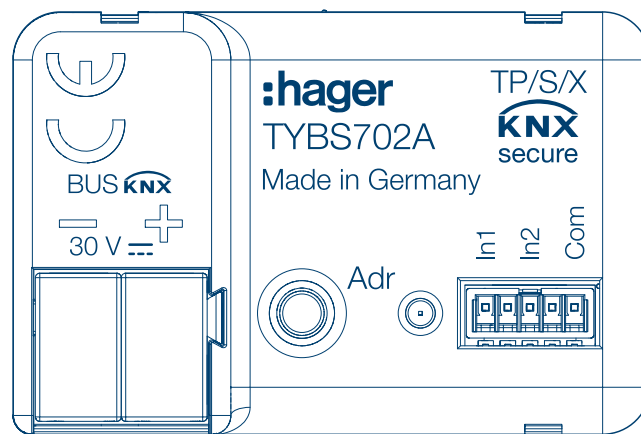


# KNX building management system

## KNX binary input



Binary input 2-gang, KNX Secure, flush-mount-  
ed

**TYBS702A**



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## 2 Introduction

These instructions describe the safe and correct installation and commissioning of the KNX Secure binary input. These instructions are provided as information in addition to the product.

Symbols used

☑ Requirement. This requirement must have been met before continuing with the next assembly step.

● Single-step instruction or any sequence

① Multi-step instruction Sequence must be maintained.

– List

► Reference to additional documents/information




















	Scope of delivery		Installation by a qualified electrician		For further information on configuring the device, refer to the application manual
	KNX-certified		Supports KNX Data Secure		
	Compatibility with KNX S-mode (ETS≥ 5.6.x)		Compatibility with Hager easyTool ≥ 7.x		
	Suitable for use in China		Suitable for use in Morocco		Suitable for use in Australia and New Zealand
	Suitable for use throughout Europe and Switzerland		Manufacturer's information is in accordance with § 18 Para. 4 of the German Electrical and Electronic Equipment Act.		Suitable for use in England, Wales and Scotland

Table 1: Symbols used

Symbol	Warning word	Consequence of non-observance
	Danger	Leads to serious injuries or death.
	Warning	Can lead to serious injuries or death.
	Caution	Can lead to minor injuries.
	Caution	Can lead to device damage.
	Note	Can lead to physical damage.

## Introduction

Symbol	Description
	Warning against electric shock.
	Warning against damage from mechanical stress.
	Warning against damage from electricity.
	Warning against damage from fire.



Electronic devices may only be assembled, installed and configured by a specialist with electrical training and certification in accordance with the relevant installation standards of the country. The accident prevention regulations valid in the appropriate countries must be complied with.

In addition, these instructions are intended for system administrators and electrically trained specialists.

### **3 Safety instructions**

Electrical devices must only be installed and assembled by a qualified electrician in accordance with the relevant installation standards, guidelines, regulations, directives, safety and accident prevention directives of the country.

**Hazard due to electric shock. Disconnect before working on the device or load. Take into account all circuit breakers that supply dangerous voltages to the device or load.**

**Failure to comply with these installation instructions may result in damage to the device, fire or other hazards.**

**When installing and routing cables, always comply with the applicable regulations and standards for SELV electrical circuits.**

**Danger due to electric shock. During installation, ensure sufficient insulation between the mains voltage and the bus. Maintain a minimum distance between the bus and mains voltage wires of at least 4 mm.**

**Danger due to electric shock on the installation. Do not connect any external voltages to the inputs. The device could be damaged and the SELV potential on the bus cable is no longer provided.**

