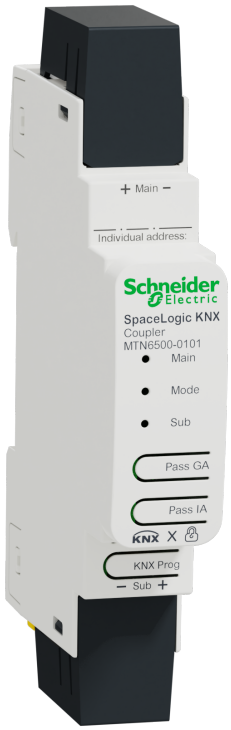
Spacelogic KNX Coupler DIN Rail

Product information and Application description

This document gives you product information about the Spacelogic KNX Coupler DIN Rail, MTN6500-0101 and describes the ETS application Coupler secure 7117/1.1

MTN6500-0101
12/2019



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Safety information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that accompany this symbol to avoid possible injury or death.

⚠⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

For your safety

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Safe electrical installation must be carried out only by qualified electrical personnel. Qualified electrical personnel must prove profound knowledge in the following areas:

- Connecting to installation networks
- Connecting several electrical devices
- Laying electric cables
- Connecting and establishing KNX networks
- Safety standards, local wiring rules and regulations

Failure to follow these instructions will result in death or serious injury.

Product information

The Spacelogic KNX Coupler is a KNX coupler in a compact design. It connects two KNX bus segments (for example, a KNX main line with a KNX area).

The device supports KNX Security. The option can be activated in the ETS. As a secure line coupler, the device enables the forwarding of both secured and unsecured communication. In addition, access to the device itself (example for a download) is protected by KNX Security.

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.

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 and sub line).

KNX Security

The KNX standard was extended by KNX Security to protect KNX installations from unauthorized access. KNX Security reliably prevents the monitoring of communication as well as the manipulation of the system.

KNX Data Security describes the encryption at telegram level. This means that the telegrams on the KNX bus are also encrypted.

KNX Data Security for the device

The KNX Coupler also supports KNX Data Security to protect the device from unauthorized access from the KNX bus. If the KNX Coupler is programmed via the KNX bus, this is done with encrypted telegrams.

> **NOTE:** Encrypted telegrams are longer than the previously used unencrypted ones. For secure programming via the bus, it is therefore necessary that the interface used (for example, USB) and any intermediate line couplers support the so-called KNX long frames.

The secured device configuration is also contained in KNX data security.

KNX Data Security for forwarded telegrams

Telegrams from the bus that do not address the KNX Coupler as a device are forwarded or blocked according to the filter settings (parameters and filter table). It does not matter whether the telegrams are unencrypted or encrypted. Forwarding takes place exclusively on the basis of the destination address. The security properties are checked by the respective recipient.

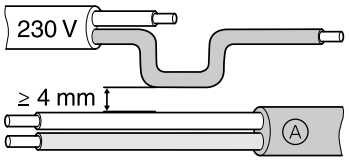
Installation and connection

The device is designed for installation on a DIN rail with a width of 1 unit (18 mm).

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK AND DEVICE DAMAGE

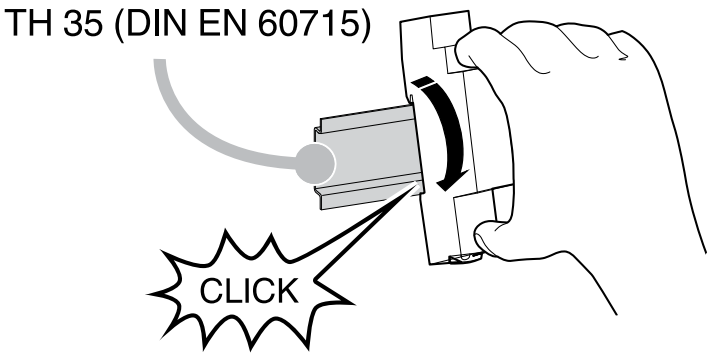
- Ensure a safety clearance of minimum 4 mm between the individual cores of the 230 V supply cable and the KNX line Ⓐ, in accordance with IEC 60664-1.



