



# **KSR-01IP KNX IP Router Instruction manual**



# KSR-01IP Instruction Manual

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# KSR-01IP Instruction Manual

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## 1. Product Description

The KNX IP Router KSR-01IP works as a KNX line/area coupler to provide a bi-directional data connection between KNXnet/IP line (main line) and KNX TP line (subline). KNX IP and KNX TP are coupled having a galvanic isolation in between. The flexible KSR-01IP can be used as a KNX TP line coupler to connect several KNX TP lines but also as a KNX TP area coupler to connect several TP areas or different KNX TP installation systems via an IP Backbone/Ethernet/Internet. Telegram filtering is accomplished according to the installation place in the hierarchy (Physical Telegrams) and according to the built in filter tables for group communication (Group Telegrams). For detailed diagnosis all operational modes/states are shown by a duo-LED display.

With the ETS (or compatible commissioning tool) KSR-01IP also works as the KNX programming interface having no KNX communication objects for itself. Connecting a personal computer to the KNX TP bus can ideally be done via Ethernet/Internet. For Tunnelling and Routing up to four tunnelling addresses can be used. To ease commissioning and troubleshooting the Manual Function for short-time telegram filter switch-off and special routing/repetition/confirmation settings are available. A comfortable Web front-end to watch the busload history, to identify KSR-01IP in a network and to update the firmware via IP is provided.

**Note:** In this document, physically addressed telegrams are named Physical Telegrams  
**Note:** In this document, group oriented telegrams are named Group Telegrams.

### 1.1 Front Panel

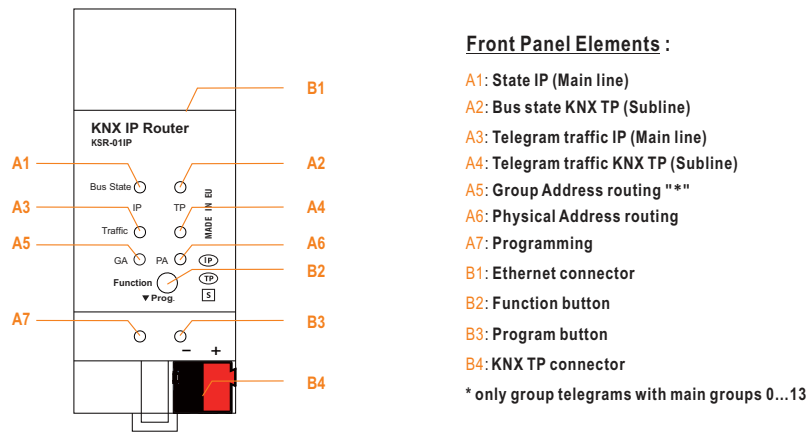


Figure 1: Front View

## 1.2 LED Indication

If KSR-01IP is used as IP Router without physical address x.y.0, LED A6 (Physical address routing) works not like described here.

**Table 1: LEDs Colors**

<b>A1</b>	<b>State IP (Main line)</b> green: Main line OK red: Manual Function active
<b>A2</b>	<b>Bus state KNX TP (Subline)</b> green: Subline OK
<b>A3</b>	<b>Telegram traffic IP (Main line)</b> green, blink.: Telegram traffic extent red, blink.: Transmission error
<b>A4</b>	<b>Telegram traffic KNX TP (Subline)</b> green, blink.: Telegram traffic extent red, blink.: Transmission error
<b>A5</b>	<b>Group Address routing</b> green: Filter active orange: Route all red: Block all <off>: Main line / subline different
<b>A6</b>	<b>Physical Address routing</b> green: Filter active orange: Route all red: Block all <off>: Main line / subline different
<b>A7</b>	<b>Programming</b> red: Program Mode red, blink.: No IP connection

## 1.3 Commissioning

Please note for commissioning with default settings:

- The Manual Function switch-off time is 120 min
- Physical address is 15.15.0
- **WARNING: Do not connect to 230 V**

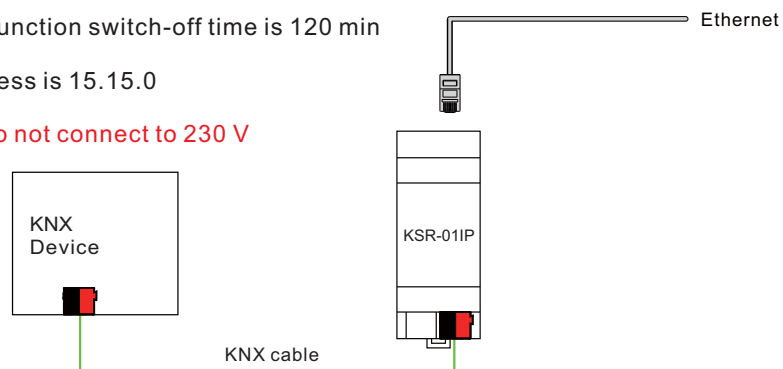


Figure 2: Connection Scheme

#### 1.4 Feature Summary

- KSR-01IP supports extended frames and long telegrams up to 240 bytes APDU length. With all other system devices i.e. couplers and interfaces supporting long messages e.g. for energy metering applications and visualization purposes can be processed.
- KSR-01IP favourably replaces a common TP line/area coupler. The great advantage is using KNX IP as a fast KNX backbone medium (for sending telegrams between lines and areas).
- KSR-01IP works without external power supply.
- Providing IP Tunnelling to the ETS connection interface (also other tools to enable commissioning and monitoring) the additional tunnelling addresses are not the same used for ETS connection. Four different tunnelling connections with a separate address for each can be realized in parallel.
- ACK sending on sent out messages is ETS configurable.
- When there is no IACK response on the subline KSR-01IP is able to repeat messages up to three times. Repetitions can be configured for both Physical Telegrams and Group Telegrams via ETS (to ease troubleshooting). After an IACK response no repetition is following and the negative IACK/BUSY failure mechanism is maintained.
- Automatic function for switching back to run-time telegram filtering after configurable suspension period (see Manual Mode). This avoids forgetting the reactivation of filtering.
- For an ETS configurable time period, it is possible to switch off telegram filtering by only pressing a button on the device front panel. Without additional ETS download filtering is suspended. This is necessary for running fast diagnostics on site.
- Temporarily suspending telegram filtering eases commissioning and debugging. Without ETS download temporary access to other lines becomes possible.
- UPnP is available to discover the device within the IP network. This can only be realized by a proper network installation in terms of topology. With use of KNXnet/IP ETS is able to recognize the communication interface device.
- Updating the firmware can easily be accomplished by a Web browser. The available Web front-end provides informative settings and enables to switch the device into Program Mode without use of the Program Button.
- In networks with high busload the internal amount of communication buffers are capable of smoothing peaks in the communication load course.
- KSR-01IP's ETS database entries are available for ETS4 and later.
- KSR-01IP supports KNXnet/IP, ARP, ICMP, IGMP, HTTP, UPnP discovery, UDP/IP, TCP/IP, DHCP und AutoIP.

