



FRITZ!Box

Fon WLAN 7113

**Installation,
Configuration
and Operation**



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FRITZ!Box Fon WLAN 7113

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Symbols and Highlighting

The following sections present explanations about the symbols and highlighting used in this manual.



This symbol indicates useful hints to assist you in working with the FRITZ!Box.



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

The table below explains the highlighting used in this manual.

Highlighting	Function	Examples
Quotation marks	Keys	“F1” key
	Buttons	“Help”
	Settings pages	“Advanced”
	Menus	“Edit/Paste”
	Commands	“Copy”
	File paths	“C:/My Documents”
	File names	“Documentation”
Underlined text	Text input	fritz.box
Pointed brackets	Joker	<MSN>
Bold	Emphasis	Do not click the button...



For detailed information about the numerals and function keys used in the manual, see the section “Operation at the Telephone” on page 42.

I CONNECTING AND OPERATION

1 Security and Handling

What to watch out for

Safety Instructions

When working with the FRITZ!Box Fon WLAN 71130, observe the following security instructions in order to protect yourself and the FRITZ!Box from harm.

- ◆ Do not install the FRITZ!Box during an electrical storm.
- ◆ Disconnect FRITZ!Box from the power supply during electrical storms.
- ◆ Never let liquids get inside the FRITZ!Box. Otherwise, electric shocks or short circuits may result.
- ◆ The FRITZ!Box is intended for indoor use only.
- ◆ Do not open the FRITZ!Box housing. The device contains hazardous components and should only be opened by authorized repair technicians.

Handling the FRITZ!Box

You can either place FRITZ!Box on a horizontal surface or mount it on a wall. Please note the following:

- ◆ Place or hang the FRITZ!Box in a dry location that is free of dust and protected from direct sunlight.
- ◆ Do not place the FRITZ!Box on excessively heat-sensitive surfaces, as the base of the device can heat up during normal operation.
- ◆ Make sure that the ventilation slits are unobstructed. For this reason the FRITZ!Box should not be placed on a carpet or on upholstered furniture. The ventilation slits provide for air cooling of the FRITZ!Box.
- ◆ When connecting FRITZ!Box to your computer using the network, remember to take the length of the cable into account.

- ◆ If you would like to establish wireless connections between the FRITZ!Box and the computer, position the device at a central location.
- ◆ Make sure to keep sufficient distance from potential sources of interference like microwave devices or electric devices with large metal housings.

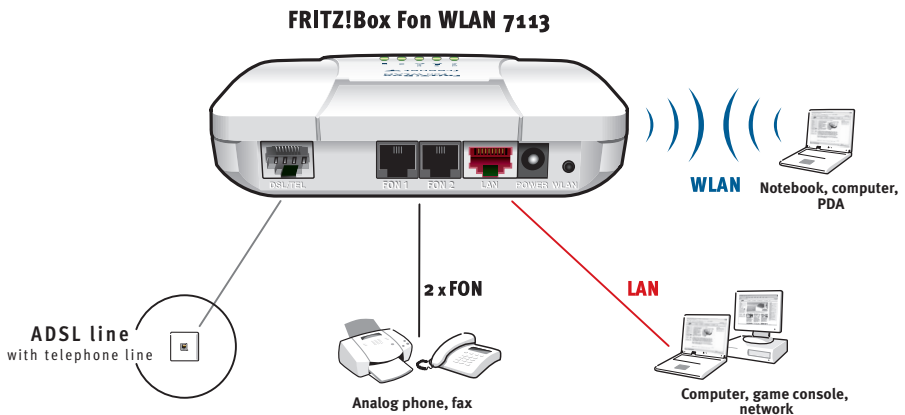


For detailed information about the symbols, numerals and function keys used in the manual, see the sections “Symbols and Highlighting” on page 6 and .

2 FRITZ!Box Fon WLAN 7113 An Overview

The FRITZ!Box is a DSL modem that connects your computers directly with your DSL line. Each connected computer can establish an Internet connection over the FRITZ!Box. As a WLAN access point, FRITZ!Box offers you the possibility of connecting your computer to the DSL line wirelessly.

The FRITZ!Box is a Private Branch Exchange (PBX) for making telephone calls via the Internet and the fixed-line network.



Possibilities for connecting FRITZ!Box

PBX Two analog telephones, fax machines and answering machines can be connected to FRITZ!Box to take advantage of the features of ISDN.

Connecting Computers A computer can be connected directly to FRITZ!Box's LAN port.

You can also connect a network hub or switch to the LAN ports so that even more computers can be connected to FRITZ!Box.

WLAN Access Point The FRITZ!Box is a WLAN access point. All computers equipped with a WLAN adapter can be wirelessly connected to the FRITZ!Box.

- Local Network** All of the computers connected with the FRITZ!Box constitute a network and can share access to any files released for file sharing.
- Internet** All of the computers connected to the FRITZ!Box can access the Internet.

The FRITZ!Box works as a DSL router, making the Internet connection available to all connected computers. All connected computers can then use the Internet connection at the same time.
- Firewall** The FRITZ!Box is equipped with an integrated firewall. The integrated firewall protects your network from attacks from the Internet as long as the FRITZ!Box is operated as a router.
- Network Devices** Other network devices can also be connected to the network ports of the FRITZ!Box, for instance game consoles.
- Operating Systems Supported** The FRITZ!Box can be connected to computers with Windows operating systems, the Linux operating system or Apple computers with the Mac OS X operating system.

2.1 Package Contents

The following is included in the FRITZ!Box Fon WLAN 7113 package:

- ◆ FRITZ!Box Fon WLAN 7113
- ◆ one power supply unit with a cable for connection to the power mains
- ◆ one DSL/telephone cable for connecting the FRITZ!Box to your DSL line
- ◆ one network cable for connection to a computer or a network
- ◆ one FRITZ!Box CD with
 - Installation Help
 - documentation for all enclosed AVM components
- ◆ one quick guide

2.2 Operation Requirements

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

- ◆ a Web browser that supports Java script (for instance, Internet Explorer version 6.0 or higher, or Firefox version 1.5 or higher)
- ◆ Internet connection:
 - DSL line, ITU G.992.1 standard Annex A, ITU G.992.3 standard Annex A, ITU G.992.5 standard Annex A
 - or a cable line with cable modem
 - or another Internet connection
- ◆ for connection via WLAN:
computer with a WLAN adapter compliant with IEEE 802.11n draft 2.0, IEEE 802.11g, or IEEE 802.11b, for example a FRITZ!WLAN USB Stick
- ◆ for connection via network cable:
computer with a network port (network adapter standard Ethernet 10/100 Base-T)
- ◆ for fixed-line telephony:
one analog telephone line

3 Connection

Connecting FRITZ!Box

This chapter contains instructions on the following topics:

- ◆ Launching FRITZ!Box Operation
- ◆ Connecting FRITZ!Box to electrical power
- ◆ Connecting one or several computers to the FRITZ!Box
- ◆ connecting FRITZ!Box to DSL.
- ◆ Connecting FRITZ!Box to the Analog Telephone Line
- ◆ Connecting analog terminal devices to the FRITZ!Box



Please see the instructions about setting up the FRITZ!Box in section “Security and Handling” on page 7.

3.1 Launching Operation



We recommend using the Installation Help on the FRITZ!Box CD when launching operation of the FRITZ!Box for the first time.

Using the Installation Help on the CD

On computers with Windows operating systems you can use the Installation Help on the FRITZ!Box CD. The Installation Help presents instructions on the screen, guiding you through the steps required to launch operation of the FRITZ!Box.

1. Insert the FRITZ!Box CD in the CD-ROM drive of your computer.
The Installation Help starts automatically.
2. Follow the instructions in the Installation Help to prepare the FRITZ!Box for operation.

At the conclusion of the Installation Help, you will be routed directly to the FRITZ!Box user interface.

Launching Operation without the Installation Help CD

If you do not want to use the Installation Help on the FRITZ!Box CD, then work through the instructions below in the recommended order:

1. Mounting FRITZ!Box; see the section “Security and Handling” from page 7.
2. Connecting FRITZ!Box to the power supply; see the section “Connecting to electrical power” on page 13.
3. Connecting FRITZ!Box to the computer(s); see the section “Connecting to the computer” on page 14.
4. Connecting FRITZ!Box to DSL; see section “Connecting DSL and the Telephone Line” from page 20.
5. If you want to make telephone calls with the fixed-line network using FRITZ!Box: see the section “Connecting with the Analog Telephone Line” on page 21.
6. If you want to make telephone calls and fax using the FRITZ!Box over the Internet and/or the fixed-line network, connect your analog equipment to the FRITZ!Box: See the section “Connecting Telephone, Fax, or Answering Machine” on page 22.

3.2 Connecting to electrical power



Connecting to the power supply

Connecting Set aside the power supply unit out of the FRITZ!Box package.

1. Connect the power supply unit to the socket on the FRITZ!Box labeled “Power”.
2. Plug the other end into an AC power outlet.

The green “Power/DSL” LED will light up after a few seconds to indicate that the device is ready for operation.

3.3 Connecting to the computer

If you would like to surf the web using the FRITZ!Box or to open the FRITZ!Box user interface, then you must connect a computer with the FRITZ!Box.

A computer can be connected with the FRITZ!Box in two different ways:

- ◆ via a LAN port
- ◆ wirelessly via WLAN

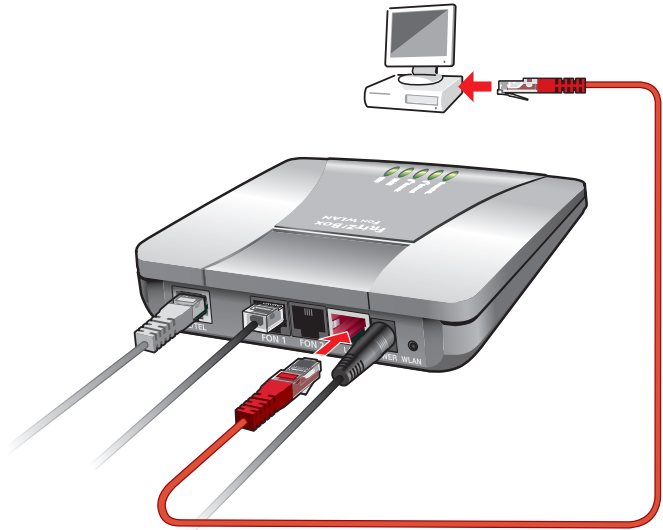
Properties Note the following when connecting computers to the FRITZ!Box:

- ◆ **One** computer can be connected to the FRITZ!Box by only **one** of these means.
- ◆ At each of the network ports of the FRITZ!Box, a computer can be connected directly or via a hub/switch.
- ◆ Using WLAN you can connect multiple computers with the FRITZ!Box at the same time.
- ◆ The way a computer is connected to the FRITZ!Box is the same regardless of the operating system on the computer.
- ◆ All of the computers connected with the FRITZ!Box constitute a network.

3.4 Connecting Computers to the LAN Port



If you would like to connect a computer to the LAN port of the FRITZ!Box, make sure the computer is equipped with a LAN port (network adapter). A LAN port is usually designated by the icon at left or labeled “LAN”.



Connecting a computer to a LAN port on the FRITZ!Box

Connecting

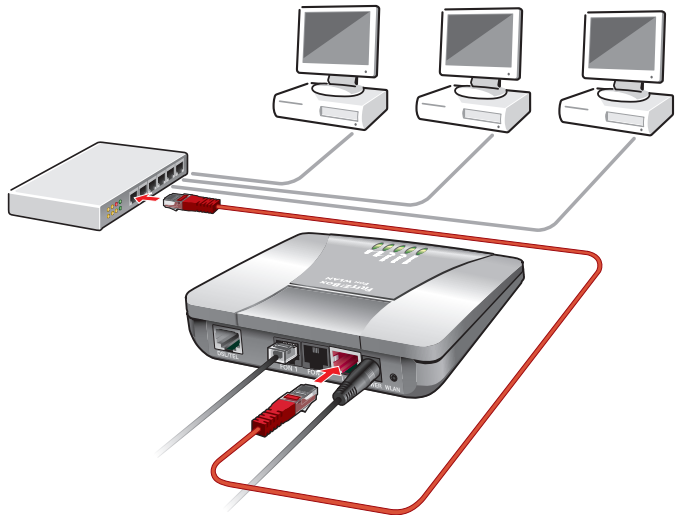
Set aside the network cable (red) from the FRITZ!Box package.

1. Switch on your computer.
2. If you work with a Linux operating system, use YaST to configure your network card with the setting “DHCP”, if this setting is not already configured.
3. Insert one end of the LAN cable to the computer’s network adapter.
4. Connect the other end of the network cable to one of the sockets on FRITZ!Box labeled “LAN”.

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

Connecting a Network Hub or Switch

You can connect a network hub or switch to the LAN port if you would like to connect multiple computers to the FRITZ!Box via LAN.



Connecting FRITZ!Box to a network hub

Connecting Set aside the network cable (red) from the FRITZ!Box package.

1. Connect one end of the LAN cable to the uplink port of the network hub or switch.
2. Connect the other end of the cable to the socket on the FRITZ!Box labeled LAN.

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

3.5 Connecting computer(s) wirelessly via WLAN

Using WLAN you can connect one or multiple computers with the FRITZ!Box wirelessly.

The wireless WLAN connection is independent of the operating system used. Each computer to be connected to the FRITZ!Box via WLAN must support WLAN, by means of a compatible WLAN adapter, for instance the FRITZ!WLAN USB Stick.



For more information on WLAN, see the section “More about WLAN” from page 77.

Presettings in the FRITZ!Box

The FRITZ!Box is delivered with preset values for WLAN security. These values must also be entered on the computer with the WLAN adapter in order to be able to establish a successful WLAN connection.

The following values are configured in the FRITZ!Box factory settings:

Setting	Preset Value
SSID (name of the radio network)	FRITZ!Box Fon WLAN 7113
Encryption methods	WPA (TKIP) and WPA2 (AES-CCMP)
Encryption	WPA PSK
Key	The key is printed on the sticker attached to the base of the device.
Network mode	Infrastructure

Connect Using a WLAN Adapter

You can connect computers with the FRITZ!Box wirelessly as soon as you have installed a WLAN adapter and configured WLAN software.

Installing

1. Switch on your computer.
2. Install a WLAN adapter, for instance the FRITZ!WLAN USB Stick, on your computer along with the appropriate software. Please take note of the instructions in the documentation of the adapter.

