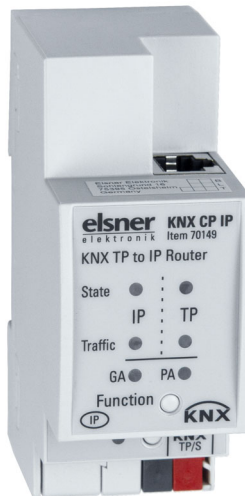




KNX CP IP

KNX TP to IP Router

Item number 70149



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This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual



Safety advice.



Safety advice for working on electrical connections, components, etc.

DANGER!

... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.

WARNING!

... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.

CAUTION!

... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.



ATTENTION! ... indicates a situation which may lead to damage to property if it is not avoided.

ETS

In the ETS tables, the parameter default settings are marked by underlining.

1. Safety and usage instructions



Installation, testing, operational start-up and troubleshooting should only be performed by an authorised electrician.



CAUTION! **Live voltage!**

There are unprotected live components inside the device.

- Inspect the device for damage before installation. Only put undamaged devices into operation.
 - Comply with the locally applicable directives, regulations and provisions for electrical installation.
 - Immediately take the device or system out of service and secure it against unintentional switch-on if risk-free operation is no longer guaranteed.
-

Use the device exclusively for building automation and observe the operating instructions. Improper use, modifications to the device or failure to observe the operating instructions will invalidate any warranty or guarantee claims.

Operate the device only as a fixed-site installation, i.e. only in assembled condition and after conclusion of all installation and operational start-up tasks, and only in the surroundings designated for it.

Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

For information on installation, maintenance, disposal, scope of delivery and technical data, please refer to the installation instructions.

2. Description

The **KNX TP to IP Router KNX CP IP** works as a KNX IP Router to provide a bi-directional data connection between KNXnet/IP main line and KNX TP subline. KNX IP and KNX TP are coupled having a galvanic isolation in between. Extended frames and long telegrams with up to 240 bytes APDU length are supported.

KNX CP IP can be used to connect a KNX TP line or area to KNX IP or an Ethernet network. In this way, several TP lines, TP areas or different KNX TP installation systems can be connected via an IP Backbone, Ethernet network or the 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. Programming on IP side from the subline can be suppressed. Number of repetitions on subline can be reduced.

With the ETS (or compatible commissioning tool), **KNX CP IP** can also work as a KNX programming interface having no KNX communication objects for itself. Connecting a

personal computer to the KNX TP bus can ideally be done via IP connection. For Tunneling and Routing up to four tunneling addresses can be used.

To ease commissioning and troubleshooting, special routing/repetition/confirmation ETS settings and a configurable Manual Function for short-time telegram filter switch-off are available. E.g. "transmit all group telegrams" can be activated by a single button press. After the set time period, **KNX CP IP** switches back to normal operation automatically. Another feature to increase the data throughput is the ability to send IACKs (on TP side) on own telegrams.

For IP Tunneling, up to four tunneling addresses can be used. A comfortable Web front-end to watch the busload history, to remotely control **KNX CP IP** in a network and to update the firmware via IP is provided. It is easy to identify the **KNX CP IP** in a network by remotely switching on its Programming LED.

In this document, physically addressed telegrams are named Physical Telegrams.

In this document, group oriented telegrams are named Group Telegrams.

