Product Manual

KNX RF Multi/TP media coupler or RF repeater

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Legal Information

KNX RF Multi/TP media coupler or RF repeater Product Manual
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ise Individuelle Software und Elektronik GmbH
Osterstraße 15
26122 Oldenburg, Germany
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Feedback and information about products

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Contents

1 About this Documentation

This documentation will accompany you through all phases of the product life cycle of KNX RF Multi/TP media coupler or RF repeater. You will learn for example how to assemble, install, commission and configure the device.

All descriptions in this documentation on configuration in the ETS (Engineering Tool Software) refer to the ETS Professional version. The ETS version depends on the application used.

Explanations of KNX concepts do not form part of this documentation.

1.1 Target group

This documentation is aimed at qualified electricians and KNX processors.

Only qualified electricians may assemble and install the KNX RF Multi/TP media coupler or RF repeater. Specialist knowledge of KNX is a prerequisite.

Anyone may configure the KNX RF Multi/TP media coupler or RF repeater. We recommend that configuration is done by a system integrator. with sound specialist knowledge of KNX and using the ETS.

1.2 Symbols and typographical conventions

Symbol / label	Meaning
	Warning of possible material damage
	General warning
	Warning of electrical voltage

Table 1: Symbols and safety notes

Symbol / label	Meaning
[F1]	PC button
<<Inscription>>	Text on software interface
	Troubleshooting tip
	Important additional information

Table 2: Special symbols and typographical conventions
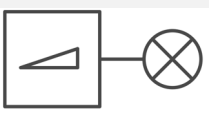
Symbol / label	Meaning
~ / = PS	Power supply
TP / RF MC	RF/TP media coupler
IP / TP BC	Backbone coupler
TP / TP LC	Line coupler
TP / TP SC	Segment coupler
USB ↔ RF	RF-USB interface
USB ↔ TP	TP-USB interface
↔ RF	RF repeater
⊗	RF button
	Dimmer

Table 3: Graphic symbols

2 About KNX RF Multi/TP media coupler or RF repeater

2.1 Proper use

The KNX RF Multi/TP media coupler or RF repeater acts as an interface between a wired KNX TP installation and a KNX RF environment. The device can also be used as a repeater in an RF domain.

The routing properties of the media coupler enable its used as an area and line coupler, and as a segment coupler from ETS6.

The KNX RF Multi/TP media coupler or RF repeater is a KNX system device and complies with the KNX guidelines.

> **ℹ Important**
>
> ise Individuelle Software und Elektronik GmbH assumes no liability for damage caused by improper use or use for purposes other than or contrary to the intended purpose.

Configuration: compatible ETS version

Simple integration into the KNX system (completely programmable via ETS):

- ETS from v5.7.5 as a KNX RF Ready device
- ETS from v6.1.1 as a KNX RF Ready device or as a KNX RF Multi device
- Product database entry: Download the corresponding product database entry from our website www.ise.de or from the ETS online catalogue free of charge.

KNX Secure

The KNX RF Multi/TP media coupler or RF repeater is KNX Secure.

The device is compatible with KNX Secure. KNX Secure offers protection against manipulation in building automation and can be configured in the ETS project.

- The required KNX Secure certificate or the FDSK (Factory Default Setup Key) that it contains can be found on a sticker on the side of the device and is also enclosed with the device.

- For maximum security, we recommend removing the sticker from the device.

- Keep the certificate in a safe place.

- You cannot restore the certificate yourself.

- Please contact our support team if you lose the certificate despite utmost care.

- Only use KNX Secure for a safe communication. The BCU key has no function.

2.2 How it works

The KNX RF Multi/TP media coupler or RF repeater is connected to the KNX installation via KNX/TP. By supporting KNX RF Multi and KNX RF Ready, both radio standards can be operated in one KNX installation. Due to the configured filter properties, only necessary telegrams pass through the media coupler in the direction of the RF domain and the TP installation.
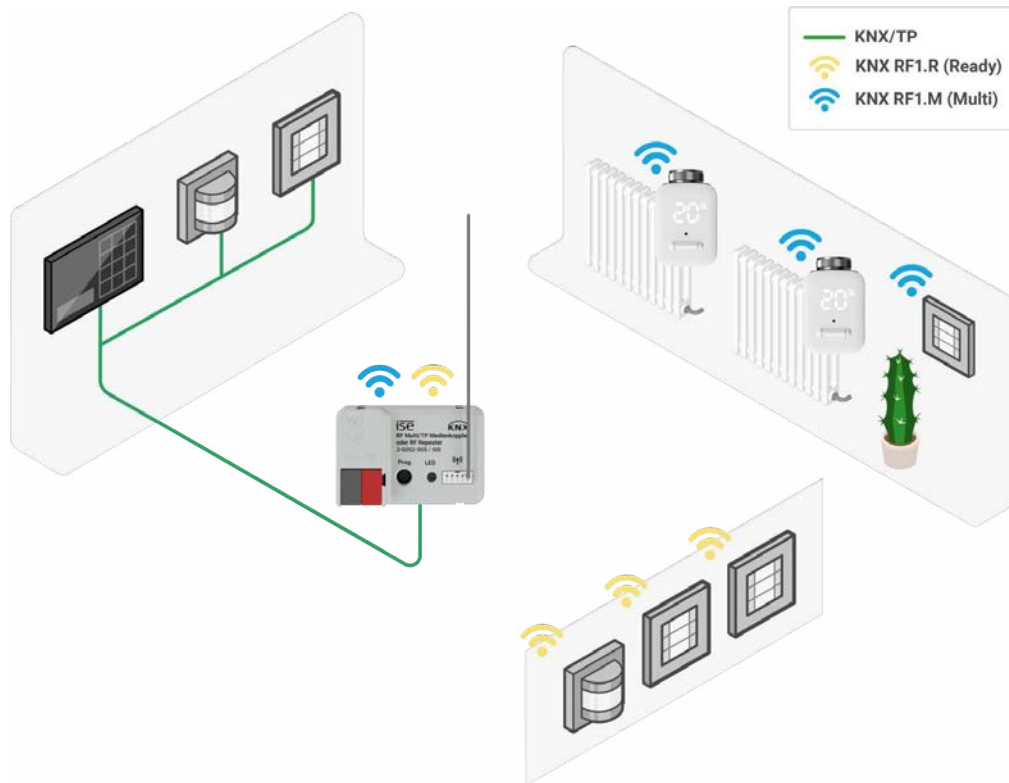
Figure 1: System at home

2.3 Overview of functions

Ready to Slow Proxy (from ETS6)

The Ready to Slow Proxy enables the use of KNX RF Ready and KNX RF Multi devices in one installation.

KNX Security Proxy (from ETS6)

The Security Proxy enables the connection of devices with and without KNX Secure in one installation. This means, for example, that an existing TP installation without KNX Secure can be extended with an RF line with KNX Secure.

Repeater (retransmitter)

The RF repeater repeats radio telegrams to extend the range of the RF installation. The enables RF devices to be positioned as required, even under difficult transmitting and receiving conditions.

In repeater mode, power is supplied via the TP line or a suitable external DC power supply unit.

Use as an area coupler/line coupler/segment coupler

Depending on its location in the topology, the media coupler can be used as an area, line or segment coupler to filter telegrams.

- Use as an area coupler is possible up to ETS5.

- The integration of segments is possible from ETS6.

Forwarding/blocking/filtering telegrams

The forwarding, blocking or filtering of physically addressed telegrams, group telegrams and broadcast telegrams can be configured in the parameter settings of the product database entry for KNX RF Ready.

In a KNX RF Multi domain, the filter settings are automatically set by the location of the media coupler in the topology of the ETS project.

RF programming lock

The RF programming lock (programming via TP only) enables secure operation, for instance in hotels and other publicly accessible areas. However, we recommend using KNX Secure to prevent unauthorised programming via RF.

