FRITZ!Box 6820 LTE

Configuration and Operation

Table of Contents

Safety Instructions

Before connecting the FRITZ!Box 6820 LTE, 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.

- 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.
  - During a storm, disconnect the FRITZ!Box from the power supply.
- 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 8.

1   The FRITZ!Box 6820 LTE

Welcome! We are pleased you decided on a FRITZ!Box. The FRITZ!Box 6820 LTE is the hub of your home network, connecting your computers and network devices with the Internet. For fast Internet connections the FRITZ!Box uses the mobile communications standard LTE. The FRITZ!Box also supports the mobile communications standards UMTS and GSM.

The FRITZ!Box has a port for a computer or another network device. The FRITZ!Box also supports wireless LAN radio technology. This means you can use the FRITZ!Box as a wireless access point for wireless devices like notebooks, tablets or smartphones.

The FRITZ!Box integrates connected computers and network devices into your private home network, where all devices can exchange data with each other.

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

LTE radio network

HSPA+/UMTS radio network

WLAN N
2.4 GHz

Notebook, PC, smartphone, video/TV streaming

SIM card

SIM

WLAN

WPS

LAN, 1 Gbit/s, PC, game console, network

1 x Gigabit

LAN
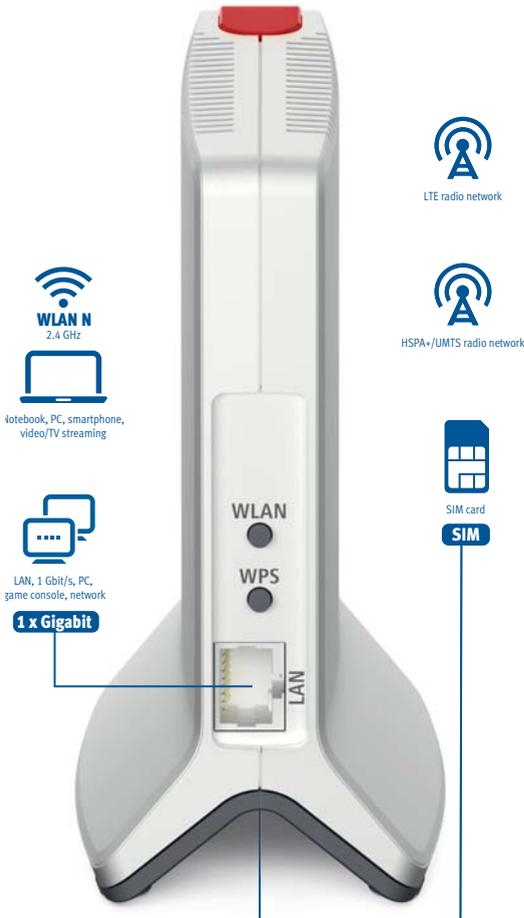
Possibilities for connecting the FRITZ!Box

- **SIM card**

  Slot for the LTE or UMTS SIM card (mini SIM)

- **LAN**

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

- **Wireless access point**

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

2.2   Buttons

The FRITZ!Box has two buttons on the back of the device.
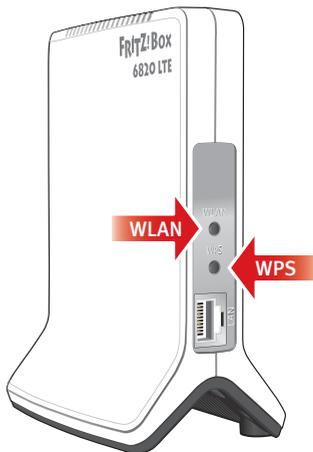
FRITZ!Box buttons

Button Functions

"WLAN" Button

With the **"WLAN"** button on the FRITZ!Box you can switch the wireless network on and off.

"WPS" Button

With the "WPS" button you can establish a wireless LAN connection via WPS; see Establishing a Wireless LAN Connection Using WPS from page 23.

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 6820 LTE has five LEDs, which flash or light up to display various connection statuses and events.

