RFID Entrance Guard System

Overview

This lesson will teach you how to use RC522 RFID module, and you can learn how to read and write cards through the RFID Entrance Guard System experiment.

Specification

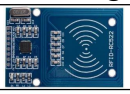
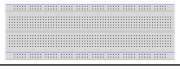
Please view “MFRC522.pdf”

Path: \Public_materials\Datasheet\ MFRC522.pdf

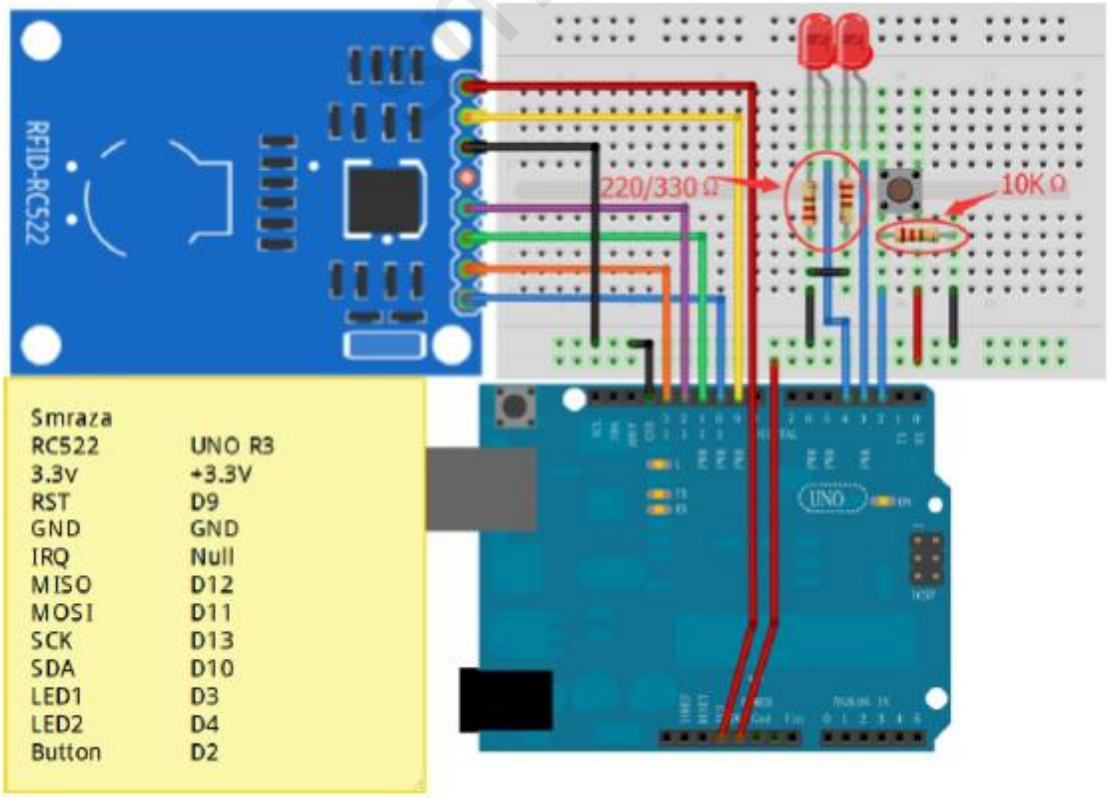
Pin definition

RC522	Arduino
3.3V	->+3.3V
RST	->D9
GND	->GND
IRQ	->Null
MISO	->D12
MOSI	->D11
SCK	->D13
SDA	->D10

Hardware required

Material diagram	Material name	Number
	RC522 RFID	1
	RFID Card	1
	RFID Key	1
	Button	1
	LED	2
	220/330Ω resistor	2
	10KΩ resistor	1
	USB Cable	1
	UNO R3	1
	Breadboard	1
	Jumper wires	Several

Connection diagram



Note: For this module, please use a 3.3V power supply, or it will get burnt.

Sample code

Note: sample code under the **Sample code** folder

You need to add the **RFID** to the Arduino library file directory, otherwise the compiler does not pass. **Please refer to 'How to add library files.docx'.**

```
#include <SPI.h>
#include <RFID.h>
const int LED1 = 3;
const int LED2 = 4;
boolean flag = false;     //Write card flag
RFID rfid(10,9);
//The fourth byte is card's serial number and the five byte is card's Check byte
unsigned char serNum[5];
// Write data
unsigned char writeDate[16] ={'W', 'e', 'l', 'c', 'o', 'm', 'e', 'T', 'o', 'S', 'm', 'r', 'a', 'z', 'a', 0};
//A password original sector, 16 sectors, each sector password 6Byte
unsigned char sectorKeyA[16][16] = {
      {0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF},
      {0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF},
      {0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF},};
      //A password new sector, 16 sectors, each sector password 6Byte
unsigned char sectorNewKeyA[16][16] = {
      {0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF},
      {0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xff,0x07,0x80,0x69, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF,
0xFF},
      {0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xff,0x07,0x80,0x69, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF,
0xFF},};

void setup()
{
      Serial.begin(9600);
      SPI.begin();
      rfid.init();
      pinMode(LED1,OUTPUT);
      pinMode(LED2,OUTPUT);
      attachInterrupt(0, WriteCardInterrupt, RISING);
}

void loop()
{
      unsigned char i,tmp;
      unsigned char status;
      unsigned char str[MAX_LEN];
      unsigned char RC_size;
```

