

## Application note

# Modbus Integration of room controllers SE8000 Series

## How to integrate room controllers SE8000 Series with Wiser for KNX



# Safety Information

## Important Information



Read these instructions carefully before trying to install, configure, or operate this software. The following special messages may appear throughout this bulletin 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 follow this symbol to avoid possible injury or death.

### DANGER

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

### WARNING

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

### CAUTION

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

### NOTICE


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A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

## Safety Precautions

 <b>WARNING</b>
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Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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# 1 Introduction

This application note describes integration of room controllers SE8000 Series with Wiser for KNX logic controller via Modbus RTU. SE8000 Series room controller enables significant energy savings with accurate temperature control which can be improved by integration with *Property Management System* (PMS). On top of that you can use integration with Wiser for KNX which allows you to have 100% control over room controller and extend the applicability of the device.

Using Wiser for KNX as a logic controller with SE8000 Series room controller brings following benefits:

- Real-time access to every value in the room controller
- Process room controller's values in Wiser for KNX and use it for additional calculations
- Visualize room controller's values in Wiser for KNX via integrated web browser
- Command room controller via Wiser for KNX's GUI or from visualization
- Export data to supervising system as BACnet (StruxureWare Building Operation)
- Build an architecture consist of many room controllers managed from Wiser for KNX

A glossary is available in the appendix chapter of this document. Please refer to it whenever necessary.

This Application note is extension of AN027 Creation of Modbus profile. We recommend you to read AN027 firstly.

## Competencies

This document is intended for readers who have been trained on Wiser for KNX or spaceLYnk products.

Integration should not be attempted by someone who is new to the installation of either products. In addition, we recommend that you are familiar with:

- The technical knowledge of Modbus protocol and PLCs
- JSON (JSON profiles are described in AN027)

## System prerequisites

Software	Version	Download
Wiser for KNX	2.1 and newer	<a href="http://www.schneider-electric.com">http://www.schneider-electric.com</a>

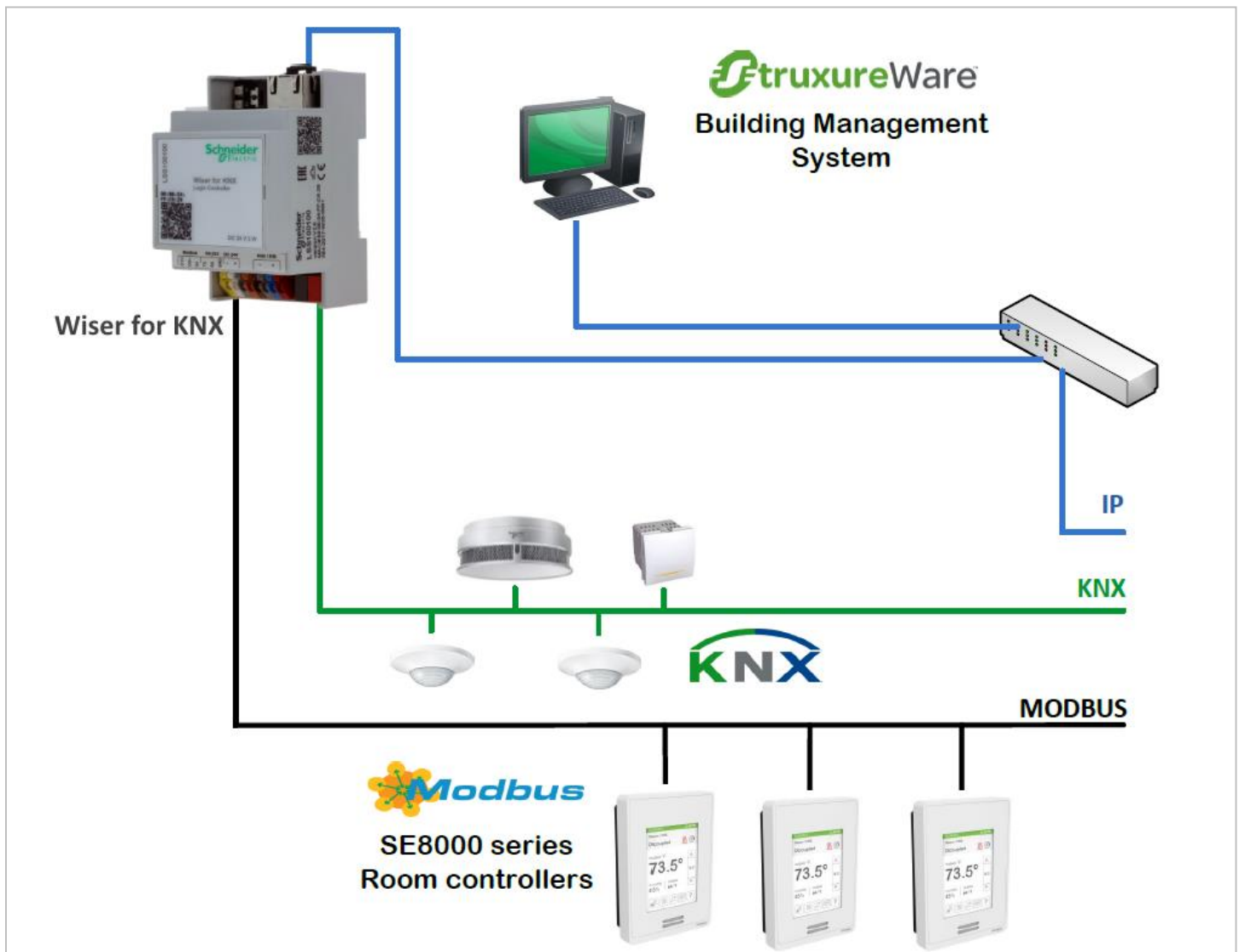
Table 1: software versions of used software

