B.E.G. LUXOMAT® net

Binary input

BIP4-KNXs REG

Application description

90412

Subject to technical changes.

All device data can also be found here:

https://beg-luxomat.com/qr.php?prtno=90412

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1 About this document

1.1 Applicable documents

Brief operating instructions (enclosed with the device).

1.2 Means of presentation used

	Symbol for danger to life due to electric shock
	Symbol for possible danger to persons
	Symbol for possible material damage
	Symbol for useful information and tips
NOTE	Signal word for possible material damage
CAUTION	Signal word for possible minor injuries
WARNING	Signal word for possible serious injuries
DANGER	Signal word for possible fatal injuries

1.3 Prerequisites for understanding

NOTE	
	KNX knowledge A KNX commissioning or project planning course is required to understand this application description.

2 Security

The appliance has been developed, manufactured and tested in compliance with the applicable safety standards. It corresponds to the state of the art.

2.1 Intended use

The device is a binary input for controlling lights, blinds, etc. via the KNX bus system. It is mounted on a top-hat rail in accordance with EN 60715 in the sub-distribution board.

CAUTION
Observe the intended use! The protection of operating personnel and the appliance is not guaranteed if the appliance is not used in accordance with its intended use. ➜ Only use the device in accordance with its intended use. ➜ B.E.G. Brück Electronic GmbH is not liable for damage caused by improper use. ➜ Read these operating instructions before commissioning the appliance. Knowledge of the operating instructions is part of the intended use.

NOTE
Comply with regulations and provisions! ➜ Observe the locally applicable legal regulations and the regulations of the employers' liability insurance associations.

WARNING
Work on electrical systems may only be carried out by qualified electricians or by instructed persons under the direction and supervision of a qualified electrician in accordance with the electrotechnical regulations. Danger of electric shock. Device is not suitable for unlocking. Danger of electric shock. ➜ Before working on the appliance or replacing lamps, disconnect the mains voltage and switch off the circuit breaker.

2.2 Foreseeable misuse

Any use other than that specified under "Intended use" or any use beyond this is considered improper use.
Use of the device is not permitted in the following cases in particular:

- in rooms with explosive atmospheres
- in safety-relevant circuits
- for medical purposes

NOTE
Do not tamper with or modify the device! ➜ Do not tamper with or modify the appliance. Interventions and modifications to the device are not permitted. ➜ The appliance must not be opened. It does not contain any parts to be adjusted or maintained by the user. ➜ Repairs may only be carried out by B.E.G. Brück Electronic GmbH.

2.3 Qualified persons / qualified electricians

Connection, installation, commissioning and adjustment of the appliance may only be carried out by authorised persons.
Requirements for authorised persons:

- You have suitable technical training.
- They know the rules and regulations on occupational health and safety.
- You are familiar with the operating instructions for the device.
- They were instructed in the installation and operation of the appliance by the person responsible.

Qualified electricians

Work on electrical systems may only be carried out by qualified electricians or by instructed persons under the direction and supervision of a qualified electrician in accordance with the electrotechnical regulations.
Due to their specialist training, knowledge and experience as well as knowledge of the relevant standards and regulations, qualified electricians are able to carry out work on electrical systems and recognise potential hazards independently.
In Germany, qualified electricians must fulfil the provisions of accident prevention regulation DGUV regulation 3 (e.g. master electrician). Corresponding regulations apply in other countries and must be observed.

2.4 Disclaimer

B.E.G. Brück Electronic GmbH is not liable in the following cases:

- The appliance is not being used as intended.
- Reasonably foreseeable misapplications are not taken into account.
- Installation and electrical connection are not carried out professionally.
- Changes (e.g. structural) are made to the device.

3 General information

3.1 Basics of the KNX BUS

A KNX commissioning or project planning course is required to understand these instructions.
To be able to work with the B.E.G. applications, they must first be imported into the ETS. ETS version 5 or higher is supported.

3.2 Symbolism

Various symbols are used in the following application description to provide a better overview. These symbols are briefly explained here.

	Attention: This symbol indicates text passages that must be read in order to avoid errors during project planning and commissioning.
	Recommendation: Under this symbol you will find parameter settings which experience has shown to lead to optimum device utilisation.

4 Functional description

4.1 Application

The device is a compact binary input with 4 inputs.
The application offers extensive functions for switching, dimming, blinds, value transmitters, scene and colour control as well as a runtime and pulse counter.
This allows, for example, energy meters with S0 output or anemometers to be connected.
The inputs can be controlled via potential-free contacts and are suitable for connecting conventional push-buttons.
Two push-buttons and three LEDs enable local operation and visualisation of the device status.
In addition, the device contains 16 independent logic or time functions. The device supports KNX Data Security.

4.2 Device structure

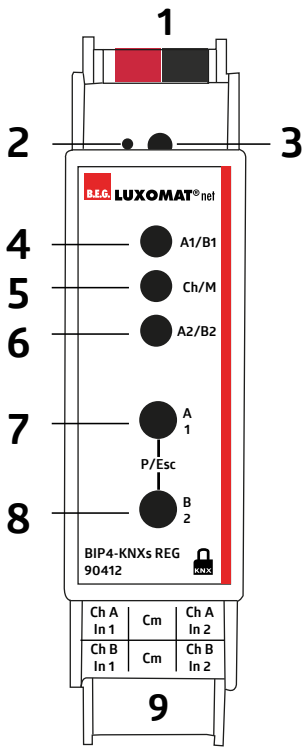

Fig. 1

1	KNX bus connector
2	KNX programming LED
3	KNX button for programming mode
4	LED multicolour A1/B1
5	LED multicolour Ch/M
6	LED multicolour A2/B2
7	Button **A1**
8	Button **B2**
9	Pluggable screw terminals

5 Commissioning

Once the device has been installed and the bus line has been connected, the device can be put into operation. The following procedure is generally recommended.

5.1 Carry out ETS commissioning

Switch on the power supply to the device.
Before you can work with the device, the product database must first be imported into the ETS.

NOTE	
	ETS version 5 or higher is supported.

➞ Download the product database of the device from the B.E.G. website or from the ETS online catalogue.
➞ Import the downloaded product database of the device into the ETS.
You can now configure the device in your project.

5.2 KNX programming mode

The KNX programming mode is activated/deactivated either by pressing the recessed KNX programming button **3** or by simultaneously pressing the buttons (P/Esc) **7** and **8**.
When programming mode is active, programming LED **2** and the LED Mode **5** light up red**.** See „4.2 Device Structure“ on page 10.

5.3 Manual operation and status display

The LED Ch/M **5** lights up or flashes if the device is successfully powered by the KNX bus.

By pressing button A1 **7** long, the manual operation mode will be entered for channel pair A (Ch A In1/In2). This is indicated by cyclic single flashing of LED Ch/M **5** in orange.

By pressing button B2 **8** to switch to manual mode for the second channel pair (Ch B In1/In2). This is indicated by the Ch/Mode LED **5** flashing orange twice cyclically.

If manual operation of a channel pair is activated, the bus telegrams of In1 and In2 can be triggered by button A1 **7** and B2 **8**, if input channel is configured by ETS.

The A1/B1 LED **4** and A2/B2 LED **6** are used to display the status of the selected channel pair during manual operation. They light up green when button A1 **7** and B2 **8** are pressed.

