

3.1

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KNX

Fieldbus Configuration Manual



DELÉGO SERVER **Visualisation webserver**

EK-DEL-SRV01 / EK-DEL-SRV01-M

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1 Introduction

1.1 Scope of this manual

This document contains all the information for configuring and visualising a building automation system based on the KNX standard, inside DELÉGO SERVER, the multiprotocol webserver for the connected buildings by EKINEX.

The present user manual is part of the suite of application manuals dedicated to the DELÉGO SERVER, available on the section dedicated to this product in the EKINEX website. Before reading this document, it is recommended to consult the following application manuals:

REF	DOCUMENT	DESCRIPTION
[D1]	DOCUMENTATION PLAN	Overview of the application manuals of DELÉGO SERVER
[D2]	GENERAL FUNCTIONS - APPLICATION USER MANUAL	General installation manual of the webserver
[D3]	ONLINE SERVICES - APPLICATION USER MANUAL	Manual that describes how to use online services, such as VPN, cloud, with DELÉGO SERVER.
[D4]	ENERGY MANAGEMENT AND DATA LOGGING - APPLICATION USER MANUAL	Manual that describes the energy management, load control and data logging functionalities with DELÉGO SERVER.

These documents are available for download in the area of the EKINEX website dedicated to the webserver.

1.2 Conventions

The following conventions are used in this manual:

[KEY]	The keyboard keys that the installer must press are shown in square brackets
<i>Courier</i>	Software messages generated by the DELÉGO SERVER configuration software are reported in the “courier” font
<i>Function name</i>	Names of buttons, table fields or other graphic elements of the user interface of the DELÉGO SERVER configuration software are shown in italics
	Information note
	Important note that requires particular attention

1.3 Safety information

DELÉGO SERVER is a product intended for trained and specialized personnel only; anyone who interacts with the device must first read this documentation, especially this safety information. This document supplements and does not replace any legislation or legal directives on safety.

The device has been developed following the safety regulations currently in force; however, it is not possible to exclude with certainty possible damage or interactions with other devices during its operation. The device complies with EMC guidelines and harmonized European standards; any modifications to the device may affect EMC compatibility.

The supply voltage must be strictly within the range indicated in the GENERAL FUNCTIONS application manual and on the device; risk of fire or explosion if powered outside this range. The CE declaration of conformity of the device can be requested from EKINEX®, at the references on the site www.ekinex-delego.com.



In compliance with Directive 2002/96/EC the DELÉGO SERVER electronic device must be disposed of in the appropriate facilities and not in the collection of solid urban waste.

1.4 Warnings

- This application manual is aimed at installers, system integrators and designers.
- The assembly, electrical connection, configuration and commissioning of the appliance can only be carried out by specialized personnel in compliance with the applicable technical standards and the laws in force in the respective countries
- Opening the appliance case causes the immediate interruption of the warranty period
- In the event of tampering, compliance with the essential requirements of the applicable directives for which the appliance has been certified is no longer guaranteed.
- EKINEX defective appliances must be returned to the manufacturer at the following address:
Ekinex S.p.A. Via Novara 37, 28010 Vaprio d'Agogna (NO)

1.5 Copyright

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This application manual, the DELÉGO SERVER software and the DELÉGO iOS and Android apps are subject to copyright; all rights are reserved. Copying, reproduction, translation and/or modification, even partial, are expressly prohibited unless approved in writing by EKINEX®.

1.6 Open Source Licenses

DELÉGO SERVER contains open source software, such as the Linux operating system and its kernel. These software components are subject to various open-source licenses, including:

- GNU General Public License (GPL), <https://www.gnu.org/licenses/gpl-2.0.html>
- GNU Lesser General Public License (LGPL), <https://www.gnu.org/licenses/lgpl-2.0.en.html>

If you own a product, for a period of 3 years from the last production date, you can request from EKINEX the source code of the software components licensed under the GNU General Public License (GPL) or the GNU Lesser General Public License (LGPL), and use, distribute and modify them in accordance with the respective licenses.

EKINEX cannot be considered responsible in any way for the source code thus distributed, which is provided without guarantees. EKINEX cannot also be held responsible for any damage or consequence resulting from modifications (additions / removals) made to this software by third parties, unless specifically authorized.

1.7 More information

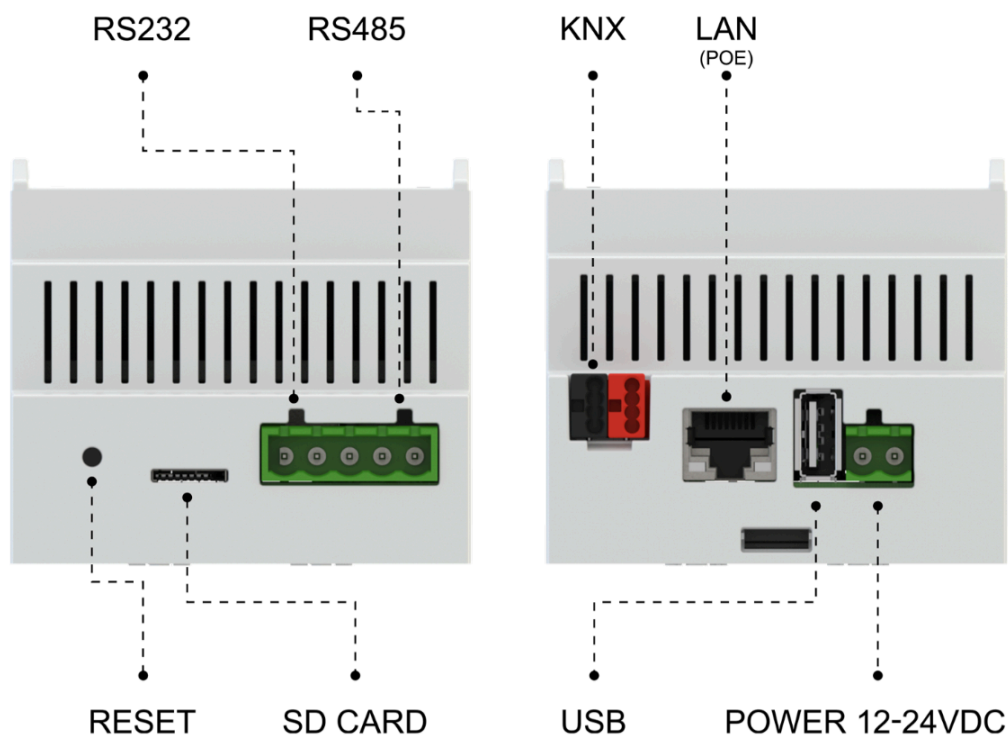
- For further information on the product, you can contact EKINEX technical support® to the e-mail address: support@EKINEX.com or consult the website www.EKINEX.com
- EKINEX® is a registered trademark of Ekinex S.p.A.
- KNX® ed ETS® are registered trademarks of KNX Association cvba, Brussels

The company reserves the right to make changes to this documentation without notice.

2 Preliminary operations

2.1 Connection

DELÉGO SERVER is a DIN-rail module intended for the installation in an electric cabinet, and directly connected to the local network (it can be power supplied via POE) and the KNX bus, by means of a certified KNX TP (twisted pair) cable and the provided standard red-black connector.

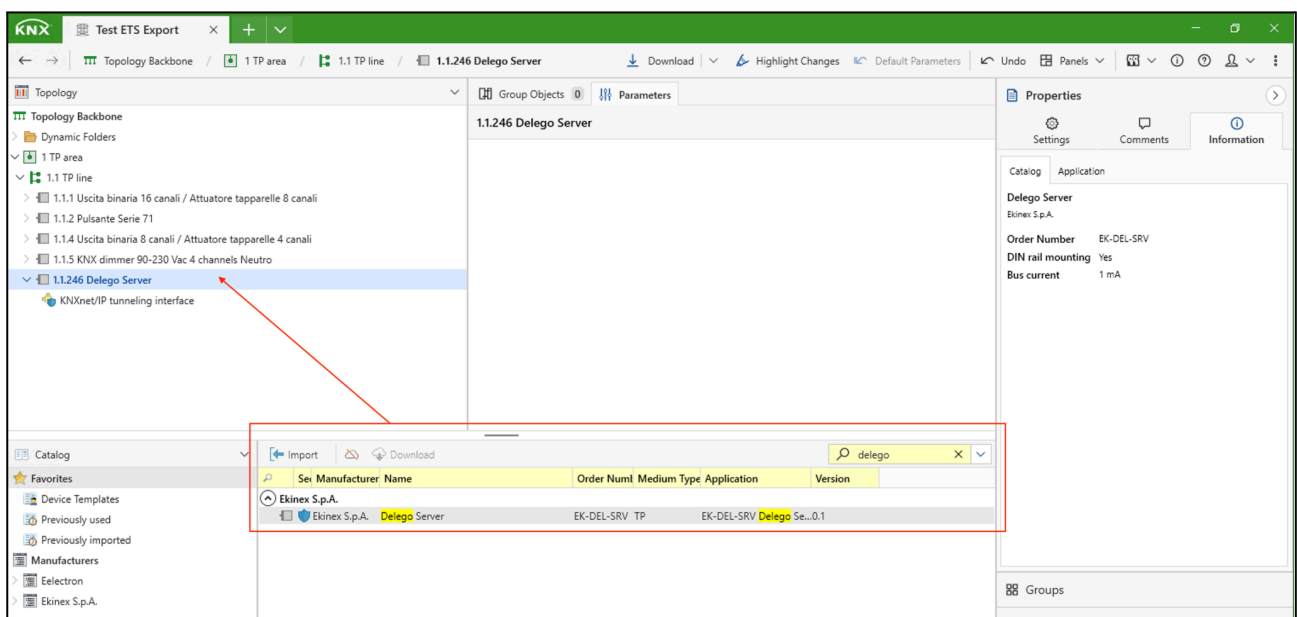


It is also possible to interact with the KNX installation through the IP network, by configuring the communication driver as described below.

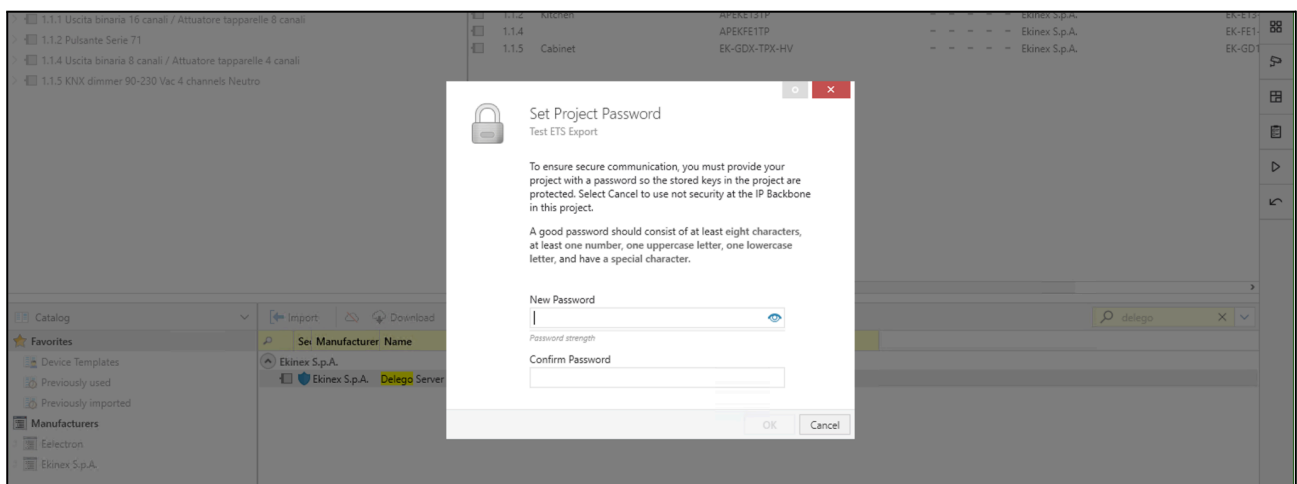
The connection to the KNX bus is not strictly essential for its configuration; However, it is not possible to verify the correctness of the project or simulate the automation functions configured on the server until this connection is established.

2.2 ETS library

It is recommended to add the DELÉGO SERVER library into the ETS project, by searching it in the online catalogue, or downloading it from the EKinex website:



When adding the library into the project, being KNX secure enabled, it is requested to enter a (optional) password:



The library offers only a KNXNet/IP tunnelling interface, as an IP interface, without any parameter to be set nor communication object. It is only necessary to assign an unique address, to be entered in DELÉGO SERVER.



The ETS library is compulsory in case of KNX Secure projects. Otherwise, it is not strictly necessary, even if it's recommended.

2.3 Communication settings



Starting from release 2.7.0 the KNX-related settings have been moved from the TECHNOLOGIES section into the new FIELD TECHNOLOGIES menu item.

Enter the administration space of DELÉGO SERVER and open the following item in the menu:

FIELD TECHNOLOGIES > KNX > KNX SETTINGS

It contains all the settings related to the communication with a KNX installation, as better described in the following paragraphs.

2.3.1 KNX physical address

Enter the physical address of DELÉGO SERVER in the textbox at the beginning of the page.

The address must be specified in the X.Y.Z format respecting the limits imposed by the KNX protocol:

- First number between 0 and 15
- Second number between 0 and 15
- Third number between 0 and 255

When a driver with the “ETS remote” support is selected (see the next paragraph for further details) it automatically allocates the next 10 physical addresses not only for its communication with the bus, but also for ETS remote control (the reserved addresses are shown on the screen, like in the following figure).

KNX - Physical address

Physical address

e.g.: 1.1.200

1.1.150	Base address (assigned to the dummy in the ETS project)
1.1.151	Reserved for ETS remote control
1.1.152	Reserved for ETS remote control
1.1.153	Reserved for ETS remote control
1.1.154	Reserved for ETS remote control
1.1.155	Reserved for ETS remote control
1.1.156	Reserved for ETS remote control
1.1.157	Reserved for ETS remote control
1.1.158	Reserved for ETS remote control
1.1.159	Reserved for internal communication

Communication interface

Driver

Communication channel

IP Address

Port

Routing Counter

Use NAT

With ETS remoting and KNX secure support

KNXnet/IP interface

6

☐

KNX Secure

Key archive file

Key archive password

Choose file No file chosen

KNX IP Secure

Commissioning password

Authorization code

SAVE

CLOSE

KNX Settings

Both the base address and the 10 reserved addresses must be free within the project and not used by any other KNX device.

2.3.2 Communication driver

Starting from version 2.6.0 it is possible to select one of the following KNX communication drivers:

DRIVER NAME	DESCRIPTION
Standard	Basic communication driver for the visualisation
With ETS remote	Enhanced communication driver supporting visualisation and KNXNet/IP server for ETS remoting
With ETS remote and KNX secure support	Full-feature driver supporting also KNX data secure layer Available starting from software version 2.6.0 and only on 4 DIN-rail module version of the server

The drivers supporting the “ETS remote” functionality allow the use of DELÉGO SERVER as an IP interface for ETS PROFESSIONAL. As better described in [section 11](#), this functionality can be used locally and remotely, thanks to the CLOUD VPN service.

2.3.3 Communication interface settings

The following options are available for the KNX communication interface:

Communication channel	Allows the selection of the communication medium with the bus; the following options are available: - Integrated KNX interface (twisted pair directly connected to the server) - KNXNet/IP router - KNXNet/IP interface (only available when KNX Secure is enabled) If an external IP interface is selected, it is also asked to enter its IP address.
Routing counter	Establishes how many passes through line couplers the telegrams sent by DELÉGO SERVER can exceed (default: 6).
Enable integrated KNXNet/IP router	If the option is selected, DELÉGO SERVER automatically forwards all the telegrams received from the twisted pair onto the IP network, and vice versa, like a common IP router. NOTE: router mode must not be activated in the presence of other IP routers in the network, otherwise continuous telegram retransmission loops would occur.
Enable integrated KNXNet/IP interface (tunnelling)	This option allows external devices to communicate/program KNX devices, for example Control4. NOTE: if the communication mode with ETS remote control is activated, this option is always active and cannot be inhibited.



The additional ROUTING and TUNNELING services allow access to the KNX bus through port 3671. For security reasons, it is important to avoid exposing this port outside the LAN network through security rules. *port forwarding* to exclude the possibility of intrusions and alterations to the programming of the KNX devices.

2.3.4 KNX IP Secure

By activating the driver with KNX secure support, it is possible to communicate with an external IP interface in an encrypted way, with the KNX IP SECURE protocol.

In this case it is necessary to set what follows:

IP Address IP Port	IP address and port of the IP interface to be used in the network
Commissioning password Authorization code	Information provided by ETS in the PROPERTIES of the IP interface necessary for the secure communication. These parameters are not necessary if the IP interface is not in secure mode.

3 ETS import

3.1 Introduction

It is possible to import the ETS project in order to facilitate the creation of the KNX WIDGETS and the structure of FLOORS and ROOMS, starting from the information already present in the project.

Even if the importing of the ETS project is not strictly necessary, it is strongly recommended as a starting point for the creation of a KNX visualisation.

3.2 Supported formats

The following file formats are supported for the import from ETS:

FORMAT	EXTENSION	NOTES
Full project file	*.KNXPROJ	Contains all the information of the project. Compatible with ETS 5 and 6 Supported only on 4 DIN-rail module version of the server, with software release 2.6.0 or higher
OPC export	*.ESF *.PHD	Contain only non-empty group addresses (and their relations) and the unique addresses of the physical devices. Compatible with ETS 3+
List of group addresses	*.CSV	Contains only group addresses

The recommended format for the export is the full-project with extension *.KNXPROJ; this format is compatible with ETS 5 and 6. For older ETS versions and/or of the webserver, it is necessary to choose the OPC format.

The CSV is intended for specific purposes.

3.3 Project export from ETS

3.3.1 Full project (KNXPROJ)

Select the desired project in the main screen of ETS, and press the EXPORT button, by choosing *.KNXPROJ as format. This format is compatible only with ETS 5 or 6.

3.3.2 OPC export

In order to export the project in the OPC format, do the same procedure (select the project in the main screen of ETS and press the EXPORT button) by selecting the OPC format.



When exporting in OPC format, two different files are generated:

- *.ESF → Group addresses and relations
- *.PHD → Physical addresses

3.3.3 CSV group addresses list

The tree structure of group addresses, also partially, can be exported in CSV format, directly from the GROUP ADDRESS panel of ETS, by right-clicking on the interested main group.

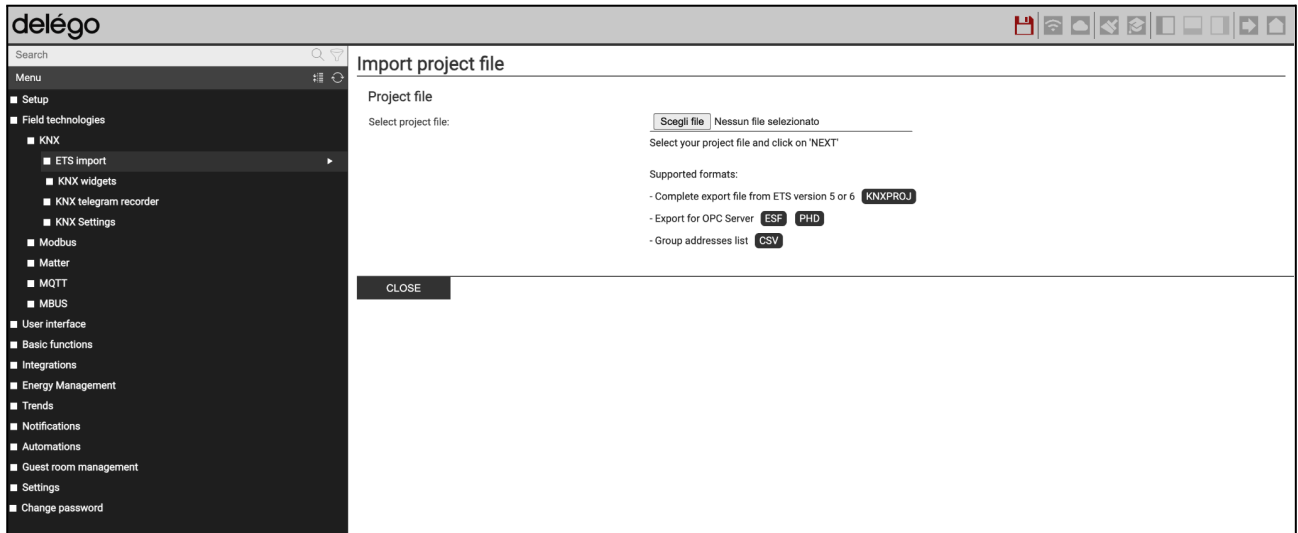
This format shall be used only for special situations; the OPC or (if supported) the KNXPROJ import is recommended for general use.

3.4 Project upload and options setting

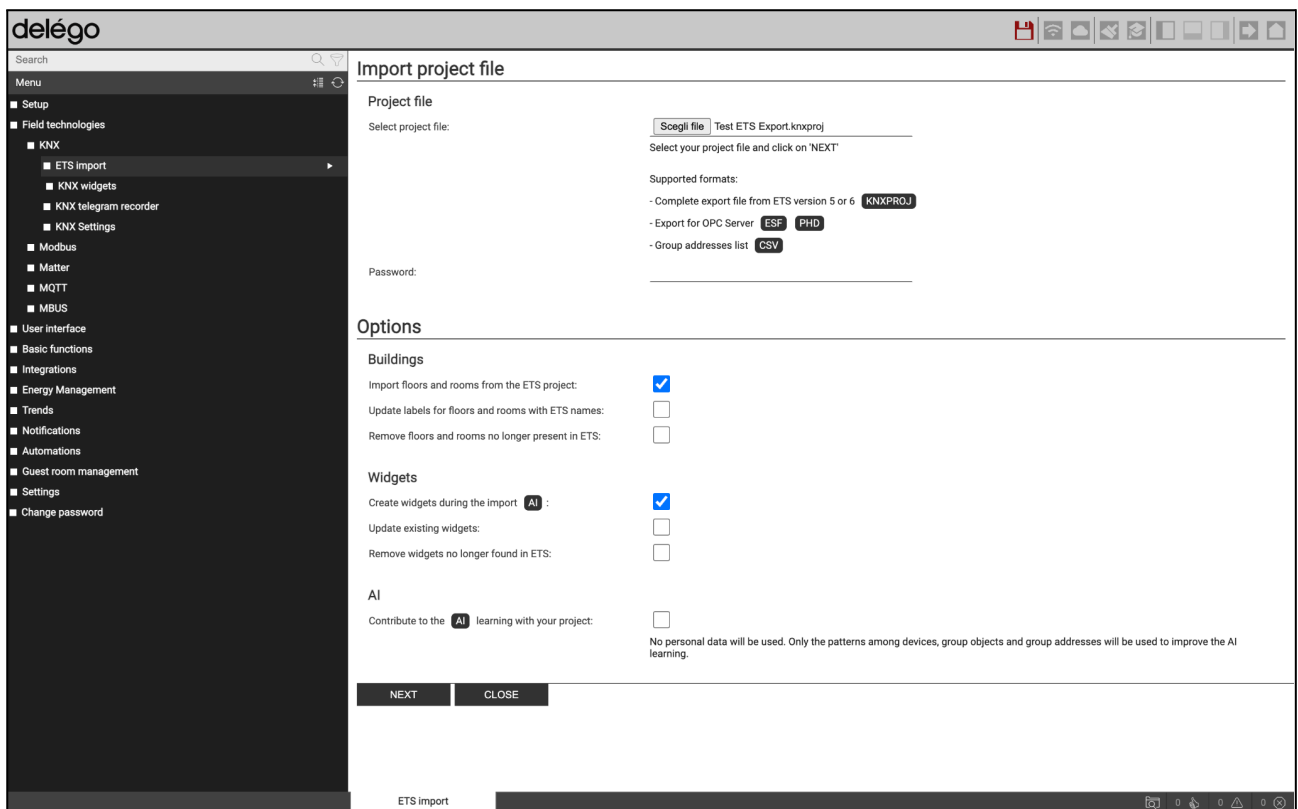
To import a new ETS project, in the Administration view of DELÉGO SERVER navigate to

FIELD TECHNOLOGIES > KNX > ETS IMPORT

The following page is opened:



As soon as a project file is selected, a list of additional settings is displayed, according to the file format; the following screenshot refers to the KNXPROJ format:



The following settings are available for the KNXPROJ format, other formats may offer a shorter list:

GENERAL

PASSWORD	For *.KNXPROJ files, it is possible to enter the password, if the project has been protected. Leave it empty for no-password projects.
----------	--

BUILDINGS

Import floors and rooms from the ETS project	When selected, the building parts in the ETS project are interpreted and created as FLOORS and ROOMS in DELÉGO SERVER.
Update labels for floors and rooms with ETS name	When selected, the names previously assigned to the imported floors and rooms, are adjusted with the ones in the ETS project, if different
Remove floors and rooms no longer present in ETS	When selected, floors and rooms imported previously, no longer found in the project, are automatically removed from the visualisation project

WIDGETS

Create widget during the import	When selected, the integrated IA engine interprets the structure of the project and the contained devices, and tries to automatically create the corresponding widgets, by placing them in the most appropriate room. <i>Note: this function works only with Ekinex KNX products.</i>
Update existing widgets	When selected, widgets previously created by the import are adjusted / changed in the eventuality the corresponding devices / addresses changed in the ETS project.
Remove widgets no longer found in ETS	When selected, widgets previously created by the import, that the AI does not find any more in the ETS project, are automatically removed from the visualisation

AI

Contribute to the AI learning with your project	When selected, the imported project is elaborated on the cloud to improve the AI automatic widgets detection algorithm
Update existing widgets	When selected, widgets previously created by the import are adjusted / changed in the eventuality the corresponding devices / addresses changed in the ETS project.