## **2.KNXnet/IP**

KSR-01IP is a KNX IP router. KNX IP routers are highly similar to TP line couplers. The only difference is that they use the IP communication medium as main line and the KNXnet/IP communication protocol. However, KNX end devices can be integrated directly via IP. This makes the Ethernet a real KNX medium.

As documented in the KNXnet/IP protocol specifications, KNX telegrams can also be transmitted encapsulated in IP telegrams. Ethernet networks as well as Internet can be used to route or tunnel KNX telegrams. In this way, IP interfaces and IP routers are an alternative to USB data interfaces and TP line/area/backbone couplers. In the latter case, the normal TP backbone is replaced by a fast Ethernet based line.

### **2.1 IP Tunnelling**

The presence of the Internet Protocol (IP) has led to the definition of the KNXnet/IP protocol. KNXnet/IP offers the possibility for point-to-point connections for the ETS (KNXnet/IP Tunnelling) and/or between supervisory system and KNX installation. The KNXnet/IP device management enables KNXnet/IP device configuring via the KNX network in order to reduce the time required for complete network configuration.

### **2.2 IP Routing**

IP Routing is the way of interconnecting KNX lines and areas by IP network(s) via KNXnet/IP. In IP networks the KNXnet/IP Routing defines the way of KNXnet/IP router communication.

### **2.3 IP Bootloader / Boot Mode**

The IP bootloader function is used to completely rewrite the flash memory content and is not just a simple application download. Both communication stack and application software are downloaded. The download tool is a separate tool independent from ETS.

The firmware update procedure via IP is executed by a Web front-end and makes use of special messages to speed up the process. To be protected, their contents are encrypted.

**Note:** Entering Boot Mode is equivalent to activating the IP bootloader function.

### 3. Operational Description

In network installations KSR-01IP can be used as KNX IP area coupler or KNX IP line coupler. With its default settings KSR-01IP operates as is supposed to.

#### 3.1 IP Coupler Application

When KSR-01IP receives telegrams (for example during commissioning) that use physical addresses as destination addresses, it compares the physical addresses of the receiver with its own physical address and decides on that whether it has to route the telegrams or not.

When KSR-01IP receives telegrams that use group addresses as destination addresses, it reacts in accordance with the parameter settings. During normal operation (with default settings), KSR-01IP only routes telegrams whose group addresses are entered in the filter table.

If KSR-01IP routes a telegram and does not receive an acknowledgement, or if a bus device discovers a transmission error, the coupler repeats telegrams up to three times (depending on the corresponding parameter that is set by ETS). With the parameters „Repetitions if errors...“, this function can be set separately for each line. It is recommended to use the default parameter setting.

IP Coupler is designed for use in 10/100 BaseT networks compliant to IEEE802.3. The AutoSensing function sets the baud rate (10 Mbit or 100 Mbit) automatically. IP address can be received from a DHCP server. For this, the ETS automatic assignment setting of the IP address is required. If no DHCP server is found by this setting KSR-01IP starts an AutoIP procedure and autonomously assigns the IP address. The IP address that KSR-01IP receives during its start-up (via DHCP or AutoIP) is retained until next start-up (e.g. due to power off or reprogramming). If the IP address of the KSR-01IP is supposed to have a fixed assignment a fixed IP address (as well as subnet mask and standard gateway) can be set by ETS.

**Note:** ETS does not provide an unload procedure for applications.

#### 3.2 IP Network

KSR-01IP sends telegrams from/to the TP network to/from the IP network in accordance with the KNXnet/IP protocol specification. According to the default setting these telegrams are sent as multicast telegrams to the multicast IP address 224.0.23.12 port 3671. The multicast IP address 224.0.23.12 is the defined address for the KNXnet/IP by KNX Association in conjunction with the IANA. It is recommended to use this default address as defined. Only if it becomes necessary due to the existing network, the address can be changed as shown in chapter 4.3 KNX Multicast Address. Important notes:

- All KNX IP devices that are intended to communicate with each other via IP must have the same IP multicast address.



- Multicast IP address 224.0.23.12 may need to be changed in respect of the network type and of the network components' settings.
- IGMP (Internet Group Management Protocol) is used for IP configuration to establish multicast group belonging.
- If the IP address is changed from the IP side it may happen that ETS does no longer recognize the device and connection cannot be maintained (tunnelling uses IP addresses).
- It is recommended to trigger a restart and to change IP addresses only from TP side.
- If problems occur for IP address assignment please ask your network administrator.
- According to the topology, the Tunnelling addresses always have to be assigned in the range of subline addresses. For more information about additional physical addresses for tunnelling please refer to IP Tunnelling Address Assignment.
- Programming devices of another line different to which the device used for (re)programming is connected the use of a correct topology is mandatory!

### **3.3 KNX Network Installation**

For line coupler functionality in a KNX network KSR-01IP has to use the correct physical address of a line coupler (X.Y.0,  $1 \leq X \text{ \& \ } Y \leq 15$ ). In ETS up to 225 addresses can be defined (from 1.1.0 to 15.15.0).

For area coupler functionality in a KNX network KSR-01IP has to use the correct physical address of an area coupler (X.0.0,  $1 \leq X \leq 15$ ). In ETS up to 15 areas can be defined.

If KSR-01IP is used in a KNX system for both purposes, it is only necessary to ensure that the KSR-01IP used as a line coupler has a line coupler address assigned from a free addressing area. Following figure illustrates the KSR-01IP router topology for KNX lines and KNX areas.

