# FRITZ!Box 5490

## Configuration and Operation

# Table of Contents

# Safety Instructions

Before connecting the FRITZ!Box 5490, observe the following security instructions in order to protect yourself and the FRITZ!Box from harm.

- The FRITZ!Box has no on/off switch. Therefore it must always be possible to disconnect the FRITZ!Box from the power supply.
  - Insert the power supply unit of the FRITZ!Box into an electrical outlet that is easy to reach.
- Overloaded outlets, extension cords and power strips can lead to fires or electric shocks.
  - Avoid using socket strips and extension cords if at all possible.
  - Do not connect multiple extension cords or socket strips to each other.
- Damage to electric wiring or gas or water pipes during drilling can present a significant danger.
  - Before mounting the FRITZ!Box on the wall, make sure that there are **no** electrical lines, gas or water pipes located where you need to drill the holes. If necessary, check the site with a pipe detector or consult with qualified experts.
- Heat accumulation can lead to overheating of the FRITZ!Box and subsequently damage the FRITZ!Box.
  - Provide for sufficient air circulation around the FRITZ!Box.
  - Make sure that the ventilation slits on the FRITZ!Box housing are always unobstructed.
  - The FRITZ!Box should not be placed on a carpet or on upholstered furniture.
  - Do not cover the FRITZ!Box.

- The base of the FRITZ!Box can heat up during normal operation. This heat can cause damage to heat-sensitive surfaces.
  - Do not place the FRITZ!Box on heat-sensitive surfaces.
- During electrical storms, lightning and electrical surges present a danger to connected electrical devices.
  - Do **not** install the FRITZ!Box during an electrical storm.
- Moisture and liquids that find their way into the FRITZ!Box can cause electric shocks or short circuits.
  - Only use the FRITZ!Box indoors.
  - Never let liquids get inside the FRITZ!Box.
- The FRITZ!Box contains hazardous components and should only be opened by authorized repair technicians.
  - Do not open the FRITZ!Box housing.
  - If the FRITZ!Box needs to be repaired, please take it to a specialized vendor.
- Dust, moisture and vapors as well as caustic cleaners or solvents can damage the FRITZ!Box.
  - Protect the FRITZ!Box from dust, moisture and fumes.
  - Remove FRITZ!Box from the mains before cleaning.
  - Clean the FRITZ!Box with a slightly moist, lint-free cloth.

# Conventions in the Manual

This manual uses the following symbols and emphases:

This symbol marks useful hints and tips.

This symbol indicates important instructions that must be observed to avoid malfunctions.

- Quotation marks designate elements and features in the user interface and paths.

  **Example**

  Select “System / Push Service” and click “Sender”.

- Pointed brackets mark wild cards.

  **Example**

  To edit the device called ‹Name›, click the “Edit”button.

- Bold type in the text emphasizes important words.

  **Example**

  Do **not** leave the page without saving.

- Blue font in the text designates links and references within this manual and addresses to be entered in the browser.

  **Example**

  See also the information on page 10.

# 1 The FRITZ!Box 5490

Welcome! We are pleased you decided on a FRITZ!Box. The FRITZ!Box 5490 is the hub of your home network, connecting your computers and network devices with the Internet. You can operate the FRITZ!Box as an Internet router directly at the fiber optic connection.

The FRITZ!Box is equipped with ports for computers, telephones and USB devices and supports the wireless technologies wireless LAN (WiFi) and DECT. You can use the FRITZ!Box as a wireless LAN access point for wireless devices like notebooks, tablets or smartphones and as a DECT base station for your cordless telephones.

Connected telephones use the FRITZ!Box as a telephone system (PBX).

The FRITZ!Box integrates connected computers and network devices into your private home network. The devices can exchange data with each other and enjoy shared access to USB hard drives, USB printers and other USB devices. The FRITZ!Box transmits music, video and image files to suitable playback devices in the home network.

You can expand the scope of functions of your FRITZ!Box with AVM smart home devices for home automation.

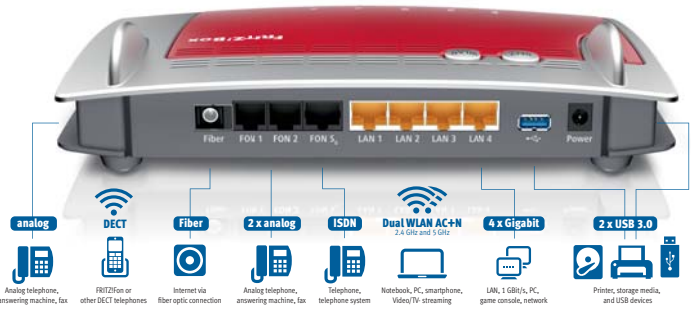
Settings for the FRITZ!Box and for your private network are configured in an easy-to-use user interface. The user interface can be opened in any web browser. Wizards guide you step by step through the setup of the most important FRITZ!Box functions, and comprehensive Help is available on all functions.

This manual assists you in connecting, configuring and operating your FRITZ!Box. Its purpose is not only to introduce to you the many functions of the FRITZ!Box, but also to familiarize you with some of the technical context.

# 2 Ports, Interfaces, Buttons and LEDs

This chapter describes the ports, interfaces, buttons and LEDs of the FRITZ!Box.

## 2.1 Ports and Interfaces




Possibilities for connecting the FRITZ!Box

- Socket for connecting with the fiber optic connection
- **FON 1 and FON 2**

  2 TAE sockets and 2 RJ11 sockets for connecting analog telephones and other analog terminal devices

  You can connect one line to each of the sockets FON 1 and FON 2. This means you can connect a total of two analog telephones.
- **FON $S_0$**

  RJ45 socket for connecting ISDN telephones or telephone systems (PBXs)
- **LAN 1—LAN 4**

  4 gigabit Ethernet ports (10/100/1000 Base-T) for connecting computers and other network devices like game consoles and network hubs

- **USB**

  2 USB 3.0 ports for connecting USB devices like printers or storage media

- **Wireless access point**

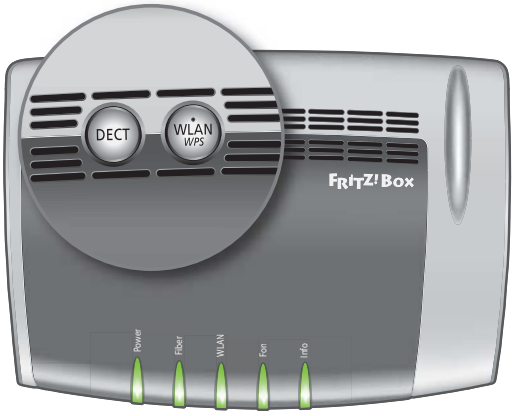
  Integrated wireless access point for connecting to wireless LAN devices that use the radio standard IEEE 802.11a, IEEE 802.11b, IEEE 802.11g or IEEE 802.11n (in the 2.4- or 5-GHz frequency band) or IEEE 802.11ac

- **DECT base station**

  Integrated DECT base station for connecting up to 6 cordless telephones that use the DECT standard

## 2.2 Buttons

The FRITZ!Box has two buttons on the top of the housing.




FRITZ!Box buttons

## Button Functions

### “WLAN” Button

- Switches wireless LAN on and off
- Establishes a wireless LAN connection using WPS, see Establishing a Wireless LAN Connection Using WPS from page 27

### “DECT” Button

- Registers cordless telephones, see page 47
- Pages cordless telephones, see page 119

## Locking the Buttons on the FRITZ!Box

You can lock the buttons on the FRITZ!Box. Locking the buttons prevents the settings for your FRITZ!Box or your home network from being changed unintentionally or without authorization.

**Example**

With the “WLAN” button the wireless network of the FRITZ!Box can be switched off at the touch of a button. If this happens by accident, in some cases it may take some time before the cause is found and the wireless LAN radio network can be restored to all FRITZ!Box users in the home network.

The button lock is configured in the FRITZ!Box user interface, under “System / Buttons and LEDs” on the “Keylock” tab.

## 2.3 LEDs

The FRITZ!Box 5490 has five LEDs, which flash or light up to display various connection statuses and events.

For the “Info” LED you can assign any event desired in addition to the preset events. For more information, read Assigning Any Event to the “Info” LED on page 16.

### Meaning of the LEDs

| LED | Condition | Meaning |
|---|---|---|
| Power | on | • Device has electrical power, FRITZ!Box is ready for operation |
| Fiber | on | An Internet connection is active |
| WLAN | on | Wireless LAN function is enabled |
| | flashing | • Adopting the wireless LAN settings<br>• Switches the radio network on or off<br>• Performing WPS |
| Fon | on | A telephone connection is active |
| | flashing | Voice messages are waiting in the network |
| Info | on | • Displays an event specified in the user interface under “System / Buttons and LEDs / “Info” Display”<br>• Stick & Surf procedure with FRITZ!WLAN USB Stick from AVM concluded |
| | flashing | • Updating FRITZ!OS<br>• New messages are available on the FRITZ!Box answering machine<br>• Signals an event specified in the user interface under “System / Buttons and LEDs / “Info” Display”.<br>• Stick & Surf procedure with FRITZ!WLAN USB Stick from AVM in progress |
| | flashing red | Error:<br>• Open the FRITZ!Box user interface.<br>• Follow the instructions on the “Overview” page in the user interface |

## Assigning Any Event to the “Info” LED

The “Info” LED on the upper panel of the FRITZ!Box signals various events. Some events for which the “Info” LED flashes or lights up are preset in the Info. You also have the option of assigning any other event to the “Info” LED.

1. Open the FRITZ!Box user interface.
2. Under “System / Buttons and LEDs”, click the ““Info” Display” tab.
3. In the “Freely Selectable Options” area, select from the list the additional event which is to be assigned to the LED.
4. Then click the “Apply” button.

The “Info” LED now flashes not only for the preset events, but also for the event you selected.

# 3 Before You Connect the FRITZ!Box

- Read the security instructions on page 8.
- Check the contents of your FRITZ!Box package. The contents are described on page 17.
- Make sure that the requirements for operating the FRITZ!Box have been met; see page 17.
- Read the handling instructions for your FRITZ!Box on page 18.
- Note the tips for password on page 19.

## 3.1 Contents of the FRITZ!Box Package

- FRITZ!Box 5490
- one power supply unit
- one network cable
- one quick guide
- one FRITZ! Notice

## 3.2 Requirements for Operation

In order to operate the FRITZ!Box, you must have the following:

- an up-to-date web browser

  Some of the FRITZ!Box functions can be used only with a web browser that supports HTML5, for instance Firefox version 35 or higher, Internet Explorer version 10 or higher, or Google Chrome version 40 or higher.

- a fiber optic connection
- for the wireless LAN connection to tablets, smartphones and computers:

  Tablets, smartphones or computers that support wireless LAN compliant with IEEE 802.11ac, IEEE 802.11n, IEEE 802.11g, IEEE 802.11a, or IEEE 802.11b.

Computers that do not have wireless LAN integrated can be equipped with wireless LAN support by installing a wireless LAN device, like a FRITZ!WLAN USB Stick, for instance.

- for connecting computers using network cables:

  computer with a network port (network adapter standard Ethernet 10/100/1000 Base-T)

## 3.3 Handling the FRITZ!Box

- Read the Safety Instructions from page 8.
- You can place the FRITZ!Box on a horizontal surface or mount it on a wall. For a drilling template to mount the FRITZ!Box on a wall, see page 182.
- Place or hang the FRITZ!Box in a dry location that is free of dust and protected from direct sunlight.
- For ideal operating conditions, mount the FRITZ!Box on a wall with the cables connected on the bottom.
- When connecting the FRITZ!Box to your computer using a network cable, keep in mind that the cable can be no longer than 100 m.
- Make sure to keep sufficient distance from potential sources of interference like microwave devices or electric devices with large metal housings.

## 3.4 Tips for Passwords

Passwords are assigned at various places in the user interface to protect your settings and data in the FRITZ!Box. The FRITZ!Box assists you in assigning secure passwords, for instance when creating new users or configuring MyFRITZ!: A graphic display indicates how secure the password is. Note the following:

- Use a password rated as secure.
- Select a password with at least twelve characters, which includes capitals and lower-case letters as well as numerals and special characters.
- Under the search term “Characters for Passwords” the Help of the FRITZ!Box user interface contains more information about which characters you can use.
- Be sure to keep your passwords in a safe place!
- Configure the “Forgot password” push service. This notification service sends you an access link at regular intervals, with which you can access the FRITZ!Box user interface even if you have forgotten your password. See Push Services: Using Notification Services from page 154.
- If you lose your password for the user interface, you will have to restore the factory settings to the FRITZ!Box and, for reasons of security, reconfigure all of your personal settings for your Internet connection, your telephone system and your home network.

# 4 Connecting the FRITZ!Box

- Before you connect the FRITZ!Box, read the instructions on Safety Instructions from page 8.
- Connect the FRITZ!Box to the power supply.
- Connect the FRITZ!Box to your fiber optic connection.

## 4.1 Connecting to Electrical Power

Connecting to the power supply

1. Pick up the power supply unit included in the FRITZ!Box package.

   Use only this power supply unit for connecting to electrical power.

2. Connect the power supply unit to the socket on the FRITZ!Box labeled “Power”.

3. Plug the other end into an AC power outlet.

The “Power” LED lights up after a few seconds to indicate that the FRITZ!Box is ready for operation.

## 4.2 Connecting to the Internet

The FRITZ!Box 5490 can be connected to the fiber optic connection in various ways.

- directly to the fiber optic network with a fiber optic cable
- to a fiber optic modem (FTTH-ONT / media converter) with a network cable

## Connecting to the Fiber Optic Connection

### Fiber Optic Cable

To connect the FRITZ!Box you need a fiber optic cable.

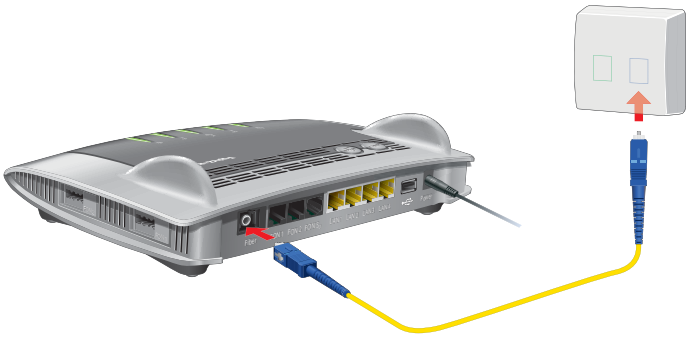
The fiber optic cable is supplied by the operator of your fiber optic network. The fiber optic cable is not included in your FRITZ!Box package.

### Connectors on the Fiber Optic Cable

Various connectors may be installed, depending on your location and fiber optic network:

| Connector | Description |
|---|---|
|  SC connector | The SC connector is for connecting the FRITZ!Box. Some providers use the SC connector for connecting to the blue fiber socket. |
|  LC connector, blue | The blue LC connector is used by various providers for connecting to the blue fiber socket. |
|  LC connector, green | The green LC connector is used in Switzerland, among other places, for connecting to the green fiber socket. |

## Connecting



Connecting to the fiber optic connection

1. Connect the fiber optic cable to the “Fiber” port of your FRITZ!Box and to the blue socket on the fiber optic socket.
2. Connect a computer with the FRITZ!Box either via wireless LAN or using a network cable; see Connecting a Computer with a Network Cable from page 24 and Connecting Devices with the FRITZ!Box over Wireless LAN from page 27.
3. Set up the Internet connection for connections via the fiber optic modem/the media converter in the FRITZ!Box; see “Configuring the Internet Connection”.

## Connecting with a Fiber Optic Modem

If a fiber optic modem (FTTH—ONT) or a media converter is attached to your fiber optic socket, then connect the FRITZ!Box 5490 to this device using a network cable.

1. Connect the free end of the network cable to the LAN (Ethernet) port on the fiber optic modem.
2. Connect the other end of the network cable to the socket on the FRITZ!Box labeled “LAN 1”.
3. Connect a computer with the FRITZ!Box either via wireless LAN or using a network cable; see Connecting a Computer with a Network Cable from page 24 and

Connecting Devices with the FRITZ!Box over Wireless LAN from page 27.

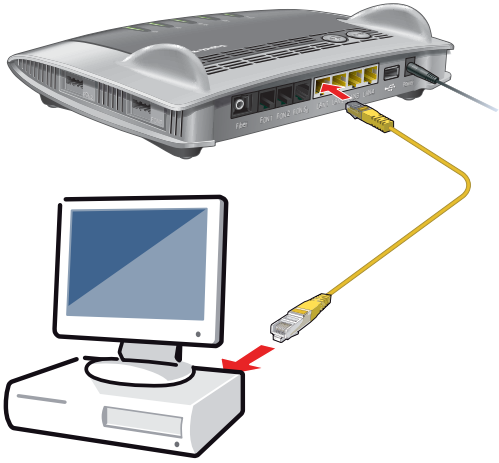
4. Set up the Internet connection for connections via the fiber optic modem/the media converter in the FRITZ!Box; see “Configuring the Internet Connection”.

# 5 Connecting a Computer with a Network Cable

You can connect computers and other network devices with the FRITZ!Box using a network cable.

## 5.1 Connecting to the Computer

One computer or other network device can be connected to each LAN port of the FRITZ!Box.



Connecting a computer using a network cable

1. Insert the network cable included in the package into the LAN port of the computer.

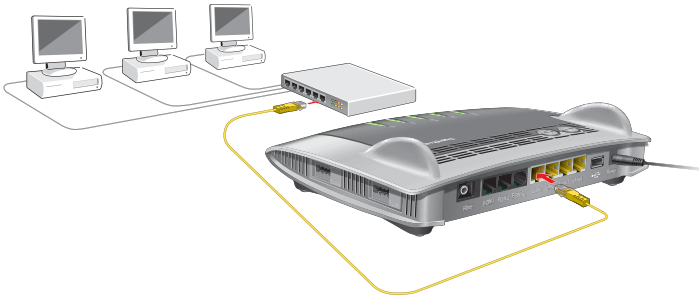
   You can also use any other network cable. For more information, see page 175.

2. Insert the free end of the cable into a LAN socket on the FRITZ!Box.

Now the FRITZ!Box and the computer are connected with each other.

## 5.2 Connecting a Network Hub or Switch

You can connect a network hub or network switch to the FRITZ!Box.



1. Insert the network cable included in the package into the uplink port of the network hub or network switch.

   You can also use any other network cable. For more information, see page 175.

2. Insert the free end of the cable into a LAN socket on the FRITZ!Box.

The FRITZ!Box and the network hub are now connected with each other.

## 5.3 Saving Energy at the LAN Ports

For energy-efficient use of your gigabit LAN ports you can specify for each individual LAN port whether it should always operate with full power (power mode) or with reduced energy consumption (green mode). With green mode you can reduce the power consumption of the FRITZ!Box to the level necessary for your applications.

The LAN ports can be configured in the advanced view of the FRITZ!Box user interface; see page 33. Under “Home Network / Network / Network Settings” you can select from among the following operating modes in the “LAN Settings” area:

| Operating Mode | Functionality and Power Consumption |
|---|---|
| Power mode | In this setting LAN connections are established with a maximum transmission rate of 1 Gbit/s.<br>Higher power consumption than in green mode if the LAN port is used. |
| Green mode | As needed, the FRITZ!Box establishes LAN connections with a transmission rate of 100 Mbit/s.<br>Lower power consumption than for the “Power Mode” setting. |

# 6 Connecting Devices with the FRITZ!Box over Wireless LAN

Computers and other devices with wireless LAN, for instance smartphones and network printers, can be connected wirelessly with the FRITZ!Box.

You can establish the wireless LAN connection using WPS or by entering the FRITZ!Box network key on the wireless device.

Mobile devices with a camera, like smartphones or tablets, can scan the QR code of the network key to establish a wireless LAN connection.

## 6.1 Establishing a Wireless LAN Connection Using WPS

WPS is a procedure for establishing secure wireless LAN connections. With WPS, connecting a wireless device with the FRITZ!Box is quick and easy.

### Requirements

The wireless device must support WPS.

### Establishing a Connection on a Windows Computer Using WPS

Here is how to establish a wireless connection with WPS on a computer with Windows 10, 8, or 7:

1. If the “WLAN” LED on the FRITZ!Box is off, press the “WLAN” button briefly.

   The wireless radio network of the FRITZ!Box will be switched on.

2. Open the wireless LAN software on the computer.

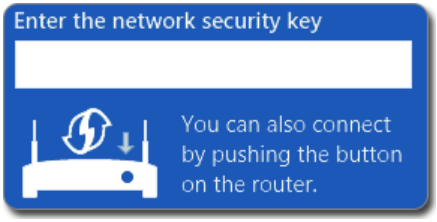
   In Windows 10 and 8, for instance, click the wireless LAN icon  in the task bar.

3. Select the wireless radio network of the FRITZ!Box.

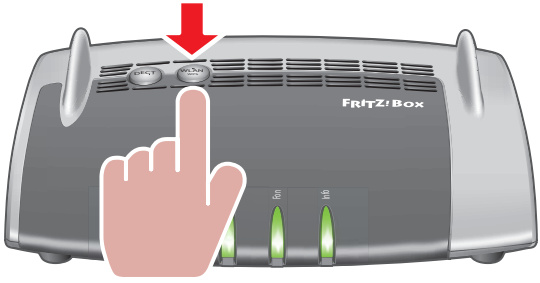
   The preconfigured name of the wireless radio network (SSID) is consists of “FRITZ!Box 5490” and two capital letters, and is printed on the bottom of the housing.

4. Click “OK”.

   The field for the network key appears, along with the information that you can establish the connection by pressing a button on the router:




5. For this step you have two minutes: Press the “WLAN” button on the FRITZ!Box and hold it down until the “WLAN” LED begins flashing.




The wireless LAN connection will be established.