Support of long frames

Telegrams with an APDU length of up to 238 bytes can be forwarded.

Functional enhancements through firmware updates

You can obtain functional enhancements for the KNX RF Multi/TP media coupler or RF repeater with a new version of the firmware. The firmware can be installed via TP or RF. Simply download the latest firmware and the relevant product manual from our website www.ise.de.

3 Important notes

3.1 General safety instructions

⚠	**Warning**
🔧	**Danger from incorrect use** Incorrect use can result in damage to the device, fire or other dangers. • Only qualified electricians may install and mount electrical devices. • The frequency band is not exclusively available to KNX RF Multi and is not suitable for safety-related applications (e.g. emergency calls). • Follow the instructions in this product manual. • This product manual is part of the product and must remain with the customer.

3.2 Storage and transport

Store the device in its original packaging. The original packaging provides optimum protection during transport. Store the device in a temperature range of -5 °C to +45 °C.

3.3 Cleaning and maintenance

The KNX RF Multi/TP media coupler or RF repeater is maintenance-free.

If necessary, clean the device with a dry cloth.

ℹ	**Important**
	Device damage due to improper opening • Never open the housing. • If you suspect that the device is damaged, contact our Support. • We provide a warranty in accordance with statutory requirements. • Send the device back to us postage free with a detailed error description only if our support team asks you to.

4   Technical data

Power supply and connections	
Rated voltage:	Supply from KNX bus or 24 V SELV
Rated voltage (repeater mode):	DC 24 V
KNX current consumption:	8 mA
Connections:	KNX: Bus connection terminal (black/red)

Ambient conditions/approvals	
Installation environment temperature:	-5 °C to +45 °C
Relative humidity	10 … 100 % (no condensation)
Protection type:	IP 20 (according to DIN EN 60529)
Protection class:	III (compliant with IEC 61140)
Receiver category	2 (according to DIN EN 300220)

Device dimensions	
Installation length:	43 mm
Installation width:	29 mm
Installation height:	16 mm
Antenna length:	80 mm

KNX	
Communication:	KNX TP; KNX RF
Installation method:	S-Mode
Medium:	TP1-256; KNX RF Multi; KNX RF Ready
Radio frequency (KNX RF Ready):	868.3 MHz
Radio frequencies (KNX RF Multi):	868.3 MHz 868.950 MHz 869.525 MHz 869.850 MHz
Transmission power:	max. 25 mW
Transmission range in free field:	approx. 100 m
Supported telegram length:	Up to 238 bytes

Power supply unit (not included in scope of supply)	
Secondary rated voltage	DC 24 V
Secondary rated current	max. 0.3 A

5   Device Design

5.1   Front
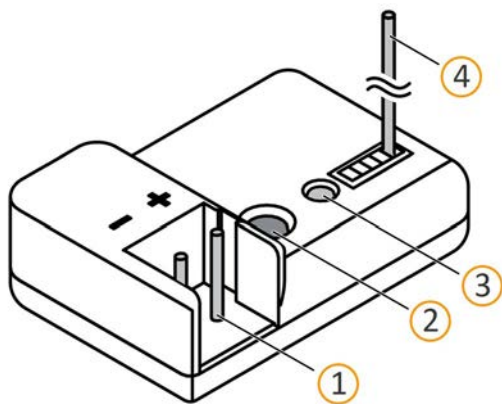
No.	Description
1	KNX/TP bus connection
2	Programming button
3	Status LED
4	Antenna

Figure 2: Front

5.2   Data on device sticker (front)
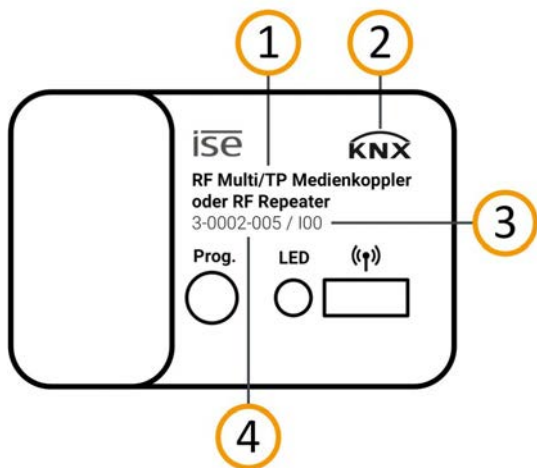
No.	Description
1	Product name
2	KNX certification
3	Index status
4	Order number

Figure 3: Device sticker front

5.3 Data on device sticker (back)
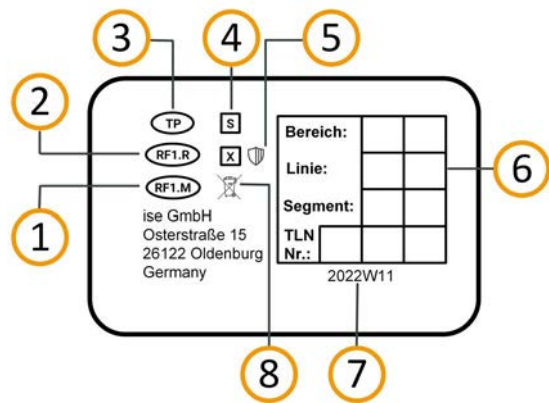
No.	Description
1	KNX medium „RF Multi"
2	KNX medium „RF Ready"
3	KNX medium „TP"
4	Installation method, here "S mode"
5	KNX Secure
6	Individual address: Enter the assigned individual address in the field with a permanent marker.
7	Batch number
8	WEEE symbol

Figure 4: Device sticker back

6   Installation

6.1   Scope of supply
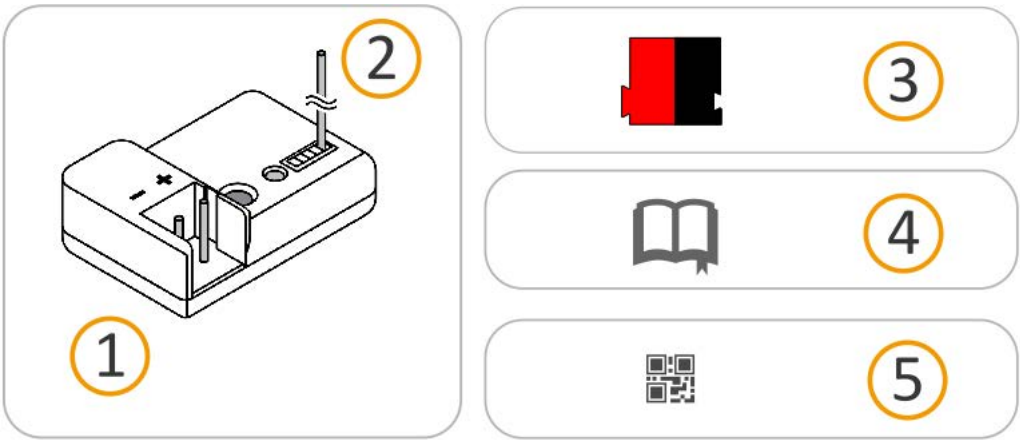
Figure 5: Scope of supply

No.	Objects supplied	Explanation
1	Device	KNX RF Multi/TP media coupler or RF repeater
2	Antenna	To receive/send RF frequencies.
3	Bus connection terminal	To connect the KNX/TP bus lines.
4	Installation instructions	This product manual also provides you with the information from the installation instructions but with additional details, application examples and configuration instructions.
5	Sticker set	Additional set of stickers with data for KNX Secure. The same stickers are attached to the side of the device.

The installation instructions are part of the product.
Give these instructions to your customer.

6.2   Checking the installation conditions

Before starting the installation process, check that the requirements for the planned installation environment have been met.