Meaning of the LEDs

LED	Condition	Meaning
	on	strong signal
	on	average signal strength
	on	weak signal
	flashing	• for update • The value specified for the online meter has been reached. Note: For this function the rate must be entered in the FRITZ!Box user interface under "Internet / Online Monitor / Online Meter".
WLAN	on	Wireless LAN function is enabled.
	flashing	• Switching the radio network on or off. • Adopting the wireless LAN settings. • Performing WPS • WPS procedure aborted: More than two wireless devices are performing WPS at the same time. Repeat the connection routine.
Power	on	FRITZ!Box ready for operation: Connected to power supply, connected to mobile communications network.
	flashing	• The device has electrical power. • Connecting to the mobile communications network or connection is interrupted.

3   LTE: Radio Standard for Connecting to the Internet

LTE (Long Term Evolution) is a radio standard specified starting with the 3GPP standard, Release 8. According to the specification, the FRITZ!Box 6820 LTE is classified as a category 4 UE (User Equipment) device.

Frequency Ranges

FRITZ!Box 6820 LTE supports the following frequency bands in the LTE mobile communications network:

- 800 MHz: The LTE band 20 is located in this range. This band is called the "digital dividend" spectrum.

- 1.8 GHz: The LTE band 3 is located in this range.

- 2.6 GHz: The LTE band 7 is located in this range.

- 2.1 GHz: The LTE band 1 is located in this range.

- 900 MHz: The LTE band 8 is located in this range.

- 850 MHz: The LTE band 5 is located in this range.

Channel Bandwidth

Within these frequency bands the FRITZ!Box supports various channel bandwidths.

The smaller the channel bandwidth, the lower the throughput:

20 MHz	up to 150 Mbit/s download
	up to 50 Mbit/s upload
15 MHz	up to 110 Mbit/s download
	up to 40 Mbit/s upload
10 MHz	up to 72 Mbit/s download
	up to 28 Mbit/s upload
5 MHz	up to 36 Mbit/s download
	up to 14 Mbit/s upload
3 MHz	up to 21 Mbit/s download
	up to 8.5 Mbit/s upload

| 1.4 MHz | up to 6.6 Mbit/s download |
| | up to 3.2 Mbit/s upload |

All devices located in the same radio cell of a mobile communications provider share the bandwidth and thus the throughput.

Antenna Technology

The FRITZ!Box supports Multiple-Input Multiple-Output (MIMO) antenna technology.

4 Before You Connect the FRITZ!Box

- Read the security instructions on page 6.

- Check the contents of your FRITZ!Box package. The contents are described on page 16.

- Make sure that the requirements for operating the FRITZ!Box have been met, see page 16.

- Read the handling instructions for your FRITZ!Box on page 17.

- Note the tips for passwords on page 18

4.1 Contents of the FRITZ!Box Package

- FRITZ!Box 6820 LTE

- one power supply unit

- one network cable

- one quick guide

- one FRITZ! Notice

4.2 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.

- an LTE SIM card or a UMTS-SIM card for the Internet connection

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

  Tablets, smartphones or computers that support wireless LAN compliant with IEEE 802.11n, IEEE 802.11g 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)

4.3   Handling the FRITZ!Box

- Read the Safety Instructions from page 6.

- Place the FRITZ!Box in a dry location that is free of dust and protected from direct sunlight.

- 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.

- Use the alignment aid of the FRITZ!Box to determine the best possible position of the FRITZ!Box for LTE reception.

  The alignment aid is located in the FRITZ!Box user interface under "Internet / LTE Information / Reception".

- Make sure to keep sufficient distance from potential sources of interference like microwave devices or electric devices with large metal housings.

4.4   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 88.

- 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 and your home network.

5   Connecting the FRITZ!Box

- Before you connect the FRITZ!Box, read the instructions on Safety Instructions from page 6.

- Insert the SIM card.

- Connect the FRITZ!Box to the power supply.

5.1   Inserting the SIM Card

You received a SIM card from your mobile communications provider, which must be inserted into the SIM card slot on the FRITZ!Box. The SIM card slot is located on the underside of the FRITZ!Box.

Inserting the SIM Card

1. Pick up the FRITZ!Box so that you are facing the underside of the device and can read the "SIM Card" label on the slot.