Summary of the states of the Ch/M LED **5**:

LED behaviour	Meaning
LED lights up green	The device works in normal operating mode.
LED lights up red	Programming mode is active.
LED flashes orange once	Programming mode is not active. Manual control active: Switching first channel pair (Ch A In1/In2)
LED flashes orange 2x	Programming mode is not active. Manual operation active: Switching second channel pair (Ch B In1/In2)
LED flashes red	Programming mode is not active. Manual operation is not active. The device is not charged correctly e.g. after cancelling a download.
LED flashes green	The device is currently in the ETS download.

6 Reset to factory settings

It is possible to reset the device to the factory settings.
➞ Disconnect KNX bus connection **1** from the device
➞ Press and hold KNX programming button **3**
➞ Restore KNX bus connection **1** to the device
➞ Press and hold programming button **3** for at least another 6 seconds
➞ All LEDs**(2 4 5 6**) flash briefly to indicate that the factory settings have been reset successfully.
See „4.2 Device Structure“ on page 10.

In the factory setting, the device has the physical address 15.15.255 and no more group addresses are connected. In addition, KNX Data Security is not active and the initial key (FDSK) must be used for secure commissioning.

7 KNX Security

KNX Security has been added to the KNX standard to protect KNX installations from unauthorised access. KNX Security reliably prevents both eavesdropping on communication and manipulation of the installation.

The specification for KNX Security distinguishes between KNX IP Security and KNX Data Security. KNX IP Security protects the communication via IP while the communication on KNX TP remains unencrypted. This means that KNX IP Security can also be used in existing KNX systems and with non-secure KNX TP devices.

KNX Data Security describes the encryption at telegram level. This means that the telegrams on the twisted pair bus or via RF (radio) are also encrypted.

	NOTE
	Encrypted telegrams are longer than the previously used unencrypted telegrams. It is therefore necessary for secure programming via the bus that the interface used (e.g. USB) and any intermediate line couplers support the so-called KNX long frames.

8 ETS database

The ETS database (for ETS 5.7 or newer) can be downloaded from the product website of the device (www.beg-luxomat.com) or via the ETS online catalogue.
The device supports KNX Data Security to protect the device against unauthorised access from the KNX bus. If the device is programmed via the KNX bus, this is done with encrypted telegrams.

8.1 Secure commissioning

If the first product with KNX Security is added to a project, the ETS prompts you to enter a project password.

This password protects the ETS project from unauthorised access. This password is not a key that is used for KNX communication. The password entry can be bypassed with "Cancel", but this is not recommended for security reasons.
The ETS requires a device certificate for every device with KNX Security that is created in the ETS. This certificate contains the serial number of the device and an initial key (FDSK = Factory Default Setup Key).

The certificate is printed as text on the device. It can also be scanned via a webcam from the printed QR code.
The list of all device certificates can be managed in the ETS window Reports - Project security.
The initial key is required to securely commission a device from the outset. Even if the ETS download is recorded by a third party, they will not have access to the secured devices afterwards. During the first secure download, the initial key is replaced by the ETS with a new key that is generated individually for each device. This prevents people or devices that may know the initial key from accessing the device. The initial key is reactivated when the factory settings are reset.
The serial number in the certificate enables the ETS to assign the correct key to a device during a download.
Safe commissioning can be activated and the device certificate added in the ETS project in the properties of the device:

8.2 Secure group communication

Each object of the device can communicate either encrypted or unencrypted. The encryption is set in the properties of the group address used under "Security":

The "Automatic" setting switches encryption on if both objects to be connected can communicate in encrypted form. Otherwise, encrypted communication between the objects is not possible.
In the overview of communication objects in the ETS project, secured objects can be recognised by a shield symbol:

A separate key is automatically generated by the ETS for each secured group address. These keys can also be checked in the ETS window Reports - Project security. In order for all devices to be able to communicate with a secure group address, the key must be known to all. Therefore, a download must be made to all devices that use this group address if a key has been generated or changed. Among other things, a key is changed by the ETS when the encryption of a group address is switched off and on again.

9 General settings

9.1 Device name (30 characters)

An arbitrary name can be assigned for the device. The device name should be meaningful, e.g. „Living Room“. This helps the clarity of the ETS project.

General settings	
Device name	**... [max. 30 characters]**

9.2 Send delay after bus power return

A send delay of telegrams after the return of the bus voltage can be set via this parameter. In this case, telegrams from the device are sent to the KNX bus in a delayed manner by the set time. This results in a reduction of the bus load at a bus power return. Other functions such as receiving telegrams or query of the inputs are not affected by this parameter.

General settings	
Send delay after bus power return	... **[5 s]**

9.3 Prog. mode on device front

In addition to the normal programming button **3** the device allows activating the programming mode on the device front without opening the switchboard cover. The programming mode can be activated and deactivated via pressing simultaneously both buttons **7** and **8**.
This feature can be enabled and disabled via the parameter “Prog. mode on device front”. The recessed programming button **3** (next to the Programming LED **2**) is always enabled and not influenced by this parameter.

General settings	
Prog. mode on device front	Disabled
	Enabled

9.4 Manual operation on device

This parameter is used to configure the manual operation on the device. The manual operation mode can be disabled or activated (with or without time limitation). The time limit defines the duration until the automatic return from the manual operation mode back into the normal operating mode.
The device is in normal operating mode when the manual control is not active. In the manual operating mode, received switching telegrams are ignored. When the manual operation mode is terminated (after expiry of the time limit or manually by pressing both buttons **7** and **8**), the next telegram is sent on state change of the inputs.

General settings	
Manual operation on device	Disabled
	Enabled with time limit 1 min.
	Enabled with time limit 10 min.
	Enabled with time limit 30 min.
	Enabled without time limit

9.5 Heartbeat

Cyclic sending of values to the KNX-Bus, to indicate that the device is operational. For the Cycle time values between 1 min and 24h are selectable.

General settings	
Heartbeat	**Disabled**
	Enabled

Group Object	Type KNX	Size	Direction
GO 1 Heartbeat - Trigger	1.001	1 Bit	To KNX

Furthermore, the parameters Heartbeat and Cycle time are used as configuration for cyclic sending, in case that switching is configured as state query. For a more detailed description regarding state query please take a look at “Input A1: Switching – State query”.

9.6 Long button press after

The time for detection of a long button press can be set here, this time is valid for all input channels.

General settings	
Long button press after	**... [1,2 s]**

9.7 LED visualisation top/bottom

Here the operating mode of the LEDs **4** and **6** in normal operation can be set, it is selectable:

General settings	
LED visualisation top/bottom	Disabled *(LED is disabled always.)*
	Channel A1 *(LED top)*
	Channel A2 *(LED bottom)*
	Channel B1
	Channel B2 *(LED indicates the state of the connected contact at the selected input **9**..)*
	Via group object *(LED is operated only via group object.)*

10 Diagnostics

This parameter page allows the display of diagnostic data directly in the ETS, without having to read group objects. The current status of each channel is displayed. For channels with the “Impulse counter” or “Operation time counter” function, the switching cycles are also displayed. Switch cyclces can be reset using the “Reset”-buttons. The display is updated using the “Update” button. To activate the diagnostics, the function of the channel must be programmed.

