RFID BoosterPack

TRF7970ABP

With MSP430G2 LaunchPad

Texas Instruments

Table of Contents

Prerequisites

Hardware

1. 1x MSP-EXP430G2 LaunchPad, orderable from the TI eStore.
2. 1x DLP-7970ABP, orderable through third party vendors.

Software

1. Download Uniflash installation file.
2. Download TRF7970ABP software zip folder. It can also be found on the DLP-7970ABP Product Page under Technical Documents/User Guides/DLP-7970ABP Example Code.
3. Download and install Terminal Program.
    - Docklight recommended, but any terminal can communicate with LaunchPad and BoosterPack.

Assumptions & Knowledge Base

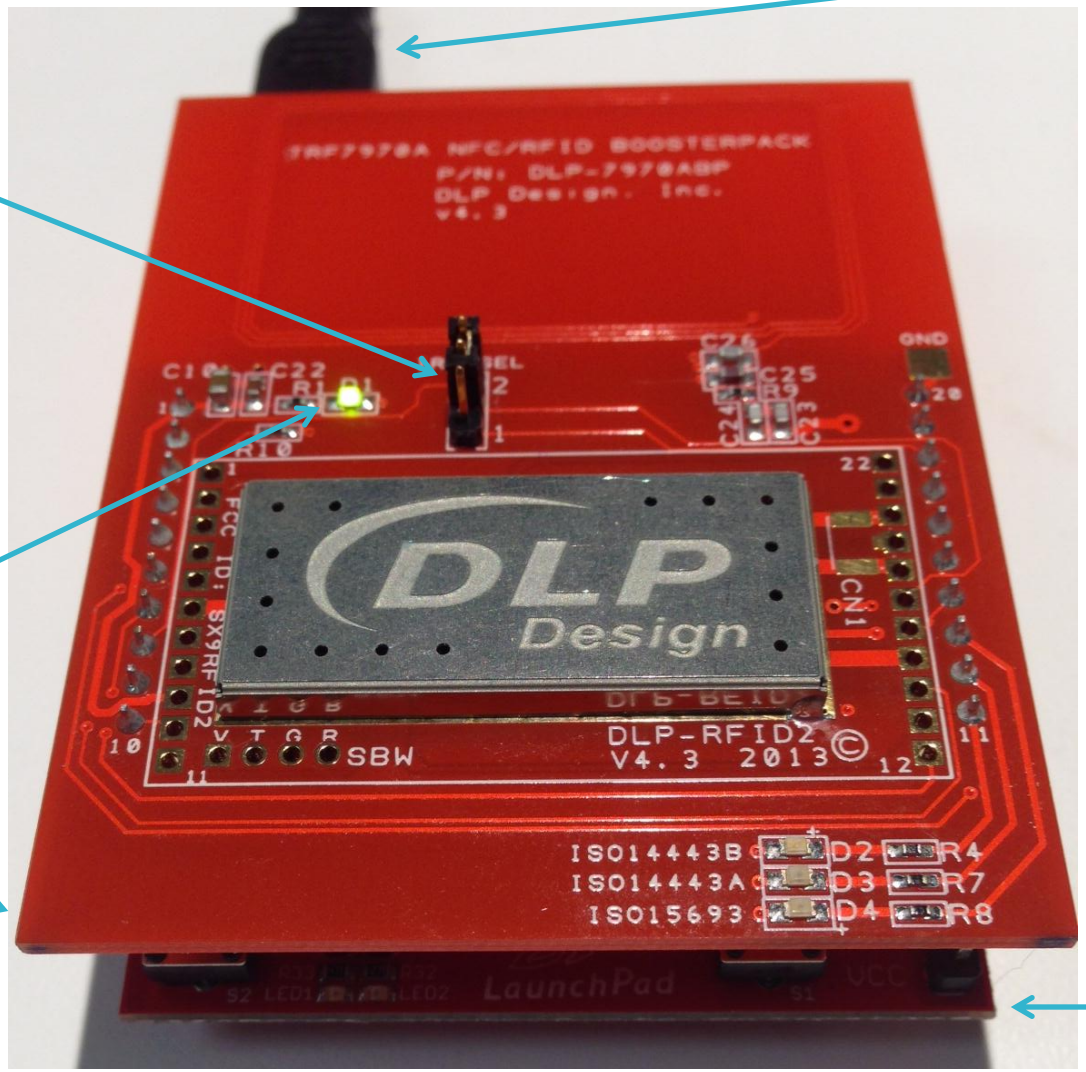
1. The user should have knowledge of or be familiar with:
    - MSP430G2 LaunchPad

Basic Installation

Enable Hardware UART

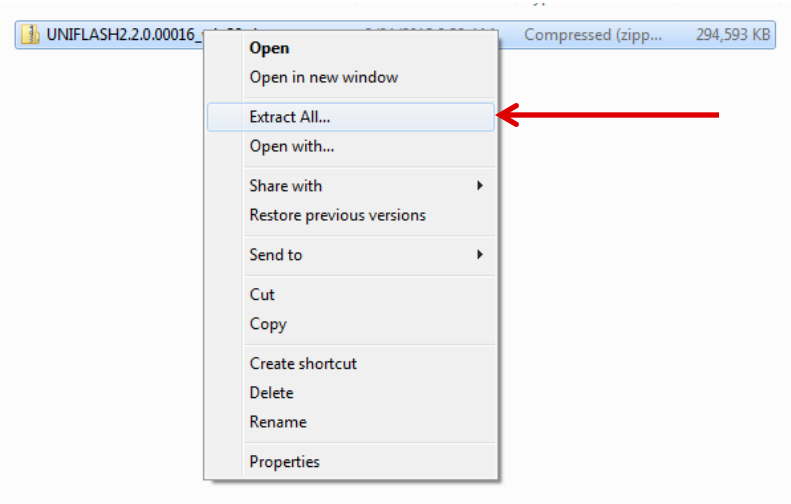
- Identify revision number located under MSP-EXP430G2 text on board.
- Follow J3 Jumper placement instructions below for corresponding revision number.
- For more information regarding enabling the Hardware UART, see **here.**

Hardware Configuration Image



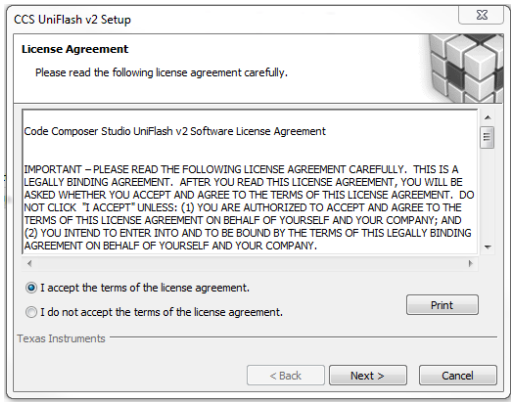
Install UniFlash

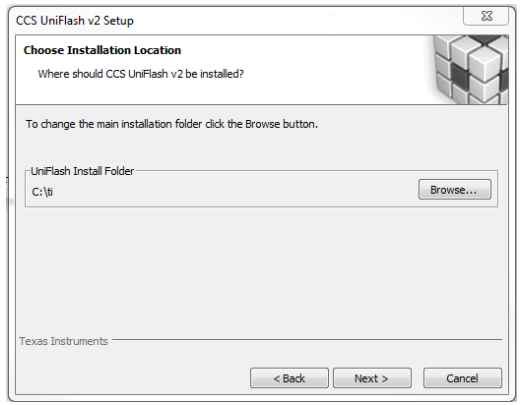
- Download UniFlash zip file to preferred download location.
- Extract all files from UniFlash zip file (note: UniFlash revision numbers vary).
- The file path will depend on where the zip file has been downloaded.

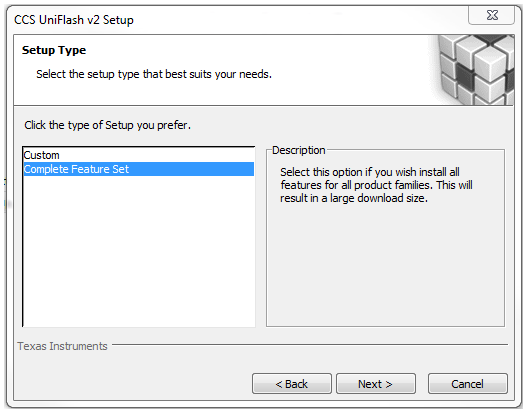


Install UniFlash

- 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.

