JULY 2020

Webinar “KNX Radio Frequency (KNX RF)”

Webinar– Competence Center Europe – Smart Buildings
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Webinar – Competence Center Europe - Smart Buildings

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From home office to home office
Agenda

Introduction
Advantages and applications
Transmission technology
Product overview
Topology
Commissioning
Further information (documentation, videos, brochures, ...)

July 30, 2020
Webinar “KNX RF”

Introduction
Areas of application for the various media

- The exchange of KNX data between devices is typically done via a separate control cable (TP)
- KNX data can also be sent via
  - Ethernet/WIFI “KNX IP”
  - Wireless “KNX Radio Frequency transmission medium”
  - The existing 230 V cable “Powerline transmission medium”
- When connecting different media, media couplers have to be used (e.g. IP Router IPR/S 3.1.1)
- Via appropriate gateways, transmission of KNX telegrams is also possible on other media, e.g. optical fibre
  - Optical Fibre Interface LL/S 1.1
- KNX RF is mandatory for KNX training centres (Certified Basic Course)

<table>
<thead>
<tr>
<th>Medium</th>
<th>Transmission via</th>
<th>Preferred areas of application</th>
</tr>
</thead>
</table>
| Twisted Pair    | Separate control cable            | - New installations
                  |                                                                  | - Extensive renovations
                  |                                                                  | - Highest level of
                  |                                                                  | transmission reliability
| IP              | Ethernet/WIFI                     | - In large installations where a fast backbone is needed
                  |                                                                  | - For communication
                  |                                                                  | with mobile devices
| Radio Frequency | Radio line                        | - When no cables can be installed                                   |
| Powerline       | Existing network (Neutral and phase must be available) | - If no additional control cable can be installed
                  |                                                                  | - When 230 V cable is available                                    |
Overview of the media “RF”, “TP” and “IP” in a KNX project
Types of configuration

KNX can be configured (i.e. linked, setting of parameters) via S-Mode and E-Mode

KNX RF supports S-Mode and E-Mode

- **System installation Mode “S-Mode”** – all media
  - Design of the installation and configuration is done via a PC with the installed manufacturer-independent ETS software
  - This type of configuration is intended for KNX certified building designers and contractors and for installations of all sizes

- **Easy installation Mode “E-Mode”**
  - Configuration is done without the help of a PC but with a central controller, push buttons…
  - This type of configuration is intended for the skilled contractor with basic bus knowledge
  - Easy compatible products normally have limited functionality
RF as transmission medium

- KNX RF allows the wireless transmission of telegrams by means of the medium radio frequency
- KNX-RF uses the frequency band 868 MHz
- A separate bus cable is therefore not necessary
- The range of KNX RF components is indicated as free-field range
- The free-field range is significantly higher than the achievable distance within a building
- Due to the maximum allowed transmission power and the limitation of available energy for the transmission in case of battery-operated or battery-free (e.g. operated by solar energy) devices the free-field range is limited to about 100 m
RF as transmission medium

- Radio frequency signals are attenuated on their way from the transmitter to the receiver by many factors
- The real operating range within buildings is therefore reduced. The radio signals do not pass through walls, ceilings and furniture without hindrance but are attenuated during penetration and also partially reflected.
- Metallic objects shield or reflect the radio signals and radio shadows are produced on their reverse side, in which direct reception is not possible.

Radio shadows by metal walls, doors or cabinets.
RF as transmission medium

The radio transmission medium range cannot be determined precisely in spatial terms i.e. KNX RF telegrams can also be received by devices installed in adjacent KNX RF installations. KNX RF S-Mode devices send their domain address as device identifier. Only the receivers taught in to or linked to this transmitter or form part of the same domain, will evaluate its telegrams.

In addition to the necessary separation from adjacent KNX radio installations, the range of the radio signals in buildings is also limited by structural conditions such as walls and ceilings.

