PRODUCT MANUAL

INZENNIO Z38i

KNX Touch Panel

ZN1VI-TP38i

Edition 1.2
Version 1.1

INDEX

1. INTRODUCTION

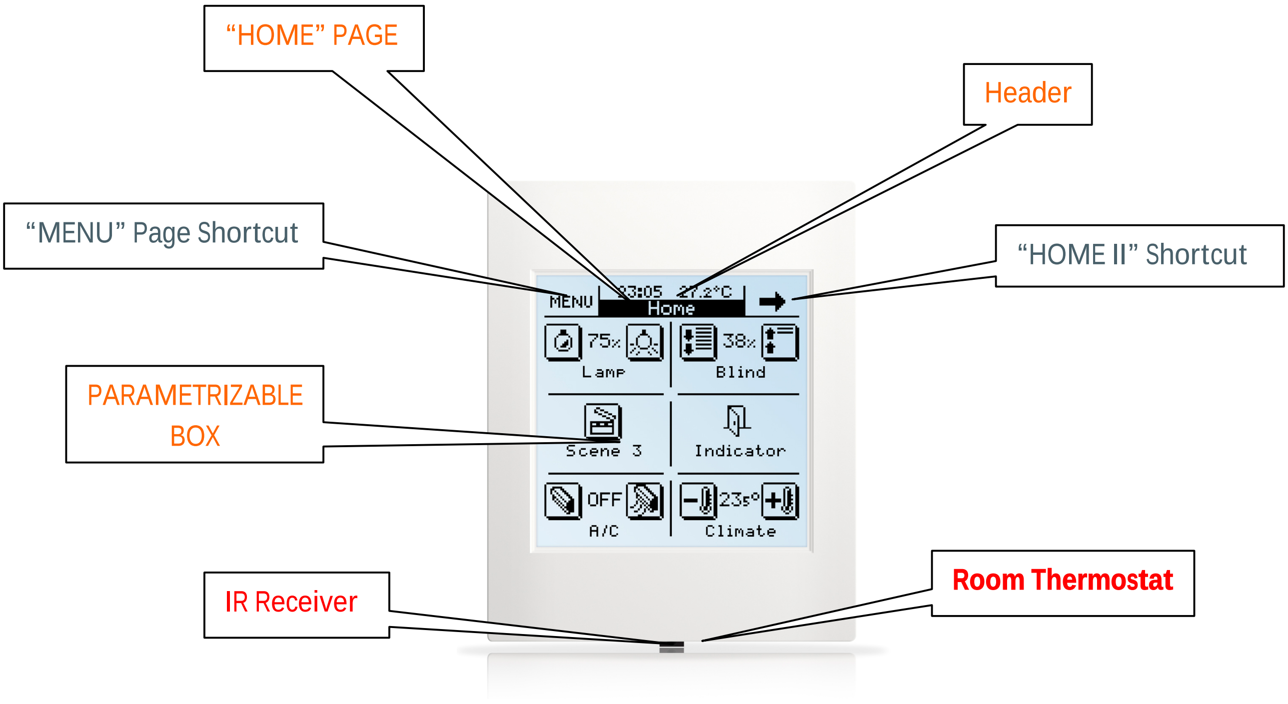
1.1. PRODUCT

InZennio Z38i is an **LCD Touch Panel with Room Thermostat, Binary Inputs** and **IR Receiver built-in**. Some of its most important features are mentioned below:

- KNX 3.8” back-lighted monochrome Touch Panel
- Room thermostat
- Presence Simulation
- Full Climate Management
- 12 Configurable Direct Control Functions
- 5 Additional Pages with up to 6 independent functions:
  - Scene Control [5 Functions]
  - Schedule Programming [4 Functions]
  - Climate Control [5 Functions]
  - Technical Alarms [6 Functions]
  - Display Parameters
- IR Receiver built-in (Remote Control)
- 4 Binary Inputs for Voltage free push buttons or switch/sensors
- No external supply required
- KNX BCU included
- Total Data Saving when Power failure occurs

The Touch Panel **InZennio Z38i** is organized into **"Pages"**; every page consists of several "**parametrizable boxes**" and a "**header**.

Figure 1.1 shows schematically the screen organization of Touch Panel **InZennio Z38i**.



The next schema represents available pages to be "enabled" and its hierarchy.

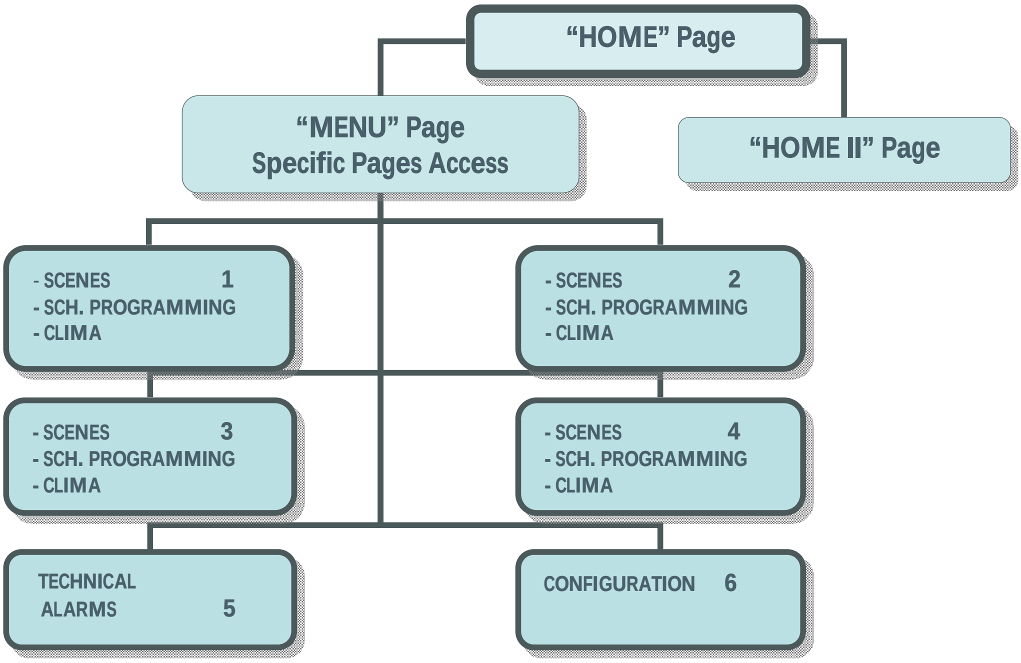
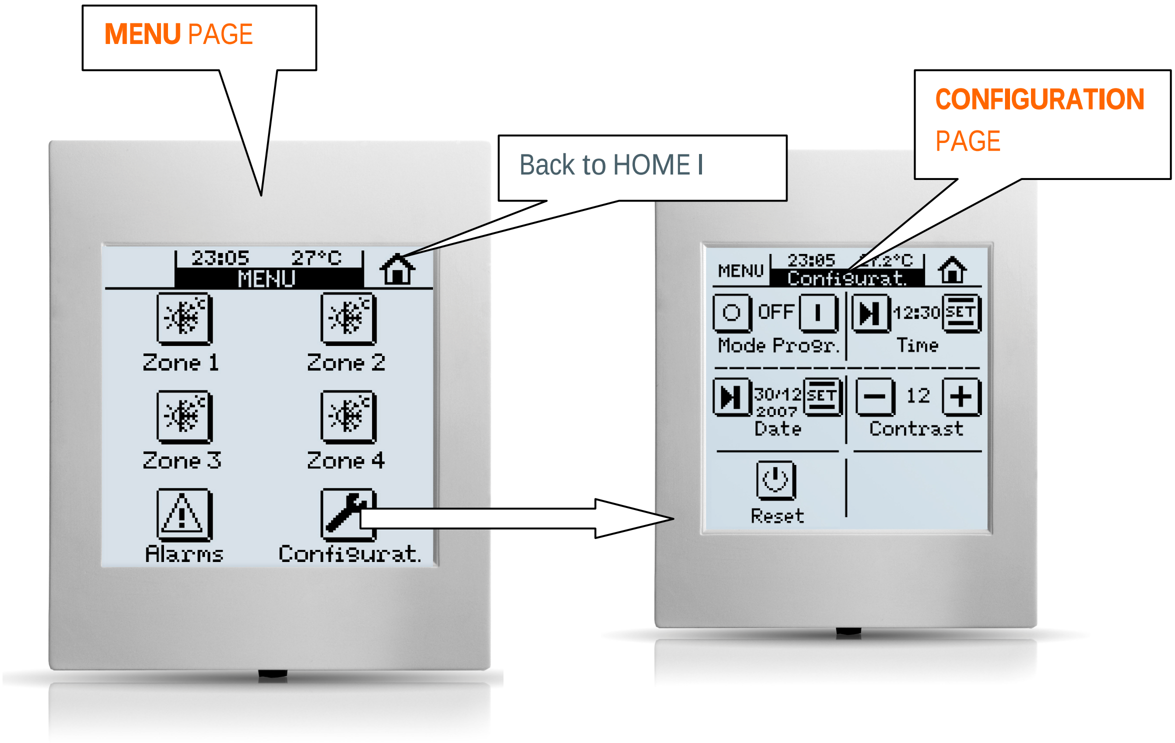


Figura 1.1. Schematic page organization



Next sections in this manual will detail the correct way to configure and program the LCD Panel **InZennio Z38i**, so that a user can control all (or part of) the KNX installation from a single device.

<<PAGES>>

- **Home I / Home II**

  The **"Home"** page is the InZennio Z38i "Welcome" page; this will be the starting point (once the necessary boxes have been enabled) to access, the most commonly required functions.

  The "**Home II**" page is just like the "Home" one, as far as functionality and potential programming terms is concerned. The "**Home II"** page is an extension of the own "Home" page.

- **MENU Page:** Access to Specific Pages.

  In this case, users have the option to "enable" up to six different pages, and even, when talking about the **"Specific 1, 2, 3 & 4"** ones, to associate them with a particular function:

  - Scenes
  - Schedule Programming
  - Clima

Note: ***"Home"***, ***"Home II"*** *and the* ***"Technical Alarms" pages*** *in the* ***InZennio Z38i*** *Panel have* *<u>6 parametrizable boxes</u>* *each.* ***"Clima"***, ***"Scenes"***, *and the* ***"Configuration"*** *pages have* *<u>5 parametrizable boxes</u>* *each, while the* ***"Schedule Programming"*** *one has only* *<u>4 parametrizable boxes</u>*.

1.2. INSTALLATION

Please, refer to the **Product Data Sheet**, for up to date information on the installation of the **InZennio Z38i** Panel, as well as to gather detailed information on its technical characteristics.

The **Data Sheet** is included in the original packaging of the product, and is available to be downloaded from the website http://www.zennio.com.

1.3. CONFIGURATION

The **InZennio Z38i** includes 233 Communication Objects responsible to transmit and receive data through the BUS.

To begin with the InZennio Z38i module configuration, it will be necessary to import in ETS, a project that contains an InZennio Module of the device, or a database **.vd** file of the product (See http://www.zennio.com.)

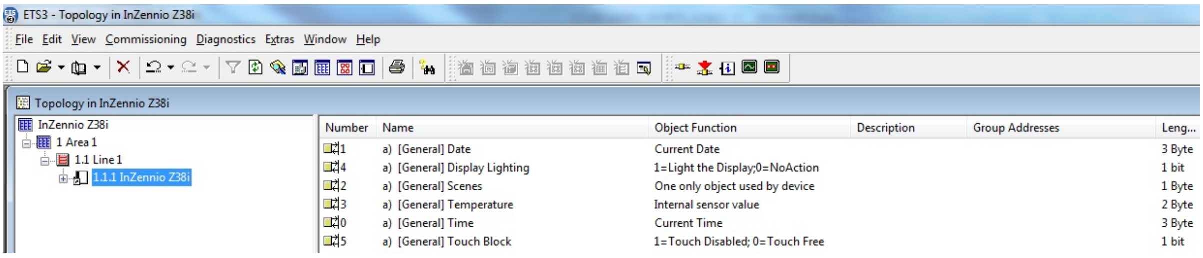
This manual starts from the **"default"** product configuration, to gradually configure the device according to the user requirements.

