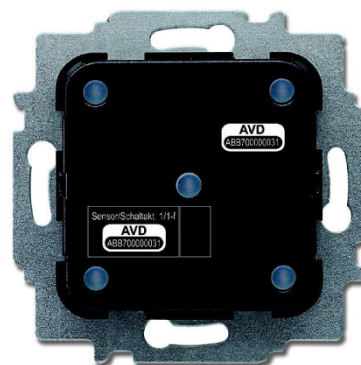


Busch-free@home®

Sensor unit, 1gang, 2gang, wireless

6221/1.0-WL

6221/2.0-WL



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1 Information on the manual

Please read this manual carefully and observe the information it contains. This will assist you in preventing injuries and damage to property, and ensure both reliable operation and a long service life for the device.

Please keep this manual in a safe place.

If you pass the device on, also pass on this manual along with it.

Busch-Jaeger accepts no liability for any failure to observe the instructions in this manual.

If you require additional information or have questions about the device, please contact Busch-Jaeger or visit our Internet site at:

www.busch-jaeger.de/freeathome

2 Safety

The device has been constructed according to the latest valid regulations governing technology and is operationally reliable. It has been tested and left the factory in a technically safe and reliable state.

However, residual hazards remain. Read and adhere to the safety instructions to prevent hazards of this kind.

Busch-Jaeger accepts no liability for any failure to observe the safety instructions.

2.1 Information and symbols used

The following Instructions point to particular hazards involved in the use of the device or provide practical instructions:



Danger

Risk of death / serious damage to health

- The respective warning symbol in connection with the signal word "Danger" indicates an imminently threatening danger which leads to death or serious (irreversible) injuries.



Warning

Serious damage to health

- The respective warning symbol in connection with the signal word "Warning" indicates a threatening danger which can lead to death or serious (irreversible) injuries.



Caution

Damage to health

- The respective warning symbol in connection with the signal word "Caution" indicates a danger which can lead to minor (reversible) injuries.



Attention

Damage to property

- This symbol in connection with the signal word "Attention" indicates a situation which could cause damage to the product itself or to objects in its surroundings.



NOTE

This symbol in connection with the word "Note" indicates useful tips and recommendations for the efficient handling of the product.



This symbol alerts to electric voltage.

2.2 Intended use

This device is a sensor unit for decentralized flush-mounted installation. The sensor unit can be assigned to an available switch actuator. The devices serve for switching processes and are not pre-programmed.

The device is intended for the following:

- Operation according to the listed technical data
- Installation in dry interior rooms and suitable flush-mounted boxes
- Use with the connecting options available on the device

The intended use also includes adherence to all specifications in this manual.

2.3 Improper use

Each use not listed in Chapter 2.2 "Intended use" on page 5 is deemed improper use and can lead to personal injury and damage to property.

Busch-Jaeger is not liable for damages caused by use deemed contrary to the intended use of the device. The associated risk is borne exclusively by the user/operator.

The device is not intended for the following:

- Unauthorized structural changes
- Repairs
- Outdoor use
- The use in bathroom areas

2.4 Target group / Qualifications of personnel

Installation, commissioning and maintenance of the device must only be carried out by trained and properly qualified electrical installers.

The electrical installer must have read and understood the manual and follow the instructions provided.

The electrical installer must adhere to the valid national regulations in his/her country governing the installation, functional test, repair and maintenance of electrical products.

The electrical installer must be familiar with and correctly apply the "five safety rules" (DIN VDE 0105, EN 50110):

1. Disconnect
2. Secure against being re-connected
3. Ensure there is no voltage
4. Connect to earth and short-circuit
5. Cover or barricade adjacent live parts

2.5 Safety instructions



Danger - Electric voltage!

Electric voltage! Risk of death and fire due to electric voltage of 100 ... 240 V. Dangerous currents flow through the body when coming into direct or indirect contact with live components. This can result in electric shock, burns or even death.

- Work on the 100 ... 240 V supply system may only be performed by authorised and qualified electricians.
- Disconnect the mains power supply before installation or dismantling.
- Never use the device with damaged connecting cables.
- Do not open covers firmly bolted to the housing of the device.
- Use the device only in a technically faultless state.
- Do not make changes to or perform repairs on the device, on its components or its accessories.



Caution! - Risk of damaging the device due to external factors!

Moisture and contamination can damage the device.

- Protect the device against humidity, dirt and damage during transport, storage and operation.

2.6 Environment



Consider the protection of the environment!

Used electric and electronic devices must not be disposed of with domestic waste.

- The device contains valuable raw materials which can be recycled.
Therefore, dispose of the device at the appropriate collecting depot.

All packaging materials and devices bear the markings and test seals for proper disposal. Always dispose of the packaging material and electric devices and their components via the authorized collecting depots and disposal companies.

The products meet the legal requirements, in particular the laws governing electronic and electrical devices and the REACH ordinance.

(EU Directive 2012/19/EU WEEE and 2011/65/EU RoHS)

(EU REACH ordinance and law for the implementation of the ordinance (EC) No.1907/2006).