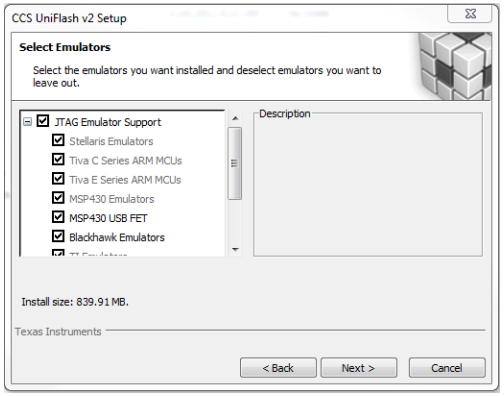


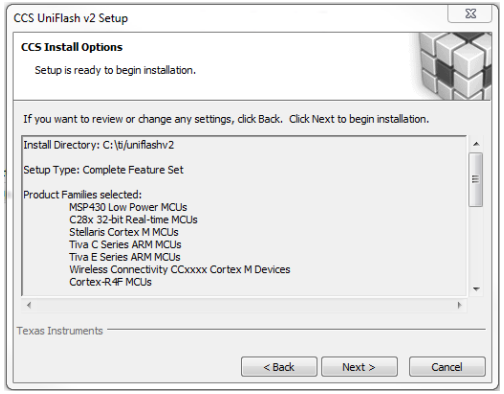


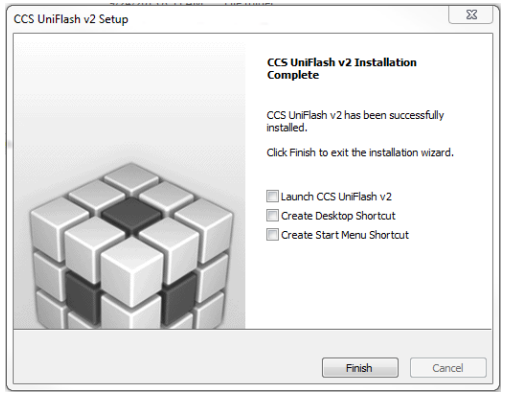


Install UniFlash

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

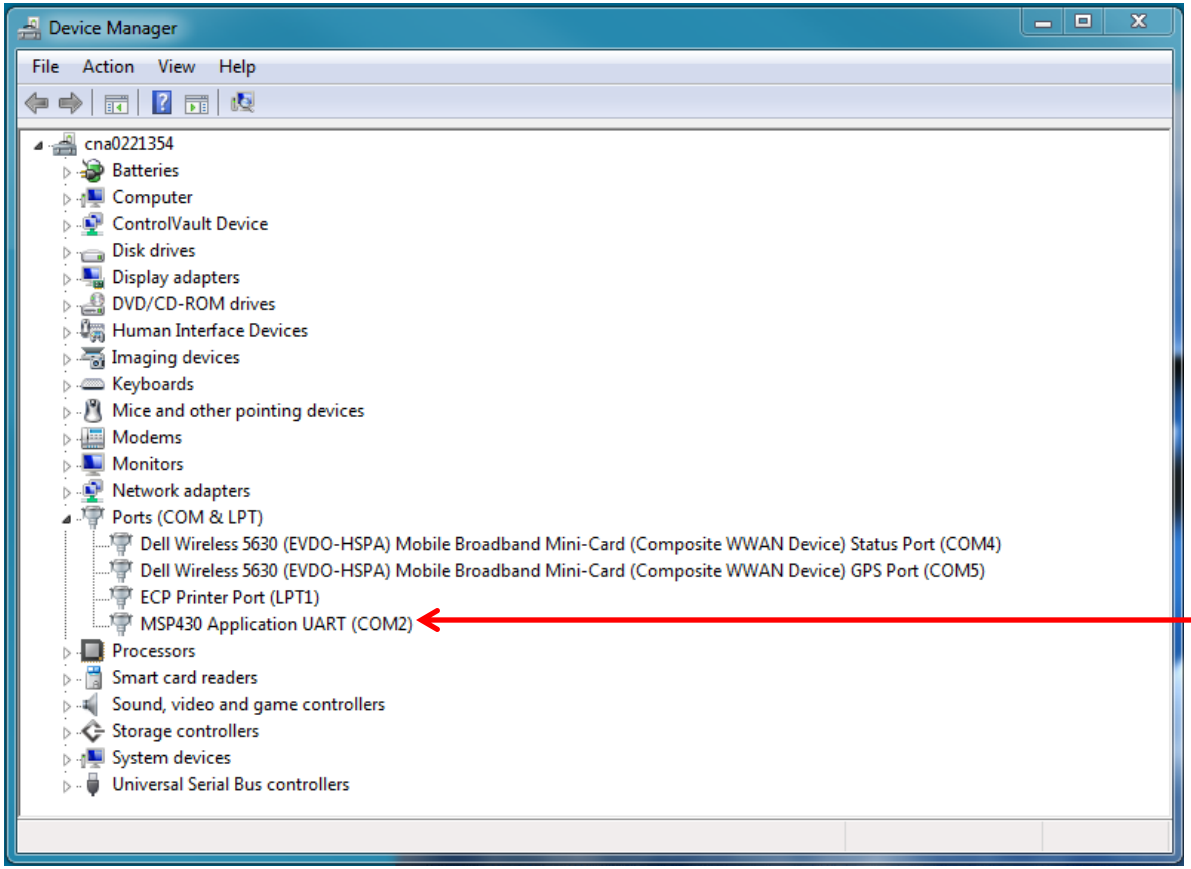






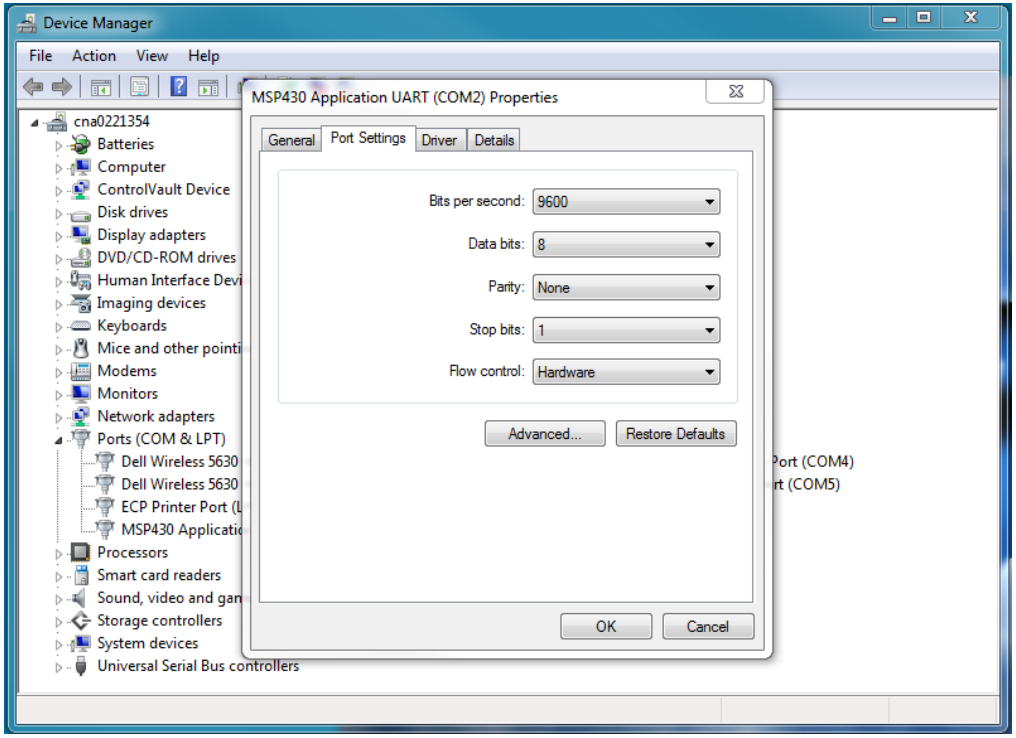
Detect COM Port

- Open Device Manager from Control Panel
- Determine COM Port from Ports Menu (MSP430 Application UART)



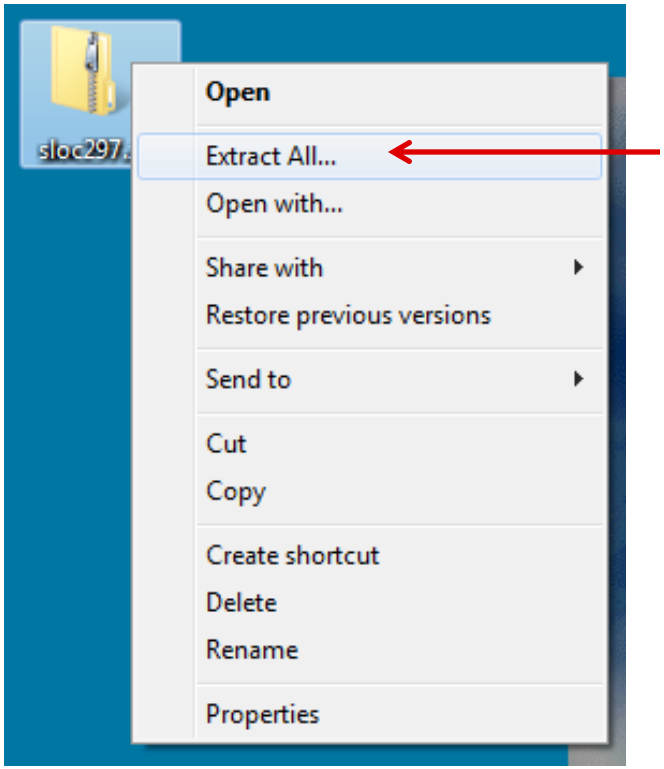
COM Port Settings

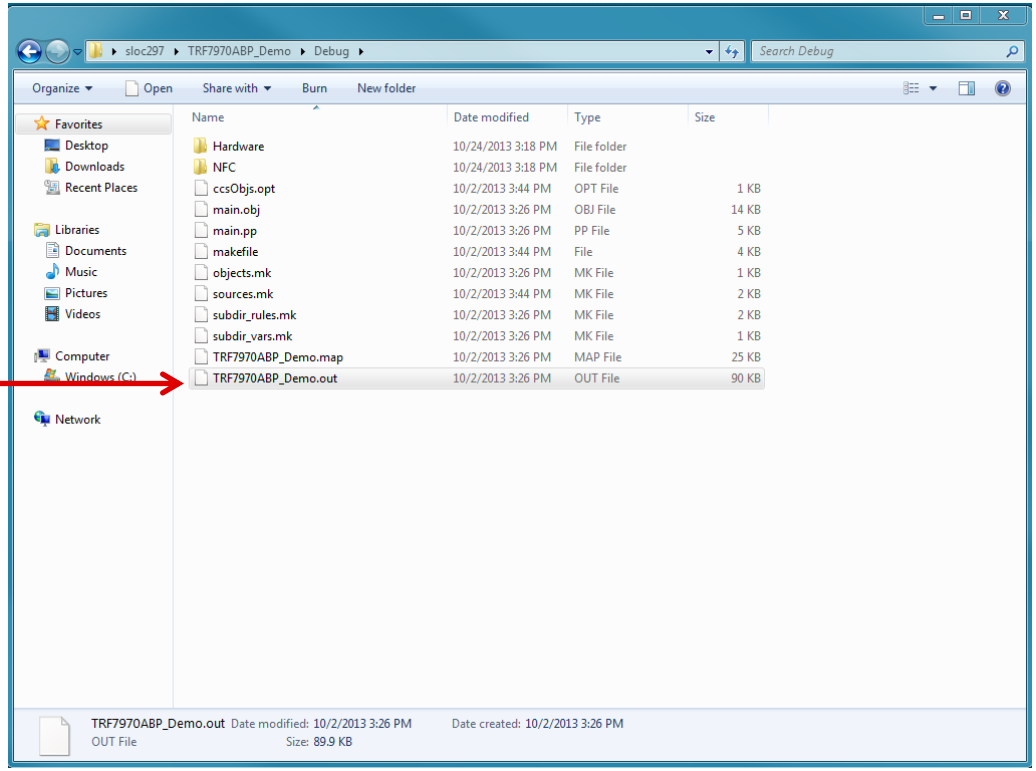
- Right click on MSP430 Application UART Port, select Properties, and visit Port Settings tab
- Adjust Virtual COM Port settings to 9600, 8, None, 1, Hardware
  - Note that COM port numbers vary between systems



Unzip Software Folder

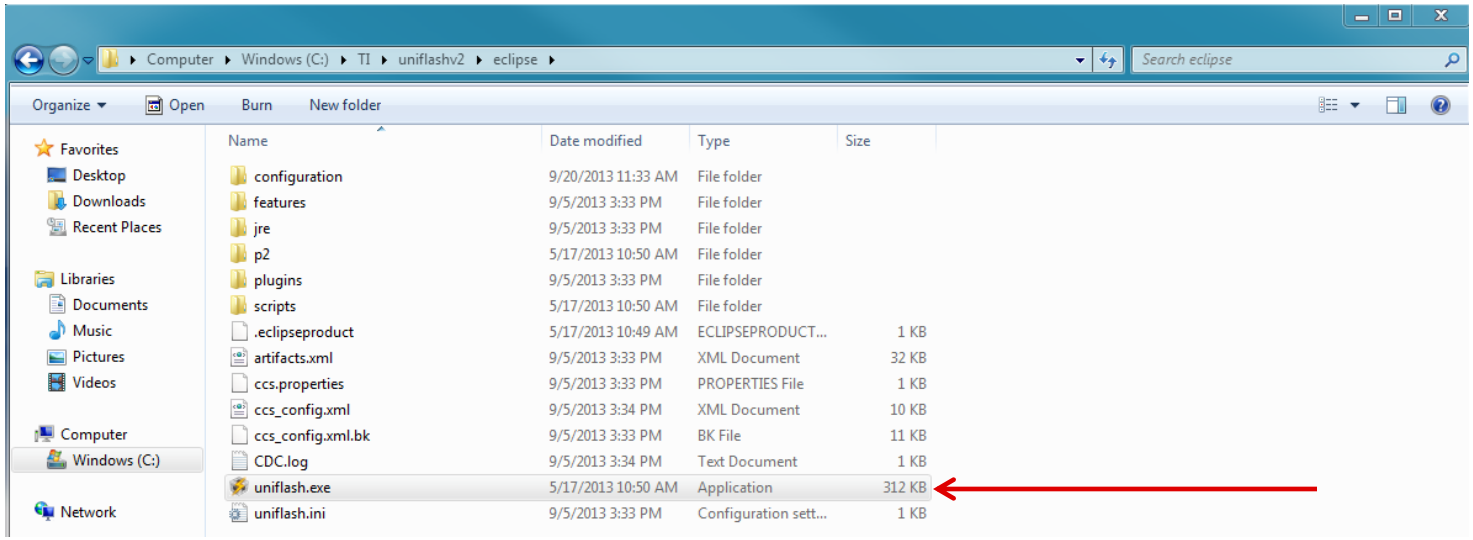
- Extract files from downloaded software folder.
- Note location of TRF7970ABP_Demo.out file.
- Default location for program file is:
  - sloc297\TRF7970ABP_Demo\Debug





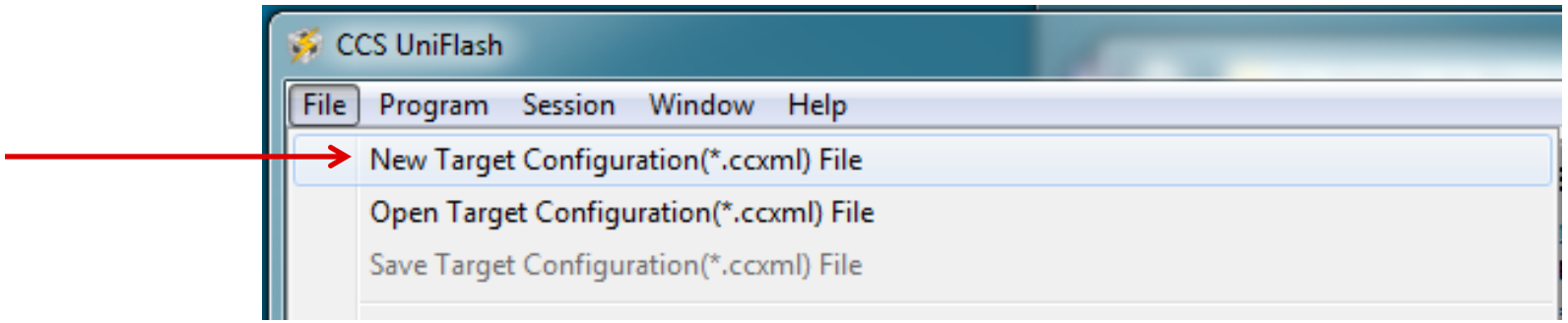
Open UniFlash

- Open uniflash.exe from installation folder.
- Uniflash may also install a shortcut to the desktop, which can be used to open the program.