Functions:

- Supports extended frames and long telegrams up to 240 bytes APDU length. (With all couplers and UIM interfaces long messages e.g. for energy metering applications and visualization purposes can be processed)
- Favourably replaces a common TP line/area coupler. The great advantage is using KNX IP as a fast KNX backbone medium
- Works without external power supply
- For IP Tunneling, four different tunneling connections, with a separate address for each, can be realized in parallel. Quick assignment can be done by the web front-end
- IACK sending on sent out messages is ETS configurable
- When there is no IACK response on the subline, **KNX CP IP** is able to repeat messages up to three times. Repetition can be configured for both Physical Telegrams and Group Telegrams via ETS (to ease troubleshooting). E.g. after an IACK response no repetition is following and the negative IACK/BUSY failure mechanism is maintained
- 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
- Automatic function for switching back to run-time telegram filtering after configurable suspension period (see Manual Mode). This avoids forgetting the reactivation of filtering
- 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 remotely

switch the device into Programming Mode without use of the Programming Button

- In networks with high busload the internal amount of communication buffers are capable of smoothing peaks in the communication load course
- In the web front-end, a diagram of a 60 min busload history can be watched
- Database available for ETS4 and higher
- Supports KNXnet/IP, ARP, ICMP, IGMP, HTTP, UPnP discovery, UDP/IP, TCP/IP, DHCP und AutoIP

3. Commissioning

Configuration is made using the KNX software as of ETS 4. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu. There you will also find the product manual.

3.1. Addressing of the device at the bus

The equipment is delivered with the individual address 15.15.0. This can be changed via the ETS. A button and a control LED are located on the unit for this purpose. Only individual addresses x.y.0 are allowed.

3.2. Default settings

- All telegrams are blocked because the filter table is not defined
- The Manual Function switch-off time is 120 min

4. KNXnet/IP

KNX CP IP 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 be transmitted encapsulated in IP packets. 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, respectively. In the latter case, a TP backbone can be completely replaced by a fast Ethernet based line then called IP backbone.

4.1. IP Tunneling

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 Tunneling) 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.

4.2. 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.

4.3. IP Bootloader / Boot Mode

The IP bootloader function is used to update the firmware and completely rewrite the flash memory content. This is not just a simple application download. Both communication stack and application software are downloaded.

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

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

5. Operation

In network installations **KNX CP IP** is used as KNX IP line/area coupler to couple KNX IP and KNX TP. After connecting to KNX TP, **KNX CP IP** operates with its default settings. Setting the correct physical address is necessary to include **KNX CP IP** in the present KNX bus system. Only physical addresses x.y.0 are allowed to be set.

5.1. IP Router Application

When **KNX CP IP** 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 **KNX CP IP** receives telegrams that use group addresses as destination addresses, it reacts in accordance with the parameter settings. During normal operation (with Group Telegram routing set to filter), **KNX CP IP** only routes telegrams whose group addresses are entered in its filter table.

If a telegram is routed by **KNX CP IP** without receiving the corresponding acknowledgement, i.e. due to a missing receiver or to a transmission error, the telegram will be repeated up to three times (depending on the ETS setting). With the parameters "Repetitions if errors...", this function can be configured separately for each line and both kinds of telegrams. It is recommended to use the default parameter setting.

IP Router 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 automatic assignment setting of the IP address can be set by ETS (use DHCP). If set so and no DHCP server is found, **KNX CP IP** starts an AutoIP procedure and autonomously assigns the IP address. The IP address that **KNX CP IP** receives during its start-up (via DHCP or AutoIP) is retained until next start-up (e.g. due to power off or reprogramming). If **KNX CP IP** is supposed to

have a fixed IP address (as well as subnet mask and standard gateway) it can be set by ETS.

ETS does not provide an unload procedure for applications.

5.2. IP Network

KNX CP IP 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 6.3. 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 (tunneling uses IP addresses). So, it is recommended to change IP addresses and restart only from TP side.
- If problems occur for IP address assignment please ask your network administrator.
- According to the topology, the Tunneling addresses always have to be assigned in the range of subline addresses. For more information about additional physical addresses for tunneling please refer to IP Tunneling Address Assignment.
- Default factory settings of the 4 tunnelling addresses: 15.15.241-244
- To program devices of a line different to which the device used for (re)programming is connected the use of a correct topology is mandatory!

