Wiser for KNX

LSS 100100

User guide

01/24 – Firmware R 3.0.0

Schneider Electric
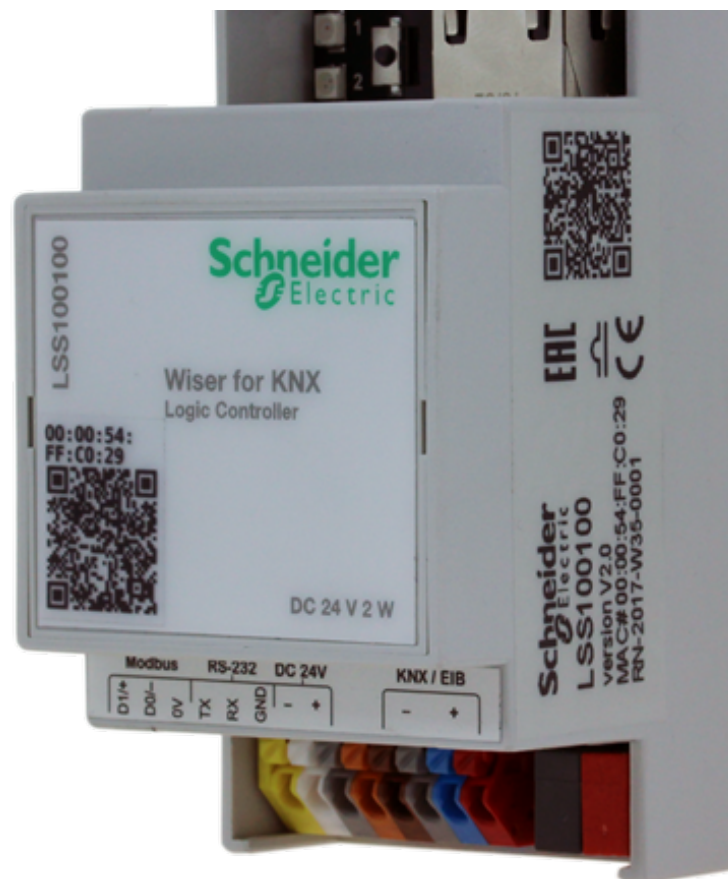
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Safety information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that accompany this symbol to avoid possible injury or death.

⚡ ⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTE is used to address practices not related to physical injury.

Symbols

Additional information

The information provided has to be complied with. Otherwise, program or data errors may occur.

Table of contents

1   For your safety

⚠ ⚠ **DANGER**

HAZARD OF ELECTRIC SHOCK, OR ARC FLASH.

Safe electrical installation must be carried out only by skilled professionals.
Skilled professionals must prove profound knowledge in the following areas:

- Connecting to installation networks
- Connecting several electrical devices
- Laying electric cables
- Connecting and establishing KNX networks
- Safety standards, local wiring rules and regulations

Failure to follow these instructions will result in death or serious injury.

1.1   Qualified personnel

This document is aimed at personnel who are responsible for setting up, installing, commissioning and operating the device and the system in which it is installed.

Detailed expertise gained by means of training in the KNX system is a prerequisite.

2   Introduction

This document describes features and the programming interface for the Wiser for KNX device.

The software programming interface is embedded in Wiser for KNX and requires a web browser.

Pre-programming and configuration cannot be performed without the Wiser for KNX device.

Read through the following instructions carefully and familiarise yourself with the device before installation, operation, and maintenance.

3   Product features

3.1   Connectivity

- IP LAN connection 10/100 Mbit
- USB 2.0 (for GMS modem, EnOcean…) 5V, 500 mA max.
- RS-232
- Modbus (RS-485)
- Wi-Fi through IP connection and wireless router
- KNX / EIB TP Bus

3.2   Security recommendation

- Network security has to be set up at the appropriate level. Wiser for KNX should be part of a secure network with limited access. In case of Internet connection, it is strictly recommended to use VPN or HTTPS channel.
- Use secure protocol access HTTPS://IP:Port.
- The security method is determined by the ability of other network elements (firewall, protection against viruses and malware threats).
- It is strictly recommended to store the files containing your backups in a safe place without access of unauthorized persons.
- Make sure your Wiser for KNX does not have a publicly accessible IP address.
- Do not use port forwarding to access your Wiser for KNX from the public Internet.
- Wiser for KNX should be located on its own network segment.
- If your router supports a guest network or VLAN, it is preferable to locate your Wiser for KNX there.

In case you find cyber security incidents or vulnerabilities, please contact us through this page:
https://www.se.com/ww/en/work/support/cybersecurity/security-notifications.jsp.

You can read more on system hardening here:
https://www.se.com/ww/en/download/document/AN002_107/.

If the HTTP communication is detected, the following warning appears:

HTTP communication detected   HTTP communication detected

HTTP connection is not encrypted. All communication data can be in intercepted by a third party.

Do you want to switch to HTTPS (encrypted mode)?

It is strongly recommended to use HTTPS.

Note: The device comes with a self-signed SSL certificate which encrypts information. Web-browsers will display a warning message and request to confirm the exception to proceed.

> **NOTE**
>
> **MATERIAL DAMAGE THROUGH UNAUTHORIZED ACCESS TO THE KNX INSTALLATION**
>
> As soon as you access the KNX installation via the Internet, the data traffic can be read by third parties.
>
> - Only use a VPN access for this connection with a secure encryption for all data packages.
> - The required hardware (VPN router) and the features offered by mobile service providers differ significantly with regard to the settings and technical possibilities depending on the country or region.
> - Always have the VPN access set up and commissioned by a specialist VPN service provider. The VPN service provider selects a suitable mobile service provider and suitable hardware for the VPN access and ensures that the VPN is set up by a qualified specialist.
>
> **Schneider Electric cannot be held responsible for performance problems and incompatibilities caused by applications, services or devices from third-party providers. Schneider Electric offers no technical support when setting up a VPN access.**
>
> **Failure to follow these instructions can result in equipment damage.**

The VPN access (VPN = Virtual Private Network) authorises the portable device to access the local network, and therefore also the KNX installation, via the Internet.

Benefits of VPN:
- Only authorised users have access to the local network.
- All data is encrypted.
- The data is not changed, recorded or diverted during the transfer. This is often referred to as a VPN tunnel.

Requirements for setting up a VPN connection:
- Internet connection.
- The portable device and the router are enabled for a VPN connection (VPN client installed).

3.3   Password recommendation

- Your password can be any combination of upper case and lower case characters, numbers, and special characters.
- Use a minimum of 8 characters.
- Make your password hard to guess or find in the cybercriminal dictionaries.
- Prefer phrases.
- Change your password frequently, at least once a year.
- Change a default Admin password immediately after you get it and after a factory reset.
- Never re-use your passwords.

3.4   Maintenance

- In case of problems or questions regarding the operation of Wiser for KNX, please contact your supplier or contact the Schneider Electric helpdesk in your country.
- Be aware of higher security risks if you access your local network remotely.

3.5   Patch management

- See chapter Install updates → 33 to install patches and firmware Add-ons.
- You should always upgrade manually. Please backup before an upgrade. See chapter Backup → 34 for backup procedure.

3.6   Factory reset

See chapter Reset/clean-up → 32 for a description of how to reset the device.

3.7   Firmware upgrade

See chapter Firmware upgrade → 13 for a description on how to upgrade the firmware of Wiser for KNX.

3.8   Differences between spaceLYnk and Wiser for KNX

Differences between the devices

Feature	Wiser for KNX	spaceLYnk
Modbus GUI	Up to 10 Modbus devices	Up to Modbus addressable range ≥ 31 by default
BACnet Server	Up to 150 exported objects	*No limit (≤ 2000 recommended)
User Administration	Up to 8 users	No limit (≤ 20 recommended)
One click adding to the filter table	N/A	Fully supported

Performance testing was measured on HW3.0 when object value change interval was set to 60 s. The recommended limit for HW1.x remains 500 objects.

One click object filtering (spaceLYnk only).

Object filtering

Group address ▲	Object name	IP > Loc filter	Loc > IP filter
0/0/1	CO2	☐	☐
0/0/2	Humidity	☐	☐
0/0/3	Temperature	☐	☐
0/0/4	Minimal CO2	☐	☐
0/0/5	Maximal CO2	☐	☐

3.9   New features in firmware version 3.0.0

A full list of new features with descriptions is available in the changelog.

Feature	Link to the chapter
KNX data secured group address feature	KNX data secure key → 62
Read-only trends	Trend logs → 72
IP settings in KNX connections	KNX connection → 49
802.1X EAP TLS network setting added	801.1X EAP-TLS → 57
User detail - new feature - home page setting	Add new user → 110
Acceptance of the NTP server from DHCP server	Interfaces → 45

4   Getting started

- Follow the steps listed to help you get started with Wiser for KNX.
- Mount the device on the DIN rail.
- Connect the bus cables (KNX, Modbus, and/or RS232) and/or flash drive.
- Connect 24V power supply to the device (Positive conductor to the red clamp, negative conductor to the blue clamp).
- Recommended accessory - Power supply REG/24V DC/0,4A, article No.: **MTN693003**
- Connect Ethernet cable from the PC.
- The default IP address of the Wiser for KNX device is **192.168.0.10**. Change the IP address of the computer to the same range e.g. **192.168.0.9**; mask **255.255.255.0**.
- Run Google Chrome or Mozilla Firefox (for OS Windows), Safari (for OS X), and go to **192.168.0.10**.

> Internet Explorer is not supported.

> Default login properties of the Wiser for KNX device are:
> User name: **admin**
> Password: **admin**

Login properties

You will be prompted to change your password. See chapter Default configuration → 19 for details.

4.1   Start page

The start page is providing a dashboard-like view, pointing to the key areas of Wiser for KNX. The following options are located on the start page.

Start page
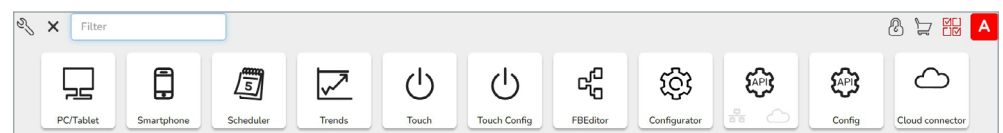
Set User name and Password will be prompted in the first log in or after factory reset.

The default User name to log as an Admin: **admin**
The default password to log as an Admin is: **admin**

> In default, there is only an Admin account. Users have to be created first. See chapter User access → 110 for details.

PC/Tablet Visualization

This icon navigates to the rich visualization with plans containing individual objects. It is ideal for PCs, iPads, and Android tablets (preferably 10'' or bigger display size).

Smartphone Visualization

This icon navigates to the simple list visualization designed for iPhone/iPod/iPad/ Android smartphones/ Android tablets (7'' or smaller display size). All objects added in Wiser for KNX Visualization are visible in this Smartphone visualization (if there is no **Hide in Smartphone** option enabled). Different icons may be set for Smartphone Visualization.

Scheduler

This icon navigates to a user-friendly interface for the end-user to manage scheduler tasks, for example, to specify thermostat values depending on the day of the week, time, and holidays.

Trends

This icon navigates to a user-friendly display of Trend logs with the ability to compare values over time. It can display trends for up to 10 years.

Touch

This icon navigates into the visualization created in the Touch Config environment.

Touch Config

This icon navigates to the premade widgets visualization creator. Access is restricted to administrators.

Configurator

This icon navigates to programming, settings, and configuration interface. Access is restricted to administrators.

Configurator use is not recommended in mobile devices.

Function blocks editor

This icon navigates to Function blocks editor which is graphics, easy to use alternative to LUA scripting.

KNX IoT 3rd Party API

Enable API for cloud and/or local network.

KNX IoT 3rd Party API Config

Cloud connector

Establish a connection to the KNX cloud.

4.2   Start page configuration

Configuration

This icon navigates to the configurator page. Click ⊞ to unlock the menu for editing. The menu will become orange.

Start page menu

Allow users to show/hide applications

Allow users to modify the visibility of icons on the main screen (only available when in admin mode).

Change admin password

Only available when in admin mode.

Language

Select the language of the user interface.

Light theme/Dark theme

Select between normal and inverse colors of the user interface.

The background will be changed to the selected colour/pattern.

Customize theme
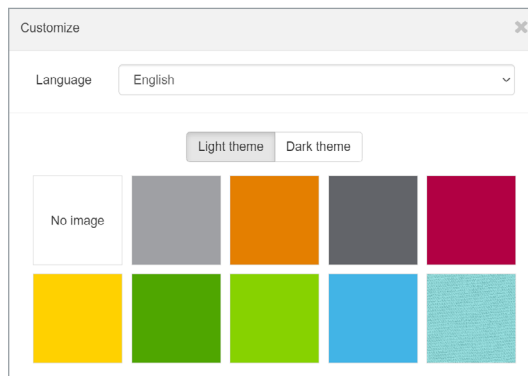
Search

Filter menu Applications containing typed letters.

Lock/unlock

Lock/unlock grid for sorting order of icons in the menu.
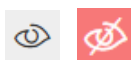
Show/hide Applications

Allow to showing/hiding applications on the main screen (only in Admin mode or Use view or when permitted by Admin).

Show/hide applications

Edit User view

This icon navigates to the sub-menu allowing to edit User view (Admin mode only).

Save view

Save Default view of User home page view.

Login

Only for Wiser for KNX after firmware upgrade already containing project.

A   spaceLYnk is in Admin mode. Click will log off.

U   spaceLYnk is in User mode. Click will log off.

4.3 Marketplace

Marketplace

This icon navigates to the Marketplace page. Available only in admin mode. In case of missing connection to the Internet, only installed Applications are visible without update possibility.

Marketplace applications

Filter	✕
Install new apps and widgets	
Cloud connector (1.8.3) `Verified` Version: 20220920 / 20220715 ☑ Update automatically	🗑
FB Editor 2.0 `Verified` Version: 20220920 / 20201210	🗑
KNX IoT 3rd Party API (1.16.3) `Verified` Version: 20220920 / 20220905 ☑ Update automatically	🗑
Touch (3.13.0) `Verified` Version: 20220920 / 20220809 ☑ Update automatically	🗑
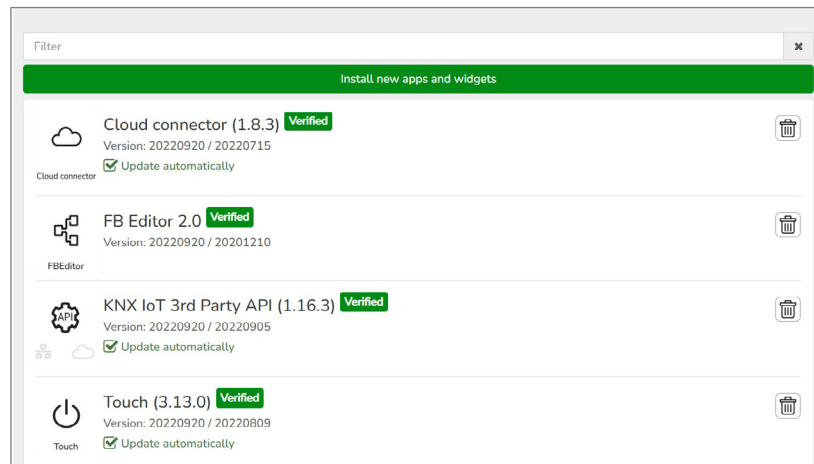
☰   Icon on the left side will open following sub-menu:

Marketplace submenu

☰
Apps
Installed
Install from file
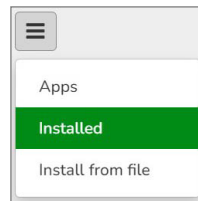
Apps
Shows all available applications.

Installed
Shows all installed applications (yellow number indicates the number of installed applications).

Install from file
Installs application directly from the file.

Install from file

> **Install from file**   ✕
>
> Package file
> [Choose File] No file chosen
>
> Signature file
> [Choose File] No file chosen
>
> ☐ Allow to install package without signature
>
> > When enabled, you can install a package without a signature. This may present risks. Please ensure that you trust the source of the package
>
> [OK] [Cancel]

Search bar

Filters applications containing typed letters.

This icon installs selected application.

This icon updates selected application.

This icon uninstalls selected application.

Verified This icon marks applications verified by Schneider Electric. Applications which are not verified are not supported by Schneider Electric and you use them at your own risk.

Applications signing

Applications installed from the file should be verified by signature similarly as all applications on the Marketplace are. Installation of applications without a signature is still possible, but you should be ensured about the source and specifically tick this option in a dialog window.

4.4 Default configuration

Login: **admin**

Password: **admin**

When the default password was not changed, you will be prompted to enter the Admin access password, if you have brand new Wiser for KNX or after a firmware upgrade.
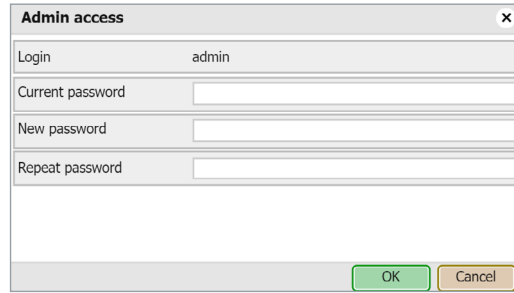
Password requirements

Password complexity requirement:
- The length of the password is 8-20 characters.
- The password should contain uppercase letters of European languages (A through Z, with diacritic marks, Greek and Cyrillic characters)
- It should contain lowercase letters of European languages (a through z, sharp-s, with diacritic marks, Greek and Cyrillic characters).
- It should contain at least one of the base 10 digits (0 through 9)

The IP address on LAN: **192.168.0.10**
Networks mask on LAN: **255.255.255.0**

Admin access dialog
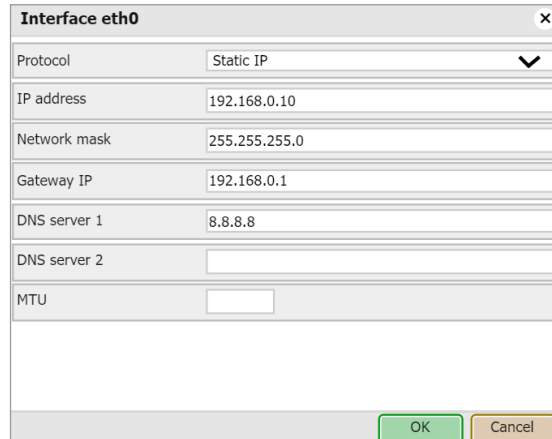
Admin access	✕
Login	admin
Current password	
New password	
Repeat password	

OK   Cancel

4.5   Change IP settings

Configurator → Utilities → System → Network → Interfaces window, click on the specific interface to change the IP settings.

Change IP settings

Interface eth0	✕
Protocol	Static IP ⌄
IP address	192.168.0.10
Network mask	255.255.255.0
Gateway IP	192.168.0.1
DNS server 1	8.8.8.8
DNS server 2	
MTU	

OK   Cancel

Protocol
Specific protocol used for addressing.

Static IP
Static IP address (default 192.168.0.10).

DHCP
DHCP protocol used to fetch the IP configuration. The IP address as received from the DHCP server. This field appears only if the IP address is assigned.

Network mask
Network mask (default 255.255.255.0 (/24)).

Gateway IP
Gateway IP address.

DNS server 1
Primary DNS server IP address.

DNS server 2
Secondary DNS server IP address.

MTU

Maximum Transmission Unit: The largest size of the packet which is passed in the communication protocol (150 by default).

When changes are made, the *Apply changes* icon appears in the top-right corner. This should be applied for changes to take effect. Wiser for KNX will automatically reboot after changes are applied.

4.6 Discover your Wiser for KNX in IP network

Windows OS

Use the utility service browser which can be downloaded here:
https://downloads.digitaltrends.com/bonjour/windows

If the host is not changed and only **one** Wiser for KNX is on the network, type in your browser:
http://Wiser_for_KNX.local

Installed Bonjour service is needed.

Linux OS

You can download the utility called **Avahi** from here https://www.avahi.org/.

Android

The freely available app called *ZeroConf Browser* can be downloaded in Google Play.

iOS/Mac OS

You can download the freely available app *Discovery DNS-SD Browser* the iOS App Store.

For iPad install the iPhone/iPod version of the utility.

5 Import KNX project from ETS

5.1 ETS3

To use Wiser for KNX with KNX TP UART/IP functionality and to program with the other KNX bus devices, Wiser for KNX has to be added into the **ETS Connection Manager**. ETS programming through Wiser for KNX is available only when KNX IP features are enabled.

ETS Connection Manager
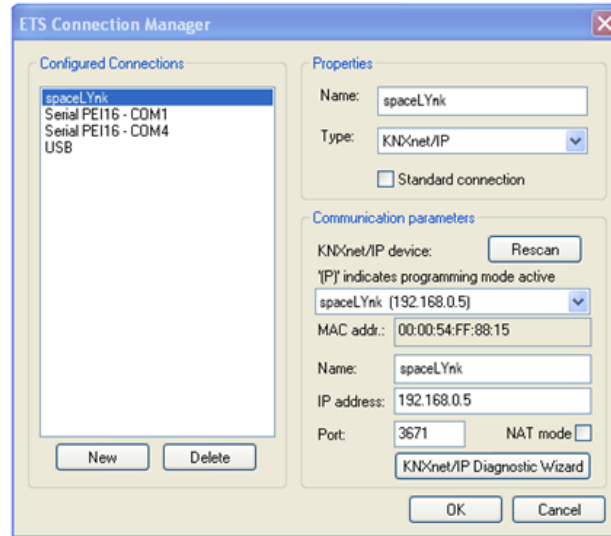
The function **Bus monitor** is not included in Wiser for KNX.

Extras → Options → Communication → Configure interfaces

Enter any Name for the connection.

1. Choose *Type* and select *KNXnet/IP* from the drop-down menu.
2. Click *Rescan* and then select Wiser for KNX from the drop-down menu.
3. Click *OK*.
4. In the *Options → Communication* window, select the newly created interface as *Communication Interface* from the drop-down menu.
5. To test the communication with ETS, click *Test*.
6. Make sure that the bus status is *Online* – click in the ETS.

ETS3 Communication setting

5.2 ETS4

If you want to use Wiser for KNX with KNX TP UART/IP functionality and to program with the other KNX bus devices, Wiser for KNX has to be added into the **ETS Connection Manager**. ETS programming through Wiser for KNX is available only when KNX IP features are enabled.
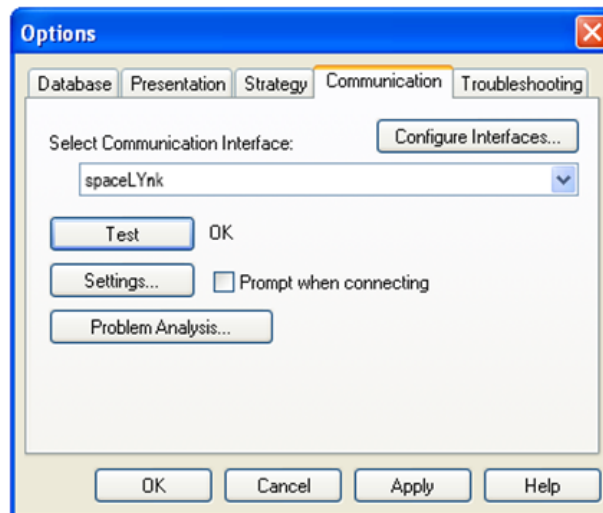
i   The function **Bus monitor** is not included in Wiser for KNX.

Settings → Communication

Newly added Wiser for KNX will be discovered automatically if it is connected to the same network as the PC running ETS4 software.

1. Choose *Select* to move it to the *Configured connections*.
2. Wiser for KNX KNX individual address and mask can be set by clicking the *Local settings*.
3. Select *Use project connection if available* check box to make it a default project connection.
4. Select *Use direct KNX-IP connection if available* option for direct communication in IP network.
5. Click *New* to add Wiser for KNX manually and enter any *Name* for the device.
6. Set IP address, Port, and NAT mode (if needed).
7. Click *OK* to save changes.
8. To test the communication with ETS, click *Test*.
9. Click *Apply changes* for changes to take effect.

5.3 ETS5

To use Wiser for KNX with KNX TP UART/IP functionality and to program with the other KNX bus devices, the device should be added into the ETS Connection Manager. ETS programming through Wiser for KNX is available only when KNX IP features are enabled.

i   Function **Bus monitor** is not included in Wiser for KNX.

Bus → Connections → Interfaces

If your Wiser for KNX is in the same network as a computer running ETS5, it is possible to discover the Wiser for KNX interface automatically. If your Wiser for KNX is discovered, choose the interface by double-clicking on the item in *Discovered Interfaces* list.

If your interface is not discovered, follow the steps below:

1. Click the green + icon next to the *Configured Interfaces*.
2. Select *IP Tunnelling*.
3. Click *New Connection (0.0.0.0:3671)* which is created in *Configured Interfaces*.
4. In the setting tab on the right-hand side set the *Name* of your connection, *Server* (IP address of Wiser for KNX), and *Port*.
5. Select the interface which you have configured in the previous step.
6. To test the communication with ETS, click *Test* in the lower-right corner.
7. If the test is OK, select the interface as active by double click on the item in the list of *Configured Interfaces*.
8. The current Interface is set.

ⓘ **Port 3671 is blocked from any public IP address.**

5.4   KNX data secure

If you have data secure devices in your installation and want your controller to communicate directly with these devices (sending/receiving data secure telegrams), add the controller secure dummy device to your installation. Use dummy device by Feller (https://online-katalog.feller.ch/download/index.php?menueidLev1=279). Connect the individual group addresses of the data secure device with your controller dummy device.

If the controller works like a router, you do not need the controller secure dummy device for secured KNX communication.

5.5   KNX specific configuration

See *Configurator → Utilities → System → Network → KNX connection* for details. When changes are done the *Apply changes* icon appears in the top-right corner. Click it.

✎ Wiser for KNX automatically reboots after changes are applied.

ⓘ Since firmware version 2.6.1 the controller supports KNX long frames with 55 bytes length maximum. This improvement significantly decreases the download time needed for the commissioning of the KNX device.

6 Touch 3 visualization

Easy, fast, and neat looking visualization in a fraction of time compared with visualization as described in chapter Visualization → 84. It is perfect for touch screen devices. Pre-made widgets cover all basic automation needs.

6.1 Touch configuration

Visualization structure can contain multiple floors and rooms.

Rooms then can be filled with pre-made widgets or with the widgets created in the Widget creator. The actual position in the structure is displayed at the bottom in the middle.
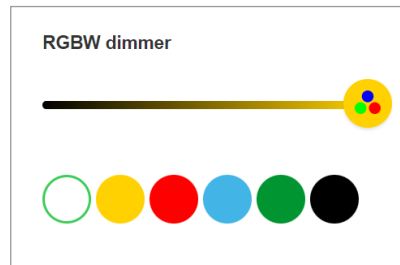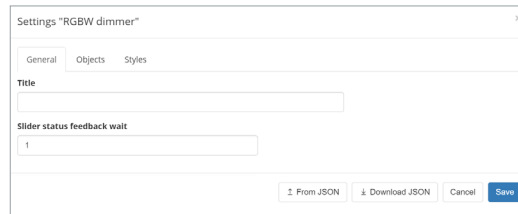
Touch configuration
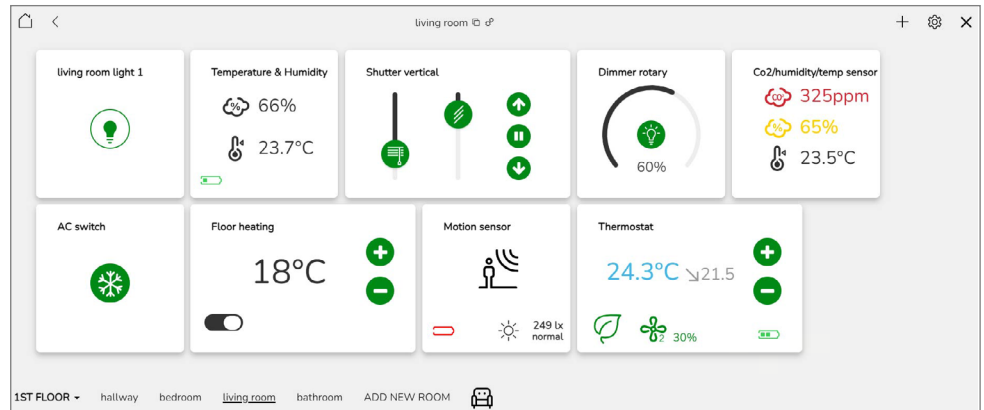
6.2 Adding widgets

Add new widget

Click *Add new widget* to add widgets to your rooms. Custom widget title and set styles for each widget.