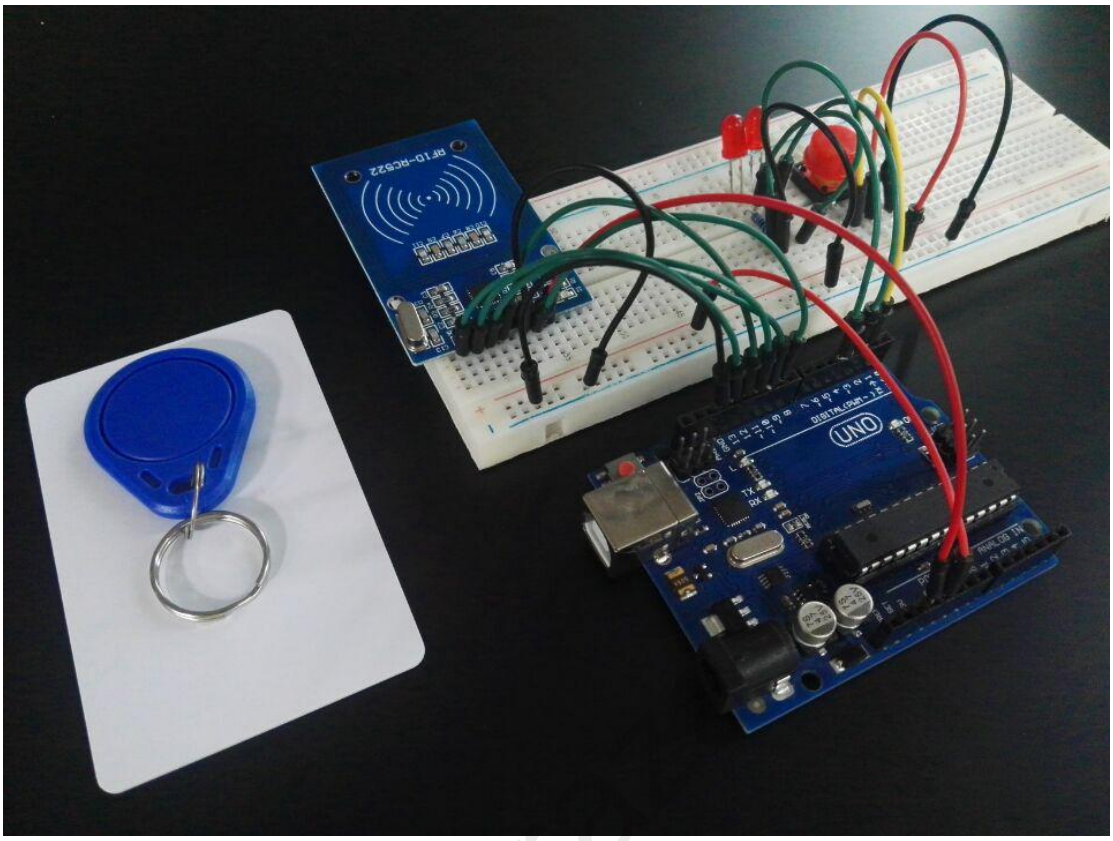
```
    unsigned char blockAddr;
    //Detecting card
    rfid.isCard();
    //Reading the card serial number
    if (rfid.readCardSerial())
    {
        Serial.print("The card's number is : ");
        Serial.print(rfid.serNum[0],HEX);
        Serial.print(rfid.serNum[1],HEX);
        Serial.print(rfid.serNum[2],HEX);
        Serial.print(rfid.serNum[3],HEX);
        Serial.print(rfid.serNum[4],HEX);
        Serial.println(" ");
    }
    //Select card and return memory size(note:Card is locked to prevent multiple read
and write rfid.selectTag(rfid.serNum);

    // write data to card
    blockAddr = 7;                    //data block 7
    if(flag==true)
    {
        if (rfid.auth(PICC_AUTHENT1A, blockAddr, sectorKeyA[blockAddr/4],
        rfid.serNum) == MI_OK) //authenticate
        {
            //Write data
            status = rfid.write(blockAddr, sectorNewKeyA[blockAddr/4]);
            Serial.print("Set the new card password, and can modify the data of the
            Sector:");
            Serial.println(blockAddr/4,DEC);
            //Write data
            blockAddr = blockAddr - 3 ; //data block 4
            status = rfid.write(blockAddr, writeDate);
            if(status == MI_OK)
            {
                Serial.println("Write card OK!");
                digitalWrite(LED2,LOW);   //LED status for writing card
                delay(1000);
                flag=false;     //Reset interrupt status
            }else{
                Serial.println("Write card Error!");
            }
        }
    }
    //Read card
```

