



FRITZ!Powerline 540E

Connecting
and Operating



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1 Security Instructions

Be sure to observe the following security instructions to protect yourself and the FRITZ!Powerline from harm.

- FRITZ!Powerline has no on/off switch. This means it must be possible to disconnect the FRITZ!Powerline from the power supply at any time.
 - Insert FRITZ!Powerline into an electrical outlet that is easy to reach.
- Moisture and liquids that find their way into FRITZ!Powerline can cause electric shocks or short circuits.
 - Only use FRITZ!Powerline indoors.
 - Never let liquids get inside FRITZ!Powerline.
- FRITZ!Powerline contains hazardous components and should only be opened by authorized repair technicians.
 - Do not open the FRITZ!Powerline housing.
 - If FRITZ!Powerline needs to be repaired, please take it to a specialized vendor.
- Dust, moisture, vapors and caustic cleaners or solvents can damage FRITZ!Powerline.
 - Protect FRITZ!Powerline from dust, moisture and steam.
 - Install FRITZ!Powerline at a dust-free, dry location.
 - Remove FRITZ!Powerline from the mains before cleaning.
 - Clean FRITZ!Powerline with a slightly moist, lint-free cloth.
- Heat accumulation can lead to overheating of FRITZ!Powerline and subsequently damage FRITZ!Powerline.
 - Install FRITZ!Powerline in a place that is protected from direct sunlight, and provide for sufficient ventilation.

- Avoid operating FRITZ!Powerline in the direct vicinity of a radiator or heating unit.
- The slits and openings on the housing of FRITZ!Powerline are for ventilation and must not be blocked or covered.
- Overloaded outlets, extension cords and power strips can lead to fires or electric shocks.
 - Always plug FRITZ!Powerline directly into a wall outlet.
 - Avoid using socket strips and extension cords if at all possible.

2 Conventions in the Manual

This manual uses various symbols and emphases:

2.1 Symbols



This symbol marks useful hints and tips.



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

2.2 Highlighting

Highlighting	Function
Quotation marks	Designate elements in the user interface and paths. Example: Click “System/Update” and then click the “Find New FRITZ!OS” button.
Blue lettering	Designates cross-references and addresses for entry in the web browser. Example: See also the information on page 7 .

3 FRITZ!Powerline 540E

3.1 This Is FRITZ!Powerline 540E

FRITZ!Powerline 540E is a powerline adapter with wireless LAN.

FRITZ!Powerline connects network devices like PCs, notebooks, tablets and smart TV with your FRITZ!Box or another Internet router. The devices receive access to the home network and the Internet.

FRITZ!Powerline uses the power lines for data transmission to the FRITZ!Box.

Network devices can be connected with FRITZ!Powerline wirelessly or using a LAN cable.

You can integrate FRITZ!Powerline into an existing powerline network or combine it with a second powerline adapter to create a new powerline network.

3.2 Powerline: Data Transmission over the Electrical Wiring

FRITZ!Powerline uses electrical wiring for data transmission. This allows for transmission over greater distances and through multiple walls and ceilings.

To ensure safe data transmission in the FRITZ!Powerline network, encryption and a unique network password are enabled in FRITZ!Powerline upon delivery; see also [page 33](#).

3.3 Package Contents

- 1 FRITZ!Powerline 540E
- 1 network cable
- printed product information

4 Buttons, LEDs and LAN Ports

4.1 Buttons and LEDs

FRITZ!Powerline has two buttons with integrated LEDs.



Meaning of the LEDs

The LEDs show you the status of FRITZ!Powerline:

LED	Condition	Meaning
WLAN • WPS	on	Wireless LAN is enabled.
	off	Wireless LAN is disabled.
	flashing	WPS Quick Connection is in progress.
Powerline • Security	on	FRITZ!Powerline is integrated in the powerline network.
	off	Powerline is switched off.
	flashing	FRITZ!Powerline is establishing a powerline connection or is not connected with the powerline network.



You can switch off the LEDs in the FRITZ!Powerline user interface.

Button Functions

The buttons have the following functions:

Button	Press	Function
WLAN • WPS	briefly	Starts WPS.
Powerline • Security	briefly	Establishes a secure powerline connection.
WLAN • WPS and Powerline • Security	simultaneously for 10 seconds	Restores the factory settings to FRITZ!Powerline.

4.2 LAN Ports

FRITZ!Powerline 540E has two LAN ports (network ports).

Both LAN ports are Fast Ethernet ports for data rates of up to 100 Mbit/s.

The LAN ports can be used as follows:

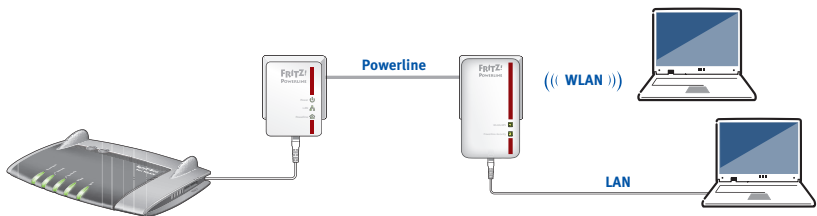
- To connect a PC, notebook, smart TV or other network devices; see [page 15](#).
- To connect a FRITZ!Box or another Internet router, see [page 26](#).

