

B.E.G.

LUXOMAT[®]net

KNX Line Coupler TP/TP



LK-TP/KNX REG

Operating Manual

All device data can also be found here:



<https://beg-luxomat.com/qr.php?prtno=90401>

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1 About this document




1.1 Further applicable documents

Short operating manual

90401M1_V1_Short_MAN_LK-TP_KNX REG_90401_DE_EN_FR_NL_260419

(supplied with the device).

1.2 Used symbols and signal words



	Symbol indicating possible dangers to persons
	Symbol indicating possible property damage
	Symbol for useful information and tips
NOTICE	Signal word for possible property damage
CAUTION	Signal word for possible minor injuries
WARNING	Signal word for possible serious injuries
DANGER	Signal word for possible fatal injuries

2 Safety

The KNX line coupler LK-TP/KNX REG was developed, manufactured and tested in accordance with the applicable safety standards. It corresponds to the state of the art.

2.1 Intended use

The device is a line coupler for KNX TP for indoor installation in the sub-distribution cabinet.

 CAUTION	
	<p>Observe intended use!</p> <p>The protection of personnel and the device cannot be guaranteed if the device is operated in a manner not complying with its intended use.</p> <ul style="list-style-type: none"> → Only operate the device in accordance with its intended use. → B.E.G. Brück Electronic GmbH is not liable for damages caused by improper use. → Read these operating instructions before commissioning the device. Knowledge of the operating instructions is an element of proper use.

NOTICE

**Comply with conditions and regulations!**

→ Observe the locally applicable legal regulations and the rules of the employer's liability insurance association.

2.2 Foreseeable misuse

Any use other than that defined under "Intended use" or which goes beyond that use is considered improper use.

In particular, use of the device is not permitted in the following cases:

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

NOTICE

**Do not modify or otherwise interfere with the device!**

→ Do not carry out modifications or otherwise interfere with the device. The device must not be tampered with and must not be changed in any way.

→ The device must not be opened. There are no user-serviceable parts inside.

→ Repairs must only be performed by B.E.G. Brück Electronic GmbH.

2.3 Qualified persons / electricians

Connection, mounting, commissioning and adjustment of the device must only be carried out by competent persons.

Prerequisites for competent persons:

- They have a suitable technical education.
- They are familiar with the rules and regulations for occupational safety and safety at work.
- They are familiar with the operating instructions for the device.
- They have been instructed by the responsible person on the mounting and operation of the device.

2.3.1 Certified electricians

Work on electrical equipment may only be carried out by certified electricians or by instructed persons under the direction and supervision of a certified electrician in accordance with the electrical engineering regulations.

Due to their technical training, knowledge and experience as well as their familiarity with relevant standards and regulations, certified electricians are able to perform work on electrical systems and independently detect possible dangers.

In Germany, certified electricians must fulfill the requirements of accident-prevention regulations DGUV (German Social Accident Insurance) provision 3 (e.g. electrician foreman). In other countries, there are respective regulations that must be observed.

