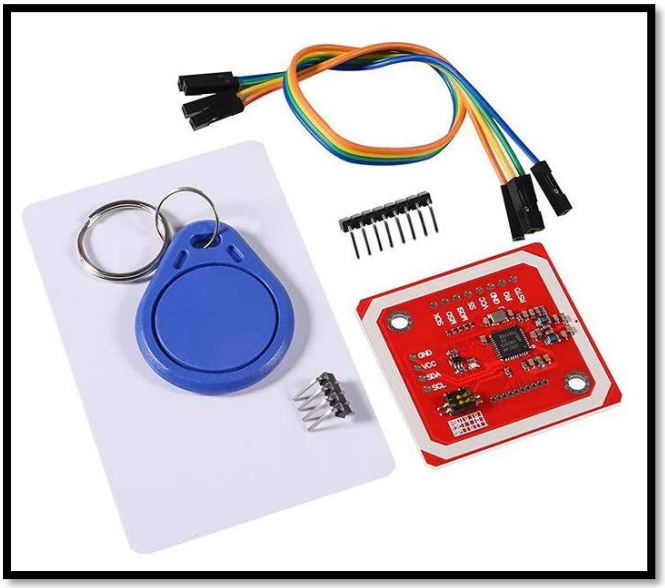
SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K)
No.25 Lorong 1/SS3, Bandar Tasek Mutiara,
14120 Simpang Ampat, Penang, Malaysia.
T: +604.586.0026 F: +604.586.0026
WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

PN532 NFC RFID V3 Card Tag Reader Module I2C SPI HSU for Arduino

Introduction:



The PN532 NFC RFID V3 Card Tag Reader Module is a versatile and advanced component designed for seamless integration with Arduino projects. With support for various communication interfaces such as I2C, SPI, and HSU (High-Speed UART), this module offers flexibility in connecting with different microcontrollers and devices. Its compatibility with the Arduino platform makes it an excellent choice for projects requiring near field communication (NFC) and radio-frequency identification (RFID) capabilities. The PN532 module enables the reading and writing of NFC cards and tags, opening up possibilities for applications like access control, payment systems, and smart devices. Its ease of use and extensive documentation make it accessible for both beginners and experienced developers, allowing them to harness the power of NFC and RFID technology in their Arduino-based projects. Whether you are a hobbyist or a professional, the PN532 NFC RFID V3 Card Tag Reader Module provides a reliable and feature-rich solution for incorporating contactless communication into your electronic creations.

Features:

- Small dimension and easy to embed into your project
- Support I2C, SPI and HSU (High Speed UART), easy to change between those modes
- Support RFID reading and writing, P2P communication with peers, NFC with Android phone
- RFID reader/writer supports :
- Mifare 1k, 4k, Ultralight, and DesFire cards
- ISO/IEC 14443-4 cards such as CD97BX, CD light, Desfire, P5CN072 (SMX)
- Innovision Jewel cards such as IRT5001 card
- FeliCa cards such as RCS_860 and RCS_854
- Up to 5cm~7cm reading distance
- On-board level shifter, Standard 5V TTL for I2C and UART, 3.3V TTL SPI
- Arduino compatible, plug in and play with our shield

Specs:

- Typically supports a wide range, often 3.3V to 5V
- Works in the 13.56 MHz frequency range
- Designed for use with Arduino boards, ensuring easy integration into Arduino-based projects
- Generally designed to be power-efficient for battery-powered applications

Objectives:

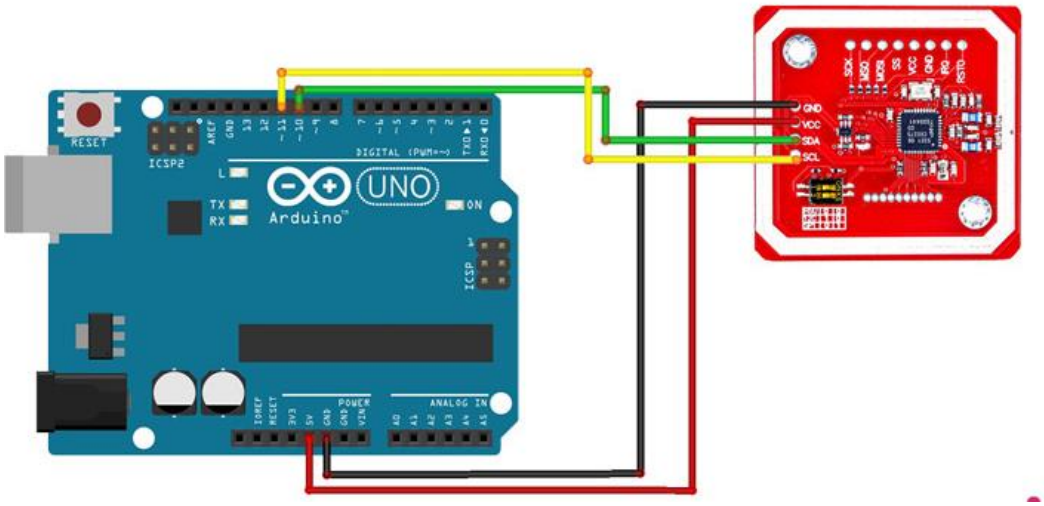
The PN532 NFC RFID V3 Card Tag Reader Module serves multiple objectives in Arduino-based projects, offering a versatile and efficient solution for incorporating contactless communication capabilities. Firstly, the module facilitates seamless integration with Arduino microcontrollers through various communication interfaces, including I2C, SPI, and HSU. This ensures compatibility with a wide range of Arduino boards, enabling developers to leverage its functionalities in diverse applications. The primary goal of the PN532 module is to enable near field communication (NFC) and radio-frequency identification (RFID) capabilities, allowing Arduino projects to read and write data to NFC cards and RFID tags. This opens up possibilities for applications such as access control systems, payment solutions, and smart devices.

