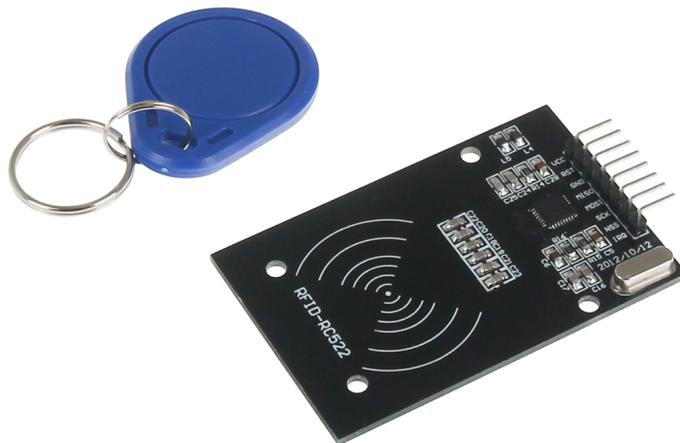


RFID MODULE

based on NXP MFRC-522



GENERAL INFORMATION

Dear customer,

thank you very much for choosing our product.

In following, we will introduce you to what to observe while starting up and using this product.

Should you encounter any unexpected problems during use, please do not hesitate to contact us.

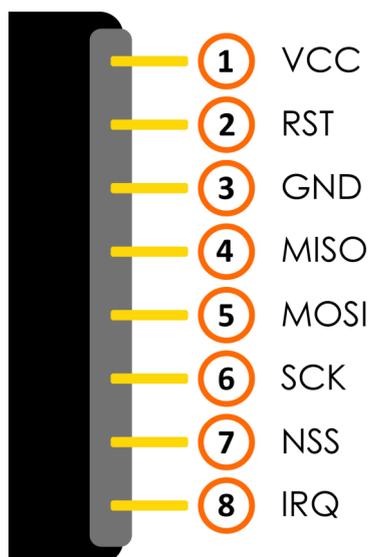
TABLE OF CONTENTS

1. Overview
2. Pin Assignment
3. Use with an Arduino
 - 3.1 Connection of the module
 - 3.2 Installation of the module
 - 3.3 Example application
4. Use with a Raspberry PI
 - 4.1 Connection of the module
 - 4.2 Setting up the system
 - 4.3 Installation of the module
 - 4.4. Example applications
5. Information and take-back obligations
6. Support

1. OVERVIEW

Frequency	13,56 MHz
Communication	SPI
RFID Protocol	Mifare
Voltage supply	DC 3,3V