<u>Default Z38i Panel Configuration (Communication Objects)</u>

To make Communication Objects working easier, as well as to facilitate its understanding, these have been reorganized as selected by parameters.

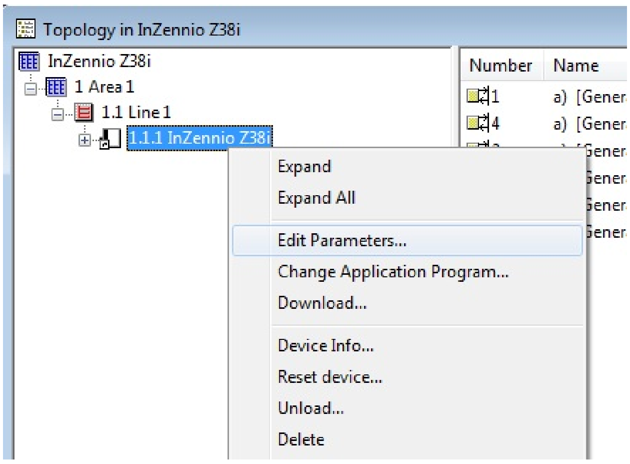
The Communication Object arrangement has also been substantially improved by ordering them alphabetically by sections on the ETS.

<u>Note:</u> *For this arrangement to be effective, it is necessary to click on the* ***"NAME"*** *column, instead of the* ***"NUMBER"*** *one.*

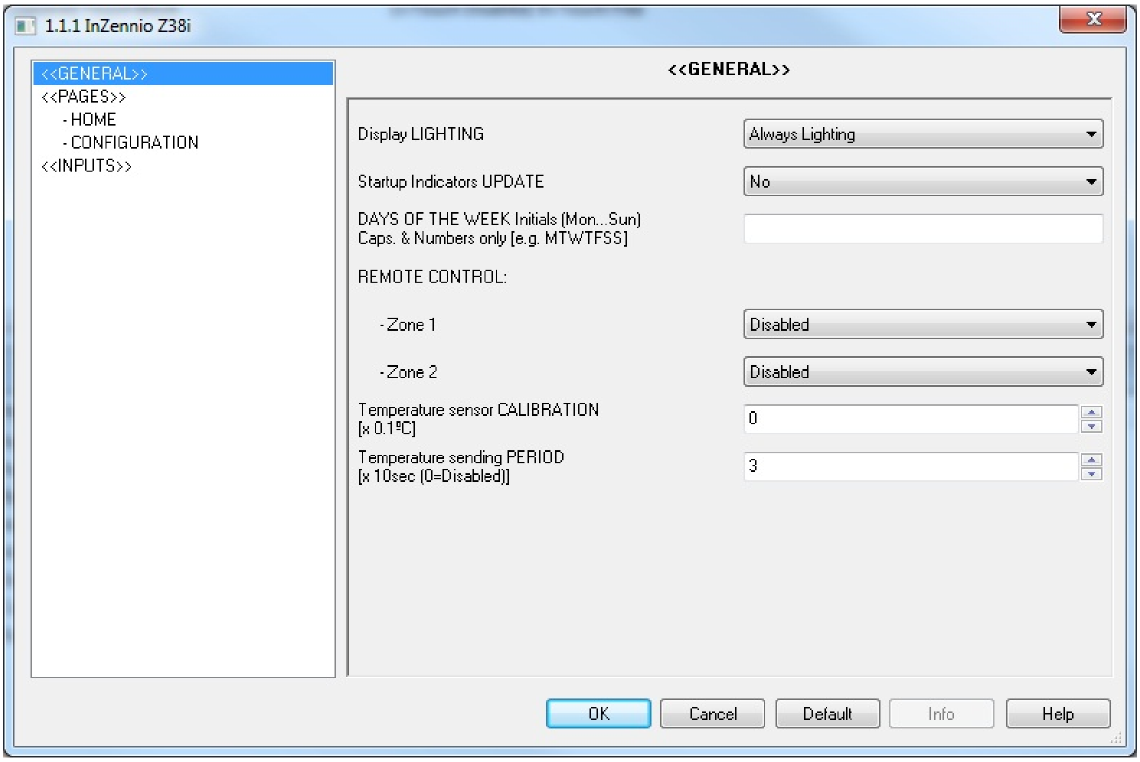


Parameters will be shown as they appear initially

In order to visualise and configure the parameters of an ETS device, click the right-mouse button on the BUS device you want to configure, then click left-mouse button on **"Edit Parameters"**.



Main Parameterization Window appears



2. PARAMETERIZATION

Access via ETS to the Main Parameterization Page on the ETS, has three main sections:

- **<<GENERAL>>**
- **<<PAGES>>**
- **<<INPUTS>>**

Every section is detailed next.

2.1. GENERAL

This parameterization section allows users to enable the remote control zones as well as to associate them with the **"Home"** or **"Home II"** pages for its control; this section also allows configure various aspects of the display backlight and other general parameters.

Available configuration options involving the display backlight are represented in the figure 2.1**.**

Each available option is described below:

- **DISPLAY BRIGHTNESS** (Figure 2.1)
  - **Always lighting**: Light on the display remains always ON, even when the page is not in use.
  - **Automatic Luminosity Attenuation:** 45 seconds after the last interaction on the display, this will recover its stand-by mode.
    - **LUMONOSITY ATTENUATION LEVEL**
      - **Completely Dark**: After 45 seconds (Auto Dimming), the own auxiliary light on the display will remain OFF (until a new touch on it is made).
      - **Low Luminosity**: After 45 seconds (Auto Dimming), the display will light slightly, (this is useful to identify it in dark places).
    - **DISPLAY STATUS WHILE DIMMING**
      - **Display Enabled:** Display remains always active; this means that any interaction with it will obtain an immediate response.

- **<u>Display Disabled (touch anywhere to unblock):</u>** The display needs a first touch onto it to be unlocked, after this, this can be normally operated.

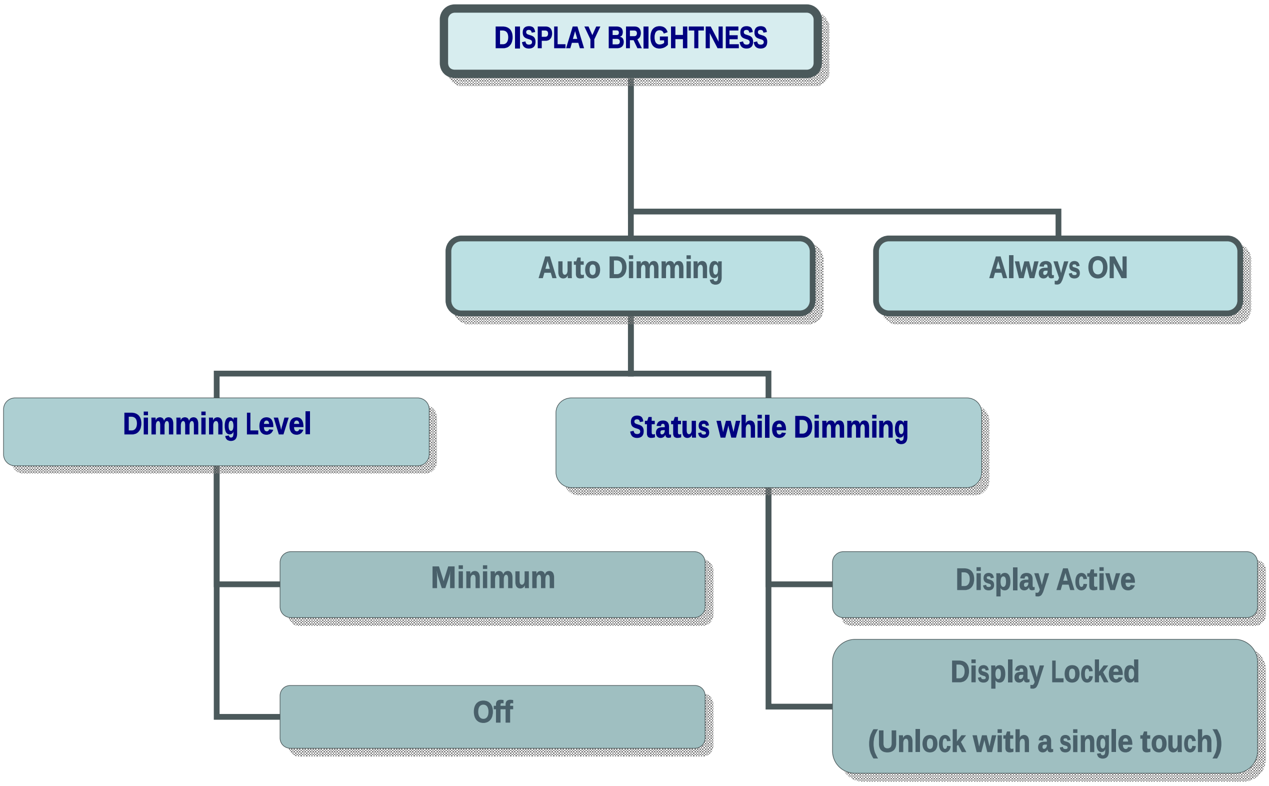


Figure 2.1. Display backlight

INDICATORS UPDATE WHEN INITIATING

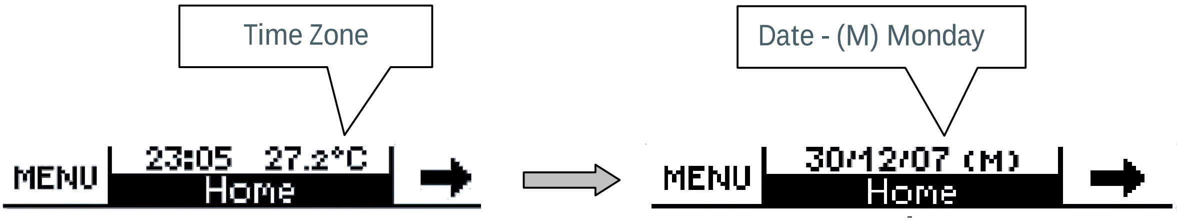
When recovering the BUS voltage (or after a program download), the **InZennio Z38i** may ask the rest of devices in the installation for their corresponding values, in order to update the display indicators.

- **<u>Delay:</u>** This field allows a user to set a delay (in seconds) to put off the indicators update, until the rest of devices on the installation are completely initiated.

WEEKDAY INITIALS

Seven free characters are available to enter the weekday initials.

Both the date and the week-day will appear on any page header, when the “**Time Zone**” is pressed.



Note: *Weeks days are automatically calculated by the own display when adjusting the date on it.*

REMOTE CONTROLLER

- **Zone 1**: This field will allow users to associate this zone of the control to either any of both **“Home”** or **“Home II”** pages.

- **Zone 2:** This field will allow users to associate this zone of the control to either any of both **“Home”** or **“Home II”** pages.

Note I: *Buttons arrangement on the remote controller is similar to the **“Home & Home II”** boxes structure to make its control easier.*

Note II: *If remote controller is disabled in the parameterization, a press key over any button **DOES NOT** have effect in the touch panel.*

TEMPERATURE SENSOR CALIBRATION

Allow users to recalibrate the Temperature Sensor referred to the own temperature measured by the sensor itself when the calibration parameter remains unchanged (value “0”).

- **TEMPERATURE SENDING PERIOD**

  This field is meant to set a period of time for the Z38i to send the registered temperature to the BUS through the **"Temperature-Internal Sensor value"** Communication object**.**

  If a "0" value is set, the temperature will not be sent.

2.1.1. "DISPLAY LIGHTING" OBJECT

Z38i Panel has a Communication Object "**Display Brightness"** which has the same effect than touching onto the display:

- When this object receives a "**1"** from the BUS, the display lights up and gets active.
- A Display active implies that any interaction with it by the user will always get an immediate response, regardless of the **"Status while Dimming"** parameterized before (See page 9).

__Note__***:*** *When receiving a "0" nothing happens.*

__Example__***:*** *This functionality allows a presence detector or a door contact to send a "1" to the BUS notifying the user that someone entered the room, or that someone got up during the night. When receiving a "1", the display lights up (either to welcome the user entering the room or to let him see the display in the dark).*

2.2. PAGES

This Manual section is intended to detail the different pages the **InZennio Z38i** provides the user with, including the submenus offered in each of these pages.