Once installation has been completed, you generally have software available to control your WLAN connections. In the Windows operating systems you can open the user interface of the WLAN software by clicking an icon in the taskbar (specific to each manufacturer) or from the start menu.

Alternatively, you can use the WLAN software supplied with the operating system to establish a WLAN connection to the FRITZ!Box.

Establishing a connection

This description uses the values given in the section “Presettings in the FRITZ!Box” on page 17.

If you would like to establish a WLAN connection using these preset values, then your WLAN adapter must support the WPA encryption procedure.

1. Start the WLAN software.
2. Select the SSID (WLAN radio network) “FRITZ!Box Fon WLAN 7113” in the user interface.

If the radio network is not displayed, follow the instructions in the section “The WLAN Adapter Cannot Find FRITZ!Box” from page 59.

3. Set “Infrastructure” as the network mode.
4. Select “WPA PSK” as encryption or authentication.
5. Enter the preset key in the “Network Key” field. The key is printed on the sticker on the base of your FRITZ!Box.



Sticker with sample values

6. Confirm your entries using the relevant button in the user interface (for instance, “OK” or “Connect”).

The WLAN connection is established.

7. Now read the security instructions in the section “Security” from page 79.

Further WLAN settings can be configured in the user interface of your FRITZ!Box. See the section “Opening the User Interface” on page 23 for instructions on how to open the interface.

WLAN adapter
does not support
WPA

If your WLAN adapter does not support the WPA security mechanism, you must change the WLAN settings in the FRITZ!Box to WEP.



From today’s perspective, WEP encryption does not offer adequate protection. Contact the manufacturer of your WLAN adapter for an update that makes the adapter able to support WPA. We strongly advise against using WEP for encryption in the long term!

Proceed as follows to change the encryption method:

1. Connect the FRITZ!Box and the computer using the network cable (see the section “Connecting Computers to the LAN Port” from page 15).
2. Start a web browser.
3. Enter fritz.box in the address field.

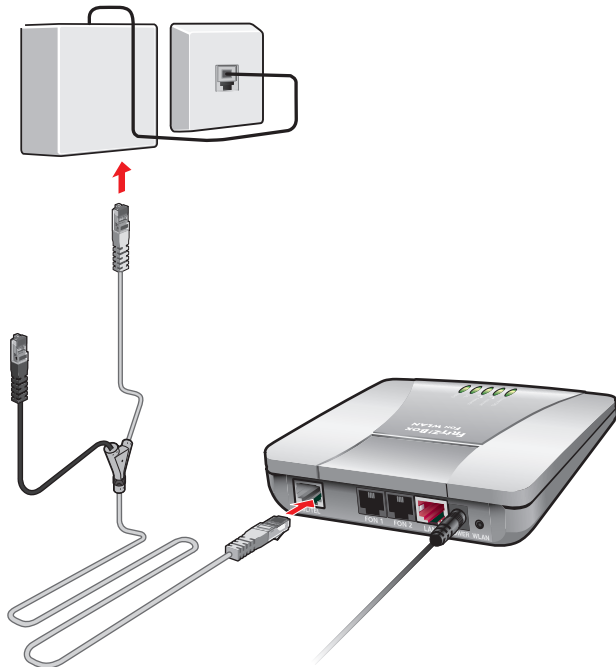
The FRITZ!Box user interface opens.

4. In the “WLAN / WLAN Security” menu, select WEP encryption and enter the network key you have chosen.
5. Click the “Apply” button.

A window is displayed with the WLAN security settings. Print out the page by clicking “Print Page”. The data in the printout will be needed for the WLAN configuration of your WLAN adapter.

6. Close the user interface.
7. Remove the network cable connecting the computer and the FRITZ!Box.

3.6 Connecting DSL and the Telephone Line



Connecting to the DSL splitter

Connecting

If you have a DSL line and a telephone line, then connect the FRITZ!Box using the DSL/telephone cable (gray-black).

1. Connect the longer of the two gray ends of the cable to the port labeled “DSL/TEL”.
2. Then connect the shorter, gray end of the cable to the socket on the DSL splitter labeled “DSL”.



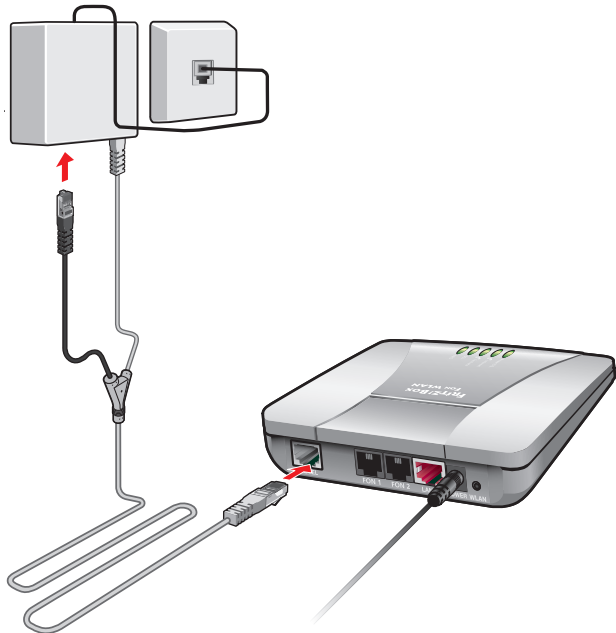
The black branch of the Y-shaped cable is for connection to the telephone line (see the sections page 21).

The green “Power” LED stops flashing after a short time and remains lit to signalize that FRITZ!Box is ready for Internet connections over DSL.

3.7 Connecting with the Analog Telephone Line

Your telephone line is either an analog line or an ISDN line.

If you have an analog telephone line, read here about how to connect the FRITZ!Box with the analog telephone line.



Connecting to the analog telephone line via the DSL splitter

Connecting Set aside the Y-shaped cable (gray-black) delivered in the package. This cable is a combined DSL/telephone cable.

1. Connect the longer gray end of the cable to the socket on the FRITZ!Box labeled “DSL/TEL”.
2. Then insert the black plug into the appropriate jack of your DSL splitter.

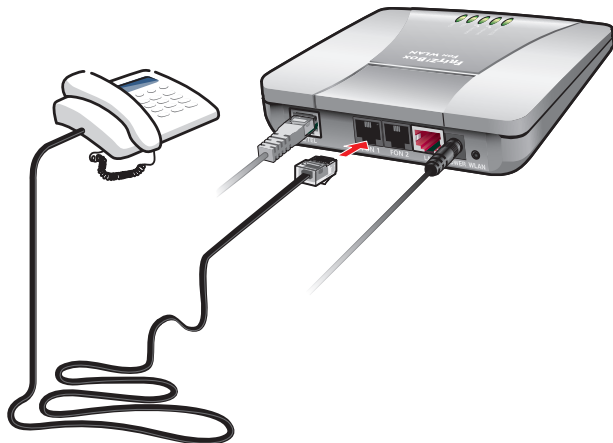
Now the FRITZ!Box and the analog telephone line are connected.

3.8 Connecting Telephone, Fax, or Answering Machine

The FRITZ!Box provides Internet and/or fixed-line telephony for analog terminal devices.

You can connect two analog terminal devices like telephones, fax machine or answering machine to the FRITZ!Box.

Analog equipment with an RJ11 plug is connected to the RJ11 jacks “FON 1” and “FON 2”. These two jacks are located on the back panel of the FRITZ!Box.



Connecting an analog telephone to an RJ11 jack

Now your analog device is connected with the FRITZ!Box.

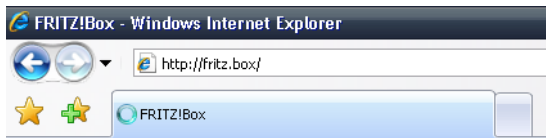
4 Opening the User Interface fritz.box

The FRITZ!Box has a user interface that can be used in a web browser.

The user interface presents information about the FRITZ!Box product, terminals and connections. This is where you configure all of the settings for operating the FRITZ!Box.

The user interface can be opened from any computer connected with the FRITZ!Box. The settings you configure are saved in the FRITZ!Box.

- Starting
1. Start a web browser on your computer.
 2. Enter “fritz.box” in the address line of the browser.



The “fritz.box” address entry in the address field of an Internet browser

The FRITZ!Box user interface opens.



If the user interface does not open, please see the instructions in the section “Errors Opening the User Interface” on page 53.

4.1 Password Protection

Use the password protection set up for the user interface to protect your settings and all information in the FRITZ!Box from unauthorized access.

Here is how to set up the password protection in the FRITZ!Box:

1. Open the FRITZ!Box user interface.
2. Select “Advanced Settings / System / FRITZ!Box Password” in the FRITZ!Box Settings” area.
3. Enable password protection and enter a password.
4. Save your settings by clicking “Apply”.

Be sure to use a password you can remember easily. If you forget the password, the only way to access the FRITZ!Box is to restore the factory settings. All settings made during operation will be overwritten. Then you can open the user interface again in order to reconfigure your settings or restore the settings you saved during previous operation.

4.2 Save Settings

The settings you made in the FRITZ!Box can be saved as a file on your computer. This file contains all user-defined settings, including the account information for the Internet and telephony connections. This settings file can be loaded back into your FRITZ!Box at any time.

The FRITZ!Box features a Wizard to accompany you step by step through the process of saving and restoring your settings.

5 Internet Connections

Set Up Internet Connection

In order to allow Internet access with the FRITZ!Box, you must first configure the Internet connection in the FRITZ!Box user interface.

The FRITZ!Box can be operated directly at the DSL line. Alternatively, it can be connected to a cable modem, a DSL modem, or a DSL router, or integrated into an existing network.

If no DSL line is available, the Internet connection can be established over the mobile telephone network using a USB modem.

5.1 Configuring the Internet Connection Using the Wizard

If the FRITZ!Box is connected directly to the DSL line, the account information from your Internet Service Provider is required to configure the Internet connection in the FRITZ!Box.

Use the Wizard to configure the Internet connection:

1. Open the FRITZ!Box user interface.
2. In the “Settings” area, please select the “Wizards” menu.
3. Click the “Configure Internet Connection” Wizard and follow the instructions.

Once configuration has been completed, all of the computers connected with the FRITZ!Box can be used to surf the Internet without any further settings required.

5.2 Configuring the Internet Connection Manually

Changes to the Internet connection settings can be made in the FRITZ!Box user interface.

Proceed as follows:

1. Open the FRITZ!Box user interface.
2. Select the “Advanced Settings” menu in the “Settings” area.
3. Select “Internet / Account Information”.

4. Select the setting “Use one Internet connection for all computers (router)” if this setting is not already configured.
5. Enter in these fields the Internet account information you received from your Internet Service Provider. Take advantage of the Help available in the FRITZ!Box user interface for more information and instructions.
6. As a final step, click “Apply”.

If the FRITZ!Box is connected to a cable modem, a DSL modem or a router, or integrated into an existing network, you must also configure your Internet connection as described above. To do so, enable the expert view in the “System / Expert Mode” menu.

5.3 Surfing the Net

Once you have set up the Internet connection in your FRITZ!Box, you can surf the Internet with any computer connected to the FRITZ!Box.

1. Start a web browser on your computer.
2. Enter in the address field the URL of the Internet page you would like to visit, for instance “<http://www.avm.de/en>”.

6 Telephone Connections

Configuring FRITZ!Box for Telephony

Using the FRITZ!Box you can make telephone calls via the Internet and the fixed-line network.

Once you have connected the FRITZ!Box as described in the chapter “Connection” from page 12, you can configure the FRITZ!Box for making telephone calls.

The configuration is performed in two consecutive steps:

- ◆ entering your phone numbers
- ◆ configuring the connected telephony equipment



In the “Settings“ area of the FRITZ!Box user interface there are various Wizards for the configuration of your FRITZ!Box. We recommend using these step-by-step instructions.

6.1 Entering your Phone Numbers

The “Enter Your Phone Numbers” Wizard supports you in performing the following tasks:

- ◆ entering Internet telephone numbers
- ◆ entering fixed-line telephone numbers
- ◆ changing numbers already entered
- ◆ deleting entered numbers



If you used the Basic Configuration Wizard after connecting your FRITZ!Box and entered numbers then, these numbers are already entered in your FRITZ!Box. In this case you can start right away with the configuration of the connected telephony devices.

Entering New Internet Telephone Numbers

In order to be able to make calls via the Internet with the FRITZ!Box, you will need an Internet telephone number from an Internet telephony carrier. Enter the Internet telephone number in the FRITZ!Box.

You can enter multiple Internet numbers in the FRITZ!Box. The Internet numbers can be from one or from multiple different Internet telephony providers.

Entering Fixed-line Numbers

In order to make calls via the analog fixed-line network with the FRITZ!Box, enter your telephone numbers in the FRITZ!Box.

6.2 Setting Up Telephony Devices

For the configuration of telephony equipment, the “Configure Telephony Devices” Wizard is available in the FRITZ!Box.

Telephony devices supported

The following telephony devices are supported by the FRITZ!Box:

- ◆ telephones
 - analog telephones
 - analog telephones with an integrated answering machine
- ◆ Answering machine

If you have connected an analog answering machine (to the “FON 1” or “FON 2” jack, for instance), configure it as an answering machine.
- ◆ Fax machines

The FRITZ!Box supports:

 - analog fax machines
 - analog fax-telephone combinations

Settings for Telephony Devices

Telephony equipment like telephones, faxes and answering machines can be connected to the FRITZ!Box. The “Configure Telephony Devices” Wizard can assist you in configuring the necessary settings for all telephony devices.

Devices connected to the FRITZ!Box

- ◆ Telephone
 - kind of connection used to connect the telephone with the FRITZ!Box
 - internal name for the telephone
 - number used to conduct outgoing calls: With this entry you specify whether outgoing calls should be conducted via the Internet or the fixed-line network.
 - Call acceptance: Specify here whether the telephone should react to all calls or only to calls for certain telephone numbers.
- ◆ Fax machine
 - Kind of connection used to connect the fax machine with the FRITZ!Box
 - internal name for the fax machine
 - Number used to send faxes: This entry defines whether outgoing faxes are sent via the Internet or the fixed-line network.
 - Call acceptance: Here you define the numbers to which the fax machine should react.
- ◆ Answering machine
 - Kind of connection used to connect the answering machine with the FRITZ!Box.
 - internal name for the answering machine
 - Call acceptance: Enter here whether the answering machine should react to all calls or only to calls for certain numbers.

6.3 Telephony Functions



More functions and settings options for telephony are available in the “Settings / Advanced Settings” area, in the “Telephony” menu.

Call List

The Call List displays outgoing calls and sent faxes, incoming calls and faxes, as well as incoming calls in absence.

