

**Table of Contents:**

SAFETY AND MAINTENANCE ..... 2

- Connection ..... 2
- Operating Environment ..... 3
- Ambient temperature ..... 3
- Channel / Usage Limitations ..... 3
- Maintenance ..... 4

WHAT'S IN THE BOX? ..... 5

WHAT IS A ROUTER? ..... 6

- What does a router actually do? ..... 7

GETTING STARTED ..... 8

- Connecting ..... 8
- Connect your router to a DSL modem ..... 8
- Connect your router to a network ..... 8
- Connect your router a 56k modem ..... 9
- Connect your Modem cable to the electricity mains..... 9
- Set up in an Ethernet network ..... 9
- Set up in a wireless network..... 11
- Router configuration..... 12
- Which details do you need for the configuration?..... 12
- Router browser interface ..... 12
- OneClick configuration..... 14
- User Mode configuration ..... 17
- Expert Settings ..... 31

CUSTOMER SERVICE ..... 41

- Troubleshooting..... 41
- LED signals ..... 42
- Technical Support ..... 42
- If you need further assistance ..... 43
- Glossary ..... 44
- Limitation of Warranty ..... 54
- Limits of Liability ..... 55
- Local Law ..... 55
- Making Copies of This Manual ..... 55

# SAFETY AND MAINTENANCE

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Keep these instructions with your router at all times. The proper set up, use and care can help extend the life of your product. In the event that you transfer ownership of this device, please supply these instructions to the new owner.

- ⇒ Whenever you edit or change your computer data, it is advisable to make backup copies on an external data medium (CD-R/RW or DVDR/RW). We are not liable for any loss of data and consequential damages.
- ⇒ Follow the safety instructions for the computer to which you are connecting the router.
- ⇒ Never open up the component housings. This might lead to a short circuit or even to a fire.
- ⇒ Never allow children to use electronic devices unsupervised. Children may not always correctly identify potential hazards.

Remove the power adapter of the router from the mains and contact our hotline:

- if any connections are cut or otherwise damaged;
- if liquid has entered the device housing;
- if the device does not operate correctly;
- if the device has been dropped or the housing damaged.

## CONNECTION

When connecting the router be sure to correctly observe the following instructions:

### POWER SUPPLY

- ⇒ The outlet must be in the vicinity of the router and must be easily accessible.
- ⇒ Only use the mains adapter on grounded sockets at 100 – 240V~ AC, 50/60 Hz. If you are unsure about the power being supplied to the place of use, ask the relevant energy provider.
- ⇒ Use only the power adapter provided with the router.

- ⇒ For additional safety, we recommend the use of a surge protector in order to protect your router from damage from electrical spikes or lightning strikes on the power network.

## CABLING

- ⇒ Arrange cables so that no-one can tread on them or trip over them. Do not place any items on the cables.


## OPERATING ENVIRONMENT

- ⇒ Keep the device away from moisture and avoid dust, heat and direct sunlight. Ensure an ambient temperature that is suitable for office equipment.
- ⇒ Position and operate the device only on a stable, even and vibration-free surface or wall (if you have wall mounted the router).
- ⇒ Allow a clearance of at least 50 cm (19.7") from sources of high-frequency and magnetic interference (TV, mobile telephones, infrared devices, loudspeaker cabinets, etc), in order to avoid malfunctions and/or loss of data.
- ⇒ This device is not intended for use in a heavy industrial environment.

## AMBIENT TEMPERATURE

The device is most reliably operated at an ambient temperature of between 41°F and 104°F (5°C and 40°C) and at a relative humidity of between 10% and 90% (non-condensing).

This device has been tested and meets the European directives for radio systems and telecommunications technical equipment (R&TTE 1999/5/EG).

CE 0470 

## CHANNEL / USAGE LIMITATIONS

**FRANCE:** Only channels 10 to 13 (2457 MHz and 2472 MHz respectively) may be used in French territory. It is not permitted to operate the device on any other channel supported by the device. Outdoor use is prohibited.

**SPAIN:** Only channels 10 to 13 (2457 MHz and 2462 MHz respectively) may be used in Spanish territory. It is not permitted to operate the device on any other channel supported by the device. Outdoor use is prohibited.

**GREECE:** For private indoor applications ONLY.

**Other countries:** No limitations are known when this manual was printed. However, please check with your local regulation authorities.

## MAINTENANCE

⇒ **Warning:** There are **no user-serviceable** or **parts that require cleaning inside** the device housing.

- ⇒ This device should only be repaired by an authorised service centre. Please contact the hotline if you have any technical problems.
- ⇒ Before cleaning the device, remove the cable connection with the computer. Clean the device and other components with a damp cloth. Do not use any solvents, corrosives or gaseous detergents.

# WHAT'S IN THE BOX?

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Please check the below-mentioned parts and accessories are supplied in the box. In case of any missing item(s) please contact your local service centre accordingly. Any claim for missing parts will only be accepted within 7 days from date of purchase. Included in delivery is the following:

- 1 - WLAN DSL router
- 1 - Ethernet cable (RJ45- RJ45)
- 1 - Modem cable (RJ11- RJ11) suitable for DSL or 56k modem
- 1 - Software driver/setup CDROM
- 1 - User manual

# WHAT IS A ROUTER?

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Your new WLAN DSL router is a fully-equipped, high performance router. What purpose does a router actually fulfill?

To answer this question, we must first consider how data is exchanged or transferred within a network. When copying a file from a server, for example, the complete file is not put on the network in one go, but is divided into small packets. Other information, such as a database request, for instance, is also broken up into such packets.

These packets are transferred according to specific rules, the so-called protocols. Initially each computer manufacturer developed it's own protocol. Exchange between different protocols was only possible with the help of special devices. Thanks to the success of the Internet, the TCP/IP protocol family became obligatory for all manufacturers, even for use within local networks.

Your data is accordingly broken down into several IP packets and carried over the local Ethernet. So that the individual packets arrive at the correct recipient, each packet is provided with sender and receiver information. This information is called the IP addresses and with the help of IP addresses servers and users can be found within a network. If, however, you want to reach a server on the Internet, for example a web page, it will usually not be located in your local network. This is where a router comes into play. It is the job of a router to connect your computer (or network) to the remote servers. To do this, the router transmits the single IP packets from the local network over DSL or 56k modem to the public Internet. Based on the IP address, the router determines whether an IP packet should stay within the network or whether it needs to be re-routed. In such cases, the router establishes a connection via 56k modem or DSL to your Internet provider – also called Internet Service Provider (ISP) – who in turn transfers the packets to the Internet. The Internet provider charges for this service and will offer several different tariffs and billing methods. As soon as the router recognises that an IP packet is not intended for the internal Ethernet, it logs in to the ISP and transfers this IP packet to the Internet.

## WHAT DOES A ROUTER ACTUALLY DO?

A router connects different networks together. It can route Ethernet networks, DSL, 56k modem and also wireless networks. A number of further features have also been built into your WLAN DSL router:

### **Firewall**

A firewall protects a local network from attacks coming from outside the network.

### **DHCP server** (Dynamic Host Configuration Protocol)

A DHCP server automatically allocates the IP configuration of clients within a local network. As such, the users do not have to manually enter their IP address.

### **DNS server**

(Domain Name Server)

A DNS server translates the domain address for accessing a web page (for example [www.medion.com](http://www.medion.com)) into a valid IP address.

In the following pages of this user guide we will explain these functions in more detail. To get started quickly and with no hassle, we recommend you start your configuration with the **One-Click** page. As detailed on this page, all you need to enter are the few details the WLAN DSL router requires to establish a connection to the Internet. In just "one click" this will give you almost instantaneous high speed access to the Internet and other services.

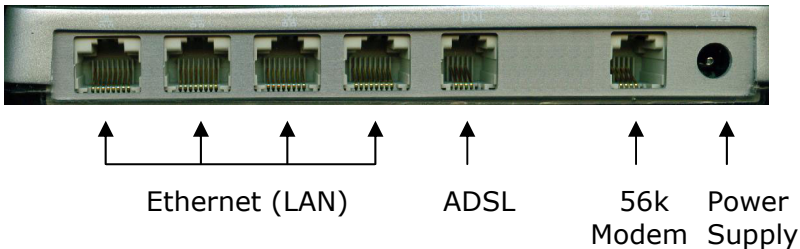
# GETTING STARTED

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In the product box you will find the router, which should be connected to your network as well as to the ADSL line and/or telephone (modem) line. This chapter describes how to easily connect your router.

## CONNECTING

On the back of your router you will find ports for Ethernet, ADSL and Modem as well as for the power supply of the device:



Connect your router as follows:

### CONNECT YOUR ROUTER TO ADSL

1. Put one plug of the supplied ADSL cable into the **ADSL** port of the router.
2. Plug the other end of the ADSL cable into your ADSL splitter (not supplied). The LED on top of the router next to the DSL label lights up.