The range can however be extended with up to 2 repeaters, so that radio signals can also be transferred over several floors.
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Introduction

RF as transmission medium

KNX RF in general natively supports long frame telegrams

This is necessary to be able to support the KNX Secure Application Layer (used for security applications), which can also be used by other KNX media

This allows authentication and encryption

Long frame telegrams (APDU > 15) are required to download Secure devices (e.g. IP Router Secure IPR/S 3.5.1)

In this way the media coupler does not constitute the weak point in the security concept
Webinar “KNX RF”
Advantages and applications
Webinar “KNX RF”
Advantages and applications

**Advantages**

- Based on KNX and supported by KNX organization
- RF as official transmission media in the KNX world
- Products from various manufacturers
- Supports the trend of wireless communication
- In case of extension of wired KNX installation consistent solution
- Programming with the same software tool ETS
- Allows to add missing or forgotten devices without cabling
- Integration of different and also self powered push buttons, even with ABB Busch-Jaeger design
- No complex programmable gateway needed
- Easy handling

→ a further option to enhance or optimize a project under the headline KNX, completes the system KNX
Webinar “KNX RF”
Advantages and applications

It is KNX \( \rightarrow \) The same rules apply as for TP and IP

- Different products from different manufacturers communicate with each other
- Commissioning with ETS5 - no additional software required
  - Add RF product from catalogue, set parameters, link group addresses, download individual address (press programming button) and application
- Media Coupler MC is a “real coupler” between TP and RF line (filter table entries,…) and no gateway
- An RF device has an individual address, parameters, group objects, …
### Installation solutions
- Push button on glass or metal wall
- Outdoor installation e.g. garden house
- Walls which cannot be processed, e.g. in listed buildings

### Component solutions
- Mobile push buttons, wireless remote control, e.g. for disabled people
- Socket adapter to integrate mobile lamps with simple installation
- Connection of decentral push buttons or contacts, e.g. motion sensor

### Functional solutions
- Lighting control (switching/dimming) in a church, garage or any building both with wireless sensor and actuator
- Control of shutter, blinds or windows with wireless shutter actuator
- Decentralized valve control
Webinar “KNX RF”
Transmission technology
**Webinar “KNX RF”**

Transmission technology

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**Structure of the bus devices**

KNX RF components are available in flush-mounted, surface-mounted and built-in versions.

The flush-mounted devices largely consist of equipment for switching or dimming lights, for controlling shutter drives or mains equipment on which push buttons for operation are clipped on.

As surface-mounted or built-in versions, various sensors, actuators or combined devices are available, which can be mounted, glued or built into various locations and surfaces.

The classic separation between bus coupling unit, application module and loadable application software in most cases does no longer exist.

They are complete devices, in which the application software is loaded by the ETS.

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Principle structure of a KNX RF
Structure of the bus devices

Unidirectional devices
- Can either only send or only receive
- Send a telegram immediately if required
- Due to the duty cycle of 1% it is nearly excluded, that collisions occur
- Only sending devices are mainly battery-operated sensors or detectors such as hand-held or wall-mounted transmitters, binary inputs and door/window contacts

Bidirectional devices
- Can both send and receive i.e. they can be sensors and actuators at the same time
- Check whether the radio channel is free before sending a telegram
- If the channel is occupied, the device waits until the radio channel is free and then sends the telegram
Telegram structure and addressing

A KNX RF telegram consists of several data blocks separated by checksum bytes.

The data blocks contain the actual useful information (e.g. a switching or dimming command) and bus-specific information used for addressing.

The blocks at the start and end of the radio telegram are used to synchronize the receivers to the transmitter.
Telegram structure and addressing

The first data block consists of the

- Control field (4 bytes)
  - It contains information about the telegram length, type of device (uni- or bi-directional) the transmission quality (signal strength) as well as the battery status of battery-operated radio components

- Domain address to which the device is assigned (6 bytes)
  - The domain address is included in each telegram and stored in the receiver (done during commissioning with the ETS)
  - It is also used for separating from the devices in adjacent KNX radio installations

- Cyclic redundancy check (CRC 2 bytes)
  - The receiver detects via the cyclic redundancy check (CRC) whether a telegram has been transferred without any errors
Telegram structure and addressing

The second data block consists of the

- Individual source address
  - It is only required when programming the devices via ETS
- Target address
  - During normal operation (e.g. when transmitting a switching command), the target address contains the group address
  - In the case of physical addressing i.e. during download, the target address is the individual address of the device
- Data (useful information)
  - It contains the data to be transferred such as commands, messages, parameters, measured values etc.

