Graphic controls

DS34xx00

Programming manual

www.besknx.com

Index

1   General description

The Bes Ref. 342x00/343x00 is a full colour capacitive 4.3" touch screen to control and monitor any KNX installation, using 3D plans, photographs, friendly-icons, etc.

It allows to program up to 4 pages with 8 icons in each page with which to control lights, shutters, thermostats, RGB leds, executing scenes and control any other KNX installation devices being ideal to work as a room controller.

It incorporates two user levels (normal user and administrator) and the appearance of the pictures, menus and icons shown is completely customizable by the programmer with the programming software SIDEKNX that allows creating different themes. The appearance theme can be also changed manually by the user or automatically by programmed hours.

General characteristics:

- Plus version: Wi-Fi connectivity with integrated web server for remote control via Android/iOS applications and improved TFT screen with high luminosity and vision angle.
- Admits up to 4 control pages (background: 3D plans, photographs, etc.).
- 8 control icons per plan.
- Scenes, on/off, dimming, shutter, thermostats, RGB Leds control.
- Internal temperature sensor and chronothermostat.
- Fully customizable themes (icons, background and menus appearance).
- Programmable automatic theme change by hour.
- Two user level modes: administrator and standard user.

2 Technical information

|	
Power supply	18 - 30 Vdc from auxiliary power supply.
Current consumption	250 mA from auxiliary power supply 18 - 30 Vdc. 1 mA from KNX BUS.
Mounting	Surface. Flush mounting with box (included). On universal distribution box, screwed on wall. Easily mounting on plasterboard wall.
Size	129 x 88 x 4 mm (13 mm depth).
Connections	Quick micro-connector T. BUS and Supply connection terminal KNX.
Programming	Via Wi-Fi connectivity (FTP upload).
Supported software	SIDEKNX v1.2.7
Control pages	Up to 4.
Icons per page	Up to 8.
Environment temperature range	Operation: -10ºC/55ºC Storage: -30ºC/60ºC Transportation: -30ºC/60ºC
Regulation	According to the directives of electromagnetic compatibility and low voltage: EN 50090-2-2 / UNE-EN 61000-6-3:2007 / UNE-EN 61000-6-1:2007 / UNE-EN 61010-1.

3 Programming

3.1 Introduction

The "Development System KNX®" (SIDE KNX) is the software for programming Ingenium KNX web servers and touchscreens (ETHBUSKNX, PPKL-7, PPKL-4, Smart Touch, etc.)

SIDE KNX general characteristics are the following:

- **Quick and easy programming:** All the controlled devices that have been added to the project are shown intuitively over the plans. Every icon can be set according to your needs and control preferences.

- **Importing:** The ETS group addresses can be imported in *.xml to make the programming easier.

- **FTP downloading:** Fastest programming method to download all the data to the devices.

- **Images processing**: The 3D Drawings, photographs, etc. used and set by the designer / programmer are processed to obtain a good visualization without losing quality.

- **Personalization:** The software allows to use any picture or icon created by the programmer

With this program the programmer can place plans (usually pictures or 3D drawings of the rooms of a house or zones of the installation) and over them the icons of the controlled objects. Every icon object is linked to the KNX devices to control. When everything is programmed, the project must be transferred to the touchscreens or web server, to do so it is necessary to be connected to the device by a TCP/IP connection. The device will self-reset and when it finishes it will be ready to operate with it.
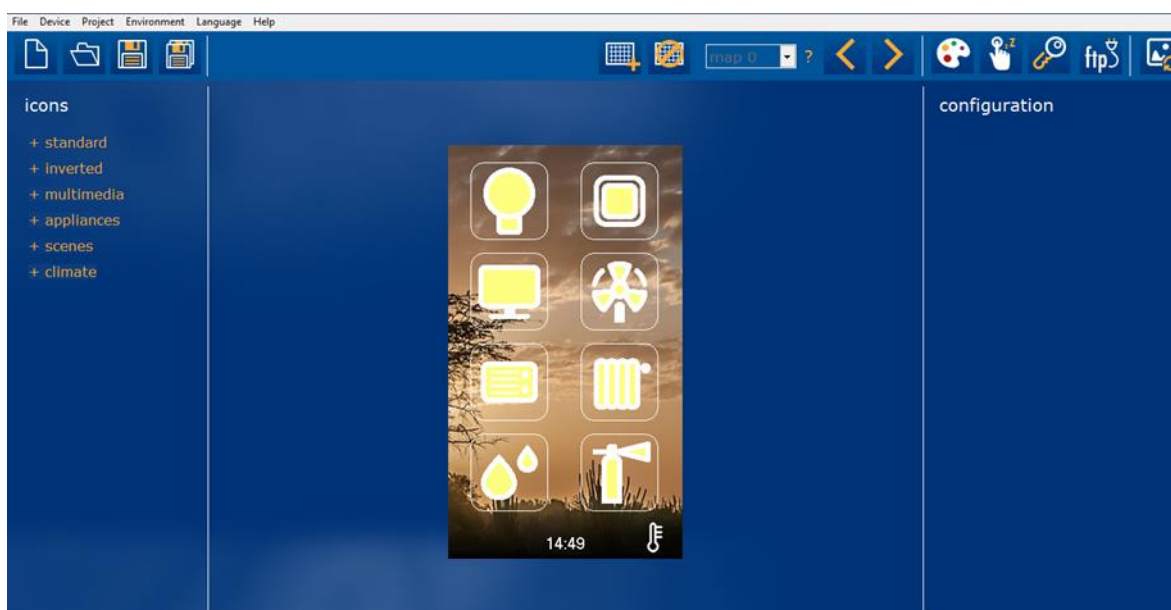
3.2   Device

The first thing to do when starting a programming project with the SIDEKNX is selecting the type of device that will be the target of the project. The software can be used for programming Ingenium KNX web servers (Ethbus) and different types of touchscreens (PPKL-x, Smart Touch, etc.).
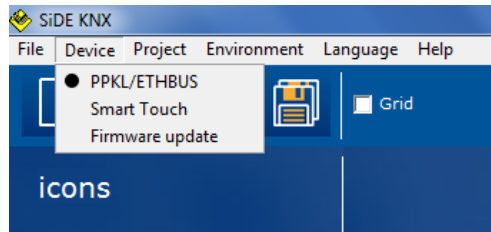
When the target of the project is a Smart Touch, it must be selected in the corresponding menu: Device -> Smart Touch.
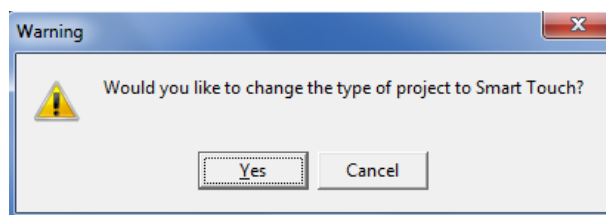
3.3   Firmware update

It is possible to update the firmware of the device by using this option from the device menu. The new firmware is downloaded through FTP by using the Wi-Fi or Ethernet connection of the device, so the computer must be connected to the same network.

