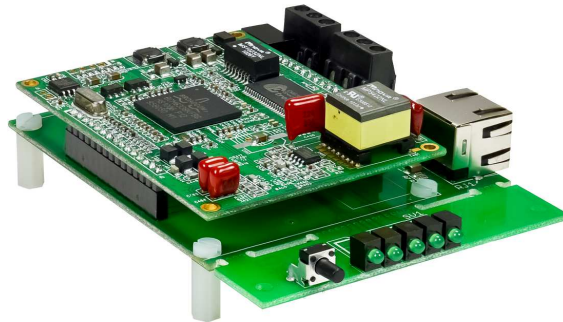
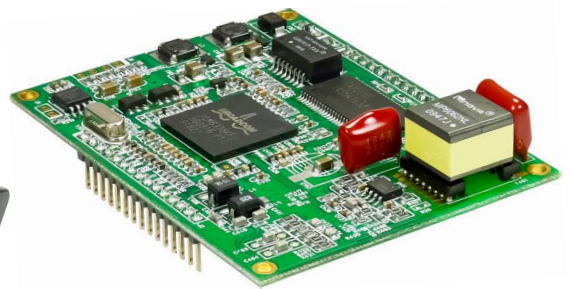


Manual for AK-ADSL



EVA-KIT-ADSL



ADSL-Modul



AK-DinRail - ADSL



AK-RailPort - ADSL



AK – Nord
EDV- Vertriebsges. mbH
Stormstrasse 8
D-25524 Itzehoe
Germany

Phone: +49 (0) 4821 8040350
Fax: +49 (0) 4821 4083024

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AK-DinRail-ADSL

AK-DinRail-ADSL

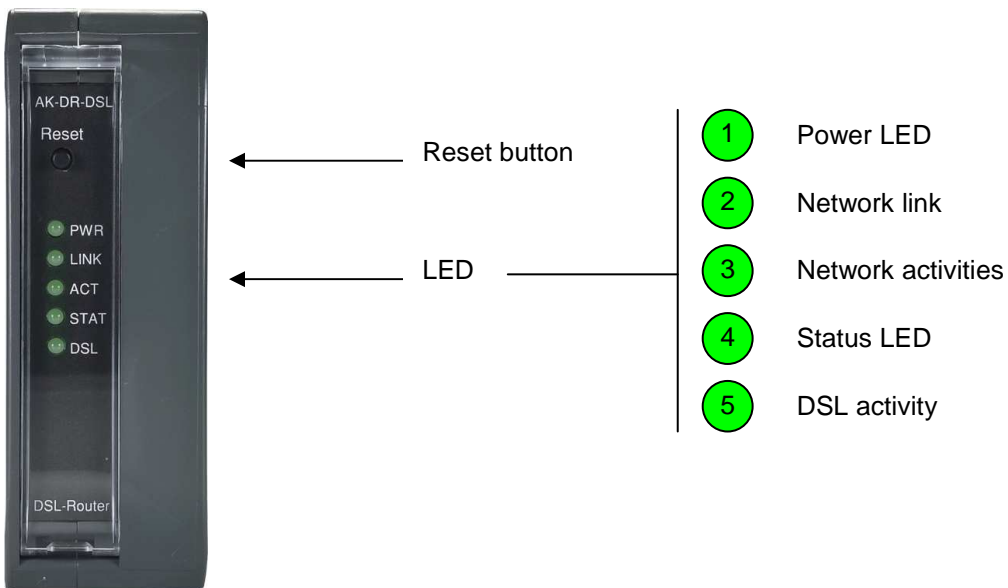
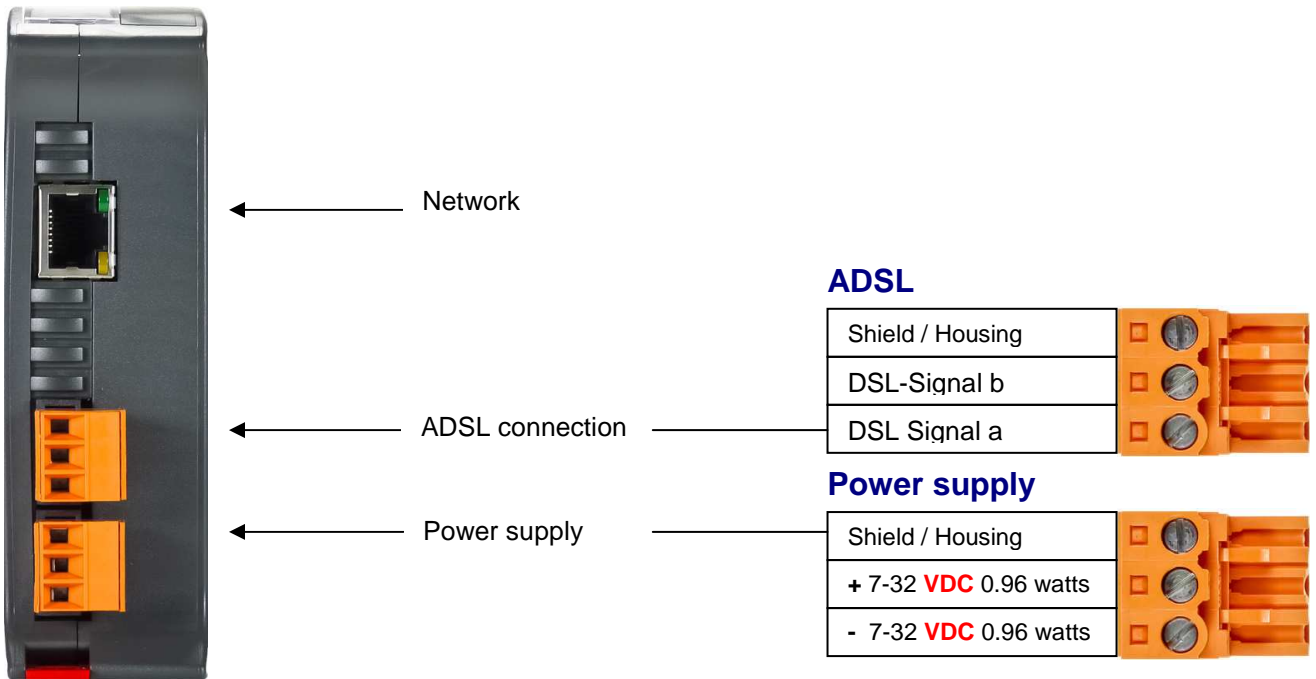


Technical description

Dimensions:	35 x 120 mm(WxH)
Temperature range:	From -20°C to +70°C
Power consumption:	7 to 34 volts / 2.4 watts (equals at 12 volts = 200mA)
Network connections:	Ethernet 10/100MBit (M-DIX) RJ45
Network speeds:	10/100 MBit Full/Half Duplex
Supported protocols:	Static IP, Dynamic RIP routing, IP/TCP/UDP/ICMP/ARP/RARP Application, Network Address Translation(NAT), Port Mapping/Forwarding, DHCP Server/Relay/Client, DNS Relay Agent, DMZ
ADSL:	ANSI T1.413 Issue 2 (ADSL) ITU-T G.992.1 (G.dmt) ITU-T G.992.2 (G.lite) ITU-T G.992.3/4 (ADSL2) ITU-T G.992.3 Annex L (RE-ADSL) ITU-T G.992.5 (ADSL2+) ITU-T G.992.5 Annex M (ADSL2+M)
Routing and encapsulation:	RFC2684 Bridge and Routed, LLC and VC Mux support, RFC2364 PPPoA Client, RFC2516 PPPoE Client, RFC2225/RFC1577 Classical IP, Transparent Bridge, PAP/CHAP/MS-CHAP for Password Authentication
Connections:	1 x ADSL 1 x Power supply Removable female connector strips with screwed connection grid 5.08mm

AK-DinRail-ADSL

Description and connection assignment



AK-RailPort-ADSL

AK-RailPort-ADSL

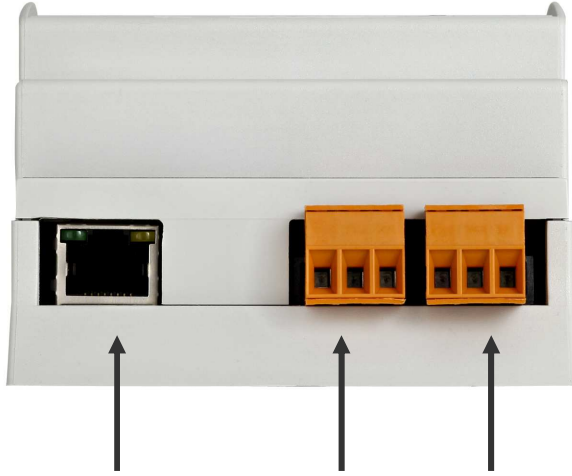


Technical description

Dimensions:	87 x 62 mm(WxH)
Temperature range:	From -20°C to +70°C
Power consumption:	7 to 34 volts / 2.4 watts (equals at 12 volts = 200mA)
Network connections:	Ethernet 10/100MBit (M-DIX) RJ45
Network speeds:	10/100 MBit Full/Half Duplex
Supported protocols:	Static IP, Dynamic RIP routing, IP/TCP/UDP/ICMP/ARP/RARP Application, Network Address Translation(NAT), Port Mapping/Forwarding, DHCP Server/Relay/Client, DNS Relay Agent, DMZ
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Routing and encapsulation:	RFC2684 Bridge and Routed, LLC and VC Mux support, RFC2364 PPPoA Client, RFC2516 PPPoE Client, RFC2225/RFC1577 Classical IP, Transparent Bridge, PAP/CHAP/MS-CHAP for Password Authentication
Connections:	1 x ADSL 1 x Power supply Removable female connector strips with screwed connection grid 5.08mm

AK-RailPort-ADSL

Description and connection assignment



Network

ADSL

Power supply

Power supply

Shield / Housing	
+ 7-32 VDC	0,96 watts
- 7-32 VDC	0,96 watts



ADSL

Shield / Housing	
DSL-Signal b	
DSL Signal a	



Reset

- ① Power LED
- ② Network link
- ③ Network activities
- ④ Status LED
- ⑤ DSL activity

