



Basic / Intermediate / Expert

# Authorize actions on KNX with RFID-Tags

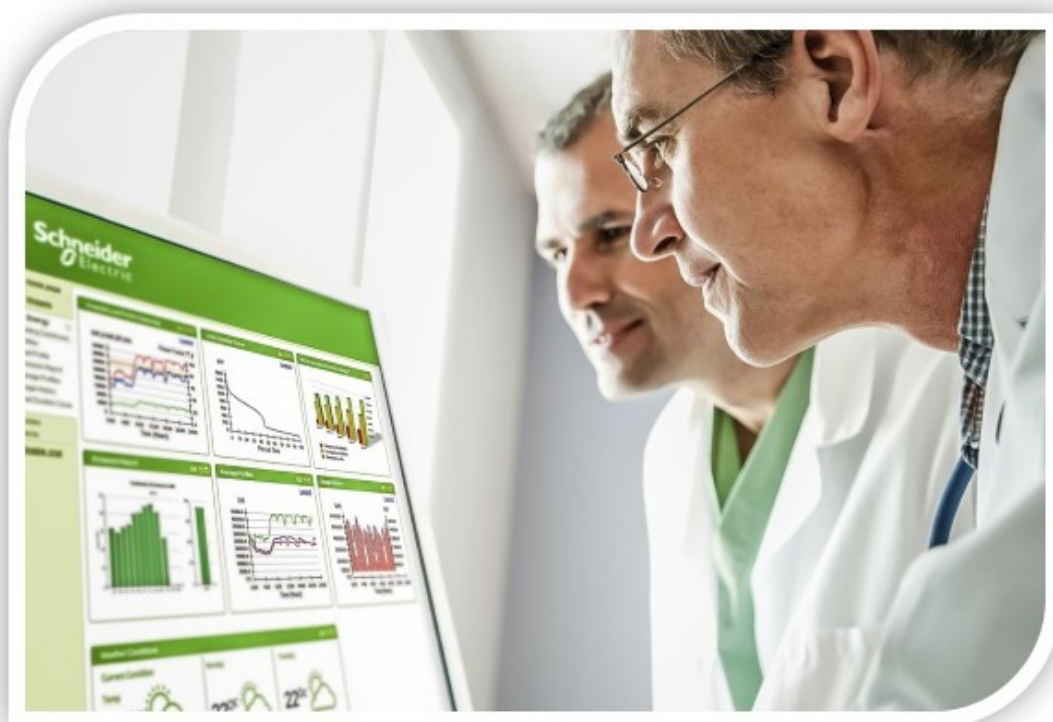
**RFID-Reader XGCS49LB201**

**RFID Tags XGHBPB3345**

## Application note

Trigger a door opener when a preconfigured RFID-Tag is detected.

02/2020



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# Important 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 follow 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.

## **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**

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

## Further information



The information provided must be complied with, otherwise program or data errors may occur.



You will find additional information here to make your work easier

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## For your safety



### **DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, 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 to several electrical devices**
- **Laying electrical cables**
- **Safety standards, local wiring rules and regulations**

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

# 1 Introduction

When you have in your project a function where a kind of authentication is needed (e.g. door opener, to start a certain scenario etc.) then you can use this application example. It consists out of a RFID-Reader, RFID-Tags and a Wiser for KNX / spaceLYnk.

This AN will guide you through the configuration of the Wiser for KNX/spaceLYnk and the connection of the RFID-Reader.



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

## 1.1 Competencies

This document is intended for readers who have been trained on Wiser for KNX, spaceLYnk products. The integration should not be attempted by someone who is new to the installation of either products. In addition we recommend that you be familiar with:

- The concepts of KNX
- The concepts of adapting a script in a simple way
  - basic technical knowledge on software technologies such:
    - » Web Services, XML, JSON
    - » Lua scripting
    - » KNX

### 1.1.1 System prerequisites

Software	Version	Download
Wiser for KNX / spaceLYnk LSS100100 / LSS100200	2.4 and newer	<a href="http://www.schneider-electric.com">http://www.schneider-electric.com</a>
XGCS49LB201 / Modbus-Profile		