11 Input A1: General

Name (30 characters)
An arbitrary name can be assigned for the channel. However, this should be clear and meaningful, this makes it easier to work with the associated group objects, because the given name is displayed there as a label. If no name is assigned, the group objects are named “Input ...” with the channel number, which is also used in this manual. The 1st channel will be described below, the functioning of the other 3 channels is according to the 1st.

Function
This parameter defines the functionality of the input. The following options are available:

- Disabled
- Switching
- Dimming
- Shutter
- Send value
- Scene
- Impulse counter
- Operation time counter

A more detailed description of the individual functions can be found in the function descriptions below.

11.1 Function "Switching, dimming, blinds, send value, scene"

If one of the above-mentioned functions of an input channel is activated, the following parameters also appear:

Type
The mode of action of the contact connected to the input channel can be configured here. You can choose between normally closed contact or normally open contact.

Lock function *(deactivated for operating hours counter)*
With this parameter the lock function can be enabled. If this functionality is activated, the associated group objects as well as the parameter page “Input A1: Lock function” are displayed for further configuration. If the lock has been activated via the group object, no telegrams are triggered by state changes of the connected contact.

Group object	Type KNX	Size	Direction
GO 17 Input A1: Lock - Activate	1.001	1 Bit	From KNX

11.2 Pulse counter" function

If the pulse counter function of an input channel is activated, other parameters become visible with which the general settings of the pulse counters are made. In addition, the scaled counter and/or the rate of change must be activated.

Input signal
Here you can select whether DC or AC voltage is present at the binary input.

Count on
This parameter can be used to determine whether the value of the counter is increased at the rising or falling edge at the input.

Scaled counter (e.g. [kWh])
The scaled counter can be activated here. When activated, the "Scaled counter" parameter page is displayed.

Rate of change (e.g. [kW], [m/s], [km/h])
The counter for a rate of change can be activated here. If activated, the „Rate of change“ parameter page is displayed.

12 Input A1: Switching

If the Switch function is selected, up to 2 binary switching telegrams can be sent via the following objects when the input is activated:

Group object	Type KNX	Size	Direction
GO 11 Input A1: Output a – Switch	1.001	1 bit	To KNX
GO 12 Input A1: Output b – Switch	1.001	1 bit	To KNX

*Output b is only visible if activated via parameters.

User control
The parameter "User control" determines whether telegrams are sent when the input is changed (e.g. key switches) or when the button is operated short/long (e.g. button for switching/dimming).

Function of object a/b on press
Function of object a/b on short press
Function of object a/b on release
Function of object a/b on long press

It is selectable for each object a and b, which telegram is sent on press and release or on short/long button press.
The following options are available:

- No reaction
- Switch on
- Switch off
- Toggle
  When switching, the last value received from the bus is analysed if the write flag is activated on the object.

Output b
Here you can show/hide the parameters and the object for output b.

12.1 Input A1: Switching – State query

The Status query function is used, for example, to monitor window contacts.
The status query mode is automatically recognized by the firmware if the following parameter settings are present:

User control: Press / Release
Function (...) on press: Switch on
Function (...) on release: Switch off

or inverted:
User control: Press / Release
Function (...) on press: Switch off
Function (...) on release: Switch on

With configured status query, the value on the object is kept up to date. The value corresponds to the current state that is read. If the lock is active, the object value corresponds to the last status before the lock or the configured value when the lock is activated.

Cyclic sending of object a/b *(only for state query)*
When the status query is active, cyclic sending can be configured independently for object a and b. The following options are available:

- 1 min.
- 2 min.
- 5 min.
- 10 min.
- 20 min.
- 30 min.
- 1 hr.
- 6 hrs.
- 12 hrs.
- 24 hrs.

NOTE	
	When the lock is active, cyclic sending is disabled.

13 Input A1: Dimming

On selection of function Dimming following objects are visible:

Group object	Type KNX	Size	Direction
GO 11 Input A1: Dimming on/off – Switch	1.001	1 bit	To KNX
GO 12 Input A1: Dimming relative – Brighter/Darker	3.007	4 bit	To KNX

NOTE	
	The time for detection of a long button press can be set in the general parameters and is valid for all inputs/ buttons.

Dimming function
The dimming function parameter determines whether only one switching / dimming direction or 1-button control is to be used:

- On / Dim brighter
- Off / Dim darker
- Toggle direction
  On toggle direction, the last value received from the bus is evaluated if the write flag is activated on the object. This applies to object 11 and object 12.
  In addition, object 13 is visible. If one of the limit values is received here as the status (e.g. 0 % or 100 %), the dimming direction is adjusted accordingly.

Group object	Type KNX	Size	Direction
GO 13 Input A1: Dimming absolute – State	5.001	1 bit	To KNX

If the input detects a short button press, a switching telegram is sent via object 11. On long button press, a relative dimming is sent over the entire dimming range to object 12. On release after long button press, a dimming-stop telegram is sent via object 12.
The time for detection of a long button press can be set in the general parameters and is valid for all channels.

Dimming direction after switch on (only for toggle direction)
This parameter is only visible on toggle direction and determines the dimming direction of the next dimming command following an ON telegram.
This is useful in the bathroom, for example, when the light is switched on at low brightness at night and then should be turned up.

14 Input A1: Shutter

On selection of Shutter function following objects are visible:

Group object	Type KNX	Size	Direction
GO 11 Input A1: Drive start – Up/Down	1.008	1 bit	To KNX
GO 12 Input A1: Drive stop – Step/Stop	1.007	1 bit	To KNX

NOTE

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Shutter direction
The parameter "Shutter direction" determines whether only one shutter direction or 1-button control is to be used.

- Up
- Down
- Toggle
  If the write flags are set, the shutter objects evaluate the last value received from the bus. This keeps the direction and state of the shutter in the button up to date. This applies to object 11 and object 12. In addition, object 13 is visible. If one of the limit values is received here as the status (e.g. 0 % or 100 %), the driving direction is adjusted accordingly.

Group object	Type KNX	Size	Direction
GO 13 Input A1: Blind position – State	5.001	1 bit	To KNX

User control
The parameter "User control" determines the sending of telegrams on short and long button press:

- **KNX Standard: Long / Short**
  This is the standard configuration for controlling a shutter.
  - ***Long actuation:*** Drive command via object 11
  - ***Short actuation:*** Stop/step command via object 12
  - ***Very long actuation:*** Additional function

- **KNX standard with turning time**
  This is the standard configuration for controlling a shutter with the extension that a stop is triggered when the shutter is released within the turning time. Thus, you can turn the slats with dead man.
  - ***Long actuation:*** Drive command via object 11
  - ***Release after long actuation within turning time:*** Stop/step command via object 12
  - ***Release after long actuation after turning time:*** No reaction
  - ***Short actuation:*** Stop/step command via object 12
  - ***Very long actuation:*** Additional function

- **KNX Inverted: Short / Long**
  This is the inverted standard configuration for controlling a shutter. This should be used when the main usage is on move commands.
  - ***Short actuation:*** Drive command via object 11
  - ***Long actuation:*** Stop/step command via object 12
  - ***Actuation during travel:*** Stop/step command via object 12
  - ***Very long actuation:*** Additional function