3 Setup and function

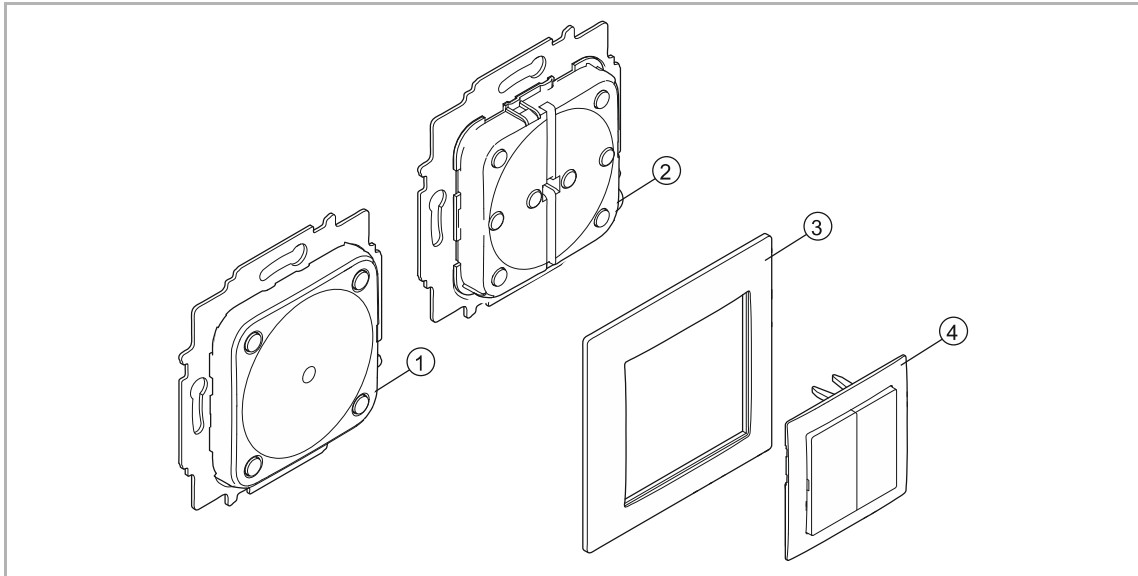


Fig. 1: Product overview

- [1] Flush-mounted insert of sensor unit, 1gang (sensor pre-mounted)
- [2] Flush-mounted insert of sensor unit, 2gang (sensor pre-mounted)
- [3] Cover frame (not included in scope of delivery)
- [4] Rocker (not included in scope of delivery)

This device is a sensor unit for decentralized flush-mounted installation. The sensor unit can be assigned to an available switch actuator.

The devices serve for switching processes and are not pre-programmed. The devices must be parameterised for the use of the functions.

The sensor is integrated in a flush-mounted insert [1 or 2]. The sensor is already pre-mounted.

Additional product features:

- Green LEDs as light for orientation and status indication
- Exchangeable rockers with corresponding icons

3.1 Scope of supply

The scope of supply only contains the flush-mounted insert [1 or 2] with pre-mounted sensor. It must still be completed with a suitable rocker [4] and a cover frame [3].



Notice

- Depending on the application, rockers with different printing can be selected. Additional information on the switch ranges is available in the electronic catalogue (www.busch-jaeger-catalogue.com).

3.2 Overview of types

Article Number	Product name	Sensor channels
6221/1.0-WL	Sensor unit, 1gang, wireless	1 
6221/2.0-WL	Sensor unit, 2gang, wireless	2 

Table 1: Overview of types

3.3 Functions

The following table provides an overview of the possible functions and applications of the device:

Icon of the user interface	Information	
	Name:	Sensor
	Type:	Sensor
	Made available by:	Sensor unit
	Function:	Control element for the control of free@home functions

Table 2: Overview of functions

3.4 Device overview

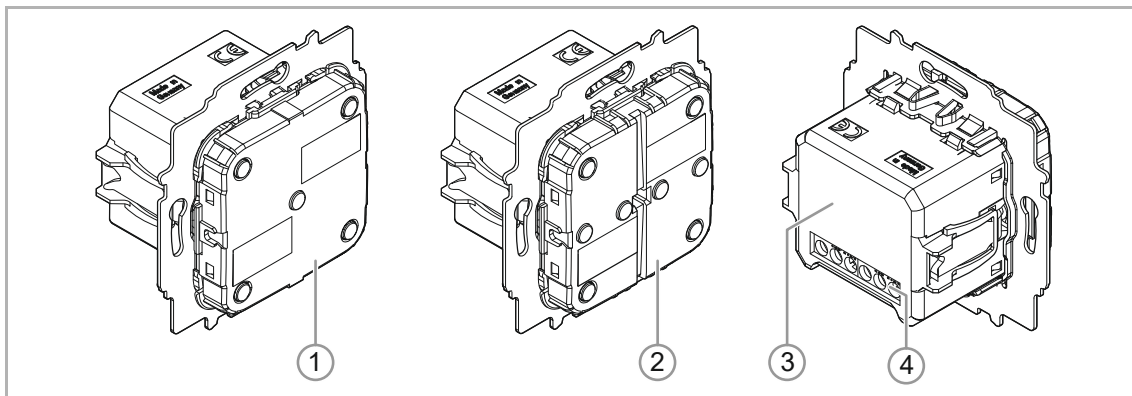


Fig. 2: Overview of devices Sensor unit, 1gang, 2gang, wireless (with sensors)

- [1] Sensor unit, 1gang
- [2] Sensor unit, 2gang
- [3] Type plate
- [4] Connecting terminal

4 Technical data

Designation	Value
Operating voltage	230 V AC, 50/60 Hz
Connection	L, N (option), inputs and outputs non-floating Screw-type terminal: 2 x 2.5 mm ² rigid; 2 x 1.5 mm ² flexible
Claw	With protective cover and reset (optionally removable)
Transmission protocol	free@home wireless
Transmission frequency	2.400 - 2.483 GHz
Maximum transmission power WL (wireless)	< 15 dBm
Power consumption	< 1 W
Protection rating	IP20
Ambient temperature	-5°C to +45°C
Storage temperature	-20°C to +70°C

Table 3: Technical data

4.1 Dimensional drawings



Notice

All dimensions are specified in mm. All device types listed in this manual have the same dimensions.

