



RFID BoosterPack

TRF7970ABP

With MSP430F5529 LaunchPad



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Prerequisites

Hardware

1. 1x MSP-EXP430F5529 LaunchPad, [orderable from the TI eStore](#).
2. 1x DLP-7970ABP, [orderable through third party vendors](#).

Software

1. Download [NFCLink](#) installation file.
2. Download [Uniflash](#) installation file.

Assumptions & Knowledge Base

1. The user should have knowledge of or be familiar with:
 - MSP430F5529 LaunchPad

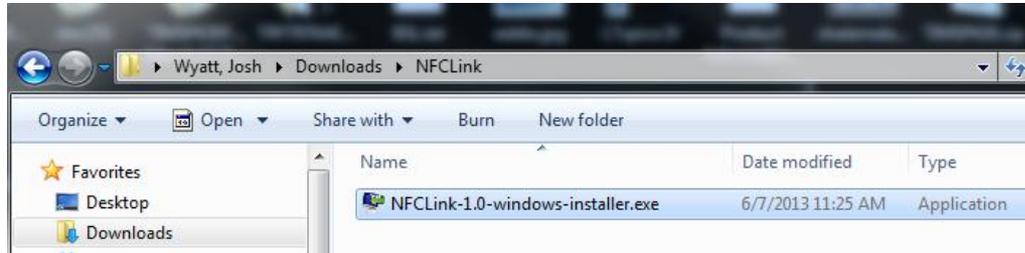


Basic Installation

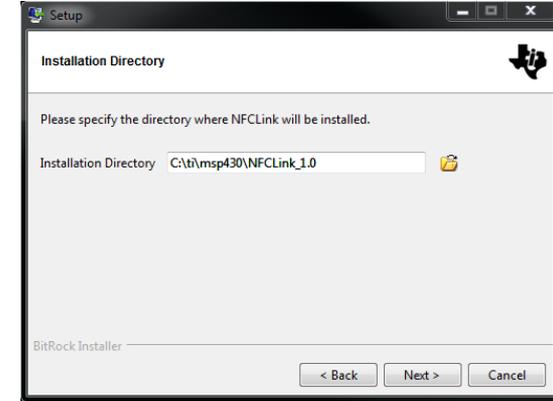
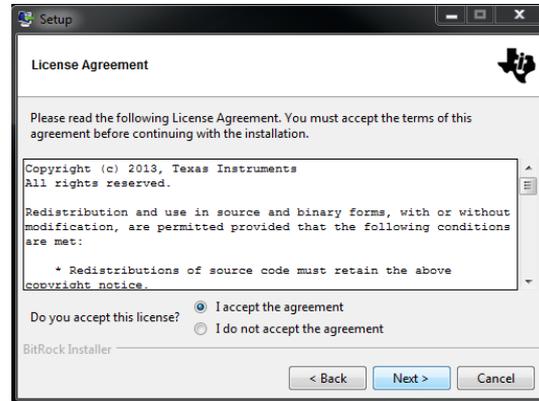
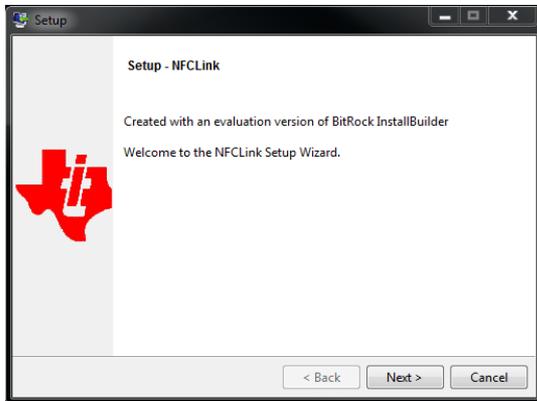
Install NFCLink



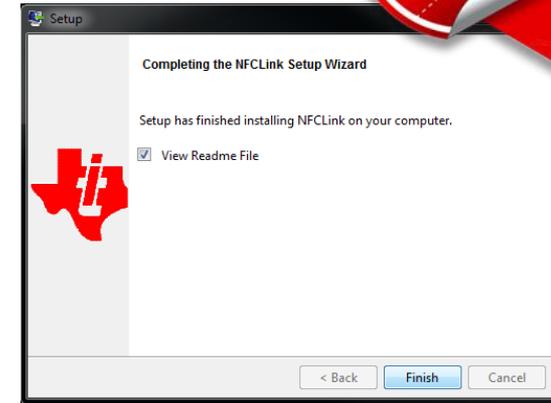
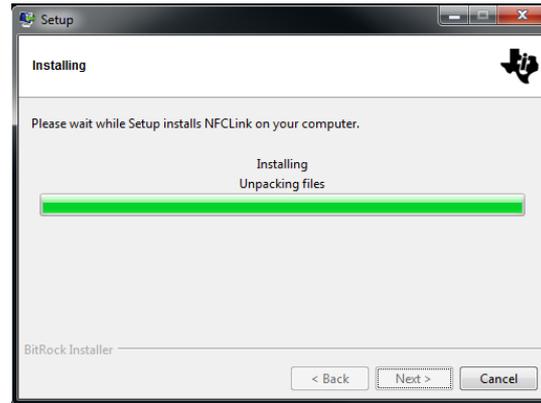
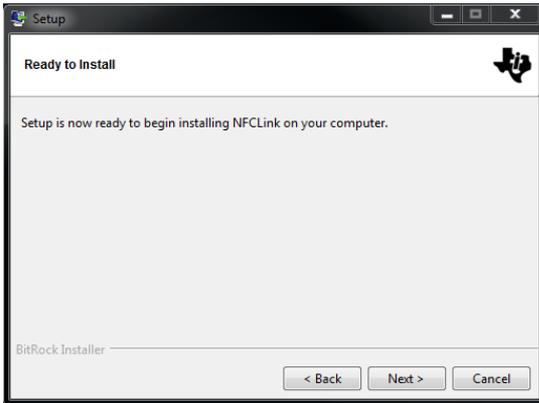
- Use the downloaded NFCLink Installer executable to get the firmware code project and the NFCPlayer GUI loaded onto PC.



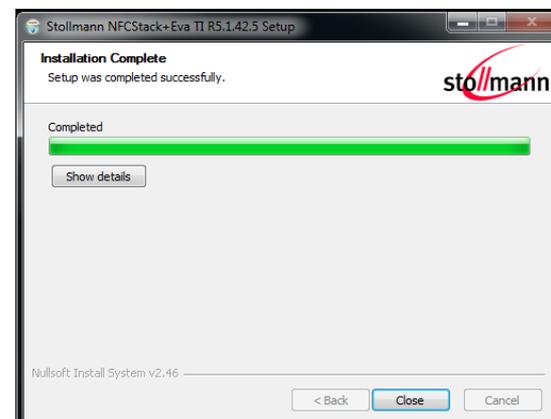
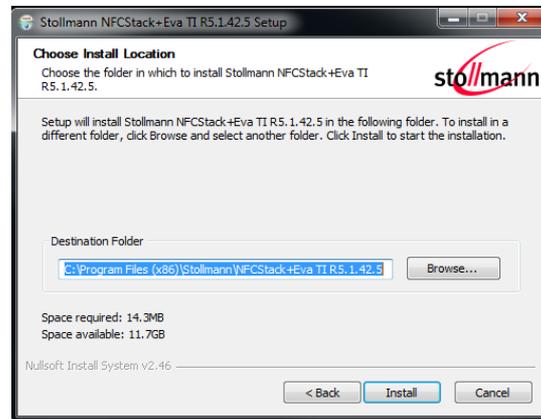
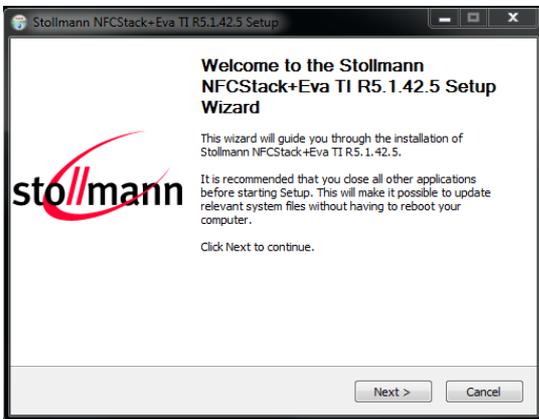
- Double click installer and follow instructions.



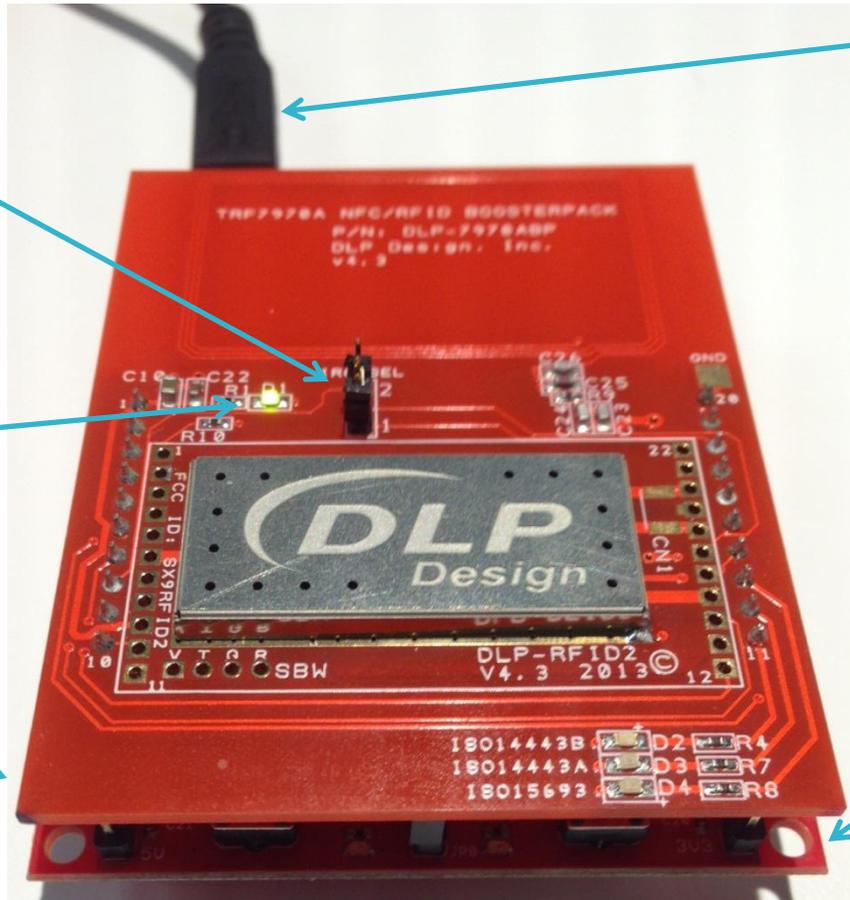
Install NFCLink



- The NFCPlayer GUI will begin installation automatically.



Hardware Setup



USB Connection to PC

Jumper in position 1 for MSP430F5529 LaunchPad

D1 (green when powered)