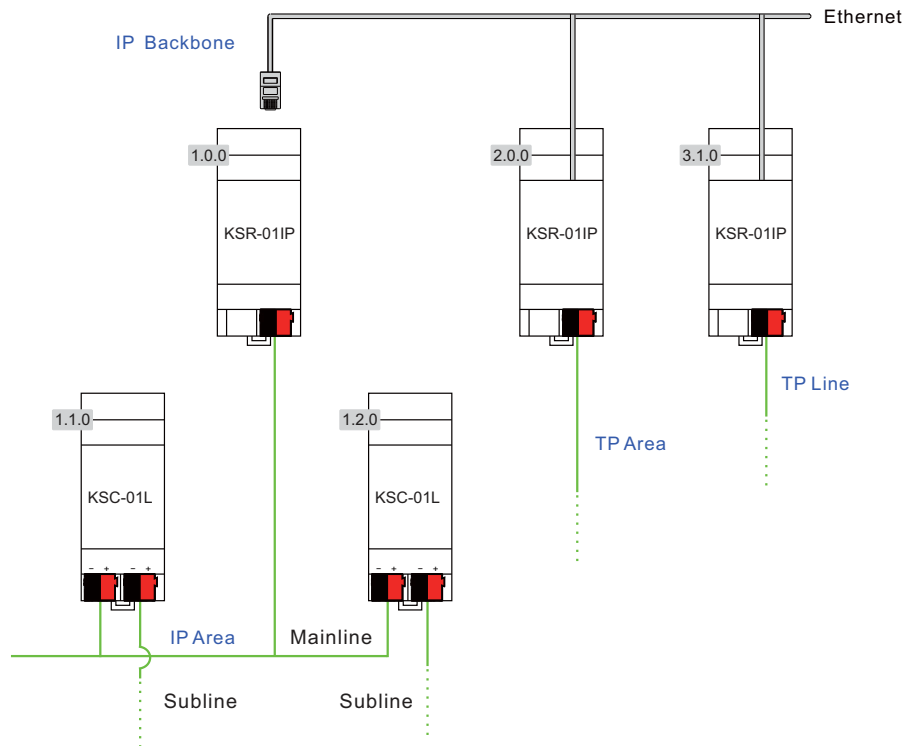


Figure 3: KSR-01IP Network Topology

Example: If an IP router with address 1.0.0 already exists on the backbone no IP router with address 1.X.0,  $1 \leq X \leq 15$  can be added here. Even if no line coupler with address 1.1.0 exists on the subline of the 1.0.0 IP coupler. Vice versa, if a line coupler with address 1.1.0 already exists in the installation no IP router with address 1.0.0 can be added.

### 3.4 Programming

#### 3.4.1 Program Button

To download the desired physical address or an ETS setting the Program Button must be pressed first. Successive pressing the Program Button will turn on and off the Program Mode. LED A7 lighting in red colour indicates Program Mode is active. When Program Mode is active ETS recognizes the device of interest for downloading.

**Note:** A blinking red Programming LED indicates the Ethernet cable is not properly connected.

**Note:** Even when Boot Mode is active successive pressing the Program Button will turn on and off Program Mode and Programming LED.

### 3.4.2 Physical Address Assignment

To commission the device an interface connection (IP, USB) to the KNX bus system is required. The device is supplied with the individual physical address 15.15.0. The KNX product database entry (available for ETS4 and higher) can be downloaded from the Meanwell website and from the KNX Online Catalog.

With the ETS the physical address can be assigned to the device by setting the desired address in the properties window of the ETS. After starting the ETS download and then pressing the Program Button the device restarts itself.

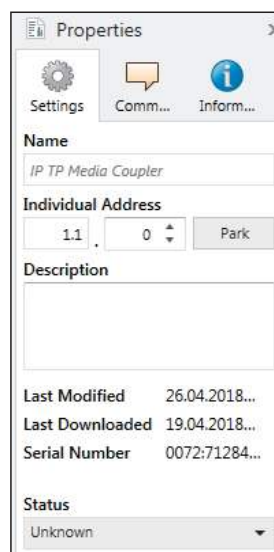


Figure 4: ETS Properties Window

**Note:** 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.

### 3.5 Function Button

The Function Button activates KSR-01IP’s special functions Manual Function, Factory Reset and Boot Mode. It depends on time/number/state the Function Button is being pressed.

#### 3.5.1 Manual Function

A rather short press ( $\approx 3$  sec) of the Function Button activates the Manual Function during normal operation. With a second short button press it can be deactivated before the Manual Function Switch-off time is expired.

When the Manual Function is active either all Physical Telegrams or all Group Telegrams or both pass the KSR-01IP without filtering. After the Switch-off time period has elapsed KSR-01IP automatically switches back to normal operation. To configure the Manual Function and set the Switch-off time use the parameter tab General like shown in chapter 4.1 General. After switching back from Manual Function to normal operation the latest downloaded parameter setting / filter table entries are active again.

### 3.5.2 Factory Reset

A long press ( $\approx 15$  sec) of the Function Button soon followed by a second press for some seconds executes the Factory Reset. After the first press the LED display lights different (see table 4). After the second press all parameters will be set to factory default (incl. physical address). Subsequently, LEDs show the normal display again.

When Boot Mode is active the Function Button executes the Factory Reset in a different way. After pressing the Button for about five seconds the LEDs light with green color. After second press (about two seconds) the parameters will be set to factory default (incl. physical address) and LEDs again display Boot Mode is on.

**Note** After a factory reset executed in Boot Mode the KSR-01IP stays in Boot Mode.

### 3.5.3 Boot Mode Activation

For Boot Mode activation the firmware update process must be executed. During the process, the Function Button must be pressed to enter Boot Mode (see chapter 5.4).

BOOT MODE	
Device is currently running in boot mode.	
Status:	update authorized
DHCP:	false
IP Address:	192.168.30.80
Subnet Mask:	255.255.255.0
Gateway:	192.168.30.254
DNS:	8.8.8.8
Http Port:	8080
MAC Address:	D0-76-50-00-2B-19
Hostname:	KNX-IFRT-002E19
Description:	MEAN WELL KNX TP IP
UDN:	uuid:595b4b78-7912-1b1c-4a51-d07650002b19
Application SW version:	2.0.8a
Bootloader SW version:	2.3

Figure 5: Boot Mode is active

### 3.5.4 LED Status Display

Table 2: LED Status Display for Manual Function

Number	LED	Color	Comment
A1	State IP	orange	Lights red if not connected
A2	Bus State KNX TP	green	
A5	Group Address Routing	orange	
A6	Physical Address Routing	orange	

Table 3: LED Status Display for Factory Reset after first Button Press

Number	LED	Color	Comment
A1	State IP	orange	Lights red if not connected
A2	Bus State KNX TP	orange	
A5	Group Address Routing	orange	
A6	Physical Address Routing	orange	

Table 4: LED Status Display for Boot Mode

Number	LED	Color	Comment
A1	State IP(Main line)	green	
A2	State KNX TP(Subline)	blinking green	
A3	Telegram Traffic IP(Main line)	blinking green	not the same tempo as LED A2
A7	Programming	red	

## 4.ETS Database Parameters

All screen shots are related to the KSR-01IP database file R2-1g in ETS5.

