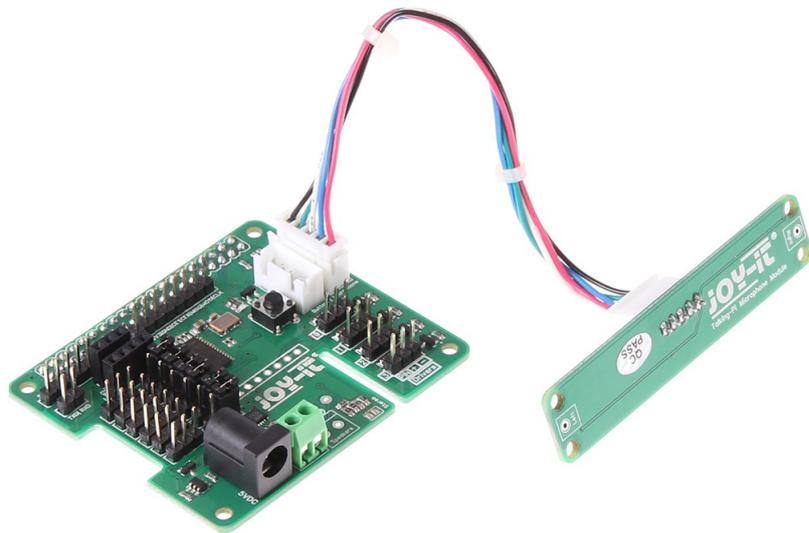


JOY-IT

Talking-Pi



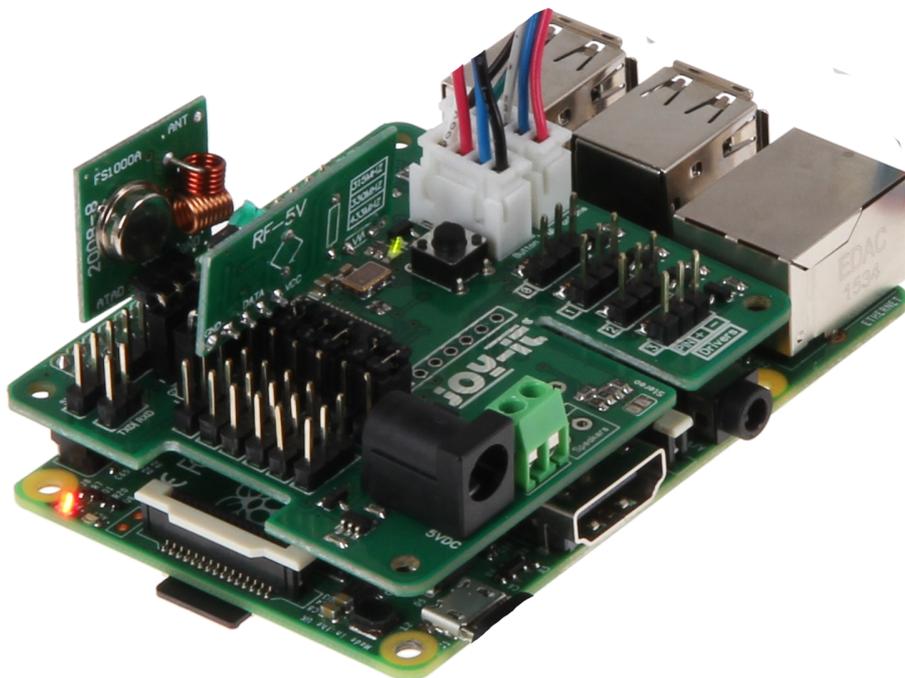
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Dear customer,
thank you for purchasing our product.
Please find our instructions below.

1. Systeminstallation

There are only a few steps for the first installation.
Please note that the Talking Pi set is only compatible to the Raspberry Pi 3.
Older Raspberry Pis are not supported.

