EAE KNX LINE Coupler

Product Manual LC200

Order Code: 50564

Content

1. General

The KNX LineCoupler 200 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 (ETS4 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).

1.1. Technical Data

Power supply	Bus	DC 21...30V SELV
	Current consumption from KNX **main line**	5 mA
	Current consumption from KNX **sub line**	3 mA
Connections	KNX Main Line	Bus connection terminal
	KNX Sub Line	Bus connection terminal
KNX	Medium	TP/TP
	Extended filter table for main group 0...31	
	Max. APDU length	55
	Device model	0x0912
Display elements	LED for programming mode (Red)	
	LED Main Line (Multicolor)	
	LED Mode (Multicolor)	
	LED Sub Line (Multicolor)	
Operating elements	2 Function Button, Programming Button	
Installation	DIN rail mount	
Type of protection	IP20	EN 60529
Temperature range	Operation	-5° C + 45° C non-condensing
	Storage	-25° C + 70° C
Humidity		%5 to 93 % no moisture condensation
Dimensions	Width W in units (18 mm modules)	
Weight	40 g	
Box	Housing plastic (PC)	

CE	▪ EMC directive 2014 / 30 / EU
	▪ RoHS directive 2011 / 65 / EU
	▪ EN 63000: 2018
	   EN 63044-3: 2018
		▪ EN 50491-5-1: 2010
		   EN 50491-5-2: 2010
		   EN 50491-5-3: 2010
		▪ EN 61000-6-2: 2019
		   EN 61000-6-3: 2007 + A1: 2011

NOTE: Device default physical address is 15.15.0. In order to configure KNX Presence detector, ETS application file ".knxprod" is needed. It's possible to download the file on EAE website. ETS is required for programming the device. Parameter settings and related group addresses can be changed by ETS. Learn more by reading ETS help file.

1.2. Installation and Connection

The KNX LineCoupler 200 is designed for installation on a DIN rail with a width of 1 unit (18mm). It features the following controls and displays:
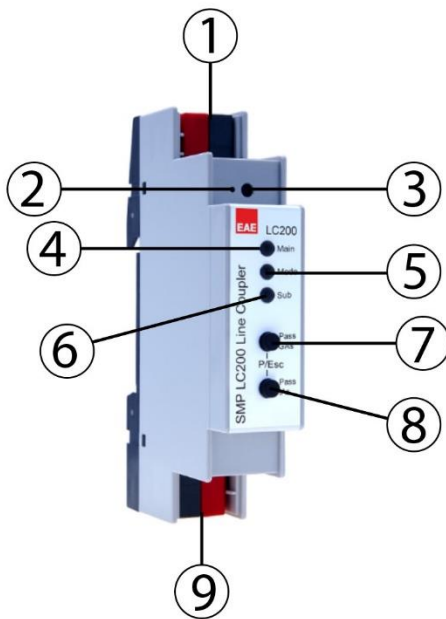
1. KNX Bus Connector (main line)
2. LED for Programming Mode (red)
3. Button for Programming Mode
4. LED KNX (mainline, multicolor)
5. LED Mode (multicolor)
6. LED KNX (sub line, multicolor)
7. Button „Pass Gas"
8. Button „Pass IAs"
9. KNX bus connector (sub line)

An external power supply is not necessary as the device is powered by the KNX bus.

The device is not working without bus power (main line).

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.

3. Manual Operation and Status display

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

Communication failures (e.g. repetitions of telegrams or telegram fragments) are indicated by a short change of the LED color to red.

Overview of the different indications of KNX main line LED ④:

LED Status	Meaning
LED lights green	KNX Bus power (main line) active
LED flashes green	Telegram traffic on the KNX bus (main line)
LED turns red (short)	Communication error on the KNX bus (main line)

The KNX sub line LED ⑥ 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 (such as telegram repeats or telegram fragments) are indicated by a short time color change to red.

Overview of the different indications of KNX sub line LED ⑥:

LED Status	Meaning
LED lights green	KNX Bus power (sub line) active
LED flashes green	Telegram traffic on the KNX bus (sub line)
LED turns red (short)	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 visualized with a single flash of the Mode LED ⑤ (orange). If both modes are activated the Mode LED ⑤ flashes two times.

Pressing button "Pass GAs" ⑦ or button "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 LED ⑤ can visualize configuration errors (for details see table below).