5 Using FRITZ!Powerline in the Powerline Network

This section describes how to use FRITZ!Powerline 540E in the powerline network:

- You can use FRITZ!Powerline to expand an existing powerline network; see [page 12](#)
- You can use FRITZ!Powerline and a second powerline adapter to configure a new powerline network; see [page 13](#)

5.1 What Is a Powerline Network?



A powerline network consists of FRITZ!Powerline 540E and at least one other powerline adapter. The adapters are connected with each other over the electrical wiring (powerline).

The other powerline adapter is connected to the Internet router (for instance, FRITZ!Box) so that it connects the powerline network with the home network and with the Internet connection.

Position FRITZ!Powerline 540E in a place where you need a connection to the home network and Internet access. Notebooks, tablets, smart TVs and other devices can then be connected with FRITZ!Powerline using a LAN cable or wirelessly.

Advantages of a powerline network: Using the electrical wiring allows for transmission over greater distances and through multiple walls and ceilings.

5.2 Expanding a Powerline Network with FRITZ!Powerline 540E

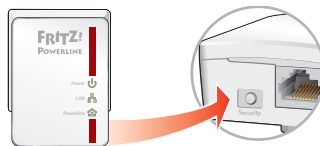
If a powerline network is already set up, you can expand it with FRITZ!Powerline:



Before you launch operation of FRITZ!Powerline: Make note of the network key on the back of the device for later use.

1. Insert FRITZ!Powerline 540E in an outlet in the vicinity of a powerline adapter that is integrated in the powerline network.
2. Wait for the “Powerline • Security” LED to start flashing. This will take about a minute.
3. Press the button for secure powerline connections on the other powerline adapter. The button is labeled “Security”, “Powerline” or something similar.

This starts transmission of the network password.



4. For the next step you have two minutes: Press the “Powerline • Security” button on the FRITZ!Powerline 540E.

The “Powerline • Security” LED flashes more quickly and FRITZ!Powerline receives the network password. When the LED lights up, FRITZ!Powerline is integrated in the powerline network.



5. Plug FRITZ!Powerline 540E into an outlet where you would like to use FRITZ!Powerline. You can use any outlet in the circuit.

Now you can connect PCs, notebooks, tablets, smart TVs and other network devices with FRITZ!Powerline; see [Connecting PCs, Tablets, Smart TVs and Other Devices](#) on page 15.

5.3 Configuring a New Powerline Network with FRITZ!Powerline 540E

Requirements

The following requirement must be met in order to configure a new powerline network with FRITZ!Powerline 540E:

- You have a second powerline adapter.

Configuring the Powerline Network



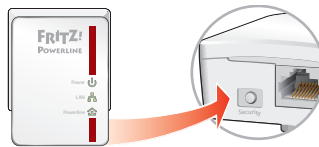
Before you launch operation of FRITZ!Powerline: Make note of the network key on the back of the device for later use.

1. Insert the two powerline adapters into a multi-connector strip, or in two outlets located close to each other.
2. Wait for the “Powerline • Security” LED to start flashing. This will take about a minute.
3. Press the “Powerline • Security” button on FRITZ!Powerline 540E for one second.

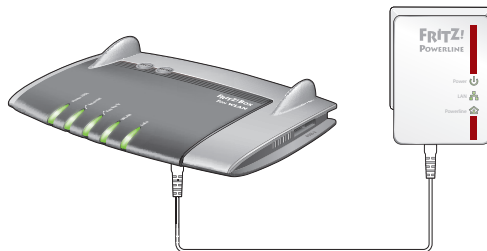
The “Powerline • Security” LED flashes more rapidly.



4. Press the button for secure powerline connections on the second powerline adapter. The button is labeled “Security”, “Powerline” or something similar.



5. Wait until the “Powerline • Security” LED on FRITZ!Powerline 540E lights up.
The powerline network is configured.
6. Insert the second powerline adapter in an outlet near the FRITZ!Box.
7. Connect the second powerline adapter to the FRITZ!Box using a LAN cable.



8. Plug FRITZ!Powerline 540E into an outlet where you would like to use FRITZ!Powerline. You can use any outlet in the circuit.

Now you can connect PCs, notebooks, tablets, smart TVs and other network devices with FRITZ!Powerline; see [Connecting PCs, Tablets, Smart TVs and Other Devices](#) on page 15.