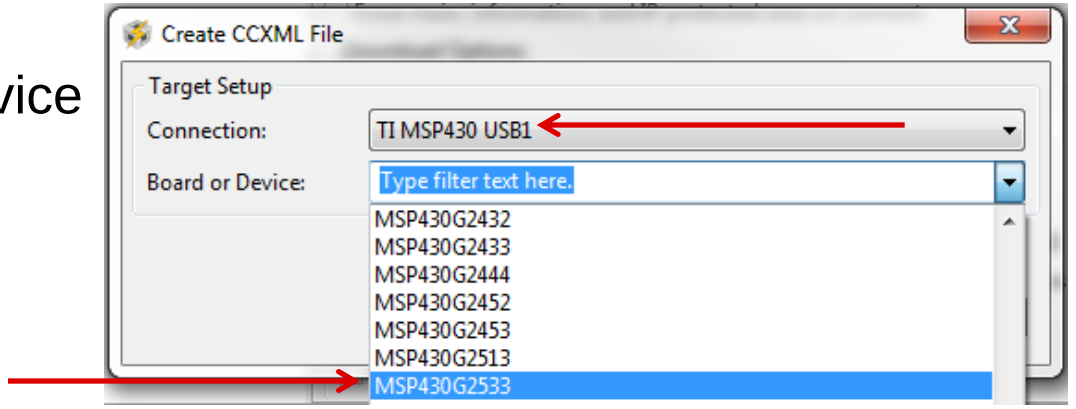


Install the MSP430G2553 Target Configuration

- Click File
- Choose New Target Configuration

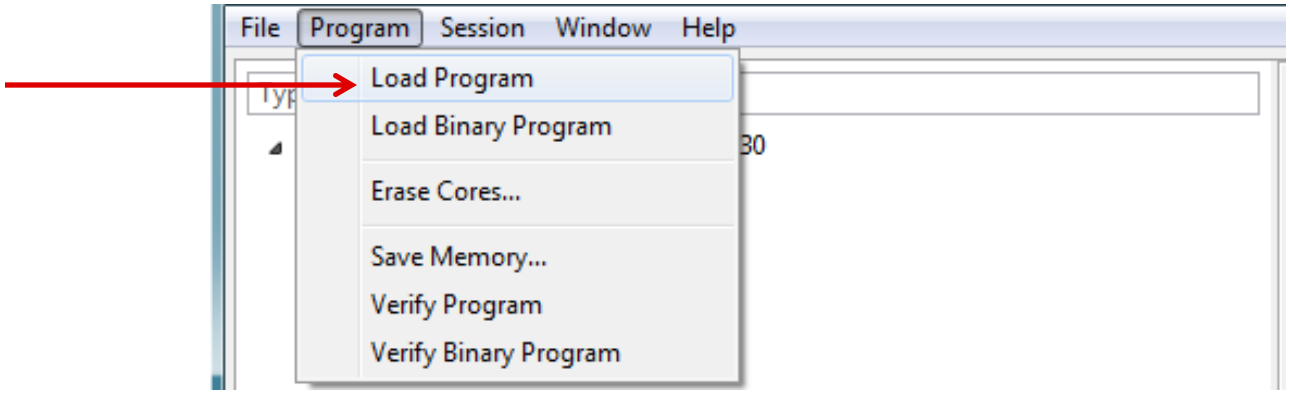


- Select Connection (USB1)
- Select MSP430G2553 Device

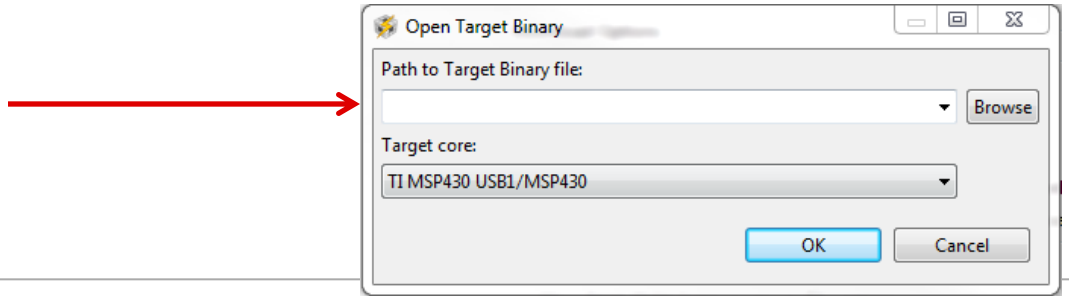


Load the Target Binary

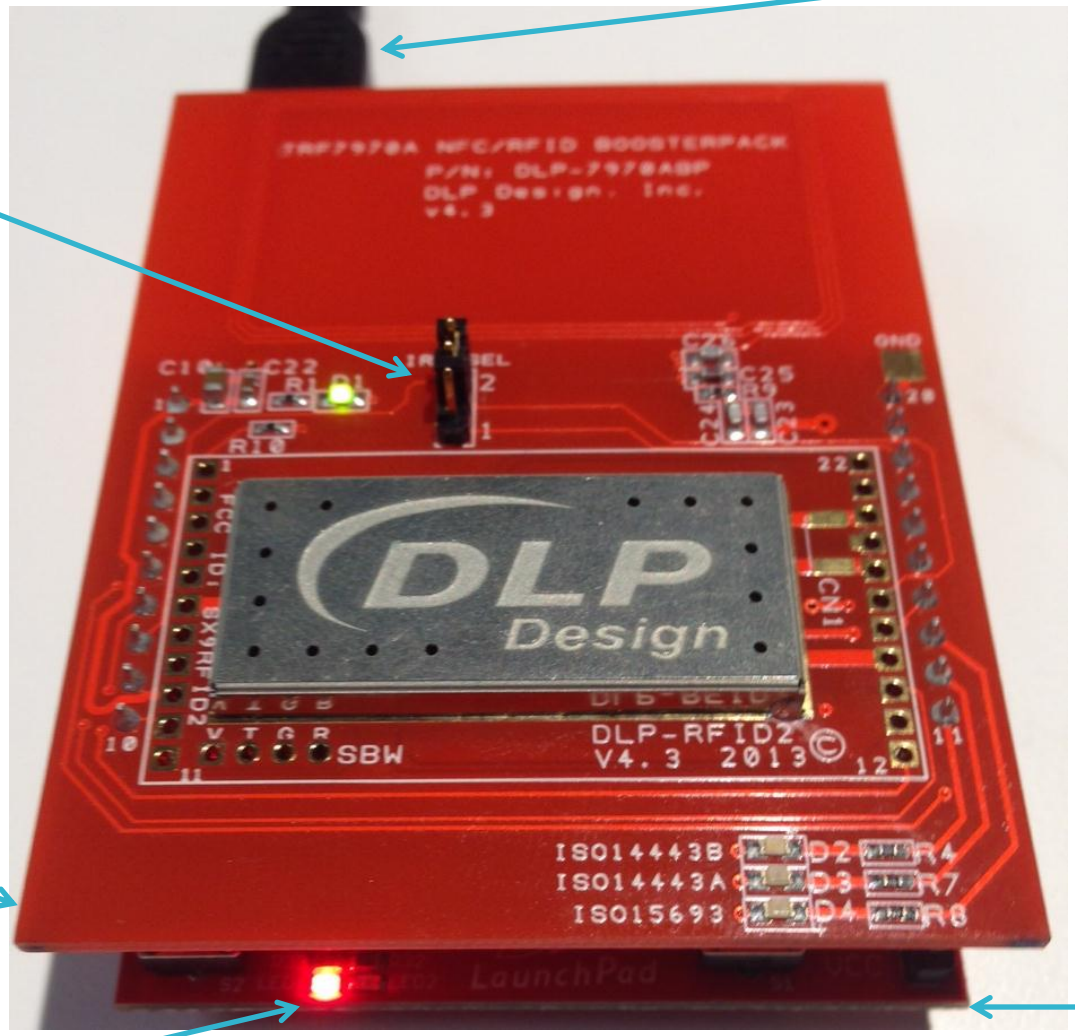
- Click Program
- Choose Load Program



- Select path to TRF7970ABP_Demo.out within sloc297 folder, targeting MSP430 LaunchPad Core:
  - sloc297\TRF7970ABP_Demo\Debug



Hardware Configuration Image



Terminal Notes

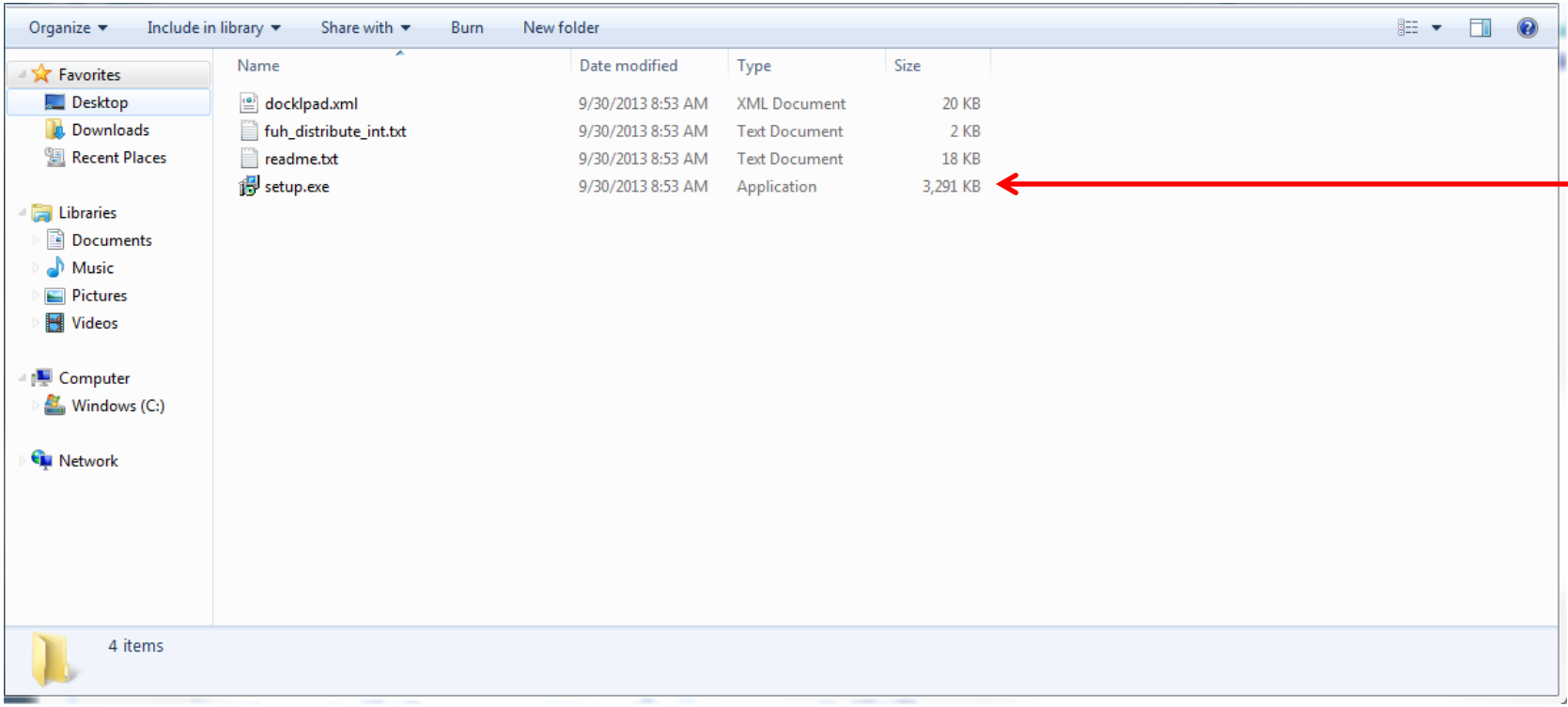
- Any terminal program can communicate with the TRF7970ABP BoosterPack.
- If using Docklight, continue to Docklight slides for specific instructions.
- If using another terminal, enable the terminal settings as seen on the next slide.