Custom the widget style

Widget title

All mandatory objects have to be linked to show the widget in the visualization structure.

Select and link objects
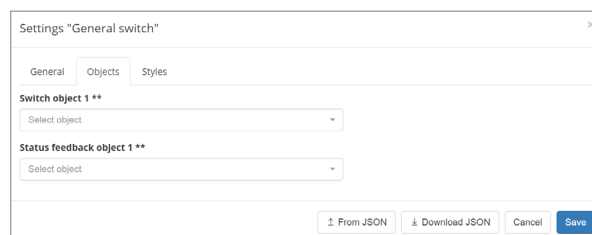
Widget styles
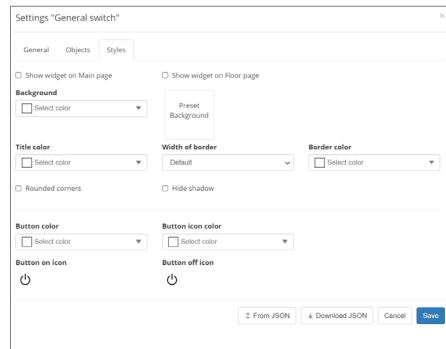
* symbol
Mandatory object

** symbol
One of the mandatory objects

Alert field   Some objects have the alert field. Fill it in and the object generates alert when the alarm condition is met.

Touch config menu
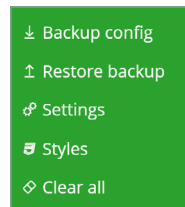
Backup config
Touch visualization backup.

Restore
Touch visualization restore.

Settings
General setting of the Touch.

Styles
General styles of visualization and widgets.

Clear all
Clears all settings for rooms, widgets and styles.

6.3   Touch application

Touch application
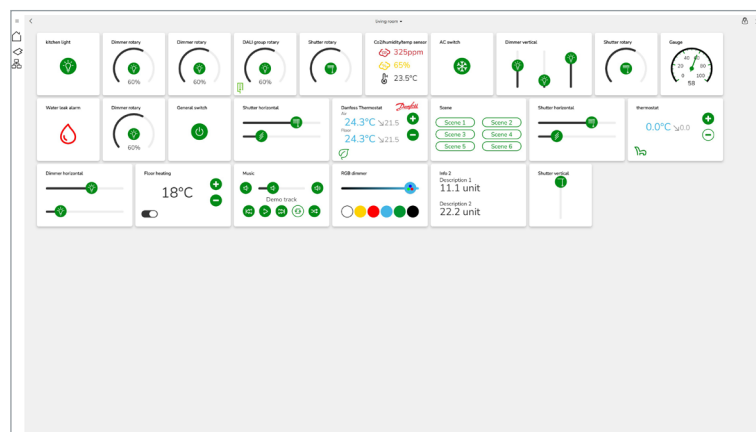
Menu

The menu can be locked by clicking on ☰ (the icon then turns vertically |||).

Floors

Shows the list of floors and rooms.

Functions

Shows groups of widgets according to their function.

Touch application menu

☰	Menu	
⌂	Home	
◇	Rooms	›
◇	living room	
品	Functions	›
☀	Lighting	
❄	Climate	
⌇	Floor heating	
☰	Blinds	
!	General	
♫	Multimedia	
⚡	Power	

7   Configurator main page

Configurator's main page - top bar:
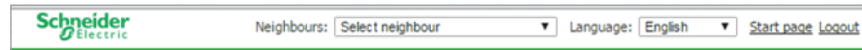
Neighbours

Switch to the next Wiser for KNX in the same network. This selection appears only if any other spaceLYnks or Wiser for KNX devices are discovered.

Select neighbour

Language

Switch the language of the GUI to English, Bulgarian, Chinese, Czech, Danish, Dutch, French, German, Greek, Italian, Portuguese, Russian, Spanish, Turkish, Hungarian, Polish or Swedish.

Start page

This option takes you to the Start page.

Logout

For secure logout.

Version: 3.0.0

This is the actual firmware version of Wiser for KNX.

CPU/IO: 0.43 0.60 0.69, Memory 14%

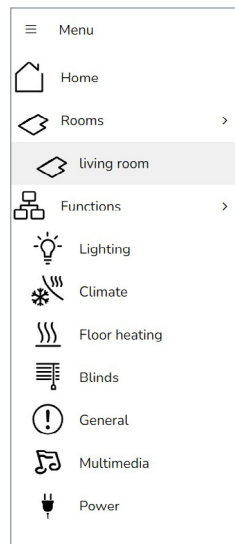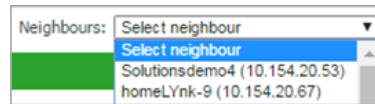Load average numbers **0.43 0.60 0.69** represent averages over progressively longer periods (one, five and fifteen-minute average). The lower number the better. If value 0.7 is overreached, color of CPU/IO values is change to red.

Bridge traffic analogy to processes:

≈ Load of 0.50

≈ Load of 1.00

≈ Load of 1.70
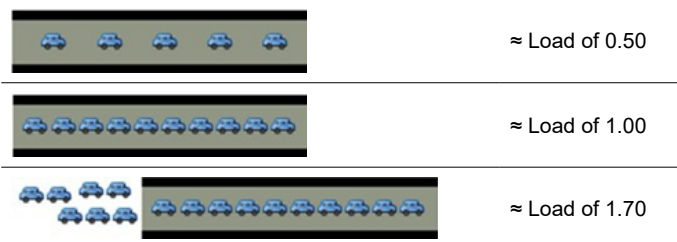
Inspect your running tasks if the load exceeds the level **0.70!**

LED1 and LED2 may be also used for approximate load estimate. See **Operating instructions** for details.

$$Memory = \frac{Used\ memory - Buffered - Cached}{Total\ system\ memory}$$ (minimum occupied memory in %).

See *System → Status → System status → Memory usage* for details.

Beware of Linux terminology. Linux calls cached and buffered memory as "*used*" even if it could be understood as "*free*" for new applications.

KNX/IP: Each time the Configurator is opened, Wiser for KNX checks if the KNX bus is connected. If not connected an error message appears:

"Scripting, visualization and other features will not work. Do you want to switch to KNX/IP instead?"

KNX connection error message
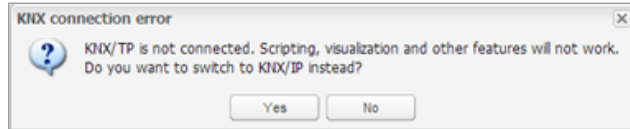
Selected connection and its status are visible in the right bottom corner:

Connection and its status

KNX/TP error message indicate Wiser for KNX has no connection to the bus.

KNX interface has to be changed back to TP-UART once KNX bus is connected under *System → Network → KNX connection → Mode*.

KNX interface change has to be confirmed by rebooting Wiser for KNX (manually or clicking the *Apply changes* icon.

KNX statistics: This graph shows load on KNX BUS. Click on graph picture opens detailed KNX statistics.

KNX statistics
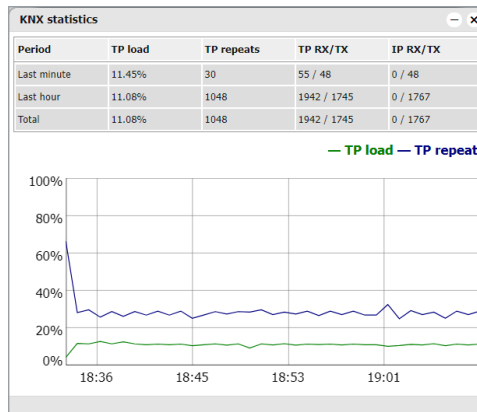
Sync project data

This button is useful if you make a bigger change in the project. When you click it project is immediately saved to the microSD card.

Automatic synchronization is performed every 15 minutes only and all unsaved changes and data may be lost.

8   Utilities

Utilities tab
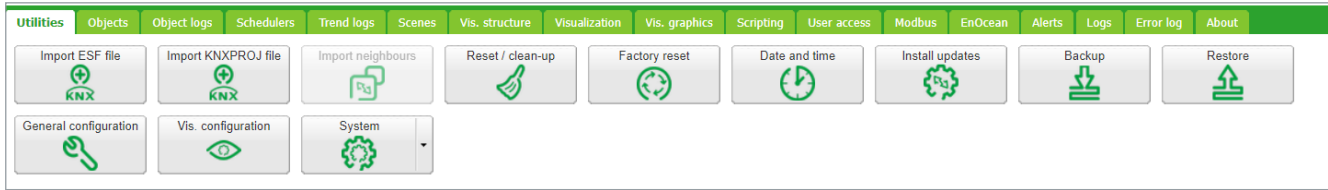
Icons will move when window is resized.

8.1   Import ESF file

Imports the *.esf object file. It is important to set correct data types for imported objects. Existing objects will not be overwritten.

Objects with the same name are considered duplicates and might not be imported and marked as discarded.

List of imported and discarded object is displayed after each import.

Import result
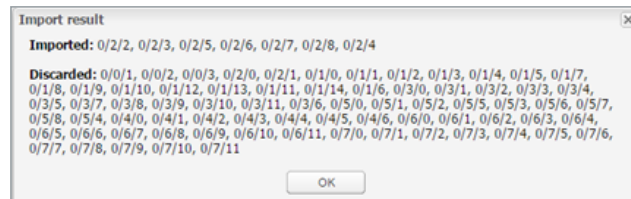
Comment *ETS import* will be displayed in *Object comments* for each ETS imported object.

See chapter for details.

Import ESF file
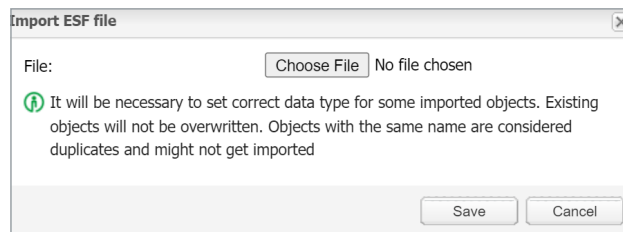
8.2   Import KNXPROJ file

You can import the *.KNXPROJ file directly to the controller. The structure of the project and DPTs of the group addresses including automatic units and suffixes remains preserved.

Import KNXPROJ file

Import KNXPROJ file	✕
File:	Choose File No file chosen
Password:	
Add objects without data type:	☐
Add level names to objects:	☐
Import security keys:	☑
Create filtering table from the project data:	☐
Set group address filtering policy to "Accept":	☐

ⓘ Existing objects will not be overwritten. Objects with the same name are considered duplicates and might not get imported

Save   Cancel

- Password protected *.knxproj files request password set in ETS. Without knowing correct password import process is not possible.
- Import allows you to add objects without defined data types and give the objects structure level names.
- *Import security keys*: Enabled by default. If enabled, the backbone key and KNX data secure keys for group objects will be filled in automatically after import - see also Object parameters → 60.
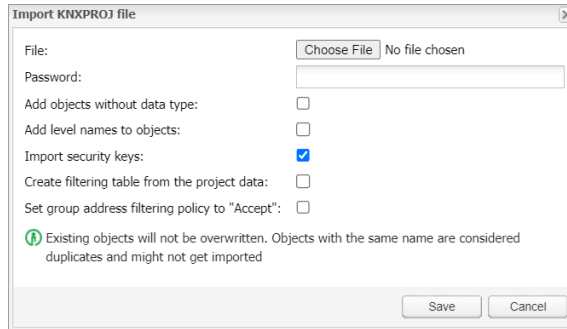- *Create a filtering table from the project data* – when checked, the filtering tables from a KNX project are automatically created.
- *Set group address filtering policy to "Accept"*: If enabled, the import will automatically set *DST group policy* to *Accept selected group addresses* in *Configurator* > *Network* > *KNX connection* > *IP* > *Local Filter* (IP > Local filter → 51) and *Local* > *IP filter* (Local > IP filter → 52). If unchecked, the *DST group policy* remains unchanged.
- **Objects with the same name are considered duplicates and might not** get **imported and marked as discarded.**

8.3 Import neighbours

Single Wiser for KNX in the IP network.
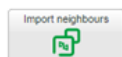
Multiple spaceLYnks/Wisers for KNX.

Remote services have to be enabled on both devices for object sharing.

Enable remote services

Remote services	✕
Service status	Enabled ▼
Allow only exported objects	☐
Username	remote
Password	

ⓘ Leave password blank to keep it unchanged.

OK   Cancel
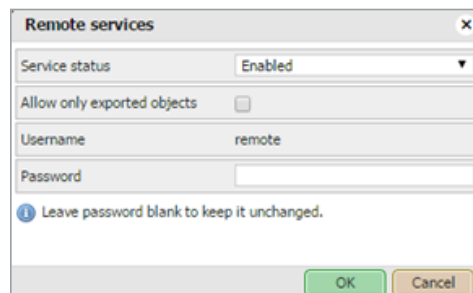
It allows importing the objects marked for export from another spaceLYnk/Wiser for KNX. System will ask for the *Remote password* of the second device from which data will be exported.

For remote access change the IP and password according to your Wiser for KNX settings for example:

https://remote:remote@192.168.0.10/scada-remote?m=rss&r=alerts

The export option has to be activated for objects so that you can share them between spaceLYnk/Wiser for KNX. Enabling makes objects visible via BACnet and remote services (XML/JSON).

8.4   Reset/clean-up

Delete selected items from Wiser for KNX. If you select *Objects*, they will be deleted from the visualization part as well.

Reset/clean up menu

Back all the important data up before proceeding with Reset/clean-up.

8.5   Factory reset

Factory reset feature deletes all configurations and resets to the factory default settings. System settings stay unchanged.

Hardware factory reset
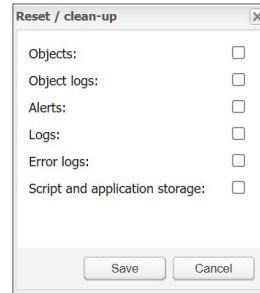
To perform HW factory reset, long press on the *RESET* button located on the front side of the Wiser for KNX device (press and hold for 10 s, release and press and hold for 10 s).

Hardware reset button
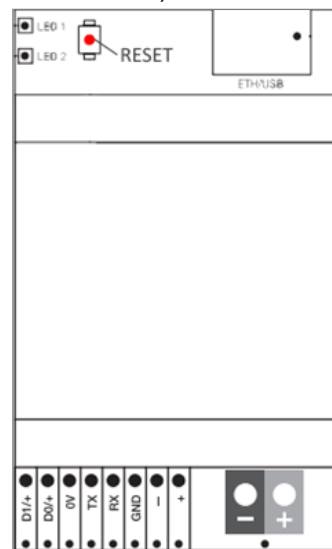
IP address after HW factory reset with HW button is always 192.168.0.10.

Factory reset with hardware button is meant especially for situations where Wiser for KNX is not accessible due to wrong settings.

Software factory reset

Software factory reset (software button in the main menu):
• Does not change the IP address.
• Erases visualization, Applications, graphics, and all data.
• Resets the device name to default (Wiser for KNX).

- Resets the KNX settings to default.
- Deletes FTP and Nginx certificates.
- Sets FTP password to empty.
- Deletes Lua scripts including planned and init commission.

For default IP address 192.168.0.10 with preserved project press HW reset button for 10 s. This feature is helpful in case of a forgotten or incorrectly set IP address.

Factory reset dialog

Factory reset   ✕
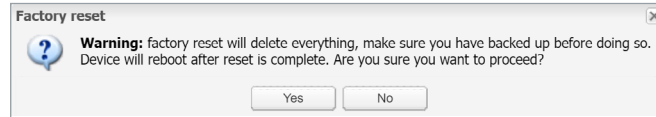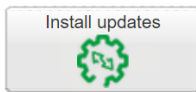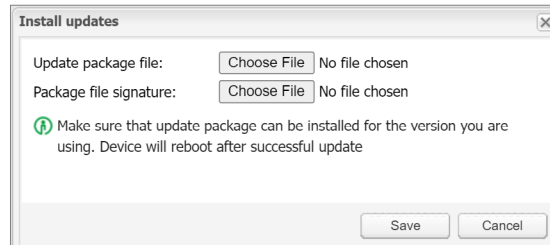
❓ **Warning:** factory reset will delete everything, make sure you have backed up before doing so. Device will reboot after reset is complete. Are you sure you want to proceed?

Yes   No
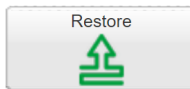
8.6   Install updates

Install updates

Install updates

Click the *Install updates* button for partial updates/patches or adding pre-made solutions. Install Wiser for KNX update file *.lmup. Wiser for KNX will reboot after the successful update.

Install updates   ✕

Update package file: Choose File   No file chosen

Package file signature: Choose File   No file chosen

ⓘ Make sure that update package can be installed for the version you are using. Device will reboot after successful update

Save   Cancel

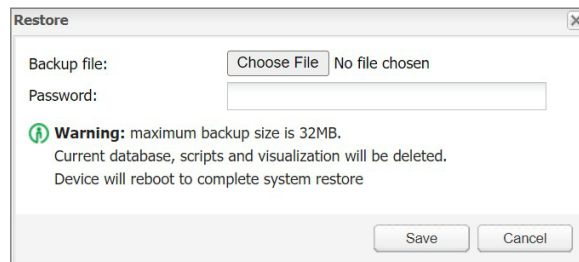✏️ Updates installed from the file are verified by signature. You can not install updates without the correct signature.

8.7   Restore

Restore

You can restore the configuration from a backup file. The maximal backup size is 32 MB. Bigger projects can not be restored.

When backing up, you need to choose a password to open the backed up file later. You have to enter this password when restoring the project.

Restore from a backup file

Restore   ✕

Backup file: Choose File   No file chosen

Password:

ⓘ **Warning:** maximum backup size is 32MB.
Current database, scripts and visualization will be deleted.
Device will reboot to complete system restore

Save   Cancel

Data are re-calculated if LED 1 is flashing red/green during the restore. Do not switch off Wiser for KNX until it is finished.
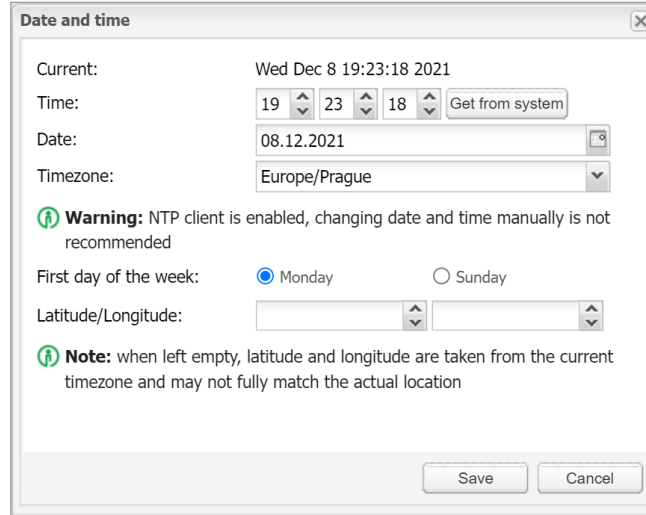
8.8   Date and time

Network time protocol (NTP) is implemented. Along with the internet connection, Wiser for KNX automatically updates time from servers defined in *Utilities*/*System*/*Services*/*NTP client*:

- 0.schneider.pool.ntp.org

- 1.schneider.pool.ntp.org
- 2.schneider.pool.ntp.org
- 3.schneider.pool.ntp.org

It is important to select correct time zone.

Setting date and time

Date and time   ☒

Current:	Wed Dec 8 19:23:18 2021

Time: 19 ⏷ 23 ⏷ 18 ⏷   Get from system

Date: 08.12.2021

Timezone: Europe/Prague ⏷

ⓘ **Warning:** NTP client is enabled, changing date and time manually is not recommended

First day of the week: ⦿ Monday   ○ Sunday

Latitude/Longitude: [   ]⏷   [   ]⏷

ⓘ **Note:** when left empty, latitude and longitude are taken from the current timezone and may not fully match the actual location

Save   Cancel

If there is no internet connection, click on *Get from the system* to adopt time from the PC.

First day of the week

Select starting day of the week.

Latitude/Longitude

Set up latitude and longitude coordinates of the geographic position of Wiser for KNX for accurate calculation of sunrise/sunset. When not set it is calculated from time zone which may cause inaccurate sunset/sunrise time.

The exact geographic position can be easily found in **Google Maps**, simply by left-clicking on your location.

Google Maps position
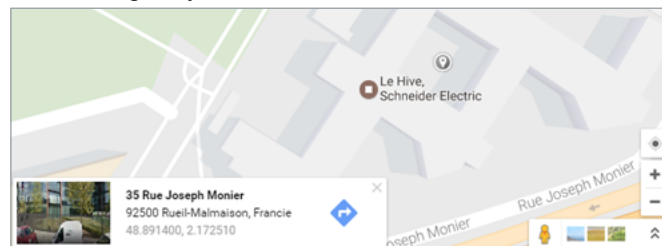
Without power, Wiser for KNX will maintain time and date settings only for a limited time (app. 5 minutes).

8.9 Backup

Backup

Backup all the objects, trends, logs, scripts, icons, images, backgrounds, visualization, and KNX filter table to the Project-device name-dd.mm.yyyy-hh.mm.tar.gz file (actual Wiser for KNX time and date are used when the backup is generated).

When backing up, you need to choose a password to open the backed up file later.
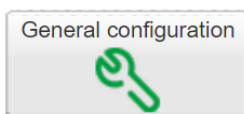
Choose your password

Backup   ✕

Password: [   ]

Repeat password: [   ]

                                        [Save]   [Cancel]

You can find your backup file in the browser *Downloads* folder.

🖉 The maximum backup size is 32 MB. Check the size of the backup once you create it. If it is bigger than 32 MB, you will not be able to restore it.

System configuration, network settings, passwords, or KNX settings are not backed up. The filter table is backed up.

8.10 General configuration

General configuration

General configuration   ✕

Interface language:	English
Automatic address range start:	1/1/1
Virtual address range start:	32/1/1
Discover new objects:	No, bus sniffer disabled
Object log size:	1000
Default log policy:	Log only selected objects
Log read telegrams:	☑
Alert log size:	200
Log size:	200
Error log size:	200
Code editor tab size:	2
Block unsafe functions in scripts:	☐

ⓘ • Log policy only affects new objects, current per-object log settings are kept unchanged
Warning: excessive object logging degrades performance

                                        [Save]   [Cancel]

Interface language

Select your language: English, Bulgarian, Chinese, Czech, Danish, Dutch, French, German, Greek, Hungarian, Italian, Polish, Portuguese, Russian, Spanish, Swedish and Turkish.

Automatic address range start

Define the address range for new group objects.

Virtual address range start

Define the address range for new virtual group objects.

Discover new objects

KNX object sniffer is enabled. If *YES* is selected all new objects automatically appear in the objects list. Bus sniffer is enabled by default and it is recommended to disable it when not used. Especially if multiple Wisers for KNX are connected in the same network.

Object log size

This line displays the count of object logs. (Maximum = 10 000).

Default log policy

Here you can select the log status for all objects or only for checked objects.

Alert log size

This line informs you about the count of logged alerts. (Maximum = 5 000).

Log size

This is the information about the count of logs. (Maximum = 5 000).

Error log size

This line displays the count of logged errors. (Maximum = 5000).

Save object values in storage

Script storage is logged and updated when object value changes.

Code editor tab size

TAB press in scripting editor inserts defined number of spaces.

Block unsafe functions in scripts

This option blocks os.exec, io.writefile, etc., which may be used in harmful scripts. You are recommended to enable this option.

ⓘ The controller keeps the log objects above the limit for 10 minutes; after the time elapse, all records above the limit are cleared.

Excessive objects logging degrades Wiser for KNX performance.

8.11 Vis. configuration

PC/Tablet sidebar

Enable sidebar with list of plans in visualization docked/with auto-hide option/hidden.

PC/Tablet view
- *Align plans to top left, no size limits*
- *Center plans, limit size*
- *Center plans, enable auto-sizing*
- *Center horizontally, auto size width*

ℹ️ Auto sizing works only in web browsers with WebKit engine (Chrome, Safari) and Firefox.

PC/Tablet page transition

Here you can select the transition effect for page changing in visualization.
- *No transition*
- *Flip X*
- *Flip Y*
- *Shrink*
- *Expand*
- *Slide Up*
- *Slide Down*
- *Slide Left*
- *Slide Right*
- *Slide Up Big*
- *Slide Down Big*
- *Slide Left Big*
- *Slide Right Big*

PC/Tablet auto/size upscaling

Enables automatic rescaling for multiple screen resolutions.

PC/Tablet background color

Choose your background colour for visualization.

PC/Tablet background image

You can choose the background image for visualization.

Custom font

Select font for visualization.

Use dark theme

Dark theme gauge sample

You can invert the colour, fonts, graphs and controls to match dark palettes visualizations.

Dark theme control

Enable swipe gesture

With this option you can enable swipe gestures for use with touch screen devices i.e. zooming with two fingers.

Disable object click animation

You can disable icon animation (useful for slower devices).

Hide Home button in Smartphone

You can hide the Home button to avoid the possibility of leaving visualization (kiosk mode).

Dim inactive visualization after: ? minutes
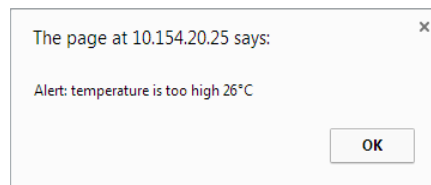
This feature saves energy of battery powered devices.

Dimming level: ?%

You can set the brightness level of dimmed screen.

Show alerts in PC/Tablet

If you trigger new alerts, they start to pop-up in PC/Tablet visualization.

Alert sample

> The page at 10.154.20.25 says:
>
> Alert: temperature is too high 26°C
>
> OK

Allow external access via iframe

You can access the controller's content via iframe. This option is disabled by default.

9   System quick menu

Click on arrow on the right side to open menu with most used system settings.

System quick menu
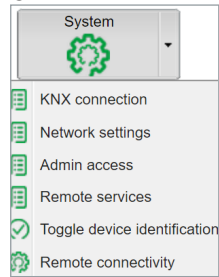
9.1   KNX connection

See chapter KNX connection → 49 for details.

KNX connection

9.2   Network settings

See chapter Network utilities → 58 for details.

9.3   Admin access

The username is admin by default. You can set the new password for the administrator account.

Admin password change

Admin access	✕
Login	admin
Current password	
New password	
Repeat password	
	OK Cancel

i The User access login and password settings are in the main menu.

9.4   Remote services

You can enable or disable remote access for Wiser for KNX maintenance, control and export purposes.

Remote services

Remote services	✕
Service status	Enabled ⌄
Allow only exported objects	☐
Username	remote
Password	
	OK Cancel

Service status

In this line, you can enable or disable remote services.

Allow only exported objects

If you tick this option, only objects marked as exported are available for remote services.

Username

Remote by default.

Password

8-20 characters

URL

Change the IP and password according to your Wiser for KNX settings i.e.:
https://remote:remote@192.168.0.10/scada-remote?m=rss&r=alerts

Request parameters

m – set the return value format
- json
- xml
- rss

r – requested function name

alerts – for 50 newest alerts
- **alert** alert text
- **time** alert time (UNIX timestamp)
- **date** alert date (RFC date)

errors – for 50 newest errors

- **error** error text
- **script** error script name
- **time** error time (UNIX timestamp)
- **date** error time (RFC date)

objects - list of return values of export

marked objects ordered by their update time

- **address** object address e.g. 1/1/1
- **name** object name e.g. **My object**
- **data** decoded object value e.g **42** or **01.01.2012**
- **datatype** object datatype e.g. **1** or **5.001**
- **time** object update time (UNIX timestamp)
- **date** object update time (RFC date)
- **comment** object comment e.g.

