

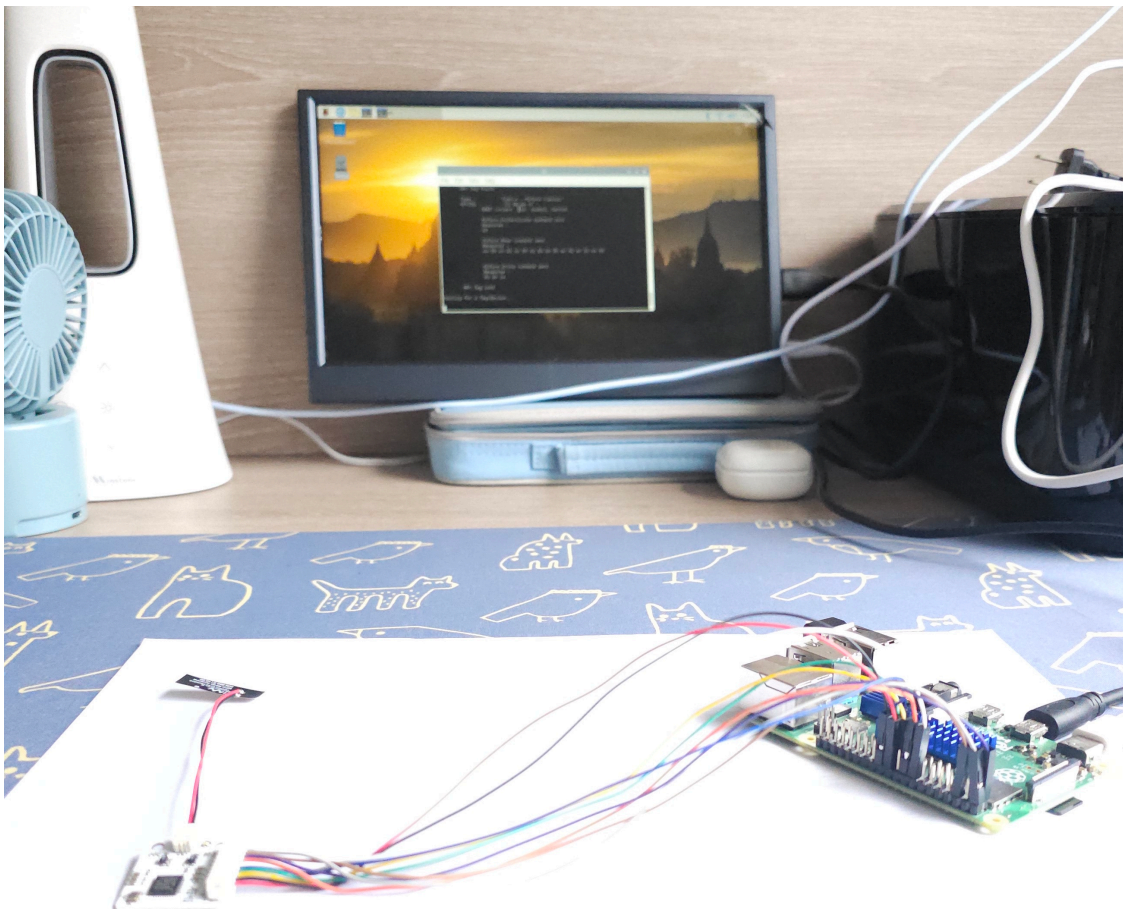
TESTING GUIDE

ELECHOUSE PN7160 SPI board quick start guide

This guide is based on NXP AN12991

For the following products:

PN7161 MINI V1 — SPI

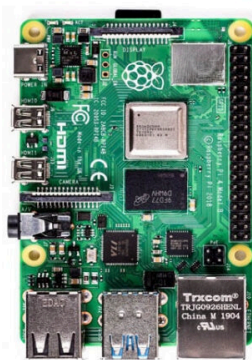


Quick Startup with Raspberry Pi interface board

3.1 Required items

- Raspberry Pi [\[1\]](#) running raspbian distribution.