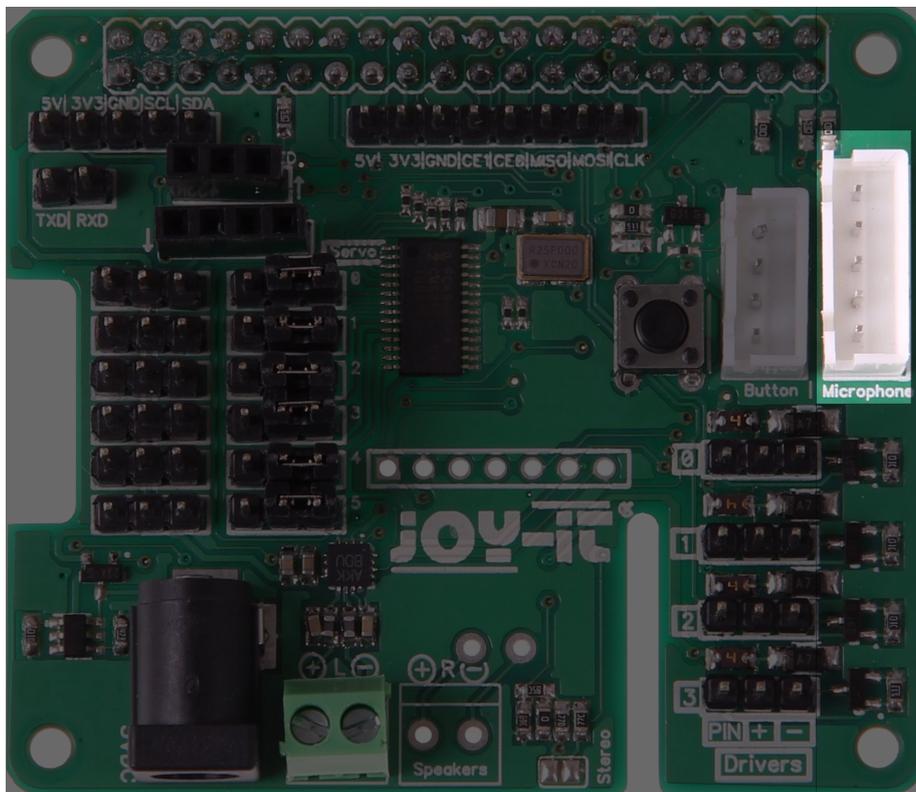
First, plug the Talking-Pi extensionboard on to the GPIO-Header of your Raspberry Pi so that both boards are placed over each other.



The Talking-Pi set is fully compatible to the [Google AIY Project](#) so we recommend to use the Voice Kit SD image. You can download the image on the [AIY project page](#).

Download the image and write it with a compatible program (e.g. Etcher) to your SD-card. You can insert the card to your Raspberry Pi afterwards.

You can now connect the supplied microphone-module to the Talking-Pi extensionboard.



The Talking-Pi system is now ready. To activate the Google Assistant SDK, and of course the voice control, you should follow the instructions on the [AIY project page](#).

2. Installation and activating additional libraries

To be able to use all features of the Talking-Pi board you need to install and activate additional modules and libraries.

Follow the next steps to activate all modules and be able to use all of the features.

Please remember to restart your Raspberry Pi after you installed/activated the modules.

2.1 Overview

Different modules are necessary for different features.

If you only need a few features or if you don't want to activate all features, you can of course only activate the needed modules.

Note the overview below to see which modules are necessary for the different features.

Function	Needed module
433 MHz Module	433Utils wiringPi
Servo Module	Servo-Motor-Extension (modified PCA9685 library)
I2C Header	I2C

2.2 I2C

The I2C functions are already installed.

You just need to activate them.

Open up a terminal window and enter the Raspberry configuration menu with the following command:

```
sudo raspi-config
```

Enter the *Interfacing Options* menu.

```
Raspberry Pi Software Configuration Tool (raspi-config)
1 Change User Password Change password for the default user (pi)
2 Hostname             Set the visible name for this Pi on a network
3 Boot Options         Configure options for start-up
4 Localisation Options Set up language and regional settings to match your location
5 Interfacing Options  Configure connections to peripherals
6 Overclock            Configure overclocking for your Pi
7 Advanced Options     Configure advanced settings
8 Update               Update this tool to the latest version
9 About raspi-config   Information about this configuration tool

<Select>                                <Finish>
```

And activate the I2C option by confirming the opening windows with *Yes*.

Now leave the configuration menu and restart your Raspberry Pi.

```
Raspberry Pi Software Configuration Tool (raspi-config)
1 Expand Filesystem    Ensures that all of the SD card storage is available to the OS
2 Change User Password Change password for the default user (pi)
3 Enable Boot to Desktop/Scratch Choose whether to boot into a desktop environment, Scratch, or the command-line
4 Internationalisation Options Set up language and regional settings to match your location
5 Enable Camera        Enable this Pi to work with the Raspberry Pi Camera
6 Add to Rastrack      Add this Pi to the online Raspberry Pi Map (Rastrack)
7 Overclock            Configure overclocking for your Pi
8 Advanced Options     Configure advanced settings
9 About raspi-config   Information about this configuration tool

<Select>                                <Finish>
```

```
sudo reboot
```

2.3 Servo-Motor Extension

A special library is needed to use the servo-module.