Terminal Notes

- Ensure the following settings:
  - Send/Receive on the Comm. Channel listed in Device Manager
  - Baud Rate: 9600
  - Parity: None
  - Data Bits: 8
  - Stop Bits: 1
  - Flow Control: Hardware
- Communicating with the device will automatically read any technology present, with the device updating every second or so.
- If using another terminal, note indication lights corresponding to technology types read:
  - D2: ISO14443B / NFC Forum Type 4B Tag Platform
  - D3: ISO14443A / NFC Forum Type 2 and Type 4A Tag Platforms
  - D4: ISO15693 / NFC Forum Type V Tag Platform

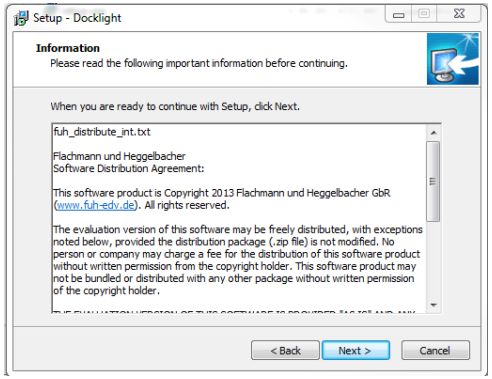
Install Docklight

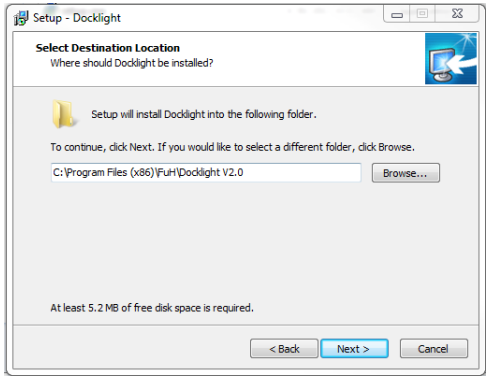
- Extract all files from Docklight.zip
- Run setup.exe

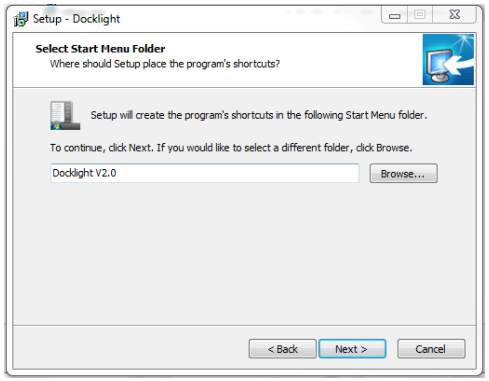


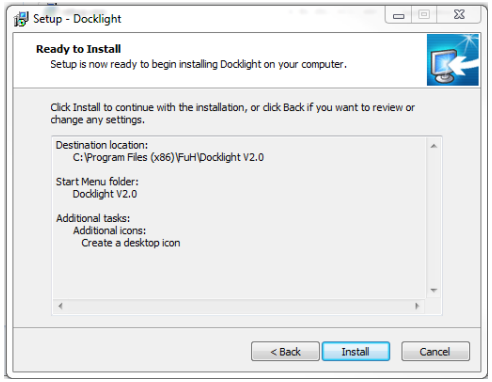
Install Docklight

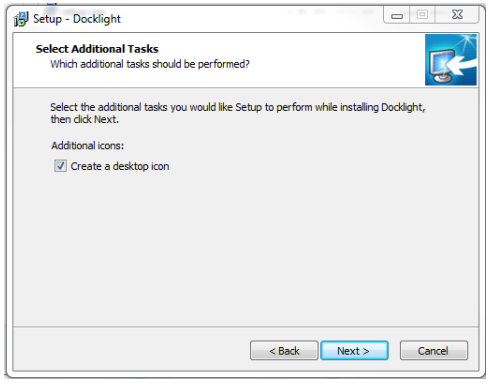
- Follow on screen instructions, making sure to create a desktop icon.





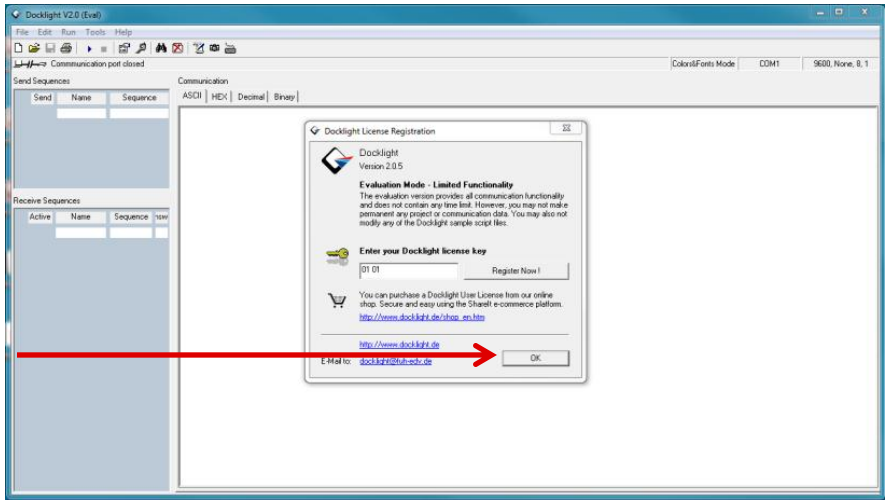


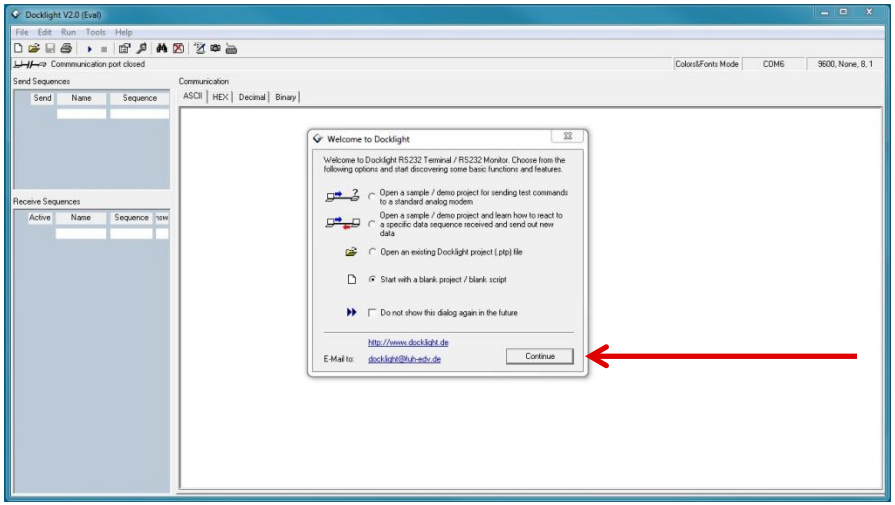




Execute DockLight Terminal

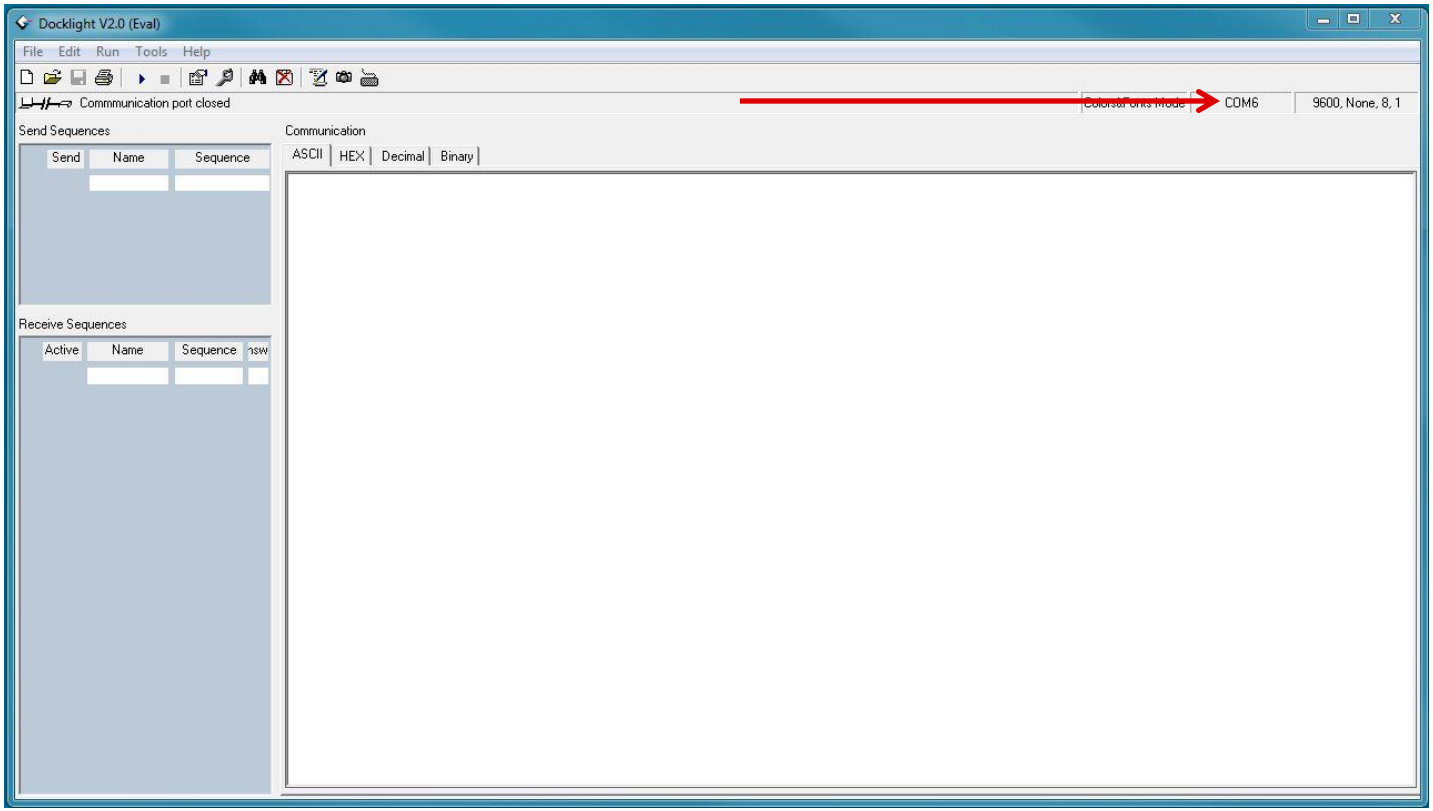
- Execute Docklight from desktop icon.
- If there is no desktop icon, then Docklight should be an option in the start menu.
- Upon opening, click OK, then start a blank project