Further data blocks can be transmitted in a KNX RF telegram depending on the length of the useful information
Webinar “KNX RF”
Product overview
Webinar “KNX RF”

Product overview

Products (extract)

- System devices
  - Media Coupler (RF - TP)
  - Signal repeater
- Interfaces
  - USB RF Interface
- Sensors (battery, supply voltage or energy harvesting)
  - Push button
  - Binary inputs
  - Remote control
  - Temperature, brightness, ...
- Actuators
  - Switching, dimming, shutter control
- ... and more
Webinar “KNX RF”
Product overview

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Webinar “KNX RF”

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- Actuators
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  - ... and more

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KNX RF push button module + Mounting set for RF push button modules + Frame ABB Balance SI

- Thanks to the standardized 55mm dimension, the mounting set for RF buttons can be used to install an energy harvesting push button module (EnOcean, Zigbee, KNX RF) in the most common switch ranges
- It is compatible with the switch range ABB Balance SI
Webinar “KNX RF”

Product overview

Products (extract)

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Webinar “KNX RF”

Product overview

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  • Temperature, brightness, …
– Actuators
  • Switching, dimming, shutter control
– … and more (KNX Association, www, …)
Webinar “KNX RF”
Topology
Webinar “KNX RF”

Topology

**General**

A KNX system can consist of RF devices as well as a combination of RF with other media (e.g. KNX RF, KNX TP and KNX IP)

Each RF device has an individual address, parameters and group object

Each RF line has its own domain address

An RF Media Coupler can be used as an area or line coupler

Line repeater function is not yet supported

There is no limit to 64 bus devices in a RF line

A maximum of 256 RF devices can be installed in a RF line, including a RF Media Coupler

There can only be one RF Media Coupler in a KNX RF line
Webinar “KNX RF”

Topology

Pure radio network – only KNX RF

The KNX system consists only of RF devices
An RF line has its own domain address
Only RF devices with the same domain address can interact with each other within an RF network
Each RF device has an individual address, parameters, group object and domain address
A maximum of 255 RF devices can be installed in a RF line
Webinar “KNX RF”

Topology

Pure radio network – only KNX RF

The KNX system consists only of RF devices
An RF line has its own domain address
Only RF devices with the same domain address can interact with each other within an RF network
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Pure radio network – only KNX RF

The KNX system consists only of RF devices
An RF line has its own domain address
Only RF devices with the same domain address can interact with each other within an RF network
Each RF device has an individual address, parameters, group object and domain address
A maximum of 255 RF devices can be installed in a RF line
Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface
Webinar “KNX RF”

Topology

Mixed network with the media RF and TP

The KNX system consists as a combination of RF with TP

An RF Media Coupler can be used as an area or line coupler

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface
**Webinar “KNX RF”**

**Topology**

**Mixed network with the media RF and TP**

The KNX system consists as a combination of RF with TP

An RF Media Coupler can be used as an area or line coupler

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface

Example:
- Area 1 and main line 1.0 → TP
- Line 1.1.x and line 1.2.x → TP
- Line 1.3.x → RF
Mixed network with the media RF and TP

The KNX system consists as a combination of RF with TP. An RF Media Coupler can be used as an area or line coupler. Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line. Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface.

Example:
- Area 1 and main line 1.0 → TP
- Line 1.1.x and line 1.2.x → TP
- Line 1.3.x → RF

Domain addr.: 00FA:961A1B76
Mixed network with the media RF and TP

The KNX system consists as a combination of RF with TP

An RF Media Coupler can be used as an area or line coupler

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**Example:**
- Area 1 and main line 1.0 → TP
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Webinar “KNX RF”

Mixed network with the media RF and TP

The KNX system consists as a combination of RF with TP
An RF Media Coupler can be used as an area or line coupler
Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line
Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface
Example:
- Area 1 and main line 1.0 → TP
- Line 1.1.x and line 1.2.x → TP
- Line 1.3.x → RF – only for commissioning!

Topology

Mixed network with the media RF and TP
Mixed network with the media RF and TP

The KNX system consists as a combination of RF with TP

An RF Media Coupler can be used as an area or line coupler

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface
**Webinar “KNX RF”**

**Topology**

**Mixed network with the media RF and TP**

The KNX system consists as a combination of RF with TP

An RF Media Coupler can be used as an area or line coupler

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface

Example:
- Area 1 and main line 1.0 → TP
- Line 1.1.x → TP
- Line 1.2.x and line 1.3.x → RF
Webinar “KNX RF”

Topology

Mixed network with the media RF, TP and IP

The KNX system consists as a combination of RF with TP and IP.

An RF Media Coupler can be used as an area or line coupler.

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line.

