D-Link®
Building Networks for People

HORSTBOX

DVA-G3342SD

Manual

Firmware Version 2.0x

DSL WLAN LAN VoIP ISDN Analog

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of about eight inches (20cm) between the radiator and your body.

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

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Mark Ups

Mark Up	Function	Example
Small caps	Buttons, Links, Name of tabs or pages	NEXT Tab TELEPHONY
Italics	Options	*base* or *expert mode*
Coloured background	Notes	**Note:**
Typewriter	URLs	`http://www.dyndns.org/`

Safety Instructions

Please read this section carefully and follow the instructions for your own safety and correct use of the HorstBox.

Heed the warnings and follow instructions on the device and in the manual.

The HorstBox is built and tested by D-Link Deutschland in accordance with IEC 950/EN60950 and left the work in in perfect condition.

In order to maintain this condition and ensure safe operation, the user must follow the instructions and heed the warnings in this manual.

1. The device must be used in accordance with the instructions for use.
2. For transport, use the original wrapping or a adequate wrapping. Protect the HorstBox against shocks and blows.
3. To avoid condensation wait until the device has reached room temperature before you put it into operation. The HorstBox has to be completely dry.
4. Review the information about the environmental conditions in the specification (see section Appendix in the manual). In the manual read the sections “Installation” and “Installation Considerations”.
5. Use only the power adaptor supplied.
6. The electrical installations in the room must meet regulatory requirements.
7. The wall socket or power source must not be shared by other power consumers. Do not use an extension cable.
8. The unit is completely disconnected from the power source only when the power cord is disconnected from the power source. Therefore the power cord and its connectors must always remain easily accessible.
9. Take care that there are no cables, particularly power cables, in the areas where persons can trip over them. For installation follow the instructions in section “Installation” in the manual.
10. Use only adequate and undamaged power cords and network or telephone cables.
11. Do not connect or disconnect data cable connection during thunderstorms.
12. Clean the HorstBox with a damp cloth only.
13. Do not set up the device in the proximity of heat sources or in a damp location. Make sure the device has adequate ventilation.
14. Take care that no extraneous objects or liquids enter the housing.

15. In emergencies switch off the device immediately, disconnect the power supply and contact a sales person.
16. Do not open the HorstBox!
17. Repairs should only be carried out by qualified service personnel. Unauthorized openings and unqualified repairs endanger the user(s).
18. Specified normal operation of the HorstBox (according to IEC 950/EN60950) requires the lid to be mounted.
19. The guarantee becomes void, if you add or change parts to the HorstBox.

Contents

1 Introduction

Dear Customer,

Thank you for choosing a D-Link product.

By choosing the HorstBox you have opted for a high quality product, able to satisfy the requirements for a simple communication infrastructure for data and voice today and in the future. The HorstBox connects D-Link's experience in routing, WLAN, security and telephony over analog and digital lines with the know-how in VoIP.

The HorstBox provides all ports you need today to integrate network and phones efficiently and cost-effectively. Start a gentle migration of standard phones and new technology without the need to renew all equipment at hand at once.

Simply connect the phones to the HorstBox, start the wizard to guide you through the configuration and within minutes you can surf in and phone over the Internet or use the existing phone line.

> The HorstBox's lifeline support provides access to an analog line via an analog phone in times of electrical power outage.

Please read the section 1.2 Installation Considerations on p.13.

1.1 About this manual

In this manual you will be introduced to all settings of the HorstBox.

Starting with the first chapter you will learn about the device and its installation (chapter 2 Getting Started on p.18). The next chapter will guide you through the installation and configuration of the HorstBox DVA-G3342SD (chapter 3 Wizard on p.27).

The next chapters each introduce an area of funcionality each:

1. chapter 4 Telephony on p.49;
2. chapter 5 Internet on p.88;
3. chapter 6 Network on p.115;
4. chapter 7 System on p.142.

You will find some help on troubleshooting in chapter B Troubleshooting on p.168.

Check the appendix for the product specification and the warranty.

Please read the section 1.2 Installation Considerations on p.13.

Note: All user names, phone numbers or passwords used in this manual are examples only.
Do use your own data only!

1.2 Installation Considerations

Several environmental factors may influence the effectiveness of the radio signal. If you are installing a WLAN device for the first time ever, please take some time to read and consider this section.

The HorstBox lets you access your network using a wireless connection from virtually anywhere within its operating range. Keep in mind, however, that the number, thickness, and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending

on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

1. **Keep the number of walls and ceilings between the HorstBox and other network devices to a minimum.**
   Each wall or ceiling can reduce the radio range from 1-30 meters (3-90 feet). Position your devices so that the number of walls or ceilings is minimized.

2. **Be aware of the direct line between network devices.**
   A wall that is 0,5 meters thick (1.5 feet), at a 45-degree angle appears to be almost 1 meter (3 feet) thick. At a 2-degree angle it looks over 14 meters (42 feet) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.

3. **Building materials can impede the wireless signal.**
   A solid metal door or aluminum studs may have a negative effect on range. Try to position wireless devices and computers with wireless adapters so that the signal passes through drywall or open doorways and not other materials.

4. **Align the antenna for best reception.**
   Align and position the antenna until you get best coverage. Some WLAN devices or access points will help you with this task. Sometimes fixing the antenna in a higher position advances the reception.

5. **Keep distance to other devices.**
   Keep your product away (at least 1-2 meters or 3-6 feet) from electrical devices or appliances that generate RF noise.

6. **Choose a useful combination of channels.**
   To avoid disturbances of radio waves, choose a useful combination of radio channels.

   Standard 802.11b/g devices may always use 3 channels at once. It's most effective to use a combination like 2/5/9, as the factory settings of most devices will be 6 or 11. Make sure the distance between the channels is a least 2 to 3 unused channels.

1.3 Standards-Based Technology

D-Link Wireless products utilize the 802.11b and the 802.11g standards.

The IEEE 802.11g standard is an extension of the 802.11b standard. It increases the data rate up to 54 Mbps within the 2.4GHz band.

802.11g offers the most advanced network security features available today, including: WPA , TKIP, AES and Pre-Shared Key mode.

D-Link wireless products are based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity within your home, business or public access wireless networks. D-Link wireless products will allow you access to the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking brings.

A Wireless Local Area Network (WLAN) is a computer network that transmits and receives data with radio signals instead of wires. WLANs are used increasingly in both home and office environments, and public areas such as airports, coffee shops and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Wireless users can use the same applications they use on a wired network. Wireless adapter cards used on laptop and desktop systems support the same protocols as Ethernet adapter cards.

People use WLAN technology for many different purposes:

MOBILITY - Productivity increases when people have access to data in any location within the operating range of the WLAN. Management decisions based on real-time information can significantly improve worker efficiency.

LOW IMPLEMENTATION COSTS - WLANs are easy to set up, manage, change and relocate. Networks that frequently change can benefit from WLANs ease of implementation. WLANs can operate in locations where installation of wiring may be impractical.

INSTALLATION AND NETWORK EXPANSION - Installing a WLAN system can be fast and easy and can eliminate the need to pull cable through walls and ceilings. Wireless technology allows the network to go where wires cannot go - even outside the home or office.

INEXPENSIVE SOLUTION - Wireless network devices are as competitively priced as conventional Ethernet network devices.

SCALABILITY - WLANs can be configured in a variety of ways to meet the needs of specific applications and installations. Configurations are easily changed and range from Peer-to-Peer networks suitable for a small number of users to larger infrastructure networks to accommodate hundreds or thousands of users, depending on the number of wireless devices deployed.

1.4 Ports

1.4.1 Analog

The HorstBox provides two ports for analog devices and one port for the telephone line.

Note: For an analog telephone line connect the socket with the port “a/b” on the HorstBox.

1.4.2 ISDN

The HorstBox provides one port for an ISDN device (internal S_0-Bus) and a port for an ISDN telephone line. To connect 2 or more ISDN devices, use an ISDN distributor (ISDN hub). You may connect a total of 8 ISDN devices to the internal S_0-Bus.[1] The HorstBox administrates up to 20 different ISDN devices.

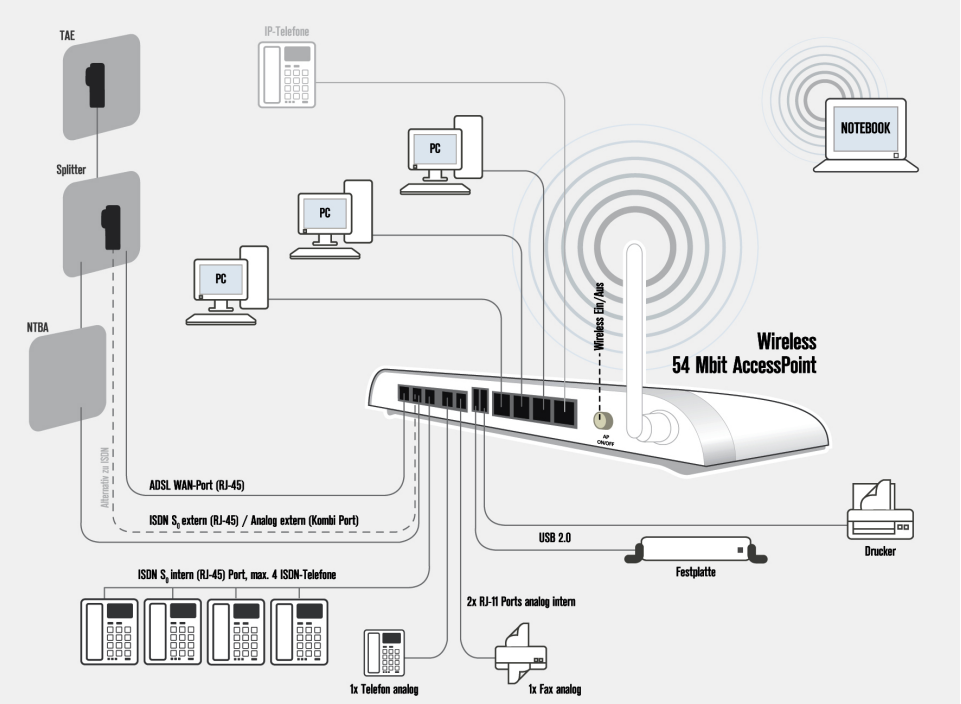
[1] If you want to connect more than 4 devices, the additional devices will need their own power supply.

Note: For an ISDN line connect the NTBA with the port "S_0 ext" on the HorstBox. This is ***mandatory***! Connect the NTBA to the wall socket according to your service providers instructions.

1.4.3 VoIP and Ethernet

The HorstBox provides 4 ethernet ports and one port to connect to the WAN. You may increase the number of ethernet ports by connecting a hub or switch. The HorstBox administrates up to 30 different VoIP phones.

1.4.4 Example



Note: Analog line: Please connect analog line to port "a/b" on the HorstBox.
ISDN line: Please connect ISDN line to NTBA[2]and NTBA to port "S0 Ext" on the HorstBox.

[2]Connecting the ISDN line to NTBA is mandatory!

2 Getting Started

Before you install the HorstBox, check to see whether a network is installed and configured. If necessary, install and configure a network according to the documentation of the operating system of your computer.

2.1 Shipment

HorstBox DVA-G3342SD	
- Power adaptor: 230V (Output: 12V, 1,5A)	
- TAE adaptor, universal coded	- ADSL cable (RJ45), gray
- Phone cable (RJ45 to TAE), black	- ISDN cable (RJ45), red
- CAT-5 Network cable, blue	- ISDN cable (RJ45), black
- WLAN antenna, screwable [1]	- Wall bracket
- Installation guide	- CD-ROM
- Adaptor: RJ11 plug to 3 TAE ports (NNF) for analog devices	

Table 2.1: Shipment

Please contact your sales person immediately, if parts are missing or broken.

Note: According to the terms of guarantee the HorstBox must be operated only with the power adaptor provided. Elsewise the guarantee becomes void.

[1] To extend the range of the WLAN you may want to connect a different WLAN antenna, e.g. D-Link ANT24-0700 oder D-Link ANT24-0501, to the HorstBox.

2.2 Description

2.2.1 Front Panel

On the front panel of the HorstBox you will find LEDs, which inform about the status of the device and its ports.

Figure 2.1: Front panel

Name	LED	Function
Power/Status		Power/Status
	Off	Power: no
	Red	Power: yes; Internet: no
	Blue	Power: yes; Internet: yes
WLAN		Communication over WLAN
	Off	Access Point: switched off
	Blue	Access Point: switched on
	Blue & blinking	Data activity
LAN 1-4		Communication over LAN 1-4
	Off	Netwerk connection: no
	Blue	Netwerk connection: yes
	Blue & blinking	Data activity
USB 1, USB 2		
	Off	Device connected: no
	Blue	Device connected: yes
VoIP		Communication on VoIP connection
	Off	Connected to VoIP server: no
	Blue	VoIP account registered or online
	Blue & blinking	Connected to VoIP server: connecting
Tel 1-2		Analog phone
	Off	Activity: no
	Blue	Activity: via land line
	Blue & blinking	Activity: via VoIP
S_0 int		Communication on internal S_0-Bus
	Off	Activity: no
	Blue	Activity: via land line
	Blue & blinking	slow: ca. 2x per second Activity: via VoIP
	Blue & blinking	quick: ca. 4x per second Activity: via analog *or* ISDN phone *and* VoIP
ADSL		Communication over ADSL
	Blue	DSL connection: yes
	Blue & blinking	slow: ca. 2x per second DSL connection: no
	Blue & blinking	quick: ca. 4x per second DSL connection: synchronising
	Blue & blinking	erratic: Data communication

Table 2.2: Front panel: Functions of LEDs

2.2.2 Back Panel

The back panel houses all ports of the HorstBox and the WLAN and Reset switches.

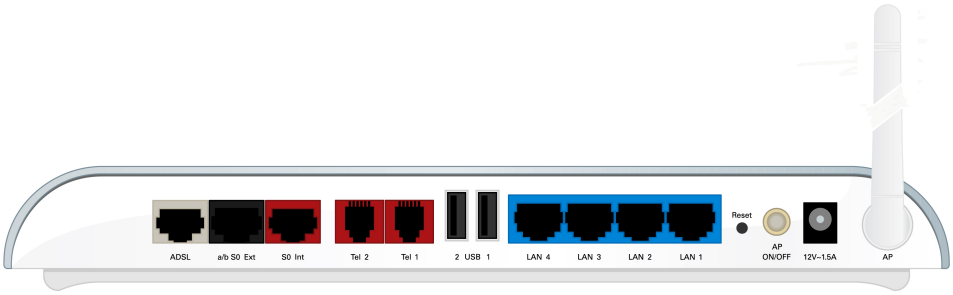


Figure 2.2: Back panel

Name	Port type, Color	Function
Order from left to right		
ADSL	WAN port, (RJ45), gray	connect to DSL port on splitter
a/b S_0 Ext	Combi port, (RJ45), black	connect to ISDN port on splitter or analog port (for analog lines use the adaptor)
S_0 Int	ISDN port, (RJ45), red	connect ISDN devices to internal S_0-Bus
Tel 2, Tel 1	Phone ports, (RJ11), red	Connect up to two analog phones
USB 2, USB 1	USB ports	Connect USB devices
LAN 4 - 1	Ethernet ports, (RJ45), blue	Connect up to four ethernet devices
Reset	Reset switch	To restart press switch for ca. 1 second For a factory reset press switch and hold for ca. 10 second
AP ON/OFF	WLAN switch	Switch WLAN on and off
12V-1,5A	Power port (round)	Connect to power supply
AP	Antenna port (round, RP-SMA)	Connect WLAN antenna

Table 2.3: Back panel: Colors and functions of ports

2.3 Installation

Please read chapter 1.2 Installation Considerations on p.13 before installing the HorstBox.

2.3.1 Preparations

Before configuring the HorstBox prepare the device as described in this section.

- Install the HorstBox at the desired location.
- Provide for air circulation. Do not cover the HorstBox.
- Connect the HorstBox to your computer. Use the blue network cable provided. Plug it into one of the blue ports of the device. Plug the other end into the port of the network adapter card (NIC) of your computer.
- Plug the power adaptor plug into the power port of the HorstBox.
- Plug the power plug of the power adaptor into a socket. This will make the HorstBox boot up.
- Boot up the computer you want to use for configuring the HorstBox.

All preparations are done now. You can start to configure the HorstBox after the LED reports readiness of the device. These LEDs should be "on" by now: **Power**, **Stat** and at least 1x **LAN**, assumed that the computer connected to a LAN port is ready, too.

Note: If you plan to integrate the HorstBox into an existing network, you may want to disable the DHCP server temporarily as the HorstBox provides another DHCP server as default. Using two DHCP servers uncontrolled in one network may cause severe problems.

The default IP address of the HorstBox is **http://horstbox**. Make sure that your network is working in the same segment (192.168.0.x).

An easy way to configure the HorstBox is to connect a computer directly and let it get an IP address from the DHCP server of the HorstBox. Start the HorstBox first, the computer second.

2.3.2 Connect to the HorstBox

The HorstBox can be configured via a WLAN connection or via a LAN connection using an ethernet cable.

WLAN Connection

Setting up a WLAN requires a WLAN adaptor installed on your computer, eg. DWL-G630 (PCMCIA), DWL-G122 (USB) or DWL-G510 (PCI).

This section describes the setup of a WLAN for Windows XP. For other operating systems please refer to the documentation provided. You may find additional information on the web-sites of the software manufacturer.

The procedure may differ, if the WLAN adaptor comes with its own setup program. Please refer to the documentation delivered or configure the program to use the Windows configuration procedure.

On the desktop right click on the Symbol NETWORK. From the context menu choose PROPERTIES.

In the dialog NETWORK CONNECTIONS click right click on the icon WIRELESS NETWORK CONNECTIONS. From the context menu choose SHOW WIRELESS NETWORKS.

Mark the entry *dlink* and click on CONNECT. In the next dialog enter the network key as asked. The HorstBox uses WPA-PSK for encryption.

You will find the network key on a sticker on the bottom of the device.

Enter the network key into both fields and click on CONNECT.

Figure 2.3: Sticker with Network Key

The dialog WIRELESS NETWORK CONNECTIONS now shows the connection to network *dlink*.

Note: For security reasons change the WPA-PSK key at once.

The status tray will show a symbol for the wireless connection.

LAN Connection

To connect the HorstBox to your computer, use the blue ethernet cable delivered. Put one end into one of the blue ports on the HorstBox, the other end into the ethernet port of your computer.

2.3.3 Configuration

To configure the HorstBox via its graphic user interface, call up the URL **http://horstbox** in a browser.

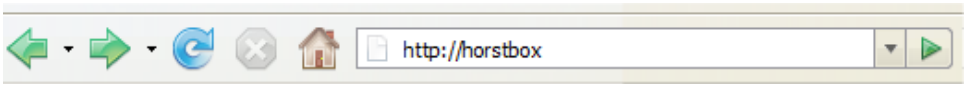


Figure 2.4: Enter address in browser

Username and Password are pre-defined as **a**dmin. If you didn't change the password, just click on LOGIN to get access the HorstBox.: **admin** / default password: **admin**.

Else enter the changed password first. Click on LOGIN.

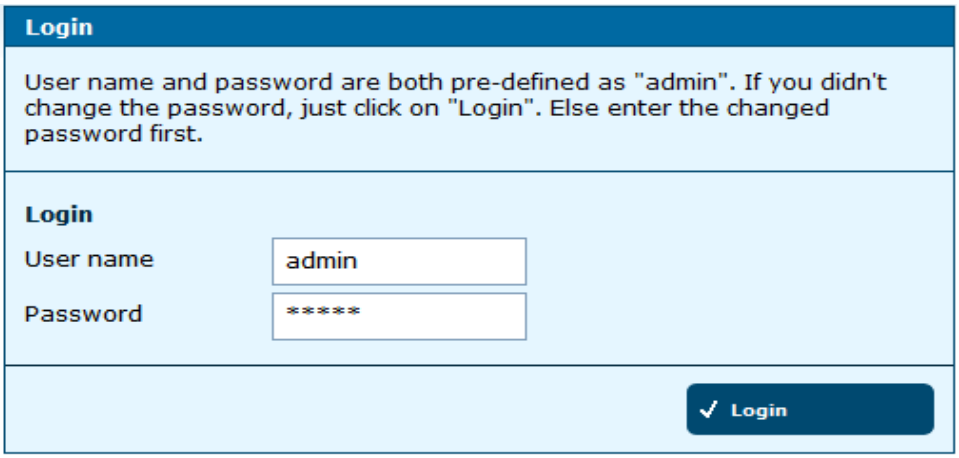


Figure 2.5: User name and Password

If you do the first configuration best use the wizard, which will start automatically in the browser.

The wizard guides you through all important settings and within minutes the HorstBox is up and running.

To change settings or install phones later, call up the URL **http://horstbox** again. If you have changed the default IP address of the HorstBox, start the graphical user interface by entering the new IP address into the browser.

The graphical user interface shows up in the browser. It is structured by several tabs, one for each area of functionality.

You can switch between basic and expert mode. While the expert mode provides more detailed settings, for most users the settings made in basic mode will be sufficient.

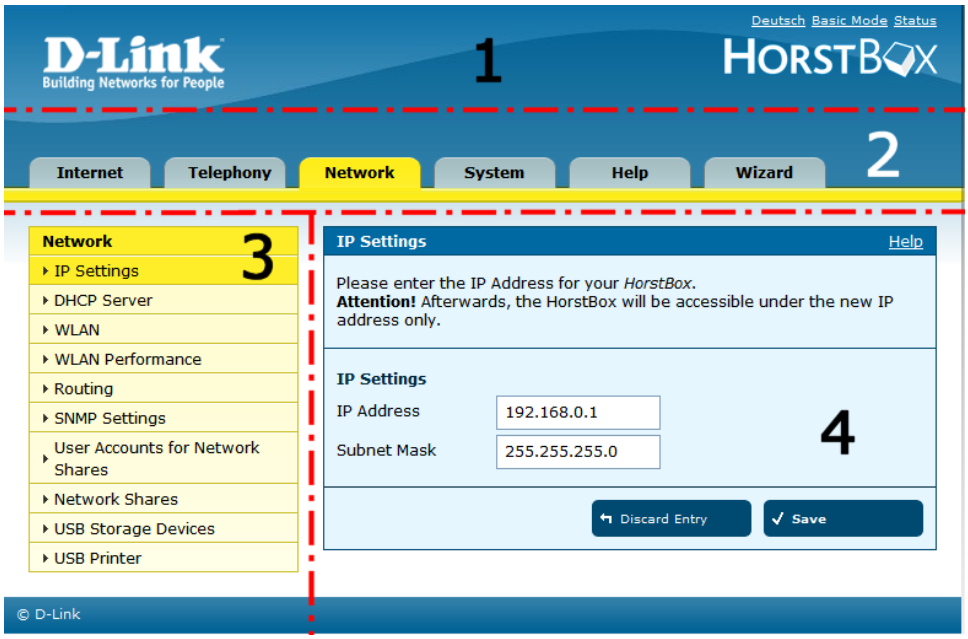


Figure 2.6: Graphical user interface

No	Name	Function
1	Switch	Switch language and modes; status report
2	Tab	Open a new tab by clicking on it
3	Navigation column	Open new page inside a tab for more settings
4	Text	Information / settings / online help

Table 2.4: Graphical User Interface: Functions

3 Wizard

The Wizard will guide you step-by-step through the installation and configuration of the HorstBox. Within minutes the HorstBox will be ready to go.

Note: For security reasons configure the HorstBox via a network cable only. Do not use a WLAN connection.

To start the wizard click on START WIZARD on the start page. Alternatively start the wizard via the tab WIZARD.

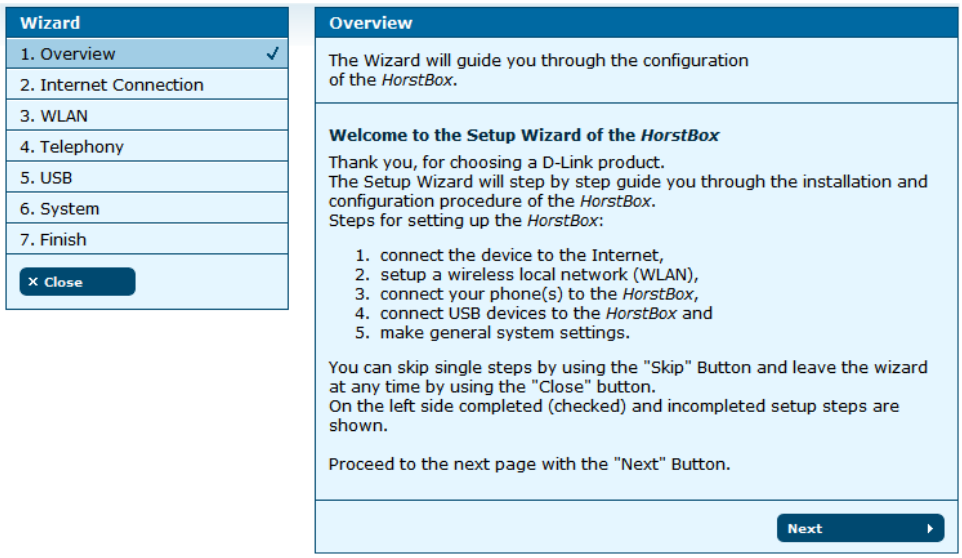


Figure 3.1: Overview Wizard

On the left side of the screen all steps are shown. Those already finished are ticked off. Clicking on CLOSE will terminate the Wizard with no settings saved.

The configuration of the HorstBox is arranged in five main steps:

1. connect the device to the Internet,
2. setup a wireless local network (WLAN),
3. connect your phone(s) to the HorstBox,
4. connect USB devices to the HorstBox and
5. make general system settings.

Note: All user names, phone numbers or passwords used in this manual are examples only.
Please make sure to use your own data only!

This section will explain all configuration steps. If you do not want e.g. to connect an analog phone, just skip that step. To open the next page, click on NEXT.

3.1 Internet Connection

Here you will set up the Internet connection of the HorstBox. Connect the device to the DSL socket, enter all necessary login details and choose some general connectivity options.

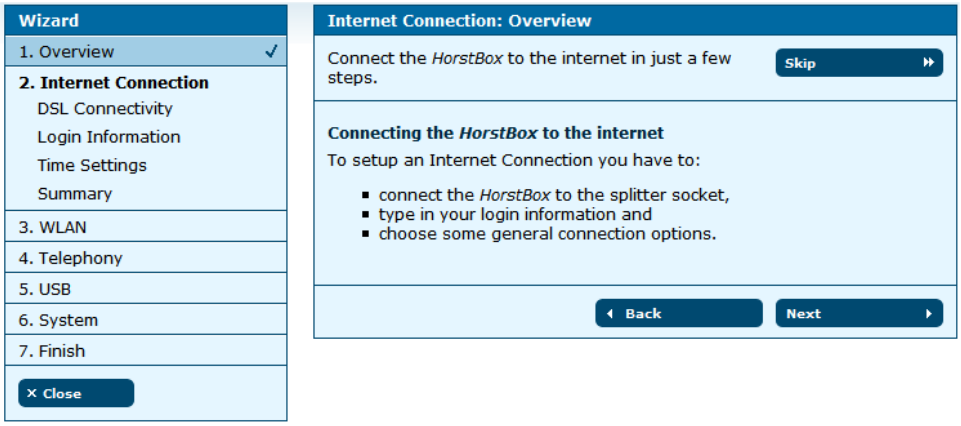


Figure 3.2: Internet connection: Overview

The overview shows all steps required to set up the Internet connection.

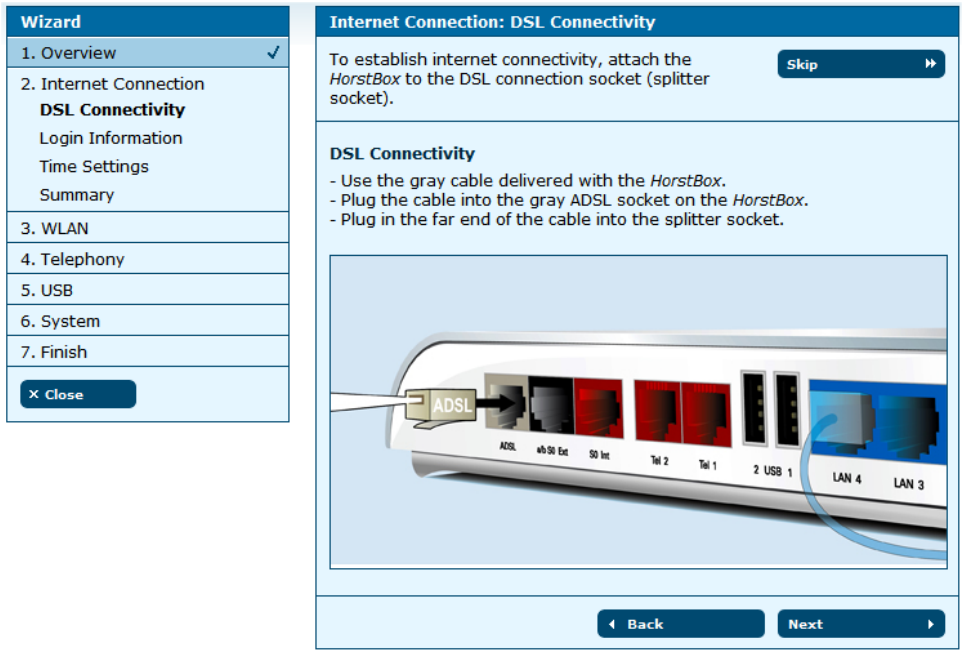


Figure 3.3: Internet connection: DSL connectivity

Use the gray network cable delivered with the HorstBox. Put one end into the DSL port (gray), the other end into the DSL port on the splitter.

Click on NEXT, to open the next page to enter the login details.

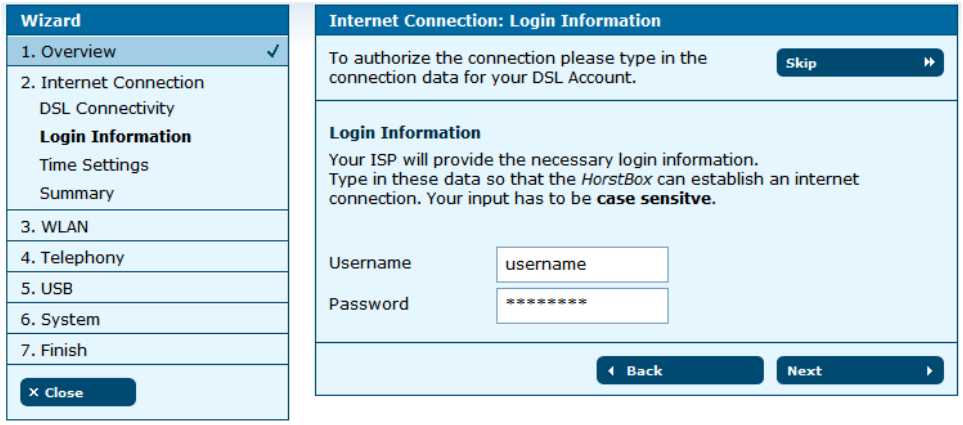


Figure 3.4: Internet connection: Login details

Your Internet Service Provider (ISP) will provide your login details.

Enter User name and Password for the HorstBox to store and to establish an Internet connection. Your input has to be case sensitve.

Click on NEXT, to open the page for the time settings.

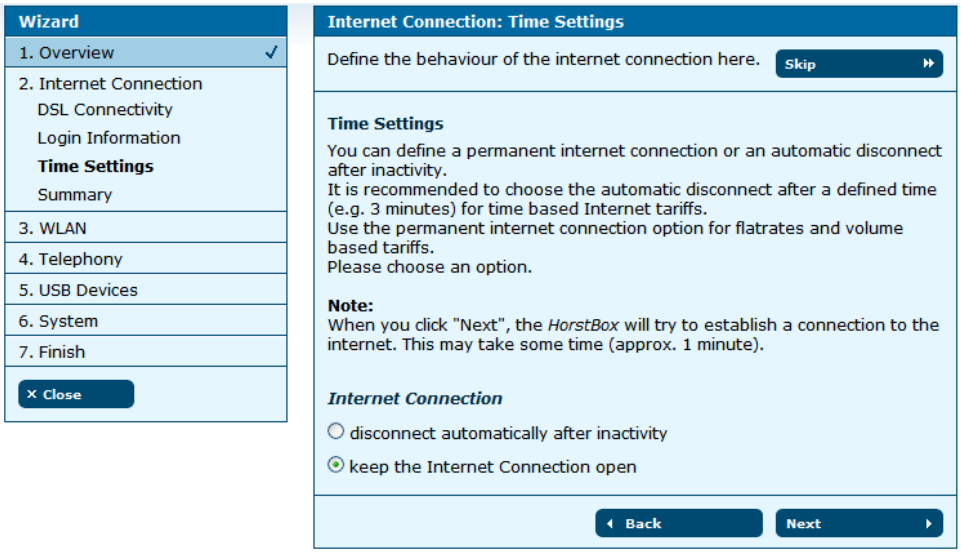


Figure 3.5: Internet connection: Time Settings

You can define a permanent Internet connection or an automatic disconnection after inactivity.

It is recommended to choose the automatic disconnect after a defined time (e.g. 3 minutes) for time based Internet tariffs.

Use the permanent Internet connection option for flatrates and volume based tariffs.

You can change these settings later on the tab INTERNET, page DSL ACCESS.

Choose an option.

Note: If you choose automatic disconnect after certain period of inactivity, the connection will be terminated. No VoIP calls will go through until a new connection is established.

Click on NEXT, to open the summary page for the Internet connection settings.

Click on NEXT to set up the WLAN in just three simple steps.

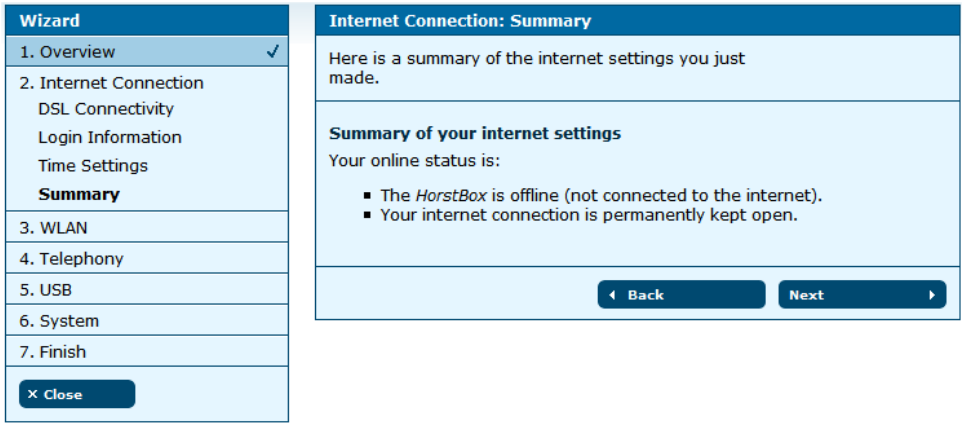


Figure 3.6: Internet connection: Summary

3.2 WLAN

Here you will prepare the HorstBox for the WLAN. Attach the antenna to the device, enter a name for your wireless network and choose some simple security options.

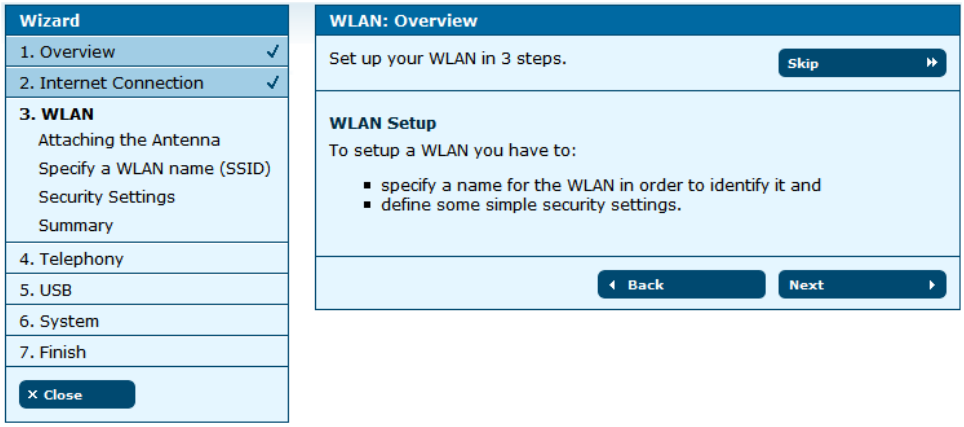


Figure 3.7: WLAN: Overview

Click on NEXT to get instructions on how to attach the antenna.

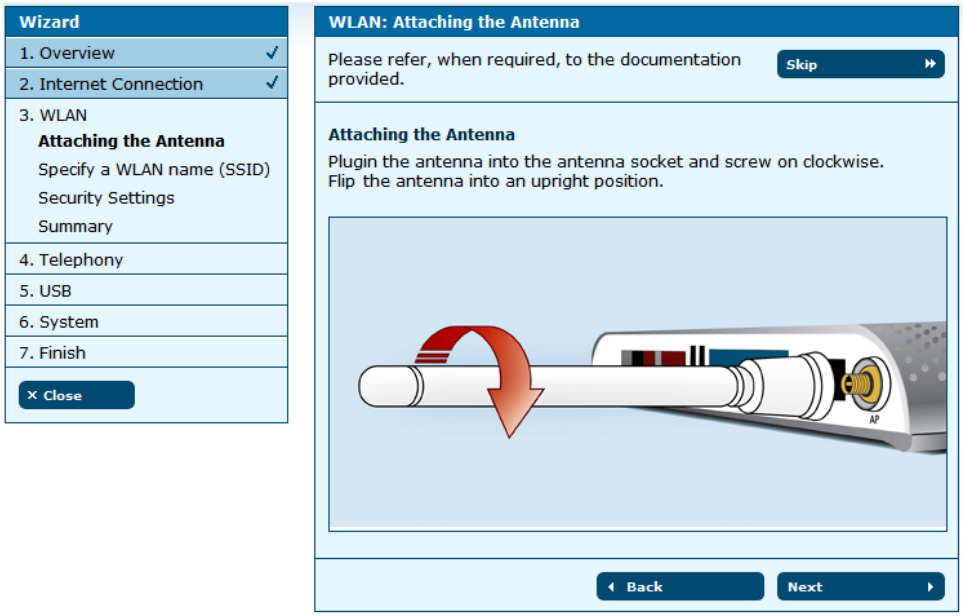


Figure 3.8: WLAN: Attaching the antenna

Plugin the antenna into the antenna socket and screw on clockwise. Flip the antenna into an upright position.

Click on NEXT, to open the page to specify a name (SSID) for your WLAN.

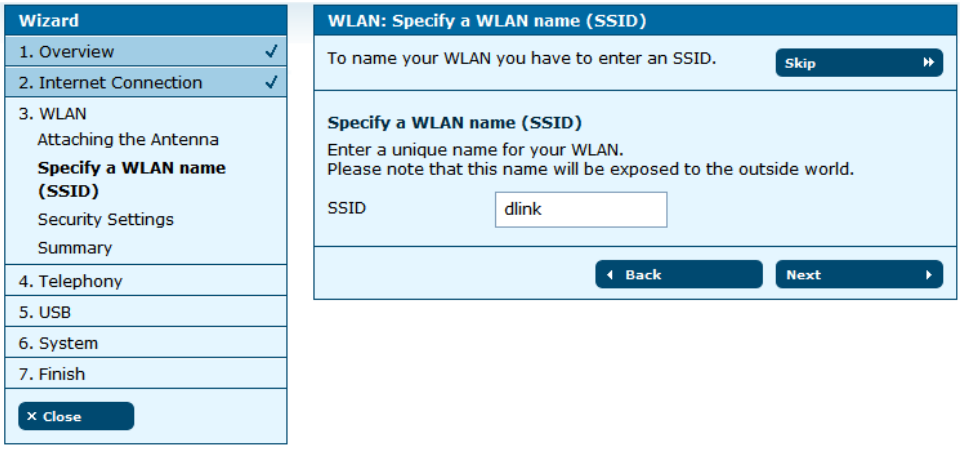


Figure 3.9: WLAN: Name (SSID)

Enter a unique name for your WLAN in order to identify and propagate it wireless.

Click on NEXT, to open the page for the security settings.

Note: Without any security your WLAN will be open for everyone!