### CONNECT YOUR ROUTER TO THE NETWORK

- ⇒ If you wish to set up a wireless network, please refer to **"Set up in a wireless network"** (page 11). However, we recommend first setting up your router through a computer which is connected to Ethernet (LAN). This will avoid any difficulty caused through improper security settings.
- ⇒ Before you connect your router to the Ethernet LAN, please check if you already use the automatic IP assignment (DHCP server) within your network. Furthermore, make sure that the pre-configured router IP address (192.168.0.100) is not already in use within the network.



If the above conditions are met, you can connect your router directly to the Ethernet. For further information, please refer to section **“Set up in an Ethernet network”** (page 9).

If you have a small network, you can connect your DSL router either to the network adapter of your computer or to a hub. You have simply to pay attention to the choice of the cable. In section **“Set up in an Ethernet network”** (page 9), it is explained under which circumstances your router is to be connected to a computer or to a hub.

1. Put one plug of the supplied blue Ethernet cable into the Ethernet port of your router.
2. Plug the other end of the Ethernet cable into a free Ethernet port of your computer, or alternatively a network hub.
3. The LED on top of the router next to the LAN label lights up.

### **CONNECT YOUR ROUTER MODEM**

The router's 56k modem is supposed to be a back-up solution in case of a missing or non-functional ADSL connection.

1. Put one plug of the supplied modem cable into the **Modem** port of the router.
2. Plug the other end of the modem cable into a telephone socket.
3. The LED on top of the router next to the Modem label lights up.

### **CONNECT YOUR POWER CABLE TO THE ELECTRICITY MAINS**

Use the power supply to connect your router to a mains socket.

- ⇒ Make sure that you use only the power supply supplied with your router and ensure that the voltage indicated on the plug corresponds to your local voltage supply.

You have now finished connecting up your WLAN ADSL router.

## **SET UP IN AN ETHERNET NETWORK**

Whether you should connect your router directly to the Ethernet port of a computer or to an Ethernet hub depends on your current network configuration. The two crucial issues are whether automatic IP address allocation (i.e. a DHCP server) or the pre-configured WLAN DSL router IP address (192.168.0.100) are already in use within your network.

- ⇒ For the DHCP server and client configuration, please refer to the documentation of your operating system. A short description of the DHCP client configuration can be found at the end of this manual in section “How do I configure my computer as a DHCP client?” on page 41.

The following questions should help you decide how best to connect your router for the first set up:

**Are the client addresses within your network automatically allocated by an existing DHCP server?**

- Yes:  
In this case, the router may not perform this function and the setting “**Automatic client addresses**” must be set to “**No**” in the **OneClick** page.
- No:  
You are free to decide whether the router should assume this role within your network or not. We recommend using automatic IP address allocation in order to remove the need for manual administration of the network addresses. In this case, as the option “**Automatic client addresses**” is set by default to “**Yes**”, you should leave this setting unchanged. Make sure that the networked computers are set up as DHCP clients, enabling them to request an IP address from the DHCP server upon booting.

**Is the router default address “192.168.0.100” already in use in your network?**

- Yes:  
In this case, the IP address of your router must be changed. Connect your router directly to the Ethernet port of a computer (one having a different IP address to that of your router) and replace the pre-configured IP address with a valid, free IP address from your network in the **OneClick** configuration page. After doing so you can connect your router directly to the Ethernet hub.
- No:  
You can connect your router directly to the Ethernet hub using the supplied cable.

## SET UP IN A WIRELESS NETWORK

The wireless function of the router is activated by default. A few minutes after connecting the device, the "Wireless" LED will light up and you then have wireless access to your router.

In order to communicate over the wireless network with the router, your computer has to be equipped with an IEEE 802.11b or IEEE 802.11g compatible wireless card.

1. Make sure first that the TCP/IP configuration of your computer is set to "DHCP client" and that there is no entry for the Domain Name Server.
2. Activate now the wireless card of your computer (Please refer to the documentation of the wireless card or computer). The router declares itself within the wireless network under the name "Medion".
3. Choose "Medion" from the list of the available wireless networks.
4. The WEP encryption is deactivated by default on your router.
5. You can now communicate with the router and proceed to make any further setting changes, as required.

# ROUTER CONFIGURATION

## WHICH DETAILS DO YOU NEED FOR THE CONFIGURATION?

Before starting to configure your router, we recommend you have the following information ready to hand:

- Name of your ADSL Internet provider
- Your personal access details received from your ADSL Internet provider upon signing up for the service
- A valid, free IP address for your router in case you need to replace the default IP address.

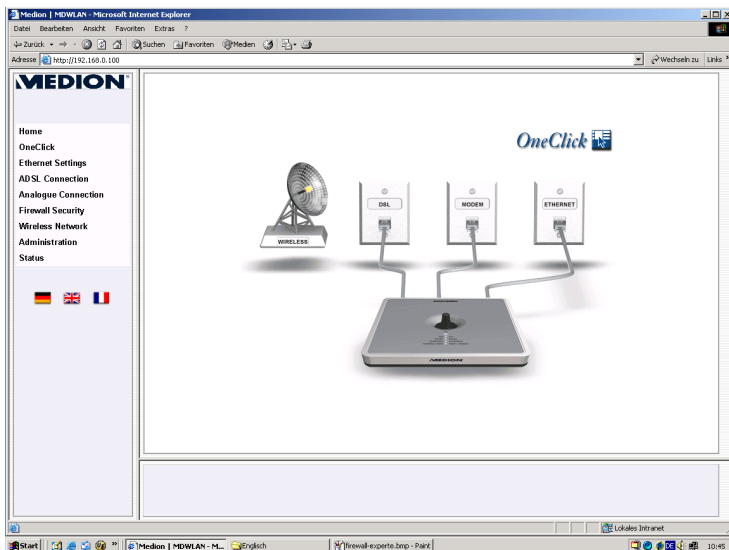
Before you can start to use your router it must first be configured. This can be done automatically with the help of the browser interface:

## ROUTER BROWSER INTERFACE

The router browser interface enables you to configure your router and control its activities.

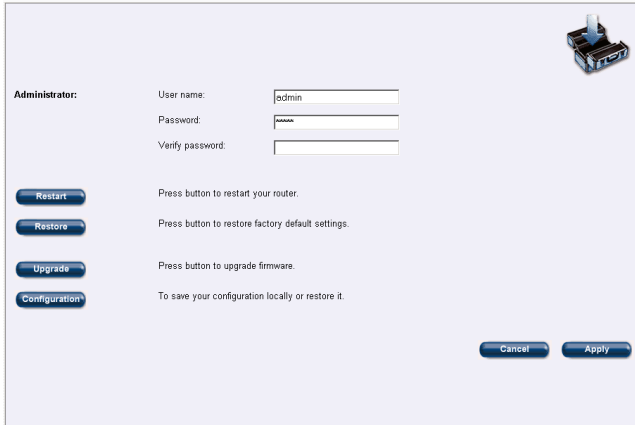
In order to access the pages of the browser interface, enter the IP address of your router in the address line of your browser application. The default IP address is "192.168.0.100".

Once the router is successfully found, this Homepage is displayed:



Upon first accessing one of the configuration pages you will be prompted for the administrator user name and password.

The factory default settings are “**admin**” as user name and “**admin**” as password. Please check your shift/caps lock settings because the entry is case sensitive:



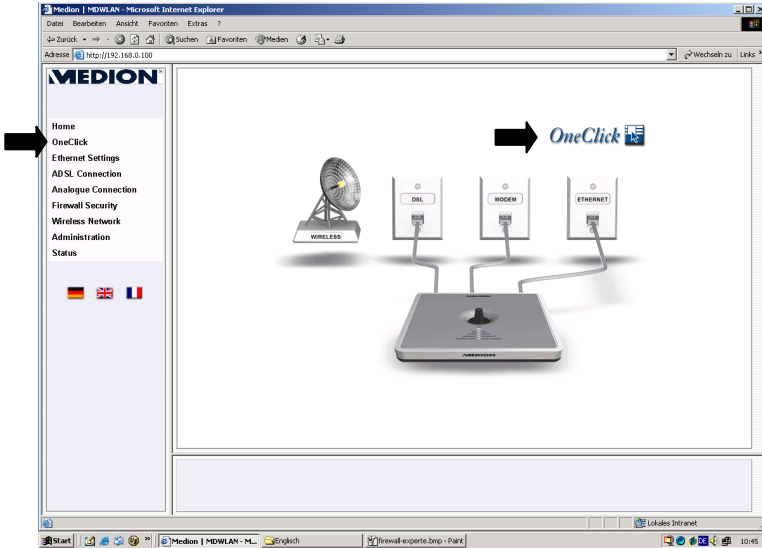
The screenshot shows a web-based configuration interface for a router. At the top right, there is a small icon of a blue and black router. Below it, the 'Administrator:' section contains three input fields: 'User name:' with 'admin' entered, 'Password:' with masked characters, and 'Verify password:' which is empty. To the left of these fields are four blue buttons: 'Restart', 'Restore', 'Upgrade', and 'Configuration'. To the right of these buttons are three lines of text explaining their functions: 'Press button to restart your router.', 'Press button to restore factory default settings.', and 'Press button to upgrade firmware.' Below the 'Configuration' button, there is a line of text: 'To save your configuration locally or restore it.' At the bottom right of the form area, there are two blue buttons: 'Cancel' and 'Apply'.

