



PN7462 family – Product support package

NFC + MCU + CT + SW in one chip

MobileKnowledge
April 2016

Agenda

Session 13th April: PN7462 family introduction

- ▶ Positioning within the NFC portfolio and overview
- ▶ Target markets and benefits
- ▶ PN7462 family derivatives
- ▶ Detailed product description and key features
- ▶ OM27460CDK development kit and product support package
- ▶ Ordering details

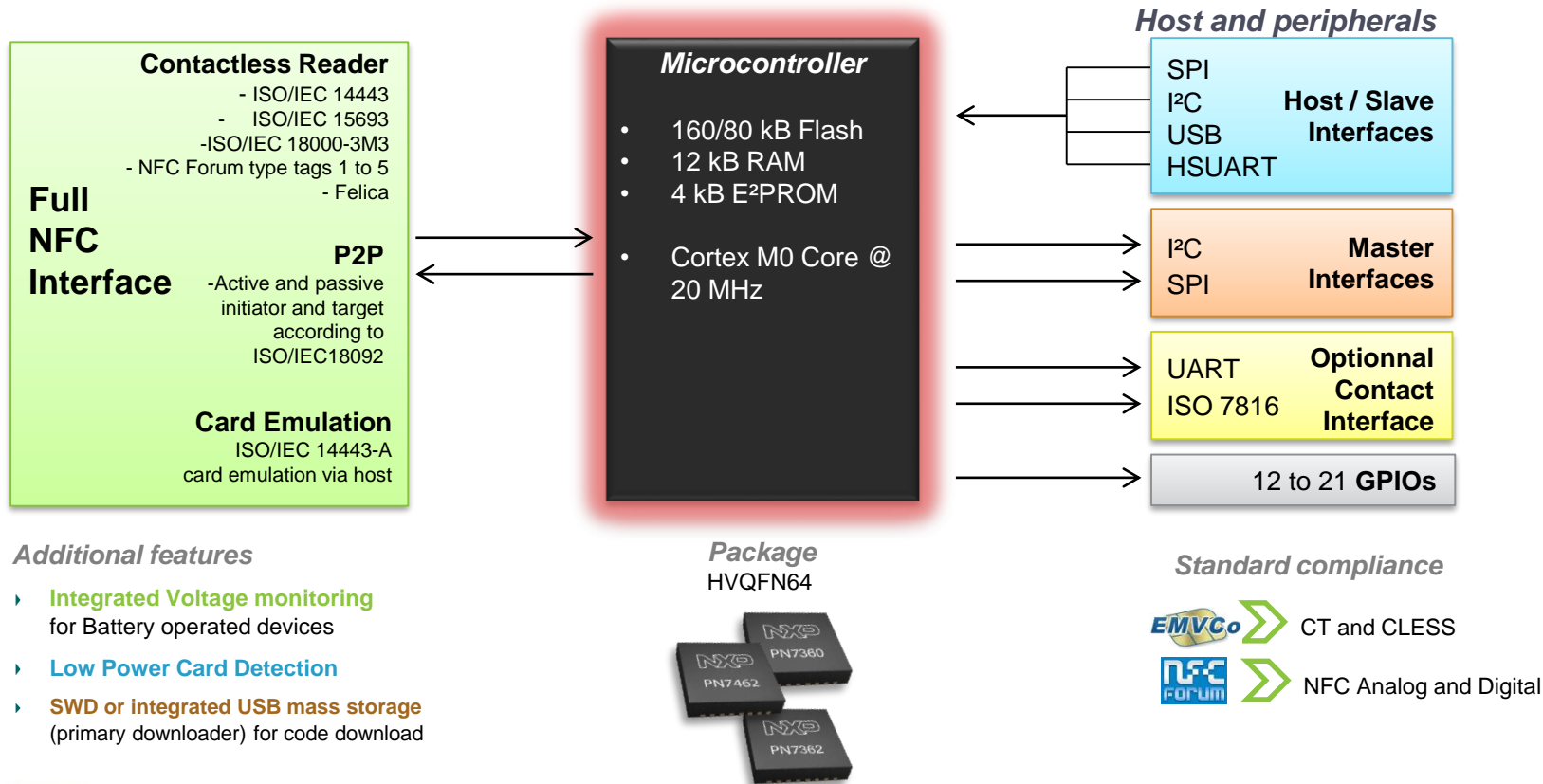
Session 20th April: **PN7462 product support package**

- ▶ Where to find PN7462 documentation
- ▶ OM27462CDK development kit
- ▶ PN7462AU hardware overview
- ▶ PN7462 SW architecture and SW development environment
- ▶ PN7462 NFC Cockpit
- ▶ Datasheet, application notes, user manuals and other tools



Last session - Quick review

PN7462 – Feature overview



PN7462 family is the solution for your application

Typical applications	PN7462	PN7362	PN7360	
Corporate access	✓	✓	✓	
Hospitality (access)		✓	✓	
Payment terminal	✓			
Home banking	✓			
USB reader		✓	✓	
Gaming console accessories		✓	✓	
NFC enabled board game		✓	✓	
	160 kB	160 kB	80 kB	Flash
	✓			Contact reader
	PN7462	PN7362	PN7360	Features



Where to find PN7462 documentation

Where to find PN7462 documentation

The screenshot shows the NXP website homepage. The navigation bar at the top includes 'PRODUCTS', 'SOLUTIONS', 'SUPPORT', and 'ABOUT'. The 'PRODUCTS' tab is highlighted. Below the navigation bar, there are several product categories listed in a grid. The 'IDENTIFICATION & SECURITY' category is highlighted with a red box, and the 'NFC' sub-category is also highlighted with a red box. Other categories include ARM® PROCESSORS, POWER ARCHITECTURE® PROCESSORS, DISCRETE & LOGIC, AUTOMOTIVE PRODUCTS, DEVELOPMENT TOOLS, SOFTWARE CENTER, MORE PRODUCT INFORMATION, INTERFACE AND CONNECTIVITY, MEDIA AND AUDIO PROCESSING, POWER MANAGEMENT, RF, and SENSORS. At the bottom, there is a footer with links for 'ABOUT NXP', 'RESOURCES', 'FOLLOW US', and 'NEWS'.

PRODUCTS SOLUTIONS SUPPORT ABOUT

ARM® PROCESSORS >

- Kinetix Cortex®-M Microcontrollers
- LPC Cortex-M Microcontrollers
- LPC ARM7/ARM9 Microcontrollers
- i.MX Applications Processors
- QorIQ Multicore Processors

POWER ARCHITECTURE® PROCESSORS >

MORE PROCESSORS >

DISCRETE & LOGIC >

- Bipolar Transistors
- Diodes
- ESD Protection
- Logic
- MOSFETs

IDENTIFICATION & SECURITY >

- NFC**

INTERFACE AND CONNECTIVITY >

MEDIA AND AUDIO PROCESSING >

POWER MANAGEMENT >

RF >

SENSORS >

AUTOMOTIVE PRODUCTS >

- Automotive Radar
- CAN/LIN/FlexRay Transceivers
- Car Access & Immobilizers
- Multi Standard Digital Radio
- S12 & S32 MCUs/MPUs

DEVELOPMENT TOOLS >

SOFTWARE CENTER >

MORE PRODUCT INFORMATION

- All Products
- Packages
- Product Longevity Program
- Product Selector

Automotive

Discrete & Logic

NFC

RF

ALL PRODUCTS >

Documentation

Product Selector

SOFTWARE CENTER >

Video Vault

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The screenshot shows the NXP website page for 'NFC Controller Solutions'. The navigation bar at the top includes 'PRODUCTS', 'SOLUTIONS', 'SUPPORT', and 'ABOUT'. The 'PRODUCTS' tab is highlighted. Below the navigation bar, there are several product categories listed in a grid. The 'IDENTIFICATION & SECURITY' category is highlighted with a red box, and the 'NFC Controller Solutions' sub-category is also highlighted with a red box. Other categories include Microcontrollers and Processors, Discretes and Logic, Identification and Security, Security Technology, Authentication, Car Access & Immobilizers, Identification and Security and Surveillance IP Camera, NFC and Reader ICs, NFC Everywhere, NFC Controller Solutions, Connected Tag Solutions, Contact Smart Card Reader ICs, MIFARE SAMs for Reader Systems, HITAG Reader ICs, Smart Card ICs, Smart Label and Tag ICs, Interface and Connectivity, Media and Audio Processing, Power Management, RF, Sensors, Automotive Products, and Software and Tools. At the bottom, there is a footer with links for 'ABOUT NXP', 'RESOURCES', 'FOLLOW US', and 'NEWS'.

PRODUCTS SOLUTIONS SUPPORT ABOUT

Microcontrollers and Processors

Discretes and Logic

Identification and Security

- Security Technology
- Authentication
- Car Access & Immobilizers
- Identification and Security and Surveillance IP Camera
- NFC and Reader ICs
- NFC Everywhere
- NFC Controller Solutions**

Connected Tag Solutions

Contact Smart Card Reader ICs

MIFARE SAMs for Reader Systems

HITAG Reader ICs

Smart Card ICs

Smart Label and Tag ICs

Interface and Connectivity

Media and Audio Processing

Power Management

RF

Sensors

Automotive Products

Software and Tools

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

NFC Controller Solutions

Overview **Products**

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Products/Parts

7

Show/Hide Parameters (3 Hidden)

Reset Filters

Compare Selected

Order

Distributor

PN5321A3HN Buy Options

PN5331B3HN Buy Options

PN7120A0EV Buy Options

PN746X_736X_SERIES

PR5331C3HN Buy Options

PR601HL Buy Options

PRH601HL Buy Options

PRODUCT SELECTOR

Easily locate your ideal product based on technical specifications. Try Now >

Where to find PN7462 documentation

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ALL

PRODUCTS SOLUTIONS SUPPORT ABOUT

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

PN746X_736X_SERIES: NFC Cortex-M0 microcontroller ☆

Overview **Documentation** Software & Tools Buy / Parametrics Package / Quality

Filter By | [Show All](#)

- Data Sheets (1)
- Application Notes (4)
- Users Guides (6)
- Brochures (1)
- Package Information (1)

Filter Documentation by Keyword

Data Sheets (1)

Name/Description	Modified Date
NFC Cortex-M0 microcontroller (REV 3.1) PDF (711.0 kB) PN746X_736X [English]	06 Apr 2016

Application Notes (4)

Name/Description	Modified Date
PN7462AU Antenna design guide (REV 1.0) PDF (2.1 MB) AN11706 [English]	29 Mar 2016
PN7462AU - Contact Smart Card application (REV 1.0) PDF (410.0 kB) AN11738 [English]	29 Mar 2016
PN7462AU How to integrate RTOS (REV 1.0) PDF (116.0 kB) AN11784 [English]	29 Mar 2016
PN7462AU LPCD and Standby mode (REV 1.0) PDF (197.0 kB) AN11785 [English]	29 Mar 2016

[Less](#)

Users Guides (6)

Name/Description	Modified Date
PN7462AU Software user manual (REV 1.0) PDF (2.0 MB) UM10913 [English]	31 Mar 2016
PN7462 HW User Manual (REV 1.0) PDF (5.9 MB) UM10858 [English]	30 Mar 2016

NXP [Sign In or Register](#) [English](#) [Cart](#)

ALL

PRODUCTS SOLUTIONS SUPPORT ABOUT

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

PN746X_736X_SERIES: NFC Cortex-M0 microcontroller ☆


Overview Documentation **Software & Tools** Buy / Parametrics Package / Quality

Filter By | [Show All](#)


- Hardware Development Tools (1)
- Evaluation/Development Boards and Systems (1)
- Software Development Tools (2)
- Software (2)


Filter Software & Tools by Keyword

Evaluation/Development Boards and Systems (1)

 [NFC Controller development kit](#) new
NFC Controller development kit. OM27462CDK is a complete kit enabling easy and fast development of applications. It contains a PN7462 NFC controller...

Software (2)

 [NFC Cockpit tool \(REV 1.0\)](#) new
NFC Cockpit tool.
[ZIP](#) (5.6 MB) SW3707 4/7/2016 [Download](#)

 [PN7462AU FW and SW Examples Full Version - v04_01_00 \(REV 1.1\)](#) new
PN7462AU FW and SW Examples Full Version - v04_01_00.
[ZIP](#) (29.2 MB) SW3683 4/13/2016 [Download](#)

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PN7462 product support package in a nutshell



NFC Controller development kit	› PN7462 NFC controller development kit OM27460CDK
PN7462AU FW and SW examples	› SW3683 – Installer package PN7462AU FW and SW Examples full version v4.0_01_00
PN7462AU NFC Cockpit	› SW3683 - Installer package PN7462 NFC Cockpit v1.3
Documentation	<ul style="list-style-type: none">› AN11706 – PN7462AU Antenna design guide› AN11738 – PN7462AU Contact smartcard application› AN11784 – PN7462AU How to integrate RTOS› AN11785 – PN7462AU LPCD and standby mode› UM10833 – PN7462 Quick start guide – customer board› UM10913 – Software user manual› UM10957 – PN7462AU Door access user manual› UM10915 – PN7462AU PC CCID reader user manual› UM10951 – PN7462 Reference POS application

OM27462CDK development kit

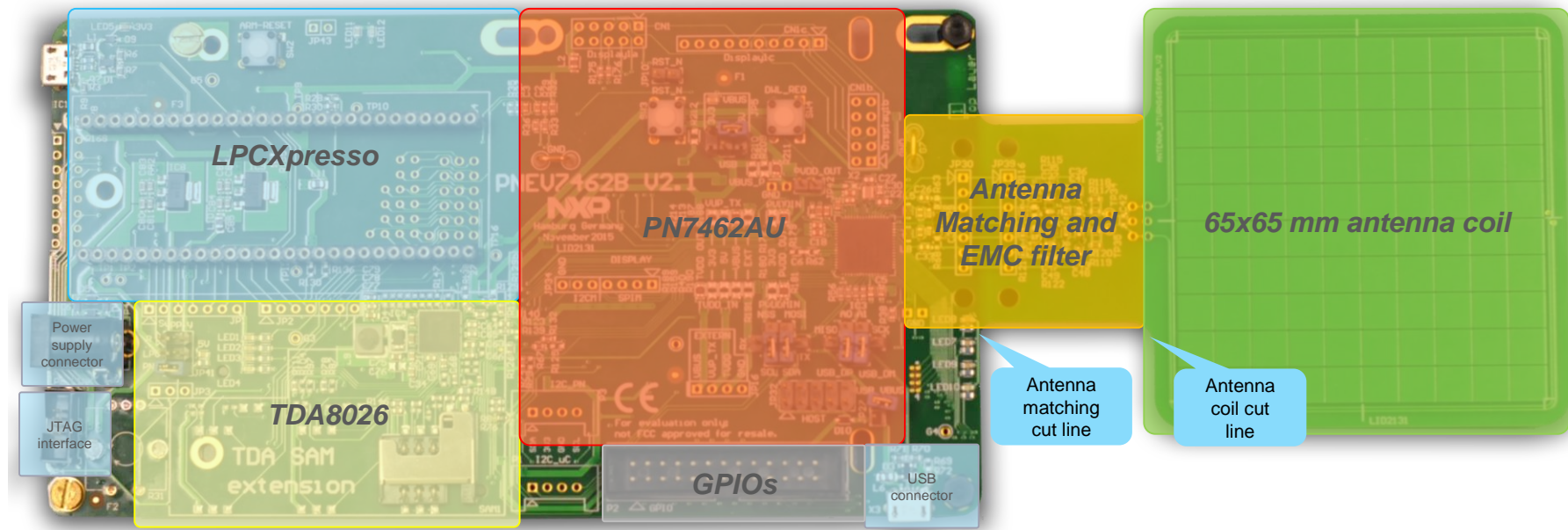
- ▶ The OM27462CDK development kit features
 - Easy antenna design with NFC Cockpit SW and PCBs adaptors for antenna matching
 - Easy application development with full NFC Forum compliant and contact SW libraries
 - Smartcard reader and SAM slots extension
 - Two different antennas (65x65 and 30x50mm) with matching components
 - 3 PCBs for individual antenna matching
 - 10 PN7462 samples
- ▶ And it is completed with an extensive set of documentation, source code examples and video tutorials