ℹ️	**Important**

Device functional fault due to incorrect ambient temperature in the installation environment

- Pay attention to the temperature of the installation environment: min. -5°C to max. 45°C
- Mount the in a non-metallic flush-mounted or surface-mounted device socket.
- No conductors or sheathed cables from other circuits may be routed through the device socket.
- Use an IP55 socket in outdoor areas.
- Choose as central a position as possible in the RF installation in order to enable low-loss communication with the RF devices.
- Maintain a sufficient distance from potential sources of interference, such as metallic surfaces, microwave ovens, Hi-Fi and TV systems, ballasts and transformers.

6.3   Choosing the installation location

The media coupler can be used as a line, area or segment coupler.
In addition, up to two more KNX RF Multi/TP media coupler or RF repeater can be used as repeaters per radio type (2x RF Ready/Fast and 2x Slow) in order to increase the range of the RF installation.
Depending on the type of use, there are different installation locations:

- Area couplers are connected to the TP area line (backbone).

- Line couplers are connected to the TP main line of an area.

- Segment couplers are connected to the main segment line.

- Repeaters are connected to the TP line for the corresponding media coupler.
  Alternatively, a separate DC power supply can be used, see Power supply unit (not included in scope of supply), p. 9.

> If you use a separate DC power supply, install the repeater within radio range of the media coupler.

6.4   Connecting the device

Only qualified electricians may assemble and install the KNX RF Multi/TP media coupler or RF repeater. Specialist knowledge of the installation regulations is a prerequisite.

⚠	**Warning**
🧑‍🔧	**Danger from incorrect use** Incorrect use can result in damage to the device, fire or other dangers. • Only qualified electricians may install and mount electrical devices. • Follow the instructions in this product manual. • This product manual is part of the product and must remain with the customer.

⚡	**Warning**

Danger of electric shock

An electric shock can result from touching live parts in the installation environment.
Electric shock can cause death.
Pay attention to the installation regulations:

• Install bus line leads without sheathing (SELV) reliably disconnected from all non-safety low-voltage cables (SELV/PELV).

• Maintain the specified clearance.

• For more information, see also the VDE regulations governing SELV (DIN VDE 0100-410 / "Safe separation", KNX installation regulation).

ℹ	**Important**

Danger due to impermissible heating

Do not connect using the unchoked 30 V output of a KNX power supply!
This could cause the KNX RF Multi/TP media coupler or RF repeater to heat up to impermissible levels.

Work steps

1. Connect the KNX/TP bus line (referred to below as the bus line) to the KNX connection of the device by means of the supplied bus connection terminal. Polarity: left/red: "+", right/black "-".

   a. Attach the bus connection terminal.

   b. Route the bus line with the sheathing intact until it is close to the bus connection terminal.

   c. Firmly press the bus line into the bus connection terminal as far as possible.

2. Insert the device into the socket.

3. Stretch the antenna out as far as possible, or wind in a circle behind the device.

7 Commissioning and configuration

After installing the device and connecting the bus line, the device can be commissioned.

7.1 Reading device status using the LED

The KNX RF Multi/TP media coupler or RF repeater has a two-tone status LED on the front of the device.

Priority	Colour	Description
1	● (red)	Programming mode is active. Activated by pressing the programming button or in the ETS.
2	○.●.○.●.○.● (off).(red).(off).(red).(off).(red) Rapid flashing	The filter table has no function. Telegrams are forwarded unfiltered. (Only in media coupler mode)
3	●...● (red)...(yellow) Brief change	Display test after • Device restart • Voltage recovery • ETS programming process
4	○...●...○... (off)...(yellow)...(off)... Brief flashing	Telegram forwarding between TP and RF (Only in media coupler mode)

Table 4: Device status based on priority

7.2 Configuration

The device is configured in the ETS (Engineering Tool Software) regardless of operation mode. The ETS is available with various ranges of functions from the KNX Association (www.knx.org).

All descriptions in this documentation on configuration in the ETS refer to the ETS Professional version.

> Help on the ETS is available in the integrated ETS Online Help.
> Press the [F1] button in the ETS.

Requirement for the commissioning as a KNX RF Multi device

In the project details of the ETS under <<Compatibility>>, the parameter <<Use low bus communication rate>> must be disabled.

Work steps

1. Select the product database entry depending on the ETS version used. Please note that KNX RF Multi devices can only be used with the ETS6 product database entry.

2. Create the repeater as a device in the ETS.
   ► see Creating the device in the ETS, p. 18.

3. Select and configure a data interface,
   ► see Data interface configuration, p. 20.

4. Select the operation mode,
   ► see Selecting the operation mode, p. 21.

5. In the ETS, assign the device and its individual address according to the KNX topology,
   ► see Programming an individual address, p. 22.

6. Set the general parameters,
   ► see Parametrisation, p. 27.

7. The KNX RF Multi/TP media coupler or RF repeater is now ready for commissioning using << Program ETS>>.

7.2.1 Creating the device in the ETS

Depending on whether the product database entry already exists in the ETS catalogue or whether the device is already being used in your existing project, different work steps are required in order to use the current version.

Work steps	
Device already exists in the ETS catalogue?	
Yes	No
Update product database. During an update, the old product database entry is replaced by the new one.	Importing product database entry. There are numerous possibilities for importing a new product database entry. Below we will assume that you have downloaded the product database entry yourself. ► see Importing a new product database entry, p. 18.
Device in existing project should be updated?	
Yes	No
You must update the device properly so that the existing links to group addresses are maintained. ► see Updating a product in the existing project, p. 19.	Add the device to your topology in the usual way.

Table 5: Work steps – creating the device in the ETS

Importing a new product database entry

Requirement: You have downloaded the product database entry (product file) from our website at www.ise.de

1. Start the ETS and select the <<Catalogue>> tab in your ETS project.

2. Select the <<Import>> button in the toolbar.

3. In the <<Open product file>> window, open the product file and press on the <<Open>> button to confirm your selection.

4. Follow the further instructions in the ETS. If necessary, call up the Online Help with the [F1] button.

Updating a product in the existing project

Requirement: New product database entry exists in the catalogue.

1. In the ETS, open the project for which the device is to be updated.

2. Search for the new product database entry in the catalogue and add the new version of the device to the devices in your project.

3. Select the old version of the device in your topology.

4. Under <<Properties>>, select the <<Information>> ➜ <<Application program>> tab.

5. Select the <<Update>> button under the item <<Update application program version>>
    (see figure 6, Pos. 2)

    If you change the value under <<Change application program>> (see figure 6, Pos. 1), user-defined settings will be lost.

6. Select the newly added device and delete it again from your topology.
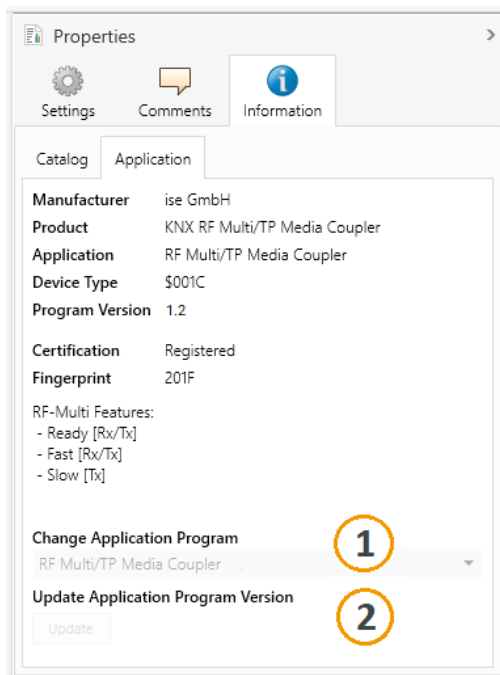
Figure 6: Updating the application program

7.2.2 Data interface configuration

The choice of data interface depends on the KNX medium.

Commissioning from TP

Connect your PC to the KNX installation using a USB or IP data interface.