First, write the IP address of the device and do click on the search button at the bottom right of the window.
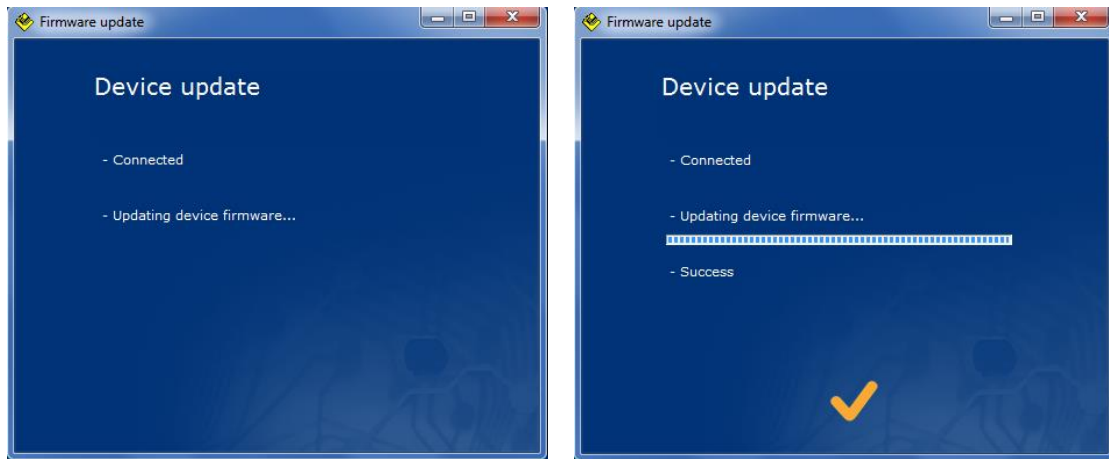

The SIDEKNX software will search for it and read the type of device.
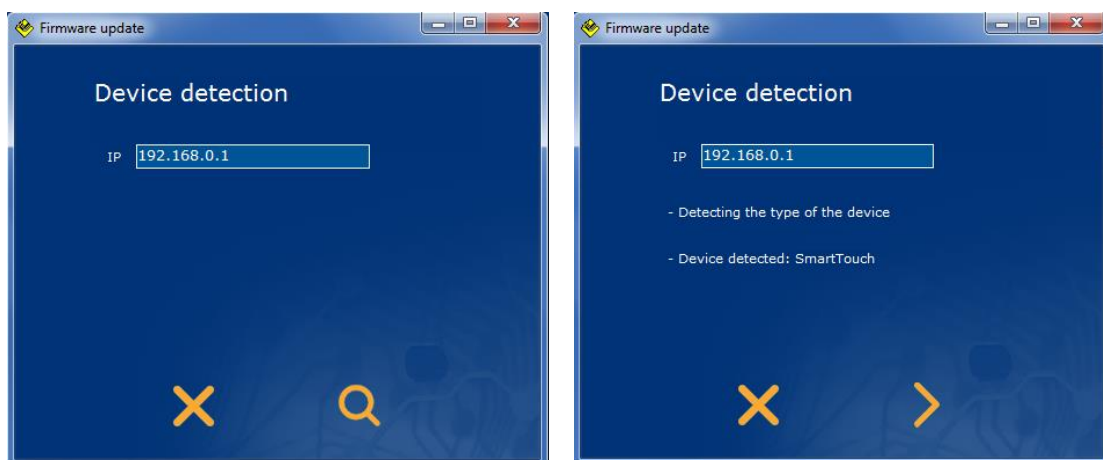
Then, do click on the arrow button to download the new firmware

The newest firmware will be downloaded and the device will reboot automatically after that.

3.4   Group addresses import

The SIDEKNX allows importing the group addresses created in any ETS project by clicking on the environment menu and import group addresses. The file to import must be in XML format.

Once the group addresses have been imported they can be selected for each object when programming the type of icons.
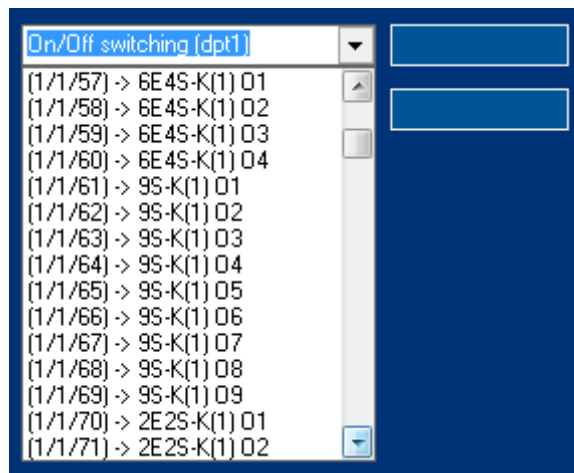
Do click on delete group addresses option in the environment menu to remove them from the SIDEKNX project. It is recommended to do so before importing new xml files.

3.5   Individual address assignment

The Smart Touch individual address it is not assigned by the ETS as other KNX devices. This touchscreen is completely programmed by the SIDEKNX software, including the individual address and group associations.

Do click on *Project* > *Individual address* from menu bar to show the individual address configuration window.
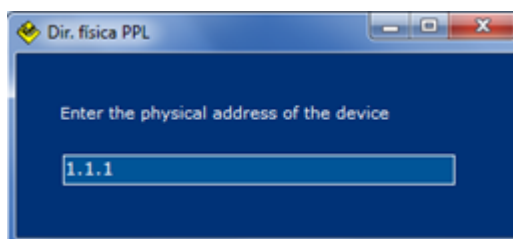
Here it is set the KNX individual address that the device takes when it is programmed. Write it down manually in the standard individual address format: *x.x.x*.

3.6   Theme creation

The appearance of the screen icons and menus can be changed by selecting different themes according to the customer likes, in the configuration menu of the Smart Touch. It can be selected a fixed theme or a list of themes that will change automatically by programmed hours (see the device user manual).

The Smart Touch incorporates 3 default themes to change the appearance of the screen with different colours and icon styles, but it can also incorporate another 3 themes that can be customized by the programmer/integrator by using the SIDEKNX theme creator tools.

3.6.1   Background pictures

Each theme must have a background picture that it is loaded with the following button:

In the installation directory of the SIDEKNX there are some different pictures available, use the window that appears to select which one to be loaded in the current theme.
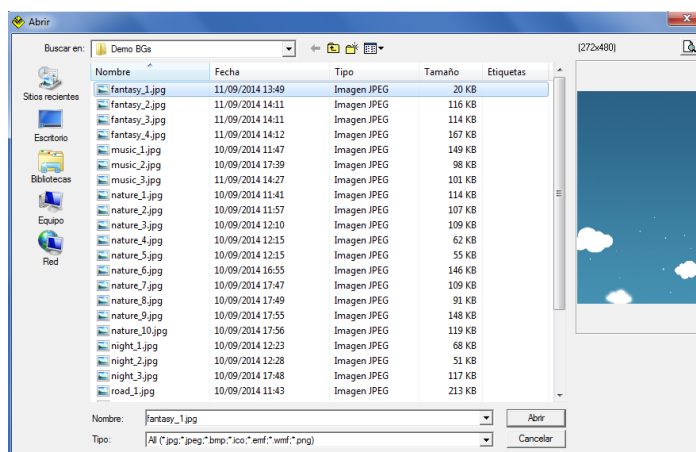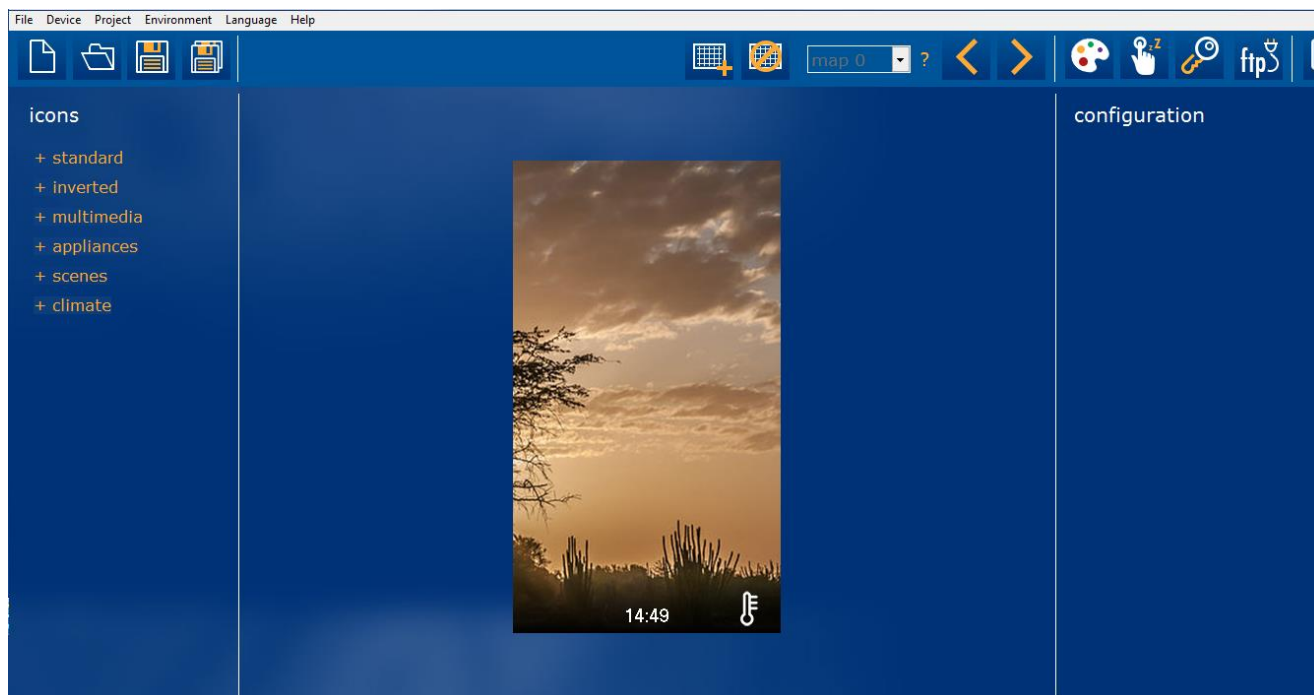
3.6.2   Style edition palette