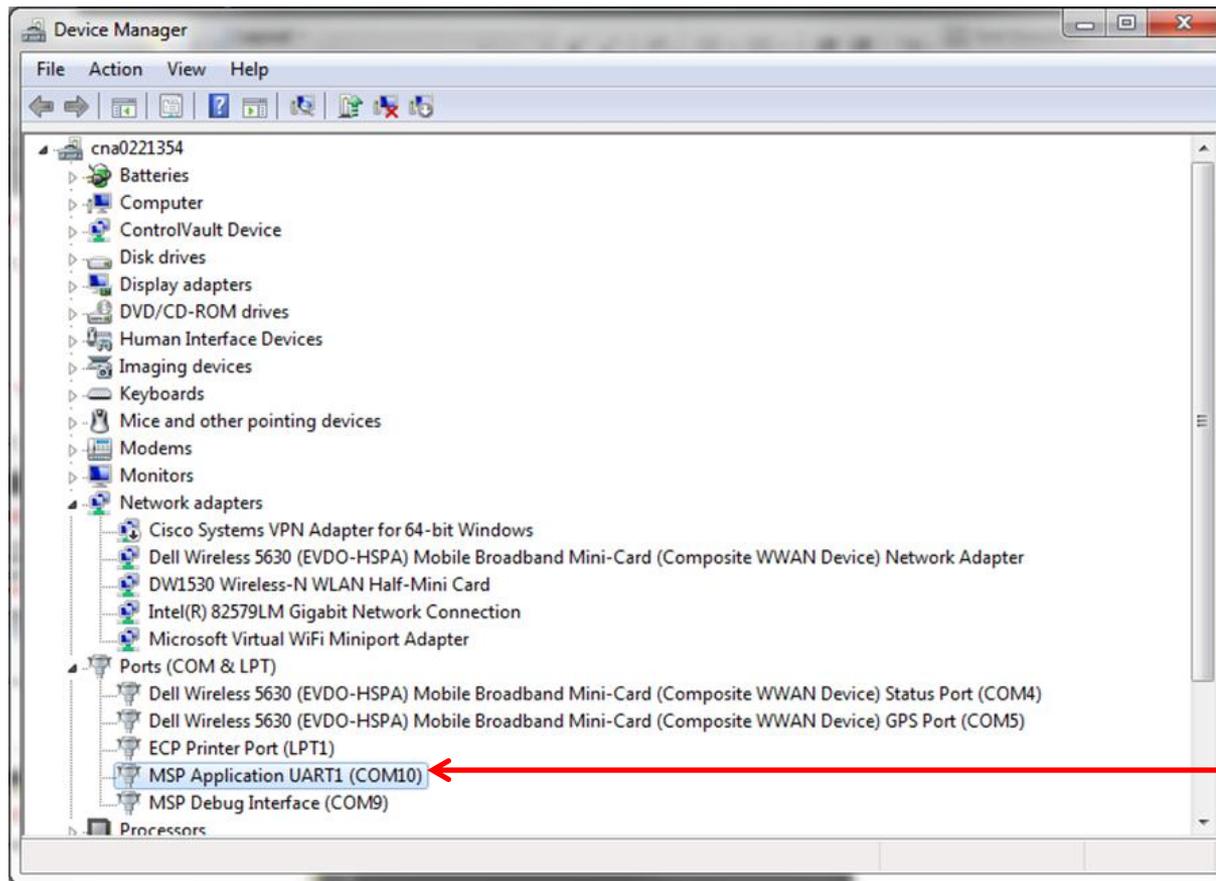
TRF7970ABP

MSP430F5529 LaunchPad

Detect COM Port



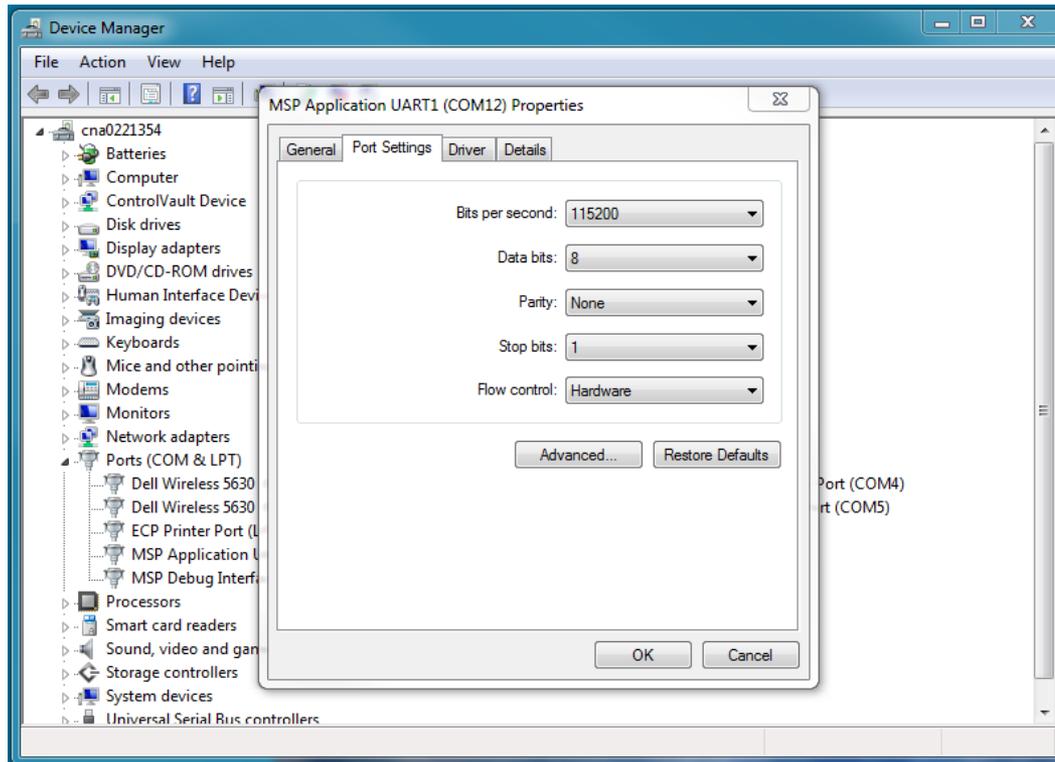
- Open Device Manager from Control Panel
- Determine COM Port from Ports Menu (MSP Application UART)



COM Port Settings



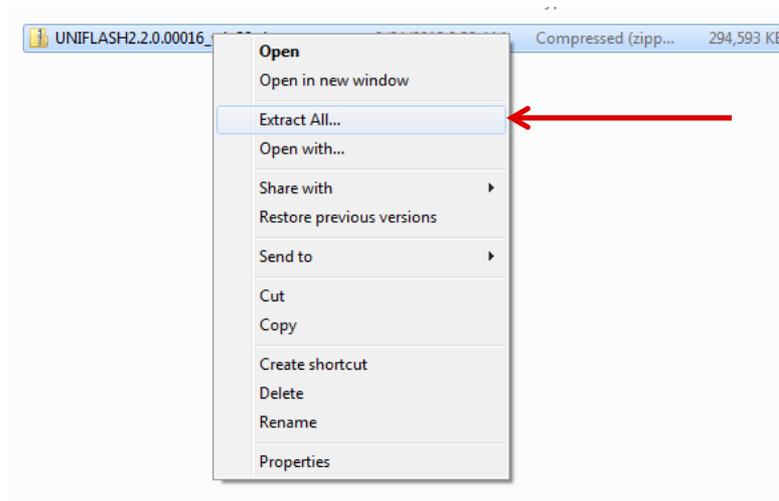
- Right click on MSP430 Application UART Port, select Properties, and visit Port Settings tab
- Adjust Virtual COM Port settings to 115200, 8, None, 1, Hardware
 - Note that COM port numbers vary between systems



Install UniFlash



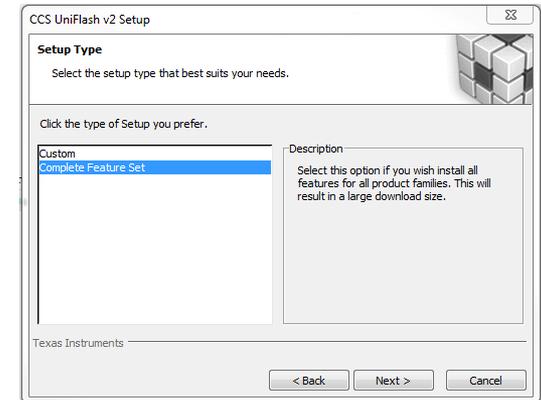
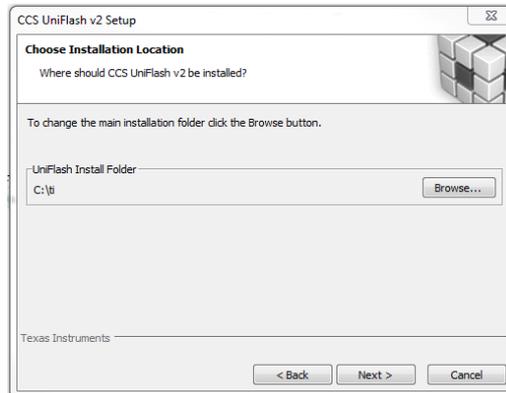
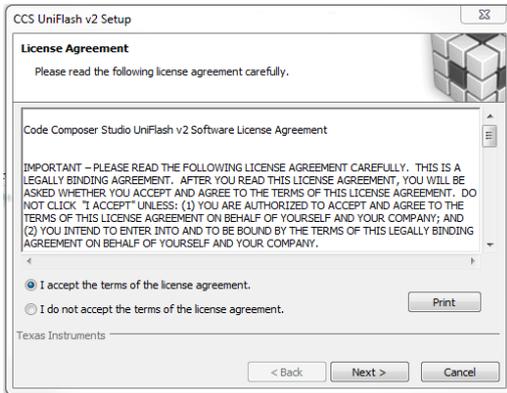
- Download UniFlash zip file to preferred download location.
- Extract all files from UniFlash zip file (note: UniFlash revision numbers vary).
- The file path will depend on where the zip file has been downloaded.



Install UniFlash



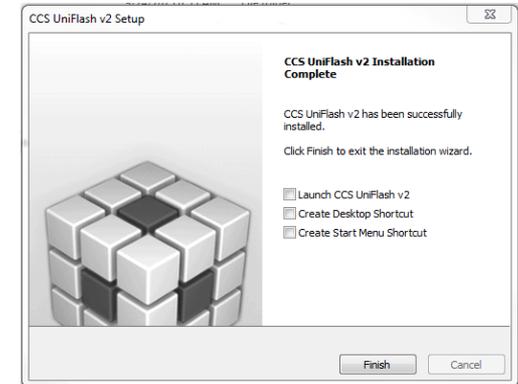
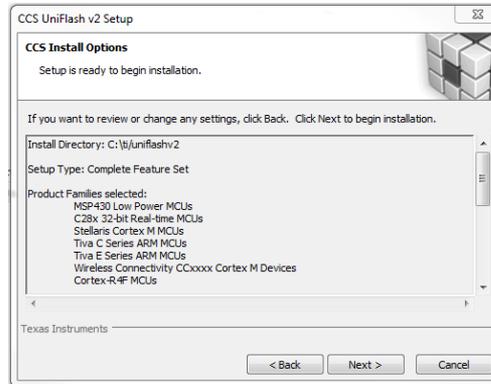
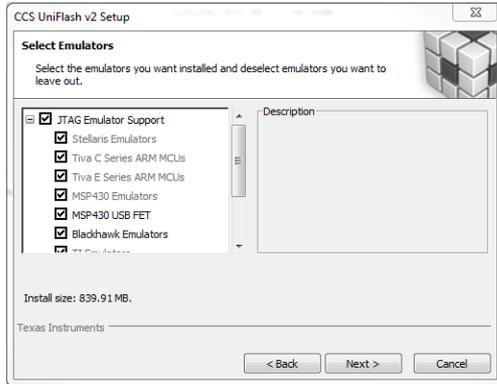
- Execute UniFlash installation file (.exe file extension).
- The installation file can be found in the extracted file folder.
- Follow installation instructions.
- Note location of installation folder.



Install UniFlash



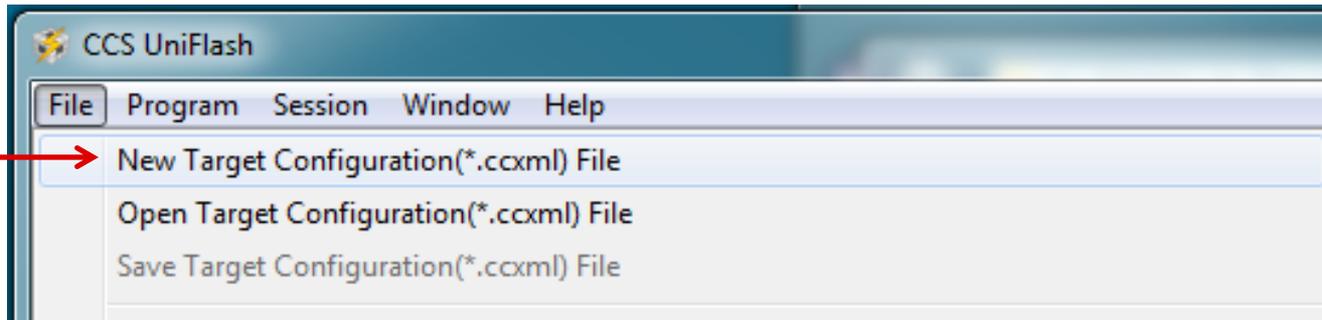
- Continue to follow installation instructions, installing the appropriate drivers for the application.



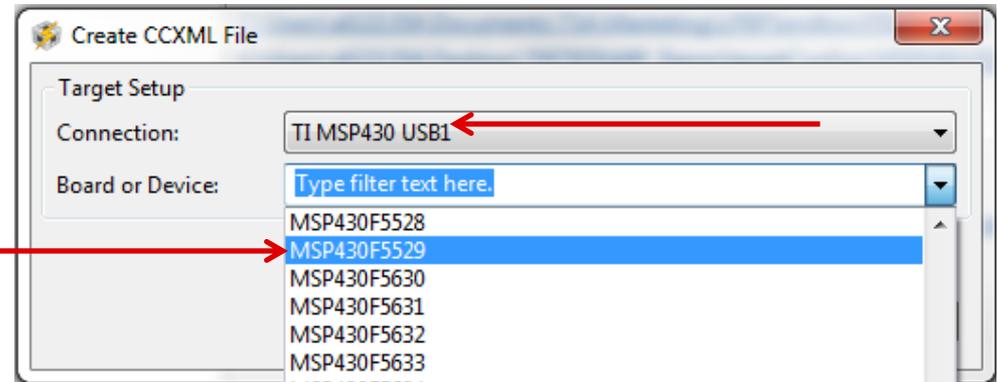
Install the MSP430F5529 Target Configuration



- Click File
- Choose New Target Configuration



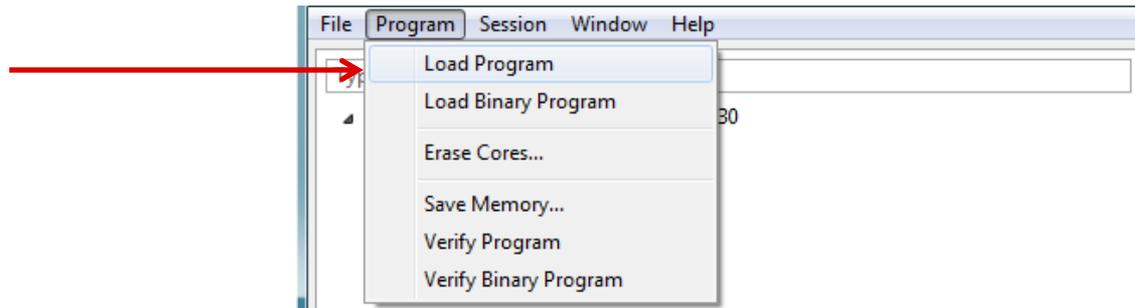
- Select Connection (USB1)
- Select MSP430F5529 Device