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface.
**Webinar “KNX RF”**

Topography

**Mixed network with the media RF, TP and IP**

The KNX system consists as a combination of RF with TP and IP

An RF Media Coupler can be used as an area or line coupler

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface

**Example:**
- Area 1 → IP
- Line 1.1.x, line 1.2.x, main line 2.0 and Line 2.1.x → TP
- Line 2.2.x → RF
Mixed network with the media RF, TP and IP

The KNX system consists as a combination of RF with TP and IP

An RF Media Coupler can be used as an area or line coupler

Note: The Media Coupler has a coupler functionality and must be connected to a main or backbone line

Commissioning, diagnostic, etc. takes place with the ETS and USB RF Interface, USB TP Interface or IP Interface

Example:
- Area 1 → IP
- Line 1.1.x, line 1.2.x, main line 2.0 and Line 2.1.x → TP
- Line 2.2.x → RF
Webinar “KNX RF”

Topology

Extension of only one KNX line in an existing building (e.g. family home) with KNX RF

Existing KNX TP line 1.1.x

- PS
- DEV 1.1.59
- DEV 1.1.8
- DEV 1.1.44
Line 1.1.x

Extension with KNX RF 1.2.x

- MC 1.2.0
- DEV 1.2.6
- DEV 1.2.45
- DEV 1.2.29
Line 1.2.x

Domain addr.: 00FA:961A1B76
Webinar “KNX RF”

Topology

Extension of only one KNX line in an existing building (e.g. family home) with KNX RF

Existing KNX TP line 1.1.x

<table>
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<tr>
<th>Device</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
<td>1.1.x</td>
</tr>
<tr>
<td>DEV</td>
<td>1.1.59</td>
</tr>
<tr>
<td>DEV</td>
<td>1.1.44</td>
</tr>
<tr>
<td>DEV</td>
<td>1.1.37</td>
</tr>
</tbody>
</table>

Line 1.1.x

Extension with KNX RF 1.2.x

<table>
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<th>Device</th>
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<tbody>
<tr>
<td>MC</td>
<td>1.2.0</td>
</tr>
<tr>
<td>DEV</td>
<td>1.2.6</td>
</tr>
<tr>
<td>DEV</td>
<td>1.2.45</td>
</tr>
<tr>
<td>DEV</td>
<td>1.2.29</td>
</tr>
</tbody>
</table>

Line 1.2.x

Change all individual addresses from line 1.1.x to main line 1.0.x.

→ The KNX line 1.1x does not longer exist

New KNX TP line 1.0.x and KNX RF 1.2.x

<table>
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</thead>
<tbody>
<tr>
<td>PS</td>
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</tr>
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<td>DEV</td>
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</tr>
<tr>
<td>DEV</td>
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</tr>
<tr>
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<td>1.0.44</td>
</tr>
</tbody>
</table>

Domain addr.: 00FA:961A1B76

Main line

<table>
<thead>
<tr>
<th>Device</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC</td>
<td>1.2.0</td>
</tr>
<tr>
<td>DEV</td>
<td>1.2.6</td>
</tr>
<tr>
<td>DEV</td>
<td>1.2.45</td>
</tr>
<tr>
<td>DEV</td>
<td>1.2.29</td>
</tr>
</tbody>
</table>

Domain addr.: 00FA:961A1B76

Line 1.2.x
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Topology

Overwrite an existing individual address

- Move device from line 1.1.x into main line 1.0.x
- The individual address changes to 1.0.8
  - Go to the device, press programming button as usual and download new ind. address 1.0.8
  - Click on “Download” → “Overwrite individual address” and enter existing ind. address 1.1.8
  - Start diagnostics:
    Enter ind. address 1.1.8
    Click on “Device LED ON” → device goes into the programming mode
    Download new ind. address 1.0.8
Webinar “KNX RF”
Commissioning
### General

The commissioning procedure for RF devices is largely identical to that of TP mode devices.

According to the topology defined in the ETS project, devices that are assigned to RF lines get not only the individual addresses also always a domain address.

The ETS allocates each RF line a unique domain address.

The purpose of the domain address is to avoid interference between neighboring RF lines.

Therefore each KNX RF line gets an own domain address.

RF interfaces are available for the configuration and commissioning of devices directly via PC/laptop.
Domain address

A Media Coupler must always have the same domain address as all devices in its subordinate RF line.