The style of the icons and menus of the Smart Touch can be edited by clicking on the palette icon.

Use the right and left arrows at the top of the palette window to change between the 3 themes and editing their styles.
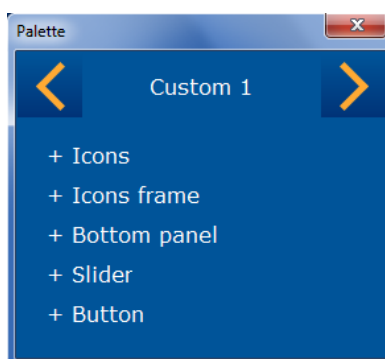
These are the part of icons, menus and control dialogues that can be edited for each theme. It can be selected any colour and in some cases a factor of transparency: alpha, which can vary from 0 to 255, being 0 the maximum transparency and 255 the maximum opacity.

Icons: Stroke, Fill and Main.
Icons frame: Stroke, Fill/Alpha, and Radius.

Icon: Stroke

Icon: Fill

Icon frame: Stroke

Icon frame: Fill/Alpha

Icon frame: Radius

Bottom panel: Background, text.
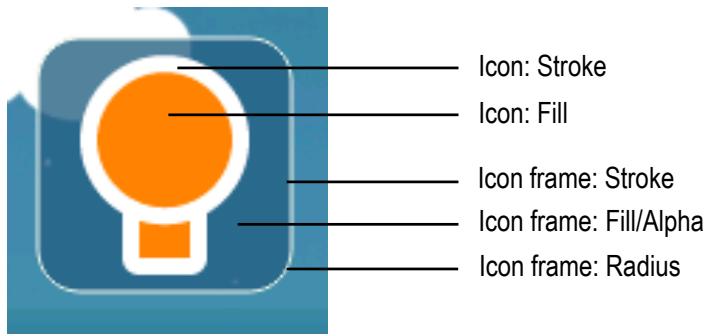
Bottom panel: background/Alpha

Bottom panel: text

Button: Background, Main, Secondary, Text.

Button: Background/Alpha

Button: Main (on/off)

Button: Secondary (on/off)

Button: Text (on/off)
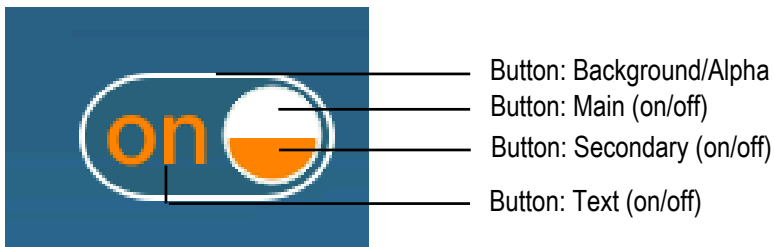
Slider: Background, Arch 1, Arch 2, Text.

Slider: Arch 2 (on/off)

Slider: Arch 1 (on/off)

Slider: Text (on/off)

Slider: Background/alpha

Icons: Main
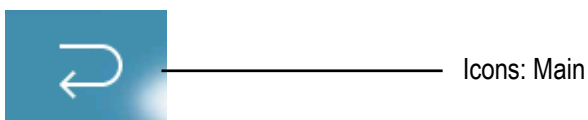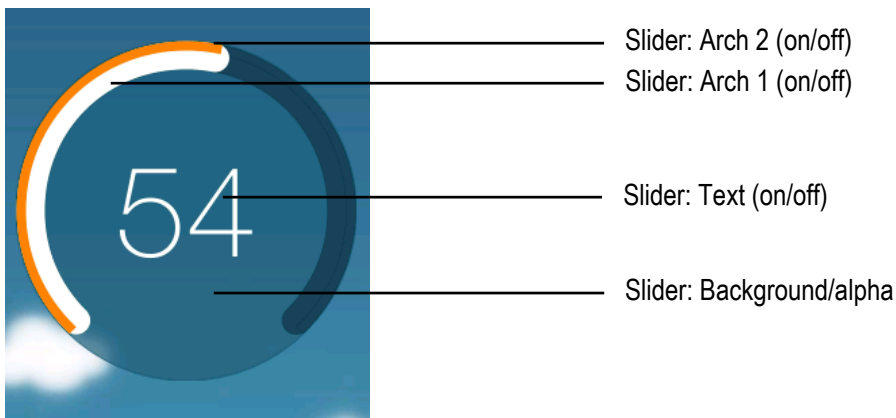
3.7   Adding new pages

Use the left and right arrows to add new pages of icons to the Smart Touch. It can be added up to 4 pages with 8 icons each.
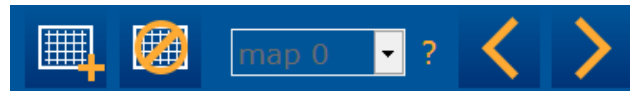
Do not confuse backgrounds with pages, only one background can be loaded per theme. It cannot be left empty pages in the programming project.

