TAPKO
TECHNOLOGIES GMBH

UIMrf

USB RF Interface

Technical & Application Description

Content

1 Product Description

The USB RF interface UIMrf connects a PC to KNX RF via RF data connection. With the ETS (or compatible commissioning tool) the UIMrf works as programming interface. Due to HID profile support no specific USB driver is required.

As a KNX RF Ready S-mode device the UIMrf establishes access to all KNX RF bus devices for S-mode configuring (to feature commissioning, addressing, setting parameters, visualization, protocolling, and diagnostic operation) and E-mode installation. The protocol used for communication between interface and host is the flexible "cEMI" protocol.

The connection between KNX and a PC with standard software (like ETS, EITT, also in Raw Frame operating mode) or other software is handled by the Falcon driver. UIMrf supports extended frames and long messages with up to 208 byte APDU length. Easy software handling also under operating systems not supported by the Falcon driver (e.g.: Linux) is ensured. For specific diagnostic applications like EITT the UIMrf supports the "Raw Frame" operating mode.

The UIMrf is conforming to KNX-AN168 in all options. For future KNX RF Multi and KNX Secure applications the UIMrf will be supported by appropriate firmware updates. With the latest firmware update the option "route last flag" is supported in cEMI and in RF frames.
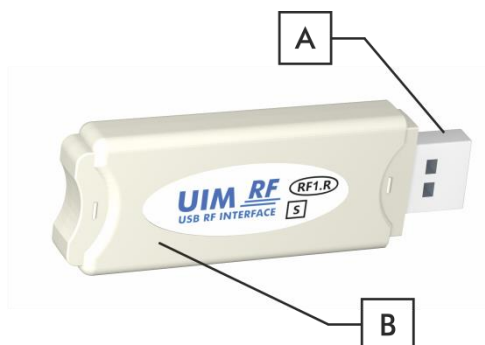
1.1   Front View

Figure 1: Front View

Table 1: Connector Element

LEDs	Buttons / Connectors	
no LED	A	USB Connector
	B	RF Antenna (internal)

1.2   Commissioning

<u>Please note for commissioning with default settings:</u>
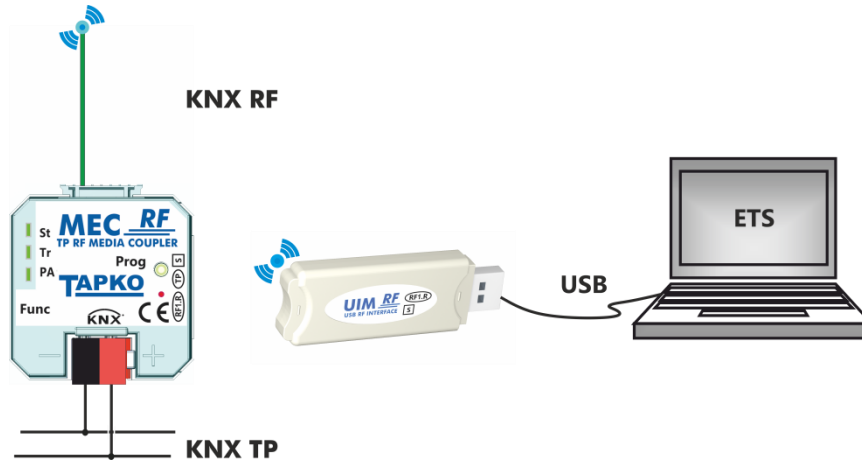
- Physical address is 15.15.255

Figure 2: Connection Scheme

<u>Please read carefully before first use:</u>

- After connection to USB, the device works with its default settings as intended

- For planning and construction of electric installations the appropriate specifications, guidelines and regulations in force of the respective country have to be complied

- Installation only in dry locations

- For changing the configuration use the ETS

- The housing must not be opened

- Protect the device from moisture, dirt and damage

- The device needs no maintenance

- If necessary, the device can be cleaned with a dry cloth

- In the case of damage (at storage, transport) no repairs may be carried out by unauthorized personnel

1.3   Feature Summary

- RF.1 S-mode USB interface device to enable direct data connection between PC and KNX bus line via RF.