- **Short / Short**
  This is an optimized variant for controlling a shutter, which uses only short button presses. The step command in the actuator should be disabled.
  - ***Short actuation:*** Drive command via object 11
  - ***Actuation during travel:*** Stop/step command via object 12
  - ***Long actuation:*** Additional function

- **Short / Short plus Long with turning time**
  This is an optimized variant for controlling a shutter, which mainly uses short button presses. A long button press can additionally be used to turn the slats. The step command in the actuator should be disabled.
  - ***Short actuation:*** Drive command via object 11
  - ***Long actuation:*** Drive command via object 11
  - ***Release after long actuation within turning time:*** Stop/step command via object 12
  - ***Release after long actuation after turning time:*** No reaction
  - ***Actuation during travel:*** Stop/step command via object 12
  - ***Very long actuation:*** Additional function

- **Hold (Deadman switch)**
  The dead man operation mode can be used for applications with short moving time, for example for skylights. The step command in the actuator should be disabled.
  - ***On actuation:*** Drive command via object 11
  - ***On release:*** Stop/step command via object 12

- **Hold with turning time**
  This operating mode is suitable for applications with mainly short moving times, with the addition that long moving times, by holding beyond the turning time, can also be easily realized. The step command in the actuator should be disabled.
  - ***On actuation:*** Drive command via object 11
  - ***On release within turning time:*** Stop/step command via object 12
  - ***On release after turning time:*** No reaction

- **Hold, delayed with turning time**
  This is analog to the operating mode „Hold with turning time“, with the difference that the movement is on the long button press. The step command in the actuator should be disabled.
  - ***Long actuation:*** Drive command via object 11
  - ***Release after long actuation within turning time:*** Stop/step command via object 12
  - ***Release after long actuation after turning time:*** No reaction
  - ***Short actuation:*** Additional function
  - ***Actuation during travel:*** Stop/step command via object 12

Drive time (Time window for stop) [s]
Only displayed for the user controls with “Actuation during drive: Stop/Step command”. The time window for the actuation at which a stop/step command is sent is set here.

Turning time [s]
Only displayed for the user controls with turning time. In general, by releasing within the turning time, the shutter can be stopped while continuing to move after the turning time.

	NOTE
	If the button tone is activated on the „General settings“ page, the end of the turning time is indicated by a signal tone.

Additional function on short/long/very long button press
The following functions can be triggered by short/long/very long keystrokes:

- Switch on
- Switch off
- Toggle
  On toggle, the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Switch	1.001	1 bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Dimming relative	3.007	1 bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Up/Down	1.008	1 bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Step/Stop	1.007	1 bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Send value	5.001	1 bit	To KNX

- Call scene
  This function can be used to send a scene; a parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Call scene	18.001	1 bit	To KNX

- Save scene
  With this function, a scene can be saved. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 14 Input A1: Additional function – Save scene	18.001	1 bit	To KNX

Very long button press after [s]
This parameter is visible only when using the very long actuation, it sets the time to detect a very long button press.

15 Input A1: Send value

If function Send value is selected, the following telegrams can be sent at button press:

- **1 byte - Percent value**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send percent value (1 byte) – Set value	5.001	1 byte	To KNX

- **1 byte - Integer value**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send integer value (1 byte) – Set value	5.010	1 byte	To KNX

- **2 byte - Integer value**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send integer value (2 byte) – Set value	7.001	2 byte	To KNX

- **2 byte - Float value**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send float value (2 byte) – Set value	9.001	2 byte	To KNX

- **3 byte - RGB value**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send RGB color value (3 byte) – Set value	232.600	3 byte	To KNX

- **14 byte - ASCII string**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send ASCII string (14 byte) – Set value	16.000	14 byte	To KNX

- **Shutter**

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send blind position – Set position	5.001	1 byte	To KNX
GO 12 Input A1: Send slat position – Set position	5.001	1 byte	To KNX

NOTE

If the shutter is selected as the value to be sent, height is sent on button press, lamella is sent on releasing the button, if the respective value is used.

A field for entering the values to be sent is displayed, as well as the objects appropriate to the selected type.

16 Input A1: Color

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Datapoint type
Depending on this parameter, the following objects are available for color control:

- Single color control RGB (3 x DPT 5.001)

Group object	Type KNX	Size	Direction
GO 11 Input A1: Value R – Set color	5.001	1 byte	To KNX
GO 12 Input A1: Value G – Set color	5.001	1 byte	To KNX
GO 13 Input A1: Value B – Set color	5.001	1 byte	To KNX

- Single color control RGBW (4 x DPT 5.001)

Group object	Type KNX	Size	Direction
GO 11 Input A1: Value R – Set color	5.001	1 byte	To KNX
GO 12 Input A1: Value G – Set color	5.001	1 byte	To KNX
GO 13 Input A1: Value B – Set color	5.001	1 byte	To KNX
GO 14 Input A1: Value W – Set color	5.001	1 byte	To KNX

- Color control RGB (DPT 232.600)

Group object	Type KNX	Size	Direction
GO 11 Input A1: RGB color value (3 Bytes) – Set color	232.600	3 byte	To KNX

- Color control RGBW (DPT 251.600)

Group object	Type KNX	Size	Direction
GO 11 Input A1: RGBW color value (6 Bytes) – Set color	251.600	6 byte	To KNX

Color position 1 – 8
For each position a color can be chosen.
If only one color position is activated, it is sent on short button press. If several color positions are used, the activated positions are switched through with each short button press.
The behavior for selecting and sending the color positions can be determined by the following parameter.

Reset color position
The following options are available:

- Never
  Starting with the first color position, the next position of the list is sent with each short button press. After the last color position has been sent, the list starts again from the beginning.

- After execution
  This selection enables the parameter **Time until execution**.
  Beginning with the first color position, each short button press switches the position by one position within the execution delay. At the end of the execution delay, the current color position is sent.

- 5 s – 10 min
  On each button press the configured delay time is started.
  Starting with the first color position, the next position of the list is sent with each short button press, after the last color position has been sent, the list starts again from the beginning.
  After the delay time has expired, the list starts again at the first color position on the next short button press.

NOTE	
	When the button lock is used, the color position is always reset when unlocking.

Condition on long button press
Condition on very long button press
Here it is possible to select how a long and very long button press should be handled:

- No reaction
- Reset position
  This function is used to override the behaviour as described in the parameter **Reset color position**.
- Color off
  The color value 0/0/0 for black is sent.
- Send color value
  The selected color value is sent.
- Additional function

Additional function
The following functions can be triggered by pressing the button for a long or very long time:

- Switch on
- Switch off
- Toggle
  On toggle, the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Switch	1.001	1 bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Dimming relative	3.007	4 bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Up/Down	1.008	1 bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Step/Stop	1.007	1 bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Send value	5.001	1 byte	To KNX

- Call scene
  With this function, a scene can be sent. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Call scene	18.001	1 byte	To KNX

- Save scene
  With this function, a scene can be saved. A parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Save scene	18.001	1 byte	To KNX

Very long button press after [s]
This parameter is visible only when using the very long actuation, it sets the time to detect a very long button press.