Second floor entry lights

tags optional array of object tags e.g. **Light**, **Second floor**

grp executes one of grp functions:

fn function name, required

- **getvalue** returns current object value if found
- **find** return object info
- **write** send KNX bus group write telegram
- **response** send KNX bus group response **telegram**
- **read** send KNX bus group read telegram
- **update** update local hL/sL object value without KNX bus group write
- **alias** group address or name, required
- **value** new value to write, required for write / response / update, except for time and date

time datatypes:
- **day number** (0-7), day of the week, optional
- **hour number** (0-23)
- **minute number** (0-59)
- **second number** (0-59)

date datatypes:
- **day number** (1-31)
- **month number** (1-12)
- **year number** (1990-2089)

datatype: optional for write / response / update, data type is taken from the database if not specified:

bool, bit2, bit4, char, uint8, int8, uint16, int16, float16, time, date, uint32, int32, float32, access string

Examples:

Write boolean value to **1/1/2** you can use **true** or **false**, as well as **1** or **0**

https://remote:remote@192.168.0.10/scada-remote?m=json&r=grp&fn=write&alias=1/1/2&value=true

Write value of **50** to **1/1/1**

https://remote:remote@192.168.0.10/scada-remote?m=json&r=grp&fn=write&alias=1/1/1&value=50

Explicit datatype setting to scale, send **50** to **1/1/1**

https://remote:remote@192.168.0.10/scada-remote?m=json&r=grp&f-n=write&alias=1/1/1&value=50&datatype=scale

9.5   Toggle device identification

You can enable flashing of the LED 2 red/green, for easy identification of Wiser for KNX in the cabinet.

9.6   Remote connectivity

Enable or disable remote connectivity possibility(i.e. for cloud connection).

The remote connectivity is disabled by default in Wiser for KNX.

Enable remote connectivity

Remote connectivity   ☒

❓   Enable remote connectivity? Current state:
     disabled

   [Yes]   [No]   [Cancel]
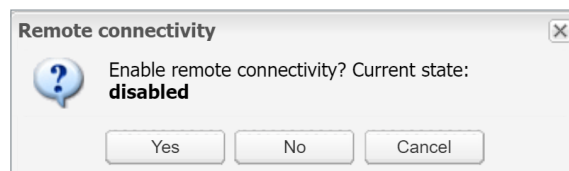
10 System - service page

Click on the System tab and open the new page with system settings.

10.1 Hostname

Change the name of your Wiser for KNX for easy identification. The name displays in the Neighbour list or the Backup file.

Hostname change

Hostname	✕
Hostname	Wiser for KNX
	OK Cancel

10.2 Admin access

You can change your admin password.

Login
Admin by default.

Current password
Enter your current password.

New password
Enter your new password (8-20 characters).

Repeat password
Repeat your new password.

Admin password change

Admin access	✕
Login	admin
Current password	
New password	
Repeat password	
	OK Cancel

10.3 Upgrade firmware

System → Upgrade firmware upgrades the system. You can not downgrade Wiser for KNX firmware.

During the firmware upgrade the device does not respond. It is because Wiser for KNX reboots several times.

Upgrade can take up to 10 minutes (especially when a lot of trend is used in the project).

LED1 is flashing red/green during upgrade. Do not switch Wiser for KNX off until LED1 stops flashing red/green.

Choose firmware file

Upgrade firmware   ✕

| Firmware file | Choose File | No file chosen |
| Signature file | Choose File | No file chosen |

ⓘ HW: **Wiser for KNX (i.MX6)**
SW: **2.8.0**
Warning: firmware downgrade is not supported.
It will take about 5 minutes for upgrade to complete. All config files will be kept unchanged. Do not unplug your device while upgrade is in progress!

OK   Cancel
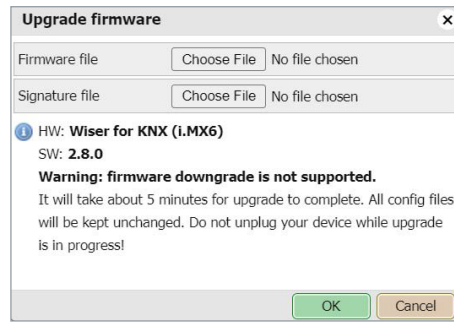
You are requested to add a signature file since firmware 3.0.0. Otherwise, the firmware upgrade is not performed.

🖉 After each upgrade, it is strongly recommended to clean the browser cache.

10.4 System backup and restore

System → Backup configuration

Wiser for KNX backs the system configuration up and generates a backup file.

Backup configuration

Backup configuration   ✕

| Password | |
| Repeat password | |

OK   Cancel
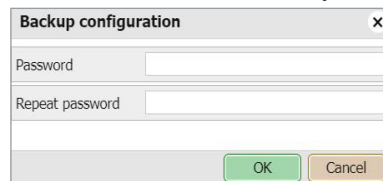
Password is requested for backup and restore.

System → Restore configuration

Wiser for KNX restores the system configuration from the backup file.

Restore configuration

Restore configuration   ✕

| Password | |
| File | Choose File | No file chosen |

ⓘ Device will reboot automatically after configuration has been restored

OK   Cancel
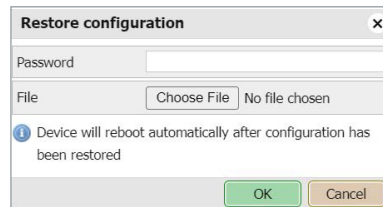
10.5 Reboot

If you click *System → Reboot*, Wiser for KNX restarts.

10.6 Shutdown

By executing the *System → Shutdown* command, Wiser for KNX shuts down.

It is strongly recommended to shut down the system before the unit is powered off so that the database can be saved securely. The system is shut, when LED 1 stops blinking and LED 2 is off.

ⓘ The only way to switch Wiser for KNX on again is to disconnect and re-connect the power supply. Wiser for KNX can not be switched ON remotely!

Interfaces

Ethernet interface is listed in the first tab.

11 Network – service page

11.1 Interfaces

Ethernet interface is listed in the first tab.

Interfaces

Name	MAC address	IP address	MTU	TX Bytes	RX Bytes	Errors
eth0	00:00:54:FC:8F:42	192.168.0.10	1500	36 MB	3 MB	0 / 0

By clicking the interface, the configuration window appears.

Interface configuration

Interface eth0

Protocol	Static IP
IP address	
Network mask	
Gateway IP	
IPv6	Enabled
IPv6 address/prefix	
IPv6 gateway	
Duplicate IP messages	1
DNS server 1	8.8.8.8
DNS server 2	
MTU	

OK   Cancel

Interface eth0

Protocol	DHCP
Current IP	192.168.4.45
Use DHCP NTP servers	☐
IPv6	Enabled
IPv6 address/prefix	
IPv6 gateway	
Duplicate IP messages	1
DNS server 1	8.8.8.8
DNS server 2	
MTU	

OK   Cancel

Protocol

Shows specific protocol for addressing.
- *None*: No protocol is used.
- *Static IP*: Displays the static IP address. It is 192.168.0.10 by default.

- *DHCP*: Use DHCP protocol to get IP configuration.

Current IP

The IP address from DHCP server. This field appears only if the IP address is given. Otherwise it is hidden.

Use DHCP NTP servers

If you set the DHCP interface protocol, the controller ignores NTP servers. Here, you can enable the controller to accept NTP servers from the DHCP server.

IP address

By default **192.168.0.10**.

Network mask

By default 255.255.255.0 (/24).

Gateway IP

Gateway IP address.

IPv6

If you enable IPv6 processing. The controller generates an *IPv6 address/prefix* (128-bit alphanumeric value). You can also enter the address manually. Then the controller has two IPv6 addresses.

IPv6 gateway

Optional – for example, if you want your controller to have an Internet connection.

IPv6 feature is not supported for HW1.xx.

Duplicate IP messages

The number of checks for duplicate IP addresses before the controller sets its IP address.

DNS server 1

Primary DNS server IP address.

DNS server 2

Secondary DNS server IP address.

MTU

Maximum transmission unit. The largest size of the packet which could be passed in the communication protocol. (Default 1 500).

Click on 📊 at the end of the interface line and open its traffic flowchart.

Network usage graph
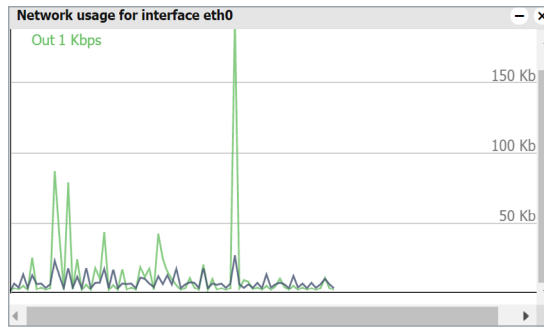
It displays a real-time graph of the traffic flow passing the interface (both In and Out). There is a possibility to switch the units of measurement – bite/s or Byte/s and graph Auto Scale follow or Up.

11.2 Routes

A routing table is a data table that lists the routes to a particular network destination. It contains information about the topology immediately around it.

The system routing table is located in *Network → Routes menu*.

Routing table

The window is divided in two parts: Dynamic and Static routes.

Dynamic

List of self-learned network destinations and automatic selection of the 'best route'.

Interface – Interface name indicates the locally available interface that is responsible for reaching the gateway.

Destination – Destination subnet IP address describes together with Network mask the Network ID.

Gateway – Gateway IP address points to the gateway through which the network can be reached.

Network mask displays the network mask address.

Static

Manual entering of routes into the Wiser for KNX routing table, they do not change automatically.

Interface
Interface name.

Destination

Destination IP address.

Gateway

Gateway IP address.

Network mask

Network mask address.

Flags
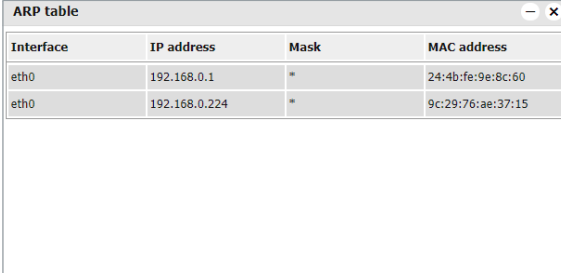
Helps in troubleshooting your network problem, see the attached coding table.

11.3 ARP table

Address Resolution Protocol table is listed in *Network → ARP table*.

It is used for a resolution of network layer addresses into a link layer addresses; it converts IP address to a physical address.

ARP table

Interface	IP address	Mask	MAC address
eth0	192.168.0.1	*	24:4b:fe:9e:8c:60
eth0	192.168.0.224	*	9c:29:76:ae:37:15

11.4 KNX connection

KNX specific configuration is located in *Configurator → Utilities → System → Network → KNX connection* window.

KNX connection

General

Mode

This box displays the KNX connection mode. Wiser for KNX has built-in TP-UART interface by default.

- *TP-UART*: Twisted pair connection via black/red plug. Transfer rate = 9.6 kB/s.
- *EIBnet/ IP Tunneling*: IP connection, it is 1 000 x faster than TP-UART. Wiser for KNX behaves as a server. Unicast, acknowledged data exchange, additional individual address per tunneling connection.
- *EIBnet/ IP Tunneling (NAT mode) – Network Address Translation mode*: Allows multiple devices to connect to the public network using the same public IPv4 address. It modifies the IP address information in the IPv4 headers while in transit across a traffic routing device.
- *EIBnet/IP Routing*: Multicast, unacknowledged data transfer. Wiser for KNX behaves as a line or a backbone coupler.
- *ACK all group telegrams*: If Wiser for KNX communicates directly with another KNX device it has to acknowledge received telegrams. Unselect if Wiser for KNX operates as a sniffer of group addresses only.

KNX address

KNX individual address of the device.

Enable IP Routing

Receiving/sending telegrams from/to IP routing (multicast).

Pass individual telegrams via IP routing

Receiving/sending individual telegrams from/to IP routing. You have to enable IP routing as well (for example, for commissioning KNX devices).

Accept IP Tunneling connections

Accept IP tunneling (unicast) connections. Most often used for commissioning from ETS or diagnostics. For example, you can also create a tunnel from a second controller in IP tunneling mode.

Multicast IP

Multicast IP address.

Multicast TTL

Default value is 1; it allows communication between different sub-networks.

Maximum telegrams in queue

Count of maximum telegrams in the queue.

TOS priority level

The priority of KNX telegrams from 0 – 7.

Backbone key (encryption)

Backbone key for decrypting secured telegrams for IP routing. Backbone key can be exported from ETS software in *Reports → Project Security*.

🖉 You can import the backbone key during the KNXPROJ import process.

Enable only secure communication

Tunnelling and non-secure routing are disabled.

Backbone key

🖉 Routing mode should be used to ensure the group addresses are updated correctly. The device will reboot after applying the changes.

IP > Local filter

The filter accepts or drops received telegrams from the defined KNX devices/physical addresses. All outgoing telegrams are not filtered.

Apply filter to tunneling

This filter was created to provide enhanced functionality in comparison to a standard KNX router. The defined filter can be applied even to tunneling mode, by default it passes all telegrams. This option relates to both directions (IP > Local filter & Local > IP filter)

SRC policy

It is the policy to apply to the list of source addresses.
* *No filter*
* *Accept selected individual addresses*
* *Drop selected individual addresses*

Ind. address list

Lists the individual or group addresses (one address per line). Use * (e.g. 1.1.* or 1/1/*) to filter all the addresses in the given line.

DST group policy

Destination group filter accepts or drops received telegrams belonging to one group as 1/2/3 or subgroup as 1/2/*. All outgoing telegrams are not filtered.

DST group filter

This is the policy to apply to the list of destination group addresses.
- *No filter*
- *Accept selected individual addresses*
- *Drop selected individual addresses*

Group address list

List of group addresses (one address per line). Use *(e.g. 1/1/*) to filter all the addresses in the given line.

IP > Local filter

KNX connection	✕

| General | **IP > Local filter** | Local > IP filter |

Apply filter to tunneling	☐
SRC policy	No filter ⌄

Ind. address list

[empty text box]

ⓘ One address/range per line. Use * (e.g. 1.1.*) to filter all addresses in the given line.

DST group policy	No filter ⌄

Group address list

```
0/1/0
1/1/1-1/1/2
```

ⓘ One address/range per line. Use * (e.g. 1/1/*) to filter all addresses in the given line.
Note: by default Local > IP filter only applies to telegrams from TP connection, unless update telegrams are also filtered.
Filtering lists are updated at once, changing policies requires restart.

[OK]   [Cancel]

🖉 KNX IP features have to be enabled for filters to work.

Local > IP filter

Filter accepts or drops received telegrams from the defined KNX devices/physical addresses. Ongoing telegrams are not filtered.

Local > IP filter

KNX connection   ✕

| General | IP > Local filter | **Local > IP filter** |

| Filter local update telegrams | ☑ |
| SRC policy | No filter ⌄ |

Ind. address list

ⓘ One address/range per line. Use * (e.g. 1.1.*) to filter all addresses in the given line.

| DST group policy | No filter ⌄ |

Group address list   1/0/0

ⓘ One address/range per line. Use * (e.g. 1/1/*) to filter all addresses in the given line.
Note: by default Local > IP filter only applies to telegrams from TP connection, unless update telegrams are also filtered.
Filtering lists are updated at once, changing policies requires restart.

[OK]   [Cancel]

Apply filter to virtual objects

The virtual object serves for internal data exchange inside Wiser for KNX (e.g. from Modbus to Visualization). If command `grp.update()` is used in LUA, then the group address is not written to TP but is written to IP only. If this option is ticked, the listed groups are filtered (=not written) from IP and thus virtual.

SRC policy

This is the policy to apply to the list of source addresses.
• *No filter*
• *Accept selected individual addresses*
• *Drop selected individual addresses*

Ind. address list

List of individual addresses. One address per line. Use * (for example, 1.1.* or 1/1/*) to filter all addresses in the given line.

DST group policy

Destination group filter accepts or drops the received telegrams belonging to one group as 1/2/3 or subgroup as 1/2/*. All outgoing telegrams are not filtered.

DST group filter

Policy to apply to the list of the destination group addresses.
• *No filter*
• *Accept selected individual addresses*
• *Drop selected individual addresses*

Group address list

List of group addresses. One address per line. Use *(e.g. 1/1/*) to filter all addresses in the given line.

KNX IP features should be enabled for filters to work. This applies to the incoming telegrams only!

11.5 BACnet settings

See chapter for more details.
See chapter for more details.
See chapter for more details.

12 Services – service page

12.1 NTP/client/server

Client status

When you enable *Client status* Wiser for KNX obtains data from up to four selected servers.

Clock synchronization

NTP (clock synchronization)	✕
Client status	Enabled ▼
Server 1	0.schneider.pool.ntp.org
Server 2	1.schneider.pool.ntp.org
Server 3	2.schneider.pool.ntp.org
Server 4	3.schneider.pool.ntp.org
Local server status	Disabled ▼
	OK Cancel

Network Time Protocol (clock synchronization) **Servers 1- 4**

Define the server from which date and time is obtained.

Local server status

If you enable this option Wiser for KNX can serve as local NPT server for other devices.

ⓘ Reboot needed. Check availability of NTP server with ping tool if needed.

12.2 HTTP server

Allows you to use the additional ports both for HTTP and HTTPS.
Default HTTP port: 80
Default HTTPS port: 443

HTTP server setting

HTTP server	✕
Additional HTTP port	
Additional HTTPS port	
HTTPS mode	HTTP and HTTPS enabled ▼
ⓘ Default HTTP port: 80, default HTTPS port: 443	
CORS origin 1	
CORS origin 2	
CORS origin 3	
CORS origin 4	
	OK Cancel

Available HTTPS modes:
* *HTTP and HTTPS enabled*
* *HTTPS only, redirect HTTP to HTTPS*
* *HTTPS only, HTTP port is disabled*

CORS origin 1 – 4

Up to 4 IP addresses/hosts which can use CORS.

i Reboot needed.

12.3 HTTP SSL certificate

SSL certificates are small data files that digitally bind a cryptographic key to a device's details. When installed on a web server, it activates the padlock and the HTTPS protocol and allows secure connections from a web server to a browser.

There is amount of online SSL certificate providers some SSL certificates are free some are paid.

HTTP SSL certificate

Mode
- *Upload new private key/certificate* – for upload existing RSA key/SSL certificate
- *Generate new private key/certificate* – generate RSA private key/SSL certificate from one already installed.

12.4 FTP server

You can access the Wiser for KNX FTP server if you enable *Service → FTP Server*.

FTP server setting

FTP server	✕
Free space	577.3M
Server status	Disabled ⌄
Require encryption (FTPS)	☑
Port	21
Username	ftp
Password	
Username	apps
Password	
External IP	
Passive mode min port	
Passive mode max port	

ⓘ Leave password blank to keep it unchanged. External IP and passive mode ports must be set when you want to access FTP behing NAT. Make sure both FTP port and passive mode port range are forwarded on your router.

[OK] [Cancel]

Free space

Remaining free space on the build-in USB card.

Server status

Setting status of FTP server.

Require encryption (FTPS)

When FTP encryption is required FTP server will not accept the unsecured connections. When FTP encryption is not required FTP server will accept FTP and FTPS both.

Port

Port of the service.

Username

Login name (ftp and apps by default for use with SE services).

Password

Password, length 6 – 20 symbols. Default password is empty and has to be changed prior to FTP use.

External IP

IP address used for external connection.

Passive mode min port

Minimum port for passive mode.

Passive mode max port

Maximum port for passive mode.

ⓘ Maximum simultaneous FTP connections are limited to 5.

12.5 802.1X EAP-TLS

EAP-TLS (Extensible Authentication Protocol – Transport Layer Security) authentication is faster than credential-based authentication, and it occurs automatically without involvement from the user.

When the controller is in range of the secure network, it will initiate and complete the connection on its own.

You set the EAP parameters as follows:

1. Go to *Configurator* > *System* > *Services* > *802.1X EAP–TLS*.
2. Enable *Service status*.
3. Fill in the parameters (provided by a network administrator).

801.1X EAP-TLS

802.1X EAP-TLS		✕
Service status	Enabled ▼	
Device identity	admin	
Private key	Choose File	No file chosen
Private key password	••••••••	
Certificate	Choose File	No file chosen
CA chain	Choose File	No file chosen
	OK	Cancel

4. Click *OK*.

Your controller can connect to an EAP secured network.

This feature is not supported for HW1.xx.

12.6 Remote services

See chapter [Remote services → 40](#) for details.

12.7 Remote diagnostic

You can enable or disable the remote diagnostic possibility.

Port 22 has to be forwarded on your router.

Enable remote diagnostics

Remote diagnostics		✕
Service status	Disabled ▼	
ⓘ Port **22** must be forwarded on your router		
	OK	Cancel

13 Status – service page

13.1 System status

System information is shown is the following tabs:

System information

System status	— ✕

General	Memory	Partitions	Serial ports

CPU model	ARMv7 Processor rev 5 (v7l)
Linux kernel version	4.4.291
System uptime	0d 1h 41m
Load averages	0.00 0.00 0.00
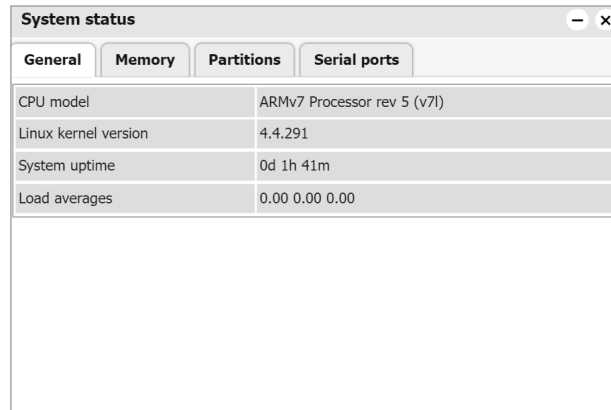
General

Information about hardware and system details provided by kernel.

Memory usage

Current memory used by the system.

Partitions

List of partitions available in the system.

Serial ports

List of serial ports available in the system.

13.2 Network utilities

Network utilities

Network utilities	— ✕

Ping	Traceroute

IP / Hostname

OK   Cancel
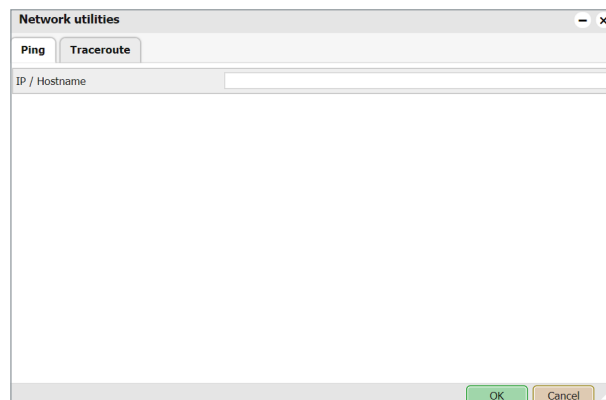
Ping

The computer network tool is used to test whether a particular host is reachable across an IP network.

Trace route

The computer network diagnostic tool is used to display the route (path) and measure transit delays of packets across an IP network.

13.3 System log

Log entries

Log files are automatically created and maintained by Wiser for KNX of all the system events.

System log

13.4 Running processes

List of running system processes.

List of running processes

14 Objects

The list of KNX network objects appears in the **Objects** menu. The object is listed accordingly:

- Captured by sniffing the bus for telegrams from unknown group addresses (if enabled in *Utilities*).
- Added manually.
- Imported in ESF file (in **Utilities**).

Objects are sorted with the following parameters:
- *Group address*
- *Object name*
- *IP>TP filter*
- *TP>IP filter*
- *Event script*
- *Data type*
- *Current value*
- *Log, Export*
- *Tags*
- *Updated at*
- *Set value*
- *Vis.parameters*
- *Custom values*

Objects are further distinguished by color of their background for a quick overview:

Yellow – Object discovered by a bus sniffer.

Green – Object value has updated.

14.1 Object parameters

The object can be created as a standard KNX object or virtual object. Virtual objects are marked with V icon, their range starting from 32/1/1 and therefore they cannot be sent to the KNX TP bus. Filtering is disabled for virtual objects. Virtual objects are useful for visualization purposes or communication with 3rd parties i.e. BACnet.

Object name

Name of the object.

Group address

Group address of this object.

Data type

KNX data type of the object. This has to be set once the Wiser for KNX sniffs the new object for actual object to work.

Current value

Actual value of the object.

Tags

Assigns object to a tag which can be later used in the writing scripts, for example,

To change the settings for existing or new objects, click on the specific list entry address or its name.

Edit object

Unit/suffix

Add unit/suffix to value of object. Units which cannot be created from keyboard can be created in external editor and pasted into the browser.

Log

Enable logging for this object. Logs appear in the *Object logs* tab.

Export

Makes object visible by remote XML requests.

Read during start-up

Object actual value will be updated during start of Wiser for KNX. KNX object has to have read flag set.

Poll interval (seconds)

Performs automatic object read after the selected time interval.

KNX data secure key

If you want to set up encrypted group address communication, enter the encryption key in this field. The encryption key can be any hexadecimal characters (the length of the key must be exactly 32 characters).

If you enable the *Import security key* option (see Import KNXPROJ file → 31) when importing KNXPROJ file, the key will be filled in automatically.

You can leave this field blank if you do not need encrypted communication for the group address.

Each group address with an encryption key has an *S* icon next to its number in the object list.

Object comments

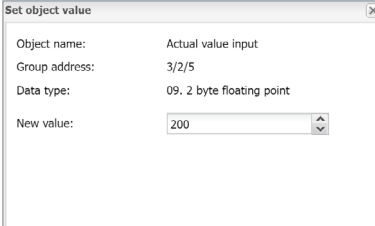Object's further description. Can be also used for filtering.

14.2 Event script

By clicking 🗒 in the object list, the Script editor opens and the event-based script can be created. Script will run each time the telegram is sent to the selected group. If the script is attached to a group, the icon changes to green 🗒.

14.3 Set object value

In the object list, by clicking 🔘 , the state of the object can be changed.

Set object value

Set object value	✕
Object name:	Actual value input
Group address:	3/2/5
Data type:	09. 2 byte floating point
New value:	200 ⏶⏷

The appearance of the *New object value* window depends on what visualization parameters are set for specific objects.

14.4 Object visualization parameters

By clicking ⚙, the corresponding object-specific visualization parameters for this type can be set.
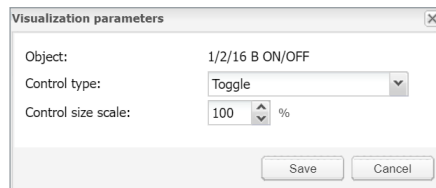
1-bit

Control Type

Types of the visual control element:

- *Toggle*
- *Checkbox*
- *Start/Stop* – object is in On state as long as pressed
- *Stop/Start* – object is in Off state as long as pressed
-

1-bit visualization parameters

4-bit (3-bit controlled)

4-bit visualization parameters
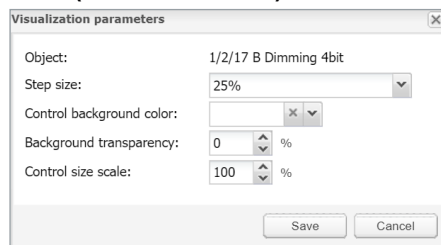
Step size

Step size example for blinds control:

2-bit (1-bit controlled), 1-byte unsigned integer (scale), 1-byte signed integer, 2-byte unsigned integer, 2-byte signed integer, 2-byte floating point (temperature), 4-byte unsigned integer, 4-byte signed integer, 4-byte floating point.

Control type – Types of the visual elements:

- Direct +/-
- Slider
- Circular slider
- Custom value select

Circular slider

Vertical slider

3-bit visualization parameters
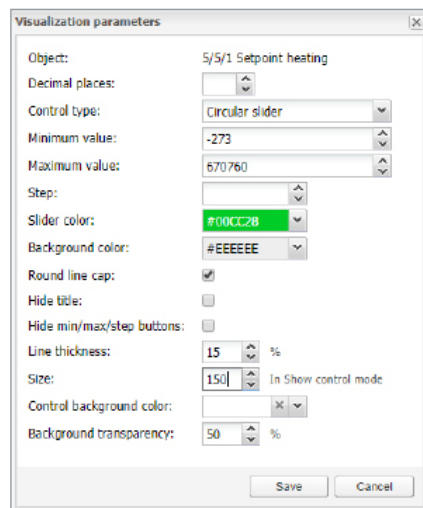
Minimum value

Define minimum value for visualization only.

Maximum value

Define maximum value for visualization only.

Step

If defined, value changes depending on the defined step.

Vertical slider

Vertical position of slider e.g. for Blinds control.

Invert vertical slider

Inverts direction of vertical slider.

Slider colour

Defines slider filling colour.

Background color
Defines background colour of circular slider.

Round line cap
Rounding edges of circular slider.

Hide title
Hide Object/custom name in visualization.

Hide min/max/step buttons
Hide buttons in visualization for touch screen enabled devices.

