Tunneling server for IPX/S 3.1.1 devices
Settings and applications

GPG BUILDING AUTOMATION

Doc.-Type:	Step-by-Step Guide		Doc.-Nr.	9AKK107045A4278	Doc.-Version:	1.1
Department: Global Support			Author:	Kevin Klemm		
System:	i-bus KNX		Product:	IPR/S 3.1.1, IPS/S 3.1.1		
Page:	1/16		Date:	21.09.2017		

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Introduction

This document explains the settings for the tunneling server and describes step by step how to use them.

The KNX system generally has two types of communication on Ethernet basis: KNXnet/IP routing and KNXnet/IP tunneling, both use the UDP protocol.

Tunneling has the goal of accessing the KNX bus via Ethernet, e.g. for commissioning, error diagnostics or visualization. A point-to-point connection is established between a PC and the IP router. This can be done locally over LAN or over the Internet.

Objectives of the document

– This description is intended for commissioning.
– Tunneling has the goal of accessing the KNX bus via Ethernet, e.g. for commissioning, error diagnostics or visualization.

Content

Fig. 1 - IPR/S 3.1.1

Fig. 2 - IPS/S 3.1.1

1. Tunneling settings in ETS3, ETS4 and ETS5

After programming the five integrated tunneling servers in the ETS and downloading the application in the IPR/S 3.1.1, the following steps are necessary for the configuration of these tunneling servers. A tunnel is only used when working with the KNX bus, e.g. Group monitor.

- ETS3

The following images describe how to configure a tunnel for the IP router IPR/S 3.1.1 or the IP interface IPS/S 3.1.1 in the ETS3.

1.

2.

4.

5.

3.
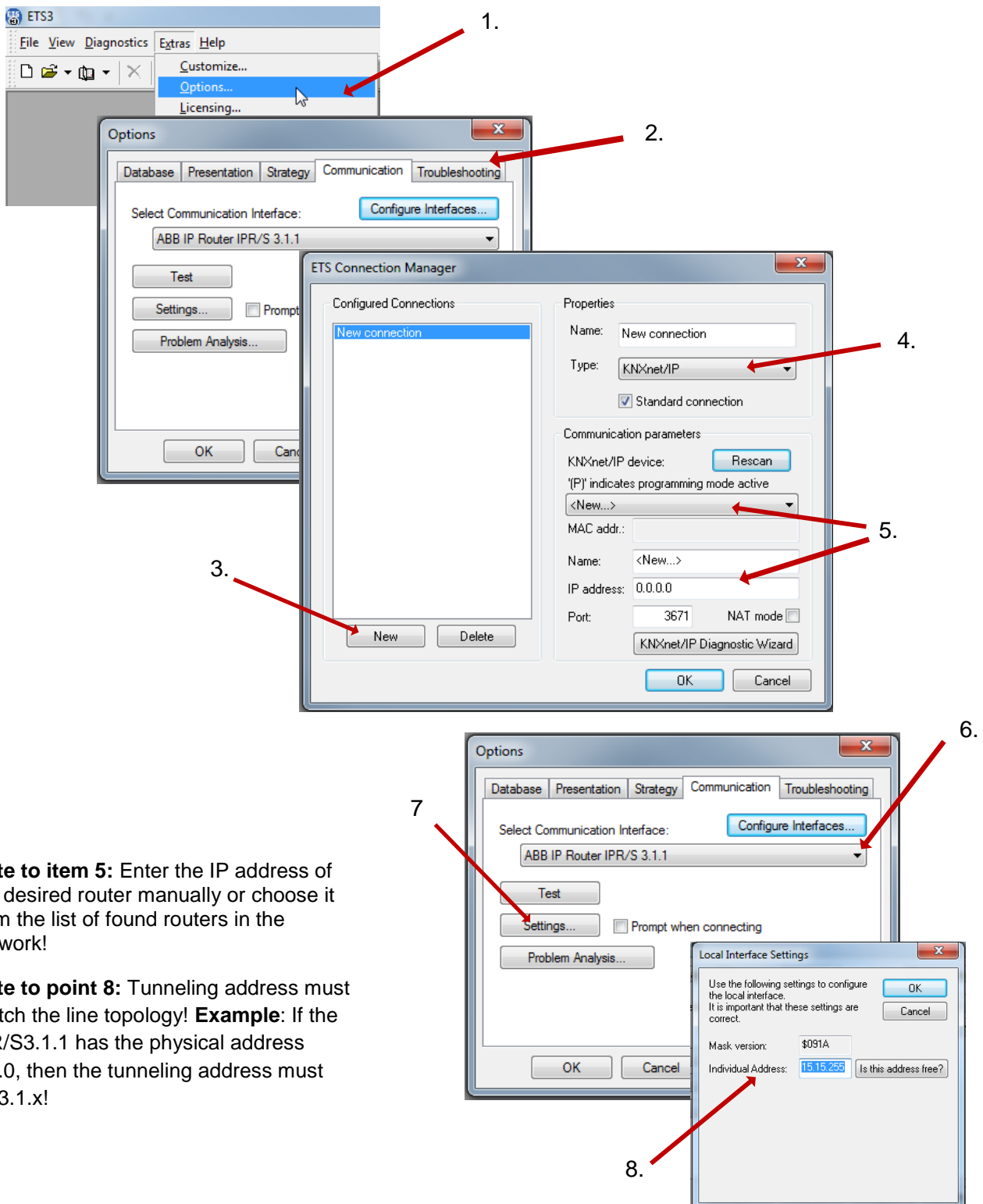
Note to item 5: Enter the IP address of the desired router manually or choose it from the list of found routers in the network!

