 32	SWAP32 can be used to swap bytes of a Word: [C][D] [A][B] > [12h] [00h] [08h] [FCh]
SWAP 16 + 32	SWAP16+32 can be combined together: [D][C] [B][A] > [00h] [12h] [FCh] [08h]
SWAP 64	In the case of registers that are 4-word long, also the SWAP 64 can be used: [A][B] [C][D] [E][F] [G][H] [G][H] [E][F] [C][D] [A][B]
SWAP 16	SWAP16 can be used to swap the nibbles of a byte: [B][A] [D][C] > [FCh] [08h] [00h] [12h]

Data conversion menu

The Data conversion menu contains the parameters that can be used to apply mathematical operations to the target variable. It contains three sub-menus: **Check limits before scaling**, **Scaling formula**, **Check min/max limits** and **Rules**.

Check limits before scaling

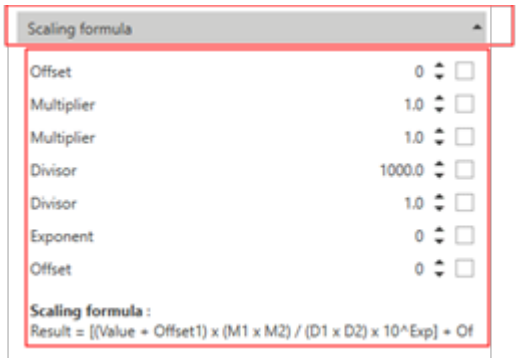
In this menu, you can enter a value that rejects invalid read data.

This operation can be done before and/or after having read the registers that contain the raw values.

The table below describes each field:

	Parameter	Description
Before Scaling	Invalid value	Special decimal value indicating invalid reading
	Underflow	Special decimal value indicating **Underflow**
	Overflow	Special decimal value indicating **Overflow**
	Rollover	Decimal value indicating **Rollover** value
After Scaling	Min	If the read value exceeds these limits, that value will be not considered.
	Max	

Scaling formula



In the **Scaling formula** menu, you can enter the value that rejects invalid read data. This operation can be done before and/or after reading the registers that contain the raw values.

Enter a divisor or factor to adjust the applied value to the current value (e.g., correct positioning of the decimal point).

The following table describes the **Scaling formula**:

Parameter	Description
Offset1 Multiplier Multiplier Divisor Divisor Exponent Offset2	Scaling formula: it allows to define whatever combination of registers to calculate a variable on the basis of different registers (e.g., reading + scaling). *[(Value + Offset1) x (M1 x M2) / D1 x D2) x 10^Exp] + Offset2*

Rules

In the **Rules** sub-menu, the user can enter a value that rejects invalid read data. This operation can be done before and/or after reading the registers that contains the raw values.

The following table describes the **Rules** parameters:

Rules list	List of configured rules
If VALUE is	Operator used to evaluate the condition
To/Than	Value to be checked
If VALUE is	Operator to evaluate the condition
To/Than	Value to be checked
Then convert to	Result of the evaluation

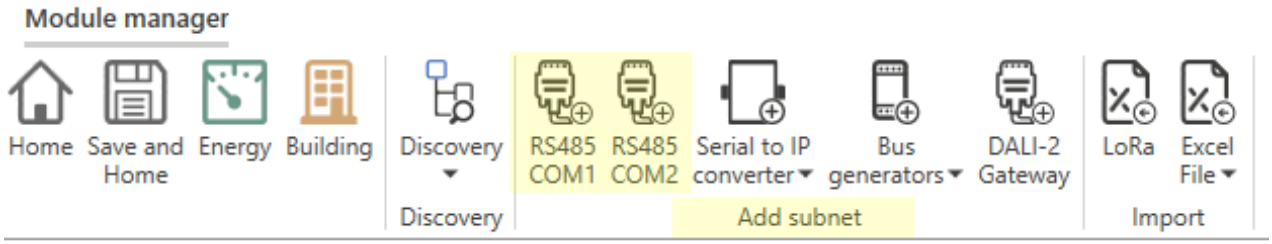
Procedures

Content

This section includes the following topics:

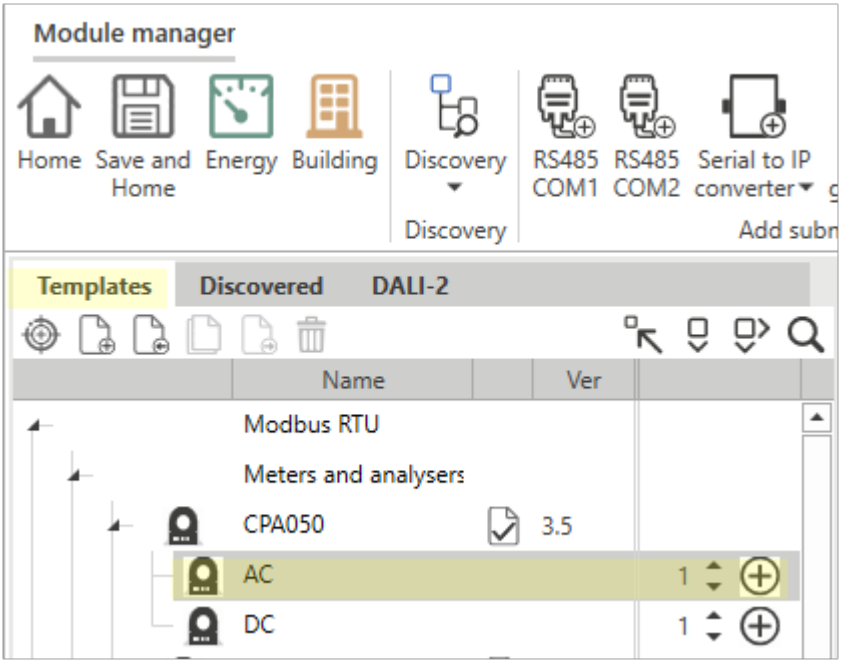
Add an energy meter manually

1. From the **Home** menu bar, access the **Module manager** menu
2. From the **Add subnet** area, select a serial port (see the picture below).

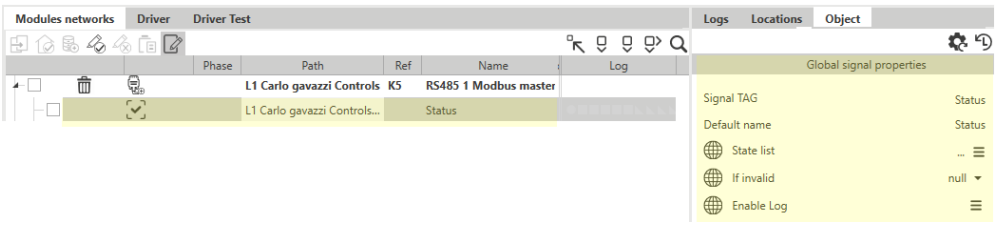


Note: if you don't select any serial port, the software assigns the COM1 port.

3. From the **Templates** tab, select the module you want to add.



*If you select the added module from **Modules networks**, on the right panel the relevant properties appear.*

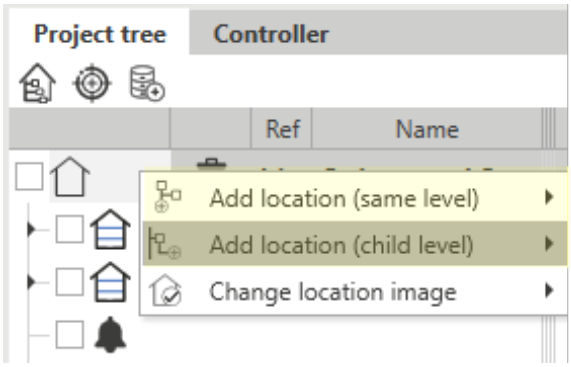


4. Click **Save and Home**

Add locations

From the Home page

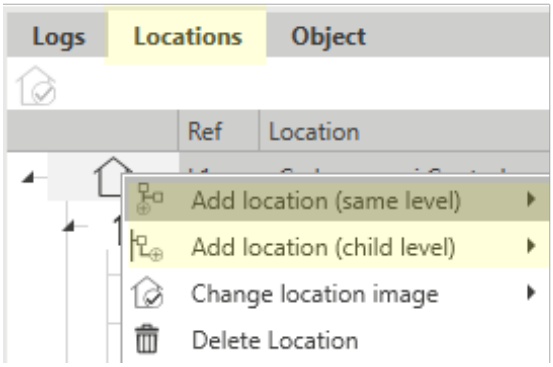
1. From the **Home** page
2. From the **Project tree** tab, right click an object
3. Click **Add location same level** or **Add location child level**



4. Click **Save and Home**

From the Module manager

1. From the **Home** page, access the **Module manager** menu
2. Go to the right panel **Locations** tab
3. Right click an object
4. Click **Add location same level** or **Add location child level**



5. Click **Save and Home**

Automatically find and add Smart Dupline® modules to a new project

1. From the **Home** menu bar, access the **Module manager** menu
2. From the **Discovery** menu, select the **HSBUS full discovery**.
   The system automatically finds the MCGs and the connected Dupline® modules
3. From the **Discovered** tab, click ⊕ to add the module(s).
4. Click **Save and Home**

Automatically find and add Smart Dupline® modules to an existing project

1. From the **Home** menu bar, access the **Module manager** menu
2. From the **Discovery** menu, select the **HSBUS quick discovery**.
   The system automatically finds the Dupline® modules connected to the existing MCGs.
3. From the **Discovered** tab, click ⊕ to add the module(s).
4. Click **Save and Home**

Move a Smart Dupline® module from an MCG to another

1. From the **Home** page, access the **Module manager** menu
2. From the **Modules networks** tab, select an object
3. Drag and drop the selected object to a different Master Channel Generator
4. Click **Save and Home**

Move an energy meter from a COM port to another

1. From the **Home** page, access the **Module manager** menu
2. From the **Modules networks** tab, select an object
3. Drag and drop the selected object to a different COM port interface
4. Click **Save and Home**

Move an object to another location

From the Home page

1. From the **Home** page
2. From the **Project tree** tab, select the object to be moved
3. Drag and drop the object to the desired location

From the Module manager

1. From the **Home** page, access the **Module manager** menu
2. From the **Modules networks** tab, flag the object(s) you want to move
3. Select the new location by right-clicking the selected object from the **Modules networks** tab or from the **Locations** tab (right panel)
4. Click  **Apply location on checked modules** or  **Apply location on selected modules**

Import module list from Template file

This functionality permits you to add modules in a faster way, reducing the time of creating the module list and customizing the module/signal names.

You can execute this following actions:

Download a template file

Import an Excel file

Template file

How to download the Template file

You can override the module, signal and location default names using an Excel file.

Follow this procedure to download the **Template file** and fill it according to the project requirements.

1. From *Module manager* > *Import* > *Excel File*, click **Get Excel template file**
2. In the **Save As** window, choose the target directory to download the template file.

Template file overview

The **Template file** is an .xlsm document you can edit with Microsoft ® Office 2007 or later.

The example below shows the file structure related to a module.

Note: you can only edit the green cells but not the red ones, otherwise the file will not be imported correctly.

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
00204507800016	B4X-LS4-U	002	045	078			In	1	
							In	2	
							Out	3	
							Dia	4	

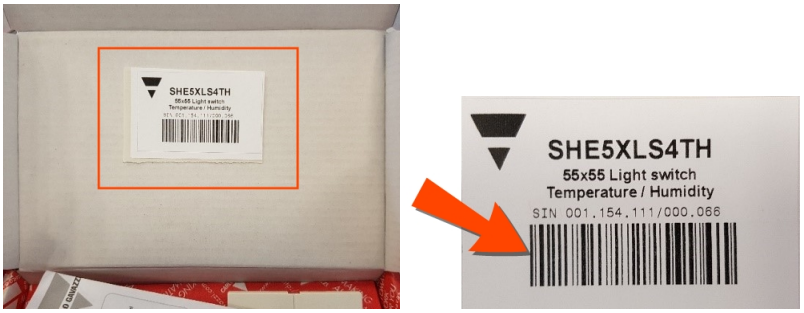
Following are the field descriptions:

Field name	Description
Bar code	It can be scanned or typed manually. The fields such as **PartNumber**, **Sin (A, B, C)** and signals are automatically compiled according to the module information.
Part Number*	It can be entered manually or automatically. The **Sin (A, B, C)** and signals are automatically entered according to the module information. *See the table below for the list of modules supported by this function.*
SinA, SinB, SinC*	These fields are automatically compiled if you scan a valid bar code. When the **Part Number** is entered manually, you have to fill in the **Sin A, B, C** fields with the module SIN.
Module Name	You can replace the default name with a custom name.
Location path	You can enter a custom location path, using the \ between each nesting location (e.g. *Building\Floor1\ Room1*). *Note: the \ is not a valid character for a location name.*
Type (In, Out, Dia)*	These fields are automatically compiled according to the number of signals. *Note: you cannot change them.*
# (Number)*	
Signal name	You can replace the default name with a custom name.

**These fields are mandatory.*

How to find the bar code to enter

You can find the bar code on the product carton-box labels. See the pictures below:



List of available modules

The part numbers you will manage in the template file are listed here.

*Note: other modules than those listed below will not be recognized and marked as **NOT VALID**.*

Part Number	Description
SBB4I2O24	Fire damper I/O module
SBB4I2O230	Fire damper I/O module
BDB-INCON4-U	Decentralised module with 4 contacts inputs
BDB-INCON8-U	Decentralised module with 8 contacts inputs
BDB-IOCP8-U	Decentralised module for 4 push buttons and 4 outputs for LED
BDB-IOCP8A-U	Decentralised module for 4 push buttons and 4 outputs for LED
BDA-RE13A-U	Decentralised relay output
SH2RE16A4	Output relay module with 4 outputs
SH2INDI424	Input module for 4 inputs
B4X-LS4-U	Light switch with 4 push buttons and 4 LEDs
B5X-LS4-U	Light switch with 4 push buttons and 4 LEDs
SHA4XLS4TH	Light switch with 4 push buttons and 4 LEDs with temperature and humidity
SHE5XLS4TH	Light switch with 4 push buttons and 4 LEDs with temperature and humidity
SHSQP360L	PIR sensor with an integrated Luxmeter
SHPINV2T1P124	Analogue input module with 2 0-10 V inputs, 1 thermistor input, 1 potentiometer input
SHPOUTV224	Analogue output module with 2 0-10 V outputs
SHPINNI2	Analogue input module with two configurable Pt1000/Ni1000 inputs
SHSUTD	Temperature sensor with display
SHSUTHD	Temperature and humidity sensor with display

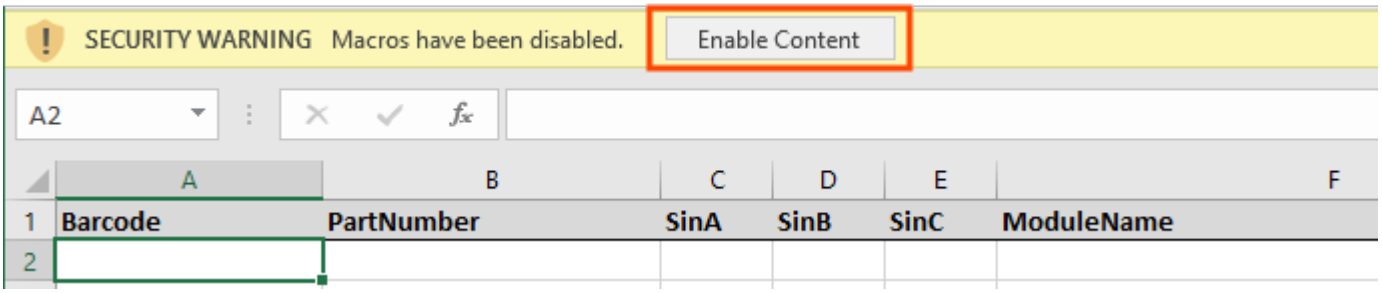
Part Number	Description
SHE5XLS2TEMDIS	TEMDIS module with 2 programmable push buttons
SH2SSTRI424	Output relay module with 4 solid state outputs
SH2RE1A424	Output relay module with 4 outputs
SBB4I	Fire damper input module
SBB2I	Fire damper input module
SBB4I2O230T	Fire damper I/O module
SBB4I2O24T	Fire damper I/O module
SBB4I2O230T6	Fire damper I/O module
SBB4I2O24T6	Fire damper I/O module
SBB4I2O230B	Fire damper I/O module
SBB4I2O24B	Fire damper I/O module

Compile the Template file with Microsoft Excel

The **Template file** is a *macro-enabled workbook* (.xlsm). After the download, open it with Microsoft Office 2007 or a later version to enable the macro content.

Enable Excel macros

If the **SECURITY WARNING** bar appears, click **Enable Content** to activate the macro content (red rectangle below):



For more details please go to Enable or disable macros in Office files

There are two ways to compile the template file with modules, as shown in the following pages:

- Automatic insertion with a bar code scanner
- Manual insertion (through a keyboard)

Automatic insertion with a bar code scanner

Use a bar code scanner to fill in the **Template file** with the module information automatically.

Please refer to the following information:

System requirements	
Hardware	A bar code scanner *Note: configure the bar code scanner to send only one CRLF or enter a key after the scanning. Please refer to bar code scanner documentation.*
Software	Microsoft ® Excel 2007 or later *Note: the Excel macros must be allowed by security policies.*

1. Open the **Template file**

The active cell in the Excel workbook is the first one (**Bar code**).

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName

2. Scan a bar code to add it to the relevant cell (see below):

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
AAABBBCCCDDEE									

If the bar code is valid, it is recognised and the **PartNumber** and the **Sin** cells are filled in with the module information automatically (green rectangle below):

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
AAABBBCCCDDEE	PRTNMB001	AAA	BBB	CCC					

The **Type** and **#** cells are automatically filled in according to the number of signals (blue cells below). The active cell is moved to the next available cell in the **Bar code** column automatically (orange cell below):

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
AAABBBCCCDDEE	PRTNMB001	AAA	BBB	CCC			In	1	
							In	2	
							Out	3	
							Dia	4	

3. Fill in fields such as **ModuleName**, **LocationPath** and **SignalName**.

Repeat steps 1-3 for every other module you want to add.

4. From the Excel file, click **Save**.

The file is now ready to be imported.

Manual insertion without a bar code scanner

You can also fill in the template file manually.

Please refer to the following information and procedure:

System requirements	
Hardware	Keyboard
Software	Microsoft ® Excel 2007 or later *Note: the Excel macros must be allowed by security policies.*

1. Open the **Template file**.

The active cell in the Excel workbook is the first one (**Bar code**).

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName

2. Enter the bar code manually.

If the bar code is recognised, the module information will be filled in automatically. Otherwise, select the first valid **PartNumber** cell and type the desired module part number.

Note: the part number must be in capital letters (for example, sha5xls4th would not be recognized).

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
	PRTNMB001								

3. Click **Enter** to fill in the **Type** and **#** cells according to the number of signals automatically (blue cells below).

Note: these fields cannot be edited.

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
	PRTNMB001						In	1	
							In	2	
							Out	3	
							Dia	4	

4. Enter the Sin numbers (red cells below)

Barcode	PartNumber	SinA	SinB	SinC	ModuleName	Location path	Type	#	SignalName
	PRTNMB001	AAA	BBB	CCC			In	1	
							In	2	
							Out	3	
							Dia	4	

5. Select the first active cell from the **Bar code** column (orange cell above).

Repeat steps 1-5 for every other module you want to add.

6. From the Excel, click **Save**.

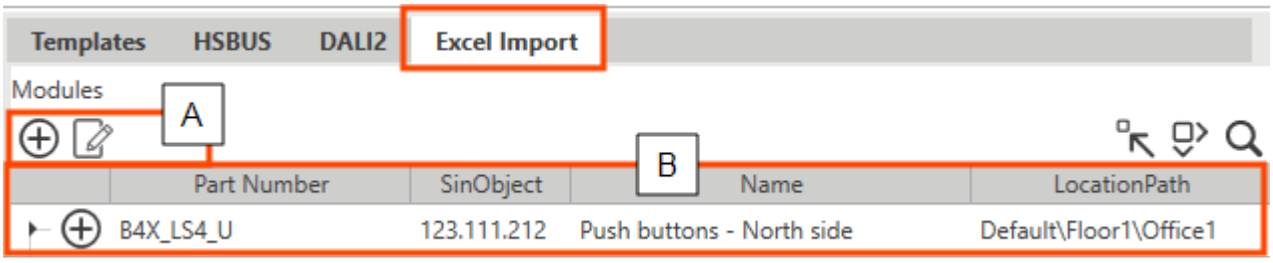
The file is now ready to be imported.

Import an Excel file

Excel Import tab

From ***Module manager menu > Excel Import tab*** you can add the modules imported by the file.

Two parts compose the **Excel Import** tab:



Element	Description
Multifunction panel (A)	⊕ : adds or updates all the imported devices
Imported modules (B)	For each module, a row containing the following information is created:

Column	Description
Multi-status icon	According to the status, the icon can be a command or a feedback:
Part Number	Module part number
SIN object	Module SIN address
Name	Module/signal name. You can change the default one in the Excel file.
Path	Path created by the user. If you don't specify it, the field remains empty.

Type	Icon	Description
Command	⊕	Adds module to configuration
	↻	Updates module to configuration
Feedback	⚠	Module SIN not valid
		Module part number not valid
	✓	Module already present in the configuration

How to import a fulfilled Template file

1. From ***Module manager > Import section > Excel File***, click **Import Excel file**
2. Select and open the **Template file**: the system starts to check the **file** for data consistency.
3. The available modules will be added to the **Excel list**(on the left of the Module manager menu).

   See the table describing the fields.

4. From the **Networks** tab in the central panel, select the master channel generator to which you want to add the modules.
   Notes:
   - the selected row turns grey.
   - only the SH2MCG24 or SBP2MCG324 Master Channel Generators are allowed. If no master channel generator is present, a new module will be added.
5. In the **Location** tab, select the Location where you want to add the modules.
   Otherwise, the location tree will be created according to the file specification and the modules added accordingly.

See Location.

6. Add or update the modules to the project using the icons of the **Excel Import** tab.

Location

Import modules to predefined locations

When the path is added to the Excel, the system splits it into single strings using \ as a separator and then looks for the **Root**.

If...	Then...
The system does not find any string	Creates a Root
The system does not identify the string	The modules will be added according to the association order
There are duplicated strings	The modules will be added to the first relevant location
You select the new location	The new module will be added to it

Import file Excel with modules without location

If you don't specify the path in the Excel file, the new module is added to the location you select.

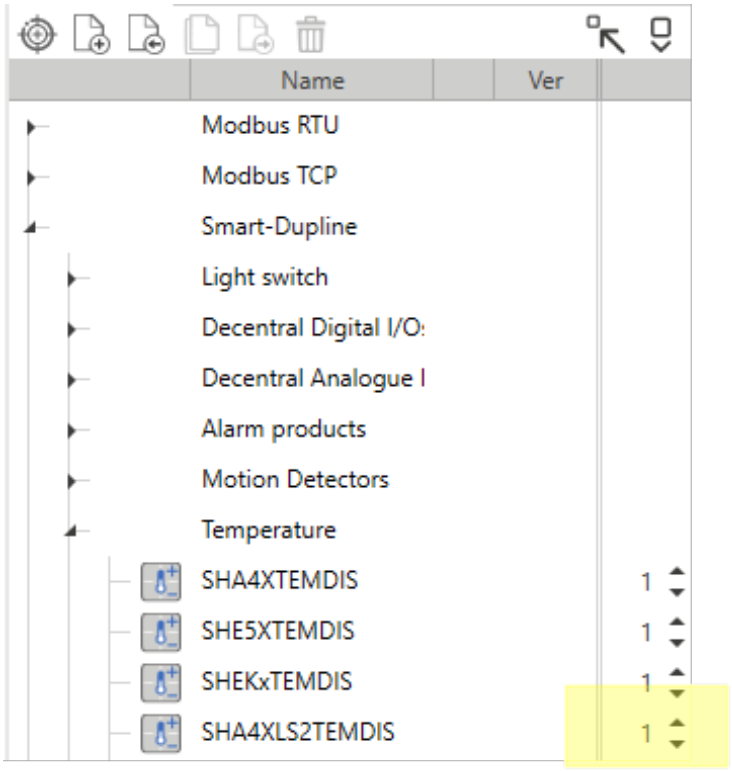
Fix a template with errors

In the **Excel Import** tab, in case of not valid row, you will see the  icon.

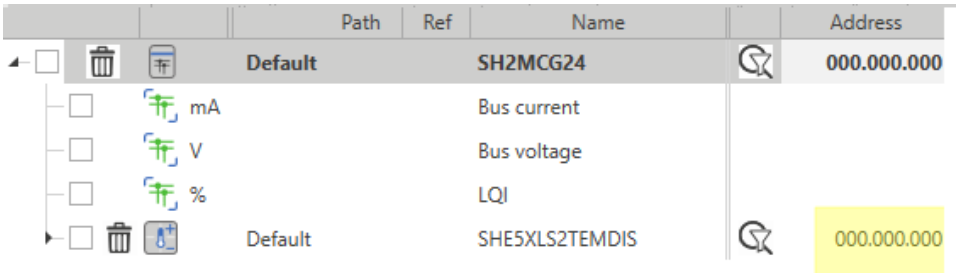
1. Hover over the  icon to open the information pop-up.
2. Fix the Excel file.
3. Import the fixed **Template file**.

Create an offline project with Smart Dupline® modules

1. Open the **File** menu
2. Click **New project**
3. From the **Home** page, access the **Module manager** menu
4. From the **Templates** tab, add the modules manually (⊕)

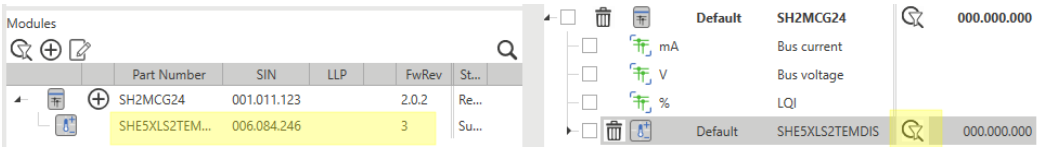


5. Leave the module SIN set to 000.000.000 (see the picture below).



6. Rename the modules/signals and use them inside the functions so to create the project offline
7. As soon as you go to the field, upload the project
8. Connect to the controller
9. Access the **Module manager** menu again
10. Open the **Discovery menu** ( ) and select the **HSBUS full discovery** so to find all the connected submaster modules

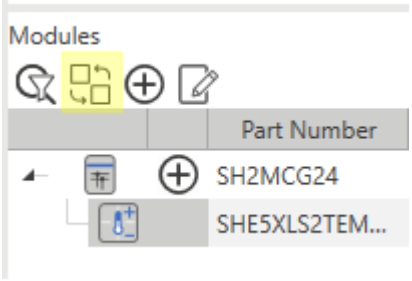
11. Click **Find compatible modules found with quick/full discovery**( ) to filter the found modules by those compatible with the module selected



12. Select the module from the list

    Note: the selected module will be marked in grey

13. Click **Apply SIN of selected modules to selected module in installation** ( ) to assign the SIN to the module used for filtering



14. Repeat the previous steps for all the modules with SIN set to 000.000.000
15. Click **Save and close** to write the project and configure the system

Replace a faulty module previously used in the configuration

1. Open the **File** menu
2. **Open** your project
3. From the **Home** page, access the **Module manager** menu
4. Select the faulty module from the list
5. Replace physically the faulty module by connecting the new one to the bus.
   Notice: join or divide the modules ONLY when they are NOT power supplied
6. Open the **Discovery menu** () and select the **HSBUS full discovery** to find the new module
7. Click **Find compatible modules found with quick/full discovery**() to filter the found modules by those compatible with the module selected
8. Select the new module from the list
   Note: the selected module will be marked in grey
9. Click **Apply SIN of selected modules to selected module in installation** () to assign the SIN to the module used for filtering
10. Click **Save and close**
11. Send the configuration to the controller again to configure the new module with the faulty module settings

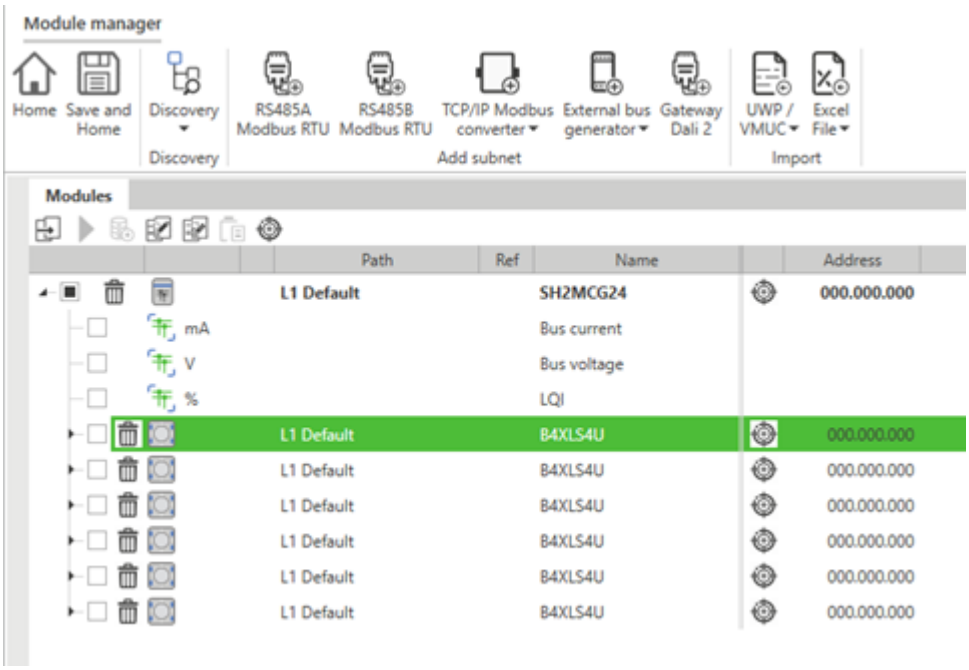
Change module network

1. From the **Home** menu bar, access the **Module manager** menu
2. Place the mouse over the module whose network you want to change
3. Drag and drop the module under the new generator

Copy and paste modules

1. From the **Home** menu bar, access the **Module manager** menu.
2. From the **Modules** area (in the centre of the window), mark ( ) the item row whose properties you want to copy.

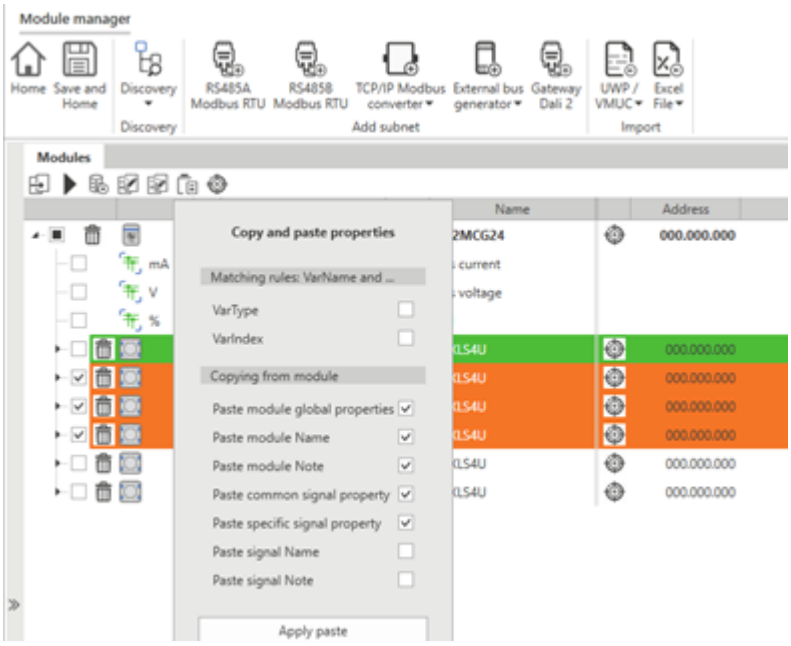
   Note: the copied item row becomes green (see the picture below).



3. Check the item rows where you want to paste the properties.

   Note: the destination item rows that have similar specifications to the first selected are highlighted in orange. The system uses the "Type" and "Index" tags to identify items with similar specifications.

4. Click to open the **Copy and paste properties** panel
5. Check the properties to be pasted to the items highlighted in orange

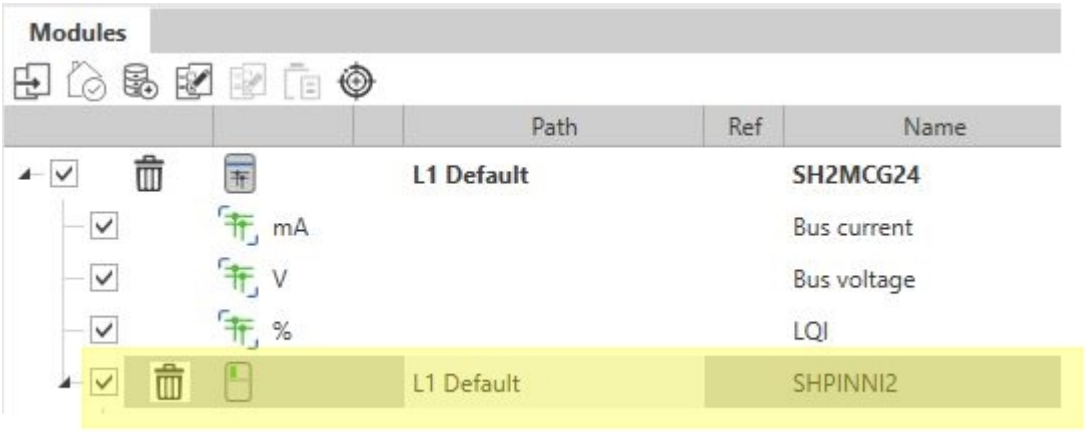


6. Click **Apply paste** to confirm the changes

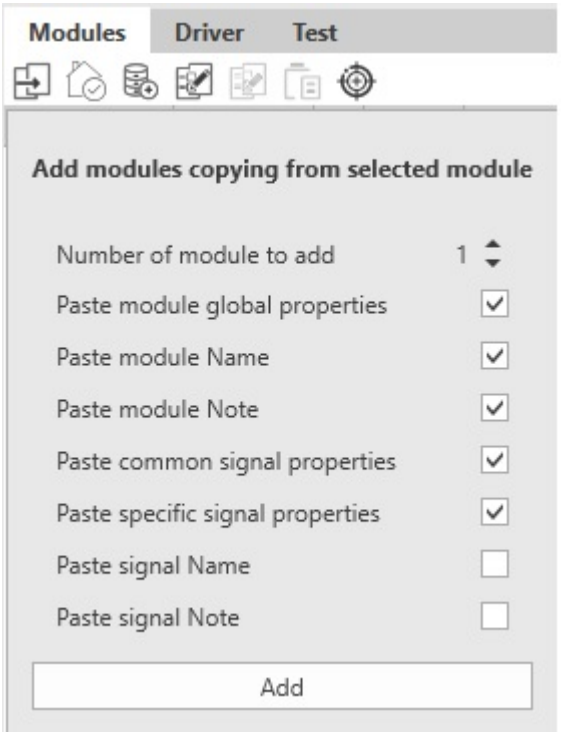
7. Click  (**Remove mark**) to remove the selection

Clone modules

1. From the **Home** menu bar, access the **Module manager** menu
2. From the **Modules** area (in the centre of the window), select the item to clone



3. Click  (**Clone selected module**)
4. From the **Clone settings**, select the modules to add as clone and the other options (see picture below)



5. Click **Add** to confirm the changes and clone the module(s)

Delete modules

1. From the **Home** menu bar, access the **Module manager** menu.
2. Click  to delete the module from the configuration.
   Note: the master channel generator modules cannot be deleted if there is at least one module in their network.

Set the data logging

From the Home page

1. From the **Home** page
2. From the **Project tree** tab, select an object
3. Click  (**Configure data logging for selected signals**) to open the logging options.
   Note: the panel shows the available logging options according to the signal types you have checked.
   *For example, if you have selected just analogue signals, the panel shows only the **Analogue input signals** menu.*
4. Click **Apply log settings** to assign the selected options to the signals
   *Note: in the **Modules** area, the **Log** column shows the signals saved on the database.*

From the Module manager

1. From the **Home** page, access the **Module manager** menu
2. From the **Modules networks** area (in the centre of the window), check the signals where you want to set the data logging (as shown below)

3. Click  (**Configure data logging for selected signals**) to open the logging options
   Note: the panel shows the available logging options according to the signal types you have checked.
   *For example, if you have selected just analogue signals, the panel shows only the **Analogue input signals** menu.*
4. Select the log type, the sampling time and other parameters
5. Click **Apply log settings** to assign the selected options to the signals
   *Note: in the **Modules** area, the **Log** column shows the signals saved on the database.*

Functions

Content

This chapter includes the following sections:

Function list menu

Home > Building / Energy > Function list

The **Function list** changes according to the application you select (**Energy** or **Building**).
Each function has its own dedicated page for setting the relevant parameters.

Switch

Content

This section includes the following topics:

Introduction to the Switch function

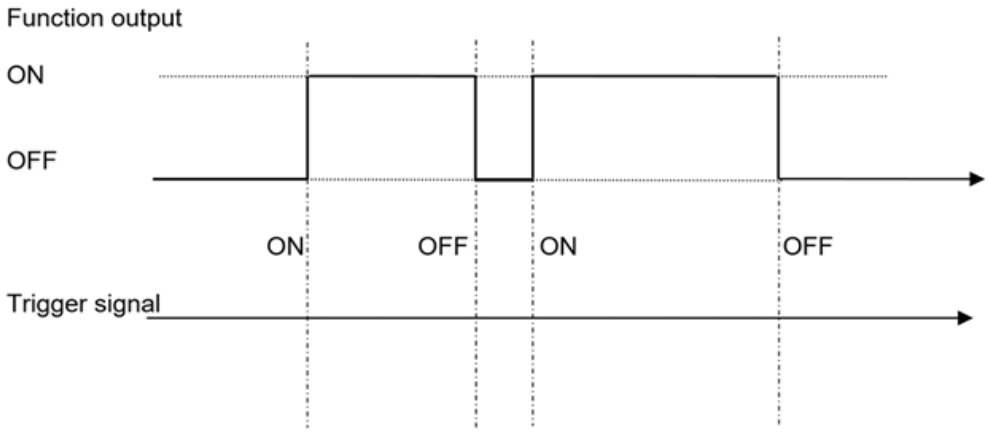
The **Switch** function can be used to switch one or more digital outputs ON and OFF. You can add a **Local Calendar** to schedule the function activities.

You can also set the **Switch** function to turn the output OFF according to a delay timer.

Please refer to the following examples to better understand the operating mode.

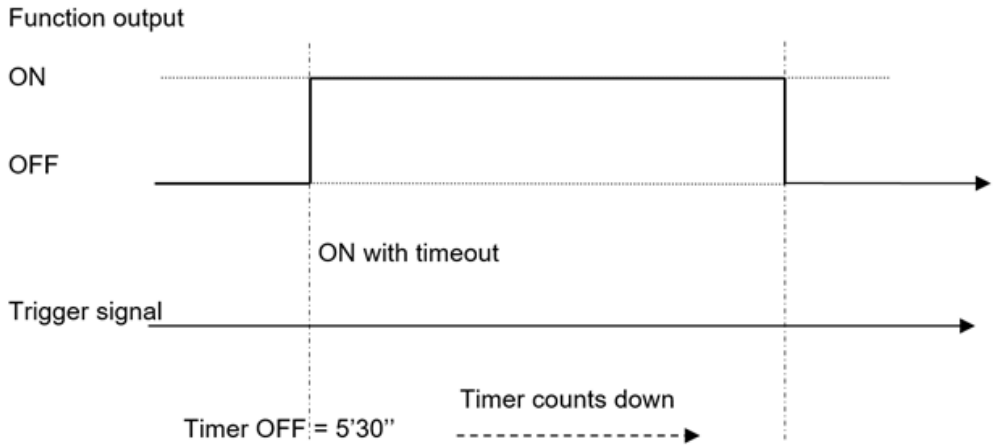
Example 1

The **Switch** function replicates on the output the status of the input (trigger signal). When the trigger signal for ON is activated, the function output goes ON. When the trigger signal for OFF is activated, the output goes OFF.



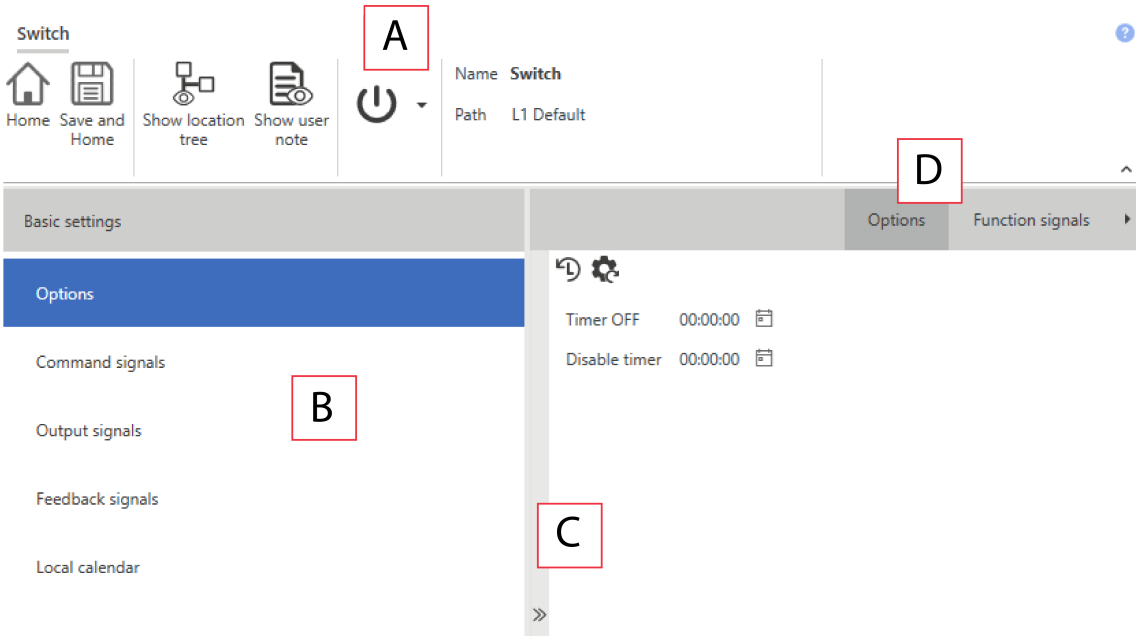
Example 2

When the **Switch** function turns ON, the Timer OFF starts. When the time expires, the output goes automatically OFF.



Switch page

Home page > (Building) > Function menu > Switch



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
Timer OFF	Sets the time period before the output switches OFF (0 - 24 h. Default value: 1 min)
Disable timer	Sets the time period after which the **Disable ON** condition is deactivated (0 - 24 h. Default value: 1 min)
OFF status string (web app)	Sets the string for the ON condition displayed in the web app
ON status string (web app)	Sets the string for the OFF condition displayed in the web app

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Main signal</td><td>Shows the function status</td><td>OFF = Function is not active
ON = Function is active</td></tr>
<tr><td>Status signal</td><td>Shows the function status</td><td>
<table>
<tr><th>Status</th><th>Value shown</th></tr>
<tr><td>1</td><td>Output OFF</td></tr>
<tr><td>2</td><td>Output ON</td></tr>
<tr><td>3</td><td>Output ON with time-out</td></tr>
<tr><td>4</td><td>Disabled, output OFF</td></tr>
<tr><td>5</td><td>Disabled, output ON</td></tr>
<tr><td>6</td><td>Forced ON, output ON</td></tr>
</table>
</td></tr>
<tr><td>Custom signal</td><td>It is ON if the status selected from the combo-box is true</td><td>ON = The selected status is true
OFF = The selected status is false</td></tr>
</table>

*For further information, see "Procedures" on page 96 (**Functions> Switch > Settings > Options tab > Function signals**)*

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Switch** function is controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button (e.g. SHA4XLS4TH module)	• Trigger the output status • Manage the **Disable automation** • Manage the **Force conditions**	*You can add max 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function Analog signal		

*For further information, see "Procedures" on page 96 (**Functions> Switch > Settings > Command signals tab: Add the command signals**)*

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output	Inverted logic of the function can be enabled
Digital LED	
Digital signal	

*For further information, see "Procedures" on page 96 (**Functions> Switch > Settings > Command signals tab: Add the output signals**)*

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the Switch status.

Signal type	Available options
Digital LED	Inverted logic of the function can be enabled
Digital	

Note: You can add max 50 signals

*For further information, see "Procedures" on page 96 (**Functions> Switch > Settings > Command signals tab: Add the feedback signals**)*

Local calendar tab

The **Local calendar** functionality can be used to trigger action according to time schedules.

From the **Local calendar** sub-menu, you can set the following parameter:

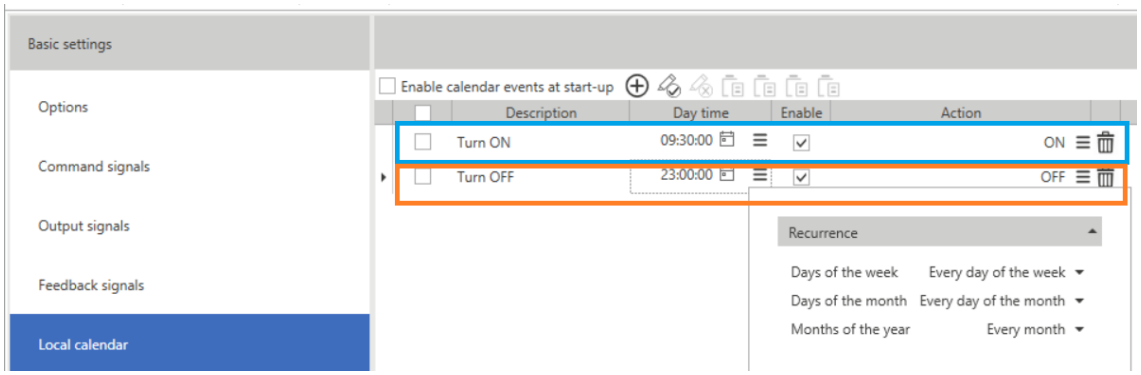
Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*

Parameter	Description
⊕	Adds a new event
🗑	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list
Day time	Triggers the event at the specific time determined by the option you choose from 📅 . From ☰, you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
Action	Selects the action to be performed when the time condition is verified. *See "Available actions" on page 95 to see the available options*

*For further information, see "Procedures" on page 96 (**Functions> Switch > Settings > Local calendar tab**)*

Example

In the example below, there are two events: the first is set to turn the switch function ON every day at 9:30 (Turn ON – blue rectangle) and to turn it OFF at 23:30 (Turn OFF – orange rectangle):



Trigger signals

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold Action on falling*
Action on falling	As soon as the function goes OFF, the selected action is executed *Note: The analogue value must be ≤ the falling threshold*

Automations

Automations are used in Building Automation systems to automate functions thanks to time schedules, actions triggered by sensors or by timers.

These automations have priority over manual actions (such as the pressure of a push button) so, if you need to stop any automation associated to the function, you can activate the **Disable ON** condition.

From the **Signal local properties** of the **Command signals** tab, you can associate actions to the trigger signals.

The following tables show the types of signal according to the action behaviour:

Push Button

	As soon as you press the push button **(Action on rising)**	As soon as you click the push button **(Action on click)**	After a long press **(Action on long click)**	After a very long press **(Action on very long click)**
Action				
Disable ON	The automation is disabled			
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*			
Disable OFF	The **Disable ON** condition is removed			
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode			
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts			

Digital switch / digital function

	As soon as the switch closes/ the function goes ON **(Action on rising)**	As soon as the switch closes / the function goes OFF **(Action on falling)**
Action		
Disable ON	The automation is disabled	
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*	
Disable OFF	The **Disable ON** condition is removed	
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode	
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts	

Analogue signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Disable ON	The automation is disabled	
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*	
Disable OFF	The **Disable ON** condition is removed	
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode	
Disable ON with timer / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts	

Force ON and OFF conditions

If you want to force the output ON or keep it OFF regardless of the logical status of the function, select **Force ON** and **Force OFF**.

These automation have priority over manual actions (such as the pressure of a push button) so, if you need to stop any automatism associated to the function, you can activate the **Disable ON** condition.

Note: When you activate the force output ON signal and the force output OFF signal, the force output ON signal has the priority.

From the **Command signals** tab of the function you can manage the automation and the actions to enable/disable the automation:

Push Button

	As soon as you press the push button **(Rising edge)**	As soon as you click the push button **(Click)**	After a long press **(Long)**	After a very long press **(Very long)**
Action				
Force ON	The output is forced ON regardless of all the other signals used in the function			
Remove force ON	The Force ON action is removed (if the function output is forced ON)			
Force ON toggle	The Force ON condition is enabled/disabled			
Force OFF	The output is forced OFF regardless of all the other signals used in the function			
Remove force OFF	The Force OFF action is removed (if the function output is forced OFF)			
Force OFF toggle	The Force OFF condition is enabled/disabled			

Digital switch / digital function

	As soon as the switch closes or the function goes ON **(Rising edge)**	As soon as the switch opens/function goes OFF **(Falling edge)**
Action		
Force ON	The output is forced ON regardless of all the other signals used in the function	
Remove force ON	The Force ON action is removed (if the function output is forced ON)	
Force ON toggle	The Force ON condition is enabled/disabled	
Force OFF	The output is forced OFF regardless of all the other signals used in the function	
Remove force OFF	The Force OFF action is removed (if the function output is forced OFF)	
Force OFF toggle	The Force OFF condition is enabled/disabled	

Analogue signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Force ON	The output is forced ON regardless of all the other signals used in the function	
Remove force ON	The Force ON action is removed (if the function output is forced ON)	
Force ON toggle	The Force ON condition is enabled/disabled	
Force OFF	The output is forced OFF regardless of all the other signals used in the function	
Remove force OFF	The Force OFF action is removed (if the function output is forced OFF)	
Force OFF toggle	The Force OFF condition is enabled/disabled	

Available actions

The following table shows the available actions for the **Switch** function:

Action	When the action is triggered...
ON	Switches the function ON
ON with time-out	Switches the function ON and starts the timer *Note: if the function is already ON, it reloads the timer value*
OFF	Switches the function OFF
ON / OFF toggle	Switches the function ON/OFF in toggle mode
ON with time-out / OFF toggle	Switches the function ON, starts the timer and switches the function OFF in toggle mode
Disable ON	Disables the automation (such as time schedules of a local calendar)
Disable ON with time-out	Disables the automation for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*
Disable OFF	Removes the **Disable ON** action
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. When the **Disable ON** is active, the timer starts
Force ON	Forces the output ON regardless of all the other signals used in the function
Remove force ON	Removes the **Force ON** action if the function output is forced ON
Force ON toggle	The **Force ON** condition is enabled/disabled
Force OFF	Forces the output OFF regardless of all the other signals used in the function
Remove force OFF	Removes the **Force OFF** action if the function output is forced OFF
Force OFF toggle	The **Force OFF** condition is enabled/disabled

Procedures

Functions > Switch > Settings > Options tab [1] > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties** panel
2. From the central area, select the signal you need to change.
3. Type a name in the text box.

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties** panel
2. From the **Signal properties** panel, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Note: its value is ON when at least one of the selected status is true

Functions> Switch > Settings > Command signals [2] tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel.
3. From the **Signal local properties** panel, set the options according to the configuration.

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

---

*1*For further information, go to Switch > Settings > Options tab

*2*For further information, go to Settings > Command signals tab

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set
2. From the **Signal local properties** panel, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions> Switch > Settings > Local calendar [1] *tab*

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Actions** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

[1] For further information, go to Switch > Settings > Local calendar tab

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar tab**, click 

Functions > Switch

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

   2. From the toolbar, you can also change the function name in the text box.

Counter

Content

This section includes the following topics:

Introduction to the Counter function

The **Counter** function is mainly used to acquire pulses from input signals for counter applications (energy, water, gas) or count part.

You can then adjust the acquired values and use them independently by using, for instance, push buttons or remote commands.

The possible applications are the following:

- **Pulse counter**

Note: the UWP 4.0 controller must always be online to monitor the input signals (contacts). During the download of a configuration the function does not operate (this means the pulses are lost).

- **Generation of an adjustable value**

You can set the function to generate a value by using manual or remote commands. This is useful to perform threshold variations, simulations, tests.

Note: The generated value can be used as a signal in other functions.

- **Sum of analogue/counter variables with offset handling**

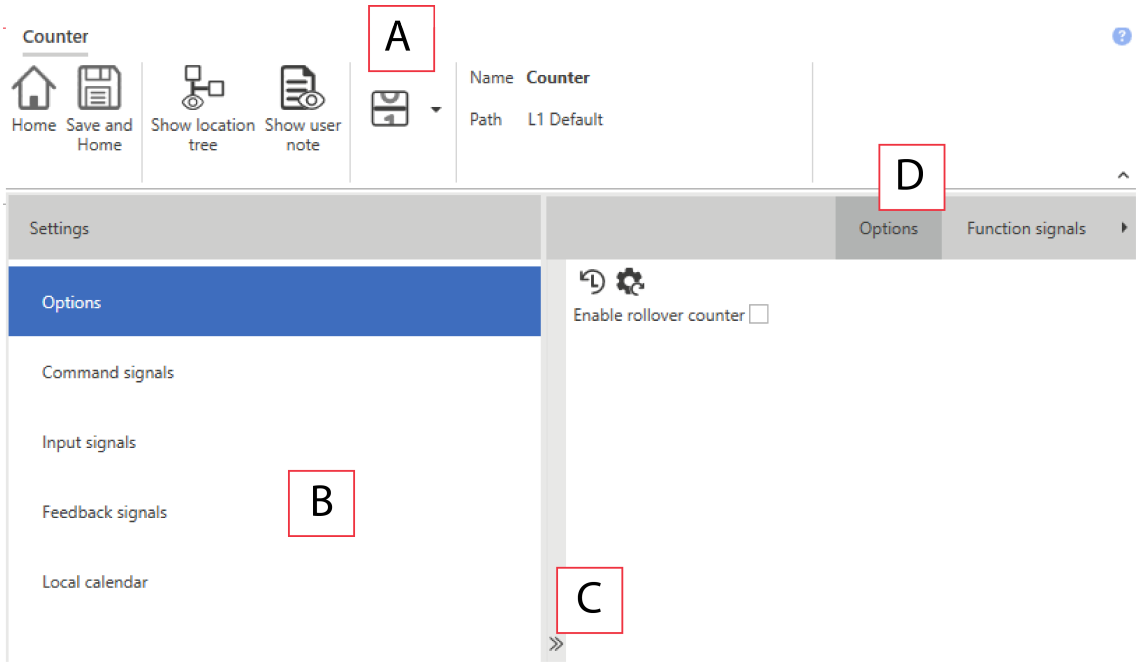
The **Counter** function can sum analogue values or values coming from a counting module. The function can also be used as a virtual energy meter to sum up the values coming from different meters or different input modules such as SH2INDI424, SHPINCNT4, SHPINCNTS04 and SHJWINS04xxx.

- **People counting**

The function always counts the counter-linked variables (input value); the adjustable value can be enabled/disabled by a command.
If the function is disabled (**Adjustable value frozen**) any adjustable value is ignored, while signals used as input values continue to be counted.

Counter page

Home page > (Building) > Function menu > Counter



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Input signals**, sets the input signals to count the pulses • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Measure unit</td><td>Selects the unit of measure for the counter value. It is used as label in the UWP IDE and web app</td></tr>
<tr><td>Resolution</td><td>Sets the decimal point position used in the UWP IDE and web app to represent the counter value according to your needs. The selection does not affect the calculations (sum differences of counter signals).
Note: the UWP 4.0 controller applies the resolution also after the calculations. If you acquire pulses from a signal with a resolution greater than the function's one, the differences will probably be lower than the resolution you set, and the Counter value won't increase</td></tr>
<tr><td>Max adjustable limit / Min adjustable limit</td><td>Sets the minimum/maximum limits of the adjustable value.</td></tr>
<tr><td>Enable adjustable rollover counter</td><td>
<table>
<tr><th>If it is…</th><th>And...</th><th>Then...</th></tr>
<tr><td>Checked</td><td rowspan="2">the counter value exceeds the min/max limits</td><td>The counter value is forced to the value defined in the Max adjustable limit / Min adjustable limit fields (above mentioned)</td></tr>
<tr><td>Unchecked</td><td>Value > max -> value=value - (max-min)
Value < min -> value=value - (min-max)</td></tr>
</table>
</td></tr>
</table>

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Element	Description	Value
Total value	Shows the total counting value. This field does not show the measure unit, nor the resolution format	

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Status signal</td><td>Shows the current function status related to the adjustable counting functionality</td><td>The adjustable value can be enabled/disabled<table><tr><th>Status</th><th>Value shown</th></tr><tr><td>1</td><td>Adjustable counting is enabled</td></tr><tr><td>2</td><td>Adjustable counting is disabled</td></tr></table></td></tr>
<tr><td>Custom signal</td><td>It is ON if the statuses selected from the combo-box is true</td><td>ON = The selected status is true
OFF = The selected status is false</td></tr>
<tr><td>Adjustable value</td><td>Shows the counter value related to the adjustable counting value</td><td></td></tr>
<tr><td>Input value</td><td>Shows the counter value related to counter input signals</td><td></td></tr>
<tr><td>Adjustable rollover counter value</td><td>Shows the option status</td><td><table><tr><th>Status</th><th>Value shown</th></tr><tr><td>0</td><td>The option is checked</td></tr><tr><td>1</td><td>The option is unchecked</td></tr></table></td></tr>
</table>

For each signal you can set the available properties in the **Signal global properties** panel.

Command signals tab

The **Command signals** tab shows the list of all the available signals.

The **Counter** function is controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	• Increment/decrement the adjustable value • Enable/disable the adjustable counting value • Manage the rollover counter	*You can add max 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Input signals tab

The **Input signals** tab shows the list of all the input signals that can be used as counters.

In this tab, you can add any analogue signals and the **Counter** function calculates the sum of the counting values coming from different signals. The result of the function is the sum of the twocounting values:

Counter function= Counter 1+ Counter 2+ Counter n

The **Counter** function can be used as a virtual energy meter to sum up the values coming from different meters or it can be used to sum up the counting values coming from different input modules.

The following table shows the types of signal you can add:

Signal type	Note
Pulse counter signal (e.g. SH2INDI424 module)	*You can add max 50 signals*
Digital switch	
Digital function	
Analogue function	
Analogue signal	

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Counter** status.

Signal type	Available options
Digital LED	Inverted logic of the function can be enabled
Digital	

Note: You can add max 50 signals

Local calendar

The **Local calendar** functionality can be used to trigger action according to time schedules.

From the **Local calendar** sub-menu, you can set the following parameter:

Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*
	Adds a new event
	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list
Day time	Triggers the event at the specific time determined by the option you choose from  . From ☰, you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
Action	Selects the action to be performed when the time condition is verified.

Trigger signals

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold Action on falling*
Action on falling	As soon as the function goes OFF, the selected action is executed *Note: The analogue value must be ≤ the falling threshold*

Procedures

Functions > Counter > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Counter > Command signals

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area.

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the Signal local properties, set the options according to the configuration

Add the input signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration
4. From the **Signal global properties**, set the option according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set.
2. From the **Signal local properties**, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Counter

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Analogue comparator

Content

This section includes the following topics:

Introduction to the Analogue comparator function

The **Analogue comparator** is a function that compares two values: the **Real value**, such as the value of one or several input signals, and the **Reference value**, such as a low / high thresholds that can either be fixed according to your needs or read by external references.

Moreover, thanks to this function you can decide whether the given input value has to be compared according to the high/low thresholds; the **Analogue comparator** function in fact can be set according to different comparator modes (see "Comparator type" on page 117).

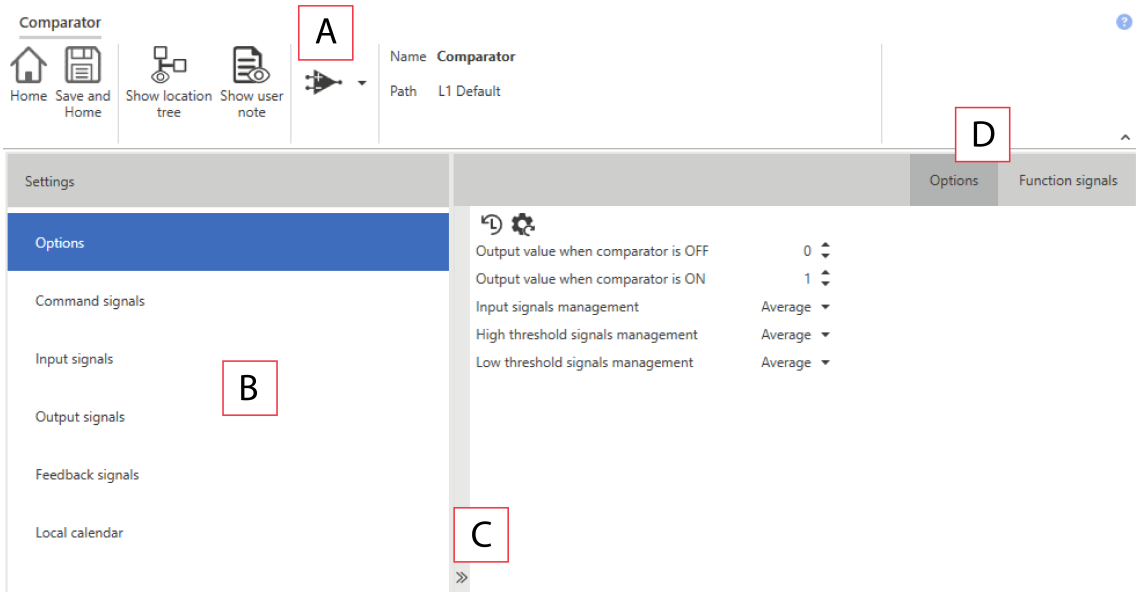
A specific numeric value can be set for the output function ON and OFF: this way, the function can be used to warn you when a monitored signal or condition goes out of the required value / condition and, in the context of building automation, to control other functions or signal.

You can also add the following triggers to change the comparison type:

- Command signals, such as a push button, digital function
- Calendar event
- Another Analogue comparator function

Analogue comparator

Home page > (Building) > Function menu > Analogue comparator



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Input signals**, sets the alarm input signal to activate the alarm ON condition. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Reference by external function**, comparator reference linked to an external **Analogue comparator** function. *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**. From the **Options** sub-menu, you can set the following parameter:

Parameter	Description
Measure unit	Selects the measure unit for the function value. It is used as label in the UWP 3.0 Tool and in the Web-App *Note: the selected measure unit does not impact the resolution of the function value*
Resolution	Sets the resolution value according to your requirements. The selection does not affect the calculations (sum differences of counter signals)
Max input limit / Min input limit /	Sets the minimum/maximum limits the input value can assume
Default input (when not valid)	Input value used as default before receiving a valid value
External references	Enables the possibility to link another comparator function whose settings and thresholds are inherited
Comparator type	Sets the parameters according to the selected Comparator type *See Comparator type for field description and working mode*
Output value when comparator is OFF	Sets the output value of the function when the **Analogue comparator** function is OFF
Output value when comparator is ON	Sets the output value of the function when the **Analogue comparator** function is ON
Input signals management	Selects how to treat the input signals. The available options are the following: • **AVG**. Uses the average value of all signals present in the **Input signals** tab as input. • **MIN**. Uses the minimum value among the signals present in the **Input signals** tab as input. • **MAX**. Uses the maximum value among the signals present in the **Input signals** tab input.

Parameter	Description
High threshold signals management	Selects how to treat the input signals to get the **High reference** value. The available options are the following: • **AVG**. Uses the average value of all signals present in the **Input signals** tab as high reference. • **MIN**. Uses the minimum value among the signals present in the **Input signals** tab as high reference. • **MAX**. Uses the maximum value among the signals present in the **Input signals** tab as high reference.
Low threshold signals management	Selects how to treat the input signals. The available options are the following: • **AVG**. Uses the average value of all signals present in the **Input signals** tab as low reference. • **MIN**. Uses the minimum value among the signals present in the **Input signals** tab as low reference. • **MAX**. Uses the maximum value among the signals present in the **Input signals** tab as low reference.

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Main status</td><td>Shows the current function status</td><td>OFF = Analog function is OFF (the comparison is not verified)
ON = Analog function is ON (the comparison is verified)</td></tr>
<tr><td>Status signal</td><td>Shows the current function status</td><td>Shows the function status among those values:<table><tr><th>Value</th><th>Status</th></tr><tr><td>1</td><td>OFF</td></tr><tr><td>2</td><td>OFF (Delay ON running)</td></tr><tr><td>3</td><td>ON</td></tr><tr><td>4</td><td>ON (Delay OFF running)</td></tr><tr><td>5</td><td>OFF (Comparator disabled)</td></tr><tr><td>6</td><td>ON (Comparator disabled)</td></tr></table></td></tr>
<tr><td>Custom signal</td><td>It is ON if the statuses selected from the combo-box is true</td><td>You can associate several function statuses, as described in the Status signals description</td></tr>
<tr><td>Analog output signal</td><td>Shows the output value according the set parameters</td><td>Refers to the following parameters set from the Options tab:
Output value when comparator is OFF
Output value when comparator is ON</td></tr>
<tr><td>Input value</td><td>Shows the input value</td><td></td></tr>
<tr><td>High threshold</td><td>Shows the high threshold</td><td>The value can be:
Fixed, i.e. set manually in the Comparator type field (Options tab)
Dynamic, by using input signals as high threshold in the Input signals tab</td></tr>
<tr><td>Low threshold</td><td>Shows the low threshold</td><td>The value can be:
Fixed, i.e. set manually in the Comparator type field (Options tab)
Dynamic, by using input signals as high threshold in the Input signals tab</td></tr>
</table>

Input signals tab

The **Input signals** tab shows the list of all the available input signals that can be used as input reference value to be compared according to the low and/or high thresholds.

Here you can also define if the value of a signal has to be used as high or low threshold instead of fixed value set in the **Comparator type** parameters (**Options** tab).

The following table shows the type of signals you can associate:

Signal type		Notes
Digital signals	Digital signal that belongs to the functions	• In the **Signal global properties** panel, the available options change according to the signal type. • See Input Signals properties to configure the input signals accordingly to the Group field. • You can add max 50 signals
	Digital signal that belongs to the modules (i.e. B4X-LS4-U)	
Analog signals	Analog signal that belong to functions	
	Analog signal that belong to modules	

Input Signals properties

In the **Input signal properties** area, for each input signal the following option is proposed:

If the Group field is set to...	Then the input signal is …
Input	used as real reference value *Note: the real reference signal has priority over the threshold limit and the latter is used only if a fault should occur to the real reference signal*
High reference	used as a dynamic high threshold *Note: If you do not set any input signal as high threshold, or if all the signals value is invalid, the Analogue comparator function works according to the fixed high threshold configured in the field **Comparator type** in the **Options** tab.*
Low reference	used as a dynamic low threshold *Note: If you do not set any input signal as high threshold, or if all the signals value is invalid, the Analogue comparator function works according to the fixed high threshold configured in the field **Comparator type** in the **Options** tab*

*Note: from the **Options** tab you can set the calculation mode (**Average, Maximum, Minimum**).*

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output	Inverted logic of the function can be enabled
Digital LED	

Note: You can add max 100 signals

Feedback signals tab

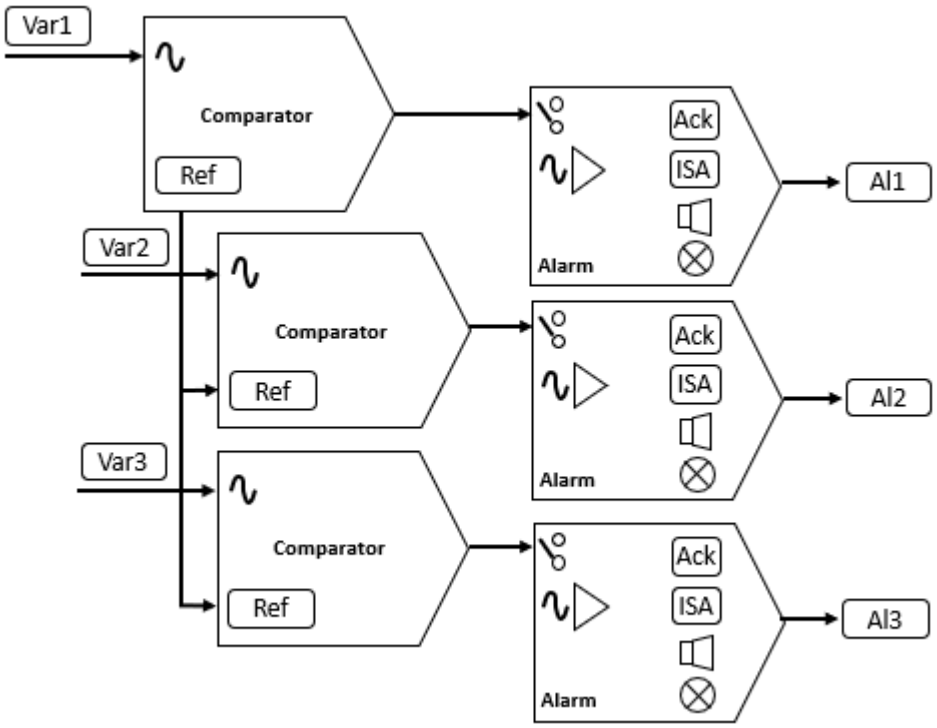
The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Alarm status**.

Signal type	Available options
Digital LED	Inverted logic of the function can be enabled
Digital	

Note: You can add max 50 signals

External references tab

From the **External references** tab, you can link an external **Analogue comparator** function for gathering the comparator settings. This way, you can have several analogue comparators working according to just one set of parameters: for each function, you have to set only the **Measure unit** and the **Resolution**.