- UIMrf supports extended frames and long telegrams with up to 208 bytes APDU length (CRC-16 bytes included). With all MEC couplers and UIM interfaces long messages, e.g. for energy metering applications and visualization purposes, can be processed.

- Communication with other RF devices in the network via any software based on Falcon (ETS, EITT, …) due to the flexible cEMI ("Common EMI") protocol. Easy usage even without Falcon driver software granted.

- No specific USB driver needed due to USB HID Profile.

- Conform to KNX-AN168 in all options.

- Suitable of S-Mode configuring (KNX RF Ready S-Mode), Visualization, Protocol, Diagnostics, E-Mode installations.

- Available working modes: Bus Monitor Mode, Raw Mode, Link Layer Mode.

- Support of Raw Frames, a special diagnostic mode.

- Can be updated via USB.

- UIMrf's ETS database entries are available for ETS5.

2   Operational Description

In KNX network installations the UIMrf can be used as USB RF interface. After establishing the USB connection, UIMrf operates with its default settings. Setting both physical address and domain address correctly is necessary to include UIMrf in the KNX bus system. In Microsoft Windows the UIMrf is recognized as HID (Human Interface Device). So, no extra drivers have to be installed or downloaded.

The UIMrf's ETS (dummy) database entry, e.g. for connecting a visualization device, is available for ETS5. The database without parameters and without communication objects can be added to an ETS project as usual.

In bus monitor mode the CRC-16 bytes are also contained in the data. For this reason the maximum telegram length that is usable in bus monitor mode is 178 bytes.

The UIMrf can be connected to a PC also by a USB cable. To guarantee full functionality only use a USB cable with a maximum length of 3m.

All screen shots are related to the UIMrf database file R1-0c in ETS5.

2.1   KNX Programming Interface

To use UIMrf for ETS programming it has to be chosen as the Current Interface in the ETS Bus Connections window or alternatively during editing a project, at the bottom line ("Name and state of current connection") of the ETS window.

The domain address of the UIMrf must match the domain address assigned to the respective KNX RF line containing the devices to be programmed.
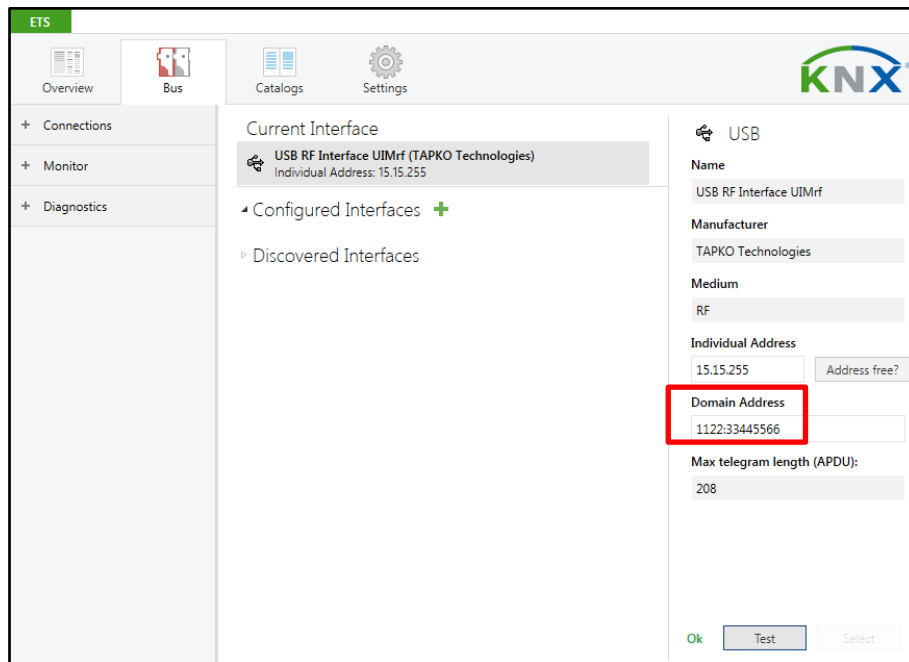

Figure 3: ETS Bus Connection Interface Window

2.2   Physical Address Assignment

The device is supplied with the individual physical address 15.15.255. With the ETS the physical address can be assigned to the device by setting the desired address in the Individual Address field of the Bus Connections window of the ETS. To download the desired physical address the UIMrf has to be chosen as the Current Interface. Then type in the Individual Address and press the Test button.

