

**KNX IP Interface 730**

**KNX IP Router 750**

**KNX IP Linemaster 760**

**KNX IP BAOS 770**

**KNX IP BAOS 771**

**KNX IP BAOS 772**

Remote access with the ETS

WEINZIERL ENGINEERING GmbH

Bahnhofstr. 6

84558 Tyrlaching, Germany

Tel. 08623 / 987 98 03

Fax 08623 / 987 98 09

E-mail: [info@weinzierl.de](mailto:info@weinzierl.de)

Web: [www.weinzierl.de](http://www.weinzierl.de)

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## Versions

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# 1 Introduction

This document describes how remote access can be established to a KNX installation via the Internet by means of the ETS. Remote access can be achieved using either NAT (Network Address Translation) or VPN (Virtual Private Network).

Any device that supports KNXnet/IP tunnelling can be used for remote access. These devices are the KNX IP Interface 730, KNX IP Router 750, KNX IP Linemaster 760 and KNX IP BAOS 770. In this document, they will be collectively referred to as "KNX IP devices".

## 2 Remote access with NAT

### 2.1 Network Address Translation (NAT)

NAT (Network Address Translation) is a method used to translate IP addresses. It is primarily used in routers (e.g. DSL routers).

### 2.2 Example of a configuration

#### 2.2.1 Structure

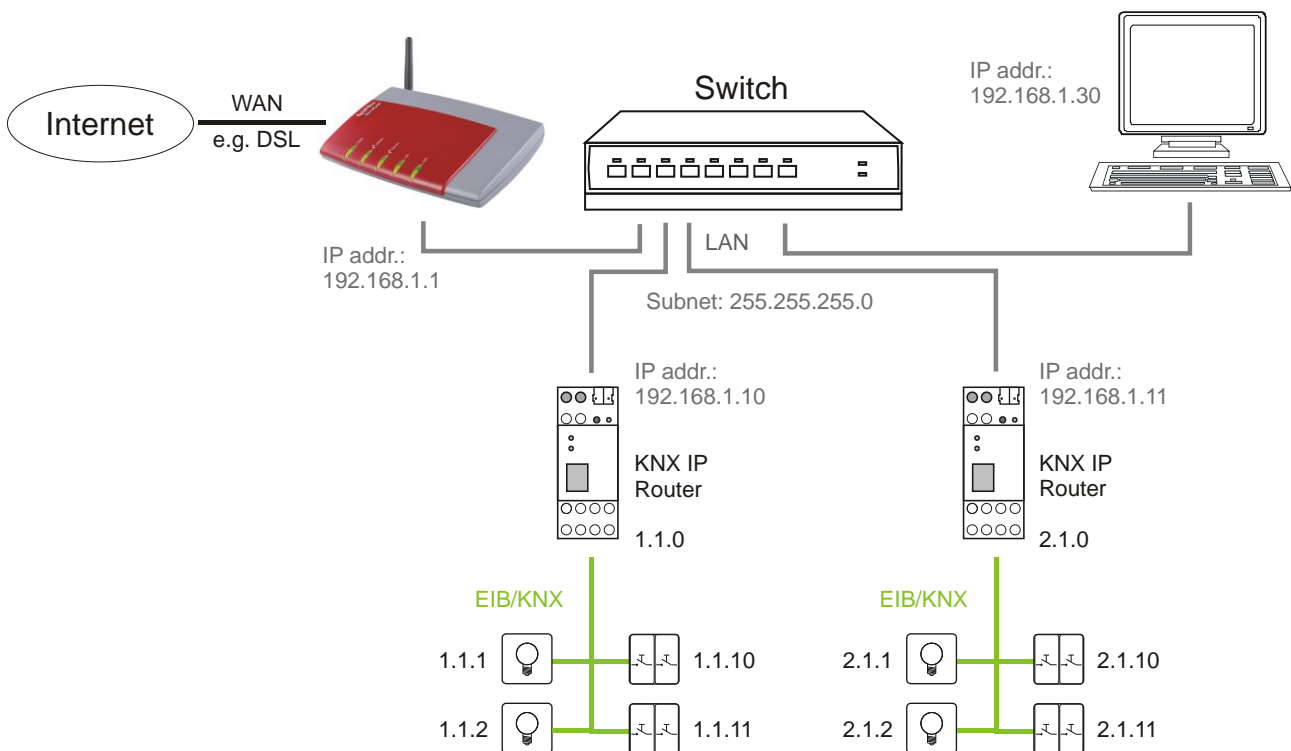


Figure 1: KNX installation