Components needed:

- PN532 NFC RFID Module
- Arduino UNO Board
- Jumper wire

Procedures:

Step 1: Circuit

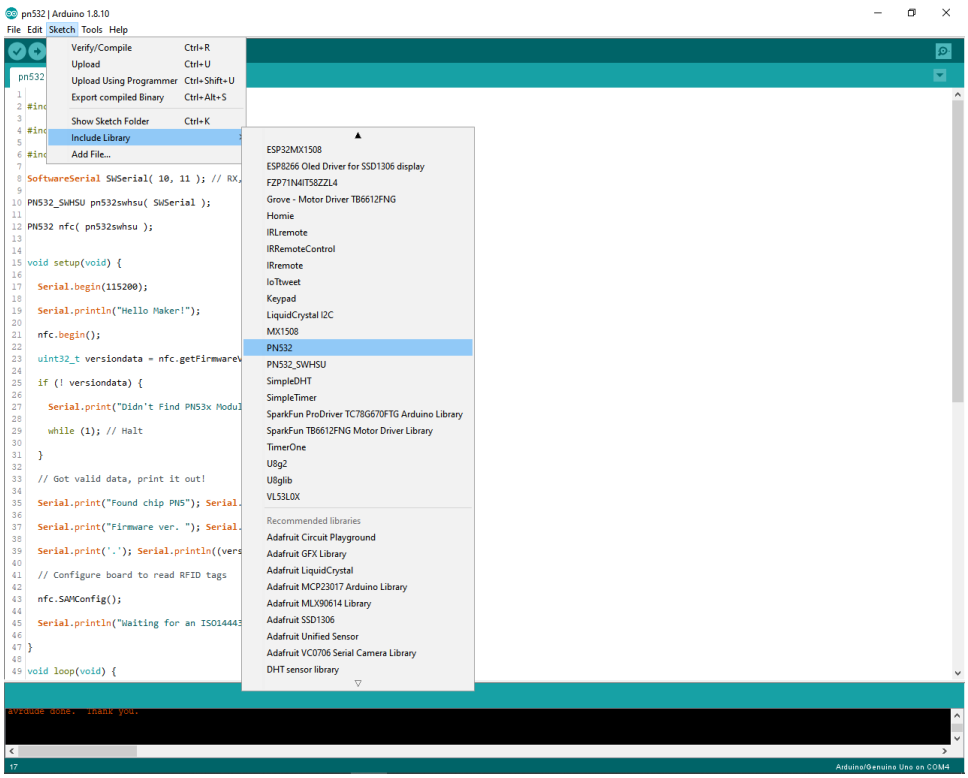


The following circuit show how you could connect Arduino to PN532 module. Connect wires accordingly.

Step 2: Library

Download the library Zip files below. Unzip the files and copy the folders to Arduino installation section (Libraries section).