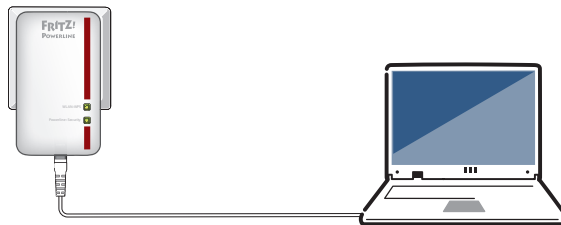
6 Connecting PCs, Tablets, Smart TVs and Other Devices

PCs, notebooks, tablets, smartphones, smart TVs and other network devices can be connected with FRITZ!Powerline using a LAN cable or wirelessly.

Other network devices include Blu-ray players, satellite/TV receivers, printers, network storage devices and IP telephones.

Via FRITZ!Powerline the network devices receive access to the home network and to the FRITZ!Box's Internet connection.

6.1 Connecting a Network Device with LAN Cable



1. Insert a LAN cable in the “LAN 1” or “LAN 2” port on the FRITZ!Powerline.
2. Insert the free end of the cable into the LAN socket on the network device.

The network device is connected securely with the Internet access of the FRITZ!Box via the powerline connection.

6.2 Connecting a Hub or Switch

You can also connect a network hub or switch to the LAN ports on FRITZ!Powerline. Network devices connected to the hub or switch can exchange data with all other devices in the home network.

6.3 Connecting Network Devices Wirelessly

Network devices that support wireless LAN can be connected wirelessly with the FRITZ!Powerline 540E and the home network.

You can establish wireless connections using WPS or a wireless LAN software.

Establishing a Wireless LAN Connection Using WPS

FRITZ!Powerline supports the WPS Push Button method for establishing wireless connections. You can use this method if your network device has a WPS button, or if WPS can be started in the wireless LAN software of the network device.

1. Briefly press the “WLAN • WPS” button of the FRITZ!Powerline.

The LED in the button begins flashing.

2. Start WPS on the network device within two minutes.

The wireless LAN connection will be established.

Entering the Network Key in Wireless LAN Software

1. Remove FRITZ!Powerline from the outlet briefly and take note of the network key printed on the back of the device.

If you have already assigned a new network key in the user interface (see [page 20](#)), be sure to enter the new one.

2. Start the wireless LAN software on the network device.
3. Search for wireless networks in the vicinity.
4. Select the wireless network of FRITZ!Powerline.

The preconfigured name of the wireless radio network (SSID) is “FRITZ!Powerline 540E”.

5. Enter the network key.
6. Start the connection procedure.

6.4 Adopting the Wireless LAN Registration Data of the FRITZ!Box

At the touch of a button FRITZ!Powerline can adopt the wireless radio network name (SSID) and the network key of the FRITZ!Box.

Wireless devices on which a wireless LAN connection to the FRITZ!Box is already configured then automatically connect with FRITZ!Powerline when they change location.

Example

The FRITZ!Box is located in the home office and FRITZ!Powerline is in the living room one floor above it. The same radio network name (SSID) and the same network key are configured in both devices.

Your notebook is connected with the FRITZ!Box via wireless LAN. When you leave the wireless network of the FRITZ!Box with the notebook to go to the living room, the notebook automatically connects with the FRITZ!Powerline there.

Adopting the Wireless LAN Registration Data of the FRITZ!Box

1. Press the “Powerline • Security” button on FRITZ!Powerline 540E for one second.

The “Powerline • Security” LED starts flashing.



2. Press the button for WPS on the FRITZ!Box until the “WLAN” LED on the FRITZ!Box starts flashing. The button is labeled “WPS”, “WLAN / WPS” or “WLAN”.

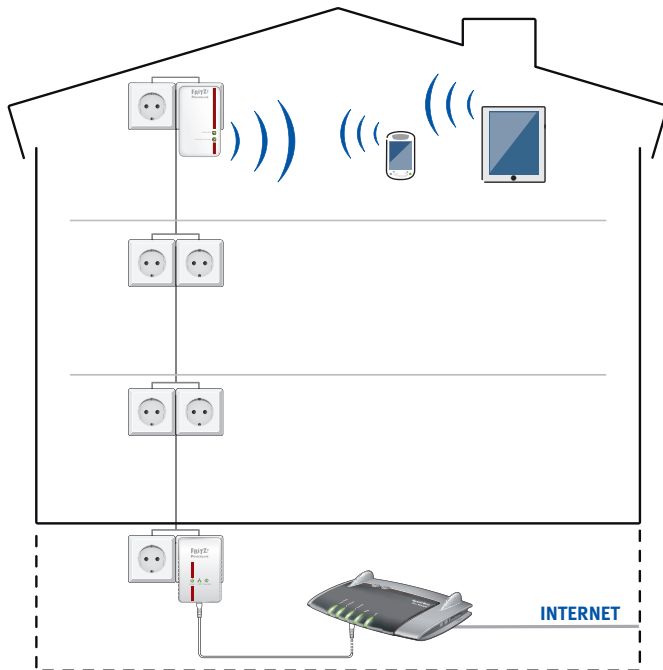
FRITZ!Powerline adopts the wireless LAN registration data of the FRITZ!Box.