This library is based on the Adafruit_PCA9685 Python-library but is specially adjusted to our board.

We recommend to use our own, adjusted, library.

You can download the adjusted library [here](#).

Copy the extracted library to your Raspberry Pi and navigate with a terminal into this folder.

Install the library with the following command;

```
sudo python setup.py install
```

2.4 wiringPi

The wiringPi library is necessary to be able to connect additional modules (e.g. the 433 radio module).

Execute the following commands to install this library:

```
sudo apt-get install git git-core  
git clone git://git.drogon.net/wiringPi  
cd wiringPi  
./build
```

2.5 433Utils

To use the radio modules, another library is necessary.

You can use the [433Utils library by ninjablocks](#).

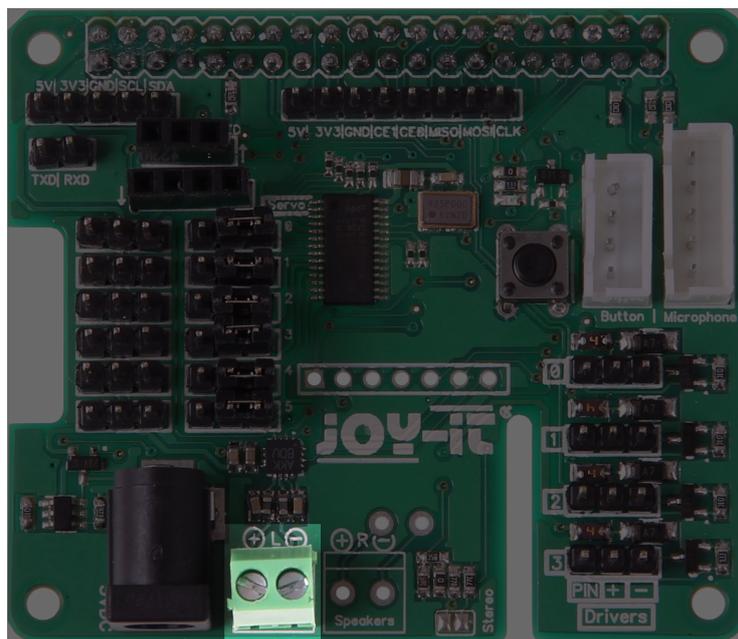
This library was published under the MIT license and allows you to easily use the radio modules.

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

3. Connecting a speaker

The Talking-Pi module is equipped with a preinstalled speaker-connector. This one is suited for a speaker with a power of **3 Watt**.

To connect a speaker, loosen the marked screws of the screw terminal.



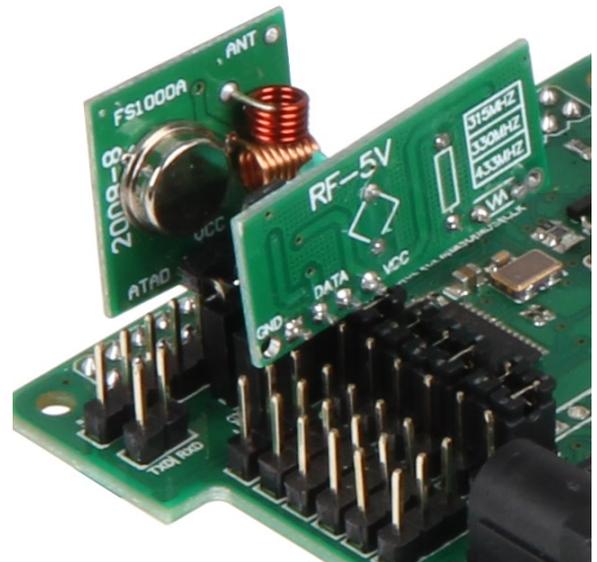
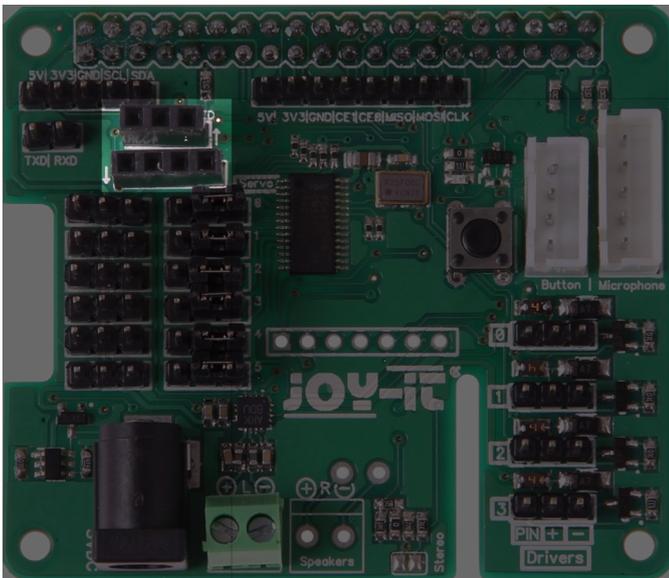
Now connect the red speaker cable to the left opening (marked with a +) and the black speaker cable to the right opening (marked with a -) and tighten the upper screws.

