



ZAS

KNX Room Controller

ZN1VI-TPZAS



Edition 1
Version 1.0

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1. INTRODUCTION

ZAS is a simple and analog room controller that includes thermostat, IR receiver and analog/binary inputs. ZAS is a great solution for demanding applications in hotel rooms and apartments since it is able to manage climate, shutters, lights... and all through an intuitive and modern touch panel.



Figure 1 Room Controller ZAS

Device Characteristics:

- 1.8" black-lighted display: 128 × 64 pixels
- Temperature sensor with thermostat function.
- It has 12 tactile buttons
- Screensaver showing the hour and temperature measured by ZAS, with the suitable letter size for its reading from several meters away.
- The menu in the display offers several submenus:
 - ✓ Climate control
 - ✓ Scenes control
 - ✓ Presence simulation
 - ✓ Security

✓ General configuration

- Different types of status indicators: binary, 1-byte, floating, etc, and, moreover, texts for the options of the menus, name of controls, binary values, etc, can be pre-defined by parameter.
- Each button of the device counts on a LED that lights during 2 seconds for showing that the key-press has been correctly done. Moreover, ZAS will beep every time one button is pressed or the display is touched.
- It includes two opto-coupled A/D inputs. The digital input operates as switch/sensor (detection of rising and falling edges) and the analog input allows the connection of one temperature probe.
- CE compliant.

2. INSTALLATION

2.1. ZAS INSTALLATION

ZAS is connected to the KNX installation as any other KNX device, through the KNX connector placed in its rear part.

For installing ZAS, first it is necessary to fix the metallic piece into the squared/rounded standard box where it is going to be installed, with the corresponding screws.

Next, the KNX bus and the inputs terminal must be connected using the corresponding connectors; both terminals are placed in the rear part of the device.

Once inputs and bus KNX are connected, the device is fitted in the metal platform thanks to the magnets that includes.

Finally, it is necessary to check, by the side, that nothing unless the ZAS outline can be seen (the metal platform should be completely hidden by ZAS).

This device does not need any additional external power supply since it is powered through the KNX bus.

For further information about the installation and technical characteristics, look up the ZAS Datasheet, available at www.zennio.com and in the packaging of the product.

Elements Description

Nº	Description
1	EIB Connector
2	Temperature sensor
3	Programming button
4	Programming LED
5	Inputs
6	Magnet
7	Tactile area
8	Display
9	IR Receiver

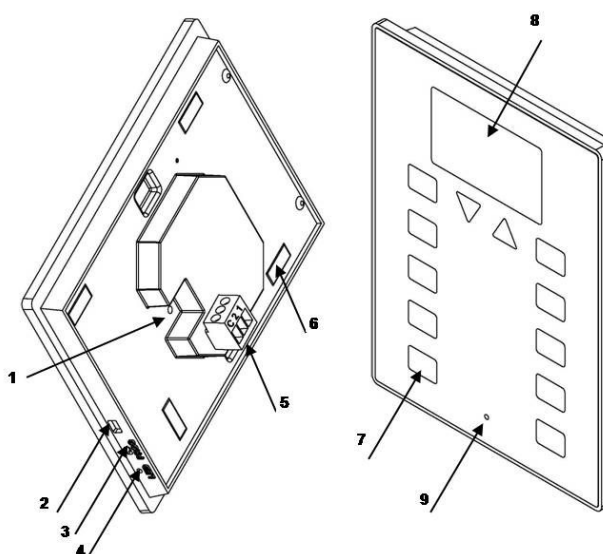


Figure 2 Elements description

3. DISPLAY MANAGEMENT

ZAS counts on 12 tactile buttons for controlling all its functionalities.



Figure 3 ZAS Front view

The first row of buttons consists of the button *Menu* that allows the direct access to the menu, two arrow-shaped buttons that allows to scroll up and down through the different options of the menu and increasing/decreasing the temperature (configurable temperature control by parameter), and the button *OK* that allows selecting the desired option.

Within any submenu, for returning to the previous one, it is necessary to press the button *Menu* or the “arrow” icon that will appear in the upper right corner of the display. Likewise, in the upper right corner a “cross” icon, that allows directly going out of the menu.

The menu of the display offers several submenus:

- Climate control
- Scenes control
- Presence simulation
- Security
- General configuration

Each submenu allows to access the functionalities configured by parameter with the program ETS.

Under this first row of buttons, there are 8 buttons, arranged in 4 rows of two buttons each one. The buttons of these rows can be configured by means of the ETS in

order to operate either independently or in couple implementing joint functions (binary control, temperature control, light, etc). Moreover, when these buttons are pressed the text message, previously configured in the ETS for every action, will appear in the display. Once the message is shown in the display, ZAS will automatically return to the submenu shown in the display before carrying out the action or the screensaver if it was active.

Each button counts on a LED that lights during 2 seconds for showing that the key-press has been correctly done.

Moreover the device will beep every time one button is pressed or the display is touched.

4. IR CONTROL

ZAS has a remote control (optional) that allows the control of the functions from distance.

Moreover, it counts on a series of buttons that directly activates some special functions such as scenes, special thermostat modes, 1-bit object sending, etc.

The [Figure 4 Remote control](#) shows the front view of the remote control.

First row of buttons matches up with the first row of buttons of the own ZAS, both in position and functionality. It has the keys **Menu**, two keys **Arrows** and the key **OK**.

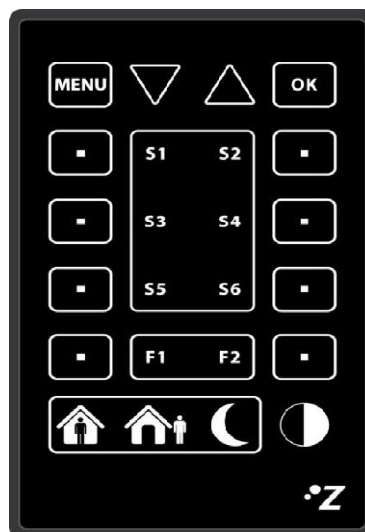


Figure 4 Remote control

Functions associated to the buttons in the most external lateral columns match up with the rows of buttons of the device.

Besides the described buttons that have their equivalent button in the touch panel, the remote control counts on the following keys which directly activate special functions:





- **Buttons S1-S6:** they activate the configured scenes for the submenu “scenes” (scenes 1-6). Unlike ZAS, the remote control only allows executing scenes but not saving them.
- **Buttons F1-F2:** they allow sending 1-bit object configurable from ETS for sending a “0”, a “1” or switching between “0” and “1”.
- **Buttons Comfort/Night/Standby:** they allow directly establishing the special thermostat modes *Comfort/Night/Standby*. It is necessary that these modes had been previously enabled in ETS (thermostat).

- **Button *Switch off*:** it switches off the luminosity of the device. One press on the display or pressing a key of the remote control will activate the default luminosity of the device.

When pressing a key of the remote control, besides executing the associated function, ZAS will show the corresponding text message of that function. Once the message of the action has been shown, the display automatically returns to the submenu shown before pressing the button or the screensaver if it was active.

5. CONFIGURATION

The configuration of ZAS is carried out with the program ETS and it is organized in the following sections:

-  **General**
-  **General labels**
-  **Inputs**
-  **Buttons**

In the following sections the configuration of each option will be detailed.

5.1. GENERAL

The general configuration allows enabling the different general functions of ZAS as well as defining the texts to appear on the display when executing them:

Functions

The section *Functions* allows enabling the following general functionalities:

Luminosity

This functionality allows establishing different luminosity levels for ZAS when being in normal operation screensaver.

Moreover, it offers the possibility of configuring two additional special levels of luminosity that can be activated using 1-bit objects or scenes. These special levels are configured by parameter.

Touch blocking

The buttons can be blocked using 1-bit objects, scenes or automatically establishing the interval of time that must pass since the last key-press until the automatic blocking takes place (time to block).

In the same way, the buttons can be configured for being unblocked using a scene, sending 1-bit object or simply pressing the display that will also send a welcome object.

It is also possible configuring the blocking of the remote control at the same time with the ZAS blocking.

Initial updating

This functionality allows re-establishing the value of the general indicators as well as the values of the 1-bit objects associated to the buttons, after a power failure. Moreover, this functionality allows establishing a delay for sending the initial values since the power is recovered.

Remote control

ZAS counts on a remote control that can be enabled/disabled by parameter.

Each button of the room controller has its equivalent button in the remote control (See [IR Control](#)). Besides them, the remote control has several buttons that allow the execution of special functions.

Internal temperature sensor

ZAS has an internal temperature probe with an associated communication object. This communication object can be configured for being periodically sent to the bus or after a temperature change.