Any necessary changes to the wireless LAN registration data can be made in the user interface (see [page 20](#)).

7 Application Examples

The following sections contain several examples for how to use FRITZ!Powerline 540E in your home network.

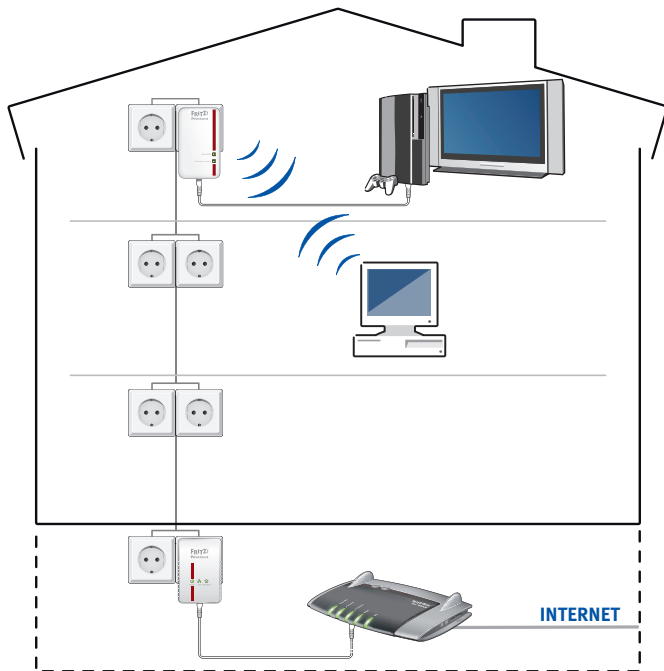
7.1 Wireless Internet Access from Anywhere in the Home



With the FRITZ!Powerline 540E you can provide an Internet connection to the entire household.

- FRITZ!Powerline 540E is connected over the power lines with another adapter in a powerline network. This is how FRITZ!Powerline accesses the Internet connection in the basement.
- In the attic a tablet PC and a smartphone are connected with FRITZ!Powerline 540E over wireless LAN and through this to the Internet connection.

7.2 Connecting Network Devices by Cable and by Wireless LAN



With FRITZ!Powerline 540E you can integrate network devices into the home network by cable (LAN) and using wireless LAN.

- FRITZ!Powerline 540E is connected over the power lines with another adapter in a powerline network. This is how FRITZ!Powerline accesses the Internet connection in the basement.
- In the attic a game console is connected to FRITZ!Powerline 540E with a LAN cable, and through this it has access to the Internet.

Via the second LAN port on FRITZ!Powerline 540E a television is connected with the network and thus with the Internet.

- On the floor below, a computer is connected with FRITZ!Powerline 540E via wireless LAN.

8 User Interface

FRITZ!Powerline has a user interface that can be opened in a web browser on a PC, notebook, tablet or smartphone.

8.1 Settings and Functions in the User Interface

You can configure and operate FRITZ!Powerline in the user interface, for instance:

- Change wireless LAN settings
- Change network settings
- Performing a FRITZ!OS Update

8.2 Open the User Interface

Here is how to open the user interface when FRITZ!Powerline is located in the home network of a FRITZ!Box:

1. Open a web browser on a PC, notebook or tablet in the home network.
2. In the web browser, enter the address <http://fritz.powerline> or 192.168.178.2.

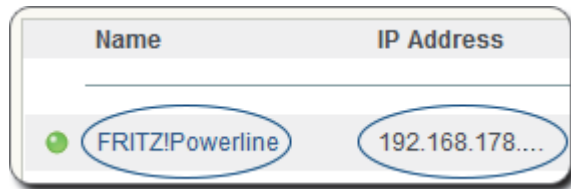
The user interface appears.

8.3 Special Case: Multiple FRITZ!Powerline Devices with Wireless LAN

If you have more than one FRITZ!Powerline devices with wireless LAN, this is how to open the user interface (each device has its own user interface):

1. Open a web browser on a PC, notebook or tablet in the home network.
2. In the web browser, enter the address <http://fritz.box>.
The user interface of FRITZ!Box appears.
3. Click “Home Network”.

4. To open the user interface of a FRITZ!Powerline, click the name of the device or enter the IP address in the web browser:



8.4 Special Case: Another Internet Router (No FRITZ!Box)

Here is how to open the user interface when FRITZ!Powerline is located in the home network of another Internet router (no FRITZ!Box):

1. Open the user interface of the Internet router.
2. Check the IP address of FRITZ!Powerline.
3. Open a web browser on a PC, notebook or tablet in the home network.
4. Enter the IP address of FRITZ!Powerline in the web browser.

The user interface appears.

8.5 Special Case: No Connection to the Home Network

Here is how to open the user interface if FRITZ!Powerline is not integrated in the home network and does not have a connection with your Internet router (FRITZ!Box):

1. Plug a FRITZ!Powerline adapter into an outlet.
2. Connect a PC, notebook or tablet to FRITZ!Powerline.
You can establish a wireless connection or use a LAN cable.
3. Open a web browser on the connected device.
4. In the web browser, enter the address <http://fritz.powerline> or 192.168.178.2.