AK-ADSL module

ADSL module

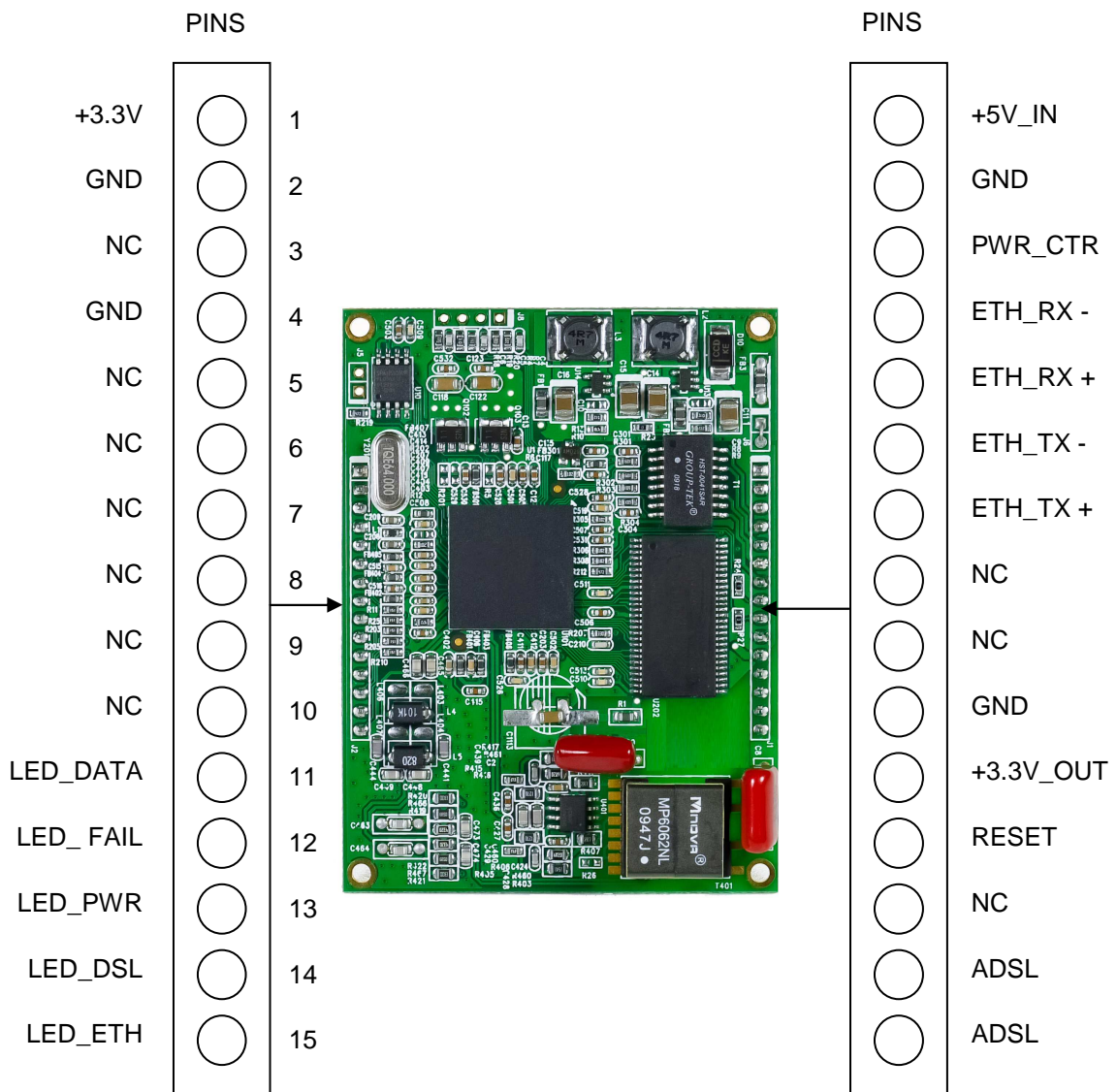


Technical description

Dimensions:	60 x 80 x 14mm
Temperature range:	From -20°C to +70°C
Power consumption:	5 volts (DC) / 2.5 watts
Network connections:	Ethernet 10/100MBit (M-DIX)
Network speeds:	10/100 MBit Full/Half Duplex
Supported protocols:	Static IP, Dynamic RIP routing, IP/TCP/UDP/ICMP/ARP/RARP Application, Network Address Translation(NAT), Port Mapping/Forwarding, DHCP Server/Relay/Client, DNS Relay Agent, DMZ
ADSL:	ANSI T1.413 Issue 2 (ADSL) ITU-T G.992.1 (G.dmt) ITU-T G.992.2 (G.lite) ITU-T G.992.3/4 (ADSL2) ITU-T G.992.3 Annex L (RE-ADSL) ITU-T G.992.5 (ADSL2+) ITU-T G.992.5 Annex M (ADSL2+M)
Routing and encapsulation:	RFC2684 Bridge and Routed, LLC and VC Mux support, RFC2364 PPPoA Client, RFC2516 PPPoE Client, RFC2225/RFC1577 Classical IP, Transparent Bridge, PAP/CHAP/MS-CHAP for Password Authentication
Connections:	1 x ADSL 1 x Power supply

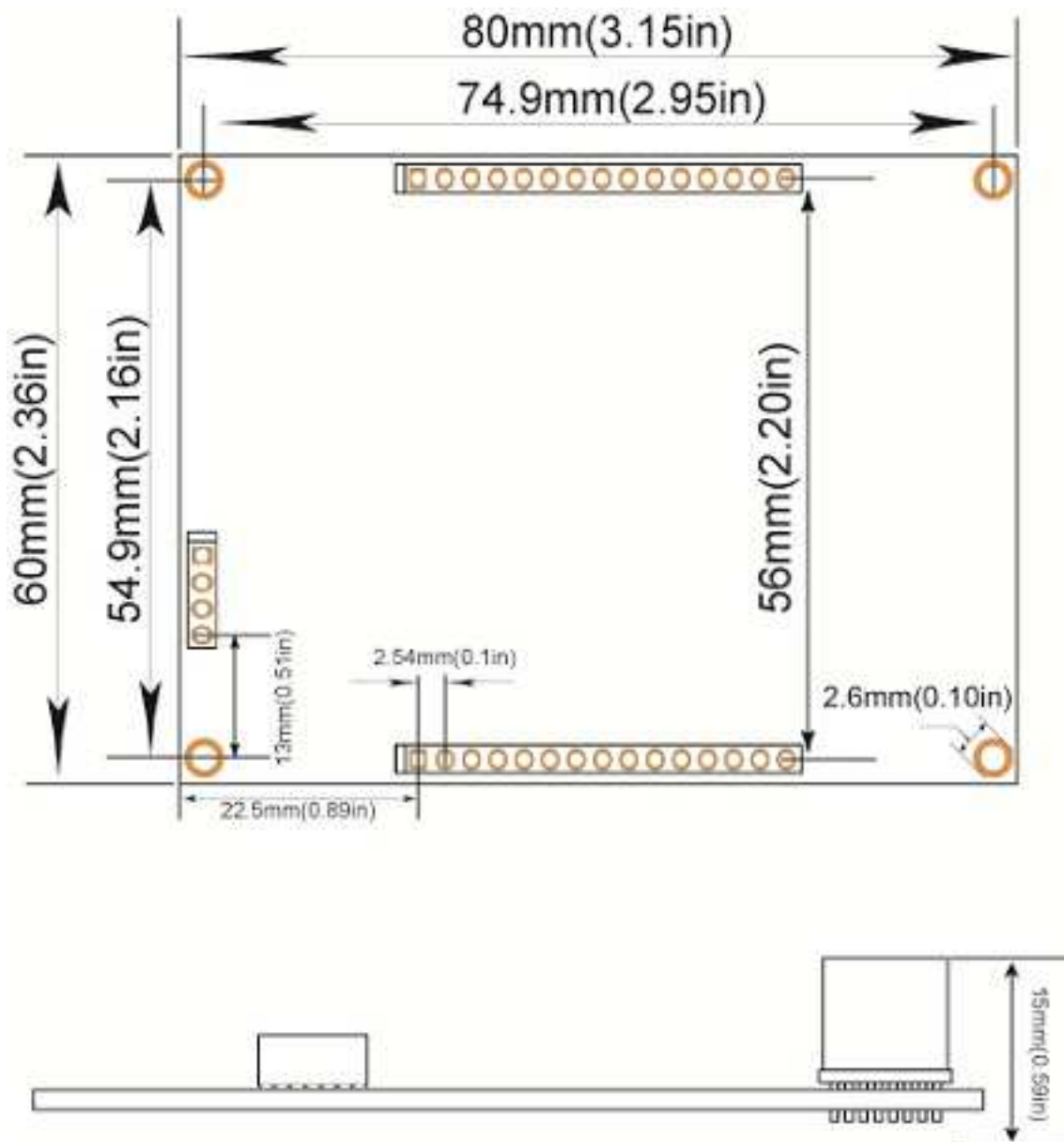
AK-ADSL module

Pin assignment



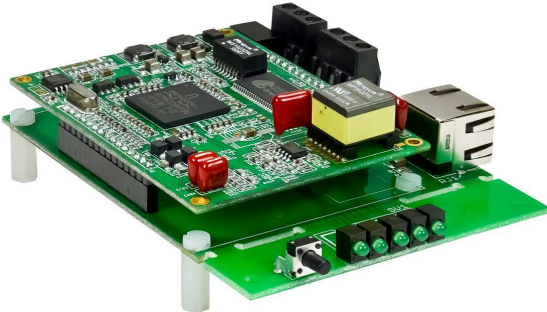
AK-ADSL module

Dimensioning



EVA-KIT-ADSL

AK-EVA-KIT-ADSL

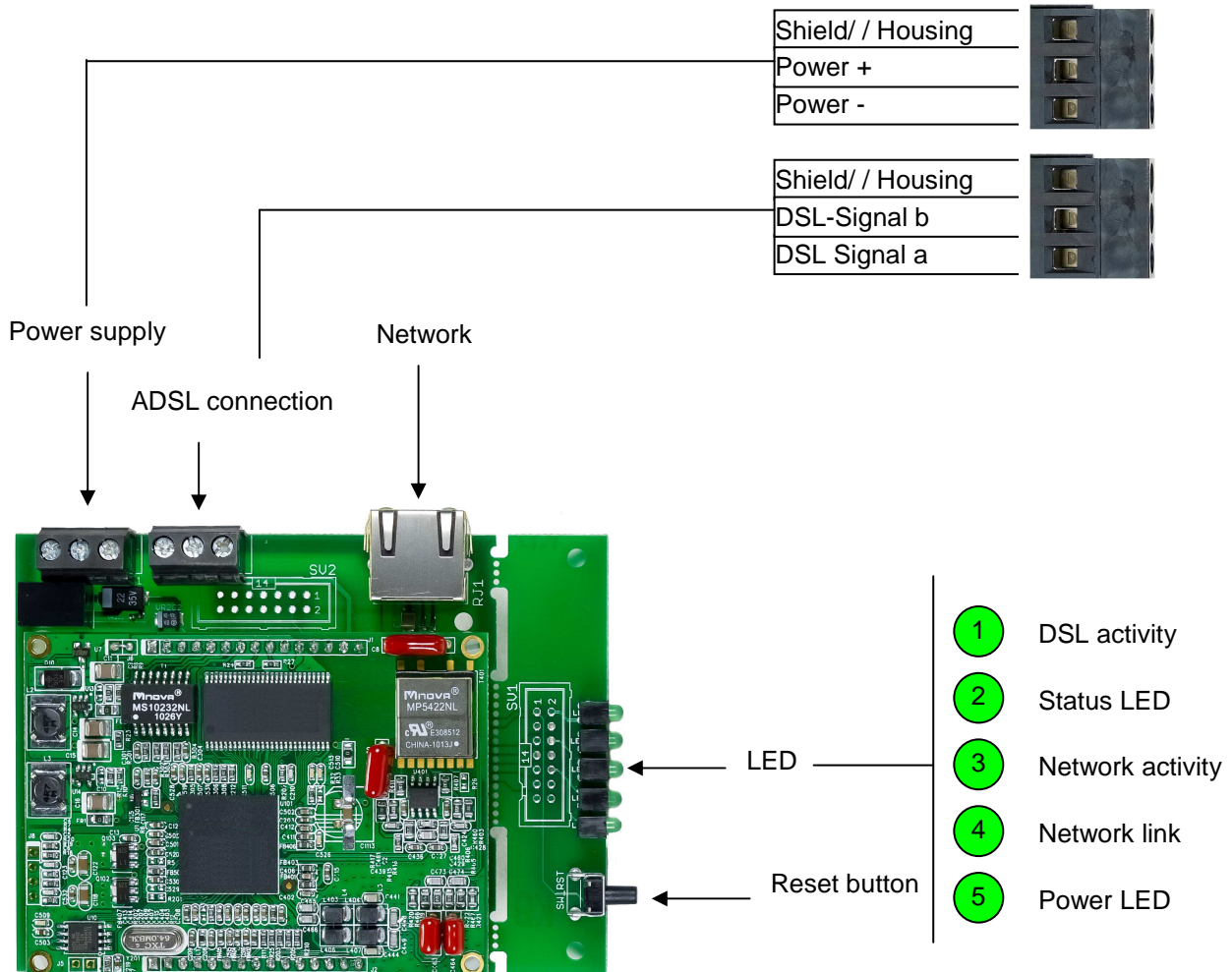


Technical description

Temperature range:	From -20°C to +70°C
Network connections:	Ethernet 10/100MBit (M-DIX) RJ45
Network speeds:	10/100 MBit Full/Half Duplex
Supported protocols:	Static IP, Dynamic RIP routing, IP/TCP/UDP/ICMP/ARP/RARP Application, Network Address Translation(NAT), Port Mapping/Forwarding, DHCP Server/Relay/Client, DNS Relay Agent, DMZ
ADSL:	ANSI T1.413 Issue 2 (ADSL) ITU-T G.992.1 (G.dmt) ITU-T G.992.2 (G.lite) ITU-T G.992.3/4 (ADSL2) ITU-T G.992.3 Annex L (RE-ADSL) ITU-T G.992.5 (ADSL2+) ITU-T G.992.5 Annex M (ADSL2+M)
Routing and encapsulation:	RFC2684 Bridge and Routed, LLC and VC Mux support, RFC2364 PPPoA Client, RFC2516 PPPoE Client, RFC2225/RFC1577 Classical IP, Transparent Bridge, PAP/CHAP/MS-CHAP for Password Authentication
Connections:	1 x ADSL 1 x Power supply

EVA-KIT-ADSL

Description and connection assignment

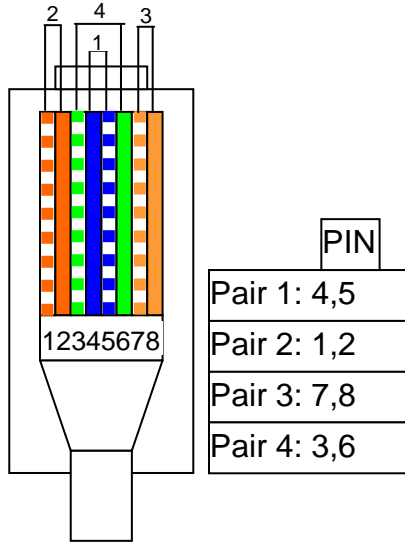


Description for ADSL connection

1st Option

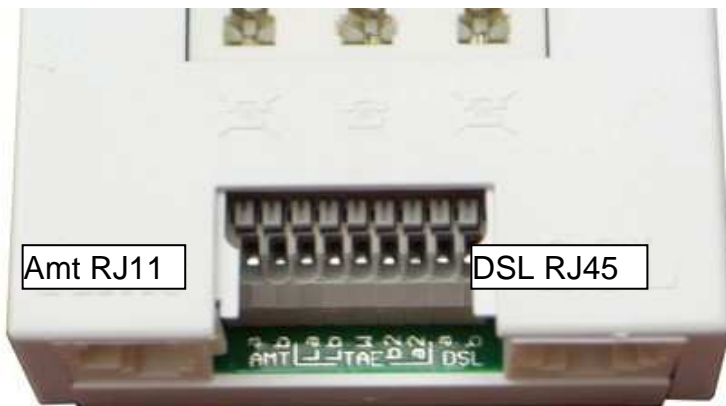
Connection from the splitter to the AK-DinRail-ADSL / EVA-KIT-ADSL via Ethernet cable:

Pin pairs

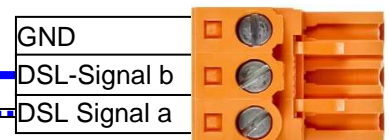


For the ADSL connection the two wires are required which transfer the DSL signals a and b. For an Ethernet cable with RJ45 plug (T568A or T568B) with 8 PINs the two signals are transferred on the pin pair 1 (4=a, 5=b).