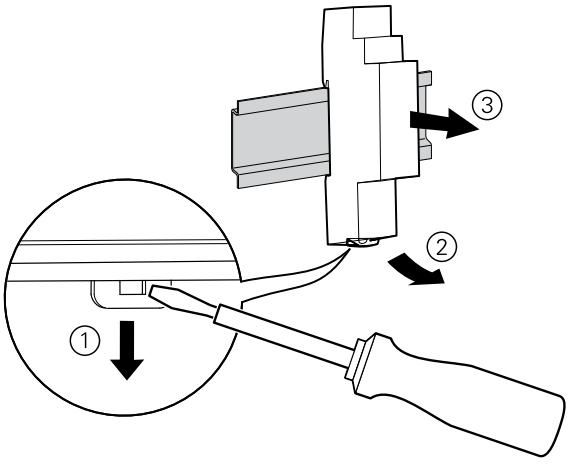
- Ensure that the installed devices have minimum basic insulation next to the device.

Failure to follow these instructions will result in death or serious injury.

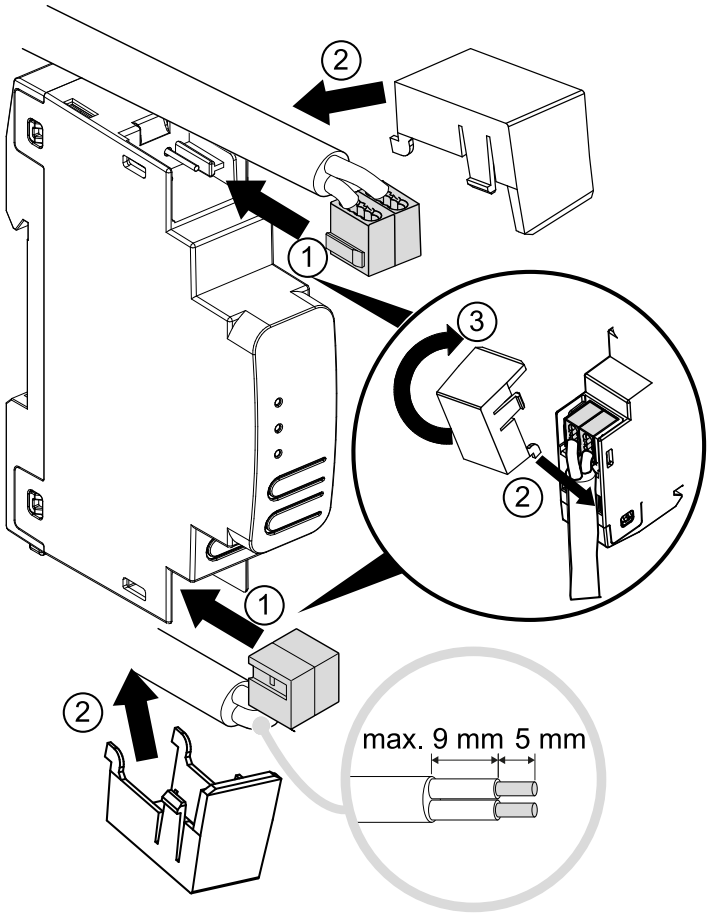
Installing



Removing



Connecting



Technical data

Power supply	via KNX bus
Main line	< 5 mA
Sub line	< 3 mA
KNX Connection	Bus connecting terminal
Dimensions (LxWxD)	110x18x66 mm
Device width	1 module = 18 mm

Coupler function (TP Routing)

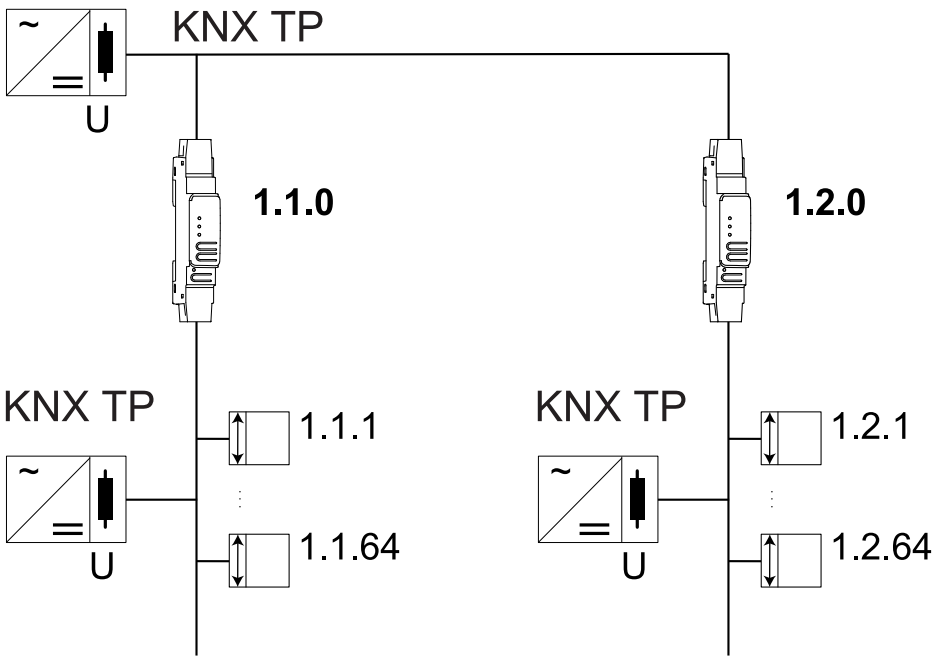
The KNX Coupler operates as a line or backbone coupler. In both cases, the Twisted Pair (TP) is used as a backbone.