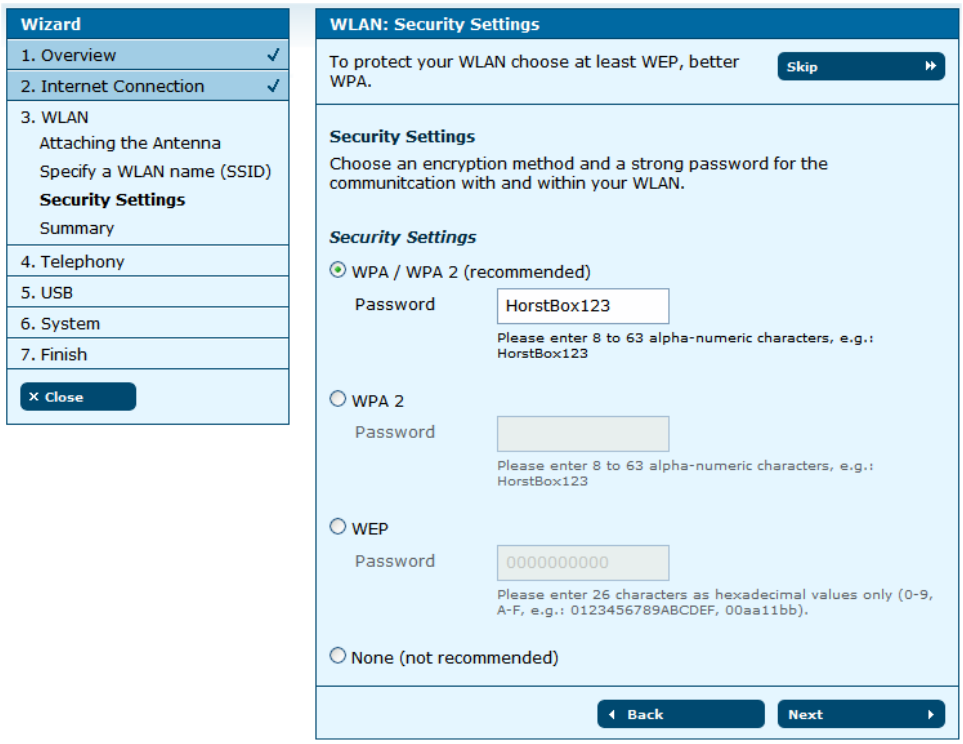


Figure 3.10: WLAN: Security settings

Choose a encryption method and a strong password for the communication with and within your WLAN.

Note: Use at least WEP as security standard, better WPA. Check whether all WLAN devices are able to handle WPA.

Click on NEXT, to open the summary page for the WLAN settings.

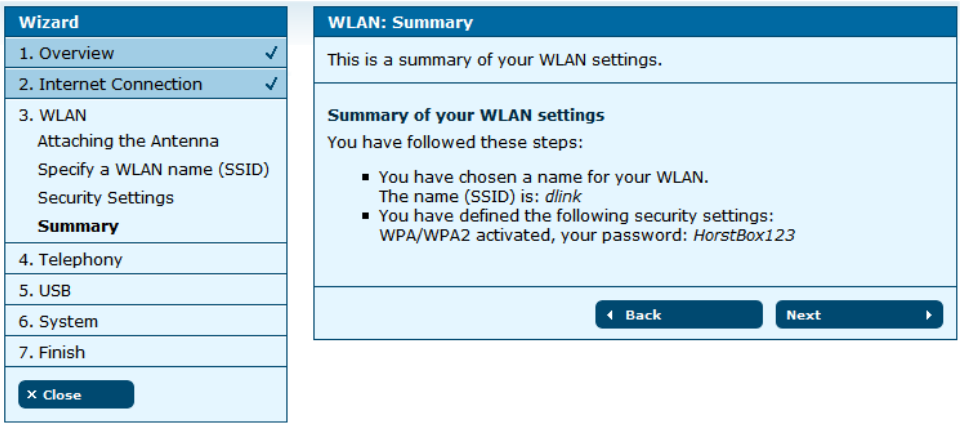


Figure 3.11: WLAN: Summary

If you used the WLAN switch to switch off the WLAN, a red framed warning will appear. You may continue using the wizard. All WLAN settings will become effective once the WLAN is switched on manually.

If the WLAN is switched off (WLAN switch on the backpanel), a red framed warning is shown. Continue with the wizard. All WLAN settings became active, the next time you switch on the WLAN.

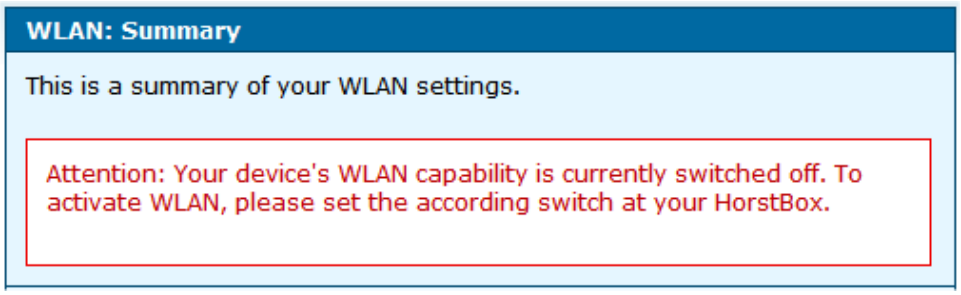


Figure 3.12: Message WLAN switched off

Click on NEXT to configure the HorstBox as a PBX in just four steps.

3.3 Telephony

To use the HorstBox as phone system PBX you must at least connect one phone (analog or ISDN). Configure the HorstBox and do a functional test. You may set up a VoIP account here as well.

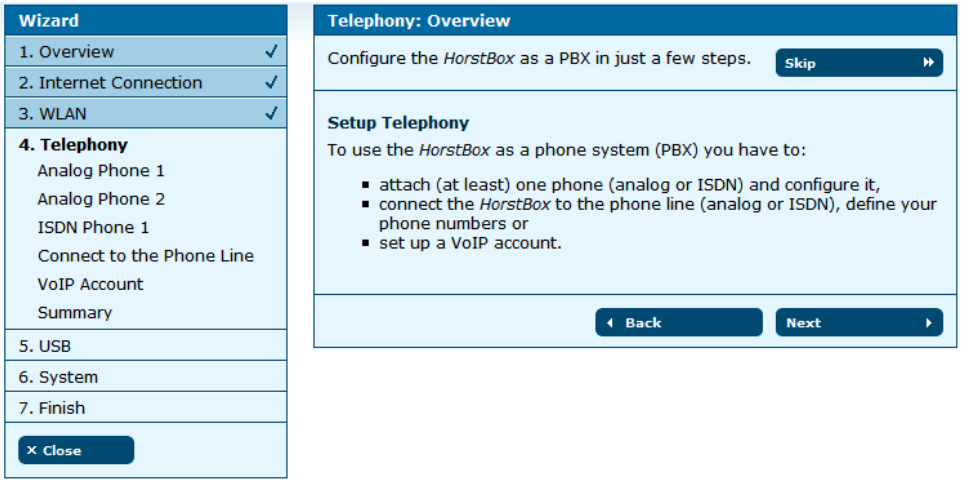


Figure 3.13: Telephony: Overview

Click on NEXT to learn how to connect an analog phone.

Connect an analog phone to one of the analog ports (red) “Tel 1” or “Tel 2” on the HorstBox. Use the adaptor provided (left port, f-coded) and the cable of your telephone.

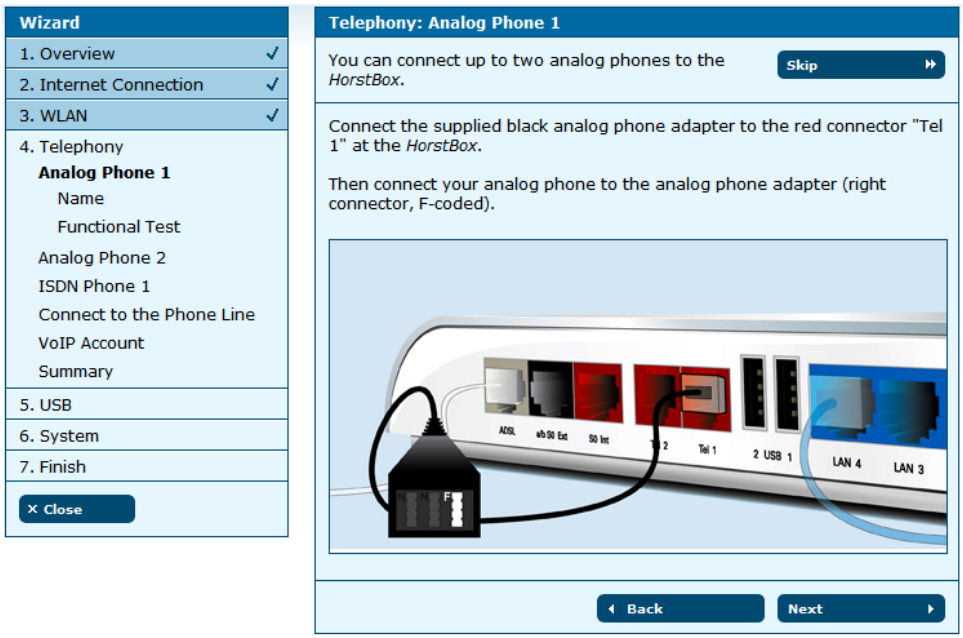


Figure 3.14: Telephony: Connect an analog phone

Click on NEXT.

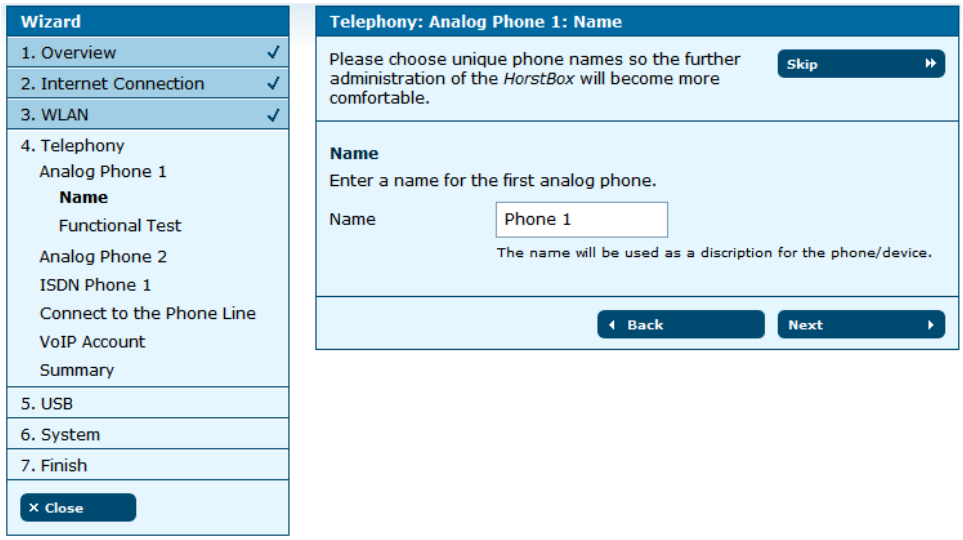


Figure 3.15: Telephony: Name the analog phone

Please choose unique phone names so the further administration of the HorstBox will become more comfortable.

Click on NEXT to open the functional test page.

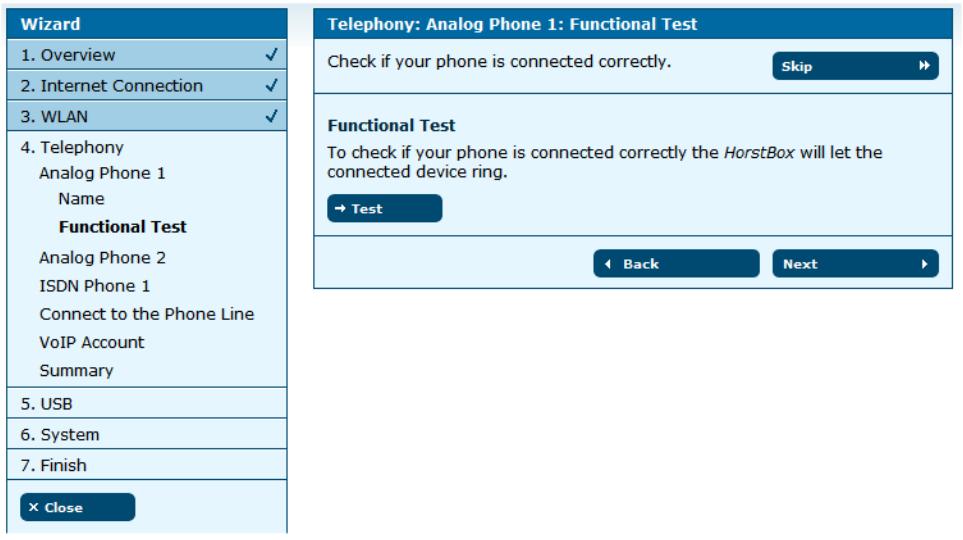


Figure 3.16: Telephony: Functional test

The functional test checks whether the phone is properly connected. The HorstBox sends a signal and the phone should ring. Pick up the receiver and put it back into the craddle.

Click on NEXT to continue.

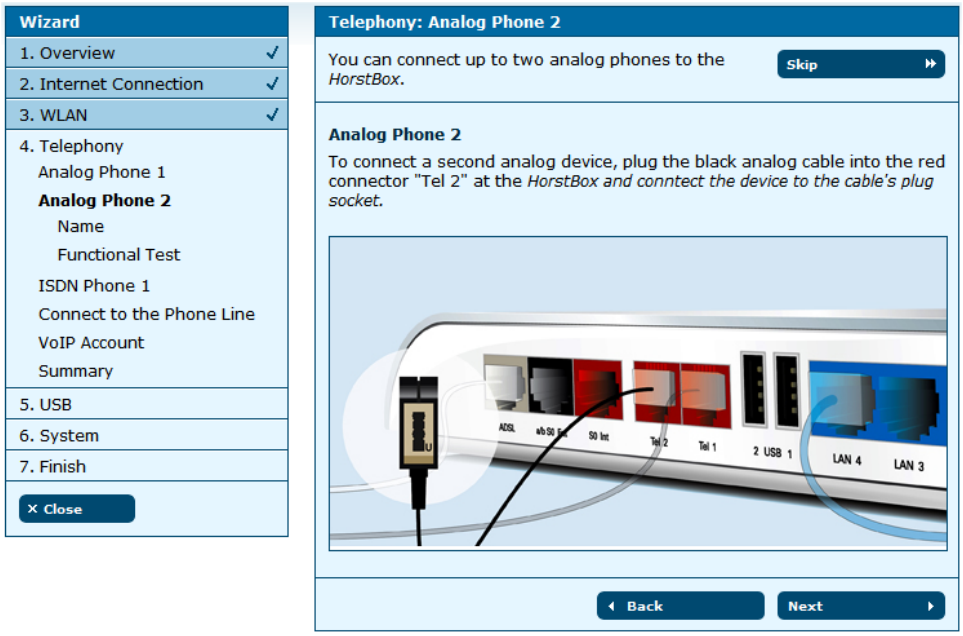


Figure 3.17: Telephony: Second analog phone

If desired, you may connect and set up a second analog phone. Use the red telephone cable provided. Please repeat the steps described above. Else skip this step.

Now you can connect and set up an ISDN phone. Connect the phone to the port "S_0 Int" on the HorstBox. Use the red phone cable (ISDN) provided.

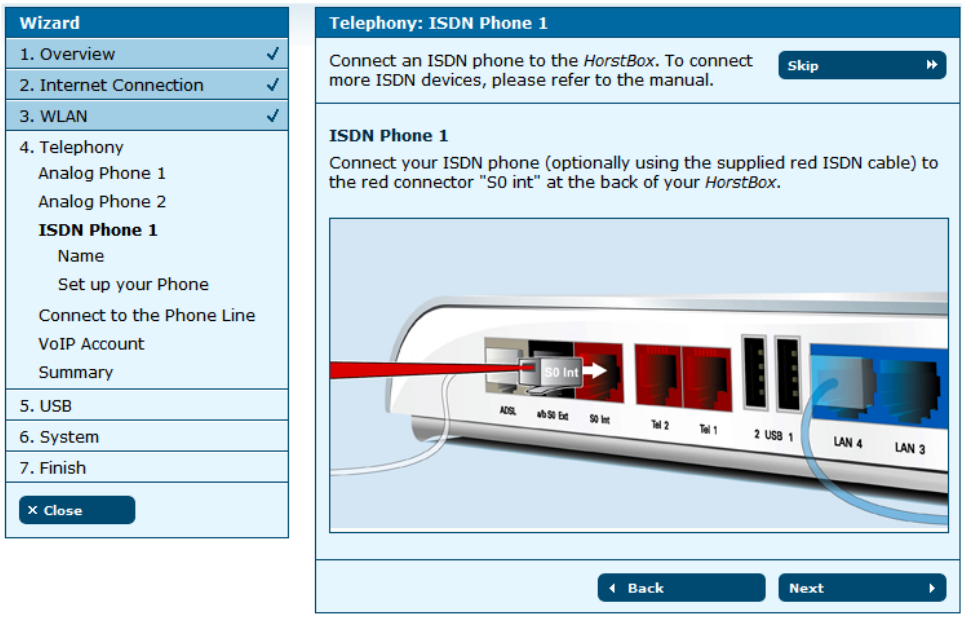


Figure 3.18: Telephony: ISDN Phone

Click on NEXT.

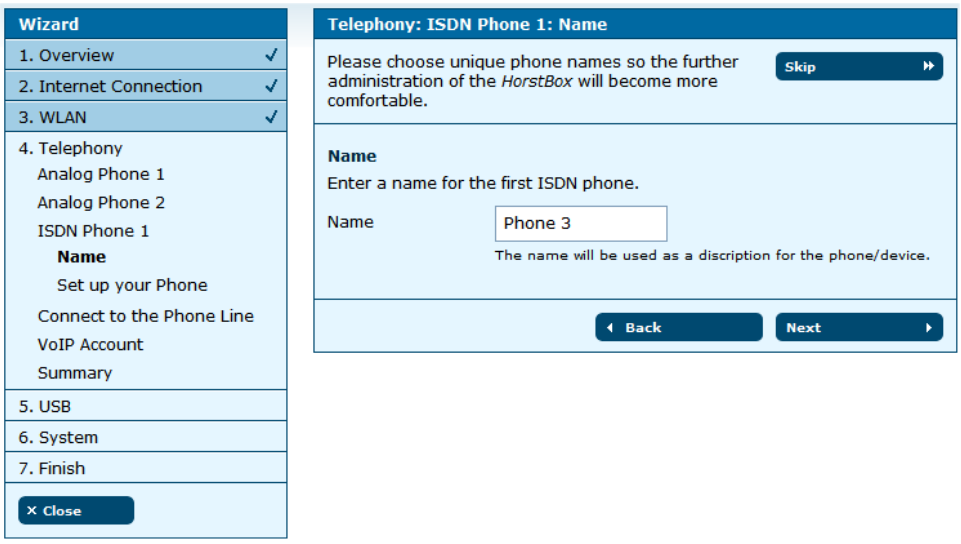


Figure 3.19: Telephony: Name the ISDN phone

Please choose unique phone names so the further administration of the HorstBox will become more comfortable.

Click on NEXT to open the functional test page.

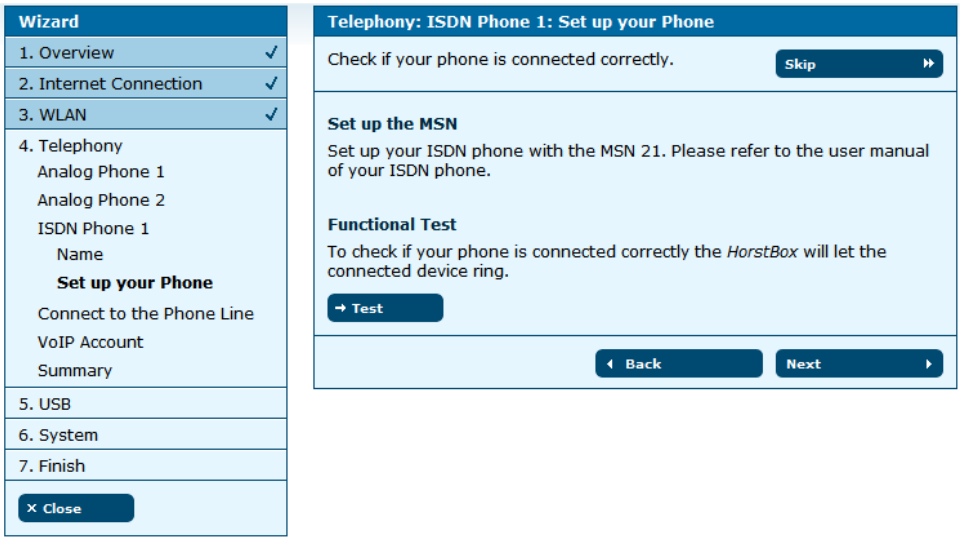


Figure 3.20: Telephony: Functional test

The functional test checks whether the phone is properly connected. The HorstBox sends a signal and the phone should ring. Pick up the receiver and put it back into the craddle.

Before executing the functional test you have to set up your ISDN phone to MSN 21. Please refer to the documentation of the phone to learn how to to do this.

You can configure more ISDN phones later on the tab TELEPHONY on the page PHONES AND DEVICES.

Click on NEXT to continue.

Now you will set up the external phone line.

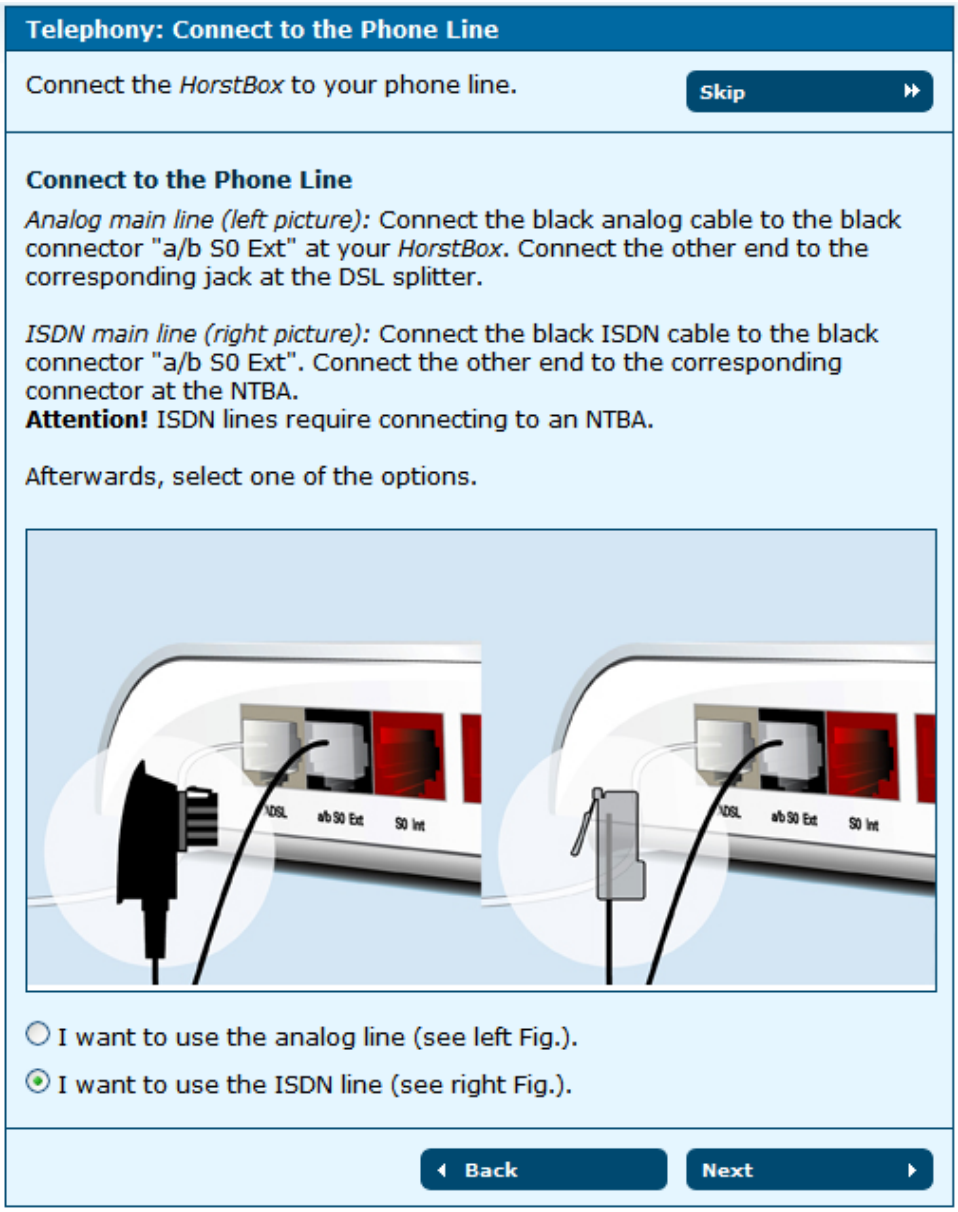


Figure 3.21: Telephony: External phone line

Connect the HorstBox to the phone line.

Analog main line: Connect the black analog cable to the black connector "'a/b S0 Ext'" at your HorstBox. Connect the other end to the corresponding jack at the DSL splitter.

ISDN main line: Connect the black ISDN cable to the black connector "'a/b S0 Ext'". Connect the other end to the corresponding connector at the NTBA.

Note: Attention! ISDN lines require connecting to an NTBA.

Afterwards you have to choose one of the options: *I want to use the analog line (see left Fig.)* or *I want to use the ISDN line (see right Fig.)*.

Click on NEXT, to enter the phone numbers.

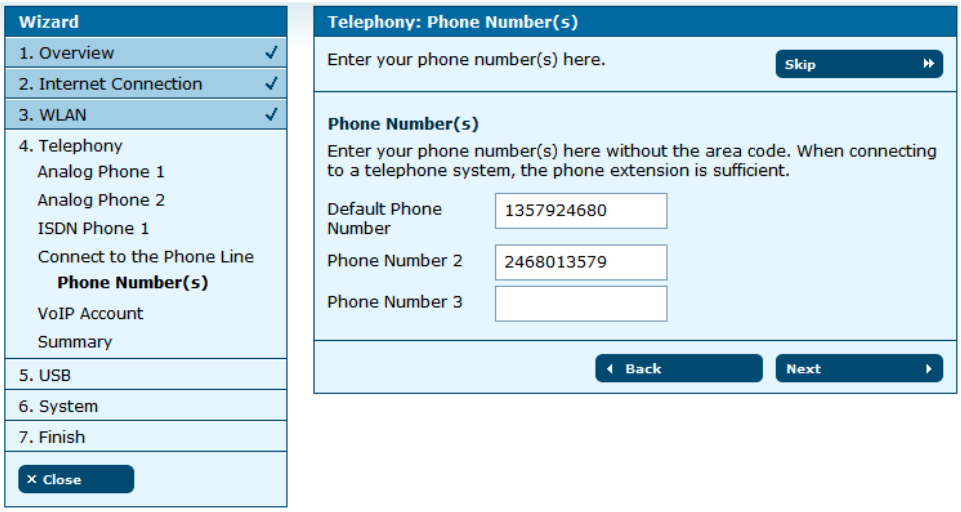


Figure 3.22: Telephony: Phone numbers

Enter the phone number(s). Use the first ISDN phone number respectively the analog phone number as default number. The HorstBox will use the number to handle outgoing calls. This number will be displayed as "'Caller ID"'.

Click on NEXT.

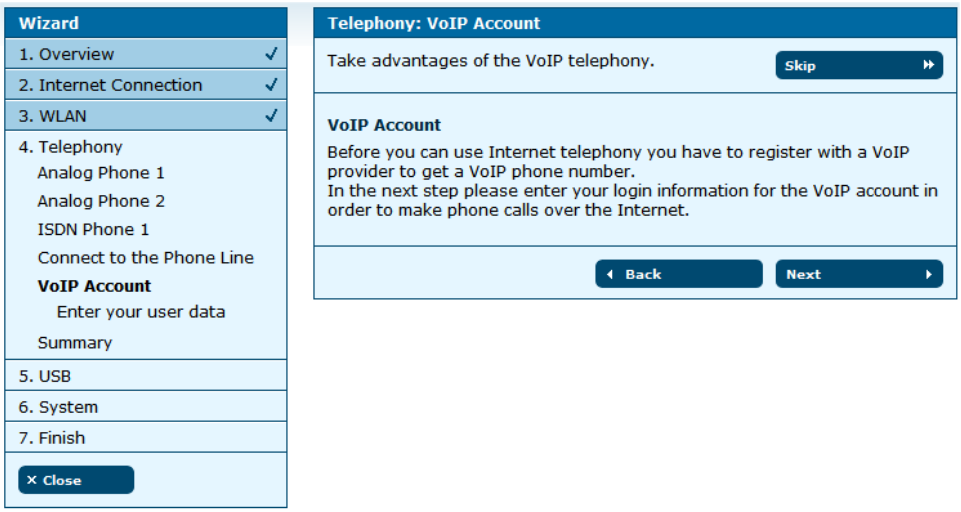


Figure 3.23: Telephony: VoIP

Before you can use Internet telephony you have to register with a VoIP provider, e.g. SipGate to receive a VoIP phone number.

In the next step please enter your login details for the VoIP account in order to make phone calls over the Internet.

Click on NEXT.

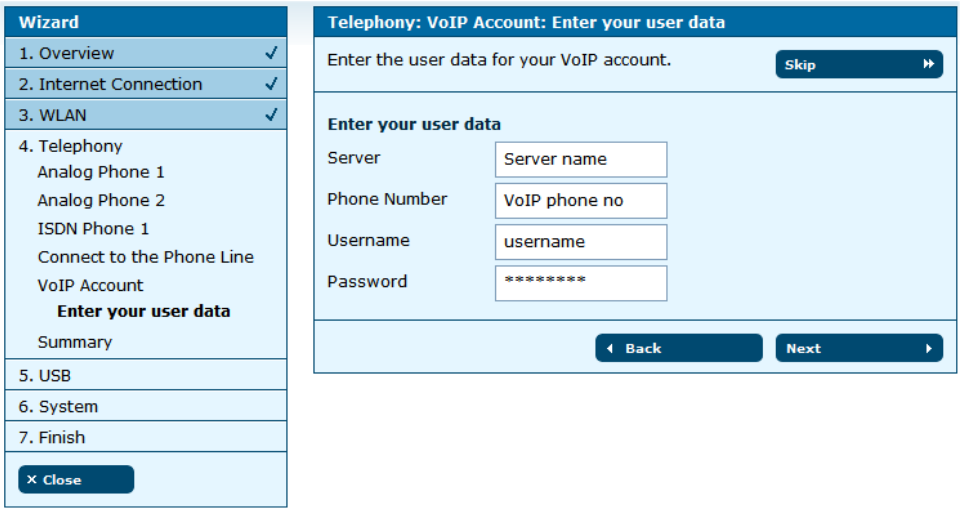


Figure 3.24: Telephony: VoIP login details

Enter host name or IP address of the VoIP server into the field SERVER, the VoIP number into the field PHONE NUMBER, user name and password of the VoIP account into the appropriate fields.

Click on NEXT for the summary of the telephony settings.

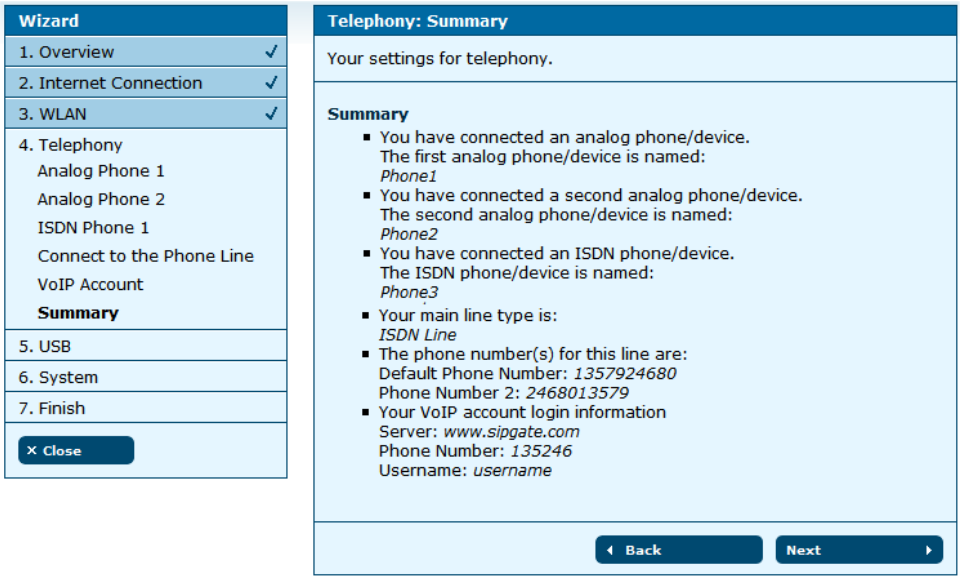


Figure 3.25: Telephony: Summary

Click again on NEXT to set up the USB devices.

3.4 USB

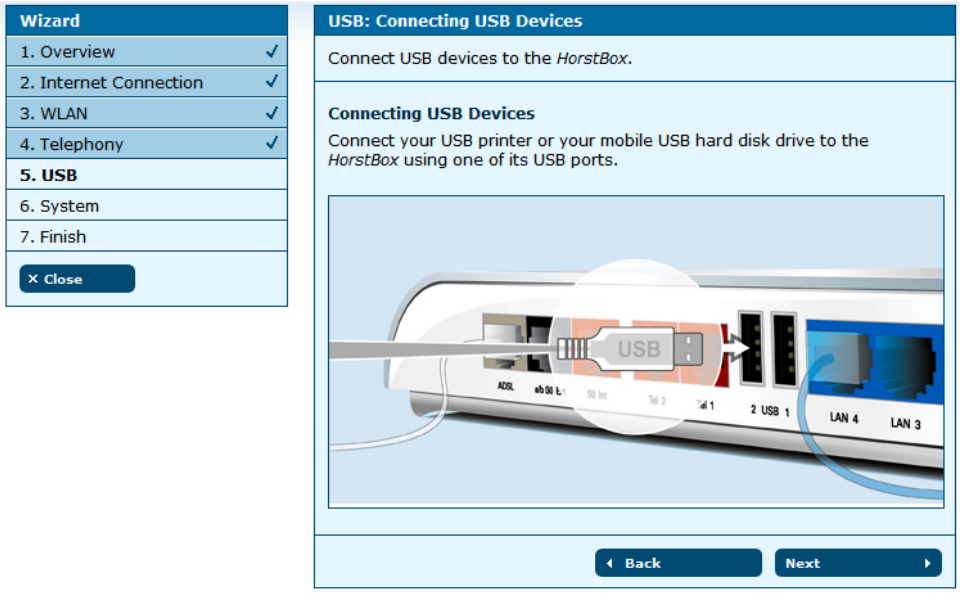


Figure 3.26: USB: Overview

Click on NEXT to set up the storage shares. From the drop-down list *Share (guest account)* choose an option.

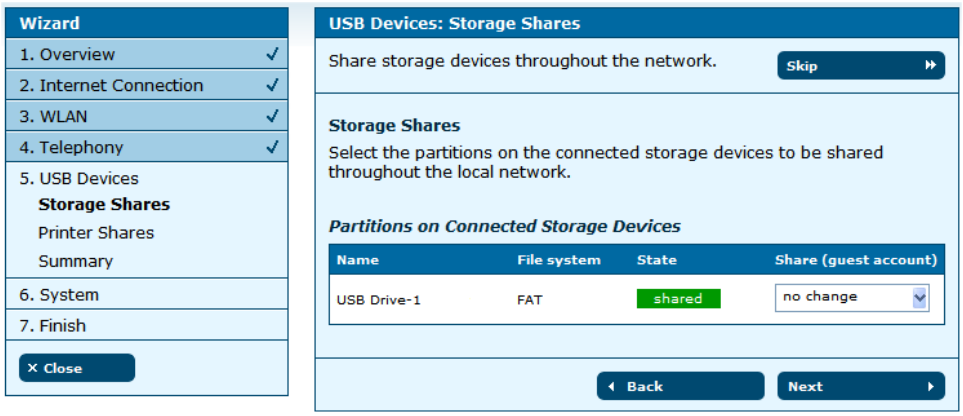


Figure 3.27: USB: Storage Shares

Click on NEXT to set up the printer shares.

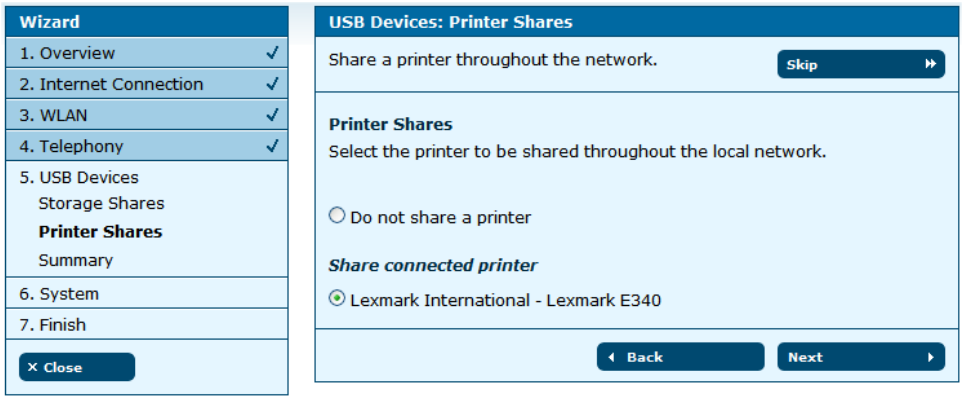


Figure 3.28: USB: Printer Shares

Select the printer you want to share in your LAN. Only one printer may be shared at a time.

Click on NEXT for the summary page of the USB devices.

Figure 3.29: USB: Summary

Click again on NEXT for the system settings.

3.5 System

Only some more settings are required now:

1. System Time. To make sure that rules and tasks can be executed at the right time you have to set up the system time properly.
2. Password. To protect the HorstBox against unauthorized or illegal access you have to enter an Administration Password. [Default user: **admin**; default password: **admin**.]

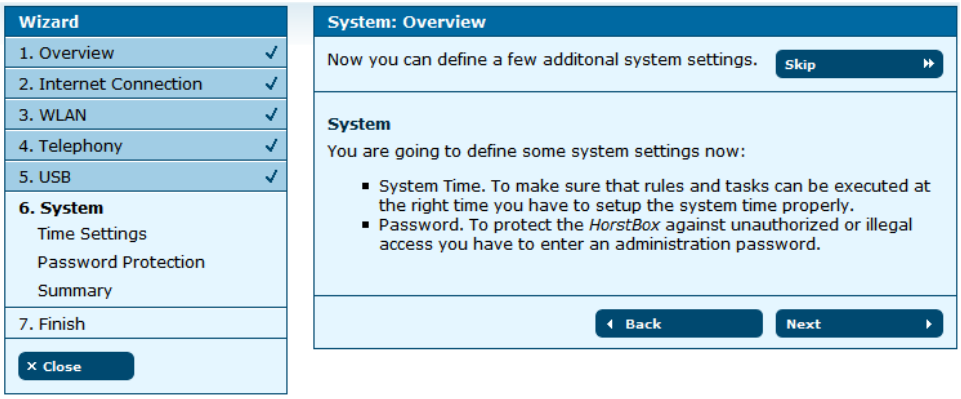


Figure 3.30: System: Overview

Click on NEXT to set up the time of the HorstBox.

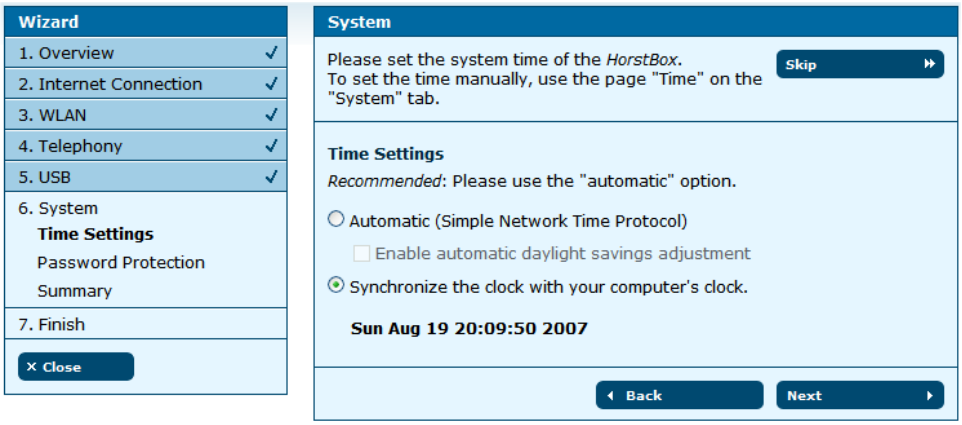


Figure 3.31: System: Time Settings

Let the HorstBox regulate the system time via Network Time Protocol (NTP) automatically or synchronize the system time with your computer's time.

Note: It's recommended to use the "automatic" option.

To set the time manually, use the page TIME on the tab SYSTEM.

Choose one option and click on NEXT to set up the password protection.

A password protects against unauthorized or illegal access. Change the default password: **admin** at once!