Note to point 8: Tunneling address must match the line topology! **Example**: If the IPR/S3.1.1 has the physical address 3.1.0, then the tunneling address must be 3.1.x!

6.

7.

8.

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Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 3/16

Notes on NAT mode (third image - ETS Connection Manager): The NAT-mode (Network Address Translation) is a common application in network technology. If there are several computers connected to one DSL router with internet access, NAT can be used. For this the DSL router must be NAT-capable. In combination with ETS and KNXnet/IP tunneling, the NAT mode can be activated to support remote access to the IP router.

- ETS4

The next images show the settings in ETS4.
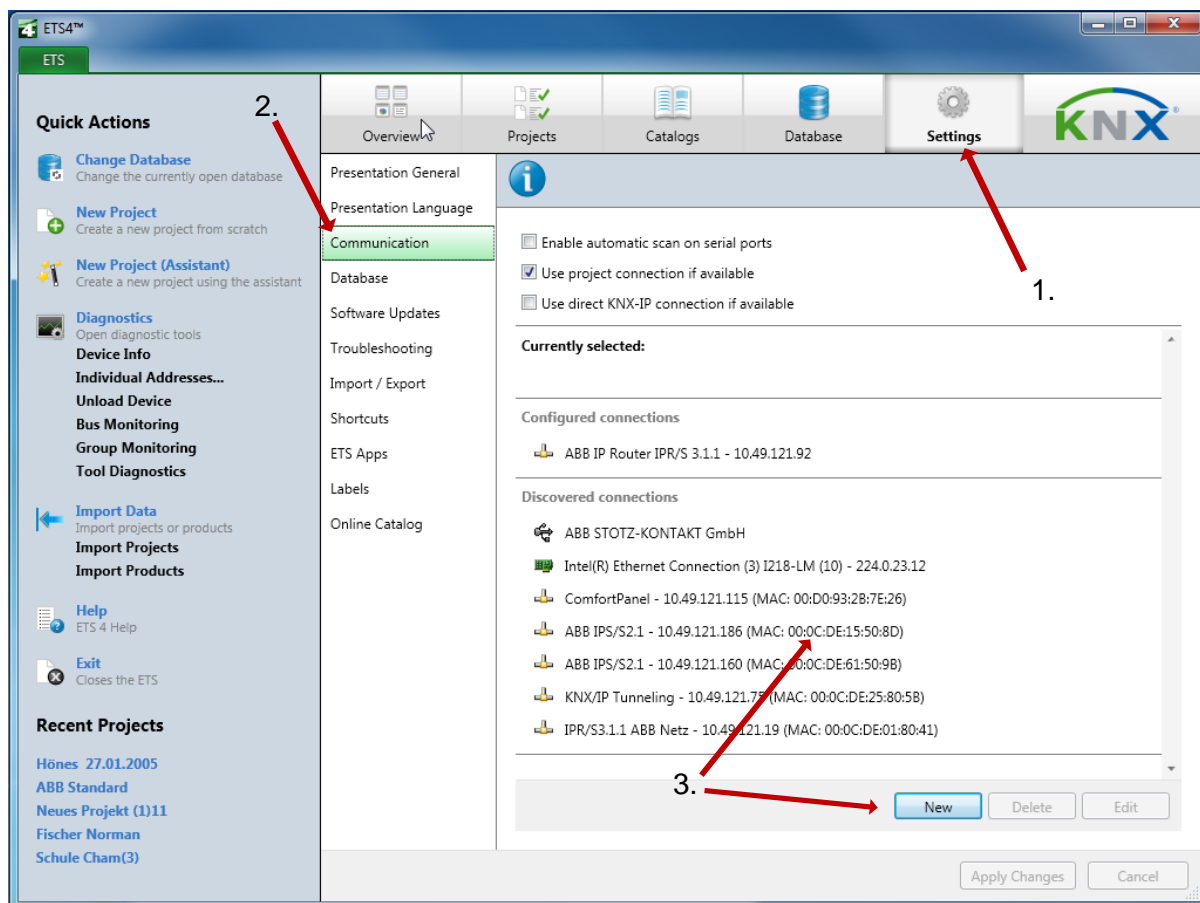
Note to point 3: Here, either one of the found connections can be selected or a new connection can be configured.

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Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 4/16

If a new connection is required, this dialog box opens.

- Point 4: Enter a meaningful name, so that the router can be found faster in the KNX installation