Table 1: Software versions and used software

Products	Order number	Download
Wiser for KNX / spaceLYnk	LSS100100 / LSS100200	<a href="http://www.schneider-electric.com">http://www.schneider-electric.com</a>
RFID-Reader	XGCS49LB201	<a href="https://www.schneider-electric.com/en/product/XGCS49LB201/panel-smart-antenna-with-pilot-lights/">https://www.schneider-electric.com/en/product/XGCS49LB201/panel-smart-antenna-with-pilot-lights/</a>
Connection-Cable	TCSMCN1F2	<a href="https://www.schneider-electric.com/en/product/TCSMCN1F2/modbus-shielded-cable---m12-female-connector---end-with-free-wires---ip67---2-m/">https://www.schneider-electric.com/en/product/TCSMCN1F2/modbus-shielded-cable---m12-female-connector---end-with-free-wires---ip67---2-m/</a>
RFID-Tags	XGHBPB3345	<a href="https://www.schneider-electric.com/en/product/XGHBPB3345/key-fob-tag/">https://www.schneider-electric.com/en/product/XGHBPB3345/key-fob-tag/</a>

Table 2: products

## 2 Design

The picture shows the principle.

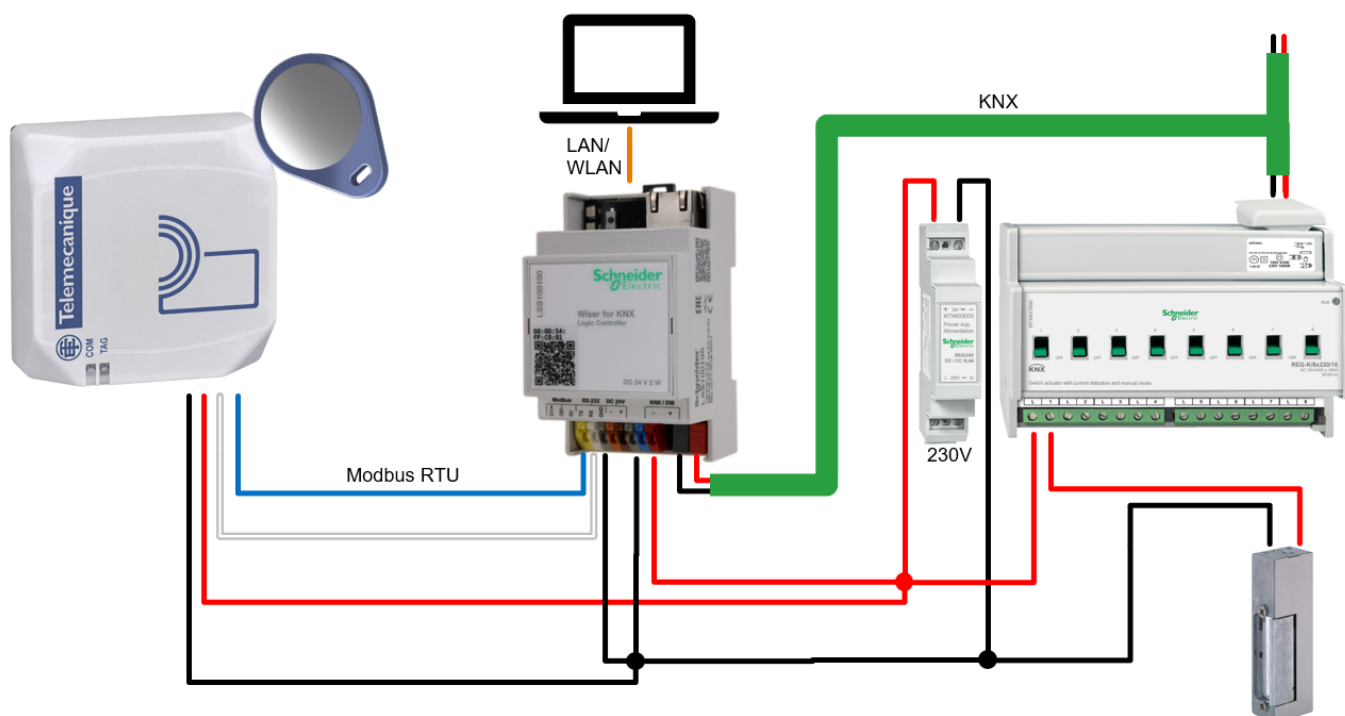


Figure 1: Principle overview

The script is designed to support up to 30 RFID-Tags. Each can be linked to a dedicated GA or several RFID-Tags to a single GA. Each time when a known RFID-Tag is detected the inbuilt LEDs of the RFID-Reader will be switched to green. An unknown RFID-Tag will be shown with red LEDs.