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 1x orange	Programming mode is not active. Manual operation is active. Forwarding IA **or** GA
LED flashes 2x 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 download.
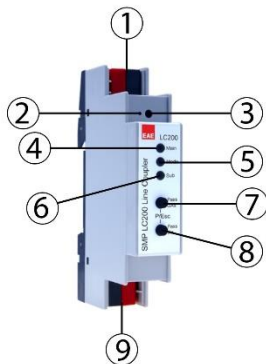
4. Factory Default Settings

Factory default configuration	
Individual device address	**15.15.0**
Routing (sub line -> main line)	
Individual addressed telegrams:	**Filter**
Group addressed telegrams:	**Lock**
Routing (main line -> sub line)	
Individual addressed telegrams:	**Filter**
Group addressed telegrams:	**Lock**

5. Reset to factory device Settings

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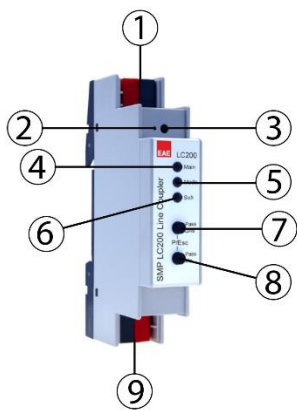
- Disconnect the KNX Bus connector (main line) ① from device
- Press the KNX programming button ③ and keep it pressed down
- Reconnect the KNX Bus connector (main line) ① of device
- Keep the KNX programming button ③ pressed for at least another 6 seconds
- A short flashing of the programming LEDs (②)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

6. Coupler function

The KNX LineCoupler 200 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 KNX LineCoupler 200 compared to the IP based topology:

	Classical Topology (without IP)	IP coupling of areas (IP area coupler)	IP coupling of lines (IP line coupler)
Area (Backbone)	TP	IP	IP
Coupling	KNX Line Coupler (max. 15 Pcs.)	KNX IP Router (max. 15 Pcs.)	Directly via LAN Switch
Main line	TP	TP	IP
Coupling	KNX Line Coupler (max. 15x15 Pcs.)	KNX Line Coupler (max. 15x15 Pcs.)	KNX IP Router (max. 225 Pcs..)
Line	TP	TP	TP
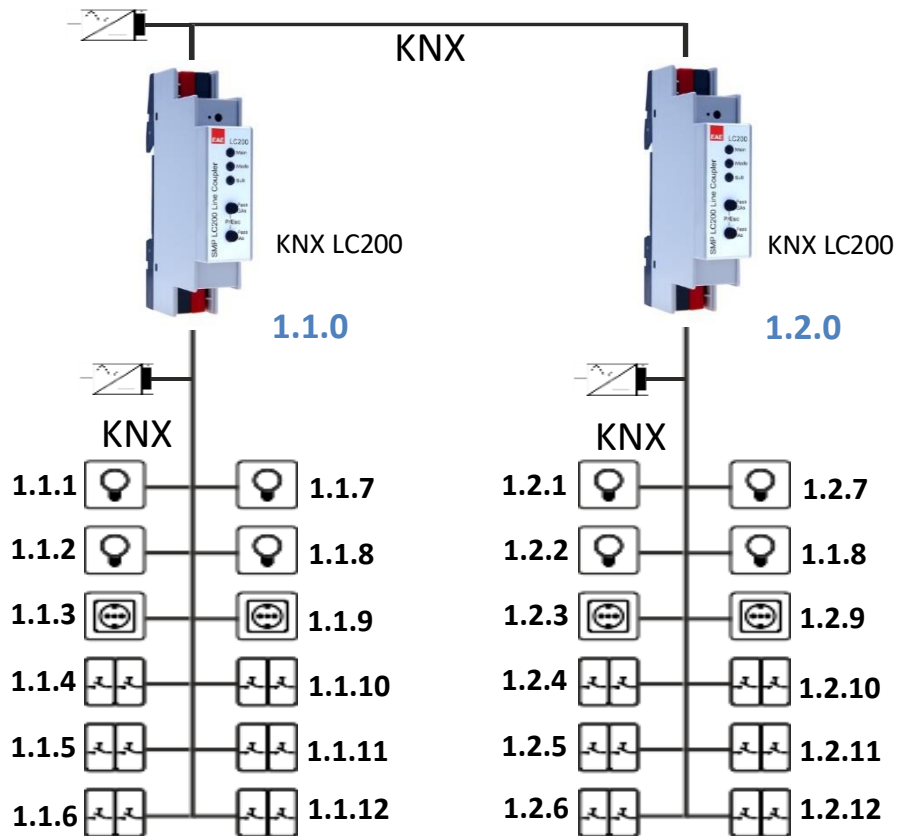
KNX LineCoupler 200 as line coupler