## 2 Design

In the Picture 1 you can see connection between Wiser for KNX and room controllers SE8000 Series as well as integration with *Building Management System* (BMS). Wiser for KNX logic controller is used as a gateway between Modbus devices (room controllers) and other protocols such as *KNX*, *BACnet* or *EnOcean*.

Wiser for KNX has following physical interfaces: *KNX*, *RS-232*, *RS-485 (Modbus)*, *RJ-45*, *USB*

For additional information about available interfaces and protocols in Wiser for KNX use Wiser for KNX's user guide available on Schneider Electric website.



Picture 1: Room controllers SE8000 Series & Wiser for KNX

### 3 Room controller SE8000 Series

SE8000 Series is a product range of room controllers. The SE8000 Series room controllers can be easily integrated into most building management systems (BMS). We use Wiser for KNX logic controller as a Modbus gateway in this application note.

Main benefits of SE8000 Series:

- Touch screen interface, multi-language support, discreet occupancy sensor
- Simple, quick and cost-effective installation
- Integrated BACnet, Modbus, ZigBee communication protocols



Picture 2: SE8000 Series room control

Whole integration process is divided into 5 steps described in following chapters.

1. Room controller installation (wiring) - [chapter 3.2](#)
2. Room controller settings (Modbus communication settings) - [chapter 3.3](#)
3. Wiser for KNX Modbus RTU settings – [chapter 3.3](#)
4. Modbus profile adding – [chapter 5](#)

Modbus registers mapping to objects in Wiser for KNX - [chapter 5](#)



### 3.1 SE8000 Series room controller models

SE8000 Series consist of 3 main models which can be modified via multiple options as humidity sensor, PIR sensor, network as well as casing and cover's color.

SE8000 Series room controller models:

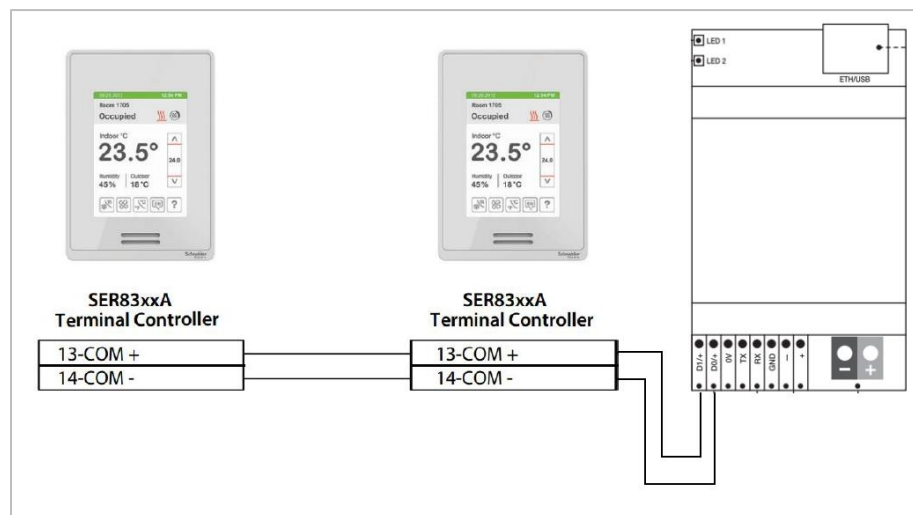
- SE8300 - Low Voltage FCU Controller
- SER8300 - Line Voltage FCU Controller
- SE8600 - RTU, Heat pump & IAQ Controller