2. Insert the SIM card into the slot with the slanted edge of the card on the left and the contacts facing downwards.

3. Push the SIM card gently into the slot until it clicks into place.

    A few millimeters of the SIM card protrude from the slot.

Removing the SIM Card

➡   To remove the SIM card, press it briefly.

5.2   Connecting to Electrical Power
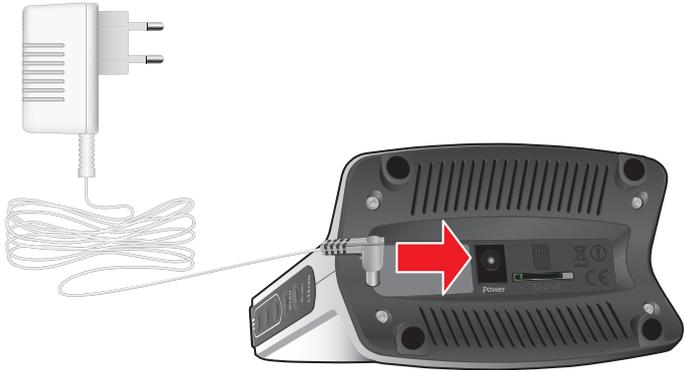
Connecting to the power supply

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 begins flashing after a few seconds.

6   Connecting a Computer with a Network Cable

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

6.1   Connecting to the Computer

One computer or other network device can be connected to the LAN port of the FRITZ!Box.
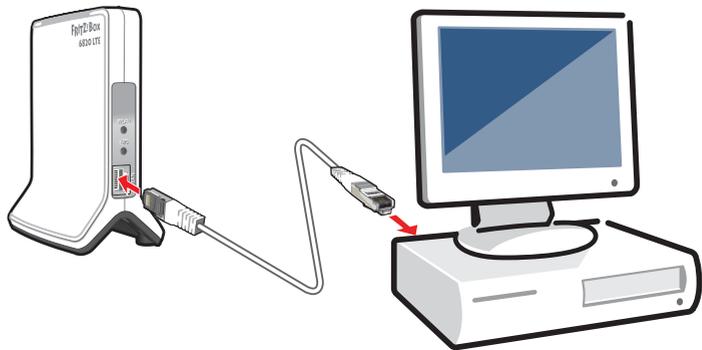
Connecting a computer using a network cable

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 .

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

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

6.2   Connecting a Network Hub or Switch

You can connect a network hub or network switch to the FRITZ!Box.
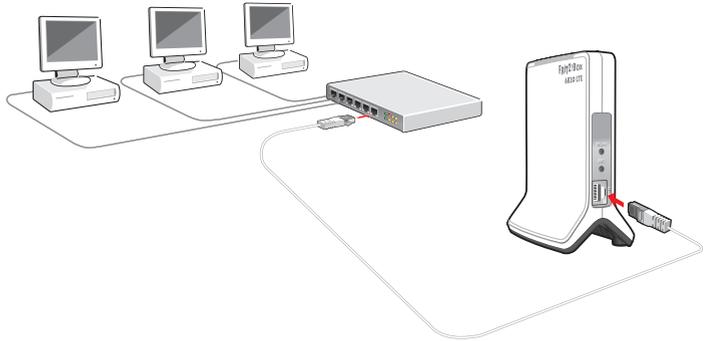
1.   Insert the network cable included in the package into the uplink port of the network hub or network switch.

You can also use any other network cable. For more information, see page 112.

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

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

7 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.

7.1 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 6820 LTE" 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 "WPS" button on the FRITZ!Box briefly.
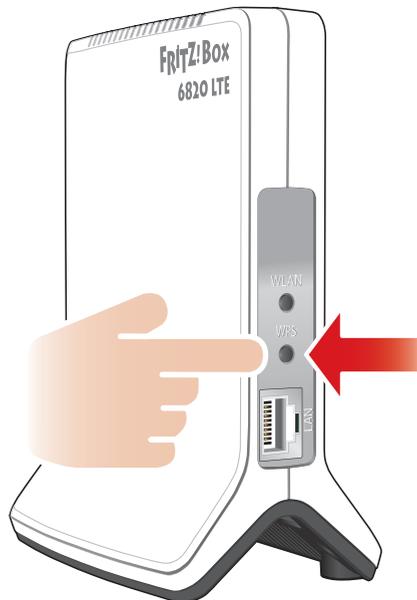
    The wireless LAN connection will be established.