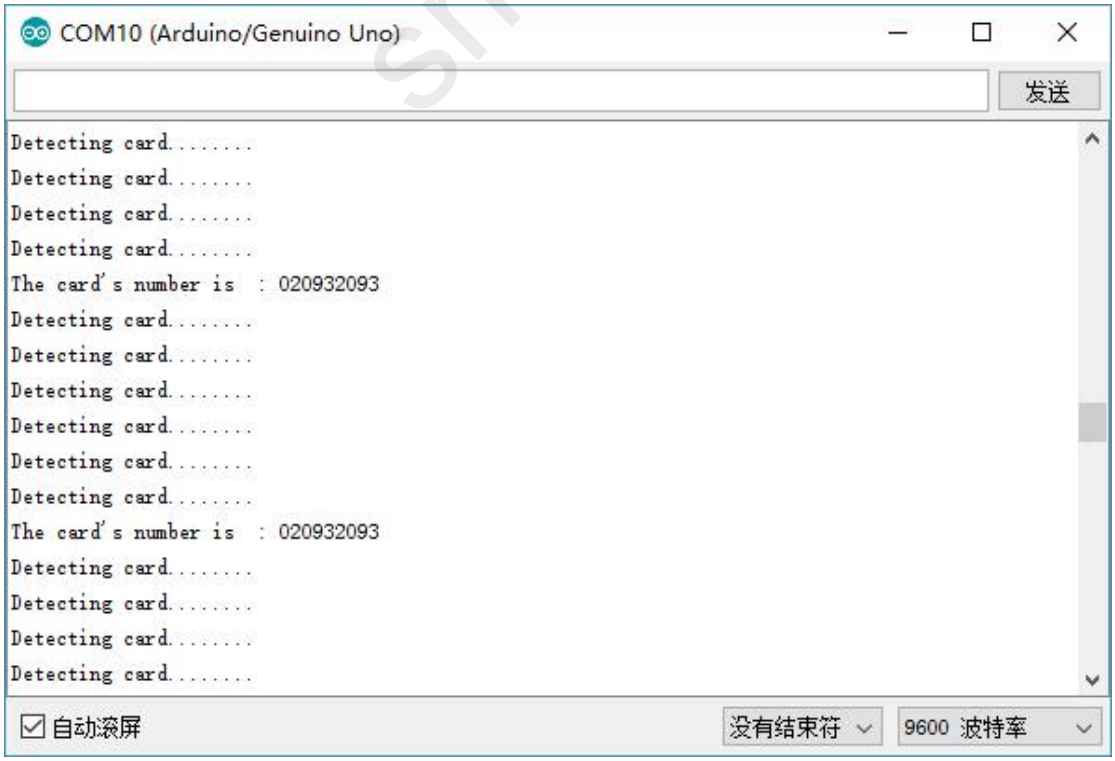
```
    blockAddr = 7;                    //data block 7
    status = rfid.auth(PICC_AUTHENT1A, blockAddr, sectorNewKeyA[blockAddr/4],
rfid.serNum);

    if (status == MI_OK) //authenticate
    {
        //Read Data
        blockAddr = blockAddr - 3 ; //data block 4
        if( rfid.read(blockAddr, str) == MI_OK)
        {
            Serial.print("Read from the card ,the data is : ");
            Serial.println((char *)str);
            for(int j=0;j<2;j++)     // LED status for reading card
            {
                digitalWrite(LED1,HIGH);
                digitalWrite(LED2,HIGH);
                delay(500);
                digitalWrite(LED1,LOW);
                digitalWrite(LED2,LOW);
                delay(500);
            }
        }
    }
    rfid.halt();
    flashled();        // LED lamp for detecting card
}
void WriteCardInterrupt() //Interrupt function
{
    digitalWrite(LED2,HIGH);
    flag = true;
}
void flashled()
{
    digitalWrite(LED1,LOW);
    delay(200);
    digitalWrite(LED1,HIGH);
    delay(200);
    Serial.println("Detecting card.....");
}
/* Tips: Open serial port monitor.
* LED1 blinking and LED2 off        ->        Detecting card
* LED1 blinking and LED2 on         ->        Waiting for write card
* LED1 and LED2 blinking            ->        Reading card is finished
*/
```

Example picture



Result



Language reference

Tips：click on the following name to jump to the web page.

If you fail to open, use the Adobe reader to open this document.

attachInterrupt

Application effect

Detecting card: LED1 blinking and LED2 off
Writing card: Press the button, and then put the card/key on top of RC522.
LED1 and LED2 blinking->Writing card is finished.
Reading card: Put the card/key on top of RC522.

LED1 and LED2 blinking->Writing card is finished.

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