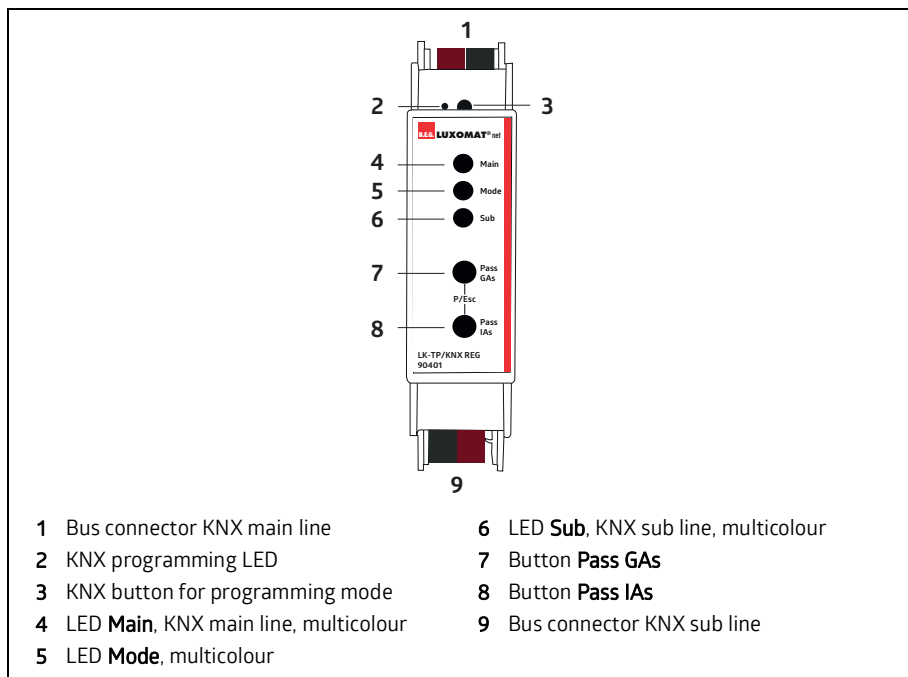
2.4 Disclaimer

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

- The device is not being used properly.
- Reasonably foreseeable misuse is not taken into account.
- Mounting and electrical connection are not properly performed.
- Changes (e.g., constructional) are made to the device.

3 Device description

3.1 Device overview



The LK-TP/KNX REG is a KNX line coupler in a compact design. It connects two KNX bus segments (for example, a KNX line with a KNX area).

The device has a filter table (8k bytes) and ensures a galvanic separation between the lines. The coupler supports KNX long-frames and is compatible with the ETS® software (ETS3 or higher).

The buttons on the front side allow to deactivate the telegram filters for test purposes. The LEDs indicate operating conditions as well as communication errors on the KNX bus.

The power is supplied via the KNX bus (main line).

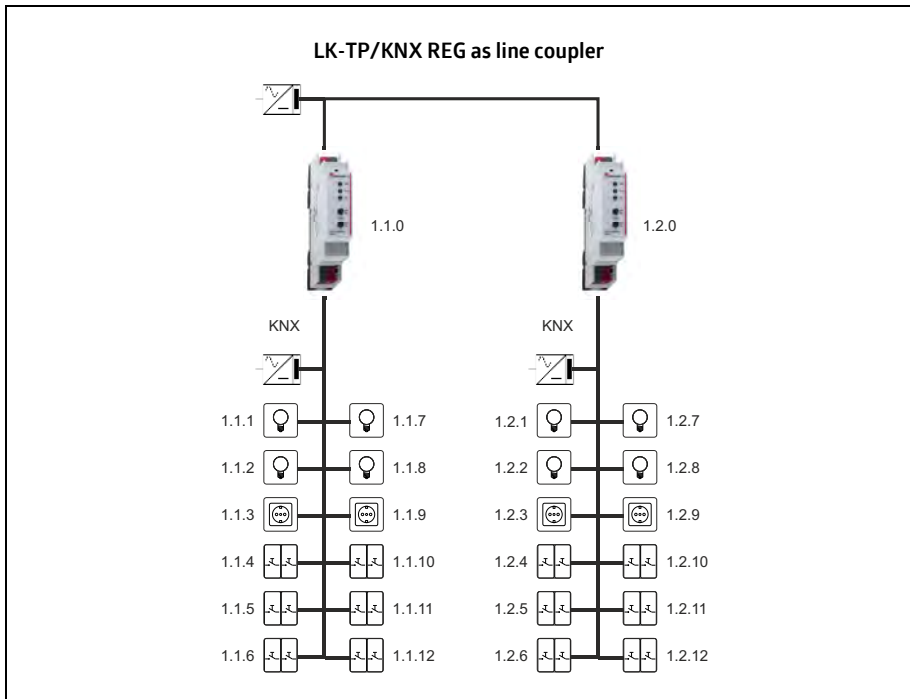
3.2 Functions

3.2.1 Coupler function

The LK-TP/KNX REG operates as a line or backbone coupler. In both cases, KNX TP is used as a backbone.