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 "WPS" button on the FRITZ!Box briefly.
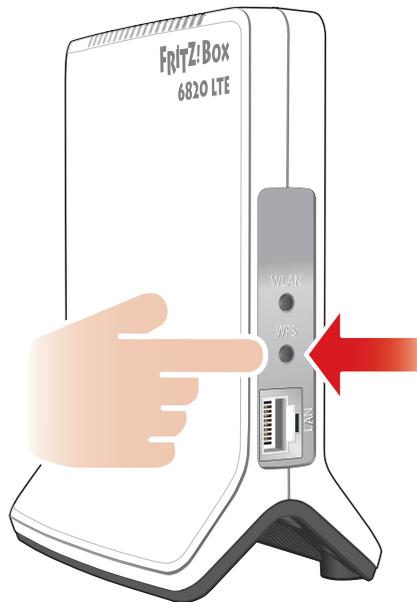
The wireless LAN connection will be established.

7.2   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 6820 LTE" 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.

7.3   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".

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.

8   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.

8.1   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 103.

8.2 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 you can jump from the "Overview" page to the corresponding menus and configure other settings.
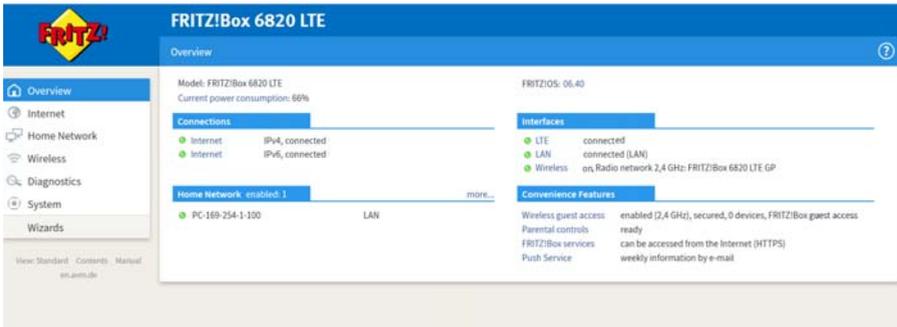
The "Overview" page of the FRITZ!Box

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.

Depending on your settings, the following information is displayed here:

- the name you assigned for your FRITZ!Box; see page 30

- the availability of a new FRITZ!OS version for your FRITZ!Box; see page 95

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

The **lower** area of the window presents the devices connected in the home network and the enabled convenience features.

8.3   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:
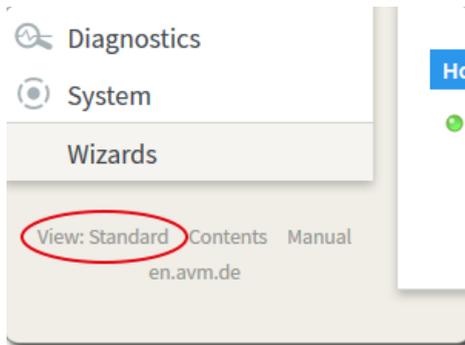
The "View" link in the user interface

8.4   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

- Individualized FRITZ!Box name for MyFRITZ!

- Push service sender name

9 Password Protection: Using FRITZ!Box Safely

Your FRITZ!Box contains many personalized settings for your home network 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 32, or with FRITZ!Box users; see page 33.

9.1 Overview

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

Property	FRITZ!Box Password	FRITZ!Box User
Password	You specify a password. Or you use the preconfigured password. Everyone who knows the password can access the FRITZ!Box user interface.	There are user accounts. 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.

9.2 Setting a FRITZ!Box Password

Overview

The basic method of logging 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, however. In such a case you also require an account as a FRITZ!Box user; see Creating FRITZ!Box Users from page 33.