The following table shows the application possibilities of the Spacelogic KNX Coupler:

	Classical topology (without IP)
Area (Backbone)	TP
Coupling	KNX Line Coupler (max. 15)
Main line	TP
Coupling	KNX Line Coupler (max. 15x15)
Line	TP

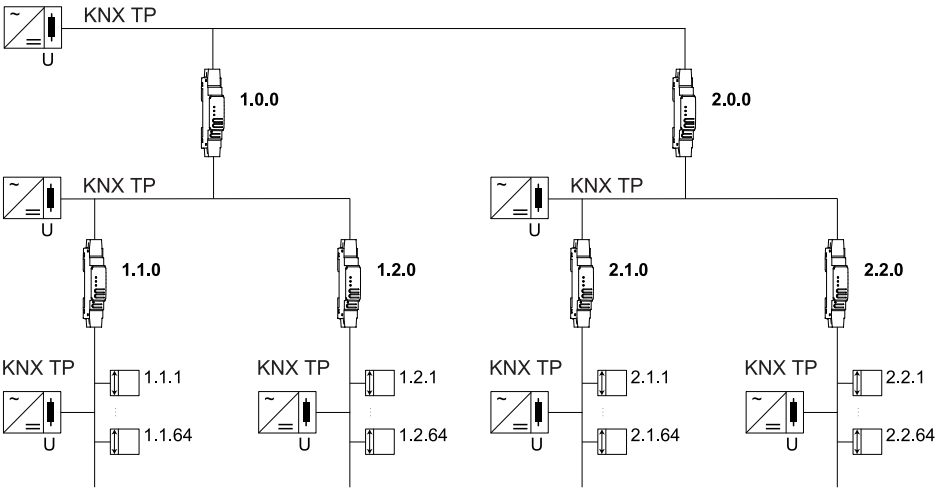
KNX Coupler as line coupler

The individual address assigned to the Spacelogic KNX Coupler determines whether the device operates as a line or area coupler.



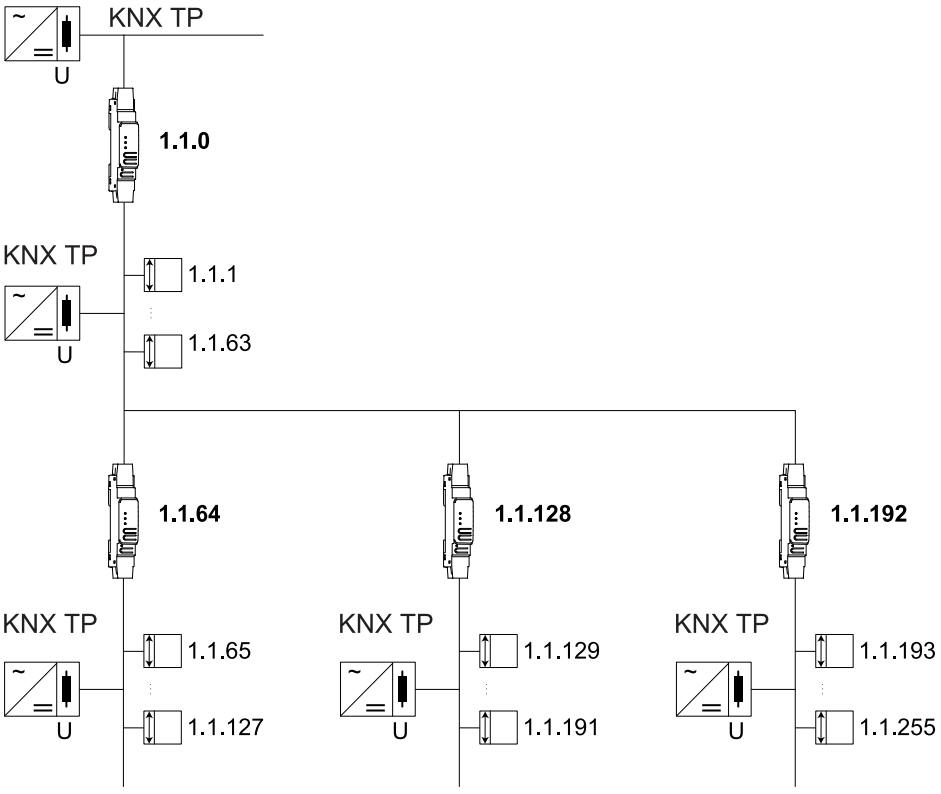
If the individual address is in the form of x.y.0 (x, y: 1…15), the router operates as a line coupler. If it is in the form of x.0.0 (x: 1…15), the coupler acts as a backbone coupler.