The user interface appears.

9 Updating FRITZ!OS

AVM provides free updates for the FRITZ!OS of your FRITZ!Powerline 540E.

9.1 What Is FRITZ!OS?

FRITZ!OS is the firmware for FRITZ!Powerline. FRITZ!OS updates contain further developments of existing functions and often also introduce new functions.

9.2 Performing a FRITZ!OS Update

Here is how to perform an update to the latest version of FRITZ!OS:

1. Open the user interface (see [page 20](#)).
2. Select “System / Update”.
3. Click the “Find New FRITZ!OS” button.
4. If a new FRITZ!OS is found, click the “Start Update” button.



Do not remove FRITZ!Powerline from the power supply during the FRITZ!OS update.

The FRITZ!OS update is transferred to FRITZ!Powerline. Then FRITZ!Powerline turns off briefly before restarting.

10 Operating Modes: Powerline Bridge, Wireless LAN Bridge and LAN Bridge

In FRITZ!Powerline you can configure the operating mode “Powerline bridge” (preconfigured), “WLAN bridge” or “LAN bridge”.

10.1 Which Operating Mode Do I Configure?

Which operating mode is right for you depends on how you would like to use FRITZ!Powerline 540E.

In every operating mode FRITZ!Powerline connects devices like PCs, notebooks, tablets and smart TVs with your Internet router (FRITZ!Box). The devices can be connected with FRITZ!Powerline by cable or wirelessly.

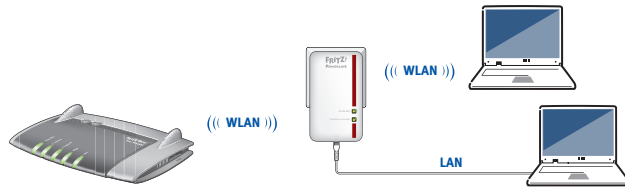
Operating Mode	Function
Powerline bridge (preset)	<p>Data transmission to the Internet router (FRITZ!Box) over the electrical wiring</p> <p>Prerequisite: You have at least one more powerline adapter or an already configured powerline network.</p> <p>Instructions: Using FRITZ!Powerline in the Powerline Network on page 11</p>
WLAN bridge	<p>FRITZ!Powerline works as a wireless repeater and expands the network range of your wireless router (FRITZ!Box)</p> <p>You do not need any additional powerline adapters.</p> <p>Instructions: WLAN Bridge Operating Mode on page 24</p>
LAN bridge	<p>Data transmission to the Internet router (FRITZ!Box) via a single LAN cable or over LAN cabling</p> <p>FRITZ!Powerline connects wireless devices like tablets and smartphones with an Internet router that does not have wireless LAN itself, without additional powerline adapters.</p> <p>Instructions: LAN Bridge Operating Mode on page 26</p>

10.2 Wireless Data Rates

For wireless connections with devices like PCs, notebooks, tablets and smart TV, the following data rates are available:

Operating Mode	Data Rate
Powerline bridge	Full data rate of up to 300 Mbit/s
WLAN bridge	FRITZ!Powerline uses the wireless LAN connection to transmit data not only to the wireless devices, but also to the FRITZ!Box. This means that only part of the data rate is available for connections to your wireless devices.
LAN bridge	Full data rate of up to 300 Mbit/s

10.3 WLAN Bridge Operating Mode



In the WLAN bridge operating mode you connect FRITZ!Powerline with your FRITZ!Box or another wireless router via wireless LAN. FRITZ!Powerline works as a wireless repeater and expands the network range of the wireless router.

Network devices like a PC, notebook, tablet or smart TV that are located outside the range of your FRITZ!Box's wireless network can be connected with FRITZ!Powerline via LAN cable or wirelessly. Through FRITZ!Powerline the network devices receive access to the home network and the Internet.

Requirements

FRITZ!Powerline is used at a location with good reception of the wireless radio network of the FRITZ!Box.

Configuring a WLAN Bridge

1. Open the user interface (see [page 20](#)).
2. Select “System / Operating Mode”.
3. Click the “Change Operating Mode” button.
4. Select “WLAN bridge” as the operating mode and click “Next”. A Wizard starts, which guides you through configuration of the WLAN bridge.

Settings and Button Functions

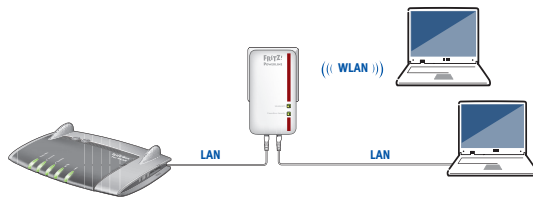
When the WLAN bridge to the Internet router has been established, the following settings and button functions apply:

- **WLAN:** If the Internet router is a FRITZ!Box, FRITZ!Powerline adopts the name of the wireless radio network and the network key of the FRITZ!Box.

