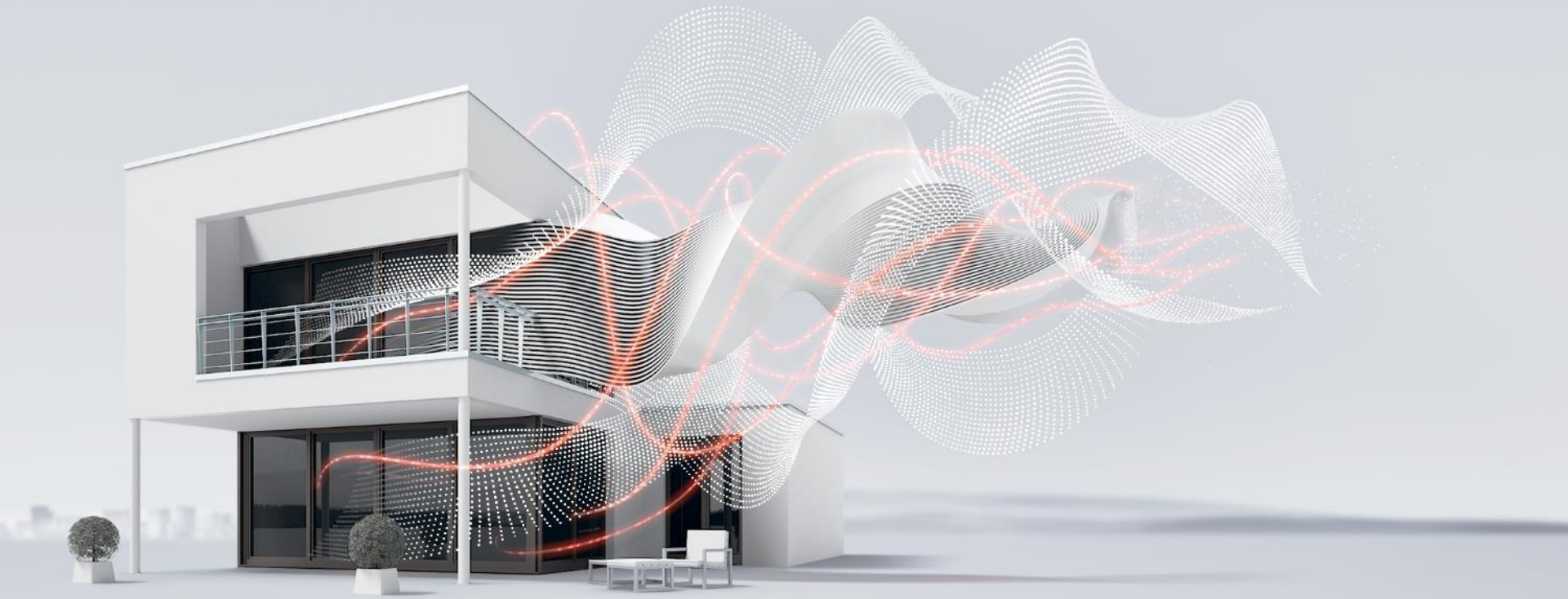


HEIDELBERG, SEPTEMBER 2017

# Webinar KNX Split Unit Gateway SUG/U

## BU EPBP GPG Building Automation

Carolina Bachenheimer-Schaefer, Thorsten Reibel, Jürgen Schilder & Ilija Zivadinovic
Global Application and Solution Team

# Agenda

Split Unit Gateway SUG/U 1.1

- Introduction and device overview
- Application and benefits
- ETS parametrization
- Integration i-bus Tool

# Split Unit Gateway SUG/U 1.1

## Introduction

# Split Unit Gateway SUG/U 1.1

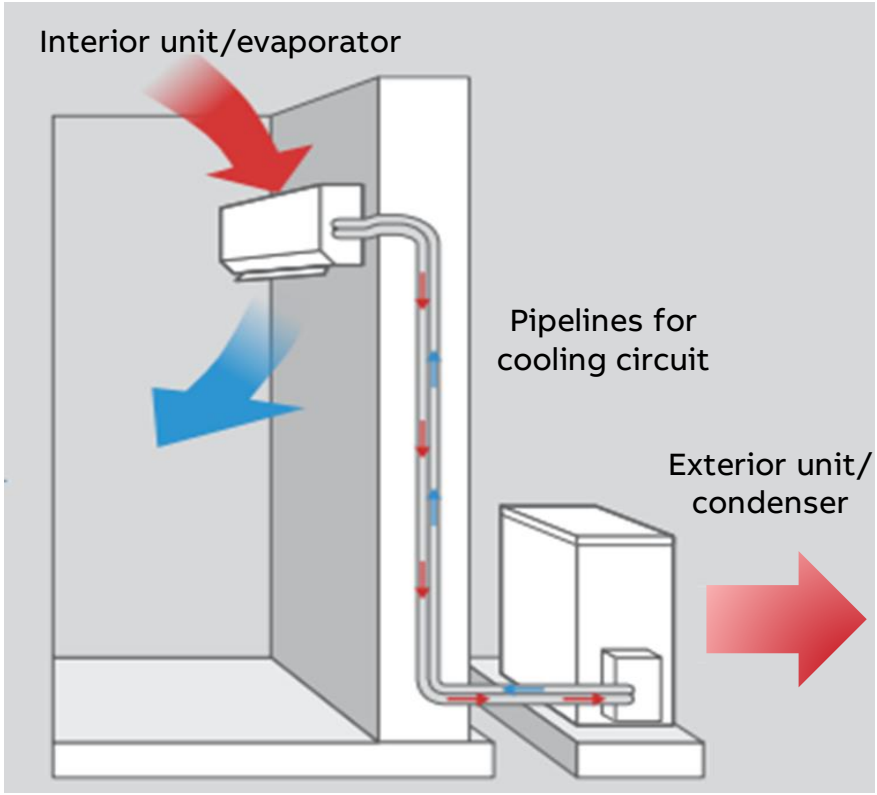
## Overview of air-conditioning systems

### Decentralized building air-conditioning systems

Split units

- With a decentralized air-conditioning system in the form of a split unit, the refrigerant is compressed outdoors, while the air-treatment processes (air conveyance, filtering and temperature control) are performed in the room to be cooled
- Many small units only recirculate the room air to cool it
- Some devices draw in a small amount of air ahead of the facade (independently of the building's orientation), blow it into the room and usually discharge the same quantity of exhaust air from the room to the outside

Source: WIKIPEDIA



# Split Unit Gateway SUG/U 1.1

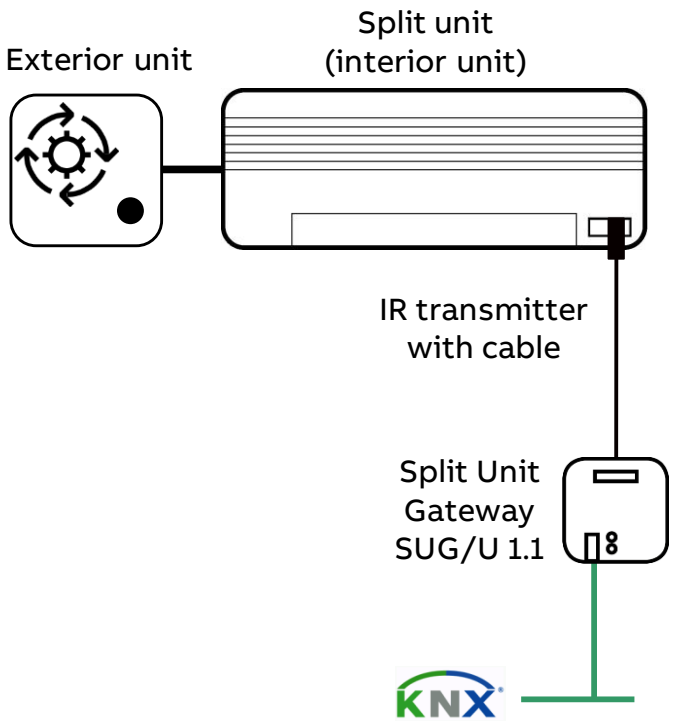
## What is a Split Unit Gateway?

Many manufacturers' air-conditioning units, so-called split units, are operated using an infrared remote control from the manufacturer

The Split Unit Gateway now replaces this remote control

The Split Unit Gateway forms the interface between the KNX system and the air-conditioning systems from many manufacturers, also referred to as split units

It allows users to integrate the split unit into a KNX system for convenient, energy efficient control



# Split Unit Gateway SUG/U 1.1

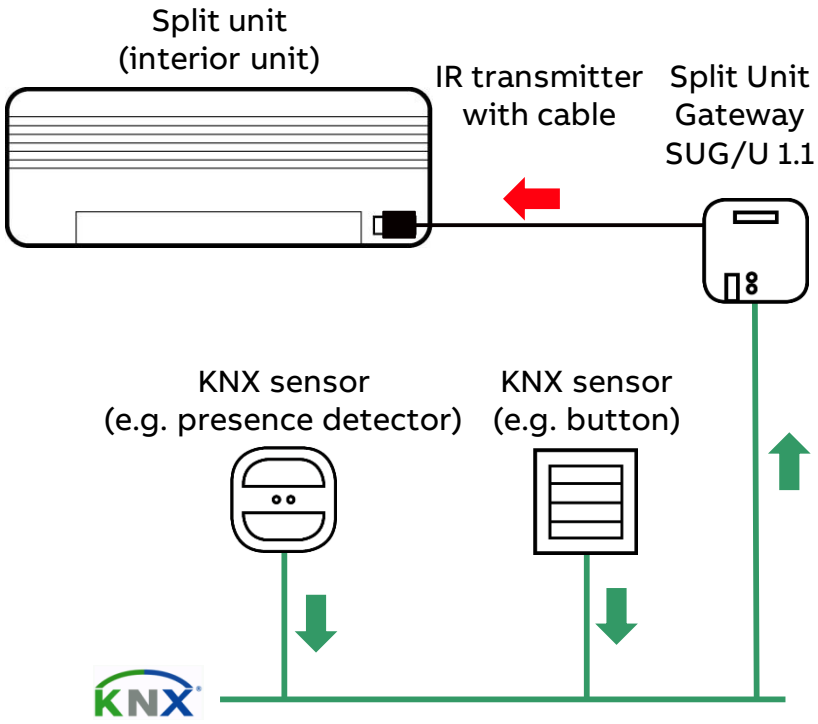
## What is a Split Unit Gateway?