KNX Coupler as area and line coupler



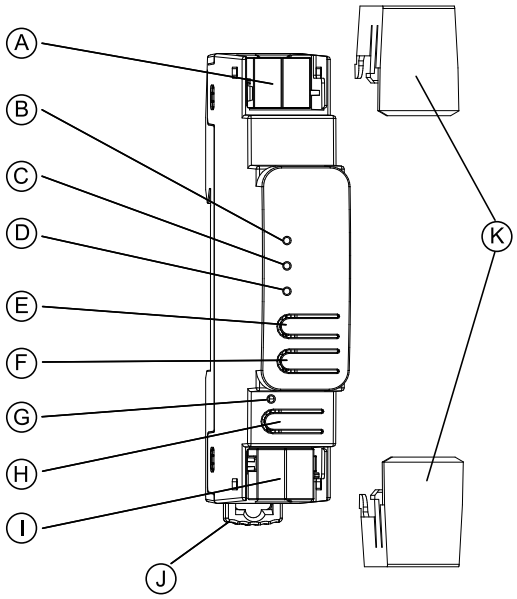
The KNX Coupler has a filter table and thus contributes to reducing the bus load. The filter table (8 kB) supports the extended group address range (main groups 0…31) and is automatically generated by the ETS.

KNX Coupler as repeater



The KNX Coupler 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.

Connections and operating elements



A	KNX bus connector (main line)
B	KNX LED (main line, multicolor)
C	Mode LED (multicolor)
D	KNX LED (sub line, multicolor)
E	Button: Pass GA (Forwarding of group addressed telegrams)
F	Button: Pass IA (Forwarding of individually addressed telegrams)
G	Programming LED (red)
H	Button for programming mode
I	KNX bus connector (sub line)
J	Release lever for disassembly
K	Cable cover

The KNX Coupler is powered by the KNX bus. An external power supply is not necessary.

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

KNX Programming mode

The KNX programming mode is activated/deactivated by pressing the flushed KNX programming button Ⓗ.

It is possible to write the programmed individual address on the labeling field with a non permanent marker or pencil. So it is possible to change it, if needed.

Status display

Overview of the different indications of the KNX main line LED

KNX main line LED Ⓑ Status	Meaning
LED lights green	Device is successfully powered by the KNX bus (main line).
LED flickers green	Telegram traffic on the KNX bus (main line).
LED shortly red	Communication failure on the KNX bus. For example, repetition of the telegrams or telegram fragments are indicated by a short change of the LED color to red (main line).

Overview of the different indications of the Mode LED

Mode LED Ⓒ Status	Meaning
LED lights green	Device is working in standard operation mode.
LED flashes 1x/s orange	Manual operation is active. Forwarding IA **or** GA.
LED flashes 2x/s orange	Manual operation is active. Forwarding IA **and** GA.
LED flashes red	Manual operation is not active. The device is not properly loaded. For example, after an interrupted download.

Overview of the different indications of the KNX sub line LED

KNX LED Ⓓ Status	Meaning
LED lights green	Device is successfully powered by the KNX bus (sub line).
LED flickers green	Telegram traffic on the KNX bus (sub line).
LED shortly red	Communication failures on the KNX bus. For example, repetitions of telegrams or telegram fragments are indicated by a short change of the LED color to red (sub line).

Manual operation

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

With the button Pass GA Ⓔ the forwarding of all group addressed telegrams can be activated.

With the button Pass IA Ⓕ the forwarding of all individually addressed telegrams can be activated.

This is visualized by flashing of the Mode LED Ⓒ 1x/s (orange). If both modes are activated the Mode LED Ⓒ flashes 2x/s.