The individual address assigned to the KNX LineCoupler 200 determines whether the device operates as a line or 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 it is in the form of x.0.0 (x: 1..15), the router acts as a backbone coupler.
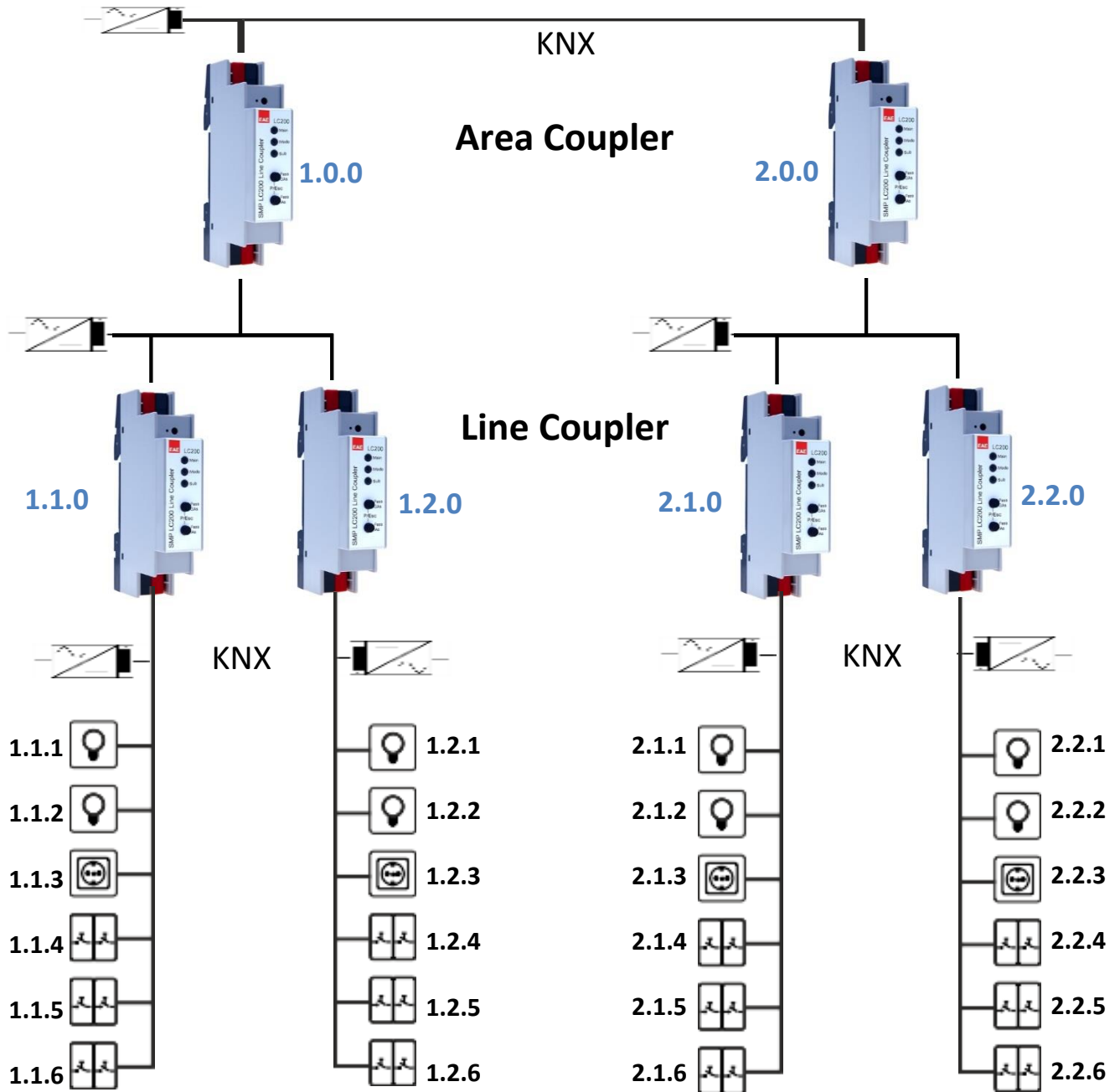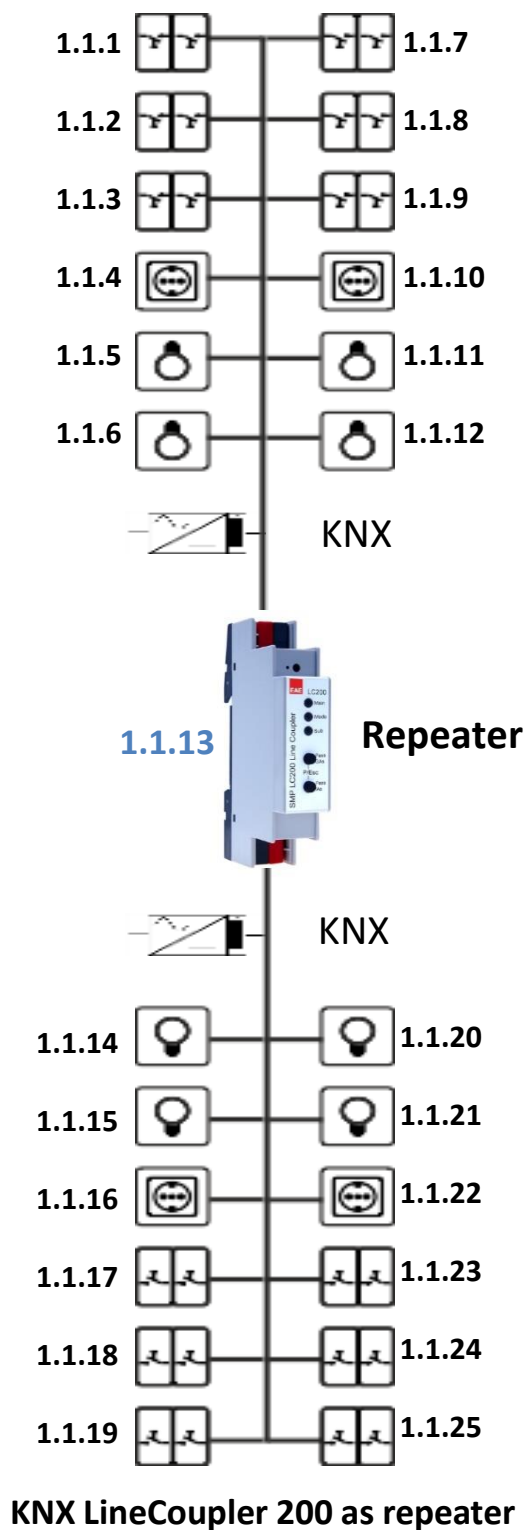
KNX LineCoupler 200 as area and line coupler