If the number of a caller or someone called is entered in the Telephone Book, the Call List will display the name from the Telephone Book.

The Call List can be saved as a file.

Menu The Call List is found in the “Settings / Advanced Settings” area, in the “Telephony / Calls” section.

Telephone Book

A Telephone Book is at your disposal in the FRITZ!Box.

Menu The “Telephone Book” is found in the “Settings / Advanced Settings” area, in the “Telephony” menu.

Block Calls

The telephone number block of the FRITZ!Box offers you the following options:

- ◆ Numbers and number ranges can be blocked for outgoing calls

From the FRITZ!Box no outgoing calls to a blocked number range are possible. In this manner you can block connections to certain mobile networks, for instance.

- ◆ blocking telephone numbers for incoming calls

For incoming calls you can block certain numbers to avoid receiving calls from unwanted callers.

Menu The command for blocking calls is located in the “Settings / Advanced Settings” area, in the “Telephony / Calls” menu.

Alarm

With the alarm function you can use the telephones connected to the FRITZ!Box as alarm clocks.

- ◆ You can specify several different times for the alarm to go off.
- ◆ An individual telephone can be selected for the alarm function.

Menu The “Alarm” function is located in the “Settings / Advanced Settings” area, in the “Telephony” menu.

Dialing Rules

Dialing rules specify when calls are conducted on the fixed-line network, and when they take place over the Internet.

All connections to number ranges for which a dialing rule has been defined are established using the specified connection type.

Menu The “Dialing Rules” menu is located in the “Settings / Advanced Settings / Telephony” area.

7 Configuration and Operation on the Telephone

FRITZ!Box Keypad Sequences

Many of the FRITZ!Box functions and features can be configured and used over a telephone connected to a FRITZ!Box extension. Only tone-dialing (dual-tone multi-frequency = DTMF) telephones can be used in configuration and operation. Pulse dialing telephones are **not** suitable.



The telephone network features can be used only if they are supported by your telephone network carrier and enabled on your telephone line.








Acknowledgment tone

Entries input on the telephone are confirmed with acknowledgement tones (see also “Audible Signals” on page 34):

- ◆ Entries made correctly are confirmed with a positive acknowledgement tone (a single tone of one second in length).
- ◆ If the entry was not successful, because of an incorrect key sequence, for instance, you hear a negative acknowledgement tone (an intermittent tone broken into intervals of about 0.25 seconds).

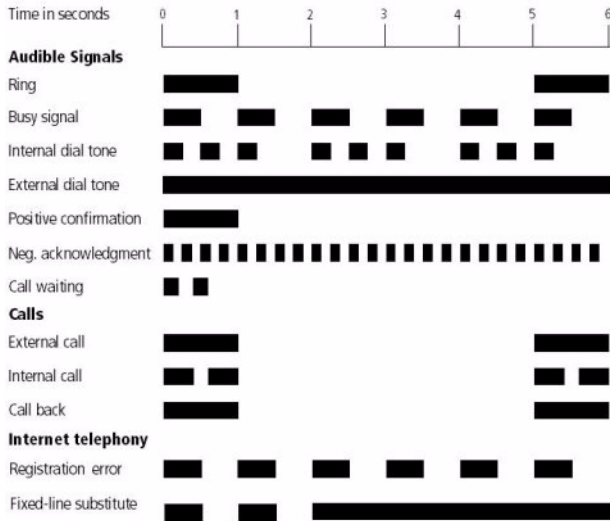
7.1 Instructions for Operation at the Telephone

The table explains the symbols used in this chapter:

	Dial a number
	Pick up the handset
	Hang up the handset
	Talk
	three-party conference call
	Wait for the acknowledgement tone
	You hear the ring tone
<Ext.>	Enter an extension number (Ext.). In the place of the abbreviation <Ext.> used here, enter the number 1 , 2 or a higher number, corresponding to the extension you would like to configure.
<MSN>	Enter an ISDN number (MSN). In place of the abbreviation <MSN> used here, enter the complete MSN desired, without any dialing prefix.
<DNo>	Enter an external telephone number (destination number). In the place of the abbreviation <DNo>, enter the complete number of the external line.
<DNo./Ext.>	Enter the external telephone number (destination number) or extension number (Ext.) to which your calls are to be diverted.

7.2 Audible Signals

The following diagram illustrates the duration and intervals of the various audio signals and ring tones of the telephones connected to the FRITZ!Box Fon WLAN 7113.



Audio signals and ring tones of the connected telephones



7.3 Configuring on the Telephone

Saving New Settings

In this section, saving refers to **all** current settings made in the FRITZ!Box. It is not necessary to save the configuration immediately after every change. You may first configure all of your settings as desired, and then save them permanently.



Permanent saving cannot be reversed. However, you can change the settings by using new commands or restore the FRITZ!Box to its factory settings.

Saving Permanently	
	Pick up the handset.
#991*1*	Save all settings permanently by dialing the sequence shown at left.
	Hang up the handset.

Restore factory settings

The FRITZ!Box can be reset to its condition upon delivery by restoring factory settings.



All settings you made in the FRITZ!Box—including the configured Internet connection—are deleted when the factory settings are restored.

Restore factory settings	
#991*15901590*	resets the FRITZ!Box to its condition upon delivery.

After restoring factory settings, the FRITZ!Box is restarted.

Enabling/Disabling WLAN

The WLAN function can be switched on and off using the telephone keypad. This is especially convenient when the WLAN function has been switched off. Simply use your telephone to turn it back on. This means that the WLAN function can be enabled without having use a wired connection to open the user interface.

Enabling and Disabling WLAN	
#96*1*	enables the WLAN function
#96*0*	disables the WLAN function

Do Not Disturb

You can enable a Do Not Disturb function for any telephone connected to FRITZ!Box in the user interface. When Do Not Disturb is enabled, the telephone will not ring. In configuring this function you can choose between enabling the function immediately and selecting a specific time period.

Immediately

When Do Not Disturb is enabled immediately, no incoming calls will be signaled at the specified extension. The Do Not Disturb setting will remain enabled until it is disabled.

Enabling Do Not Disturb effective immediately	
#81<Ext.>*0*	immediately enables Do Not Disturb for the extension entered as <Ext>

Period

Alternatively, you can enter a Do Not Disturb period during which the telephone will not ring. At the extension for which a Do Not Disturb period is to be configured, define the period during which the phone should not ring and save your entries. Then enable Do Not Disturb. Do Not Disturb then automatically will be switched on daily at the time entered in the “Start” field and switched off again at the time defined in the “End” field.

Example: Do Not Disturb should be configured from 20:00 p.m. until 07:00 a.m. daily. Enter the value “2000” for <Start> and “0700” for <End>.

Enabling Do Not Disturb for a prescribed period	
#80<Ext.>* <Start>*<End>*	defines the period for Do Not Disturb at extension <Ext.>
#91**	saves the settings
#81<Ext.>*6*	enables Do Not Disturb for the defined period.

Disabling the function

Both kinds of Do Not Disturb settings can be disabled by means of a keypad sequence.

Disabling Do Not Disturb	
#81<Ext.>*6*	disables Do Not Disturb for extension <Ext.>

Alarm

The FRITZ!Box includes an alarm function. The alarm can be configured individually for each connected telephone.

First enter on the telephone the time at which you would like to be awakened and save this entry. Then enable the alarm function.

Example: The telephone should ring at 07:00 a.m. Enter the value “0700” as the <Time> and save this setting.

Configuring the Alarm for a Telephone	
#881* <time> * <Ext.>*	defines for the extension <Ext.> the time at which the telephone should ring
#91**	saves the settings

Enabling/disabling the alarm function	
#881**	enables the alarm function for all extensions on which a time was set
#881#	disables the alarm function for all extensions





Call Waiting



Call waiting can be switched on or off for each extension. Some older terminal equipment connected to extensions may misinterpret the call waiting signal. This is especially true of fax machines and modems. If communication errors occur, you should disable call waiting for fax and modem extensions.

See section “Waiting Calls” on page 44 for information about how to accept a call while another connection is active.



When Call Waiting is enabled, modem and fax connections may be interrupted.

Enable Call Waiting	
	Pick up the handset.
#2 <Ext.> *0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Disable Call Waiting	
	Pick up the handset.
#2 <Ext.> *1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.



Suppress caller ID for Outgoing Calls (CLIR)



The CLIR (Calling Line Identification Restriction) function prevents your telephone number being displayed on the other party's phone during outgoing calls.



The CLIR function is disabled in the factory settings. You have the option of enabling this function permanently and then disabling it again. CLIR can also be used for individu-

al connections. When CLIR is permanently enabled, this setting is saved for the extension and always enabled for outgoing connections.

If you would like to conduct only certain calls with the Caller ID suppressed, prefix the number dialed with a keypad sequence. This enables CLIR only for the current connection.

Enable CLIR permanently	
	Pick up the handset.
#51<Ext.>*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Disable CLIR permanently	
	Pick up the handset.
#51<Ext.>*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

CLIR on a Case-by-Case Basis	
	Pick up the handset.
*31#	Dial the sequence shown at left. Now you hear the external dial tone.
	Dial the number you want to call.

Displaying the Incoming Caller ID (CLIP)

The CLIP (Calling Line Identification Presentation) function makes the number of callers –external and internal– visible on your telephone display.



This feature is only effective if your telephone supports CLIP.



The CLIP function is enabled in the factory settings. This function can be permanently disabled and enabled again.



Enable display of incoming Caller ID (CLIP)	
	Pick up the handset.
#50<Ext.>*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Disable display of incoming Caller ID (CLIP)	
	Pick up the handset.
#50<Ext.>*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Disable Automatic Outside Dialing



The FRITZ!Box offers the possibility of disabling automatic outside dialing. This means that you will receive an internal dialing tone when you lift the handset at the corresponding extension. This makes sense at any extension which is used to make many internal calls, for instance, between the extensions of the FRITZ!Box. When automatic outside dialing is disabled, for an external call the **0** must be dialed before the telephone number.



Disable Automatic Outside Dialing	
	Pick up the handset.
#1<Ext.>*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Enable Automatic Outside Dialing	
	Pick up the handset.
#1<Ext.>*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Call Rejection on Busy (Busy on Busy)

Calls for an extension can be rejected using the “Busy on Busy” feature. This means that the user receives a busy signal whenever the extension is busy.

Enable Busy on Busy	
	Pick up the handset.
#52<Ext.>*1*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

Disable Busy on Busy	
	Pick up the handset.
#52<Ext.>*0*	Dial the sequence shown at left.
#91**	Save your settings if desired by dialing the sequence shown at left.
	Hang up the handset.

7.4 Operation at the Telephone

This section describes how you can use the FRITZ!Box features via your telephone keypad.

Shortening the Dialing Procedure

The FRITZ!Box automatically recognizes when a number has been entered, but not until a few seconds after the final digits are entered.

You have the possibility of shortening the dialing procedure by closing your entry with the **#** key.

shortening the dialing procedure	
<number> #	indicates that a number has been dialed to shorten the dialing procedure

Selecting the Outgoing Number and the Type of Connection

For outgoing connections you can specify the kind of connection to be used for the next dialing procedure. For this entry you can use settings already made, or circumvent the settings currently configured. In this case the dialing rules are suspended for the given dialing procedure.

By entering precisely which Internet telephony account should be used it is possible to have the dialing procedure conducted via a certain Internet telephone number, even though this number was never previously configured for the extension used.

Select the Outgoing Number and the Type of Connection	
* 111 # ⟨Phone number⟩	dials up this connection using the fixed line
* 12 # ⟨Phone number⟩	establishes a connection for this dialing procedure using the first Internet telephone number
* 12 ⟨P⟩#	establishes an Internet telephony connection via the specified Internet telephone number. For ⟨P⟩ enter the position of the Internet telephone number in the List of Internet Telephone Numbers.

Making Internal Calls



All calls conducted between telephones connected to the FRITZ!Box, be they analog or ISDN/DECT phones, are internal telephone calls. These calls are free of charge.

Dial internal calls with Automatic Outside Dialing	
Ⓡ	Pick up the handset. You can hear the external dial tone immediately, since the extension is set for automatic outside dialing.
* + ⟨Ext.⟩	If you would like to make an internal call to one of the extensions, dial * + , followed by the number of the extension, for instance 1 or 2 .

Dial internal calls without Automatic Outside Dialing	
Ⓡ	Pick up the handset. You hear the internal dial tone.
⟨Ext.⟩	Dial the desired extension number. for instance 1 or 2 .




Group Call

Place a group call to call all other extensions at the same time. Your call is connected with whichever extension answers first.

Group Call	
	Pick up the handset.
	Dial the keypad sequences listed here to call all free extensions.

Picking up a Call from the Answering Machine

Use this function to pick up incoming calls on your telephone that already have been taken by the answering machine.

picking up a call	
	Pick up the handset.
	Dial the sequence shown at left.
	The call is now connected to your extension. You are now connected to the caller.

Waiting Calls

When the “Call Waiting” feature is enabled and you are conducting a call, you will be notified as soon as an external call arrives on your your line. This call will be signaled by an acoustic signal in the handset. You can accept the connection with the new caller within 30 seconds. If you ignore the signal, the waiting call is rejected after 30 seconds.






For instructions on how to turn the Call Waiting function on and off, see the section “Call Waiting” on page 38.

Accept or Reject Waiting Calls	
R 2	To accept a waiting call, dial the sequence shown at left. Your original call is now on hold.
R 1	To return to your original connection, dial the sequence shown at left. You can also accept the waiting call by hanging up your existing connection, i.e., by hanging up the handset. In this case the phone rings as soon as you have hung up. Pick up the handset again to accept the waiting call.
R 0	To reject a waiting call, dial the sequence shown at left.

Alternating Between Calls







Whenever you have one active connection and one caller on hold, you can switch from one call to the other as often as you want using the Hold button.




alternating between calls	
Call 1 📞	You are talking to Caller 1.
R	Press the Hold button. Call No. 1 is now on hold.
#	To establish a second call, simply dial * * * plus the desired extension number for an internal call, or the desired external number.
Call 2 📞	If the call is answered, you can consult on this line. The original caller is still on hold.
R 2	To switch back from Call No. 2 to Call No. 1, dial the sequence shown at left.
Call 1 📞	Caller 1 is now active again and Caller 2 is on hold.
R 2	To switch back again from Call 2 to Call 1, dial the same sequence. In this way you can alternate between the two connections.

