

APRICUM

DOCUMENTATION

UIM^{ip}



TECHNICAL AND APPLICATION DESCRIPTION

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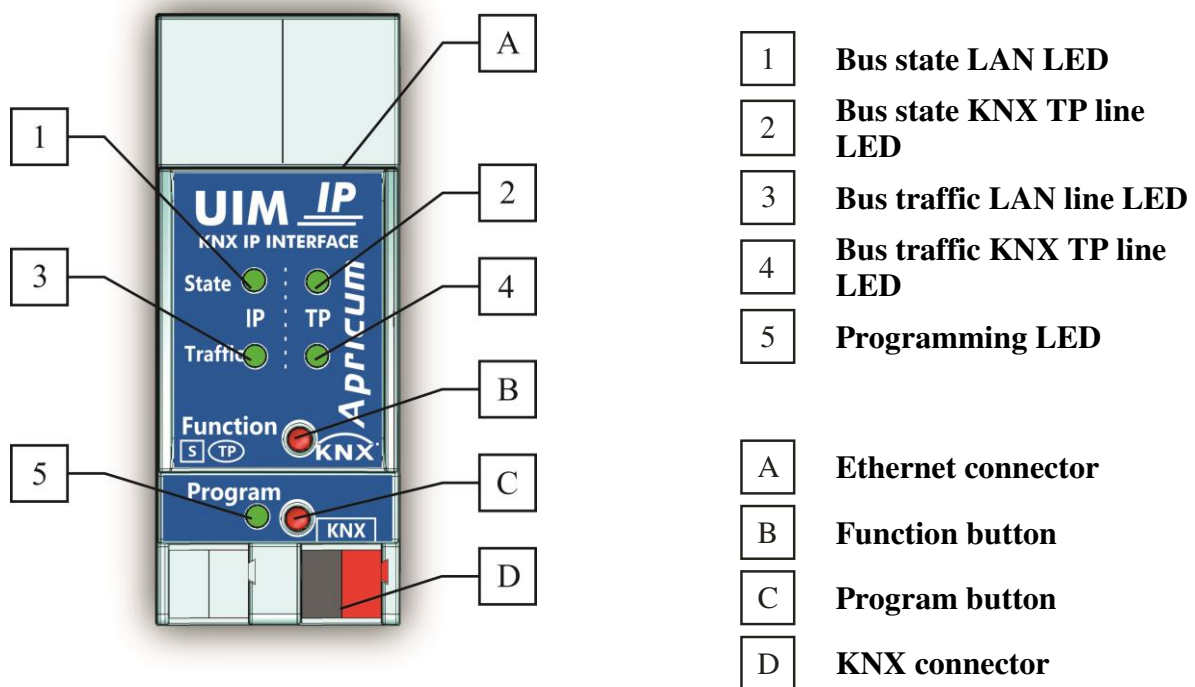
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2 UIMip PRODUCT DESCRIPTION

The Apricum IP interface **UIMip** is a tunneling¹ device and connects a personal computer to the KNX TP bus. The device uses no KNX communication objects for itself. With the ETS or with another KNX compatible commissioning tool the **UIMip** can be used as the programming interface. For this purpose the device provides up to four additional physical addresses² that can be used for tunneling connections.

Four LEDs and two buttons are located on the front panel as illustrated below. The device offers diagnostic features by displaying all operational states with combined LEDs (see [Operational Description](#)). The LEDs indicate details concerning the bus state, traffic on the KNX bus, error/faulty communication NACK, BUSY on the bus, etc.



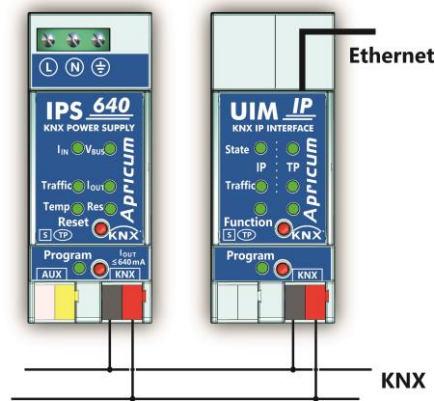
Picture 1: Front view

¹ Information basics about tunnelling and device management: The presence of the Internet Protocol (IP) has led to the definition of KNXnet/IP. KNXnet/IP provides the means for point-to-point connections like “KNXnet/IP Tunneling” for ETS and/or between a supervisory system and a KNX installation. The KNXnet/IP Device Management provides configuring KNXnet/IP devices via the KNX network effectively. Additionally, with this the time required for network configurations is reduced.

² Please note that in this document the term “physical address” means the “physical address” as well as the “individual address”. Both of these terms are used by the KNX organisation interchangeably. *In this document only the term “physical address” is used.*

3 APRICUM **UIMip** HIGHLIGHTS

- The **UIMip** works without external power supply.