## Connecting on Other Wireless Devices Using WPS

Here is how to establish a wireless connection with WPS on a wireless LAN device without Windows:

1. If the “WLAN” LED on the FRITZ!Box is off, press the “WLAN” button briefly.

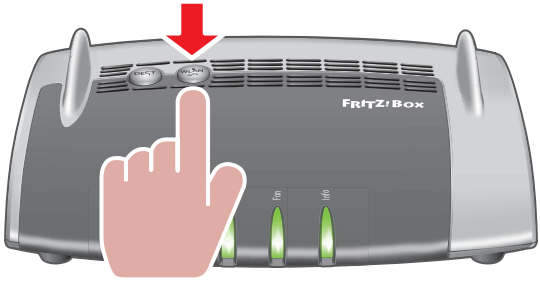
   The wireless radio network of the FRITZ!Box will be switched on.

2. Use your wireless device to search for wireless networks in the vicinity.

   See the documentation of the wireless LAN device for instructions on how to do this.

3. Select the wireless radio network of the FRITZ!Box and start connecting with WPS.

4. For this step you have two minutes: Press the “WLAN” button on the FRITZ!Box and hold it down until the “WLAN” LED begins flashing.




The wireless LAN connection will be established.

## 6.2 Entering the Network Key on the Wireless Device

You can establish a wireless LAN connection by entering the FRITZ!Box network key on the wireless device.

The preset network key is printed on the bottom of the housing on the FRITZ!Box. A new network key can be entered in the user interface.

1. If the “WLAN” LED on the FRITZ!Box is off, press the “WLAN” button briefly.

   The wireless radio network will be switched on.

2. Open the wireless LAN software on your wireless device. In Windows 10 and 8, do this by clicking the wireless LAN icon  in the task bar.

3. Select the wireless radio network of the FRITZ!Box.

   The preconfigured name of the wireless radio network (SSID) is consists of “FRITZ!Box 5490” and two capital letters, and is printed on the bottom of the housing.

4. Click “OK”.

5. Enter the network key of the FRITZ!Box in the wireless LAN software.

6. Start the connection procedure.

## 6.3 Connecting to Mobile Devices Wirelessly Using the QR Code

With mobile devices that have a camera and a QR code reader (app), like smartphones and tablets, you can connect wirelessly by reading a QR code.

1. Open the FRITZ!Box user interface.

2. Select “Wireless / Radio Network”.

   The FRITZ!Box shows QR codes for the wireless radio networks in the 2.4-GHz and the 5-GHz bands.

3. Read the QR code with your mobile device’s QR code reader, directly from the monitor of from a printout.

The mobile device automatically establishes a secure wireless connection to the FRITZ!Box.

# 7 The FRITZ!Box User Interface

The FRITZ!Box has a user interface you can open in a web browser on your computer.

In the user interface you can configure the FRITZ!Box, enable or disable functions and receive information on the FRITZ!Box and on your connections.

## 7.1 Opening the User Interface

The FRITZ!Box user interface can be opened on any computer connected with the FRITZ!Box.

1. Start a web browser on your computer.
2. Enter http://fritz.box in the address field of your web browser.


Entering the address http://fritz.box in the browser

3. Follow the instructions on the screen and enter your FRITZ!Box password.

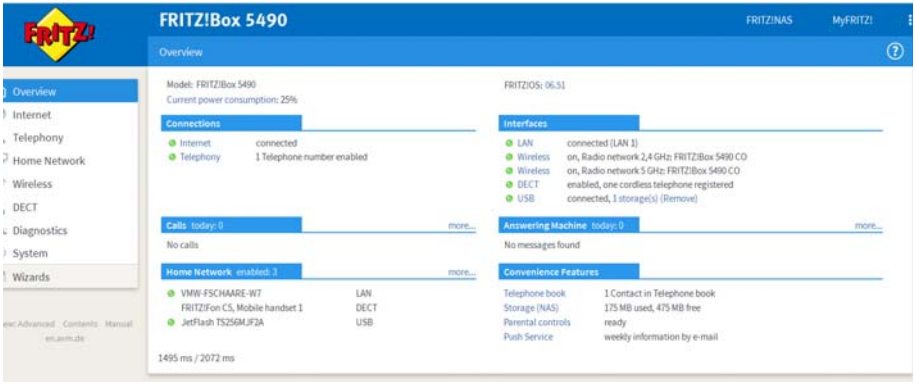
   The preset network key is printed on the bottom of the housing of the FRITZ!Box.

If the user interface is **not** opened, read the information starting from page 165.

## 7.2 Overview: FRITZ!Box at a Glance

All important information about the FRITZ!Box is displayed under “Overview” in the FRITZ!Box user interface.

By clicking the linked entries or “more...” you can jump from the “Overview” page to the corresponding menus and configure settings there.




The “Overview” page of the FRITZ!Box

In the **upper** area of the window the complete name of your FRITZ!Box model is displayed, along with the currently installed version of FRITZ!OS, and its current energy consumption.

The **middle** area of the window presents information about connections and interfaces.

The **lower** area of the window presents the last calls made, any answering machine messages received, the devices connected in the home network and the enabled convenience features.

## 7.3 Standard View and Advanced View

The FRITZ!Box user interface has two views: the standard view and the advanced view.

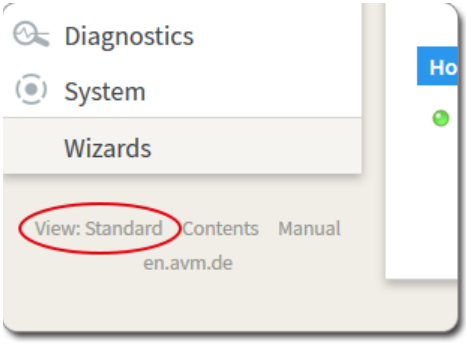
Enable the advanced view in the “Internet” and “Home Network” areas only if you have advanced network expertise. Incorrect combinations of settings in these areas can produce a situation in which the FRITZ!Box user interface can no longer be opened.

Upon delivery, the FRITZ!Box interface is set to display the standard view. In the standard view all of the settings required for daily operation of the FRITZ!Box are at your disposal. Some pages and areas of the FRITZ!Box user interface are not displayed.

In the advanced view additional settings options appear under various menus and commands. The expanded menu items contain settings for advanced users and are not required for daily FRITZ!Box operation.

### Fast Switching between the Views

The “View” link below the menu of the FRITZ!Box allows you to switch instantly between the standard view and the advanced view:




The “View” link in the user interface

## 7.4 Assigning FRITZ!Box a Name

You can assign an individual name for your FRITZ!Box in the FRITZ!Box user interface. The name is set up under “Home Network / FRITZ!Box Name” and appears in the following areas of your home network display:

- Name of the wireless radio network (SSID)
- Name of the guest radio network (SSID)
- Name of the working group released for home network sharing
- Name of the media server
- Individualized FRITZ!Box name for MyFRITZ!
- Name of the DECT base station
- Push service sender name

# 8 Password Protection: Using FRITZ!Box Safely

Your FRITZ!Box contains many personalized settings for your home network, your telephone system and your Internet connection. For this reason we recommend protecting access to the user interface of your FRITZ!Box with a password.

A preconfigured password is already set in your FRITZ!Box upon delivery. This means the user interface of your FRITZ!Box is protected with a password from the start.

The preset network key is found here:

- on the bottom of the housing of the FRITZ!Box
- on the enclosed FRITZ! Notice

If needed, you can replace the preconfigured password with a FRITZ!Box password of your own; see page 36, or with FRITZ!Box users; see page 37.

## 8.1 Overview

The FRITZ!Box offers two ways to configure password protection:

| Property | FRITZ!Box Password | FRITZ!Box User |
|---|---|---|
| Password | You specify a password.<br>Or you use the preconfigured password.<br>Everyone who knows the password can access the FRITZ!Box user interface. | There are user accounts.<br>Every FRITZ!Box user receives her or his own password for opening the user interface. |
| Scope of access | With the FRITZ!Box password, access to all contents and settings in the FRITZ!Box is permitted. | For each FRITZ!Box user, you define which contents and settings of the FRITZ!Box the given user is allowed to access. |
| Kind of access | Login to the user interface is permitted from devices located in the home network of the FRITZ!Box. | A FRITZ!Box user can also log in to the FRITZ!Box user interface—with the appropriate user rights—from the Internet. |

## 8.2 Configuring a FRITZ!Box Password

### Overview

The basic method of loggin in to the FRITZ!Box user interface is to enter the FRITZ!Box password. With this password all users can open the user interface and access all of the FRITZ!Box's contents and settings.

With the FRITZ!Box password it is not possible to access the FRITZ!Box from the Internet. In such a case you also require an account as a FRITZ!Box user; see Creating FRITZ!Box Users from page 37.

### Rules

You would like to change the preconfigured password of your FRITZ!Box?

When setting passwords, comply with the following rules:

- Use a password rated as secure.
- Select a password with at least twelve characters, which includes capitals and lower-case letters as well as numerals and special characters.
- Be sure to keep your passwords in a safe place!
- Use the "Forgot password" push service. When you have forgotten a password, the FRITZ!Box sends you an access link to the e-mail address you specified. You can assign a new password using this link.

If you lose your FRITZ!Box password, you will have to restore the factory settings to the FRITZ!Box and you will have to reconfigure all of your personal settings for your Internet connection, your telephone system and your home network.

### Configuring a FRITZ!Box password

Here is how to set up a new FRITZ!Box password:

1. Open the FRITZ!Box user interface.
2. Select “System / FRITZ!Box Users / Login to the Home Network”.
3. Select “Login with the FRITZ!Box password”.
4. Enter a password.
5. Click “Apply”.

   You will be directed to the welcome screen of your FRITZ!Box.
6. Enter your password to log in to the user interface of your FRITZ!Box.

## 8.3 Creating FRITZ!Box Users

### Overview

You can set up as many as 18 user accounts in the FRITZ!Box. A FRITZ!Box user opens the user interface of the FRITZ!Box by entering her or his personal password. There she or he can view and change those contents or settings for which she or he has been granted access rights.

It is up to you whether to use FRITZ!Box users instead of the FRITZ!Box password. You need password-protected login with the FRITZ!Box account in the following cases:

- You would like to access your FRITZ!Box from the Internet.
- You would like to assign different rights to different users.

## Rules

You want to add FRITZ!Box with individual passwords to the preconfigured password of your FRITZ!Box or replace it?

When setting passwords, comply with the following rules:

- Use a password rated as secure.
- Select a password with at least twelve characters, which includes capitals and lower-case letters as well as numerals and special characters.
- Be sure to keep your passwords in a safe place!
- Use the “Forgot Password” Push Service. When you have forgotten a password, the FRITZ!Box sends you an access link to the e-mail address you specified. You can assign a new password using this link.

## Configuring FRITZ!Box Users

First you must set up at least one FRITZ!Box user with the right “FRITZ!Box Settings”. Then you can configure more users.

1. Open the FRITZ!Box user interface.
2. Select “System / FRITZ!Box Users / Users”.

   Information on the preconfigured FRITZ!Box user “ftpuser” is found on page 39.
3. Click “Add User”.
4. Enter a user name, a valid e-mail address and a password.
5. Specify whether or not the FRITZ!Box user is allowed to access from the Internet the FRITZ!Box contents for which she or he has access rights.

   Keep in mind that in order to access the FRITZ!Box from the Internet, a corresponding service must also be enabled in the FRITZ!Box. Continue with the section Access the FRITZ!Box from the Internet from page 40 for instructions.

6. In the “Rights” area, specify which contents each FRITZ!Box user is allowed to use.

   The first user you create must have at least the “FRITZ!Box settings” right.

7. Save your entries by clicking “OK”.

   The FRITZ!Box user account has been configured.

   Repeat steps 3 to 7 to set up any other additional FRITZ!Box users.

   If you would like to use user accounts to log into the FRITZ!Box from the home network as well, also perform the following two steps:

8. Switch to the “Login to the Home Network” tab. Select the option “Login with FRITZ!Box user name and password” and click “Apply”.

   You will be directed to the welcome screen of your FRITZ!Box.

9. Select your user name and enter your password.

Do not create any user accounts for temporary users (like weekend guests, for example) whom you would like to grant Internet access over your FRITZ!Box temporarily. Use the guest access of the FRITZ!Box over wireless LAN instead; see page 145.

## Preconfigured FRITZ!Box User: ftpuser

The first time you open the overview of user accounts under “System / FRITZ!Box Users / Users”, the user “ftpuser” is already listed.

This is because the FRITZ!NAS service, in which the storage media connected with the FRITZ!Box are summarized, can also be accessed over the protocols SAMBA and FTP. If you access FRITZ!NAS via Windows file sharing or an FTP client, your users must be authenticated by entering “ftpuser”.

The preconfigured user account ensures smooth access to FRITZ!NAS over SAMBA and FTP. Therefore it is important not to delete or rename this user.

If you use only the login method with FRITZ!Box user name and password to access your FRITZ!Box, you can also set up a user account with NAS access rights.

You can delete the preconfigured “ftpuser” account only if you **always** use your FRITZ!Box user account to access the FRITZ!Box, be it from home or via the Internet. In every other case deleting this user account will make it impossible to use the NAS services of the FRITZ!Box, or allow only restricted use.

### Access the FRITZ!Box from the Internet

To be able to access your FRITZ!Box from the Internet, the following conditions must be fulfilled:

- You have set up an account with the MyFRITZ! service; see page 149. Your FRITZ!Box is registered with this MyFRITZ! account.
- The “Access from the Internet allowed” option is enabled in your FRITZ!Box user account.
- The option “Internet access to the FRITZ!Box via HTTPS enabled” is checked in the “Internet / MyFRITZ! Access” menu or in the “Internet / Permit Access / FRITZ!Box Services” menu.

  When the MyFRITZ! service is enabled this check mark is set automatically.

A FRITZ!Box user who has been granted Internet access can use the MyFRITZ! service (myfritz.net) to access the corresponding FRITZ!Box from any location. From the Internet this user can reach only those FRITZ!Box functions fo which she or he is authorized.

Check in regular intervals whether a FRITZ!Box user still requires access to the FRITZ!Box from the Internet, and if not, disable this feature in the properties of the user. For reasons of security we recommend disabling Internet access to the FRITZ!Box via HTTPS whenever no more FRITZ!Box users require access to the user interface of your FRITZ!Box from the Internet.

For more information about MyFRITZ!, see the chapter MyFRITZ!: Accessing the FRITZ!Box from Anywhere from page 148.

For more information about HTTPS, see the chapter Access from the Internet via HTTPS, FTP and FTPS from page 65.

### Here Is How to Use Access from the Internet

- As a FRITZ!Box user with the “FRITZ!Box settings” you can view and edit the settings of your FRITZ!Box from anywhere.
- With the “VPN” right you can establish a VPN connection between your iOS or Android device and your FRITZ!Box over the Internet. this way you can integrate your smartphone or tablet in the home network and communicate with other devices in the network or use FRITZ!Box functions.
- If you set up a FRITZ!Box user account for every member of the family, with at least the rights to access voice messages, faxes, FRITZ!App Fon and the call list, the entire family can check the answering machine or view the call list even when they’re away from home.
- With a FRITZ!Box user account that has only the right to access a certain area of the NAS, you can grant your friends Internet access to your latest vacation pictures, for instance.
- As a FRITZ!Box user with the “Smart home” right, you can switch your lamps or aquarium pumps on and off from anywhere in the world. The prerequisite is that you connect them to smart home devices from AVM (like FRITZ!DECT 200, for instance) which are integrated in the home network of your FRITZ!Box. You can remote control up to 10 switchable outlets over your MyFRITZ! access.

### Disabling FRITZ!Box Users

You can disable a user account without deleting it. The owner of a disabled account can no longer access the FRITZ!Box.

You can neither delete nor disable the user account with which you are currently logged in to the user interface of your FRITZ!Box.

1. In the user interface, open the “System / FRITZ!Box Users / Users” menu.
2. Click the “Edit” button for the user account to be disabled.
3. Remove the checkmark in front of the “User account enabled” option.
4. Apply the change by clicking “OK”.

The user account has been disabled.

## 8.4 “No login” Mode

From within the home network you can operate the FRITZ!Box user interface without enabling password protection. This means that every user who accesses the interface of your FRITZ!Box can view and change all information and settings.

In the “No login” mode, your private information is not sufficiently protected from malicious programs or unwelcome activities. Therefore we urgently advise against using the FRITZ!Box without password protection!

Protect your FRITZ!Box by defining a password for the FRITZ!Box user interface. To do this, go to the “System / FRITZ!Box Users / Login to the Home Network” menu and select one of the password protection methods.

For comprehensive information about logging in to the FRITZ!Box with a password, see the sections Creating FRITZ!Box Users from page 37 and Configuring a FRITZ!Box Password from page 36.

# 9 Configuring the Internet Connection for the Fiber Optic Connection

Enter the Internet account information you received from your fiber optic network operator/Internet service provider. These data are required to configure the Internet connection.

Your Internet service provider also supplied information about the configuration of your Internet connection. Always perform the Internet connection setup as described by your provider.

## Configuring Your Internet Connection Automatically

If your Internet service provider arranges for automatic configuration of the Internet connection, proceed as follows:

1. Open the FRITZ!Box user interface.
2. Select the “Internet / Account Information” menu.
3. Select the connection type in the “Internet Connection via” area.
   - Select “Fiber optic”, if you connected the FRITZ!Box 5490 directly to the fiber optic socket.
   - Select “LAN 1” if the FRITZ!Box 5490 is connected to a fiber optic modem or a media converter.
4. If your received a VLAN ID from your Internet service provider, then click “Change Connection Settings” and proceed as follows:
   - Under “VLAN Settings”, check the “Use VLAN for Internet access” checkbox.
   - Enter the VLAN ID and the PBit value in the corresponding fields.
5. Click “Apply”.

Configuration of the Internet connection is now complete.

## Configuring the Internet Connection (Not Automatically)

1. Open the FRITZ!Box user interface.
2. Select the connection type in the “Internet Connection via” area.
   - Select “Fiber (fiber optic)”, if you connected the FRITZ!Box 5490 directly to the fiber optic socket.
   - Select “LAN 1” if the FRITZ!Box 5490 is connected to a fiber optic modem or a media converter.
3. Select the “Internet / Account Information” menu.
4. If you received account information from your Internet service provider, under “Account Information” select “Yes” and enter the account information.
5. If your received a VLAN ID from your Internet service provider, then click “Change Connection Settings” and proceed as follows:
   - Under “VLAN Settings”, check the “Use VLAN for Internet access” checkbox.
   - Enter the VLAN ID and the PBit value in the corresponding fields.
6. Click “Apply”.

In the Help of the FRITZ!Box user interface you can find detailed instructions.

# 10 Connecting Telephones and Other Terminal Devices

This chapter describes how to connect telephones, fax machines, answering machines and telephone systems (PBXs) to the FRITZ!Box.

## 10.1 Connecting Analog Telephones and Terminal Devices

You can connect two analog terminal devices.

### Two Sockets Have to Stay Free (Not Allocated)

The FRITZ!Box has different sockets for analog terminal devices:

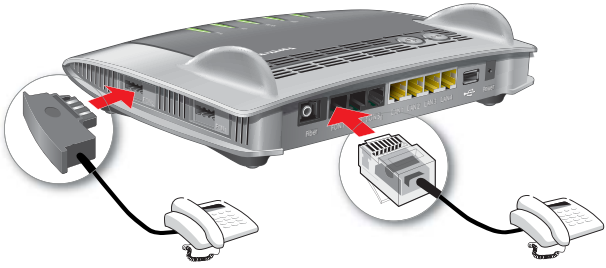
- on the back, “FON 1” and “FON 2” for terminal devices with RJ11 plug
- on one side, “FON 1” and “FON 2” for terminal devices with TAE plug

You can connect a total of two analog terminal devices to these sockets. One “FON 1” socket and one “FON 2” socket have to stay free (not allocated).

### Connecting a Telephone

1. Connect the telephone to a “FON 1” or “FON 2” socket.

   Keep in mind that one “FON 1” socket and one “FON 2” socket have to stay free (not allocated).



2. Configure the telephone in the FRITZ!Box; see page 52.

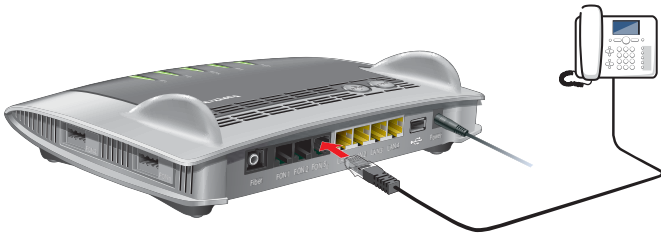
## 10.2 Connecting ISDN Telephones and ISDN Terminal Devices

### Requirements

- ISDN terminal devices must support operation on an ISDN point-to-multipoint line.

### Connecting an ISDN Telephone

1. Connect the ISDN telephone to the “FON $S_0$” port.



2. Configure the ISDN telephone in the FRITZ!Box; see page 52.

### Connecting Multiple ISDN Telephones

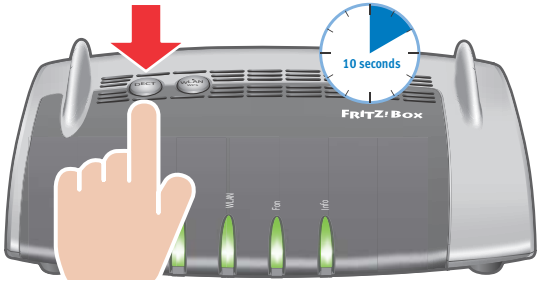
With $S_0$ bus cabling you can connect up to eight ISDN telephones to the FRITZ!Box. Please note for configuration:

- Since the FRITZ!Box has terminators installed, the FRITZ!Box must be positioned on one end of the $S_0$ bus cabling.
- The FRITZ!Box can supply one ISDN telephone with electrical power. All other ISDN telephones will need their own power supply.

## 10.3 Registering FRITZ!Fon and Other Cordless (DECT) Telephones

Up to six cordless DECT telephones can be registered with the FRITZ!Box.

1. Start the registration of your cordless telephone with a base station.
2. Press and hold down the “DECT” button on the FRITZ!Box until the “Info” LED on the FRITZ!Box flashes.




3. If you are asked on your cordless telephone for the PIN of the base station, enter the PIN of the FRITZ!Box.

   The preset value is 0000. The PIN is listed in the FRITZ!Box user interface under “DECT / Base Station”.