17 Input A1: Scene

On selection of Scene function the following object is visible:

Group object	Type KNX	Size	Direction
GO 11 Input A1: Send percent value (1 byte) – Set value	5.001	1 byte	To KNX

NOTE	
	The time for detection of a long button press can be set in the general parameters and is valid for all inputs/ buttons.

Scene position 1 - 8
For each position, scene 1 – 64 can be activated.
If only one scene position is activated, it is sent on short button press.
If several scene positions are used, the activated positions are switched through with each short button press.
The behavior for selecting and sending the scene positions can be determined by the following parameter.

Reset scene position
The following options are available:

- Never
  Starting with the first scene position, the next position of the list is sent with each short button press, after the last scene position has been sent, the list starts again from the beginning.

- After execution
  This selection enables the parameter **Time until execution.**
  Beginning with the first scene position, each short button press switches the position by one position within the execution delay, at the end of the execution delay, the current scene position is sent.

- 5 s – 10 min
  On each button press the configured delay time is started.
  Starting with the first color position, the next position of the list is sent with each short button press, after the last color position has been sent, the list starts again from the beginning.
  After the delay time has expired, the list starts again at the first color position on the next short button press.

NOTE	
	When the button lock is used, the scene position is always reset when unlocking

Condition on long button press
Condition on very long button press
It is also possible to select how a long and very long button press should be handled:

- No reaction
- Reset position
  This function is used to override the behaviour as described in the parameter **Reset scene position**.
- Call scene
  The scene configured in the appearing parameter is sent.
- Save last scene
  A telegram for “save scene” with the last sent scene is triggered.
- Additional function

Additional function

The following functions can be triggered by pressing the button for a long or very long time:

- Switch on
- Switch off
- Toggle
  On toggle, the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Switch	1.001	1 bit	To KNX

- Dim brighter
- Dim darker

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Dimming relative	3.007	4 bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Up/Down	1.008	1 bit	To KNX

- Step up / Stop
- Step down /Stop

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Step/Stop	1.007	1 bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO 15 Input A1: Additional function – Send value	5.001	1 byte	To KNX

Very long button press after [s]

This parameter is visible only when using the very long actuation, he sets the time to detect a very long button press.

18 Input A1: Generic

With this button function, a separate object is available for each event at the input/pushbutton in order to set the function of the input/pushbutton individually.

These events at the input/button and their associated objects are:

- Button - Pressed

Group object	Type KNX	Size	Direction
GO 11 Input A1: Pressed – ...	Depending on function		To KNX

- Button - Released

Group object	Type KNX	Size	Direction
GO 12 Input A1: Released – ...	Depending on function		To KNX

- Button - Pressed short

Group object	Type KNX	Size	Direction
GO 13 Input A1: Pressed short – ...	Depending on function		To KNX

- Button – Pressed long

Group object	Type KNX	Size	Direction
GO 14 Input A1: Pressed long – ...	Depending on function		To KNX

- Button – Pressed very long

Group object	Type KNX	Size	Direction
GO 15 Input A1: Pressed very long – ...	Depending on function		To KNX

Each event can be assigned the following functions:

- Switch on
- Switch off
- Toggle
  On toggle the last value received from the bus is evaluated if the write flag is activated on the object.

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Switch	1.001	1 bit	To KNX

- Dim brighter (no Stop)
- Dim darker (no Stop)
- Dim Stop

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Dimming relative	3.007	4 bit	To KNX

- Drive up
- Drive down

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Up/Down	1.008	1 bit	To KNX

- Step up / Stop
- Step down / Stop

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Step/Stop	1.007	1 bit	To KNX

- Send value
  With this function, a byte value can be sent. A parameter for selecting the value is displayed.

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Send value	5.001	1 byte	To KNX

- Call Scene
  With this function a scene can be sent, a parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Call scene	18.001	1 byte	To KNX

- Save scene
  With this function a scene can be saved, a parameter for selecting the scene is displayed.

Group object	Type KNX	Size	Direction
GO ... Input A1: ... – Save scene	18.001	1 byte	To KNX

The time for detection of a long button press can be set in the general parameters and is valid for all inputs/buttons.

Very long button press after [s]
This parameter is visible only when using the very long actuation, he sets the time to detect a very long button press.

Long triggering (with very long keystroke)
This parameter is only visible when the long and very long actuation is used simultaneously.
If this parameter is activated, both events are always triggered after a very long actuation; if it is deactivated, the duration of the activation is evaluated: if it lies between the time of long and very long actuation, only the function for long actuation is triggered. If the time for very long actuation is exceeded, only the function for very long actuation is triggered.

19 Input A1: Scaled counter

This counter can be used to count values on input impulses, where an integer value or a floating-point value can be selected as a counter variable. With this function, e.g. Electrical energy can be counted directly and sent to the bus via an object.

Scaling factor (Value per pulse)
Here, a floating-point value is to be entered. It determines the value by which the counter value is increased per pulse.

Datapoint type
The datapoint type of output object of the counter variable can be selected here:

- Integer (32 bit) - DPT 13

Group object	Type KNX	Size	Direction
GO 11 Input A1: Counter value	13.013	4 byte	To KNX

- Float (16 Bit) – DPT 9

Group object	Type KNX	Size	Direction
GO 11 Input A1: Counter value	9.024	2 byte	To KNX

- Float (32 Bit) – DPT 14

Group object	Type KNX	Size	Direction
GO 11 Input A1: Counter value	14.056	4 byte	To KNX

Send condition
This parameter can be used to determine how the current counter value is to be sent:

- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  An additional parameter is displayed to select the minimal delta from the last sent value for sending a new counter value.
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

If the counter is locked by the object, also cyclic sending is stopped.

Monitoring limit value

Group object	Type KNX	Size	Direction
GO 12 Input A1: Counter threshold – State	1.002	1 bit	To KNX

When limit monitoring is activated, the following parameters are displayed:

Limit value *(with limit value monitoring = "Activated")*
Here you can edit the checked limit value. The datapoint type is the same as the counter value.

Behavior on reaching limit value (object) *(with limit value monitoring = "Activated")*
Here it is possible to determine whether a 0 or a 1 is sent via the object "Counter threshold – State" when the limit value is reached.

Behavior on reaching limit value (counter) *(with limit value monitoring = "Activated")*
In addition to the limit value itself, it is possible to determine the behavior of the counter when the limit value is reached:

- Counter continue
  Counter value continues increasing on ever pulse
- Counter reset and continue
  Counter value is reset to 0 and continues increasing on ever pulse
- Counter stop
  Counter value stays on limit value and must be reset by object

Send on device restart
It can be determined with this parameter whether the counter value should be sent when the device is restarted.

Reset via object
If this function is activated, the following object appears:

Group object	Type KNX	Size	Direction
GO 13 Input A1: Reset – Trigger	1.017	1 bit	From KNX

When a telegram is received via this object, the current count values are reset to 0.

Reset for ETS download
If this parameter is activated, the counter values are reset to 0 after device reset (e.g. after ETS download), otherwise they are retained.

Lock function
The lock function can be activated or deactivated here. If this functionality is activated, the following group object appears, as well as the parameter page „Input A1: Lock function" for detailed configuration.