Commissioning from RF (using example of a line coupler)

1.   Connect your PC to the KNX installation using a KNX RF USB data interface.

2.   Establish the topology of the KNX installation in the ETS project and assign a domain address for the RF line.

3.   Assign an individual address for the KNX RF USB data interface. This must match the RF line address and may not be assigned elsewhere.

4.   Assign the same domain address to the KNX RF USB data interface

> The RF line domain address and the KNX RF USB data interface must be the same!

Several RF domains in one KNX installation

If several RF lines are required, for example due to structural requirements, each RF line must be assigned its own domain address in the ETS topology. For cross-line communication, such as for commissioning, a separate media coupler is required for each RF line.
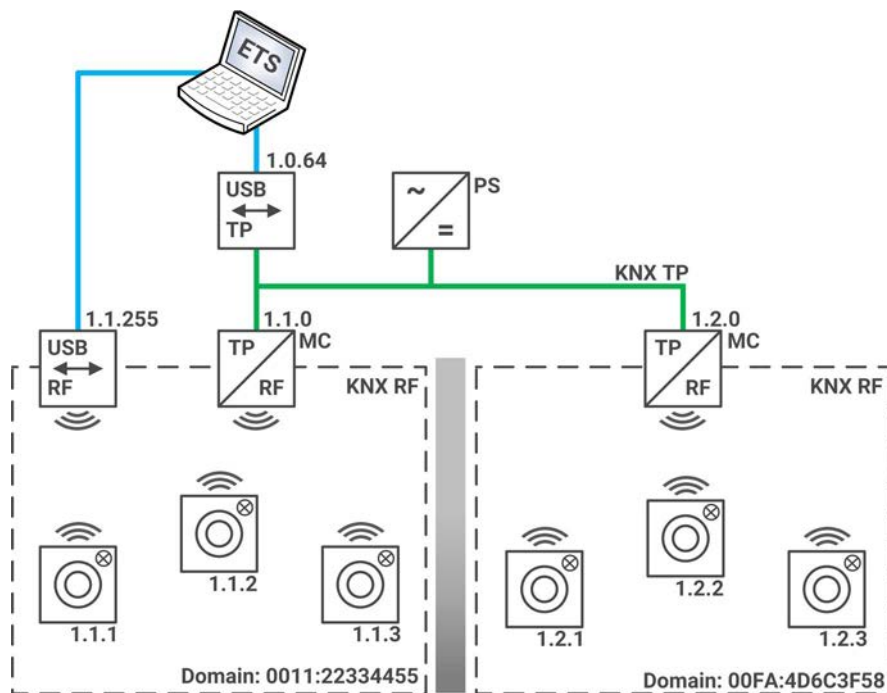
Figure 7: Coupling two RF lines via one TP line

7.2.3 Selecting the operation mode

ETS5 product database entry

Select the operation mode in the device parameters:
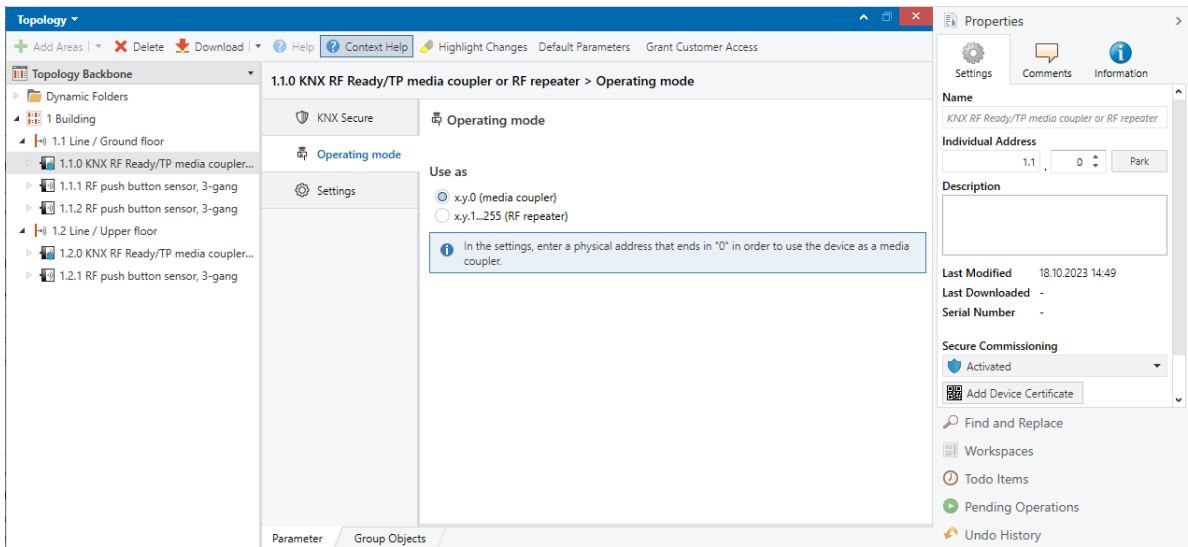
Figure 8: Select operation mode

ETS6 product database entry

Select the desired use in the catalogue:
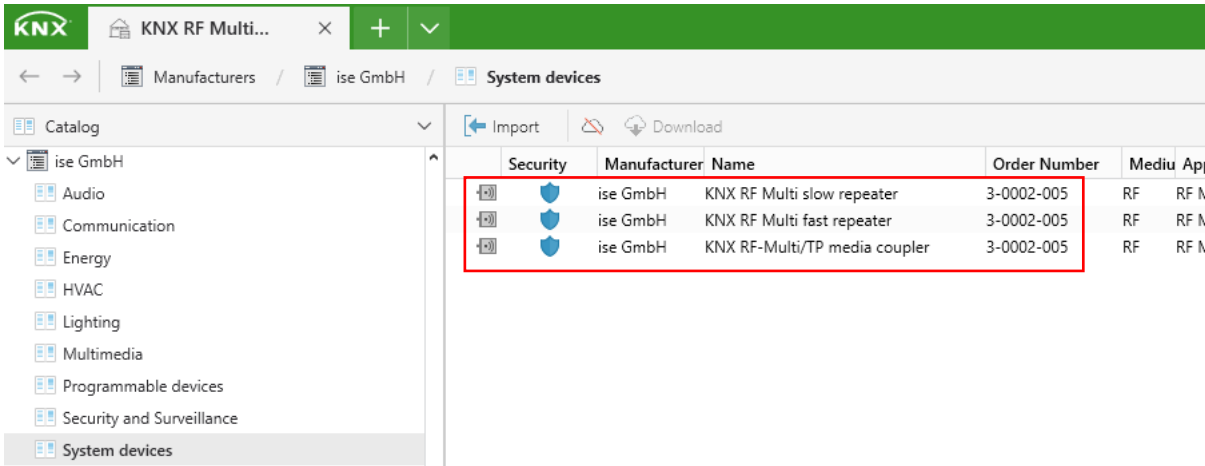
Figure 9: Select application

7.2.4 Programming an individual address

The individual address defines the position within the KNX topology and thus also the intended use of the device.

Use as a backbone coupler (up to ETS5)

Assign an individual address in the range x0.0 (x = backbone address, e.g. 1.0.0).

- The backbone must be of the media type TP.

- There can be a maximum of 255 participants per backbone or line in the ETS.
  You can divide the EF devices into max. 15 subordinate lines.

- Only one media coupler is permitted per RF backbone.