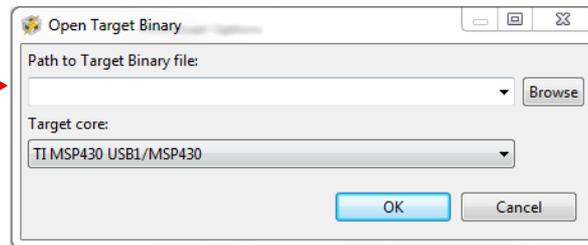
Load the Target Binary



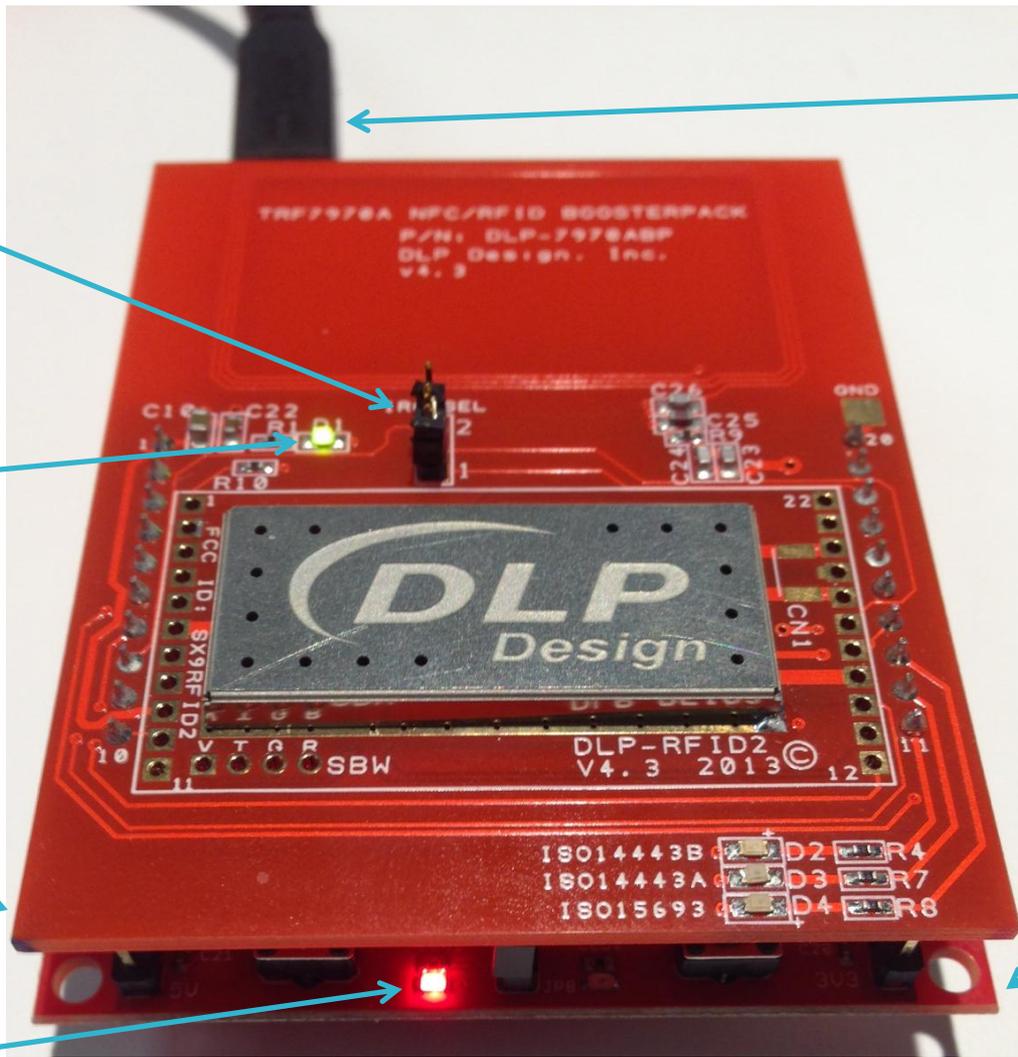
- Click Program
- Choose Load Program



- Select path to "RW_P2P_CE_2.out" within TRF7970ABP software folder, targeting MSP430 LaunchPad Core.
- Default location for program file is:
 - C:\TI\msp430\NFCLink_1.0.0.1\examples\allModes\RW_P2P_CE_2\ccs\Debug



Hardware



USB Connection to PC

Jumper in position 1 for MSP430F5529 LaunchPad

D1 (green when powered)

TRF7970ABP

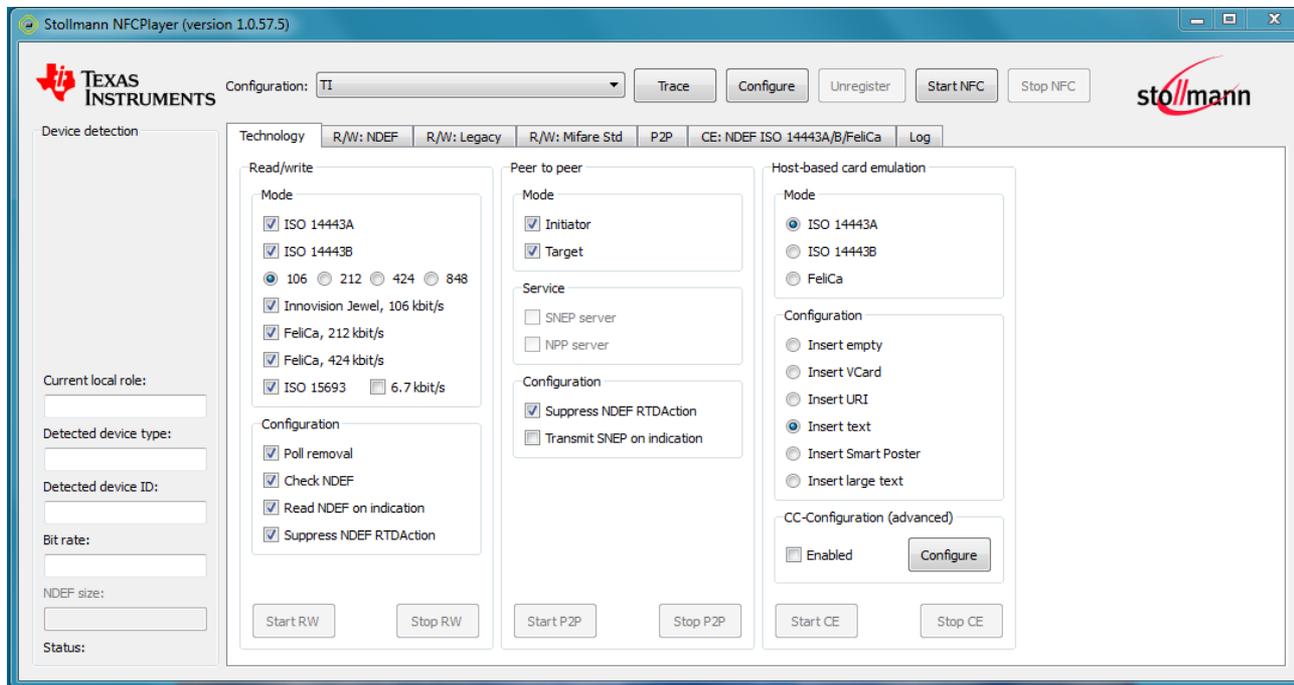
Heartbeat LED (will be blinking when TRF7970A it is initialized after using Uniflash)

MSP430F5529 LaunchPad

Execute NFCPlayer



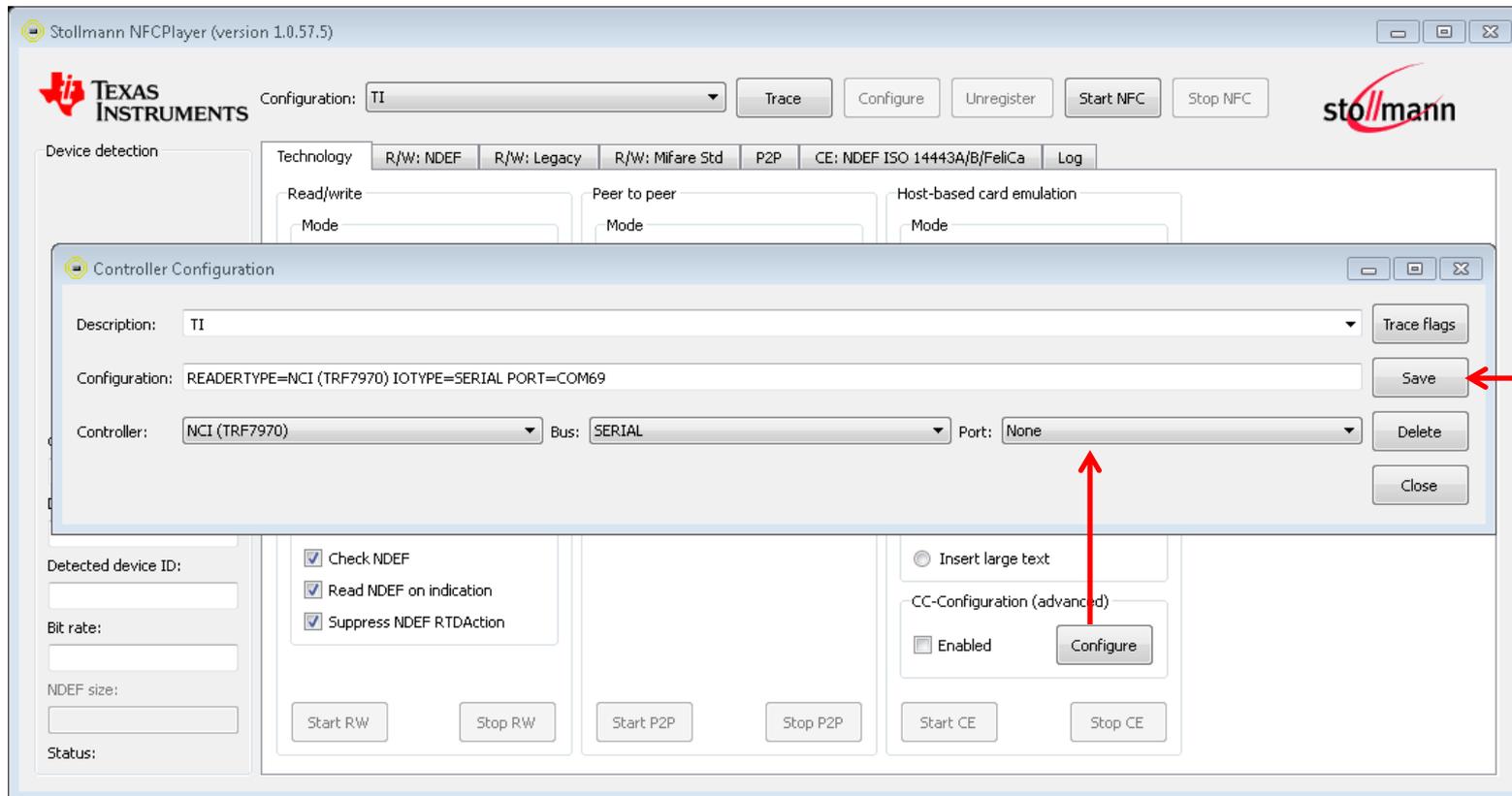
- Execute NFCPlayer by double clicking on icon generated during NFCLink installation.
- The GUI will open as seen below.