The Split Unit Gateway is installed near the split unit, and the transmitter of the supplied cable is bonded directly to the receiver of the split unit

The device converts KNX telegrams to infrared commands and sends them to the split unit

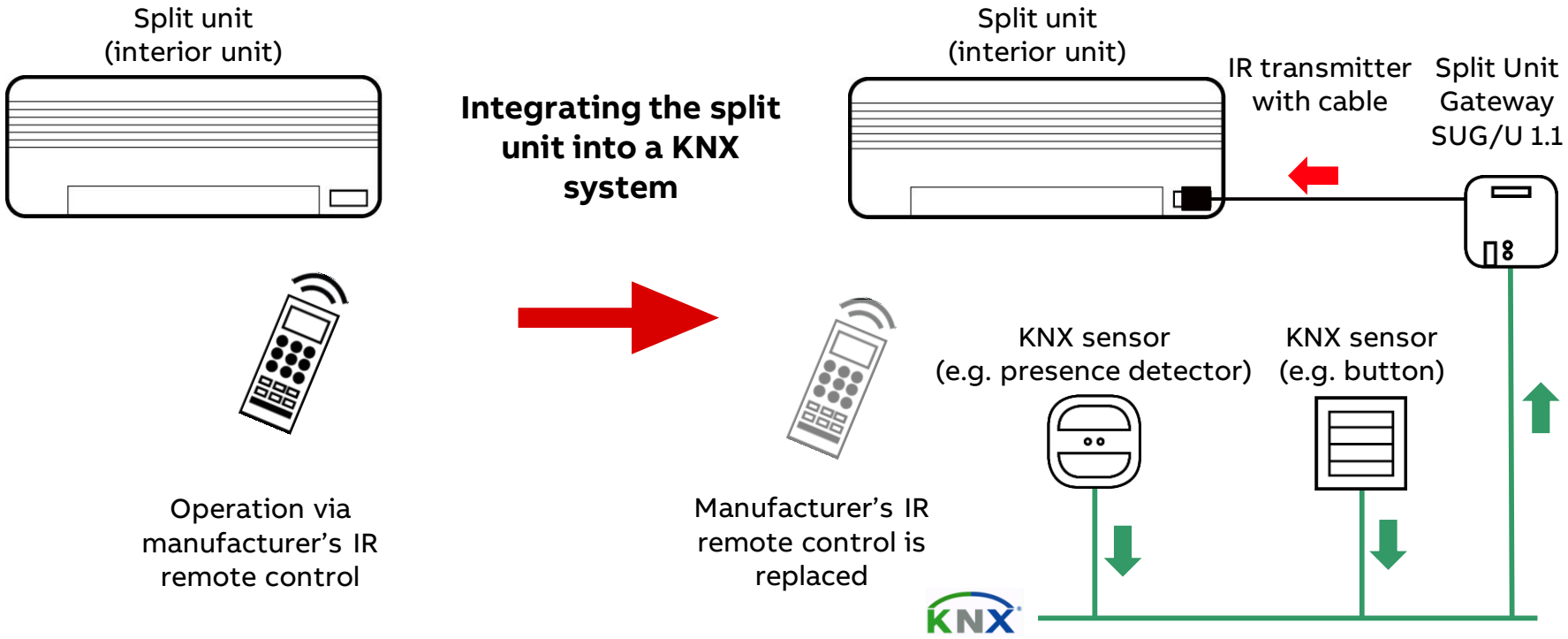
This makes it possible to control the split unit via KNX group commands

The air-conditioning system then no longer receives the commands from a remote control but instead can be operated via any KNX sensors or via a visual display



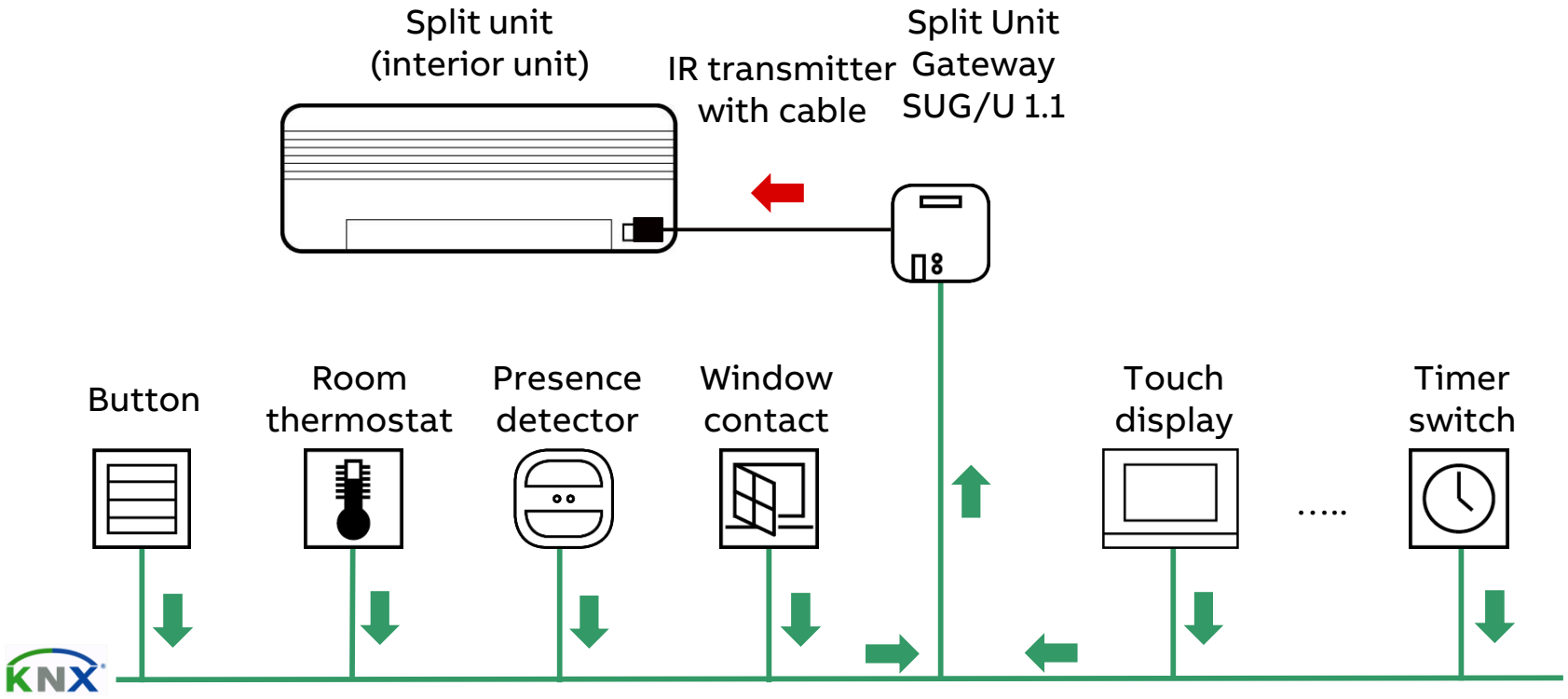
# Split Unit Gateway SUG/U 1.1

## What is a Split Unit Gateway?



# Split Unit Gateway SUG/U 1.1

## Overview



# Split Unit Gateway SUG/U 1.1

## Product overview

Flush-mounted device for installation in a flush-mounted or surface box

Dimensions 39 x 40 x 12 mm (H x W x D)

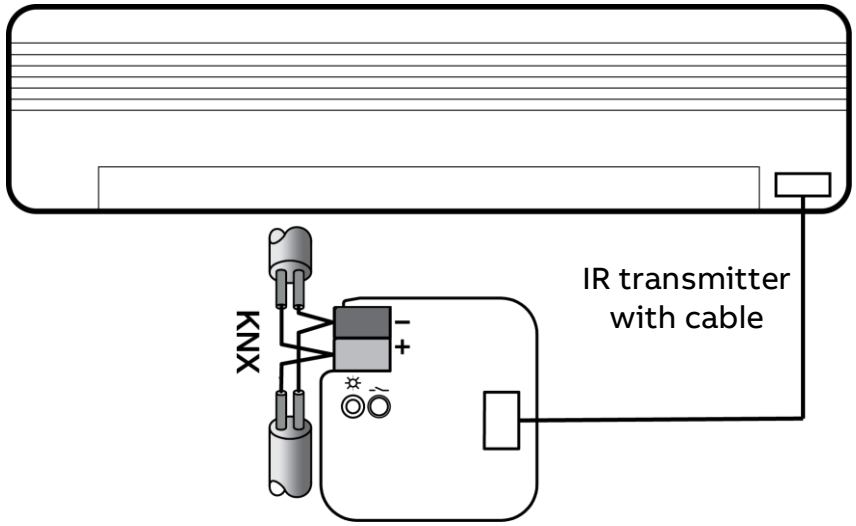
Connection terminal for IR cable and KNX

Length of cable for IR transmitter: 2m

The transmission diode of the supplied IR cable is bonded directly to the receiver of the split unit

Power supply is via the ABB i-bus® KNX; no additional auxiliary voltage is required

Red LED and button for assignment of the physical address



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

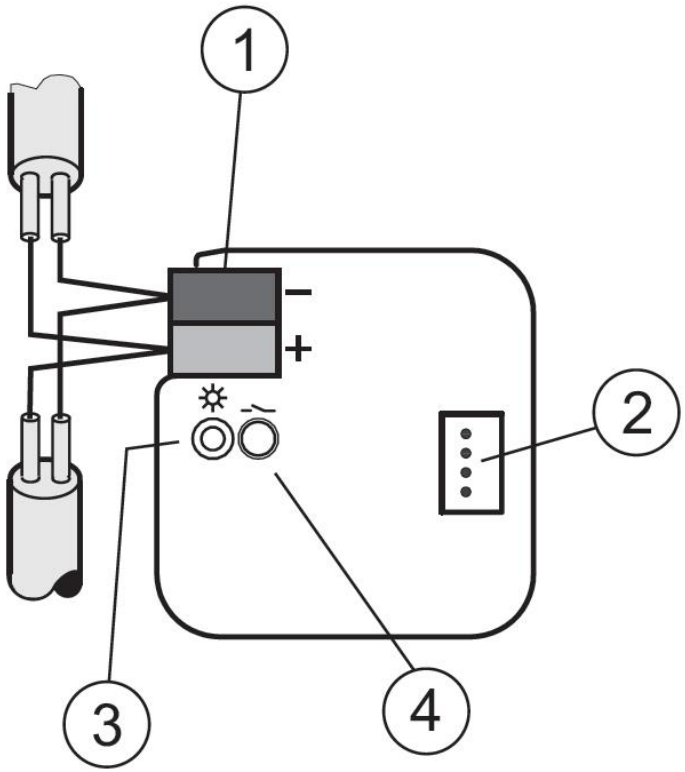
## Connection diagram, controls/indicators