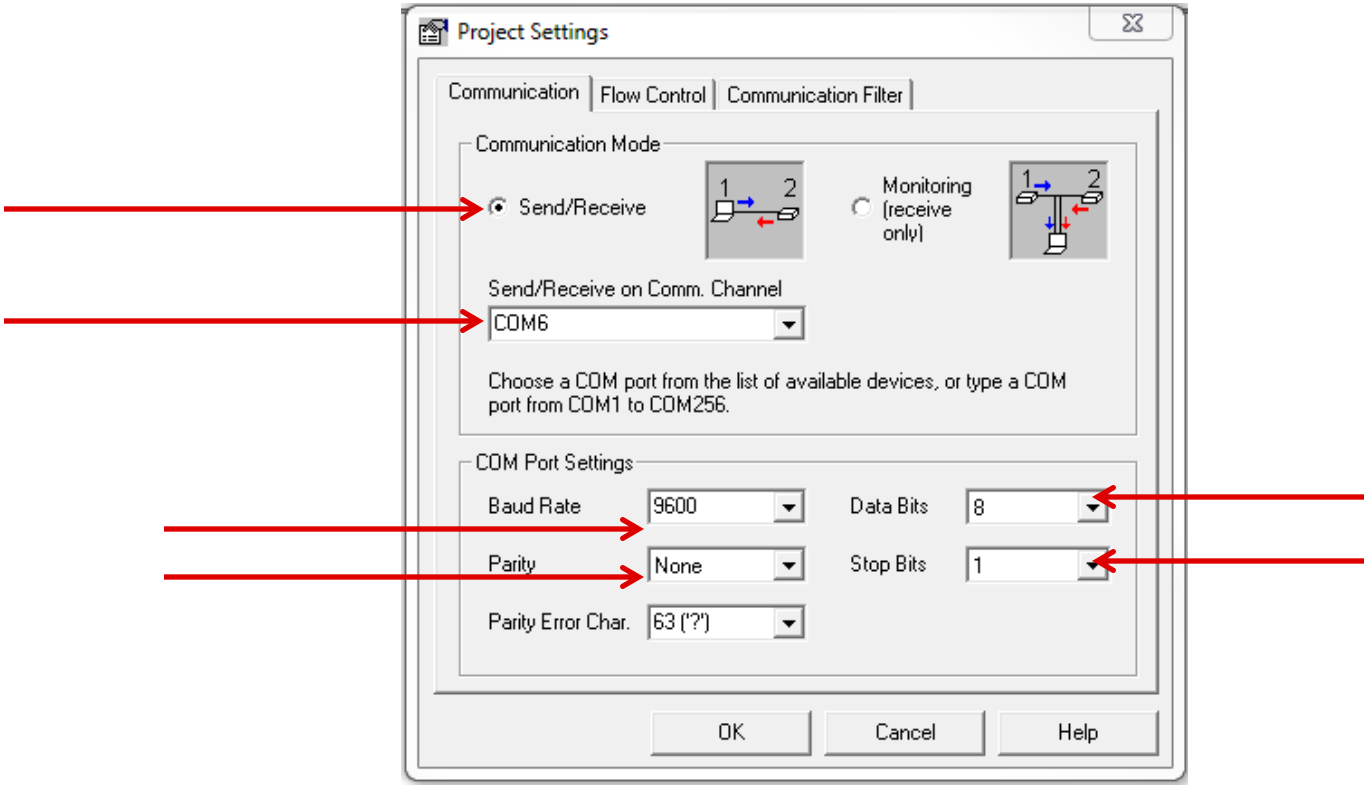
Modify Settings

- Modify settings by double clicking on COM port assignment in upper right of screen.



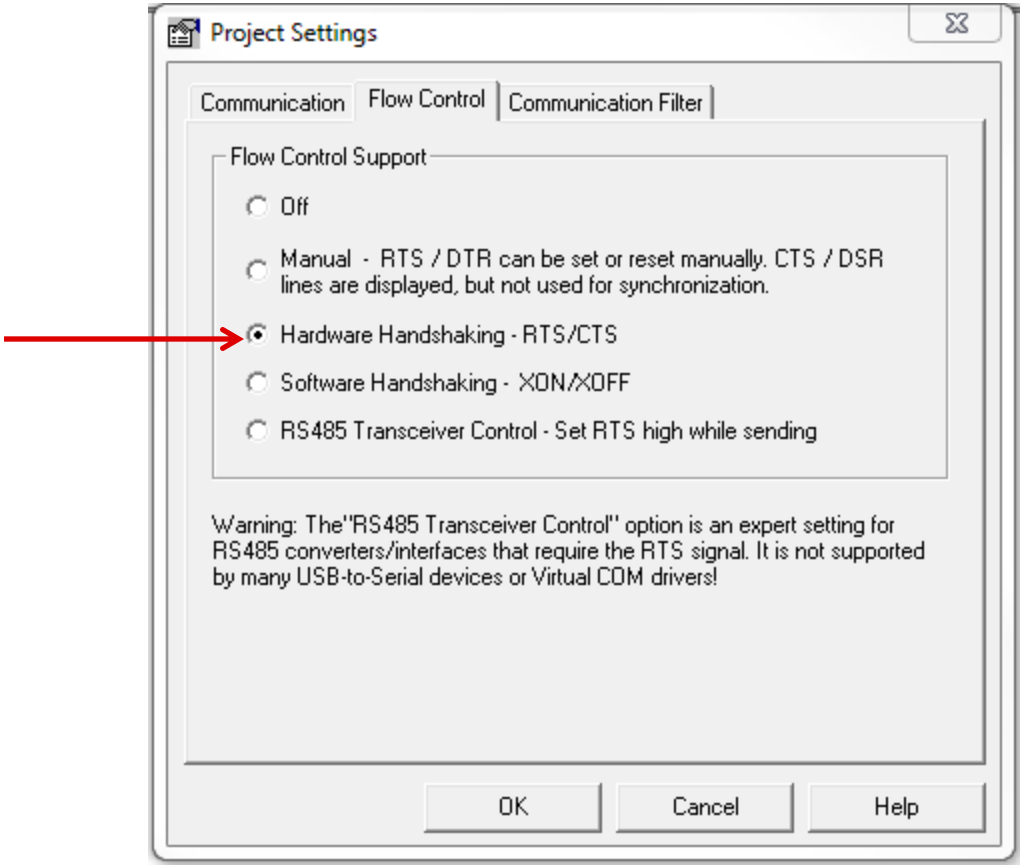
Assign Correct COM Port

- Ensure Communication Mode is set on Send/Receive, the Comm. Channel matches the COM Port used as displayed by the device manager, and the COM Port Settings reflect 9600, N, 8, and 1



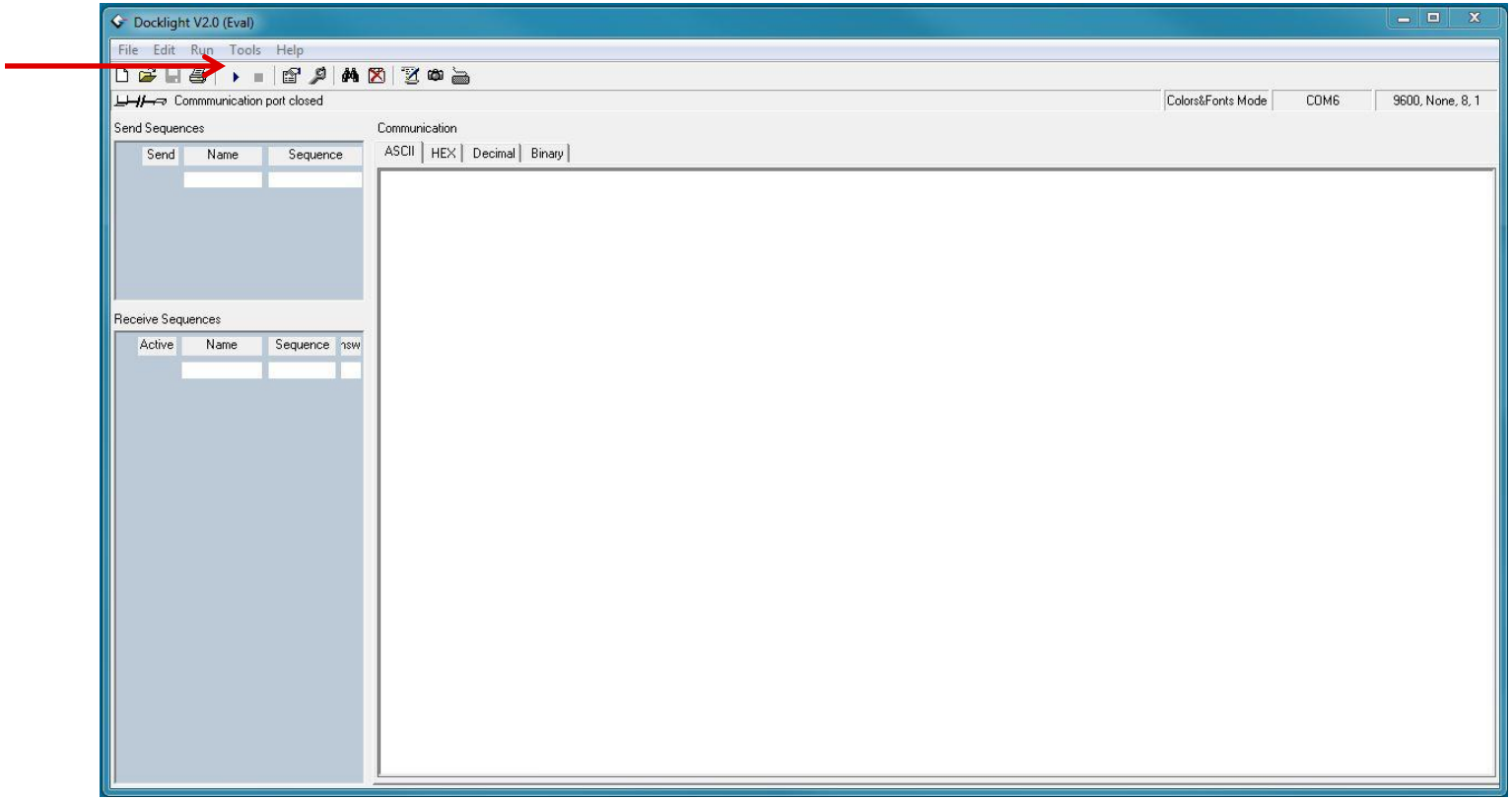
Enable Handshaking

- Ensure that Hardware Handshaking RTS/CTS is enabled.



Begin Communication

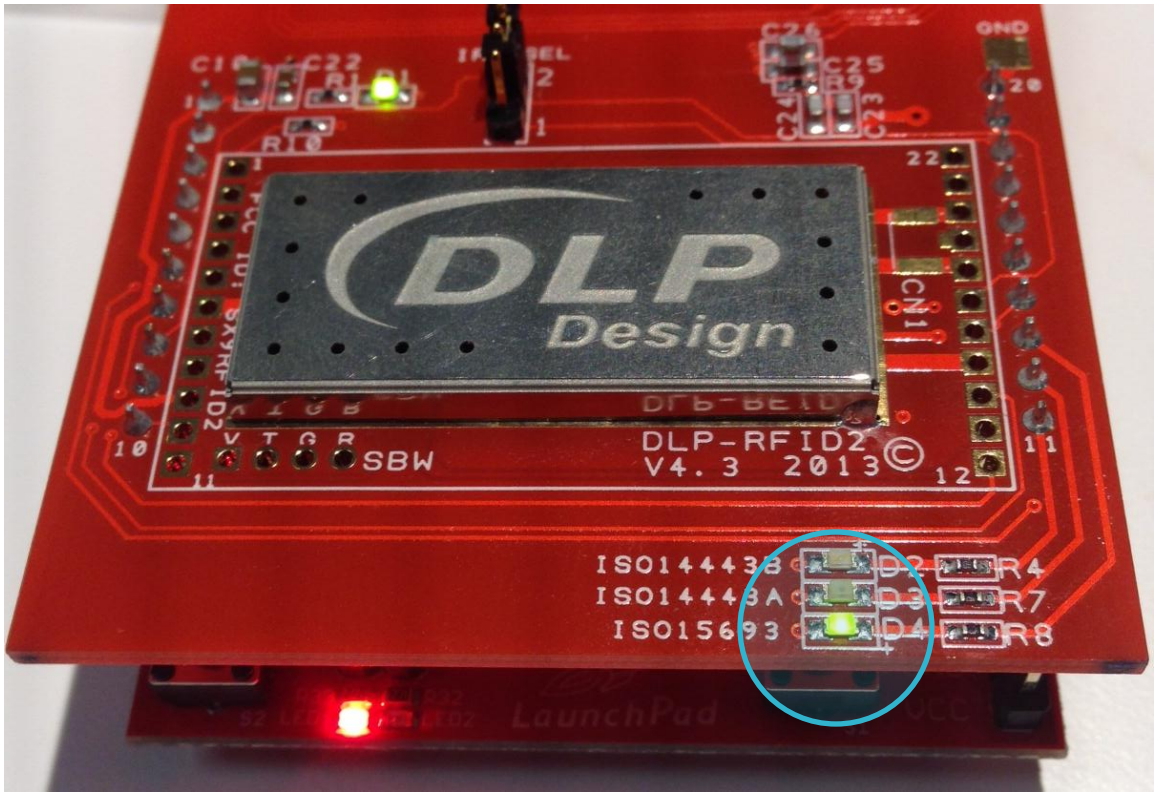
- Click on Blue Play Button to start.