Pressing button Pass GA Ⓔ or button Pass IA Ⓕ again these settings can be selected and deselected on demand.

If neither programming mode nor manual mode are active the LED Ⓒ can visualize configuration errors.

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: Group addressed telegrams:	 **Filter** **Lock**
Routing (main line -> sub line): Individual addressed telegrams: Group addressed telegrams:	 **Filter** **Lock**

Reset to factory device settings (master reset)

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

1. Disconnect the KNX Bus connector Ⓐ (main line) from device.
2. Press the KNX programming button Ⓗ and keep it pressed down.
3. Reconnect the KNX Bus connector Ⓐ (main line) of device.
4. Keep the KNX programming button Ⓗ pressed for at least another 6 seconds.
5. A short flashing of the programming LED Ⓖvisualizes the successful reset of the device to factory default settings.

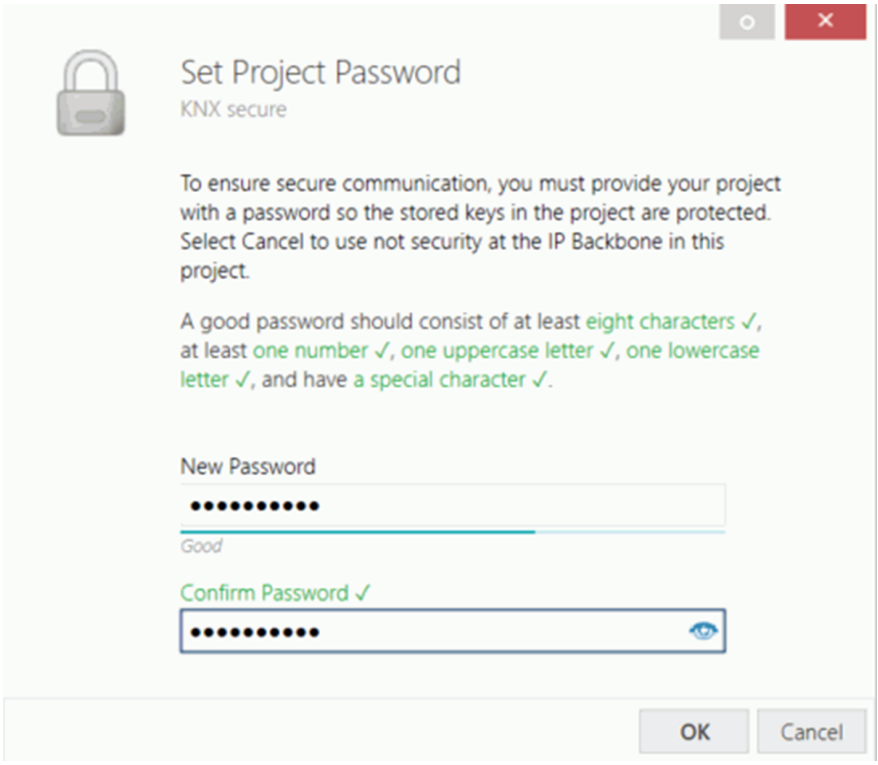
ETS application

The ETS database (ETS 5.7.3 or higher) can be downloaded from the product website of the KNX Coupler (*www.schneider-electric.com*) or via the KNX online catalogue.

Product family	1.1 System Devices
Product type	1.1.03 Coupler
Manufacturer	Schneider Electric Industries SAS
Name	SpaceLogic KNX Coupler DIN Rail
Order number	MTN6500–0101