Execute NFCPlayer



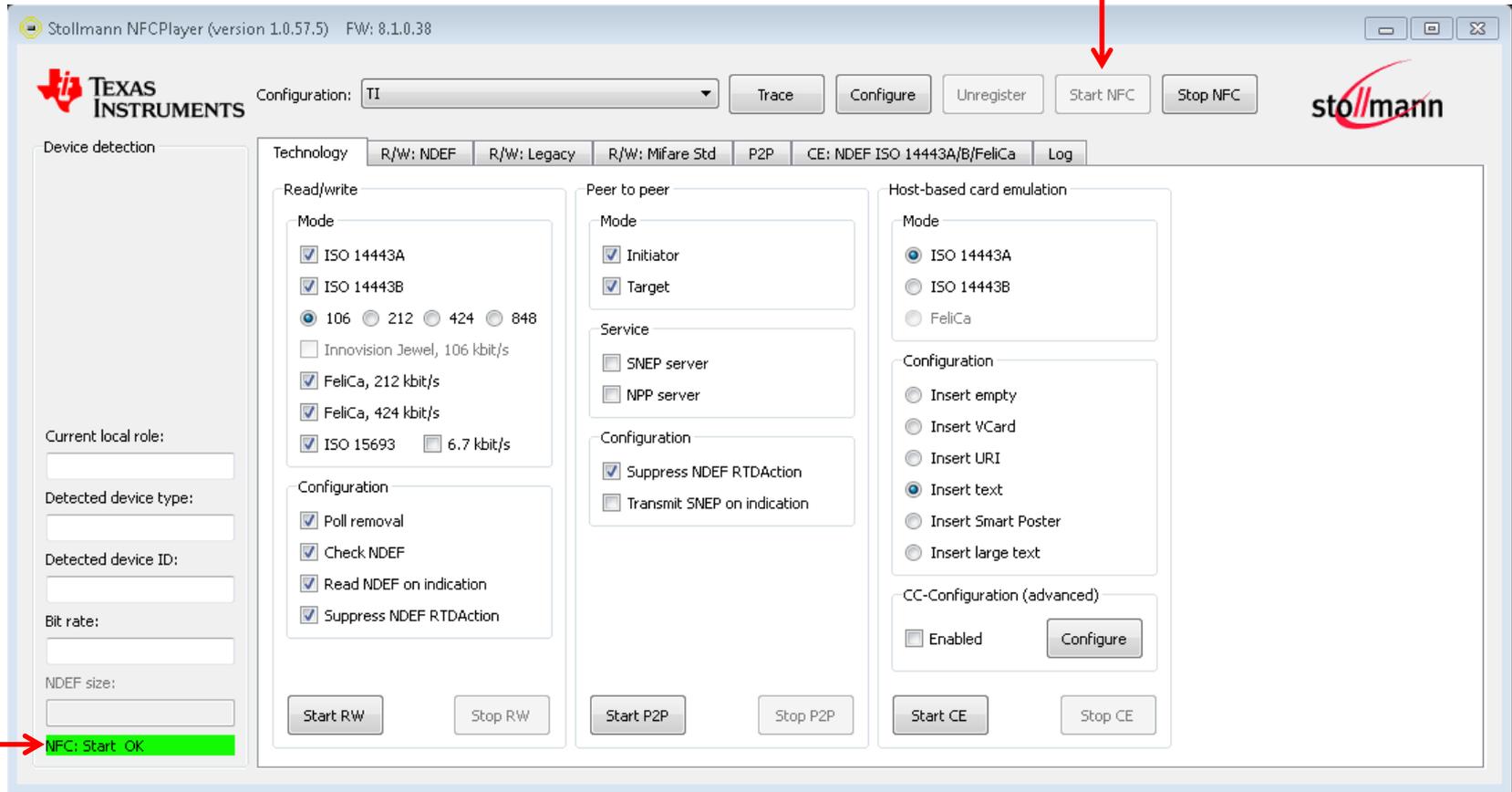
- After GUI opens, press the Configure button to pop up sub-screen and type in the number that the COM port enumerated to.
- Save this sub window and close.



Execute NFCPlayer



- Press Start NFC Button. NFC: Start OK will appear in lower left hand window of the GUI.



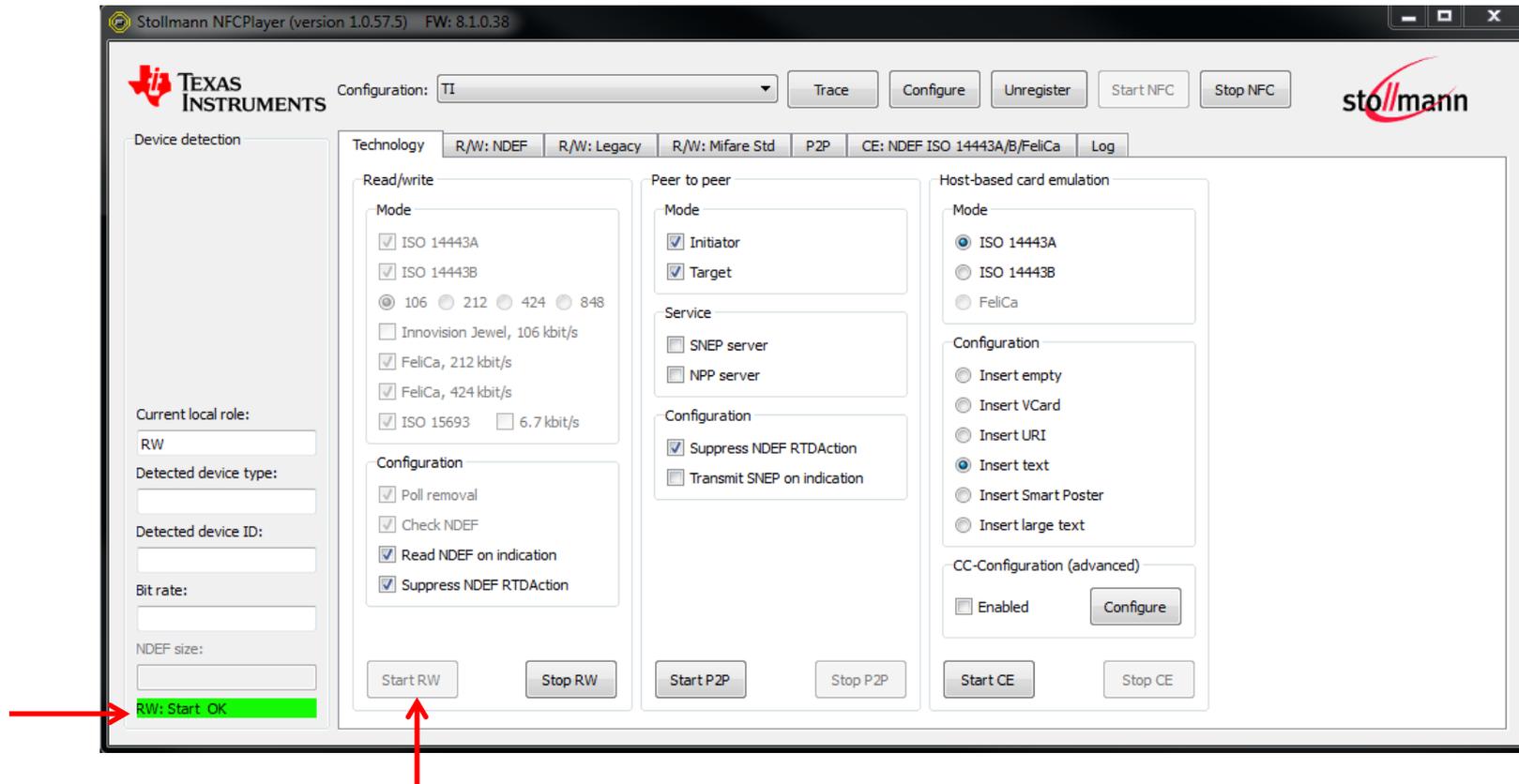


NFC/RFID Read/Write Mode

Read/Write Mode



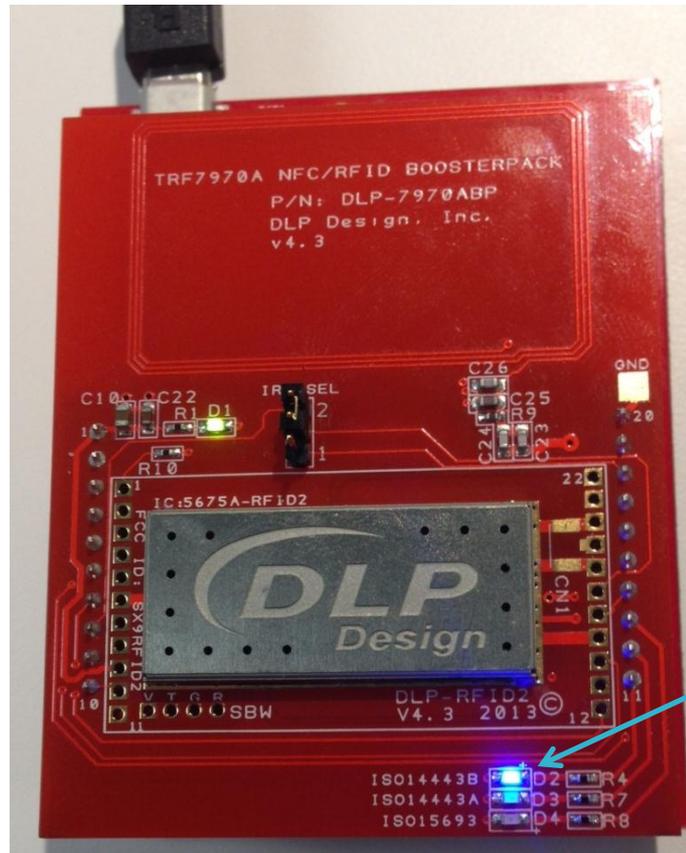
- Press the Start RW button to begin Read/Write Mode.
 - (RW: Start OK will appear in green in lower left hand window of the GUI)



Read/Write Mode



- When hardware is in Read/Write mode, D2 will be flashing. The LED will switch to solid when any NFC/RFID tag is presented.

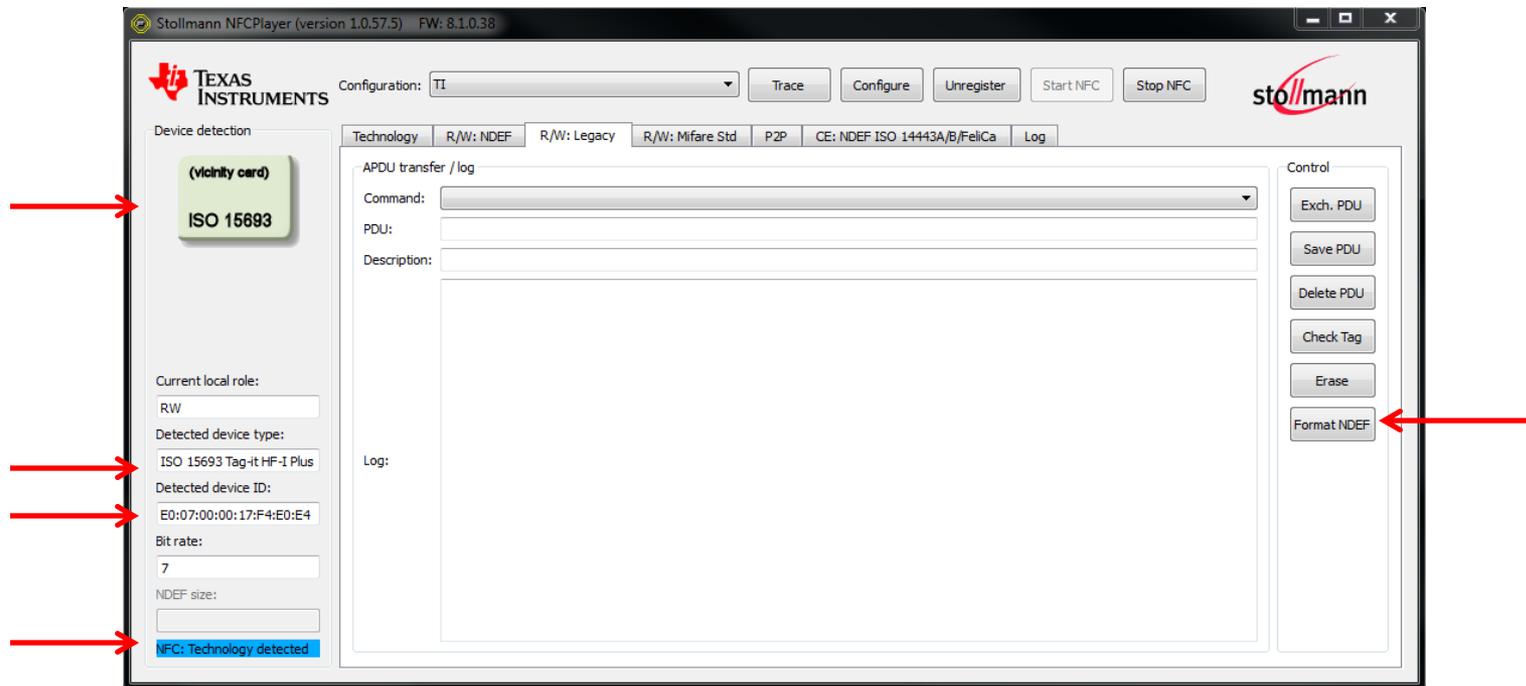


D2

Read/Write Mode NFC-V Tag



- Present any NFC-V tag (unformatted NFC-V ISO15693, TI HF-I tag shown).
 - Tab automatically flips to R/W: Legacy. Type of card is displayed graphically along with the Unique ID (in this case: E007000017F4E0E4)
 - Press the Format NDEF button to make the tag NFC-V type.



Read/Write Mode NFC-V Tag



- After the tag is formatted, the GUI status window will quickly flip to Format NDEF OK, then the R/W NDEF tab will open, with the status changing to RW: Read NDEF OK.

The screenshot displays the Stollmann NFCPlayer interface (version 1.0.57.5, FW: 8.1.0.38). The left sidebar shows device detection details for an ISO 15693 tag, with red arrows pointing to the "ISO 15693" label, the "NFC FORUM" logo, the "Detected device type: ISO 15693 Tag-it HF-I Plus", the "Detected device ID: E0:07:00:00:17:F4:E0:E4", and the "RW: Read NDEF OK" status bar at the bottom. The main window is in "Read" mode for "R/W: NDEF" technology. The "Read" section contains a table with columns: Level, Index, TNF, Type, Code, and Content. The "Write" section is also visible, showing options for RTD Text, RTD URI, RTD Smart Poster, VCard, and MIME, with a language code set to "English" and a text area containing "NFC powered by Texas Instruments".

Level	Index	TNF	Type	Code	Content
-------	-------	-----	------	------	---------

Read/Write Mode NFC-V Tag



- Enter data into Text field and press Write button to write the tag.
- The screen will quickly flip to Write NDEF. Press Read or remove/re-present tag to read newly written data.

