



PN71xx product support package

Plug-and-play NFC solutions

MobileKnowledge
July 2016

Agenda

Session 11th July: **PN71xx product presentation**

- ▶ Product introduction, target market and use cases
- ▶ PN7150 vs PN7120
- ▶ Product technical specifications
- ▶ Software integration
- ▶ Product support package
- ▶ Final remarks

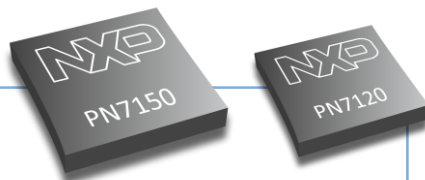
Session 20th July: **PN71xx product support package**

- ▶ Review of PN71xx product features
- ▶ Where to find PN71xx documentation
- ▶ PN71xx NFC controller SBC kits
- ▶ OM557x/PN71xx hardware details
- ▶ How to get started with OM557x/PN71x0ARD
- ▶ How to get started with OM5578/PN7150BB and OM5577/PN7120S
- ▶ How to get started with OM5578/PN7150RPI and OM5577/PN7120S



PN71xx family review

PN71xx - *Plug-and-play NFC solutions*



- ▶ Full **NFC Forum-compliant** controller
- ▶ Support NFC card emulation, reader/writer and peer-to-peer modes
- ▶ Compatible with **ISO/IEC 14443-A&B**, **FeliCa** and **ISO/IEC 15693** cards
- ▶ Very easy to integrate thanks to the embedded firmware and NCI-standardized interface
- ▶ Linux, Android and WinIoT drivers ease integration and reduce time to market
- ▶ **Low power** operation mode
- ▶ Standard packages: HVQFN40(PN7150), VFBGA49(PN7120)

Easy to integrate

Easy to use

Lower bill of materials

Optimized for portable applications



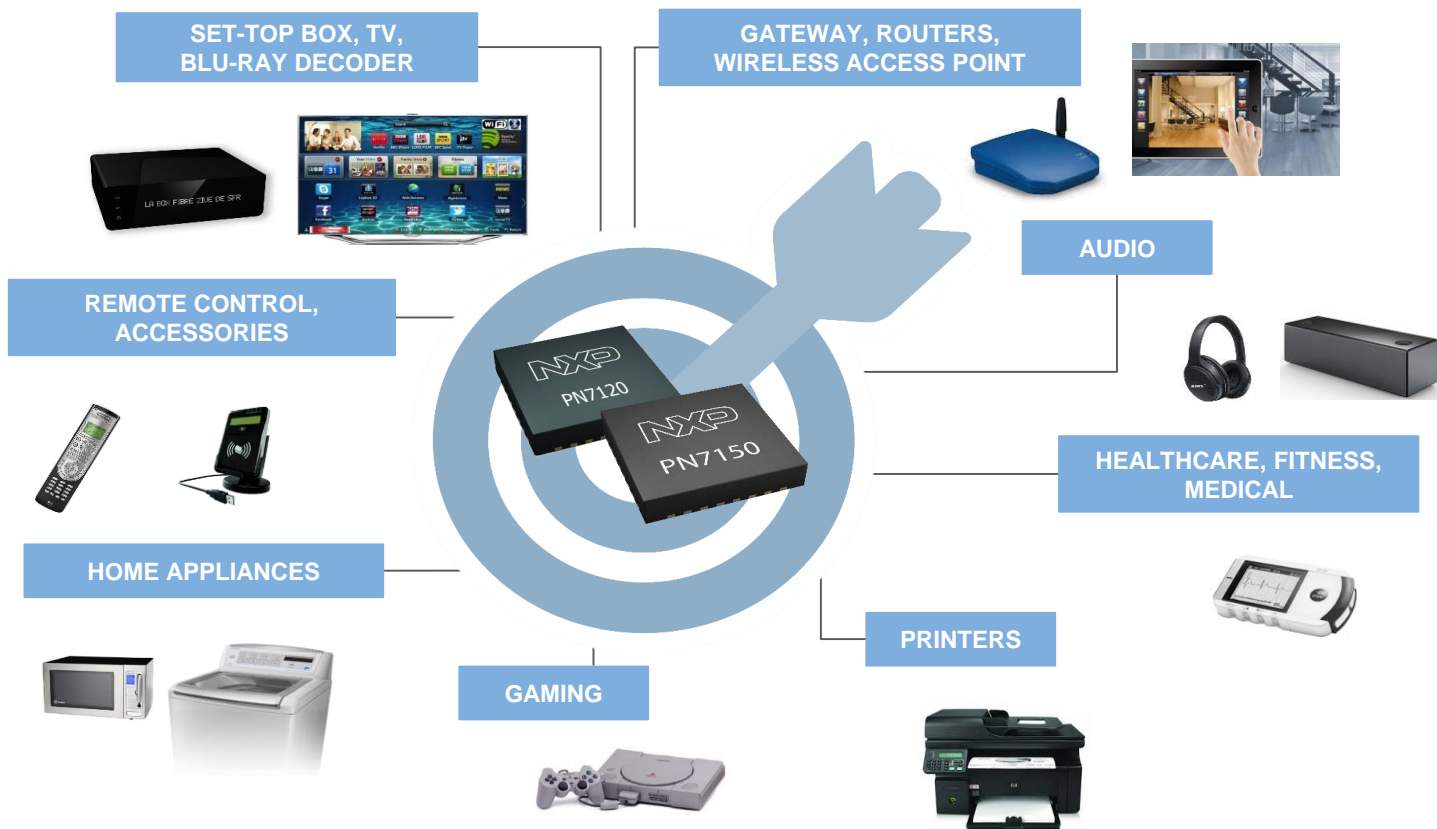
PN71xx key benefits

**Best plug'n play and high performance full NFC solutions
make your application smarter!**



Best plug'n play Fast to market	Smooth integration	High performance & interoperability
Standard NFC Interface (NCI) to the application host	Embedded FW minimizes host interactions and code size	Full NFC Forum compliant R/W, P2P and CE modes
Linux, Android and WinIoT drivers for OS applications	Low power detection mode, fully configurable	Standard (PN7120) or high (PN7150) output power
Code examples for RTOS and NullOs applications	Standard I ² C physical interface	NFC reader Tag type 1 to 5
Demo-kits interfacing with ARD, RPI and BBB platforms	BGA (PN7120) and QFN (PN7150) package	Passive (PN7120) or Active (PN7150) Load Modulation

PN71xx target market and use cases

The solution for any market which wants to make its application smarter with NFC

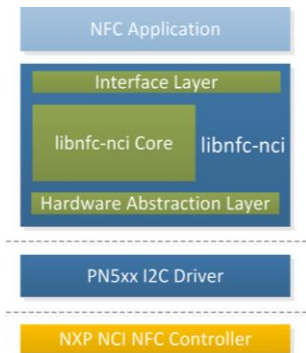


PN7150 vs PN7120

			Benefits
RF driver supply voltage	2.7V... 4.75V	2.7V or 3.3V	More output power to work with smaller antenna or better performance
Card emulation mode	NFC forum T4T - ISO/IEC A&B NFC forum T3T - FeliCa	NFC forum T4T - ISO/IEC A&B	Enable FeliCa use cases (Japan, HK, Singapore)
Package	HVQFN40	VFBGA49	Decrease PCB manufacturing cost (no microvias)
Load modulation concept	Active Load Modulation*	Passive Load Modulation	Allow decreasing antenna size with same RF performance in Card Emulation and passive Target modes

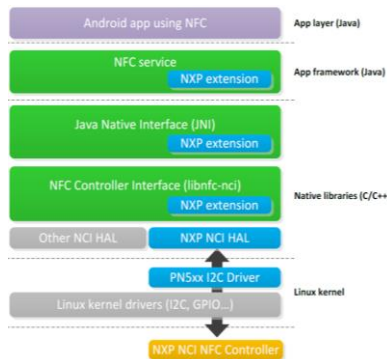
PN71xx easy SW integration into any environment

- ▶ NXP provides a portfolio of NFC controller solutions optimized for integration in OS environments such as Linux, Android, Windows or RTOS and even without operating system.



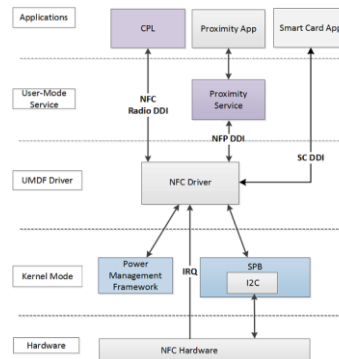
Linux NFC architecture

Linux integration is offered through NXP's Linux libnfc-nci SW stack



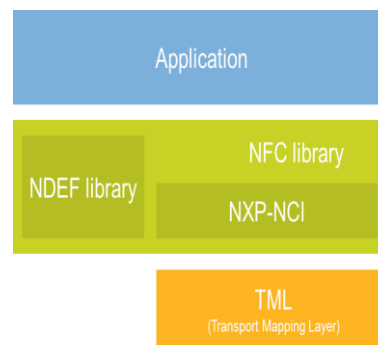
Android NFC architecture

Android integration is offered through the Android AOSP SW stack for which NXP delivers dedicated patches.



Windows NFC architecture

Windows integration is offered through Microsoft Windows universal NFC device driver model,




NulIOS/RTOS architecture

NullOS/RTOS integration is demonstrated with code examples running on NXP's LPC , Kinetis and i.MX MCUs

Where to find PN71xx support package

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Wide range of NFC and reader ICs for physical access systems, POS terminals, PC solutions, eGovernment applications, public transport schemes, Pay TV solutions, eMetering, gaming, industrial and white goods applications.

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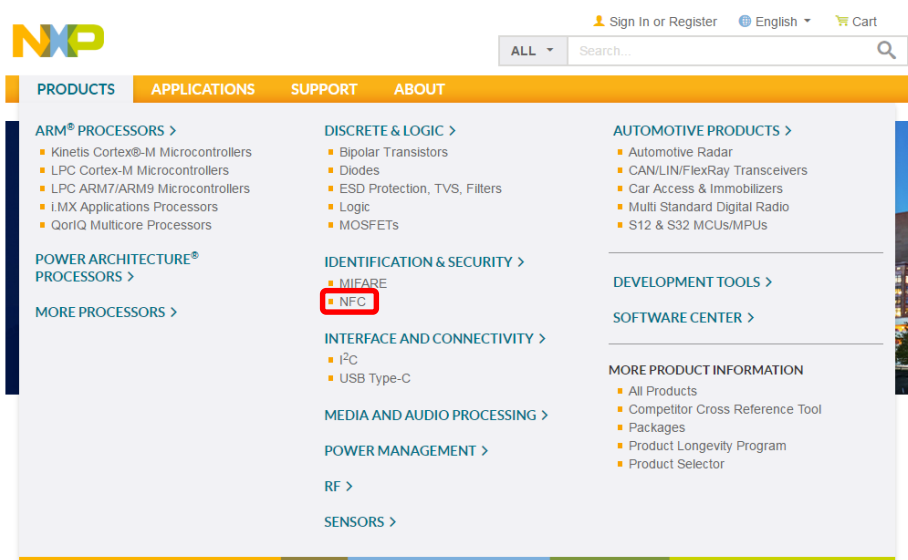
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 - HITAG Reader ICs
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- Media and Audio Processing
- Power Management
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- Single Chip Modules
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Where to find PN71xx support package

Browsing NXP website



The screenshot shows the NXP website's main navigation menu. The 'PRODUCTS' tab is selected, and the 'NFC' link is highlighted under the 'IDENTIFICATION & SECURITY' category. The 'NFC' link is circled in red.