- Point 5: Select the type "KNXnet/IP"
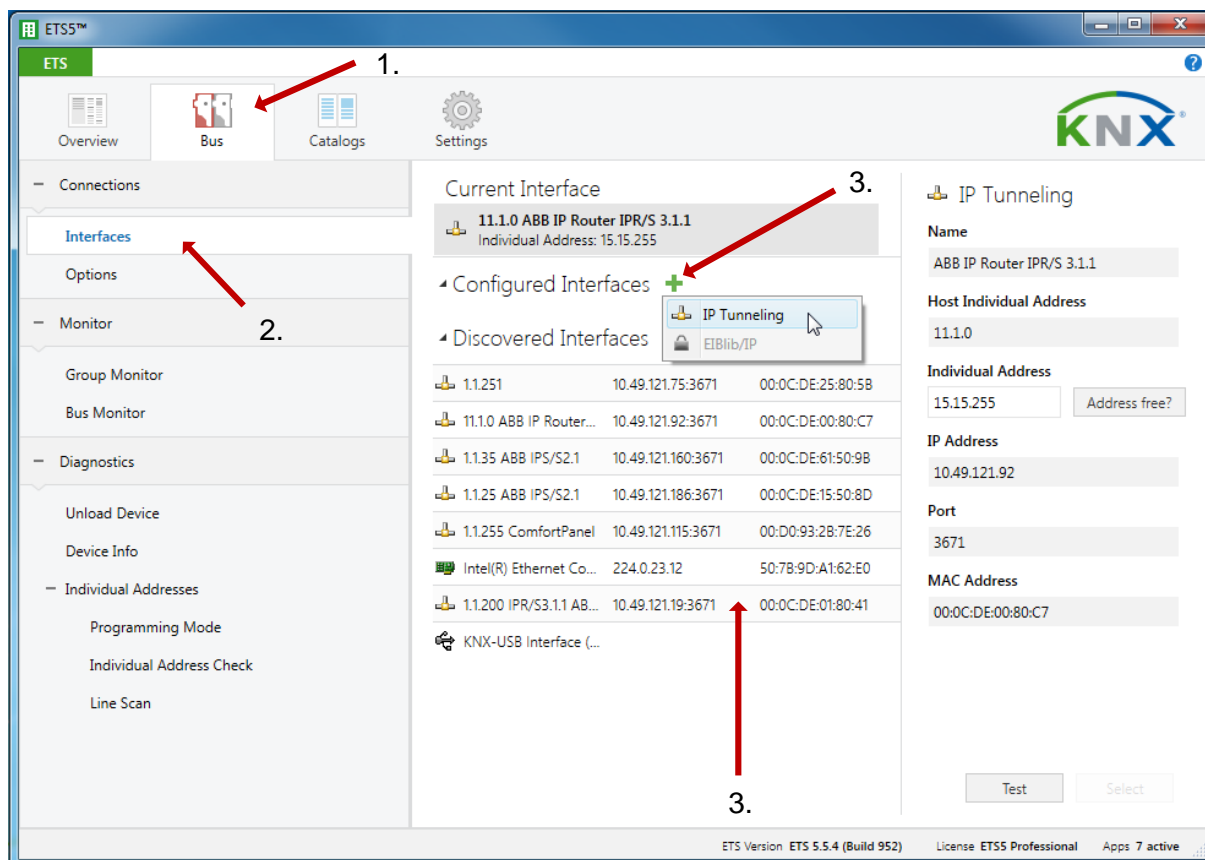
- Point 6: Enter the IP address
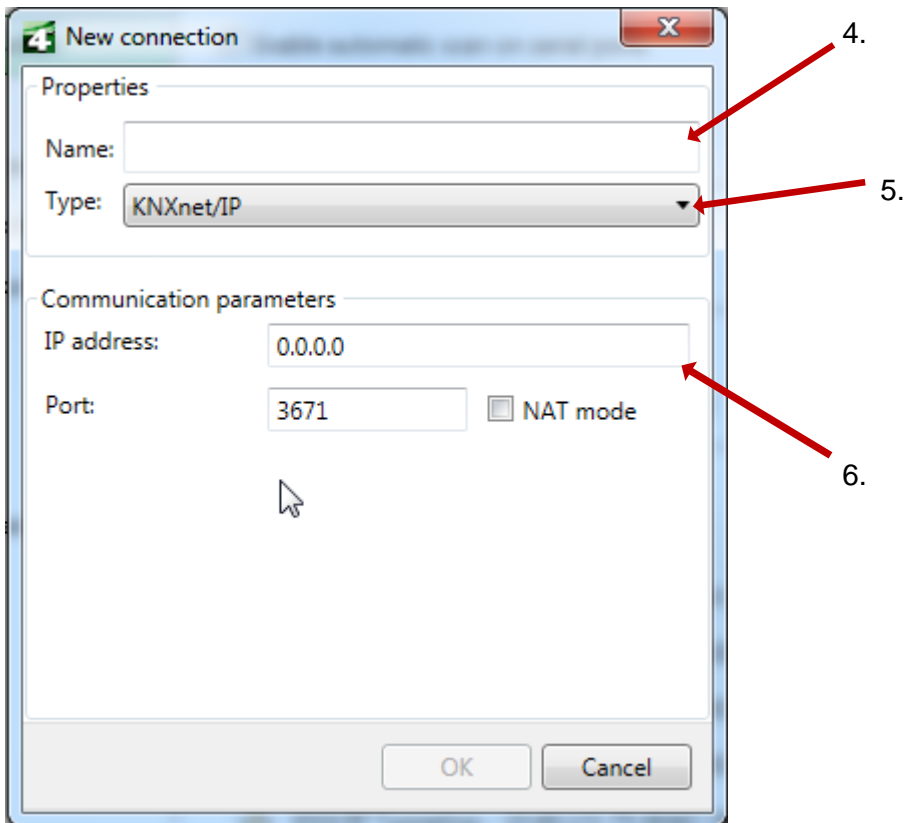
In the next picture the ABB IP Router IPR/S 3.1.1 with the IP