(1) KNX connection

(2) IR cable connection

(3) Programming LED (red)
LED lights up when the programming button is pressed, in order to assign a physical address to the bus device

(4) Programming button
For assignment of the physical address



# Split Unit Gateway SUG/U 1.1

## Integration into the i-bus® Tool

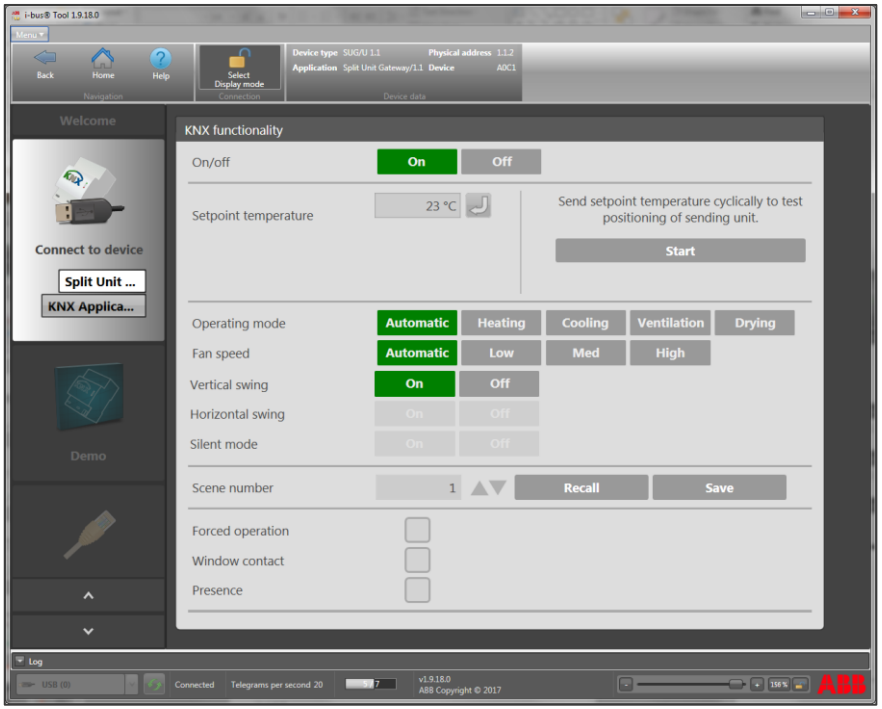
The device possesses an interface to the i-bus® Tool

The i-bus® Tool can be used to read out data and test functions on the connected device

The i-bus® Tool can be downloaded free from the ABB website (www.abb.com/knx)

ETS is not required for the software tool

A description of the functions is provided in the i-bus® Tool online help



# Split Unit Gateway SUG/U 1.1

## Device functions – software

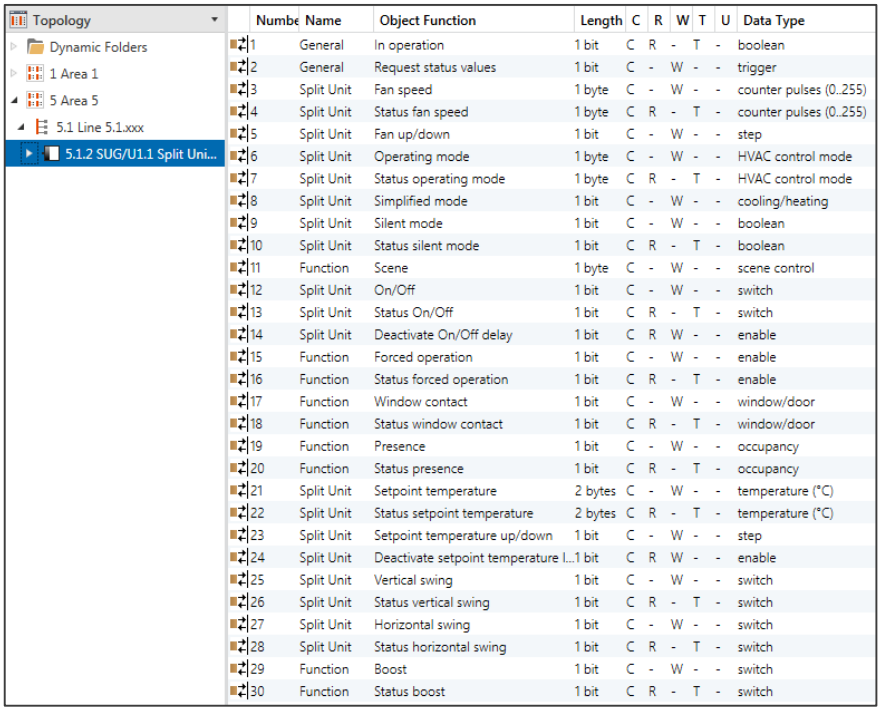
Parameterization is performed using the ETS4 or ETS5 software

The free “ABB SUG/U 1.1” ETS App available from the KNX Online Shop must also be installed

Further parameters* permit functions such as

- Fan speed control
- Horizontal and vertical swing
- Swing activation
- Specification of setpoint temperature and limitation
- Activation of Silent Mode
- Scene and boost function
- Status messages

* If the function is supported by the split unit device




| Numbe | Name | Object Function | Length | C | R | W | T | U | Data Type |
|---|---|---|---|---|---|---|---|---|---|
| 1 | General | In operation | 1 bit | C | R | - | T | - | boolean |
| 2 | General | Request status values | 1 bit | C | - | W | - | - | trigger |
| 3 | Split Unit | Fan speed | 1 byte | C | - | W | - | - | counter pulses (0..255) |
| 4 | Split Unit | Status fan speed | 1 byte | C | R | - | T | - | counter pulses (0..255) |
| 5 | Split Unit | Fan up/down | 1 bit | C | - | W | - | - | step |
| 6 | Split Unit | Operating mode | 1 byte | C | - | W | - | - | HVAC control mode |
| 7 | Split Unit | Status operating mode | 1 byte | C | R | - | T | - | HVAC control mode |
| 8 | Split Unit | Simplified mode | 1 bit | C | - | W | - | - | cooling/heating |
| 9 | Split Unit | Silent mode | 1 bit | C | - | W | - | - | boolean |
| 10 | Split Unit | Status silent mode | 1 bit | C | R | - | T | - | boolean |
| 11 | Function | Scene | 1 byte | C | - | W | - | - | scene control |
| 12 | Split Unit | On/Off | 1 bit | C | - | W | - | - | switch |
| 13 | Split Unit | Status On/Off | 1 bit | C | R | - | T | - | switch |
| 14 | Split Unit | Deactivate On/Off delay | 1 bit | C | R | W | - | - | enable |
| 15 | Function | Forced operation | 1 bit | C | - | W | - | - | enable |
| 16 | Function | Status forced operation | 1 bit | C | R | - | T | - | enable |
| 17 | Function | Window contact | 1 bit | C | - | W | - | - | window/door |
| 18 | Function | Status window contact | 1 bit | C | R | - | T | - | window/door |
| 19 | Function | Presence | 1 bit | C | - | W | - | - | occupancy |
| 20 | Function | Status presence | 1 bit | C | R | - | T | - | occupancy |
| 21 | Split Unit | Setpoint temperature | 2 bytes | C | - | W | - | - | temperature (°C) |
| 22 | Split Unit | Status setpoint temperature | 2 bytes | C | R | - | T | - | temperature (°C) |
| 23 | Split Unit | Setpoint temperature up/down | 1 bit | C | - | W | - | - | step |
| 24 | Split Unit | Deactivate setpoint temperature l... | 1 bit | C | R | W | - | - | enable |
| 25 | Split Unit | Vertical swing | 1 bit | C | - | W | - | - | switch |
| 26 | Split Unit | Status vertical swing | 1 bit | C | R | - | T | - | switch |
| 27 | Split Unit | Horizontal swing | 1 bit | C | - | W | - | - | switch |
| 28 | Split Unit | Status horizontal swing | 1 bit | C | R | - | T | - | switch |
| 29 | Function | Boost | 1 bit | C | - | W | - | - | switch |
| 30 | Function | Status boost | 1 bit | C | R | - | T | - | switch |

# Split Unit Gateway SUG/U 1.1

## Overview

| | SUG/U 1.1 |
|---|---|
| Design | Flush-mounted device |
| Order code | 2CDG 110 207 R0011 |
| Launch | available |

# Split Unit Gateway SUG/U 1.1

## Product documentation

Product Manual

Technical datasheet

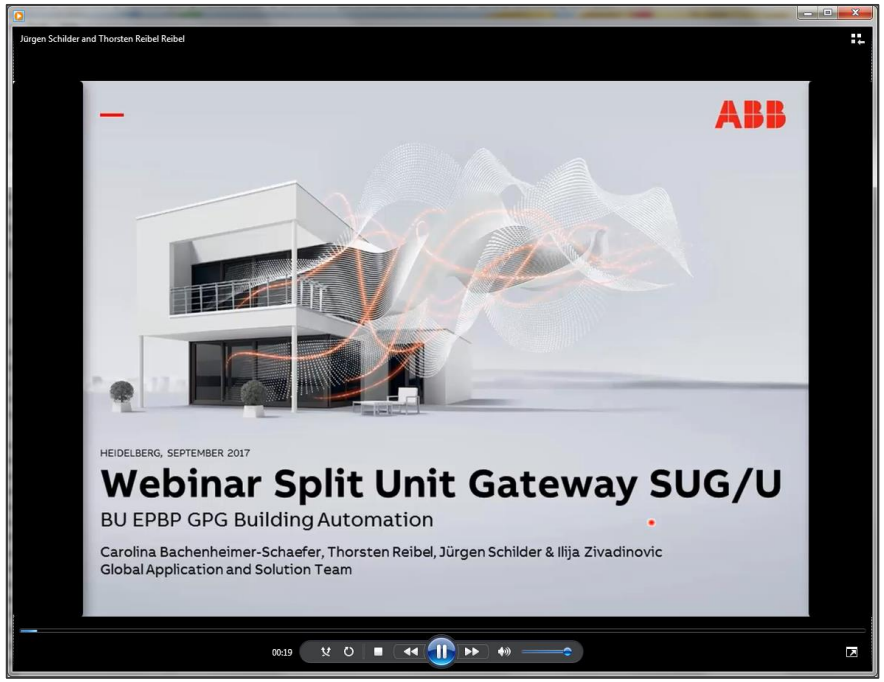
Installation and operating instructions

…

Training & Qualification Database

– Presentation slides

– Webinar recording (English)
(MP4 file on YouTube)