- The RF backbone and subordinate RF lines have the same domain address.
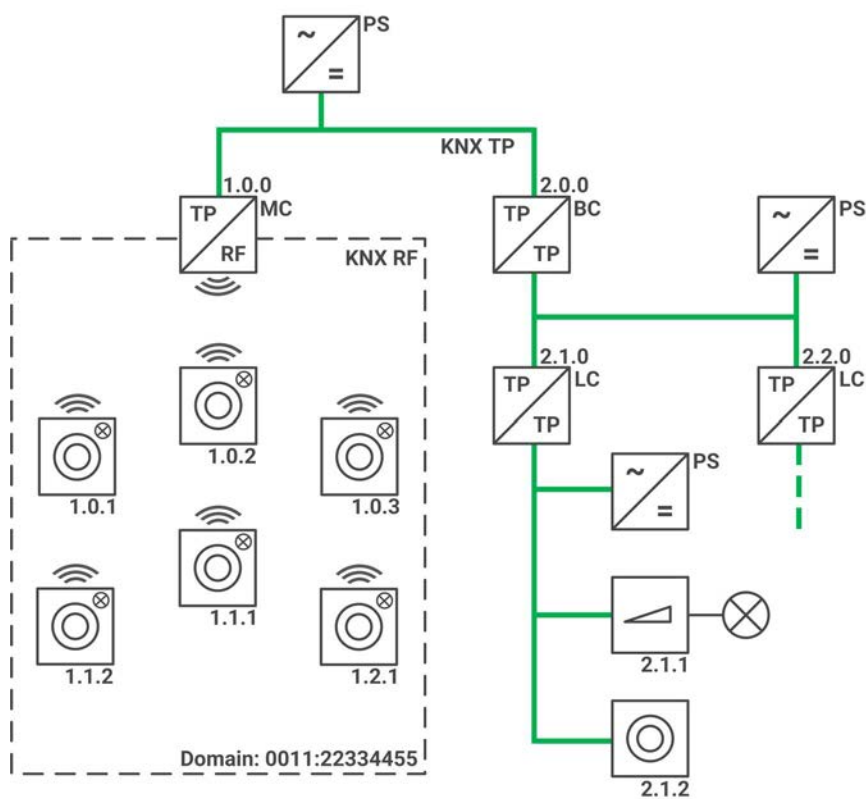
Figure 10: Use as a backbone coupler

Use as a line coupler

Assign an individual address in the range x.y.0 (x = backbone address, y = line address, e.g. 1.1.0).

- The KNX RF Multi/TP media coupler or RF repeater is connected to the TP main line of an area.

- A KNX RF line can contain up to 255 RF devices.
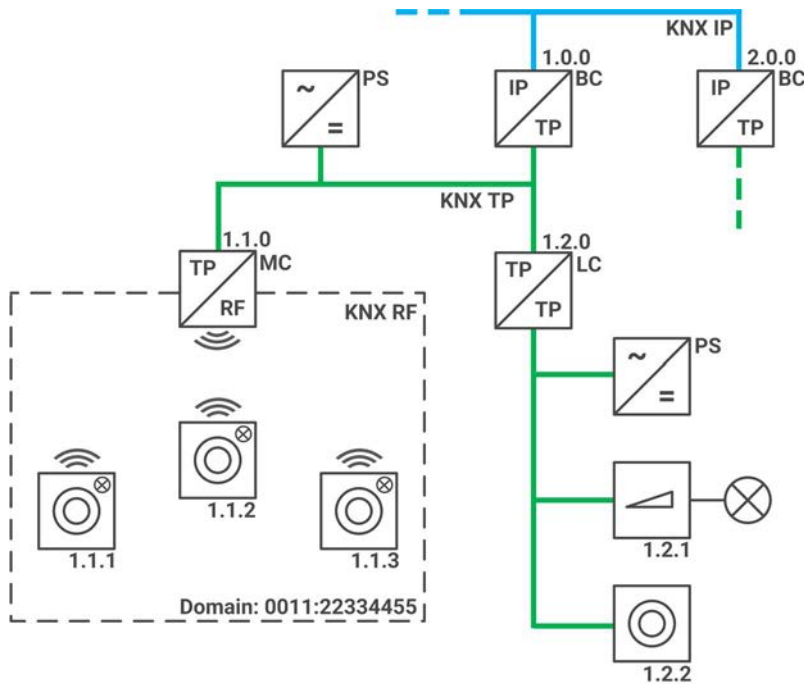
Figure 11: Use as a line coupler

Use as a segment coupler (only ETS6)

Assign an individual address in the range x.y.z (x = backbone address, y = line address, z = segment address, e.g. 1.3.1).

The KNX RF Multi/TP media coupler or RF repeater is connected to a TP line.
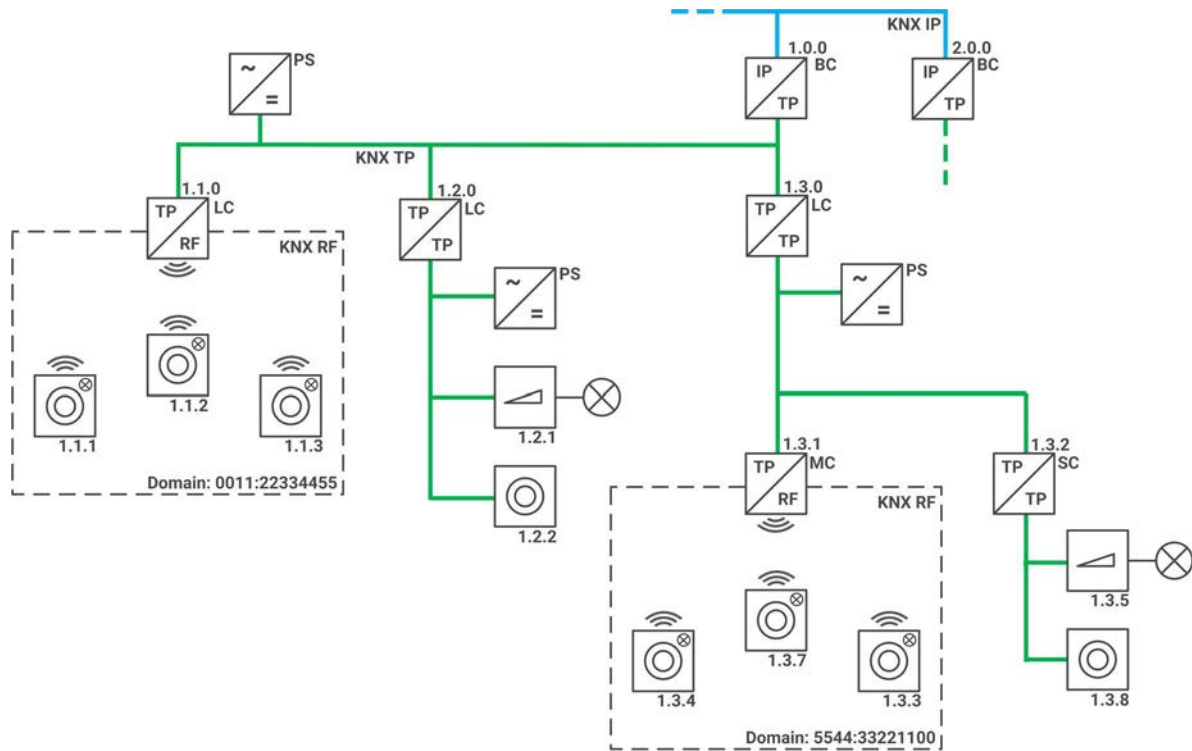
Figure 12: Use as a segment coupler

Use as an RF repeater

Requirement:
You already have a media coupler in operation and have programmed its individual address.

ETS5:
Assign an individual address in the range x.y.1…255 (x = backbone address, y = line address).
After download, the media coupler function is now fully switched off.

ETS6:
Select either the KNX RF Multi Fast Repeater or the KNX RF Multi Slow Repeater and assign an individual address in the range x.y.1…255 (x = area address, y = line address). The KNX RF Multi slow repeater is suitable for the connection with battery-operated devices.