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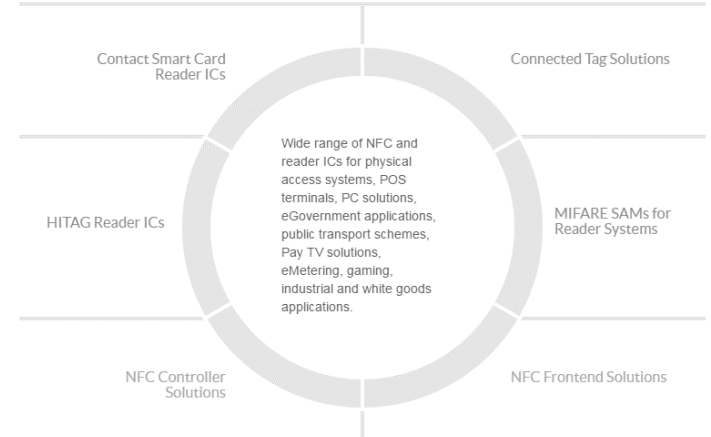
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NFC and Reader ICs

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Wide range of NFC and reader ICs for physical access systems, POS terminals, PC solutions, eGovernment applications, public transport schemes, Pay TV solutions, eMetering, gaming, industrial and white goods applications.

Contact Smart Card Reader ICs

Connected Tag Solutions

MIFARE SAMs for Reader Systems

NFC Frontend Solutions

NFC Controller Solutions

HITAG Reader ICs

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NFC and Reader ICs

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Wide range of NFC and reader ICs for physical access systems, POS terminals, PC solutions, eGovernment applications, public transport schemes, Pay TV solutions, eMetering, gaming, industrial and white goods applications.

Contact Smart Card Reader ICs

Connected Tag Solutions

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NFC Controller Solutions

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Show/Hide Parameters (4 Hidden)						
Reset Filters						
Compare Selected						
<input type="checkbox"/> PN5321A3HN	<input type="checkbox"/> Distributor	<input type="checkbox"/> 100.0 <input type="checkbox"/> 150.0 <input type="checkbox"/> 180.0 <input type="checkbox"/> 250.0			<input type="checkbox"/> I2C <input type="checkbox"/> NCI protocol <input type="checkbox"/> SPI <input type="checkbox"/> UART	
<input type="checkbox"/> PN5331B3HN	Buy Options	150	ISO/IEC 14443A; PCD and PICC modes ISO/IEC...	300mW	SPI, I2C, UART	N
<input type="checkbox"/> PN7120	Buy Options	100	ISO/IEC 14443A; PCD and PICC modes ISO/IEC...	300mW	USB, UART	N
<input checked="" type="checkbox"/> PN7120	Buy Options	180	ISO/IEC 14443A; PICC and PCD ISO/IEC ...	450mW	I2C, NCI protocol	N
<input type="checkbox"/> PN7150B0HN		180	ISO/IEC 14443A; PICC and PCD ISO/IEC ...	700mW	I2C, NCI protocol	N

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NXP > Identification and Security > NFC and Reader ICs > NFC Controller Solutions

NFC Controller Solutions


Overview **Products**

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Products/Parts	Order	RF driver current [max] (mA)	Supported RF standards	RF Output Power [max]	Host Interface	Contact Interface
<input type="checkbox"/> PN5321A3HN	Buy Options	150	ISO/IEC 14443A; PCD and PICC modes ISO/IEC...	300mW	SPI, I2C, UART	N
<input type="checkbox"/> PN5331B3HN	Buy Options	100	ISO/IEC 14443A; PCD and PICC modes ISO/IEC...	300mW	USB, UART	N
<input checked="" type="checkbox"/> PN7120	Buy Options	180	ISO/IEC 14443A; PICC and PCD ISO/IEC ...	450mW	I2C, NCI protocol	N
<input type="checkbox"/> PN7150B0HN		180	ISO/IEC 14443A; PICC and PCD ISO/IEC ...	700mW	I2C, NCI protocol	N

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 - NFC Controller Solutions**
 - NFC Frontend Solutions
 - Connected Tag Solutions
 - Contact Smart Card Reader ICs
 - MIFARE SAMs for Reader Systems
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Products/Parts	Order	RF driver current [max] (mA)	Supported RF standards	RF Output Power [max]	Host Interface	Contact Interface
7						
Show/Hide Parameters (4 Hidden)						
Reset Filters						
Compare Selected						
<input type="checkbox"/> PN5321A3HN	Buy Options	150	ISO/IEC 14443A; PCD and PICC modes ISO/IEC...	300mW	SPI, I2C, UART	N
<input type="checkbox"/> PN5331B3HN	Buy Options	100	ISO/IEC 14443A; PCD and PICC modes ISO/IEC...	300mW	USB, UART	N
<input type="checkbox"/> PN7120	Buy Options	180	ISO/IEC 14443A; PICC and PCD ISO/IEC ...	450mW	I2C, NCI protocol	N
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PN7150B0HN: High performance full NFC Forum-compliant controller with integrated firmware and NCI interface ☆

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Data Sheets (1)

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High performance full NFC Forum-compliant controller with integrated firmware and NCI interface (REV 3.3) PDF (2.1 MB) PN7150 [English]	05 Jul 2016

Application Notes (10)

Name/Description	Modified Date
PN7150 Arduino SBC Kit Quick Start Guide (REV 1.1) PDF (692.0 kB) AN11841 [English]	22 Jun 2016
PN71x0 Linux Software Stack Integration Guidelines (REV 2.1) PDF (293.0 kB) AN11697 [English]	07 Jun 2016
PN71x0 Windows IoT Porting Guidelines (REV 1.1) PDF (265.0 kB) AN11767 [English]	07 Jun 2016

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PN7150 User Manual (REV 1.1) PDF (1.6 MB) UM10936 [English]	27 May 2016



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Demoboard for PN7150
Demoboard for PN7150. PN7150 is the highest performing plug-and-play solution for NFC. It complies to NFC Forum device requirements V1.3 for...

Software (6)



Android patches for support of NCI based NXP NFC Controllers in KitKat (REV 1.0)
It contains the patch adding support for PN7150/PN7120 to the Android Open Source Project, version KitKat 4.4.4.
● HTML (0 B)
Android patches for support of NCI based NXP NFC Controllers in KitKat
6/7/2016

Download



Android patches for support of NCI based NXP NFC Controllers in Lollipop (REV 1.0)
It contains the patch adding support for PN7150/PN7120 to the Android Open Source Project, version Lollipop 5.1.1 and higher.
● HTML (0 B)
Android patches for support of NCI based NXP NFC Controllers in Lollipop
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Linux NFC stack for NCI based NXP NFC Controllers (REV 1.0)
This repository contains the files for the Linux NFC stack in order to support NFC controllers (PN7120, PN7150).
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Name/Description	Modified Date
PN7150 Arduino SBC Kit Quick Start Guide (REV 1.1) PDF (692.0 kB) AN11841 [English]	22 Jun 2016
PN71x0 Linux Software Stack Integration Guidelines (REV 2.1) PDF (293.0 kB) AN11697 [English]	07 Jun 2016
PN71x0 Windows IoT Porting Guidelines (REV 1.1) PDF (265.0 kB) AN11767 [English]	07 Jun 2016

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Demoboard for PN7150. PN7150 is the highest performing plug-and-play solution for NFC. It complies to NFC Forum device requirements V1.3 for...

Android patches for support of NCI based NXP NFC Controllers in KitKat (REV 1.0)
It contains the patch adding support for PN7150/PN7120 to the Android Open Source Project, version KitKat 4.4.4.
HTML (0 B)
Android patches for support of NCI based NXP NFC Controllers in KitKat
6/7/2016

Android patches for support of NCI based NXP NFC Controllers in Lollipop (REV 1.0)
It contains the patch adding support for PN7150/PN7120 to the Android Open Source Project, version Lollipop 5.1.1 and higher.
HTML (0 B)
Android patches for support of NCI based NXP NFC Controllers in Lollipop
6/7/2016

Linux NFC stack for NCI based NXP NFC Controllers (REV 1.0)
This repository contains the files for the Linux NFC stack in order to support NFC controllers (PN7120, PN7150).
HTML (0 B) Linux NFC stack for NCI based NXP NFC Controllers
6/7/2016

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High performance full NFC Forum-compliant controller with integrated firmware and NCI interface (REV 3.3) PDF (2.1 MB) PN7150 [English]	05 Jul 2016

Application Notes (10)

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PN7150 Arduino SBC Kit Quick Start Guide (REV 1.1) PDF (692.0 kB) AN11841 [English]	22 Jun 2016
PN71x0 Linux Software Stack Integration Guidelines (REV 2.1) PDF (293.0 kB) AN11697 [English]	07 Jun 2016
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OM5578: Demoboards for PN7150 ☆

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OM29110 NFC's SBC Interface Boards User Manual (REV 1.1) PDF (912.0 kB) UM10956 [English]	27 May 2016

Supporting Information (1)

Name/Description	Modified Date
OM5578_PN7150 available add-on kits (REV 1.0) MP4 (1.3 MB) OM5578_PN7150_AVAILABLE_ADD_ON [English]	08 Jun 2016



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Code example OM5578: PN7150 Arduino Demoboard with OM13071:
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PN71x0 on RPI winIoT driver installation files (REV 1.1)
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Board Support Packages (2)



Hardware design files OM29110 (REV 1.1)
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Hardware design files OM5578_PN7150S (REV 1.1)
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Operating Systems (6)



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OM5578: Demoboards for PN7150 ☆

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Support Packages (2)

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PN71xx NFC controller SBC kits

OM5578/PN7150 and OM5577/PN7120

PN7120 NFC controller single board computer (SBC) kits: OM5577

PN7120



**PN7120 SBC Kit for
Raspberry Pi and
BeagleBone Black**
(OM5577/PN7120S)

- › PN7120 NFC Controller Board
- › Raspberry Pi Interface board
- › BeagleBone Black Interface board
- › NFC Forum Type 2 Tag (MIFARE UL Card)