This application note contains Modbus profile for all 3 models. These Modbus profiles covers all functions available for Modbus. SE8000 Series room controllers exist in a few variants (with / without PIR, with / without humidity sensor) so that take care when mapping. Not all Modbus registers have to be used.

### 3.2 SE8000 Series installation

Follow the installation guide of your room controller in term of power connection and other specific wiring options according to your needs.

For Modbus functionality connect RS485 + and RS485 - with correct terminals on Wiser for KNX (D1/+ and D0/-). Modbus use the same RS485 port as BACnet. Setup menu allows switching between the two protocols.

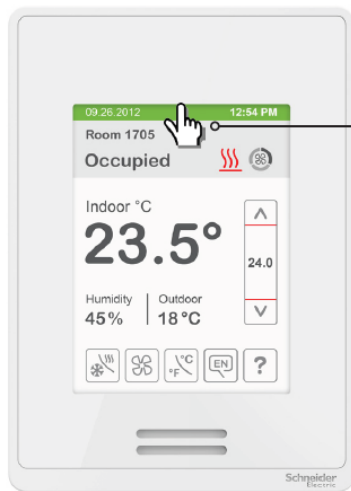


### Picture 3: Modbus wiring

Note: If you use Modbus protocol it is not possible to communicate over BACnet. Nevertheless, you can use BACnet server in Wiser for KNX in case of needs.

### 3.3 SE8000 Series settings

Step 1. Enter setup mode



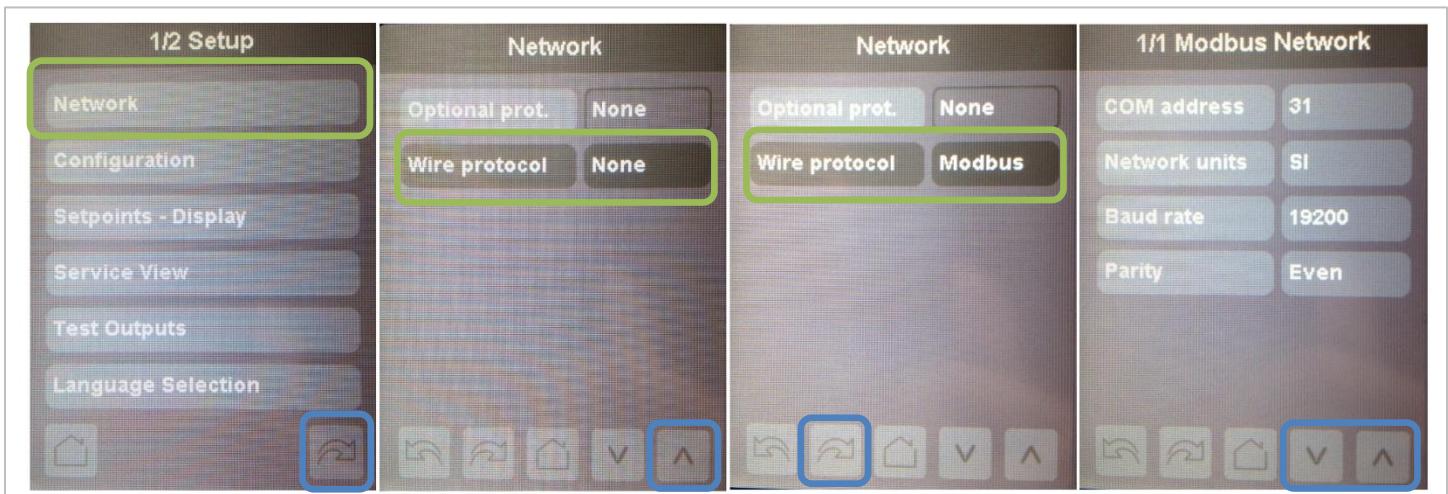
Touch and hold this point for 3 seconds to enter setup mode

**Note:** If a configuration/installer password is activated to prevent unauthorised access to the configuration menu parameters, a password entry prompt shows to prevent access to device configuration components.