By enabling the EXPERT mode , the following sections are made available:

PREVIOUS IMPORTS

Delete all previously imported items	When selected, all floors, rooms and widgets eventually created by previous imports, are completely erased, and all the support tables with the "memory" of the previous projects cleared.
--------------------------------------	--

3.5 Status feedback search configuration

When the *search for status feedback* option is active, the project is scanned to find couples of group addresses, matching specific rules to be considered one the command and the other the corresponding status feedback.



This option is only available for formats different from the KNXPROJ, and significantly increases the project import time; we therefore do not recommend activating it for large projects. In this case, feedback can be associated with KNX widgets later.

By pressing the CONFIGURE button, the following page is displayed:

The correct configuration of these rules is fundamental because it will ease the configuration of the widgets. In fact, if DELÉGO SERVER is not correctly trained on the relationships between command addresses and feedback addresses, it cannot pre-populate the selection of these address pairs when creating a new widget.

The general settings on this tab are:

Combination rules:	Options: - All rules must be met (AND) - At least one rule must be satisfied (OR)
Combining rules by name:	Options: - All rules must be met (AND) - At least one rule must be satisfied (OR)
Combination rules per address:	Options: - All rules must be met (AND) - At least one rule must be satisfied (OR)
NAME-BASED RULES	The following options are available: - DELETE RULE - ENABLE ADJUST

	- COMMAND KEYWORD: example <i>command</i>, <i>cmd</i>. Keywords can be separated by commas or entered as new rules - MANDATORY - POSITION (command rule): Start, End, Any - KEYWORD STATUS: example <i>state</i>, <i>feedback</i>, <i>st</i>. As with the command, the different rules can be separated by commas or inserted as new rules - POSITION (state rule): Start, End, Any
RULES BASED ON GROUP ADDRESS	The following options are available: - DELETE RULE - ENABLE ADJUST - LEVEL: main group (X/-/-), intermediate group (-/X/-), group address (-/-/X) - COMMAND ADDRESS - STATE ADDRESS - OFFSET

It is possible to create two types of rules:

NAME-BASED RULES	Status feedback is searched among objects whose name differs from the command by one or more keywords.
ADDRESS-BASED RULES	Feedback is searched based on the KNX address, which must be related to the respective command in some way.

The rules can be defined and not activated by deselecting the appropriate "ENABLE" selection box; in this case, their definition remains stored in the project, but is not used during the import phase.

If you define (and activate) multiple rules, you can decide whether they should work in OR or AND, using the appropriate options at the beginning "COMBINATION OF RULES"; it is possible to establish an AND/OR criterion within the rules by name (if more than one), by address and cumulatively between the two types of rules, for maximum flexibility.

The rules based on the name work like this: it is possible to specify one or more words that must be searched for in the command objects and which will be removed to search for the corresponding state; if these words must necessarily be present, the "mandatory" option must be selected. One or more words to search for in the state objects must then be defined, specifying (as in the case of keywords on commands) whether they should be at the beginning, at the end or in any position of the ETS name.

The search automatically ignores a number of "special" characters:

- Space
-
- _
- +
- ,
- ;

Address-based rules provide a possible filter on the command address; by choosing "any" all are fine, otherwise it is possible to establish a filter on the command address (based on the level - 1, 2 or 3 - of the KNX address on which the rule operates). The status address can be "any", "same as command" or "offset on command", in the latter case a positive or negative offset must be chosen.

Some examples:

- same name with additional "status" or "feedback" (possibly replacing "command" or "cmd");
- KNX address shifted by 1 on intermediate address with the same "main group" and "address group" (the first and third numbers of the address, so to speak).

By combining multiple rules you can obtain more powerful filters, for example: if you have created a project in which the states are shifted by 1 as the intermediate address and by 10 as the group address, i.e. for example

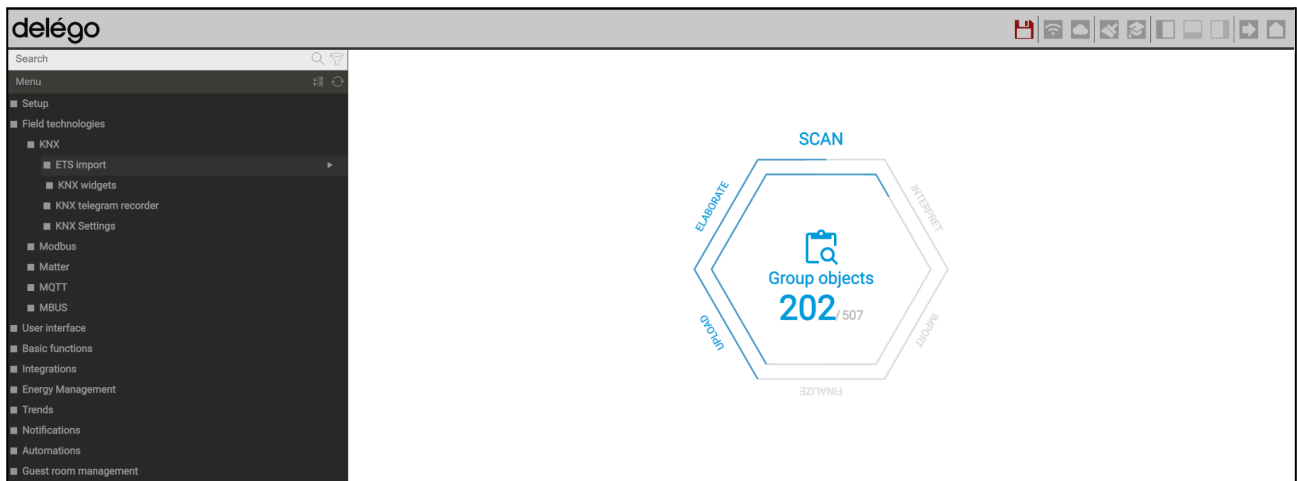
0/0/1 -> 0/1/10

0/0/2 -> 0/1/11

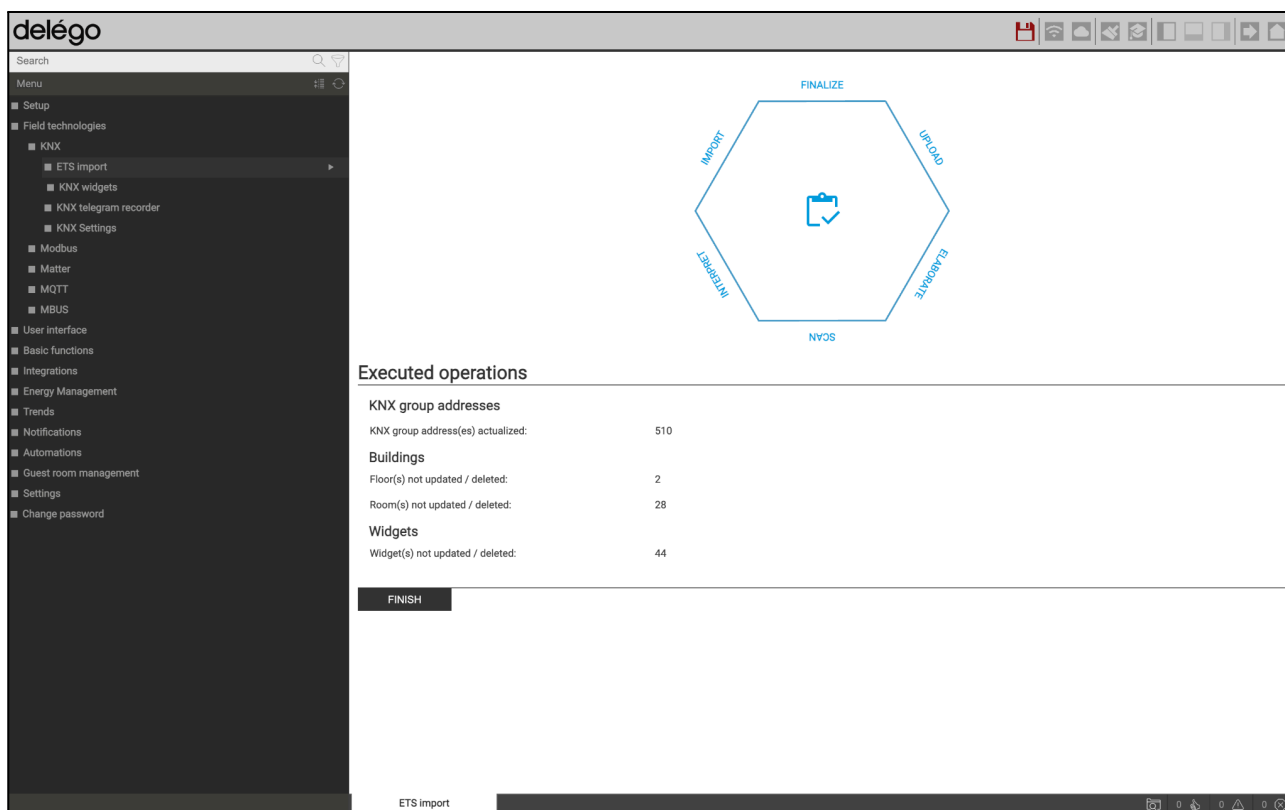
you can create two address-type rules by putting AND as a combination.

3.6 Project import and final report

After specifying the import options, when pressing the NEXT button it starts the project analysis and import; during this procedure, an animation gives information about the current stage and advance. Do not exit this page until the import is finished; it normally takes no more than 5 minutes for large projects.



At the end of the import procedure, a summary of the performed operations is given, like in the following example:



The elements reported as “not updated / deleted” mean had been already created by a previous import, and have not been considered in this import, because the corresponding update flags were not set.

Since the topology in DELÉGO SERVER is based on 2 levels (FLOORS and ROOMS) while on ETS the BUILDING structure is scalable up to 4 levels (BUILDING > BUILDING PART > FLOOR > ROOM), during the KNXPROJ import is used the following algorithm:



- ROOMS and FLOORS in ETS are mapped to the corresponding levels in DELÉGO SERVER, by omitting the BUILDING and/or BUILDING PARTS
- ROOMS, CABINETS or STAIRS directly associated to a BUILDING (PART) are created as ROOMS in DELÉGO SERVER, and the BUILDING (PART) they belong to, as FLOOR

The FLOORS and ROOMS automatically generated by the ETS import can be manually customized, in the same way as those manually created.

3.7 Encoding and function assignment

KNX group addresses unrecognised by the import procedure, must be manually checked before proceeding, in order to ensure the proper encoding is used for the communication.



When importing a project in the KNXPROJ format, this step of the import procedure is normally skipped, due to the fact that all the requested information can be retrieved from the project file.

Only in case of unknown encodings, the specific group addresses are listed here.

For each of these addresses, the following options are given:

TYPE	Length (in bits/bytes) used in the KNX addresses to search within the ETS project
ENCODING	Type of encoding to use in DELÉGO to correctly interpret the data in transit on the KNX bus (depends on the length of the data specified in the "TYPE" field)

It is possible to proceed in two ways:

- Configure the single address, choosing the exact coding, the membership function (not mandatory) and the most appropriate icon to represent it.
- In case of multiple addresses that could be managed with one rule, press EDIT RULES and create an ad hoc ETS rule

In this second case, a page containing a list of predefined rules is displayed; each rule consists of the following information:

KEYWORDS	One or more words (or pieces of words) to search for within the names assigned to the group addresses in ETS. To specify more than one word, separate them with a comma; the space is searched within the ETS project, thus allowing greater granularity in the composition of the rules
TYPE	Length (in bits/bytes) used in the KNX addresses to search within the ETS project
ENCODING	Type of encoding to use in DELÉGO to correctly interpret the data in transit on the KNX bus (depends on the length of the data specified in the "TYPE" field)

The rule must be interpreted in the following way: if DELÉGO SERVER finds a group address that contains in the name at least one of the KEYWORDS specified in the rule, and which includes the length of data specified as TYPE, it adopts the ENCODING specified in the rule to write/read information on the KNX bus, automatically assigns the chosen FUNCTION and adopts the chosen ICON for the graphic representation of the corresponding object.

Once the rules have been integrated, return to the ETS import tab and press RECALCULATE RULES. Repeat the operation as many times as necessary to manage the entire list of addresses present in the project; It is possible to leave KNX addresses in this list unmapped, but they may not be managed correctly in the subsequent configuration phases of the KNX widgets.

Press NEXT to complete the import procedure. At the end the page is reloaded and all the addresses in the project will be visible in the ETS PROJECT Tab divided into the address levels foreseen in the project, ready to be used in association with the KNX widgets.

4 KNX widgets

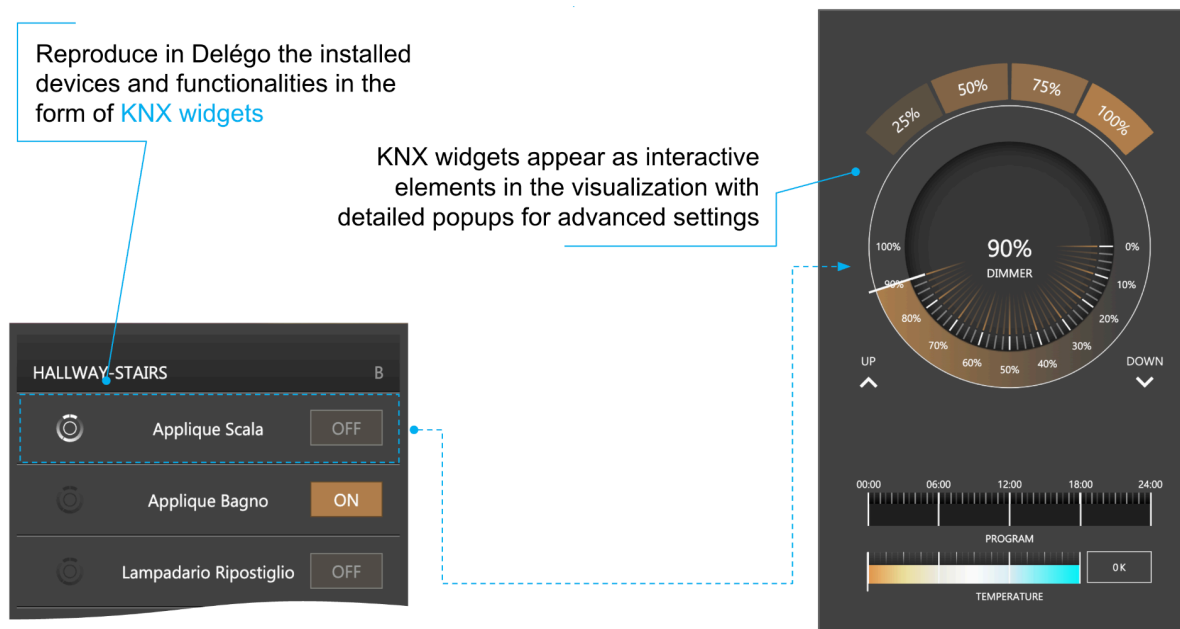
4.1 Introduction

As described in [D2] KNX WIDGETS visually represent a functionality executed by one or more KNX DEVICES; these devices exchange commands and states by communicating on the KNX bus by means of *telegrams* destined to one or more GROUP ADDRESS.

Each command / state is normally associated with a different group address (or a couple of group addresses, the one being the command, and the other the corresponding status feedback). They are also called *sub-items* of the WIDGET.

A typical example is a dimmer (light with brightness control) which can be commanded in different ways:

- ON/OFF switching
- Brightness control
- Tunable white control (hot/cold light temperature) if supported



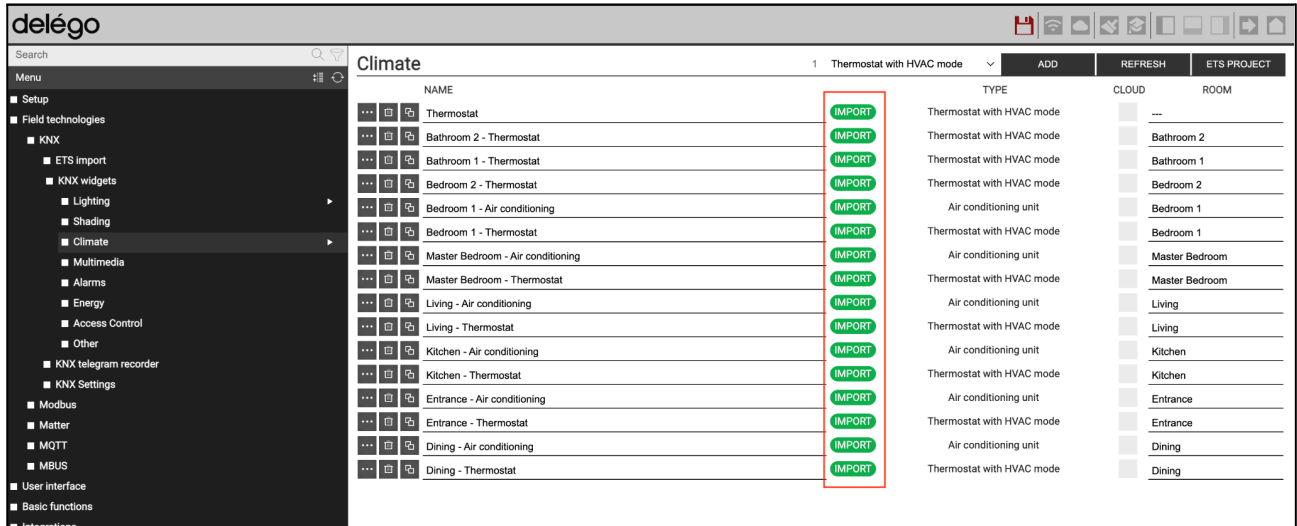
The KNX WIDGETS can be configured

FIELD TECHNOLOGIES > KNX > KNX WIDGETS

section of the Administration view of DELÉGO SERVER. This section contains several CATEGORIES where the widgets can be created; each category contains the list (initially empty) of widgets belonging to the corresponding function.

4.2 Creating a new KNX widget

If a KNXPROJ file containing Ekinex products is imported, typically almost all the necessary widgets are automatically created by the AI. These widgets are identified by the “IMPORT” tag in the list of the existing widgets, like in the following example:



NAME	TYPE	CLOUD	ROOM
Thermostat	Thermostat with HVAC mode	---	---
Bathroom 2 - Thermostat	Thermostat with HVAC mode	---	Bathroom 2
Bathroom 1 - Thermostat	Thermostat with HVAC mode	---	Bathroom 1
Bedroom 2 - Thermostat	Thermostat with HVAC mode	---	Bedroom 2
Bedroom 1 - Air conditioning	Air conditioning unit	---	Bedroom 1
Bedroom 1 - Thermostat	Thermostat with HVAC mode	---	Bedroom 1
Master Bedroom - Air conditioning	Air conditioning unit	---	Master Bedroom
Master Bedroom - Thermostat	Thermostat with HVAC mode	---	Master Bedroom
Living - Air conditioning	Air conditioning unit	---	Living
Living - Thermostat	Thermostat with HVAC mode	---	Living
Kitchen - Air conditioning	Air conditioning unit	---	Kitchen
Kitchen - Thermostat	Thermostat with HVAC mode	---	Kitchen
Entrance - Air conditioning	Air conditioning unit	---	Entrance
Entrance - Thermostat	Thermostat with HVAC mode	---	Entrance
Dining - Air conditioning	Air conditioning unit	---	Dining
Dining - Thermostat	Thermostat with HVAC mode	---	Dining

Otherwise, or more in general each time a new functionality not already present in the visualisation, must be represented to the end user, one or more KNX widget(s) must be created manually.

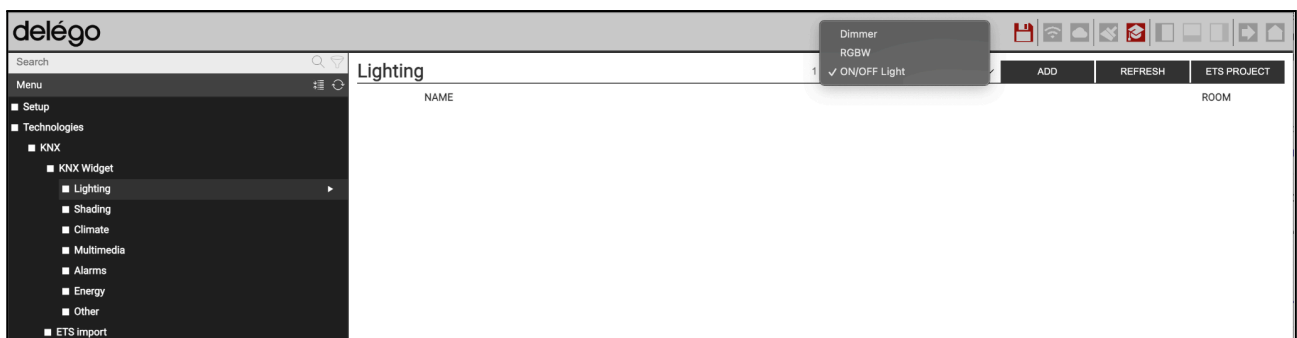


It is strongly suggested to create manually only one widget for each typology in the project, check that it works properly, and then duplicate it, as explained in the next paragraph.

Thanks to the powerful offset-based duplication engine, this approach saves a lot of configuration time.

To create manually a new KNX WIDGET:

- Select the most appropriate TEMPLATE in the drop-down menu at the beginning of the list
- Press the ADD button



By choosing, for example, a **dimmer**, and entering the details page of the new widget once it has been created (by pressing the edit button), the following page is displayed:

The screenshot shows the 'delégo' web interface. On the left is a sidebar menu with categories: Setup, Technologies, and Modbus. Under 'Technologies', 'KNX' is expanded, showing various widget types like Lighting, Shading, Climate, etc. The main content area is titled 'Object properties' and contains a form for configuring a 'Dimmer' widget. The form has fields for Name (set to 'Dimmer'), Room (set to '---'), Function (set to 'Lighting'), Cloud sync (disabled), and Voice control (enabled). Below the form are buttons for 'CLOSE', 'REFRESH', and 'CLONE'. To the right of the form is a section titled 'KNX addresses' which displays a table of addresses with columns for Functionality, Voice Command, Feedback, Write, and State.

The OBJECT PROPERTIES section contains some general attributes of the widget:

NAME	Label used to identify the widget in the visualisation
ROOM	Drop down menu that allows to select to which room the widget is associated.
FUNCTION	The category to which the widget belongs (e.g., lighting, climate, shading, etc). Assigned by default to the category initially selected to create the widget, it can eventually be modified to <i>move</i> the widget into a different category.
ENABLE CLOUD SYNC	It allows you to synchronize the widget on the cloud, and enable it for external services, such as control via voice assistants.
VOICE CONTROL	Indicates if the widget can be controlled with a voice assistant. For further details, please refer to [D3]

By enabling the EXPERT mode , with the dedicated button in the TOOLBAR, it is possible to set:

VISIBLE	Establishes whether or not the component should be visible in the Visualisation view of DELÉGO SERVER.
ENABLE PIN CONTROL NEW PIN REPEAT NEW PIN	If selected, a numeric PIN code will be requested to the user before sending commands and/or opening the details popup of the widget. Assign (and repeat for security reasons) a <i>strong</i> numeric PIN in the following textbox fields

In the KNX ADDRESSES section below, there is the list of possible commands / states that the template can support. Normally, each row corresponds to a GROUP ADDRESS (called MAIN) for sending commands, and eventually a FEEDBACK where the value is received from the bus.

More in details, each element of the list offers the following parameters:

FUNCTIONALITY	Describe the function of the KNX address of the component. It is not editable, except in the case of generic components.
VOICE	Highlights which address can be controlled with voice assistants; are not editable. For further details, please refer to [D3].
COMMAND	Primary KNX address, used to send commands to the KNX bus
FEEDBACK	The KNX address (if present) where devices send their actual status (e.g. the actuator after a command). In case of read-only objects, insert here the KNX address on which DELÉGO expects to receive telegrams.
WRITE	Determines whether or not the address should be writable by the user interface DELÉGO
STATE	It shows the real-time status of the address and allows, if writable, to send test commands on the KNX bus

If the EXPERT mode () is enabled, the following attributes are also visible:

ETS ENCODING	Type of data exchanged on the KNX bus on this address. It is recommended to keep the default value.
MIN MAX STEP	In the case of addresses with a numerical value, it allows you to force a minimum and maximum limit value and a step for the increase/decrease of the value. In this way, for example, it is possible to narrow or widen the selection limits of a temperature set point in the component of a thermostat.
READ	Establishes whether the KNX address can be queried via read telegram. To send KNX reading telegrams, use a scenario.
SCH/TRG	Allows to select which element of the list will be selected when the widget is dropped into a TRIGGER, or it is SCHEDULED. In some sections of the Administration view, a modal allows the user to select a different item and/or multiple items to be used, as explained better in the following chapters.
SCEN.	In a similar way to the previous flag, it determines which item of the list is automatically chosen by the system when the end user adds the widget to a scenario.
LIBRARY	For some widgets, it allows to change the GUI library and aspect in the Visualisation view.