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 and your home network.

Configuring the 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 Home Network".

3. Select the option "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 user name to log in to the user interface of your FRITZ!Box.

9.3 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".

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 Accessing the FRITZ!Box from the Internet from 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 80.

Accessing 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 83. Your FRITZ!Box is registered with this MyFRITZ! account.

* The option "Access from the Internet allowed" is enabled in your user account.

* The option "Internet access to the FRITZ!Box via HTTPS enabled" is checked in the "Internet / MyFRITZ!" 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 for which she or he is authorized.

Check at 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 82.

For more information about HTTPS, see the chapter Access from the Internet via HTTPS from page 50.

Here Is How to Use Access from the Internet

- As a FRITZ!Box user with the "FRITZ!Box Settings" right 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.

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 / User" 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.

9.4 "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 33 and Setting a FRITZ!Box Password from page 32.

10   Configuring an Internet Connection in the Mobile Communications Network

The Internet connection for the mobile telephone network has to be set up once in the FRITZ!Box, then it is always available.

Along with the SIM card, you received a PIN (Personal Identification Number) and a corresponding PUK (Personal Unlock Key) or a Super PIN from your mobile telephone network provider. Keep both numbers handy.

The first time you open the FRITZ!Box user interface, you will automatically be prompted to configure the Internet connection.

1. Start a web browser on your computer.

2. Enter the address http://fritz.box in the address field of your web browser.

3. The Wizard for configuring the Internet connection starts automatically.

4. Follow the instructions displayed on the screen.

5. As soon as you are prompted to do so, enter the PIN. If you enter the PIN incorrectly during login three times in a row, the device is blocked for further entries. With the PUK or the Super PIN you can release this block.

11 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.

11.1 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:
	• There are no time restrictions.
	• HTTPS queries are permitted.
	• 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.
	• 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 "Guest" 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 preconfig-ured "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 ac-cess 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 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.
  - 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 44.

- Prepare the filter lists if you would like to use filter lists; see Editing Filter Lists from page 45.

- If desired, add the list of network applications; see Adding Network Applications from page 45.

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 "Edit" button: ✏ .

5. Select the access profile to be applied to the network device and then click "OK".

Configuring an Access Profile

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 .
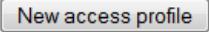
5. Configure the settings for the access profile in the "New Access Profile" window. Use the FRITZ!Box Help.

Editing Filter Lists

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

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 .
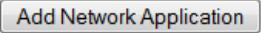
5. In the "Network Application" window, enter the network application you would like to add to the list.

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".

11.2   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:
	The FRITZ!Box responds to ping inquiries from the Internet addressed to the IPv4 address of the FRITZ!Box.
	IPv6:
	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 UDP	IPv4: 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: 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 GRE	IPv4: Within IPv4 networks you can open the firewall for the two protocols ESP and GRE, which do not use ports.
Exposed host (Open fire-wall com-pletely)	IPv4: 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: 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 82. For more information about dynamic DNS, see the section Dynamic DNS: Name Instead of IP Address on page 50.

11.3   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.

11.4   Access from the Internet via HTTPS

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 user interface externally from the Internet requires a FRITZ!Box user account which is authorized for access from the Internet.

- The HTTPS protocol must be enabled in the FRITZ!Box.

HTTPS (Hypertext Transfer Protocol Secure)

The HTTPS protocol is used for access over the Internet.

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.

Enabling HTTPS 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 HTTPS protocol.

11.5 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 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, IPTV or 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.

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.

11.6   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/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/vpn

11.7   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.

11.8   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.

11.9   IPv6: The New Internet Protocol

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

The FRITZ!Box supports the new Internet protocol IPv6, as long as the connection is over LTE. IPv6 technology is not supported in the UMTS and GSM mobile networks. Ask whether your mobile communications provider supports IPv6 in the LTE network.

If the provider supports IPv6 according to release 8 of the 3GPP standard, the FRITZ!Box receives a single native IPv6 address. If your mobile communications provider supports IPv6 in accordance with release 10 of the 3GPP standard, the FRITZ!Box receives a continuous range of native IPv6 addresses.