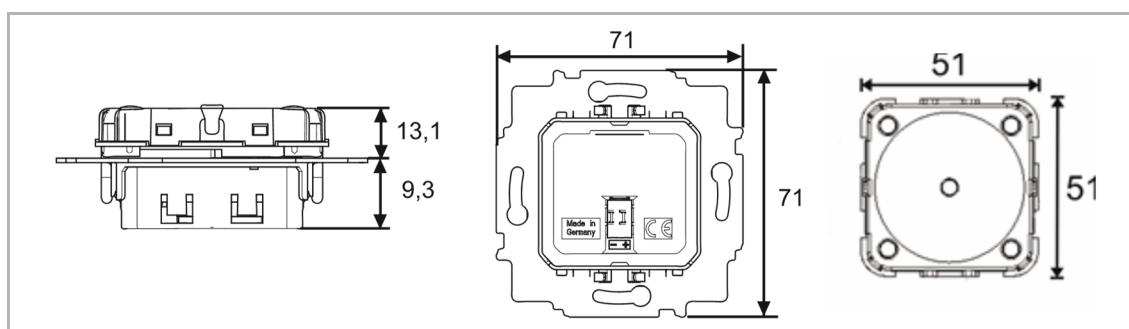


Fig. 3: Dimensions of all described device types (all dimensions in mm)

5 Connection and installation

5.1 Planning instructions



Note

Planning and application instructions for the system are available in system manual for Busch-free@home®. This can be downloaded via .



Note

Transmitter and receiver communicate via radio control. The transmission range depends on the structural conditions. Walls and ceilings, especially steel reinforcements or metal claddings, reduce the transmission range. The distance of components to each other and to other transmitters that also emit high-frequency signals (e.g. computers, audio and video systems) should be at least 1 m.

5.2 Safety instructions



Danger - Electric shock due to short-circuit!

Risk of death due to electrical voltage of 100 ... 240 V during short-circuit in the low-voltage conduit.

- Low-voltage and 100 ... 240 V conduits must not be installed together in a flush-mounted box!
- Observe the spatial division during installation (> 10 mm) of SELV electric circuits to other electric circuits.
- If the minimum distance is insufficient, use electronic boxes and insulating tubes.
- Observe the correct polarity.
- Observe the relevant standards.



Danger - Electric voltage!

Install the device only if you have the necessary electrical engineering knowledge and experience.

- Incorrect installation endangers your life and that of the users of the electrical system.
- Incorrect installation can cause serious damage to property, e.g. due to fire.

The minimum necessary expert knowledge and requirements for the installation are as follows:

- Apply the "five safety rules" (DIN VDE 0105, EN 50110):
 1. Disconnect
 2. Secure against being re-connected
 3. Ensure there is no voltage
 4. Connect to earth and short-circuit
 5. Cover or barricade adjacent live parts.
- Use suitable personal protective clothing.
- Use only suitable tools and measuring devices.
- Check the type of supply network (TN system, IT system, TT system) to secure the following power supply conditions (classic connection to ground, protective earthing, necessary additional measures, etc.).
- Observe the correct polarity.

5.3 Circuit diagrams

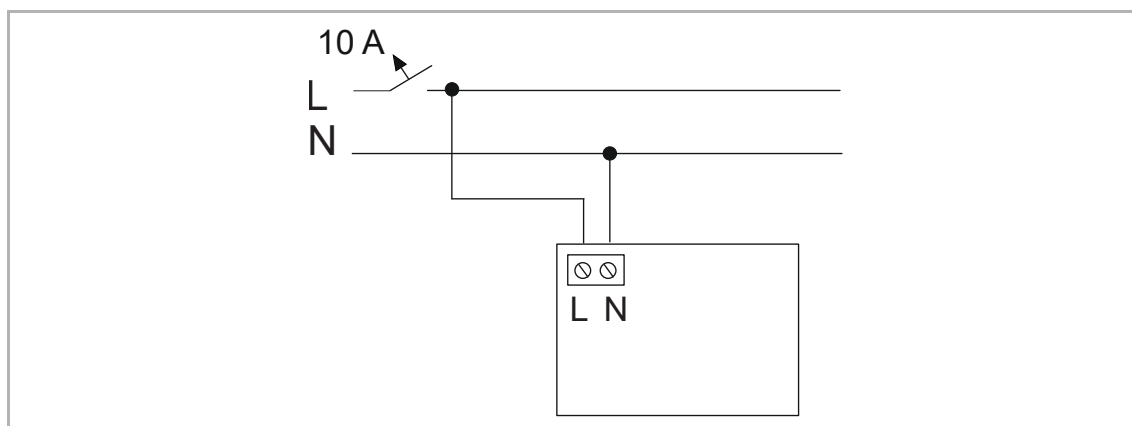


Fig. 4: Electrical connection

5.4 Installation



Note

The devices have been prepared for installing in flush-mounted boxes in connection with the corresponding mounting plate. The device insert has already been inserted in the mounting plate.

To install the device, perform the following steps:



Note

The sensor must be pulled off the flush-mounted insert before mounting!



Note

Observe correct wiring!

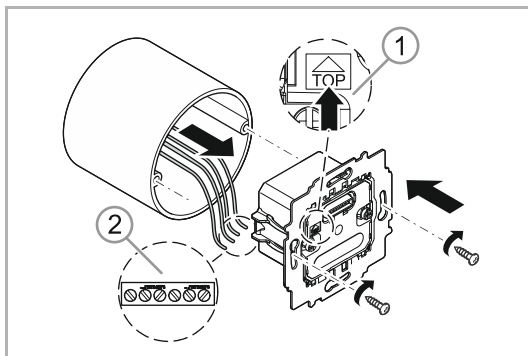


Abb. 5: Connection and installation

1. Turn the device into the correct installation position [1].
2. Connect the 230 V power cord to the bottom terminal block [2].