Screens

In the section *Screens*, the screensaver can be enabled for showing the hour, the temperature or both of them, alternating the data every 4 seconds.

On the other hand, the menu and the general indicators of the device can be enabled for their configuration:

General indicators

ZAS allows the configuration of up to 6 indicators that will be shown in the display every time the display is pressed or after the execution of an action associated to a key-press.

Each indicator has associated one communication that, when it is received by the device through the bus, will show the pre-configured text message for each indicator (name of indicator) and the value of the communication object in the display.

There are 5 types of indicators:

- ✓ **Binary** (1 bit): it shows different texts according to the received value.
- ✓ **Counter** (1 byte): it shows the received value (0-255).
- ✓ **Percentage** (1 byte): it shows the received value (0-100%).
- ✓ **Enumeration** (1 byte): it allows the introduction of up to 6 numerical values with their corresponding labels (configurable texts by parameter).

- ✓ **Float** (2 bytes): it shows the received value specifying the units (configurable text by parameter).

Menu

In the section *Menu*, the different options of ZAS can be enabled. When each of this option is enabled, it could be configured selecting the corresponding option in the lateral menu of the parameters edition.

Each option allows introducing the name that will be shown in the display when the menu is accessed:

❖ **Thermostat**

ZAS offers the option of activating the thermostat for the following:

- ✓ Heating: this option includes Freezing protection
- ✓ Cooling: this option includes Overheating protection.
- ✓ Heating and cooling

Moreover, ZAS allows selecting one or two temperature sources as reference temperature. In case of using two temperature sources, the values provided by these sources will be mixed in a proportion configurable by parameter.

Note: The internal temperature sensor can be used as reference temperature linking the corresponding communication objects with the same group addresses.

In this section, the special modes, Comfort, Night and Standby, can be enabled, and the initial configuration for the thermostat when the power is recovered. In the same way, customized text message can be introduced for each label. These messages will be shown in the display when the different thermostat functionalities are activated.

❖ **Escenas**

The scenes or “lifestyles” consist of a synchronized activation of some devices in the domotic installation, so that different predefined atmospheres are generated.

ZAS allows the configuration of up to 6 scenes that can be activated by means of one communication object, used for running or learning scenes.

It can be also introduced a text chain for each scene in order to be shown in the display when the corresponding scene is activated.

❖ Presence Simulation

This function is designed to simulate presence in a house.

It allows establishing the initial and the final hour of the simulation and the maximum and minimum duration of the switching on/off of the devices linked to the simulation.

❖ Security

By means of this functionality, the different menus and buttons can be protected against un-authorized access establishing a password that consists of a particular combination of key-presses.

For accessing the protected options of the menu or buttons, it will be necessary to press the established combination of buttons before pressing the protected button or selecting the desired option. Once the password has been introduced, the user has 60 seconds to access or activate the protected functionalities. After this period of time, the user will have to introduce the password again to activate the protected functions.

Moreover this menu allows introducing text messages for guiding the user in the process of password change, error messages, etc.

❖ Configuration

The menu *Configuration* allows enabling the following controls: contrast, time, programming LED, touch calibration and reset to the values of the last configuration, and assigning the name to be shown in the display to each control.

General labels

The section *General labels* allows introducing labels for options used in multiple menus: “On”, “Off”, “Scene”, “Saved scene”, and the text chains that will guide the calibration process.

Note: The touch calibration is carried out pressing the buttons 1, 2, 7 y 8, in this order. The display will indicate the buttons to press, showing the corresponding instructions.

5.2. INPUTS

ZAS has two A/D inputs that can be configured as:

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 do not 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.

When selecting an input as Switch/Sensor, it will be sent to the bus the 1-bit object "[Switch/Sensor] Sensor Edge" every time a falling or rising edge takes place (with the corresponding configured value by parameter).

This type of input allows also configuring a delay for sending the communication object as well as a cyclical sending and an automatic status sending after a power failure.

Temperature Sensor

A temperature sensor provides the real temperature measure of a room or place.

The ZAS application program allows configuring both inputs as temperature sensors and, in the menu *Thermostat*, configuring the measure provided by these temperature sensors as temperature references for the thermostat.

When configuring an input as temperature sensor, the temperature calibration temperature sending period, the minimum temperature change for sending the temperature value to the bus can be established.

Moreover freezing and overheating protection can be enabled.

5.3. BUTTONS

ZAS has 8 tactile buttons for general use, two arrow-shaped buttons (temperature control and scrolling) and two buttons for accessing the *Menu* and validating the selected options (OK).

The 8 buttons for general use, located in 4 rows of 2 buttons, can be configured in the following way:

Buttons for individual use

These buttons can be configured for sending 1-bit, a scene or 1-bit that sends different values when pressing and releasing the key.

Buttons for operating in couple

Buttons that are located in the same row can be configured to jointly operate implementing the following functions:

- ✓ Light Control
- ✓ Shutter Control
- ✓ Scalling Control
- ✓ Counter Control
- ✓ Enumeration Control
- ✓ Temperature Control

Each button of the device counts on a LED that lights during two seconds for indicating that the key-press has been correctly carried out. ZAS will also emit a “beep” every time a button is pressed.

The arrow-shaped buttons can be configured for controlling the setpoint temperature.

Note: A short key-press of the right button will increase 0.5°C the temperature while la the long key-press will increase 1 °C the temperature. In the same way, the left button will decrease the temperature.

6. PARAMETERIZATION

For carrying out the parameterization of the room controller ZAS, it is necessary, once the ETS is open, importing the product data base ZAS 1.0.vd2.

Next, ZAS must be added to the project where the device is required and, clicking the right button of the mouse on the device, the *Edition of Parameters* must be selected for beginning the configuration.

In the following sections there is a detailed description about the parameterization of the different functionalities of the device in ETS.

6.1. DEFAULT CONFIGURATION

This section shows the default configuration of the device.

When opening “*Edit parameters*” for the first time, the default **General** configuration will appear.

The following figure shows the appearance of the window General:

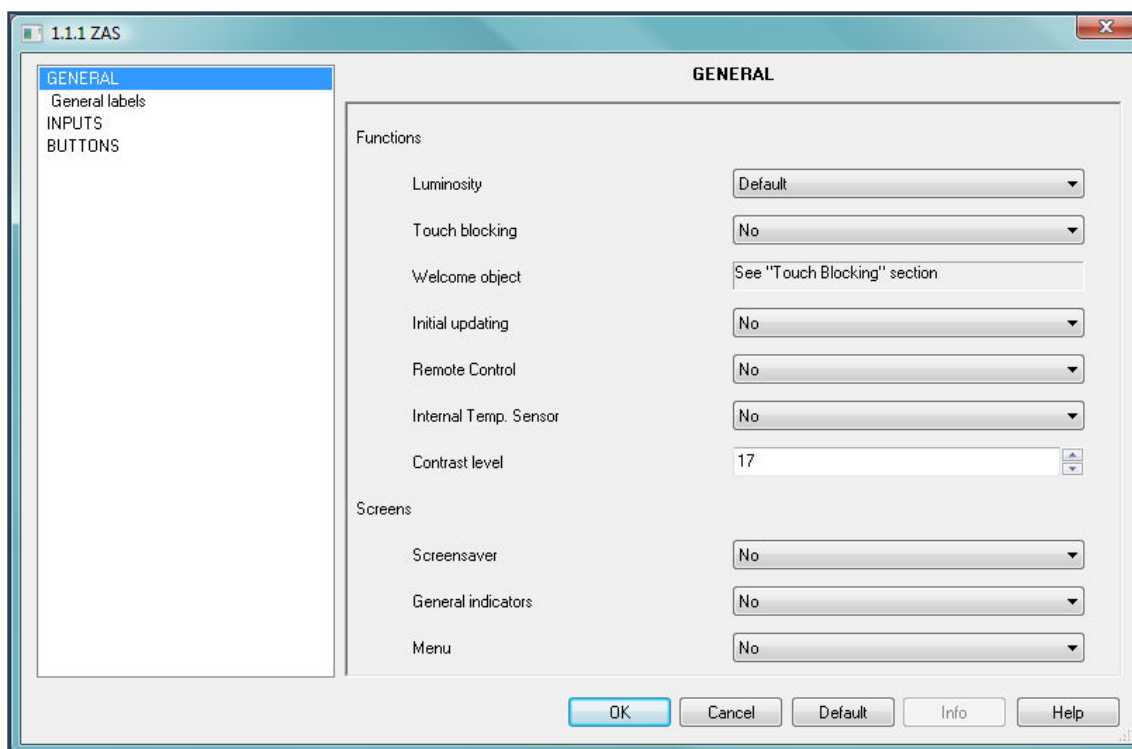


Figure 5 Default General configuration

If the **Inputs** and **Buttons** are selected, it will be seen that ZAS has two inputs and 8 buttons, disabled by default.