End Hold	
	The caller on hold hangs up. You can continue talking on the active connection.
	You end the active connection by dialing the sequence shown at left and return to the conversation with Call No. 1
  Call 	You can also return to the call on hold by hanging up the handset: this ends the currently active connection. In this case the phone rings as soon as you hang up. Pick up the handset again to return to the last call that was on hold.

Three-Party Conference Call






FRITZ!Box allows you to hold telephone conferences with two other people at once. Two external and one internal party, or two internal and one external party can conduct a conference call with each other.

Conduct a Three-Party Conference Call	
	Pick up the handset.
	Dial the external number of the first party. Talk.
	Press the Hold button.
	To establish a second call, simply dial  plus the desired extension number for an internal call, or the desired external number. You can now conduct a second conversation while your first call is on hold.
	Dial the sequence shown at left to begin a three-party conference call.

Conduct a Three-Party Conference Call	
	Now all three participants can confer together. If either of the other two parties hangs up, your connection with the remaining participant remains active.
	You can end the three-party call by hanging up the handset.
	You can also switch from the three-party call back to the original two-party connection. Dial the sequence shown at left. This ends the three-party conference. The connection that was active last before you initiated the three-party conference is now active again. The other call is on hold. You can alternate between the two connections by dialing the same sequence again.

Consultation / Hold

The Consultation/Hold feature allows you to place an existing call on hold. You then may consult with someone else at your workplace or dial a second call. The party on hold does not hear the second conversation. Once you have finished the consultation, you can return to the original connection.

Consultation / Hold	
Call 1	You are talking to Caller 1.
	
	Press the Hold button. Call 1 is now on hold and you can consult someone else.
	To establish a second call, simply dial   plus the desired extension number for an internal call, or the desired external number.

Consultation / Hold	
Call 2 ⌚	If the call is answered, you can consult on this line. The original caller is still on hold.
R	If the number you dialed is busy or the call is not answered, press the Hold button again to return to Call No. 1.
R 1	To switch back to Call No. 1 after talking on the second connection, dial the sequence shown at left. Call 1 is now active again.



If you return to Caller No. 1 by pressing the Hold button, the connection to Caller No. 2 is not cleared down until Caller No. 2 hangs up.

End Consultation	
Call 1 ⌚	You can also return to Call No. 1 by hanging up the handset: this ends the connection to Call No. 2. In this case, your phone rings as soon as you hang up. Pick up the handset to return to Call No. 1 again.
Ⓣ	Hang up the handset to end the connection.

Transferring Calls

The “Call Transfer” function allows you to transfer a connection from one of FRITZ!Box’s extension to another.

transferring calls	
Call 1 ⌚	You are talking to Caller 1.
R	Press the Hold button. Caller No. 1 is now on hold.

transferring calls	
✳✳ <Ext.>	To establish a connection to Caller 2, dial the star key twice and then her or his extension number.
Call 2 📞	You can now talk with the other Caller 2.
📞	To transfer the Caller 1 to Caller 2, simply hang up the handset.

Explicit Call Transfer (ECT)

Use the “Explicit Call Transfer” function to connect two external parties with each other while one connection is active and the other is on hold. Then you can end your own connection while the other two parties continue their conversation.

Explicit Transfer of one active and one held connection	
📞	Pick up the handset.
☎	Dial the external number of the first party. Talk.
📞	Press the Hold button.
☎	Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold.
	To clear your connection while allowing the external parties to continue the call, connect the parties with each other.
📞 4	Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection.
📞	Hang up the handset.

Explicit Call Transfer from a three-party conference call	
📞	Pick up the handset.
☎	Dial the external number of the first party. Talk.
📞	Press the Hold button.






Explicit Call Transfer from a three-party conference call	
☎	Dial the number for your second external call. You can now conduct a second conversation while your first call is on hold.
R 3	Dial the sequence shown at left to begin a three-party conference call.
➔	Now all three participants can confer together. If either of the other two parties hangs up, your connection with the remaining participant remains active.
	To clear your connections while allowing the external parties to continue the call, connect the parties with each other.
R 2	You can also switch from the three-party call back to the original two-party connection. Dial the sequence shown at left. This ends the three-party conference. The connection that was active last before you initiated the three-party conference is now active again. The second external call is on hold. You can alternate between the two connections by dialing the same sequence again.
R 4	Dial the sequence shown at left. The connection on hold and the active connection are connected with each other. The external parties continue the call while you clear the connection.
Ⓗ	Hang up the handset.

Room Monitoring (Baby Monitor)

The following key combination enables the function for monitoring the sound level in a room. First enter the volume level (a value between 1 and 8). Enter a telephone number. Do not hang up the handset! When the volume in the room reaches the specified level, the number you entered will be dialed. When the telephone rings and you pick up the handset, you will be connected with the telephone on which you enabled the room monitoring function.



When using this feature, it is advisable to activate the speaker phone function.

Enable Room Monitoring	
	Pick up the handset or activate the speaker phone function of your telephone.
 4 <level>  <number> 	Dial the sequence shown at left. For <Level>, enter a number between 1 (the most sensitive sound level) and 8 . For <Number>, enter the number to be called. This may be the number of another internal extension, a 9 for an internal group call, or any external number desired.
	Wait for the acknowledgement tone. The baby monitoring phone function is now enabled.
	Do not hang up the handset!

Dial the number of the extension to listen in at an extension with room monitoring activated.




After initiating a room monitoring phone call, the PBX cannot generate a new call until at least one minute has lapsed.





You can disable the function by simply hanging up the handset of the telephone at which you enabled it.

Using Keypad Messages

The Keypad function allows you to control services and features on the telephone line by entering characters and strings on the telephone keypad.

These keyboard entries are called keypad messages. Ask your telephone carrier for the specific keypad messages to access ISDN features.

Enter keypad sequences on an extension with Automatic Outside Dialing	
	Pick up the handset.
  <Seq>	Dial the sequence shown at left. Seq stands for the keypad sequence you received from your telephone carrier.

Enter keypad sequences on an extension without Automatic Outside Dialing	
	Pick up the handset.
   <Seq>	Dial the sequence shown at left. Seq stands for the keypad sequence you received from your telephone carrier.

8 Troubleshooting Help for Errors

This chapter provides concrete assistance if you are not able to open the user interface of your FRITZ!Box, if you are having problems with the WLAN connection, or if you want to change the IP settings on your computer.

8.1 Errors Opening the User Interface

If an error message is returned when you open the user interface, this can have various causes. Check the possible causes and attempt to resolve the error.

Restarting the FRITZ!Box

The user interface cannot be opened or does not react.

Possible Cause
Inconsistencies within the FRITZ!Box.
Remedy
<ol style="list-style-type: none">Restart the FRITZ!Box. Remove the power cable from the socket.Wait about five seconds before reconnecting to the power supply.Try again to open the FRITZ!Box user interface by entering fritz.box in the address field.

Checking the Cable Connections

The user interface of the FRITZ!Box does not appear in the window of your web browser.

Possible Cause

The cable connections are not secure.

Remedy

Make sure that all cable connections are plugged in securely.

Check Name Resolution

The user interface of the FRITZ!Box cannot be opened by entering fritz.box.

Possible Cause

The name resolution of the FRITZ!Box does not work.

Remedy

1. In the web browser, enter the following IP address in place of fritz.box:
192.168.178.1
2. If the user interface cannot be reached via this address, check the settings configured for your network adapter as described in section “Obtain an IP Address Automatically” from page 64.

Check the IP Address

The user interface of the FRITZ!Box cannot be reached at the address fritz.box nor at 192.168.178.1.

Possible Cause

The IP address set on the connected computer is inapplicable.

Remedy

Set the network adapter to DHCP so that the IP address can be obtained via the DHCP server of the FRITZ!Box. Adjust the settings to those described in the section “Obtain an IP Address Automatically” from page 64.

Disable Dial-Up Connections

The user interface is not opened; a window for a dial-up connection appears instead.

Possible Cause

The browser must use the network connection between the computer and FRITZ!Box when the user interface is opened. For this the automatic establishment of a Dial-Up Networking connection must be disabled.

Remedy

You can disable the automatic attempt to establish a Dial-Up Networking connection. The following example explains how to check the settings of Internet Explorer 6:

1. Select the “Connections” settings page under “Tools / Internet Options...”.
2. In the “Dial-up and Virtual Private Network settings” section, enable the option “Never dial a connection”.
3. As a final step, click “OK”.

Disable Online Operation

The user interface does not appear in the window of your web browser.

Possible Cause

The web browser is set for offline operation.

Remedy

Configure the web browser for online operation. Using the example of Internet Explorer 6:

1. Open the “File” menu.
2. If a checkmark is displayed in front of “Work Offline”, click this line.

The checkmark will be removed and Internet Explorer will switch to online operation.

Check Proxy Settings

The user interface does not appear in the window of your web browser.

Possible Cause

The proxy settings of the web browser prevent the user interface from being opened.

Remedy

Enter the DNS name and the IP address of the FRITZ!Box as an exception in the proxy settings of the web browser.

1. Select the “Connections” settings page under “Tools / Internet Options...”.
2. Click the “LAN Settings...” button in the “Local Area Network (LAN) settings” area, and in the next window, click the “Advanced...” button in the “Proxy server” area.
3. Under “Exceptions” enter: “fritz.box; 192.168.178.1; 169.254.1.1” and click “OK”.

Check CGI Settings

The user interface does not appear in the window of your web browser.

Possible Cause

The execution of CGI scripts is disabled in the web browser.

Remedy

Configure the web browser so that the execution of scripts is allowed in the user interface. Using the example of the Internet Explorer 6:

1. Select “Tools / Internet Options... / Security”.
2. If the “Default Level” button is not available for selection, the “Medium” security level is already configured, which means that CGI scripts can be executed in the Internet browser.
3. Proceed as follows if the “Default Level” button is available for selection:
4. Select the “Local Intranet” icon and click the “Sites...” button.
5. In the next window, click the “Advanced...” button and enter in the “Add this Web site to the zone:” field:
fritz.box
6. Disable the option “Require server verification (https:) for all sites in this zone”.

Check Security Software

The user interface cannot be displayed in the web browser.

Possible Cause

Security software is blocking access to the user interface.

Remedy

Security software like firewalls can prevent access to the user interface of the FRITZ!Box. Configure exceptions for the FRITZ!Box in all of the enabled security software.



If you would like to exit security software to test access to the FRITZ!Box, remove the DSL cable first! After testing, first start the security software before reinserting the DSL cable and connecting to the Internet!

Open the User Interface of the FRITZ!Box

The FRITZ!Box is equipped with a fixed IP address that cannot be changed. FRITZ!Box always can be reached at this IP address. This fixed IP address is:

Fixed IP Address	169.254.1.1
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Proceed as follows to open the FRITZ!Box user interface using this IP address:

1. Connect the FRITZ!Box to the computer using the network cable (yellow). See the section “Connecting Computers to the LAN Port” from page 15 for more information.
2. Make sure that the computer obtains its IP address automatically. You can check this setting in the computer’s IP settings (see section “Obtain an IP Address Automatically” from page 64).
3. Restart your computer.

4. Start your Internet browser and enter FRITZ!Box's fixed IP address:

169.254.1.1

The FRITZ!Box user interface opens.



Once you have reached the FRITZ!Box user interface again, you should check the FRITZ!Box settings and correct them if necessary.

8.2 The WLAN Adapter Cannot Find FRITZ!Box

If the “FRITZ!Box Fon WLAN 7113” radio network is not found by the WLAN adapter of a computer, work through the following steps to find the source of the error and resolve it.

Enable the WLAN Adapter

The WLAN adapter cannot find a wireless network.

Possible Cause

The WLAN adapter is not ready for operation.

Remedy

Make sure that the WLAN adapter is ready for operation. Some of the WLAN adapters installed in notebooks must be activated by flipping a switch on the notebook.



For questions on the WLAN adapter of your computer, please contact the manufacturer.

Enable WLAN

The wireless network of the FRITZ!Box is not found by the WLAN adapter.

Possible Cause

WLAN is not enabled in the FRITZ!Box. If the “WLAN” LED on the FRITZ!Box is not lit up or is flashing, this means that WLAN is not enabled.

Remedy

Press the WLAN switch on the FRITZ!Box. The “WLAN” LED begins flashing and then lights constantly. This means that the WLAN function is enabled.

Announce the name of the radio network

The WLAN Adapter cannot find the wireless network of the FRITZ!Box.

Possible Cause

The name of the wireless network of the FRITZ!Box is concealed.

Remedy

Enable the setting “Announce name of the radio network (SSID)” is enabled in the WLAN settings of the FRITZ!Box.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computers to the LAN Port” on page 15.
2. Start a web browser.
3. Enter fritz.box in the address field.
4. Select the “Settings” menu.
5. Select the “Advanced Settings / WLAN / Radio Settings” menu and enable the setting “Announce name of the radio network (SSID)”.

6. Click the “Apply” button.
7. Remove the network cable and try again to establish a connection via WLAN.

8.3 WLAN Connection Is Not Established

Comparing the Security Settings for WLAN

Make sure that the WLAN security settings registered in the FRITZ!Box agree with the security settings of the WLAN adapter.

Here is how to view the WLAN security settings of the FRITZ!Box and print them out.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computers to the LAN Port” from page 15.
2. Start a web browser.
3. Enter fritz.box in the address field.
4. Select the “Settings” menu.
5. Select the “Advanced Settings / WLAN / Security” menu.
6. Click the “Apply” button.

A window is displayed with the WLAN security settings. Print out this page by clicking the “Print Page” button at the upper left of the page.

7. Remove the network cable and check the configuration of the WLAN adapter in the printout. Try again to establish a connection.

Testing the WLAN Connection Without Security Settings

Disable the WLAN security settings to test whether a WLAN connection between the FRITZ!Box and the WLAN adapter is possible at all.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computers to the LAN Port” from page 15.
2. Open the user interface in a web browser. Proceed as described in the section “Opening the User Interface” on page 23.
3. In the “Advanced Settings / WLAN / Security” menu and select “Enable Access without Encryption”. As a final step, click “Apply”.
4. Remove the network cable and try again to establish a connection.



This non-secured condition should be used only for testing, to find out whether a WLAN connection is possible at all.

If the attempt to connect to the WLAN using the non-encrypted connection is not successful either, check the installation of the WLAN adapter and contact the manufacturer of the WLAN adapter if necessary.

Enable WLAN encryption again after completing the tests. Follow the steps listed above and then enable the kind of encryption that was previously configured.

Install the Patch for WPA2 with Microsoft WLAN Service

The WLAN connection to FRITZ!Box cannot be established using the Microsoft WLAN Service (WZC) in Windows XP Service Pack 2.