Picture 2: Connection diagram

- The **UIMip** is one of the rare KNX IP interfaces on the market that supports the extended frame format and long telegrams up to **240 bytes (APDU)**. In combination with the Apricum line coupler “*MECtp*” long messages are made possible (e.g. for energy metering applications).
- With the ability to feature a tunneling protocol conversation, a connection point for the ETS or other tools to enable program commissioning and monitoring is provided (four parallel connections are possible; one separate address for each connection). The ETS address for tunneling is not necessarily the one which is already configured.
- The great advantage of tunneling is using LAN as a fast medium to exchange telegrams between the lines and/or areas.
- The **UIMip** is featuring a high internal amount of communication buffers being capable of smoothening peaks in the communication load course.
- Using a high internal amount of communication buffers is suitable for networks with a high bus load.
- UPnP is available to discover the device in an IP network. In terms of topology, this is only possible with a proper network installation. With the KNXnet/IP Search Request the ETS can discover the device as communication interface.
- The comfortable operation via a Web interface provides the option to modify a set of tunneling addresses of the device and an opportunity to switch the “Program Mode” on or off. Also the firmware can be updated via the [Web Front-End](#).
- The **UIMip**’s ETS database entries are available for the ETS3.0d and upward.
- The **UIMip** supports KNXnet/IP, ARP, ICMP, IGMP, HTTP, UPnP discovery, UDP/IP, TCP/IP, DHCP and AutoIP.

4 OPERATIONAL DESCRIPTION

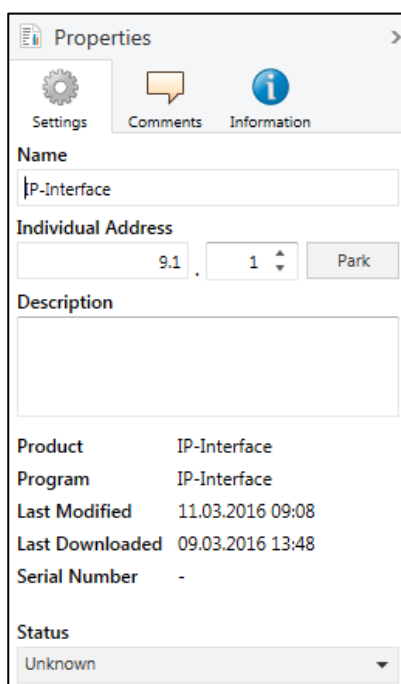
The **UIMip** features two different modes, the “Normal Mode” and the “Boot Mode”. In this chapter it is explained how to [assign the individual physical address](#) to the device and how to carry out a [factory reset](#) or a [firmware update](#).

4.1 NORMAL MODE


According either to the factory default settings or the latest parameter settings downloaded from the ETS (also other tools) in normal operating mode the **UIMip** operates as it is supposed to and LEDs 1, 2 light green.

	Green	Red
LED 1 Bus State LAN	On: LAN line OK Off: LAN line error	N.A.
LED 2 Bus State KNX	On: KNX line OK Off: KNX line error	N.A.
LED 3 Traffic LAN	Off	Blinking: transmission error LAN line
LED 4 Traffic KNX	Blinking: bus traffic KNX TP line	Blinking: transmission error KNX TP line
LED 5 Programming	N.A.	On: device in Boot Mode Blinking: LAN line error

4.1.1 PROGRAMMING BUTTON AND PHYSICAL ADDRESS ASSIGNMENT




Picture 3: Properties window

To download the desired physical address or a full ETS setting into the device, during the procedure the programming button () needs to be pressed. (The programming button is used to put the device into “Program Mode”). With the ETS the physical address can be assigned to the device by setting the desired address in the properties window of the ETS, starting the download and pressing the programming button. After assignment the device restarts itself. (A blinking red LED 5 indicates that the Ethernet cable is not properly connected.)

To commission the device a PC with ETS and an interface connection (IP, USB) to the databus is required. The device is supplied with the individual physical address 15.15.255. The KNX product database entry (available for ETS3 and higher) can be downloaded from our website or the KNX Online Catalog App.

4.1.2 FUNCTION BUTTON AND FACTORY RESET

The function button () is used to execute a factory reset of the **UIMip**. The factory reset is carried out by pressing the button for about 15 seconds (LEDs 1, 2 light orange). After release, pressing it again until all LEDs turn off resets all parameters to factory default settings (incl. physical address). Subsequently, after the automatic restart of the device LEDs 1, 2 light green again indicating the normal operation status.

1. Long press of the function button (≈ 15 s) in “Normal Mode”
2. Short press of the function button (≈ 3 s)

4.2 BOOT MODE AND FIRMWARE UPDATE

As described for the “Normal Mode” the same factory reset procedure applies when the device is in “Boot Mode”. Additionally, the **UIMip** exits the “Boot Mode” afterwards.

1. Long press of the function button (≈ 15 s) in “Boot Mode”
2. Short press of the function button (≈ 3 s)

When operating in “Boot Mode”, it is possible to update the **UIMip**'s firmware. For more detailed information concerning the update procedure please refer to the section [Update](#). In order to switch from “Normal Mode” to “Boot Mode” it is necessary to begin the firmware update procedure and use the “Request Update” button in the [Web Front-End](#):

1. Press the programming button in “Normal Mode”
2. Press the function button
3. Press the “Refresh” button in the Update tab of the Web front-end
4. Press the “Request Update” button

While being in “Boot Mode” LED 1, 2 and 5 have the states as described here:

LED 1 Bus State LAN	Keeps on lighting green
LED 2 Bus State KNX	Blinking green
LED 3 Traffic LAN	Blinking green
LED 5 Programming	Keeps on lighting red

In general, there are three options to switch from “Boot Mode” back to “Normal Mode”:

- Update the firmware (if you have a new firmware available for your **UIMip**).
- Cancel the update procedure and reset the application by pressing the “Abort” button.
- Wait 10 minutes until the device switches to “Normal Mode” automatically by itself.