The diagram above shows a typical KNX installation that is connected to the Internet via a DSL router: Two TP lines are connected to each other via two KNX IP routers. These KNX IP routers were assigned IP addresses from the local network. The DSL router needed for Internet access has a fixed local IP address (192.168.1.1) and a public IP address (here, 84.145.85.60), which is assigned by the Internet provider. Generally, the public IP address is dynamic, meaning that it is reassigned every time an Internet connection is reestablished.

### 2.2.2 Settings in the DSL router

In the DSL router, forwarding must be set up under the "NAT" item. For this, a port (standard: 3671) and an IP address (local IP address of the KNX IP device, e.g. 192.168.1.10) must be specified. Afterwards, all telegrams that are received from the Internet and are directed to port 3671 are forwarded to the specified KNX IP device.

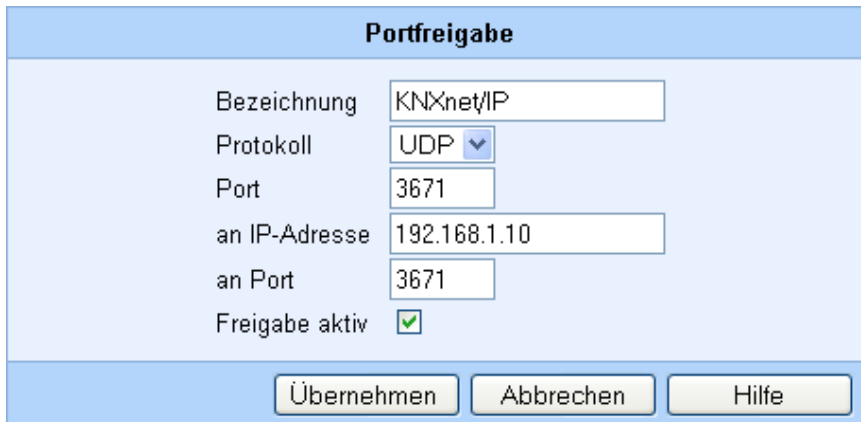


Figure 2: Settings in the DSL router (port forwarding for KNXnet/IP)

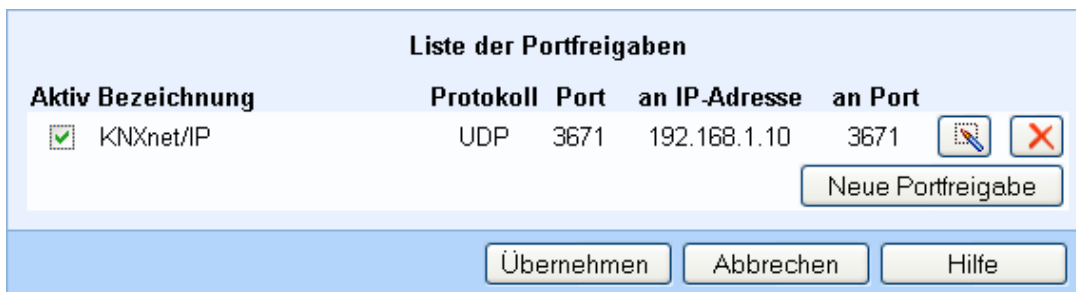


Figure 3: Settings in the DSL router (list of port forwardings)

### 2.2.3 IP configuration of the KNX IP Interface

Since the IP address of the KNX IP device must be known, manual configuration is recommended. The IP address (192.168.1.10), subnet mask (255.255.255.0) and gateway IP address (192.168.1.1) must be specified.