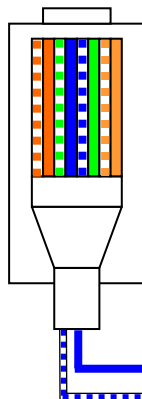
Splitter



ADSL connection



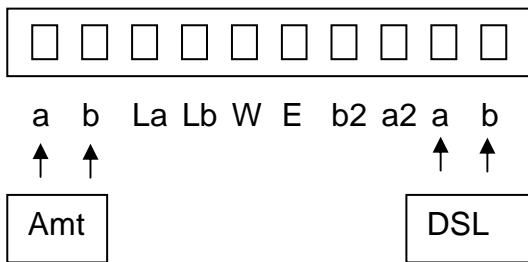
RJ45 plug



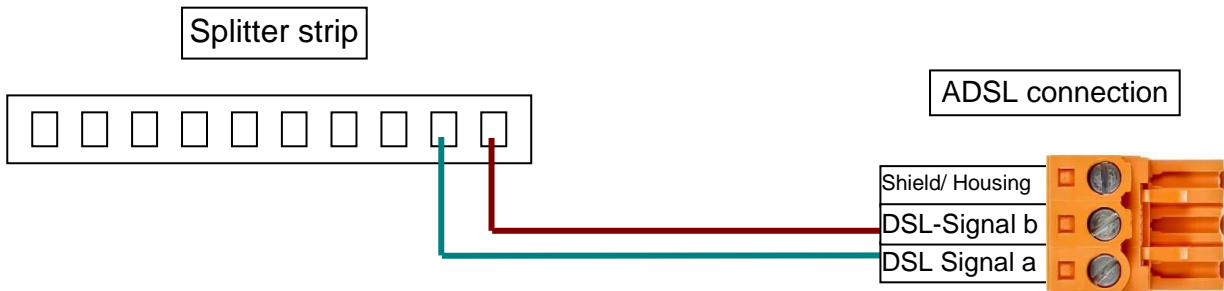
Description for ADSL connection

2nd Option

Connection from the splitter to the AK-DinRail-ADSL / EVA-KIT-ADSL via two wires:



In order to connect the splitter and the DinRail-ADSL / EVA-KIT-ADSL two wires are clamped in the DSL a and b connections.



Setting the TCP/IP



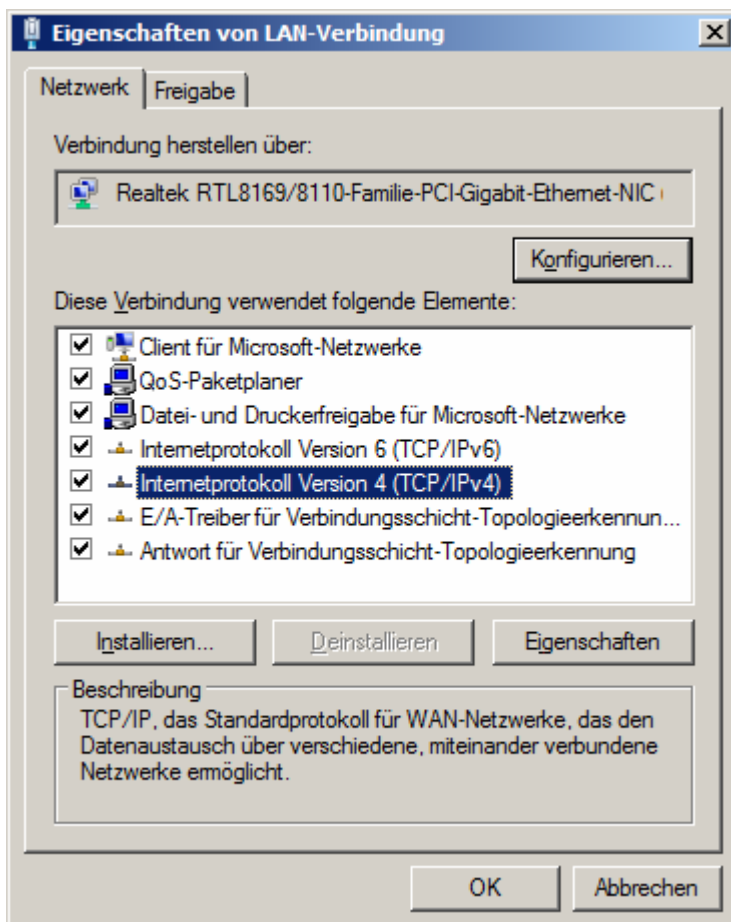
Do not connect the AK-DinRail-ADSL / the EVA-KIT-ADSL into the network in any way if a DHCP server is already available in the network! When starting up the connected devices it might happen that both DHCP servers assign different IP addresses to the devices and the existing network will not work correctly any longer! This function should be deactivated when subsequently configuring the AK-DinRail-ADSL / EVA-KIT-ADSL in the LAN menu.



The configuration of the router is performed via a web browser based function. In order to be able to access the router, the router must be connected to the PC via Ethernet. The following standard data are used for the configuration: IPv4 address 192.168.1.1 and subnet mask 255.255.255.0.

1. Check, if your PC possesses an IPv4 address.

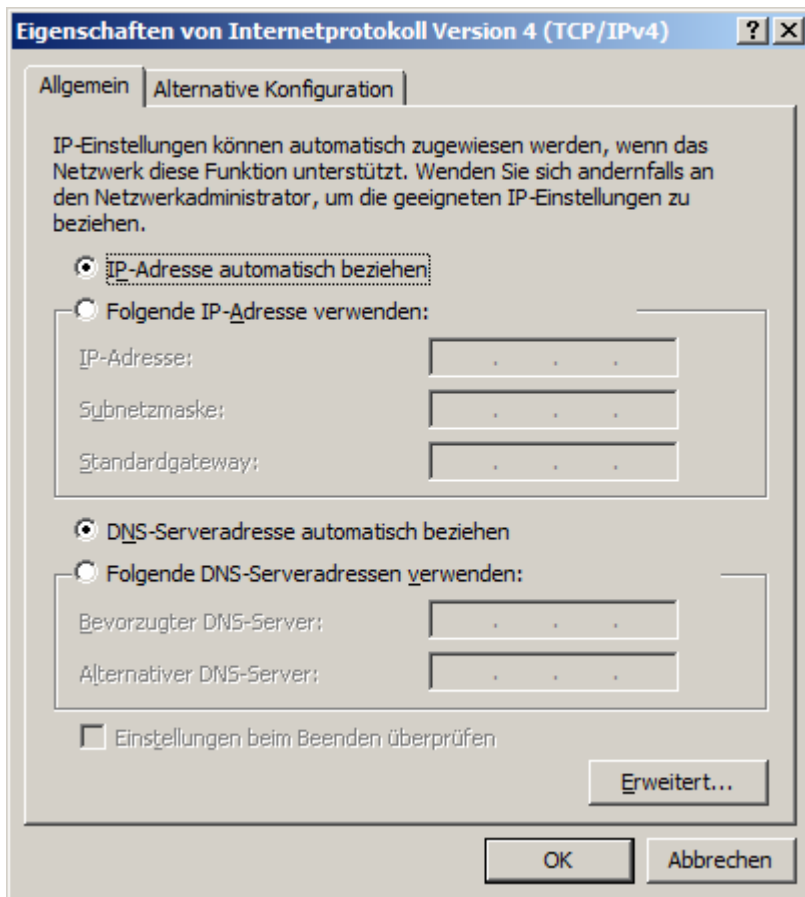
To do so, select under “Network and Internet” -> “Network connections” -> by right-clicking on your “LAN connection” and go to “Properties”. Then the following window should open up:



Then double-click on IPv4 or select IPv4 and click on “Properties”.

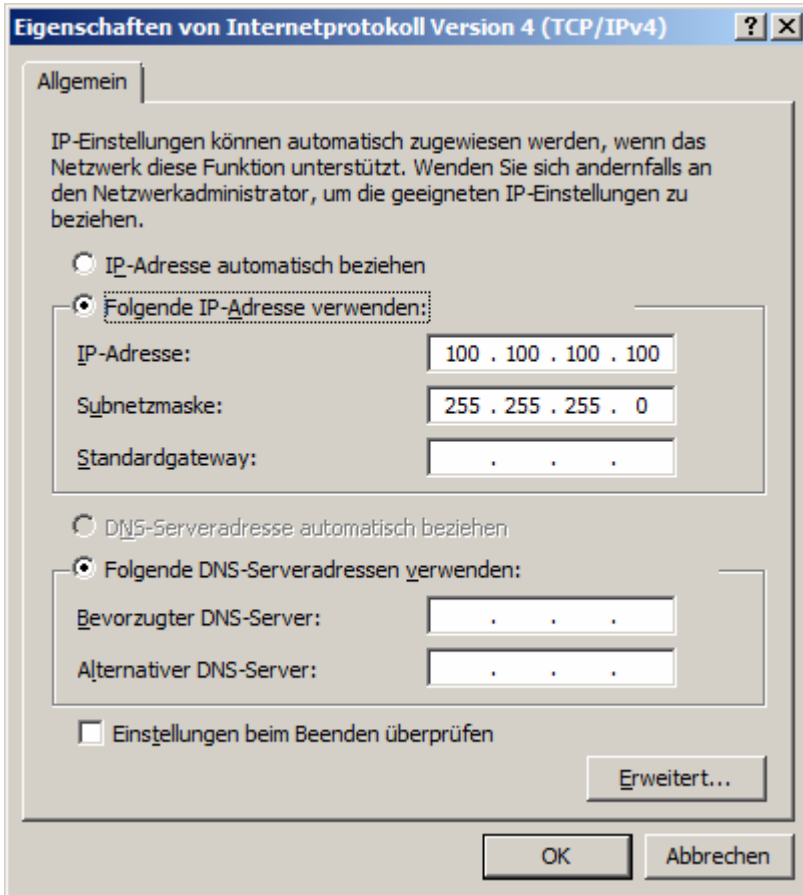
Setting the TCP/IP

1.1 No IPv4 address is available / PC refers automatically to the IPv4 address: The IPv4 address is automatically assigned to your PC by the integrated DHCP server



Setting the TCP/IP

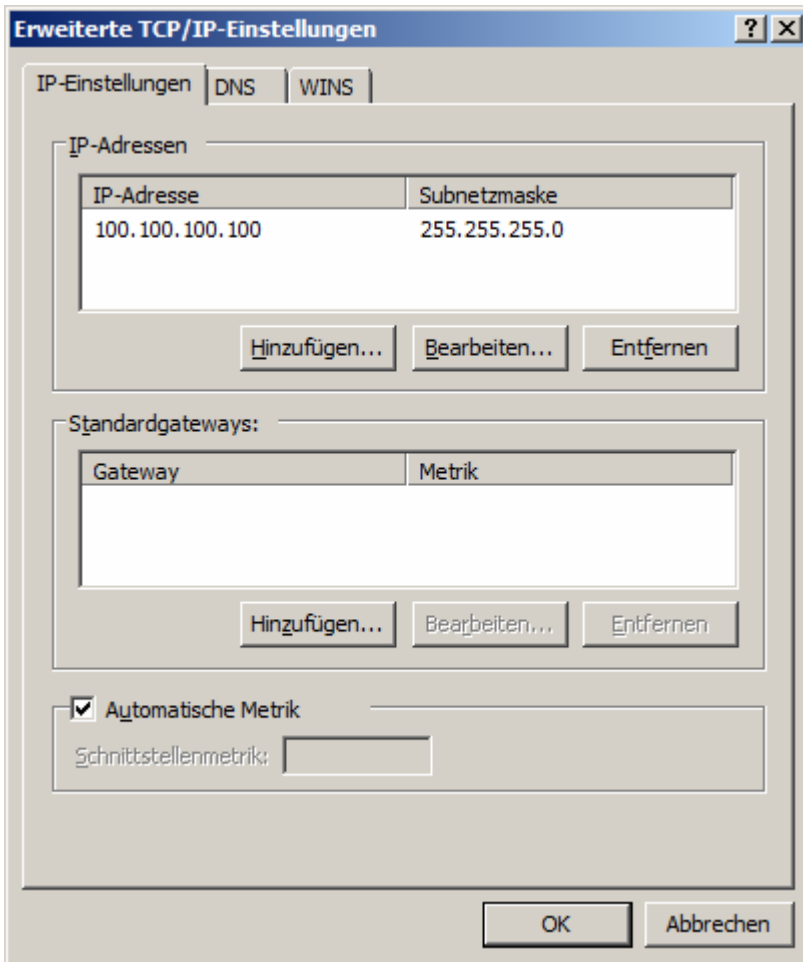
1.2 IPv4 address available:



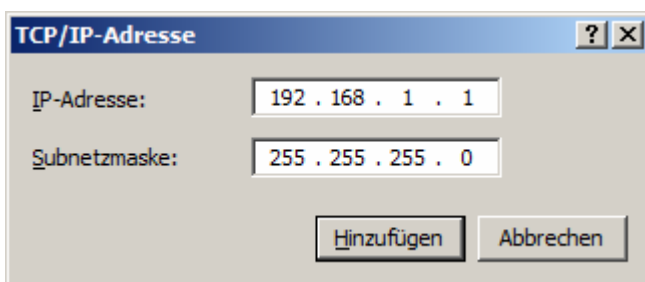
Click on "Extended..."