The KNX LineCoupler 200 has a filter table and thus contributes to reducing the bus load. The filter table (8kB) supports the extended group address range and is automatically generated by the ETS.

7. Repeater function

The KNX LineCoupler 200 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 dialog of the ETS are ineffective in repeater mode.

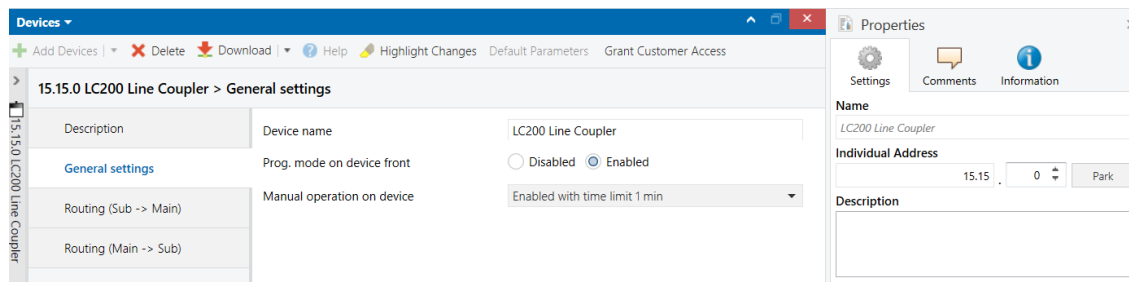

KNX LineCoupler 200 as repeater

8. ETS Database

The ETS database (for ETS 4.2 or higher) can be downloaded from the product website of the KNX Line Coupler 200 (www.eaetechnology.com).
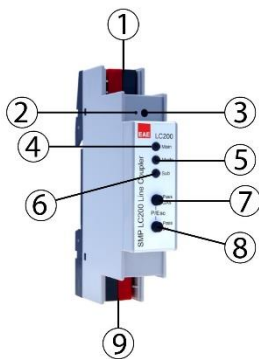
8.1. ETS Parameter Dialogue

The following parameters can be set using the ETS.