Group object	Type KNX	Size	Direction
GO 16 Input A1: Lock – Activate	1.001	1 bit	From KNX

20 Input A1: Rate of change

This counter is used to connect devices to the bus where the rate of change is critical within a time interval, e.g. an anemometer.

Scaling factor (Value per delta in base time span)
A floating-point value is to be entered here. It determines the value by which the counter value is increased on every pulse

Time base
Here the time base of the rate of change can be specified:

- Pulses per second (e.g. [m/s], [km/h])
  The value from the scaling factor parameter is multiplied by 1
- Pulses per hour (e.g. [kW])
  The value of the scaling factor parameter is multiplied by 3600.

Measurement time span
The measurement time span determines how quickly the counter can react to changes. Therefore, a short sample rate should be selected for fast processes (e.g. anemometer).
The rate of change is calculated using the 3 parameters mentioned above:
The device saves several meter readings per measurement interval, scales it with the scaling factor * time base and divides it by the measuring interval.

Datapoint type
The datapoint type of output object of the counter variable can be selected here:

- Floating point (16 Bit) - DPT 9

Group object	Type KNX	Size	Direction
GO 14 Input A1: Rate of change – Value	9.024	2 byte	To KNX

- Floating point (32 Bit) - DPT 14

Group object	Type KNX	Size	Direction
GO 14 Input A1: Rate of change – Value	14.056	4 byte	To KNX

Send condition
This parameter can be used to determine how the current counter value is to be sent:

- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  An additional parameter is displayed to select the minimal delta from the last sent value for sending a new counter value.
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

Monitoring limit value
When limit monitoring is activated, the following object is displayed:

Group object	Type KNX	Size	Direction
GO 15 Input A1: Rate threshold – State	1.002	1 bit	To KNX

When limit monitoring is activated, the following parameters are displayed:

Limit value
Here you can edit the checked limit value. The datapoint type is the same as rate of change value.

Behavior on exceeding limit value
In addition to the limit value itself, it is possible to determine whether the counter should transmit 0 or 1 via the object if the limit value is exceeded.

Behavior on going below limit value
Here it is possible to determine whether the counter should transmit 0 or 1 via the object if the counter variable goes under limit value.

Example: Electricity meter with S0 interface
From the data sheet of the electricity meter it can be seen that the device delivers 4 pulses/s at a wind speed of 1 m/s.

The counter for the rate of change measures the wind speed:
Scaling factor (Output in m/s): 1/4 = 0.25
*Scaling factor (Output in km/h): 1/4 * 3.6 = 0.9*
Time base: Pulses per second
Measurement time span: 10 s

Example: Anemometer
The data sheet for the anemometer shows that it delivers 4 pulses/s at a wind speed of 1 m/s.

The counter for the rate of change measures the wind speed:
Scaling factor (output in m/s): 1/4 = 0.25
*Scaling factor (output in km/h): 1/4 * 3.6 = 0.9*
Time base: pulses per second
Measuring interval: 10 s

21 Input A1: Operation time counter

The operation time counter can be used to output how long the channel has been switched on.

Input state send condition

This parameter is used to determine how the current input status is to be sent:

- Disabled
- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  Sends on changed value
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

Group object	Type KNX	Size	Direction
GO 11 Input A1: Input – State	1.001	1 bit	To KNX

Switch counter send condition

This parameter is used to determine how the current switching counter is to be sent:

- Disabled
- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  Sends on changed value
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the counter variable.
- On change and cyclically
  Both sending conditions are active.

Group object	Type KNX	Size	Direction
GO 12 Input A1: Switch counter – State	13.001	4 bytes	To KNX
GO 13 Input A1: Reset switch counter – Trigger	1.017	1 bit	From KNX

Operation time send condition [s]

This parameter is used to determine how the current operating time is to be sent:

- Disabled
- On read
  No independent sending of the counter value by the device. To read the counter value, the read-flag of the group object has to be set.
- On change
  An additional parameter is displayed to select the minimal delta from the last sent value for sending a new value.
- Cyclically
  An additional parameter is displayed to configure the sending frequency of the operation time.
- On change and cyclically
  Both sending conditions are active.

Group object	Type KNX	Size	Direction
GO 14 Input A1: Operation time – State	13.100	4 bytes	To KNX
GO 15 Input A1: Reset operation time – Trigger	1.017	1 bit	From KNX

22 Input A1: Lock function

22.1 Lock function "Switching"

Polarity of object
This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0. The respective opposite telegram deactivates the lock again.

Behavior of object a/b on start
The telegram can be configured here, which is sent on the according object when the lock is activated.

Behavior of object a/b at end
The telegram can be configured here, which is sent on the according object when the lock is deactivated.

22.2 Lock function "Dimming, Shutter, Send value, Color, Scene"

Polarity of object
This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0. The respective opposite telegram deactivates the lock again.

Behavior on start
The telegram can be configured here, which is sent on the according object when the lock is activated.

Behavior at end
The telegram can be configured here, which is sent on the according object when the lock is deactivated.

22.3 Lock function “Dimming, Shutter, Send value, Color, Scene“

Polarity of object
This parameter defines, if the lock should be activated by receiving a 1 or by receiving a 0. The respective opposite telegram deactivates the lock again.

22.4 Lock function “Scaled counter“

Only when the locking function is activated and the "Pulse counter" function is active.

Polarity of object
This parameter can be used to determine how the lock is to be activated, either by receiving a 1 or a 0. The corresponding telegram disables the lock again.

Behavior on start of lock
With this parameter the behavior of the counter can be configured when the lock is activated:

- Counter stop
- Counter stop and reset

Behavior on end of lock

With this parameter the behavior of the counter can be configured when the lock is deactivated:

- Counter continue
- Counter reset and continue

23 Sequence controller

With the sequence controller, one or more switching or value telegrams can be triggered by an input telegram to a switching or scene object. In this way several devices can be controlled simultaneously in different ways via a presence detector, for example.
The output telegrams can be sent simultaneously or with an individually adjustable time delay.

NOTE	
	There are 4 sequence controllers available in the device, each controller can send up to 8 different output telegrams. Sequence 1 is described below, the function of sequences 2 – 4 is identical.

Sequence call via binary object
This parameter activates the following binary object to control the sequence:

Group object	Type KNX	Size	Direction
GO 51 Sequence controller: Sequence 1 – Binary	1.001	1 bit	From KNX

Reaction on '1' *(only for binary object)*
Reaction on '0' *(only for binary object)*

If sequence call via binary object is activated, these parameters can be used to define how the sequence controller reacts to the corresponding binary telegram.
The following options are available:

- Disabled
  No reaction to the corresponding telegram.
- Start
  When the corresponding value is received, the sequence is started with output A. Restarting via this value is only possible again after the sequence has run through.
- Start and retrigger
  Each time the corresponding value is received, the sequence is restarted with output A.
- Start once (until sequence 'Off')
  When the corresponding value is received, the sequence is started with output A. Any further starting of the sequence by receiving this value is no longer possible until the function Sequence 'Off' is triggered.
- Save
  For each activated output, a reading telegram is sent on KNX, the received value overwrites the parameter value of the corresponding output. The received values are stored and active until the device is reloaded with the ETS.
- Stop
  When the corresponding value is received, the sequence is stopped.
- Sequence 'Off'
  The sequence 'Off' function sends an OFF telegram or 0% via every activated output, regardless of the value set in the parameters. Only the minimum delay between the telegrams is observed, but not the delay before sending the individual outputs. Sequence 'Off' is always executed completely.