NFC/RFID READ MODE

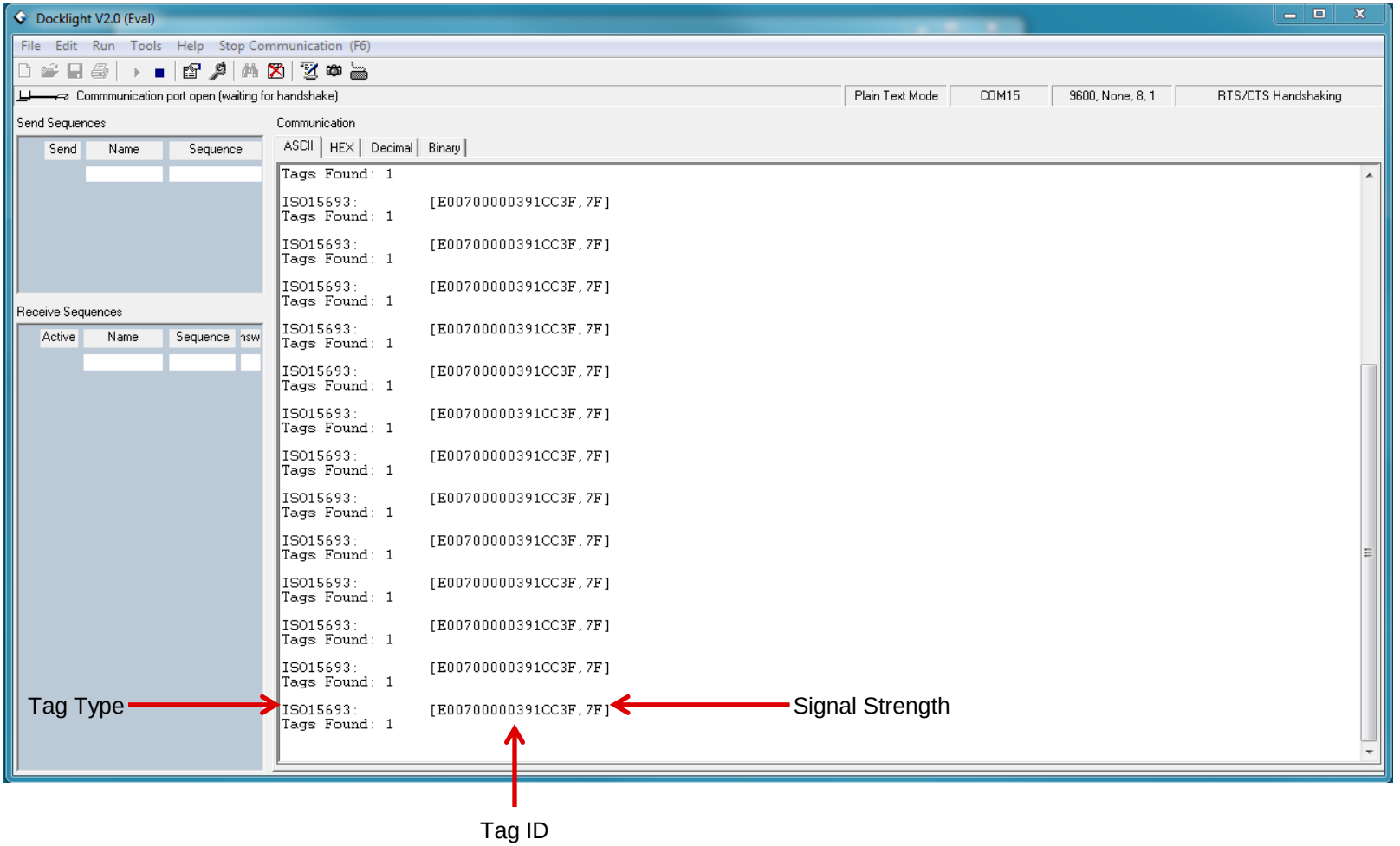
Read NFC-V Tag

- Present an NFC-V Tag.
- LED D4 will illuminate when technology is present.



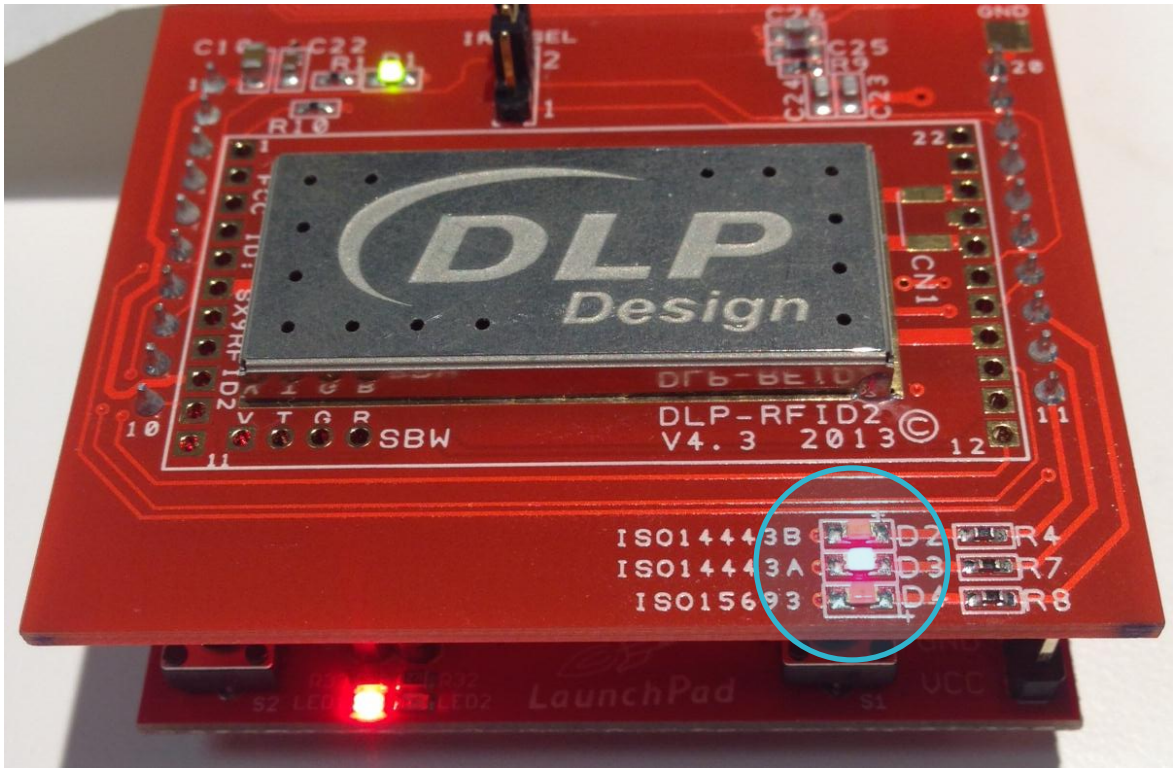
Read NFC-V Tag

- Tag will be identified and read as below.



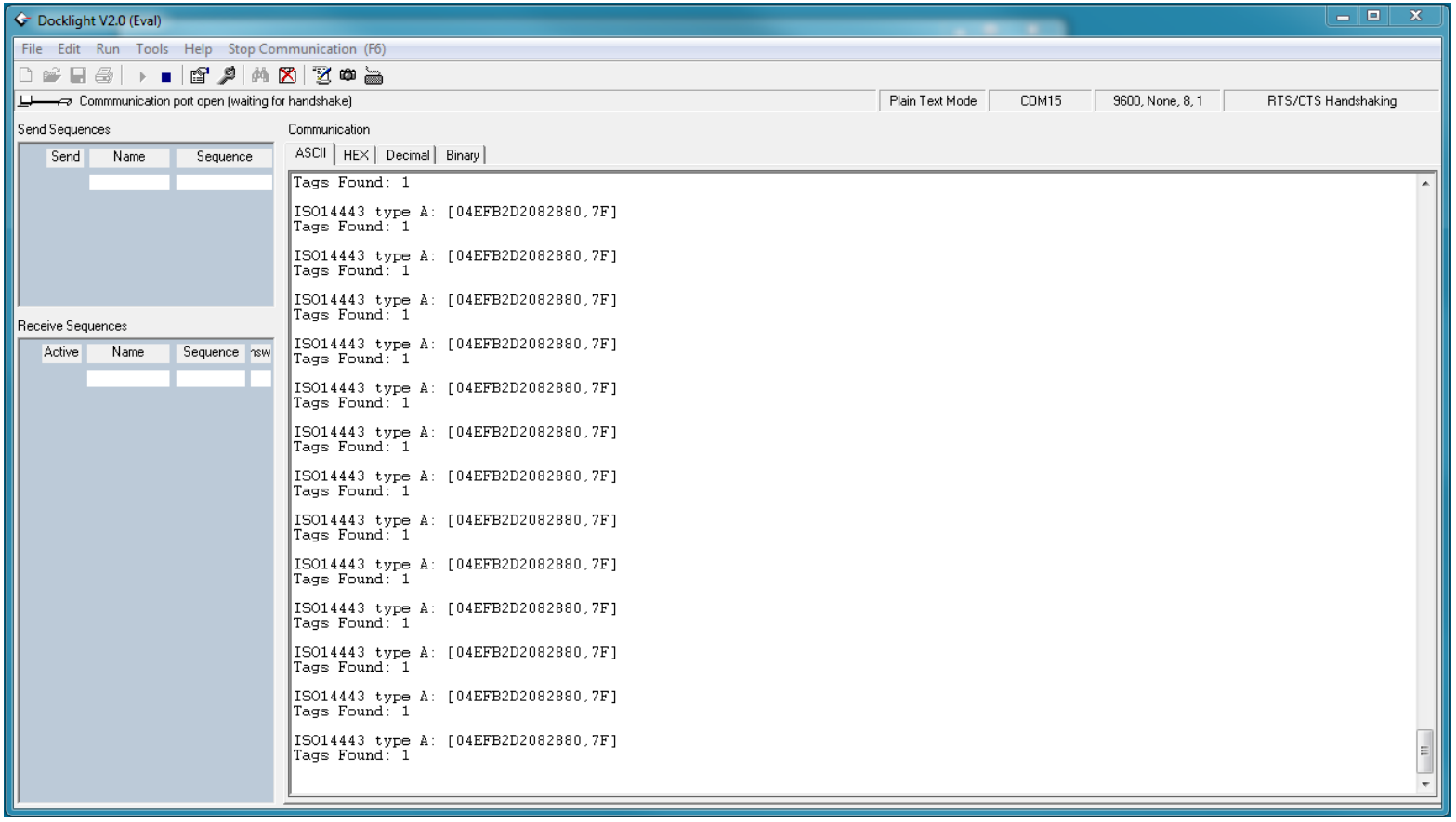
Read Type 2 Tag

- Present a Type 2 Tag.
- LED D3 will illuminate when technology is present.