If your mobile communications provider supports IPv6, the FRITZ!Box can establish IPv6 connections:

- 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

- 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.

- Automatic provisioning (TR-064)

IPv6-Capable Services in the Internet

- Completely closed firewall to protect against unwanted data from the Internet (Stateful Inspection Firewall)

- 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 "Internet / Account Information" menu.

4. 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.

11.10 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: • 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. • 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. 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 • is assigned by the Internet service provider • is a public IP address • is contained in the external header of the LISP packet • can be an IPv4 address • can be an IPv6 address
EID	• identifies a network (network segment or network device) • is assigned by the LISP provider • is contained in the internal header of the LISP packet • can be an IPv4 address • can be an IPv6 address • can be a public IP address • 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.

12   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 N standard. 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.

12.1   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 "WLAN / 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.

12.2 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

12.3   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 802.11b, IEEE 802.11g and IEEE 802.11n. 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
802.11n	2.4 GHz	450 Mbit/s	150 Mbit/s

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.

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. Modulation processes and antenna techniques like MIMO (Multiple Input, Multiple Output) use the frequency band 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).

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 the "WLAN / Radio Channel" menu and select "Adjust radio channel settings" to make the desired changes.

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.

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
	AES-CCMP
	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 6820 LTE you can establish wireless LAN connections in the 2.4-GHz range.

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.

In the 2.4-GHz frequency range the European regulation authorities have designated 13 channels for wireless LAN.

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.

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		

13 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.

13.1 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 106.

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 78.

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.

13.2   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".
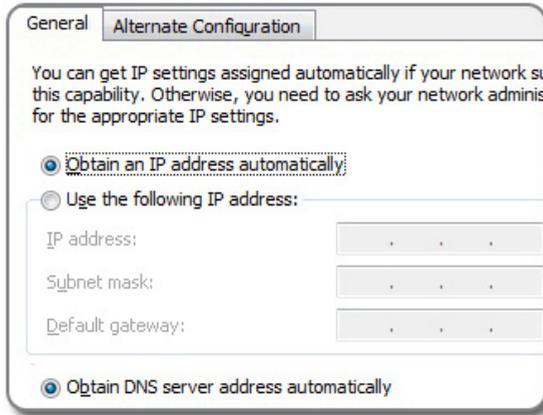
7. Click "OK" to save the settings.

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

14   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.

14.1   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 "WLAN / 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.

15 MyFRITZ!: Accessing the FRITZ!Box from Anywhere

15.1 Overview: The MyFRITZ!

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:

Number range	Function
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

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).

15.2 Creating a MyFRITZ! Account

Overview

A MyFRITZ! account is required in order to be able to use My-FRITZ!.

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 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.

15.3 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 is 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.

15.4 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.

15.5 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.

16   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.

16.1   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.
Wireless guest access	Sends you a message whenever devices register with or deregister from the wireless guest access.
New FRITZ!OS	Notifies you whenever a new FRITZ!OS is available for your FRITZ!Box.
Save 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.

16.2 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.

16.3 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.

17 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.

17.1 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.

17.2   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

18 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.

18.1 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.

18.2 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.

18.3   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 / Backup" 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.

19   Update: Updating FRITZ!OS

Always install the latest version of FRITZ!OS on all FRITZ! products in your FRITZ!Box home network. This keeps your FRITZ! products up to date and ensures optimum synchronization of all devices in your home network.

AVM provides regular free FRITZ!OS updates for your FRITZ!Box. FRITZ!OS is the operating system of the FRITZ!Box and controls all functions and settings of your FRITZ!Box. FRITZ!OS updates provide for maximum security in your home network, contain further developments of existing FRITZ!Box functions and often also introduce new features for your FRITZ!Box.

19.1   Updating FRITZ!Box Automatically

With the "Automatic Update" feature you have the option of installing updates automatically whenever a new FRITZ!OS version becomes available. For the "Automatic Update" function you can select among various methods:

Procedure	Description
Notify about new FRITZ!OS versions	The FRITZ!Box indicates that a new version of FRITZ!OS is available on the start page.
	You start the update yourself; see page 97.