Not all the items in the list of KNX ADDRESSES are required. Templates require a minimum set of elements for a correct visualisation; if group addresses are omitted in the administration, the corresponding graphical element will not be visible.

4.3 Cloning KNX widgets

Once a widget is fully configured, it can be duplicated several times, to make the creation of similar widgets quicker. This approach represents the fastest way to quickly implement the supervision project, thanks to the possibility - during duplication - of automatically increasing the group addresses.

To duplicate a widget:

- Press the corresponding CLONE button in the widgets list
- Press the CLONE button in its detail sheet

The following dialog page is opened:



It is needed to specify the following:

NUMBER OF COPIES	Allows you to specify the number of components you want to create, starting from the chosen one
GROUP ADDRESSES	If you select “keep originals”, identical copies of the original widget will be created. Conversely, by selecting "apply offset" it is possible to indicate an increment (offset) for each of the 3 numbers that make up the KNX addresses (main, intermediate and group address), to be applied for each of the duplicates. It is also possible to indicate negative values. For example, by entering “1” or “+1” as an offset on the group address, each KNX address present in the starting widget will be increased by 1 on the last number, as many times as there are copies requested: 3/0/1 3/0/2 3/0/3 ...

By pressing the RUN button the duplication starts; after a few seconds, the widgets are available in the corresponding section of the KNX WIDGET page.



After the duplication of a widget, it is required to press the REFRESH button in the category list, in order to see the new widgets

At this point:

- Change the label of the new widgets.
- Assign them to the appropriate room.

4.4 Customization

By enabling the EXPERT mode , it is possible to customize specific aspects of the items in a widget.

For the numeric items, it is possible to force the MIN, MAX and STEP values, in order to set a specific range of values and the “granularity” of the intermediate values between the limits. The *round sliders* in the visualisation will adjust the displayed values accordingly.

- Manual		3/1/5	-/-/-	Float value (2 bytes)	15	25	0.1							2
----------	--	-------	-------	-----------------------	----	----	-----	--	--	--	--	--	--	---

Furthermore, for a specific subset of the items, a different graphic library can be set, from the default one. By pressing the corresponding button, a dialog window is displayed, with the possibility to filter and select the most appropriate set.

KNX addresses

FUNCTIONALITY		VOICE MAIN	FEEDBACK	ETS ENCODING	MIN	MAX	STEP	WRITE	READ	SCH/TRG	SCEN.	STATE	LIBRARY	
...	Measured temperature		3/0/0	3/0/0	Float value (2 bytes)								20.6	
...	Thermostat ON/OFF		-/-/-	-/-/-	Switching (1 bit)								On	
...	HVAC Operating Mode - Manual		3/0/3	3/0/4	Numeric value 0-255 (1 byte)								Stby	
...	HVAC Operating Mode - Chrono		3/1/3	-/-/-	Numeric value 0-255 (1 byte)								Com	
...	Chrono active status		-/-/-	-/-/-	Switching (1 bit)								On	
...	Setpoint - Actual		3/0/13	3/0/13	Float value (2 bytes)								22	
...	Setpoint - Manual		-/-/-	-/-/-										

PICK A RENDERING

HVAC Operating Mode

1:Com, 2:Stby, 3:Night, 4:Off

HVAC Operating Mode (with AUTO)

0:Auto, 1:Com, 2:Standby, 3:Night, 4:Frost

HVAC Operating Mode [EU] (no AUTO)

1:Com, 2:Standby, 3:Night, 4:Frost

CANCEL

hvac

The graphic library can be even customized, as better explained in [D2].

4.5 Functions

As explained in [D2], all the visible items in DELÉGO SERVER must belong to a FUNCTION. Also the KNX WIDGETs must comply with this requirement.

In the following chapters, the available templates for the KNX WIDGETs for each FUNCTION will be examined and illustrated in all their graphical aspects.

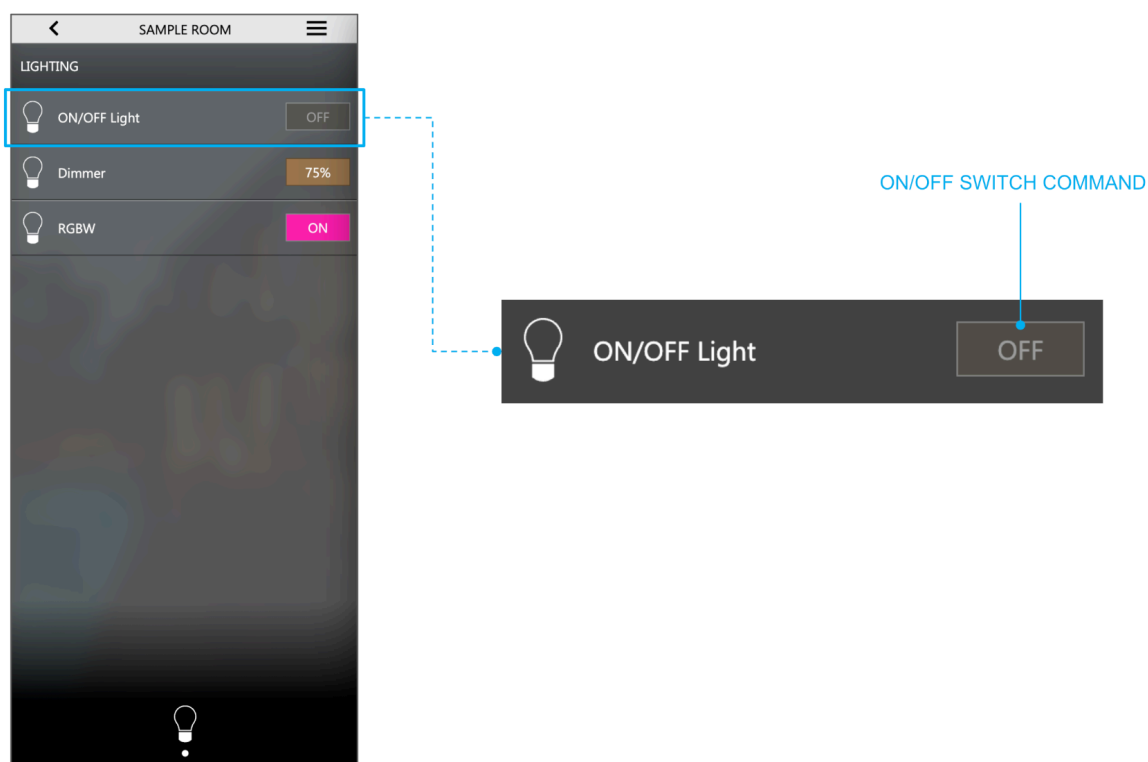
5 Lighting

5.1 ON/OFF light

Simple widget for the control of ON/OFF lights and, more in general, switching relays. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
ON/OFF	Switching (1 bit DPT 1)	RW	Turns the light ON and OFF. <i>Mandatory element for this type of widget.</i>

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:



5.2 Dimmer

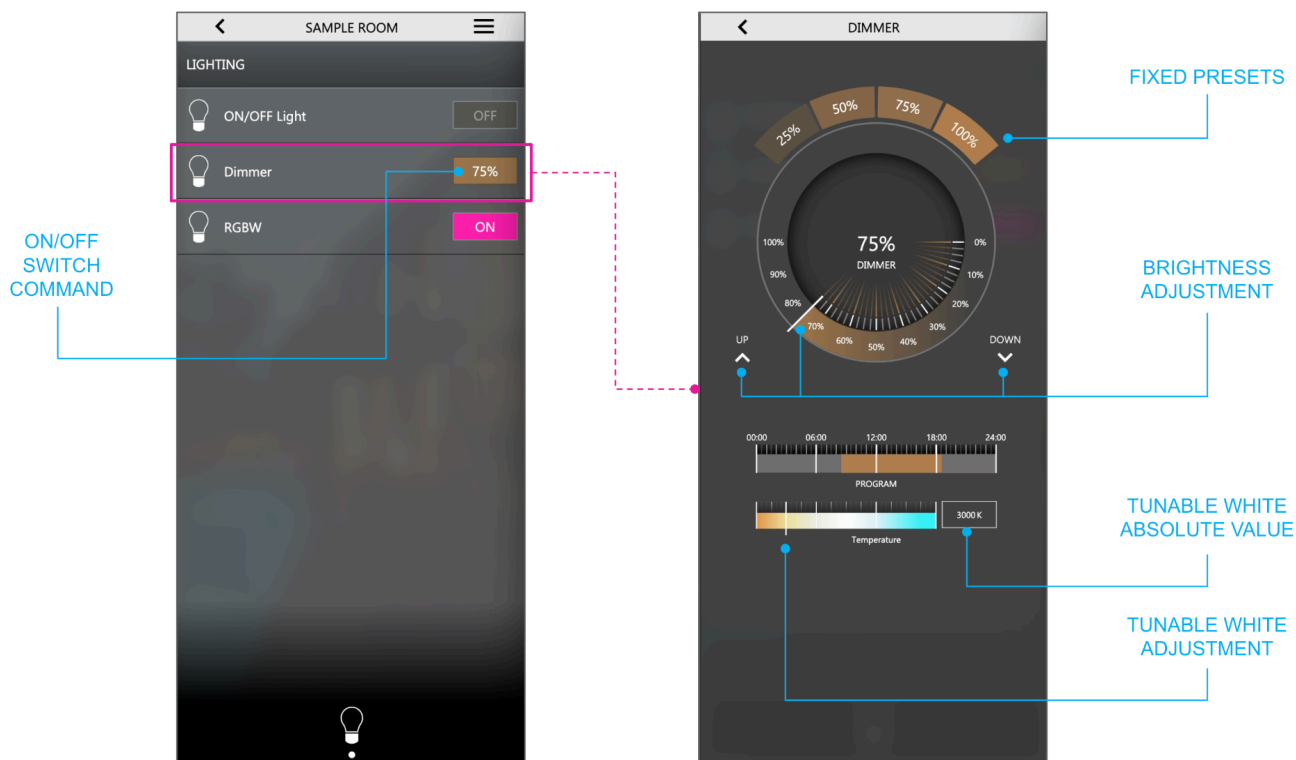
Template dedicated to the control of lights with brightness and, eventually, tunable white control. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
ON/OFF	Switching (1 bit DPT 1)	RW	Turns the light ON and OFF. <i>Mandatory element for this type of widget.</i>
Brightness value	Percent value (1 byte DPT 5)	RW	Adjustment of the percentage intensity of the light. <i>Mandatory element for this type of widget.</i>
Color temperature	16 bit counter (2 byte DPT 7.600)	RW	Adjustment of color temperature (tunable white) in absolute value expressed in K
Color temperature %	Percent value (1 byte DPT 5)	RW	Color temperature adjustment (tunable white) in the form of a percentage between cold and warm light



The “color temperature” and “color temperature %” are mutually exclusive being alternative encodings for the same meaning.

The following picture displays how the widget is displayed in the Visualisation view of DELEGO SERVER:



5.3 RGBW

Template dedicated to the control of coloured lights. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
ON/OFF	Switching (1 bit DPT 1)	RW	Turns the light ON and OFF. <i>Mandatory element for this type of widget.</i>
RGBW - Red	Percent value (1 byte DPT 5)	RW	Individual component coloring when using RGB color coding
RGBW - Green			
RGBW - Blue			
RGBW - White	Percent value (1 byte DPT 5)	RW	If present, the WHITE component of the RGBW
Intensity dimmer	Percent value (1 byte DPT 5)	RW	Adjustment of the intensity of the lighting body regardless of the color selection
HSV - Hue	Percent value (1 byte DPT 5)	RW	Individual component coloring when using HSV color coding
HSV - Saturation			
HSV - Value			
HSV	3 byte (DPT 232.600)	RW	Color control in HSV coding with single telegram
RGB	3 byte (DPT 232.600)	RW	Color control in RGB coding with single telegram



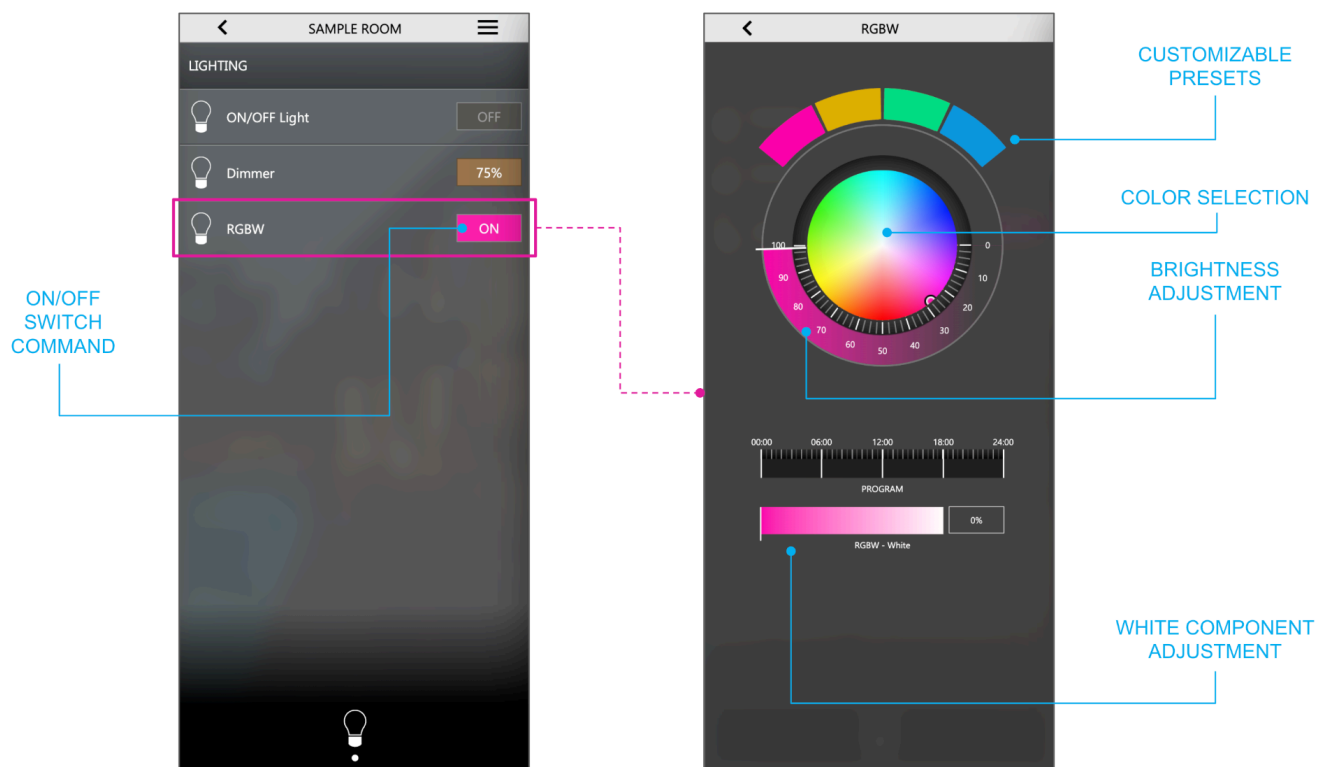
It is important to specify only one of the following color adjustment modes, which must be considered mutually exclusive:

- RGB single components
- RGB single telegram
- HSV single components
- HSV single telegram

This template allows to save the actual colour in a PRESET, in order to retrieve it in a second moment. It is possible to save up to 4 presets. In order to save a preset:

- Set the desired colour
- Long press on one of the four elements on top of the colour picker

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:



6 HVAC

6.1 Thermostat with HVAC mode

Full-featured template for thermostats configured in ETS to be used with the HVAC operating mode(s) (also called “absolute” temperature control).

GENERIC THERMOSTATS

Supported items by the template for generic thermostats:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Measured temperature	Float value (2 byte DPT 9)	R	Measured temperature read from the internal sensor
Thermostat ON/OFF	Switching (1 bit DPT 1)	RW	If present, activates or deactivates thermostat management and related graphics
HVAC manual mode	Numeric value 0-255 (1 byte DPT 6)	RW	Standard convention: 1 → Comfort 2 → Precomfort / Standby 3 → Economy 4 → Off / Protection <i>Note: this sub-object is the one associated by default with scenarios and schedules</i>
Setpoint - Actual	Float value (2 byte DPT 9)	R	Setpoint used by the thermostat based on the current mode. Read only.
Setpoint - Manual	Float value (2 byte DPT 9)	RW	In case of single setpoint thermostats, assign this item to the setpoint group address. In case of “dual” chrono and manual modes configurations of EKINEX thermostats, set this item to the manual setpoint group address (refer to the specific instructions below)
Offset	Float value (2 byte DPT 9)	RW	If the thermostat provides +/- 3° regulation compared to the basic set point, associate a KNX address to adjust it in the graphics, instead of the set point
Setpoint XXX Heating / Cooling	Float value (2 byte DPT 9)	RW	Setpoints associated with the different HVAC modes for the heating and cooling
Heating / cooling	Switching (1 bit DPT 1)	RW	Convention: 0 → cooling 1 → heating <i>Note: in the absence of this address, the thermostat is considered to be in heating only mode</i>

Heating Cooling (ON/OFF)	Switching (1 bit DPT 1)	R	Heating or air conditioning request status; read only. If the thermostat controls a single output in both seasons, report the same KNX address in both lines
Automatic / manual mode	Switching (1 bit DPT 1)	RW	Convention: 0 → manual 1 → auto
Ventilation speed	Numeric value 0-255 (1 byte DPT 6)	RW	Fan speed. Depending on the chosen sub-object, the regulation occurs in discrete steps or as a percentage (continuous regulation). To modify the values exchanged on the KNX bus, select the button in the last column on the right, and locate the most appropriate set of options in the popup that is shown
Ventilation speed (%)	Percent value (1 byte DPT 5)		

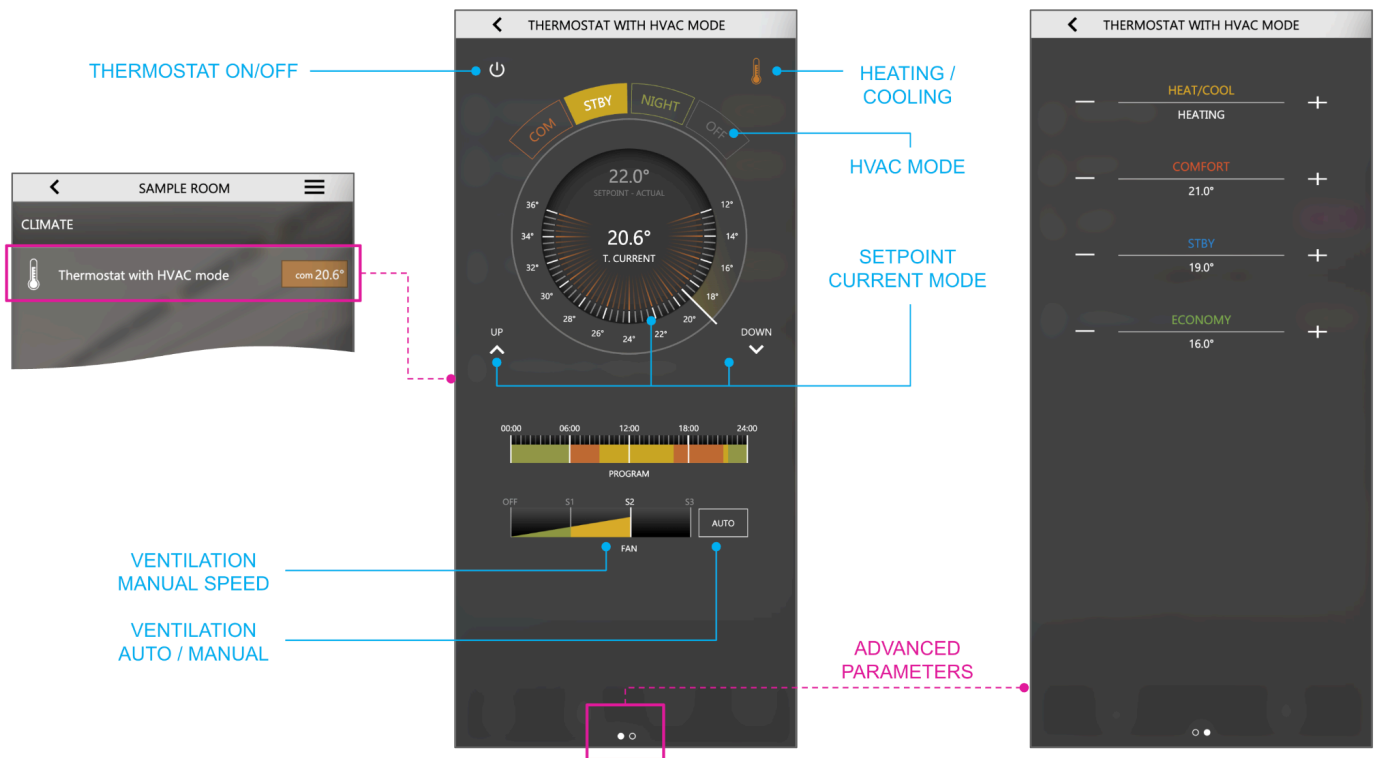


If a single HVAC mode has to be used, the **“HVAC manual mode”** item **must be filled** with the KNX group addresses from ETS, **and not the “HVAC mode”**. The “HVAC mode” is intended for the *dual mode* configuration, specific for EKINEX thermostats / pushbuttons, as explained below.



The “ventilation speed” and “ventilation speed (%)” are mutually exclusive; assign KNX group address(es) only to one of the two items, according to the encoding (datapoint type) configured in ETS.

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:



EKINEX THERMOSTATS AND PUSHBUTTONS

EKINEX's thermostats and pushbuttons with integrated thermostat have an advanced HVAC regulation, normally not available on KNX devices from other manufacturers, based on the principle of two different operating conditions, where the thermostat can be in:

- Chrono mode
- Manual mode

In *chrono mode* the thermostat is under the control of a BMS - like DELÉGO SERVER - where the temperature and HVAC operating mode are managed automatically and scheduled during the day. In that condition, the “**HVAC Mode**” is considered as the operating mode of the thermostat. When the user interacts with the thermostat (e.g., by changing the *HVAC mode* or the *manual setpoint*) the thermostat goes to the *manual mode*.

The advantage of this *dual mode* approach, is an easy way - for the end user - to “override” the automatic (chrono) functionality with a temporary manual mode; during the *manual mode*, anyway, the thermostat keeps in memory the changes of the automatic mode; when the user restores the *chrono mode*, the thermostat returns to the state it would have had if it had not gone into manual mode.