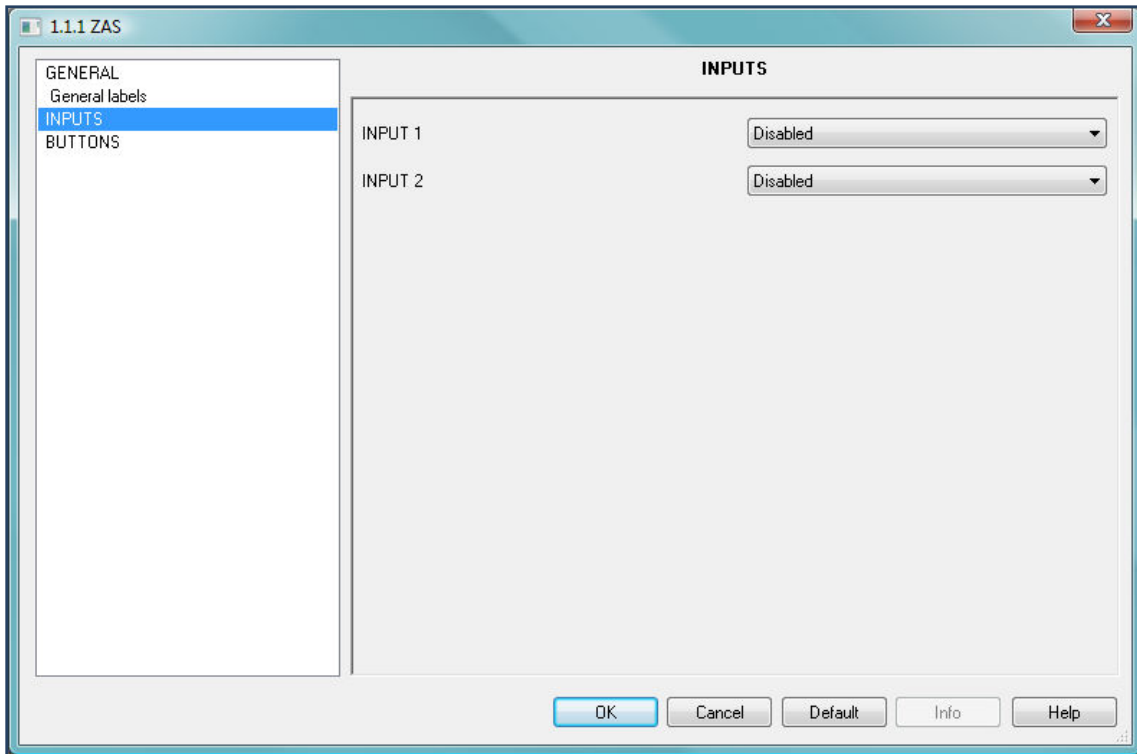


Figure 6 Default inputs configuration

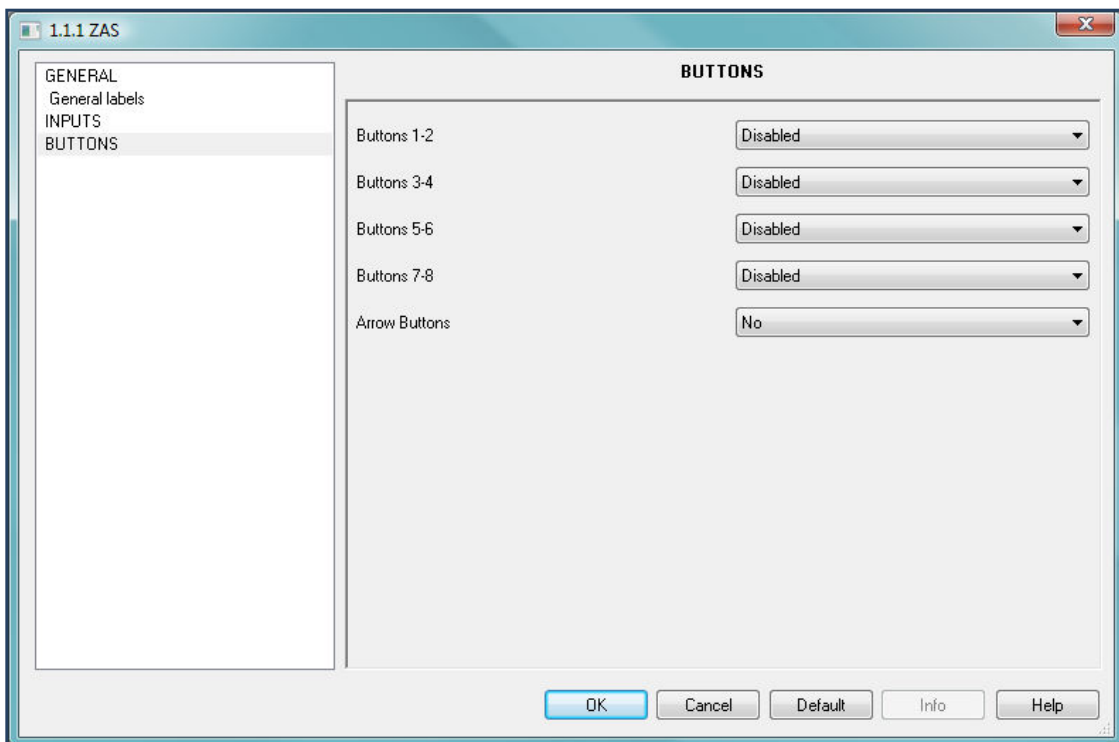


Figure 7 Default buttons configuration

Next figure shows the available **communication objects** by default: *Hour*, and the communication objects for sending and receiving *Scenes*.

Number	Name	Object Function	Length	R	W	T
0	[General] Time - Current	Current Time	3 Byte	-	W	T
1	[General] Scenes: receive	0-63 (Run scene 1-64)	1 Byte	-	W	-
2	[General] Scenes: send	0-63 (Run or save scene 1-64)	1 Byte	-	-	T

Figure 8 Available communication objects by default

6.2. GENERAL

The parameterization window *General* allows configuring the basic functionalities, menus and screens of the room controller ZAS.

GENERAL

GENERAL labels
Touch blocking
Remote
Internal Temp. Sensor
INPUTS
GENERAL INDICATORS
BUTTONS
MENU
Thermostat (Config.)
Heating
Cooling
Thermostat (Labels)
Configuration

FUNCTIONS

Luminosity: Default

Touch blocking: Yes

Welcome object: See "Touch Blocking" section

Initial updating: Yes

The general indicators will be initialized with a READ message

Delay [x 1sec.]: 2

Remote Control: Yes

Internal Temp. Sensor: Yes

Contrast level: 17

SCREENS

Screensaver: Time + Temperature

Time [x1sec.]: 30

General indicators: Yes

Header: Indicators







Menu: Yes

Header: Menu

Buttons: OK, Cancel, Default, Info, Help

Figure 9 General configuration

The basic functions that can be configured in the section *General* are the following:

-  Luminosity
-  Touch Blocking
-  Initial Updating
-  Remote Control
-  Internal Temperature Sensor
-  Contrast level

When the desired function is enabled in the scroll down menu located at the right of the name, the corresponding communication objects will be enabled and the access to the configuration window of the function will appear in the lateral menu.

Luminosity

This functionality allows carrying out a customized configuration of the luminosity when it is in normal operation and in screensaver mode:

- *Level while normal operation*: value between 1 (minimum luminosity) and 10 (maximum luminosity).
- *Level while screensaver*: value between 1 (minimum luminosity) and 10 (maximum luminosity).

Moreover it is also possible to configure two special levels of luminosity that can be activated using 1-bit communication objects or scenes. For these special levels it can be configured the following parameters:

- *Luminosity level*: value between 1 (minimum luminosity) and 10 (maximum luminosity).
- *Enabling*: using 1-bit communication object or scene.
- *Value*: luminosity value for the special level. This value can be “0” or “1”, in case of using 1-bit object or the number of the scene.