When you select the radio network of the FRITZ!Powerline on a wireless device, it will automatically connect with the device (FRITZ!Powerline or FRITZ!Box) with the stronger wireless signal.

- FRITZ!Powerline is a network device in the FRITZ!Box home network.
- FRITZ!Powerline 540E receives its IP address from the DHCP server of the FRITZ!Box.
- The “WLAN • WPS” button starts WPS, in order to connect network devices with FRITZ!Powerline via wireless LAN; see also [page 16](#).
- With the “Powerline • Security” button you can integrate powerline devices into the powerline network.

10.4 LAN Bridge Operating Mode



In the LAN bridge operating mode you connect FRITZ!Powerline 540E to your Internet router (FRITZ!Box) using the home's Ethernet wiring or a LAN cable.

Network devices like a PC, notebook, tablet or smart TV can be connected with FRITZ!Powerline via LAN cable or wirelessly. Through FRITZ!Powerline the network devices receive access to the home network and the Internet.

Configuring a LAN Bridge

1. Insert one end of a LAN cable into the “LAN 1” port on the FRITZ!Powerline.
2. Insert the free end of the cable into a LAN socket on your Internet router (FRITZ!Box) or into a socket of your home's Ethernet wiring.
3. Open the user interface (see [page 20](#)).
4. Select “System / Operating Mode”.
5. Click the “Change Operating Mode” button.
6. Select “LAN bridge” as the operating mode and click “Next”. A Wizard starts, which guides you through configuration of the LAN bridge.

Settings and Button Functions

As soon as the LAN bridge to the Internet router has been established, the following settings and button functions apply:

- **WLAN:** In the FRITZ!Powerline user interface you have the option of changing the name of the wireless network and the network key.
- FRITZ!Powerline is a network device in the FRITZ!Box home network.
- FRITZ!Powerline receives its IP address from the DHCP server of the FRITZ!Box.
- The “WLAN • WPS” button starts WPS, in order to connect network devices with FRITZ!Powerline via wireless LAN.
- With the “Powerline • Security” button you can integrate powerline devices into the powerline network.

11 The FRITZ!Powerline Software

With the FRITZ!Powerline software you manage your FRITZ!Powerline network.

11.1 Downloading the FRITZ!Powerline Software

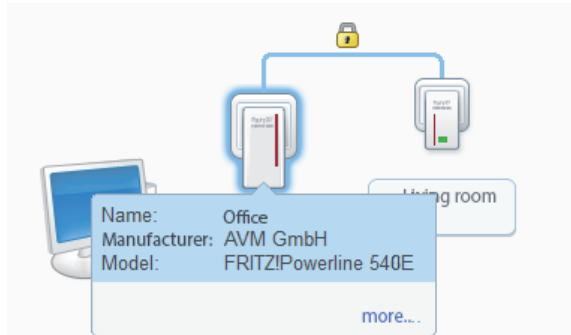
Under

en.avm.de/service/fritzpowerline/software-for-fritzpowerline you can download FRITZ!Powerline for free.

The program is available for Windows 8, 7 and Vista.

11.2 Settings and Functions

- Overview of all powerline adapters



- Add a powerline adapter to the network
- Change the network password; see also [page 29](#)
- Rename the FRITZ!Powerline adapter

12 Changing the Network Password

You can change the password for your FRITZ!Powerline network.

12.1 When Must the Network Password Be Changed?

A new network password must be configured in the following cases:

- The old password is no longer secure, for instance because it is known to persons who should not have access to the powerline network.
- Two or more smaller networks are to be made out of one larger powerline network.

12.2 Changing the Network Password with the FRITZ!Powerline Software

A new network password can be entered in the FRITZ!Powerline software.

Preparations: Installing the FRITZ!Powerline Software

1. Download the FRITZ!Powerline software from: en.avm.de/service/fritzpowerline/software-for-fritzpowerline
2. Install the program on a computer.

Configuring a New Network Password

1. Insert each FRITZ!Powerline adapter into an outlet.
2. Use a LAN cable to connect the FRITZ!Powerline adapter to the computer on which the FRITZ!Powerline software is installed.
3. Start the FRITZ!Powerline program.
4. Double-click the icon of a FRITZ!Powerline that is not connected with the computer.

The “Device Profile” window opens.

5. Enter a new password and then click “OK”.
The “Device Password” window appears.
6. In the “Device password” field, enter the password printed on the sticker on the underside of the FRITZ!Powerline adapter.
7. Click “OK”.
The FRITZ!Powerline restarts.
8. Repeat steps 4 to 7 for all other FRITZ!Powerline adapters that are not connected to the computer. Always enter the same network password.
9. Next, go to the FRITZ!Powerline software and double-click the icon of the FRITZ!Powerline connected with the computer.
The “Device Profile” window opens.
10. Enter the same network password as for the other FRITZ!Powerline adapters.
11. Click “OK”.