**PN7120 SBC Kit for
Arduino**
(OM5577/PN7120ARD)

- › PN7120 NFC controller board
- › Arduino Interface board
- › NFC Forum Type 2 Tag



PN7150 NFC controller single board computer (SBC) kits: OM5578

PN7120



PN7150

**PN7150 SBC Kit for
Arduino**
(OM5578/PN7150ARD)

- › PN7150 NFC controller board
- › Arduino Interface board
- › NFC Forum Type 2 Tag



**PN7150 SBC Kit for
Raspberry Pi**
(OM5578/PN7150RPI)

- › PN7150 NFC controller board
- › Raspberry Pi Interface board
- › NFC Forum Type 2 Tag



**PN7150 SBC Kit for
BeagleBone Black**
(OM5578/PN7150BBB)

- › PN7150 NFC controller board
- › BeagleBone Black Interface board
- › NFC Forum Type 2 Tag



OM5578/PN7150 and OM5577/PN7120

Hardware details

OM5578/PN7150S

PN7150 NFC controller board

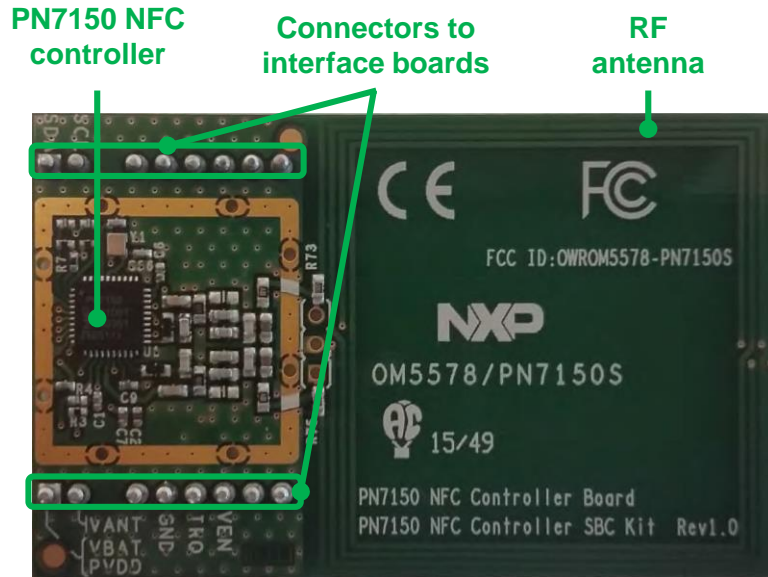


Fig. OM5578/PN7150S NFC controller board

On-board antenna must be disconnected removing resistors R73 and R75

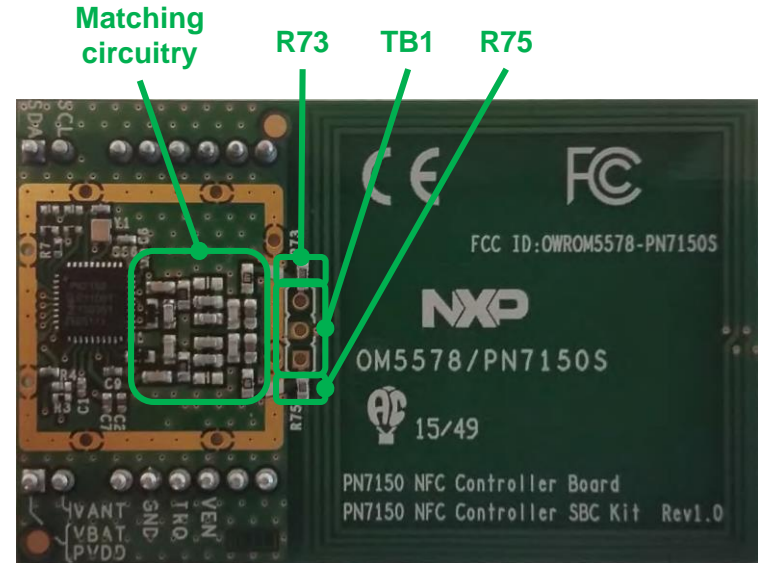


Fig. OM5578/PN7150S NFC controller board RF antenna components

OM5578/PN7150S

PN7150 NFC controller board

OM5578 comes with configuration 2 (external 5V) used to generate TVDD. Can be changed to Configuration 1 (VBAT to generate the TVDD)

R3 and R4



Fig. OM5578/PN7150S NFC controller board TVDD supply option

OM5578 comes with default I2C address 0x28. It is possible to change it between 0x28 and 0x2B

R6, R23, R24 and R32



Fig. OM5578/PN7150S NFC controller board I2C address configuration

OM5578/PN7150S

OM29110 interface boards

Connectors to
Raspberry Pi board

NFC generic
interface connectors

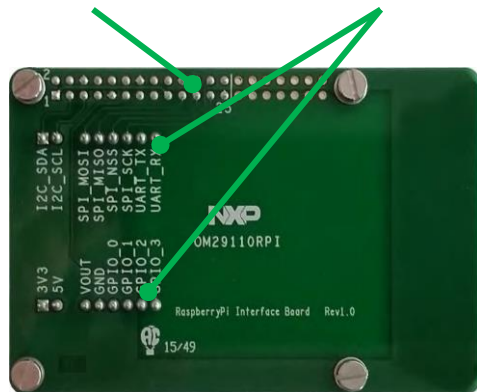


Fig. OM29110 Raspberry Pi interface board

Connectors to
BeagleBone Black
board

NFC generic
interface connectors



Fig. OM29110 Beagle Bone interface board

Connectors to
Arduino header
boards

NFC generic
interface connectors

R1
footprint

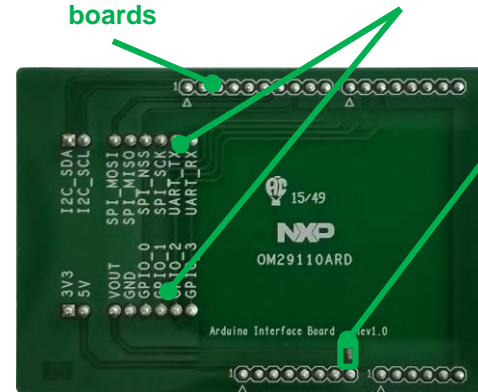
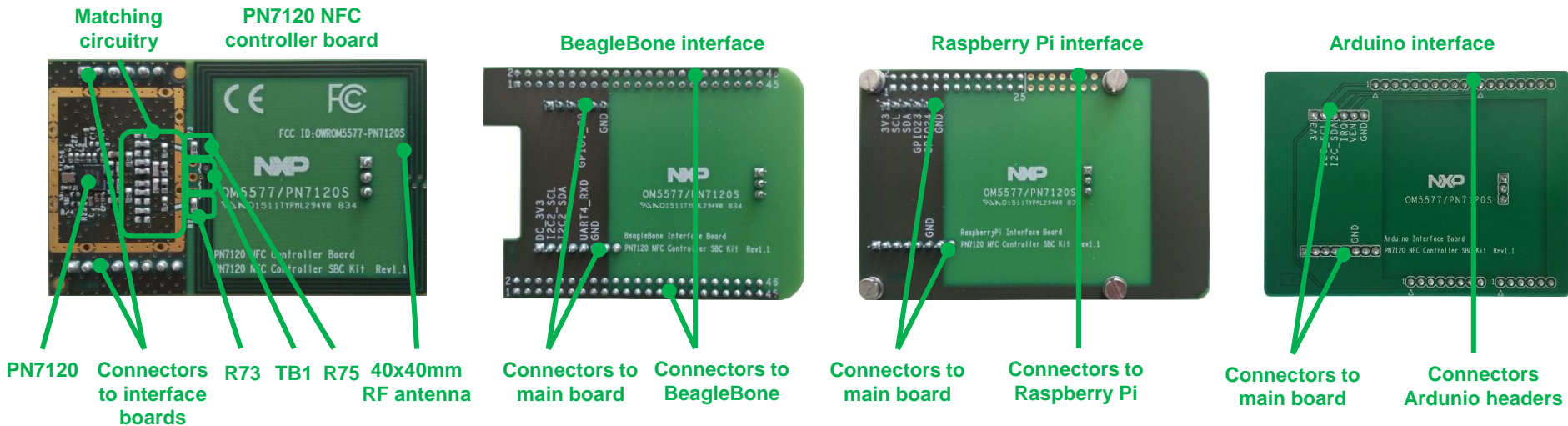


Fig. OM29110 Arduino interface board

OM5578/PN7150 kit can be re-used
in another system by building your
own interface board

OM5577/PN7120S

PN7120 NFC controller board and interface boards



On-board antenna must be disconnected removing resistors R73 and R75

OM5577/PN7120 kit can be reused in another system by building your own interface board

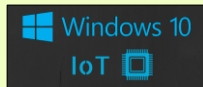
OM5578/PN7150 and OM5577/PN7120
SW images included in the PSP

OM5778/PN7150 and OM5577/PN7120

SW images

PN7150

OM5578/PN7150ARD



OM5578/PN7150RPI

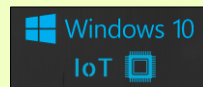


OM5578/PN7150BBB



PN7120

OM5577/PN7120ARD



OM5577/PN7120S



How to get started with

OM5578/PN7150ARD
OM5577/PN7120ARD

Getting started with OM557x/PN71xxARD

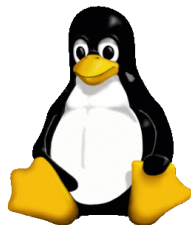
Software compatibility

Hardware compatibility

Linux driver support

[OM5578 PN7150 ARD UDOO Linux demo image](#)

[OM5577 PN7120 ARD UDOO Linux](#)



Android driver support

[OM5578 UDOO Neo Android Lollipop demo image](#)

[OM5577 UDOO Neo Android Lollipop demo image](#)



RTOS and NulIOS support

[NXP-NCI LPCXpresso example](#)

[NXP-NCI Kinetis Design Studio example](#)



Getting started with OM557x/PN71xxARD

Software compatibility

Hardware compatibility

LPCXpresso boards

LPC8xx, LPC11xx, LPC12xx + any LPC controller & related boards:
LPCXpresso824-MAX and LPCXpresso board for LPC11u37H