> The RF repeater can no longer be reached from the TP after programming its individual address.
> Access to the device is possible through the previously programmed media coupler, a KNX RF USB data interface or after a factory reset. If you want to change an already programmed KNX RF Multi slow repeater to a fast repeater or a media coupler, also perform a factory reset first. As an alternative, use the ETS function <<Unload>> → <<Application>> before changing the physical address of the slow repeater or remove the slow repeater from the project.
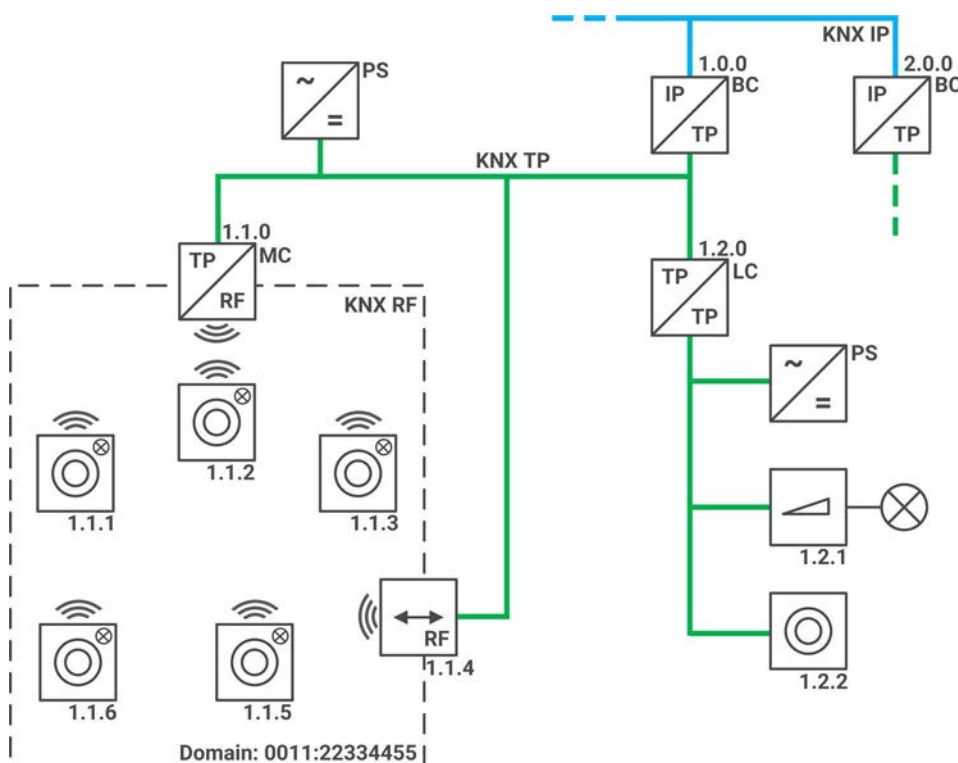
Figure 13: Use as an RF repeater with TP connection

Assigning an individual address

The individual address that you issued in the ETS must be assigned to the device.

Requirements: Device and bus voltage switched on. The status LED is off.

1. Briefly press the programming button (see figure 14, Pos. 1).
   The status LED (see figure 14, Pos. 2) lights up red.

2. In the ETS, assign the individual address to the device in accordance with the KNX topology and execute programming in the ETS. For this, use <<Download>> → <<Download all>>.

3. On the back of the device, enter the selected area, line or segment and the corresponding participant number with a permanent marker.
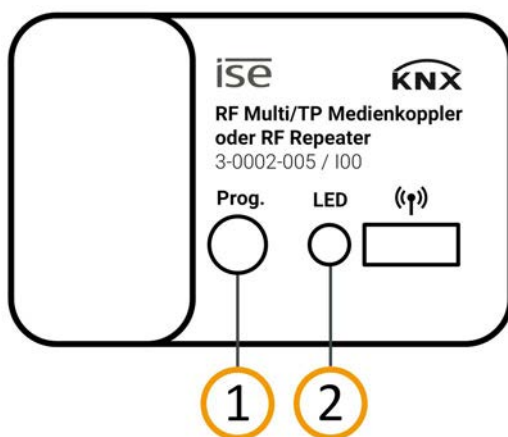
Figure 14: Programming

How to recognise successful assignment of the individual address:

- Device: The status LED on the device is off.

- ETS: The completed transfer is indicated on the <<History>> tab by a green marking. Programming flag <<Adr>> is set and <<Cfg>> is not set. More information about this and other flags is available from the ETS documentation.

7.3   Update firmware

You can obtain functional enhancements for the KNX RF Multi/TP media coupler or RF repeater with a new version of the firmware. The current firmware and corresponding product manual are available on our website at www.ise.de

So that you can use the new functions, it is necessary for the versions of the firmware being used and the product database entry are compatible.

8   Parametrisation

The scope of media coupler parametrisation depends on the product database entry used. No parametrisation is provided for repeater operation.

If you require an explanation of a parameter, use the context help in the ETS.

Calling up the context help in the ETS

1.   Enable the <<Context help>> button in the <<Parameter>> tab in the toolbar.

2.   Click on the desired parameter. The corresponding explanation appears in the lower area of the parameter dialogue.
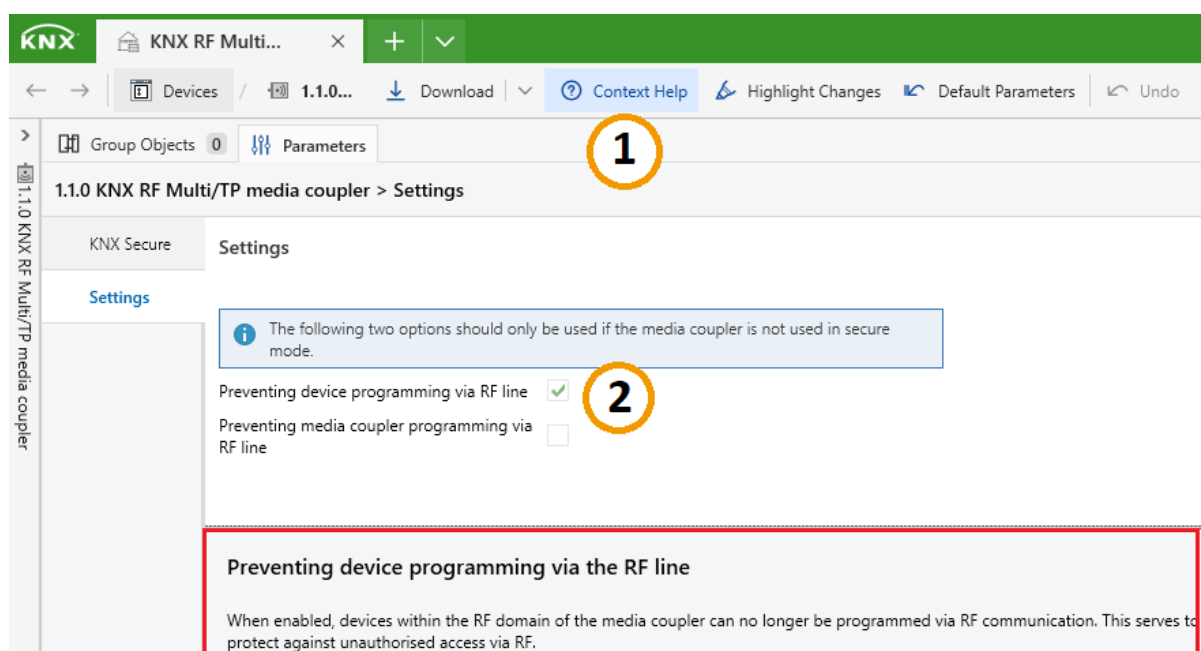
Figure 15: ETS context help

Filter settings (only ETS5)

Parametrisation determines which types of telegrams can pass through the media coupler in which direction. The ETS generates a filter table using this definition and the assignment of individual addresses. The media coupler filter table is automatically loaded onto the device through programming. In repeater mode, the filter table has no function.

> ℹ️ **Important**
>
> **Settings for telegram forwarding**
>
> Forwarding all telegrams should only be permitted in a KNX installation as part of system commissioning. In the normal operation of a KNX installation, it is recommended to enable the group telegram filter function in both directions of communication. This is done through the parameter settings "filter" (default setting) or "block all".