   The cordless telephone is registered with the FRITZ!Box.
4. Configure the cordless telephone in the FRITZ!Box; see page 52.

## 10.4 Registering an iPhone or Android Smartphone

With FRITZ!App Fon you can used your Android smartphone or iPhone as a cordless telephone registered with the FRITZ!Box.

### Requirements

- iPhone iOS 4 or later, or Android smartphone with Google Android 2.1 or later

### How FRITZ!App Fon Works

Once it has been set up on your smartphone, FRITZ!App Fon remains active in the background. Whenever the smartphone is connected with the FRITZ!Box over wireless LAN, the following applies:

- Outgoing calls are dialed using your landline at home rather than the mobile network.
- You can accept calls to your Internet telephone numbers on your smartphone.
- The smartphone can still be reached at the mobile telephone number.

### Registering a Smartphone with FRITZ!Box

1. Establish a wireless LAN connection to the FRITZ!Box on your smartphone; see page 27.
2. Install FRITZ!App Fon on your smartphone.

   FRITZ!App Fon is available at the Google Play Store and in the Apple App Store.
3. Start the FRITZ!App Fon.

### The Icon in the FRITZ!App Fon Title Bar

The icon in the title bar of FRITZ!App Fon indicates whether you are making calls with the smartphone via FRITZ!Box:

| Symbol | Meaning |
|---|---|
|   | Active wireless LAN connection between smartphone and FRITZ!Box. |
|   | You are making calls with the smartphone via the FRITZ!Box. |

### Assigning Telephone Numbers

Assign telephone numbers to the smartphone for calls over the FRITZ!Box:

1. In the FRITZ!App Fon select “More / FRITZ!Box”.

   The “Telephony device” display shows the name used to register the smartphone with the FRITZ!Box.

2. Configure the smartphone in the FRITZ!Box; see page 52.

## 10.5 Connecting an IP Telephone

An IP telephone is a telephone with which you can make telephone calls over the Internet.

You can also connect an IP telephone directly to the Internet connection without a telephone system (FRITZ!Box). This is not possible with other telephones.

### Connecting via LAN or Wireless LAN

1. Connect the IP telephone to the FRITZ!Box using a network cable or wireless LAN.

   The preconfigured wireless network key of the FRITZ!Box is printed on the underside of the FRITZ!Box.

2. Configure the IP telephone in the FRITZ!Box; see page 52.

## 10.6 Connecting a Door Intercom System

Door intercom systems with an a/b interface can be connected to the FRITZ!Box.

Read more in the FRITZ!Box Help:

1. Open the FRITZ!Box user interface.
2. Click the Help button  .
3. Enter “door intercom system” in the search field.

# 11 Configuring the FRITZ!Box for Telephone Calls

This chapter describes how to configure your FRITZ!Box for making telephone calls.

## 11.1 Configuring Your Telephone Numbers

Configure your Internet telephone numbers in the FRITZ!Box.

### Automatic Configuration

Some telephony providers configure the Internet telephone numbers in the FRITZ!Box automatically. This procedure is also known as “remote configuration”.

Remote configuration starts right after the FRITZ!Box is connected to the Internet or right after the FRITZ!Box user interface is opened.

The configured Internet telephone numbers are located in the user interface under “Telephony / Telephone Numbers”.

### Configuring Telephone Numbers with the Wizard

1. Open the FRITZ!Box user interface.
2. Select “Wizards / Manage Telephone Numbers”.
3. Click “Add Telephone Number” and follow the Wizard’s instructions.

## 11.2 Configuring Telephones and Other Terminal Devices in the FRITZ!Box

Configure your telephones and other terminal devices in the FRITZ!Box. To do this, for each terminal device define:

- the internal name to be displayed in the call list of the FRITZ!Box.
- the telephone number the terminal device uses for outgoing calls to the public telephone network
- Numbers for incoming calls:

  Should the terminal device ring for every call (telephone) or pick up (fax machine, answering machine)? Or only for calls to previously defined telephone numbers?

### Configuring Terminal Devices

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephony Devices”.
3. Click “Configure New Device”.

   To change the settings of a device that has already been configured, click the  button.

# 12 FRITZ!Box as an Internet Router

The FRITZ!Box connects computers in your home network with the Internet. This chapter explains the possibilities presented by using the FRITZ!Box as an Internet router and how to take advantage of them.

## 12.1 Parental Controls: Access Profiles for Internet Use

Using access profiles you can control the use of the Internet by devices in your network.

### Access Profiles

### Settings for Internet Use

The following settings for Internet use are defined in an access profile:

| Setting | Description |
|---|---|
| Online time | The online time specifies when and for how long Internet access is permitted. |
| Permitted websites | Using filter lists you can specify which websites may be accessed. |
| Internet access through network applications | You can specify which network applications are allowed to communicate over the Internet. |

### Preconfigured and Own Access Profiles

- In the FRITZ!Box there are four preconfigured access profiles.
- You can create and configure many access profiles of your own.

### No Network Device without Access Profile

- Network devices that log in to the home network for the first time are automatically assigned the preconfigured “Standard” access profile. As soon as a network device is registered in the home network you can assign a different access profile.

- Network devices that log in to the FRITZ!Box guest network are automatically assigned the “Guest” access profile. This is the only access profile possible in the guest network.

## Preconfigured Access Profiles

In the FRITZ!Box there are four preconfigured access profiles available for use.

The “Standard” Access Profile

| Property | Description |
|---|---|
| Limitations | In the factory settings the “Standard” profile is allowed to do everything. There are no restrictions on time or activity. |
| Changeable | The “Standard” profile can be changed. |
| Automatic assignment | Network devices that register with the FRITZ!Box for the first time are automatically assigned the “Standard” profile. |
| Default | Unknown network devices can only receive the “Standard” profile. Unknown network devices are devices that have not registered with the FRITZ!Box, but should already have been configured in the FRITZ!Box and have parental controls configured. |
| No budget | No shared budget can be configured in the “Standard” profile. |

### The “Guest” Access Profile

| Property | Description |
|---|---|
| Limitations | The profile has the following settings configured upon delivery:<br>• There are no time restrictions.<br>• HTTPS queries are permitted.<br>• The web pages indexed by the German federal government (BPjM) will be filtered. You can use the BPjM module only if you select “Germany” as your country on the “System / Region and Language / Regional Options” page.<br>• Surfing and mail are allowed. Web access is blocked for all other network applications. |
| Changeable | The “Guest” profile can be changed. |
| Automatic assignment | Network devices that are connected with the FRITZ!Box via the guest access receive the “Guest” profile. |
| Single access profile | This is the only access profile available for the guest access. |
| No budget | No shared budget can be configured in the “Standard” profile. |

### The “Unrestricted” Access Profile

| Property | Description |
|---|---|
| Limitations | This profile allows unrestricted use of the Internet. |
| Changeable | The “Unrestricted” profile cannot be changed. |

The “Blocked” Access Profile

| Property | Description |
|---|---|
| Limitations | This profile blocks Internet use. |
| Changeable | The “Blocked” profile cannot be changed. |

## Online Time

The online time is defined as follows:

| Setting | Description |
|---|---|
| Period | On a timetable you define when the Internet connection may be used. |
| Online time | For each day of the week you define how long the Internet is allowed to be used. |
| Shared budget | You decide and define whether all network devices that use the same access profile must share this online time limit. For the pre-configured “Standard” and “Guest” access profiles, no budget sharing is permitted. |

Example:

For a child you can configure an access profile to be assigned to all of the child’s network devices. The online time in the access profile could look something like this example:

| | |
|---|---|
| Monday and Wednesday | from 2 pm to 9 pm; no more than 3 hours each day |
| Tuesday, Thursday and Friday | from 6 pm to 9 pm; no more than 3 hours each day |
| Saturday and Sunday | from 10 am to noon; and from 4 pm to 10 pm; no more than 5 hours each day |
| Shared budget | yes<br>all devices (computer, game console, smartphone, etc.) share the online time |

## Permitted Websites

Access to websites with inappropriate content can be blocked using filters. The following filtering options are available:

- Prevent HTTP queries: You can prevent HTTPS queries. HTTPS is used, for instance, to open Facebook, Gmail and online banking.
- Permit websites with a whitelist:
  - The whitelist is a filter list that should be used when access should be limited to just a few websites.
  - Access to web pages entered in the whitelist is permitted.
  - When a whitelist is used, only those websites included in the list can be opened, and no others.
- Block websites with a blacklist:
  - The blacklist is a filter list that should be used when access to most websites is to be permitted, and the number of blocked websites is relatively small.
  - Access to web pages entered in the blacklist is blocked.
  - BPjM module: The blacklist can integrate the BPjM list of websites with adult content issued by the German federal government. You can use the BPjM module only if you select “Germany” as your country on the “System / Region and Language / Regional Options” page in your FRITZ!Box.
  - If the blacklist is used, no website can be opened by entering its IP address. This is also true for websites that are not included in the blacklist.
  - For applications that address websites only directly via the IP address, for instance virus scanner update software, the relevant IP addresses can be released for access by entering them in the exception list of “Permitted IP addresses”.

### Internet Access by Network Applications

You can list network applications for which you would like to block communication with the Internet. For instance, you can prohibit file sharing programs or online games from communicating over the Internet.

## Configuring Parental Controls

### Preparations

- Configure the access profiles required for the members of the home network; see Configuring an Access Profile on page 58.
- Prepare the filter lists if you would like to use filter lists; see Editing Filter Lists from page 59.
- If desired, add the list of network applications; see Adding Network Applications from page 59.

### Configuring Parental Controls for Network Devices

1. Open the FRITZ!Box user interface.
2. Select the “Internet / Filters” menu.
3. Select a network device on the “Parental Controls” tab.
4. Click the  button.
5. Select the access profile to be applied to the network device and then click “OK”.

## Configuring an Access Profile

### Requirements

The “Internet / Filters” menu is available only if you have configured the Internet connection in the FRITZ!Box and already established an Internet connection.

### Configuring an Access Profile

1. Open the FRITZ!Box user interface.
2. Select the “Internet / Filters” menu.

3. Select the “Access Profiles” tab.
4. Click New Access Profile.
5. Configure the settings for the access profile in the “New Access Profile” window. Use the FRITZ!Box Help.

## Editing Filter Lists

### Requirements

The “Internet / Filters” menu is available only if you have configured the Internet connection in the FRITZ!Box and already established an Internet connection.

### Editing a Filter List

1. Open the FRITZ!Box user interface.
2. Select the “Internet / Filters” menu.
3. Select the “Lists” tab.
4. Select the list you would like to edit and then click “Edit”.
5. Edit the list in the window that opens.

## Adding Network Applications

### Requirements

The “Internet / Filters” menu is available only if you have configured the Internet connection in the FRITZ!Box and already established an Internet connection.

### Adding a Network Application

1. Open the FRITZ!Box user interface.
2. Select the “Internet / Filters” menu.
3. Select the “Lists” tab.
4. Click Add Network Application.

5. In the “Network Application for Prioritizations Rules” window, enter the network application you would like to add to the list.

### AVM FRITZ!Box Parental Controls for Windows Users

In the Windows operating systems (Windows 10, Windows 8 and Windows 7), parental controls can be also configured for each individual Windows user.

You will need the “AVM FRITZ!Box Parental Controls” software if multiple Windows users with different rights in the Internet are sharing a single computer. The “AVM FRITZ!Box Parental Controls” software detects the various Windows users.

### AVM FRITZ!Box Parental Controls

- The AVM FRITZ!Box software can be downloaded free of charge from the AVM website.
- The AVM FRITZ!Box parental control software must be installed on every Windows computer on which users are configured who are to be protected by parental controls.
- AVM FRITZ!Box parental controls are installed on the computer as a service. The service must be enabled at all times. If it is not enabled, the FRITZ!Box will not detect the user accounts. Windows users that are not detected are treated like user accounts without any parental controls.

### Downloading AVM FRITZ!Box Parental Controls from the AVM Website

1. Open the AVM website: en.avm.de.
2. Select “Service”.
3. Scroll to the area “Further service information”.
4. Click “FTP Server”.

   This will take you to AVM’s FTP server.
5. Select “fritz.box”.
6. Select “tools”.

7. Select “kindersicherung”.
8. Select “english”.
9. Click the exe file and save the program on your computer.

### Configuring Parental Controls for Windows Users

1. Open the FRITZ!Box user interface.
2. Select the “Internet / Filters” menu.
3. Select a Windows user on the “Parental Controls” tab.
4. Click the  button.
5. Select the access profile to be applied to the Windows user and then click “OK”.

## 12.2 Sharing: Making Computers Accessible from the Internet

With default settings in the FRITZ!Box, programs on your computer and LAN cannot be accessed from the Internet.

For applications like online games and file sharing software or server services like HTTP, FTP, VPN, terminal and remote access servers, you have to make your computer accessible for other Internet users.

### Port Forwarding

Using port sharing you allow incoming connections from the Internet. By releasing certain ports for incoming connections, you grant controlled access to the computers in your network to other Internet users.

The following port forwarding methods are possible in the FRITZ!Box:

| | |
|---|---|
| PING | IPv4:<br><br>The FRITZ!Box responds to ping inquiries from the Internet addressed to the IPv4 address of the FRITZ!Box. |
| | IPv6:<br><br>The FRITZ!Box responds to ping inquiries from the Internet addressed to the IPv6 address of the FRITZ!Box. Additionally, you can set up PING6 port forwarding rules for each computer in the home network since each computer has its own globally valid IPv6 address. |
| TCP<br><br>UDP | IPv4:<br><br>Within IPv4 networks you can open the FRITZ!Box firewall for the protocols TCP and UDP when entering the port range. One port can be opened for exactly one computer. |
| | IPv6:<br><br>Within IPv6 networks you can open the FRITZ!Box firewall for the protocols TCP and UDP when entering the port range. One port can be opened for each computer in the network. |
| ESP<br><br>GRE | IPv4:<br><br>Within IPv4 networks you can open the firewall for the two protocols ESP and GRE, which do not use ports. |
| Exposed host<br><br>(Open firewall completely) | IPv4:<br><br>Within IPv4 networks you can open the firewall completely for one computer. This computer is then no longer protected by the FRITZ!Box firewall. If individual ports are already open for other computers, then data packets for these ports are not forwarded to the exposed host, but to the other computer instead. |
| | IPv6:<br><br>Within IPv6 networks you can open the firewall completely for each computer. These computers are then no longer protected by the FRITZ!Box firewall. |

### Configuring Port Forwarding in the FRITZ!Box

- IPv4:
  - Port sharing is configured in the “Internet / Permit Access” menu, on the “Port Forwarding” page.
- IPv6:
  - Enable the advanced view.
  - Port sharing is set up in the “Internet / Permit Access” menu, on the “IPv6” page.

### Determining the IPv4 Address for Accessing the FRITZ!Box

If you have enabled ports for forwarding in the FRITZ!Box, other Internet users can access your computers at the IP address assigned to your FRITZ!Box by the Internet service provider. This is a public IPv4 address.

Here is how to determine the public IPv4 address of the FRITZ!Box:

1. Open any Internet page in order to establish an Internet connection.
2. Open the FRITZ!Box user interface.
3. Enable the advanced view.
4. The FRITZ!Box’s public IPv4 address is displayed on the “Overview” page in the “Connections” area.

### Can Always Be Reached, Even When the IP Address Changes

Every time the Internet connection is interrupted, the Internet service provider re-assigns the IP address. The IP address may change in the process. Therefore it is a good idea to use MyFRITZ! or dynamic DNS so that the IP address can always be reached under the same name. For more information about MyFRITZ!, see the chapter MyFRITZ!: Accessing the FRITZ!Box from Anywhere on page 148. For more information about dynamic DNS, see the section Dynamic DNS: Name Instead of IP Address on page 64.

## 12.3 Dynamic DNS: Name Instead of IP Address

Dynamic DNS is an Internet service that makes it possible for the FRITZ!Box to remain accessible from the Internet at all times under a fixed name, even though the public IP address changes.

Dynamic DNS can be used as an alternative to MyFRITZ!. Both services can be used in parallel.

You must register with a dynamic DNS provider to use this service. When you register, you agree on the fixed name (domain name) at which your FRITZ!Box should be accessible from the Internet. You also define a user name and password.

Every time the IP address changes, the FRITZ!Box transmits the new IP address to the dynamic DNS provider in the form of an update request. Then the domain name is assigned to the current IP address by the dynamic DNS provider.

### Configuring Dynamic DNS in the FRITZ!Box

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Internet / Permit Access” menu.
4. Select the “Dynamic DNS” page and set up dynamic DNS. See the Help available in the FRITZ!Box user interface for more information.

## 12.4 Access from the Internet via HTTPS, FTP and FTPS

Over the Internet it is possible to access the user interface of the FRITZ!Box. With a laptop, smartphone or tablet PC you can configure settings in the FRITZ!Box user interface.

### Requirements for Access over the Internet

- Access to the user interface: Every user who would like to access the FRITZ!Box externally from the Internet requires a FRITZ!Box user account which is authorized for access from the Internet.
- Access to storage: Every user who would like to access the storage of the FRITZ!Box externally from the Internet requires a FRITZ!Box user account with the rights to access from the Internet and to access the contents on the storage media.
- The protocols for the desired access must be enabled in the FRITZ!Box.

### HTTPS, FTP and FTPS

The protocols HTTPS, FTP and FTPS are used for access over the Internet.

- HTTPS (Hypertext Transfer Protocol Secure)

  HTTPS is an Internet protocol for bug-proof communication between the web server and the browser in the World Wide Web.

  Enable this protocol to allow access to the FRITZ!Box from the Internet.

- FTP (File Transfer Protocol)

  FTP is a network protocol for transmitting files in IP networks.

  Enable this protocol to allow access by FTP to the FRITZ!Box storage media from the Internet.

- FTPS (FTP over SSL)

  FTPS is a method for encrypting the FTP protocol.

  Enable this protocol to secure transmission over FTP.

### Enabling HTTPS, FTP and FTPS in the FRITZ!Box

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Internet / Permit Access” menu.
4. Select the “FRITZ!Box Services” page and enable the protocols you need. See also the Help on the user interface.

## 12.5 Prioritization: Right of Way for Internet Access

Prioritization is a function you can use to specify that network applications and network devices be treated with higher or lower priority when they access the Internet connection. For example, you may wish to ensure that applications like Internet telephony, IPTV and video on demand are always treated with higher priority than other applications. You can also specify that file-sharing applications like eMule and BitTorrent always have to wait behind online games.

### Categories for Prioritization

There are three categories for prioritization: “Real-time applications”, “Prioritized applications” and “Background applications”.

Network applications and network devices are assigned to the categories using rules.

### Real-time Applications

This category is suitable for applications with high demands on transmission rates and reaction times (for example, Internet telephony, IPTV, video on demand).

- Network applications of this category always have priority over other applications accessing the Internet at the same time.
- When the Internet connection is working at full capacity, the network packets of the applications of this category will always be sent first. In this case data from network applications assigned to other categories will be transmitted later.
- If multiple network applications are assigned to this category, then they must share the available capacity.
- Whenever Internet telephony is included in this category, this application always has the highest priority, even over other real-time applications.

### Prioritized Applications

This category is suitable for applications that require a fast reaction time (for example, company access, terminal applications, games).

- For network applications prioritized in this category, 90% of the FRITZ!Box's upload bandwidth is available, as long as no application from the "Real-time applications" category requires bandwidth. The remaining 10% of the upload bandwidth is available for applications that are prioritized in lower categories or not prioritized at all.
- If multiple network applications are assigned to the "Prioritized applications" category, then they must share the available capacity.

### Background Applications

This category is suitable for applications that do not require any high transmission rates and which are not time-critical (for example, peer-to-peer services or automatic updates).

- Network applications assigned to this category are always treated with the lowest priority when the Internet connection is working at full capacity. So whenever an application from a different category or a non-prioritized

application requires the entire bandwidth, all background applications must wait until bandwidth capacity becomes available again.

- If no other network applications are active, then the background applications receive the entire bandwidth.

## Prioritization Method in the FRITZ!Box

The following techniques are used in the FRITZ!Box to send data packets according to their prioritization:

- Change in the order in which packets are sent to the Internet (upstream direction)

  The order of the packets the FRITZ!Box receives from the Internet (downstream direction) cannot be changed.

- Discard low-priority packets in order to ensure the transmission of higher-priority packets. This technique is used whenever more packets are supposed to be sent to the Internet than the upstream transmission rate of the Internet connection allows.

- As long as no packets are being sent from higher-priority applications, the full transmission rate of the Internet connection is available for low-priority packets.

## Configuring Prioritization in the FRITZ!Box

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Configure prioritization in the “Internet / Filters / Prioritization” menu.

## 12.6 VPN: Remote Access to the Home Network

Via a VPN (Virtual Private Network) a secure remote access to the network of the FRITZ!Box can be established.

### VPN in the FRITZ!Box

| | |
|---|---|
| IPSec | VPN in the FRITZ!Box is based on the IPSec standard. |
| Computer—LAN | Computer-LAN linkup: VPN connections can be configured for individual remote computers. |
| LAN—LAN | LAN-LAN linkup: VPN connections can be configured for remote networks. |
| Eight simultaneous connections | FRITZ!Box supports a maximum of eight simultaneous VPN connections. |
| Configuration software | The configuration files for the VPN connections are created using a separate program. The program is provided free of charge and can be downloaded from the AVM website. |
| FRITZ!Box user | For FRITZ!Box users who have the right to access the FRITZ!Box via VPN, no further settings must be configured. All required VPN settings are included in the user account. |
| VPN client | A free VPN client for individual computers can also be downloaded from the AVM website. |

The AVM website offers a service page which presents comprehensive information on VPN in general and in connection with the FRITZ!Box. Visit this page to obtain more detailed information.

en.avm.de/service/vpn

## Configuring VPN in the FRITZ!Box

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Internet / Permit Access” menu.
4. Select the “VPN” page.

See also the Help available in the FRITZ!Box user interface for assistance with configuring VPN.

## Supplementary Software for VPN

All of the information required for a VPN is saved in a configuration file. The terminals involved in any VPN must receive this file.

Individual computers that are networked over a VPN require a VPN client.