Line thickness
Thickness of circular slider control line (1-50%).

Size
Size of circular slider (150-500 pixels).

Control Background color
Color of element background.

Background transparency
Element background transparency.

14.5 Custom text value

In the object list, by clicking 📊 , custom text can be added to the object values.
Custom text values can be set only to boolean or integer values.
Default text – Text displayed if the value is not defined.

Custom values

Click *Add custom value*, select *Object value* and define *Display text*.

You can delete the *Object value* line if you click ❌.

14.6 Object control bar

Add new object: Manually add new objects to the list.
Auto update enabled: Specifies either the object list is updated automatically or not.
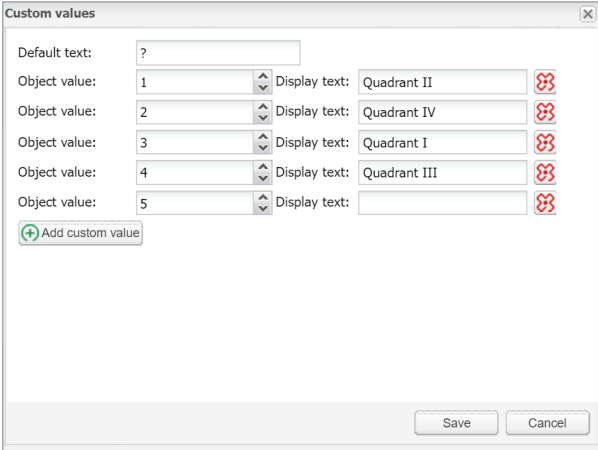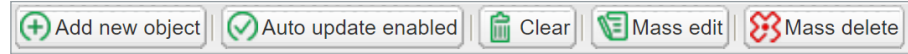*Clear*: Clear the list of filtered group addresses.
Mass edit: For mass edit of filter selected objects.
Mass delete: For mass delete of selected objects.

Next/Previous page: Move to the next or previous page.
Refresh: Refresh the object list.
IP > Loc policy: Selected filtering policy.

14.7 Object filter

On the left side of the object list, you can filter.

Object filter
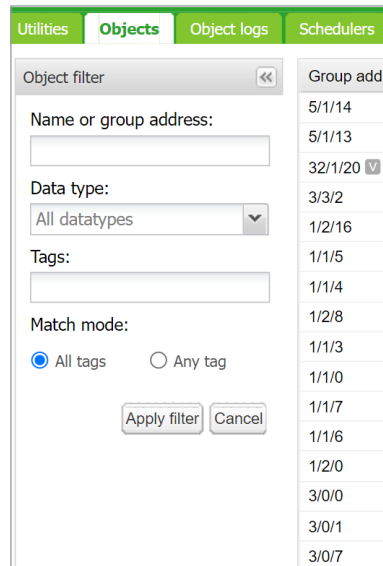
Name or group address – filter by name or group address. Digits in address can be replace by a star for filtering in range.
Data type – filter by data type of objects.
Tags – filtering by Tag. Match mode can be selected between *All tags* and *Any tag*.
Press the *Apply filter* button for filter to take effect.

Mass edit

Mass edit menu

Objects filtered in the object filter can be mass edited by:

Object properties – Mass edit based on *Objects properties* as listed in the objects menu.

Visualization parameters – Mass edit based on *Visualization parameters* e.g. toggle, checkbox, slider.

Custom values – Mass edit based on *Custom values* for boolean and integer data types.

Mass delete

Mass delete menu

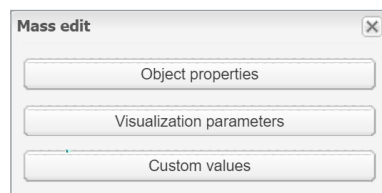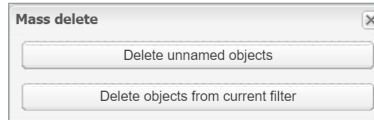| Mass delete	✕
Delete unnamed objects	
Delete objects from current filter	

Objects filtered in the object filter can be mass deleted by:

Delete unnamed objects – delete all unnamed object from list.

Delete object from current filter – delete all object selected by current filter.

Wildcards search in objects – can filter on all objects with search-string e. g. "*.G*_S".

Wildcard search in objects

Object filter	«	Group address	Object name
Name or group address:		1/2/16	B ON/OFF
*B *		1/2/17	B Dimming 4bit
Data type:		1/2/21	B failure status Yes/No
All datatypes	▼	1/2/19	B status ON/OFF
Tags:		1/2/20	B status value
		1/2/18	B value
Match mode:		1/2/31	RGB Feedback
◉ All tags ○ Any tag			
Apply filter Cancel			
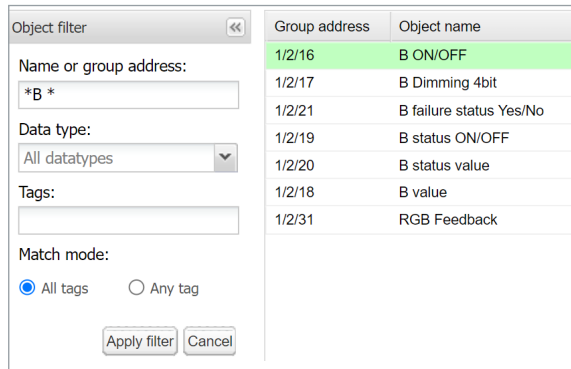
15 Object logs

Object historical telegrams are available in the *Object logs* tab. After logging is enabled for an object, all the future data will be logged in.

Filtering is available when there is a need to find specific period information:

Start date – A start date and time for log filtering.

End date – A start date and time for log filtering.

Name or group address – Specific name or group address of the object.

Tags – Group objects with the same tags filtered.

Value – Specific object value.

Source address – Specific source address.

All logs can be cleared by clicking the *Clear* button.

For important objects, activate the parameter *High Priority log* together with *Log* parameter. This function will list the selected objects on the top of the *Object logs* list.

Logging memory properties can be set up in the *Utilities → Configurations*.

16 Schedulers

Schedulers allow the end user to control KNX group address values based on the date or day of the week.

Schedulers

The user´s view

✎ Events can be added and *Schedulers* can be enabled/disabled by the user.

16.1 Add new scheduler

Object – The object group address which will be controlled by the scheduler.

Active – Defines whether a scheduler is active or not.

Scheduler on/off object – Scheduler can be enabled or disabled by object

Name – Name of the scheduler.

Category - Sort schedulers to created categories for better clarity

Starts date – Start date of the scheduler.

End date – End date of the scheduler.
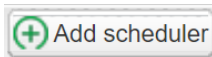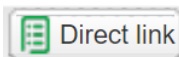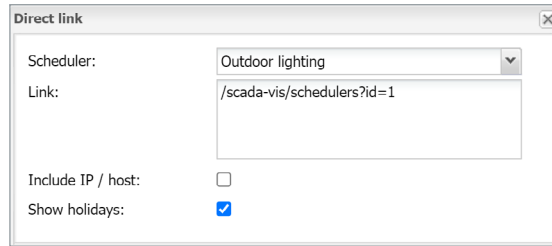
16.2 Direct link

The *Direct link* icon opens a dialog to create a direct link for the scheduler's visualization. The link can include the IP address of the host and display or not display olidays in the scheduler.

Direct link dialog
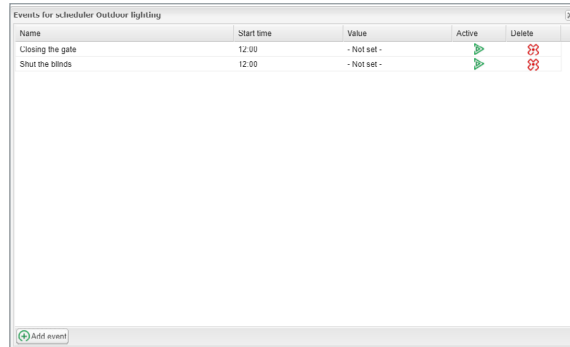
16.3 Scheduler Events

The event can be added both in the administrator interface and by the user in the **special User mode schedulers** interface. Click ✎ icon to open Events list.

The list of events

Active – Defines the Event to be active or not.

Name – The name of the Event.

Run at – The event could be triggered by a specific time, sunrise, or sunset.

Start time offset – The offset can be set for sunrise/sunset i.e. when the location is in the valley and surrounding hills casting shadows.

Start time – The time of the event activation.

Day of the week – Days in which the event will be active.

Weekday in month – The weekday on which the event will be active i.e. every first Monday in the month which may fall to the second week in some months.
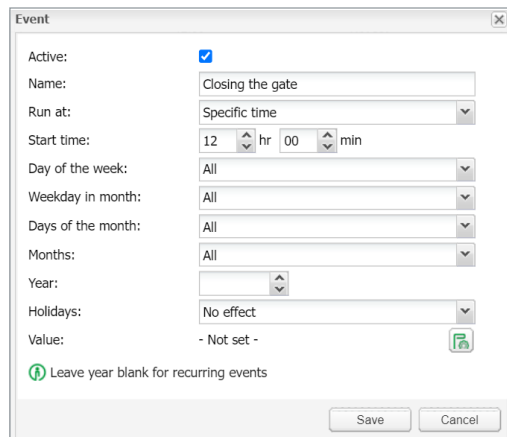
Months – Months in which the event will be active

Year– A year in which the vent will be active, (leave year blank for recurring events).

Holidays – Holidays which are defined in the *Holidays* - "*No effect*", "*Do not run on holidays*" and "*Run only on holidays*" options available.

Value – The value to send to the group address when the event will be triggered.

Event setting

It is recommended to create all necessary schedulers by Admin while setting as User can only add events but not Schedulers.

16.4 Scheduler Holidays

Once the event is marked to run on, **Holiday** entry will be activated.

Holiday entry dialog

Name – The name of holiday.

Holiday type – The type of holidays, specific date or day in the week can be selected.

Day – Day on which holiday will be active.

Months – Months in which holiday will be active.

Year – Year in which event will be active, (leave year blank for recurring events).

Duration (days) – Duration of holidays.

Scheduler visualization use is not recommended in *Smartphone visualization*.

16.5 Change sort ordering
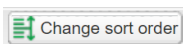
The *Change sort order* icon opens a window for drag and drop ordering of schedulers.

Change sort order

17 Trend logs

Trend logs or so-called data logging allows the user to store the selected data and compare the different time periods from the past.

You can create a trend log in the GUI of the Configurator, as described in Adding new trend log → 74.

Some externally created trends (e.g., created from the Wiser KNX application Energy plugin) are created in the background, and they are read-only. You cannot open the detail of read-only trends, you cannot edit or delete them.

Trend logs

Trend logs user overview

Selecting displayed period of trends

Selecting displayed period of trend(s).

Current – for selection of current date.

Previous – for selection of previous date.

Show previous – enable/disable function of previous values for selected time period (Day/Month/Year) for data comparison.

Trend log visualization
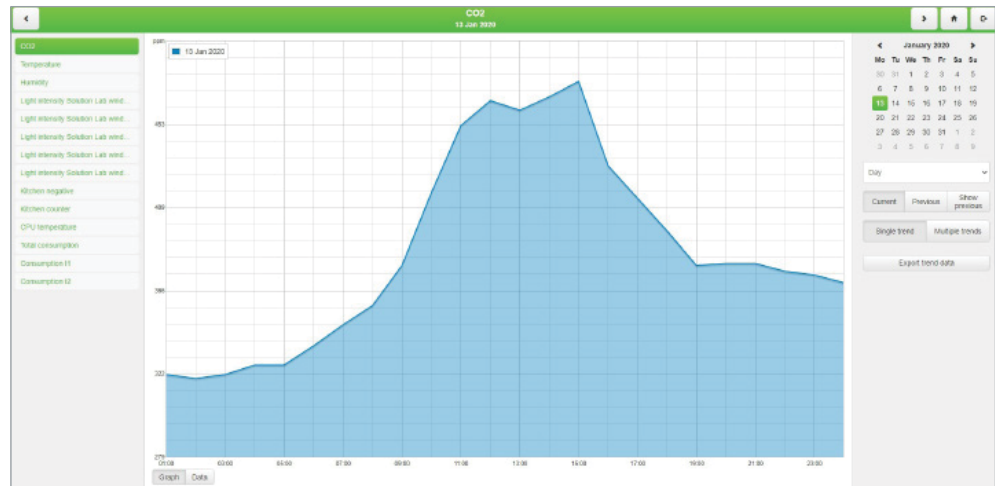
Selection between displaying single and multiple trends in trends visualization.
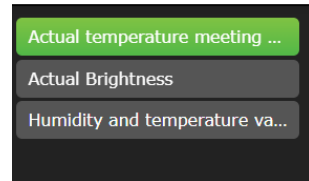
Selection of visible trends is done in trends list.
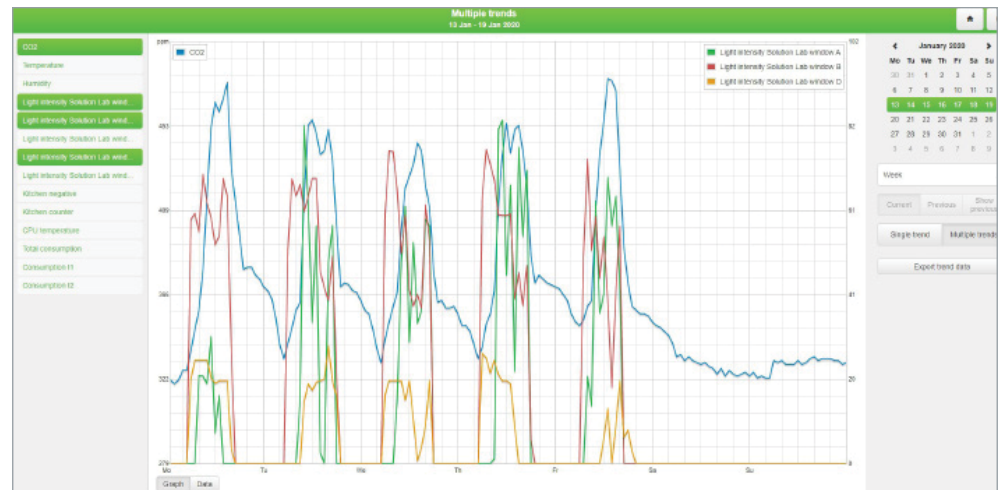
Automatic secondary axis – for two trends with different units/scales.
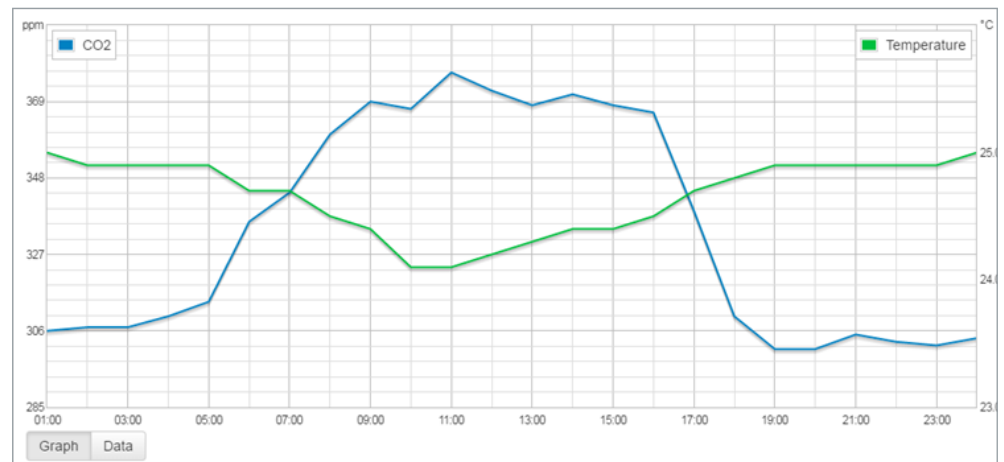
Data can be also exported in CSV format for further use.
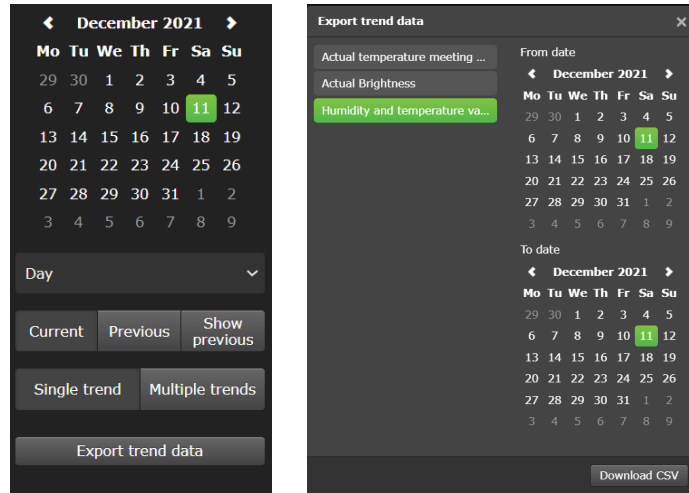
Multiple trends export supported.

ℹ Trend's number have a flexible limit based on the total size of all trends. Each trend reserve part of system memory according to its settings. The system will not allow you to create further trends when full. Do not store data for an unnecessary long time or use a high rate of trend sampling if not necessary. Export your trend data regularly.

17.1 Adding new trend log

Add new trend log

Object – Choose from the list of objects the one to make the trends for.

Name – Name of the trend.

Category - Sort trends into categories for better clarity

Log type – Type of the log.

Counter - Used to count the data.

Counter with negative delta - Used to count the data with alternately increasing/decreasing count. E.g. number of movement detection from PIR per hour.

Absolute value – Saves the actual readings.

Aggregate function – From stored data get one of chosen value (average, minimum, maximum, or last value) and show it to a graph.

Each trend stores data for 3 periods:

1. Every minute (for the last hour) – data are added to the trend once a minute.
2. Once every X minutes (X = user selectable) – data are added to the trend every time which was selected by the user.
3. Once in 1 day – data are added to the trend once in a day.

You can choose from average, minimum, maximum, and last value.

Trend Resolution - Average value of counted samples for specific time interval data will be shown on the trend. For example, if 1 hour – trend step will be 1 hour with average od 60 readings data.

Trend resolution

1 hour ▼
5 minutes
10 minutes
15 minutes
20 minutes
30 minutes
1 hour

Trend log
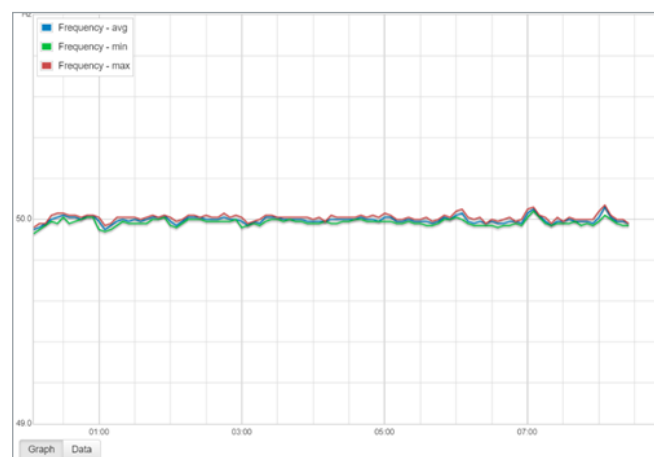
Decimal places – If the object is floating type, then the precision needs to be selected. Example, 1.1111 = precision is 4.

Resolution data – Time of storage of short term data (Max = 5 years).

Daily data – Time of storage of long term data (Max = 10 years).

*Always show zero***:** On graph Y axis. When selected Y axis is beginning on zero. Some measures never reach zero (e.g. CO_2 level) and starting on lowest real value will improve trend resolution.

If the log type is set to *Counter*, it cannot have permanently decreasing tendency. For this option use *Counter with negative delta*.

Trend logs are stored in internal SD card memory.

Trends visualization use is not recommended in Smartphone visualization.

17.2 Direct link
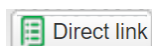
Direct link

The *Direct link* icon opens a dialog to create a direct link for the trend's visualization. View mode in Day/Week/Month/Year.

Link can include IP address of the host and display or not displays multiple trends.

Direct link dialog
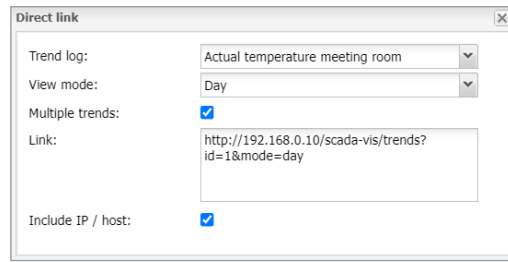
Change sort ordering

17.3 Change sort ordering
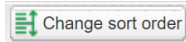
The *Change sort order* icon opens a window for drag and drop ordering for trend logs.
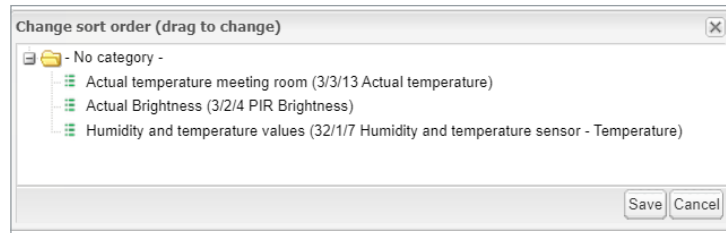
18 Scenes

The scene module allows you to skip time-consuming setting of scenes inside ETS and make scenes directly inside Wiser for KNX in a few seconds.

Scenes overview

18.1 Adding new scene
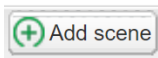
Click the *Add scene* button to add new scene.

Add new scene

Name – scene name.

Scene is active – to enable disable scene.

Trigger object – object which is activating scene.

Trigger value – the value of the object for activating scene.

Tags – scene tag (only for scenes not compatible with object's tags).

18.2 Adding sequence to Scene

Click the *Sequence* icon in the *Scene* view.

Sequence for scene

Add objects and status objects in order to create a sequence. Live values can be taken from the status object or main object. Possibility to specify a delay before writing each sequence.

Run scene – run scene instantly.

Save live values – save actual values of objects to the scenes.

Change sort order – drag and drop ordering for the sequence in scenes.

Delete – delete sequence.

18.3 Object value setting

Click *Set object value* to set the value of object manually.

Scene's objects order can be sorted with move Up/Down arrows or deleted.

Set the object value

19 Vis. structure

The *Vis. structure* is used for creating all building levels and visualizations plans. Additionally, it can create layouts and widgets for the plan visualization.

Starting a new project, only *Layout* and *Widget* folders are visible. Adding a new level, allows the user to define a specific plan of the flat. *Layouts* and *Widgets* are additional tools that are not mandatory for basic visualizations; they can be defined and implemented in other plans.

19.1 Levels

Level tab

To add a new level, click *Add new level*. The main level usually is the project name. Additional levels can be added later.

To import level click *Import*.

Plans/visualization structures can be imported from another project with a possibility to keep/clear linked objects.

19.2 Change sort ordering
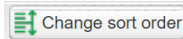
The *Change sort order* icon opens a window for drag and drop ordering for vis. structure.

Change sort order
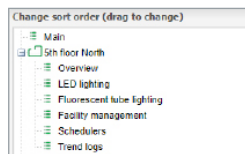
19.3 Second level

The second level is used in buildings with multiple floors.

If you need an additional level click ⊕ button next to the main level.

Select an action
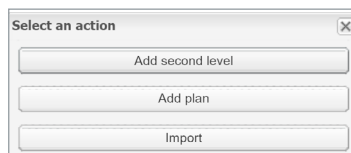
Select *Add second level* and give it a name and sort order.

Each level can be duplicated or imported together with sublevels and plans by pressing the duplicate icon next to the level.

19.4 Plan

Plan can show either one room in a flat with cumulated functions or one function (as lighting or heating) of the whole flat.

Level/Plans tab

To add Plans click ⊕ next to a level under which the plan is to be added and select *Add plan*.

Plan setting

Name – Name of the plan.

Plan size – Size of the plan. For pre-defined sizes unfold the drop-down menu ▦▾.

Layout – Layout for this specific plan. All objects from Layout will be duplicated on this particular plan, including the background color and the plan image. If they are not defined separately for this specific plan. Layout should be created before adding the Plan.

PC/Tablet visualization – Visibility for this particular plan in the PC/Tablet visualization.

Smartphone visualization – Visibility for this particular plan in the Smartphone visualization.

Pin code – Possibility to protect each plan with Pin code. The minimum PIN is 4 digits with brute force protection.

Primary background image – Choose the primary background of the plan.

Secondary background image – Choose the secondary background of the plan for the parallax look of the visualization. Select background previously added to *Vis. graphics → Images/Backgrounds*.

Background color – Choose the background color of the plan.

Smartphone background color – Choose the background color of the plan for Smartphone visualization.

Repeat background image – Either show the image once, or repeat it and fill the whole plan.

Fixed primary background – Static primary picture in Parallax projection.

ID – ID of the plan is used in direct link

Each plan can be duplicated together with all the components on a plan by pressing the duplicate icon next to the plan ⊞.

The content of the created plan should be defined under the Visualization tab. Empty plan (no objects) will be not visible in visualization.

19.5 Layout

The *Layout* is an advanced background for plans. Any object from the editor can be placed on the layout which later can be attached to one or many plans. All objects from the layout will be visible on the plan, but all the objects on the plan will be above the objects from the layout.
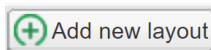
⊕ Add new layout

To add layout click ⊕ button next to a *Layout/Widgets* tab or the *Add new layout* button.

Layout setting

Layout		
Parent:	Layout	
Name:	Overview layout	
Plan size:	1024 ⬍ 768 ⬍	
Primary background image:	FHDBackgroundalloff.png	× ⌄
Secondary background image:	FHDoffice.png	× ⌄
Background color:	#C199FF	× ⌄
Smartphone background color:	#33FFCC	× ⌄
Repeat background image:	☐	
Fixed primary background:	☐	
	Save Cancel	

Each layout can be duplicated together with all the components by clicking the duplicate icon next to the layout .

Content of this layout should be defined under the Visualization tab.

19.6 Widget

Widget is a small web page that can be attached to a button and pop-up when activated.

⊕ Add new widget

To add the widget click ⊕ button next to the widgets folder or the *Add new widget* button. Each widget can be duplicated together with all the components by pressing the duplicate icon next to the widget.

The content of this widget should be defined under the Visualization tab.

Widget size always has to be smaller than the plan on which it is placed.

Empty widget (no objects) will be not visible in visualization.

Widget setting

19.7 Visualization structure example

Plan
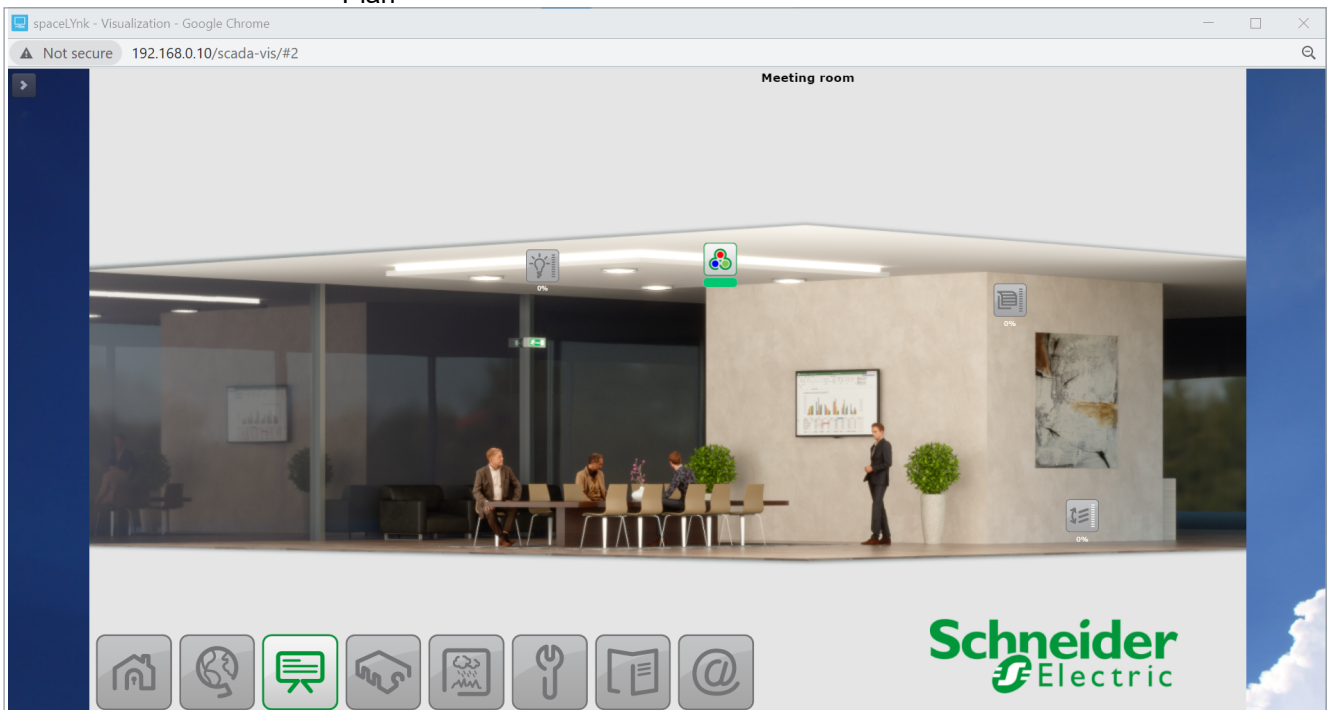
Layout

19.8 Visualization object order

Each object on visualization has its priority which is described from the highest to the lowest order:

1. Text label on plan
2. Object on plan
3. Plan link as text on plan
4. Plan link as icon on plan
5. Camera on plan
6. Graph on plan
7. Gauge on plan
8. Image on plan
9. Frame on plan
10. Text label on layout
11. Object on layout
12. Plan link as text on layout
13. Plan link as icon on layout
14. Camera on layout
15. Graph on layout
16. Gauge on layout
17. Text label on layout
18. Image on layout
19. Frame on layout
20. Background of plan
21. Background of layout

> The order of objects with the same priority is not defined and it can differ in the editor and PC/Tablet visualization.