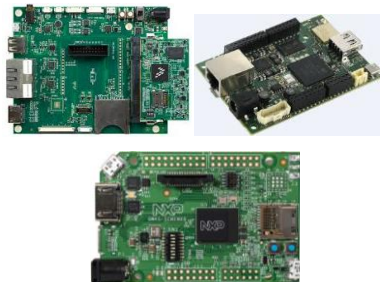
Kinetis & Freedom boards

K64F, KL43, KW40Z/KW41Z + most other Kinetis controller & related boards: FRDM-K64F, FRDM-KL43, FRDM-LW40Z/FRDM-KW41Z



i.MX boards

i.MX6, i.MX7 & related boards:
i.MXUltralite Evaluation kit, Quick start board for SCM-i.MX 6DQ, UDOO Neo and UDOO Dual/Quad



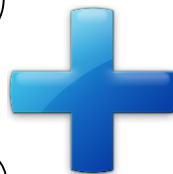
Quick startup on UDOO Neo

Quick startup on UDOO Neo

Required items

Headless IoT Device Mode

**UDOO Neo
board**



**PN71xx
controller board**



**PN71xx Arduino
interface board**



MicroSD card



**External
computer**

Quick startup on UDOO Neo

Required items

Computer mode

UDOO Neo board



MicroSD with OS Image



PN71xx controller board



PN71xx Arduino interface board



Cables and peripherals



Quick startup on UDOO Neo

Steps to follow

1

Download & Flash the image in the microSD card

2

Assembling the interface board and connecting the UDOO Neo to PC

3

Connect the UDOO Neo to peripherals or computer

4

Start the UDOO Neo board

5

Execute the demo example

[Link to video](#)

Quick startup on UDOO Neo

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[Link to video](#)

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Start the UDOO Neo board

5

Execute the demo example

[Link to video](#)

UDOO Neo – Application Example

Pairing a BLE Phone

[Link to video](#)

UDOO Neo – Application Example

Pairing a BLE Phone

[Link to video](#)

Quick startup on Kinetis

Required items



**Computer with KDS
(running Windows, Linux or
Mac OS X)**



or



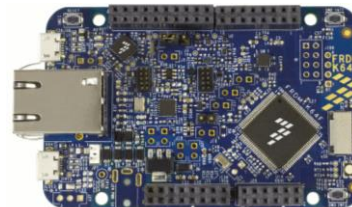
PN71xx controller board



or



PN71xx Arduino interface board



FRDM-K64F board

Freedom FRDMK-K64F:

<http://www.nxp.com/products/software-and-tools/hardware-development-tools/freedom-development-boards/freedom-development-platform-for-kinetis-k64-k63-and-k24-mcus:FRDM-K64F>

Hardware setup

OM5578/PN7150ARD + FRDM-K64F hardware setup

*Stack together PN7150 NFC controller board + Arduino
interface board + FRDM-K64F board*



OM5577/PN7120ARD + FRDM-K64F hardware setup

*Stack together PN7120 NFC controller board + Arduino
interface board + FRDM-K64F board*

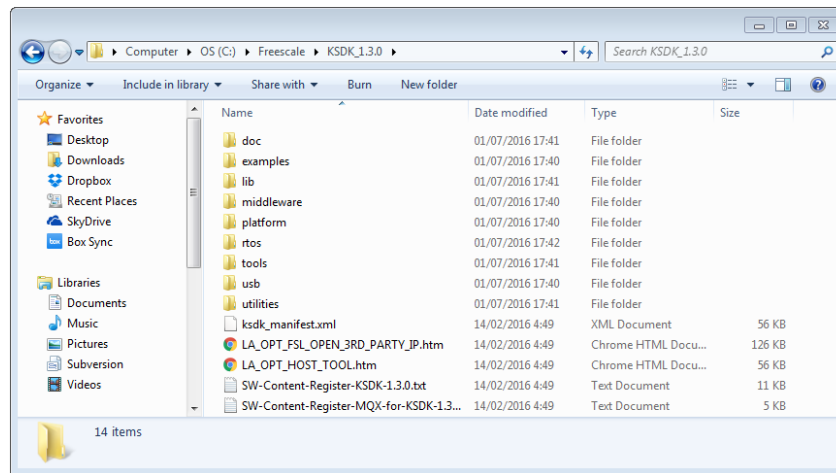
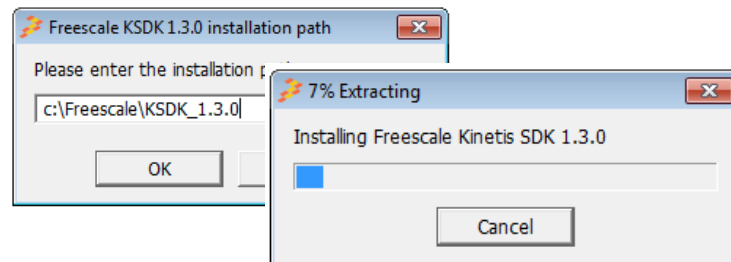


Software setup

FRDM-K64F software setup

Get Kinetis Design Studio (KDS), Kinetis Software Development Kit (KSDK), install virtual COM driver, install a terminal application, import and run the example.

- 1 Kinetis SW development kit v1.3 ([Download](#))

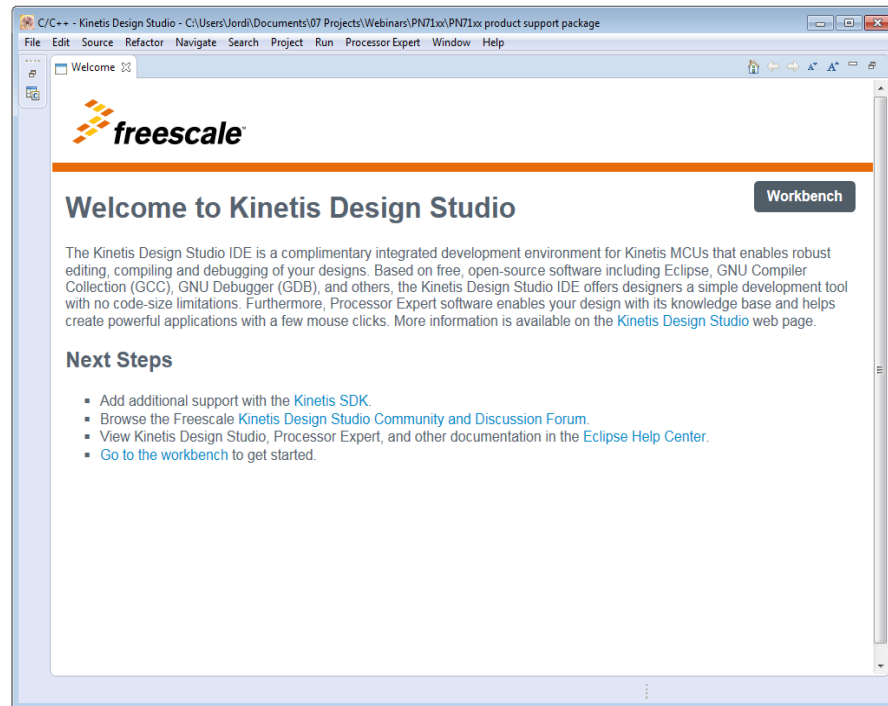


Software setup

FRDM-K64F software setup

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- 1 Kinetis SW development kit v1.3 ([Download](#))
- 2 Kinetis Design Studio ([Download](#))

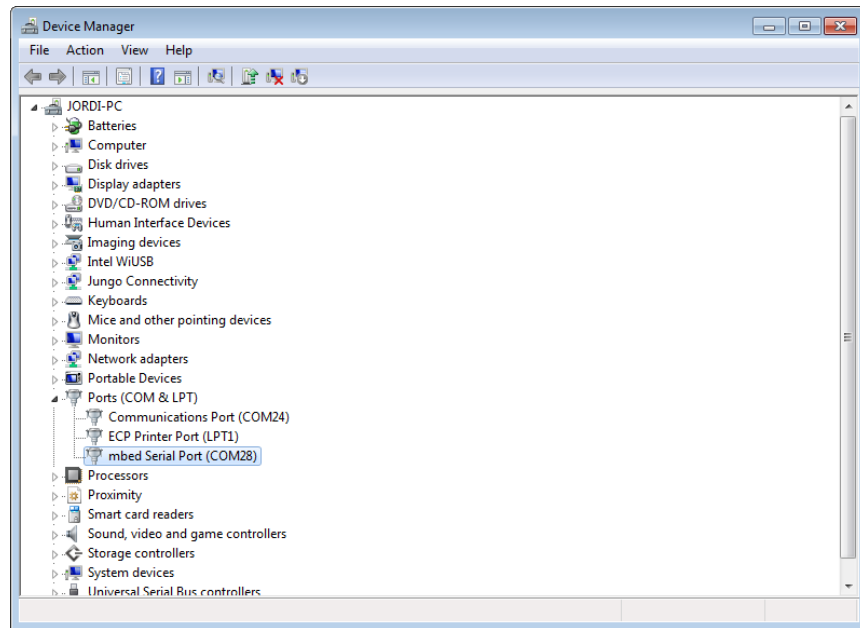


Software setup

FRDM-K64F software setup

Get Kinetis Design Studio (KDS), Kinetis Software Development Kit (KSDK), install virtual COM driver, install a terminal application, import and run the example.

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- 2 Kinetis Design Studio ([Download](#))
- 3 Virtual COM Driver ([Download](#))



Software setup

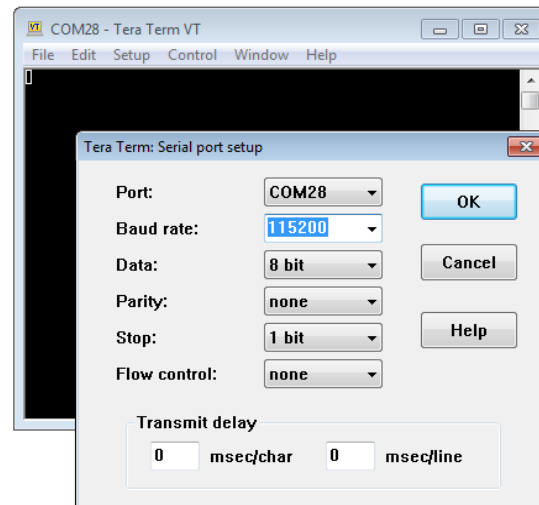
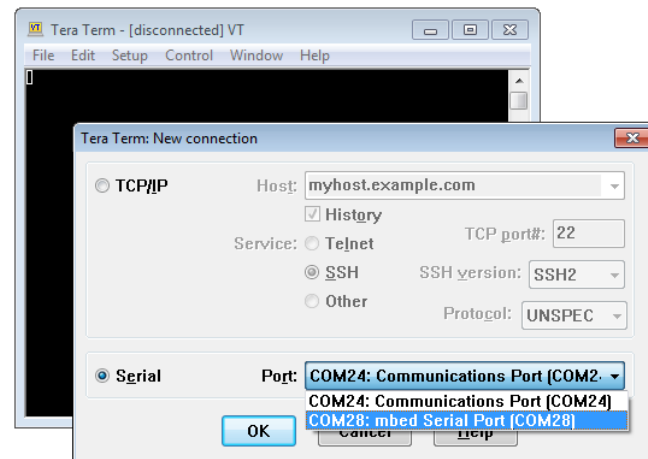
FRDM-K64F software setup