### 4.1 General

If the host name is changed by a download in ETS4, a manual device restart (bus disconnection, reset of the line) is recommended to take over this change.

Figure 6: General Tab Parameters

Table 5: General Tab Parameter Settings

ETS Parameter	Setting [Factory Default]	Comment
Host name	<30 Characters allowed> [KNX IP Router]	Field to enter the device name providing an easy search of the device by ETS, by Windows Network and by KNXnet/IP visualisation systems.
Slow tunnelling connections support	yes no [no]	Enable to support slow tunnelling connections.
Switch-off time for Manual Function	10 min, 1 hour, 4 hours, 8 hours [1 hour]	After expiry of this time period the Manual Function is switched off automatically.
Manual Function	disabled pass all telegrams pass all Physical telegrams pass all Group telegrams [pass all telegrams]	Configuration setting for telegram routing when the Manual Function is active.

#### 4.2 IP Configuration

After an ETS download IP addresses are not updated. It is essential to execute a manual device restart (bus disconnection, reset of the line) to get IP configuration data updated.

1.1.0 IP TP Media Coupler > IP configuration

General HTTP Port  80  8080

IP configuration DHCP  do not use  use

KNX multicast address

Main line (IP)

Subline (KNX TP)

Figure 7: IP Configuration Tab Parameters, DHCP on

Table 6: IP Configuration Tab Parameter Settings, DHCP on

ETS Parameter	Setting [Factory Default]	Comment
HTTP Port	80 8080 [8080]	Select one of the two official system ports.
DHCP	do not use use [use]	If DHCP is used, no further IP parameters have to be set.

1.1.0 IP TP Media Coupler > IP configuration

General	HTTP Port	<input type="radio"/> 80 <input checked="" type="radio"/> 8080
IP configuration	DHCP	<input checked="" type="radio"/> do not use <input type="radio"/> use
KNX multicast address	IP address	0.0.0.0
Main line (IP)	Net mask	255.255.255.0
Subline (KNX TP)	Gateway	0.0.0.0
	Domain name system	0.0.0.0

Figure 8: IP Configuration Tab Parameters, DHCP off

Table 7: IP Configuration Tab Parameter Settings, DHCP off

ETS Parameter	Setting [Factory Default]	Comment
IP address	0-255.0-255.0-255.0-255 [0.0.0.0]	IP Byte 1 to 4: manual input.
Subnet mask	0-255.0-255.0-255.0-255 [255.255.255.0]	SM Byte 1 to 4: manual input.
Default gateway	0-255.0-255.0-255.0-255 [0.0.0.0]	DG Byte 1 to 4: manual input.
DNS server	0-255.0-255.0-255.0-255 [0.0.0.0]	DNS Byte 1 to 4: manual input

#### 4.3 KNX Multicast Address

For KNXnet/IP the multicast address 224.0.23.12 is the defined address from KNX Association in conjunction with IANA. Change this address only if it becomes necessary due to the existing network. Make sure that during commissioning all KNX IP devices intended to communicate with each other via IP use the same multicast address. After downloading a new multicast address a manual restart has to be executed.

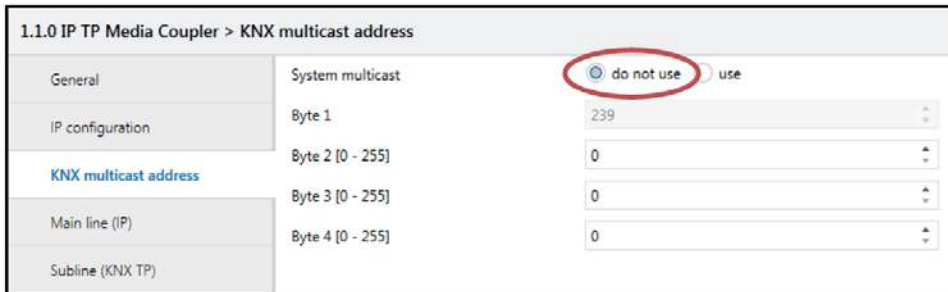
1.1.0 IP TP Media Coupler > KNX multicast address

General	System multicast	<input type="radio"/> do not use <input checked="" type="radio"/> use
IP configuration		
KNX multicast address		

Figure 9: KNX Multicast Address Tab Parameters, System Multicast on

Table 8: KNX Multicast Address Tab Parameter Settings, System Multicast on

ETS Parameter	Setting [Factory Default]	Comment
System multicast	do not use use [use]	System multicast is 224.0.23.12, otherwise 239.0.0.0 will be set.



1.1.0 IP TP Media Coupler > KNX multicast address

General	System multicast	<input checked="" type="radio"/> do not use <input type="radio"/> use
IP configuration	Byte 1	239
	Byte 2 [0 - 255]	0
Main line (IP)	Byte 3 [0 - 255]	0
	Byte 4 [0 - 255]	0
Subline (KNX TP)		

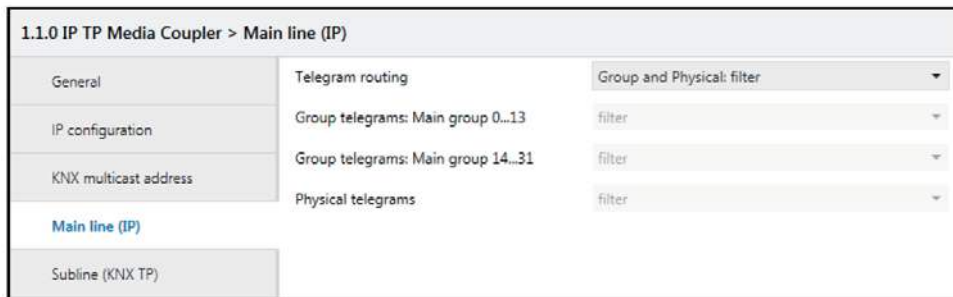
Figure 10: KNX Multicast Address Tab Parameters, System Multicast off

Table 9: KNX Multicast Address Tab Parameter Settings, System Multicast off

ETS Parameter	Setting [Factory Default]	Comment
System multicast	do not use use [use]	If System multicast is not used the multicast address has to be defined manually.
Byte 1 (of the IP address)	224 (System) 239 [239]	If System multicast address is used "224" is set permanently. Otherwise "239" is set permanently.
Byte 2 [0 - 255] (of the IP address)	0-255 [0]	Set manually if System multicast address is not used.
Byte 3 [0 - 255] (of the IP address)	0-255 [0]	Set manually if System multicast address is not used.
Byte 4 [0 - 255] (of the IP address)	0-255 [0]	Set manually if System multicast address is not used.