Possible Cause

The required Microsoft patch for WPA2 (IEEE 802.11i) may not be installed.

Remedy

Support for WPA2 in Microsoft WLAN service was not available until the current patch for Windows XP Service Pack 2. Install the current patch from Microsoft:

support.microsoft.com/kb/917021

Alternatively, you can install Service Pack 3 instead.

Ruling Out Interference Cause by Other Wireless Networks

If there are other devices in the immediate vicinity of your FRITZ!Box that use the 2.4-GHz band, simultaneous use of frequencies can result in mutual interference (for example, fluctuations or interrupted connections). Disruptions can also be caused by other WLAN access points, or by Bluetooth devices, garage door openers or wireless AV bridges. In this case, please test a different radio channel for your FRITZ!Box.

1. Connect the FRITZ!Box to a computer using a network cable. Proceed as described in the section “Connecting Computers to the LAN Port” from page 15.
2. Start a web browser.
3. Enter fritz.box in the address field.
4. Select the “Settings” menu.
5. Open the “Advanced Settings / WLAN / Radio Settings” menu.

6. Select a different radio channel from the “Select radio channel” list.
7. Click the “Apply” button.
8. Remove the network cable and check whether interference continues to occur.

8.4 Obtain an IP Address Automatically

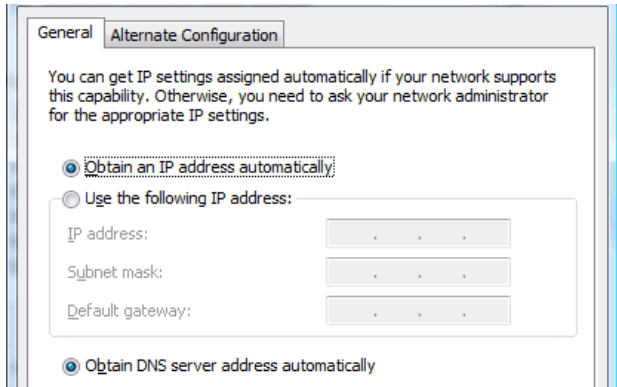
The FRITZ!Box is equipped with its own DHCP server. This means that the connected computers obtain their IP addresses from the FRITZ!Box. The connected computers must be configured such that they can receive their IP addresses automatically. The steps for checking and adjusting this option differ among 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. If you need to operate a DHCP server, please disable the DHCP feature in the “Advanced System Settings”.

Obtaining an IP Address Automatically in Windows Vista

1. Click the “Start” button in the task bar and select “Control Panel / Network and Sharing Center”.
2. From the “Tasks”, select “Manage network connections”.
3. In the “LAN or High-Speed Internet” area, select the LAN connection between your computer and the FRITZ!Box. Click the right mouse button and select “Properties”.
4. If the “User Account Control” window is displayed, click “Continue” in this window.
5. Under “This connection uses the following items”, select the “Internet Protocol Version 4 (TCP/IPv4)” entry and click “Properties”.
6. Enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.



Properties of the Internet protocol (TCP/IP)

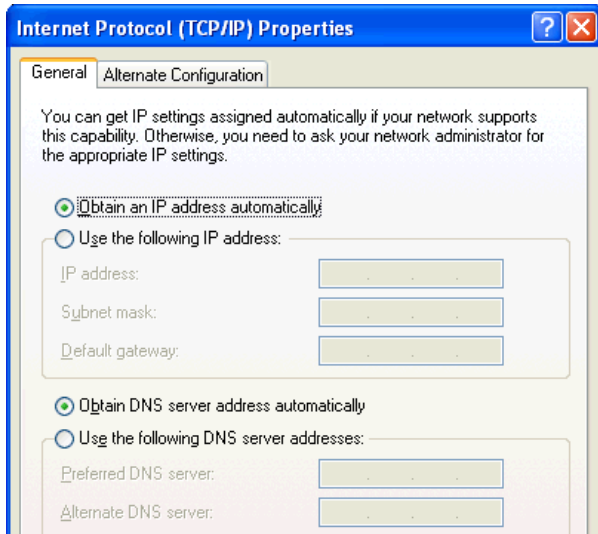
7. Confirm your selection by clicking “OK”.

If necessary, repeat steps 5 through 7 for the “Internet Protocol Version 6 (TCP/IPv6)” as well.

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

Obtaining an IP Address Automatically in Windows XP

1. Go to “start / Control Panel / Network and Internet Connections / Network Connections” and double-click the LAN connection icon of the network adapter connected to the FRITZ!Box.
2. Click the “Properties” button.
3. Select “Internet Protocol (TCP/IP)” in the list of items used in this network connection and click “Properties”.
4. Enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.



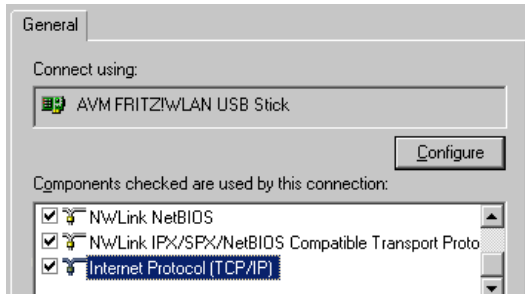
Properties of the Internet protocol (TCP/IP)

5. Confirm your selection by clicking “OK”.

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

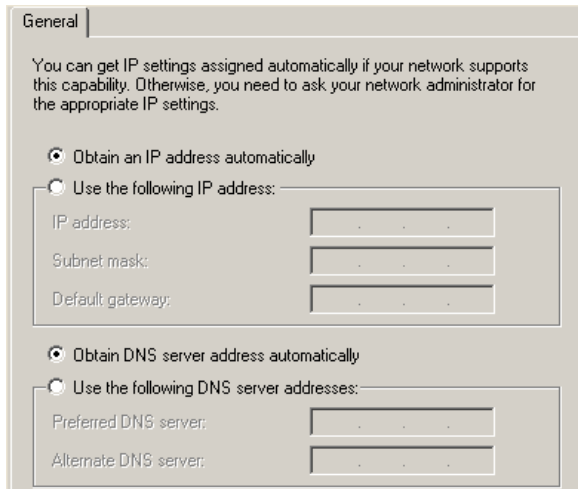
Obtaining an IP Address Automatically in Windows 2000

1. Select “Start / Settings / Control Panel / Network and Dial-up Connections”.
2. Double-click to select the Local Area Network connection of the network adapter bound to the FRITZ!Box.
3. Click the “Properties” button.
4. Double-click to select “Internet Protocol (TCP/IP)” in the list of network components.



Properties of the LAN connection of a network adapter

5. Enable the options “Obtain an IP address automatically” and “Obtain DNS server address automatically”.



Properties of the Internet protocol (TCP/IP)

6. Confirm your selection by clicking “OK”.

The computer now 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 “Built-in Ethernet” entry from the “Show:” drop-down menu.
4. Switch to the “TCP/IP” settings page and select the “Using DHCP:” option from the “Configure IPv4” drop-down menu.
5. Click “Apply Now”.

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

Obtaining an IP Address Automatically in Linux

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

<http://www.tldp.org/HOWTO/NET3-4-HOWTO-5.html>

9 Uninstalling the FRITZ!Box Removing Program Entries

This chapter describes how to remove the FRITZ!Box from the computer and uninstall the corresponding software.

Disconnecting the FRITZ!Box from the Computer

- LAN Port** If the computer is connected to one of the LAN ports on the FRITZ!Box, simply remove the network cable.

If the computer is connected to the FRITZ!Box via a network hub or switch, remove the network cable between the FRITZ!Box and the network hub or switch.
- WLAN** If the computer is connected to the FRITZ!Box wirelessly via WLAN, deactivate the WLAN connection to the FRITZ!Box in the software of the WLAN adapter or the WLAN module.

II PRODUCT DETAILS AND USEFUL INFORMATION

1 Product Details

FRITZ!Box Fon WLAN 7113

This chapter provides you with product details on FRITZ!Box Fon WLAN 7113. You receive information on the LEDs, the audible signals, cables and adapters, technical data and further details.

1.1 Cable

See the information in the following section on the individual cables and sockets on the FRITZ!Box Fon WLAN 7113.

DSL/Telephone Cable

The DSL/telephone cable is a special combined cable developed by AVM to connect the FRITZ!Box Fon WLAN 7113 to the DSL splitter and the ISDN NT or analog telephone line.

If you need a longer cable, you can extend one or multiple ends of the combined cable using RJ45 double couplings. Which ends of the cable you extend depends on the spatial conditions at your location.

You will need the following components to extend the length of one or more ends of your DSL/telephone cable:

- ◆ 1 standard network cable
- ◆ 1 standard RJ45 CAT5 double coupling

Both components are available from specialized vendors.

If you need to extend the cable by splicing a standard network cable, AVM recommends a final length of no more than 10 meters.



Remember that the quality of the line may be decrease as the distance from the central switching station increases.

Network Cable





Additional network cable is required if you would like to use all of the FRITZ!Box Fon WLAN 7113 network ports.

The FRITZ!Box Fon WLAN 7113 network cable (yellow) is a standard Ethernet cable. If you need a replacement cable, a longer cable or an extension, use a standard STP-type (Shielded Twisted Pair, 1:1) CAT5 Ethernet cable. To extend the cable you will also need a standard CAT5 double coupling link to RJ45. You can use either straight cable or cross-link cable. All components are available from specialized vendors.

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

1.2 LEDs

Five LEDs are built into the top of the FRITZ!Box Fon WLAN 7113, which flash or light up to display various connection statuses.

LED	Status	Meaning
Power/DSL	lights up	<ul style="list-style-type: none"> ◆ FRITZ!Box on standby ◆ the device has electrical power and the DSL line is ready for operation
	flashes	<ul style="list-style-type: none"> ◆ the device has electrical power ◆ the connection to DSL is being established or has been interrupted
 Internet	lights up	a telephone connection to the Internet is active
	flashes	there are messages in your mailbox (this function must be supported by your telephony carrier)
 Fixed Line	lights up	a telephone connection via the telephone line is active
	flashes	there are messages in your mailbox (this function must be supported by your telephony carrier)
WLAN	lights up	the WLAN function is enabled
	flashes	the WLAN function is being enabled or disabled
INFO	lights up	<ul style="list-style-type: none"> ◆ a telephone connection between two Internet telephony subscribers is active; the call is free of charge (this function must be supported by your Internet telephony provider) ◆ signals an event that can be configured freely by the user
	flashes	<ul style="list-style-type: none"> ◆ updating the firmware ◆ the value specified for the online meter has been reached ◆ signals an event that can be configured freely by the user
	flashes red	An error occurred – open the FRITZ!Box user interface and follow the instructions in the overview

1.3 WLAN Button

The FRITZ!Box is equipped with a WLAN switch on its rear panel.

The WLAN button can be used to enable and disable WLAN.

1.4 Technical Specifications

Ports and Interfaces

- ◆ DSL/Telephone port
 - DSL modem in accordance with the standard ITU G.992.1 Annex A, ITU G.992.3 Annex A (ADSL2), ITU G.992.5 Annex A (ADSL2+), ITU G.994.1 (G.hs)
 - telephone port for connecting to the analog network
- ◆ two a/b ports for connecting two extensions via RJ11 sockets
- ◆ one LAN port via RJ45 sockets (standard Ethernet, 10/100 base-T)
- ◆ WLAN

WLAN access point with support for radio networks in accordance with IEEE 802.11b (11 Mbit/s) and IEEE 802.11g (54 Mbit/s). The IEEE 802.11g++ standard is also supported and can be used when a compatible WLAN adapter is installed.

Router Function

- ◆ DSL router
- ◆ DHCP server
- ◆ Firewall with IP masquerading/NAT

User Interface and Display

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

Physical Specifications

- ◆ Dimensions (w x h x d) approx. 123 x 125 x 31 mm
- ◆ Supply voltage: 230 V / 50 Hz
- ◆ Maximum power consumption: 8.5 W
- ◆ Average power consumption: 5-7 W
- ◆ Firmware can be updated
- ◆ Conform 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 %

1.5 Declaration of CE Conformity

The manufacturer AVM GmbH
Alt-Moabit 95
D-10559 Berlin

herewith declares that the product

FRITZ!Box Fon WLAN 7113
Type: ADSL-WLAN Router

complies with the following directives:

1999/5/EC	R&TTE Directive: Radio Equipment and Telecommunications Terminal Equipment
2004/108/EC	EMC Directive: Electromagnetic Compatibility
72/23/EEC	Low Voltage Directive: Electrical equipment designed for use within certain voltage limits

The following norms were consulted to assess conformity:

- EN 60950-1:2006	- EN 301 489-1 V1.8.1 (2008)
- CTR 3/1998.06.17	- EN 301 489-1 V1.3.2 (2008)
- ETSI TS 101 388 V1.4.1 (2007-08)	- EN 55024/9.98 + A1/10.01 + A2/01.03
- ITU-T G.992.1	- EN 300 328 V1.6.1 (11.2004)
- ITU-T G.992.2	
- ITU-T G.992.3	
- ITU-T G.992.4	
- ITU-T G.992.5	
- ITU-T G.994.1	
- ETSI ETR 328 (1996-11)	



The CE symbol confirms that this product conforms with the above mentioned norms and regulations.

Berlin, 2009-03-24

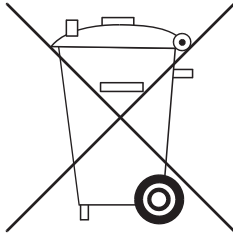
Peter Foxel, Technical Director

Indication of Countries

The radio technology of this device is designed for use in all countries of the European Union and in Switzerland, Norway and Iceland. In France only indoor operation is permitted.

1.6 Disposal

Electrical and electronic equipment must be disposed of separately from household waste.



Labeling of electrical and electronic scrap

In accordance with European regulations and the Electrical and Electronic Equipment Act (ElektroG), the FRITZ!Box Fon WLAN 7113, as well as all devices and electronic components contained in the FRITZ!Box Fon WLAN 7113 package may not be disposed with household waste. Please bring these to your local collection points for disposal.

2 More about WLAN

WLAN (Wireless Local Area Network) is a radio technology that allows networks and access to the Internet to be provided without cable connections. This allows multiple users to share one wireless Internet connection.

2.1 Standards

The WLAN standards IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n (on the basis of the preliminary draft 2.0 of the standard) and IEEE 802.11i were developed by the Institute of Electrical and Electronic Engineers (IEEE).

The standards IEEE 802.11a, IEEE 802.11b, IEEE 802.11g and IEEE 802.11n define the transmission rate within a wireless LAN. The IEEE 802.11i standard is a security standard.