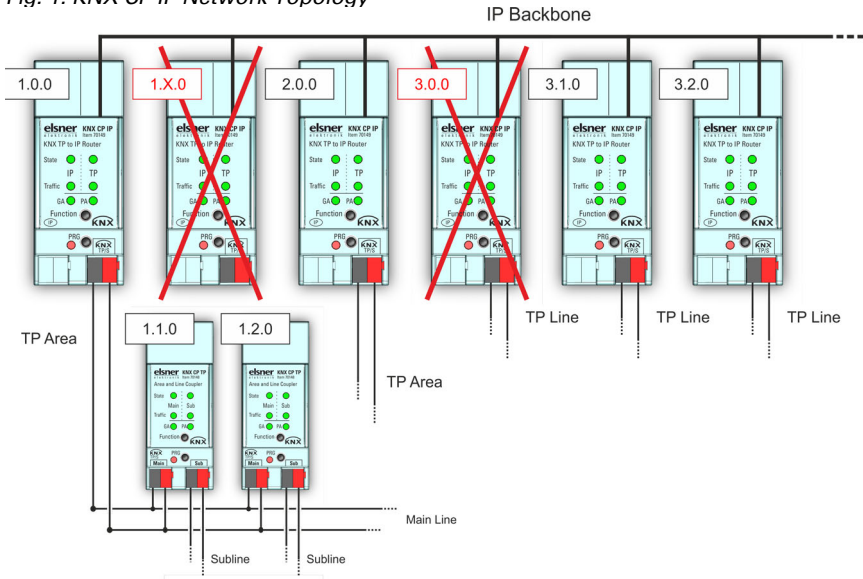
5.3. KNX Network Installation

For line coupler functionality in a KNX network **KNX CP IP** has to use the correct physical address of a coupler (x.y.0, $1 \leq x$ & $y \leq 15$). In ETS, up to 225 addresses can be defined from 1.1.0 to 15.15.0.

For backbone coupler functionality in a KNX network **KNX CP IP** 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.

In a KNX system with **KNX CP IP** backbone couplers and KNX CP TP line couplers, it is necessary to ensure that **KNX CP IP** has an address assigned from a free addressing area. Following figure illustrates a possible topology scenario.

Fig. 1: KNX CP IP Network Topology



Example: If a KNX IP router with address 1.0.0 already exists on the backbone no KNX IP router with address 1.x.0 can be added here. Even if no line coupler with address 1.1.0 exists on the subline of the 1.0.0 router. Vice versa, when line couplers with addresses 1.x.0 already exist in an installation, an IP router with address 1.0.0 cannot be added differently as shown in Fig. 1.

5.4. Programming

5.4.1. Programming Button

To download the desired physical address or an ETS setting the Programming Mode must be activated. Successive pressing the Programming Button will turn on and off the Programming Mode. LED 7 lighting in red colour indicates Programming Mode is active. When Programming Mode is activated, the ETS is able to download the physical address.

A blinking red Programming LED indicates the Ethernet cable is not properly connected or no IP network connection is available.

Also when Boot Mode is active, successive pressing the Programming Button will turn on and off Programming Mode and Programming LED.

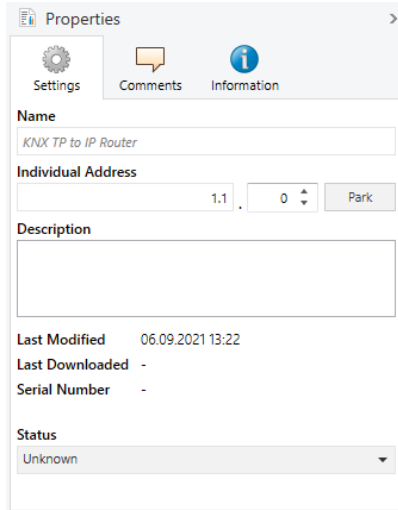
5.4.2. Physical Address Assignment

To configure 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 TAPKO website and from the KNX Online Catalog.