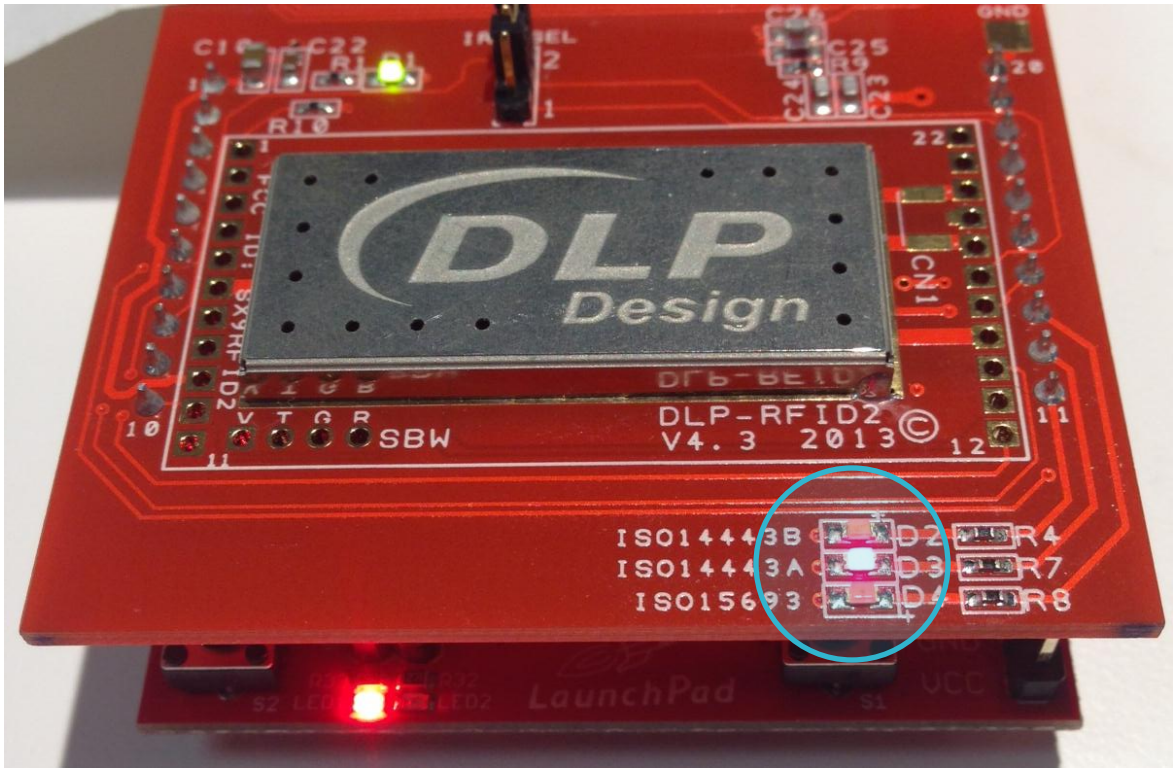
Read Type 2 Tag

- Tag will be identified and read as below.



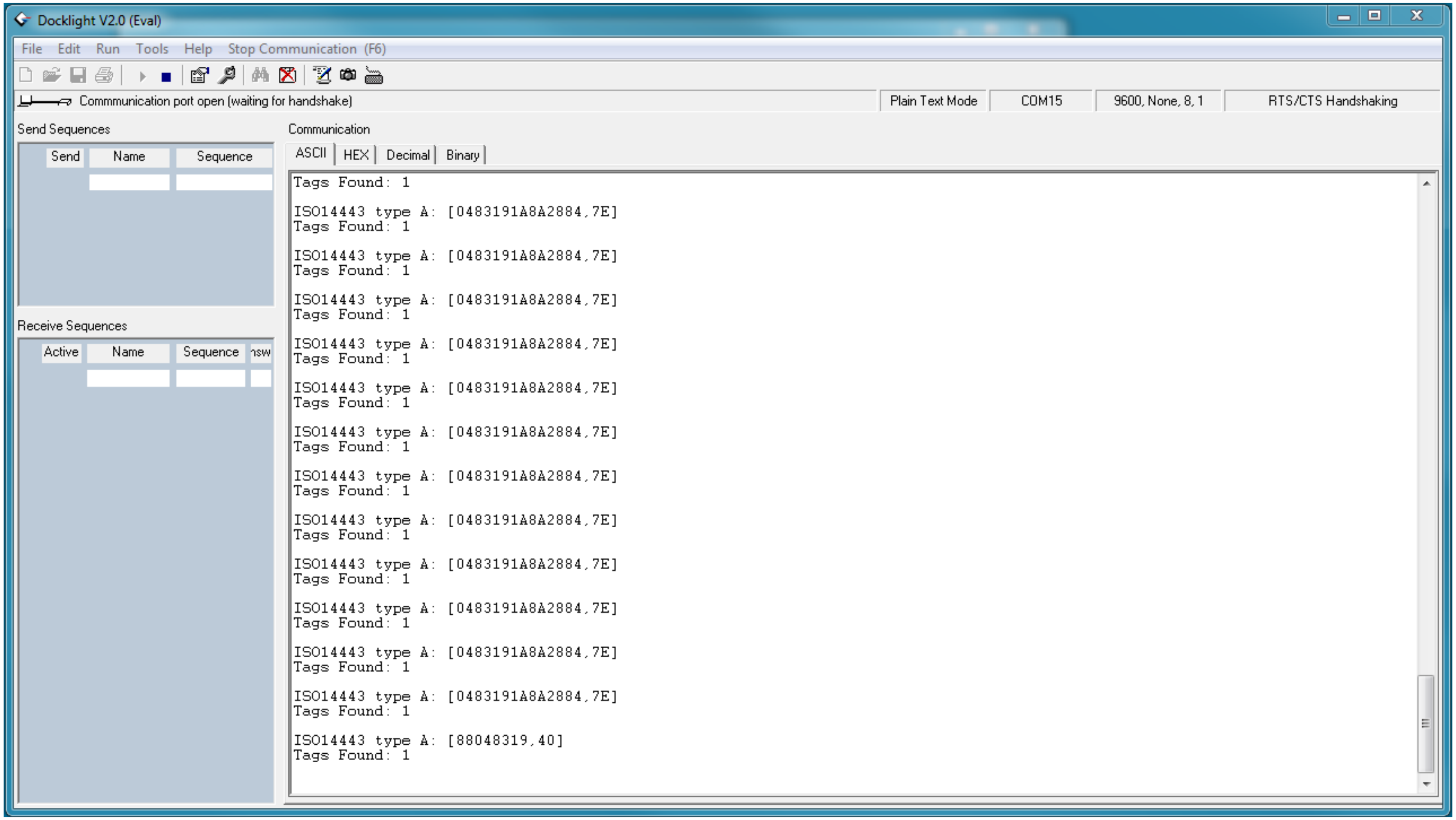
Read Type 4A Tag

- Present a Type 4A Tag.
- LED D3 will illuminate when technology is present.



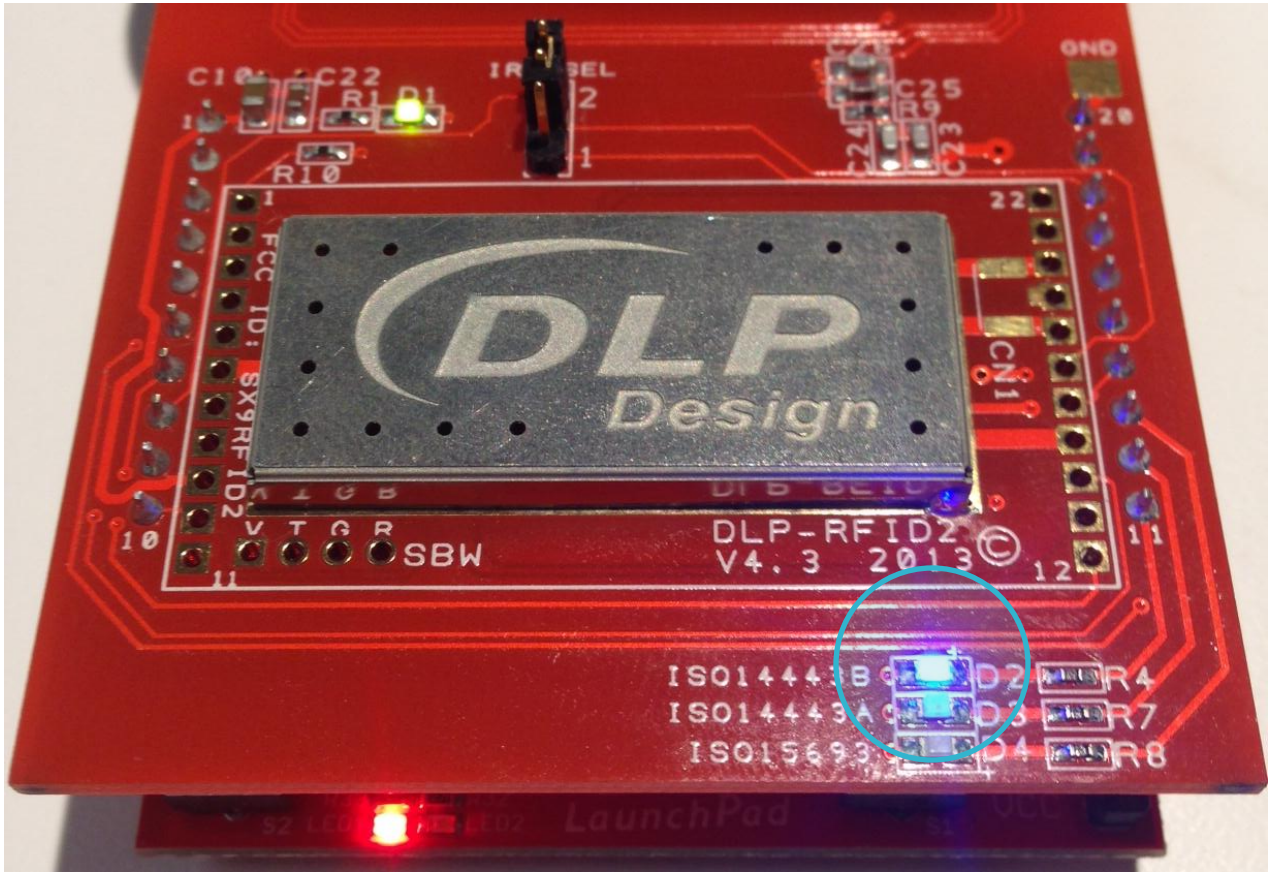
Read Type 4A Tag

- Tag will be identified and read as below.



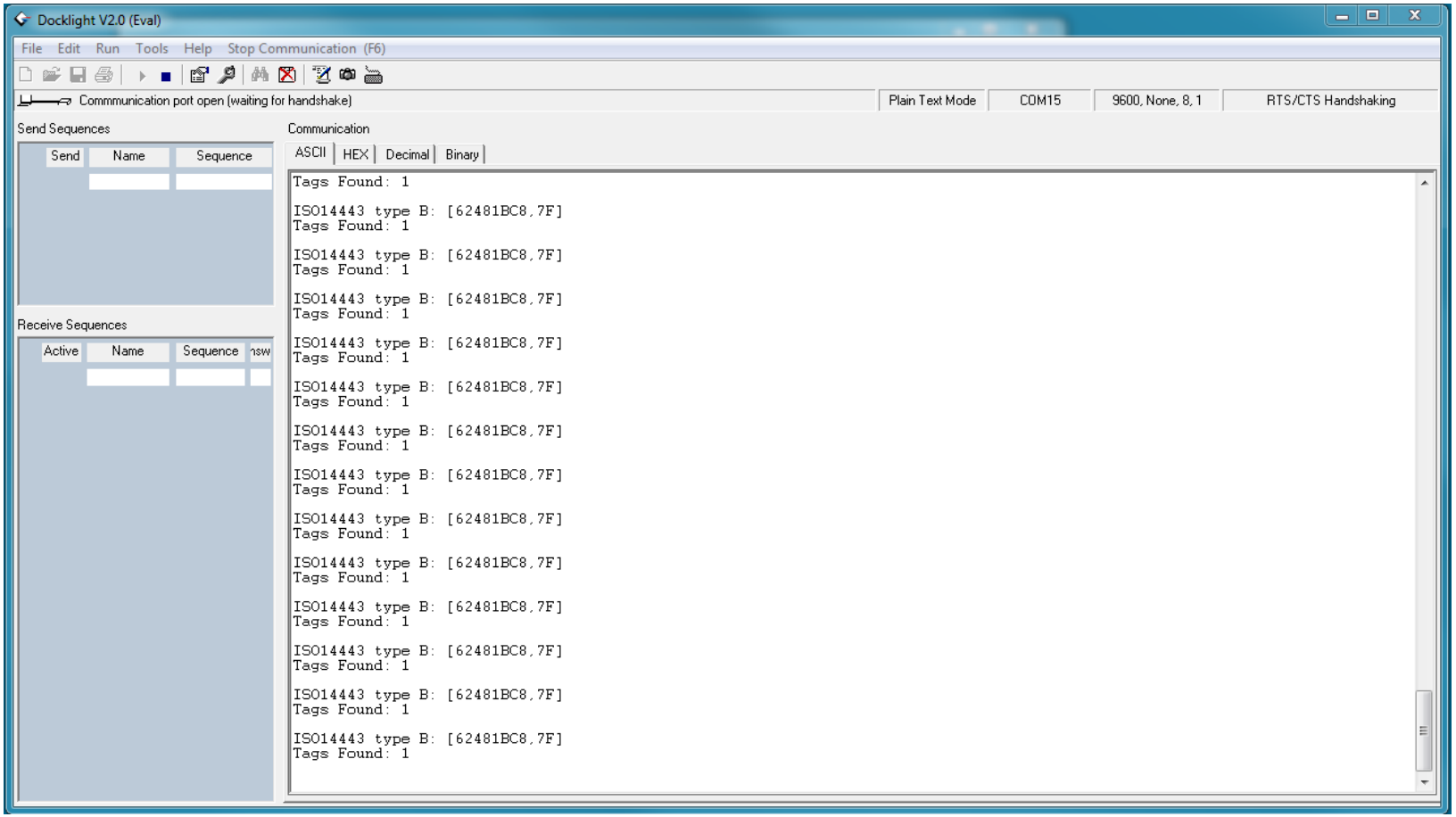
Read Type 4B Tag

- Present a Type 4B Tag.
- LED D2 will illuminate when technology is present.



