PN532 NFC Module for Raspberry Pi

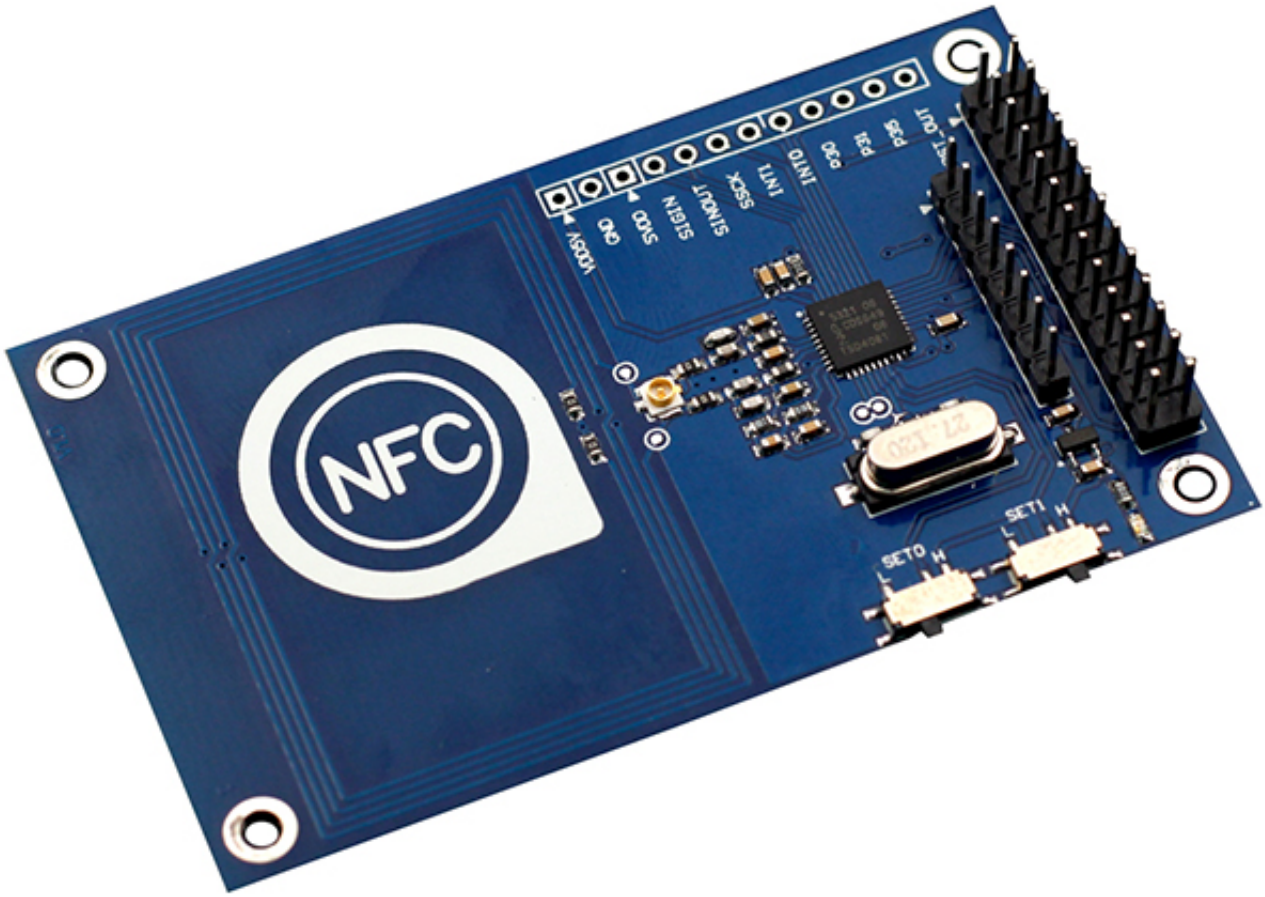
Premise

Note: If you have configured libnfc before, please delete the config file.

```
sudo rm -rf /etc/nfc
```

Introduction

Raspberry Pi PN532 NFC module, as its name implies, is based on PN532 chip and used to 13.56 MHz near field communication. This module is equipped with on-board antenna, so there is no external antenna coil. It is compatible with SPI, IIC interfaces to communicate. With the support of NFC library, Raspberry Pi can connect products with the function of NFC, thus it is easy to use.