Observe Chapter 5.3 “Circuit diagrams” on page 14.

3. Insert the device into the flush-mounted box and screw it on.

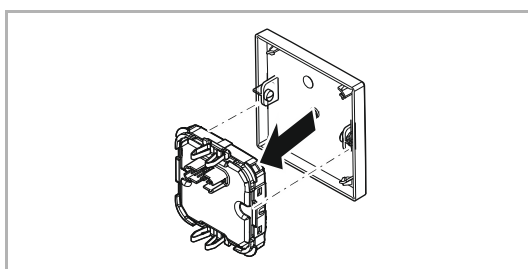


Fig. 6: Mounting the cover

4. Attach the cover (rocker; example shows only a 1gang rocker) to the sensor.

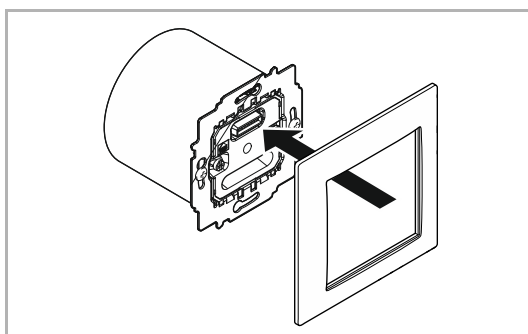


Fig. 7: Mounting the cover frame

5. Mount the cover frame.

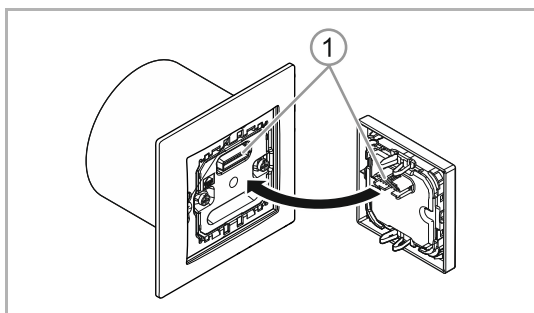


Fig. 8: Mounting the sensor

6. Attach the cover (with mounted sensor) to the flush-mounted insert.

Observe the correct position of the sensor connection [1].

6 Commissioning

Commissioning of the device is always carried out via the Web-based surface of the System Access Point. It is assumed that the basic commissioning steps of the overall system have already been carried out. Knowledge about the Web-based commissioning software of the System Access Point is assumed.

The System Access Point establishes the connection between the free@home participants and the smartphone, tablet or PC. The System Access Point is used to identify and program the participants during commissioning.

When energized, a device that has not been programmed is in programming mode for 30 minutes and can be logged into the system. Programmed devices share information about their type and supported functions with the System Access Point.

During initial commissioning all devices are given a universal name (e.g. sensor/switch actuator, sensor/dimming actuator, sensor/blind actuator, room temperature controller, movement detector, etc.). The installer must change this name within the commissioning process to a name practical and specific for the system (in case of an actuator, e.g. to "Living room ceiling light").

The devices must be parameterised for the use of additional functions.

**Notice**

General information about commissioning and parameterization is available in the Busch-free@home® system manual.

6.1 Coupling of wireless devices with the System Access Point

free@home wireless devices must first be coupled with the System Access Point before they can be used in a project. The devices exchange a security key during the coupling process.

Communication between devices is carried out encrypted after coupling and they are firmly connected with the System Access Point. Coupled devices cannot be connected with a different System Access Point. They must first be reset to the factory settings.

Carry out the following steps to couple one or several devices with the system:

1. Install the free@home wireless device(s).
2. Use your smartphone, tablet or PC to call up the user interface of the System Access Point that is ready for use.
3. Switch on the mains power supply of the free@home wireless devices.

The devices are now in programming mode for 30 minutes.

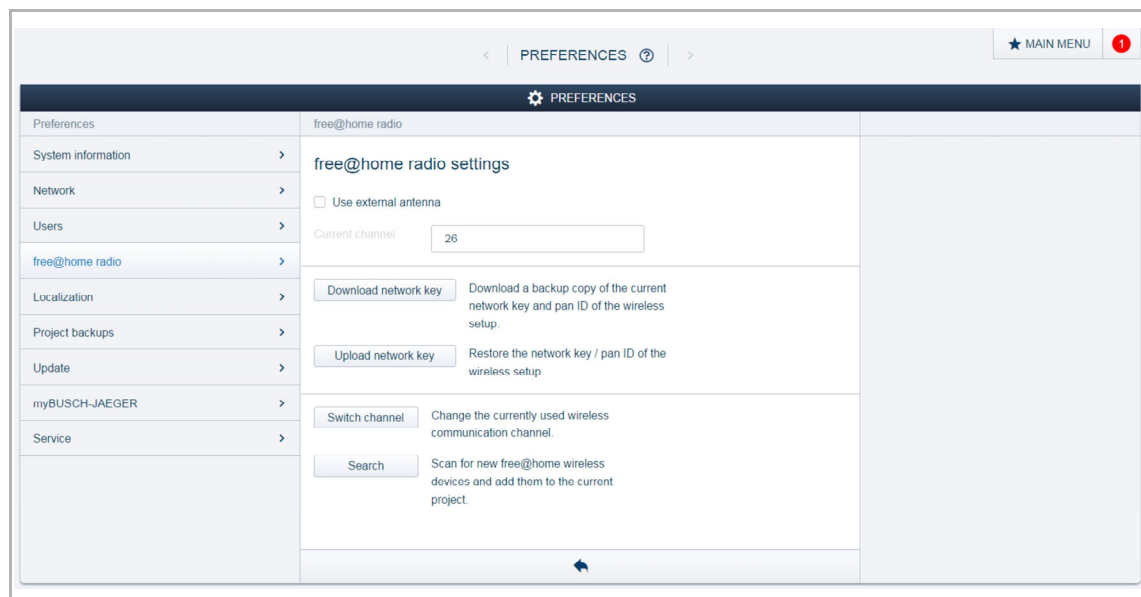


Fig 9: Coupling wireless devices with the System Access Point

4. In the user interface of the System Access Point select "System settings" → "free@home-Wireless settings" → "Search for wireless devices".
The System Access Point consecutively scans all free@home-Wireless channels. Devices that are in programming mode are automatically integrated into the system. The scanning process ends 10 minutes after the last device has been found.