Procedure	Description
Notify me about new versions of FRITZ!OS and install necessary updates automatically (recommended)	The FRITZ!Box indicates that a new version of FRITZ!OS is available on the start page. You start the update yourself; see page 97.
	Updates which AVM regards as necessary for continued secure and reliable operation (for instance, security updates) will be installed automatically.
	The FRITZ!Box selects a suitable time for the update, generally at night.
	During the installation all Internet and telephony connections will be interrupted briefly.
Notify me about new versions of FRITZ!OS and install new versions automatically	The FRITZ!Box indicates that a new version of FRITZ!OS is available on the start page.
	Every new version of FRITZ!OS will be installed automatically.
	The FRITZ!Box selects a suitable time for the update, generally at night.
	During the installation all Internet and telephony connections will be interrupted briefly.

Configuring Automatic Update

1. Open the FRITZ!Box user interface.

2. Select the "System / Update" menu and click the "Automatic Update" tab.

3. Select the desired auto-updating option.

4. Click "Apply".

This concludes the configuration of the auto-update feature.

You can also request notification about new updates by e-mail; see Push Services: Using Notification Services from page 88.

19.2   Performing an Update with the Wizard

A wizard is available in the FRITZ!Box user interface to assist you in updating your FRITZ!Box. The wizard checks whether an update of the FRITZ!OS is available for your FRITZ!Box and guides you step by step through installation.

Performing the Update

1.   Open the FRITZ!Box user interface.

2.   Select "Wizards".

3.   Start the "Update" wizard.

     The Wizard checks whether a FRITZ!OS update is available for your FRITZ!Box.

     If the Wizard finds an update, it displays the version number of the new FRITZ!OS. Click the link under the FRITZ!OS version to view information about further developments and new functions contained in the FRITZ!OS update.

     Interrupting the FRITZ!OS update could damage your FRITZ!Box. Do not clear the connection between FRITZ!Box and the computer during a FRITZ!OS update, and do not unplug the power cord.

4.   To transfer the FRITZ!OS update to the FRITZ!Box, click "Start Update Now".

     The FRITZ!OS update begins and the lower LED in the mobile communications display on the FRITZ!Box starts flashing.

The FRITZ!OS update is complete when the lower LED in the mobile communications display on the FRITZ!Box stops flashing.

19.3   Performing a Manual Update

In some cases it is not possible to perform an automatic up-date, for instance when the FRITZ!Box is not connected to the Internet. Then you have the option of performing an update manually.

Downloading the FRITZ!OS File

Before you can perform a manual update, you must download an up-to-date FRITZ!OS file from the Internet (using your neighbor's or friend's computer, or at an Internet café) and save it on your computer or on a connected storage medium.

1.   Enter the address ftp://ftp.avm.de/fritz.box in your web browser.

2.   Switch to the folder for your FRITZ!Box model, then to the sub-folder "firmware", and then to the folder named "english".

   The complete model name of your FRITZ!Box is shown in the user interface on the "Overview" page and is also printed on the sticker on the underside of the housing.

3.   Download the latest FRITZ!OS file for your FRITZ!Box with the file extension ".image" to the computer.

   The currently installed version of FRITZ!OS is displayed on the "FRITZ!OS File" tab and on the "Overview" page. The version number of the FRITZ!OS you downloaded and saved is included in the name of the "*.image" file. Perform an update only if the downloaded FRITZ!OS is a newer version than the FRITZ!OS currently installed.

Now you can copy the FRITZ!OS file to the computer that is connected to the FRITZ!Box, for instance using a USB flash drive.

Performing a FRITZ!OS Update

1. Open the FRITZ!Box user interface.

2. Enable the advanced view.

3. Select "System / Update / FRITZ!OS File".

4. Click the "Save Settings" button to save the current settings of your FRITZ!Box on your computer and save the export file on your computer.

   Using this file you can restore the settings of your FRITZ!Box as needed.

5. Click the "Browse…" button and choose the file with the new FRITZ!OS you already downloaded and saved on your computer.

   Interrupting the FRITZ!OS update could damage your FRITZ!Box. Do not clear the connection between FRITZ!Box and the computer during a FRITZ!OS update, and do not unplug the power cord.