**4 Scope of delivery**

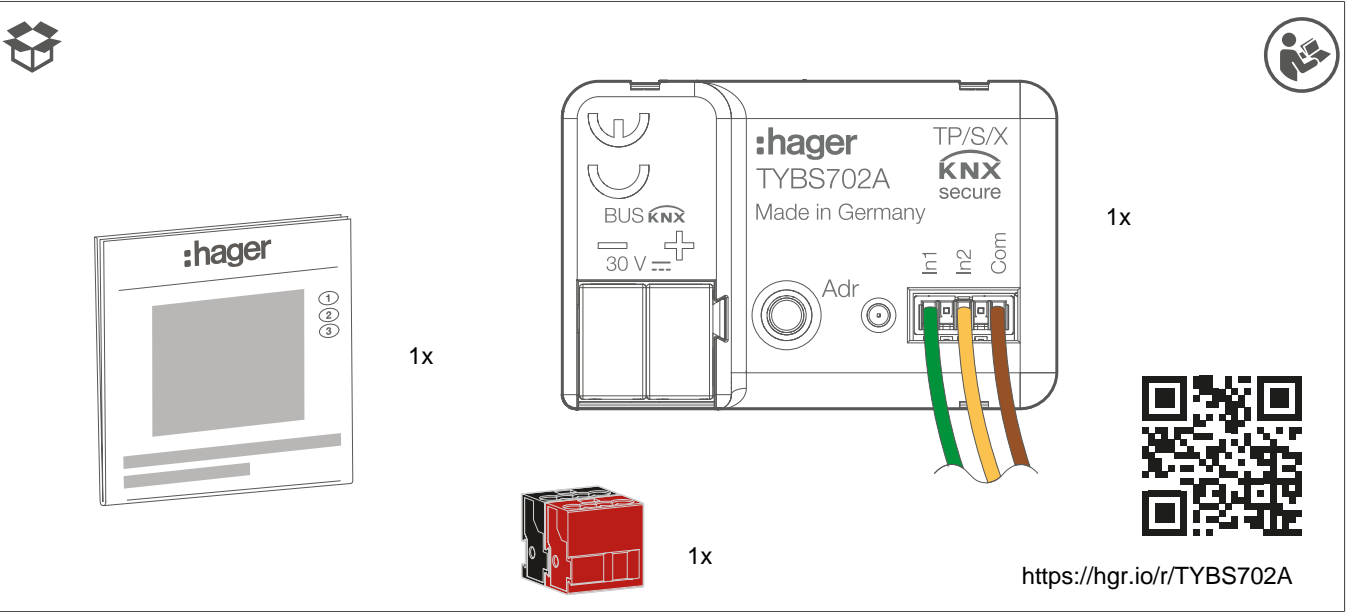


Fig. 1: Scope of delivery TYBS702A

### 5 Design and layout of the device

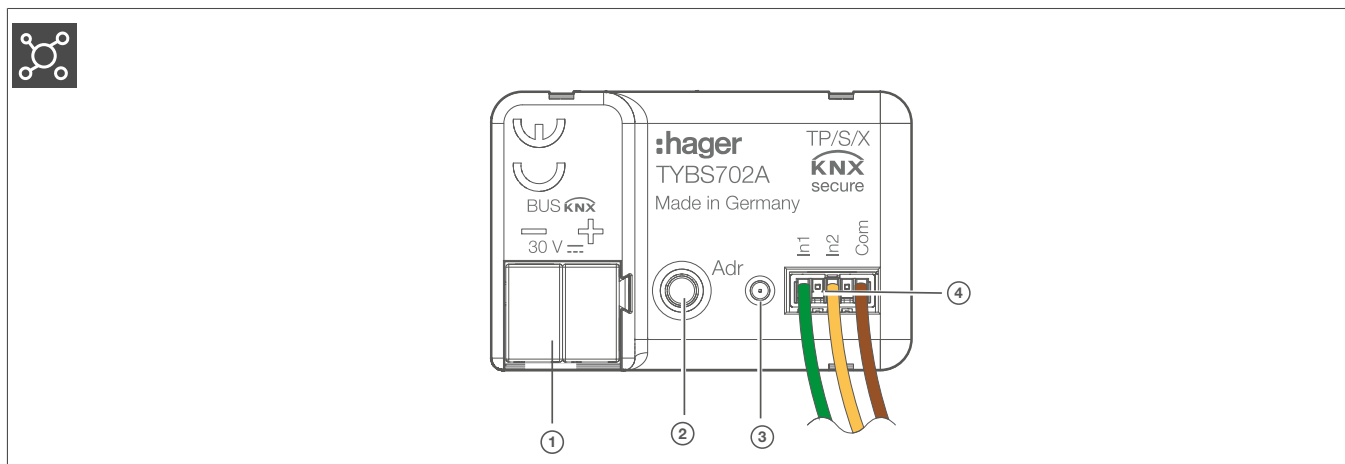


Fig. 2: Design and layout of the device TYBS702A

- ① KNX bus connection terminal
- ② Programming button
- ③ Programming LED
- ④ Connection cables

## 6 Function

### **System information**

This device is a product of the KNX system and corresponds to the KNX guidelines. Detailed specialised knowledge obtained from KNX training courses is required for understanding.

The device is KNX Data Secure-compatible. KNX Data Secure can be configured in the ETS project and offers protection against manipulation in building automation. Detailed knowledge on this subject is required. A device certificate (FDSK), which is attached to the device (QR code sticker), is required for commissioning a KNX Secure device. During installation, the device certificate must be removed from the device and kept in a safe place.