2. PIN ASSIGNMENT

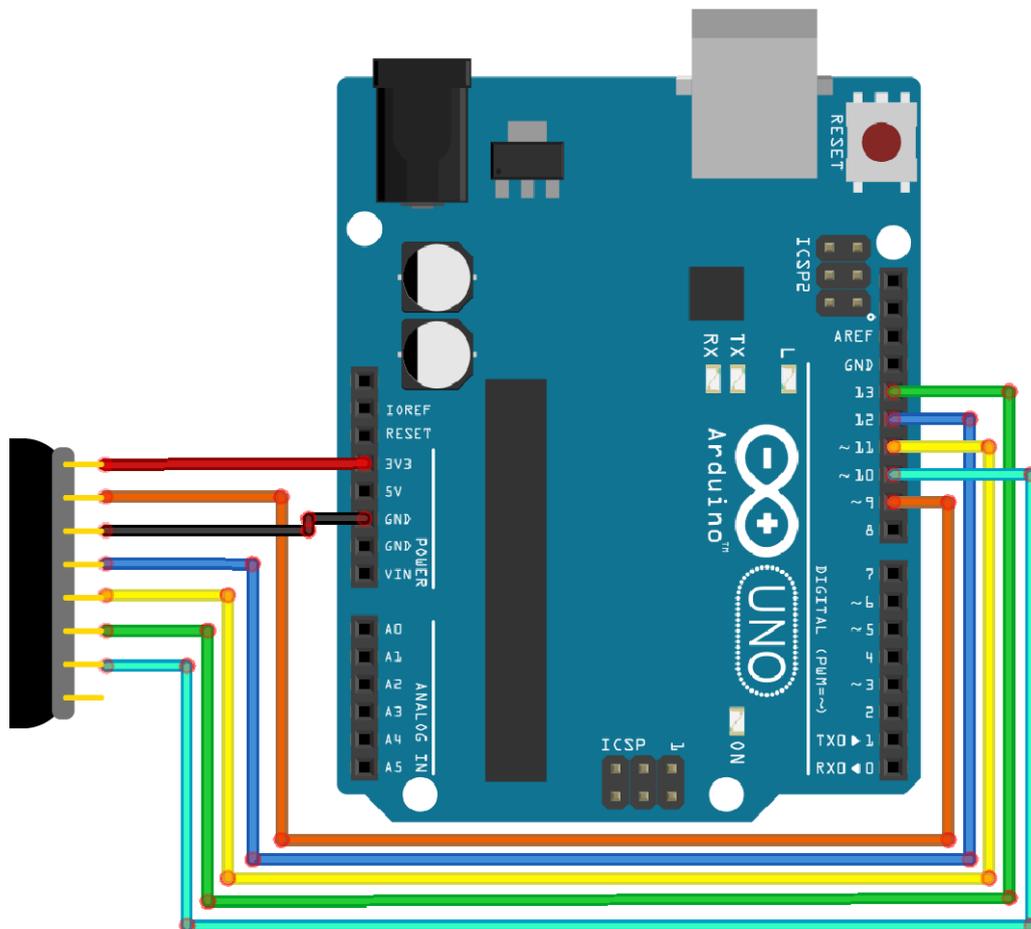


PIN Assignment		
RFID Module	Arduino	Raspberry Pi
VCC	3,3V	1 (3,3V)
RST	9	22 (BCM 25)
GND	GND	6 (GND)
MISO	12	21 (BCM 9)
MOSI	11	19 (BCM 10)
SCK	13	23 (BCM 11)
NSS	10	24 (BCM 8)
IRQ	/	/

3. USE WITH AN ARDUINO

3.1 CONNECTION OF THE MODULE

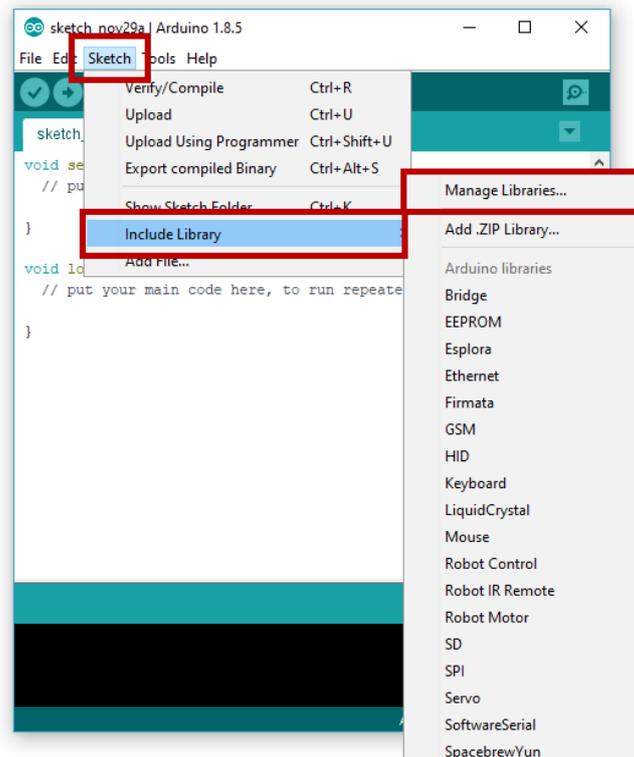
Close the RFID module as shown in the following picture and in the table in chapter 2, to the pins of your Arduino.