3.8   Adding new icons

Add icons to the current page with the tree on the left. Open each category and press over the icons to include them to the project. Each icon will be added consecutively.
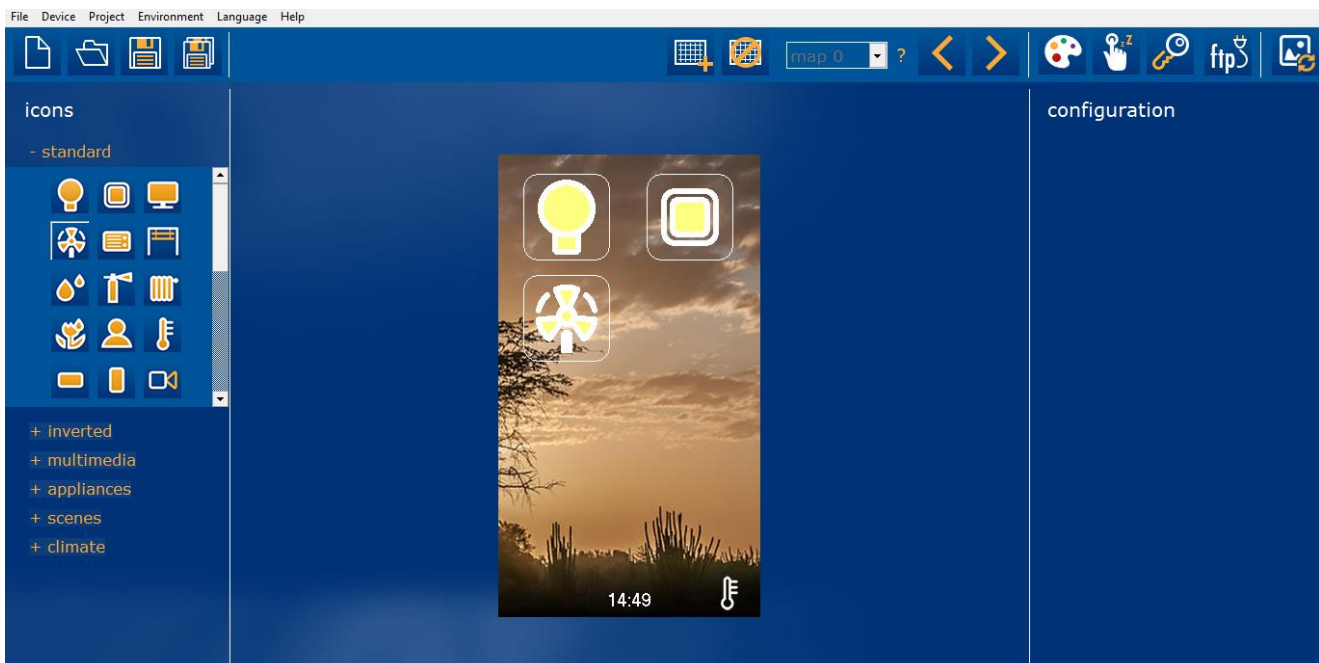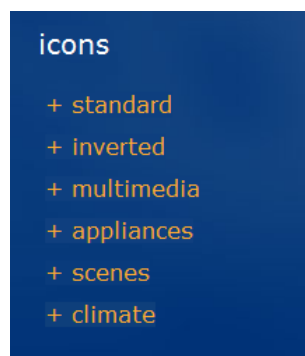
After adding every icon, they can be put in order by doing click with the right mouse button or by the keyboard shortcut (Ctrl+up/down/left/right).
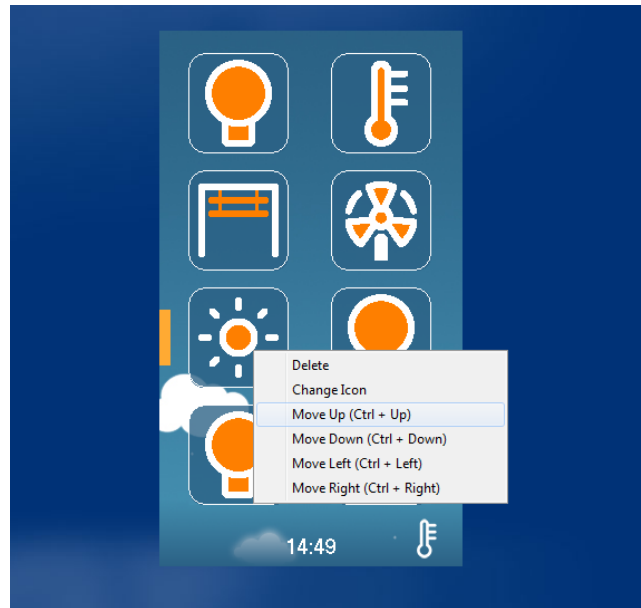
Do click on change icon and select the new one if you want to change the icon appearance without changing its properties.
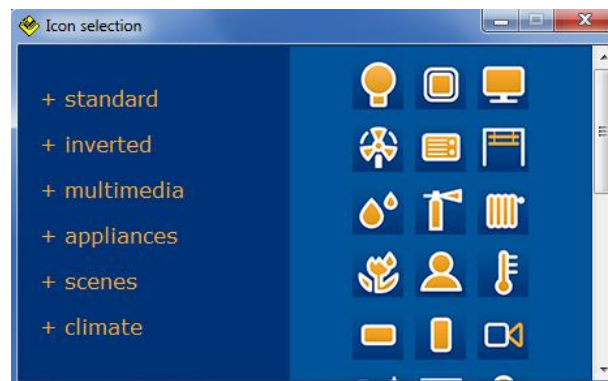
3.9   Type of icons

Do click on each icon to select it and then program the type using the combo box on the right.

The type of icons available in the Smart Touch and their communication objects are explained next.
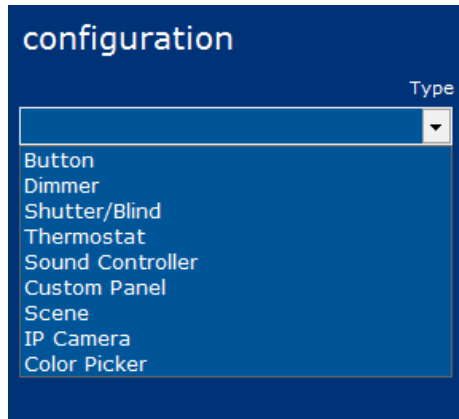
Use the name field to write the label that the icon will have on the screen and use write also the group addresses for each communication object.

3.9.1   Button

When the type *button* is selected the following options are shown:
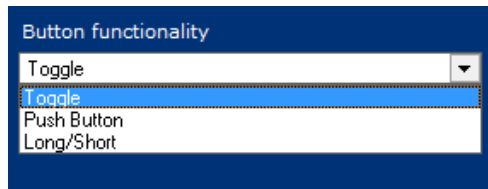
TOGGLE BUTTON

Use the toggle type button to control a light or any other output and perform a standard switch on / switch off control. The following communication objects can be programmed for the toggle type button:

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Button toggle: action	1 bit	1.001	●			●	
1	Button toggle: feedback	1 bit	1.001	●		●		●

PUSH BUTTON (PRESS/RELEASE)

Use the push button type if it is necessary to execute different actions depending on the press and release events. When a push button is configured it can also be set if using press action, release action or both.
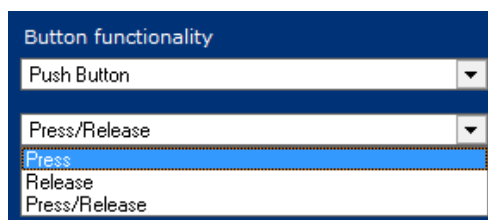
These communication objects can be programmed:

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Button press object: action	1 bit	1.001	●			●	
0	Button press object: action	1 byte	5.010	●			●	
0	Button press object: action	2 bytes	7.001	●			●	
1	Button release object: action	1 bit	1.001	●			●	
1	Button release object: action	1 byte	5.010	●			●	
1	Button release object: action	2 bytes	7.001	●			●	
2	Button press/release: icon feedback	1 bit	1.001	●		●		●

LONG/SHORT BUTTON

Use the long/short button type if it is necessary to execute different actions with long and short pulsations of the icon. When this button is configured it must be set the time that the device uses to evaluate the type of pulsation.

Detection time (ms.)	300

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Button short press object: action	1 bit	1.001	●			●	
0	Button short press object: action	1 byte	5.010	●			●	
0	Button short press object: action	2 bytes	7.001	●			●	
1	Button long press object: action	1 bit	1.001	●			●	
1	Button long object: action	1 byte	5.010	●			●	
1	Button long object: action	2 bytes	7.001	●			●	
2	Button long/short: icon feedback	1 bit	1.001	●		●		●

3.9.2 Dimmer

When the type *Dimmer* is selected the following objects are shown:

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	On/off switching	1 bit	1.001	●			●	
1	On/off feedback	1 bit	1.001	●		●		●
2	Brightness value	1 byte	5.001	●			●	
3	Brightness value feedback	1 byte	5.001	●		●		●

3.9.3 Shutter/blind

When the type *Shutter/Blind* is selected the following objects are shown:

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Position value	1 bit	1.001	●			●	
1	Position feedback	1 bit	1.001	●		●		●
2	Lamella position	1 byte	5.001	●			●	
3	Lamella feedback	1 byte	5.001	●		●		●

3.9.4 Thermostat

EXTERNAL

Use this type of icon to control a thermostat, temperature probe, gateway, etc. of the home automation system by using a thermostat control dialogue of the device (see **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.** pag.**¡Error! Marcador no definido.**) to know how to program the internal thermostat of the device).