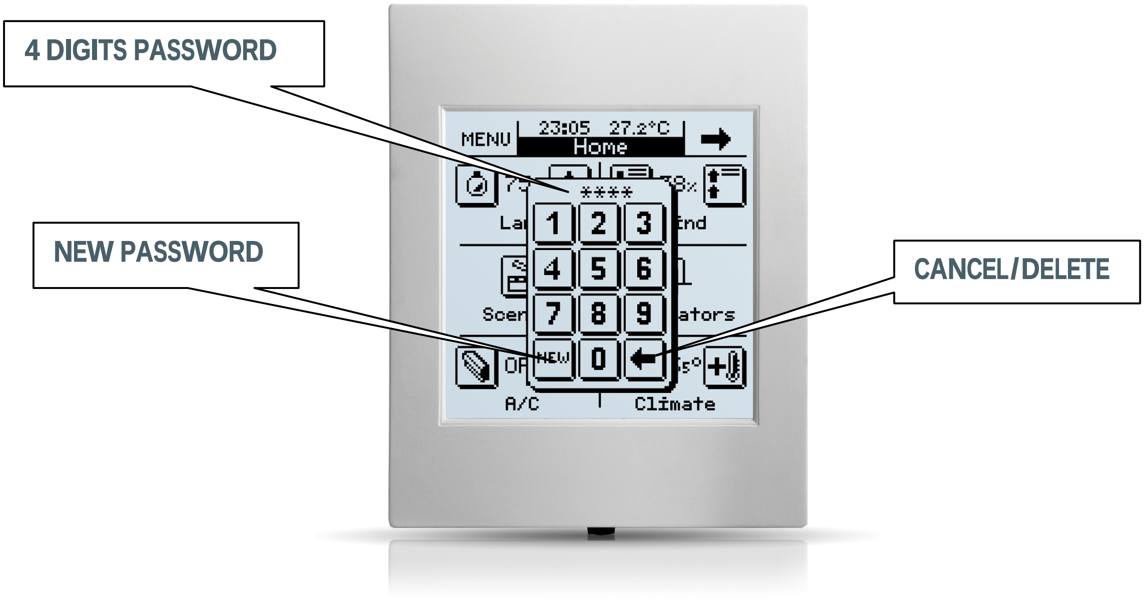
When a Panel page is enabled, two parameterization fields become available:

__NAME__ **→** This field allow users to associate a name to any of the InZennio Z38i pages; this name will appear on any of the page headers the user is moving through (12 free characters are available to set the name).

__Note:__ *The only page which cannot be renamed is the* ***MENU*** *one (to access Specific Pages).*

__SECURITY__ **→** A restricted page prevents unauthorized access to it. A 4 digits password is required to enter a protected page. The default password is **"1234".**

__Note__: *The "**Home**" page is enabled by default. Access to the **"Home"** page cannot be restricted.*



To change the password, next steps need to be followed:

1. - Press **NEW.** In the upper part of the box the word **"OLD"** will appear and the old password has to be written.

2. - After introducing it correctly, the word "NEW" will appear. That is the moment to insert the new password.

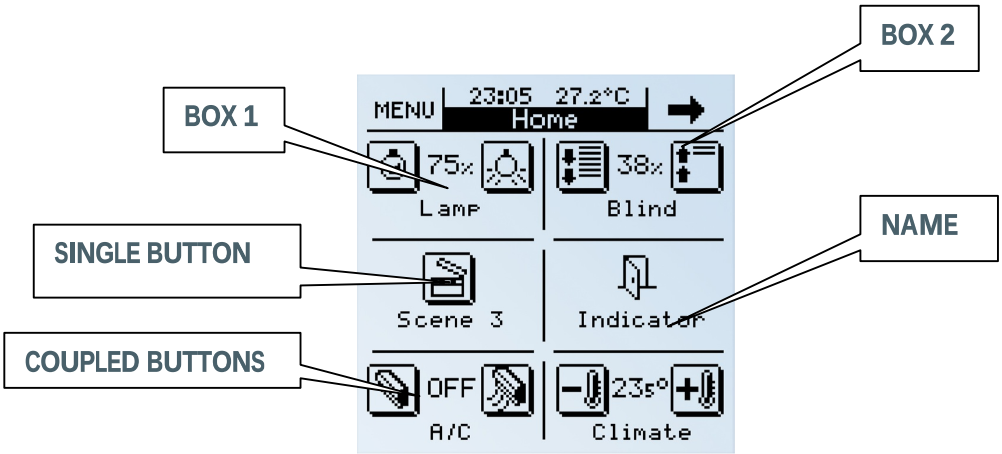
3. - "REPEAT". Insert again the desired new password.

2.2.1. "HOME" & "HOME II" PAGES

These two pages are intended to parameterize their boxes so that a user can easily access the most common used functions when controlling an installation.

As well as the pages, every box on **"Home"** and **"Home II"** pages has a parametrizable field:

NAME → This field allows a user to associate a name with the corresponding box in the page, (11 free characters are available to set the name).



Note: ***"Home"*** *Page will be shown again 90 seconds after last interaction on the display took place.*

2.2.1.1. BINARY CONTROL

This is a generic control to communicate all those devices susceptible to be, by sending a single bit ("0" or "1").

BUTTON 1 → In **"Binary Control"**, this button will always appear as **"enabled"** by default.

- **Short Press:** User can choose between different behaviours when pressing this button in the screen: **Nothing**, send **"0" or "1"** or **toggle** (changing the value of the receiver associated of the communication object).
- **Long Press:** Same case than before, the only difference is that now users will need to keep the button on the display pressed during at least 0.5 seconds to send the corresponding data through its Communication Object.
- **Icon:** An icon can be associated to the page box. (See Annex II).

BUTTON 2 → It might be possible to have two buttons on the same BOX, by simply activating this option in the corresponding field.

Although both buttons will transmit data independently; both of them also share the same Communication Object.

The way to parameterize this button is the same than the explained for **BUTTON 1**.

INDICATOR → By activating this parameter, a status indicator will be inserted between both buttons.

2.2.1.2. LIGHT CONTROL

This control is specifically designed for lighting control. Through its Communication Objects, users will be able to turn On/Off any kind of incandescent lamps, low voltage lamps, compact fluorescent lamps, etc., and even controlling their output intensity.

Note: *When trying to control compact fluorescent lamps (CFL), an electronically reactance or a specific KNX actuator would be necessary to control their intensity*.

TYPE → This field allows the user to choose the control type:

- **On/Off:** This is the most basic control type; turn On/Off; pretends to simulate a common switch action. The user can select an indicator to show the ON/OFF light status.

- **On/Off + Simple Regulation (4 bits):** Users can simulate a common switch action, **turn On/Off** (short press on the buttons), or a **discreet regulation** (long press on the buttons), where depending on the **"dimming step"** set, keeping the button pressed will reduce or increase the brightness on the controlled lamps.

  Dimming step: Seven different regulation levels are available for this duty. A long press on the display buttons will reduce or increase the brightness level step by step the percentage set in this parameter; once the desired level is reached, stop pressing the button on the display to keep the desired value.

  Indicator: This will inform users about the brightness percentage applied at any time.

Note: *In this case, for this indicator to be functional, it is necessary to use a KNX dimmer to give back the brightness applied to the load.*

- **Precise Dimming (1 byte):** This is the most accurate control method, as any short press on the display buttons will increase or reduce (1%) the brightness level. A long press on any of the two buttons will increase or reduce gradually 10 % the brightness level.

  Indicator: This will inform users about the brightness percentage applied at any time.

ICON → An icon can be associated to the page box. (See Annex III).

2.2.1.3. SHUTTER CONTROL

Specifically designed to control any type of shutters, blinds, sun blinds, or any other drive. Through its communication objects, users will be able to raise / lower shutters, and even knowing its exact position at any time.

The basic shutter control is made as follows:

- **Long Press:** Move the shutter.
  - Raise Shutter: 0" is sent trough the object "**Move Shutter"**.
  - Lower Shutter: "1" is sent trough the object "**Move Shutter".**

Note: *When the object **"Move Shutter**" sends **"0"** or **"1"**, the shutter will start moving, and won't stop unless the whole shutter length is covered or that any other order cancelling the previous is received.*

- **Short Press:** Stop the shutter.

  To stop a moving shutter, a **"0"** or a **"1"** must be sent through the object **"Stop Shutter"**.

ICON → An icon can be associated to the page box. (See Annex III)**.**

INDICATOR → By activating this parameter, users can insert an indicator between both buttons to get an estimation in percentage terms of the shutter position.

2.2.1.4. CLIMA CONTROL

Designed specifically to control the functioning of air conditioning devices without the need to access a specific climate page.

This can be very useful if there are free boxes in "Home" or "Home II" pages because that way, the user will avoid browsing between the different pages and will have access directly to determinate specific functions:

TYPE OF CONTROL → Choose the specific climate function to control:

- Mode (Heat/Cool)
- Fan
- Swing

Note: *Depending on the selected option, a communication object associated to the specific box will appear in the ETS environment; the same object type corresponding the selected option.* ***This characteristic allows users to control also external climate systems.***

2.2.1.5. 1 BYTE CONTROL

This is a generic control to communicate all those devices susceptible to be, by sending a single byte (value in the range 0 - 255).

TYPE → Three possible options available in this case:

- **Fixed Value (one button, no indicator):** By pressing the button on the display, the same value will always be sent; the value selected in the field "**Value**".

- **Percentage (2 buttons with indicator):** To send a percentage

    - Short Press: Rise or lower 1% with every short key press.
    - Long Press: Rise or lower 10% with every long key press.

Note: *Take into account that value 0 corresponds with 0% and value 255 with 100%.*

- **Value 0-255 (2 buttons with indicator):** A value between 0 and 255 is sent.

  It exists, choosing this option, the possibility to shorten the sending range in the parameterization process with parameters "**Minimum Value**" and "**Maximum Value**".

    - Short Press: Rise or lower one single point in the range with every short key press.
    - Long Press: Rise or lower 10 points in the range with every long key press.

ICON→ A couple of icons can be associated to the corresponding display box. (See Annex III).

2.2.1.6. SCENE CONTROL

Scenes or "lifestyles" consist of a synchronized activation of some devices in the domotic installation, so that different predefined atmospheres are generated.

There is an only Communication Object associated with **"Scenes"**. All the scenes will be always sent through the object **"[GN] Scenes".**

Before continuing with the parameterization of this type of control, a small <u>introduction to the Communication Object **"[GN] Scenes"**</u> is done next:

The **DPT** (Datapoint Type) Scene Control is a one byte object with the following format:

C	R	N ≡ Scene Number
1bit	1bit	6 bits

- **C** 0 = Activate the scene corresponding the field Scene Number.

  1 = Learn the scene corresponding the field Scene Number.

- **R** Reserved field with value "0"

- **N** Scene Number Range [0 - 63]

<u>Note I</u>: *If C=0, the DPT valid range is [0 - 63], whereas if C=1, the DPT valid range is [128 - 191]*

<u>Note II:</u> *Activate Scene 1 → **DPT=0***

*Activate Scene 2 → **DPT=1***

…………………

…………………

*Activate Scene 64 → **DPT=63***

*Learn Scene 1 → **DPT=128***

*Learn Scene 2 → **DPT=129***

…………………

…………………

*Learn Scene 64 → **DPT=191***

*Therefore, a single **Communication Object** will be valid to **Activate** Scenes and /or **learn** them (depending on the C value).*

TYPE → Users can choose (by using the same button on the display) between:

- **Run Scene:** A single press on the display button will generate the atmosphere predefined by the user for that scene.

- **Run + Learn Scene:** A short press on the button will generate the atmosphere predefined by the user for that scene (same than above). Additionally, a long press (3 seconds) on the display button gives users the possibility to learn (modify) new scenes. See the following example to know how:

Example: ***Guess a user defines the "Scene Night" (programming the Panel with parameters and group addresses via ETS***:

- *Turn all the lights Off.*
- *Turn Off the Heating and the A/C Systems.*
- *Activate the Alarm System.*

Once the scene is defined, every time we run it, a predefined atmosphere is generated.