#### 4.4 Main Line (IP)

For Group Telegrams and Physical Telegrams the setting "transmit all" is intended only for testing purposes. Please do not use for normal operation.



1.1.0 IP TP Media Coupler > Main line (IP)

General	Telegram routing	Group and Physical: filter
IP configuration	Group telegrams: Main group 0..13	filter
	Group telegrams: Main group 14..31	filter
Main line (IP)	Physical telegrams	filter
	Subline (KNX TP)	

Figure 11: Main Line (IP) Tab Parameters



Table 10: Main Line (IP) Tab Parameter Settings

ETS Parameter	Setting [Factory Default]	Comment
Telegram routing	Group: filter, Physical: block Group and Physical: filter Group: route, Physical: filter Group and Physical: route configure <b>[Group and Physical: filter]</b>	block: no telegrams are routed.
		filter: telegrams entered in the filter table are routed.
		route: all telegrams are routed.
		configure: the following parameters must be set manually.
Group telegrams: Main group 0...13	transmit all (not recommended) block filter <b>[filter]</b>	<ul style="list-style-type: none"> <li>Group telegrams (main group 0...13) are all routed.</li> <li>Group telegrams (main group 0...13) are all blocked.</li> <li>Group telegrams (main group 0...13) are routed if entered in the filter table.</li> </ul>
Group telegrams: Main group 14...31	transmit all (not recommended) block filter <b>[filter]</b>	<ul style="list-style-type: none"> <li>Group telegrams (main group 14...31) are all routed.</li> <li>Group telegrams (main group 14...31) are all blocked.</li> <li>Group telegrams (main group 14...31) are routed if entered in the filter table.</li> </ul>
Physical telegrams	transmit all (not recommended) block filter <b>[filter]</b>	<ul style="list-style-type: none"> <li>Physical telegrams are all routed.</li> <li>Physical telegrams are all blocked.</li> <li>Depending on the physical address Physical telegrams are routed.</li> </ul>

#### 4.5 Subline (KNX TP)

For Group Telegrams and Physical Telegrams the setting “transmit all” is intended only for testing purposes. Please do not use for normal operation.

1.1.0 IP TP Media Coupler > Subline (KNX TP)

General	Telegram routing	Group and Physical: filter
IP configuration	Group telegrams: Main group 0...13	filter
KNX multicast address	Group telegrams: Main group 14...31	filter
Main line (IP)	Physical telegrams	filter
Subline (KNX TP)	Physical telegrams: Repetition if errors on subline	up to 3 repetitions
	Group telegrams: Repetition if errors on subline	up to 3 repetitions
	Telegram confirmation on subline	if routed
	Send confirmation on own telegrams	no
	Configuration from subline (KNX TP)	<input checked="" type="radio"/> enable <input type="radio"/> disable

Figure 12: Subline (KNX TP) Tab Parameters

Table 11: Subline (KNX TP) Tab Parameter Settings

ETS Parameter	Setting [Factory Default]	Comment
Telegram routing	Group: filter, Physical: block Group and Physical: filter Group: route, Physical: filter Group and Physical: route configure <b>[Group and Physical: filter]</b>	block: no telegrams are routed.
		filter: telegrams entered in the filter table are routed.
		route: all telegrams are routed.
		configure: the following parameters must be set manually.
Group telegrams: Main group 0...13	transmit all (not recommended) block filter <b>[filter]</b>	<ul style="list-style-type: none"> <li>Group telegrams (main group 0...13) are all routed.</li> <li>Group telegrams (main group 0...13) are all blocked.</li> <li>Group telegrams (main group 0...13) are routed if entered in the filter table.</li> </ul>
Group telegrams: Main group 14...31	transmit all (not recommended) block filter <b>[filter]</b>	<ul style="list-style-type: none"> <li>Group telegrams (main group 14...31) are all routed.</li> <li>Group telegrams (main group 14...31) are all blocked.</li> <li>Group telegrams (main group 14...31) are routed if entered in the filter table.</li> </ul>
Physical telegrams	transmit all (not recommended) block filter <b>[filter]</b>	<ul style="list-style-type: none"> <li>Physical telegrams are all routed.</li> <li>Physical telegrams are all blocked.</li> <li>Depending on the physical address Physical telegrams are routed.</li> </ul>
ETS Parameter	Setting [Factory Default]	Comment
Physical telegrams: Repetition if errors on subline	no up to 3 repetitions one repetition <b>[up to 3 repetitions]</b>	After subline transmission error (e.g. due to missing receiver) Physical telegrams <ul style="list-style-type: none"> <li>are not repeated.</li> <li>are repeated max. 3 times.</li> <li>are repeated once.</li> </ul>
Group telegrams: Repetition if errors on subline	no up to 3 repetitions one repetition <b>[up to 3 repetitions]</b>	After subline transmission error (e.g. due to missing receiver) Group telegrams <ul style="list-style-type: none"> <li>are not repeated.</li> <li>are repeated max. 3 times.</li> <li>are repeated once.</li> </ul>
Telegram confirmation on subline	if routed always <b>[if routed]</b>	<ul style="list-style-type: none"> <li>Routed telegrams to IP main line are confirmed by an ACK on the subline.</li> <li>Each telegram on the subline is confirmed by an ACK.</li> </ul>
Send confirmation on own telegrams	yes no <b>[no]</b>	<ul style="list-style-type: none"> <li>Telegrams sent out to the subline are confirmed by added ACK.</li> <li>No ACK confirmation.</li> </ul>
Configuration from subline (KNX TP)	allow block <b>[allow]</b>	If blocked an ETS download to the KSR-01IP can occur only via IP main line.

## 5.WEB Front-End

The Web front-end can be used to readout KSR-01IP ´s actual device parameters (HTTP port, IP address, MAC address, ...), to update its firmware and to adjust the (additional) tunnelling addresses. To identify a particular KSR-01IP of a KNX network the Programming LED/Program Mode can be remotely switched on without pressing the Program Button.

**Note:**To switch back from Boot Mode to normal operation it is necessary to run the firmware update procedure.

### 5.1 Accessing the KSR-01IP Web Front-End

There are three ways to access the KSR-01IP. It can be accessed like a Microsoft Windows UPnP network device (Windows7 or later) and by a web browser. For access by a web browser either the IP address or the MAC address, together with the HTTP port, have to be known. How to use IP address and MAC address with the browser´s URL bar is described in the following.