When the type *Thermostat* is selected the following objects are shown:

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	On/off switching	1 bit	1.001	●			●	
1	On/off feedback	1 bit	1.001	●		●		●
2	Set point temperature value	2 bytes	9.001	●			●	
3	Set point temperature feedback	2 bytes	9.001	●		●		●
5	Room temperature feedback	2 bytes	9.001	●		●		●

Do click on the settings button to set the thermostat configuration such as modes and limits.
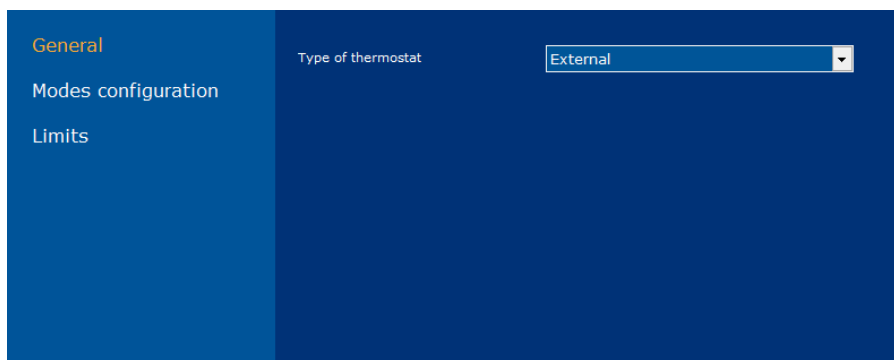
General

Type of thermostat: Use the selector to choose if the icon will be associated to an external thermostat, temperature probe, gateway, etc., or to the internal thermostat of the device, in this case, the configuration is done in another window (see **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.** pag.**¡Error! Marcador no definido.**)

Modes configuration

In the thermostat control dialogue, there can be two rows of icons that can be configured and parametrized for any programmer purpose, for example controlling modes, fan speeds, etc.

First select the behaviour of the group of icons and choose between the two types of controls: binary (individual bit communication objects for each icon) or byte (one byte communication objet for the group of icons).
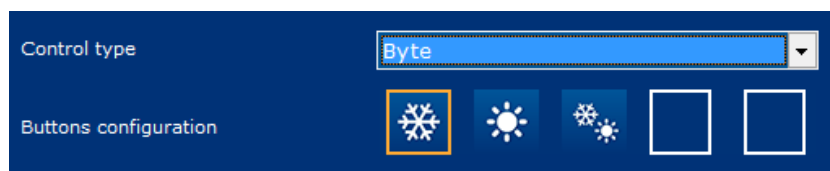
Do click on "add new button" and select one of the icons set, then do click into a box. Finally write the group addresses and values for each icon.

Limits

It is possible to limit the set point temperature that can be modified by the user from the thermostat control dialogue. If not limited, the user will be able to send values from 0ºC to 51ºC. If limits are enabled, it is possible to set the minimum and the maximum value sent.

The parameter called Show limited setpoint allows to hide/show the real set point temperature chosen by the user. When this parameter is set to no, the set point scroll bar in the screen will show temperatures from 0ºC to 51ºC while internally is limiting the real set point according to the configuration. When the parameter is set to yes, the real limited set point temperature can be seen by the user.

INTERNAL THERMOSTAT

Do click on the bottom of the edition window to program the internal thermostat of the Smart Touch.
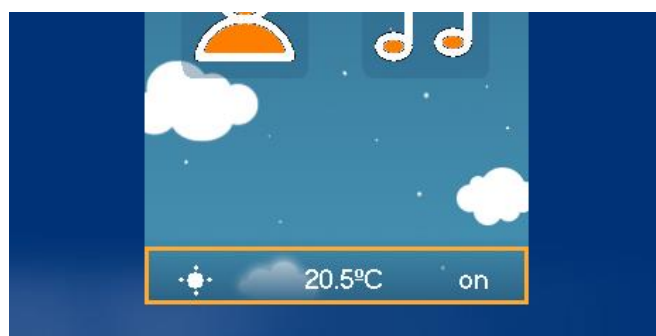
When the *internal thermostat* is selected the following objects are shown:

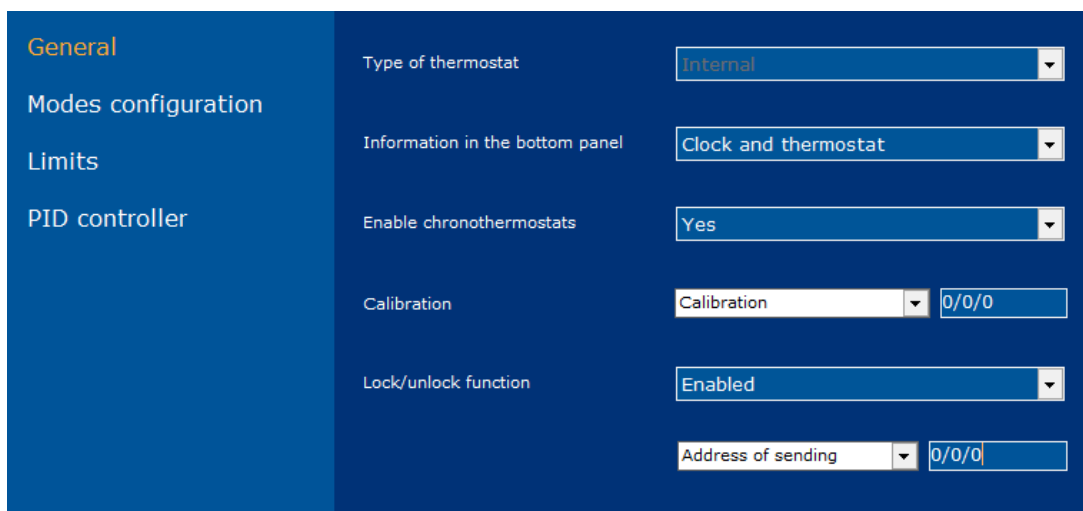| Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	On/off switching	1 bit	1.001	●		●		●
1	On/off feedback	1 bit	1.001	●	●		●	
2	Set point temperature value	2 bytes	9.001	●		●		●
3	Set point temperature feedback	2 bytes	9.001	●	●		●	
4	Room temperature	2 bytes	9.001	●		●		●
5	Room temperature feedback	2 bytes	9.001	●	●		●	

Do click on the settings button to configure other parameters of the internal thermostat. The following pages are explained next.

General

Information in bottom panel: This parameter allows configuring the behaviour of the screen's bottom panel.

- Only clock: The internal thermostat will not be accessible from the bottom panel and it will only show the time.
- Only thermostat: The bottom panel will show the thermostat information only.
- Clock and thermostat: Both clock and thermostat will be shown changing cyclically.

Enable chronothermostats: this parameter enables/disables the thermostat scheduling functionally in the time menu of the screen (see the device user manual).

Calibration: It is the deviation value of the internal temperature probe. It must be set the difference between the temperature measured by the screen and the real temperature (typical value between 10ºC and 15ºC). Take into account that the deviation depends on the installation of the screen and backlight parameters.