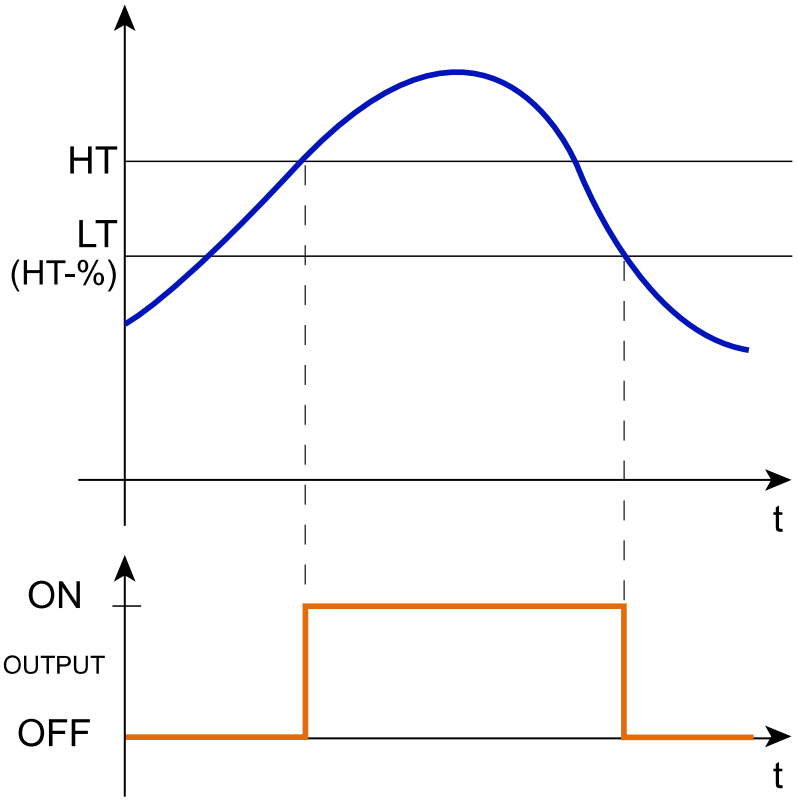
Comparator type

Moreover, from the **Options** tab, in the **Comparator type** field you can select the comparator working mode that and set the relevant parameters:

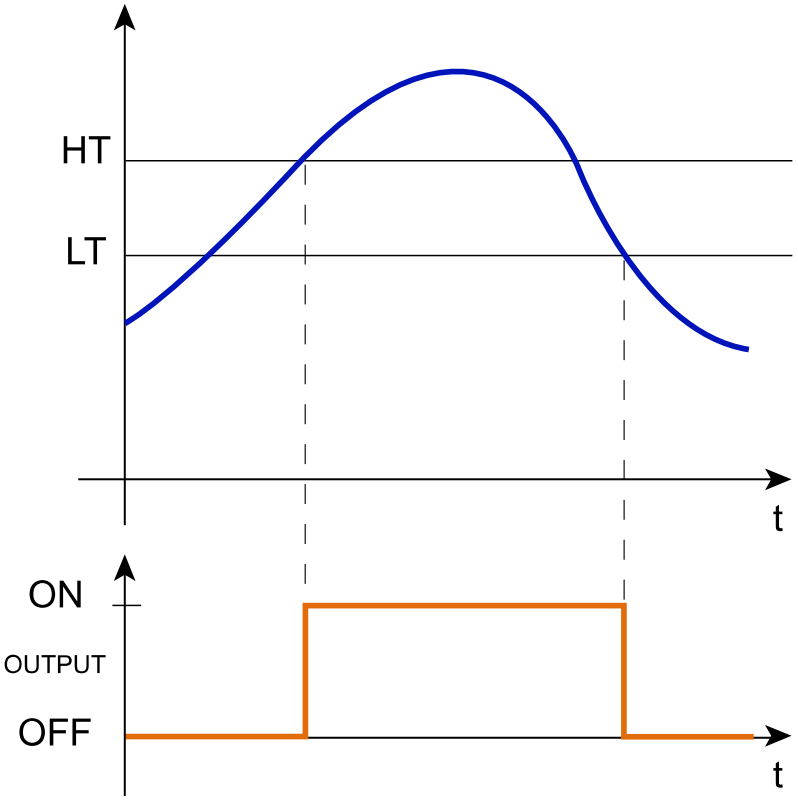
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Comparator type</td><td>Sets the Comparator mode:
Note: the parameters are shown according to the Comparator type selected
<table>
<tr><th>Option</th><th>Comparison modes to activate the alarm</th></tr>
<tr><td>Higher than (hysteresis %)</td><td>ON when the value is ≥ High threshold
OFF when the value is < High threshold - HIGH Level * HIGH hysteresis (%) / 100</td></tr>
<tr><td>Higher than (hysteresis = low threshold)</td><td>ON when the value is ≥ High threshold
OFF when the value is < Low threshold</td></tr>
<tr><td>Lower than (hysteresis %)</td><td>ON when the value is ≤ Low threshold
OFF when the value is > Low threshold + LOW Level * LOW hysteresis (%) / 100</td></tr>
<tr><td>Lower than (hysteresis = high threshold)</td><td>ON when the value is ≤ Low threshold
OFF when the value is > High threshold</td></tr>
<tr><td>Inside low and high thresholds</td><td>ON when value is inside the Low and High threshold</td></tr>
<tr><td>Outside low/high thresholds</td><td>ON when value is outside the Low or High thresholds</td></tr>
<tr><td>Disable comparator, status OFF</td><td>The comparator algorithm is disabled and the analogue output status is set to OFF</td></tr>
<tr><td>Disable comparator, status ON</td><td>The comparator algorithm is disabled and the analogue output status is set to ON</td></tr>
<tr><td>External analogue comparator reference</td><td>Comparator reference is linked to an external analogue comparator function. See "Settings" on page 112 > External reference</td></tr>
</table></td></tr>
<tr><td>High threshold</td><td>Sets the value for the High threshold. When the analogue signal value goes above the threshold, the condition is activated</td></tr>
<tr><td>Hysteresis (%)</td><td>Sets in percentage the hysteresis value for the High threshold</td></tr>
<tr><td>Low threshold</td><td>Sets the value for the Low threshold. When the analogue signal value goes below the threshold, the condition is activated</td></tr>
<tr><td>Hysteresis (%)</td><td>Sets in percentage the hysteresis value for the Low threshold</td></tr>
<tr><td>Delay ON (s)</td><td>Defines the delay before the activation of the Analogue comparator function when the comparison is true</td></tr>
<tr><td>Delay OFF (s)</td><td>Defines the delay before the deactivation of the Analogue comparator function when the comparison is false.</td></tr>
</table>

*Note: these are the same fields for setting the **Comparator type** to command signals or calendar events (**Dynamic behaviour** tab)*

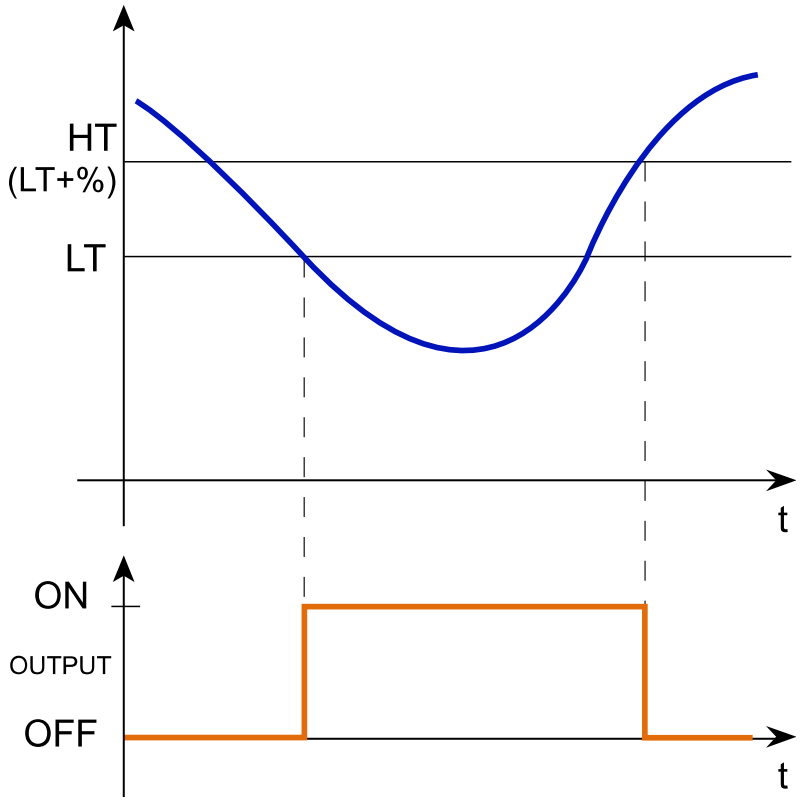
Comparator type: Higher than hysteresis %



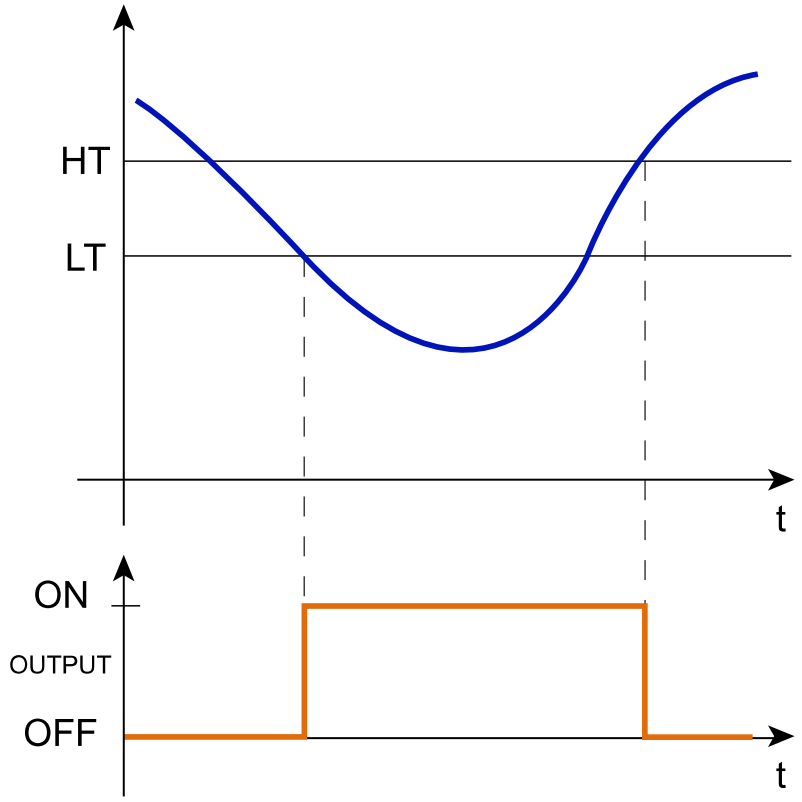
Comparator type: Higher than hysteresis is low threshold



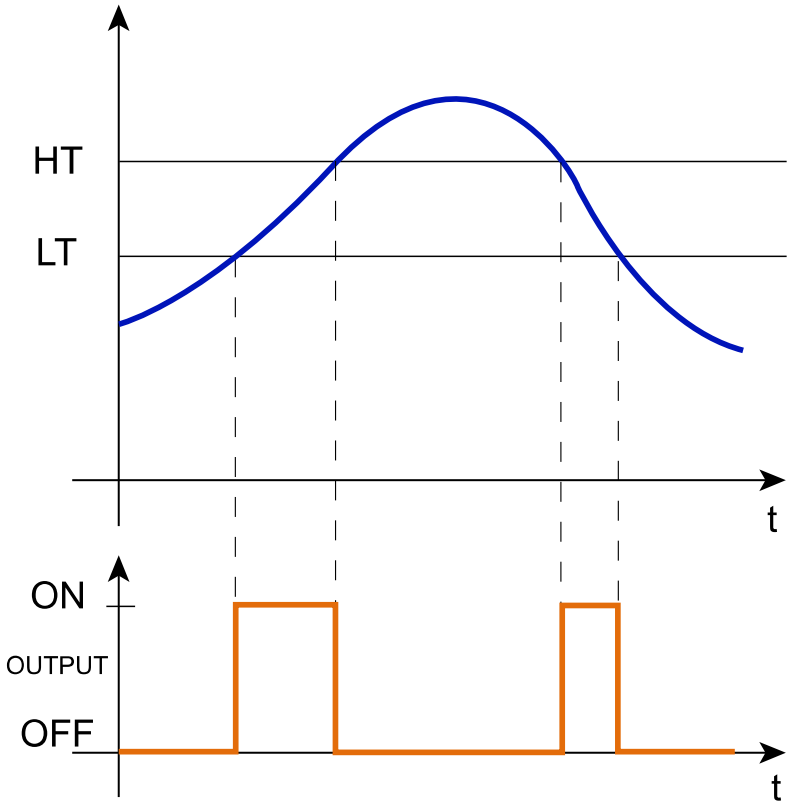
Comparator type: Lower than hysteresis %



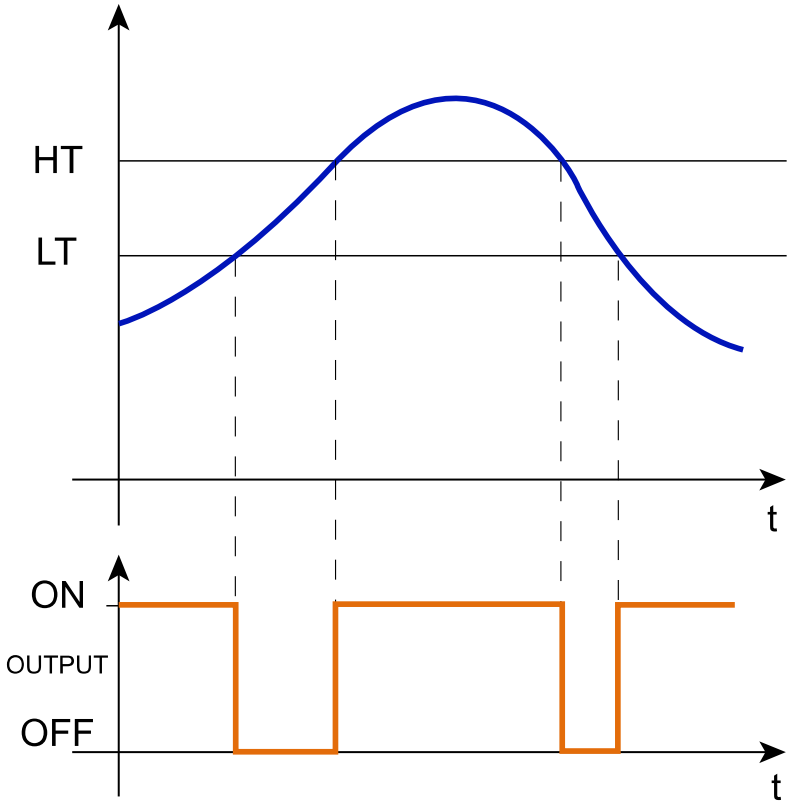
Comparator type: Lower than hysteresis is high threshold



Comparator type: Inside LT and HT



Comparator type: Outside LT and HT



Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold Action on falling*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold*

Procedures

Functions > Analogue comparator > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Custom** column, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Analogue comparator > Settings > Command signals

Add the input signals

1. From the **Input signal** list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the Main signal panel
3. From the **Group** field, set the input property among **Input**, **Low** or **High threshold**
4. From the **Signal global properties**, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Main signal** panel
3. From the **Type** field, set the condition the output is activated among **Warning** or **Alarm**
4. From the **Signal local properties**, set the options according to the configuration

Add the command signals

1. From the command signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the Properties panel
3. From the Signal local properties, set the Comparator type according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set.
2. From the **Signal local properties**, set the **Feedback mode** for each function status
3. From the Feedback mode column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Analogue comparator

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Home > Functions > Analogue comparator > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Multigate

Content

This section includes the following topics:

Introduction to the Multigate function

The **Multigate** function can be used for executing a logical operation with one or more inputs and with one output condition.

The function input is a list of signals; the output is a digital signal controlled by the value of the formula associated.

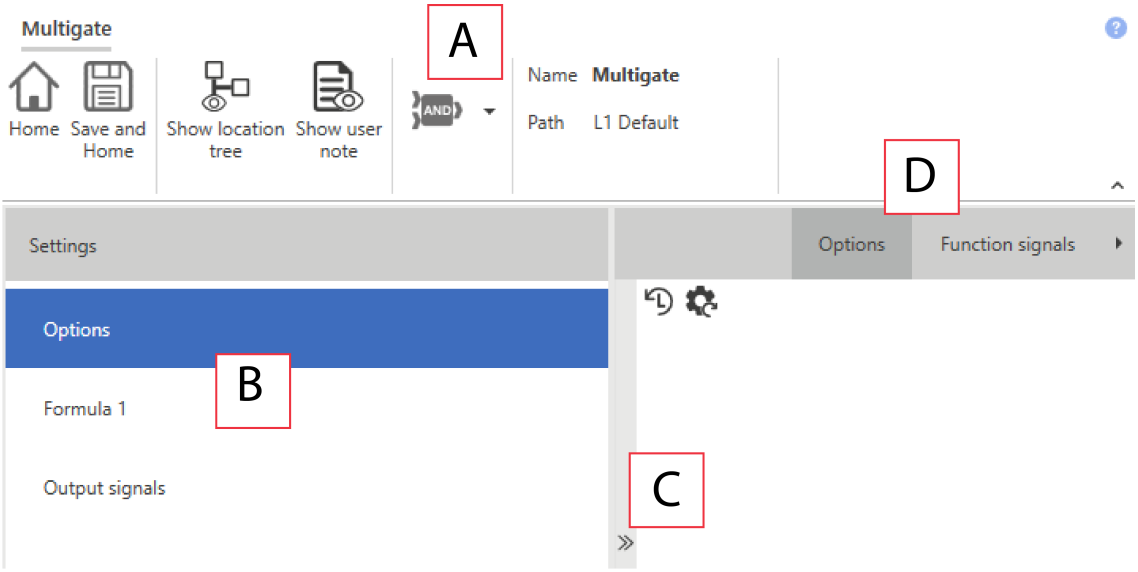
Following are the actions that you can perform with a **Multigate** function:

- Collect signals from different monitoring points (e.g., door contacts or window switches in an **Alarm** function).
- Monitor signals and/or functions to get quickly a status overview.

You can use a formula value as the input of another formula so to get a single custom logical function.

Multigate page

Home page > (Building)/Energy > Function menu > Multigate



Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, selects the formulas and manages the signal names. • **Formula 1**, edits the formula 1. • **Formula 2, 3, 4**, edits additional formulas. These tabs will be shown only if the related check box is enabled from the **Options** tab. • **Output signals**, sets the output signals driven by the formula values *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
Enable formula 2	Enables the relevant **Formula** tab
Enable formula 3	
Enable formula 4	

Note: you can enable a formula even if you do not need to edit it. This way you can send a command to force a value. If you do not enable the formula, you cannot force the value.

The **Function signals** sub-menu shows the list of the available function signals and the relevant statuses:

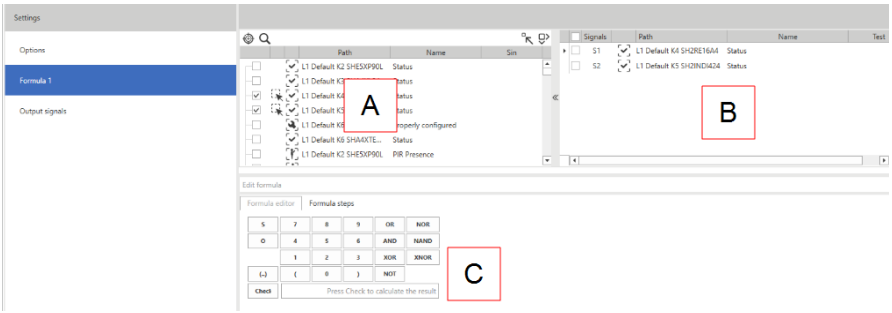
<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Formula signal status (default, Formula 1/2/3 or 4 signal)</td><td>For each formula, you can see its value</td><td>Shows the function status:
<table>
<tr><th>Status</th><th>Value</th><th>Description</th></tr>
<tr><td>1</td><td>OK OFF (0)</td><td>The formula status is OK and is False (0)</td></tr>
<tr><td>2</td><td>OK ON (1)</td><td>The formula status is OK and is True (1)</td></tr>
<tr><td>3</td><td>Not valid input</td><td>The input value used in the formula is not valid</td></tr>
<tr><td>4</td><td>Formula</td><td>The formula calculation is not correct.
Check the formula syntax since it could be wrong.</td></tr>
<tr><td>5</td><td>Formula not used</td><td>The formula value is not used by the function output or as input by another function.</td></tr>
<tr><td>6</td><td>Forced OFF(0)</td><td>The formula status is forced to OFF (0)</td></tr>
<tr><td>7</td><td>Forced ON (1)</td><td>The formula status is forced to ON (1)</td></tr>
</table></td></tr>
</table>

*Note: you can rename each signal (**Name** field) with the operator used in the formula.*

Formula tab

The **Formula 1, 2, 3** or **4** tabs permit you to access the input signals and the logical operation of the function by selecting the keyboard.

Following is the window structure:



Element	Description
A	**Main signals**panel, shows the list of all the available signals in the current configuration
B	**Selected signals** panel, shows the signals added from the Main signals panel, available for the formulas.
C	**Formula editor** tab. The keyboard permits you to edit the formula for the selected signals and to test the formula. **Formula steps** tab, shows how the system calculates the formula.

Main signals panel

This panel shows the types of signal you can use as input signals in the formula. Following are the signal types:

Signal type		Notes
Digital signal	Digital signal belonging to functions	• *From the **Signal global properties** you can manage additional parameters for each signal.* • *You can add max. 50 signals*
	Digital signal belonging to modules (i.e. B4X-LS4-U)	
Function status	Analogue signal belonging to functions	
	Analogue signal belonging to modules	

Selected signals panel

This panel shows the signals you added to the **Multigate** function and that are available for the formula calculation. Following are the parameters for each signal:

Parameter	Description
☐	Check it to enable the signal
Signals	Shows the index identifying the signal in the system
Path	Shows the function/signal name and icon
Name	Shows the function/signal type

Parameter	Description
Test value	Permits simulating the signal value, setting the value to 0 or 1. *Note: the default value is 0 for all the signals added.*

Formula panel

This panel contains a keyboard with the following elements:

Elements	Description
Edit formula	Shows the formula syntax and permits editing it manually through the keyboard
Keyboard	See the table below.
Formula steps	Shows the steps followed by the system to calculate the formula

Keyboard elements

Element	Description
S	Permits adding to the formula the identifier for an input signal *Note: if the signals are added automatically, this operation is not needed.*
O	Permits using a formula value as the input of another formula. Following are the different syntaxes: • O1 represents the syntax to use the formula 1 value as input. • O2 represents the syntax to use the formula 2 value as input. • O3 represents the syntax to use the formula 3 value as input. • O4 represents the syntax to use the formula 4 value as input.
(..)	Adds two round brackets
(	Adds an opening round bracket
)	Adds a closing round bracket
0-9	Adds the numeric index representing the signal to be added to the formula. *N.B.: the index has to go after an S if referred to a signal in the **Selected signals** tab.*
OR	Applies the logical operator OR to the selected signals
AND	Applies the logical operator AND to the selected signals
XOR	Applies the logical operator XOR to the selected signals
NOR	Applies the logical operator NOR to the selected signals
NAND	Applies the logical operator NAND to the selected signals
NOT	Applies the logical operator NOT to the selected signals
Check	Checks if the formula is correct and verifies the system steps in the **Formula steps** tab. This way, it is possible to understand if the operation has been correctly calculated.

Output signals tab

The **Output signals** tab shows the list of all the available output signals that can be controlled by the function main status according to the formula result.

<table>
<tr><th>Signal type</th><th>Available options</th></tr>
<tr><td>Digital output</td><td rowspan="2">According to your requirements, the parameters for each output signal are the following:
<table><tr><th>Working type</th><th>Behaviour</th></tr><tr><td>Inverted</td><td>You can enable the inverted logic of the output</td></tr><tr><td>Formula 1 Out</td><td rowspan="4">The output takes the Formula 1/2/3 or 4 status</td></tr><tr><td>Formula 2 Out</td></tr><tr><td>Formula 3 Out</td></tr><tr><td>Formula 4 Out</td></tr></table>
In the Signal global properties panel, you can manage additional parameters.
Note: You can add max 50 signals</td></tr>
<tr><td>Digital LED</td></tr>
</table>

Procedures

Functions > Multigate > Formula tab

Edit a formula

1. From the **Main signals** list, select the input signals to add to the configuration.

   Notes:

   - *When you select a signal, it appears in the **Selected signals** list.*
   - *The **Signals**column indicates the signal identifier. S1 is the first signal.*

2. From the **Selected signals** panel, select the input signals by checking the relevant boxes.
3. From the keyboard, select the logical operator to be applied to the selected signals

   Notes:

   - *In the **Edit formula** field you see the formula syntax*
   - *In this box you can edit manually the formula value*

Use a formula output as input for another formula

Note: to use a formula value as input for another formula, you have to activate at least two formulas.

1. Click **O** from the keyboard to add the output identifier.
2. According to the formula used as input signal, enter the numeric identifier.

   *Example: if in the Formula 2 you want to use the Formula 1 value, enter **O1**.*

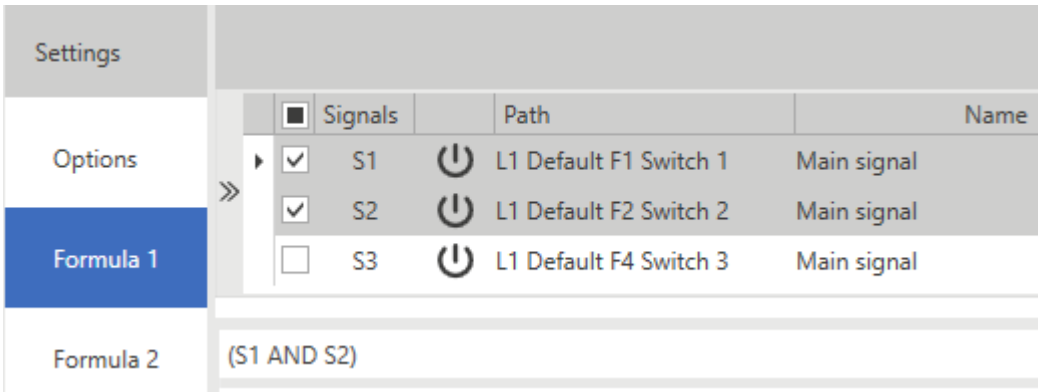
3. From the **Selected signals** panel, select the input signals you want to use in the calculation by checking the related boxes
4. From the keyboard, select the logical operator to apply to the selected signals and another formula value.

   Notes:

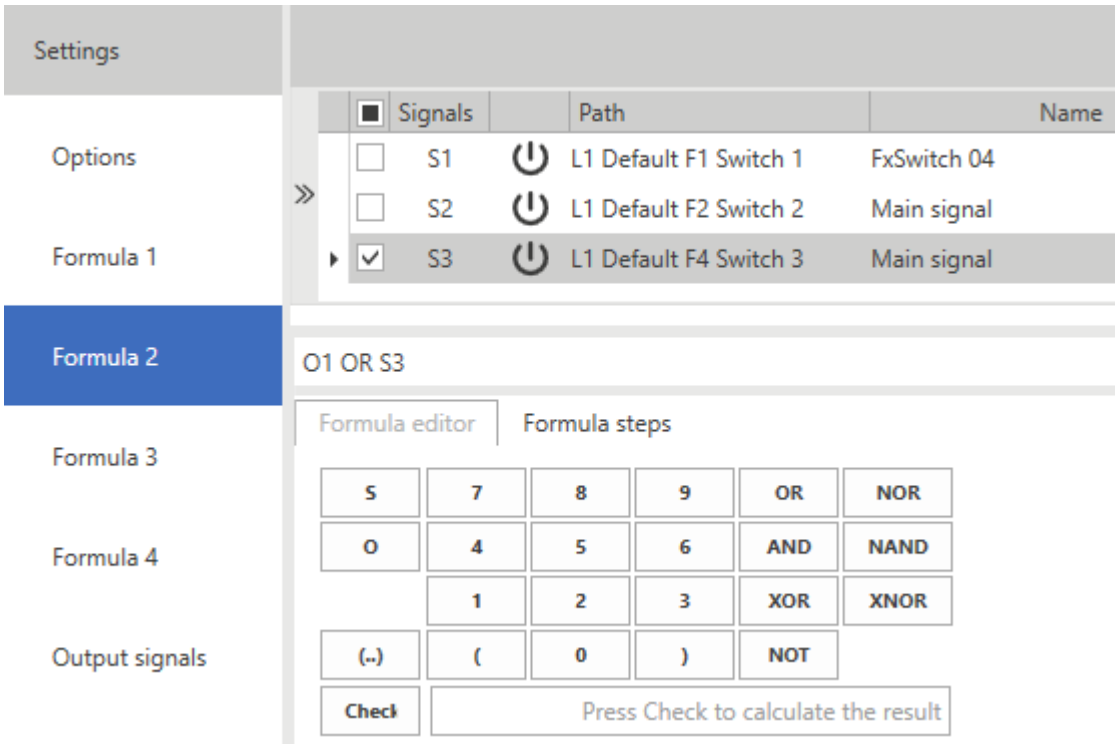
   - *In the Edit field you see the formula syntax.*
   - *In this box you can edit manually the formula value.*

Example:

1. Formula 1 applies the AND logic between the S1 and S2 signals:



2. Formula 2 applies the OR logic between the Formula 1 and S3 signal:



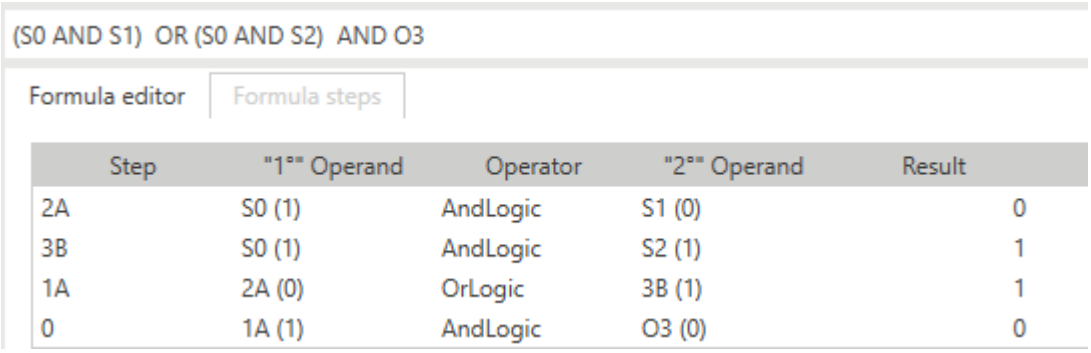
Test a formula

1. From the Test value column (Selected signals list), for each signal you can simulate the signal value (0 - OFF and 1 - ON), through spin box.

   Note: the default value is 0 for all the signals.

2. Click **Check** from the keyboard to see the value simulated by the formula.

   *Note: if you select the **Formula steps** tab, you can verify the steps the systems follows for calculating the formula.*



Functions > Multigate > Output signals tab

Add the output signals

1. From the **Main signals** panel, select the output signals you want to add to the configuration.

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signals from the **Selected signals** panel
3. From the **Type** field, select for which formula value you want to pilot the output
4. From the **Signal global properties** panel, you can manage additional parameters

Functions > Multigate

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Edit the function signal name

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the statuses you want to assign to the **Custom signal**

   Note: its value is ON when at least one of the selected statuses is true.

Mathematical

Content

This section includes the following topics:

Introduction to the Mathematical function

The **Mathematical** function provides you with a set of mathematical operations for two or more digital or analogue input signals.

Following are the available operations:

- **Average**, gives the average value among the input signals (**Selected signals** panel).
- **Maximum**, gives the maximum value among the input signals (**Selected signals** panel).
- **Minimum**, gives the minimum value among the input signals (**Selected signals** panel).
- **Algebraic operations**, such as addition, subtraction, multiplication, division, logarithm, square root, exponentiation.
- **Linear approximation**, calculates an analogue output through a curve defined by the user.
- **Derivative**, calculates the signal derivative within an interval of time defined by the user.

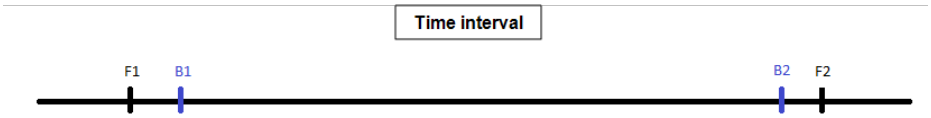
Calculate a derivative

*See **"Settings" on page 140**> Keyboard > Operators*

The Mathematical function can be used to calculate the derivative. The derivative value (deintegration of the b value within the interval) is calculated as (b2-b1)/T where b1 is the value at the beginning of the interval T and b2 the value at the end.

The interval can be set from the **Formula editor** tab, using the **Derivative time** field of the keyboard and can be of 5, 10, 15, 20, 30, 60 minutes or 24 hours.

As soon as the time expires, the system calculates the derivative new value as the difference between the current value (b2) and the previous one (b1) divided by the time (T as fraction of one hour).



At the first start, the derivative value will be **Not valid** until the first valid value of b1 will not be available, according to the T value. As soon as the time expires, the derivative will be calculated using the formula

(b2-b1)/T

where b2 is the variable new value. After that, b2 will be the new b1.

Example of derivative calculation

Derivative Time: 5 minutes

t0 : 00:03:00 → b1 = Not valid, b2 = Not valid, derivative = Not valid
t1 : 00:05:00 → b1 = 10, b2 = Not valid, derivative = Not valid
t2 : 00:10:00 → b1 = 20, b2 =10, derivative = (20-10)/ (T/60)
t3 : 00:15:00 → b1 = 30, b2 =20, derivative = (30-20)/ (T/60)

Notes:

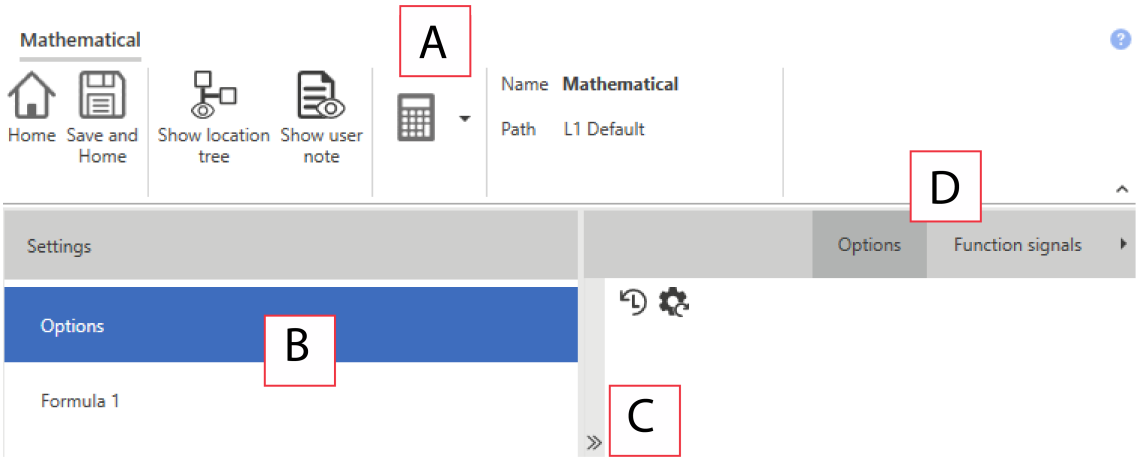
- *in case of system reboot, the derivative value will be saved in the database restore. The next values will be calculated according to the algorithm described before.*
- *If you change the time, the derivative value will be that previously calculated and the next values will be calculated according to the algorithm but starting from the new time.*
- *If you cannot read the variable value or if the value is not valid, the derivative value will not be valid and as soon as the variable value will be available again it will be possible to use the algorithm described before to recalculate the variable.*
- *If b2- b1 is negative, the not valid value is restored and the calculation is repeated.*

- *If the variable does not change quickly, there could be some incorrect values. In that case, you should save and calculate the derivative before the time expiring.*

*See **"Procedures" on page 146** > Calculate a derivative*

Mathematical page

Home page > (Building) > Function menu > Mathematical



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Formula 1**, defines the list of signals to be used in the calculation formula. • **Formula 2, 3, 4**, tabs of additional formulas. **Enable** the relevant tab from the **Options**tab. *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
Enable formula 2	Enables the relevant **Formula** tab
Enable formula 3	
Enable formula 4	

Note: you can enable a formula even if you do not need to edit it. This way you can send a command to force a value. If you do not enable the formula, you cannot force the value.

The **Function signals** sub-menu shows the list of the available function signals and the relevant statuses:

Element	Description	Value
Mathematical signal 1, 2, 3, 4	Each formula has its output signal	The signal value is the result of the formula calculated by means of statistic, algebraic, linearisation or derivation operators. Each output signal can be used as input signal in other functions. *Please see the other functions for further details.*

*Note: there can be max. four output signals (one for each formula activated from **Options** tab > **Options**)*

You can change the signal name or force the default name visualization (**Name** field).

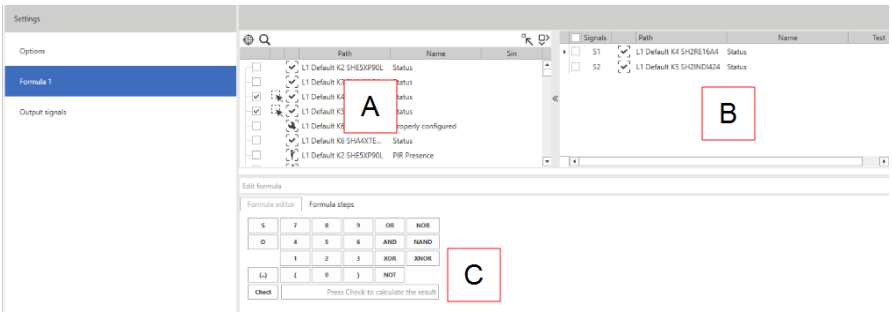
From the Signal global properties you can set the local and global properties (such as the pulse weight, resolution or measure unit) of the signal.

Formula tab

The **Formula 1, 2, 3** or **4** tabs permit you to access the input signal selection. Moreover, thanks to the keyboard, you can define the formula according to statistic, algebraic, linearisation and derivation operators.

By default the **Formula 1** tab is enabled and from the **Options** you can enable the other **Formula** tabs.

Following is the window structure:



Element	Description
A	**Main signals** panel, shows the list of all the available signals in the current configuration

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>B</td><td>Selected signals panel, shows the signals added from the Main signals panel, available for the formulas. From this panel you can Add, Move, Select or Remove a row.
The operands in the formula are named S1, S2, S3 and so on, according to the order assigned in the Signals column.</td></tr>
<tr><td>C</td><td>From the Signal global properties for each signal you can change the resolution. This way, the formula can calculates accurately. Following are the properties that you can manage:
Signal TAG
Measure unit
Resolution
Minimum
Maximum
Default
Offset
Enable log
Note: these properties can be changed according to the signal type.
The If not valid field has the following options:
Default
Minimum / Maximum
Last valid
Note: for a not valid value the default is applied.
0
Null</td></tr>
<tr><td>D</td><td>Formula section. Following are the different tabs that you can manage:<table><tr><th>Tab</th><th>Description</th></tr><tr><td>Formula editor</td><td>Thanks to the keyboard you can edit the formula for the selected signals and test the validity.
Note: the system considers the selection order of the signals used in the formula syntax.</td></tr><tr><td>Formula editor</td><td>Shows the formula syntax. The syntax can be automatically compiled with the previously selected signals and operators (from the keyboard) or manually edited by users.</td></tr><tr><td>Linearisation curve editor</td><td>You can change the linearisation curve.</td></tr></table></td></tr>
</table>

Important note: the input signal properties do not depend on the function where they are used. You can also change them from each window where the signal appears, from the Signal global properties panel. Any change to a parameter will be applied to all the configuration.

Main signals panel

This panel shows the types of signal you can use as input signals in the formula. The input signal can be any physical signal (such as energy, power, energetic current, temperature, humidity, brightness and so on) or also output signals of other functions of the configuration.

Following are the signal types:

Signal type		Notes
Digital signal	Digital signal belonging to functions	• *From the Signal global properties you can manage additional parameters for each signal.* • *You can add max. 50 signals*
	Digital signal belonging to modules (i.e. B4X-LS4-U)	
Function status	Analogue signal belonging to functions	
	Analogue signal belonging to modules	

Selected signals panel

This panel shows the signals you added to the **Mathematical** function and that are available for the formula calculation. Following are the parameters for each signal:

Parameter	Description
☐	Check it to enable the signal
Signals	Shows the index identifying the signal in the system
Path	Shows the function/signal name and icon
Name	Shows the function/signal type
Test value	Permits defining the value to test the formula. *Notes:* • *This value is considered only to check the formula and has nothing to do with the default value that can be applied to the signal.* • *The default value is 0 for all the signals added.*

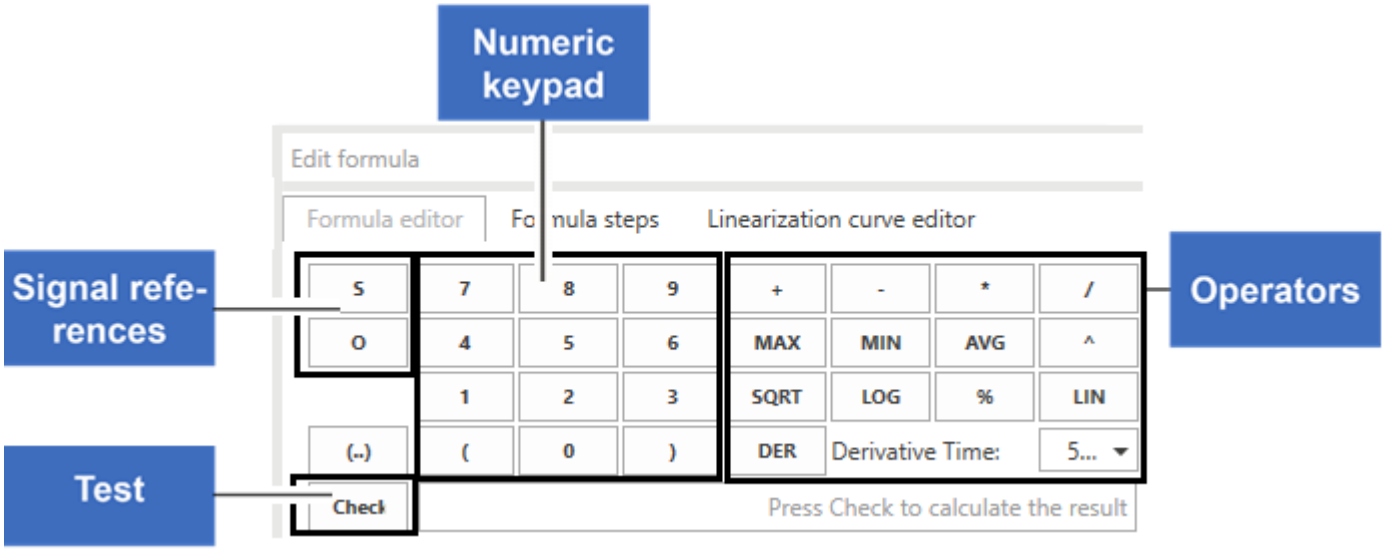
Formula panel

This panel contains a keyboard with the following elements:

Elements	Description
Edit formula	Shows the formula syntax and permits editing it manually through the keyboard
Keyboard	Please go to "Keyboard" on the next page
Formula steps	Shows the steps followed by the system to calculate the formula

Keyboard

The following elements compose the keyboard.



Element	Description
Signal references	Permits selecting the operands for the formula calculation.

Element	Description
S	Permits adding to the formula the identifier for an input signal *Note: if the signals are added automatically, this operation is not needed.*
O	Permits using a formula value as the input of another formula. Following are the different syntaxes: • O1 represents the syntax to use the formula 1 value as input. • O2 represents the syntax to use the formula 2 value as input. • O3 represents the syntax to use the formula 3 value as input. • O4 represents the syntax to use the formula 4 value as input.
Constants	You can add a constant to the formula.

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>Operators</td><td>
Can be unary, binary or multiple:

A unary operation is an operation with only one operand. Following are the unary operators:

<table>
<tr><th>Operator</th><th>Description</th><th>Editing formula text</th><th>Result</th></tr>
<tr><td>SQRT</td><td>Square root</td><td>(SQRT b)</td><td>SQRT(b)</td></tr>
<tr><td>LIN</td><td></td><td>(LIN b)</td><td>LIN(b), with the curve coordinates</td></tr>
<tr><td>DER</td><td></td><td>(DER b)</td><td>Derivative of the signal B within the interval T (s). The system calculates the discrete derivative (b2-b1) / T where b1 is the value at the beginning of the interval and b2 is the value at the end of the interval.</td></tr>
</table>

A binary operation uses two operands (between two terms). Following are the binary operators:

<table>
<tr><th>Operator</th><th>Description</th><th>Editing formula text</th><th>Result</th></tr>
<tr><td>LOG</td><td>(a LOG b)</td><td>Log with base b of a</td><td>LOG</td></tr>
<tr><td>%</td><td>(a % b)</td><td>a % of b</td><td>%</td></tr>
<tr><td>^</td><td>(a ^ b)</td><td>a ^ b</td><td>^</td></tr>
</table>
A multiple operation uses two or more operands (always between two terms). Following are the multiple operators:
<table>
<tr><th>Operator</th><th>Description</th><th>Editing formula text</th><th>Result</th></tr>
<tr><td>+</td><td>(a + b)</td><td>a + b</td><td>+</td></tr>
<tr><td>-</td><td>(a - b)</td><td>a – b</td><td>-</td></tr>
<tr><td>*</td><td>(a * b)</td><td>a * b</td><td>*</td></tr>
<tr><td>/</td><td>(a / b)</td><td>a / b</td><td>/</td></tr>
<tr><td>MAX</td><td>(a MAX b)</td><td>Max of (a, b)</td><td>MAX</td></tr>
<tr><td>MIN</td><td>(a MIN b)</td><td>Min of (a, b)</td><td>MIN</td></tr>
<tr><td>AVG</td><td>((a + b) / n</td><td>Average of (a, b) - n = number of operands</td><td>AVG</td></tr>
</table>
</td></tr>
</table>

Element	Description
Numeric keypad	Contains the buttons below:

Element	Description
(..)	Adds two round brackets
(	Adds an opening round bracket
)	Adds a closing round bracket
0-9	You can add a reference to a signal if then you select **S** or **O**. You can also add a constant.
Check	Checks if the formula is correct and verifies the system steps in the **Formula steps** tab. This way, it is possible to understand if the operation has been correctly calculated.

Procedures

Functions > Mathematical > Formula tab

Select the input signals

1. From the **Mail signal** list of the **Formulas** tab, select the input signals you want to add to the **Selected signals** list.
2. As soon as the signal is added, from the **Signals**column you will see the unique identifier (starting from S1).

Remove the selected signals

From the **Mail signal** list of the **Formulas** tab, click to remove the relevant signal.

Notice: if a formula contains a reference to a signal you have removed, the consecutive signal input value will be considered and the formula result will change.

Edit a formula

1. From the **Selected signals** list, select the input signals by checking the relevant boxes.

   Note: the order in which the input signals are selected will be applied to the formula. For example, in case of division, if you select S2 before S1, the syntax of the formula will be (S2/S1).

2. From the **Keyboard**, select the operator you want to apply.

If you select…	Then in the *Edit Formula* field…
a unary operator with one operand	you get ([operator] Signal)
a binary operator with two operands	you get (Signal a [operator] Signal b)
multiple operators with two or more operands	you get (Signal a [operator] Signal b [operator] Signal c)
all the other cases	you get only the operator

   *Note: in the **Edit formula** box you can always change the formula value manually.*

3. Click **Check** to simulate the formula using the value entered in the **Test value** column.

   Note: you can test the formula also reusing previous formulas (syntax O1-4). Go to "Use a formula output as input for another formula" below

Use a formula output as input for another formula

Note: to use a formula value as input for another formula, you have to activate at least two formulas.

The system executes the calculation of formulas following this order: 1, 2, 3, 4.

If the system uses the Formula 1 output in the Formula 2, the value of the Formula 2 will update. If the system uses the Formula 2 output in the Formula 1, the Formula 1 result will be that of the previous interaction.

For this reason, you have to properly order the formulas.

*Notice: if you use a formula output value that has not yet been calculated , you will see the **Formula not valid** status. This condition resolves automatically as soon as the value is calculated / updated.*

1. Click **O** from the keyboard to add the output identifier.
2. According to the formula used as input signal, enter the numeric value.

   *Example: if in the Formula 2 you want to use the Formula 1 value, enter **O1**.*

Define the values to test the output signals

Open the **Function signals** tab (from the **Options** menu)

From the **Test value** column, enter the value as follows:

If you want to use the test value…	Then set the value to...
O1	Mathematical signal 1
O2	Mathematical signal 2
O3	Mathematical signal 3
O4	Mathematical signal 4

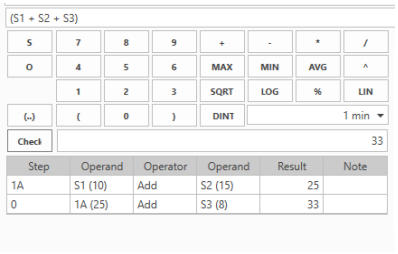
Test a formula

1. From the **Test value** column (**Selected signals** list), for each signal you can simulate the signal value (0 - OFF and 1 - ON), through spin box.

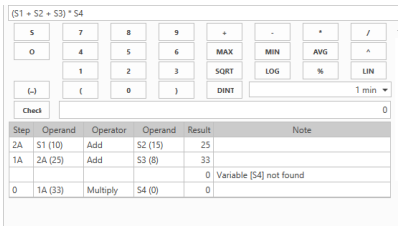
   Note: the default value is 0 for all the signals.

2. Click **Check** from the keyboard to see the value the formula simulates.

Following are some examples.

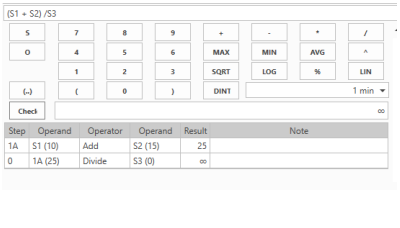


Example 1



Example 2

(reference to an input signal not in the list)

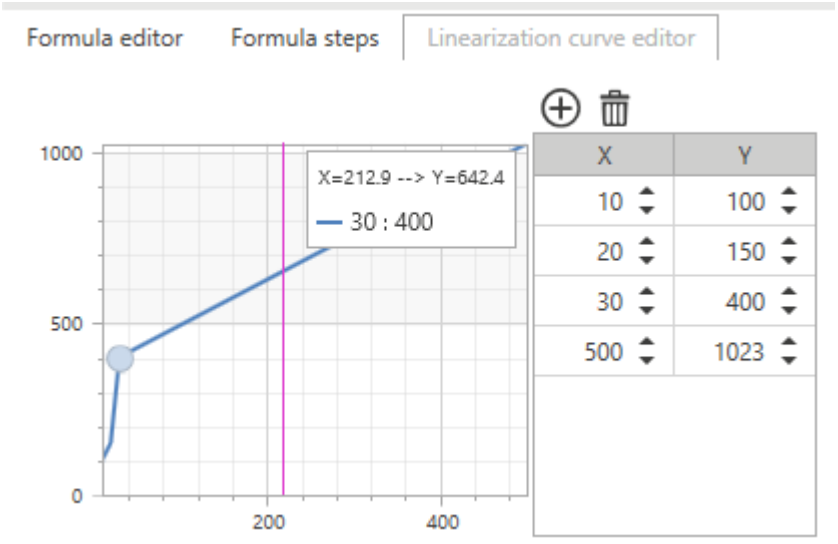


Example 3 (division by 0).

*In this example, the division by 0 is considered a not valid condition and the signal value is replaced with the default value or with the value set in the **If not valid** field.*

Define a linearisation curve

Through a linearisation curve, you can set the X/Y coordinates to convert an input signal value. This linearised signal can be used as input signal in other functions.



If you want…	Then...	Note
a linearisation point in the table	Enter the X/Y coordinates to calculate the linearised value	*The input values that are not included in the curve are replaced with Y/X.*
to see the Y and X coordinates	Hover over the desired point	• *The X coordinates are ordered automatically before applying the calculation (the representation on the table does not change).* • *In the formula, you cannot use a linearisation curve of another signal.* • *You can drag and drop the linearisation curve from a signal to another.*

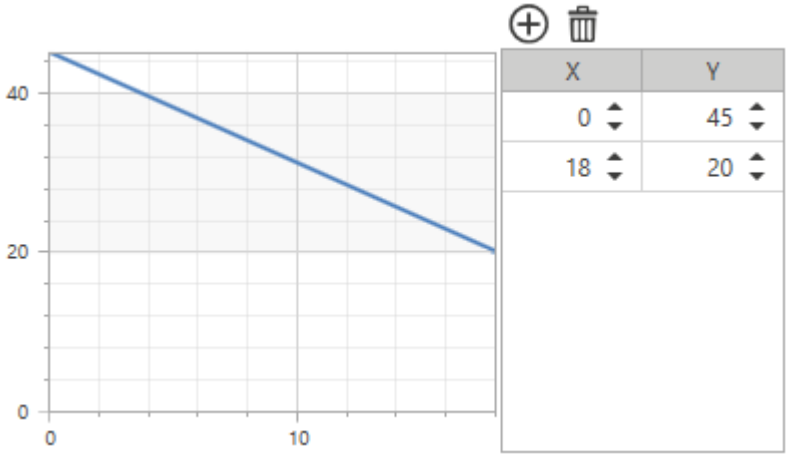
Use case 1 - example of compensation of the heating threshold

In this example, the **Mathematical** function is used to balance a boiler water temperature according to the external temperature. If the external temperature is lower, the water temperature increases to get a better response from the heating system.

In the **Formula** tabs, you can select an external temperature (e.g., coming from the BSI-TEMANA-U module) as input signal.

If the external temperature is...	Then the water temperature will be…
≤ than 0° C	45° C
0 - 18° C	
> than 18° C	20° C
12° C	28° C

In the **Linearisation curve editor** tab, you can set the coordinates according to the conditions described in the table above. Moreover, you can add (⊕) or remove a row (🗑).



After defining the curve, from **Formula editor** > **Selected signals** you have to select the temperature signal and click **LIN** on the keyboard. Doing so, you will see the following syntax:

LIN S1

Calculate a derivative

1. From the **Selected signals** list of the **Formula** tabs, select the input signals you want to use for the derivative calculation.
2. Select DER from the keyboard to complete the formula or edit the formula manually.
3. Set the interval value from the **Derivative Time** field.

Functions > Mathematical

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Edit the function signals name

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the statuses you want to assign to the **Custom signal**

   Note: its value is ON when at least one of the selected statuses is true.

Analogue output

Content

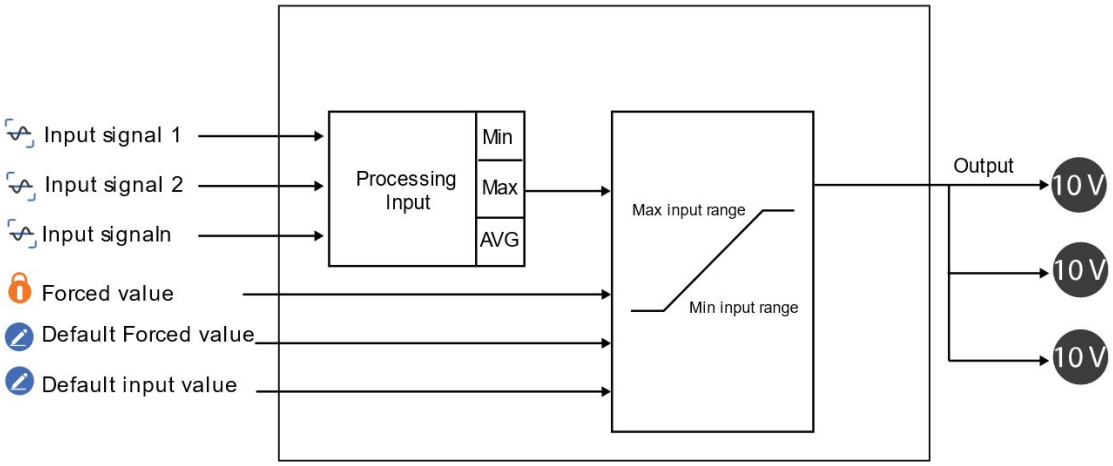
This section includes the following topics:

Introduction to the Analogue output function

The **Analogue output** function permits you to connect one or more system signals to an analogue output module.

The function manages the following types of signal:

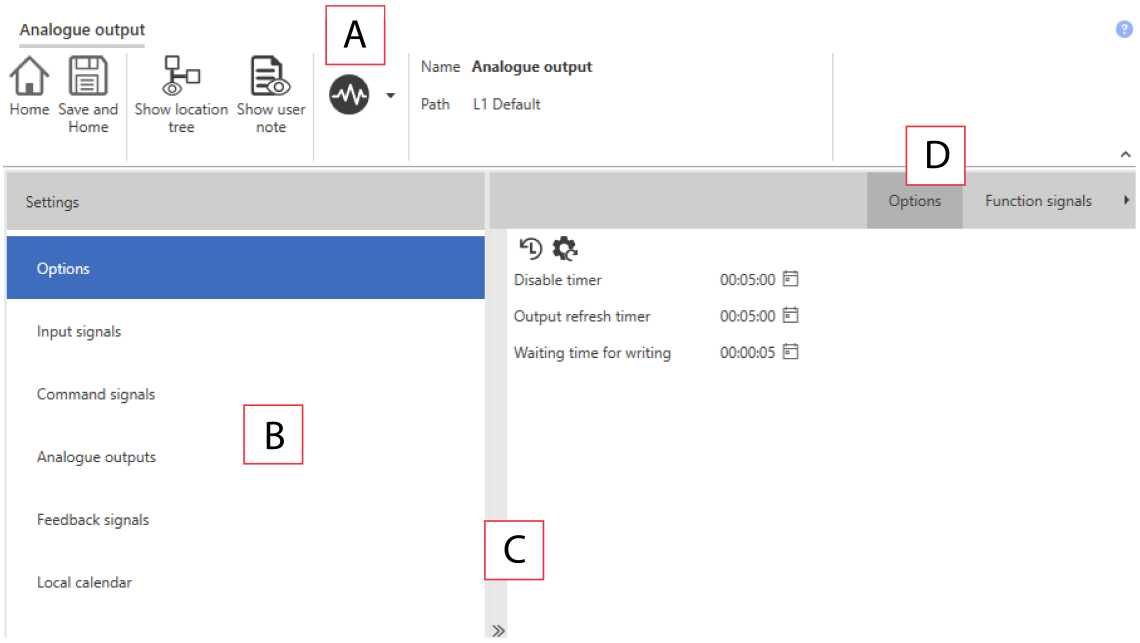
- **10 V signals** (SHPOUTV224 module). This type of signal is an industrial standard that transmits a value to a panel meter or to an actuator (e.g. pump, boiler, fan). The programmability of the output signal permits also to manage the 0-1 V / 0-5 V industrial signals.



10. Analogue output functioning

Analogue output page

Home page > (Building) > Function menu > Analogue outputs > Analogue output

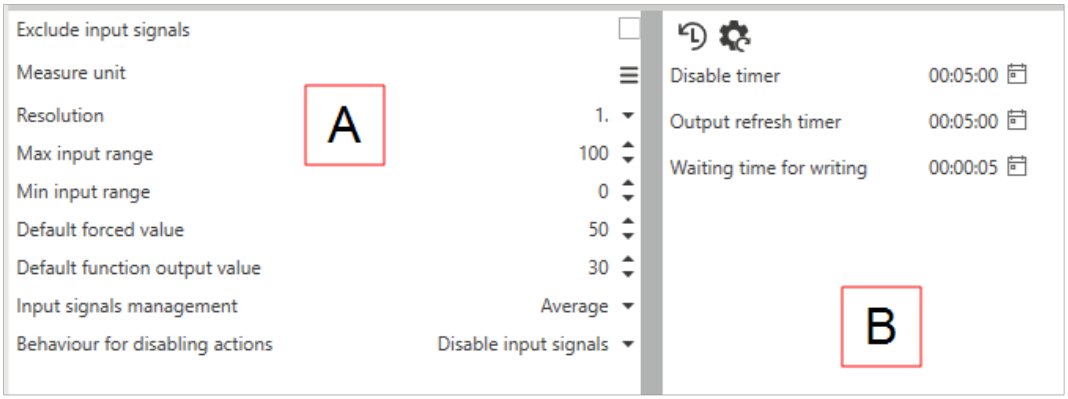


Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Input signals**, sets the input signals to change the function output status. • **Command signals**, sets the command signals to trigger the actions. • **Analogue signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local calendar**, sets calendar events to automate the function according to time schedules. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.
From the **Options** sub-menu, you can set the following parameters:



Element	Description

A

Parameter	Description
Exclude input signals	If you enable it, the input signals will not be considered and the **Input signals** tab will not be shown. When this functionality is enabled, the output signals are changed when the function receives a command from Modbus/BACnet or the Web App.
Measure unit	Selects the measure unit for the function value. *Notes:* • *the selected measure unit does not impact the resolution of the function value.* • *it will be used as label in the UWP IDE and in the Web-App.*
Resolution	Sets the resolution value according to your requirements.
Max input range / Min input range	Sets the minimum/maximum limits the input value can assume
Default forced value	Defines the forced value that is applied at the first **Force** command if you don't specify any value.
Default function output value	Defines the value that is applied to the output at the system start-up if no signal is connected or if all the output signal values are **Not valid**.
Input signal management	Selects how to treat the input signals. The available options are the following: • **AVG**. Uses the average value of all signals present in the **Input signals** tab as input. • **MIN**. Uses the minimum value among the signals present in the **Input signals** tab as input. • **MAX**. Uses the maximum value among the signals present in the **Input signals** tab input. *Notes:* • *If the **Exclude input signals** parameter is activated, this value will not be shown.* • *If an input value is **Not valid**, the average calculation will not be affected.*
Behaviour for disabling actions	Defines the behaviour of the **Disable** condition when active: • **Disable inputs**. The input variation does not change the output. • **Disable calendar**. Only the calendar events are disabled. • **Disable inputs and calendar**. Both the automatisms are disabled.

Element	Description
B	Parameters you can change from the **Live signals** panel:

Parameter	Description
Disable timer	Sets the time period after which the **Disable ON** condition is deactivated. (0 - 24 h. Default value: 5 minutes).
Refresh output timer	Sets the refresh time to rewrite the output values periodically (0 - 24 h. Default value: 5 minutes).

If this parameter is set to...	Then...
another value than zero	as soon as the timer expires, the function rewrites the output value. When the timer expires or the output value changes, the **Refresh output timer** recharges.
zero	the output values are not rewritten automatically.

Parameter	Description
Waiting time for writing	Sets the refresh period (0 - 24 h. Default value: 5 seconds) after which the output value is updated (written). The timer starts as soon as the writing is executed; the function does not execute any other writing until the timer expires.

If this parameter is set to...	Then...
another value than zero	it filters writings that come in succession quickly
zero	the output values are updated (written) after any change.

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant statuses.

Element	Description	Value
Status signal	Shows the function status	**Value** / **Status** 1 / Disabled 2 / Running 3 / Disabled, timeout is running
Function value signal	Function value	It can be the value calculated by the connected input values or by the value assumed as soon as a **Disable** or **Force** condition is verified.
Writing error signal	Shows the status of the writing commands	ON = writing error OFF = no writing error

Element	Description	Value
Input error signal	Shows the status of the input signals	ON = input signal error OFF = no input signal error
Custom signal	You can define when the custom signal has to be ON according to the status signal selected (see above)	ON = the selected status signal is true OFF = the selected status signal is false

Input signals tab

The **Input signals** tab shows the list of all the available input signals that can be used as input values.

The following table shows the types of signal you can associate:

Signal type		Notes
Analogue signals	belonging to functions	• *In the **Signal global properties** panel, the available options change according to the signal type.* • *You can add max 50 signals*
	belonging to modules	

Command signals tab

The **Command signals** tab shows the list of all the available signals.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Notes
Digital push button (e.g. SHA4XLS4TH module)	• Refresh the output status • Manage the **Disable** automations • Manage the **Force** conditions	• *You can add max 50 signals* • *See Available actions*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Analogue outputs tab

The **Analogue outputs** tab permits you to define the analogue output signals that are controlled by the function main status.

Signal type	Module part number	Note
Analogue output signal	SHPOUTV224	*You can add max 50 signals*

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Analogue output** status.

Signal type	Available options
Digital LED	Inverted logic
Digital	

Note: You can add max 50 signals

Local calendar

The **Local calendar** functionality can be used to trigger actions according to time schedules.

From the **Local calendar** sub-menu, you can set the following parameters:

Parameter	Description
Enable at controller start up	Executes all the events at the controller start-up. *Note: if at the controller powering ON the system finds some scheduled event, this event starts if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed.*
	Adds an event
	Defines the action recurrence. You can execute the action on some days of the week, some days of the month or some months of the year. *Note: settings are updated automatically every year.*
	Removes the selected event
Enable	Enables/disables the event
Description	Defines the event name that will appear in the **Local calendar** list
Day time	Triggers the event at the time set from the list (HH:MM:SS:)
Action	Selects the action to be performed when the time condition is verified. *See "Settings" on page 153*

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold*

Procedures

Functions > Analogue outputs > Analogue output > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Analogue outputs > Analogue output > Command signals

Add the input signals

1. From the **Signal list** panel, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. From the **Signal global properties**, set the options according to the configuration

   *Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Add the command signals

1. From the signal list, select the command signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

   *Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Add the analogue outputs

1. From the signal list, select the analogue signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. From the **Signal global properties**, set the properties according to the configuration.

*Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. From the **Signal local properties**, set the options according to the configuration

*Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set.
2. From the **Signal local properties**, set the **Feedback mode** for each function status
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

FunctionsAnalogue outputs > Analogue output

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Home > Functions > Analogue outputs > Analogue output > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time and any other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Modbus outputs

Content

This section includes the following topics:

Introduction to the Modbus output functions

The **Modbus output** functions permit you to write one or more variables previously defined in a Modbus driver created in the UWP IDE.

According to the type of variable you want to control, there are three functions available:

- **Analogue output function**. It permits writing the analogue variables (function codes 6 or 16)
- **Digital output function**. It permits writing the digital variables (function codes 1 or 2)
- **Multistate output function**. It permits writing the multistate analogue variables (function codes 6 or 16)

Note: each Modbus output variable must first be created at the driver level (type and format) to be then written by the functions described above.

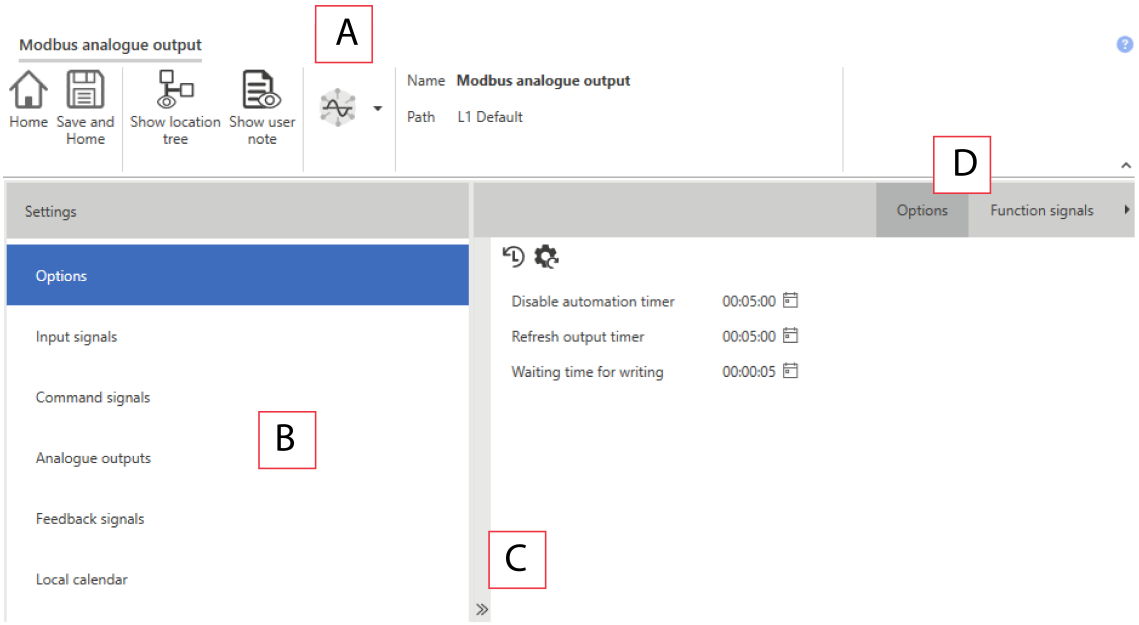
The **Modbus output** functions permit:

- scaling between the output value calculated by the function and the value written in the output signal (only analogue output through min./max. input range)
- writing the output when the function value changes
- forcing the output value to a defined value
- periodically writing the output value (through the **Refresh output timer** parameter)
- writing the output value from local calendar
- calculating the function output value according to the input signals.

*Note: the **Modbus multistate output** function does not support this feature.*

Modbus output page

Home page > (Building) > Function menu > Analogue outputs > Modbus output



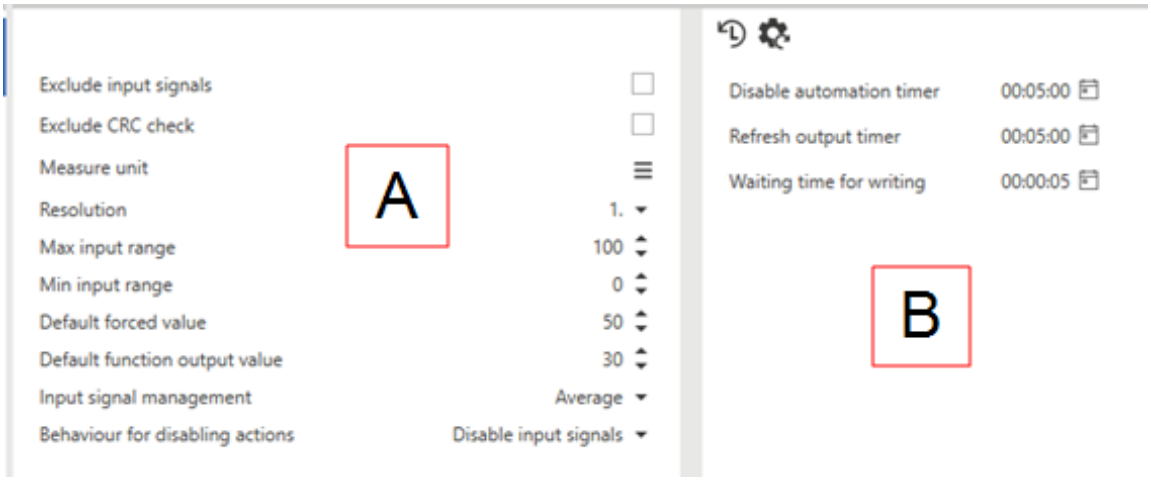
11. Modbus analogue output

Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Input signals**, sets the input signals to change the function output status. • **Command signals**, sets the command signals to trigger the actions. • **Analogue output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local calendar**, sets calendar events to automate the function according to time schedules. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.
From the **Options** sub-menu, you can set the following parameters:



Element	Description

A

Parameter	Description
Exclude input signals	If you enable it, the input signals will not be considered and the **Input signals** tab will not be shown. When this functionality is enabled, the output signals are changed when the function receives a command from Modbus/BACnet or the Web App. *Note: the Modbus multistate output function does not support this feature.*
Exclude CRC check	This option avoids the comparison between the read value and the value written by the variable. It also permits avoiding problems during the writing whenever the variable is “written” also by other BMS systems.
Measure unit	Selects the measure unit for the function value. *Notes:* • *the selected measure unit does not impact the resolution of the function value.* • *it will be used as label in the UWP IDE and in the Web-App.* • *it is valid only for the **Modbus analogue output** function.*
Resolution	Sets the resolution value according to your requirements. *Note: it is valid only for the **Modbus analogue output** function.*
Max input range / Min input range	Sets the minimum/maximum limits the input value can assume. *Note: it is valid only for the **Modbus analogue output** function.*
Default forced value	Defines the forced value that is applied at the first **Force** command if you don't specify any value.
Default function output value	Defines the value that is applied to the output at the system start-up if no signal is connected or if all the output signal values are **Not valid**.