- Sequence 'Off' once (until sequence)
  When the corresponding value is received, the function Sequence 'Off' is started; any further starting of this function by receiving this value is no longer possible until the sequence has been started.

Sequence call with scene object
This parameter can be used to activate a scene object for sequence call up and to determine its scene number. If a scene number is selected, additional parameters and the following object become visible:

Group object	Type KNX	Size	Direction
GO 52 Sequence controller: Sequence 1 – Scene	18.001	1 byte	From KNX

Function *(only for scene object)*
This parameter determines the reaction of the sequence controller when the set scene is received. It is available for selection:

- Start
  When the corresponding scene is received, the sequence is started with output A; restarting via this scene is only possible again after the sequence has run through.

- Start and retrigger
  Each time the corresponding scene is received, the sequence is restarted with output A.

- Start and stop
  When the corresponding scene is received, the sequence is alternately started or stopped with output A.

- Start once (until sequence 'Off')
  When the corresponding scene is received, the sequence is started with output A; any further start of the sequence via reception of this scene is no longer possible until the Sequence 'Off' function is triggered.

Save *(only for scene object)*
This parameter determines whether the "Save scene" command should be evaluated for sequence recall when the scene is received. If this function is activated, a read telegram is sent on KNX for each activated output when "Save scene" is received; the value received overwrites the value of the corresponding output. The received values are saved and active until the device is reloaded with the ETS.

Sequence 'Off' with scene object
This parameter can be used to activate a scene object to start the 'Off' sequence function and to determine its scene number.

Group object	Type KNX	Size	Direction
GO 53 Sequence controller: Sequence 1 – Scene 'Off'	18.001	1 byte	From KNX

If "Start once (until sequence 'Off')" is set for sequence call up with scene object, sequence 'Off' must first be executed to start the sequence again.

Minimum delay between telegrams
This parameter defines the minimum delay between 2 output telegrams, this delay is always kept and has priority over the individually adjustable delays before sending of the outputs.

Output A ... H
For each output either a switch or a value object can be activated:

Group object	Type KNX	Size	Direction
GO 54 – 61 Sequence controller: Sequence 1 – Output A-H	1.001	1 bit	To KNX

Group object	Type KNX	Size	Direction
GO 54 – 61 Sequence controller: Sequence 1 – Output A-H	5.001	1 byte	To KNX

Value

Depending on the set object type of the output, the value of the output telegram can be determined here:

- Switch on if output switching (1 bit)
- Switch off if output switching (1 bit)
- 0 ... 255 or 0 ... 100 %, if output value (1 byte)

Delay before sending

This determines the waiting time from starting the sequence (output A) or from sending the previous output (output B – H), which waits until the output telegram of the corresponding output has been sent.

24 Logic / Timer / Comparison / Calculation

Function 1 - 16
These parameters contain the functions timer and logic, whereby all 16 functions are identical.

The following options are available:

- Disabled
  No parameters and group objects for timer and logic.
- Timer
  Parameters and group objects for timer are available.
- Logic
  Parameters and group objects for logic are available.
- Compare
  Parameters and group objects for compare are available.
- Calculation
  Parameters and group objects for calculation are available.

NOTE
The functions for timer and logic can be linked to one another by means of the associated group objects. This also allows to create complex structures. For this purpose, the output of a function is set to the same group address as the input of the next function.

24.1 Function 1 – 16: Timer

Function name *(10 characters)*
The function name can be chosen freely.
The name is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects, because the given name is displayed there as a label.

Timer type
The type of time switch can be selected here:

- Switch-on delay
  The ON telegram (1) received at the input is output with a delay at the output.
  Input: --1---------0------
  Output: --|-T-1-----0------

Group object	Type KNX	Size	Direction
Timer – Switch-on delayed – Input	1.002	1 bit	From KNX
Timer – Switch-on delayed – Output	1.002	1 bit	To KNX

- Switch-off delay
  The OFF telegram (0) received at the input is output with a delay at the output.
  Input: --1---------0------
  Output: --1---------|-T-0-

Group object	Type KNX	Size	Direction
Timer – Switch-off delayed – Input	1.002	1 bit	From KNX
Timer – Switch-off delayed – Output	1.002	1 bit	To KNX

- Switch-on and switch-off delay
  The ON/OFF telegram (1/0) received at the input is output with a delay at the output.
  Input: --1---------0------
  Output: --|-T-1-----|-T-0-

Group object	Type KNX	Size	Direction
Timer – Switch-on/off delayed – Input	1.002	1 bit	From KNX
Timer – Switch-on/off delayed – Output	1.002	1 bit	To KNX

- Impulse (staircase)
  The ON telegram (1) received at the input is output at the output. After a delay, the output sends the OFF telegram (0).
  Input: --1---------0------
  Output: --1-T-0-----------

Group object	Type KNX	Size	Direction
Timer – Impulse (staircase) – Input	1.002	1 bit	From KNX
Timer – Impulse (staircase) – Output	1.002	1 bit	To KNX

NOTE

Each timer can be stopped by sending the opposite value to its input group object. For example: An already started switch-on timer can be stopped by sending OFF (0) to its input group object.

Delay[s]
This parameter defines the delay when sending at the output.

Output
Via this parameter the sent value on the output can be inverted:
- Not inverted
- Inverted

24.2 Function 1 - 16 (logic)

Group object	Type KNX	Size	Direction
Logic - Gate Input A - Input	1.002	1 bit	From KNX
Logic - Gate Input B - Input	1.002	1 bit	From KNX
Logic - Gate output - Output	1.002	1 bit	To KNX

Function name *(10 characters)*
The function name can be freely selected.
It is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects later, as the assigned name is displayed there as a designation.

Gate type
This parameter defines the type of logic gate:

- And gate
  The output is triggered ON (1), if all inputs are switched ON (1).

- OR gate
  The output is triggered ON (1), if at least one input is switched ON (1).
- XOR gate
  The output is triggered ON (1), if an odd number of inputs is switched ON (1).
- NAND gate
  The output is triggered ON (1), if at least one inputs is switched OFF (0).
- NOR gate
  The output is triggered ON (1), if all inputs are switched OFF (0).
- XNOR gate
  The output is triggered ON (1), if an even number of inputs is switched ON (1).

Group object	Type KNX	Size	Direction
Logic – Gate input A – Input	1.002	1 bit	From KNX
Logic – Gate input B – Input	1.002	1 bit	From KNX
Logic – Gate output – Output	1.002	1 bit	To KNX
Logic – Gate input C – Input	1.002	1 bit	From KNX
Logic – Gate input D – Input	1.002	1 bit	From KNX

NOTE

The output sends when a telegram is received at an input. The condition for this is that both inputs are valid (have received at least one telegram). The output sends a 1 if the respective condition is fulfilled, otherwise a 0.

- INVERTER
  The input is inverted at the output, ON (1) becomes OFF (0) and OFF (0) becomes EIN (1).

Group object	Type KNX	Size	Direction
Logic – Gate input – Input	1.002	1 bit	From KNX
Logic – Gate output – Output	1.002	1 bit	To KNX

NOTE

The output transmits when a telegram is received at the input.