The screenshot displays the Stollmann NFCPlayer (version 1.0.57.5) FW: 8.1.0.38 interface. The window title bar shows the version and firmware information. The interface is divided into several sections:

- Device detection:** Shows a detected device as "(vicinity card) ISO 15693" with an NFC Forum logo below it. A red arrow points to this section.
- Configuration:** Includes a dropdown menu set to "TI" and buttons for "Trace", "Configure", "Unregister", "Start NFC", and "Stop NFC".
- Technology:** A tabbed interface with "R/W: NDEF" selected. Other tabs include "R/W: Legacy", "R/W: Mifare Std", "P2P", "CE: NDEF ISO 14443A/B/FeliCa", and "Log".
- Read Section:** Contains a table with columns "Level", "Index", "TNF", "Type", "Code", and "Content". A "Control" panel on the right has a "Read" button (indicated by a red arrow), "Check Tag", and checkboxes for "Suppress" and "Auto read".
- Write Section:** Features tabs for "RTD Text", "RTD URI", "RTD Smart Poster", "VCard", and "MIME". The "RTD Text" tab is active, showing a "Lang. code" dropdown set to "English" and a text area containing: "Welcome Texas Instruments Field Applications Engineers! NFC powered by Texas Instruments - NFCLink Rocks!!! NFC is a growth engine for Texas Instruments across all business units! We value your skills - thanks for your attention!". A "Control" panel on the right has "Write", "Format", and "Erase" buttons.
- Current local role:** Set to "RW".
- Detected device type:** "ISO 15693 Tag-it HF-I Plus".
- Detected device ID:** "E0:07:00:00:17:F4:E0:E4".
- Bit rate:** Set to "7".
- NDEF size:** "236 of 250".
- Status:** A green bar at the bottom left indicates "RW: Write NDEF OK".

Red arrows on the left side of the interface point to the device detection area, the detected device type, detected device ID, bit rate, and NDEF size fields.

Read/Write Mode NFC Type 2 Tag



- Present Type 2 tag (programmed RTD Smart Poster tag shown).
- If Suppress NDEF RTD Action (in front panel) box is unchecked, tag will open programmed web page.

The screenshot shows the Stollmann NFCPlayer (version 1.0.42.5) FW: 8.1.0.27 interface. The left sidebar displays device detection results for an NXP Mifare UL tag and an NFC Forum tag. The main area shows the 'Read' section with a table of NDEF records and the 'Write' section with options for RTD Text, RTD URI, RTD Smart Poster, VCard, and MIME. The 'Read' section includes a table with columns: Level, Index, TNF, Type, Code, and Content. The 'Write' section includes a 'Lang. code' dropdown set to 'English' and a 'URI' field set to 'http://www.ti.com/nfc'. A green status bar at the bottom left indicates 'RW: Read NDEF OK'.

Level	Index	TNF	Type	Code	Content
0	0	RTDWellKnown	Sp		
1	0	RTDWellKnown	T	en	Check this out - NFC powered by Texas Instruments!
1	1	RTDWellKnown	U		http://www.ti.com/nfc
1	2	RTDWellKnown	act		start application

Read/Write Mode NFC Type 3 Tag



- Present Type 3 tag (RTD URI tag shown).

The screenshot shows the Stollmann NFCPlayer (version 1.0.42.5) interface. The configuration is set to TI. The Technology dropdown is set to R/W: NDEF. The detected device is a FeliCa (Type 3) with ID 01:2E:30:C8:51:52:62:77. The Read section displays a table with one entry:

Level	Index	TNF	Type	Code	Content
0	0	RTDWellKnown	U		http://www.ti.com/product/trf7970A

The Write section shows the RTD URI tab selected, with the Prefix set to http://www. and the URI set to ti.com/product/trf7970A. The status bar at the bottom indicates "RW: Read NDEF OK".

Read/Write Mode NFC Type 4A Tag



- Present Type 4A tag (vCard programmed Type 4A tag).

The screenshot shows the Stollmann NFCPlayer (version 1.0.42.5) interface. The left sidebar displays device detection information for a Mifare DESFire (Type 4) tag, with red arrows pointing to the 'Desfire' icon, 'Detected device type', 'Detected device ID', 'Bit rate', 'NDEF size', and 'RW: Read NDEF OK' status. The main window shows the 'Read' tab with a table of NDEF records and a 'Write' section for programming a vCard.

Level	Index	TNF	Type	Code	Content
0	0	MIME	text/x-vCard	BEGIN:VCARD	VERSION:3.0 N:Wyatt;Josh;;;Applications Manager FN:Josh Wyatt ORG:Texas Instruments TITLE:NFC Expert URL:www.ti.com EMAIL;TYPE=INTERNET;josh.wyatt@ti.com TEL;TYPE=voice,work,pref:214-567-5124 TEL;TYPE=cell:214-567-5124

Write Section:

RTD Text	RTD URI	RTD Smart Poster	VCard	MIME
Title:	Applications Manager	First name:	Josh	
Job title:	NFC Expert	Last name:	Wyatt	
Phone:	214-567-5124	Mobile:	214-567-5124	E-Mail: josh.wyatt@ti.com
Company:	Texas Instruments	Country:	USA	City: Dallas
URL:	www.ti.com	Code:	75243	Street: 13532 N. Central Expressway

Read/Write Mode NFC Type 4B Tag



- Present Type 4B tag (RF430CL330H which has been formatted and programmed for NFC Forum Bluetooth Connection Handover shown).
- Enter data into Write field and press Write.

The screenshot shows the Stollmann NFCPlayer (version 1.0.42.5) interface. The window title is "Stollmann NFCPlayer (version 1.0.42.5) FW: 8.1.0.27". The interface includes a Texas Instruments logo, a configuration dropdown set to "TI", and buttons for "Trace", "Configure", "Unregister", "Start NFC", and "Stop NFC". The "stollmann" logo is in the top right.

The "Device detection" panel on the left shows an "ISO 14443-B" tag and the "NFC FORUM" logo. Below this, the "Current local role:" is set to "RW". The "Detected device type:" is "ISO 14443B (Type 4)", "Detected device ID:" is "24:B5:A3:CE", "Bit rate:" is "106", and "NDEF size:" is "68 of 3072". A green bar at the bottom of this panel indicates "RW: Read NDEF OK".

The main interface has tabs for "Technology" (selected), "R/W: NDEF", "R/W: Legacy", "R/W: Mifare Std", "P2P", "CE: NDEF ISO 14443A/B/FeliCa", and "CE: Embedded SE". A "Log" button is also present.

The "Read" section contains a table with the following data:

Level	Index	TNF	Type	Code	Content
0	0	MIME	application/vnd.bluetooth.ep.oob	21 00 06 05 04 03 02 01 0D 09 48 65 61 64 53 65 74 20 4E 61 6D 65 04 0D 04 04 20 05 03 1E 11 0B 11	

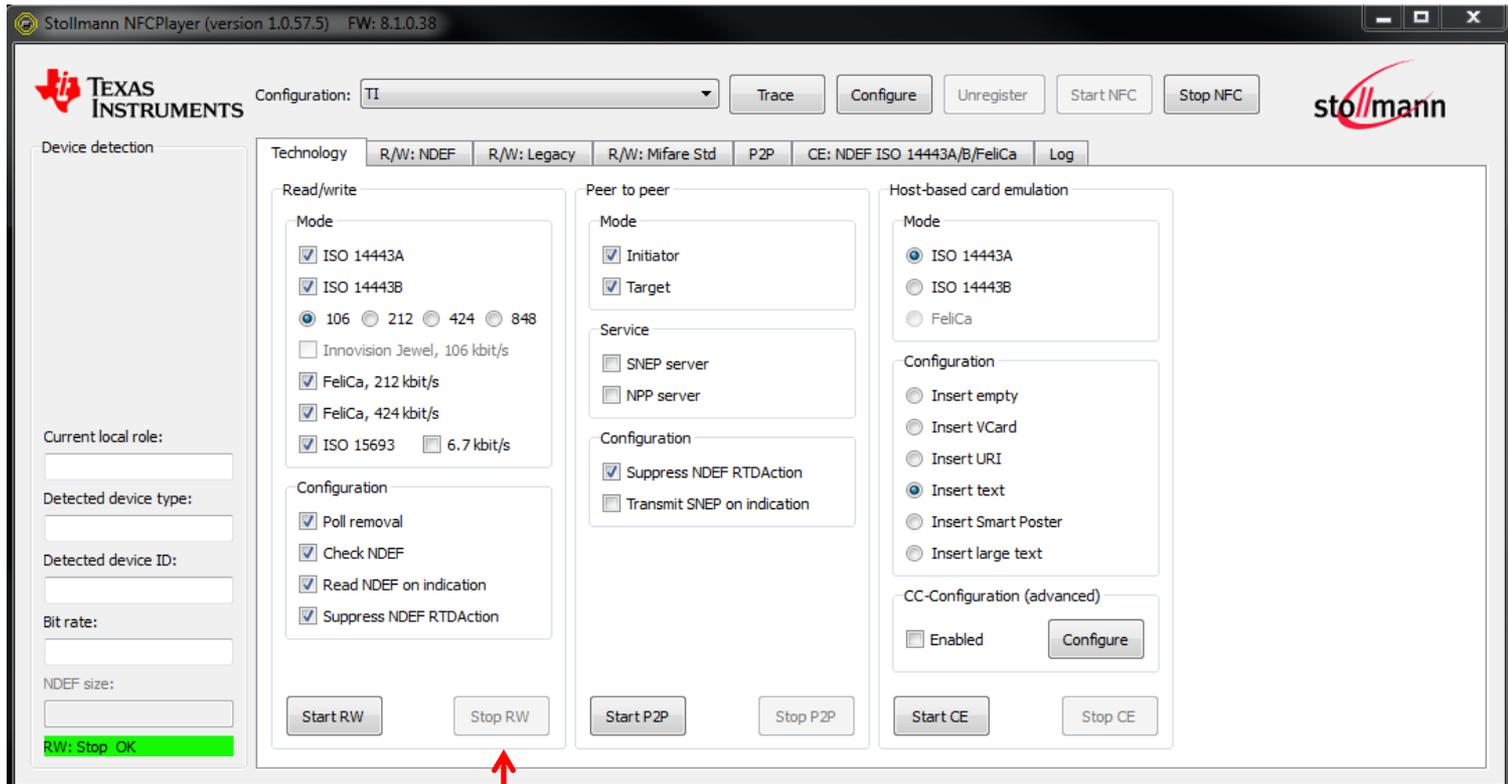
The "Write" section has tabs for "RTD Text", "RTD URI", "RTD Smart Poster", "VCard", and "MIME". The "Lang. code:" is set to "English". The "Text:" field contains "NFC powered by Texas Instruments".

Control buttons for "Read", "Check Tag", "Write", "Format", and "Erase" are visible on the right side of the interface.

Exiting or Stopping the Read/Write Mode



- To stop the R/W mode, remove the tag in the field and press the Stop RW button.



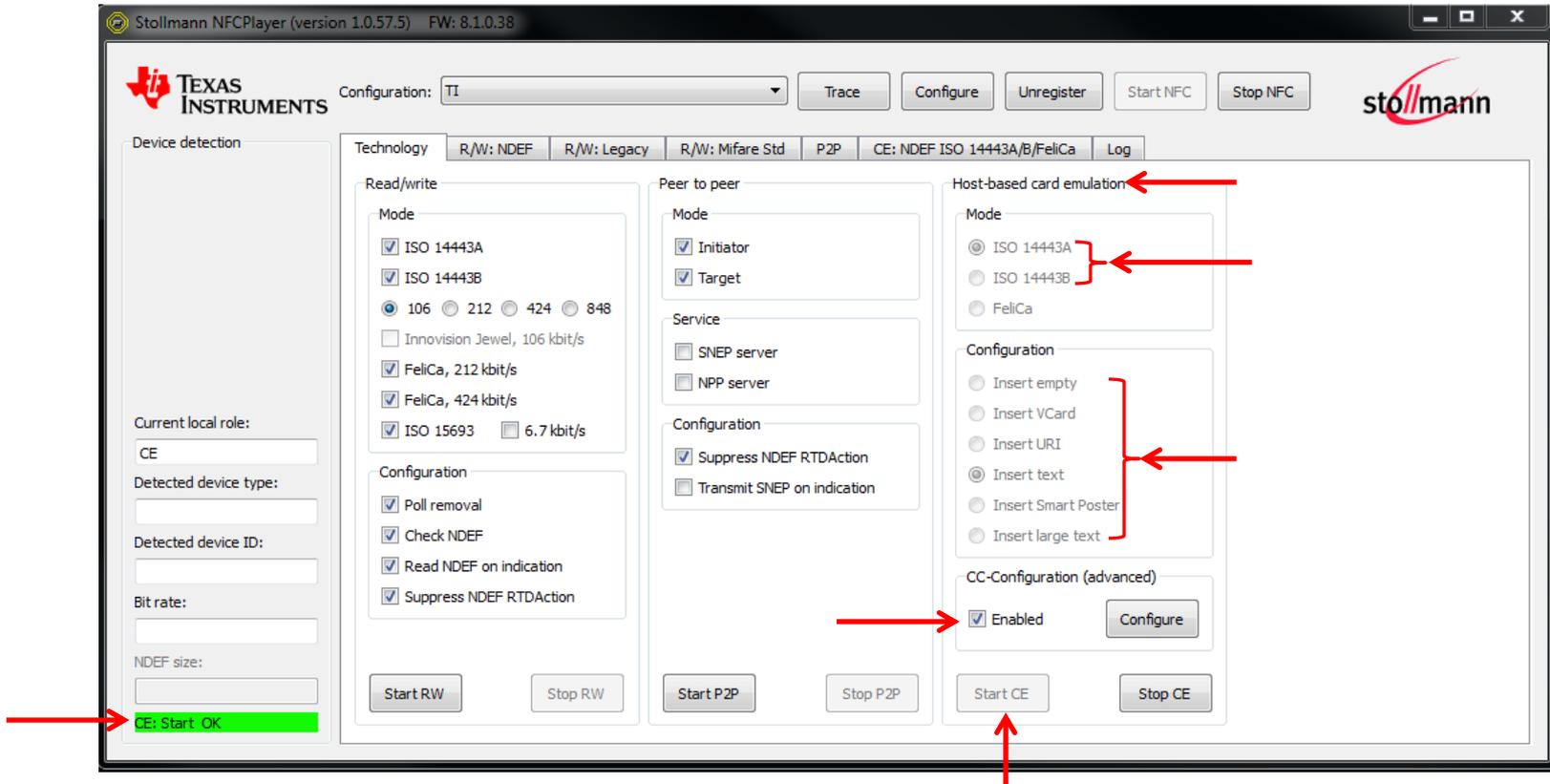


NFC/RFID Card Emulation Mode

Card Emulation Mode



- Under Host-based card emulation, choose the Mode and the Configuration, then press the Start CE button.
 - (CE: Start OK will appear in lower left hand window of the GUI)



Card Emulation Mode



- When hardware is in card emulation mode, D4 will be solid.