When a known RFID-Tag is detected the LEDs will be switched to blue to as long as the configurable staircase time is running. During that time no other RFID-Tag is accepted. Either a known one (LEDs will be switched to yellow) or even an unknown one (LEDs switch to red).

### 3 Configuration within W4K/spaceLYnk

#### 3.1 Adding the new Modbus-Profile

Add the new Modbus-Profile “XGCS49LB201.json” to the collection of existing profiles.

1. Go to the Tab “Modbus” within the configurator.
2. Click the button “Profiles”.
3. Click on “Add profile” and search for the dedicated file within your computer.
4. Click “Save” to implement it.

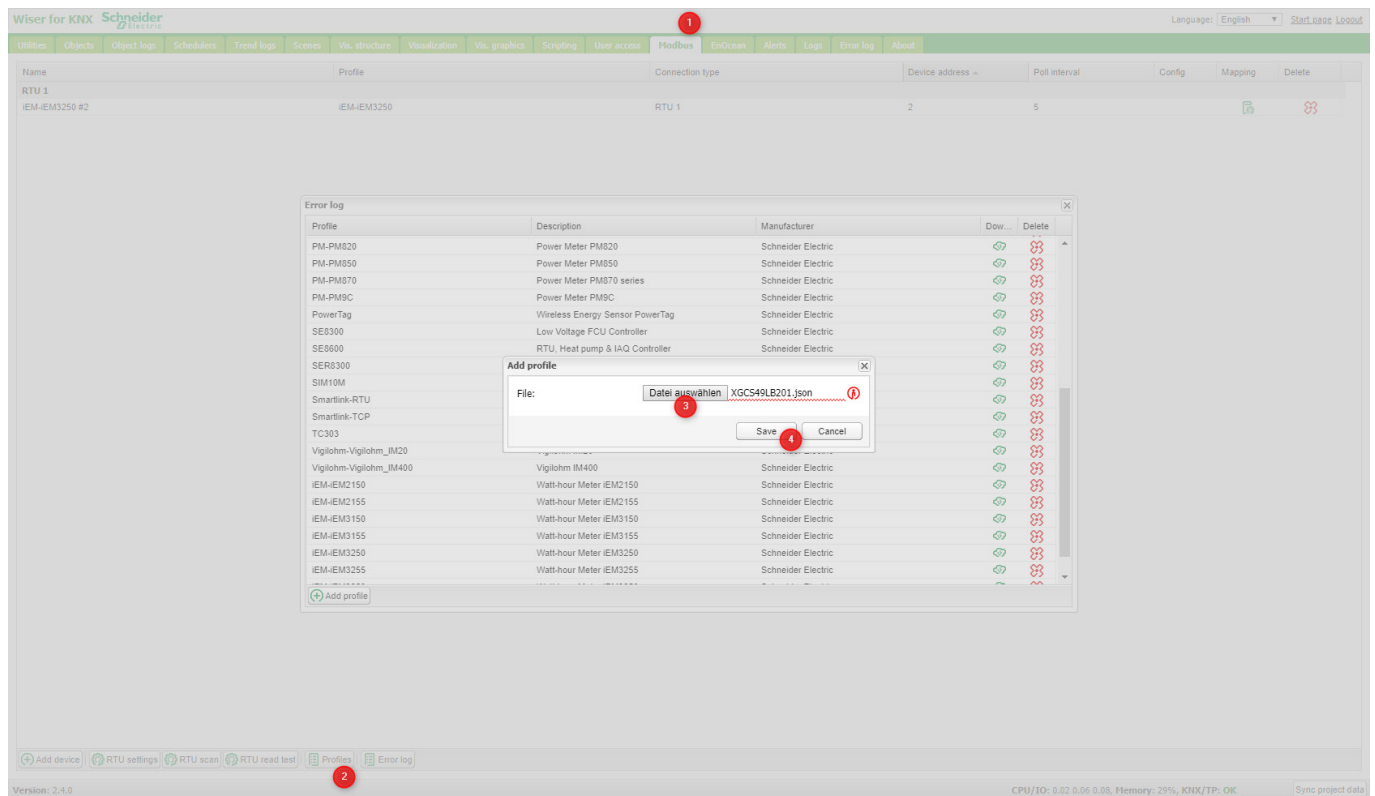


Figure 2: Adding Modbus profile



### 3.1.1 Adding the new Modbus device

Add the new device into the list of Modbus devices.