1.1.1 KNX IP Interface 730

General  
IP-Configuration 1  
IP-Configuration 2

IP-Configuration 1

IP-Address

Byte 1	192
Byte 2	168
Byte 3	1
Byte 4	10

OK Cancel Default Info Help

Figure 4: IP configuration (part 1)

1.1.1 KNX IP Interface 730

General  
IP-Configuration 1  
IP-Configuration 2

IP-Configuration 2

IP-Subnet

Byte 1	255
Byte 2	255
Byte 3	255
Byte 4	0

IP-Gateway Address

Byte 1	192
Byte 2	168
Byte 3	1
Byte 4	1

OK Cancel Default Info Help

Figure 5: IP configuration (part 2)

## 2.2.4 Establishing a connection with the ETS

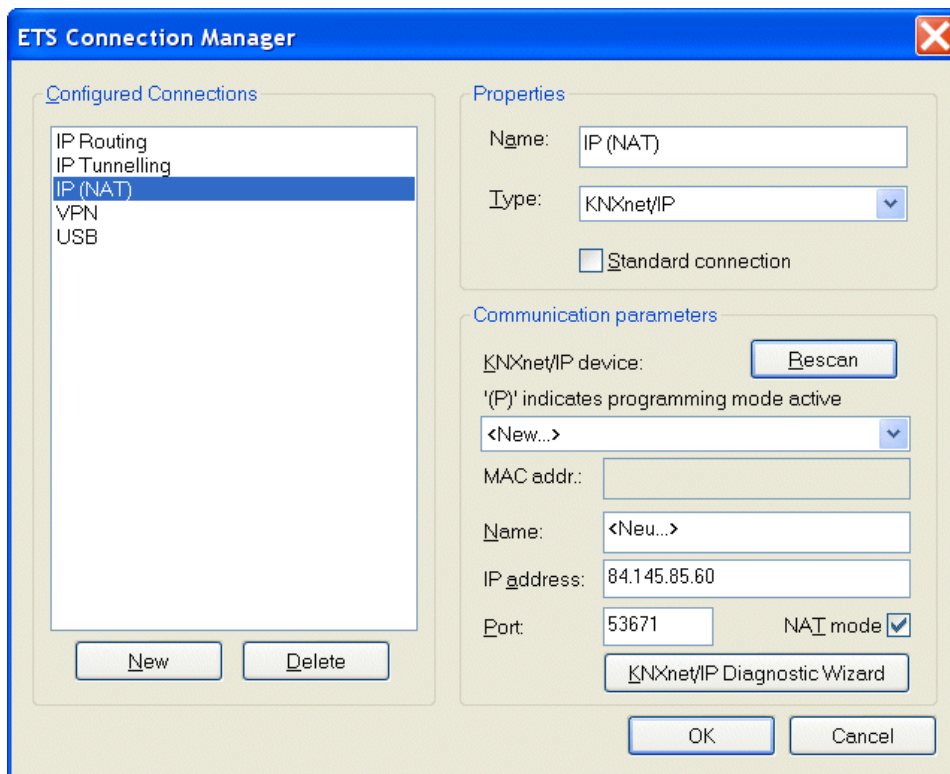


Figure 6: ETS Connection Manager

A separate connection should be created for remote access, such as "IP (NAT)" in the example shown here. Select "KNXnet/IP" for the type. In the "IP address" field, enter the public IP address of the remote KNX installation. The port (3671) specified here must be the same as the one contained in the DSL router settings. Important: The "NAT mode" box must be checked.

Note: The IP address must be entered manually since the devices cannot be scanned via the Internet.

Remote access by means of NAT requires at least ETS 3.0f.

### 3 Remote access via a VPN

#### 3.1 Virtual Private Network (VPN)

##### 3.1.1 Introduction

A VPN is an extension of private networks. It can be used to enable remote access (site-to-end) and link private networks (site-to-site) via the Internet.

##### 1.1 Site-to-end

A site-to-end VPN can be used to establish access to an internal network. For example, employees in the field can use it to dial into their company network.

##### 1.1 Site-to-site

A site-to-site VPN can be used to link private networks. For example, a site-to-site VPN can link two remote company networks.

### 1 Remote access to a KNX/IP router using the DrayTek Vigor2200Eplus as an example

#### 3.2.1 Configuration of the VPN server

This example shows how a VPN connection is set up with the PPTP protocol (Point-To-Point Tunneling Protocol). Alternatively, a VPN connection can be established via L2TP over IPsec (Layer 2 Tunneling Protocol).

Descriptions are only provided for those pages on which settings need to be made. The following figure shows the main menu of the DrayTek router.