4.3 KNX TELEGRAMS IN THE IP NETWORK

The **UIMip** can be used as an interface in a network installation field. In accordance with the KNXnet/IP protocol specification the **UIMip** sends telegrams from the KNX network to the IP network and vice versa. If the IP address is changed from the IP side it might happen that the ETS does no longer recognize the device. Then the connection cannot longer be established (Tunneling uses IP addresses!).

Please note:

- *As a precaution, always run a restart or change the IP address from the TP side.*
- *If there are problems with the IP address assignment please ask your administrator.*
- *According to the topology, the additional physical addresses for tunnelling always have to be assigned in the range of sub line addresses. For more information about the additional tunneling addresses please refer to [Tunneling Addresses \(Additional Physical Addresses\)](#).*

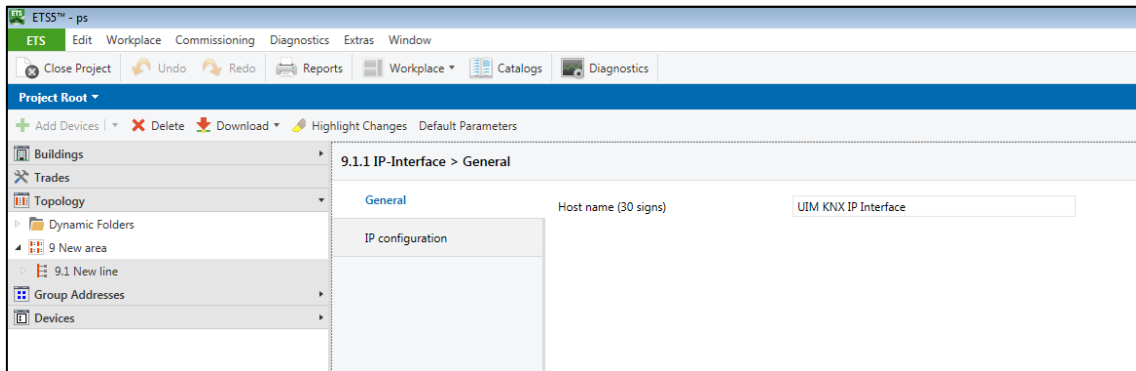
5 APPLICATION DESCRIPTION

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

6 ETS-PARAMETERS

All screen shots in this chapter represent the **UIMip** 's data base entry in the ETS5.

6.1 GENERAL

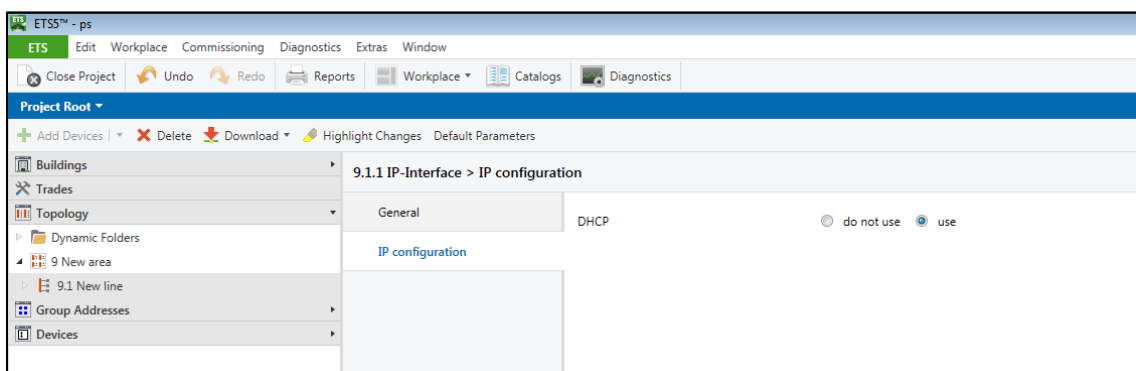


Picture 4: General

ETS-Text	Selection [Factory default]	Comment
Host name	UIM KNX <i>IP</i> Interface [KNX IP Interface]	Field to enter the device name (30 signs max.) providing an easy search of the device with the ETS or any KNXnet/IP visualisation system.