These settings can be modified in the Administration page. To move around the configuration pages use either the navigation bar on the left hand side of the window or simply click on the corresponding element in the main diagram on the Homepage. The browser interface contains three configuration modes:

- **OneClick mode:** In this mode you need to enter just the essential settings for your router to give you immediate access to the Internet. Details of this extremely easy-to-use configuration mode can be found on the next page.
- **User mode:** Here you can configure the basic settings for your router, as described on page 17.
- **Expert mode:** In this mode, experts have access to advanced settings. The various configuration options under this mode can be found on page 31.

In all modes **detailed online** descriptions and explanations help you through the configuration process. These help texts appear automatically in the bottom frame of your window upon moving the mouse over the various elements. On starting your router for the first time, you will access the OneClick page automatically. User name and password will be requested.

# ONECLICK CONFIGURATION



To access the OneClick page click either on the “OneClick” logo in the diagram or click the corresponding button in the navigation bar on the left hand side. The following window is opened:

**ADSL settings:**

Country:

Internet provider:

User name:

Password:

Verify password:

**Automatic client addresses:**  Yes  No

**Router address:** IP address:  .  .  .

Enter on this page just the essential settings for your router to give you immediate access to the Internet.

## ADSL settings

Here you should enter your personal access details received from your ADSL Internet provider:

1. Choose the country you are in.
2. Select your Internet provider from the pop-up menu. If your Internet provider is not listed, you can enter the necessary settings manually in the "ADSL Connection" page.
3. Enter your account name in the field marked "User name".
4. Enter the password assigned to your account in the field marked "Password".

## Automatic client address

Within a network all devices must be individually "numbered" and have their own client address – a so-called IP address. The allocation of these addresses can be automatically carried out by your router. The advantage being that you do not have to enter manually the IP address for all the networked devices. Using the radio buttons, you can activate or deactivate the automatic IP address allocation carried out by the DHCP server incorporated in your router.

- **Yes:** By default, the automatic IP address allocation is switched on. Ensure that the networked computers are set up as DHCP clients. When set as DHCP client, the computer requests an IP address from the DHCP server upon booting.
- **No:** The automatic IP address allocation is deactivated. Remember to check the IP address management within the network, as to work properly within a TCP/IP network all devices require unique IP addresses.

## Router address

Your router is pre-configured with the IP address 192.168.0.100. The subnet mask is automatically set to 255.255.255.0 and is not shown in this mode. Here you can replace the pre-configured IP address with another, valid IP address.

## Apply

Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

Finished! In just these few clicks of your mouse you have completely set up your router ready for accessing the Internet. All computers in your network can now 'surf' the Web.

## Cancel

Click "Cancel" to cancel your changes and restore the previous settings. The OneClick page remains open, enabling you to make further configuration changes as required. If a DHCP server and automatic IP address allocation are already set-up within your network, then you must deactivate this function within your router. The default IP address of your router is 192.168.0.100. This can be changed in the "Ethernet settings" page should the IP address already exist within your network.

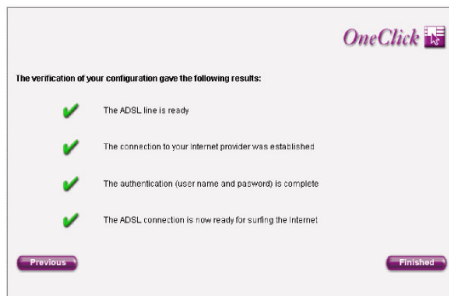
⇒ **Note:** If you change the IP address of your router, you must then login again using the new IP address, in order to continue your configuration.

## Verify

Click "Verify" to test your settings and ADSL line and establish a connection to the Internet. The following confirmation page lists the important steps of the login procedure and shows the result of each step accordingly:

⇒ Make sure that you have first saved and activated the settings of your router by clicking "Apply".

The following confirmation page lists the important steps of the login procedure and shows the result of each step accordingly:



The results are displayed as follows:

- ✓ The step was successful.
- ✗ The step failed.

This enables you to easily locate the problem should the connection to the Internet not be successful. Click "Previous" to return to the OneClick page and adjust the incorrect setting accordingly.



## USER MODE CONFIGURATION

In user mode (not using the OneClick configuration) you can configure the basic settings for your router. The various configuration options are dependant on your product model and are listed in the left hand navigation bar. To open the various configuration pages select the item from the navigation bar or simply click on the corresponding element in the main diagram on the Home page.

### ETHERNET SETTINGS

In this window you can configure your local network settings and determine the behaviour of your router within the network. If your router does not contain correct settings it will not be found by the computers within the network.

The screenshot shows a configuration window for Ethernet settings. At the top right is a small icon of a router with the word 'ETHERNET' below it. The main area contains the following elements:

- DHCP server:** Two radio buttons, 'Deactivated' (selected) and 'Activated'.
- First address:** Two rows of input fields. The first row is 'IP address' with values 192, 168, 0, 100. The second row is 'Subnet mask' with values 255, 255, 255, 0.
- Second address:** Two rows of input fields. The first row is 'IP address' with values 10, 0, 0, 1. The second row is 'Subnet mask' with values 255, 0, 0, 0.
- At the bottom left is a button labeled 'Expert Mode'. At the bottom right are two buttons labeled 'Cancel' and 'Apply'.

### DHCP server

Every computer in your network – just like your router - requires a unique IP address. Dynamic Host Configuration Protocol (DHCP) offers a way of automatically allocating IP client configurations within your local network. If your router is configured as DHCP server, then it will automatically allocate an IP address to a client computer requesting address information within the network. The client computer broadcasts a request, the DHCP server receives it, assigns a new address for a specific period of time and sends it to the client together with other required configuration information. Your router can be set-up and used as a DHCP server and consequently manages the IP addresses within its TCP/IP network.

## Activate

Your router automatically allocates IP addresses to all networked devices. The advantage being that you do not have to enter manually the IP address for all the networked devices.

- By default, the automatic IP address allocation is switched on. Ensure that the networked computers are set up as DHCP clients. When set as DHCP client, the computer broadcasts a request for IP configuration from the DHCP server upon booting. Ensure that there are no other DHCP servers within the network. Should this be the case, you must deactivate the DHCP server in your router.

## Deactivate

The automatic IP address allocation is switched off. Remember to check the IP address management within the network, as to work properly within a TCP/IP network all devices require unique IP addresses.

## First router address

The IP address and subnet mask give every device in the network a unique identification. As default, your router carries the IP address 192.168.0.100. The subnet mask is automatically set to 255.255.255.0. In these fields you can replace the default address with another valid IP address and subnet mask.

- If you change the IP address of your router you must then login to the router again under this new IP address in order to continue your configuration.

## Second router address

As default your router uses 10.0.0.1 as its second IP address and 255.0.0.0 as its second subnet mask. Should the router be connected to a network with two separate address ranges then you should also enter IP address and subnet mask for the second network. The router uses the IP address 192.168.0.100 to communicate within the first network address range and 10.0.0.1 for the second. The subnet mask must also be defined for both networks.

In these fields you can replace both default settings with another valid IP address and subnet mask.

## Apply

Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

## Cancel

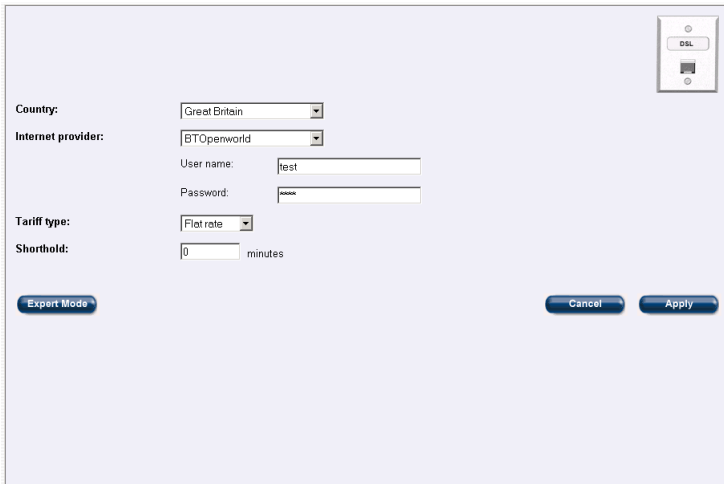
Click "Cancel" to cancel your changes and restore the previous settings. The Ethernet settings page remains open, enabling you to make further configuration changes as required.