The powerline connection will be established. The process is completed as soon as the “powerline” LEDs on the FRITZ!Powerline adapters light up.

13 Optimizing Powerline Transmission Capacity

With the following tips you can optimize transmission capacity in the powerline network.

13.1 Finding the Ideal Outlet

In contrast to the cabling in computer networks, the wires for electric power does not offer any shielding. Every branch, every socket and every switch on the way between two stations reduces transmission capacity.

The shorter and more direct route over the electrical wiring, the higher the transmission capacity.

The FRITZ!Powerline software shows the transmission capacity (gross) for each FRITZ!Powerline adapter.

To find the ideal power outlet, compare the transmission capacity at various outlets.

13.2 Avoiding Multi-Outlet Strips

Multi-outlet strips have the following disadvantages:

- Because multi-outlet strips are junctions, they reduce transmission capacity.
- Connected electrical devices can interfere with the powerline signal.
- In multi-outlet strips with surge protection, the integrated filter can block the powerline signal.

Therefore please note:

- ➔ Never use multi-outlet strips with surge protection in front of a powerline adapter.
- ➔ If possible, insert FRITZ!Powerline in a wall outlet rather than a multi-outlet strip.
- ➔ If you have to use a multi-outlet strip, insert FRITZ!Powerline in the socket located closest to the cable.

14 Loading Factory Settings

The factory settings can be restored in the user interface or using the buttons.

FRITZ!Powerline has the following settings upon delivery:

- The “Powerline bridge” operating mode is preset.
- The IP address 192.168.178.2 is preconfigured.
- The DHCP server of FRITZ!Powerline is switched on by default.
- Wireless LAN is enabled.
- FRITZ!Powerline has a wireless network name and its own network key.

14.1 Restoring Factory Settings in the User Interface

1. Open the FRITZ!Powerline user interface (see [page 20](#)).
2. Select “System / Backup”.
3. Click the “Factory Settings” tab.
4. Click the “Load Factory Settings” button.

FRITZ!Powerline loads the factory settings and restarts.

14.2 Loading the Factory Settings Using the Buttons

- ➔ Press the buttons “WLAN • WPS” and “Powerline • Security” at the same time and hold them down for 10 seconds.

FRITZ!Powerline loads the factory settings and restarts.

15 Security in the Powerline Network

Various security mechanisms of FRITZ!Powerline 540E ensure the safety of your FRITZ!Powerline network.

15.1 FRITZ!Powerline Always Password Protected

A powerline network with FRITZ!Powerline 540E is protected with a unique password:

- When you set up a new powerline network with FRITZ!Powerline 540E, the network is protected by encryption (128-bit AES) and a unique network password. Both are enabled in FRITZ!Powerline upon delivery.

The password protects from unauthorized access and is used to encrypt the transmitted data.

- When you integrate FRITZ!Powerline 540E into an existing powerline network that does not have a unique network password, a unique password is configured automatically.

15.2 No Access from Outside Permitted

No access to a FRITZ!Powerline is possible from outside your home or your apartment:

Anyone who wants to integrate a powerline adapter into the FRITZ!Powerline network must press the “Security” button on a FRITZ!Powerline adapter.

Pressing the button starts transmission of the network password to the new powerline adapter.

15.3 Changing the Network Password

The preconfigured network password can be changed. For instructions, see [page 29](#).

16 Technical Information on Operating FRITZ!Powerline

16.1 Electromagnetic Interference

There are norms that limit the emission of high-frequency interference for all electronic devices. The standard EN 55022 (Information technology equipment—Radio disturbance characteristics—Limits and methods of measurement) applies for FRITZ!Powerline adapters. FRITZ!Powerline does not cause any more interference than power drills, refrigerators, or similar appliances.

No disturbance of wireless communications applications is to be expected.

Radio reception is generally restricted to the FM band between 87.20 and 108.00 MHz. The FRITZ!Powerline band is considerably lower, at 2 to 68 MHz.

No disturbance of amateur radio bands are to be expected, either. Within the frequency bands of amateur radio, FRITZ!Powerline transmits at a lower level; in comparison to conventional radio technologies, the transmitter capacity is low and through symmetrical coupling only a very small part of it is radiated by the power line.

16.2 Electricity Meter, Fuse Box, and GFCI Ground Fault Circuit Interrupter

In some cases, the signal of powerline adapters can be received even on the other side of an electricity meter, fuse box or GFCI (or RCCB: residual-current circuit breaker)—even by unauthorized users like neighbors.

However, data traffic in your FRITZ!Powerline network is protected from unauthorized access; see [Security in the Powerline Network](#) on [page 33](#).

16.3 Using FRITZ!Powerline with Cross Blocking in the Power Supply

Home networking with FRITZ!Powerline is possible even when the FRITZ!Powerline adapters are used in different phases (phase conductors) of the home's own electrical wiring.