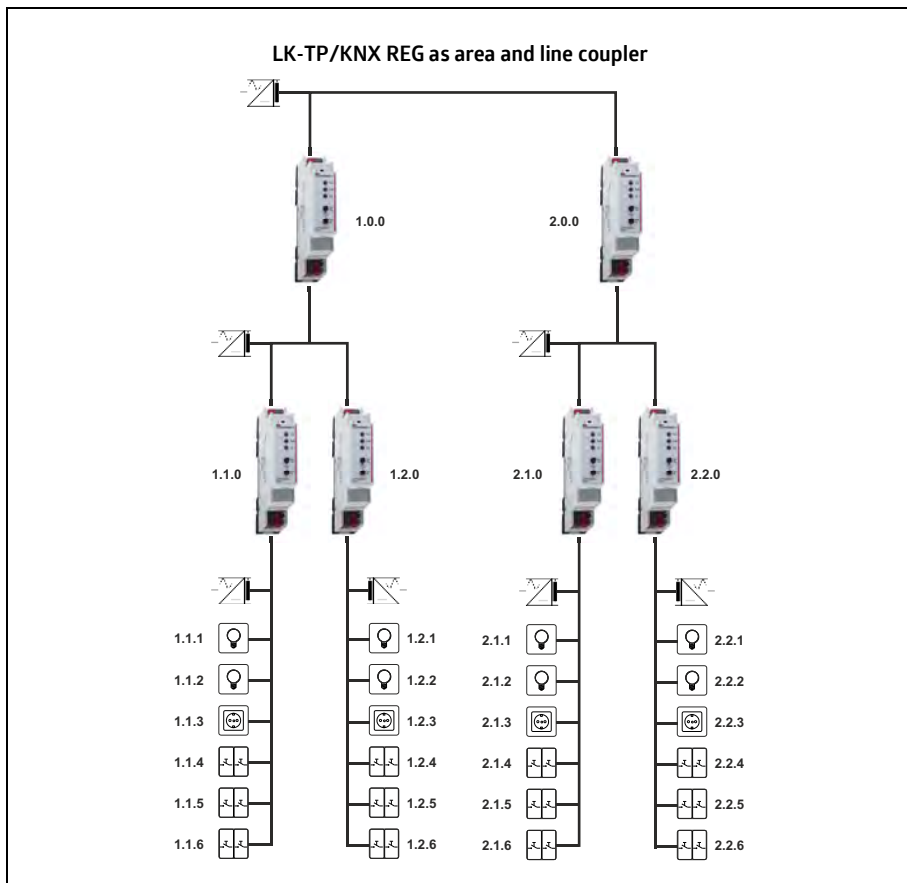
The following table shows the application possibilities of the LK-TP/KNX REG compared to the IP based topology:

	Classical Topologie (without IP)	IP coupling of areas	IP coupling of lines
Area (Backbone)	TP	IP	IP
Coupling	KNX line coupler (max. 15 pcs.)	KNX IP router (max. 15 pcs)	direct via LAN switch
Main line	TP	TP	IP
Coupling	KNX line coupler (max. 15 x 15 = 225 pcs.)	KNX line coupler (max. 15 x 15 = 225 pcs.)	KNX IP router (max. 15 x 15 = 225 pcs.)
Line	TP	TP	TP



The individual address of the LK-TP/KNX REG determines whether the device operates as a line or an area coupler.

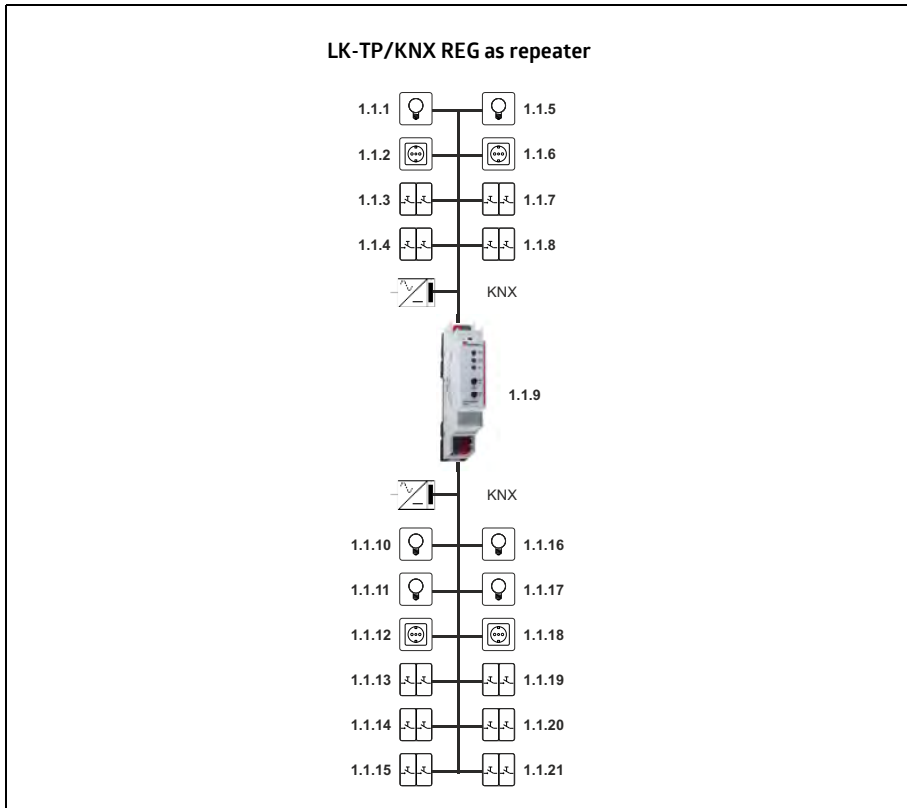
- If the individual address is in the form of **x.y.0** (x, y: 1..15), the device operates as a line coupler.
- If the individual address is in the form of **x.0.0** (x: 1..15), the device acts as an area coupler.