**Note:** For access via web browser the HTTP port that is set by ETS (or the factory default parameter value) has to be used.

**Note:** KSR-01IP is able to use both official HTTP system ports (80 and 8080).

**Note:** Factory default HTTP port is 8080.

#### 5.1.1 via Windows Network UPnP



Figure 13: KSR-01IP as UPnP network device (“KNX TP IP”)

When the UPnP network function is enabled, KSR-01IP appears in the Windows Network. A click on the KSR-01IP network device opens the Web front-end with the standard web browser. If KSR-01IP is not visible as an UPnP network device a manual restart is recommended. After that, the device becomes visible in the list of network devices.

### 5.1.2 via IP Address

When IP address and HTTP port (80 or 8080) are known, this information is sufficient to access the KSR-01IP Web front-end by a web browser. The actual IP address is shown in the ETS list of Discovered Interfaces.

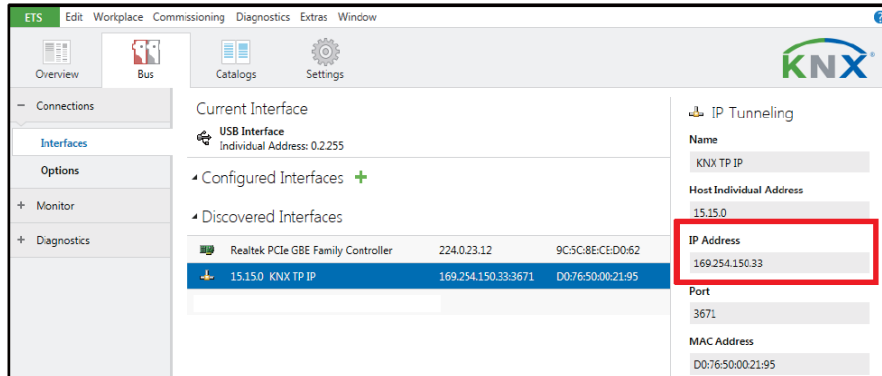


Figure 14: Identifying KSR-01IP 's IP address with ETS

According to KSR-01IP 's pre-set IP configuration (HTTP port, IP address and DHCP, respectively) in the URL bar has to be entered (without brackets):

**http://[IP address]:[HTTP port]/**

Example1: DHCP is not used. With the latest ETS download the IP address was set to 192.168.1.32 and HTTP port was set to 80. In the browser's URL bar has to be entered `http://192.168.1.32:80/`.

Example2: With the latest ETS download HTTP port was set to 8080 and DHCP was activated.

The DHCP server assigned a free IP address to KSR-01IP and ETS shows this IP address to be 192.168.1.201. In the browser's URL bar has to be entered `"http://192.168.1.201:8080/"`.

### 5.1.3 via MAC Address

When NetBIOS is installed (by default on Windows systems and Linux systems containing SAMBA) the MAC address that is printed on a label on the side of the KSR-01IP housing can be used. Due to name resolution is mandatory to establish communication by Host name, activation of NetBIOS is necessary. Use the MAC address in the form of AA-BB-CC-XX-YY-ZZ and the pre-set HTTP port to be entered in the browser's URL bar as described here (without brackets):

**http://knx-iprt-[XXYYZZ]:[HTTP port]/**

Example: On the housing side KSR-01IP is labelled with MAC address D0-76-50-11-22-33 and the pre-set HTTP port is 8080. Then, in the web browser's URL bar has to be entered "http://knx-iprt-112233:8080/".

## 5.2 Device Info

After accessing the Web front-end the Device Info tab is shown. All general information about the current device settings is visible.



## KNX-IP router

The screenshot shows a web interface for a KNX-IP router. On the left, there is a vertical navigation menu with three tabs: 'Device Info' (selected), 'KNX', and 'Update'. The main content area is titled 'Device Information' and displays the following details:

Status:	normal operation
DHCP:	On
IP Address:	192.168.30.80
Subnet Mask:	255.255.255.0
Gateway:	192.168.30.254
DNS:	8.8.8.8
Http Port:	8080
MAC Address:	D0-76-50-00-2B-19
Hostname:	KNX-IPRT-002B19
Description:	KNX IP Router
UDN:	uuid:1f6b0c73-7912-1b1c-4a51-d07650002b19
Application SW version:	2.0.8a
Bootloader SW version:	2.3

Figure 15: Device Info Tab

### 5.3 KNX

With a simple click on “On” or “Off” Program Mode can be switched on/off. This function is equivalent to a Program Button press. Together with the Device Info tab it is easy to distinguish the regarded device (with a certain IP address or MAC address or serial number) from other similar devices in the same IP network. Also, setting changes can easily be checked.

Four tunnelling addresses can be set. ETS sets the first tunnelling address. With a click on “Set” the remaining ones are set. Moreover, routing multicast address, serial number of the device and a last-60-minutes KNX busload diagram are visible. The red curve shows the maximum busload history and the green one shows the average busload history both of the TP side.



Figure 16: KNX Tab

Note: The web browser used has to support SVG graphics.

### 5.4 (Firmware) Update / Boot Mode

Under the Update tab the KSR-01IP firmware can be updated like described in following steps 1 to 5. During the firmware update process KSR-01IP enters Boot Mode. Then LEDs 1, 2, 3, and 7 have states as described in Table 3.

Note: If Boot Mode is already active only the Web front-end instructions from step 3 to step 5 must be followed (refresh, request update).

Note: Boot Mode is still active after device reset and after factory reset.

To exit Boot Mode it is necessary to enter the Update tab of the Web front-end. Then either the firmware update has to be completed (if a new firmware is available) or the firmware update process has to be stopped by a click on the “Abort” button. After that KSR-01IP restarts and continues with normal operation.

Step 1: Open the Update tab of the Web front-end.

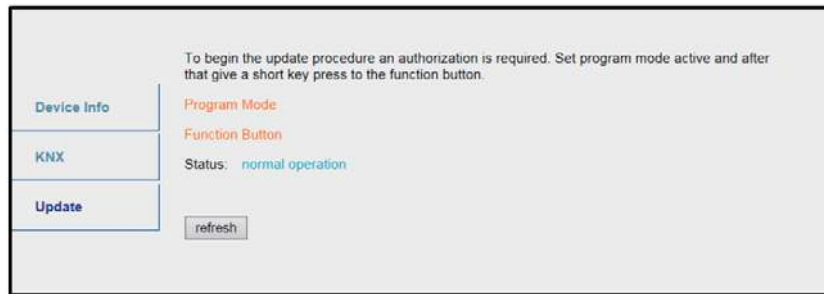


Figure 17: Update Tab

Step 2: Activate Program Mode (at the KNX tab or by Program Button press ).