19.8 Visualization object order

20 Visualization

This window splits into three sections:

1. *Structure* – Navigation tree for levels, plans, widgets which were created under the visualization structure tab.
2. *Visualization map* – Actual visualization field where you can add all visualization components.
3. *Plan Editor* – All parameters of the component are set up here.

Both side bars can be minimized by clicking [«] icon making the plan more visible, especially on small displays.
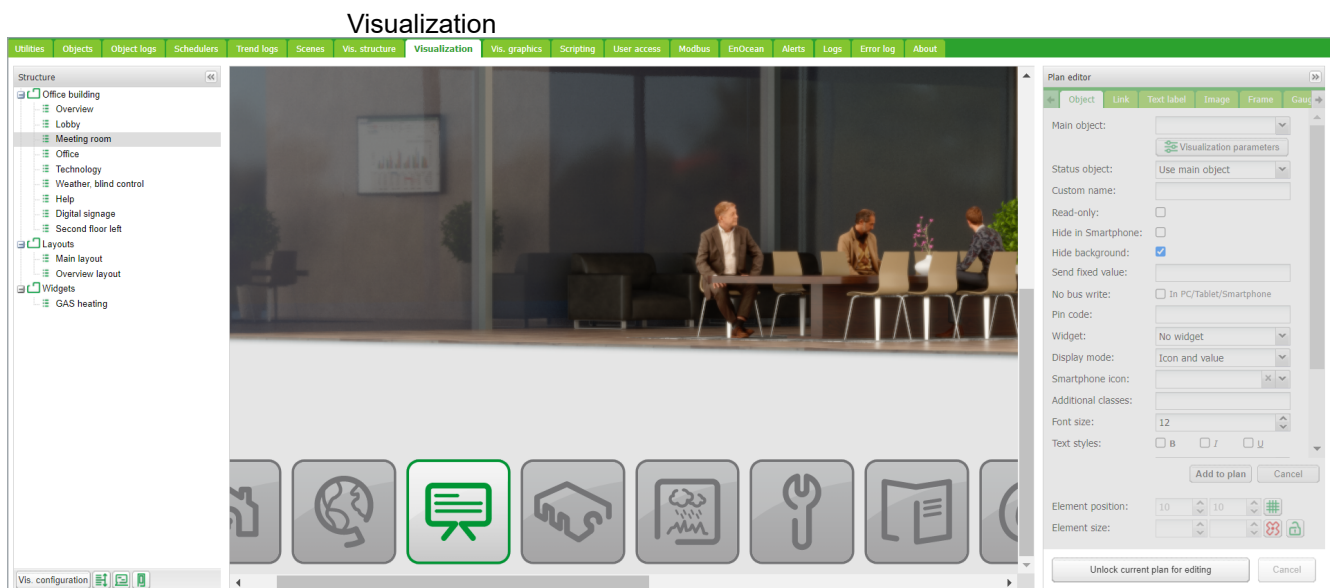
Visualization

20.1 Structure

To navigate between the plans, layouts, and structure widgets using the navigation tree in the structured view.

Visualization structure
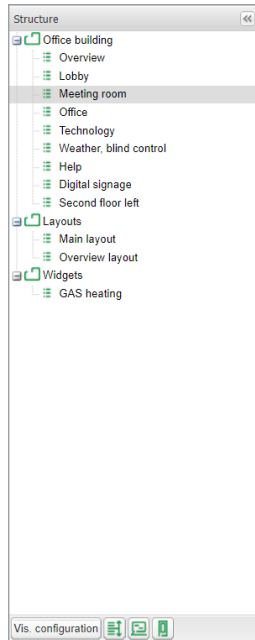
In the editing mode the following additional parameters are available:
- Size of plans, layouts, or widgets.
- Source picture/background color

The size of the plan should be positioned correctly against the background. Widget size has to be always smaller than the plan on which it is placed. Always use the component position to align the objects.

Vis. configuration
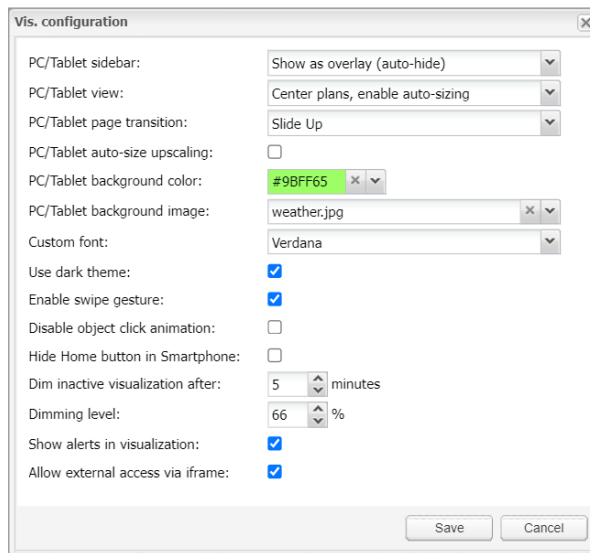
List of predefined plans

iPad landscape, fullscreen (XGA) 1024 x 748
iPad landscape, browser (XGA) 1024 x 672
iPad portrait, fullscreen (XGA) 768 x 1004
iPad portrait, browser (XGA) 768 x 928
Tablet landscape (WSVGA) 1024 x 600
Tablet portrait (WSVGA) 600 x 1024
Laptop / Tablet landscape (WXGA) 1280 x 800
Laptop / Tablet portrait (WXGA) 800 x 1280
Laptop / Tablet landscape (HD) 1360 x 768
Laptop / Tablet portrait (HD) 768 x 1360
Big screen (Full HD) 1920 x 1080

To order the object in the smartphone visualization, press the *Reorder smartphone objects* button.

Change smartphone object order

Change Smartphone object order (drag to change) ✕
Object: 6/6/6 SONOS control
Object: 6/6/4 SONOS track
Object: 6/6/4 SONOS track
Object: 6/6/6 SONOS control
Object: 6/6/6 SONOS control
Object: 6/6/6 SONOS control
Object: 1/1/0 Main ON/OFF
Object: 2/0/10 Height manual mode 3
Object: 0/1/15 Meeting room RGB
Object: 0/1/15 Meeting room RGB
Save Cancel
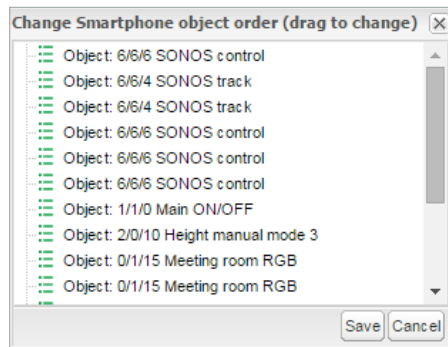
Next to the icon *Reorder smartphone objects*, there are two icons for a quick:
• Preview in PC/tablet
• Preview in smartphone

20.2 Visualization map

Each newly added object will be placed on the top left corner of the plan with vertical and horizontal spacing predefined in the object menu.

Delete | 10 10 Duplicate | Copy

The selected object can be resized by pulling the strip on the bottom or right side, deleted or duplicated (the duplicated object will be displayed with predefined spacing).

A snap to grid feature can be enabled by the icon next to the element position.

Copy button provides the possibility to copy existing visualization objects from one plan to another.
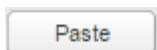
The *Paste* button is available if the visualization object was selected for copying.

Paste

Plan editor is located on the right side of the visualization map. Editing mode can be accessed by pressing *Unlock current plan for editing*.

Plan editor

20.3 Object

Every control or monitoring of the objects is configured under this tab. Different data types have different parameters.

Object tab in Plan editor

Main object

List of existing group addresses on KNX/EIB bus, the ones available for configuration in the *Objects* tab. To speed up the selection, it is recommended to start writing group addresses.

Status object

List of the status objects on the KNX/EIB bus. Controls objects can also be used as status.

Custom name

Name for the object. Custom name is important for Smartphone Visualization; if the name is left blank, the group address name is used instead.

Read-only

The object is read-only, with no write (control) permission.

Hide in Smartphone

Do not show this object in the smartphone visualization.

Hide background

Hide icon background.

Send fixed value

Allows sending a specific value to the bus each time the object is pressed.

No bus write

The value will not be written into the KNX bus. Useful for triggering scripts with busload limitation.

Pin code

Via adding a pin you can protect the object. Each time the value is changed the pin code will be requested to enter. The minimum PIN is 4 digits with brute force protection.

Widget

A widget can be attached to a button that needs to be created before. The widget cannot be tested in the editor mode, but only in PC/tablet visualization.

Display mode

How to display the object.

Smartphone Icon

Default icon for a smartphone if differ from PC/tablet one.

On icon

On-state icon for binary-type objects.

Off icon

Off-state icon for binary-type objects.

Additional classes

Create an additional class, which can be used in a custom CSS file to modify a particular group of graphical objects.

Font size

For value, display text style can be defined.

Text styles

Bold, Italic, Underscore option.

Custom font

selection from installed fonts.

Show value background – show value background for improved readability.

Show control – If enabled, any control button graphics will change from a symbol to a switch [✓]. Visible only in PC/Tablet Visualization.

For value-type objects, an additional button appears while specifying parameters – *Additional icons*.

Additional icons
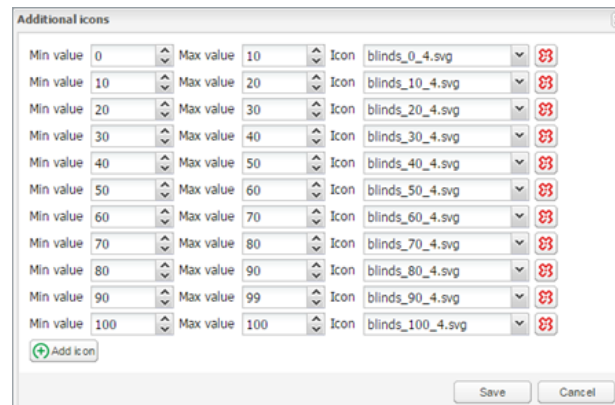
Different icons for different object values can be defined in the window. Object visualization parameters can be changed via clicking [icon]. It refers to *Vis.parameter* in the *Objects* tab.

Selecting parameters to edit
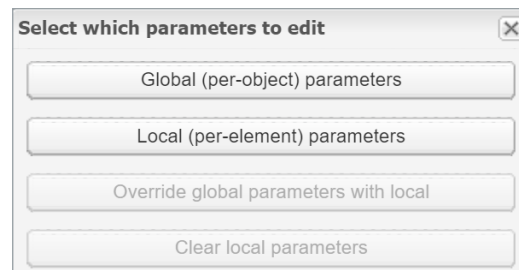
Global (per object) parameters

Parameters shared for all visualization elements with the same object.

Local (per-element) parameters

Settings only for certain visualization element.

Override global parameters with local

Object will be changed due to local status.

Clear local parameters

Reset local settings.

Visualization parameters

Settings of the parameters for visualization control element. Control type, minimum and maximum value, step, colors, and size can be set.

Visualization parameters
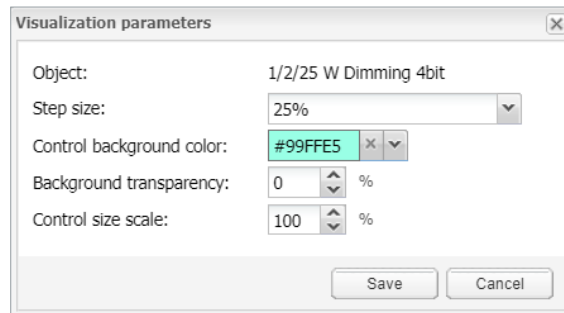
You can define the text style for a value display.

Add to plan   After defining the object parameters, press *Add to plan* button and a newly created object appears. The object can be moved to any location of the plan.

Duplicate   You can duplicate each object if you click the *Duplicate* button on the left side.

Cancel   The *Cancel* button sets the object parameters to default settings.

Element position

Can be added manually or by drag and drop of the object for the X and Y axis position on the plan.

Element size

This can be added manually or by dragging a vertical-horizontal strip of the object. The minimum value is 5 × 5 px.

Object size can be reset to the default size by clicking [icon].

The aspect ratio of the object can be locked by clicking [icon].

In the editing mode, the object does not work. When all the necessary objects are added, press *Save* and reload the floor plan button so that the objects start functioning.

Each added object can be edited while clicking on it in editing mode.

Click [Add to plan] button after each change.

20.4 Link tab in Plan editor

To make the visualization more convenient, there are plan links integrated. Special icons on the map can be added which would act as a link to other plans.

Link tab in Plan editor
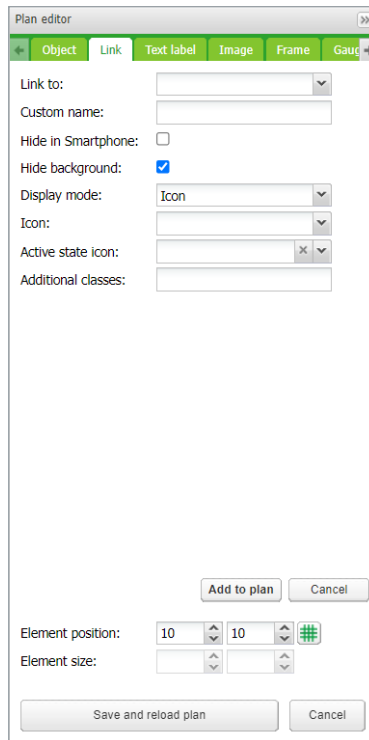
Link to
Select plan link.

Custom name
Type the name for the link.
Hide in Smartphone
Do not show this plan link in Smartphone Visualization.

Hide background
Hide the icon background.

Display mode [icon; value]
Choose how to display the plan link.

Icon
The icon which will be displayed in the visualization. If only text is selected, text parameters are selected.

Active state icon
If the icon is selected, then the active plan icon is available.

Additional classes
Create the additional class, which can be used in the custom CSS file to modify a particular group of graphical objects.

20.5 Text label

Text labels can be added and moved across the visualization map.

Text
Label text.

Font size
Label font size.

Text style
Style of the text – bold, italic, underscored.

Custom font
Font name.

Font color
Label font color.

Additional classes
For custom CSS styles.

Element size and position – see *Plan editor → Object* tab.

Once the label parameters are defined, click *Add new object* button and the newly created label will appear on the map. The object can be moved to the desired location. Press on *Save and reload plan* button so the label starts functioning.

The last two rows in the color palette refer to the predefined Schneider Electric corporate colors

It is recommended to use the Layout for menu and plan link creation. You can save time while adding it to different plans and later when making changes. By adding it to different plans it would save time and be beneficial when changes are required.

20.6 Image

The *Image* section allows adding images from local storage or from the internet into the visualization map. External image is useful for example, to grab dynamic weathercast images.

Image tab in Plan editor

Plan editor

| Object | Link | Text label | Image | Frame | Gaug |

Image source: Local
Select image:
Image size:
External link:
Refresh interval (seconds):
Additional classes:

Add to plan   Cancel

Element position: 10   10
Element size:

Save and reload plan   Cancel

Image source [Local, Remote]
Select image source.
Select image
Select the image previously added to *Vis. graphics → Images/Backgrounds*.

Image size
Set the size of images.

External link
External link URL when clicking the image example: http://www.se.com.

Refresh interval
The interval of refreshing the picture when it comes from external source.

Additional classes
For custom CSS styles.

Once the image parameters are defined, click the *Add to plan* button and a newly created object will appear on the map. The object can be moved to the desired lo-

cation. You can resize the image if you grab its the edge and move. Click *Save and reload plan* to apply changes.

20.7 Frame

Frame allows displaying internal or external webpage in visualization. *Schedulers* and *Trends* can be integrated into the frame.

Frame tab in Plan editor

Source

Select Scheduler, Trend log or external URL.

Frame size

Width/height of the frame.

Custom name

Specify the title of the frame.

Refresh interval (seconds)

Refreshing rate for frame content (max. = 3 600 s).

Persistent

By default, frames are loaded once the plan is visible and removed when your plan is hidden for performance reasons when many frames are used.
Persistent frames are loaded on init and are not removed. This is needed i.e. for alerts app.

Hide in Smartphone

When ticked, not available in the Smartphone visualization.

After defining the frame parameters, press *Add to plan* button and newly created object will appear on the map. The frame can be moved to the desired location. The frame can be resized via holding the edge of the frame and moving. Click the *Save and reload plan* button so the frame starts functioning.

- Some web pages have a java script that prevents from using the frame, if this is implemented, the webpage will open in full screen rather than in the frame
- It is recommended to stretch the frame to maximum width if a Scheduler or Trend is used. Recommended minimum width is 1024.
- The frame is only visible under PC/Tablet Visualization.
- Do not allow Scheduler or Trend to be viewed from Smartphone visualization. Settings are available in *Vis. structure* under a dedicated plan.

20.8 Gauge

The *Gauge* allows a dynamic way of visualization and changing the object value in the gauge.

Gauge tab in Plan editor

Data object

KNX group address.

Gauge size

Size of the gauge.

Custom name

Custom name for the object.

Read only

Make the gauge read-only.

Additional classes

Create an additional class, which can be used in custom CSS files in order to modify a particular group of graphical objects.

After defining the gauge parameters press *Add to plan* button and a newly created object will appear on the map. The object can be moved to the desired location. Click The *Save and reload plan* button so that the gauge starts functioning.

20.9 Camera

Wiser for KNX supports third-party IP web camera integration into its visualization.

Only cameras that support HTTP MJPEG streaming in the web browser can be visualized.

Camera tab in Plan editor
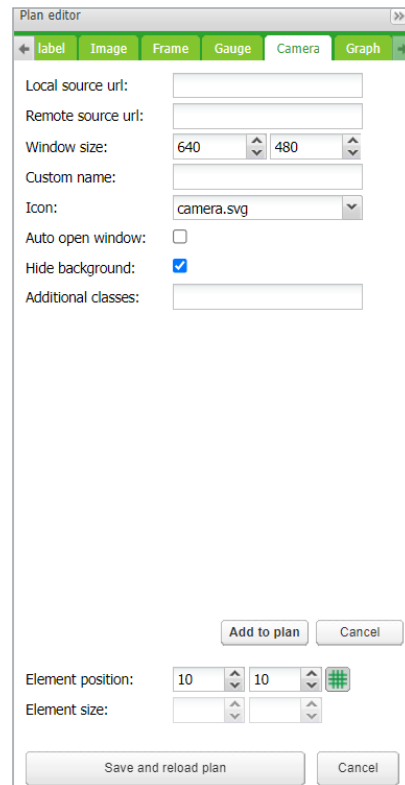
Local Source URL

The local source address of the video stream is available on the same sub-network.

Remote Source URL

A remote source address of the video stream. Remote camera stream is displayed when the client IP is from a different sub-network than the server.

Window size

Width and height for displaying the graph.

Custom name

Name for the object.

Auto open window

Automatically open video window when the plan is open.

Additional classes

Create an additional class, which can be used in custom CSS files in order to modify a particular group of graphical objects.

Hide background

Hide icon background.

Sort order

Order cameras for touch visualization
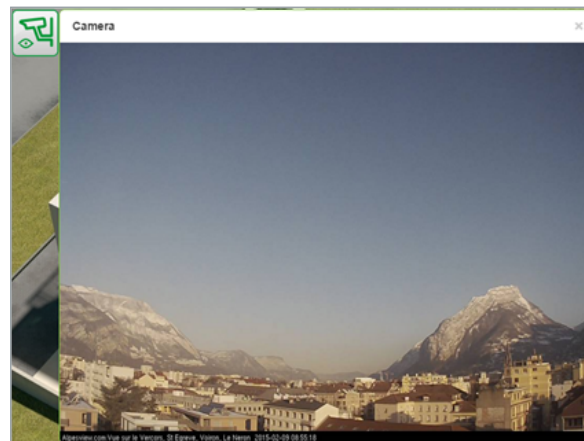
If IP camera requires user name and password, enter the URL accordingly: http://
USER:PASSWORD@IP

- Feel free to change the icon or its label for your camera
- Wiser for KNX is only a redirecting stream from the camera to the browser. If the stream does not work, it is a web browser issue, not Wiser for KNX.
- If it is a cameras issue, please check if the video stream is available in the browser.
- If the camera is available from the external, the IP of the camera needs to be port forwarded through the router. While adding the external camera, IP with the correct port has to be used (IP: port). If the local IP is used, then the camera will not be available externally.
- Contact Technical support of the camera manufacturer if the direct video stream is hidden by the manufacturer.

20.10   Graph

Real-time graphs can be integrated into a visualization system to monitor the current and the old value of the scale-type objects. Make sure logging is enabled for the object in the *Object* tab where values are planned to be shown in the graph.

Graph tab in Plan editor
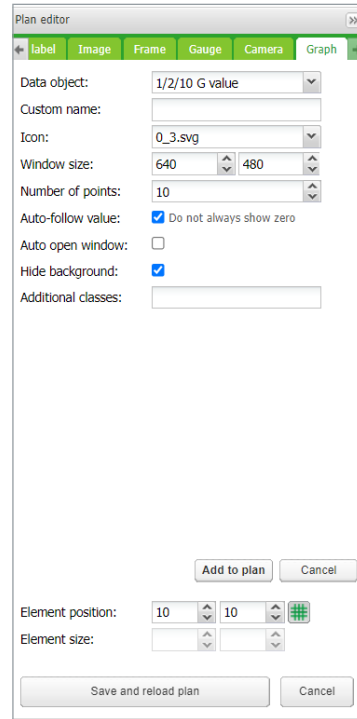
Data object

Group address of the object.

The object has to have *Log* option activated for *Graph* to be active in *Visualization*.

Custom name

Name of the object.

Icon

Icon to launch the graph.

Window size

Width and height for displaying the graph.

Number of points

The number of data points to show in the graph. (Max. = 200 points).

Auto-follow value

For objects which never reach zero value e.g. CO_2 level. Improves graph resolution.

Auto open window

Graph window is automatically opened.

Hide background

Hide icon background.

Additional classes

Create an additional class, which can be used in custom CSS files in order to modify a particular group of graphical objects.

Once the graph parameters are defined, click the *Add to plan* button and a newly created object appears. The object can be moved to the desired location.

> In the editing mode, the graph will not work. Click the *Save and reload plan* button so that the objects start functioning (with delay for obtaining relevant data). The object from which the data are obtained has to be set as logged in *Object's properties*.

20.11   Launching visualization on iPhone

Please follow the next steps:

1. Make sure the iPhone is connected wirelessly to Wiser for KNX (through a separate access point – wireless router).
2. Enter Wiser for KNX IP (default **192.168.0.10**) in iPhone web browser.
3. Click on the *Smartphone* visualization icon.
4. Application's link can be saved providing a shortcut in the iPhone for easy access with full-screen view by clicking the *Add to Home Screen* icon in the *Share* menu of the Safari browser.

Launching visualization on iPhone
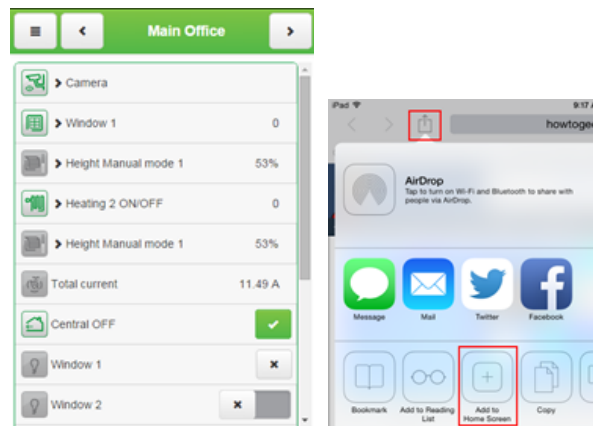
20.12   Launching visualization on PC

For PC, tablet or any other touch device with large screen, please follow the next steps:

1. Ensure the PC/tablet device is able to access Wiser for KNX, and enter the IP in the browser (default **192.168.0.10**).
2. Click on *PC/Tablet* visualization.
3. Select the desired plan.
4. A sidebar can be minimized by clicking ⟨ icon to make the map more visible.

21 Vis. graphics

This tab is split into three sections:
- *Icons* where all object icons are located.
- *Images/Backgrounds* for all the locally stored pictures.
- *Edit custom CSS* to create or edit the custom cascade style sheets.

Vis. graphics
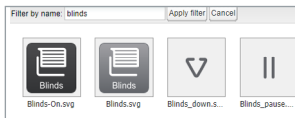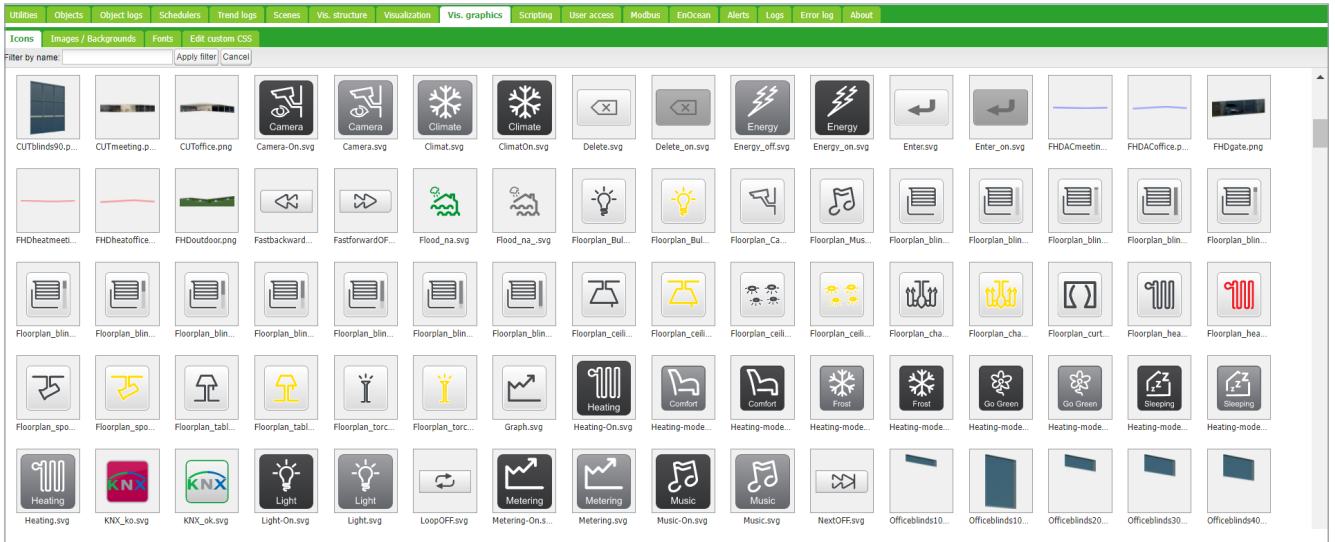
Filter by name

Filter icons or images/backgrounds graphics according to name.