Integrated devices are listed in the "Device list" of the user interface.

5. Use the serial numbers to check whether all installed devices have been found.
If a device has not been found, reset it to the factory settings and start a new scanning process.

Possible reasons for not finding devices:

- The device is not in programming mode.
- The 30-minute programming time has expired.
- The device has already been coupled with a different system.

6.1.1 Resetting the wireless device to the factory settings

1. Switch the free@home wireless device off.

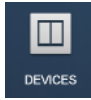
2. Keep the button at the bottom left pressed.
3. Switch the device on again.

The LED flashes slowly for 10 seconds, then fast for 5 seconds and then goes out.

The factory settings are restored and the device can now be programmed again.

6.2 Allocation of devices and definition of channels

The devices connected to the system must be identified, i.e. they are allocated to a room according to their function and are given a practical name.



The allocation is made via the device function of the Web-based user interface of the System Access Point.

6.2.1 Add device

1. In the "Add devices" bar select the desired application and pull it via drag-and-drop into the floor plan.

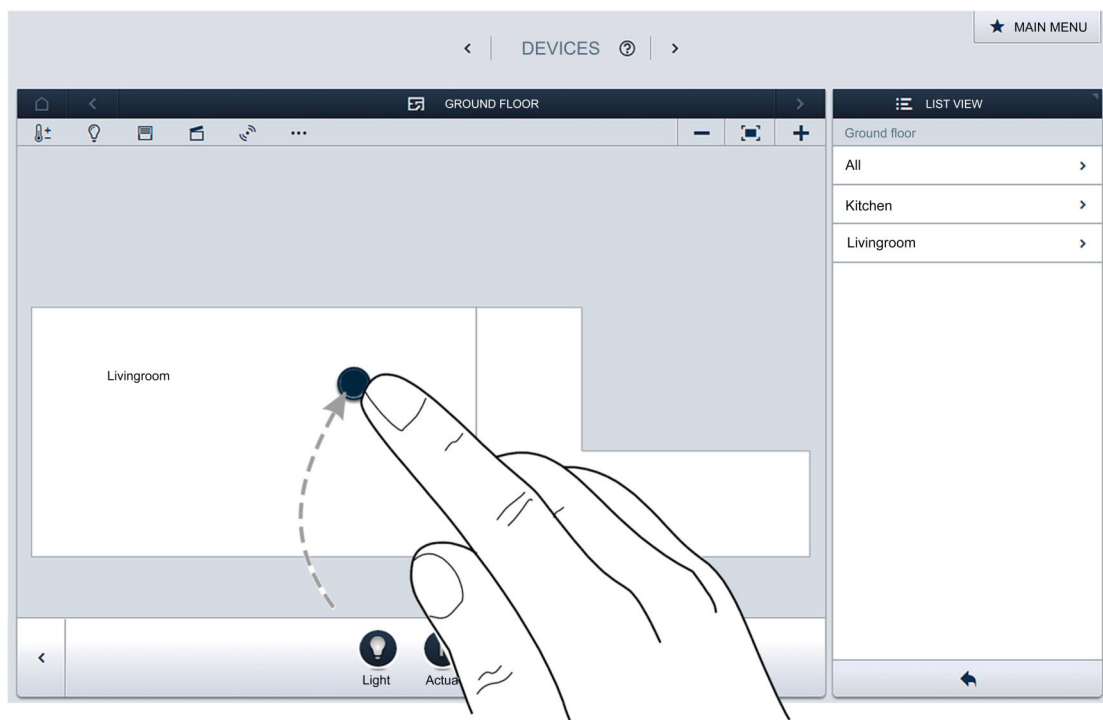


Fig. 10: Dragging the application from the add bar

A pop-up window opens which lists all the devices that are connected to the bus and suitable for the selected application.