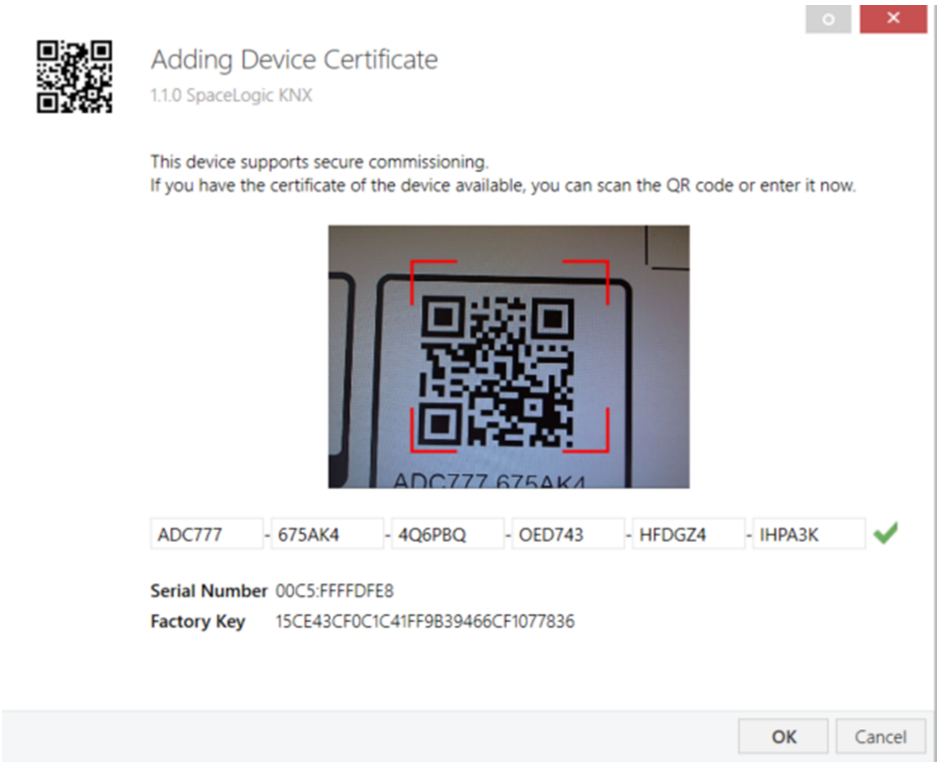
ETS project

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



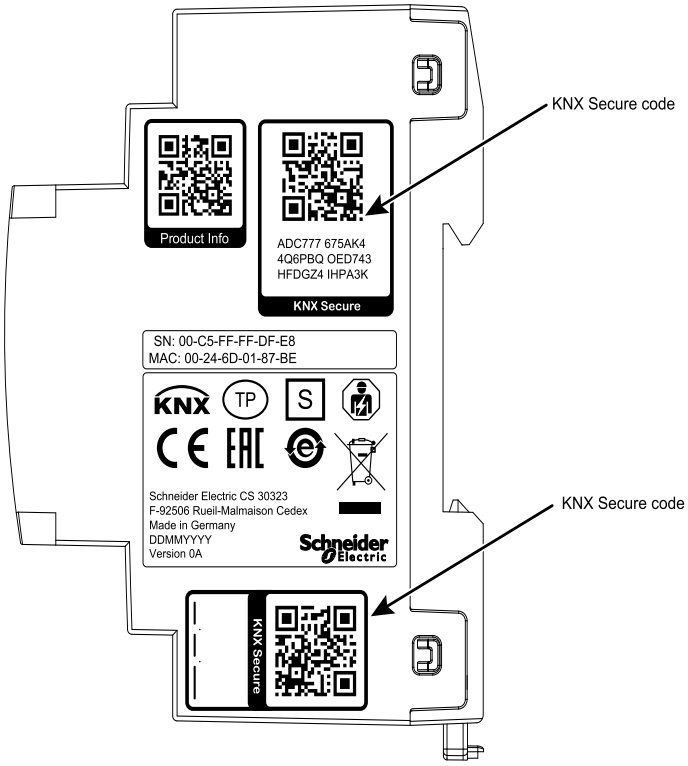
This password protects the ETS project from unauthorized access. This password is not a key that is used for KNX communication. The entry of the password can be bypassed with **Cancel**, but this is not recommended for security reasons.

ETS requires a device certificate for each device with KNX Security that is created in the ETS. This certificate contains the serial number of the device as well as an intangible key (FDSK = Factory Default Setup Key).



The certificate is printed as text on the device. It can also be conveniently scanned from the printed QR code via a camera connected to the PC that runs the ETS.

The KNX Secure code can be found on the right side of the device. The small KNX Secure code sticker with labeling field at the bottom of the device can be removed for documentation purpose.



The list of all device certificates can be managed in the ETS **Overview > Projects > Security** window.