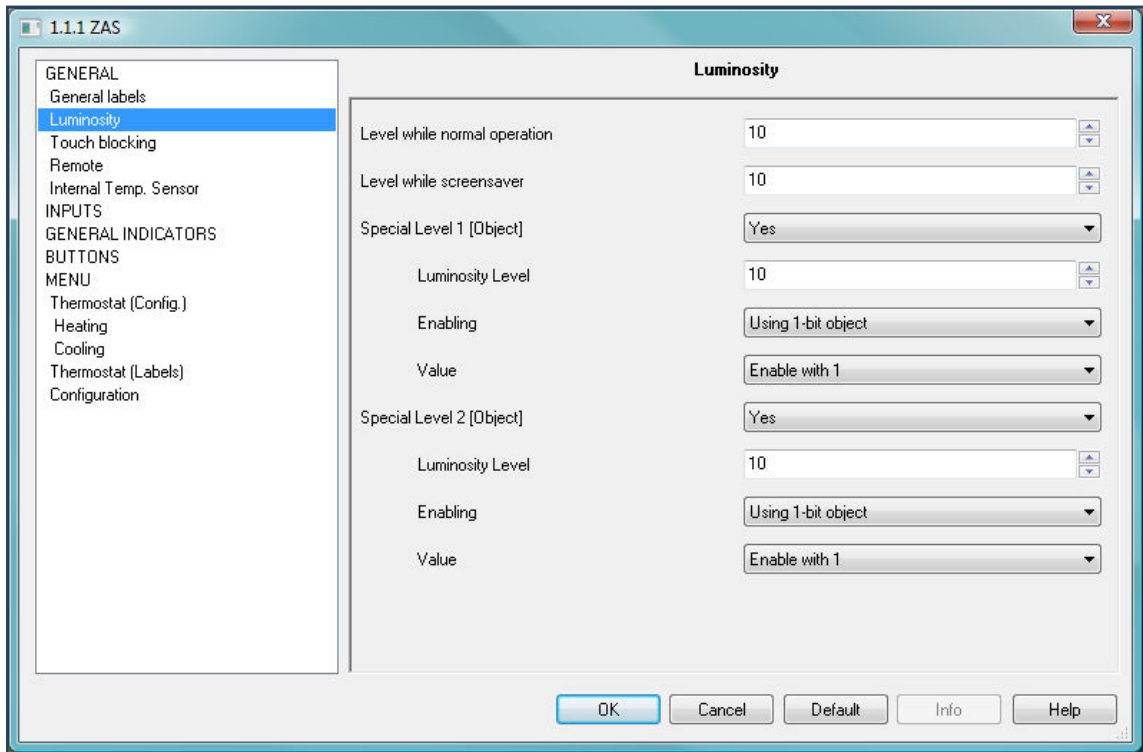


Figure 10 Luminosity configuration

Touch Blocking

This function allows blocking and unblocking of the buttons.

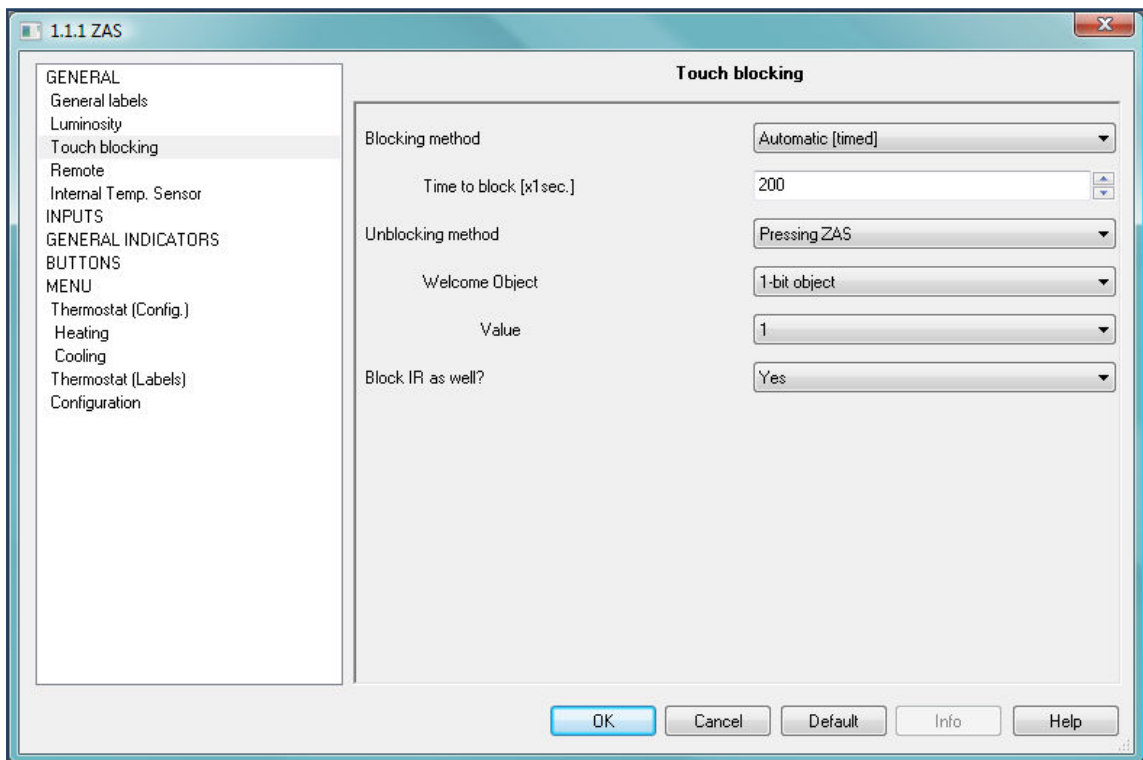


Figure 11 Touch blocking configuration

It can be configured different blocking and unblocking methods for the device:

- **Blocking method:** by means of 1-bit object (value “0” or “1”, configurable), scenes (configurable scene number) or automatic blocking establishing the time to pass between the last key-press and the automatic blocking. (time to block).
- **Unblocking method:** by means of 1-bit object (value “0” or “1”, configurable), scenes (configurable scene number) or pressing the ZAS which also allows a welcome object sending (1-bit object or scene).

In this option of the menu, the remote control can be configured to be blocked at the same time with the touch panel blocking.

- **Block IR as well?:** Yes or No.

Remote control

Enabling the function *Remote control*, it will directly enable the remote control operation.

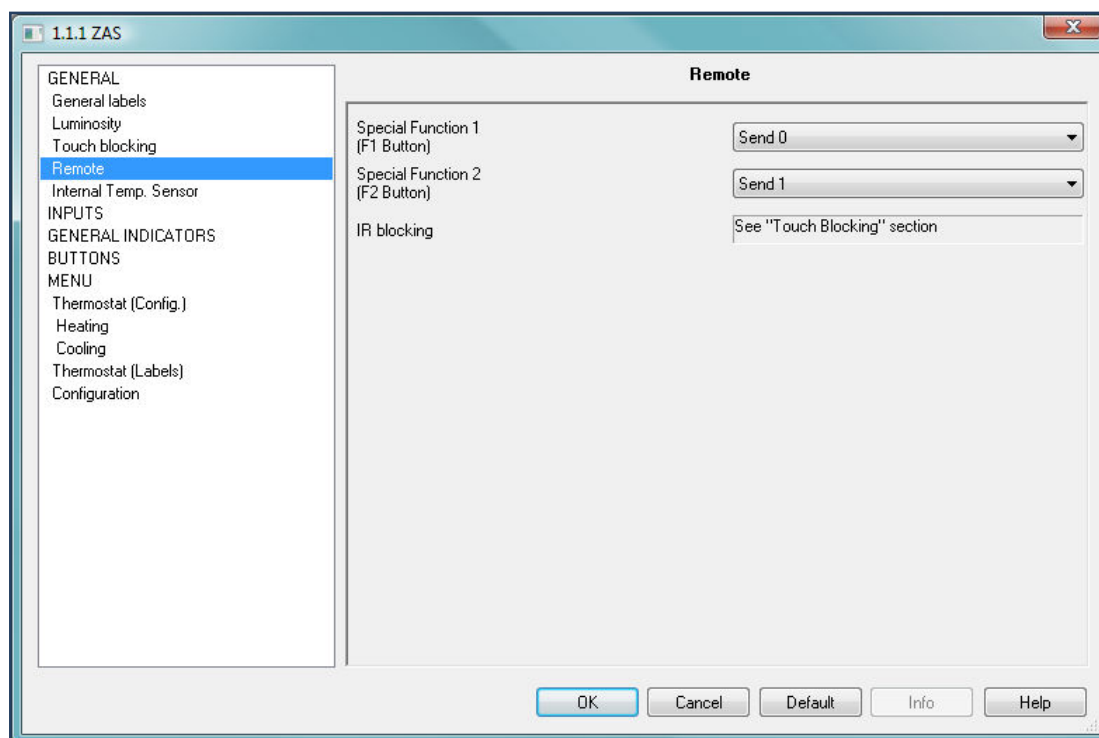


Figure 12 Remote control configuration

Moreover it will be enabled a window where configuring the buttons F1 and F2 of the remote control which executes special functions.

- **Special Function 1:** configurable for sending the value “1”, the value “0” or switching between these values.