The LK-TP/KNX REG has a filter table and thus contributes to reducing the bus load. The filter table (8 kB) supports the extended group address range and is automatically generated by the ETS.

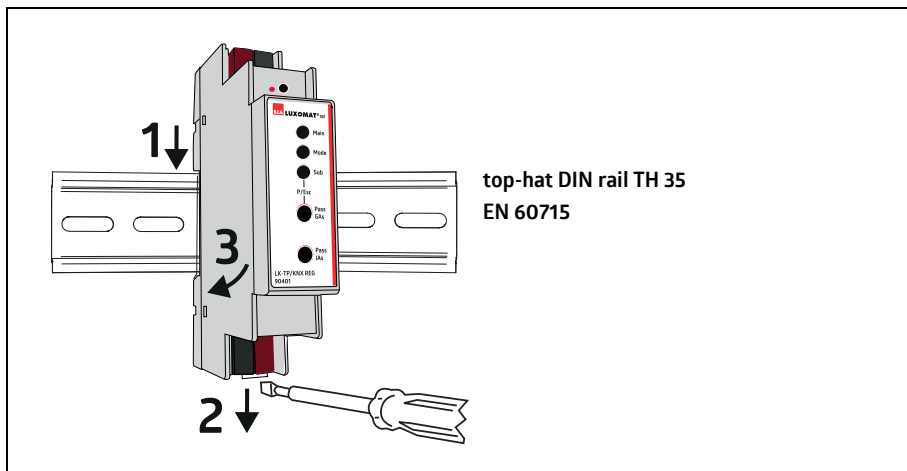
3.2.2 Repeater function

The LK-TP/KNX REG can also be used as a repeater. In this case, the individual address has the form x.y.z, where z must not be equal to 0. The filter settings in the parameter dialogue of the ETS are ineffective in repeater mode.



4 Mounting

The LK-TP/KNX REG is fixed to a top-hat DIN rail in the sub-distributor and requires 1 rail unit (18 mm) of space.



CAUTION



Observe KNX installation regulations!

This device complies with the KNX guidelines. Detailed knowledge of the KNX system is required for commissioning.

5 Electrical connection

⚠ CAUTION



Observe KNX installation regulations!

This device complies with the KNX guidelines. Detailed knowledge of the KNX system is required for commissioning.

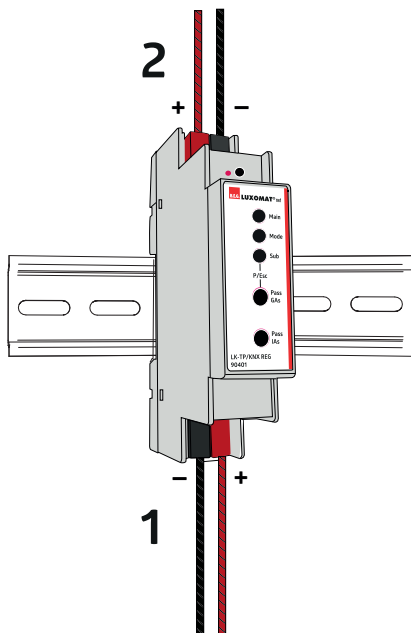
The device is powered via the KNX bus main line connection.
It is not necessary to connect an external supply voltage.

NOTICE



Missing bus voltage!

If there is no bus voltage (main line), the device has no function.



- 1 KNX sub line
- 2 KNX main line

6 Commissioning

6.1 Factory default settings

The following configuration is set by factory default:

Individual device address: **15.15.0**

Routing (sub line -> main line):

Individual addressed telegrams: **Filter**

Group addressed telegrams: **Block**

Routing (main line -> sub line):

Individual addressed telegrams: **Filter**

Group addressed telegrams: **Block**

6.1.1 Reset to factory default settings

CAUTION

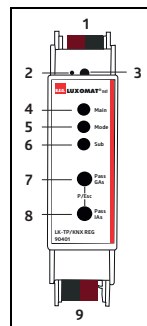


Factory default settings!

The individually made settings are lost.