1. Click on “Add device”.
2. Give the new device a name.
3. Click the button “Profiles” and select “XGCS49LB201”.
4. The RFID-Reader has by default the device Address “1”.
5. Select a short Poll-Intervall to get quickly the information in case a Tag is detected.
6. Click “Save” to implement it.

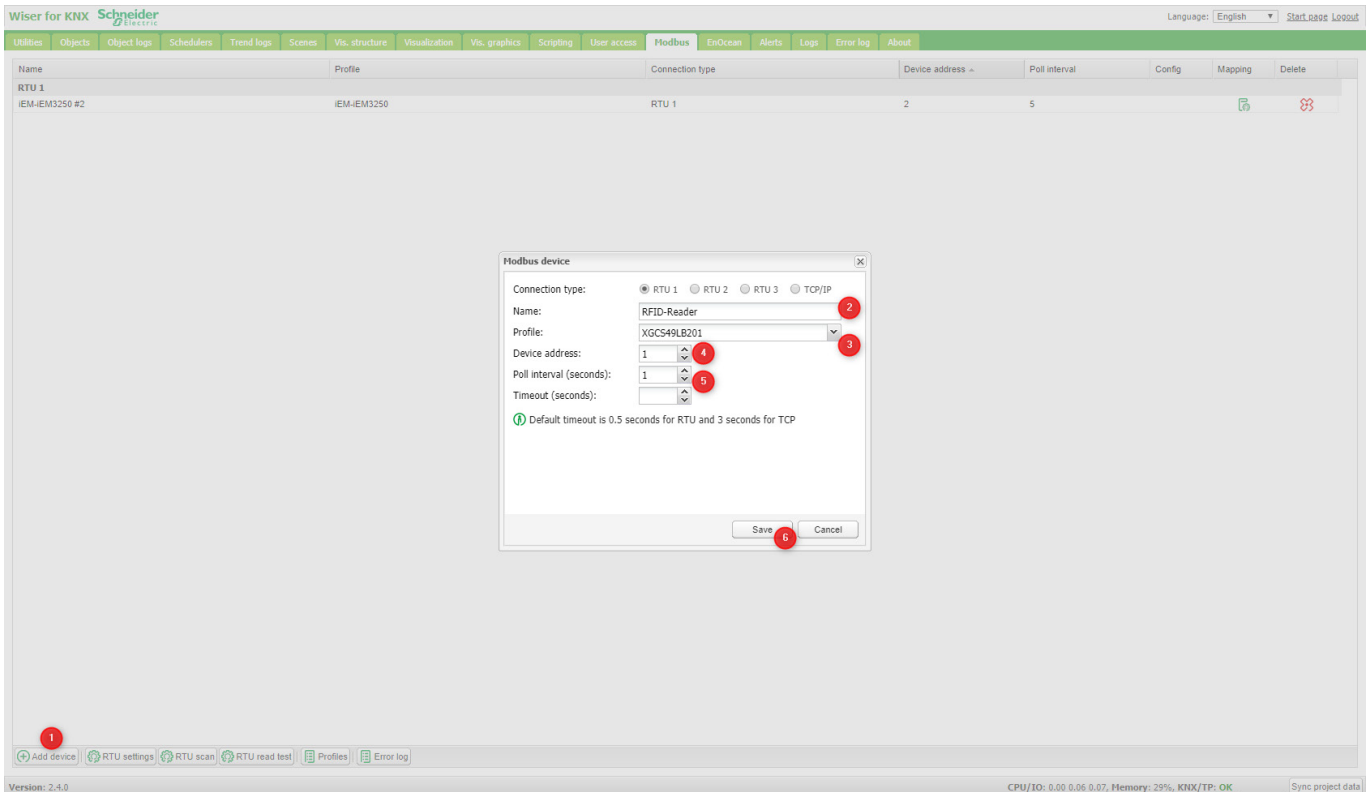


Figure 3: Adding new Modbus device

## 3.2 Mapping of Group-Addresses

Before you can map the GA's make sure that you have the following set of GA's available.