The planning, installation and commissioning of the device are carried out with KNX-certified software.

### **systemlink commissioning**

The function of the device is software-dependent. The software is to be obtained from the product database. You can find the latest version of the product database, technical descriptions as well as conversion and additional support programmes from our website.

### **easylink commissioning**

The function of the device is configuration-dependent. The configuration can also be performed using devices developed specially for simple setting and commissioning.

This type of configuration is only possible with easylink system devices. easylink stands for easy, visually supported commissioning. Preconfigured standard functions are assigned to the inputs/outputs by means of a service module.

### **Functional description**

The push-button interface has 2 independent channels. Each channel can operate as an input or output. The push-button interface can read potential-free contact states with a common reference potential via its inputs and send telegrams accordingly to the bus.

If a push button is connected, telegrams can be sent to the bus in the 'Push button' channel function for switching, for forced positioning, for dimming the brightness or colour temperature, for shading control, for sending out values, for calling up or switching a scene as a scene extension unit or for operating a room thermostat with the room thermostat operating section. Optionally, different telegrams can also be sent to the bus with a short or long push-button press.

If a switch is connected, one or two objects can be used in the 'Switch' channel function to send telegrams to the bus for switching, for forced positioning, for sending out values, for calling up or switching a scene as a scene extension unit or push-button interface for operating a room thermostat with the room thermostat operating section. One value can be parameterised each time the contact is closed and opened.

If door or window contacts are connected, various window or door statuses can be evaluated in the 'Door/window status' channel function and corresponding telegrams can be sent to the bus.

If a leakage sensor or condensation sensor is connected, the leakage or condensation status can be evaluated in the 'Leakage/condensation sensor' channel function and corresponding telegrams can be sent to the bus.



**Correct use**

- Inputs to poll conventional, potential-free contacts in KNX systems
- Sending telegrams to the KNX bus to signal statuses, counter levels, operation of consumers, etc.
- Outputs to control LEDs
- Installation in wall box with dimensions according to DIN 49073 in combination with a suitable cover
- When installing behind switch and push-button inserts, use a wall box with sufficient installation depth

**Product characteristics**

- Independent channels that operate as inputs or outputs depending on ETS parameterisation
- Common reference potential for all channels
- Disabling of individual channels
- Supply via bus, no additional supply voltage required
- KNX Data Secure compatible as of ETS 5.7.7 or as of ETS 6.1.0

**Inputs**

- Connection of potential-free contacts, such as push buttons, switches, or reed contacts
  - Polling with a pulse current avoids contact contamination (formation of an oxide layer) on the connected contacts
  - Operating functions: Switching, dimming, control of blinds, scene or room temperature
  - Value transmitter for dimming, colour temperature, RGBW, temperature, or brightness values
  - Transmission of the current input status after a bus voltage failure
  - Connection of door or window contacts to evaluate the open, closed, tilted, and handle position statuses
  - Connection of temperature sensors
  - Pulse counter with main and intermediate counters
  - Combination of adjacent input channels when connecting a push button, door contact or window contact
- Logic functions

## 7 Information for qualified electricians

### 7.1 Installation and electrical connection



#### Danger

Electric shock when live parts are touched!

An electric shock can lead to death!

- Disconnect all connection cables before working on the device and cover any live parts in the area!

#### Connection and installation of the device

- For KNX Secure operation: Remove the device certificate from the device and store it securely ([Chapter , Commissioning in KNX Secure mode](#) ).
- Install in a suitable wall box. Pay attention to proper cable routing and distance between the cables.
- Connect the bus cable via the bus connection terminal.

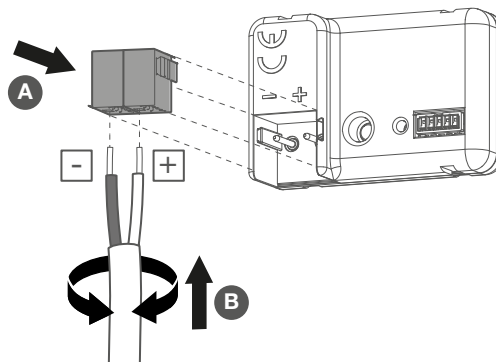


Fig. 3: Connecting the bus cable

#### Installation instructions

- To avoid electromagnetic interference, the cables of the inputs should not be routed parallel to mains-carrying cables or load cables.
- The voltage potentials of the connection cables for the inputs and outputs are not galvanically isolated from the bus voltage. The connection cables effectively extend the bus cable. The specification for the bus cable length (max. 1000 m) must be observed.
- Do not connect the Com connections of several push-button interfaces to each other.
- For NTC temperature sensors, use channels 1 and 2 ([see Accessories , page 18](#)).
- A series resistor is not required to connect matching LEDs ([see Technical data , page 18](#)).