address 10.49.121.46 was selected from the found connections. This will appear below in the configured connections.
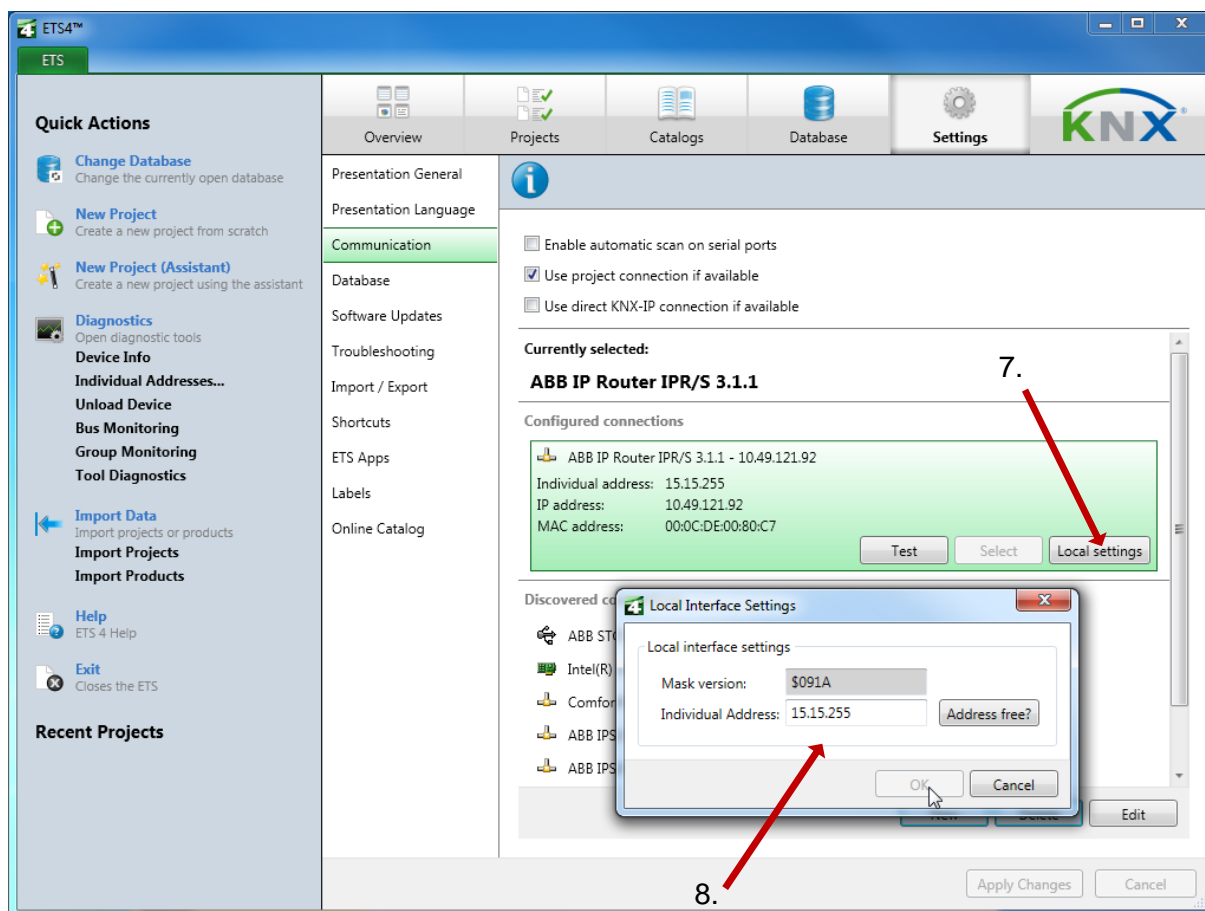
Note to point 8: Tunneling address must match the line topology!