## Expert Mode

Click "Expert Mode" to access further advanced Ethernet settings for your router, e.g. DHCP server set-up.

## ADSL connection

Here you can configure your ADSL connection quickly and easily.



## Personal details

1. Choose the country you are in.
2. Select your Internet provider from the pop-up menu.  
If your Internet provider is not listed, you can enter the necessary settings manually in the Expert mode.
3. Enter your account name in the field marked "User name".
4. Enter the password assigned to your account in the field marked "Password".

## Further settings of the ADSL line

1. Select the tariff agreed with your Internet provider from the tariff type list. The most common tariffs are as follows:
  - Flat rate:  
A flat rate is the ideal tariff for surfers who spend a lot of time in the Internet or who download large amounts of data (MP3s, movies, etc.). This tariff is also recommended for those planning to host an FTP or web server.
  - Online time:  
Billing charged according to time spent online is best suited for users who only surf the Internet occasionally.
2. Enter in the field "Shorthold" the time in minutes after which the connection should be dropped should there be no activity on the line. This setting only makes sense if your Internet connection is charged according to time spent online.

### Apply

Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

### Cancel

Click "Cancel" to cancel your changes and restore the previous settings. The ADSL connection page remains open, enabling you to make further configuration changes as required.

### Expert Mode

Click "Expert Mode" to access further advanced ADSL settings for your router, e.g. access mode or encapsulation type.

## ANALOGUE CONNECION (MODEM)

### Modem Backup

The built-in Modem adapter serves as an automatic backup should the ADSL line temporarily not be available. Your Internet connection thus remains available at all times. Modem backup is switched off by default. Should you wish to use this, ensure that your router is correctly connected to the phone outlet.

To enable Modem backup click "Yes" and set the various parameters in the following fields on this page:

**Modem backup:**  Yes  No

**Country:**

**Internet provider:**

**Access details of the Internet provider:**

Dial-up no.:

User name:

Password:

**Tariff type:**

**Shorhold:**  minutes

## FIREWALL SECURITY

Your router contains comprehensive security mechanisms. They guarantee security of data transferred and protection against unwanted intruders.

**Firewall:**

Deactivated

Security level - low

Security level - medium

Security level - high

**Further measures:**

Intruder detection activated

This device should not respond to ping

## Firewall

A firewall protects the local network from unwanted attacks from outside. Your router contains a so-called 'Statefull Packet Inspection Firewall'. By default, the router firewall is activated and set to a medium security level.

The firewall is activated by just clicking on one of the pre-defined security levels or alternatively, turned off completely. We recommend, however, switching on at least the lower security level. The ports set in the pre-defined security levels are as follows:

| <b>Service</b> | <b>Port</b> | <b>Description</b>   |
|----------------|-------------|--|
| http           | 80          | World wide web   |
| DNS            | 53          | Domain Name Server   |
| FTP            | 21          | File Transfer Protocol   |
| Telnet         | 23          | Terminal session   |
| SMTP           | 25          | Simple Mail Transfer Protocol                                      |
| POP3           | 110         | Post Office Protocol Version 3                                     |
| NNTP           | 119         | Network News Transfer Protocol                                     |
| ARCP           | 7070        | Real audio & video   |
| ICMP           | N/A         | Internet Control Message Protocol (error and information messages) |
| H.323          | 1720        | Video conference   |
| T.120          | 1503        | Whiteboarding (for video conference)                               |
| SSH            | 22          | Secure Unix Shell, Remote login protocol                           |

All other ports not contained in this list are blocked by default and must be set to "Allowed" manually in the Expert Mode.

⇒ For describing the firewall we use the term "service". In the context of a firewall, "service" means the request on a particular port. This request can be initialised from outside or from within the local network. Thereby it is important who the initiator of the request is. Example: If the outbound "service" for the port http is allowed, a user within the local network can send an http request to the outside. He will be returned the corresponding answer to his request, that means, he can surf the Internet. The inbound "service" for http is blocked most of the time (exception: webserver); This implies that http requests coming from outside are denied.

Security level: **High** - for the passive user

All inbound services are blocked.

The following outbound services are allowed: surfing, e-mails and minimal management tools, ARCP.

The following outbound services are blocked: ARCP.

The settings for this level are summarised in the table below:

High security level:

| <b>Service</b> | <b>Port</b> | <b>Inbound</b> | <b>Outbound</b> |
|----------------|-------------|----------------|-----------------|
| http           | 80          | blocked        | allowed         |
| DNS            | 53          | blocked        | allowed         |
| SMTP           | 25          | blocked        | allowed         |
| POP3           | 110         | blocked        | allowed         |
| ARCP           | 7070        | blocked        | blocked         |
| ICMP           | N/A         | blocked        | allowed         |

Security level: **Medium** - for the active user incl. video & audio

The only inbound activities allowed are real audio and video. All other inbound services are blocked.

All outbound activities listed below are allowed.

The settings for this level are summarised in the table below:

Medium security level

| <b>Service</b> | <b>Port</b> | <b>Inbound</b> | <b>Outbound</b> |
|----------------|-------------|----------------|-----------------|
| http           | 80          | blocked        | allowed         |
| DNS            | 53          | blocked        | allowed         |
| FTP            | 21          | blocked        | allowed         |
| Telnet         | 23          | blocked        | allowed         |
| SMTP           | 25          | blocked        | allowed         |
| POP3           | 110         | blocked        | allowed         |
| NNTP           | 119         | blocked        | allowed         |
| ARCP           | 7070        | allowed        | allowed         |
| ICMP           | N/A         | blocked        | allowed         |
| H.323          | 1720        | blocked        | allowed         |
| T.120          | 1503        | blocked        | allowed         |
| SSH            | 22          | blocked        | allowed         |

Security level: **Low** - for the power user

The following inbound activities are allowed: real audio and video, video conferencing, whiteboarding, SSH, error messages (ICMP), DNS.

The following inbound services are blocked: Home banking, surfing secured web pages, webserver, FTP, Telnet, SMTP, NNTP, POP3.

All outbound activities listed below are allowed.

The settings for this level are summarised in the table below:

Low security level

| <b>Service</b> | <b>Port</b> | <b>Inbound</b> | <b>Outbound</b> |
|----------------|-------------|----------------|-----------------|
| http           | 80          | blocked        | allowed         |
| DNS            | 53          | allowed        | allowed         |
| FTP            | 21          | blocked        | allowed         |
| Telnet         | 23          | blocked        | allowed         |
| SMTP           | 25          | blocked        | allowed         |
| POP3           | 110         | blocked        | allowed         |
| NNTP           | 119         | blocked        | allowed         |
| ARCP           | 7070        | allowed        | allowed         |
| ICMP           | N/A         | allowed        | allowed         |
| H.323          | 1720        | allowed        | allowed         |
| T.120          | 1503        | allowed        | allowed         |
| SSH            | 22          | allowed        | allowed         |

### **Further measures**

Under this item you can set further measures for the security of your network.

### **Intruder detection activated**

Activating this option automatically delays replies to repeated requests coming from the same IP address. These repeated requests are a way of scanning all the ports of the router in order to find an "open" door to the internal network.

This is what happens:

The first request, for example from IP address 201.201.20.1, comes in to your router. The router answers.

A second request comes from the same IP address a few seconds later. The router delays its answer by a few seconds.

A third request, again coming from the same IP address, comes a few



seconds afterwards. The router delays its answer by a few minutes. This process is repeated until the router refuses to answer, making such attacks futile.

### **The device should not respond to ping**

Here you can stop the router from replying to requests coming from outside the local network. Activating this option also automatically activates the Intruder detection.

### **Apply**

Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

### **Cancel**

Click "Cancel" to cancel your changes and restore the previous settings. The Firewall security page remains open, enabling you to make further configuration changes as required.

### **Expert Mode**

Click "Expert Mode" to access further advanced firewall settings for your router, e.g. for adding rules for additional ports.

## WIRELESS NETWORK

The wireless LAN module is based on the international IEEE 802.11g and IEEE 802.11b standards and, as such, this router is compatible with all current 54 or 11Mbit/s wireless LAN adapters. In addition, the router supports WEP encryption (Wired Equivalent Privacy).

The router has an integrated bridge and transfers all packets as they are from the wireless to the cabled network. On doing so AppleTalk packets are also transferred in Apple networks (e.g. for access of a wireless computer to a cabled networked AppleTalk printer).

⇒ The wireless module in your router should under no circumstances be removed. This may damage your device!