Click the *Add icon* button to add a new entry. The system accepts any icon size. JPEG, Gif, PNG, and SVG formats are supported. ZIP archive containing multiple graphics can be uploaded, each item cannot exceed 2 MB, and the whole archive size cannot exceed 32 MB.

Add new graphics
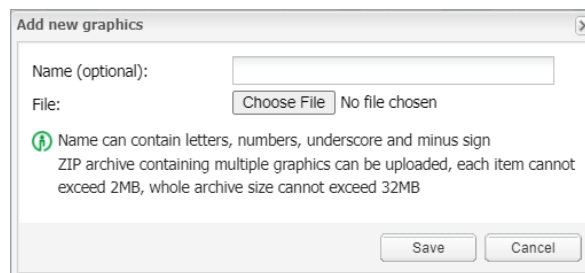
Name (optional)

The name of the icon. It will appear in the list when adding a new object. It can contain letters, numbers, underscore, and a minus sign.

File

Icon file location.

CSS style can be changed via uploading a new file. CSSs define all control buttons, Smartphone visualization, Scheduler, and Trend. For more information on how to modify the CSS file, please contact your local front office for additional documents.

Clear cache of the browser after uploading new CSS file.

22 Scripting

The *Scripting* menu allows adding and managing various scripts, depending on the type of the script. Lua programming language is used to implement user scripts.

22.1 General scripting description

Scripting tab

Utilities	Objects	Object logs	Schedulers	Trend logs	Scenes	Vis. structure	Visualization	Vis. graphics	**Scripting**	User access	M

Event-based	Resident	Scheduled	User libraries	Common functions	Start-up (init) script

Script name	Group address / tag...	Description	Category	Edi...	Act...	Du...	Del...
Event for B status ON/OFF (1/2/19)	1/2/19						
RGB splitting (1/2/30)	1/2/30						
Event for S5 Scene (3/0/12)	3/0/12						
Scene PB	3/1/2						
Event for Office climate mode (32/1/15)	32/1/15						
Lamp test	32/2/2						
Temporary reset (32/2/12)	32/2/12						
RGB collective Feedback	RGB_Feedback						

⊕ Add new script

There are four actions you can do with each script:
- *Editor* – Enter scripting editor to write specific code for the particular program.
- *Active* – Make the script active (green) or deactivate it (grey).
- *Duplicate* – Duplicate the script with its source code.
- *Delete* – Delete the script. When pressing this icon, the confirmation is asked to accept the delete.

🖊 Data format — in most cases data is stored and transferred between Wiser for KNX parts using hex-encoded strings (2 bytes per 1-byte of data).

Programing in LUA and code samples are available at www.se.com.

22.2 Event-based script

These are scripts that are executed when a group event occurs on the bus. Usually used when the real-time response is required.

Script name

The name of the script.

Group address/tag

Group addresses or tags have to be entered. It can be entered manually or selected from the drop-down list.

Group address

Allows to enter only digits from 0 to 15 and / as a separator. When 🔴 icon appears on the right side of the text box, the wrong address form is used. The correct form of the group address is, for example, 1/1/1.

Tag

The script can run on tags. If group addresses have the tag attached to and the script is using the tag, then any telegram which is sent to the group with this tag will execute the script.

Execute on group read

Run script with every group read.

Execution mode

There are 3 options:

• Normal

• First instance only

• Last instance only

The event script runs each time when you trigger it. The script can run for some time especially when you add a delay. The same script may run several times if you trigger it in quick succession.

The First instance does not start a new script (PID) if it is already running.

The Last instance stops all running scripts and PIDs as these are the processes running internally and it runs only the last one triggered. This option is commonly used when users save the current PID into storage. If the next one is triggered then it stops the running PID.

Description

Description of the script.

Category

A new or existing name of the category the script will be included. This will not affect on script action, helps only by grouping the scripts and watching by categories in *Tools → Print* script listings page.

Active

Specifies whether the script is active (green circle) or disabled (red circle).

> If the script is run only on a read request, use the following script example:
>
> ```
> if event.type == 'groupread' then
> -- script here
> end
> ```

22.3 Resident script
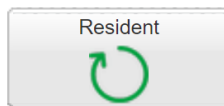
Script name

The name of the script

Sleep interval (seconds)

Interval after which the script will be executed.

Active

Specifies whether the script is active (green circle) or disabled (red circle).

Category

A new or existing name of the category the script will be included. This will not affect on script action, helps only by grouping the scripts and watching by categories in *Tools → Print* script listings page.

Description

Description of the script.

22.4 Scheduled script
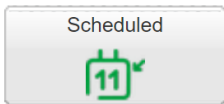
Scheduled

Script name – The name of the script.

Minute – Minute.

Hour – Hour.

Day of the month – Day of the month.

Month of the year – Month of the year.

Day of the week – Day of the week.

Active– Specifies whether the script is active (green circle) or disabled (red circle).

Category – A new or existing name of the category the script will be included. This will not effect on script action, helps only by grouping the scripts and watching by categories in **Tools > Print** script listings page.

Description – Description of the script.

22.5 User libraries

User libraries usually contain user defined functions which could be called from other scripts.
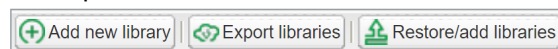
User libraries in Scripting tab

Secure the Code

There is an option **Keep source** available for user libraries. Once disabled, the code is compiled in the binary form and cannot be seen for further editing. If this option is enabled, the source code is seen in the editor.

Auto load library option will load selected script when Wiser for KNX starts.

Include the Library in the Scripts

To use functions defined in user library, they should be included in the beginning of the script, for example, user library with the name 'test' should be included as below: **require('user.test')**

User Libraries can be backed up and restored/added from archive.

The existing library will be replaced by imported one.

22.6 Common functions

Common functions contain library of globally used functions. They can be called from any script, any time, without special inclusions with **User libraries**. Functions like sunrise/sunset; e-mail is included by default in **Common functions**.
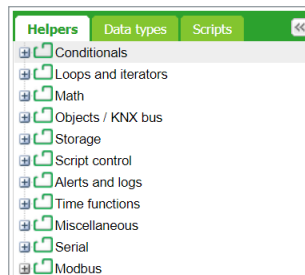
22.7 Start-up script
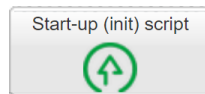
Init script is used for initialization on specific system or bus values on system start. Init script is run each time after the system has restarted (power up, reboot in the SW or via hardware *Reset* push button).

22.8 Tools

Tools menu
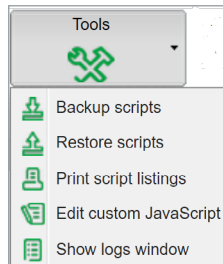
Backup scripts – Backup all scripts in *.gz file.

Script backup does not backup user libraries, those have to be backed up separately.

Restore scripts – Restore script from archive (*.gz) file with two possibilities:
- Remove existing scripts and import from backup.
- Append keeping existing (s) scripts.

Print script listings – Shows all scripts with codes in list format sorted by Categories.

Edit custom JavaScript - insert Java script code for script control.

Show logs window – All log data are listed here; it is a duplicated window **Configuration/Logs**. It allows debugging a script and in parallel checking the logged data.

Restore scripting backup
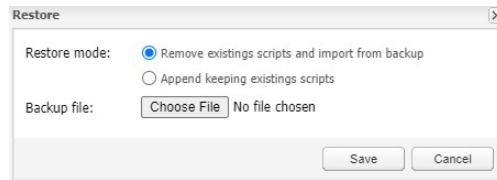
Example: Sample code for 1byte object 1/0/0 controlling navigation between pages according to page number.

```
$(function(){
  /* Create event listener on 1/0/0 to jump to page with ob-
ject value */
  addr = Scada.encodeGroupAddress('1/0/0');
  objectStore.addListener(addr, function(obj, type) {
    /* to avoid execution on opening page */
    if (type == 'init') {
      return;
    }
    /* jump to page with objectvaue */
    if ( currentPlanId != obj.value ){
      showPlan(obj.value);
      /* Write object back to 0 */
      setObjectValue({ address: '1/0/0', rawdatatype: 5 }, 0,
'text');
    }
  });
});
```

22.9 Script editor

When a script is added 📜 icon appears in the Editor column that allows opening a script in the scripting editor and re-working it with built-in code snippets. Code snippets save time and make the coding convenient. After clicking on the appropriate snippet, it automatically adds code to the editor field.

Script editor
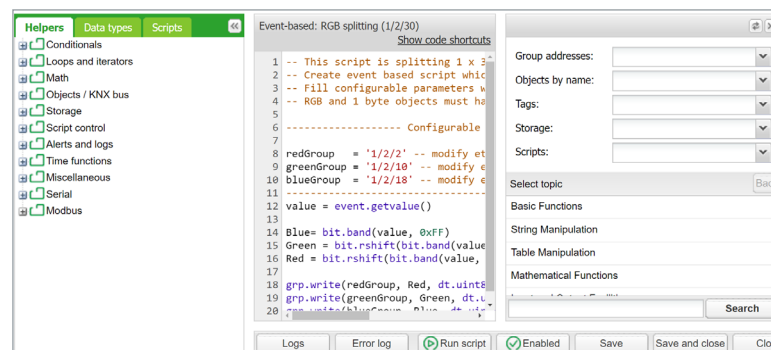
Keyboard shortcuts are implemented for help with script writing.

Logs and error window are also available.

Ctrl + F – Find syntax in a code, text will be highlighted in yellow.

Ctrl + G – After finding a text via Ctrl+F, we can use Ctrl +G to select the next syntax in a script.

Shift + Ctrl + G – Select previous syntax.

Shift + Ctrl + F – Replace syntax in a script by another one. You will be allowed to choose one by one if you want to change it.

Shift + Ctrl + R - Replace all syntaxes in a script by another one at once.

Ctrl + Space – Helps to auto detect code and write for you. Press Ctrl + Space and write first letter of a command, then select the correct one from the list.

Keyboard shortcuts

Ctrl-F: Find, **Ctrl-G**: Find next, **Shift-Ctrl-G**: Find previous, **Shift-Ctrl-F**: Replace, **Shift-Ctrl-R**: Replace all, **Ctrl-Space**: Autocomplete

OK
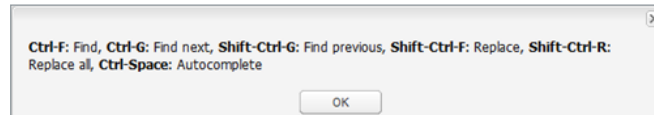
There are six main groups of Script editor:

Helpers – Predefined code snippets, like if-then statement. Helpers consist of eleven main sub-groups: **Conditionals** – If Else If, If Then etc.

- **Loops and iterators** – Array, Repeat...Until etc.
- **Math** – Random value, Ceiling, Absolute value, Round etc.
- **Objects/KNX bus** – Get object value, Group read, Group write, Update interval etc.
- **Storage** – Get data from storage, Save data to storage.
- **Script control** – Get other script status, enable or disable other scripts.
- **Alerts and logs** – Alert, Log variables, Formatted alert.
- **Time functions** – Delay script execution.
- **Miscellaneous** – Sunrise/sunset etc.
- **Serial** – Communication through internal Wiser for KNX I/O ports.
- **Modbus** – Create RTU/TCP connection, Write register, Read register etc.

Group addresses – Existing group addresses on the KNX bus.

Objects by name – Chose object by name.

Tags – Choose object by tag.

Data types – Choose object by data type.

Scripts – List of already made scripts consist 4 sub-groups:

Event – based- List of event-based scripts.

Resident - List of resident scripts.

Scheduled – List of scheduled scripts.

User libraries - List of common functions a Star-up (init) scripts.

23 User access

User access menu allows creating and managing user accounts.

User access

Amount of users is recommended < 20 in Wiser for KNX.

23.1 Add new user
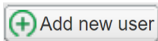
Click on the *Add new user* icon to add new user.
Update user acces settings accordingly.

General

User acces settings General

User name

Name of the account.

Login

Length 2 to 20 characters, accepted characters: "-", "_", "a-z", "0-9".

Active

Active/deactivate user account.

Password

Length 6 to 20 characters. Any character accepted. See chapter Password recommendation → 12 for security recommendations.

Visualization/Schedulers/Trends access [None/Partial/Full]

If you select a partial access, the *Visualization/Schedulers/Trend logs* tabs become active, and you can specify parameters for user access.

Touch access [Partial/Full]

Homepage

Here, you can set the page that the user sees after logging in. It can be default *Start page* or any application from your *Start page*.

Applications

If you select *Partial* for the applications in the *General* tab, the *Applications* tab becomes active. You can select the applications to which the user will have access. Checked applications are visible and accesible to the user on the Start page.

User acces settings Applications
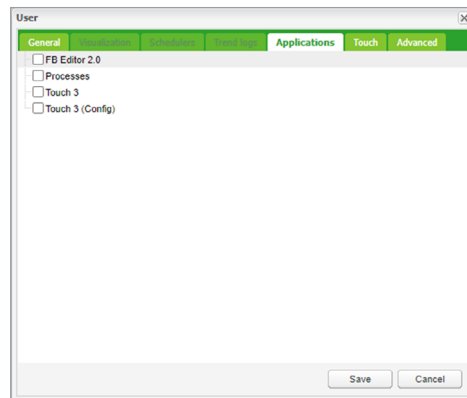
Touch

If you select *Partial* for the *Touch access* in the *General* tab, the *Touch* tab becomes active. You can specify which rooms are visible to the user in the *Touch* visualization. In the list of rooms, check the ones that you allow the user to access.

User acces settings Touch
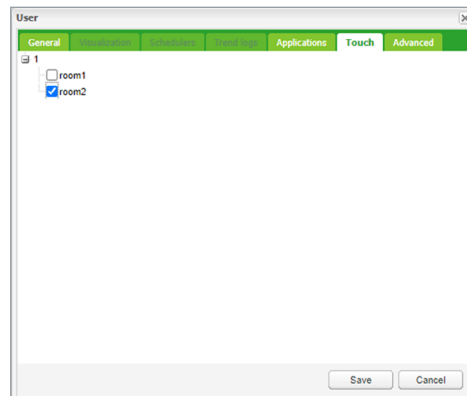
Advanced

In this setting, you can provide a list of group addresses that will be available to users.

User acces settings Advanced
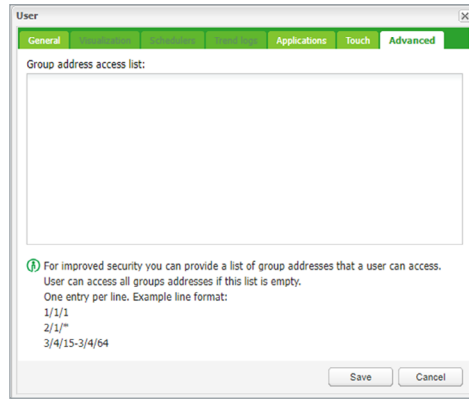
23.2 User access settings

Click on the *User access settings* icon to manage user access settings.

User access settings dialog
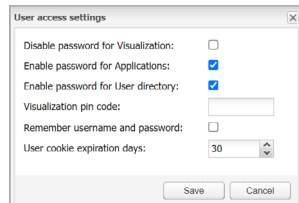
Disable password for visualization – The active password protection is disabled for visualization access. Protect your visualization with PIN when disabling this option

Enable password for Apps – A password is requested when entering any Application on the main page.

Enable password for User directory – The user directory on the main page is hidden when this feature is active.

Visualization pin code – When active password protection is disabled the visualization can be protected by PIN code with minimal length of 6 digits.

Remember username and password – User's credential will be stored.

User cookies expiration days – Web browser cookies will be deleted after selected amount of days.

23.3 Acces logs

Login history

Click on the *Access logs* button to view login history.

Unsuccessful logins are marked in red. FTP and Applications access are also logged.

24 Modbus

Modbus tab

Name	Profile	Status object	Connection ty…	Device …	Poll int…	C…	M…	D…
RTU 1								
iEM 3155	iEM-iEM3155		RTU 1	1	60			

⊕ Add device　⚙ RTU settings　⚙ RTU scan　⚙ Read test　▤ Profiles　▤ Error log
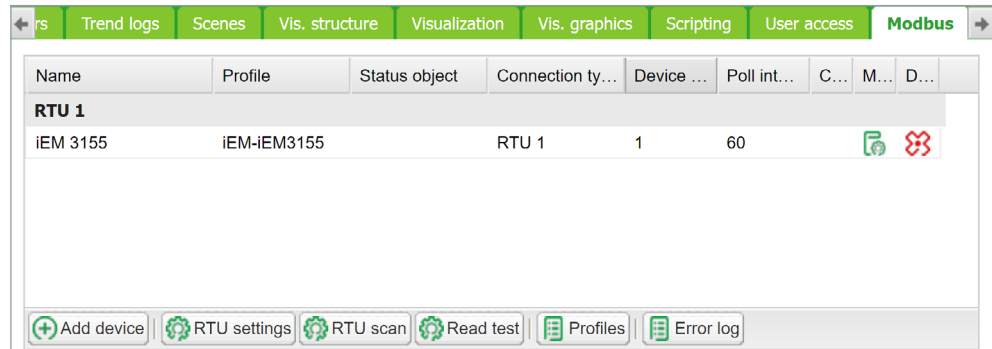
24.1 Characteristics

The Modbus open standard allows you to receive a more in-depth analysis of consumption in all areas of your building.

You can connect up to 31 Modbus extension devices of the following types of meters based on Modbus remote terminal unit (RTU) within one Modbus line:

- Schneider Electric energy meters
- Schneider Electric power meters
- Schneider Electric Smart Interface Modules (SIM10M module)
- Schneider Electric Smartlink
- Other Schneider Electric Modbus devices (e.g. SE8000, Modicon PLCs, etc.)
- Non-Schneider Electric Modbus TCP/RTU devices (offering you greater flexibility)

With the information which Wiser for KNX provides, you can visualize energy or media consumption. This can also be used to reduce consumption through the use of control strategies within the KNX/IP network.

Modbus RTU is supported over RS485 interface. Modbus TCP is supported over Ethernet port. Modbus communication settings is done using *Modbus* tab in Wiser for KNX *Configurator*. Modbus registers can be easily mapped using predefined Modbus profiles.

Modbus Master can be controlled directly from scripts (usually resident script is used to read Modbus values after some specific time interval and write them into KNX object or visualization).

Once script is added, you can add the code in the Script Editor. There are lots of predefined code blocks in the Helpers.

✎ Do not use Modbus settings using profiles together with Modbus controlled from scripts. Interference of those two settings can cause communication errors. We strongly recommend you to use rather Modbus device profiles than configuration by scripting.

24.2 Application example

Requirements

- Measure and visualize how much energy is used for lighting an office building.
- Measure the gas and water consumption of the building.
- Monitor the quality of the network to ensure the operational safety of the IT equipment.

Solution

- Install an iEM3150 meter to measure the energy consumed by the lights.
- Install an iEM3255 meter to determine the power mains quality.
- Install a SIM10M module to measure gas and water consumption using pulse meters.
- Connect the devices to each other via Modbus.

24.3 Modbus RTU interface

Characteristics of Modbus RTU Interface

Supported over RS 485 physical interface

Can act as Modbus/RTU Master or Modbus/RTU Extenstion

Supported Function Codes: #01, #02, #03, #04, #05, #06, #07, #0F, #10

Maximum 32 devices on bus (1 master and 31 extenstions)

RS 485 interface is not isolated!

RS 485 Bus Topology Characteristics

Main RS 485 Characteristics

- Mode of operation: differential
- Voltage at any bus terminal: -7 V to +12 V
- Receiver Input Sensitivity: +/-200 mV
- Sink/Source current: 60 mA
- Built-in asymmetrical protection against transient voltages resulting from electro-static discharge (ESD), electrical fast transients (EFT), and lighting.
- Non isolated RS-485 interface.

Connection Type	• point-to-point connections
	• point-to-multipoint connections
Type of Trunk Cable	shielded cable with 1 twisted pair and at least a third conductor
Maximum Length of Bus	1.000 m (3.280 ft) at 19.200 bit/s with the Telemecanique TSX CSA cable
Maximum Number of Devices (without repeater	32 (1 UL) devices, i.e. 31 extensions
Maximum Length of Tap Links	• 20 m (65 ft) for one tap link
	• a total of 40 m (131 ft) for all tap links available on the bus

Common Ground Wires

- In order to keep the voltage between drivers and receivers within the allowed range (-7 V to +12 V), an additional third wire (in 2-wire systems) is required.
- This wire will be used as common circuit and has to therefore be directly connected to protective ground, preferably at one point only for the entire bus.
- As grounding point for the entire bus you should choose the master device or its tap.

No terminal for cable shield. For longer cable in harsh environment we recommend you to place additional shield clamp close to the controller in order to drain EMC disturbances.

Earthed connectors from USB, RS232, LAN and Modbus are interconnected. Earth leakage currents may harm the operation of the controller.

Maximum Number of Devices without Repeater

An RS 485 network can principally have a maximum load of 32 devices.

If you want to connect more than 32 devices to a standard RS 485 driver, then integrate a repeater in your network.

Biasing the Network

When there is no data activity on the Modbus bus, i.e. all nodes are in receive mode and there is no active driver available, the state of the line is unknown. In these cases, the line is subjected to external noise or interference. In order to prevent the receivers from adopting improper states, the line needs to be biased, i.e. the constant state of the line has to be maintained by an external pair of resistors connected to the RS 485 balanced pair.

RC Termination

To prevent unintended effects, like reflections, from occurring in your Modbus SL application, make sure to terminate the transmission lines properly.

Use RC termination to minimize the loop current and the line reflections. Furthermore, RC termination increases the noise margin.

Choose two serial capacitors of 1 nF (10 V minimum) and two resistors of 120 Ω (0.25 W) as line termination. Integrate these components at both ends of your Modbus SL communication line.

R Termination Only

If the client insists on the R=150 Ohm termination only (not RC), he has to connect external polarization resistors himself 450 - 650 Ohm (at the master's tap).

See the scheme in picture below.

Modbus interface isolation

Modbus interface of Wiser for KNX is not isolated. We strongly recommend to use optic-coupler separation of Modbus line and Wiser for KNX RS485 interface. It will increase robustness of the Modbus network and reduce noise in the bus traffic.

Termination, polarization and separation using Schneider Electric devices

Schneider Electric delivers devices for RS 485 termination, polarization and separation

Refer to following product numbers:

• TWD XCA ISO
• TWD XCA T3J

TWD XCA ISO and TWD XCA T3J devices can be used in order to ensure recommended RS 485 connection scheme (see the picture below). For more detailed information about TWD XCA ISO and TWD XCA T3J please refer to product documentation on Schneider Electric website.
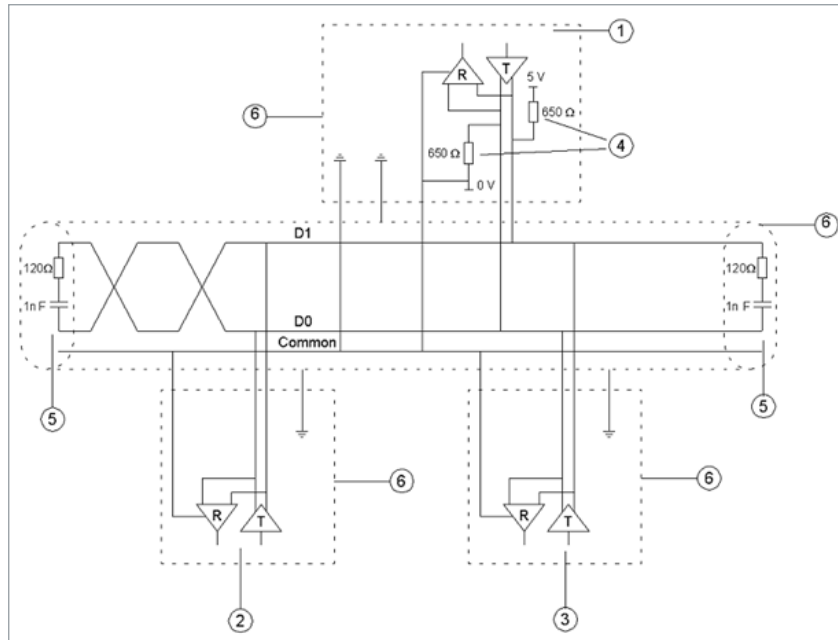
Elements of the application:

1. master
2. extension 1
3. extension n
4. polarization resistors
5. line termination
6. shield

Maximum cable length without termination

When cable is not terminated, you have to adjust the transmission rate to cable length.

Transmission Rate	9600	19.200	57.600	115.200
Bit Time (µs)	104,1	52,08	17,36	8,68
Bit Time/4 (µs)	26,0	13,0	4,3	2,2
Max. Cable Length Without Termination (m)	859	430	143	72

Modbus TCP Interface

Characteristics of Modbus TCP Interface:
• Supported over Ethernet interface 10Mb, 100Mb
• Can act as Modbus/TCP-IP Client or Modbus/TCP-IP Server
• DHCP support
• Max. opened TCP connections: 100
• Supported Function Codes: #01, #02, #03, #04, #05, #06, #07, #0F, #10

Grounding-Isolation

Metal cover of the RJ45 socket is connected to device ground.

24.4 Modbus settings in Wiser for KNX using device profiles

General Procedure of Modbus Settings

All settings regarding Modbus communication in Wiser for KNX are available in Modbus tab.

There are plenty of preinstalled device profiles, which are used for mapping the Modbus addresses (registers) to KNX group objects in Wiser for KNX. If there is a need to read/write some Modbus register, you only set the mapping rules, which allows you to access Modbus register by read/write of KNX group objects.

In general, the procedure of Modbus communication settings can be divided into following steps:

1. Setting the details of Modbus RTU communication (baud rate, parity, …) in case you use Modbus RTU.

2. Make sure there is device profile uploaded in Wiser for KNX. There are preinstalled profiles for Schneider-Electric devices. Custom Modbus profiles can be uploaded and used as well.

3. Add the device to the device list.

4. Configure the register mapping.

Automatic discovery

You can find Modbus devices connected to Wiser for KNX over Modbus RTU using scan function. This function is placed here: Configurator -> Modbus -> RTU scan. Devices, which are marked as **"RTU scan = No"**, do not support automatic discovery.

List of preinstalled Modbus profiles in Wiser for KNX

Modbus device	RTU scan	Modbus device	RTU scan	Modbus device	RTU scan
Compact_NSX-Compact_NSX_E	No	PM-PM820	No	EM-EM6400	-
Masterpact_NT_NW-Masterpact_A	No	PM-PM850	No	EM-EM6433	-
Masterpact_NT_NW-Masterpact_H	No	PM-PM870	No	EM-EM6434	-
Masterpact_NT_NW-Masterpact_P	No	PM-PM9C	No	EM-EM6436	-
PM-PM1200	No	SIM10M	No	EM-EM6436 and EM-EM6436dual	-
PM-PM210	No	Smartlink-RTU	Yes	EM-EM6438	-
PM-PM3250	Yes	Smartlink-TCP	No	ION-ION6200	-
PM-PM3255	Yes	SE8300	No	ION-ION7300	-
PM-PM5110	No	SE8600	No	ION-ION7330	-
PM-PM5111	No	SER8300	No	ION-ION7350	-
PM-PM5310	No	TC303	No	ION-ION7550	-
PM-PM5330	No	iEM-iEM2150	Yes	ION-ION7650	-
PM-PM5350	No	iEM-iEM2155	Yes	Masterpact_NT_NW-Masterpact_E	-
iEM-iEM3150	Yes	Vigilohm IM20	Yes	PM-PM500	-
iEM-iEM3155	Yes	Vigilohm IM400	Yes	PM-PM5111	-
iEM-iEM3250	Yes	PowerTag	No	PM-PM5320	-
iEM-iEM3255	Yes	CM-CM3250	-	PM-PM5331	-
iEM-iEM3350	Yes	CM-CM3350	-	PM-PM5340	-
iEM-iEM3355	Yes	CM-CM4000	-	PM-PM5341	-
PM-PM710	No	Compact_NSX-Compact_NSX_A	-	PM-PM5560	-
PM-PM750	No	EM-EM3550	-	PM-PM5561	-
PM-PM810	No	EM-EM3555	-	PM-PM5563	-

24.5 Add new Modbus device
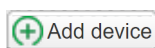
⊕ Add device

In order to add new Modbus device to Wiser for KNX configuration click the *Add device* button.

