

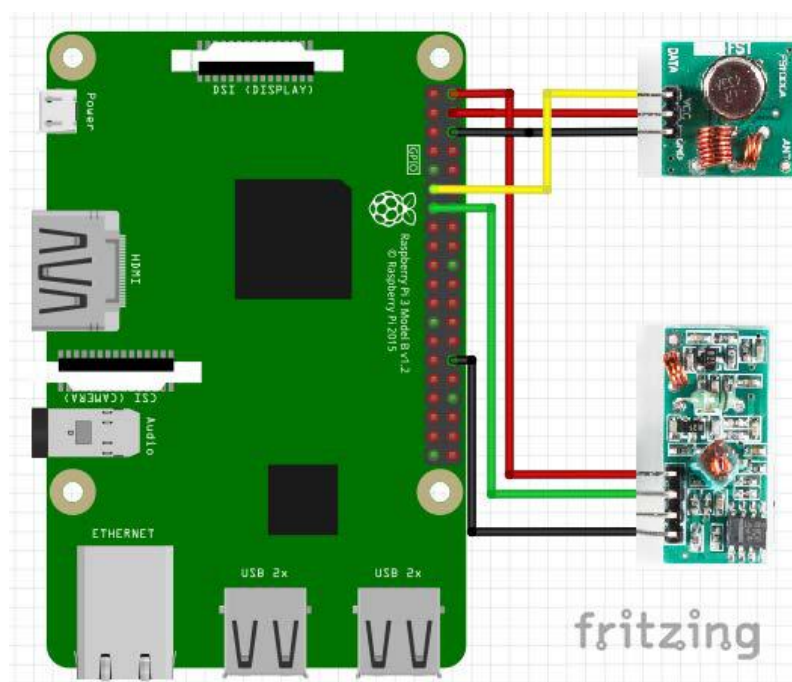
Welcome!

And thank you for purchasing our **AZ-Delivery 433 MHz radio transmitter and Receiver module set** for the Raspberry Pi or Arduino. On the following pages, we will take you through the first steps of the installation process of the Raspberry Pi. We wish you a lot of fun!



The transmitter (XY-FST) and the receiver (XY-MK) of the radio module set communicate at 433,92 MHz. With the module, you can, for example, control radio sockets, which will be explained in this eBook.

Wiring up the module with the Raspberry Pi:



Each module has only 3 ports, VCC, GND and Data.

There are 4 pins attached to the receiver module, from which the 2 middle ones (DATA) are bridged.

Transmitter module (3 Pin):

VCC is connected with PIN 2 (5V) on the Raspberry	Red wire
GND is connected to PIN 6 (GND)	Black wire
DATA is connected to PIN 11 (GPIO 17)	Yellow wire

Receiver module (4 Pin):

VCC is connected with PIN 4 (5V) on the Raspberry	Red wire
GND is connected to PIN 30 (GND)	Black wire
DATA is connected to PIN 13 (GPIO 27)	Green wire

Antennas

At the beginning, we should always attach an antenna to each module.
Let us calculate this briefly:

The module transmits to **433,92 MHz**.

The wavelength λ is calculated as follows: $\frac{\text{speed of light}}{\text{frequency}}$

$$\lambda = \frac{299.792.458 \text{ m/s}}{433.920.000 \text{ 1/s}} = 0,69 \text{ m}$$

The antenna should be $\frac{1}{4} \lambda$, that is $69\text{cm} / 4 = > 17,25 \text{ cm}$

Each wire we connect to the antenna should be with a length of approx. 17 cm.

After everything has been wired, the Raspberry Pi can be started.

Additional information: These instructions are based on Raspberry Pi Image from 29.11.2017 (Stretch - Lite) – updates may require slight modifications to the instructions.

As an alternative to the pins on Raspberry that we described, any ground pin can be used, as well as other GPIO pins. If the GPIO pins are changed, then the example software must be adapted and recompiled.

„Programming“ the Raspberry Pi:

Before you install anything on the Raspberry Pi Software, the Raspberry Pi should be updated to the latest version available:

```
sudo apt-get update  
sudo apt-get upgrade
```

Do you want to continue? [Y/n] -> **y** (enter Y and confirm with *Enter*)

Now that the Raspberry Pi is updated, we can install the software.

```
sudo apt-get install git-core
```

git-core: Software to download software from GIT

Do you want to continue? [Y/n] -> **y**

When *git* has been completely installed, we load (**git clone**) from *git*, the library from *Ninjablocks* and *wiringPi*.

Then we compile the packages (**./build** or **make all**):

```
git clone git://git.drogon.net/wiringPi  
cd ~/wiringPi  
./build  
cd ~
```

```
git clone --recursive https://github.com/ninjablocks/433Utils.git  
cd ~/433Utils/RPi_utils  
make all
```

After the compilation, we are in the following folder: **433Utils/RPi_utils**

```
pi@raspberrypi:~/433Utils/RPi_utils $
```

If that is not the case with you, enter the following command:

```
cd ~/433Utils/RPi_utils
```

Let us first test the receiver and read the code of our remote control:

```
sudo ./RFSniffer
```

The Raspberry should now receive something when switching the radio-controlled socket on and off:

Received 263505

Received 263508

In my case, when switching the Raspberry on, I received 263505 and when I switched it off, I got 263508.

With the key combination CTRL + C we end the RFSniffer.

The program *codesend*, allows us to switch a socket. In the beginning, when we start, we provide it with the activation code and then it broadcasts this code to 433,92 MHz.

```
sudo ./codesend 263505
```

The radio-controlled socket is now switched on.

And if you want to switch it off:

```
sudo ./codesend 263508
```

How wonderful! Now we can control our radio socket. But what can we do, if we do not have an available remote control, which we can read?



O N	O N		O N	O N	O N				
		O F F				O F F	O F F	O F F	O F F
1	2	3	4	5	A	B	C	D	E

For that, there is the *send* command. We give this command to the set system code (the first 5 switches on the socket), followed by the socket number (1, 2, 3, ...) and 0 (OFF) or 1 (ON).

In my case that is

```
sudo ./send 11011 1 0
```

 OFF

```
sudo ./send 11011 1 1
```

 ON

You have managed to run your radio-controlled modules!

Now it is time to learn and put your own projects into practice.

And for more hardware, our online store is always at your disposal:

<https://az-delivery.de>

Enjoy!

Imprint

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