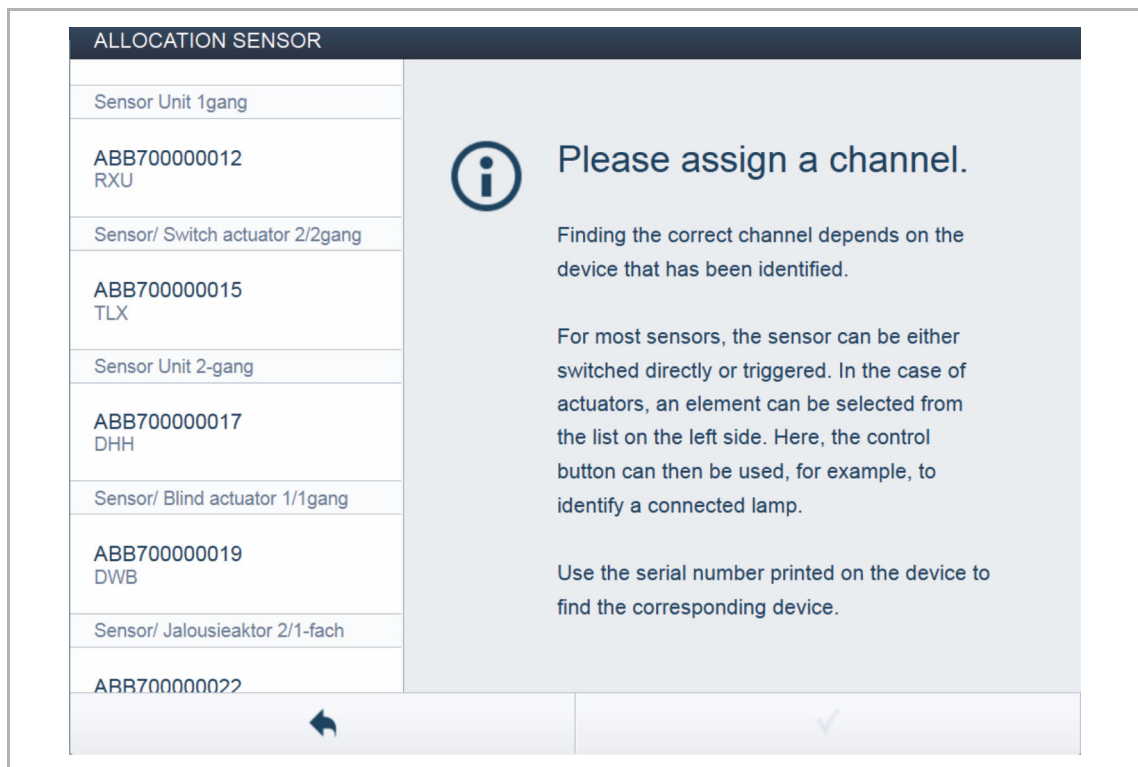


Fig. 11: Pop-up window with the suitable devices

Identification

The device can be identified via the serial number.

Identification via serial number

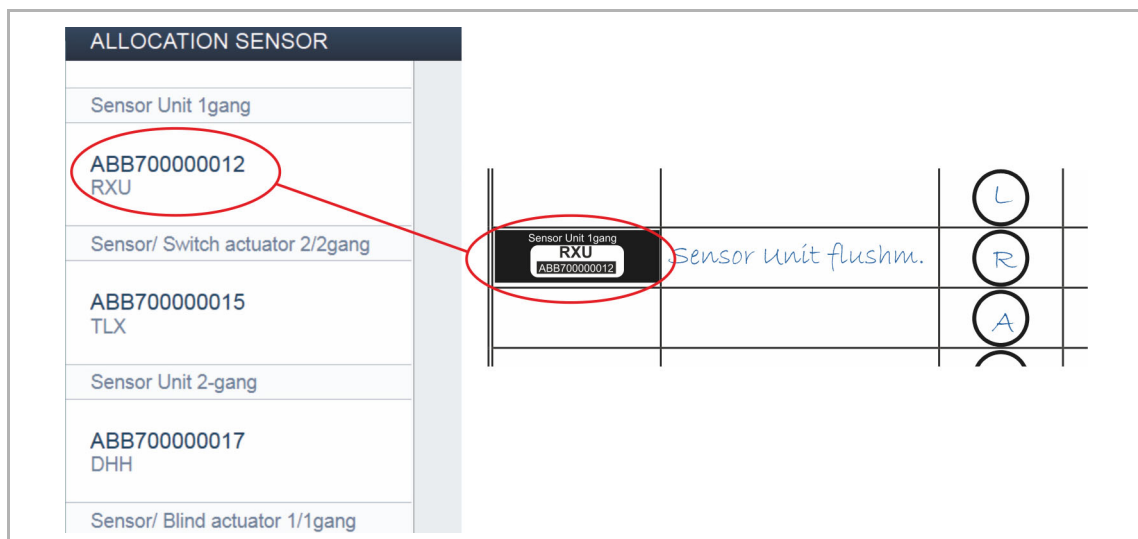


Fig. 12: Identification via serial number

- Compare the serial number and the short ID of the identification label, which is glued on the device plan, with the numbers and IDs in the list. This is how the searched for device and possibly the searched for channel are identified.

Specifying a name

ALLOCATION SENSOR

Sensor Unit 1gang

ABB700000012
RXU

Sensor/ Switch actuator 2/2gang

ABB700000015
TLX

Sensor Unit 2-gang

ABB700000017
DHH

Sensor/ Blind actuator 1/1gang

ABB700000019
DWB

Sensor/ Jalousieaktor 2/1-fach

ABB700000022

Sensor

FloorGround floor

RoomLivingroom

NameSensor Unit 1gang

Serial numberABB700000012

Short IDRXU

Sensor

Sensor Livingroom

Name

Sensor Livingroom

↩

✓

Fig. 13: Specifying a name

1. Enter a name that is easy to understand and under which the application is to be displayed later, e.g. "Push-button switch living room".
2. Press the tick at the bottom right.

This takes over the entry.

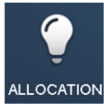


Notice

The settings of the device can be adjusted via the Web-based user interface of the System Access Point.

6.3 Setting options per channel

General settings and special parameter settings must be made for each channel.



The settings are made via the allocation function of the Web-based user interface of the System Access Point.