Number of inputs
This parameter defines the number of inputs for the logic gate.

Input (A, B, C, D)
This parameter specifies whether the input is to be filled via an external (from the bus) or internal value (from the device).

Value (A, B, C, D) *(for input (A, B, C, D) = "Internal")*
This parameter defines the internal value that is used as an input.
The status of a channel can only be used as a value for the input if the function is set for this channel. (Only for Function != “Impulse counter”)

Send cyclically
This parameter specifies whether the result is to be sent cyclically and at what interval.

24.3 Function 1 - 16: Compare

Function name *(10 characters)*
The function name can be freely selected.
It is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects later, as the assigned name is displayed there as a description.

Operation
This parameter defines the type of comparison operation with which the values of input A and B are compared:

- A < B
  Input A is lower than input B
- A = B
  Input A is equal to input B
- A > B
  Input A is higher than input B

Input type
This parameter defines the type of inputs:

- Percent (DPT 5.001 - 1 byte)
  Value range: 0 (≙ 0) - 100% (≙ 255)
- Integer (DPT 5.010 - 1 byte)
  Value range: 0 - 255
- Integer (DPT 7.001 - 2 bytes)
  Value range: 0 - 65535
- Integer (DPT 12.001 - 4 bytes)
  Value range: 0 - 4294967295
- Float (DPT 9.001 - 2 bytes)
  Value range: -671088.64 - +670433.28
- Float (DPT 14.001 - 4 bytes)
  Value range: -3.4E+38 - +3.4E+38

Input B
This parameter specifies whether the input is to be filled via an external (from the bus) or static (from the ETS).

Value B *(Input = "Static")*
This parameter defines the static value that is used as an input.

Send cyclically
This parameter specifies whether the result is sent cyclically and at what interval

Group object	Type KNX	Size	Direction
Logic – Comparison – ... Byte input A	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 byte, 2 bytes, 4 byte	From KNX
Logic – Comparison – ... Byte input B*	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 byte, 2 bytes, 4 Byte	From KNX
Logic – Comparison – Output	1.002	1 bit	To KNX

* Only with parameter "Input A"/"Input B" = External
** KNX type is determined by the "Input type" parameter

NOTE
The output sends when a telegram is received at an input. The condition for this is that both inputs are valid (have received at least one telegram). The output sends a 1 if the respective condition is fulfilled, otherwise a 0.

24.4 Function 1 - 16: Calculation

Function name *(10 characters)*
The function name can be freely selected.
It is visible in the group object entry in the ETS software. This makes it easier to work with the associated group objects later, as the assigned name is displayed there as a description.

Operation
This parameter defines the type of comparison operation:

- Average value of input A and B
  (input A + input B) / 2
- Convert value
  Convert input A to another type
- Limit value
  Limit input A

Input type
This parameter defines the type of inputs:

- Percent (DPT 5.001 - 1 byte)
  Value range: 0 (≙ 0) - 100% (≙ 255)
- Integer (DPT 5.010 - 1 byte)
  Value range: 0 - 255
- Integer (DPT 7.001 - 2 bytes)
- Value range: 0 - 65535
- Integer (DPT 12.001 - 4 bytes)
  Value range: 0 - 4294967295
- Float (DPT 9.001 - 2 bytes)
  Value range: -671088.64 - +670433.28
- Float (DPT 14.001 - 4 bytes)
  Value range: -3.4E+38 - +3.4E+38

Input B *(for operation = "average value of input A and B")*
This parameter specifies whether the input is to be filled via an external (from the bus) or static (from the ETS) input.

Value B *("Static")*
This parameter defines the static value that is used as an input.

Correction *(with operation = "Convert value")*
This parameter specifies whether the value is to be added with an offset or multiplied by a factor.

Offset *(with correction = "Offset" AND for output type != "Binary (DPT 1.002 - 1 byte)")*
This parameter defines the offset that is added to the input.

Factor *(with correction = "Factor" AND for output type != "Binary (DPT 1.002 - 1 byte)")*
This parameter defines the factor that is multiplied by the input.

Send 1 on *(with operation = "Convert value" AND for output type = "Binary (DPT 1.002...")*
This parameter specifies whether 1 is sent at input A lower or higher than the threshold value.

Threshold value *(with operation = "Convert value" AND for output type = "Binary (DPT 1.002...")*
This parameter defines the threshold value with which the input is compared.

Limit (min.) *(with operation = "Limit value")*
This parameter defines the lower limit with which the output is limited.

Limit (max.) *(with operation = "Limit value")*
This parameter defines the upper limit with which the output is limited.

Output type *(with operation = "Convert value")*
This parameter defines the type of inputs:

- Binary (DPT 1.002 - 1 byte)
  Value range: 0 - 1
- Percent (DPT 5.001 - 1 byte)
  Value range: 0 (≙ 0) - 100% (≙ 255)
- Integer (DPT 5.010 - 1 byte)
  Value range: 0 - 255
- Integer (DPT 7.001 - 2 bytes)
  Value range: 0 - 65535
- Integer (DPT 12.001 - 4 bytes)
  Value range: 0 - 4294967295
- Float (DPT 9.001 - 2 bytes)
  Value range: -671088.64 - +670433.28
- Float (DPT 14.001 - 4 bytes)
  Value range: -3.4E+38 - +3.4E+38

Send cyclically
This parameter specifies whether the result is sent cyclically and at what interval.

Group object	Type KNX	Size	Direction
Logic – Calculation – ... Byte Input A	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 byte, 2 bytes, 4 byte	From KNX
Logic – Calculation – ... Byte Input B*	5.001, 5.010, 7.001, 12.001, 9.001, 14.001**	1 byte, 2 bytes, 4 byte	From KNX
Logic – Calculation – ... Output	1.002, 5.001, 5.010, 7.001, 12.001, 9.001, 14.001***	1 bit, 1 byte, 2 byte, 4 byte	To KNX

* Only with parameter "Input B" = External
** KNX type is determined by the "Input type" parameter
*** Type KNX is determined by the types of the inputs. With the Operation “Convert value”, the output type can be freely chosen.

NOTE	
	The output sends when a telegram is received at an input. The condition for this is that both inputs are valid (have received at least one telegram). The output sends a 1 if the respective condition is fulfilled, otherwise a 0.

25 Diagnosis / troubleshooting

	NOTE
	Diagnosis / troubleshooting via the ETS! ➜ Use the corresponding functions of the ETS for diagnostics / troubleshooting, e.g. ■ Group monitor ■ Bus monitor ■ Line scan

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26 Service / Support

26.1 Manufacturer's warranty

The company B.E.G. Brück Electronic GmbH grants a warranty in accordance with the warranty conditions, which you can download from the website at https://www.B.E.G.-luxomat.com/service/downloads/.

26.2 Contact details

Service hotline:
+49 (0)2266 90121-0
Monday to Thursday 8.00 to 16.00 (UTC+1)
Friday 8.00 to 15.00 (UTC+1)

E-Mail:
support@beg.de

Return address for repairs:
Please contact your B.E.G. branch or representative.
You can find the contact details at https://www.beg-luxomat.com/en-in/service/service-points/.

Or contact us directly at
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