In the ETS6 product database entry, the filter setting is configured automatically using the linked group addresses.

The filter table can be subsequently edited in both ETS5 and ETS6.

9 Troubleshooting

9.1 Resetting to factory settings

When you reset the device to the factory settings, it behaves as it does in the state of delivery. The device is then unconfigured:

- The device remains in the existing projects.

- The device keeps the version of the application program in the ETS.

- The entire parametrisation is rejected.

- The individual KNX address of the device returns to: 15.15.0.

- The domain address is reset to FFFF:FFFFFFFF.

⚡	**Warning**

Danger of electric shock
An electric shock can result from touching live parts in the installation environment. Electric shock can cause death.
Pay attention to the installation regulations:

- Route the bus line with the sheathing intact until it is close to the bus connection terminal.

- Firmly press the bus line into the bus connection terminal as far as possible.

- Install bus line leads without sheathing (SELV) reliably disconnected from all non-safety low-voltage cables (SELV/PELV).

- Maintain the specified clearance.

See also the VDE regulations governing SELV (DIN VDE 0100-410 / "Safe separation", KNX installation regulation) for more information.

Manually resetting the device to the factory settings

Requirement: the device must be switch off without voltage.

1. Press and hold the programming button while you attach the bus connection terminal.
2. Hold the programming button down until the status LED briefly flashes red and then turns yellow. The status LED will then flash red slowly.
3. Release the programming button briefly.
4. Press the programming button again for at least 5 seconds (max. 20 seconds).
5. Release the programming button.
6. The status LED will flash quickly 5 times.

The device is reset to the factory settings. You do not have to restart the device.

9.2   Contacting Support

If you have a problem with your KNX RF Multi/TP media coupler or RF repeater and require support, contact us:

- E-mail to support@ise.de

- Call us on tel.: +49 441 680 06-12

- Fax us: +49 441 680 06-15

We will need the following data in order to help you:

- To identify the device: Product name or order number
- Version of the firmware
- ETS version
- Clear error description

10   Disassembly and Disposal

If you want to disassemble the device due to a defect, for example, proceed in reverse order to installation.

Disassembling the device

⚠️	**Warning**

Danger from incorrect use

Incorrect use can result in damage to the device, fire or other dangers.

- Only qualified electricians may install and disassemble electrical devices.
- Follow the instructions in this product manual.

⚡	**Warning**

Danger of electric shock

An electric shock can result from touching live parts in the installation environment. Electric shock can cause death.

- Enable the device.
- Cover up live parts in the vicinity.

1. Disconnect the device from the socket.

2. Remove the bus connection terminal from the device.

Disposal

Make an active contribution to protecting the environment by disposing of all materials in an environmentally-responsible way.

Packaging and box
Dispose of the packaging material appropriately, in a card, paper or plastic recycling bins.

Device
Old devices must not be disposed of with domestic refuse! You can dispose of your old device free of charge at designated collection facilities or, if necessary, you can hand it in to your specialist dealer. Contact your local authority for recycling details.

11   Glossary

Backbone coupler

The area coupler filters telegrams between a main line and an backbone line. The function is only available for RF up to ETS5.

Broadcast telegram

Broadcast telegrams are transmitted to all participants in the network.

ETS (Engineering Tool Software)

The device is configured in the ETS software. The ETS is available with various ranges of functions from the KNX Association (www.knx.org).

Fast

The "Fast" channel defines rapid data transmission within the KNX RF Multi standard.

FDSK (Factory Default Setup Key)

The FDSK is used for secure communication between category "KNX IP Secure Device" devices. The combination of FDSK and serial number enables each device to be unambiguously identified. Together, they form the device certificate.

Depending on the use case, the FDSK is required for initial authentication in the ETS or for the encryption of communication.

The FDSK is printed on a sticker on the side of the device. A second sticker is enclosed with the product.

Firmware update tool

Software which is embedded on the device hardware and enables operation of the device. Function enhancements for the device are available via a new firmware version.

Filter table

Media couplers have a filter table that is automatically generated in the ETS based on the corresponding parametrisation. In the filter table, individual addresses are created that are allowed to pass through the media coupler when two lines, areas or segments are coupled.

Group telegram

Group telegrams (also called multicast telegrams) are transmitted within the network to several participants of a certain group.

Main segment

Every line has a main segment. This main segment can be subdivided into several sub-segments by segment couplers.

Catalogue

Short for "Online KNX Product Catalogue". The catalogue is a product database. The catalogue contains all KNX-certified devices. The device data is saved as a product database entry.

KNX RF Multi

KNX radio standard that can switch between four frequencies to prevent interference.

KNX RF Ready

KNX radio standard that uses the medium frequency 868.3 MHz.

KNX Security Proxy

The KNX Security Proxy is a communication interface between secure and insecure elements within the KNX installation (from ETS6).

Line coupler

The line coupler filters telegrams between a line and a main line.

Long frames

Devices that can support long frames can send and receive telegrams with APDU length (>15 bytes).

Power supply unit

Stand-alone device for converting the existing mains voltage into the required input voltage of another device.

Physically addressed telegram

A physically addressed telegram (also known as a unicast telegram) is sent to a specific recipient within a network.

Product database entry (also catalogue entry)

Data relating to a device in the "Online KNX Product Catalogue" of the ETS. The product database entry contains all data to allow the device to be configured in the ETS. The product database entry is provided in the form of a file by the device manufacturer. The latest version of product database entries from ise Individuelle Software und Elektronik GmbH can be downloaded free of charge from our website www.ise.de.

The product database entry is often also called the "catalogue entry".

Ready to Slow Proxy

The Ready to Slow Proxy or KNX RF1.R/Multi Proxy enables the use of KNX RF Ready and KNX RF Multi devices in one installation (from ETS6).

Repeater (retransmitter)

The repeater function of the RF repeater amplifies radio waves and thus optimises the range of RF devices within the KNX installation.

RF

Abbreviation for radio frequency.
It covers all frequencies in the high frequency range.

Segment

A segment serves (from ETS6) as a topology level below a line. Every line has at least one main segment. This main segment can be subdivided into several sub-segments by segment couplers.

Segment coupler

The segment coupler filters telegrams between a line segment and a line.

Slow

The "Slow" channel defines slow data transmission within the KNX RF Multi standard.

Sub-segment

Sub-segments are ordered below the main segments on the topology level and are separated from them through segment couplers.

Updates

You will find information on new versions of the firmware in this documentation under the search term "Update".

12 Licence Agreement KNX RF Multi/TP media coupler or RF repeater

The following outlines the contract terms for your use of the software as the "licensee".

On accepting this agreement and installing the KNX RF Multi/TP media coupler or RF repeater software or putting the KNX RF Multi/TP media coupler or RF repeater into use, you conclude an agreement with ise Individuelle Software und Elektronik GmbH and agree to abide by the terms in this agreement.

12.1 Definitions

Licensor: ise Individuelle Software und Elektronik GmbH, Oldenburg (Oldb), Osterstraße 15, Germany

Licensee: The legal recipient of the KNX RF Multi/TP media coupler or RF repeater software.

Firmware: Software which is embedded into the KNX RF Multi/TP media coupler or RF repeater hardware and is used to operate the KNX RF Multi/TP media coupler or RF repeater.

KNX RF Multi/TP media coupler or RF repeater: The KNX RF Multi/TP media coupler or RF repeater software designates all of the software provided for the KNX RF Multi/TP media coupler or RF repeater product, including the operating data. This includes, in particular, the firmware and the product database.

12.2 Object of the agreement

The object of this agreement is the KNX RF Multi/TP media coupler or RF repeater software provided on data storage devices or through downloads and the associated documentation in written or electronic format.