This initial key is required to safely put a device into operation from the start. Even if the ETS download is recorded by a third party, the third party has no access to

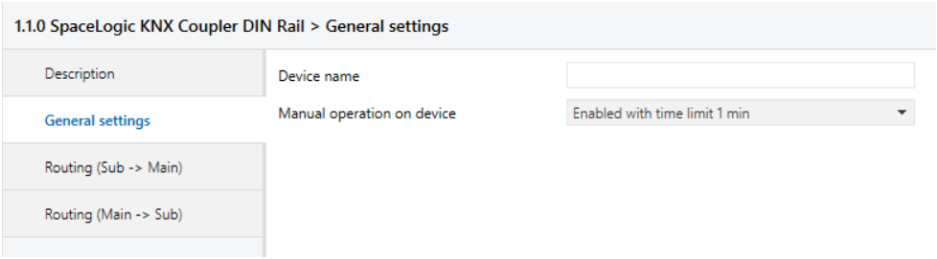
the secured devices afterwards. During the first secure download, the initial key is replaced by the ETS with a new key that is generated individually for each device. This prevents persons or devices who may know the initial key from accessing the device. The initial key is only reactivated after a master reset.

The serial number in the certificate enables the ETS to assign the correct key to a device during a download.

ETS parameter dialogue

The following parameters can be set using the ETS.

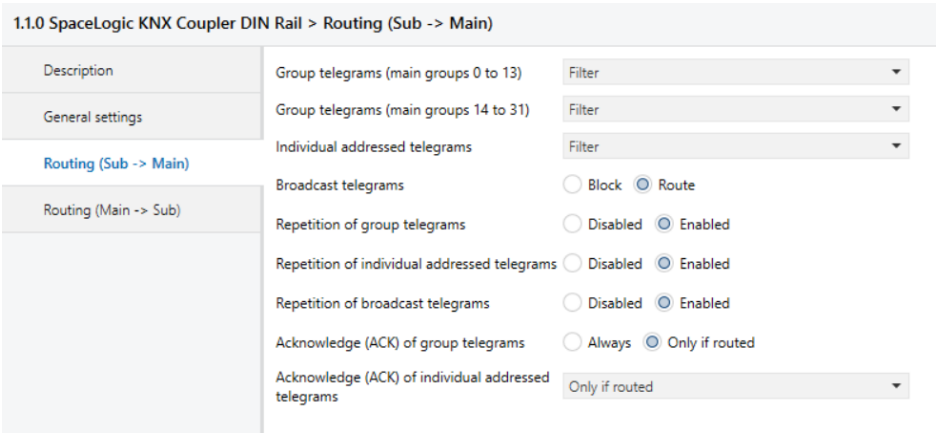
General settings



Manual operation on device

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

Routing (Sub line → Main line)



Group telegrams (main group 0 to 13)

Block	No group telegrams of these main groups are routed to the main line.
Route	All group telegrams of these main groups 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 these main groups are routed to the main line.
Route	All group telegrams of these main groups 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.

Individual 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 used for testing 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 case of a fault.
Enabled	The received group telegram is resent up to three times in case of a fault.

Repetition of individual 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

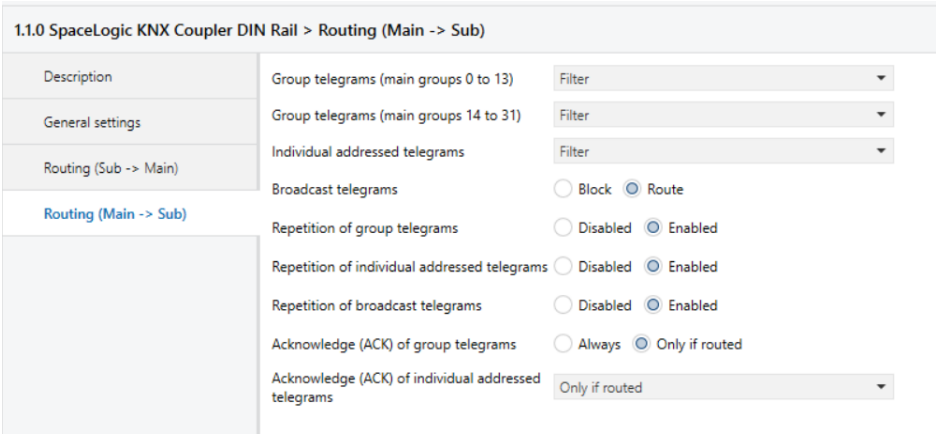
Always	An acknowledge is generated for every received group telegram (from the sub line).
Only if routed	An acknowledge is only generated for received group telegrams (from the sub line) if they are routed to the main line.

Acknowledge (ACK) of individual 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.

NOTE: 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. This can be used to make an installation more secure.

Routing (Main line → Sub line)



Group telegrams (main group 0 to 13)

Block	No group telegrams of these main groups are routed to KNX.
Route	All group telegrams of these main groups are routed to KNX independent of the filter table. This setting is used for testing purposes only.
Filter	The filter table is used to check whether the received group telegram should be routed to KNX.