It is possible to reset the device to its factory settings:

- Disconnect the KNX bus connector (main line) (1) from device.
- Press the KNX programming button (3) and keep it pressed down.
- Reconnect the KNX bus connector (main line) (1) to the device.
- Keep the KNX programming button (3) pressed for at least another 6 seconds.
- A short flashing of the programming LEDs (2) visualises the successful reset of the device to factory default settings.



6.2 KNX programming mode

The KNX programming mode is activated/deactivated either by pressing the flushed KNX programming button (3) or by simultaneously pressing the buttons (7) and (8).

6.3 Manual operation and status display

The KNX **Main LED (4, main line)** lights up green if the device is successfully powered by the KNX bus. This LED indicates telegram traffic on the KNX bus by flickering.

Errors in the communication (e.g. repetitions of telegrams or telegram fragments) are indicated by a short change of the LED colour to red.

Overview of the different indications of KNX main line LED Main (4):

LED Status	Meaning
LED lights green	KNX bus power (main line) active.
LED flickers green	Telegram traffic on the KNX bus (main line).
LED flashes red shortly	Communication error on the KNX bus (main line).

The KNX **Sub LED (6, sub line)** lights up green when the device is ready for operation (supplied by the main line) and the KNX bus voltage is present on the sub line. If the LED is flickering, telegram traffic takes place on the sub line.

Errors in the communication (e.g. repetitions of telegrams or telegram fragments) are indicated by a short change of the LED colour to red.

Overview of the different indications of KNX sub line LED Sub (6):

LED Status	Meaning
LED lights green	KNX bus power (sub line) active.
LED flickers green	Telegram traffic on the KNX bus (sub line).
LED flashes red shortly	Communication error on the KNX Bus (sub line).

For testing purposes (for example, during commissioning) the configured routing settings (filter or block) can be bypassed via manual operation.

With the button **Pass GAs (7)** the forwarding of group addressed telegrams can be activated.

With the button **Pass IAs (8)** the forwarding of individually addressed telegrams can be activated.

This is visualised with a single flash of the **Mode LED (5, orange)**.

If both modes are activated the **Mode LED (5, orange)** flashes two times.

Pressing button **Pass GAs (7)** or **Pass IAs (8)** again these settings can be selected and deselected on demand. Via the Escape function (**Esc**) the manual operation can be stopped by simultaneously pressing the buttons **Pass GAs (7)** and **Pass IAs (8)**.

If neither programming mode nor manual mode are active the **Mode LED (5)** can visualise configuration errors (for details see following table).

Overview of the different indications of the Mode LED (5):

LED Status	Meaning
LED lights green	Device is working in standard operation mode.
LED lights red	Programming mode is active.
LED flashes 1 x orange	Programming mode is not active. Manual operation is active: Forwarding IA or GA
LED flashes 2 x orange	Programming mode is not active. Manual operation is active: Forwarding IA and GA
LED flashes red	Programming mode is not active. Manual operation is not active: The device is not properly loaded e.g. after an interrupted down-load.

6.4 Commissioning via ETS**6.4.1 ETS product database**

The ETS database (for ETS 4.2 and ETS 5) can be downloaded from the product website of the LK-TP/KNX REG line coupler:



<https://beg-luxomat.com/qr.php?prtno=90401>

For existing installations a database for ETS 3 is also available.

6.4.2 Setting parameters with the ETS

The following parameters can be set using the ETS.

General settings

The screenshot shows the ETS software interface for the 'LK-TP/KNX REG' device. The title bar reads '--- LK-TP/KNX REG > General settings'. The interface is divided into a left sidebar and a main content area. The sidebar contains a 'Description' section with a 'General settings' link highlighted in blue, and two 'Routing' options: 'Routing (Sub -> Main)' and 'Routing (Main -> Sub)'. The main content area displays three parameters: 'Device name' is set to 'LK-TP/KNX REG'; 'Prog. mode on device front' is set to 'Enabled' (indicated by a selected radio button); and 'Manual operation on device' is set to 'Enabled with time limit 1 min' (shown in a dropdown menu).

Programming 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.

Manual operation on device

This parameter sets the duration of the manual mode.

Upon completion the normal display mode is restored.

Routing (sub line -> main line)

--- LK-TP/KNX REG > Routing (Sub -> Main)

Description	Group telegrams (main groups 0 to 13)	Filter ▼
General settings	Group telegrams (main groups 14 to 31)	Filter ▼
Routing (Sub -> Main)	Individual addressed telegrams	Filter ▼
Routing (Main -> Sub)	Broadcast telegrams	<input type="radio"/> Block <input checked="" type="radio"/> Route
	Repetition of group telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of individual addressed telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of broadcast telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Acknowledge (ACK) of group telegrams	<input type="radio"/> Always <input checked="" type="radio"/> Only if routed
	Acknowledge (ACK) of individual addressed telegrams	Only if routed ▼

Group telegrams (main groups 0 to 13)

- Block** No group telegrams of this main group are routed to the main line.
- Route** All group telegrams of this main group are routed to the main line independent of the filter table. This setting is for test purposes only.
- Filter** The filter table is used to check whether or not the received group telegram should be routed to the main line.