- The “Configure FRITZ!Box VPN Connection” Wizard

  AVM provides the “Configure FRITZ!Box VPN Connection” software for creating configuration files. This program is a Wizard that takes you step by step through the VPN configuration. All of the necessary VPN settings, like the encryption method and access rules, are set automatically. The resulting configuration files must be imported to the terminals of the VPN tunnel. At the terminal with the FRITZ!Box the configuration file is then imported to the FRITZ!Box. The VPN parameters in these files can be adjusted manually to connect to products by other manufacturers.

- The “FRITZ!VPN” VPN client

  AVM offers the “FRITZ!VPN” software as a VPN client.

Both the Wizard and the client can be downloaded free of charge from the VPN Service page on the AVM website:

en.avm.de/service/vpn

## 12.7 Freely Selectable DNS Servers

DNS servers are preset in the FRITZ!Box for IPv4 and IPv6.

These are the DNS servers assigned by the Internet service provider.

For both IPv4 and IPv6, the preset DNS server can be replaced by a free DNS server. Free DNS servers include, for instance, OpenDNS and Google DNS.

Here is how to change the DNS server entry:

The “DNSv6” page is displayed only if you enabled IPv6 support for the FRITZ!Box on the “IPv6” page.

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. In the “Internet / Account Information” menu, select the “DNS Server” page.
4. Change the settings for the DNS servers.

## 12.8 DNSSEC: Security for DNS Queries

DNSSEC is short for Domain Name System Security Extensions. As the name says, this is an extension of DNS, the domain name system.

DNSSEC ensures that both the DNS server and the information returned by the DNS server are authentic, or genuine.

### Security with DNSSEC

When a home user surfs the web, she or he sends queries to the Internet by entering URLs in the address field of the browser. A URL is the name of a website that is easy to remember, for instance en.avm.de. Every query is sent to the DNS server first. The DNS server resolves the URL into the corresponding IP address. There is one unique IP address for every URL.

The home user relies on the authenticity of the IP address returned by the DNS server. Authentic means that the response is the IP address of the desired website, and not a faked IP address that leads to a fake website. DNSSEC can ensure that the returned addresses are authentic.

### Support with the FRITZ!Box

The FRITZ!Box supports DNSSEC queries over UDP.

The FRITZ!Box has a DNS proxy. The computers in the home network use the FRITZ!Box as a DNS server. The FRITZ!Box forwards DNSSEC queries from the home network to the Internet. The FRITZ!Box forwards DNSSEC responses from the Internet to the home network. The DNSSEC information must be validated on the computer in the home network. For this DNSSEC must be supported in the operating system.

## 12.9 IPv6: The New Internet Protocol

IPv6 stands for Internet protocol version 6 and is the successor to IPv4.

- IPv6 support can be switched on in the FRITZ!Box user interface.
- For simultaneous use of IPv6 and IPv4, the FRITZ!Box supports Dual Stack and Dual-Stack Lite. This means that the FRITZ!Box can communicate with both IPv4 and IPv6 domains in the Internet.
- The FRITZ!Box supports native IPv6 and IPv6 with a tunnel protocol. Native IPv6 means that your Internet service provider supports IPv6 directly on your line.

#### IPv6-Capable Services in the Home Network

- FRITZ!NAS access via SMB or FTP/FTPS
- Access to the user interface with http or https over IPv6
- The DNS resolver of the FRITZ!Box supports queries for IPv6 addresses (AAAA records) and can query the upstream DNS resolver of the Internet service provider over IPv6.

- The globally valid prefix is distributed via router advertisement.
- For guest access to the wireless LAN, the home network and wireless guests are separated by IPv6 subnetworks.
- UPnP, UPnP AV media server
- Automatic provisioning (TR-064)

IPv6-Capable Services in the Internet

- FRITZ!NAS access via FTPS
- Completely closed firewall to protect against unwanted data from the Internet (Stateful Inspection Firewall)
- Voice over IPv6
- Automatic provisioning (TR-069)
- Time synchronization over NTP (Network Time Protocol)
- Remote access via HTTPS
- Dynamic DNS via dyndns.org and namemaster.de

## Configuring IPv6 in the FRITZ!Box

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “IPv6” page and configure IPv6 in the FRITZ!Box. See the Help available in the FRITZ!Box user interface for more information.

## Configuring IPv6 on the Computer

You can establish connections in the IPv6 range of the Internet only if IPv6 is installed and enabled on the computers in your home network.

- IPv6 is already installed and enabled in the Windows 10, Windows 8 and Windows 7 operating systems.
- IPv6 has been available in the Mac OS X operating systems since Mac OS 10.

# 12.10 LISP: FRITZ!Box as a LISP Router

LISP is a routing architecture which separates information about location and identity. There are two IP addresses: one for the location and one for the identity.

The FRITZ!Box can be configured as a LISP router.

- This chapter address system administrators.
- It presents a short introduction to LISP.
- You receive an overview about the possibilities for using LISP.
- This section includes instructions on how to configure the FRITZ!Box as a LISP router.

## Definition and Components

### LISP: Definition

| LISP: Locator/Identifier Separation Protocol | |
|---|---|
| IP protocol | LISP is a protocol for the transmission of IP packets. |
| IP address pairs | LISP uses IP address pairs:<br>• One IP address for identification, which is called the EID (Endpoint Identifier). The EID can be the IP address of a host or an entire IP subnet.<br>• One IP address for the location, known as the RLOC (Routing Locator). The RLOC is the IP address of the LISP router. |
| Tunnel protocol | LISP is a tunnel protocol.<br>A LISP packet consists of an internal IP packet and an additional external header. The header of the internal packet contains the EID; the external header contains the RLOC. |

## Properties of RLOC and EID

| | |
|---|---|
| RLOC | • specifies the location where the addressed network (network segment or network device) is located<br>• is assigned by the Internet service provider<br>• is a public IP address<br>• is contained in the external header of the LISP packet<br>• can be an IPv4 address<br>• can be an IPv6 address |
| EID | • identifies a network (network segment or network device)<br>• is assigned by the LISP provider<br>• is contained in the internal header of the LISP packet<br>• can be an IPv4 address<br>• can be an IPv6 address<br>• can be a public IP address<br>• can be a private, non-public IP address |

## Components of a LISP System

| | |
|---|---|
| Mapping system | The mapping system is responsible for allocating the EIDs to the RLOCs. |
| ETR (Egress Tunnel Router) | The ETR accepts IP packets whose destination IP address contained in the external header is the ETR's own RLOC. ETR unpacks the LISP packets. |
| ITR (Ingress Tunnel Router) | The ITR accepts IP packets from members of the local IP network (EID network) and packs them into LISP packets. The external header of the LISP packet contains the RLOC of the destination network (remote EID network) as the destination address. |
| PETR (Proxy ETR) | A PETR (Proxy ETR) is required for communication between LISP sites and non-LISP sites. On the LISP side it works like a LISP router; on the non-LISP side it works like a native IP router. |
| PITR (PROXY ITR) | A PITR (Proxy ITR) is required for communication between LISP sites and non-LISP sites. On the LISP side it works like a LISP router; on the non-LISP side it works like a native IP router. |
| xTR | xTR is what we call a component that is both ETR and ITR. xTR is also known as a tunnel endpoint or encapsulation endpoint. |

## Possible Uses

- LISP is useful if technical or organization reasons make it preferable to keep the same IP addresses, even when you switch Internet service providers.

  Mobility example: When you change locations, devices do not lose their identity (host devices, virtual machines).

- LISP is suitable for communication between IPv4 and IPv6 networks.

- Transport of address families: IPv4 via IPv4, IPv4 via IPv6, IPv6 via IPv6, IPv6 via IPv4

  Example: The encapsulation of IPv6 packets in IPv4 headers allows IPv6 web sites to be connected over IPv4.

## Configuring FRITZ!Box as a LISP Router

### FRITZ!Box as a LISP Router

- The FRITZ!Box can be configured as a LISP router.
- As a LISP router the FRITZ!Box is an xTR (ETR and ITR).

### Preparations

You need a LISP provider.

➡ Register with a LISP provider.

All of the information you need to configure the FRITZ!Box as a LISP router is supplied by the LISP provider.

### Configuring a LISP Router

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Internet / Account Information” menu.
4. Select the “LISP” tab.
5. Enable the setting “LISP support enabled”.
6. Enter in the fields the information you received from the LISP provider.

# 13 FRITZ!Box as a Wireless Access Point

The FRITZ!Box is a wireless access point for wireless devices like notebooks, tablets or smartphones. The FRITZ!Box can establish wireless LAN connections compliant with the fast Wireless AC standard and the Wireless N standard in two frequency bands at the same time. The FRITZ!Box is preconfigured with encryption using today's safest method WPA2. This encryption method is supported by most of the latest wireless devices. The FRITZ!Box supports wireless LAN convenience functions like night service and WPS Quick Connection.

## 13.1 Switching the Wireless Radio Network On and Off by Schedule

You can configure a schedule for times at which the wireless network of the FRITZ!Box is to be turned on and off automatically. This reduces the power consumption of the FRITZ!Box.

The FRITZ!Box schedule also affects any other AVM products connected in the network, the FRITZ!WLAN Repeater, for instance: the radio network of these devices is also switched on and off for the specified times.

1. Open the FRITZ!Box user interface.
2. Open the "Wireless / Schedule" menu.
3. Enable the schedule for the wireless radio network.
4. Configure the settings for the schedule:
   - With the options "Switch off wireless LAN daily" and "Switch off wireless LAN according to schedule" you define the intervals for switching.
   - You can also enable the option "The radio network cannot be switched off until no more wireless LAN devices are active".
5. Click "Apply" to save your settings.

Now the schedule of the FRITZ!Box is enabled and configured.

In the Help of the FRITZ!Box user interface you can find detailed instructions.

### Switching Wireless LAN On and Off

You can switch the wireless radio network of the FRITZ!Box on and off at any time, even when the device is hibernating.

➡ Press the “WLAN” button on the FRITZ!Box briefly.

or

➡ Switch on the wireless LAN radio network using a connected telephone:

wireless LAN on #96*1*

wireless LAN off #96*0*

## 13.2 Extending a Wireless LAN Network

The range of a wireless radio network is not fixed. It depends on

- the wireless devices you are using for your wireless LAN connections
- interference in the vicinity of your wireless radio network
- the structural conditions where you operate the wireless radio network
- the number of wireless devices in the vicinity of your FRITZ!Box that work in the same frequency range

You can extend the range of your wireless radio network with a wireless LAN repeater.

### Extending a Wireless Radio Network with a Wireless LAN Repeater

You can extend your wireless radio network with a wireless LAN repeater. In combination with the FRITZ!Box the AVM FRITZ!WLAN Repeater is especially suitable. All models of the FRITZ!WLAN Repeater series can be integrated into your wireless radio network and your home network by WPS Quick Connection. Find out more in the Internet at:

en.avm.de/products/fritzwlan

## 13.3 Wireless LAN—Getting Technical

A wireless LAN is based on standards defined by the Institute of Electrical and Electronic Engineers (IEEE). These standards describe, for instance, the transmission rate, encryption methods and frequencies used in a wireless network.

### Throughput Rate

The FRITZ!Box supports your choice of the standards IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n and IEEE 802.11ac. Wireless devices based on one or more of the standards listed can be used for wireless LAN connections with the FRITZ!Box.

| Standard | Frequency Band | Transmission Rate (Gross) up to | Transmission Rate (Net) up to |
|---|---|---|---|
| 802.11b | 2.4 GHz | 11 Mbit/s | 5 Mbit/s |
| 802.11g | 2.4 GHz | 54 Mbit/s | 25 Mbit/s |
| 802.11a | 5 GHz | 54 Mbit/s | 25 Mbit/s |
| 802.11n | 2.4 / 5 GHz | 450 Mbit/s | 200 Mbit/s |
| 802.11ac | 5 GHz | 1300 Mbit/s | 650 Mbit/s |

The standards are intended for different frequency bands.

### IEEE 802.11a

Because this standard works exclusively in the seldom used 5-GHz range, it offers the opportunity to transmit data relatively free of interference from external influences. Wireless devices that support 802.11a are much less common than devices that work in accordance with the 802.11b/g standard.

### IEEE 802.11b

With a maximum transmission rate of 11 Mbit/s, this is the oldest wireless standard. Older wireless devices of the first generation can communicate with the FRITZ!Box using 802.11b. However, if the wireless device supports newer standards such as 802.11g, the latest standard should be used.

### IEEE 802.11g

In this wireless LAN standard data are transmitted in the 2.4-GHz range at a maximum gross throughput of 54 Mbit/s. This standard is compatible with a wide range of wireless devices.

However, due to heavy use of the 2.4-GHz range, interference is more common than in the less-used 5-GHz range.

### IEEE 802.11n

This standard provides for high transmission rates and ranges. The FRITZ!Box supports 802.11n in the 2.4-GHz frequency band, and parallel in the 5-GHz frequency band. Modulation processes and antenna techniques like MIMO (Multiple Input, Multiple Output) use whichever frequency band is available more effectively than the older standards.

The use of the 802.11n standard—and thus the availability of higher throughput rates—is possible only if the wireless LAN connection is secured using the WPA2 security mechanism (AES-CCMP).

Thanks to compatibility with the 802.11g standard, you can also continue to use older wireless devices.

### IEEE 802.11ac

This standard provides for transmission rates in the gigabit range. The high throughput rates are achieved using wider wireless LAN channels, deeper modulation and more MIMO streams. Channels can be 20, 40, or 80 MHz wide. Modulations of up to 8 bit/256QAM are applied. The standard uses only the 5-GHz range, which reduces interference with other users.

This standard is compatible with the 802.11a and 802.11n standards, which means it can be used with older wireless devices.

The FRITZ!Box 5490 has a second wireless access point responsible for the 2.4-GHz range. This allows wireless devices compatible with the 802.11b/g/n to be used as well.

The use of the 802.11ac standard—and thus the availability of higher throughput rates—is possible only if the wireless LAN connection is secured using the WPA2 security mechanism (AES-CCMP).

### Setting the Right Standard in the FRITZ!Box

The throughput rate that can be achieved in your wireless radio network depends on the wireless standards used by the integrated wireless devices. These wireless standards must also be set in the FRITZ!Box. Proceed as follows to check which wireless LAN standards are set and change them if needed:

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Open “WLAN / Radio Channel” and select which wireless LAN standards should be used for both frequency bands.

Note the following for the configuration of this setting:

- Your FRITZ!Box 5490 can make two wireless networks available simultaneously for data transmission. One of the wireless radio networks works in the 2.4-GHz frequency band, and the other in the 5-GHz frequency

band. This means the FRITZ!Box can be implemented as an especially flexible wireless access point for the various wireless devices and applications in your network.

- Set the standards of the two wireless radio networks in the FRITZ!Box such that they are compatible with all of the wireless LAN devices used in the wireless network.

Make a note of which standards the wireless devices in your network are compatible with and then adjust the FRITZ!Box settings according to the following information:

### 11n, 11g

In your radio network there are wireless LAN devices that are compatible with one or both of the following standards:

- 802.11n
- 802.11g

In this case set the wireless LAN standard for the 2.4-GHz frequency band to: 802.11n+g

### 11g, 11b

In your radio network there are wireless LAN devices that are compatible with one or both of the following standards:

- 802.11g
- 802.11b

In this case set the wireless LAN standard for the 2.4-GHz frequency band to: 802.11b+g

### 11n, 11g, 11b

In your radio network there are wireless LAN devices that are compatible with one or all of the following standards:

- 802.11n
- 802.11g
- 802.11b

In this case set the wireless LAN standard for the 2.4-GHz frequency band to: 802.11n+b+g.

### 11n, 11a

In your radio network there are wireless LAN devices that are compatible with one or both of the following standards:

- 802.11n
- 802.11a

Set the wireless LAN standard for the 5-GHz frequency band to: 802.11n+a

### 11ac

In your radio network there are wireless devices that support the 802.11ac standard:

Set the wireless LAN standard for the 5-GHz frequency band to: 802.11ac

An unused frequency band can be disabled in the FRITZ!Box in order to reduce energy consumption without losing wireless LAN connections.

## The Standard for Security

### IEEE 802.11i

The WPA2 security mechanism is defined in the IEEE 802.11i standard. WPA2 is an extension of the familiar security mechanism WPA (Wi-Fi Protected Access).

The main feature of the extension of WPA to WPA2 is the AES-CCMP encryption process.

| Mechanism | Encryption |
|---|---|
| WPA | TKIP (Temporary Key Integrity Protocol) |
| WPA2 | TKIP<br>AES-CCMP<br>based on the extremely secure AES (Advanced Encryption Standard) procedure. CCMP (Counter Mode with CBC-MAC Protocol) defines how the AES procedure is applied to wireless LAN packets. |

FRITZ!Box supports the AES encryption procedure as part of the WPA2 mechanism, and the TKIP encryption procedure as part of the WPA mechanism. This means that the FRITZ!Box can be used in combination with any wireless devices that also support WPA2 with AES or WPA with TKIP.

## Frequency Ranges

Wireless LAN uses the frequency ranges at 2.4 GHz and 5 GHz for transmission.

With the FRITZ!Box 5490 you can establish wireless LAN connections in both frequency ranges at the same time.

## 2.4-GHz Frequency Band

In the 2.4-GHz frequency band wireless LAN works in the same range as Bluetooth, microwave devices and various other devices like radio-controlled toys, garage-door openers and video bridges. This means that interference may occur within wireless networks operated in the vicinity of such devices. Generally this has adverse effects on the transmission rate, including aborted connections.

A channel can have a bandwidth of 20 MHz (throughput of up to 216 Mbit/s) or 40 MHz (throughput of up to 450 Mbit/s).

Channels located directly next to each other in the 2.4-GHz band may overlap and result in mutual interference. For instance, if several wireless networks are operated close to each other in the 2.4-GHz frequency range with a bandwidth of 20 MHz, a distance of at least five channels should be left empty between each two channels used. This means that if channel 1 is selected for one wireless network, the channels 6 through 13 can be selected for a second wireless network. This maintains the minimum distance between channels.

Should interference in a wireless network persist, the first step should be to select a different channel.

## Wireless Auto Channel

With the wireless auto channel function, the FRITZ!Box automatically searches for the channel subject to the least interference. This process takes into consideration interference from radio networks in the vicinity (wireless access points) and potential sources of interference (for instance video bridges, baby monitors, microwave ovens). Should problems with interference persist despite this function, try to identify the source of interference and switch it off manually.

## 5-GHz Frequency Band

The FRITZ!Box can operate in parallel in the 5-GHz frequency band. This frequency range is used much less often than the most common 2.4-GHz frequency range.

In the 5-GHz frequency band the FRITZ!Box supports automatic channel switching by DFS (Dynamic Frequency Selection). DFS ensures that the channels from 52 to 140 are kept free for higher-priority users, like weather radar systems. If you are operating your FRITZ!Box in one of these channels, it monitors the selected channel periodically for higher-priority users, and, if necessary, switches to a different channel. Note that the FRITZ!Box waits up to ten minutes, as legally required, before occupying a free channel. During this period you cannot register any wireless devices. The wireless LAN connection is then established automatically.

A prerequisite for use of the 5-GHz frequency band is that wireless devices used in the network support this frequency range in accordance with the IEEE 802.11a, IEEE 8002.11n or IEEE 802.11ac standard.

In the 5-GHz frequency band, two large ranges of frequencies can be used: 5.15 GHz to 5.35 GHZ, and 5.47 GHz to 5.805 GHz. In the EU, up to 19 channels are available in these areas:

5150 to 5350 MHz (channels 36, 40, 44, 48, 52, 56, 60 and 64)

5470 to 5725 MHz (channels 100, 104, 108, 112, 116, 120, 124, 128, 132, 136 and 140)

Different conditions may apply for the individual ranges.

## 2.4 GHz and 5 GHz

The FRITZ!Box works in the wireless network in the 2.4-GHz range and parallel in the 5-GHz range. Both frequency ranges can be used simultaneously for wireless LAN connections. This means you always have the optimum data connection at your disposal:

For applications that rely on a high transmission rate as steady as possible (“streaming”), use the 5-GHz frequency band. This radio band provides more channels, these channels do not overlap, and they also are subject to significantly less external interference.

For applications that require a low to normal transmission rate (for instance, reading and writing e-mail), use the 2.4-GHz frequency band.

## Bandwidth

Depending on which generation of the IEEE 802.11n standard is used, the FRITZ!Box can transport 300 to 450 Mbit/s over wireless LAN. Up to 1300 Mbit/s are possible with the IEEE 802.11ac standard. If not enough space is available in the radio spectrum to allow interference-free transmission on the channel with bandwidth of 40/80 MHz, the FRITZ!Box automatically reduces bandwidths to 20/40 MHz (“fallback”) with a correspondingly lower transmission capacity.

| Standard | Channel Bandwidth (MHz) |
|---|---|
| 802.11ac | Automatic selection of 20, 40 or 80 |
| 802.11n | Automatic selection of 20 or 40 |
| 802.11a | 20 (always) |

For connections in accordance with the 802.11ac standard with three separate data streams (three antennas), higher data throughput can be achieved with greater bandwidth:

| Bandwidth (MHz) | Maximum Throughput (Mbit/s) |
|---|---|
| 20 | 216 |
| 40 | 450 |
| 80 | 1300 |

Increasing bandwidths also increases the probability of interference by wireless networks in the vicinity. Large bandwidths reduce the frequency range available to other wireless networks in the vicinity.

Allocation of the Wireless LAN Channels in the 2.4-GHz Range

| Channel | Frequency (GHz) | Channel | Frequency (GHz) |
|---|---|---|---|
| 1 | 2.412 | 8 | 2.447 |
| 2 | 2.417 | 9 | 2.452 |
| 3 | 2.422 | 10 | 2.457 |
| 4 | 2.427 | 11 | 2.462 |
| 5 | 2.432 | 12 | 2.467 |
| 6 | 2.437 | 13 | 2.472 |
| 7 | 2.442 | | |

Allocation of the Wireless LAN Channels in the 5-GHz Range

| Channel | Frequency (GHz) | Channel | Frequency (GHz) |
|---|---|---|---|
| 36 | 5.180 | 108 | 5.540 |
| 40 | 5.200 | 112 | 5.560 |
| 44 | 5.220 | 116 | 5.580 |
| 48 | 5.240 | 120 | 5.600 |
| 52 | 5.260 | 124 | 5.620 |
| 56 | 5.280 | 128 | 5.640 |
| 60 | 5.300 | 132 | 5.660 |
| 64 | 5.320 | 136 | 5.680 |
| 100 | 5.500 | 140 | 5.700 (20 MHz bandwidth only) |
| 104 | 5.520 | | |

# 14 FRITZ!Box as a Telephone System

This chapter describes how to use the FRITZ!Box as a telephone system.