Figure 7: Setup Main Menu

Select the "VPN and Remote Access Setup":

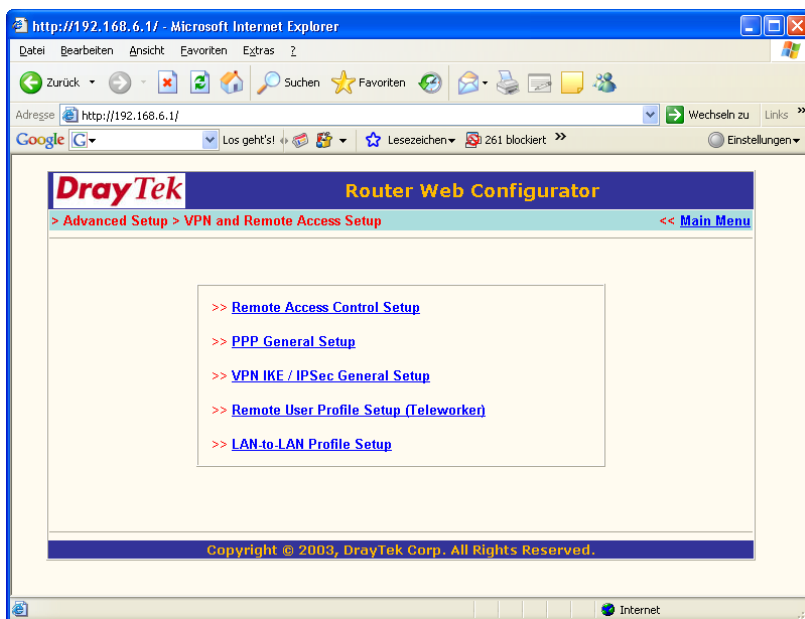


Figure 8: VPN and Remote Access Setup

Select the "Remote User Profile Setup (Teleworker)". The next dialogue box shows a table in which various accounts can be created:

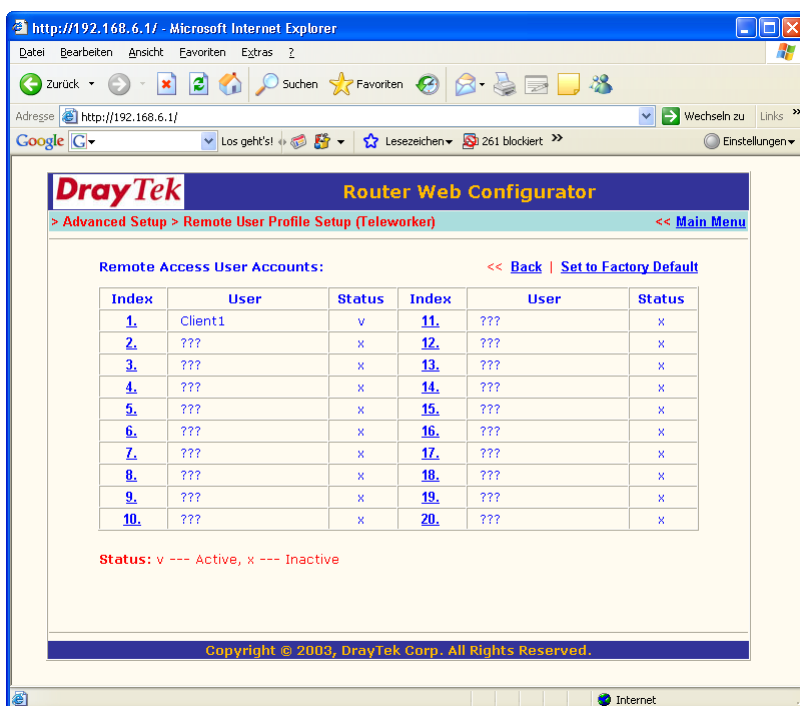


Figure 9: Remote User Profile Setup (part 1)

Select an account. The following box appears:

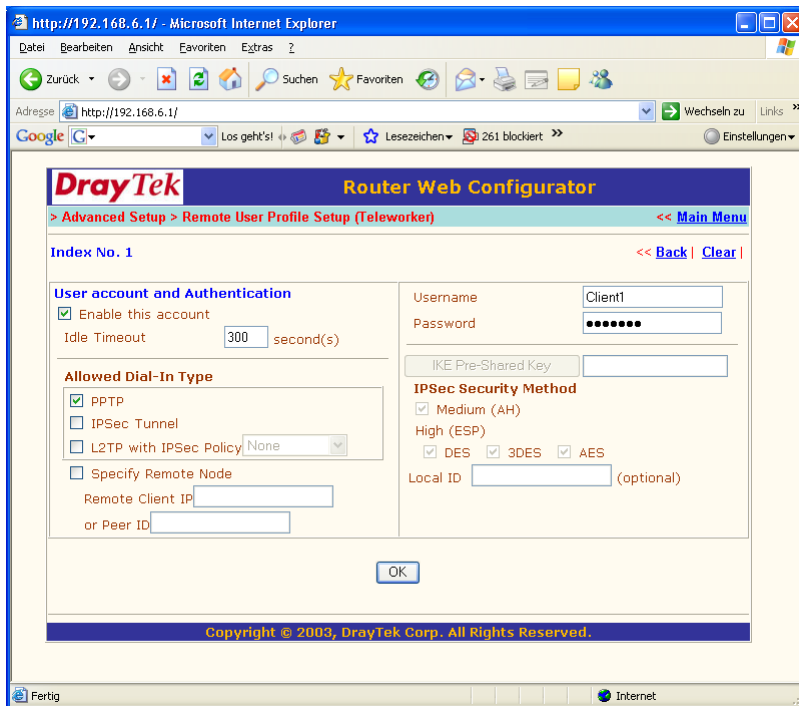


Figure 10: Remote User Profile Setup (part 2)

Activate the account using "Enable this account". Create a "Username" with the associated "Password". Select the protocol under "Allowed Dial-In Type". Several protocols can be activated if necessary. In this example, only "PPTP" is used.

### 3.2.2 Configuration of the VPN client under Windows XP

Select "Create a new connection" in the Network Connections. In the dialogue box that opens, select "Connect to the network at my workplace".

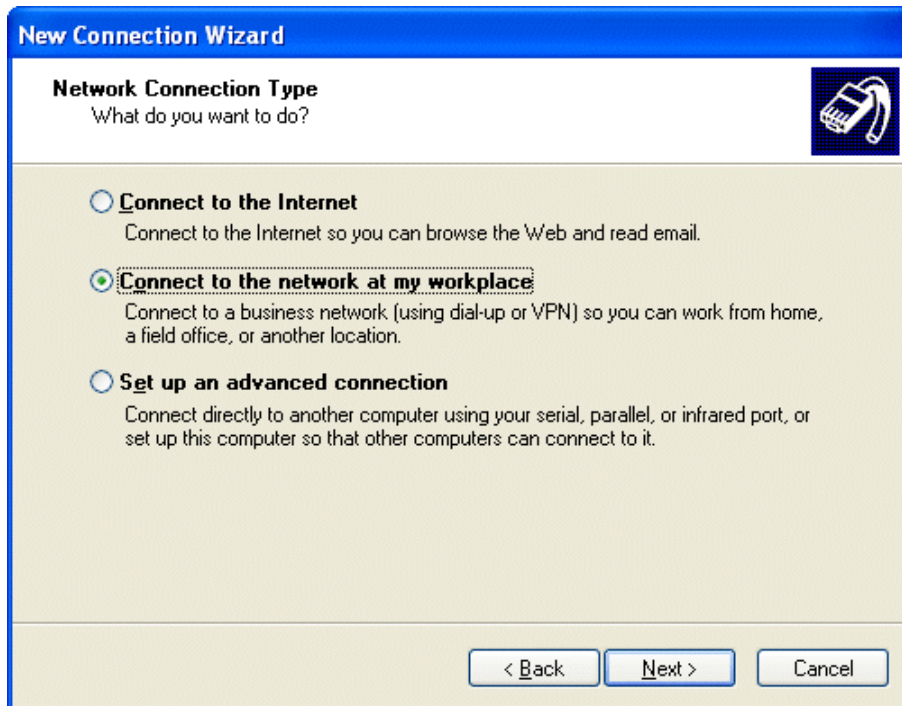


Figure 11: Network Connection Type

In the next box, select "Virtual Private Network connection".