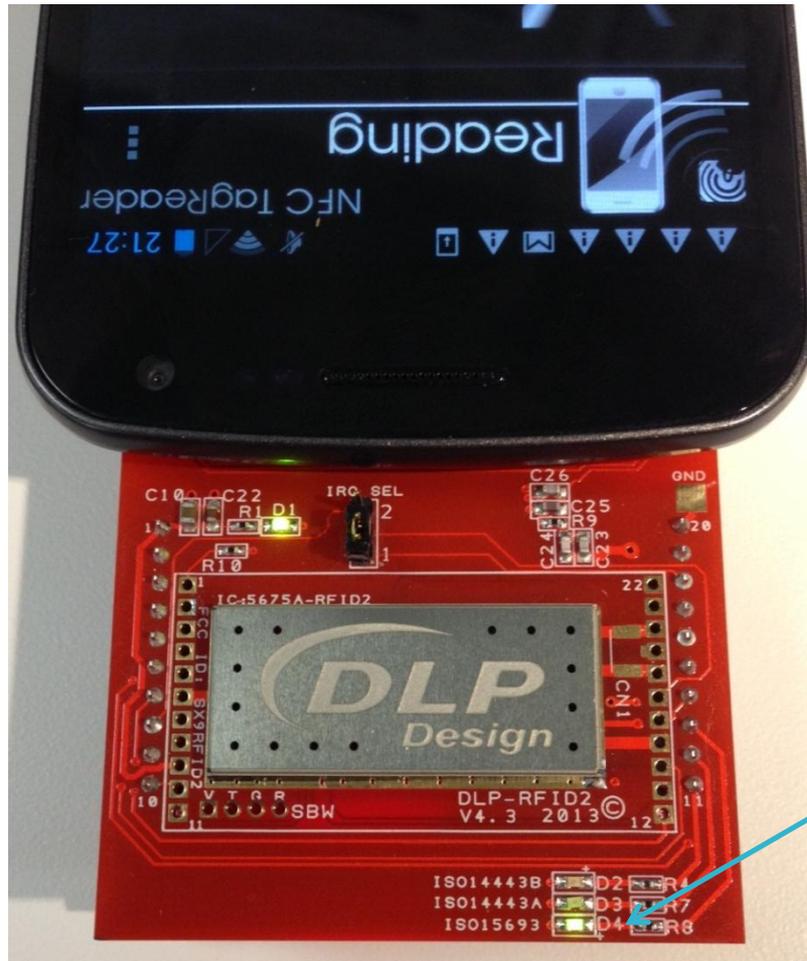


Card Emulation Mode

Card Emulation Mode



- Place NFC enabled device above BoosterPack antenna.



Card Emulation Mode

Card Emulation Mode



- When an NFC enabled reader/writer is presented, the BoosterPack will read like a passive NFC/RFID tag.
- Screen captures below from NFC TagReader (KDDI).



VCard



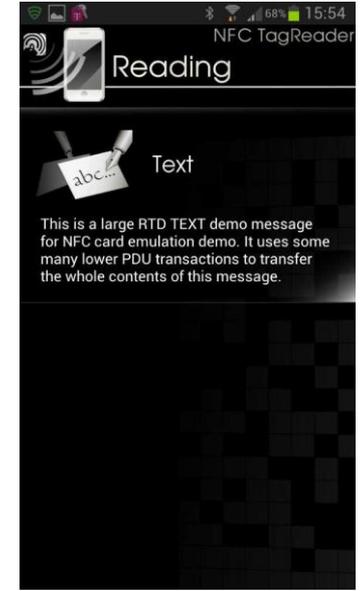
URI



text



Smart Poster



Large text

Card Emulation Mode



- NFCLink will read out packet activity between NFC enabled reader/writer and BoosterPack.

The screenshot displays the Stollmann NFCPlayer software interface. The title bar indicates the version is 1.0.42.5 and the firmware is 8.1.0.27. The interface includes a Texas Instruments logo, a configuration dropdown set to 'TI', and buttons for 'Trace', 'Configure', 'Unregister', 'Start NFC', and 'Stop NFC'. The 'Device detection' panel on the left shows 'NFC FORUM Emu' and 'NFC FORUM' icons, along with fields for 'Current local role' (CE), 'Detected device type' (CE: ISO 14443A), 'Detected device ID' (4A:2F:F6:8F), 'Bit rate' (106), and 'NDEF size'. The main 'Log' window shows the following activity:

```
Log
ID 0x0000E104 selected
TX (hex):
90 00
-----
RX (hex):
00 B0 00 00 20
ISO14443-4 command: READ BINARY
TX (hex):
00 44 D1 02 3F 53 70 91 01 1E 54 02 65 6E 43 61
72 64 20 65 6D 75 6C 61 74 69 6F 6E 20 62 79 20
90 00
-----
RX (hex):
00 B0 00 00 20
ISO14443-4 command: READ BINARY
TX (hex):
53 74 6F 2F 2F 6D 61 6E 6E 11 01 12 55 00 77 77
77 2E 73 74 6F 6C 6C 6D 61 6E 6E 2E 63 6F 6D 51
90 00
-----
RX (hex):
00 B0 00 40 06
ISO14443-4 command: READ BINARY
TX (hex):
03 01 61 63 74 00 90 00
```

A red vertical line and a red arrow point from a yellow callout box to the RX (hex) lines of the second and third log entries. The callout box contains the text: "Log of NDEF Message being read out".

Card Emulation Mode



- An NFC enabled reader/writer can write an image to the BoosterPack, as shown below.

A screenshot of the Stollmann NFCPlayer software interface. The window title is "Stollmann NFCPlayer (version 1.0.42.5) FW: 8.1.0.27". The interface includes a "Texas Instruments" logo, a configuration dropdown set to "TI", and buttons for "Trace", "Configure", "Unregister", "Start NFC", and "Stop NFC". The "stollmann" logo is in the top right. The main area is divided into "Device detection" on the left and a "Log" window on the right. The "Device detection" section shows two "NFC FORUM Emu" icons and fields for "Current local role: CE", "Detected device type: CE: ISO 14443B", "Detected device ID: 4A:2F:F6:8F", "Bit rate: 106", and "NDEF size:". The "Log" window shows a series of ISO14443-4 commands and data exchanges. A red bracket highlights a section of the log, and a red arrow points from a yellow text box to the RX (hex) data of the second command. The yellow text box contains the text: "Log of NDEF Message being written over the air from NFC enabled reader/writer".

Stollmann NFCPlayer (version 1.0.42.5) FW: 8.1.0.27

Configuration: TI Trace Configure Unregister Start NFC Stop NFC stollmann

Device detection

Technology R/W: NDEF R/W: Legacy R/W: Mifare Std P2P CE: NDEF ISO 14443A/B/FelIca CE: Embedded SE Log

Log

```
ISO14443-4 command: UPDATE BINARY
TX (hex):
90 00
-----
RX (hex):
00 D6 18 60 20 01 A2 55 43 8E 7D 3F 2A EF FE DD
69 E2 A8 4E 97 7F A3 6A 12 DA 37 49 DA 16 25 4F
AF 4C 82 3D 47
ISO14443-4 command: UPDATE BINARY
TX (hex):
90 00
-----
RX (hex):
00 D6 18 80 18 E2 0D 47 6B D2 0F A9 A5 B9 FF 00
8F DB 4F F7 EB 36 AC AC 36 F5 4C FF D9
ISO14443-4 command: UPDATE BINARY
TX (hex):
90 00
-----
RX (hex):
00 D6 00 00 02 1B 96
ISO14443-4 command: UPDATE BINARY
TX (hex):
90 00
```

Current local role: CE

Detected device type: CE: ISO 14443B

Detected device ID: 4A:2F:F6:8F

Bit rate: 106

NDEF size:

NFC: Technology detected

Log of NDEF Message being written over the air from NFC enabled reader/writer

Card Emulation Mode



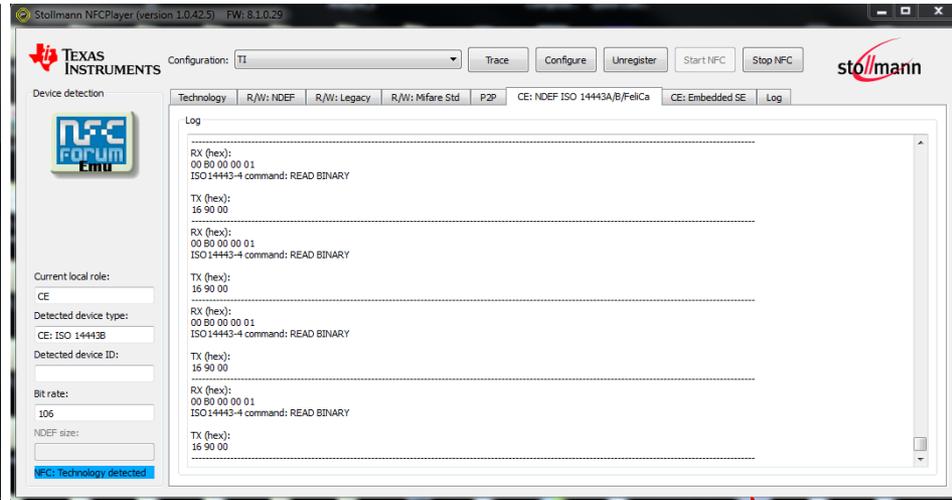
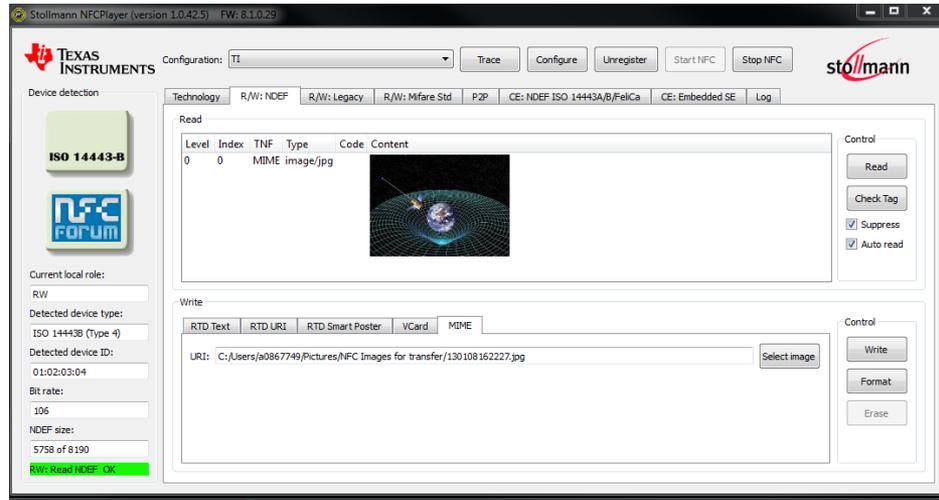
- NFC enabled reader/writer can read image back from written BoosterPack card emulation tag.



R/W & Card Emulation Modes used in conjunction with one another

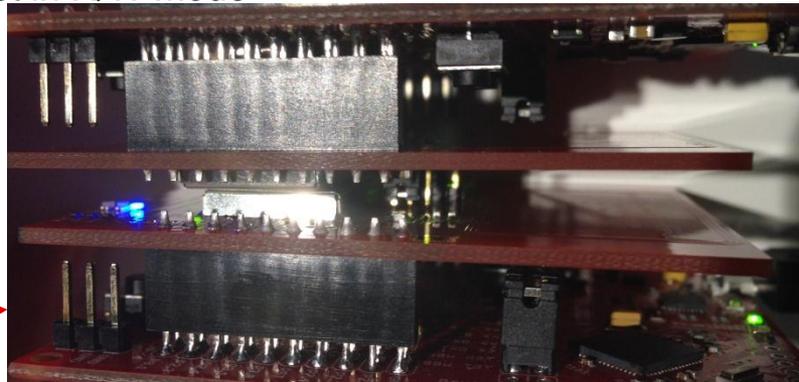


- Two instances of NFCLink with two LaunchPads with BoosterPack can communicate using CE and R/W mode simultaneously.