Standards for the Throughput Rate

Data Throughput

The FRITZ!Box supports your choice of the standards IEEE 802.11b, IEEE 802.11g and the proprietary standard IEEE 802.11g++. WLAN adapters based on one or more of the standards listed can be used for WLAN connections with the FRITZ!Box.

If you use a FRITZ!WLAN USB Stick from AVM as a WLAN adapter with the FRITZ!Box, you can also establish WLAN connections using the IEEE 802.11g++ standard.

Connection type	Gross data throughput up to	Net data throughput up to
802.11b	11 Mbit/s	5 Mbit/s
802.11g	54 Mbit/s	25 Mbit/s
802.11g++	125 Mbit/s	35 Mbit/s

The throughputs listed differentiate between gross and net transmission rates. The net speed describes the transmission rate of the user data.

- Range** The range within a WLAN is highly dependent on the following factors:
- ◆ the WLAN adapter used
 - ◆ the structural conditions
 - ◆ the amount of radio traffic on the same frequency band. Other WLAN networks, microwave ovens or Bluetooth transmitters (mobile telephones) may be active.

IEEE 802.11b With a maximum throughput rate of 11 Mbit/s, this is the oldest standard for radio networks. Older WLAN adapters of the first generation can communicate with the FRITZ!Box using 802.11b. However, if the WLAN adapter supports newer standards such as 802.11g, the latest standard should be used.

IEEE 802.11g This is currently the most common WLAN standard. It communicates with a maximum of 54 Mbit/s gross in the 2.4-GHz frequency range (ISM) and guarantees broad compatibility with many WLAN devices.

IEEE 802.11g++ The FRITZ!Box also supports the high-speed mode 802.11g++. The transmission rate within a wireless LAN can be increased with this extension to as high as 125 Mbit/s gross and 35 Mbit/s net when the remote site is connected to a WLAN access point compatible with this mode (an FRITZ!WLAN USB Stick AVM, for example).

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. CCM (Counter with CBC-MAC) defines how the AES procedure is applied to WLAN 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 WLAN adapters that also support WPA2 with AES or WPA with TKIP.

2.2 Security



Security is of utmost importance within radio networks.

Radio signals can also be received outside of office or residential spaces and abused for criminal purposes.

Therefore it is important that no unauthorized users can register in a WLAN to use its Internet access or shared network resources.

FRITZ!Box includes settings on various levels that contribute to the security of your WLAN and thus to the security of your computers.

Encryption

The most important security setting is encryption. The FRITZ!Box supports the security mechanisms WEP (Wired Equivalent Privacy), WPA (Wi-Fi Protected Access) and WPA2 as follows:

- ◆ As part of the WEP mechanism a static key is determined to serve for the encryption of the user data.

Enter the key in the WLAN Security settings of the FRITZ!Box. All of the WLAN adapters in your wireless network must also use this key.

- ◆ The WPA and WPA2 mechanisms provide for authentication while the connection is being established. For this a WPA password must be defined.

When WPA is selected, the TKIP encryption method is used to encrypt the user data. In WPA2 the AES-CCMP encryption method is used.

The encryption method you configure here must also be supported by your WLAN adapter.

The user data are encrypted using an automatically generated key. This key is regenerated at regular intervals.

The WPA password used may be 8 to 63 characters in length. For increased security, however, the password should be at least 20 characters long. Use numerals, letters and special characters and combine capitals and lower-case letters.

Default Setting

In the FRITZ!Box a WPA encryption with the TKIP encryption method is preconfigured.



Recommendation

It is advisable to change the preconfigured WLAN key as soon as possible. Changes to the settings can be configured on the FRITZ!Box user interface.

If your WLAN adapter supports an encryption method that is more secure than the one preconfigured in the FRITZ!Box, you should select the more secure encryption method in your FRITZ!Box.

To configure the best security settings possible with FRITZ!Box and your WLAN adapter, please note the following recommendations:

- ◆ If your WLAN adapter supports WPA2 in accordance with the 802.11i standard:
 - Enable WPA encryption.
 - Select the WPA mode “WPA2 (CCMP)” or “WPA+WPA2”.
 - Replace the WPA network key with a new, unique value.
- ◆ If your WLAN adapter supports the WPA mechanism, but not the WPA2 mechanism:
 - Enable WPA encryption.
 - Select the WPA mode “WPA (TKIP)” or “WPA+WPA2”.
 - Replace the WPA network key with a new, unique value.
- ◆ If your WLAN adapter supports neither the WPA nor the WPA2 mechanism:
 - Enable WEP encryption.
 - Replace the WLAN key with a new, unique value.



We strongly recommend the use of a WLAN adapter that supports WPA or WPA2 (for instance, the FRITZ!WLAN USB Stick). WEP is out of date and data encrypted with WEP can be deciphered within minutes.

WLAN Radio Network Name (SSID)

In the factory settings of FRITZ!Box a value of “FRITZ!Box Fon WLAN 7113” is preset for the SSID (Service Set Identifier).



If an additional device with the same network name is located in the vicinity, it can occur that the WLAN adapter attempts to register there. Therefore you should change the SSID as soon as possible.

2.3 Frequency Ranges

WLAN uses the frequency range around 2.4 GHz in the ISM band or, alternatively, the frequency range at 5 GHz.

You can use both frequency ranges with the FRITZ!Box.

2.4-GHz frequency band

In the 2.4-GHz frequency band WLAN works in the same range as Bluetooth, microwave equipment and various other devices like radio-controlled toys, garage-door openers and video bridges. This means that interference may occur within WLANs 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 WLAN. One channel has a bandwidth of 20 MHz.

A channel can have a bandwidth of 20 MHz (throughput up to 130 Mbit/s) or 40 MHz (throughput of up to 300 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 WLANs 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 WLAN, the channels 6 through 13 can be selected for a second WLAN. This maintains the minimum distance between channels.

WLAN Autochannel

With the WLAN Autochannel function, the FRITZ!Box automatically searches for the channel subject to the least interference. Should problems with interference persist despite this function, try to identify the source of interference and switch it off manually.

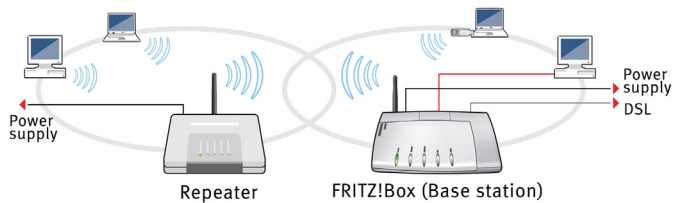
Additional tips on interference in the WLAN radio network are presented in the section “Ruling Out Interference Cause by Other Wireless Networks” from page 63.

Allocation of the WLAN Channels in the 2.4-GHz Range

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

2.4 Increasing the WLAN Range Using WDS

WDS You can extend the range in your wireless network using WDS (Wireless Distribution System). For this you need another WLAN access point in addition to the FRITZ!Box. One of the two WLAN access points works as the base station, the other as a repeater. The base station and repeater are connected to each other via WLAN. The base station then can use the repeater to reach even computers that would be located beyond its range without the repeater.



WDS: Expanding the WLAN range using a repeater

Please note:

- ◆ In order to expand the range of your wireless network, you need at least one additional WLAN access point. The wireless network of your FRITZ!Box can be expanded to a WDS (Wireless Distribution System) with up to four WLAN access points.

- ◆ All WLAN access points implemented in the WDS must support WDS and be configured for this technology.
- ◆ All WLAN access points implemented as repeaters in the WDS must be located within the radio range of the base station.
- ◆ The FRITZ!Box can function as a base station to establish the Internet connection for other repeaters, or as a repeater to expand the range of a base station.
- ◆ Make sure that the WDS connections between the WDS base station and the WDS repeaters are secured using the same encryption (for instance, WPA/WPA2). Note that the WPA2 encryption method is available only when your network consists of AVM devices.
- ◆ Make sure that all WLAN access points in the WDS use the same radio channel.
- ◆ Every access point participating in the WDS fulfills the tasks of a WLAN access point for its given WLAN clients. This means that the WLAN clients see each WLAN access point with an individual name (SSID) and individual encryption settings.

If you use the WLAN control software provided in Windows Vista or by the Windows XP Service Pack 2 on your WLAN clients, you can assign the same SSID and the same encryption settings to different WLAN access points. Each client can then automatically register at the WLAN access point with the best availability.

- ◆ Make sure that each IP address is assigned only once in the wireless network.

FRITZ!Box as a Base Station

The FRITZ!Box can be configured as a base station or as a repeater:

- ◆ As a **base station**, the FRITZ!Box establishes Internet connections for other WLAN repeaters and WLAN clients.
- ◆ As a **repeater**, the FRITZ!Box extends the range of a base station in the wireless network.

To set up the FRITZ!Box as a base station, proceed according to the following directions:

1. Start a web browser.
2. Enter fritz.box in the address field.
The FRITZ!Box user interface opens.
3. Click on “Settings / Advanced Settings...”
4. Make sure that the expert mode is enabled in the “System / Expert Mode” menu.
5. Open the “WLAN / Radio Settings” menu.
6. If the wireless network (WLAN) is not enabled yet, enable the setting “Enable WLAN” and then click “Apply”.
7. Click the “WDS Repeater” menu command.
8. Enable the “Enable support for WLAN repeater (WDS repeater mode)” setting.
9. Select “Base station” as the operating mode.
10. Select from the list of “Known WLAN Devices” the devices that are to be used as repeaters.
11. In the “Security” area define how the repeater connection should be encrypted.



Please note that the WPA2 encryption method is only available for AVM AVM devices.

12. Enter a password.

13. Click “Apply”.

The “Repeater Settings” of the FRITZ!Box are displayed.

14. We recommend printing out these settings.

This concludes the configuration of the FRITZ!Box as a base station.



Register the FRITZ!Box settings you printed out in each repeater operating in your wireless network.

FRITZ!Box as a Repeater

The FRITZ!Box can be configured as a base station or as a repeater:

- ◆ As a **base station**, the FRITZ!Box establishes Internet connections for other WLAN repeaters and WLAN clients.
- ◆ As a **repeater**, the FRITZ!Box extends the range of a base station in the wireless network.

To set up the FRITZ!Box as a repeater, proceed as directed below:

1. Start a web browser.
2. Enter fritz.box in the address field.
The FRITZ!Box user interface opens.
3. Click on “Settings / Advanced Settings...”
4. Make sure that the expert mode is enabled in the “System / Expert Mode” menu.
5. Open the “WLAN / Radio Settings” menu.
6. If the wireless network (WLAN) is not enabled yet, enable the setting “Enable WLAN” and then click “Apply”.
7. Click the “WDS Repeater” menu command.
8. Enable the “Enable support for WLAN repeater (WDS repeater mode)” setting.

9. Select the “Repeater” option as the operating mode.
10. Select from the “Known WLAN Devices” list the WLAN device that should be used as the base station.
11. If the FRITZ!Box is to be operated as a repeater, you must change its IP settings.
 - **IP address**
 - Enter here the IP address for this FRITZ!Box, taking the following into consideration:
 - The FRITZ!Box must have a different IP address than the base station.
 - The IP address must be from the IP address range of the base station.
 - The IP address may not come from the address pool of the DHCP server of the base station.
 - **Subnet mask**
 - Enter the value “255.255.255.0” in this field.
 - **Default gateway**
 - Enter the IP address of the base station here.
 - **Primary DNS server**
 - Enter the IP address of the base station here.
 - **Secondary DNS server**
 - Enter the IP address of a second DNS server here.
12. In the “Security” area define how the repeater connection should be encrypted.



Please note that the WPA2 encryption method is only available for AVM AVM devices.

13. Enter a password.
14. Click “Apply”.

The “Repeater Settings” of the FRITZ!Box are displayed.

15. We recommend printing out these settings.

This concludes the configuration of the FRITZ!Box as a repeater.



Register the FRITZ!Box settings you printed out in the base station operating in your wireless network.

3 More about Networks

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.

- ◆ The Glossary explains concepts and terminology having to do with IP networks.
- ◆ The section “Network Overview” on page 89 introduces the network overview of the FRITZ!Box.
- ◆ The sections “IP Address” on page 91, “DHCP Server” on page 92 and “Subnetwork” on page 93 explain when it may make sense to change the preconfigured network settings, what the effects of these changes are, and how to make the changes.

3.1 Network Overview

The FRITZ!Box user interface shows an overview with all of the devices and users connected with the FRITZ!Box.

The “Devices and Users” network overview is found in the following two menus: “Start menu / Network” or “Settings / Advanced Settings / System / Network”.

There is an entry in the network overview for each user and each network device. The columns have the following meanings:

Name	This column displays the name under which the user or the network device is known to the FRITZ!Box. The name can be changed by clicking the button to edit the entry.
IP Address	Here the IP address is displayed with which the device is integrated into the FRITZ!Box network.
MAC Address	This field shows the individual hardware address of the given network device used to control the devices in the network.

3.2 IP Settings

The IP settings of the FRITZ!Box are preset upon delivery with the following values:

Factory Settings	
All computers are located in the same IP network	enabled
IP address	192.168.178.1
Subnet mask	255.255.255.0
DHCP server	enabled

The IP address and the corresponding subnet mask yield the following values:

Network address of the subnet	192.168.178.0
Entire IP address range for the computers	192.168.178.2 - 192,168,178,253

The following addresses are reserved for certain purposes:

192.168.178.1	is used by the FRITZ!Box itself
192,168,178,254	reserved for internal use
192,168,178,255	broadcast address used to send messages into the network

3.3 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. Programs with UPnP support on these computers can receive this information and use them to display the status of the FRITZ!Box (e.g., DSL synchronization, connection status, data transmission). UPnP service thus allows you to monitor your FRITZ!Box from a connected computer.

The FRITZ!DSL software receives status information from the FRITZ!Box via UPnP.

3.4 IP Address

Upon delivery the FRITZ!Box is assigned the following IP address:

192.168.178.1

If you would like to change the IP address, please read through the following sections. Also note the additional information in the section “Reserved IP Addresses” on page 91.

When Does It Make Sense to Change the IP Address?

You should change the IP address of the FRITZ!Box if the following apply to your network:

- ◆ You have an existing local IP network, one subnet with several computers.
- ◆ Fixed IP 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 subnet in order to make the FRITZ!Box features available to all of the computers in the subnet.

Reserved IP Addresses

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

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

3.5 DHCP Server

The FRITZ!Box is equipped with its own DHCP server. 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:

192.168.178.20 - 192,168,178,200

This IP address can be changed as needed.