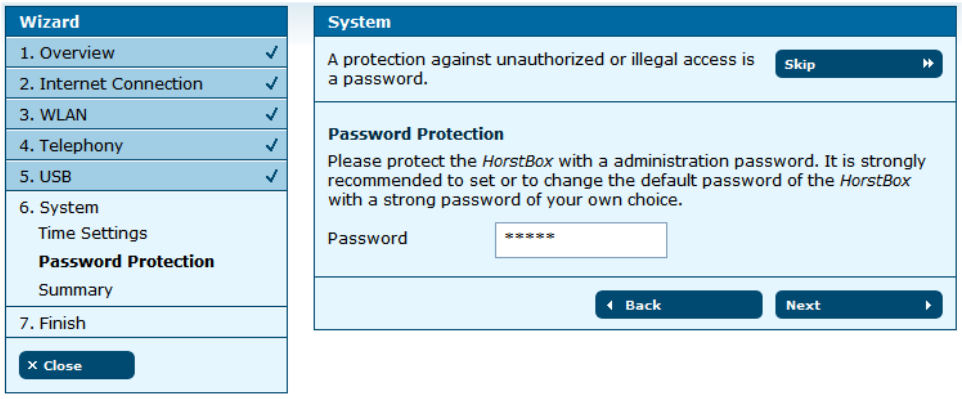


Figure 3.32: System: Password Protection

Click on NEXT.

You may have to re-login with user name *admin* and the new password.

Click on NEXT for the summary of the system settings.

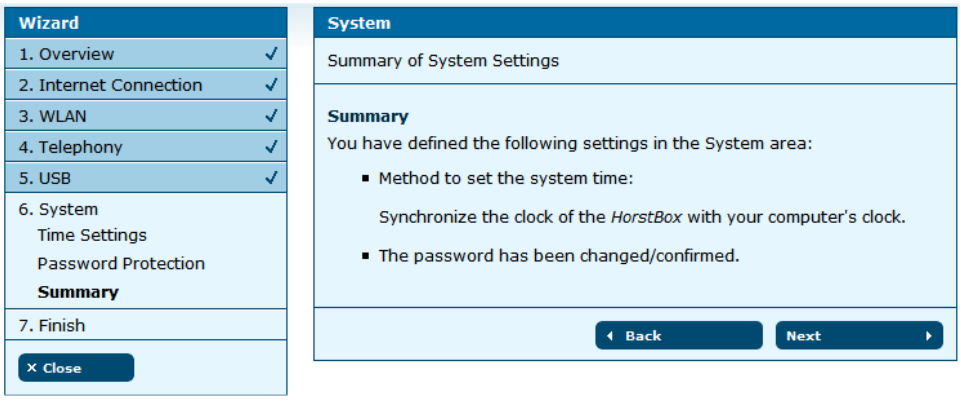


Figure 3.33: System: Summary

Click on NEXT for the last page of the wizard.

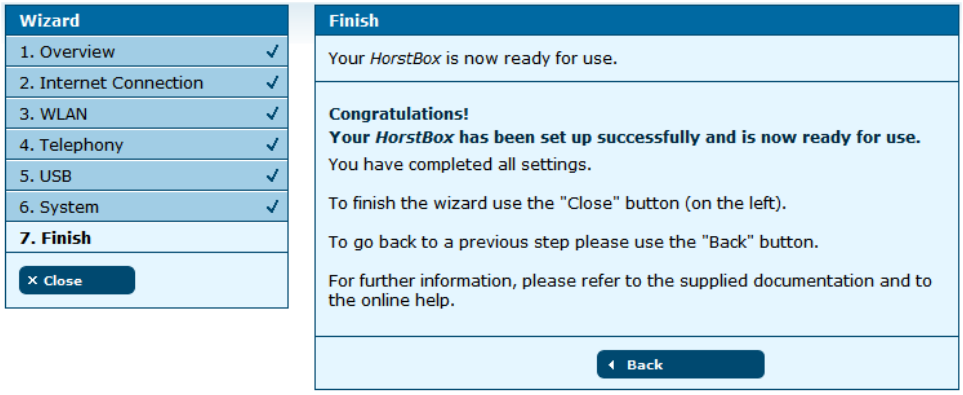


Figure 3.34: Wizard: Finish

Congratulation! Your HorstBox has been setup successfully and is now ready for use.

You have completed all settings now. To finish the Wizard and to save all settings, click on NEXT on the Finish page.

To go back to a previous step please use BACK.

To close the Wizard click on CLOSE (on the left). The STATUS PAGE (see next page)s will be shown.

For further questions, additional information and help, please take a look at the user manual and the online help.

On the status page all important information of your HorstBox (Internet, Telephony, Network and System) can be viewed at a glance.

Figure 3.35: Status page

Note: To call up the status page, use the link STATUS (top right corner) or just click on the D-Link logo.

4 Telephony

This chapter introduces all telephony settings.

Additionally you may need:

- *Phone numbers/external MSNs*
  as provided by your telephone service provider.
- *Manuals for your phone(s)*

To navigate in the tab TELEPHONY use the navigation column.

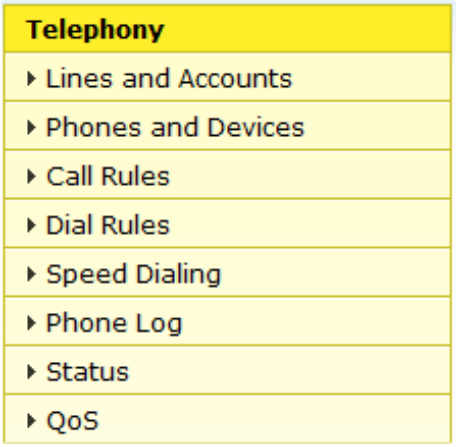


Figure 4.1: Navigation column Telephony

Note: To stay online permanently use a flatrate!

4.1 Lines and Accounts

4.1.1 Main Telephone Line

Before you configure the accounts choose the main telephone line: analog or ISDN. Select the desired entry in the drop down list *Line Type* and click on SAVE.

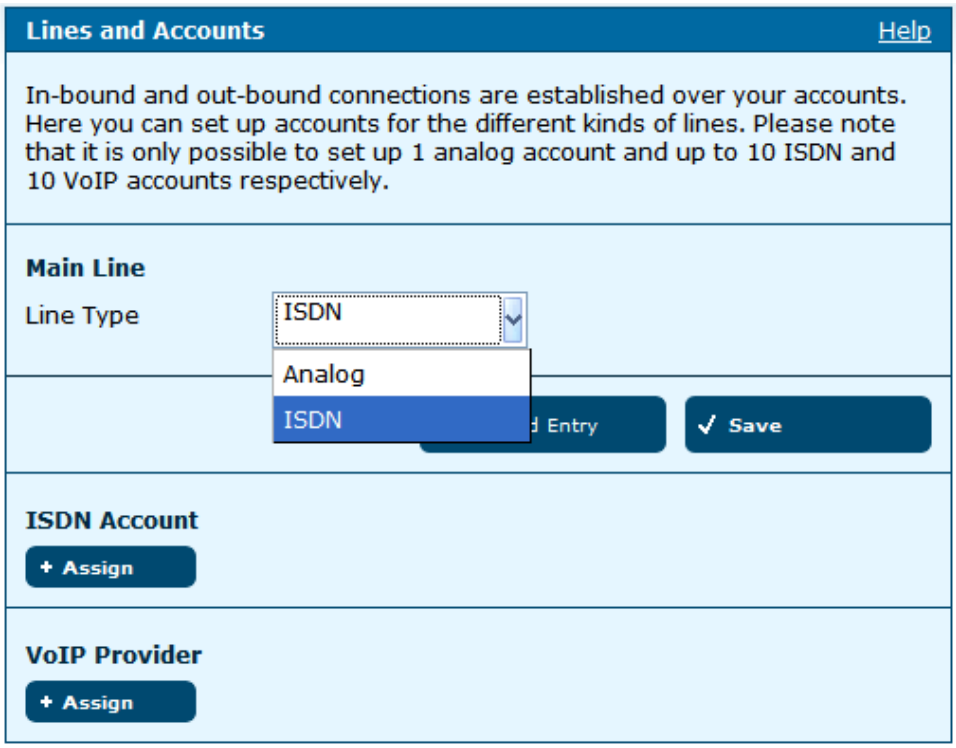


Figure 4.2: Lines and Accounts

In-bound and out-bound connections are established over accounts. Here you can set up accounts for different kinds of lines. You can set up one analog account only and up to 10 ISDN and 10 VoIP accounts respectively.

The HorstBox's lifeline support provides access to an analog line via an analog phone in times of electrical power outage.

On the tab PHONES AND DEVICES you will link accounts to phones or devices.

You can use rules (see tabs CALL RULES and DIAL RULES to preselect which account will use what phone and when).

4.1.2 Edit Analog Account

To edit the analog account, first select *Analog* as line type. In the bottom part of the screen click on EDIT. The analog account is set up as default. This will change if you change the line type.

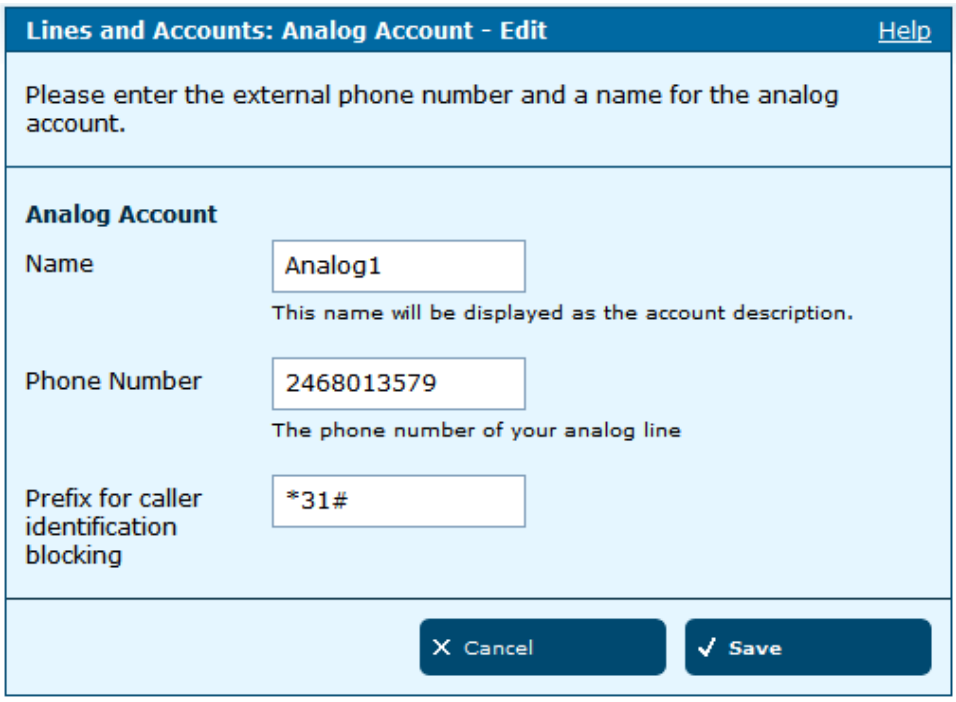


Figure 4.3: Edit Analog Account

Enter a name for the account and the phone number. Please choose unique account names so the further administration of the HorstBox will become more comfortable.

Calling Line Identification Restriction (CLIR) is a feature which may be provided by your phone service provider. The common term for preventing the display of a calling number is blocking.

You may block your caller ID by choosing the option *Caller ID Blocking*. Enter a prefix, e.g. * 3 1 #. To block your caller ID for the next call dial * 3 1 # as prefix before the phone number.

To unblock your caller ID, simply press # 3 1 # <Your phone number>.

For emergency calls your phone number will not be blocked, independent whether you have activated or deactivate Caller ID Blocking.

To save the settings, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

4.1.3 Delete Analog Account

There is no need to delete the analog account. Simply select *ISDN* as line type and click on SAVE.

The analog account will not be used any longer. Changing the line type changes the default account too.

4.1.4 Assign ISDN Account

To assign an ISDN account, choose *ISDN* as line type. At the bottom part of the screen click on ASSIGN.

On the page ISDN ACCOUNT - ADD enter an unique name for the ISDN account and the phone number (MSN).

Call Transfers as ISDN Service

You may set up some ISDN services as options. These ISDN services may be offered by your telephone service provider. The HorstBox will help you to configure the service, but the functions will be allocate at the switchboard.

- **Permanent call forwarding**: Activate this option and all in-bound calls to this phone number (MSN) will be transfered to the phone number entered in the field NUMBER permanently.
- **Call forwarding on no reply**: Activate this option and all in-bound calls to this phone number (MSN) will be transfered to the phone number entered in the field NUMBER on no reply.
- **Call forwarding on line busy**: Activate this option and all in-bound calls to this phone number (MSN) will be transfered to the phone number entered in the field NUMBER when the line is busy.

Example

Phone number (MSN) 135790 should be transferred permanently to phone number 246813.

After you have entered the values accordingly, click on SAVE. The HorstBox will now send the information to the switchboard. All in-bound calls to 135790 are rerouted to 246813 now.

The HorstBox will no longer answer to 135790, until the permanent transfer is cancelled.

To deactive the call transfers, deactivate the option accordingly and click on SAVE. Again the HorstBox will send the information to the switrchboard. The call transfers are reset. All in-bound calls to 135790 are answered by the HorstBox.

Note: Using call transfer options may cause additional costs!

To save the new account, click on SAVE.

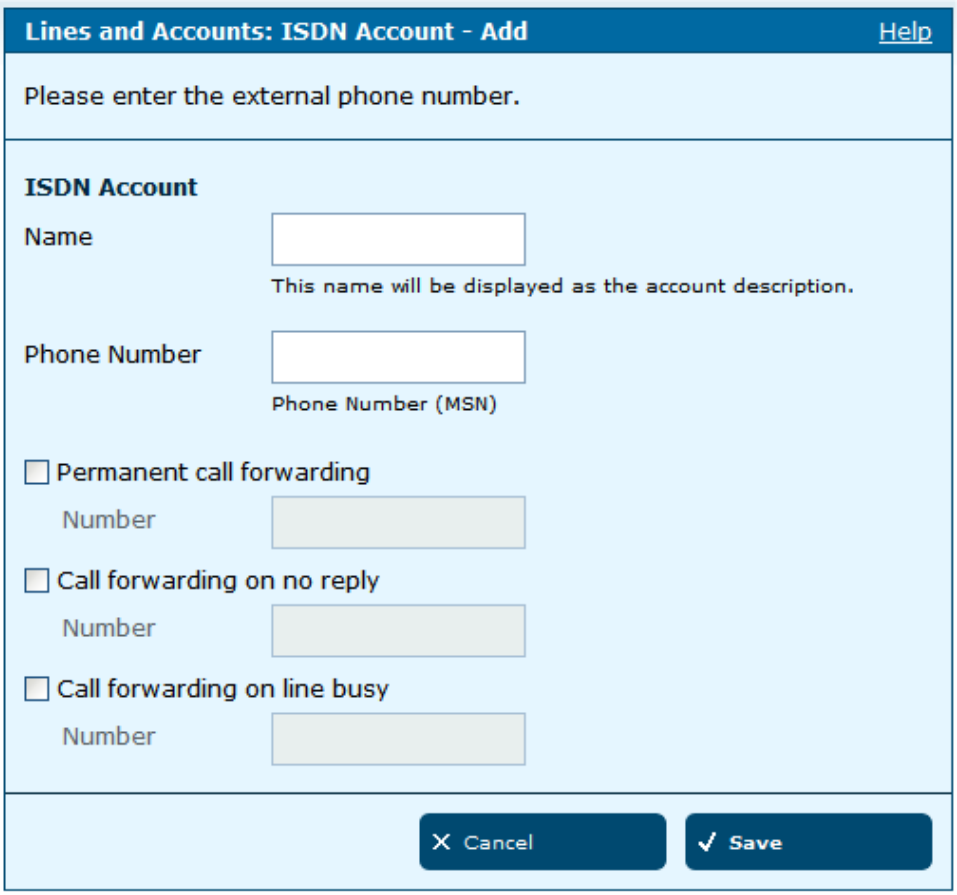


Figure 4.4: Add ISDN Account

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

4.1.5 Edit ISDN Account

To edit an ISDN account click on EDIT. The same dialog as for adding an account opens, but this time all fields contain values. Edit the values and click on SAVE.

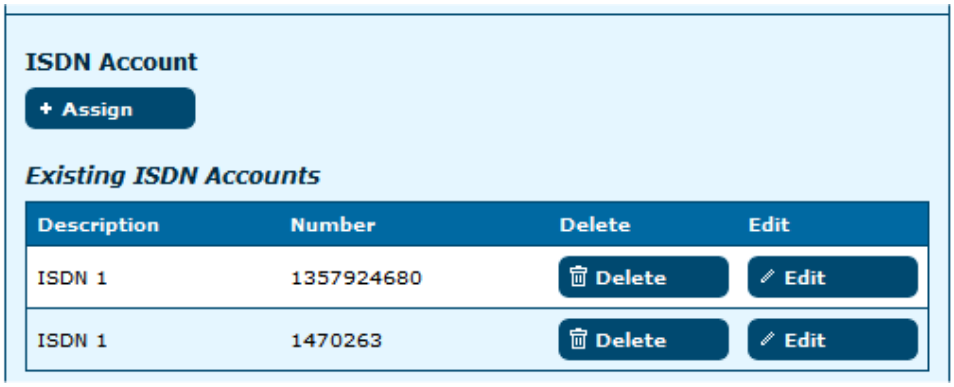


Figure 4.5: Edit ISDN Account

4.1.6 Delete ISDN Account

To delete an ISDN account click on DELETE. Confirm the warning by again clicking on DELETE. The account will be deleted and the page LINES AND ACCOUNTS will open and display a message.

4.1.7 Assign VoIP Account

Before you can use Internet telephony you have to register with a VoIP provider, e.g. SipGate to receive a VoIP phone number.

To assign a VoIP account, click on ASSIGN.

Enter host name or IP address of the VoIP server into the field SERVER, the VoIP phone number into the field PHONE NUMBER, User name and Password into the appropriate fields.

To save the settings, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

Note: While using VoIP stay online permanently and use a flat-rate!

If the option *disconnect automatically after inactivity* is activated (see INTERNET, page DSL ACCESS), in-bound calls are no longer possible, once the connection is terminated. Out-bound calls need to establish a connection to the Internet first.

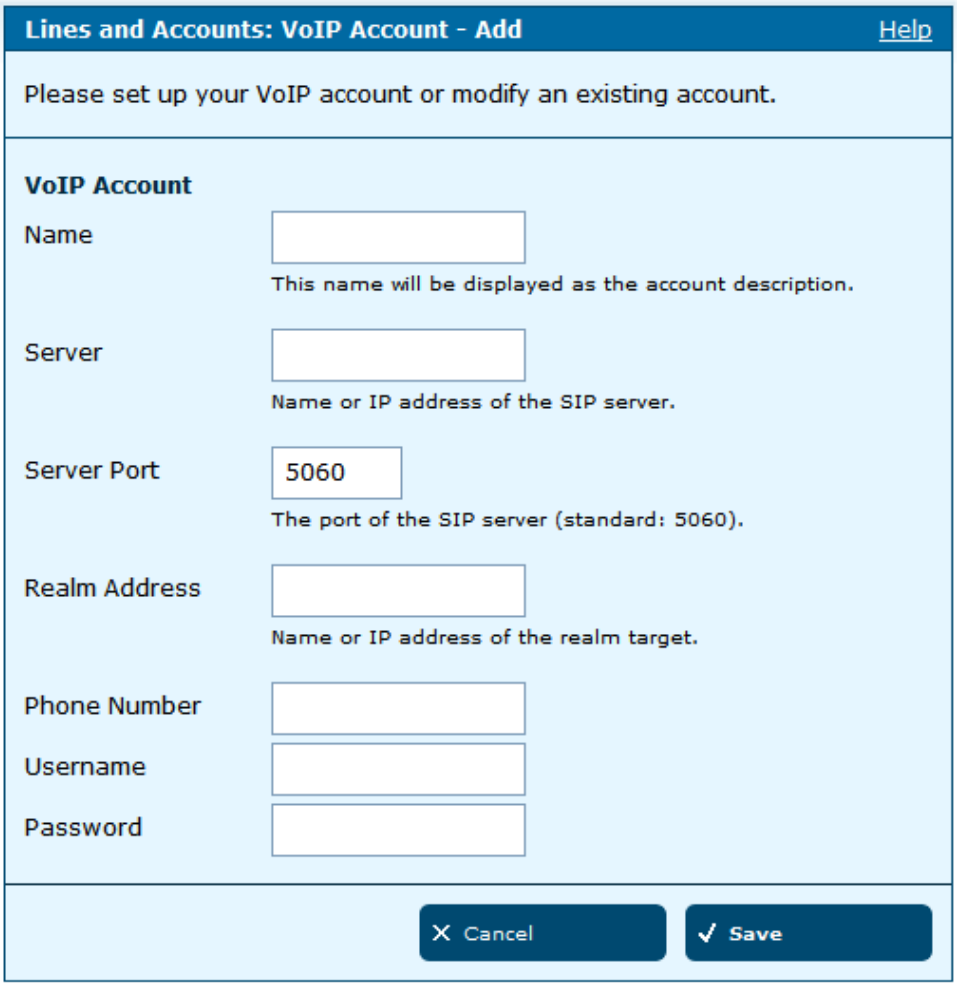


Figure 4.6: Assign VoIP Account

4.1.8 Edit VoIP Account

To edit a VoIP account click on EDIT. The same dialog as for adding an account opens, but this time all fields contain values. Edit the values and click on SAVE.

4.1.9 Delete VoIP Account

To delete a VoIP account, click on DELETE. Confirm the warning by again clicking on DELETE. The account will be deleted and the page LINES AND ACCOUNTS will open and display a message.

4.2 Phones and Devices

Register the connected phones with the HorstBox. You can set up external call diversions. For each connected device Dial and Call rules can be defined.

You may connect up to 2 analog devices and up to 4 ISDN devices. The HorstBox comes with some devices preconfigured. Adjust those devices to your needs. You may also administrate up to 10 MSNs.

For internal calls (i.e. from one of your phone to another) dial ** (double asterisk) as a prefix. For outgoing calls simply dial the phone number.

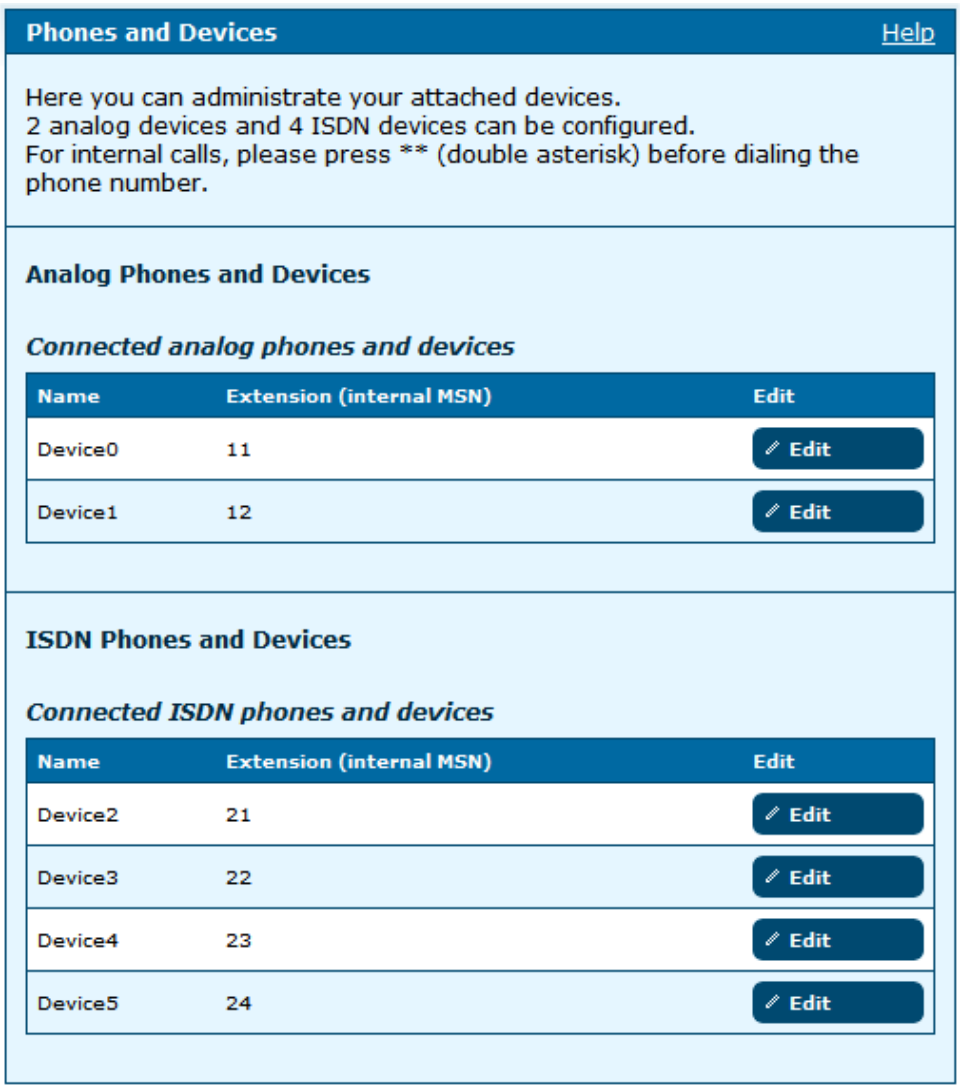


Figure 4.7: Phones and Devices

4.2.1 Default and Fallback account

The Default account will be used for out-bound calls.

The Fallback account will be used for out-bound calls, if the default account is now available. Therefor use different account types (analog, ISDN or VoIP) for default and fallback account.

4.2.2 Comfort Options

The HorstBox offer a variety of comfort options for phones and devices.

- *Call Through (ISDN only):* Enter a phone number (MSN) for an ISDN phone, which will receive in-bound calls without further configuration.
- *Do not disturb:* Once activated, the telephone will ring no longer. Out-bound calls are still possible. Select *Always* or specify a period of time. This may be helpful as a night switch. Enter the time in 5 minute intervals.
  Use the key combinations: [*] [2] [6] [#] to activate the option and [#] [2] [6] [#] to deactivate.
- *Block caller identification:* (CLIR) Your phone number will not be transmitted.[1]
- *Allow call waiting:* A second in-bound call will be signaled during a ongoing call.
- *Call forwarding*

  Permanent call forwarding: Activate this option and all in-bound calls to this phone number (MSN) will be transfered to the phone number entered in the field NUMBER permanently.

  Call forwarding on no reply: Activate this option and all in-bound calls to this phone number (MSN) will be transfered to the phone number entered in the field NUMBER on no reply.

[1] For emergency calls your phone number will not be blocked, independent whether you have activated or deactivated Caller ID Blocking.

Call forwarding on line busy: Activate this option and all in-bound calls to this phone number (MSN) will be transfered to the phone number entered in the field NUMBER when the line is busy.

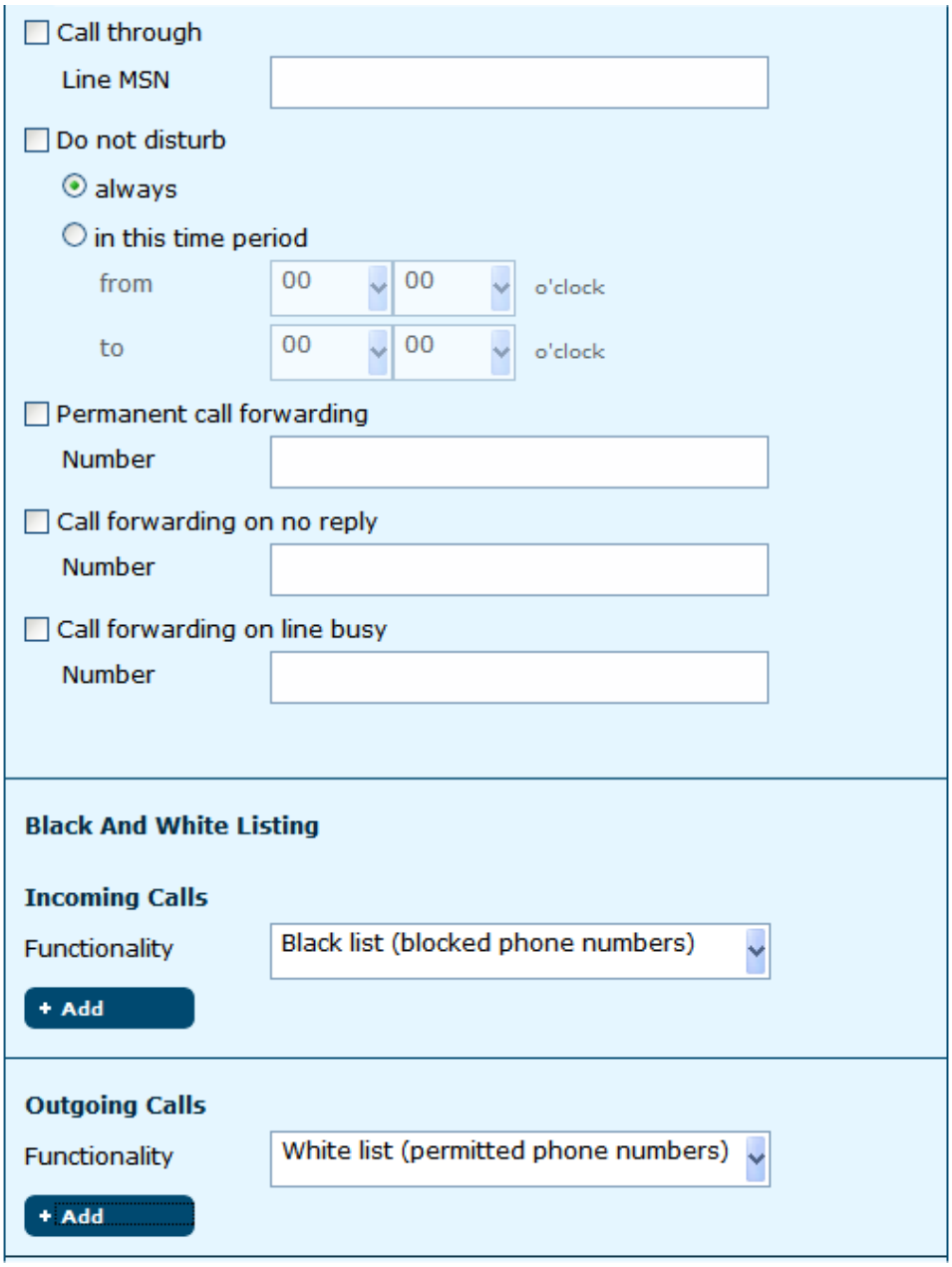


Figure 4.8: Comfort options

Black- and White Listing

Manage in- and out-bound calls via Black or White Listing.

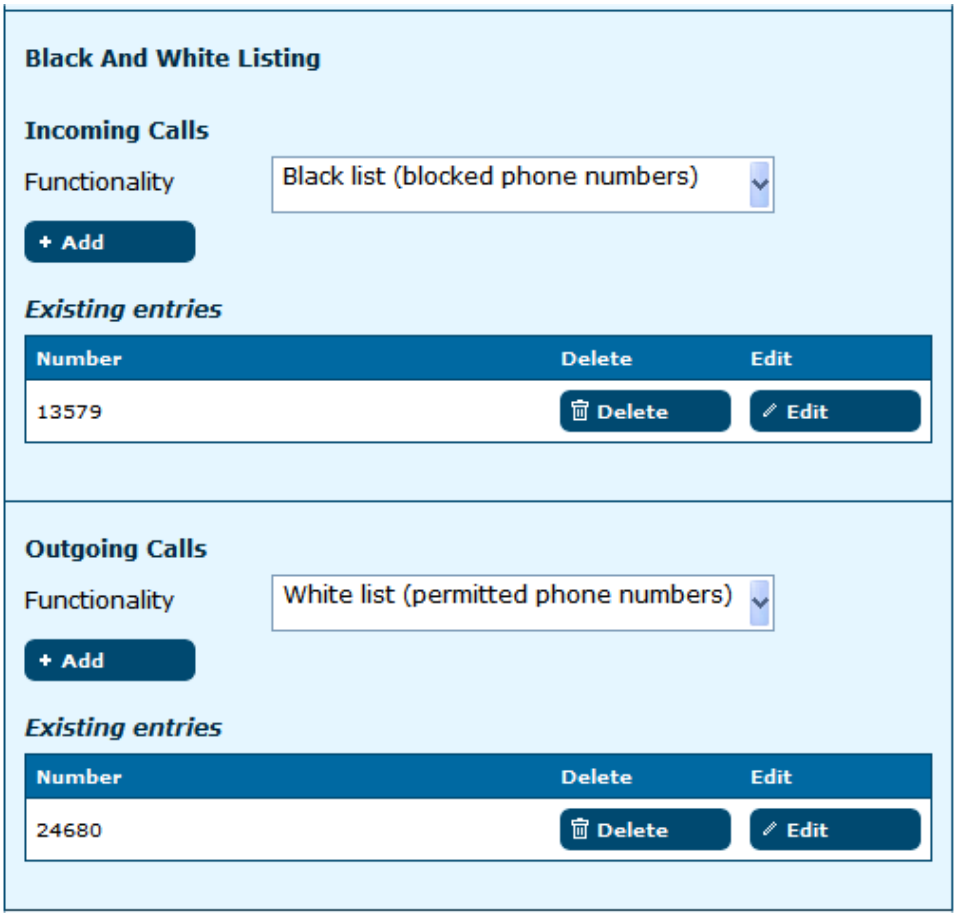


Figure 4.9: Black and White Listing

A “black list” will suppress all phone numbers entered. In-bound calls to these numbers will be rejected, while out-bound calls to any of the numbers entered will be blocked.

A “white list” does allow calls to the numbers entered only. For any other number, in-bound calls will be rejected, while out-bound calls will be blocked respectively.

Add Black or White Listing

To add black or white listing for incoming or out-bound calls, choose the appropriate optin form one of the drop-down lists *Functionality*, and click on ADD.

You may edit black or white lists.

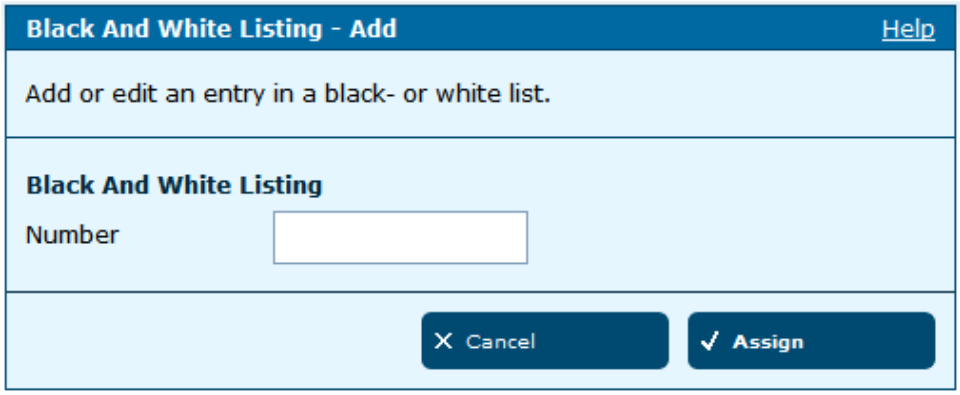


Figure 4.10: Add Black/White Listing

Enter the phone number and click on ASSIGN.

Delete Black or White Listing

To delete a black or white list, click on DELETE. Confirm the warning by again clicking on DELETE

4.2.3 Edit Analog Device

The HorstBox allows for up to two analog devices to be connected. Both devices are already configured. Adjust those settings to your needs.

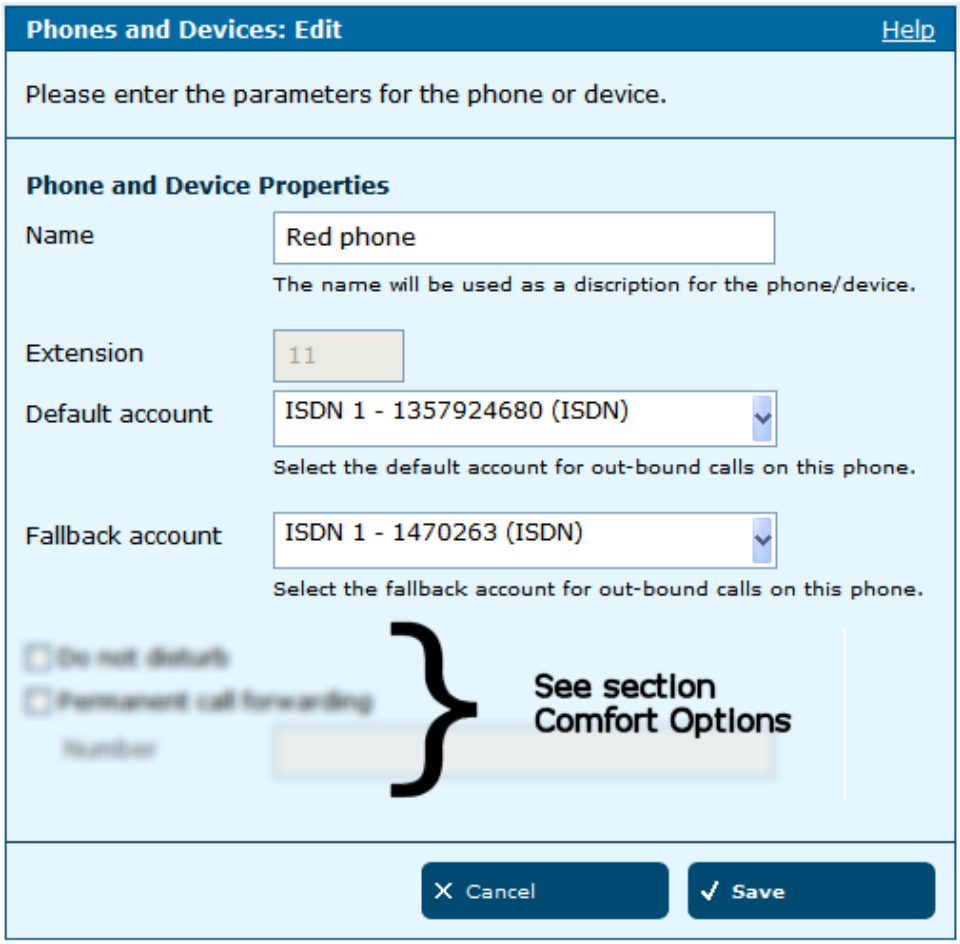


Figure 4.11: Edit Analog Device

To edit an analog device click on EDIT.

In the field NAME enter an unique name for the phone.

A phone connected to port “Tel 1” will answer to phone number 11, connected to port “Tel 2” to number 12. The internal phone number can not be changed.

For internal calls dial * * (double asterisk) as a prefix, e.g. * * 1 2 to call the second analog phone. For outgoing call simply dial the phone number.

Choose the default account and the Fallback account.

Choose one or more comfort options, see 4.2.2 Comfort Options on p.59.

To save the settings, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

4.2.4 Delete Analog Device

The analog devices can not be deleted. Remove the cables if neccessary.

4.2.5 Edit ISDN Device

The HorstBox allows for up to four ISDN devices to be connected. All four devices are already configured. Adjust those settings to your needs. Use an ISDN hub, if you need to connect more than one ISDN device.

To edit the settings of an ISDN device click on EDIT.

In the field NAME enter an unique name for the phone.

For internal calls dial * * (double asterisk) as a prefix, e.g. * * 2 2 to call the MSN 21. You may configure several ISDN devices to answer to the same MSN. For outgoing calls simply dial the phone number.

Choose the default account and the fallback account.

Choose one or more comfort options, see 4.2.2 Comfort Options on p.59.

To save the settings, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

4.2.6 Configure ISDN Device

Next you have to configure your ISDN device(s) to answer to an internal MSN, as set up before. Please refer to the devices documentation.

One ISDN device may answer to several MSN and two devices may answer to the same MSN.

Figure 4.12: Edit ISDN Device

4.2.7 Delete ISDN Device

The ISDN devices can not be deleted. Remove the cable if neccessary.

4.3 Call Rules

Call Rules manage the handling of in-bound calls. For each account you can define which phone is supposed to ring. Of course several devices may signal an in-bound call in parallel.

To use Call Rules you have to set up at least one account (see section 4.1 Lines and Accounts on p.50) and register one device (see section 4.2 Phones and Devices on p.58).

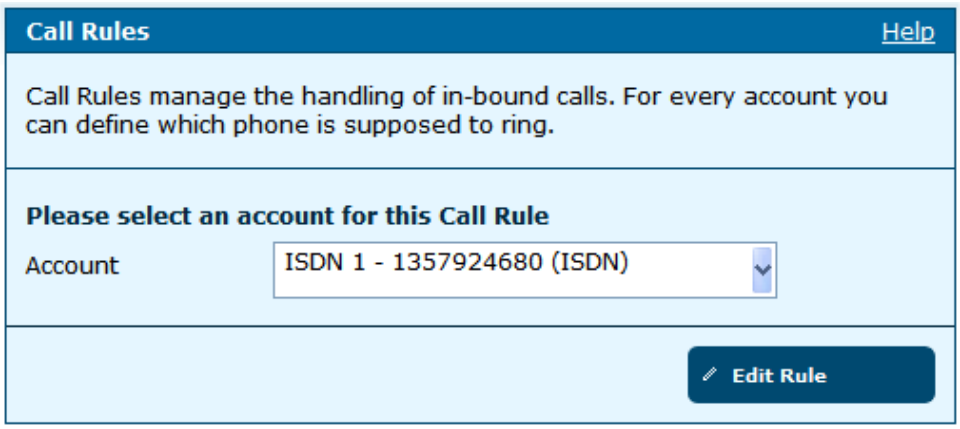


Figure 4.13: Call Rules

4.3.1 Edit Call Rule

To edit a call rule choose its account and click on EDIT RULE. Change the options.