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 Programming Button the device restarts itself.

Fig. 2: ETS Properties Window



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.

5.5. Function Button

The Function Button activates **KNX CP IP**'s special functions. Manual Function and Factory Reset can be activated. Device settings of **KNX CP IP** can be reset to manufacturer default values with the Factory Reset function. During the firmware update procedure the Function Button has to be pressed for Boot Mode activation.

5.5.1. Manual Function

During normal operation a rather short press (approx. 3 sec) activates and deactivates the Manual Function. LED 5 and LED 6 show the current filtering states.

When the Manual Function is active, either all Physical Telegrams or all Group Telegrams or both pass the **KNX CP IP** without filtering. After the Switch-off time period has elapsed **KNX CP IP** 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 6.1. General. After switching back from Manual Function to normal operation the latest downloaded parameter setting / filter table entries are active again.

5.5.2. Factory Reset

A long press (approx. 15 sec) of the Function Button soon followed by a short press (approx. 3 sec) executes the Factory Reset. After the first press, the LED display lights like described in Table 4. After the second press, all parameters will be set to factory default (incl. physical address). Subsequently, LEDs indicate normal operation again.

5.5.3. Boot Mode Activation

To start the firmware update process, Boot Mode must be activated. During this process, a press on the Function Button is necessary. After a click on the "request update" button, **KNX CP IP** enters Boot Mode (see chapter 7.4. (Firmware) Update / Boot Mode).

Fig. 3: Boot Mode is active

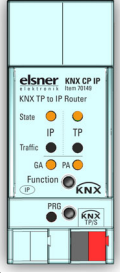
5.5.4. LED Status Display

Table 1: LED Status Display for Manual Function

Number	LED	Colour	Comment
1	State IP	orange	Lights red if not connected
2	Bus State KNX TP	green	
5	Group Address Routing	green:	filter
6	Physical Address Routing	orange:	route all
		red:	block all

Table 2: LED Status Display for Factory Reset after first Button Press

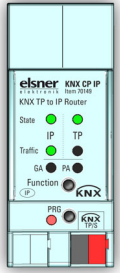
Number	LED	Colour	Comment
1	State IP	orange	Lights red if not connected
2	Bus State KNX TP	orange	
5	Group Address Routing	green: orange: red:	filter route all block all
6	Physical Address Routing		



The image shows the LED status display of the elsner KNX CP IP router. The display is a vertical strip with several LEDs and labels. From top to bottom, the labels and their corresponding LED colors are: State (orange), IP (orange), TP (orange), Traffic (orange), EA (orange), PK (orange), Function (orange), and PRG (orange). The KNX logo is also visible at the bottom of the display.

Table 3: LED Status Display for Boot Mode

Number	LED	Colour	Comment
1	State IP	green	
2	Bus State KNX TP	blinking green	
3	Telegram Traffic IP	blinking green	not the same tempo as LED2
7	Programming LED	red	



The image shows the LED status display of the elsner KNX CP IP router in boot mode. The display is a vertical strip with several LEDs and labels. From top to bottom, the labels and their corresponding LED colors are: State (green), IP (green), TP (green), Traffic (green), EA (green), PK (green), Function (green), and PRG (red). The KNX logo is also visible at the bottom of the display.

6. ETS Database Parameters

The default settings of the parameter are labelled by an underscore.

6.1. General

The host name is the name with that the device appears within the Windows network.

Host name	KNX IP Router [Free text, 30 Characters allowed]
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 tunneling connections support	yes • <u>no</u>
Enable to support slow tunneling connections.	
Switch-off time for Manual Function	10 min • <u>1 hour</u> • 4 hours • 8 hours
After expiry of this time period the Manual Function is switched off automatically.	
Manual Function	<ul style="list-style-type: none"> • disabled • <u>pass all telegrams</u> • pass all Physical telegrams • pass all Group telegrams
Configuration setting for telegram routing when the Manual Function is active.	