Element	Description

A

Parameter	Description
Input signal management	Defines how to treat the input signals. For the **Modbus analogue output** function, the available options are the following: • **AVG**. Uses the average value of all signals present in the **Input signals** tab as input. • **MIN**. Uses the minimum value among the signals present in the **Input signals** tab as input. • **MAX**. Uses the maximum value among the signals present in the **Input signals** tab input. For the **Modbus digital output** function, the available options are the following: • **OR**. Sends the value when at least one input signal is ON. • **AND**. Sends the value when ALL input signals are ON. *Notes:* • *If the **Exclude input signals** parameter is activated, this value will not be shown.* • *If an input value is **Not valid**, the average calculation will not be affected.* • *It is valid only for the Modbus multistate output function.*
Behaviour for disabling actions	Defines the behaviour of the **Disable** condition when active: • **Disable inputs**. The input variation does not change the output. • **Disable calendar**. Only the calendar events are disabled. • **Disable inputs and calendar**. Both the automatisms are disabled.
Function status table	In this table you can define the function statuses. To each status you can associate a label that will be displayed in live signals and in the web app to indicate the value the function is writing in the variable. *Note: this table is available in the Modbus digital output and Modbus multistate output functions.*

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>B</td><td>
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Disable automation timer</td><td>Sets the time period after which the Disable ON condition is deactivated. (0 - 24 h. Default value: 5 minutes).</td></tr>
<tr><td>Refresh output timer</td><td>Sets the refresh time to rewrite the output values periodically (0 - 24 h. Default value: 5 minutes).
<table>
<tr><th>If this parameter is set to...</th><th>Then...</th></tr>
<tr><td>another value than zero</td><td>as soon as the timer expires, the function rewrites the output value.
When the timer expires or the output value changes, the Refresh output timer recharges.</td></tr>
<tr><td>zero</td><td>the output values are not rewritten automatically.</td></tr>
</table>
</td></tr>
<tr><td>Waiting time for writing</td><td>Sets the refresh period (0 - 24 h. Default value: 5 seconds) after which the output value is updated (written). The timer starts as soon as the writing is executed; the function does not execute any other writing until the timer expires.
<table>
<tr><th>If this parameter is set to...</th><th>Then...</th></tr>
<tr><td>another value than zero</td><td>it filters writings that come in succession quickly</td></tr>
<tr><td>zero</td><td>the output values are updated (written) after any change.</td></tr>
</table>
</td></tr>
</table>
</td></tr>
</table>

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant statuses.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Status signal</td><td>Shows the function status</td><td>
<table>
<tr><th>Value</th><th>Status</th></tr>
<tr><td>1</td><td>Disabled</td></tr>
<tr><td>2</td><td>Running</td></tr>
<tr><td>3</td><td>Disabled, timeout is running</td></tr>
</table>
</td></tr>
<tr><td>Function value signal</td><td>Function value</td><td>It can be the value calculated by the connected input values or by the value assumed as soon as a Disable or Force condition is verified.</td></tr>
<tr><td>Writing error signal</td><td>Shows the status of the writing commands</td><td>ON = writing error
OFF = no writing error</td></tr>
</table>

Element	Description	Value
Input error signal	Shows the status of the input signals	ON = input signal error OFF = no input signal error
Custom signal	You can define when the custom signal has to be ON according to the status signal selected (see above)	ON = the selected status signal is true OFF = the selected status signal is false

Input signals tab

The **Input signals** tab shows the list of all the available input signals that can be used as input values.

The following table shows the types of signal you can associate:

Signal type		Notes
Analogue signals	belonging to functions	• *In the **Signal global properties** panel, the available options change according to the signal type.* • *You can add max 50 signals*
	belonging to modules	

Local calendar

The **Local calendar** functionality can be used to trigger actions according to time schedules.

From the **Local calendar** sub-menu, you can set the following parameters:

Parameter	Description
Enable at controller start up	Executes all the events at the controller start-up. *Note: if at the controller powering ON the system finds some scheduled event, this event starts if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed.*
⊕	Adds an event
☰	Defines the action recurrence. You can execute the action on some days of the week, some days of the month or some months of the year. *Note: settings are updated automatically every year.*
🗑	Removes the selected event
Enable	Enables/disables the event
Description	Defines the event name that will appear in the **Local calendar** list
Day time	Triggers the event at the time set from the list (HH:MM:SS:)
Action	Selects the action to be performed when the time condition is verified. *See Available actions*

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold*

Procedures

Functions > Analogue outputs > Modbus analogue output > Command signals

Add the input signals

1. From the **Signal list** panel, select the input signals you want to add to the configuration.

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. From the **Signal global properties**, set the options according to the configuration

   *Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Add the command signals

1. From the signal list, select the command signals you want to add to the configuration.

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

   *Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Add the Modbus analogue outputs

1. From the signal list, select the Modbus analogue signals you want to add to the configuration.

   Notes:

   - *The configuration file must contain a Modbus driver with a valid variable to select*
   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. From the **Signal local properties**, set the options according to the configuration

   *Tip: you can use the **Copy and paste** functionality to share the properties among different signals. See "Copy and paste modules" on page 77.*

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set.
2. From the **Signal local properties**, set the **Feedback mode** for each function status

3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Analogue outputs > Modbus analogue output

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Home > Functions > Analogue outputs > Modbus analogue output > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time and any other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Alarm

Content

This section includes the following topics:

Introduction to the Alarm function

The **Alarm** function warns you when an event occurs. Events can be related to smoke alarms, water leakage alarms or to any other event you need to be warned of.

Monitoring the alarm input signal (smoke detector, water leakage sensor or other digital/analogue sensors), the function notifies you an alarm condition through feedback signals (sound of siren or flashing lights).

The function output and feedback options can be configured according to the following ISA alert sequences:

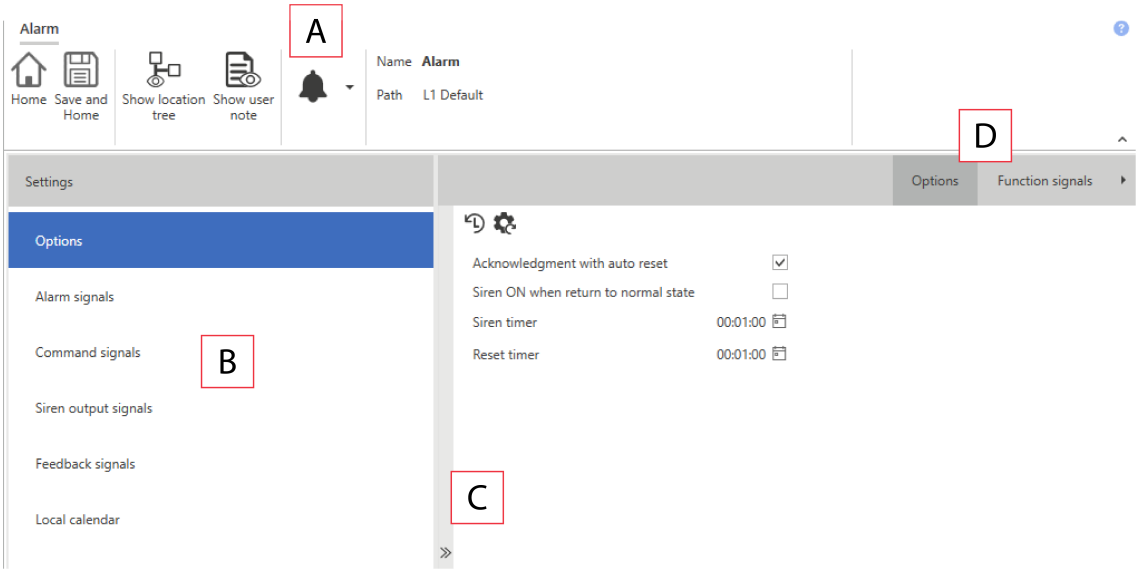
- ISA-A
- ISA-A5
- ISA-R8
- ISA-M
- ISA-M5.

Note: you can configure these options according to your needs.

Moreover, the **Alarm** function can be directly linked to the **Siren** function for the acoustic alarming so to have a complete alarm system.

Alarm page

Home page > (Building) > Function menu > Alarm



Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Alarm signals**, sets the alarm input signal to activate the **alarm ON condition**. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, schedules events to automate the function accordingly. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
Signal type	Sorts the following alarm signals by priority : • Generic digital • Generic analogue • Smoke alarm • Water alarm
Compliant with ISA sequence	Sets the output and feedback options according to the following ISA sequences: • ISA-A • ISA-A5 • ISA-R8 • ISA-M • ISA-M5 *Note: select **No (customize)**to set the options according to your preferences.*
Auto reset after acknowledgement	Acknowledges the alarm and activates the **Reset ON**. The **acknowledgment** command never activates the **Reset timer**, even if its value is different from 0.
Siren ON when return to normal state	Activates the siren as soon as the alarm condition finishes or after an acknowledgement and replicates the ISA-R8 sequence behaviour.
Siren timer	Siren activation timer (0 - 24 h. Default: 1 min). When the siren is active, the output **Siren status** is ON. *Note: it can be disabled manually by using the **Acknowledgment** / **Reset** command.*
Reset timer	Sets the time period after which the alarm condition turns ON again (0 - 24 h. Default value: 1 min). If the timer value is set to 0 s, the command is temporary.
Alarm message string (Web-App)	Sets the string describing the alarm events in the Web-App report

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Alarm status</td><td>Shows the current function status</td><td>The available function status are the following:<table><tr><th>Status</th><th>Value shown</th></tr><tr><td>Alarm OFF</td><td>The alarm is OFF or the initial condition after reset command</td></tr><tr><td>Alarm ON</td><td>The alarm is active but not acknowledged</td></tr><tr><td>Alarm was ON</td><td>The alarm is no longer active and is still waiting for the acknowledgment</td></tr><tr><td>Acknowledged, alarm ON</td><td>The alarm has been acknowledged but it is still active</td></tr><tr><td>Acknowledged, alarm was ON</td><td>The alarm has been acknowledged and it is no longer active</td></tr><tr><td>Reset</td><td>Reset timer is running, regardless of the input (alarm) condition.
Note: the status corresponds to Alarm OFF.</td></tr></table></td></tr>
<tr><td>Siren status</td><td>Shows the current</td><td>Used in the Siren function to link the Alarm function for acoustic alarming.
It behaves as follows:
OFF = the Siren function output is not activated by the Alarm function.
ON = the Siren function output is driven by the Alarm function status.
See "Procedures" on page 188 (Link the Alarm function to the Siren function).</td></tr>
<tr><td>Custom signal 1</td><td rowspan="2">The Siren status is ON if the statuses selected from the combo- box are true</td><td rowspan="2">To each Custom signal you can associate several function statuses (see Alarm status description).</td></tr>
<tr><td>Custom signal 2</td></tr>
</table>

Alarm signals tab

The **Alarm signals** tab shows the list of all the available input signals that can be used to trigger the alarm.

*For instance, when a sensor detects smoke, the **Alarm** function is activated and the output goes ON until the warning stops.*

The following table shows the types of signal you can select to trigger the alarm event.

Signal type		Notes
Digital signals	PIR signals	• *In the **Signal local properties** panel, the available options change according to the signal type. See **Alarm signal properties** to configure them accordingly.* • *You can add 50 signals max.*
	PIR alarm signals	
	Water leakage sensor (e.g. BSF-WAT-U)	
	Smoke detector (e.g. BSG-SMOx-U)	
	Function digital signal	
	Modules (e.g.B4X-LS4-U) digital signal	
Analog signals	Function analogue signal	
	Module analogue signal	

Digital signals

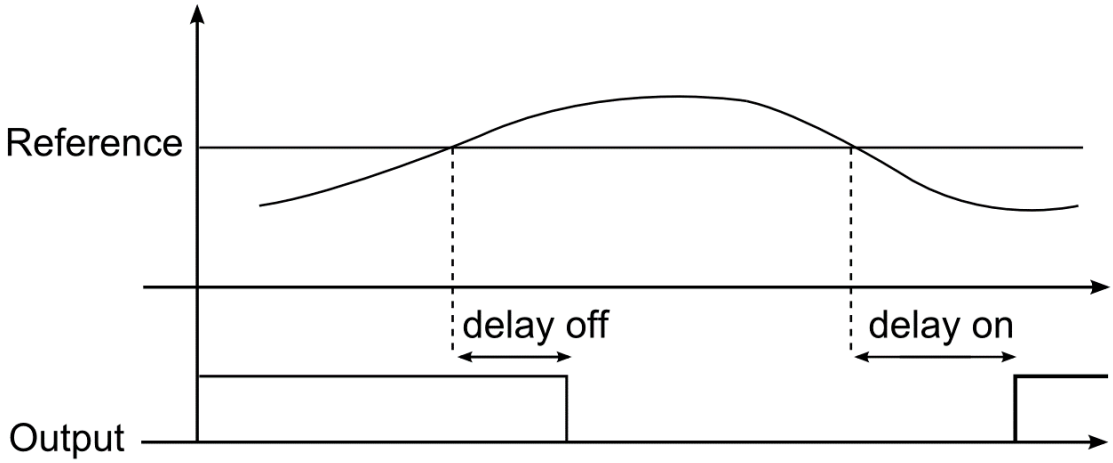
Element	Value
Enable inverted signal	When flagged, the signal status operates with inverted logic
Enable pulse filter	When flagged, the following parameters appear: **Status** / **Value shown** Pulse number: The alarm input condition is triggered when the specified pulse number within the Window time are detected Window time (s): The time interval within which the pulses are detected
Delay ON	The alarm input condition is enabled when the alarm input signal is enabled for the time period set in this field.
Delay OFF	The alarm input condition is disabled when the alarm input signal returns to normal condition for the time period set in this field.

*Note: if you deselect the **Enable pulse filter** option, you see the **Delay ON** and **Delay OFF** parameters instead of the **Pulse number** and **Window time** options.*

Analogue signals

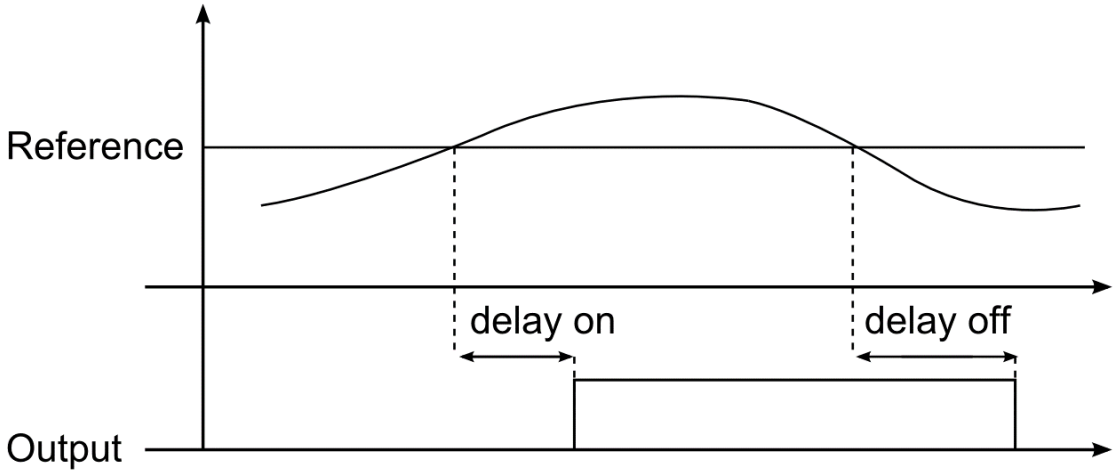
For the analogue signals, you can set one of the following comparison types to activate the alarm condition.

1. **Lower than**



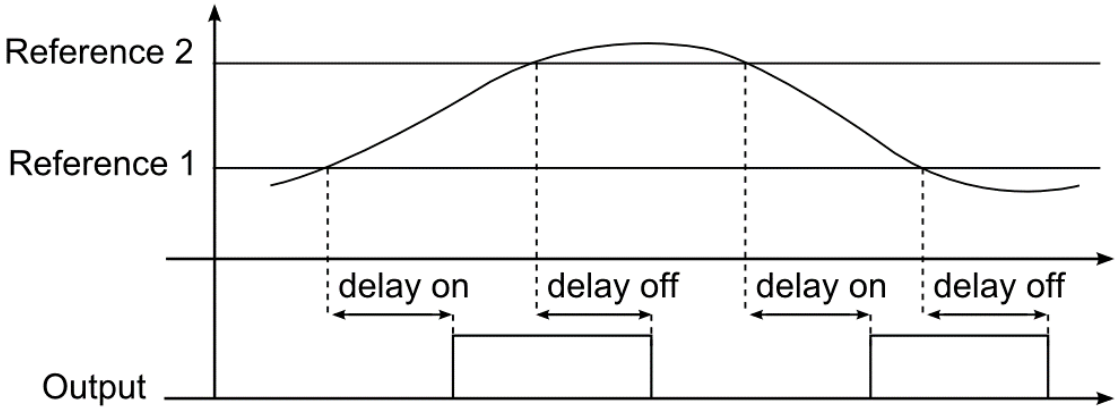
12. Comparison between High limit and hysteresis%

2. Higher than



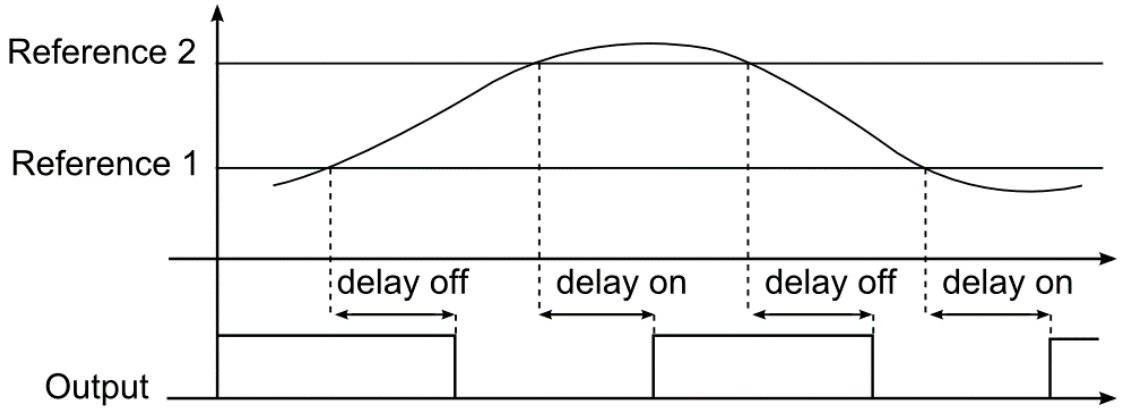
13. Comparison between Low limit and hysteresis%

3. Inside limits



14. Inside High-Low limit and hysteresis%

4. Outside limits



15. Outside High-Low limit with hysteresis%

Element	Value
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Enable pulse filter	If it is flagged, the following parameters appear: **Status** / **Value shown** Pulse number: The alarm input condition is triggered when the set pulses are detected. Window time (s): The time interval within which the pulses are detected.
Delay ON	Time period after which the alarm input condition is activated.
Delay OFF	Time period after which the alarm input condition is deactivated.

*Note: if you deselect the **Enable pulse filter** option, you see the **Delay ON** and **Delay OFF** parameters instead of the **Pulse number** and **Window time** options.*

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Alarm** function is controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note

Digital push button Digital switch Module digital (e.g. SH2INDI424 module) Digital function Analog function Analog signal	• Acknowledge the alarm • Reset the alarm • Test the alarm (simulation)	*You can add 50 signals max.*

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Alarm** status.

Signal type	Available options
Digital LED Digital Siren signal of BSG-SMOx-U module	**Inverted logic**

Note: You can add 50 signals max.

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output Digital LED Siren signal of BSG-SMOx-U module	**Inverted logic**

Note: You can add 100 signals max.

Local calendar tab

The **Local calendar** can be used to trigger actions according to time schedules. From the **Local calendar** sub-menu, you can set the following parameters:

Parameter	Description
Enable at controller start up	Executes all the events at the controller start-up. *Note: when the controller is powered ON, the system checks the time periods and triggers the relevant event. If the event time period is not verified, it is triggered the next time.*
	Adds an event
	Removes the selected event
Enable	Enables/disables the event

Parameter	Description
Description	Defines the event name that will appear in the **Local calendar** list
Day time	Triggers the event at the time set from the list (HH:MM:SS:)
Days	Triggers the event on the selected days
Months	Triggers the event on the selected months
Week days	Triggers the event on the selected week days
Action	Selects the action to be performed when the time condition is verified.

Trigger signals

Push button

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.
Action on long click	After a long press, the selected action is executed.
Action on very long click	After a very long press, the selected action is executed.

Switch

Property	Description
Enable inverted signal	When flagged, the signal status operates in **inverted logic** .
Action on rising	As soon as the switch turns ON, the selected action is executed.
Action on click	As soon as the switch turns OFF, the selected action is executed.

Digital function

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.

Analogue function

Property	Description
Rising mode	Sets the high threshold above which the signal is considered ON.
Falling mode	Sets the low threshold below which the signal is considered OFF.

Property	Description
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold.*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold.*

Test alarm conditions

If you want to simulate the **alarm ON** and **alarm OFF** conditions, regardless of the real alarm statuses, there are different actions you can use.

All the test actions have priority over the real alarm signals status. This means that if the **Alarm signal** detects a warning situation (i.e. the **Alarm** function is ON) and a **Test action** (**Test ON** or**Test OFF**) starts, the latter has the priority. As long as a test condition is active, no audible and visual alarms associated to the **Alarm** function will be activated.

*Note: When the **Test ON** and the **Test OFF** actions are activated at the same time, the **Test OFF** has the priority.*

Following are the actions you can perform from the **Command signals** tab, according to the signal type.

Push Button

	As you press the push button **(Rising edge)**	As you click the push button **(Click)**	After a long press **(Long)**	After a very long press **(Very long)**
Action				
Test alarm signal ON	Simulates the activation of an alarm signal			
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test			
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode			
Test alarm signal OFF	Simulates the deactivation of an alarm signal			
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test			
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode			

Digital switch / digital function

	As soon as the switch is closed or the function goes ON **(Rising edge)**	As soon as the switch is open/function goes OFF **(Falling edge)**
Action		
Test alarm signal ON	Simulates the activation of an alarm signal	
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test	

	As soon as the switch is closed or the function goes ON **(Rising edge)**	As soon as the switch is open/function goes OFF **(Falling edge)**
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode	
Test alarm signal OFF	Simulates the deactivation of an alarm signal	
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test	
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode	

Analog signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Test alarm signal ON	Simulates the activation of an alarm signal	
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test	
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode	
Test alarm signal OFF	Simulates the deactivation of an alarm signal	
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test	
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode	

Procedures

Functions > Alarm > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties** panel
2. From the central area, select the signal you need to change.
3. Type a name in the text box.

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

"Introduction to the Siren function" on page 250

Link to a Siren function

"Introduction to the Siren function" on page 250

Functions > Alarm > Command signals tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel.
3. From the **Signal local properties** panel, set the options according to the configuration.

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel

3. From the **Signal local properties** panel, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set
2. From the **Signal local properties** panel, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Alarm

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Add an event

1. From central area, click ⊕ near the centre-right.
2. Enter the event **Description**, the **start**/ **end** time, how often it repeats, and the other details.
3. From the **Action** combo-box select the action to perform.
4. From the **Enable** column check the box of the event to enable.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Counter alarm

Content

This section includes the following topics:

Introduction to the Counter alarm function

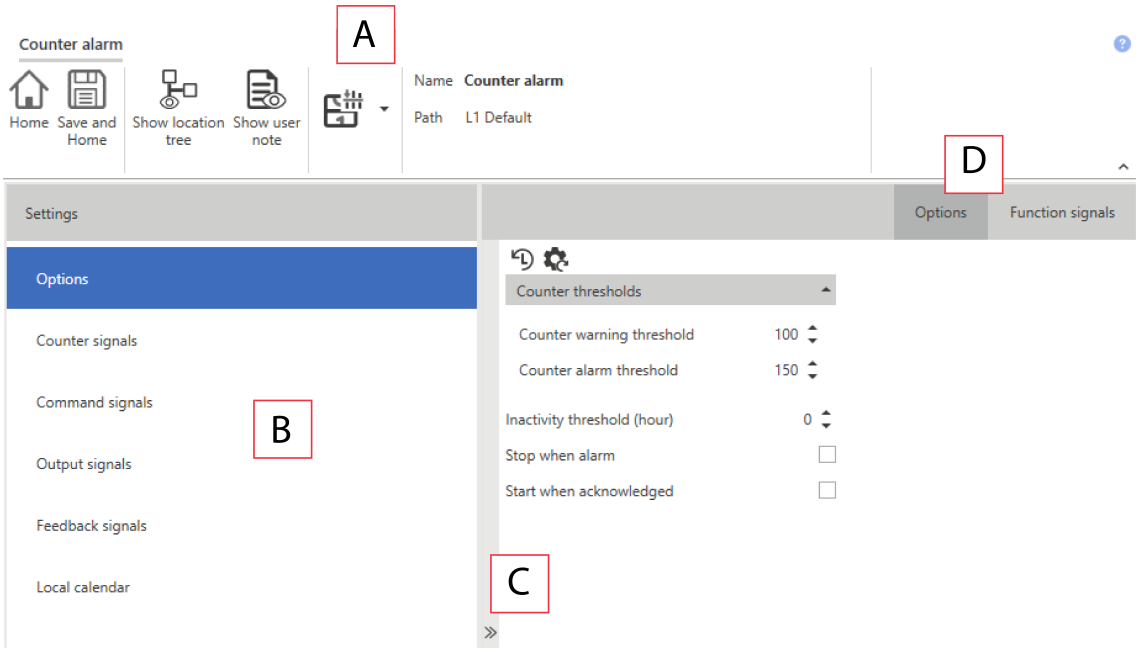
The **Counter alarm** function permits you to control the counter variables.

The most common applications of this function are the installations that monitor the energy consumption (for example, camping and marinas) according to predefined thresholds. There are other similar cases in the industrial world: there, the batch counter is connected to the machine, line or department consumption.

The function input can be a counter signal and/or the status of a **Counter** function output. Unlike the **Counter** function, the **Counter Alarm** is optimised since the input counter variables can only increase: it means that the value cannot be adjusted and the rollover cannot be managed.

Counter alarm page

Home page > (Building/Energy) > Function menu > Alarm > Counter alarm



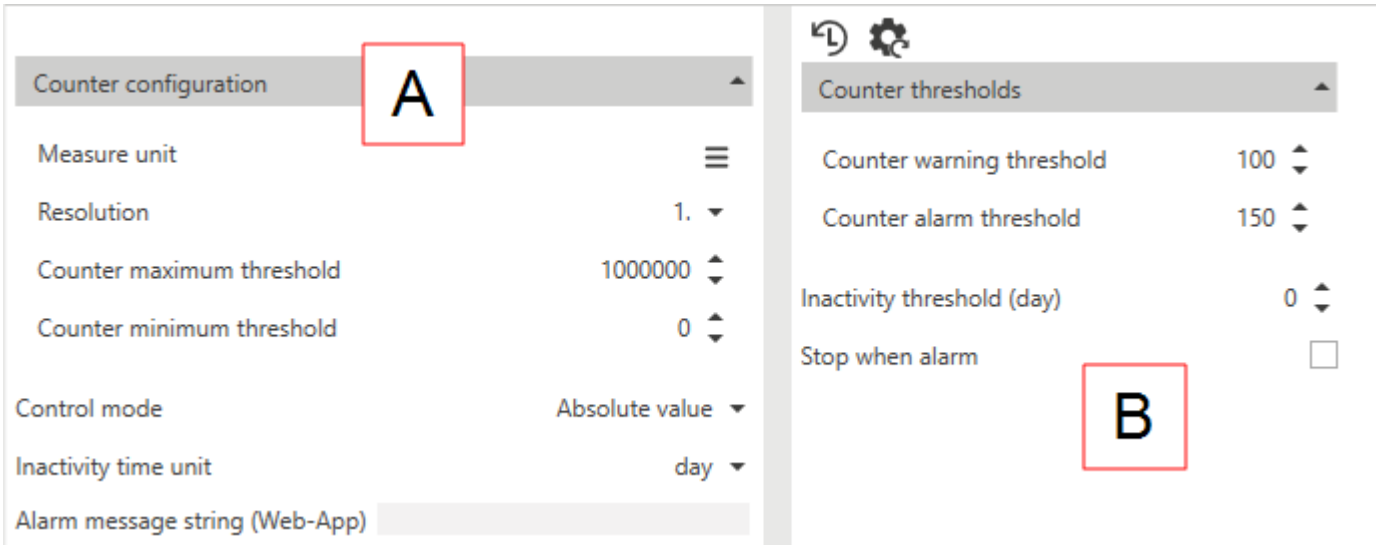
Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Counter signals**, sets the counter signals the function uses • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** and **Function signals**.

The **Options** sub-menu contains the setting parameters that appear as follows:



*Note: this menu changes according to what you select from **Control mode** (see the table below).*

Element	Description
A	Parameters you can set only from the **Function manager** (not from **Live signals**). These parameters appear in the menu that you can open/hide («)

Parameter	Description	Notes
Measure unit	Selects the measure unit for the function value. It is used as label in the UWP Tool and in the Web-App *Note: the selected measure unit does not impact the resolution of the function value.*	• ***Counter configuration*** *options* • *These options disappear for some* ***Control modes****.*
Resolution (Counter)	Sets the resolution value according to your requirements. The selection does not affect the calculations (sum differences of counter signals). *N.B: If you select the* ***Time*** *mode, this field will be hidden.*	
Counter maximum threshold	Maximum limit of the input values, connected to the signal type. *N.B: If you select the* ***Time*** *mode, this field will be hidden.*	
Counter minimum threshold	Minimum limit of the input values, connected to the signal type. *N.B: If you select the* ***Time*** *mode, this field will be hidden.*	
Inactivity time unit	Combo-box for selecting the measure unit (**Minutes, Hours, Days**). The label will be assigned to the function value and to the relevant parameters in the **Live Signals** panel. *N.B: the measure unit you select does not affect the values resolution (decimal point position).*	

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>Control mode</td><td>Combo-box for selecting the function working mode. According to your selection, different sub-menus can appear/disappear.
<table>
<tr><th>If you select....</th><th>Then....</th></tr>
<tr><td>Absolute value</td><td>The absolute value the counter variable assumes will be considered and in the element B menu the Stop when alarm parameter appears</td></tr>
<tr><td>Automatic re-arming</td><td rowspan="2">No menu changes</td></tr>
<tr><td>Daily re-arming</td></tr>
<tr><td>Weekly re-arming</td><td>You set the starting from the Week start day field(Tool system settings)</td></tr>
<tr><td>Monthly re-arming</td><td>No menu changes</td></tr>
<tr><td>Batch counter</td><td>In the element B menu the Stop when alarm and Start when acknowledged parameters appear.</td></tr>
<tr><td>Time slot</td><td>The Counter configuration menu disappears and the Time configuration options appear.</td></tr>
<tr><td>Batch counter or Time slot</td><td rowspan="2">The Time configuration options appear and in the element B menu the Time thresholds options appear.</td></tr>
<tr><td>Batch counter and time slot</td></tr>
</table></td></tr>
<tr><td>Alarm message string (Web-App)</td><td>Permits editing the alarm message shown on the web app Alarms page.</td></tr>
<tr><td>Time unit</td><td>Combo-box for selecting the measure unit (Minutes, Hours, Days). The label will be assigned to the function value and to the relevant parameters in the Live Signals panel.
N.B: the measure unit you select does not affect the time values resolution (decimal point position).</td></tr>
</table>

Element	Description
B	Parameters you can change also from the **Live Signals** panel.

Parameter	Description
Counter warning threshold	Sets the variation value of the input signals to enable the warning status. Its value is between the **Counter minimum threshold** and **Counter maximum threshold**. *Note: the 0 inhibits the Counter warning control.*
Counter alarm threshold	Sets the variation value of the input signals to enable the alarm status. Its value is between the **Counter warning threshold** and **Counter maximum threshold**. *Note: the 0 inhibits the Counter alarm control.*
Time warning threshold	Duration of the function monitoring to enable the warning status. Its value is between the **Time minimum threshold** and **Time maximum threshold**. *Note: the 0 inhibits the Time warning control.*
Time alarm threshold	Duration of the function monitoring to enable the alarm status. Its value is between the **Time minimum threshold** and **Time maximum threshold**. *Note: the 0 inhibits the Time alarm control.*
Inactivity threshold	Function inactivity threshold to enable the **Inactivity Alarm** status. The default value is 0, that inhibits the **Inactivity** control. *N.B: This field is not shown in **Time slot** mode.*
Stop when alarm	Enables/disables the automatic management of the alarm status. *N.B: This field is not shown for any re-arming mode.*
Start when acknowledged	Enables/disables the automatic restart in case of manual acknowledgement. *N.B: This field is not shown for any re-arming mode.*

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant statuses.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Status signal</td><td>Shows the current function status</td><td>The function status are the following:<table><tr><th>Status</th><th>Value shown</th></tr><tr><td>1</td><td>Counting</td></tr><tr><td>2</td><td>Counter warning ON</td></tr><tr><td>3</td><td>Counter alarm ON</td></tr><tr><td>4</td><td>Time warning ON</td></tr><tr><td>5</td><td>Time alarm ON</td></tr><tr><td>6</td><td>Inactivity alarm ON</td></tr><tr><td>7</td><td>Alarm acknowledged (Counter, Time, Inactivity)</td></tr><tr><td>8</td><td>Stop with alarm ON</td></tr><tr><td>9</td><td>Stop with alarm acknowledged</td></tr><tr><td>10</td><td>Stop</td></tr></table></td></tr>
<tr><td>Counter value</td><td>Shows the input counter value</td><td></td></tr>
<tr><td>Warning status</td><td>Shows the Warning status</td><td>ON = Warning ON
OFF = Warning OFF</td></tr>
<tr><td>Alarm status</td><td>Shows the Alarm status</td><td>ON = Alarm ON
OFF = Alarm OFF</td></tr>
<tr><td>Input alarm status</td><td>Shows input status value in error
N.B: it is shown only if you select the Time mode</td><td>ON = Input alarm status ON
OFF = Input alarm status OFF</td></tr>
<tr><td>Enable status</td><td>Shows the function enabling status</td><td>ON = The selected status is true
OFF = The selected status if false</td></tr>
<tr><td>Custom signal</td><td>It is ON if the statuses selected from the combo-box is true</td><td>ON = The selected status is true
OFF = The selected status is false</td></tr>
</table>

For each signal you can set the available properties in the **Signal global properties** panel.

Counter signals tab

The **Counter signals** tab shows the list of all the available signals.

The following table shows the types of signal you can select:

Signal type	Note
Counter signal belonging to modules (e.g., SH2INDI424, Modbus drivers)	• *You can add max 50 signals* • *For each signal you can set the available properties in the **Signal global properties** panel* • *You can attach the output signal of another counter function as an input to the function*
Counter output signal belonging to functions	

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Counter alarm** function is controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated
Digital push button (e.g., SHA4XLS4TH module)	• Trigger the counting start/end • Manage the warning or alarm thresholds for different control modes
Digital switch	
Digital module (e.g., SH2INDI424 module)	
Digital function	
Analogue function	
Analogue signal	

Note: You can add 50 signals max.

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Counter Alarm** status.

Signal type	Available options
Digital output	**Inverted logic**
Digital LED	
Digital relay output	

Note: You can add 50 signals max.

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select, to be managed according to the function status.

<table>
<tr><th>Signal type</th><th>Available options</th></tr>
<tr><td>Digital output

Digital LED

Digital output (relay, Modbus)</td><td>According to your requirements, for each signal the available working modes are as follows:

<table><tr><th>Working type</th><th>Behaviour</th></tr><tr><td>Alarm</td><td>When the Alarm ON signal is active, the relevant output signal activates.</td></tr><tr><td>Warning</td><td>When the Warning ON signal is active, the relevant output signal activates.</td></tr><tr><td>Enable</td><td>When the Enable signal is active, the relevant output signal activates.</td></tr><tr><td>Input not connected</td><td>When the Input not connected signal is active, the relevant output signal activates.</td></tr></table>
Notes:
• You can add max 100 signals
• Inverted logic of the function can be enabled
• In the Signal global properties panel, you can manage additional properties.</td></tr>
</table>

Local calendar tab

The **Local calendar** can be used to trigger action according to time schedules. From the **Local calendar** sub-menu, you can set the following parameters:

Parameter	Description
Enable at controller start up	Executes all the events at the controller start-up. *Note: when the controller is powered ON, the system checks the time periods and triggers the relevant event. If the event time period is not verified, it is triggered the next time*.
⊕	Adds an event
🗑	Removes the selected event
Enable	Enables/disables the event
Description	Defines the event name that will appear in the **Local calendar** list
Day time	Triggers the event at the time set from the list (HH:MM:SS:)

Parameter	Description
Days	Triggers the event on the selected days
Months	Triggers the event on the selected months
Week days	Triggers the event on the selected week days
Action	Selects the action to be performed when the time condition is verified.

Control mode

Absolute value

In the **Absolute Value** mode, unlike the other modes, the alarm control is executed according to the input absolute value.

- You set the **Counter alarm threshold**
- The **AlarmON** condition is activated because the **Counter Value** is >= **Counter alarm threshold**
- You acknowledge the event
- The **AlarmOFF** condition is activated again and it is acknowledged
- The system does not open the alarm or the output until the **Alarm threshold** changes.

Automatic re-arming

In the **Automatic re-arming** mode, the alarm control is executed according to the input value delta.

- You set the **Counter Alarm Threshold**
- The **AlarmON** condition is activated because the **Counter delta** is >= **Counter Alarm Threshold**
- You acknowledge the event
- The **AlarmOFF** condition is activated again
- The system has to open the alarm and activate the output as soon as the Counter delta becomes again higher than the **Counter alarm threshold** (the warning threshold is no longer considered after the alarm acknowledgement).

*Note: there is not data loss. For this reason the **Counter delta** value is always updated so to be between 0 and the **Counter alarm threshold**.*

Daily/Weekly/Monthly re-arming

In the **Daily/Weekly/Monthly re-arming** modes, the alarm control is executed according to the input value delta.

- You set the **Counter Alarm threshold**
- The **AlarmON** condition is activated because the **Counter delta** is >= **Counter AlarmThreshold**
- You acknowledge the event
- The **AlarmOFF** condition is activated again
- The system has to open the alarm and activate the output as soon as the **Counter delta** becomes higher than the **Counter Alarm threshold** but only within the next time interval (day/week/month).
- If the **Counter Alarm threshold** is not reached in the current time interval, the input value delta will start from zero as soon as the next time interval begins.

Batch counter, Time slot, batch counter or time slot, batch counter and time slot

There are some cases where it is needed to notify the user when a consumption threshold is reached: this case can be called a "batch counter" and is present, for example, in the management of camp-sites, marinas, and so on.

The batch meter follows this flow:

- A batch meter (based on a real or a virtual meter) is activated by a command (web interface, digital input, another ON/OFF command).

- The batch meter count starts and increments. The alarm is triggered when one of the following two conditions is reached: **Energy threshold** or **Time threshold**.

Two cases occur following the alarm:

1. **Automatic management**: acknowledgement of the alarm, interruption of dispensing and the batch meter also stops. The user will take appropriate action (e.g. request to the customer for payment for reaching the quota).
2. **Manual management**: the batch meter does not stop and continues counting, the user will stop counting and dispensing to account for consumption.

There are other similar cases in the industrial world: there, the batch counter is connected to the machine, line or department consumption.

Notes:

- *For all **Batch counter** cases, when an alarm condition occurs, the **Counter Delta** continues to increment (unless the **Stop when alarm** parameter is enabled).*
- *When the function is set to **Stop**, and you switch to **Start**, the **Counter Delta** must start from zero.*

Here are some examples:

Only batch counter, Stop when alarm, Start without ACK

*In this case, the counting is stopped when the counter value exceeds the **Alarm threshold**. The counting will be restarted by a manual **Start Counting** command, regardless of an alarm **Acknowledgement** command.*

Only batch counter, Stop when alarm, Start with ACK

*In this case, the counting is stopped when the value counter exceeds the**Alarm threshold**. The counting will be restarted by an alarm **Acknowledgement** command.*

Only time slot, Stop when alarm, Start with ACK

*In this case, the counting will be stopped when the time counter exceeds the **Alarm Threshold**. The counting will be restarted by an alarm **Acknowledgement** command.*

Batch counter or time slot, Stop when alarm, Start with ACK

*In this case, the counting is stopped when either counter (value or time) exceeds the relevant **Alarm Threshold**. The counting will be restarted by the alarm **Acknowledgement**command.*

Batch counter and time slot, Stop when alarm, Start with ACK

*In this case, the counting is stopped when both counters (value and time) exceed the relevant **Alarm Threshold**. The counting will be restarted by the alarm **Acknowledgement**command.*

Procedures

Functions > Counter Alarm > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Counter > Command signals

Add the Counter signals

1. From the signal list, select the counter input signal you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the Properties panel
3. From the **Signal local properties**, set the options according to the needed configuration

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options or the actions according to the needed configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. Select the **Type of control** (Alarm, Warning, Enable) from the same signal row, set the options according to the configuration
4. From the **Signal global properties**, set the option according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Set the feedback modes

1. From the Main signals list, select the feedback signals you want to set.
2. From the Signal local properties, set the Feedback mode for each Function status
3. From the Feedback mode column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Set the Local calendar

Please refer to Local calendar procedures

Functions > Counter

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time and any other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Hour counting

Content

This section includes the following topics:

Introduction to the Hour counting function

The **Hour Counting** function records the activation time of the associated signal and notifies when and if it is necessary to execute a programmed action (for example, the maintenance). There are two types of notification:

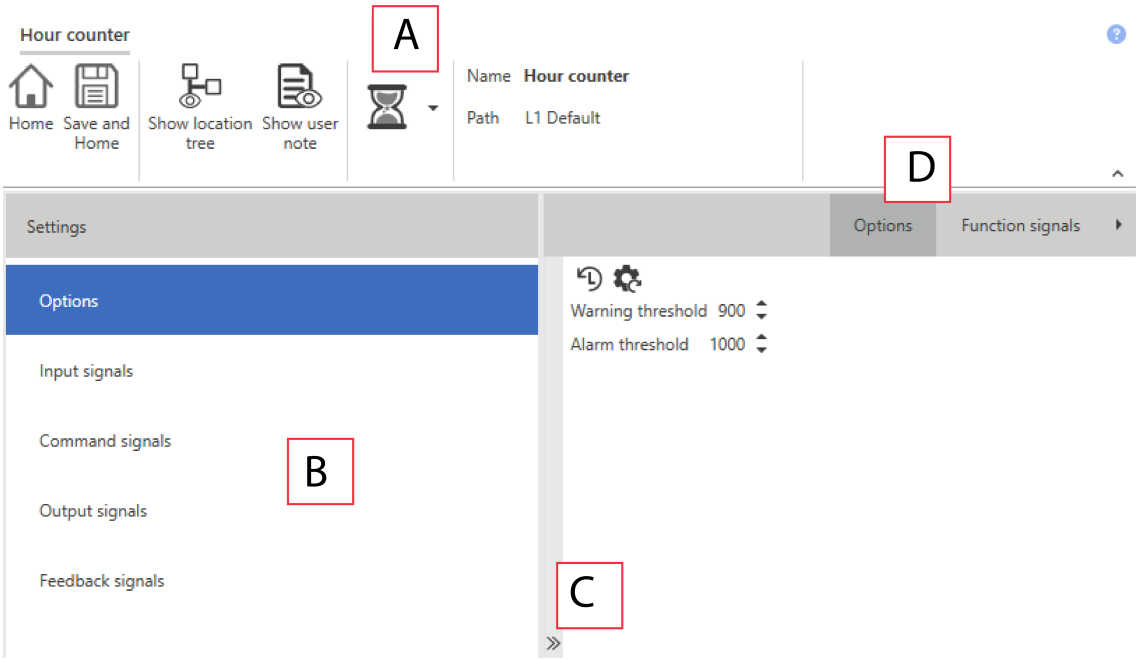
- **Warning**. You are warned when a warning threshold is reached
- **Alarm**. You are informed when an alarm threshold is reached

The main scope of the function is to manage programmed actions after a working time interval (for example, after preventive maintenance intervals). You can set a warning and an alarm to get a notification about the monitoring status.

The most common applications of this function are the lighting control for the preventive replacement of fluorescent tubes and working hour tracking of pumps for their replacement and for programming their maintenance.

Hour counting page

Home page > (Building) > Function menu > Hour counting



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Input signals**, sets the input signals that enables the counting according their statuses • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The function can be controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	*See the Available actions*	*You can add max 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Input signals tab

The **Input signals** tab shows the list of all the available input signals you can select for enabling the hour courting.

The status of the signals defines the trigger behaviour of the counting conditions, as described in the **Options tab – Input mode** field.

The following table shows the types of signal you can associate:

Signal type		Notes
Digital signal	Digital signal that belongs to the functions	• *In the **Signal local properties** panel, the available options change according to the signal type. See Input signals properties to configure them accordingly.* • *You can add max 50 signals*
	Digital signal that belongs to the modules (i.e. B4X-LS4-U)	
Analogue signal	Analogue signal that belongs to the functions	
	Analogue signal that belongs to the modules	

Output signals tab

The **Output signals** tab shows all the available output signals you can select according to the function status.

<table>
<tr><th>Signal type</th><th>For each output signal, it is possible to set these available options</th></tr>
<tr><td>Digital output</td><td>Inverted logic of the function can be enabled
<table><tr><th>Element</th><th>Behaviour</th></tr><tr><td>Inverted</td><td>Enables the inverted signal</td></tr><tr><td>Type</td><td>Alarm: The output goes ON when the Alarm ON condition is verified.
Warning: The output goes ON when the Warning ON condition is verified.</td></tr></table></td></tr>
<tr><td>Digital LED</td><td></td></tr>
</table>

Note: You can add max 100 signals

Feedback signals tab

The **Feedback signals** tab shows all the available feedback signals you can select to check the **Hour counting** status.

Signal type	Available options
Digital LED	Inverted logic of the function can be enabled
Digital	

Note: You can add max 50 signals

Trigger signals

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold Action on falling*
Action on falling	As soon as the function goes OFF, the selected action is executed *Note: The analogue value must be ≤ the falling threshold*

Procedures

Functions > Hour counting > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Hour counting > Command signals

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the Signal local properties, set the options according to the configuration

Add the input signals

1. From the Input signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the Main signal panel
3. From the Type field, set the condition the output is activated among Warning or Alarm
4. From the Signal local properties, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Set the feedback modes

1. From the Main signals list, select the feedback signals you want to set.
2. From the Signal local properties, set the Feedback mode for each Function status
3. From the Feedback mode column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Hour counting

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

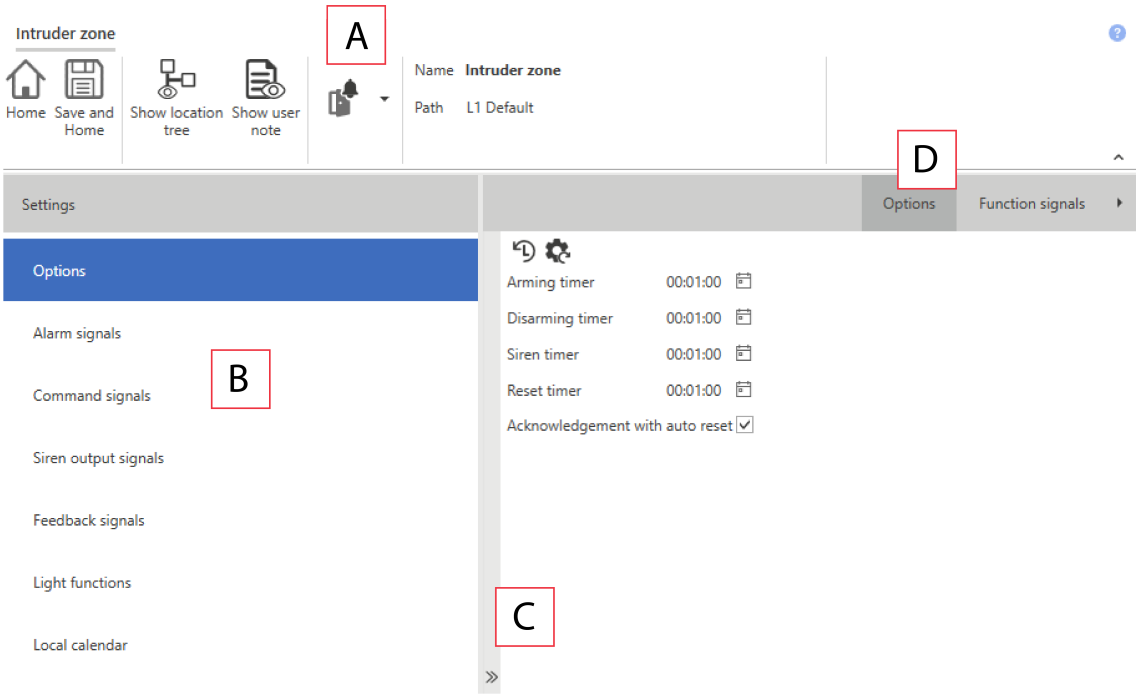
Zone Intruder

Content

This section includes the following topics:

Zone Intruder page

Home page > (Building) > Function list > Alarms > Zone intruder alarm



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Alarm signals**, adds the alarm input signals • **Siren output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function. • **Light functions**, adds light functions that can be used as visual feedback when an alarm condition in ON • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
Arming timer	Sets the time period after which the function is armed (0 - 24 h. Default value: 1 min). During the arming time the alarm condition is managed but the Siren is deactivated. *Note: if the function belongs to a Main intruder alarm, the arming command should be performed by the Main function.*
Disarming timer	Sets the time period after which the function is disarmed (0 - 24 h). Default value: 1 min). During the disarming time the alarm condition is managed but the Siren is deactivated. *Note: if the function belongs to a **Main intruder** alarm, the disarming command should be performed by the Main function.*
Siren timer	Siren activation timer (0 - 24 h, default 1 min). During the siren activation time the output **Siren status** is ON. *Notes:* • *you can tacit it manually by using the **Acknowledge/Reset** commands* • *Set this field to 0 if an external **Siren** function is used. It will be use the Siren timer value of the external function*
Reset timer	Sets the time period after which the alarm condition turns ON again (0 - 24 h). Default value: 1 min). *Note: the reset state can remain active for the duration of the scheduled reset timer. If the timer value is set to 0 seconds, the command is pulsed.*
Acknowledgement with auto reset	Acknowledges the alarm condition and activates the **Reset ON**. This command never activates the Reset timer even if its value is different from 0.

Notes:

- *The arming/disarming commands should be performed by the **Main intruder alarms** in order to arm/disarm together all the **Zone intruder** functions that belong to the **Main intruder** function.*
- *The acknowledgement and reset commands should be performed by the **Main intruder alarms**.*

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable status.

Element	Description	Value
Zone status signal	Shows the value of the function (according to the table on the right)	Shows the function status (see the table below). *Note: The status of each zone function is the result of the logical OR of all its alarm signals.*
Siren status signal	Shows the warning condition status	OFF = Alarm is OFF the Siren output stays OFF ON = When the alarm goes ON the external siren output is activated(driven) by the this signal *See **"Procedures" on page 228** (**Link the alarm functions to the Siren function**)*
Custom signal 1	It is ON if the status selected from the combo- box is true	You can associate to each custom signal several function statuses.
Custom signal 2		
Custom signal 3		
Custom signal 4		

Function statuses

Status	Value	Description
1	Disarmed, alarm OFF	The function is disarmed: all the alarm signals of the function are not active or initial condition after the reset command
2	Disarmed, alarm ON	The function is disarmed but at least one alarm signal in the function is ON
3	Arming, alarm OFF	The function is arming and all its alarm signals are OFF
4	Arming, alarm ON	The function is arming and at least one alarm signal is ON. *Note: this status warns who has armed the zone that someone is still present in the area*
5	Arming, alarm was ON	The function is arming, the alarm is no longer active, but still waiting for alarm acknowledgement
6	Arming, alarm ON acknowledged	The function is arming, the alarm is still active but it has been acknowledged
7	Arming, alarm was ON acknowledged	The function is arming, the alarm is no longer active and it has been acknowledged
8	Armed, alarm OFF	The function is armed all the alarm signals present in the function are not active
9	Armed, alarm ON	The function is armed and at least one alarm signal in the function is ON
10	Armed, alarm was ON	The function is armed, the alarm is no longer active, but still waiting for alarm acknowledgement

Status	Value	Description
11	Armed, alarm ON acknowledged	The function is armed, the alarm is still active but it has been acknowledged
12	Armed, alarm was ON acknowledged	The function is armed, the alarm is no longer active and it has been acknowledged
13	Disarming, alarm OFF	The function is disarming and all its alarm signals are OFF
14	Disarming, alarm ON	The function is disarming and at least one alarm signal is ON
15	Disarming, alarm was ON	The function is disarming, the alarm is no longer active, but still waiting for alarm acknowledge
16	Disarming, alarm ON acknowledged	The function is disarming, the alarm is still active but it has been acknowledged
17	Disarming, alarm was ON acknowledged	The function is disarming, the alarm is no longer active and it has been acknowledged
18	Reset	Reset , regardless of the input (alarm) condition. Status corresponds to Alarm OFF

Alarm signals tab

The **Alarm signals** tab shows the list of all the available input signals that can be used to monitor the zone. The status of each **Zone intruder** function is the result of the logical **OR** of all its alarm signals. Regardless the status of the function, as soon as one of the signal detects an alarm condition (movement, window opening) the signal goes ON and the alarm is activated.

The following table shows the types of signal you can associate to the **Zone intruder** function:

Signal type	Actions that can be associated	Note
Digital push button	PIR signals that belong to the modules	• *In the **Signal local properties** panel, the available options change according to the signal type.* *See **"Alarm signals properties" on page 225** to configure them accordingly* • *You can add max 50 signals*
	PIR alarm signals that belong to the modules	
	Digital switch that belongs to the modules (i.e. SHDWWISENSxx)	
	Digital switch alarm	

Command signals tab

The **Command signals** tab shows the list of all the available input signals that can be used to perform commands.

The **Zone intruder** function can be controlled directly by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	• Arm/disarm the function • Reset the alarm condition • Acknowledge the alarm condition • Test (simulation) the alarm ON/OFF conditions	*You can add max 50 signals* *See the list of the "Available actions" on page 224*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

*Note: The arming/disarming signals should be entered in the **main intruder alarm** function and they are automatically used in each zone function linked to the **main intruder alarm** function. When the arming/disarming signal is activated, all the linked zones are automatically armed/disarmed.*

To add the arming/disarming signal, select the **Command signals** tab in the **Main intruder** function (see the relevant "Settings" on page 237).

Siren output signals tab

In the **Zone intruder** function, the **Siren output signals** tab shows the list of all the available output signals that are driven by the Zone status but the siren output behaviour only works in fixed mode. This means that you cannot manage any output parameter (i.e. tON and tOFF timers).

You should link the **Zone alarm** function to an external **Siren function**.

*See **Link the alarm functions to the Siren function** ("Procedures" on page 228)*

Signal type	Available options
Digital output	**Enable inverted signal parameter**
Digital LED	
Siren signal of BSG-SMOx-U module	

Note: You can add max 100 signals

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Alarm** status.

Signal type	Available options
Digital LED	• For each feedback signal, in the **Signal local properties** panel you can set the output behaviour according to your requirements. *See Set the feedback modes procedure ("Procedures" on page 228):* • You can enable the **Inverted logic** of the function
Digital	
Siren signal of BSG-SMOx-U module	

Note: You can add max 50 signals

Light function tab

The **light functions** tab allows you to add one or more light functions that can be turned ON/OFF when the **Zone intruder** function is in alarm.

When the **Zone intruder** function is in alarm, all the lights of the **Light functions** tab are activated according to the flashing time settings. When the alarm condition in the **Zone intruder** ends, all the light functions stop flashing, even if the status of the **Siren alarm** and the **Main intruder** functions are still active.

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Alarm** status.

Signal type	Available options
Light On/Off functions	You can enable the **Inverted logic** of the function . *Note: dimmable light output is managed from 10 to 100%. The output is never switched OFF because the switching OFF could damage the ballast.*
Dimmable light functions	
Smart light functions	

Note: You can add max 50 signals

Local calendar

The **Local calendar** functionality can be used to trigger action according to time schedules.

From the **Local calendar** sub-menu, you can set the following parameter:

Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*
⊕	Adds a new event
🗑	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list
Day time	Triggers the event at the specific time determined by the option you choose from . From ☰, you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months

Parameter	Description
Action	Selects the action to be performed when the time condition is verified. *See "Available actions" on page 224 to see the available options*

Parameters

Arming and disarming timer

The **Arming time** is the time needed to leave the building, when the person arms the alarm system and it reacts on an alarm signal.

The **Disarming time** goes from the alarm signal activation to the alarm sound. It can be used to delay the alarm when someone enters the room where the PIR and the alarm ON/OFF switch are installed, so to have time to deactivate the alarm entering the building.

The arming/disarming commands has to be performed by the **Main intruder alarm** function: as soon as the arming/disarming commands are executed, all the linked **Zone intruder** functions are automatically armed/disarmed. Each **Zone intruder** function is armed according to the set **Arming time**. If the arming/disarming timers are set to 0 seconds, the reaction of all the alarm signals is immediate (i.e. all the signals are armed immediately and the **Siren** sounds as soon as the **Main intruder** function is armed).

Acknowledge / reset alarm conditions

The reset signal is used to inhibit the alarm status in the **Main intruder** function and in all the linked **Zone intruder** functions.

When a **Zone intruder** function is linked to a **Main intruder**, the **acknowledge** and **reset** commands have to be executed by the **Main intruder** function. As soon as a **reset** command is executed, the **Siren output** is deactivated immediately and stays OFF for the set time period.

Important notes:

- *If a **Siren** function is used as a common output for **Alarm** functions, the **Siren output** is automatically reset if the **Reset timer** action is executed by the linked **Zone intruder** function. This means that the reset command performed by a linked **Zone intruder alarm** resets the timer and the **Siren output**.*
- *When the alarm is reset and the **Disable timeout** expires, all the zones are armed again.*

Available actions

The following table shows the available actions for the **Zone intruder** function:

Action	When the action is triggered...
Arm	Arms the **Zone intruder alarm** function according to the time period set
Disarm	Disarms the **Zone intruder alarm** function according to the time period set
Arm/disarm toggle	Arms/disarms the **Zone intruder alarm** function in toggle mode
Acknowledge alarm	Recognizes the alarming condition *N.B: this command does not deactivate the alarm*
Reset (ignore timer)	Resets the alarm ON condition regardless of the **Reset timer** value (even if the value differs from 0 second)
Reset ON	Resets the alarm ON condition. If the **Reset timer** value is set to 0, the reset condition remains ON until a **Reset OFF** action is triggered
Reset ON with timeout	Resets the alarm ON condition for the time period set in the **Reset timer**. If the **Reset timer** value is set to 0, the reset condition remains ON until a Reset OFF action is triggered
Reset OFF	Removes the Reset ON
Reset ON/OFF toggle	The reset is enabled/disabled in toggle mode
Reset ON with timer/OFF toggle	The reset is enabled/disabled in toggle mode. When the **Reset ON** is active, the timer starts
Test alarm ON	Simulates the activation of an alarm signal
Remove test alarm ON	Removes the activation of an alarm signal for the simulation test
Test alarm ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode
Test alarm OFF	Simulates the deactivation of an alarm signal
Remove test alarm OFF	Removes the deactivation of an alarm signal for the simulation test
Test alarm OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode

Alarm signals properties

In the **Signal local properties** panel, the following parameters are proposed according to the Alarm signal type.

Digital signals

<table>
<tr><th>Element</th><th>Value</th></tr>
<tr><td>Enable inverted signal</td><td>When flagged, the signal status operates with inverted logic</td></tr>
<tr><td>Enable pulse filter</td><td>When flagged, the following parameters appear:<table><tr><th>Status</th><th>Value shown</th></tr><tr><td>Pulse number</td><td>The alarm input condition is triggered when the specified pulse number within the Window time are detected</td></tr><tr><td>Window time (s)</td><td>The time interval within which the pulses are detected</td></tr></table></td></tr>
<tr><td>Delay ON</td><td>The alarm input condition is enabled when the alarm input signal is enabled for the time period set in this field.</td></tr>
<tr><td>Delay OFF</td><td>The alarm input condition is disabled when the alarm input signal returns to normal condition for the time period set in this field.</td></tr>
</table>

*Note: When the Enable pulse filter option unselected, the **Delay ON** and **Delay OFF** parameters are shown instead of the **Pulse number** and **Window time** options.*

Analogue signals

For analogue signals it is possible to set one of the available Comparator modes to activate the alarm condition.

See "Comparator type" on page 117

Test alarm conditions

If you want to simulate the alarm ON and alarm OFF conditions, regardless of real alarm statuses, there are different actions you can use to test the alarm conditions.

All the test actions have priority over real alarm signals status, this means that if the alarm signal detects an intrusion so the Zone intruder alarm is ON and at the same time a Test action (Test ON, Test OFF) is performed, the latter has the priority.

Note: When the Test ON action is activated and at the same time the Test OFF action is activated, the Test OFF has the priority.

Push Button

	As you press the push button **(Rising edge)**	As you click the push button **(Click)**	After a long press **(Long)**	After a very long press **(Very long)**
Action				
Test alarm signal ON	Simulates the activation of an alarm signal			
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test			
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode			
Test alarm signal OFF	Simulates the deactivation of an alarm signal			
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test			
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode			

Digital switch / digital function

	As soon as the switch is closed or the function goes ON **(Rising edge)**	As soon as the switch is open/function goes OFF **(Falling edge)**
Action		
Test alarm signal ON	Simulates the activation of an alarm signal	
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test	
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode	
Test alarm signal OFF	Simulates the deactivation of an alarm signal	

	As soon as the switch is closed or the function goes ON **(Rising edge)**	As soon as the switch is open/function goes OFF **(Falling edge)**
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test	
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode	

Analog signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Test alarm signal ON	Simulates the activation of an alarm signal	
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test	
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode	
Test alarm signal OFF	Simulates the deactivation of an alarm signal	
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test	
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode	

Procedures

Functions > Zone intruder function > Settings > Options tab > Function signals

Edit the function signals name

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the Custom signal

Add the Alarm signals

1. From the signal list, select the alarm input signal you want to add to the configuration

   Notes:

   • *When a signal is selected, it appears in the central area*

   • *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Add the command signals

1. From the signal list, select the alarm input signal you want to add to the configuration

   Notes:

   • *When a signal is selected, it appears in the central area*

   • *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Add the Siren output

1. From the signal list, select the output signal you want to add to the configuration

   Notes:

   • *When a signal is selected, it appears in the central area*

   • *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the Enable inverted signal option according to the configuration

Note: You should link the Zone alarm function to an external Siren function.

See "Link the alarm functions to the Siren function" below.

Link the alarm functions to the Siren function

1. Create and configure the alarm functions (intruder alarm, smoke alarm and water alarm)

   See "Introduction to the Alarm function" on page 175

2. When the alarm functions are configured, create and configure the Siren alarm function
   Note: the Siren function can be created before/after the alarm functions

3. In the Siren input signals tab from the signal list, select the Siren status signals of the alarm functions you want to add to the configuration

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created*

4. From the Group field, set the priority group among Priority group 1, Priority group 2 and Priority group 3
5. From the Signal global properties, set the options according to the configuration
   Note: you can select also other input signals related to Digital input modules or functions.

Set the feedback modes

1. From the Feedback signals tab, select the output signals you want to add to the configuration
   Notes:
   • *When a signal is selected, it appears in the central area*
   • *Every time a signal is added, a new row is created.*
2. Select the signal by checking the box from the Main signals list
3. From the Signal local properties panel, in the Feedback mode column for each Function status ("Settings" on page 217), you can define their behaviour:

If you select…	Then…
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values Ton (s)
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Set the behaviour of linked light functions

1. From the **Light functions** tab, select the light functions you want to add to the configuration
   Notes:
   • *When a signal is selected, it appears in the central area*
   • *Every time a signal is added, a new row is created.*
2. Select the signal by checking the box from the Main signals list
3. From the **Signal local properties** panel, in the Feedback mode column for each Function status, you can define their behaviour:

If you select…	Then…
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values Ton (s)
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Zone intruder

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Home > Functions > Zone Intruder > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Main intruder

Content

This section includes the following topics:

Introduction to the Intruder alarm system

The **Intruder alarm system** can be used to protect the building against burglars and undesired intruders. The **Intruder alarm system** consists of two different types of functions:

Main alarm function. It is used to manage all the **Zone intruder** functions and collecting all the **Zone intruder** functions statuses. This function should be used to send commands such as **arming/disarming**, **acknowledge** and **reset** to all the **Zone intruder alarm** belonging to a **Main intruder**.

Zone intruder function. It corresponds to a building area (e.g. a room or an office) that has to be monitored. The **Zone intruder** is used to manage one or more alarm sensors (PIR detectors or window sensors). Since these functions are part of the UWP 4.0 platform, you can use the sensors used in other building automation functions. Each function has **arming/disarming timers**.

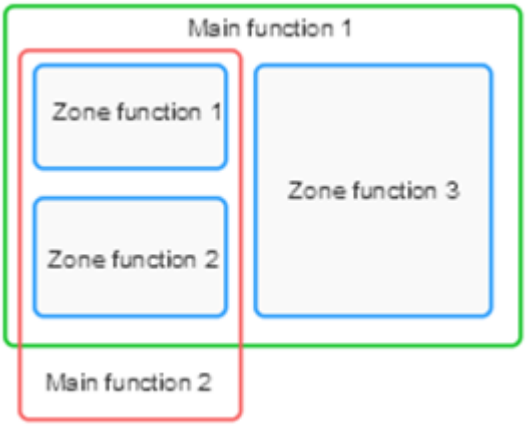
If an intrusion event is detected in at least one of the monitored **Zone intruder** function, the system can be configured to notify user through feedback signals (i.e. a sound of siren or flashing lights).

Main intruder and Zone intruder functions

These functions provide a complete overview of what is happening in a building, allowing the owner/supervisor to monitor both the **Main intruder** and the **Zone intruder** functions.

A **Zone intruder** function can belong to different **Main intruder** functions ("Zone Intruder" on page 215) so to have a zone (i.e. a floor, a room or a specific building area) that is secured with the alarm system.

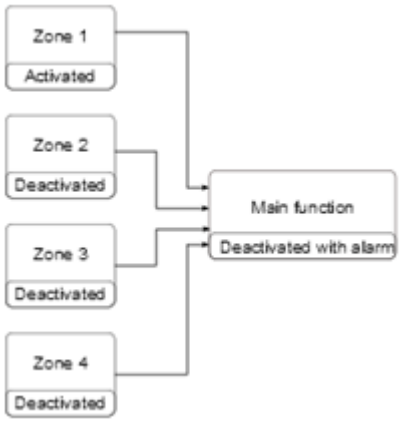
Examples



The **Main intruder 1** is used to arm/disarm all the zones linked to the function.
Note: the alarm signal could be the keypad at the entrance of the house, used for arming the entire system when the user leaves the house.

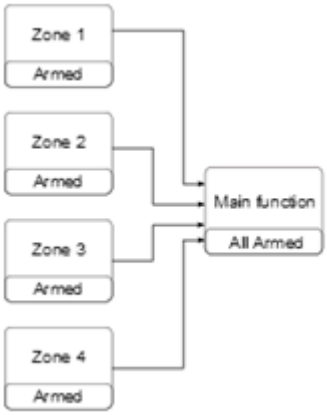
The **Main function 2** is used to arm/disarm zone 1 and zone 2 (zone 3 is not linked to this function).
Note: the alarm signal could be a push button on the first floor used to arm the zones on the ground floor.

An example could be a building with two floors, where the owner wants to have the alarm active on the ground floor during the night. This means that the user can walk around the 1st floor without triggering the alarm, while the ground floor is secured.

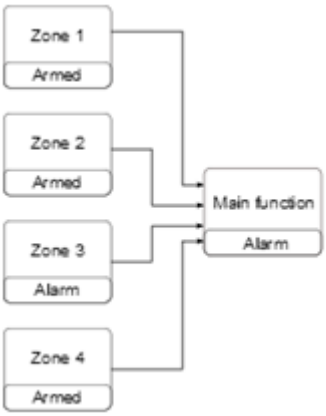


The **Zone intruder 1** function has one PIR sensor to detect the presence of people, while all the other **Zone Intruder** functions are deactivated because there are no people in the rooms. The **Main intruder** function is disarmed because in the **Zone 1** there is an alarm signal active (i.e. somebody is already in). The owner leaves the building and arms the **Main intruder alarm**.

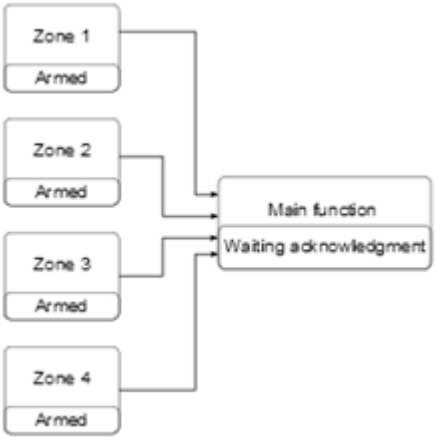
All the zones are arming: the **Zone 4** is immediately armed because the arming time is set to 0 seconds; the **Zones 2-3** are arming with no alarm signals active; the **Zone 1** status is warning because the owner is detected by the PIR sensor. The status of the function is **Warning**. If the owner leaves the **Zone 1** within the arming time, the zone status goes to **Arming**.



When all the zones are armed, the status of the **Main intruder** function goes to **All armed**.