In this document only the term "physical address" is used. The term "physical address" means the KNX physical address as well as the ETS individual address. Both terms are used by the KNX organisation interchangeably.
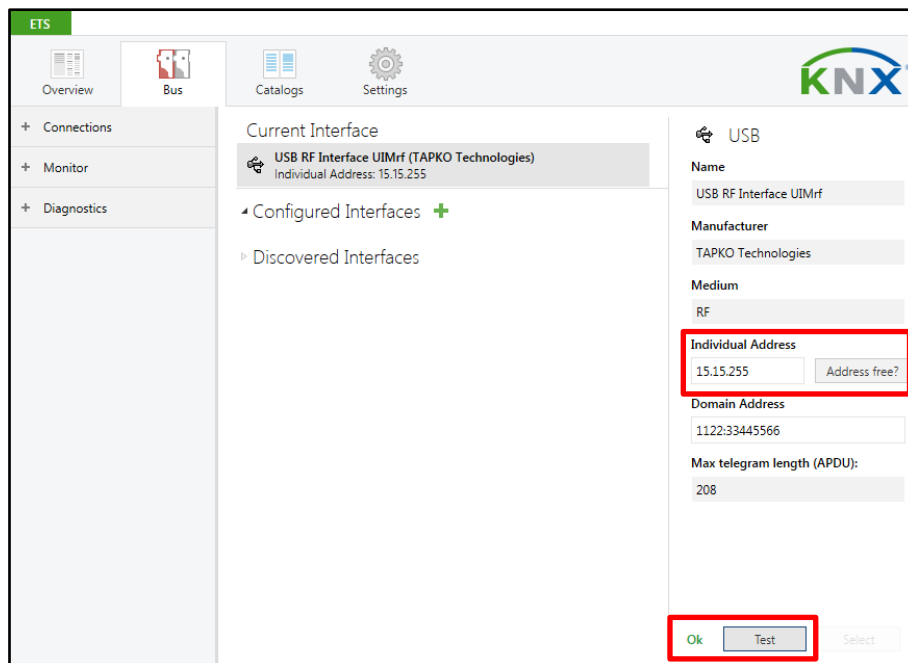

Figure 4: Physical Address Assignment

2.3   Project Physical Address

The UIMrf product database entry can be downloaded from the TAPKO website and from the KNX Online Catalog.
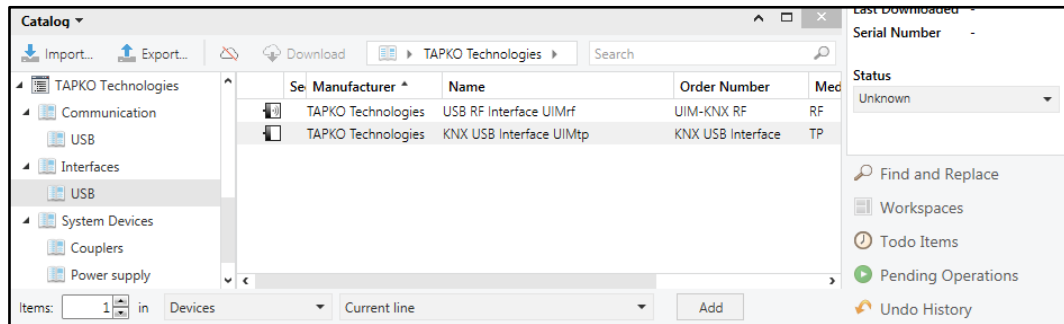