On the page CALL RULES - EDIT CALL RULE all registered phones and devices are listed.

Choose the phones and devices that should ring for the in-bound call. Of course several devices may signal an in-bound call in parallel.

To answer an in-bound call on a non-active phone, pick up the receiver and dial * 8 2.

To save the settings, click on SAVE.

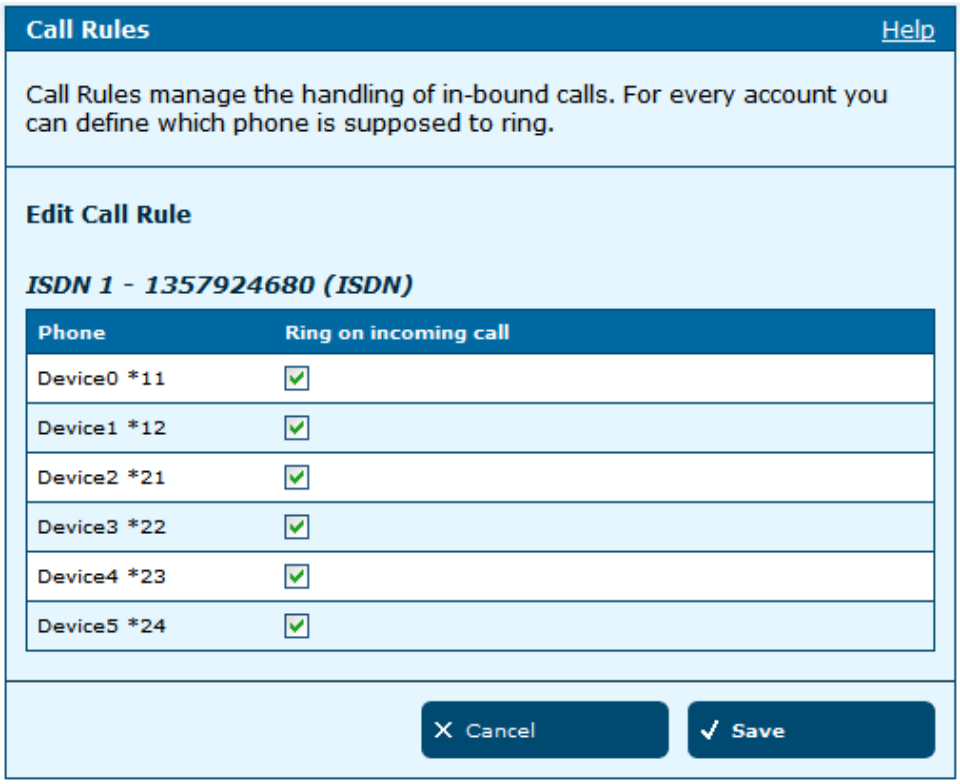


Figure 4.14: Edit call rules

To cancel the dialog, click on CANCEL. The previous page will be displayed.

4.3.2 Delete Call Rule

Call rules cannot be deleted, but you can deactivate all options.

4.4 Dial Rules

Dial Rules can define favorable connections for out-bound calls. The application of these rules depends on the time of day and on the prefix number of the number you have dialed (e.g. long-distance-call, local call, cell phone call or VoIP call). Dialing specific digits before the phone number allows Least-Cost-Routing.

Note: Emergency call numbers will always be connected via the exchange line.

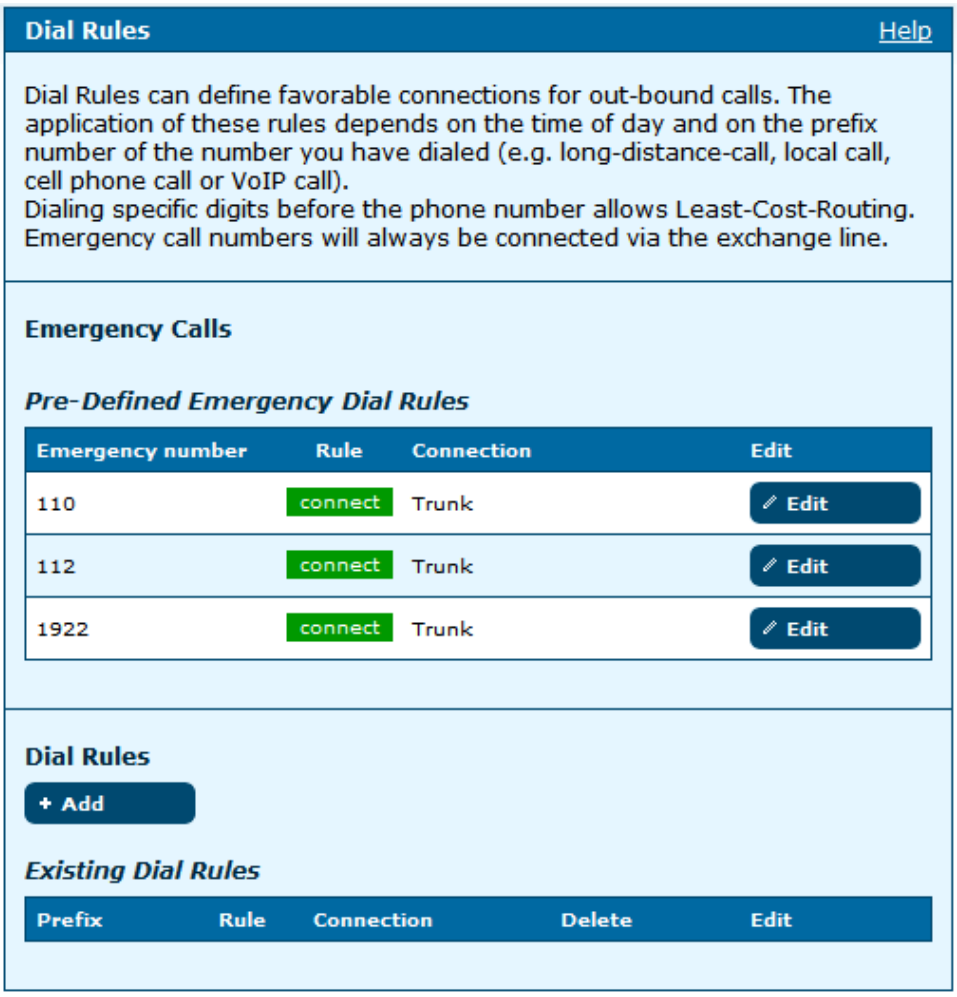


Figure 4.15: Dial rules

4.4.1 Pre-Defined Emergency Call Dial Rules

Adjust the pre-defined emergency call dial rules to your needs. Always keep these phone number current. Under no circumstances enter irregular phone numbers. In case of an emergency police, fire brigade or ambulance cannot be called.

To change the pre-defined dial rules, click on EDIT, change the phone numbers and click on SAVE.

4.4.2 Add Dial Rules

To add dial rules, click on ADD.

Now set up the conditions for the new dial rule.

In the first field PREFIXES enter the first numbers. Any phone number starting with these numbers will be handled by that rule.

Next set up the time conditions:

time conditions	
always	The rule is valid continuously.
in this time period	Set up the time period in 5 minute intervals. *from*: hour:minute *to*: hour:minute
Day of week	Choose the day(s) of the week: *Mon Tue Wed Thu Fri Sat Sun*

Now define the rule. You can

- block
- connect via this account
- connect via this account with amended phone number and prefix/modifier

To save the new call rule, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

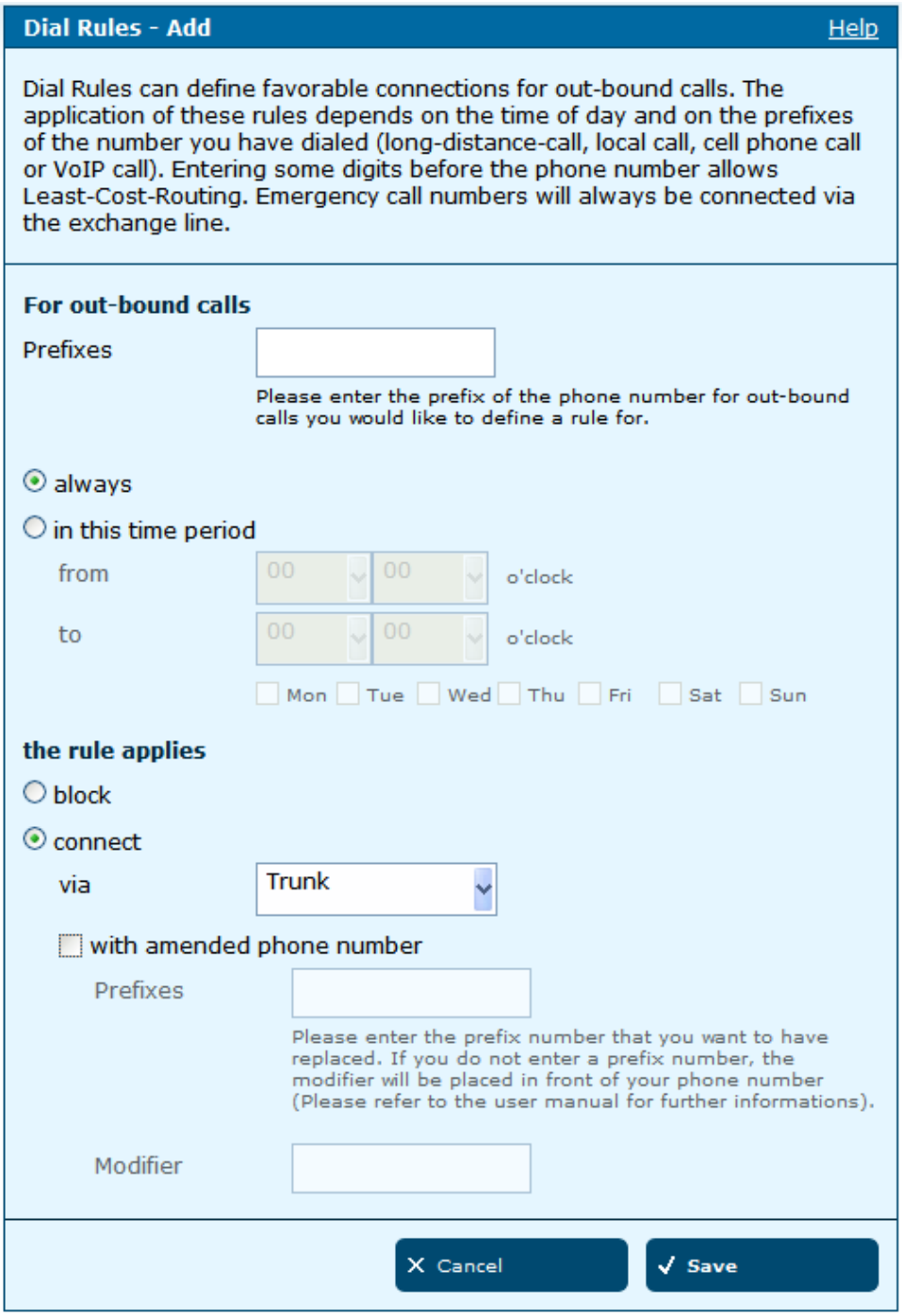


Figure 4.16: Add/Edit Dial Rule

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

4.4.3 Edit Dial Rules

To edit a dial rule click on EDIT. The same dialog as for adding a dial rule opens, but this time all fields contain values. Edit the values and click on SAVE.

4.4.4 Delete Dial Rule

To delete a dial rule click on DELETE. Confirm the warning by again clicking on DELETE. The dial rule will be deleted and the page DIAL RULES will open and display a message.

4.4.5 Least Cost Routing/Pre-Selection

For Least Cost Routing (LCR) use the option *with amended phone number*. Use either *Prefix* or *Modifier* to manipulate the phone number.

Note: Make sure that date and time are always adjusted correctly, so the dial rules will be executed at the right time.

Example for calling abroad

1. Define a new dial rule.
2. Enter the first digits, e.g. the country code, in the field PREFIXES (1 in fig. 4.17).
3. Choose the option *always* or define the time period for the rule to be applied.
4. Choose the option *connect* and the account to use, e.g. "'ISDN account 2"'.

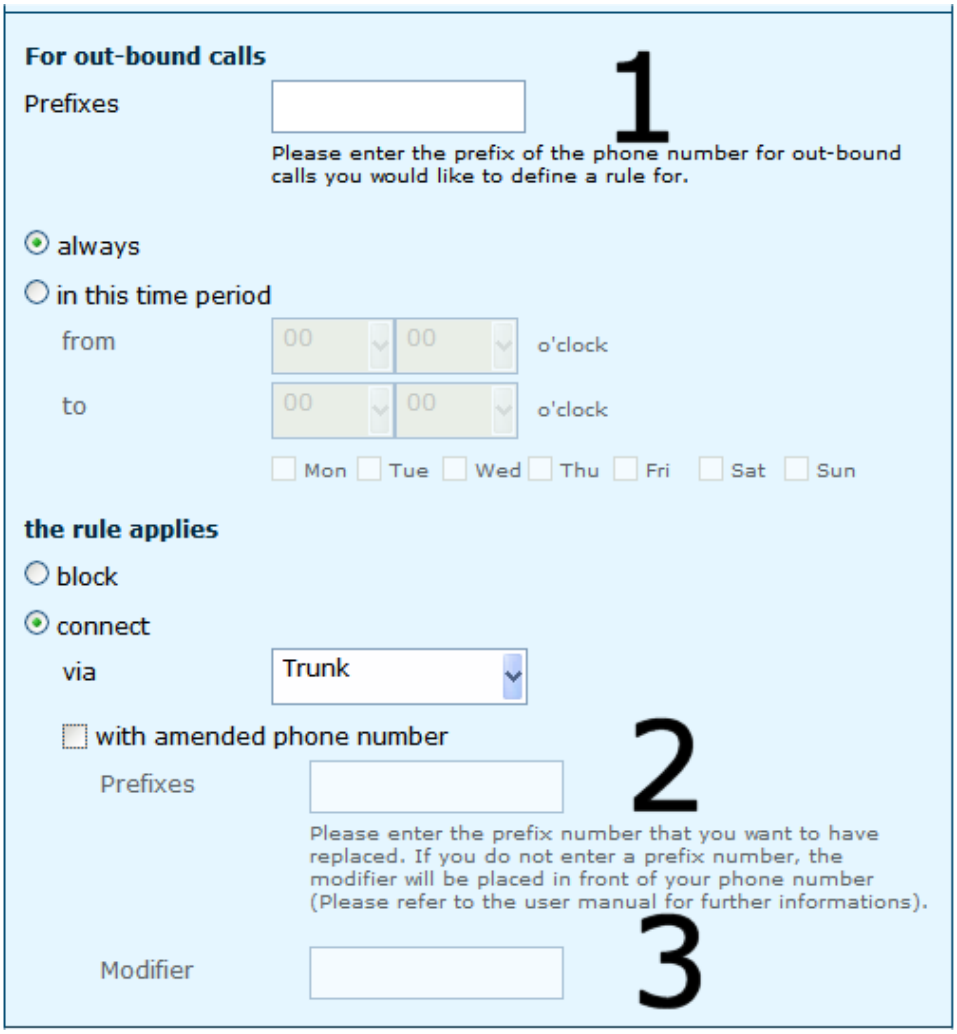


Figure 4.17: Least Cost Routing/Pre-Selection

5. Activate the option *with amended phone number*.
6. Leave the field PREFIXES (2 in fig. 4.17) blank.
7. Enter the phone number of the Call-by-Call provider.
8. To save the new rule, click on SAVE.

All out-bound calls to the certain country will be routed via the chosen Call-by-Call provider.

Define other dial rules for the weekend, the evenings, or other area/country codes.

Example for Prefix

Define a new call rule and activate the option *with amended phone number*.

Phone number to call:	01234567890
Enter in field PREFIXES (1 in fig. 4.17):	01234567890
Leave the field PREFIXES (2 in fig. 4.17) blank.	
Enter in field MODIFIER (3 in fig. 4.17):	0999
The HorstBox will dial:	099901234567890

Table 4.2: Least Cost Routing: Prefix

To save the new call rule click on SAVE.

Example for Number Modification

Define a new call rule and activate the option *with amended phone number*.

Phone number to call:	01234567890
In the field PREFIXES (1 in fig. 4.17) enter:	012
In the field PREFIXES (2 in fig. 4.17) enter:	012
In the field MODIFIER (3 in fig. 4.17) enter:	0999
The HorstBox will dial:	099934567890

Table 4.3: Least-Cost-Routing: Number modification

To save the new call rule click on SAVE.

You may refine call rules by defining several call rules for different periods of time and various telephone service providers. The HorstBox will choose the appropriate call rule, depending on the day of the week and the current time.

4.4.6 Preselection

You can set up the HorstBox to use a certain telephone service provider for every out-bound call, differentiate even for calls to mobile phone numbers or overseacalls.

Define a new call rule and activate the option *with amended phone number*.

Example

Always use another account for certain out-bound calls:

1. Define a new dial rule.
2. Enter the first digits, e.g. the area code, in the field PREFIXES (1 in fig. 4.17)
3. Choose the option *always* or define the time period for the rule to be applied.
4. Choose the option *connect* and the account to use, e.g. "'VoIP account 1'".
5. Leave the fields PREFIXES (2 in fig. 4.17) and MODIFIER (3 in fig. 4.17) blank.
6. To save the new rule, click on SAVE.

All out-bound calls starting with the saved digits will be routed via the chosen account.

Example for Prefix

Define a new call rule and activate the option *with amended phone number*.

Phone number to dial:	01234567890
In the field PREFIXES (1 in fig. 4.17) enter:	012
Leave the field PREFIXES (2 in fig. 4.17) blank.	
In the field MODIFIER (3 in fig. 4.17) enter:	0999
The HorstBox will dial:	099901234567890

Table 4.4: Preselection: Prefix

Example for Number Substitution

Define a new call rule and activate the option *with amended phone number*.

Phone number to dial:	01234567890
In field PREFIXES (1 in fig. 4.17) enter:	012
In field PREFIXES (2 in fig. 4.17) enter:	012
In field MODIFIER (3 in fig. 4.17) enter:	0999
The HorstBox will dial:	099934567890

Table 4.5: Preselection: Number Substitution

To save the new call rule, click on SAVE.

4.5 Speed Dialing

Speed Dialing saves time when calling to certain numbers (up to 99) regularly.

To use Speed Dialing enter * * 7 as prefix before the speed dialing number.

Example: Speed Dialing for your bank: 01.

To call your bank, dial * * 7 0 1.

4.5.1 Add Speed Dialing

To add a speed dialing number, click on ASSIGN.

In the field SPEED DIALING enter the desired shortcut and in the field PHONE NUMBER the phone number.

To save the new speed dialing number, click on SAVE.

If an error occurs you will see an error message (red frame).

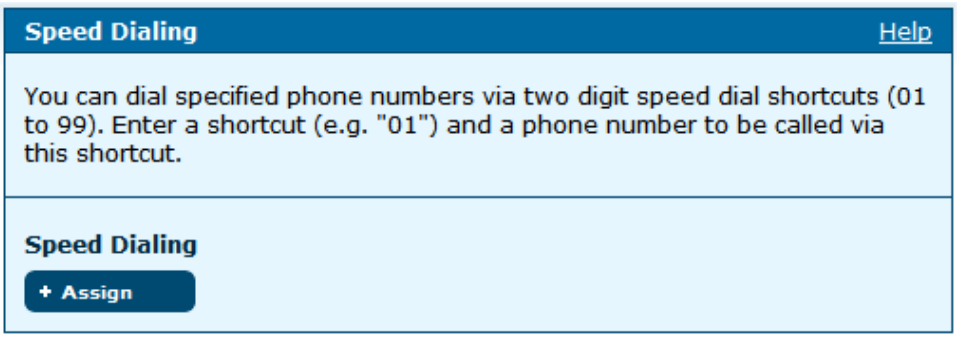


Figure 4.18: Speed Dialing

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

4.5.2 Edit Speed Dialing

To edit a speed dialing number click on EDIT. The same dialog as for adding a speed dialing number opens, but this time all fields contain values. Edit the values and click on SAVE.

4.5.3 Delete Speed Dialing

To delete a speed dialing number click on DELETE. Confirm the warning by again clicking on DELETE. The dial rule will be deleted and the page SPEED DIALING will open and display a message.

4.6 Phone Log

The phone log shows an overview over all in-bound and out-bound calls.

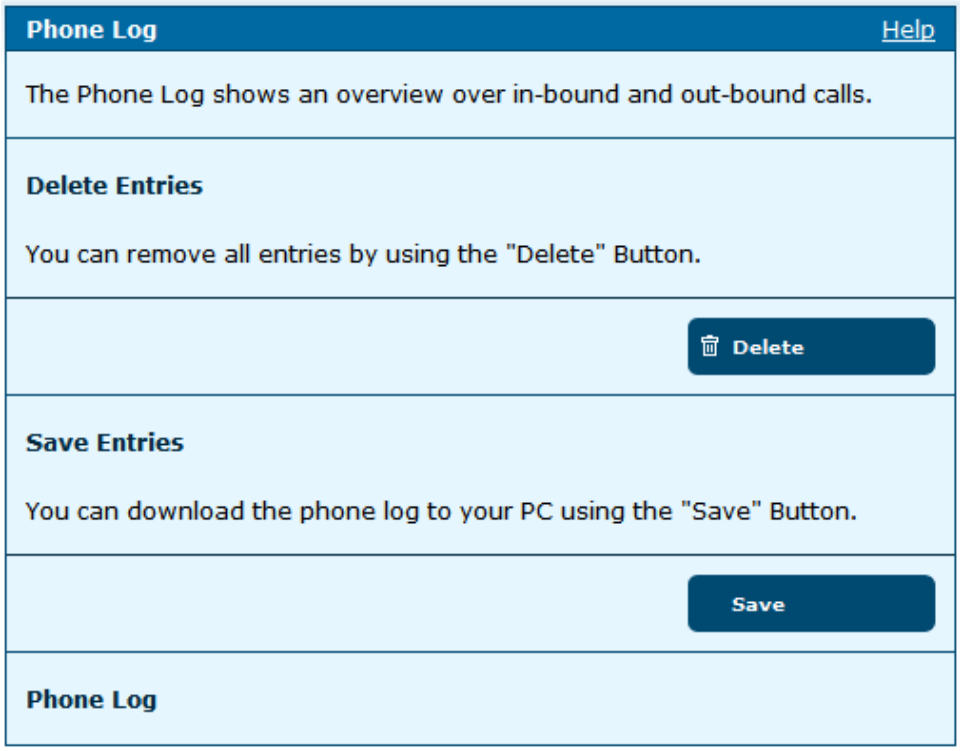


Figure 4.19: Phone Log

4.6.1 Delete Phone Log

To delete the phone log and start a new one, click on DELETE.

4.6.2 Save Phone Log

To save the recent phone log as a file on your computer, click on SAVE. Choose the path and directory to store the file and click on SAVE.

4.7 Status

The Phone Status indicates the attached VoIP devices and phones and assists you with the troubleshooting.

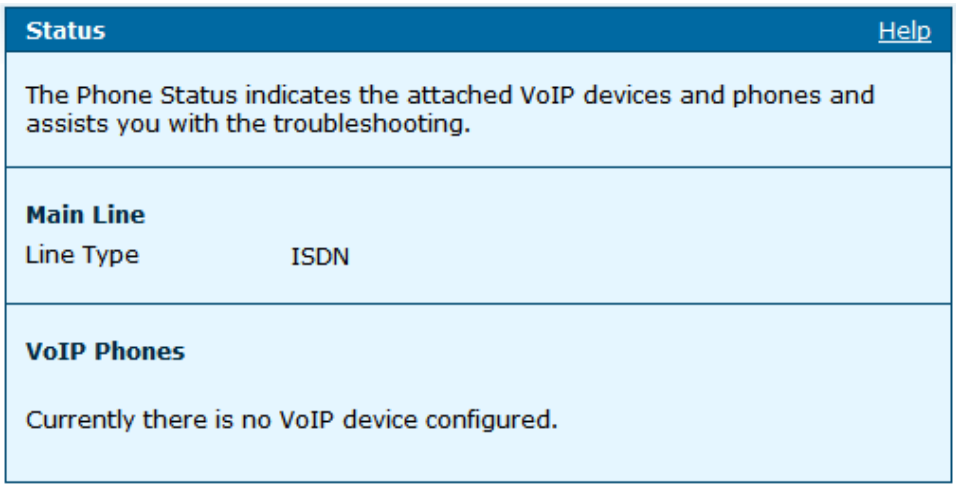


Figure 4.20: Status

4.8 QoS

QoS is short for *Quality of Service*. Voice data packets flagged with a priority mark may be privileged by routers.

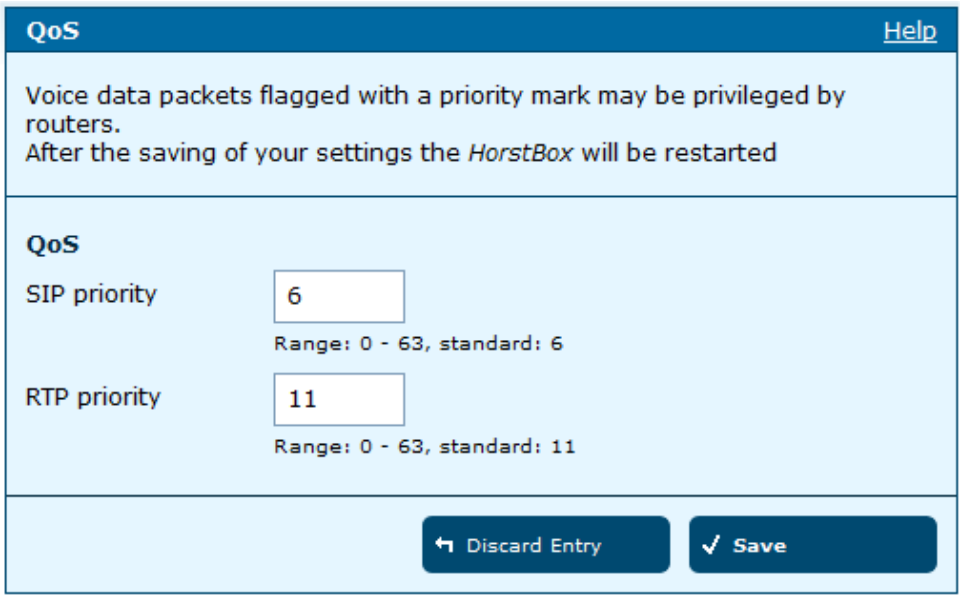


Figure 4.21: QoS

For SIP priority (for VoIP) the range is 0 to 63. The default value is 6.

For RTP priority (for audio and video streams) the range is 0 to 63. The default value is 11.

Please note! Your ISP must support SIP and RTP priority. Please use the values for SIP and/or RTP priority provided by the ISP.

4.9 How To Telephone

Note: Diverting calls to external numbers may cause additional costs.

Please refer to the documentation of your phones to find out which features they support. Sometimes your telephone service provider has to (de-)activate certain features.

After you have connected and set up all devices to the HorstBox and added all neccessary (dial or call) rules, you may now use the phones. Internal calls are free, while external calls may generate costs.

Most of the known ISDN services will function with the HorstBox as well, even with analog phones, as long as they provide the necessary funcions, e.g. a display.

Some of the HorstBox's PBX funcions can be configured via the keys of a phone in addition to the graphical user interface (see overview 4.10 How to control the HorstBox via a phone on p.86 at the end of this chapter).

4.9.1 Answering A Call

You may answer in-bound calls on any registered phone. If due to call rules a phone does not ring, pick up the receiver and dial *82.

4.9.2 Internal Calls

You can do internal calls between all registered phones.

For internal calls first press **, then dial the internal phone number (MSN).

The quantity of internal phone numbers depends on how many devices were registered with the HorstBox.

Combination	Device	Port / Internal MSN
* * 1 1	Analog 1	"“Tel 1"”
* * 1 2	Analog 2	"“Tel 2"”
* * 2 1 – 2 4	ISDN 1 – ISDN 4	MSN 21 – MSN 24

Table 4.6: Overview Combination * *+phone number for internal calls

4.9.3 External Calls

Out-bound calls are handled by the default account, unless dial rules define a different account. To change the account on demand, press * and dial the number of the desired account for the current call.

Combinations depend on set up accounts accordingly.

Combination	uses account:
* 1 1 <No. of account> # <phone no.>	analog or ISDN account
* 1 2 <No. of account> # <phone no.>	VoIP account

Table 4.7: Overview: Combination *-phone number for external calls

Examples

- To use the analog account to call phone number 0123456789, dial:
  * 1 1 1 # 0 1 2 3 4 5 6 7 8 9
- To use the second VoIP account to call phone number 0987654321, dial: * 1 2 2 # 9 8 7 6 5 4 3 2 1

4.9.4 Speed Dialing

(Numbers to be stored beforehand!)

To use a speed dial or vanity number use [*][*][7] as a prefix.

Example

The phone number of your bank is stored as speed dialing number 01. To call your bank just dial: [*][*][7][0][1].

4.9.5 Transfer Calls

- To transfer a call to another phone number during a call, press [R] (aka Hook-Flash).
- Dial the new number and talk to the participant.
- After you put down the receiver, the first caller will talk to the new participant

4.9.6 Park A Call on Phones without Park Function

- To park a call during the call press [R] on the phone, then [2].

4.9.7 Unpark A Call

- Lift the receiver.
- Press [R], then [3].

4.9.8 Park A Call on Phones with Park Function

- To park a call during the call press the PARK key on your phone. Please refer to the manual of your phone to learn more about this function.

4.9.9 Unpark A Call on Phones with Park Function

- To unpark a call use the menu on your phone. Please refer to the manual of your phone to learn more about this function.

4.9.10 Telephone Conference with 2 Additional Callers

Analog Phone

For a telephone conference with two more participants and an *analog phone*, proceed as follows:

- Call the first participant.
- During the call press R or Hook-Flash.
- Dial the other phone number and talk to the second participant.
- Next dial R again, then 3.
- You are connected to both parties now.

ISDN Phone

For a telephone conference with two more participants and an *ISDN phone*, proceed as follows:

- Call the first participant.
- During the call press the TRANSFER key.
- Dial the other phone number and talk to the second participant.
- Press the CONFERENCE key to start the telephone conference.

4.9.11 Three-Way Calling (Analog Phone)

- While talking to participant A you want to talk to participant B.
- During the call press R (aka Hook-Flash) and dial the phone number.
- Participant A is on hold now..
- Talk to participant B.

To end the call you have 3 possibilities:

Hold Second Call, Continue First Call

To return to A, press R, then 2. Now B is on hold and you can talk to A.

Start Telephone conference

To start the telephone conference, press R, then 2.

Finish Second Call, Continue First Call

To finish the second call press R, then 0. Afterwards you will talk to participant A again.

4.9.12 Call Waiting (Analog phone)

Answering Call

To answer the new call, press R.

Reject Call

To reject the new call, press R 0.

4.9.13 Do Not Disturb (DND)

Activate Do Not Disturb Function

- Lift the receiver.
- Dial * 2 6 #. All in-bound calls are blocked now, but you still do out-bound calls.

Deactivate Do Not Disturb Function

- Lift the receiver.
- Dial # 2 6 #. All in-bound calls are routed through again.

4.9.14 Dial Immediately

Normally the HorstBox waits a few seconds after the last digit is enter for further input.

Entering # after the last digit of the phone number, lets the HorstBox dial without delay.

4.10 How to control the HorstBox via a phone

The overview on the next page shows all key combinations you may use to control the HorstBox via the keys of your telephone.

Key Combination	Function
* * 1 1 or 1 2	internal call to analog phones
* * 2 1 to 2 4	internal call to ISDN phones
* * 7 <Speed Dial>	Call a phone number via speed dial
* * 9	Internal call to all phones
* 1 1 <No. of account> # <TN>	Call a TN using analog or ISDN account
* 1 2 <No. of account> # <TN>	Call a number (TN) using a VoIP account
* 8 2	Pick up call on a non-active phone
Call Transfers on the HorstBox	
* 4 1 * <phone number>	Switch call transfer **on**
# 4 1 #	Switch call transfer **off**
* 4 2 * <phone number>	Switch call transfer **on** for "no answer"
# 4 2 #	Switch call transfer **off** for "no answer"
* 4 3 * <phone number>	Switch call transfer **on** for "busy"
# 4 3 #	Switch call transfer **off** for "busy"
Call Transfers as ISDN service	
* 2 1 * <phone number>	Switch call transfer **on**
# 2 1 #	Switch call transfer **off**
* 6 1 * <phone number>	Switch call transfer **on** for "no answer"
# 6 1 #	Switch call transfer **off** for "no answer"
* 6 7 * <phone number>	Switch call transfer **on** for "busy"
# 6 7 #	Switch call transfer **off** for "busy"
CLIR	
* 3 1 # <phone number>	Activate CLIR for recent call
# 3 1 # <phone number>	Deactivate CLIR for recent call
* 3 2 #	Activate CLIR permanently
# 3 2 #	Deactivate CLIR permanently
Do not disturb function	
* 2 6 #	Switch function **on**
# 2 6 #	Switch function **off**
Operations with the R key (aka Hook-Flash)	
R 0	Terminate call waiting
R 1	Terminate active call
R 2	Switch to call on hold
R 3	3-Way-Calling with active and call on hold
WLAN	
* 9 1 #	Switch WLAN **on**
# 9 1 #	Switch WLAN **off**

5 Internet

This chapter introduces all settings to access the internet and how to set up other useful features of the HorstBox.

The default IP address of the HorstBox is **http://horstbox**. Open this in a browser to start the graphical user interface.

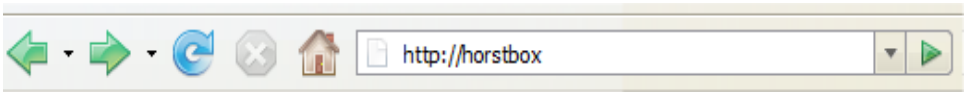


Figure 5.1: Enter the URL of the HorstBox

Username and Password are pre-defined as **a**dmin. If you didn't change the password, just click on LOGIN to get access the HorstBox.: **admin** / default password: **admin**.

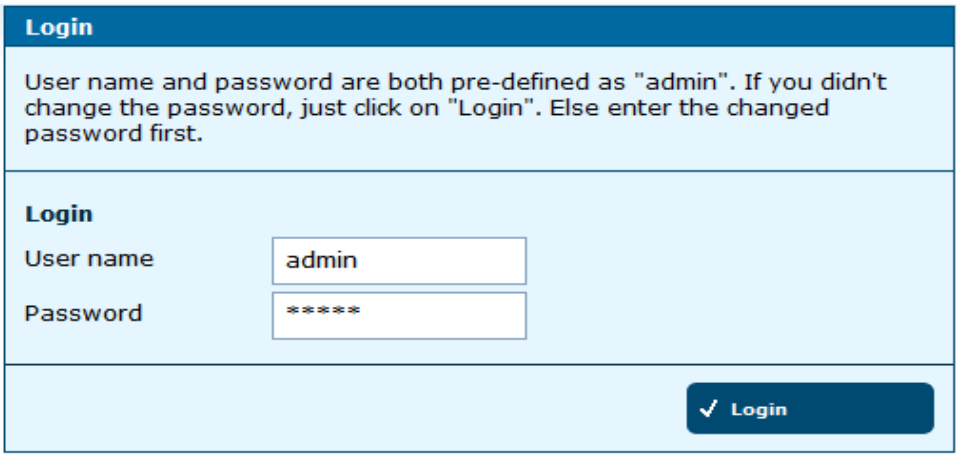


Figure 5.2: Enter the user name and password

Else enter the changed password first. Click on LOGIN.

To navigate in the tab NETWORK use the navigation column.

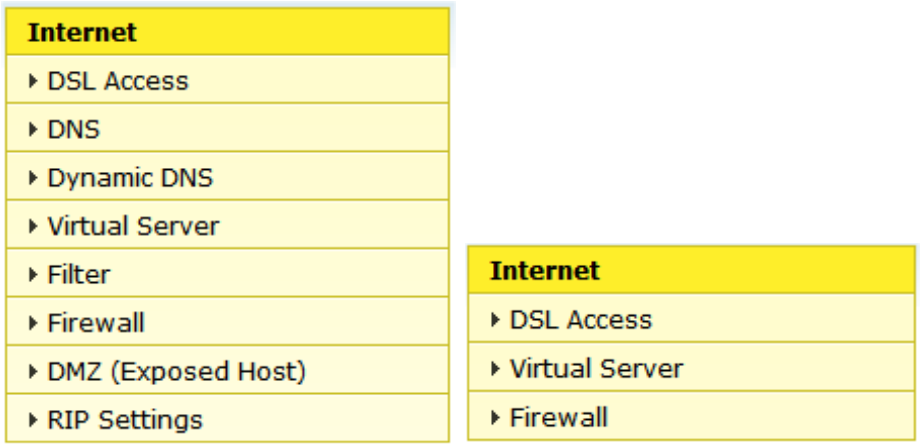


Figure 5.3: Navigation column Internet (expert and basic mode)

5.1 DSL Access

You may need this information:

- *user name* and *password* for the DSL access
  You get these details from your Internet Service Provider (ISP). About case sensitivness of username and password please refer to B.9 Username and Passwords on p.173.

Please refer to the documentation provided by your ISP before you change the settings for *VPI*, *VCI*, *MTU* or *MRU*.

Changing these values without need may result in a bad data transfer rate or no connectivity at all.

Activate the option *Use login data*. Enter user name and password (twice) into the appropriate fields.

5.1.1 DSL Connection

Choose to use the internal modem (connect port WAN to the splitter) or an external modem (connect port LAN1 to external modem).

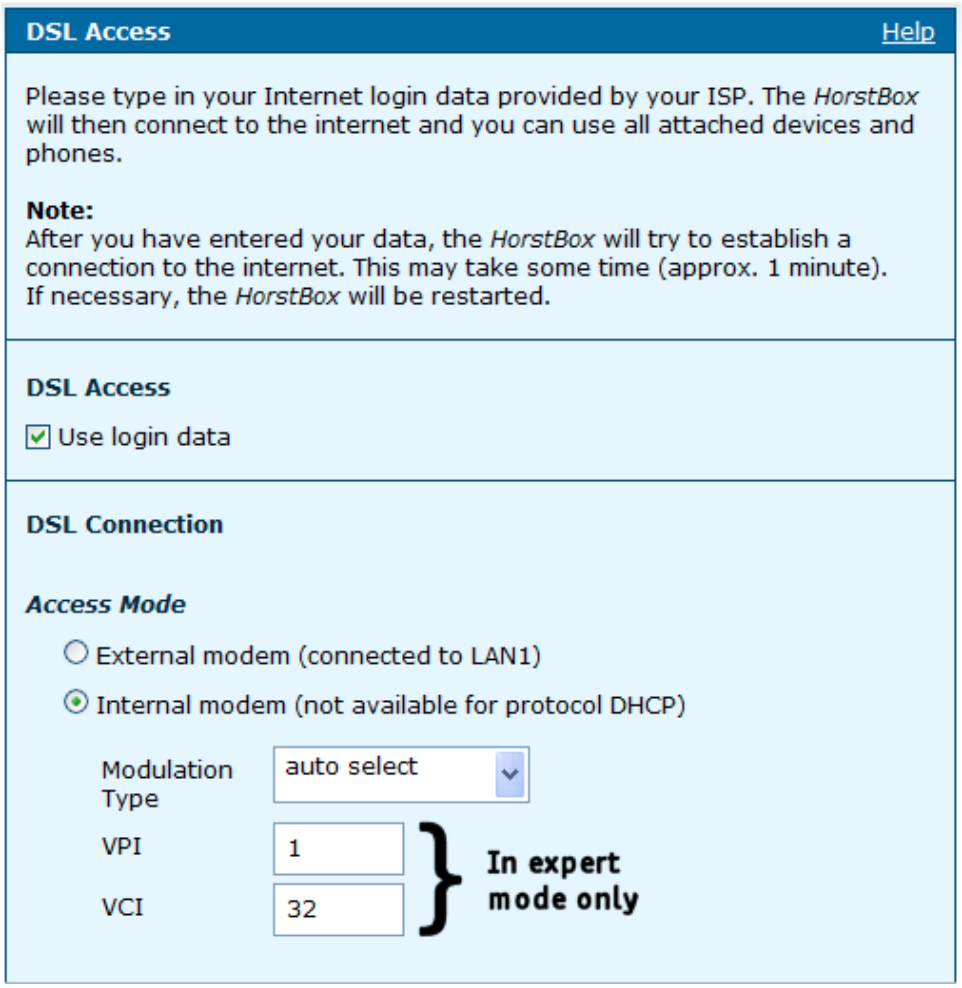


Figure 5.4: Login data

Please note! Using the ethernet port as Internet access restricts the data transfer rate to 100MBit/s for all ports. Connecting a VDSL modem (data transfer rate: 50MBit/s) leaves 50MBit/s for the 3 other ports. This restriction is not valid for WLAN connections.

