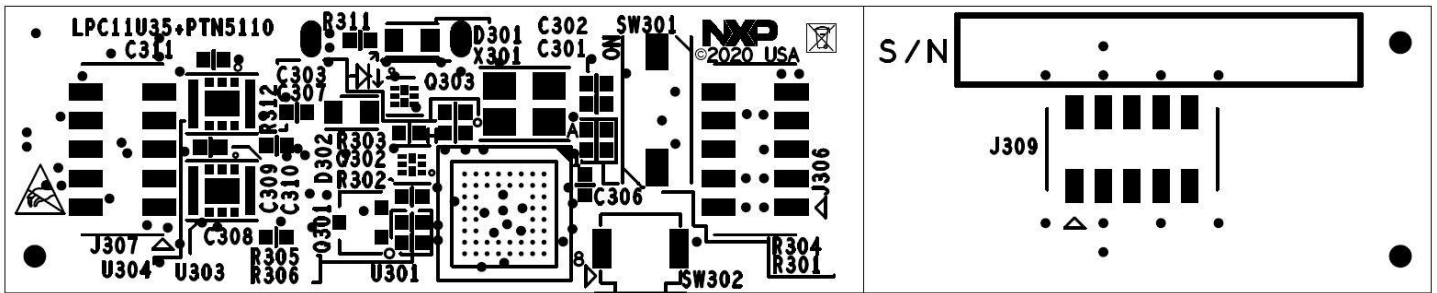


Functional Verification Test (FVT) for X-PTN38007-BASE

FSW-47770 REV A1



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Revision History				
Rev.	Date	Name	Description	Overall Test Time
A	1/28/2021	Angel Navarro	Initial Release.	3 minutes
A1	4/15/2021	Angel Navarro	Initial Release.	4 minutes

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Any questions pertaining to this document contact Test engineer.

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1 INTRODUCTION

This document will describe the Functional Verification Test (FVT) procedure for the **X-PTN38007-BASE (700-47770)**. This document will define the setup and operation of the FVT.

Please, read this document from beginning to end before starting to perform the FVT procedure. Steps of the procedure will require the operator to pass or fail the test based on criteria outlined in this document.

This document “**47770-X-PTN38007-BASE-FSW-REV-A1.pdf**” is in NXP Agile database “**FSW-47770 Rev-A1**”, NXP internal Agile link is <http://pdm.freescale.net/>. For external CM access to Agile contact the NXP Manufacturer Product Manager (MPM).

After the test package installation on the test PC, this procedure is located at “**C:\NXPTTEST\2021\47770-X-PTN38007-BASE\Rev-A1\Docs**”.

1.1 Terminology used

Not all acronyms are listed.

CM -	Contract Manufacturer
BU -	NXP Business Unit
DC -	Direct Current
TFA -	Test Fixture Assignment
FVT -	Functional Verification Test
FAT -	Functional Acceptance Test same as FVT
CPU -	Central Processing Unit
PC -	Personal Computer
USB -	Universal Serial Bus Port
LED -	Light Emitting Diode
DUT -	Device Under Test
PCB -	Printed Circuit Board

2 THEORY OF OPERATION

2.1 Features to be tested/not tested

The features to be tested by FVT are listed below:

- Power Test
- Micro USB
- LPC MCU
- ISP Push Button
- Regulators

The features not to be tested by FVT are listed below:

2.2 Environmental Needs

2.2.1 Hardware

- (n) **X-PTN38007-BASE** production Kit Assembly **700-47770**
- (1) Micro USB cable
- (1) Multimeter

2.2.2 Software

- **X-PTN38007-BASE** Test Package Installer FSW-47770
- Adobe Reader TFA-00012
- Columbus GUI

2.2.3 Host Computer

Host computer with Windows Operative System.

- Host Computer Win-7/Win-10 64-bit
- (2) available USB ports
- Hard disk, with at least 1 Gigabyte available for FVT software
- Desired but not mandatory an internet browser with internet connection

2.2.4 MAC Address Requirement

N/A

3 FUNCTIONAL VERIFICATION TEST (FVT) OVERVIEW

To be able to complete the FVT follow the below steps:

- Perform the “**SOFTWARE INSTALLATION/CONFIGURATION**”
- Perform the “**FUNCTIONAL VERIFICATION TEST**”

Contact a NXP test engineer for any issues.

4 SOFTWARE INSTALLATION/CONFIGURATION

The installation software can be delivered in any media form currently available, example USB-Flash Drive, CD-ROM, DVD-ROM, via Agile thru an Ethernet connection, TFTP, etc.

Make sure to do the software configuration after installing the software.

Do not skip the installation order; also, do not change the default path of each installation.

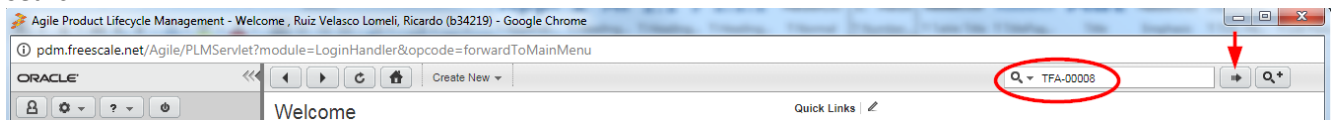
Please note that during installation default path is for 64-bit, example “C:\Program Files (x86)” on a 32-bit the path is just “C:\Program Files”.

