TESTING GUIDE ELECHOUSE PN7160 board quick start guide

This guide is based on NXP AN12991



3.1 Required items

• Raspberry Pi [1] running raspbian distribution.

3.2 Hardware setup



			Physical P	ins		
	Function	BCM	pin#	pin#	BCM	Function
	3.3 Volts		VDD 1	2 VANT		5 Volts
	GPIO/SDA1 (I2C)	2	SDA 3	4		5 Volts
	GPIO/SCL1 (I2C)	3	SCL 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	19	20		GND
	MISO(SPI)	9	21	22 DWL	25	GPIO
	SCLK(SPI)	11	23	24	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
Tracom [®]	GPIO	13	33	34		GND
TRJ00926HENL China M 1904	GPIO	19	35	36	16	GPIO
	GPIO	26	37	38	20	GPIO
	GND		39	40	21	GPIO

Connection

PN7160	Raspberry PI 4
SDA	#3 SDA
SCL	#5 SCL
IRQ	#16 GPIO23
VEN	#18 GPIO24
VDD	#1 3.3V PWR
VANT	#2 OR #4 5V PWR
GND	#6 GND
DWL	#22

3.3 Software setup

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

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

3.3.1 Enable I²C interface

1. Run command:

sudo raspi-config

- 2. Use the down arrow to select "Interface Options"
- 3. Arrow down to "P5 I2C"
- 4. Select "yes" when it asks you to enable I2C
- 5. Use the right arrow to select the <Finish> button

P1 Cam	era	Enable/disable	connection to the R	aspberry Pi Camera	ı.		
P2 SSH		Enable/disable	remote command line	access using SSH			
P3 VNC		Enable/disable	graphical remote ac	cess using RealVNC	:		
P4 SPI		Enable/disable	automatic loading o	of SPI kernel modul	.e		
P5 I2C		Enable/disable	automatic loading o	of I2C kernel modul	.e		
P6 Ser	ial Port	Enable/disable	shell messages on t	he serial connecti	.on		
P7 1-W:	ire	Enable/disable	one-wire interface	·			
10 1010				10 5100			
				(De els			
	<sei< td=""><td>ect></td><td></td><td><back></back></td><td></td><td></td><td></td></sei<>	ect>		<back></back>			
	P1 Came P2 SSH P3 VNC P4 SPI P5 12C P6 Seri P7 1-Wi P8 Remo	PI Camera P2 SSH P3 VNC P4 SPI P5 I2C P6 Serial Port P7 1-Wire P8 Remote GPIO <sel< td=""><td>PI Camera Enable/disable P2 SSH Enable/disable P3 VNC Enable/disable P4 SPI Enable/disable P5 I2C Enable/disable P6 Serial Port Enable/disable P7 1-Wire Enable/disable P8 Remote GPIO Enable/disable <pre><select></select></pre></td><td>PI Camera Enable/disable connection to the F P2 SSH Enable/disable remote command line P3 VNC Enable/disable graphical remote ac P4 SPI Enable/disable automatic loading of P5 I2C Enable/disable automatic loading of P6 Serial Port Enable/disable shell messages on t P7 1-Wire Enable/disable one-wire interface P8 Remote GPIO Enable/disable remote access to GP <pre></pre></td><td>PI 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 modul P5 I2C Enable/disable automatic loading of I2C kernel modul P6 Serial Port Enable/disable shell messages on the serial connecti P7 1-Wire Enable/disable one-wire interface P8 Remote GPIO Enable/disable remote access to GPIO pins <pre></pre> <select> <select> Select> Select> Select> Select> Select> Select></select></select></td><td>PI 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 <select></select></td><td>PI 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 <select></select></td></sel<>	PI Camera Enable/disable P2 SSH Enable/disable P3 VNC Enable/disable P4 SPI Enable/disable P5 I2C Enable/disable P6 Serial Port Enable/disable P7 1-Wire Enable/disable P8 Remote GPIO Enable/disable <pre><select></select></pre>	PI Camera Enable/disable connection to the F P2 SSH Enable/disable remote command line P3 VNC Enable/disable graphical remote ac P4 SPI Enable/disable automatic loading of P5 I2C Enable/disable automatic loading of P6 Serial Port Enable/disable shell messages on t P7 1-Wire Enable/disable one-wire interface P8 Remote GPIO Enable/disable remote access to GP <pre></pre>	PI 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 modul P5 I2C Enable/disable automatic loading of I2C kernel modul P6 Serial Port Enable/disable shell messages on the serial connecti P7 1-Wire Enable/disable one-wire interface P8 Remote GPIO Enable/disable remote access to GPIO pins <pre></pre> <select> <select> Select> Select> Select> Select> Select> Select></select></select>	PI 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 <select></select>	PI 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 <select></select>

To verify the l^2C interface is enabled, enter the following command ls /dev/i2c*.

The Pi should respond with "/dev/i2c-1" which represents the user-mode I^2C 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 I²C interface (only for OM27160A1EVK)

Edit linux_libnfc-nci/conf/libnfc-nxp.conf file to update NXP_TRANSPORT and NXP NFC DEV NODE settings as shown below:

NXP_TRANSPORT=0x02

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_libnf 🛛 🗙
##
                      NFC demo
                                                 ##
##
                   Poll mode activated
                                                 ##
... press enter to quit ...
Waiting for a Tag/Device...
    NFC Tag Found
    Type :
NFCID1 :
             'Type A - Mifare Classic'
'35 43 9F 93 '
         NDEF Content : NO, mode=1, tech=8
         Mifare Authenticate command sent
         Response :
         00
         Mifare Read command sent
         Response :
         Mifare Write command sent
         Response :
         00 0A 14
```