1. PN532.zip
2. PN532_SWHSU.zip



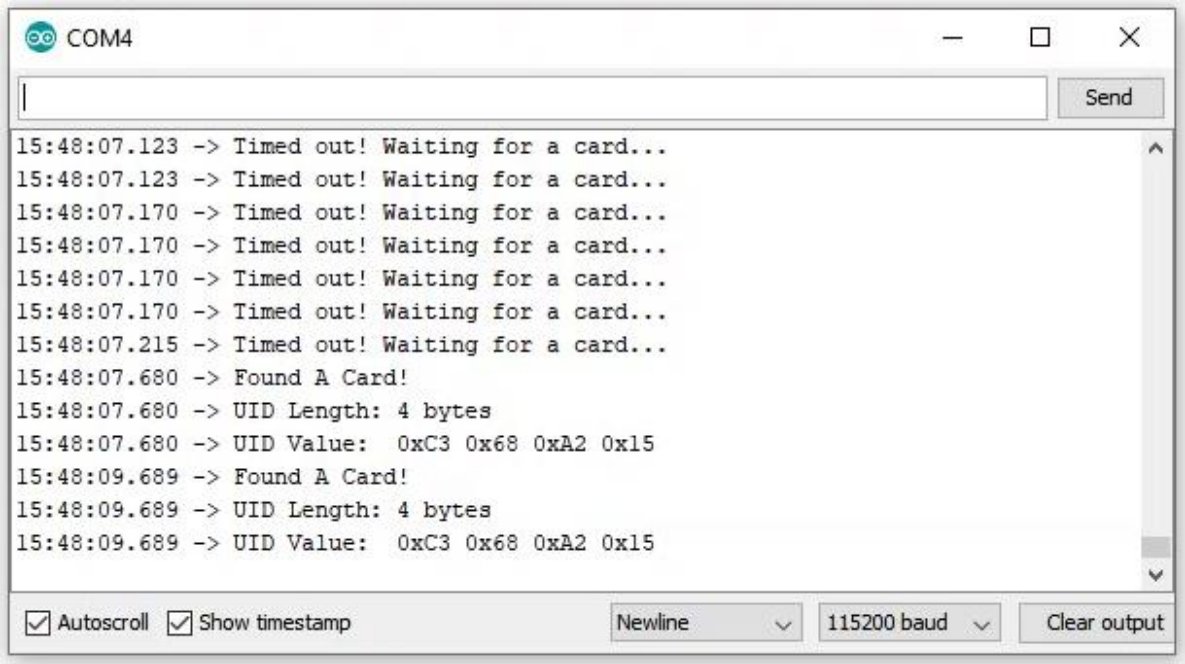
Step 3: Code

```
#include <SoftwareSerial.h>

#include <PN532_SWHSU.h>

#include <PN532.h>

SoftwareSerial SWSerial( 10, 11 ); // RX, TX

PN532_SWHSU pn532swhsu( SWSerial );

PN532 nfc( pn532swhsu );


void setup(void) {

  Serial.begin(115200);

  Serial.println("Hello Maker!");

  nfc.begin();

  uint32_t versiondata = nfc.getFirmwareVersion();

  if (! versiondata) {

    Serial.print("Didn't Find PN53x Module");

    while (1); // Halt

  }

  // Got valid data, print it out!

  Serial.print("Found chip PN5"); Serial.println((versiondata>>24) & 0xFF, HEX);

  Serial.print("Firmware ver. "); Serial.print((versiondata>>16) & 0xFF, DEC);

  Serial.print('.'); Serial.println((versiondata>>8) & 0xFF, DEC);

  // Configure board to read RFID tags

  nfc.SAMConfig();

  Serial.println("Waiting for an ISO14443A Card ...");

}

void loop(void) {

  boolean success;

  uint8_t uid[] = { 0, 0, 0, 0, 0, 0, 0 };  // Buffer to store the returned UID

  uint8_t uidLength;                        // Length of the UID (4 or 7 bytes depending on ISO14443A card type)

success = nfc.readPassiveTargetID(PN532_MIFARE_ISO14443A, &uid[0], &uidLength);

  if (success) {

    Serial.println("Found A Card!");

    Serial.print("UID Length: ");Serial.print(uidLength, DEC);Serial.println(" bytes");

    Serial.print("UID Value: ");

    for (uint8_t i=0; i < uidLength; i++)

    {

      Serial.print(" 0x");Serial.print(uid[i], HEX);

    }

    Serial.println("");

    // 2 second halt

    delay(2000);

  }

  else

  {

    // PN532 probably timed out waiting for a card

    Serial.println("Timed out! Waiting for a card...");

  }
}
```

Upload the following code to Arduino. After that open the Serial Monitor.

Step 4: Result

If we bring the card near to the module, it is detected, and its data appears on Serial Monitor.



Conclusion:

In conclusion, the PN532 NFC RFID V3 Card Tag Reader Module emerges as a valuable and versatile component within the realm of Arduino-based projects. With its support for multiple communication interfaces, including I2C, SPI, and HSU, the module ensures broad compatibility, seamlessly integrating with various Arduino microcontrollers. Its key objectives are centered on enabling efficient near field communication (NFC) and radio-frequency identification (RFID) capabilities, empowering developers to incorporate contactless functionality into their projects. Whether used for access control systems, payment solutions, or smart devices, the PN532 module stands out for its ability to read and write data to NFC cards and RFID tags. The inclusion of different operating modes and compatibility with diverse cards and tags, including popular MIFARE cards, enhances its adaptability to a wide range of applications. Supported by Arduino libraries, the PN532 module facilitates a user-friendly implementation, catering to both beginners and experienced developers. In essence, the PN532 NFC RFID V3 Card Tag Reader Module not only meets but exceeds expectations, contributing to the innovation and advancement of electronic designs within the Arduino ecosystem.