The GA's in the picture below are just an example. So take the ones which fits to your own GA-Structure.

Please make sure that all GA's have the Data type “2 byte unsigned integer”.

Group address	Object name	Event script	Data type	Current value
36/1/1	RFID_Status		07. 2 byte unsigned integer	0 Data
36/1/2	RFID_Counter		07. 2 byte unsigned integer	76 Times
36/1/3	UID_01_8002		07. 2 byte unsigned integer	36100 UID1
36/1/4	UID_02_8003		07. 2 byte unsigned integer	50267 UID2
36/1/5	UID_03_8004		07. 2 byte unsigned integer	0 UID3
36/1/6	UID_04_8005		07. 2 byte unsigned integer	0 UID4
36/1/7	UID_05_8006		07. 2 byte unsigned integer	0 UID5
36/1/8	UID_06_8007		07. 2 byte unsigned integer	0 UID6
36/1/9	UID_07_8008		07. 2 byte unsigned integer	0 UID7
36/1/10	UID_08_8009		07. 2 byte unsigned integer	0 UID8
36/1/11	LEDs		07. 2 byte unsigned integer	0 Colour

The script is designed to deal with up to 30 RFID-Tags and each can be linked with his own GA. But you can link several RFID-Tags with the same GA either. So you are pretty flexible according to the needed solution.

So you need to create the needed amount of GA within the object list like as shown below.

Please make sure that all GA's have the Data type "1 bit".

Utilities

Objects

Object logs

Schedulers

Trend logs

Scenes

Vis. structure































Visualization

Vis. graphics

Scripting

User access

>>

Group address ▲	Object name	Event script	Data type	Current value
36/2/1 ▾	Object1		01. 1 bit (boolean)	0
36/2/2 ▾	Object2		01. 1 bit (boolean)	0
36/2/3 ▾	Object3		01. 1 bit (boolean)	0
36/2/4 ▾	Object4		01. 1 bit (boolean)	0
36/2/5 ▾	Object5		01. 1 bit (boolean)	0
36/2/6 ▾	Object6		01. 1 bit (boolean)	0
36/2/7 ▾	Object7		01. 1 bit (boolean)	0
36/2/8 ▾	Object8		01. 1 bit (boolean)	0
36/2/9 ▾	Object9		01. 1 bit (boolean)	0
36/2/10 ▾	Object10		01. 1 bit (boolean)	0
36/2/11 ▾	Object11		01. 1 bit (boolean)	0
36/2/12 ▾	Object12		01. 1 bit (boolean)	0
36/2/13 ▾	Object13		01. 1 bit (boolean)	0
36/2/14 ▾	Object14		01. 1 bit (boolean)	0
36/2/15 ▾	Object15		01. 1 bit (boolean)	0
36/2/16 ▾	Object16		01. 1 bit (boolean)	0
36/2/17 ▾	Object17		01. 1 bit (boolean)	0
36/2/18 ▾	Object18		01. 1 bit (boolean)	0
36/2/19 ▾	Object19		01. 1 bit (boolean)	0
36/2/20 ▾	Object20		01. 1 bit (boolean)	0
36/2/21 ▾	Object21		01. 1 bit (boolean)	0
36/2/22 ▾	Object22		01. 1 bit (boolean)	0
36/2/23 ▾	Object23		01. 1 bit (boolean)	0
36/2/24 ▾	Object24		01. 1 bit (boolean)	0
36/2/25 ▾	Object25		01. 1 bit (boolean)	0
36/2/26 ▾	Object26		01. 1 bit (boolean)	0
36/2/27 ▾	Object27		01. 1 bit (boolean)	0
36/2/28 ▾	Object28		01. 1 bit (boolean)	0
36/2/29 ▾	Object29		01. 1 bit (boolean)	0
36/2/30 ▾	Object30		01. 1 bit (boolean)	0

When all GA's are in place you can continue with the mapping of GA's to the Modbus-Register.