Setting the TCP/IP

You access the extended IPv4 settings:



Here you can see the already available IPv4 address(es) and then you have to add the IPv4 address for AK-DinRail-ADSL / EVA-KIT-ADSL required for the configuration. To do so, simply select “Add...” and the IPv4 address 192.168.1.1 as well as the subnet mask 255.255.255.0 need to be entered:



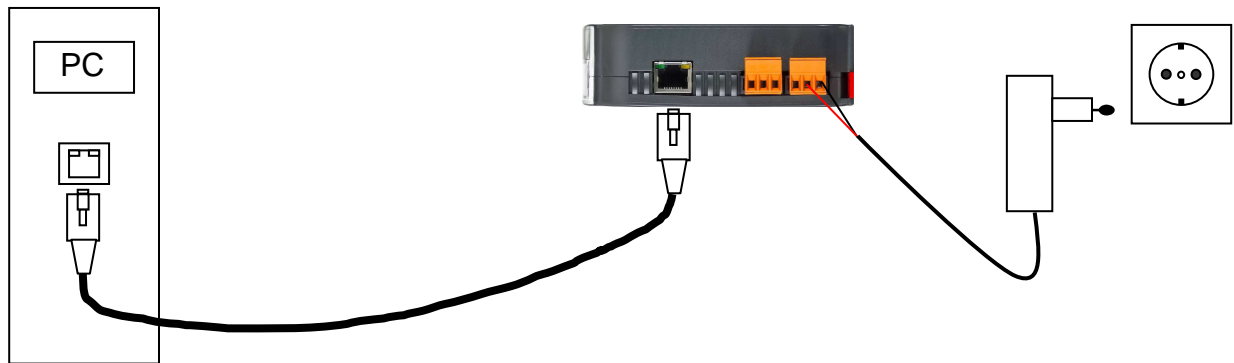
Select “Add”

Setting the TCP/IP

2. During first use disconnect the PC from the existing network.

3. Connect the power supply for the AK-DinRail-ADSL / das EVA-KIT-ADSL and connect the AK-DinRail-ADSL / the EVA-KIT-ADSL to your PC via Ethernet.

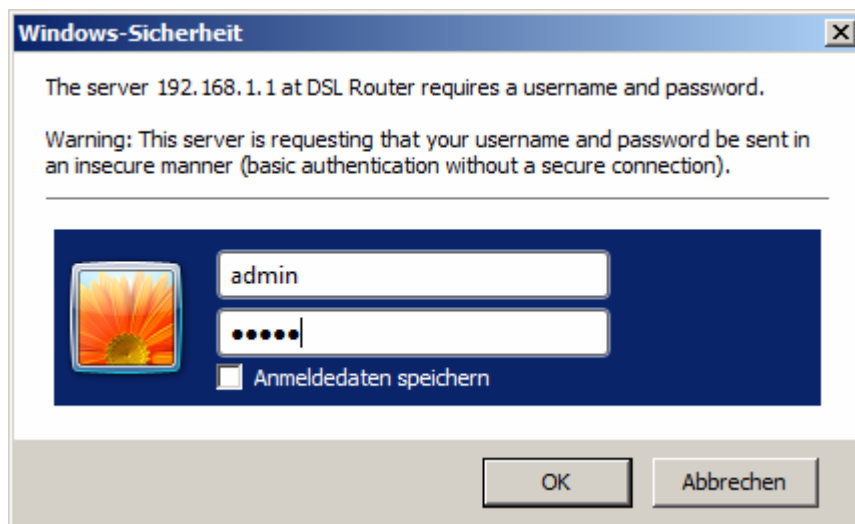
Example for installation:



Then open up your web browser and enter <http://192.168.1.1> in the address field. After successfully establishing a connection to the router, you are prompted to enter the user name and password.

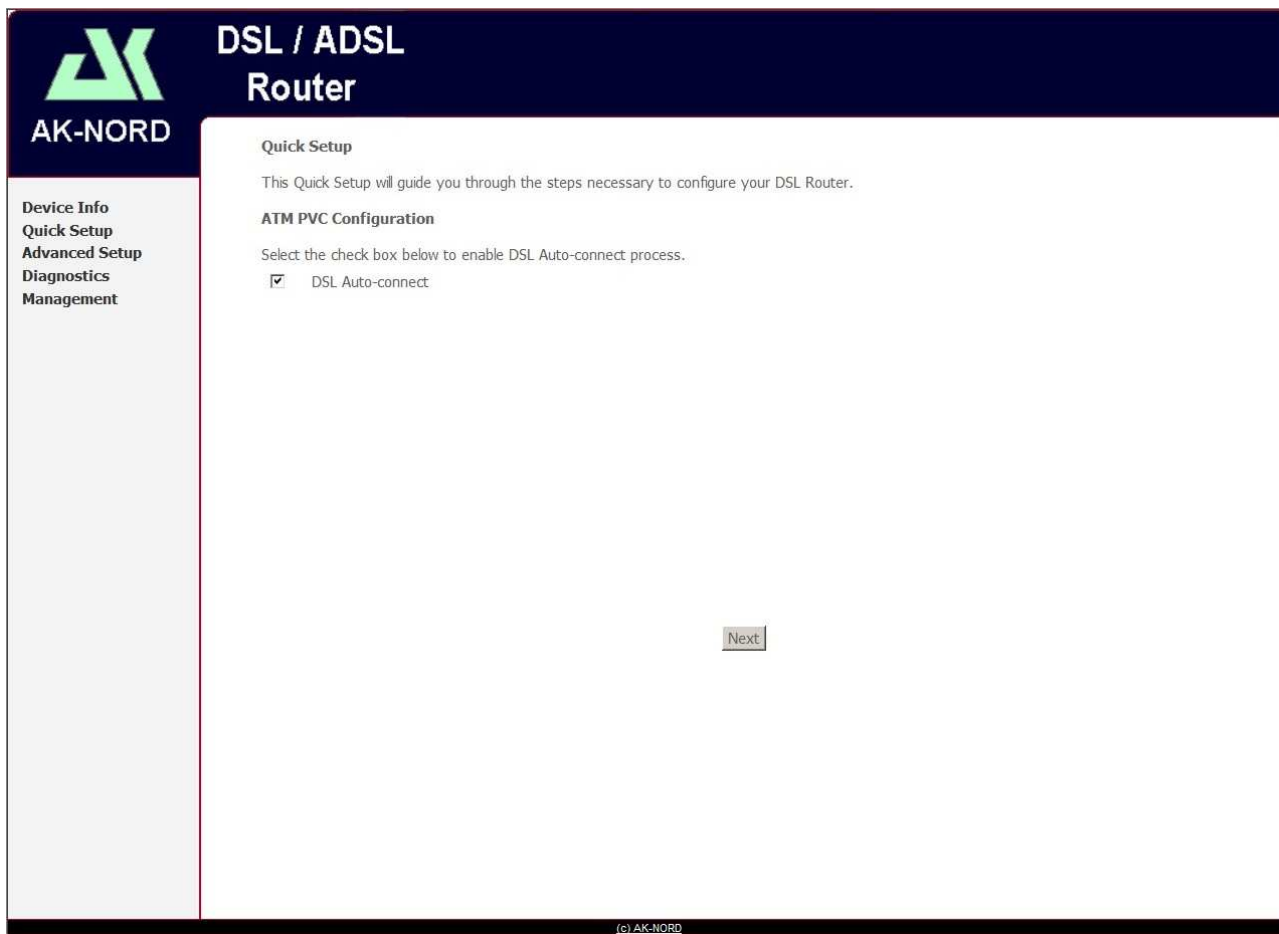
User name: admin

Password: admin



Configuration ADSL

Welcome to the menu of the DSL / ADSL router



On the left side you will see five menus:

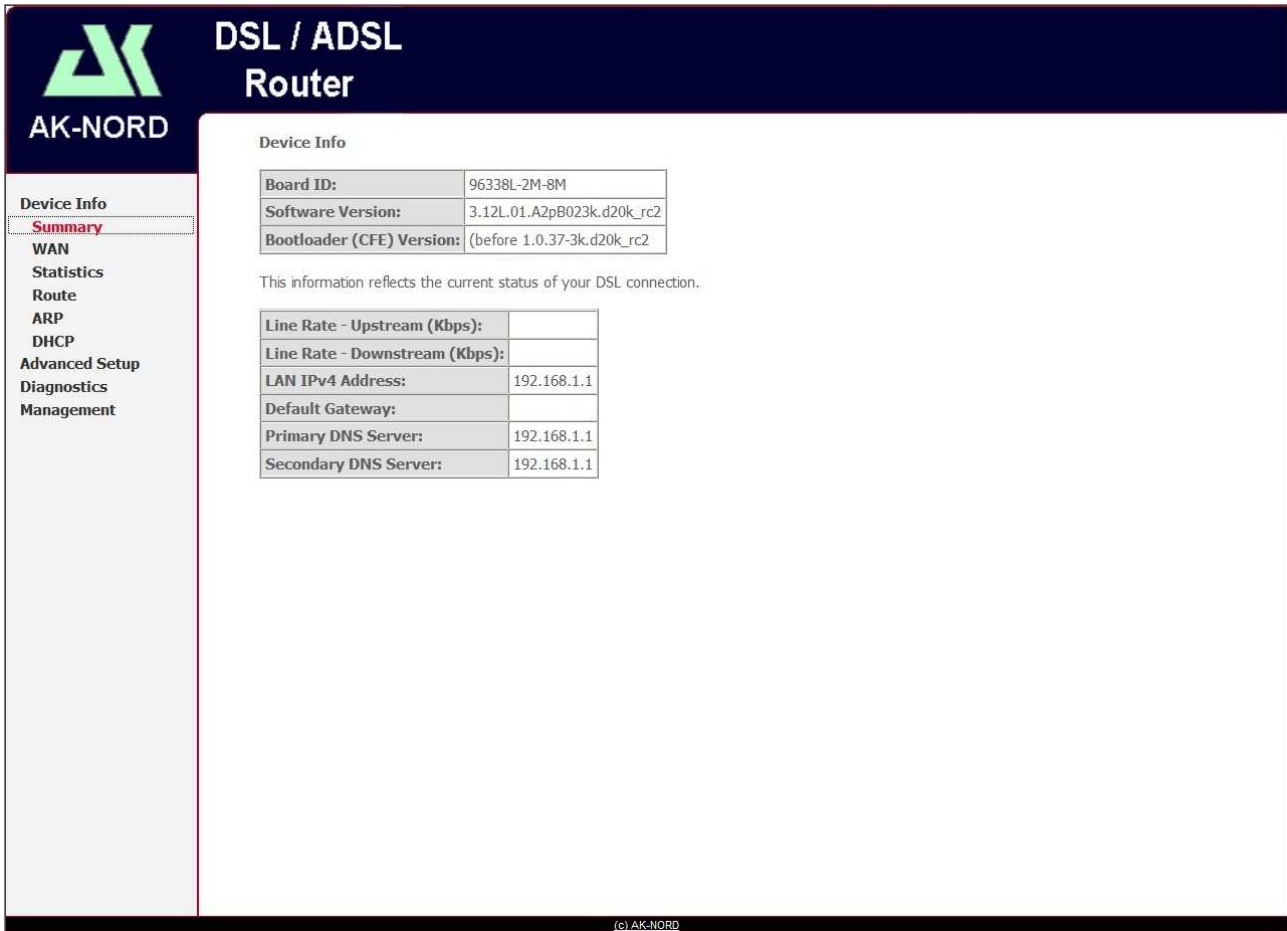
- 1) Device Info
- 2) Quick Setup
- 3) Advanced Setup
- 4) Diagnostics
- 5) Management

On the first page which shows up the “Quick Setup“ menu is available and if you do not possess any exact configuration data, you can also perform this setup. The only disadvantage is the long time required to perform this setup.