Picture 4: Enter setup mode

Step 2. Click **Network**

Step 3. Set **Wire protocol** to **Modbus**



Picture 5: Modbus network settings

Step 4. Change COM address to 1-31 to allow Modbus communication. Default value of 254 disables Modbus communication for the room controller

Step 5. Set other parameters according **RTU settings** in Wiser for KNX to establish Modbus communication. Modbus settings for Wiser for KNX are in *Configurator -> Modbus -> RTU settings*.

Modbus communication between Room controller and Wiser for KNX is established. Next step is to add Modbus profile (described in [chapter 5](#)).

Note: If your room controller does not support Modbus interface (older fw's versions) firstly use software called **Uploader SE8000** for update to the latest fw version. The software is available on **The Exchange Community Download Center**.

## 4 Modbus device profile

Modbus profile is a \*.json file with structure which defines how to read and write registers in Modbus device. This \*.json file contains parameters as register addresses, description, datatypes, units which is necessary to handle Modbus device. Each Modbus device has its own profile (\*.json file).

Pre-installed Modbus profiles in Wiser for KNX are available on The Exchange Community as well as an attachment of this AN.

<https://exchangecommunity.schneider-electric.com>

These Modbus profiles can be downloaded for free. Downloaded Modbus profiles can be used for creation of own profile or in case of delete pre-installed profile from Wiser for KNX.

SE8000 Series room controller profiles:

- SE8300.json
- SER8300.json
- SE8600.json

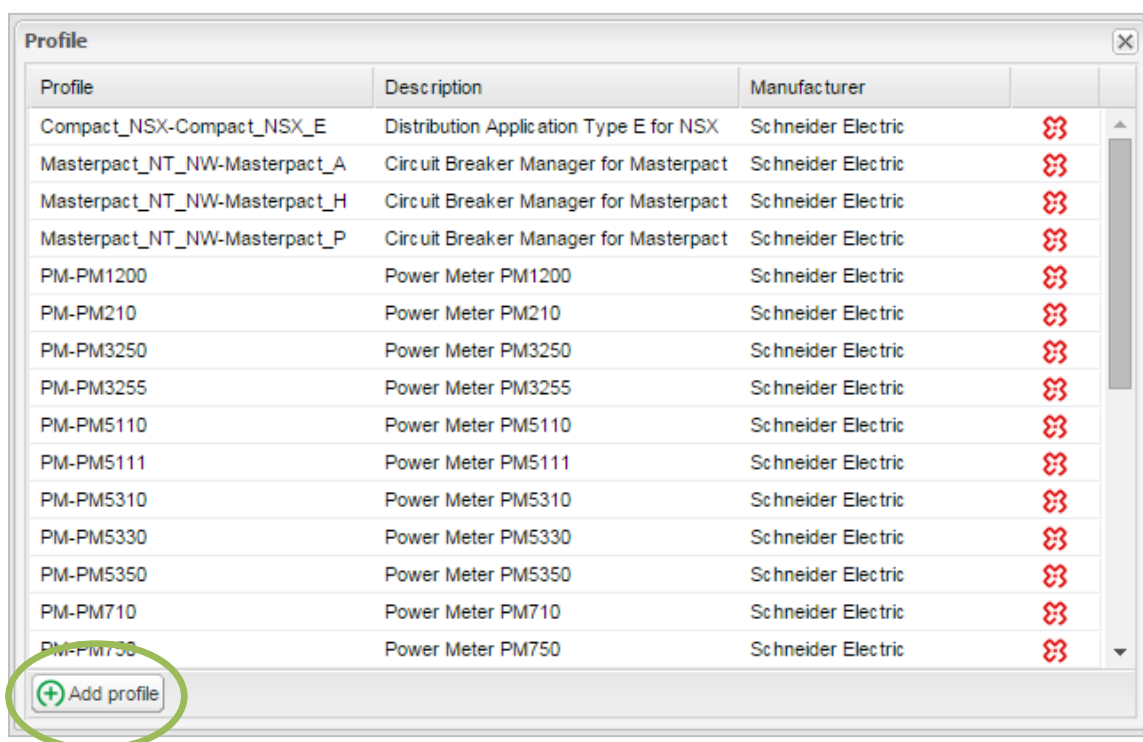
These Modbus profiles are fully customizable. You can modify or delete unnecessary registers in text editors as Notepad++. For more information use AN027 where it is described.