Demokits at edemoboard portal and distis

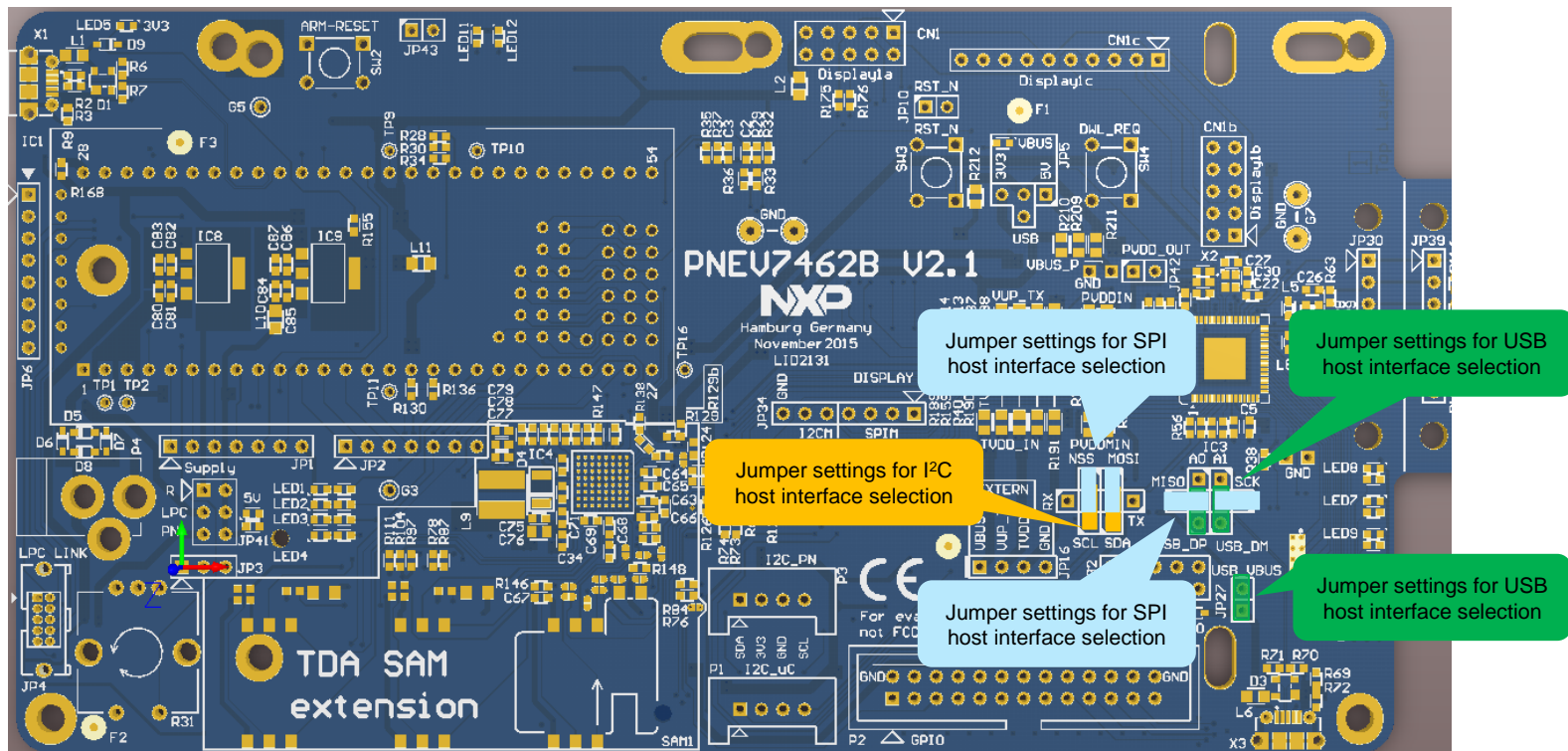
Reference	12NC	Product description
OM27462CDK		PN7462 NFC controller development kit

PN7462AU hardware introduction



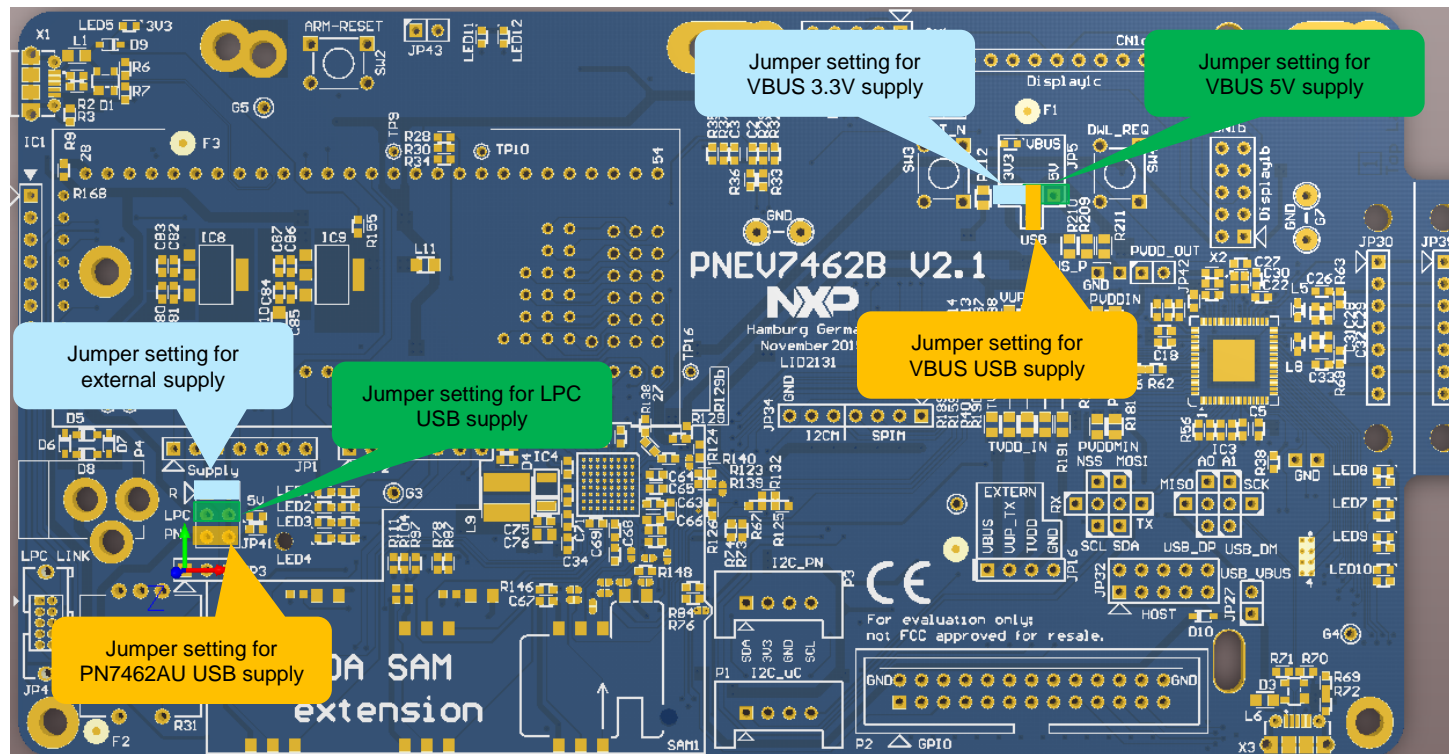
PN7462AU hardware introduction

Host interface selection



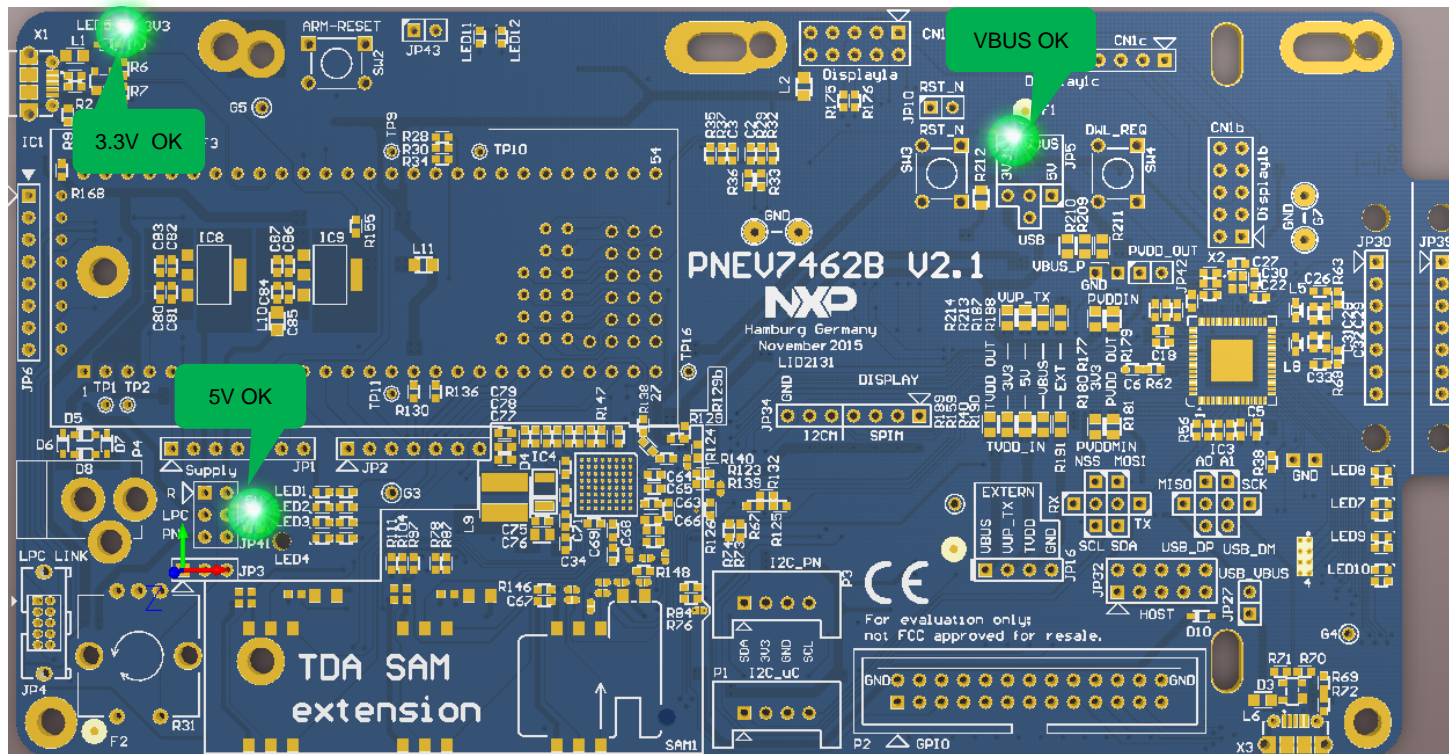
PN7462AU hardware introduction

Board and PN7462 supply settings



PN7462AU hardware introduction

Supply status LED indicators



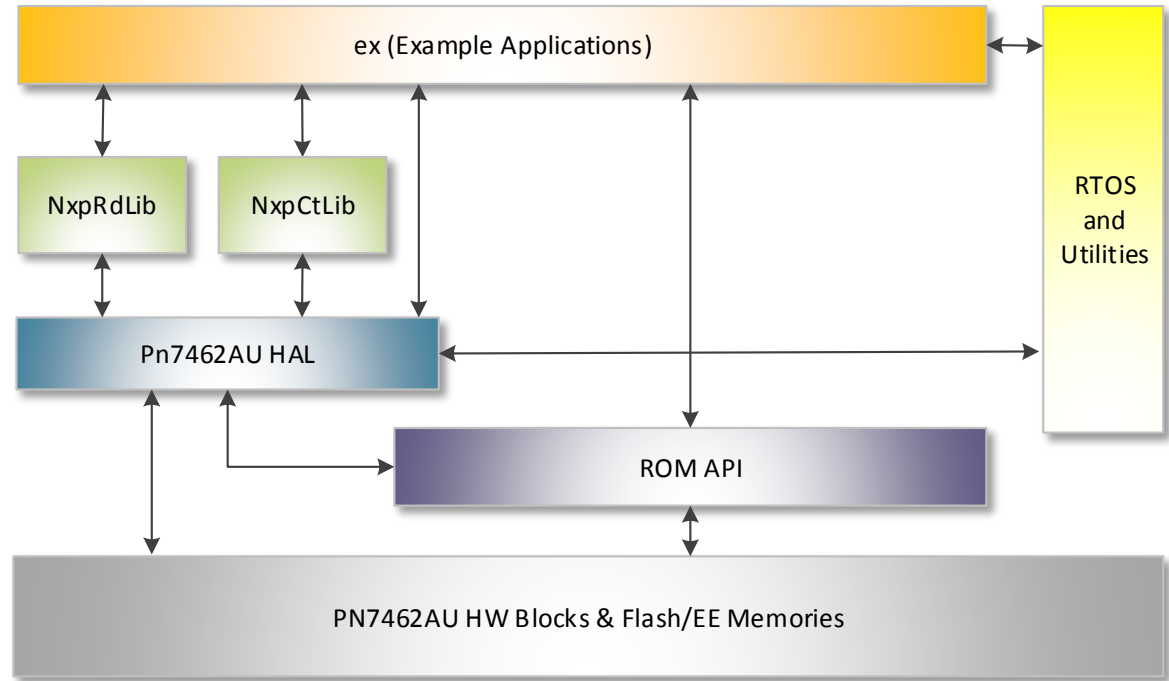
PN7462 product support package in a nutshell



NFC Controller development kit	› PN7462 NFC controller development kit OM27460CDK
PN7462AU FW and SW examples	› SW3683 – Installer package PN7462AU FW and SW Examples full version v4.0_01_00
PN7462AU NFC Cockpit	› SW3683 - Installer package PN7462 NFC Cockpit v1.3
Documentation	<ul style="list-style-type: none">› AN11706 – PN7462AU Antenna design guide› AN11738 – PN7462AU Contact smartcard application› AN11784 – PN7462AU How to integrate RTOS› AN11785 – PN7462AU LPCD and standby mode› UM10833 – PN7462 Quick start guide – customer board› UM10913 – Software user manual› UM10957 – PN7462AU Door access user manual› UM10915 – PN7462AU PC CCID reader user manual› UM10951 – PN7462 Reference POS application

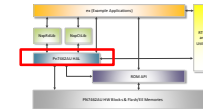
PN7462AU SW architecture stack

- ▶ The PN7462AU Firmware is modular software written in C language.
- ▶ It provides an API that enables customers to create their own contact and contactless software stack and applications for the PN7462AU.
- ▶ The SW stack consists of 4 main layers:
 - Application and example layer
 - Protocol abstraction layer
 - Hardware abstraction layer
 - RTOS and utilities layer



PN7462AU SW architecture stack

PN7462 HAL

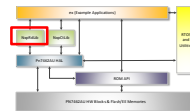


- ▶ Hardware abstraction layer (HAL) is responsible for the CPU, communication, memory and utility peripherals.
- ▶ The HW functions can further be divided into:
 - **Atomic functions:** functions which configure the HW, but don't result in any event from the HW, EEPROM, Flash, CRC, RNG, PMU/ PCR.
 - **Blocking functions:** functions which configure the HW and wait until one or more expected events occur from the HW. CLIF HAL, CT HAL, I2CM/ SPIM HAL
 - **Non-blocking functions:** functions which configure the HW and expect one or more events, but don't wait until they occur. The events are notified to the caller of the function. Timer, Host interface.