Group telegrams (main groups 14 to 31)

- Block** No group telegrams of main groups 14 to 31 are routed to the main line.
- Route** All group telegrams of main groups 14 to 31 are routed to the main line. This setting is for test purposes only.
- Filter** The filter table is used to check whether or not the received group telegram should be routed to the main line.

Individually addressed telegrams

- Block** No individually addressed telegrams are routed to the main line.
- Route** All individually addressed telegrams are routed to the main line. This setting is for test purposes only.
- Filter** The individual address is used to check whether the received individually addressed telegram should be routed to the main line.

Broadcast telegrams

Block	No received broadcast telegrams are routed to the main line.
Route	All received broadcast telegrams are routed to the main line.

Repetition of group telegrams

Disabled	The received group telegram is not resent to the main line in case of a fault.
Enabled	The received group telegram is resent up to three times in case of a fault.

Repetition of individually addressed telegrams

Disabled	The received individually addressed telegram is not resent to the main line in case of a fault.
Enabled	The received individually addressed telegram is resent up to three times in case of a fault.

Repetition of broadcast telegrams

Disabled	The received broadcast telegram is not resent to the main line in case of a fault.
Enabled	The received broadcast telegram is resent up to three times in case of a fault.

Acknowledge (ACK) of group telegrams

Always	An acknowledge is generated for every received group telegram (from the sub line).
Only if routed	An acknowledge is only generated for received group telegrams (from the sub line) if they are routed to the main line.

Acknowledge (ACK) of individually addressed telegrams

Always	An acknowledge is generated for every received individual addressed telegram (from the sub line).
Only if routed	An acknowledge is only generated for received individually addressed group telegrams (from the sub line) if they are routed to the main line.
Answer with NACK	Every received individually addressed telegram (from the sub line) is responded to with NACK (Not acknowledge). This means that communication with individually addressed telegrams on the corresponding KNX line is not possible. Group communication (group telegrams) is not affected. This setting can be used to block attempts at manipulation.

NOTICE**Answer with NACK!**

When using "Answer with NACK" an access to the device via the KNX sub line is no longer possible. The configuration must be performed via the main line.

Routing (main line -> sub line)

--- LK-TP/KNX REG > Routing (Main -> Sub)

Description	Group telegrams (main groups 0 to 13)	Filter
General settings	Group telegrams (main groups 14 to 31)	Filter
Routing (Sub -> Main)	Individual addressed telegrams	Filter
Routing (Main -> Sub)	Broadcast telegrams	<input type="radio"/> Block <input checked="" type="radio"/> Route
	Repetition of group telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of individual addressed telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Repetition of broadcast telegrams	<input type="radio"/> Disabled <input checked="" type="radio"/> Enabled
	Acknowledge (ACK) of group telegrams	<input type="radio"/> Always <input checked="" type="radio"/> Only if routed
	Acknowledge (ACK) of individual addressed telegrams	Only if routed

Group telegrams (main groups 0 to 13)

- Block** No group telegrams of this main group are routed to the sub line.
- Route** All group telegrams of this main group are routed to the sub line independent of the filter table. This setting is for test purposes only.
- Filter** The filter table is used to check whether or not the received group telegram should be routed to the sub line.

Group telegrams (main groups 14 to 31)

- Block** No group telegrams of main groups 14 to 31 are routed to the sub line.
- Route** All group telegrams of main groups 14 to 31 are routed to the sub line. This setting is for test purposes only.
- Filter** The filter table is used to check whether or not the received group telegram should be routed to the sub line.

Individually addressed telegrams

- Block** No individually addressed telegrams are routed to the sub line.
- Route** All individually addressed telegrams are routed to the sub line. This setting is for test purposes only.
- Filter** The individual address is used to check whether the received individually addressed telegram should be routed to the sub line.

Broadcast telegrams

Block	No received broadcast telegrams are routed to the sub line.
Route	All received broadcast telegrams are routed to the sub line.

Repetition of group telegrams

Disabled	The received group telegram is not resent to the sub line in case of a fault.
Enabled	The received group telegram is resent up to three times in case of a fault.