Hardware set in R/W mode

Hardware set in CE mode



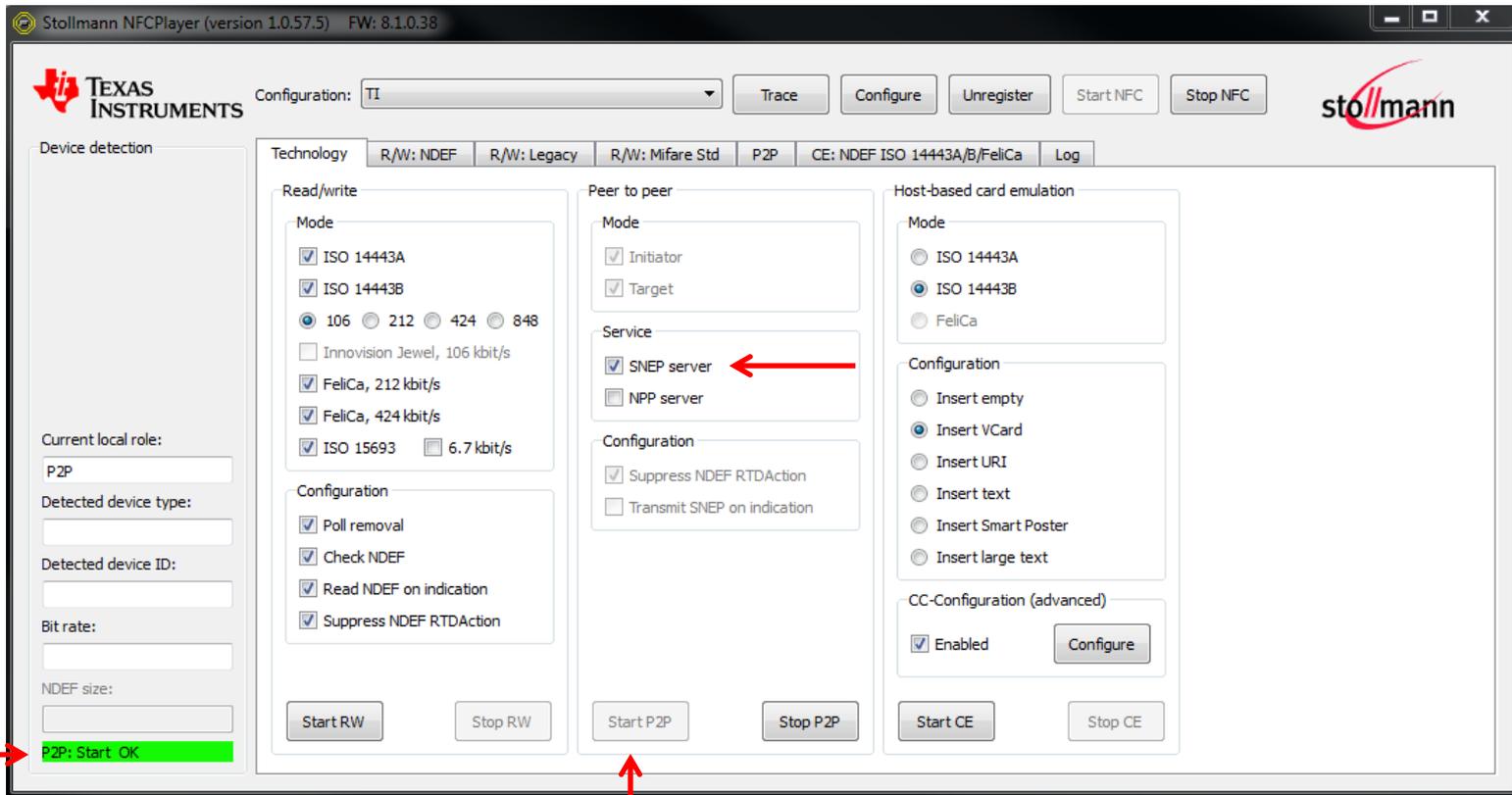


NFC/RFID P2P Mode

Peer to Peer Mode (P2P)



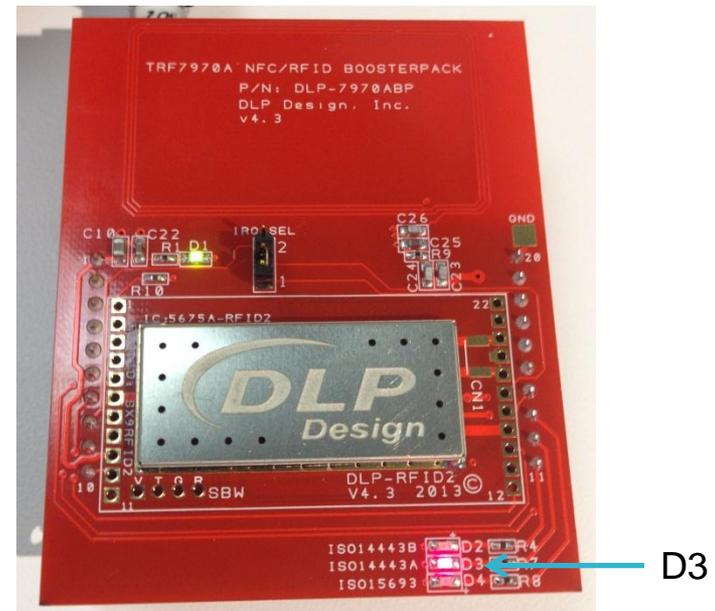
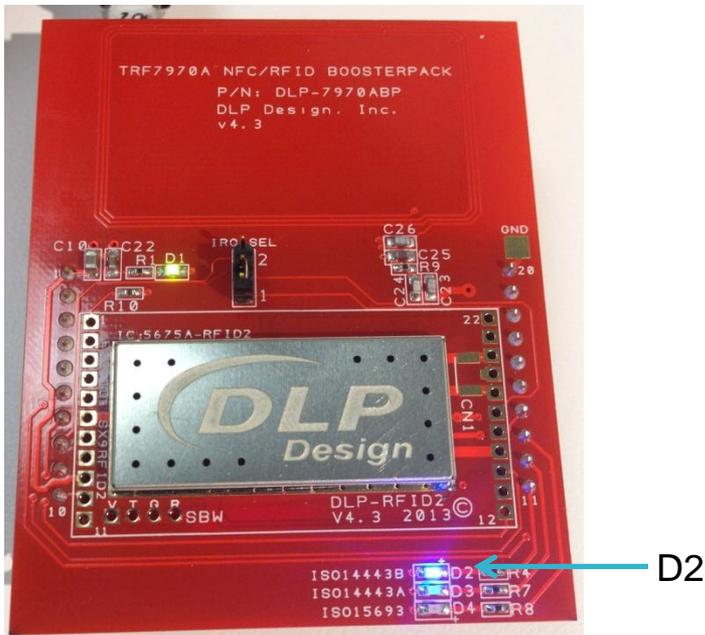
- Under the Peer to Peer column, choose the SNEP box, then press the Start P2P button.
 - (P2P: Start OK will appear in lower left hand window of the GUI)



Peer to Peer Mode (P2P)



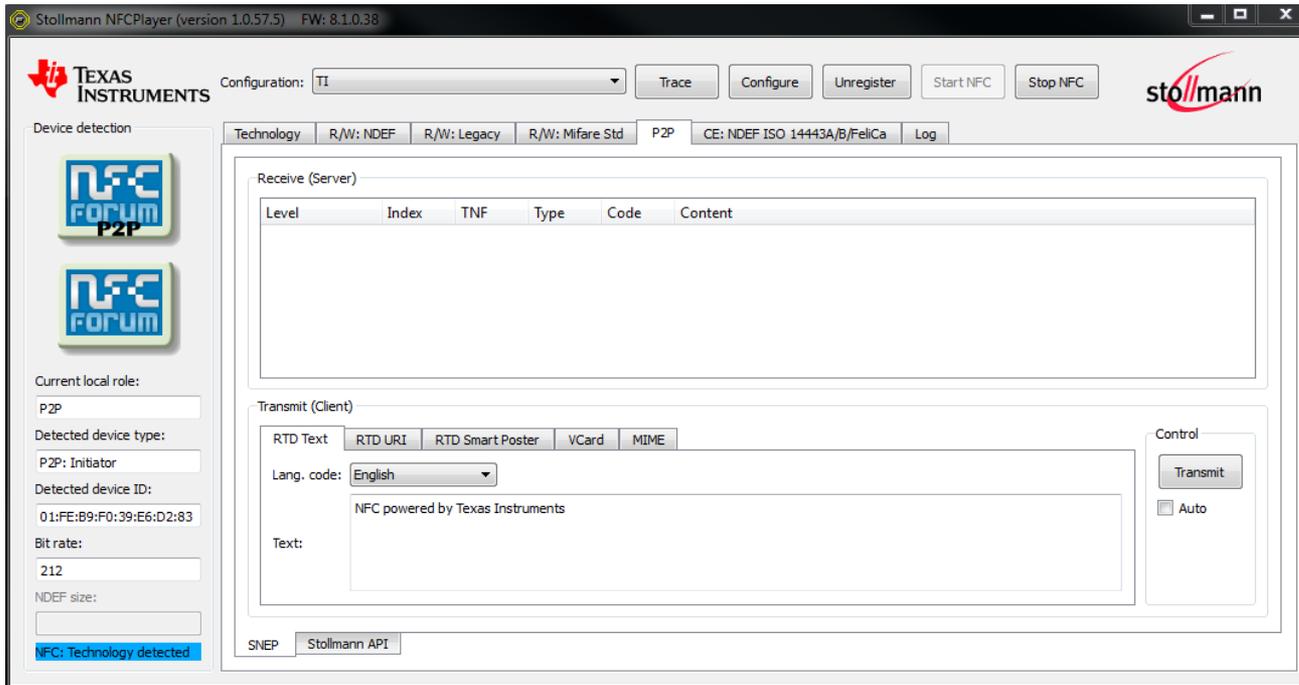
- D2 & D3 will flash alternately in P2P mode until another NFC device is presented.
- When NFC device is presented, the LED that is currently on will remain on for the duration of the connection.
- After transfer is complete, the LEDs will go back to alternately flashing



Peer to Peer Mode (P2P)



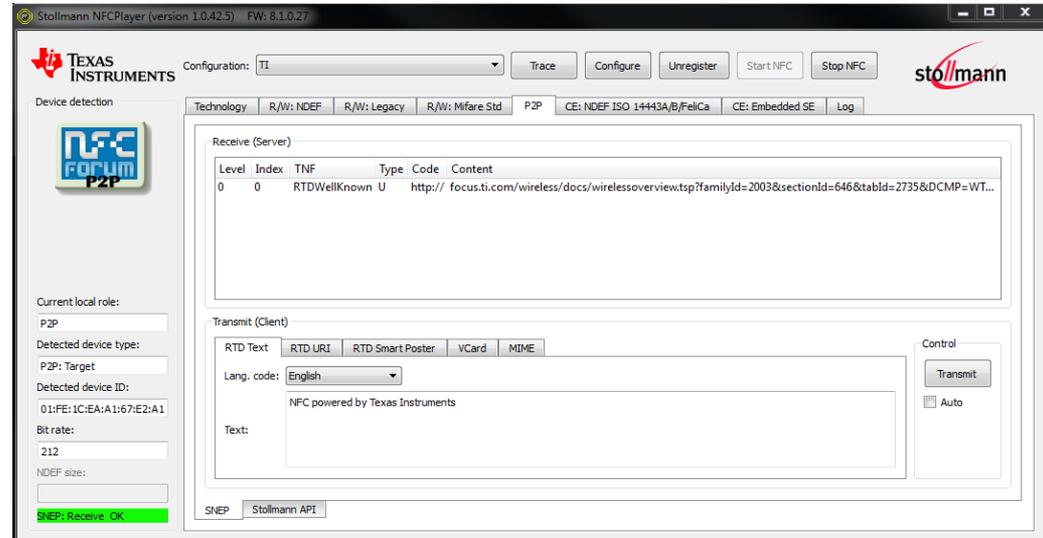
- Present NFC Enabled device. The GUI screen flips over to P2P mode.
- Message can now be sent from GUI to the NFC enabled device using the Transmit button. This will open the native or default application.