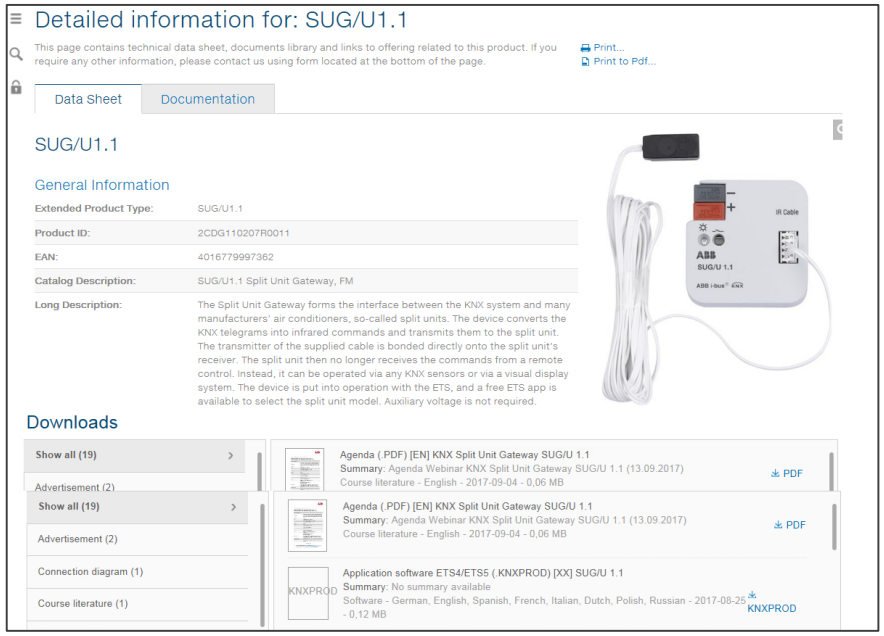


# Split Unit Gateway SUG/U 1.1

## Technical documents

www.abb.com/knx
→ Product category
→ Heating, Ventilation & Air Conditioning
→ Split Unit Gateway SUG/U 1.1

- ETS4 and ETS5 application software
- Product Manual
- Technical datasheet
- Installation and operating instructions
- Text for bid invitation
- Product information
- Presentation slides
- CE declaration of conformity
- • •



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of operation

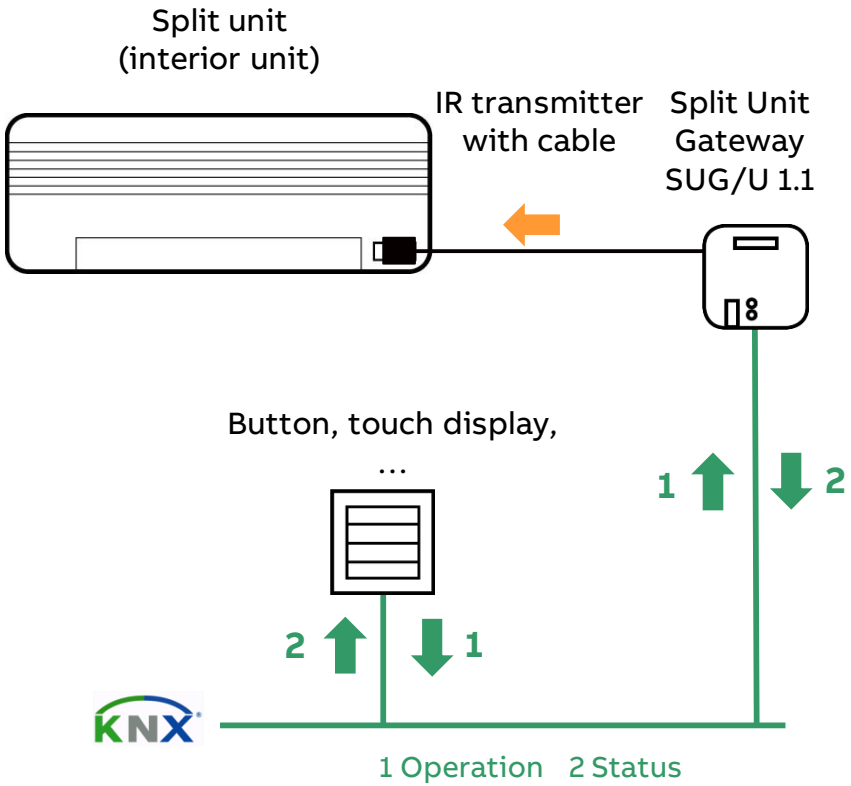
The split unit can be operated via KNX using any operating elements (e.g. buttons, touch display, smartphone)

The Split Unit Gateway sends the respective current status on the KNX

It can be indicated on the rocker switch LEDs

Example: button with four rocker switches

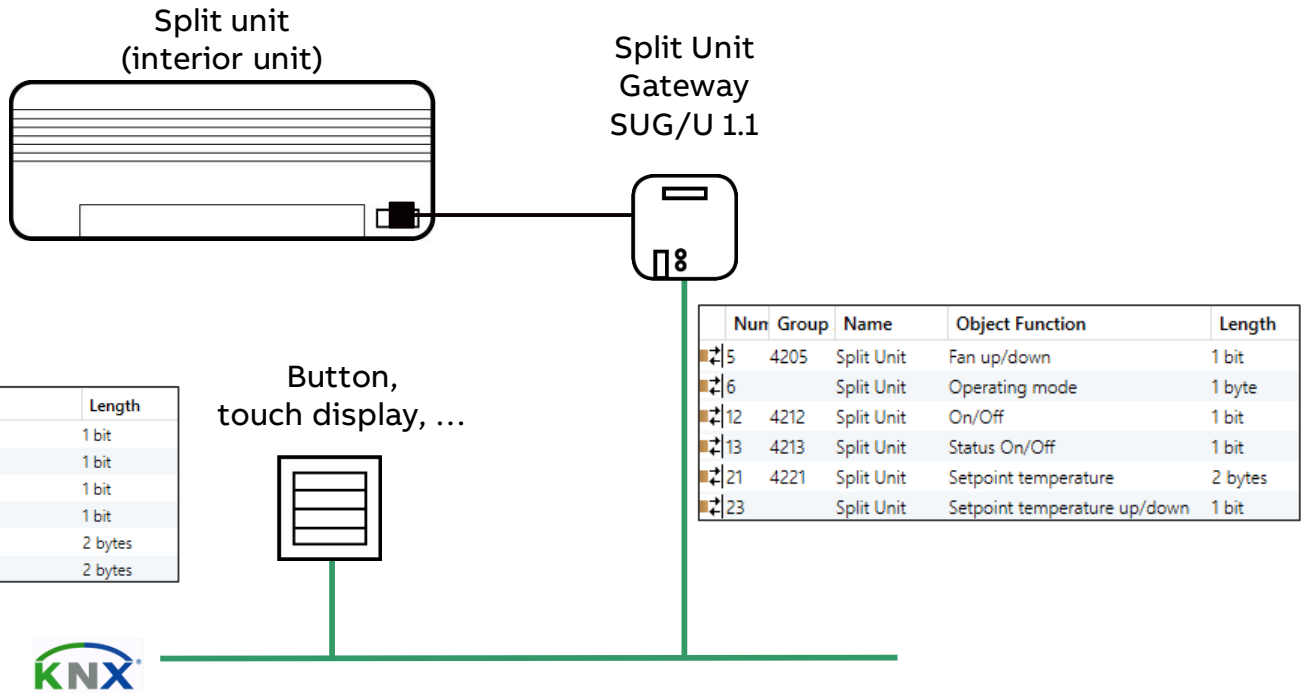
| | Object function | Left | Right |
|---|---|---|---|
| Rocker switch 1 | On/Off | On | Off |
| Rocker switch 2 | Fan speed | UP | DOWN |
| Rocker switch 3 | Setpoint temperature | 19 °C | 21 °C |
| Rocker switch 4 | Setpoint temperature | 23 °C | 24 °C |



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of operation

| | |
|---|---|
| Rocker switch 1 | On/Off |
| Rocker switch 2 | Fan up/down |
| Rocker switch 3 | Setpoint temp. 19 °C and 21 °C |
| Rocker switch 4 | Setpoint temp. 23 °C and 25 °C |




| Numbe | Group | Name | Object Function | Length |
|---|---|---|---|---|
| 1 | 4212 | S1.1: Switching | Input / output | 1 bit |
| 5 | 4213 | LED1.1: Status | Input | 1 bit |
| 10 | 4213 | LED1.2: Status | Input | 1 bit |
| 15 | 4205 | S2.1: Switching | Input / output | 1 bit |
| 29 | 4221 | S3.1: Value switching | Input / output | 2 bytes |
| 43 | 4221 | S4.1: Value switching | Input / output | 2 bytes |

| Nun | Group | Name | Object Function | Length |
|---|---|---|---|---|
| 5 | 4205 | Split Unit | Fan up/down | 1 bit |
| 6 | | Split Unit | Operating mode | 1 byte |
| 12 | 4212 | Split Unit | On/Off | 1 bit |
| 13 | 4213 | Split Unit | Status On/Off | 1 bit |
| 21 | 4221 | Split Unit | Setpoint temperature | 2 bytes |
| 23 | | Split Unit | Setpoint temperature up/down | 1 bit |

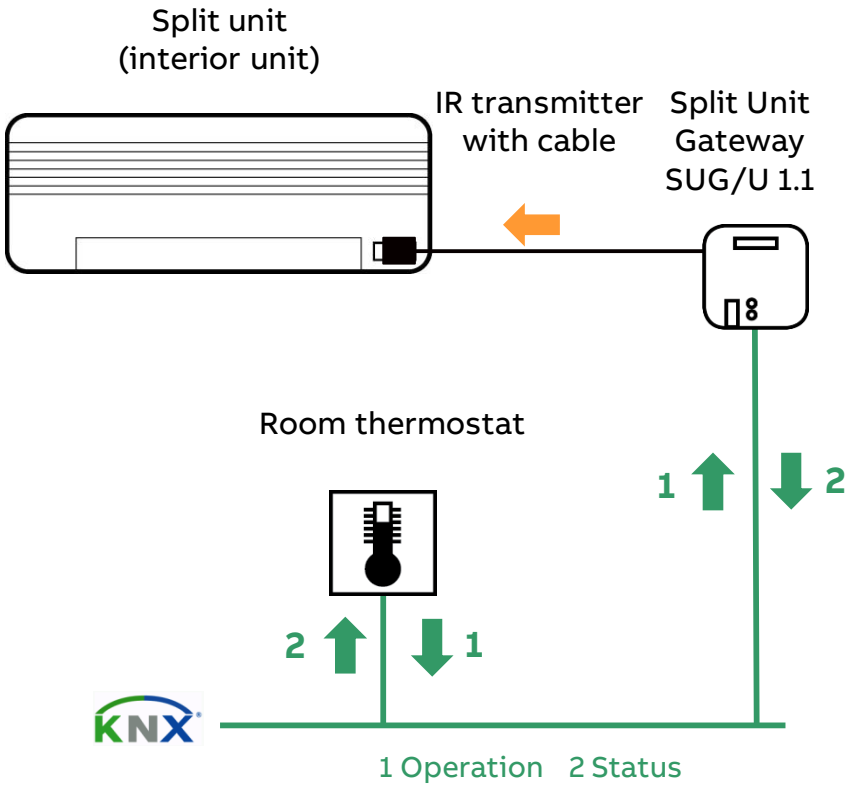
# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of operation

The split unit can be operated via KNX using a room thermostat.