If a line is set to the media type “RF”, all RF devices automatically get the same domain address.

The ETS automatically downloads the domain address into the RF devices if the physical address is programmed.

A domain address is 6 bytes long and is entered in the ETS in hexadecimal notation or automatically generated (2 bytes manufacturer specific octets + 4 bytes random octets).

The input notation provides a colon (read from the left) after the first 2 byte.

A domain address can look like this: “0011:22334455” or “00FA:4F5B3122”.
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Commissioning

Commissioning of a pure KNX RF project

The procedure for RF devices is largely identical to that for devices in TP mode

- Create a new project, add devices, set parameter, link group addresses, ...
- Set medium of the line to “RF”
- The ETS creates a unique domain address (e.g. “00FA:961A1B76”) and assigns it to each RF devices in the line
- Bus → Interfaces:
  Set local address and enter domain address of USB RF Interface
- Download individual address and application (group addresses, program,...)
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x
- Push button (left/right), based on energy harvesting principle → A battery adapter is required to download
- KNX RF+ Socket (1-fold)
- USB RF Interface
  Set local address and enter domain address

Domain address: 00FA:961A1B76
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x
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Commissioning of a pure KNX RF project

Example: RF Line 2.3.x

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  Set local address and enter domain address
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x

- Push button (left/right), based on energy harvesting principle → A battery adapter is required to download
  - The battery adapter supplies the push button module with energy
  - After plugging the push button module changes automatically into programming mode
  - As long as the push button module is in programming mode the red LED on the battery adapter lights up
  - The individual address and application can be loaded
  - After disconnecting the battery adapter changes the push button module automatically back in operating mode
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x
- Push button (left/right), based on energy harvesting principle → A battery adapter is required to download
- KNX RF+ Socket (1-fold)
- USB RF Interface
  Set local address and enter domain address
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x
- KNX RF+ Socket (1-fold)
  - The RF socket can switch almost all electrical devices (230V 10A)
  - The output can be switched via a short key press on the button
    An active output is shown by the green status LED
  - Via a long key press, the programming mode is activated/deactivated
    An active programming mode is shown by the red programming LED
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x
- Push button (left/right), based on energy harvesting principle → A battery adapter is required to download
- KNX RF+ Socket (1-fold)
- USB RF Interface
  Set local address "2.3.255" and enter domain address "00FA:961A1B76" (copy from topology view and paste)
Webinar “KNX RF”
Commissioning

Commissioning of a pure KNX RF project

Example: RF Line 2.3.x

– Download
  • Individual address
  • Application (group addresses, program, ...)

– Diagnostics
  • Group and bus monitor
Commissioning of a pure KNX RF project

Example: RF Line 2.3.x

- Download
  - Individual address
  - Application (group addresses, program,...)
- Diagnostics
  - Group and bus monitor
  - Device in programming mode
  - Line scan
  - Device info
  - ...

![Commissioning example](image-url)
Webinar “KNX RF”
Commissioning

Commissioning of a mixed KNX RF, TP and IP project

An existing KNX TP / IP installation is expanded with an RF line

- The property of the Media Coupler is the same as that of a TP Line Coupler or IP Router (e.g. filter table entries) → only the media is different!
- An RF Media Coupler can be used as an
  • Area Coupler → Backbone and main line must be TP
  • Line coupler → Main line must be TP
  • Line repeater function is not yet supported
- There can only be one RF Media Coupler in a KNX RF line
- Regardless of the medium, all KNX devices (TP/RF/IP) can be downloaded using USB RF Interface, USB TP Interface or IP Router/Interface
**Commissioning of a mixed KNX RF, TP and IP project**

An existing KNX TP / IP installation is expanded with an RF line

- The property of the Media Coupler is the same as that of a TP Line Coupler or IP Router (e.g. filter table entries) → only the media is different!