The “Advanced Setup“ is considerable more rapid!

Configuration ADSL

1) Device Info



The screenshot shows the configuration interface for an AK-NORD DSL/ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info (selected), Summary, WAN, Statistics, Route, ARP, DHCP, Advanced Setup, Diagnostics, and Management. The main content area is titled "Device Info" and contains the following information:

Board ID:	96338L-2M-8M
Software Version:	3.12L.01.A2pB023k.d20k_rc2
Bootloader (CFE) Version:	(before 1.0.37-3k.d20k_rc2)

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	
Line Rate - Downstream (Kbps):	
LAN IPv4 Address:	192.168.1.1
Default Gateway:	
Primary DNS Server:	192.168.1.1
Secondary DNS Server:	192.168.1.1

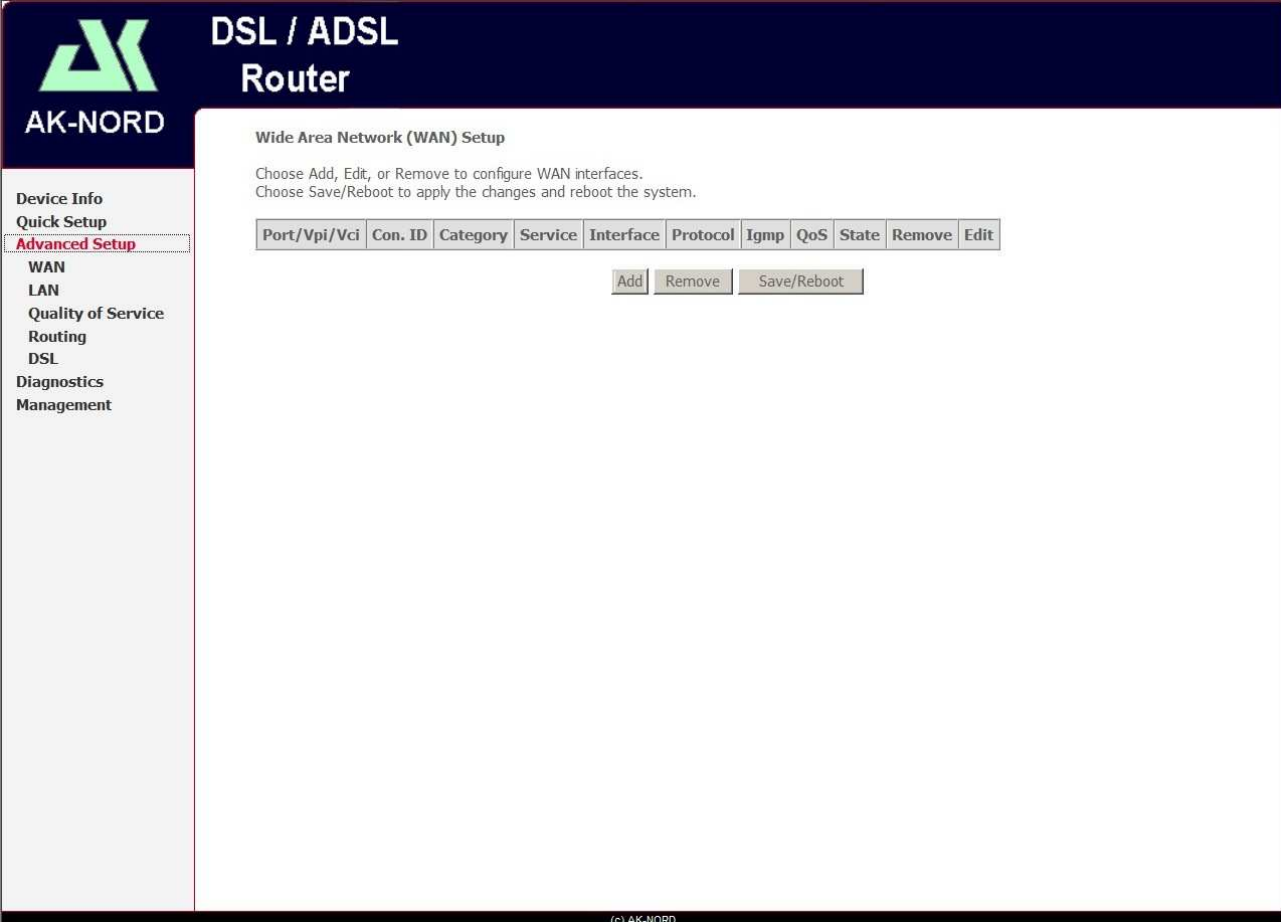
(c) AK-NORD

Here you can see the general data of the router:

- WAN: All accounts as well as their settings are listed
- Statistics: You receive clearly arranged tables for LAN, WAN, ATM and ADSL, displaying e.g. Received Bytes or Transmitted Bytes or Errors.
- Route: The routing procedure of the router is displayed in a table.
- ARP: Overview of the address data records for the translation of IP to physical addresses.
- DHCP: All DHCP-Clients are listed to which your router assigns an IP address. For the single Client the Hostname, MAC address, IP address and DHCP Lease Time are displayed.

Configuration ADSL

3) Advanced Setup



The screenshot displays the configuration page for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, **Advanced Setup** (highlighted), WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "Wide Area Network (WAN) Setup". Below the title, there is a brief instruction: "Choose Add, Edit, or Remove to configure WAN interfaces. Choose Save/Reboot to apply the changes and reboot the system." A table with the following headers is present: Port/Vpi/Vci, Con. ID, Category, Service, Interface, Protocol, Igmp, QoS, State, Remove, and Edit. Below the table, there are three buttons: "Add", "Remove", and "Save/Reboot". At the bottom of the page, there is a small copyright notice: "(c) AK-NORD".

As you can see, you have accessed the Advanced Setup. Here you have the following selection options in order to configure your router:

- 3.1) WAN (Wide Area Network) for Internet accounts and Bridge function
- 3.2) LAN (Local Area Network) for the existing Ethernet connection to the router
- 3.3) Quality of Service to classify/prioritize the IP packages
- 3.4) Routing to determine the path for the message flow
- 3.5) DSL for an exact setting of the DSL

Configuration ADSL

3.1) The WAN menu

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". The left sidebar contains a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN (highlighted in red), LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "Wide Area Network (WAN) Setup" and includes the following text: "Choose Add, Edit, or Remove to configure WAN interfaces. Choose Save/Reboot to apply the changes and reboot the system." Below this text is a table with the following columns: Port/Vpi/Vci, Con. ID, Category, Service, Interface, Protocol, Igmp, QoS, State, Remove, and Edit. At the bottom of the table, there are three buttons: Add, Remove, and Save/Reboot. The footer of the page contains the copyright notice "(c) AK-NORD".

You can generally manage accounts with the functions Add, Remove, Save/Reboot and Edit, if there is already an account existing.

Configuration ADSL

Adding a WAN account

The screenshot shows the configuration page for an ATM PVC on a DSL/ADSL router. The interface includes a sidebar with navigation options and a main configuration area. The main area contains fields for PORT, VPI, and VCI, a dropdown for Service Category, and a checkbox for Enable Quality Of Service. The values shown are PORT: 0, VPI: 0, VCI: 35, and Service Category: UBR Without PCR. The 'Enable Quality Of Service' checkbox is unchecked. There are 'Back' and 'Next' buttons at the bottom of the configuration area.

DSL / ADSL Router

ATM PVC Configuration
This screen allows you to configure an ATM PVC identifier (PORT and VPI and VCI) and select a service category. Otherwise choose an existing interface by selecting the checkbox to enable it.

PORT: [0-3]

VPI: [0-255]

VCI: [32-65535]

Service Category:

Enable Quality Of Service
Enabling packet level QoS for a PVC improves performance for selected classes of applications. QoS cannot be set for CBR and Realtime VBR. QoS consumes system resources; therefore the number of PVCs will be reduced. Use **Advanced Setup/Quality of Service** to assign priorities for the applications.

Enable Quality Of Service

(c) AK-NORD

After clicking on the button Add, you can configure your router:

Enter for VPI (Virtual Path Identifier), VCI (Virtual Channel Identifier) as well as Service Category and Enable QoS the data from ISP(Internet Service Provider). If your ISP did not make any indications for the last two items, just leave them as they are.

Configuration ADSL

Click on “Next” and you access the following page.

AK-NORD

DSL / ADSL Router

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)
- IP over ATM (IPoA)
- Bridging

Encapsulation Mode

LLC/SNAP-BRIDGING

Back Next

(c) AK-NORD

Here you can select your connection type:

- 3.1a) PPP over ATM (PPPoA)
- 3.1b) PPP over Ethernet (PPPoE)
- 3.1c) MAC Encapsulation Routing (MER)
- 3.1d) IP over ATM (IPoA)
- 3.1e) Bridging

The selection of your connection type is depending on your ISP or on the fact, if you would like to use your router as Bridge. Most providers in Germany offer PPPoE connections in the most common cases.

Configuration ADSL

Service Category / Encapsulation

Service Category:

- UBR (Unspecified Bit Rate): You receive the bandwidth according to the Best-Effort principle, i.e. you receive the bandwidth which can currently be implemented.
 - However for standard settings for TCP/IP there is no guaranteed cell transfer, e.g. in case of a data bottleneck in the line, the UBR cells are more likely rejected than others. Appropriate for any data transfer.

- CBR (Constant Bit Rate): A certain peak rate is demanded which can be guaranteed and remains constant (but if a higher rate is available, it might cause that this bandwidth remains unused).
 - the isochronous Service Category is intended for real-time Traffic which does not tolerate hardly any cell transfer delay, respectively cell transfer variations and is defined over a certain time such as e.g. Voice, Video, Circuit Emulation. Not appropriate for suddenly increasing Traffic such as LAN.

- VBR (Variable Bit Rate): An average cell rate is made available which may be exceeded for a certain time.
 - VBR-RT: the synchronous Service Category is appropriate for suddenly increasing Traffic, it allows statistic multiplexing and is characterized by a peak cell rate (PCR), continuous cell rate as well as a maximum burst size. VBR-RT assumes a certain delay guarantee, however no fixed bandwidth. For instance packed interactive videos or Voice applications with voice activation.
 - VBR-NRT: can be used for applications with suddenly increasing traffic which do not assume any cell transfer delays / cell delay variations. VBR-NRT allows statistic multiplexing and assumes a low cell loss rate. Furthermore, this Service Category does not require a certain latency and is characterized by a peak cell rate (PCR), continuous cell rate as well as a maximum burst size. It is used mostly for multimedia applications.

PCR (Peak Cell Rate) – can be set for a peak rate which should be guaranteed

RT (Real-Time) – only, if also bandwidth is required, it is also sent (on- / -off Traffic)

NRT (Non-Real-Time) – similar to RT, only tolerant towards time delays



We recommend to use the standard setting “UBR without PCR“. This guarantees a balanced Internet connection. In case that you would like to perform other settings, you should be exactly informed in advance about the different service categories in order that no problems occur.

Encapsulation



We recommend to use the standard setting “LLC/ SNAP-Bridging“. If you would like to perform another setting, please be informed beforehand by your Internet service provider.

Configuration ADSL

3.1a/b) PPPoA / PPPoE

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "PPP Username and Password". It contains the following text: "PPP usually requires that you have a user name and password to establish your connection. In the boxes below, enter the user name and password that your ISP has provided to you." Below this text are three input fields: "PPP Username:" (text box), "PPP Password:" (text box), and "Authentication Method:" (dropdown menu with "AUTO" selected). There are seven checkboxes: "Enable Fullcone NAT", "Dial on demand (with idle timeout timer)", "PPP IP extension", "Use Static IP Address", "Retry PPP password on authentication error", and "Enable PPP Debug Mode". At the bottom of the form, there are "Back" and "Next" buttons. The footer of the page reads "(c) AK-NORD".

When using a PPPoA / PPPoE connection, you have to indicate your PPP data from ISP in the following step. Furthermore, the options Fullcone NAT, Dial on Demand, IP Extension, Static IP, Retry PPP and Debug Mode are available.

NAT – Network Address Translation

Dial on Demand – If you do not want to operate your Internet connection continuously, since e.g. you do not have a flat rate, you may set a timer which disconnects the Internet connection in case of an inactivity of x minutes.

IP Extension – An IP address is assigned to your router and only the PC to which this IP address is assigned can establish a connection to the Internet.

Static IP – Indications of a static IP address.