The screenshot shows a configuration window for a wireless network. It includes the following fields and options:

- Wireless network:** Radio buttons for  Activated and  Deactivated.
- Network name:** Text input field containing "Medion".
- Network name hidden:** Check box, currently unchecked.
- Mode:** Radio buttons for  802.11b/g,  802.11b, and  802.11g.
- Radio channel:** Dropdown menu showing "channel 10".
- Security:** Radio buttons for  Deactivated,  64 bit, and  128 bit.
- Password:** Text input field with masked characters.
- Password as WEP key:** Text input field with masked characters.
- Buttons: "Show", "Cancel", and "Apply".

### Activated / Deactivated

The wireless function enables you to set up a wireless network. The router assumes the role of a wireless Access Point. The wireless function in this router is activated by default, but can, however, be deactivated if not required. Once deactivated, the router no longer broadcasts radio signals and the wireless network cannot be accessed.

⇒ If you are using the router in a wireless network and disable the wireless function, please be aware that you will no longer be able to access your device using the wireless network after having activated the change. In this case, you will have to connect your device to the Ethernet or a computer to access it again.

**Network name**

To specify the network name.

**Network name hidden**

Activate this option to stop the router from broadcasting the name of the wireless network. Hiding the name of the network makes intrusion by unauthorised persons more difficult as the router will not appear as wireless access point in the users' selection list. As a consequence, it can then only be accessed by users knowing where it can be received, what it is called and the password. This option is per default not activated.

**Mode**

To select whether to use IEEE 802.11g, IEEE 802.11b or both modes simultaneously.

**Radio channel**

Here you can select the radio channel your router Wireless should use to establish the wireless network. Only the channels approved for use in your country are shown in the list: Radio channels are reserved specifically according to the country. A list of the radio channels used in each country can be found in the glossary at the end of this user guide. Radio channel is set to 10 by default.

- ☞ If you change the radio channel set by default, you should check that you choose a radio channel which is not already in use for other purposes and which is supported by all wireless cards in the network. Otherwise you may not be able to establish a radio connection to your router.

**Security**

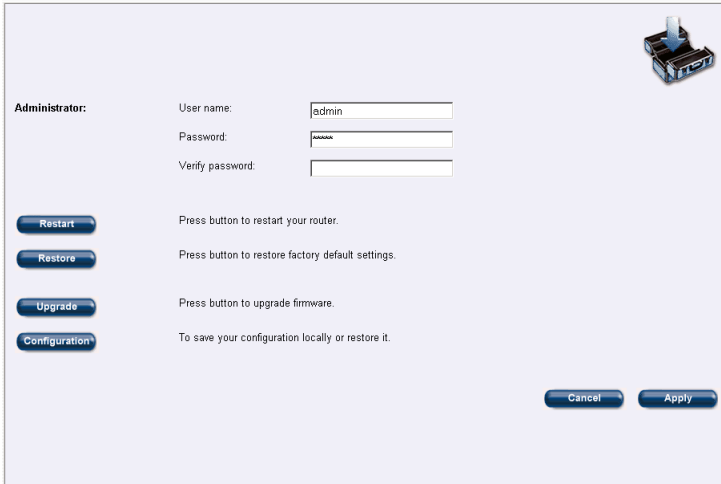
For improved security within the wireless network router Wireless contains a 64 and 128 bit WEP or WPA encryption giving added protection against line-tapping.

**Expert**

To manage ACL (Access Control Lists) based on MAC-addresses.

## ADMINISTRATION

- ➔ For security reasons, we recommend changing the pre-configured administrator user name and password and assigning your own. These should also be changed at regular intervals.



The screenshot shows a web-based administration interface for a router. In the top right corner, there is a small image of the router. The main area is titled "Administrator:" and contains three input fields: "User name:" with the text "admin", "Password:" with masked characters, and "Verify password:" which is currently empty. Below these fields are four blue buttons: "Restart", "Restore", "Upgrade", and "Configuration". Each button has a corresponding text description: "Restart" is "Press button to restart your router.", "Restore" is "Press button to restore factory default settings.", "Upgrade" is "Press button to upgrade firmware.", and "Configuration" is "To save your configuration locally or restore it.". At the bottom right of the interface are two more buttons: "Cancel" and "Apply".

### Restart

Click here to restart your router.

### Restore

Click here to restore the factory default settings. On doing so, your own settings will be deleted.

### Upgrade

So that you can always use the latest software with your router, it is fitted with a flash ROM chip, enabling you to easily upload new firmware, without having to open up the device.

To update the software you need to load a new firmware onto your router. New firmware can contain for example new functions, improved performance and bug fixes for a previous version. If you update your software, please read beforehand the read-me documentation. These detail the changes that have been made in the firmware.

- ➔ After installing the new firmware you must restart your router.

## Configuration

Click here to save or restore your configuration.

## Apply

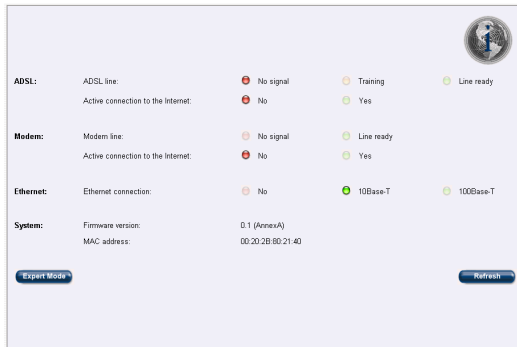
Click “Apply” to apply and save the settings in your router. You will then be returned to the Home page.

## Cancel

Click “Cancel” to cancel your changes and restore the previous settings. The Administration page remains open, enabling you to make further configuration changes as required.

## STATUS

At a glance, this window gives you an overview of the status of your router.



## ADSL line

“No signal” indicates that there is no connection to your provider. This usually comes down to a cable problem. Possible causes could be that a plug has become disconnected somewhere, or that workmen have damaged a main line, or that a switch at your local Telcom distribution is faulty.

“Training”: Every now and then a so-called training phase can occur. During this phase, the line quality is checked and the modulation adapted as required.

“Line ready” indicates that the router is connected and ready to go. Active connection to the Internet

- No: There is currently no active connection to the Internet.
- Yes: There is currently an active connection to the Internet.

## Modem

### Modem line

“No signal” indicates that there is no connection to your provider. This usually comes down to a cable problem. Possible causes could be that a plug has become disconnected somewhere, or that workmen have damaged a main line, or that a switch at your local Telcom distribution is faulty. “Line ready” indicates that your router is connected and ready to go.

### Active connection to the Internet

- No: There is currently no active connection to the Internet.
- Yes: There is currently an active connection to the Internet.

## Ethernet

At a glance, you can check the connection of your router to the Ethernet.

### Active connection to the Internet

No: Your router is not correctly connected to the Ethernet. Please check that the cables are plugged properly.

### 10Base-T

Is displayed if your router is connected to an 10Base-T Ethernet network.

### 100Base-T

Is displayed if your router is connected to an 100Base-T Ethernet network.

## System

You obtain here information about the firmware version and MAC address of your router.

## Refresh

The status display is updated at regular intervals. Click “Refresh” to update the status display immediately.

⇒ The Status page is updated automatically every 10 seconds, unless your web browser does not support HTML meta information.

## Expert Mode

Click “Expert Mode” to access further advanced status information of your router.

## Wireless

Displays information about connected WLAN-clients.

## EXPERT SETTINGS

Expert mode offers you many more parameters and configuration settings for your router. The various configuration options are dependant on your product model and are listed in the left hand navigation bar

The Expert mode settings are accessed by clicking on the Expert button of the corresponding configuration page.

### ETHERNET SET-UP

The screenshot shows the 'EXPERT MODE' configuration page for the DHCP server. It includes sections for 'DHCP server' (with 'Activated' selected), 'DHCP server settings' (with 'Use default range' checked and IP address fields set to 192.168.0.101 and 192.168.0.200), 'Lease times' (with 'Default lease time' at 43200 and 'Maximum lease time' at 86400), 'Gateway' (with 'Use this router as default gateway' checked), and 'DNS server set-up' (with 'Use this router as DNS server' checked and empty IP address fields). Navigation buttons for 'Back', 'Cancel', and 'Apply' are at the bottom.

Every computer in your network – just like your router – requires a unique IP address. Dynamic Host Configuration Protocol (DHCP) offers a way of automatically allocating IP client configurations within your local network.

If your router is configured as DHCP server, then it will automatically allocate an IP address from a specified range of addresses to a client computer requesting address information within the network. The client computer configured as DHCP client broadcasts a request, the DHCP server receives it, assigns a new address for a specific period of time and sends it to the client together with other required configuration information. This has the advantage that you do not need to manually configure fixed IP addresses for the clients in your network. This not only reduces the network administration overhead but also removes any chance of making mistakes.

You can set an address range for the DHCP server from which the router takes the IP addresses. The DHCP server also transfers the

subnet mask as well as the addresses of specified Domain Name Servers.

Your router can be set-up and used as a DHCP server and consequently manages the IP addresses within its TCP/IP network. In this window, you can configure the DHCP server along with further more detailed Ethernet settings for your router.