Choose the modulation type. The option *auto select* choose an moduldation type automatically.

5.1.2 Internet Connection

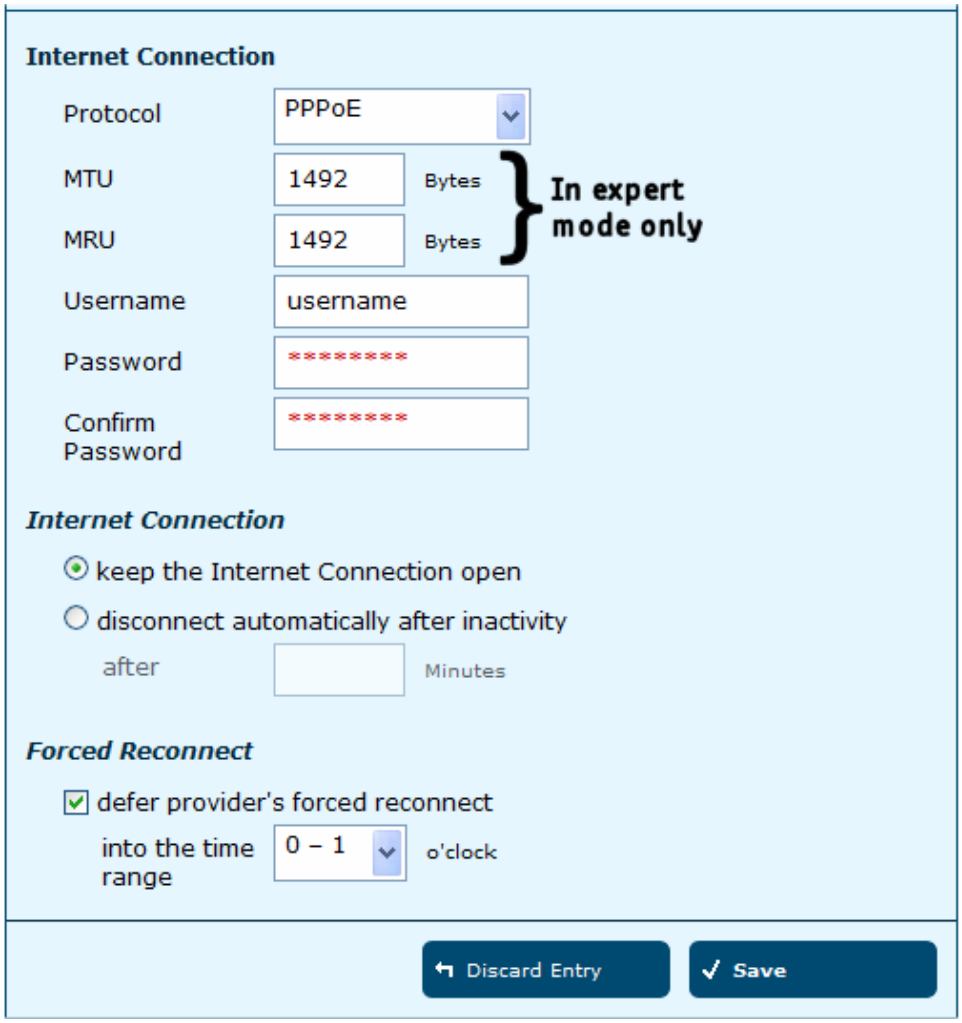


Figure 5.5: Internet Connection

If you change the passwort for the DSL access on the IPS's website, you have to change it on this page as well. Failing to do so, will result in denied access to the internet.

From the drop-down list *Protocol* select the protocol (PPPoE or PPPoA) and the modulation typ. Select *auto select*, if you are not sure what to choose.

Enter user name and password (twice) into the appropriate fields. Next choose the option *disconnect automatically after inactivity* if

you do not have a flatrate for your internet connection. This will help you to save valuable online time.

When using a flatrate activate the option *keep the Internet Connection open*. The HorstBox will stay online permanently.

Define the period of inactivity before disconnecting, e.g. 5 minutes.

Note: Some programs, e.g. anti-virus software or firewall will connect to the internet periodically.
If the option *automatic* on the tab SYSTEM, page TIME is activated, the HorstBox will connect to a NTP server in the internet in regular intervals to adjust the system time. This may influence volume or time-based tariffs.

Some ISPs will disconnect a permanent internet connection once a day.

By activating the option *Putting off the forced disconnection by your provider* you can put off the forced disconnection to a more suitable point of time, e.g. between 3 and 4 o'clock in the morning.

If you plan to use VoIP, make sure to book a flatrate, to receive in-bound calls around the clock.

If you activate the option *disconnect automatically after inactivity*, in-bound VoIP calls will not be routed to the HorstBox. Out-bound calls need to establish a connection to the Internet first.

Note: Use a flatrate to connect to the Internet to save and reduce costs.

To save the settings, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

To discard all recent entries click on DISCARD ENTRY.

5.1.3 Additional Settings in Expert Mode

Note: Do only change the following values if requested by your ISP. Choosing improper values may causes deterioration of performance and data transfer rate or no internet connectivity at all.

Settings in Expert Mode		Scope	Default
VPI:	Virtual Path Identifier	0-255	**1**
VCI:	Virtual Channel Identifer	32-65535	**32**
MTU:	Maximum Transmission Unit	128-65535	**1492**
MRU:	Maximum Receive Unit	128-1500	**1492**

Table 5.1: Settings in Expert Mode

To save the settings, click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

5.2 DNS

The resolving of IP addresses to host names/domains and vice versa is managed by the DNS. The required information (IP addresses of at least one DNS server) is normally provided by your ISP. But the HorstBox is also able to detect the DNS servers available automatically.

Choose whether to use the Domain Name Service (DNS) and if so, which server to use.

Note: This option refers to the internet connecting only. It may influence the settings on the tab NETWORK, page DHCP SERVER, option *DNS Mode*.

Choose the option *Use only automatically detected DNS servers* to let the HorstBox detect your ISP's DNS servers automatically.

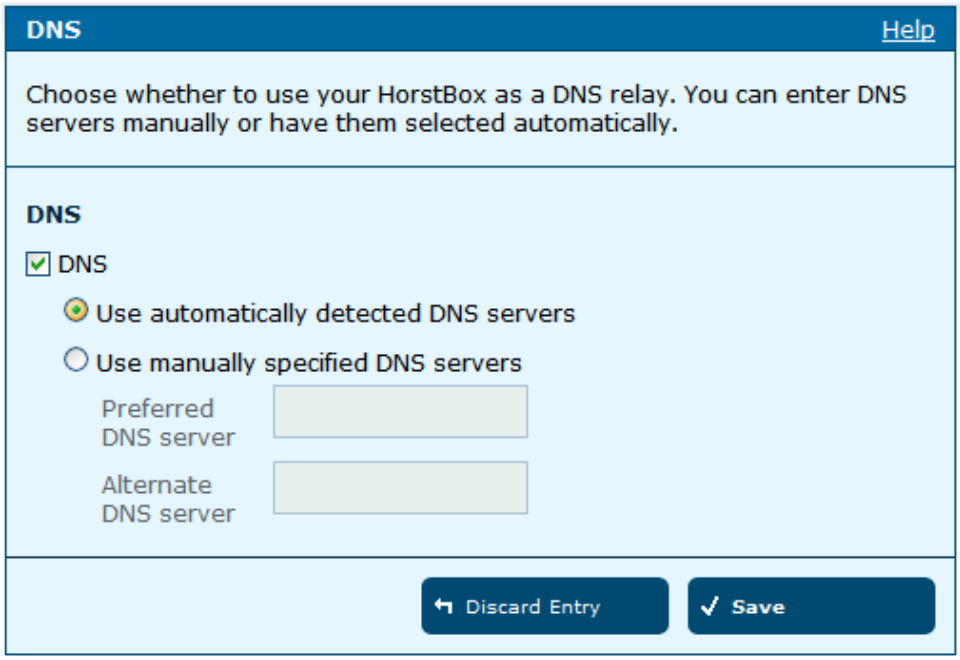


Figure 5.6: DNS settings

Choose the option *Use only manually specified DNS servers* an enter the names or IP address of a preferred and an alternate DNS server. You may choose DNS servers other than those your ISP provides.

To save the settings, click on SAVE. Saving successfully is reported in a success message (green frame). Changes will take effect after reboot.

To discard all recent entries click on DISCARD ENTRY.

Note: Without a DNS server connections to the internet or the LAN will become unreliable. Domain names can no longer be resolved into IP addresses.

5.3 Dynamic DNS

DDNS makes your computer accessible from the internet under a constant host name even if your IP address changes dynamically. The dynamic change of the IP address occurs regularly after fixed periods of time and is enforced via a short connection interruption by your ISP. When getting reconnected, a new IP address is assigned to your computer by your ISP.

With its integrated DDNS client, the HorstBox automatically transmits the new IP address to the DDNS service.

The usage of DDNS requires a registration at a DNS provider.

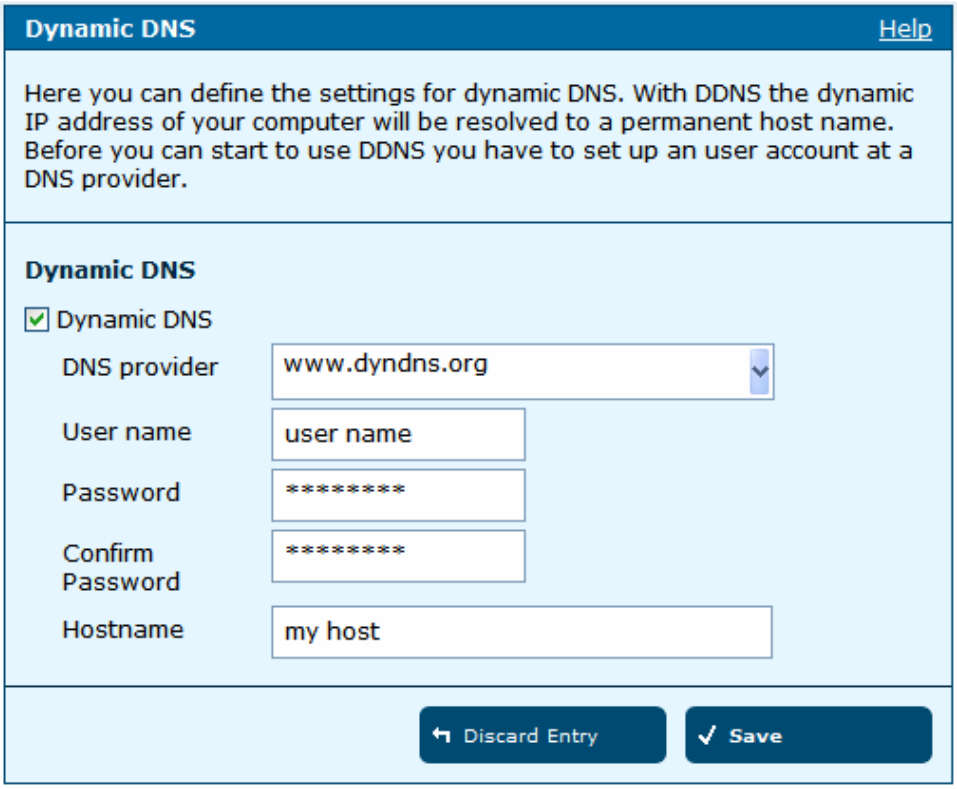


Figure 5.7: Dynamic DNS settings

5.3.1 Register a DDNS Account

Before you can use DDNS you have to set up an user account at dyndns.org (http://www.dyndns.org) or no-ip.com (http://www.no-ip.com). Please refer to information provided by your DDNS provider too.

5.3.2 Enable DDNS

To enable Dynamic DNS you should have this information ready:

- *user name* and *password* for the DDNS account at your DDNS provider
- *Hostname of your computer*
- Activate the option *Dynamic DNS*.
- From the drop-down list *DNS Provider* choose the desired provider.
- In the field USER NAME enter the user name for your DDNS account.
- In the fields PASSWORD and CONFIRM PASSWORD enter the password for your DDNS account.
- In the field HOSTNAME enter the hostname as set up for your DDNS account.

To save the settings, click on SAVE. Saving successfully is reported in a success message (green frame). Changes will take effect after reboot.

To cancel the setup of DDNS, click on DISCARD ENTRY.

5.4 Virtual Server

Via the virtual server you can forward the access to specified ports of your external IP address to a virtual server within your internal network, e.g. for FTP or POP3 access.

Towards the outside, the HorstBox plays the server part receiving requests from external users under your public IP address and routing them to the virtual server.

A computer in your internal network behind NAT or behind a firewall can thus provide services to the outside as a virtual server. Single ports or port ranges and protocols (UDP/TCP) can be specified for this purpose. File sharing or web services like HTTP, FTP or POP3 are possible. The private IP addresses of servers within the local network remain protected. If you use a dynamic public IP address, consider to activate DDNS.(see 5.3 Dynamic DNS on p.95)

You can also use a virtual server to redirect HTTP hacking attacks to a HTTP server within the DMZ.

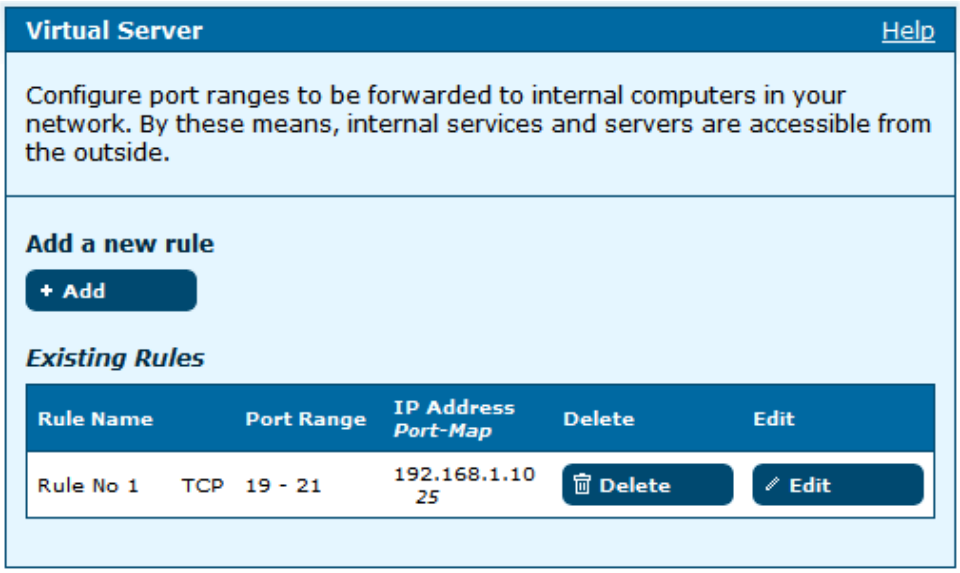


Figure 5.8: Virtual Server

5.4.1 Add A New Rule

To add a new rule, click on ADD.

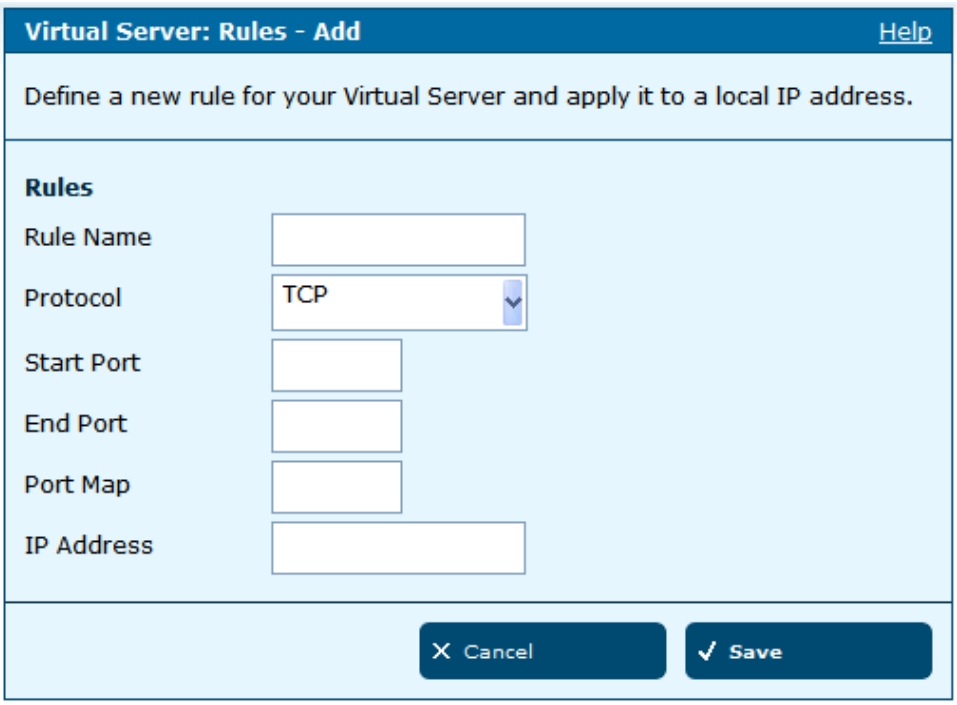


Figure 5.9: Virtual Server, Add rule

Fields	Content
Rule Name	Enter a name for the new rule.
Protocol	Choose the protocol: - TCP - UDP - TCP & UDP
Start Port	Enter the port number of the first port of the port range.
End Port	Enter the port number of the last port of the port range. To define a rule for a single port, enter the same port number twice.

Fields	Content
Port Map	Enter the local port number. If neccessary change the application settings if you redirect to a non default port number.
IP Address	Enter the IP address of the local server.

Table 5.2: Add a rule

To save the rule, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

5.4.2 Edit A Rule

To edit a rule, click on EDIT. Change the settings and click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

5.4.3 Delete A Rule

To delete a rule, click on DELETE. Confirm the warning by again clicking on DELETE.

5.5 Filter

Filters manage the LAN users' access to the Internet. It is possible to permit the access to the Internet for specified IP addresses within your LAN or to restrict the access for specified IP addresses. You can also define filters for the access to ports.

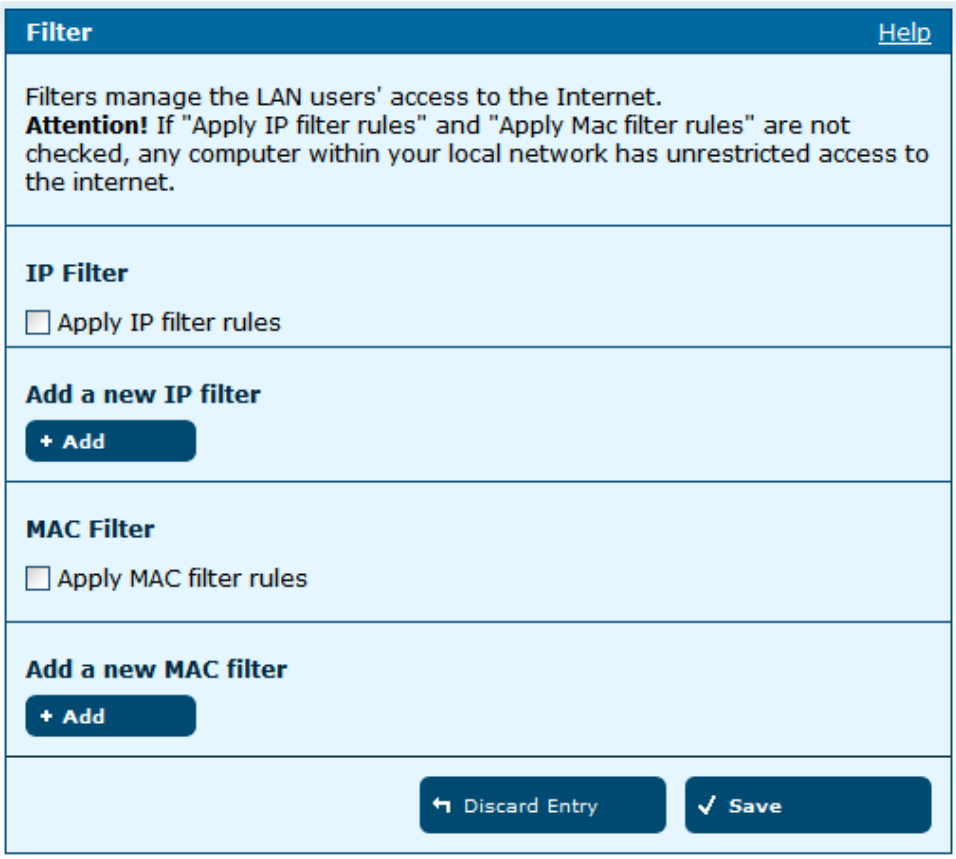


Figure 5.10: Filter

5.5.1 Add A New IP Filter

IP filters block the access to specified internet addresses for single computers in the local network.

To add a new IP filter, click on ADD.

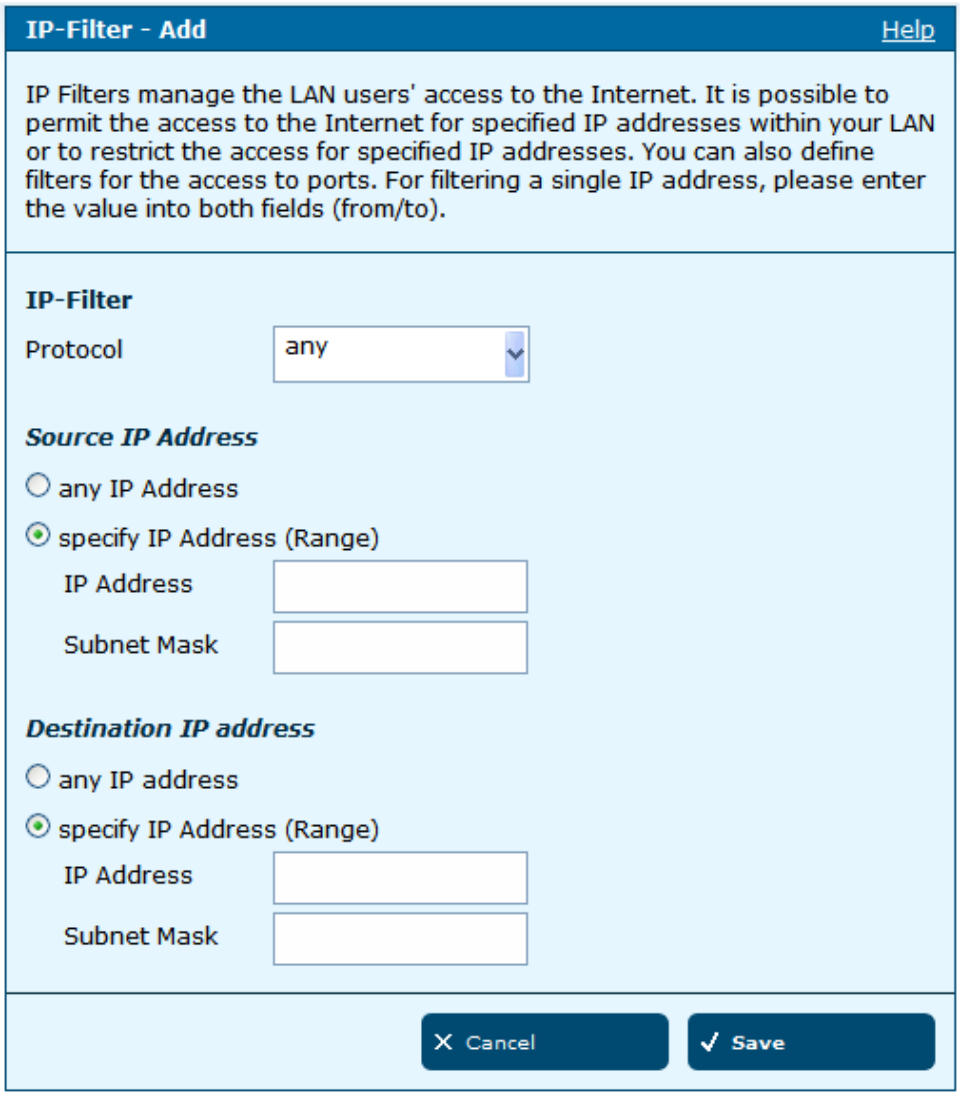


Figure 5.11: Add IP filter

In the next dialog define the filter. Depending on the protocol choosen different settings are possible.

Protocol: Any

Option	Filter
Source IP Address	- any IP address or IP address range
Destination IP Address	- any IP address or IP address range

Table 5.3: Filter options

For filtering a single IP address, please enter the same value into both fields (from/to).

Protocols: UDP, TCP and UDP/TCP

Additionally you may specify ports or a port range.

Option	Filter
Source Ports	- any port or port range
Destination Ports	- any port or port range
Protocol	- any - TCP/UDP - TCP - UDP
Action	- allow - deny

Table 5.4: Filter options

For filtering a single port, please enter the same value into both fields (from/to).

To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

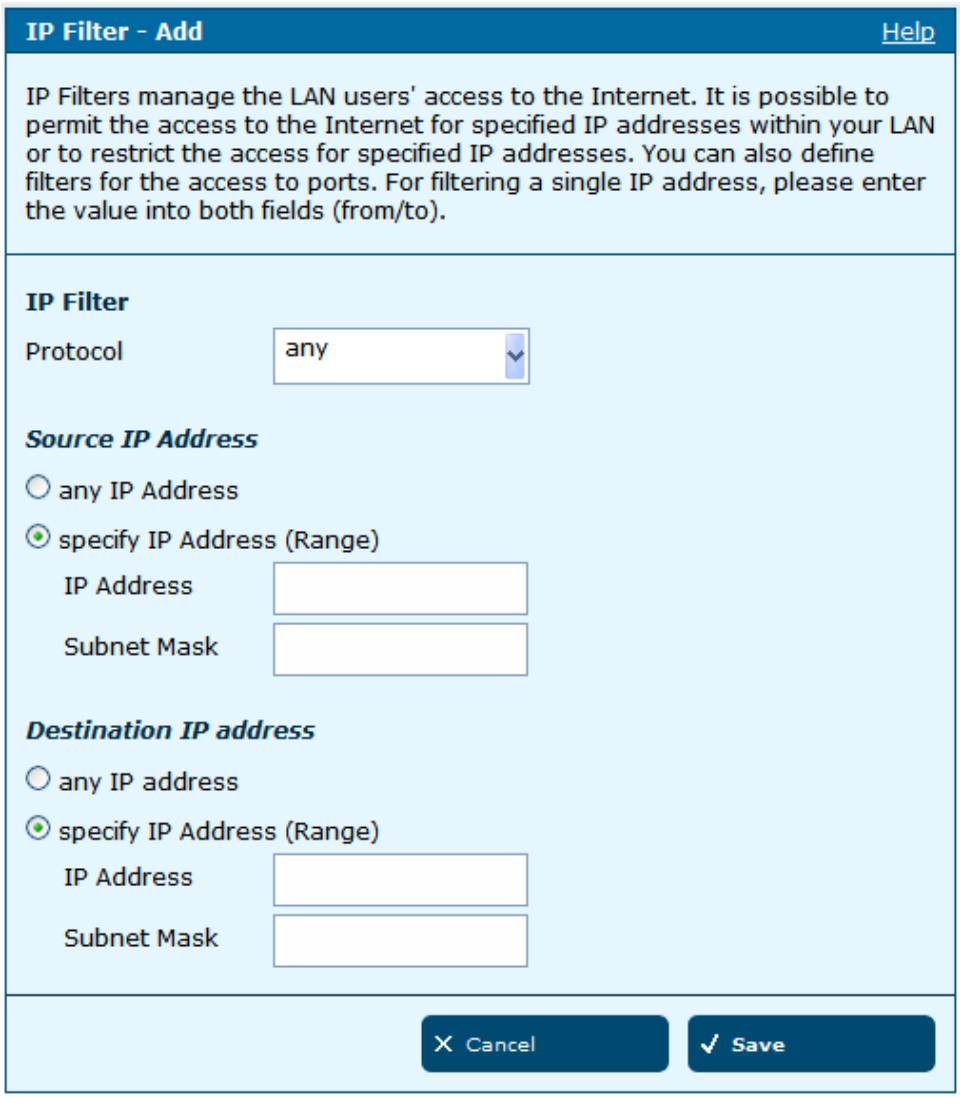


Figure 5.12: Add IP filter, Ports

5.5.2 Activate IP Filters

To activate the usage of IP filters, acticate the option *Apply IP filter rules*.

5.5.3 Add A New MAC Filter

Mac address filters grant internet access for single computers in the local network allowing for specific time ranges.

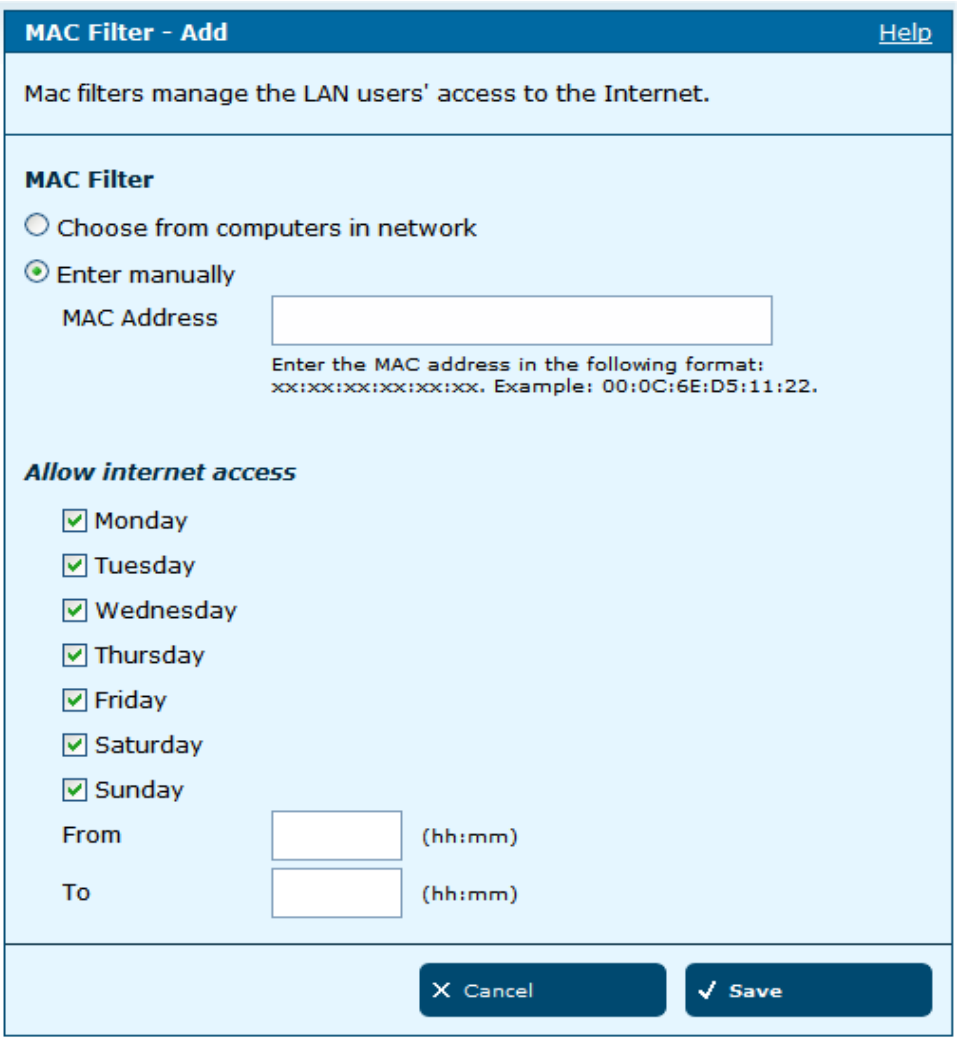


Figure 5.13: Add MAC filter

From the drop-down list *MAC Address* choose the MAC address from one of the computers in your LAN. Or enter the desired MAC address manually.

In the section *Allow internet access* define days and time for the Internet access of the specified computer.

To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

5.5.4 Activate MAC Filters

To activate the usage of MAC filters, acticate the option *Apply MAC filter rules*.

5.5.5 Edit Filter

To edit a filter (MAC or IP Address), click on EDIT. Change the settings and click on SAVE.

5.5.6 Delete A Filter

To delete a filter (MAC or IP Address) click on DELETE. Confirm the warning by again clicking on DELETE.

5.6 Firewall

The firewall protects your LAN against intruders. You can choose to activate different options.

In computing, a firewall is a piece of hardware and/or software which functions in a networked environment to prevent some communications forbidden by the security policy, analogous to the function of firewalls in building construction.

A firewall monitors incoming and outgoing data traffic on the data packet level. Each packet is checked against a set of rules defined by the administrator. In case of a rule violation, the corresponding packet will be blocked. When no rule has been violated, the packet will be transmitted. This method is called a packet filter.

Additionally a firewall can supply certain security functions for special applications or ports protecting them against well known attacks, e.g. a firewall can be configured for an FTP server or a web server.

For maximum protection activate all options. Nevertheless use an Anti-Virus software and a personal firewall. Make sure to update these programs regularly.

VPN Passthrough

This option allows for connections of an internal VPN client to a server in the internet. A VPN (Virtual Privat Network) enables you to secure the entire data traffic between several computers via encryption.

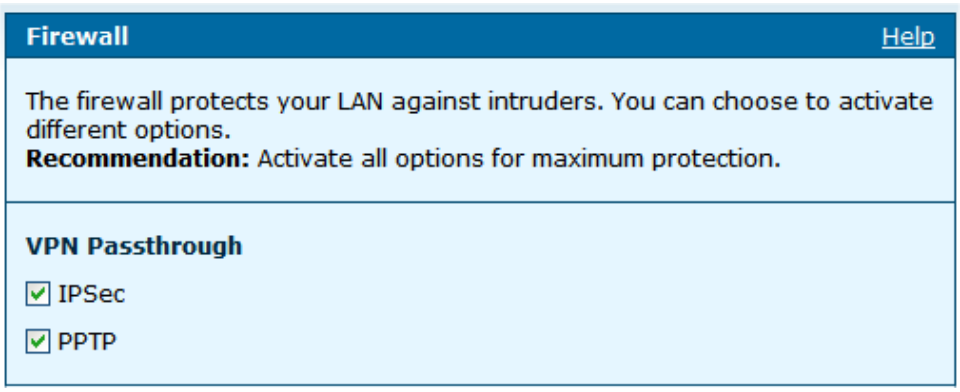


Figure 5.14: Firewall options: VPN Passthrough

PING Behavior

Enable one or both option(s).

- *Discard PING forwarding*: Suppress the transmission of ping packets via the HorstBox.
- *Discard PING from internet to gateway*: Suppress the transmission of ping packets from the Internet to the HorstBox.

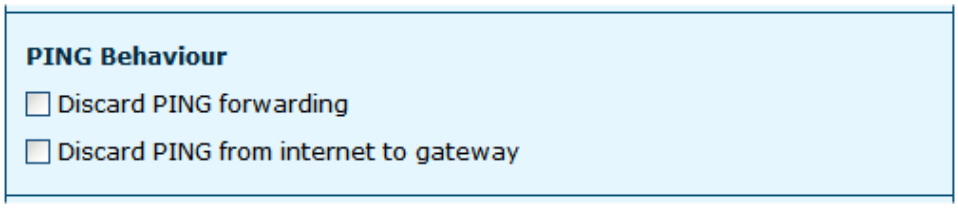


Figure 5.15: Firewall options: PING behaviour

Protection against DoS attacks

With DoS attacks, the offender tries to prevent legal users from accessing a service. In the most trivial case, this is reached by flooding the server with meaningless packets thus blocking the line capacity. A typical example is ICMP flooding, i.e. the flooding of the network with a great number of ICMP protocol packets.

Activate the option *Enable DoS protection*.

Application related DoS attacks

This setting lets you repel known attacks on popular software or protocols.

Please enter the ports used by the software on their clients within the internal network (standard ports are pre-selected).

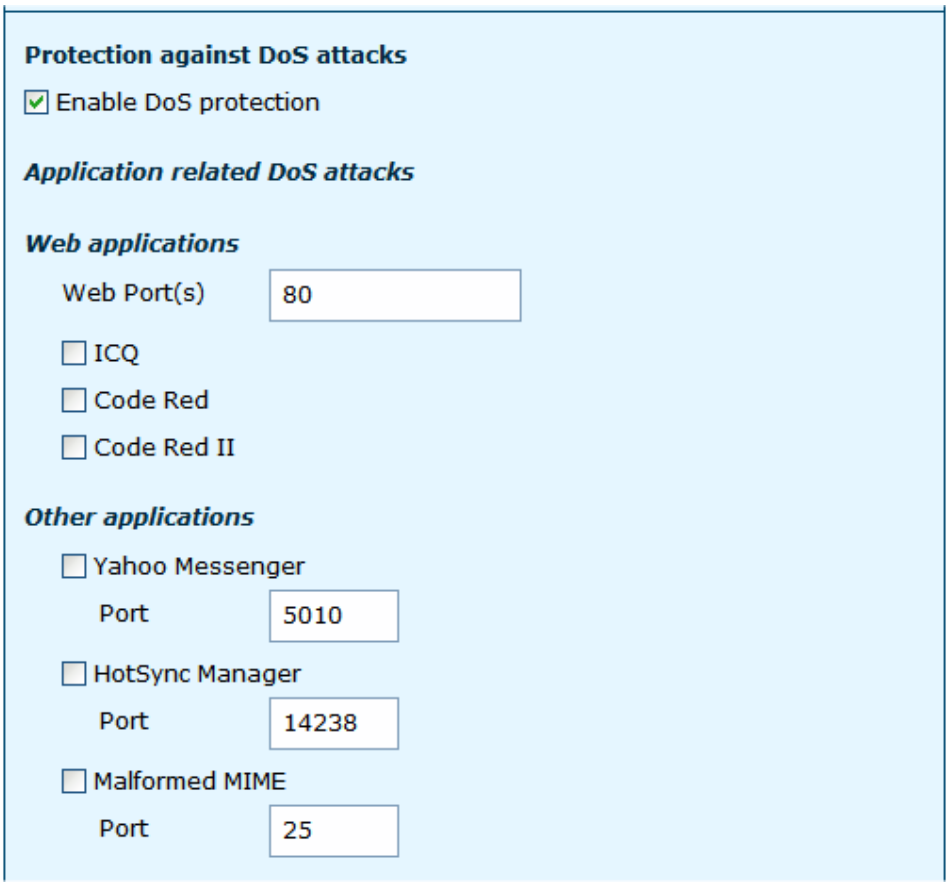


Figure 5.16: Firewall options: Application related DoS attacks

Networking related DoS attacks

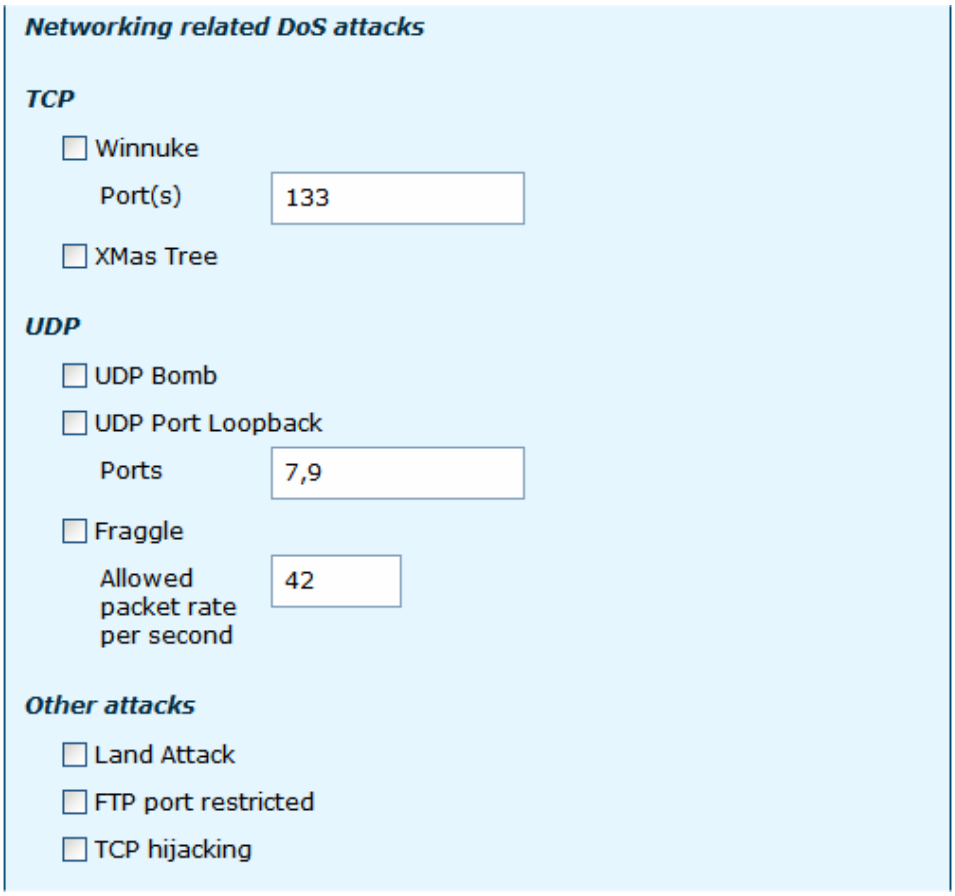


Figure 5.17: Firewall options: Networking related DoS attacks

These settings let you repel further attacks:

Winnuke is an attack on older Microsoft operating systems; it should no longer be possible when using an up-to-date system.