The rocker switches can change the setpoint temperature, switch on/off and increase/decrease the fan speed

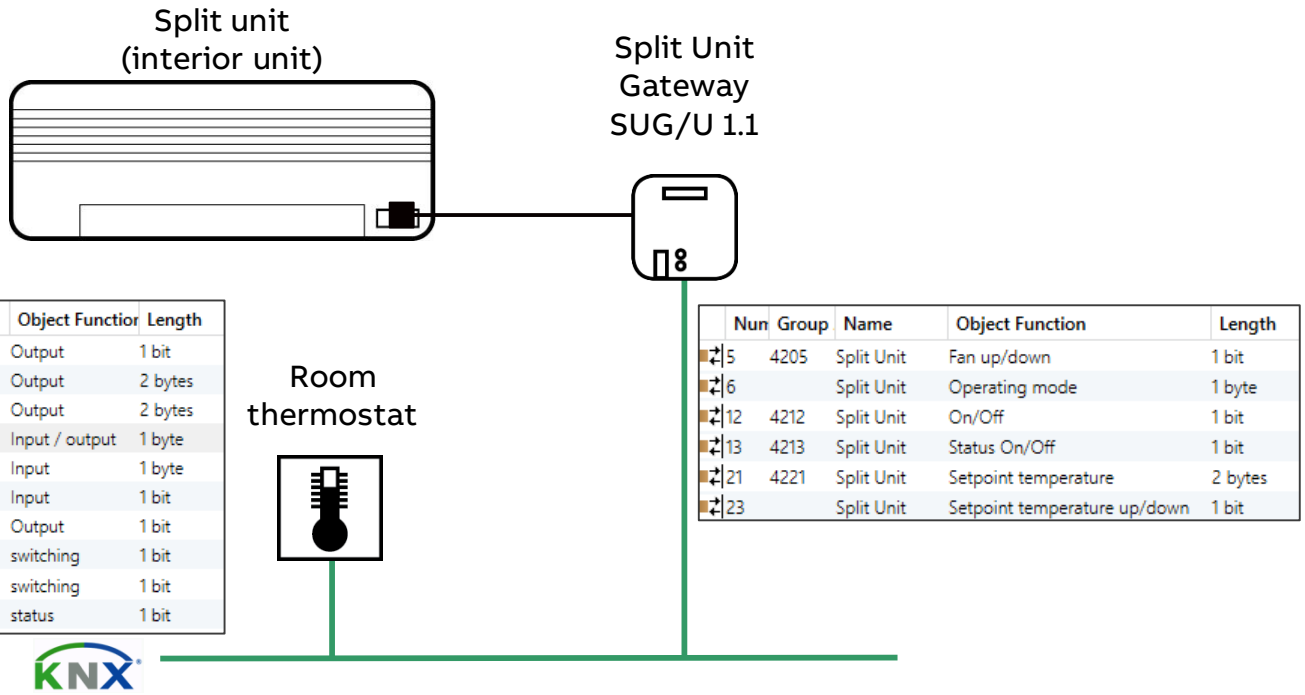
| | Object function | Left | Right |
|---|---|---|---|
| Rocker switch 1 | On/Off | On | Off |
| Rocker switch 2 | Setpoint adjustment | Up | Down |
| Rocker switch 3 | Fan speed | Up | Down |



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of operation

| | |
|---|---|
| Rocker switch 1 | On/Off |
| Rocker switch 2 | Setpoint adjustment |
| Rocker switch 3 | Fan up/down |




| Nun | Group | Name | Object Functior | Length |
|---|---|---|---|---|
| 3 | | Cooling control value | Output | 1 bit |
| 6 | | Actual temperature | Output | 2 bytes |
| 11 | 4221 | actual set value | Output | 2 bytes |
| 12 | | Operating mode | Input / output | 1 byte |
| 13 | | Superimposed operating mode | Input | 1 byte |
| 35 | | Fahrenheit | Input | 1 bit |
| 47 | | Commissioned | Output | 1 bit |
| 50 | 4212 | rocker 1 | switching | 1 bit |
| 74 | 4205 | rocker 3 | switching | 1 bit |
| 200 | 4213 | LED 1 | status | 1 bit |

| Nun | Group | Name | Object Function | Length |
|---|---|---|---|---|
| 5 | 4205 | Split Unit | Fan up/down | 1 bit |
| 6 | | Split Unit | Operating mode | 1 byte |
| 12 | 4212 | Split Unit | On/Off | 1 bit |
| 13 | 4213 | Split Unit | Status On/Off | 1 bit |
| 21 | 4221 | Split Unit | Setpoint temperature | 2 bytes |
| 23 | | Split Unit | Setpoint temperature up/down | 1 bit |

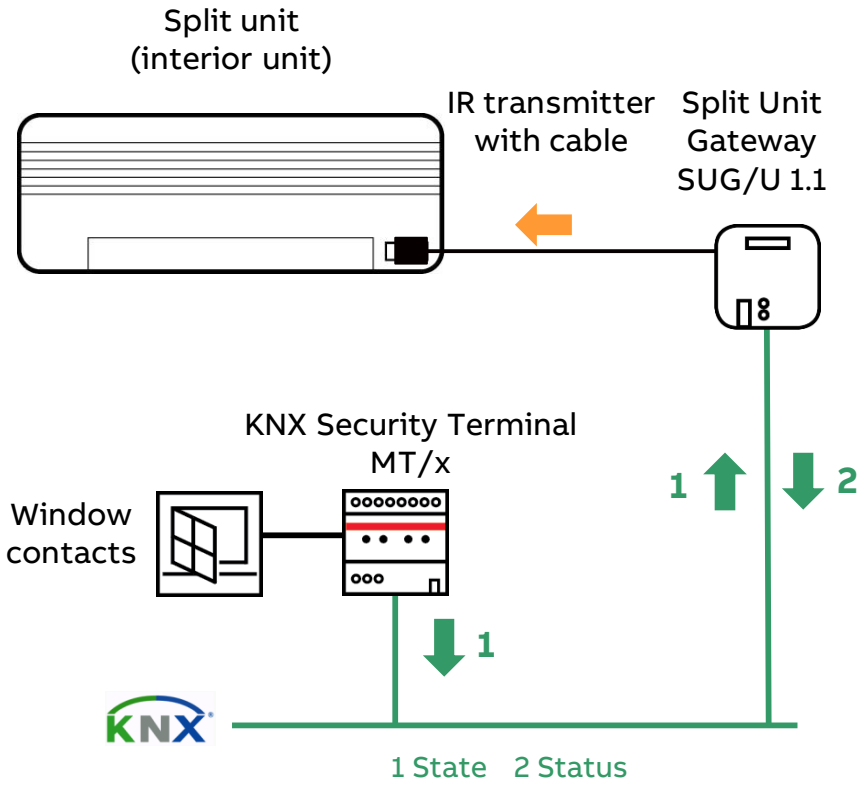
# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of window contact

A window contact (magnetic contact) is connected to an input of a KNX Security Terminal and sends the open/closed state of the window to the Split Unit Gateway

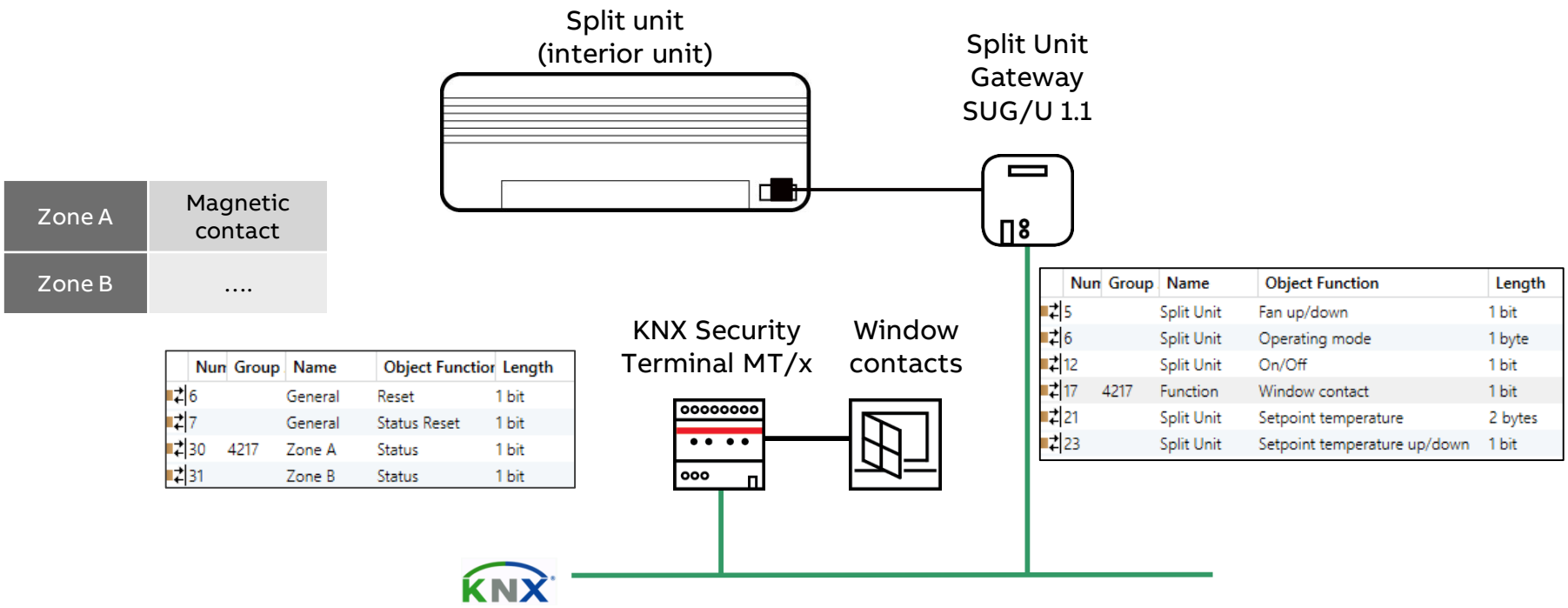
When a window is open, the function “Window contact” is activated with a higher priority and the split unit is switched off (optional OFF delay)