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Calibration object (in ºC)	2 bytes	9.001	●	●	●		●

Lock / Unlock function: If this parameter is enabled, it is possible to use an additional communication object that locks or unlocks the internal thermostat of the screen (lock = 1 / unlock = 0).

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Lock/unlock object	1 bit	1.001	●	●	●		●

The lock/unlock status is shown by a padlock at the bottom right corner of the thermostat control dialogue (see **¡Error! No se encuentra el origen de la referencia. ¡Error! No se encuentra el origen de la referencia.** pag.**¡Error! Marcador no definido.**). When the thermostat is locked keeps working but it can only be controlled by bus telegrams.

Modes configuration
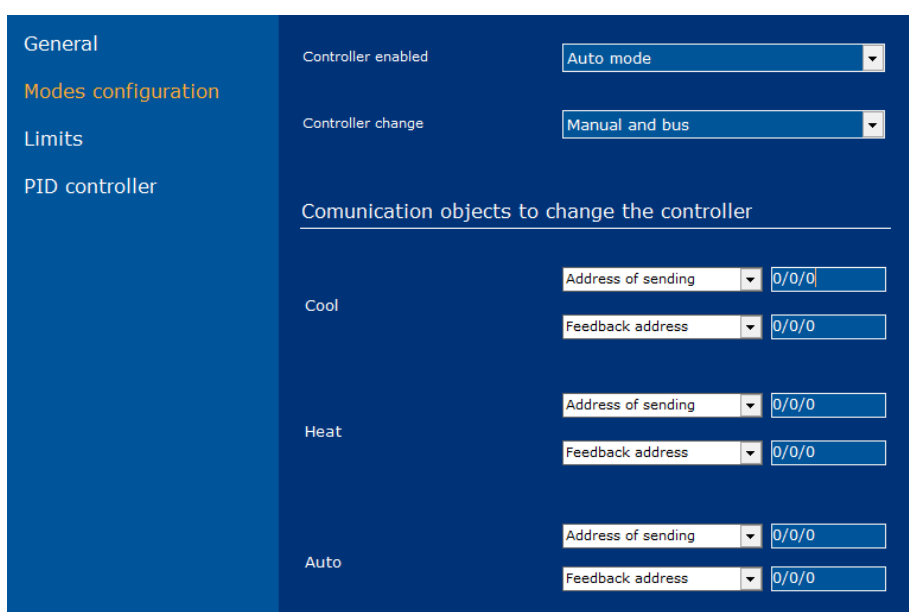
Controller enabled: This parameter defines the type of controller for the internal thermostat. It can be heating, cooling or auto (both modes simultaneously).

Controller change: If auto mode is enabled, it is also possible to define whether the user can change manually between working modes by clicking on the corresponding icon or not (see the device user manual). Any time the working mode of the thermostat can be changed by bus telegrams by programming the bit group objects.

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Cool mode	1 bit	1.001	●		●		●
1	Cool mode feedback	1 bit	1.001	●	●		●	
2	Heat mode	1 bit	1.001	●		●		●
3	Heat mode feedback	1 bit	1.001	●	●		●	
4	Auto mode	1 bit	1.001	●		●		●

				Flags				
5	Auto mode feedback	1 bit	1.001	●	●		●	

Limits

For the internal thermostat, it is also possible to limit the set point temperature that can be modified by the user. If not limited, the user will be able to send values from 0ºC to 51ºC.

Setpoint limits	Absolute limits
Show limited setpoint	No

Absolute limits

Minimum temperature	15
Maximum temperature	25

There are two types of setpoint limitations that can be enabled individually or simultaneously:

- Absolute limits: Minimum and maximum limits that can be sent in any case.
- Relative limits: Defined by a deviation value above and below a temperature point that can be set by bus.

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Reference object	2 bytes	9.001	●	●	●		●

The parameter called Show limited setpoint allows to hide/show the real set point temperature chosen by the user. When this parameter is set to no, the set point scroll bar in the screen will show temperatures from 0ºC to 51ºC while internally is limiting the real set point according to the configuration. When the parameter is set to yes, the real limited set point temperature can be seen by the user.

PID controller

In this window are programmed the Internal thermostat output communication objects, which are linked to the heating or cooling system (radiator, pump, electro-valve, fan-coil, etc.). The following control methods can be used individually or simultaneously: pwm (bit object) and continuous (byte object).

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Heat PWM	1 bit	1.001	●			●	
1	Cool PWM	1 bit	1.001	●			●	
2	Heat Continuous	1 byte	5.001	●			●	
3	Cold Continuous	1 byte	5.001	●			●	

PID controller parameters

The thermostat temperature control method is based on a PI algorithm to obtain a better result and efficiency. Use the selector to set the better PI regulator parameters according to the heating/cooling system type:

- Radiant floor
- Water radiators
- Electric radiators
- Convection cooling
- Split systems
- PID disabled: 2 points control

It is also possible to tune in the PI regulator manually by selecting the type custom and using the Kp, Ki and T constants.

3.9.5   Scene

When the type *Scene* is selected the following options are shown:

The scene icon can be programmed to send a value from 1 to 64 (0x00 to 0x40) to the object. When receiving these values, KNX actuators will recall their internal scene which number corresponds to it.

The "save scene" checkbox allows to execute a save function with long press of the icon. After the time programmed, a value from 128 to 192 (0x80 to 0xC0) is sent to the object and the KNX actuators will save their current status in the internal scene which number corresponds to it.

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Scene save/recall	1 byte	18.001	●			●	

3.9.6   Colour picker

When the type *Colour picker* is selected the following objects are shown:
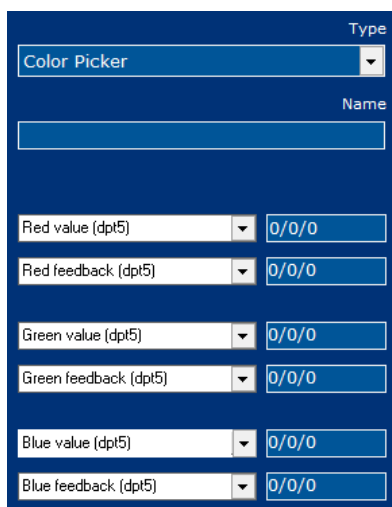
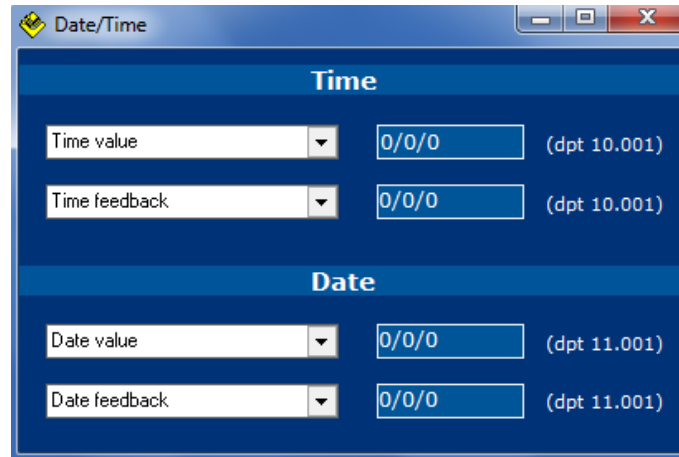| Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Red brightness value	1 byte	5.001	●			●	
1	Red brightness feedback	1 byte	5.001	●		●		●
2	Green brightness value	1 byte	5.001	●			●	
3	Green brightness feedback	1 byte	5.001	●		●		●
4	Blue brightness value	1 byte	5.001	●			●	
5	Blue brightness feedback	1 byte	5.001	●		●		●

3.10 Other functions

3.10.1 Date and time

Do click on the project menu -> Date/time to show the settings window.
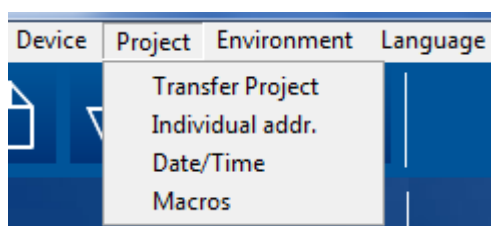
The Smart Touch can work as date and time master or slave in the KNX bus by sending or receiving the corresponding data by telegrams from any other KNX clock.

Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Time of day	3 bytes	10.001	●		●		
1	Time of day feedback	3 bytes	10.001	●			●	
2	Date	3 bytes	11.001	●		●		
3	Date feedback	3 bytes	11.001	●			●	

Write down the group addresses for objects 0 and 2 if the Smart Touch must be a date/time slave in the KNX bus. On the other hand, complete the group addresses for objects 1 and 3 if the Smart Touch must be a date/time master. In this case, use the time menu (options) to set the current configuration (see the device user manual).

3.10.2 MACROS

A macro can be an action or group of actions that are executed simultaneously in the home automation system. These macros can be scheduled weekly in the time menu of the device (see the device user manual) and they are programmed easily as explained next.

Do click on the project menu -> Macros to show the settings window.
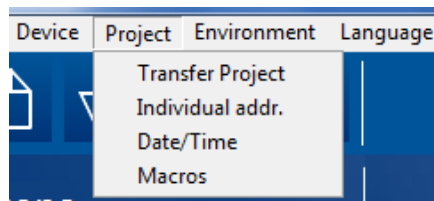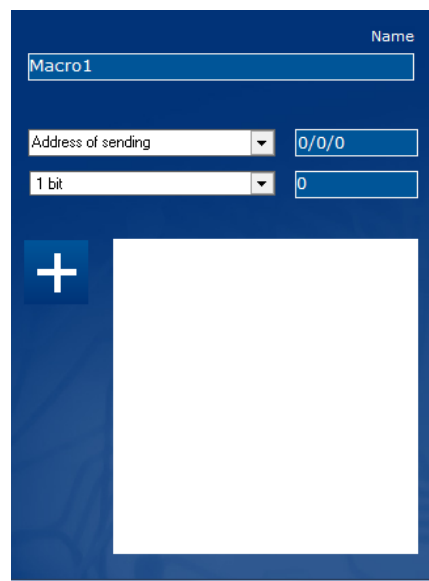

Then, do right click over the tree on the left and select add macro.
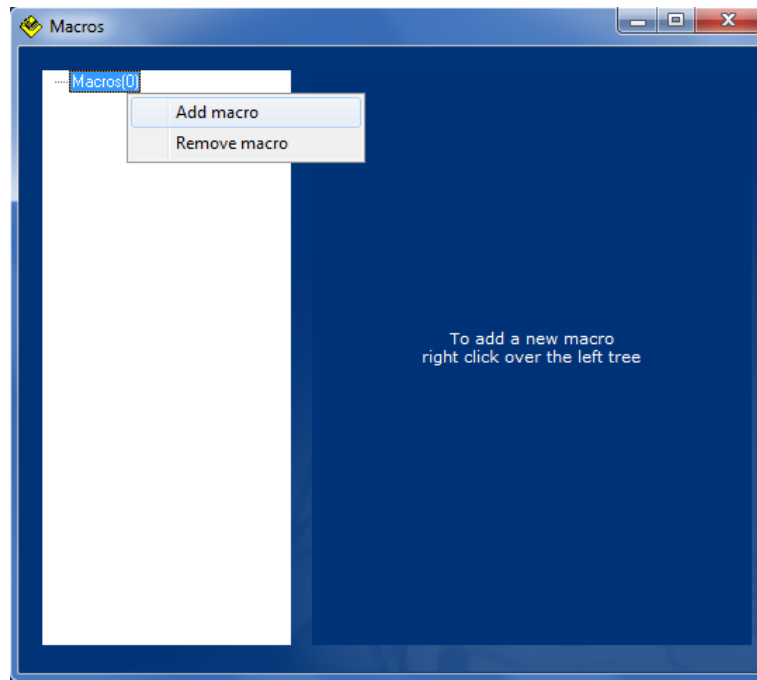
Assign a name/description to the Macro and then write the group address and the size and data sent. Do click on the plus button to add new events. It is also possible to program delays between telegrams by selecting the corresponding function.
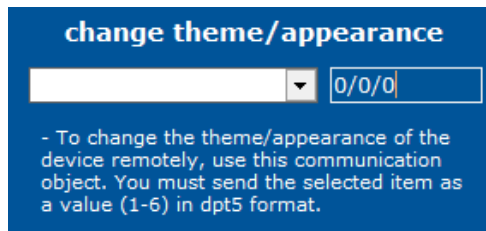

3.10.3 Appearance change

The appearance of the screen icons and colours can be changed by selecting different themes according to the customer likes. It can change automatically by programmed hours (see the device user manual) or by bus telegrams from any other device of the KNX system.

Do click on the following icon at the top right of the main window of SIDEKNX to program the corresponding group address.

Writing a value from 1 to 6 to this communication object will change the current theme of the Smart Touch to the desired one.


Object	Name	Length	DPT	Flags				
				C	R	W	T	U
0	Theme change (appearance)	1 byte	5.001	●		●		

3.10.4 Administrator password

The options menu, which allows configuring the appearance, brightness, language, etc., can be hidden only for administrators.

Do click on the following icon at the top right of the main window of SIDEKNX to program the corresponding password for enabling/disabling it.
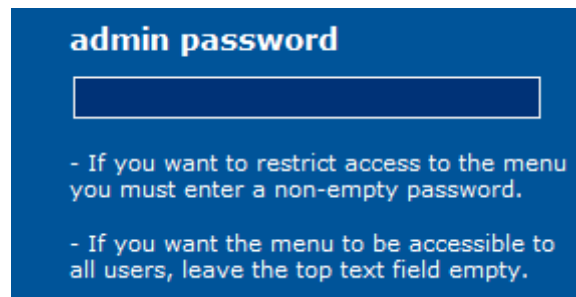
This function is enabled just by writing a password. If the menu is blocked (administrator mode enabled), press in the centre of the Smart Touch main window for 5 seconds approximately and use the keyboard to enter the access password.

Leave the admin password empty to disable this function. If the menu is unblocked (administrator mode disabled) any type of user will be able to change any configuration. In this case, it can be used the bar at the top of the main window to slide down the menu.


3.10.5 Default actions

The Smart Touch allows executing some programmed actions by gesture control (sliding up or down) when the screen is off or locked.

Do click on the following icon at the top right of the main window of SIDEKNX to program the actions that will be executed for each gesture control.

Write the sending group address, set the size of the telegram (1bit, 1byteor 2bytes) and the value sent. It is also possible to program a sleep function (in seconds) in order to wait a time between programmed actions. Finally do click on the plus button to add the command to the scenario.
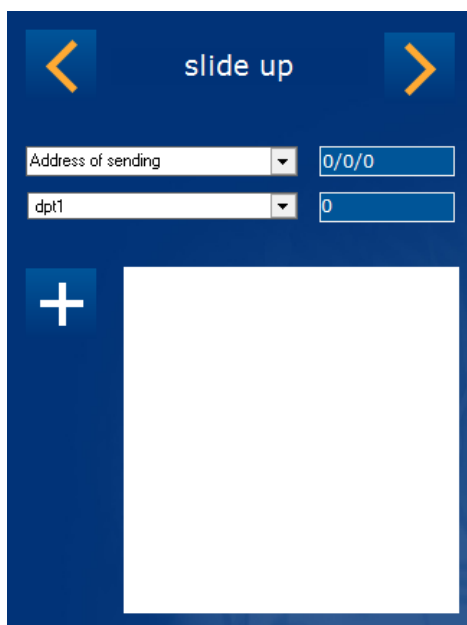
3.11 Downloading the project

The SIDE KNX allows programming Ingenium KNX web servers and touchscreens. In the case of the Ref. 342100/343100, it is programmed through the internet by connecting the computer to the same Wi-Fi network.