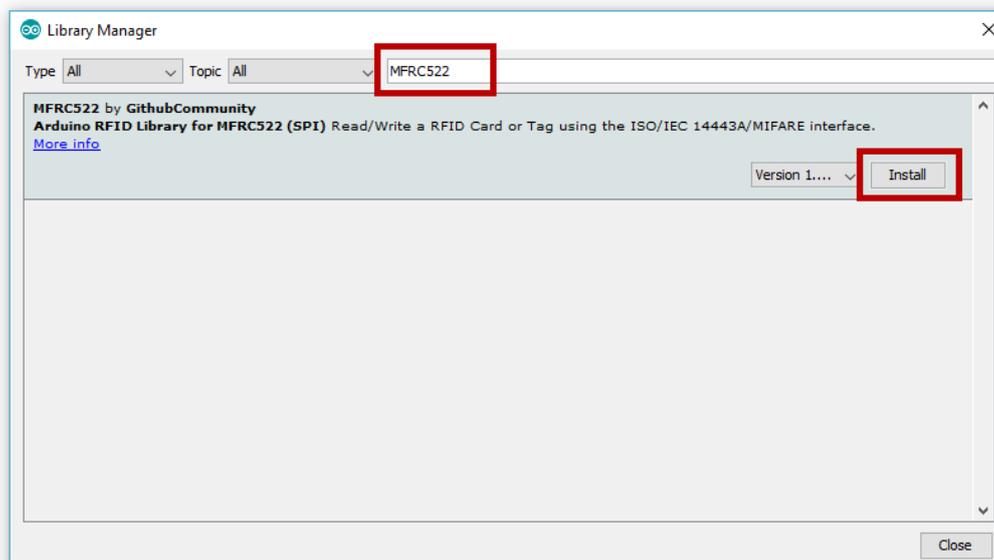
3. USE WITH AN ARDUINO

3.2 INSTALLATION OF THE MODULE

To use the module with your Arduino, you must first install the **MFRC522** library from the Arduino library manager.



In the window that opens, enter the term "**MFRC522**" in the search field and install the library.



3. USE WITH AN ARDUINO

3.3 EXAMPLE APPLICATION

After you have successfully installed the library, your module is ready for use.