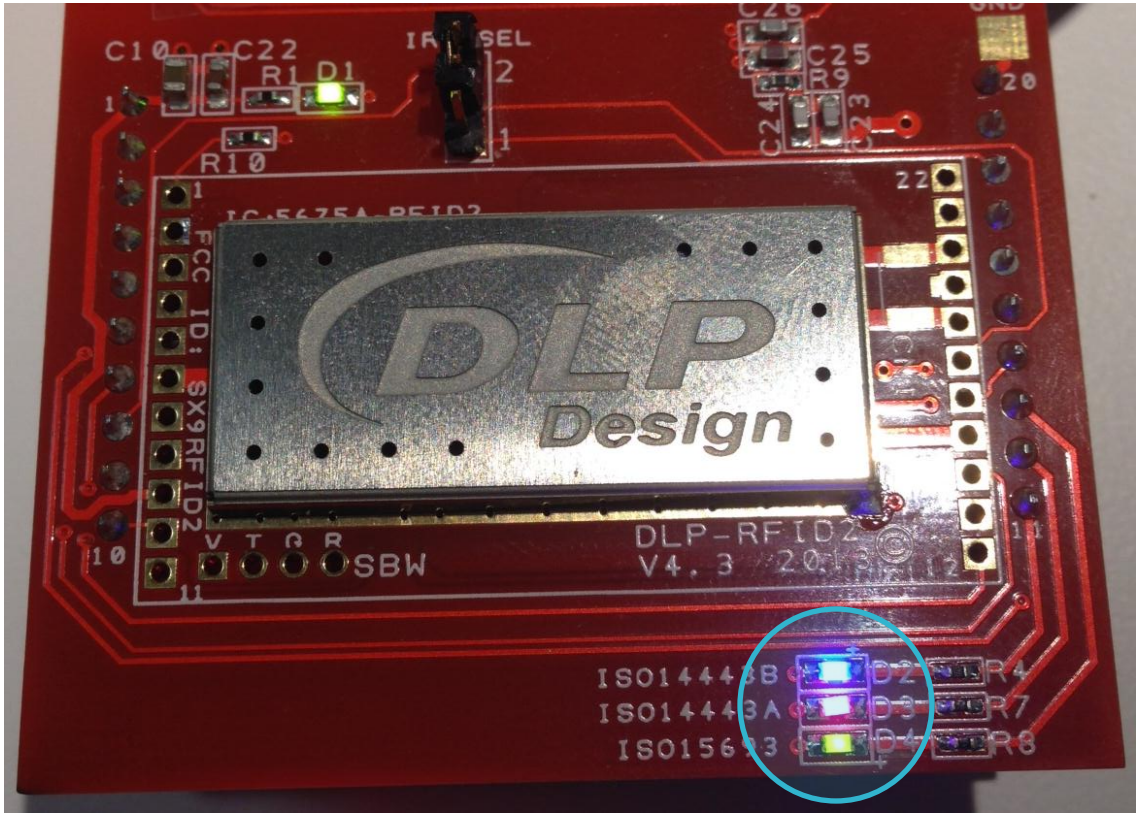
Read Type 4B Tag

- Tag will be identified and read as below.



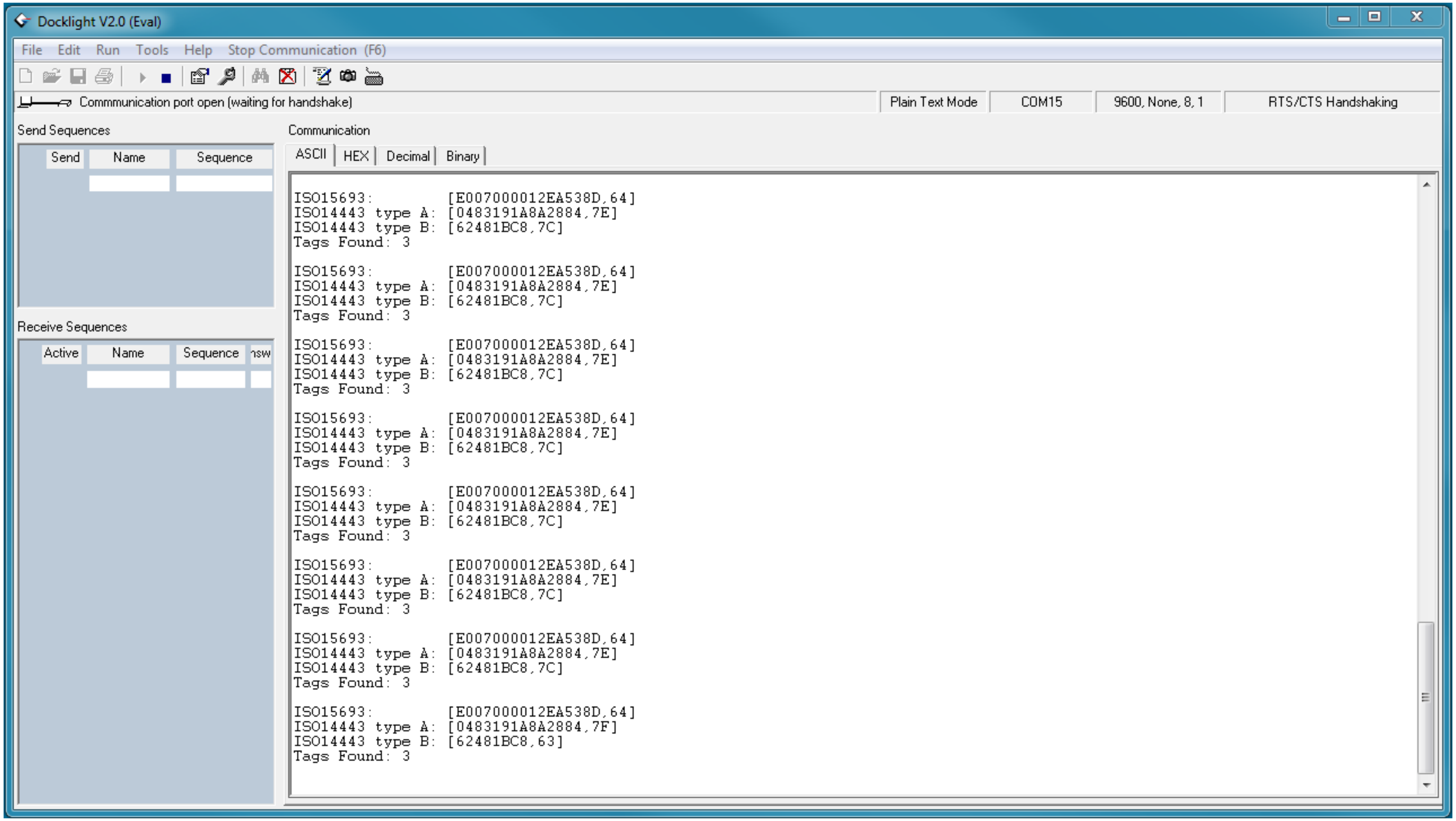
Read Multiple Tags

- Hardware can read multiple tags simultaneously.
- Corresponding LED for each tag type present will illuminate when technology is present.



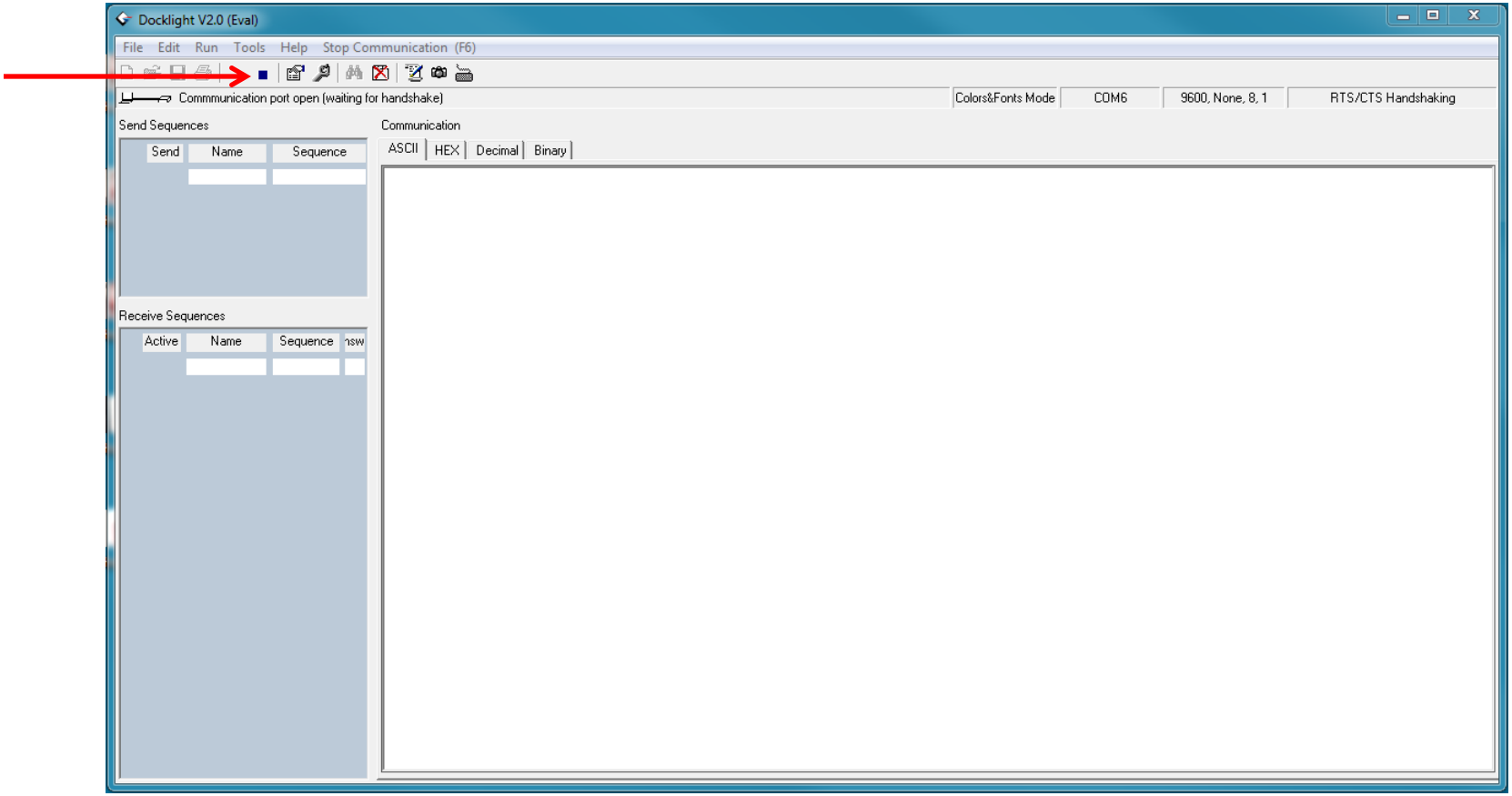
Read Multiple Tags

- Tags will be identified and read as below.



Ending Communication

- To stop communications, press Blue Stop Button



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 terminal program, then unplug/replug LaunchPad.

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