#### Note!

When extending the supplied cable sets (see Fig. 4), the maximum cable length specified in the technical data may not be exceeded (see [Technical data](#), page 18).

Therefore: The total length of the Com cable per cable set may not exceed 30 m.

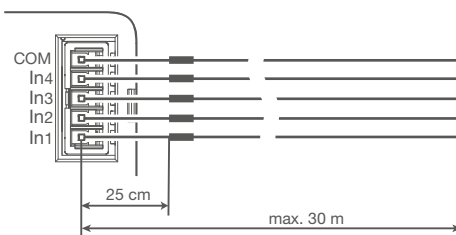


Fig. 4: Max. cable length per cable set



#### Danger

There is a danger of electric shock when connecting 230 V mains voltage or other external voltages!

An electric shock can lead to death!

Only connect potential-free push buttons, switches or contacts.



#### Attention

There is a danger of electric shock when connecting 230 V mains voltage or other external voltages!

Device could be destroyed.

Only connect potential-free push buttons, switches or contacts.

- 4 Connect the push buttons, switches, contacts, LEDs or NTC with the supplied connection cables according to the connection examples (Fig. 2/4) (Fig. 5). Unused wires must be insulated.

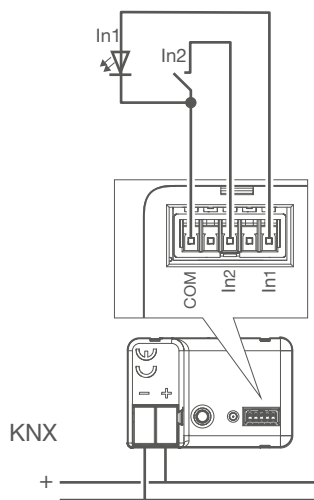


Fig. 5: Connection example, 2-gang push-button interface



Outputs can also be connected in parallel to increase the output current. The outputs must be parameterised in the same way. In the example, the In1-In2-In3 outputs are connected in parallel (Fig. 6).

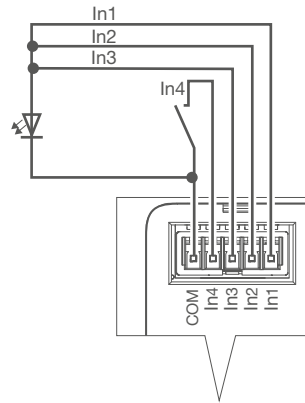


Fig. 6: Connection example for parallel-connected outputs

## 7.2 Commissioning

The device can be programmed in three ways:

- KNX systemlink mode (standard ETS programming) [see systemlink – loading the physical address and application software , page 12](#)
- KNX Secure mode [see Commissioning in KNX Secure mode , page 12](#)
- KNX easylink mode, [see easylink commissioning , page 13](#)

### systemlink – loading the physical address and application software

- 1 Switch on the mains voltage.
  - 2 Switch on the bus voltage.
  - 3 Press the programming button (Fig. 2/2).
- The programming LED (Fig. 2/3) lights up.



If the button does not light up, no bus voltage is present on the device.

- 4 Load the physical address into the device.  
The programming LED goes out.
- 5 Note down the physical address on the device.
- 6 Load the application software into the device.

### Commissioning in KNX Secure mode

☑ The device has been installed and connected so that it is ready for operation.

- 1 Activate safe commissioning mode in ETS.
- 2 Enter the device certificate (QR code) (Bild X), scan it (Bild X) or add it to the project in ETS.



### Note!

Use a high-resolution camera to scan the QR code.

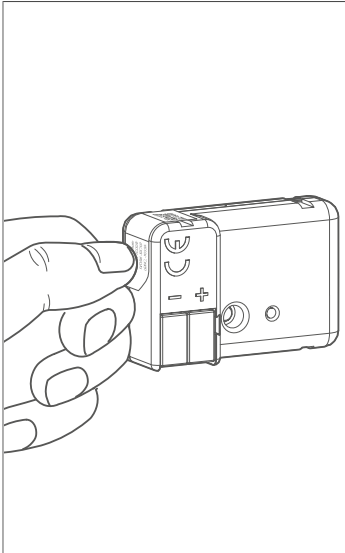


Fig. 7: Removing the device certificate from the device (similar to illustration)