Debug Mode – Offers you the option, e.g. to view an exact analysis of the problem in case of a connection failure.

(Only for PPPoE there is the option to use “Bridge PPPoE Frames Between WAN and Local Ports“, which allows you to start PPPoE connections from your PC! And the field PPP Service Name which is left empty or assigned by default, depending on your provider.)

Configuration ADSL

3.1a/b) PPPoA / PPPoE

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "Enable IGMP Multicast, and WAN Service". It contains three settings: "Enable IGMP Multicast" with an unchecked checkbox, "Enable WAN Service" with a checked checkbox, and "Service Name" with a text input field containing "pppoa_0_0_35_1". At the bottom right of the main content area, there are "Back" and "Next" buttons. The footer of the page contains the copyright notice "(c) AK-NORD".

Here you have to perform the last settings for the PPPoA connection.

Enable IGMP Multicast - Internet Group Management Protocol must only be set, if the devices support Multicast.

Enable WAN Service – should be activated (if you have several WAN accounts, you can also deactivate them using this function)

Service Name – Name of the Internet account

Configuration ADSL

3.1c) MER

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "WAN IP Settings" and contains the following text: "Enter information provided to you by your ISP to configure the WAN IP settings. Notice: DHCP can be enabled for PVC in MER mode or IP over Ethernet as WAN interface if 'Obtain an IP address automatically' is chosen. Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection. If you configure static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the 'Use IP address'. The 'Use WAN interface' is optional." Below this text are several configuration options: "Obtain an IP address automatically" (radio button), "Use the following IP address:" (radio button, selected), "Obtain default gateway automatically" (radio button), "Use the following default gateway:" (radio button, selected), "Obtain DNS server addresses automatically" (radio button), and "Use the following DNS server addresses:" (radio button, selected). There are also checkboxes for "Use IPv4 Address" and "Use WAN Interface". The "Use WAN Interface" dropdown menu is set to "mer_0_0_35/". There are "Back" and "Next" buttons at the bottom right of the form.

WAN IP Settings

Enter information provided to you by your ISP to configure the WAN IP settings.
Notice: DHCP can be enabled for PVC in MER mode or IP over Ethernet as WAN interface if "Obtain an IP address automatically" is chosen. Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from DHCP or other WAN connection.
If you configure static default gateway over this PVC in MER mode, you must enter the IP address of the remote gateway in the "Use IP address". The "Use WAN interface" is optional.

Obtain an IP address automatically

Use the following IP address:

WAN IPv4 Address:

WAN Subnet Mask:

Obtain default gateway automatically

Use the following default gateway:

Use IPv4 Address:

Use WAN Interface:

Obtain DNS server addresses automatically

Use the following DNS server addresses:

Primary DNS server:

Secondary DNS server:

If you are using MER (MAC Encapsulation Routing), you must configure the IP address, Gateway and DNS server by indicating your ISP in the following step.

Configuration ADSL

3.1c) MER

The screenshot shows the configuration interface for an AK-NORD DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "Network Address Translation Settings". It includes a descriptive paragraph: "Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN).". Below this, there are three checkboxes: "Enable NAT" (unchecked), "Enable Firewall" (unchecked), and "Enable IGMP Multicast, and WAN Service". Under the last checkbox, there are two sub-options: "Enable IGMP Multicast" (unchecked) and "Enable WAN Service" (checked). A "Service Name" field contains the text "mer_0_0_35". At the bottom right of the form, there are "Back" and "Next" buttons. A small copyright notice "(c) AK-NORD" is visible at the bottom center of the page.

One step further you have the following setting options:

Enable NAT

Enable Firewall

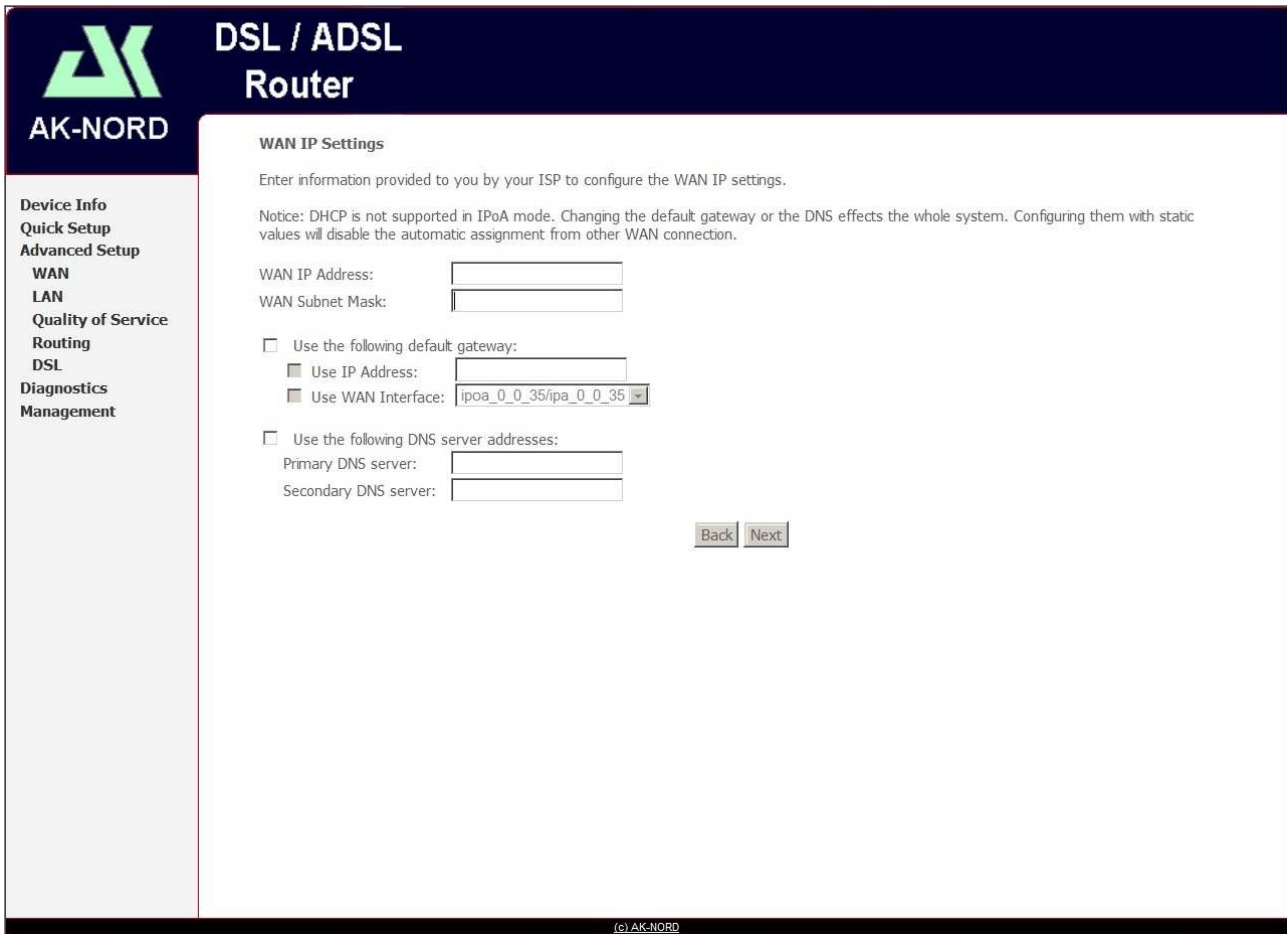
IGMP Multicast - Internet Group Management Protocol must only be set, if the devices support Multicast.

WAN Service – should be activated

Service Name –Name of the Internet account

Configuration ADSL

3.1d) IPoA



The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "WAN IP Settings" and contains the following text: "Enter information provided to you by your ISP to configure the WAN IP settings." and "Notice: DHCP is not supported in IPoA mode. Changing the default gateway or the DNS effects the whole system. Configuring them with static values will disable the automatic assignment from other WAN connection." Below this, there are input fields for "WAN IP Address:" and "WAN Subnet Mask:". There are two main sections for configuration, each starting with an unchecked checkbox. The first section is "Use the following default gateway:", which includes a checked checkbox for "Use IP Address:" with an empty input field, and a checked checkbox for "Use WAN Interface:" with a dropdown menu showing "ipoa_0_0_35/ipa_0_0_35". The second section is "Use the following DNS server addresses:", which includes a checked checkbox for "Primary DNS server:" with an empty input field, and a checked checkbox for "Secondary DNS server:" with an empty input field. At the bottom right of the form, there are "Back" and "Next" buttons. The footer of the page contains the text "(c) AK-NORD".

For the IP over ATM connection you have to set your WAN data and, if required, Gateway and DNS server according to the indications of the ISP.

Configuration ADSL

3.1d) IPoA

The screenshot shows the configuration interface for an AK-NORD DSL/ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "Network Address Translation Settings". It contains the following text: "Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN)." Below this text are three checkboxes: "Enable NAT" (unchecked), "Enable Firewall" (unchecked), and "Enable IGMP Multicast, and WAN Service". Under the last checkbox, there are two more checkboxes: "Enable IGMP Multicast" (unchecked) and "Enable WAN Service" (checked). Below these is a text input field labeled "Service Name:" with the value "poa_0_0_35". At the bottom right of the form area, there are two buttons: "Back" and "Next".

You have the following setting options:

Enable NAT

Enable Firewall

IGMP Multicast - Internet Group Management Protocol must only be set, if the devices support Multicast.

WAN Service – should be activated (if you have several WAN accounts, you can also deactivate them using this function)

Service Name –Name of the Internet account

Configuration ADSL

3.1e) Bridging

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area has a dark blue header with the AK-NORD logo and the text "DSL / ADSL Router". Below the header, there is a section titled "Unselect the check box below to disable this WAN service". Under this section, there are two fields: "Enable Bridge Service:" with a checked checkbox, and "Service Name:" with a text input field containing "br_0_0_35". At the bottom of the main content area, there are two buttons: "Back" and "Next".

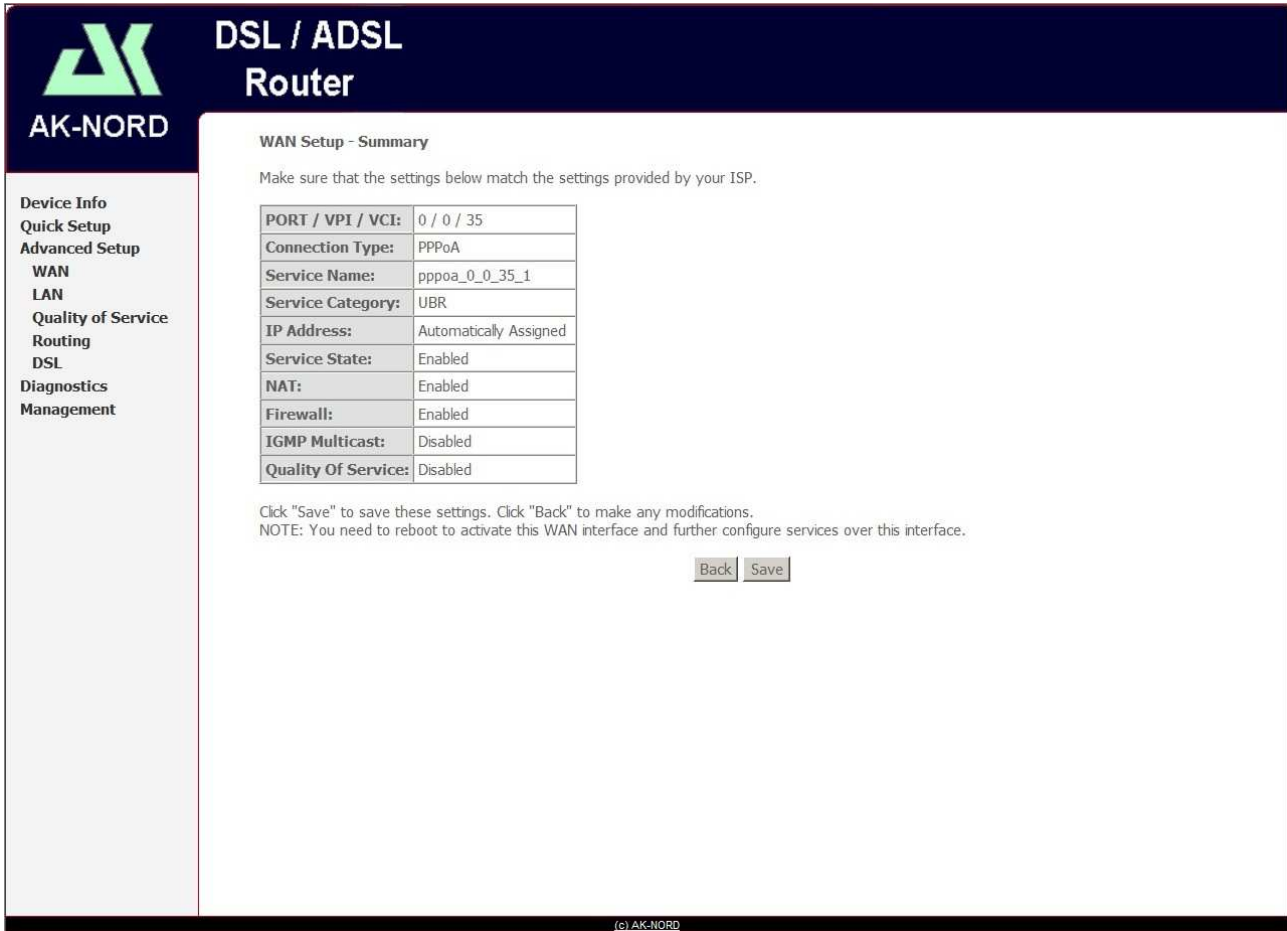
By selecting “Bridging“, you have the option to use your router as Bridge.