PN7462AU SW architecture stack

PN7462 NXP NFC contactless protocol library



- ▶ The NFC Reader Library implements for PN7462AU application development:
 - Contactless protocol components
 - Application components.
 - ISO/IEC contactless standard protocol components
- ▶ Protocol abstraction Layer (PAL)
 - Implement HW independent communication protocols for contactless
- ▶ Application Layer (AL)
 - Customer applications shall be implemented in the application layer and can directly use HAL APIs or APIs from the PAL libraries.



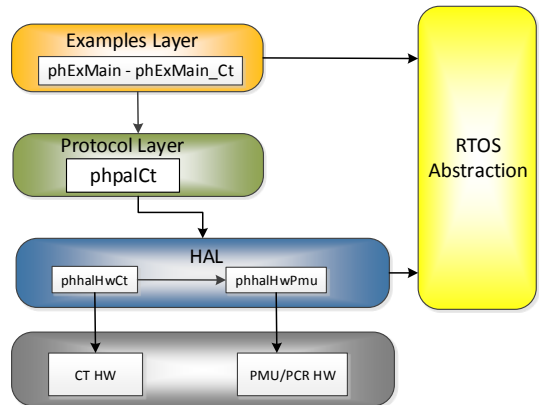
PN7462AU SW architecture stack

PN7462 NXP contact protocol library

- ▶ The CT Protocol library can be configured with two different profiles, namely ISO7816 or EMVCo profile.
- ▶ **Contact Protocol Abstraction Layer (PAL)**
 - Protocol selection
 - T=0, T=1 management
- ▶ **Contact Hardware Abstraction Layer (HAL)**
 - Interface configuration
 - Activation / deactivation
 - Low level transceiver
- ▶ **PN7462 Hardware Abstraction Layer (HAL)**
 - Activation / deactivation
 - Card protection
 - Card power supply

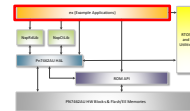


Contact interface



- Customer application or examples
- Reader Library
- HAL
- PN7462 HW

PN7462AU PSP SW examples



SW project	Description
phExMain	Example which implements the polling for contact and contactless cards. It is the root of many sub examples described below
phExEMVCo	Example which implements the polling for the EMVCo contact and contactless cards and implement reference EMV transaction.
phExRF	Example which implements the polling for contactless cards without NFC Reader Library support. Application use only HAL APIs and perform same CLIF functionality
phExCT	Example which implements simple polling for contact cards. Application use only HAL APIs
phExCTEMVCo	Example which implements the CT functionality with CT Pal library support
phExC7816	Example which implements the CT functionality with CT library support
phExHif	Example which is demonstrating the host interface loop back functionality for I2C, SPI, HSU and master interface functionality for I2CM, SPIM. Besides that it demonstrates secondary downloader functionality to EEPROM and FLASH memory over SPI Host interface.
phExHCE	Example which demonstrates how to use PN7462AU in Host Card Emulation mode
phExLLCP	Example which is demonstrating Peer-To-Peer (P2P) communication between PN7462AU and NFC Device.
phExPOS	POS use-case shows how to use PN7462AU in combination with second application hosted on the µController.
phExCCID	The PC USB reader application demonstrate how to use the PN7462AU Customer Demo board as a CCID reader and shows how connected PN7462AU via USB interface
phExDoorAccess	This document describes “Door Access application” and shows how PN7462AU Customer Demo board can be used in the door access management

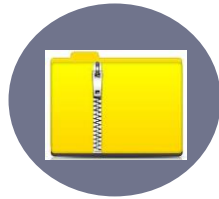
PN7462AU SW development environment

What do you need?



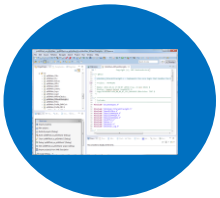
PN7462AU SW package

- Folder containing the PN7462AU FW source code and SW examples provided to support PN7462AU. They are ready to import and compile within the LPCXpresso IDE development environment.



PN7462AU LPCXpresso plugin

- A separate PN7462AU plugin is required for development of PN7462AU firmware via LPCXpresso for operations such as build and download code and access internal peripheral registers of the PN7462AU.



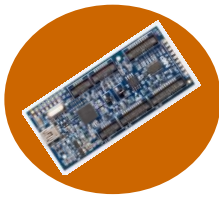
LPCXpresso IDE v8.0

- It is a low-cost development tool platform, available directly from NXP, that provides a quick way to develop advanced applications using NXP's highly efficient and low-power LPC microcontrollers. It includes everything to take end users from evaluation to final products



PN7462AU board

- The PN7462AU board enables easy antenna design with the NFC Cockpit software and fast application development with the full NFC Forum compliant and contact software libraries



LPC Link2 board

- It is an extensible, stand-alone debug adapter, that can be connected to virtually any development board, and that supports a broad variety of development tools and IDEs via downloadable firmware images

PN7462AU SW development environment

Getting started

1

Download and install PN7462AU SW package

2

Download, install and activate LPCXpresso IDE

3

Install PN7462AU LPCXpresso plugin

4

Import SW examples into LPCXpresso IDE

5

Build and run or debug a SW example



Setting up PN7462AU SW development environment

Step 1: Download and install PN7462AU SW package

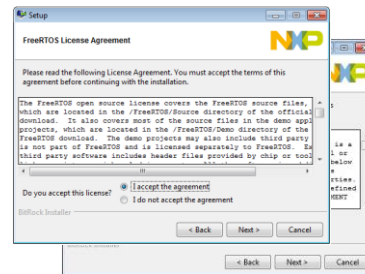


- Download PN7462AU FW and SW examples full version v04_01_00

- <http://cache.nxp.com/documents/software/SW3683.zip>

- Unzip and install the SW3683 installer

- Accept NXP and FreeRTOS SW licenses



- Check the installation directory

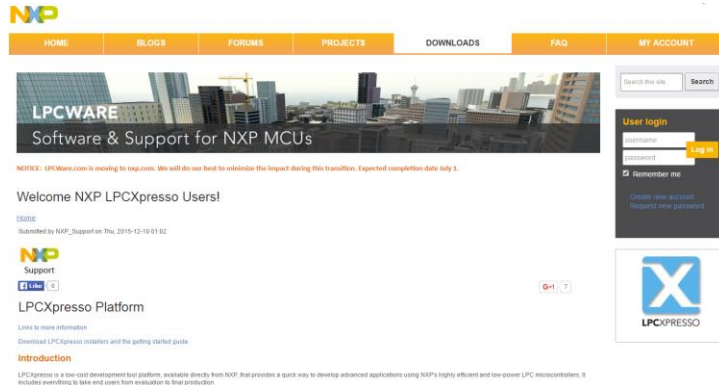
- Datasheet, documentation and SW is extracted

Name				Date modified	Type	Size
PN7462AU Datasheet				4/14/2016 8:40 AM	File folder	
PN7462AU Documentation				4/14/2016 8:40 AM	File folder	
PN7462AU Software				4/14/2016 8:40 AM	File folder	
FreeRTOS-License.txt				1/26/2016 4:42 PM	TXT File	21 KB
NXP_SLDA.pdf				9/1/2015 6:25 AM	Firefox HTML Doc...	47 KB
README.txt				4/11/2016 3:25 PM	TXT File	3 KB
uninstall.dat				4/14/2016 8:40 AM	DAT File	5 KB
uninstall.exe				4/14/2016 8:40 AM	Application	3,810 KB

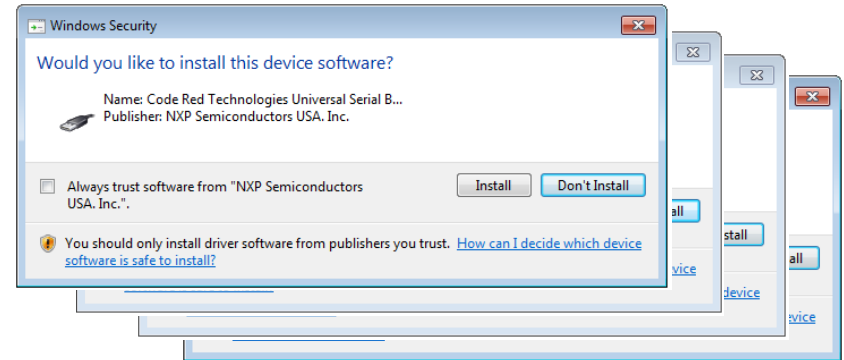
Setting up PN7462AU SW development environment

Step 2: Download and install LPCXpresso IDE

- Download LPCXpresso IDE
 - Free download at LPCware [website](#)



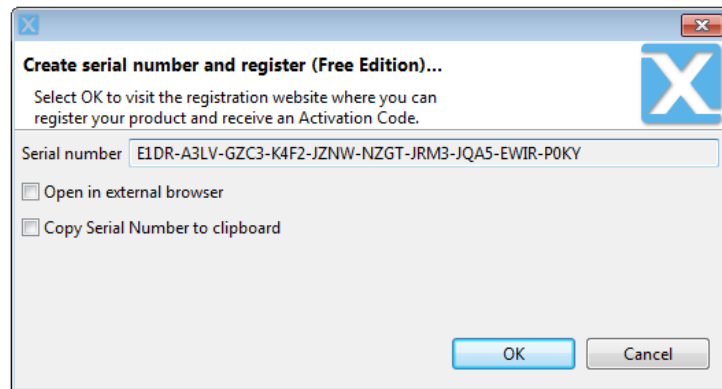
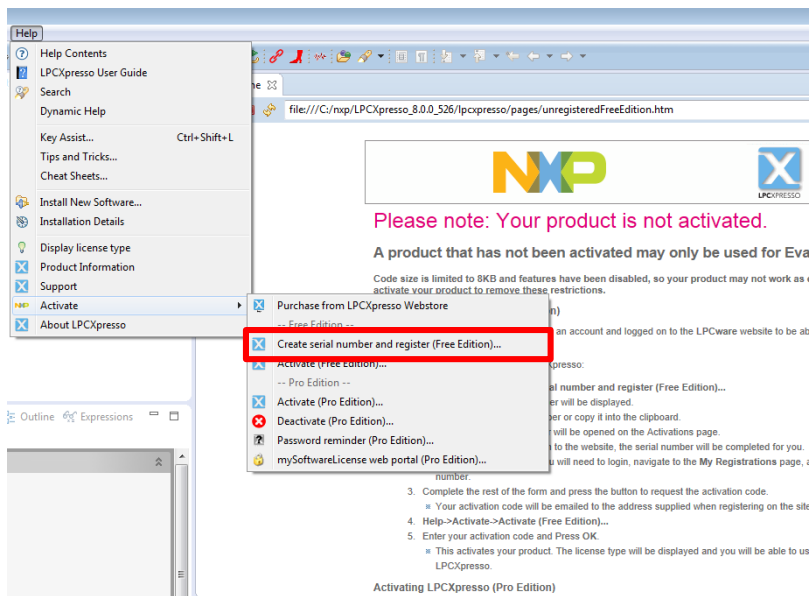
- Accept the installation of the required drivers
 - NXP LPC-Link1 Debug, NXP LPC-Link2 Redlink and Red Probe debug drivers, etc



Setting up PN7462AU SW development environment

Step 2: Get serial number for your LPCXpresso copy

- LPCXpresso IDE product activation
 - *Help → Activate LPCXpresso → Create Serial Number*



Setting up PN7462AU SW development environment

Step 2: Register and obtain your activation key

- LPCXpresso IDE product activation
 - Register and obtain your activation key in LPCware website



NOTICE: LPCware.com is moving to nxp.com. We will do our best to minimize the impact during this transition. Expected compl

User account

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Account information

Username: *
Jordi Jofre

E-mail address: *
jordi.jofre-nk@nxp.com

A valid e-mail address. All e-mails from the system will be sent to this address. The e-mail address is not made public and will only be used if you v

[XML sitemap](#)



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LPCXpresso Key Activation

[Home](#) » [LPCXpresso home](#)

Submitted by lpcxpresso-support on Fri, 2013-06-07 10:22



Registration Information

Serial Number: * E1DR-A3LV-GZC3-K4F2-JZNVW-NZGT-JRM3-JQA5-EWIR-P0KY

LPCXpresso Activation Key: <valid once serial number is submitted>

[Register LPCXpresso](#)



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Submission #86516

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Thank you for registering your LPCXpresso product. YOUR ACTIVATION CODE IS DISPLAYED BELOW - please with your activation code in a few minutes.

You product registration history can be located here or by selecting the 'My LPCXpresso activations' menu item in

You must be logged in with the account you used to register your product to view activation key history.