### **DHCP server**

#### Deactivated

The automatic IP address allocation is switched off. Remember to check the IP address management within the network, as to work properly within a TCP/IP network all devices require unique IP addresses.

#### Activated

The router automatically allocates IP addresses to all networked devices set as DHCP client. The advantage being that you do not have to enter manually the IP address for all the networked devices.

- ⇒ By default, the automatic IP address assignment is switched on. Ensure that the networked computers are set up as DHCP clients. When set as DHCP client, the computer broadcasts a request for IP address configuration from the DHCP server on starting. Ensure that there are no other DHCP servers within the network. Should this be the case, you must deactivate the automatic IP address assignment in your router.



## **DHCP server settings**

So that your router can allocate IP addresses to the client computers in the network, an address range from which it takes the addresses must be determined.

You have two options for setting the address range:

- The IP addresses can be taken from the default IP address range, which is set to 192.168.0.101 to 192.168.0.200.
- An address range (starting address and ending address) from which the address should be taken can be manually set.

When a computer set as DHCP client in the network is started and requests an IP address, the DHCP server will allocate an address taken from the specified range. The DHCP server will not reallocate the address during the lease period and will attempt to return the same address every time the client requests an address.

### **Address range**

Check this option if you want the router to use the pre-configured default address range (192.168.1.2 to 192.168.1.128).

### **First IP address**

Here you can manually set your own address range. Enter in this field the first IP address of the address range.

### **Last IP address**

Here you can manually set your own address range. Enter in this field the last IP address of the address range.

If your router is set-up as DHCP server it will also automatically assign the subnet mask.

### **Lease time**

The allocated IP addresses can only be used for a certain period of time – the so-called lease time. After this lease time has expired the client can no longer use the address. So that the client does not lose its addresses (most importantly its IP address) it requests an extension before the lease time expires. This is usually granted. The address configuration will only be lost if the lease time expires whilst the client computer is switched off.

The lease time can be determined using two settings.

Default lease time (in seconds)

Enter in this field the lease time which should be allocated should the client computer not request a lease time.

The default setting 43.200 seconds represents approximately 12 hours.

Maximum lease time (in seconds)

Enter in this field the maximum lease time that the DHCP server can allocate to the client computers.

Even if the client computer requests a longer lease time, the DHCP server will only grant the maximum lease time. The default setting 86,400 seconds represents approximately 24 hours.

## **Gateway**

Your router can be used as default gateway. This option is activated by default. As such, the DHCP server will configure the client computers with its own IP address as the gateway address. If required, this setting can be manually over-written in the client computer settings.

## **DNS server settings**

In TCP/IP networks, the DNS (Domain Name Server) translates network / domain names to IP addresses. This is necessary for Internet communication. Every time a domain name (e.g. www.medion.com) is used, a DNS is used to translate the "human-readable" domain name into a "machine-readable" IP address. Even within a local network or when connecting two separate networks it is advisable to use this in order to uniquely assign the IP addresses within the network to the particular computer names. Your router can also be used as a DNS server.

Your router obtains the necessary information from POP (Point of Presence). This option is activated by default.

## **1st and 2nd IP address**

If you wish to use different, external DNS servers, then enter the IP addresses in these fields.

## **Apply**

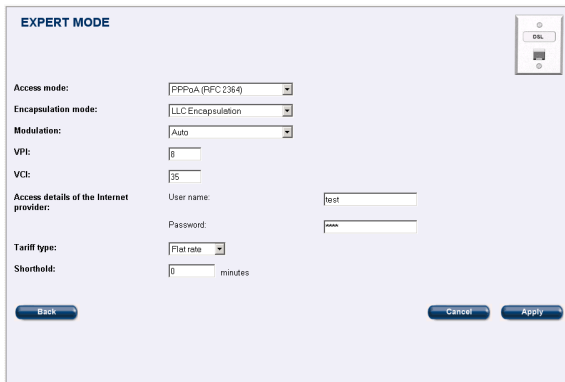
Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

## **Cancel**

Click "Cancel" to cancel your changes and restore the previous settings. The Ethernet Expert page remains open, enabling you to make further configuration changes as required.

## ADSL CONNECTION

We advise that you only make modifications to the ADSL parameters if you know what you are doing! An incorrect configuration could result in your device no longer working on your ADSL line. Here you can see the technical parameters your ADSL connection is based upon. During installation these values are set automatically depending on your environment. If your Internet connection works properly you can rely on these settings being correct. These parameters are specified by your ADSL provider and your router must “talk the same language” to connect successfully.



The screenshot shows a configuration window titled "EXPERT MODE". It contains several settings:

- Access mode:** PPPoA (RFC 2364)
- Encapsulation mode:** LLC Encapsulation
- Modulation:** Auto
- VPI:** 8
- VCI:** 35
- Access details of the Internet provider:** User name: test, Password: \*\*\*\*
- Tariff type:** Flat rate
- Shorthold:** 0 minutes

At the bottom, there are three buttons: "Back", "Cancel", and "Apply".

### Access mode

Select the access mode supported by your Internet provider from the pop-up menu. Access mode is the protocol or “language” the information is transferred with.

### Encapsulation mode

Select the encapsulation mode supported by your Internet provider from the pop-up menu. According to the chosen protocol (access mode) the Internet packets can be packed in different ways to optimise the transport.

### Modulation

Select the modulation type supported by your Internet provider from the pop-up menu. The modulation defines the way signals are decoded/encoded onto a carrier wave.

### VPI / VCI

Enter in both fields the values given to you by your Internet provider. Virtual Path/Channel Identifier are used in combination as

an identifier for an ATM connection and enable that the data packets are transferred correctly via all switches and routers.

**Further ADSL settings** when using the access modes PPPoA or PPPoE. The setup window is adapted to the technical details of the chosen access mode. If "PPPoA" or "PPPoE" is selected, the following special settings are required.

### **Access details of the Internet provider**

Enter your name in the field marked "User name". Enter your password in the field marked "Password".

### **Further settings of the ADSL line**

Select the tariff agreed with your Internet provider.

### **Further ADSL settings** when using the access mode non PPP

The setup window is adapted to the technical details of the chosen access mode.

### **Dynamic IP address**

As a rule Internet providers allocate their customers with dynamic IP addresses. Should, however, your Internet provider allocate you with a fixed IP address, then you can enter this here. As such, your router will register at the Internet provider under this fixed IP address.

### **IP details of the Internet provider**

Assigned IP address and subnet mask.

These fields contain the IP address and subnet mask assigned to you from your Internet provider. These values are either automatically assigned from the DHCP router of the provider, or communicated to you by your Internet provider and you need to enter them manually here.

### **IP address of the Internet provider**

Here you can see the IP address of the router on the side of the Internet provider.

### **Apply**

Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

### **Cancel**

Click "Cancel" to cancel your changes and restore the previous settings. The ADSL Expert page remains open, enabling you to make further configuration changes as required.

## Back

Click "Back" to return to the previous page (ADSL user mode).

## FIREWALL SECURITY

On this page, specialists can modify the firewall parameters to fit to their individual needs. This page is divided into two areas:

- In the upper area you can add new ports.
- In the lower area the ports are listed for which rules regarding in/outbound services have been specified. Any ports not contained in this list are blocked by default.

| Port | Type | Description                      | Outbound | Inbound |   |    |
|------|------|----------------------------------|----------|---------|---|----|
| 21   | TCP  | File Transfer (Control)          | Allowed  | Blocked | 🔒 | 🗑️ |
| 22   | TCP  | SSH Remote Login Protocol        | Allowed  | Blocked | 🔒 | 🗑️ |
| 23   | TCP  | Telnet                           | Allowed  | Blocked | 🔒 | 🗑️ |
| 25   | TCP  | Simple Mail Transfer             | Allowed  | Blocked | 🔒 | 🗑️ |
| 53   | TCP  | Domain Name Server               | Allowed  | Blocked | 🔒 | 🗑️ |
| 53   | UDP  | Domain Name Server               | Allowed  | Blocked | 🔒 | 🗑️ |
| 80   | TCP  | World Wide Web HTTP              | Allowed  | Blocked | 🔒 | 🗑️ |
| 110  | TCP  | Post Office Protocol - Version 3 | Allowed  | Blocked | 🔒 | 🗑️ |
| 119  | TCP  | Network News Transfer Protocol   | Allowed  | Blocked | 🔒 | 🗑️ |
| 443  | TCP  | HTTP protocol over TLS           | Allowed  | Blocked | 🔒 | 🗑️ |
| 1503 | TCP  | Databeam                         | Allowed  | Blocked | 🔒 | 🗑️ |
| 1886 | TCP  | Leonardo over IP                 | Allowed  | Blocked | 🔒 | 🗑️ |

## Add rule

By defining a new port in the upper part of the screen and setting rules for in and outbound services you can add new ports to your firewall and either allow or block further services.

