

Part 2

Lesson

20

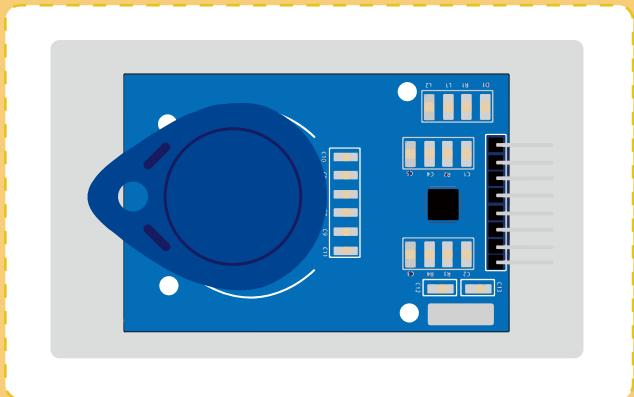
**RC522 RFID
Module**

Overview

In this lesson, you will learn how to apply the RC522 RFID Reader Module on UNO R3. This module uses the Serial Peripheral Interface (SPI) bus to communicate with controllers such as Arduino, Raspberry Pi, beagle board, etc.

■ Component Required:

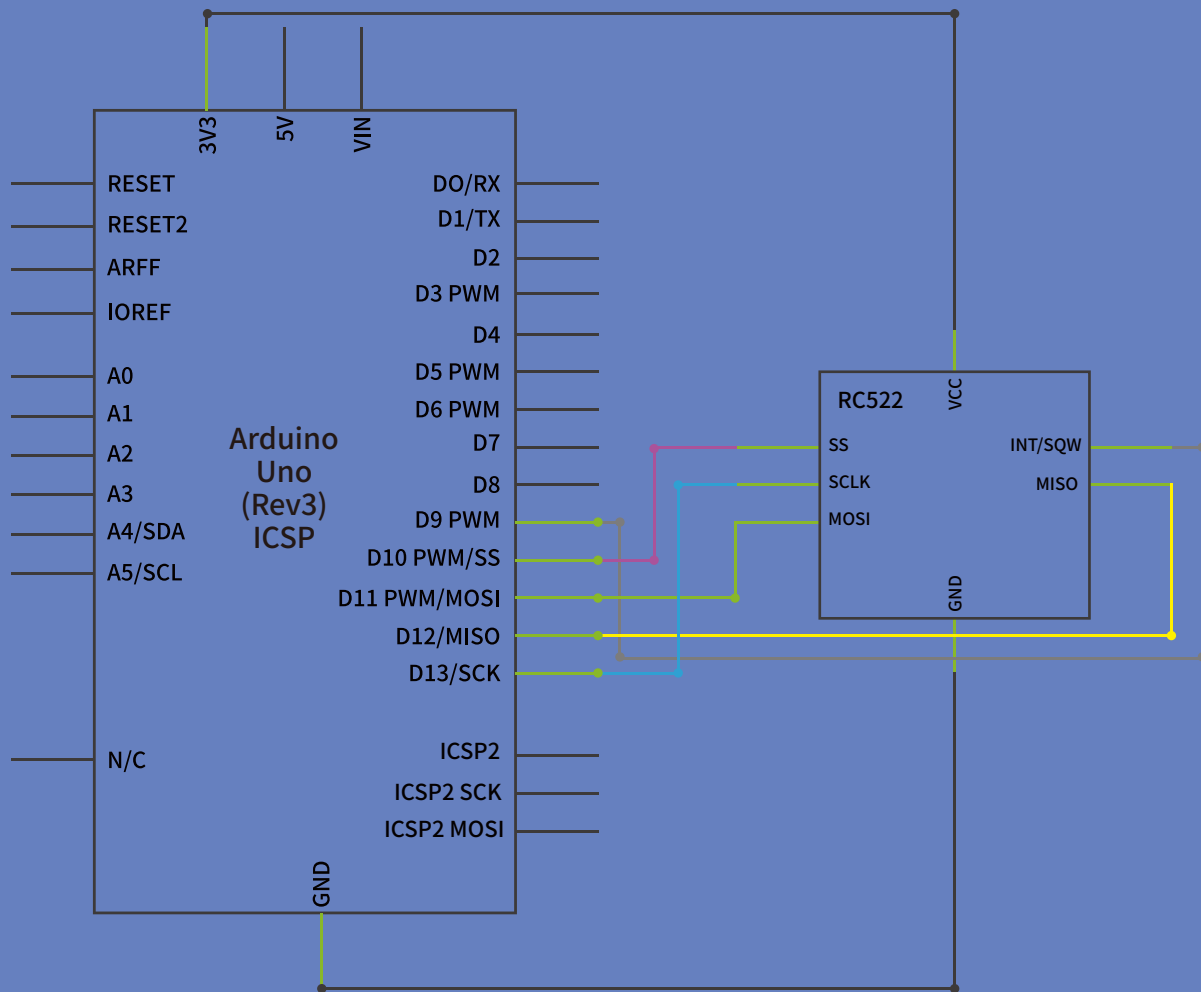
- (1) x Elegoo Uno R3
- (1) x RC522 RFID module
- (7) x F-M wires (Female to Male DuPont wires)