Registration Information

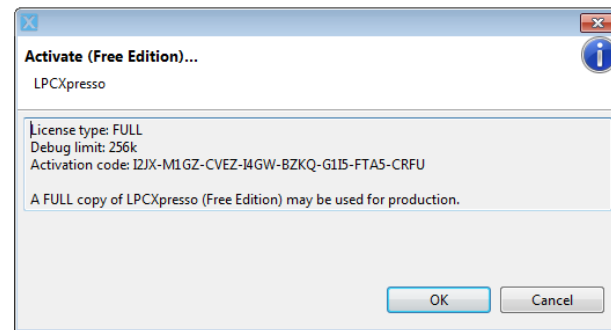
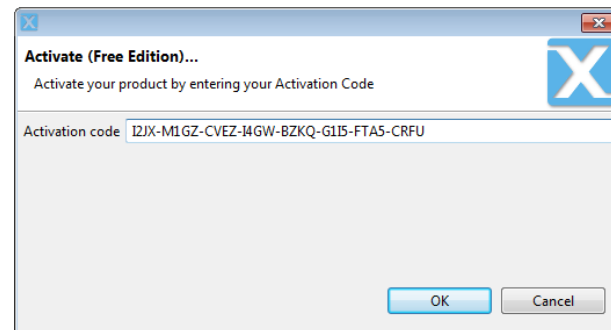
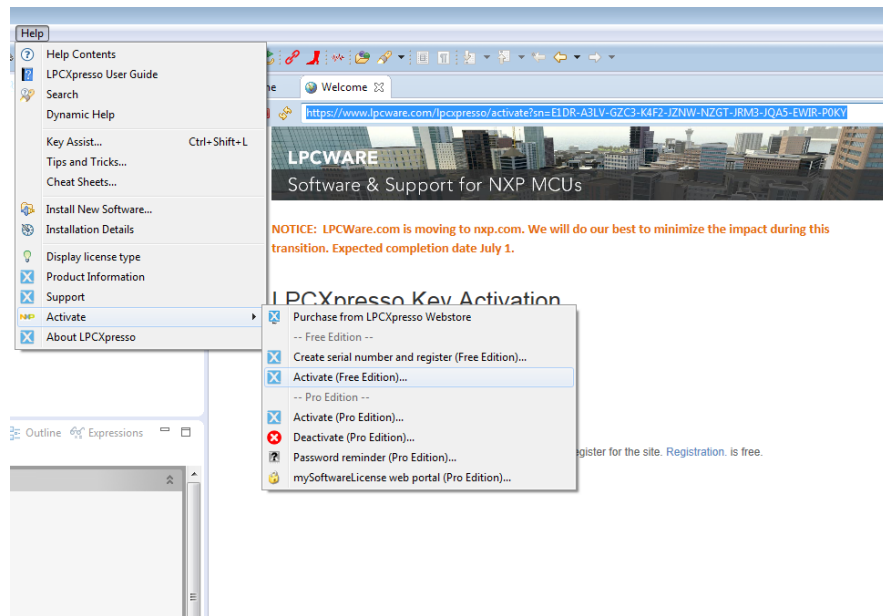
Serial Number:
E1DR-A3LV-GZC3-K4F2-JZNVW-NZGT-JRM3-JQA5-EWIR-P0KY

LPCXpresso Activation Key:
I2JX-M1GZ-CVEZ-14GW-BZKQ-G115-FTA5-CRFU

Setting up PN7462AU SW development environment

Step 2: Activate your LPCXpresso copy

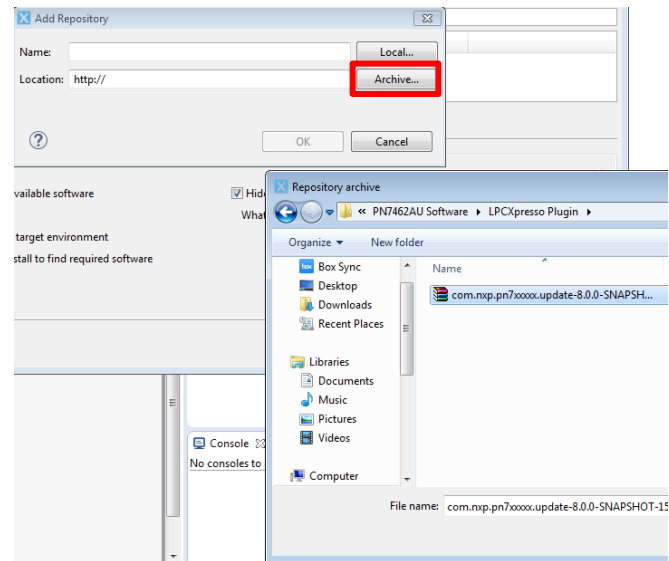
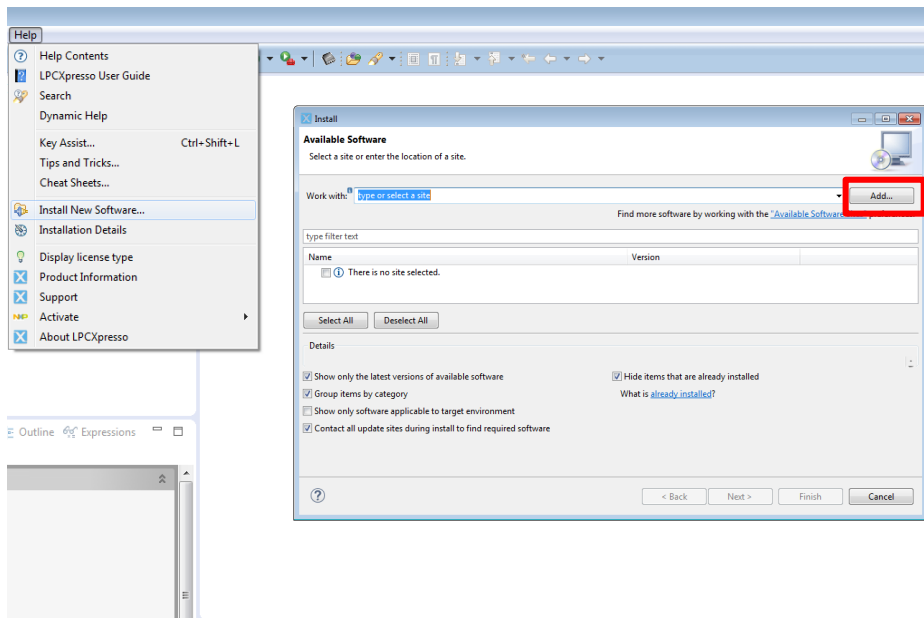
- LPCXpresso IDE product activation
 - *Activate your LPCXpresso copy*



Setting up PN7462AU SW development environment

Step 3: Adding PN7462AU LPCXpresso plugin

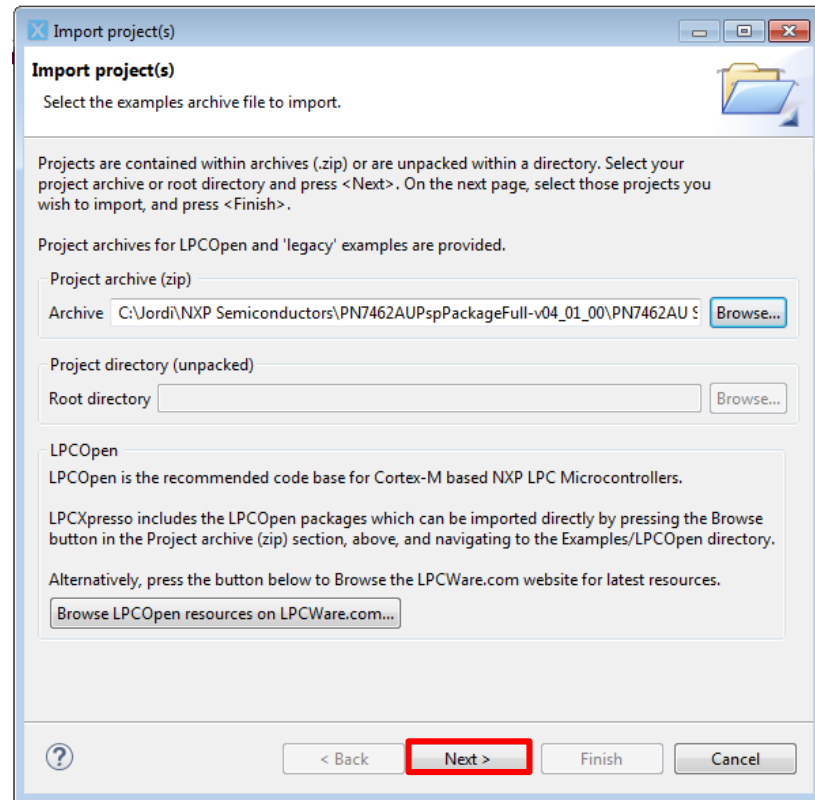
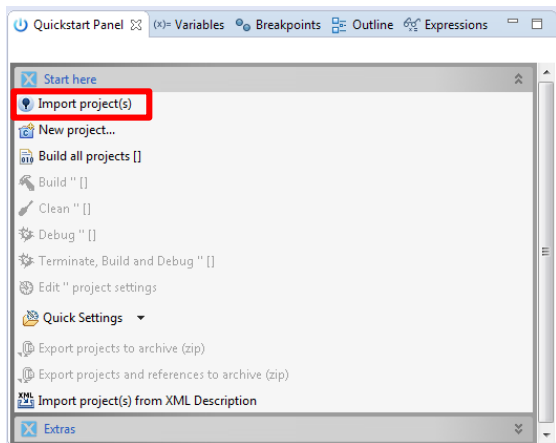
- Find PN7462AU LPCXpresso plugin in your installation directory
 - Your directory → PN7462AU Software → LPCXpresso plugin



Setting up PN7462AU SW development environment

Step 4: Importing provided SW example projects

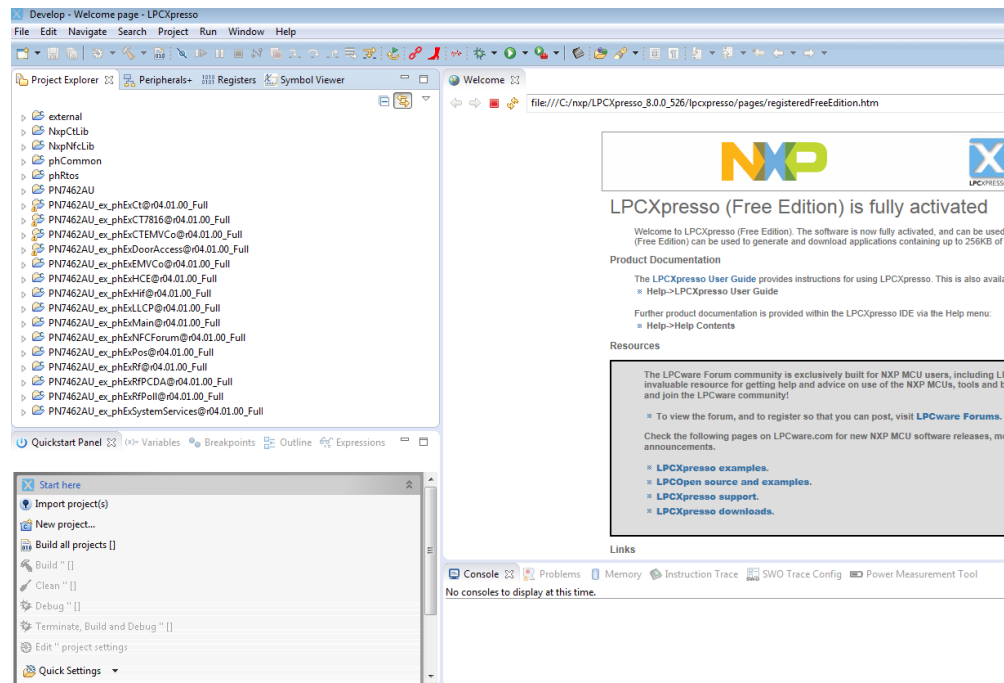
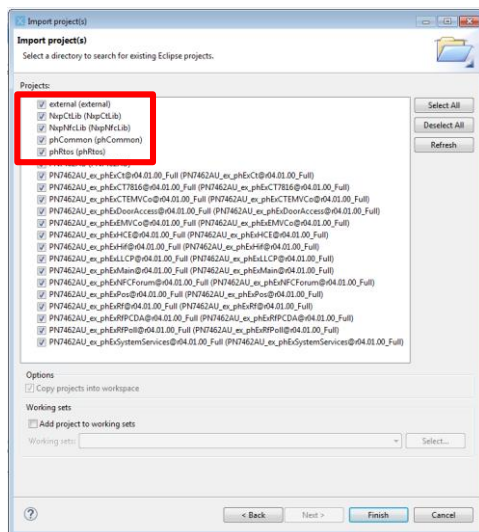
- Start the LPCXpresso IDE and select new workspace
- Select the option Import Projects
- Browse the zip archive in your installation directory



Setting up PN7462AU SW development environment

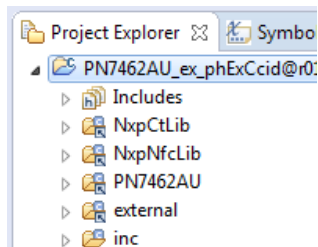
Step 4: Importing provided SW example projects

- LPCXpresso IDE unzips the SW package
- SW examples packages are ready for use

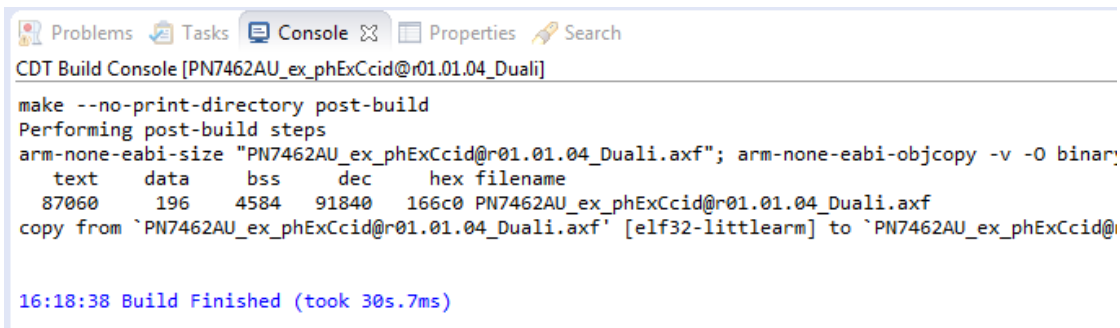
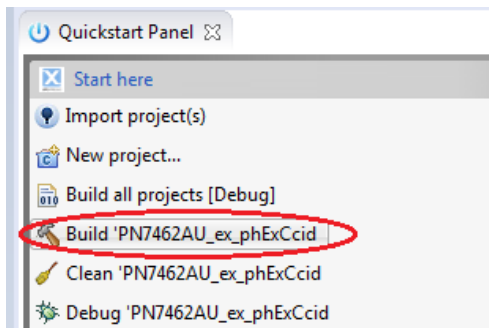


Setting up PN7462AU SW development environment

Step 5: Build a SW example using LPCXpresso IDE



- Connect the PN7462AU customer demo board
 - PC + LPC-Link2 + Customer demo board
- Select project from the Project Explorer view
 - Press build from the Quickstart Panel