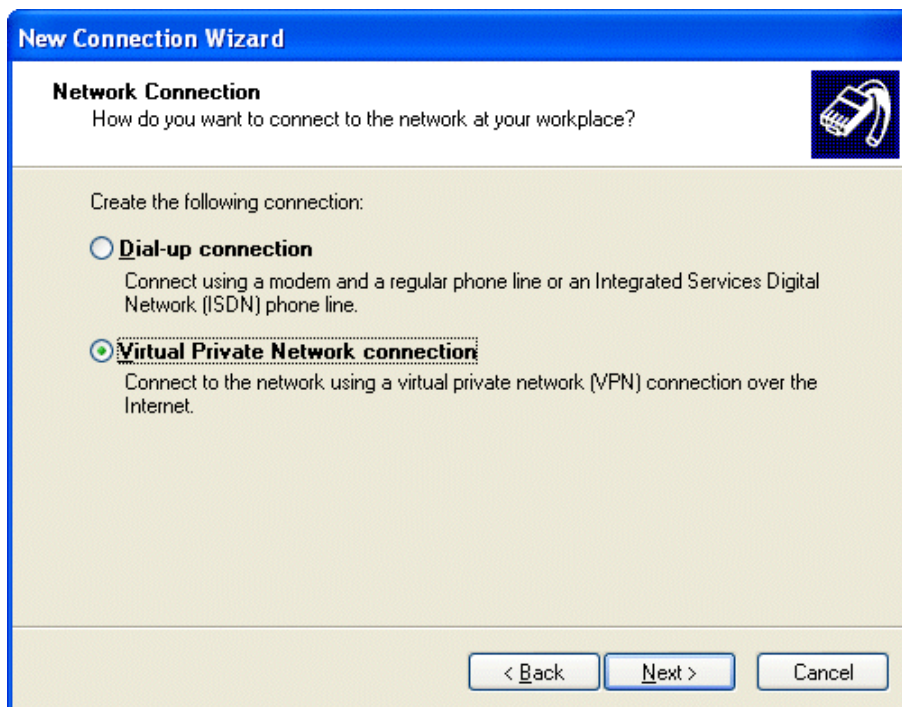
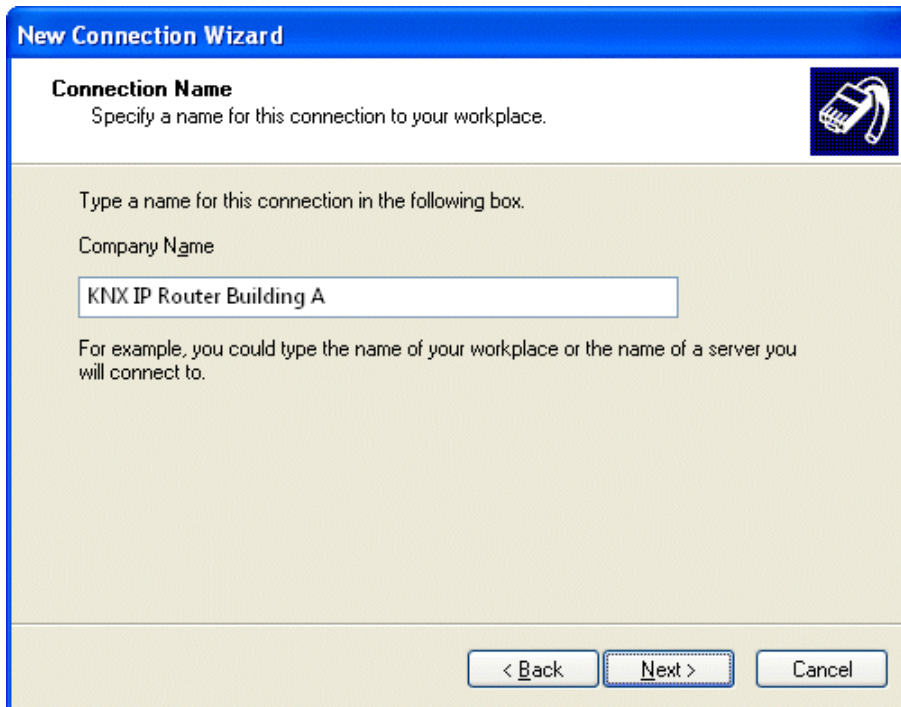