12.3 Software usage rights

The licensor grants the licensee the non-exclusive, non-transferable right to use the KNX RF Multi/TP media coupler or RF repeater software for an unlimited time in accordance with the following conditions for the purposes and applications specified in the valid version of the documentation (which shall be provided in printed format or also as online help or online documentation).

The licensee is obliged to ensure that each person who uses the program only does so as part of this license agreement and observes this license agreement.

12.4 Restriction of rights of use

12.4.1 Copying, modification and transmission

The licensee is not authorised to use, copy, modify or transfer the KNX RF Multi/TP media coupler or RF repeater software in whole or in part in any way other than as described herein. Excluded from this is one (1) copy produced by the licensee exclusively for archiving and backup purposes.

12.4.2 Reverse engineering and conversion technologies

The licensee is not authorised to apply reverse-engineering techniques to the KNX RF Multi/TP media coupler or RF repeater software or to convert the KNX RF Multi/TP media coupler or RF repeater software into another type. Such techniques include, in particular, disassembly (conversion of the binary-coded computer instructions of an executable program into an assembler language which can be read by humans) or decompilation (conversion of binary-coded computer instructions or assembler instructions into source code in the form of high-level language instructions).

12.4.3 Firmware and hardware

The firmware may only be installed and used on the hardware (KNX RF Multi/TP media coupler or RF repeater) approved by the licensor.

12.4.4 Transfer to a third party

The KNX RF Multi/TP media coupler or RF repeater software must not be transferred or made accessible to third parties.

12.4.5 Renting out, leasing out and sub-licensing

The licensee is not authorised to rent or lease the KNX RF Multi/TP media coupler or RF repeater software or grant sub-licenses to the program.

12.4.6 Software creation

The licensee requires written approval from the licensor to create and distribute software which is derived from the KNX RF Multi/TP media coupler or RF repeater software.

12.4.7 The mechanisms of license management and copy protection

The mechanisms of the license management and copy protection of the KNX RF Multi/TP media coupler or RF repeater software must not be analysed, published, circumvented or disabled.

12.5   Property and confidentiality

12.5.1 Documentation

The KNX RF Multi/TP media coupler or RF repeater software and its documentation (which shall be provided in printed format or also as online help or online documentation) are business secrets of the licensor and/or the object of copyright and/or other rights and shall continue to belong to the licensor. The licensee shall observe these rights.

12.5.2 Transfer to a third party

Neither the software, the data backup copy nor the documentation (which shall be provided in printed format or also as online help or online documentation) may be passed on to third parties at any point in time, in whole or in part, for a fee or free of charge.

12.6   Modifications and subsequent deliveries

The KNX RF Multi/TP media coupler or RF repeater software and the documentation (which shall be provided in printed format or additionally as online help or online documentation) shall be subject to possible changes by the licensor. You will find the latest software and documentation versions at www.ise.de.

12.7   Warranty

The KNX RF Multi/TP media coupler or RF repeater software works together with software from third parties. No warranty is provided for software from third parties. For more information ► see Open Source Software, p. 40.

12.7.1 Software and documentation

The KNX RF Multi/TP media coupler or RF repeater software and the documentation (which shall be provided in printed form or additionally as online help or online documentation) shall be provided to the licensee in the respective valid version. The warranty period for the KNX RF Multi/TP media coupler or RF repeater software is 24 months. The licensor shall provide the following warranty during this time:

- The software shall be free of material and manufacturing defects when handed over to the customer.

- The software shall function as described in the documentation enclosed with it in its respective valid version.

- The software shall be executable on the computer stations specified by the licensor.

The warranty shall be fulfilled with the supply of spare parts.

12.7.2 Limitation of warranty

No warranty is given for the freedom from errors of the KNX RF Multi/TP media coupler or RF repeater software and its data structures. Similarly, the warranty does not cover defects due to improper use or other causes beyond the control of the licensor. Any additional warranty claims shall be excluded.

12.8   Liability

The licensor is not liable for damages due to loss of profit, data loss or any other financial loss resulting from the use of the KNX RF Multi/TP media coupler or RF repeater software, even if the licensor is aware of the possibility of such damage.

This limitation of liability is valid for all the licensee's damage claims, regardless of the legal basis. In any case, liability is limited to the purchase price of the product.

The exclusion of liability does not apply to damage caused due to wilful intent or gross negligence on the part of the licensor. Furthermore, claims based on the statutory regulations for product liability shall remain intact.

12.9   Applicable law

This agreement is subject to the laws of the Federal Republic of Germany.
The place of jurisdiction is Oldenburg (Oldb).

12.10 Termination

This agreement and the rights granted herein shall end if the licensee fails to fulfil one or more provisions of this agreement or terminates this agreement in writing. The supplied KNX RF Multi/TP media coupler or RF repeater software and its documentation (which is provided in printed format or also as online help or online documentation), including all copies, shall be returned immediately in such a case without the licensor specifically requesting their return. No claim to reimbursement of the price paid shall be accepted in such a case.

The license to use the KNX RF Multi/TP media coupler or RF repeater software shall expire upon termination of the agreement. In this case, the KNX RF Multi/TP media coupler or RF repeater product must be taken out of operation. Further use of the KNX RF Multi/TP media coupler or RF repeater without a licence is forbidden.

The commissioning and visualisation software must be uninstalled and all copies must be destroyed or returned to the licensor.

12.11 Subsidiary agreements and changes to the agreement

Subsidiary agreements and changes to the agreement shall only be valid in writing.

12.12 Exception

All rights not expressly mentioned in this agreement are reserved.

13   Open Source Software

This product uses software from third-party sources which are published within the framework of various Open Source licences.

The source code for the Open Source software used in this product can be obtained by sending an e-mail to support@ise.de.

This offer is valid for 3 years after the service for this product has been discontinued.
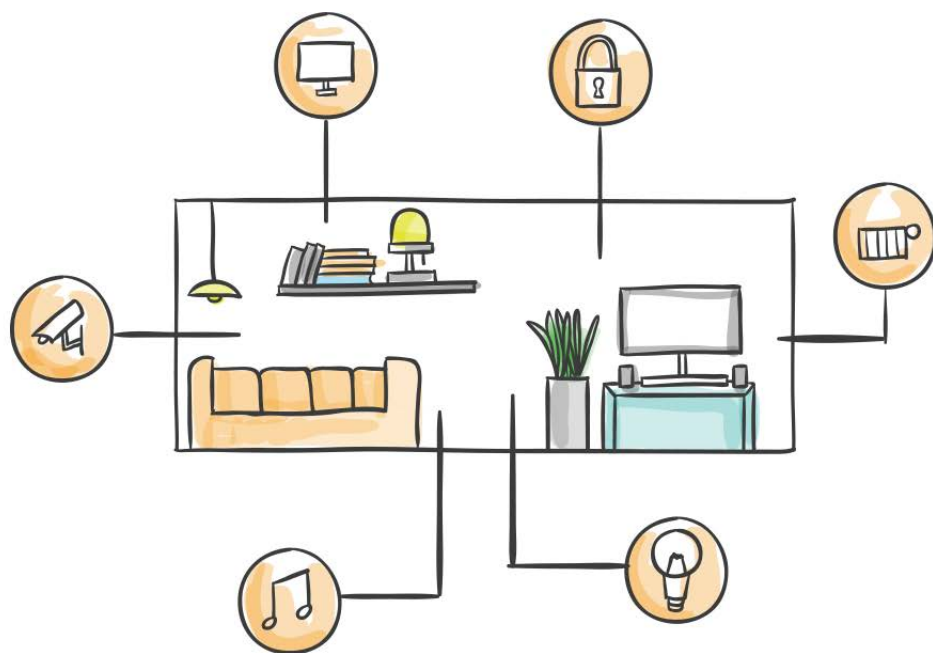
ise Individuelle Software und Elektronik GmbH
Osterstraße 15
26122 Oldenburg, Germany

Phone: +49 441 680 06-11
Fax: +49 441 680 06-15
E-mail: sales@ise.de