Figure 18: Update Tab and activated Program Mode

Step 3: After Program Mode activation give a short press to the Function Button . Then click on the “refresh” button (alternatively, refresh the browser).

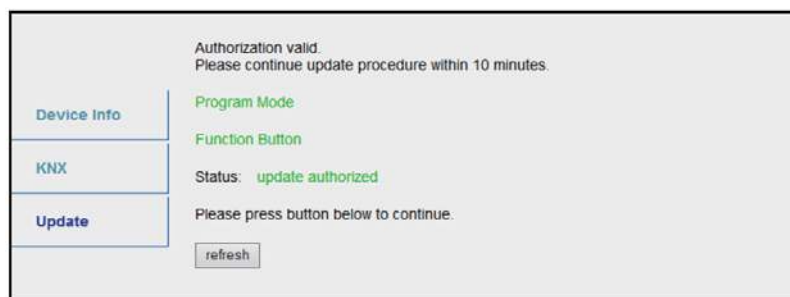


Figure 19: Update Authorized

Step 4: When the „request update“ button appears it has to be pressed to select the update file and enter “Boot Mode”.

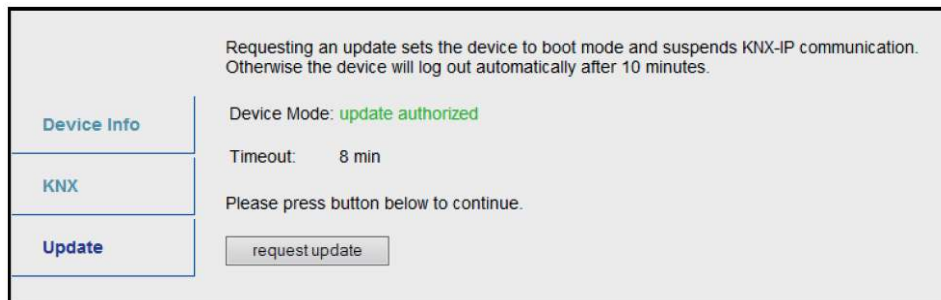


Figure 20: Request Update

Step 5: The update file can be selected and uploaded. Clicking on the „Abort“ button cancels the firmware update procedure and the device exits Boot Mode.

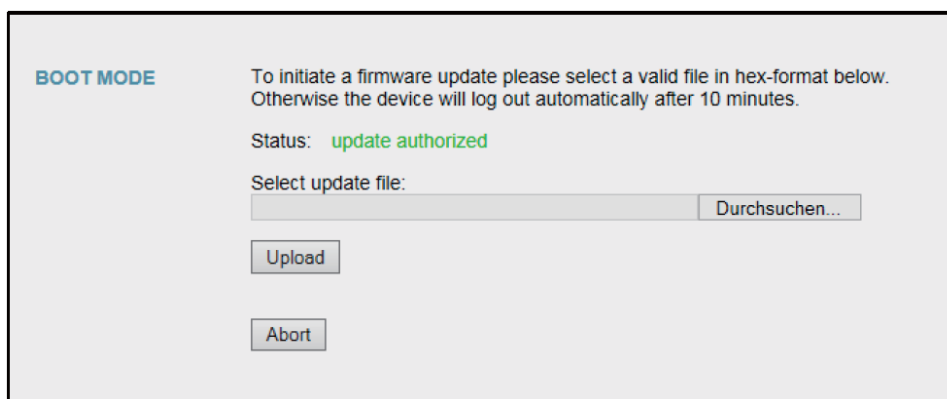


Figure 21: Select Update File

## 5.5 IP Tunnelling Address Assignment

According to the host's physical address assignment the first tunnelling address (additional physical address) of the KSR-01IP can only be set by ETS.

**Note:** Please make sure: The additional physical addresses for tunnelling and the host's physical address have to be different.

Step 1: Open the ETS Bus tab and select KSR-01IP as the “Current Interface”. In the “IP Tunneling” window the already assigned host physical address can be read.



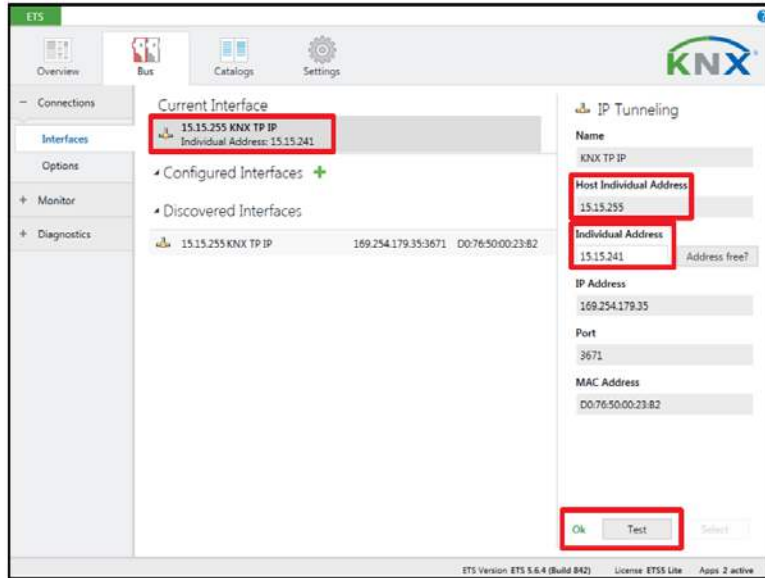


Figure 22: First Additional Physical Address (First Tunnelling Address) Assignment

Step 2: Set the first additional physical address by the “Individual Address” field. Click on the “Test” button. If the green **Ok** appears, the first tunnelling address is set. In this example it is “9.1.241”.

Step 3: Now open the KNX tab of the Web front-end. Click on the “Set” button to set the remaining three tunnelling addresses basing on the first tunnelling address as follows.