6.2. IP Configuration

Here, HTTP port and IP address assignment can be configured.

HTTP Port	80 • <u>8080</u>
Select one of the two official system ports.	
DHCP	do not use • <u>use</u>
If DHCP is used, no further IP parameters have to be set.	
IP address	<u>0.0.0.0</u> ...255.255.255.255
IP Byte 1 to 4: manual input.	
Subnet mask	0.0.0.0...255.255.255.255; <u>255.255.255.0</u>
SM Byte 1 to 4: manual input.	
Default gateway	<u>0.0.0.0</u> ...255.255.255.255
DG Byte 1 to 4: manual input.	
DNS server	<u>0.0.0.0</u> ...255.255.255.255
DNS Byte 1 to 4: manual input	

6.3. 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. To ensure proper functioning, execute a manual restart after changing the multicast address.

System multicast	do not use • use
System multicast is 224.0.23.12, otherwise 239.0.0.0 will be set.	
Byte 1 (of the IP address)	224 (System) • <u>239</u>
If System multicast address is used "224" is set permanently. Otherwise "239" is set permanently.	
Byte 2 [0 - 255] (of the IP address)	<u>0</u> ...255
Set manually if System multicast address is not used.	
Byte 3 [0 - 255] (of the IP address)	<u>0</u> ...255
Set manually if System multicast address is not used.	
Byte 4 [0 - 255] (of the IP address)	<u>0</u> ...255
Set manually if System multicast address is not used.	

6.4. 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.

Telegram routing	<ul style="list-style-type: none"> • Group: filter, Physical: block • <u>Group and Physical: filter</u> • Group: route, Physical: filter • Group and Physical: route • configure
<p><i>block</i>: no telegrams are routed. <i>filter</i>: telegrams entered in the filter table are routed. <i>route</i>: all telegrams are routed. <i>configure</i>: the following parameters must be set manually.</p>	
Group telegrams: Main group 0...13	transmit all • block • <u>filter</u>
<p><i>transmit all</i>: Group telegrams (main group 0...13) are all routed. <i>block</i>: Group telegrams (main group 0...13) are all blocked. <i>filter</i>: Group telegrams (main group 0...13) are routed if entered in the filter table.</p>	
Group telegrams: Main group 14...31	transmit all • block • <u>filter</u>
<p><i>transmit all</i>: Group telegrams (main group 14...31) are all routed. <i>block</i>: Group telegrams (main group 14...31) are all blocked. <i>filter</i>: Group telegrams (main group 14...31) are routed if entered in the filter table.</p>	
Physical telegrams	transmit all • block • <u>filter</u>
<p><i>transmit all</i>: Physical telegrams are all routed. <i>block</i>: Physical telegrams are all blocked. <i>filter</i>: Depending on the Individual Address Physical telegrams are routed.</p>	

6.5. Sub Line (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.

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

7. Web Front-end

The Web front-end can be used to read out **KNX CP IP**'s actual device parameters (HTTP port, IP address, MAC address, ...), to update its firmware and to adjust the (additional) tunneling addresses. To identify a particular **KNX CP IP** of a KNX network the Programming LED/Programming Mode can be remotely switched on and off without pressing the on-device Programming Button.

To switch back from Boot Mode to normal operation it is necessary to run the firmware update procedure and then abort, or wait for the 10 min timeout.