- An RF Media Coupler can be used as an
  - Area Coupler → Backbone and main line must be TP
  - Line coupler → Main line must be TP
  - Line repeater function is not yet supported

- There can only be one RF Media Coupler in a KNX RF line

- Regardless of the medium, all KNX devices (TP/RF/IP) can be downloaded using USB RF Interface, USB TP Interface or IP Router/Interface
Commissioning of a mixed KNX RF, TP and IP project

An existing KNX TP / IP installation is expanded with an RF line
- The property of the Media Coupler is the same as that of a TP Line Coupler or IP Router (e.g. filter table entries) → only the media is different!
- An RF Media Coupler can be used as an
  • Area Coupler → Backbone and main line must be TP
  • Line coupler → Main line must be TP
  • Line repeater function is not yet supported
- There can only be one RF Media Coupler in a KNX RF line
- Regardless of the medium, all KNX devices (TP/RF/IP) can be downloaded using USB RF Interface, USB TP Interface or IP Router/Interface

<table>
<thead>
<tr>
<th>Domain address: 00FA:8AA5A869</th>
<th>2.1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor L: 1/2/141 R: 1/2/151</td>
<td>2.1.24</td>
</tr>
<tr>
<td>Actuator A: 1/2/141 B: 1/2/151</td>
<td>2.1.8</td>
</tr>
<tr>
<td>FT: 1/2/151 1/2/161</td>
<td>2.0.0</td>
</tr>
<tr>
<td>Main line 2.0</td>
<td></td>
</tr>
<tr>
<td>IP Router 2.0.0</td>
<td></td>
</tr>
<tr>
<td>LAN</td>
<td></td>
</tr>
</tbody>
</table>

| Line 2.2.x |
| Actuator A: 1/2/141 B: 1/2/161 |
| FT: 1/2/151 1/2/161 |
| KNXnet/IP |
| Switch Actuator A: 1/2/131 B: 1/2/151 C: 1/2/161 D: ...
| Control element R1: 1/2/131 R2: 1/2/161 R3: ... R4: ...
| Line 1.1.x |
| IP Router 1.1.0 |
| KNX TP |
| FT: 1/2/151 1/2/161 |
| 1.1.31 |
| 1.1.8 |
| 1.1.39 |
| 1.1.59 |

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Commissioning of a mixed KNX RF, TP and IP project

Regardless of the medium, all KNX devices (TP/RF/IP) can be downloaded using USB RF Interface, USB TP Interface or IP Router/Interface

**USB TP Interface**
- ETS: Bus → Interfaces
  - Set local address to e.g. 1.1.255
- Download IP Router 1.1.0
- Download all devices in TP line 1.1.x
- Download IP Router 2.0.0
- Download Media Coupler 2.1.0
- Download all devices in RF line 2.1.x
- ...

Diagram:
- **1.** Laptop
- **2.** IP Router 1.1.0
- **3.** KNX TP
- **4.** IP Router 2.0.0
- **5.** KNX RF
- **6.** Domain address: 00FA:8AA5A869
**Commissioning of a mixed KNX RF, TP and IP project**

Regardless of the medium, all KNX devices (TP/RF/IP) can be downloaded using USB RF Interface, USB TP Interface or IP Router/Interface

**IP Router/Interface**

- ETS: Bus → Interfaces
  - Select IP Router 1.1.0 and set local address to e.g. 1.1.251
- Download IP Router 1.1.0
- Download all devices in TP line 1.1.x
- Bus → Interfaces:
  - Select IP Router 2.0.0 and set local address to e.g. 2.0.251
- Download IP Router 2.0.0
- Download Media Coupler 2.1.0
- Download all devices in RF line 2.1.x
- …
Webinar “KNX RF”
Commissioning

Commissioning of a mixed KNX RF, TP and IP project

Regardless of the medium, all KNX devices (TP/RF/IP) can be downloaded using USB RF Interface, USB TP Interface or IP Router/Interface

**USB RF Interface**

- ETS: Bus → Interfaces
  + Set local address to e.g. 2.1.255 and enter domain address of USB RF Interface
- Download Media Coupler 2.1.0
- Download all devices in RF line 2.1.x
- Download IP Router 2.0.0
- Download IP Router 1.1.0
- Download all devices in TP line 1.1.x
- ...