## 14.1 Telephone Book

### How Can I Use the Telephone Book?

#### On FRITZ!Fon Cordless Telephones

The telephone book is available in the menu of your FRITZ!Fon cordless telephones.

You can configure a separate telephone book for each FRITZ!Fon, see page 90.

#### Quick-Dial

With quick-dial numbers you can conduct calls on all telephones. You assign quick-dial numbers in the telephone book entries.

#### Click to Dial

With Click to Dial you can place calls by just clicking telephone book entries with the mouse, see page 91.

### Creating a New Telephone Book Entry

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephone Book”.
3. Click “New Entry”.
4. Enter the information on the contact.

   In the first telephone book you can also enter a quick-dial number.

   In the Help of the FRITZ!Box user interface you can find detailed instructions.
5. Save with “OK”.

## Creating a New Telephone Book for FRITZ!Fon

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephone Book”.
3. Click the “New telephone book” link.
4. Select “Create as new”.
5. Under “Telephone Assignment”, select all FRITZ!Fon cordless telephones on which you would like to use the telephone book.
6. Save with “OK”.

The telephone book is available in the menu of your selected FRITZ!Fon cordless telephones.

## Configuring Online Telephone Books (for instance, Google Contacts)

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephone Book”.
3. Click the “New telephone book” link.
4. Select “Use the telephone book of an e-mail account”.
5. Select a provider and enter the e-mail address and password.
6. Under “Telephone Assignment”, select all FRITZ!Fon cordless telephones on which you would like to use the telephone book.
7. Save with “OK”.
8. For Google contacts you can also select contact groups.

   In the Help of the FRITZ!Box user interface you can find detailed instructions.

The telephone book is available in the menu of your selected FRITZ!Fon cordless telephones.

### Synchronizing Online Contacts

The FRITZ!Box synchronizes the configured online telephone books with the telephone book of your e-mail account every 24 hours.

You can also synchronize the telephone books with the click of a button. In the Help of the FRITZ!Box user interface you can find detailed instructions.

### Configuring Click to Dial

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephone Book / Click to Dial”.
3. Enable click to dial and select a telephone.
4. Save with “Apply”.

You can use click to dial. In the Help of the FRITZ!Box user interface you can find detailed instructions.

## 14.2 Call List

The call list contains your telephone conversations and calls you missed.

### Icons in the Call List

The icon in front of a call shows the kind of call concerned:

| Symbol | Meaning |
|---|---|
|  | Outgoing call |
|  | Incoming call |
|  | Missed call (a call that was not picked up) |
|  | Rejected call<br>The call was rejected by pressing a button on the telephone or automatically through a call block. |

## Saving New Telephone Numbers in the Telephone Book

New telephone numbers can be saved to the telephone book with a mouse click:

1. In the call list, click the “Add to Telephone Book” button  .
2. Select an option:
   - Create new: Create a new telephone book entry
   - Add to: Add a telephone number to an entry
3. Click “Next”.

## Saving the Call List in a CSV File

You can save the call list in a CSV file on your computer. CSV files can be opened and processed in spreadsheet programs.

1. Click the “Save” button in the call list.
2. Select “Save” or “Save File”. What to do next depends on the web browser you are using.

## FRITZ!App Ticker for Android Smartphones

FRITZ!App Ticker shows the call list and new messages on the answering machine on your Android smartphone.

For more information, read en.avm.de/products/fritzapps.

## 14.3 Answering Machine

You can use the FRITZ!Box as an answering machine without connecting any additional devices.

If you have several telephone numbers, you can configure up to five different answering machines.

### Features

- Voice to mail: If desired you can receive any new messages automatically by e-mail.
- Schedule: You can define times for the answering machine to switch on and off on different days of the week.
- Remote playback: You can check the answering machine from on the go.

### Configuring an Answering Machine

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Answering Machine”.
3. Click the “Settings” button to configure the first answering machine.

   To configure a new answering machine, click the “Another answering machine” link.

In the Help of the FRITZ!Box user interface you can find detailed instructions.

### Picking Up a Call from the Answering Machine

You can pick up on your telephone a call that has already been accepted by the answering machine:

1. Press the keys ✪09 on the telephone.
2. Pick up the handset.

You are connected with the caller.

## Operating the Answering Machine on FRITZ!Fon

You can operate the answering machine in the menu of your FRITZ!Fon cordless telephones.

For comprehensive instructions, see the current FRITZ!Fon manual on en.avm.de/service/manuals/fritzfon.

## Operating the Answering Machine Using the Voice Menu

Using a voice menu you can operate the answering machine on any telephone connected with the FRITZ!Box.

Audio prompts in the voice menu guide the user through operation. Use the telephone keys to select functions.

1. Press the following keys on the telephone:

| For ... | Keys |
|---|---|
| Answering Machine 1 | ✪✪6000 |
| Answering Machine 2 | ✪✪6001 |
| Answering Machine 3 | ✪✪6002 |
| Answering Machine 4 | ✪✪6003 |
| Answering Machine 5 | ✪✪6004 |

2. Pick up the handset.
3. Follow the audio prompts in the voice menu.

   You can also simply press a key on the telephone without waiting for the prompts.

   An overview of the voice menu is presented on page 94.

## Overview of the Voice Menu

### Main Menu

| Key | Function |
|---|---|
| 1 | Play back messages |
| 2 | Delete all messages |

| Key | Function |
|---|---|
| ❸ | Switching the Answering Machine On and Off |
| ❹ | Record a greeting |
| ❺ | Enable recording mode (callers can leave messages) or announcement mode (answering machine does not record any messages) |

## The “Listen to Messages” Menu

| Key | Function |
|---|---|
| ❸ | Return caller’s call |
| ❺ | Delete message |
| ❼ | To previous message |
| ❾ | To next message |

## The “Record Greeting” Menu

| Key | | Function |
|---|---|---|
| ❶ | | Greeting for recording mode |
| ❷ | | Greeting for announcement mode |
| ❸ | | Closing message at end of recording length |
| | ❶ | Listen to greetings › Select greeting with ❷ |
| | ❺ | Delete greeting/announcement |
| | ❽ | Start recording › End recording with ❶ |

## In All Menus

| Key | Function |
|---|---|
| ❶ | Listen to messages in current menu from the beginning |
| ❽ | Back to main menu |

## 14.4 Fax Function

With the FRITZ!Box you can send and receive faxes without a fax machine. The FRITZ!Box can be configured to forward received faxes by e-mail.

### Configuring the Fax Function

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephony Devices”.
3. Click “Configure New Device”.
4. Under “Integrated in the FRITZ!Box”, select the “Fax function” option and confirm by clicking “Next”.
5. Enter the fax ID in the following format:

   +49 30 12345 (country code, area code without 0, your fax number)
6. Define whether the FRITZ!Box forwards incoming faxes by e-mail or saves them.

   You can also enter multiple e-mail addresses. Use a comma to separate the individual addresses.
7. Click “Next”.
8. Select your fax number. Please note:

   The fax function accepts all calls to the selected number, including telephone calls.

   If you would like to take telephone calls at this number, too, you can set up automatic fax detection.
9. Click “Next” and “Apply”.

The fax function is configured.

### Configuring Automatic Fax Detection

Here is how automatic fax detection works:

The answering machine checks each incoming call to see whether it is a telephone call or a fax. Callers can leave a message, and faxes are forwarded to the fax function.

Here is how to enable automatic fax detection:

1. Open the FRITZ!Box user interface.
2. Configure the fax function; see page 96.
3. Select “Telephony / Telephony Devices”.
4. Click the “Edit” button to open the settings of the fax function:

5. Click the “Help” button.

   The Help on the fax function contains instructions on how to configure automatic fax detection.

## Sending Faxes from the User Interface

1. Configure the fax function. For instructions, see Configuring the Fax Function on page 96.
2. Open the FRITZ!Box user interface.
3. Select “Telephony / Fax”.
4. Select the recipient’s name and fax number from the telephone book and enter the data in the “to” and “Fax number” fields.
5. You can enter your name and address in the “Sender” field.
6. Select a fax number from the “Send with” list. The list contains all telephone numbers assigned to the fax function.
7. Enter a subject and the text of your fax.
8. In the Internet browser **Google Chrome** or **Mozilla Firefox**, you can attach an image to the fax. Click “Browse” to select an image.

   You can attach jpg or png files. Other files like PDF or Word files cannot be sent by fax.

   Images smaller than DIN A4 will be centered. Images larger than DIN A4 will be reduced in size.
9. Click “Send”.

   Fax sending begins.

## 14.5 Call Diversion

You can configure call diversion for incoming calls in the FRITZ!Box.

### Which Calls Can I Divert?

Call diversion can be set up for the following calls:

- All incoming calls
- All calls from a certain telephone number or a certain person in the telephone book
- If you have multiple telephone numbers: all calls **for** a certain telephone number or a certain telephone
- All anonymous calls in which the caller does not transmit a telephone number

### Where Can I Divert Calls to?

You can divert calls to:

- Another telephone number (a different telephone line or mobile telephone number)
- One of the FRITZ!Box's internal answering machines

### Configuring Call Diversion

1. Open the FRITZ!Box user interface.
2. Select the "Telephony / Call Handling / Call Diversion" menu.
3. Click "New Call Diversion".
4. Define which calls should be diverted.

   In the Help of the FRITZ!Box user interface you can find detailed instructions.
5. Define the destination and the type of call diversion.
6. Click "OK" to save the settings.

## 14.6 Dialing Rules for Outgoing Calls

If you have multiple telephone numbers, you can configure dialing rules.

A dialing rule determines which telephone number the FRITZ!Box uses for outgoing calls in a certain number range, for instance to the mobile network or abroad.

Example: You have a telephone number with which you can save on calls to foreign numbers. Then configure a dialing rule so that calls to foreign countries will be conducted with this telephone number.

### Configuring Dialing Rules

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Call Handling / Dialing Rules”.
3. Click the “New Dialing Rule” button.
4. Define the range of telephone numbers or the telephone number to which the dialing rule should apply.
5. Select a telephone number from the “Connect via” drop-down list.
6. Click “OK” to save the settings.

## 14.7 Dial Around Service Using Dialing Rules

If you would like use a dial around service number for certain calls, set up a dialing rule in the FRITZ!Box.

A dialing rule can specify, for example, that the FRITZ!Box automatically dials all international using a dial around service.

### Entering a Dial Around Number

First enter all of the dial around service numbers you would like to use in dialing rules:

1. Open the FRITZ!Box user interface.

2. Click the “View: Standard” link to switch on the advanced view:


3. Select “Telephony / Call Handling”.
4. Switch to the “Carrier Prefixes” tab.

   If the tab is not available, the FRITZ!Box does not support the use of dial around service on your connection type.
5. Under “Other Provider Prefixes”, enter all of the dial around service numbers you would like to use in dialing rules.
6. Click “Apply”.

## Configuring Dialing Rules

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Call Handling”.
3. Switch to the “Dialing Rules” tab.
4. In the “Number range” list, choose for which outgoing telephone calls the dialing rule applies.

| Number Range | Numbers Starting With |
|---|---|
| Mobile Telephone Network | 015, 016 or 017 |
| Local area network | 2, 3, 4, 5, 6, 7, 8 or 9 |
| Long-distance calls | 0 |
| International | 00 |
| Special rate numbers | 0900, 0190 or 0180 |
| Directory assistance | 118 |

5. Select the desired dial around service number from the “Connect via...” list.
6. Click “OK” to save the dialing rule.

## Example: Configuring Dialing Rules for International Calls

If you would like to conduct all international calls using a dial around service, configure the dialing rules as follows:

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Call Handling”.
3. Switch to the “Dialing Rules” tab.
4. Select from the “Number range” list the “International” entry.
5. Select the desired dial around service number from the “Connect via...” drop-down list.
6. Click “OK” to save the dialing rule.

Now whenever you call a telephone number that begins with 00 (2 zeroes) with the FRITZ!Box the call will be dialed using the dial around service number defined in the dialing rule.

## 14.8 Blocking Telephone Numbers and Callers

In the FRITZ!Box you can block telephone numbers for outgoing and for incoming calls.

### How Does a Call Block Work?

You can configure various kinds of call blocks:

| Call Block for | Function |
|---|---|
| Outgoing calls | The blocked telephone number can no longer be called from the FRITZ!Box.<br>Ranges of telephone numbers, for instance, mobile networks, can also be blocked. |
| Incoming calls | The FRITZ!Box will not accept calls from the blocked telephone number.<br>However, the call block only works if the caller allows transmission of her or his telephone number. |
| Anonymous callers | The FRITZ!Box will not accept any calls from callers who suppress their telephone number. |

### Configuring a Call Block

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Call Handling / Call Blocks”.
3. Click the “New Blocking Rule” button.
4. Select whether the call block is to apply to incoming or outgoing calls.
5. Enter a range of telephone numbers or a telephone number.
6. Click “OK” to save the settings.

## 14.9 Do Not Disturb

Do Not Disturb keeps a telephone from ringing at specified times. Calls you miss then appear in the FRITZ!Box call list.

### Configuring Do Not Disturb

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Telephony Devices”.
3. Click the “Edit” button to open the settings of a telephone:

4. Switch to the “Do Not Disturb” tab and configure the Do Not Disturb settings.
5. Click “OK” to save the settings.

## 14.10 Alarm

When you configure an alarm, your telephone rings at the specified time.

### Configuring the Alarm

1. Open the FRITZ!Box user interface.
2. Select “Telephony / Alarm”.
3. Enable the alarm and enter a time.
4. Select which telephone should ring at the specified time.
5. Define here whether the alarm should be repeated.
6. Click “Apply” to save the settings.

The alarm is configured and enabled.

## 14.11 Baby Monitor

The following telephones can be configured as a baby monitor:

- FRITZ!Fon cordless telephones
- Telephones connected to the “FON 1” or “FON 2” socket on the FRITZ!Box.

### How Does a Telephone Work as a Baby Monitor?

You configure the telephone as a baby monitor by entering a telephone number at which you can be reached.

Now when the volume in the room reaches a certain level, the telephone will call the specified telephone number.

Incoming calls to the telephone are signaled silently.

### Configuring a FRITZ!Fon Cordless Telephone as a Baby Monitor

1. Press the menu key on your FRITZ!Fon.
2. Select “Suppl. services” and then press “OK”.
3. Select “Baby monitor” and then press “OK”.
4. Select “Destination no.” and then press “OK”.
5. Enter an external telephone number, an internal telephone number or ✪✪❾ for an internal broadcast call.

   The internal numbers of the telephones you have connected are listed in telephone book of the FRITZ!Box user interface.
6. Press “OK”.
7. Select “Activation” and “OK”.
8. Set the sensitivity.

   The baby monitor is enabled. The display of your FRITZ!Fon shows the text “Baby monitor enabled”.

To disable the baby monitor, exit the “Baby Monitor Enabled” menu.

## Configuring a Telephone at the FON Port as a Baby Monitor

Here is how to configure a telephone at the “FON 1” or “FON 2” port:

1. Press the following keys on the telephone:

| This Is Where the Baby Monitor Should Call | Keys |
|---|---|
| Another telephone or mobile number | ✪41✪‹telephone number›# |
| Internal telephone number, see page 106 | ✪41✪‹internal telephone number without **›# |
| All other telephones connected to the FRITZ!Box (broadcast call) | ✪41✪9# |

2. The baby monitor is enabled. Place the handset near the child to be monitored.
3. If the baby monitor is too sensitive, set it to a lower sensitivity. The third button defines the sensitivity. Eight levels are available:

| Sensitivity | Keys |
|---|---|
| Highest | ✪41✪‹telephone number›# |
| | ✪42✪‹telephone number›# |
| | ... |
| Lowest | ✪48✪‹telephone number›# |

To disable the baby monitor, hang up the handset.

# 14.12 Making Telephone Calls with Convenience Functions

This chapter describes convenience functions you can use when placing and making telephone calls, for instance internal calling, forwarding calls, alternating between calls and three-party conferences.

## Making Internal Calls

You can conduct free, internal calls between telephones connected to the FRITZ!Box.

1. Enter an internal telephone number on the telephone.

   The internal numbers of the telephones you have connected are listed in telephone book of the FRITZ!Box user interface.

2. Pick up the handset.

## Group Call

A group call or broadcast call is an internal call that is signaled on all telephones connected with the FRITZ!Box. The call is conducted with the party who picks up the telephone first.

1. Press the keys ✱✱⑨ on the telephone.
2. Pick up the handset.

## Transferring: Forwarding Calls Internally

Here is how to transfer a call to a different telephone:

1. While you are conducting the call, press the Hold button ®.

   The call is on hold.

2. Enter an internal number.

   The internal numbers of the telephones you have connected are listed in telephone book of the FRITZ!Box user interface.

   When the called party accepts the call the second call is connected.

3. Hang up to connect the two external parties with each other.

### Calling Line Identification Restriction (CLIR) Once for FON 1 or FON 2

For outgoing calls on the lines “FON 1” and “FON 2” you can restrict identification of your calling line once (for one call).

1. Press the keys ✪❸❶# on the telephone.
2. Enter the telephone number you would like to call.
3. Pick up the handset.

For this call your telephone number will not be transmitted to the other caller.

## Three-Party Conference Call

### Making a Three-Party Conference Call

1. Connect the first call: Call someone or pick up their call.
2. Press the Hold button Ⓡ.

   Call 1 is on hold.
3. Connect the second call: Enter an internal or external telephone number.

   When the called party accepts the call the second call is connected.
4. Press the keys Ⓡ❸.

   The three-party conference is set up.

   Any party can hang up. The two other parties remain connected.

### Interrupting a Three-Party Conference Call

1. Press the keys R2.
2. You are speaking with party 1 and holding call 2.
3. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Ending call 2 and switching to call 1 | R1 |
| Switching between call 1 and call 2 (alternating) | R2 |
| Making a three-party conference call | R3 |

## Accepting or Rejecting Waiting Calls on FON 1 and FON 2

### Requirements

- The “Call waiting” feature must be enabled for the individual telephone in the FRITZ!Box. The telephone settings can be edited in the user interface of the FRITZ!Box under “Telephony / Telephony Devices”.

### Rejecting a Waiting Call

➡ Press the keys R0.

### Accepting a Waiting Call and Holding Call 1

1. Press the keys R2.
2. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Switching between call 1 and call 2 (alternating) | R2 |
| Ending call 2 and switching to call 1 | R1 |

### Accepting a Waiting Call and Ending Call 1

1. Hang up.

   Call 1 is ended and your telephone rings.

2. Pick up the handset.

   You are connected with the waiting caller.

### Holding, Consultation and Alternating

You can put a call on hold in order to call another party and establish a second call (consultation).

You can alternate between the two calls as often as you like.

### Holding and Consultation

1. While you are conducting the call, press the Hold button Ⓡ on the telephone.

   Call 1 is on hold.

2. Enter an internal or external telephone number.

   When the called party accepts the call the second call is connected.

### Alternating Between Calls

Here is how to switch from the active to the held call:

➡ Press the keys Ⓡ❷.

The call that was just active is put on hold and you continue the other call.

### Ending the Active Call—Continuing the Call on Hold

1. Hang up the handset.

   The active call is ended. Your telephone rings.

2. Pick up the handset.

   You are speaking with the party that was on hold.

## Using Keypad Shortcuts

Keyboard shortcuts are commands consisting of multiple characters and numerals. They can be used to control services and features in the telephone network.

For information about which keypad sequences you can use, contact your carrier.

1. Press the keys ✱#‹Seq›. ‹Seq› stands for a keyboard sequence.

   If the telephone is connected to the “FON 1” or “FON 2” port and you have disabled automatic outside dialing (see page 117), press 0✱#‹Seq›.

2. Pick up the handset.

# 15 Configuring FRITZ!Box on the Telephone

Various functions can be configured using a telephone connected to the FRITZ!Box.

## 15.1 Alarm

### Requirements

You set up an alarm in the FRITZ!Box; see Alarm on page 103.

### Can I Switch More than One Alarm On and Off?

No. With the telephone keys you always switch the first alarm on or off.

The second and third alarm can be switched on and off here:

- in the FRITZ!Box user interface; see Alarm on page 103
- in the menu of a FRITZ!Fon cordless telephone

### Switching the Alarm On and Off

1. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Alarm on | #8801** |
| Alarm off | #8801# |

2. Pick up the handset and hang it up again.

## 15.2 Do Not Disturb

For the lines “FON 1” and “FON 2” you can enable the Do Not Disturb feature.

In the FRITZ!Box user interface you can also configure the Do Not Disturb function for other telephones; see Do Not Disturb on page 103.

### Switching Do Not Disturb On and Off for FON 1

1. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Do Not Disturb enabled | #8110* |
| Do Not Disturb disabled | #8110*1* |

2. Pick up the handset and hang it up again.

### Switching Do Not Disturb On and Off for FON 2

1. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Do Not Disturb enabled | #8120*0* |
| Do Not Disturb disabled | #8120*1* |

2. Pick up the handset and hang it up again.

## 15.3 Call Diversion

Call diversion automatically diverts incoming calls to a previously specified external telephone number.

If your telephony provider supports this, calls will be diverted by your provider. Otherwise the FRITZ!Box establishes a second connection. In either case, extra charges will accrue according to your contracted telephone rates.