Note: The ABB IP Router IPR/S 3.1.1 and the IP interface IPS/S 3.1.1 support both group monitor operation and bus monitor operation during a tunneling connection! The previous version of the IP router IPR/S 2.1 supported only the group monitor operation.

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Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 6/16

- ETS5

Images of the settings in the ETS5:

Note on point 3: in the ETS5 a found connection can be selected or a new connection can be configured.

Note: The type KNXnet/IP no longer must be selected in the ETS5. The IP Tunneling suggestion is shown directly on the right side of the window. USB and IP routing is automatically recognized in the ETS5 and cannot be created!

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This version is from the 21.09.2017

Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 7/16

If a new connection is required, the "Properties window" of the new connection opens in the same window.

– Point 4: Enter a meaningful name so that the router can be found faster in the KNX installation

– Point 5: Enter the IP address in the "Server" field

– Click on the "Select" button to set the connection as the present interface
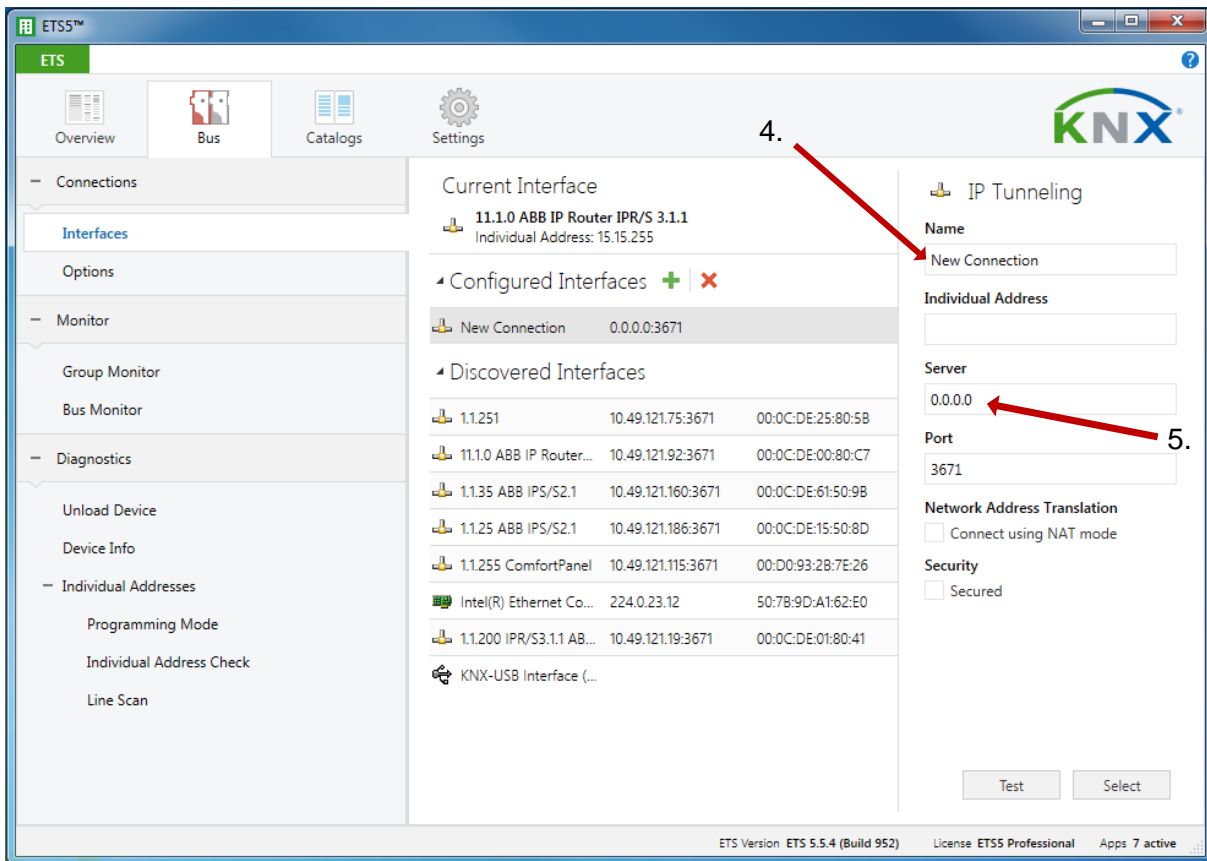
In the next picture the ABB IP Router IPR/S 3.1.1 with the IP address 10.49.121.46 was selected from the found connections. This will appear below under the "Current Interface" view.
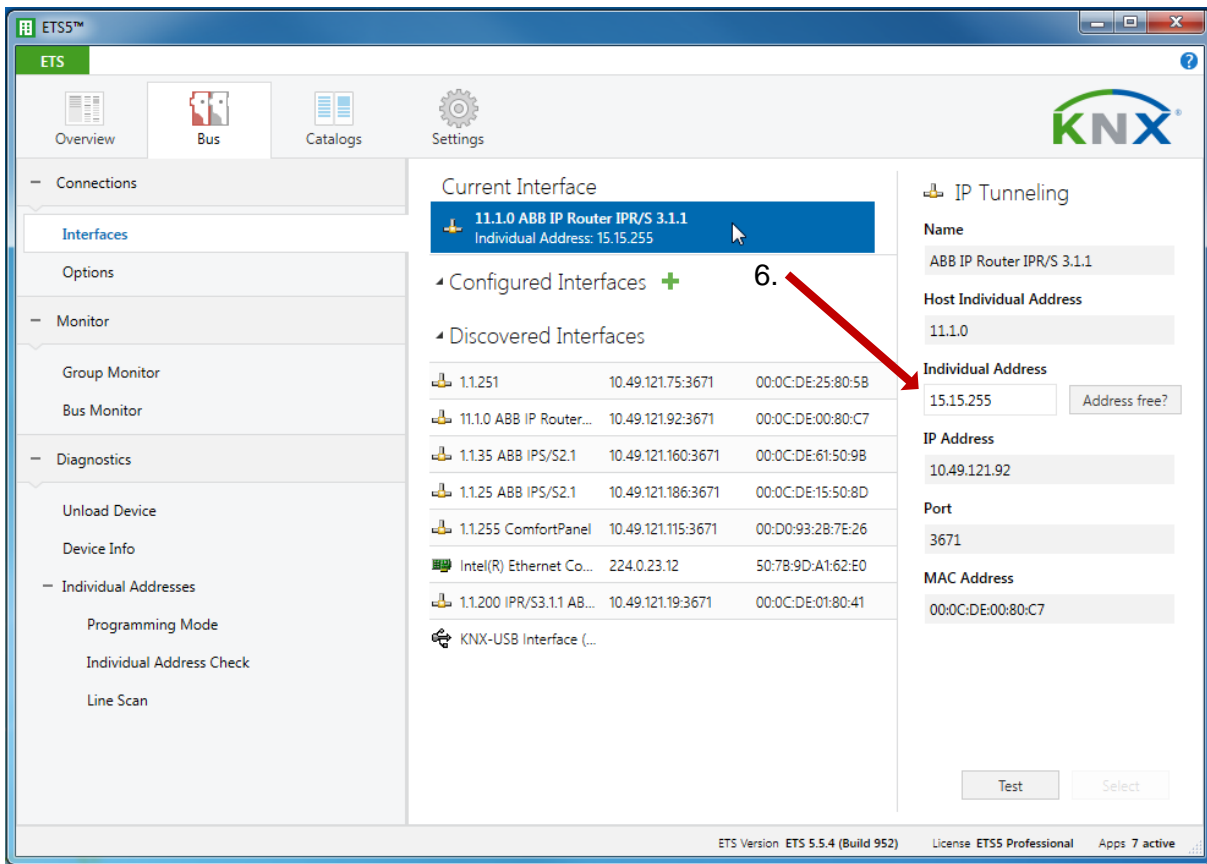

Note to point 6: The tunneling address must match the line topology!