Bridge Service – should be activated (if you have several WAN accounts, you can also deactivate them using this function)

Service Name – Name of the Bridge

Configuration ADSL

3.1a-e) PPPoA / PPPoE / MER / IPoA / Bridging



The screenshot shows the configuration interface for an AK-NORD DSL/ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing, DSL, Diagnostics, and Management. The main content area is titled "WAN Setup - Summary" and includes a warning: "Make sure that the settings below match the settings provided by your ISP." Below this is a table of settings:

PORT / VPI / VCI:	0 / 0 / 35
Connection Type:	PPPoA
Service Name:	pppoa_0_0_35_1
Service Category:	UBR
IP Address:	Automatically Assigned
Service State:	Enabled
NAT:	Enabled
Firewall:	Enabled
IGMP Multicast:	Disabled
Quality Of Services:	Disabled

Below the table, there is a note: "Click 'Save' to save these settings. Click 'Back' to make any modifications. NOTE: You need to reboot to activate this WAN interface and further configure services over this interface." At the bottom of the note are two buttons: "Back" and "Save".

On the last page of the setting of an account a summary of your settings is displayed allowing you to check, if the settings are right before finally saving them.

After having performed all settings respectively adaptations when editing an existing account, the data are buffered first in the Flash memory and are coming into force after a restart of the router. Since you are back to your WAN menu, click on Save/Reboot in order to activate the setting.

This process will take about two minutes.

Configuration ADSL

3.2) The LAN menu

AK-NORD DSL / ADSL Router

Local Area Network (LAN) Setup

Configure the DSL Router IP Address and Subnet Mask for LAN interface. Save button only saves the LAN configuration data. Save/Reboot button saves the LAN configuration data and reboots the router to make the new configuration effective.

IP Address:

Subnet Mask:

Enable IGMP Snooping

Standard Mode

Blocking Mode

Disable DHCP Server

Enable DHCP Server

Start IP Address:

End IP Address:

Subnet Mask:

Leased Time (hour):

Static IP Lease List: Please click on Save/Reboot button to make the new configuration effective. (A maximum 32 entries can be configured)

MAC Address	IP Address	Remove

Enable DHCP Server Relay

DHCP Server IP Address:

Configure the second IP Address and Subnet Mask for LAN interface

(c) AK-NORD

In this menu you can perform all configurations which concern the router in the LAN.

IP Address – current IP address which the router possesses (standard is 192.168.1.1)

Subnet Mask – current subnet mask of the router.

UPnP – Universal Plug and Play to activate the devices in a network

IGMP Snooping – allows to monitor the connection from the host and the router.

Standard Mode

Blocking Mode

DHCP Settings – Dynamic Host Configuration Protocol is the integration of PC in an existing network without its manual configuration.

Static IP Lease List – Reserving a certain IP address for a PC.

Second IP Address and Subnet Mask – Adding another IP address and subnet mask for the router.

Configuration ADSL

3.3) The QoS menu

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". The left sidebar contains a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service (highlighted), Queue Config, QoS Classification, Routing, DSL, Diagnostics, and Management. The main content area is titled "QoS -- Queue Management Configuration". It contains the following text: "If Enable QoS checkbox is selected, choose a default DSCP mark to automatically mark incoming traffic without reference to a particular classifier. Click 'Save/Apply' button to save it." Below this, there are two notes: "Note: If Enable QoS checkbox is not selected, all QoS will be disabled for all interfaces." and "Note: The default DSCP mark is used to mark all egress packets that do not match any classification rules." There is a checked checkbox labeled "Enable QoS". Below the checkbox, there is a label "Select Default DSCP Mark" followed by a dropdown menu showing "No Change(-1)". At the bottom right of the configuration area, there is a "Save/Apply" button. The footer of the page contains the text "(c) AK-NORD".

In the QoS menu with the two sub-items Queue Config and QoS Classification you can classify and prioritize the QoS.

Quality of Service describes a procedure to influence the data traffic within networks in order to sort the data according to different parameters. In this case, it is regarding the QoS procedure of the IETF for real-time transfer in the Internet with the Differentiated Services (DiffServ or also called soft QoS). At this, some data are treated with "preference", i.e. by highlighting or simultaneous prioritizing of the data, you can direct them more rapidly to the target and this way guarantee a stable data transfer. You can prioritize critical traffic such as Voice or the streaming of media and make available a lower latency and simultaneously for the remaining non-critical traffic, such as Web traffic or data transfer by applying the Best-Effort principle.

Configuration ADSL

3.4) Routing

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Quick Setup, Advanced Setup, WAN, LAN, Quality of Service, Routing (highlighted), Default Gateway, Static Route, DSL, Diagnostics, and Management. The main content area is titled "Routing -- Default Gateway". It contains the following text: "If Enable Automatic Assigned Default Gateway checkbox is selected, this router will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click 'Save/Apply' button to save it." Below this is a note: "NOTE: If changing the Automatic Assigned Default Gateway from unselected to selected, You must reboot the router to get the automatic assigned default gateway." The configuration options are: Enable Automatic Assigned Default Gateway, Use Default Gateway IP Address (with an empty text input field), and Use Interface (with a dropdown menu). A "Save/Apply" button is located at the bottom right of the configuration area. At the bottom of the page, there is a small copyright notice: "(c) AK-NORD".

In the Routing menu the standard setting is “Enable Automatic Assigned Default Gateway“. At this, the system automatically searches for a path for the message flow. However, you can determine a default Gateway yourself. It is also possible to set a static route.

Configuration ADSL

3.5) DSL

DSL / ADSL Router

DSL Settings

Select the modulation below.

- G.Dmt Enabled
- G.lite Enabled
- T1.413 Enabled
- ADSL2 Enabled
- AnnexL Enabled
- ADSL2+ Enabled
- AnnexM Enabled

Select the phone line pair below.

- Inner pair
- Outer pair

Capability

- Bitswap Enable
- SRA Enable

(c) AK-NORD

Serves to configure your DSL. In the Advanced Settings the following options are available:

DSL Advanced Settings

Select the test mode below.

- Normal
- Reverb
- Medley
- No retrain
- L3

Configuration ADSL

After having added an account, four new sub-items are displayed in the Advanced Setup: NAT, Security, Parental Control and DNS.

3.6) NAT

The screenshot shows the configuration interface for a DSL / ADSL Router. The page title is "DSL / ADSL Router". On the left, there is a navigation menu with the following items: Device Info, Advanced Setup, WAN, LAN, NAT (highlighted in red), Virtual Servers, Port Triggering, DMZ Host, Security, Parental Control, Quality of Service, Routing, DNS, DSL, Diagnostics, and Management. The main content area is titled "NAT -- Virtual Servers Setup". Below the title, there is a descriptive text: "Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum 32 entries can be configured." Below the text are two buttons: "Add" and "Remove". Below the buttons is a table with the following columns: Server Name, External Port Start, External Port End, Protocol, Internal Port Start, Internal Port End, Server IP Address, Remote Host, and Remove. The table is currently empty.

Serves for NAT configuration of virtual servers in order to direct the incoming traffic as well as to activate the Port Triggering for programs (some programs require certain port releases in order to be able to control them) and the DMZ Host determination (DMZ = Demilitarized Zone).

Configuration ADSL

3.7) Security

The screenshot shows the configuration interface for a DSL / ADSL Router. The left sidebar contains a navigation menu with the following items: Device Info, Advanced Setup, WAN, LAN, NAT, Security, IP Filtering (highlighted), Outgoing, Incoming, Parental Control, Quality of Service, Routing, DNS, DSL, Diagnostics, and Management. The main content area is titled "DSL / ADSL Router" and "Outgoing IP Filtering Setup". It includes a brief explanation: "By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be **BLOCKED** by setting up filters. Choose Add or Remove to configure outgoing IP filters." Below this is a table with the following columns: Filter Name, Protocol, Source Address / Mask, Source Port, Dest. Address / Mask, Dest. Port, and Remove. The table is currently empty, and there are "Add" and "Remove" buttons below it. The footer of the page contains the copyright notice "(c) AK-NORD".

The Security menu is used to set the IP filtering for incoming as well as for outgoing traffic.

Configuration ADSL

3.8) Parental Control

AK-NORD DSL / ADSL Router

Time of Day Restrictions -- A maximum 16 entries can be configured.

Username	MAC	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Start	Stop	Remove
<input type="button" value="Add"/> <input type="button" value="Remove"/>											

Device Info
Advanced Setup
WAN
LAN
NAT
Security
Parental Control
URL Filter
Quality of Service
Routing
DNS
DSL
Diagnostics
Management

(c) AK-NORD

Using this menu, you can limit the Internet usage for participants in the Internet and block Internet sites using the URL filter.

AK-NORD

URL Filter -- A maximum 100 entries can be configured.

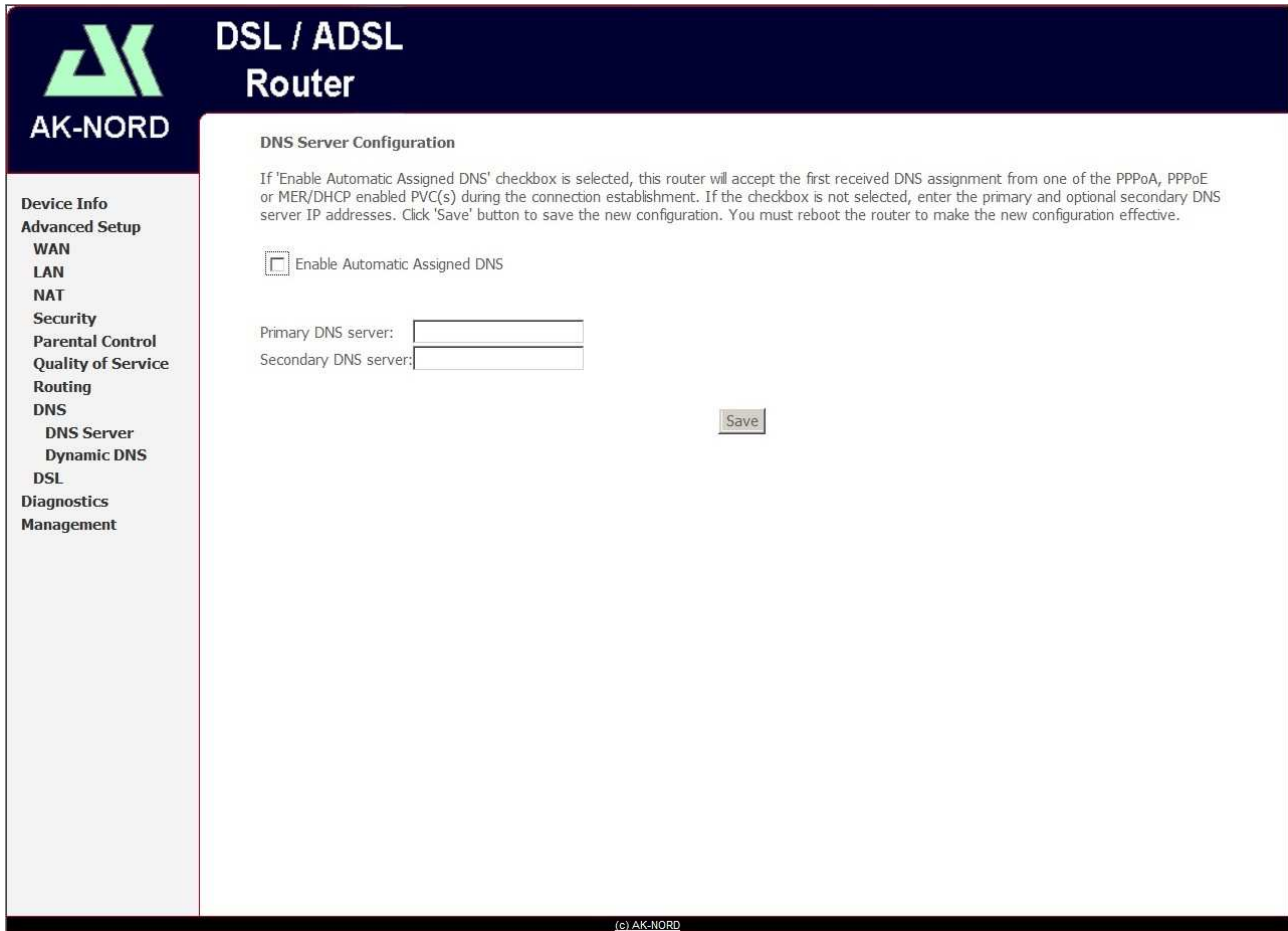
URL List Type: Exclude Include

Address	Port	Remove
<input type="button" value="Add"/> <input type="button" value="Remove"/>		