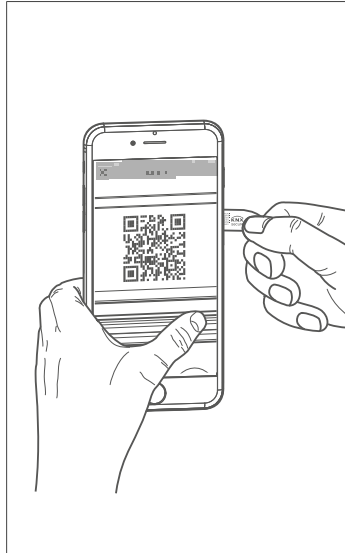


Fig. 8: Scanning the QR code

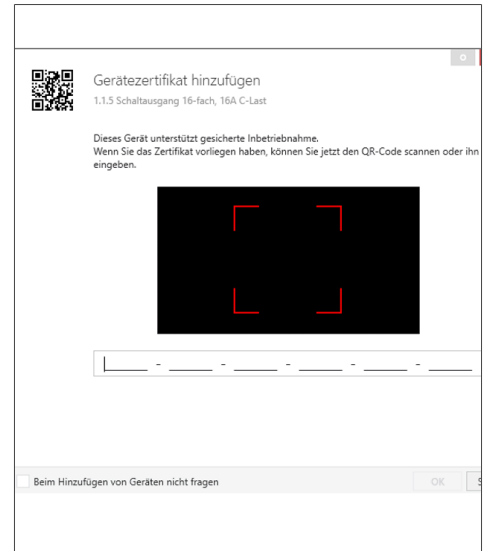


Fig. 9: Entering the QR code manually

- 3 Document all passwords and keep them in a safe place.
- 4 Remove the device certificate (QR code) from the device and store it with the passwords.
- 5 Note down the device certificate along with the physical address and product reference in a list.

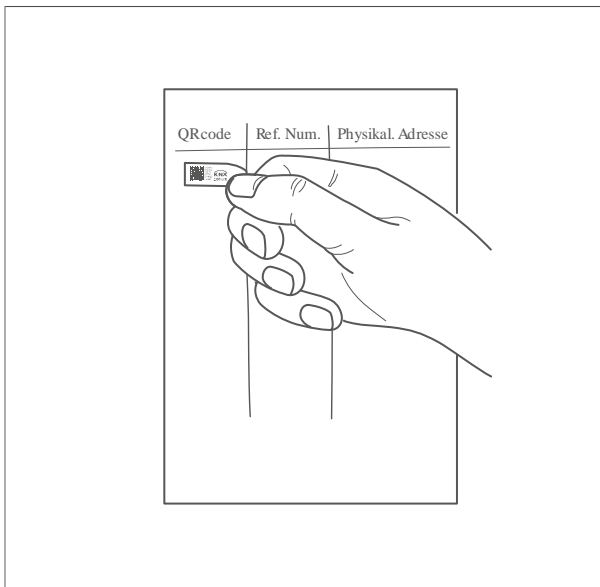


Fig. 10: Storing the device certificate in the project documentation

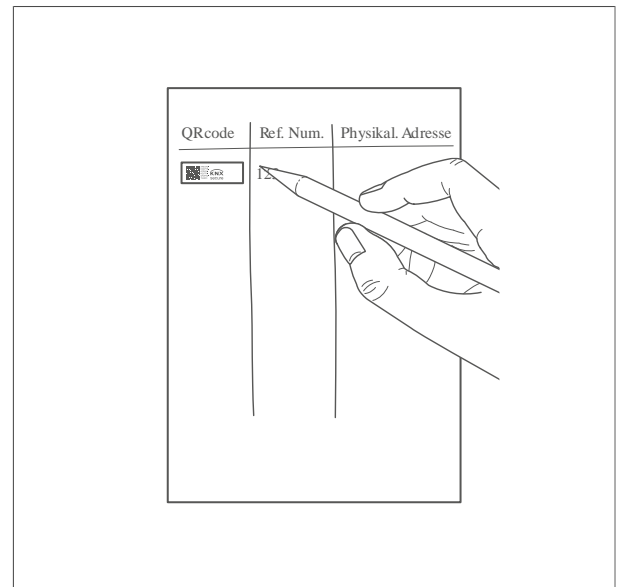


Fig. 11: Noting down the article number and physical address for the device certificate

### easylink commissioning

For commissioning in the easylink system, an easylink configuration server (e.g. domovea basic/expert with easy TJA470 or TJA670 or domovea basic/plus TJAS471 or TJAS671) must be installed temporarily or permanently in the KNX system.