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- 1 Kinetis SW development kit v1.3 ([Download](#))
- 2 Kinetis Design Studio ([Download](#))
- 3 Virtual COM Driver ([Download](#))
- 4 Tera Term terminal application ([Download](#))

a Configure new connection:
File → New connection → Select mbed Serial Port

b Configure serial port settings:
Setup → Serial Port: Set 115200 baud rate, 8 data bits, no parity and 1 stop bit



Kinetis development environment setup

1

Create an empty workspace in Kinetis Design Studio (KDS) IDE

2

Import the kds_platform_lib_K64F12 project from the Kinetis Software Development Kit (KSDK)
Can be found in KSDK v1.3 installation directory

3

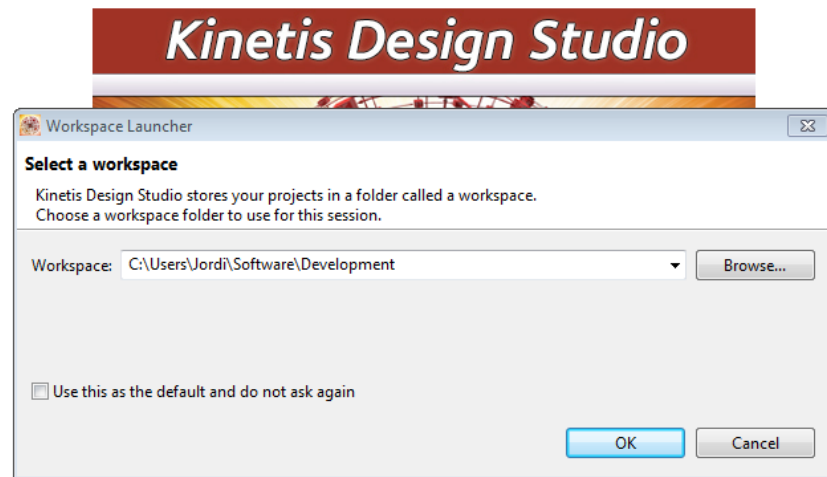
Import the NXPNCI_KDS_Example project
SW3735- NXP-NCI Kinetis Design Studio example

4

Build the NXPNCI_KDS_Example project
Clicking on the "hammer" icon

5

Debug the NXPNCI_KDS_Example project
Generate a debug configuration



Kinetis development environment setup

1

Create an empty workspace in Kinetis Design Studio (KDS) IDE

2

Import the kdsdk_platform_lib_K64F12 project from the Kinetis Software Development Kit (KSDK)

Can be found in KSDK v1.3 installation directory

3

Import the NXPNCI_KDS_Example project

SW3735- NXP-NCI Kinetis Design Studio example

4

Build the NXPNCI_KDS_Example project

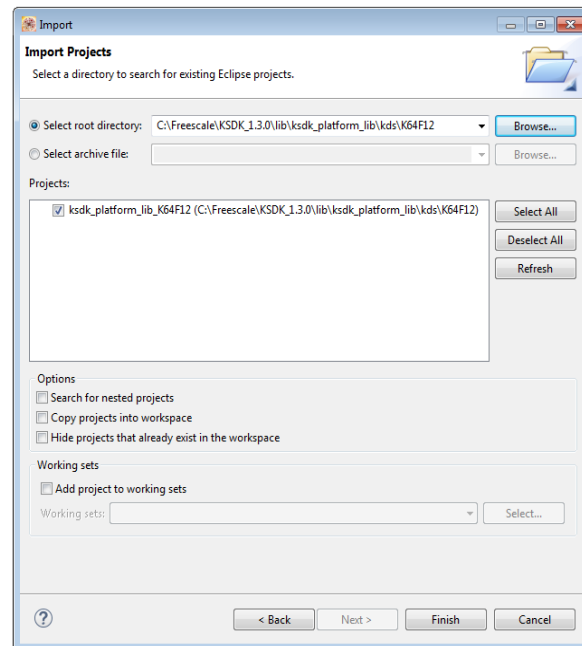
Clicking on the "hammer" icon

5

Debug the NXPNCI_KDS_Example project

Generate a debug configuration

Go to File → Import → General → Existing Projects into Workspace



Kinetis development environment setup

1

Create an empty workspace in Kinetis Design Studio (KDS) IDE

2

Import the kds_platform_lib_K64F12 project from the Kinetis Software Development Kit (KSDK)
Can be found in KSDK v1.3 installation directory

3

Import the NXPNCI_KDS_Example project
SW3735- NXP-NCI Kinetis Design Studio example

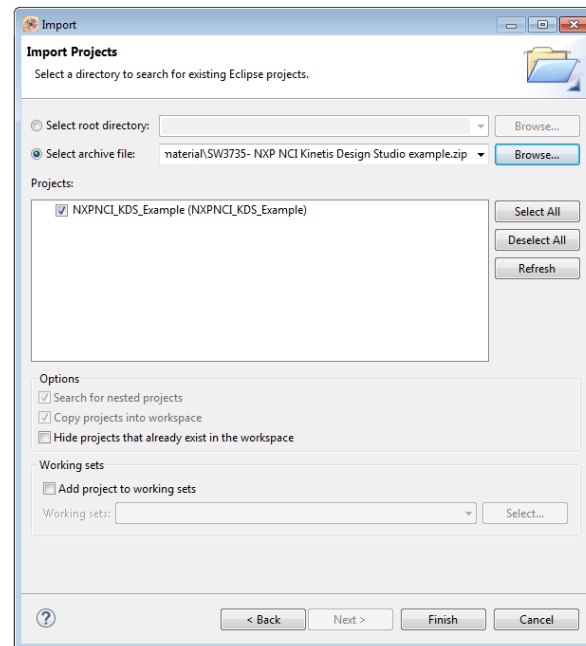
4

Build the NXPNCI_KDS_Example project
Clicking on the "hammer" icon

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Debug the NXPNCI_KDS_Example project
Generate a debug configuration

Go to File → Import → General → Existing Projects into Workspace



1

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4

5

The screenshot shows the Kinetis Design Studio IDE interface. The top menu bar includes File, Edit, Source, Refactor, Navigate, Search, Project, Run, Processor Expert, Window, and Help. Below the menu is a toolbar with various icons; one icon (a bug) is highlighted with a red rectangle.

The Project Explorer on the left shows a project named 'NXPNCL_KDS_Example' under the 'ksdk_platform_lib_K64F12' workspace. The Source Editor displays the file 'hardware_init.c' with the following code:

```

}
}

//-----
// Main Function
//-----

int main(void) {
    // Configure board specific pin muxing
    hardware_init();

    printf("\nRunning the NXP-NCI project.\n");

    OSA_Init();

    /* Create NFC task */
    if (OSA_TaskCreate(task_nfc, (uint8_t*) "NFC task",
        TASK_NFC_STACK_SIZE, task_nfc_stack,
        TASK_NFC_STACK_PRIORITY, (task_param_t) 0,
        false, &task_nfc_task_handler) != KSTATUS_OSA_Success) {
        printf("Error creating the NFC task\n");
        return 1;
    }

    /* Register for NFC functionalities */

```

The Problems Console at the bottom shows the build output for the CDT Build Console [NXPNCL_KDS_Example]. It details the building process for 'hardware_init.c' and 'pin_mux.c' using the Cross ARM C Compiler and Linker, and the final linking step to produce 'NXPNCL_KDS_Example.elf'. The console ends with the message: '10:26:54 Build Finished (took 11s.286ms)'.

Kinetis development environment setup

1

Create an empty workspace in Kinetis Design Studio (KDS) IDE

2

Import the kds_platform_lib_K64F12 project from the Kinetis Software Development Kit (KSDK)
Can be found in KDSK v1.3 installation directory

3

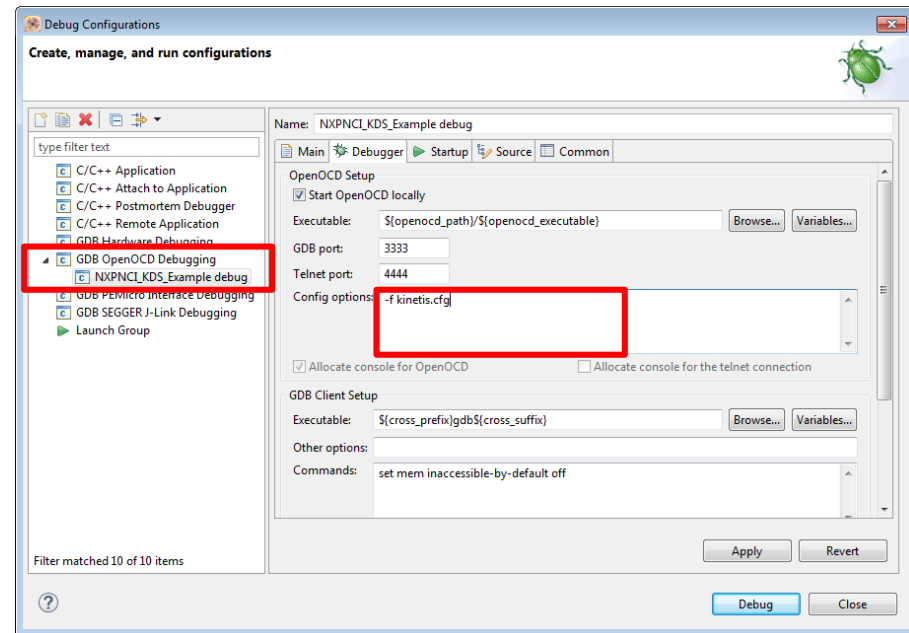
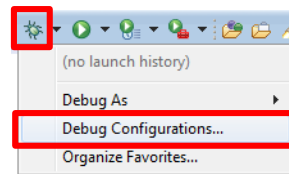
Import the NXPNCI_KDS_Example project
SW3735- NXP-NCI Kinetis Design Studio example