6. Click the "Start Update" button.

   The new FRITZ!OS is transmitted to your FRITZ!Box.

The update is complete when the lower LED in the mobile communications display on the FRITZ!Box stops flashing.

20   Taking FRITZ!Box Out of Operation

In this chapter you receive tips and recommendations for taking the FRITZ!Box out of operation.

20.1 Removing the SIM Card

If you want to end operation of the FRITZ!Box, remove the SIM card from the slot. To do this, press the SIM card briefly.

20.2 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 network key of the factory settings will be activated again.

- The IP configuration of the factory settings will be restored.

Preparing to Load Factory Settings

Before loading the factory settings of your FRITZ!Box, save your settings.

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 92.

Loading Factory Settings

Before loading factory settings, we recommend saving the settings configured on your FRITZ!Box in a backup file; see page 92.

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.

20.3 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.

21   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

21.1 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 78.

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" 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 78.

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".

21.2   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.

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 21.

2. Open the FRITZ!Box user interface.

3. Select "Wireless / Radio Network".

4. Enable the option "Name of the wireless 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 .

2. Open the FRITZ!Box user interface.

3. Select "Wireless / Security".

4. Take note of the network key or click "Apply" and print out the wireless LAN security settings.

21.3   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 "Wireless / Radio Channel".

3. Enable the option "Set radio channel settings automatically (recommended)".

4. Click "Apply".

22 Technical Specifications

Facts worth knowing: Here you will find comprehensive technical data on your FRITZ!Box 6820 LTE.

22.1 Ports and Interfaces

- LTE modem compliant with 3GPP standard, release 8 LTE category 4 UE

- LTE frequency bands
  - Band 20: 800 MHz range (digital dividend)
  - Band 3: 1.8 GHz range
  - Band 7: 2.6 GHz range
  - Band 1: 2.1 GHz range
  - Band 8: 900 GHz range
  - Band 5: 850 GHz range

- UMTS Frequency Bands
  - Band 1: 2.1 GHz range
  - Band 8: 900 GHz range
  - Band 5: 850 GHz range

- GSM Frequency Bands
  - E-GSM 900
  - DCS 1800

- One LAN port over RJ45 socket (standard Ethernet, 10/100/1000 Base-T)

- Wireless access point with support for wireless networks in the 2.4-GHz frequency band
  - IEEE 802.11b—11 Mbit/s
  - IEEE 802.11g—54 Mbit/s
  - IEEE 802.11n—450 Mbit/s

22.2   Router Functions

- Router
- DHCP server
- Firewall with IP masquerading/NAT
- IPv4 and IPv6
- Parental controls and filter lists
- Port sharing
- Dynamic DNS
- VPN

22.3   User Interface and Display

- Configuration and status messages via a web browser on a connected computer
- Five LEDs indicate the condition of the device

22.4   Device Properties

- Dimensions (W x D x H): approx. 64 x 134 x 99 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: 6 W

- Average power consumption: 4 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

  – one network device connected to the LAN port; no data transfer

22.5 Cable

Network Cable (White/Yellow)

Use

The network cable is used to connect computers and network devices to the FRITZ!Box 6820 LTE.

- AVM recommends using a network cable no more than 100 meters long.

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.

23 Customer Service

Be it further product documentation, frequently asked questions, tips or support—this chapter presents information on all important service topics.

23.1 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.

23.2 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

23.3   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.

23.4 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 16

   – Connecting the FRITZ!Box from page 19

   – Connecting a Computer with a Network Cable from page 21

   – Connecting Devices with the FRITZ!Box over Wireless LAN from page 23

2. If you have any problems, for instance in establishing connections, read the section Help in Case of Errors from page 103.

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.

Legal Notice

Legal Notice

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 en.avm.de/ce.

Disposal Information

In accordance with European regulations, FRITZ!Box 6820 LTE, 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 6820 LTE 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.
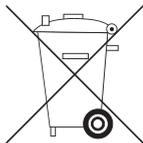
Symbol for the separate collection of electric and electronic devices

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