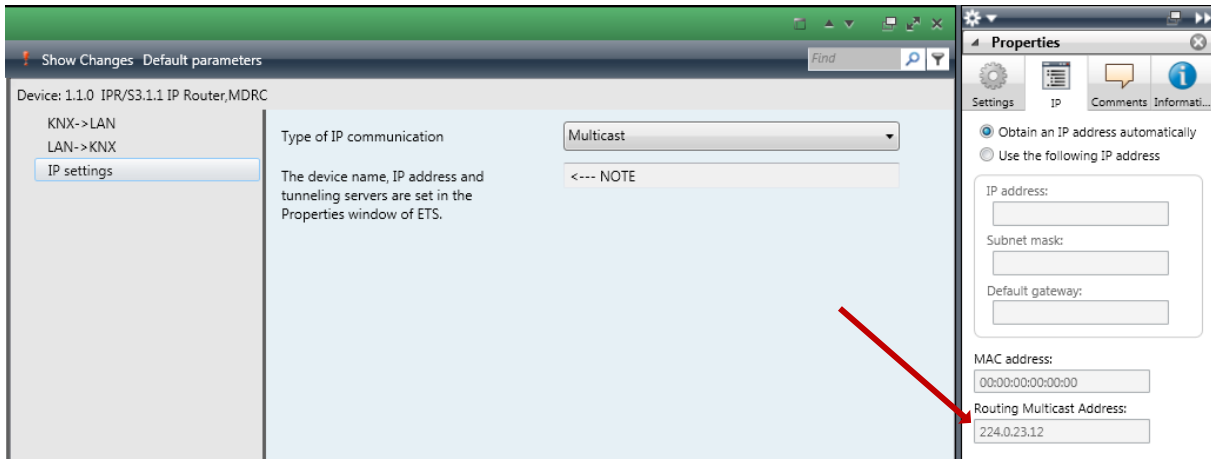## 2. Routing multicast address - settings in ETS3, ETS4 and ETS5

If the communication between the routers must work as a standard via multicast, this section explains the settings for the routing multicast address for the IPR/S 3.1.1.

The following images show the configuration of multicast address on the IP router IPR/S 3.1.1 in the ETS3.
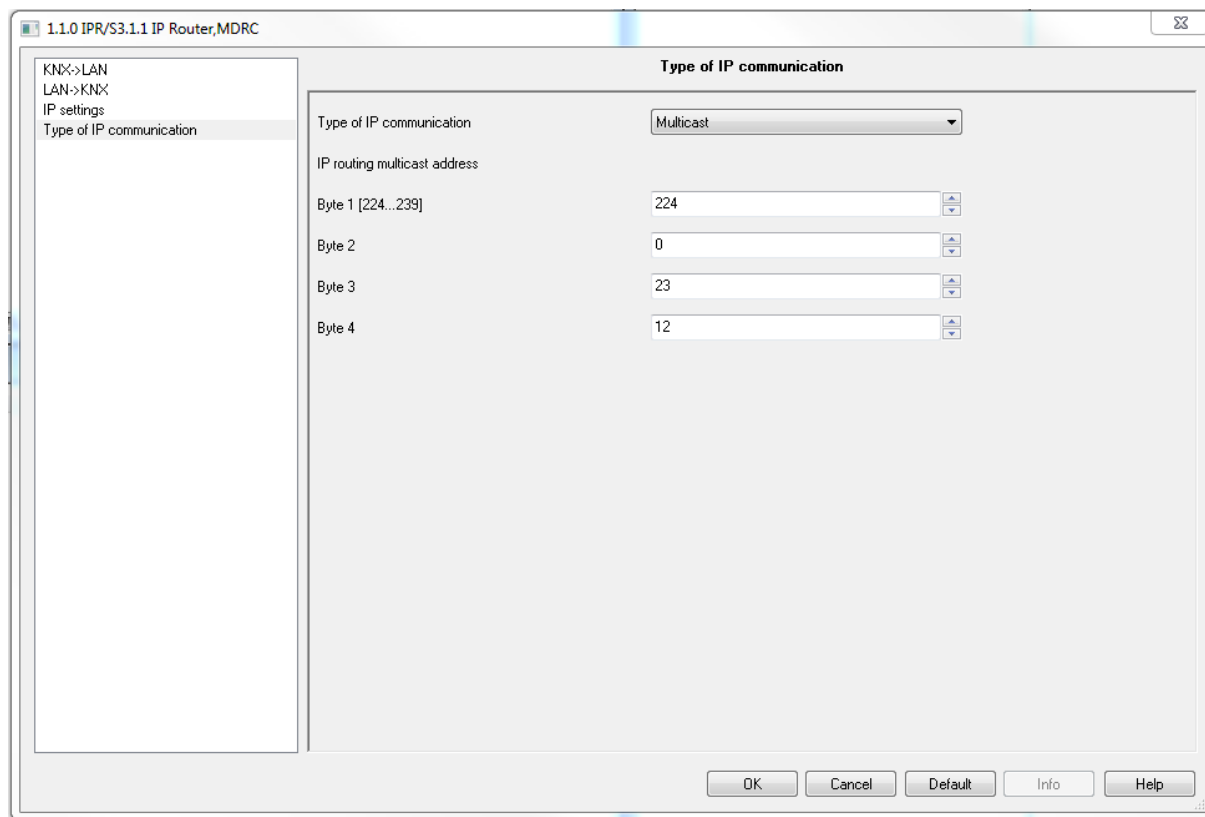
In the ETS3, a multicast address cannot be set for the whole project. The multicast address must be set separately for each IP router via the parameter page, but only if the default address 224.0.23.12 is to be changed. If all IP routers are to be operated on the same network but do not communicate with each other, then a different multicast address must be entered for each IPR/S 3.1.1.