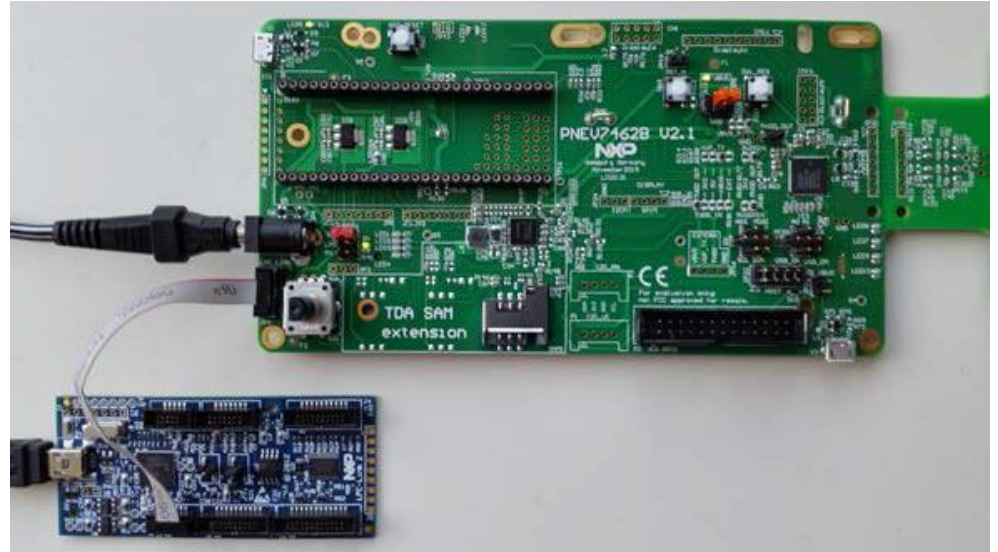
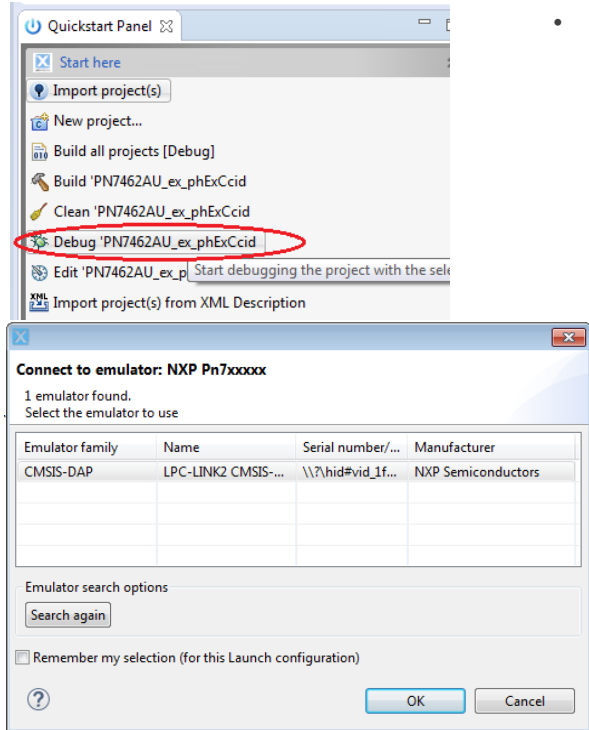


After the build process, you can see the size of the image in the console window

Setting up PN7462AU SW development environment

Step 5: Debugging a SW example using LPCXpresso IDE

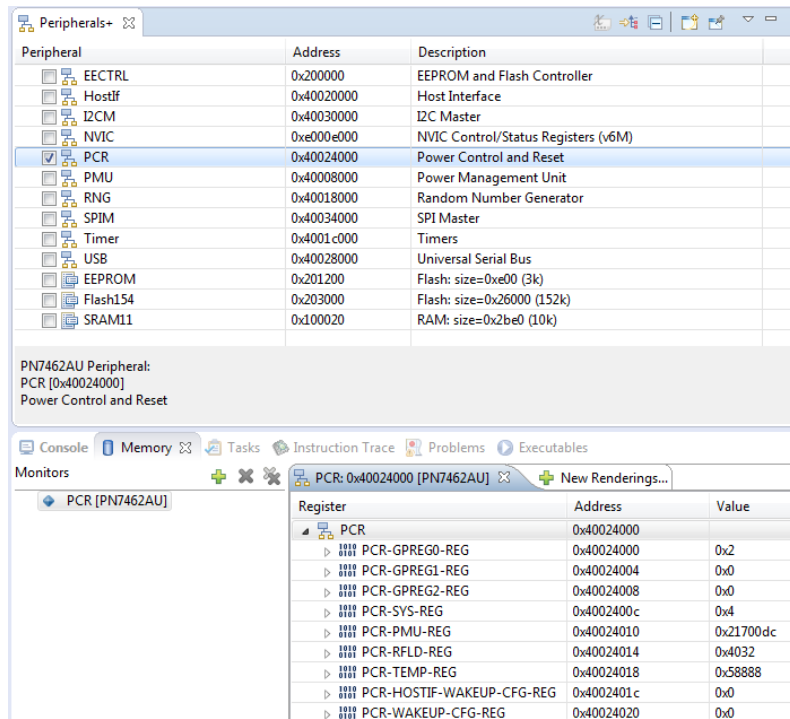
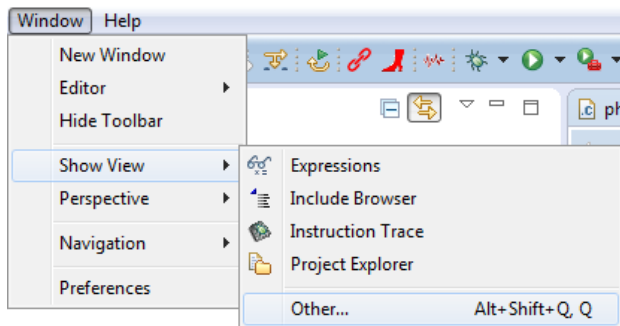
- Select “debug” option in the quick start panel
 - Select the right emulator



Setting up PN7462AU SW development environment

Step 5: Peripheral view

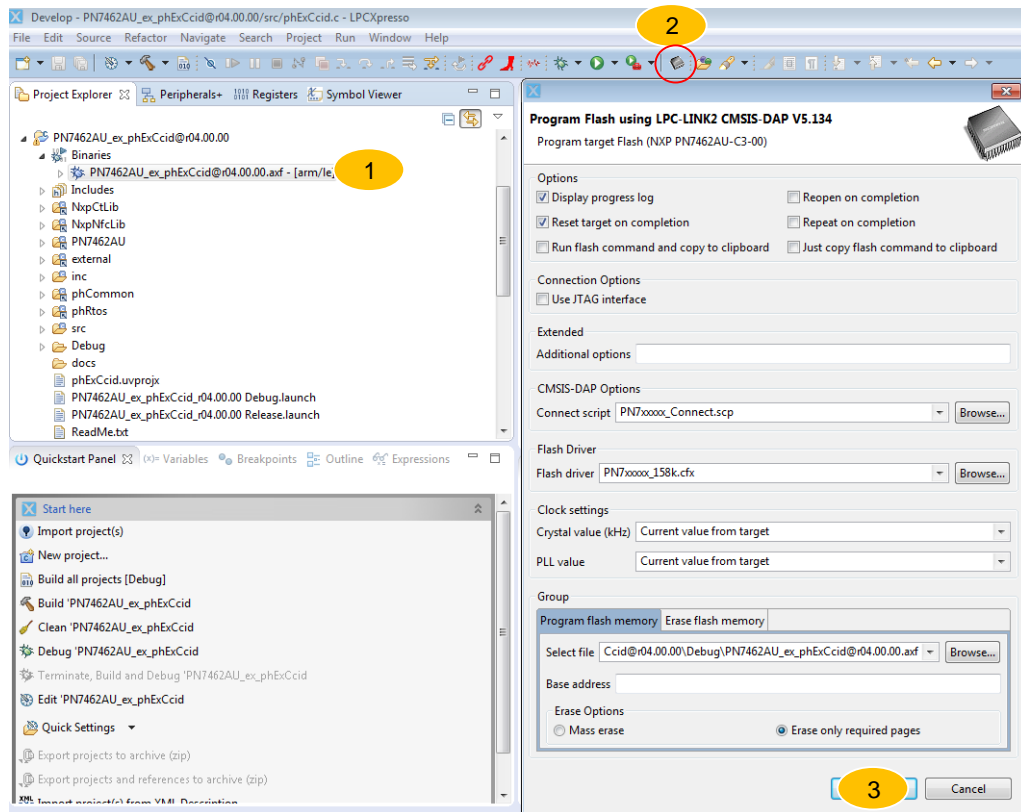
- Go to window → show view → other → select “peripherals”
- Go to debug mode
 - Direct access to PN7462AU registers
 - Direct access to PN7462 memory
- Select the relevant peripheral
- You will see the register, bit fields and description



Setting up PN7462AU SW development environment

Step 5: Flashing a SW example using LPCXpresso IDE

- Select build output binary file
- Click on the “program flash option”
- Ensure that all the options are set properly and click OK

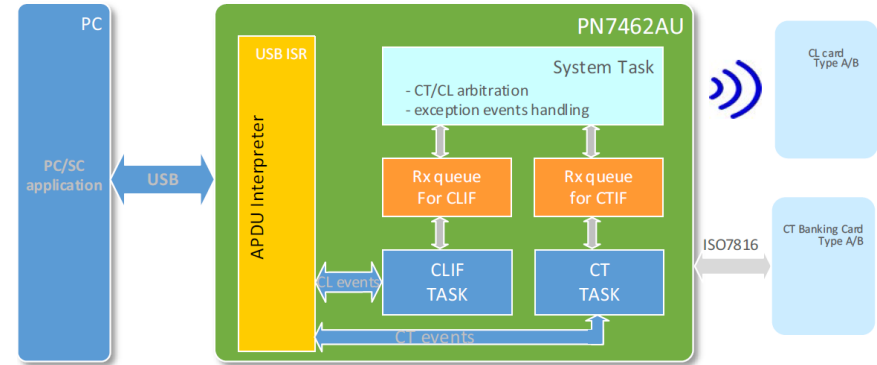


PN7462AU SW development

Example: Running and using PN7462AU PC CCID SW example

PN7462AU PC CCID SW example

- ▶ The CCID reader example describes how to connect PN7462AU by USB interface to a PC and provide the CCID protocol implementation on the top of the physical link.
- ▶ The CCID reader example can be tested with any PC/SC application running on the PC with Windows OS.
- ▶ PN7462AU CCID reader application has the following modules:
 - **USB ISR:** send and receive the CCID class commands
 - **System task:** Responsible for initiating CT/CL task messages, notifications and any exceptions
 - **Contactless task:** Wait for messages from system task to start CL task for polling.
 - **Contact task:** Wait for messages from system task to start CT task for card activation



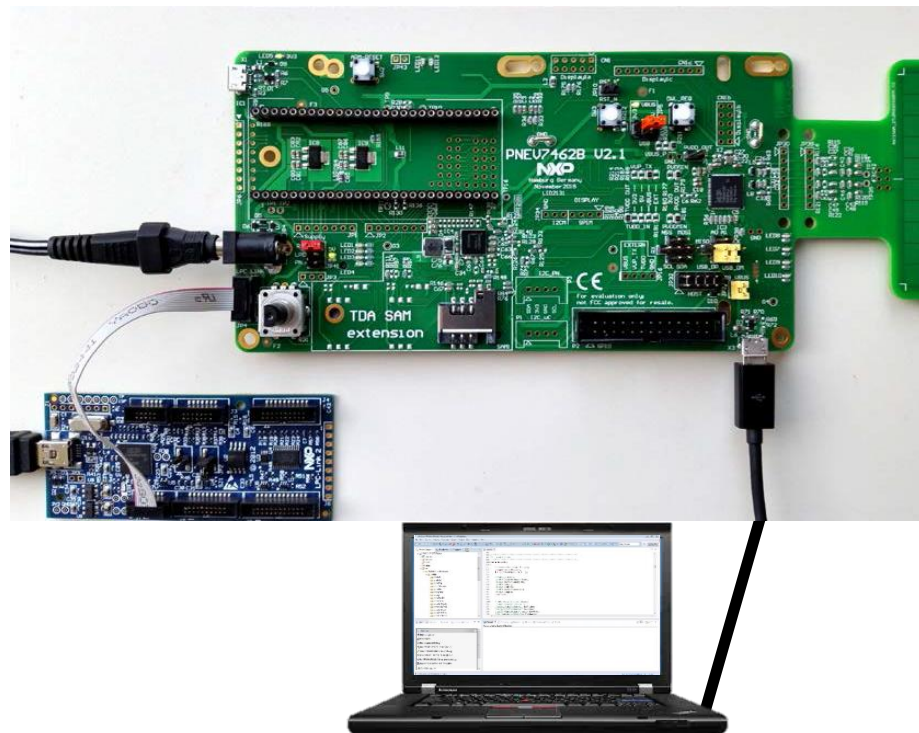
PN7462AU PC CCID SW example

HW components to run this demo

- To prepare the HW environment, components listed in the table below are required.

Item	Purpose
PN7462AU	Demoboard for running the project
LPC-Link2	Stand-alone debug adapter
USB cable	For PC connection
Power adapter	Board supply

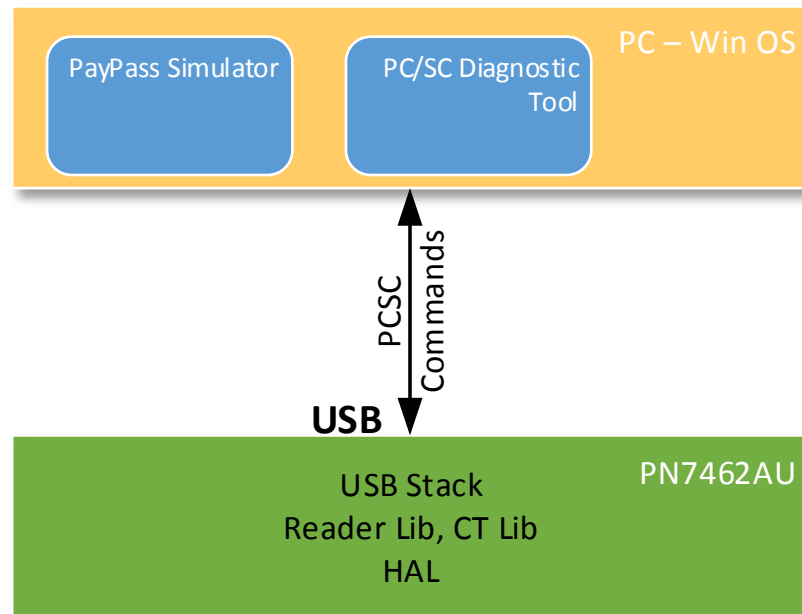
Note: External Power Adapter is not mandatory, the board can be supplied by USB only



PN7462AU PC CCID SW example

Running and using the example

1. Download and import the PC CCID Reader application source code in LPCXpresso environment
2. Build and compile the SW project.
3. Debug SW project
4. Execute PC PayPass Simulator tool
 1. Perform a contactless payment transaction
 2. Perform a contact payment transaction
5. Execute SCRTTester tool
 1. Perform an authentication with a MIFARE Classic card
 2. Read a MIFARE Classic data block

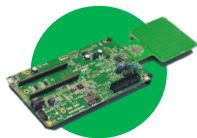


PN7462 product support package in a nutshell



NFC Controller development kit	› PN7462 NFC controller development kit OM27460CDK
PN7462AU FW and SW examples	› SW3683 – Installer package PN7462AU FW and SW Examples full version v4.0_01_00
PN7462AU NFC Cockpit	› SW3683 - Installer package PN7462 NFC Cockpit v1.3
Documentation	<ul style="list-style-type: none">› AN11706 – PN7462AU Antenna design guide› AN11738 – PN7462AU Contact smartcard application› AN11784 – PN7462AU How to integrate RTOS› AN11785 – PN7462AU LPCD and standby mode› UM10833 – PN7462 Quick start guide – customer board› UM10913 – Software user manual› UM10957 – PN7462AU Door access user manual› UM10915 – PN7462AU PC CCID reader user manual› UM10951 – PN7462 Reference POS application

PN7462AU NFC Cockpit



PN7462AU board

- The PN7462AU board enables easy antenna design with the NFC Cockpit software and fast application development with the full NFC Forum compliant and contact software libraries



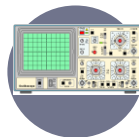
PN7462AU NFC Cockpit FW

- The PN7462AU NFC Cockpit tool expects a specific firmware to already be part of the PN7462AU board. The firmware binary for this purpose is provided with the installer. The firmware is coupled with the EEPROM layout existing in the IC.