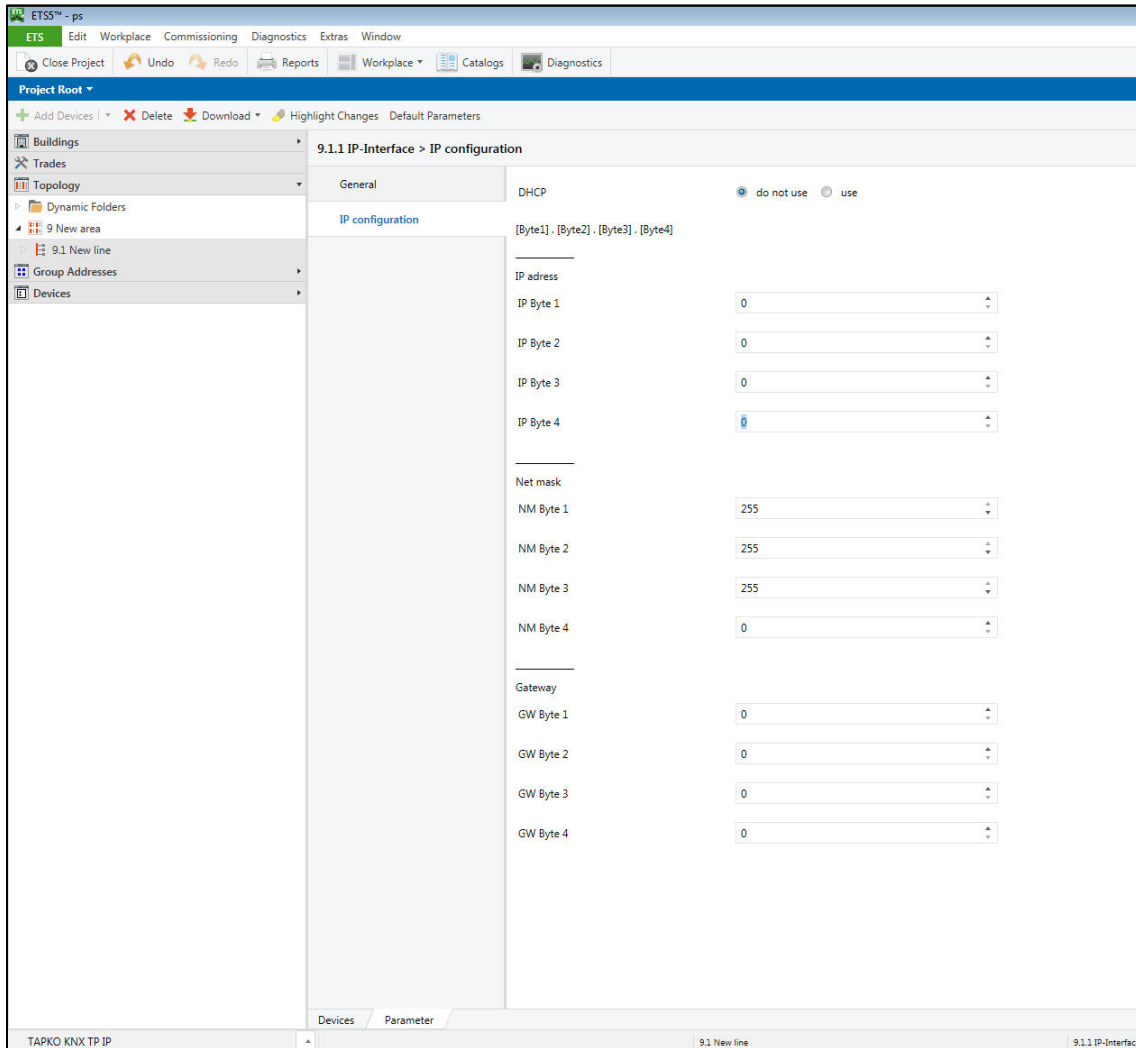
Note: *If the Host name is changed by an ETS4 download, a manual restart is recommended.*

6.2 IP CONFIGURATION



Picture 5: IP configuration

ETS-Text	Selection [Factory default]	Comment
DHCP	use do not use [use]	If DHCP is used, no parameterisation of the IP parameters must be done. If DHCP is not used, the IP parameters must be set manually (see following picture and table).



Picture 6: Manual configuration of the IP address

ETS-Text	Selection [Factory default]	Comment
DHCP configuration	use do not use [use]	If DHCP is not used, the following IP parameters must be set manually.
IP address	0-255.0-255.0-255.0-255 [0.0.0.0]	IP Byte 1 to 4: manual input.
Net mask	0-255.0-255.0-255.0-255 [255.255.255.0]	NM Byte 1 to 4: manual input.
Gateway	0-255.0-255.0-255.0-255 [0.0.0.0]	GW Byte 1 to 4: manual input.

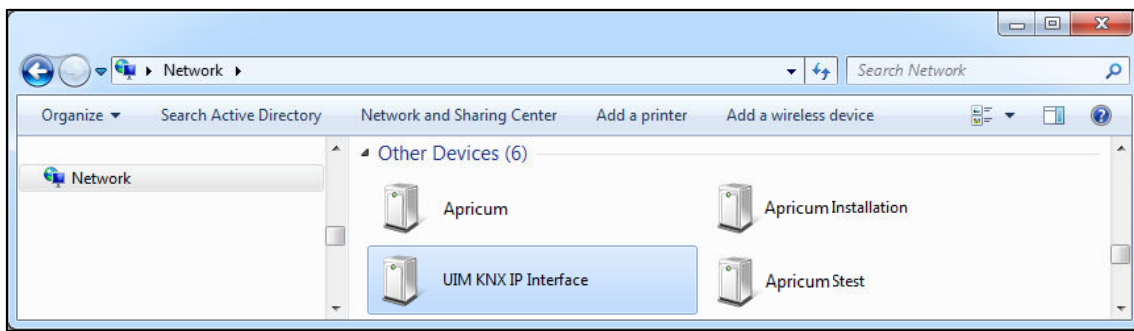
Note: *The configuration of the IP connectivity (Host name, IP address, KNX multicast address) is not updated automatically after an ETS download. To get these values updated it is essential executing a manual device restart.*

7 WEB FRONT-END

7.1 ACCESSING THE DEVICE

To [download the firmware into the device](#) and/or to [adjust the tunneling addresses](#) please use the Web front-end. Therefore, to access the device it has to be opened as a Microsoft Windows (Version 7 or higher) UPnP network device. Alternatively, one can use either the IP address or the MAC address as URL base in the web browser.

7.1.1 VIA THE WINDOWS NETWORK WITH UPNP



Picture 7: UPnP network device

In the event that the network device is not visible a manual restart is recommended. Then wait until the device gets visible in the list of network devices. If it is still not visible make sure that the UPnP function of the network is enabled.