## 5 Add Modbus profile and map registers

When you download \*.json file for your room controller it is necessary to add this profile to Wiser for KNX.

1. Open *Configurator* -> *Utilities* -> *Modbus*
2. Click **Profiles**
3. Click **Add profile**
4. Choose \*.json file on your hard drive
5. Click **Save**

Modbus profile is added in the list of Modbus devices.



Picture 6: Adding Modbus profile

Next step is to add device and map registers.

1. On *Modbus tab* click **Add device**
2. Fill in required information
3. Click **Save**
4. Click **Mapping** and map registers which you need

Registers are mapped and available in *Configurator -> Utilities -> Objects*

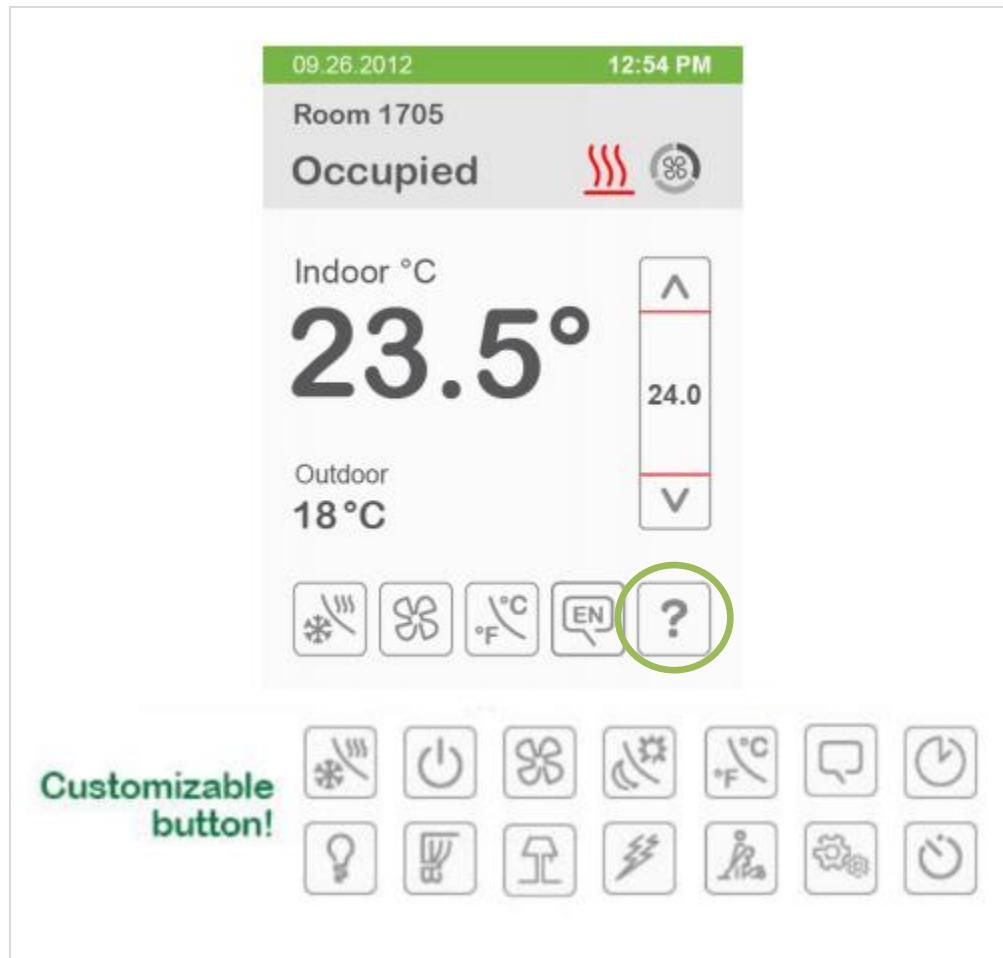
You can fully control room controller from this point, because most of the Modbus registers are writable. You can set behaviour, settings of your room controller from Wiser for KNX GUI remotely.

Note: Complete Modbus integration guide is available as an attachment of this AN.

Modbus profiles SE8000 Series are attached as a \*.json files ([see chapter 4](#)).