1. Enter a valid port number in the field "Port". The port description is automatically displayed under "Description".
2. Select either "TCP" or "UDP" from the pop-up menu "Type".

⇒ Port numbers are defined internationally and are consequently unique.

3. In the field "Outbound" define if the port should be blocked or allowed for outbound services.
4. In the field "Inbound" define if the port should be blocked or allowed for inbound services.
5. Click "Add Rule" in order to add the security rule for the particular port to the firewall settings of your router. The new port is now displayed in the lower area with the other activated ports. You can edit this port later directly in the list.

## **Edit port settings**

In and outbound services of a port can be modified with one click directly in the list.

### **Red arrow (for in and/or outbound services)**

The service is blocked for this port. Click on the arrow to change the setting and allow the in/outbound service via that port.

### **Green arrow (for in and/or outbound services)**

The service is allowed for this port. Click on the arrow to change the setting and block the in/outbound service via that port.

### **Lock**

One click on the lock completely blocks all inbound and outbound services via the particular port.

### **Trashcan**

The settings for that particular port can be deleted and the port removed from the list by clicking on the trashcan. On doing so, the port is returned to its original default state (blocked).

### **Apply**

Click "Apply" to apply and save the settings in your router. You will then be returned to the Home page.

### **Back**

Click "Back" to return to the previous page (Firewall user mode).

## WIRELESS NETWORK

### **Restricted access**

The purpose of this setting is to control which devices are allowed to access the wireless can set-up by the router.

You can choose between **Unrestricted** (all devices are allowed), **White-list** (all devices are rejected except the ones added to the list) or **Black-list** (all devices are granted access except the ones in the list).

For the last two options you need to add the device's MAC-Address to the list.

To simplify things you can easily let connect all your wireless clients to the router and hit "Add new" next to the option "Add all currently attached clients to the list".

## STATUS

This page gives you further information about the status of your router.



The screenshot shows a web interface titled "EXPERT MODE" with a globe icon in the top right. It displays network configuration details under three sections: "Device in the network", "ADSL specifications", and "Transfer statistics".

| Device in the network: |               |
|------------------------|---------------|
| IP address:            | 192.168.1.100 |
| Subnet mask:           | 255.255.255.0 |

| ADSL specifications: |           |
|----------------------|-----------|
| Internet provider:   | Country:  |
| Assigned IP address: | 0.0.0.0   |
| Downstream rate:     | 0 kBits/s |
| VPI:                 | VCI:      |
| Upstream rate:       | 0 kBits/s |

| Transfer statistics: |                  |
|----------------------|------------------|
| Packets received:    | Packets sent:    |
| Total packets:       | Total packets:   |
| Damaged packets:     | Damaged packets: |

At the bottom of the page, there are two buttons: "Back" on the left and "Refresh" on the right.

### Router in the network

At a glance you can see which IP address and subnet mask your router has within your network.

### ADSL specifications

All important technical details about your ADSL connection are summarised here.

### Internet Provider

Here, the Internet provider you have configured is displayed.

### Country

Here, the country you have configured is displayed.

### Assigned IP Address

Under this item the external IP address assigned by your Internet provider to your router is displayed.

### Downstream and upstream rate

Depending on the Internet provider, the terms of condition of your agreement, and local conditions, the downstream and upstream rates may vary. These fields show the actual maximum rates offered by your ADSL line.

## **VPI/VCI**

The values for VPI/VCI are shown here.

## **Transfer statistics**

Under this item you can see the number of received and sent data packets. Information is also given about how many of those packets were damaged. This gives you feedback about the stability of the ADSL line.

## **Refresh**

The status display is updated at regular intervals. Click "Refresh" to update the status display immediately.

⇒ The Status page is updated automatically every 10 seconds, unless your web browser does not support HTML meta information.

## **Back**

Click "Back" to return to the previous page (Status user mode).



## TROUBLESHOOTING

If your router does not work as expected, please use the following checklist to isolate the problem and solve it:

- Make sure your router is connected correctly.
- Make sure you have connected all cables correctly.
- Please make sure you are using the cables and power supply supplied with your router.
- Check the connection to your Internet provider.  
Make sure you have entered your user name and your password correctly (as well as the correct phone number for 56k modem access).
- Check that the caps lock key is not pressed when entering the password.

Changes made to settings are not taken into account!

- Make sure you have saved and activated all setting changes. This is done by clicking on the "Apply" button of the appropriate page of the browser user interface.

How do I configure my computer as DHCP client?

- Configuration of a Windows computer as DHCP client:
  1. Open the network control panel "LAN connection".
  2. Click "Properties".
  3. Select "Internet protocol (TCP/IP)" and click "Properties".
  4. Activate the option "Obtain an IP address automatically" and save your changes.

Your Windows computer is now configured as DHCP client and will automatically be assigned an IP address from the DHCP server within the network.

## LED SIGNALS

The 5 LEDs on the top of your router give you useful information regarding the status of your router and the line.

Description of the 5 LEDs from left to right:

- LED: Power  
LED is not lit: The router is receiving no power.  
LED is permanently lit: The router is correctly connected to the power supply.
- LED: ADSL  
LED is not lit: There is no ADSL connection to the switch.  
LED is pulsing very fast: Training phase.  
LED is permanently lit: ADSL connection is ready to be used.  
LED is slowly pulsing: Connection is currently active.
- LED: WLAN (Wireless)  
LED is not lit: The wireless function of your router is not activated.  
LED is permanently lit: The wireless function of your router is activated and radio signals are emitted.
- LED: Ethernet  
LED is not lit: The router is not connected to Ethernet.  
LED is permanently lit: The router is correctly connected to Ethernet (link indication).
- LED: Modem  
LED is not lit: No modem connection to the telephone switch.  
LED is permanently lit: Modem connection ready to be used.  
LED is pulsing: A connection is currently active.

## TECHNICAL SUPPORT

This product has been extensively and successfully tested in our test laboratory with a number of different devices. However, it is normal for the drivers to be updated periodically. If you are having difficulty using your device, you may need to update the driver. Driver updates and the most up-to-date information on this product can be found at the following Internet address:



Internet: [www.medion.com](http://www.medion.com)

## **IF YOU NEED FURTHER ASSISTANCE .....**

If the suggestions in the above sections have not solved your problem, please contact us. It will help us to help you if you can have the following information available:

- What is your computer configuration?
- What additional peripherals are you using?
- What messages are appearing on the screen?
- What software was running when the fault occurred?
- What steps have you already taken to solve the problem?
- If you already have a customer number, please state this.

## **GLOSSARY**

### **10Base-T**

A 10Mbit Ethernet connection using so-called twisted pair cable. The cable is technically the same as ISDN cables used for the telephone network, but usually with a better shielding.

### **100Base-T**

Also known as Fast Ethernet, 100Base-T uses the same type of cable as 10Base-T. The maximum theoretical transfer rate is 100Mbit/s.

### **802.11 Standard**

Industrial standard for wireless networks (WLAN). The most important variants of this standard are as follows:

802.11b: Maximum data transfer rate 11Mbit/s.

The frequency used is 2.45 GHz. This protocol allows standard, basic encryption up to 128 bit. This standard is used worldwide and in most wireless devices.

802.11a: Maximum data transfer rate 54Mbit/s. The frequency used is 5 GHz. This standard is still relatively new and not available everywhere.

802.11g: Maximum data transfer rate 54Mbit/s. The frequency used is 2.45 GHz. This standard is compatible with the 802.11b standard and is used in the Apple AirPort Extreme product, for example.

### **Access Point**

In a wireless network (WLAN) the wireless connection is performed by the Access Point. The Access Point enables communication between the wireless devices and, if used, also with wired devices. The Access Point can be connected to normal wired devices via Ethernet as well as to an analogue or digital line via a modem or

a router. In this way it can give the wireless devices access to further communication lines and services.

### **ADSL (Asymmetric Digital Subscriber Line)**

ADSL technology is one the many types of DSL technology. ADSL stands for Asymmetric Digital Subscriber Line, i.e. an asymmetrical usage of the line. A significant advantage of ADSL is that existing telephone lines can be used for providing broadband services without effecting existing analogue or ISDN connections. The download/downstream rate (i.e. the transfer speed from the Internet to your computer) reaches far higher speeds than the upload/ upstream rate (i.e. the transfer speed from your computer to the Internet). With ADSL, transfer speeds of up to 8Mbit/s downstream and 1.5Mbit/s upstream are possible. As such, large amounts of data can be transferred very quickly. Because ADSL uses very high frequencies, there are limits over the distance that the signal can be reliably received. Most ADSL services have a maximum range of 5.5km – meaning only customers within this radius of their local telephone exchange can take advantage of ADSL.

For home users, who as a rule mainly download data from the Internet, there are several cheaper offers with lower transfer speeds.