Repetition of individually addressed telegrams

Disabled	The received individually addressed telegram is not resent to the sub line in case of a fault.
Enabled	The received individually addressed telegram is resent up to three times in case of a fault.

Repetition of broadcast telegrams

Disabled	The received broadcast telegram is not resent to the sub line in case of a fault.
Enabled	The received broadcast telegram is resent up to three times in case of a fault.

Acknowledge (ACK) of group telegrams

Always	An acknowledge is generated for every received group telegram (from the main line).
Only if routed	An acknowledge is only generated for received group telegrams (from the main line) if they are routed to the main line.

Acknowledge (ACK) of individually addressed telegrams

Always	An acknowledge is generated for every received individual addressed telegram (from the main line).
Only if routed	An acknowledge is only generated for received individually addressed group telegrams (from the main line) if they are routed to the main line.
Answer with NACK	Every received individually addressed telegram (from the main line) is responded to with NACK (Not acknowledge). This means that communication with individually addressed telegrams on the corresponding KNX line is not possible. Group communication (group telegrams) is not affected. This setting can be used to block attempts at manipulation.

NOTICE**Answer with NACK!**

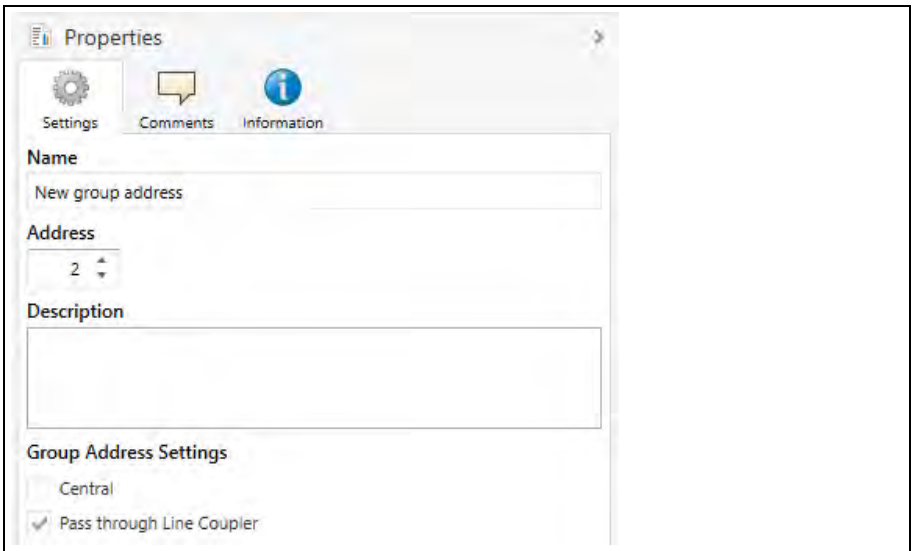
When using "Answer with NACK" an access to the device via the KNX main line is no longer possible. The configuration must be performed via the sub line.

6.4.3 Filter table

The filter table is automatically created by the ETS. The group addresses of the telegrams which shall be forwarded via the coupler are added to the filter table. The contents of the filter table can be displayed via the preview:



The filter table can be extended by manually adding group addresses. This requires activating "Pass through Line Coupler" in the property window of the corresponding group address.



7 Care, maintenance and disposal

7.1 Cleaning

If necessary, clean the device surface with a soft, lint-free cloth.

NOTICE

Do not use aggressive cleaning agents!



→ Do not use aggressive cleaning agents such as thinner or acetone for cleaning the device.

→ To clean the device, use only a lint-free cloth.

Tips and hard objects can destroy the device.

7.2 Maintenance

Usually, the device does not require any maintenance by the operator. Repairs to the device must only be carried out by the manufacturer.

For repairs, contact your local B.E.G. Brück Electronic subsidiary or directly B.E.G. Brück Electronic GmbH, Germany.

7.3 Disposal

For disposal observe the applicable national regulations regarding electronic components.

8 Diagnostics and troubleshooting

NOTICE

Diagnosis / Troubleshooting via the ETS!



→ Use the corresponding ETS functions for diagnosis / troubleshooting, e.g.