To program the Ingenium device, first save the project and then press the *transfer project* button from Toolbar panel or select *Project > Transfer* and the following window will be showed. Then do click on the corresponding button to select the ftp downloading method.
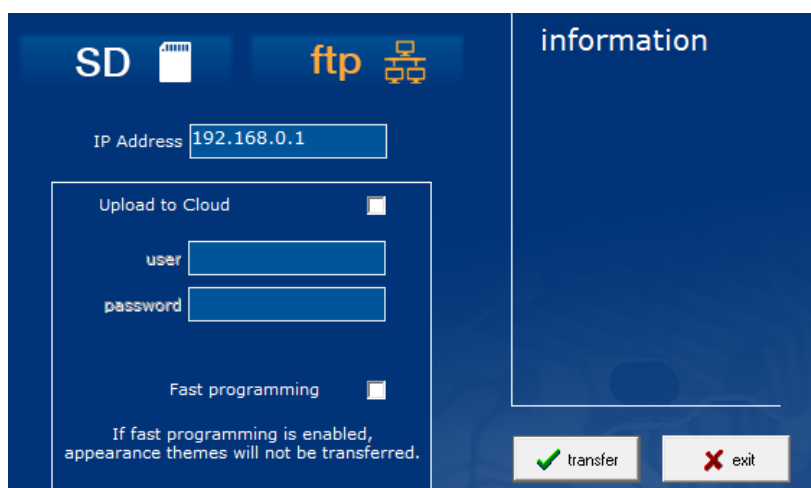
Enter the IP address of the screen (see the device user manual). The "upload to cloud" function is used only when programming the Smart Plus (that incorporates web server).
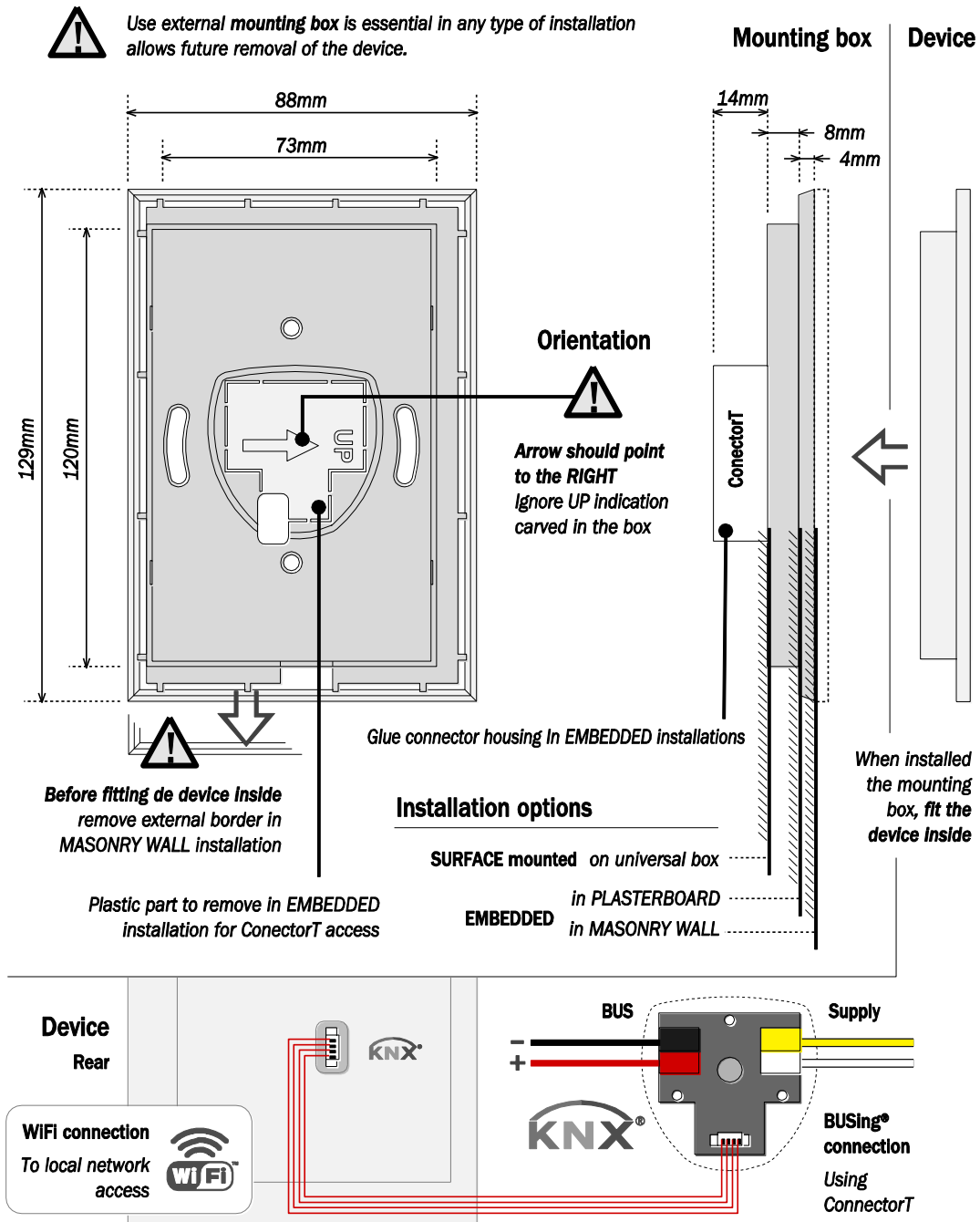
Note: The device and the programmer computer must be connected to the same network and configured in the same subnet. Check the correct connection of the screen by using ping network command before downloading.

Do click on "fast programming" to activate it if you do not want to change the appearance themes of the screen.

Do click on transfer to complete the process. The status will be shown in the information window. After the downloading process the screen will reboot automatically.

4 Installation

Use external **mounting box** is essential in any type of installation allows future removal of the device.

Mounting box | **Device**

88mm

73mm

129mm

120mm

14mm

8mm

4mm

ConectorT

Orientation

Arrow should point to the RIGHT
Ignore UP indication carved in the box

When installed the mounting box, fit the **device inside**

Glue connector housing In EMBEDDED installations

Before fitting de device inside
remove external border in MASONRY WALL installation

Installation options

SURFACE mounted   on universal box

in PLASTERBOARD

EMBEDDED   in MASONRY WALL

Plastic part to remove in EMBEDDED installation for ConectorT access

Device
Rear

BUS

Supply

KNX

–
+

KNX

BUSing® connection

Using ConnectorT

WiFi connection
To local network access

WiFi

Feed low voltage lines (BUS and inputs) in separate ducting to that of power (230V) and outputs to ensure there is enough insulation and avoid interferences.

Do not connect the main voltages (230 V) or any other external voltages to any point of the BUS or inputs.
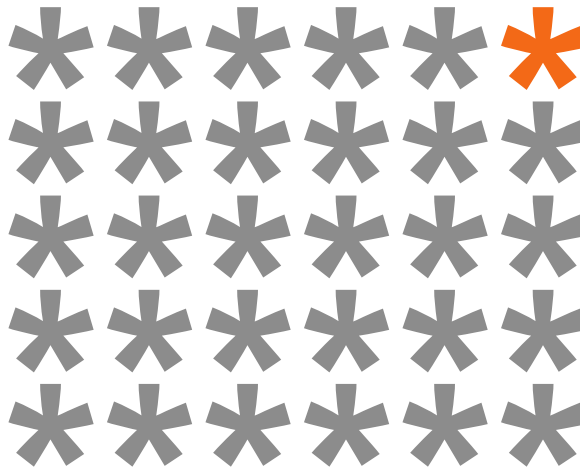
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