Figure 12: Network Connection

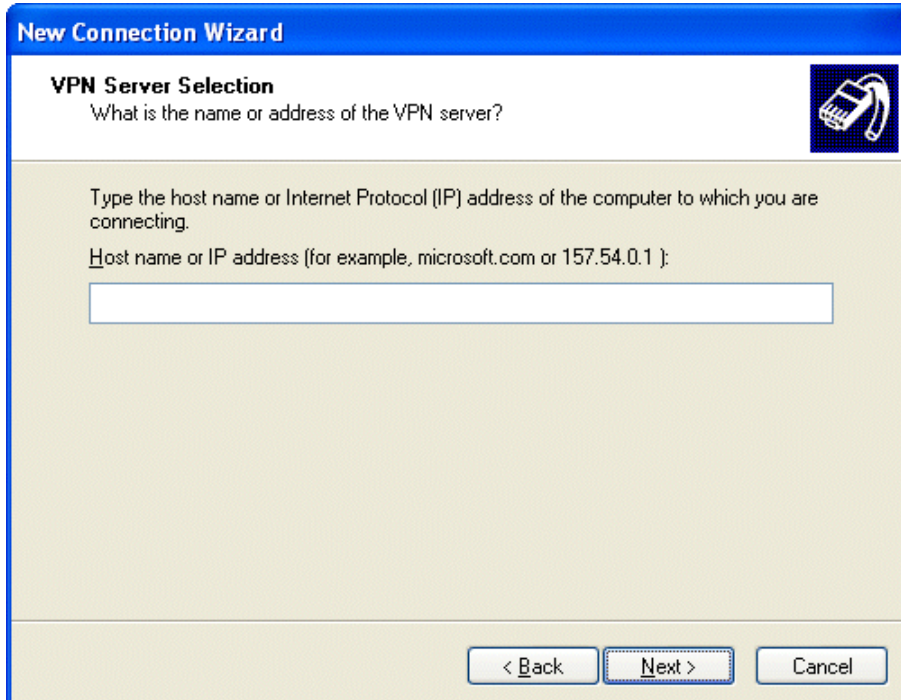
The connection should be assigned a meaningful name:



The screenshot shows the 'New Connection Wizard' window with the 'Connection Name' step. The title bar is blue with the text 'New Connection Wizard'. Below the title bar, the section 'Connection Name' is highlighted. The text 'Specify a name for this connection to your workplace.' is followed by a small icon of a computer and a network cable. The main area has a light beige background and contains the instruction 'Type a name for this connection in the following box.' followed by the label 'Company Name'. A text input field contains the text 'KNX IP Router Building A'. Below the input field, there is a note: 'For example, you could type the name of your workplace or the name of a server you will connect to.' At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Figure 13: Connection Name

To reach the VPN server, its IP address must be entered. Because many DSL connections have a dynamic IP address, it must be determined first. A service such as "DynDNS" can be used instead. In this case, the corresponding name must be entered instead of the IP address.



The screenshot shows the 'New Connection Wizard' window with the 'VPN Server Selection' step. The title bar is blue with the text 'New Connection Wizard'. Below the title bar, the section 'VPN Server Selection' is highlighted. The text 'What is the name or address of the VPN server?' is followed by a small icon of a computer and a network cable. The main area has a light beige background and contains the instruction 'Type the host name or Internet Protocol (IP) address of the computer to which you are connecting.' followed by the label 'Host name or IP address (for example, microsoft.com or 157.54.0.1) :'. A text input field is empty. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Figure 14: VPN Server Selection

Before the connection is established, the password must be entered in addition to the user name. These must be identical with the entries in the VPN server.