3.2 Hardware setup



Function	Physical Pins					
	BCM	pin#	pin#	BCM	Function	
3.3 Volts		VDD 1	2	VANT	5 Volts	
GPIO/SDA1 (I2C)	2	3	4		5 Volts	
GPIO/SCL1 (I2C)	3	5	6	GND	GND	
GPIO/GCLK	4	7	8	14	TX UART/GPIO	
GND		9	10	15	RX UART/GPIO	
GPIO	17	11	12	18	GPIO	
GPIO	27	13	14		GND	
GPIO	22	15	16	IRQ	23	GPIO
3.3 Volts		17	18	VEN	24	GPIO
MOSI (SPI)	10	MOSI 19	20			GND
MISO(SPI)	9	MISO 21	22	DWL	25	GPIO
SCLK(SPI)	11	SCK 23	24	NSS	8	CEO_N (SPI)
GND		25	26	7		CE1_N (SPI)
RESERVED		27	28			RESERVED
GPIO	5	29	30			GND
GPIO	6	31	32	12		GPIO
GPIO	13	33	34			GND
GPIO	19	35	36	16		GPIO
GPIO	26	37	38	20		GPIO
GND		39	40	21		GPIO

Connection

PN7160 SPI -----Raspberry PI 4

MOSI	#19 MOSI
MISO	#21 MISO
NSS	#24 NSS
SCK	#23 SCLK
IRQ	#16 GPIO23
VEN	#18 GPIO24
VDD	#1/#17 3.3V PWR
VANT	#2/#4 5V PWR
GND	#6 GND
DWL	#22

3.3 Software setup

Use Raspbian (<https://www.raspberrypi.org/software/operating-systems/>). Guidelines to set up Linux environment on raspberry pi can be found here: <https://www.raspberrypi.org/documentation/installation/installing-images/>).

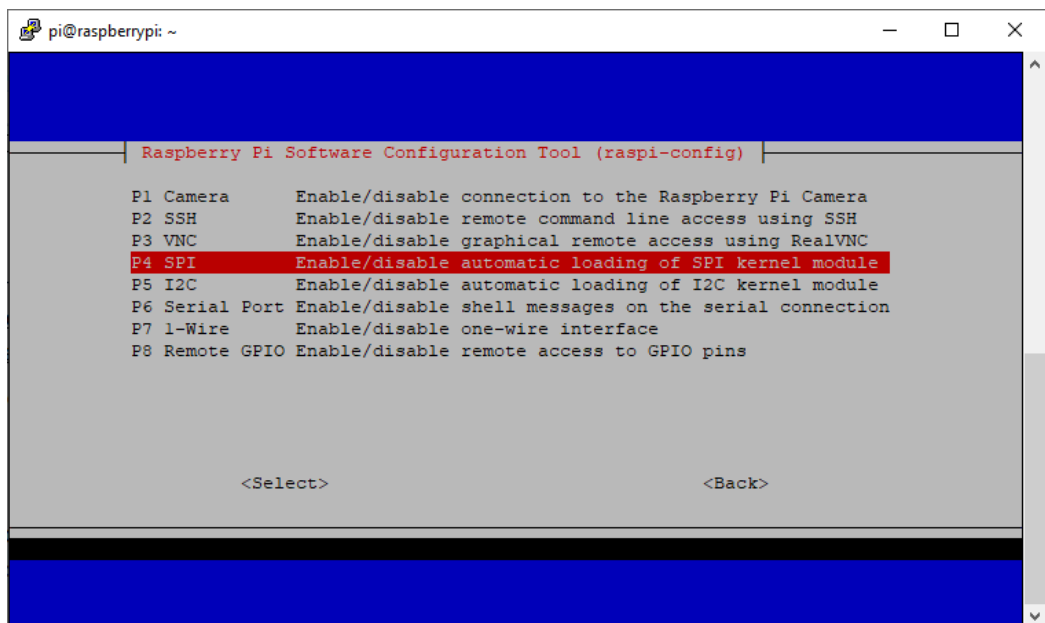
Below is the step-by-step procedure run from the Raspberry Pi to add software support for PN7160:

3.3.1 Enable SPI interface

1. Run command:

```
sudo raspi-config
```

2. Use the down arrow to select "Interface Options"
3. Arrow down to "P4 SPI"
4. Select "yes" when it asks you to enable SPI
5. Use the right arrow to select the <Finish> button



The screenshot shows a terminal window titled "pi@raspberrypi: ~" with the "Raspberry Pi Software Configuration Tool (raspi-config)" running. The tool displays a list of options for configuration. The "P4 SPI" option is highlighted in red, indicating it is the current selection. The options are:

Option	Description
P1 Camera	Enable/disable connection to the Raspberry Pi Camera
P2 SSH	Enable/disable remote command line access using SSH
P3 VNC	Enable/disable graphical remote access using RealVNC
P4 SPI	Enable/disable automatic loading of SPI kernel module
P5 I2C	Enable/disable automatic loading of I2C kernel module
P6 Serial Port	Enable/disable shell messages on the serial connection
P7 1-Wire	Enable/disable one-wire interface
P8 Remote GPIO	Enable/disable remote access to GPIO pins

At the bottom of the screen, there are two navigation options: "<Select>" and "<Back>".

To verify the SPI interface is enabled, enter the following command `ls /dev/spi*`.

The Pi should respond with `"/dev/spi0.0"` which represents the user-mode SPI interface to which is connected the PN7160.

3.3.3 Install necessary tools

Execute the command:

```
sudo apt-get install autoconf automake libtool git
```

3.3.4 Clone Linux libnfc-nci library repository

Execute the command:

```
git clone https://github.com/NXPnfcLinux/linux_libnfc-nci.git -b NCI2.0_PN7160
```

3.3.5 Configure the library

Execute the commands:

```
cd linux_libnfc-nci
./bootstrap
./configure
```

3.3.6 Set the library to map SPI interface

Edit `linux_libnfc-nci/conf/libnfc-nxp.conf` file to update `NXP_TRANSPORT` and `NXP_NFC_DEV_NODE` settings as shown below:

```
#####
# TRANSPORT Type
# 0x00 - I2C /SPI for noraml nxpnfc driver
# 0x01 - Not Used, kept to align with Android code
# 0x02 - ALT_I2C
# 0x03 - ALT_SPI
```

```
NXP_TRANSPORT=0x03
```

```
#####
# NXP HW Device Node information
NXP_NFC_DEV_NODE="/dev/spidev0.0"
```

3.3.8 Build and install the library

Execute the commands:

```
make
sudo make install
export LD_LIBRARY_PATH=/usr/local/lib
```

To make this last setting permanent, run the following command:

```
echo "export LD_LIBRARY_PATH=/usr/local/lib" >> .bashrc
```

3.3.9 Run the demo application (built and installed together with the library during previous step)

To simply display all data collected from remote NFC device (Peer, reader/writer or card), run the demo application in "poll mode" executing the command:

```
nfcDemoApp poll
```

For more details about the demo application modes execute command:

```
nfcDemoApp --help
```

For more detailed information about the demo application, but also for additional example applications, please refer to [\[2\]](#).

```
pi@raspberrypi: ~/linux_libnfc x + v
pi@raspberrypi:~/linux_libnfc-nci $ ./nfcDemoApp poll
#####
##                               NFC demo                               ##
#####
##                               Poll mode activated                       ##
#####
... press enter to quit ...

Waiting for a Tag/Device...

NFC Tag Found

Type :          'Type A - Mifare Classic'
NFCID1 :        '35 43 9F 93 '
NDEF Content :  NO, mode=1, tech=8

Mifare Authenticate command sent
Response :
00

Mifare Read command sent
Response :
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Mifare Write command sent
Response :
00 0A 14
```