*How does a user **modify and learn** a scene, with the devices used in the scene described above?*

For example if the user wants this instead:

- *Turn all the lights Off except one (the one to remain ON, will be a guiding light).*
- *Turn Off the Heating and the A/C Systems.*
- *Activate the Alarm System.*

The way to do this:

1. *Run the scene to be **modified**.*
2. *Turn the light we want it to be the guiding light On.*
3. *Just **save** the new scene into the Panel by keeping a long press (3 seconds) on the original scene "Run" button.*

✓ **This process replaces the original scene by the modified one.**

SCENE NUMBER → This is a number defined by the user to identify the scene or the "lifestyle" to be created.

ICON → An icon can be associated to the screen box (See Annex II).

2.2.1.7. TEMPERATURE CONTROL

This is an additional and generic temperature control. When enabled, this control uses a 2 byte Communication Object. **This control is totally independent from the Climate Control.**

CONTROL RANGE → [0ºC - 95ºC]

ICON → A couple of icons can be associated to the screen box (See Annex III).

2.2.1.8. BINARY INDICATOR

This control enables a binary status indicator on the display box.

An icon, specifically enabled for this function, may be associated to the page box when a "0" is received through the (1 bit) corresponding Communication Object.

Same case if data received is a "1".

ACTION WHEN VALUE "0" IS RECEIVED→ This box should be enabled when users need to know when a "0" has been received through the specific Communication Object.

ACTION WHEN VALUE "1" IS RECEIVED → This box should be enabled when users need to know when a "1" has been received through the specific Communication Object.

ICON → Different icons can be associated to both of the (**ACTION**) cases, so that users can identify what is received through the specific Communication Object (a "0" or a "1") (See Annex II).

2.2.1.9. 1 BYTE INDICATOR

One byte provides much more information relating to an event than one bit. This indicator is normally used with percentages (%) relating to particular events (shutter position, wind speed…), however another possible configuration option is a numerical range among 0 and 255.

TYPE → Permits specify the output data type as percentage (%) or as numeric value (0 - 255).

2.2.1.10. FLOATING POINT INDICATOR

Floating Point is a real number representation method that can be adapted to the order of magnitude of the value represented.

In this particular case, enabling a box as **"Floating Point indicator"**, integrators can select the type of data represented on the display, choosing among:

- Temperature (ºC) → Range [-273ºC - 670,760ºC]
- Wind Speed (m/s) → Range [0m/s - 670,760m/s]
- Humidity (%) → Range [0% - 670,760%]
- Luminosity (lux) → Range [0 lux - 670,760 lux]
- Other (no symbol) → Range [-670,760 - 670,760]

Note I: *Depending on the data type selected, a different unit symbol will be shown*.

Note II: *To distinguish the thousands, a separation **"space"** is defined in the number, whereas to distinguish the decimals a **"point"** is used.*

2.2.1.11. SECURITY CONTROL

In the same way that it exists the possibility to protect any page (see section 2.2) against non-authorized access, this protection is also available for the boxes individually in **"Home"** and **"Home II"**.

In this case, the Panel will not send any binary data to the BUS unless the correct password is entered.

ICON → An icon can be associated to the display box. (See Annex III).

INDICATOR → By activating this parameter, a status indicator will be inserted between both buttons:

- **ON/OFF**
- **0/1**

2.2.1.12. PRESENCE SIMULATION

This function is designed to simulate presence in a house. Once the devices on the KNX installation have been correctly parameterized, two new Communication Objects become active:

- **Presence Simulation (1 bit):** Enable/Disable the function.
- **Simulation Channel (1 bit):** Generate the ON/OFF.

This function consists on the cyclical sending of "0" and "1" (making use of **"Simulation Channel"** communication object) while activated (using the communication object **"Presence Simulation"**). A random semi-cycle duration is applied for the ON/OFF within the parameterized limits.

Note: *This simulation can be enabled / disabled through the display or through an object; and once activated; this will only be running during the parameterized time range.*

STARTING TIME / FINISH TIME → This parameter adjusts the time for the daily simulation to start/stop running (once enabled the function).

MAXIMUM / MINIMUM ON/OFF TIME→ Users can adjust by parameter the minimum and maximum ON/OFF time for the devices on the installation.

2.2.2. "SPECIFIC" PAGES

The Touch Panel InZennio Z38i offers four specific **free-configuration pages**. The enable options which will be described are:

- SCENES (5 boxes available)
- SCHEDULE PROGRAMMING (4 boxes available)
- CLIMATE (5 boxes available)

To enable these pages, just go to the Main Menu **<<PAGES>>** when "Editing Parameters".

It has to be taken into account that the final user is who really decides which option fits better for his application; due to the desired control type is possible that a user needs associate all the boxes of **"Specific pages 1, 2, 3 and 4"** to one particular type of control, for example schedule programming, etc.

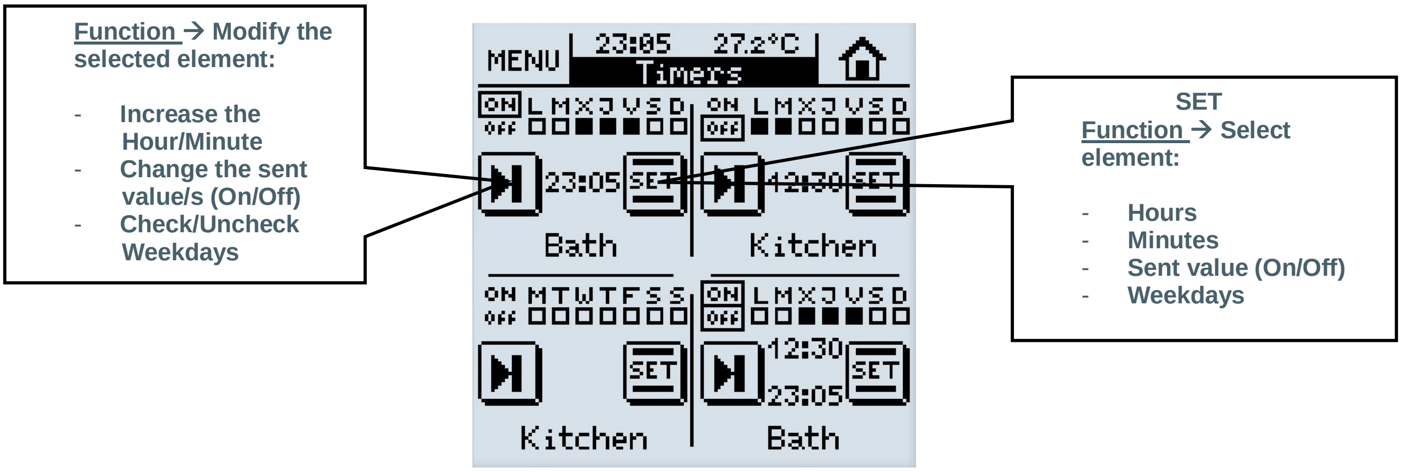
2.2.2.1. SCENES

Actually, the parameterization of “Scenes” has been already described in this manual. Two pages are available (**“HOME**” and **“HOME II”**) where there is the possibility to configure one or several boxes to scenes control.

The way to parameterize a “Specific Page” to control scenes is exactly the same as that described in section “**2.2.1.6 SCENE CONTRO**L”; please refer to this section to obtain detailed information on this topic.

2.2.2.2. SCHEDULE PROGRAMMING

The daily/weekly programming of certain events the user wants them to happen on the KNX installation is much easier using this Page.



The Schedule programming is associated to the On/Off of the devices in the KNX installation, and any specific page enabled to scenes control will have available four boxes (each enabled page) to this purpose.

Every time a user enables a specific “Schedule Programming” page; four free boxes with their respective **Programming Channel Communication Objects** will become available to be enabled if necessary.

> **NAME** → This field allows users to associate a name with the corresponding box in the display, (11 free characters are available to set the name).
>
> **LINKED TO SCENES** → When this box is enabled, a user can control Scenes by mean of a programming; the possible control associations are:
>
> - **Only for ON:** The **Scene Number (On)** box will appear where it is needed to write the scene number to execute when the ON programming set by the user is fulfilled.

- **Only for OFF:** The **Scene Number (Off)** box will appear where it is needed to write the scene number to execute when the OFF programming set by the user is fulfilled.

- **Both timer ON and OFF:** The **Scene Number (On)** box and **Scene Number (Off)** will appear.

Note I: *These associations* ***are solved through internal links****; this means it is not necessary any kind of addressing process to carry out Schedule Programming associated to* ***Scenes.***

Note II: *when many different schedule programming send different scenes at the same moment, just one of them will be sent, specifically, the scene linked to the last box of the last schedule programming page.*

Please see the following example:

It is parameterized in ETS the specific pages 1 and 3 as Schedule Programming pages. The schedule programming page 1 is configured like this:

- Box 2 → linked to scene number 64. Only for ON.

- Box 3 → linked to scene number 1. Only for OFF.

- Box 4 → linked to scene number 52. Only for ON.

And the schedule programming page 3 this way:

- Box 3 → linked to scene number 11. Only for ON.

In case that all these schedules send their own scene at the same time, the only scene that will be sent is the one linked to the last box of the last schedule programming page configured, in this example, Z38i will send the scene number 11 (linked to the Box 3, in the schedule programming page 3).

2.2.2.3. CLIMA

Air Conditioning, Thermostat and Fan Coil Control have been unified in a unique Specific Page called **"Clima"**. Thus, due to the possibility of enabling up to **4 different Climate Specific Pages**, up to 4 different Climate Systems can be now controlled from the **Z38i**. The control of them is done from "Specific Pages 1, 2, 3 and 4", after being enabled to this purpose.

The number of "**Specific Pages"** to control Climate Systems will mainly depend on the number of different Systems to control in the installation.

Every time a user enables a specific **"Climate"** page, two different configurable fields become available:

> **NAME** → This field allow users to associate a name with the corresponding box in the display, (11 free characters are available to set the name).
>
> **ICON** → A couple of icons can be associated to the page box (see Annex III).

The parameterization of the 5 different boxes in the specific climate page is detailed next:

> **BOX 1 (ON/OFF)** → Allows users to Turn On/Off the Climate System connected to the KNX BUS through the display.
>
> **BOX 2 (SETPOINT TEMPERATURE)** → To set users preferred temperatures.
>
> Once this parameter is set and the System is ON, this value will be the system temperature reference to keep.
>
> **BOX 3 (MODE)** → Allows users to choose the functioning mode of the Climate System. There are two possible options to configure:

Heat/Cool

- 1=Heat
- 0=Cool

Auto/Heat/Dry/Fan/Cool

- 0=Auto
- 1=Heat

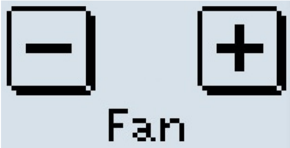
- 3=Cool
- 9=Fan Only
- 14=Dry

Note I: *This second option can only be selected to control* ***Air Conditioning Systems.***

Note II: *Enabling the Thermostat has no sense when this second Mode option has been selected, as the Thermostat can only control the Heat/Cool contribution*.