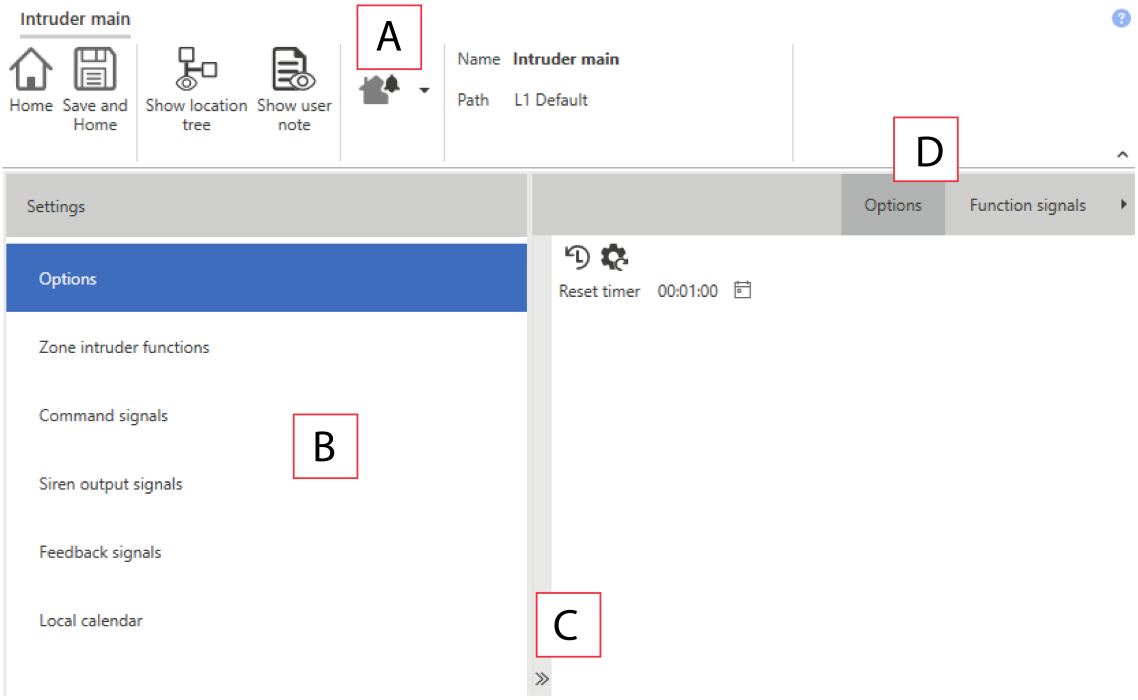
When all the zones are armed, if an intrusion is detected in the **Zone 3**, the status goes to **Alarm**. The alarm status is transmitted to the **Main intruder** function and the main status goes to **Alarm**.



If the alarm input signal is no longer active, the previous alarm condition is still saved and the status of the **Main function** is **Alarm was active** to advise the owner that an intrusion has been detected. This status is reset when the **Main alarm** function is disarmed.

Main Intruder page

Home page > (Building) > Function list > Alarms > Main intruder alarm



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options, sets the function parameters and signals** • **Intruder zone functions**, adds the Zone intruder functions • **Command signals**, sets the command signals to trigger the actions. • **Siren output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameter:

Parameter	Description
Reset timer	Sets the time period after which the alarm condition turns ON again (0 - 24 h. Default value: 1 min). *Note: the reset state can remain active for the duration of the scheduled reset timer. If the timer value is set to 0 seconds, the command is pulsed.*

Important notes:

- *Arming/disarming commands should be performed by the Main intruder alarms in order to arm/disarm together all the Zone intruder functions that belong to the Main intruder function.*
- ***Reset** commands should be performed by the Main intruder alarms. The reset commands performed by the Main intruder have the priority over the individual reset command of the Zone intruder functions. If a Zone intruder function has a lower **Reset timer** than the Main intruder function, the reset command stays active during the time period set in the Main intruder function.*

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Element	Description	Value
Main status signal	Shows the value of the function (according to the table on the right)	Shows the function status (see the table below). *See **Main intruder function statuses** for further details.*
Siren status signal	Shows the warning condition status	OFF = Alarm is OFF the Siren output stays OFF ON = When the alarm goes ON the external siren output is activated (driven) by the this signal *See **"Procedures" on page 246** (**Link the alarm functions to the Siren function**)*
Custom signal 1	It is ON if the status selected from the combo- box is true	You can associate to each custom signal several function statuses.
Custom signal 2		
Custom signal 3		
Custom signal 4		

Main intruder function statuses

Value	Status	Description
1	All the **Zone intruder** functions are reset	All the linked **Zone intruder** functions are reset
2	All the **Zone intruder** functions are disarmed, alarm OFF	All the **Zone intruder** functions are disarmed and the alarm signals used in the linked **Zone intruder** alarm is OFF
3	All the **Zone intruder** functions are disarmed, alarm ON	All the **Zone intruder** functions are disarmed but at least one alarm signal used in a linked **Zone intruder** function is ON
4	All the **Zone intruder** functions are disarmed, alarm OFF	At least one Zone intruder function is armed with the alarm ON
5	Some **Zone intruder** functions are armed, alarm ON	At least one linked zone is armed with an activated alarm signal
6	Some **Zone intruder** functions are disarming, alarm ON	At least one linked zone is disarming with at least one alarm signal ON
7	Some **Zone intruder** functions are armed, alarm was ON	At least one linked zone is armed with at least one alarm signal was ON
8	Some **Zone intruder** functions are disarming, alarm was ON	At least one linked zone is disarming with at least one alarm signal was ON
9	Some **Zone intruder** functions are arming, alarm ON	At least one linked zone is arming with at least one alarm signal ON

Value	Status	Description
10	Some Zone intruder functions are arming, alarm was ON	At least one linked zone is arming with at least one alarm signal was ON
11	Some **Zone intruder** functions are armed, alarm ON acknowledged	At least one linked zone is armed with an activated alarm signal that has been acknowledged
12	Some **Zone intruder** functions are disarming, alarm ON acknowledged	At least one linked zone is disarmed with an activated alarm signal that has been acknowledged
13	Some **Zone intruder** functions are armed, alarm was ON acknowledged	At least one linked zone is armed with at least one alarm signal that was ON is acknowledged
14	Some **Zone intruder** functions are disarming, alarm was ON acknowledged	At least one linked zone is disarming with at least one alarm signal that was ON is acknowledged
15	Some **Zone intruder** functions are arming, alarm ON acknowledged	At least one linked zone is arming with an activated alarm signal that has been acknowledged
16	Some **Zone intruder** functions are arming, alarm was ON acknowledged	At least one linked zone is arming with at least one alarm signal that was ON is acknowledged
17	Some **Zone intruder** functions are reset	At least one linked zone is reset
18	Some **Zone intruder** functions are armed, alarm OFF	At least one linked zone is armed with all alarm signals OFF

Value	Status	Description
19	Some **Zone intruder** functions are disarming, alarm OFF	At least one linked zone is disarming with all alarm signals OFF
20	Some **Zone intruder** functions are arming, alarm OFF	At least one linked zone is arming with all alarm signals OFF
21	Some **Zone intruder** functions are disarmed, alarm OFF	At least one linked zone is disarmed with all alarm signals OFF

The statuses 1 to 4 mean that all the **Zone intruder** functions have the same status. For instance, for the status 1 **All the Zone intruder functions are reset**, all the **Zone intruder** functions that belong to the Main intruder are reset.

The statuses 4 to 20 mean that at least one **Zone intruder** function has the status described. For instance, the status 4 **All the Zone intruder functions are disarmed, alarm OFF** indicates that at least one **Zone intruder** function is armed with the alarm ON.

The status of the **Main intruder** function is updated according to the status of the linked **Zone intruder** functions: the purpose of the **Main intruder** function status represents the most significant conditions of the group. The most significant condition is the one with the lowest value status number among the active ones.

Example: if the conditions for the status 17, 18, 19 are active, the prevailing status is 17.

For more details, check the status of the linked functions.

Zone intruder functions tab

The **Zone intruder functions** tab shows the list of all the available **Zone intruder** functions that can be linked to the **Main intruder** function:

Function	Signal type	Notes
Zone intruder	Zone status signal	• *A **Zone intruder** function can belong to different **Main intruder** functions* • *Inverted logic of the function can be enabled*

Command signals tab

The **Command signals** tab shows the list of all the available input signals that can be used as command.

All the **Zone intruder** function that belong to the **Main intruder** function are controller by the command performed by the **Main intruder** function.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button Digital switch Module digital (e.g. SH2INDI424 module) Digital function Analogue function Analogue signal	• Arm/disarm all the **Zone intruder** functions • Reset all the **Zone intruder** functions • Acknowledge the alarm condition of all the **Zone intruder** functions • Test (simulation) the ON/OFF conditions of the **Main intruder** function	*You can add max 50 signals*

*Note: The arming/disarming signals should be entered in the **Main intruder alarm** function and they are automatically used in each zone function linked to the **Main intruder alarm** function. When the arming/disarming signal is activated, all the linked zones are automatically armed/disarmed.*

To add the arming/disarming signal, select the **Command signals** tab (in the **Main intruder** function.

Siren output signals tab

In the **Main intruder** function, the **Siren output signals** tab shows the list of all the available output signals driven by the main status

Note: the siren output only works if fixed. This means that you cannot manage any output parameters (i.e. tON and tOFF timers).

Link the **Main intruder** function to an external **Siren** function.

See Link the alarm functions to the Siren function "Procedures" on page 260

Signal type	Available options
Digital output Digital LED Siren signal of BSG-SMOx-U module	The only available option is the **Enable inverted signal parameter**

Note: You can add max 100 signals

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Alarm** status.

Signal type	Available options
Digital LED Digital Siren signal of BSG-SMOx-U module	• For each feedback signal, in the **Signal local properties** panel you can set the output behaviour according to your requirements. *See Set the feedback modes procedure ("Procedures" on page 246):* • You can enable the **Inverted logic** of the function

Note: You can add max 50 signals

Local calendar

The **Local calendar** functionality can be used to trigger action according to time schedules.

From the **Local calendar** sub-menu, you can set the following parameter:

Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*
⊕	Adds a new event
🗑	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list
Day time	Triggers the event at the specific time determined by the option you choose from 📅. From ☰, you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
Action	Selects the action to be performed when the time condition is verified. *See Available actions to see the available options*

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed.
Action on falling	As soon as the function goes OFF, the selected action is executed.

Test alarm conditions

If you want to simulate the alarm ON and alarm OFF conditions, regardless of real alarm statuses, there are different actions you can use to test the alarm conditions.

All the test actions have priority over real alarm signals status, this means that if the alarm signal detects an intrusion so the **Zone intruder alarm** is ON and at the same time a **Test action** (**Test ON, Test OFF**) is performed, the latter has the priority.

*Note: when the **Test ON** action is activated and at the same time the **Test OFF** action is activated, the Test OFF has the priority.*

In the **Command signals** tab of the function for which the**Test alarm** actions can be performed, there are these actions:

Push Button

	As you press the push button **(Rising edge)**	As you click the push button **(Click)**	After a long press **(Long)**	After a very long press **(Very long)**
Action				
Test alarm signal ON	Simulates the activation of an alarm signal			
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test			
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode			
Test alarm signal OFF	Simulates the deactivation of an alarm signal			
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test			
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode			

Digital switch / digital function

	As soon as the switch is closed or the function goes ON **(Rising edge)**	As soon as the switch is open/function goes OFF **(Falling edge)**
Action		
Test alarm signal ON	Simulates the activation of an alarm signal	
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test	

	As soon as the switch is closed or the function goes ON **(Rising edge)**	As soon as the switch is open/function goes OFF **(Falling edge)**
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode	
Test alarm signal OFF	Simulates the deactivation of an alarm signal	
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test	
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode	

Analog signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Test alarm signal ON	Simulates the activation of an alarm signal	
Remove test alarm signal ON	Removes the activation of an alarm signal for the simulation test	
Test alarm signal ON (activate/deactivate)	Enables/disables the activation test of an alarm signal in toggle mode	
Test alarm signal OFF	Simulates the deactivation of an alarm signal	
Remove test alarm signal OFF	Removes the deactivation of an alarm signal for the simulation test	
Test alarm signal OFF (activate/deactivate)	Enables/disables the deactivation of an alarm signal in toggle mode	

Procedures

Functions > Main intruder function > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Note: its value is ON when at least one of the selected status is true.

Add the Zone intruder signals

1. From the signal list, select the **Zone intruder** functions you want to add to the configuration

   Notes:

   • When a signal is selected, it appears in the central area

   • Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Add the command signals

1. From the signal list, select the input signal you want to add to the configuration

   Notes:

   • When a signal is selected, it appears in the central area

   • Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Add the Siren output

1. From the signal list, select the output signal you want to add to the configuration

   Notes:

   • When a signal is selected, it appears in the central area

   • Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the Properties panel
3. From the **Signal local properties**, set the **Enable inverted signal** option according to the configuration

Note: You should link the Zone alarm function to an external Siren function.

See "Link the alarm functions to the Siren function" below.

Link the alarm functions to the Siren function

1. Create and configure the alarm functions (intruder alarm, smoke alarm and water alarm)

   See "Alarm" on page 174

2. When the alarm functions are configured, create and configure the Siren alarm function
   Note: the Siren function can be created before/after the alarm functions
3. In the Siren input signals tab from the signal list, select the Siren status signals of the alarm functions you want to add to the configuration

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created*

4. From the **Group** field, set the priority group among **Priority group 1, Priority group 2** and **Priority group 3**
5. From the **Signal global properties**, set the options according to the configuration
   Note: you can select also other input signals related to Digital input modules or functions.

Set the feedback modes

1. From the **Feedback signals** tab, select the output signals you want to add to the configuration
   Notes:
   • When a signal is selected, it appears in the central area
   • Every time a signal is added, a new row is created.
2. Select the signal by checking the box from the **Main signals** list
3. From the **Signal local properties** panel, in the **Feedback mode** column for each **Function** status ("Settings" on page 237), you can define their behaviour:

If you select…	Then…
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values Ton (s)
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Main intruder

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Home > Functions > Main Intruder > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Siren

Content

This section includes the following topics:

Introduction to the Siren function

The **Siren** function allows you to use the function output as an acoustic alarm for multiple alarm functions.

You can link the following types of function to the **Siren** function:

- **Generic alarm** function (see "Introduction to the Alarm function" on page 175)
- **Water alarm** function (see "Introduction to the Alarm function" on page 175)
- **Fire alarm** function (see "Introduction to the Alarm function" on page 175)
- **Main Intruder** function (see "Main intruder" on page 232)
- **Zone Intruder** function (see "Zone Intruder" on page 215)
- **Counter alarm** function (see Counter Alarm)

The functions can be linked to the **Siren** function through the **Siren output status**: thanks to this feature, when at least one of the linked alarms goes ON, the **Siren output** is activated according to the configured parameters.

You can also assign each alarm function to one of the priority groups (see "Priority group 3 " below) in order to set the behaviour of the **Siren output** according to your needs.

Moreover, the **Acknowledge/Reset** commands can be performed by the individual alarm function to reset/acknowledge the **Siren** function status.

Priority group

For each **Siren status** , you can define the priority group for an alarm function. There are three priority groups and for each one you can set the behaviour of the **Siren output**, such as the activation time and the acoustic working mode (always ON, pulsating).

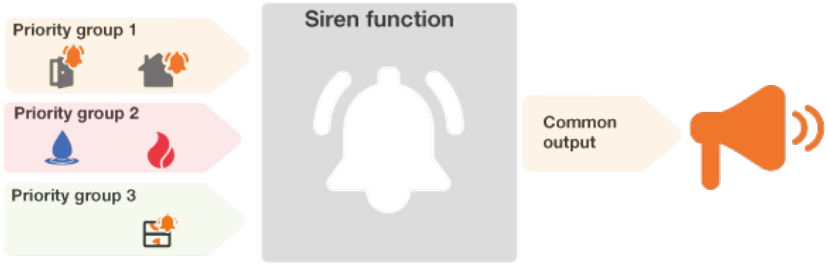
The siren is driven by the group with the highest priority with at least one alarm of the group is ON (**Alarm ON** condition).

The priority list of the groups is as follows:

Priority	Group
Higher	Priority group 1
	Priority group 2
Lower	Priority group 3

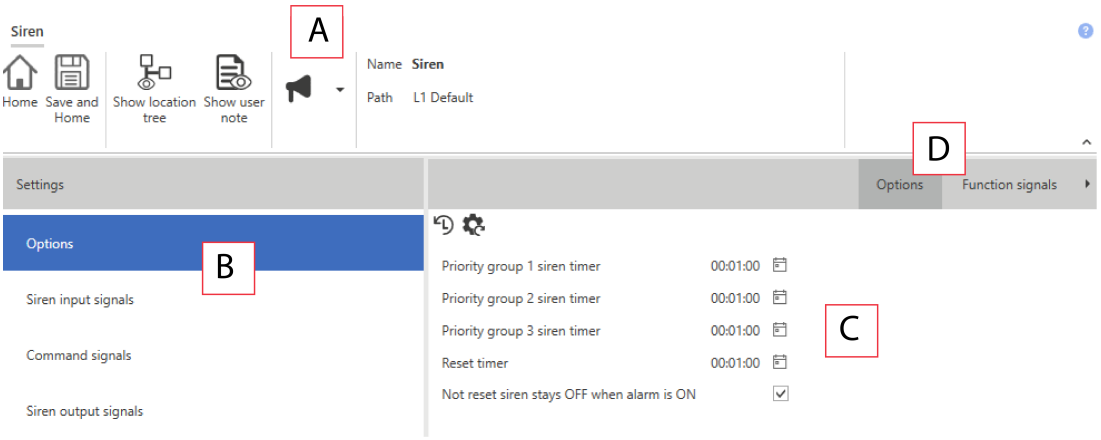
When a higher priority group signal goes ON, it turns the **Siren output** ON. If the **Siren output** is activated by a group and a higher priority group is activated, it replaces the siren activation.

As shown in the example below, the first priority group activates the siren: all the other alarm events (e.g. when other priority groups go ON) do not affect it if it is already ON.



Siren page

Home page > (Building) > Function menu > Alarms > Siren alarm



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Siren input signals**, adds the alarm input signal and assigns to the three groups • **Command signals**, sets the command signals to trigger the actions. • **Siren output signals**, sets the output signals driven by the function *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

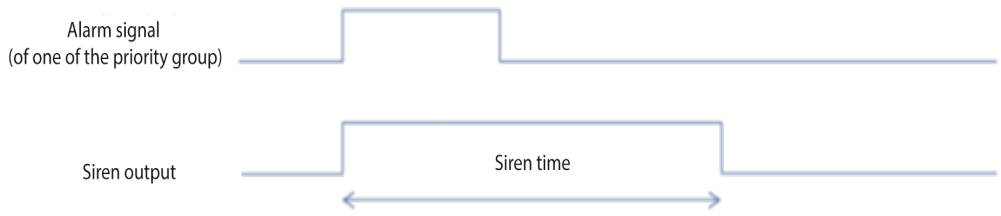
The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can set the following parameters:

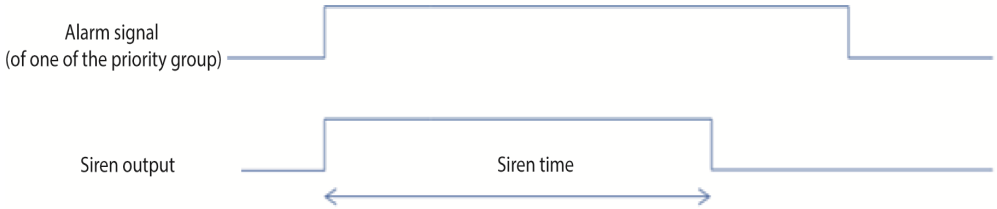
Parameter	Description
Priority group 1 siren timer	Output activation timer (0 - 24 h, default 1 min) when the **Siren** function is triggered by an alarm function of the priority group 1 During the siren activation time the output "Siren status" is ON. *Note: it can be tacitly manually by using the **Acknowledge/Reset** command*
Priority group 2 siren timer	Output activation timer (0 - 24 h, default 1 min) when the **Siren** function is triggered by an alarm function of the priority group 2 During the siren activation time the output "Siren status" is ON. *Note: it can be tacitly manually by using the **Acknowledge/Reset** command*
Priority group 3 siren timer	Output activation timer (0 - 24 h, default 1 min) when the **Siren** function is triggered by an alarm function of the priority group 3 During the siren activation time the output "Siren status" is ON. *Note: it can be tacitly manually by using the **Acknowledge/Reset** command*
Reset timer	Sets the time period after which the alarm condition turns ON again (0 - 24 h. Default value: 1 min). *Note: the reset state can remain active for the duration of the scheduled reset timer. If the timer value is set to 0 seconds, the command is pulsed.*

Siren running timer

The siren output is activated when at least one of the priority groups goes ON and stays active (even if the alarm of the group goes OFF) during the relevant **Priority** group timer.

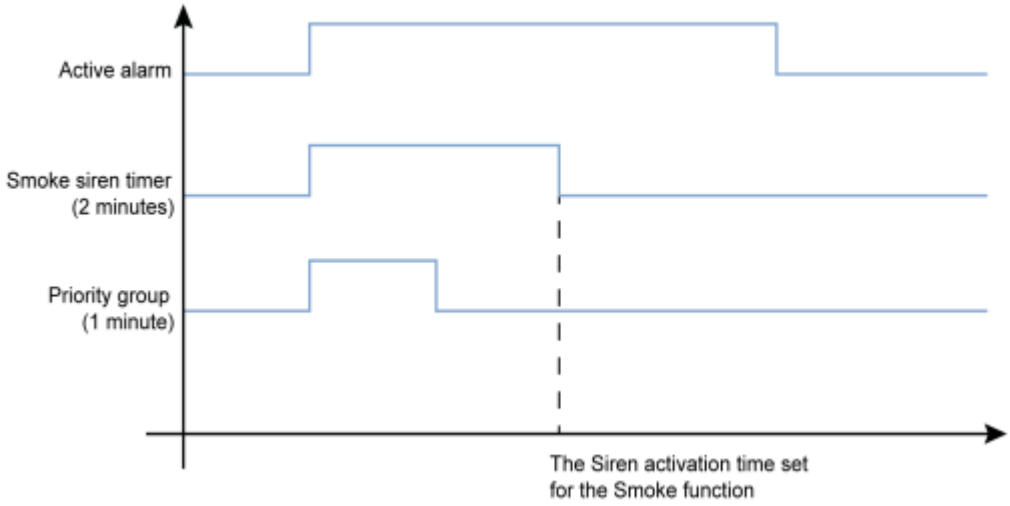


If the alarm signal of one of the priority groups is still active when the **Priority group 1 siren timer** expires, the siren output goes OFF.



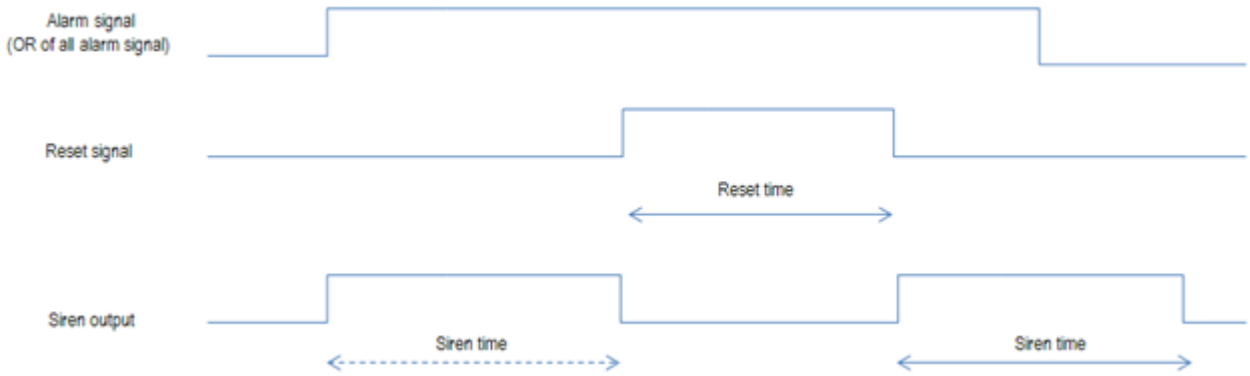
*Important note: when a **Siren** function is used as common output for linked alarm functions, the **Priority group siren timers** must be set to zero (i.e. disabled) otherwise the activation of the siren may do not work as expected.*

For instance, if the **Priority group 1 timer** is set to 1 minute and the **Siren timer** of a **Smoke** function of the same priority group is set to 2 minutes, the siren output is triggered when the alarm is activated but the Siren output turns OFF after 1 minute, according to the **Priority group 1 timer**.



Reset the siren output

If a **Reset signal** is activated, the siren is inhibited during the reset time. Once the reset time has expired, if the alarm signal is active, the siren is triggered again. When the reset signal occurs or the siren function goes OFF, the output is deactivated.



Important notes:

- *If a **Siren** function is used as common output for linked alarm functions (such as Water or Smoke alarm), if the Reset timer of a linked function is activated then also the **siren output** is automatically reset.*
- *When the activation timer of a priority group expires, click **Reset** to allow this priority group to activate the siren output as its alarm goes ON again.*

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Main signal</td><td>Shows the current function status</td><td>OFF = Siren output is not activated
ON = Siren output is activated (at least one of the priority group is ON)
See Link the alarm functions to the Siren function ("Procedures" on page 260)</td></tr>
<tr><td>State signal</td><td>Shows the current</td><td>Shows the function status among those values:
<table>
<tr><th>Value</th><th>Status</th><th>Description</th></tr>
<tr><td>1</td><td>OFF</td><td>The Siren output is OFF/ Initial condition after reset command</td></tr>
<tr><td>2</td><td>Priority group 1 ON</td><td>The Siren is activated by the priority group 1</td></tr>
<tr><td>3</td><td>Priority group 2 ON</td><td>The Siren is activated by the priority group 2</td></tr>
<tr><td>4</td><td>Priority group 3 ON</td><td>The Siren is activated by the priority group 3</td></tr>
<tr><td>5</td><td>Reset</td><td>Reset timer is running, regardless of the activation of the groups.
The status corresponds to the Alarm OFF condition.</td></tr>
</table></td></tr>
<tr><td>Custom signal 1</td><td rowspan="2">Siren status: it is ON if the statuses selected from the combo- box is true</td><td rowspan="2">You can associate to each Custom signal several function statuses (as described in the above Alarm status description).</td></tr>
<tr><td>Custom signal 2</td></tr>
</table>

Siren input signals tab

The **Siren input signals** tab shows the list of all the available alarm functions that can be linked to the **Siren** function. In addition, for each **Siren** status signal, related to the alarm functions can be defined in which of the three priority groups it has to belong.

The following table shows the type of signals you can associate to trigger the **Siren** function:

Signal type	Function	Notes
Siren status signal	Alarm function (Generic, Fire alarm Water alarm)	• *For each **Siren status signal** related to the alarm function, you can set its priority group.* • *See **Link the alarm functions to the Siren function** ("Procedures" on page 260) to configure them accordingly* • *For the **Siren status** signals, the inverted signals option is not available*
	Intruder Main	
	Intruder Zone	
	Counter alarm	
Digital signal	Input signals that belong to modules	
Digital function	Input signals that belong to functions	*For these types of signal the **Siren status signal** is not available.*

Command signals tab

The **Command signals** tab shows the list of all the available input signals that can be used as commands.

The **Siren** function can be controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	• Reset the **Siren output** • Test the **Siren output (simulation)**	*You can add max 50 signals*
Analogue function		
Analogue signal		
Digital push button		
Digital switch		

Siren output signals tab

The **Siren output signals** tab shows the list of all the available output signals that are driven by the main status of the **Siren** function.

Signal type	Available options
Digital output	• For each output signal that is added, in the **Signal local properties** panel you can set the output behaviour according to your requirements. *See **Set the feedback modes** procedure.* • Inverted logic of the function can be enabled.
Digital LED	
Siren signal of BSG-SMOx-U module	

Note: You can add max 100 signals

Trigger signals

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold Action on falling*
Action on falling	As soon as the function goes OFF, the selected action is executed *Note: The analogue value must be ≤ the falling threshold*

Available actions

The following table shows the available actions for the **Siren** function:

Action	When the action is triggered...
Reset (ignore timer)	Resets the **Siren output ON** condition regardless of the **Reset timer** value (even if the value differs from 0 second).
Reset ON	Resets the **Siren output ON** condition. If the **Reset timer** value is set to 0, the reset condition remains ON until a **Reset OFF** action is triggered.
Reset ON with timer	Resets the **Siren output ON** condition for the time period set in the **Reset timer** field. If the **Reset timer** value is set to 0, the reset condition remains ON until a Reset OFF action is triggered.
Reset OFF	Removes the **Reset ON**
Reset ON/OFF toggle	The reset is enabled/disabled in toggle mode
Reset ON with timer/OFF toggle	The reset is enabled/disabled in toggle mode. When the **Reset ON** is active, the timer starts
Test priority group 1 ON	Simulates the activation of the **Siren output** when priority group 1 is ON
Remove test priority group 1 ON	Removes the activation of the **Siren output** for the simulation test of group 1 ON
Test priority group 1 ON (activate/deactivate)	Enables/disables the activation test of the **Siren output** for group 1 ON in toggle mode
Test priority group 2 ON	Simulates the activation of the **Siren output** when priority group 2 is ON
Remove test priority group 2 ON	Removes the activation of the **Siren output** for the simulation test of group 2 ON
Test priority group 2 ON (activate/deactivate)	Enables/disables the activation test of the **Siren output** for group 2 ON in toggle mode
Test priority group 3 ON	Simulates the activation of the **Siren output** when priority group 3 is ON
Remove test priority group 3 ON	Removes the activation of the **Siren output** for the simulation test of group 3 ON
Test priority group 3 ON (activate/deactivate)	Enables/disables the activation test of the **Siren output** for group 3 ON in toggle mode
Test priority group 1 OFF	Simulates the deactivation of the **Siren output** when priority group 1 goes OFF
Remove test priority group 1 OFF	Removes the deactivation of the **Siren output** for the simulation test when priority group 1 goes OFF
Test priority group 1 OFF (activate/deactivate)	Enables/disables the deactivation test of the **Siren output** when priority group 1 goes OFF

Action	When the action is triggered...
Test priority group 2 OFF	Simulates the deactivation of the **Siren output** when priority group 2 goes OFF
Remove test priority group 2 OFF	Removes the deactivation of the **Siren output** for the simulation test when priority group 2 goes OFF
Test priority group 2 OFF (activate/deactivate)	Enables/disables the deactivation test of the **Siren output** when priority group 2 goes OFF
Test priority group 3 OFF	Simulates the deactivation of the **Siren output** when priority group 3 goes OFF
Remove test priority group 3 OFF	Removes the deactivation of the **Siren output** for the simulation test when priority group 3 goes OFF
Test priority group 3 OFF (activate/deactivate)	Enables/disables the deactivation test of the **Siren output** when priority group 3 goes OFF

Test alarm conditions

If you want to simulate the **Siren output ON** and **OFF** conditions for the different priority groups, regardless of the real alarm condition of the linked functions, you can use test commands to simulate the two conditions.

The commands test used to simulate the alarm works in the same way: as soon as at least one of the test conditions is activated (for instance, the simulation of priority groups goes ON), the Siren output is activated.

All the test actions (see "Available actions" on page 257) have priority over the alarm condition of the linked alarm functions: this means that if the priority group 1 is ON (at least one of the alarm functions that belongs to the priority group 1 is in alarm condition) and at the same time a Test ON action is performed, the latter has the priority. As long as a test condition is active, no audible and visual alarms associated to the **Alarm** function is activated.

*Note: When the **Test ON** and the**Test OFF** action are activated at the same time, the **Test OFF** has the priority.*

Procedures

Functions > Siren > Settings > Options tab > Function signals

Edit the function signals name

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Note: its value is ON when at least one of the selected status is true

Link the alarm functions to the Siren function

1. Create and configure the alarm functions (intruder alarm, smoke alarm and water alarm)
2. When the alarm functions are configured, create and configure the Siren alarm function
   Note: the Siren function can be created before/after the alarm functions.
3. In the Siren input signals tab from the signal list, select the Siren status signals of the alarm functions you want to add to the configuration.

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*
4. From the Group field, set the priority group among Priority group 1, Priority group 2 and Priority group 3
5. From the Signal global properties, set the options according to the configuration

Note: you can select also other input signals related to Digital input modules or functions.

Add the Siren output signals

1. From the Siren output signals tab, select the output signals you want to add to the configuration

   Notes:

   • When a signal is selected, it appears in the central area

   • Every time a signal is added, a new row is created
2. Select the signal by checking the box from the Main signals list
3. From the Signal local properties, in the Feedback mode column for each Function status, you can define the activation timer of the Siren output

If you select…	Then…
OFF	The feedback signal of the siren output stays OFF
ON	The feedback signal of the siren output stays always ON
Fast flashing	The feedback signal of the siren output pulsates quickly
Flashing	The feedback signal of the siren output pulsates normally

If you select…	Then…
Slow flashing	The feedback signal of the siren output pulsates slowly
Enable blinks	Check this option to set a number of acoustic signals Note: the acoustic signal number must be configured
Blinks number	You see the number of acoustic signals (default value: 1)
Enable custom	Check this option to set the Ton and Toff values Note: the ton e toff times must be configured
tON (seconds)	You see the time period during which the feedback signal stays on (default value: 1 second)
tOFF (seconds)	You see the time period during which the feedback signal stays off (default value: 1 second)

Functions > Siren

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Delay timer

Content

This section includes the following topics:

Introduction to the Delay timer function

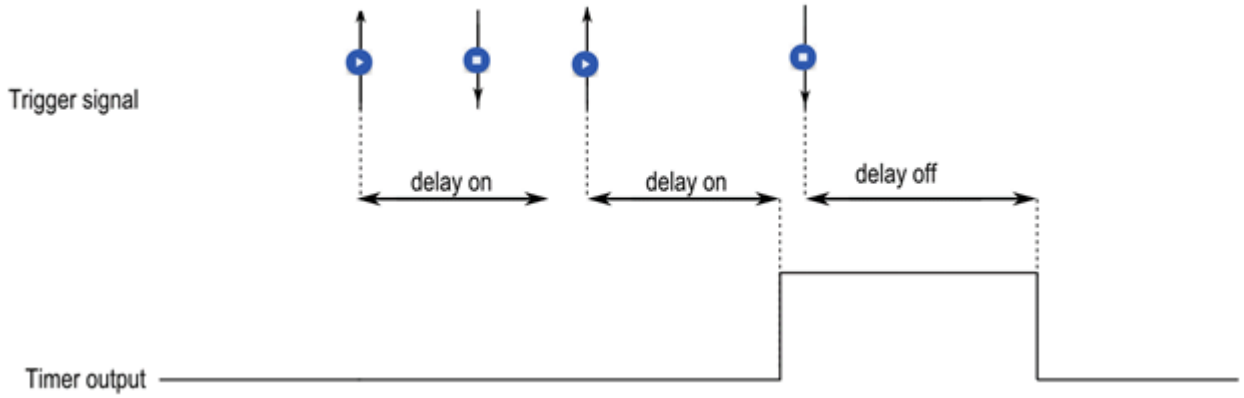
The **Delay timer** replicates on the output the status of the input and applies a delay to the switching ON and/or OFF (**Delay ON** and **Delay OFF**).

If the start signal is triggered, the **Delay ON** starts. As soon as this time expires, the output of the function switches ON.
On the contrary, if the stop signal is triggered, the **Delay OFF** starts. As soon as this time expires, the output of the function switches OFF.

Please refer to the following examples to better understand the operating mode.

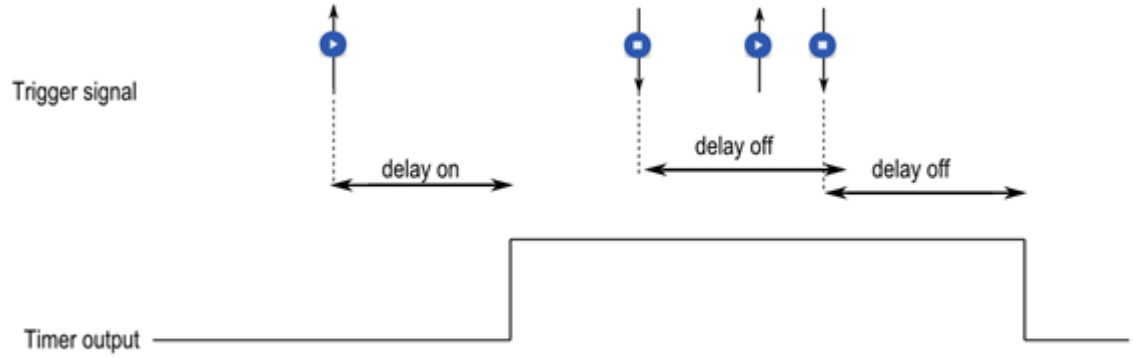
Example 1: Delay ON reset

If the stop signal is triggered before the **delay ON timer** expires, the **delay ON** is reset and the output function is not activated.



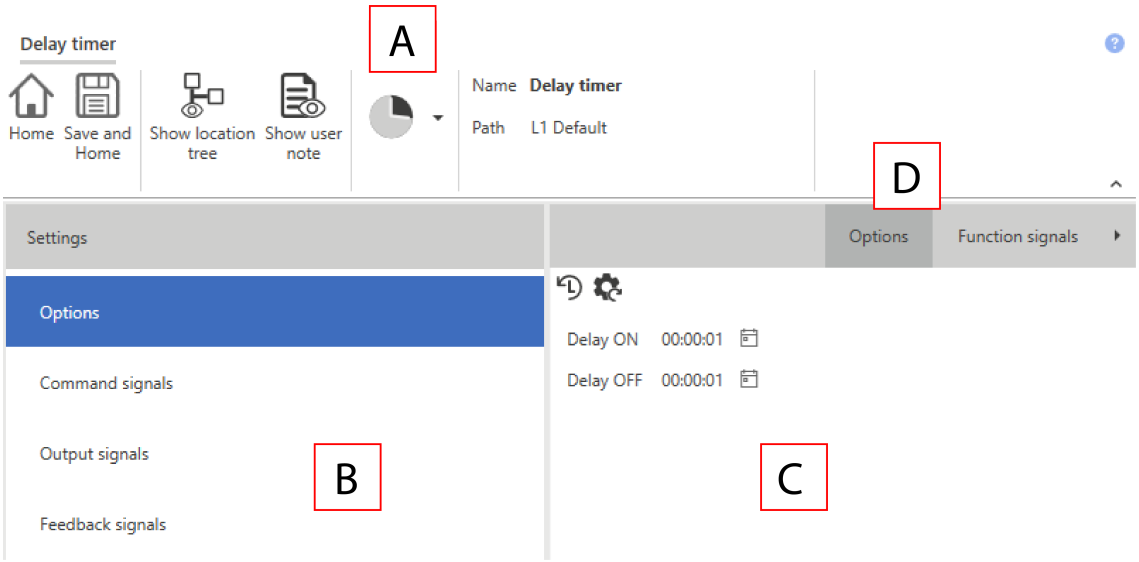
Example 2: Delay OFF reset

If the start signal is triggered before the **delay OFF timer** expires, the **delay OFF** is reset and the function stays on.



Delay timer page

Home page > (Building) > Function menu > Delay timer



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** and **Function settings**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
DelayON	Set the delay timer before the output turns ON (0 - 24 h. Default: 1 min)
DelayOFF	Set the delay timer before the output turns OFF (0 - 24 h. Default: 1 min)

From the **Function settings** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Parameter	Description	Value
Main signal	Shows the function status	OFF = Function is not active ON = Function is active
Status signal	Shows the function status	**Status** / **Value** 1 / OFF 2 / ON 3 / OFF (The delay ON is running) 4 / ON (The delay OFF is running) 5 / OFF (The delay ON is paused) 6 / ON (The delay OFF is paused)
Custom signal	It is ON if the status selected from the combo-box is true	ON = The selected status is true OFF = The selected status is false

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Delay timer** function is controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the type of signals you can associate to the trigger actions:

Signal type	Actions that can be associated	Notes
Digital push button (e.g. SHA4XLS4TH module) Digital switch Module digital (e.g. SH2INDI424 module) Function digital Function analogue	• Start • Stop • Toggle Start / Stop • Pause • Restore • Toggle Pause / Restore • Set output ON • Set output OFF	• *The **Pause** action works only if the Delay ON or OFF timer is running.* • *The **Restore** action works only if the function is paused.* • *The **Restore** starts from the last valid timer value.* • *You can add max. 50 signals*

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output Digital LED	Inverted logic of the function can be enabled

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the Delaytimer status.

Signal type	Available options
Digital LED Digital	Inverted logic of the function can be enabled

Note: You can add max. 50 signals

Moreover, from this tab you can select the **Options** sub-menu, on the top-right area, and set the behaviour of the feedback signals according to the function status.

If the function status is true in the column…	Then…
Fast flashing	The feedback signals flash quickly
Flashing	The feedback signals flash normally
Slow flashing	The feedback signals flash normally
Enable blinks	Check this option to set a number of blinks Note: the blink number must be configured
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	Check this option to set the ton and toff values Note: the ton e toff times must be configured

If the function status is true in the column…	Then…
Ton (sec)	You see the time period during which the feedback signals stay on (default value: 1 second)
Toff (sec)	You see the time period during which the feedback signals stay off (default value: 1 second)

Trigger signals

Push button

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.
Action on long click	After a long press, the selected action is executed.
Action on very long click	After a very long press, the selected action is executed.

Switch

Property	Description
Enable inverted signal	When flagged, the signal status operates in **inverted logic** .
Action on rising	As soon as the switch turns ON, the selected action is executed.
Action on click	As soon as the switch turns OFF, the selected action is executed.

Digital function

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.

Analogue function

Property	Description
Rising mode	Sets the high threshold above which the signal is considered ON.
Falling mode	Sets the low threshold below which the signal is considered OFF.

Property	Description
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold.*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold.*

Procedures

Functions > Delay timer > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties** panel
2. From the **Signal properties** panel, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Delay timer > Settings > Command signals tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties panel**
3. From the **Signal local properties**, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Functions > Delay timer

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Interval timer

Content

This section includes the following topics:

Introduction to the Interval timer function

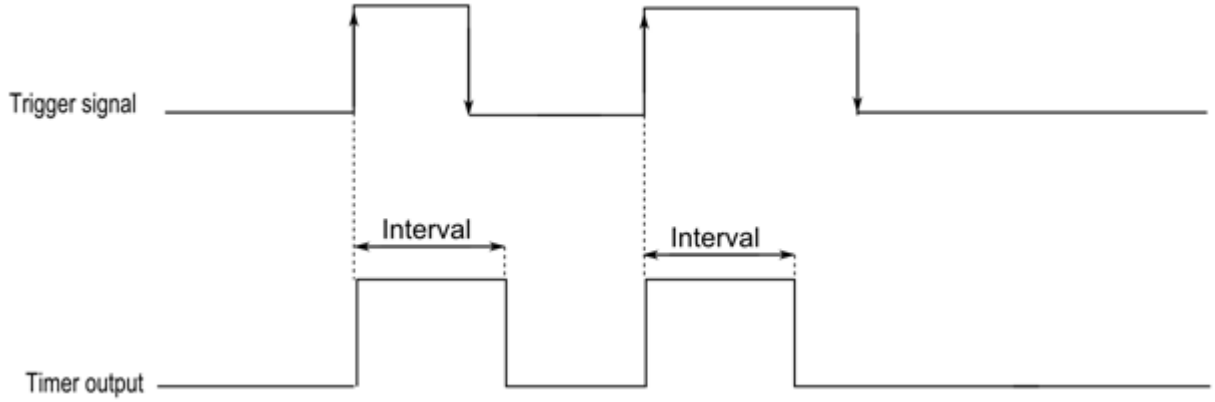
The **Interval timer** can be used to control an output when an automated temporizing is required. As soon as the **start signal** is triggered, the function output goes ON immediately and the timer starts. On the contrary, as soon as the timer expires, the function output goes OFF.

The **start signal** can be activated by selecting one of the following actions:

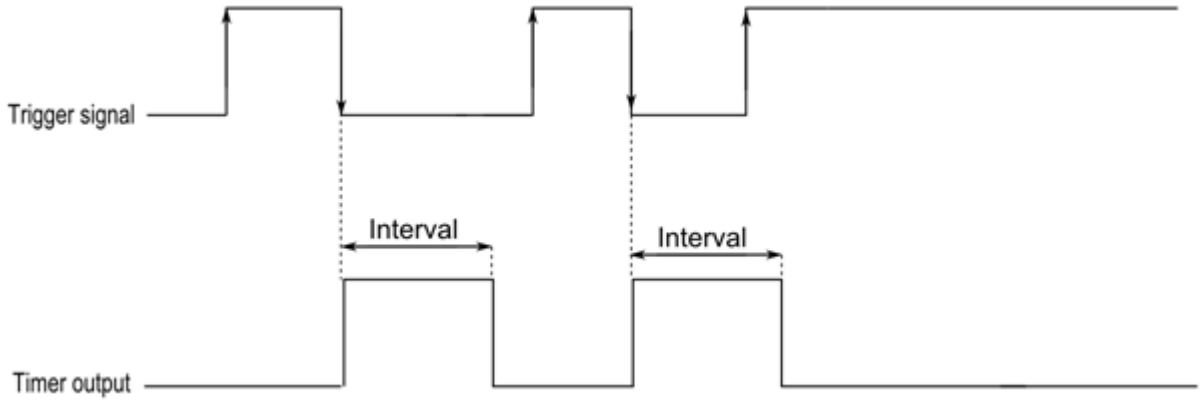
- **On rising edge of the trigger signal**
- **On falling edge of the trigger signal**
- **On each change of the trigger signal**

Please refer to the following examples to better understand the operating mode.

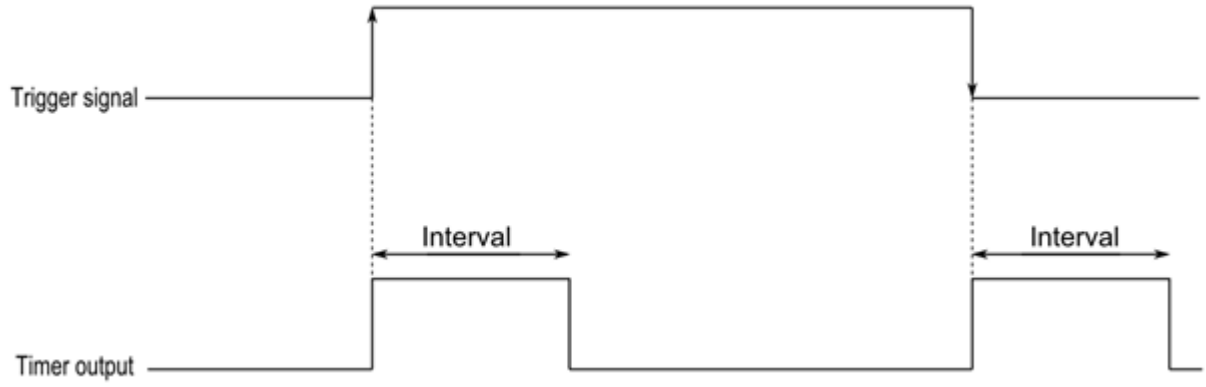
Example 1: The timer starts on the rising edge of the trigger signal



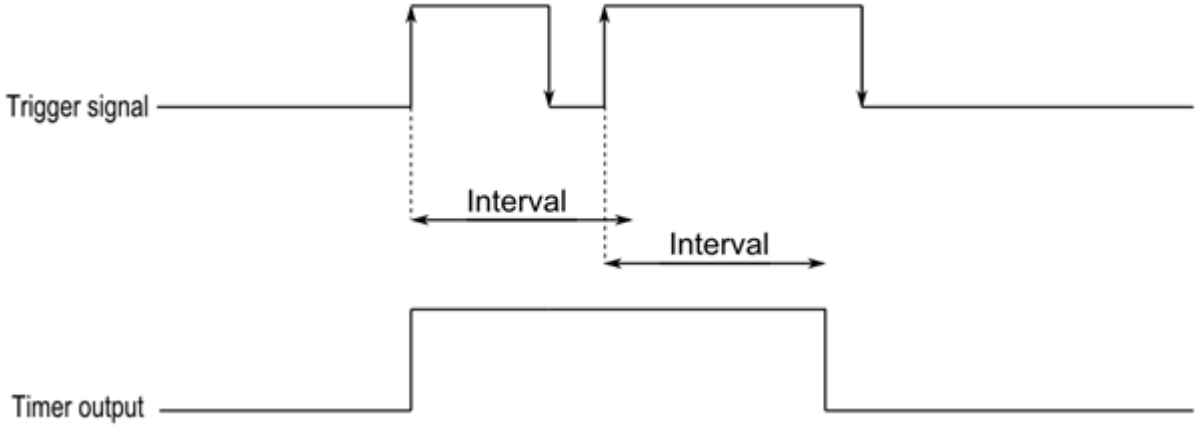
Example 2: The timer starts on the falling edge of the trigger signal



Example 3: The timer starts on each change of the trigger signal

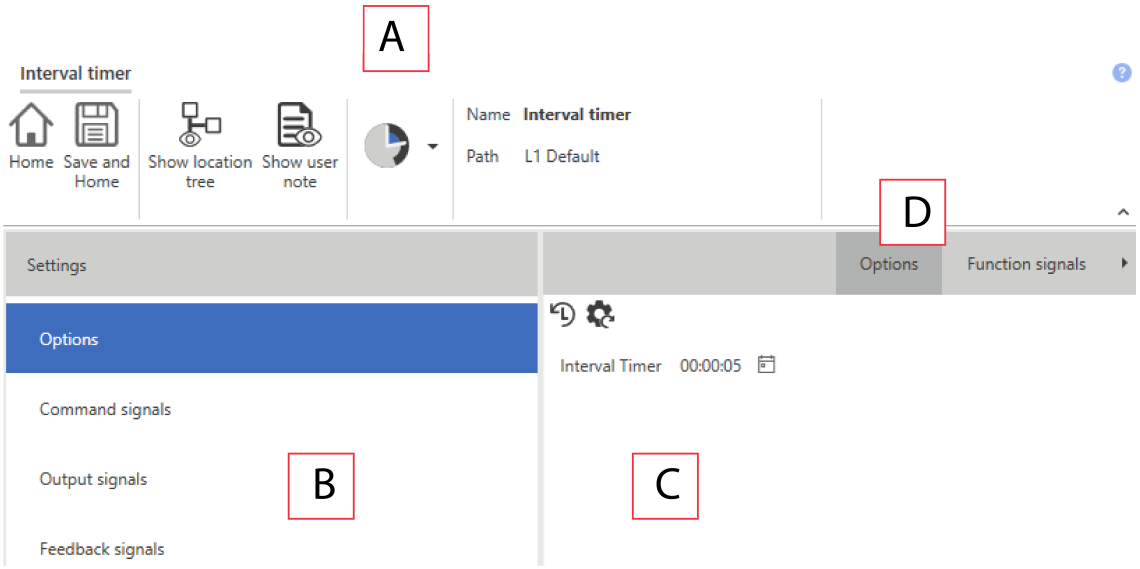


Example 4: The timer is reloaded if a trigger event is received before the timer expires



Interval Timer page

Home page > (Building) > Function menu > Interval timer



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** and **Function signals**.

From the **Options** sub-menu, you can set the following parameter:

Parameter	Description
Interval timer	Delay before the output switches ON (0 - 24 h. Default value: 1 min)

From the Function signals sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Element	Description	Value
Main signal	Shows the function status	OFF = Function is not active ON = Function is active
Status signal	Shows the function status	<table><tr><th>Status</th><th>Value</th></tr><tr><td>1</td><td>OFF</td></tr><tr><td>2</td><td>ON</td></tr><tr><td>3</td><td>ON (The interval timer is running)</td></tr><tr><td>4</td><td>ON (The interval timer is paused)</td></tr></table>
Custom signal	It is ON if the status selected from the combo-box is true	ON = The selected status is true OFF = The selected status is false

Trigger signals

Push button

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.
Action on long click	After a long press, the selected action is executed.
Action on very long click	After a very long press, the selected action is executed.

Switch

Property	Description
Enable inverted signal	When flagged, the signal status operates in **inverted logic** .
Action on rising	As soon as the switch turns ON, the selected action is executed.
Action on click	As soon as the switch turns OFF, the selected action is executed.

Digital function

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.

Analogue function

Property	Description
Rising mode	Sets the high threshold above which the signal is considered ON.
Falling mode	Sets the low threshold below which the signal is considered OFF.

Property	Description
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold.*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold.*

Procedures

Functions > Interval timer > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties** panel
2. From the **Signal properties** panel, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Interval timer > Settings > Command signals tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties panel**
3. From the **Signal local properties**, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Functions > Interval timer

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Cyclic timer

Content

This section includes the following topics:

Introduction to the Cyclic timer function

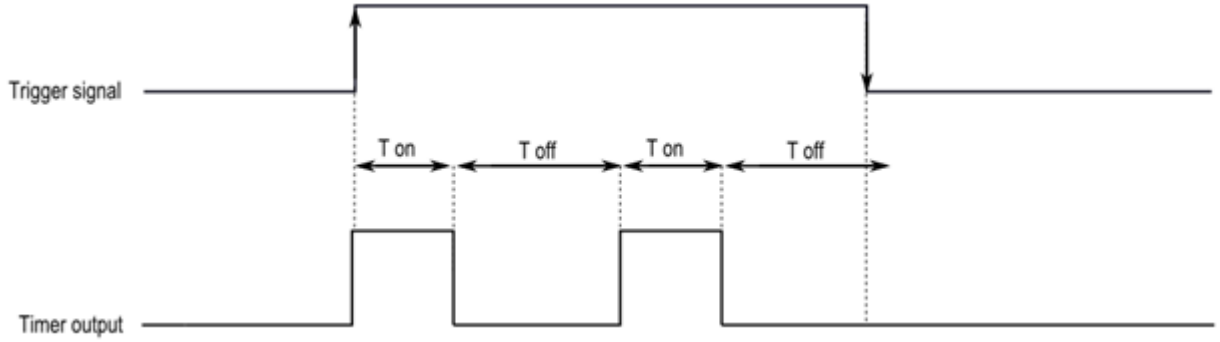
The **Cyclic timer** can be used to switch ON and OFF an output with a fixed timing. As soon as the **start signal** is triggered, the function output goes ON and OFF according to the ON and OFF timers. On the contrary, as soon as the **stop signal** is triggered, the function output goes OFF.

The **Cyclic timer** can also be set to start with the ON or OFF-timing condition.

Please refer to the following examples to better understand the operating mode.

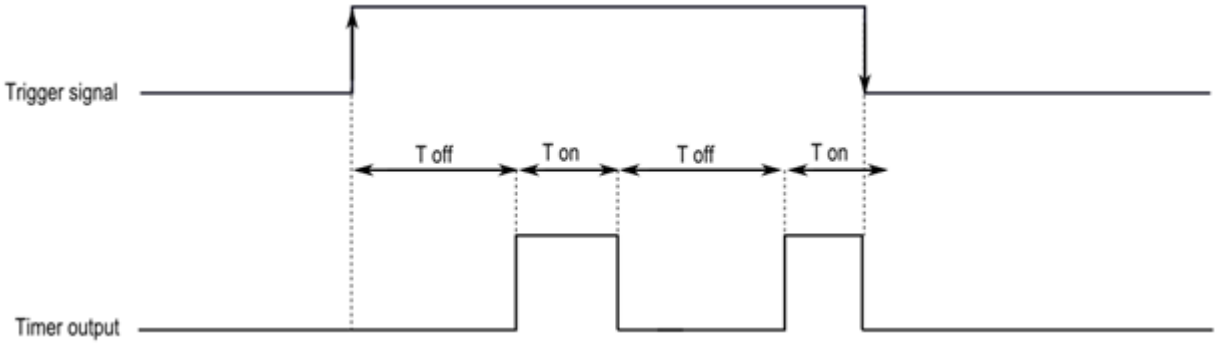
Example 1

The **Cyclic timer** starts from the **ON** condition: as soon as the **start signal** is triggered, the output starts with the ON timer.



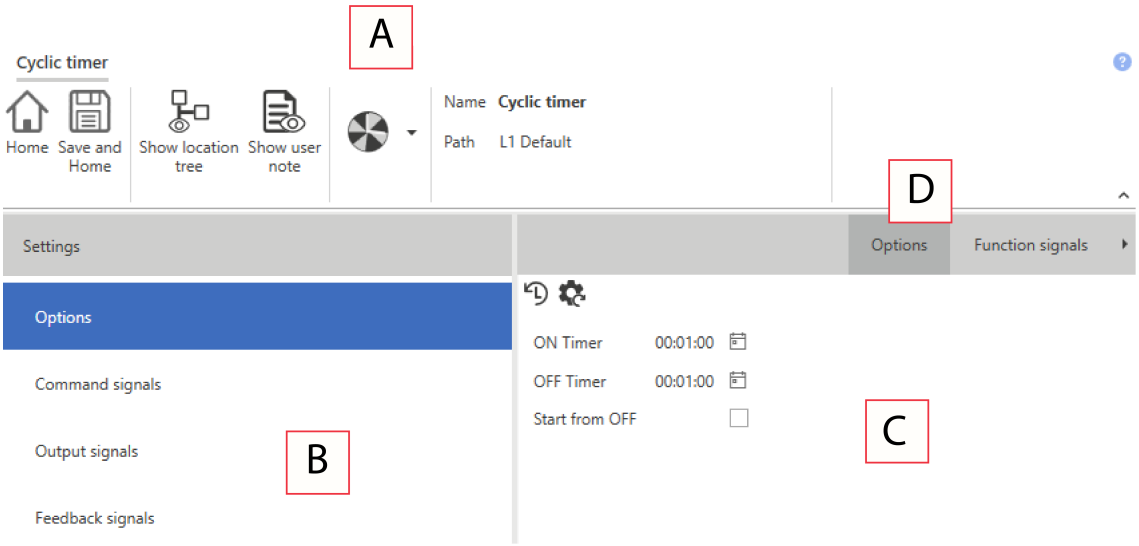
Example 2

The **Cyclic timer** starts from the **OFF** condition: as soon as the **start signal** is triggered, the output starts with the OFF timer. As soon as the stop signal is triggered, the output goes OFF.



Cyclic Timer page

Home page > (Building) > Function menu > Cyclic timer



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function settings**.

From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
ON Timer	Sets the time period during which the output stays ON (0 - 24 h. Default value: 1 min)
OFF Timer	Sets the time period during which the output stays OFF (0 - 24 h. Default value: 1 min)
Start from OFF	If checked, the function starts with the OFF Timer (Default value: Start with the ON Timer)

From the **Function settings** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Element	Description	Value
Main signal	Shows the function status	OFF = Function is not active ON = Function is active
Status signal	Shows the function status	<table><tr><th>Status</th><th>Value</th></tr><tr><td>1</td><td>OFF</td></tr><tr><td>2</td><td>ON</td></tr><tr><td>3</td><td>OFF (The OFF Timer is running)</td></tr><tr><td>4</td><td>ON (The ON Timer is running)</td></tr><tr><td>5</td><td>OFF (The OFF Timer is paused)</td></tr><tr><td>6</td><td>ON (The ON Timer is paused)</td></tr></table>
Custom signal	It is ON if the status selected from the combo-box is true	ON = The selected status is true OFF = The selected status is false

Trigger signals

Push button

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.
Action on long click	After a long press, the selected action is executed.
Action on very long click	After a very long press, the selected action is executed.

Switch

Property	Description
Enable inverted signal	When flagged, the signal status operates in **inverted logic** .
Action on rising	As soon as the switch turns ON, the selected action is executed.
Action on click	As soon as the switch turns OFF, the selected action is executed.

Digital function

Property	Description
Enable inverted signal	If it is flagged, the signal status operates in **inverted logic**.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.

Analogue function

Property	Description
Rising mode	Sets the high threshold above which the signal is considered ON.
Falling mode	Sets the low threshold below which the signal is considered OFF.

Property	Description
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold.*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold.*

Procedures

Functions > Cyclic timer > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties** panel
2. From the **Signal properties** panel, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions> Cyclic timer > Settings > Command signals tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties panel**
3. From the **Signal local properties**, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Functions > Cyclic timer

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Light

Content

This section includes the following topics:

Introduction to the Light function

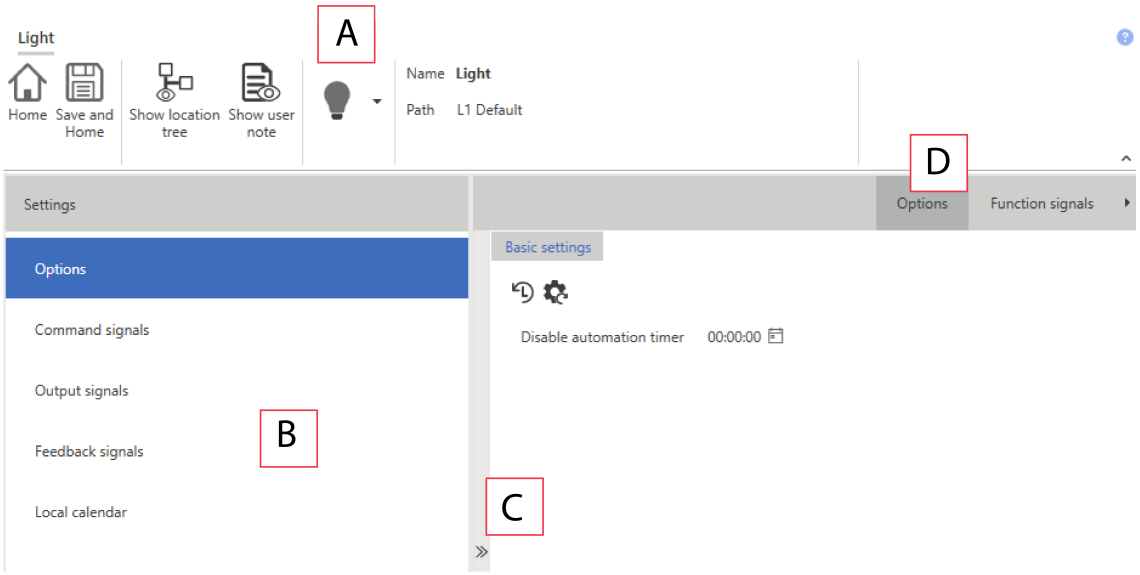
The **Light** function permits you to control one or more bright objects through three different control modes that adapt to the actuator you want to control.

Following are the three control modes:

- ON/OFF
- dimmer
- constant light.

Light page

Home page > (Building) > Function menu > Lights > Light function

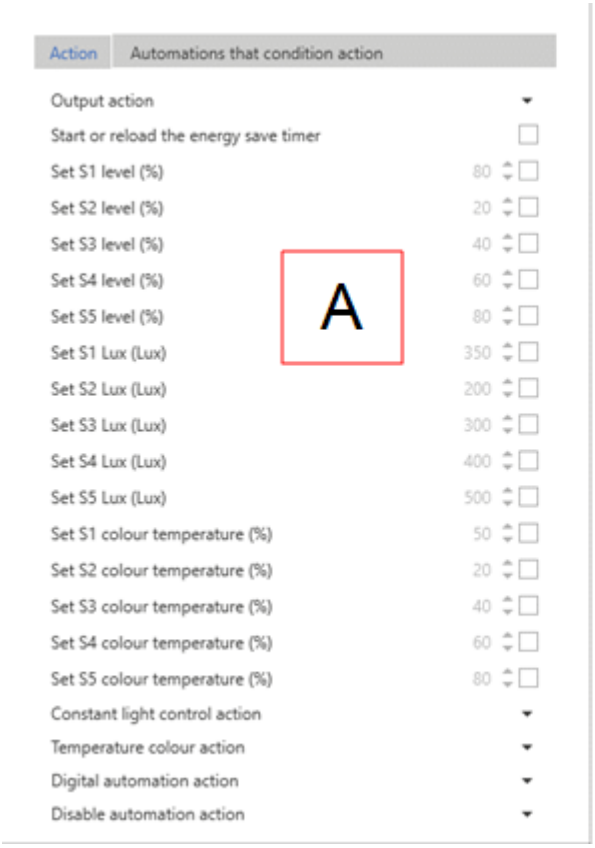


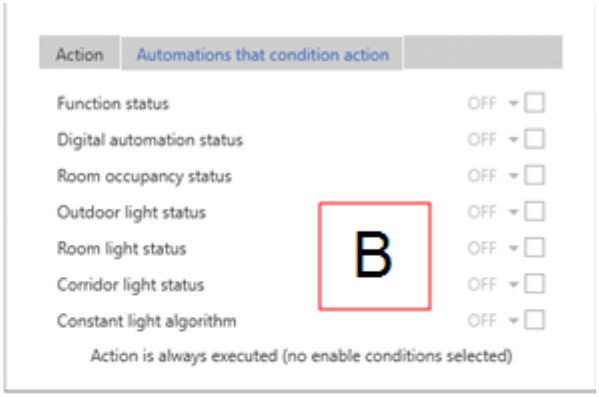
Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals that trigger the actions. • **Output signals**, sets the signals used as actuators to control the light. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, schedules events to automate the function accordingly. • **Room occupancy signals**. If you enable it, you can set the signals used to detect movement or presence in the room. • **Room light luxmeter signals**. If you enable it, you can set the signals used to measure the light level in the room. *This field is important when the **Constant light** option is active.* • **Outdoor luxmeter signals**. If you enable it, you can set the signals used to measure the light level in the room (outdoor luxmeter). • **Corridor light signals**. If you enable it, you can set the function signals used to keep the light on. It is used to automate the corridor light control according to the office occupancy. • **Master glass signals**. If you enable it, you can set the input signals compatible with inputs like SHGxxxxLD. *Note: the list varies according to the options/parameters you enable in the **Options** list.* *For further information, see "Settings" on the next page*
C	**Options** menu, sets the function options. *Note: the list varies according to the options/parameters you enable in the **Options** list.*
D	Central area: shows the available options and tabs according to the parameters you select in **Options**.
E	Sub-menu: shows the available sub-menus according to the selected tab .

Settings

Command action list

The following table describes the tabs that compose the programmable actions of the **Light** function.





Area	Description
A	The **Action** tab identifies the command type to be sent to the function. Following are the different command categories: • **Output action** • **Start** or **reload the energy save timer** • **Set S1 level (%)** • **Set S2 level (%)** • **Set S3 level (%)** • **Set S4 level (%)** • **Set S5 level (%)** • **Set S1 lux** • **Set S2 lux** • **Set S3 lux** • **Set S4 lux** • **Set S5 lux** • **Set S1 colour temperature (%)** • **Set S2 colour temperature (%)** • **Set S3 colour temperature (%)** • **Set S4 colour temperature (%)** • **Set S5 colour temperature (%)** • **Constant light control** • **Colour temperature** • **Custom automation** • **Disable automation** *Note: the actions can be programmed to be executed by the same command simultaneously.*
B	The **Automations that condition action** tab identifies the condition needed to execute the actions selected in the **Action** tab (see above). If you select nothing, the actions will always be executed.

Action tab parameters

The table below describes the **Action** tab parameters.

Action type	Selectable element	Description and notes
Output action	None	Does nothing
	ON	Switches ON. *Note: for all working modes (except for ON/OFF), this action also matches the switching ON scenario (S1, S2, S3, S4, S5).*
	OFF	Switches OFF
	ON/OFF toggle	Switches ON and OFF in an alternating manner. *Note: for all working modes (except for ON/OFF), this action also matches the switching ON scenario (S1, S2, S3, S4, S5)*

	Change Output	Changes the (lux-level-tc) of an equal past delta. *For example, the **Change output** command (20%) increases the level of S1 by 20% compared to the value assumed at that time. The same logic is applied to the Lux and to the colour temperature; also the negative values are valid.*
	Activate force ON	Enables the forcing to the ON status. *Note: for all working modes (except for ON/OFF), this action brings the output to the highest level.*
	Deactivate force ON	Disables the forcing to the ON status. *Note: as soon as you remove the forcing, the output takes the last value before the forcing.*
	Toggle Force ON activation /deactivation	Enables / disables the forcing ON in an alternating manner.
	Activate Force OFF	Enables the forcing to the OFF status.
	Deactivate Force OFF	Disables the forcing to the OFF status. *Note: as soon as you remove the forcing, the output takes the last value before the forcing.*
	Force OFF toggle	Enables / disables the forcing ON in an alternating manner.
	Activate forced value	Enables the forcing to the ON status. *Note: for all working modes (except for ON/OFF), this action freezes the output to the current level.*
	Deactivate forced value	Disables the forcing to the ON status. *Note: as soon as you remove the forcing, the output takes the last value before the forcing.*
	Force Value toggle	Enables / disables the forcing ON in an alternating manner.
	Start sequence A	Starts the sequence A.
	Stop sequence A	Stops the sequence A.
	Toggle start/stop sequence A	Starts/stops the sequence A in an alternating manner.
	Start sequence B	Starts the sequence B.
	Stop sequence B	Stops the sequence B.
	Toggle start/stop sequence B	Starts/stops the sequence B in an alternating manner.
	Refresh output	Rewrites the last valid output value. *Note: this action aligns the brightness of the function if any fail status value is active.*
Start or reload the energy save timer	-	Starts or reloads the energy save timer.
Set S1 level	-	Sets the new level value in the current scenario (S1).
Set S2 level	-	Sets the new level value in the scenario S2
Set S3 level	-	Sets the new level value in the scenario S3

Set S4 level	-	Sets the new level value in the scenario S4
Set S5 level	-	Sets the new level value in the scenario S5
Set S1 lux	-	Sets the new lux value in the current scenario (S1)
Set S2 lux	-	Sets the new lux value in the scenario S2
Set S3 lux	-	Sets the new lux value in the scenario S3
Set S4 lux	-	Sets the new lux value in the scenario S4
Set S5 lux	-	Sets the new lux value in the scenario S5
Set S1 colour temperature	-	Sets a new colour temperature value in the current scenario (S1)
Set S2 colour temperature	-	Sets a new colour temperature value in the scenario S2
Set S3 colour temperature	-	Sets a new colour temperature value in the scenario S3
Set S4 colour temperature	-	Sets a new colour temperature value in the scenario S4
Set S5 colour temperature	-	Sets a new colour temperature value in the scenario S5
Constant light control action	None	Does nothing.
	Disable constant light control	Disables the constant light algorithm to change to dimmer light.
	Disable constant light control with timeout	Disables the constant light algorithm temporarily to change to dimmer light. *Important note: you have to defined the **Timer back to constant mode** parameter from the **Constant light algorithm** tab.* *As soon as the timer expires, the **Constant light** mode is restored.*
	Remove disable constant light control	Enables the constant light algorithm to change to dimmer.
	Toggle disable constant light control	Enables/disables the constant light algorithm in an alternating manner.
	Toggle disable constant light control with timeout	Enables/disables the constant light algorithm temporarily in an alternating manner. *Important note: you have to defined the **Timer back to constant mode** parameter from the **Constant light algorithm** tab.*

Colour temperature action	None	Does nothing.
	Disable dynamic colour temperature mode	Disables the automatic colour temperature change.
	Disable dynamic colour temperature mode with timeout	Disables the automatic colour temperature change temporarily. *Important note: you have to defined the **Timer to switch to automatic colour mode** parameter from the **Dynamic colour function** tab.* *As soon as the timer expires, the functioning is restored automatically.*
	Remove disable dynamic colour temperature mode	Removes the disabling of the automatic colour temperature change.
	Toggle Disable dynamic colour temperature mode	Disables the automatic colour temperature change in an alternating manner.
	Toggle Disable dynamic colour temperature mode with timeout	Disables/Enables the automatic colour temperature change temporarily in an alternating manner. *Important note: you have to defined the **Timer to switch to automatic colour mode** parameter from the **Dynamic colour function** tab.*
Digital automation action	None	Does nothing.
	Automation ON	Sets the logical status to ON. *Note: this is a custom automation that can have value 0 = OFF or 1 = ON.*
	Automation OFF	Sets the logical status to OFF. *Note: this is a custom automation that can have value 0 = OFF or 1 = ON.*
Disable automation action	None	Does nothing.
	Disable ON	Selects the disabled elements. *Note: you have to select the automations affected by the command.*
	Disable ON with timeout	Selects the disabled elements. *Note: you have to select the automations affected by the command.*
	Disable OFF	Selects the elements for which the disabling has been removed. *Note: you have to select the automations affected by the command.*
	Disable ON/OFF toggle	Selects the elements that have been disabled / re-enabled again. *Note: you have to select the automations affected by the command.*
	Disable ON/OFF toggle with timeout	Selects the elements that have been disabled / re-enabled. *Note: you have to select the automations affected by the command.*

Local calendar tab

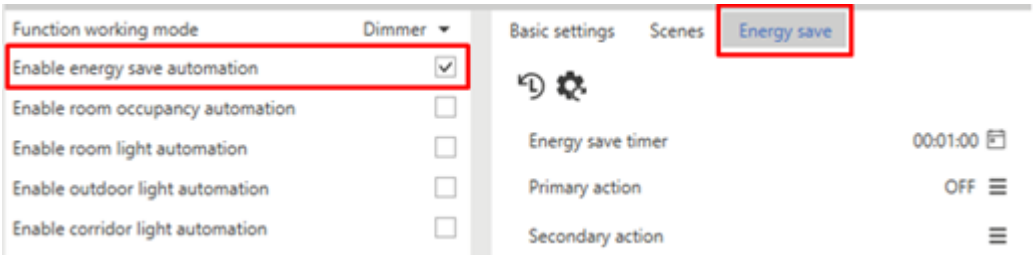
The **Local calendar** can be used to trigger actions according to time schedules. From the **Local calendar** sub-menu, you can set the following parameters:

Parameter	Description
Enable at controller start up	If you enable it, it executes the closest missed events at the controller start-up. *Note: when the controller is powered ON, the system checks the time periods and triggers the relevant event. If the event time period is not verified, it is triggered the next time.*
⊕	Adds an event
Day time	Triggers the event at the specific time determined by the option you choose from 📅 . From ☰, you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
🗑	Removes the selected event
Enable	Enables/disables the event
Description	Defines the event name that will appear in the **Local calendar** list
Day time	Triggers the event at the time set from the list (HH:MM:SS:)
Days	Triggers the event on the selected days
Months	Triggers the event on the selected months
Week days	Triggers the event on the selected week days
Action	Selects the action to be performed when the time condition is verified.