Closing the window deactivates the function, and the split unit can be operated again



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of window contact




| Nun | Group | Name | Object Functior | Length |
|---|---|---|---|---|
| 6 | | General | Reset | 1 bit |
| 7 | | General | Status Reset | 1 bit |
| 30 | 4217 | Zone A | Status | 1 bit |
| 31 | | Zone B | Status | 1 bit |

| Nun | Group | Name | Object Function | Length |
|---|---|---|---|---|
| 5 | | Split Unit | Fan up/down | 1 bit |
| 6 | | Split Unit | Operating mode | 1 byte |
| 12 | | Split Unit | On/Off | 1 bit |
| 17 | 4217 | Function | Window contact | 1 bit |
| 21 | | Split Unit | Setpoint temperature | 2 bytes |
| 23 | | Split Unit | Setpoint temperature up/down | 1 bit |

# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of presence

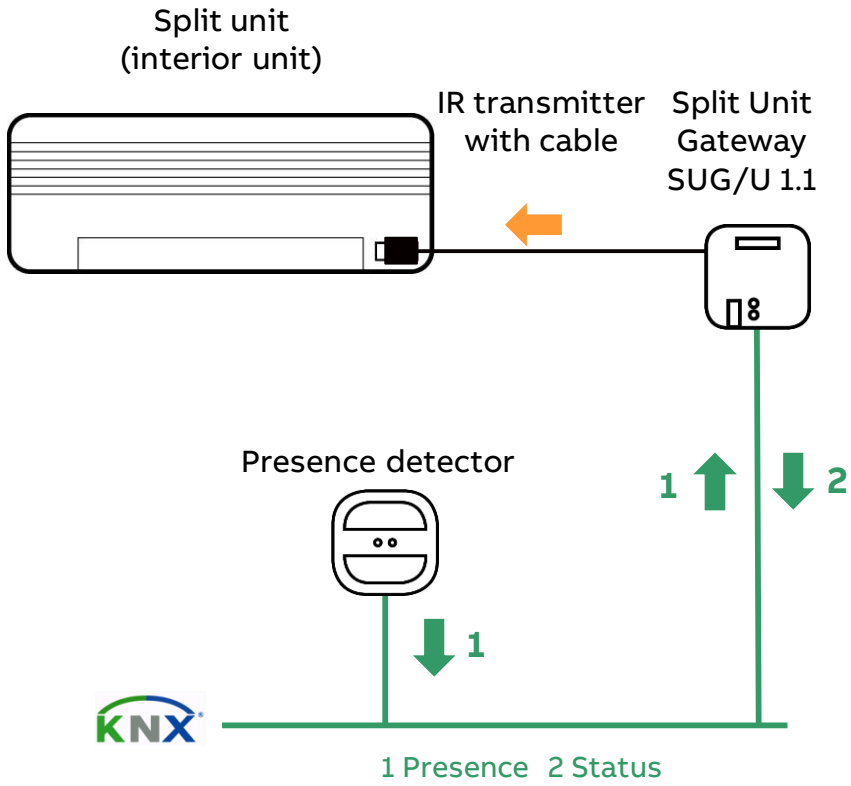
A presence detector automatically detects a person in the room, activates the function “Presence” and the parameterized state is established, e.g.

– Split unit ON, AUTO mode, setpoint temperature 22 °C, fan speed AUTO, …

After the room is left (including a run-on time), the function “Presence” can be deactivated and the parameterized state is established

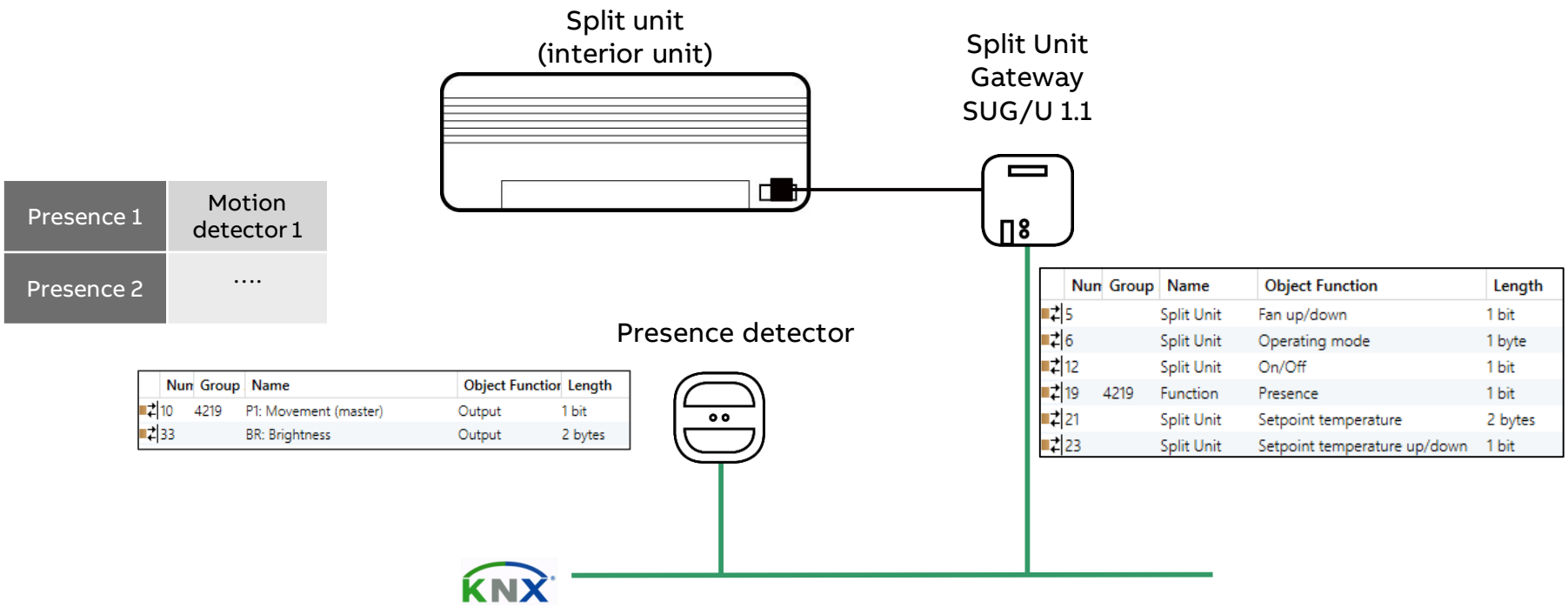
– Split Unit ON/OFF/unchanged

The function “Presence” can also be activated and deactivated via a card reader (e.g. hotel room)



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Functional description of presence



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

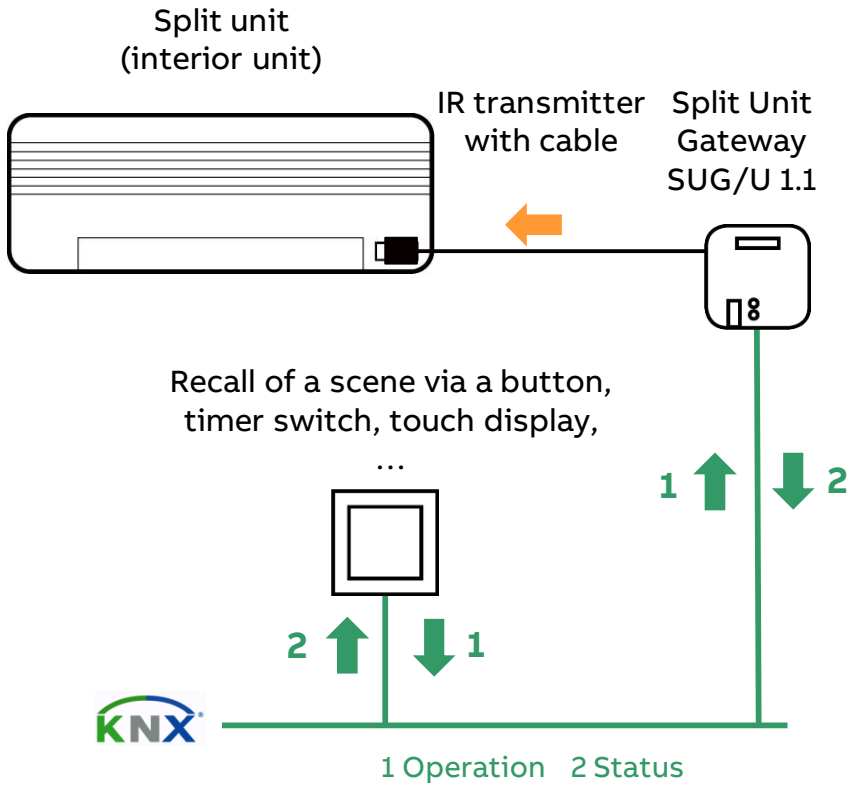
## Functional description of scenes

The function “Scenes” can be used for convenient recall of various scenes, e.g. in a conference/training room

- Welcome scene
- Presentation scene
- Break scene

The parameterized state is established as soon as the corresponding scene is recalled