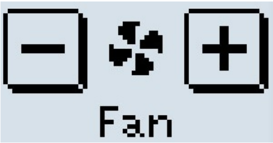
BOX 4 (FAN SPEED) → This is an Up/Down (1 bit) control, but its indicator may be three different types:

- **No indicator**



- **Percentage indicator**

0%= Auto
1-33%= Mín
34-66%= Med
67-100%= Max

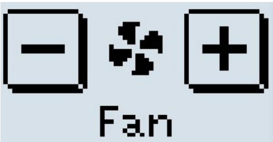


Note I: *This option is only compatible with* ***IRSC-Plus version 4.0 and further*****.**

Note II: *The central indicator in the box varies its size depending on the value received; thus, whenever the fan speed increases so does the central icon (progressively) and when the speed decreases, so does the icon size (see Annex II. Icons for air conditioning).*

- **1 byte Indicator**

0=Auto
1=Min
2=Med
3=Max



Note I: *This option is only compatible with **IRSC-Plus versions previous to V4.0**.*

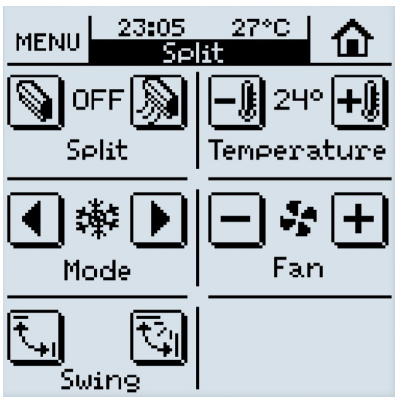
Note II: *The central indicator in the box varies its size depending on the value received; thus, whenever the fan speed increases so does the central icon size (progressively) and when the speed decreases, so does the icon size (see Annex II. Icons for air conditioning.*

Note III: *The **"1 byte indicator"** option is the one to choose when controlling a **"Fan Coil system"**.*

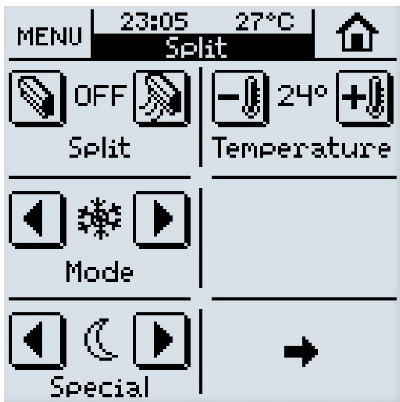
BOX 5 (SPECIAL MODES or SWING) → This box is customizable as "Blinds" (for Air Conditioning control), or as "Special Modes – Comfort, Night, Stand-By" (for Thermostat). This last option is controlled **as a rotary box** (with two buttons, "Left arrow" and "Right arrow" to change modes, and a "Mode indicator" in the middle), but with the 3 typical 1 bit objects together with their respective 1 bit indicator objects.

- **TYPE (Response to a Special Mode)**: This section allows integrators to select the response of the Thermostat when this is Off and a Special Mode (Night, Comfort, Stand-by) is selected:
  - It remains Off and nothing changes.
  - It remains Off but Setpoint Temperature is updated.
  - Setpoint Temperature changes and Clima turns ON.

Two possible Climate (Specific Pages) configuration Options are shown in the Pictures below:



Climate Page set for Air Conditioning Control.



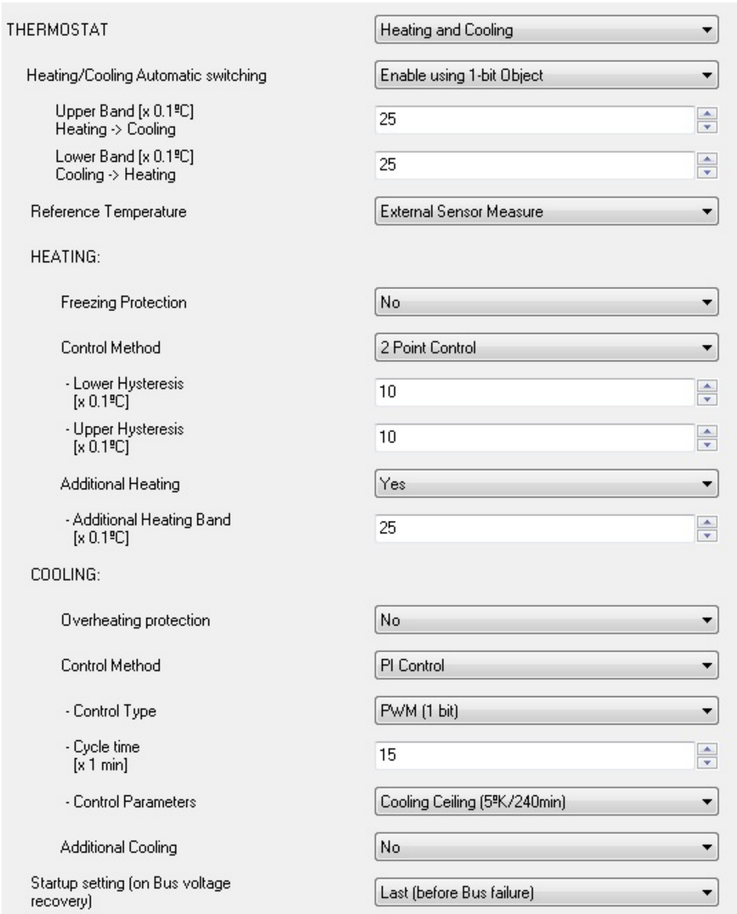
Climate Page set for Thermostat

Any “Climate Specific Page” includes the thermostat functionality to choose by parameter whether to include this feature or not.

<u>THERMOSTAT</u> → Select the type of control to carry out:

- **Heating**
- **Cooling**
- **Heating and Cooling**

The Thermostat main page has the appearance shown in the next figure:



The different available options (depending on the chosen regulation type: Cooling, Heating or Both) are explained below.

- **HEATING.**

  <u>REFERENCE TEMPERATURE</u> → For every enabled thermostat in Z38i, users will be asked by parameter whether to use the internal sensor measure or an external one as a temperature reference.

If the measure got by the internal sensor is chosen as the reference temperature, it has to be taken into account that, after a download, the default value of the object will be **25ºC**.

The same parameterization field also offers the possibility to choose a proportion between both measures (Z38i internal sensor and the one given by the external sensor):

Proportion	Z38i Internal Sensor	External Sensor
1	25%	75%
2	50%	50%
3	75%	25%

The resulting measure is exclusively used by the thermostat in Z38i, and cannot be shown through any available communication object.

FREEZING PROTECTION → Allows acting over the thermostat automatically if the temperature measured reaches a minimum temperature value defined in the **Protection Temperature** parameter (ºC). The system is able to react instantaneously to face this situation, maintaining the temperature always above this fixed value.

It is necessary to emphasize that this protection has effect only when the **thermostat is Off**. Switching on the thermostat, the protection will be deactivated, whatever its status, and, if its activation is necessary, it will be done after the evaluation.

When the freezing situation is activated, the thermostat is not switched on, whereas a control variable is sent with a 100% value.

This value will be back to its original value 0% when the measured temperature is **one Celsius degree higher than the protection temperature**.

CONTROL METHOD → With this parameter, user can choose the control method the thermostat will follow to calculate the control variable:

- **2 Point Control with Hysteresis**
- **Proportional Integral Control (PI)**

Next, these two methods will be explained in detail:

2 Point Control with Hysteresis

One of the temperature control methods used by the thermostat is “2 Points with Hysteresis”. The only factor which is needed to take into account when this method is applied is to fix its sensibility; this means, fix upper and lower points of the hysteresis curve (see figure 2.4).

Example: a water heater is wanted to be controlled by a thermostat. It will be switched on when the temperature is lower than a fixed temperature (A) and it will be switched off when it is higher than another fixed temperature (B). Thus the On/Off output of the thermostat to the heater when the temperature is between A and B depends on the history of the temperature. This prevents rapid switching On and Off as the temperature drifts around a set point.

It’s important to notice if the GAP (range between the upper and lower hysteresis points) is too narrow, the life of the devices responsible to send the ON/OFF order to the heating system (relays, contactors and even the elements of the heating system themselves) can be damaged, due to a rapid switching.

The default configuration sets a 2ºC GAP respect to the **“Set Temperature”** (1ºC lower and 1ºC higher).

Note: *The control method the Thermostat uses when this reacts autonomously to the “**Freezing or Overheating Protection**” is “**2 Points with Hysteresis**”.*

In this case the lower hysteresis point is 0ºC (referred to the parameterized Temperature) while the upper point is 1ºC. This means that the system will start working exactly when the “Protection Temperature” is detected and won’t stop until the room temperature raises one degree exactly.

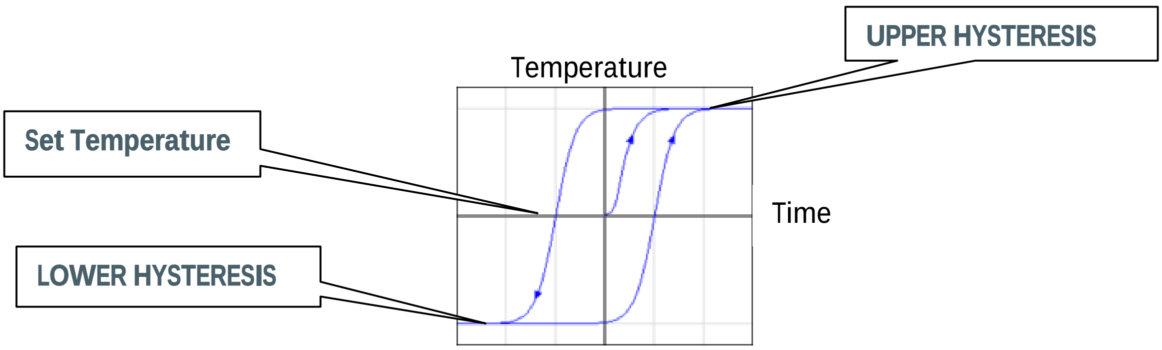


Figure 2.4. Hysteresis curves

The heating system inertia will cause that the temperature is higher in several tenths of the upper threshold.

PI Control (Proportional Integral)

This control follows the Standard KNX rules.

There are different systems to get a room conditioned:

HEATING	**COOLING**
- Warm Water	*- Cooling Ceiling*
- Floor Heating	*- Blow Convector*
- Electric Heating	*- A/C Split*
- Blow Convector	
- A/C Split	

Depending on the climate control system used on the installation, the user must choose the suitable option.

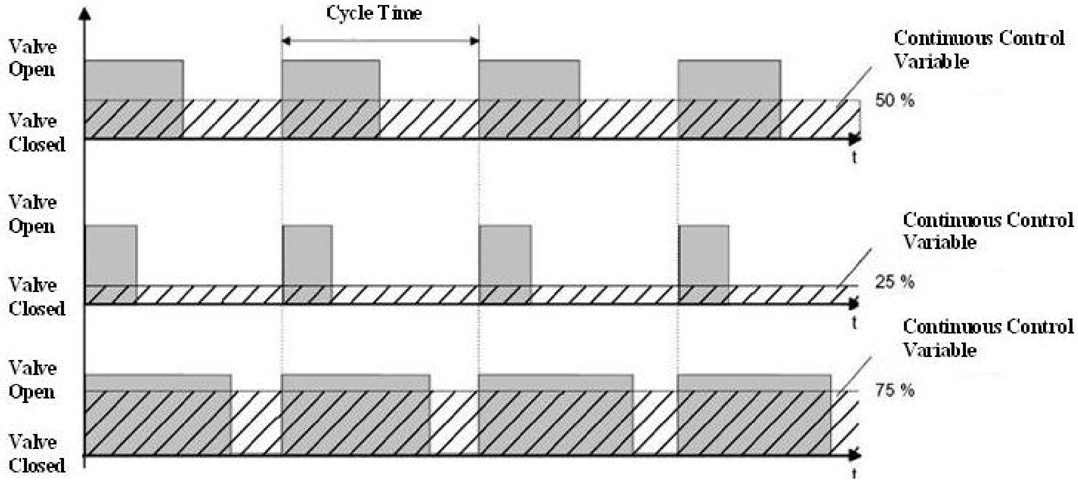
Any available option is internally parameterized for best performance in each case. The pre-set options correspond to practical tests, ensuring a perfect performance control when controlling a room temperature.

Note: *Advanced users may customize their own parameterizable constants: Proportional Band and Integral Time.*

The PI Control Method may be applied following two different Control Types:

- **PWM (1 bit):** Acts over the ON/OFF. This type of control makes an internal estimation on the "Cycle Time" prefixed by parameter, for the climatization system to be ON, to comply with the user requirements.

- **Continuous (1 byte):** Acts over the ON/OFF. This type of control makes an internal estimation on the "Cycle Time" prefixed by parameter, for the climate system to be ON, to comply with the user requirements. The only difference with the PWM control consists on that in this case, the decision to turn the system ON/OFF is up to the corresponding actuator.