Xmas Tree Packets are normally used to scan a network.

With an *UDP Bomb*, the offender tries to cause a computer crash by sending illegal UDP packets.

For *UDP Port Loopback* you can specify ports that will be blocked in order to avoid UDP PING attacks. Normally, these are port 7,17 and 19.

To repel *Fraggle Attacks*, specify the maximum number of UPD packets per second that should be allowed to pass through the HorstBox per second.

With a *Land Attack* a manipulated TCP packet causes the target computer to repeatedly try to connect to itself. This may crash the system.

FTP port restricted lets you repel attacks via the FTP protocol.

TCP hijacking means the taking over of an established TCP connection through an offender.

DoS Scans

Port scans are a popular method to detect vulnerable points in your network.

A *port scanner* either tries to connect to a service (connect scan) or tries to retrieve information about a computer's active services from the answers on invalid packets (stealth scan). A port scan sending a great number of packets can be considered a DoS attack as well.

With *SYN flooding* the offender attempts to overload the target system with a great number of faked connection requests via the TCP protocol. This may hinder the server to answer requests from legal clients. You can limit the number of SYN packets the HorstBox accepts.

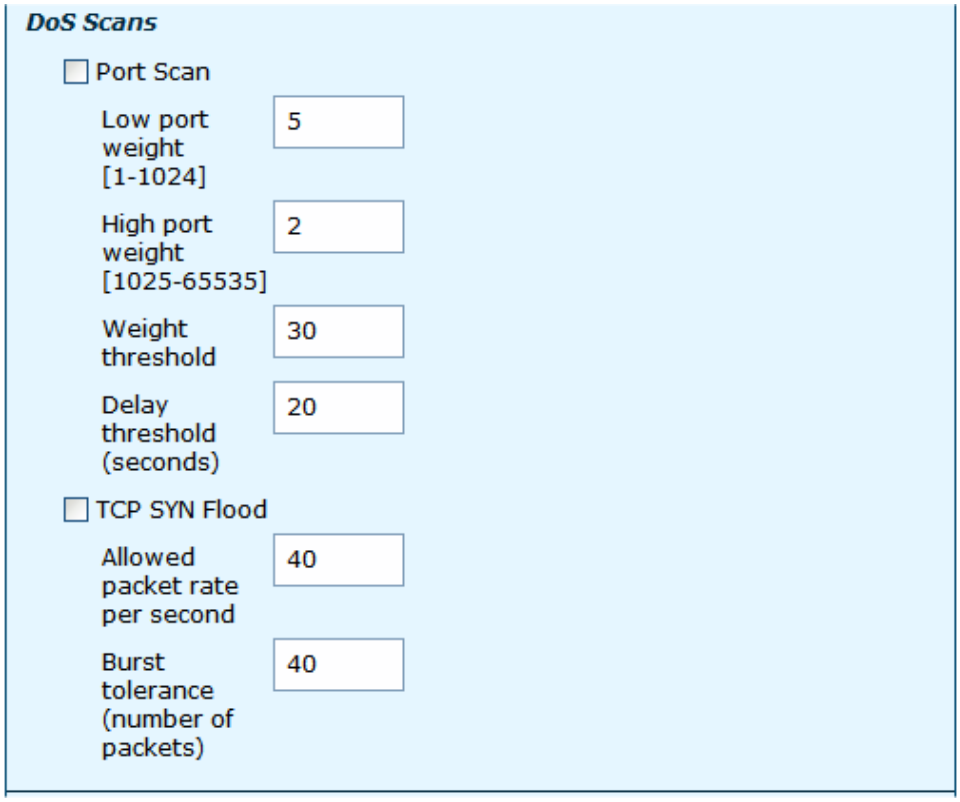


Figure 5.18: Firewall options: DoS Scans

To save the settings, click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

5.7 DMZ (Exposed Host)

DMZ is short for Demilitarized Zone.

A demilitarized zone is a network area (a subnetwork) that sits between your internal network and an external network, usually the Internet. The point of a DMZ is that connections from the internal and the external network to the DMZ are permitted, whereas connections from the DMZ are only permitted to the external network. Hosts in the DMZ may not connect to the internal network. This allows the DMZ's hosts to provide services to the external network while protecting the internal network in case intruders compromise a host in the DMZ. For someone on the external network who wants to illegally connect to the internal network, the DMZ is a dead end.

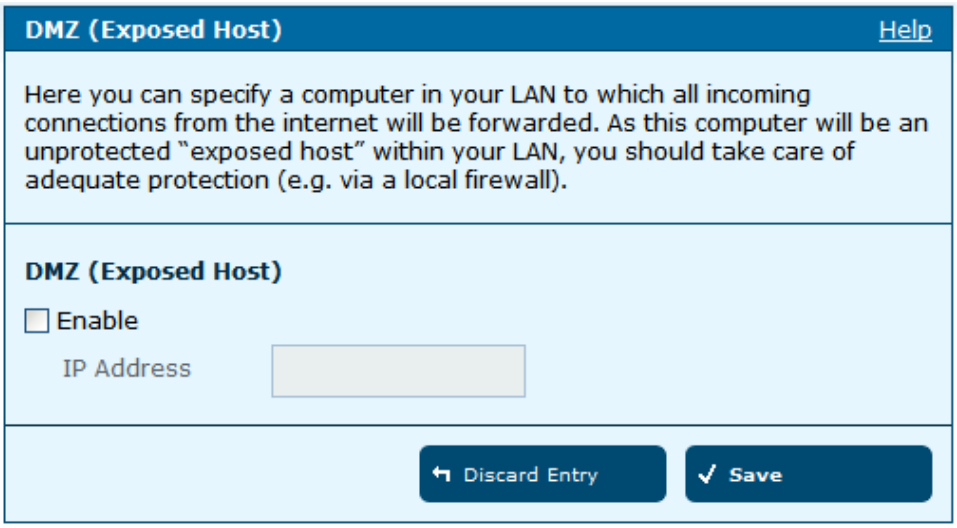


Figure 5.19: DMZ

The HorstBox uses a slightly different approach. The DMZ (Exposed Host) connects to the internal network without further security. That is, the DMZ host is able to connect to hosts on the internal network, but hosts in a real DMZ are prevented from doing so by the firewall that sits between them.

Default: DMZ deactivated.

Activate the option *DMZ* and enter the local IP address of the computer to become accessible from the Internet. To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

5.8 RIP Settings

The Routing Information Protocol (RIP) is one of the most commonly used interior gateway protocol (IGP) routing protocols on internal networks (and to a lesser extent, networks connected to the Internet), which helps routers dynamically adapt to changes of network connections by communicating information about which networks each router can reach and how far away those networks are.

For the protocol RIP (Routing Information Protocol) please define the routes for the traffic in your network in the routing table. You can specify the version of the protocol as well as the required direction of action.

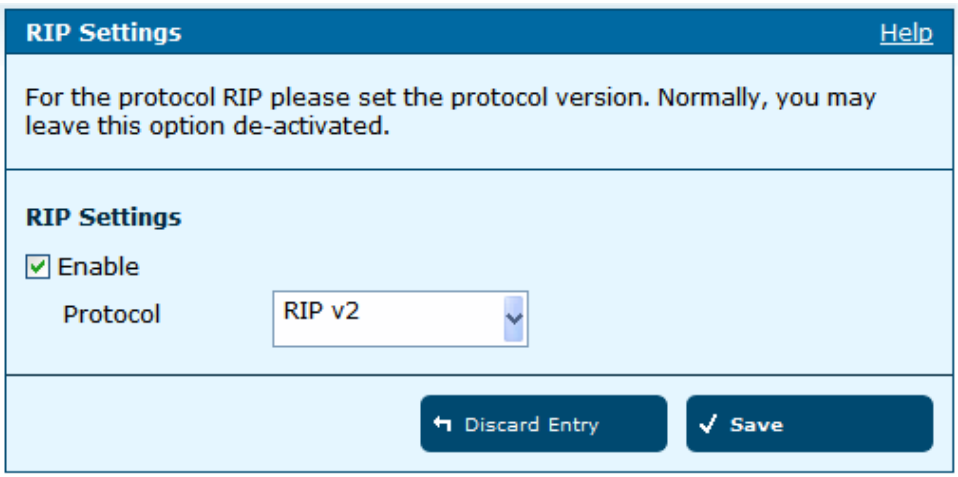


Figure 5.20: RIP

Note: There is no need to enable RIP. Default: disabled.

Enable the option *RIP* and choose a protocol (RIP v1, RIP v2 or RIP v1 compatible).

To save the settings, click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

6 Network

This chapter introduces all LAN settings. Configure your own WLAN and setup LAN and USB shares. In the basic mode you can access the page WLAN, only.

To navigate in the tab NETWORK use the navigation column.

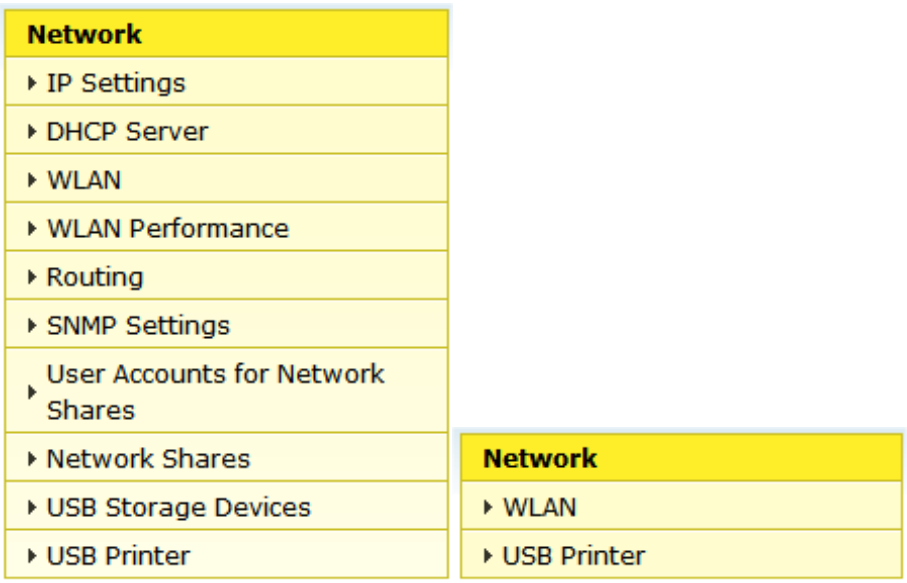


Figure 6.1: Navigation column Network (expert- and basic mode)

6.1 IP Settings

You may need the following information:

- unused *IP address(es) in your LAN*
  Every device in a LAN has to have a unique IP address from

the same segment (i.e. 192.168.0.x) to communicate with other devices.

- *value for subnet mask*
  This value has to be the same for all devices in your LAN.

The default IP address of the HorstBox is: **http://horstbox**, and the default value for subnet mask: 255.255.255.0.

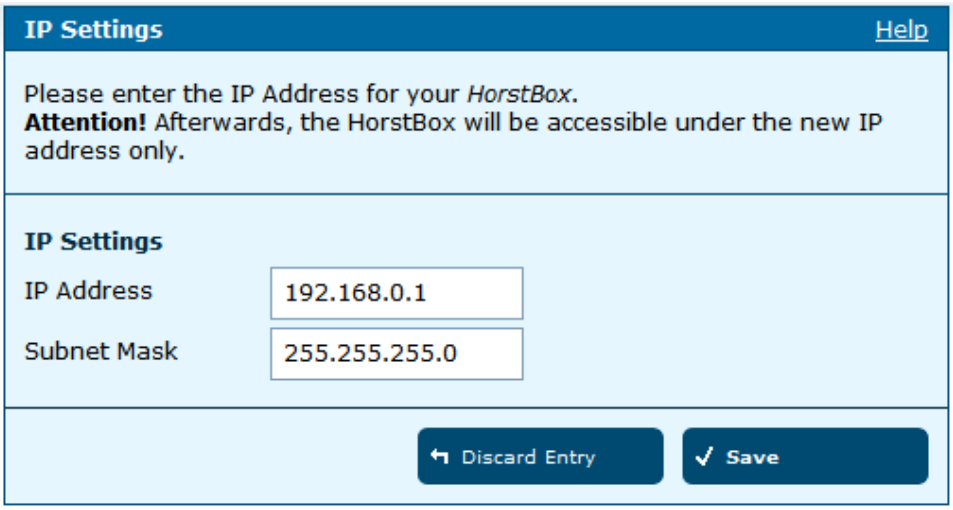


Figure 6.2: IP settings

Enter values for the IP address and the subnet mask.

To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

Note: After changing the IP address, the HorstBox will be accessible via the new IP address only!

6.2 DHCP Server

A DHCP Server will distribute IP addresses within the network on demand. Please define a range for the IP addresses and a duration of validity (Lease Time).

The HorstBox is by default set up as DHCP server. This may cause conflicts with another DCHP server already in your LAN. Deactivate one of the servers.

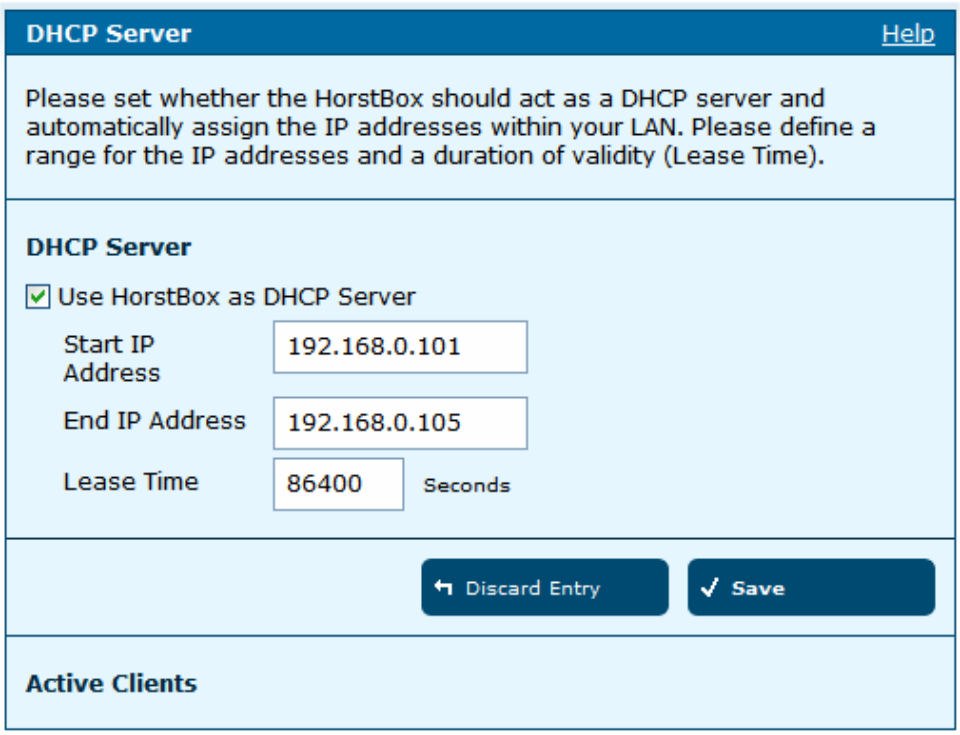


Figure 6.3: DHCP server

6.2.1 Set up DHCP Server

Enter an IP address range in the fields START IP ADDRESS and END IP ADDRESS.

An IP address issued by the DCHP server is valid for a certain period of time, called “lease time”. After expiration a renewal or extension is necessary.

Define the lease time in the field LEASE TIME. Default value: 86400 seconds (= 24 hours).

To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

In the section *Active Clients* you will see clients connected to the DHCP server.

6.2.2 Edit Settings

To edit the settings, change the values and click on SAVE.

6.3 WLAN

To use the HorstBox as a WLAN Access Point enable the option *WLAN Access Point* and choose the Security Settings.

6.3.1 Activate WLAN

To switch the Access Point (AP) on, use the WLAN switch on the back panel. Settings changed while the AP was switched off, become active once the AP is switched on.

To switch the Access Point (AP) off, use the WLAN switch on the backpanel. The status of the AP is reported by the LED “WLAN” (off) and by a message on the page WLAN.

6.3.2 Enable WLAN

Switch the AP on and activate the option *Enable Access Point*.

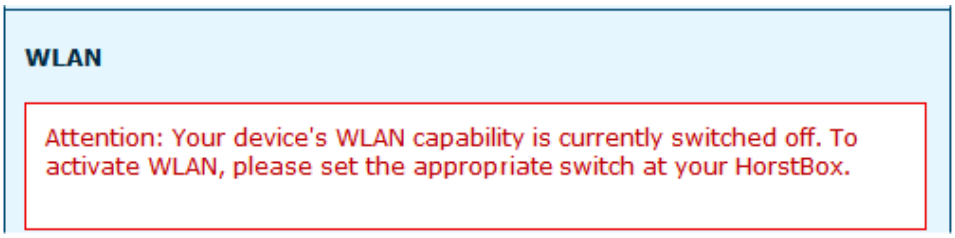


Figure 6.4: Message: WLAN switched off

Enter a SSID (Network name) for your WLAN and choose a channel [Default: 7].

Best not to use a common name like D-Link WLAN or MYWLAN as SSID.

Set up all other WLAN devices to use the same SSID and channel.

Time Switch

Use the Time Switch to set up the period of time for the AP to be active, or to operate the AP around the clock, choose the option *Always*.

Enter the time in 5 minute intervals.

Example

To switch the AP off during night time, enter 23:55 and 6:35.

Note: While using the HorstBox as an Access Point you should keep in mind, that the radio signal can be detected outside the premises. An intruder might be able to misuse your Internet connection or steal sensitive data. You should consider the security settings painstakingly.

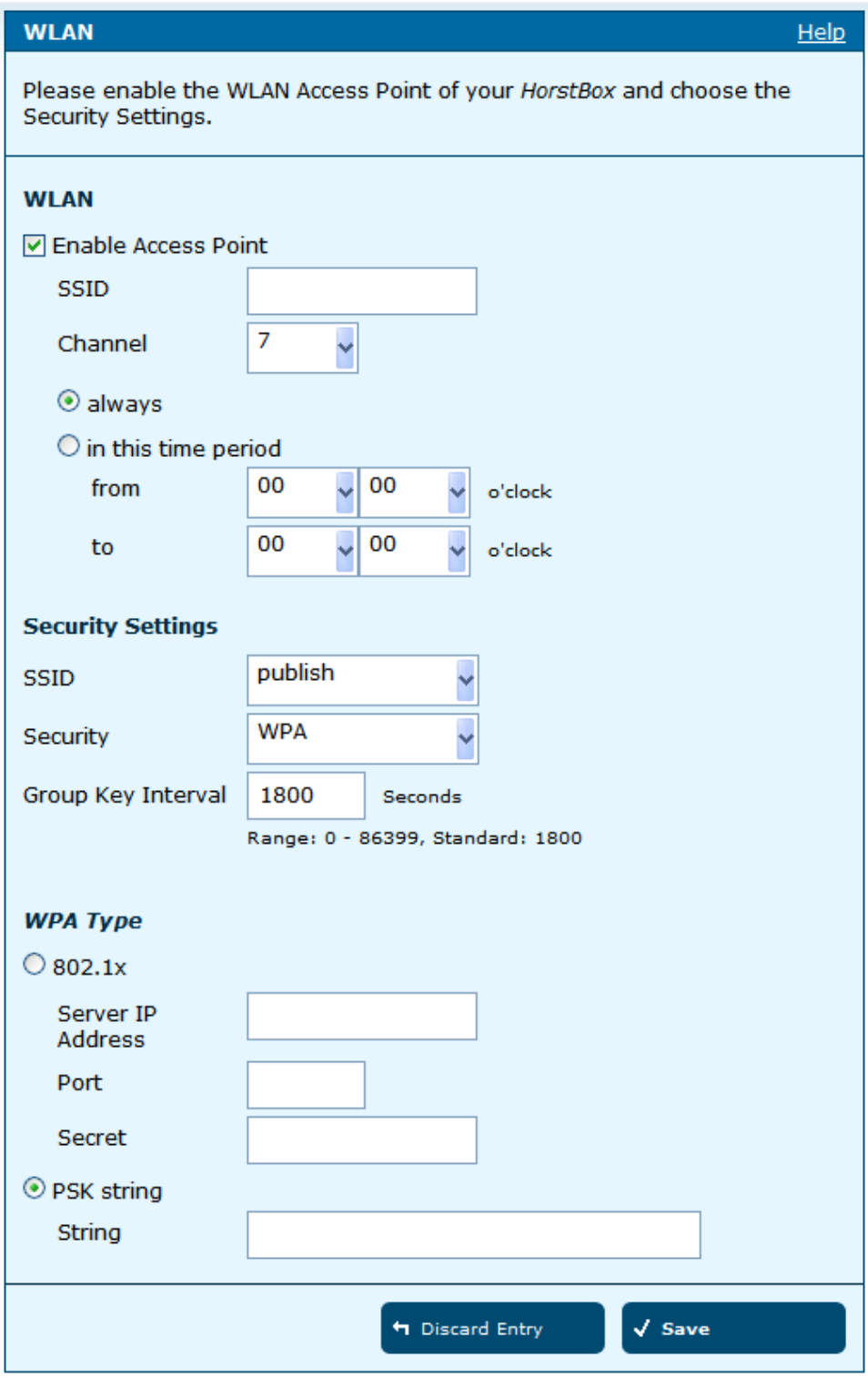


Figure 6.5: WLAN settings

6.3.3 Security Settings

SSID

Select from the menu list whether the SSID should be hidden or public. If the SSID is concealed, you must explicibly enter this in the settings of the remaining WLAN devices. If the SSID is public, the WLAN devices will find it.

You have several possibilities for the security:

1. **None**

   No data encryption method will be used.
   Use this setting only if the (old) WLAN hardware fails to connect to the Access Point using WEP or WPA. Please think about whether to use such apparently old hardware at all.
   Not recommended!

2. **WEP, Encryption: 64- or 128Bit (10 or 26 hex values**
   Wired Equivalent Privacy (WEP) is the former default encryption algorithm for WLANs. Due to several flaws WEP is considered to be unsafe.
   Use this setting only if a device does not support WPA.

3. **WPA**

   Wi-Fi Protected Access (WPA) is the new standard encryption method for WLANs.
   Strongly recommended!

4. **WPA 2**

   Wi-Fi Protected Access (WPA2) is the successor of WPA. The WLAN standards IEEE 802.11a, b, g are implemented as well as basic functions of the new security standard IEEE 802.11i. WPA 2 is based on the Advanced Encryption Standard (AES).

5. **WPA / WPA2**
   Mixed Mode: **Recommended**. Use this mode for devices supporting WPA 2, to get the best WLAN security possible. For devices supporting WPA only, this mode offers the standard WPA .

From the drop-down list *Security* choose the desired seurity level. The display changes.

WEP

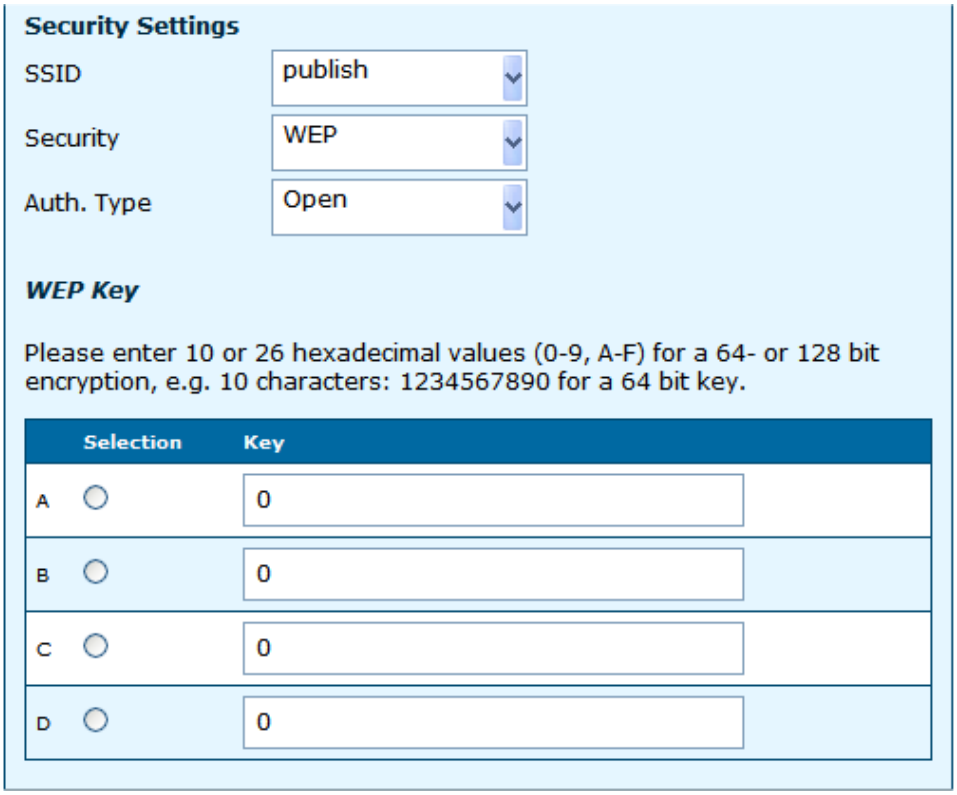


Figure 6.6: WEP settings

Choose the authentication type from the drop-down list *Auth. Type*: *Open* or *Shared*.

Auth. Typ – **Explanation**	
Open	The HorstBox is visible to all devices in the WLAN.
Shared	Communication is possible between devices with the same WEP settings only.

Select a key and enter the pass key. Choose the length of the key accordingly. You may set up up to four keys. The key selected will be the default key.

Key Strength	Number of Hex Digits
64 Bit	10
128 Bit	26

A higher key strength makes decrypting of the encrypted communication more difficult.

To save the settings, click on SAVE.

WPA, WPA 2 and WPA/WPA2

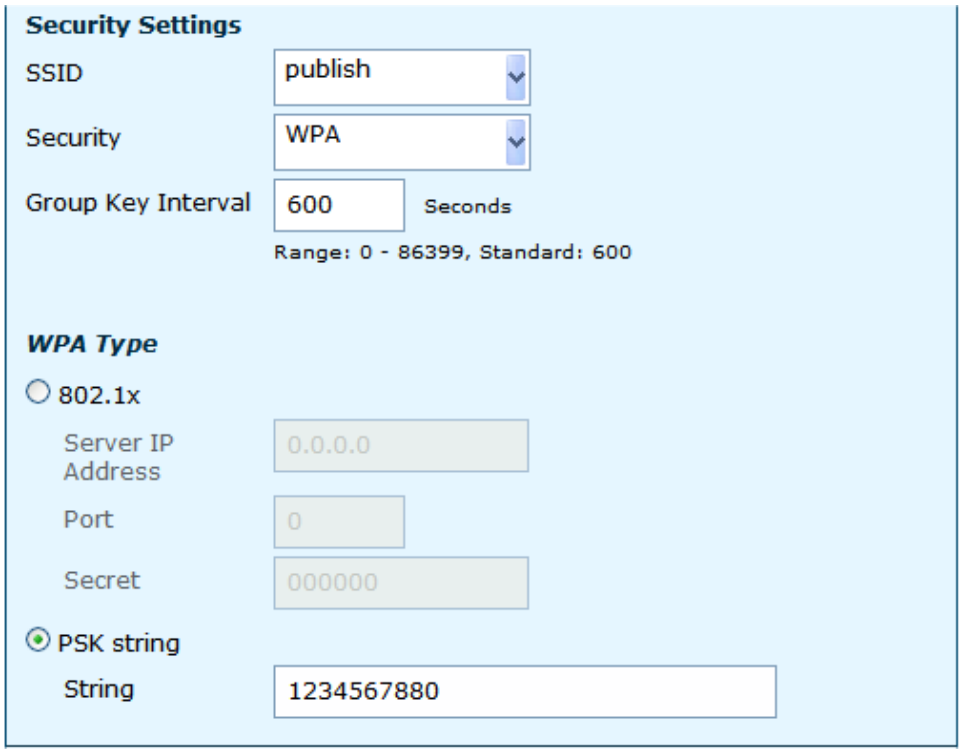


Figure 6.7: WPA, WPA2 and WPA/WPA 2 settings

WPA is based on the Temporal Key Integrity Protocol (TKIP) and offers Pre-Shared-Keys (PSK) for user authentication. The PSKs are used to generate temporary keys for the WLAN devices.

Enter a time for automatically changing the group keys in the field GROUP KEY INTERVAL.

WPA Type	Values
802.1x	Enter IP address of server, port number and password.
PSK string	Enter the PSK as Hex Value. Min.: 8, max.: 63 digits

To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

6.3.4 Deactivate WLAN

To deactivate the WLAN disable the option *Enable Access Point* and click on SAVE.

To switch the AP off permanently, use the WLAN switch on the back panel of the HorstBox.

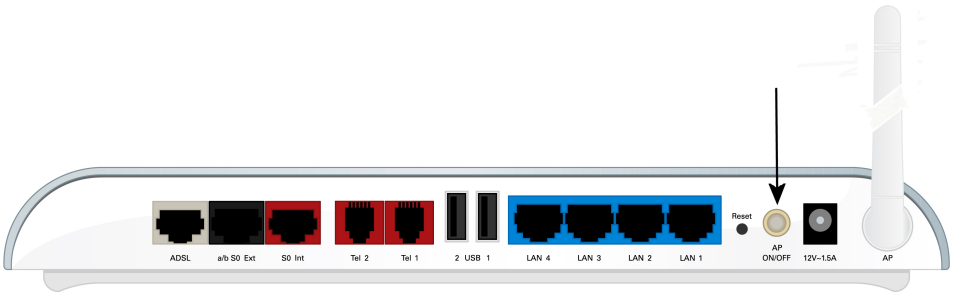


Figure 6.8: Back panel: WLAN switch

6.4 WLAN Performance

Set up the performances of your Access Point here. You can modify some of the parameters to obtain an improved performance. Always change just one parameter and keep track of the effects.

The position of the HorstBox may influence the performance, especially the range of the radio signal. Please refer to section

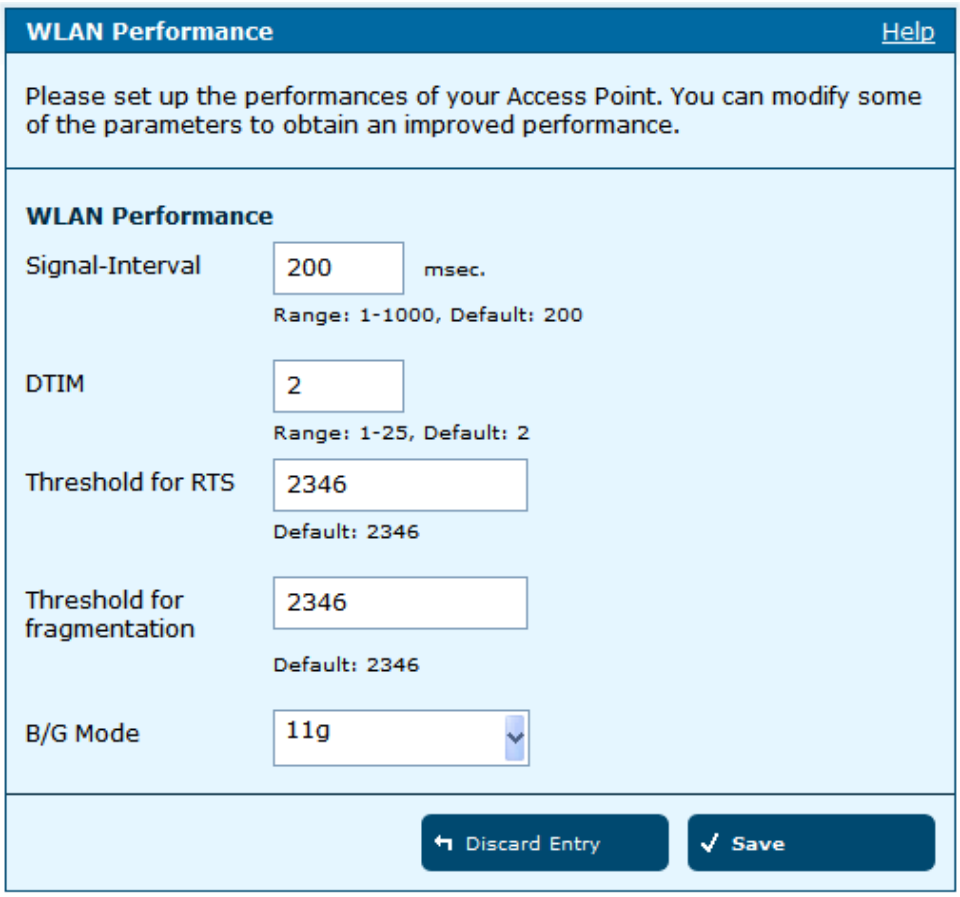


Figure 6.9: WLAN performance

Options	Values
Signal Interval	Time interval for sending a beacon for synchronization. Range of valid values: 20 to 1000. Default: **200**.
DTIM	The Access Point caches deliveries for its clients. Then a Delivery Traffic Indication Message (DTIM) informs the client about the delivery. The client prepares for receiving the messages. Default: **2**.
Threshold for RTS	Generally there is no need to change this value. If the flow of traffic becomes inconsistent, change the value within the range between 256 and 2,346. Default: **2346** **Note:** If you have to change this value, do it in small steps and keep track of the effects.
Threshold for Fragmentation	Default: **2346** Treshold for breaking down of data packets; measured in bytes. Data packets larger than 2,346 bytes are broken down before transmission. Generally there is no need to change this value, exept for a huge packet error rate. Valid range between 256 and 2,346. Default: **2346** **Note:** Chosing a low value for fragmentation may result in bad data transfer rates.
B/G Mode	Choose between both supported 802.1x standards to adjust the HorstBox as Access Point to all devices in your WLAN. - 11b: just IEEE 802.11b. - 11g: Mixed Mode: both standards (IEEE 802.11b and IEEE 802.11g).

Table 6.2: WLAN performance options

6.5 Routing

Routing determines the data packet's way from the sender to the receiver.

Routing is managed via entries in a router's routing table specifying how a data packet should be transmitted. Normally, data packets will be transmitted out of your LAN through a gateway, e.d. the HorstBox, to your ISP's server and further on into the internet.

The routing decision is made per packet, i.e. changes in the routing table will have an instant effect.

Routing table configuration is realized via static entries or dynamically via routing protocols (e.g. RIP).

The HorstBox allows you to configure static routes to subnets or single computers as well as the reception of such information via RIP, provided that a RIP server exists within your LAN.

Normally, you do not need to define any settings. The value for the Subnet mask must be the same for all devices in the LAN, e.g. 255.255.255.0.

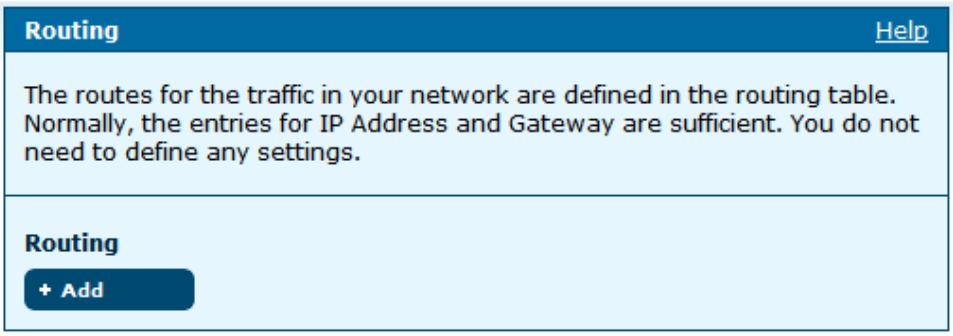


Figure 6.10: Routing

6.5.1 Add Route

Enter the destination IP address in the field DESTINATION IP ADDRESS, the Subnet mask in the field SUBNET MASK and the IP address of the gateway in the field GATEWAY IP ADDRESS.

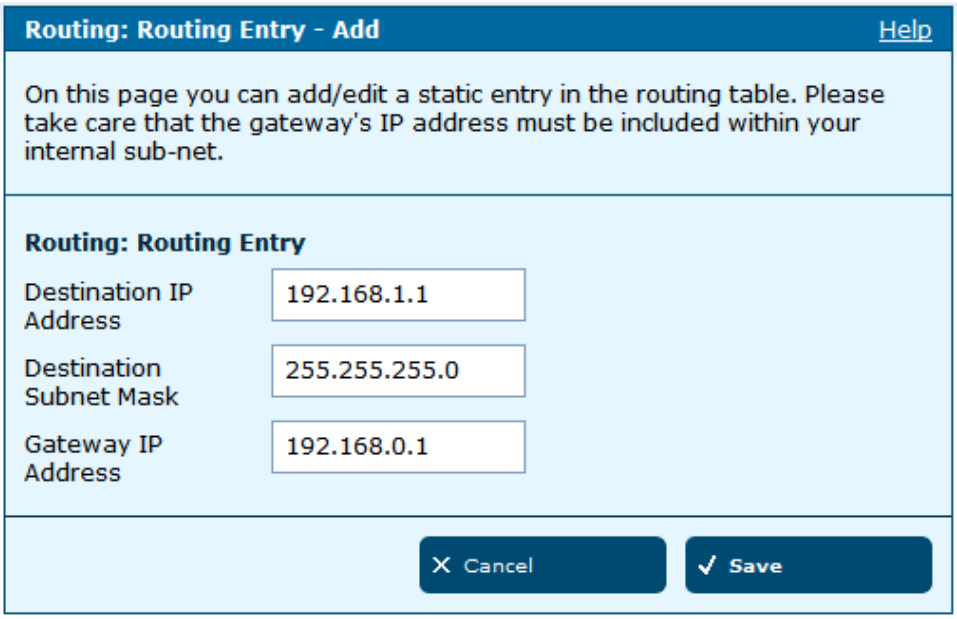


Figure 6.11: Add Route

To save the new route click on SAVE.

If an error occurs you will see an error message (red frame).

To cancel the dialog, click on CANCEL. The previous page will be displayed.

6.5.2 Edit Route

To edit a route click on EDIT. The same dialog as for adding a route opens, but this time all fields contain values. To save the changes, click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

6.5.3 Delete Route

To delete a route click on DELETE. Confirm the warning by again clicking on DELETE. The route will be deleted and the page ROUTING will open and display a message.

6.6 SNMP Settings

SNMP is short for *Simple Network Management Protocol*. This protocol provides functionalities for controlling and monitoring a network. It responds to specific incidents such as errors and notifies the administrator in an appropriate way.

To use SNMP an additional software is necessary. Here you can enable agent and traps only.

All devices monitored have to have an agent. These agents will send in regular intervals, on request or triggered by events data. The structure of this data is defined in MIBs.

The SNMP community provides a simple access protection by creating a community named public with the right “Read Only”. A second community, named admin possesses the right “Read Write”, i.e. members of this community can edit the settings.

Via the community string a SNMP manager discloses his affiliation to a certain community. Unfortunately this string is transmitted as plaintext, making the security vulnerable.

A trap is sent each time an event happens. A trap message contains among other things the TrapID. There are 7 different trap IDs (see below).

The message consists among other things of the common TrapID. 7 common TrapIDs are defined:

TrapID	**Explanation**
1. Cold boot	The device had to do a cold reboot.
2. Warm boot	The device had to do a warm reboot.
3. Link Down	No connection to device.
4. Link Up	Connection to device.
5. Authentication Error	No authentication due to an error.
6. EGP neighbor lost	No connection to another router in the LAN. (EGP is short for Exterior Gateway Protocol. This protocol is used to exchange information about the accessibility between two routers in stand-alone systems.)
7. internal information	Internal information; depends on manufacturer.