PN7462AU NFC Cockpit

- The PN7462AU NFC Cockpit is a PC based interface (GUI) which allows you to control the PN7462AU for development and customer support. It gathers in one window all the needed functions.

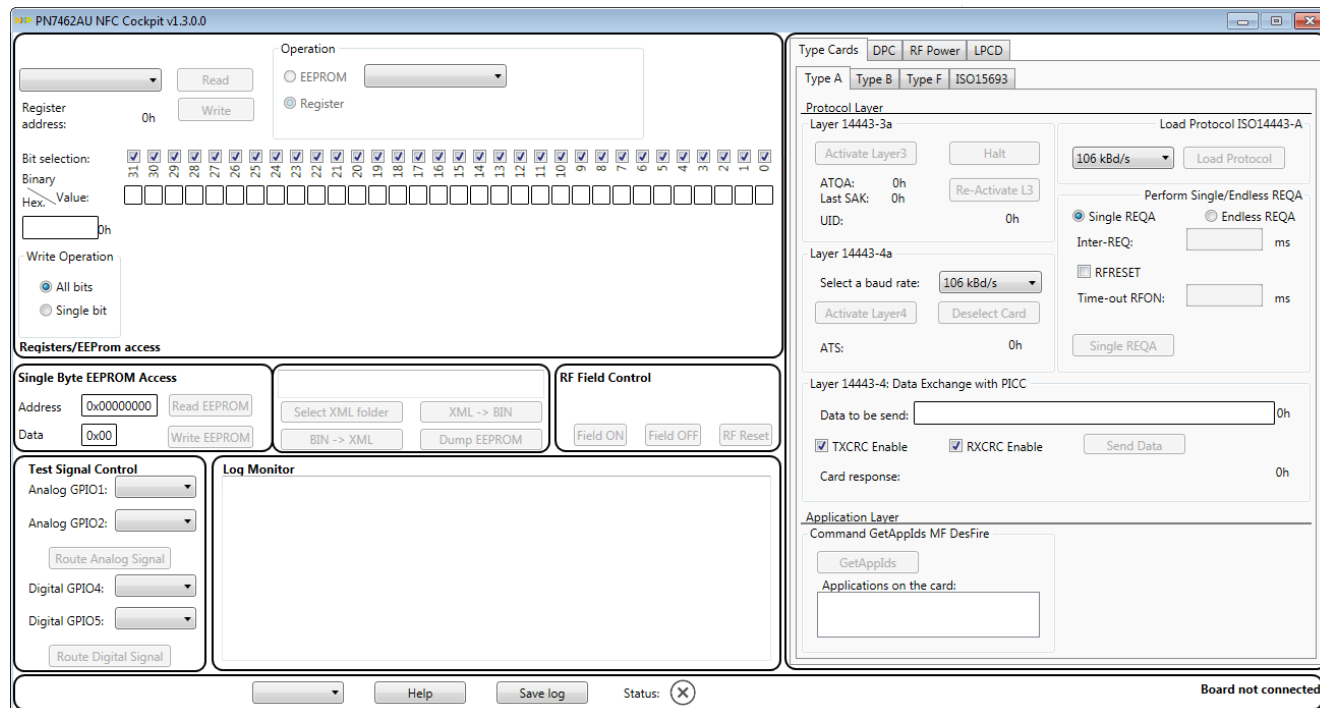


Lab equipment

- Other equipment you may need depending on the tests and measurements to be performed (e.g. oscilloscope, waveform generator, vector network analyzer, probes, multimeter, reference PICCs, wires, components, etc.)

PN7462AU NFC Cockpit, the complete design tool for engineers

- ▶ The NFC Cockpit is a PC based interface which allows you to easily control all PN7462 functions.
- ▶ The support tool is composed of these parts:
 - Registers and EEPROM access
 - Low Power Card Detect(LPCD)
 - Dynamic Power Control(DPC)
 - Test signals control
 - Generic commands
 - Log monitor
 - Type cards
 - Status bar



PN7462AU NFC Cockpit

Getting started

1

Download and install PN7462AU NFC Cockpit package and related drivers

2

PN7462AU NFC Cockpit HW preparation

3

Flashing PN7462AU NFC Cockpit FW into PN7462AU board

4

Start PN7462AU NFC Cockpit and provide directory for EEPROM and XML files

5

Perform your tests and generate a EEPROM binary with your device configuration



PN7462AU NFC Cockpit

Step 1: Download and install PN7462AU NFC Cockpit package and related drivers

- Download PN7462AU NFC Cockpit

- <http://cache.nxp.com/documents/software/SW3707.zip>

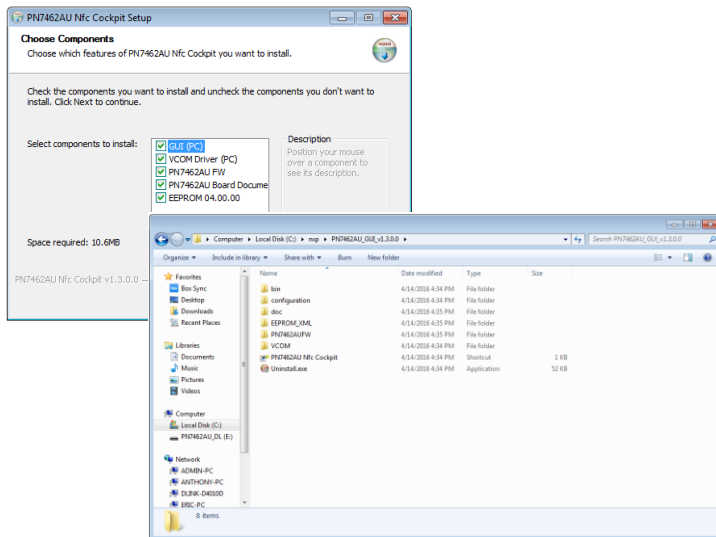


- Unzip and install the SW3707 installer

- Accept NXP SW licenses

- Install all the components

- GUI, VCOM driver, PN7462AU FW, EEPROM XML, etc

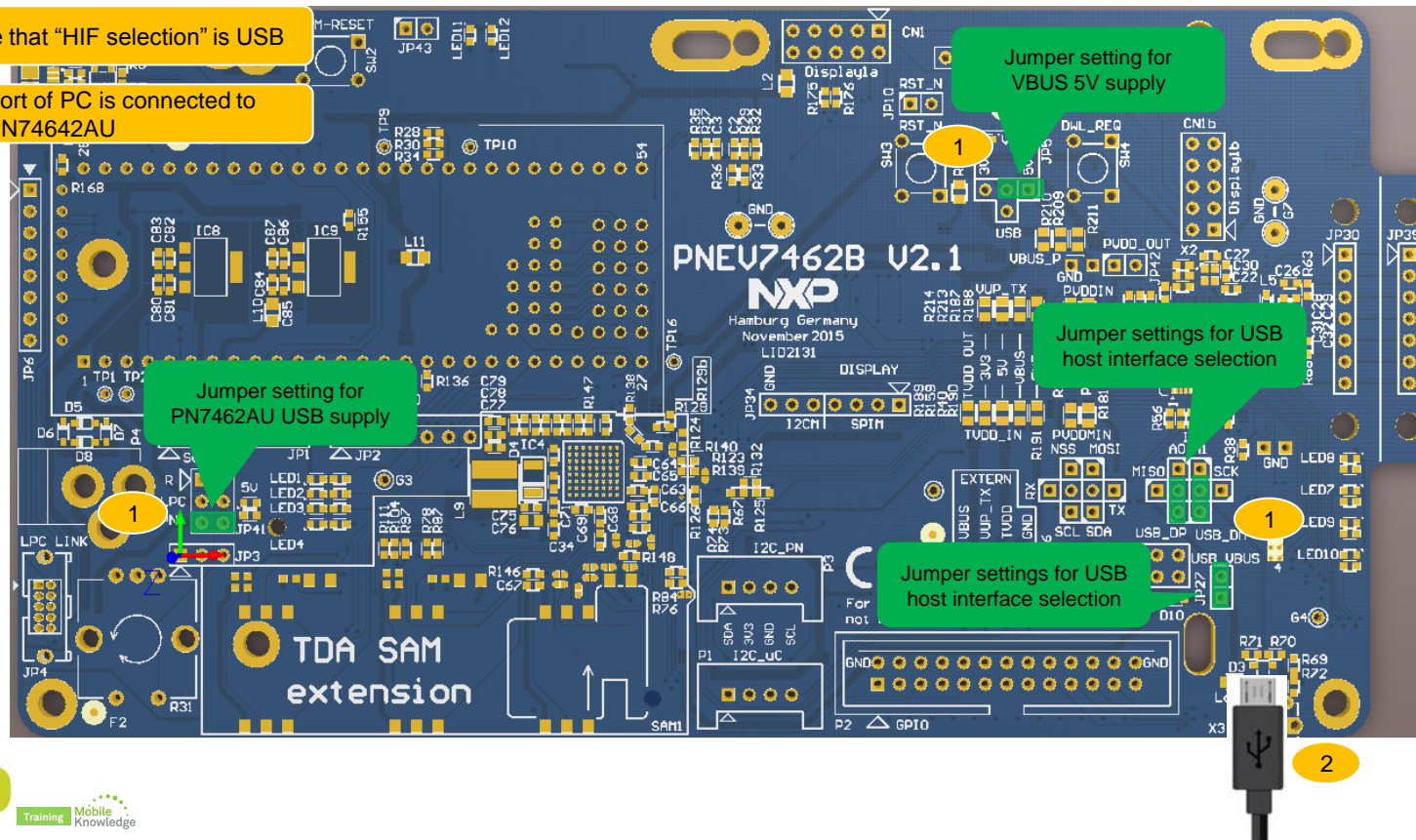


PN7462AU NFC Cockpit

Step 2: HW preparation

1 Ensure that "HIF selection" is USB

2 USB Port of PC is connected to USB-PN7462AU



PN7462AU NFC Cockpit

Step 3: Flash NFC Cockpit FW - Mounting USB as mass storage

The image shows the PN7462AU NFC Cockpit circuit board with four numbered callouts indicating the steps for flashing the firmware:

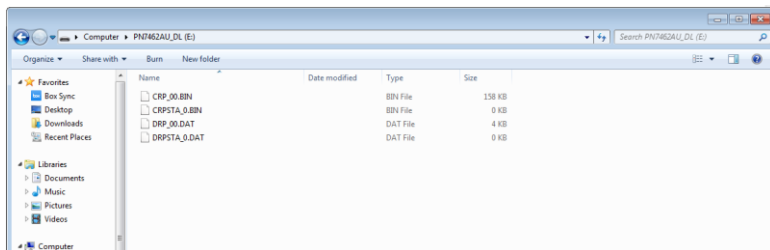
- 1 Press "RST_N" switch
- 2 Press "DWL_REQ" switch
- 3 Release "RST_N" and keep holding "DWL_REQ" switch
- 4 Release "DWL_REQ" after some seconds

The board is labeled "PNEU7462B VZ.1" and "NXP". It features various components including switches, LEDs, and connectors. The AutoPlay interface is shown in the bottom left, displaying the drive "PN7462AU_DL (E:)" with the following files:

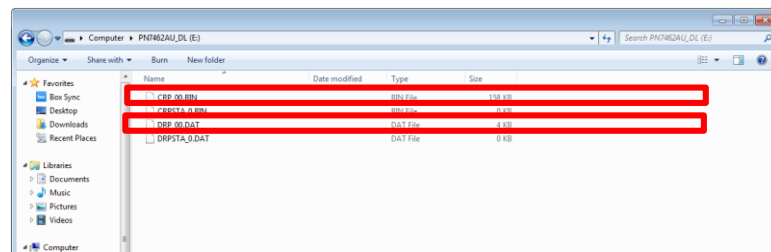
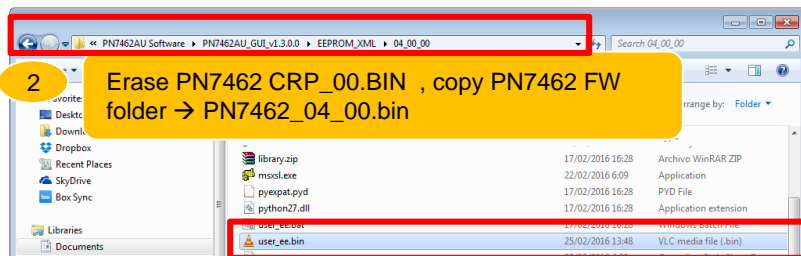
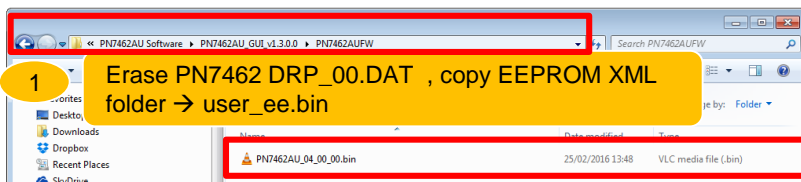
Name	Date modified	Type
CRP_00.BIN		BIN File
CRPSTA_0.BIN		BIN File
DRP_00.DAT		DAT File
DRPSTA_0.DAT		DAT File