Different from ETS3, in the ETS4 and the ETS5 a multicast address can be set for the whole project. That means there is no possibility to configure in the device parameters the multicast address. You can only select the IP communication type "Multicast" or "Unicast". In the Properties window (under the tab IP) in the ETS, the routing multicast address is displayed in gray.

Set the multicast address in the ETS4 on the backbone line.

After clicking on the range line "0.0", the Routing Multicast address appears in the ETS in the Properties window (under the Settings tab). There you can set the address for all KNX / IP devices. After a change in this field, all grayed-out routing multicast addresses on the devices are automatically updated by the ETS.

The ETS5 works almost identical to the ETS4. However, in the ETS5, click the "Topology" button to change the routing multicast address. Here, too, only multicast or unicast communication is to be selected in the device parameters. The multicast address is also grayed out as in ETS4.

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This version is from the 21.09.2017

Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 11/16

1.1.0 IPR/S3.1.1 IP Router,MDRC > IP settings

KNX->LAN		
LAN->KNX	Type of IP communication	⦿ Multicast ◯ Unicast
IP settings	The device name, IP address and tunneling servers are set in the Properties window of ETS.	<--- NOTE

Properties

Settings | IP | Comme... | Informa...

⦿ Obtain an IP address autom...
◯ Use a static IP address

MAC Address
Unknown

Routing Multicast Address
224.0.23.12

As mentioned above, set the multicast address on the topology.

Topology

+ Add Areas | ▼   ✕ Delete   ⬇ Download | ▼   ⓘ Info ▼   ↻ Reset   ▼   Search 🔍

🗏 Topology
 ▷ 📁 Dynamic Folders
 ▲ 🗏 1 New area
  ▲ ⫶ 1.1 New line
   ▷ 🗖 1.1.0 IPR/S3.1.1 IP Router,MDRC

Area ▲	Name	Description
1	New area	

1.

2.

Properties

Settings | Comments | Information

Backbone Name
Backbone area

Description

Status
Unknown

Backbone Medium
IP

Network Latency
WAN (< 2s)

Multicast Address
224.0.23.12

Security
Automatic

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Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 12/16

3. Unicast settings for the IP router IPR / S 3.1.1

If it is not possible to select the IP communication type "Multicast" for network technology reasons, the IP routers can also communicate via the IP communication type "Unicast". In contrast to the predecessor model IPR / S 2.1, the unicast groups are configured in the ABB i-bus tool. In the communication type "Unicast", the KNXnet / IP routing of the IPR / S 3.1.1 is switched off. The IP router IPR / S 3.1.1 can send telegrams to up to nine other destinations, that is, that a group of up to 10 ABB IP routers can exist.