Refer to the detailed descriptions for domovea expert/basic with easy for further information on system configuration in easylink mode.

### Special features of localisation in the easyTool

The localisation of the universal interface TYBS702A is described in the following steps and differs from the usual procedure for localisation in the easyTool. Localisation is carried out after installing several (e.g. identical) devices, in order to be able to assign them uniquely in the easy project.

In contrast to the usual procedure, only the programming button and red programming LED are used on the device.

- ☑ The KNX installation is installed in accordance with the regulations for easyTool operation.
- ☑ The universal interface is connected to the bus.
- ☑ The easyTool or the domovea basic/expert are connected ready for operation.
- ☑ The universal interface has already been added to the easy project.

- 1 Start the Hager Pilot on the preferred medium/means of communication (tablet, laptop, etc.) and connect it to the server.
- 2 In the easyTool, click the Localization menu box.

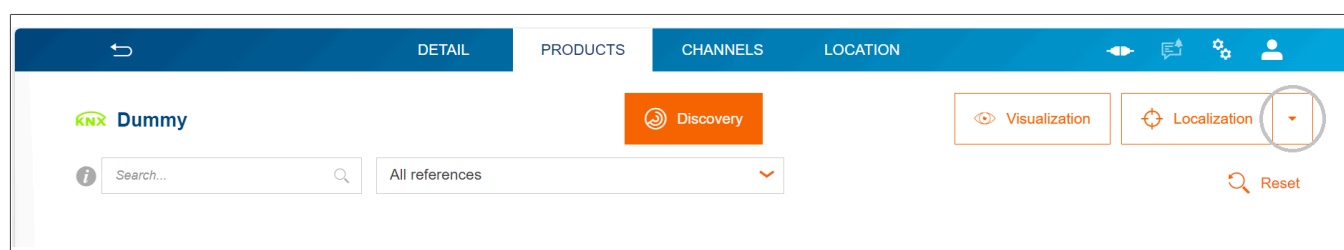


Fig. 12: Screenshot: whole screen

Two menu entries are visible.

- 1 In the Localization menu box, select either **Localization with Physical Effect** or **Localization without Physical Effect**.

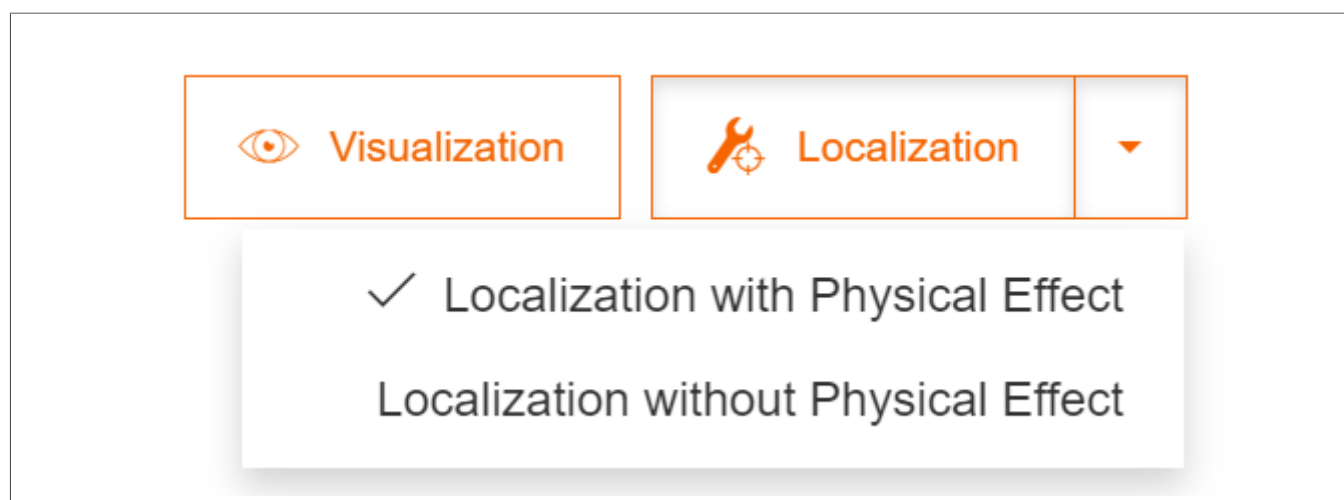
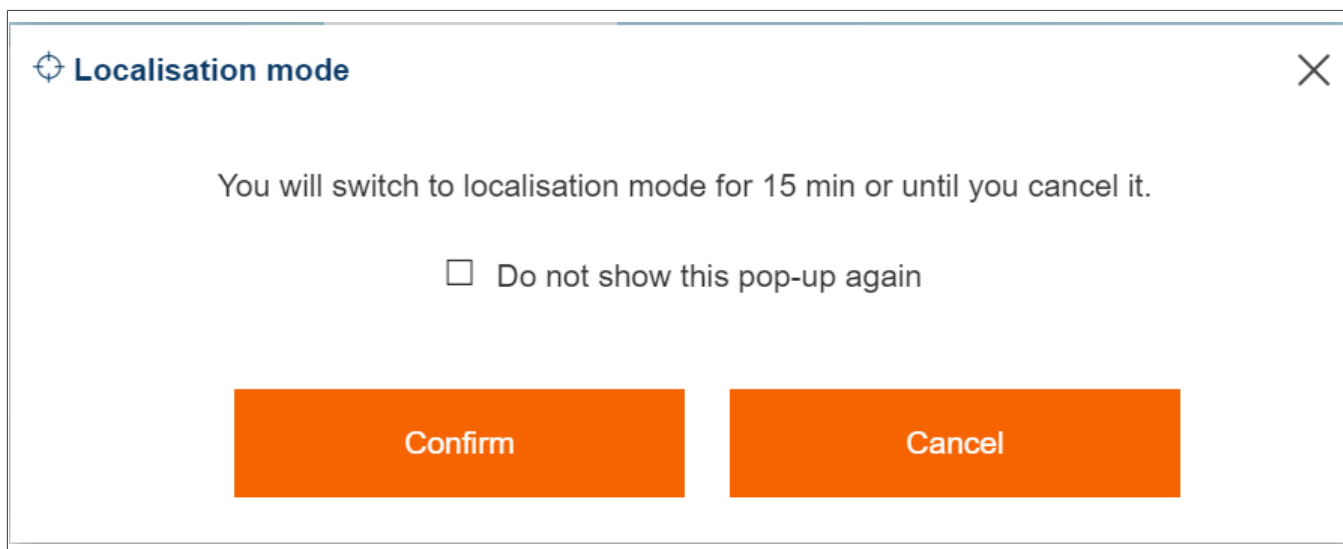