You can use the following code example and transfer it to your Arduino, to commission and test the module:

```
#include <SPI.h>
#include <MFRC522.h>

#define RST_PIN      9
#define SS_PIN       10

MFRC522 mfrc522(SS_PIN, RST_PIN);

void setup() {
  //Initialisierung des RFID-Moduls
  Serial.begin(9600);
  while (!Serial);
  SPI.begin();
  mfrc522.PCD_Init();
  mfrc522.PCD_DumpVersionToSerial(); //Details des Lesegerätes ausgeben
  Serial.println(F("Scan PICC to see UID, type, and data blocks..."));
}

void loop() {
  //Suche nach neuen Karten
  if ( ! mfrc522.PICC_IsNewCardPresent() ) {
    return;
  }

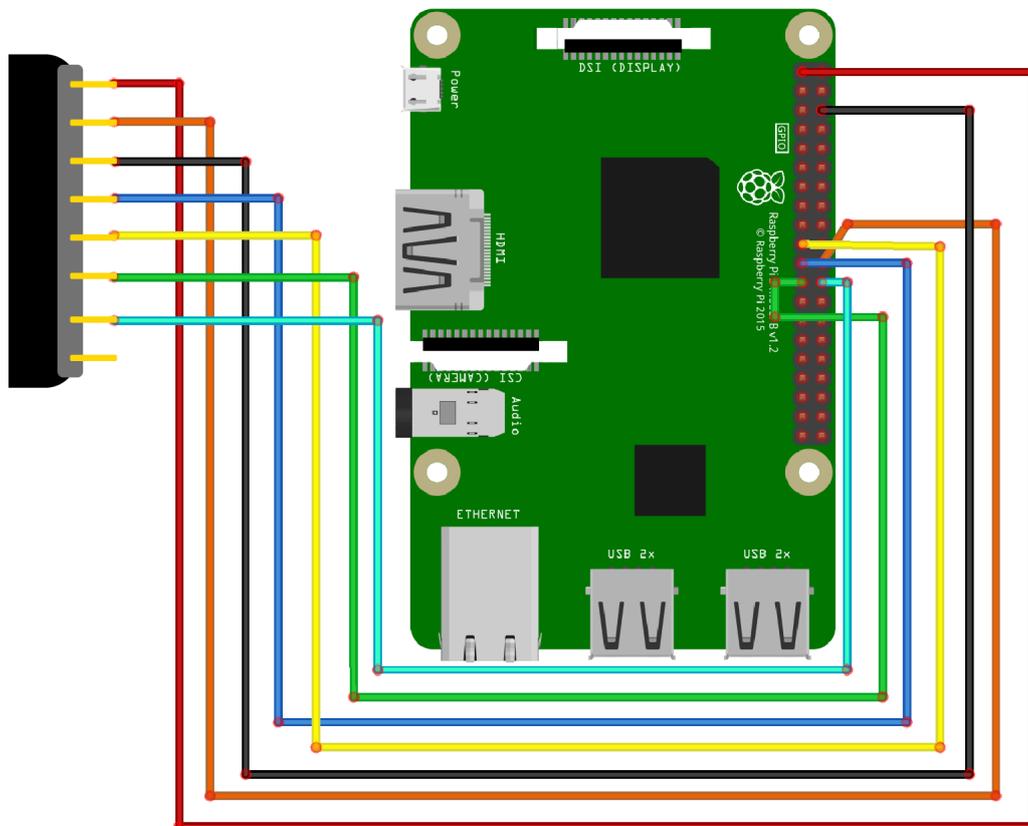
  if ( ! mfrc522.PICC_ReadCardSerial() ) {
    return;
  }

  //Informationsabruf des RFID-Gerätes
  mfrc522.PICC_DumpToSerial(&(mfrc522.uid));
}
```

4. USE WITH A RASPBERRY PI

4.1 CONNECTION OF THE MODULE

Connect the RFID module to the pins of your Raspberry Pi as shown in the following picture and in the table in chapter 2.

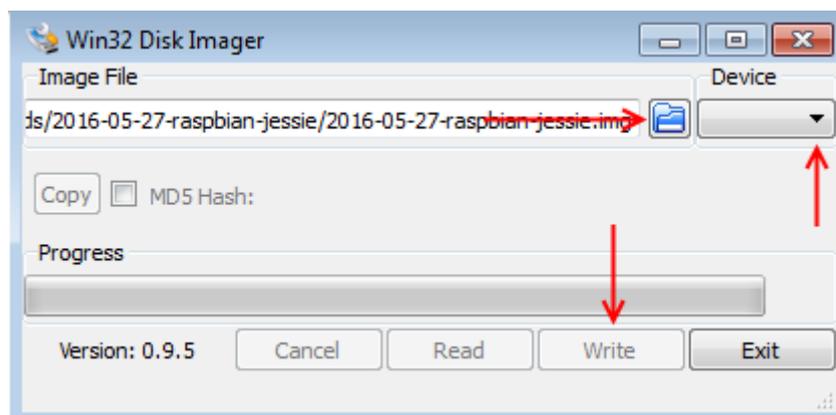


4. USE WITH A RASPBERRY PI

4.2 SETTING UP THE SYSTEM

If you are already using a current Raspbian system on your Raspberry, you can skip this step and proceed immediately to step 3.

First download the latest version of the Raspbian operating system [here](#). With the help of a suitable program (e.g. „[Win32 Disk Imager](#)“) you can install the downloaded image file on a micro-SD card.



Once the process is complete, you can insert the micro-SD card into your Raspberry Pi and start it.