Device Info
Advanced Setup
WAN
LAN
NAT
Security
Parental Control
URL Filter
Quality of Service
Routing
DNS
DSL
Diagnostics
Management

Configuration ADSL

3.9) DNS

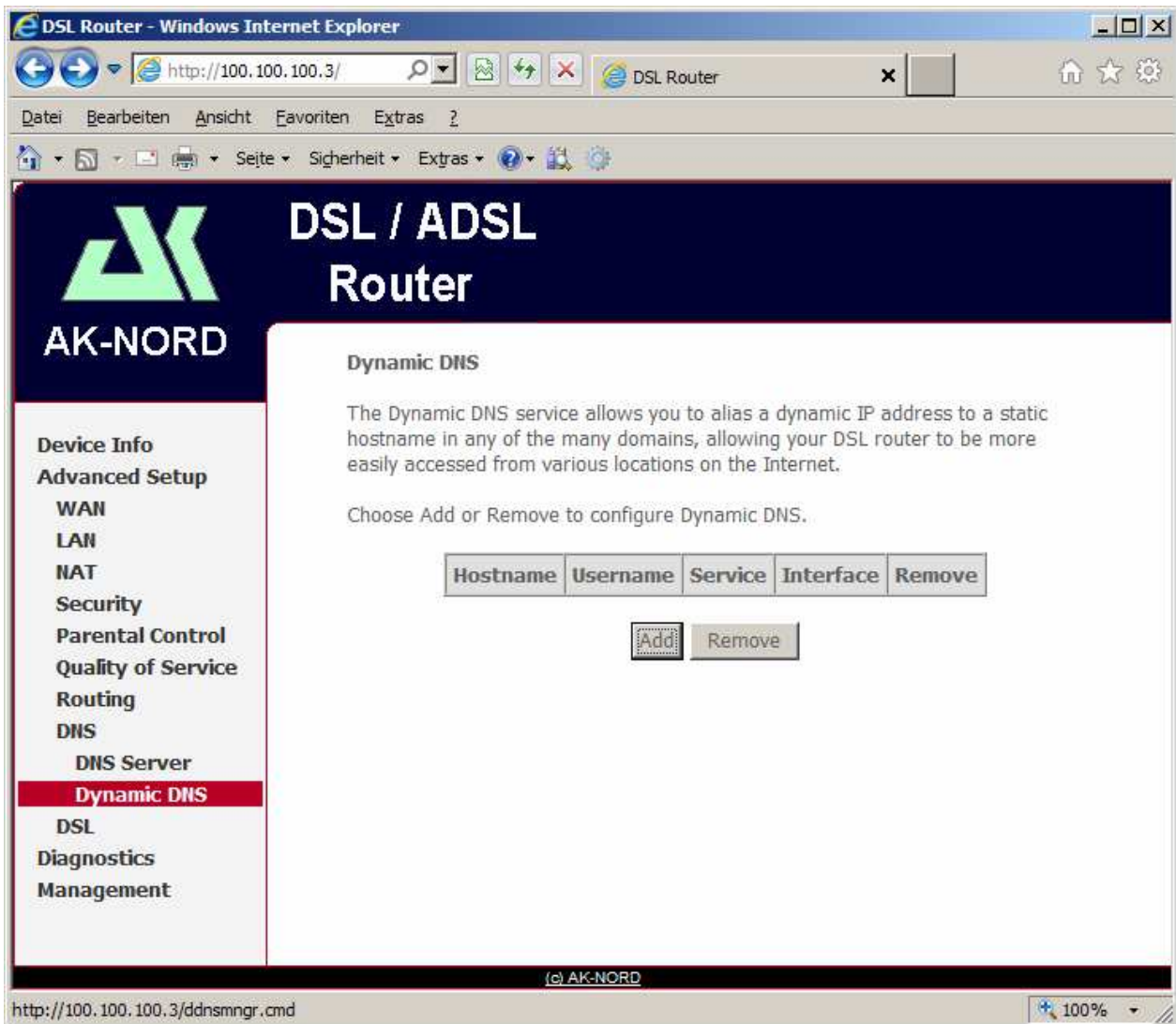


The screenshot shows the configuration interface for an AK-NORD DSL/ADSL Router. The page title is "DSL / ADSL Router". The left sidebar contains a navigation menu with the following items: Device Info, Advanced Setup (WAN, LAN, NAT), Security, Parental Control, Quality of Service, Routing, DNS (DNS Server, Dynamic DNS), DSL, Diagnostics, and Management. The main content area is titled "DNS Server Configuration" and contains the following text: "If 'Enable Automatic Assigned DNS' checkbox is selected, this router will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click 'Save' button to save the new configuration. You must reboot the router to make the new configuration effective." Below this text is a checkbox labeled "Enable Automatic Assigned DNS" which is currently unchecked. There are two input fields: "Primary DNS server:" and "Secondary DNS server:". A "Save" button is located to the right of the input fields. At the bottom of the page, there is a small copyright notice: "(c) AK-NORD".

Using the DNS menu, it is possible to configure the DNS server. Furthermore, you can also set up a Dynamic DNS. Standard setting is "Enable Automatic Assigned DNS".

Konfiguration ADSL

3.10) DynDNS



Please press „ADD“ in order to create an DynDNS - Connection

Configuration ADSL

4) Diagnostics

AK-NORD DSL / ADSL Router

pppoa_0_0_35_1 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

Test the connection to your local network

Test your ENET(1-3) Connection:	FAIL	Help
Test your ENET4 Connection:	PASS	Help
Test your USB Connection:	DOWN	Help

Test the connection to your DSL service provider

Test ADSL Synchronization:	FAIL	Help
Test ATM OAM F5 segment ping:	FAIL	Help
Test ATM OAM F5 end-to-end ping:	FAIL	Help

Test the connection to your Internet service provider

Test PPP server session:	FAIL	Help
Test authentication with ISP:	PASS	Help
Test the assigned IP address:	FAIL	Help
Ping default gateway:	FAIL	Help
Ping primary Domain Name Server:	PASS	Help

(c) AK-NORD

Using the function Diagnostics you can test the settings for the accounts. The router shows, if the settings are right by indicating "FAIL" or "PASS". Under "Help" you will find possible error sources.

Configuration ADSL

5) Management

The screenshot displays the web interface of an AK-NORD DSL/ADSL Router. The top header is dark blue with the AK-NORD logo on the left and the text "DSL / ADSL Router" on the right. Below the header is a navigation menu on the left side with the following items: Device Info, Advanced Setup, Diagnostics, Management, Settings, Backup (highlighted in red), Update, Restore Default, System Log, Internet Time, Access Control, Update Software, and Save/Reboot. The main content area is titled "Settings - Backup" and contains the text: "Backup DSL router configurations. You may save your router configurations to a file on your PC." Below this text is a button labeled "Backup Settings". At the bottom of the page, there is a small copyright notice: "(c) AK-NORD".

Under Management you have the option to edit the Backup/Update settings to reset the router to the default settings to create System-Logs, to determine Internet time, to set the access rights for the router, to perform an update and to save/restart.

Exemplary provider settings



Please note the indications regarding VPI, VCI, connection type, PPP Username/Password, PPPoE service name made by your Internet provider!!!

For Encapsulation Mode and Service Category, please use our standard setting:

- Encapsulation Mode: LLC/SNAP-Bridging
- ATM Service Category: UBR without PCR

T-Online

Port: 0
VPI: 1
VCI: 32

PORT: [0-3]	<input type="text" value="0"/>
VPI: [0-255]	<input type="text" value="1"/>
VCI: [32-65535]	<input type="text" value="32"/>

Service Category:

-> PPPoE connection

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)
- IP over ATM (IPoA)
- Bridging

Encapsulation Mode

Exemplary provider settings

PPP Username:

{Connection recognition}{T-Online number}{Number of associated user}@t-online.de

Connection recognition and T-Online number with 12 digits (if the T-Online number does not have 12 digits, you have to place a # between the T-Online number and the associated user)

PPP Password: Assigned password of T-Online

PPPoE Service Name:

PPP Username:	<input type="text" value="0975#0001@t-online.de"/>	.B.: 00097655234502652138975#0001@t-online.de
PPP Password:	<input type="password" value="....."/>	
PPPoE Service Name:	<input type="text"/>	
Authentication Method:	<input type="text" value="AUTO"/>	

“Next“

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast

Enable WAN Service

Service Name

Exemplary provider settings

Alice

Port: 0
VPI: 1
VCI: 32

PORT: [0-3]
VPI: [0-255]
VCI: [32-65535]

Service Category:

-> PPPoE connection

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)
- IP over ATM (IPoA)
- Bridging

Encapsulation Mode

Exemplary provider settings

PPP Username: Assigned user name of Alice

PPP Password: Assigned password of Alice

(if you did not receive a password from Alice, please enter something. Furthermore, you should observe the information in the letter of Alice regarding your access data)

PPPoE Service Name:

PPP Username:	<input type="text" value="Alice-Benutzername"/>	e.g.: 123456789@alice-dsl.de
PPP Password:	<input type="password" value="....."/>	
PPPoE Service Name:	<input type="text"/>	
Authentication Method:	<input type="text" value="AUTO"/>	

“Next“

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast

Enable WAN Service

Service Name

Exemplary provider settings

1und1

Port: 0
VPI: 1
VCI: 32

PORT: [0-3]
VPI: [0-255]
VCI: [32-65535]

Service Category:

-> PPPoE connection

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)
- IP over ATM (IPoA)
- Bridging

Encapsulation Mode

Exemplary provider settings

PPP Username: 1und1/Username@online.de or Username@onlinehome.de

PPP Password: Assigned password of 1und1

PPPoE Service Name:

PPP Username:	<input type="text" value="Username@onlinehome.de"/>	e.g.: 1und1/1234-5678@online.de
PPP Password:	<input type="password" value="••••••••"/>	
PPPoE Service Name:	<input type="text"/>	
Authentication Method:	<input type="text" value="AUTO"/>	

“Next“

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast	<input type="checkbox"/>
Enable WAN Service	<input checked="" type="checkbox"/>
Service Name	<input type="text" value="1und1"/>

Exemplary provider settings

Versatel

Port: 0
VPI: 1
VCI: 32

PORT: [0-3]	<input type="text" value="0"/>
VPI: [0-255]	<input type="text" value="1"/>
VCI: [32-65535]	<input type="text" value="32"/>

Service Category:

-> PPPoE connection

Connection Type

Select the type of network protocol for IP over Ethernet as WAN interface

- PPP over ATM (PPPoA)
- PPP over Ethernet (PPPoE)
- MAC Encapsulation Routing (MER)
- IP over ATM (IPoA)
- Bridging

Encapsulation Mode

Exemplary provider settings

PPP Username: Assigned user name of Versatel

PPP Password: Assigned password of Versatel

PPPoE Servicename:

PPP Username:	<input type="text" value="nutzername von Versatel"/>	e.g.: johndoe@versatel
PPP Password:	<input type="password" value="••••••••••"/>	
PPPoE Service Name:	<input type="text"/>	
Authentication Method:	<input type="text" value="AUTO"/>	

“Next“

Enable IGMP Multicast, and WAN Service

Enable IGMP Multicast

Enable WAN Service

Service Name

Explanations

ATM – “Asynchronous Transfer Mode“ is a standardized group of network technologies allowing you to create QoS (Quality of Service) supported high-speed networks.

PVC – “Permanent Virtual Circuit“ is a permanent virtual ATM connection between two users

PPP=Point-to-Point-Protocol

Default DSCP Mark – is used in order to mark all outgoing packages which do not comply with the classification.

NAT – Network Address Translation

The NAT process is used to convert network-internal to public IP addresses. In this way, on the one hand more internal IP addresses are freely available and on the other hand they remain concealed to the public which guarantees a higher protection.

If you did not receive sufficient IP addresses from your ISP to configure each PC in the network you have to use this function. In this way, you can assign an IP address to each PC. The PCs will then communicate via the router which possesses a public IP address.

The annex Fullcone means that the internal IP addresses are converted into a public IP address according to a statistic template. In this way, external hosts can create connections to internal hosts via the public IP address.

MER – The ISP uses the Mac address of a PC in order to authenticate it in the network; this function is only used, if the ISP does not support IP -Routing. MER works similar to NAT: more safety and more IP addresses are available in the internal network.