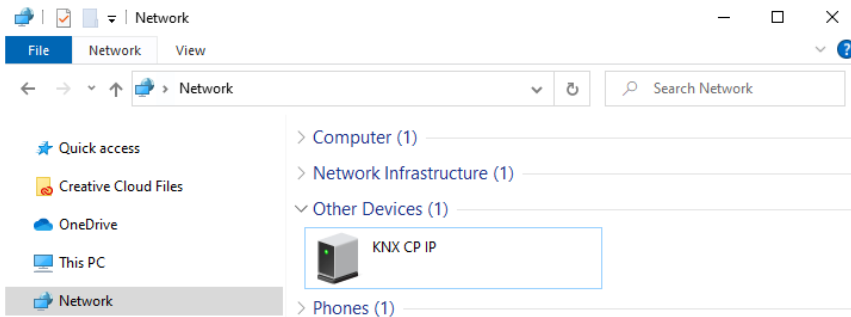
7.1. Accessing the KNX CP IP Web Front-End

There are three ways to access the **KNX CP IP**. 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.

- For access via web browser the HTTP port that is set by ETS (or the factory default parameter value) has to be used.
- **KNX CP IP** is able to use both official HTTP system ports (80 and 8080).
- Factory default HTTP port is 8080.

7.1.1. via Windows Network UPnP

Fig. 4: **KNX CP IP** as UPnP network device ("KNX CP IP")

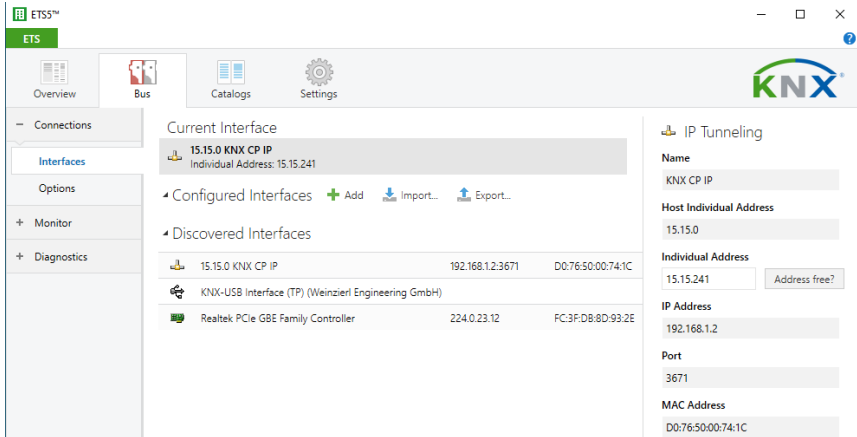


When the UPnP network function is enabled, **KNX CP IP** appears in the Windows Network. A click on the **KNX CP IP** network device opens the Web front-end with the standard web browser. If **KNX CP IP** is not visible as an UPnP network device a manual restart is recommended. After that, the device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

7.1.2. via IP Address

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

Fig. 5: Identifying **KNX CP IP**'s IP address with ETS



According to **KNX CP IP**'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 **KNX CP IP** 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/".

7.1.3. 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 **KNX CP IP** 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 **KNX CP IP** 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/".

7.2. Device Info

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

Fig. 6: Device Info Tab



KNX TP to IP Router

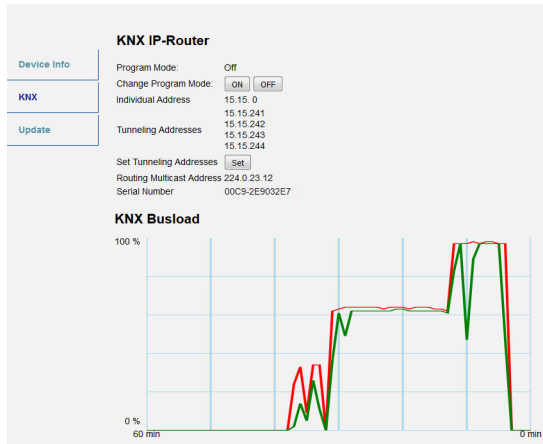
Device Info	Device Information	
KNX	Status:	normal operation
Update	DHCP:	On
	IP Address:	192.168.1.2
	Subnet Mask:	255.255.255.0
	Gateway:	192.168.1.1
	DNS:	192.168.1.1
	Http Port:	8080
	MAC Address:	D0-76-50-00-74-1C
	Hostname:	KNX-IPRT-00741C
	Description:	KNX CP IP
	UDN:	uuid:581e780d-581e-7869-4a51-d0765000741c
	Application SW version:	2.0.15
	Bootloader SW version:	2.4

7.3. KNX

Here, all KNX specific addresses are shown. Setting changes can easily be checked. With a simple click on "On" or "Off" Programming Mode can be switched on/off. This function is equivalent to a Programming 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.