Wiser for KNX Schneider									
Language: English Start/Save Logout									
Utilities	Objects	Object logs	Schedulers	Trend logs	Scenes	Vis. structure	Visualization	Vis. graphics	Scripting
Modbus									
EnOcean Alerts Logs Error log About									
Name	Profile	Connection type	Device address	Poll interval	Config	Mapping	Delete		
RTU 1									
RFID-Reader									
RFID-Reader - Tag Family Flags	36/1/1	RFID_Status	0 Data			Holding register: 32768 (uint16)			
RFID-Reader - Tag Counter	36/1/2	RFID_Counter	87 Times			Holding register: 32769 (uint16)			
RFID-Reader - ID	36/1/3	UID_01_8002	33026 UID1			Holding register: 32770 (uint16)			
RFID-Reader - ID	36/1/4	UID_02_8003	514 UID2			Holding register: 32771 (uint16)			
RFID-Reader - ID	36/1/5	UID_03_8004	0 UID3			Holding register: 32772 (uint16)			
RFID-Reader - ID	36/1/6	UID_04_8005	0 UID4			Holding register: 32773 (uint16)			
RFID-Reader - ID	36/1/7	UID_05_8006	0 UID5			Holding register: 32774 (uint16)			
RFID-Reader - ID	36/1/8	UID_06_8007	0 UID6			Holding register: 32775 (uint16)			
RFID-Reader - ID	36/1/9	UID_07_8008	0 UID7			Holding register: 32776 (uint16)			
RFID-Reader - ID	36/1/10	UID_08_8009	0 UID8			Holding register: 32777 (uint16)			
RFID-Reader - LED	36/1/11	LEDs	0 Colour			Holding register: 33295 (uint16)			

Figure 4: Mapping of GAs

### 3.3 Adding a new script

Please add a new script within the “Resident” section.

1. Click on “Scripting”
2. Click on “Resident”
3. Click on “Add new Script”
4. Give the Script a name.
5. Select a small “Sleep interval” to make the RFID-Reader responsive for e.g. “1s”
6. Set it active (or even later on)
7. Click on “Save”