4

Build the NXPNCI_KDS_Example project
Clicking on the "hammer" icon

5

Debug the NXPNCI_KDS_Example project
Generate a debug configuration



Running the *NXPNCI_KDS_Example*

Example customization

Discovery loop configuration

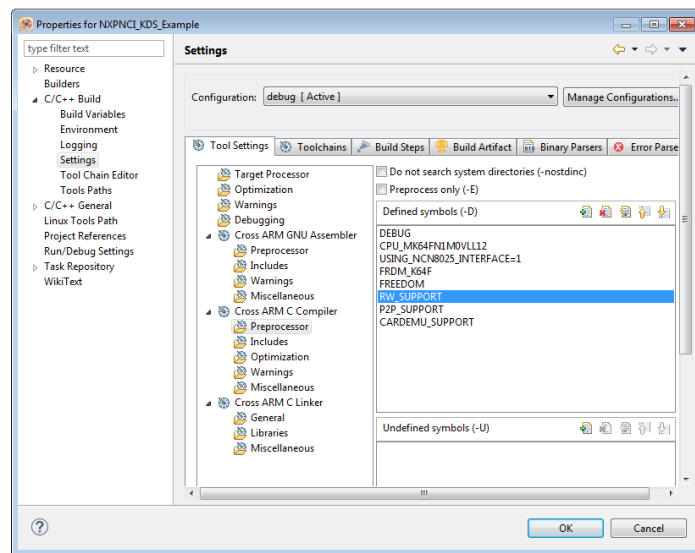
The discovery loop can be configured by setting “discovery technologies” variable inside the main.c function

By default all technologies are enabled (Passive NFC-A, NFC-B and NFC-F as well as Active NFC-F in both Poll and Listen modes

```
unsigned char DiscoveryTechnologies[] = {
#ifdef P2P_SUPPORT || defined RW_SUPPORT
    MODE_POLL | TECH_PASSIVE_NFCA,
    MODE_POLL | TECH_PASSIVE_NFCF,
#endif
#ifdef RW_SUPPORT
    MODE_POLL | TECH_PASSIVE_NFCB,
#endif
#ifdef P2P_SUPPORT
    MODE_POLL | TECH_ACTIVE_NFCF,
#endif
#ifdef P2P_SUPPORT || defined CARDEMU_SUPPORT
    MODE_LISTEN | TECH_PASSIVE_NFCA,
#endif
#ifdef CARDEMU_SUPPORT
    MODE_LISTEN | TECH_PASSIVE_NFCB,
#endif
#ifdef P2P_SUPPORT
    MODE_LISTEN | TECH_PASSIVE_NFCF,
    MODE_LISTEN | TECH_ACTIVE_NFCA,
    MODE_LISTEN | TECH_ACTIVE_NFCF,
#endif
};
```

NFC modes compile flags

To disable a mode, just remove the related definition in the project properties (“RW_SUPPORT”, “P2P_SUPPORT”, “CARDEMU_SUPPORT”)



Running the *NXPNCI_KDS_Example*

Read/Write mode

[Link to video](#)

Extracts NDEF content from
a NFC Forum tag

Authenticates, reads and
writes MIFARE Classic block

Running the *NXPNCI_KDS_Example*

Card emulation mode

[Link to video](#)

Exposes NDEF content to a remote NFC reader

Running the *NXPNCI_KDS_Example*

Peer-to-Peer mode

[Link to video](#)

Exchanges NDEF content
with remote P2P device

How to get started with

OM5578/PN7150BBB

OM5577/PN7120S (BBB interface board)

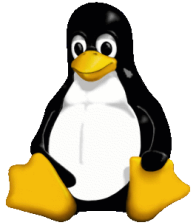
Getting started with OM5578/PN7150BBB and OM5577/PN7120S

Software compatibility

Linux driver support

[OM5578 PN7150 BBB Linux demo image](#)

[OM5577 BeagleBone Linux demo image](#)



Android driver support

[OM5578 PN7150 BBB KitKat demo image](#)

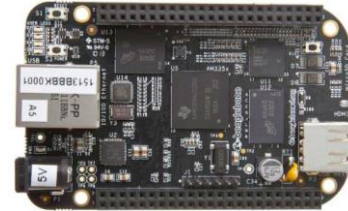
[OM5577 BeagleBone Android KitKat demo image](#)



Hardware compatibility

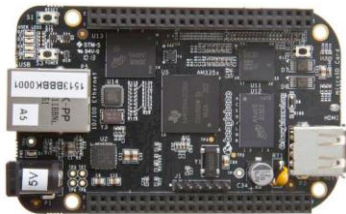
BeagleBone Black

Low-power open-source hardware single board credit-card-sized Linux computer that runs Android and Ubuntu.



Required items

**BeagleBone
Black
board**



**MicroSD with
OS Image
(8GB)**



**PN71xx
controller board**



**PN71xx BBB
interface board**



**Cables and
peripherals**



Quick startup on BeagleBone Black

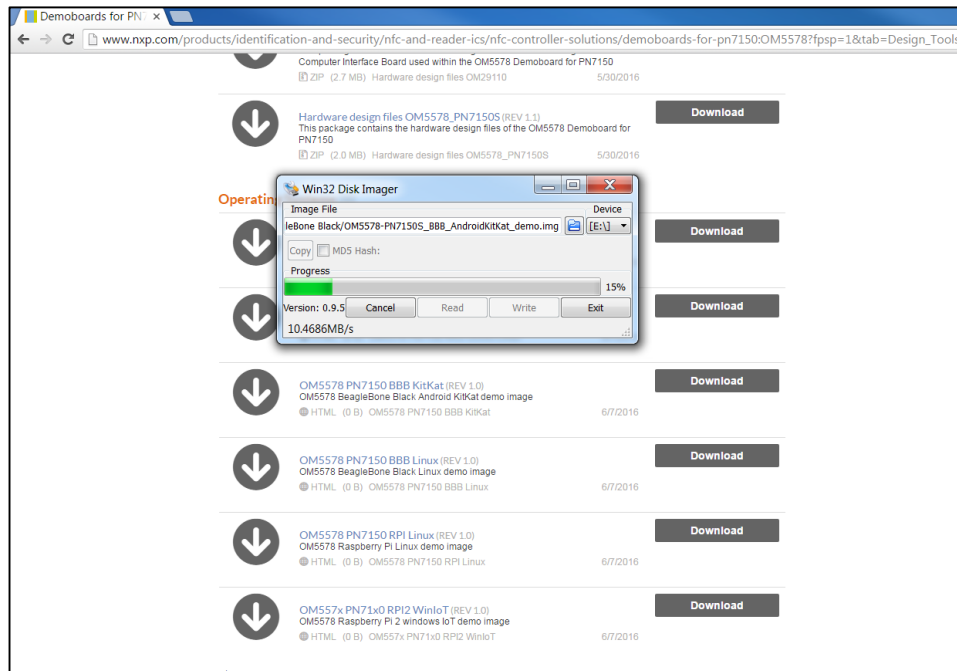
Steps to follow

1 Download & Flash the image in the microSD card

2 Assembling the interface board to the BeagleBone Black

3 Connect the peripherals to the BeagleBone Black

4 Start the BeagleBone Black board and execute demo example



Quick startup on BeagleBone Black

Steps to follow

1

Download & Flash the image in the microSD card

2

Assembling the interface board to the BeagleBone Black

3

Connect the peripherals to the BeagleBone Black

4

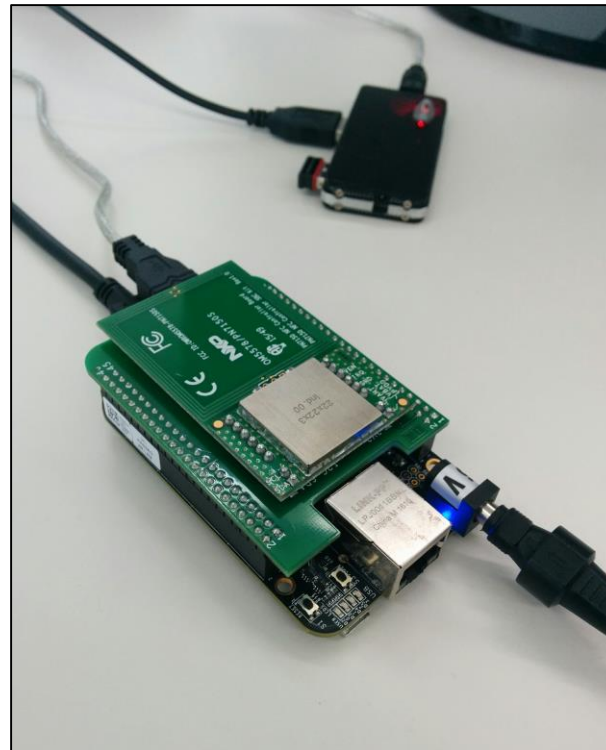
Start the BeagleBone Black board and execute demo example



Quick startup on BeagleBone Black

Steps to follow

- 1 Download & Flash the image in the microSD card
- 2 Assembling the interface board to the BeagleBone Black
- 3 Connect the peripherals to the BeagleBone Black
- 4 Start the BeagleBone Black board and execute demo example



Quick startup on BeagleBone Black

Steps to follow

1

Download & Flash the image in the microSD card

2

Assembling the interface board to the BeagleBone Black

3

Connect the peripherals to the BeagleBone Black

4

Start the BeagleBone Black board and execute demo example

[Link to video](#)

How to get started with

OM5578/PN7150RPI

OM5577/PN7120S (RPI interface board)

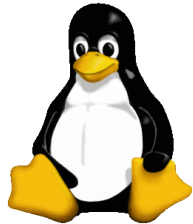
Getting started with OM5578/PN7150RPI and OM5577/PN7120S

Software compatibility

Linux driver support

[OM5577 Raspberry Pi Linux demo image](#)

[OM5578 PN7150 RPI Linux demo image](#)



Win10 IoT driver support

[OM557x PN71x0 RPI2 WinIoT](#)



Hardware compatibility

Raspberry Pi

Low-cost, credit-card sized computer that plugs into a computer monitor and uses standard keyboard and mouse



Quick startup on Raspberry Pi

Required items

Computer mode

Raspberry Pi
board



MicroSD with
OS Image



PN71xx
controller board



PN71xx
Raspberry Pi
interface board



Cables and
peripherals







Quick startup on Raspberry Pi

Steps to follow (Linux)

- 1 Download & Flash the Linux image in the microSD card
- 2 Assembling the interface board to the Raspberry Pi
- 3 Connect the peripherals to the Raspberry and insert the microSD
- 4 Start the Raspberry Pi board and execute demo example

Operating Systems (6)

	OM5578 UDOO Neo Android Lollipop demo image (REV 1.0) OM5578 UDOO Neo Android Lollipop demo image. HTML (0 B) OM5578-PN7150ARD-UDOO-LOLLIPOP 6/21/2016	Download
	OM5578 PN7150 ARD UDOO Linux (REV 1.0) OM5578 UdoNeo Linux demo image HTML (0 B) OM5578-PN7150-ARD-UDOO-Linux 6/22/2016	Download
	OM5578 PN7150 RPI Linux (REV 1.0) OM5578 Raspberry Pi Linux demo image HTML (0 B) OM5578-PN7150-RPI-Linux 6/7/2016	Download
	OM557x PN71x0 RPI2 WinIoT (REV 1.0) OM5578 Raspberry Pi 2 windows IoT demo image HTML (0 B) OM557x-PN71x0-RPI2-WinIoT 6/7/2016	Download