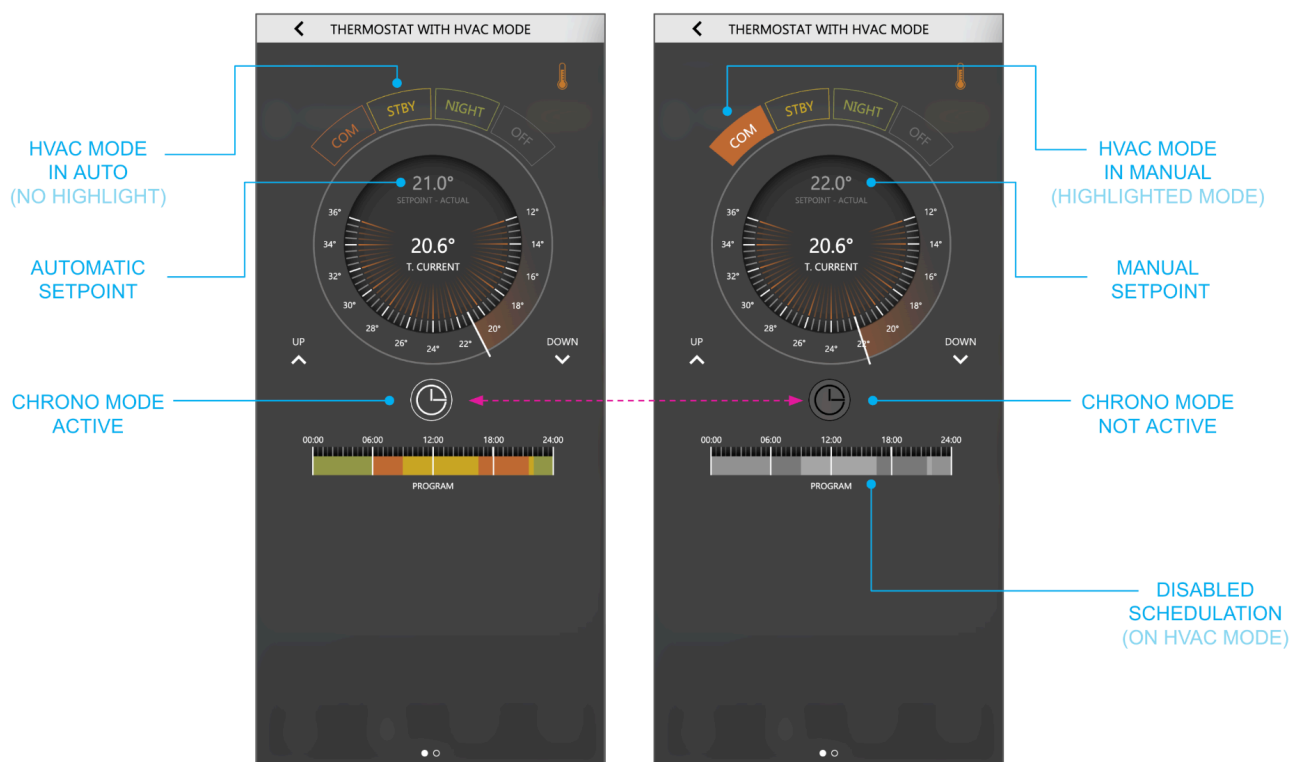
The following specific items in the thermostat widget are involved in the *dual mode*:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
HVAC mode	Numeric value 0-255 (1 byte DPT 6)	RW	Operating mode of the thermostat used when it is in <i>Chrono mode</i> To be associated to the NX group address(es) of the following communication object(s): - HVAC Mode In (COMMAND) - HVAC Mode Out (FEEDBACK)
HVAC manual mode	Numeric value 0-255 (1 byte DPT 6)	RW	Operating mode of the thermostat used when it is in <i>Manual mode</i> To be associated to the NX group address(es) of the following communication object(s): HVAC Manual Mode (COMMAND)
Chrono active status	Switching (1 bit DPT 1)	R	Status of the “Chrono mode”. To be associated to the NX group address(es) of the following communication object(s): HVAC Manual Mode (COMMAND)
Setpoint - Manual	Float value (2 byte DPT 9)	RW	Setpoint to be used in manual mode to override the one associated with the operating mode. To be associated to the NX group address(es) of the following communication object(s): Manual setpoint (COMMAND)
Manual setpoint active status	Switching (1 bit DPT 1)	RW	Status of the “manual setpoint”. To be associated to the NX group address(es) of the following communication object(s): Manual setpoint active status (COMMAND)

The following picture shows the communication objects in the ETS library involved with the *dual mode*:

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
240	Temperature value				2 bytes	C	R	-	T	-	temperatu...Low	
262	Thermostat - Heating/cooling status out				1 bit	C	R	-	T	-	cooling/h... Low	
263	Thermostat - Heating/cooling status in				1 bit	C	-	W	-	-	cooling/h... Low	
264	Thermostat - HVAC mode in				1 byte	C	-	W	-	-	HVAC modeLow	
265	Thermostat - HVAC forced mode in				1 byte	C	-	W	-	-	HVAC modeLow	
266	Thermostat - HVAC mode out				1 byte	C	R	-	T	-	HVAC modeLow	
267	Thermostat - HVAC manual mode				1 byte	C	-	W	T	U	HVAC modeLow	
268	Thermostat - Chrono active status				1 bit	C	R	-	T	-	state Low	
269	Thermostat - Actual setpoint				2 bytes	C	R	-	T	-	temperatu...Low	
270	Thermostat - Manual setpoint				2 bytes	C	-	W	-	-	temperatu...Low	
271	Thermostat - Comfort setpoint (heating)				2 bytes	C	R	W	T	U	temperatu...Low	
272	Thermostat - Comfort setpoint (cooling)				2 bytes	C	R	W	T	U	temperatu...Low	
273	Thermostat - Standby setpoint (heating)				2 bytes	C	R	W	T	U	temperatu...Low	
274	Thermostat - Standby setpoint (cooling)				2 bytes	C	R	W	T	U	temperatu...Low	
275	Thermostat - Economy setpoint (heating)				2 bytes	C	R	W	T	U	temperatu...Low	
276	Thermostat - Economy setpoint (cooling)				2 bytes	C	R	W	T	U	temperatu...Low	
277	Thermostat - Building protection setpoint (heating)				2 bytes	C	R	W	T	U	temperatu...Low	
278	Thermostat - Building protection setpoint (cooling)				2 bytes	C	R	W	T	U	temperatu...Low	
279	Thermostat - Room temperature controller status				1 bit	C	R	-	T	-	enable Low	
280	Thermostat - Heating out command				1 bit	C	R	-	T	-	switch Low	
281	Thermostat - Cooling out command				1 bit	C	R	-	T	-	switch Low	
291	Thermostat - Alarm text				14 bytes	C	R	-	T	-	Character... Low	
292	Thermostat - Manual setpoint active status				1 bit	C	R	W	T	U	state Low	
296	Thermostat - Room temperature control alarm				1 bit	C	R	-	T	-	alarm Low	
308	Thermostat - Thermal generator lock				1 bit	C	-	W	-	-	alarm Low	
309	Thermostat - Building protection HVAC mode active				1 bit	C	R	-	T	-	state Low	

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER for both chrono and manual modes:





In order the *dual mode* to work properly, it is also necessary to do the following steps:

- Activate the EXPERT mode 
- Select the CRONO MODE in the column SCH/TRG

By doing this, the schedules will be done on the chrono HVAC mode, and not on the manual one.

6.2 Thermostat with single setpoint

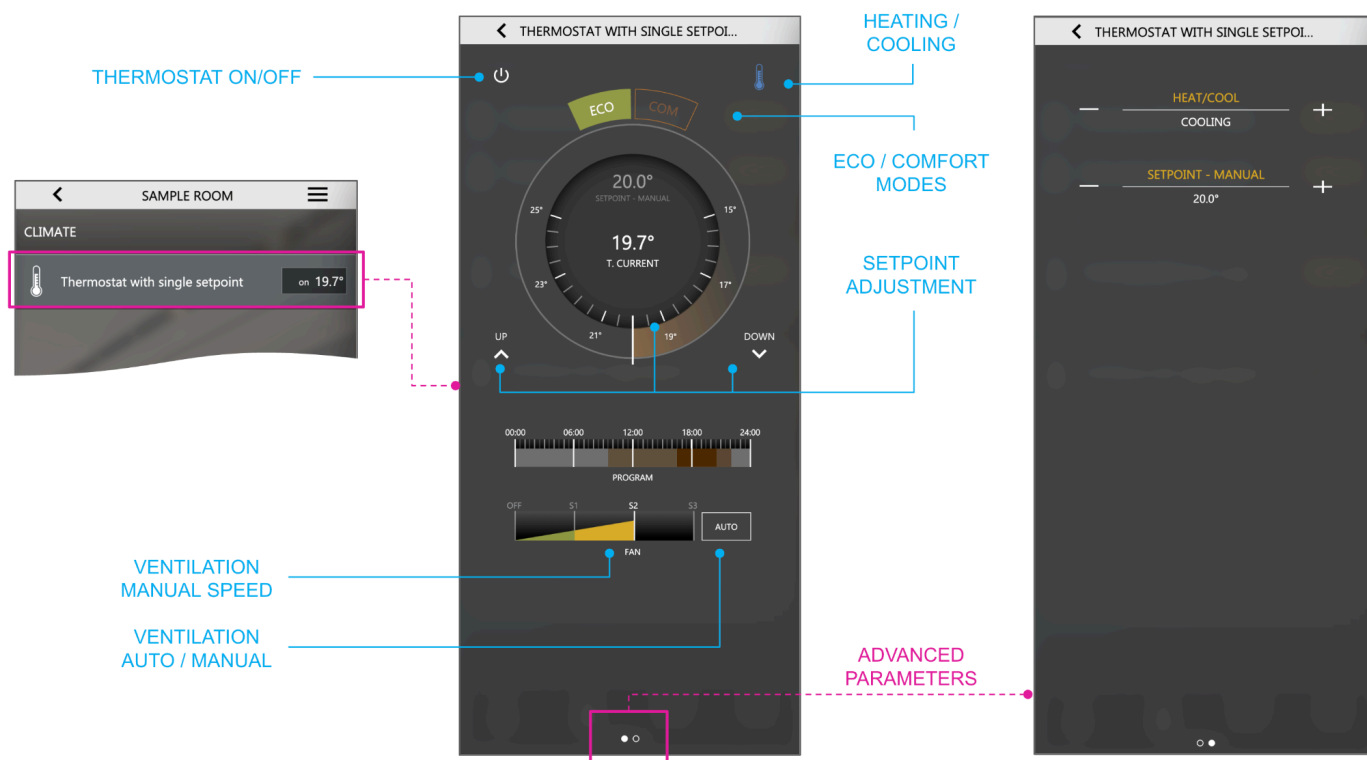
Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Measured temperature	Float value (2 byte DPT 9)	R	Measured temperature read from the internal sensor
Thermostat ON/OFF	Switching (1 bit DPT 1)	RW	If present, activates or deactivates thermostat management and related graphics
Comfort mode Eco mode	Switching (1 bit DPT 1)	RW	If present, activate respectively a “comfort mode” (increased comfort with an offset on the temperature setpoint) and an “eco mode” (reduced setpoint for energy saving)
Setpoint - Actual	Float value (2 byte DPT 9)	R	Setpoint used by the thermostat based on the flags. Read only.
Setpoint - Manual	Float value (2 byte DPT 9)	RW	Adjustable temperature (base) setpoint.
Offset	Float value (2 byte DPT 9)	RW	If the thermostat provides +/- 3° regulation, this item overrides the setpoint regulation
Heating / cooling	Switching (1 bit DPT 1)	RW	Convention: 0 → cooling 1 → heating Note: in the absence of this address, the thermostat is considered to be in heating only mode
Heating Cooling (ON/OFF)	Switching (1 bit DPT 1)	R	Heating or air conditioning request status; read only. Enter the same address in case of single output.
Automatic / manual mode	Switching (1 bit DPT 1)	RW	Convention: 0 → manual 1 → auto
Ventilation speed	Numeric value 0-255 (1 byte DPT 6)	RW	Fan speed. Depending on the chosen sub-object, the regulation occurs in discrete steps or as a percentage (continuous regulation).
Ventilation speed (%)	Percent value (1 byte DPT 5)		



The “ventilation speed” and “ventilation speed (%)” are mutually exclusive; assign KNX group address(es) only to one of the two items, according to the encoding (datapoint type) configured in ETS.

The following picture displays how the widget is displayed in the Visualisation view of DELEGO SERVER:



6.3 Thermostat with seasonal setpoint

This template is similar to the thermostat with a single setpoint, but offers two different temperature setpoints, one for the heating, and the other for the cooling.

Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Measured temperature	Float value (2 byte DPT 9)	R	Measured temperature read from the internal sensor
Thermostat ON/OFF	Switching (1 bit DPT 1)	RW	If present, activates or deactivates thermostat management and related graphics
Comfort mode Eco mode	Switching (1 bit DPT 1)	RW	If present, activate respectively a “comfort mode” (increased comfort with an offset on the temperature setpoint) and an “eco mode” (reduced setpoint for energy saving)
Setpoint - Actual	Float value (2 byte DPT 9)	R	Setpoint used by the thermostat based on the flags. Read only.
Setpoint - Heating Setpoint - Cooling	Float value (2 byte DPT 9)	RW	Adjustable temperature setpoint, respectively for the heating and the cooling mode
Offset	Float value (2 byte DPT 9)	RW	If the thermostat provides +/- 3° regulation, this item overrides the setpoint regulation
Heating / cooling	Switching (1 bit DPT 1)	RW	Convention: 0 → cooling 1 → heating Note: in the absence of this address, the thermostat is considered to be in heating only mode
Heating Cooling (ON/OFF)	Switching (1 bit DPT 1)	R	Heating or air conditioning request status; read only. Enter the same address in case of single output.
Automatic / manual mode	Switching (1 bit DPT 1)	RW	Convention: 0 → manual 1 → auto
Ventilation speed	Numeric value 0-255 (1 byte DPT 6)	RW	Fan speed. Depending on the chosen sub-object, the regulation occurs in discrete steps or as a percentage (continuous regulation).
Ventilation speed (%)	Percent value (1 byte DPT 5)		

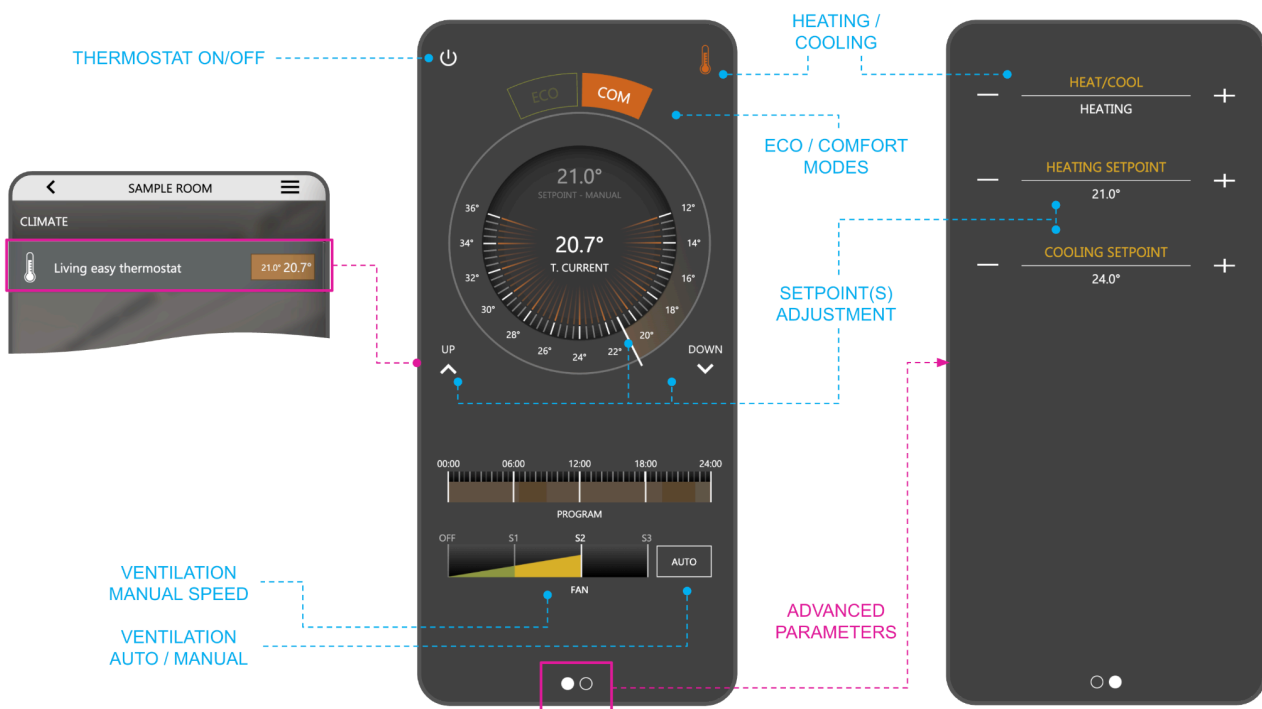


The “ventilation speed” and “ventilation speed (%)” are mutually exclusive; assign KNX group address(es) only to one of the two items, according to the encoding (datapoint type) configured in ETS.

This template is particularly suited for the Ekinex EK-ER2-TP easy thermostat; the following picture shows the communication objects that normally have to be configured, to obtain a suitable visualisation in DELÉGO SERVER:

Number	Name	Object Function	Linked with	Group Addresses	Length	C	R	W	T	U	Data Type	Priority
3	Temperature value	ER2 - Temperature value	12/1/81	2 bytes	C	R	-	-	-	-	temperatu...Low	
34	Room temperature (from bus)			2 bytes	C	-	W	-	-	-	temperatu...Low	
47	Weighted temperature	ER2 - Weighted temperat...	12/1/82	2 bytes	C	R	-	-	-	-	temperatu...Low	
48	Heating/cooling status out	ER2 - Heating/Cooling Out	12/2/82	1 bit	C	R	-	-	-	-	cooling/h... Low	
49	Heating/cooling status in	ER2 - Heating/Cooling In	12/2/81	1 bit	C	-	W	-	-	-	cooling/h... Low	
52	Actual setpoint	ER2 - Actual setpoint	12/3/91	2 bytes	C	R	-	-	-	-	temperatu...Low	
54	Thermostat off status			1 bit	C	R	-	-	-	-	state Low	
56	Thermostat off command			1 bit	C	R	W	T	U		state Low	
57	Setpoint (heating)	ER2 - Heating setpoint	12/3/92	2 bytes	C	R	W	T	U		temperatu...Low	
58	Setpoint (cooling)	ER2 - Cooling setpoint	12/3/93	2 bytes	C	R	W	T	U		temperatu...Low	
65	Heating out command	ER2 - Heating Cmd	12/5/81	1 bit	C	R	-	-	-	-	switch Low	
66	Cooling out command	ER2 - Cooling Cmd	12/5/82	1 bit	C	R	-	-	-	-	switch Low	
71	Fan continuous speed			1 byte	C	R	-	-	-	-	percentag... Low	
72	Fan speed 1			1 bit	C	R	-	-	-	-	switch Low	
73	Fan speed 2			1 bit	C	R	-	-	-	-	switch Low	
74	Fan speed 3			1 bit	C	R	-	-	-	-	switch Low	
76	Fan manual speed	ER2 - Fan Speed Cmd	12/4/22	1 byte	C	R	W	-	U		counter p... Low	
77	Fan speed	ER2 - Fan Speed Status	12/4/27	1 byte	C	R	-	-	-	-	counter p... Low	
78	Fan manual active status	ER2 - Manual/Auto	12/4/21	1 bit	C	R	W	T	U		state Low	
90	Temperature setpoint change lock			1 bit	C	-	W	-	-	-	enable Low	
93	Rockers lock			1 bit	C	-	W	-	-	-	boolean Low	
94	Thermal generator lock			1 bit	C	-	W	-	-	-	alarm Low	
95	Alarm 1 (from bus)			1 bit	C	-	W	-	-	-	alarm Low	
96	Alarm 2 (from bus)			1 bit	C	-	W	-	-	-	alarm Low	
97	Alarm 3 (from bus)			1 bit	C	-	W	-	-	-	alarm Low	
98	Alarm 4 (from bus)			1 bit	C	-	W	-	-	-	alarm Low	
102	Fan manual speed percentage			1 byte	C	R	-	-	-	-	percentag... Low	
103	Fan manual speed off status			1 bit	C	R	-	-	-	-	state Low	

The following picture displays how the widget is displayed in the visualisation view:



The Ekinex easy thermostat EK-ER2-TP does not support the ECO and COM mode, even if they are present in the DELÉGO SERVER template (being it more generic).

Furthermore, in order to manage the ON/OFF of the thermostat from the visualisation, it is necessary to invert the group object called “thermostat OFF” with a logic function, because the thermostat accepts the value 1 to switch OFF, instead of 0.

Number	Name	Object Function	Linked with	Group Addresses	Length	C	R	W	T	U	Data Type	Priority
3	Temperature value											
34	Room temperature (from bus)											
47	Weighted temperature	ER2 - Weighted temperat...	12/1/82		2 bytes	C	-	W	-	-	temperatu...	Low
48	Heating/cooling status out	ER2 - Heating/Cooling Out	12/2/82		1 bit	C	R	-	T	-	cooling/h...	Low
49	Heating/cooling status in	ER2 - Heating/Cooling In	12/2/81		1 bit	C	-	W	-	-	cooling/h...	Low
52	Actual setpoint	ER2 - Actual setpoint	12/3/91		2 bytes	C	R	-	T	-	temperatu...	Low
54	Thermostat off status				1 bit	C	R	-	T	-	state	Low
56	Thermostat off command				1 bit	C	R	W	T	U	state	Low
57	Setpoint (heating)	ER2 - Heating setpoint	12/3/92		2 bytes	C	R	W	T	U	temperatu...	Low
58	Setpoint (cooling)	ER2 - Cooling setpoint	12/3/93		2 bytes	C	R	W	T	U	temperatu...	Low
65	Heating out command	ER2 - Heating Cmd	12/5/81		1 bit	C	R	-	T	-	switch	Low
66	Cooling out command	ER2 - Cooling Cmd	12/5/82		1 bit	C	R	-	T	-	switch	Low
71	Fan continuous speed				1 byte	C	R	-	T	-	percentag...	Low
72	Fan speed 1				1 bit	C	R	-	T	-	switch	Low
73	Fan speed 2				1 bit	C	R	-	T	-	switch	Low
74	Fan speed 3				1 bit	C	R	-	T	-	switch	Low
76	Fan manual speed	ER2 - Fan Speed Cmd	12/4/22		1 byte	C	R	W	-	U	counter p...	Low
77	Fan speed	ER2 - Fan Speed Status	12/4/27		1 byte	C	R	-	T	-	counter p...	Low
78	Fan manual active status	ER2 - Manual/Auto	12/4/21		1 bit	C	R	W	T	-	state	Low
90	Temperature setpoint change lock				1 bit	C	-	W	-	-	enable	Low
93	Rockers lock				1 bit	C	-	W	-	-	boolean	Low
94	Thermal generator lock				1 bit	C	-	W	-	-	alarm	Low
95	Alarm 1 (from bus)				1 bit	C	-	W	-	-	alarm	Low
96	Alarm 2 (from bus)				1 bit	C	-	W	-	-	alarm	Low
97	Alarm 3 (from bus)				1 bit	C	-	W	-	-	alarm	Low
98	Alarm 4 (from bus)				1 bit	C	-	W	-	-	alarm	Low
102	Fan manual speed percentage				1 byte	C	R	-	T	-	percentag...	Low
103	Fan manual speed off status				1 bit	C	R	-	T	-	state	Low

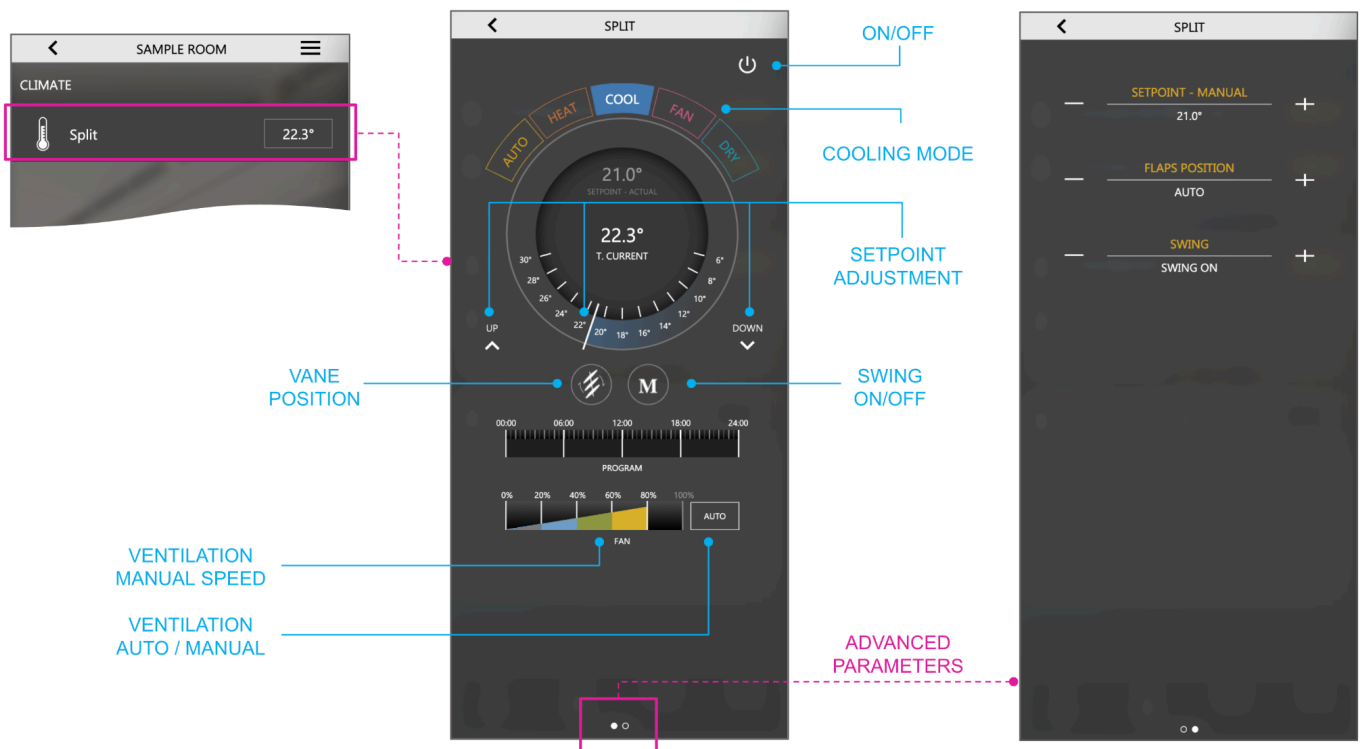
6.4 Air conditioning unit

Template dedicated to AC (Air Conditioning) interfaces for VRV / Split systems and native KNX devices.

Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Measured temperature	Float value (2 byte DPT 9)	R	Measured temperature read from the internal sensor
Thermostat ON/OFF	Switching (1 bit DPT 1)	RW	If present, activates or deactivates the split management and related graphics
Working status ON/OFF	Switching (1 bit DPT 1)	R	Operating status of the AC system reported by the device
Cooling mode	Numeric value 0-255 (1 byte DPT 6)	RW	Standard convention: 0 → Auto 1 → Heat 3 → Cool 9 → Fan 14 → Dry
Setpoint - Command	Float value (2 byte DPT 9)	RW	Adjustable temperature (base) setpoint.
Setpoint - Actual	Float value (2 byte DPT 9)	R	Setpoint used by the thermostat based on the flags. Read only.
Automatic / manual mode	Switching (1 bit DPT 1)	RW	Convention: 0 → manual 1 → auto
Ventilation speed	Numeric value 0-255 (1 byte DPT 6)	RW	Fan speed. Depending on the chosen sub-object, the regulation occurs in discrete steps or as a percentage (continuous regulation).
Ventilation speed (%)	Percent value (1 byte DPT 5)		To modify the values exchanged on the KNX bus, select the button in the last column on the right, and locate the most appropriate set of options in the popup that is shown
Flaps position	Numeric value 0-255 (1 byte DPT 6)	RW	Position of the slats; There are 5 values corresponding to as many inclinations, plus an AUTO mode and SWING (i.e. the oscillatory movement of the slats)
Swing	Switching (1 bit DPT 1)	RW	As an alternative to selecting the SWING (oscillation of the slats) via the previous object, it is possible to send the command or know the status of the SWING via this sub-object

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:

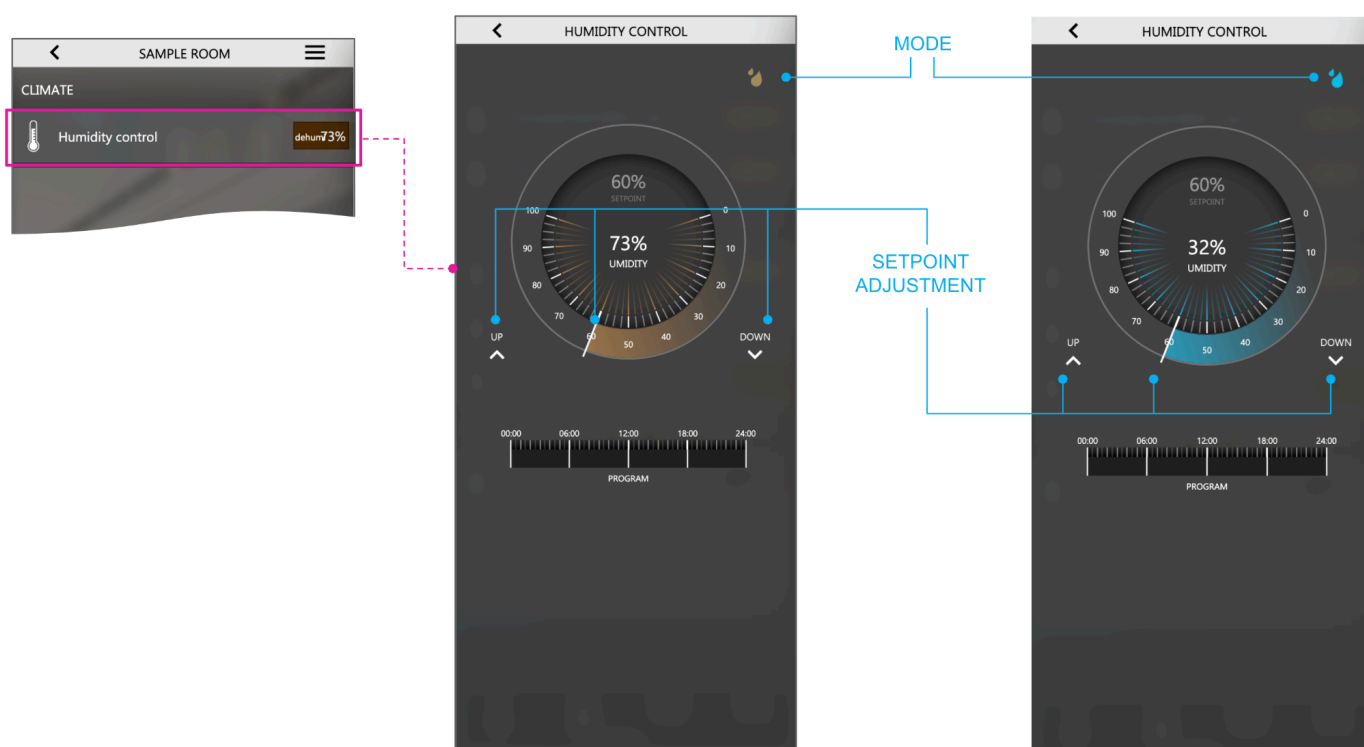


6.5 Humidity control

Template dedicated to humidity sensors and controllers. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Humidity % - Actual	Percent value (1 byte DPT 5)	R	Measured relative humidity and corresponding setpoint, expressed with a percent value
Humidity % - Setpoint		RW	
Humidity value - Actual	Float value (2 byte DPT 9)	R	Measured humidity and corresponding setpoint, expressed with an absolute value
Humidity value - Setpoint		RW	
Humidification Dehumidification	Switching (1 bit DPT 1)	R	State of the humidification and dehumidification respectively
Mode	Switching (1 bit DPT 1)	RW	Selector between humidification and dehumidification mode. Convention: 0 → Humidification 1 → Dehumidification

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:



6.6 CO₂ and VOC Control

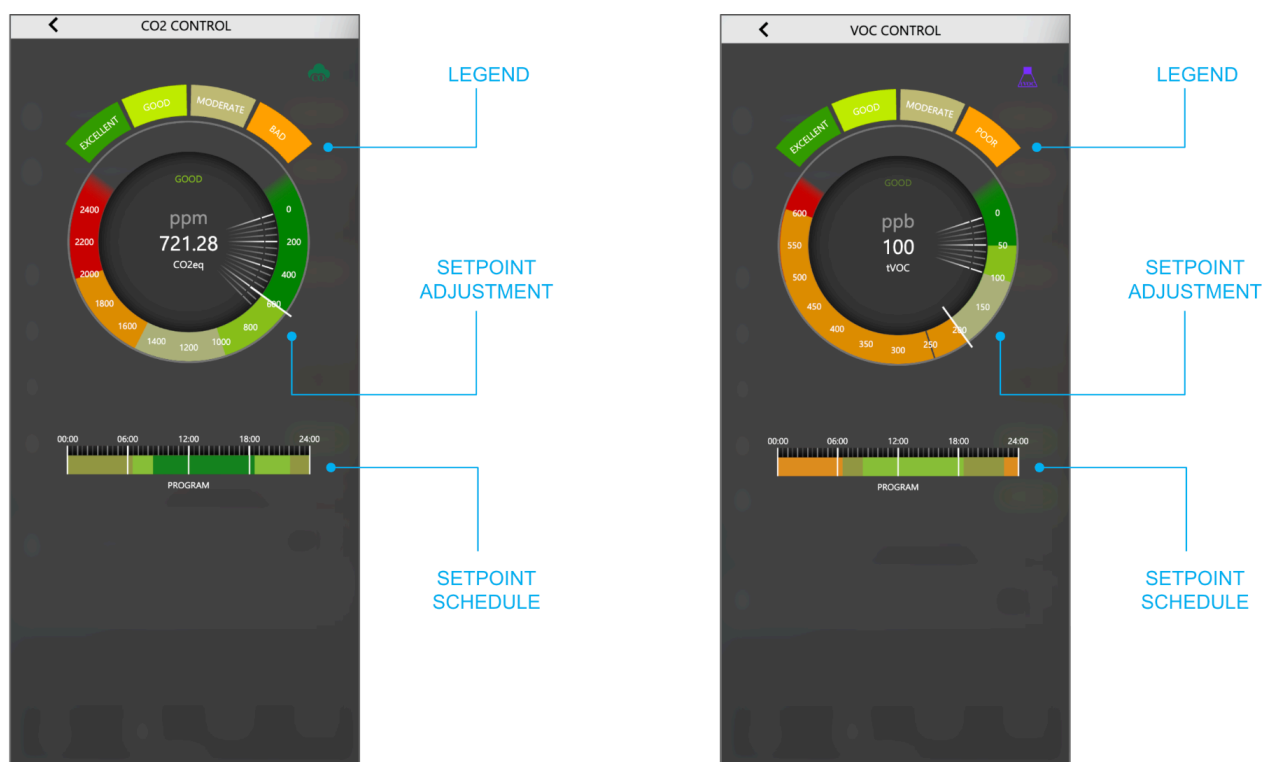
Templates dedicated to air quality sensors with CO₂ / VOC measurement and control. Supported items by the CO₂ control template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
CO ₂ level	Floating point (2 byte DPT 9)	R	Measured value of CO ₂ expressed in PPM
CO ₂ setpoint	Floating point (2 byte DPT 9)	RW	Setpoint value for the CO ₂

Supported items by the VOC control template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
VOC level	Floating point (2 byte DPT 9)	R	Measured value of CO ₂ expressed in PPM
VOC setpoint	Floating point (2 byte DPT 9)	RW	Setpoint value for the CO ₂

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER for both CO₂ and VOC controls:



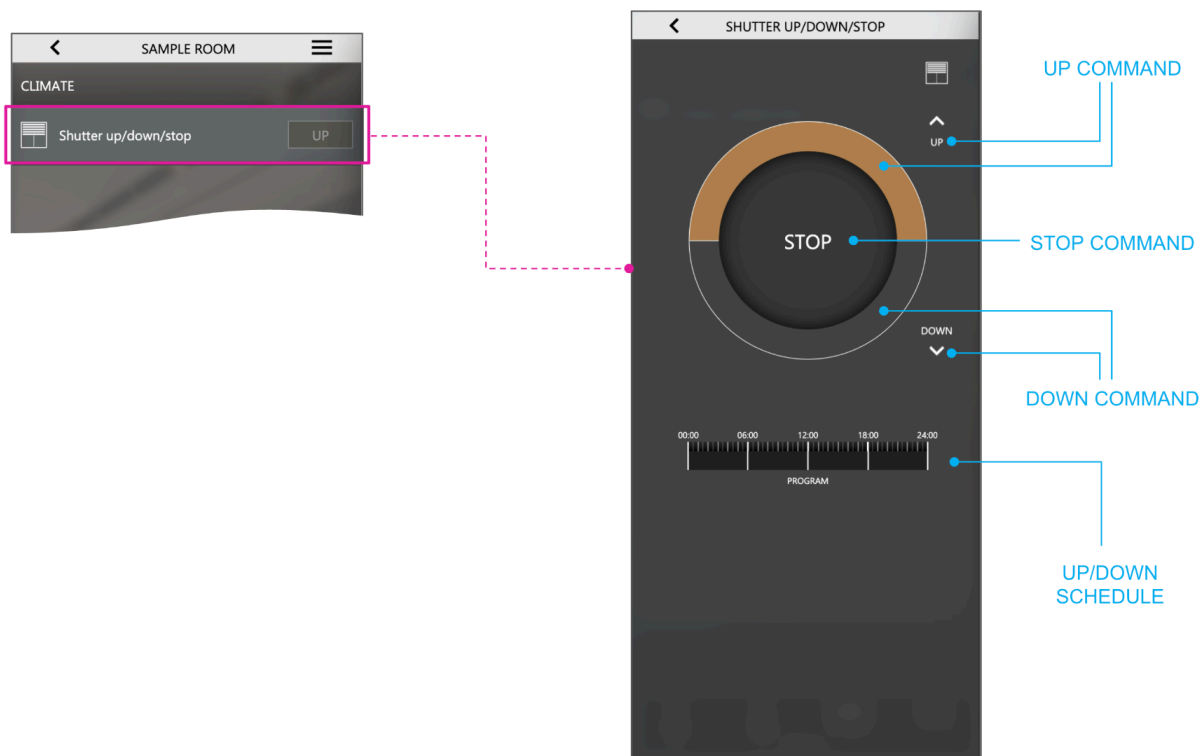
7 Motorizations

7.1 Shutter up/down/stop

Simple motor control for up/down and stop control of shutters and similar motorizations. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Movement (up/down)	Switching (1 bit DPT 1)	RW	Typical convention: 1 → lower / close 0 → raise / open
Stop	Switching (1 bit DPT 1)	W	

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:

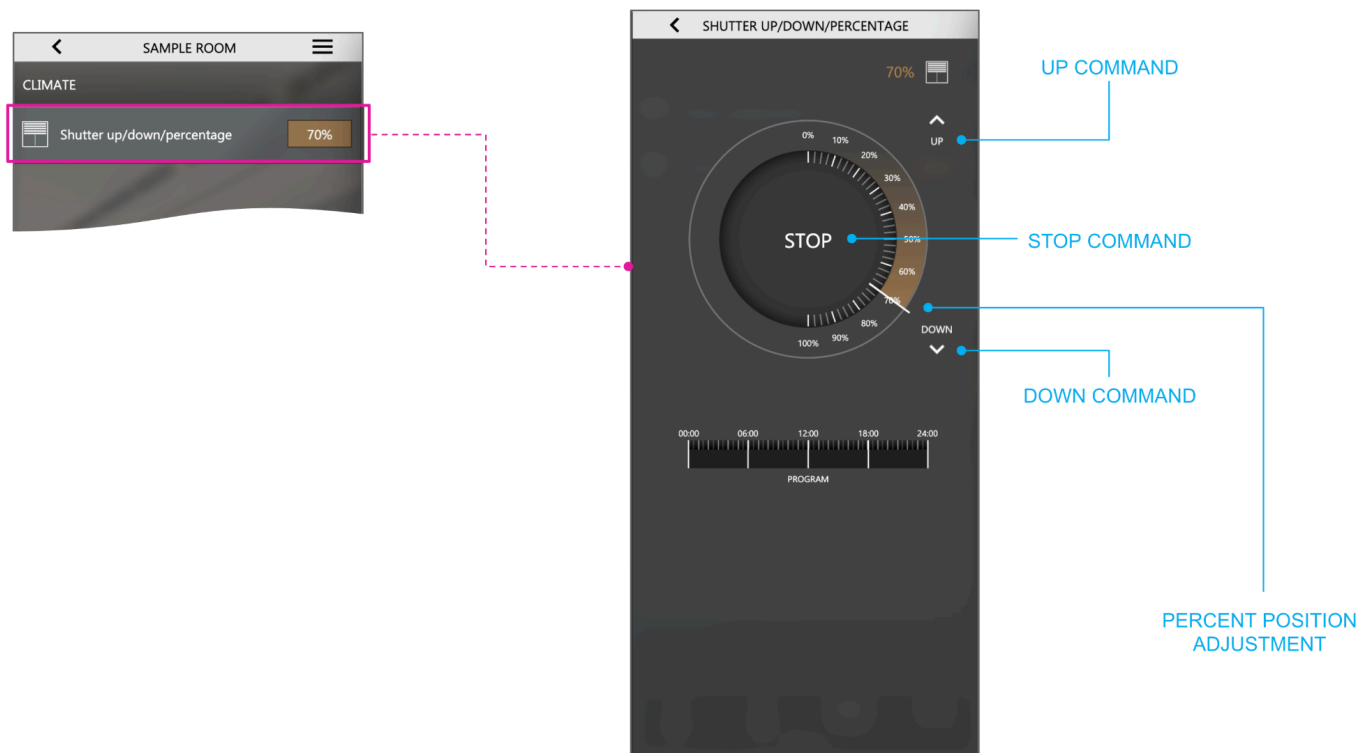


7.2 Shutter up/down/percentage

Motor control for up/down and stop control of shutters and similar motorizations with percent (absolute) position control. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Movement (up/down)	Switching (1 bit DPT 1)	RW	Typical convention: 1 → lower / close 0 → raise / open
Percent value	Percent value (1 byte DPT 5)	RW	Typical convention: 100% → Fully closed / down 0% → Fully opened / up
Stop	Switching (1 bit DPT 1)	W	

Visualisation preview:

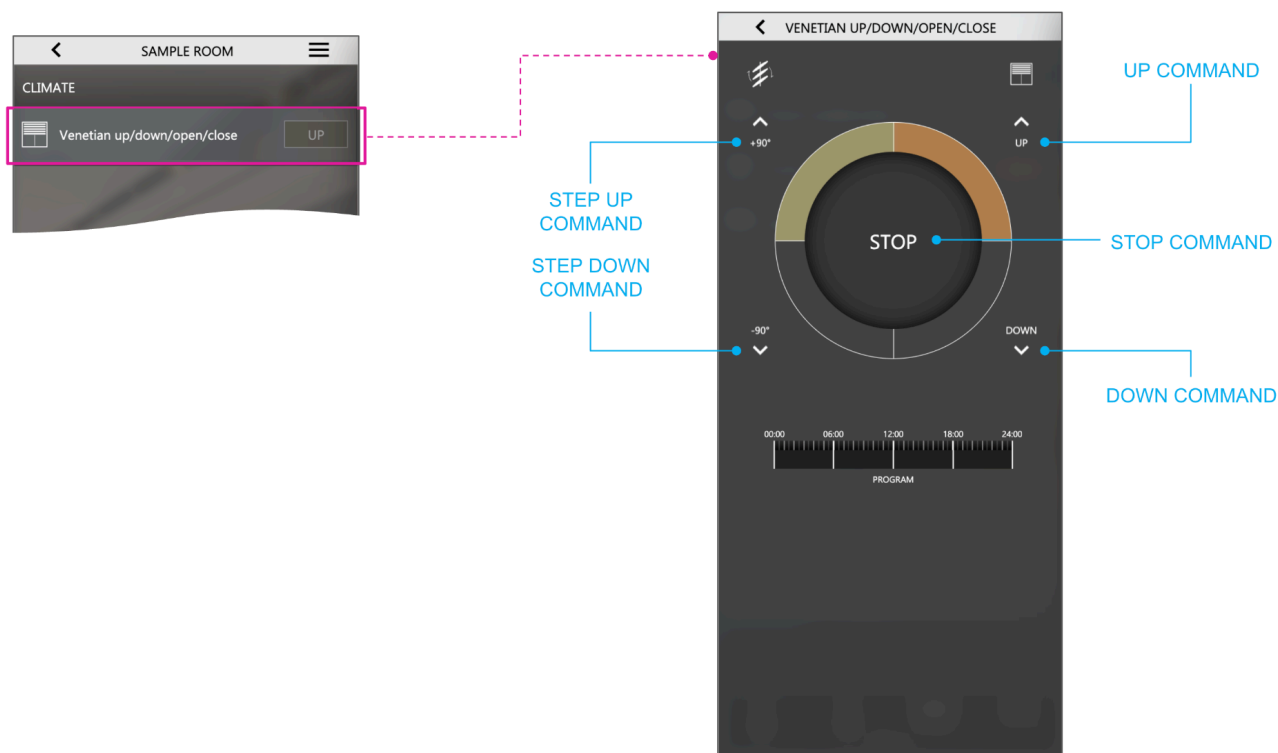


7.3 Venetian blinds up/down/step

Simple venetian blinds control with up/down/stop movement control and slats open/close (step up/down). Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Movement (up/down)	Switching (1 bit DPT 1)	RW	Typical convention: 1 → lower / close 0 → raise / open
Slats (step up/down)	Switching (1 bit DPT 1)	RW	
Stop	Switching (1 bit DPT 1)	W	

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:

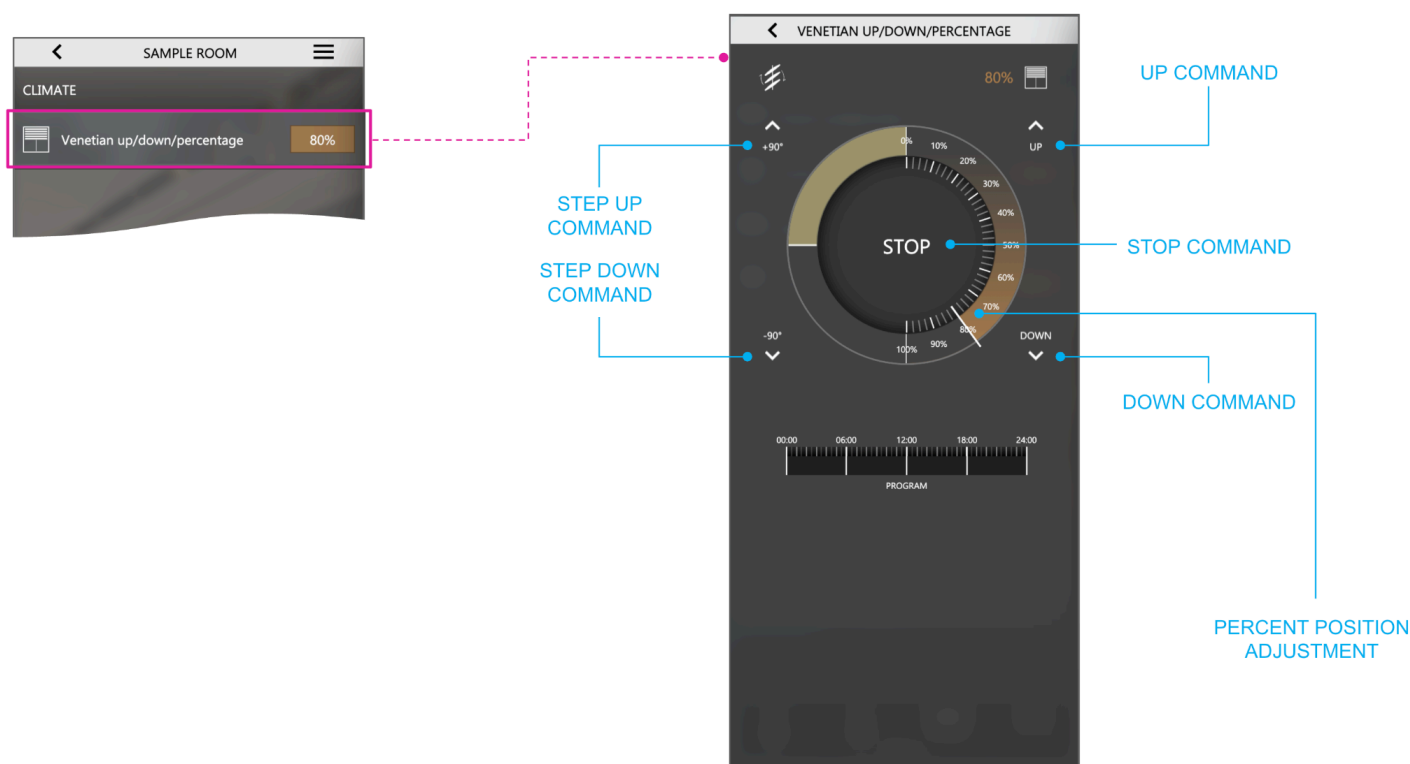


7.4 Venetian up/down/percentage

Venetian blind control with percent position and slats step up/down command. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Movement (up/down)	Switching (1 bit DPT 1)	RW	Typical convention: 1 → lower / close 0 → raise / open
Percent value	Percent value (1 byte DPT 5)	RW	Typical convention: 100% → Fully closed / down 0% → Fully opened / up
Slats (step up/down)	Switching (1 bit DPT 1)	RW	
Stop	Switching (1 bit DPT 1)	W	

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:

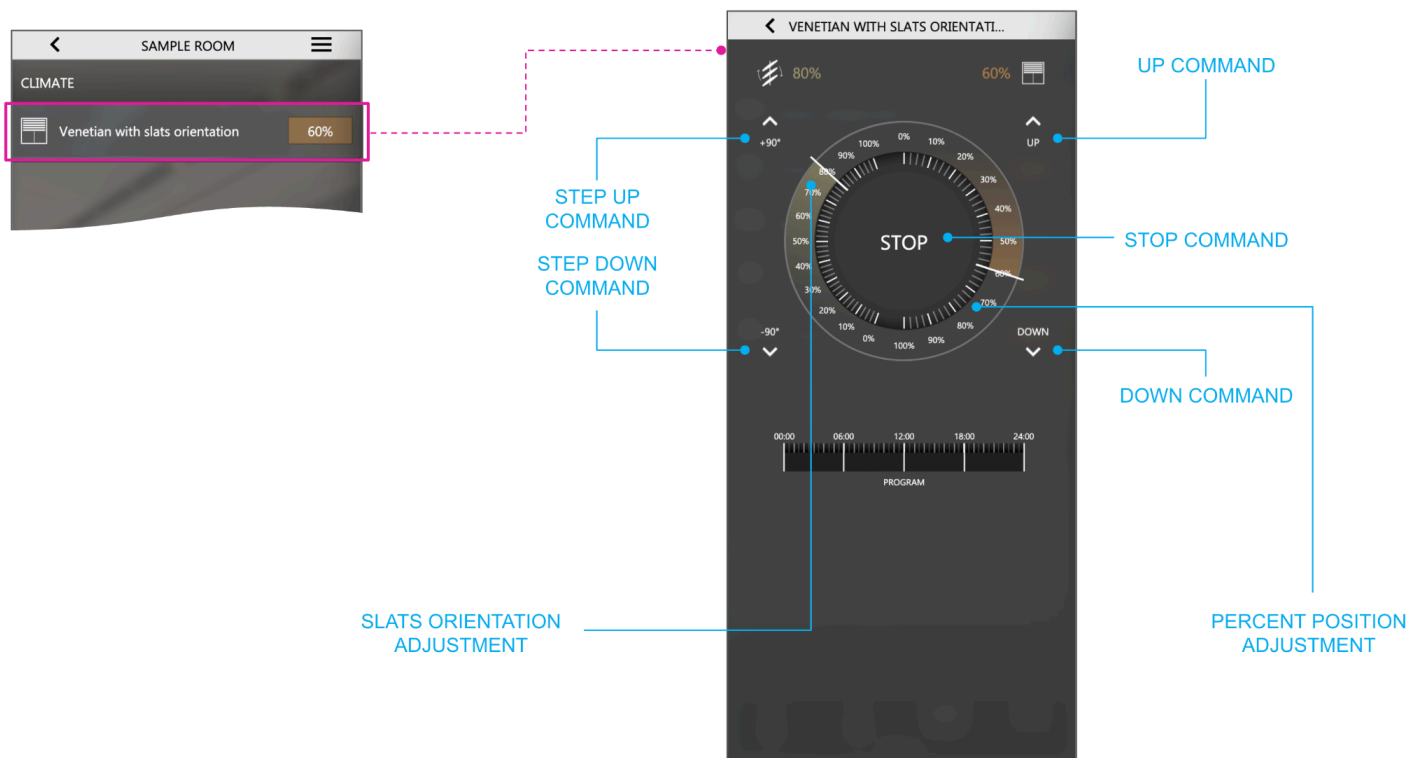


7.5 Venetian with slat orientation

Full-feature venetian blinds control with up/down/percent positioning management and slats orientation percent control. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Movement (up/down)	Switching (1 bit DPT 1)	RW	Typical convention: 1 → lower / close 0 → raise / open
Percent value	Percent value (1 byte DPT 5)	RW	Typical convention: 100% → Fully closed / down 0% → Fully opened / up
Slats (step up/down)	Switching (1 bit DPT 1)	RW	
Slats (orientation)	Percent value (1 byte DPT 5)	RW	Typical convention: 100% → Fully oriented up 0% → Fully oriented down
Stop	Switching (1 bit DPT 1)	W	

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:



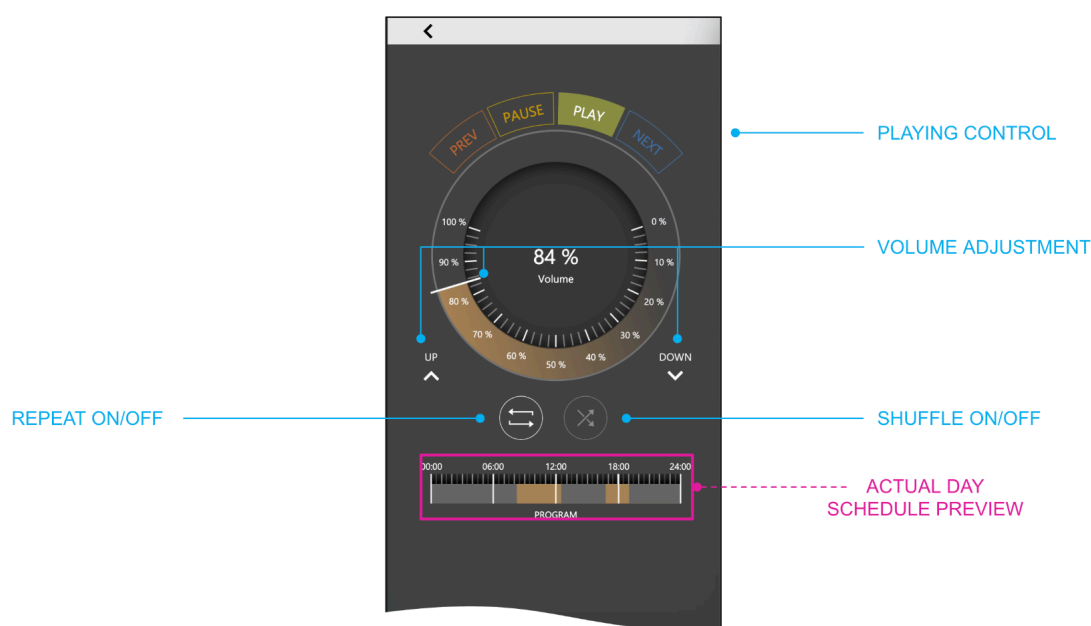
8 Multimedia

8.1 Multiroom - Zone

Audio zone management for KNX-based multiroom systems. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Play/Pause	Switching (1 bit DPT 1)		2 group addresses can be entered, one for monitoring and one for command. The command allows you to activate and pause playback
Stop	Switching (1 bit DPT 1)		2 group addresses can be entered, one for monitoring and one for command. The command allows you to stop playback
Previous/next track	Switching (1 bit DPT 1)		The command allows you to select the previous and next tracks
Playback mode	Numeric value 0-255 (1 byte DPT 6)		The playback mode can be selected from the following modes: • Normal • Repetition • Random
Volume	Percent value (1 byte DPT 5)		Allows you to monitor and control the volume on a scale between 0,..100%

The following picture displays how the widget is displayed in the Visualisation view of DELÉGO SERVER:



9 Other functions

9.1 Alarm

Simple widget associated with a single KNX address to represent an alarm or anomaly. Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Alarm	Switching (1 bit DPT 1)	R	KNX group address where the alarm can be received

9.2 Energy

This category contains “special” widget templates dedicated to energy monitoring. Please refer to [D4] for further details.

9.3 Single value

This template is intended for the generic visualisation of single KNX group addresses (with eventually the corresponding status feedback address) not already covered by existing templates in the categories seen before.

When creating a single value widget, the following additional option can be set:

STYLE	Determines the style of visualisation of the widget. Available options: - Buttons (popup) - Slider (popup) - Toggle - Textbox
-------	--

Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
Single value	To be set manually Default: switching	RW	KNX group address where commands have to be sent, and eventual status feedback

If the default ON/OFF switching (1 bit) encoding is not suitable for the specific need, activate the EXPERT mode in the TOOLBAR (), and select the most appropriate encoding with the drop-down menu in the ETS ENCODING column.

The single value widgets, in the OTHER category, can be assigned to one of the following functions:

GATES	Intended for doors, gates and similar
-------	---------------------------------------

SOCKETS	Intended for controlled outlets and sockets
SPRINKLING	Intended for irrigation of gardens and outdoor spaces
TECHNOLOGIC	Generic function for technical functionalities



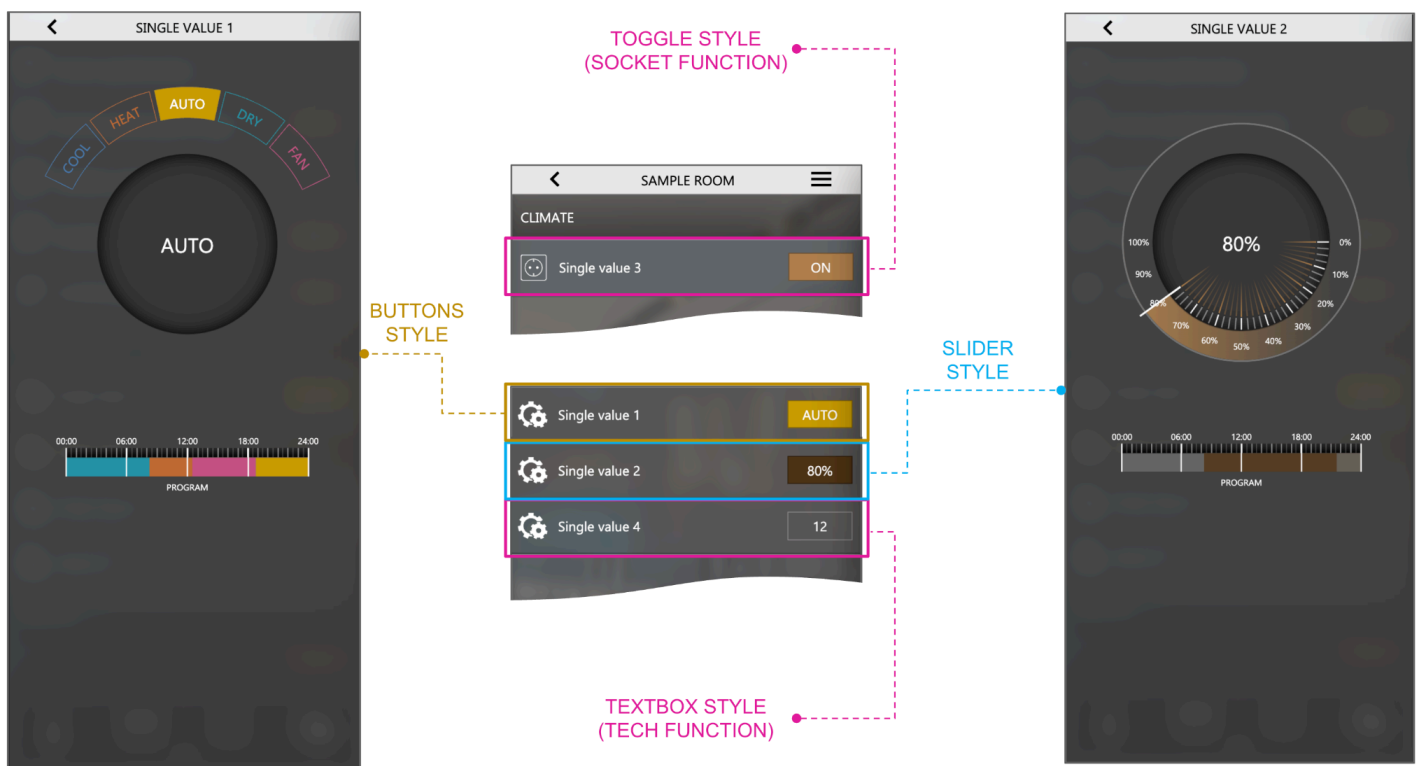
If a different category is assigned (e.g. lighting, shading, climate etc...) after a page reload, the widgets will be no longer visible in the OTHER category, but in the assigned category.



The single value widget template is useful also when a KNX group address must be used in an automation (trigger, logic, connection etc...) without the need to be put in the visualisation.

In that case, no matter the style, the creation of the widget is still necessary, because otherwise, the group address (even if it was imported from ETS) cannot be used in the project.

The following picture displays an example of the widget display in the Visualisation view of DELEGO SERVER:



9.4 KNX Scenario

This template is intended for the execution of a KNX scenario configured in ETS. This functionality is normally associated with a group address belonging to DPT 17.001 or 18.001, but an encoding of 1 byte unsigned integer (DPT 5.001) is also supported.

Supported items by the template:

IDENTIFIER	ETS ENCODING	R/W	DESCRIPTION / NOTES
KNX Scenario	Scenario (DPT 17.001 / 18.001) Unsigned integer (DPT 5.001)	RW	KNX group address used to execute the scenario

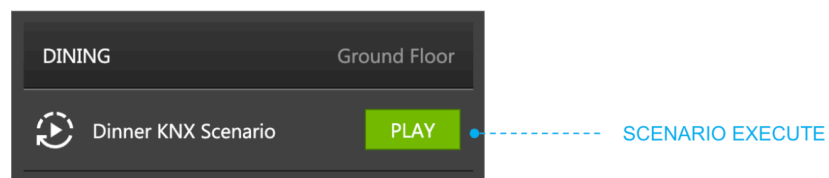
When creating a KNX scenario widget, the following additional option must be set:

SCENARIO VALUE	The numeric value to be written on the bus in order to execute a specific scenario
----------------	--



In case the same group address is associated with multiple scenarios with different values, it is recommended to create several widgets (with the KNX scenario template) by entering the same group address, and the different values in the SCENARIO VALUE field.

In the visualisation, a KNX scenario is displayed as a simple element; when pressed on the PLAY symbol, the scenario is executed, and the display becomes green for a while.



9.5 Generic

General purpose flexible template useful to create popup-based widgets hosting multiple KNX group addresses (up to 64).

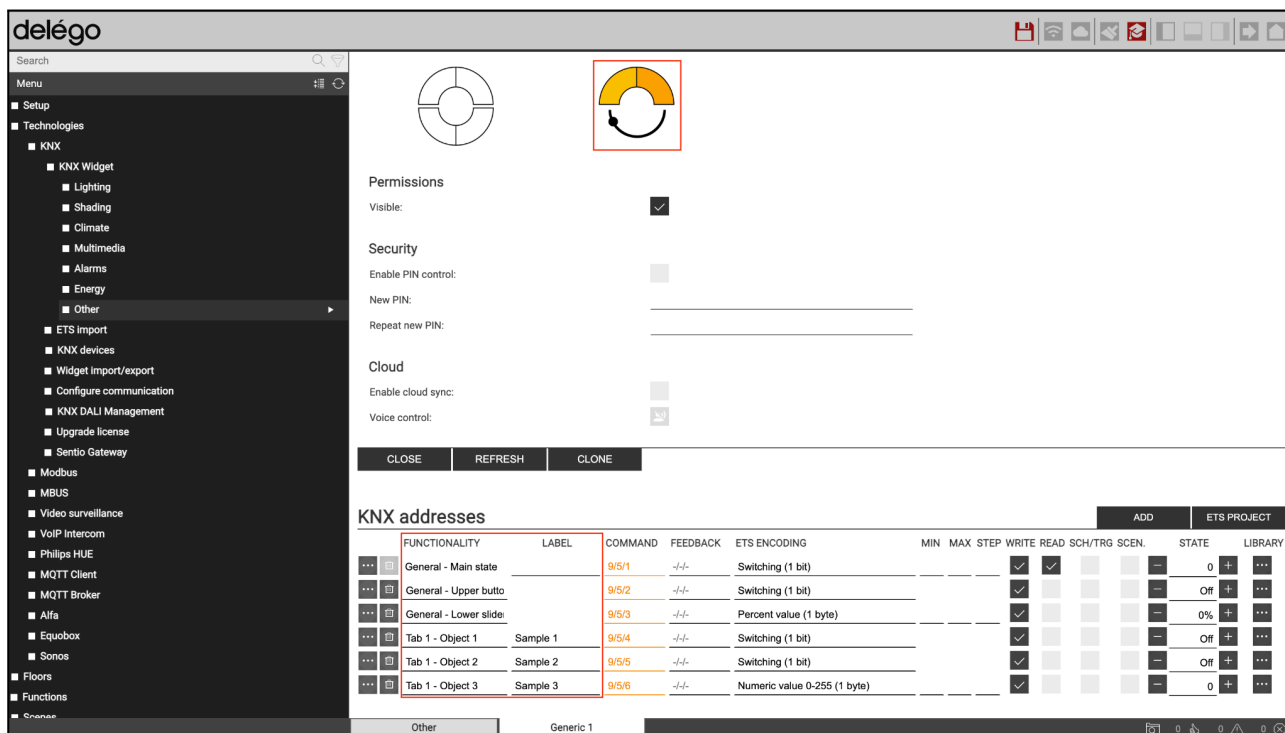
When editing a generic template is needed to set the following additional option:

APPEARANCE	Style of the main page of the popup:  2 buttons set  1 buttons set + 1 slider
------------	--

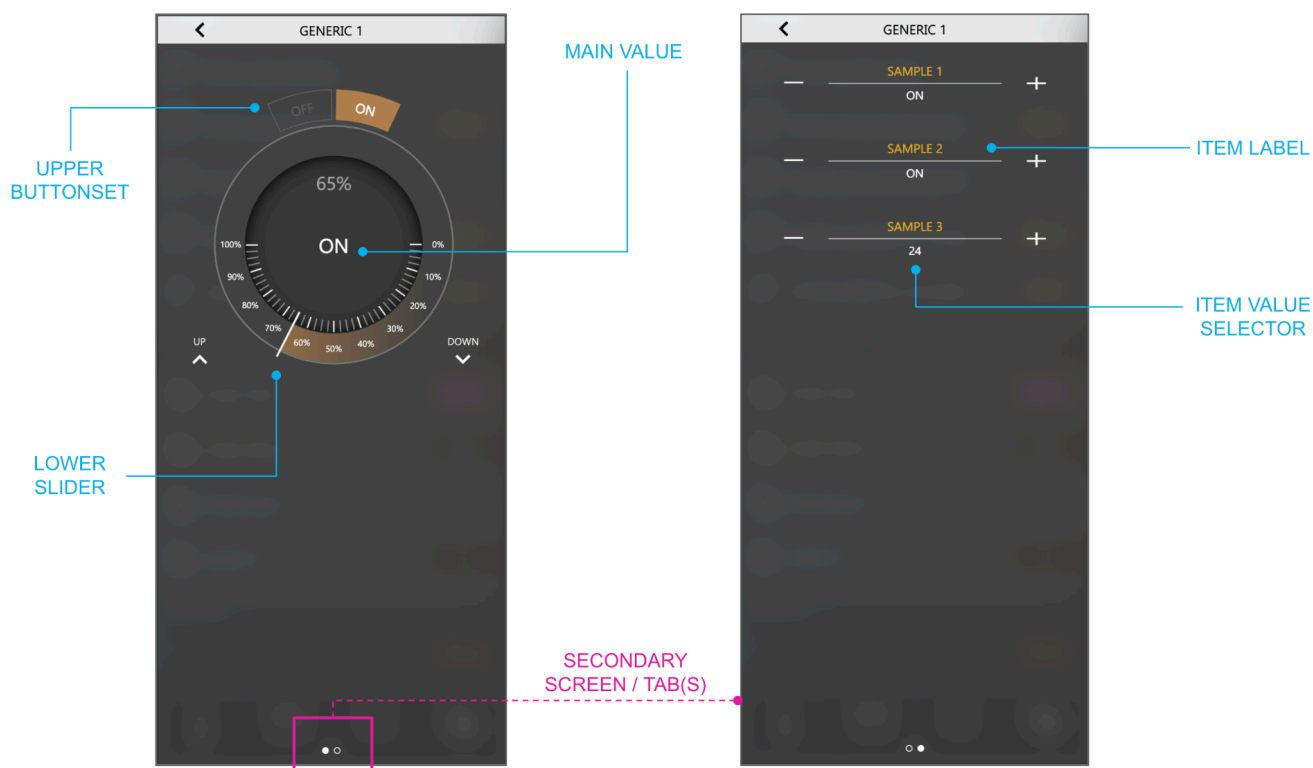
In the list of KNX addresses, in order to add new items, press the ADD button and select the position where the new item must be placed:

GENERAL - MAIN STATE	State of the widget visible in the list (outside the popup) and in the center of the main screen of the popup
GENERAL - UPPER BUTTONSET	Buttons set in the top part of the popup
GENERAL - LOWER BUTTONSET	Buttons set in the bottom part of the popup
GENERAL - LOWER SLIDER	Slider in the bottom part of the popup
TAB X - OBJECT Y	Up to 6 additional sections of the popup ("tabs") with up to 12 elements each. Elements are in the form of increment / decrement / textbox fields.

Each item in this list, can be accompanied by a LABEL that will be presented in the popup (secondary screens). As an example, with the following configuration



this is the result in the Visualisation view of DELÉGO SERVER:



10 KNX Telegram recorder

10.1 Introduction

Starting from software version 2.7.0, DELÉGO SERVER offers the possibility to trace and store the KNX telegrams history, to be consulted interactively or exported to ETS PROFESSIONAL.



Due to the intense load on the storage that can be determined by this functionality, especially on high KNX traffic installations, it is recommended to activate the KNX TELEGRAM RECORDER only if needed, and to deactivate it when the diagnostic purposes are over.



To take the most benefit from this functionality, it is suggested to install an SD card, and to activate the long-term storage of the KNX telegrams. In this way, it will be possible to retrieve the entire log for a specific day and consult it in ETS,

10.2 Activation

To activate the KNX TELEGRAM RECORDER, enter the following section of the side menu

FIELD TECHNOLOGIES > KNX > KNX TELEGRAM RECORDER

and select the item “enable telegram recording”, by pressing the SAVE button (and confirming the warning message). Wait until the browser reloads, and open again this section to start using it.

10.3 Interactive use

By entering the KNX TELEGRAM RECORDER (once it has been activated) the most recent telegrams detected on the bus are displayed, in descending order. In case of a high number of telegrams, it is possible to move among the pages with the dedicated buttons (SHOW PAGE X OF Y).

The following informations are contained in the log:

DATE / TIME	The instant when the telegram has been recorded
SOURCE	Physical address of the device which sent the telegram
DESTINATION	The group address, in case of <i>multicast</i> telegrams, or the physical address, in case of point-to-point communication, to which the telegram was destined to
DESCRIPTION	The name of the group address, if it has been imported by ETS in Delégo
DPT	Encoding of the payload and corresponding data length
VALUE	Value of the payload decoded accordingly with the detected encoding

KNX telegram recorder

Enable telegram recording: ☒

SAVE

Search Criteria

Sender: _____ Recipient: _____ Payload: _____ Date: from _____ to _____

REFRESH **EXPORT CSV** **EXPORT XML** **LOG ON SD** **CLOSE**

List of results (38 of 38)

	DATE	TIME	SOURCE	DESTINATION	DESCRIPTION	DPT	VALUE
1	2025-09-02	12:45:57	1.1.5	10/1/1		4 byte float (DPT 14.x)	0
2	2025-09-02	12:45:57	1.1.5	10/1/4		4 byte float (DPT 14.x)	0
3	2025-09-02	12:45:48	1.1.5	10/1/6		4 byte float (DPT 14.x)	232.71
4	2025-09-02	12:44:07	1.1.51	12/1/0		2 byte float (DPT 9.x)	25.84
5	2025-09-02	12:40:58	1.1.5	10/1/1		4 byte float (DPT 14.x)	0
6	2025-09-02	12:40:58	1.1.5	10/1/4		4 byte float (DPT 14.x)	0
7	2025-09-02	12:40:49	1.1.5	10/1/6		4 byte float (DPT 14.x)	229.96
8	2025-09-02	12:35:59	1.1.5	10/1/4		4 byte float (DPT 14.x)	0
9	2025-09-02	12:35:58	1.1.5	10/1/1		4 byte float (DPT 14.x)	0
10	2025-09-02	12:35:50	1.1.5	10/1/6		4 byte float (DPT 14.x)	228.98
11	2025-09-02	12:35:36	1.1.5	10/1/7		4 byte float (DPT 14.x)	—
12	2025-09-02	12:34:08	1.1.51	12/1/0		2 byte float (DPT 9.x)	25.72
13	2025-09-02	12:30:59	1.1.5	10/1/1		4 byte float (DPT 14.x)	0
14	2025-09-02	12:30:59	1.1.5	10/1/4		4 byte float (DPT 14.x)	0
15	2025-09-02	12:30:51	1.1.5	10/1/6		4 byte float (DPT 14.x)	229.32
16	2025-09-02	12:26:00	1.1.5	10/1/1		4 byte float (DPT 14.x)	0
17	2025-09-02	12:26:00	1.1.5	10/1/4		4 byte float (DPT 14.x)	0
18	2025-09-02	12:25:52	1.1.5	10/1/6		4 byte float (DPT 14.x)	242.94
19	2025-09-02	12:24:10	1.1.51	12/1/0		2 byte float (DPT 9.x)	25.68
20	2025-09-02	12:21:01	1.1.5	10/1/1		4 byte float (DPT 14.x)	0

By activating the expert mode () the following additional information is displayed:

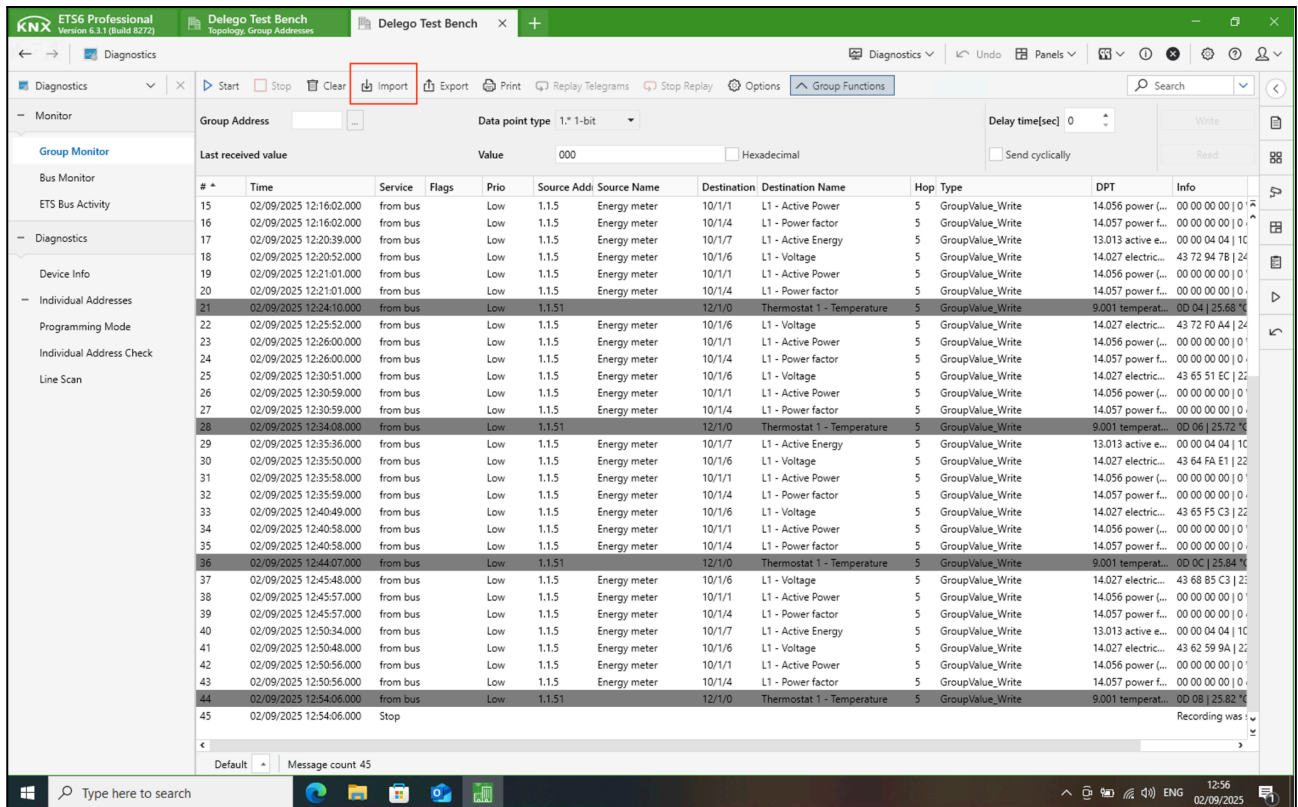
TYPE	Typology of the telegram. Can be a multicast type (GROUP value WRITE or READ) or a point-to-point (MEMORY READ/WRITE etc...) According to the typology, a different color is adopted for the row in the log: • White > normal multicast telegrams • Yellow > value reads / answers • Gray > point-to-point telegrams
(RAW)	The hexadecimal value of the payload before decoding, sometimes useful to interpret the telegram if the detected encoding is not the most appropriate one

The log does not update automatically unless the REALTIME button is pressed; to show the telegrams eventually received by the webserver in the meanwhile, press the REFRESH button.