I2C Communication Instructions for Raspberry Pi

1. Open I2C of the Raspberry Pi :

```
sudo raspi-config
```

Select **5 Interfacing Options** -> **I2C** -> **yes**.

2. Install some dependent packages

```
sudo apt-get update
sudo apt-get install libusb-dev libpcsclite-dev i2c-tools
```

3. Download and unzip the source code package of libnfc

```
cd ~
wget http://dl.bintray.com/nfc-tools/sources/libnfc-1.7.1.tar.bz2
tar -xf libnfc-1.7.1.tar.bz2
```

4. Compile and install

```
cd libnfc-1.7.1
./configure --prefix=/usr --sysconfdir=/etc
make
sudo make install
```

5. Write the configuration file for NFC communication

```
cd /etc
sudo mkdir nfc
sudo nano /etc/nfc/libnfc.conf
```

Check the following details of the file *etc/nfc/libnfc.conf*:

```
# Allow device auto-detection (default: true)
# Note: if this auto-detection is disabled, user has to set manually a devi
# configuration using file or environment variable
allow_autoscan = true
```

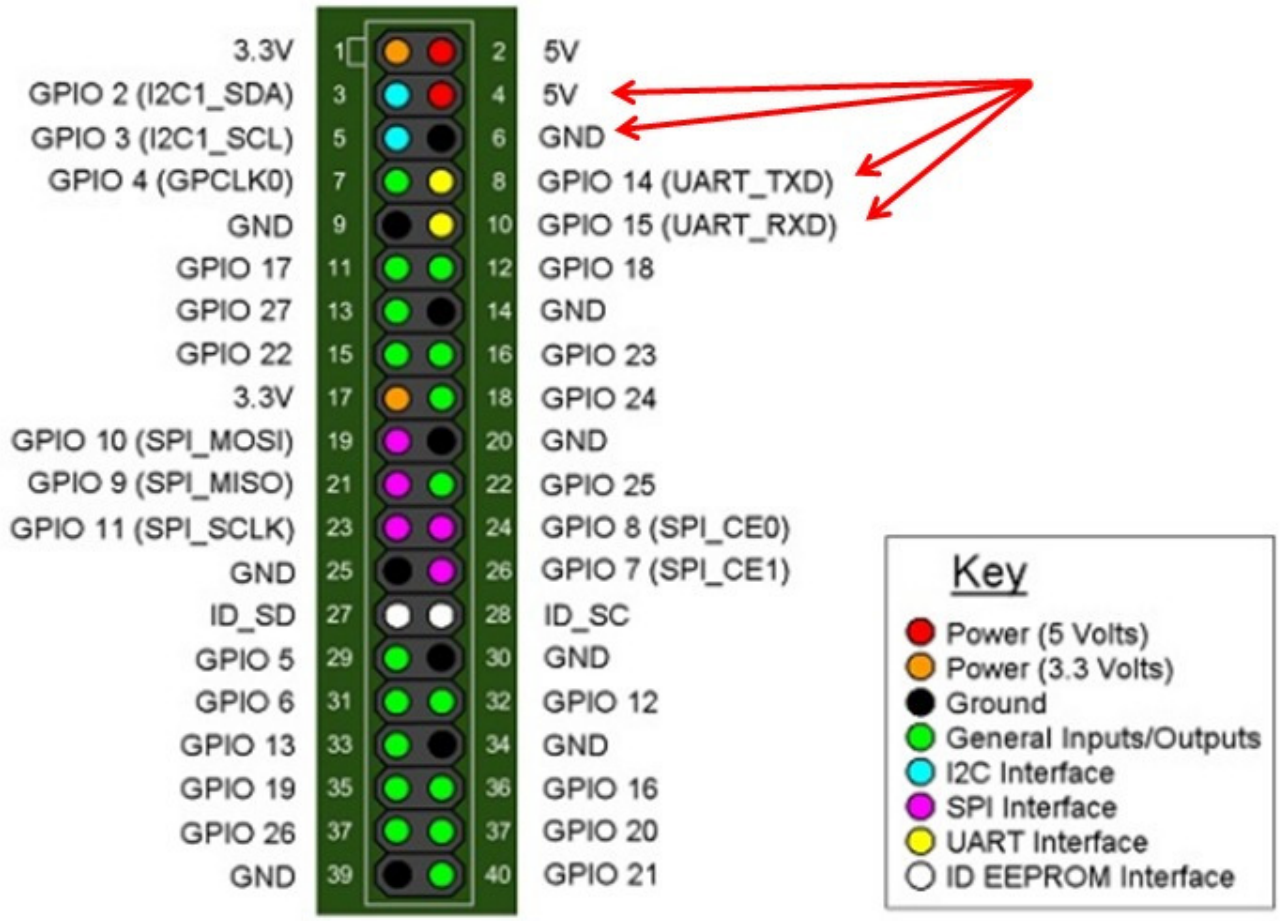
```
# Allow intrusive auto-detection (default: false)
# Warning: intrusive auto-detection can seriously disturb other devices
# This option is not recommended, user should prefer to add manually his de
allow_intrusive_scan = false

# Set log level (default: error)
# Valid log levels are (in order of verbosity): 0 (none), 1 (error), 2 (inf
# Note: if you compiled with --enable-debug option, the default log level i
log_level = 1

# Manually set default device (no default)
# To set a default device, you must set both name and connstring for your d
# Note: if autoscan is enabled, default device will be the first device ava
#device.name = "_PN532_SPI"
#device.connstring = "pn532_spi:/dev/spidev0.0:500000"
device.name = "_PN532_I2c"
device.connstring = "pn532_i2c:/dev/i2c-1"
```