PN7462AU NFC Cockpit

Step 3: Update binary for the EEPROM and FW



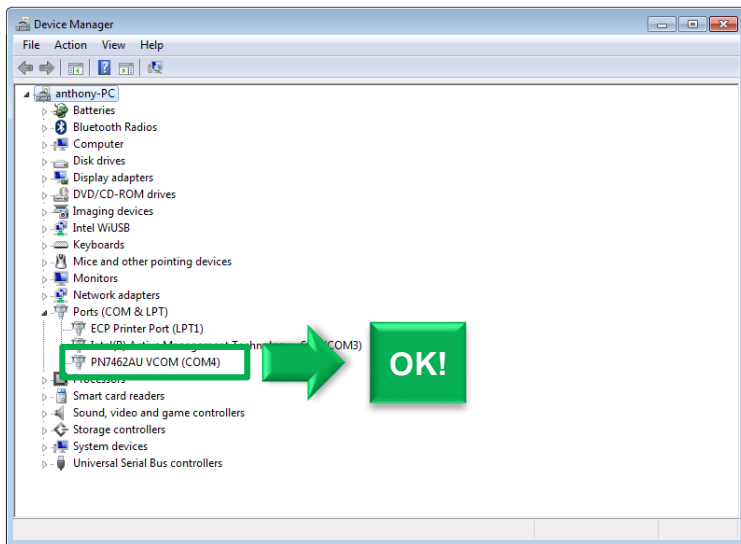
File	Description
CRP_<nn>.BIN	PN7462AU user flash code
CRPSTA_<s>.BIN	Status of previous write operation to user flash
DRP_<nn>.DAT	PN7462AU user EEPROM data
DRPSTA_<s>.DAT	Status of previous write operation to user EEPROM



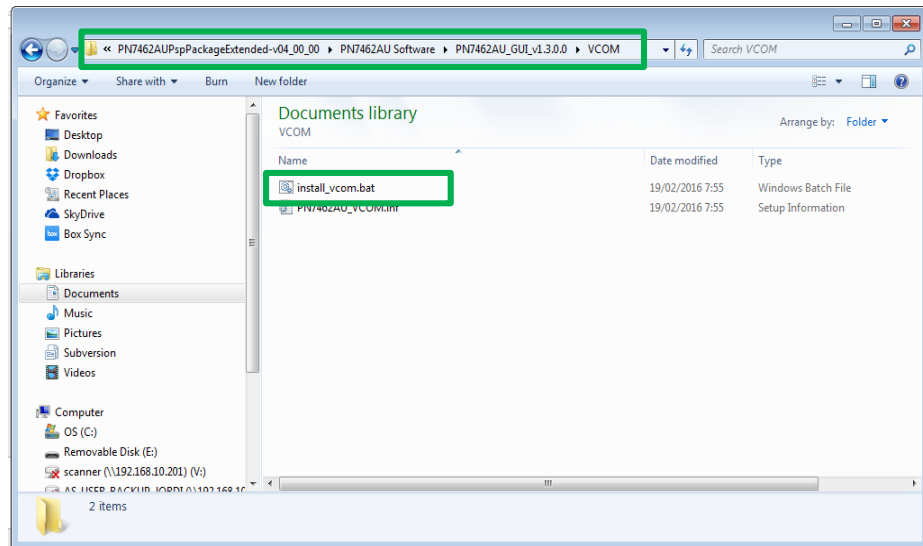
PN7462AU NFC Cockpit

Step 3: Check VCOM driver is installed

- Check VCOM driver is installed and recognized

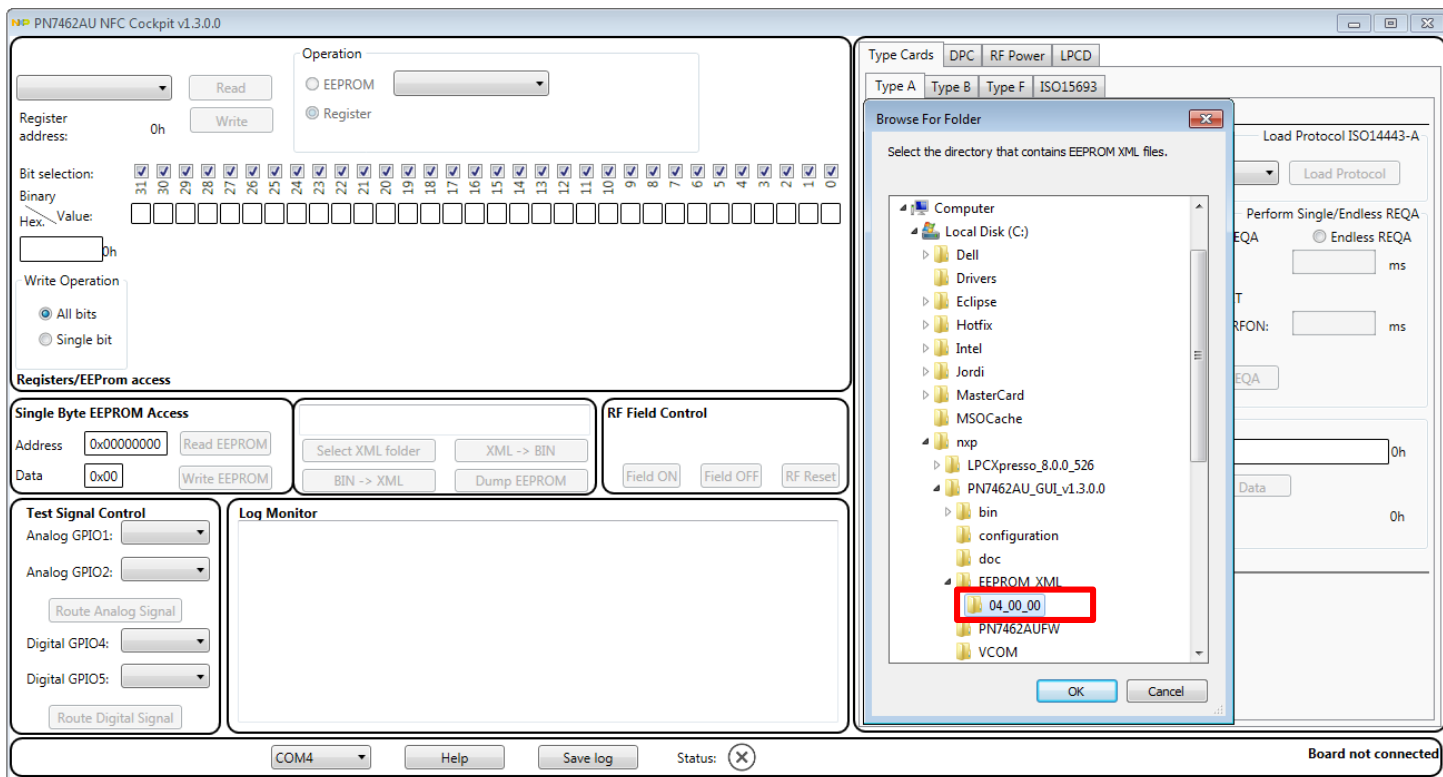


- If VCOM driver is not automatically installed, manually install it running with administrator rights *install_vcom.bat*



PN7462AU NFC Cockpit

Step 4: Open NFC Cockpit and init EEPROM XML folder

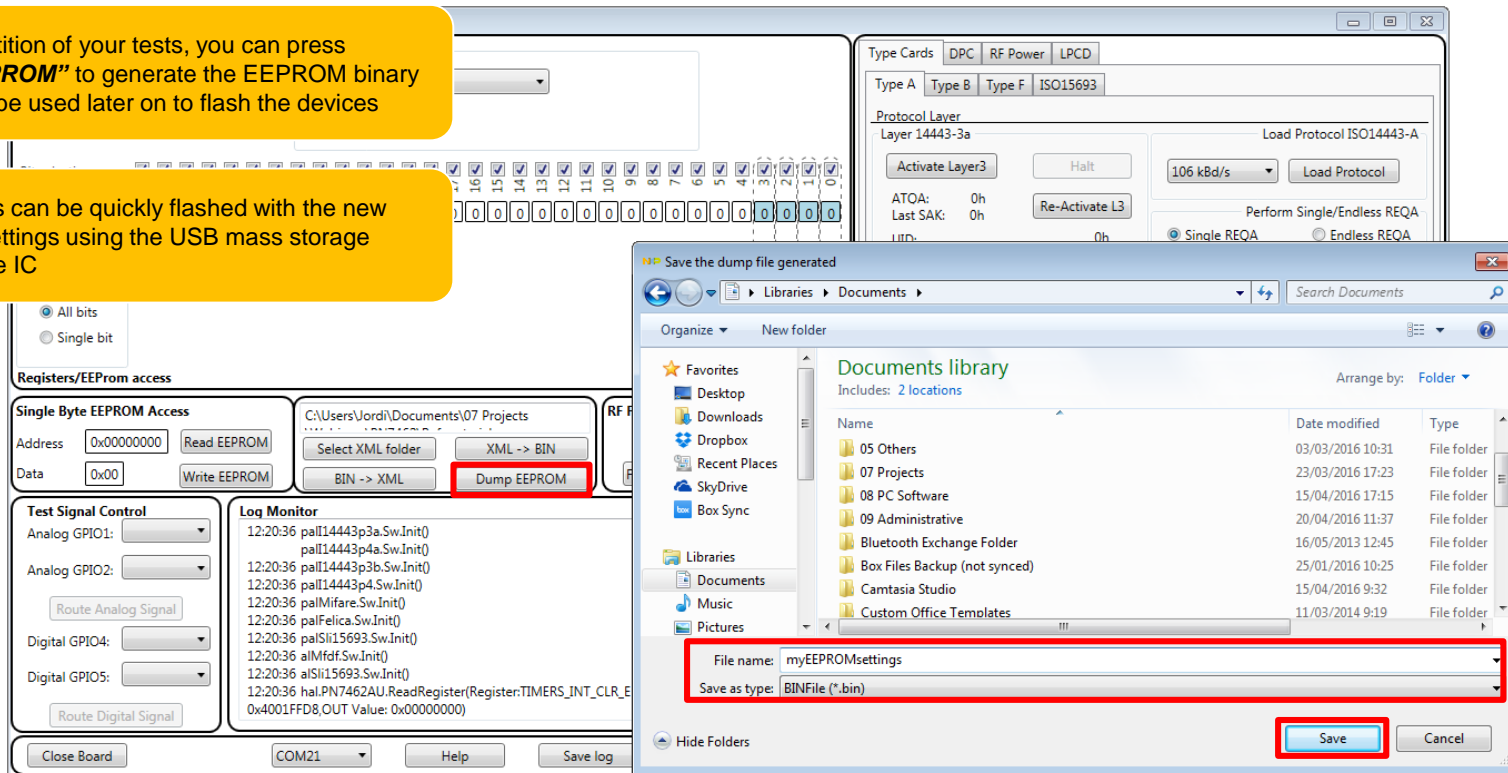


PN7462AU NFC Cockpit

Step 5: Dump EEPROM settings

After completion of your tests, you can press **"Dump EEPROM"** to generate the EEPROM binary file that can be used later on to flash the devices

Your devices can be quickly flashed with the new EEPROM settings using the USB mass storage feature of the IC



PN7462AU NFC Cockpit

Simple demonstration of use

PN7462 NFC Cockpit: Reader mode

"Create application" command to a MIFARE DESFire card

- 1 Load protocol
- 2 Field ON
- 3 REQ + Anticoll + Select
- 4 RATS
- 5 DESFire Create App command

The screenshot displays the PN7462 NFC Cockpit software interface. The main window is divided into several sections:

- Protocol Layer:** Shows the selected protocol (ISO14443-3a) and the card type (Type A). The "Load Protocol" button is highlighted with a yellow circle and the number 1.
- Field Control:** The "Field ON" button is highlighted with a yellow circle and the number 2.
- REQ + Anticoll + Select:** The "Activate Layers" button is highlighted with a yellow circle and the number 3.
- RATS:** The "RATS" button is highlighted with a yellow circle and the number 4.
- DESFire Create App command:** The "Send Data" button is highlighted with a yellow circle and the number 5.

The interface also includes a "Single Byte EEPROM Access" section, a "Log Monitor" section, and a "Test Signal Control" section. The status bar at the bottom indicates "success in data exchanging with PICC--> (DATA_L4: 0x00000000) (Option: 0x00000000TxBuffer: 0xCA)".

PN7462 NFC Cockpit: *Reader mode*

“Get Application AIDs” command to a MIFARE DESFire card

The screenshot displays the PN7462 NFC Cockpit software interface. On the left, a vertical list of six steps is provided in yellow boxes:

- 1 Load protocol
- 2 Field ON
- 3 REQ + Anticoll + Select
- 4 RATS
- 5 DESFire Create App command
- 6 DESFire Get App AIDs command

The main interface is divided into several panels:

- Operation:** Includes a dropdown for 'TIMERS_INT_CLR_ENA', a 'Read' button, and a selection for 'EEPROM'.
- Bit selection:** A row of checkboxes for bits 23 through 0, with bit 0 currently selected.
- RF Field Control:** Contains 'Field ON', 'Field OFF', and 'RF Reset' buttons.
- Test Signal Control:** Features dropdowns for Analog GPIO1, Analog GPIO2, Digital GPIO4, and Digital GPIO5, along with 'Route Analog Signal' and 'Route Digital Signal' buttons.
- Log Monitor:** A text area showing a log of commands and responses, including '0x40,OUT UidOut: 0x7A4F2280,OUT NvbUidOut: 0x00000040' and '8:15:20 Hal.PN7462AU.SetConfig(Config: 0x02,Value: 0x01)'. The final log entry is 'pall14443p4.Sw.Exchange(Option: 0x00,TxBuffer: 0x6A,OUT RxBuffer: 0x00A2A1A0)'. A red box highlights the 'Card response: A2A1A0' in the 'Application Layer' section.
- Right Panel:** Contains settings for 'Type Cards' (DPC, RF Power, LPCD), 'Type A' (Type B, Type F, ISO15693), 'Protocol Layer' (Layer 14443-3a, Layer 14443-4a), and 'Load Protocol ISO14443-A'. It also includes buttons for 'Activate Layer3', 'Halt', 'Re-Activate L3', 'Activate Layer4', and 'Deselect Card'. The 'Perform Single/Endless REQA' section has radio buttons for 'Single REQA' and 'Endless REQA', and input fields for 'Inter-REQ:', 'Time-out RFON:', and 'Single REQA'. The 'Data to be send:' field is set to '6A'.