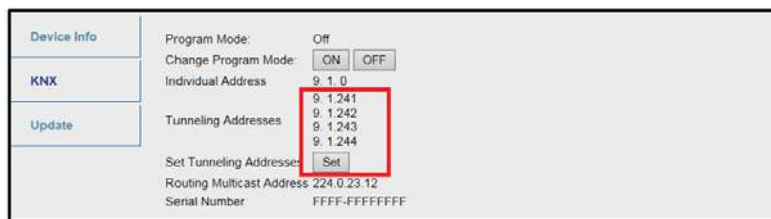


Figure 23: Additional Tunnelling Address Assignment in the Web Front-end

## 6 State of Delivery

### 6.1 Default Factory Setting

Table 12: Default Factory Setting

<b>General</b>	
Product	IP TP Media Coupler
Order Number	KSR-01IP
Application	IP Router
ETS Name	MEAN WELL KNX TP
Physical Address	15.15.0
Tunnelling Addresses	<ul style="list-style-type: none"><li>• 15.15.241</li><li>• 15.15.242</li><li>• 15.15.243</li><li>• 15.15.244</li></ul>

<b>IP configuration</b>	
IP address assignment	DHCP/AutoIP
IP routing multicast address	224.0.23.12

<b>IP (IP Main line to KNX TP Subline)</b>	
Group telegrams (main group 0...13)	filter
Group telegrams (main group 14...31)	filter
Physical telegrams	filter

<b>KNX TP (KNX TP Subline to IP Main line)</b>	
Group telegrams (main group 0...13)	filter
Group telegrams (main group 14...31)	filter
Physical telegrams	filter
Physical: Repetition if errors on subline (KNX TP)	up to 3 repetitions
Group: Repetition if errors on subline (KNX TP)	up to 3 repetitions
Telegram confirmations on subline (KNX TP)	if routed
Send confirmation on own telegrams	no
Configuration from subline (KNX TP)	allow

## 6.2 Technical Datasheet

<b>Marking/Design</b>	KSR-01IP
<b>Current consumption</b>	< 20 mA
<b>Connections</b>	IP (line): RJ45 socket for 100 Mbit and 10 Mbit BaseT, IEEE 802.3 networks KNX TP line: KNX TP connector (red/black), screwless, for single-core cable $\varnothing$ 0.6...0.8 mm
<b>LED Display elements</b>	State (IP and TP) Traffic (IP and TP) Routing (GA and PA) Programming
<b>Control elements</b>	Function Button Program Button
<b>Mounting</b>	35 mm top-hat rail (TH35) according to IEC60715
<b>Protection type</b>	IP20 according to IEC60529
<b>Pollution degree</b>	2 according to IEC60664-1
<b>Protection class</b>	III according to IEC61140
<b>Overvoltage category</b>	II according to IEC60664-1
<b>Approbation</b>	KNX-certified according to ISO/IEC14543-3
<b>CE Marking</b>	According to low voltage and EMC guidelines Compliance with EN50428, EN50581, EN61000-6 and EN62479
<b>Power supply</b>	Safety extra low voltage, 21...30V DC (SELV)
<b>Housing colour</b>	Plastic PA66 housing, grey
<b>Housing dimensions</b>	H = 90 mm, W = 36 mm (2 modules), D = 71 mm
<b>Mounting depth</b>	64 mm
<b>Weight</b>	70 g
<b>Working temperature</b>	-5...45 °C
<b>Storage temperature</b>	-20...60 °C
<b>Ambient humidity</b>	5...93 %, non-condensing

## 6.3 Technical Drawings

Note: All dimensions shown here are specified in mm.

Note: The total device width is 2 modules at 18 mm.

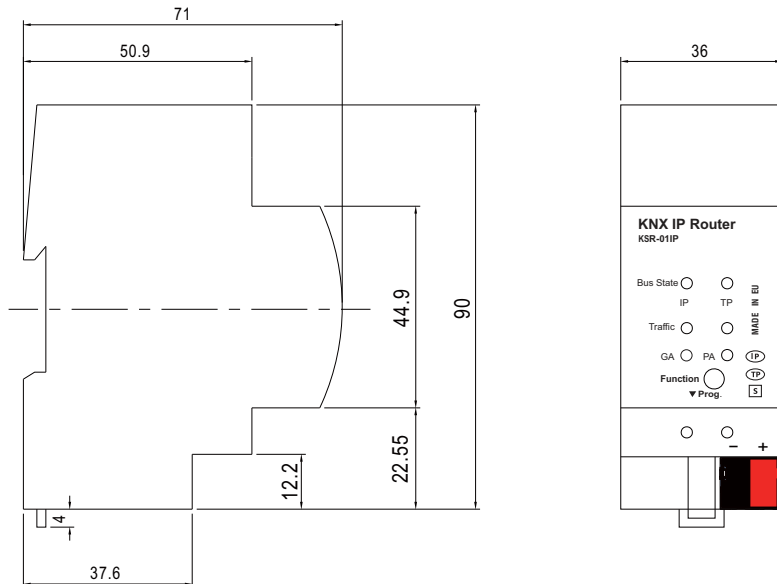


Figure 24: Dimension drawings

## 7.FAQ

- ⊙ **The firmware update finished successfully but the device doesn't work.**  
Turn the power off and on again (or dis-/reconnect bus line). Try to restart like this.
- ⊙ **Is it Ok to connect and disconnect the Ethernet cable quickly?**  
No! Don't do this. To observe, State IP LED will light green for a few seconds and after that, the device will reset.
- ⊙ **What shows the Programming LED if the Ethernet cable is not connected?**  
When the cable is not properly connected, the Programming LED is blinking red.
- ⊙ **LED A2 Bus State KNX TP is continuously blinking green. Why?**  
This indicates KSR-01IP is in Boot Mode. For more information and how to switch back to normal operation please refer to chapter 5.4 (Firmware) Update/Boot Mode.
- ⊙ **I disabled DHCP and assigned a correct IP configuration, but I cannot access the Web front-end. Why?**  
Reset the KSR-01IP and try again. More information about changing the IP network configuration can be found in chapter 4.2 IP Configuration.
- ⊙ **I try to access the Web front-end but I'm not successful. What can I do?**  
Make sure the URL bar entry matches the correct IP address together with the right HTTP port or use the MAC address in exactly the way as explained (see chapter 5.1). Then wait for about 5 or 10 seconds, refresh the browser and try again.

© **Is it possible to reach the Web front-end when the device is in Boot Mode?**

Yes, it is. The Web front-end is accessible also in Boot Mode (see chapter 9.4 (Firmware) Update Tab). When Boot Mode is active, the Web front-end looks like illustrated in figure 5. To run a firmware update procedure and/or exit Boot Mode the Web front-end Update tab must be used.

© **I was able to reach the Web front-end. But when I try to use its tabs or buttons my browser only shows a connection error to me. What can I do?**

Refresh the browser window. The Web front-end will show up again.

© **How can I find out the actual IP address of my KSR-01IP?**

The Device Info tab of the Web front-end shows the actual IP address, but also the list of Discovered Interfaces in ETS.

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