Peer to Peer Mode (P2P)



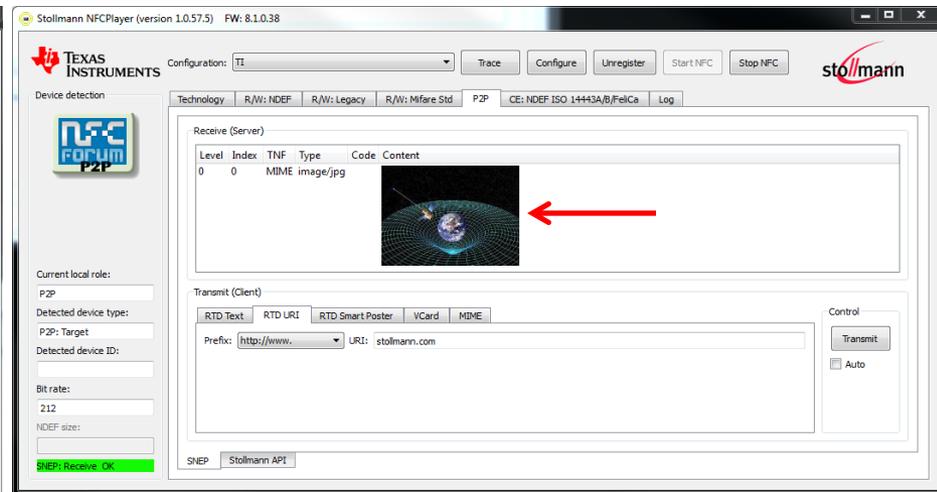
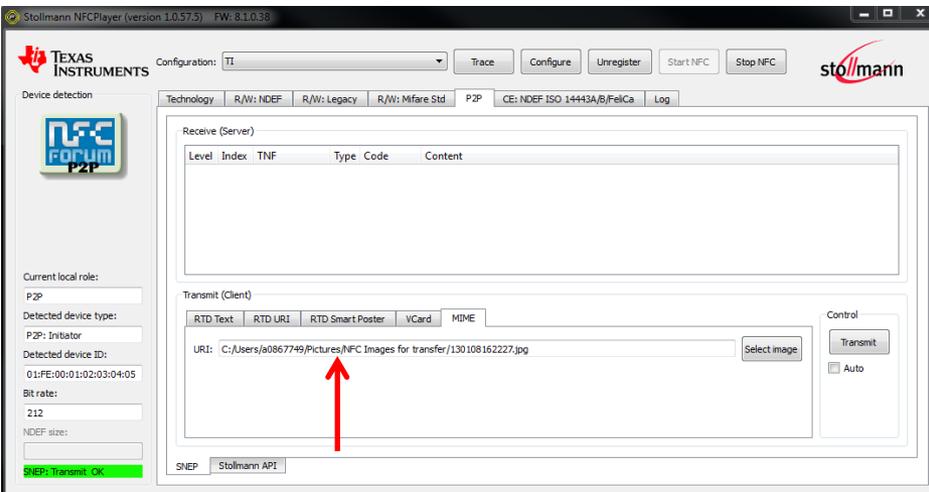
- Send message from the NFC enabled device to the GUI.
- The BoosterPack can send/receive URLs, Radio Handovers, text content, SmartPoster, Phone Numbers, Applications, Images, etc.



Peer to Peer between two NFCLink hardware sets



- Set up two of the hardware sets and run two instances of the GUI on the same PC, then use P2P functionality without using an NFC handset.
- RTD MIME message can be sent from one hardware set to another using SNEP.



Bi-Directional P2P



- To enable ultra-fast communication, NFCLink offers bi-directional communication through P2P mode.
- When two NFCLink hardware sets are connected through P2P, select the Stollman API tab.

The screenshot shows the Stollmann NFCPlayer (version 1.0.42.5) FW: 8.1.0.31 interface. The main window is titled "Stollmann NFCPlayer" and features a Texas Instruments logo and a "stollmann" logo. The interface is divided into several sections:

- Configuration:** TI (selected), Trace, Configure, Unregister, Start NFC, Stop NFC.
- Device detection:** NFC FORUM P2P logo.
- Current local role:** P2P.
- Detected device type:** P2P: Initiator.
- Detected device ID:** 01:FE:00:01:02:03:04:05.
- Bit rate:** 212.
- NDEF size:** (empty field).
- SNEP:** Receive OK (highlighted in green).

The main content area is divided into "Receive (Server)" and "Transmit (Client)" sections.

Receive (Server) Table:

Level	Index	TNF	Type	Code	Content
0	0	RTDWellKnown	U	http://www.stollmann.com	
0	0	RTDWellKnown	U	http://www.ti.com/nfc	
0	0	RTDWellKnown	Sp		
1	0	RTDWellKnown	T	en	Check this out - NFC powered by Texas Instruments!
1	1	RTDWellKnown	U	http://www.ti.com	
1	2	RTDWellKnown	act		start application

Transmit (Client) Section:

- RTD Text:** RTD URI, RTD Smart Poster, VCard, MIME.
- Lang. code:** English (selected).
- Text:** NFC powered by Stollmann.
- Control:** Transmit button, Auto checkbox.

SNEP: Stollmann API (indicated by a red arrow pointing to it).

Bi-Directional P2P



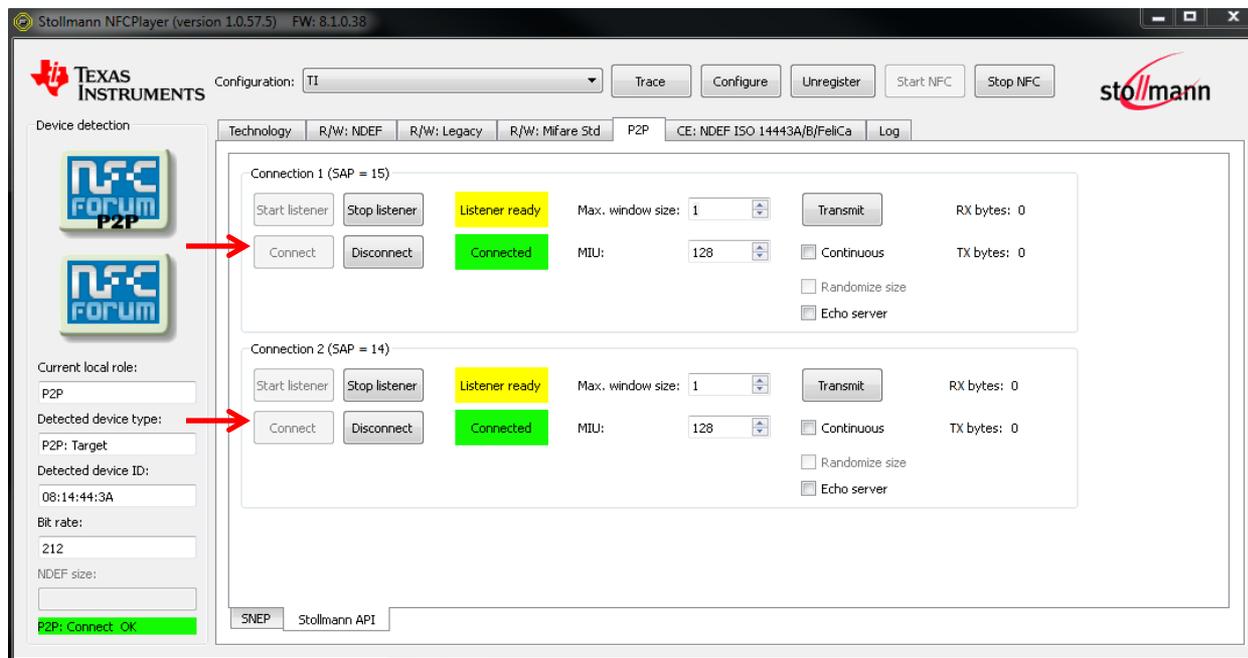
- Start the listener for Connections 1 and 2 on either side of the channel.

The screenshot displays two instances of the Stollmann NFCPlayer software (version 1.0.57.5, FW: 8.1.0.38). The top instance is in the foreground, and the bottom instance is partially obscured. Both instances show the 'Device detection' tab with 'P2P' selected. The 'Connection 1 (SAP = 15)' and 'Connection 2 (SAP = 14)' sections are visible. The 'Start listener' button is highlighted in yellow, and a red arrow points to it. The status bar at the bottom of each window shows 'P2P: Start listener OK'.

Bi-Directional P2P



- Establish the connections by clicking the Connect buttons on either side of the channel.



Bi-Directional P2P



- Select Continuous box and then press Transmit button for reach connection on either side of the channel.

The screenshot displays the Stollmann NFCPlayer (version 1.0.57.5) FW: 8.1.0.38 interface. The main window is titled "Stollmann NFCPlayer (version 1.0.57.5) FW: 8.1.0.38". The interface includes a Texas Instruments logo, a configuration dropdown set to "TI", and buttons for "Trace", "Configure", "Unregister", "Start NFC", and "Stop NFC". The "stollmann" logo is also present in the top right.

The "Device detection" section on the left shows an "NFC FORUM P2P" icon. Below it, the "Current local role" is set to "P2P", the "Detected device type" is "P2P: Initiator", and the "Detected device ID" is "01:FE:00:01:02:03:04:05". The "Bit rate" is "212" and the "NDEF size" is empty. A green status bar at the bottom left indicates "P2P: Connect OK".

The main area shows two connections, both with "SAP = 15" and "SAP = 14" respectively. Each connection has a "Start listener" and "Stop listener" button, a "Listener ready" status, and a "Connected" status. The "Max. window size" is set to "1" and the "MIU" is "128". The "Continuous" checkbox is selected for both connections. The "Transmit" button is highlighted with a red arrow, and the "RX bytes: 0" and "TX bytes: 0" are displayed. The "Randomize size" and "Echo server" checkboxes are unselected.

At the bottom, there are tabs for "SNEP" and "Stollmann API".

Bi-Directional P2P



- Note the data transfer amounts and the direction.
- This bi-directional communication link can ensure fast data transfer.

The screenshot displays the Stollmann NFCPlayer interface (version 1.0.57.5, FW: 8.1.0.38) showing two active P2P connections. The interface includes a sidebar with "NFC FORUM P2P" logos, a configuration menu, and a main panel with connection details.

Connection ID	SAP	Local Role	Detected Device Type	Detected Device ID	Bit Rate	NDEF Size	TX Bytes	RX Bytes
Connection 1	15	P2P	Target	08:14:44:3A	212		0	41600
Connection 2	14	P2P	Initiator	01:FE:00:01:02:03:04:05			28544	0

Red arrows in the original image point to the TX and RX byte counts for each connection, highlighting the bidirectional data flow.



Troubleshooting

Troubleshooting Tips

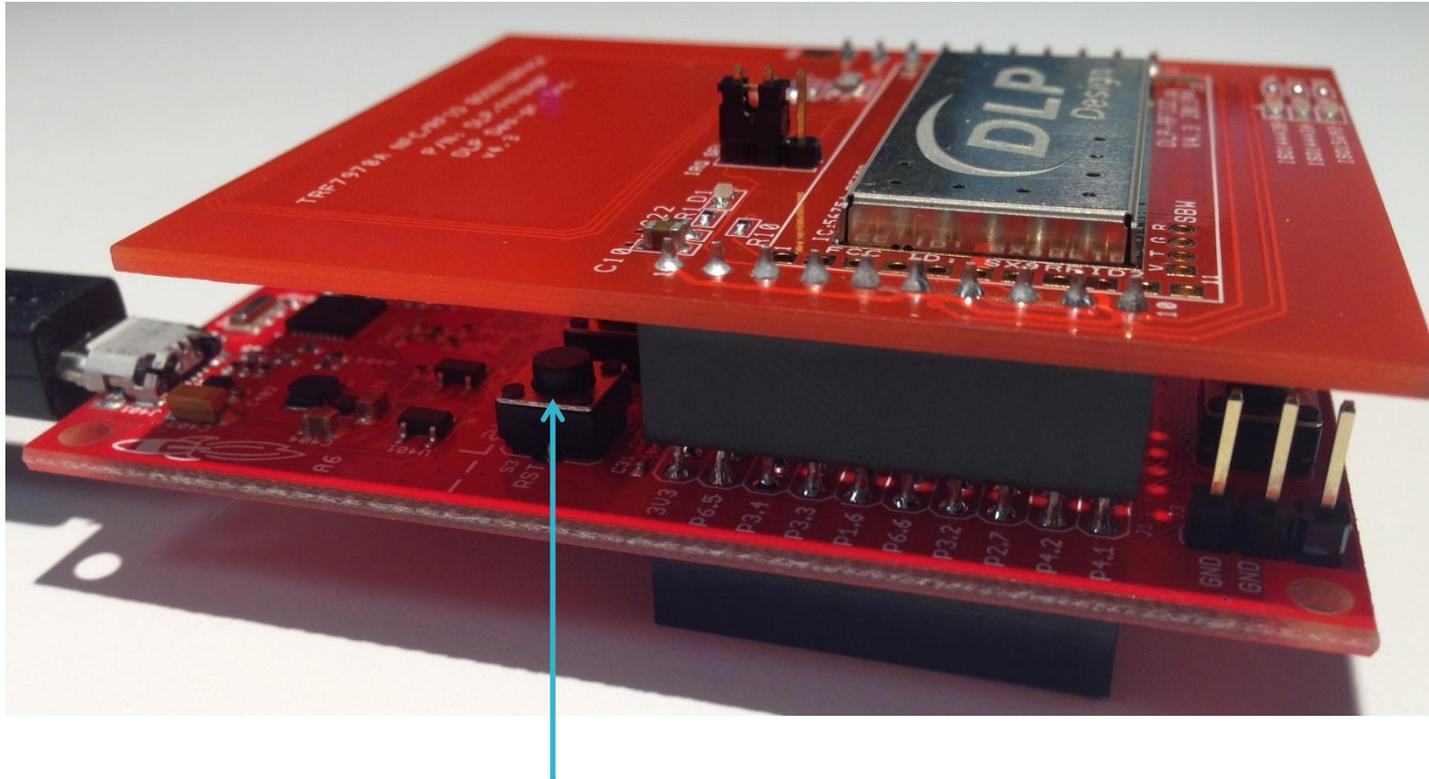


- If the blinking red “heartbeat” on the LaunchPad stops, reset the LaunchPad by pressing the reset button. If the “heartbeat” does not resume, go through the Uniflash flash steps again to re-flash the system.
- If LaunchPad is not responding, close Uniflash and NFCLink, then unplug/replug LaunchPad.
- If LaunchPad is still not responding, reset following steps on next slide.

Reset LaunchPad



- Press and LaunchPad RST button for three seconds to reset the device.



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