Add new Modbus device

Connection type

[RTU(RS-485), TCP/IP]

Select the connection type of Modbus device.

Name – Define a name of Modbus device.

Status object – The connection with Modbus device can be monitored by Status object. When the communication is broken, status object is set to 0.

Profile – Select Modbus profile of your device. You can use preinstalled profile or your custom device profile. Custom profiles need to be created and uploaded to Wiser for KNX before. Procedure of device profile creation is described in New profile definition → 123.

Device address – Set the extension address of your Modbus device.

Poll interval – Set how often the values are polled from Modbus extension device. Value 5 means that new values are read every 5 seconds.

Timeout – If there is error in connection device will wait for set time and then send error message to Error log

IP – Set the IP address of the Modbus device (in case you use Modbus TCP). If Modbus device is connected over Modbus gateway, the IP address of the gateway has to be set here.

Device mapping
Port – Set port for Modbus TCP communication. Default value given by Modbus standard is 502.

Persistent connection – Keeps connection open. When disabled, controller reads out all registers and disconnect.

Some Modbus TCP/IP devices cannot handle frequent (re)connections well (panel server, inverters, Modbus meters). Consider using *Persistent connection* when your polling interval is less than a minute.

24.6 Modbus RTU settings

In order to communicate with Modbus extensions connected over Modbus RTU (serial), it is necessary to enable the communication and set the connection details.

RTU settings

RTU (serial) enabled – This option enables Modbus RTU communication. Only RTU1 can be set for Modbus communication

Port – Set the name of the serial port. Default settings is /dev/RS485.

Parity – Set a parity or stop bits.

Duplex – Select the Half-duplex or Full-duplex option. Default value is Half-duplex.

Reset to defaults – This button resets all parameters of RTU settings to default.

24.7 Modbus RTU scan

RTU scan

RTU scan feature automatically finds and adds Modbus devices connected to Modbus RTU.

RTU scan setting

Only devices with a valid profile will be added. This feature does not work with custom made profiles.

Devices supporting automatic discovery are listed in chapter Modbus profiles table → 121.

24.8 RTU read test

For the quick test of RTU communication.
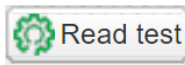
Device address – The address of Modbus device.

Function – The distinction between Coil, Discrete input, Holding register and input register functions.

Address – A register address.

Data type – A message data point type.

Read swap – You can change order of reading if needed.

Read length – The length of read message.

24.9 Modbus profiles table

All the Modbus profiles uploaded in Wiser for KNX are displayed in the table, which pops up after clicking on *Profiles* button.

You can delete each profile by clicking on or downloaded by pressing button and then used for further customization.
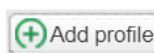
It is possible to modify downloaded profile (.json file) and upload it back to Wiser for KNX using *Add profile* button.

If there is a need to read/write registers, which are not available in preinstalled profile, it is recommended to modify the preinstalled profile according to your needs.

Profiles table

24.10 Modbus mapping

Once the Modbus device has been added as described in *Modbus RTU Scan* it is necessary to set the register mapping. It means that bindings between Modbus registers and KNX group objects in Wiser for KNX have to be created.

Navigate to *Modbus* tab of Wiser for KNX *Configurator*.

Each device in the list has a green mapping icon on the right side. Click this icon and open the *Object mapping* settings.

Mapping settings

Each row of the *Object mapping* table represents one of the Modbus registers (defined in the device profile).
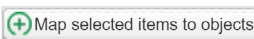
Double-click selected line or click the *Map selected items to objects* button. *Mapping* dialog opens.

Mapping dialog

Link to object – Select the Wiser for KNX object, where the value read from Modbus register will be saved. You can select existing object from the drop down menu or you can click on ⊕ and create the new object directly from this dialog.

Write to bus – Enable sending data to KNX TP bus.

If this option is disabled, telegrams to KNX TP are not sent, when Modbus value is changed. Telegrams are sent to KNX IP anyway. In case you do not want to share the values through KNX IP, it is important to set the filtering table properly.

Value send delta – Set the value of delta. If the change of value read from Modbus register is bigger than this delta, value is sent to the KNX bus. In case of KNX TP, *Write to bus option* needs to be enabled.

Unit/suffix – Set the unit of the Modbus value. This setting is applied to selected group object in Wiser for KNX. This parameter is optional.

Tags – Select a tag, which is applied to selected group object in Wiser for KNX. This parameter is optional.

Comments – Select a comment, which is applied to selected group object in Wiser for KNX. This parameter is optional.
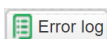
Error log   *Error logs* – All errors related to Modbus are displayed in *Error log* window under *Modbus* tab.

Error logs
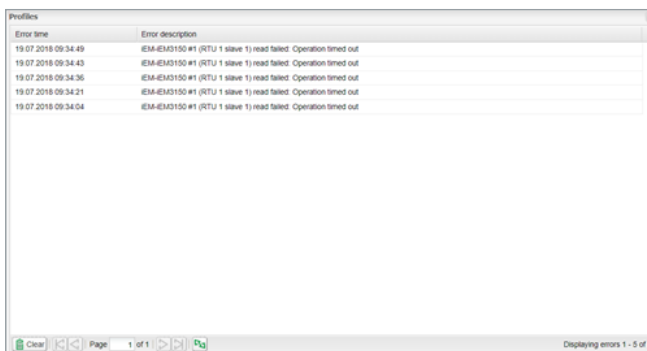
Modbus device is highlighted red after 3 unsuccessful poll.

24.11   New profile definition

If your Modbus device profile is not present in the list of preinstalled profiles in Wiser for KNX, you can define your own profile.

Modbus device profiles are distributed in *.json files. You can use common text editor (e.g. Notepad or Notepad++) in order to create and edit your profile. While saving the file set extention to *.json. The following example shows the structure of new device profile:

```
{
"manufacturer": "Schneider Electric",
"description": "Example device",
"mapping": [
{ "name": "Output 1", "bus_datatype": "bool", "type": "coil",
"address": 0, "writable": 1 },
{ "name": "Input 1", "bus_datatype": "float16", "type": "inputregister", "address": 0, "value_multiplier": 0.001, "units": "V" }
]
}
```

Each line of "mapping" table of the *.json file contains mapping information of one Modbus register, coil, input or output. All the possible mapping settings are listed in the table below.

Profile definition

Parameter	Description	Type	Required
Name	Object name, e.g. Output 2	String	**Yes**
bus_datatype	KNX object **data** type, key from dt table, e.g. float32	String / Number	**Yes**
type	Modbus register type, possible values: coil, discreteinput, register, inputregister.	String	**Yes**
address	Register address (0-based)	Number	**Yes**
writable	Set to true to enable writing to register if type is either coil or register.	Boolean	No

Profile definition

Parameter	Description	Type	Required
write_only	Set to tru to disable reading coil or register value when "writable" is enabled.	Boolean	No
datatype	Modbus value data type. If set, conversion will be done automatically. Possible values: bool, uint16, int16, float16, uint32, int32, float32, uint64, int64, quad10k, s10k	String	No
value_delta	New value is sent when the difference between previously sent value and current value is larger than delta. Defaults to 0 (send after each read).	Number	No
value_base	Add specified number to the resulting value.	Number	No
value_multiplier	Multiply resulting value by the specified number, value = value_base + value * value_multiplier.	Number	No
value_bitmask	Bit mask to apply, shifting is done automatically based on least significant 1 found in the mask.	Number	No
value_nan	Array of 16-bit integers. If specified and read operation returns the same array no further processing of value is done.	Array	No
value_conv	Apply one of built-in conversion functions	String (Int)	No
value_custom	Name of a built-in enumeration or a list of key -> value mapping, resulting value will be 0 if key is not found.	String / Object	No
internal	Not visible to user when set to true, should be used for scale registers.	Boolean	No
units	KNX object units/suffix	String	No
address_scale	Address of register containing value scale, value = value * 10 ^ scale	Number	No
read_count	Number of register to read at once (for devices that only support reading of a specific block of registers)	Number	No
read_swap	Swap register order during conversion (endianness)	Boolean	No
read_offset	Position of first register of data from the block of registers (0-based).	Number	No
timeout	Specify device timeout in seconds. If the extension device does not reply within specified time, it is considered as timeout error. Default values: 0.5s for Modbus RTU, 3s for Modbus TCP	Number	No
write_multiple	This parameter set the multiple writing function (function 15 or 16 is used instead of function 5 or 6). If "*Type*" is set to "*register*" and "*Write_multiple*" is set to "*true*", Modbus function 16 is used for writing to the register. If "*Type*" is set to "*coil*" and "*Write_multiple*" is set to "*true*", Modbus function 15 is used for writing to the coil. Default value is "false", which means that Modbus function 5 or 6(depending on register type) is used for writing.	String	No

Once you create your *.json file, which contains all the information of your profile, you can upload it easily into your Wiser for KNX by *Configurator → Modbus → Profiles → Add profile*.

It is recommended to use an existing device profile as example or template, when new device profile is created. It is possible to download existing profiles from Wiser for KNX and see the structure and syntax used there.

For more details about custom device profile creation please refer to the application note available at www.se.com.

24.12   Modbus settings in Wiser for KNX using scripts

Modbus Function Codes and Corresponding Master Functions

All the possible Modbus function codes, which can be used in Wiser for KNX, are listed below. There is a Lua function in Wiser for KNX for each function code.

All the functions described below can be used both for Modbus TCP and Modbus RTU.

FC#01 Read Coils

Name	"Read single coil"
Command	coil = mb:readcoils(address)
Command	coil= mb:readcoils(start, count)
Arguments	[address]: address of the coils
Returned values	1: ON, 0: OFF
Exception codes	01 or 02 or 03 or 04
Name	**"Read Multiple coil"**
Arguments	[start]: address of first coil to read [count]: number of coils to read (max 2000)
Returned values	1: ON, 0: OFF
Exception codes	01 or 02 or 03 or 04
Example	coil1,coil2,coil3= mb:readcoils(1000, 3) Value read from coil address 1000 is returned into variable coil1. Value read from coil address 1001 is returned into variable coil2. Value read from coil address 1002 is returned into variable coil3.

FC#02 Read Discrete Inputs

Name	"Read discrete input"
Command	value = mb:readdiscreteinputs(address)
Arguments	[address]: address of the input
Returned values	1: ON, 0: OFF
Exception codes	01 or 02 or 03 or 04.
Name	**"Read discrete inputs"**
Command	value = mb:readdiscreteinputs(start,count)
Arguments	[address]: address of first input to read [count]: number of inputs to read (max 2000)
Returned values	1: ON, 0: OFF
Exception codes:	01 or 02 or 03 or 04
Example	bool1, bool2= mb: readdiscreteinputs(10,2) Value read from discrete input address 11 is returned into variable bool1. Value read from discrete input address 12 is returned into variable bool2.

FC#03 Read Holding Registers

Name	"Read registers"
Command	value = mb:readregisters(address,count)
Arguments	[address]: address of first register to read [count]: number of registers to read (max 125)
Returned values	2byte values
Exception codes	01 or 02 or 03 or 04.

Example	int1, int2= mb: readregisters(1100,3)
	Value read from register address 1100 is returned into variable int1.
	Value read from register address 1101 is returned into variable int2.
	Value read from register address 1102 is returned into variable int3.

FC#04 Read Input Registers

Name	"Read input registers"
Command	value = mb:readinputregisters(address,count)
Arguments	[address]: address of first input register to read
	[count]: number of input registers to read (max 125)
Returned values	2byte values
Exception codes	01 or 02 or 03 or 04.
Example	value1, value2, value3, value4 = mb:readinputregisters(1015,4)
	Value read from input register address 1015 is returned into variable value1.
	Value read from input register address 1016 is returned into variable value2.
	Value read from input register address 1017 is returned into variable value3.
	Value read from input register address 1018 is returned into variable value4.

FC#05 Write Single Coil

Name	"Write single bit"
Command	value = mb:writebits (1000, value)
	[starting address, value "true" or "false"/"0"]

FC#05 Write Single Coil

Name	"Write single bit"
Command	value = mb:writebits(1000, value)
	[starting address, value "true" or "false"/"0"]

FC#06 Write Single Register

Name	"Write single register"
Command	value = mb:writeregisters(1000, 123)
	[address, value]

FC#0F Write Multiple Coils

Name	"Write multiple bits"
Command	value = mb:writebits(1000, true, false, true, ...)
	[address, bit value1, bit value2,..{max 1968 bits}]

FC#10 Write Multiple Registers

Name	"Write multiple registers"
Command	value = mb:writeregisters(1000, 123, 321, 222, ...)
	[address, value1, value2, ..{max 123 registers}]
Exception codes	mb:readcoils(start, count)
	mb:readdiscreteinputs(start, count)
	mb:readregisters(start, count)
	mb:readinputregisters(start, count)These commands read one or more registers/coils from the start address and return all values in case of success. In case of error, three variables are sent back:
	Nil
	Exception code description
	Exception code

The following information is taken from the Modicon website (https://modbus.org) and the Modbus application protocol manual.

Modbus exception codes

Code	Name	Meaning
01	Illegal Function	The Function Code received in the query is not an allowable action for the server (or extension). This may be because the function code is only applicable to newer devices, and was not implemented in the unit selected. It could also indicate that the server (or extension) is in the wrong state to process a request of this type, for example because it is not configured and is being asked to return register values.
02	Illegal Data Address	The data address received in the query is not an allowable address for the server (or extension). More specifically, the combination of reference number and transfer length is invalid. For a controller with 100 registers a request of offset 96 and a length of 5 will generate exception 02.
03	Illegal Data Value	The value contained in the query data field is not an allowable value for the server (or extension). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the MODBUS protocol is unaware of the significance of any particular value of any particular register.
04	Failure In Associated Device	An Unrecoverable error occurred while the server (or extension) was attempting to perform the requested action. (See Note 1)
05	Acknowledge	Specialized in conjunction with programming commands. The server (or extension) has accepted the request and is processing it, but long duration of time will be required to do so. This response is returned to prevent a timeout error from occurring in the client (or master). The client (or master) can next issue a poll program complete message to determine if processing is completed.
06	Busy, Rejected Message	Specialized use in conjunction with programming commands. The server (of extension) is engaged in processing a long-duration program command. The client (or master) should retransmit the message later when the server (or extension) is free.
07	NAK – Negative Acknowledgement	The program function just requested cannot be performed. Issue poll to obtain detailed device dependent error information. Valid for Program/Poll 13 and 14 only.
08	Memory Parity Error	Specialized use in conjunction with function codes 20 and 21 and reference type 6, to indicate that the extended file area failed to pass a consistency check. The server (or extension) attempted to read record file, but detected a parity error in the memory. The client (or master) can retry the request, but service may be required on the server (or extension) device.
0A	Gateway Path Unavailable	Specialized use in conjunction with gateways. Indicates that the gateway was unable to allocate an internal communication path from the input port to the out port for processing the request.
0B	Gateway Target Device Failed to respond	Specialized use in conjunction with gateways. Indicates that no response was obtained from the target device. Usually means that the device is not present on the network.

24.13   Modbus RTU configuration commands

Create Modbus RTU object
- require('luamodbus')
- mb = luamodbus.rtu()

Open Modbus RTU connection
- -- 19200 baud rate, even parity, 8 data bits, 1 stop bit, half duplex
- mb:open('/dev/RS485', 19200, 'E', 8, 1, 'H')
- mb:connect()

Terminal name
- '/dev/RS485'

Supported Baud rates
- 300 bit/s
- 600 bit/s
- 1200 bit/s
- 2400 bit/s
- 4800 bit/s
- 9600 bit/s
- **19200 bit/s**
- 38400 bit/s
- 57600 bit/s
- 115200 bit/s
- 230400 bit/s

Parity
- „N" None
- „E" Even
- „O" Odd

Data bits and stop bits
- **Data bits:** [Number of data bits = 5, 6, 7, **8**]
- **Stop bits:** [Number of stop bits **1**, 2]**Duplex**

„H"   **Half duplex**

"F"   Full duplex (not supported in RS-485)

The Baud rate is set depending on the distance between Modbus RTU devices. For instance, with a Baud rate of 9600 bit/sec the maximum communication distance between 1 - 15 Modbus RTU device is 1,200 metres. With the Baud rate of 19200 bit/sec the maximum communication distance is 900 metres, as shown in the table:

Baudrate setting

Baudrate setting	Maximum communication distance for 1 to 15 Modbus RTU devices (Typical with Belden 3105A cables)
9600 bit/sec	1200 m
19200 bit/sec	900 m

Parity refers to the technique of checking if transmission has been successful when transmitting between the devices. It lets you know if some data has been lost during transmission.

Setting of Parity

The Modbus supports only 11 bit frames. "Parity" refers to the number of 1s in a given binary number. Odd parity means there are an odd number of 1s and even parity means that there is an even number of 1s. Parity bits are used as a means of error detection as digital data is transmitted and received.

Both the Gateway and Meter have to be always set to the same as one another, odd, even or none. The default parity mode of Modbus is "even" parity.

- Parity = None: choose between one and two stop bits
- Parity = Even: one stop bit is set
- Parity = Odd: one stop bit is set

Delay between frames

Some devices require considerable time after the end of response until they are ready to receive the following request from the master. Henceforth, it applies to Schneider Electric SEPAM power devices and legacy extension devices. As they are slow in dealing with the original request they may miss the following request.

The time between the requests should be greater than 3.5 characters according to the Modbus specification. However, these legacy devices need more time. Please use the delay command appropriately:

```
--Wait for 1.5 seconds
os.sleep(1.5)
```

Communication itself takes care of minimal 3, 5-character delay.

Set the extension address:

```
--set slave address to 123
mb:setslave(123)
[1..247]
```

Read registers:

```
--read from address 1000 and write it to value
value = mb:readregisters(1000)
```

Close modbus connection:

```
mb:close()
```

Example:

```
--init modbus on first script execution
    if not mb then
            require('luamodbus')
            mb = luamodbus.rtu()
            mb:open('/dev/RS485', 38400, 'E', 8, 1, 'H')
            mb:connect()
    end
    mb:setslave(30)
    mb:flush()
```

Timeout interval between two consecutive bytes of the same message

```
    mb:getbytetimeout()
    mb:setbytetimeout(timeout)
```

Timeout interval used to wait for a response:

```
    mb:getresponsetimeout()
    mb:setresponsetimeout(timeout)
```

Timeout interval used to for an incoming indication from the master (extension mode only):

```
mb:getreceivetimeout()
mb:setreceivetimeout(timeout)
```

24.14   Modbus TCP configuration commands

Create Modbus TCP object

```
require('luamodbus')
mb = luamodbus.tcp()
```

Open Modbus TCP connection

```
-- IP: 192.168.1.2, port: 1234
mb:open('192.168.1.2', 1234)
mb:connect()
```

All the rest of commands needed to configure the Modbus TCP connection are the same as for Modbus RTU.

24.15   Modbus Master functions

Functions listed below can be used for Modbus RTU master or Modbus TCP client.

```
mb:setslave(slaveid)
```
sets extension id to read/write data from/to

```
mb:readcoils(start, count) [01]
```
start – address of first coil to read
count – number of coils to read

```
mb:readdiscreteinputs(start, count) [02]
```
start – address of first discrete input to read
count – number of discrete inputs to read

```
mb:readregisters(start, count) [03]
```
start – address of first holding register to read
count – number of holding registers to read

```
mb:readinputregisters(start, count) [04]
```
start – address of input register to read
count – number of input registers to read
returns all values on success and nil, error description on error

```
mb:writebits(start, v1, [v2, [v3, ...]]) [05]
```
writes values to coils from start address

```
mb:writeregisters(start, v1, [v2, [v3, ...]]) [06]
```
writes values to registers/coils from the start address
single write will be used when only one value is supplied, multiple write otherwise
returns all of values written on success and nil, error description on error

```
mb:reportslaveid()
```

reads extension internal data
returns values on success

returns nil, error description on error

Modbus extension functions

Receive data from master

  mb:receive()

receives data from master with 1-minute timeout

returns data as a binary string on success

returns nil, error description on error

Set modbus mapping of extension device

  mb:setmapping(coils, inputs, holding_regs, input_regs)

creates memory mapping for the registers with size specified for each type

Handle extension

  mb:handleslave()

waits for an incoming indication from master and sends a reply when necessary

Get functions

  mb:getcoils(start, count)

  mb:getdiscreteinputs(start, count)

  mb:getinputregisters(start, count)

  mb:getregisters(start, count)

gets one or many register/coil/input values from mapping from the start address

returns all values on success

returns nil, error description on error, exception code if applicable

Set functions

  mb:setcoils(start, v1, [v2, [v3, ...]])

  mb:setdiscreteinputs(start, v1, [v2, [v3, ...]])

  mb:setinputregisters(start, v1, [v2, [v3, ...]])

  mb:setregisters(start, v1, [v2, [v3, ...]])

sets value to register/coil mapping from the start address

returns true on success

returns nil, error description on error, exception code if applicable

Callback functions

  mb:setwritecoilcb(fn)

  mb:setwriteregistercb(fn)

sets a callback function for coil/register write event

callback should accept two parameters - coil/register address and value (boolean or number)

for multiple writes callback is executed for each coil/register separately

use nil to remove a callback.

25 EnOcean

EnOcean is energy harvesting wireless technology. It brings the opportunity to interconnect wireless devices such as push buttons, thermostats or PIR sensors with Wiser for KNX. It enlarges the possibilities of the wired KNX installation thanks to easy implementation and configuration in Wiser for KNX.

It is necessary to plug in USB EnOcean gateway to enable EnOcean technology in Wiser for KNX.

Details are described in following section.

25.1 EnOcean USB gateway

EnOcean functions of Wiser for KNX have been tested with EnOcean USB Gateway LSS10020040. Note that this product reference is not available in all countries. It is possible to use all USB En0cean gateways, which are based on product USB 300 (OEM), delivered by EnOcean organization as OEM product to 3rd parties.

Note that different frequencies are used for EnOcean (based on geographical region). Be careful and select the proper USB gateway for your location.

EnOcean USB Gateway

EnOcean frequencies:
- 868 MHz – Europe
- 902 MHz – USA / Canada
- 928 MHz – Japan
- 2.4 GHz – Worldwide usage

USB gateway is a small USB stick which connects PC's, consumer devices, DSL boxes and other USB master devices to EnOcean based radio products. It is equipped with a TCM 310 transceiver gateway module. It provides bidirectional EnOcean radio and bidirectional serial interface via USB. Radio messages are sent and received via an externally connected USB host.

It is possible to use only 1 EnOcean gateway connected to the USB port on the top of Wiser for KNX case.

It can be extended with extension cable (maximum 5 m).

25.2 EnOcean interfaces

In order to connect USB EnOcean gateway to your Wiser for KNX navigate to *Configurator → EnOcean → Interfaces*

EnOcean tab

Rescan

Connect you USB EnOcean gateway to USB port of Wiser for KNX and click *Rescan* in the left-bottom corner.

Once the device is found it appears in the list of interfaces.

List of interfaces

25.3 EnOcean to KNX mapping

All EnOcean devices send telegrams periodically. When the telegram is received by EnOcean gateway, the device will appear in the section **Configurator → EnOcean → EnOcean >> KNX**.

Most of EnOcean devices have dedicated button, which is used to send telegram immediately without waiting for periodic sending.

EnOcean >> KNX tab

ID	Device name	Profile	Interface	Last telegram	RSSI (dBm)	Mapping	
00069109		Not set	USB:1-1	23.03.2016 15:28:19	-54		
0006BFD6		Not set	USB:1-1	23.03.2016 15:23:04	-52		
0006C156		Not set	USB:1-1	23.03.2016 14:26:44	-57		

Once a specific device needs to be mapped to KNX, corresponding row has to be clicked and the EnOcean **Profile** needs to be specified. You can assign **Device Name** to the device. All supported device profiles are listed in section *Supported EnOcean Profiles.*

Specify device name and profile

Device	
Device name:	Light sensor
Profile:	A5-06-02 Light Sensor (0lx..1024lx)

Once the **Profile** of the devices is specified, mapping to KNX objects can be done. Open the **Device mapping** dialog with click on ⊕ icon on a desired line in the list of devices.

Each data object of the EnOcean device can be linked to KNX object in Wiser for KNX. Select the Wiser for KNX object from the drop-down menu or create new object directly from the dialog using ⊕ icon.

If parameter *Write to bus* is enabled, value is sent to KNX TP bus.

Mapping the device

Device mapping

Button A – 01. 1 bit (boolean)
Link to object: _____ ⊕
Write to bus: ☐ Does not apply to virtual objects

Button B – 01. 1 bit (boolean)
Link to object: _____ ⊕
Write to bus: ☐ Does not apply to virtual objects

When EnOcean gateway received telegram from specific device, the respective row is highlighted green.

ID	Device name	Profile	Interface	Last telegram	RSSI (dBm)	Mapping	
0087157A	Humidity&CO2&Temperature	A5-09-04 Humidity, CO2, Temperature S...	USB:1-1	23.03.2016 16:05...	-58		
008A4CB2	Light sensor	A5-06-02 Light Sensor (0lx..1024lx)	USB:1-1	23.03.2016 15:57...	-68		

Respective KNX group address gets updated with the new value coming from EnOcean.

Group ...	Object name	IP ...	TP ...	Ev...	Data type	Current va...	Log	Ex...	Tags	Updated at	Set...	Vis...	Cu...	
1/1/8	Humidity&CO2&Temperatu...	☐	☐		09. 2 byte ...	729.60	☐	☐		23.03.2016 16:05:50				

25.4 KNX to EnOcean mapping

Setting in the section *Configurator → EnOcean → KNX >> EnOcean* enables the possibility to control EnOcean devices (actuators, dimmers, etc.) from KNX installation via Wiser for KNX.

Wiser for KNX simulates behaviour of specific EnOcean device, which can control other EnOcean device.

Example:

EnOcean switch actuator can be controlled by EnOcean rocker switch. In order to control this switch actuator from KNX installation, Wiser for KNX simulates function of the rocker switch and control the switch actuator.

The first step of the configuration is definition of the device, which is simulated by Wiser for KNX.

⊕ Add new device

Click the *Add new device* button in the left-bottom corner. In the *Device* dialog you select unique *Address*, *Device name* and *Profile*, which represents the function of the device simulated by Wiser for KNX.

Device dialog
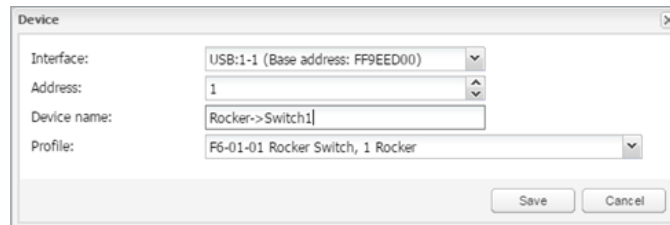
Once the device is added, pair it with a specific device in EnOcean network.
Set the EnOcean device in learning mode and then press the *Teach-in* button in Wiser for KNX configuration.

When the teaching telegram is sent successfully, the following message pops up.

Teach-in pop-up message
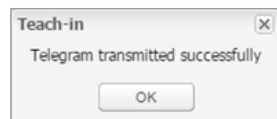
Further this device created in Wiser for KNX can be mapped with a specific KNX addresses.

When the KNX object value is changed (1/1/18 in the example above), the telegram is sent to the device, which has been paired with Wiser for KNX virtual device (F6-01-01 in the example above).

> Option "Send telegram" has to be ticked. Otherwise, the EnOcean telegram is not sent.