Four tunneling addresses can be set. ETS sets the first tunneling 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.

Fig. 7: KNX Tab



The web browser used has to support SVG graphics.

7.4. Firmware Update / Boot Mode

Under the Update tab the **KNX CP IP** firmware can be updated via IP i.e. the Ethernet network like described in following steps. During the remote update process **KNX CP IP** enters Boot Mode. Then LEDs 1, 2, 3, and 7 light as described in Table 3.

- If Boot Mode is already active only the Web front-end instructions from step 3 to step 5 must be followed (refresh, request update).
- 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 **KNX CP IP** restarts and continues with normal operation.

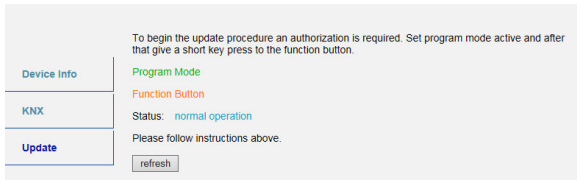
Step 1: Open the Update tab of the Web front-end.

Fig. 8: Update Tab



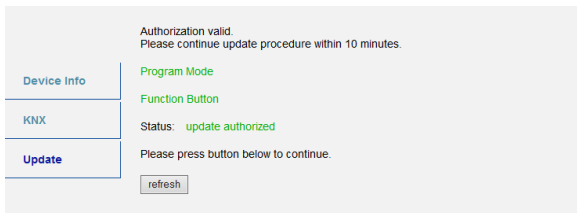
Step 2: Activate Programming Mode (KNX tab or Programming Button).

Fig. 9: Update Tab and activated Programming Mode



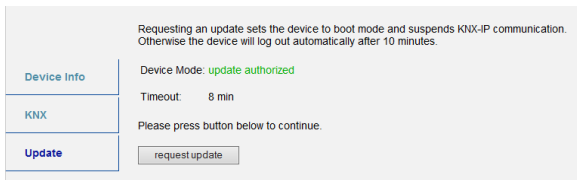
Step 3: After Programming Mode activation give a short press to the Function Button. Then click on the "refresh" button (alternatively, refresh the browser).

Fig. 10: Update Authorized



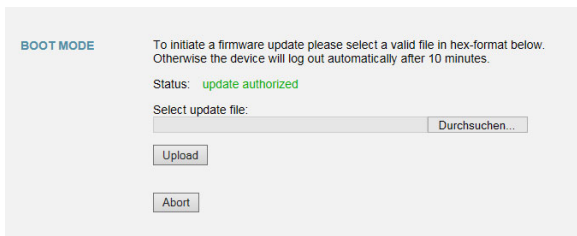
Step 4: When the "request update" button appears it has to be pressed to select the update file and enter "Boot Mode".

Fig. 11: Request Update



Step 5: The update file can be selected and uploaded. After that, the device restarts. Clicking on the "Abort" button cancels the firmware update procedure and the device exits Boot Mode.