### Enabling: Call Diversion for All Calls

Here is how to configure call diversion to an external number (destination number) that applies to all incoming calls:

1. Press the following keys on the telephone:

| Type of Call Diversion | Keys |
|---|---|
| Immediately | ✪21✪‹destination phone number›✪# |
| delayed (after 20 seconds) | ✪61✪‹destination phone number›✪# |
| only when busy | ✪67✪‹destination phone number›✪# |

2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

### Disabling: Call Diversion for All Calls

1. Press the following keys on the telephone:

| Type of Call Diversion | Keys |
|---|---|
| Immediately | ✪21✪✪# |
| delayed (after 20 seconds) | ✪61✪✪# |
| only when busy | ✪67✪✪# |

2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

## Enabling: Call Diversion for Own Telephone Number

You can configure call diversion that applies only for all calls that arrive for a certain telephone number. Calls for your other telephone numbers will not be diverted.

Here is how to configure call diversion to an external number (destination number):

1. Press the following keys on the telephone:

| Type of Call Diversion | Keys |
|---|---|
| Immediately | ✱21✱‹destination phone number› ✱‹own number›# |
| delayed (after 20 seconds) | ✱61✱‹destination phone number› ✱‹telephone number›# |
| only when busy | ✱67✱‹destination phone number› ✱‹telephone number›# |

2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

## Disabling: Call Diversion for Own Telephone Number

1. Press the following keys on the telephone:

| Type of Call Diversion | Keys |
|---|---|
| Immediately | ✱21✱✱‹own telephone number›# |
| delayed (after 20 seconds) | ✱61✱✱‹own telephone number›# |
| only when busy | ✱67✱✱‹own telephone number›# |

2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

## Enabling: Call Diversion for FON 1

1. Press the following keys on the telephone:

| Type of Call Diversion | Keys |
|---|---|
| immediately without ringing | #41*‹destination phone number›* |
| immediately with ring | #451*‹destination phone number›* |
| delayed (after 20 seconds) | #421*‹destination phone number›* |
| only when busy | #431*‹destination phone number›* |
| immediately when busy, otherwise delayed | #441*‹destination phone number›* |

2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

## Disabling: Call Diversion for FON 1

1. Press the keys *401#** on the telephone.
2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

## Enabling: Call Diversion for FON 2

1. Press the following keys on the telephone:

| Type of Call Diversion | Keys |
|---|---|
| immediately without ringing | #412*‹destination phone number›* |
| immediately with ring | #452*‹destination phone number›* |

| Type of Call Diversion | Keys |
|---|---|
| delayed (after 20 seconds) | #422*‹destination phone number›* |
| only when busy | #432*‹destination phone number›* |
| immediately when busy, otherwise delayed | #442*‹destination phone number›* |

2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

### Disabling: Call Diversion for FON 2

1. Press the keys *402#** on the telephone.
2. Pick up the handset.

   Wait for the second-long positive acknowledgment tone.

3. Hang up the handset.

## 15.4 Switching the Wireless Network On and Off

1. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Wireless LAN on | #96*1* |
| Wireless LAN off | #96*0* |

2. Pick up the handset and hang it up again.

## 15.5 Loading Factory Settings

All settings you made in the FRITZ!Box will be deleted.

1. Press the keys #9901*15901590*.
2. Pick up the handset and hang it up again.

The factory settings are loaded. Then the FRITZ!Box will restart.

## 15.6 Disabling and Enabling Automatic Outside Dialing

On the “FON 1” and “FON 2” lines you can enable and disable automatic outside dialing. The default setting is “enabled”.

When automatic outside dialing is enabled, dial “**” before internal numbers; when automatic outside dialing is disabled, dial “0” before external numbers. Example:

| Automatic Outside Dialing Is | Call to the External Telephone Number 2345 | Call to the Internal Number 2 |
|---|---|---|
| enabled | 2345 | **2 |
| disabled | 02345 | 2 |

### Automatic Outside Dialing on FON 1

1. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Disabling automatic outside dialing | #11*0* |
| Enabling automatic outside dialing | #11*1* |

2. Pick up the handset and hang it up again.

## Automatic Outside Dialing on FON 2

1. Press the following keys on the telephone:

| Function | Keys |
|---|---|
| Disabling automatic outside dialing | #120* |
| Enabling automatic outside dialing | #121* |

2. Pick up the handset and hang it up again.

# 16 FRITZ!Box as a DECT Base Station

The FRITZ!Box is equipped with a DECT base station, on which you can register and configure a total of up to six cordless telephones.

## 16.1 Paging Cordless Telephones

If you have misplaced a cordless telephone, you can find it by using a paging call:

1. Briefly press the “DECT” button of the FRITZ!Box. All cordless telephones registered on the FRITZ!Box will ring.
2. To end the paging call press the “DECT” button on the FRITZ!Box again, or any button on your cordless telephone.

## 16.2 Registering a Cordless Telephone

➡ Read Registering FRITZ!Fon and Other Cordless (DECT) Telephones on page 47.

## 16.3 Deregistering a Cordless Telephone

Deregister from the FRITZ!Box the cordless telephones you no longer use.

1. Open the FRITZ!Box user interface.
2. Select “DECT”.
3. To deregister a cordless telephone, click the “Delete”  button.

The cordless telephone will be deregistered from the FRITZ!Box and deleted from the user interface.

## 16.4 Enabling DECT Eco

DECT Eco allows the DECT radio network to be switched off during standby operation.

### How Does DECT Eco Work?

When all registered cordless telephones are in standby operation, the DECT radio network of the FRITZ!Box and the telephones is switched off.

When a call arrives or you press a key on a cordless telephone, the DECT radio network is switched back on.

A telephone is on standby operation when you are not making any calls, not using any other features, and not pressing any buttons.

### Requirements

- In the user interface (see page 31), the option “DECT Eco supported” must be displayed for each cordless telephone under “DECT / DECT Monitor”.
- The FRITZ!Box must be configured as a DECT base station: The setting “DECT enabled” must be enabled under “DECT / Base Station” in the user interface.
- The following devices may **not be registered with the FRITZ!Box**: DECT-ULE devices (for instance FRITZ!DECT), FRITZ!DECT Repeater, FRITZ!Box in DECT repeater mode.

### Enabling DECT Eco in the FRITZ!Box

1. Open the FRITZ!Box user interface.
2. Select the “DECT / Base Station” menu.
3. Enable the “DECT Eco” option and define when DECT Eco should be active.
4. Click the “Apply” button to save the settings.
5. Register all of the cordless telephones on the FRITZ!Box again.

# 17 FRITZ!Box Connects Network Devices

All network devices connected with the FRITZ!Box comprise a network. Network devices include, for instance, computers, game consoles and smartphones. The devices can be connected with the FRITZ!Box by cable or wirelessly. This chapter describes the network settings in the FRITZ!Box and how you can change them. You will also learn how you can change the IP settings for the computer in the most common operating systems.

## 17.1 Network Settings in the FRITZ!Box

The FRITZ!Box is delivered with preconfigured network settings. According to these settings, all network devices connected with the FRITZ!Box are located in a single network.

The network settings can be changed and adapted to your conditions and needs. But you should do so only if you are well versed in networking technology.

### Network Overview

All of the devices and users connected with the FRITZ!Box are displayed in a table on the “Network Connections” tab in the “Home Network / Home Network Overview” menu.

- For each user and each network device, you find an entry in the network overview.
- If you use FRITZ!Powerline devices in your network, these will be displayed in the network overview. All of the network devices connected to the FRITZ!Powerline will also be displayed.
- If you use FRITZ!WLAN Repeater in your network, these will be displayed in the network overview. Network devices connected via a repeater will also be displayed.
- The network overview is divided into the areas “Active Connections”, “Guest Network” and “Idle Connections”.

## Accessing Network Devices by Mouse Click

Network devices that can be reached over the HTTP protocol can be accessed within the home network with a the click of the mouse. The name of the network device. Clicking the device name opens the user interface of the HTTP application.

## Network Devices: Settings

The settings described in the following section can be configured for each network device individually.

## Always Assigning the Same IP Address

For network devices there is the setting “Always assign this network device the same IP address”.

This setting has the effect that the DHCP server of the FRITZ!Box will assign the same IP address to the device every time it connects to the network.

## Starting the Computer—Wake on LAN

Wake on LAN is a function that allows a computer in the local network to be started when it is accessed from the Internet. For instance, you can access a computer using remote maintenance software, without wasting electricity by keeping the computer switched on permanently.

The FRITZ!Box supports Wake on LAN both for IPv4 and for IPv6 connections.

Requirements:

- The computer must support Wake on LAN.
- The computer must be connected with the FRITZ!Box via network cable or via a FRITZ!Powerline device.
- For access from the Internet, the computer must be in standby operation.

There are two ways to start the computer:

- The “Start Computer” button

  Using this button you can start the computer every time it is accessed from the Internet.

- Starting automatically

  With the “Start this computer automatically as soon as it is accessed from the Internet” option the computer is started automatically when it is accessed from the Internet.

### Configuring Settings

The settings are configured in the detailed view of the individual network devices:

1. Select the “Home Network / Home Network Overview” menu.
2. Select the “Network Connections”tab.
3. Select the computer and click the “Edit” button: 

The detailed view for the computer will be opened.

## IPv4 Settings in the FRITZ!Box

### Factory Settings

The following IPv4 settings are preconfigured in the FRITZ!Box upon delivery:

| Setting | Preconfigured Value |
|---|---|
| IPv4 address | 192.168.178.1 |
| Subnet mask | 255.255.255.0 |
| DHCP server | enabled |

The following IP addresses can be derived from the IP address and the subnet mask:

| IP Addresses | Value |
|---|---|
| Network address | 192.168.178.0 |
| Entire IPv4 address range for the computers | 192.168.178.2 – 192.168.178.254 |

## Reserved IP Addresses

The following IPv4 addresses cannot be assigned because they are reserved for certain purposes:

| IP Address / Purpose | Value |
|---|---|
| This IP address is used by the FRITZ!Box itself | 192.168.178.1 |
| This IP address is the broadcast address used to send messages into the network | 192.168.178.255 |

The entire IP network 192.168.180.0 in the FRITZ!Box is reserved for internal purposes.

IPv4 addresses from this network may **not** be assigned to the FRITZ!Box.

## Changing the IPv4 Address

In most home networks it is not necessary to change the IPv4 settings.

Yet there are situations in which it makes sense to adjust the IPv4 settings of the FRITZ!Box. For instance, in the following case:

- You have an existing local IPv4 network, one subnet with several computers.
- Fixed IPv4 addresses are registered in the network settings of the computer, and you do not want to or are not permitted to change these addresses.
- You want to connect the FRITZ!Box to the local IPv4 network in order to make the FRITZ!Box features available to all of the computers in the IPv4 network.

## IPv4 Address in Case of Emergency

The FRITZ!Box has a fixed IPv4 address that cannot be changed. The FRITZ!Box always can be reached at this IPv4 address.

| | |
|---|---|
| Emergency IPv4 address | 169.254.1.1 |

For instructions about how to handle the emergency IPv4 address, see the section Opening the User Interface Using an Emergency IP Address from page 168.

## DHCP Server for IPv4

The FRITZ!Box has a DHCP server for the IPv4 range. The DHCP server is enabled by default in the factory settings. The following range of IP addresses is reserved for the DHCP server in the factory settings:

| | |
|---|---|
| IP address range reserved upon delivery | 192.168.178.20 – 192.168.178.200 |

## How the DHCP Server Works

Every time a network device connected with the FRITZ!Box is started, the DHCP server assigns it an IPv4 address from the IP address range of the DHCP server.

Only one DHCP server may be active within any network.

Assigning the IP addresses via the DHCP server ensures that all of the network devices connected with the FRITZ!Box are located in the same IP network.

The IPv4 settings of the network devices must have the “Obtain an IP address automatically” option enabled. This is the only way to receive the IP address from the DHCP server. For more information, see the chapter Obtaining an IP Address Automatically from page 129.

### Fixed IPv4 Addresses When the DHCP Server Is Enabled

If you would like to configure fixed IPv4 addresses on individual computers connected with the FRITZ!Box even though the DHCP server is enabled, please note the following:

- The IPv4 addresses must be from the IPv4 network of the FRITZ!Box.
- The IPv4 addresses may not come from the address range of the DHCP server.
- Each IPv4 address can be assigned only once.

### Changing the IP Address Range of the DHCP Server

If the DHCP server does not have enough IP addresses, you can expand the address range.

### Disabling the DHCP Server

You can disable the DHCP server of the FRITZ!Box.

- If you use a different DHCP server in your home network, you must disable the DHCP server of the FRITZ!Box.
- If you want to manage the IP address assignments of all devices in the home network yourself, you can disable the DHCP server of the FRITZ!Box.

Please note that the FRITZ!Box must be located in the same IP network as all of the device connected with it. Integrate the FRITZ!Box in your network by adjusting the IP address of the FRITZ!Box to your home network.

### IPv6 Settings in the FRITZ!Box

The following settings options for IPv6 are found in the advanced view in the “Home Network / Home Network Overview” menu on the “Network Settings” page.

### Additional IPv6 Routers in the Home Network

- IPv6 prefixes from other IPv6 routers

  You can allow the network devices connected to the FRITZ!Box to receive IPv6 prefixes announced by other IPv6 routers in the local network.

- Also announce DNSv6 server via router advertisement

  With this setting you specify that the FRITZ!Box announces the local DNSv6 server in the local network via router advertisement. Alternatively, the network devices can identify the local DNSv6 server via DHCPv6.

### IPv6 Settings

Click the “IPv6 Addresses” button to configure settings for the IPv6 addresses in the local network.

### Unique Local Addresses

Communication within the local network takes place via the Unique Local Addresses (ULA). If no IPv6 Internet connection is established, the network devices do not have a ULA and communication between them is restricted. For this case you can set the FRITZ!Box such that the network devices receive the ULA from the FRITZ!Box.

### DHCPv6 Servers in the Home Network

The FRITZ!Box is equipped with its own DHCPv6 server. The DHCPv6 server of the FRITZ!Box is switched on by default.

The DHCPv6 server assigns the network devices their IPv6 settings. These settings are used instead of the data in the router advertisement messages. The DNS server, IPv6 prefixes or IPv6 addresses can all be assigned by DHCPv6. Define which IPv6 settings should be assigned by the DHCPv6 server.

## Changing Network Settings

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Home Network / Home Network Overview” menu.
4. Select the “Network Settings” page.
5. Click the “IPv4 Addresses” or “IPv6 Addresses” button, depending on the address range you would like to change.

Note that changes to the network settings in the FRITZ!Box may make it necessary to adjust the network settings of your computers so that you can continue to access the FRITZ!Box user interface.

## UPnP Settings

The Universal Plug-and-Play (UPnP) service included in your FRITZ!Box provides status information about the FRITZ!Box to all connected computers. UPnP-compliant programs on these computers can receive this information and use it to display the status of the FRITZ!Box (e.g., connection status, data transmission). UPnP service thus allows you to monitor your FRITZ!Box from a connected computer.

Here is how to change the UPnP settings:

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Home Network / Home Network Overview” menu.
4. Select the “Network Settings” tab.
5. Configure the UPnP settings in the “Access Settings in the Home Network” area.

## 17.2 Obtaining an IP Address Automatically

The FRITZ!Box has its own DHCP server, which assigns IP addresses to the connected computers. The connected computers must be configured such that they can receive their IP addresses automatically. The steps for checking and adjusting this option differ among the operating systems. See the relevant section for your operating system.

If FRITZ!Box is operated in a network, no other DHCP server may be activated in this network.

### Obtaining an IP Address Automatically in Windows

1. In Windows 10 and 7 click “Start”.

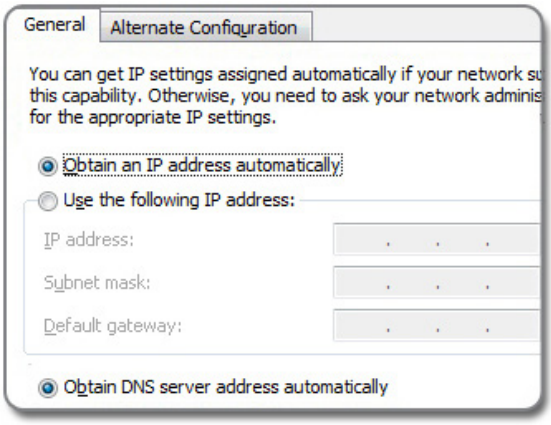
   In Windows 8, press the Windows key and the Q key at the same time.

   In Windows 10 the taskbar appears with the search field. In Windows 8 the “Search” menu for apps appears. In Windows 7 the Start menu with the “Search” field appears.

2. Enter “ncpa.cpl” in the search field and press Enter.


Entering “ncpa.cpl” in Windows 10

3. Click the network connection between the computer and the FRITZ!Box with the right mouse button and select “Properties”.
4. Under “This connection uses the following items”, select “Internet Protocol Version 4 (TCP/IPv4)”.
5. Click the “Properties” button.
6. On the “General” tab, enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.




7. Click “OK” to save the settings.
8. Enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically” for the Internet protocol version 6 (TCP/IPv6) as well.

The computer receives an IP address from the FRITZ!Box.

## Obtaining an IP Address Automatically in Mac OS X

1. Select the “System Preferences” in the Apple menu.
2. In the “System Preferences” window, click the “Network” icon.
3. In the “Network” window, select the “Ethernet” entry from the“Show:” list.
4. Click the “Advanced...” button. The “TCP/IP” settings page opens. Select the “Using DHCP” option from the “Configure IPv4:” drop-down list.
5. Click “OK”.

The computer now receives an IP address from the FRITZ!Box.

## Obtaining an IP Address Automatically in Linux

For comprehensive information and tips on network settings in Linux, see, for example:

www.tldp.org/HOWTO/NET3-4-HOWTO-5.html

# 18 Connecting USB Devices to the FRITZ!Box

The FRITZ!Box has two USB ports to which you can connect various USB devices. All network devices in the FRITZ!Box home network can use these USB devices jointly and simultaneously.

This chapter describes how to share a printer in the network, which USB devices can be used in your FRITZ!Box home network, and how to use these devices safely.

## 18.1 Power Supply for USB Devices

You can connect USB devices with the following properties to the FRITZ!Box:

- Some USB devices require more than one USB port for operation, for instance, hard drives with a USB Y cable. Connect this type of USB device to the FRITZ!Box using a USB hub with its own power supply.
- The total current consumption of connected USB devices without their own power supply may not exceed 900 mA. Check the rating plates of the connected USB devices.

  USB devices that exceed the total current consumption of 900 mA can be connected to the FRITZ!Box using a USB hub with its own power supply.

## 18.2 USB Devices on the FRITZ!Box

These USB devices can be connected to the FRITZ!Box:

- You can connect up to four USB storage media like hard disks, USB flash drives or card readers.
- USB storage media must use the file systems EXT2, FAT, FAT32 or NTFS. On storage media with the FAT and FAT32 file systems you can use files up to a size of 4 GB. In the EXT2 and NTFS file systems there is no limit to the size of files that can be used.

- You can connect **one** standard USB printer or **one** all-in-one device with scanner and fax function.

  The complete range of functions available in all-in-one printers is guaranteed only with the USB remote connection of the FRITZ!Box; see Sharing a USB Printer on page 135.

- You can connect a USB hub to the FRITZ!Box and use up to four USB devices at this hub.

  You can use USB hubs with or without a separate power supply. We recommend deploying a USB hub with its own power supply if the USB devices to be connected exceed a total current consumption of 900 mA; see Power Supply for USB Devices on page 131.

## 18.3 Using USB Devices Safely

Follow the instructions below about how to use USB devices on your FRITZ!Box.

- The FRITZ!Box can not defend the USB memory from external influences. This means that voltage spikes or drops, like those that occur during electrical storms, may lead to data losses on connected USB storage media. We recommend making regular backups of the USB memory contents to avoid any losses.
- Whenever you want to remove USB devices from the FRITZ!Box, go to the “Home Network / USB Devices” area in the FRITZ!Box user interface to remove them safely and avoid any loss of data.

## 18.4 Configuring Access Rights

You can protect the data on your USB storage from unauthorized access by securing the user interface of your FRITZ!Box with a password. In the “System / FRITZ!Box Users” menu you can

- configure a shared password that is requested every time anyone in your home network accesses the FRITZ!Box and the connected USB storage media.
- configure various FRITZ!Box users. You can configure a password for each FRITZ!Box user and then specify which connected USB storage media each user is allowed to access.

A USB storage medium connected to the FRITZ!Box can be reached in the home network by entering the shared FRITZ!Box password. From the Internet you can reach the USB storage medium only by logging in with your individual user name and password.

Information on the user controls of your FRITZ!Box is presented in the section Password Protection: Using FRITZ!Box Safely from page 35.

## 18.5 Accessing USB Memory

The participants in the home network have various possibilities for accessing the various storage media of the FRITZ!Box.

- Home network members can access the contents of connected USB memory and all other memory of the FRITZ!Box especially conveniently with FRITZ!NAS. For this FRITZ!NAS offers a graphic interface. Read the section Managing Memory with FRITZ!NAS on page 142 for more information.
- Participants in the home network can use FTP software like FireFTP to exchange files among the FRITZ!Box storage media and workplaces.

  Alternatively, you can enter ftp://fritz.box in the address line of your Internet browser to access the storage media.

  If you would like to use FTP software, see the documentation of the software as well as the instructions in the Help on the FRITZ!Box user interface.
- For access to media data like music, images and videos available on the memory or on storage media of the FRITZ!Box you can enable the FRITZ!Box media server. Suitable playback devices like TV sets, web radios, smartphones and the Windows Media Player can then call up the data from the media server for streaming.

  Playback devices to be used in connection with the media server must support the UPnP AV standard. The term “DLNA” is often used to designate this support.

  Enable the “Media Server enabled” function in the FRITZ!Box user interface under “Home Network / Media Server”.

## 18.6 Enabling Energy-saving Mode for USB Hard Drives

In the FRITZ!Box you can enable an energy-saving function for USB hard drives connected to the FRITZ!Box. When the energy-saving function is enabled, connected USB hard drives will be switched off when they are idle—as long as the hard drives support the energy-saving function.

Enable the energy-saving function in the “Home Network / USB Devices” menu in the FRITZ!Box user interface. You can also test here whether your USB hard disk supports the energy-saving function.

## 18.7 Sharing a USB Printer

You can connect a USB printer to the FRITZ!Box to make it available to all participants in your home network.