Table 6.3: SNMP TrapIDs

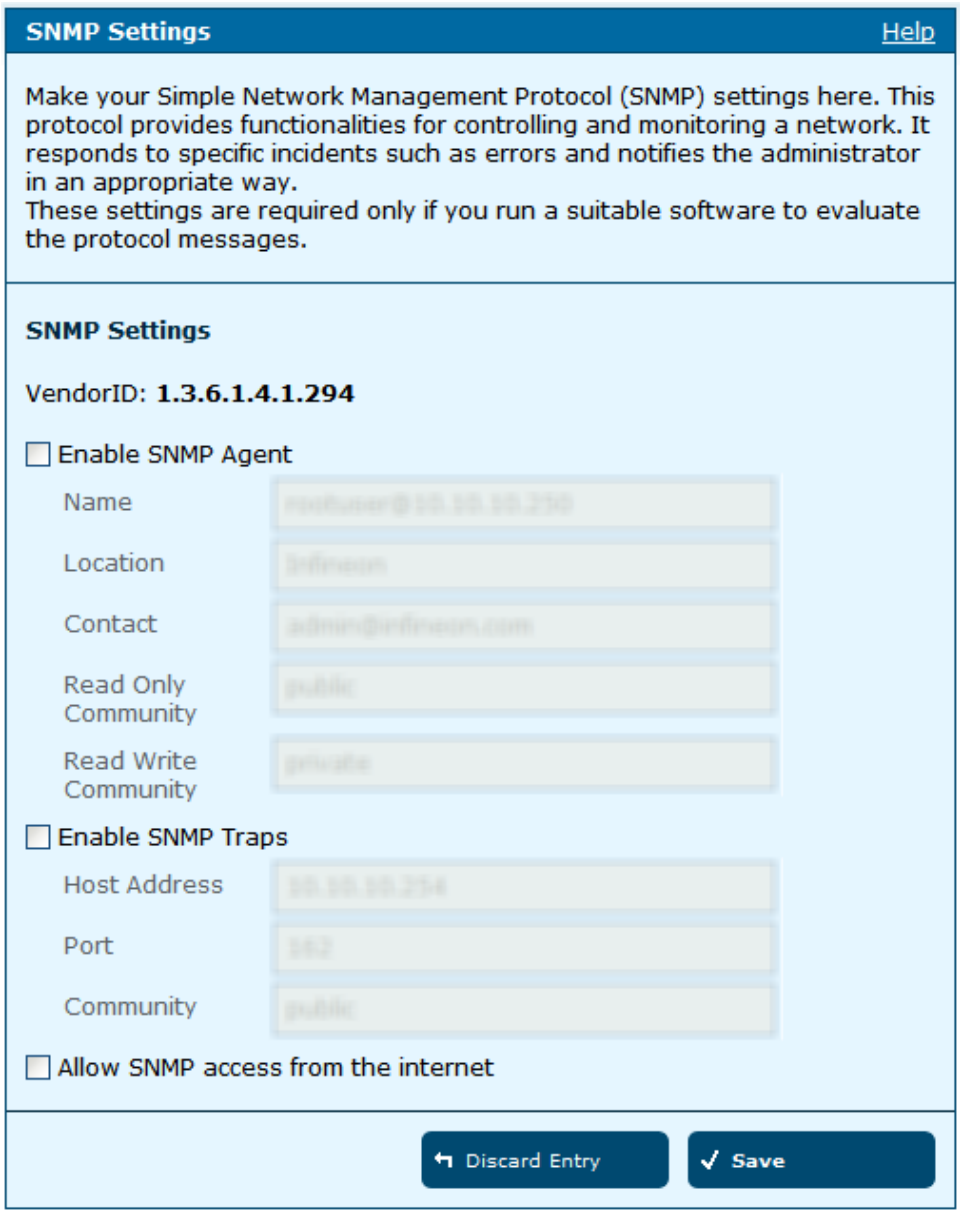


Figure 6.12: SNMP settings

As default two communities were added: *public* (right: "Read Only") and *admin* (right: "Read Write").

6.6.1 Enable Agent

To activate an agent activate the option *Enable SNMP Agent*, enter the necessary values and click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

6.6.2 Edit Agent

Change the settings and click on SAVE.

6.6.3 Disable Agent

To deactivate the agent, deactivate the option *Enable SNMP Agent* and click on SAVE.

6.6.4 Add Community

To add a new community click on ADD.

Enter a name for the new community and choose the access right from the drop-down list.

To save the settings, click on SAVE. Changes will take effect after reboot.

If an error occurs you will see an error message (red frame).Change the settings in the box with the red frame and again click on SAVE. Changes will take effect after reboot.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

6.6.5 Edit Community

To edit edit a community click on EDIT and click on SAVE.

6.6.6 Delete Community

To delete a Community, delete the entry in the field COMMUNITY and click on SAVE.

6.6.7 Add Trap

To add a new trap at least one community has to be added. Activate the option *Enable SNMP Traps*.

Enter the destination IP address, port number and a community.

To save the settings, click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

6.6.8 Disable Trap

To disable the trap, deactivate the option *Enable SNMP Traps* and click on SAVE.

6.6.9 Allow SNMP access from the internet

To query SNMP message from the HorstBox via the Internet, activate the option *Allow SNMP access from the internet* and click on SAVE.

6.6.10 Disallow SNMP access from the internet

To disallow SNMP access via the Internet, deactivate the option *Allow SNMP access from the internet* and click on SAVE.

6.7 User Accounts for Network Shares

The HorstBox is equipped with two USB ports at the back panel. You can attach any USB storage device, such as USB Memory Sticks or USB hard drives. Using a Card Reader memory cards like Compact Flash (CF) or Secure Digital (SD) will be recognized also. Even MP3 players, PDAs, digital cameras or mobile phones can be used as long as they operate as USB storage device. Supported file systems: FAT, FAT32 and EXT2.

Using an USB hub with an additional power supply (such as D-Link's DUB-H7) several devices can be attached concurrently.

Please be patient for a short moment while the HorstBox detects and initialises the attached USB device.

6.7.1 Add User Account

Network shares enable users to access folders and files on USB devices.

Create user accounts for the *network shares* and decide, if you want to protect some shares through user name and password or if any user within the LAN can access the share(s).

It is best to set up the users for the network shares according to the user management in your LAN.

To protect a network share set up a password.

To assign one network share to one user, set up this user (and a password).

To allow access for all users assign the guest account to this network share.

To add a new user account click on ADD.

Enter a user name and a password (twice).

To save the settings, click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

If an error occurs you will see an error message (red frame).

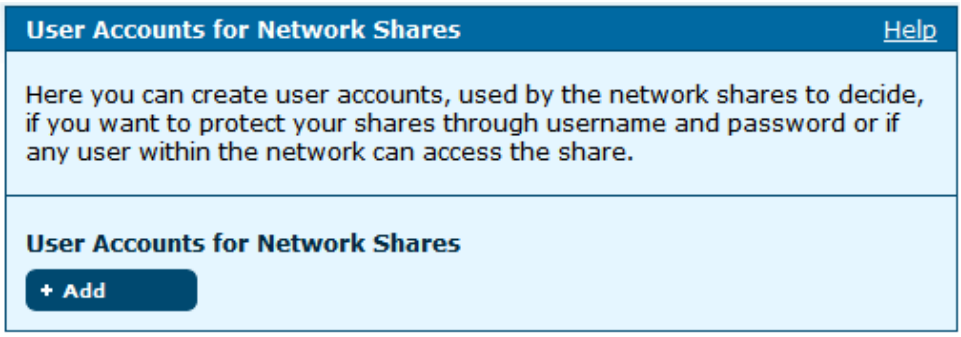


Figure 6.13: User Accounts for Network Shares

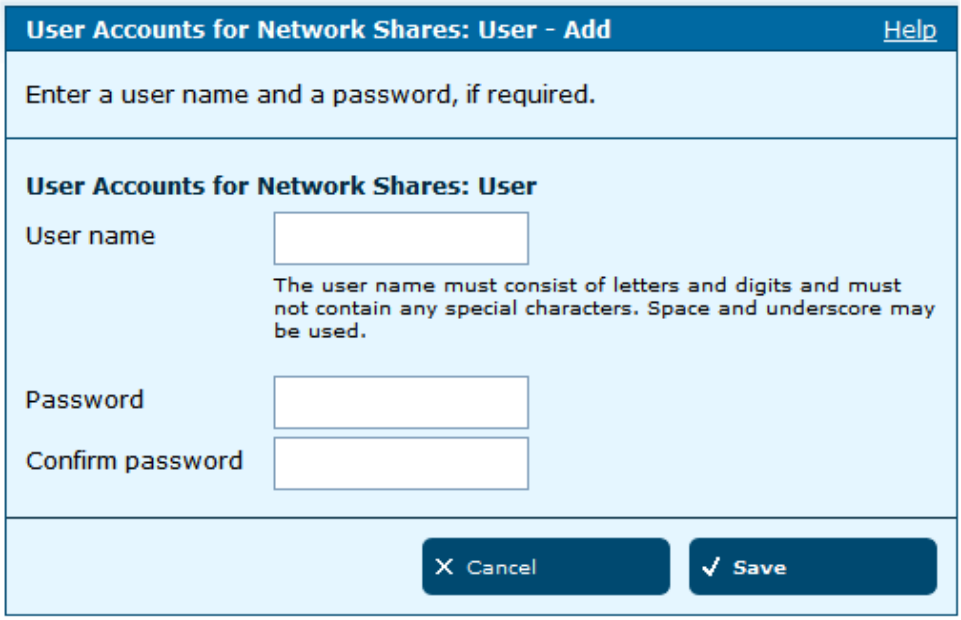


Figure 6.14: Add user account

6.7.2 Edit User Account

To edit a user account, e.g. to change the password click on EDIT. The user name cannot be changed.

To save the settings, click on SAVE.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

Note: You do not have to enter a password yet, but this share will be open to any user in your LAN who knows the user name for this share.

6.7.3 Delete User Account

To delete a user account click on DELETE. Confirm the warning by again clicking on DELETE.

An error message occurs if a network share is still assigned to this user account.

Edit/Change the network share and delete the user account afterwards.

To cancel the dialog, click on CANCEL. The previous page will be displayed.

6.8 Network Shares

For more information about network shares and the HorstBox see section 6.7 User Accounts for Network Shares on p.133.

To connect a USB device simply plug it one of the USB ports on the back panel. You may use an USB extension cable or connect an USB hub as well.

Please be patient for a short moment while the HorstBox detects and initialises the attached USB device.

6.8.1 Activate Network Shares

Before you can add network shares you have to activate the option *Network Share active* and to enter the name of your LAN workgroup. To save the settings, click on SAVE.

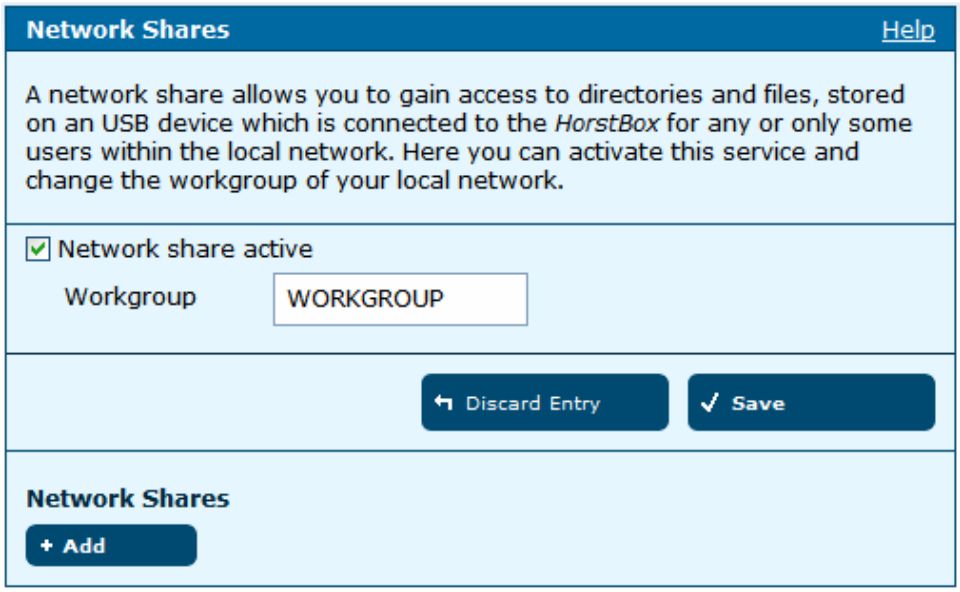


Figure 6.15: Activate Network Shares

6.8.2 Add Network Shares

To add a new network share click on ADD.

Enter a name for the network share into the field SHARE NAME. This name will appear in the list Current Shares once the network share is set up.

Choose a user from the drop-down list *User*.

Click on CHOOSE to choose a partition.

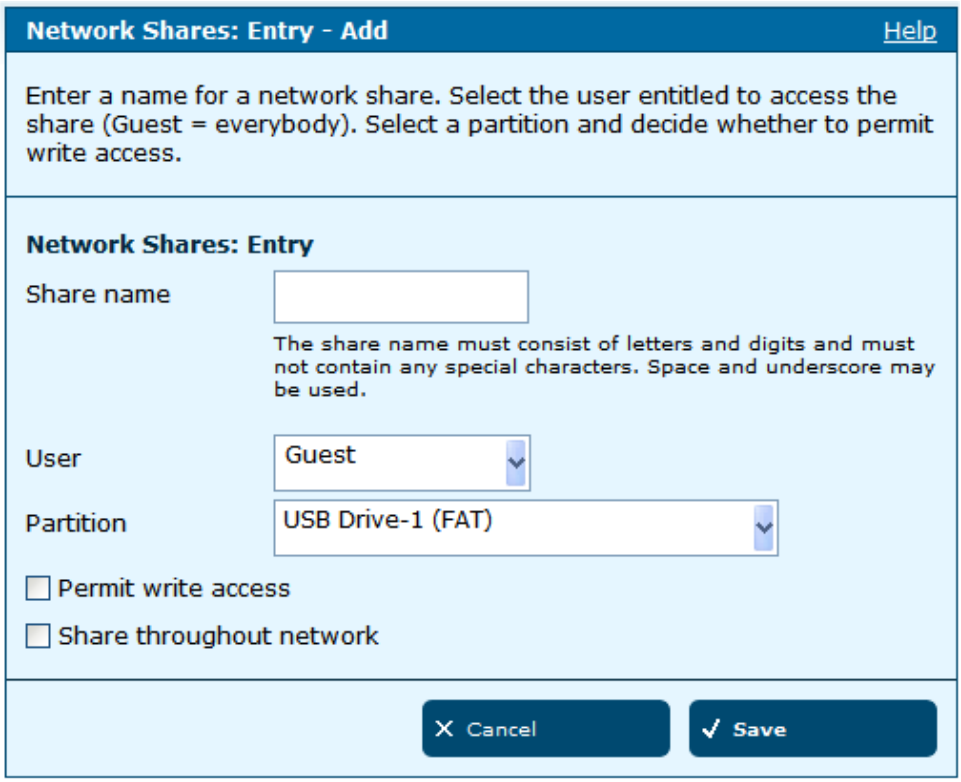


Figure 6.16: Add Network Share

From the drop-down list *Partition* choose a device or a partition if several partitions are shown.

Click on ACCEPT.

Back on the previous page assign *Write Access*, if necessary. Otherwise users can only read the files.

Next decide whether to activate the share. You may set up network shares and enable them later.

To save the settings, click on SAVE.

If an error occurs you will see an error message (red frame).

Change the settings in the box with the red frame and again click on SAVE.

6.8.3 Edit Network Shares

To edit a network share click on EDIT.

Note: Network shares with status “not connected” cannot be edited.

Edit the settings. To save the changes, click on SAVE.

6.8.4 Delete Network Share

To delete a network share click on delete. Confirm the warning by again clicking on DELETE.

Saving successfully is reported in a success message (green frame).

6.8.5 Configured Shares

This section shows all configigured shares, their share name and the partition and the status (not connected [red], not shared [yellow] or shared [green]). After each entry you may find DELETE and EDIT.

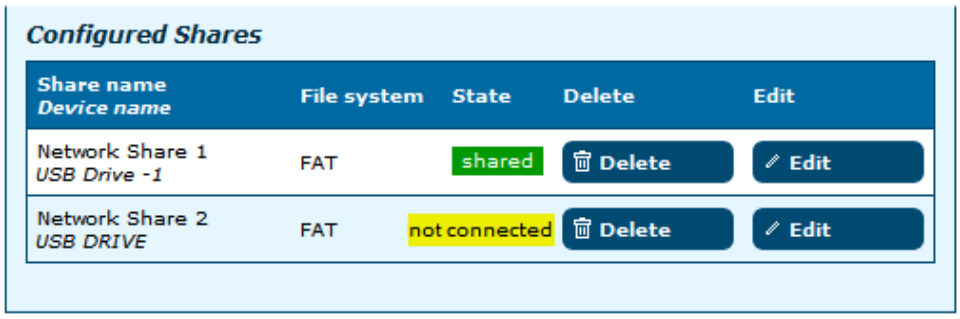


Figure 6.17: Configured Network Shares

Note: Network shares with status “not connected” cannot be edited, but deleted.

6.8.6 How To Use Network Shares

Please refer to the documentation and/or online help of the operating system on how to use network shares. You may attach a network share as a network drive or as a network resource.

6.9 Manage USB-Storage devices

6.9.1 Unmount USB Storage Device

Removing a USB device without unmounting it first may result in data losses, as the operating system may not have finished writing onto the device yet.

To unmount a USB device click on UNMOUNT.

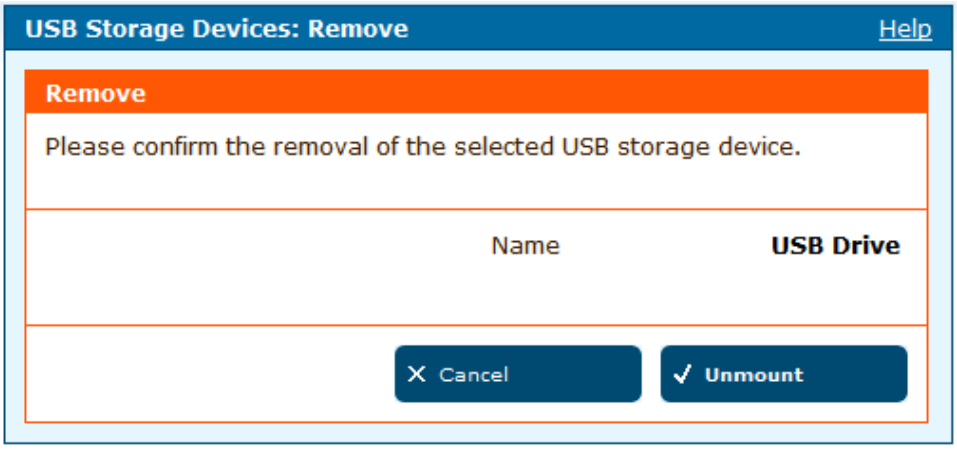


Figure 6.18: Unmount USB Storage Device

Confirm the warning by again clicking on UNMOUNT.

6.10 USB Printer

The HorstBox comes with a build-in printer server to share one printer in a LAN. This printer server supports most printers connected to the USB port, except GDI-printers[1] (host-based printers).

Note: Only one USB printer may be shared at a time.

6.10.1 Share USB Printer

Connect the USB printer to the USB port on the back panel of the HorstBox. Please be patient for a short moment while the HorstBox detects and initialises the attached USB printer.

Refresh the page SHARE USB PRINTER.

The printer will be shown in the section “USB Printer”

Activate the desired printer and click on SAVE.

To save the settings, click on SAVE.

Saving successfully is reported in a success message (green frame).

If an error occurs you will see an error message (red frame).

6.10.2 Do Not Share USB Printer

If you just want to set up a USB printer now activate the option *Do not share printer*.

To save the settings, click on SAVE.

[1] This printer uses a Windows API to preprocess the data.

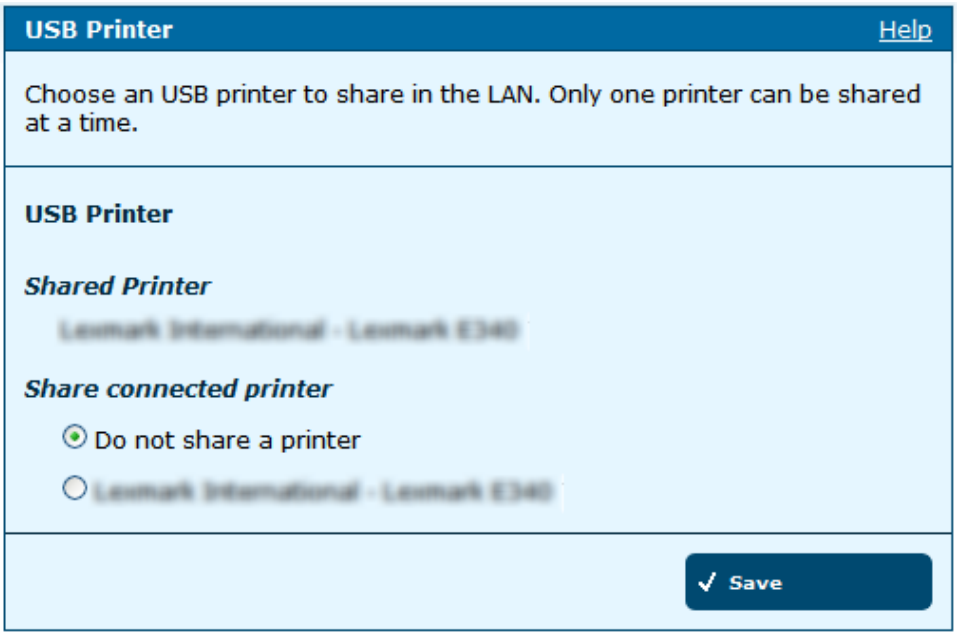


Figure 6.19: Share USB Printer

6.10.3 Remove USB Printer

The HorstBox automatically detects all connected printer.

To unconnect a printer, simply switch it off. Make sure that all print jobs are finished beforehand. Otherwise these print jobs may be lost.

6.10.4 Install USB Printer

Please refer to the documentation and/or online help of the operating system on how to install an USB printer on your system.

7 System

To navigate in the tab SYSTEM use the navigation column.

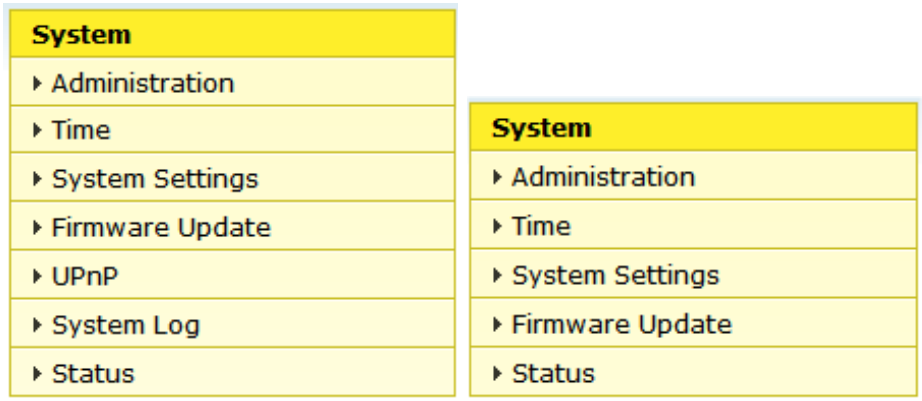


Figure 7.1: Navigation column System (expert and basic mode)

7.1 Administration

Without a valid password you can not manage the HorstBox. Resetting the device to the factory settings may solve the problem.

Enter a new password in the field PASSWORD and confirm it in the field CONFIRM. The user name *admin* can not be changed.

A password will protect the HorstBox against unauthorized usage.

Note: First thing to do: Change the password for the default user *admin*. Do not operate the HorstBox with the default password **admin**.

To save the settings, click on SAVE.

To discard all recent entries click on DISCARD ENTRY.

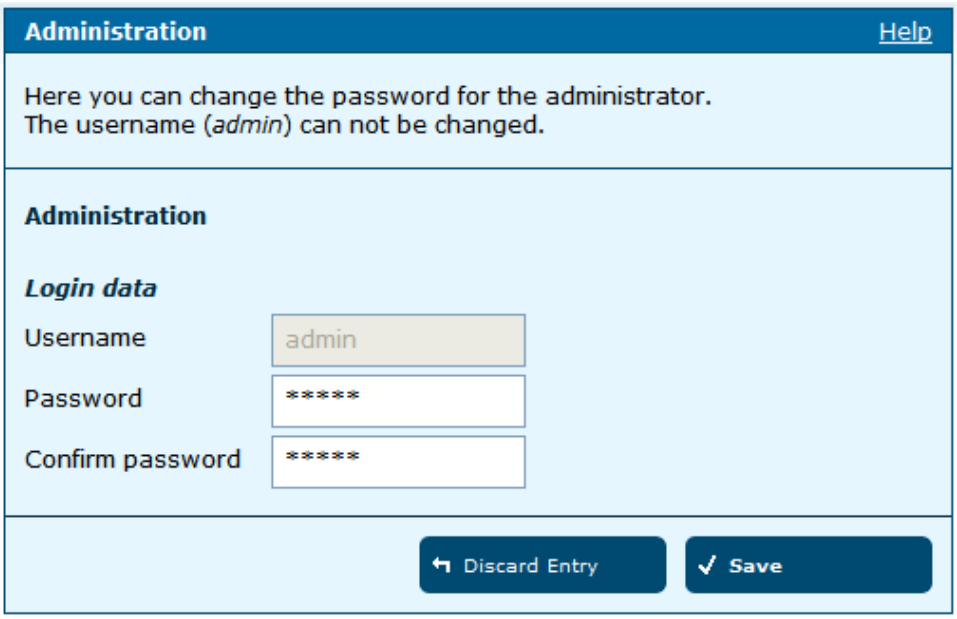


Figure 7.2: Admin

7.2 Time

Please make sure that the time is set correctly in order to ensure that your rules will be applied at the right time.

Note: It may happen that after a reboot all settings for date and time are lost. With the option *Automatic* activated, date and time will be set automatically. Otherwise you may have to change the settings manually.

Choose an option, if necessary enter the required data and click on SAVE.

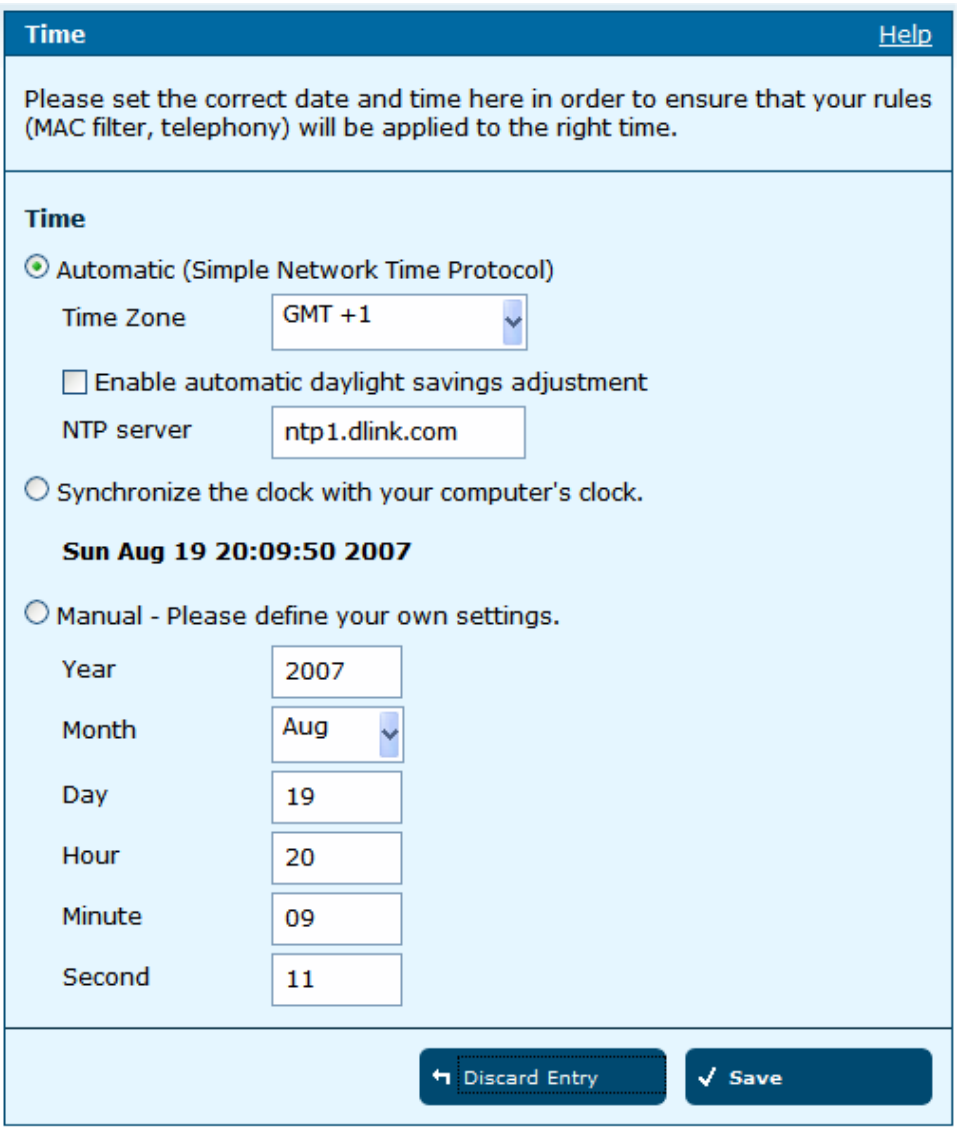


Figure 7.3: Time

To discard all recent entries click on DISCARD ENTRY. The option *Automatic* will (again) be activated.

7.2.1 Automatic (Simple Network Time Protocol)

Choose this option to synchronize date and time via a NTP server in the Internet. You may use the predefined NTP server ntp1.dlink.com or enter the name of another NTP server, e.g. ntp.dlink.com.tw.

Activate the option *Enable automatic daylight savings adjustment*, to let the HorstBox take care of daylight savings adjustments.

7.2.2 Synchronize the clock with your computer's clock

The recent date and time of your computer's clock is displayed. Activate this option to accept the values and synchronize the HorstBox with your computer.

7.2.3 Manual

Activate this option and enter the necessary values into the according field.

7.3 System Settings

All settings will be automatically saved to your HorstBox. There is no need to manually save or reboot. If you want to restart the device anyway, it is better done via the REBOOT.

7.3.1 Reboot

Click on REBOOT to reboot the HorstBox.

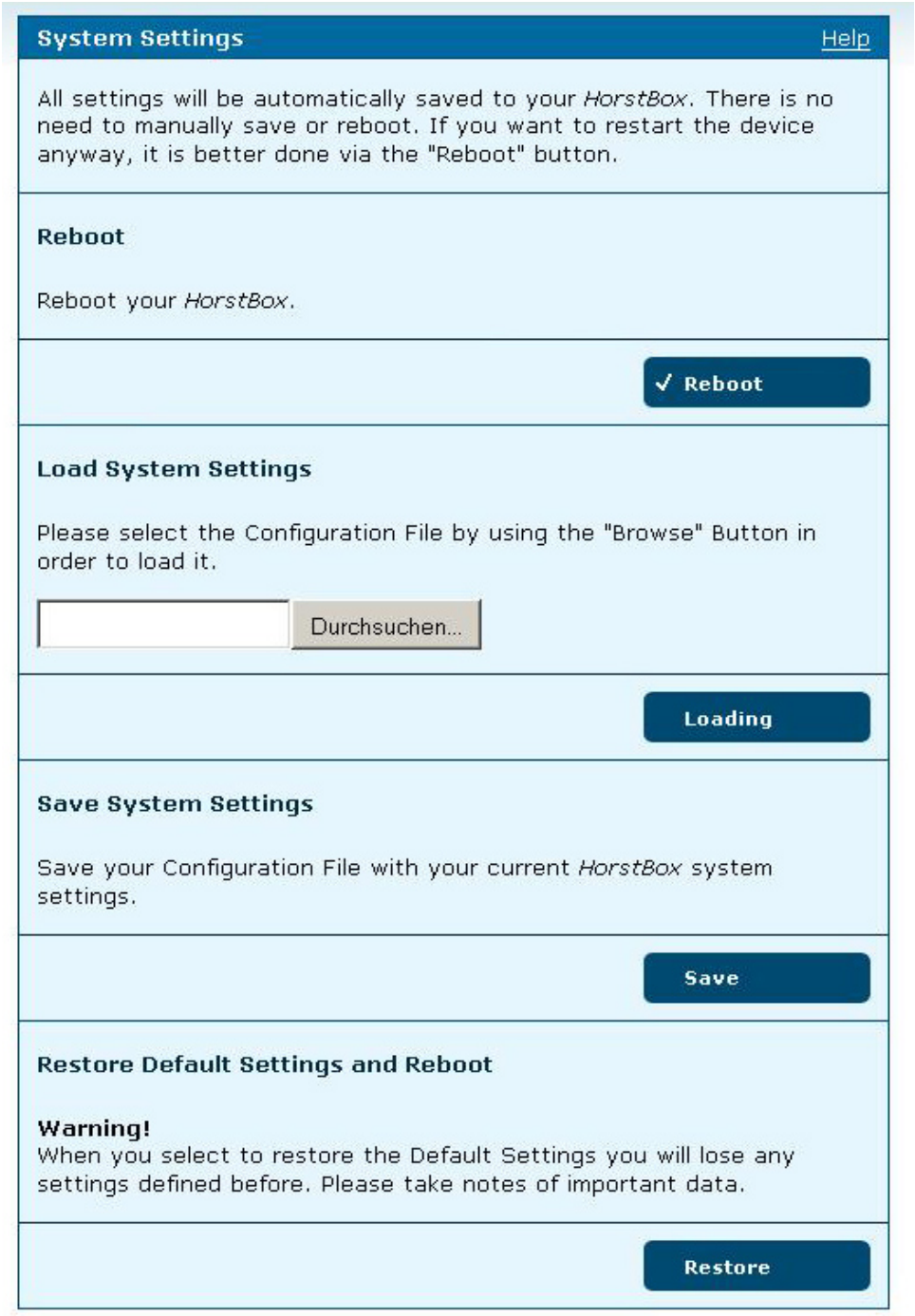


Figure 7.4: System settings

7.3.2 Load System Settings

You may want to restore the settings you saved before. To do so, click on CHOOSE and in the next dialog choose a configuration file. Click on OPEN.

To load the configuration file into the HorstBox, click on LOAD.

The HorstBox now checks the chosen configuration file. Please note: Only configuration files saved whilest using the same firmware version can be restored.

Next the device reboots twice and loads the configuration file. Please be patient as the procedure may take up to 2 minutes.

7.3.3 Save System Settings

You may save the current system settings of your HorstBox in a file on a hard disk (or another storage device). Use SAVE to specify where the configuration file should be saved.

7.3.4 Restore Default Settings And Reboot

Restore the default settings if the HorstBox does not work properly after an abortive configuration.

Click on RESTORE.

If the admin's password is lost you no longer can manage the HorstBox. You have to reset the HorstBox via the reset switch at the back of the device.

- Press the reset switch for about 10 seconds (see fig. below for details).
- Release the switch.
- The HorstBox will reboot. This may take some minutes.
- Once the reboot is finished all factory settings are restored.

The HorstBox will be reset to these values:

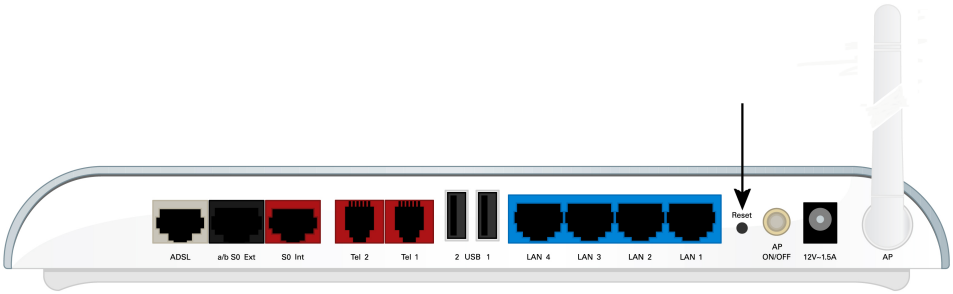


Figure 7.5: Back panel: Reset switch

- Default address: **http://horstbox**
- Default IP address: **http://192.168.0.1**
- Default user: **admin**
- Default password: **admin**

Note: When you select to restore the Default Settings you will lose any settings defined before. Take notes of all necessary settings before.

7.4 Firmware Update

For a manual firmware update you need to download a firmware file first. Please obtain this file from D-Link's Web-Site only!

For security reasons always update the firmware via an ethernet connection (cable) only.

In field INSTALLED VERSION the recent firmware version of your HorstBox is shown.

Locate Firmware File

Use SEARCH or BROWSE[1] to locate the new firmware file stored on your system. In the next dialog choose the firmware file. Click on OPEN.

[1]The name of the button may vary, depending on the browser used.

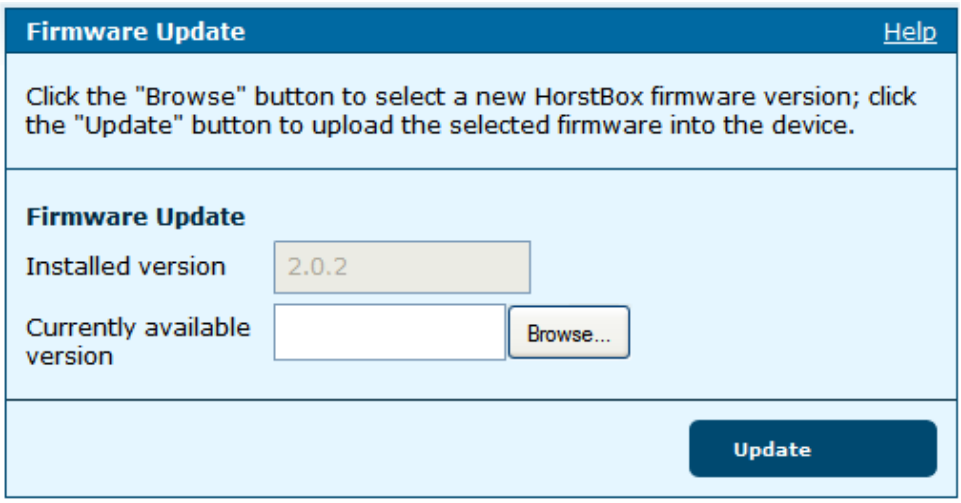


Figure 7.6: Firmware update

Update Firmware

To update the firmware, click on UPDATE. The HorstBox first verifies the file and then starts the update procedure. This may take some minutes.

Warning!
Never switch off the HorstBox during a firmware update.

Once the firmware update is finished, the HorstBox reboots to start the new firmware.

After the reboot login in as default user: **admin** with the default password: **admin**.

7.5 UPnP

UPnP (Universal Plug and Play) is based on a series of standard network protocols and file formats. Via UPnP various device, e.g. stereo system, router, printer, can be controlled, manufacturer spanning over an IP based network.

Due to the lack of authentication mechanisms, the usage of UPnP may impose security risks.

Default: The option *Activate UPnP* is deactivated.

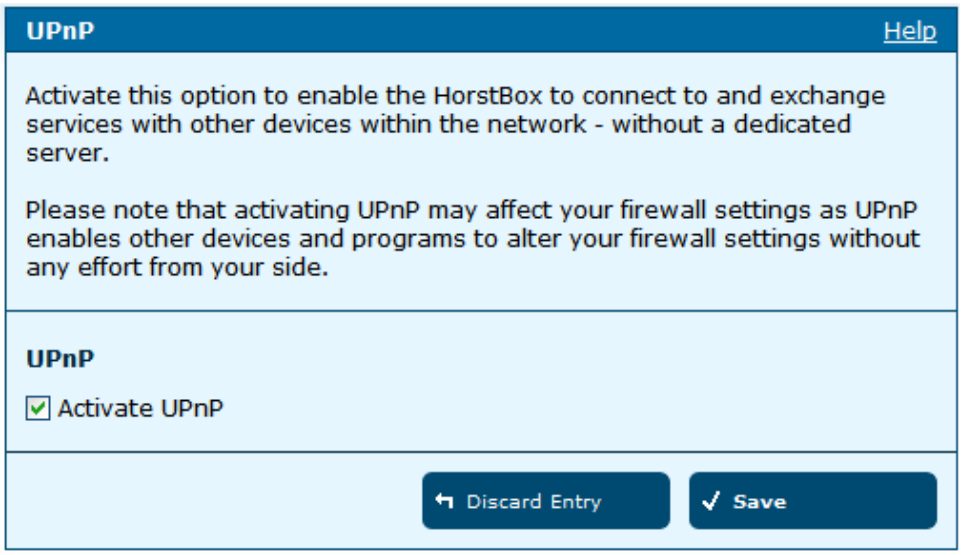


Figure 7.7: UPnP Settings

To use UPnP, activate the option *Activate UpnP*. To save the settings, click on SAVE.

The HorstBox now acts as an UPnP device in your network.

7.6 System Log

System Log stores internal system information. The messages may be helpful when trouble shooting.

Click on REFRESH to get the newest messages.