6. Wiring

Toggle the switch to the **I2C mode**

SEL0	SEL1
H	L

Pin diagram of Raspberry pi



Connect the devices:

PN532	Raspberry
5V	5V
GND	GND
SDA	SDAo
SCL	SCLo

7. Run *i2cdetect –y 1* to check whether the I2C device is recognized.

If yes, it means both the module and the wiring work well.

Then type in *nfc-list* to check the NFC module:

```
pi@raspberrypi: ~
pi@raspberrypi:~ $ i2cdetect -y 1
     0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:          -- -- -- -- -- -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
20: -- -- -- -- 24 -- -- -- -- -- -- -- -- -- -- --
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- --
pi@raspberrypi:~ $ nfc-list
nfc-list uses libnfc 1.7.1
NFC device: pn532_i2c:/dev/i2c-1 opened
pi@raspberrypi:~ $
```

Run *nfc-poll* to scan the RFID tag and you can read information on the card:

```
pi@raspberrypi:~ $ nfc-list
nfc-list uses libnfc 1.7.1
NFC device: pn532_i2c:/dev/i2c-1 opened
pi@raspberrypi:~ $ nfc-poll
nfc-poll uses libnfc 1.7.1
NFC reader: pn532_i2c:/dev/i2c-1 opened
NFC device will poll during 30000 ms (20 pollings of 300 ms for 5 modulations)
ISO/IEC 14443A (106 kbps) target:
    ATQA (SENS_RES): 00  04
       UID (NFCID1): f4  55  4e  b8
      SAK (SEL_RES): 08
nfc_initiator_target_is_present: Target Released
Waiting for card removing...done.
pi@raspberrypi:~ $
```

SPI Communication Instructions for Raspberry Pi

1. Open SPI of the Raspberry Pi:

```
sudo raspi-config
```

Select **9 Advanced Options -> SPI -> yes**.