Every time the operating system on a computer connected with FRITZ!Box is started, the DHCP server assigns it an IP 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 computers connected with the FRITZ!Box are located in a single subnet.



The computers can receive their IP addresses from the DHCP server only if the setting “Obtain an IP address automatically” is enabled in their IP settings. For more information, see the section “Obtain an IP Address Automatically” from page 64.

Fixed IP Addresses when the DHCP Server Is Enabled

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

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

Disabling the DHCP Server

You can disable the DHCP server.

To make sure that all computers remain in the same IP network as the FRITZ!Box, you must enter the IP addresses manually in the computers' network settings. First disable the option "Obtain an IP address automatically" and then enter the IP address manually in the appropriate field.

In the case of the preset IP address of the FRITZ!Box, the following IP addresses are available for assignment to the computers:

192.168.178.2 - 192,168,178,253

Each IP address can be assigned only once.

3.6 Subnetwork

By default the option "All computers are located in the same IP network" is enabled in the " ".

If the factory settings were not changed, this setting has the following effect:

The DHCP server of the FRITZ!Box assigns all of the computers connected with the FRITZ!Box an IP address from the address range of the DHCP server.

This means that all of the computers connected with the FRITZ!Box are located in the same IP network.

Disabling "All computers are located in the same IP network"

If you switch off the setting "All computers are located in the same IP network", the interfaces of the FRITZ!Box will receive their own IP addresses.

Factory Settings

Upon delivery the interfaces of the FRITZ!Box are configured as follows:

Interface	IP Address	Subnet mask	DHCP server
LAN	192.168.178.1	255.255.255.0	enabled
WLAN	192.168.182.1	255.255.255.0	enabled

Thus the following address pools are available to the DHCP server:

Interface	Address pool of the DHCP server at the interface
LAN	192.168.178.20 - 192,168,178,200
WLAN	192.168.182.20 - 192,168,182,200

Computers connected with the FRITZ!Box via different interfaces are located in different IP networks.

Interface	network address of the IP network
LAN	192.168.178.0
WLAN	192.168.182.0

3.7 Changing the Network Settings

In order to change the network settings of the FRITZ!Box, the Expert Mode must be enabled in the user interface:

1. Start a web browser on your computer and enter fritz.box in the address line of the browser.
2. Select the “Advanced Settings / System” menu in the “Settings” area.
3. Click “Expert Mode” in the System menu, enable the setting “Show expert setting”s and confirm this setting by clicking “Apply”.



Here is how to change the network settings:

1. Select the “Advanced Settings / System / Network” menu in the “Settings” area.
2. Select the “IP Settings” tab.
3. Click the “IP Addresses” button.

The “IP Settings” page is opened.

4. Once all desired changes to the settings have been configured, confirm by clicking “OK” to apply them.



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

4 More about Internet Telephony Voice over IP (VoIP)

Internet telephony has already been in use for years, but today it allows even private customers the convenience familiar from conventional telephony, usually at significantly lower prices.

Internet telephony has also made it considerably more convenient to use applications like conference calls and answering machines in networks. Further advantages include global availability at a single telephone number, and the development of new standards for security and voice quality.

File transfer

All kinds of data transmission in the Internet use the Internet Protocol (IP). IP is packet-oriented. This means that the data are broken down into data packets for transmission and IP takes care of the transport of the individual data packets through the Internet. Language is also transmitted in the Internet in this manner.

In opposition to this, fixed-line telephony transmits data in a line-oriented manner. In this case data are transmitted in a coherent data stream.

4.1 Telephony Scenarios

If you have configured both a fixed-line number and an Internet telephone number in FRITZ!Box, you can make calls in all directions:

- ◆ from the fixed-line network into the fixed-line network
- ◆ from the Internet into the fixed-line network
- ◆ from the Internet into the Internet

and receive calls from all directions as well.

4.2 Bandwidth Management

The FRITZ!Box is equipped with integrated bandwidth management. This function ensures that the speech quality during telephone calls over the Internet is not reduced by surfing activity. To do this, the FRITZ!Box adjusts all uploads and downloads to the currently available bandwidth. Because the FRITZ!Box also places a higher priority on Internet telephony connections over Internet data connections, unwelcome interference is largely avoided. Just as for any other analog call, once Internet telephony transmission capacity has been reached, remote partners receive a busy signal.

5 More Functions

This chapter introduces additional useful functions and features of the FRITZ!Box.

5.1 Night Service

In the FRITZ!Box you can set up Night Service for WLAN and for the telephones connected to the FRITZ!Box.

Configure Night Service in the “Settings” area, using the menu command “Advanced Settings / System / Night Service”.

First define the period of time for which the Night Service of the FRITZ!Box should be active. For instance, from 10:00 p.m. to 6:00 a.m.

The function must be enabled after you specify the settings.

- ◆ “Switch off wireless network (WLAN)”

When this setting is selected, WLAN is switched off during the Night Service period. This saves electricity. The wireless network can be switched back on at any time manually by pressing the WLAN button.

- ◆ Enable Do Not Disturb setting

When this setting is selected, the telephones connected with the FRITZ!Box will not ring.

If you connected a fax machine to the FRITZ!Box, this device is disabled during Night Service.

If you connected an answering machine to the FRITZ!Box, this device is not active during Night Service.

Individual settings can be made for different devices; for instance, different times for the Do Not Disturb setting can be set for individual telephones. Or, you can exempt individual devices entirely from the Do Not Disturb setting. The individual settings can be configured in the “Settings” area, in the “Advanced Settings / Telephony / Telephony Devices” menu.

5.2 Alarm

The FRITZ!Box offers you the option of using connected telephones as alarm clocks.

Configure the alarm function in the “Settings” area, using the menu command “Advanced Settings / Telephony / Alarm”.

Enable the alarm function, enter the time and (if relevant) the day on which the alarm is to ring, and then select which telephone should ring at the specified time. As a final step, click the “Apply” button to save your settings in the FRITZ!Box.

6 Customer Service Guide

Help on All Important Service Topics

AVM is there to help should any questions or problems arise. Here you will find the important information you need, in the form of manuals, updates and support.

Microsoft Updates In many cases problems which arise during operation can be resolved by installing the current Microsoft Service Pack or other Microsoft updates.

The current service packs and updates can be obtained free of charge from Microsoft at the address:

www.microsoft.de

6.1 Documentation

To take advantage of all commands and features of your FRITZ!Box Fon WLAN 7113, consult the following documentation:

Help In the FRITZ!Box user interface you can open the detailed Help by clicking the “Help” buttons.

Readme The Readme file contains current information which was not yet available at the time the manual was completed. The Readme file is included on the FRITZ!Box CD.

Manual The manual of the FRITZ!Box Fon WLAN 7113 is included in PDF format in the “Info” folder on the FRITZ!Box CD.



The current Adobe Acrobat Reader for reading PDF documents can be downloaded from the Internet free of charge at www.adobe.com.

6.2 information in the Internet

On its web site AVM presents comprehensive information on your AVM products as well as new product announcements and new product versions.

Frequently Asked Questions (FAQs)

We would like to make our products as easy to use as possible. If you still have problems, sometimes a little tip is all you need to resolve them. That is why we present you with a selection of frequently asked questions.

The FAQs can be viewed at the following address:

www.avm.de/en/service/FAQs

6.3 Updates and Software

FRITZ!Box Fon WLAN 7113 provides firmware updates and various software for the AVM for free downloading over the Internet.

Firmware Use the “Firmware Update” Wizard on the FRITZ!Box user interface to perform an update of your firmware.

In the “Settings” area, open the “Wizards / Firmware Update” command to download the firmware from the Internet and perform the update with a single mouse click.

Programs The “Software” menu in the “Settings” area shows all of the software for your FRITZ!Box available for downloading from the Internet.

The latest software is also available for download at the following address:

www.avm.de/en/download

FTP Experienced users can also download updates from the AVM FTP server. Click the “FTP Server” link in the download area, or enter the following address:

ftp.avm.de

6.4 Support from the Service Team

Should problems with your FRITZ!Box arise, we recommend taking the following steps:

1. If you have questions about starting operation of your FRITZ!Box, please consult the chapter “Connection” from page 12.
2. Please see the information in the section “Product Details” from page 70.
3. If you have any problems, seek first aid by consulting the chapter “Troubleshooting” from page 53.

This chapter also presents useful tips on problems with establishing connections.

4. The next step is to consult the FAQs in the Internet:

www.avm.de/en/service/FAQs

This site contains answers to questions our customers have frequently asked our Support team.

5. If you do not find the answer you need in the FAQs, AVM Support will assist you. The support desk can be reached by e-mail or by fax.



Please take advantage of the information sources described above before contacting AVM support.

Support by E-mail

You can send us an English-language e-mail request at any time using the Service area of our web site. The Service area can be reached at:

www.avm.de/en/service

Select the product for which you need support from the Support area. Click the “Mail Form” link to open the e-mail form. Fill out the form and send it to “ support by clicking the ”SendAVM button. Our Support team will respond by e-mail as quickly as possible.

Support by Fax

If necessary, you can reach AVM Support at the fax number:

+49 (0)30 / 39 97 62 66

The following information should be included in your fax to the Support team:

- ◆ Your name and address.
- ◆ An e-mail address or fax number at which you can be reached.
- ◆ the serial number of the FRITZ!Box

The serial number is printed on the sticker attached to the base of the device. Support staff will always check this number to ensure that you are a registered user.

- ◆ Which operating system are you using (e.g., Windows Vista or Windows XP)?
- ◆ How is the FRITZ!Box connected to your computer, with a network cable or via WLAN?
- ◆ At what step of the installation or in which application does an error occur or an error message appear? What is the exact wording of the message?
- ◆ Which firmware does FRITZ!Box use? The firmware version is displayed on the “Overview” page of the FRITZ!Box user interface.

Once you have put together this information, please fax it to AVM Support. The Support team will assist you in resolving your problem.

Glossary

802.11g++ Term for an accelerated variant of WLAN based on IEEE 802.11g.

The 802.11g++ procedure functions as a kind of "turbo mode" for the IEEE 802.11g WLAN standard. By implementing special accelerations methods (frame bursting, packet aggregation), it increases the maximum gross transmission rate to 125 Mbit/s - as opposed to 54 Mbit/s for radio communication compliant with IEEE 802.11g. As a result, the maximum net data transmission rate increases by around 35 percent, from approximately 25 Mbit/s to approximately 34 Mbit/s.

If multiple devices that support the turbo mode 802.11g++ are located in the same WLAN radio cell, they can communicate with each other at higher speeds. However, this results in slight disadvantages for all other devices within the WLAN radio cell that do not support the turbo mode.

Since 802.11g++ is merely a non-standardized variant of WLAN, the turbo mode works only between devices designed for it by a single manufacturer, because even when identical chip sets are used, the implementation of the procedure defined in 802.11g++ differs slightly from one manufacturer to the next.

ADSL abbreviation for Asymmetric Digital Subscriber Line

designates a fast kind of file transfer that works with standard copper cables and transports signals in both directions at different speeds (upstream at 640 Kbit/s and downstream at up to 9 Mbit/s).

ADSL2 abbreviation for Asymmetric Digital Subscriber Line 2

ADSL 2 (G.992.3) is a further development of the ADSL norm G.992.1/G.992.2).

ADSL2 offers range much greater than did the first ADSL generation, and is significantly more robust than ADSL, as it can simply disable single carrier frequencies when they produce interference. This feature allows ADSL2 to prevent synchronization losses.

With a throughput rate of up to 12 Mbit/s downstream, ADSL2 offers considerably greater bandwidth than ADSL.

ADSL2 is completely downward compatible, meaning that terminal equipment compliant with ADSL can also be operated on ADSL2 lines, although they cannot exploit the advantages of ADSL2.

ADSL2+ abbreviation for Asymmetric Digital Subscriber Line 2 with extended bandwidth

ADSL2+ (G.992.5) is a further development of the ADSL norm (G.992.1/ G.992.2).

ADSL2+ offers a doubled frequency range used for downstream transmission, and thus double the maximum bandwidth achievable for downstream to 24 Mbit/s.

ADSL2+ is completely downward compatible, meaning that terminal equipment compliant with ADSL and ADSL2 can also be operated on ADSL2+ lines, although they cannot exploit the advantages of ADSL2+.

ADSL-Controller An ADSL-Controller is an electronic hardware module that allows a PC to access an ADSL line. ADSL-Controllers are stationary equipment, included on internal ADSL cards (for the PCI bus) or in external ADSL modems (with USB or Ethernet ports).

context menu The context menu is a menu that is normally not visible. The context menu opens only when you click with the right mouse button on a button, a graphic or a word. Depending on where you clicked, the context menu contains only the most common menu commands for the given object.

If you are using an Apple computer, click the “Ctrl” while clicking instead.

default gateway see gateway

DHCP abbreviation for Dynamic Host Configuration Protocol

DHCP is a protocol for the dynamic negotiation of the operating parameters for the TCP/IP protocol (TCP is a transport protocol based on the Internet protocol).

The computers of a local IP network (DHCP clients) access the DHCP server as part of their operating systems' start procedure.

The central administration of the TCP/IP operation parameters makes it possible to avoid address conflicts caused by IP addresses accidentally assigned more than once.

DHCP server The DHCP server assigns each client an IP address that is has not yet been assigned at the present time. The DHCP server also informs the client of the IP addresses of the DNS server to be used and of the default gateway. In assigning the IP addresses the DHCP server selects from a prescribed pool of IP addresses.

DNS abbreviation for Domain Name System

Domain Name Service takes care of determining the IP address for a given domain name. Domain Name Service is running on every PC. It accepts the domain name entered by a user and inquires about the corresponding IP address at a DNS server known to the service. If a DNS server cannot answer the inquiry itself, it can inquire about the IP address (DNS resolution) at other DNS servers.

If the Domain Name Service receives negative information from the DNS server (domain name not known), it can send inquiries to other DNS servers it knows or return a corresponding error message to the user. If it receives the desired IP address instead, the application can use the IP address to retrieve the destination desired by the user.

This hierarchical system of DNS servers is known as the Domain Name System. The addresses of the DNS servers at which the Domain Name Service is to inquire by default generally are handed over to the PC by the Internet Service Provider automatically whenever a connection to the Internet is established. In local networks addresses can also be assigned via DHCP. Otherwise they must be entered manually in the TCP/IP settings of the PC by the user or the system administrator.

download Downloading files from the Internet

DSL modem A DSL modem connects a computer to the Internet via the DSL line. In contrast to the analog modem, a connection via the DSL modem does not mean that the telephone line is busy.