- *Special Function 2*: configurable for sending the value "1", the value "0" or switching between these values.

Note: The remote control blocking is configured in the window *Touch Blocking*.

In case of **Initial Updating** and **Contrast Level**, once enabled, it is only necessary to directly introduce the desired delay and the contrast level in the window *General*.

- *Initial Updating*: Yes or No.
 - *Delay*: value between 0 and 255, in seconds.
- *Contrast Level*: value between 1 (minimum luminosity) and 10 (maximum luminosity)

Moreover, in the window *General* the different screens and general indicators can be enabled:

Screensaver

It allows configuring the information to show in the display when being in screensaver mode:

- ✓ Only Time
- ✓ Only Temperature
- ✓ Time + Temperature (switches between time and temperature every 4 seconds)

And the time interval, after the last key-press, that has to pass for entering in screensaver mode.

General Indicators

It enables a window where specifying up to 6 indicators of different types: binary, counter, percentage, enumeration and float.

According to the type of indicator, the application program allows introducing a series of additional data such as the indicator name (name that will be shown in the display for each indicator), a message or label for different status, units, etc.

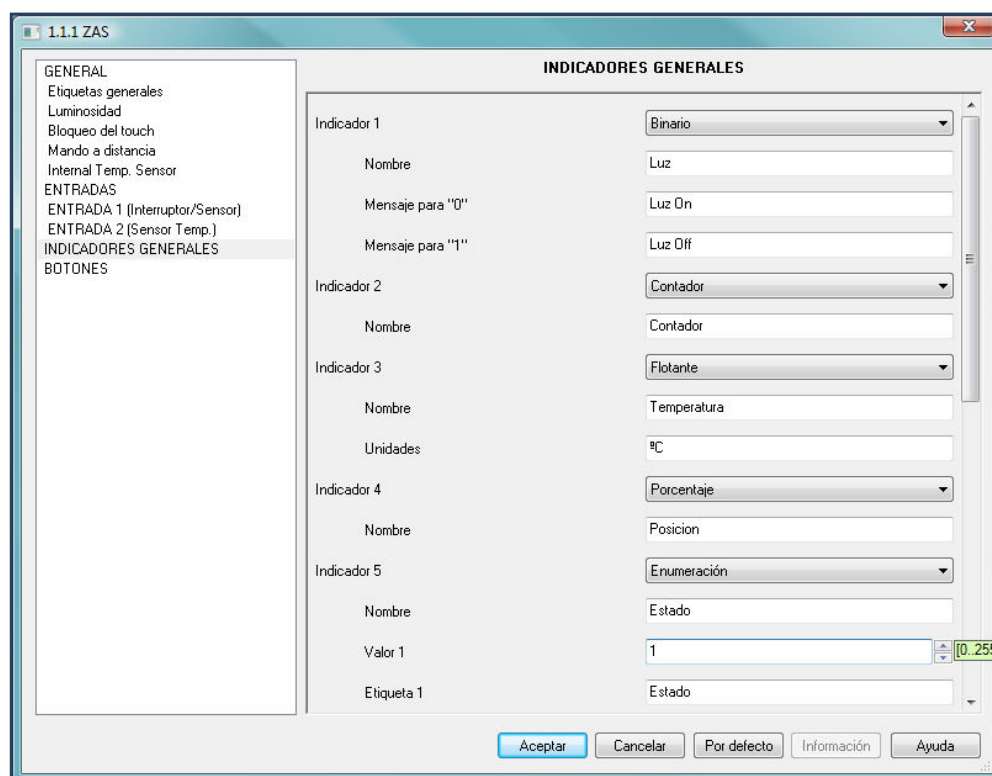


Figure 13 General Indicators

Menu

It activates a window where enabling different options for the menu of the device. Each of these options has its own configuration window in ETS, accessible from the left menu once they are enabled. See section [6.3 Menu options](#).

6.3. MENU OPTIONS

Once the *Menu* is enabled in *General*, the options to activate must be selected.

Each functionality has an associated window for its configuration, accessible from the main menu, except for the password that will be configured in this window selecting the key-press order of the buttons.

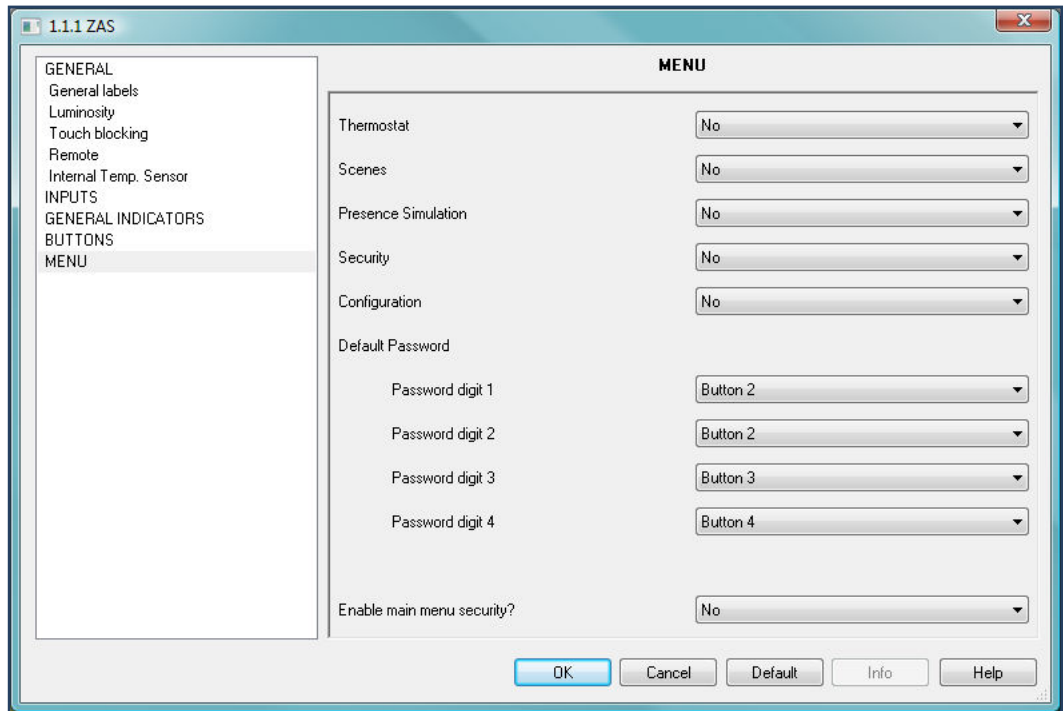


Figure 14 Menu configuration

Thermostat

The thermostat can be configured with the following modes: *Heating*, *Cooling* and *Heating and Cooling*.

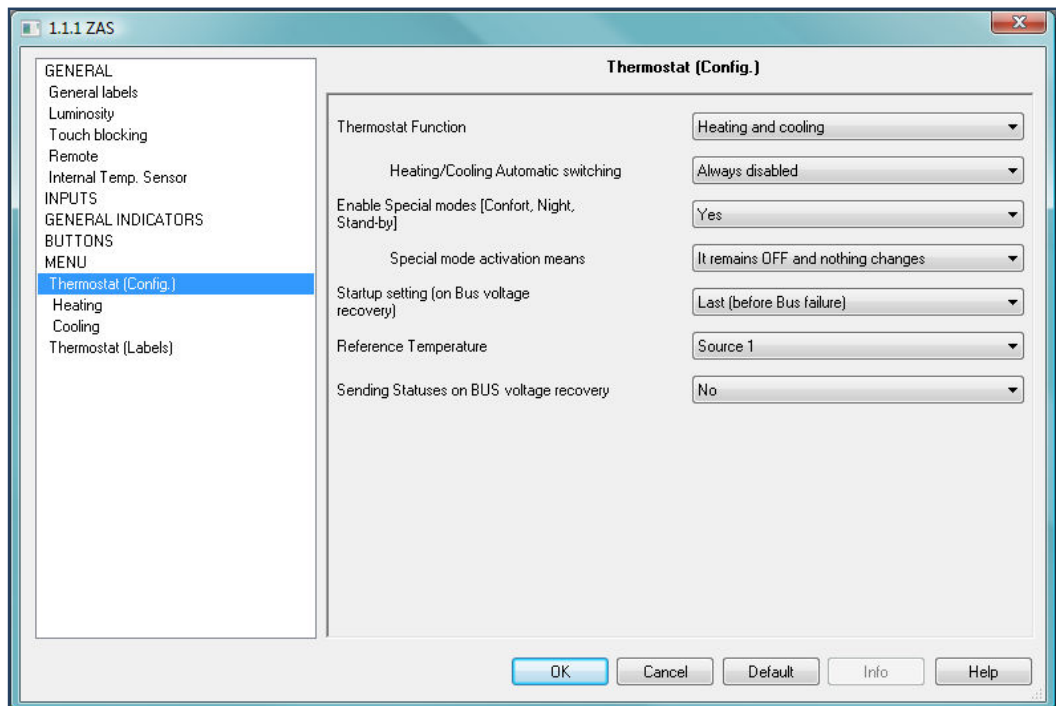


Figure 15 Thermostat configuration

When one of this modes is configured, the access to its configuration window appears in the lateral menu:

✓ **Heating**

It can be configured:

- **Freezing protection** and the corresponding temperature.
- **Control method** for thermostat: 2-Point control or PI Control.