4. USE WITH A RASPBERRY PI

4.3 INSTALLATION OF THE MODULE

Before you can use the module, you have to install additional libraries and activate the SPI interface. To do this, open a terminal window on your Raspberry Pi and enter the following commands:

```
sudo raspi-config
```

Use the arrow keys to select "**5 Interfacing Options**" and confirm with Enter. Select "**P4 SPI**" and confirm the activation with "**Yes**".

Now open the config.txt file with the following command:

```
sudo nano /boot/config.txt
```

Add the following lines to the end of the file:

```
dtoverlay=spi=on
```

Save the file with the key combination **CTRL+O**, confirm with **Enter** and leave the editor with the combination **CTRL+X**.

The Raspberry Pi must now be restarted with the following command:

```
sudo reboot
```

4. USE WITH A RASPBERRY PI

4.3 INSTALLATION OF THE MODULE

Now after preparations have been completed, the actual library can be installed:

```
sudo apt-get install python3-dev python3-pip
sudo pip3 install spidev
sudo pip3 install mfrc522
```

After installing the required libraries, we will create a new folder to save our sample codes and open it:

```
mkdir /home/pi/rc522
cd /home/pi/rc522
```

Now we have to write the scripts for writing and reading the data.

Enter the following command to create the script for writing:

```
sudo nano Write.py
```

Enter the following script into this file:

```
#!/usr/bin/env python
import RPi.GPIO as GPIO
from mfrc522 import SimpleMFRC522

reader = SimpleMFRC522()

try:
    text = input('Enter a value:')
    print("Hold the card / clip against the sensor:")
    reader.write(text)
    print("Sucesfully written.")
finally:
    GPIO.cleanup()
```

Save the file with the key combination **CTRL+O**, confirm with **Enter** and leave the editor with the combination **CTRL+X**.

4. USE WITH A RASPBERRY PI

4.3 INSTALLATION OF THE MODULE

Now type the following command to create the script to read:

```
sudo nano Read.py
```

Enter the following script into this file:

```
#!/usr/bin/env python

import RPi.GPIO as GPIO
from mfrc522 import SimpleMFRC522

reader = SimpleMFRC522()

try:
    id, text = reader.read()
    print(id)
    print(text)
finally:
    GPIO.cleanup()
```

Save the file with the key combination **CTRL+O**, confirm with **Enter** and leave the editor with the combination **CTRL+X**.

4. USE WITH A RASPBERRY PI

4.4 EXAMPLE APPLICATIONS

To run our sample codes, run the file to describe a clip or card with the following command:

```
sudo python3 Write.py
```

You can start the application for reading with the following command:

```
sudo python3 Read.py
```

5. INFORMATION AND TAKE-BACK OBLIGATIONS

Our information and take-back obligations according to the Electrical and Electronic Equipment Act (ElektroG)

Symbol on electrical and electronic equipment:



This crossed-out dustbin means that electrical and electronic appliances do not belong in the household waste. You must return the old appliances to a collection point.

Before handing over waste batteries and accumulators that are not enclosed by waste equipment must be separated from it.

Return options:

As an end user, you can return your old device (which essentially fulfils the same function as the new device purchased from us) free of charge for disposal when you purchase a new device.

Small appliances with no external dimensions greater than 25 cm can be disposed of in normal household quantities independently of the purchase of a new appliance.

Possibility of return at our company location during opening hours:

Simac Electronics Handel GmbH, Pascalstr. 8, D-47506 Neukirchen-Vluyn, Germany

Possibility of return in your area:

We will send you a parcel stamp with which you can return the device to us free of charge. Please contact us by e-mail at Service@joy-it.net or by telephone.

Information on packaging:

If you do not have suitable packaging material or do not wish to use your own, please contact us and we will send you suitable packaging.

6. SUPPORT

If there are still any issues pending or problems arising after your purchase, we will support you by e-mail, telephone and with our ticket support system.

E-Mail: service@joy-it.net

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

Telephone: +49 (0)2845 98469-66 (10-17 o'clock)

For further information please visit our website:

www.joy-it.net