Figure 5: TAPKO USB Interfaces in the ETS Catalog

With the ETS the project physical address can be assigned by setting the desired address in the properties window of the ETS.
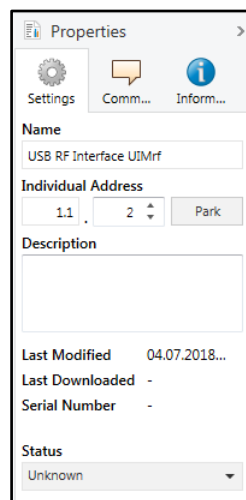

Figure 6: ETS Properties Window

3 State of Delivery

3.1 Default Factory Setting

Table 2: Default Factory Setting

General	
Physical Address	15.15.255
Domain Address	FFFF:FFFFFFFF

3.2   Technical Datasheet

Marking/Design	UIMrf
Current consumption	< 25 mA
Connections	USB: USB2.0 connector (Type A, male)
Protection type	IP20 according to IEC60529
Pollution degree	2 according to IEC60664-1
Protection class	III according to IEC61140
Overvoltage category	III according to IEC60664-1
Approbation	KNX-certified according to ISO/IEC14543-3
CE Marking	In compliance with directives 2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (RoHS), 2014/53/EU (RED)
Standards	ETSI EN300220-1, ETSI EN300220-2, EN301489-1, EN301489-3, EN50491-5-2, EN50581, EN61000-6-2, EN61000-6-3, EN62368-1, EN62479
Voltage supply	USB: 5 V DC (SELV)
Housing colour	Plastic housing, white
Housing dimensions	H = 8.7 mm, W = 71 mm, D = 23 mm
Weight	10 g
Operating temperature	-10…55 °C
Storage temperature	-20…60 °C
Ambient humidity	5…93 %, non-condensing
USB cable length	Max. 3 m
USB driver	HID Device, standard driver included in Windows/Linux
USB Sleep Mode	Supported

3.3 Communication Data

KNX RF	Serial number	Used also as USB serial number
	KNX Ready	RF1.R (with Listen Before Talk medium access)
	KNX Multi	Not supported
	Configuration mode	S-mode
	Bibat	Not supported
	max. APDU length	208 bytes (CRC-16 bytes included) 178 bytes (bus monitor mode)
RF Performance	RF antenna	Circuit-integrated
	RF range	Max. 100m
	Frequency range	868.3 MHz $^+$/- 300 kHz
	Modulation	FSK
	Tx transmit power	+3.7 dBm
Protocol	Over HID	KNX cEMI
KNX cEMI	Mask version	2311h
	Optional filtering mode	Individual address, repetition, domain address, extended Group address
	Supported communication modes	Raw Mode, Bus Monitor Mode, Data Link Layer Mode

3.4　Technical Drawings

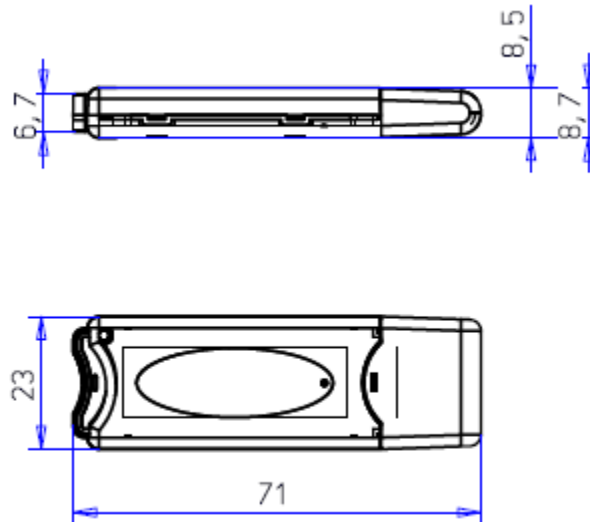All dimensions shown here are specified in mm.

Figure 7: Dimension drawings

4 Simplified EU Declaration of Conformity

Hereby, TAPKO Technologies GmbH declares that the radio equipment type UIMrf is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: www.tapko.de/ce

UIMrf