### Using a USB Printer: Possibilities

A USB printer connected to the FRITZ!Box can be configured in various ways:

| Type of Configuration | Your device is a |
|---|---|
| network printer | • A printer that is to be used simultaneously and jointly by the participants in the home network.<br>• A printer that is to be used by computers that use an operating system other than Windows. |
| Printer with FRITZ!Box USB remote connection | • An all-in-one device (fax/printer/scanner) and the entire range of functions is to be used.<br>• A printer with convenience features like ink level display, which are to be used.<br>• A printer that uses bidirectional data exchange. In other words: Not only does the computer send data to the printer, the printer also sends status messages to the computer. This communication in both directions is typical of “Windows printers” or “GDI printers” that work only with special Windows device drivers. |

## Configuring a USB Printer as a Network Printer

Connect the USB printer to the USB port of the FRITZ!Box.

## Preparing Configuration

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Home Network / USB Devices” menu.
4. Select the “USB Remote Connection” tab.
5. Make sure that the option “printers (including all-in-one printers)” is disabled.
6. Save your settings by clicking “Apply”.
7. Connect the USB printer to the FRITZ!Box.

This concludes the preparations. Continue reading in the section for your operating system.

## Setting Up a USB Printer in Windows 10

1. Press the keyboard shortcut “Windows key+X” and select “Control Panel” from the context menu.
2. Click “Hardware and Sound” and select “Devices and Printers”.
3. In the menu bar, click “Add a printer”.
4. Click “The printer that I want isn't listed” in the window “Choose a device or printer to add to this PC”.
5. Enable the option “Add a printer using TCP/IP address or hostname” and click “Next”.
6. Enter “fritz.box” in the **Hostname or IP address:** field.

If the FRITZ!Box is configured as a wireless repeater or an IP client, enter here the IP address at which the FRITZ!Box can be reached within the network.

7. Click “Next”.
8. Select the printer manufacturer and model.

If the printer is not displayed, you must first install the printer drivers for this device. Consult the documentation of your printer for instructions.

9. Click “Next”.
10. If the “Printer Sharing” window appears, select “Do not share this printer” and click “Next”.
11. Click “Finish”.

The USB printer has been configured and can be used as a network printer.

## Setting Up a USB Printer in Windows 8

1. Press the keyboard shortcut “Windows key+X” and select “Control Panel” from the context menu.
2. Click “Hardware and Sound” and select “Devices and Printers”.
3. In the menu bar, click “Add a printer”.

4. In the “Add Printer” window, select “The printer that I want isn’t listed” and then “Next”.
5. Enable the option “Add a printer using TCP/IP address or hostname” and click “Next”.
6. Enter “fritz.box” in the **Hostname or IP address:** field.

If the FRITZ!Box is configured as a wireless repeater or an IP client, enter here the IP address at which the FRITZ!Box can be reached within the network.

7. Click “Next”.
8. Select the printer manufacturer and model.

If the printer is not displayed, you must first install the printer drivers for this device. Consult the documentation of your printer for instructions.

9. Click “Next” and confirm with “Finish”.

The USB printer has been configured and can be used as a network printer.

## Setting Up a USB Printer in Windows 7

1. Click “Start” and then “Devices and Printers”.
2. In the menu bar, click “Add a printer”.
3. In the “Add Printer” window, select the “Add a network, wireless or Bluetooth printer” option and then click “Next”.
4. Click “The printer that I want isn't listed.”
5. Enable the option “Add a printer using TCP/IP address or hostname” and click “Next”.
6. As the “Device Type”, select “Automatic detection” and enter in the input field “Host name or IP address”: **fritz.box**.

If the FRITZ!Box is configured as a wireless repeater or an IP client, enter here the IP address at which the FRITZ!Box can be reached within the network.

7. Click “Next”. Windows attempts to detect the TCP/IP port.
8. If Windows reports “Additional port information required”, select “Custom” as the device type and then click “Next”.
9. Select the printer manufacturer and model.

If the printer is not displayed, you must first install the printer drivers for this device. Consult the documentation of your printer for instructions.

10. Click “Next” and confirm with “Finish”.

The USB printer has been configured and can be used as a network printer.

## Configuring a USB Printer in Mac OS X Version 10.5 or Higher

1. In the dock, click “System preferences”.
2. Click “Print & Fax”.
3. Click the “+” sign.
4. Click “IP Printer”.
5. In the “Protocol:” drop-down list, select the entry “HP Jet Direct – Socket”.
6. Enter **fritz.box** in the “Address:” input field.

If the FRITZ!Box is configured as a wireless repeater or an IP client, enter here the IP address at which the FRITZ!Box can be reached within the network.

7. In the “Print Using:” drop-down list, select the printer that is connected to the USB port of your FRITZ!Box.

If the printer is not displayed, you must first install the printer drivers for this device. Consult the documentation of your printer for instructions.

8. Click “Add” or “Add Port...”.

The USB printer has been configured and can be used as a network printer.

## Configuring a USB Printer in Other Operating Systems

The names of entries or menus in operating systems not described above may be slightly different than the terms we use here.

- As the port type, select “Raw TCP”.
- Enter “9100” as the port.
- Enter **fritz.box** as the printer name.

If the FRITZ!Box is configured as a wireless repeater or an IP client, enter here the IP address at which the FRITZ!Box can be reached within the network.

## Configuring a USB Printer with FRITZ!Box USB Remote Connection

If you are using an all-in-one device or would like to use the convenience features of a USB printer connected to the FRITZ!Box, we recommend installing the FRITZ!Box USB remote connection software. The FRITZ!Box USB remote connection program can be installed on computers with Windows 10, Windows 8 or Windows 7 (32- and 64-bit).

## Installing FRITZ!Box USB Remote Connection

Install the program for FRITZ!Box USB remote connection on all of the computers with which you want to use the connected USB device.

1. Connect the USB printer to the USB port of the FRITZ!Box.
2. Open the FRITZ!Box user interface.
3. Enable the advanced view.
4. Select the “Home Network / USB Devices / USB Remote Connection”.
5. Click the “USB remote connection software” link.
6. In the “USB Remote Connection” window, click “Download”.
7. Download the file “fritzbox-usb-fernanschluss.exe”.

8. Double-click the file and follow the instructions on your screen.

The FRITZ!Box USB remote connection software is now installed on your computer. Repeat the steps in these instructions for all other Windows users who wish to use the USB remote connection on this computer.

## Enabling the FRITZ!Box USB Remote Connection

1. Open the FRITZ!Box user interface.
2. Enable the advanced view.
3. Select the “Home Network / USB Devices / USB Remote Connection”.
4. Enable the USB remote connection for printers and select the option “Printers (including all-in-one printers)”.

   For an all-in-one printer with a memory function, also enable the “USB storage media” option.

   For an all-in-one printer with a scanner function, also enable the “Others (e.g. scanner)” option.
5. Click “Apply”.

The FRITZ!Box USB remote connection is enabled.

## Using a USB Printer with FRITZ!Box USB Remote Connection

1. Open the FRITZ!Box USB remote connection by clicking the  icon in the Windows task bar.
2. Enter the FRITZ!Box password in the “My FRITZ!Box” area.
3. Click “Refresh”.
4. Click the USB printer in the “Devices” area.

The USB printer is being connected to the computer.

Do not conduct any firmware updates for USB devices that are connected with the computer via the FRITZ!Box USB remote connection.

# 19 Managing Memory with FRITZ!NAS

With FRITZ!NAS you can display the data on the storage media of your FRITZ!Box in a clearly arranged interface. All participants in the FRITZ!Box home network can start FRITZ!NAS in a web browser and use it as a platform to access music, images, videos and documents in the FRITZ!Box memory.

## 19.1 Requirements for FRITZ!NAS

In order to use FRITZ!NAS, your computer must have a web browser installed that supports HTML5 (for instance, Internet Explorer version 9 or higher, Firefox version 17 or higher, or Google Chrome version 23 or higher).

## 19.2 Starting FRITZ!NAS

1. Open a web browser.
2. Enter “fritz.nas” in the address field.

FRITZ!NAS opens and displays the storage media enabled in the FRITZ!Box.

## 19.3 FRITZ!NAS Password Protection

Access to FRITZ!NAS and thus to the storage media of the FRITZ!Box can be protected by defining a password in the user interface. In the “System / FRITZ!Box Users / Login to the Home Network” menu you can

- configure a shared password that is requested every time anyone in your home network accesses the FRITZ!Box and FRITZ!NAS.
- configure various FRITZ!Box users. You can configure a password for each FRITZ!Box user and then specify which FRITZ!NAS contents each user is allowed to access.

FRITZ!NAS can be reached in the home network by entering the shared FRITZ!Box password. From the Internet you can reach FRITZ!NAS only by logging in with your individual user name and password.

Information on the password protection of your FRITZ!Box is presented in the section Password Protection: Using FRITZ!Box Safely from page 35.

# 20 Extending the Scope of Functions with Smart Home

You can expand the scope of functions of your FRITZ!Box with AVM smart home devices for home automation.

A smart home device that is especially easy to integrate in your home network is FRITZ!DECT 200. FRITZ!DECT 200 is a switchable socket that lets you control the power supply to connected devices, and measure, record and evaluate their power consumption. FRITZ!DECT 200 is integrated with your FRITZ!Box via DECT radio transmission and can then be controlled with the computer, smartphone or tablet, from home or anywhere else with Internet access.

Comprehensive information on smart home solutions is presented in the “Guide” area on the AVM website.

en.avm.de/guide

# 21 Configuring Internet Access for Guests

With the FRITZ!Box you can provide houseguests with an Internet connection of their own. At this guest access they can surf the web with their own devices, but cannot access the contents of your home network.

## 21.1 Wireless Guest Access: Private Hotspot

For your guests you can configure a wireless guest access. The wireless guest access is your private hotspot.

### Features of the Wireless Guest Access

- At the wireless guest access your guests can log in with their own smartphones, tablets, laptops or other network devices.
- Guest devices can surf the Internet.
- Guest devices have no access to your home network.
- The guest access can be disabled automatically.
- The guest access can use push service to notify you about all devices registering and deregistering.
- The access profile “Guest” is set for the wireless guest access. This access profile can be edited in the “Internet / Filters” menu on the “Access Profiles” tab.

### Configuring Wireless Guest Access

1. Open the FRITZ!Box user interface.
2. Select the “Wireless / Guest Access” menu and enable guest access.
3. Assign a name for the guest wireless network (SSID) and enter a network key.

This concludes the configuration of your guest access. Now guests can register their wireless devices with the FRITZ!Box.

### Manually Registering a Wireless Device with the Wireless Guest Access

1. Your guest starts the wireless LAN software of her or his wireless device and searches for the guest network.
2. Your guests authorize themselves using the network key you assigned.

The wireless LAN connection will be established.

### Registering a Wireless Device with the Wireless Guest Access via QR Code

1. Print out the QR code for your guest.
2. Your guest starts the QR code reader on his or her wireless device and reads in the QR code of the wireless network.

The wireless LAN connection will be established.

### Registering a Wireless Device with the Wireless Guest Access via WPS

1. Your guest starts WPS on his or her wireless device.
2. In the “WLAN / Guest Access” menu, click the “Start WPS” button.

The wireless LAN connection will be established.

## 21.2 Configuring Guest Access on the LAN 4 Port

For guests you can configure the network port “LAN 4” as a guest access.

### Features of the LAN Guest Access

- Guests can connect their laptops to the guest access with a network cable.
- Guest devices can surf the Internet.
- Guest devices have no access to the home network.
- The access profile “Guest” is set for the LAN guest access. This access profile can be edited in the “Internet / Filters” menu on the “Access Profiles” tab.

### Configuring Guest Access

Set up the guest access as follows:

1. Open the FRITZ!Box user interface.
2. In the “Home Network / Home Network Overview” menu, select the “Network Settings” tab.
3. In the “Guest Access” area, check the box in front of the “Guest access enabled for LAN 4” option.
4. Click “Apply”.

# 22 MyFRITZ!: Accessing the FRITZ!Box from Anywhere

## 22.1 Overview: The MyFRITZ! Service

### Overview

MyFRITZ! is an Internet service from AVM, with which you can access your FRITZ!Box from anywhere.

### MyFRITZ! Functions

Using an active Internet connection on any computer, tablet or smartphone, with MyFRITZ! accessing your FRITZ!Box from anywhere is safe and simple. Depending on the rights in your FRITZ!Box user account, you can use the following areas of your FRITZ!Box:

| Area | Function |
|---|---|
| Calls | • Access the call list |
| Answering machine | • Listen to voice messages<br>• save voice messages locally on a network device |
| User interface | • View and change the FRITZ!Box settings |
| Storage (NAS) | • Access photos, music and documents located on the NAS storage media attached to the FRITZ!Box |
| Smart home | • Switch on and off AVM devices for home automation that are connected with your FRITZ!Box<br>• Display the power consumption of a device connected with a smart home outlet |

### Configuring MyFRITZ!

Configuration of MyFRITZ! consists of the following steps:

- Creating a MyFRITZ! account in the FRITZ!Box.
- Registering the FRITZ!Box with the MyFRITZ! account.
- Configuring the MyFRITZ! on your smartphone or tablet (optional).

## 22.2 Creating a MyFRITZ! Account

### Overview

A MyFRITZ! account is required in order to be able to use MyFRITZ!.

### Requirements

- The computer is connected with the Internet.
- You can access your e-mail on this computer.

### Rules

Comply with the following rules when assigning a password for your MyFRITZ! account:

- Your MyFRITZ! password must be different from the password of your FRITZ!Box user account.
- Use a password rated as secure.
- Select a password with at least twelve characters, which includes capitals and lower-case letters as well as numerals and special characters.
- Be sure to keep your passwords in a safe place!

### Creating a MyFRITZ! Account

1. Open the FRITZ!Box user interface.
2. Select “Internet / MyFRITZ!”.
3. Select “Create a new MyFRITZ! account”.
4. Enter your e-mail address. If you are already configured as a FRITZ!Box user, enter here the e-mail address you use for the FRITZ!Box user account.
5. Assign a MyFRITZ! password. This password must be different from the password for your FRITZ!Box account.
6. If you do not have a MyFRITZ! user account yet, you will be prompted to set one up by assigning a user name and an additional password. If you already have a FRITZ!Box user account, follow the instructions in the FRITZ!Box user interface.
7. You receive an e-mail from MyFRITZ! containing a registration link. If possible, open the e-mail on the computer on which you began setting up the account. Click the registration link.
8. You are forwarded to the MyFRITZ! website to activate the account. After successful activation, you will end up back on your FRITZ!Box user interface.

Now the FRITZ!Box is registered with your MyFRITZ! account.

## 22.3 Registering the FRITZ!Box with the MyFRITZ! Account

### Overview

You set up a new MyFRITZ! account via the user interface of your FRITZ!Box. In so doing your FRITZ!Box was automatically registered with your MyFRITZ! account.

You can continue to use this MyFRITZ! account, even if you eventually replace the FRITZ!Box with another FRITZ!Box.

If needed, you can also register multiple FRITZ!Boxes with your MyFRITZ! account. Each FRITZ!Box ist then registered with the MyFRITZ! account via its own user interface.

### Purpose of Registration

Once a FRITZ!Box is registered with your MyFRITZ! account, the FRITZ!Box determines the public IP address each time it is changed and conveys it to the MyFRITZ! account. This means that the MyFRITZ! always has the latest information at its disposal about how to reach the FRITZ!Box in the Internet, so that it can route you to the user interface.

### Registering with an Existing MyFRITZ! Account

1. Open the FRITZ!Box user interface.
2. From the “Internet / MyFRITZ!” menu, select the setting “Register the FRITZ!Box with an existing MyFRITZ! account” and follow the instructions.

## 22.4 Configuring MyFRITZ!App

### Overview

If you would like to access your FRITZ!Box from a smartphone or tablet, you can do so using the free MyFRITZ!App from AVM.

The MyFRITZ!App is available in the Google Play Store and the Apple App Store.

### Requirements

- Android smartphone or Android tablet with Google Android 2.2 (or newer), or iPhone (model 3GS or later) or iPod touch (3rd generation or higher) or iPad with iOS 5.0 (or newer).
- A MyFRITZ! account was set up.
- Your FRITZ!Box is registered with this MyFRITZ! account.
- On your FRITZ!Box you have an account as a FRITZ!Box user.
- Your mobile device is connected with your FRITZ!Box via wireless LAN.

### Configuring the MyFRITZ!App

1. Install the MyFRITZ!App on your mobile device.
2. Open the MyFRITZ!App and enter the password for the user interface of your FRITZ!Box.

The MyFRITZ! address of your FRITZ!Box is read automatically and saved in the app.

3. Connect the MyFRITZ!App with your FRITZ!Box.
4. To register with the FRITZ!Box, enter the data of your FRITZ!Box user account.

MyFRITZ! is opened. Configuration of the MyFRITZ! is concluded.

## 22.5 Using MyFRITZ!

### Overview

With MyFRITZ! you can access your FRITZ!Box directly via your home network, the Internet, or the MyFRITZ!App on your mobile device.

Note that you have access to only those FRITZ!Box areas which your rights in the FRITZ!Box authorize you to access.

When using MyFRITZ! your personal data are stored always and exclusively only on the FRITZ!Box and are transferred neither to the MyFRITZ! Internet platform at AVM nor to any other services or providers.

### Requirements

- A MyFRITZ! account was set up.
- The “Access from the Internet allowed” option is enabled in your FRITZ!Box user account.

### MyFRITZ! in the Web Browser

1. Open a web browser.
2. Enter “myfritz.net” in the address field of the browser.
3. Log in with e-mail address and MyFRITZ! password.

MyFRITZ! is opened.

### MyFRITZ! via Smartphone or Tablet

1. Open the MyFRITZ!App.
2. To register with your FRITZ!Box, enter the data of your FRITZ!Box user account.

MyFRITZ! is opened.

### MyFRITZ! in the Home Network

1. Open a web browser.
2. Enter “myfritz.net” in the address field of the browser.
3. Log in to the user interface of your FRITZ!Box.

MyFRITZ! is opened.

# 23 Push Services: Using Notification Services

Push services are notification services that inform you about the activities of your FRITZ!Box and assist you in saving your passwords and FRITZ!Box settings. With the push services you can have e-mail sent to you at regular intervals informing you about the latest connections, usage and configuration of your FRITZ!Box.

Various push services are available in the user interface under “System / Push Service”. There you can select the push service interesting for you and specify which events in the FRITZ!Box you would like to be informed about, how often these e-mails should be sent, and to which e-mail address.

## 23.1 Available Push Services

You can request push service mails about the following FRITZ!Box areas and activities:

| Push Service | Information |
|---|---|
| FRITZ!Box info | Sends you regular e-mail messages with data on FRITZ!Box usage and connections. |
| Answering machine | Forwards recorded messages on the FRITZ!Box answering machines to the specified e-mail address. |
| Calls | Sends you e-mail when calls arrive—either only for missed calls, or for all calls. |
| Wireless guest access | Sends you a message whenever devices register with or deregister from the wireless LAN guest access. |
| Fax function | Forwards your faxes by e-mail and also saves them to a storage location you defined. |
| New FRITZ!OS | Notifies you whenever a new FRITZ!Box is available for your FRITZ!OS. |

| Push Service | Information |
|---|---|
| Saving settings | The settings of your FRITZ!Box are saved automatically and sent to the specified e-mail address before every update and each time the factory settings are restored. |
| Forgot password | Sends you an access link to the specified e-mail address if you have forgotten your password. |
| Current IP address | Sends the IP address assigned by the Internet service provider every time the Internet connection is established. |
| Change notice | Notifies you by e-mail about changes to the FRITZ!Box settings and about security-relevant events. |

## 23.2 Enabling Push Services

A wizard is available in the FRITZ!Box user interface to guide you step by step through the configuration of push services.

1. Open the FRITZ!Box user interface.
2. Select “Wizards”.
3. Start the “Configure Push Service” Wizard.

The wizard guides you through the menus and dialogs to enable the push services.

## 23.3 Configuring Push Services

You can adjust the push services to your needs, and also disable any or all push services.

1. Open the FRITZ!Box user interface.
2. Select the “System / Push Service / Push Services” menu.
3. To configure a push service, click the “Edit” button.

4. Configure various settings in the details.

   The Help of the FRITZ!Box user interface presents comprehensive information on the settings of each push service.

5. Click “OK” to save your settings.

In the Help of the FRITZ!Box user interface you can find detailed instructions.

# 24 Diagnostics: Checking Function and Security

In the “Diagnostics” area the FRITZ!Box offers you the possibility of checking the status of functions and security-relevant settings of your FRITZ!Box. This ensures safe operation of the FRITZ!Box and makes sure that it is kept up with the latest technical developments.

## 24.1 Checking FRITZ!Box Functions

With the function diagnosis you can get an overview of the functional status of your FRITZ!Box, its Internet connection and the devices in your home network. In the case of an error the diagnostics results can help you localize and remedy any problems.

### Starting the Function Diagnosis

1. Open the FRITZ!Box user interface.
2. Select “Diagnostics / Function”.
3. Click “Start” to start the diagnostics.

The diagnostics run through the various test areas.

For more information on test areas and test items, as well as on the icons and information in the result of the diagnostics, see the Help on the FRITZ!Box user interface.

### Canceling Diagnostics

You can end diagnostics in progress without losing any data.

➡ To end a diagnostics run, click “Cancel”.

The results obtained up to that point remain visible.

## 24.2 Checking the Security of the FRITZ!Box

In the “Security” overview the FRITZ!Box offers you a list of all security-relevant settings that control access to the FRITZ!Box from the Internet or from the home network. This shows, for instance, which ports are open, which users are logged in on or off the FRITZ!Box, which wireless devices are connected with the FRITZ!Box and whether the latest FRITZ!OS is installed.

The “Security” overview also offers the following functions:

- It indicates configured settings that the security diagnostics classify as insecure.
- From the test entries in the “Security” overview you can navigate directly to the relevant settings.
- Help is available for each test entry.
- You can print the results of the security diagnostics.

The “Security” overview is located in the “Diagnostics / Security” menu in the FRITZ!Box user interface.