- Group Monitor
- Bus Monitor
- Line Scan

9 Service and support

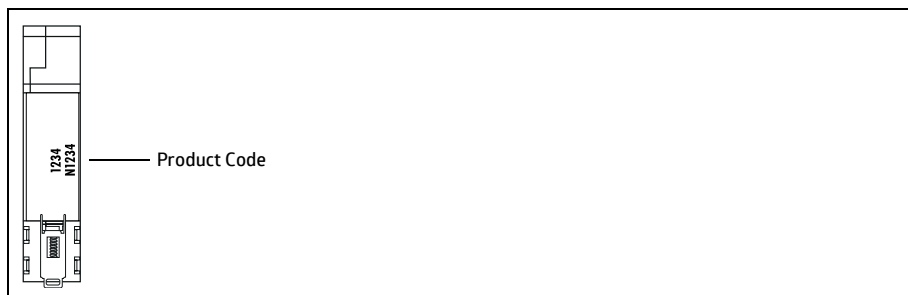
9.1 Manufacturer's warranty

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.beg-luxomat.com/service/downloads/>.

9.1.1 Product code

The product is provided with a product code that enables the product to be traced in the event of a warranty/complaint.

The product code of the **LK-TP/KNX REG** is labelled on the back of the housing.



9.2 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:

Contact your B.E.G. subsidiary or representative.

The contact details can be found at <https://www.beg-luxomat.com/en-in/service/service-points/>.

Or contact us directly at

B.E.G. Brück Electronic GmbH

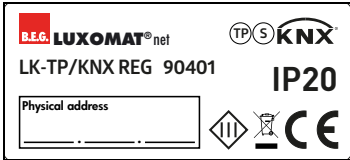
Gerberstrasse 33

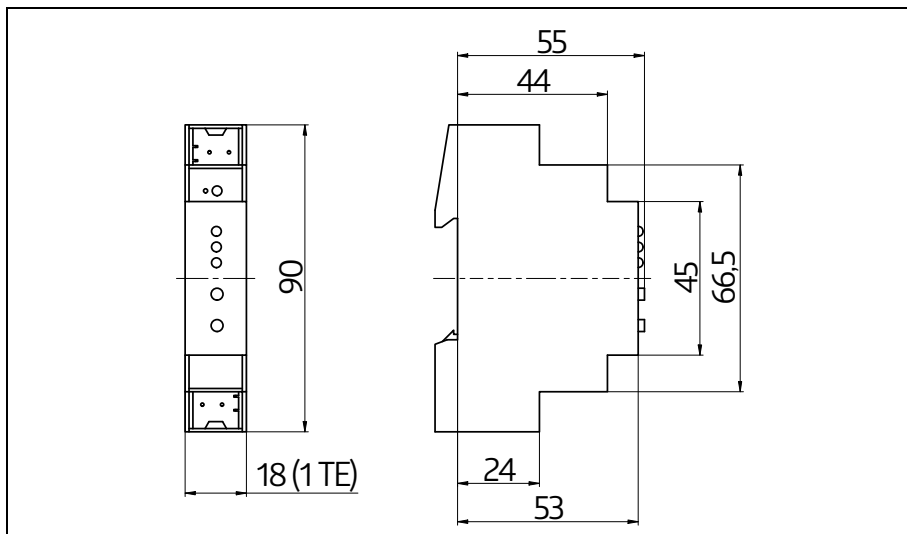
51789 Lindlar

GERMANY

10 Technical data

10.1 General data

Voltage supply	via KNX bus
Current consumption	Main line approx. 5 mA, Sub line approx. 3 mA
Connection	Bus connector red/black for KNX-TP main line, Bus connector red/black for KNX-TP sub line
Controls and indicators	2 buttons, 3 multicolour LEDs, KNX programming button with LED (red)
Housing	DIN rail-mounted device, polycarbonate
Housing width	18 mm (1 rail unit)
Weight	approx. 40 g
Protection class / degree of protection	III / IP20
Ambient temperature (operating/storage)	-5 °C – +45 °C / -25 °C – +70 °C
Relative humidity	5 – 93 % non-condensing
Conformity with standards	Low-voltage directive 2014/35/EU EMC directive 2014/30/EU RoHS directive 2011/65/EU EN 50491-3: 2009 EN 50491-5-1: 2010 EN 50491-5-2: 2010 EN 50491-5-3: 2010 EN 61000-6-2: 2005 EN 61000-6-3: 2007 + A1: 2011 EN 50581: 2012
Nameplate	

10.2 Dimensional drawings LK-TP/KNX REG**11 EU declaration of conformity**

The product complies with the following EU directives

1. Electromagnetic Compatibility (2014/30/EU)
2. Low voltage (2014/35/EU)
3. Restriction of the use of certain hazardous substances in electrical and electronic equipment (2011/65/EU)

NOTICE**EU declaration of conformity**

A detailed EU Declaration of Conformity can be found at www.beg-luxomat.com or can be requested from the manufacturer.



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