8.2. General Settings


8.3. 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.

8.4. Manual operation on device

This parameter sets the duration of the manual mode. Upon completion the normal display mode is restored.

8.5. Routing (Sub line → Main line)
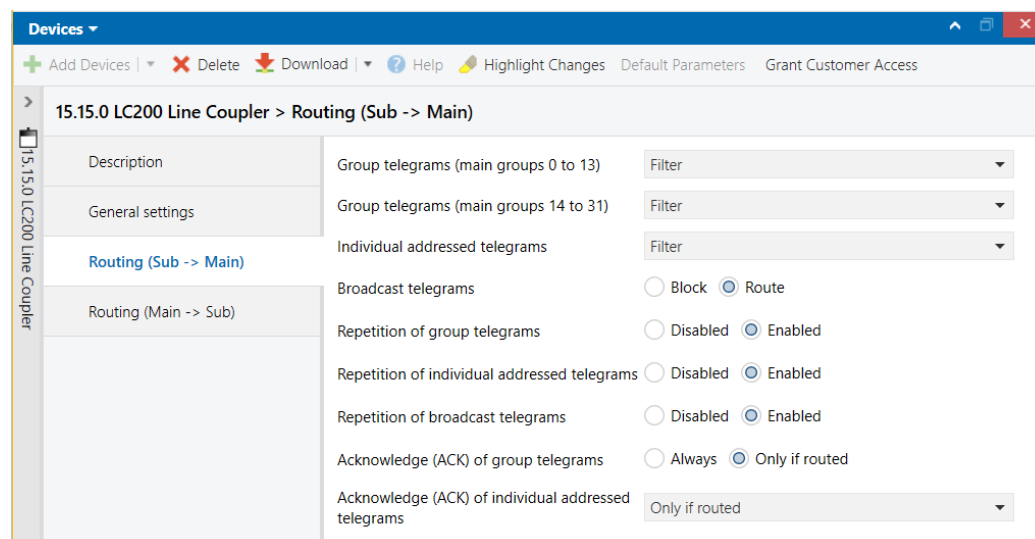
Group telegrams (main group 0 to 13)	
Block:	No group telegrams of this main group are routed to the main line.
Route:	All group telegrams of this main group are routed to the main line independent of the filter table. This setting is for test purposes only.
Filter:	The filter table is used to check whether or not the received group telegram should be routed to the main line.

Group telegrams (main group 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:	A acknowledge is generated for every received group telegram (from the sub line).
Only if routed:	A 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:	A acknowledge is generated for every received individual addressed telegram (from the sub line).
Only if routed:	A 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.

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.

8.6. Routing (Main line → Sub line)

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

Acknowledge (ACK) of individually addressed telegrams	
Always:	A acknowledge is generated for every received individual addressed telegram (from the main line).
Only if routed:	A acknowledge is only generated for received individually addressed group telegrams (from the main line) if they are routed to the sub 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.

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.

9. 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:

Preview of the filter table

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.
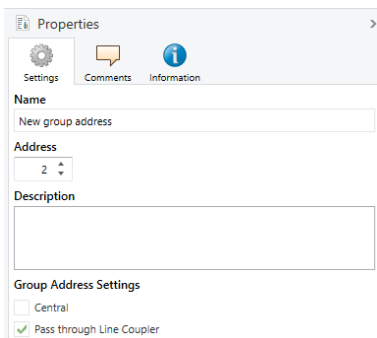
Property window of a group address

Due to the significantly shorter transmission times it is recommended to perform downloads via IP.

WARNING

- The device must be mounted and commissioned by an authorized electrician.
- The prevailing safety rules must be heeded.
- The device must not be opened.
- For planning and construction of electric installations, the relevant guidelines, regulations and standards of the respective country are to be considered.