### **ATM**

ATM stands for Asynchronous Transfer Mode and is a fast packet-oriented transfer and relay technology widely used to send data, video and voice at ultra high speeds. ATM is best known for its easy integration with other technologies and for its sophisticated management features that allow carriers to guarantee quality of service and data transfer in real time. As such, ATM

is the world's most widely deployed backbone technology and is the preferred medium for applications like interactive television, video conferencing etc.

### **Bandwidth**

Bandwidth describes the amount of data that can pass through a line within a certain period of time.

### **CAT-5 cable**

Describes the type of cable used for 10Base-T twisted pair. CAT-5 cable is suited for 100 MHz and is used in 10Mbit und 100Mbit networks.

### **Crossover cable**

For networking just two computers together a crossover CAT-5 cable is recommended. This makes a direct connection, send and receive lines are crossed. With such a connection, a hub is not required.

### **Data packets**

Data sent over a network is broken down into parts of a certain size in bytes – so-called packets. Each packet carries the information that will help it get to its destination: the sender's IP address, the intended receiver's IP address, something that tells the network how many packets the data being sent has been broken into and the number of that particular packet. An e-mail can, for example, travel around the world in many separate packets, arrive in a different sequence and yet still be recomposed again correctly. Should an error occur during the transfer, the faulty or lost packet must be requested again. This method used in large networks is very efficient and fast.

## **DHCP server (Dynamic Host Configuration Protocol)**

A DHCP server automatically allocates the IP configuration of clients within a local network. As such, the users do not have to manually enter their IP address.

## **DNS server (Domain Name Server)**

A DNS server translates the domain address for accessing a web page (for example `www.medion.com`) into a valid IP address.

## **Downstream / Upstream**

Describes the direction of the data flow to or from the network.

## **DSL**

DSL stands for "Digital Subscriber Line". It uses the standard copper wires that are used to carry telephone lines into most homes. Theoretically data can be transferred at speeds up to 50Mbit/s.

The higher the frequency that is used to send a signal over a piece of wire, the faster the signal will degrade over distance. DSL uses very high frequencies and consequently there are limits over the distance that the signal can be reliably received. As such the distance from the telephone exchange is a critical factor. Due to certain technical conditions (e.g. distance from the telephone exchange, non-availability of copper lines, etc.) DSL is not available everywhere.

With DSL, the use of a splitter is required to separate the voice information and data transfer.

## **DSL router**

A DSL router establishes a connection to the Internet provider and diverts data within the network so that several users can share the connection. A router man-

ages all the internal addresses and often also offers further options and features, such as DHCP, firewall, etc. Routers are available for various technologies: for ISDN, analogue, DSL or cable – the basic principle is the same. If you wish to share a DSL connection between several users, then a router is absolutely necessary. Software routers are also available, which emulate the hardware within the software. In such cases a small computer is sufficient to assume the role of a router.

### **Encapsulation**

In the ADSL settings, the encapsulation mode describes the way the Internet packets can be packed to optimise the transport. According to the chosen protocol (access mode), this can be done in different ways.

### **Encryption**

Encryption of data is used to protect against unauthorised access or line-tapping.

### **Ethernet**

Ethernet was first implemented in 1976 by 3Com and is today the standard technology for LAN architectures. Typical Ethernet implementations include 10Base-T, 100Base-T and gigabit Ethernet. Network protocols coming later, such as TCP/IP, were based on this architecture.

### **Firewall**

Data sent within a network is sent in so-called packets, which contain detailed information regarding the type of packet, the sender, the recipient and so on. A firewall can filter out these packets according to certain specified rules. Firewalls are available in hardware as



well as software form and are often built directly into routers. Firewalls are mainly used in critical environments to prevent, for example, unauthorised access to the internal network.

## **Gateway**

A gateway translates one network protocol into another. Routers are also referred to as gateways as they facilitate access to another network. With DSL, for example, the PPPoE protocol (PPP over Ethernet) is converted to TCP/IP and vice-versa.

## **Hub**

If several computers are to be connected using network cables, then a hub is required. This is a type of duplicater which copies arriving packets and passes them unfiltered on to other ports. As a rule, a hub has between four and eight ports, and is alone sufficient for small groups of computers. Larger networks require a more intelligent way of communicating with one another, as data collisions within the network are likely to occur. In such cases, switches are used.

## **ICMP (Internet Control Message Protocol)**

With the ICMP protocol, error and information messages are exchanged between computers within the network.

## **IP address**

An IP address consists normally of four numbers having values between 0 and 255 and which are separated by dots. This address is the unique identification number of a specific device. Every piece of equipment within a network has an IP address as it is the only way it can be found by other computers or servers try-

ing to send it information. This can be compared to the function of a postcode in locating a building on a street. IP addresses can be allocated either manually or automatically by a DHCP sever.

### **ISP (Internet Service Provider)**

The Internet Service Provider provides the connection to the Internet. The customer / user dials in to the provider using the telephone number (used for analogue and ISDN connections), user name and password.

### **Kilobit**

Data throughput is often given in kilobit. A kilobit is equivalent to 1,024.bits or 128 bytes.

### **LAN (Local Area Network)**

The local area network is an internal network having its own IP addresses. A small group of computers is usually referred to as a local area network. The Internet on the other hand is a world-wide network and as such is referred to as WAN (Wide Area Network).

### **MAC Address**

MAC stands for Media Access Control. It is the linchpin of the communication within a network. A MAC address is hard coded into each network adapter. MAC addresses are worldwide unique and distinctive. Through MAC addresses, devices within the network can be selected in a reliable way in order to grant or deny them specific rights on an IP packet level. MAC addresses are often written on the devices in hexadecimal format.

## **Modulation**

In the ADSL settings, the modulation defines the way signals are decoded/encoded onto a carrier wave.

## **NAT (Network Address Translation)**

Network Address Translation is a commonly used IP translation and mapping technology designed for conserving registered IP addresses in large networks and simplifying IP addressing management tasks.

As its name implies NAT acts as an interpreter between two networks, which translates IP addresses within private "internal" networks to "legal" IP addresses for transport over public "external" networks (such as the Internet). Incoming traffic is translated back for delivery within the inside network.

NAT therefore allows a company or home network with unregistered "private" addresses to connect to the Internet by translating those addresses into globally registered IP addresses. As such it allows an entire network to share a single internet connection over a single IP address.

NAT also increases network privacy by hiding internal IP addresses from external networks.

## **PPP**

Alongside TCP/IP, the point-to-point protocol (PPP) is one of the most popular protocols existing today. PPP is used to establish a connection between two remote sites. Most Internet providers establish a connection to the customer using the PPP protocol.

## **PPPoE**

A special form of the PPP protocol. "Point-to-Point over Ethernet" establishes a connection between two remote sites over an Ethernet network.

## **POTS (Plain Old Telephone Service)**

POTS refers to traditional, analogue telephony und telephone services.

## **Protocol**

A protocol for data transfer communication determines the way in which data is to be built-up and exchanged. TCP/IP is a very widespread protocol. If a system does not understand a protocol, then certain services within the network may not be accessible.

## **Radio channel**

The use of the radio channels is specified in each country by the relevant authority. A wireless product must support the relevant channels in order to be used in that particular country. Its sale within that country must also be agreed by the corresponding authorities. In the chapter "Safety and Maintenance" is a list with all known exceptions.

## **RJ45**

This is the terminology for the outlet and plug type used for twisted pair network cables.

## **Server**

A server is used to provide a wide variety of services within a network. For example, a server can be used to store files or as a backup system. Even if you just install a programme on your computer and make it accessible for other users, this can be classified as a server.

## **Splitter**

A splitter distributes a DSL line in a telephone and a data line. A DSL line can consequently be used for traditional telephone calls as well as for data transfer. The

splitter is installed at the user's end of the DSL line. This is generally done by the provider of the line.

### **Static IP address**

Some Internet providers and some devices within a network (e.g. a server or a router) require the allocation of fixed IP addresses. This must be manually entered and remains allocated to that particular computer until it is changed. Most Internet providers operate on a dynamic IP basis. This means that each time you connect to the Internet you are allocated a new IP address. If setting a static address, the DHCP services must be deactivated.

### **VPI / VCI**

Virtual Path/Channel Identifier are used in combination as an identifier for an ATM connection and enable that the data packets are transferred correctly via all switches and routers. Both values are given by the ADSL Internet provider.

### **WEP (Wired Equivalent Privacy)**

WEP is a data encryption method used in wireless networks and is part of the 802.11 standard. The standard foresees a 64 (40) bit or 128 (104) bit key. 24 bit of the 64 and 128 are used as initialising vector. This is the reason why the encryption is sometimes described as 40 and 104 bit.

### **WLAN /Wireless LAN**

Wireless LANs are local wireless networks and are defined by the 802.11 standard. Individual networked users are connected via radio in a wireless network. A wireless access point establishes such a wireless network and assumes its management.

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