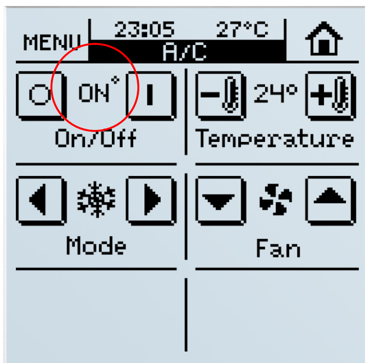


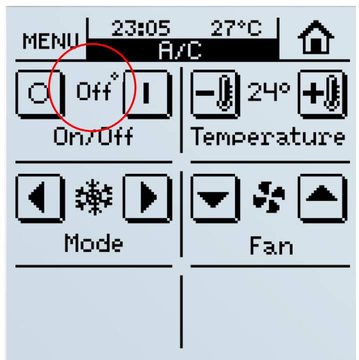
Note: *The* ***HEATING*** *section has been parameterized following the* ***"Hysteresis control method",*** *while the* ***COOLING*** *one has been parameterized following the* ***"PI Control method"****. However, both control methods can be used in either zone.*

When PWM or 2 points with hysteresis method (thus, 1 bit control method) is selected, a 4 pixels symbol will be shown in the upper right side of the ON indicator in the first box of the climate page (see the figure in the left). This symbol blinks when the valve is open ("1" cycle) and it disappears when the valve is closed ("0" cycle).

This is very useful, for instance, to know in which moment the heating of a house is on and when it is off.

When the overheating of freezing protection is activated, this symbol will also appear, but in the upper right side of the OFF indicator in the first box of the climate page, as shown in the figure of the right.





ADDITIONAL HEATING → Under normal conditions, Air conditioning Systems are responsible by themselves for the global regulation of the room temperature. However, “auxiliary systems” are more and more common every day, to be used to complement the heating system.
It is when a user relays on one of this auxiliary systems, (A/C split, Heat Pump…) when this parameter has a major importance.

Enabling this field, the auxiliary system is asked to contribute to reach the “Set temperature” as soon as possible.

Additional Heating Band: As mentioned before, the extra heating contribution must be complementary to the Heating System, this implies, that it would be inconsistent that the “Auxiliary” system provides heat until the “Set temperature” is reached. Thus, it is possible to set by parameter the number of degrees below the “Set Temperature” user wants the “auxiliary system” to be referred.

This means, this option indicates that, if the real temperature is lower than the **Set Temperature minus the defined value in the band**, an activation signal is sent (on/off) to the auxiliary system which allows a faster heating of the room.

Auxiliary System Reference (T) = “Set Temperature” – “Additional Band”

And the Auxiliary System will be providing heat to the room **until its temperature is higher than the Set Temperature minus the Additional Band plus 0.5ºC**.

After a bus failure, the value of additional heating is recovered.

STARTUP SETTING (on Bus voltage recovery) → If a bus failure occurs, the startup state of the thermostat can be parameterized after the failure. It can be chosen between the next options:

- Last (before Bus failure)
- OFF
- ON

COOLING.

REFERENCE TEMPERATURE → It is the same concept as in HEATING mode (see page 28).

OVERHEATING PROTECTION → Allows acting over the thermostat automatically if the temperature measured reaches a maximum temperature value defined in the **Protection Temperature** parameter (ºC). The system is able to react instantaneously to face this situation, maintaining the temperature always under this fixed value.

It is necessary to emphasize that this protection has effect only when the **thermostat is Off**. Switching on the thermostat, the protection will be deactivated whatever its status, and, if its activation is necessary, it will be done after the evaluation.

When the freezing situation is activated, the thermostat is not switched on, whereas a control variable is sent with a 100% value.

This value will be back to its original value 0% when the measured temperature is **one Celsius degree lower** than the protection temperature.

CONTROL METHOD → With this parameter, user can choose the control method the thermostat will follow to calculate the control variable:

- **2 Points with Hysteresis Control**
- **Proportional Integral Control (PI)**

For further information, please see pages 29 and 30 to read detailed information about these methods.

ADDITIONAL COOLING → Under normal conditions, Air Conditioning Systems are responsible by themselves for the global regulation of the room temperature. However, "auxiliary systems" are more and more common every day, to be used to complement the cooling system.
It is when a user relays on one of this auxiliary systems, (A/C split, Heat Pump…) when this parameter has a major importance.

Enabling this field, the auxiliary system is asked to contribute to reach the "Set temperature" as soon as possible.

Additional Cooling Band: As mentioned before, the extra cooling contribution must be complementary to the Cooling System, this implies, that it would be inconsistent that the "Auxiliary" system provides cool until the "Set temperature" is reached. Thus, it is possible to set by parameter the number of degrees over the "Set Temperature" user wants the "auxiliary system" to be referred. This means, this option indicates that, if the real temperature is higher than the **Set Temperature plus the defined value in the band**, an activation signal is sent (on/off) to the auxiliary system which permits a faster cooling of the room.

Auxiliary System Reference (T) = "Set Temperature" + "Additional Band"

And the Auxiliary System will be providing cool to the room **until its temperature is lower than the Set Temperature <u>plus</u> the Additional Band <u>minus</u> 0.5ºC**.

After a bus failure, the value of additional cooling is recovered.

<u>**STARTUP SETTING (on Bus voltage recovery)**</u> → If a bus failure occurred, it can be parameterized the startup state of the thermostat after the failure. It can be chosen between the next options:

- Last (before Bus failure)
- OFF
- ON

HEATING AND COOLING.

<u>**HEATING/COOLING AUTOMATIC SWITCHING**</u> → Allows the activation of manual heating/cooling switching ("Always Disabled"), automatic switching ("Always Enabled") or making use of 1 bit communication object ("Enable using 1-bit Object") which controls the switching mode.

It is also permitted the definition, in running mode, of the switching type, allowing the variation from manual switching to automatic (or vice versa).

- **Manual Switching ("Automatic ALWAYS DISABLED"):** In this mode a "0" or a "1" has to be written in the object associated to the mode switching to change between cooling or heating mode, respectively. The writing of this value will produce a switch in the mode.
- **Automatic Switching ("Automatic ALWAYS ENABLED"):** In this mode, it is the thermostat itself who decides the mode, comparing the set temperature and the reference temperature. The user has to configure an "Upper Band" (to switch from heating to cooling) and a "Lower Band" (to switch from cooling to heating). With these parameters, if the reference temperature is higher (or lower) than the set temperature plus the upper

band (or minus the lower band), there will be a switch in the mode.

- **Enable using 1-bit object:** If the automatic switching parameter is not "Always enabled" nor "Always disabled", 1 bit communication object is used to activate/deactivate the automatic switching writing a "1" or "0", respectively. Activating the automatic switching, the thermostat will choose the mode in function of the difference between the reference temperature, the set temperature and the configured upper and lower bands.

The rest of the parameters offered in heating and cooling mode, are described in the previous sections. For further information about them please, read the description in heating mode or cooling mode sections.

2.2.3. TECHNICAL ALARMS

This is a specific screen, with **up to six independent boxes** in charge to monitor the BUS looking for possible warning conditions in the KNX installation (gas, smoke...). The Touch Panel InZennio Z38i can be configured to warn the user in case of incidents inside or outside of the room where the display is installed.

Every "Enabled" box on the screen has some parameterizable fields at the user's disposal:

NAME → This field allows a user to associate a name with the corresponding box in the screen, (11 free characters are available to set the name).

ALARM TRIGGER VALUE → Choose whether it will be a "0" or "1" the value which activates the alarm; this will mainly depend on the warning device installed.

CYCLICAL MONITORING → The state of the detection devices will be cyclically monitored by enabling this parameter. This parameter assures the user two features: the detection of incidents in the minor time possible and the security that the device of detection is properly working.

CYCLE: Defines a particular interval of time to monitor the BUS looking for Technical Alarms or a detection device failure (in minutes).

Note: *When an error or accident is detected on the KNX installation, InZennio Z38i will show the "Technical Alarms Screen", and a danger icon will appear in the box affected; at the same time, the Panel blinks and emits a "beep" to warn the user.*

Once the warning reception is confirmed by the user (pressing the OK button), the screen will recover its normal state.

After 90 seconds, InZennio Z38i display will show again the "Home" default screen.

*It is **Really Important** to know that confirming a warning does not make the Danger icon disappear from the box affected; this icon will only disappear from the screen when the detector device sends again to the BUS its "normal status". If cyclical monitoring is enabled, it will be the own device which sends this status when danger disappears.*

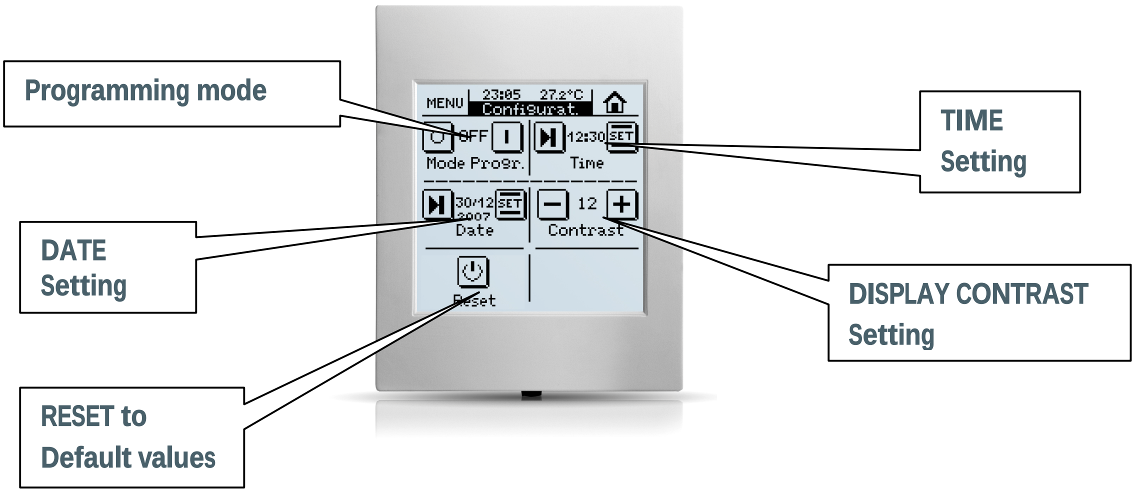
2.2.4. CONFIGURATION

This is a specific page where the user can adjust some basic parameters of the screen (time, date, contrast, etc.).

Every "enabled" Box in the display has a parameterizable field:

> **NAME** → This field allows a user to associate a name with the corresponding box in the display, (11 free characters are available to set the name).

The following picture shows the aspect of the "Configuration Page".



Next, the different function of each box in the "Configuration Page" is described:

Note: *The disabled boxes are configured as blank boxes in the Page.*

> **BOX 1 (Programming Mode):** When programming a device physical address, users can set the **"Programming Mode"** directly from this box. This characteristic makes this process easier as the user won't need to

access the rear side of the panel to push the “Programming Button” any more.

BOX 2 (Time Setting): This box allows setting the time in the Touch Panel. It must be taken into account the next characteristics:

- Time (together with the room temperature) is always displayed in the middle upper section of the display.
- When setting the time, the display will send the new settings to the BUS through its own Communication Objects.
- The refresh rate is 1 minute.
- When the display recovers from a BUS Power failure, this will show the time it had just before the incident.

Note I: *When a Power BUS failure occurs, please have on mind the delay this implies to correct it*.

Note II: *There are different KNX devices on the market which can synchronize periodically the time and date of every single device in the installation. Such devices can be really useful when the installation is based on any kind of Schedule programming.*

BOX 3 (Date Setting): Allows setting the date in the display.

To see the date in the display, users only have to press on any of the enabled pages **“header”**. The date will be shown during 3 seconds.

Note: *The day of the week does not appear on the display; however, when programming the display, this is automatically configured when setting the date.*

BOX 4 (Display Contrast Setting): The adjustment range for this function lies between 0 and 20. The default value is 12.

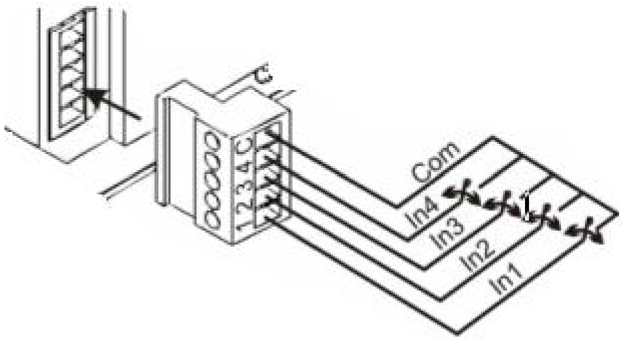
BOX 5 (Reset): After a “Reset” in the display, or after a Bus failure, the display will show the same time that it had before these two events.