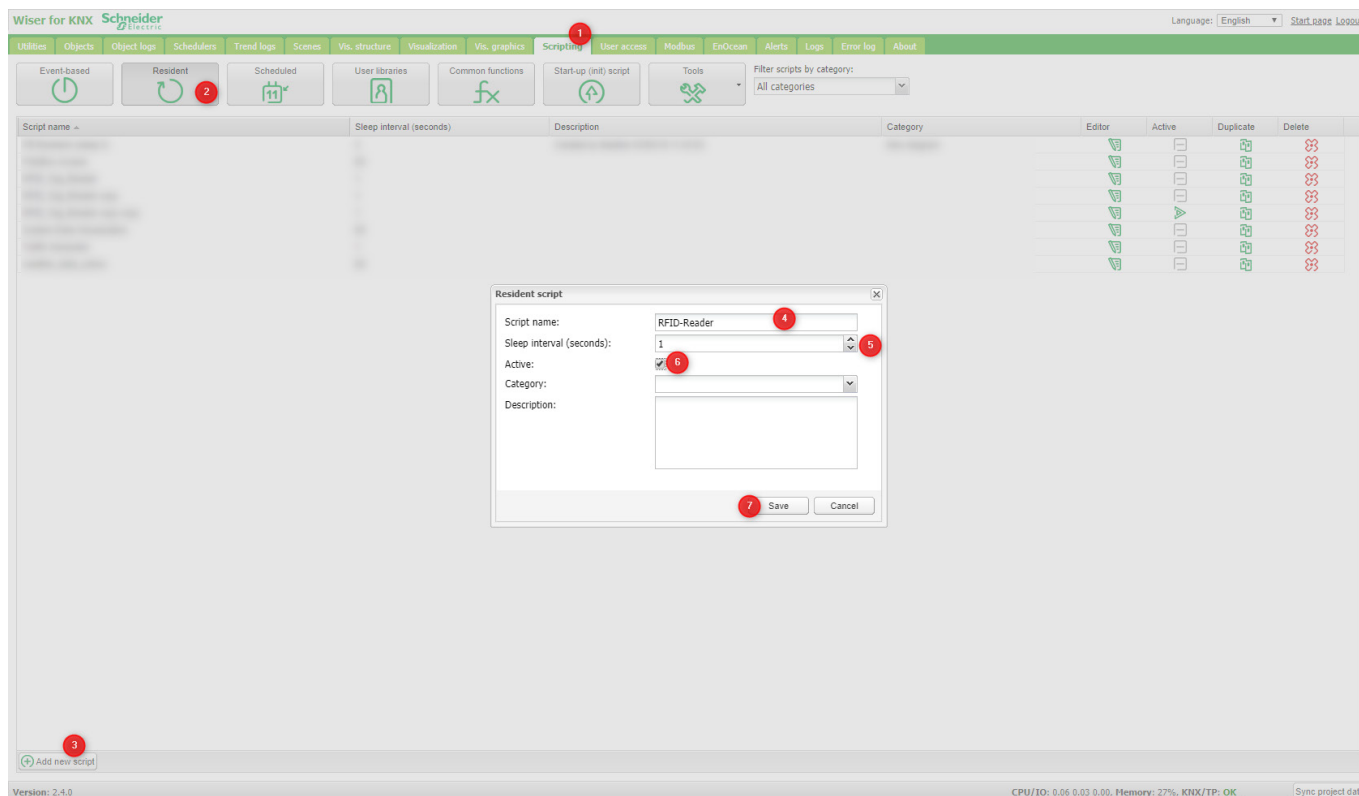


Figure 5: Adding new script

### 3.4 Open the new script and paste there the attached code

Open script editor, copy all text from attached file “RFID-Reader - Script.txt” and place it into script editor window.

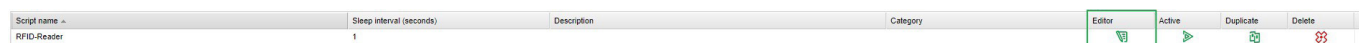




Figure 6: Editing of the script

### 3.4.1 What needs to be adapted

The script is structured in three parts:

- Description (Yellow)

```

1 -----
2
3 -- Description: RFID-Reader (XGCS49LB201) controls KNX-Objects for a certain time
4 -----
5 -- Script needs to be placed within \Scripting\Resident
6 -- You need to update the dedicated group address
7 -- and the staircasetime in seconds. In case of minutes or
8 -- hours you need to calculate accordingly.
9 -----
10
11

```

- Area to adapt (Green)

```

-- NEEDS TO BE ADAPTED! -----

RFID_Status_Obj_GA = '36/1/1'
LED_Obj_GA = '36/1/11'
UID1_Obj_GA = '36/1/3'
UID2_Obj_GA = '36/1/4'

```

```

-- Staircase time in seconds -----

```

- Main code (Don't touch when you are not familiar with LUA!)

```
-- !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
-- DONT CHANGE CODE BELOW -----
-- !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

-----
-- LED Colour Definition -----
-----

LED_GREEN = 2
LED_RED = 4
LED_BLUE = 1
LED_Yellow = 6
LED_OFF = 0

-----
-- Get RFID-Tag Status -----
-----

Tag_Present = bit.band(grp.getvalue(RFID_Status_Obj_GA), '0x01')
```

Within the script you need to adapt the KNX Group-Addresses you have used within your project.

Take care that only change the part between the apostrophe 'GA-TO\_EDIT'.

```
15
16 RFID_Status_Obj_GA = '36/1/1'
17 LED_Obj_GA = '36/1/11'
18 UID1_Obj_GA = '36/1/3'
19 UID2_Obj_GA = '36/1/4'
20
```

Within the script you can set parameters.