Fig. 13: Insert screenshot: Localization highlighted orange

- 2 After selecting one of the menu items, click the **Localization** menu box.  
The **Localization Mode** menu window opens.



- Click **Confirm**

The **Localization** menu box is highlighted in orange.

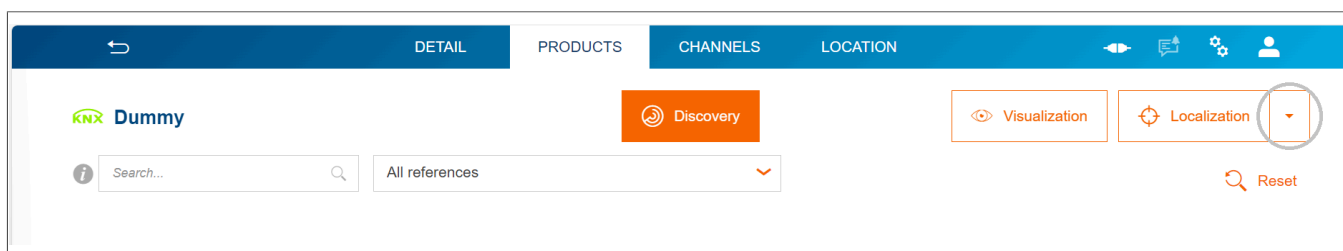


Fig. 14: Screenshot from easyTool 'Localization' language-specific



### Note

Localisation of the device is only possible if the menu box is highlighted in orange.

Devices can be identified using the programming LED via three different procedures.

#### Procedure 1: Localisation via the product list in the easyTool

- Select the device to be used in the device list by clicking.  
The programming LED of the device lights up.
- De-select the device to be used in the device list by clicking again.  
The programming LED of the device goes out.  
The device is localised in the easyTool.

#### Procedure 2: Localisation via the channel list in the easyTool

- Highlight the channel of the device to be used by clicking in the channel list.  
The programming LED of the device lights up.
- De-select the device to be used in the channel list by clicking again.  
The programming LED of the device goes out.  
The device is localised in the easyTool.



**Note**

If several channels of the same device are highlighted in the channel list, the programming LED remains activated until the last channel of the device is unhighlighted by clicking.

**Procedure 3: Localisation via the device**

- Press the programming button of the device.

The programming LED lights up.

The device is highlighted in the device list and all channels of the device are highlighted in the channel list.