4. Using the 433 MHz radio modules

4.1 Connecting the modules

You can also connect sender and receivers of 433 MHz radio modules to the Talking-Pi board to control radio devices.

Just plug the modules into the marked connections (**433 TXD**: 3-Pin Sender, **433 RXD**: 4-Pin Receiver). The modules should (note the marked arrows) direct away from each other.



Warning! Please note that you can not use the **Driver1** and **Driver2** connections and the **433MHz modules** at the same time.

The sender is connected to the GPIO port 17 and the receiver to the GPIO port 27. Normally no additional configuration is needed here.

4.2 Usage

To use the radio modules, navigate to the directory *433Utils/RPi_utils*

To use the receiver, enter the following command. As soon as the receiver receives a code it will be printed on the screen.

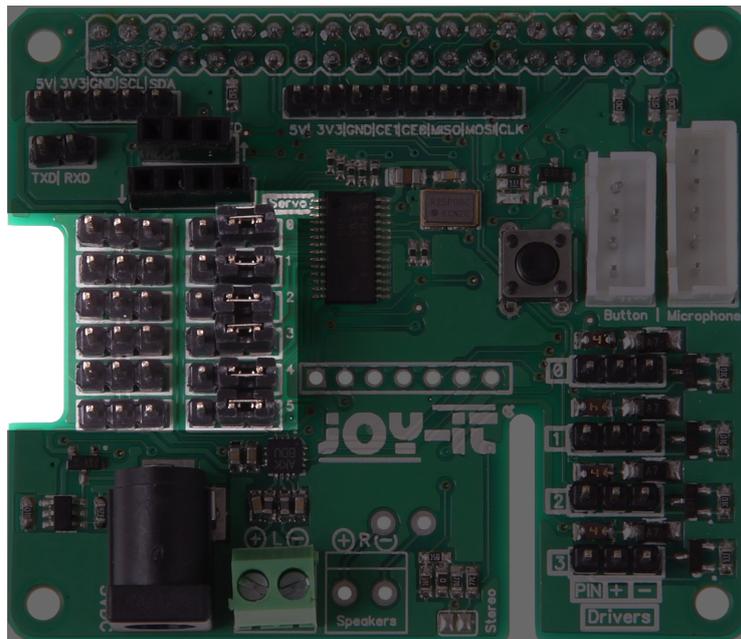
```
sudo ./RFSniffer
```

You can start the sender with the following command:
You can change the number to any code you want.

```
sudo ./codesend 1234
```

5. Servo/GPIO Connections

5.1 Servo-Usage



The marked connections can be used with up to 6 servo motors. You can switch with the jumper, placed next to the connections, between GPIO- and servo-operation. Just connect the centered and the right PIN with the jumper to activate the servo-mode.

Please note that you need an additional power supply to use the servo motors. Therefore connect the coaxial power connector (5.5 / 2.1mm, 4.8 - 6V, 6A max.) to the connector next to the speaker connection.

To test the servos, navigate to the *Adafruit_Python_PCA9685/examples* folder. You can start the example with the following command:

```
sudo python simpletest.py
```

This example program will move the servo connected to channel 0.
Of course you can adjust the example program to your needs.

Therefore open the file with the following command:

```
sudo nano simpletest.py
```

You will find the to commands *set_servo_pulse(0,start_position)* and *set_servo_pulse(0,end_position)* at the very end of the file.

The 0 defines the assigned channel number.

Just change the number or enter new commands.

You can save your changes by pressing **CTRL+C** and leave the editor by pressing **CTRL+X**.

5.2 GPIO-Usage

If you don't want to use the connections for servo-motors but for normal GPIO-operation you can just change the mode.