The 2-Point control requires configuring both the lower and upper hysteresis.

The PI Control may be applied following two different Control Types: *Continuous* or *PWM*, and it requires the introduction of the cycle time and the control parameters:

- Warm Water [5k-150min]
- Floor Heating [5k-240min]
- Electric Heating [4k-100min]
- Blow Convector [4k-90min]
- A/A Split [4k-90min]
- Customized: this option requires the introduction of the proportional band (°K) and the integral time for the PI calculus.

- **Additional Heating** and additional heating band.

Heating	
Freezing protection	Yes
Protection temperature [x 1°C]	7
Control Method	PI Control
Control Type	Continuous [1byte]
Cycle time [x 1 min]	15
Control Parameters	Customized Parameters
Proportional Band [°K]	4
Integral Time [x 1 min]	150
Additional Heating	Yes
Additional Heating Band [x 0.1°C]	25

Figure 16 Heating mode configuration

✓ **Cooling**

It can be configured:

- **Overheating Protection** and the corresponding temperature.

- **Control method** for thermostat: 2-Point control or PI Control.

The 2-Point control requires configuring both the lower and upper hysteresis.

The PI Control may be applied following two different Control Types: Continuous or PWM, and it requires the introduction of the cycle time and the control parameters:

- Cooling ceiling [5k-240min]
- Blow convector [4k-90min]
- A/A Split [4k-90min]
- Customized: this option requires the introduction of the proportional band (°K) and the integral time for the PI calculus.

- **Additional Cooling** and additional cooling band.

Cooling	
Overheating protection	No
Control Method	PI Control
Control Type	Continuous [1byte]
Cycle time [x 1 min]	15
Control Parameters	Cooling Ceiling [5K-240min]
Additional Cooling	Yes
Additional Cooling Band [x 0.1°C]	25

Figure 17 Cooling mode configuration

✓ Heating and cooling

The configuration windows, Heating and Cooling, are enabled for configuring both thermostat modes.

When one of these modes is selected, the application program allows configuring the *startup setting* for sending the initial status of the thermostat after a power failure, and in case of enabling the mode *Heating and Cooling*, the automatic switching between heating and cooling can be activated.

On the other hand, it is possible to activate the special modes (*Comfort*, *Night* and *Standby*) and the thermostat reaction when a special mode is received, when it is OFF:

- ✓ It remains OFF and nothing changes
- ✓ It remains OFF but setpoint temperature is updated
- ✓ Setpoint temperature changes and Clima turns on

In this window, it is also possible selecting the temperature value coming from *Source 1* or *Source 2* as reference temperature, or even using the result of a proportional calculus of the values provided by sources 1 and 2 (proportion 25-75%, 50-50%, 75-25%)

In the main menu, it is available the option *Thermostat (Labels)* for introducing the desired text to associate with the temperature, On/Off, setpoint temperature and different modes, and to be displayed when these options are selected in the touch panel.

Scenes

ZAS allows configuring 6 different scenes for *running* or *running+saving*.

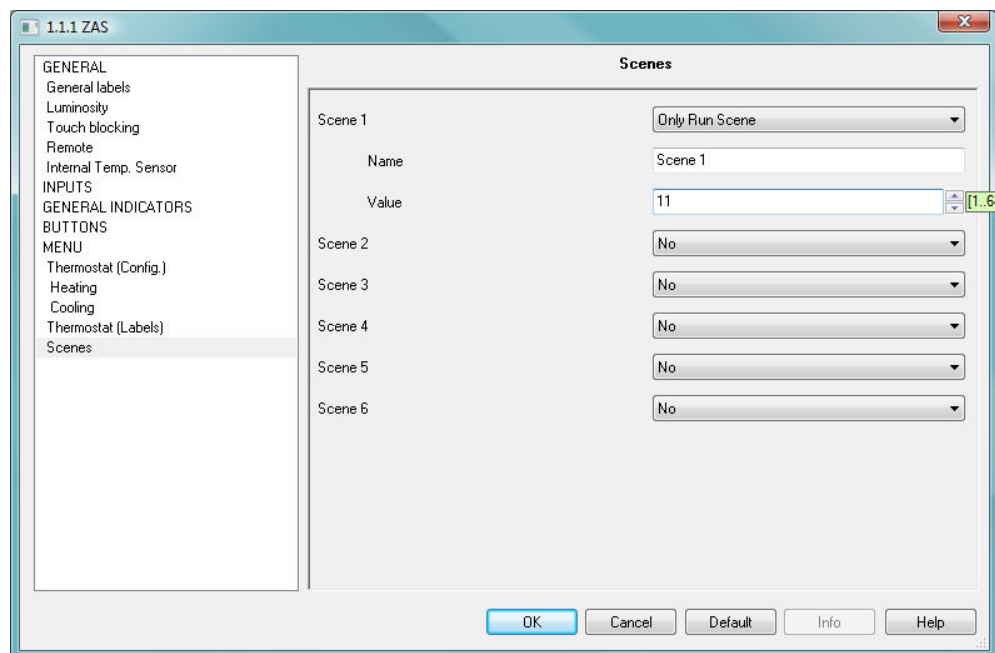


Figure 18 Scenes Configuration

All scenes allow the configuration of a name and the value associated to the scene (scene number, between 1 and 64).

Presence Simulation

The *Presence Simulation* has associated two windows: one for its configuration and the other for introducing the labels of the functionality.

The presence simulation allows introducing the initial hour, final hour and the maximum and minimum duration for the ON and OFF status of the devices linked to the presence simulation.

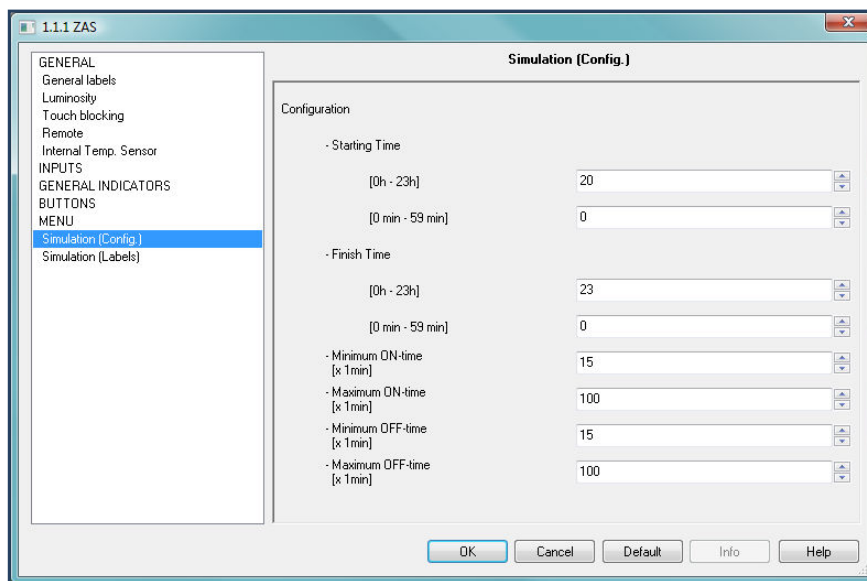


Figure 19 Configuration of Presence simulation

Configuration

In the window *Configuration* the following controls and the desired names to be displayed for these controls in the display can be enabled:

- ✓ Contrast
- ✓ Time
- ✓ Programming LED
- ✓ Touch Calibration
- ✓ Reset

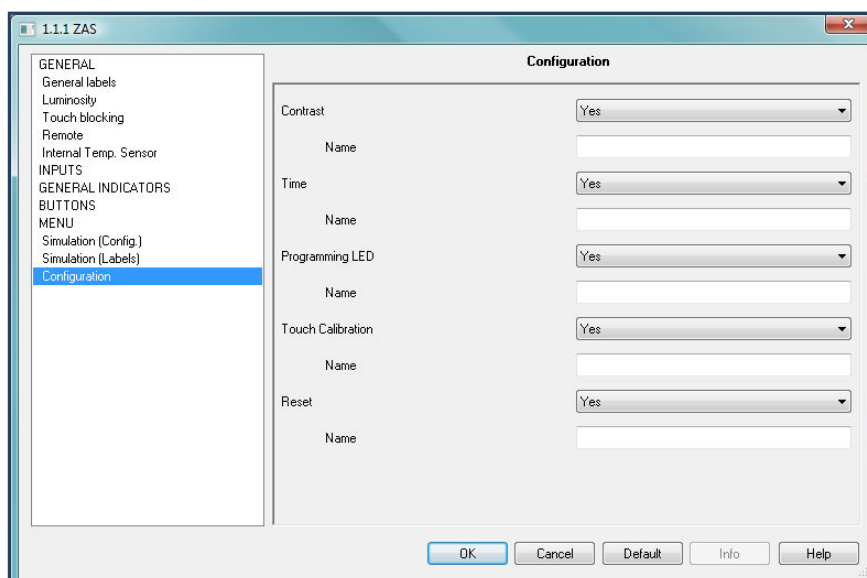


Figure 20 Configuration window

Security

The window *Security* allows establishing the code for accessing the menus and buttons that are protected under password, as well as the text messages that will be shown in the display for guiding the user in the code change process.