Select device

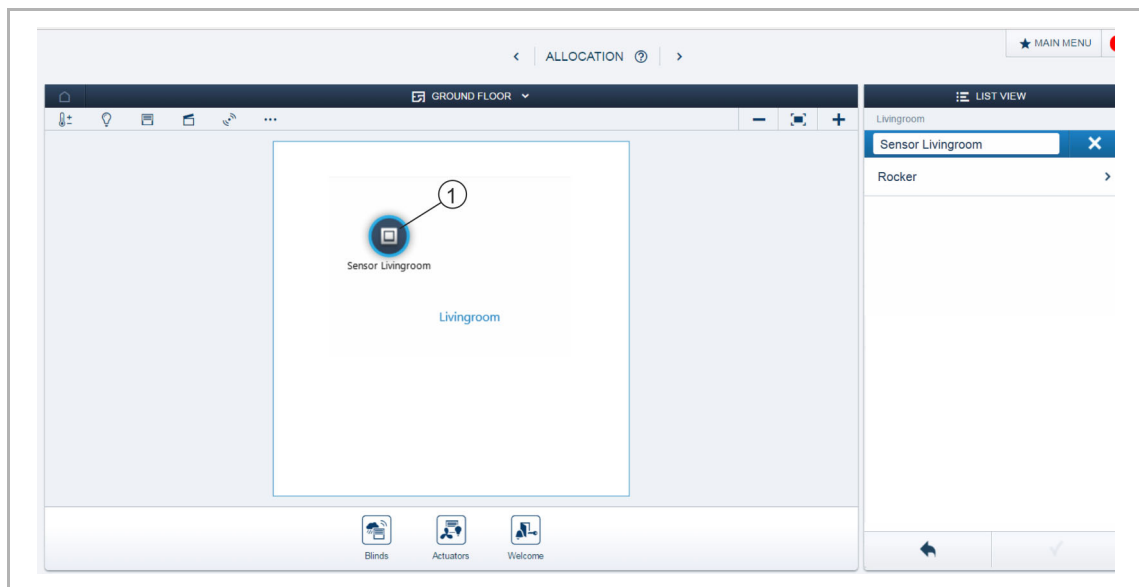


Fig. 14: Select device

1. Select the device icon [1] in the floor plan of the working area view.

All setting options for the respective channel are displayed in the list view [2]. For rockers (sensors) the corresponding rocker must be selected.

The following settings are available.

6.3.1 Parameter settings of 1gang sensor unit

Sensor settings

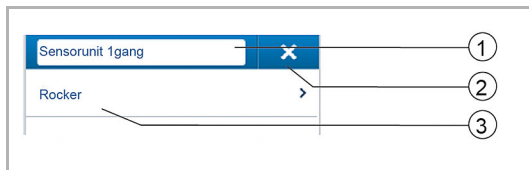


Fig. 15: Sensor settings

- [1] Changing the name
- [2] Deleting the channel
- [3] Selecting the rocker in the list view

Rocker settings

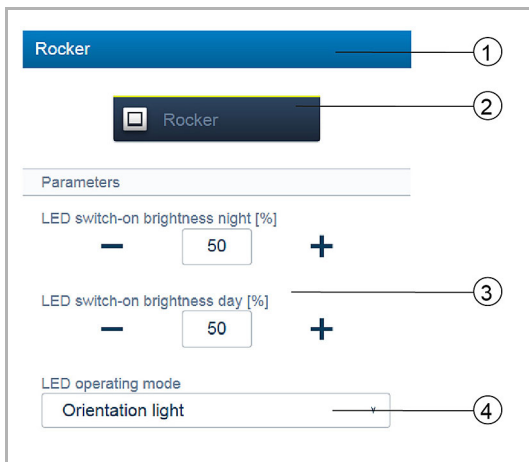


Fig. 16: Rocker settings

- [1] Changing the name
- [2] Switching of the sensor via the button
- [3] Setting the LED night/day switch-on brightness in % via the -/+ buttons
 - The parameter specifies how strong the LED lights up percentage wise during night/day.
- [4] Selecting the LED operating mode:
 - Light for orientation: LED lights up permanently
 - Status display: LED lights up during actuation

The following parameter is available immediately for pre-programmed devices.

For all other devices it becomes available only after being linked with an actuator. The setting in the list view is then made via the linking function of the Web-based user interface of the System Access Point.



Fig. 17: Rocker setting after linking with actuator

[5] Selecting the function:

- Control element
- Dimming sensor
- Staircase light sensor
- Force-position sensor On/Off
- Blind sensor
- Blind force-position
- Scene sensor (is visible only when the "Scene sensor" has been selected.
Long press of the button: "Overwrite scene"/"Retain scene")



NOTE

The parameter only functions when a time profile with the application "LED day / night switchover" is available. The device (channel) must be linked with this application.



Icon of the application

6.3.1.1 Parameter settings of 2gang sensor unit

Sensor settings

As for 1/1gang. However, two rockers (left and right rocker) are displayed in the list view.

Rocker settings

As for 1/1gang. However, the settings are made for two rockers (left rocker and right rocker).

6.4 Links

The sensors and actuators created via the allocation function can now be linked with each other. This allows simple switch-off circuits or two-way circuits to be implemented.



Linking is made via the linking function of the Web-based user interface of the System Access Point.



Notice

For pre-programmed devices (switch actuator units) a link is automatically established between actuator and sensor, since they are combined in the one device.