Energy save automation

The **Energy save timer** is used to manage the light automatic switching off and is an option available for all working modes.

If you select **Enable energy save automation** from the **Options**, a tab for editing the settings appears in the central menu.



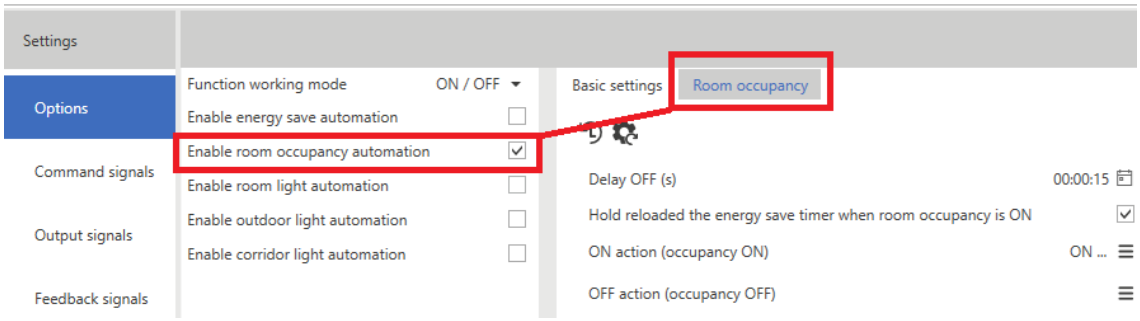
Following are the settable parameters:

Parameter	Description
Energy save timer (s)	Delay time for executing the automatic switching off. *Note: if the timer is set to 0, the functionality is temporarily disabled (the value can always be changed from web or live signals).*
Primary action	You can select the action to be executed as soon as the timer expires.
Secondary action	You can select another action to be executed as soon as the timer expires. *Notes:* *if both actions (primary/secondary) are enabled, the primary action has the priority.* *the secondary action has to be conditioned by a different automation than the primary one.*

Room occupancy automation

The **Room occupancy** automation permits you to use one or more motion detector signals for the function automation. According to the room occupancy condition, you can configure actions the function can execute.

If you select **Enable room occupancy automation** from the **Options**, a tab for editing the settings appears in the central menu.



Following are the settable parameters:

Parameter	Description
Delay OFF (s)	Delay time for executing the **OFF Action (occupancy OFF)**. *Notes:* • *the **Delay OFF** timer starts counting as soon as the room occupancy condition goes OFF.* • *the **Occupancy** status and the **Delay OFF** timer are also managed when the light is OFF so to avoid triggering a command action for a false **Occupancy ON** status.*
Hold reloaded the energy save timer when room occupancy is ON	Keeps the energy save timer loaded as long as the room occupancy status is ON. *Note: you have to use the **Energy save automation** too.*
On Action (occupancy ON)*	The function has to execute it when the **Room occupancy** condition goes ON.
OFF Action (occupancy OFF)*	The function has to execute it as soon as the **Delay OFF** timer expires.

Note: the selectable options are described in **"Light page " on page 292> Command action list.*

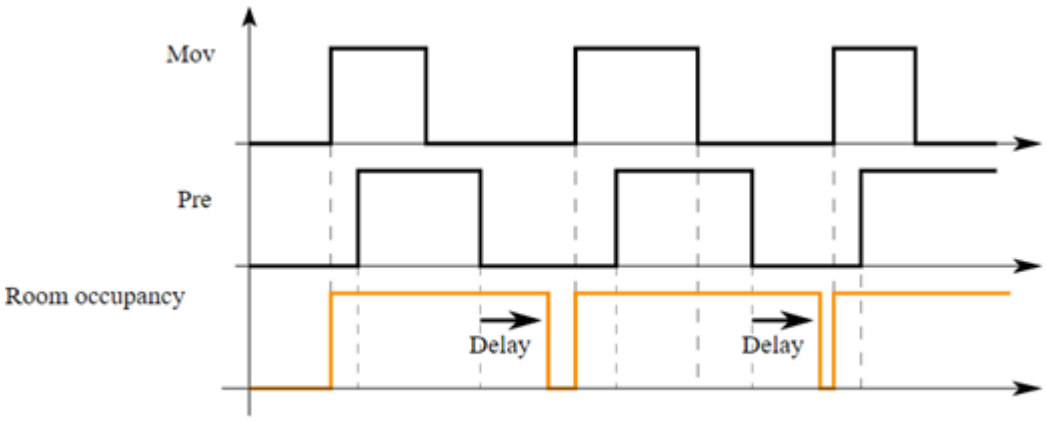
Notes (II):

*The **Room occupancy** status is calculated using the OR logic among all the input signals added from the **Room occupancy signals** field.*

*For all those signals coming from Smart Dupline PIRs, when both movement and presence signals are used, the **Room occupancy** status changes to ON if the movement signals are activated.*

*As long as the movement or presence signals are activated, the **Delay OFF** timer is reloaded.*

*As soon as the movement and the presence signals are disabled, the **Delay OFF** timer starts; as soon as the timer expires, the **Room occupancy** goes OFF (see the picture below).*



For those signals coming from Smart Dupline PIRs, if you want to use only one movement or presence signal, you have to add a movement signal but not a presence signal.

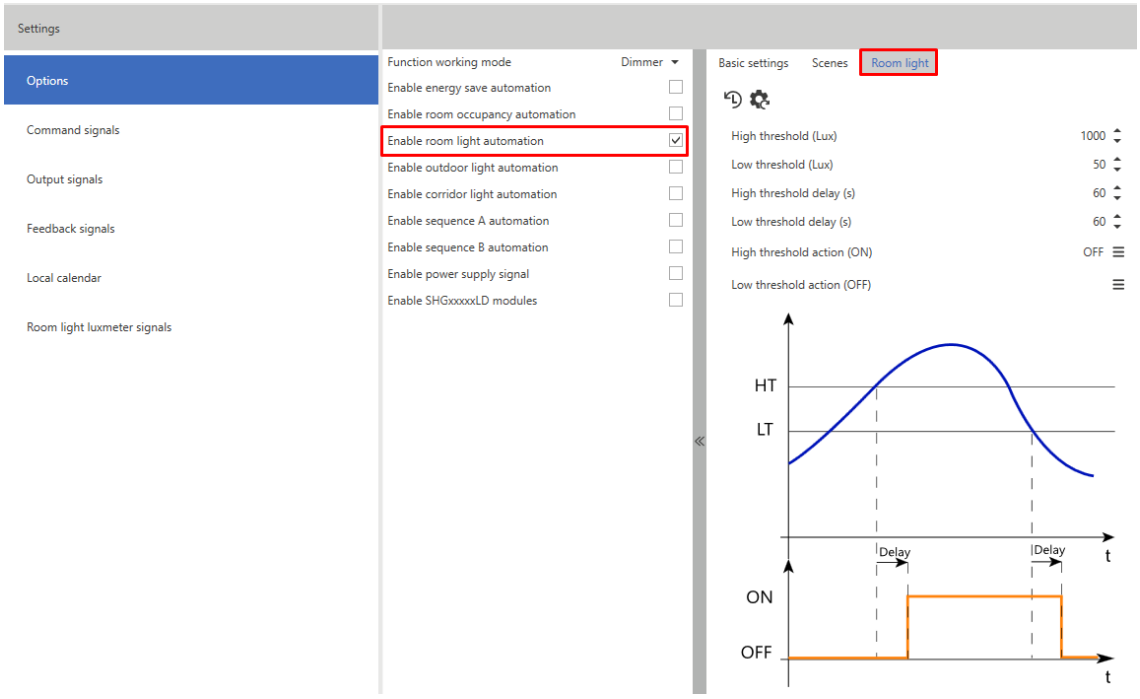
In the PIR settings, you can increase / decrease the presence, movement and alarm signal sensing by adjusting the four parameters described below:

PIR Parameter	Description
Pulse number	Minimum number of pulses to be counted for generating the input signal. *Note: this field has to be used for legacy PIR modules since the Smart Dupline PIR ones have already this functionality embedded.*
Time window (s)	Time window within which the generated pulses are counted.
Filter mode	You can select two different options that affect the sensing and the reaction time of the PIR: • Single pulse, usually used for presence signals • Double pulse, usually used for movement signals *Note: this field is used for Smart Dupline PIR signals and replaces the **Pulse number** field.*
Sensitivity	Editable value (10-100). The lowest the value, the highest the sensor sensing. *Note: to better understand how the detection area is influenced by this value, please refer to the PIR modules data sheets.*

Room light automation

The **Room light** automation permits you to use one or more luxmeter signals installed in the room so to automate the function. According to the light level measured in the room, you can program the execution of different actions.

If you select **Enable room light automation** from the **Options**, a tab for editing the settings appears in the central menu.



Following are the settable parameters:

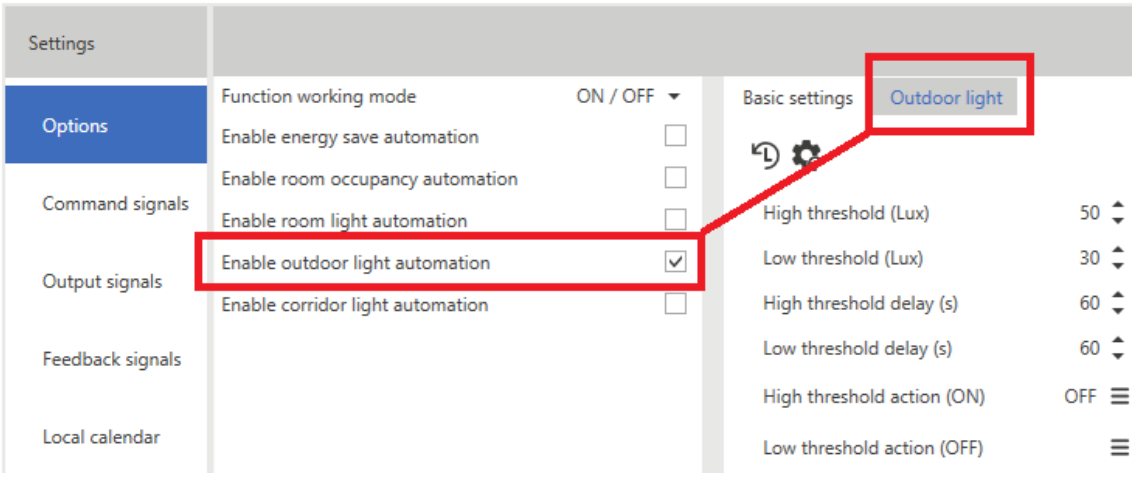
Parameter	Description
High threshold (Lux)	Light high threshold
Low threshold (Lux)	Light low threshold
High threshold delay (s)	Delay time for the programmed action when the high threshold is exceeded. *Note: if this value is set to 0, the action is executed immediately.*
Low threshold delay (s)	Delay time for the programmed action when the low threshold is exceeded. *Note: if this value is set to 0, the action is executed immediately.*
High threshold action*	Action executed as soon as the measured light exceeds the high threshold.
Low threshold action*	Action executed as soon as the measured light goes below the low threshold.

Note: the selectable options are described in **"Light page " on page 292> Command action list.*

Outdoor light automation

The **Outdoor light** automation permits you to use one or more luxmeter signals installed in the room so to automate the function. According to the external light level measured, you can program different actions to be executed.

If you select **Enable outdoor light automation** from the **Options**, in the central menu a tab for editing the settings appears.



Following are the settable parameters:

Parameter	Description
High threshold (Lux)	Light high threshold
Low threshold (Lux)	Light low threshold
High threshold delay (s)	Delay time for the programmed action when the high threshold is exceeded. *Note: if this value is set to 0, the action is executed immediately.*
Low threshold delay (s)	Delay time for the programmed action when the low threshold is exceeded. *Note: if this value is set to 0, the action is executed immediately.*
High threshold action*	Action executed as soon as the measured light exceeds the high threshold.
Low threshold action*	Action executed as soon as the measured light goes below the low threshold.

Note: the selectable options are described in **"Light page " on page 292> Command action list.*

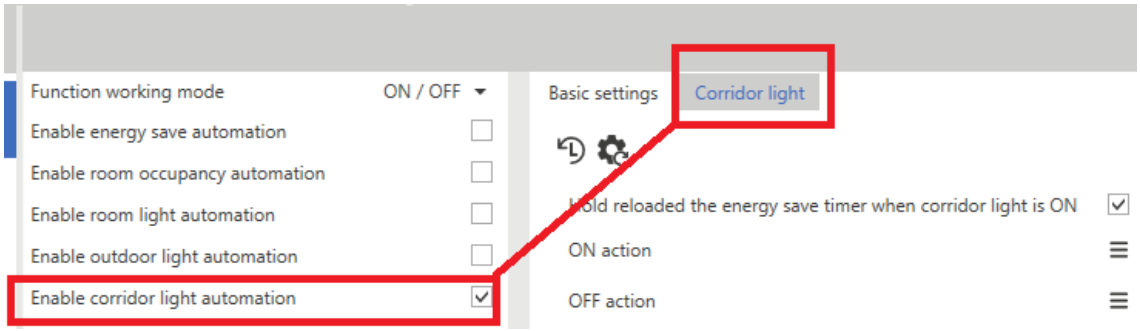
Corridor light automation

This functionality is available with all working modes (ON/OFF, Dimmer and Constant light) and permits you to automatically adjust the lights installed in the corridors.

Note: as long as at least one light in the adjacent offices stays ON, the corridor light must be ON.

If you select **Enable corridor light automation**, the light is adjusted automatically according to the logical status of the function light signals added from **Corridor light signals**.

Moreover, if you select **Enable corridor light automation** from the **Options**, a tab for editing the settings appears in the central menu.

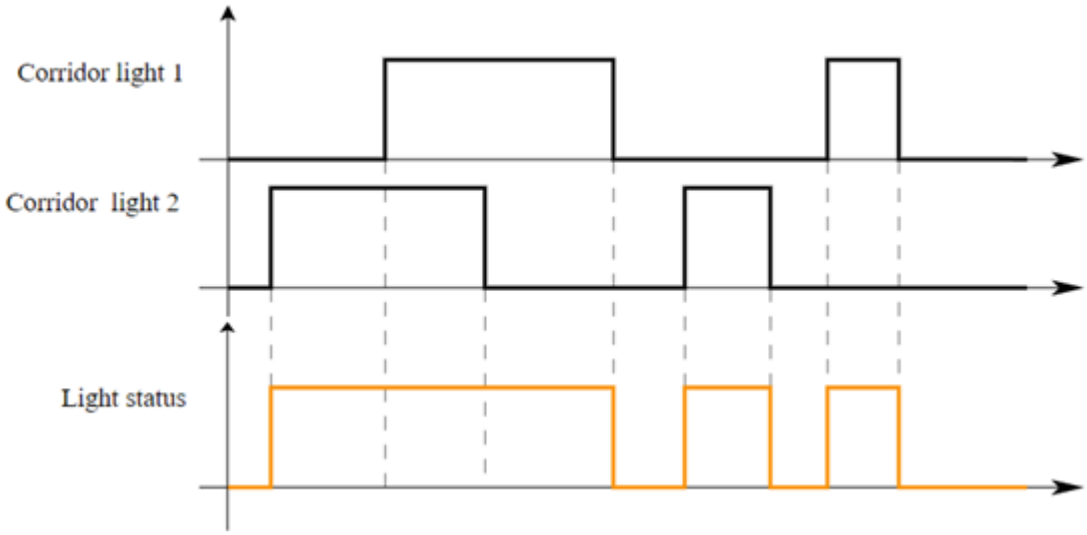


Following are the settable parameters:

Parameter	Description
Hold reloaded the energy save timer when corridor light is ON	Keeps the energy save timer reloaded as long as the status of at least one corridor light function stays ON. *Note: you have to use it together with the **Energy save automation** field.*
ON action*	Action executed if the corridor light is ON
OFF action*	Action executed if the corridor light is OFF

Note: the selectable options are described in **"Light page " on page 292> Command action list.*

*In the example below, the **Corridor light** option keeps the light on as long as one of the two offices linked to the function as corridor signals 1 and 2 has the light on.*

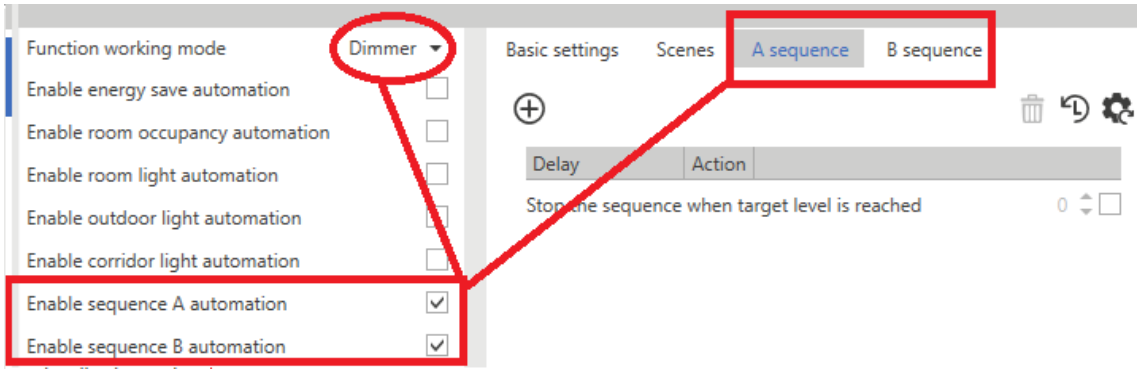


16. OR logic of the corridor light signals

Sequence A and B automation

This functionality is available with all working modes except for ON/OFF and permits you to edit a list of actions to be executed with subsequent delay times.

If you select **Enable sequence A automation** from the **Options**, a tab for editing the settings appears in the central menu.



Following are the settable parameters:

Parameter	Description
⊕	Adds a step to the sequence
🗑	Deletes a step from the sequence
Stop the sequence when target level is reached	Stops the sequence as soon as the output value matches the target value you set. *Note: this option is used together with the **Change output** field to create dynamic scenarios and stop the sequence as soon as the set value is reached (example of scenarios: cinema or presentation).*

Note: the selectable options are described in **"Light page " on page 292> Command action list.*

Power supply signal

This option permits you to manage relay signals that cut the power supply of the ballast modules.

It is valid for all types of light control using a dimmer 1-10 V technology and ensures the lamps switching off when the light is OFF and the signal is 1 V.

SHGxxxxxLD signals

This functionality is available for all working modes (except for ON/OFF) and permits you to manage the light function through signals coming from glass/slider interfaces (such as SHGxxxxLD).

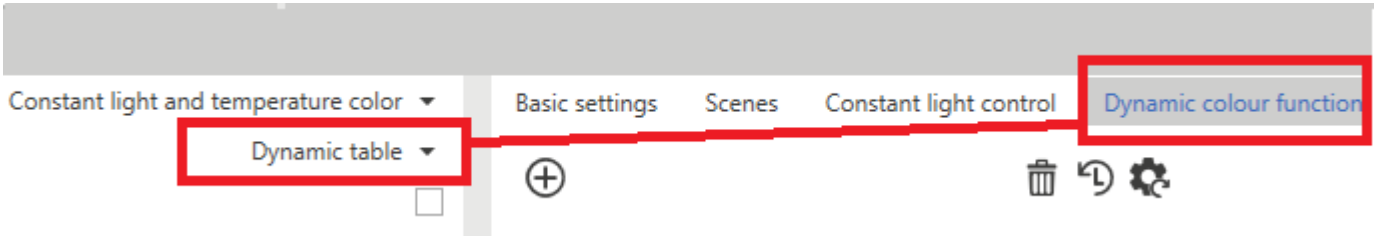
It is dedicated to Smart Dupline dimmers but not to other types of comparators.

Dynamic colour function

This functionality is available with all working modes (ON/OFF, Dimmer and Constant light) and permits you to automatically adjust the light colour temperature by scheduling different times at which the colour set point changes.

Once you have defined your scheduling points, the system interpolates them by automatically calculating the colour temperature values to be applied to the output.

If you select **Dynamic table** from the **colour temperature working mode** combo box (**Options** tab), in the central menu a tab for editing the table appears.



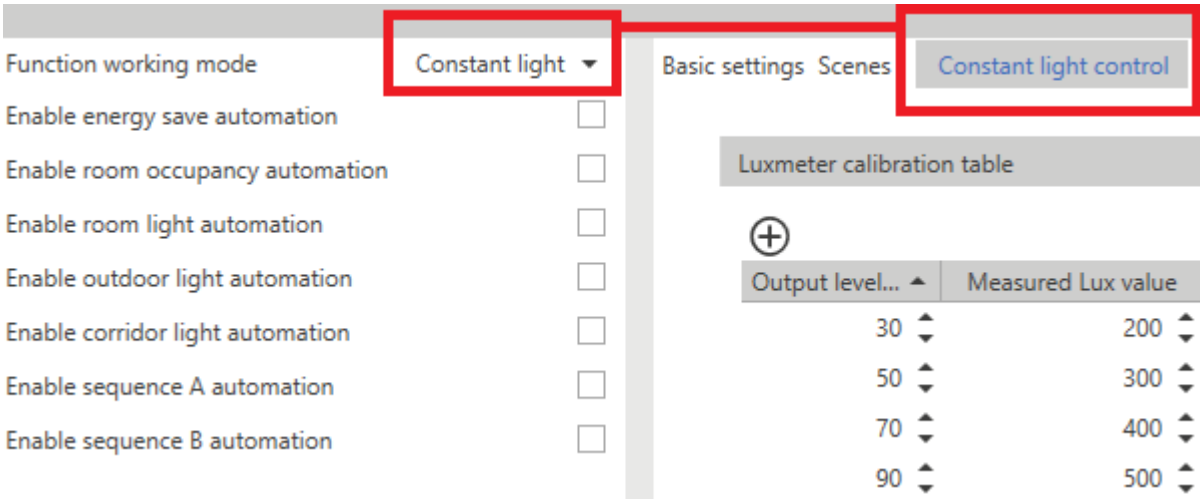
Once you have defined the points in the table, the system automatically calculates the intermediate points by making the interpolation.

The **Timer to switch to automatic colour mode** parameter permits you to set a timer that restores the dynamic colour functionality after the user has changed to the manual mode through a **Disable dynamic colour temperature mode with timeout** command.

Constant light control

In the **Constant light control** mode, a light sensor installed on the ceiling measures the luminance of the surfaces in its detection range, e.g. the floor or the desks. This value (actual value) is compared with the predefined set point value, and the control value is adjusted so that the divergence between the set point and the actual values is minimal. If outside it is brighter, the share of artificial lighting is lower. If outside it is darker, the share of artificial lighting is higher.

If you select **Constant light** from the **Options > Function working mode**,a tab for editing the settings appears in the central menu.

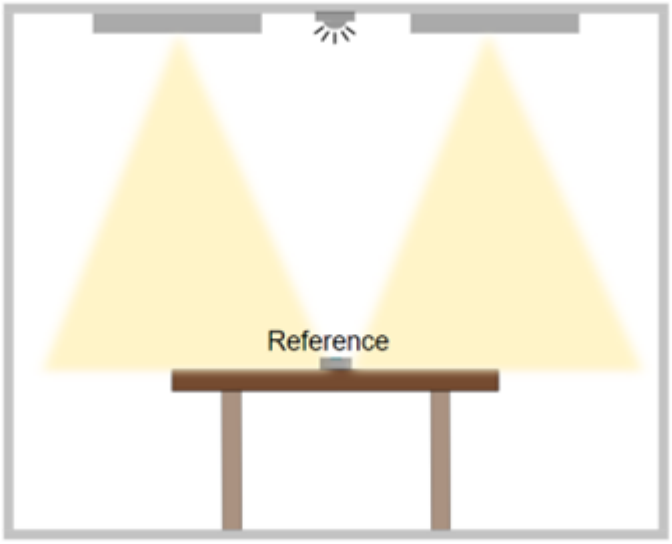


Luxmeter calibration table

The objective of the **Constant light control** is to keep the illumination degree when a set point is defined.

To do it, the light sensor should be placed exactly on the desk. Whenever this is not possible for practical reasons, the light sensor is generally mounted on the ceiling.

The calibration table permits correcting the light measurement of the sensor on the ceiling so that the read value and the table value match.



17. Portable luxmeter installed on the working surface to calibrate the luxmeter on the ceiling

The calibration points are automatically found through the calibration procedure in live signal (see How to calibrate the room luxmeter).

Algorithm parameters

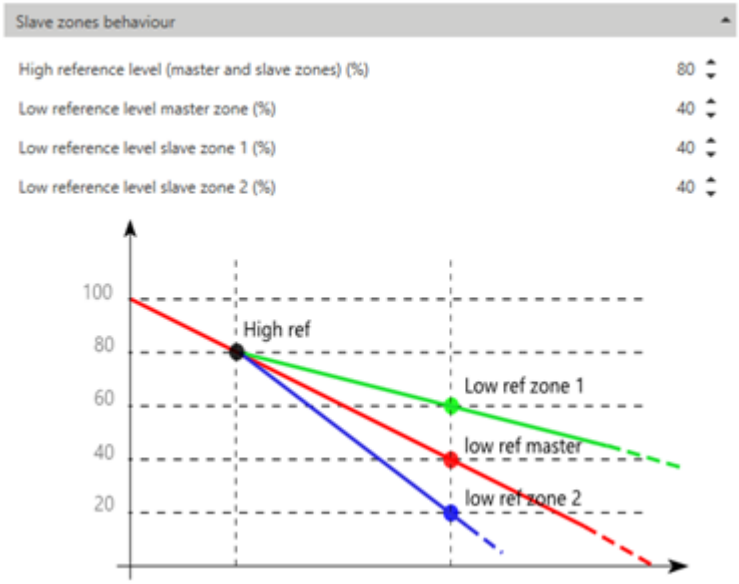
Following are the settable parameters:

Parameter	Description
Daylight influence constant	External light compensation coefficient. If K =1, no corrective factor is applied to the values found with calibration. If K<1, the output % has higher values than those found with calibration. If K>1, the output % has lower values than those found with calibration.
Output status when daylight sensor is faulty (%)	Dimming value to be applied to the output if the light sensor is not connected or if the relevant status is not valid. *Note: if the light function is OFF, no value is applied to the output.*
Timer back to constant mode	Time out to restore the **Constant light control** if the user has temporarily disabled the algorithm to change to the dimmer mode.
Disable dimmer mode when light is turned OFF	If you select it, the **Constant light control** is restored at the next light switching on, regardless of whether the constant light algorithm is active or not (dimmer mode) before the switching off.
Action when constant light mode is restored*	Action to be executed as soon as the **Timer back to constant mode** expires.

Note: the selectable options are described in* *"Light page " on page 292> Command action list****.*

Slave zone behaviour

If the **Constant light** mode provides for slave zones (one or two), the **Reference** parameters are available to set the linear relationship between the slave zones and the reference master zone. According to the set thresholds, the algorithm calculates the output in % to be generated in the slave zones in accordance with the output percentage of the master zone at that time.

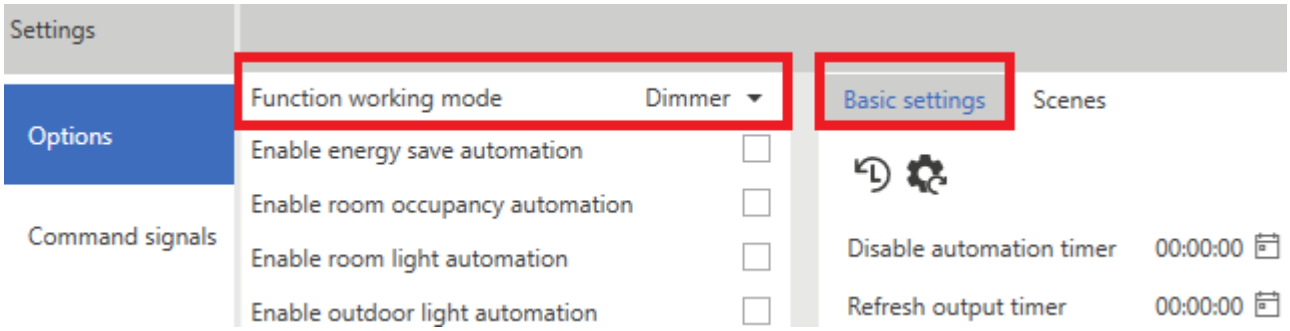


Following are the settable parameters:

Parameter	Description
High reference level (master and slave zones) (%)	High reference threshold for calibrating the zones. *Above this value, the slave zones take the same output value of the reference master function.*
Low reference level master zones (%)	Low reference threshold in the master zone.
Low reference level slave zone 1 (%)	Low reference threshold in the slave zone 1.
Low reference level slave zone 2 (%)	Low reference threshold in the slave zone 2.

Basic settings and *Scenes* tabs

The **Basic settings** tab is always visible and its parameters change according to the working mode you select.



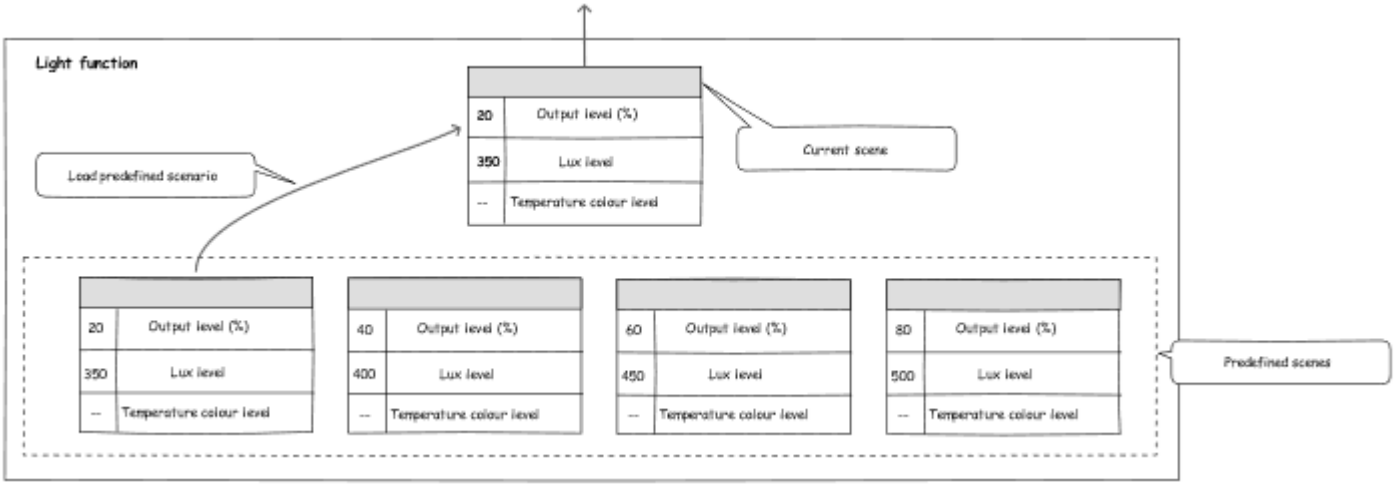
Following are the available parameters:

Parameter	Description	Notes
Disable automation timer (s)	Time for disabling one or more automations.	• *If the timer is set to 0, the functionality is temporarily disabled.* • *The value can always be changed from web or live signals and starts from the **Disable automations with timeout** command*
Refresh output timer	Timer to align the lamps and the light function status automatically after a fail state condition that changes their value.	• *As soon as the timer expires, the system rewrites the function output value.* • *Available for all working modes except for ON/OFF.*

The **Scenes** tab is visible for all working modes that control the dimmer lights.

Through this tab you can define scenarios to be used for controlling the lights.

The light function, regardless of the working mode you select, always uses the current scenario (S1) where the last valid value that the output takes before the light switches off is always saved. The value that S1 takes can be changed through manual commands or can be overwritten by the value saved in the predefined scenarios (S2, S3, S4 and S5).



*18. Management of the **Light** function scenarios*

When you select a working mode other than ON/OFF (from **Options**), a tab containing the settable parameters appears in the central menu.

Depending on the presence of the **Constant light** and **Temperatures control** modes, for each scenario you can do what follows:

- **Set level %** (range 1 ...100)
- **Set lux level (lux)** (range 1 ...100)
- **Set TC level (%)**

  The value is always expressed in % and not in °K because you do not know in advance the features of the lights controlled by the function.
- **Lock scenario modification**. It permits you to decide if the scenario is remotely editable or not. When this option is flagged, you can only change the scenario manually, through buttons.
- **Name**. It permits you to give the scenario a label that appears in the web app light widget.

*Note: the value you define in the **First start-up** field is used at the first switching on (thus overwriting S1). After that, the system saves the last value the function takes before the switching off in S1 and you use it at the following ON command.*

S1 is the current scenario where you can upload the values saved in the other scenarios, i.e., S2, S3, S4 and S5.

Procedures

How to condition two automations

This procedure shows how to condition an action command according to the status (ON/OFF) of one or more automations. The following steps show how to inhibit the PIR functioning according to the room brightness (luxmeter).

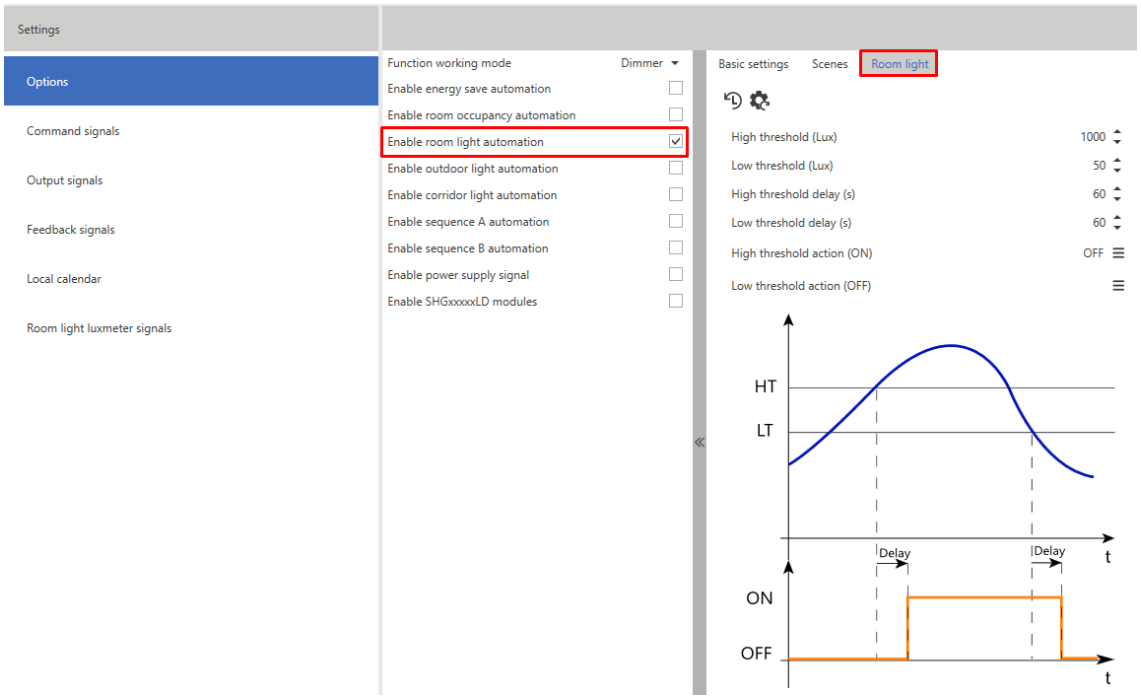
1. First, find the automation condition that limits the command.

*In this example, the automation condition is given by the **Room light automation** parameter.*

2. From the **Settings** menu, go to the **Options** tab to access the list of parameters.

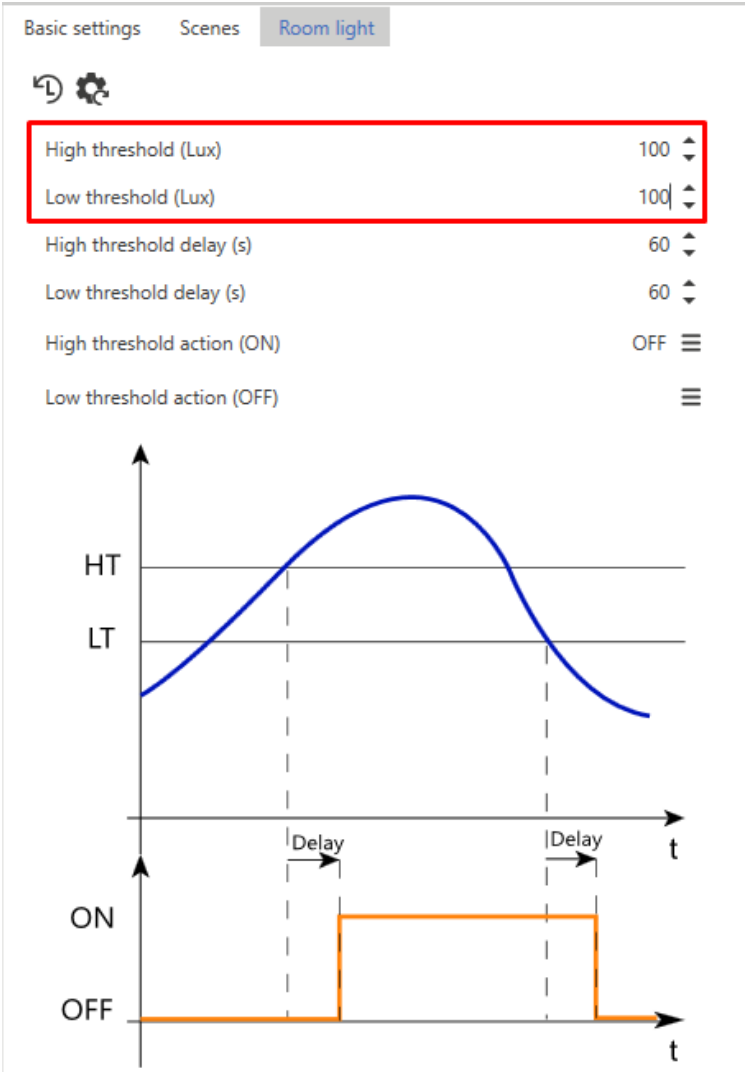
   Note: if the panel is closed, click >> to open it and see the parameters.

3. From the **Options** tab, select **Enable Room light automation**.
4. Go to the **Room light** tab from the central panel.

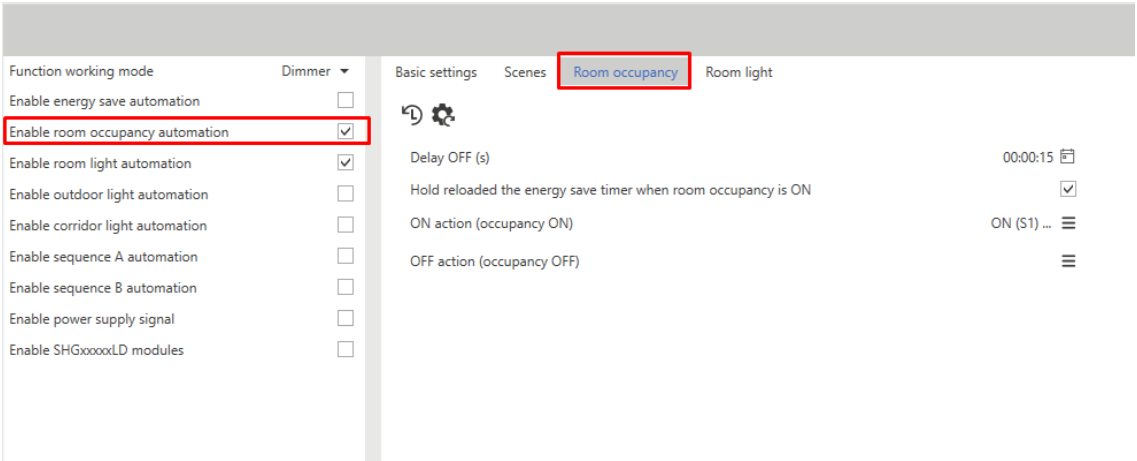


5. In the automation parameters, enter the **High** and **Low threshold**s that define the room light ON and OFF statuses, used to limit the PIR commands.

6. Set the parameters so that above 150 Lux the status is ON and below 100 Lux the status is OFF.

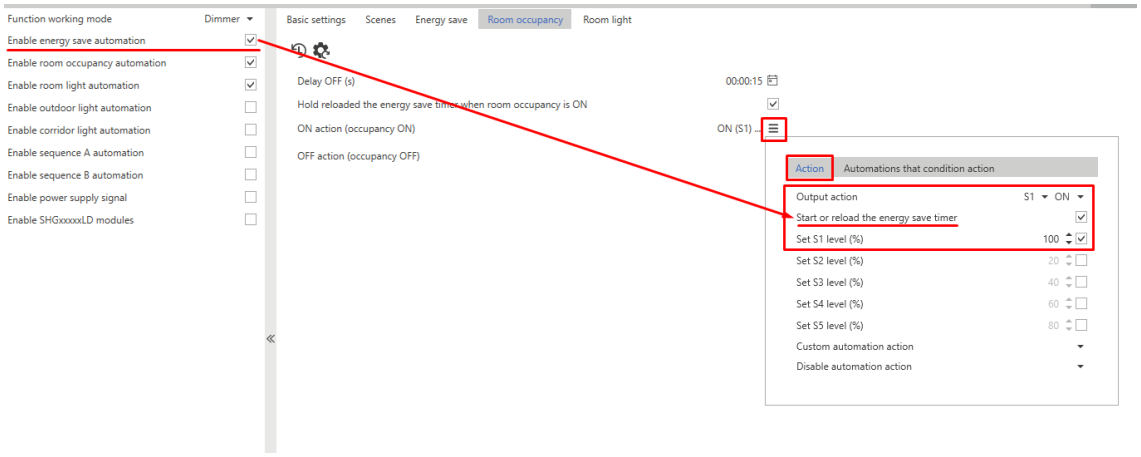


7. From the **Options** tab, select **Enable room occupancy automation** to enable the PIR use.
8. Go to the **Room occupancy** tab.



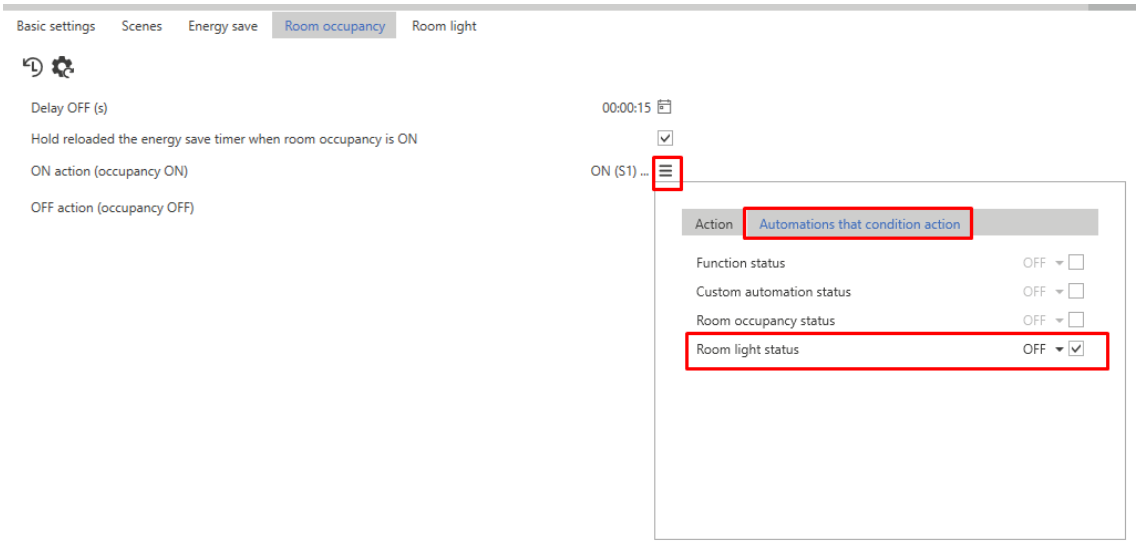
9. From the automation parameters, in the **ON action (occupancy ON)** field define the action to be executed when the PIR detects the movement.

For example, set the light to 80% and start the energy save timer.



10. From the **Automations that condition action** tab, select the condition needed for the command.

*In this case, the **Room Light status** is OFF.*



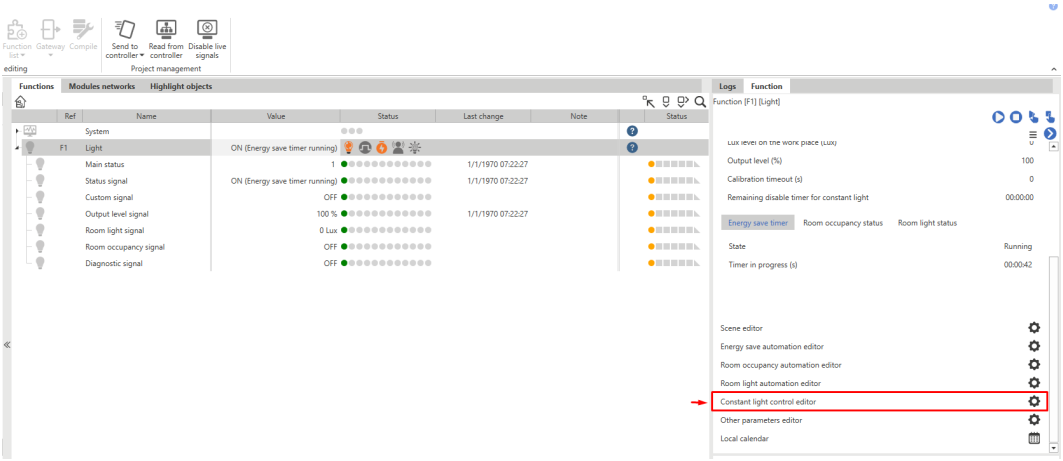
*With these settings, the PIR will turn on the light to 80% and start the energy save timer only if the **Room light automation** status is OFF, that is when the light level measured by the luxmeter is below 100 Lux.*

How to calibrate the room luxmeter

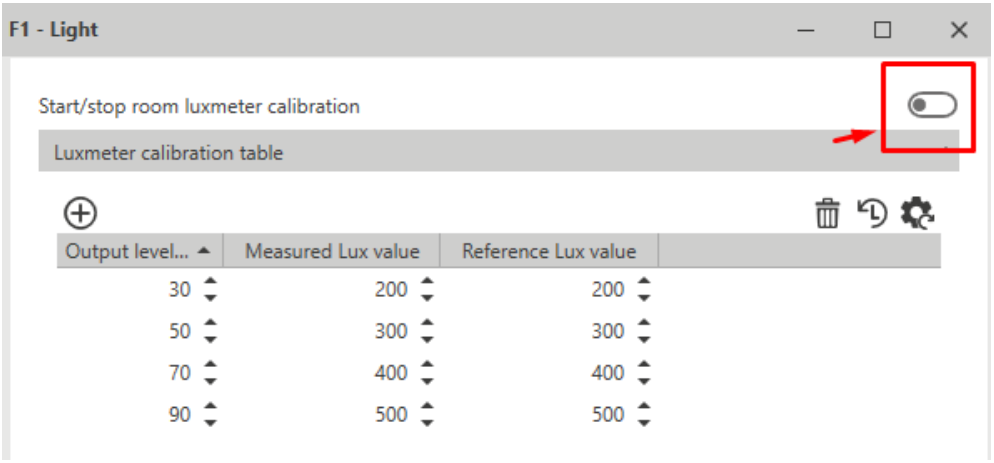
1. **Enable live signals**
2. Select the light function to be calibrated

   In the right window, the editable parameters appear automatically.

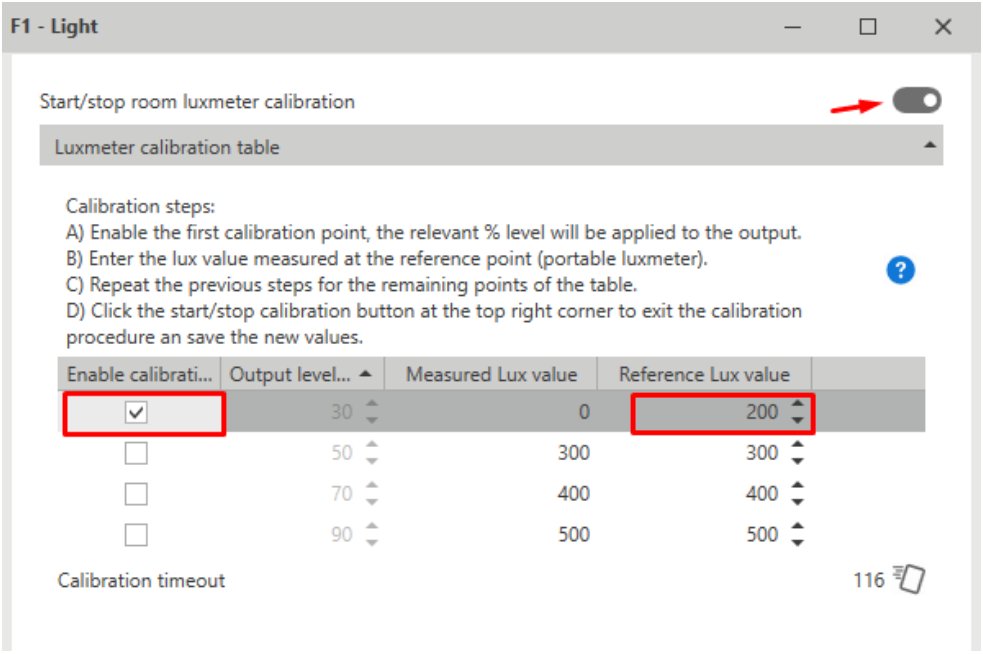
3. From the function panel menu, click **Constant light control editor** to access the page to set the algorithm and calibrate the lux sensor.



4. Click the toggle button to access the page for calibrating the sensor.

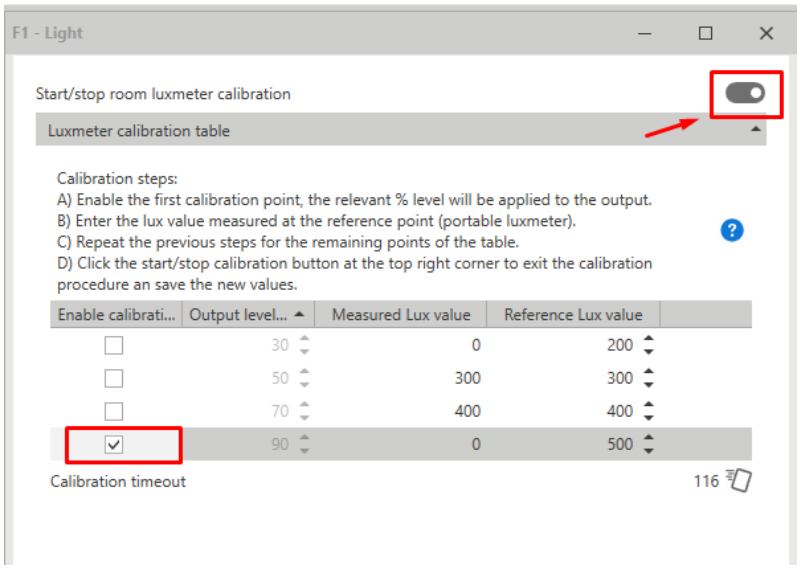


5. Select the first point in the table so that the system brings the output value to the corresponding % value.
6. Put the portable luxmeter on the working surface and enter the read value in the **Reference lux value** field.



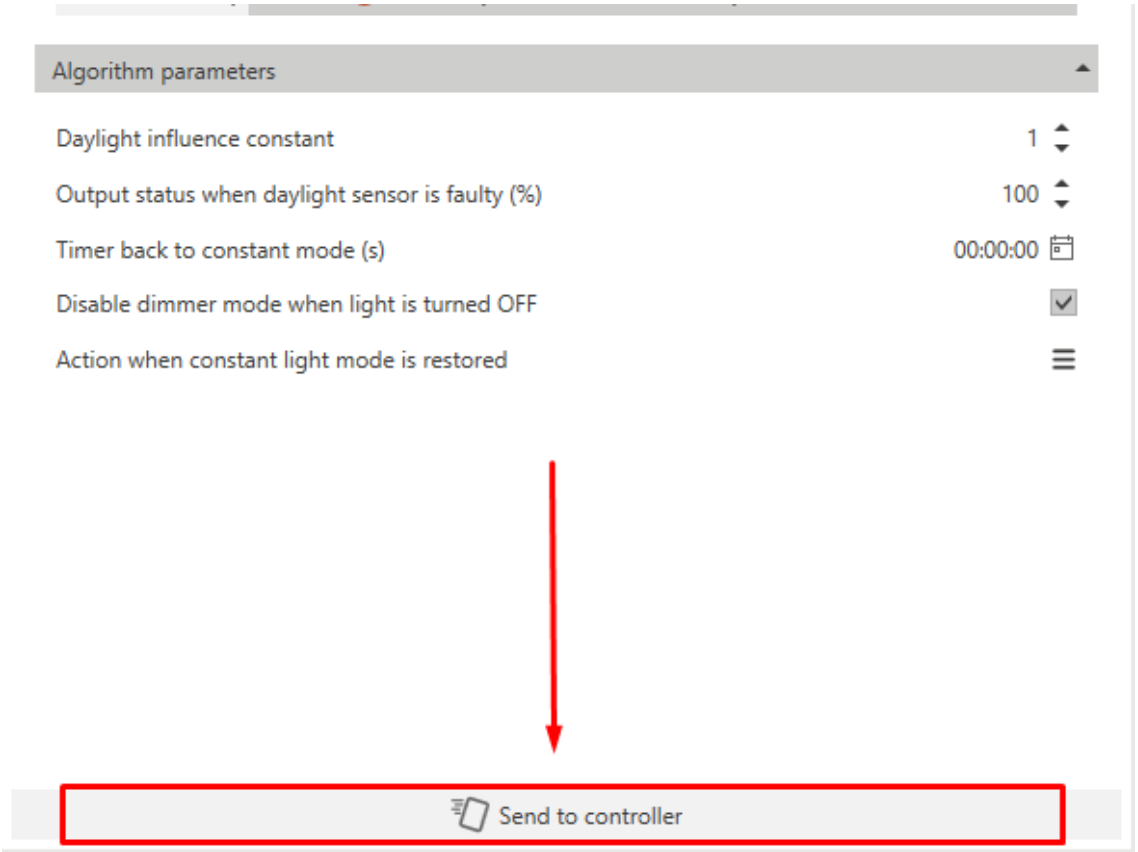
Repeat step 6 and complete all the other points of the table.

7. Once you have completed the table, click again the toggle button to exit the calibration procedure.



8. Click **Send to controller** to save the calibration results on the controller.

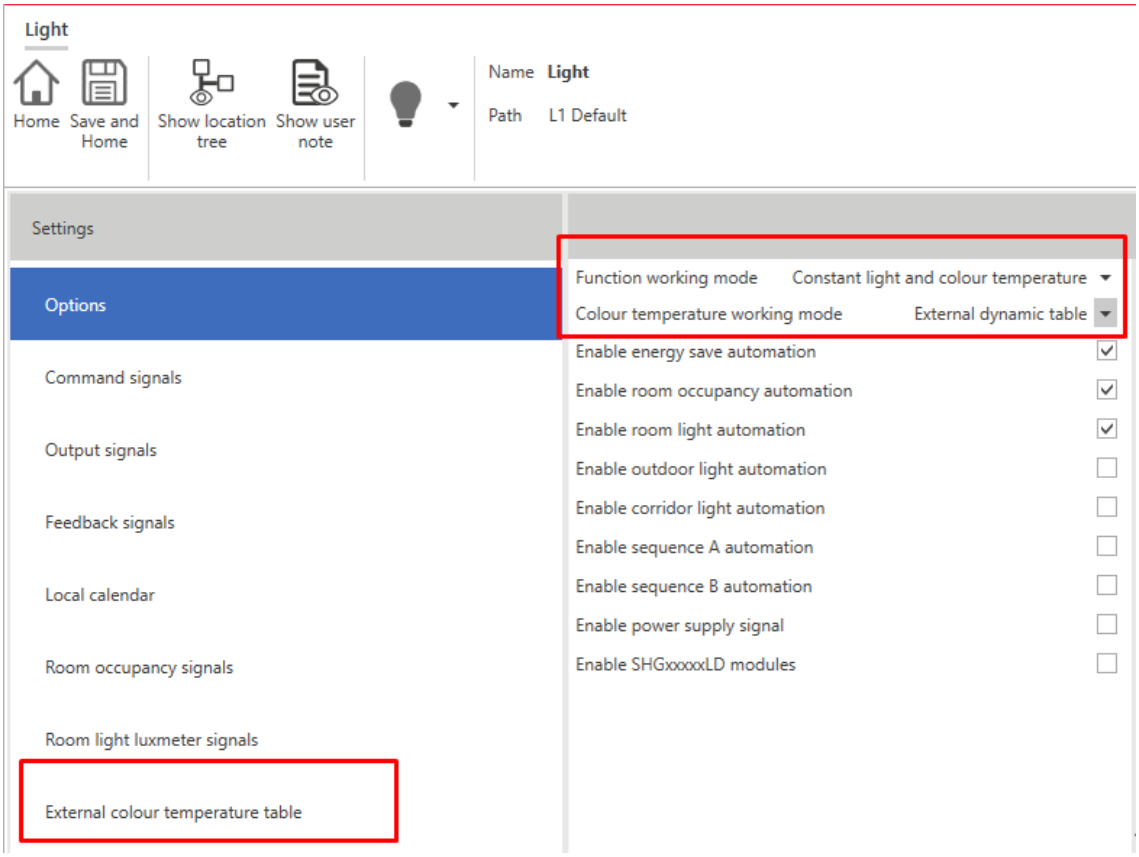
   *Note: once you have clicked **Send to controller**, the function takes the calibration new values. You should save the configuration file to keep the data found.*



How to configure external dynamic table for colour temperature adjustment

1. Select **External Dynamic table** from the **Colour temperature working mode** combo box (**Options**).

   *In the **Options** field, on the left window, a tab for linking the light function appears.*



2. Click **External colour temperature table** and select the light function of which you want to inherit the colour table.

3. Once you have confirmed and written the configuration, the light function automatically changes the colour temperature in accordance with the set points previously defined.

Motor

Content

This section includes the following topics:

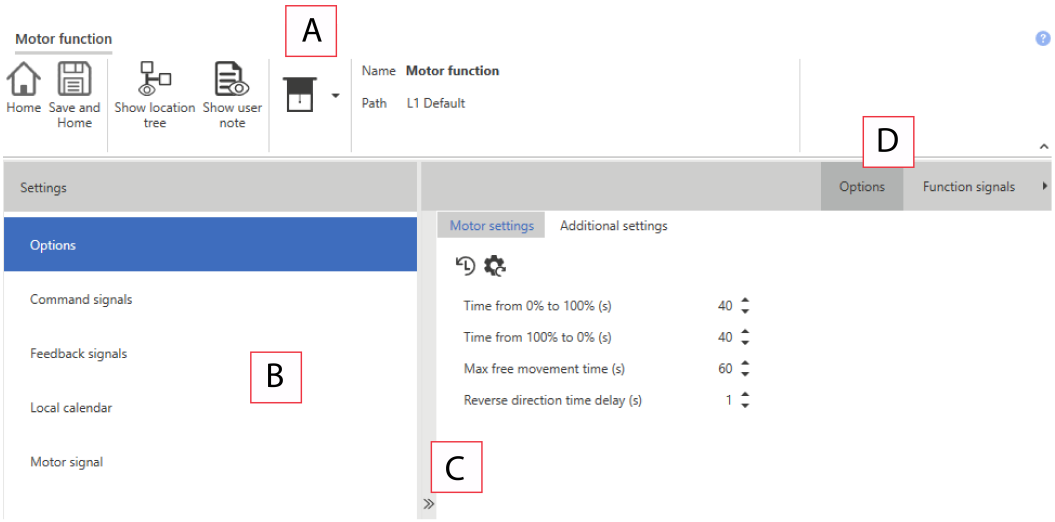
Introduction to the Motor function

The **Motor** function permits you to control blinds and windows that use a motor to manage the position. Moreover, thanks to this function, you can control 3-wire valves.

This function has been designed to manage one or more motor outputs or electronic boards piloted by digital outputs (relays).

Motor page

Home page > (Building) > Function menu > Blind and motor > Blind



Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals (see below for more information). • **Command signals**, sets the command signals to trigger the actions. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, schedules events to automate the function accordingly. *For further information, see "Settings" on the facing page*
C	**Options** menu. According to your selection, the following tabs appear in the **Settings**: • **(Enable) emergency signals**, sets the signals used as emergency contacts to stop the motor. • **(Enable) wind automation**, sets the analogue signals used as wind speed reference for function automation. • **(Enable) rain automation**, sets the digital signals used as rain condition reference for function automation. • **(Enable) light automation**, sets the analogue signals used as lighting reference for function automation. • **(Enable) temperature automation**, sets the analogue signals used as temperature reference for function automation. • **(Enable) analogue signals**, sets the analogue signals used as generic reference for function automation. • If you select **Follow the status of analogue input signal**, the **Input signals** tab appears: it sets the function input signals that are used to control the motor output • If you select ***Output type > Motor signal***, the **Motor signal** tab appears: it sets the function controlled outputs (motor or relays outputs).
D	Central area: shows the available options according to the selected tab
E	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** and **Function signals**.

From the **Options**, you can set the following parameter in the **Options** menu, then the available parameters and tabs are shown in the **Central-Area** panel:

Parameter	Description
Output type	Defines the working mode for the **Motor** function: **If you select...** / **Then you can manage…** Motor signal — the motor signals through Dupline actuators Digital output signal — relay digital signals
0% position label (web app)	Label shown in the web app if the motor is set to 0%. *Note: all the other positions [1- 99] are shown in %.*
100% position label (web app)	Label shown in the web app if the motor is set to 100%. *Note: all the other positions [1- 99] are shown in %.*
Follow the status of analogue input signal	In this mode, the function operating logic is strictly linked to the selected analogue input signal. If you select this mode, all the other automation options are disabled. *Note: the related tab appears in the **Settings** menu.*
Enable tilt function	If you enable it, you can adjust the tilt position of motorized blinds.
Enable emergency signals	If you enable it, you can manage digital signals that block the motor movement for safety reasons. *Note: the related tab appears in the **Settings** menu.*
Enable wind automation	Check it to enable the wind automation parameters. *Note: the relevant tab appears in the Central-Area panel.*
Enable rain automation	Check it to enable the rain automation parameters. *Note: the relevant tab appears in the Central-Area panel.*
Enable light automation	Check it to enable the light automation parameters. *Note: the relevant tab appears in the Central-Area panel.*

Parameter	Description
Enable temperature automation	Check it to enable the temperature automation parameters. *Note: the relevant tab appears in the Central-Area panel.*
Enable analogue signals	Check it to enable the analogue signals automation parameters. *Note: the relevant tab appears in the Central-Area panel.*

See "Tabs of options parameters" below for more information.

Tabs of options parameters

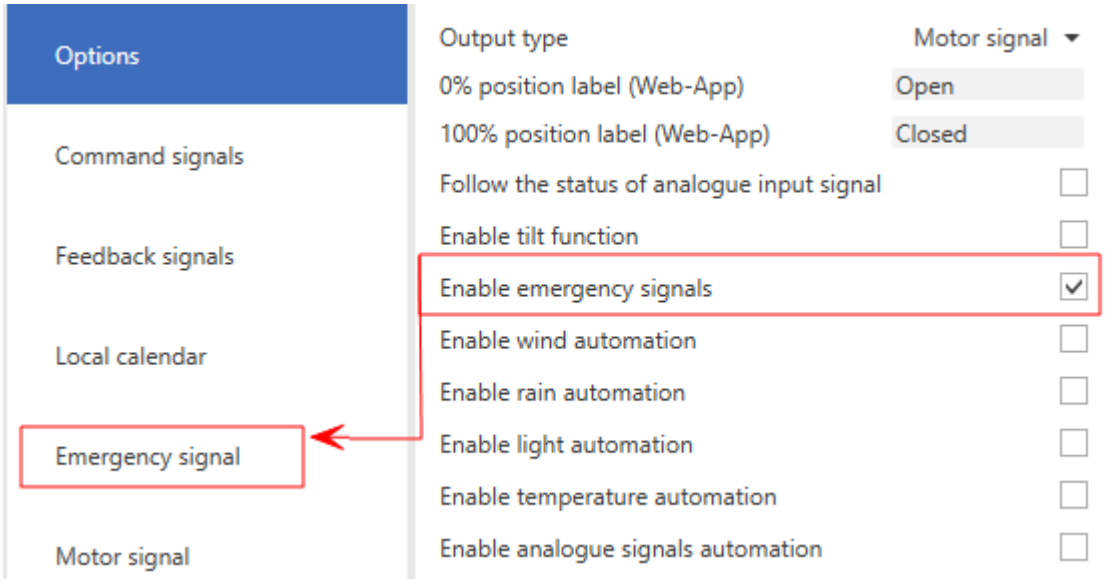
Motor signal tab

The **Motor signal** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Motor output	Following is the available working mode:
Digital output	**If you flag...** / **Then...** Motor direction inverted / the motor direction inverts without changing the connections.

Emergency signals tab

If you select **Enable wind automation** from the ***Settings > Options***, the tab containing the relevant parameters appears:



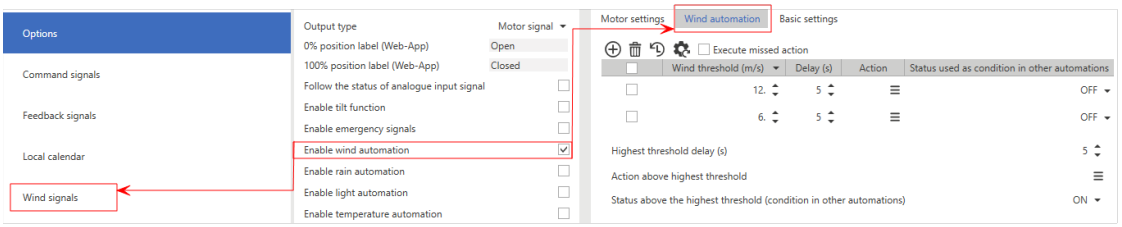
It permits you to define a list of signals that activate the emergency condition. Until the emergency condition is active, no command (manual or automation) is allowed to move the roller blind.

If more signals are used, the functionality applies the OR logic.

According to your requirements, you can select the **Emergency state** parameter to apply the inverted logic to the signal.

Wind automation control

If you select **Enable wind automation** from the ***Settings > Options***, the tabs containing the relevant parameters appears on the left panel and in the central area:

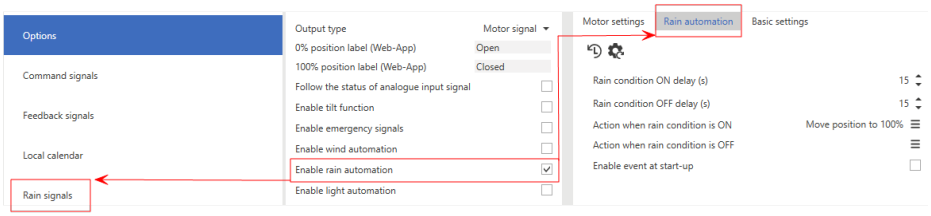


It permits you to use one or more anemometer signals for the function automation. According to the wind speed level, the function can perform different actions.

See "Automations settings" on page 330 for more information about settings and automation thresholds.