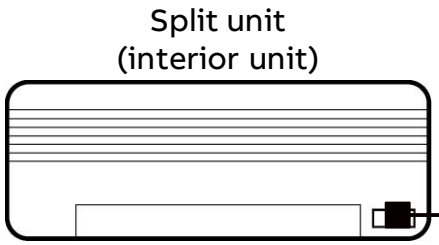
| Scene | Welcome | Presen-tation | Pause | End |
|---|---|---|---|---|
| Split unit | On | On | Unchan. | Off |
| Setpoint temp. | 21 °C | 21 °C | 22 °C | - |
| Operat. mode | Auto | Auto | Ventilat. | - |
| Fan speed | 1 | Auto | 3 | - |
| Slat adjustment | Start | Unchan. | Start | - |



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

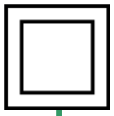
## Function description of scenes

| | |
|---|---|
| Rocker switch 1 | Scenes 3 and 9 |
| Rocker switch 2 | Scenes 38 and 52 |





Recall of a scene via a button, timer switch, touch display, …



| Num | Group | Name | Object Fur | Length |
|---|---|---|---|---|
| 1 | 4211 | S1.1: Number of light scene | Output | 1 byte |
| 3 | 4211 | S1.2: Number of light scene | Output | 1 byte |
| 15 | 4211 | S2.1: Number of light scene | Output | 1 byte |
| 17 | 4211 | S2.2: Number of light scene | Output | 1 byte |

| Num | Group | Name | Object Function | Length |
|---|---|---|---|---|
| 5 | | Split Unit | Fan up/down | 1 bit |
| 6 | | Split Unit | Operating mode | 1 byte |
| 11 | 4211 | Function | Scene | 1 byte |
| 12 | | Split Unit | On/Off | 1 bit |
| 21 | | Split Unit | Setpoint temperature | 2 bytes |
| 23 | | Split Unit | Setpoint temperature up/down | 1 bit |

# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Commissioning

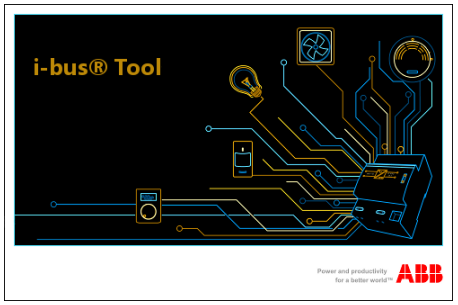
ETS4 or ETS5 and the current application of the device are required for programming

Ensure that the latest ETS application is used. Download from www.abb.com/knx

In addition to the ETS application, you will require the “ABB SUG/U 1.1 Configuration” app for commissioning; this can obtained free from the KNX Online Shop

The device possesses an interface to the i-bus® Tool (reading out data and checking functions)



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## ETS App “ABB SUG/U 1.1 Configuration”

Download the ETS App (ABBSUG.etsapp) and the license file (*.license) from the KNX Online Shop

In the ETS:

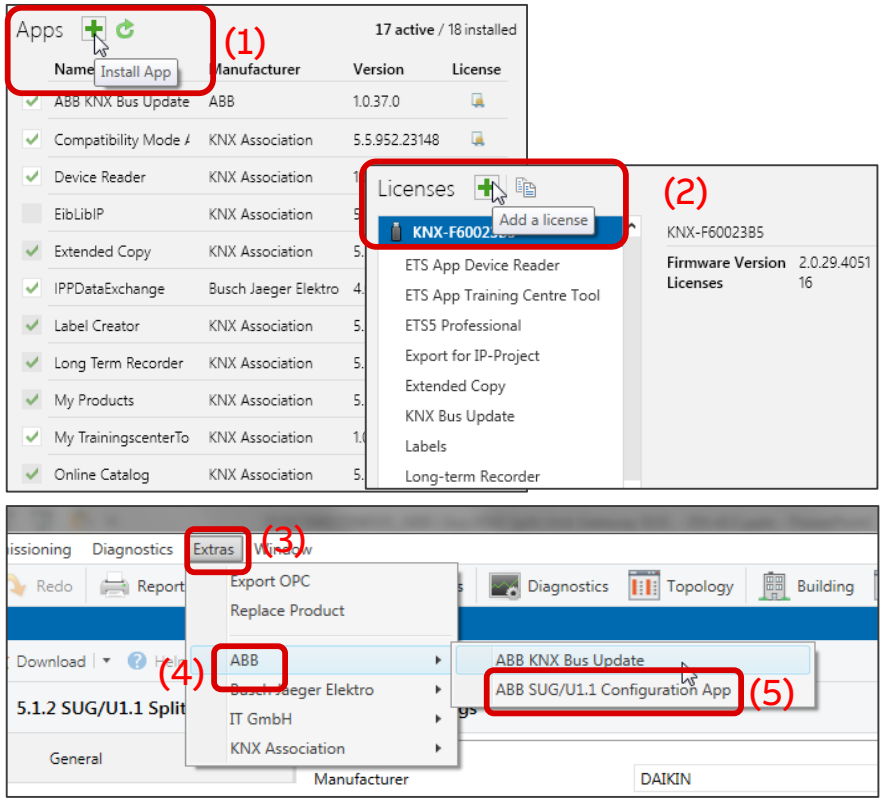
– Install the app

– Add license

The app appears in the menu “Extras” → “ABB” → “ABB SUG/U Configuration”

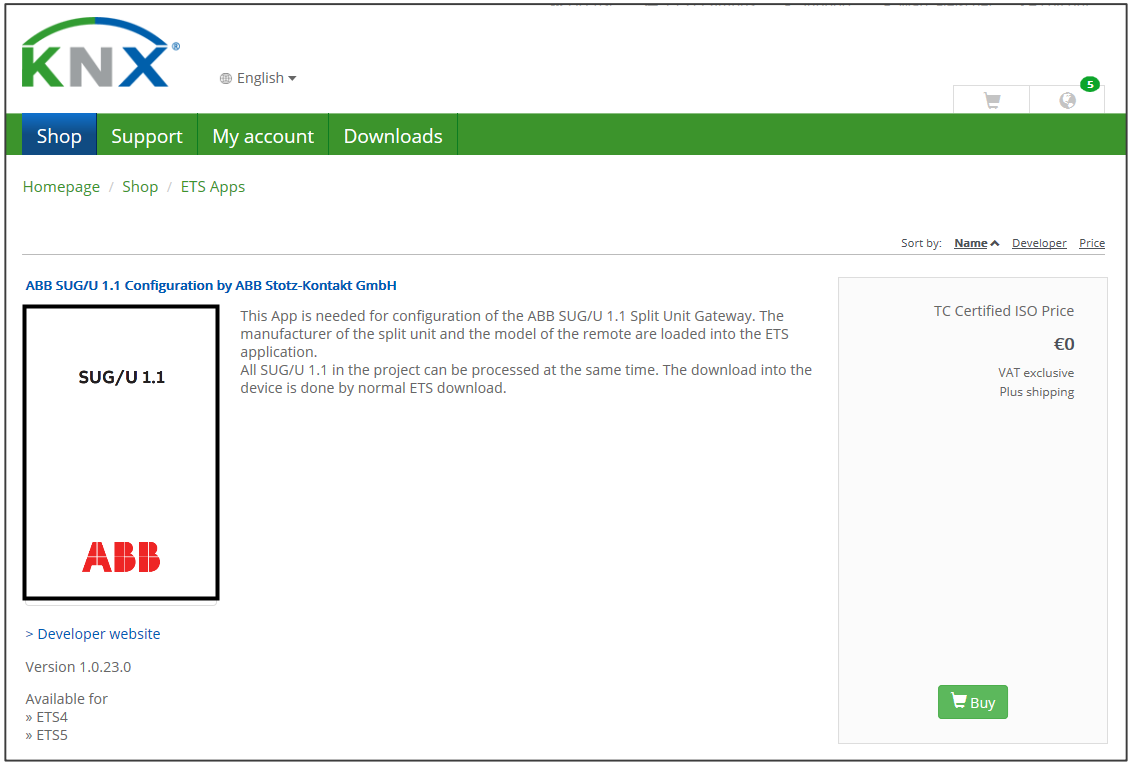
The IR databases of the split unit devices are also installed during this process

The IR database files are updated online in the app



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## ETS App “ABB SUG/U 1.1 Configuration”



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

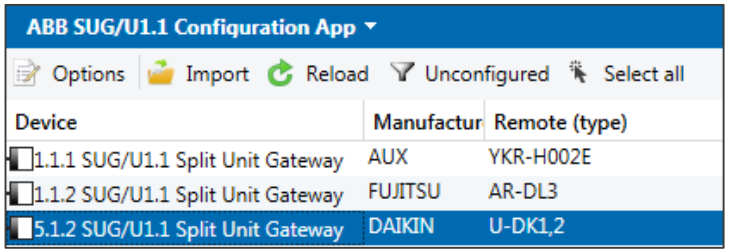
## Commissioning

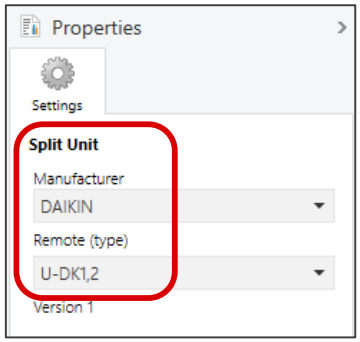
Add the Split Unit Gateway to the building or topology view

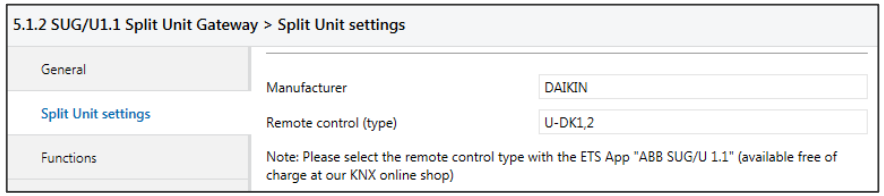
Click on the Gateway and start the app (menu “Extras” → “ABB“ → “ABB SUG/U Configuration”)

Click the Gateway in the window of the “ABB SUG/U Configuration” app and select the remote control manufacturer and type in the “Properties” window

The functions supported by the split unit are displayed, and the IR codes of the selected remote control are adopted in the ETS application and parameters