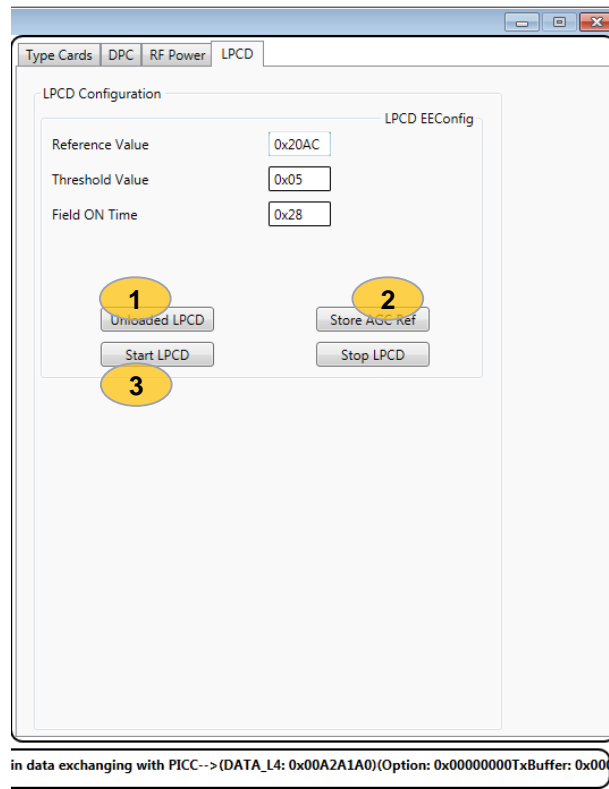
The status bar at the bottom indicates 'success in data exchanging with PICC-->(DATA_L4: 0x00A2A1A0)(Option: 0x00000000TxBuffer: 0x00)'. A yellow circle with the number '6' is placed over the 'Send Data' button in the right panel.

PN7462 NFC Cockpit:

Low-power card detection (LPCD)

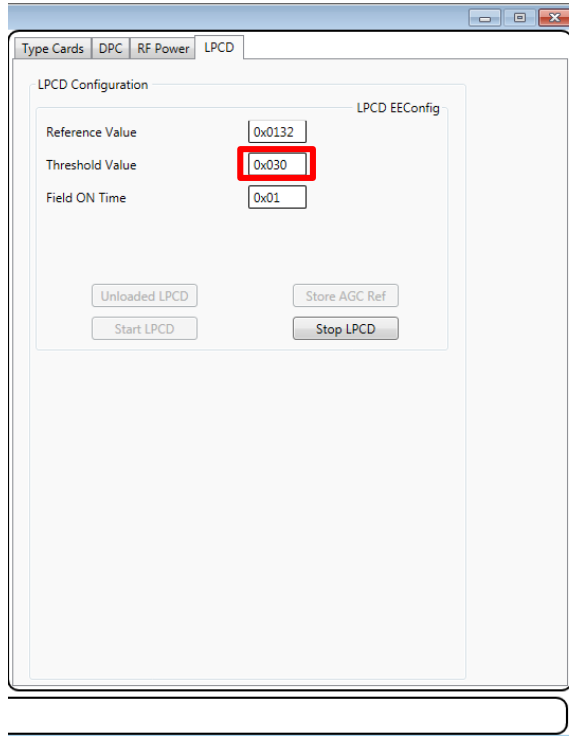
- ▶ The low-power card detection (LPCD) is an energy saving configuration option for the PN5180.
- ▶ The LPCD works in two phases:
 - **Standby phase:** Controlled by a wake-up counter and which timing can be defined
 - **Detection phase:** The RF field is switched on for a defined interval and the current AGC value is compared against a reference value.
 - ❖ If the current AGC value exceeds the reference value + the defined threshold → card detected
 - ❖ Otherwise, chip moves to standby phase again.

For more details about LPCD,
refer to AN



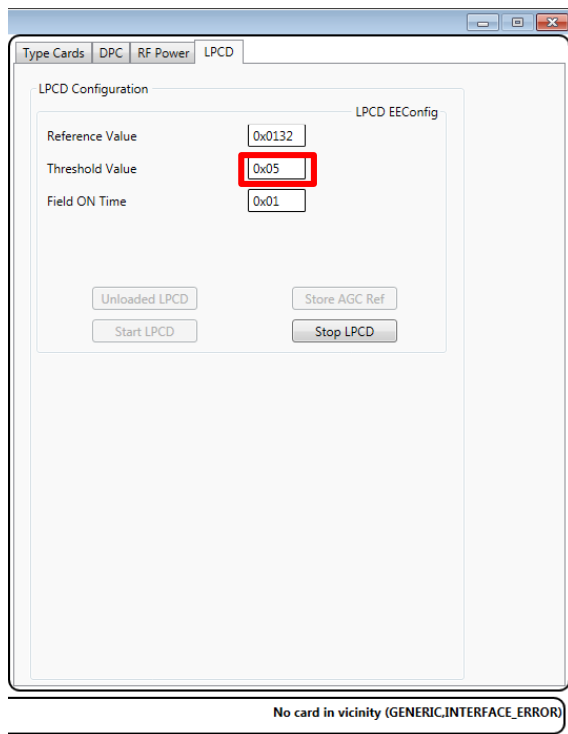
PN7462 NFC Cockpit:

Low-power card detection (LPCD)



PN7462 NFC Cockpit:

Low-power card detection (LPCD)



PN7462 product support package in a nutshell



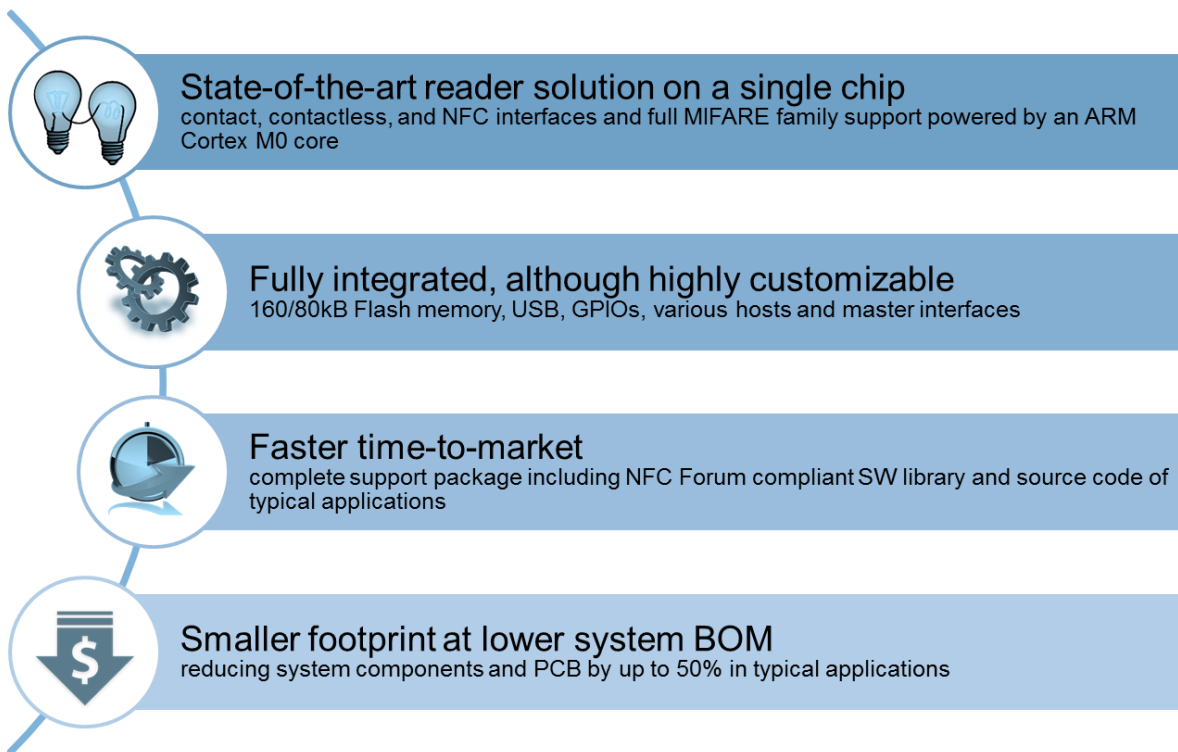
NFC Controller development kit	› PN7462 NFC controller development kit OM27460CDK
PN7462AU FW and SW examples	› SW3683 – Installer package PN7462AU FW and SW Examples full version v4.0_01_00
PN7462AU NFC Cockpit	› SW3683 - Installer package PN7462 NFC Cockpit v1.3
Documentation	<ul style="list-style-type: none">› AN11706 – PN7462AU Antenna design guide› AN11738 – PN7462AU Contact smartcard application› AN11784 – PN7462AU How to integrate RTOS› AN11785 – PN7462AU LPCD and standby mode› UM10833 – PN7462 Quick start guide – customer board› UM10913 – Software user manual› UM10957 – PN7462AU Door access user manual› UM10915 – PN7462AU PC CCID reader user manual› UM10951 – PN7462 Reference POS application

PN7462 product documentation

Doc ID	Doc Name	Description
PN746x_736X	NFC Cortex-M0 microcontroller with ISO/IEC7816 interface	This document describes the functionality and electrical specification of the PN7462 NFC controller family
AN11706	PN7462AU Antenna design guide	This document describes the antenna design related to the PN7462AU
AN11738	PN7462AU Contact smart card application	This document describes how to use the contact smart card interface on the PN7462AU
AN11784	PN7462AU How to integrate RTOS	This document describes the steps required for integration of RTOS with PN7462AU firmware
AN11785	PN7462AU LPCD and standby mode	This document describes the principle of low power card detection offered by the PN7462AU
UM10833	PN7462 Quick Start Guide - customer board	This document describes the required basic circuitry to operate the PN7462AU and it also describes how to setup and use the PN7462AU customer demo board
UM10913	Software User Manual	This document describes the PN7462AU/PN7360AU FW architecture and how to use it
UM10957	PN7462AU door access user manual	This document serves as a user manual for the Door Access Demo application use case demo on PN7462 board
UM10915	PN7462AU PC CCID reader user manual	This document briefs the setup environment required for PC CCID reader use case demo on PN7462 board
UM10951	PN7462 Reference POS application	This document briefs the setup environment required for the POS application use case demo on PN7462 board

Final remarks

PN7462 – First all-in-one full NFC solution



PN7462 family ordering information and samples



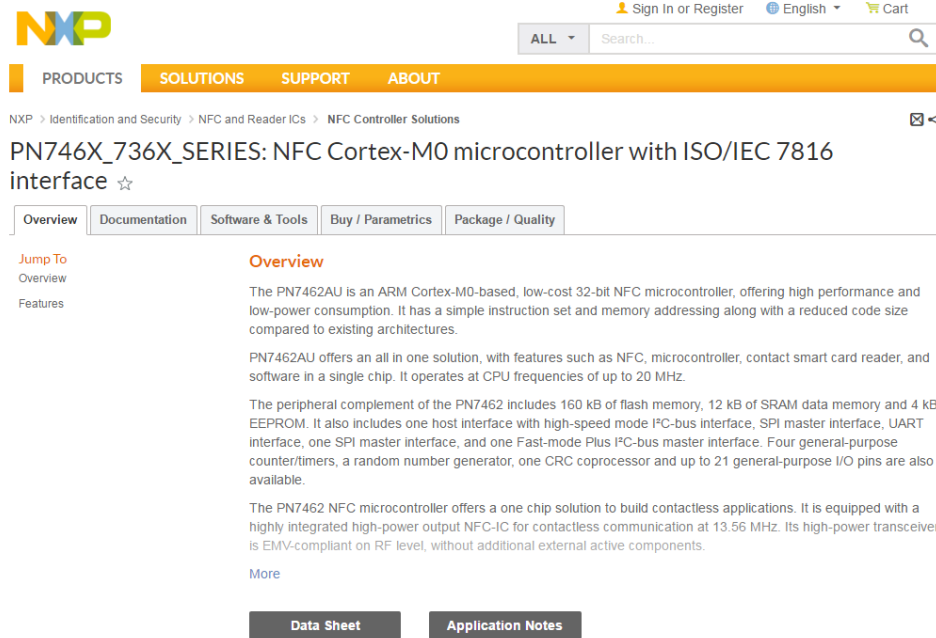
Product	Flash memory	Contact interface	Delivery	12NC
PN7462	160 kB	Yes	Single Tray	9353 076 92551
			Reel	9353 076 92518
PN7362	160 kB	No	Single Tray	9353 084 36551
			Reel	9353 084 36518
PN7362	80 kB	No	Single Tray	9353 077 96551
			Reel	9353 077 96518

Product samples can be ordered from eSample by clicking on “NXP Customer Support” → “Samples”

Do you need more?

Resources and useful links

- ▶ NFC Everywhere
<http://www.nxp.com/nfc>
- ▶ PN7462 family product website
http://www.nxp.com/products/identification-and-security/nfc-and-reader-ics/nfc-controller-solutions/nfc-cortex-m0-microcontroller-with-iso-iec-7816-interface:PN746X_736X_SERIES
- ▶ OM27462CDK NFC controller development kit website
<http://www.nxp.com/products/identification-and-security/nfc-and-reader-ics/nfc-controller-solutions/nfc-controller-development-kit:OM27462CDK>
- ▶ NFC support community
<https://community.freescale.com/community/nfc?hdr=1&subcf=SUPPORT>



The screenshot shows the NXP website's product page for the PN746X_736X_SERIES. The page features a navigation bar with links for PRODUCTS, SOLUTIONS, SUPPORT, and ABOUT. A search bar is located in the top right corner. The main heading is "PN746X_736X_SERIES: NFC Cortex-M0 microcontroller with ISO/IEC 7816 interface". Below the heading, there are tabs for Overview, Documentation, Software & Tools, Buy / Parametrics, and Package / Quality. The Overview tab is selected, displaying a detailed description of the microcontroller, its features, and its applications. The page also includes links for "Data Sheet" and "Application Notes".

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PRODUCTS SOLUTIONS SUPPORT ABOUT

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

PN746X_736X_SERIES: NFC Cortex-M0 microcontroller with ISO/IEC 7816 interface ☆

Overview Documentation Software & Tools Buy / Parametrics Package / Quality

Overview

The PN7462AU is an ARM Cortex-M0-based, low-cost 32-bit NFC microcontroller, offering high performance and low-power consumption. It has a simple instruction set and memory addressing along with a reduced code size compared to existing architectures.

PN7462AU offers an all in one solution, with features such as NFC, microcontroller, contact smart card reader, and software in a single chip. It operates at CPU frequencies of up to 20 MHz.

The peripheral complement of the PN7462 includes 160 kB of flash memory, 12 kB of SRAM data memory and 4 kB EEPROM. It also includes one host interface with high-speed mode I²C-bus interface, SPI master interface, UART interface, one SPI master interface, and one Fast-mode Plus I²C-bus master interface. Four general-purpose counter/timers, a random number generator, one CRC coprocessor and up to 21 general-purpose I/O pins are also available.

The PN7462 NFC microcontroller offers a one chip solution to build contactless applications. It is equipped with a highly integrated high-power output NFC-IC for contactless communication at 13.56 MHz. Its high-power transceiver is EMV-compliant on RF level, without additional external active components.

[More](#)

[Data Sheet](#) [Application Notes](#)



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



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PN7462 family – product support package

Jordi Jofre (Speaker) / Eric Leroux (Host)

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



Thank you