7.1.2 VIA THE MAC ADDRESS

The MAC address is printed on a label of the **UIMip** housing. Use this MAC address of the **UIMip** without brackets [] as described here:

http://knx-ipif-[XX][YY][ZZ]:8080/
[XX] = byte 4 of the MAC address
[YY] = byte 5 of the MAC address
[ZZ] = byte 6 of the MAC address

Example:

- The MAC address is “**D0-76-50-11-22-33**”.
- Enter the URL “**http://knx-ipif-112233:8080/**” into the web browser’s address bar.

7.1.3 VIA THE IP ADDRESS

Example:

- The **UIMip** has an IP address of “**192.168.1.32**”.
- Enter the URL “**http://192.168.1.32:8080/**” into the web browser’s address bar.

7.2 DEVICE INFO

If the **UIMip** has been working in “Normal Mode”, the **Device Info** tab is the first tab you might see when you reach the Web front-end. Here you get all general information about the current settings of the device.



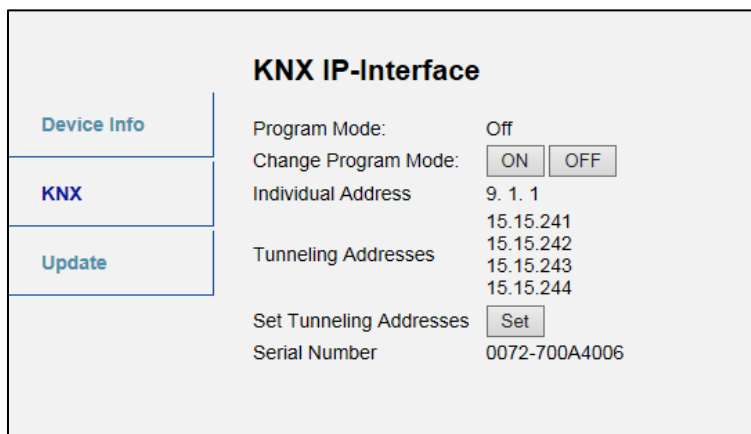
The screenshot shows the 'Device Information' page of the Apricum KNX-IP Interface. The page has a header with the 'APRICUM' logo and 'KNX-IP Interface'. On the left, there are three tabs: 'Device Info' (selected), 'KNX', and 'Update'. The main content area displays the following information:

Status:	normal operation
DHCP:	true
IP Address:	192.168.1.32
Subnet Mask:	255.255.255.0
Gateway:	192.168.1.201
DNS:	192.168.1.2
Http Port:	8080
MAC Address:	D0-76-50-00-0B-83
Hostname:	KNX-IPIF-000B83
Description:	UIM KNX IP Interface
UDN:	uuid:5f42333a-6308-1f55-4a51-d07650000b83
Application SW version:	2.0.3
Bootloader SW version:	2.2

Picture 8: Device info

7.3 KNX

Under the **KNX** tab the “Program Mode” of the **UIMip** can be turned “On” or “Off”. This function is similar to the programming button function. With this the regarded device is easy to distinguish from other interfaces in the same IP network. It can also be noticed what the particular device is currently processing (after a change in the settings, for example). With the “Set” button (and the ETS) it is possible to set the [Tunneling Addresses \(Additional Physical Addresses\)](#). Moreover, here the serial number of the device is visible.



The screenshot shows the 'KNX IP-Interface' page of the Apricum KNX-IP Interface. The page has a header with the 'KNX IP-Interface' title. On the left, there are three tabs: 'Device Info', 'KNX' (selected), and 'Update'. The main content area displays the following information:

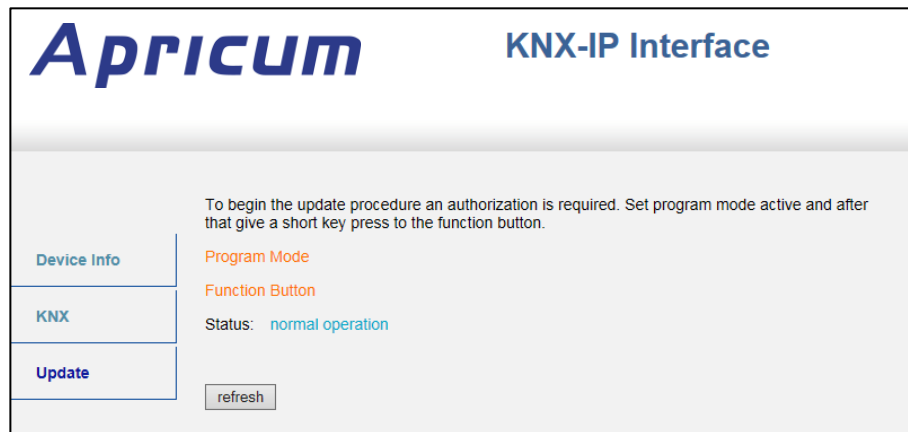
Program Mode:	Off
Change Program Mode:	<input type="button" value="ON"/> <input type="button" value="OFF"/>
Individual Address	9. 1. 1
Tunneling Addresses	15.15.241 15.15.242 15.15.243 15.15.244
Set Tunneling Addresses	<input type="button" value="Set"/>
Serial Number	0072-700A4006