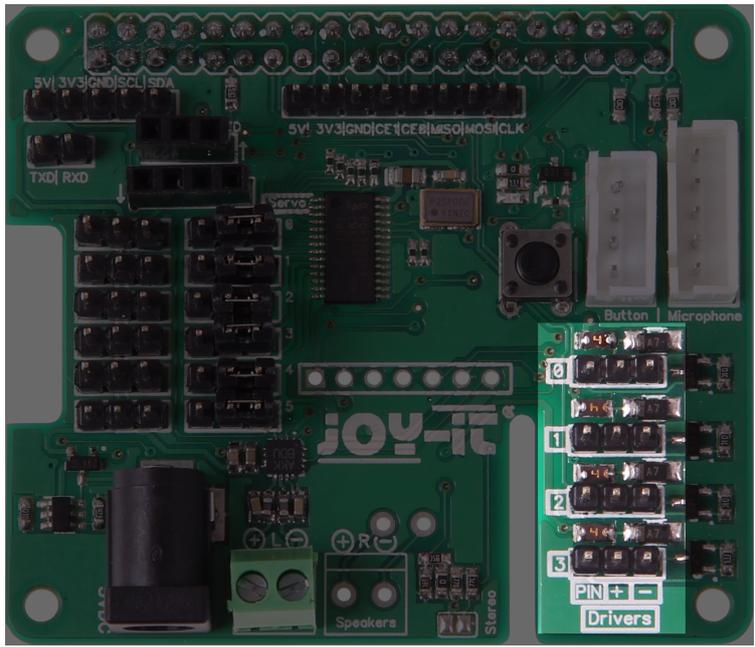
Connect the jumper to the left and the centered pin to activate the GPIO-mode.

The channels can be used with the following numbers:

Channel	GPIO
0	GPIO26
1	GPIO06
2	GPIO13
3	GPIO05
4	GPIO12
5	GPIO24

6. Drivers

The driver-connections are directly assigned to the Raspberry Pi's GPIO-connections. Next to the GPIO-Pin there are also pins for power supply and for reference connection.



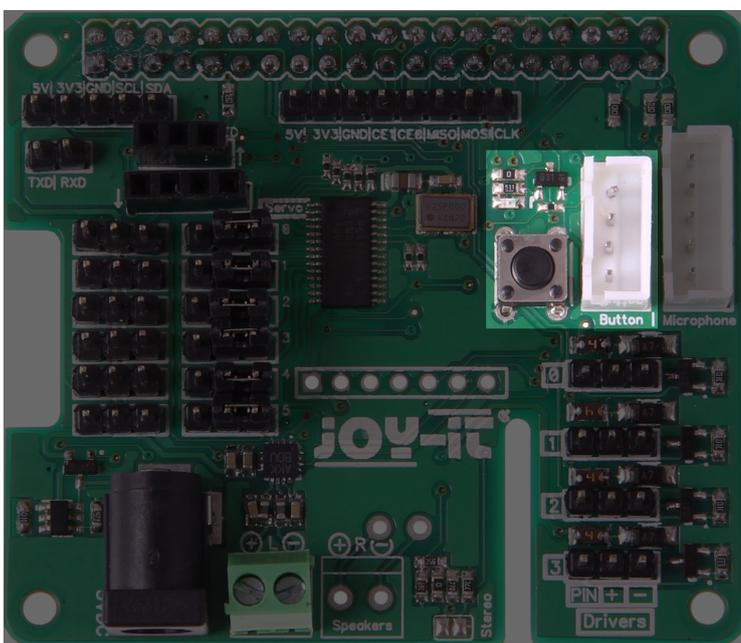
The drivers are assigned to the following GPIO-connections:

Warning! Driver1 and Driver2 can not be simultaneously used with the 433MHz radio modules!

Driver	GPIO
0	GPIO04
1	GPIO17
2	GPIO27
3	GPIO22

7. Button

The Talking-Pi board has already a preinstalled button.
 But you can also connect another button (e.g. an Arcade-Button) to the preinstalled connection.



The connection is assigned to the GPIO pin 23 and is free to use.
 The preinstalled button is connected in parallel to the connector so both buttons can be used for the same function.

8. Support

We also support you after your purchase.

If there are any questions left or if you encounter any problems please feel free to contact us by mail phone or by our ticket-supportsystem on our website.

Mail: service@joy-it.net

Ticket-System: <http://support.joy-it.net>

Phone: +49 (0)2845 98469 – 66 (11- 18 Uhr)

Please visit our website for more information:

www.joy-it.net