Comprehensive information on the subject of “Security” is presented in the “Guide” area on the AVM website:

en.avm.de/guide

# 25 Saving and Restoring Settings

All of the settings you configure in the FRITZ!Box can be saved in a backup file. With this file you can restore your settings at any time:

- in **the same FRITZ!Box** or **another FRITZ!Box of the same model**
- in a different **FRITZ!Box model**.

  In this case you can select which settings are to be applied to the FRITZ!Box.

## 25.1 Saving Settings

Backup files that are not protected by assigning a password are a security risk. Protect your backup file with a password to avoid security problems.

A wizard is available in the FRITZ!Box user interface to assist you in saving your FRITZ!Box settings, which guides you through the process step by step.

1. Open the FRITZ!Box user interface.
2. Select “Wizards”.
3. Start the “Save and Restore Settings” Wizard.
4. In the next window, select the “Save settings” option and then click “Next”.

The wizard guides you through the menus and dialogs to save your settings.

## 25.2 Restoring Settings

With the “Restore” function in the “System / Backup” you can have all settings from a backup file you created with this or another FRITZ!Box loaded to your FRITZ!Box. Your current FRITZ!Box settings will be overwritten by this function.

You can use the following backup files to restore settings:

- Backup files created with the same FRITZ!Box.

  If you apply settings from a backup file created with the same FRITZ!Box, all settings will be restored in full.

- Backup files created with a different FRITZ!Box of the same model.

  If you apply settings from a backup file that was created with a different FRITZ!Box of the same model, you can restore all settings if the backup file was protected with a password.

- Backup files created with a different FRITZ!Box model.

  If you apply settings from a backup file that was created with a FRITZ!Box of a different model, then you can restore several selected settings to your FRITZ!Box.

A wizard is available in the FRITZ!Box user interface to assist you in restoring your FRITZ!Box settings, guiding you through the process step by step.

1. Open the FRITZ!Box user interface.
2. Select “Wizards”.
3. Start the “Save and Restore Settings” Wizard.

Your current FRITZ!Box settings will be overwritten by the settings in the backup file.

4. In the next window, select the “Restore settings” option and then click “Next”.

The wizard guides you through the menus and dialogs to restore your settings.

## 25.3 Restarting the FRITZ!Box

You can restart the FRITZ!Box via the user interface or on the device. A restart may be necessary if the FRITZ!Box no longer reacts, or if Internet connections can no longer be established for no apparent reason. All components of the FRITZ!Box are reinitialized and the event messages deleted.

The FRITZ!Box settings and any messages saved on the internal memory of the FRITZ!Box will not be deleted upon restarting.

### Restarting from the User Interface

1. In the “System / Security” menu, click the “Restart” tab.
2. Click the “Restart” button.

   Restarting the FRITZ!Box takes about 2 minutes. During this time, you cannot access the FRITZ!Box user interface.

After the restart you will be automatically redirected to the “Overview” page of the FRITZ!Box.

### Restarting on the Device

If you cannot open the FRITZ!Box user interface, it is also possible to restart directly on the FRITZ!Box device.

1. Remove the power supply of the FRITZ!Box from the electrical outlet.
2. Wait 5 minutes.
3. Plug the power supply back in to the outlet.

   Restarting the FRITZ!Box takes about 2 minutes. During this time, you cannot access the FRITZ!Box user interface.

After the restart and logging back in to the FRITZ!Box you will be automatically redirected to the “Overview” page of the FRITZ!Box.

# 26 Taking FRITZ!Box Out of Operation

In this chapter you receive tips and recommendations for taking the FRITZ!Box out of operation.

## 26.1 Deleting User Settings

To delete all individual user settings you've configured in your FRITZ!Box, use the "Load Factory Settings" function. When the factory settings are restored to the FRITZ!Box, all of the settings in the FRITZ!Box are restored to their condition upon delivery.

Restoring the factory settings is recommended if you would like to pass the FRITZ!Box on to another user. By restoring the factory settings you can delete incorrect settings that prevent the FRITZ!Box from functioning properly.

Resetting the FRITZ!Box has the following effects:

- All settings you made in the FRITZ!Box will be deleted.
- The internal memory of the FRITZ!Box is deleted. Received faxes and messages on the answering machine will also be deleted.
- The network key of the factory settings will be activated again.
- The IP configuration of the factory settings will be restored.

You have the option of restoring the factory settings using the FRITZ!Box user interface or a telephone connected with the FRITZ!Box. The page 163 section describes how to restore the factory settings with the user interface. How to restore them using a telephone is described in the Loading Factory Settings on page 117 section.

## Preparing to Load Factory Settings

Before loading the factory settings of your FRITZ!Box, save your settings and FRITZ!Box data. Work through the following steps:

### Saving FRITZ!Box Settings

Before loading the factory settings, save all of the settings you made in your FRITZ!Box to a backup file. With this backup file you can restore your settings to the FRITZ!Box at any time or load them to another FRITZ!Box. For more information on this, see the section Saving and Restoring Settings from page 159.

### Saving Data from Internal Memory

1. Open the FRITZ!Box user interface.
2. Select “FRITZ!NAS” in the menu of the FRITZ!Box.

   The FRITZ!NAS interface is opened.
3. Click here with the mouse to select the data you want to save.
4. Click the ⬇ “Copy from FRITZ!NAS to my device” icon in the FRITZ!NAS toolbar and confirm by clicking “OK”.

   The selected data are copied to a ZIP file in the download order you specified.

This concludes the saving of your data from the internal memory of the FRITZ!Box.

### Loading Factory Settings

Before loading factory settings, we recommend saving the settings configured on your FRITZ!Box in a backup file; see page 159.

1. In the FRITZ!Box user interface, select the “System / Backup” menu.
2. Select the “Factory Settings” tab.
3. Click the “Load Factory Settings” button.

The FRITZ!Box is reset to its factory settings. All settings made during operation will be overwritten.

## 26.2 Uninstalling Supplementary Software

Additional software for the FRITZ!Box is available on the web pages of AVM at en.avm.de/service/downloads.

If you have installed supplementary programs on one or more computers, uninstall this software using the control panel of your Windows operating system.

### Uninstalling Programs in Windows 10 and Windows 7

1. Open “Start / Control Panel / Programs”.
2. Under “Programs and Features”, click “Uninstall a program”.
3. Mark the AVM program you want to remove in the list.
4. Click the “Uninstall/Change” button.

The program will be removed.

### Uninstalling Programs in Windows 8

1. Press the Windows key and the X key at the same time.

   A menu is opened that contains all of the important functions of Windows 8.
2. Click the “Programs and Features” entry.

   The “Uninstall or change a program” list shows all of the programs installed on your computer.
3. Mark the AVM program you want to remove in the list.
4. Click the “Uninstall” button.

The program will be removed.

# 27 Help in Case of Errors

Here you can find assistance if you are not able to open the user interface of your FRITZ!Box or if errors occur with wireless LAN connections.

For more help, see the AVM Knowledge Base in the Internet: avm.de/service

## 27.1 The User Interface Does Not Open

If the FRITZ!Box user interface cannot be opened, this can have various causes.

Work through the following steps in sequence until the error has been resolved.

### Entering http://fritz.box in the Web Browser

Enter http://fritz.box in your web browser instead of “fritz.box”.

Google Chrome, for instance, performs a Google search if the address of the FRITZ!Box is not known or was entered incompletely.

### Restarting the FRITZ!Box

1. Disconnect the FRITZ!Box from the power supply.
2. Wait about five seconds before reconnecting to the power supply.
3. Wait until the LEDs “Power” and “WLAN” (only if wireless LAN is switched on) light up.

The FRITZ!Box is ready for operation again.

## Clearing the Cache of your Web Browser

If the web browser shows only a blank, white page, empty the cache:

### Firefox

1. Click the “Menu” button and select “History / Clear Recent History...”.

   Or click “History” in the menu bar and select “Clear Recent History...”.

2. In the “Clear Recent History” dialog, select “Everything”, and under “Details”, check only the “Cache” option.

3. Click “Clear Now”.

### Internet Explorer

1. Click the “Tools” button and select “Internet options”.

2. On the “General” tab, click the “Delete...” button in the “Browsing history” area.

3. Enable the “Temporary Internet files and website files” option and click “Delete”.

### Google Chrome

1. Click the Chrome menu (“Customize and control Google Chrome” button) and select “History / Clear browsing data...”.

2. Select “the beginning of time”, and below it only the option “Cached images and files”.

3. Click “Clear browsing data”.

### Other Web Browsers

If you use a different web browser, see the Help for your browser for instructions on how to clear the cache.

## Checking the Proxy Settings of the Web Browser

If a proxy server is enabled in your web browser, the address of the FRITZ!Box must be entered as an exception. Check your web browser settings.

### Firefox

1. Click the orange Firefox button and select “Options / Options”.

   Or click “Tools” in the menu bar and select “Options”.

2. Select “Advanced / Network”.

3. Under “Connection”, click the “Settings...” button.

4. If the option “Manual proxy configuration:” is enabled, enter http://fritz.box in the “No Proxy for:” field and then click “OK”.

   If the manual proxy configuration is not enabled, click “Cancel”.

### Internet Explorer

1. Click the “Tools” button and select “Internet options”.

2. Switch to the “Connections” tab and click the “LAN settings” button.

3. If the “Use a proxy server for your LAN” option is enabled, click “Advanced”. Under “Exceptions” enter the address http://fritz.box and click “OK”.

   If no proxy server is used, click “Cancel”.

### Google Chrome

Check whether the use of a proxy server is enabled. If so, enter http://fritz.box as an exception in the proxy server settings.

Google Chrome uses the proxy settings of your operating system (Windows or Mac OS). For more information, go to Google Chrome Help and enter the keyword “network settings”.

### Other Web Browsers

Check whether the use of a proxy server is enabled. If so, enter http://fritz.box as an exception in the proxy server settings.

For more information on the proxy settings, see the Help for your web browser.

### Configuring the Computer's Network Adapter

On your computer, enable the setting "Obtain an IP address automatically" for the network adapter used to connect to the FRITZ!Box. For instructions, see page 129.

### Opening the User Interface Using an Emergency IP Address

The FRITZ!Box has an "emergency IP address" (169.254.1.1) at which it can always be reached. You can use this IP address as follows:

1. Connect your computer to the "LAN 2" port of the FRITZ!Box using a LAN cable.
2. If your computer is already connected with the FRITZ!Box over wireless LAN, clear the wireless connection.
3. Make sure that the computer obtains its IP address automatically; see page 129.
4. Clear all other connections between your FRITZ!Box and other network devices.
5. In the web browser, enter the address 169.254.1.1.
6. When the FRITZ!Box user interface is displayed, enable the DHCP server of the FRITZ!Box:

   In the user interface, select "Home Network / Home Network Overview / Network Settings". Click the "IPv4 Addresses" button, enable the option "Enable DHCP server" and click "OK".

## 27.2 Cannot Establish a Wireless LAN Connection

If you cannot establish a wireless LAN connection between your computer and the FRITZ!Box, this may be due to a variety of causes.

Work through the following steps in sequence until the error has been resolved.

### Switching On the Computer's Wireless LAN Adapter

The wireless LAN adapter in your computer must be ready for operation. On many notebooks the built-in wireless LAN adapter can be switched on by pushing a button or entering a key combination.

For more information, see the manual of your computer.

### Enabling the Wireless Radio Network of the FRITZ!Box

When the "WLAN" LED is off, press the "WLAN" button on the FRITZ!Box. Hold it down until the "WLAN" begins flashing.

The wireless network is switched on and the "WLAN" LED lights up.

### Announcing the Name of the Wireless Radio Network

If the wireless LAN software on your computer cannot find the wireless radio network of the FRITZ!Box, configure the following setting in the FRITZ!Box:

1. Connect a computer to the FRITZ!Box with a network cable; see page 24.
2. Open the FRITZ!Box user interface.
3. Select "Wireless / Radio Network".
4. Enable the option "Name of the radio network visible".
5. Click "Apply".
6. Remove the network cable and establish a connection via wireless LAN.

### Entering the Correct Network Key

If you establish the wireless connection manually, enter the correct network key, which is found in the user interface of your FRITZ!Box:

1. Connect a computer to the FRITZ!Box with a network cable; see page 24.
2. Open the FRITZ!Box user interface.
3. Select “WLAN / Security”.
4. Take note of the network key or click “Apply” and print out the wireless LAN security settings.

## 27.3 Wireless LAN Connection Interrupted

If the wireless LAN connection between your computer and the FRITZ!Box is disrupted, this may be due to a variety of causes. Work through the following steps in sequence until the error has been resolved.

### Positioning the FRITZ!Box and Wireless Devices Correctly

Often all that is needed is to position the FRITZ!Box and wireless devices in different locations to improve the wireless LAN connection:

- Do not set up the FRITZ!Box in the corner of a room.
- Do not set up the FRITZ!Box directly next to or beneath an obstacle or a metal object (like a cabinet or radiator).
- Position the FRITZ!Box and your wireless devices so that there are as few obstacles between them as possible.

### Configuring Automatic Radio Channel Selection

Configure automatic selection of the radio channel in the FRITZ!Box. Then the FRITZ!Box will automatically select a radio channel with as little interference as possible.

1. Open the FRITZ!Box user interface.
2. Select “WLAN / Radio Channel”.

3. Enable the option “Set radio channel settings automatically (recommended)”.
4. Click “Apply”.

# 28 Technical Specifications

Facts worth knowing: Here you will find comprehensive technical data on your FRITZ!Box 5490.

## 28.1 Ports and Interfaces

- Fiber optic connection (laser class 1)
- Two a/b ports with RJ11 and TAE sockets for connecting two analog terminal devices
- One ISDN $S_0$ NT port

  $S_0$ bus with support for ISDN terminal devices; the CIP services voice, telephony, audio 3.1 and fax G2/G3 are supported
- DECT base station
- Four LAN ports via RJ45 sockets (standard Ethernet, 10/100/1000 Base-T)
- Two USB host controllers (USB version 3.0)
- Wireless access point with support for wireless LAN radio networks
  - IEEE 802.11a—54 Mbit/s
  - IEEE 802.11b—11 Mbit/s
  - IEEE 802.11g—54 Mbit/s
  - IEEE 802.11n—450 Mbit/s
  - IEEE 802.11ac—1300 Mbit/s

## 28.2 Router Functions

- Router
- DHCP server
- Firewall with IP masquerading/NAT
- IPv4 and IPv6
- Parental controls and filter lists
- Port sharing
- Dynamic DNS
- VPN

## 28.3 User Interface and Display

- Configuration and status messages via a web browser on a connected computer
- Five LEDs indicate the condition of the device

## 28.4 Tones

- Busy signal: 500 ms tone, 500 ms pause, +/– 20 ms
- Ring tone: 1 s tone, 4 s pause, +/– 100 ms

## 28.5 Device Properties

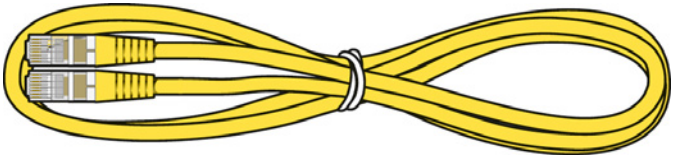
- Dimensions (W x D x H): approx. 245 x 55 x 175 mm
- FRITZ!OS can be updated
- Conforms to CE standards
- Ambient conditions
  - operating temperature: 0 °C–+40 °C
  - storage temperature: -20 °C–+70 °C
  - relative humidity (operation): 10%–90%
  - relative humidity (idle): 5%–95%
- Supply voltage: 230 V / 50 Hz
- Maximum power consumption: 27 W
- Average power consumption: 7.2 W

  The average power consumption was determined at room temperature (23 °C to 27 °C) with the following load:

  - wireless LAN on; no devices registered via wireless LAN
  - DECT on; one telephone registered via DECT; no active calls
  - one network device connected to a LAN port; no data transfer; other LAN ports not in use

## 28.6 Cable

### Network Cable (Yellow)



**Use**

The network cable is used to connect computers and network devices to the FRITZ!Box 5490.

- AVM recommends using a network cable no more than 100 meters long.
- Additional network cable is required if you would like to use all of the FRITZ!Box 5490 network ports.

**Extension**

You can extend one or both ends of the network cable. You will need the following components to extend the cable:

- Standard CAT-5 network cable
  - When components of a category smaller than Cat 5 are used, reduced transmission rates may result.
  - You can use both straight cables and crosslink cables.
- 1 standard RJ45 CAT-5 double coupling with a 1:1 pinout

All components are available from specialized vendors.

**Replacement**

The network cable is a standard cable.

- As a replacement, use a standard Cat-5 network cable.

Replacement cable is available from specialized vendors.

# 29 Customer Service

Be it further product documentation, frequently asked questions, tips or support—this chapter presents information on all important service topics.

## 29.1 FRITZ!Box Help

In the FRITZ!Box user interface you can open the detailed Help by clicking the “question mark” icon. The Help presents descriptions and instructions on all settings and functions of your FRITZ!Box.

## 29.2 Information in the Internet

On its web site AVM presents comprehensive information on your AVM product.

### AVM Service

The Service area is the portal for all product-specific services from AVM: FRITZ! Clips, manuals, downloads and support requests. In the Service area you can also receive comprehensive information and useful tips on configuring and operating your FRITZ!Box.

en.avm.de/service

### Videos on the FRITZ!Box

Videos on many of the FRITZ!Box functions are available, showing animated demonstrations of how to set up the individual functions. The videos can be viewed at the following address:

en.avm.de/service/fritz-clips/english-fritz-clips

### AVM Knowledge Base

In our AVM Knowledge Base you can find precise solutions to your problems. The AVM Knowledge Base is located in the “Service” area of the AVM web site:

en.avm.de/service

## 29.3 Feedback on FRITZ!Box

In various places in the user interface, the FRITZ!Box offers you the opportunity to send concrete feedback to AVM. Your feedback helps us to continually improve the FRITZ!Box.

When you submit feedback, only the technical data and **no personal data** are transmitted to AVM. These data are used for the exclusive purpose of product improvement. A corresponding message appears in the Event Log, stating that the feedback was sent to AVM.

### Automatically Sending Error Reports to AVM

In the case of serious errors, this service generates a report on the problem that occurred and automatically sends this error report to AVM. The error report helps improve the stability of FRITZ!OS.

The feature for automatically sending error reports is located on the “Contents / AVM Services” page of the FRITZ!Box user interface.

### Evaluating the Wireless LAN Connection

On the “Wireless / Radio Network / Known Wireless LAN Devices / Feedback” page you can evaluate your satisfaction with the wireless LAN connection between the FRITZ!Box and the wireless device. This information helps AVM optimize the wireless LAN properties of the FRITZ!Box.

### Evaluating the Voice Quality of Internet Calls

In the advanced view of the FRITZ!Box (see page 33), the “Telephony / Telephone Numbers / Voice Transmission” page offers you the opportunity to evaluate the quality of the Internet call. Your evaluation will help us continue to improve the quality of voice transmission in Internet calls made over the FRITZ!Box.

The contents of the call and numbers participating will not be transmitted to AVM.

## 29.4 Assistance from the Support Team

If you have problems with your FRITZ!Box, proceed as follows:

1. If you have questions about starting operation of your FRITZ!Box, please consult the following chapters:
   - Before You Connect the FRITZ!Box from page 17
   - Connecting the FRITZ!Box from page 20
   - Connecting a Computer with a Network Cable from page 24
   - Connecting Devices with the FRITZ!Box over Wireless LAN from page 27
2. If you have any problems, for instance in establishing connections, read the section Help in Case of Errors from page 165.
3. Search for a solution in the AVM Knowledge Base.

   en.avm.de/service

   This site contains answers to questions frequently posed to our Support team.

## Support by e-mail

You can send us an English-language e-mail request at any time using the “Service” area of our website. You can reach the service area at en.avm.de/service/support-request/your-support-request.

1. Select the product group and your product for which you need support.

   You will receive a selection of FAQs.

2. If you need more help, click the “Submit support request” link to open the e-mail support form.

3. Fill out the form and send it to AVM by clicking the “Submit support request” button.

Our Support team will respond by e-mail as quickly as possible.

# Legal Notice

## Legal Notice

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The licensing conditions are presented in the Help for the FRITZ!Box user interface under the “Legal Notice” heading.

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## Manufacturer's Warranty

We offer a manufacturer's warranty of 5 years on the hardware of this original product. The warranty period begins with the date of purchase by the first end user. Compliance with the warranty period can be proven by submission of the original invoice or comparable documents. This warranty does not restrict your warranty rights based on the contract of sale or other statutory rights.

Within the warranty period, we will remove defects to the product which are demonstrably due to faults in materials or manufacturing. Our warranty does not cover defects which occur due to incorrect installation, improper use, non-observance of instructions in the user manual, normal wear and tear or defects in the environment of the system (third-party hardware or software). We may, at our discretion, repair or replace the defective product. Claims other than the right to the removal of defects which is mentioned in these terms of warranty are not constituted.

We guarantee that the software conforms with general specifications, not, however, that the software meets your individual requirements. Delivery costs will not be reimbursed. Products which have been replaced revert to our ownership. Claims recognized under warranty entail neither an extension or recommencement of the warranty period. If we reject a warranty claim, this claim lapses no later than six months after being rejected by us.

This warranty shall be governed by German substantive law, to the exclusion of the United Nations Convention on Contracts for the International Sale of Goods (CISG).

## Declaration of CE Conformity

AVM declares herewith that the device is compliant with the basic requirements and the relevant rules in directives 2014/53/EU, 2009/125/EC and 2011/65/EU.

The long version of the declaration of CE conformity is available at http://en.avm.de/ce.

## Disposal Information

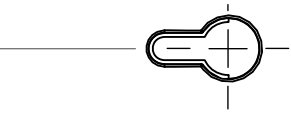
In accordance with European regulations, FRITZ!Box 5490, as well as all devices and electronic components contained in the package, may **not** be disposed with household waste.

After use, please dispose of FRITZ!Box 5490 and all electronic components and devices included with delivery at a collection point in your local community for the disposal of electric and electronic appliances.

Symbol for the separate collection of electric and electronic devices

# Drilling Template

A drilling template is presented below. Use the drilling template as a guide to mark the holes needed to mount the FRITZ!Box on a wall.



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197 mm

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