DSL router A combination of a DSL modem and a router is called a DSL router.

dynamic DNS abbreviation for Dynamic Domain Name System

Dynamic DNS is a service which allows a PC always to be reached under the same domain name despite constantly changing IP addresses. This means that even private users have an economical way of placing their own Internet offers on their PC at home.

It works by transmitting the current IP address to a special DDNS server each time the IP address changes. Except for the few seconds between the cancellation of the old IP address and the notification of the new IP address, the computer can always be reached at the selected domain name.

dynamic IP address A dynamic IP address is an IP address valid only for the duration of one Internet or network session.

Every computer participating in the Internet must have a uniquely assigned public IP address. Since only a limited number of such IP addresses is available, they must be used sparingly. That is why most of the Internet participants who dial in to the Internet receive a dynamic

IP address. They are called dynamic because every participant receives a new public address that has not been assigned yet each time he or she dials in to the Internet.

By contrast, dynamic addresses are usually used in local IP networks because they are easy to handle, and because using them avoids incorrect IP address entries or unintentional double assignments. The DHCP service is responsible for assigning unique dynamic IP addresses.

FAQ abbreviation for Frequently Asked Questions

FAQs are collections with answers to frequently asked questions on a certain subject area.

firewall A firewall protects a PC or local network against attacks from the Internet.

Most firewalls work with packet filters, which merely check the IP addresses and port numbers of incoming and outgoing data packets and filter the packets according to prescribed rules.

Some firewalls also integrate additional concepts like IP masquerading and NAT to decouple data traffic by distinguishing strictly between the internal and external network.

Especially effective firewalls go even further, analyzing and evaluating the contents of the packets and filtering them according to prescribed rules. Such techniques may also include a Stateful Packet Inspection Firewall, for instance.

firmware The firmware is saved in programmable components within a device. Through the possibility of updating the firmware by computer at any time, manufacturers enjoy great flexibility in reacting to the demands of the operational environment, integrating new functions requested by customers, and eliminating errors discovered after production,

fixed IP address Fixed IP addresses are IP addresses which are permanently assigned to a computer or another device like a network printer.

Assigning fixed IP addresses makes sense in cases where a local network has a sufficiently large pool of IP addresses available, or when a computer is always supposed to be accessible at a certain address (such as a web server or e-mail server).

FTP abbreviation for File Transfer Protocol

The File Transfer Protocol allows files to be exchanged between two computers operating in the Internet. Data exchange takes place via an FTP server and what is known as an FTP client. The more convenient FTP clients are available as stand-alone software or are components of some ISDN data transfer software; simple FTP clients are now included in many web browsers.

gateway Gateway is a general term designating an interface between two computer networks. Such a network interface can be realized using a router or a bridge, for instance.

If a PC wants to transfer data packets to a PC in another network, it must first transmit the packet to the gateway. To do this, the PC must know the address of the gateway.

If all packets that cannot be delivered in a local network always are to be transmitted to their given recipients via the same gateway, for this purpose the address of the gateway must be saved as the default gateway in the network settings of the PC.

Such a default gateway for the PC is negotiated automatically by the operating system or the dialing software whenever an ISDN-Controller or DSL-Controller establishes a connection to the Internet. If a router is used for the shared Internet access in a local network, the IP address of the router must be entered as the default gateway in the TCP/IP settings of each PC that wishes to

use the Internet connection. If the TCP/IP setting is configured by means of a DHCP server, there is no need to enter the gateway address manually.

IP abbreviation for Internet Protocol

The IP Internet Protocol is the most important basic protocol for the control of data exchange in local networks and in the Internet. The Internet protocol works without a connection; in other words, data packets are transmitted from the sender to the recipient without previous consultation. The addresses of the recipient and the sender in the data packets are given as IP addresses.

IP address abbreviation for Internet Protocol address

In IP-based networks, for instance in the Internet and local networks, all connected devices are addressed via their IP addresses. So that data packets are sure to be delivered to the right address, each IP address may be assigned only once within the Internet or a local IP network.

The IP address consists of four three-digit groups of numbers (for instance, 192.168.178.247). Each group of numbers can assume values between 000 and 255.

Every IP address contains two components: the network address and the host address. These two components can be read out of an IP address only if the subnet mask is also specified.

IP addresses can be public or private, and also fixed or assigned dynamically. See the corresponding entries in the Glossary for more information.

IP addressing Addressing is one of the main functions of the Internet Protocol (IP). Internet addresses can be written in decimal, octal or hexadecimal notation. The FRITZ!Box uses "dotted-decimal" notation: The four bytes of an address are represented by decimal numbers separated by dots. The total volume of Internet addresses, the address space, is separated into classes (A, B, C, D, and E). The full set of IP addresses, called the address space,

is grouped into address classes designated as A, B, C, D and E. Only the first three of these five address classes are actually used. These classes can be described as follows:

Classes	Properties	Network address Decimal value
Class A address	few networks, many hubs	0-127
Class B address	intermediate distribution of networks and hubs	128-191
Class C address	many networks, few hubs	192-223

Properties of IP Address Classes

Every IP address consists of two parts: the network address and the host address. The sizes of the network address and the host address are variable, and determined by the first four bits (of the first byte) of the IP address.

IP masquerading

By means of IP masquerading a computer or LAN can be protected from unauthorized connection request from the Internet. Masquerading works by converting the IP addresses used in a network to one public IP address. From the outside it appears that all requests are sent from a single computer.

IP network

A network in which data exchange takes place on the basis of the Internet Protocol is called an IP network.

outside dialing prefix

The Outside Dialing Prefix is the digit dialed at an extension line to obtain an outside line. Generally this is "0".

port

So that a single network connection on a PC can be used by multiple applications to exchange data with remote sites at the same time, a PC administers what are known as ports for the IP-based protocols TCP and UDP. Ports substantiate the point of access for the data packets delivered via the IP Internet protocol. While the IP address

determines the destination computer quite generally, the port addresses the communication interface provided by an application for a certain communication procedure.

The Internet protocol allots 16 bits for the specification of the port number. Thus a total of 65,535 different port numbers can be specified. Ports up to port number 1,024 are reserved for special system applications and typical Internet applications. These include, for instance, the port numbers 21 for FTP (File Transfer Protocol), 25 for SMTP (Simple Mail Transfer Protocol), 53 for DNS (Domain Name Service) and 80 for HTTP (Hypertext Transfer Protocol).

Ports are primarily of interest to users for their role in protecting an Internet connection from external attacks. Most firewalls offer the possibility of preventing data traffic on certain ports. This means that certain port numbers can be blocked to prevent data from being delivered to system services. This is also a way of preventing any Trojans that may have infected your computer from receiving data on ports it created as means of accessing your PC for potentially damaging activities. A firewall blocks most atypical port numbers not required for normal operation of an application and offers specialized users the opportunity to forward specified ports.

port forwarding

With port forwarding it is possible to specify ports that will allow all incoming or outgoing data packets to pass through a router or firewall.

If a PC from the local network offers server services, for instance, the settings of a router using NAT or IP masquerading must enable or forward the port used by the server service for access to incoming data packets and thus keep it open permanently. The private IP address of the given PC must be saved as the destination address for all of the packets arriving at the port.

Typical server applications which require port forwarding are FTP and Web servers. To allow access to a PC via remote management software like Symantec pcAnywhere or Microsoft's Remote Desktop, or even use of a file-

sharing program like eDonkey, the required ports must be released for port forwarding. Port forwarding settings for the most important application cases are quite simple as long as the settings of the router or the firewall already contain rules with a corresponding preconfiguration.

private IP address

Private IP addresses are used for computers and other network devices within local IP networks.

Since many local IP networks are not connected to the Internet except via single computers or routers (gateway), certain address ranges are excluded from the publicly available IP addresses so that they are available for assignment in local IP networks. An IP address may only be assigned once within the local network. A private IP address may exist in any number of other local networks.

public IP address

A public IP address is an IP address valid in the Internet. Every computer or router participating in the Internet must have a uniquely assigned public IP address. This address is usually negotiated dynamically with the Internet Service Provider when a connection to the Internet is dialed. The Internet Service Provider assigns the negotiated IP address to the computer or router for the duration of an Internet session.

Stick & Surf

Stick & Surf is a technique developed by AVM for the fast, simple, error-free and secure configuration of radio networks. This technique allows for the straightforward transmission of all important parameters of a radio network from the access point to any computer that is to be added to the radio cell.

In this process the radio parameters used, including WLAN channel, SSID and WLAN standard, as well as security parameters like the encryption method and network key, are transferred almost fully automatically from the WLAN access point to the computer with the WLAN client that is to be connected.

subnetwork A local IP network can consist of one subnetwork or be divided into multiple subnetworks. The division into subnetworks is performed when the local IP network is configured. The subnetworks of a local IP network are also IP networks.

subnet mask The subnet mask indicates which part of an IP address is the network address and which the address of the computer. The network address defines what is called the subnet.

Example 1	
IP address:	192,168,178,247
Subnet mask:	255.255.255.0
The assignment of the first three groups of numerals in the subnet mask indicates that the first three groups of numerals in the IP address define the network. The following addresses result:	
Network address of the subnet:	192.168.178.0
Address of the computer in the subnet:	192,168,178,247
IP address pool in the subnet:	192.168.178.0 - 192,168,178,255 The IP addresses 192.168.178.0 and 192.168.178.255 are reserved. This means that the addresses from 192.168.178.1 to 192.168.178.254 are available for assignment to the computers. Therefore a maximum of 254 computers can be included in the subnetwork

Example 2	
IP address:	192,168,178,247
Subnet mask:	255.255.0.0
The assignment of the first two groups of numerals in the subnet mask indicates that the first two groups of numerals in the IP address define the network. The following addresses result:	
Network address of the subnet:	192.168.0.0
Address of the computer in the subnet:	192,168,178,247
IP address pool in the subnet:	192.168.0.0 - 192,168,255,255 That's 65,536 IP addresses. The IP addresses 192.168.0.0 and 192.168.255.255 are reserved. This means that the addresses from 192.168.0.1 to 192.168.255.254 are available for assignment to the computers.

TCP/IP abbreviation for Transmission Control Protocol / Internet Protocol

TCP/IP is the “language” of the Internet. TCP/IP is used to refer to a suite of protocols used for data communication over the Internet. TCP and IP are the network and transport protocols underlying most Internet services, including file transfer (FTP) and e-mail communication (SMTP). TCP/IP is available for practically all computer systems. TCP/IP thus offers the advantage of trouble-free communication between otherwise incompatible networks and systems.

TR-069 T-069 is an HTTP-based protocol for communication between CPE (Customer Premises Equipment) and an Auto Configuration Server (ACS) belonging to the Internet Service Provider. The TR-069 protocol is also known under the alternative name CPE WAN Management Protocol (CWMP). It offers the possibility of setting up the terminal

device securely and automatically and thus, most importantly, facilitates simple initial configuration of the ADSL terminal equipment by the end customer.

The TR-069 protocol can be used for automatic configuration only if it is actively supported by the given terminal device. For this an Auto Configuration Client (ACC) must be integrated in the device. The specifications for automatic configuration of the ADSL terminal device are stored on the Auto Configuration Server by the given Internet Service Provider. The process of automatic configuration via TR-069 is initiated by the ADSL terminal device. First the user enters a security key and then the settings are retrieved from the Auto Configuration Server and implemented in the ADSL terminal device without any further interaction with the user. During this process all of the communication between the ADSL terminal device and the Auto Configuration Server takes place in encrypted form.

update A more recent version of software or firmware is called an update. Updates are often free of charge, resolve minor programming errors, and sometimes also offer new functions.

upload

This term designates the procedure of transmitting files from one's own PC to another computer in the Internet.

UPnP abbreviation for Universal Plug and Play (UPnP)

UPnP is an extension of the Microsoft Plug & Play standard that allows devices to network globally and to exchange services – without a central server or computer.

UPnP allows devices from all kinds of manufacturers (stereo systems, routers, printers, house controls) to be controlled via an IP-based network, with or without central control through a gateway. It is based on a number of standardized network protocols and data formats. Expressed simplistically, devices can communicate with each other using UPnP to exchange information.

Today the UPnP forum specifies the UPnP standard and certifies devices that are compliant with the standard.

VoIP abbreviation for Voice over IP, also known as Internet telephony

Voice over IP makes telephone calls possible via the Internet. The technology has already been in use for years, but today it allows even private customers the convenience familiar from conventional telephony, usually at significantly lower prices. VoIP has also made it considerably more convenient to use applications like conference calls and answering machines in networks. Added to this are global accessibility under a single telephone number and new VoIP features like the Buddy List known from chat rooms.

Internet telephony used to be possible only with a headset connected to the computers of the callers and their conversation partners. Today voice connections via the Internet, even to fixed-line and mobile networks, can be conducted conveniently using VoIP telephone systems that allow already existing analog telephones to be used even when the PC is switched off. Various Internet Service Providers and telephony carriers provide SIP-fixed-line gateways for this purpose. Such a gateway is used to produce voice connections between the Internet and conventional telephone networks. In principle VoIP conversations are possible via every DSL access point, but for convenient use with existing terminal equipment, and for conversations with the fixed-line and mobile networks, it is important that the DSL provider support what is known as the SIP standard. SIP is the current standard defined for VoIP by the IETF (Internet Engineering Task Force).

WLAN abbreviation for Wireless LAN, or Wireless Local Area Network

The term WLAN designates the industry standard for wireless local networks passed by the Institute of Electrical and Electronics Engineers (IEEE) in 1997 under the title IEEE 802.11.

By means of WLAN technology, individual computers or network devices like printers or DSL access points can be linked wirelessly to an existing cable-connected local network (LAN), or LANs can be converted completely to a wireless structure. A further useful purpose for WLAN technology is to link segments of existing cable-connected networks.

Although WLAN was actually developed only for short-range connections, by cascading WLAN access points or implementing transmission networks with high-power point-to-point radio transmission, even network segments located further from each other can be linked or network participants in relatively remote locations can be economically and easily integrated into an existing network.

WLAN access points often also serve as access points to the Internet in private or public institutions. Many airports, hotels and cafes, for instance, make WLAN hotspots available to their customers, either free or subject to a charge. Ultimately this has maneuvered WLAN into serious competition with mobile UMTS technology.

The application possibilities for wireless network communication also overlap with Bluetooth technology. For mobile devices with limited energy capacity Bluetooth is the more useful solution, however, as Bluetooth uses considerably less power than wireless LAN. What is more, Bluetooth technology is more flexible and thus can offer a greater bandwidth of potential applications.

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