Fig. 12: Select Update File



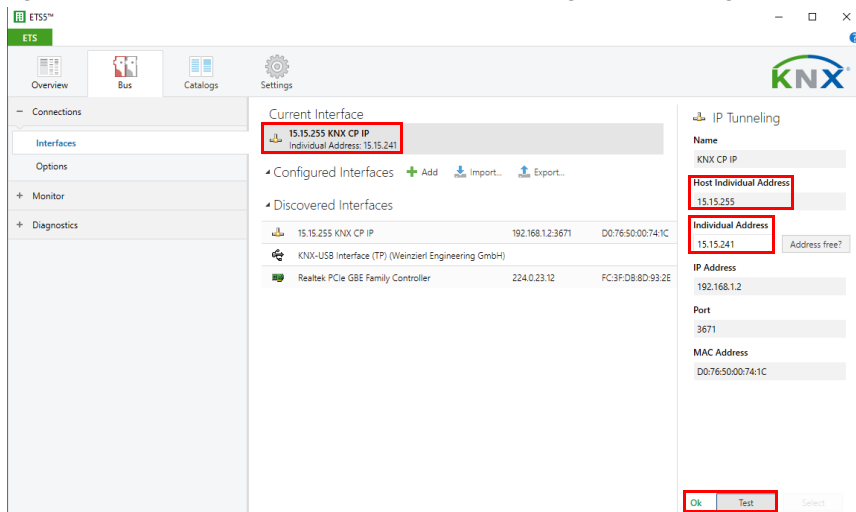
7.5. IP Tunneling Address Assignment

According to the host's physical address assignment the first tunneling address (additional physical address) of the **KNX CP IP** can only be set by ETS.

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

Step 1: Open the ETS Bus tab and select KNX CP IP as the "Current Interface". In the "IP Tunneling" window the already assigned host physical address can be read.

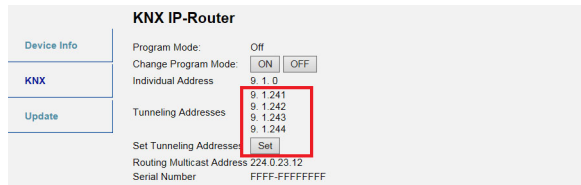
Fig. 13: First Additional Physical Address (First Tunneling Address) Assignment



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 tunneling 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 tunneling addresses basing on the first tunneling address as follows.

Fig. 14: Additional Tunneling Address Assignment in the Web Front-end



8. Legal Notice

- Lw IP is used in developing the **KNX CP IP**.
- Lw IP is licenced under the BSD licence.

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9. FAQ

1. The firmware update finished successfully but the device doesn't work.

To restart turn the power off and on again (dis-/reconnection of KNX TP line).

2. Is it Ok to connect and disconnect the Ethernet cable quickly?

No! Don't do this. Before reconnection, wait for a few seconds.

3. What shows the Programming LED if the Ethernet cable is not connected?

Similar to having no IP network available, the Programming LED is blinking red.

4. LED 2 Bus State KNX TP is continuously blinking green. Why?

This indicates **KNX CP IP** is in Boot Mode. For more information and how to switch back to normal operation please refer to chapter 7.4.

5. I disabled DHCP and assigned a correct IP configuration, but I cannot access the Web front-end. Why?

Reset the **KNX CP IP** and try again. More information about changing the IP network configuration can be found in chapter 6.2.

6. 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 (chapter 7.1.). Then wait for about 5 or 10 seconds, refresh the browser and try again.

7. 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 (chapter 7.4.). When Boot Mode is active, the Web front-end looks like illustrated in Fig. 3. To run a firmware update procedure and/or exit Boot Mode the Web front-end Update tab must be used. Otherwise, after 10 min Boot Mode will be switched off automatically.

8. 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.

9. How can I find out the actual IP address of my **KNX CP IP**?

The Device Info tab of the Web front-end and the list of Discovered Interfaces in ETS both show the actual IP address.



Elsner Elektronik GmbH Control and Automation Engineering

Sohlengrund 16
75395 Ostelsheim
Germany

Phone +49 (0) 70 33 / 30 945-0 info@elsner-elektronik.de
Fax +49 (0) 70 33 / 30 945-20 www.elsner-elektronik.de

Technical support: +49 (0) 70 33 / 30 945-250