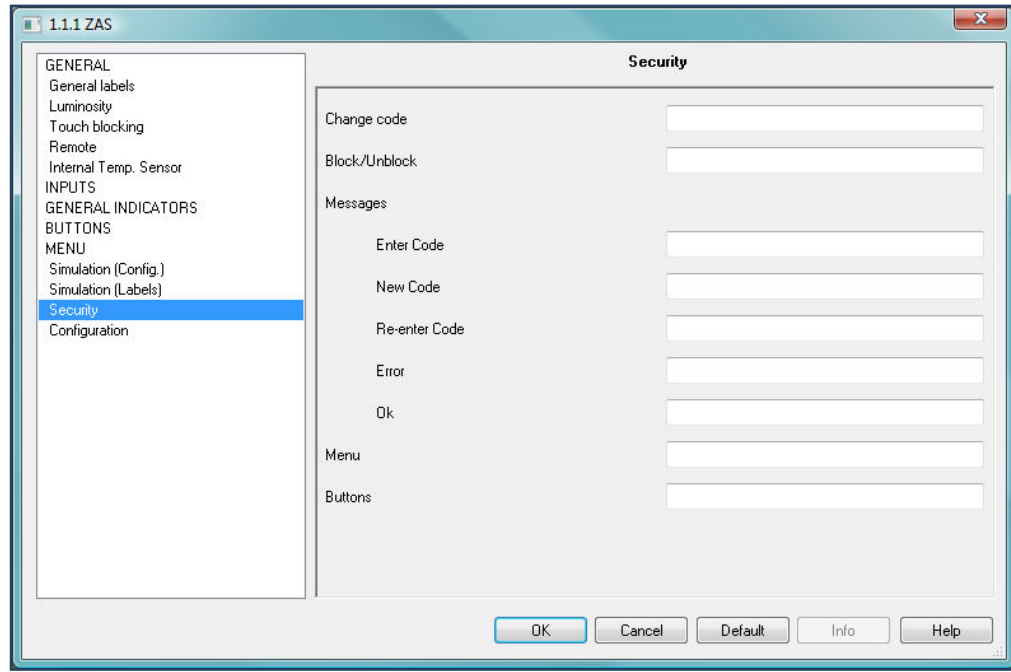


Figure 21 Security configuration

6.4. INPUTS

As it has been previously seen in the section *Configuration*, ZAS has two inputs that can be configured as switching/sensor or temperature sensor.

Once the input is enabled, the access to the corresponding configuration window appears in the main menu according to the configured type of input.

Switching/Sensor

When configuring an input as switching/sensor, it is necessary to select the action to carry out in the falling edge and the rising edge:

- *Rising Edge*: se selecciona la acción a realizar: *Nada*, envío de “1”, envío de “0”, *conmutación* entre “0” y “1”.
- *Falling Edge*: se selecciona la acción a realizar: *Nada*, envío de “1”, envío de “0”, *conmutación* entre “0” y “1”.

Moreover, it is possible to introduce delays for sending the values “0” and “1”, and defining a cyclical sending for these values:

- *Sending of “0” Delay:* value between 0 and 255, in seconds.
- *Sending of “1” Delay:* value between 0 and 255, in seconds.
- *Periodical sending of “0”:* value between 0 and 255, in seconds. The value “0” indicates that the periodical sending is not activated.
- *Periodical sending of “1”:* value between 0 and 255, in seconds. The value “0” indicates that the periodical sending is not activated.

Other available functionalities for the inputs are:

- *Block:* Yes or No. It enables a 1-bit communication object that allows blocking the input (value “1”→ blocked input).
- *Sending status (“0” y “1”) on bus voltage recovery:* this option allows configuring an automatic sending after a voltage recovery establishing a sending delay (value between 0 and 255, in seconds).

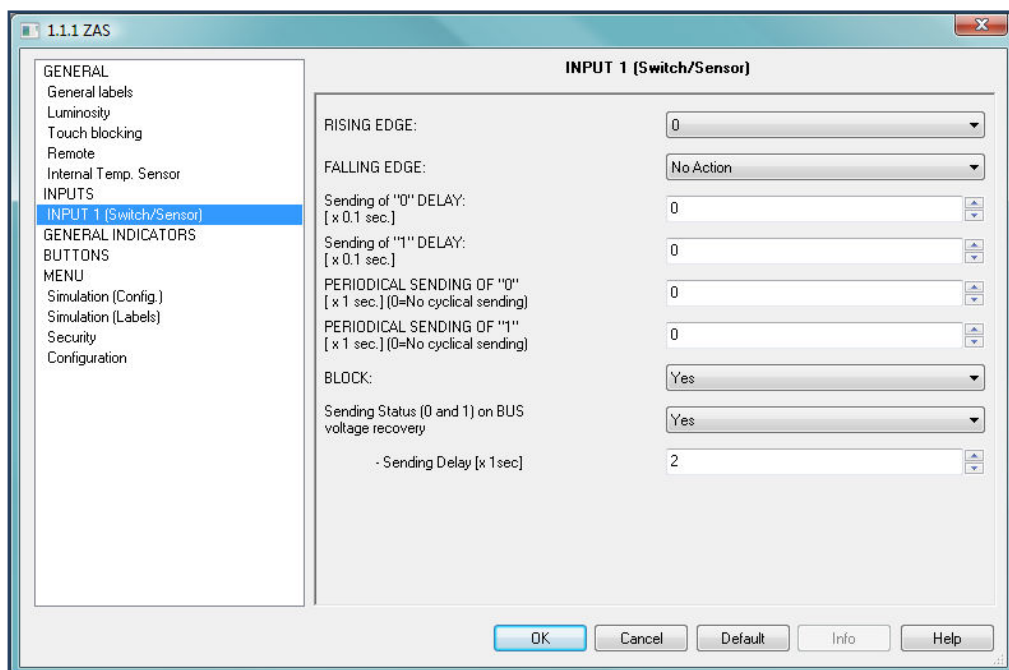


Figure 22 Switching/Sensor Configuration

Temperature

When configuring an input as temperature sensor the following options can be configured:

- *Temperature sensor calibration*: value between -50 and 50, in tenths of a degree.
- *Temperature sending period*: value between 0 and 100, in tenths of a degree. The value “0” indicates that this option is disabled.
- *Send with a temperature change*: value between 0 and 200, in tenths of a degree. The value “0” indicates that this option is disabled.

On the other hand, it can be enabled two 1-bit communication objects for temperature protection that indicate overheating or overcooling:

- *Temperature protection*: *No*, *Overheating*, *Overcooling* or *Overheating and overcooling*.

According to the selected option, it will be necessary introducing the temperature for overheating and overcooling or both (value between -30 and 50, in degrees), and the hysteresis for a correct operation, in tenths of degree (value between 1 and 50).