Group telegrams (main group 14 to 31)

Block	No group telegrams of these main groups are routed to KNX.
Route	All group telegrams of these main groups are routed to KNX independent of the filter table. This setting is used for testing purposes only.
Filter	The filter table is used to check whether the received group telegram should be routed to KNX.

Individual 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 used for testing purpose 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 individual 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 sub line.

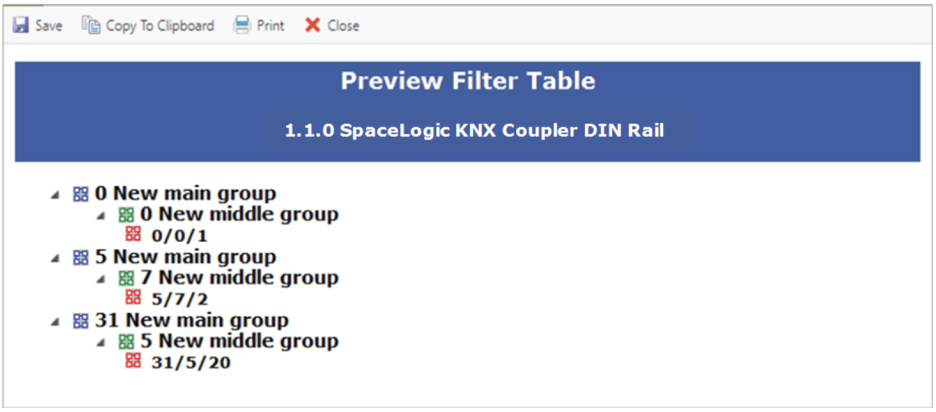
Acknowledge (ACK) of individual addressed telegrams

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 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.

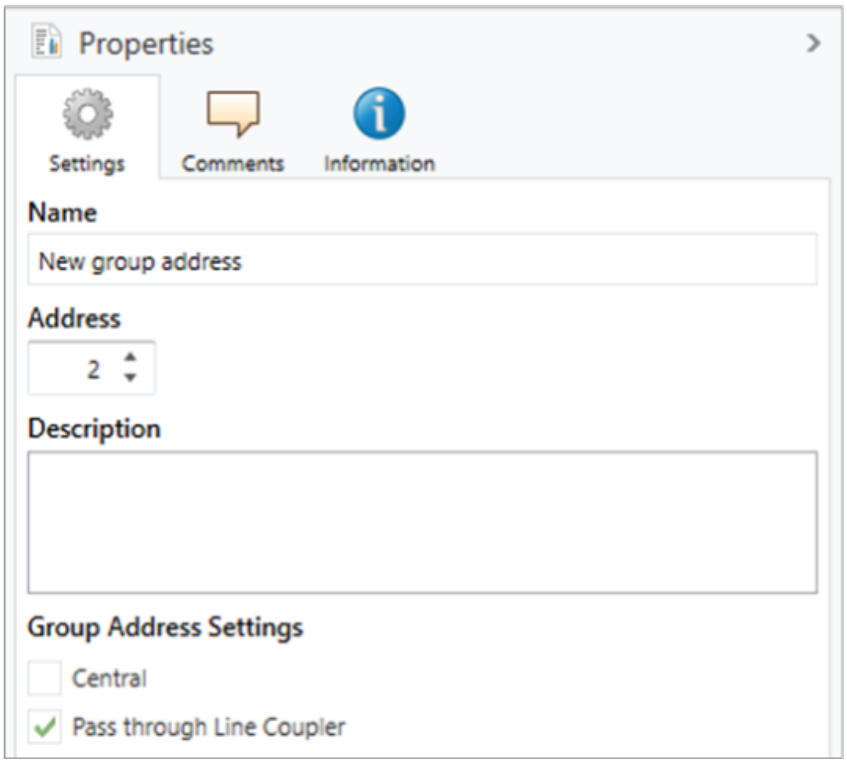
NOTE: When using **Answer with NACK**, an access to the device via KNX main line is no longer possible. The configuration must be performed via sub line.

Filter table

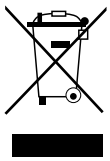
The filter table is automatically created by the ETS. The group addresses of the telegrams which shall be forwarded via the coupler are added to the filter table. The contents of the filter table can be displayed via the preview:



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.



WEEE directive



Dispose of the device separately from household waste at an official collection point.

Professional recycling protects people and the environment against potential negative effects.

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If you have any technical questions, please contact the Customer Care Centre in your country.
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