Note I: *It is necessary to **press continuously** the button for a **few seconds** to apply the Reset correctly.*

Note II: *Take into account that after the reset a few seconds delay could take place respecting correct time; whereas after a bus failure this delay can be much bigger (it depends on the duration of the bus failure).*

2.3. INPUTS

InZennio Z38i has **4 binary inputs** for voltage-free contacts at the user's disposal; these inputs can be individually configured, and connected to a "push button" or a switch/sensor.



Joining an input with the global "common" of the inputs, results in a "**Closed Contact**"; the other option is an "**Open Contact**".

2.3.1. PUSH BUTTON

A push button connected to an input consists of a device, which allows, or not, the current flow while this is being pushed; in normal conditions, push buttons contacts are always open.

Depending on the **"Threshold Time"** (time that takes a pulsation), we can distinguish two different actions:

- Short Press
- Long Press

Typical key press devices, as keyboards, are used to be configured as push button inputs.

Available configuration options for the enabled "**inputs**" are detailed next:

2.3.1.1. SHORT PRESS

Several configuration options are available for a "Short Press" on an Input:

<u>ONE BIT SENDING "0/1"</u>

This function results on sending 1 bit to the BUS.

RESPONSE → Depending on the function parameterization, the value sent to the BUS will be, "0", "1" or an alternative switching between "0 and 1".

CYCLICAL RESPONSE SENDING → This parameter allows a user to choose the cyclically data sent, "0", "1" or both (if the option "Always" is selected").

Period: Defines the elapsed time between two consecutive sends in the "Cyclical Sending".

SHUTTER CONTROL

This function results on sending 1 bit to the BUS in order to control shutters.

RESPONSE → The corresponding Control Object may be used to:

- Up: Raise the shutter. The BUS receives a "0".
- Down: Lower the shutter. The BUS receives a "1".
- Up/Down (switched): Alternative switching between the Pull Up/Down orders (to manage the shutter with an only input).
- Stop/Step up: Stops the shutter. When talking about shutters with lamellas, this mode allows the user to control them; this parameter moves lamellas a pull up step. The BUS receives a "0".
- Stop/Step down: Stops the shutter; when talking about shutters with lamellas, this mode allows the user to control them; this parameter moves lamellas a pull down step. The BUS receives a "1".
- Stop/Switched step: Stops the shutter; when talking about shutters with lamellas, this mode allows the user to control them; this parameter alternatively switches the lamellas pull up and down steps.

<u>**Note I:**</u> *The **"Stop shutter"** configuration include 3 options of **step up**, **step down** and **switched step** to lamellas control; but if the shutter does not have directional lamellas available, any of the three options will stop the shutter.*

<u>**Note II:**</u> *If the option **up/down (switched)** is chosen to short press, "**stop shutter**" action will not be able to be done in any point of the trajectory with other short key press over the same input*.

DIMMER CONTROL

This function results on sending a 4 bits Dimming Control Object to the BUS.

RESPONSE → Depending on the chosen option, the Control Object may be:

- Light ON: Turn the light ON. The BUS receives a “1”.
- Light OFF: Turn the light OFF. “The BUS receives a “0”.
- Light ON/OFF (switched): Alternative switching between the ON/OFF orders (to manage the lighting level with an only input).
- Brighter: Every press on the screen increases the lighting level; this parameter depends on the “Dimming Step” set, (See below).

  A short press reduces the lighting level; a second press stops the “Increase”.
- Darker: Reduces the lighting level with every press on the screen, this parameter depends on the “Dimming Step” set, (See below).

  A short press reduces the lighting level; a second press stops the “Reduction”.
- Brighter/Darker (switched): Alternative Switching between the orders Increase and Reduce Light level.

DIMMING STEP → Depending on the value selected, different lighting levels are offered. Once selected the “DIMMER CONTROL” option, it is necessary to set this parameter.

Dimming Step	Necessary pulsations for a complete regulation (0-100%)
(1). 100%	1
(2). 50%	2
(3). 25%	4
(4). 12.5%	8
(5). 6.25%	16
(6). 3.1%	32
(7). 1.5%	64

SENDING A SCENE

This function results on sending a (1 byte) Scene Control Object to the BUS; a scene on the BUS may be managed with the input through this Object.

RESPONSE → Choose whether the scene will be "Run" or "Saved".

SCENE → This parameter identifies the scene to Run/Save with the corresponding Input.

2.3.1.2. LONG PRESS

Configuration options are exactly the same as in the previous case "Short Press".

2.3.1.3. THRESHOLD TIME

This parameter defines the time limit where a short press turns into a long press. If a press on the screen ends before the long press time, then it is a short press. This value must be set with precision to tenths of a second (e.g. to get "0.5" seconds, set "5").

2.3.1.4. RESPONSE DELAY

This parameter sets the time to wait for the object to be sent to the BUS since the action on the input took place. This value must be set with precision to tenths of a second (e.g. to get "1" second, set "10").

To get an immediate sending (no delay), set the value "0" in this field.

2.3.1.5. BLOCK

Selecting "Yes" on the pull down menu, the corresponding **"Block"** communication object will appear. This object will disable the input.

- When receiving a "1" through this object, the InZennio Z38i will ignore any pulsation on the input.
- When receiving a "0" through this object, the input turns into the "enabled" state again (without taking into consideration the actions carried out while being disabled).

2.3.2. SWITCH/SENSOR

A Switch/Sensor connected to an input, consists of an electrical mechanism which may have its contacts open or closed under normal conditions. These mechanisms don't recover their normal position automatically as with the push button.

A transition of a digital signal from low/high/low is called "Edge":

- **Falling Edge**: Closed contact to Open Contact.
- **Rising Edge:** Open contact to Closed Contact.

Voltage-free contacts of conventional sensors and relays, in general, are usually configured as switch/sensor input type.

By selecting a Switch/Sensor input, 1 bit "[Switch/Sensor] Edge" communication object will be sent to the bus every time a rising, falling or both edge (depending on the parameter selected) is detected.

2.3.2.1. RISING EDGE

Set the value to be sent to the BUS in the transition of the digital signal from low to high:

- 0
- 1
- Switching 0/1

2.3.2.2. FALLING EDGE

Set the value to be sent to the BUS in the transition of the digital signal from high to low:

- 0
- 1
- Switching 0/1

2.3.2.3. SENDING OF "0" DELAY

Time to wait before sending value "0" through the "**[Switch/Sensor] Edge**" communication object when this value has been detected on an incoming edge.

2.3.2.4. SENDING OF “1” DELAY

Time to wait before sending value “1” through the “**[Switch/Sensor] Edge**” communication object when this value has been detected on an incoming edge.

2.3.2.5. PERIODICAL SENDING OF “0”

Set a period of time to cyclically send value “**0**” to the BUS when object “**[Switch/Sensor] Edge**” detects this value on an incoming edge. If not cyclically sending is needed, please select value “**0**” in this field.

2.3.2.6. PERIODICAL SENDING OF “1”

Set a period of time to cyclically send value “**1**” to the BUS when object “**[Switch/Sensor] Edge**” detects this value on an incoming edge. If not cyclically sending is needed, please select value “**0**” in this field.

2.3.2.7. BLOCK

By selecting “Yes” on this field, a new Communication object “**Block**” appears on the ETS. This object can be used to disable an input.

- On receiving a “1” through this object, the panel will be ignoring any Edge on the input.
- On receiving a “0” through this object, the input recovers its enabled status, so it is ready to receive orders again (but actions taken on the input while being disabled will not be taken into account).

3. ANNEX I. COMMUNICATION OBJECTS

SECTION	NUMBER	SIZE	IN/OUT	FLAGS	VALUES RANGE	1st TIME	RESET	NAME	DESCRIPTION
GENERAL	0	3bytes	I/O	WT		0:00	Previous	Time	Current Time
	1	3bytes	I/O	WT		01/01/2000	Previous	Date	Current Date
	2	1byte	O	T		Any	Any	Scenes	One only object used by device
	3	2bytes	O	RT	0ºC 60ºC	Any	Any	Temperature	Internal sensor value
	4	1bit	I	W				Display Lighting	1=Light the Display 0=No action
	5	1bit	I	W		Any	Any	Touch Block	1=Touch Disabled; 0=Touch free
HOME & HOME II	6 - 17	1bit	O	T		Any	Any	[Home X Box X] Binary Control	1 bit generic control
		1bit	O	T		Any	Any	[Home X Box X] Light On/Off	0=Off; 1=On
		1bit	O	T		Any	Any	[Home X Box X] Move Shutter	0=Up; 1=Down
		1bit	O	T		Any	Any	[Home X Box X] Security Control	0=Deactivate;1=Activate
		1bit	O	T		Any	Any	[Home X Box X] Simulation Channel	0=Off;1=On
		1bit	O	T		Any	Any	[Home X Box X] Fan Control	0=Down; 1=Up
		1bit	O	T		Any	Any	[Home X Box X] Mode Control	0=Cool; 1=Heat
		1bit	O	T		Any	Any	[Home X Box X] Swing Control	1=Swing;0=Stop/Step
	18 – 29	1bit	I	WU		0	Previous	[Home X Box X] Binary Indicator	1 bit generic indicator
		1bit	I	WU		0	Previous	[Home X Box X] Light Indicator	0=Off; 1=On
		1bit	I	WU		0	Previous	[Home X Box X] Security Indicator	0=Disarmed;1=Armed
		1bit	I	WU				[Home X Box X] Mode Indicator	0=Cool; 1=Heat
		1bit	I	WU				[Home X Box X] Swing Indicator	1=Swing; 0=Stop/step
	30-41	1 bit	I	T		Any	Any	[Home X Box X] Stop Shutter	0 or 1 -> Stop
		1 bit	I	T		Any	Any	[Home X Box X] Presence Simulation	0=Disabled;1=Enabled
	42-53	4bits	O	T		Any	Any	[Home X Box X] Light dimming	4 bits Dimmer control
	54-65	1byte	O	T		Any	Any	[Home X Box X] Precise Light Dimming	1 byte precise dimmer control
			O	T		Any	Any	[Home X Box X] 1 byte Control	1 byte generic control
			O	T		Any	Any	[Home X Box X] Mode Control	0=Aut;1=Heatl;3=Cool;9=Fan; 14=Dry;
	66-77	1byte	I	WU		0	Previous	[Home X Box X] Light Indicator	0%=Off; 100%=On
			I	WU		0	Previous	[Home X Box X] Shutter Position	0%=Up; 100%=Down
			I	WU		0	Previous	[Home X Box X] Mode Indicator	0=Auto; 1=Heat; 14=Dry;9=Fan;3=Cool
			I	WU				[Home X Box X] Fan Indicator	0%: Auto;1-33%: Minimum;34-66%: Medium;>67%: Maximum
			I	WU				[Home X Box X] Fan Indicator	0=Auto; 1=Minimum; 2=Medium; 3=Maximum
			I	WU				[Home X Box X] 1 Byte Indicator	1Byte generic Indicator
	78-89	2bytes	O	T	0ºC-95ºC	Any	Any	[Inicio X Casilla X] temperature Control	from 0ºC to 95ºC
	90-101	2bytes	I	WU	0ºC-95ºC	25ºC	Previous	[Home X Box X] Floating Point Indicator	From -273ºC to 670760ºC From 0 to 670760 m/s From 0% to 670760% From 0 lux to 670760 lux From -670760 to 670760
			I	WU				[Home X Box X] Temperature Indicator	From 0ºC to 95ºC
SPECIFIC X (PROGRAMMING)	102-117	1 bit	O	T				[Program X Box X] Channel	Linked to Timer Pages