Picture 9: KNX

7.4 UPDATE

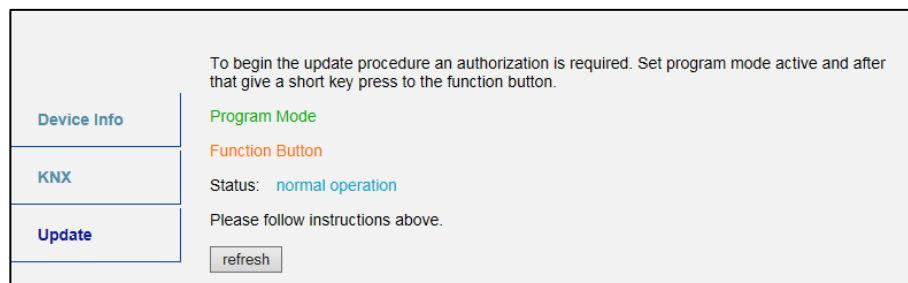
Under the **Update** tab the firmware of the device can be updated. If the device is in “Normal Mode”, proceed with following steps 1 to 5. If the device is already in “Boot Mode”, follow the instructions shown in the Web front-end and continue with step 3 (refresh, request update).

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



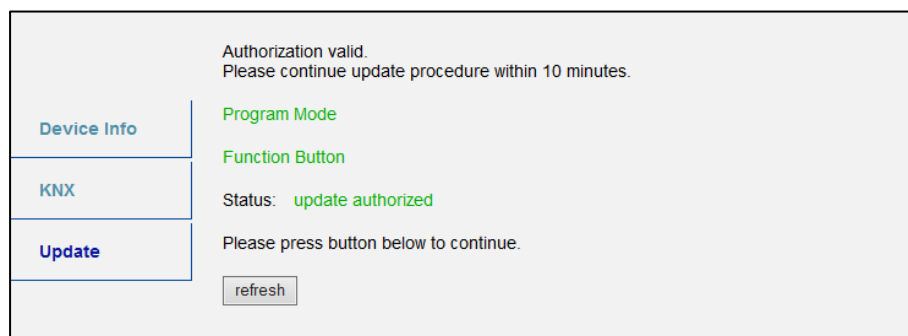
Picture 10: Update

Step 2: Either use the “Change Program Mode” function in the KNX tab or press the programming button once.



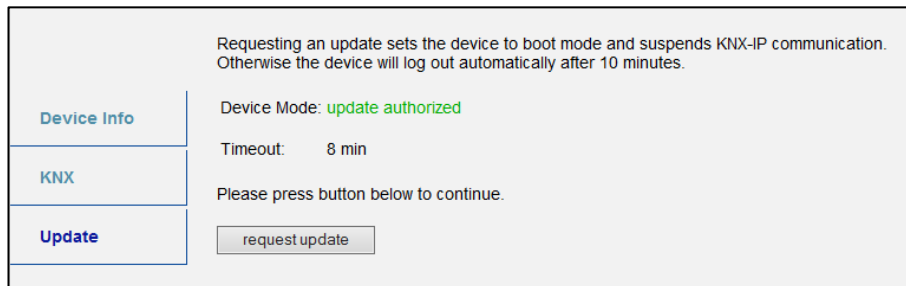
Picture 11: Program mode

Step 3: After the “Program Mode” is turned to “On” give a short key press to the function button. Then the “refresh” button in the Update tab needs to be pressed. Alternatively, refresh the browser.



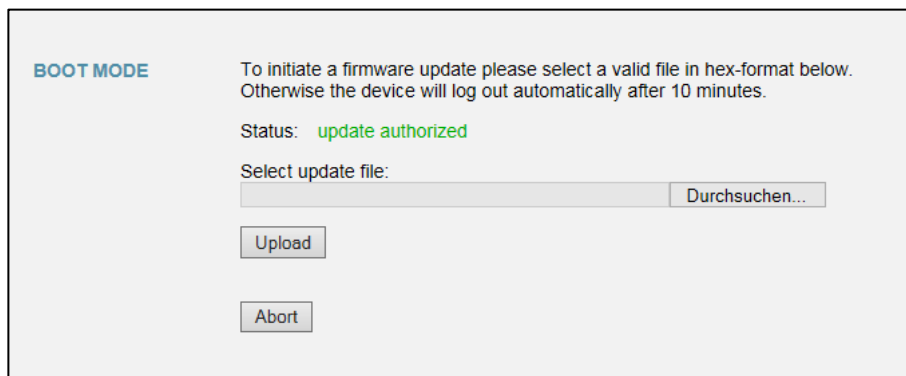
Picture 12: Update authorized

Step 4: Then the „request update“ button appears. Press it to select the update file and enter “Boot Mode”.



Picture 13: Request update

Step 5: The device now switches to “Boot Mode”. The update file can be selected and uploaded. Pressing the „Abort“ button cancels the firmware update procedure and the device **exits the “Boot Mode”**.