Domain address: 00FA:8AA5A869

KNXnet/IP

LAN

USB RF Interface

IP Router 2.0.0

Main line 2.0

IP Router 1.1.0

Line 1.1.x

IP Router 2.1.0

LAN

KNX RF

USB RF Interface

IP Router 2.1.24

2.1.255

Line 2.2.x

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Commissioning

Commissioning of a mixed KNX RF, TP and IP project

Filter table entries
- Filter table (group addresses) automatically calculated by ETS
  • IP Router
  • Line Coupler
  • Media Coupler

Do not forget:
- The corresponding couplers must also be downloaded when changes are made
  → Update filter table entries

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Commissioning

Commissioning of a mixed KNX RF, TP and IP project

Filter table entries
- Filter table (group addresses) automatically calculated by ETS
  • IP Router
  • Line Coupler
  • Media Coupler

Do not forget:
- The corresponding couplers must also be downloaded when changes are made
  → Update filter table entries
Commissioning of a mixed KNX RF, TP and IP project

Filter table entries
- Filter table (group addresses) automatically calculated by ETS
  - IP Router
  - Line Coupler
  - Media Coupler

Do not forget:
- The corresponding couplers must also be downloaded when changes are made
  → Update filter table entries
- ETS → Dynamic folders → Modified devices → Download …
Commissioning of a mixed KNX RF, TP and IP project

Manual filter table entries
- As with the Line Coupler or IP Router, group addresses can also be added manually to the filter tables (e.g. visualization)
  - Drag and drop the group address(es) onto the Media Coupler or
  - Select Media Coupler → Properties → Information and enter the group address(es)

Do not forget:
- The corresponding couplers must also be downloaded when changes are made → Update filter table entries
- ETS → Dynamic folders → Modified devices → Download …
Webinar “KNX RF”
Further information (documentation, videos, brochures, ...
Webinar “KNX RF”

Further information (documentation, videos, brochures, ...)

**KNX Association**

- Flyer “KNX Radio Frequency (KNX RF) Products”
Webinar “KNX RF”
Further information (documentation, videos, brochures, ...)

Webinar recordings on YouTube

- “KNX RF battery-less and seamless integration” ENG, KNX Assoc. https://www.youtube.com/watch?v=u9aeSnJ8hEE
- „KNX RF Webinar“ ENG, KNX Association https://www.youtube.com/watch?v=_RVWTOW2dzU
- „KNX RF & KNX Secure, the perfect symbiosis“ ENG, KNX Assoc. https://www.youtube.com/watch?v=4H_Q5KHQ4EU
- “KNX RF Harvesting Webinar” ENG, KNX Association https://www.youtube.com/watch?v=5XzjVY312nU
- “SMART FACTS | ZF AFIM-1010 KNX RF Tastsensor”, GER, Voltus https://www.youtube.com/watch?v=zpOh539vf-M
- “ZF Energy Harvesting Wireless Switches” ENG ZF Group https://www.youtube.com/watch?v=AP8AY6xitpY
Webinar “KNX RF”
Further information (documentation, videos, brochures, ...)

Training documents for Certified Training Centers

- KNX RF is mandatory for KNX Training Centers (Certified Basic Course)
- The PowerPoint Presentation and Word Document can be downloaded from the Training Center account
KNX RF Set for KNX Training Centers

- KNX RF becomes mandatory for certified KNX training centers (Mail “KNX Training Centre eNews - May 2020”)
- A certified KNX training centers must have at least one KNX RF S-Mode sensor and a KNX TP/RF Media coupler
- KNX RF is part of the certified basic course
- TAPKO Technologies GmbH offers a training set
  → All ABB certified KNX training will be informed shortly about a coordinated package
- Recommendation
  - KNX/RF media coupler to TP
  - KNX/RF-USB programming interface
  - 2-way push button module
  - Battery adapter for push button module
  - Mounting set for RF push button modules
  - KNX RF socket outlet adapter

Further information (documentation, videos, brochures, ...)

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**Webinar “KNX RF”**

**Training Material**

**Training & Qualification Database**
- The database contains extensive training content
  - Presentations
  - Video tutorials
  - Webinar slides and videos
  - and more …
  - [https://go.abb/ba-training](https://go.abb/ba-training)
  - [www.abb.com/knx](https://www.abb.com/knx) (→ Services & Tools → Training and Qualification → Training Database)

**YouTube**
- Channel “ABB Home and Building Automation”
  - [https://www.youtube.com/user/ABBibusKNX](https://www.youtube.com/user/ABBibusKNX)
Training & Qualification Calendar

In addition to the online modules and the traditional training programs offered by your local ABB sales team, we offer a variety of on-site trainings conducted by our specialists at different ABB training facilities.

In this Training & Qualification Calendar you can find the educational events that are taking place during 2020.

If you are interested in a training please click the training and you will be forwarded to register in “ABB MyLearning”

www.abb.com/knx or https://go.abb/ba-training

→ Services & Tools
   → Training and Qualification
   → Training Calendar
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