## 6 Customizable buttons

The benefits of integration of the SE8000 series room controller to Wiser for KNX can be illustrated on customizable buttons. This feature is available from FW version 1.2.



Picture 7: Customizable button

This customizable button is used to access to help page by default. Nevertheless, it can be used for many other functions. It can be combined with specific icon too.

Function	Custom value	Button Function
1	0	Default Function
2	1	No Function
3	2	System Mode Function
4	3	Fan Function
5	4	Override Function
6	5	Schedule Function
7	6	Units Function
8	7	Help Function
9	8	Language Function
10	9	Configuration Function
11	10	Custom Function
12	11	Standby Function (displays long message or standby image)

**Table 2: Customizable button function**

There are 2 registers in the SE8000.json for control the icon and behaviour at address 80 and 81.







Description	BACnet ***	Low-Limit	High-Limit	Modbus Data Type	Modbus Functions	Modbus Register	Modbus Address
Custom button icon	MSV114	0	16	16-bit holding register	3,6	81	40081
Custom button behavior	MSV115	0	11	16-bit holding register	3,6	82	40082

**Table 3: Registers for control customizable icon**

**Note:** We recommend you to read information about registers in instructions carefully. SE8000 series room controller have real register addresses shifted -1.



When you map these registers to Wiser for KNX's objects you can change Custom button icon as well as behavior of the button. There is also mapped register Lua Parameter A (AV25).

Group address ▲	Object name	IP > TP f...	TP > IP f...	Event s...	Data type	Current value
1/1/1	SE8300 - Custom button icon	<input type="checkbox"/>	<input type="checkbox"/>	 	07. 2 byte unsigned...	Lighting Button
1/1/2	SE8300 - Custom button behavior	<input type="checkbox"/>	<input type="checkbox"/>	 	07. 2 byte unsigned...	Custom function
1/1/3	SE8300 - Lua Parameter A (AV25)	<input type="checkbox"/>	<input type="checkbox"/>	 	07. 2 byte unsigned...	1

Picture 8: Mapped objects in Wiser for KNX

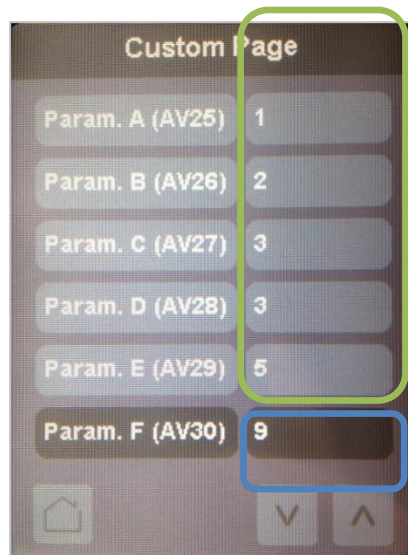
We can change value in this register thanks to mapped LUA Parameter A. As a next step, it is possible to create simple resident script which will watch the value in this register and react on this with some behaviour as switching off the lights.

**Note:** There are 6 registers available (LUA Parameters A – F) in SE8000 Series room controller.

Integrator can set behaviour of lights as follows:

When **Parameter A = 1** then switch off lights in house. When **Parameter A = 2** switch off the lights in house and garage. It is possible to create simply smart leave button with different behaviour. The functionality and usability of this smart button is almost limitless.

You can imagine LUA Parameters A – F as a multi-state memory. It is possible to initiate specific function in Wiser for KNX just via change of these parameters.



Picture 9: Custom page

## 7 Conclusion

Integration of SE8000 Series room controller in Wiser for KNX extend possibilities, functionality of room controllers. You can easily add Modbus profiles comes with this application to Wiser for KNX using *Modbus tab* in *Configurator*. Integration of SE8000 Series room controller in Wiser for KNX allows you to control SE8000 remotely from Wiser for KNX or created visualization. Additionally, you can export data comes from room controller to other supervisor systems mostly running on BACnet.

## 8 Appendix

### 8.1 Glossary

The following table describes the acronyms and defines the specific terms used in this document.

Abbreviation	Description
AN	Application Note
W4K	Wiser for KNX
HMI	Human Machine Interface
IDE	Integrated Development Environment
JSON	Javascript Object Notation

sL	Wiser for KNX
BMS	Building Management System
PMS	Property Management System
FCU	Fan Coil Unit

**Table 4: specific terms**

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