Rain automation control

If you select **Enable rain automation** from the ***Settings > Options***, the tabs containing the relevant parameters appears on the left panel and in the central area:



It permits you to use one or more digital signals fro the function automation.

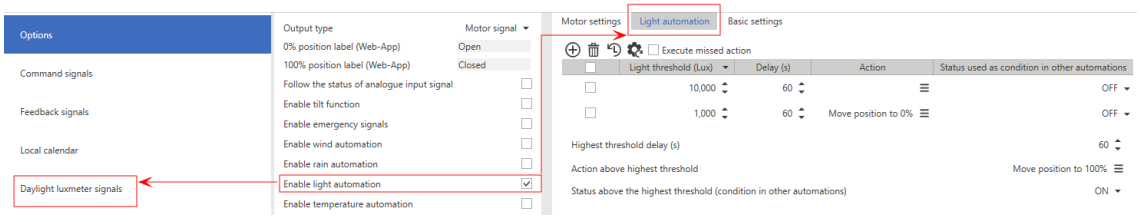
The editable parameters are the following:

Parameter	Description
Rain condition ON delay (s)	Delay time to execute the action in Rain ON condition
Rain condition OFF delay (s)	Delay time to execute the action in Rain OFF condition
Action when rain condition is ON	Action to be executed when the rain condition goes ON. *See **Command action list** to see the available options.*
Action when rain condition is ON	Action to be executed when the rain condition goes OFF. *See **Command action list** to see the available options.*
Enable event at start-up	Executes all the events at the controller's start- up. *Note: if at the controller powering ON the system finds a valid condition, the action is executed.*

See "Automations settings" on page 330 for more information about settings and automation thresholds.

Light automation control

If you select **Enable light automation** from the ***Settings > Options***, the tabs containing the relevant parameters appears on the left panel and in the central area:

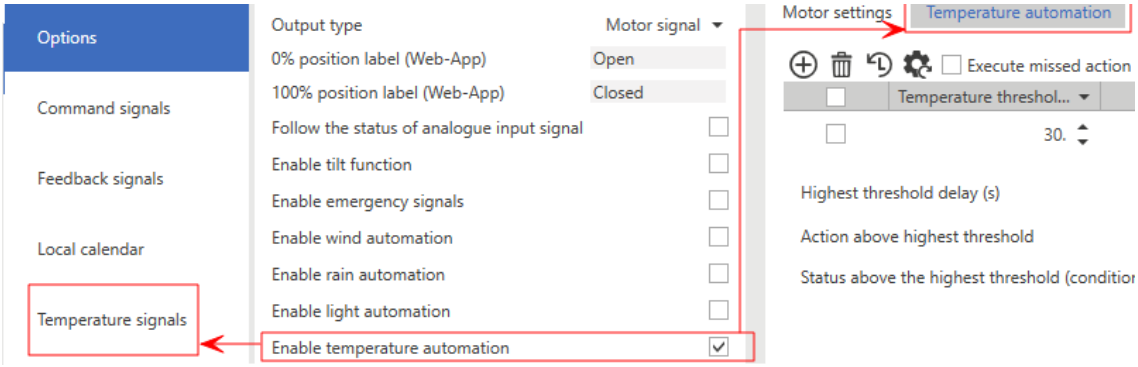


It permits you to use one or more luxmeter signals for the function automation. According to the light level measured, the function can perform different actions.

See "Automations settings" on page 330 for more information about settings and automation thresholds.

Temperature automation control

If you select **Enable temperature automation** from the ***Settings > Options***, the tabs containing the relevant parameters appears on the left panel and in the central area:

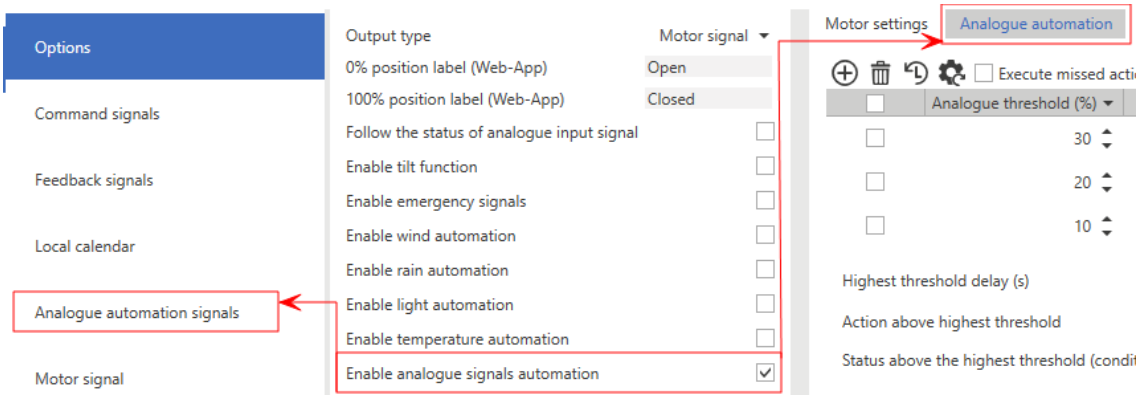


It permits you to use one or more temperature signals for the function automation. According to the temperature level measured, the function can perform different actions.

See "Automations settings" on page 330 for more information about settings and automation thresholds.

Analogue automation control

If you select **Enable analogue automation** from the ***Settings > Options***, the tabs containing the relevant parameters appears on the left panel and in the central area:

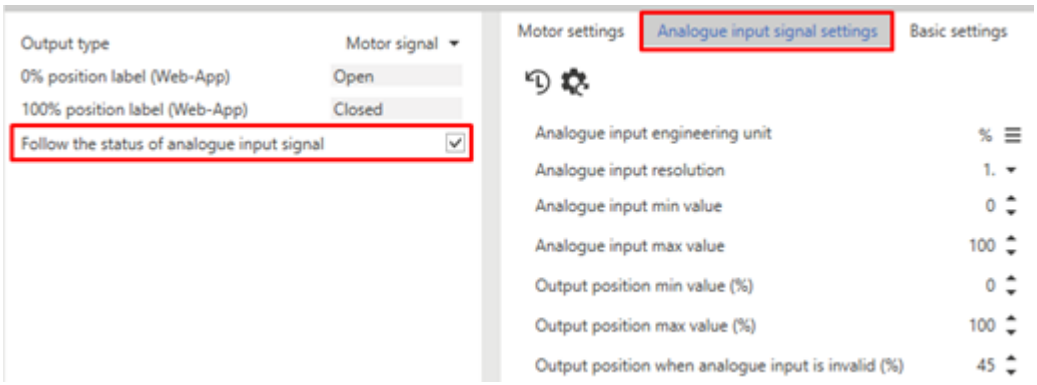


It permits you to use one or more analogue signals (0-10 V, 0-20 mA) for the function automation. Usually, this field uses sensors other than Carlo Gavazzi to acquire the sun position, wind, irradiation. According to the value measured, the function can perform different actions.

See "Automations settings" on page 330 for more information about settings and automation thresholds.

Follow the status of analogue input signal

Once you have selected the **Follow the status of analogue input signal** option (form **Options**) in the central-area, a tab containing the parameters described below appears.



19. Analogue input signal settings

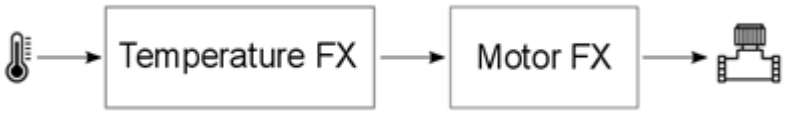
The following table shows the different parameters:

- **Analogue input engineering unit**
- **Analogue input resolution**
- **Analogue input min value**
- **Analogue input max value**
- **Output position min value (%)**
- **Output position max value (%)**
- **Output position when analogue input is invalid (%)**

In this mode, all the functioning logic is linked to the selected analogue input signal (that can come from a physically connected module or from a function).

Example: temperature function

Through the SHxROxC2xx module, the motor function adjusts the 3-wire electrovalve position. The motor function input signal is the temperature function PID status. The PID analogue signal is 0-100 and the valve opening/closing follows the input value.



Function signals

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses. The function signals list varies according to the function configuration.

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Function state signal</td><td>Shows the current function status</td><td>The available function status are the following:<table><tr><th>Status</th><th>Value shown</th></tr><tr><td>1</td><td>Steady</td></tr><tr><td>2</td><td>Running towards 0%</td></tr><tr><td>3</td><td>Running towards 100%</td></tr><tr><td>4</td><td>Forced position</td></tr><tr><td>5</td><td>Emergency condition is active</td></tr><tr><td>6</td><td>Hardware error</td></tr></table></td></tr>
<tr><td>Movement signal</td><td>Signal that is set to 0 or 1 according to the motor movement status</td><td>0 = motor stopped
1= motor moving</td></tr>
<tr><td>Movement direction 0%</td><td>Signal that is set to 0 or 1 according to the motor movement status (towards 0%)</td><td>0 = motor stopped
1= motor moving</td></tr>
<tr><td>Movement direction 100%</td><td>Signal that is set to 0 or 1 according to the motor movement status (towards 100%)</td><td>0 = motor stopped
1= motor moving</td></tr>
<tr><td>Custom signal</td><td>Signal that is set to 0 or 1 according to the selected options</td><td>The signal status is the OR logic operation among the following statuses:<table><tr><th>Status</th><th>Value shown</th></tr><tr><td>1</td><td>Steady</td></tr><tr><td>2</td><td>Running towards 0%</td></tr><tr><td>3</td><td>Running towards 100%</td></tr><tr><td>4</td><td>Forced position</td></tr><tr><td>5</td><td>Emergency condition is active</td></tr><tr><td>6</td><td>Hardware error</td></tr></table></td></tr>
<tr><td>Position signal</td><td>Analogue signal [0-100 %] that represents the motor position.</td><td>The value is updated after the motor movement or a stop command.</td></tr>
</table>

Element	Description	Value
Tilt position signal	Analogue signal [0-100 %] that represents the motor tilt position.	The value is updated after the motor movement or a stop command.

Command signals tab

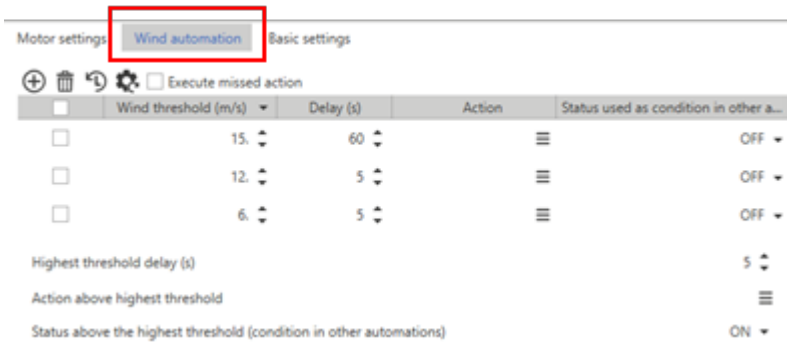
The **Command signals** tab shows the list of all the available input signals.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button (e.g. SHA4XLS4TH module)	• Command action • Disable command • Manage	*You can add 50 signals max.*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analog function		
Analog signal		

Automations settings

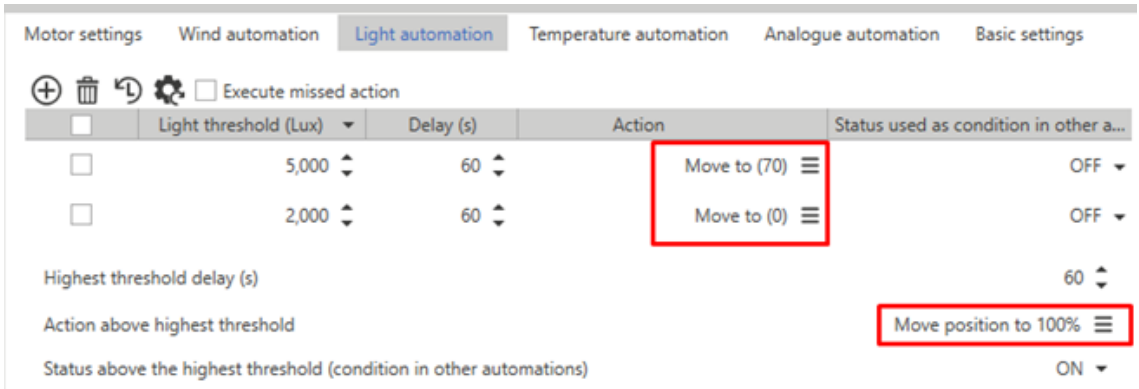
This paragraph describes how to edit the parameters used in automations like wind, light, temperature and analogue. Each automation has a table containing the relevant thresholds and actions (see below).



Parameter	Description
⊕	Add a new threshold to the table
🗑	Removes the threshold from the table

Parameter	Description
Execute missed action	If you flag it, the system generates the action if the relevant **Enable** condition is activated after a threshold is exceeded. *Example: in case of strong wind, the light automation would move the roller blind but the action is not executed because the wind is too strong and its condition has the priority. As soon as the wind speed decreases, the system **Executes** the **missed action**.*
Wind, light, temperature, analogue threshold	Set threshold. *Note: the thresholds are sorted by decreasing order.*
Delay (s)	Delay applied before the action execution
Action	Action executed if the measured input value is between the set and the low thresholds. *See "Command signals tab" on the previous page.*
Status used as condition in other automations	For each set threshold you can define the algorithm logical status (ON or OFF). This logical status can be used as conditioning signal for programmed actions in other automations. *Example: you can set the light automation functioning to the Wind OFF condition so to prevent the roller blind from moving automatically in case of strong wind.*
Highest threshold delay	Delay applied before the action execution if the set high threshold is exceeded
Action above highest threshold	Action executed if the measured value exceeds the high threshold
Status above the highest threshold	logical status of the automation if the measured value exceeds the set high threshold. You can use the status as conditioning signal for programmed actions.

Example 1



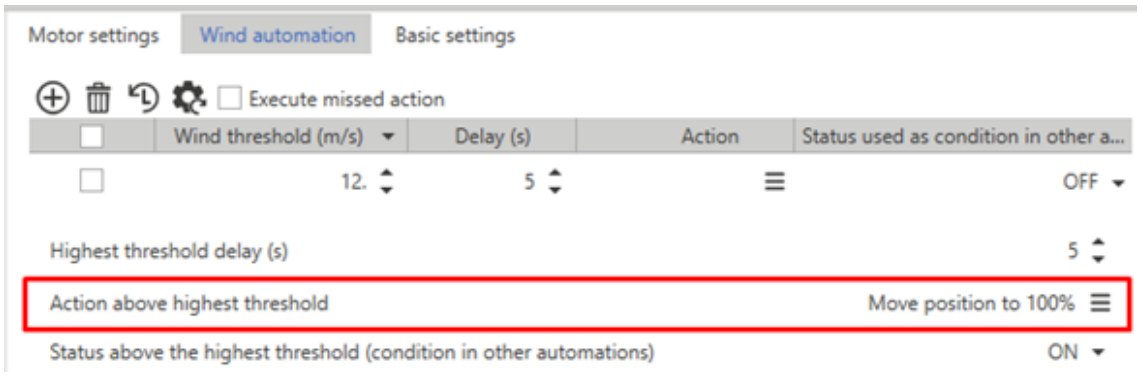
The table above permits generating three different actions:

- If Lux > 5000, the roller blind goes to 100%
- If 5000 > Lux > 2000, the roller blind goes to 70%
- If Lux < 2000, the roller blind goes to 0%

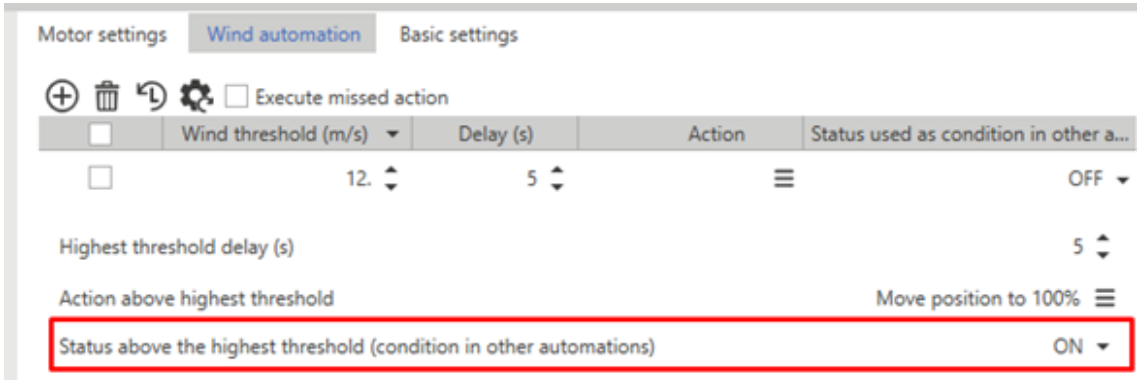
Example 2

You create an automation based on one wind threshold. If the measured wind goes above 12 m/s, the roller blind has to go to 100%. Moreover, until the wind is higher than 12 m/s, any other automation must be disabled.

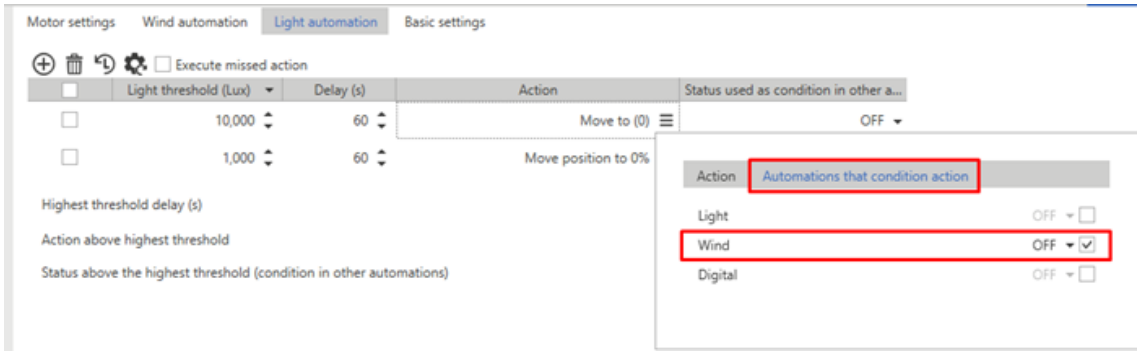
To move the roller blind above the threshold, you just have to define the **Action above highest threshold** (see below).



To force the other automations to the weak wind condition (below the threshold), you have to define the Wind ON and Wind OFF statuses.



Those statuses will be used to execute command in other automations (**Automations that condition action**).



Motor settings tab

This tab appears in the central area (see "Motor page " on page 323).

In this field you can define the parameters to manage the movement and convert the position into time.

The greater the accuracy with which times are measured and entered, the greater the precision obtained during the positioning of the roller blind.

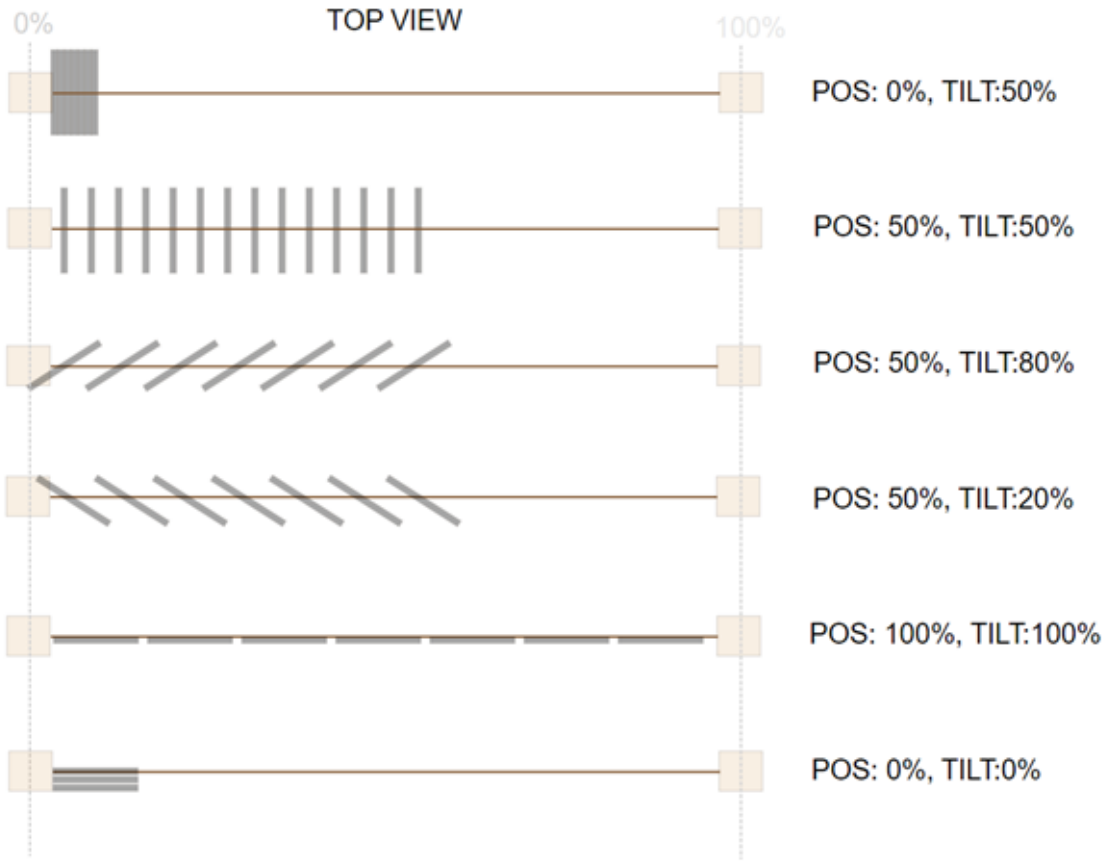
To compensate movement mechanical aspects, you can set the times so to pass from 0% to 100% and vice versa independently.

Note: usually, it takes more to raise than to lower the roller blind.

From this tab, you can set the following parameters:

Parameter	Description
Time from 0 % to 100% (s)	Time needed to move the roller blind from 0 % to 100%.
Time from 100 % to 0% (s)	Time needed to move the roller blind from 100% to 0%.
Max free movement time (s)	The free movement time permits managing the motor activation timeout in case of reset and start commands without target. It also ensures the motor switching OFF if no manual stop is executed. *Note: you should assign a free time value = 0.25 * time from 0 to 100.*
Reverse direction time delay (s)	The reverse time is a delay applied to the motor activation, before the relays exchange and before the relevant direction reversal. This parameter permits avoiding problems due to remaining voltage on the motor winding.
Tilting time (s)	If you enable the tilt function from the **Options** menu, you have to define the time to execute the orienteering cycle from 0% to 100%. *Note: the same time is applied for the cycle from 100% to 0%.*

Important note: the SH2ROAC224 modules do not save the current position in case of power-down. At the switching ON, the position 0% is always set. Set an automation in the project to reset the roller blinds after a power-down.

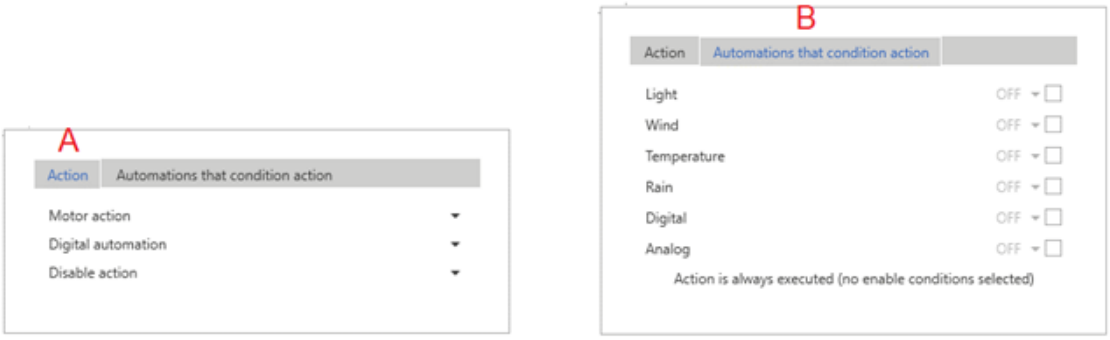


20. Rule for roller blind position

Command action list

From each automation tab (**Wind**, **Light**, **Temperature** and **Analogue**), from the **Action** column, you can open a drop-down menu (

) containing the following tabs:



21. Command panel structure

Element	Description
A	The **Action** tab identifies the command type to be sent to the function. There are three different command categories: • "Motor action parameters" below • "Disable action" on page 336
B	The **Automations that condition action** option identifies the condition needed for executing the actions selected from the **Action** tab. If you do not select anything, the actions will be always executed.

Notes:

- *When an automation is disabled and is used to execute an action, that action is always executed as if the status were valid.*
- *The motor direction reversal depends on the motor last direction.*
- *Any command requiring the movement reversal, opposite of the last performed by the motor, is carried out according to the reverse time; the command is executed immediately if it does not require the direction reversal.*
- *The commands for disabling the automation controls can be activated in combination with one of the action commands. If you activate a disable command, you have to specify the controls on which the command has an effect. If no command is activated, all commands will be considered selected.*
- *When a forcing command is removed, the motor returns to the position it had before the value was forced.*

Example: the current position is 20%. You force the value to 50% and the motor takes the roller blind to 50%. If you remove the forcing, the roller blind returns automatically to 20%.

Motor action parameters

Parameter	Description
Stop	If the motor is running, this action stops it and updates the current position
Move to (+ position and tilt definition)	
Move position to 0%	
Move position to 100%	
Move position to 0%-100% toggle	If the motor is running, this action stops it and updates the current position. If you click the button while the motor is stopped, the direction will be opposite to the last one executed.

Parameter	Description
Move one step to 0%	If the motor is running, this action recharges the step
Move one step to 100%	
Set tilt 0%	If the motor is running, this action stops it and updates the current position
Set tilt 100%	
Set tilt 0% / 100% toggle	If the motor is running, this action stops it and updates the current position. If you click the button while the motor is stopped, the direction will be opposite to the last one executed.
Tilt one step to 0%	If the motor is running, this action recharges the step
Tilt one step to 100%	
Start free time movement to 0%	If the motor is running, this action stops it and updates the current position. Users should click the button to set the desired position. Otherwise, the motor stays ON for the set free time (it is like a reset).
Start free time movement to 100%	
Start movement to 0% / 100% toggle	If the motor is running, this action stops it and updates the current position. Users should click the button to set the desired position. Otherwise, the motor stays ON for the set free time (it is like a reset). If you click the button while the motor is stopped, the direction will be opposite to the last one executed.
Activate current position forcing	Until the forcing is active, the automation and any other commands are ignored.
Deactivate current position forcing	
Activate / deactivate current position forcing	
Activate position forcing	Forces a defined position. Until the forcing is active, the automation and any other commands are ignored.
Deactivate position forcing	Until the forcing is active, the automation and any other commands are ignored.
Activate / deactivate position forcing	
Reset position to 0%	Activates the command that moves the roller blind towards 0 % for the set free time. If the function is running, the command stops the motor and sets the position to 0.
Reset position to 100%	Activates the command that moves the roller blind towards 100 % for the set free time. If the function is running, the command stops the motor and sets the position to 0.
Refresh position using reset 0%	Activates the command that moves the roller blind towards 0 % for the set free time. As soon as the roller blind gets to 0%, the motor changes the direction and returns to the start position. If the function is running, the command stops the motor and sets the position to 0.
Refresh position using reset 100%	Activates the command that moves the roller blind towards 100 % for the set free time. As soon as the roller blind gets to 100%, the motor changes the direction and returns to the start position. If the function is running, the command stops the motor and sets the position to 0.

Parameter	Description
ON	This is a function custom automation that can be 0 = OFF or 1 = ON.
OFF	

Disable action

Parameter	Description
Disable ON	Activates the automation disabling. *Note: you have to select at least an automation.*
Disable ON with timeout	Activates the automation disabling and starts the disabling timer. *Note: you have to select at least an automation.*
Disable OFF	Deactivates the automation disabling. *Note: you have to select at least an automation.*
Disable toggle	Disable ON/Disable OFF toggle
Disable toggle with timeout	Disable ON with timeout/Disable OFF

Procedures

How to force a command to an automation status

This procedure shows how to condition an action command according to one or more automation status. The following steps show how to inhibit the button functioning according to the strong wind condition.

1. Choose the automation condition that limits the command (in this example, the automation is the wind one).
2. From the **Settings** menu, open the **Options** panel (**>>**) to access the list of parameters.
3. From the automation table, define the high threshold so to ignore the strong wind condition.

   For example, set 15 m/s as high threshold.

   The **Status used as condition in other automations** parameter defines the ON and OFF statuses that are used to limit the commands.
4. Set those parameters in order to get the ON status above the 15 m/s and the OFF status for all the lower values.
5. From ***Options > Command signal***, add a push button signal
6. From the **Local properties** of the button signal, define a generic action to be assigned to the button.

   For example, 0-100% movement toggle.

   With these settings, the button moves the roller blind only if the wind automation status is OFF, i.e. when the measured wind is below 15 m/s.

How to limit the automation functioning time through the calendar

1. From the **Settings** menu, click the **Local calendar** tab to edit the local calendar action.
2. Add two different actions and the relevant functioning hours/days.
3. For both actions, define the **Digital automation** parameter specifying when the status has to be ON and OFF.

Now the status can be used to condition the function actions.

Functions > Motor

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Sequence

Content

This section includes the following topics:

Introduction to the Sequence function

The **Sequence** function is an ordered list of numbered steps and each step is a function. The steps are executed consequently as soon as the functions start.

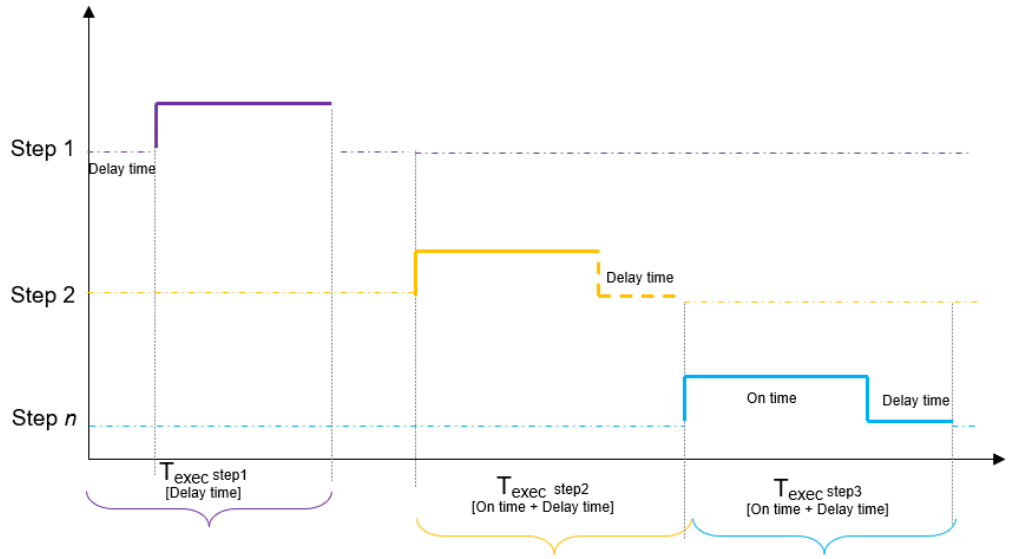
For each function you can define the action to be performed and the delay timer for each action.

The sequence starts when the first function on the list is activated.

*Note: between two steps, the system waits for the delay timer; as soon as the delay timer expires, the **Sequence** function continues with the other steps, following the predefined order.*

You can add all the types of function to the **Sequence** function and you can also add a **Local Calendar** to schedule the functions.

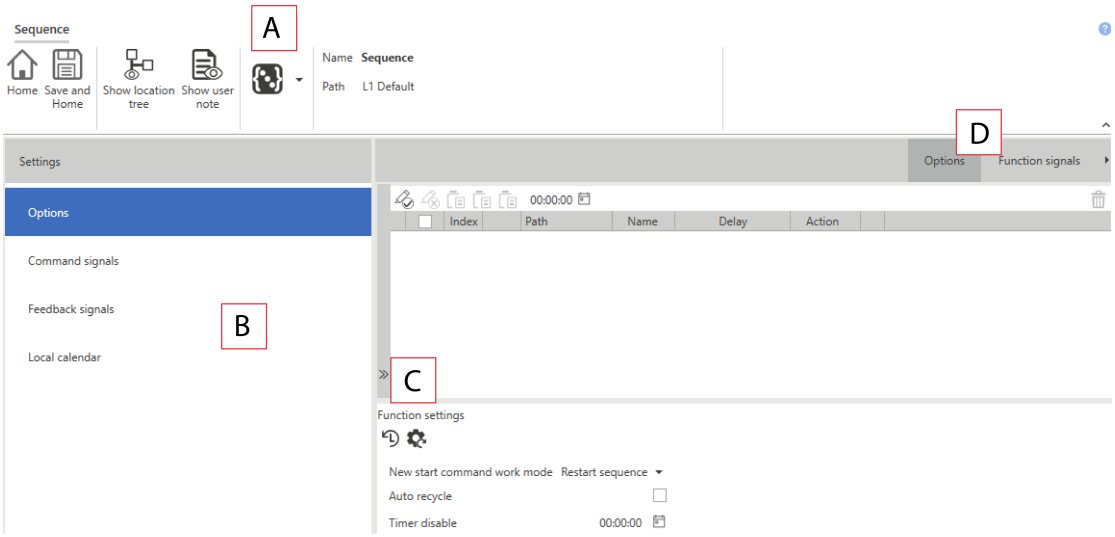
Example



In the graph above, the **Step 1** is activated when the sequence starts. All the functions related to the **Step 1** are switched ON for the **On time** value (5 minutes). When the **On time** expires, the system waits for the **Delay time timer** (1 minute) to expire and the **Step 2** is activated for the **On time** value. When the **On time** expires the system waits for the **Delay time timer** (30 seconds) to expire and the function continues with the **Step 3**. After 30 seconds, the sequence ends.

Sequence page

Home page > (Building) > Function list > Sequence and Calendar > Sequence

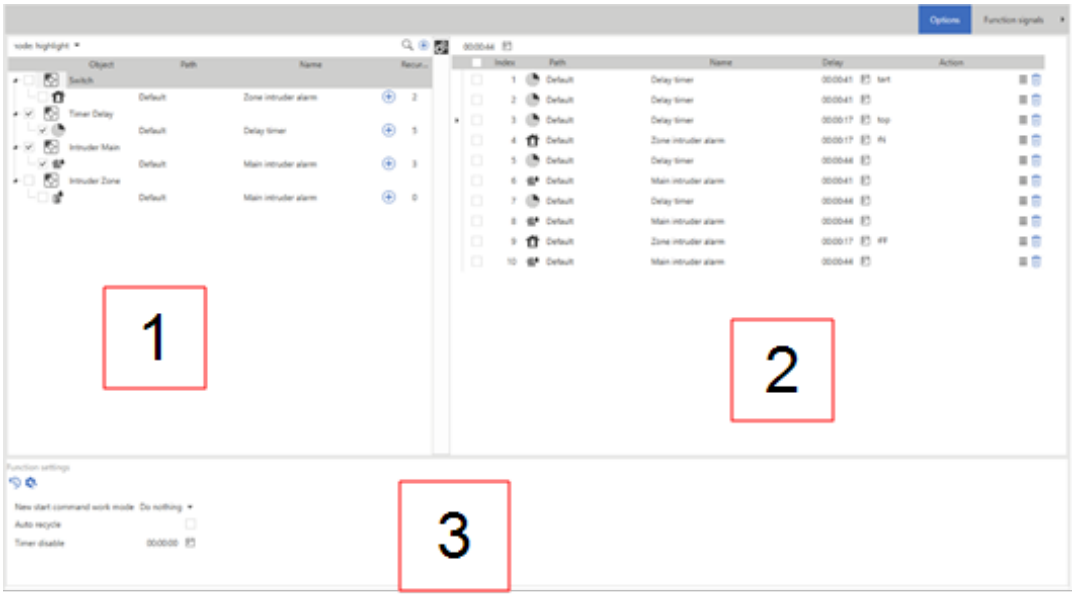


Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function lists and the Sequence parameters. • **Command signals**, sets the command signals to trigger the actions. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function** signals.



The **Options** tab provides you all the tools to add and configure the functions in the sequence. The **Options** sub-menu consists of the following elements:

Area	Description
1	**Available functions panel**. Shows the list of all the available functions in the configuration that can be activated by the **Sequence** function. *For further information, see Available actions.*
2	**Sequence steps panel**. Shows the list of the functions added to the ordered sequence. *Important note: not all the available functions for EM, BA and CP can be added to the Sequence function. For further information see "Sequence step procedures" on page 351*

<table>
<tr><th>Area</th><th>Description</th></tr>
<tr><td>3</td><td>Sequence function parameters.
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>New start command work mode</td><td>Defines the behaviour of the start command performed while the sequence is still running. The available options are the following:
<table>
<tr><td>Do nothing</td><td>The sequence works according to the sequence order of steps</td></tr>
<tr><td>Restart sequence from first step</td><td>The sequence restarts from the beginning (step 1)</td></tr>
<tr><td>Restart current step delay time</td><td>The sequence starts again from the step at which it was paused/ stopped</td></tr>
</table></td></tr>
<tr><td>Auto recycle</td><td>The sequence is repeated continuously. Every time the last function is executed, the sequence starts again from the beginning. All the functions are executed in a loop and the sequence can be stopped (stop action).</td></tr>
<tr><td>Timer recycle</td><td>The delay (s) between two repetitions of the sequence if the Auto recycle is enabled.</td></tr>
<tr><td>Timer disable</td><td>Sets the time period after which the Disable ON condition is deactivated (0 - 24 h. Default value: 1 min)</td></tr>
</table></td></tr>
</table>

Available functions panel

The **Available functions** panel in the **Options** tab shows the list of all the available functions added to the sequence. The panel consists of the following elements:

Area	Description
Filter tools	Shows the available filter options and commands for function list:

Element	Description
	Shows/hides the filter options. The available filters are shown on the top of the function list. Note: You can move among the results () or close () the filter panel
 Add all checked row	Allows you to add all the selected functions to the sequence list. *Note: it appears in the filter panel if at least two or more functions have been selected.*
Search box	Searches among the functions available in the project. *Notes:* • *The results include all the words that contain the input string.* • *You can enter the full name or part of it.*
Filter mode	Only the functions that match the combo-box option appear in the available function list

Area	Description
Available function list	Shows the available functions in the current configuration that can be added to the sequence:

Field	Description
Combo-box	Selects/deselects functions to be added by using the **Add all Checked row** button () in the filter tools panel
Object	Shows the function type
Path	Shows the location path of the function
Name	You can define the name of the function that appears on the sequence list.
	Adds the function to the sequence list. *For further information, see "Sequence step procedures" on page 351*
Recurrence	Shows how many instances of the function there are in the sequence.

*Note: in the header row of each column, additional filters are provided (i.e. **type of function, type of path**)*

Sequence steps panel

The **Sequence steps** panel in the**Options** tab shows the list of all the functions added to the sequence. The panel consists of the following elements:

Element	Description
Options	Shows the available filter options / commands for the function list: **Field** / **Description** Default step delay — Sets the default step delay timer applied to all the functions in the sequence  — Deletes all the selected functions
Available function list	Shows the available functions of the current configuration that can be added to the sequence: **Field** / **Description** Row indicator — A small arrow indicates the selected step in the *editing* mode Combo-box — Allows you to add all the selected functions to the sequence list. *Note: it appears in the filter panel if at least two or more functions have been selected.* Index — Shows the function type Path — Shows the location path of the function Name — You can define the name of the function that appears on the sequence list. Delay — Sets the step **delay timer** value. Action — Selects the action to be performed for each step in the sequence *For further information, see Available actions.*  — Deletes all the selected functions *Note: in the header row of each column, additional filters are provided (i.e. **type of function, type of path**)*

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Element	Description	Value
Main signal	Shows the function status	OFF = Function is not active ON = Function is active

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Status signal</td><td>Shows the function status</td><td>
<table>
<tr><th>Value</th><th>Status</th><th>Description</th></tr>
<tr><td>1</td><td>OFF</td><td>The sequence OFF</td></tr>
<tr><td>2</td><td>Running</td><td>The sequence is running</td></tr>
<tr><td>3</td><td>Recycling</td><td>The sequence is recycling (the Auto recycle timer is running and the
Sequence is restarted as soon as the timer ends)</td></tr>
<tr><td>4</td><td>Paused</td><td>The sequence is paused</td></tr>
<tr><td>5</td><td>OFF (Automations disabled)</td><td>The sequence is OFF and the disable automation is ON</td></tr>
<tr><td>6</td><td>Running (Automations disabled)</td><td>Sequence is running, the disable automation is ON</td></tr>
<tr><td>7</td><td>Recycling (Automations disabled)</td><td>The sequence is recycling and the disable automation is ON</td></tr>
<tr><td>8</td><td>Paused (Automations disabled)</td><td>The sequence is paused and the disable automation is ON</td></tr>
</table>
</td></tr>
<tr><td>Custom signal</td><td>It is ON if the statuses selected from the combo- box is true</td><td>ON = The selected status is true
OFF = The selected status is false</td></tr>
<tr><td>Current step signal</td><td>Shows the running step</td><td></td></tr>
</table>

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Sequence** function is controlled by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the type of signals you can associate to the trigger actions:

Signal type	Actions that can be associated	Notes
Digital push button (e.g. SHA4XLS4TH module)	• Manage the sequence • Manage the **Disable automation**	*You can add max 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Local calendar

The **Local calendar** functionality can be used to trigger action according to time schedules.

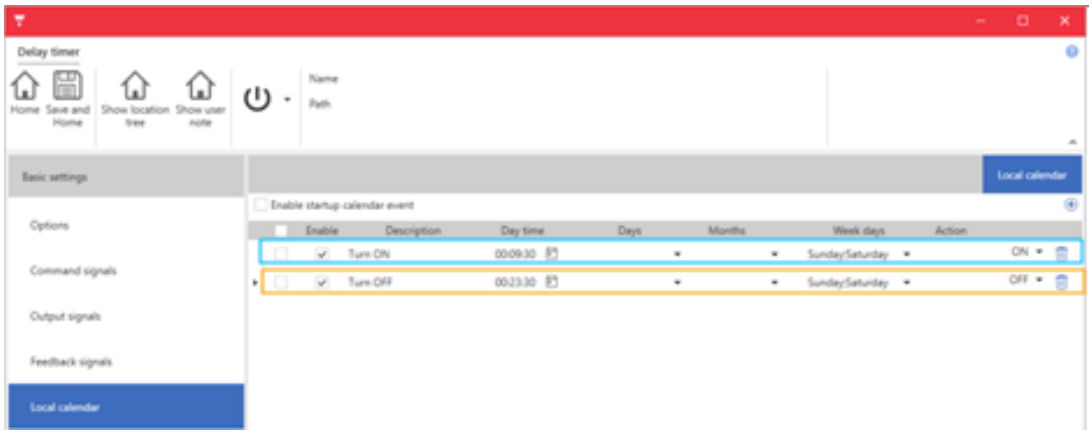
From the **Local calendar** sub-menu, you can set the following parameters:

Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*
	Adds a new event
	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list

Parameter	Description
Day time	Triggers the event at the specific time determined by the option you choose from . From , you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
Action	Selects the action to be performed when the time condition is verified. *For further information, see Available actions to see the available options*

Example

In the example below there are two events: the first is set to turn the **Switch** function ON at 9:30 every day (blue rectangle). The **Switch** function will be turned OFF at 23:30 every day according to the second activity (orange rectangle below):



Trigger signals

In the **Signal local properties** panel, the following parameters are proposed according to the signal type:

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising edge	Set the high threshold above which the signal is considered ON
Falling edge	Set the low threshold below the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed
Action on falling	As soon as the function goes OFF, the selected action is executed

Procedures

Functions > Hour counting > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Functions > Sequence > Command signals

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Set the feedback modes

1. From the **Main signals l**list, select the feedback signals you want to set
2. From the **Signal local properties**, set the Feedback mode for each Function status
3. From the Feedback mode column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Sequence

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Sequence step procedures

Options tab > Available functions list

Add steps (functions) to the sequence

From the *Options tab > Available functions list*, you can add the functions to a sequence **Individually** or **together** (**Multiple**).

Individually

1. (Optional) Enter the name function in the **Name** field.
2. (Optional) Set the default step delay timer in the **Sequence steps** panel
3. Click the ⊕ button to add a function to the **Sequence** steps

*Note: for each function you add, a new step row is created in the **Sequence steps** list.*

Multiple

1. (Optional) Enter the name function in the **Name** field.
2. (Optional) Set the default step delay timer in the **Sequence steps** panel
3. Check the functions you want to add
4. Click the ⊕ in the **Filter option** panel to add functions to the **Sequence** steps

*Note: for each function you add, a new step row is created in the **Sequence steps** list.*

Tip: add function(s) according to an index

1. In the ***Options tab > Sequence steps*** panel, select the destination row (the ▸ icon appears to indicate the selected step).
2. Add the function(s) to the sequence, after to the selected step

Options tab > Sequence steps panel

Set step properties

1. In the **Delay timer** field, set the **delay timer** for the activation of a step.
2. Click the icon and select the **Hours**, **Minutes**, **Seconds**

Notes:

- *If the value is set to 0, the step functions are activated one after the other, without any delay.*
- *In the first function of the list, the **Delay timer** value is the delay between the activation of the **Sequence** and the activation of the first action.*

3. In the **Action** field, set the action for the selected function.
4. Click the icon ≡ and select the action in the combo-box according to the type of function.

Modify the step order

1. In the ***Options tab > Function steps*** panel, check the function you want to move.

Note: the step row is highlighted in dark grey

2. Move the mouse pointer over the selected step row
3. Hold down the left mouse button and move the pointer to where you want to drop the function
4. Drop the function by releasing the left mouse button.

Notes:

- *You can change the functions added to the sequence at any time.*
- *The functions can be moved using drag-and-drop action.*
- *You can move only one function at a time.*

Delete step(s)

1. In the **Sequence steps** panel, click  of the step row you want to delete.
2. Check two or more function steps you want to delete.
3. Click  in the **Sequence list** panel to delete all the selected function steps.

Copy and paste step properties

1. Click the right mouse button over a step row
2. Select **Mark row for copy** from the contextual menu

Notes:

- *the row is highlighted in green colour*
- *you can mark only one step row at a time*
- *you can change the marked row by right-clicking over a different row and selecting **Mark row for copy***

3. Check the step rows to apply the properties
4. Click the right mouse button to select one of the available paste options:

- **Paste Delay and Action**
- **Paste Action**: applied on step rows that have the same type of function or the marked row
- **Paste delay**: applied to all lines regardless of the type of function

Note: the paste operation is applied only to the selected row.

The table below shows the available keyboard shortcuts:

Action	Keyboard shortcuts
Mark	Cntrl+C
RemoveMark	Cntrl+R
PasteDelayAndAction	Cntrl+V
PasteDelay	Cntrl+B
PasteAction	Cntrl+N

Local calendar procedures

Home > Functions > Sequence > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

Calendar

Content

This section includes the following topics:

Introduction to the Calendar function

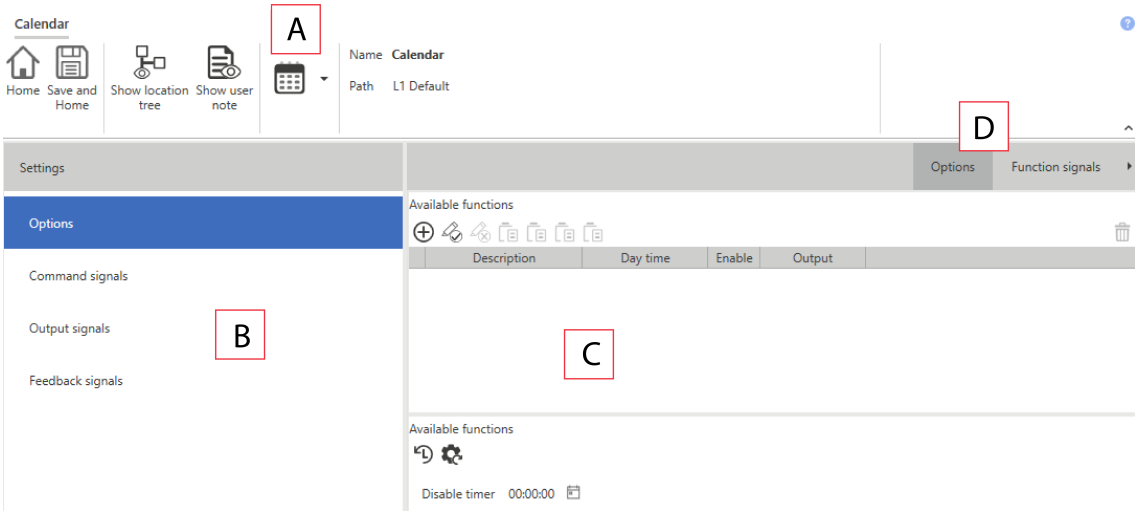
The **Calendar** manages one or more digital output signals that change their status according to the scheduled activities.

The **Main status** output signal is usually connected as a command or activation signal of other functions. This way, this signal creates automatisms such as, switch OFF all the lights in an office at the end of a working day or lower the blinds at night.

The function also includes commands for disabling automatisms and forcing the digital output signals to ON or OFF.

Calendar page

Home page > All the applications > Function list > Sequence and Calendar > Calendar



Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can manage the time schedulers to trigger the function outputs accordingly. Following are the parameters:

Parameter	Description
	Adds an event
	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event
Day time	Triggers the event at the specific time determined by the option you choose from the list (HH:MM:SS)
Days	Triggers the event on the selected days
Months	Triggers the event on the selected months
Week days	Triggers the event on the selected week days
Output	Selects the value for the output signal which has to be performed when the event is verified.
Disable timer	Sets the time period after which the Disable ON condition is deactivated (0 - 24 h. Default value: 1 minute)

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant statuses.

Element	Description	Value
Main signal	Shows the function main status	OFF = Function is not active ON = Function is active
Status signal	Shows the function status	**Status** / **Value** 1 – Output OFF 2 – Output ON 3 – Disabled, output OFF 4 – Disabled, output ON 5 – Forced OFF 6 – Forced ON

Element	Description	Value
Custom signal	It is ON if the statuses selected from the combo- box are true	ON = The selected status is true OFF = The selected status is false

Note: the Calendar status is updated according to the last activity also during the first start-up and switching ON. For this reason, the Enable calendar event at start-up option is not managed.

Command signals tab

The **Command signals** tab shows the list of all the input signals.

The **Calendar** function is controlled by trigger signals that you can select from the **Signal local properties**panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	• Disable automation • Force conditions	*You can add max 50 signals*
Digital switch		
Digital module (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can controlled according to the function main status.

Signal type	Available options
Digital output	Inverted logic
Digital LED	
Output relay	

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Calendar** status.

Signal type	Available options
Digital LED	Inverted logic
Digital output	
Digital relay	

Note: You can add max 50 signals.

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed.
Action on falling	As soon as the function goes OFF, the selected action is executed.

Automations

Automations are used in Building Automation systems to automate functions thanks to time schedules, actions triggered by sensors or by timers.

These automations have priority over manual actions (such as the pressure of a push button) so, if you need to stop any automation associated to the function, you can activate the **Disable ON** condition.

From the **Signal local properties** of the **Command signals** tab, you can associate actions to the trigger signals.

The following tables show the types of signal according to the action behaviour:

Push Button

	As soon as you press the push button **(Action on rising)**	As soon as you click the push button **(Action on click)**	After a long press **(Action on long click)**	After a very long press **(Action on very long click)**
Action				
Disable ON	The automation is disabled			
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*			
Disable OFF	The **Disable ON** condition is removed			
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode			
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts			

Digital switch / digital function

	As soon as the switch closes/ the function goes ON **(Action on rising)**	As soon as the switch closes / the function goes OFF **(Action on falling)**
Action		
Disable ON	The automation is disabled	
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*	
Disable OFF	The **Disable ON** condition is removed	
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode	
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts	

Analogue signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Disable ON	The automation is disabled	
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*	
Disable OFF	The **Disable ON** condition is removed	
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode	
Disable ON with timer / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts	

Force ON and OFF conditions

If you want to force the output ON or keep it OFF regardless of the logical status of the function, select **Force ON** and **Force OFF**.

These automation have priority over manual actions (such as the pressure of a push button) so, if you need to stop any automatism associated to the function, you can activate the **Disable ON** condition.

Note: When you activate the force output ON signal and the force output OFF signal, the force output ON signal has the priority.

From the **Command signals** tab of the function you can manage the automations and the actions to enable/disable the automation:

Push Button

	As soon as you press the push button **(Rising edge)**	As soon as you click the push button **(Click)**	After a long press **(Long)**	After a very long press **(Very long)**
Action				
Force ON	The output is forced ON regardless of all the other signals used in the function			
Remove force ON	The Force ON action is removed (if the function output is forced ON)			
Force ON toggle	The Force ON condition is enabled/disabled			
Force OFF	The output is forced OFF regardless of all the other signals used in the function			
Remove force OFF	The Force OFF action is removed (if the function output is forced OFF)			
Force OFF toggle	The Force OFF condition is enabled/disabled			

Digital switch / digital function

	As soon as the switch closes or the function goes ON **(Rising edge)**	As soon as the switch opens/function goes OFF **(Falling edge)**
Action		
Force ON	The output is forced ON regardless of all the other signals used in the function	
Remove force ON	The Force ON action is removed (if the function output is forced ON)	
Force ON toggle	The Force ON condition is enabled/disabled	
Force OFF	The output is forced OFF regardless of all the other signals used in the function	
Remove force OFF	The Force OFF action is removed (if the function output is forced OFF)	
Force OFF toggle	The Force OFF condition is enabled/disabled	

Analogue signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Force ON	The output is forced ON regardless of all the other signals used in the function	
Remove force ON	The Force ON action is removed (if the function output is forced ON)	
Force ON toggle	The Force ON condition is enabled/disabled	
Force OFF	The output is forced OFF regardless of all the other signals used in the function	
Remove force OFF	The Force OFF action is removed (if the function output is forced OFF)	
Force OFF toggle	The Force OFF condition is enabled/disabled	

Procedures

Functions > Calendar > Settings > Options tab

Add an event

1. In central area, click ⊕ near the centre-right.
2. Enter the event information (e.g., **Description**, start/end times, how often it repeats, and so on).
3. In the output combo-box select the output status to be executed.
4. From the **Enable** column check the box to enable the event.

Notes:

- *you can change any of the event details by entering the new values in the event columns.*
- *you can delete an event (🗑)*

See "Copy and paste modules" on page 77

Functions > Calendar > Settings > Command signals tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel.
3. From the **Signal local properties** panel, set the options according to the configuration.

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set
2. From the **Signal local properties** panel, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Calendar > Settings > Options > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options**tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the statuses you want to assign to the **Custom signal**

Note: its value is ON when at least one of the selected statuses is true.

Functions > Calendar

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Smart Calendar

Content

This section includes the following topics:

Introduction to the Smart Calendar function

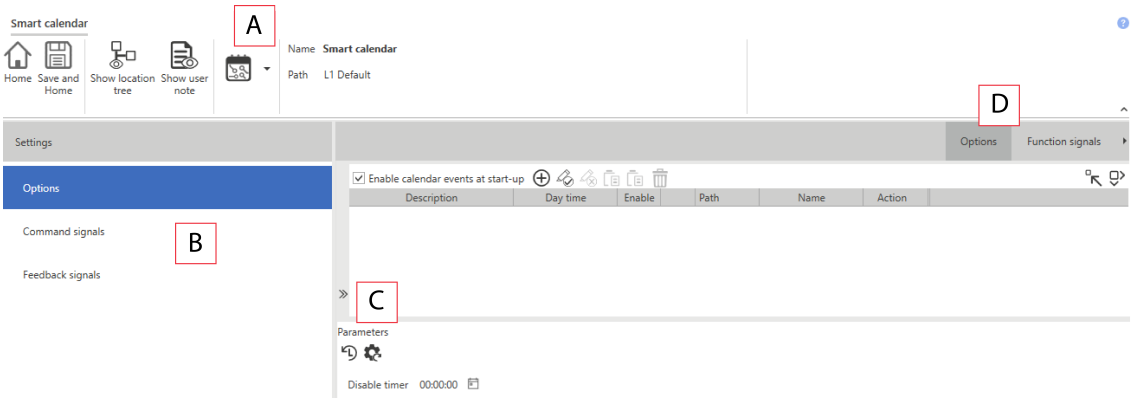
The **Smart Calendar** function permits you to define a list of commands/actions for some functions and for activities you can set. As soon as the calendar event is verified, the status of the functions changes according to the actions.

*Note: you can **Disable** the calendar event execution (if, for example, you want to stop the automatic activities for the plant maintenance).*

You can also use the **Smart Calendar** to execute the last activity set at the system start-up and/or at the reactivation of the configuration.

Smart Calendar page

Home page > All the applications > Function list > Sequence and Calendar > Smart Calendar



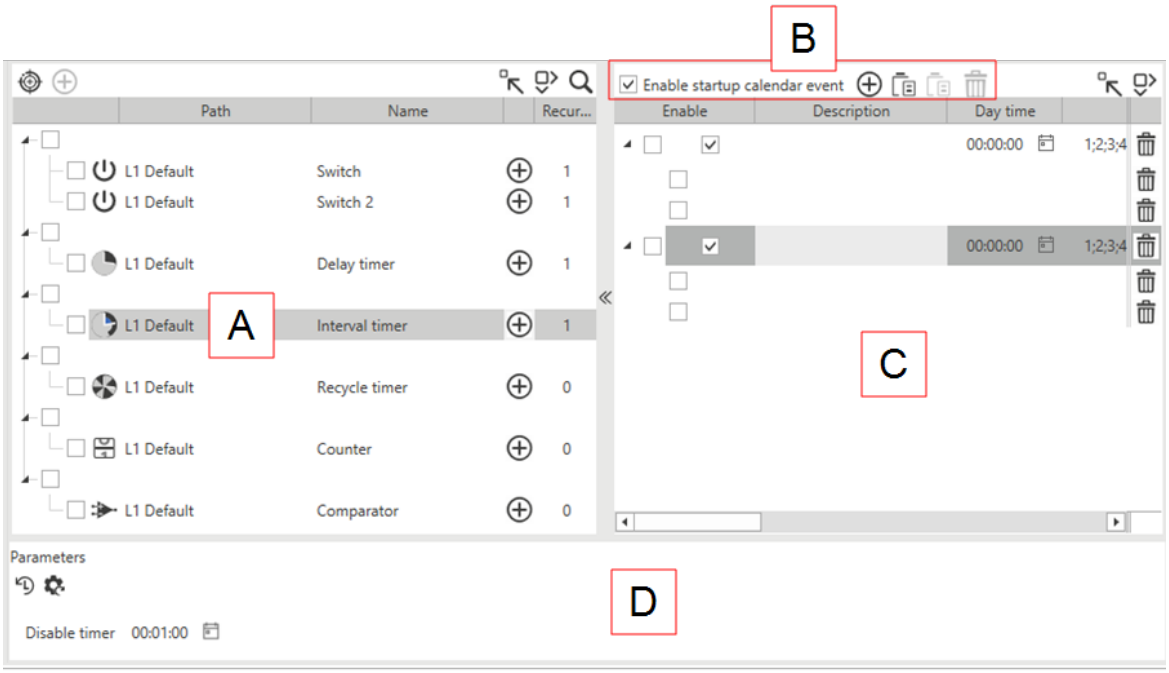
Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the calendar events to manage the function output according to time schedules. • **Command signals**, sets the command signals to trigger the actions. • **Feedback signals**, sets the feedback signals to show the function status. *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options** sub-menu, you can add the functions for which you want to manage the status according to the calendar events. Three parts compose the window:



Element	Description
A	Available functions. This panel shows the available functions, sorted by typology, that can be added to the calendar events to manage the relevant actions. Following are the types of function: • Switch • Delay Timer • Interval Timer • Recycle Timer • Siren • Intruder Alarm • Intruder Zone • Counter • Comparator *Note: you can add only the Main status signals of the functions.*

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>B</td><td>This panel shows the main functions can be managed by the Smart Calendar function. For each function, the following parameters are available:
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Enable calendar events at start-up</td><td>Executes all the events as soon as the controller is powered ON. At the controller start-up, the system triggers the events for which the time period is verified. Otherwise, the events will be triggered next time.</td></tr>
<tr><td>  </td><td>Adds a new event. The functions you select will be added automatically or a blank row will be created.</td></tr>
<tr><td>  </td><td>Replicate activity: it creates a copy of the selected event, including the associated functions and activities.</td></tr>
<tr><td>  </td><td>Mark selected row for copying</td></tr>
<tr><td>  </td><td>Remove mark</td></tr>
<tr><td>  </td><td>Paste function command</td></tr>
<tr><td>  </td><td>Deletes checked rows</td></tr>
</table></td></tr>
<tr><td>C</td><td>Activities and commands. Following are the parameters you can see/set:
<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Enable</td><td>Enables/disables the event</td></tr>
<tr><td>Description</td><td>Defines the name of the event that will appear in the Local calendar list</td></tr>
<tr><td>Day time</td><td>Triggers the event at the time you set (HH.MM.SS)</td></tr>
<tr><td>Days</td><td>Triggers the event on the selected days</td></tr>
<tr><td>Months</td><td>Triggers the event on the selected months</td></tr>
<tr><td>Week days</td><td>Triggers the event on the selected week days</td></tr>
<tr><td>Path</td><td>Shows the function name in the configuration and the relevant icon</td></tr>
<tr><td>Name</td><td>Shows the function name. Users can always edit it.</td></tr>
<tr><td>Action</td><td>Selects the action to be performed when the time condition is verified.
See Available actions.</td></tr>
<tr><td>  </td><td>Removes the row from the calendar function list.</td></tr>
</table></td></tr>
<tr><td>D</td><td>Function parameter: Disable timer. It sets the time period after which the Disable ON condition is deactivated (0 - 24 h. Default value: 1 min).</td></tr>
</table>

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant statuses.

Element	Description	Value
Main signal	Shows the function main status	OFF = Function is not active ON = Function is active
Status signal	Shows the function status	Status / Value: 1 – Disabled 2 – Running 3 – Disabled, timeout is running
Custom signal	It is ON if the statuses selected from the combo- box are true	ON = The selected status is true OFF = The selected status is false

Command signals tab

The **Command signals** tab shows the list of all the input signals.

The **Smart Calendar** function is controlled by trigger signals that you can select from the **Signal local properties**panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	Disable automation	*You can add max 50 signals*
Digital switch		
Digital module (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Smart Calendar** function status.

Signal type	Available options
Digital LED	Inverted logic
Digital output	
Digital relay	

Note: You can add max 50 signals

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analog signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed.
Action on falling	As soon as the function goes OFF, the selected action is executed.

Automations

Automations are used in Building Automation systems to automate functions thanks to time schedules, actions triggered by sensors or by timers.

These automations have priority over manual actions (such as the pressure of a push button) so, if you need to stop any automation associated to the function, you can activate the **Disable ON** condition.

From the **Signal local properties** of the **Command signals** tab, you can associate actions to the trigger signals.

The following tables show the types of signal according to the action behaviour:

Push Button

	As soon as you press the push button **(Action on rising)**	As soon as you click the push button **(Action on click)**	After a long press **(Action on long click)**	After a very long press **(Action on very long click)**
Action				
Disable ON	The automation is disabled			
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*			
Disable OFF	The **Disable ON** condition is removed			
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode			
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts			

Digital switch / digital function

	As soon as the switch closes/ the function goes ON **(Action on rising)**	As soon as the switch closes / the function goes OFF **(Action on falling)**
Action		
Disable ON	The automation is disabled	
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*	
Disable OFF	The **Disable ON** condition is removed	
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode	
Disable ON with time-out / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts	

Analogue signal / analogue function

	As soon as the analogue signal/function value goes above the threshold **(Rising edge)**	As soon as the analogue signal/function value goes below the threshold **(Falling edge)**
Action		
Disable ON	The automation is disabled	
Disable ON with time-out	The automation is disabled for the time period set in the **Disable timer** field *Note: when the timer expires, the automation returns active*	
Disable OFF	The **Disable ON** condition is removed	
Disable ON/OFF toggle	The automation is enabled/disabled in toggle mode	
Disable ON with timer / OFF toggle	The automation is enabled/disabled in toggle mode. If the **Disable ON** condition is active, the timer starts	

Procedures

Functions > Smart Calendar > Settings > Command signals tab > Available functions

Add functions to an activity

<table>
<tr><th>If you want add...</th><th>Then...</th><th>Notes</th></tr>
<tr><td>a single function</td><td>From the Available functions, click ⊕ from each function you want to add to the event activity.</td><td rowspan="2"><table><tr><th>If in the panel of activities and commands...</th><th>Then...</th></tr><tr><td>no activity is present or selected</td><td>a new activity will be created</td></tr><tr><td>you select an existing activity</td><td>the selected function will be added</td></tr></table>
In each activity, a function can appear just once and the Action column will always be empty.
For each function you can see its recurrence in the activity.</td></tr>
<tr><td>multiple functions</td><td>1. From the Available functions, check the functions you want to add.
2. Click ⊕ Add the selected functions to the highlighted activityfrom the Ribbon panel to add the functions to the event activity.</td></tr>
</table>

Functions > Smart Calendar > Settings > Command signals tab > Activities and commands

Add an event activity

From the **Activities and commands**panel, click ⊕ **Add new activity** to add a blank row.

Duplicate an activity

Note: you can create a copy of an existing activity with the following fields:

- **Description** *(blank)*
- ***Day time, Days, Months, Week days*** *inherited from the original activity.*
- ***Action****(blank)*

1. From the **Activities and commands** panel, mark the activities to duplicate.

   Note: the activity row turns grey.

2. Click **Replicate activity** to create a copy of the selected activity.

Edit the activity

If you add...	Then...
a single function	1. Enter the **Description**, **Day time, Days, Months** and **Week days** of the event. 2. From the **Action** menu (), select the status/command to associate/execute. 3. Check the **Enable** box of the event to enable.
multiple functions	See "Copy and paste modules" on page 77

Delete functions belonging to an activity

If you want to remove...	Then from the *Activities and commands* panel...
a single function	Click from the function row you want to delete
multiple functions	1. Select the functions you want to delete 2. Click

Delete an event

1. Select the event row(s)
2. From the **Activities and commands** panel, click to remove the selected item(s)

   Note: if you remove an activity, all the relevant functions will be removed too.

Functions > Smart Calendar > Settings > Command signals tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

- *When a signal is selected, it appears in the central area*
- *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set
2. From the **Signal local properties** panel, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Smart Calendar > Settings > Options > Function signals

Edit the function signals name

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options**tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the statuses you want to assign to the **Custom signal**

Note: its value is ON when at least one of the selected statuses is true.

Functions > Smart Calendar

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Zone temperature

Content

This section includes the following topics:

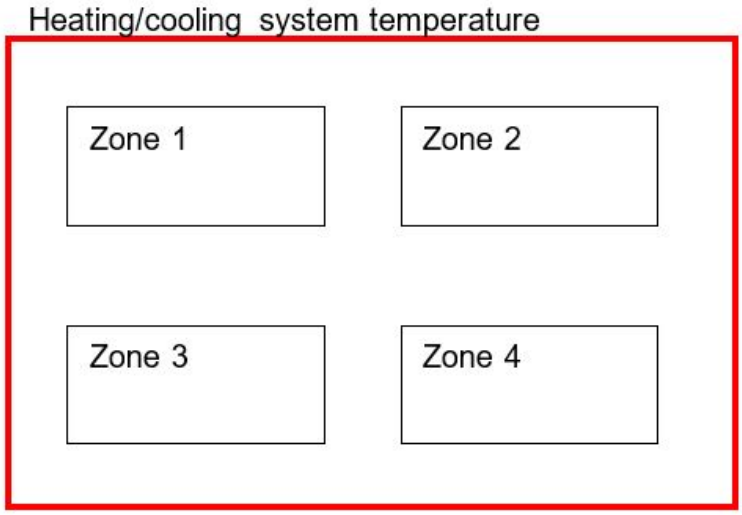
Introduction to the Zone temperature function

The **Zone temperature** function is used to manage the heating/cooling and ventilation of a building. You can manage the climate by creating different zones according to your needs. The following control modes are available:

- Heating control
- Cooling control
- Heating/Cooling separate controls. Usually, this mode is intended for buildings where heating and cooling have their own independent pipeline system
- Heating/Cooling shared controls. A common communication object for heating and cooling is required to activate two-pipe systems (i.e., the same pipeline is used for heating and cooling and the flow conversion is required).

There are two main steps to configure the temperature control:

1. Create at least one **Zone temperature** function. Each **Zone temperature** function can correspond to a part of the building with heating/cooling control.
2. Add a **System temperature** function for heating/cooling. This function is the main core of the temperature control since it is used to manage all the **Zone temperature** functions: it collects all the **Zone** statuses when a request for heating/cooling is received and activates the system by providing the **Zone** with heating/cooling. It also manages the pump output with the relevant delay via the valve activation and the ON/OFF switching according to the outdoor temperature and allows you to manage the seasoning change.