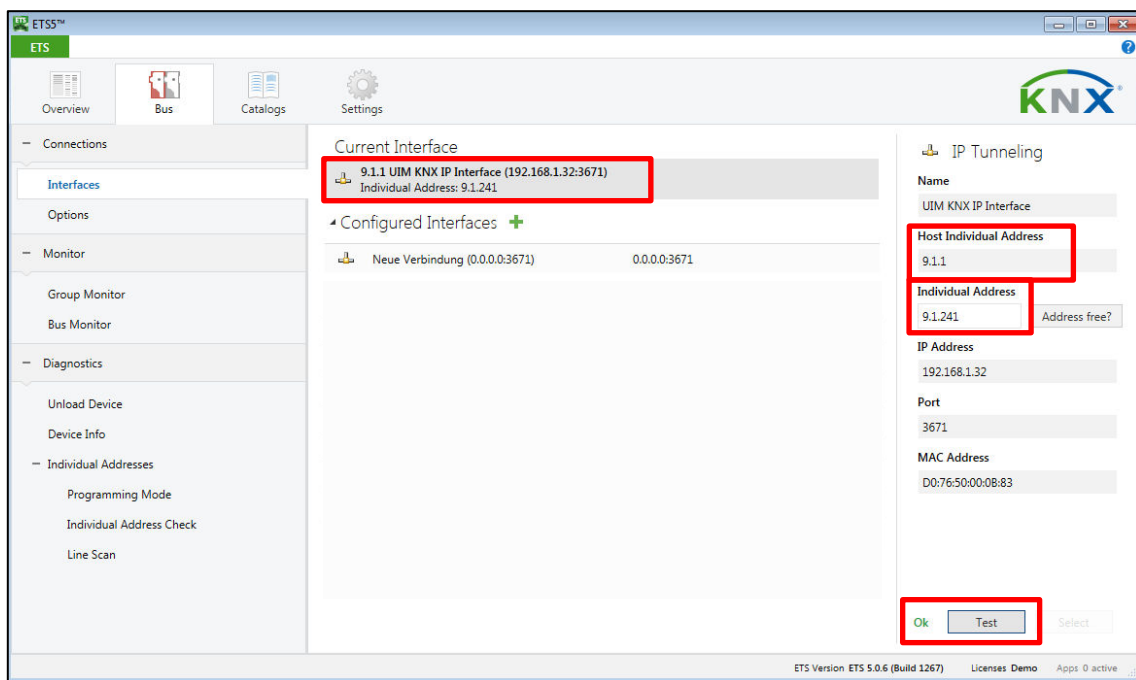


Picture 14: Select update file

7.5 TUNNELING ADDRESSES (ADDITIONAL PHYSICAL ADDRESSES)

According to the host's physical address assignment (see [Programming Button and Physical Address Assignment](#)) the first additional physical address of the **UIMip** can only be set with the ETS. **Please make sure:** The additional physical addresses for tunneling and the host's physical address have to be different.

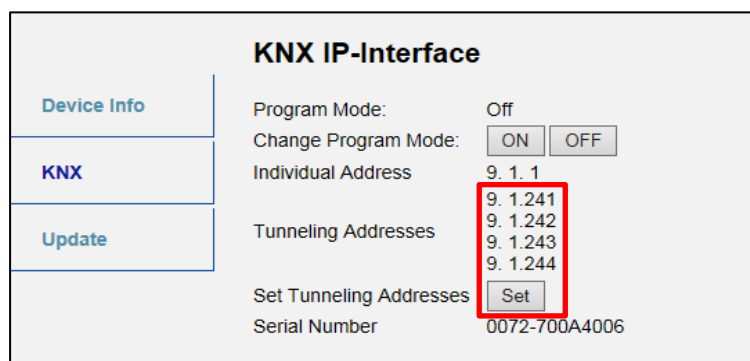
Step 1: Open the Bus tab in the ETS and select the UIMip as the "Current Interface". In the "IP Tunneling" window the already assigned host physical address can be read.



Picture 15: First additional physical address (tunnelling address)

Step 2: Type the additional physical address into the "Individual Address" field. Click on the "Test" button. If the green **Ok** appears, the first tunneling address is already set. In this example it is set to "9.1.241".

Step 3: Now open the KNX tab of the Web front-end. Click on the "Set" button to change the remaining three tunneling addresses basing on the first tunneling address as follows.



Picture 16: Additional tunneling addresses

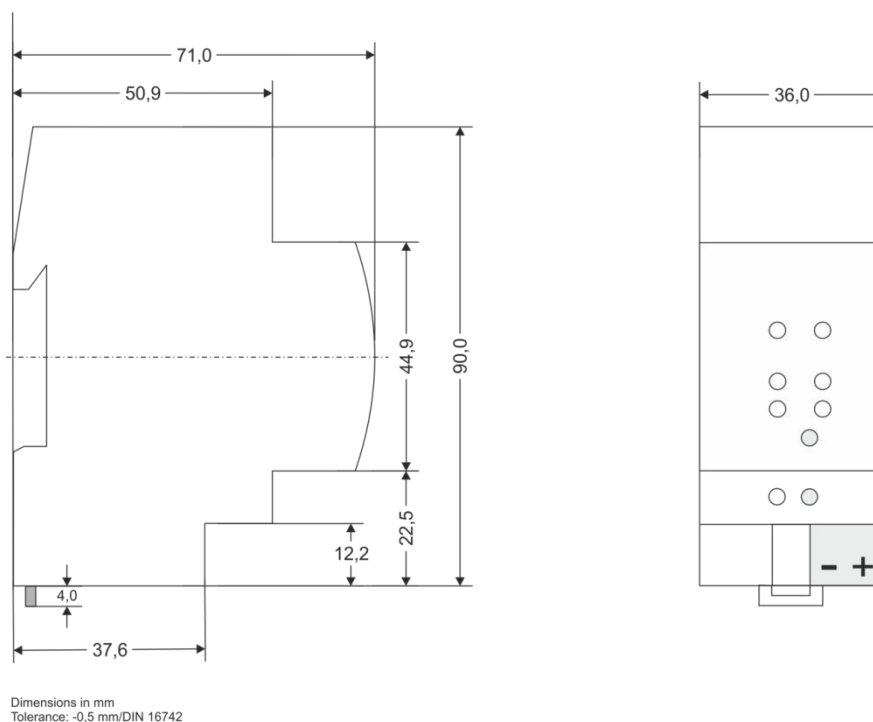
8 STATE OF DELIVERY

With the following default factory settings the **UIMip** is delivered:

Marking/Design	UIMip
Physical address	15.15.255
Physical address for tunneling connections	15.15.241 15.15.242 15.15.243 15.15.244
<i>IP configuration</i>	
IP address assignment	DHCP/AutoIP
IP routing multicast address	224.0.23.12

9 TECHNICAL DRAWINGS

All dimensions shown here are specified in mm. The device width is 2 modules at 18 mm.