25.5 Supported EnOcean profiles

Supported EnOcean profiles

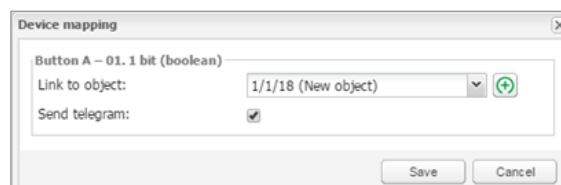| ID	Profile name	ID	Profile name
00-00-00	RAW 4-bytes	A5-04-01	Temperature & Humidity Sensor (0C..40C, 0%..100%)
00-00-01	RAW 4-bytes, split	A5-04-02	Temperature & Humidity Sensor (-20C..60C, 0%..100%, Battery)
F6-01-01	Rocker Switch, 1 Rocker	A5-06-01	Light Sensor (300lx..60000lx)
F6-01-02	Rocker Switch, 1 Rocker (inverted)	A5-06-02	Light Sensor (0lx..1024lx)
F6-01-03	Rocker Switch, 1 Rocker (separate)	A5-06-03	Light Sensor (0lx..100lx, 300lx..30000lx)
F6-02-01	Rocker Switch, 2 Rocker	A5-07-01	Occupancy Sensor
F6-02-02	Rocker Switch, 2 Rocker (inverted)	A5-08-01	Light Sensor 0lx to 510lx, Temperature 0°C to +51°C and Occupancy
F6-03-01	Rocker Switch, 4 Buttons	A5-08-02	Light Sensor 0lx to 1020lx, Temperature 0°C to +51°C and Occupancy
F6-04-01	Key Card Activated Switch	A5-08-03	Light Sensor 0lx to 1530lx, Temperature -30°C to +50°C and Occupancy
F6-10-00	Window Handle	A5-09-04	Humidity, CO2, Temperature Sensor
D5-00-01	Single Input Contact	A5-10-01	Temperature Sensor; Set Point, Fan Speed and Occupancy Control
A5-02-01	Temperature Sensor (-40C..0C)	A5-10-02	Temperature Sensor; Set Point, Fan Speed and Day/Night Control
A5-02-02	Temperature Sensor (-30C..10C)	A5-10-03	Temperature Sensor; Set Point Control
A5-02-03	Temperature Sensor (-20C..20C)	A5-10-04	Temperature Sensor; Set Point and Fan Speed Control
A5-02-04	Temperature Sensor (-10C..30C)	A5-10-05	Temperature Sensor; Set Point and Occupancy Control
A5-02-05	Temperature Sensor (0C..40C)	A5-10-06	Temperature Sensor; Set Point and Day/Night Control
A5-02-06	Temperature Sensor (10C..50C)	A5-10-07	Temperature Sensor; Set Point and Fan Speed Control
A5-02-07	Temperature Sensor (20C..60C)	A5-10-08	Temperature Sensor; Fan Speed Control
A5-02-08	Temperature Sensor (30C..70C)	A5-10-09	Temperature Sensor; Fan Speed and Day/Night Control
A5-02-09	Temperature Sensor (40C..80C)	A5-10-0A	Temperature Sensor; Set Point and Single Input Contact
A5-02-0A	Temperature Sensor (50C..90C)	A5-10-0B	Temperature Sensor and Single Input Contact
A5-02-0B	Temperature Sensor (60C..100C)	A5-10-0C	Temperature Sensor and Occupancy Control
A5-02-10	Temperature Sensor (-60C..20C)	A5-10-0D	Temperature Sensor and Day/Night Control
A5-02-11	Temperature Sensor (-50C..30C)	A5-10-10	Temperature and Humidity Sensor; Set Point and Occupancy Control
A5-02-12	Temperature Sensor (-40C..40C)	A5-10-11	Temperature and Humidity Sensor; Set Point and Day/Night Control
A5-02-13	Temperature Sensor (-30C..50C)	A5-10-12	Temperature and Humidity Sensor; Set Point Control
A5-02-14	Temperature Sensor (-20C..60C)	A5-10-13	Temperature and Humidity Sensor; Occupancy Control
A5-02-15	Temperature Sensor (-10C..70C)	A5-10-14	Temperature and Humidity Sensor; Day/Night Control
A5-02-16	Temperature Sensor (0C..80C)	A5-20-10	Generic HVAC interface
A5-02-17	Temperature Sensor (10C..90C)	A5-30-01	Single Input Contact, Battery Monitor
A5-02-18	Temperature Sensor (20C..100C)	A5-30-02	Single Input Contact
A5-02-19	Temperature Sensor (30C..110C)	A5-38-08-02	Dimmer
A5-02-1A	Rocker Switch, 2 Buttons - On/Off/Toggle/Dim/Scene	F6-03-02	Light and blind control 2 buttons
A5-02-1B	Rocker Switch, 4 Buttons - On/Off/Toggle/Dim/Scene	F6-03-03	Light and blind control 4 buttons

25.6 Blinds and dimming with EnOcean

There is a new EnOcean feature in the controller implemented since firmware 2.5.0. This feature allows the controller to use dimming and blind functions and recognizes the long/short push of the pushbutton. In EnOcean profiles F06-03-02 and F06-03-03.

Dimming/Blind function
Long/short press

F6-03-01 Rocker Switch, 4 Buttons
F6-03-02 Rocker Switch, 2 Buttons - On/Off/Toggle/Dim/Scene
F6-03-03 Rocker Switch, 4 Buttons - On/Off/Toggle/Dim/Scene
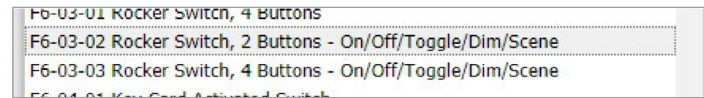
Mapping of these EnOcean pushbuttons opens settings dialog with Short and long press settings.

Setting the buttons

Device mapping

| Button A0 | Button A1 | Button B0 | Button B1 |

Short press mode: On / Start / Down / Close
Short press object: 5/1/1 Living room - Light ON/OFF
Write to bus: ☐ Does not apply to virtual objects
Long press mode: Dimming up
Long press object: 1/1/2 Dimming up - Living room
Write to bus: ☐ Does not apply to virtual objects
Step size: 25%

Save   Cancel
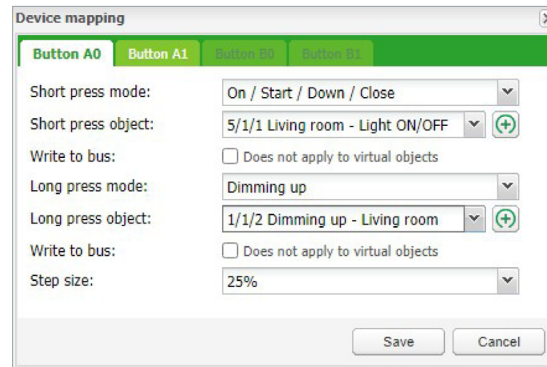
Short press modes

Short press modes:
- On / Start / Down / Close
- Off / Stop / Up / Open
- Toggle
- Start / Stop
- Stop / Start
- Scene

Short press object - link KNX object for short press action.

Long press modes:
- No Action (disabled)
- On / Start / Down / Close
- Off / Stop / Up / Open
- Toggle
- Dimming up
- Dimming down

Long press object - link KNX object for long press action.

26 Alerts

Alerts tab displaying a list of alert messages defined with alert function inside scripts. The messages are stored in the main database.

List of alert messages

Alert time	Script name	Message
10.12.2021 1…	system	System start
09.12.2021 0…	system	System start
08.12.2021 1…	system	System start
08.12.2021 1…	system	System start
29.11.2021 1…	system	System start
24.11.2021 0…	system	System start
23.11.2021 1	system	System start

🗑 Clear | ⏮ ◁ | Page 1 of 3 ▷ ⏭ | Displaying alerts 1 - 15 of 39

alert(message, [var1, [var2, [var3]]])

Stores the alert message and current system time in the main database.

Example:
```
temperature = 25.3
 if temperature > 24 then
-- resulting message: 'Temperature levels are too high: 25.3'
alert('Temperature level is too high: %.1f', temperature)
end
```

27 Logs

Logs can be used for scripting code debugging. The log message's appearance is defined by the log function.

log(var1, [var2, [var3, ...]])

Converts variables to human-readable form and stores them.

Example:

```
-- log function accepts Lua nil, boolean, number and table (up to 5
nested levels) type variables
a ={ key1 ='value1', key2 =2}
b ='test'
c =123.45
-- logs all passed variables
log(a, b, c)
```

28 Error log

Error messages are displayed in the *Error log* tab.

Error log list

ization	Vis. graphics	Scripting	User access	Modbus	EnOcean	Alerts	Logs	**Error log**	About

Error time	Script name	Error description
09.11.2021 1…	zigbee	
09.11.2021 1…	zigbee	
09.11.2021 1…	zigbee	
09.11.2021 1…	zigbee	
09.11.2021 1…	zigbee	
09.11.2021 1…	zigbee	
09.11.2021 1	zigbee	

🗑 Clear | ⏮ ◀ | Page [1] of 3 ▷ ⏭ | ⧉   Displaying errors 1 - 15 of 33

29 Web server software Nginx

The new webserver Nginx is used for Wiser for KNX. It is improving performance with low memory demand.

More info at: https://www.nginx.com.

If you are using pre 1.2 versions of firmware, clearing of browser's cache is mandatory after the firmware upgrade.

You will also need to re-do your links and Tabs as Nginx has different links to pages:

Main page link old versions sample:

http://your IP address/cgi-bin/scada-vis/index.cgi

Main page link Nginx sample:

http://your IP address/scada-vis

30 BACnet

30.1 Characteristics

BACnet is a communication protocol for Building Automation and Control Networks. It is an ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers, ANSI – American National Standards Institute, and ISO – International Organization for Standardization protocol.

Wiser for KNX has been certified by BACnet Testing Laboratories (BTL) as BACnet Application Specific Controller (B – ASC).

BACnet is designed to allow communication of building automation and control systems for applications such as heating, ventilation, air conditioning control, lighting control, access control, fire detection systems, and their associated equipment. BACnet protocol provides exchange information for building automation devices, regardless of the particular building service they perform.

30.2 Wiser for KNX configuration

Interconnection of Wiser for KNX and other BACnet devices is done over Ethernet physical layer. Wiser for KNX can act as the BACnet server only. It means that Wiser for KNX serves data that can be read by the BACnet client device and BACnet client device can write data to the server.

As Wiser for KNX is KNX based device the connection to the BACnet network comes from KNX group objects, which are exported to BACnet.

30.3 Object export

All the KNX objects in Wiser for KNX object list (*Configurator → Objects*) have the parameter "Export". By selecting this "Export" checkbox the specific KNX object will be visible in BACnet as the BACnet object.

KNX objects

Group add...	Object name	IP > L...	Loc >...	Event...	Data type	Current value	Log	Export	Tags
0/1/0	Scene object #1	✓	☐		05. 1 byte unsi...	1	✓	✓	
1/0/0	Scene object #2	☐	✓		05. 1 byte unsi...	0	☐	✓	
1/0/1	Light central	☐	☐		01. 1 bit (boole...	1	☐	✓	
1/1/0	Office light on/off	☐	☐		01. 1 bit (boole...	Off	☐	☐	SA, L
1/1/1	Office light feedback	✓	☐		01. 1 bit (boole...	Off	☐	✓	
1/1/2	Lobby light on/off	✓	☐		01. 1 bit (boole...	Off	☐	☐	SA, L
1/1/3	Lobby light feedback	☐	☐		01. 1 bit (boole...	Off	☐	✓	
1/1/4	Emergency light on/off	☐	☐		01. 1 bit (boole...	Off	☐	☐	SA, L

Binary objects will appear as binary values, numeric values will appear as analog values.

Other data types are not supported.

30.4 BACnet configuration

BACnet configuration consists of setting BACnet server parameters in Wiser for KNX. The BMS - Building Management System discovers the exposed data.

30.5 Configuration

Wiser for KNX acts as a BACnet server which has to be configured under *Configurator → Utilities → System → Network → BACnet settings*

BACnet settings

BACnet settings	✕
Server enabled	☐
Device ID	127001
Device name (optional)	
Password	mybacpwd
Object priority	16
Add group address to object name	☐
Use comment as object description	☐
Convert object units to BACnet units	☐
Port	47808
BBMD IP	
BBMD port	
BBMD lease time (seconds)	
	OK Cancel

Server enabled – Enable/Disable BACnet server.

Device ID – BACnet device ID has to be unique on the BACnet network.

Device name (optional) – BACnet name is composed of controller's hostname_Device ID by default. If Device name is filled, BACnet name equals Device name

Password – BACnet password.

Objects priority – Define to which priority array Wiser for KNX will write to. Wiser for KNX writes to Relinquish Default (RD) property by first reading (Upload from BMS) only – it takes the current value of the object. It is not possible to change the value of Relinquish Default property afterwards. If an object read from Wiser for KNX has a higher value than RD property, then it raises the Overwritten flag.

Add group address to object name – KNX address will be included in object's name.

Use comment as object description – Comment i.e. **ETS import** will be used as object's description.

Add group address to object name – Names of BACnet objects contain information about group address when this option is selected.

Port – BACnet port, default 47808.

BBMD IP – BACnet router IP.

BBMD port – BACnet router port

BBMD lease time (seconds) – registration resend interval

30.6 BACnet objects

List of BACnet objects with their parameters is available under:
Configurator → Utilities → System → Network → BACnet objects
BACnet objects can be downloaded to CSV files via the *Download CSV* button.

Download CSV button is hidden if the browser does not support this feature.

BACnet objects

• Type	▲ Instance	• Name	• Current value
2 (AV)	256	Scene object #1	1
2 (AV)	2048	Scene object #2	0
5 (BV)	2049	Light central	true
5 (BV)	2305	Office light feedback	false
5 (BV)	2307	Lobby light feedback	false

BACnet objects

Name: spaceLYnk_127001
Device ID: 127001
Port: 47808

Download CSV

30.7 BACnet COV settings

Objects exported to BACnet can be subscribed by the BACnet client using COV (Change of value) subscription.

All analog values, which are active for COV subscription are listed in:

Configurator → Utilities → System → Network → BACnet COV settings

BACnet COV settings

BACnet COV settings

Maximum COV subscriptions	256

ⓘ Changing COV values will cause all active COV subscriptions to be cancelled, priority array values will be reset

Scene object #1	1
Scene object #2	1

OK   Cancel

Each analog value active for the COV subscription has the parameter COV increment. This parameter defines the minimal change of value (delta), which implies a change of the value on the client side. The default value of COV is set to 1. It means, that until the value in Wiser for KNX is not changed by more than 1, the value is not changed on the client side.

If COV increments parameters are changed in *Configurator → Utilities → System → Network → BACnet COV settings* and saved, all COV subscriptions are canceled. The COV subscription has to be restarted from the client side.

Changing COV increment values cause a reset of priority array values of all objects.

30.8 BACnet standardized device profile

Wiser for KNX has been tested at the BACnet Testing Labs (BTL) and found to comply with all the necessary interoperability requirements.

More details and results from BTL testing can be found here:

https://www.bacnetinternational.org/

30.9 List all BACnet interoperability building blocks (BIBBs) supported

BACnet Interoperability Building Blocks

Data Sharing	ReadProperty-B	DS-RP-B
	ReadPropertyMultiple-B	DS-RPM-B
	WriteProperty-B	DS-WP-B
	COV-B	DS-COV-B
Device and Network Management	Dynamic Device Binding-B	DM-DDB-B
	Dynamic Object Binding-B	DM-DOB-B
	DeviceCommunicationsControl-B	DM-DCC-B
	TimeSynchronization-B	DM-TS-B
	UTCTimeSynchronization-B	DM-UTC-B
	ReinitializeDevice-B	DM-RD-B

BACnet Object Types Supported
- Device
- Analog Value
- Binary Value

Data Link Layer Options
- Media: BACnet IP
- Option: Register as a Foreign Device

30.10   Building operation workstation

Schneider Electric StruxureWare is a BACnet certified Building Management System.

Building Operation WorkStation is a software used to configure and commission the Enterprise Server and the Automation Server which can retrieve and send data to Wiser for KNX.

Building operation Workstation
software
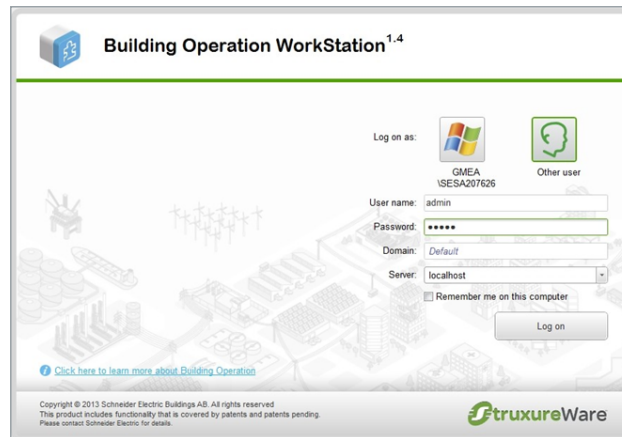
There is a dedicated document, which describes the interoperability between Wiser for KNX and Building Operation Workstation over BACnet. If you look for more details about this topic, please refer to the application note available at www.se.com.

31 RS-232 Serial line

31.1 Characteristics

The RS-232 serial interface communication standard has been in use for many years. It is one of the most widely used connections for serial data transmitting because it is simple and reliable.

The RS232 serial interface standard still retains its popularity and remains in wide-spread use. It is still found on some computers and many interfaces, often being used for applications ranging from data acquisition to supply a serial data communications facility in general computing environments.

The long-term and widespread use of the RS232 standard have meant that products are both cheap and freely available, and in these days of new higher speed standards, the reliable, robust RS232 standard still has much to offer. The interface is intended to operate over distances of up to 15 meters; it is based on one Master/one Extension rule.

Application Example:
• Connection to simple devices or other bus subsystems.
• Audio/video, IR system integration.

31.2 Configuration commands

Open connection:
```
require('serial')
port = serial.open('/dev/RS232', {baudrate = 9600})
```
Write to port:
```
port:write('test data')
```
Blocking read:
```
-- script will block until 10 characters are read
data = port:read(10)
```
Timeout read:
```
-- script will wait for 10 characters for 20 seconds
data = port:read(10, 20)
```
Close serial port:
```
port:close()
```
RS-485 serial line is controlled in the same way using the same Configuration Commands as mentioned above. The only difference is in the serial.open command:

```
port = serial.open('/dev/RS485', {baudrate = 9600})
```

For more details about RS-232 communication please refer to the application note available at www.se.com.

32 USB 2.0

Characteristics
- USB 2.0 provides a bandwidth of 480 Mbit/s, corresponding to an effective image data rate of 40 MB/s.
- Integrated voltage supply (5 VDC) for devices in the 4-pole cable. Devices complying with the USB specification may consume a total of 500 mA from the bus. Devices with a power of up to 2.5 W can therefore be supplied via the bus.
- The USB cable has to only be 4.5 m long at the maximum.
- Data transmission is possible in both directions

Application Example:
- USB interface can be used for extending memory capacity via attaching a USB flash drive.

32.1 Configuration commands

io.readfile (file)

Read the whole file at once. Returns file contents as a string on success or nil on error.

io.writefile (file, data)

Writes given data to a file. Data can be either a value convertible to a string or a table of such values. When data is a table, then each table item is terminated by a new line character. Return Boolean as write result when a file can be open for writing or nil when the file cannot be accessed.

USB flash drive supports FAT, FAT32, and NTFS file system. Maximum size of Flash drive is 32GB.

Send and receive SMS messages via attaching USB GSM adapter
- Use Huawei E173 modem.
- The modem has to be plugged into USB port of Wiser for KNX and it starts operating immediately.
- Specific functions should be added into the user script library with PIN code setting and telephone number white-list which will be able to receive and send SMS messages.

Command syntax

To change object value using SMS or read the value of an object by SMS request, you have to send SMS in the format described below.

Write to bus:

SMS command format: *W ALIAS VALUE*

Read from bus:

SMS command format: *R ALIAS*

On read request, the script will reply with an SMS message containing the current value of the selected object

ALIAS can be:

Group address (e.g. 1/1/1)

Name (e.g. Obj1). If the name contains spaces, then it has to be escaped using double quotes (e.g. "Room Temperature")

Object data type and name have to be set in the *Configurator → Objects* tab. Otherwise; the script will not be able to read and write to the object.

Only ASCII symbols are accepted in the message.

For more details about sending SMS please refer to application note document *AN011_Email SMS_and_ FTP_ in_ Wiser for KNX*
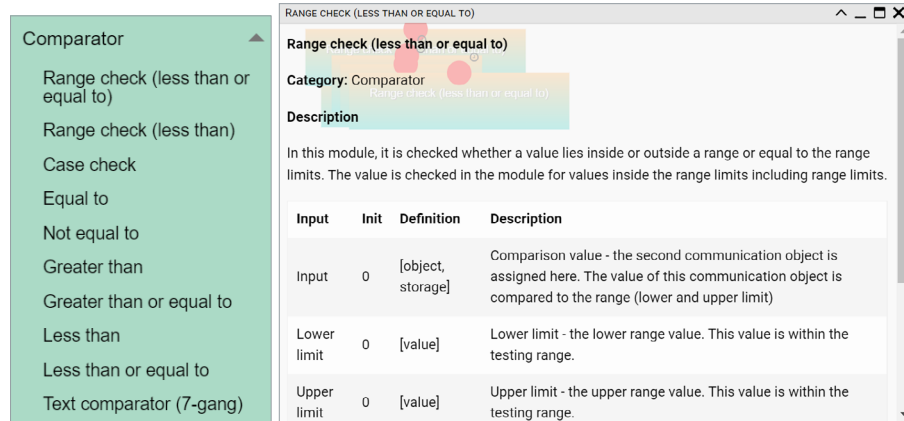
33 FB Editor

FB (Function blocks) allow easy, PLC (Programmable logic controller) like approach to programming in accordance with IEC 61499 standard.

UX helpers

UX helpers contain block, inputs, and outputs description. Helpers are transparent and can be folded. All helpers can be printed in print view.

Click on the question mark at the end of each line, a detailed description of the element appears.

33.1 FB Editor basic control

Undo – undo last change.

Redo – redo last change.

Clear and New – delete all function blocks in the diagram.

Print – print the current diagram.

Zoom in – enlarge the view.

Zoom out – reduce the view.

Live monitoring – live monitoring of values changes by sending values from block to contained group objects which will trigger block functions on outputs.

Save as file – save the current diagram as a file.
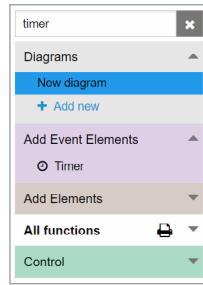
Load from file – reload diagram from a file.

Preview code – a preview of LUA code

Show and generate – show and generate LUA code

Search box - will find function block containing typed letter.

Search box

33.2 Adding new diagram

A new diagram can be added by clicking *+ Add new* in the diagram tab.
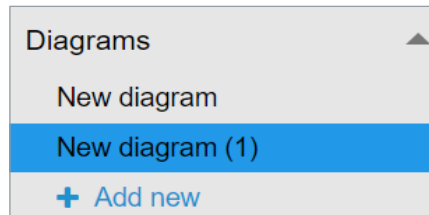
Diagram can be renamed by double click on the diagram name.

The name of each diagram has to be unique.

Diagram can be deleted by clicking on *x* beside diagram name.

All unsaved changes will be lost when creating a new diagram.

Adding function block to the diagram

Left-click on the selected function block to be added to the working space.

When added, elements need to be assigned /set.

Clicking on elements will open *Properties* dialog window on the right side.

Sample: Description of *Address* Function block changed from *Address* to selected object "0/1/0".

   ⊗　Delete FB　　　▭　Duplicate FB　　　◼　New FB properties

Complex function blocks properties window contains multiple parameters

Example: Staircase lighting function without any assigned objects

Objects connected to the function block have to be created first.

Event – object triggered by event/timer.

Input

Show – Show / hide input value/connection point in function block

Object – selecting object / value / storage / string

Select object – select concerned object

New object properties

Function Properties

Output
- **Show** – Show / hide output value / connection point in function block.
- **Write to bus** – value will be written to the bus when checked.
- Select **Output** – selecting output.
- **Min delta** – a minimal difference in value change.

Example: Staircase lighting function.

Input – staircase timer control.

Duration – duration of staircase time in sec.

Enable trigger – enable re-triggering of staircase timer.

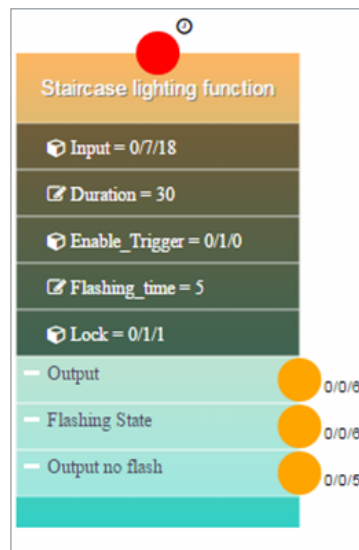**Flashing time** – warning flashing time of staircase timer before the end (inactive when empty).

Lock – enabling / disabling staircase timer.

Output – output of staircase timer.

Flashing state – warning flashing state object.

Output no flash – output of staircase timer without warning function.

Staircase lighting function block

Connecting function blocks together

Connection points colors explanation:

Red circle - to be connected with timer or event. When an event is selected at least one event element has to be linked. Block logic will run each time the event element will receive a telegram. To link event element select *Show* for all inputs triggering logic and link event element to them with corresponding group addresses.

Grey circle – not connected

Yellow circle/line – represent events

Blue circle/line – for non-event connection

After each change on the diagram *Show* and *Generate* buttons have to be pressed for changes to take an effect.

Function block diagram
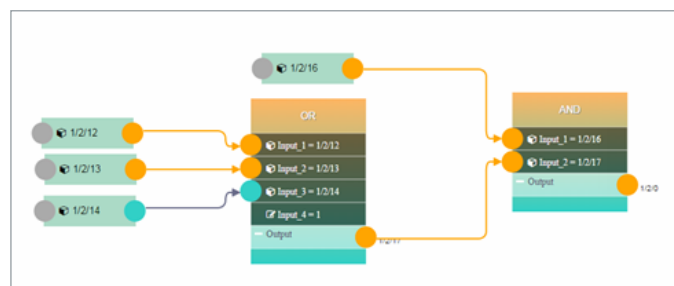
Preview of generated LUA code

Preview code

FB Resident (sleep 60)

```
require('custom.fbeditor20.Control')

Input = nil
Duration = nil
Enable_Trigger = nil
Flashing_time = nil
Lock = nil
out, flashing, no_flash = fbe_staircase_lighting(Input, Duration, Enable_Tr
if out ~= nil then
        grp.write('0/1/7', out)
end
if out ~= nil then
        grp.write('0/1/4', out)
end
```

OK

34 Application note documents

A detailed description of selected topics with a focus on easy implementation can be found in application notes documents.

List of Application notes:
- AN001_Wiser for KNX integration using BACnet
- AN003_Modbus power meters and Wiser for KNX
- AN005_PIR trend and logs with Wiser for KNX
- AN006_Advance techniques in visualization (Wiser for KNX)
- AN010_RS232 control with Wiser for KNX
- AN011_Email, SMS and FTP in Wiser for KNX
- AN015_Wiser for KNX visualization shortcut on the desktop
- AN016_Wiser for KNX as a Modbus extension
- AN017_Addressable limits of the Wiser for KNX controller
- AN018_Advanced project tutorial
- AN019_Exiway Power Control connected to SBO via Wiser for KNX
- AN023_Redundant operation mode of two Wisers for KNX
- AN025_Advanced graphic's tutorial
- AN027_Creation of Modbus profile
- AN028_Wiser for KNX upgrade procedure
- AN029_Umotion client touch panels 10 and 15
- AN032_Lighting solution for comfortable environment using Wiser for KNX
- AN033_DMX control with Wiser for KNX
- AN034_Lighting solution for comfortable environment using Wiser for KNX II
- AN037_Modbus integration of room controllers SE8000 series
- AN041_CoolMasterNet
- AN042_Optimalization of visualization in complex projects
- AN044_Power_dissipation of DIN rail KNX
- AN046_Programming in Lua with Wiser for KNX
- AN047_ Corridor Linking using LUA scripts with Wiser for KNX
- AN048_ Monthly Email Backup File of Wiser for KNX
- AN049_ Exiway Smart Control and Wiser for KNX
- AN2_001_ How to flash microSD card in Wiser for KNX
- AN2_003_ Connectivity Ecosystem
- AN2_005_ Power Dissipation of KNX devices
- AN2_100_ RGBW-Dimming with KNX Multitouch Pro
- AN2_101_ Authorize actions on KNX with RFID-Tags
- AN2_102_ Revox Integration
- AN2_103_ How to fix issue with Bootloader in Wiser for KNX / Wiser for KNX
- AN2_104_Alexa Voice control integration
- AN2_105_Touch 3
- AN106_Wiser for KNX – How to change DNS settings for remote connectivity-controller's DNS
- AN107_Wiser for KNX, SpaceLYnk- System Hardening Guideline
- AN108_Wiser for KNX – Google Assistant integration
- AN109_Wiser for KNX – KNX IoT 3rd Party API Guidelines

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