How to configure the temperature control

1. Create at least one **Zone temperature**function.

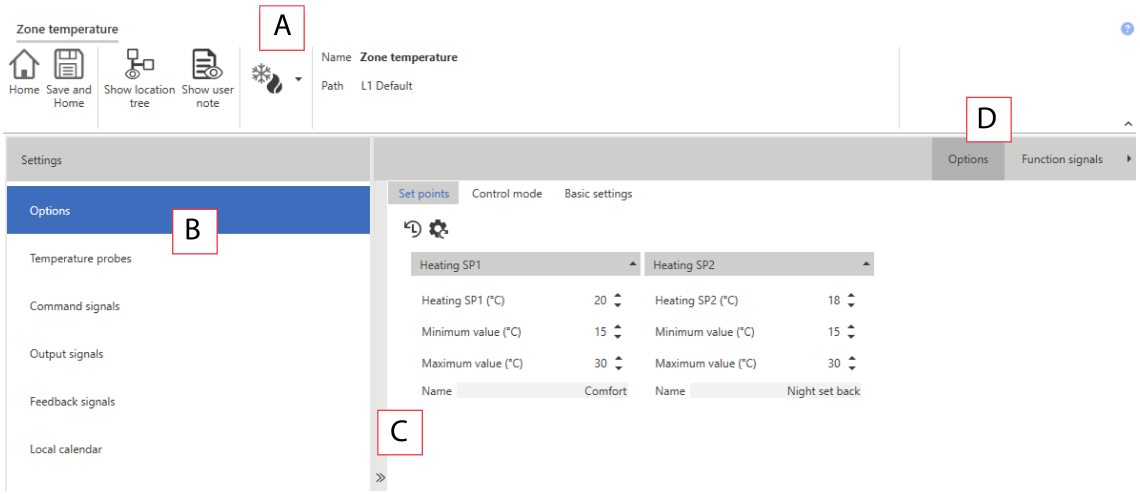
   *Note: each **Zone temperature** function can correspond to a part of the building where heating/cooling control has to be managed.*

2. Add a **System temperature** function to manage all the **Zone temperature** functions.

   *Note: when a **Zone temperature** function receives a heating/cooling request, a **System temperature** function collects all the **Zone temperature** statuses.*

Zone temperature page

Home page > (Building) > Function menu > Zone temperature



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Temperature probes**, selects the temperature signals • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local calendar**, sets calendar events to automate the function according to time schedules • **Local display** (if enabled), selects the **TEMDIS modules** that can be used to see the temperature value and to manage the available set points • **Zone humidity signals** (if enabled), selects the humidity signals to be shown in the web app • **Zone CO_2 signals** (if enabled), selects the CO_2 signals to be shown in the web app *Note: the options list varies according to the enabled options/parameters in the **Options** list.* *For further information, see "Settings" on the next page*
C	**Options** menu, sets the options for the function. *Note: the options list varies according to the selected options/parameters.*
D	Central area: shows the available options and tabs according to the selected parameters from the **Options** menu
E	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

From the **Options**, you can set the following parameter in the **Options** menu, then the available parameters and tabs are shown in the **Central-Area** panel:

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Working mode</td><td>Defines the working mode for the Zone temperature function:<table><tr><th>Select...</th><th>to enable…</th></tr><tr><td>Heating</td><td>only the heating working mode</td></tr><tr><td>Cooling</td><td>only the cooling working mode</td></tr><tr><td>Heating/Cooling</td><td>both the heating and cooling working modes (separately)</td></tr><tr><td>Heating/Cooling shared set points</td><td>shared set point management for heating and cooling working mode</td></tr></table></td></tr>
<tr><td>Heating set points</td><td>Sets how many set points have to be used for heating control:
SP1
SP1 and SP2
SP1, SP2 and SP3
Manual SP*</td></tr>
<tr><td>Cooling set points</td><td>Sets how many set points have to be used for cooling control:
SP1
SP1 and SP2
SP1, SP2 and SP3
Manual SP*</td></tr>
<tr><td>Shared Heating / Cooling set points</td><td>Sets how many shared set points have to be used for heating and cooling controls:
SP1
SP1 and SP2
SP1, SP2 and SP3
Manual SP*</td></tr>
</table>

Parameter	Description
Set point resolution (°C)	Sets the temperature resolution value for the set points: • 0.1 °C • 0.5 °C • 1 °C
Enable auxiliary control	Check to enable the **Auxiliary control** parameters. *Note: the related tab appears in the **Central-Area** panel*
Enable fan coil control	Check to enable the **Fan coil** parameters. *Note: the related tab appears in the **Central-Area** panel*
Enable antifreeze control	Check to enable the antifreeze control. *Note: the related tab appears in the **Central-Area** panel*
Enable local display	Check to enable the **Local display**. *Note: the related tab appears in the **Settings** menu*
Enable zone humidity signal	Check to enable the **Zone humidity** signal. *Note: the related tab appears in the **Settings** menu*
Enable zone CO_2 signal	Check to enable the Zone CO_2 signal. *Note: the related tab appears in the **Settings** menu*

** Note: the manual SP is shown only if at least one TEMDIS device is configured as **Local display** for the **Zone temperature** function.*

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses. The function signals list varies according to the selected working mode and the function configuration:

Element	Description	Value
Function state signal	Shows the main function status	Shows the function status among those values: **Value** / **Status** **1** / Not controlling **2** / Controlling heating (the heating control is working; no force is activated) **3** / Controlling cooling (the cooling control is working; no force is activated) **4** / Controlling heating and cooling **5** / Not controlling (RTC disabled) **6** / Controlling heating (RTC disabled) **7** / Controlling cooling (RTC disabled **8** / Controlling heating and cooling (RTC disabled)

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Heating state signal</td><td>Shows the current status of the heating working mode</td><td>Shows the function status among those values:<table><tr><th>Value</th><th>Status</th></tr><tr><td>1</td><td>Heating OFF</td></tr><tr><td>2</td><td>Heating SP1 (OFF)</td></tr><tr><td>3</td><td>Heating SP1 (ON)</td></tr><tr><td>4</td><td>Heating SP2 (OFF)</td></tr><tr><td>5</td><td>Heating SP2 (ON)</td></tr><tr><td>6</td><td>Heating SP3 (OFF)</td></tr><tr><td>7</td><td>Heating SP3 (ON)</td></tr><tr><td>8</td><td>Manual mode OFF</td></tr><tr><td>9</td><td>Manual mode ON</td></tr><tr><td>10</td><td>Safe mode (Heating forced OFF)</td></tr><tr><td>11</td><td>Safe mode (Heating forced ON)</td></tr><tr><td>12</td><td>Antifreeze (Heating forced ON)</td></tr><tr><td>13</td><td>Auxiliary control (Heating Forced ON)</td></tr><tr><td>14</td><td>Heating forced ON</td></tr><tr><td>15</td><td>Auxiliary control (Heating Forced OFF)</td></tr><tr><td>16</td><td>Heating forced OFF</td></tr><tr><td>17</td><td>System temperature (Heating forced OFF)</td></tr></table></td></tr>
<tr><td>Heating controlled temperature signal</td><td>Shows the temperature value for heating control</td><td></td></tr>
<tr><td>Heating auxiliary temperature signal</td><td>Shows the auxiliary temperature value</td><td></td></tr>
<tr><td>Heating controlled set point signal</td><td>Shows the active set point for heating control</td><td></td></tr>
<tr><td>Heating control status signal</td><td>Shows the heating control signal status</td><td>0= Control is OFF
1= Control is ON</td></tr>
<tr><td>Heating Analogue control signal</td><td>Shows the output Analogue value that can be used as input signal in the Analogue output function</td><td>0..100%</td></tr>
</table>

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Heating set point selected signal</td><td>Shows the active heating set point</td><td>
<table>
<tr><th>Value</th><th>Status</th></tr>
<tr><td>1</td><td>OFF</td></tr>
<tr><td>2</td><td>S1</td></tr>
<tr><td>3</td><td>S2</td></tr>
<tr><td>4</td><td>S3</td></tr>
<tr><td>5</td><td>Manual</td></tr>
</table>
</td></tr>
<tr><td>Heating fan coil state</td><td>Shows the fan coil state for heating control</td><td>
<table>
<tr><th>Value</th><th>Status</th></tr>
<tr><td>1</td><td>OFF</td></tr>
<tr><td>2</td><td>Leaving FS1 (activation time between FS1 and another FS)</td></tr>
<tr><td>3</td><td>FS1 (fan speed 1)</td></tr>
<tr><td>4</td><td>Leaving FS2 (activation time between FS2 and another FS)</td></tr>
<tr><td>5</td><td>FS2 (fan speed 2)</td></tr>
<tr><td>6</td><td>Leaving FS3 (activation time between FS3 and another SP)</td></tr>
<tr><td>7</td><td>FS3 (fan speed 3)</td></tr>
</table>
</td></tr>
<tr><td>Heating Analogue fan coil signal</td><td>Shows the Analogue value that can be used by fan coil control for heating mode</td><td>0..100%</td></tr>
<tr><td>Custom heating signal</td><td>Shows the current function status</td><td></td></tr>
</table>

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Cooling state signal</td><td>Shows the current status of the cooling working mode</td><td>Shows the function status among those values:<table><tr><th>Value</th><th>Status</th></tr><tr><td>1</td><td>Cooling OFF</td></tr><tr><td>2</td><td>Cooling SP1 (OFF)</td></tr><tr><td>3</td><td>Cooling SP1 (ON)</td></tr><tr><td>4</td><td>Cooling SP2 (OFF)</td></tr><tr><td>5</td><td>Cooling SP2 (ON)</td></tr><tr><td>6</td><td>Cooling SP3 (OFF)</td></tr><tr><td>7</td><td>Cooling SP3 (ON)</td></tr><tr><td>8</td><td>Manual mode OFF</td></tr><tr><td>9</td><td>Manual mode ON</td></tr><tr><td>10</td><td>Safe mode (Cooling forced OFF)</td></tr><tr><td>11</td><td>Safe mode (Cooling forced ON)</td></tr><tr><td>12</td><td>Antifreeze (Cooling forced ON)</td></tr><tr><td>13</td><td>Auxiliary control (Cooling Forced ON)</td></tr><tr><td>14</td><td>Cooling forced ON</td></tr><tr><td>15</td><td>Auxiliary control (Cooling Forced OFF)</td></tr><tr><td>16</td><td>Cooling forced OFF</td></tr><tr><td>17</td><td>System temperature (Cooling forced OFF)</td></tr></table></td></tr>
<tr><td>Cooling controlled temperature signal</td><td>Shows the temperature value for cooling control</td><td></td></tr>
<tr><td>Cooling auxiliary temperature signal</td><td>Shows the auxiliary temperature value</td><td></td></tr>
<tr><td>Cooling controlled set point signal</td><td>Shows the active set point for cooling control</td><td></td></tr>
<tr><td>Cooling control status signal</td><td>Shows the cooling control signal status</td><td>0 = OFF
1 = ON</td></tr>
<tr><td>Cooling Analogue control signal</td><td>Shows the output Analogue value that can be used as input signal in the Analogue output function</td><td>0..100%</td></tr>
</table>

<table>
<tr><th>Element</th><th>Description</th><th>Value</th></tr>
<tr><td>Cooling set point selected signal</td><td>Shows the active cooling set point</td><td>
<table>
<tr><th>Value</th><th>Status</th></tr>
<tr><td>1</td><td>OFF</td></tr>
<tr><td>2</td><td>S1</td></tr>
<tr><td>3</td><td>S2</td></tr>
<tr><td>4</td><td>S3</td></tr>
<tr><td>5</td><td>Manual</td></tr>
</table>
</td></tr>
<tr><td>Cooling fan coil state</td><td>Shows the fan coil state for cooling control</td><td>
<table>
<tr><th>Value</th><th>Status</th></tr>
<tr><td>1</td><td>OFF</td></tr>
<tr><td>2</td><td>Leaving FS1 (activation time between FS1 and another FS)</td></tr>
<tr><td>3</td><td>FS1 (fan speed 1)</td></tr>
<tr><td>4</td><td>Leaving FS2 (activation time between FS2 and another FS)</td></tr>
<tr><td>5</td><td>FS2 (fan speed 2)</td></tr>
<tr><td>6</td><td>Leaving FS3 (activation time between FS3 and another SP)</td></tr>
<tr><td>7</td><td>FS3 (fan speed 3)</td></tr>
</table>
</td></tr>
<tr><td>Cooling Analogue fan coil signal</td><td>Shows the Analogue value that can be used by fan coil control for cooling mode</td><td>0..100%</td></tr>
<tr><td>Custom heating signal</td><td>Shows the current function status</td><td></td></tr>
<tr><td>Heating and Cooling Analogue control signal</td><td>If you select the shared working mode, according to the active set point it reports the related analogue control value with scaling and offset to drive 6-way 0-10 V analogue valves to control motor</td><td>0..100%</td></tr>
<tr><td>Heating or Cooling Analogue control signal</td><td>If you select the shared working mode, it reports the respective analogue value that correspond to the active set-point</td><td>0..100%</td></tr>
<tr><td>Room temperature signal</td><td colspan="2">Shows the room temperature (°C or °F)</td></tr>
</table>

Element	Description	Value
Outdoor temperature signal	Shows the outdoor temperature (°C or °F)	
Zone humidity signal	Shows the humidity value (% R.H.)	
Zone CO_2 signal	Shows the CO_2 value (ppm)	

Temperature probes tab

The **Temperature probes** tab shows the list of all the available temperature signals that can be used to in the **Zone temperature** function.

The following table shows the type of signals you can associate:

Signal type		Notes
Temperature signal	Temperature signal that belongs to TEMDIS (see "Local display tab" on page 391 modules	• *If more than one temperature signal is added, the value is the average value of all signals present* • *You can add max 50 signals*
	Temperature signal	
Analogue signal	Generic analogue signal that belong to other modules	

According to your requirements, for each signal the available working modes are as follows:

Working type	Behaviour
Heating control	The signal is used by the heating control algorithm
Cooling control	The signal is used by the heating control algorithm
Heating auxiliary	The signal is used by the auxiliary heating control
Cooling auxiliary	The signal is used by the auxiliary cooling control
Room temperature	The signal is shown as room temperature
Outdoor temperature	The signal is shown as outdoor temperature

Note: when more temperature signals are used, the temperature value is calculated as the average value of all the added ones. Should one of them be faulty, the average value is calculated from the other ones.

In the **Signal global properties** panel, you can manage offset value for the temperature signals.

See "Procedures" on page 133 ***> Add the temperature signals***

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Zone temperature** function can be managed by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the type of signals you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button (e.g. SHA4XLS4TH module)	- Disable the calculation - Manage the Force conditions	*You can add max. 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output	See the available working mode in the table below *Note: you can add max. 100 signals.*
Digital LED	

According to your requirements, for each signal the available working mode are as follows:

Working type	Behaviour
Inverted	Inverted logic of the output can be enabled
Heating zone valve	The output is used to manage the activation of the valve for the heating control of the **Zone temperature** function
Heating fan coil speed 1	Activates the control of speed 1 in the fan coil unit for heating control
Heating fan coil speed 2	Activates the control of speed 2 in the fan coil unit for heating control
Heating fan coil speed 3	Activates the control of speed 2 in the fan coil unit for heating control
Cooling zone valve	The output is used to manage the activation of the valve for the cooling control of the **Zone temperature** function
Cooling fan coil speed 1	Activates the control of speed 1 in the fan coil unit for cooling control
Cooling fan coil speed 2	Activates the control of speed 2 in the fan coil unit for cooling control
Cooling fan coil speed 3	Activates the control of speed 2 in the fan coil unit for cooling control

The ON/OFF switching of the output is managed by the **System temperature** function according to the timing described in the paragraph *How to add the heating output*.

Note: when more temperature signals are used, the temperature value is calculated as the average value of all the added ones. Should one of them be faulty, the average value is calculated from the other ones.

In the **Signal global properties** panel, you can manage offset values for the temperature signals.

Analogue output signals

To use an analogue output signal you need to add the **Analogue output** function to your configuration.

The available analogue output signals of the **Zone temperature** function for heating and cooling modes are available and can be used for your project requirements.

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the **Zone temperature** status.

Signal type	Available options
Digital LED	Inverted logic
Digital	

Note: you can add max 50 signals

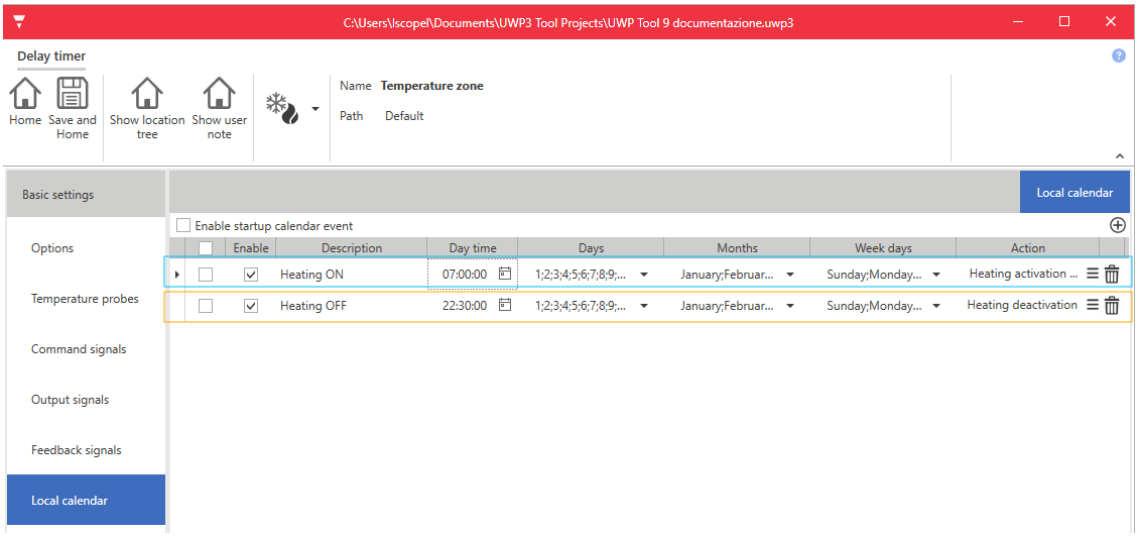
Local calendar tab

The **Local calendar** functionality can be used to trigger actions according to time schedules. From the **Local calendar** sub-menu, you can set the following parameter:

Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*
⊕	Adds a new event
🗑	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list
Day time	Triggers the event at the specific time determined by the option you choose from 📅 . From ☰, you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
Action	Selects the action to be performed when the time condition is verified. *See "Available actions" on page 405 to see the available options.*

Example

In the example below there are two events: the first is set to turn the **Heating control**ON at 7:00 every day (Heating ON – blue rectangle); the second event is set to turn the **Heating control** OFF at 22:30 every day (Heating OFF – orange rectangle below).



Local display tab

From the list of parameters, check the **Enable local display** box to open the **Local display** tab in the **Settings** menu: you will see it as soon as you can select and configure TEMDIS modules.

Local displays can be used to show locally the temperature and to change the set points.

Several modules can be used, but it is recommended to use one for each control mode.

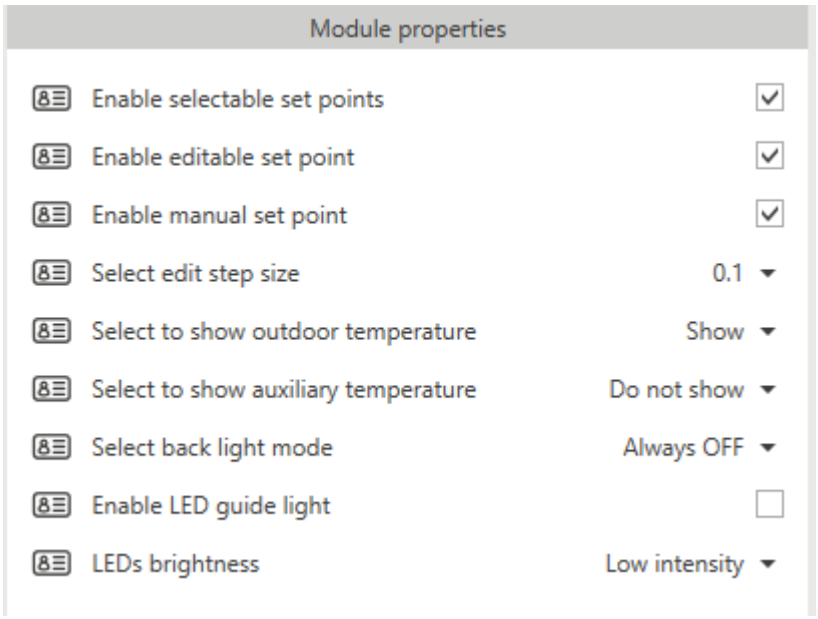
In **Local display** tab in the central area you can see the available **Local display modules.** To add TEMDIS modules to the configuration, just select them and set the control **Mode** you want to enable for the selected module(s).

Following the available control modes according to the part number:

Type	Part number	Control modes available
Temperature display	SHA4XTEMDIS SHE5XTEMDIS	• Heating • Cooling, • Heating and Cooling • Heating and Cooling shared *Note: Up to three set points and manual set point can be managed.*
Temperature display with programmable push buttons	SHA4XLS2TEMDISU SHA4XLS2TEMDIS SHE5XLS2TEMDISU SHE5XLS2TEMDIS	• Heating • Cooling *Note: only one set point can be managed.*
Glass capacitive touch temperature display	SHG060BSLT SHG060WSLT SHG503BSLT SHG503WSLT	• Heating • Cooling *Note: Up to three set points and manual set point can be managed.*

For each module, in the **Module properties** window you can then define the following properties.

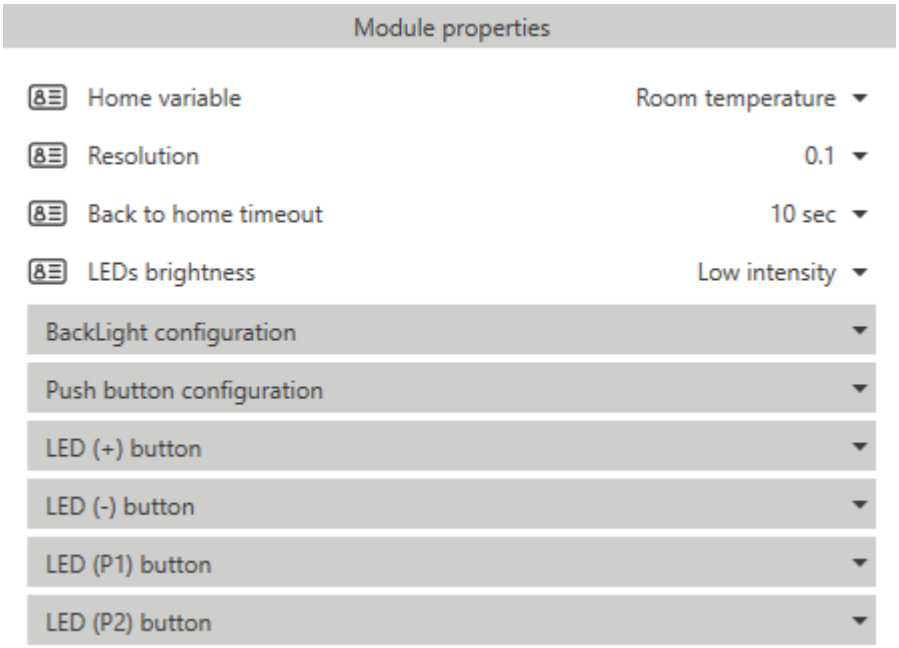
Temperature display



Parameter	Description
Enable selectable set point	Enables the selection of the available set points
Enable editable set point	Enables the set points 1, 2, 3 changes
Enable manual set point	Enables the access to a manual set point in addition to set point 1, set point 2, set point 3. It has the priority over the other set points.
Edit step	Sets the resolution of the display among 0.1 °C or 0.5 °C
Select to show outdoor temperature	If the **Zone temperature** function manages the **Outdoor temperature** value, it is possible to show the value on the display of the module
Select to show auxiliary temperature	If the **Zone temperature function** manages the **Auxiliary temperature** value, it is possible to show the value on the display of the module
Select back light mode	Enables the display back light to always be ON
Enable LED guide light	Enables the guide light on the push button
LEDs brightness	Sets the brightness of the blue and white LEDs

Temperature display with programmable push buttons

The SHA4XLS2TEMDIS and the SHE5XLS2TEMDIS are simplified TEMDIS displays with two push buttons that can be freely programmed and used in any function/automation:

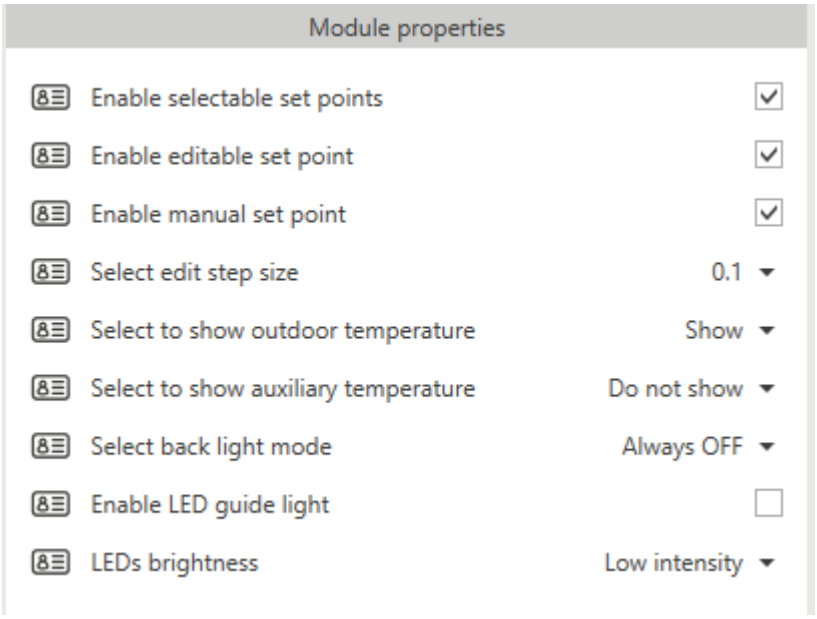


Parameter	Description
Home variable	The main visualization can be selected from one of the following options: • Room temperature: the temperature value is shown, or: • Set point:, the set point t1 value is shown *N.B: only one option can be selected at a time.*
Resolution	Sets the resolution of the display among 0.1 °C or of 0.5 °C
Back to home timeout	Sets the adjustment time-out (0 to 15 seconds) to exit from the regulation mode
LEDs brightness	Sets the brightness of the blue and white LEDs
Back-light configuration	The display back-light mode can be selected from one of the following options: • Always off: when the green V is selected, the back-light is always off • Always on: when the green V is selected, the back-light is always on • On with timeout: If this property is enabled, the back-light is switched off when the timer set in Back-light on time(sec) field expires • Control on status indicator: the back-light is on when the zone temperature function is on for heating/cooling *Note: only one option can be selected at a time*

Parameter	Description
Push button configuration (P1 mode, P2 mode)	For P1 and P2 push button, this field sets the behaviour when the push button is pressed: • Push button signal: the push button can be used in any function/automation • Show time: shows the time • Show room temperature: shows the current room temperature • Show outdoor temperature: shows the current outdoor temperature • OFF/S1 toggle: shows the T1 set-point value. By pressing the same key again, the temperature control will be switched On/Off *Note: After the Back-light on time (sec) value expires, the display will show the main visualization again.*
LED (+)button, LED (+)button, LED (P1) button, LED (P2) button	In the **Work mode** field, you can set the behaviour of the LED: • LED signal: the LED can be freely programmed as LED for any function/automation • Module feedback: the LED can be used as feedback LED for the push button if the TEMDIS module is used
	In the LED colour field you can select the colour: • Blue: used as feedback and the white LED is used as guide light • White: used as feedback and the blue LED is used as guide light
	In the **Guide light** field, you can enable or disable the guide light feature

Glass temperature display

The SHG503WSLT and SHG503BSLT have the same technical specifications as the SHG060WSLT and SHG060BSLT: they only have different front panel dimensions.



Parameter	Description
Enable slider to change set point	If you enable it, you can select the desired temperature level and change it by means of the slider.
Use the dot to indicate the half degree (20,5= 20.5)	If you enable it, the display shows the dot to indicate the half degree.
The X LED indicates if Temp function is on	If you enable it and the Kn is associated to the OFF function, the function LED Ln is ON when the relevant **Zone temperature** function is ON.
Set back-light on / off	The back-light of the glass can be enabled or disabled.
Back-light, display and LEDs ON time (sec)	This can be set always ON (slider to the far left) or programmed with a delay off timer (once the timer set with the slider expires, the back-light, display, function LED and feedback LEDs are switched off automatically).
Buzzer configuration	The module has a built-in buzzer that can be enabled or disabled. If you enable it, when a key is pressed, an acoustic feedback will be emitted. If you enable the **Enable buzzer on slider activation**, when the slider is activated, an acoustic feedback will be emitted.

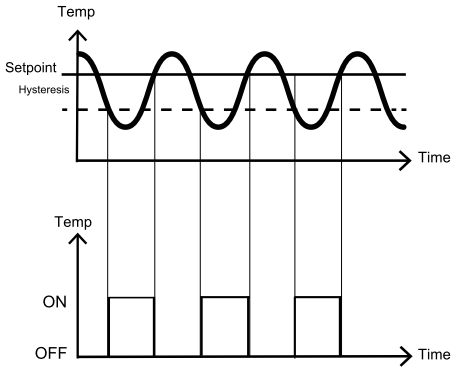
Parameter	Description	
Auto OFF configuration	**Enable automation switching off of the display**	If you enable it, the display is switched off when the timer, set in Back-light on time, expires.
	Enable automation switching off of the function LED	If you enable it, the function LED is switched off when the timer, set in Back-light on time, expires.
	Enable automation switching off of the feedback LED	If you enable it, the feedback LEDs are switched off when the timer, set in Back-light on time, expires.
	Enable automation switching off of the back-light	If you enable it, the back light is switched off when the timer, set in Back-light on time, expires.
Touch buttons configuration	For Button 1,2,3,4, this field sets the behaviour when the push button is pressed: • Select T1: Sets the set point 1 (T1) • Select T2: Sets the set point 2 (T2) • Select T3: Sets the set point 3 (T2) • Select OFF: Sets the set point OFF • Show outdoor temperature: shows the current outdoor temperature • Push button signal: the push button can be used in any function/automation *Note: after the Back-light on time (sec) value expires, the display will show the main visualization again.*	
Back-light sensitivity	Sets the back-light sensitivity in the range 0-255	

Working modes

The **Zone temperature** function can be set with four different working modes, as described below.

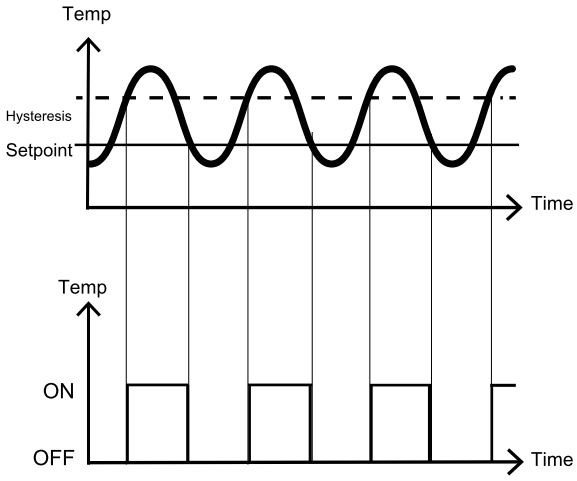
Heating

The **heating control** works as follows:
When the temperature falls below set point - hysteresis, the actuator is activated.
When the temperature rises above the set point, the actuator is deactivated.



Cooling

The cooling control works as follows:
When the temperature rises above set point + hysteresis, the actuator is activated.
When the temperature falls below the set point, the actuator is deactivated.



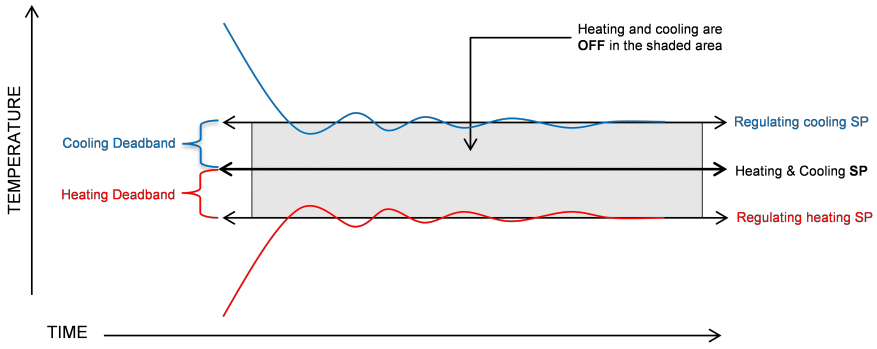
Heating / Cooling

This working mode allows the heating and cooling controls to work independently.

Heating / Cooling shared set points

This working mode allows for a more comfortable environment with more control over heating and cooling when they are needed at the same time.

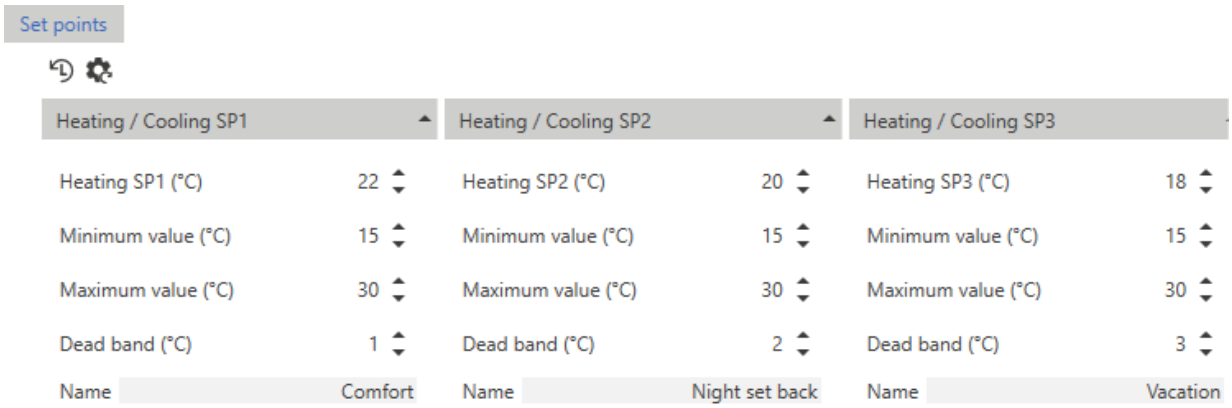
In an application where two outputs are used to control heating and cooling of the same process, this has the effect of defining a neutral band around the set point in which neither the heating nor the cooling output is on. This avoids having the heating and cooling devices working against one another. When the dead-band value is applied to an output, it has the effect of shifting the set point (see example below).



This working mode shares the same set point for heating SP1 and Cooling SP1 and a dead-band value can be set for Heating/Cooling SP1 (Dead band (°C), Heating/Cooling SP2 (Dead band (°C) and Heating/Cooling SP3 (Dead band (°C), as shown in the Set points tab in the Central-Area panel.

There are two ways of working with dead-bands:

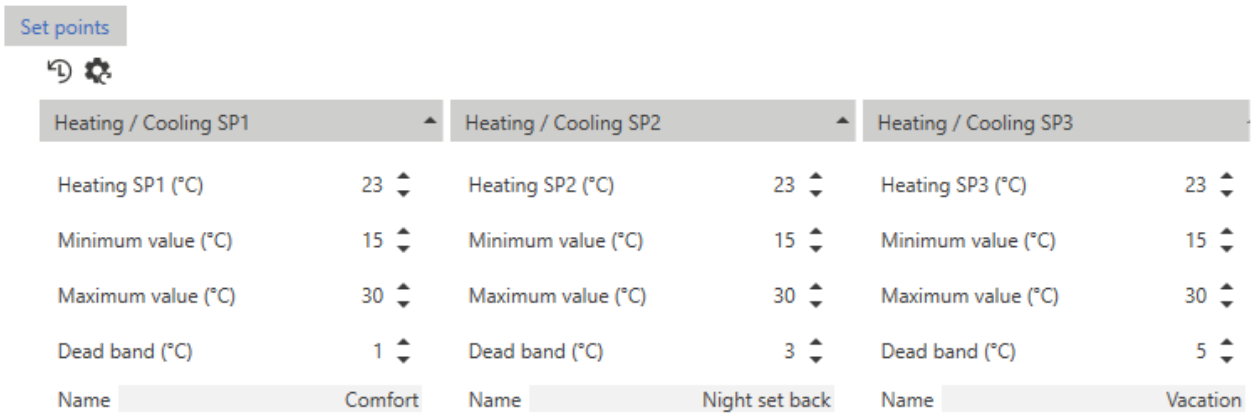
1. The three set points value can be set independently: in this situation you can set three different values for each Heating/Cooling SP and their Dead-band working with the relevant SP1, SP2 and SP3.



In the example shown above, the behaviour is as follows:

	Heating/Cooling SP (°C) value	Dead Band (°C) value	Heating will be…	Cooling will be…
SP1	22	**1**	**Switched off at 21 °C (22-1)**	Switched ON at 23 °C (22+1)
SP2	20	**2**	**Switched off at 18 °C (20-2)**	Switched ON at 22 °C (20-2)
SP3	18	**3**	**Switched off at 15 °C (18-3)**	Switched ON at 21 °C (18-1)

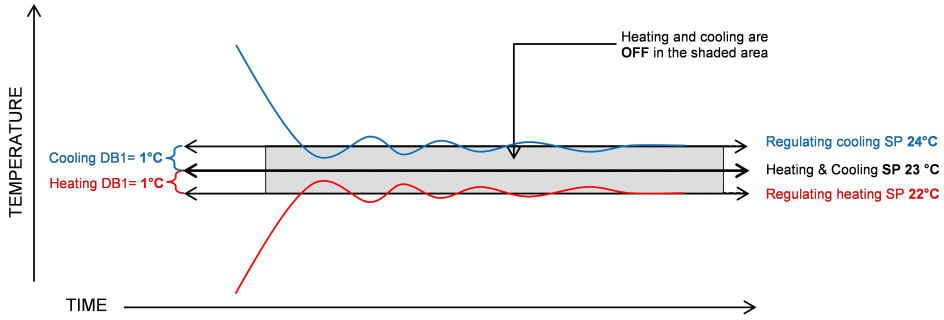
2. The three set points can be set with the same value and the three regulating levels are managed using the dead-bands.



The examples below show the working mode according to the values set in the picture:

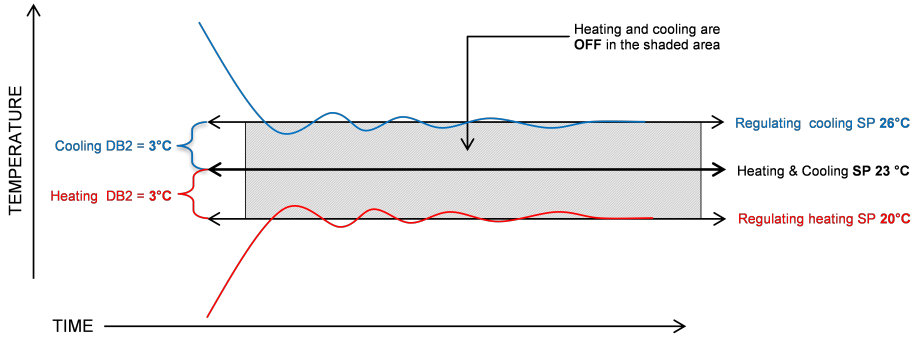
Comfort set point

- Heating/Cooling SP1=23 °C , Dead-band=1 °C
- Heating will be switched OFF at 22 °C (24-1)
- Cooling will be switched ON at 24 °C (24+1)



Night set back set point

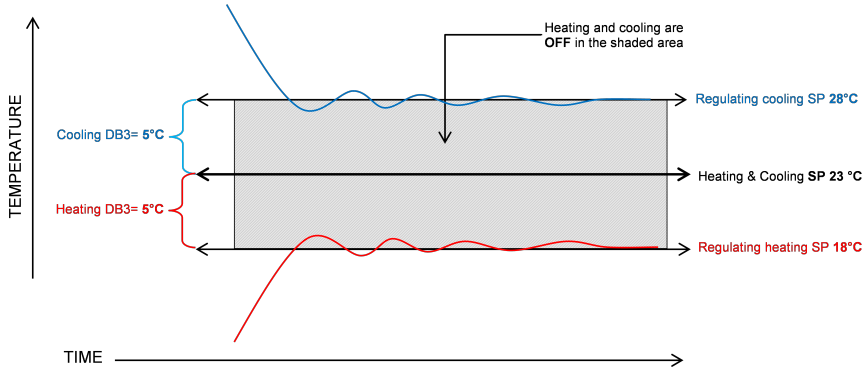
- Heating/Cooling SP2=23 °C , Dead-band=2°C
- Heating will be regulated at 20 °C
- Cooling will be regulated at 26 °C



Vacation set point

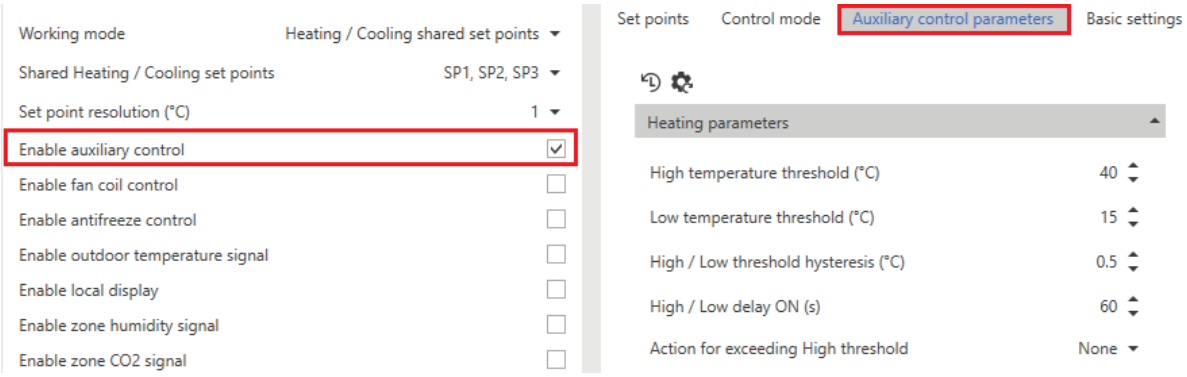
- Heating/Cooling SP3=23°, Dead-band= 5 °C
- Heating will be regulated at 18°

- Cooling will be regulated at 28°



Auxiliary control

In the list of parameters, check the **Enable auxiliary control** box to open the related tab in the central-area panel with the list of parameters for heating and cooling controls.



The auxiliary control operates in order to force the primary control (for heating and/or cooling) to a specific condition when a monitored temperature value could be hazardous or unsafe.

Several temperature signals can be used as **Heating auxiliary** or **Cooling auxiliary** by checking the related box in the **Temperature probes** tab.

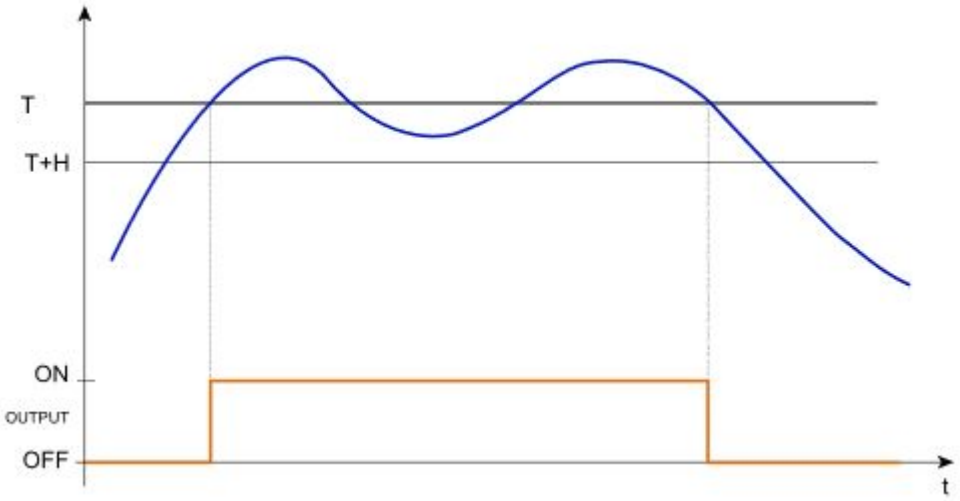
Parameter	Description
High temperature threshold (over value)	Sets the value for the **High temperature threshold**. When the auxiliary temperature value goes above the threshold + hysteresis, the condition set in the **Action for exceeding High threshold** field is activated. When the auxiliary temperature value goes below the threshold - hysteresis, the condition set in the **Action for exceeding High threshold** field is deactivated.
Low temperature threshold (under value)	Sets the value for the **Low temperature threshold**. When the auxiliary temperature value goes below the threshold + hysteresis, the condition set in the **Action for exceeding Low threshold** field is activated. When the auxiliary temperature value goes above the threshold + hysteresis, the condition set in the **Action for exceeding Low threshold** field is deactivated.
High / Low threshold hysteresis	Sets the hysteresis value of the thresholds.
High / Low delay ON	Defines the delay before the activation of the **Action comparator** function when the comparison is true.

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>Action for exceeding High threshold</td><td>Selects the action to be performed when the Auxiliary temperature goes above the High threshold. Following the available options:
<table><tr><th>Option</th><th>Behaviour</th></tr><tr><td>None</td><td>No action.
The Zone temperature output maintains the current status.</td></tr><tr><td>Force OFF</td><td>The Zone temperature function output is forced OFF, regardless of the related Zone temperature control mode.</td></tr><tr><td>Force ON</td><td>The Zone temperature function output is forced ON, regardless of the related Zone temperature control mode.</td></tr></table>
Note: if an ON/OFF action is enabled, it has priority over the regulation according to the room temperature.</td></tr>
<tr><td>Action for exceeding Low threshold</td><td>Selects the action to be performed when the auxiliary temperature goes below the Low threshold. The available options are as follows:
<table><tr><th>Option</th><th>Behaviour</th></tr><tr><td>None</td><td>No action. The Zone temperature output maintains the current status.</td></tr><tr><td>Force OFF</td><td>The Zone temperature output is forced OFF, regardless of the related Zone temperature control mode.</td></tr><tr><td>Force ON</td><td>The Zone temperature output is forced ON, regardless of the related Zone temperature control mode.</td></tr></table>
Note: if an ON/OFF action is enabled, it has priority over the regulation according to the room temperature.</td></tr>
<tr><td>Action if invalid temperature</td><td>Defines the action in case of error in the auxiliary temperature (e.g., a faulty sensor). Following the available options:
<table><tr><th>Option</th><th>Behaviour</th></tr><tr><td>None</td><td>No action. The Zone temperature output maintains the current status.</td></tr><tr><td>Force OFF</td><td>The Zone temperature output is forced OFF.</td></tr><tr><td>Force ON</td><td>The Zone temperature output is forced ON.</td></tr></table></td></tr>
</table>

Example

The example below shows the behaviour of the **Zone temperature output** depending on the auxiliary temperature (Threshold + hysteresis):

The output goes ON when the auxiliary temperature goes above the threshold while the output goes OFF only when it goes below the threshold with hysteresis.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Advanced actions

Following the advanced actions for the **Zone temperature** function:

- **Enable auxiliary control.** The relevant parameters appear in the central-area panel.
- **Enable fan coil control.** The relevant parameters appear in the central-area panel.
- **Enable antifreeze control.** The relevant parameters appear in the central-area panel ***> Control mode tab.***
- **Enable local display.** The relevant parameters appear in the in the **Settings** menu.
- **Enable zone humidity signal.** The relevant parameters appear in the in the **Settings** menu.
- **Enable zone CO_2 signal.** The relevant parameters appear in the in the **Settings** menu.

Available actions

The following table shows the available actions for the **Zone temperature** function:

Action	When the action is triggered
Heating Control activation	Activates the heating control
Heating Control deactivation	Deactivates the heating control
Heating toggle activation / deactivation	The heating control is activated / deactivated in toggle mode
Heating Set point selection	The heating set point is activated according the selected set-point in the pop-up that appears
Set Heating S1	Sets the heating Set-point S1 value
Set Heating S2	Sets the heating Set-point S2 value
Set Heating S3	Sets the heating Set-point S3 value
Add offset to heating set points	Sets an offset to all the heating set-points
Heating Set fan speed mode	Sets the fan speed mode for heating control mode: • Auto • Speed1 • Speed2 • Speed3 • Off
Activate Heating force ON	Forces the heating ON condition regardless of all the other modes
Deactivate Heating force ON	Removes the force heating ON condition regardless of all the other modes
Heating Force ON toggle activation / deactivation	The force heating ON condition is enabled/disabled in toggle mode
Activate Heating force OFF	Forces the heating OFF condition regardless of all the other modes
Deactivate Heating force OFF	Removes the force heating OFF condition regardless of all the other modes
Heating Force OFF toggle activation / deactivation	The force heating OFF condition is enabled/disabled in toggle mode
Cooling activation	Activates the cooling control
Cooling deactivation	Deactivates the cooling control
Cooling toggle activation / deactivation	The cooling control is activated / deactivated in toggle mode
Cooling Set point selection	The cooling set point is activated according the selected set-point in the pop-up that appears
Set Cooling S1	Sets the cooling Set-point S1 value
Set Cooling S2	Sets the cooling Set-point S2 value

Action	When the action is triggered
Set Cooling S3	Sets the cooling Set-point S3 value
Add offset to cooling set points	Sets an offset to all the cooling set-points
Cooling fan speed mode	Sets the fan speed mode for cooling control mode: • Auto • Speed1 • Speed2 • Speed3 • Off
Activate Cooling Force ON	Forces the cooling ON condition regardless of all the other modes
Deactivate Cooling Force ON	Removes the force cooling ON condition regardless of all the other modes
Cooling Force ON toggle activation / deactivation	The force cooling ON condition is enabled/disabled in toggle mode
Activate Cooling force OFF	Forces the cooling OFF condition regardless of all the other modes
Deactivate Cooling force OFF	Removes the force cooling OFF condition regardless of all the other modes
Cooling Force OFF toggle activation / deactivation	The force cooling OFF condition is enabled/disabled in toggle mode
Disable ON	Force the Zone temperature output ON, regardless the heating/cooling algorithm
Disable ON Timeout	Force the Zone temperature output OFF for the time period set in the Disable automation timer field in Settings tab
Disable OFF	Force the Zone temperature output OFF, regardless the heating/cooling algorithm
Disable ON/OFF Toggle	The Force output ON condition is enabled/disabled in toggle mode
Disable ON/OFF Toggle Timeout	Force the Zone temperature output OFF for the time period set in the Disable automation timer field in Settings tab

N.B: the list varies according to the active working mode and the enabled set points.

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed.
Action on falling	As soon as the function goes OFF, the selected action is executed.

Procedures

Functions > Zone Temperature > Options tab > Working mode

Set the working mode

1. From the **Settings**, click **Options** tab to access the list of parameters.

   Note: if the panel is closed, click >> icon to expand the panel to show the parameters

2. In the **Working mode** combo-box, select the **Zone temperature** working mode according to the project requirements.

Heating	Sets the parameters for heating control mode
Cooling	Sets the parameters for cooling control mode
Heating/Cooling	Sets the parameters for heating and cooling mode independently *Note: heating and cooling controls work separately. Usually, this working mode is intended for building where heating and cooling have their own independent pipeline system.*
Heating/Cooling shared set points	The same set points used for heating and cooling. *Note: a common communication object for heating and cooling is required to activate two two-pipe systems (i.e., the same pipeline is used for heating and cooling and the flow conversion is required).*

3. According to the selected **Working mode**, you can select up to three set points:

- **Heating set points**
- **Cooling set points**
- **Shared Heating/Cooling**

4. In the **Set point resolution** combo-box, select the set points minimum values:

- 0.1 °C (or °F)
- 0.5 °C (or °F)
- 1 °C (or °F)

5. Enable additional features according to the project requirements

   *See **Advanced options**.*

Set Heating/Cooling Set Points independently

1. In the **Set points** tab of the Central-area panel, for each set point define the following parameters:

[Working mode] SP1	Sets the temperature (°C/°F according to the project settings)
Minimum value	Sets the minimum value (°C/°F) allowed for the related set point
Maximum value	Sets the maximum value (°C/°F) allowed for the related set point
Dead band **(only for Shared Heating/Cooling set-points)**	Offset set applied to the set point to determine the control threshold in case of shared heating and cooling control. *Note: for the heating set, it is subtracted from the set point; for the cooling set, it is summed to the set point.*
Name	Sets a custom label that will be shown in the web app

Note: if you use a TEMDIS module with manual set management, you can set the default values. You cannot modify the manual set remotely but only via local interface.

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the statuses you want to assign to the **Custom signal**

   Note: its value is ON when at least one of the selected status is true.

Set the Control mode

1. From the **Settings** menu, click **Options** tab to access the list of parameters

   Note: if the panel is closed, click **>>** *to expand the panel to show the parameters.*
2. In the **Control mode** combo-box, select the control mode for the **Zone temperature** according to the project requirements, among those available: **Comparator** or **PID**.
3. Set the parameter according to your project requirements.

Set the Auxiliary control

1. From the **Settings** menu, click **Options** tab to access the list of parameters

   Note: if the panel is closed, click **>>** *to expand the panel to show the parameters.*
2. In the **Auxiliary control** menu set the parameters for **Heating auxiliary control**and • **Cooling auxiliary control** parameters.

See "Auxiliary control " on page 401

Set the Fan coil control

1. From the **Settings** menu, click **Options** tab to access the list of parameters

   Note: if the panel is closed, click **>>** *to expand the panel to show the parameters.*
2. In the **Fan coil control** menu set the parameters for **Heating Fan coil control**and • **Cooling Fan coil control** parameters.

See Fan coil control.

Add the temperature probes

1. From the signal list, select the temperature signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*
2. Select the signal by checking the box from the **Properties** panel
3. Set the options according to the configuration

See Temperature probes tab

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*
2. Select the signal by checking the box from the **Properties** panel
3. Set the options according to the configuration

See Command signals tab

Convert analogue signals to digital signals to execute actions

The available actions can be executed by using analogue signals and functions: as soon as the signal value changes according to the set threshold values, the command will be executed.

1. From the signal list, select an analogue signal or a function
2. From the **Signal local properties**, select **Convert to digital mode** from the **Selected analogue mode** combo-box.
3. In the **Rising edge** field, enter the threshold value for the **Action on rising field**.

   *Note: as soon as the selected signal value goes above the threshold, the action selected in the **Action on rising field** will be executed.*

4. *In the **Falling edge** field, enter the threshold value for the **Action on falling field**. Note: as soon as the selected signal value goes below the **Falling edge** value, the action selected in the **Action on falling** field will be executed.*

Link to set point

The analogue signals and analogue functions output value can be used as set point.

When the value of the analogue signal (or function) changes, its value is used as reference value for the connected set-point.

1. From the signal list, select an analogue signal or a function
2. From the **Signal local properties**, select **Link to set point** from the **Selected analogue mode** combo-box.
3. From the **Linked set point** combo-box, select the heating or cooling set point you want to connect to the analogue output value.

   *Note: the available set point varies according to the **Zone temperature** function parameters.*

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. Set the options according to the configuration

See "Settings" on page 381**> *Output signals***

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

See "Settings" on page 381**> *Feedback signals***

Set the feedback modes

1. From the Main signals list, select the feedback signals you want to set
2. From the **Signal local properties** panel, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then…
OFF	The feedback signal stays off
ON	The feedback signal stays on
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes normally
Enable blinks	Check this option to set a number of blinks Note: the blink number must be configured
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	Check this option to set the Ton and Toff values Note: the ton e toff times must be configured
Ton (sec)	You see the time period during which the feedback signal stays on (default value: 1 second)
Toff (sec)	You see the time period during which the feedback signal stays off (default value: 1 second)

Add local displays

1. From the **Available local display modules** list, select the TEMDIS modules you want to add to the configuration by checking the related box
2. In the **Mode** column, set the working mode the module has to be used for among those available:
   - Heating
   - Cooling
   - Heating & cooling
   - Shared

   Note: the available working mode varies according to the function settings and the TEMDIS part number. See "Settings" on page 381 ***> Local display*** *for further information.*
3. In the **Module properties** panel set the options according to the project requirements.

Add outdoor temperature signals

1. Check to enable the **Outdoor temperature signal** field in the **Options** tab.
2. From the **Temperature probes** tab, for the available temperature signals select the signals you want to add to the configuration by checking the **Outdoor temperature** box.

Add zone humidity signals

1. Check to enable the **Zone humidity signal** field in the **Options** tab: the related tab appears in the **Settings** menu
2. From the signal list, select the **Humidity signals** you want to add to the configuration.

   Notes:
   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

Add zone CO_2 signals

1. Check to enable the **Zone CO_2 signal** field in the **Options** tab: the related tab appears in the **Settings** menu
2. From the signal list, select the **CO_2signals** you want to add to the configuration.

Notes:

When a signal is selected, it appears in the central area
Every time a signal is added, a new row is created.

Functions > Zone temperature

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Local calendar procedures

Home > Functions > Zone temperature function > Local calendar tab

Add an event

1. From the central area, click ⊕ (centre-right corner).
2. Fill in the event details (description, start/end times, how often it repeats).
3. From the **Action** combo-box, select the action to perform.
4. From the **Enable** column, select the check box to enable the event.

Edit an event: change the time

1. In day view, touch and hold the event.
2. Drag it to a new time or adjust the grab points.
3. Change the time of an event and any of the other event details.

Edit an event: change the event details

1. Select the event.
2. Select **Edit** (top right corner).
3. In the event details, select the setting / field you want to change.

Delete an event

1. Select the event you want to delete
2. From the **Local calendar** tab, click 🗑

System temperature

Content

This section includes the following topics:

Introduction to the System temperature function

The **System temperature** function allows you to manage the seasonal change of the temperature and the hydraulic circuit pump and/or the heating/cooling generator.

The function forces the OFF condition (disabling) of the controls of the connected Temperature functions according to the following rules:

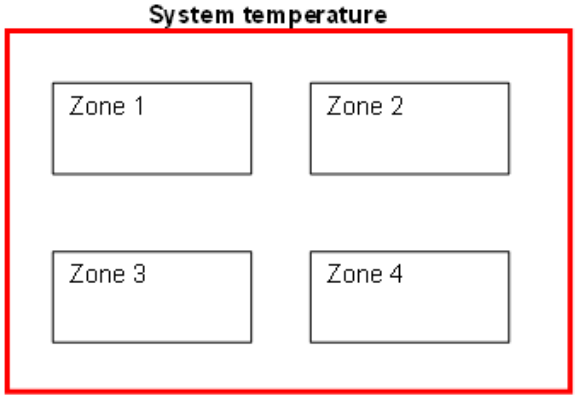
- The **Winter season** status forces the OFF condition of the linked **Zone temperature** functions set for cooling control
- The **Summer season** status forces the OFF condition of the linked **Zone temperature** functions set for heating control
- The **Mid season** status does not force any control to the linked **Zone temperature** functions

You can determine the current season status automatically through the calendar control and/or through a temperature algorithm control that processes an external temperature value so to define the current season.

You can always force the current season value over the calendar and algorithm controls.

Following are the main features of the **System temperature** function:

- activates the system, providing the building zone with heating/cooling.
- manages the delay time for pump control and for the valve activation of the linked **Zone temperature** functions.
- defines the current season status based on a calendar and/or the temperature algorithm controls so to manage the seasoning change.



How to configure the temperature control

1. Create at least one **Zone temperature** function.

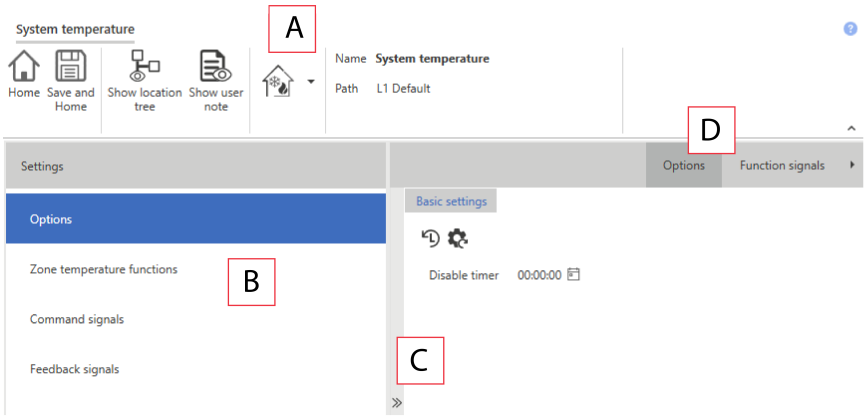
   *Note: each **Zone temperature** function can correspond to a part of the building where heating/cooling control has to be managed.*

2. Add a **System temperature** function to manage all the **Zone temperature** functions.

   *Note: when a **Zone temperature** function receives a heating/cooling request, a System temperature function collects all the **Zone temperature** statuses.*

System temperature page

Home page > (Building) > Function menu > Temperature control > System temperature



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Zone temperature functions**, selects the **Zone temperature** functions to be managed. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status • **Temperature signals**, sets the temperature signals. *Note: the options list varies according to the enabled options/parameters in the **Options** list.* *For further information, see "Settings" on the next page*
C	**Options** menu, sets the options for the function. *Note: the options list varies according to the selected options/parameters.*
D	Central area: shows the available options and tabs according to the selected parameters from the **Options** menu
E	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.

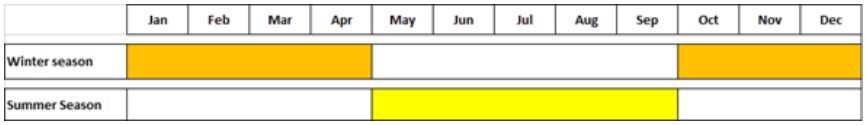
The **Options** sub-menu parameters appear if you click **<<**. This way, you will see the selection of following parameters:

Parameter	Description
Enable season calendar	Opens the season calendar parameters in the central-area panel. Following are the parameters to define the current season value:

Parameter	Description
Winter start date	Defines the date (month/day) the winter period starts
Winter end date	Defines the date (month/day) the winter period ends
Summer start date	Defines the date (month/day) the summer period starts
Summer end date	Defines the date (month/day) the summer period ends

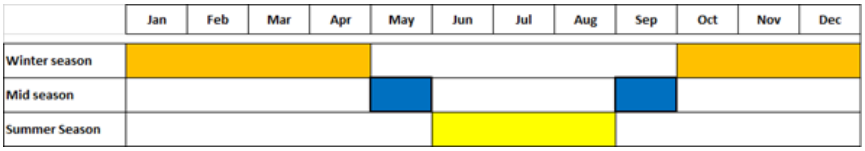
Note: the period automatically repeats year by year.

When the **Start date** is after the **End date**, the relevant season is enabled at the end and beginning of the year (see picture 1).



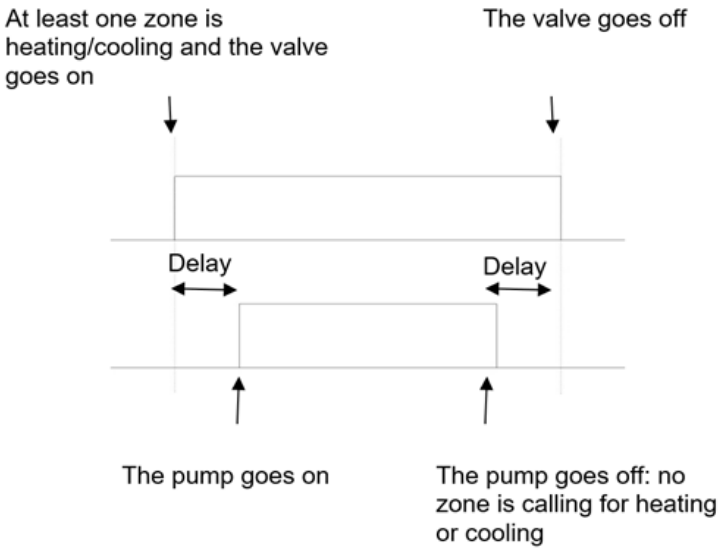
Picture 1

Where the periods overlap or where neither period is enabled, the calendar status is mid-season (see picture 2).



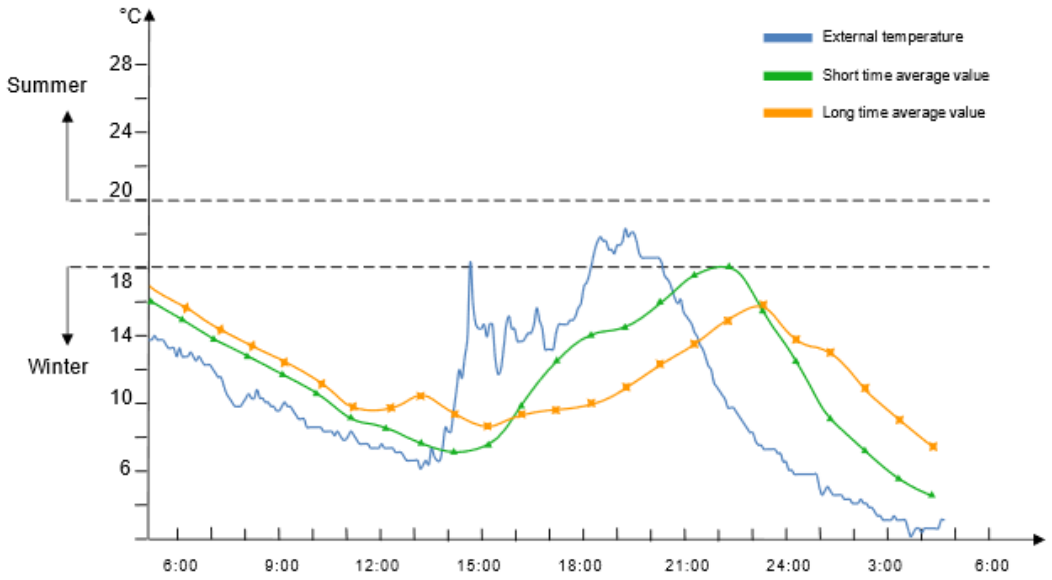
Picture 2

Parameter	Description
Enable algorithm control	Opens the **Algorithm** parameters in the central-area panel. *N.B: this features also enable the **Temperature signals** tab* The algorithm defines the season according to sample values of the external temperature. From this tab, you can define the following parameters: **Parameter** / **Description** **Winter season set point** — Sets the temperature value for the winter season threshold (default value: 18° C). **Summer season set point** — Sets the temperature value for the summer season threshold (default value: 21° C) **DMD time** — Defines the sampling time for the temperature value (default time: 1 h). **Short time average samples** — Defines the number of samples for the Short time average value (default time: 3 samples). **Long time average samples** — Defines the number of samples for the Long time average value (default time: 24 samples) See How the temperature algorithm works

Parameter	Description
Enable pump heating control	Opens the settings for heating control.  From this tab you can set two delays (**delay on/off**) to control the activation/deactivation of the system **Pump delay (s)** and the **Zone valve delay (s)** when a request for heating/cooling is received from a zone. **Parameter** / **Description** **Pump delay (s)** — Delay time (mm:ss) for the pump activation **Zone valve delay (s)** — Delay time (mm:ss) for the last valve closure *Note: if at least one of the **Enable pump heating control** or **Enable pump cooling control** field is checked, you will see them in the **Options** menu the **Output signals** tab. In this tab you can add the output signals that manage the pump control (for heating/cooling independently).*
Enable pump cooling control	Enables the settings for cooling control.

How the temperature algorithm works

The algorithm is based on a temperature value sample, usually referred to one or more external temperatures. It permits to determine the current season (summer, winter, both, mid-season).



The temperature is considered according to the DMD time value (**Algorithm settings**).

According to the **Short time average samples** and **Long time average samples** values, the following averages are calculated:

- **Short time average**. It represents the average of the last short time samples.

Example: if the value is 3, the average value is calculated according to the last three samples (see the green line in the above chart).

- **Long time average**. It represents the average of the last long time samples.

Example: if the value is 8, the average value is calculated according to the last 8 samples (see the orange line in the above chart).

The current season status is calculated by the algorithm according to the rules shown in the table below:

If the Short time average samples and Long time average samples values are...	Then the current season value is...
< **Winter season setpoint**	Winter season
> **Summer season setpoint**	Summer season
In all the other conditions	Mid season

At the first system start-up (after writing the controller configuration including the algorithm), the status will be Mid-season until the first update. The first update takes place as soon as the first **Short time average** value is calculated.

N.B.: the not valid samples are not entered in the history and the acquired samples are recovered in case of restart.

How the pump control works

If the zone temperature status goes...	Then...
ON	• The valve output in the zone goes on immediately. • The pump output in the heating control system starts when the Pump delay time expires. This is to make sure that the pump is not activated before a valve in the zone is completely opened.
OFF	• The pump of the heating control system goes off immediately (only if there are no more requests for heating/cooling from other zones). • If only one zone is used, the valve goes off immediately; otherwise, if more zones are used, the valve in the last activated zone is switched off when the Pump delay time has elapsed.

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses. The function signals list varies according to the selected working mode and the function configuration:

Element	Description	Value
Main signal	**Shows the main function status**	Shows the function status among those values: **1** Mid-season **2** Winter-season **3** Summer-season
Winter season signal	**Show the Winter season status**	0= Winter season period is OFF 1= Winter season period is ON
Heating controlled temperature signal	**Show the Summer season status**	0= Summer season period is OFF 1= Summer season period is ON
Custom signal	**It is ON if the statuses selected from the combo-box are TRUE**	
DMD outdoor temperature signals	**Last temperature sample value, according to the sample time**	
Heating pump output signals	**Shows the pump status for heating control**	0= Pump output is OFF 1= Pump output is ON
Cooling pump output signals	**Show the pump status for cooling control**	0 = Pump output is OFF 1= Pump output is ON

Zone temperature functions tab

The **Zone temperature functions** tab shows the list of all the available **Zone temperature**functions that can be linked to the **System temperature** function.

Function	Signal type	Notes
Zone temperature	Zone temperature status signal	• *A **Zone temperature** function can belong to only one System temperature function* • *Up to 50 **Zone temperature** functions can be added*

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **System temperature** function can be managed by trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the type of signals you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button (e.g. SHA4XLS4TH module)	Go to Available actions	*You can add max. 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select to manage the pump for heating / cooling control independently.

Signal type	Available options
Digital output (i.e., relay output type)	See the available working mode in the table below *Note: you can add max. 50 signals.*
Digital LED	

*Note: this tab is shown if the **Enable pump heating control** or **Enable pump cooling control** fields are checked in the **Options** menu.*

According to your requirements, for each signal the available working mode are as follows:

Working type	Behaviour
Inverted	Inverted logic of the output can be enabled
Heating	The output is used to manage the activation of the pump for the heating control of the System temperature function

Working type	Behaviour
Cooling	The output is used to manage the activation of the pump for the cooling control of the System temperature function

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed.
Action on falling	As soon as the function goes OFF, the selected action is executed.

Procedures

Functions > System Temperature > Settings > Options tab

Set the logical operator between calendar and algorithm control

1. From the **Settings**, click **Options** tab to access the list of parameters.

   Note: if the panel is closed, click >> icon to expand the panel to show the parameters

2. Set the **RTC** and/or **Algorithm** values in the combo-box (refer to the table below):

Calendar status	Algorithm status	Logical operator	The current status is
Winter season	Winter season	AND	Winter season
		OR	Winter season
Summer season	Summer season	AND	Summer season
		OR	Summer season
Winter / Mid season	Summer /mid season	AND	Mid season
Summer / Mid season	Winter / Mid season	OR	Mid season

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. Set the options according to the configuration

Add the Zone temperature functions

1. Create and configure the Zone temperature functions

   See Zone temperature function

2. Select the signal by checking the box from the **Properties** panel
3. Set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. Set the options according to the configuration

See "Settings" on page 381**> *Output signals***

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties** panel, set the options according to the configuration

See "Settings" on page 381**> *Feedback signals***

Set the feedback modes

1. From the Main signals list, select the feedback signals you want to set
2. From the **Signal local properties** panel, set the **Feedback mode** for each **Function status**
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then…
OFF	The feedback signal stays off
ON	The feedback signal stays on
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes normally
Enable blinks	Check this option to set a number of blinks Note: the blink number must be configured
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	Check this option to set the Ton and Toff values Note: the ton e toff times must be configured
Ton (sec)	You see the time period during which the feedback signal stays on (default value: 1 second)
Toff (sec)	You see the time period during which the feedback signal stays off (default value: 1 second)

Add the temperature signals

1. From the **Options** tab, check the **Enable algorithm control**field to open the **Temperature probes** tab
2. From the **Temperature signals** tab, select the signals you want to use in the **Temperature algorithm** control.