All settings relating to unicast are explained in detail in the ABB i-bus tool:
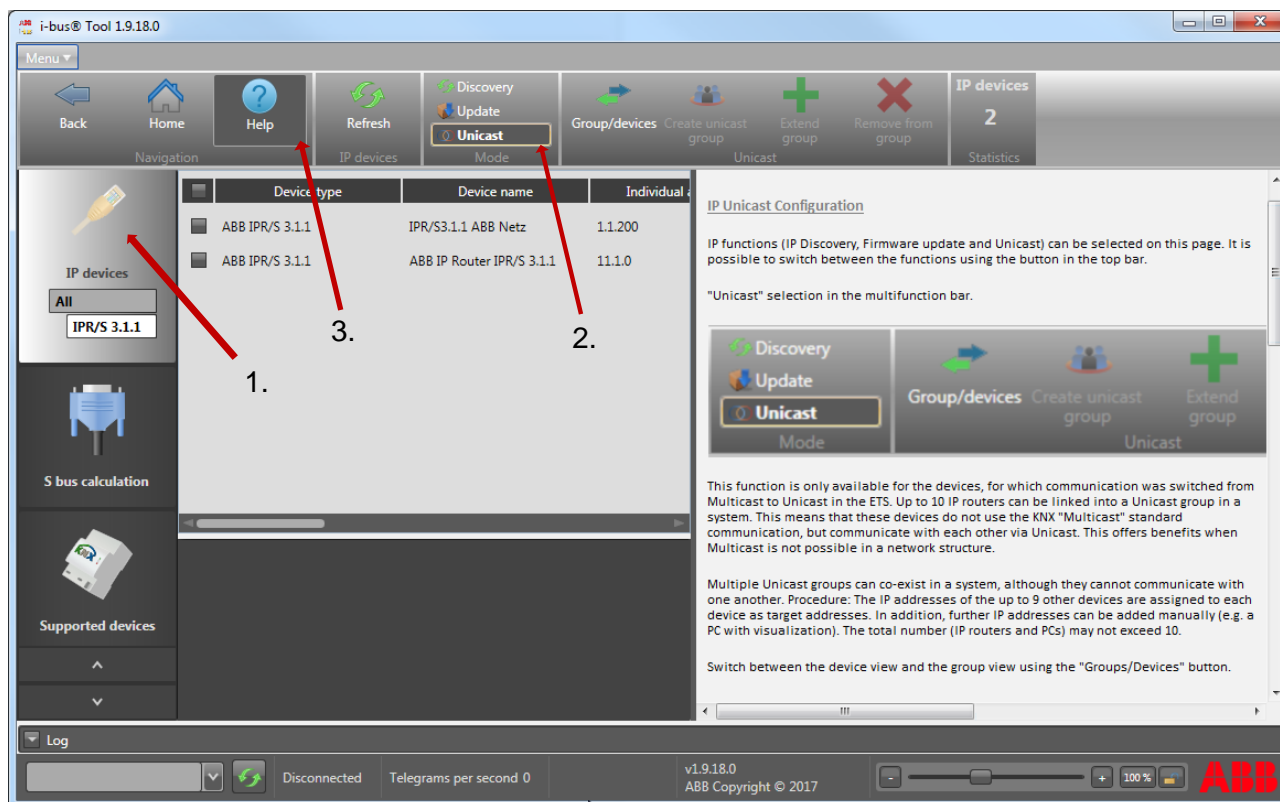
Note: If you use the "Unicast" communication type, it is recommended to assign fixed IP addresses to the IP routers because the devices cannot communicate with each other if the IP address changes. Reason: The specified IP addresses of the routers within a Unicast address table are no longer correct. There is no communication possible with this router.

4. Tips & hints when using the IP routers

In this section, you will find additional helpful tips and hints for configuring the IP router with the ETS software.

Problem:

There are many IP routers installed in the network and the switch with DHCP server starts slower than the routers. Therefore, the IP routers are first assigned an AutoIP address.

- IP Router IPR / S 3.1.1 and IP Interface IPS / S 3.1.1 have an algorithm that cyclically searches for and requests a DHCP server. If the DHCP server is available, the devices receive a dynamic address.
- Alternatively, a fixed IP address can be assigned to the routers.

Problem:

The IP router should use the "Filter" setting in normal operation. How can the filter table be filled and checked with group addresses quickly and effectively?

- A "dummy device" (not real and will not be configured) is inserted in the ETS project into the desired line in which the group addresses are to come to. Then drag the group addresses to the "dummy device" and finally check the filter table with a right click on the IP router.

Problem:

How can I find out which tunneling addresses are stored in IPR/S 3.1.1 or IPS/S 3.1.1?

- There is currently no way to find the tunneling addresses stored in the device. When configuring the tunneling settings, the first free address of the device is always displayed in the communication window.

Note: The displayed tunneling addresses can differ from those in the project!

Problem:

How can individual addresses be entered manually into the filter table of the IP router IPR / S 3.1.1 and the IP interface IPS/S 3.1.1?

ETS3

- Open the group address view and the topology at the same time

- Drag the group address into the wanted line

- A new symbol appears in this line

ETS4 and ETS5

- Click on the wanted line in the project

- In the Properties window, click on the tab "Information"

- Create manual entries

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This version is from the 21.09.2017

Title:	Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:	9AKK107045A4278
Author:	Kevin Klemm
Page:	14/16

Problem:

A device with the physical address 4.1.1 comes into an existing installation in which an IP router has the address 4.1.0. Furthermore, the tunneling address 4.1.1 is stored in the IP router. What happens when the address 4.1.1 is read?

- The ETS reports an error that the local interface itself is read out. However, the ETS shows the device with the physical address 4.1.1 during ongoing operations.

Problem:

What happens if you lose the connection to the router during a firmware update with the ABB i-bus tool and the ON LED flashes after restarting the router?

- Use the ABB i-bus tool to read the device again and check the firmware.

- In the case of inconsistent firmware, the router can lose the physical address and obtain a fixed default IP address

- Re-parameterize the affected routers with the ETS (phys. + Appl.) and restart the update

- Only after the successful update will the LED stop flashing!

5. Common causes of errors when using IP routers

–   A separate power supply for the external connection and the KNX bus

  •   There is no SELV anymore!

  •   Interferences from the network can affect the processor

–   In the ETS4 there is no backbone with 0.0.0 in the topology (backbone set to IP!)

–   The filter table not checked when the filtering was applied

–   Filter not used (observe bottle neck 100 Mbit / s -> 9.6 kbit / s)

–   IP router is incorrectly programmed!

  •   Either as a line coupler x.x.0 or as a range coupler x.0.0!

  –   IP addresses do not match in the LAN

  –   Remote programming does not work

  •   Problem of the network settings, no device error!

  –   IPR/S cannot be found for connections

  •   Re-install the application program and restart the router

References to other documents

–   [Home and Building Automation Portal](#)

–   [FAQ Home and Building Automation](#)

–   [Engineering Guide Database](#)

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This version is from the 21.09.2017

Title: Tunneling server for IPX/S 3.1.1 devices
Doc.-Nr.:   9AKK107045A4278
Author: Kevin Klemm
Page: 16/16