Less ^

Win32 Disk Imager

Image File
/OM557x-PN71x0S_Rpi2_WinIoT_demo/OM557x-PN71x0S_Rpi_WinIoT_demo_v1.1.img

Device
[D:]

Copy MD5 Hash:

Progress

Version: 0.9.5

Cancel Read Write Exit

Quick startup on Raspberry Pi

Steps to follow (Linux)

- 1 Download & Flash the Linux image in the microSD card
- 2 Assembling the interface board to the Raspberry Pi
- 3 Connect the peripherals to the Raspberry and insert the microSD
- 4 Start the Raspberry Pi board and execute demo example



Quick startup on Raspberry Pi

Steps to follow (Linux)

- 1 Download & Flash the Linux image in the microSD card
- 2 Assembling the interface board to the Raspberry Pi
- 3 Connect the peripherals to the Raspberry and insert the microSD
- 4 Start the Raspberry Pi board and execute demo example



Quick startup on Raspberry Pi

Steps to follow (Linux)

1

Download & Flash the Linux image
in the microSD card

2

Assembling the interface board to
the Raspberry Pi

3

Connect the peripherals to the
Raspberry and insert the microSD

4

Start the Raspberry Pi board and
execute demo example

[Link to video](#)

Quick startup on Raspberry Pi

Steps to follow (WinIoT)

1

Download & Flash the WinIoT image in the microSD card



2

Assembling the interface board to the Raspberry Pi

3

Connect the peripherals to the Raspberry and place the micro SD

4

Start the Raspberry Pi board and execute demo example



Operating Systems (6)



OM5578 UDOO Neo Android Lollipop demo image (REV 1.0)
OM5578 UDOO Neo Android Lollipop demo image.

HTML (0 B) OM5578-PN7150ARD-UDOO-LOLLIPOP

6/21/2016

Download



OM5578 PN7150 ARD UDOO Linux (REV 1.0)
OM5578 UdoNeo Linux demo image

HTML (0 B) OM5578-PN7150ARD-UDOO-Linux

6/7/2016

Download



OM

ON

HTML

(0 B)

OM5578-PN7150ARD-UDOO-Linux

6/7/2016

Download



OM

ON

HTML

(0 B)

OM5578-PN7150ARD-UDOO-Linux

6/7/2016

Download



OM5578 PN7150 RPI Linux (REV 1.0)
OM5578 Raspberry Pi Linux demo image

HTML (0 B) OM5578 PN7150 RPI Linux

6/7/2016

Download

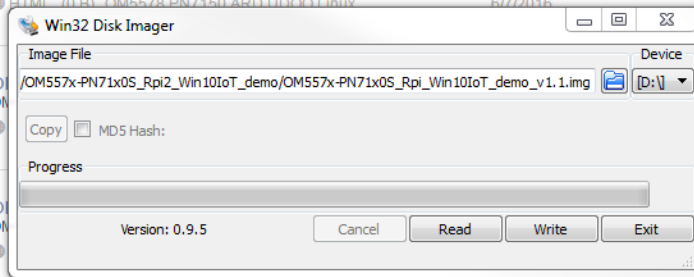


OM557x PN71x0 RPI2 WinIoT (REV 1.0)
OM5578 Raspberry Pi 2 windows IoT demo image

HTML (0 B) OM557x PN71x0 RPI2 WinIoT

6/7/2016

Download



Less ^

Quick startup on Raspberry Pi

Steps to follow (WinIoT)

1

Download & Flash the WinIoT image in the microSD card



2

Assembling the interface board to the Raspberry Pi

3

Connect the peripherals to the Raspberry and place the micro SD

4

Start the Raspberry Pi board and execute demo example



Proximity_BasicTest

This sample scenario shows when a device enters or leaves proximity communication range.

Proximate device arrived

Proximate device departed

Quick startup on Raspberry Pi

Steps to follow (WinIoT)

1

Download & Flash the WinIoT image in the microSD card



2

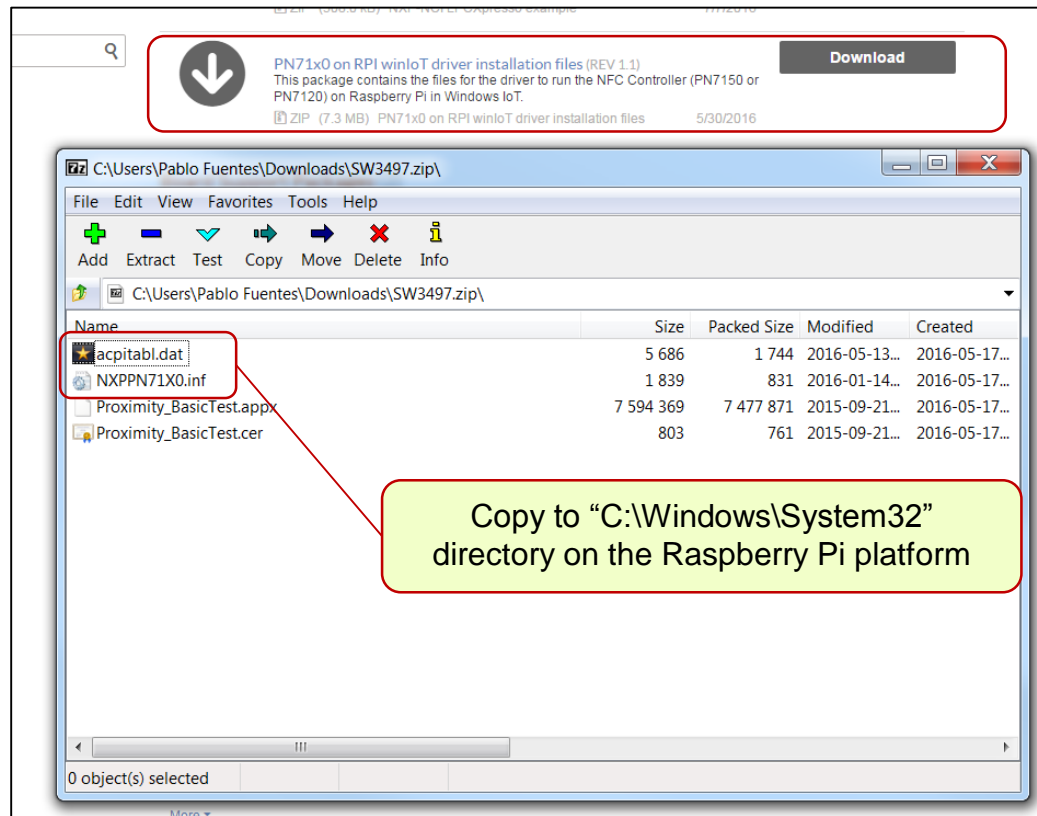
Assembling the interface board to the Raspberry Pi

3

Connect the peripherals to the Raspberry and place the micro SD

4

Start the Raspberry Pi board and execute demo example



Quick startup on Raspberry Pi

Steps to follow (WinIoT)

1

Download & Flash the WinIoT image in the microSD card



2

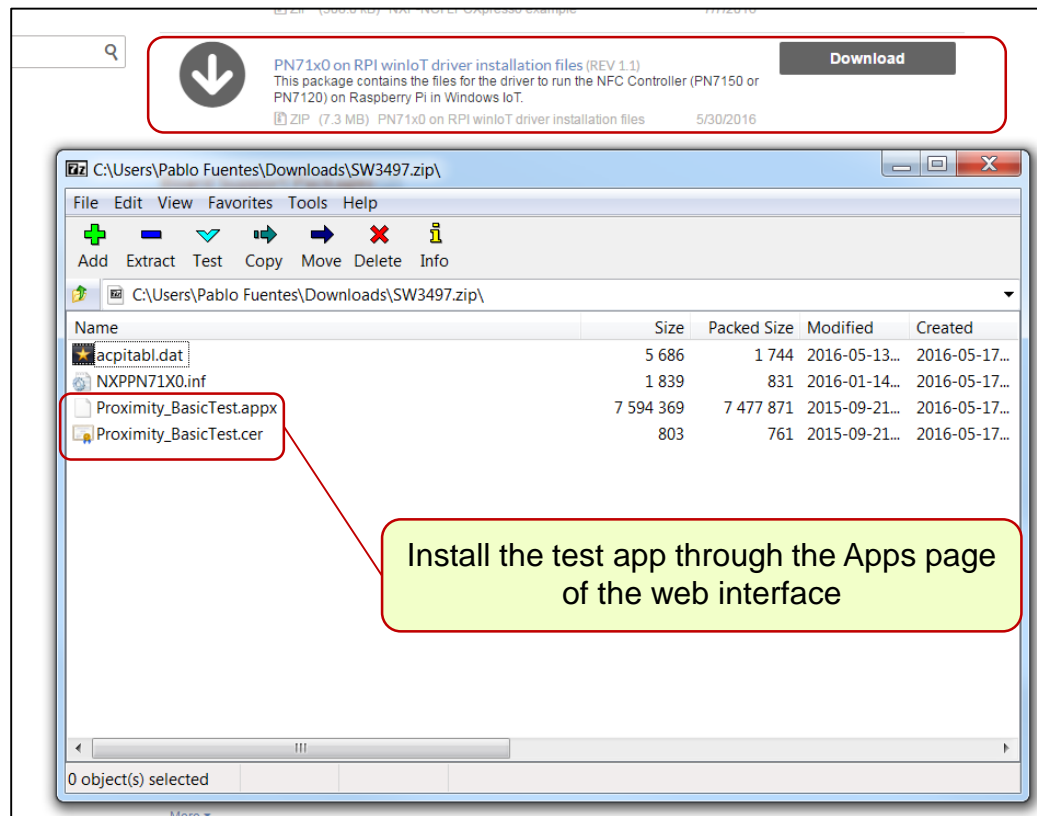
Assembling the interface board to the Raspberry Pi

3

Connect the peripherals to the Raspberry and place the micro SD

4

Start the Raspberry Pi board and execute demo example



Final remarks

PN71xx product support package in a nutshell



NFC controller SBC kits

- ▶ OM5577/PN7120S – PN7120 Controller SBC kit
- ▶ OM5577/PN7120ARD – PN7120 NFC Controller SBC kit for Arduino
- ▶ OM5578/PN7150ARD – PN7150 NFC Controller SBC kit for Arduino
- ▶ OM5578/PN7150BBB– PN7150 NFC Controller SBC kit for BeagleBone Black
- ▶ OM5578/PN7150RPI— PN7150 NFC Controller SBC kit for Raspberry Pi