It is possible to export the log in two different formats:

- CSV: useful to be opened in a calculation sheet e.g. Microsoft Excel
- XML: ready to be imported in the diagnostic tools of ETS PROFESSIONAL (bus or group monitor)

The following screenshot shows the log exported in XML from Delégo Server, and imported in ETS:



10.4 Log on SD card

If an external SD memory is installed, it can be used to store periodically the KNX log for longer amounts of time, and to retrieve it after days.

As a preliminary action, the SD memory must be activated, in the

SETUP > EXTERNAL MEMORY MANAGEMENT

page, as described in the [D2] GENERAL FUNCTIONS configuration manual. This configuration page can be accessed directly from the KNX TELEGRAM RECORDER, by pressing the LOG ON SD button.

In the KNX BUS MONITOR section, select first the “enable KNX historical saving on SD” checkbox, and then select which format must be used to store the KNX telegrams, among the following options:

- CSV: suitable for further elaboration in a spreadsheet (e.g. Microsoft Excel)
- XML: compatible with the diagnostic tools of ETS PROFESSIONAL
- TRX: older format to be imported in ETS versions 3 and 4

After doing this, DELÉGO SERVER starts saving, every hour, the KNX telegrams (and correspondingly clearing them from the temporary memory, the one that can be consulted in the interactive view) and creating a daily archive, available for a future download.

In the calendar above the settings, the highlighted days have a daily record; by pressing on a day, the corresponding log is automatically downloaded.

The screenshot shows the delégo web interface. On the left is a dark sidebar menu with options like Setup, Field technologies, and Settings. The main area is divided into two sections:

- Log reporting:** Contains a 'DEACTIVATE' button, a checkbox for 'Enable backup of tracked data', and a calendar for September 2025. Days 1 and 2 are highlighted in blue. Below the calendar are buttons for 'DOWNLOAD WEEK', 'DOWNLOAD MONTH', and 'DOWNLOAD YEAR'.
- KNX bus monitor:** Contains a checkbox for 'Enable KNX historical saving on SD', a 'Data format' dropdown set to 'XML', and a 'Download historical data' button. It also features a calendar for September 2025 with days 1 and 2 highlighted in green. Below the calendar is an 'OPEN' button.

At the bottom of the interface, there are tabs for 'KNX telegram recorder' and 'External memory management'.



The KNX log is saved in the SD card in the selected format. If the format is changed, all the previously saved archives in a different format are no longer available in the calendar (unless the original format is selected back) and only the new archives, created since now, will be highlighted.



From this page it is possible to return to the interactive KNX real-time monitor by pressing the OPEN button under the calendar.

11 KNX Secure

11.1 Introduction

Starting from software version 2.6.0, DELÉGO SERVER supports the KNX DATA SECURE layer that add the function of interpreting and sending encrypted telegrams directly on the bus.



The KNX SECURE support is only available in the new 4-DIN rail version of the webserver.

11.2 Delégo library configuration in ETS

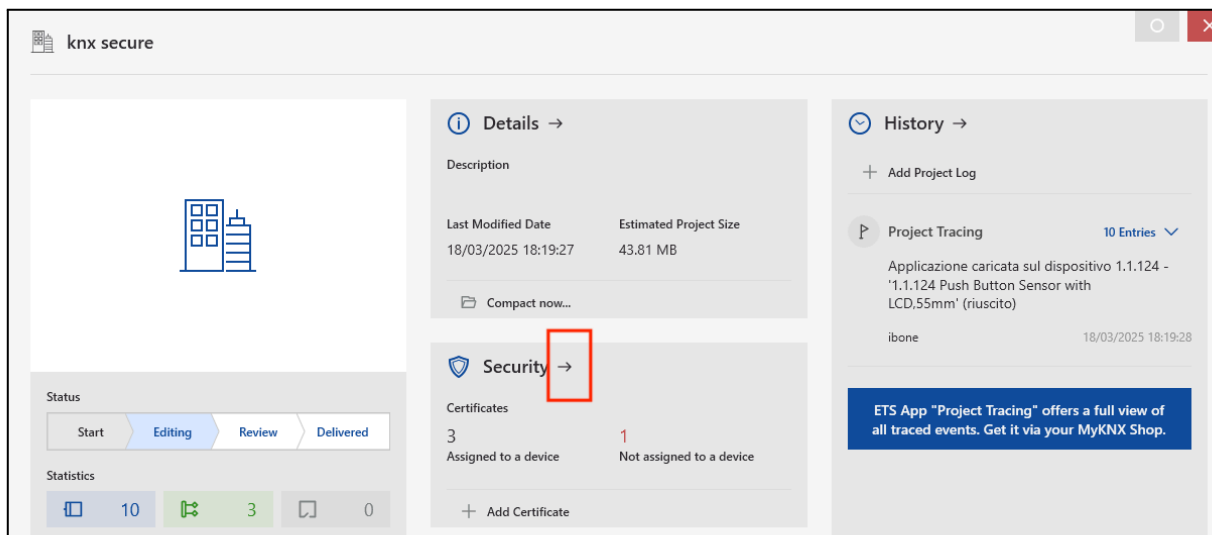
In order to be able to send commands to secure devices, the ETS library of DELÉGO SERVER must be added to the project and bound with all the KNX group addresses containing secure devices:

Middle Gr	Name	Description	Pass Thro
0	Date-Time		No
10	Keypad		
0	Keys		No
1	Thermo		No
11	Actuator		
0	Keys		No
12	Actuator		
0	Thermostat		No
1	Lights		No
2	Hearthbeat		No
3	Channel A		No
4	Channel B		No
5	Channel C		No
6	Channel D		No
13	Keypad		
0	Sensors		No

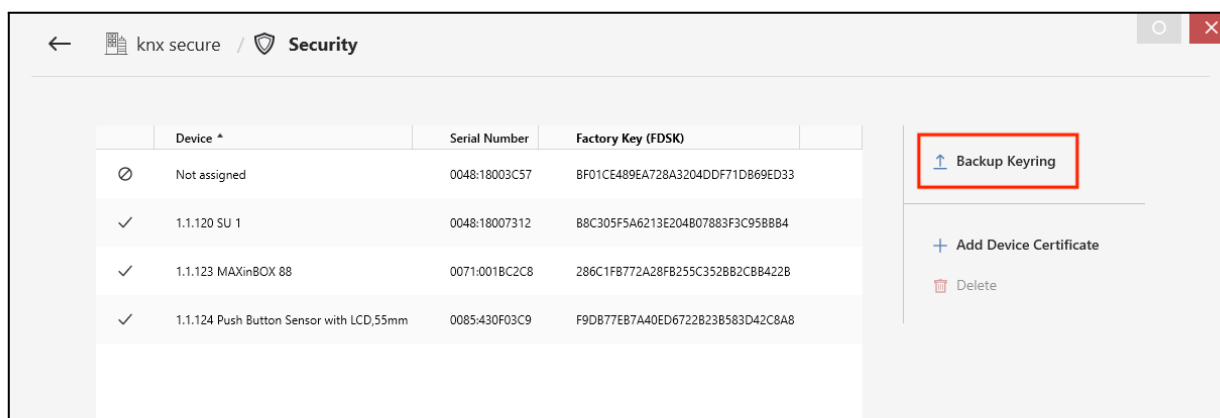
11.3 Keyring import

After doing the association of DELÉGO SERVER with all the secure group addresses, it is necessary to export the KEYRING from ETS; it is an archive containing all the certificates of the secure devices in the project. This file must be kept in a secure place, and not shared to anyone.

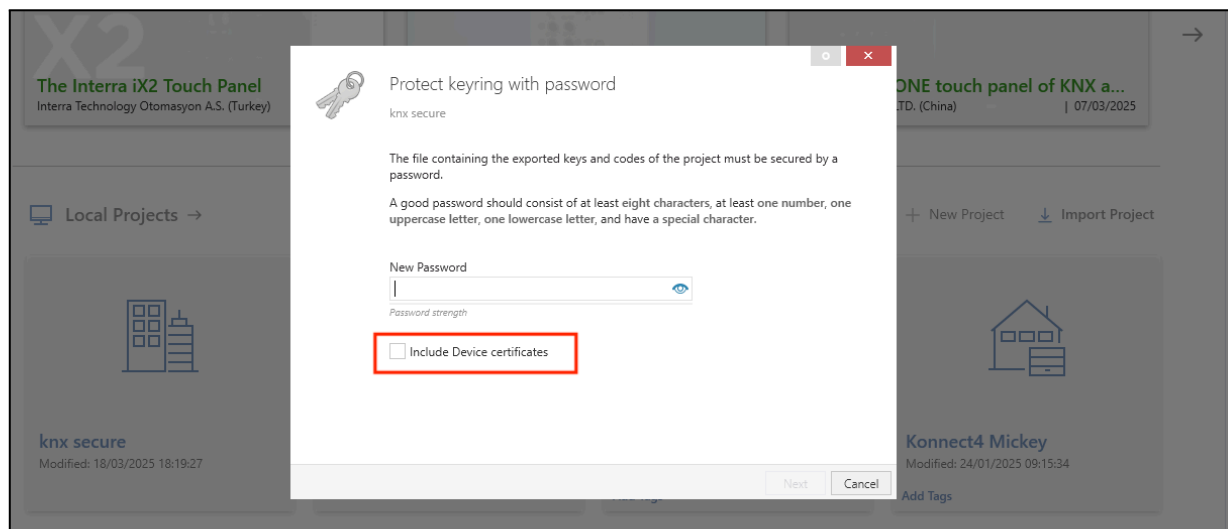
Enter the project settings and press the “arrow” in the SECURITY section



then press the BACKUP KEYRING button in the list of certificates...



and enter a password to protect the keying:



Leave the “include device certificates” checkbox not selected.

At that point, in DELÉGO SERVER, browse for the key archive file, and enter the protection password, before proceeding with the import of the project.

12 ETS remoting

12.1 Introduction

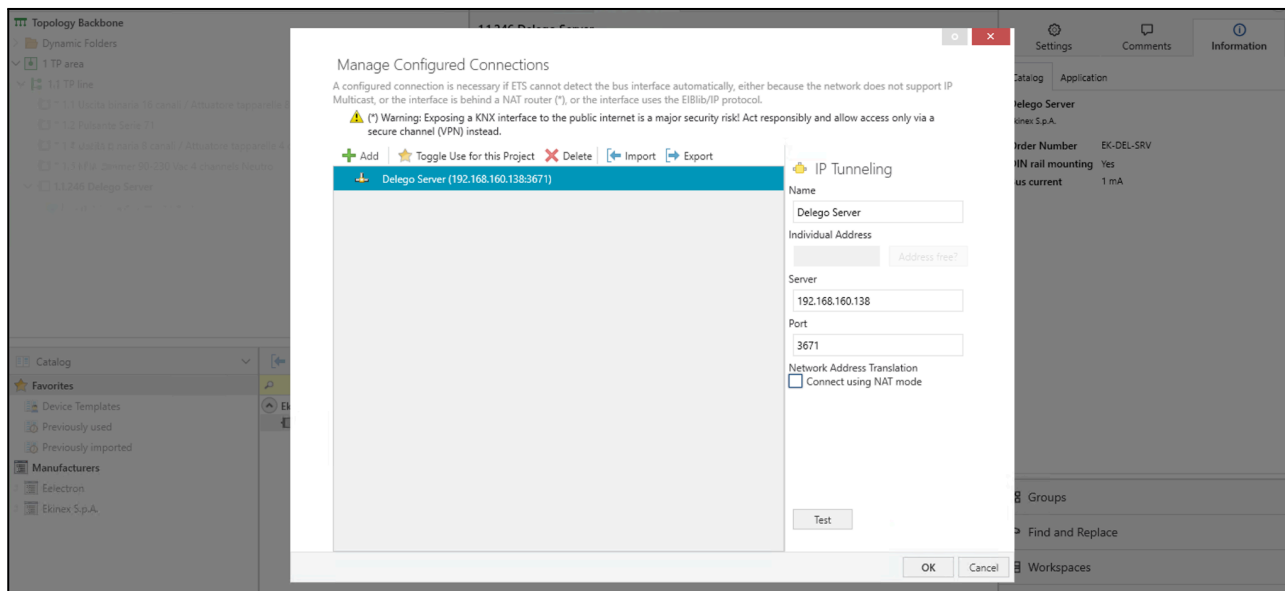
DELÉGO SERVER can be used as an IP interface for the commissioning of KNX devices and the diagnostics with ETS PROFESSIONAL.

This functionality requires the selection of a COMMUNICATION DRIVER with the ETS REMOTE support, as explained in [section 2.3.2](#).

12.2 Use in local network

When the PC with ETS PROFESSIONAL is in the same local network of DELÉGO SERVER, it is required to:

- Open the MANAGE CONFIGURED CONNECTIONS window.
- Press the ADD button.
- Enter the following information:
 - Server → IP address of DELÉGO SERVER.
 - Port → leave default value (3671).
 - Connect using NAT mode → Select in case of difficulties in starting the communication.
- Check the communication with the TEST button.
- If the TEST is OK, save with the OK button, and ensure the new connection is selected as the active one for the following download / diagnostic operations.



12.3 Remote connection

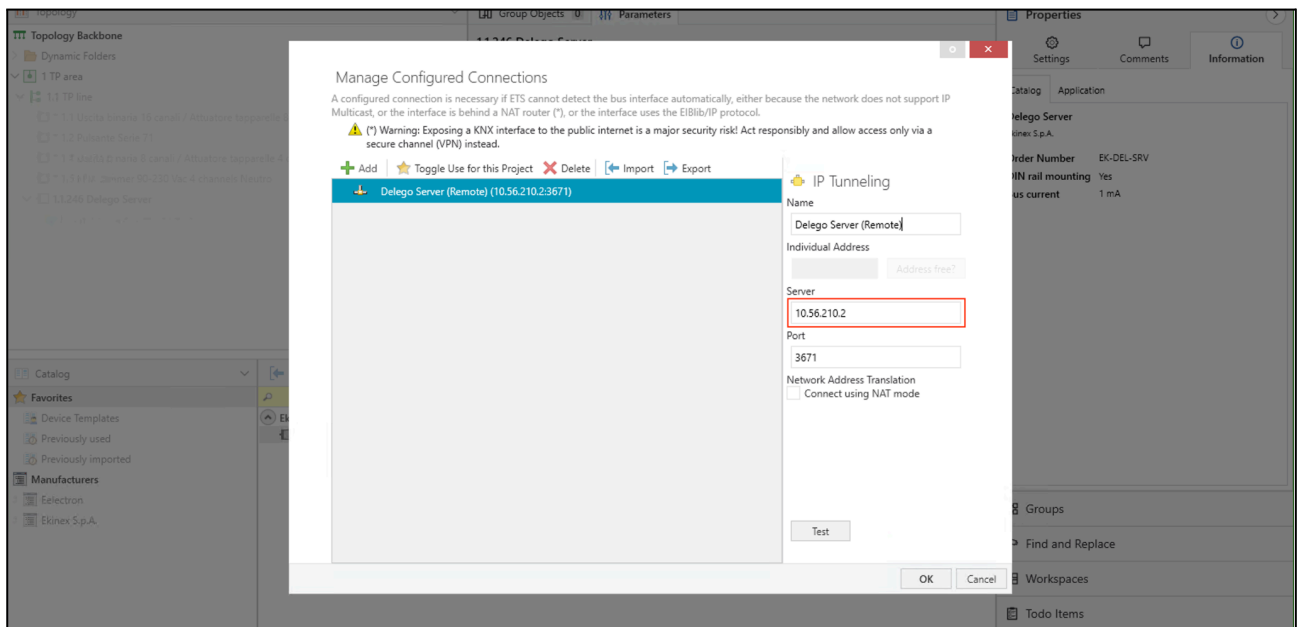
In order to remotely use DELÉGO SERVER as an IP interface for ETS PROFESSIONAL, a VPN must be established.

12.3.1 Cloud VPN

Starting from software version 2.5.2 it is possible (on the 4 DIN-rail module server) to connect the PC in VPN with DELÉGO SERVER (and the local network where it is installed) directly with the EKINEX CLOUD without any configuration on the internet router.

This approach is strongly recommended, being easier to be configured, more flexible and more secure. In order to configure the CLOUD VPN, please refer [D3].

When using the CLOUD VPN for the ETS remoting, it is necessary to enter the webserver VPN IP address (typically **10.56.210.2**) in the ETS connection (after having started the VPN connection), like in the following example:



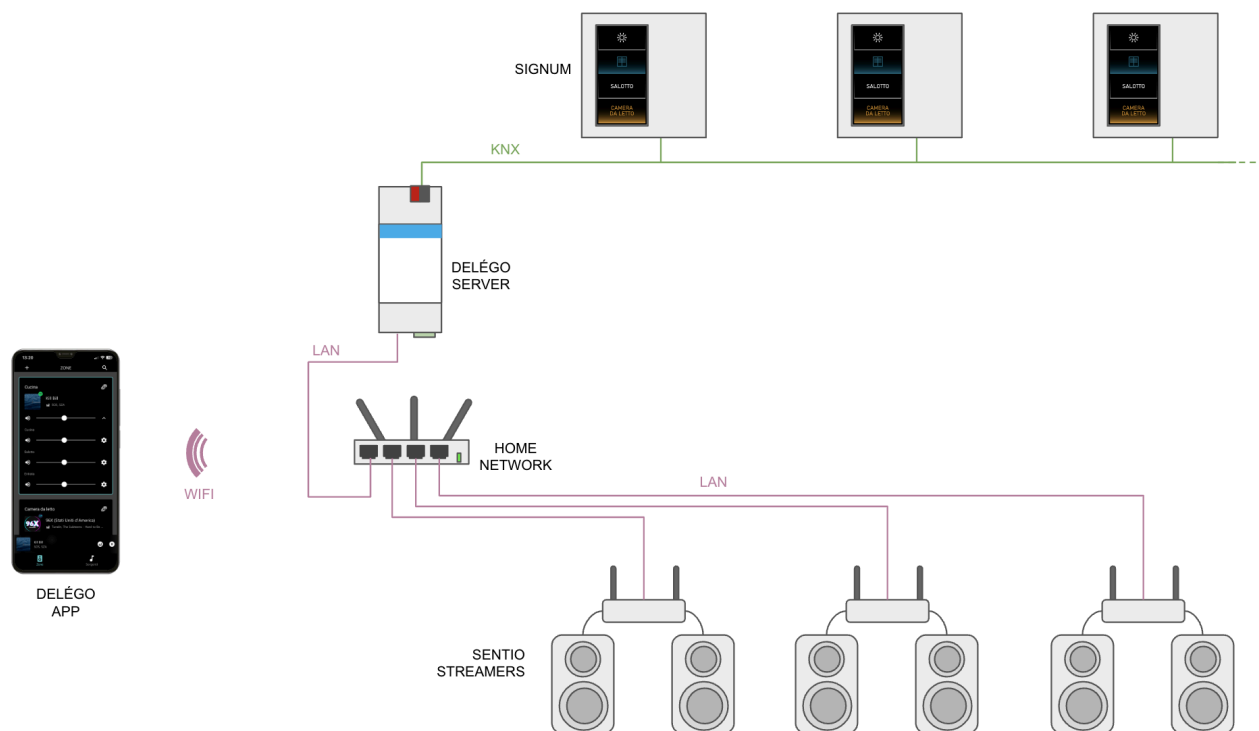
12.3.2 Local VPN

On older versions of DELÉGO SERVER, it is possible to run a VPN server locally on the webserver, as described in [D2]. This approach requires a *port forwarding* configuration in the internet router, of the location where the webserver is installed. As soon as the VPN connection is established, enter the IP address of the webserver (in the local network where it is installed) in ETS, and enable the NAT mode.

13 KNX - Sentio Gateway

13.1 Introduction

DELÉGO SERVER can act as a KNX gateway to control the Ekinex SENTIO system via pushbuttons or dedicated SIGNUM screen.



13.2 Discovery

On DELÉGO SERVER Administration view, access the section

INTEGRATIONS > AUDIO / VIDEO > KNX SENTIO GATEWAY

1 new devices found. Press CONFIGURE to insert them into the project.

General information

Execution state: Running

Permissions

Enable communication: ☒

Execute at startup: ☒

CLOSE
START
STOP

New devices

NAME	IP ADDRESS	ENABLE
SoundSystem 98A2	192.168.1.187	☒

CONFIGURE

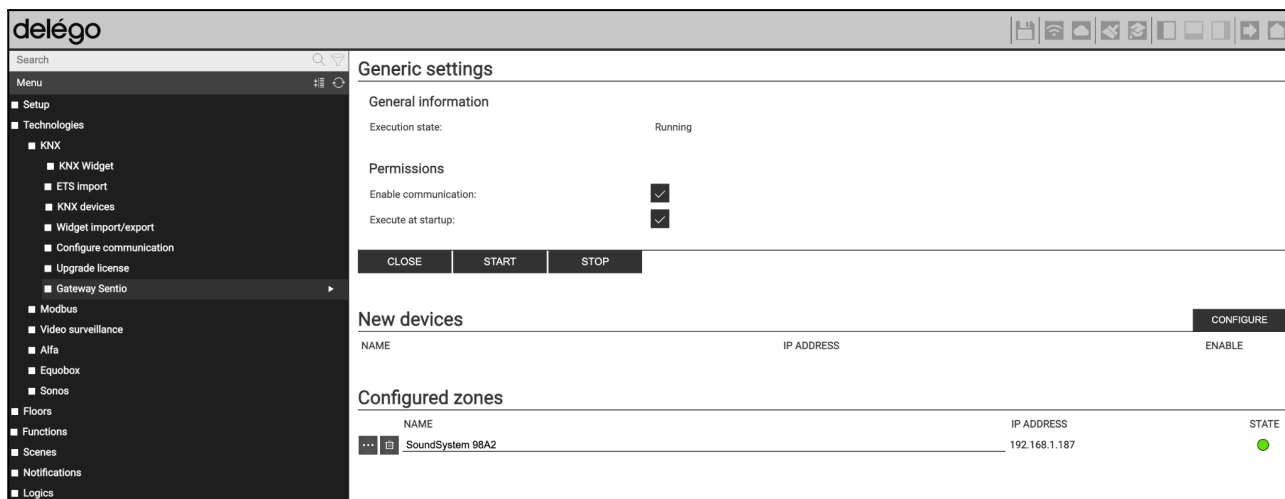
Configured zones

NAME	IP ADDRESS	STATE
------	------------	-------

If the gateway is not yet running, press the START button to start it; if SENTIO streamers are also present in the same network where DELÉGO is installed, they are recognized and listed in the NEW DEVICES section:

13.3 Configuration

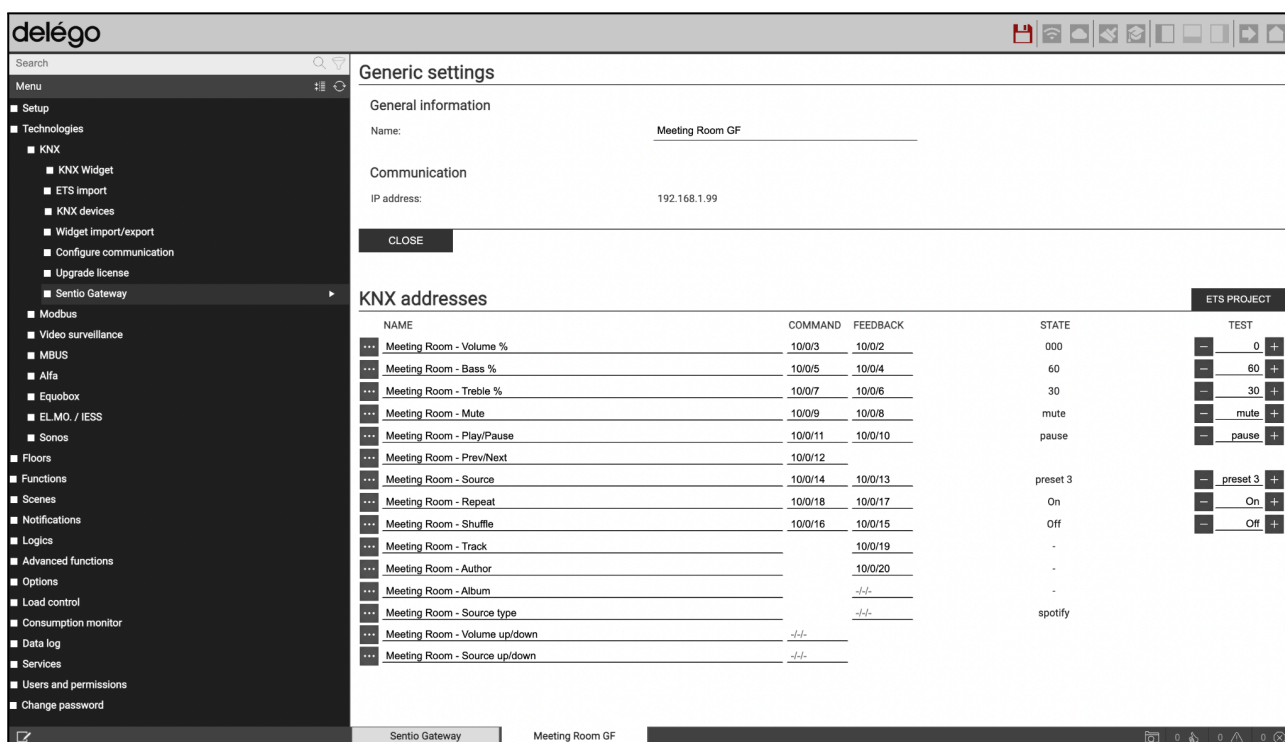
To configure one or more zones within the gateway, select the corresponding ENABLE box and press the CONFIGURE button; at the end of which the configured zones are available in the lower section of the page:



Correct communication with the streamers is confirmed by the green STATUS indicator; in case of a red signal, it is necessary to check the correct connection of the streamer to the local network.