   Notes:

   - *When a signal is selected, it appears in the central area*
   - *Every time a signal is added, a new row is created.*

   *In the **Signal global properties** tab you can set additional tags.*

Functions > System temperature

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Vehicle heating

Content

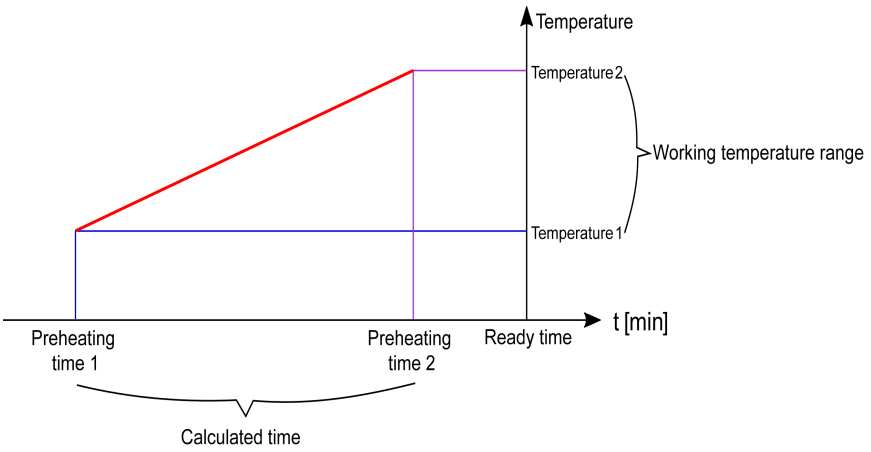
This section includes the following topics:

Introduction to the Vehicle heating function

The **Vehicle heating** function allows you to heat the vehicle at a predefined time. You have to set the **Ready time**, two external temperature limits (**Temperature 1** and **Temperature 2**) and two timers (**Preheating time1** / **Preheating time2**) that define the extreme points of a straight line. This straight line is used by the algorithm to define when the output has to be ON to heat the vehicle.

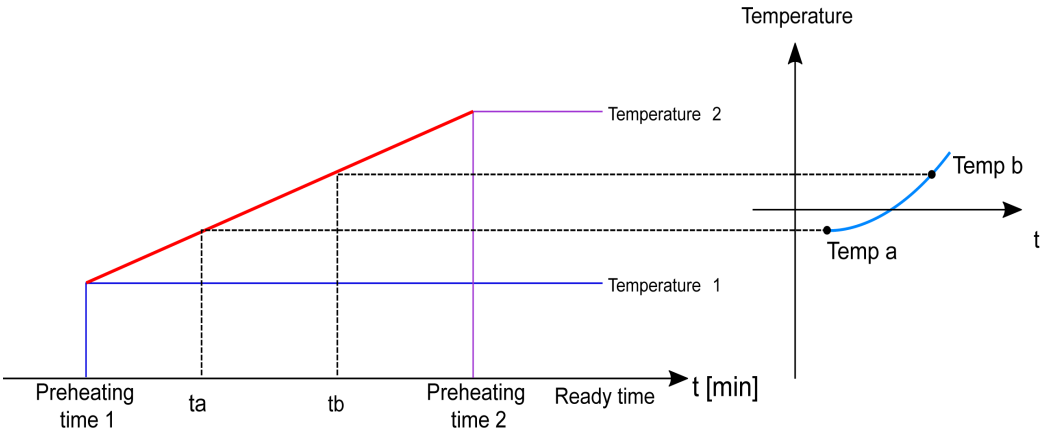
The **Ready time** is the time at which the vehicle must be ready and warmed up. The function output stays OFF until the **Preheating time1**.

The output is managed according to the following conditions.

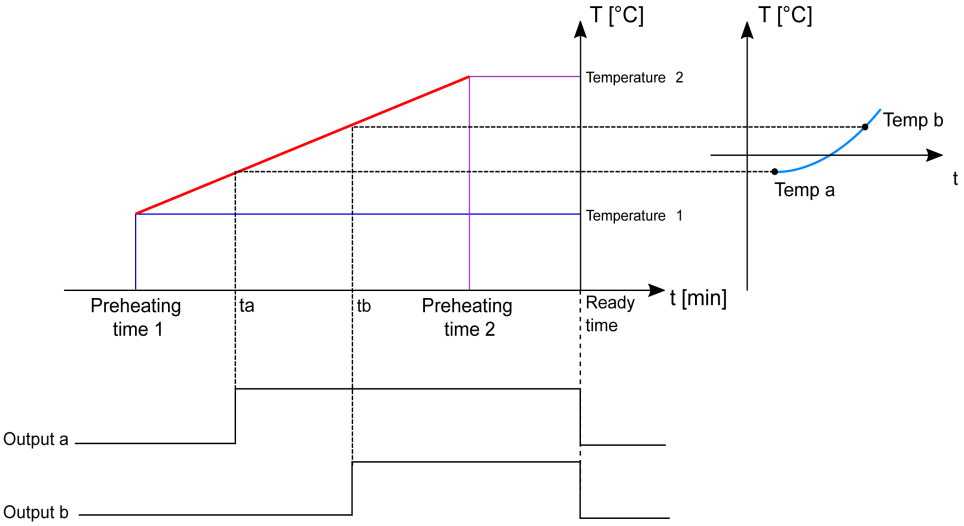
If the outdoor temperature is…	Then the heating…
lower than or equal to the **Temperature1** value	is activated before the **Ready time** according to the value set in the **PreheatingTime1** field
higher than the **Temperature2** value	is not activated
within the working temperature range (defined by the **Temperature1** and **Temperature2** values)	is activated before the **Ready time** according to the measured temperature calculation. The activation time of the output is calculated according to the defined parameters, using the straight red line (see below):  The function output is OFF at the **Ready time**.

Example

The picture below shows how the algorithm works according to the outdoor temperature. If the outdoor temperature value (**Temp a**) is within the **Temperature1** and **Temperature2** range, the output is activated at the time **ta**.



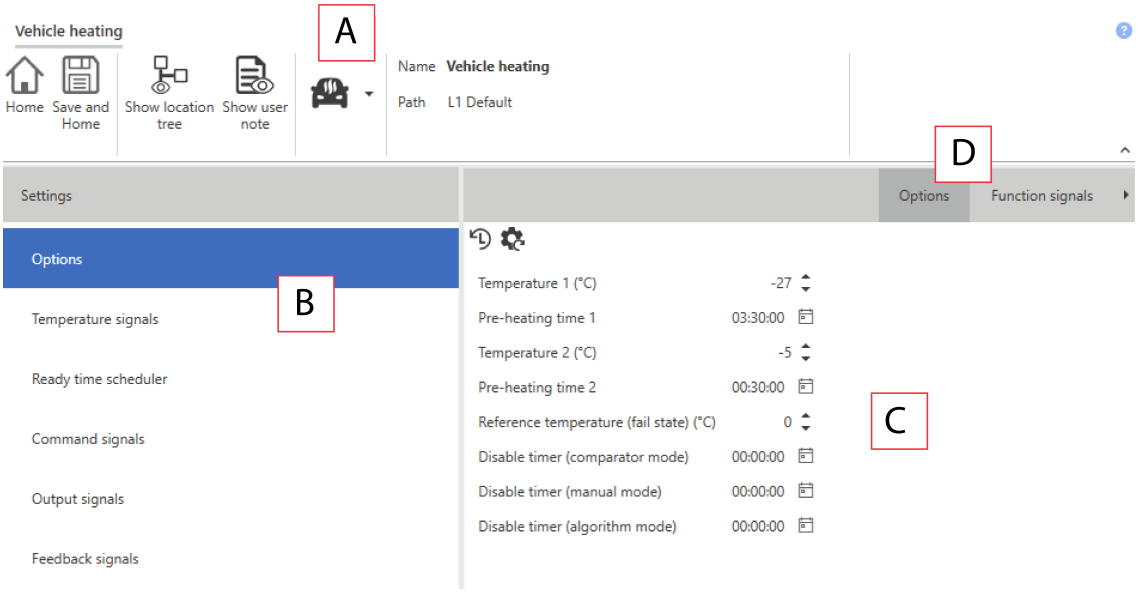
If the measured outdoor temperature value (**Temp b**) is higher than Temp a, the output is activated later (at the **tb**), since the temperature is higher and the output requires less heating time to warm the vehicle.



*Note: the **PreheatingTime1** and **PreheatingTime2** indicate an advance time interval but they do not come chronologically before the **Ready time** value.*

Vehicle heating page

Home page > (Building) > Function menu > Vehicle heating



Area	Description
A	Toolbar: navigation buttons, icon setting, function name
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Temperature signals**, adds the temperature sensors • **Ready time scheduler**, sets the calendar schedules to set the ready time • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. • **Local Calendar**, sets calendar events to automate the function according to time schedules *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**. From the **Options** sub-menu, you can set the following parameter:

Parameter	Description
Temperature 1 (°C) / Temperature 2 (°C)	Defines the working temperature range limits. *Note: the **Temperature2** value must be higher than the **Temperature1** value*
Preheating time 1 / Preheating time 2	Defines the **Preheating time 1** and **Preheating time 2** parameters to calculate the activation time. *Note: the **Preheating time2** value must be higher than the **Preheating time1** value*
Failure status temperature (°C)	Defines a temperature value if all the temperature sensors used are faulty (-40 °C to +40 °C)
Comparator mode timer	The timer starts counting every time the related command is activated. As soon as this timer expires the condition goes back to the previous status. The maximum delay is 23 hours, 59 minutes, 59 seconds.
Manual ON mode timer	The timer starts counting every time the related command is activated. As soon as this timer expires the condition goes back to the previous status. The maximum delay is 23 hours, 59 minutes, 59 seconds.
Disable algorithm timer	The timer starts counting every time the related command is activated. Note: The Disable algorithm time-out works as inverted logic: As soon as this timer expires the Heating algorithm goes ON again. The maximum delay is 23 hours, 59 minutes, 59 seconds.

From the **Function signals** sub-menu, you can see the list of the available types of signal and the relevant settable statuses.

Element	Description	Value
Main status	Shows the current status	OFF = The output of the function is OFF ON = The output of the function is ON

Element	Description	Value
Status signal	Shows the current function status	Shows the function status among those values: Value / Status 1 – Output OFF, Algorithm 2 – Output ON, Algorithm 3 – Output OFF, Algorithm disabled 4 – Output OFF, Comparator 5 – Output ON, Comparator 6 – Output OFF, Manual 7 – Output ON, Manual 8 – Output ON, Force ON 9 – Output OFF, Force OFF
Custom signal	It is ON if the statuses selected from the combo-box is true	You can associate several function statuses as described in the state signals' description

Temperature signals tab

The **Temperature signals** tab shows the list of all the available temperature signals that can be used to set the outdoor temperature used by the algorithm.

The following table shows the type of signals you can associate:

Signal type		Notes
Analogue temperature	Temperature signal that belongs to functions	• *If more than one temperature signal is added, the value is the average value of all signals present* • *You can add max 50 signals*
	Temperature signal that belongs to modules	
Analogue function	Counter function	

Ready time scheduler tab

In the **Ready time schedule** tab you can set the time at which the vehicle has to be ready. All the activities are repeated automatically each year on the basis of the schedule parameters:

Parameter	Description
Enable calendar events at start-up	Executes the last missed event at the controller's start-up. *Note: if at the controller powering ON, the system finds missed scheduled events, the last missed event is executed if the trigger criteria (day and hour) are met. When the controller is OFF, no event can be executed*
	Adds a new event
	Removes the event selected
Enable	Enables/disables the event
Description	Defines the name of the event that will appear on the **Local calendar** list
Day time	Triggers the event at the specific time determined by the option you choose from  . From  , you can open the **Recurrence** menu and set what follows: **Days of the week**. It triggers the event on the selected week days **Days of the months**. It triggers the event on the selected days **Months of the year**. It triggers the event on the selected months
Action	Selects the action which has to be performed when the time condition is verified. *See Available actions to see the available options*

*Note: If no **Ready time** activity is present in the configuration, the vehicle heating function cannot be managed according to the heating algorithm.*

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The vehicle heating function works by default in accordance with the heating algorithm, as described in the previous pages. If you need to change it to a different working mode selected from those available, input signals can be configured to trigger the relevant action.

The following table shows the type of signals you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button	• Set the Comparator mode • Set the Manual ON mode • Force the output ON • Force the output OFF • Manage the heating algorithm	*You can add max 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analogue function		
Analogue signal		

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output	Inverted logic of the function can be enabled
Digital LED	

Note: You can add max 100 signals

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the function status.

Signal type	Available options
Digital LED	Inverted logic of the function can be enabled
Digital	

Note: You can add max 50 signals

Working modes

The **Vehicle heating** function works by default in accordance with the heating algorithm, as described in the previous pages. If you need to change it to a different working mode selected from those available, an input signal can be configured to trigger the relevant action.

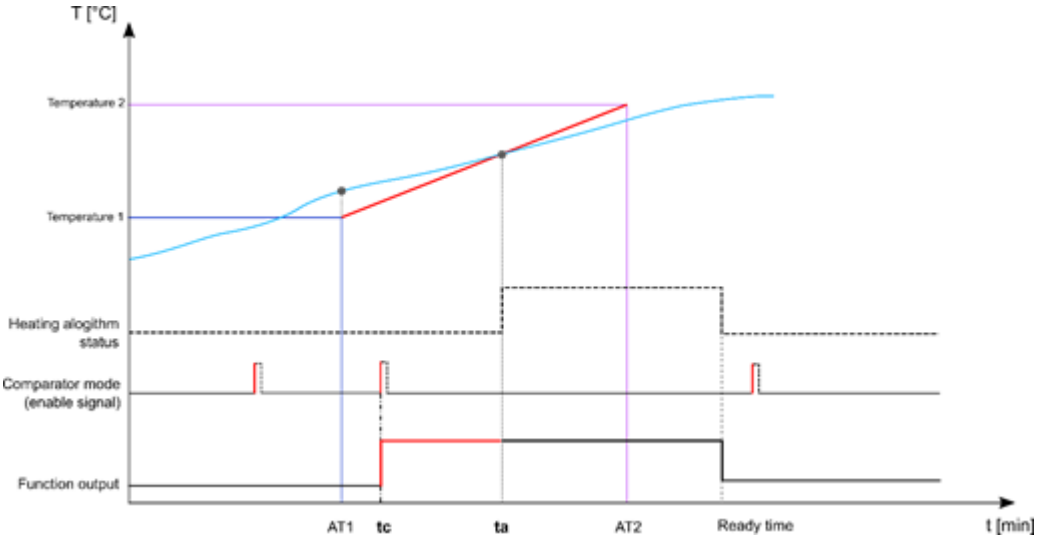
Comparator mode

The **Comparator mode** works as follows:

Working mode	Behaviour
Comparator	When the time is between **Preheating time1** and **Ready time**, the output status will be: • ON if the outdoor temperature is lower than the **Temperature2** value • OFF if the outdoor temperature is higher than the **Temperature2** value • The **Comparator mode** works with a fixed hysteresis of 2°C (°F). When the outdoor temperature goes below the **Temperature2** value (2°C), the function output will be disabled. *Notes:* • *The **Temperature1** and **Preheating time2** parameters are not used when the **Comparator working mode** is active* • *When the **Comparator mode** is activated and at the same time the function is operating in heating algorithm mode, the **Comparator mode** has the priority*

Example diagram - Comparator mode vs Heating algorithm

As shown below, after the system start-up, the **Vehicle heating** function is set to be managed by the standard heating algorithm. The **Comparator mode** has priority over the standard mode. An input signal is used to execute the **Enable comparator mode** action: if the action is performed between the **Preheating time1** and the **Ready time** values, the function output will be activated (tc, see below) before the calculated time according to the heating algorithm calculation (ta, see below).



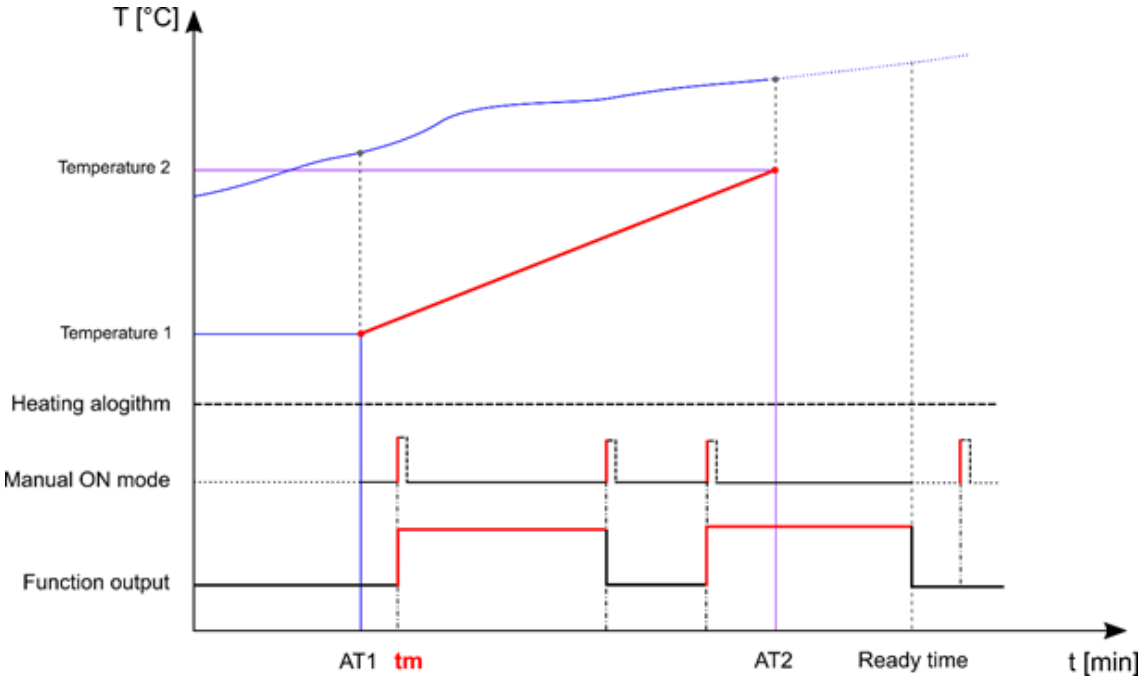
Manual mode ON

The **Manual mode** works as follows:

Working mode	Behaviour
Manual ON	When the **Manual ON mode** is activated, the day time is between **Preheating time1** and **Ready time** and the **Function output** is ON, regardless of the working temperature range. *Note: the **Manual ON mode** overrides the **Comparator mode** and the standard heating mode*

Example diagram – Manual ON mode vs Heating algorithm

As shown below, after the system start-up, the vehicle heating function is set to be managed by the standard heating algorithm. The Manual ON mode has the priority over the standard mode and also over the Comparator mode. An input signal is used to perform the manual on Mode toggle action: Since the outdoor temperature at the Preheating time1 is higher than the Temperature2 threshold, the heating algorithm is set to keep the output OFF; As soon as the action is performed between the Preheating time1 and the ReadyTime times, the function output will be activated (tm, as seen below) regardless of the temperature value.



Force the function output ON

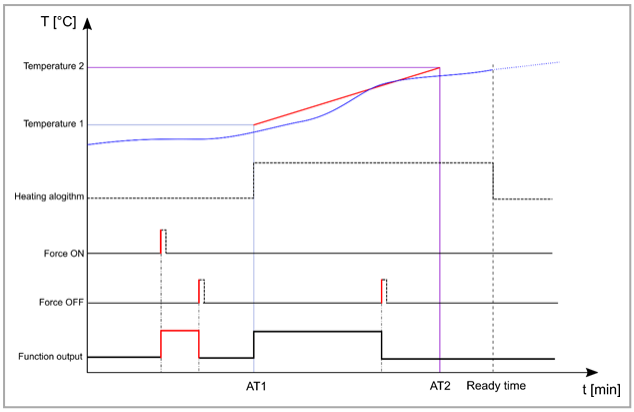
If you want to force the function output to stay ON, regardless of the **Ready time**, **Comparator mode**, **Manual ON mode** and disable heating algorithm, the **Force ON** condition can be selected.

Force the function output OFF

If you want to force the function output to stay OFF, regardless of the **Ready time, Comparator mode, Manual ON mode, Disable algorithm** and **Force ON** conditions, the **Force OFF** condition has to be selected.

Example diagram – Force ON /OFF vs Heating algorithm

As shown below, the **Vehicle heating** function output can be manually forced ON regardless of the heating algorithm working status. As soon as the trigger signal used to force the output ON is activated, the output will be switched ON; when the **Force OFF signal** is activated and at the same time the **Force ON signal** has already been performed, the **Force OFF** has priority and the output is switched OFF.

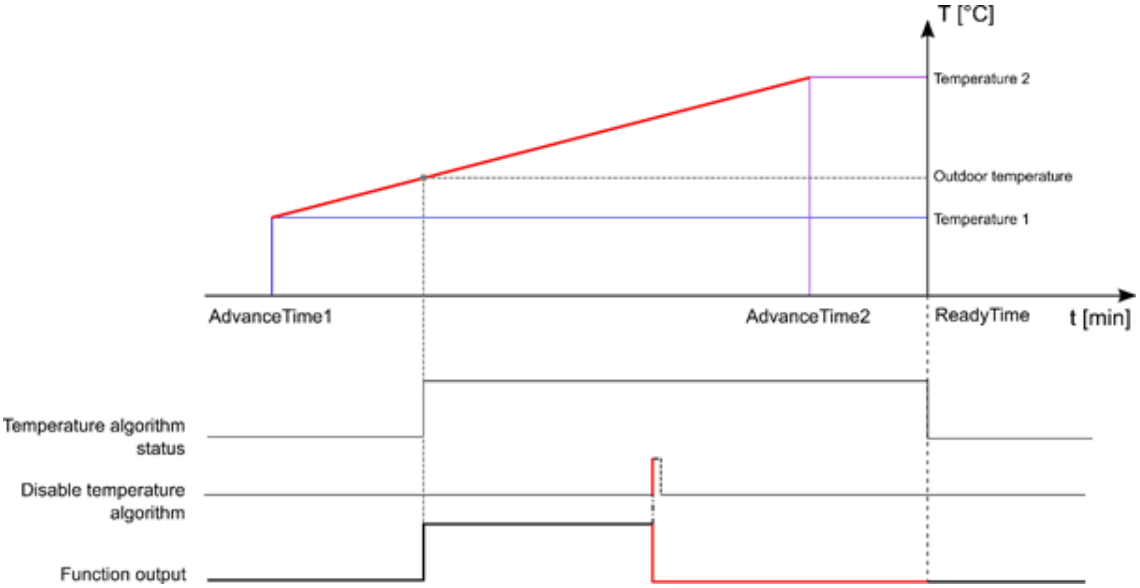


Disable the vehicle heating algorithm

If you want to disable the heating algorithm when the function has to be managed with a different working mode (**Comparator mode** or **Manual ON mode**), select the disable heating algorithm.

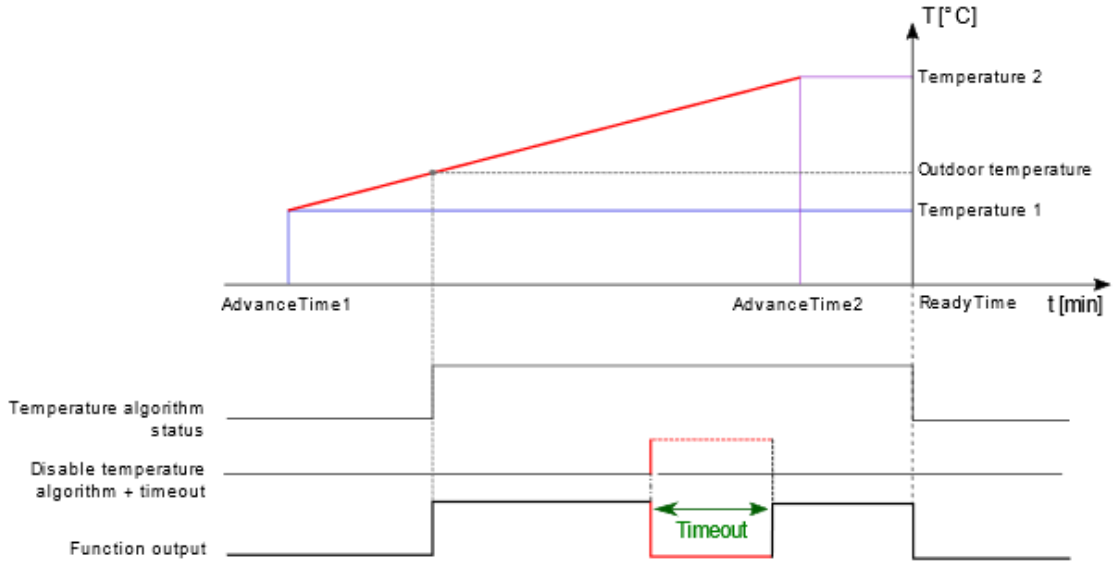
Example diagram – Disable heating algorithm

As shown below, an input signal is used to perform the disable temperature algorithm action: as soon as the action is performed, the heating algorithm is deactivated and the related function output is switched OFF.



Example diagram – Disable temperature algorithm timer

As shown below, an input signal is used to perform the **Disable temperature algorithm** action: as soon as the action is performed, the heating algorithm is deactivated and the related function output will be switched OFF. When the **Disable temperature algorithm timeout** expires, the heating algorithm is switched ON again.


T [°C]
Temperature 2
Outdoor temperature
Temperature 1
AdvanceTime1
AdvanceTime2
ReadyTime
t [min]
Temperature algorithm status
Disable temperature algorithm + timeout
Function output
Timeout

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the push button is pressed, the selected action is executed
Action on click	As soon as the push button is clicked, the selected action is executed
Action on long click	After a long press, the selected action is executed
Action on very long click	After a very long press, the selected action is executed

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON
Falling mode	Set the low threshold below which the signal is considered OFF
Action on rising	As soon as the function goes ON, the selected action is executed.
Action on falling	As soon as the function goes OFF, the selected action is executed.

Procedures

Functions > Vehicle heating > Settings > Options tab > Function signals

Edit the function signals name

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the central area, select the signal you need to change
3. Type a name in the text box

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**
2. From the **Signal properties**, click to see the available statuses
3. Select the status you want to assign to the **Custom signal**

Note: its value is ON when at least one of the selected status is true

Schedule the Ready timer

Functions > Vehicle heating > Local calendar tab

1. In the central area, click ⊕ near the centre-right.
2. Fill in the event details (enter the **Description** of the event, the start and end times, how often it repeats, and so on).
3. In the **Action** combo-box select which action has to be performed among those available.
4. Select the check box in the **Enable** column to enable the event.

   Notes:

   - *You can change the time of an event and any of the other event details.*
   - *In the **Ready timer scheduler** tab click the row of the event you want to delete.*

Functions > Vehicle heating > Settings > Command signals tab

Add the command signals

1. From the **Input signal** list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the Properties panel
3. From the Signal local properties, set the options according to the configuration

Add the temperature signals

1. From the **signal** list, select the input signals you want to add to the configuration.

Notes:

• When a signal is selected, it appears in the central area

• *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the Properties panel
3. From the Signal local properties, set the options according to the configuration

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:

• *When a signal is selected, it appears in the central area*

• *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Main signal** panel
3. From the **Type** field, set the condition the output is activated among **Warning** or **Alarm**
4. From the **Signal local properties**, set the options according to the configuration

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:

• *When a signal is selected, it appears in the central area*

• *Every time a signal is added, a new row is created.*

2. Select the signal by checking the box from the **Properties** panel
3. From the **Signal local properties**, set the options according to the configuration

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set.
2. From the **Signal local properties**, set the **Feedback mode** for each function status
3. From the Feedback mode column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF
ON	The feedback signal stays ON
Fast flashing	The feedback signal flashes quickly
Flashing	The feedback signal flashes normally
Slow flashing	The feedback signal flashes slowly
Enable blinks	You have to set the number of blinks
Blinks Number	You see the number of blinks (default value: 1 blink)
Enable custom	You have to set the Ton and Toff values
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second)
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second)

Functions > Vehicle heating

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Astronomical clock

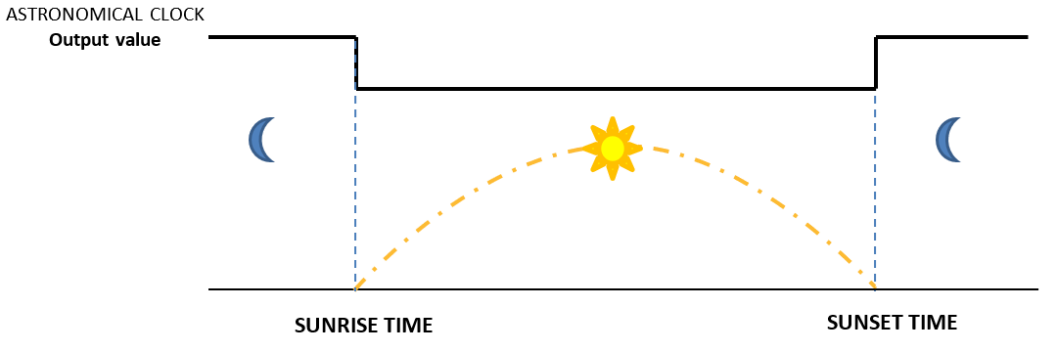
Content

This section includes the following topics:

Introduction to the Astronomical clock function

The **Astronomical clock** function automatically calculates the sunset and sunrise times according to the geographical location. When the time is between the sunset and sunrise times, the output value is **ON (Night)**, otherwise the output value is **OFF (Day)**. For both the periods an offset value can be managed to delay or advance the sunrise/sunset times.

The function is the ideal solution for turning the lights ON at sunset and OFF at sunrise, typical for outdoor light fixtures.



You need the **Latitude** and **Longitude** parameters to calculate the sunset and sunrise times. These two parameters are directly linked to the **Astronomical clock** function but also to the UWP 4.0 controller since they define the controller location.

Note: usually, the latitude and longitude don't have to be changed over time.

How to set the latitude and longitude from the UWP 4.0 web app

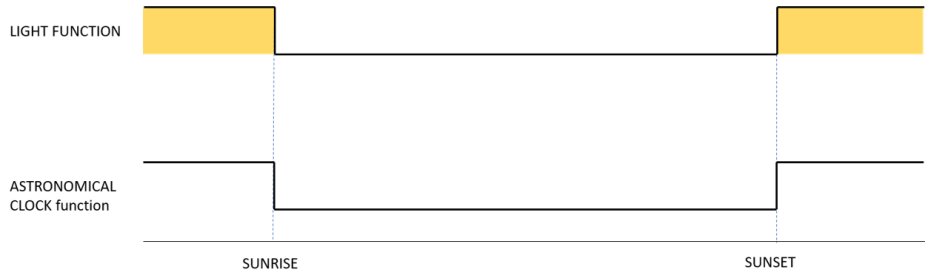
1. Access the UWP 4.0 web app via the UWP 4.0 controller IP address.
2. Click ☰ to open the **System settings**.
3. Open the **Localization** tab.
4. In the map, select the current UWP 4.0 position.
5. Save the coordinates.

*Note: after saving the coordinates and after every change, the system calculates the configured sunrise and sunset times of the **Astronomical clock** function.*

Example 1: Turn the light ON/OFF according to sunrise/sunset times

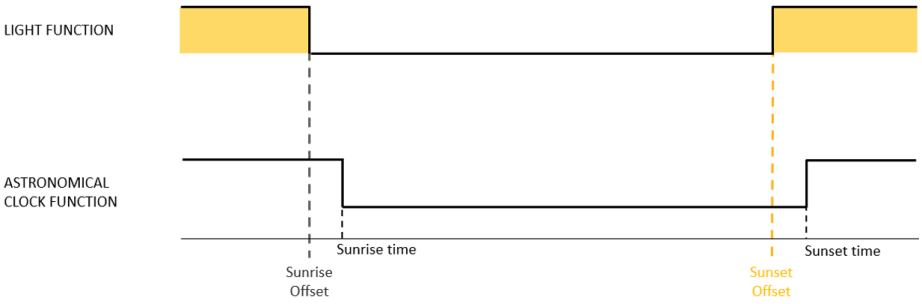
The light is turned ON at sunset time (the **Astronomical clock** function goes ON) and the light is turned OFF at sunrise time (the **Astronomical clock** function goes OFF).

Typical applications are the street lights or outdoor light fixtures.



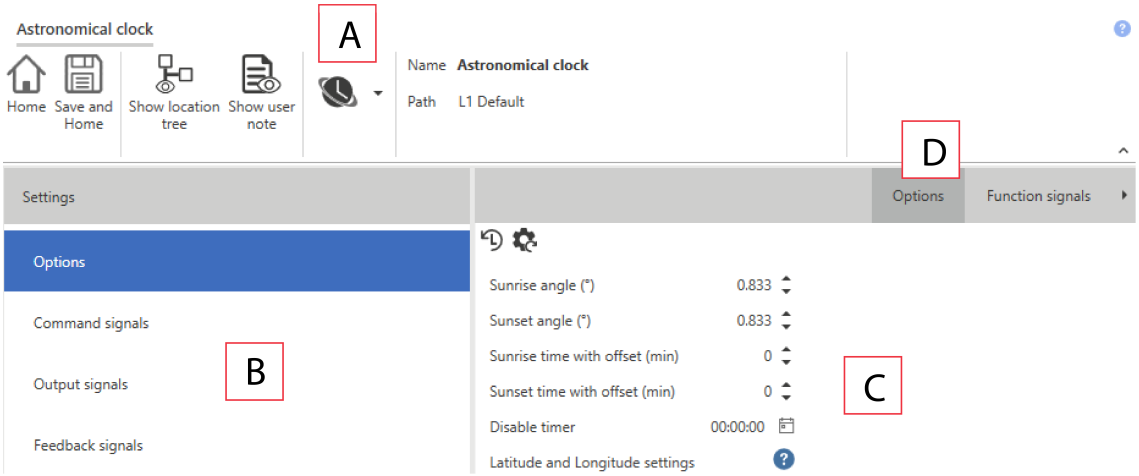
Example 2: Turn the light ON/OFF according to sunrise/sunset times + offset value

The light is turned ON at sunset offset time (**Sunset time +/- Sunset offset** value), then it is turned OFF at sunrise offset time (**Sunrise time +/- Sunrise offset** value).


LIGHT FUNCTION
ASTRONOMICAL
CLOCK FUNCTION
Sunrise time
Sunset time
Sunrise
Offset
Sunset
Offset

Astronomical clock page

Home page > (Building) > Function menu > Astronomical clock

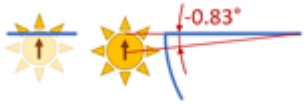
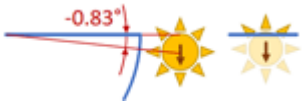


Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the function parameters and signals. • **Command signals**, sets the command signals to trigger the actions. • **Output signals**, sets the output signals driven by the function. • **Feedback signals**, sets the feedback signals to show the function status. *For further information, see "Settings" on the facing page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**. From the **Options** sub-menu, you can set the following parameters:

Parameter	Description
Sunrise angle (°)	Shows the default value (0.833°) according to the angle of the sun below the horizon. • **Sunrise**: when the upper edge of the sun appears on the horizon in the morning (the centre of the sun is 0.833 ° below the horizon). 
Sunset angle (°)	• **Sunset**: when the upper edge of the sun disappears on the horizon in the evening (the centre of the sun is 0.833 ° below the horizon).  *Note: If you want to change these two parameters, consider that the higher the value set in the Sunrise angle field, the earlier the sunrise condition will occur and the higher the value set in the Sunset angle field, the later the sunset condition will occur.*
Sunrise offset (Minutes)	Sets the offset to apply to the sunrise time (default value: 0). The offset value can be from -120 minutes to + 120 minutes: this value is added to or removed from the calculated sunrise time.
Sunset offset (Minutes)	Sets the offset to apply to the sunset time (default value: 0). The offset value can be from -120 minutes to + 120 minutes: this value is added to or removed from the calculated sunset time.
Disable timer	Sets the time period after which the **Disable ON** condition is deactivated (0 - 24 h). *Note: the default value is 1 minute.*

From the **Function signals** sub-menu, you can see the available types of signal and the relevant settable statuses.

Element	Description	Value
Main status	Shows the current status	• OFF: Day light. *Note: The time period is between the sunrise and sunset times.* • ON: Night time. • INVALID STATUS: calculation of sunrise/sunset is not valid / performed.

Element	Description	Value
Status signal	Shows the current function status	Shows the function status among the following values:
Custom signal	It is ON if the status selected from the combo-box is true	

Value	Status
1	Day (Output OFF)
2	Night (Output ON)
3	Calculation error (Output OFF)
4	Day (Calculation disabled)
5	Night (Calculation disabled)
6	Night (Forced)
7	Day (Forced)

Command signals tab

The **Command signals** tab shows the list of all the available input signals.

The **Astronomical clock** function can be managed through trigger signals that you can select from the **Signal local properties** panel, according to the signal type.

The following table shows the types of signal you can associate to the trigger actions:

Signal type	Actions that can be associated	Note
Digital push button (e.g. SHA4XLS4TH module)	• Disable the calculation • Manage the **Force** conditions	*You can add max 50 signals*
Digital switch		
Module digital (e.g. SH2INDI424 module)		
Digital function		
Analog function		
Analog signal		

Output signals tab

The **Output signals** tab shows the list of all the available output signals you can select according to the function status.

Signal type	Available options
Digital output	Inverted logic of the function can be enabled
Digital LED	

Note: You can add max 100 signals.

Feedback signals tab

The **Feedback signals** tab shows the list of all the available feedback signals you can select to check the function status.

Signal type	Available options
Digital LED	Inverted logic of the function can be enabled
Digital	

Note: You can add max 50 signals.

Trigger signals

In the **Signal local properties** panel, according to the signal type you can see the following parameters.

Push button

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic.
Action on rising	As soon as the push button is pressed, the selected action is executed.
Action on click	As soon as the push button is clicked, the selected action is executed.
Action on long click	After a long press, the selected action is executed.
Action on very long click	After a very long press, the selected action is executed.

Switch and digital function

Property	Description
Enable inverted signal	When flagged, the signal status operates in inverted logic.
Action on rising	As soon as the switch turns ON / function goes ON, the selected action is executed.
Action on click	As soon as the switch turns OFF / function goes OFF, the selected action is executed.

Analogue signal / function

Property	Description
Enable digital mode	When flagged, the analogue signal is considered as a digital signal.
Rising mode	Set the high threshold above which the signal is considered ON.
Falling mode	Set the low threshold below which the signal is considered OFF.
Action on rising	As soon as the function goes ON, the selected action is executed. *Note: The analogue value must be ≥ the rising threshold.*
Action on falling	As soon as the function goes OFF, the selected action is executed. *Note: The analogue value must be ≤ the falling threshold.*

Procedures

Functions > Astronomical clock > Settings > Options tab > Function signals

Edit the function signal names

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**.
2. From the central area, select the signal you need to change.
3. Type a name in the text box.

Set the predefined value of the Custom signal

1. From the **Options** tab, click **Function signals** on the top-right area to access the **Signal properties**.
2. From the **Signal properties**, click to see the available statuses.
3. Select the status you want to assign to the **Custom signal**.

Note: its value is ON when at least one of the selected status is true.

Functions > Astronomical clock > Command signals

Add the command signals

1. From the signal list, select the input signals you want to add to the configuration.

Notes:
• When a signal is selected, it appears in the central area.
• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel.
3. From the **Signal local properties**, set the options according to the configuration.

Add the output signals

1. From the signal list, select the output signals you want to add to the configuration.

Notes:
• When a signal is selected, it appears in the central area.
• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Main signal** panel.
3. From the **Signal local properties**, set the options according to the configuration.

Add the feedback signals

1. From the signal list, select the feedback signals you want to add to the configuration.

Notes:
• When a signal is selected, it appears in the central area.
• Every time a signal is added, a new row is created.

2. Select the signal by checking the box from the **Properties** panel.
3. From the **Signal local properties**, set the options according to the configuration.

Set the feedback modes

1. From the **Main signals** list, select the feedback signals you want to set.
2. From the **Signal local properties**, set the **Feedback mode** for each function status.
3. From the **Feedback mode** column, you can select the following different options:

If you select…	Then...
OFF	The feedback signal stays OFF.
ON	The feedback signal stays ON.
Fast flashing	The feedback signal flashes quickly.
Flashing	The feedback signal flashes normally.
Slow flashing	The feedback signal flashes slowly.
Enable blinks	You have to set the number of blinks.
Blinks Number	You see the number of blinks (default value: 1 blink).
Enable custom	You have to set the **Ton** and **Toff** values.
Ton (s)	You see the time period during which the feedback signal stays ON (default value: 1 second).
Toff (s)	You see the time period during which the feedback signal stays OFF (default value: 1 second).

Functions > Astronomical clock

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Mail/SMS

Content

This section includes the following topics:

Introduction to the Mail/SMS function

The **Mail/SMS** function permits you to set commands/notifications through text messages. More specifically, it permits you to perform the following tasks:

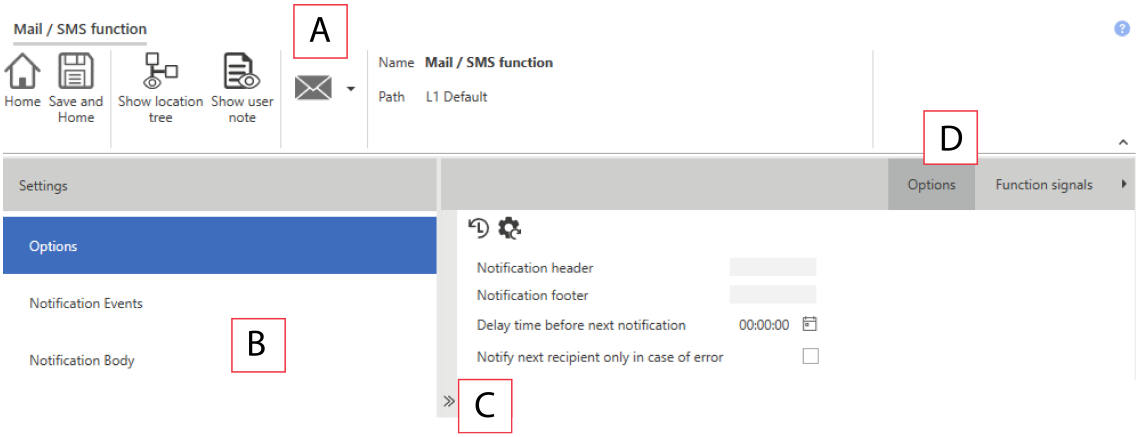
- Send SMS to activate a function (e.g., a light)
- Execute multiple commands through a set of values (e.g., to change more set points of a temperature function)
- Get a notification message about system events (e.g., a function status changed, a button pressure, a threshold exceeded)
- Get a notification message about a text message sending

The **Mail/SMS** function also includes the **Live command function** that forces the notification sending and tests the e-mail/SMS functioning.

However, the **Mail/SMS** function has some limits. In fact, it does not include output signals and it cannot be used for automation logics. Thus, it cannot be managed by BACnet, Modbus or via API and it is not available on the UWP 4.0 web app.

Mail/SMS page

Home page > (Building) > Function menu > Mail/SMS

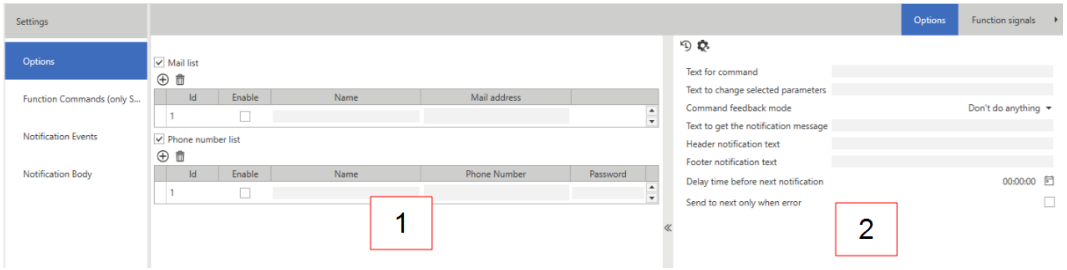


Area	Description
A	Toolbar: navigation buttons, icon setting, function name.
B	**Settings**. It displays the following function tabs: • **Options**, sets the Mail/SMS lists and the function parameters. • **Function commands (only SMS)**, shows the available functions in the system. You can select the functions that have to execute actions after receiving the command message. *Note: this field is valid only for commands received via SMS.* • **Notification events**. For each function/signal, you can select the condition/event that triggers the sending of notifications to e-mail and/or phone number recipients. • **Notification body**. You can define the notification content by selecting the signals. For each signal you can enter (in this order) *text - value - text - new line* *For further information, see "Settings" on the next page*
C	Central area: shows the available options according to the selected tab
D	Sub-menu: shows the available sub-menus according to the selected tab

Settings

Options tab

The **Options** tab has two sub-menus (on the top-right): **Options** (default) and **Function signals**.



From the **Options** sub-menu, you can set the following parameters:

Element	Description
1	Expandable menu (**<<**). This menu shows two lists (see below) that you can flag (from the relevant check boxes) so to select who can send commands or has to receive the notification (from the **Enable** check boxes). Following are the two available lists: **List** / **Description** Mail list — List of e-mail recipients who are allowed to use the function Phone number list — List of phone number contacts who are allowed to use the function *Notes:* • *The lists are valid for all the functions.* • *The lists are updated automatically at the function start, according to the system settings.* • *Any change to the lists is automatically applied also to the settings. If you add a new Mail/SMS function, the lists will still include the previous changes.*

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>2</td><td>Parameter list:

Text for command. Text message to be sent for executing the actions defined from the Function commands (only SMS) tab
Text to change selected parameters. Text to recognize a parameter value as soon as you receive a command by SMS. Usually, the text contains a special character (such as #) that, for the command execution, must go before any other value.
Command feedback mode. You can decide to receive a feedback about a command execution. Following are the feedback types:

<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td>Send acknowledgement text</td><td>The system sends a message containing the Text for acknowledgement message</td></tr>
<tr><td>Send notification message</td><td>The system sends a notification message containing the values of all the signals selected from the Notification events field</td></tr>
<tr><td>Do nothing</td><td>The system does not send any feedback</td></tr>
</table>
Note: if the system receives a wrong text message and/or password, it will not send any feedback. This way, it will not reply to automatic sending systems.

Text for acknowledgement message. Defines the reply to a command correctly executed.
Note: you see it only if you select the Send acknowledgement text field (see the Command feedback mode above)
Text to get the notification message. Defines the text you have to send to get a notification.
Note: if in the modem settings there is an SMS password, you have to include it in your message.
Notification header text. Defines the text to be included in the first part of the notification.
Note: in the e-mail case, it corresponds with the email subject.
Notification footer text. Defines the text to be included in the last part of the notification.
Note: the message body that contains information that may change is configured from the Notification body tab.
Delay time before next notification.Sets the delay time before sending the next notification triggered by internal events. Until the timer expiration, any internal notification will be ignored
Notify next recipient only in case of error. Sets the notifications' sending. If you flag it, the next recipient gets notified only in case of error during the sending to the current recipient. Otherwise, all recipients get notified.
</td></tr>
</table>

"Procedures" on page 460 > Mails *(all the procedures)*

"Procedures" on page 460 > Phone numbers > Add a phone number *and* ***Delete a phone number***

Function commands (only SMS) tab

This tab shows all the functions included in the configuration and that can receive commands by SMS. The list of the available commands depends on the function type.

Please refer to the command list of each function.

"Procedures" on the facing page > Phone numbers > Set the function commands (for SMS only)

Notification events tab

For each function/signal, you can select from the **Function status** list the condition/event that sends the notification to the e-mail or phone number contacts selected from the **Options** tab.

You can start the notification sending just selecting the signal and the property to verify.

The events are associated to signals that the system can manage and according to their type. Following are the types of event that can be managed:

- Push button
- Switch
- Function status
- Analogue values

"Procedures" on the facing page > Set the action(s) that triggers the notification

Notification Body tab

From this tab, you can select the signals to include in the notification message.

The notifications are sent by email or SMS to the contacts set from the **Options** tab (**Mail** and/or **Phone number list**).

For each function/signal you can use the following parameters to configure the notification text:

Parameter	Description
Path	Shows (read-only permission) the function/signal path in the current configuration
Name	Shows (read-only permission) the function/signal name in the current configuration
Pre value text	Defines the text that goes before the value
Include Value	Includes the function/signal status in the notification
Post value text	Defines the text that goes after the value
Start a new line	Creates a row for the next function/signal

If the notification text exceeds the maximum number of admitted characters, the SMS will be split into more parts that will be sent in sequence.

Following are the types of signal that can be selected to generate the text:

- Push button
- Switch
- Function status
- Analogue values

"Procedures" on the facing page > Set the action(s) that triggers the notification

Procedures

Mails

You can specify the e-mail addresses for each **Mail/SMS** function.

You can add an e-mail account in different ways and manage the settings from different menus. This means that if you add an address to a **Mail/SMS** function, it will be automatically added to the system global list.

*Notice: to enable the system to send e-mail, you have to configure the e-mail server (SMTP server) from the **System settings** menu*

Add an e-mail address

Functions > Mail/SMS > Options tab > Mail list

1. From the **Options** tab, check the box to enable the **Mail list**
2. Click ⊕ **Add recipient e-mail address** to add a row
3. In the **Name** field, enter the recipient name
4. In the **Mail address** field, enter the complete e-mail address

   Note: the system automatically checks if the address has the right format.

Global settings menu > Settings > Configuration > Mail service settings

1. From the **File** menu, click **Settings** to access the **Global settings** menu
2. In P1 (Loaded) tab, open the **Mail service settings** menu
3. Check the **Enable mail service** box to enable the function
4. Follow the steps 1-4 of the procedure above

Delete an email account

1. Select an address from the list
2. Click 🗑 **Delete selected recipient e-mail address**

Phone numbers

For the selected function, you can define the list of phone number recipients. You can add phone numbers in different ways and manage the settings from different menus. This means that if you add a phone number to a **Mail/SMS** function, it will be automatically added to the system global list.

*Notice: to enable the system to send SMS, you have to configure the modem (go to **Setting> Configuration > Modem/Data settings**)*

Add a phone number

Functions > Mail/SMS > Options tab > Phone number list

1. From the **Options** tab, check the box to enable the phone number list
2. Click ⊕ to add a row
3. In the **Name** filed, enter the phone contact name
4. In the **Phone number** field, enter the complete phone number including the recipient's country code
5. In the **Password** field, enter a password so to be compliant with the cybersecurity specifications.

Notes:

- *the password has to appear at the beginning of the SMS that the user will send to the system.*
- *the password has to be at least 4 and max. 8 characters long, can contain numbers and letters and cannot contain special characters.*
- *It is not case sensitive.*

Global settings menu > Setting> Configuration > Modem/Data settings

1. From the **File** menu, click **Settings** to access the **Global settings** menu
2. In P1 (Loaded) tab, open the **Modem/Data settings** menu
3. From the **Modem type** combo box, select the desired option
4. Follow the steps 1-4 of the procedure above

Delete a phone number

1. Select a number from the list
2. Click 

Set the function commands (for SMS only)

1. From the **Options** tab, in the **Text for command** field enter the text to receive for executing the command.

   Note: if the text does not match with the entered one, the message will not be processed and the command will not be executed.

2. From the **Options** tab, in the **Text to change selected parameters** field enter the special character(s) to identify the single command if the parameter has a value to apply (e.g., temperature value).

   *Note: if you do not enter values, the system applies those defined in the **Function Commands (only SMS)** tab.*

3. From the **Function commands (only SMS)** tab, select the functions(s) to which you want to send commands via text message.

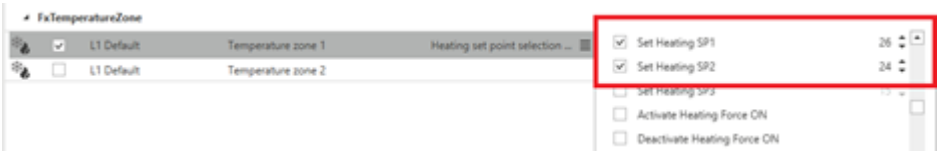
How to send single/multiple values to a function

Example 1: Change set-point values of a temperature function using # as marker

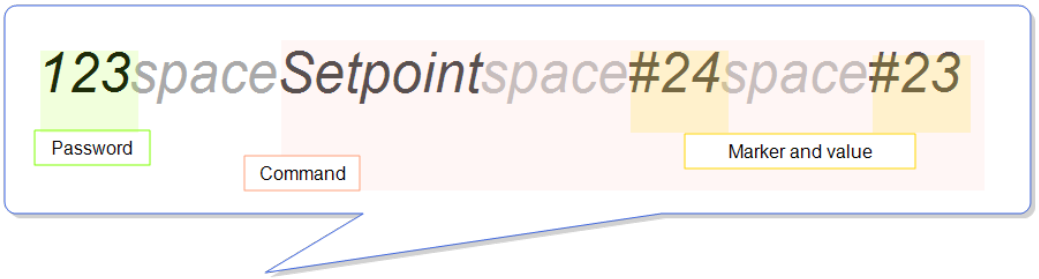
For the selected action, you can send more command values in a single SMS. The values in the message have to be ordered like in the **Actions** column (**Function commands** tab).

Note: if the values are not included in the message, the action is applied as defined.

1. From the **Options** tab, in the **Text for command** field enter *Setpoint*
2. In the **Text to change selected parameters** field enter # that will be used as marker
3. From the **Function commands (only SMS)** tab, for the **Zone temperature** function enable the two set points by checking the relevant fields (**Set Heating SP1** and **Set Heating SP2**)



To change the set points of the **Zone temperature** function, the message must have the following syntax:



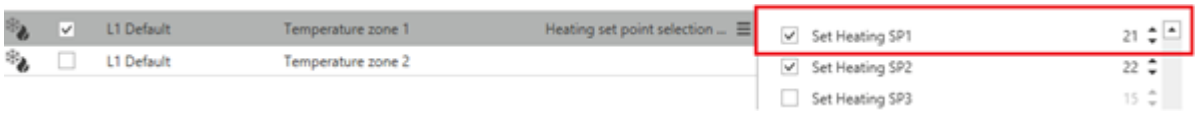
Note: if in the phone number list there is a password (e.g., PSW 123), the SMS to be sent must make it explicit in the first part.

As soon as the system receives the message, the two set points (Heating SP1 and heating SP2) of the selected function change as follows:

Heating SP1 = 24° C and Heating SP2 = 23° C

Example 2: Change only the first value of the Action list (HSP1)

If you want to change only the **Heating SP1** value and both **Heating SP1** and **SP2** values are enabled (see picture 6) from the **Actions** column (**Function commands** tab), the message must have the syntax of picture 7:



22.

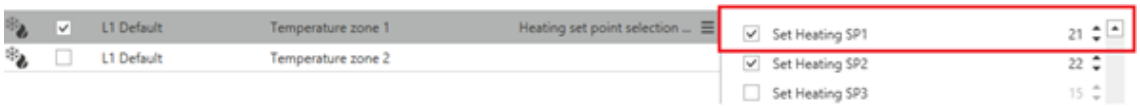
23.

As soon as the system receives the message, only the **Heating SP1** changes to 21° C.

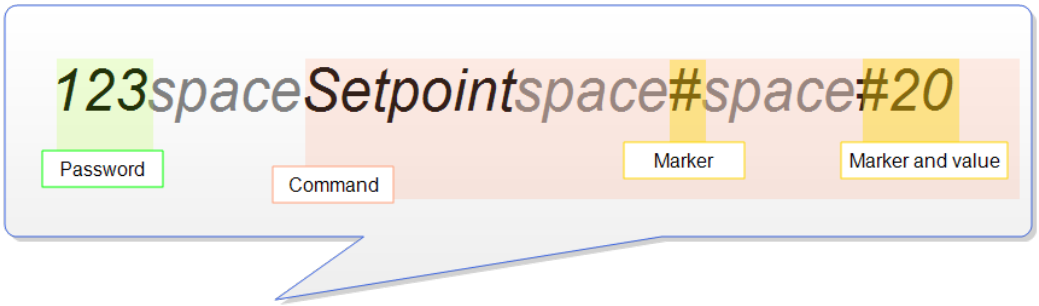
Example 3: Change only the second value of the Action list (HSP2)

If more actions are enabled and you want to send a command to change a parameter that is not first in list, you have to enter an empty marker for each parameter.

In this example, only the **Heating SP2** value has to be changed and both **Heating SP1** and **SP2** values are enabled (see below) from the **Actions** column (**Function commands** tab).



In this case, the message must have the following syntax:



As soon as the system receives the message, only the **Heating SP2** changes to 20° C.

How to send single/multiple values to more functions

Example 4: Change the value of two functions (e.g., turn ON of two Switch functions)

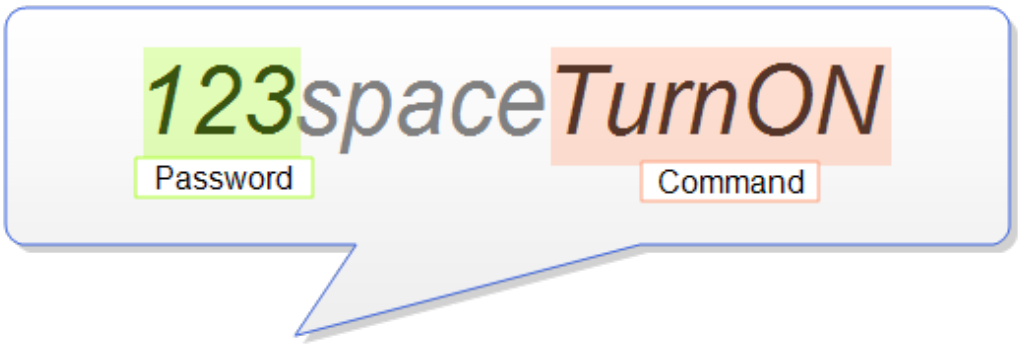
You can select more functions, specifying for each of them the action.

1. From the **Options** tab, in the **Text for command** field enter *TurnON*

Note: in the **Text to change selected parameters** you do not have to enter anything since the marker is needed just to change the value of an action that requires a parameter (like the examples above).

2. From the **Function commands (only SMS)** tab, select the two **Switch** functions and for each of them select the action to be executed from the **Actions** column.

The message must have the following syntax:



As soon as the system receives the message, the action will be executed for both **Switch** functions.

Test email accounts/phone numbers

You can test the notification sending function by enabling the Live signals of the function.

Note: before testing, you have to configure and send to the controller the Mail/SMS function.

1. From the **Home** menu, click  (Enable Live signals)
2. Select the Mail/SMS function you want to test

3. From the **Function details** panel, click 

*A feedback about the running test and the result will be shown in the **Function details** panel.*

Notes:

- *any notification and command that are not sent because of a running test or a reboot/switching off/download are not lasting.*
- *you cannot send commands during a test.*

Select the action(s) that trigger the notification

If you are in the...	Then...
Notification events tab	1. From the **Signal** list, select the functions/signals that trigger the notification sending. *Notes:* • *When you select a signal, it appears in the central area.* • *When you add a signal, a new row appears.* 2. Select the row from the **Properties** panel 3. From the Signal local properties panel, set the event(s) in the **Send by entering status** column. *As soon as the selected condition is verified for the function/signal, the notification will be sent to the Mail/phone number contacts.* 4. From the **Options** panel, set the **Notification header text** and the **Notification footer text** *Note: the delay time before next notification permits filtering conditions that are too closed and setting a delay between one notification and the next.*
Notification body tab	1. From the **Signal** list, select the functions/signals for which you want to generate a custom notification string. *Notes:* • *When you select a signal, it appears in the central area.* • *When you add a signal, a new row appears.* 2. From the **Properties** panel, select the function status/signal for which you want to enable the notification body 3. Enter the **Pre value text** 4. Check the **Include Value** box to add the current function status/signal value 5. Enter the **Post value text** 6. Check the **Start a new line** box to create a new line for each function status/signal value

Customize a function

1. From the toolbar, select a custom icon you want to assign to the function.

   Note: The selected icon will be shown both in the UWP IDE and in the Web-App. When a signal is selected, it appears in the central area.

2. From the toolbar, you can also change the function name in the text box.

Terms and conditions

Owner of UWP platform and related Services

Carlo Gavazzi Controls SPA - single shareholder

Viale Lunigiana, 46

20125 Milan, Italy

Subjected to direction and coordination of the holding company Carlo Gavazzi Holding Ag

VAT Number: 10319150156

Paid up share capital: 916.000 Eur i.v.

Chamber of Commerce of Milan

Introduction

Object of this document

This document is a legal agreement between you, the User, and the entity providing UWP. It governs your use of the online properties and, in any case, the use of the services provided.

Definitions

- "Legal agreement" means that the terms of this agreement are binding on the relationship between you and us once you have accepted the terms.
- "User", "you", "your" and similar terms, either in singular or plural form, refer to you, the User.
- "Carlo Gavazzi Controls SPA", "we", "our", "us", "Owner" and similar terms refer to the corporation that owns and manages UWP as outlined in the present document.
- "UWP" refers to the current hardware and/or firmware and/or software.
- "Agreement" refers to this document, as amended from time to time. The Agreement is concluded in the English language.

Acceptance of this Agreement

In order to use UWP, you must read this Agreement carefully and agree to accept the same by clicking the button for its acceptance. If you don't accept this Agreement you cannot use UWP.

Information about UWP

UWP is a solution embedding hardware, firmware, software components which allow user to monitor and control meters, sensors, actuators connected to the compatible fieldbuses; UWP interacts with users by means of PC software and/or embedded Web-Server tools. UWP can exchange data with other systems via local intranet and/or Internet by means of the communication protocols embedded into UWP.

Software support and updates for the UWP software will remain available for a period of time of 2 years after the End of Life of the product.

End-of-Life determinations will be made on the product at Carlo Gavazzi's sole discretion with reasonable notice to customers.

Use of UWP

1. Intellectual Property Ownership.

Carlo Gavazzi Controls SpA owns all intellectual property rights in the Product sold. You will not install, copy, or use the Product in any manner not expressly permitted above. All rights not expressly granted under this agreement are reserved by Carlo Gavazzi Controls SpA.

2. Software and Firmware Updates.

Carlo Gavazzi Controls Spa provides software and or firmware updates with the purpose of adding new functions and or improve the product and/or enhance UWP's IT security.

By using an Update, you hereby voluntarily terminate your right to use any previous version of the Software and/or Firmware.

Carlo Gavazzi may deliver Updates to you on different terms. The Product may, without additional notice, automatically connect to the Internet (intermittently or on a regular basis) to check for Updates that are available for download to UWP's hardware and/or software components and to let Carlo Gavazzi know the results of installation attempts.

3. Automatic Connections to the Internet.

The Product may automatically connect to the Internet in order to:

- provide a way to our customer's support service people to locate and connect to UWP on the Internet in case of a user support request (VPN connection). The user can disable the VPN feature but, in this case, it may be impossible to the Carlo Gavazzi personnel to provide remote support, and the user is aware that Carlo Gavazzi may require to ship the UWP system to Carlo Gavazzi's facilities for completing the relevant tasks.
- find any Software/Firmware updates ready to be downloaded

When the Product automatically connects to the Internet, an Internet address that is associated with your current Internet connection is sent to a Carlo Gavazzi website; and when the Software automatically connects to the Internet, no personally identifiable information nor information related to the user's installation is sent except the necessary information for the Carlo Gavazzi Support and Download services.

Carlo Gavazzi takes reasonable security measures to protect against the loss, misuse and alteration of data under its control. Nevertheless, it is Your responsibility to comply with the Data Protection Rules and to keep Personal Data uploaded in or transmitted to the Service confidential. It is also responsibility of the user to preserve information and personal data by setting up a data redundancy procedure.

According to the setup, this system can also communicate via the Internet. Internet traffic may lead to unexpected expenses if the landline or mobile connection contract does not meet Your needs. It is Your responsibility to agree with your Internet Service Provider upon the contract that best meets Your needs.

CYBERSECURITY

Carlo Gavazzi is committed to provide a cybersecurity profile of UWP in line with the cybersecurity best practices. Nonetheless, cybersecurity is a process and not a product: the user has to avoid any practice that could compromise the UWP cybersecurity and of any system that interacts with UWP.

Should you need to report any cybersecurity feedback about UWP, please contact our team via email: cybersecurity.cgc\@gavazziacbu.it

Services provided by third parties

Users may use third-party services or content included in UWP, but they must be aware of these third parties' terms and conditions and have given consent to them. Under no circumstances will the Owner be deemed liable in relation to the proper functionality or availability, or both, of third-party services.

Forbidden use

The Service shall be used only in accordance with these Terms.

Users may not:

- reverse engineer, decompile, disassemble, modify or create derivative works based on UWP or any portion of it;
- circumvent any technology used by UWP or its licensors to protect content accessible via it;
- copy, store, edit, change, prepare any derivative work of or alter in any way any of the content provided through UWP;
- use any robot, spider, site search/retrieval application, or other automated device, process or means to access, retrieve, scrape, or index any portion of UWP or its content;
- rent, lease or sublicense UWP;
- defame, abuse, harass, use threatening practices, threaten or violate the legal rights of others in any other way (such as rights of privacy and publicity);
- disseminate or publish content that is unlawful, obscene, illegitimate, defamatory or inappropriate;

- misappropriate any account in use by another User;
- register or use the Service in order to approach the Users to promote, sell or advertise products or services of any kind through UWP in any way;
- use UWP in any other improper manner that violates the Terms.

Disclaimer of warranties

The Owner provides the Product strictly on an "as is" basis. To the maximum extent permitted by applicable law, the Owner expressly disclaims all conditions, representations and warranties, whether express, implied, statutory or otherwise, including, without limitation, any implied warranty of merchantability, fitness for a particular purpose, or non-infringement of third-party rights. The Owner makes no warranties or representations as to the accuracy or completeness of any "content" and assumes no liability or responsibility for any:

- errors, omissions or inaccuracies in any "content";
- personal injury or property damage of any nature whatsoever resulting from your access to and use of the UWP;
- any unauthorized access to or use of our systems and/or information accessible through such systems;
- any interruption of the Services;
- any viruses, trojan horses, bugs, malware or the like in or transferred through the Services or through the actions of any third party;
- any access to your PC, Intranet, mobile phone and/or information available through such access; and/or
- any loss or damage of any kind incurred as a result of the use of the UWP.

The Owner does not endorse, warrant, guarantee, or assume responsibility for any event, product or service available through UWP or any website or application accessible through UWP. No action from or on behalf of the Owner or any other source shall create any warranty not expressly stated in this Agreement.

Some jurisdictions do not allow the exclusion of warranties, therefore the above exclusions may not apply to you.

Limitations of liability

UWP and all functions accessible through UWP are made available to the Users under the terms and conditions of the Agreement, without any warranty, express or implied, that is not required by law. In particular, there is no guarantee of suitability of the services offered for the User\'s specific goals.

UWP and functions accessible through UWP are used by the Users at their own risk and under their own responsibility.

In particular, the Owner, within the limits of applicable law, is liable for contractual and non-contractual damages to Users or third parties only by way of intent or gross negligence, when these are immediate and direct consequences of the activity of UWP. Therefore, the Owner shall not be liable for:

- any losses that are not a direct consequence of the breach of the Agreement by the Owner;
- any loss of business opportunities and any other loss, even indirect, that may be incurred by the User (such as, but not limited to, trading losses, loss of revenue, income, profits or anticipated savings, loss of contracts or business relationships, loss of reputation or goodwill, *etc*.);
- damages or losses resulting from interruptions or malfunctions of UWP due to acts of force majeure, or at least to unforeseen and unforeseeable events and, in any case, independent of the will and extraneous to the Owner\'s control, such as, by way of example but not limited to, failures or disruptions of telephone or electrical lines, the Internet and / or other means of transmission, unavailability of websites, strikes, natural disasters, viruses and cyberattacks, interruptions in the delivery of products, third-party services or applications; and
- incorrect or unsuitable use of UWP by Users or third parties.

Indemnity

The User agrees to indemnify and hold the Owner and its subsidiaries, affiliates, officers, directors, agents, co-branders, partners and employees, as the case may be, harmless from and against any claim or demand, including without limitation, reasonable lawyer\'s fees and costs, made by any third party due to or arising out of the User's content, use of or connection to UWP, violation of these Terms, or violation of any third-party rights.

Miscellaneous Terms

Software/Firmware reselling

Users are not allowed to reproduce, duplicate, copy, sell, resell or exploit any portion of UWP's Software and or Firmware without the Owner's express prior written permission, granted either directly or through a proper reselling program.

Intellectual property rights

All trademarks, nominal or figurative, and all other marks, trade names, service marks, word marks, illustrations, images, or logos that appear concerning UWP are, and remain, the exclusive property of the Owner or its licensors and are protected by the laws in force on trademarks and by related international treaties.

All trademarks and all other marks, trade names, service marks, word marks, trademarks, illustrations, images, logos regarding third parties and content posted by such third parties on UWP are and remain the exclusive property of such third parties and their licensors and are protected by applicable trademark laws and relevant international treaties. The Owner does not own the aforementioned intellectual property rights and may use them only within the limits and in accordance with the contracts concluded with such third parties and for the purposes outlined herein.

Age eligibility

Users declare themselves to be adult according to their applicable legislation. Under no circumstance may persons under the age of 18 use UWP.

Changes to these Terms

The Owner reserves the right to modify these Terms at any time, informing Users by publishing a notice within UWP.

Users who continue to use UWP after the publication of the changes accept the new Terms in their entirety.

Assignment of contract

The Owner reserves the right to transfer, assign, dispose of by novation or subcontract all or any rights or obligations under these Terms, as long as the User's rights under the Terms are not affected.

Users may not assign or transfer their rights or obligations under these Terms in any way without the written permission of the Owner.

Severability

If any provision of these Terms is invalid or unenforceable, that clause will be removed and the remaining provisions shall not be affected and they will remain in force.

Authoritative version of these legal documents

These Terms have been written and reviewed in the Italian language. Any translations into any language other than Italian are to be considered mere translations. In case of any discrepancy or inconsistency, the Italian language text shall prevail in any event.

Governing law and jurisdiction

These Terms and any dispute concerning the implementation, interpretation and validity of this agreement are subject to the law of the state and to the exclusive jurisdiction of the courts where the Owner has their registered offices. An exception to this rule applies in cases, where the law provides a sole place of jurisdiction for consumers.

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FINAL DISPOSITIONS

User is aware of all expressed in the "Disclaimer of warranties" paragraph and accepts its content, also in accordance with the provisions of Articles 1341 and 1342 of the Italian Civil Code.