SW support

- ▶ SW3735- NXP-NCI Kinetis Design Studio example
- ▶ SW3241- NXP-NCI LPCXpresso example
- ▶ SW3497- PN71x0 on RPI, WinIoT driver installation files
- ▶ OM5577_BBB_KITKAT – OM5577 BeagleBone Android KitKat demo image
- ▶ OM5577_BBB_LINUX- OM5577 BeagleBone Linux demo image
- ▶ OM5577_RPI_LINUX-OM5577 Raspberry Pi Linux demo image
- ▶ OM5577_RPI_WIN10IOT-OM5577 Raspberry Pi WinIoT10 demo image
- ▶ SW3497- PN71x0 on Raspberry Pi, WinIoT driver installation files
- ▶ OM5578 PN7150 UDOO Neo Linux system image
- ▶ OM5578 PN7150 Beaglebone Black KitKat Linux system image
- ▶ OM5578 PN7150 Beaglebone Black Linux system image
- ▶ OM5578 PN7150 Raspberry Pi Linux system image
- ▶ OM557x PN71x0 Raspberry Pi 2 WinIoT
- ▶ Linux NFC stack for NCI based NXP NFC Controllers
- ▶ Android patches for KitKat
- ▶ Android patches for Lollipop



Docs

- ▶ AN11646 – PN7120 NFC Controller SBC Kit Quick Start Guide
- ▶ AN11658 – NXP-NCI LPCXpresso example
- ▶ AN11845- NXP-NCI Kinetis Design Studio example
- ▶ UM10819 – PN7120 User Manual
- ▶ UM10878- NFC Controller SBC Kit User Manual
- ▶ AN11697 PN71x Linux Software Stack Integration guidelines
- ▶ AN11700- PN7120 Product Quick Start Guide
- ▶ AN11690 NXP-NCI Android porting guidelines
- ▶ AN11564 PN7120 Antenna Design and Matching guide
- ▶ AN11656 PN120 Hardware design guide
- ▶ AN11562 PN7120 Low Power Mode configuration
- ▶ AN11759 – Product quick start guide
- ▶ AN11755 – Antenna and tuning design guide
- ▶ AN11756 – Hardware design guide
- ▶ AN11757 – Low power mode configuration
- ▶ AN11767 – Windows IoT porting guidelines
- ▶ AN11758 – Raspberry Pi demo kit quick start guide
- ▶ AN11842 – BeagleBone demo kit quick start guide
- ▶ AN11841 – Arduino demo kit quick start guide
- ▶ UM10936 – User Manual

Find your NFC toolkit at: www.nxp.com



NFC use cases

NXP | Identification and Security | NFC and Reader ICs | NFC Technology Hub

NFC Technology Hub

Near Field Communication is hot. In today's increasingly connected world, this simple, intuitive technology lets you interact securely with the world around you with a simple touch. NFC is available in hundreds of millions of smartphones, tablets, and other consumer electronics, with new devices arriving almost daily. We are committed to see NFC everywhere very soon. This hub gives you technology insights as well as the latest news about NFC solutions from NXP.

With NFC being a specialized subset of RFID, also check out our dedicated [RFID technology page](#).

NFC News

NFC pairing - More time to relax, entertain, and connect at home
With just a tap, new purchases can perform service discovery, connect to the home network, or pair with other components, such as high-end speakers.

Blog: the future of mobile transit
With NFC (MIFARE) in your phone and wearable, you can securely pre-load your fare into the phone with an instant online purchase...

Press Release: NXP and Xsami Announce Mobile Payment Partnership
Read more about NFC >

NFC Products

NFC Everywhere: Controller, frontend, and connected-tag solutions for the next generation of NFC applications (brochure)

NFC for embedded applications: Your critical link for the Internet of Things (brochure)

Use cases & products

@ NFC Everywhere
www.nxp.com/NFC



NFC community

Community | News | Newsletters | Contacts | Feedback | Logins

NFC

Join general | Contents | Forums | Insights | Subscriptions & projects | Archives

Iniciar sesión para seguir, compartir y participar en esta comunidad

WELCOME TO NFC

We welcome to the NFC community. With our broad portfolio ranging from high power RF reader ICs to NFC enabled controllers we address all your needs. Based on our long experience we continue to lead the expansion from traditional smart card applications to a wide infrastructure based on NFC enabled devices. Get expert advice from the developer community. The support team also includes these forums to provide answers and take your feedback.

Anyone can read the discussions, but only registered NXP Community members may participate. Before you use a device, please check the community to find someone has already offered a solution. If you don't see a solution, then use the community your question.

ASK YOUR NFC QUESTION

Describe my question

Ask >

CATEGORIES

	10	0	0
Contact Smart Card Reader ICs	10	0	0
WIGG Reader ICs	11	0	0
Connected Tag Solutions	11	0	0
RFID NFC ICs for Reader Systems	10	0	0

Online community & technical support:

Support -> NXP community -> NFC
[NXP community NFC](http://www.nxp.com/NFC)



NFC training

PRODUCTS | APPLICATIONS | SUPPORT | ABOUT

NFC Community

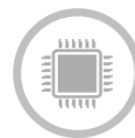
Online Academy
NFC Webinars
Customized Training & Events
Video Vault
University Programs
Sales and Support
NXP Professional Services
Documentation

NFC Webinars

Title	Overview
Antenna "Matching"	Learn in 6 steps the fundamentals of NFC antenna design with NXP's senior technical and design engineers. These technical webinars will provide you with the insights and skills about choosing the purpose, antenna matching with an overview on simulation and measurement tools, design near environment, antenna optimization and debugging, test & qualification as well as EIS aspects.
Connected NFC Tag - Overview	The Connected Life describes a world in which consumers and businesses use many different everyday computing wearables and ubiquitous Internet access. NFC is a key element in this world. NFC is not in today's increasingly connected world, this simple, and yet integral technology with the world around you with a simple touch. Fast, secure, and available in hundreds of millions of smartphones, tablets, and other consumer electronics on the connected tag portfolio of NXP built on the strong NXP NFC tag family (NFC-A, NFC-B, NFC-F).
EMC related Design	Learn in 6 steps the fundamentals of NFC antenna design with NXP's senior technical and design engineers. These technical webinars will provide you with the insights and skills about choosing the purpose, antenna matching with an overview on simulation and measurement tools, design near environment, antenna optimization and debugging, test & qualification as well as EIS aspects.
Enhancing everyday products with NFC	Today's consumers tend to purchase brands based on experience they have had before. purchase. According to a study conducted by Bazaar, a new factor affecting purchasing decisions is how they interact with a brand. The experience we form after purchase - e.g., when we experience whether or not we can connect our smartphones with a smart brand. Since the purchase experience, and how we interact with our smartphones, is a major factor to the smartphone brand's success, we are now offering our NFC solutions to help the brand and our interactions at every point. This is done through what is known as NFC product tagging, which is a new concept in the NFC world. This new NFC tag solution, the product of our efforts in this area, will address the main advantages of using NFC to tag everyday products and services in the cloud. The new NFC tag solution, the product of our efforts in this area, will address the main advantages of using NFC to tag everyday products and services in the cloud. The new NFC tag solution, the product of our efforts in this area, will address the main advantages of using NFC to tag everyday products and services in the cloud.

Recorded Webinars:

Support -> online academy -> NFC webinars
[NFC webinars](http://www.nxp.com/NFC)



NFC product selection guide

NFC Product Selection

NXP Semiconductors Business

Unrated

This app is compatible with all of your devices.

Add to Wishlist Install

What NFC device do you want to interface to?

What NFC interaction is needed?

What performance should your new NFC tag?

My system should communicate with NFC enabled smartphones (passive NFC enabled)

Only wake up the tag when a dedicated NFC tag

My system should talk to a contactless smart card or any other NFC tag (active NFC solution)

I need a high performance reader with the ability to drive any tag or reliable operating volume (e.g. for EMVCC)

Communicate with NFC with a tag

I request a cost effective standard performance.

NFC product selection guide app available:

[Google Play](#)
[App Store](#)

NXP partner program



Partner List

PRODUCTS APPLICATIONS SUPPORT ABOUT

NXP > NXP Partner Program > Partner List

Partner List

Our partners are listed in an alphabetical order below. Click on the company name to view a description of the company, their contact information, and a link to their website.

Show 10 entries Search: NFC

Company name	Type	Region	Country	Application areas	Product focus
Beijing Strong Tech Co., Ltd.	IDH	Greater China	China	Smart appliances NFC and reader IC's	MCU, Logic, GA, Interface, NFC
Bristestone Limited	IDH	Greater China	China	NFC and reader IC's	NFC, MCU, Thyristors and Sensor
Engicam	IDH	EMEA	Italy	Smart appliances NFC and reader IC's	MCU, RFID, IPCamera
GOLD FULL ELECTRONICS (H.K.) CO., LIMITED	IDH				Logic, NFC tag module, GA
Golden IC Technology CO., Ltd	IDH	Greater China	Taiwan	Smart appliances NFC and reader IC's	LPC8xx, LPC11xx, LPC1768, LPC4088, LPC4350, NFC, Logic IC
IMST	IDH	EMEA	Germany	NFC and reader IC's	NFC
ipTronix	IDH	EMEA	Italy	NFC and reader IC's	NFC
Kronegger GmbH	IDH	EMEA	Austria	NFC and reader IC's	NFC, RFID
MobileKnowledge	IDH	EMEA	Spain	NFC and reader IC's	NFC
New rFid Concept	IDH	EMEA	France	NFC and reader IC's	NFC

NXP > Support > NXP Partner Program > Partner List

NXP > Support > NXP Partner Program > Partner List

[Partner list](#) (and search for NFC)





Software development in Android and iOS

Embedded software for MCUs

JCOP, Java Card operating Systems

Hardware design and development

Digital, analog, sensor acquisition, power management

Wireless communications WiFi, ZigBee, Bluetooth, BLE

Contactless antenna RF design, evaluation and testing

MIFARE applications

End-to-end systems, readers and card-related designs

EMVco applications

Readers, cards, design for test compliancy (including PCI)

Secure Element management

GlobalPlatform compliant backend solutions

Secure services provisioning OTA, TSM services



We help companies leverage the
mobile and contactless revolution



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08018 Barcelona
(Spain)

Get in touch with us
www.themobileknowledge.com
mk@themobileknowledge.com



PN71xx - *Plug-and-play NFC solutions*

Jordi Jofre (Speaker)

Pablo Fuentes (Speaker)

Angela Gemio (Host)

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- ▶ Please remember to fill out our **evaluation survey** (pop-up)
- ▶ Check your email for **material download** and on-demand **video** addresses
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<http://www.nxp.com/support/classroom-training-events:CLASSROOM-TRAINING-EVENTS>

www.themobileknowledge.com/content/knowledge-catalog-0