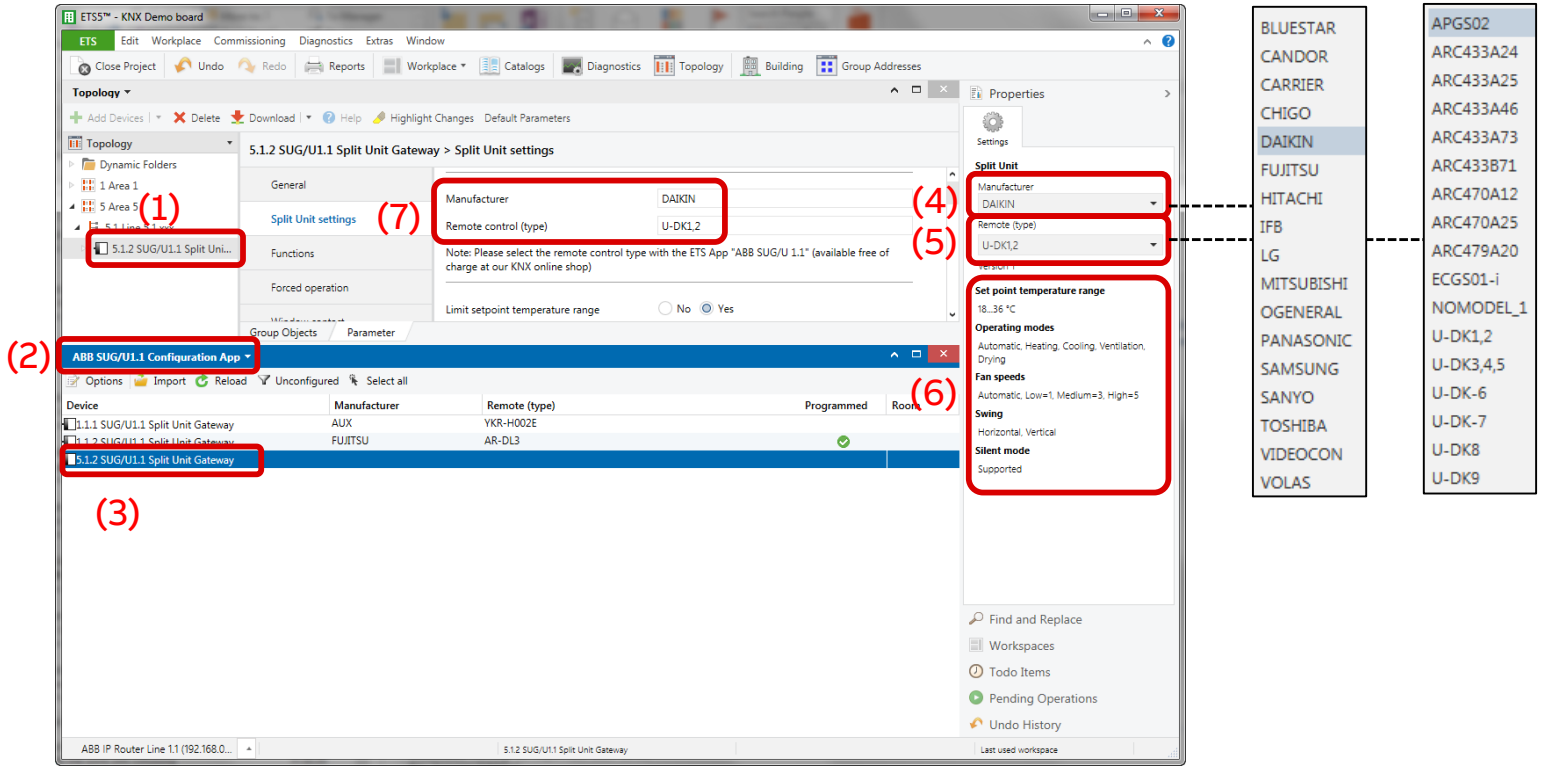


# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## ETS App “ABB SUG/U 1.1 Configuration”



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Commissioning

Set the parameters as required depending on the supported split unit functions (see “Parameters” window)

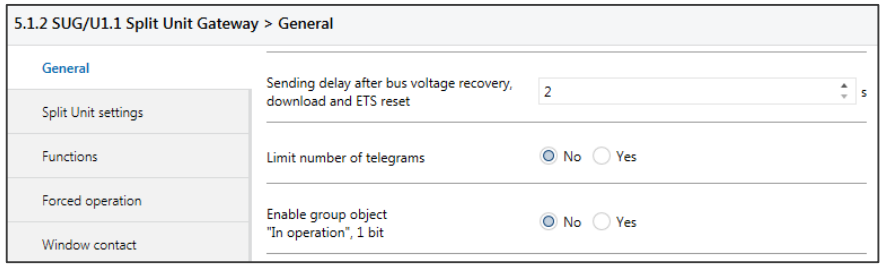
Create group addresses and link with the objects

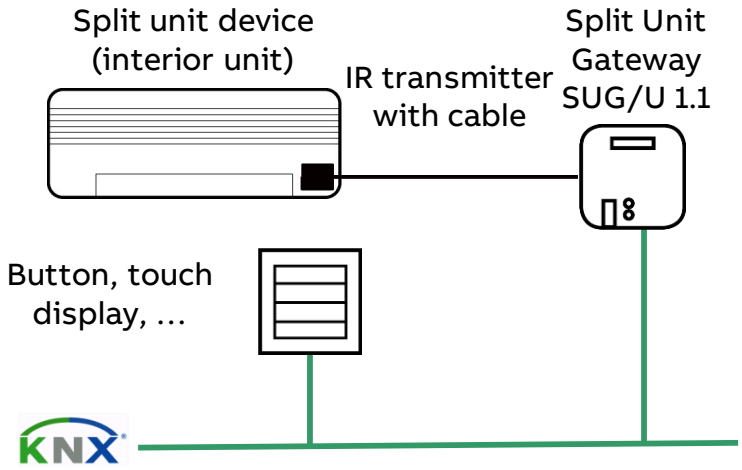
Program the physical address and load the application

Test the

– Settings and parameters in the Split Unit Gateway (i-bus® Tool)

– Functional implementation
Control element/sensor – Split Unit Gateway – split unit device



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

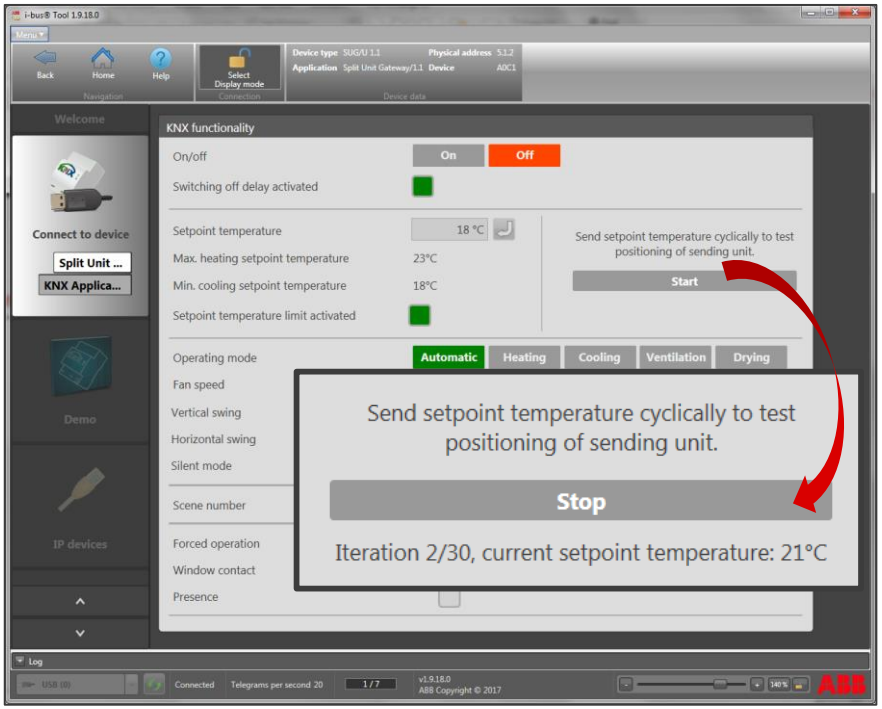
## i-bus® Tool: positioning the IR transmitter

The IR transmitter of the Split Unit Gateway must be correctly positioned on the receiver of the split unit

The function “Send temperature cyclically…” enables cyclical values to be sent, which are then confirmed by the split unit with an acknowledgment tone

This makes it possible to check whether the transmitter is in the correct position before it is affixed

30 telegrams are sent at intervals of 4 seconds (2 minutes)



# ABB i-bus KNX Split Unit Gateway SUG/U 1.1

## Testing and troubleshooting: smartphone camera

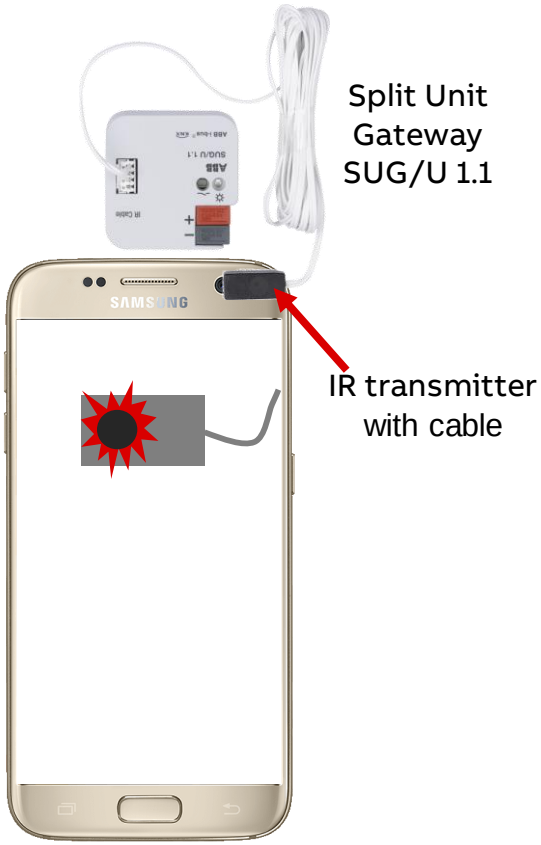
Important: This test function depends on the smartphone manufacturer and model!

The photo chip in a smartphone senses more than human eye can, and it also detects IR light

Smartphones usually have an IR blocking filter, but the signal from a transmitter held in front of the lens can nevertheless still be seen in camera recording mode

A light lights up in the smartphone display if IR radiation is present (KNX command to the Split Unit Gateway or with the test function of the i-bus® Tool, “Send temperature cyclically…”)

It is recommended to use the front camera. Its equipment quality is not as high, and it does not possess an infrared filter.



# Disclaimer

The information in this document is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this document.

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.