13.4 KNX addresses

In the details page of each streamer it is possible to set the KNX group addresses:



The KNX group addresses entered in the COMMAND column can be used by any KNX device to give commands to the SENTIO streamer; vice versa, the status information of the audio zone is sent upon change to the group addresses entered as FEEDBACK.

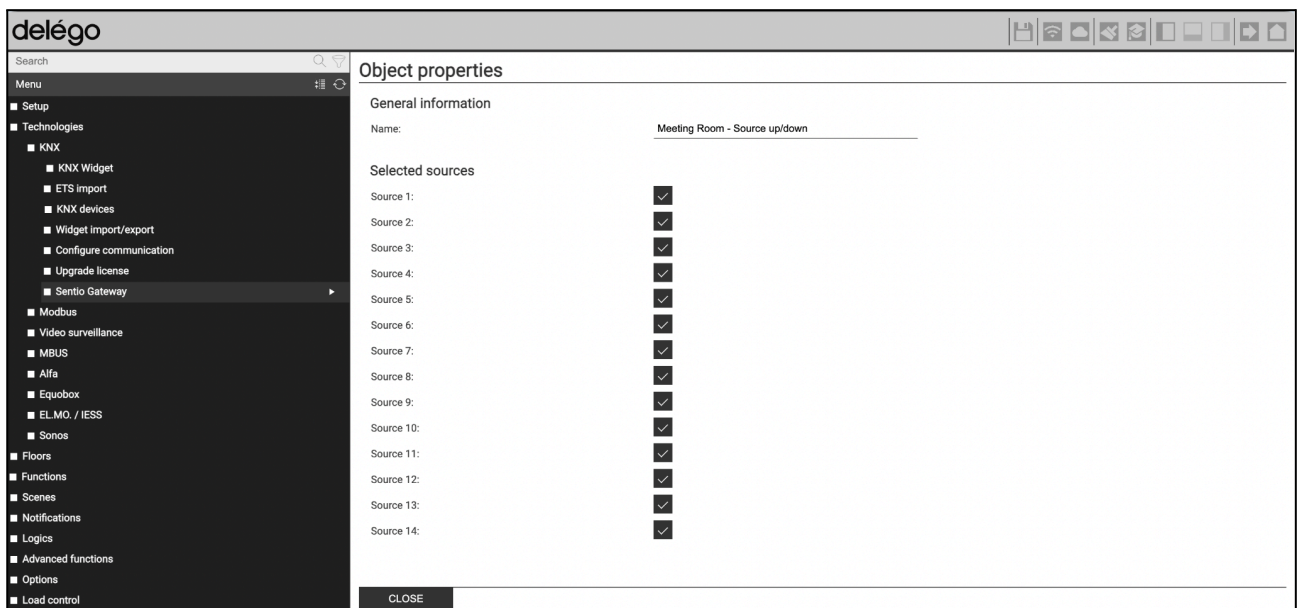
The following features are available for each audio zone:

ADDRESS	DESCRIPTION	VALUES
VOLUME %	Master volume control	0 ... 100% [1 byte dimming]
LOW % HIGH %	Equalization control	0 ... 100% [1 byte dimming]
MUTE	Setting the MUTE mode (silent)	0 = no mute 1 = mute [1 bit switching]
PLAY / PAUSE	Start or stop playback	0 = pause 1 = play [1 bit switching]
PREV / NEXT	Skip to previous or next track (for music sources that support it)	0 = prev 1 = next [1 bit switching]
SOURCE	Selection of the music source to play	1 = preset 1 2 = preset 2 3 = preset 3 4 = preset 4 5 = preset 5 6 = preset 6 7 = preset 7 8 = preset 8 9 = preset 9 10 = preset 10 11 = USB 12 = Line IN 13 = bluetooth 14 = optical [1 byte unsigned]
REPEAT	Activating playlist repeat	0 = no repeat 1 = repeat [1 bit switching]
SHUFFLE	Enabling random playback	0 = no shuffle 1 = shuffle [1 bit switching]
TRACE AUTHOR ALBUM	Information about the current playback	[14 bytes of text]
SOURCE TYPE	Current source type	0 = n.d. 1 = USB

		2 = Line IN 3 = Bluetooth 4 = Optical 15 = Internet radio 16 = TuneIn 17 = Spotify 18 = Amazon Mus. 19 = Tidal [1 byte unsigned]
VOLUME UP/DOWN	Volume increase/decrease	0 = decrease 1 = increase [1 bit switching]
SOURCE UP/DOWN	Source increment/decrement	0 = decrease 1 = increase [1 bit switching]

Once the KNX group addresses have been specified, they can be used immediately without further saving operations.

As regards specifically the increase/decrease of the source, by accessing the detail page (through the corresponding edit button) it is possible to select which sources should be taken into consideration (if not all are used):



13.5 Use in combination with Signum

The SIGNUM virtual pushbutton panel provides a graphic screen for controlling a multimedia area of a KNX compatible audio system. In particular, this screen can be used to control a SENTIO streamer, through the DELÉGO SERVER gateway function.

For optimal use we recommend using the following versions of SIGNUM:

- Firmware: release 1.2.0 or later
- ETS library: release 0.6 or later

Furthermore, to view the SIGNUM audio screen, it is necessary to apply a specific license voucher to the keypad; for further details, please refer to the relevant documentation.

Parameters

Inside the SIGNUM ETS library it is first necessary to enable the audio screen (and the corresponding *tab* configuration), through the following flag:

The screenshot shows the 'Parametri' configuration page. The left sidebar has 'Audio' selected. The main area contains the following settings:

- Luminosità display da bus:** ☒ no ☐ si
- Luminosità display:** 80 %
- Attenzione:** mantenere lo schermo acceso per più di 1 minuto può alterare la lettura della sonda interna di temperatura
- Abilita feedback aptico:** ☐ disabilitato ☒ abilitato
- Modalità standby display:** ☐ no ☒ si
- Ritardo attivazione standby:** 00:00:15.00 hh:mm:ss:ff
- Intensità massima display in standby:** 0 %
- Regolazione volume:** pagina 1
- PIN:** ☒ disabilitato ☐ abilitato
- Ritardo dopo ripristino tensione bus:** 00:00:04.000 hh:mm:ss:fff
- Allarme tecnico:** ☒ disabilitato ☐ abilitato
- Funzionalità termostato:** ☐ disabilitato ☒ abilitato
- Visualizza pagina termostato:** ☐ disabilitato ☒ abilitato
- Visualizza pagina audio:** ☐ disabilitato ☒ abilitato

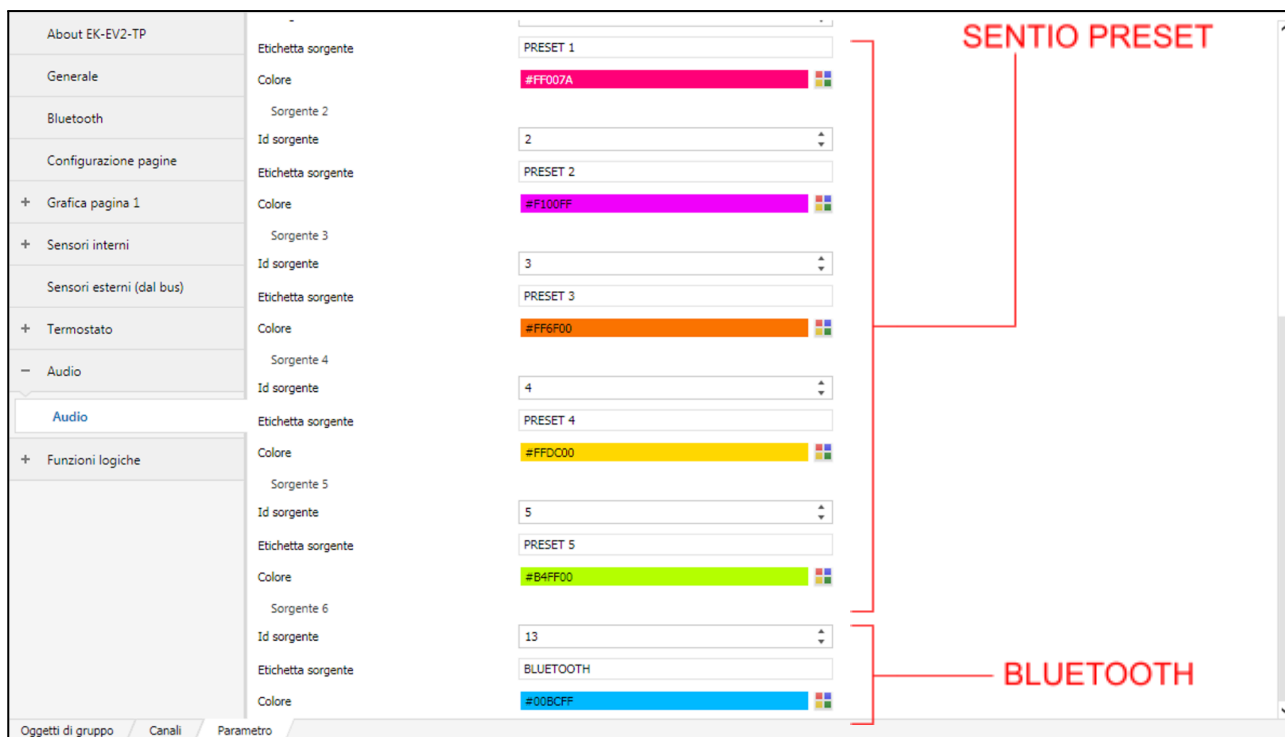
By accessing the AUDIO configuration tab, you must first enable all the features, as in the following example:

The screenshot shows the 'Audio' configuration page. The left sidebar has 'Audio' selected. The main area contains the following settings:

- Per attivare la funzione, è necessario utilizzare l'apposito voucher**
- Regolazione volume:** ☐ disabilitato ☒ abilitato (% control)
- Regolazione alti e bassi:** ☐ disabilitato ☒ abilitato (% control)
- Selezione sorgente:** ☐ disabilitato ☒ abilitato (lista)
- Numero di sorgenti:** 6
- Accensione o spegnimento:** ☐ disabilitato ☒ abilitato
- Funzione di "muto":** ☐ disabilitato ☒ abilitato
- Riproduci / Pausa:** ☐ disabilitato ☒ abilitato
- Traccia precedente / successiva:** ☐ disabilitato ☒ abilitato
- Riproduzione casuale:** ☐ disabilitato ☒ abilitato
- Ripetizione:** ☐ disabilitato ☒ abilitato
- Visualizza titolo e artista:** ☐ disabilitato ☒ abilitato
- Sorgente 1:** Id sorgente: 1, Etichetta sorgente: PRESET 1, Colore: #FF007A
- Sorgente 2:** Id sorgente: 2, Etichetta sorgente: PRESET 2, Colore: #F100FF

Finally, it is recommended to enable the maximum number available in SIGNUM (6) and to associate them with the same number of SENTIO PRESETS, therefore using the numbers from 1 to 6 as numbering (to be read / written on the KNX bus). In this way, via the SENTIO app you can associate your favorite streams with PRESETS, and you can subsequently recall them from SIGNUM.

Alternatively, you can reserve one or more *sources* of SIGNUM to activate a different input from a stream, such as Bluetooth (see following screenshot):



As regards the wording to be assigned in SIGNUM, it is recommended to adopt a generic nomenclature "PRESET 1", "PRESET 2" etc... in order to subsequently be able to customize the streaming associated with each preset, without having to consequently adapt the wording in SIGNUM. The colors obviously can be chosen as you wish.

In any case, please remember that the wordings of the SIGNUM sources can also be modified via the EKinex TOOL app, therefore without the need to modify and download the ETS project again.

Group addresses

The SIGNUM library provides a series of group objects, through which the pushbutton panel updates its status on the screen according to the SENTIO audio system, and on the other hand allows you to send commands to DELÉGO, who transmits them to the corresponding streamer.

The following figure shows an example of configuration of group addresses associated with the different group objects, for a SIGNUM with audio function enabled:

Zona audio – Stato ON/OFF	348	10/0/0	1 bit	C - W T U	switch	Bassa
Zona audio – Comando ON/OFF	349	10/0/1	1 bit	C R - T -	switch	Bassa
Zona audio – Stato livello volume	350	10/0/2	1 byte	C - W T U	percentage (0..100%)	Bassa
Zona audio – Comando livello volume	351	10/0/3	1 byte	C R - T -	percentage (0..100%)	Bassa
Zona audio – Stato livello bassi	352	10/0/4	1 byte	C - W T U	percentage (0..100%)	Bassa
Zona audio – Comando livello bassi	353	10/0/5	1 byte	C R - T -	percentage (0..100%)	Bassa
Zona audio – Stato livello alti	354	10/0/6	1 byte	C - W T U	percentage (0..100%)	Bassa
Zona audio – Comando livello alti	355	10/0/7	1 byte	C R - T -	percentage (0..100%)	Bassa
Zona audio – Stato muto	356	10/0/8	1 bit	C - W T U	switch	Bassa
Zona audio – Comando muto	357	10/0/9	1 bit	C R - T -	switch	Bassa
Zona audio – Stato Riproduci/Pausa	358	10/0/10	1 bit	C - W T U	switch	Bassa
Zona audio – Comando Riproduci/Pausa	359	10/0/11	1 bit	C R - T -	switch	Bassa
Zona audio – Comando Avanti/Indietro	360	10/0/12	1 bit	C R - T -	switch	Bassa
Zona audio – Stato selezione sorgente	361	10/0/13	1 byte	C - W T U	counter pulses (0..255)	Bassa
Zona audio – Comando selezione sorgente	362	10/0/14	1 byte	C R - T -	counter pulses (0..255)	Bassa
Zona audio – Stato riproduzione casuale	363	10/0/15	1 bit	C - W T U	switch	Bassa
Zona audio – Comando riproduzione casuale	364	10/0/16	1 bit	C R - T -	switch	Bassa
Zona audio – Stato ripeti	365	10/0/17	1 bit	C - W T U	switch	Bassa
Zona audio – Comando ripeti	366	10/0/18	1 bit	C R - T -	switch	Bassa
Zona audio – Info brano	367	10/0/19	14 bytes	C - W T U	Character String (ASCII)	Bassa
Zona audio – Info artista	368	10/0/20	14 bytes	C - W T U	Character String (ASCII)	Bassa

Oggetti di gruppo Canali Parametro

The following figure shows the corresponding configuration in DELÉGO SERVER of the same audio zone:

Indirizzi KNX				PROGETTO ETS	
NOME	COMANDO	FEEDBACK	STATO	TEST	
... Sala Riunioni - Volume %	10/0/3	10/0/2	14	—	14 +
... Sala Riunioni - Bassi %	10/0/5	10/0/4	25	—	25 +
... Sala Riunioni - Alti %	10/0/7	10/0/6	60	—	60 +
... Sala Riunioni - Mute	10/0/9	10/0/8	unmute	—	unmute +
... Sala Riunioni - Play/Pause	10/0/11	10/0/10	pause	—	pause +
... Sala Riunioni - Prev/Next	10/0/12		next		
... Sala Riunioni - Sorgente	10/0/14	10/0/13	preset 5	—	preset 5 +
... Sala Riunioni - Ripetizione	10/0/18	10/0/17	On	—	On +
... Sala Riunioni - Casuale	10/0/16	10/0/15	Off	—	Off +
... Sala Riunioni - Traccia		10/0/19	Angel		
... Sala Riunioni - Autore		10/0/20	Massive Attack		
... Sala Riunioni - Album		-/-	Mezzanine		

As you can see, the group addresses associated in ETS with the "COMMAND" type group objects must be reported in the COMMAND column of DELÉGO, and vice versa as regards the states ("FEEDBACK" column).

14 KNX - DALI Gateways

14.1 Introduction

The KNX-DALI gateways make diagnostic information on individual lamps and/or DALI groups available via specific telegrams, which typically concatenate a series of status signals to the lamp / group number.

To correctly manage this type of lamp, a special section has been set up in DELÉGO SERVER within the KNX technology.

14.2 Add a new gateway

To create a new KNX-DALI gateway access the section

TECHNOLOGIES > KNX > KNX DALI MANAGEMENT

and press the [+] button on the bottom toolbar. Once a new gateway has been created, access its profile via the "shortcut" (three dots) next to its name, or via the edit button on the toolbar.

In the general section, the following information is required:

DPT TELEGRAM FOR DIAGNOSTICS	Select the type of telegram sent by the gateway containing the diagnostic information. The following data types are supported: 1 byte (DPT 238.600) <table><tr><th colspan="8">bits</th></tr><tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="8">number electronic ballast (0...63)</td></tr><tr><td colspan="8">0 = no lamp error / 1 = lamp error</td></tr><tr><td colspan="8">0 = no electronic ballast error / 1 = electronic ballast error</td></tr></table> 2 byte (DPT 237.600) <table><tr><th colspan="16">bits</th></tr><tr><td>15</td><td>14</td><td>13</td><td>12</td><td>11</td><td>10</td><td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr><tr><td colspan="10">not used (0)</td><td colspan="6">number electronic ballast (0...63) / group (0...15)</td></tr><tr><td colspan="10"></td><td colspan="6">0 = device addressed / 1 = group addressed</td></tr><tr><td colspan="10"></td><td colspan="6">0 = response, active telegram / 1 = request telegram</td></tr><tr><td colspan="10"></td><td colspan="6">0 = no lamp error / 1 = lamp error</td></tr><tr><td colspan="10"></td><td colspan="6">0 = no electronic ballast error / 1 = electronic ballast error</td></tr><tr><td colspan="10"></td><td colspan="6">0 = no converter error / 1 = converter error</td></tr></table> Being able to choose how to configure the DALI gateway, it is advisable to adopt the 2 byte format, as it is richer in information.	bits								7	6	5	4	3	2	1	0	number electronic ballast (0...63)								0 = no lamp error / 1 = lamp error								0 = no electronic ballast error / 1 = electronic ballast error								bits																15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	not used (0)										number electronic ballast (0...63) / group (0...15)																0 = device addressed / 1 = group addressed																0 = response, active telegram / 1 = request telegram																0 = no lamp error / 1 = lamp error																0 = no electronic ballast error / 1 = electronic ballast error																0 = no converter error / 1 = converter error					
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KNX OBJECT FOR DIAGNOSTICS	Drag the KNX object of the project into this field which represents the group address on which the diagnostic telegrams are sent, consistent with the chosen format																																																																																																																																																																								

Once these two parameters have been configured, start monitoring of the diagnostic telegrams via the START button.

14.3 Add a new lamp

To create a new lamp associated with the gateway, press the ADD button in the appropriate section at the bottom of the card.

A new object is created, which requires entering the DALI number of the lamp in the DALI ADDRESS field. By accessing its detail file, the following general information is present:

DALI ADDRESS	Numbering of the single DALI lamp inside the gateway. Equivalent to the address entered directly on the gateway card.
SUCH GROUPS	Specify one or more groups to which the lamp belongs separated by a semicolon

In the DIAGNOSTIC INFORMATION section there are already "system" sub-objects which represent the possible anomaly information received from the bus. The number of these objects depends on the initially chosen diagnostic format.



If at a later time the format of the diagnostic telegram in the gateway is changed, it is necessary to re-create all the associated lamps.

It is therefore advisable to carefully select this format in the initial phase, possibly carrying out communication tests on a single lamp, before proceeding with the duplication as described below.

In the COMMAND SUB-OBJECTS section vice versa it is necessary to drag the KNX objects of the project that represent the ON/OFF command (and status) and the percentage regulation.

Once these objects have been dragged, it is possible to choose the IDENTIFIER from the appropriate drop-down menu, automatically filtered based on the type of data. The list also displays the preview of the main KNX group address (command) and allows you to send test commands through the controls in the STATUS column.

To display the lamp in the supervision, associate it at this point with an environment, dragging the latter to the ENVIRONMENTS section (by clicking on the title of this section, all available environments are automatically shown in the search results).

For each change on the DALI lamps, it is necessary to restart the diagnostic monitoring using the UPDATE button.

14.4 Duplicating lamps

Once the first DALI lamp associated with a gateway has been correctly configured, it is possible to automate replication using the DUPLICATE button, available both in the list and in its detail file. Similarly, it is also possible to export the configuration to import it later, even in a different DELÉGO SERVER. The duplication is similar to the one already explained, more in general, for the KNX widgets.

You can specify the following:

WIDGET	Confirm the selection of the lamp to duplicate
NUMBER OF COPIES	Number of lamps to create

ADDRESSING	Specify whether all the lamps must be associated with the same ON/OFF and percentage command KNX objects, or must be "scaled" with an offset with respect to the addressing of the first lamp
OFFSET	Specify the offset (increment) respectively on MAIN, INTERMEDIATE and GROUP GROUP with respect to the addresses of the first lamp. Enter this data according to the convention adopted in the ETS project to represent the different lamps.

Pressing the RUN button the following operations are performed:

- The lamps are created by duplicating the original
- For each of them, the KNX objects associated with the group addresses are searched for in the project, obtained by adding the *offset* specified

If the KNX addresses corresponding to the offsets are not found, the lamps remain without command objects; at this juncture, it is necessary to proceed with the manual association via drag&drop as seen previously.

Once the creation of the duplicate lamps is complete, restart the diagnostic monitoring using the REFRESH button.

15 Revision history

The following table contains the most relevant changes in the software releases, concerning the topics of this application manual:

Release	Changes	Date
2.8.0	Added the options for the KNX IP SECURE in the KNX configuration page	15/04/2026
2.7.1	Introduced the thermostat with seasonal setpoint in the "HVAC" category for the KNX widgets section	16/01/2026
	Introduced the KNX scenario template in the "OTHER" category for the KNX widgets section	
2.7.0	Introduced automatic widgets creation for KNXPROJ imports containing Ekinex KNX products	01/09/2025
	Added KNX telegram recorder	
2.6.0	Introduced support for KNXPROJ files in ETS import	02/04/2025
	Introduced KNX Secure support	
2.5.2	New Cloud VPN service for remote configuration of KNX devices and other appliances in the home network	14/02/2025
2.5.0	Added new templates for KNX widgets (Single setpoint thermostat and audio zone)	30/09/2024
2.4.3	Updated section dedicated to the configuration of KNX communication and ETS + remote control	15/01/2024
2.4.2	Added section dedicated to the "split" type widget	07/12/2023



Before the software release 2.6 the application manuals of DELÉGO SERVER were organized differently. An exact correspondence with older versions of the manuals and the changelog could not be found for this reason.