2. Install some dependent packages

```
sudo apt-get update
sudo apt-get install libusb-dev libpcsclite-dev i2c-tools
```

3. Download and unzip the source code package of libnfc

```
cd ~
wget http://dl.bintray.com/nfc-tools/sources/libnfc-1.7.1.tar.bz2
tar -xf libnfc-1.7.1.tar.bz2
```

4. Compile and install

```
cd libnfc-1.7.1
./configure --prefix=/usr --sysconfdir=/etc
make
sudo make install
```

5. Write the configuration file for NFC communication

```
cd /etc
sudo mkdir nfc
sudo nano /etc/nfc/libnfc.conf
```

Check the following details of the file *etc/nfc/libnfc.conf*:

```
# Allow device auto-detection (default: true)
# Note: if this auto-detection is disabled, user has to set manually a devi
# configuration using file or environment variable
allow_autoscan = true

# Allow intrusive auto-detection (default: false)
# Warning: intrusive auto-detection can seriously disturb other devices
# This option is not recommended, user should prefer to add manually his de
allow_intrusive_scan = false

# Set log level (default: error)
# Valid log levels are (in order of verbosity): 0 (none), 1 (error), 2 (inf
# Note: if you compiled with --enable-debug option, the default log level i
log_level = 1

# Manually set default device (no default)
# To set a default device, you must set both name and connstring for your d
```

```
# Note: if autoscan is enabled, default device will be the first device ava
device.name = "_PN532_SPI"
device.connstring = "pn532_spi:/dev/spidev0.0:500000"
#device.name = "_PN532_I2c"
#device.connstring = "pn532_i2c:/dev/i2c-1"
```

6. Wiring

Toggle the switch to the **SPI mode**

SEL0	SEL1
L	H

Connect the devices:

PN532	Raspberry
5V	5V
GND	GND
SCK	SCKL
MISO	MISO
MOSI	MOSI
NSS	CE0

7. Run *ls /dev/spidev0.** to check whether the SPI is opened or not.

If yes, it means both the module and the wiring work well.
Then type in *nfc-list* to check the NFC module:
/dev/spidev0.0 /dev/spidev0.1
If two devices are detected, it means the SPI is already opened.
Then type in *nfc-list* to check the NFC module:

```
pi@raspberrypi:~ $ nfc-list
nfc-list uses libnfc 1.7.1
NFC device: pn532_spi:/dev/spidev0.0 opened
pi@raspberrypi:~ $
```

For Raspberry Pi 3, you may be appear the following error

```
pi@raspberrypi:/etc $ nfc-list
nfc-list uses libnfc 1.7.1
error   libnfc.driver.pn532_spi Unable to wait for SPI data. (RX)
pn53x_check_communication: Timeout
error   libnfc.driver.pn532_spi Unable to wait for SPI data. (RX)
nfc-list: ERROR: Unable to open NFC device: pn532_spi:/dev/spidev0.0:500000
pi@raspberrypi:/etc $
```

You should modifiy the *libnfc.conf*

```
sudo nano /etc/nfc/libnfc.conf
```

then modify 500000 to 50000:

```
device.connstring = "pn532_spi:/dev/spidev0.0:50000"
```

Run *nfc-poll* to scan the RFID tag and you can read information on the card:

```
pi@raspberrypi:~ $ nfc-poll
nfc-poll uses libnfc 1.7.1
NFC reader: pn532_spi:/dev/spidev0.0 opened
NFC device will poll during 30000 ms (20 pollings of 300 ms for 5 modulations)
ISO/IEC 14443A (106 kbps) target:
    ATQA (SENS_RES): 00  04
       UID (NFCID1): f4  55  4e  b8
      SAK (SEL_RES): 08
nfc_initiator_target_is_present: Target Released
Waiting for card removing...done.
pi@raspberrypi:~ $
```