6.4.1 Linking actuator and sensor

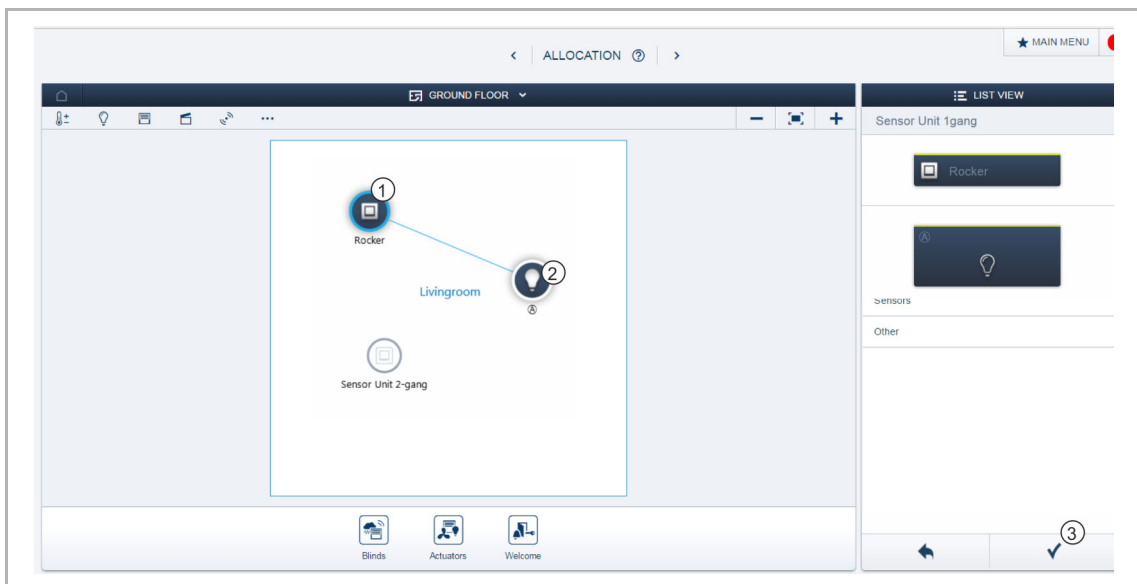


Fig. 18: Linking actuator and sensor

1. On the working area select the sensor [1] that is to be linked with the actuator.
2. Select the actuator [2] that is to be operated by the sensor.
3. Press the tick at the bottom right [3] to take over the entries.

A blue connecting line indicates the link between the two devices. The configuration is transmitted automatically to the devices. The transmission can, depending on the number of affected devices, take a number of seconds. During the transmission a progress bar is displayed around the devices affected.

6.4.2 Linking an actuator with an additional sensor

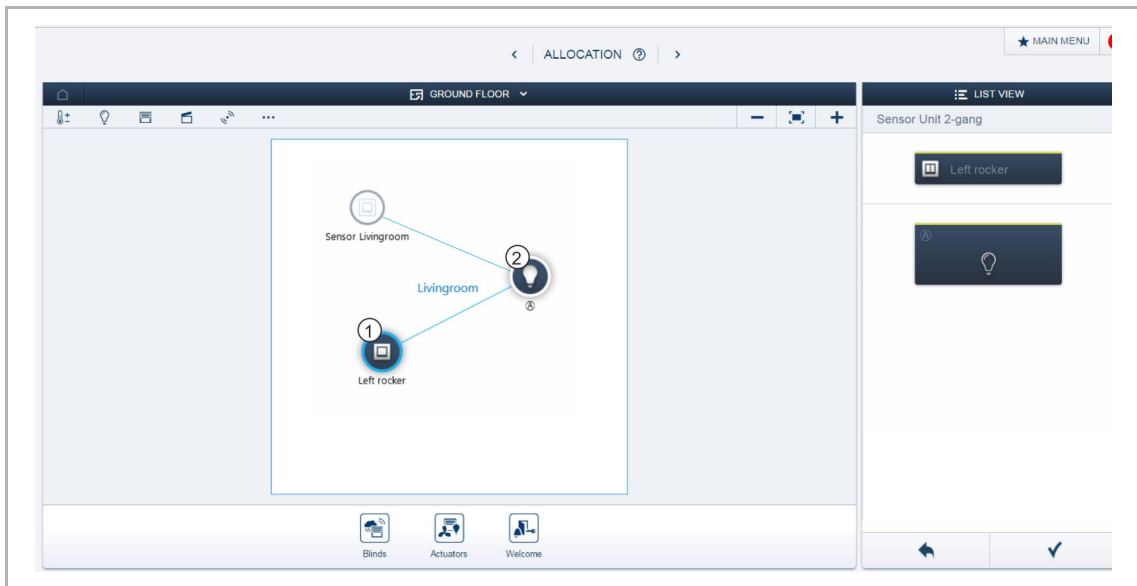


Fig. 19: Linking an actuator with an additional sensor

1. On the working area select the second sensor [1] that is to be linked with the actuator.
2. Select the actuator [2] that is to be operated by the sensor.
3. Press the arrow at the bottom right to take over the entries.

An additional blue connecting line indicates the link between the two devices. After the transmission of the configuration the sensor can be operated directly locally.

7 Update

A firmware update is carried out via the Web-based user interface of the System Access Point.

8 Operation

Operation is carried out by pressing the individual rockers. Their function is fixed via the assigned application or its pre-programming and its parameter settings.

Extensive applications are available for the rockers (control buttons).

**Note**

The scope of delivery contains only the electronic insert. It must still be completed with a suitable rocker and a cover frame.

Additional information about the switch ranges is available in the electronic catalogue (www.busch-jaeger-catalogue.com).

9 Maintenance

The device is maintenance-free. In case of damage, e.g. during transport or storage), do not perform repairs. Once the device is opened, the warranty is void.

Access to the device must be guaranteed for operation, testing, inspection, maintenance and repairs (according to DIN VDE 0100-520).

9.1 Cleaning



Caution! - Risk of damaging the device!

- When spraying on cleaning agents, these can enter the device through crevices.
 - Do not spray cleaning agents directly onto the device.
- Aggressive cleaning agents can damage the surface of the device.
 - Never use caustic agents, abrasive agents or solvents.

Clean dirty devices with a soft dry cloth.

- If this is insufficient, the cloth can be moistened slightly with a soap solution.

10 Notes

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