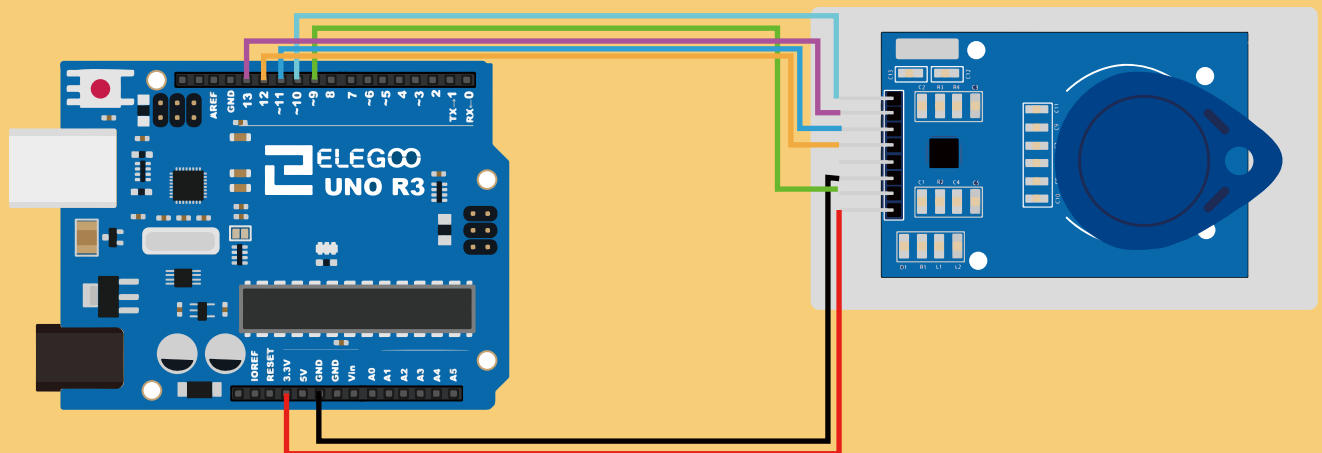
Component Introduction

RC522

- **The** MFRC522 is a highly integrated reader/writer for contactless communication at 13.56 MHz. The MFRC522 reader supports ISO 14443A / MIFARE® mode.
- **The** MFRC522's internal transmitter part is able to drive a reader/writer antenna designed to communicate with ISO/IEC 14443A/MIFARE® cards and transponders without additional active circuitry. The receiver part provides a robust and efficient implementation of a demodulation and decoding circuitry for signals from ISO/IEC 14443A/MIFARE® compatible cards and transponders. The digital part handles the complete ISO/IEC 14443A framing and error detection (Parity & CRC). The MFRC522 supports MIFARE® Classic (e.g. MIFARE® Standard) products. The MFRC522 supports contactless communication using MIFARE® higher transfer speeds up to 848 kbit/s in both directions.
- **Various** host interfaces are implemented:
 - SPI interface
 - Serial UART (similar to RS232 with voltage levels according pad voltage supply)
 - I2C interface.
- **The** figure below shows a typical circuit diagram, using a complementary antenna connection to the MFRC522.



Connection Schematic



Wiring diagram

Code

- After wiring, please open the program in the code folder- **MF-RC522_RFID** and press UPLOAD to upload the program. See Lesson 5 of part 1 for details about program uploading if there are any errors.
- Before you can run this, make sure that you have installed the **< rfid >** library or re- install it, if necessary. Otherwise, your code won't work.
- For details about loading the library file, see Lesson 5 of part 1 .

	MFRC522 Reader/PCD	Arduino Uno	Arduino Mega	Arduino Nano v3	Arduino Leonardo/Micro	Arduino Pro Micro
Signal	Pin	Pin	Pin	Pin	Pin	Pin
RSI/Reset	RSI	9	5	D9	RESET/ICSP-5	RSI
SPI SS	SDA(SS)	10	53	D10	10	10
SPI MOSI	MOSI	11 / ICSP-4	51	D11	ICSP-4	16
SPI MISO	MISO	12 / ICSP-1	50	D12	ICSP-1	14
SPI SCK	SCK	13 / ICSP-3	52	D13	ICSP-3	15

The locations of SPI pins vary with different chips, and you have to make a minor modification of the function.

#define RST_PIN	9	// Configurable, see typical pin layout above
#define SS_PIN	10	// Configurable, see typical pin layout above

```
if ( ! mfrc522.PICC_IsNewCardPresent() || ! mfrc522.PICC_ReadCardSerial() ) {
    return;
}
```

!

[Boolean Operators] Description

Logical NOT results in a true if the operand is false and vice versa.

Open the monitor then you can see the data as blow:

Click the Serial Monitor button to turn on the serial monitor. The basics about the serial monitor are set out in detail in Lesson 4 of part 2.

```
Warning: this example overwrites the UID of your UID changeable card, use with care!
Card UID: 66 E3 F4 74
Card did not respond to 0x40 after HALT command. Are you sure it is a UID changeable?
Error name: Timeout in communication.
Activating the UID backdoor failed.
New UID and contents:
Card UID: 66 E3 F4 74
Card SAK: 08
PICC type: MIFARE 1KB
Sector Block 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 AccessBits
15 63 00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF FF [ 0 0 1 ]
62 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
61 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
60 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
59 00 00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF FF [ 0 0 1 ]
58 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
57 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
56 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
13 55 00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF FF [ 0 0 1 ]
54 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
53 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
52 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
12 51 00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF FF [ 0 0 1 ]
50 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
49 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
48 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
11 47 00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF FF [ 0 0 1 ]
46 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 [ 0 0 0 ]
Autoscroll Newline 9600 baud
```