Picture 17: Dimension drawings

10 TECHNICAL DATA



Warning: device may not be connected to 230V!

Marking/Design	UIMip	
Current consumption	< 40 mA	
Connections	IP line: RJ45 socket for 100 Mbit and 10 Mbit BaseT, IEEE 802.3 networks KNX line: KNX bus WAGO connector (red/black), screwless for single-core cable Ø 0,6...0,8 mm	
Display elements	LED Bus state LED "Program Mode"	LED Traffic LED Error
Control elements	Function button, Program button	
Mounting	35 mm top-hat rail (TH35) according to IEC60715	
Protection type	IP20 according to IEC60529	
Pollution degree	2 according to IEC60664-1	
Protection class	III according to IEC61140	
Overtoltage category	II according to IEC60664-1	
Approbation	KNX-certified according to ISO/IEC14543-3	
CE-Marking	According to low voltage and EMC guidelines Compliance: EN50428, EN50581, EN61000-6, EN62479	
Power supply	Safety extra low voltage, 21...30V DC (SELV)	
Housing colour	Plastic PA66 housing grey	
Dimensions	H = 90 mm, W = 36 mm (2 modules), D = 71 mm Mounting depth = 64 mm	
Weight	70 g	
Device temperature	Working temperature: -5...45 °C Storage temperature: -20...60 °C	
Ambient humidity	5...93 %, non-condensing	

11 LEGAL NOTICE

Lw IP is used in developing the *UIMip*.

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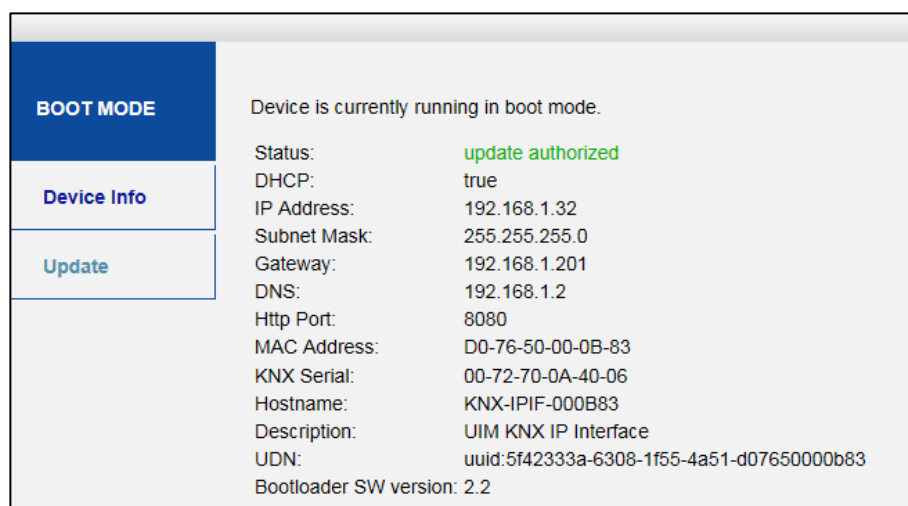
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12 FAQ

- Q: The firmware update process has finished successfully but the device doesn't react now.
A: Turn the power off and on manually (dis-/reconnect bus line). Try to restart it this way.
- Q: Is it Ok to connect and disconnect the Ethernet quickly?
A: No! You shouldn't do this. To observe, the LAN status LED will light green for a few seconds and then the device will reset.
- Q: What does the programming LED show when the Ethernet cable is not connected?
A: As long as the Ethernet cable is not connected properly the programming LED blinks red.
- Q: I have disabled DHCP and assigned a correct IP configuration to the **UIMip**. But I cannot reach the Web front-end anymore. Why?
A: Manually reset the **UIMip** and try again. For more information about changing the configuration of the IP network please refer to [IP Configuration](#).
- Q: I tried to reach the Web front-end of my **UIMip** but I wasn't successful. What can I do?
A: Make sure the "http://..." matches your device IP along with the port address "8080". Or type the MAC address into the browser's address bar in exactly the way as explained (see [Via the MAC Address](#)). Then wait (for about 5-15 seconds), refresh your browser and try again.
- Q: Is it possible to reach the Web front-end when the device is already in "Boot Mode"?
A: Yes, it is. The Web front-end is accessible in both "Normal Mode" and "Boot Mode" (see [Update](#)). In this case the Web front-end will look like illustrated next. You can use the **Update** tab to update the firmware and/or to [exit the "Boot Mode"](#).



Picture 18: Boot mode

- Q: I was able to reach the Web front-end. But when I try to use its tabs or options again my browser only shows a connection error to me. What can I do?
A: Refresh the browser window. The Web front-end will show up again.