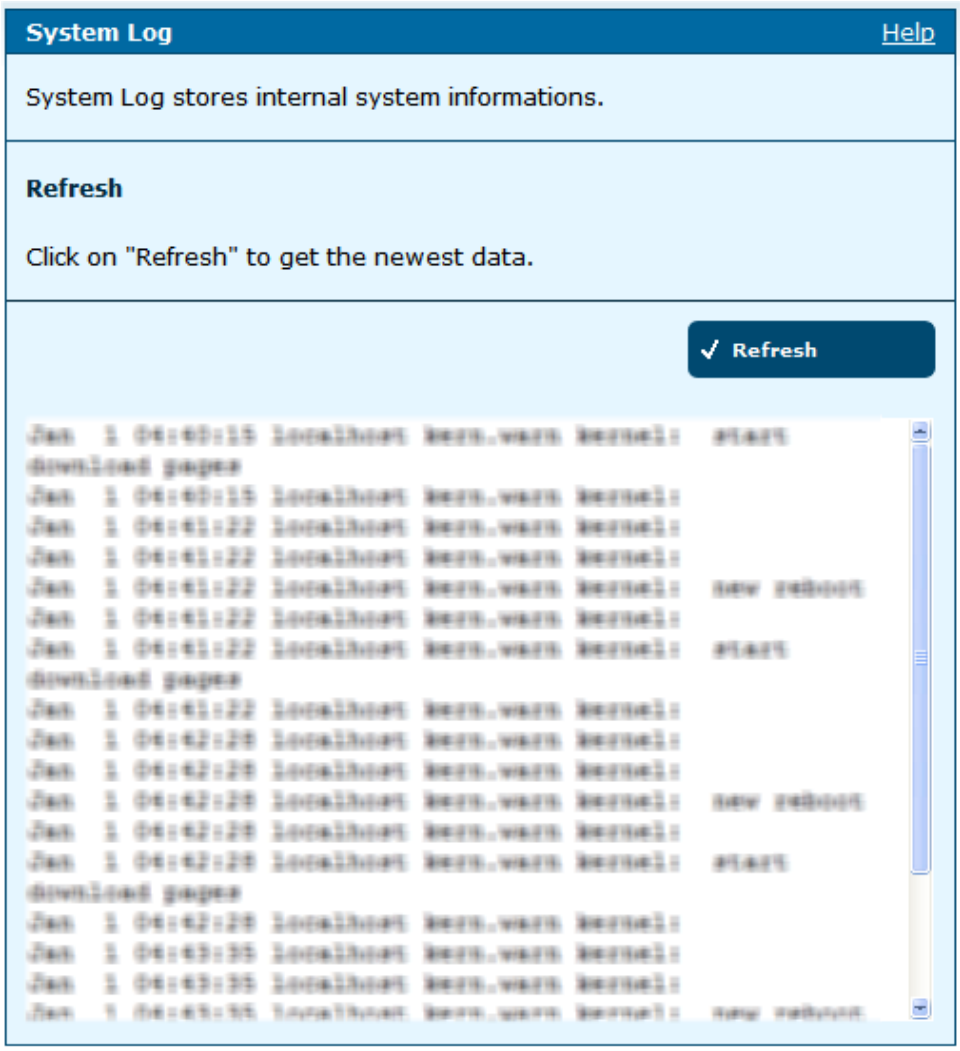


Figure 7.8: System log

7.7 Status

The page STATUS offers information about your HorstBox in four sections:

1. Internet: current connectivity status and external IP address;
2. Telephony: default accounts and devices;
3. Network: internal IP address, WLAN status, SSID and security settings;
4. System: current date and time, synchronization method and firmware version.

Click on REFRESH to get the newest data.

Note: To call up the status page, use the link STATUS (top right corner) or just click on the D-Link logo.

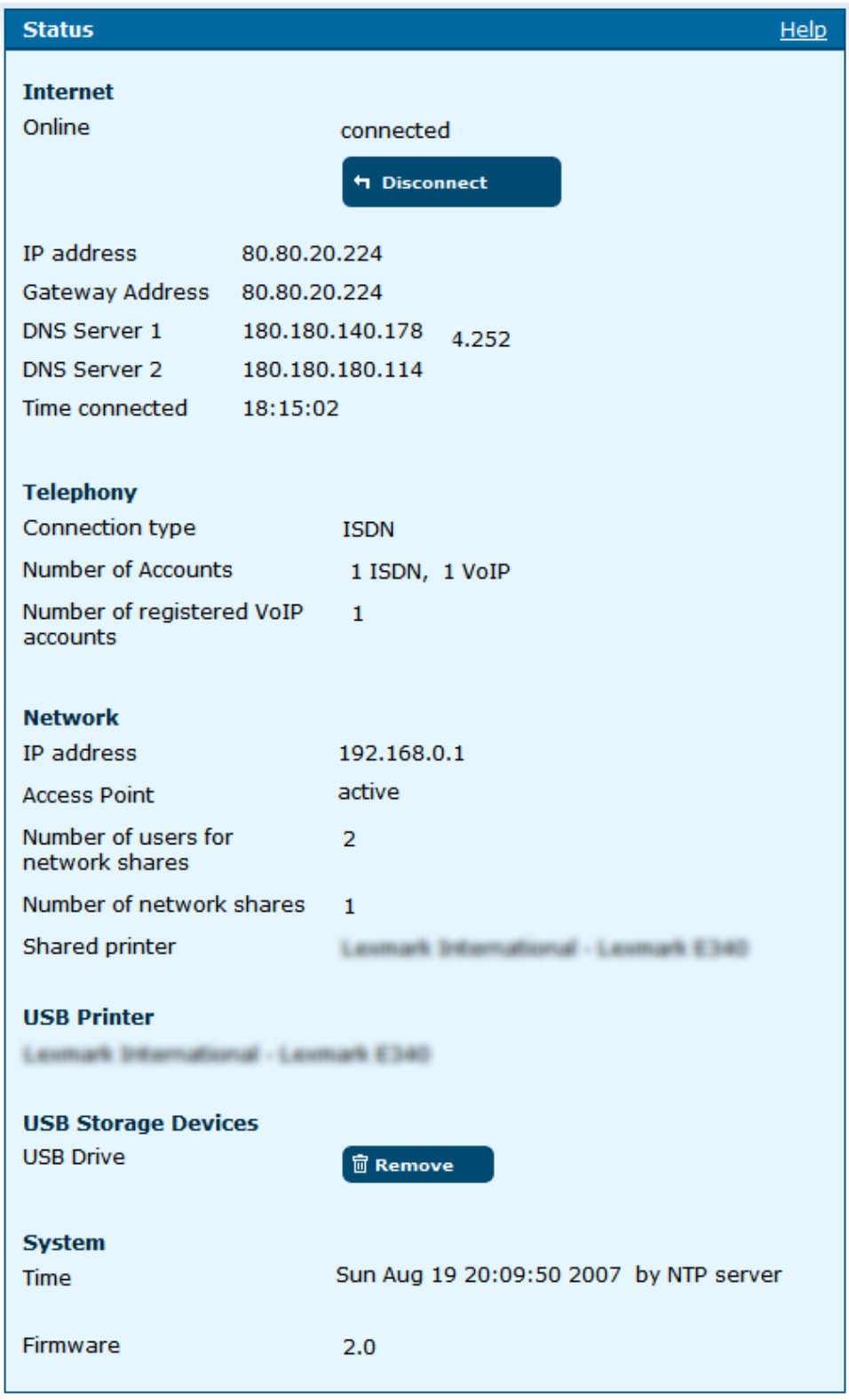


Figure 7.9: System status

8 Support

8.1 Wizard

The Wizard (see chapter 3 Wizard on p.27) guides you step-by-step through the configuration of the HorstBox.

8.2 Online Help

In the Online Help you can find some information about the settings on tabs and pages.

Clicking on the HELP tab opens an overview page of the Online Help. Choose a topic from the navigation column.

Figure 8.1: Online Help: Overview

On each page you find a link to the online help in the topic header line.

Figure 8.2: Link to Online Help on settings page

Clicking on the *Help* link on a single page will drop down the help topic for this page. Click on a header to get more information.

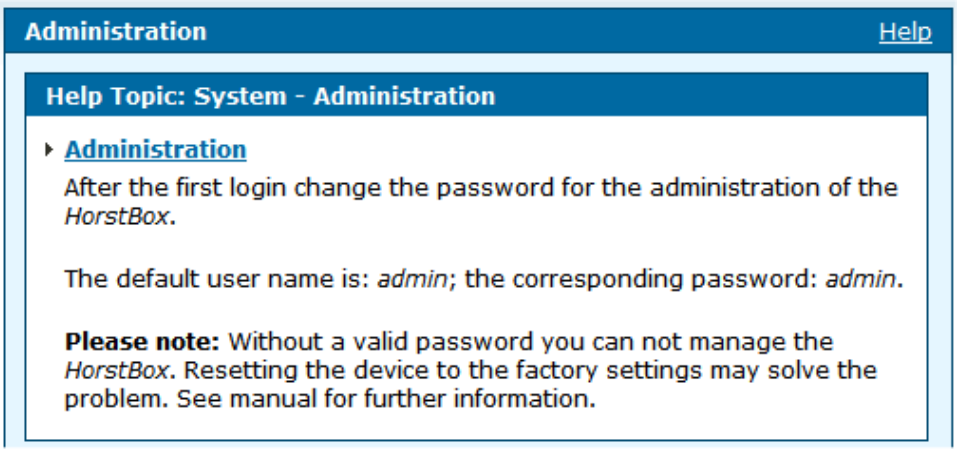


Figure 8.3: Online Help: Text extended

Start the Online Help on every page by clicking on the link *Help* in the top right corner of the text area (see fig.2.6 Graphical user interface on p.26).

8.3 The HorstBox on the Internet

More Information about the HorstBox on the Web-Site of D-Link: `http://www.dlink.eu/`.

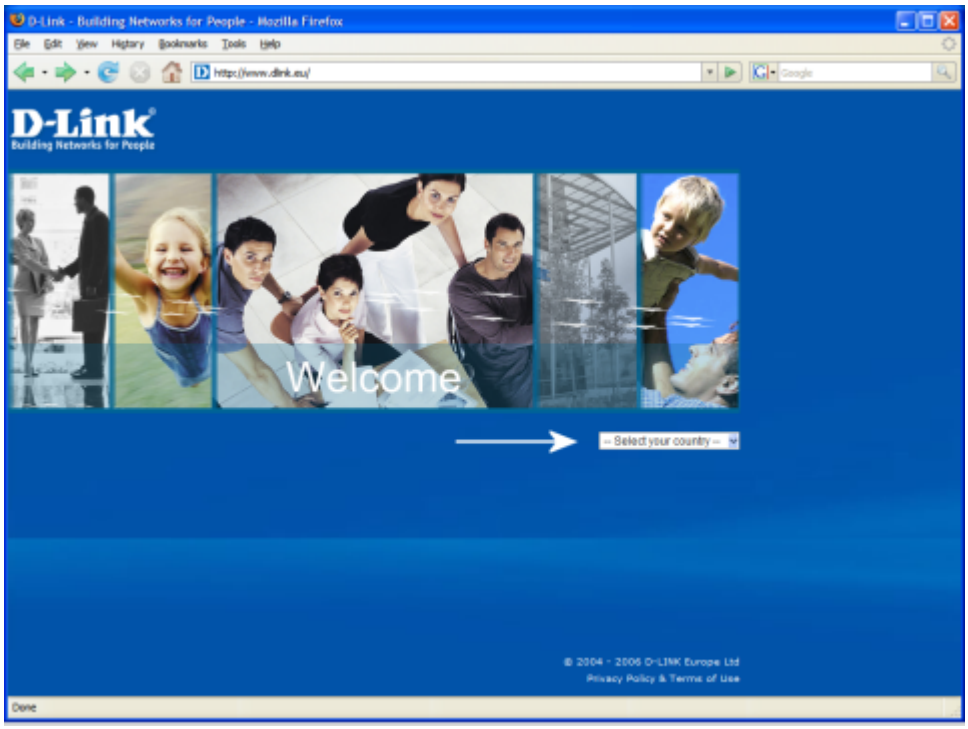


Figure 8.4: D-Link Web-Site

8.4 Special Settings

Special settings can be done in Expert Mode. Switch to expert mode first, select the desired tab and the desired area.

Note: In Basic Mode only the necessary settings are shown. For most users the settings made in basic mode will be sufficient.

Do change the settings for DSL access only if your ISP request these changes. Change the settings in small steps, one at a time, and observe the effects of these changes.

Note: Improper values may effect the performance of the HorstBox. Go back to the previous settings.

Restore the default settings if the HorstBox does not work properly after an abortive configuration or if the admin's passwort is lost. To reset the HorstBox use the reset switch at the back of the device.

- Press the reset switch for 10 seconds (see fig.2.2 Back panel on p.21 for details).
- Release the switch.
- The HorstBox will reboot. This may take some minutes.
- Once the reboot is finished all settings are restored.
- To change the settings start the user interface in a browser, default IP address: **http://horstbox**.
- Default user: **admin**
- Default password: **admin**

Note: When you restore the Default Settings, you will lose any settings defined before. Take notes of all necessary settings beforehand.

A Quick Guides and FAQs

This chapter offers some Quick Guides and Frequently Asked Questions (FAQs).

A.1 Internet Access

To enter access data open the page DSL CONNECTION on the tab INTERNET. If requested by your Internet Service Provider (ISP), you may change the settings for MTU, MRU, VPI and VCI in *Expert Mode*.

Note: Use only the values provided by your ISP. Do only change the following values if requested by your ISP. Choosing improper values may causes deterioration of performance and data transfer rate or no internet connectivity at all.

Changes only on value at once and control the behavior of the HorstBox afterwards.

A.2 How to Set Up an Analog Connection?

- Connect the black analog cable to the black connector "'a/b S0 Ext"' at your HorstBox. Connect the other end to the corresponding jack at the DSL splitter.
- Connect an analog phone to one of the analog ports (red) "Tel 1" or "Tel 2" on the HorstBox. Use the adaptor provided (left port, f-coded) and the cable of your telephone.
- Use the adaptor delivered (right port, f-coded).

- Open the configuration interface in a web browser, default IP address: **http://horstbox**.
- Change to the tab TELEPHONY.
- If necessary change to the page LINES AND ACCOUNTS.
- As *Main Line* choose *Analog* from the drop-down list *Line Type* and click on SAVE.
- Click on EDIT in the section *Analog Account / Existing Analog Account*.

  The HorstBox can administrate one analog account only.
- In the field NAME enter a name for the account, e.g. “Analog Account”.
- In the field PHONE NUMBER enter the number of your analog phone line.
- Click on SAVE.
- Change to the page PHONES AND DEVICES.
- In the section *Connected analog phones and devices* click on EDIT to next to choosen phone.
- The internal phone number (MSN) depends on the port (see backpanel) the phone is connected to. For analog phones the MSNs 11 and 12 are used.
- In the field NAME enter a name for the phone. Please choose unique phone names so the further administration of the HorstBox will become more comfortable.
- Choose *Default* and *Fallback account*
- Activate the desired comfort options (see 4.2.2 Comfort Options on p.59).
- Click on SAVE to save the settings/changes.

A.3 How to Set Up an ISDN Connection

- Connect the black ISDN cable to the black connector "a/b S0 Ext". Connect the other end to the corresponding connector/port at the NTBA.
- Connect the phone to the port "S_0 Int" on the HorstBox. Use the red phone cable (ISDN) provided. To connect more ISDN devices use an ISDN hub.
- Open the configuration interface in a web browser, default IP address: **http://horstbox**.
- Change to the tab TELEPHONY.
- If necessary change to the page LINES AND ACCOUNTS.
- As *Main Line* choose *ISDN* from the drop-down list *Line Type* and click on SAVE.
- In the section *ISDN Account* click on ASSIGN.
- In the field NAME enter a name for the phone. Please choose unique phone names so the further administration of the HorstBox will become more comfortable.
- In the field PHONE NUMBER enter the number (MSN) of your ISDN line.
- Click on SAVE.
- Change to the page PHONES AND DEVICES.
- In the section *ISDN Phones and Devices/Connected ISDN phones and devices* click on EDIT next to the choosen phone.
- The phone number depends on the phone choosen. For ISND phones the MSNs are 21 to 24 are used.
- In the field NAME enter a name for the phone. Please choose unique phone names so the further administration of the HorstBox will become more comfortable.
- Click on SAVE.
- Configure your ISDN phone to use at least on of the internal MSNs according to the phone's documentation.

A.3.1 Assigning MSNs

One ISDN devices may answer to several MSN (see next section). You have to set up the phone accordingly.

Please refer to the documentation of the phone. Setting up MSNs may vary for different phones.

Two or more ISDN devices may answer to the same MSN. Inbound calls for one MSN may ring on all phones configured.

Note: For internal calls use the internal MSNs (see A.4 How to make an internal call on p.162)

A.3.2 What is an external MSN?

MSN is short for Multiple Subcriber Number.

Via MSNs one ISDN line can be reached under different phone number. MSNs may be set up flexible to the devices. In Germany the number of MSNs for one ISDN line is restricted to 10.

Your telephone service provider informs you about your MSNs. Typically 3 MSNs will be assigned to one ISDN line.

On the tab TELEPHONY on the LINES AND ACCOUNTS enter one MSN for each account in the field PHONE NUMBER.

A.3.3 Check List 1: Installation of Phone Line

- Check whether NTBA and all devices are connected to their power supplies. Consult the connexion diagram.
- Check the terminators in the last ISDN port (2 x 100 Ohm).

Contact the service department of your telefone service provider or a specialized contractor the fault has not been found or eliminated.

A.3.4 Check List 2: Configuration of Devices

- Check all cables connected to the devices.
- Check whether NTBA and all devices are connected to their power supplies. If you want to connect more than 4 devices, the additional devices will need their own power supplies.
- Check the settings of the devices: D-channel protocol (DSS1) - MSN (in-/out-bound) - Service settings (e.g. in a PBX) - Depending on the device additional settings may be required, e.g. Password, software version, transmission protocol.

If the fault still remains, please contact manufacturer or distirbutor of the device.

A.4 How to make an internal call

For an internal call always dial [*][*] (asterix) as prefix.

Combination	Device	Connection / Internal MSN
[*][*][1][1]	Analog 1	Port 1
[*][*][1][2]	Analog 2	Port 2
[*][*][2][1] bis [2][4]	ISDN 1 – ISDN 4	MSN 21 – MSN 24

A.5 Why do I need Internal Phone Numbers?

Using internal phone numbers you may have calls to the internal phones free of charge.

A.6 How to make an External Call

Just dial the phone number you wish to call. The HorstBox handles the number entered according to the Dial Rules set up earliers (see 4.4 Dial Rules on p.69) and starts the call.

A.7 How to use Call-by-Call for National Calls

To use one Call-by-Call provider for every call, set up the HorstBox as follows:

- On the TELEPHONY change to the page DIAL RULES.
- In the section *Dial Rules* click on ADD.
- On the new page enter 0 (Zero) into the PREFIXES. This rule is valid for all calls to phone numbers beginning with 0.
- Activate the option *Always*.
- As rule activate the option *connect*.
- Leave the second field PREFIXES empty.
- In the field MODIFIER enter the prefix for the desired Call-by-Call provider.
- Click on SAVE.

You may define call rules for different prefixes and various Call-by-Call providers. To set up call rules to call mobile phone see A.8 How to Set Up Call-by-Call to Mobile Phones.

To set call rules for international calls proceed as described before. In the field PREFIXES enter the prefix for international calls.

A.8 How to Set Up Call-by-Call to Mobile Phones

To use Call-by-Call providers for international calls, set up the HorstBox as follows:

- On the TELEPHONY change to the page DIAL RULES.
- In the section *Dial Rules* click on ADD.
- On the new page enter 015 into the PREFIXES. This rule is valid for all calls to phone numbers beginning with 015.[1]
- Proceed for other prefixes accordingly.

common carrier	**Prefix**
T-Mobile	(0151*), 01511, 0160, 0170, 0171, 0175
Vodafone	(0152*), 01520, 0162, 0172, 0173, 0174
E-Plus	(0157*), 0163, 0177, 0178
O2	(0159*), 0176, 0179

* reserved, partially used already

- Activate the option *Always*.
- As rule activate the option *connect*.
- Leave the second field PREFIXES empty.
- In the field MODIFIER enter the prefix for the desired Call-by-Call provider.
- Click on SAVE.

[1] Unfortunately a call rule to filter 01 will filter phone numbers beginning with 0137, 0180x, 0190 as well.

A.9 How to Set Up Call-by-Call for Certain Time Periods

To use Call-by-Call providers for certain time periods, set up the HorstBox as follows:

- On the TELEPHONY change to the page DIAL RULES.
- In the section *Dial Rules* click on ADD.
- On the new page enter 0 (Zero) into the field PREFIXES for all non-local calls. Leave the field blank to use the call rule for all out-bound calls.
- Activate the option *for this time period*.
- Choose beginning and end of the time period in 5 minute intervalls.
- Choose the days of the week for the rule to apply.
- As rule activate the option *connect*.
- Leave the second field PREFIXES empty.
- In the field MODIFIER enter the prefix for the desired Call-by-Call provider.
- Click on SAVE.

A.10 How to Block Phone Numbers

To block phone numbers for out-bound calls, set up the HorstBox as follows:

- On the TELEPHONY change to the page DIAL RULES.
- In the section *Dial Rules* click on ADD.
- On the new page enter into the field PREFIXES the desired prefixes.
- Activate the option *Always*.
- As rule activate the option *block*.
- Click on SAVE.

A.11 How to Block 0900-Numbers

0900-numbers are Value Add Numbers. Beside the connection costs you have to pay additional for the service.

To block 0900-numbers, set up the HorstBox as follows:

- On the TELEPHONY change to the page DIAL RULES.
- In the section *Dial Rules* click on ADD.
- On the new page enter into the field PREFIXES 0900.
- Activate the option *Always*.
- As rule activate the option *block*.
- Click on SAVE.

A.12 How to Block International Calls

To block out-bound calls to international destinations, set up the HorstBox as follows:

- On the TELEPHONY change to the page DIAL RULES.
- In the section *Dial Rules* click on ADD.
- On the new page enter into the field PREFIXES 00.[2]
- Activate the option *Always*.
- As rule activate the option *block*.
- Click on SAVE.

[2] Please note: All international out-bound calls from Germany begin with 00.

A.13 Emergency Calls and Power Black-out

The HorstBox's lifeline support provides access to an analog line via an analog phone in times of electrical power outage.

Line Type	Phone	Calls possible
Analog	Analog	**Yes**
Analog	ISDN	no
ISDN	Analog	no
ISDN	ISDN	no

A.14 Power Supply for USB Devices

Is there a restriction for the power supply for USB devices?

Yes, each device is restricted to a maximum of 5V/500mA. You may want to use an external power supply instead.

B Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the HorstBox. For problems with your operating system please refer to the documentation provided.

Note: For security reasons configure the HorstBox via a network cable only. Do not use a WLAN connection.

B.1 GUI seems to be broken

Problem: Starting the user interface you see a broken gui with a red warning.

Solution: For security reasons *Javascript* is switched off in your browser.

To configure the HorstBox *Javascript* is mandatory. Activate *Javascript* in your browser. If possible, activate it just for the IP address of the HorstBox (Default IP address: **http://horstbox**).

B.2 No Access to User Interface

Check the power supply for the HorstBox. The *Power* LED should be on.

Check the LEDs for *LAN*. At least the port connected to the active computer should be on. Check whether the network cables are plugged in correctly.

Check whether the network card (NIC) is working.

Check the IP addresses and subnet masks. All IP addresses should belong to the same network segment, e.g. 192.168.0.x.

Note: Default IP address: **http://horstbox**

Two computers in a LAN using the same IP address will interfere each another and disturb the network traffic.

Try to ping all computers in your network.

Note: If the IP address of the HorstBox was changed, please ping the new IP address.

B.3 No Connection to Internet in Infrastructure Mode

Check the IP address of the WLAN client(s). Check IP address and subnet mask of the access point. All IP addresses must belong to the same network segment, e.g. 192.168.0.x

Check that the WLAN client connects to the right access point and the desired WLAN.

Note: Default IP address: **http://horstbox**

For how to set up a WLAN device to use a static IP address, please refer to the documentation of the device.

When using a DNS server do not forget to enter the IP address of the default gateway. You may use the HorstBox as a DHCP server and assign IP addresses for the devices automatically.

Check router, default gateway and DNS server by sending ping commands. Please refer to the documentation provided by your ISP for the necessary IP addresses.

B.4 No Wireless Connectivity

Using D-Link (WLAN) products enables you to access your LAN and the Internet from almost any place. Please read the section 1.2 Installation Considerations on p.13 and learn how to

avoid certain circumstances that may lead to the loss of wireless connectivity.

B.4.1 How To Avoid Wireless Connectivity Losses

Reposition the antenna of the HorstBox. Keep at least a distance of 15cm to the next wall or big objects.

If you are using 2.4GHz cordless phones, X-10 equipment or other home security systems, ceiling fans, and lights, your wireless connection will degrade dramatically or drop altogether. Try changing the channel on your HorstBox, access point and wireless adapter to a different channel to avoid interference.

Keep your HorstBox at least 1-2 meters (3-6 feet) away from electrical devices that generate RF noise, like microwaves, monitors, electric motors, etc.

B.4.2 Distance Issues

- Move the HorstBox and WLAN device into the same room and then test the wireless connection.
- Change the channels.
- Move the WLAN devices within the line of sight of the HorstBox.

B.4.3 Encryption

If you have enabled encryption on the HorstBox, you must also enable encryption on all wireless devices in the network in order to establish a wireless connection.

- The encryption settings are: 64-, 128- or 152-bit. Make sure that the encryption bit level is the same on the HorstBox and the WLAN client.
- Make sure that the SSID of the HorstBox and the WLAN device are exactly the same. If they are not, wireless connection will not be established.

B.4.4 Check WLAN Connection

- Make sure that the SSID on the HorstBox is exactly the same as the SSID on the WLAN device.
- Move the HorstBox and the WLAN device into the same room and then test the wireless connection.
- Disable all security settings. (WEP, WPA, MAC Address Control)
- Turn off your HorstBox and the WLAN device.
- Turn on the HorstBox, and then turn on the WLAN device.

B.4.5 Check Mode

- Check that all devices operate in *Infrastructure mode*.
- Check for correct IP address, subnet mask and gateway settings.

B.5 Key Lost For Encryption

Reset the HorstBox to its factory default settings (See section 7.3.4 Restore Default Settings And Reboot on p.147). Reset the WLAN device(s) to the default settings.

Note: When you select to restore the Default Settings you will lose any settings defined before. Take notes of all necessary settings before.

B.6 An Analog Phone Does Not Work

Problem: An analog phone is connected to the HorstBox, but the functional test of the Wizard produces neither ringing, nor the voice message.

Solution: Some analog phones or answering machines come with their own set of cables, because the pins inside the sockets are non-standard.

Use the adaptor (RJ11 plug to TAE sockets) provided to connect the original cable to the HorstBox.

B.7 No Change to Basic or Expert Mode

Problem: After changing the Internet access type to *LAN* the link to change to basic mode disappered.

Solution: The Internet access type *LAN* is only available in expert mode. So no change to basic mode is necessary.

To restore to basic mode, first change the Internet acces type to *DSL*.

B.8 Electrical Power Outage and Emergency Calls

The HorstBox's lifeline support provides access to an analog line via an analog phone in times of electrical power outage.

Line Type	Phone Type	Calls Possible
Analog	Analog	Yes
Analog	ISDN	No
ISDN	Analog	No
ISDN	ISDN	No

B.9 Username and Passwords

Please note: Usernames and passwords may have to be entered case sensitive.

1&1	
Username:	1und1/username@online.de or username@onlinehome.de
Password:	1&1 password
Alice	
Username:	username@hansenet.de
Password:	Alice password
Note: Mostly the username correlates to the Alice phone number. Any bandwidth higher than 2000 requires “high” as prefix, e.g. DSL 6000: high123456789 For some accounts no password is required. In those cases enter “alice” into the password field.	
AOL	
Username:	AOLName@de.aol.com
Password:	AOL password
AON	
Username:	user id
Password:	AON password
Arcor	
Username:	dsl.arcor/username or username@arcor.de or just: user id
Password:	Arcor password
Bluewin	
Username:	username@bluewin.ch
Password:	Bluewin password
Congster	
Username:	dsl/customer_number@congster.de
Password:	Congster password

Freenet	
Username:	Realm/userername
Password:	PIN + password
GMX	
Username:	GMX/kaxxxx-xxx@online.de
Password:	GMX password
Hansenet	
Username:	username
Password:	Hansenet password
Inode	
Username:	user id
Password:	Inode password
Lycos	
Username:	flatrate/12345678910-username@lycos.de or lycos/12345678910-username@lycos.de
Password:	Lycos password
M-Net	
Username:	user id
Password:	M-Net password
Netcologne	
Username:	nc-user@netcologne.de
Password:	Netcologne password
Sunrise	
Username:	username@adslpls.ch
Password:	Sunrise password
T-Com	
Username:	t-online-com/username@t-online-com.de
Password:	T-Com password
Tiscali	
Username:	tiscali/userername or usernamen@tiscali.de
Password:	Tiscali password

Tiscali Business	
Username:	flatrate/user id@tiscali.de
Password:	Tiscali password
T-Online	
Username:	account id_T-Onlinenumber#0001@t-online.de
Password:	T-Online password
Web.de	
Username:	web.de:dsl/xxxx-xxxx-xxxx
Password:	Web.de password

Table B.2: Usernames and Passwords

No guarantee. Please refer to the login details provided by your ISP.

C Specification, Product Warranty, Technical Support

C.1 Specification: Hard- and Software

Hard- and Software

WAN
- ADSL, ADSL2, ADSL2+
- Downstream: up to 24 MBit/s
- Upstream : up to 1 MBit/s
- Standards:

- ANSI T1.413 Issue 2
- ITU G.992.1 (G.dmt) Annex B
- ITU G.992.2 (G.lite) Annex B
- ITU G.994.1 (G.hs)
- ITU G.992.3 (G.dmt.bis) Annex B
- ITU G.992.4 (G.lite.bis) Annex B
- ITU G.992.5 Annex B
- IEEE 802.3
- IEEE 802.3u

LAN
- 4 Port 10/100 MBits/s
- MDI/MDX Auto sensing

WLAN AP Functions
- ESS-ID
- MAC Address Filter
- IEEE 802.1x
- IEEE 802.11b
- IEEE 802.11g

Routing
- IPv4:

- TCP/UDP
- ARP
- ICMP
- IP Routing:

- RIP v1*
- RIP v2*
- IP Static Routing*
- DHCP: Server & Client
- DNS

USB
- 2x USB 2.0

Security
- Filtering
- DOS Protection
- ESS-ID
- QoS

WLAN
- 54 Mbit WLAN
- WEP
- WPA & WPA2

Voice Features/Codecs
- G.711 (a-Law, μ-Law)
- Fax Relay via G.711
- G.726
- G.168 (Echo Canceller)
- T.38 (Fax over IP)*

NAT
- NAT/NAPT
- Port Forwarding
- NAT ALGs
- VPN Passthrough
- DMZ

Configuration/Management
- WEB-based Management
- HTTP
- Backup/Restore of Configuration
- Factory Reset
- UPnP 1.0
- TR069*
- TR104*

* Available after firmware update.

Table C.1: Specification: Hard- and Software

C.2 Specification: Telephony Functions

Telephony Functions		
● Phone Numbers Configuration	● Define Call Rules for Phone Numbers, Time, Costs (LCR)	● Call Waiting
● Call Transfer:		● 3-Way-Calling
- at once	● CLIP	● Hold, Call Back
- no answer	(CLIP)	● CLIR
- busy	● Pick Up	● Call Paging

Table C.2: Spezifikation: Telefonie-Funktionen

C.3 Specification: Security/Emission

Security/Emission		
● UL1950	● IEC60950	● EN60950
● CE Class B	● UR-2	● EMC Specification

Table C.3: Specification: Security/Emission

C.4 Technical Data

Environmental
● Operating temperature: 0°C to 40°C
● Storage temperature: -20°C to 70°C
● Humidity: 5% to 95% non-condensing

Table C.4: Technical Data

Note:

Service Level: May 2007
Product specifications are subject to change without notice.
D-Link is a registered trademark of D-Link Corporation/D-Link System Inc..
Other trademarks are the property of their respective owners.

D D-LINK Limited Product Warranty

General Terms

Nothing in this Limited Product Warranty affects your statutory rights as a consumer.

The Limited Product Warranty set forth below is given by D-LINK (Europe) Ltd. (herein referred to as "D-LINK"). This Limited Product Warranty is only effective upon presentation of the proof of purchase. Upon further request by D-LINK, this warranty card has to be presented, too.

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OTHER RIGHTS THAT MAY VARY FROM STATE TO STATE OR FROM COUNTRY TO COUNTRY. YOU ARE ADVISED TO CONSULT APPLICABLE STATE OR COUNTRY LAWS FOR A FULL DETERMINATION OF YOUR RIGHTS.

This Limited Product Warranty applies to D-LINK branded hardware products (collectively referred to as "`D-LINK Hardware Products") sold by D-LINK (Europe) Ltd., its worldwide subsidiaries, affiliates, authorized resellers, or country distributors (collectively referred to as "D-LINK Resellers") with this Limited Product Warranty. The term "D-LINK Hardware Product" is limited to the hardware components and all its internal components including firmware. The term "D-LINK Hardware Product" DOES NOT include any software applications or programs.

Geographical Scope of the Limited Product Warranty

This Limited Product Warranty is applicable to Hardware Products sold by D-Link Resellers in all European Countries as listed in the addendum "European Countries for D-LINK Limited Product Warranty". The term "European Countries" in this D-LINK Limited Product Warranty only includes the countries as listed in this addendum. The Limited Product Warranty will be honored in any country where D-LINK or its authorized service providers offer warranty service subject to the terms and conditions set forth in this Limited Product Warranty. However, warranty service availability and response times may vary from country to country and may also be subject to registration requirements.

Limitation of Product Warranty

D-LINK warrants that the products described below under normal use are free from material defects in materials and workmanship during the Limited Product Warranty Period set forth below ("Limited Product Warranty Period"), if the product is used and serviced in accordance with the user manual and other documentation provided to the purchaser at the time of purchase (or as amended from time to time). D-LINK does not warrant that the products will operate uninterrupted or error-free or that all deficiencies, errors, defects or non-conformities will be corrected.

This warranty shall not apply to problems resulting from: (a) unauthorised alterations or attachments; (b) negligence, abuse or misuse, including failure to operate the product in accordance with specifications or interface requirements; (c) improper handling; (d) failure of goods or services not obtained from D-LINK or not subject to a then-effective D-LINK warranty or maintenance agreement;

(e) improper use or storage; or (f) fire, water, acts of God or other catastrophic events. This warranty shall also not apply to any particular product if any D-LINK serial number has been removed or defaced in any way.

D-LINK IS NOT RESPONSIBLE FOR DAMAGE THAT OCCURS AS A RESULT OF YOUR FAILURE TO FOLLOW THE INSTRUCTIONS FOR THE D-LINK HARDWARE PRODUCT.

Limited Product Warranty Period

The Limited Product Warranty Period starts on the date of purchase from D-LINK. Your dated sales or delivery receipt, showing the date of purchase of the product, is your proof of the purchase date. You may be required to provide proof of purchase as a condition of receiving warranty service. You are entitled to warranty service according to the terms and conditions of this document if a repair to your D-LINK branded hardware is required within the Limited Product Warranty Period.

This Limited Product Warranty extends only to the original end-user purchaser of this D-LINK Hardware Product and is not transferable to anyone who obtains ownership of the D-LINK Hardware Product from the original end-user purchaser.

Performance of the Limited Product Warranty

If a product defect occurs, D-LINK's sole obligation shall be to repair or replace any defective D-Link Hardware Product free of charge to the original purchaser provided it is returned to an Authorized D-LINK Service Center during the Limited Warranty Period. Such repair or replacement will be rendered by D-LINK at an Authorized D-LINK Service Center. All component parts or hardware products that are replaced under this Limited Product Warranty become the property of D-LINK. The replacement part or product takes on the **remaining** Limited Warranty Period of the replaced part or product. The replacement product need not be new or of an identical make, model or part; D-LINK may in its discretion replace the defective product (or any part thereof) with any reconditioned equivalent (or superior) product in all material respects to the defective product.

Version level: Warranty Guide_v13a

Warrantor

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European Countries for D-LINK Limited Product Warranty

Albania	Andorra	Austria	Belarus
Belgium	Bosnia Herzegovina	Bulgaria	Croatia
Cyprus	Czech Republic	Denmark	Germany
Estonia	Finland	France	Greece
Great Britain	Hungary	Iceland	Italy
Latvia	Liechtenstein	Lithuania	Luxembourg
Malta	Macedonia	Moldova	Monaco
Netherlands	Norway	Poland	Portugal
Romania	Russia	San Marino	Serbia and Montenegro
Slovakia	Spain	Sweden	Switzerland
Turkey	Ukraine	Vatican	

Product Warranty Period Table

The warranty period stated in this Table supersedes and replaces the warranty period as stated in the user's manual for the relevant products.

Where products were purchased before 1 April 2007 please refer to footnotes in the table.

Product Type	Product Warranty Period
(where a '**Product Type**' is discontinued during the '**Product Warranty Period**' identified below, the Product Warranty Period shall be a maximum of two (2) years after the date of discontinuation.)	
Wireless Routers and Adapters with Built-in IEEE 802.11n Technology (excluding power supplies, internal fans and accessories) [4]	Eleven (11) years
Smart Switches (excluding external power supplies, internal fans and accessories) [1] Managed Switches (i.e. switches with built in SNMP agent, including modules and management software but excluding external power supplies, internal fans and accessories) Business Wireless Products (i.e. wireless switch family, outdoor wireless, metal chassis access points) (excluding external power supplies, internal fans and accessories) [1] Firewall Security Appliances (excluding external power supplies, internal fans and accessories) **DVA-G3342SD/DE** (HorstBox) [2]	Five (5) years
All other products (excluding external power supplies, internal fans and accessories) [3]	Two (2) years
External power supplies, internal fans, adapters and accessories	One (1) year

Footnotes:

[1] All products within this category sold in European Countries by D-LINK Resellers from 1st January 2004 to 31st October 2006 carry 2 years warranty and those sold in any other period will carry 5 years warranty.

[2] All products within this category sold in European Countries by D-LINK Resellers prior to 1 April 2007 carry 2 years warranty.

[3] All products within this category sold in European Countries by D-LINK Resellers after 1st January 2004 carry 2 years warranty and those sold before 1st January 2004 carry 5 years warranty.

[4] All products within this category sold in European Countries by D-LINK Resellers carry 11 years warranty.

E Technical Support

For technical support, updated documentation and recent firmware please visit D-Link's Web-Site in the Internet: http://www.dlink.eu/.

In the drop-down list select your country to be transfer to your national D-Link Web-Site.

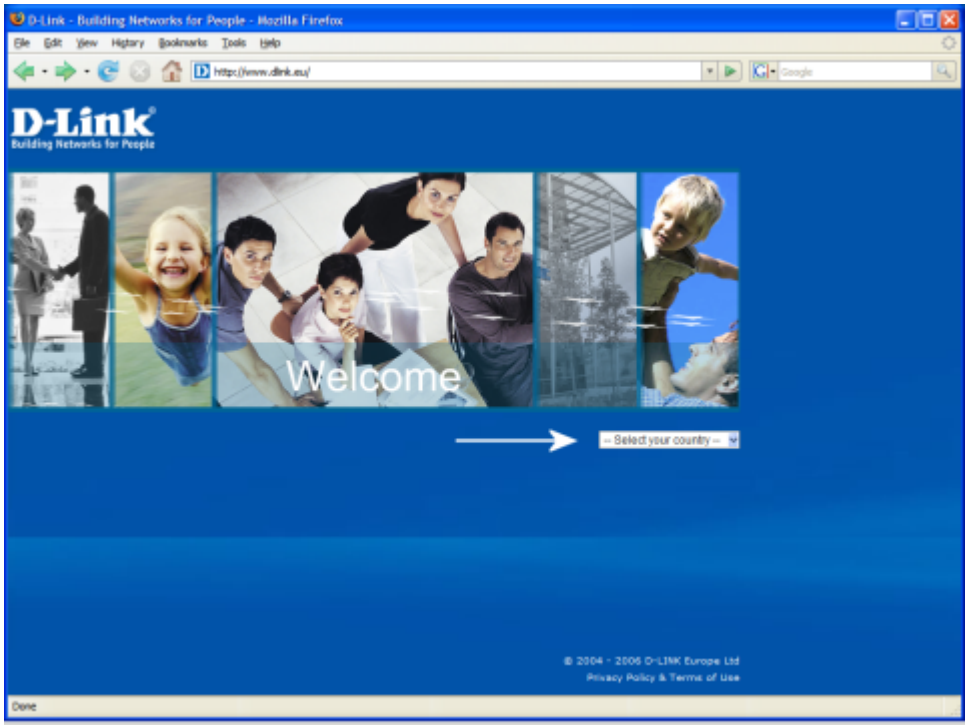

Figure E.1: http://www.dlink.eu/

To request technical support you need to have the following information ready:

- Model or Product name
- Serial number of device
- Firmware version
- Software type / Version number
- Hardware revision number
- Date of purchase

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