- The staircase in seconds. In case you want to have minutes please multiply with 60.
- You can log and trigger Alerts in case a known or unknown RFID-Tag is detected. In this case exchange the variable from “false” to “true”. When you want to use “Alerts” please have in mind that you can use for that the “Alert-App” out of the W4K/sL-Appstore.


```
21 -----
22 -- Staircase time in seconds -----
23 -----
24 |
25 -- if you need minutes please multiply with 60
26 -- staircasetime = 2 * 60 (example)
27
28 --staircasetime = 2 * 60
29 staircasetime = 30
30
31
32 -----
33 -- Alerts + Logs -----
34 -----
35
36 -- In case you want to document the detected Tags you can activate the following options by exchange
37 -- "false" against "true".
38 -- Alerts can be reviewed by the use of the dedicated App or within the tab "Alerts"
39
40 -- 1. "Log" each known detected Tag (Tag Number,
41 Log_known_Tags = false
42
43 -- 2. "Log" each unknown detected Tag
44 Log_unknown_Tags = false
45
46 -- 3. "Alert" by each known detected Tag.
47 Alert_by_known_Tags = false
48
49 -- 4. "Alert" by each unknown detected Tag
50 Alert_by_unknown_Tags = false
51
```

You need to adapt the RFID-Tag-Declaration table. Depending on the amount of RFID-Tags you want to use you need to identify the two IDs of each RFID-Tag and enter them in the table below (marked in yellow).

```

53 -----
54 -- RFID-Tag-Declaration -----
55 -----
56
57 RFID_Tag_UID = {}
58   RFID_Tag_UID[1], RFID_Tag_UID[2] = 19724, 49243      -- RFID-Tag 1
59   RFID_Tag_UID[3], RFID_Tag_UID[4] = 0, 0            -- RFID-Tag 2
60   RFID_Tag_UID[5], RFID_Tag_UID[6] = 0, 0            -- RFID-Tag 3
61   RFID_Tag_UID[7], RFID_Tag_UID[8] = 0, 0            -- RFID-Tag 4
62   RFID_Tag_UID[9], RFID_Tag_UID[10] = 0, 0           -- RFID-Tag 5

```



You will get this IDs when you bring the needed RFID-Tags one by one in front of the RFID-Reader and you need to go to the “Objects” Tap and look for the GAs where the ID will be stored. Note there the dedicated numbers and enter them as shown in the example above.

You need to enter your GAs which should be sent out when a known RFID-Tag is detected within the following table. Please make sure that you only adapt the GA himself between the apostrophe ‘GA-TO\_EDIT’.

```

90 -----
91 -- Group-Address-Declaration -----
92 -- This GA will be used (staircase timer) when the dedicated RFID-Tag is detected -----
93 -----
94
95 GA_Declaration = {}
96   GA_Declaration[1] = '36/2/1'      -- RFID-Tag 1
97   GA_Declaration[2] = '36/2/2'      -- RFID-Tag 2
98   GA_Declaration[3] = '36/2/3'      -- RFID-Tag 3
99   GA_Declaration[4] = '36/2/4'      -- RFID-Tag 4
100  GA_Declaration[5] = '36/2/5'      -- RFID-Tag 5
101  GA_Declaration[6] = '36/2/6'      -- RFID-Tag 6
102  GA_Declaration[7] = '36/2/7'      -- RFID-Tag 7
103  GA_Declaration[8] = '36/2/8'      -- RFID-Tag 8
104  GA_Declaration[9] = '36/2/9'      -- RFID-Tag 9

```

## 4 Conclusion

This Script is just one example how to easily implement an RFID-ID-Reader into your project. You can take it as it is or with the right knowledge as a basis (adapt it according to your project requirements).

The Script can as well easily enriched by the amount of RFID-Tags.

## 5 Appendix

### 5.1 Glossary

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

Abbreviation	Description
GA	Group-Address
RFID	Radio-Frequency IDentification
RFID-Tag	Is an electronic Tag that exchanges data with a RFID reader through radio waves.
W4K	Wiser for KNX (LSS100100)
sL	spaceLYnk (LSS100200)

Table 3: specific terms

### 5.2 Reference

Document title	Reference
RFID-Reader Datasheet	<a href="https://www.schneider-electric.com/en/product/download-pdf/XGCS49LB201">https://www.schneider-electric.com/en/product/download-pdf/XGCS49LB201</a>
RFID-Reader Userguide	<a href="https://download.schneider-electric.com/files?p_enDocType=User+guide&amp;p_File_Name=W916556690111.06_EN.pdf&amp;p_Doc_Ref=165566901A55">https://download.schneider-electric.com/files?p_enDocType=User+guide&amp;p_File_Name=W916556690111.06_EN.pdf&amp;p_Doc_Ref=165566901A55</a>

Table 4: reference

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