SECTION	NUMBER	SIZE	IN/OUT	FLAGS	VALUES RANGE	VALUES 1st TIME	VALUES RESET	NAME	DESCRIPTION
SPECIFIC X (CLIMA)	102-105	1 bit	O	RT				[Clima X] ON/OFF sending	0=Off; 1=On
	106-109	1 bit	O	T				[Clima X] Fan sending	0=Down; 1=Up
	110-113	1 bit	O	RWTU				[Clima X] 1 bit Sending	1=Swing; 0=Stop/Step
	114-117	1 bit	O	RWTU				[Clima X] Mode sending	0=Cool; 1=Heat
	118-121	1 byte	O	RWTU				[Clima X] Mode sending	0=Auto; 1=Heat; 14=Dry; 9=Fan; 3=Cool
	122- 125	2 Bytes	O	RT				[Clima X] Setpoint sending	Value sent to the machine
	126-129	1 bit	O	WTU				[Clima X] ON/OFF reception	0=Off; 1=On
	130-133	1 Byte	I	WTU				[Clima X] Fan reception	0%=Auto; 1-33%: Min; 34-66%: Med; >67%: Max
								[Clima X] Fan reception	0=Auto; 1=Mín; 2=Med; 3=Max
	134-137	1 bit	I	WU				[Clima X] 1 bit reception	1=Swing;0=Stop/Step
	138-141	1 bit	I	WU				[Clima X] Mode reception	0=Cool; 1=Heat
	142-145	1 Byte	I	WU				[Clima X] Mode reception	0=Aut;1=Heat;3=Cool;9=Fan; 14=Dry
	146-149	2 Bytes	I	WU				[Clima X] Setpoint reception	Value returned by the machine
	150-153	2 Bytes	I	WU				[Clima X] External Sensor Temperature	External sensor measure
	154-157	1 bit	I	WT				[Clima X] Comfort Mode	1=Set Mode; 0=Nothing
	158-161	1 bit	I	WT				[Clima X] Night Mode	1=Set Mode; 0=Nothing
	162-165	1 bit	I	WT				[Clima X] Stand-by Mode	1=Set Mode; 0=Nothing
	166-173	1bit	O	T				[Clima X] Control Variable (Cool/Heat)	2 points control
								[Clima X] Control Variable (Cool/Heat)	Proportional Integral PWM
	174-181	1byte	O	T				[Clima X] Control Variable (Cool/Heat)	Proport. Integral (Continuous)
	182-189	1 bit	O	T				[Clima X] Additional Heat/Cool	Temp>(Set+Band)="1"
	230-233	1 bit	I	W				[Clima X] Heating/Cooling Atomatic Switching	1=Enable;0=Disable
	190-195	1bit	I	WU		No alarm	Previous	[Tech Alarms; Box X] Alarm	Trigger value (0/1) -> Alarm
SPECIFIC 5 (TECHNICAL ALARMS)	196-201	1bit	I/O	WT		Any	Any	[Tech Alarms; Box X] Confirm	1=Alarm Confirm; 0=No Action
	202-205	1bit	I	W	0/1	0	Previous	[Ix] Block	1=Disabled; 0=Free
INPUTS	206-213	1bit	O	WT	0/1	0	Previous	[Ix] [Short Press] "0"	Short Pr. > Sending of "0"
								[Ix] [Long Press] "0"	Long Pr. > Sending of "0"
								[Ix] [Short Press] "1"	Short Pr. > Sending of "1"
								[Ix] [Long Press] "1"	Long Pr.> Sending of "1"
								[Ix] [Short Press] Switching	Short Pr. > Switching 0/1
								[Ix] [Long Press] Switching	Long Pr. > Switching 0/1
								[Ix] [Short Press] Move Up Shutter	Short Pr. > Sending of 0 (Up)
								[Ix] [Long Press] Move Up Shutter	Long Pr.> Sending of 0 (Up)
								[Ix] [Short Press] Move Down Shutter	Short Pr. >Sending of 1 (Down)
								[Ix] [Long Press] Move Down Shutter	Long Pr.>Sending of 1 (Down)
								[Ix] [Short Press] Move Up/Down Shutter	Short Pr. > Switching 0/1
								[Ix] [Long Press] Move Up/Down Shutter	Long Pr.> Switching 0/1
								[Ix] [Short Press] Stop/Step Up Shutter	Short Pr. > Sending of "0"
								[Ix] [Long Press] Stop/Step Up Shutter	Long Pr.> Sending of "0"
								[Ix] [Short Press] Stop/Step Down Shutter	Short Pr. > Sending of "1"
								[Ix] [Long Press] Stop /Step Down Shutter	Long Pr.> Sending of "1"
								[Ix] [Short Press] Stop/Step Shutter (switched)	Short Pr. > Switching 0/1

SECTION	NUMBER	SIZE	IN/OUT	FLAGS	VALUES RANGE	VALUES 1st TIME	VALUES RESET	NAME	DESCRIPTION
INPUTS								[Ix] [Long Press] Stop/Step Shutter (switched)	Long Pr.> Switching 0/1
								[Ix] [Short Press] Dimmer ON	Short Pr. > Sending of 1 (ON)
								[Ix] [Long Press] Dimmer ON	Long Pr.> Sending of 1 (ON)
								[Ix] [Short Press] Dimmer OFF	Short Pr. > Sending of 0 (OFF)
								[Ix] [Long Press] Dimmer OFF	Long Pr.> Sending of 0 (OFF)
								[Ix] [Short Press] Dimmer ON/OFF	Short Pr. > Switchingn 0/1
								[Ix] [Long Press] Dimmer ON/OFF	Long Pr.> Switching 0/1
								[Ix] [Sensor] Edge	Edge → Sending of "0" or "1"
	214-221	4bits	O	T	0 -15	Any	Any	[Ix] [Short Press] Brighter	Short Pr. >Bright; Short Pr. >Stop
								[Ix] [Long Press] Brighter	Long Pr. >Bright; Long Pr. >Stop
								[Ix] [Short Press] Darker	Short Pr. >Dark; Short Pr. >Stop
								[Ix] [Long Press] Darker	Long Pr. >Dark; Long Pr. >Stop
								[Ix] [Short Press] Brighter/Darker	Short Pr. -> Bright/Dark; Short Pr. -> Stop
								[Ix] [Long Press] Brighter/Darker	Long Pr. >Bright/Dark; Long Pr. >Stop
	222-229	1byte	O	T	0-63 128-192	Any	Any	[Ix] [Short Press] Run Scene	Short Pr. > Sending of 0-63
								[Ix] [Long Press] Run Scene	Long Pr.> Sending of 0-63
								[Ix] [Short Press] Save Scene	Short Pr. > Send. of 128-191
								[Ix] [Long Press] Save Scene	Long Pr.> Send. of 128-191

4. ANNEX II. INDIVIDUAL CONTROLS

BINARY

(1) – Turn Off
(2) – Turn On
(3) – Turn Off 2
(4) – Turn On 2
(5) – Turn Off 3
(6) – Turn On 3

(7) – Turn Off Light
(8) – Turn On Light
(9) – Turn Off Light 2
(10) – Turn On Light 2
(11) – Exit
(12) – In

(13) – Cancel
(14) – Accept
(19) – Off
(20) – On
(21) – Disarmed
(22) – Armed

DIRECTIONAL & INCREMENTAL

(30) – Down
(31) – Up
(32) – Left
(33) – Right
(34) – Down Arrow
(35) – Up Arrow

(36) – Left Arrow
(37) – Right Arrow
(38) – Lower Shutter
(39) – Raise Shutter
(40) – Lower Shutter 2
(41) – Raise Shutter 2

(50) – Minus
(51) – Plus
(52) – Lower Temperature
(53) – Raise Temperature

AIR CONDITIONING

(70) – Turn Off
(71) – Turn On
(72) – Cool Mode
(73) – Heat Mode
(74) – Auto Mode
(75) – Fan Mode
(76) – Dry Mode

(77) – Very Low Fan
(78) – Low Fan
(79) – Medium Fan
(80) – High Fan
(81) – Very High Fan
(82) – Stop Blades
(83) – Move Blades

(84) – Stop
(85) – Move Blades 2
(86) – Auto
(87) – Auto 2
(88) – Auto 3
(89) – Auto 4

NUMBERS

(100) – Zero
(101) – One
(102) – Two
(103) – Three
(104) – Four

(105) – Five
(106) – Six
(107) – Seven
(108) – Eight
(109) – Nine

(110) – 0
(111) – 1

SOUND & IMAGE

(150) – Stop
(151) – Play
(152) – Rewind
(153) – Forward
(154) – Before
(155) – Next
(156) – Record
(157) – Pause
(158) – Eject
(159) – Lower Volume
(160) – Raise Volume
(161) – Mute
(162) – Sound On
(163) – TV
(164) – Audio/Video
(165) – AUX
(166) – Movie
(167) – Clapperboard

OTHER

(200) – Clock 1
(201) – Clock 2
(202) – Clock Off
(203) – Clock On
(204) – Clock Off 2
(205) – Clock On 2
(206) – Set
(207) – Ok
(208) – Comfort
(209) – Night
(210) – Out
(211) – Strong
(212) – Very Strong
(217) – Key 1
(218) – Key 2
(219) – New

5. ANNEX III. DOUBLE CONTROLS

BINARY

(1) – Turn Off / On

(3) – Turn Off / On 2

(5) – Turn Off / On 3

(7) – Turn Off / On Light

(9) – Turn Off / On Light 2

(11) – Out/In

(13) – Cancel/Accept

(19) – Off/On

(21) – Disarmed/Armed

DIRECTIONAL & INCREMENTAL

(30) – Down/Up

(32) – Left/Right

(34) – Down/Up Arrow

(36) – Left/Right Arrow

(38) – Lower/Raise Shutter

(40) – Lower/Raise Shutter 2

(50) – Minus/Plus

(52) – Lower/Raise Temp

AIR CONDITIONING

(70) – Turn On/Off A/C

(72) – Cool/Heat

(79) – Minus/More Fan

(82) – Stop/Swing Blades

(84) – Stop/Swing Blades 2

NUMBERS

(100) – Zero/One

(102) – Two/Three

(104) – Four/Five

(106) – Six/Seven

(108) – Eight/Nine

(110) – 0/1

SOUND & IMAGE

(150) – Stop/Play

(152) – Rewind/Forward

(154) – Before/Next

(159) – Minus/More Volume

(161) – Sound Off/On

(163) – TV/AV

OTHER

(202) – Clock Off/On

(204) – Clock Off/On 2

(211) – Strong/Stronger

(217) – Key 1/Key 2

6. ANNEX IV. INDICATORS

BINARY

- (1) – Off
- (2) – On
- (7) – Light Off
- (8) – Light On
- (9) – Light Off 2
- (10) – Light On 2
- (13) – Rejected
- (14) – Ok
- (15) – Open Door
- (16) – Closed Door
- (17) – Open Window
- (18) – Closed Window
- (19) – Off
- (20) – On
- (21) – Disarmed
- (22) – Armed

DIRECTIONAL & INCREMENTAL

- (38) – Lowering Shutter
- (39) – Raising Shutter
- (40) – Lowering Shutter 2
- (41) – Raising Shutter 2

AIR CONDITIONING

- (70) – A/C Off
- (71) – A/C On
- (72) – Cool Mode
- (73) – Heat Mode
- (74) – Auto Mode
- (75) – Fan Mode
- (81) – Very High Fan
- (82) – Stopping Blades
- (83) – Moving Blades
- (84) – Stop
- (85) – Moving Blades 2
- (86) – Auto

(76) – Dry Mode

(77) – Very Low Fan

(78) – Low Fan

(79) – Medium Fan

(80) – High Fan

(87) – Auto 2

(88) – Auto 3

(89) – Auto 4

NUMBERS

(100) – Zero

(101) – One

(102) – Two

(103) – Three

(104) – Four

(110) – 0

(105) – Five

(106) – Six

(107) – Seven

(108) – Eight

(109) – Nine

(111) – 1

SOUND & IMAGE

(161) – Sound Off

(162) – Sound On

OTHER

(200) – Clock 1

(201) – Clock 2

(202) – Clock Off

(203) – Clock On

(204) – Clock Off 2

(205) – Clock On 2

(206) – Set

(207) – Ok

(208) – Comfort

(209) – Night

(210) – Out

(211) – Strong

(212) – Very Strong

(213) – Danger

(214) – Danger Cold

(215) – Danger Hot

(216) – Danger Wind

(217) – Key 1

(218) – Key 2

(219) – New

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