FRITZ!Powerline sends (“modulates”) the network data to the electrical wiring as high-frequency signals. This results in “crosstalk” of the powerline signal from one phase to the other as soon as the phase conductors run in close parallel over a distance of at least 0.5 meters. Since this is the case in almost all buildings, FRITZ!Powerline can also be used across different phases.

16.4 Up to Four Powerline Networks in a Circuit

Up to four FRITZ!Powerline networks can be set up within a single circuit.

By using different network passwords you can ensure that the participants in the individual networks can communicate safely, and that the networks do not interfere with each other.

17 Technical Specifications

Powerline

- Up to several hundred meters range on the power line
- Security: Encryption with 128-bit AES (upon delivery) for connecting and communications
- Powerline data rate: up to 500 Mbit/s. This is a gross value. The attainable user data rates are lower. The power lines and ambient conditions can also lower the data rate.
- Bandwidth used: 2 to 68 MHz
- Quality of Service: Integrated QoS adaptations
- Compatible with 200-, 500- and 1200-Mbit/s powerline adapters and the IEEE P1901 standard
- Implementation possible in a powerline network compliant with an older standard

Wireless LAN

- Wireless access point with support for wireless networks compliant with the standards
 - IEEE 802.11b—11 Mbit/s
 - IEEE 802.11g—54 Mbit/s
 - IEEE 802.11n—300 Mbit/s (2.4 GHz)
- Two single band antennas built in
- Wireless security with WPA and WPA2 (802.11i)
- Support for Wi-Fi Protected Setup (WPS)
- Repeater function option; increases the range of the FRITZ!Box wireless network

LAN

- 2 Fast Ethernet ports (10/100 Base-T)

Physical Specifications

- Low power consumption of less than 4 W during operation
- Supply voltage: 230 V AC, 50 Hz
- Dimensions: (H x W x D): approx. 114 mm x 67 mm x 65/27 mm (with/without plug)
- Weight: approx. 145 g
- Ambient conditions:
 - operating temperature: 0 °C to 40 °C
 - relative humidity: 10% to 90%, no condensation

18 Customer Service

18.1 Documentation on the FRITZ!Powerline

Help

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

Manual

A PDF file of the latest manual can be downloaded from the Internet at the following address:

en.avm.de/service/manuals/fritzpowerline



The Adobe Reader for reading PDF files can be downloaded from the Internet free of charge at adobe.com.

18.2 AVM Knowledge Base

The AVM Knowledge Base contains answers to questions frequently posed to our Support team.

en.avm.de/service

18.3 Assistance from the Support Team

Should problems with your FRITZ!Powerline arise, we advise:

- ➔ First search for a solution in the AVM Knowledge Base.

Support by e-mail

You can send us an English-language e-mail request at any time using the “Service” area of our website. You can reach the service area at en.avm.de/service/support-request/your-support-request.

1. Select the product group and your product for which you need support.

You will receive a selection of FAQs.

2. If you need more help, click the “Submit support request” link to open the e-mail support form.

3. Fill out the form and send it to AVM by clicking the “Submit support request” button.

Our Support team will respond by e-mail as quickly as possible.

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Declaration of CE Conformity

AVM declares herewith that the device is compliant with the basic requirements and the relevant rules in directives 1999/5/EC or 2004/108/EC and 2006/95/EC, 2009/125/EC and 2011/65/EU. The declaration of CE conformity is available at en.avm.de/ce.

Manufacturer's Warranty

We offer a manufacturer's warranty of 2 years on the hardware of this original product. The warranty period begins with the purchase date from the first end user. Compliance with the warranty period can be proven by submission of the original invoice or comparable documents. This warranty does not restrict your warranty rights based on the contract of sale or other statutory rights.

Within the warranty period, we will remove defects to the product which are demonstrably due to faults in materials or manufacturing. Our warranty does not cover defects which occur due to incorrect installation, improper use, non-observance of instructions in the user manual, normal wear and tear or defects in the environment of the system (third-party hardware or software). We may, at our discretion, repair or replace the defective product. Claims other than the right to the removal of defects which is mentioned in these terms of warranty are not constituted.

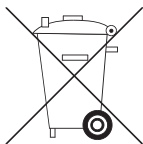
We guarantee that the software conforms with general specifications, not, however, that the software meets your individual requirements. Delivery costs will not be reimbursed. Products which have been replaced revert to our ownership. Claims recognized under warranty entail neither an extension or recommencement of the warranty period. If we reject a warranty claim, this claim lapses no later than six months after being rejected by us.

This warranty shall be governed by German substantive law, to the exclusion of the United Nations Convention on Contracts for the International Sale of Goods (CISG).

Disposal Information

In accordance with European regulations, the FRITZ!Powerline 540E, as well as all devices and electronic components contained in the package, may **not** be disposed with household waste.

After use, please dispose of FRITZ!Powerline 540E and all electronic components and devices included with delivery at a collection point in your local community for the disposal of electric and electronic appliances.



Symbol for the separate collection of electric and electronic devices

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