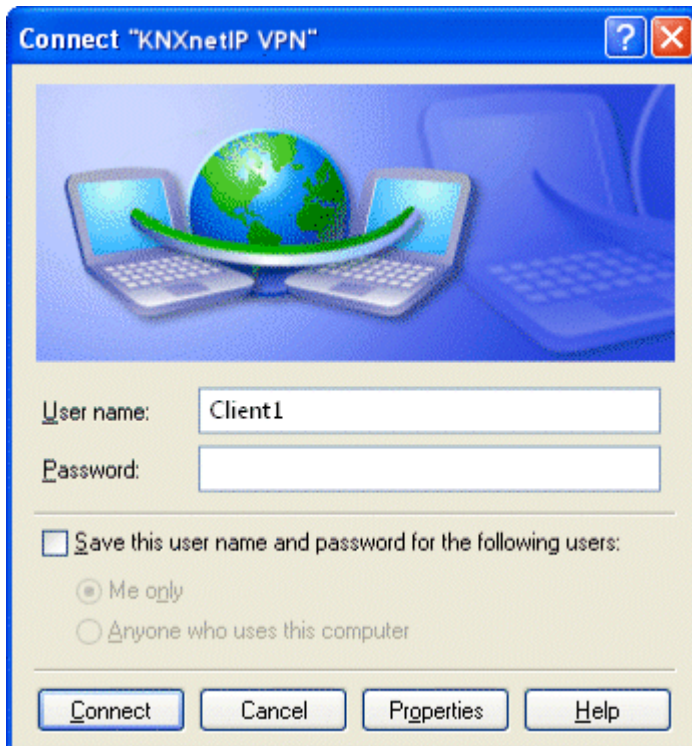


Figure 15: Connection establishment

After the connection is established, the client is assigned an IP address from the range of the remote private network.

### 3.2.3 Accessing the remote KNX IP device with the ETS

Multicast telegrammes are used to search for a KNX IP device. Because the VPN hardware (DrayTek Vigor 2200Eplus) does not allow these to pass, the IP address of the KNX IP device must be known.

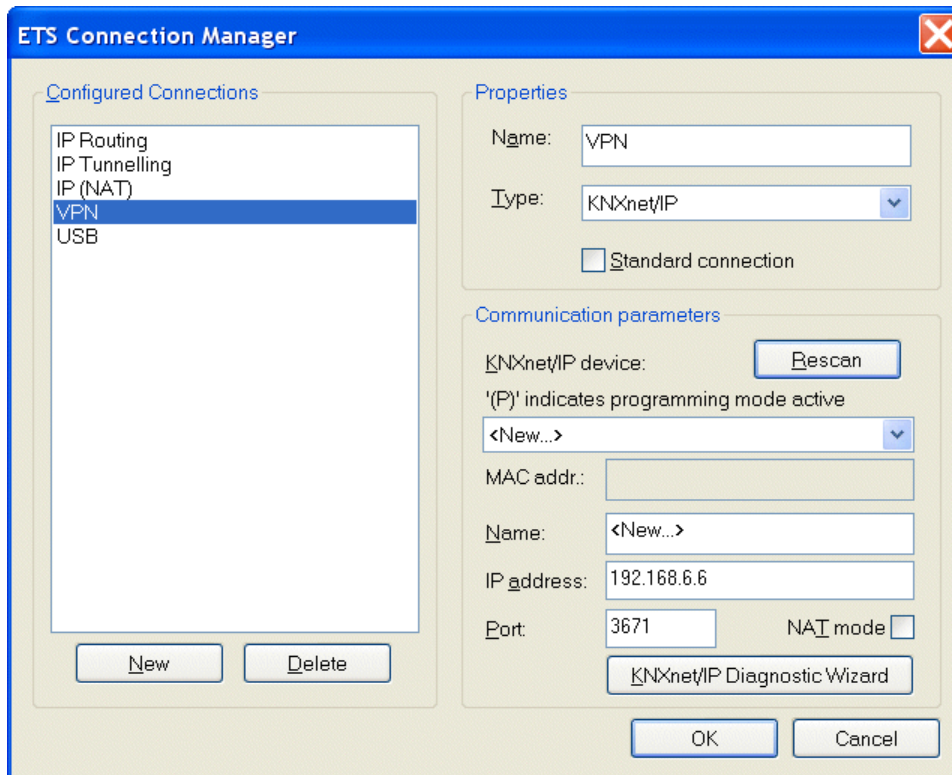


Figure 16: ETS Connection Manager

The IP address and the port of the KNX IP device must be entered in the communication parameters. If a VPN connection is active, the KNX IP device can be accessed.

### 3.2.4 Alternatives

Apart from the DrayTek Vigor2200Eplus used in this example, a VPN can be built with other devices as well. Devices of this type are available from Linksys, Netgear and AVM (Fritzbox).

Either an embedded solution or a PC with "OpenVPN" can be used.