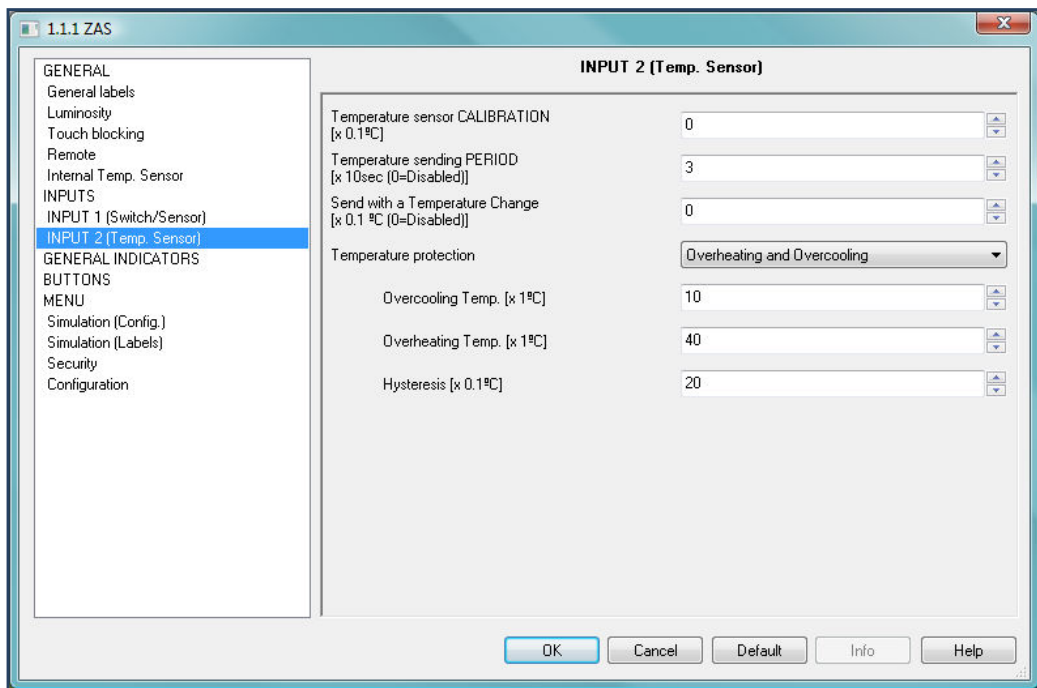


Figure 23 Temperature Sensor Configuration

6.5. BUTTONS

The window *Buttons* allows configuring the 8 direct access buttons for working in couple or individually:

- 🟡 **Buttons 1-2**: Disabled, Individual or Couple.

- **Buttons 3-4:** Disabled, Individual or Couple.
- **Buttons 5-6:** Disabled, Individual or Couple.
- **Buttons 7-8:** Disabled, Individual or Couple.
- **Arrow buttons.** Yes or No.

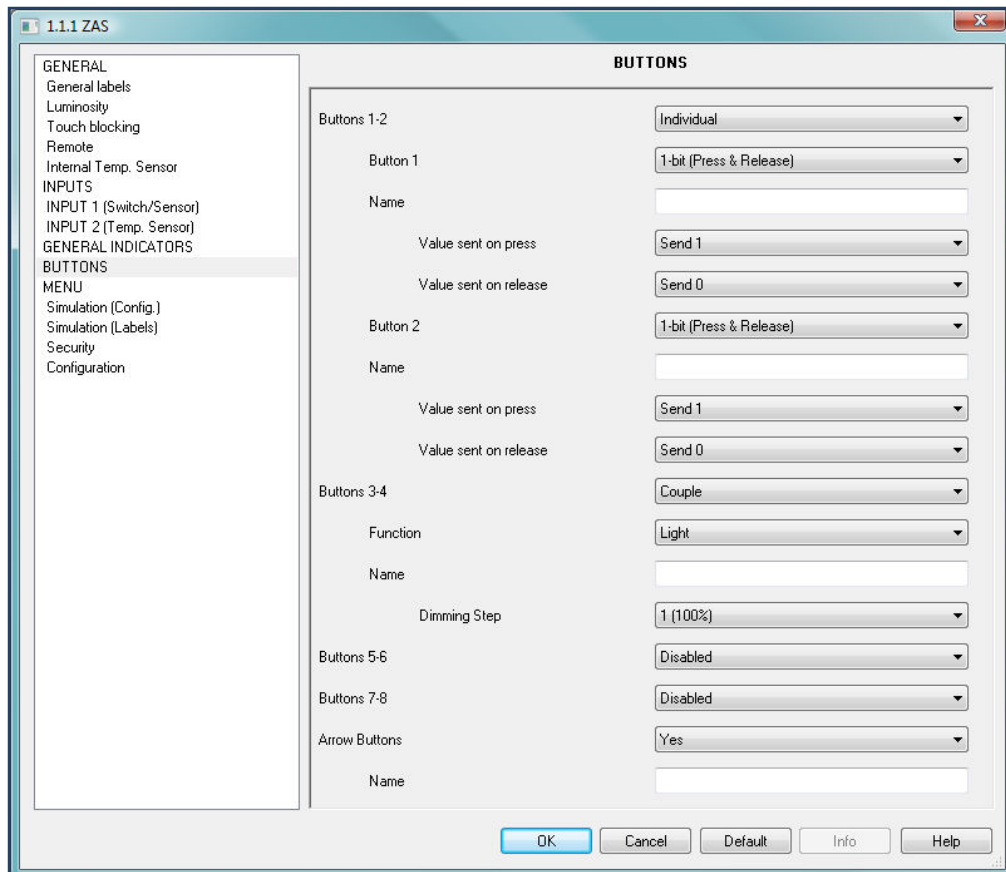


Figure 24 Buttons Configuration

Once the type of operation is selected (individual or couple), the functionality of each button or couple of buttons can be configured.

Individual Operation

The configuration options for the individual operation of the buttons are the following:

- **1 bit:** it allows sending the value “0”, “1”, or switching between them. There is an associated 1-bit communication object called *Binary control*. The LED of the button will light when the object status is “1” and it will remain switched off when the object status is “0”.

- **Scene:** it allows the configuration of the button for running a scene or running and saving a scene. The value of the configured scene will be sent by means of the general object *Scenes: send*.
- **1 bit (Press & Release):** it allows sending a binary value while the button is pressed and another value when it is released. It has two binary objects: *Binary Control: press* and *Binary Control: release*.

Operation in couple

The configuration options of the buttons for the operation in couple are the following:

- **Switch:** automatically configures the left button of the couple for sending the value “0” and the right button for sending the value “1”. This functionality enables the communication object *Binary Control*.

This option allows introducing the name of the functionality, associated to the buttons, and a text message for the actions *Switch on* and *Switch Off*.

- **Light:** this functionality regulates the light by means of a binary object for switching on and off the light, *Light On/Off*, and a 4-bit communication for regulating the luminosity, *Light Dimming*, in the following way:

- ✓ Left button: the short press switches off the light (sending “0” through *Light On/Off*) while the long press decreases the luminosity (the percentage is sent through *Light On/Off*).
- ✓ Right button: the short press switches on the light (sending “1” through *Light On/Off*) while the long press increases the luminosity (the percentage is sent through *Light On/Off*)

This option allows introducing the name of the functionality of these buttons and selecting the dimming step % (100, 50, 25, 12.5, 6.25, 3.1 or 1.5). Moreover it counts on a 1-byte object for indicating the luminosity status: *Light indicator* (100%→completely ON, 0% → OFF)

- **Shutter:** it allows controlling the movement of shutters by means of two binary objects: *Move Shutter* (0=Up, 1=Down) and *Stop Shutter* (depending on the pressed button, it sends the value “0” or “1”), and a 1-byte object *Shutter Position* (100%→bottom, 0% → top) for indicating the position of the shutter in every moment.

- ✓ Left button: the long press moves down the shutter while the short press stops the shutter, sending the value “1” through the object *Stop Shutter*.
- ✓ Right button: the long press moves up the shutter while the short press stops the shutter, sending the value “0” through the object *Stop Shutter*.

- **Scaling:** this functionality allows sending a percentage by means of the communication object *1 Byte Control* associated to the couple of buttons.
 - ✓ Left button: the short press decreases the percentage value one by one while the long press decreases the value 10 by 10.
 - ✓ Right button: the short press increases the percentage value one by one while the long press increases the value 10 by 10.
- **Counter:** this functionality allows sending a numerical value by means of the communication object *1 Byte Control* associated to the couple of buttons.
 - ✓ Left button: the short press decreases the value one by one while the long press decreases the value 10 by 10.
 - ✓ Right button: the short press increases the value one by one while the long press increases the value 10 by 10.
- **Enumeration:** it allows sending a numerical value among 6 configurable values through the communication object *1 Byte Control* associated to the couple of buttons. It is necessary to introduce a label for each value in order to enable them in the enumeration menu.

When pressing the right and left button, the different labels will be shown in the display and their value sent to the bus. First press will show the current value of the control.

The selected value can be changed using short presses or remaining the button pressed.

- **Temperature:** it allows controlling the temperature value (between 0 and 95°C). This functionality has associated a 2-Byte communication object called *Temperature Control*.
 - ✓ Left button: the short press decreases the temperature 0.5 by 0.5 °C while the long press decreases the temperature value 1 by 1 °C.
 - ✓ Right button: the short press increases the temperature 0.5 by 0.5°C while the long press increases the temperature value 1 by 1 °C.



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