- Press the programming button of the device again.

The programming LED goes out and all highlighting in the device and channel list is deactivated.

**Safe-state mode**

Safe-state mode stops the execution of the loaded application program. Only the system software of the device keeps working. ETS diagnostic functions and programming of the device are possible.

**Activating safe-state mode**

- 1 Switch off the bus voltage or remove the KNX connecting terminal.
- 2 Wait approximately 10 seconds.
- 3 Press and hold the programming button.
- 4 Switch on the bus voltage or connect the KNX connecting terminal.
- 5 Wait until the programming LED flashes slowly.
- 6 Release the programming button.

Safe-state mode is activated.

By briefly pressing the programming button again, the programming mode can also be switched on and off in safe-state mode as usual. The programming LED stops flashing when the programming mode is active.

**Deactivating safe-state mode**

- Switch off bus voltage (wait approx. 10 seconds) or perform ETS programming.

**Master reset**

The master reset resets the device to the basic settings (physical address 15.15.255, firmware is retained). The device must then be recommissioned with the ETS. For KNX Secure operation: A master reset disables device security. The device can then be recommissioned using the device certificate.

Performing a master reset

☒ Safe-state mode is activated.

- Press and hold the programming button for > 5 s.

The programming LED flashes rapidly.

- Release the programming button.

The device performs a master reset, restarts and is ready for operation after approx. 5 s.



### 7.3 Dismantling



#### **Danger**

Electric shock when live parts are touched!

An electric shock can lead to death!

- Isolate all connection cables before working on the device and cover any live parts in the area!

#### **Dismantling the device**



#### **Danger**

Electric shock when live parts are touched!

An electric shock can lead to death!

- Isolate all connection cables before working on the device and cover any live parts in the area!

☑ All the cables delivering voltage to the device are switched off.

- ① Pull the device out of the wall box.
- ② Disconnect the bus connection cable.
- ③ Disconnect the load cables from the connected device.



Dispose of the device in line with the corresponding guidelines of the country ([see Disposal note](#)) or, if you have a warranty claim, contact the point of sale ([see Warranty](#)).

## 8 Appendix

### 8.1 Technical data

KNX Medium	TP1 - 256
Configuration mode	S-Mode, E-Controller
KNX nominal voltage	21 ... 32 V $\overline{\text{SELV}}$
KNX connection mode	KNX connecting terminal
KNX current consumption	5 ... 10 mA
Output voltage	5 V DC $\overline{\text{SELV}}$
Output current per channel	Max. 3.2 mA
Number of channels	2
LED current (red LED with 1.7 V flux voltage)	2.2 mA per output
Connection of channels	3-wire cable set
Length of cable set	25 cm, extendable to max. 30 m
Cable recommendation	J-Y(St)Y 2x2x0.8
Operating height	< 2000 m
Electric strength	4 kV
Degree of protection	IP22
Protection class	III
Impact protection	IK04
Degree of contamination	2
Operating temperature	-5 °C ... +45 °C
Storage/transport temperature	-20 °C ... +70 °C
Dimensions (LxWxH)	43.0 x 28.5 x 15.4 mm

### 8.2 Accessories

LED kit, 5 V DC, 2.2 mA	TG308
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### 8.3 Troubleshooting

**Bus operation not possible.**

**Bus voltage is not present.**

- 💡 Check bus connection terminals for correct polarity.
- 💡 Check bus voltage by briefly pressing the programming button (Fig. 2/2: Design and layout of the device TYBS702A), red LED lights up if bus voltage is present.

**Connected devices (e.g. push buttons) have no function.**

**Connected devices connected incorrectly.**

- 💡 Check connecting terminals for correct polarity and contact.

**Connected device incorrectly configured in the application software.**

- 💡 Check the configuration in the application software.

### 8.4 Regulatory Compliance Australia

### 8.5 Disposal note



Correct Disposal of this product (Waste Electrical & Electronic Equipment).

(Applicable in the European Union and other European countries with separate collection systems).

This marking shown on the product or its documentation indicates that it should not be disposed of with other household waste at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this device from other types of waste. Recycle the device responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this device for environmentally safe disposal.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial waste for disposal.

## **8.6     Warranty**

We reserve the right to implement technical and formal changes to the product in the interest of technical progress.

Our products are under guarantee within the scope of the statutory provisions.

If you have a warranty claim, please contact the point of sale.



**Hager Controls**

BP10140

67703 Saverne Cedex

France

+33 (0) 3 88 02 87 00

[info@hager.com](mailto:info@hager.com)

**[hager.com](http://hager.com)**