Do the following to install the FVT software:

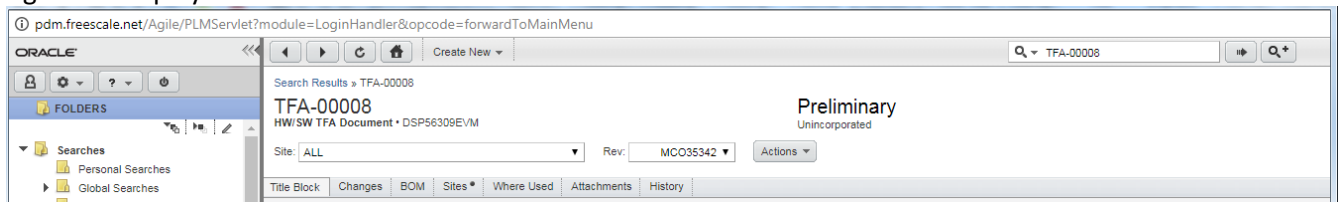
#	Installation
1	Adobe Reader
2	X-PTN38007-BASE Test Package Installer

Some software packages must be downloaded from Agile repository. The process to access and download them will be described below.

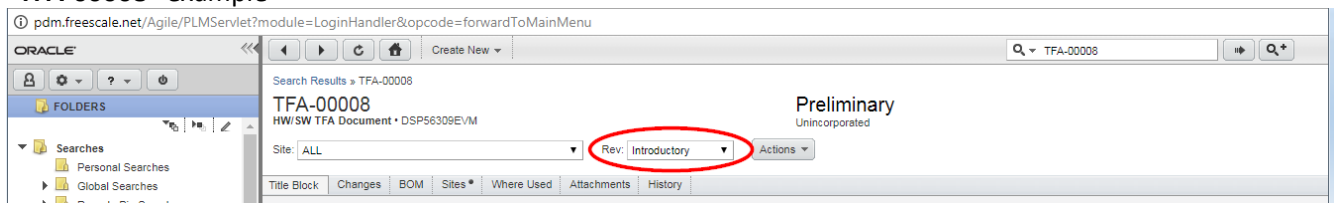
1. Agile is the NXP Database for board assembly fabrication. If you do not know how to login to Agile contact your manager or NXP test engineer.
2. Example below uses “**TFA-00008**” but is valid for any Agile item with attachments.
3. Log into Agile and search for “**TFA-00008**” where “**00008**” is the Agile part number or **47770**. The search box to enter text is the one with the magnifying glass and the button with the right pointed arrow is the execute the search



4. Agile will display the item.



5. Select the version using the drop-down box at “**Rev**”. When downloading attachments from “**TFA**” always go to “**Rev: Introductory**”. When downloading from “**FSW- 47770**” or any other use the revision mentioned on this test procedure.
6. “**TFA-00008**” example



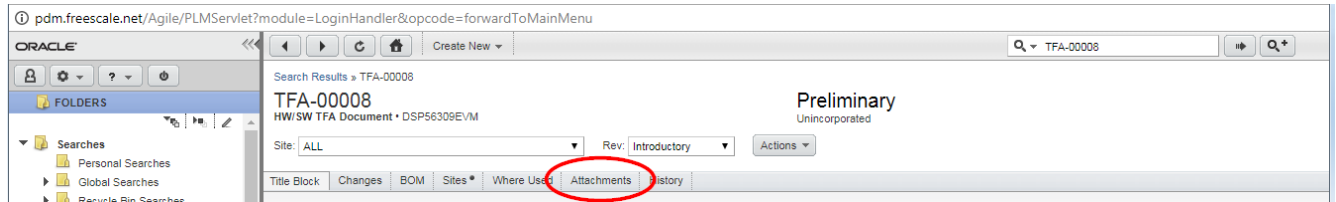
7. “FSW-27417” example

FSW-27417

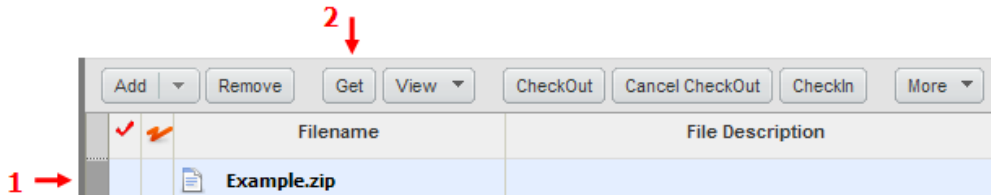
HW/SW Document • FAT TEST SOFTWARE AND PROCEDURE, 700-27417

Site: ALL Rev: X4 ECO38039

8. Go to the “Attachments” tab.



9. Select the Row with desired file. Do a click over column [1]. Now Click on the “Get” [2] button.



10. Select “Save”. To download the file.

11. Done.

4.1 Acrobat Reader 9.0 Installation: TFA-00012

Acrobat Reader 9.0 or greater is needed to be installed on the test computer. If Acrobat Reader 9.0 or greater is already installed on the PC skip this section.

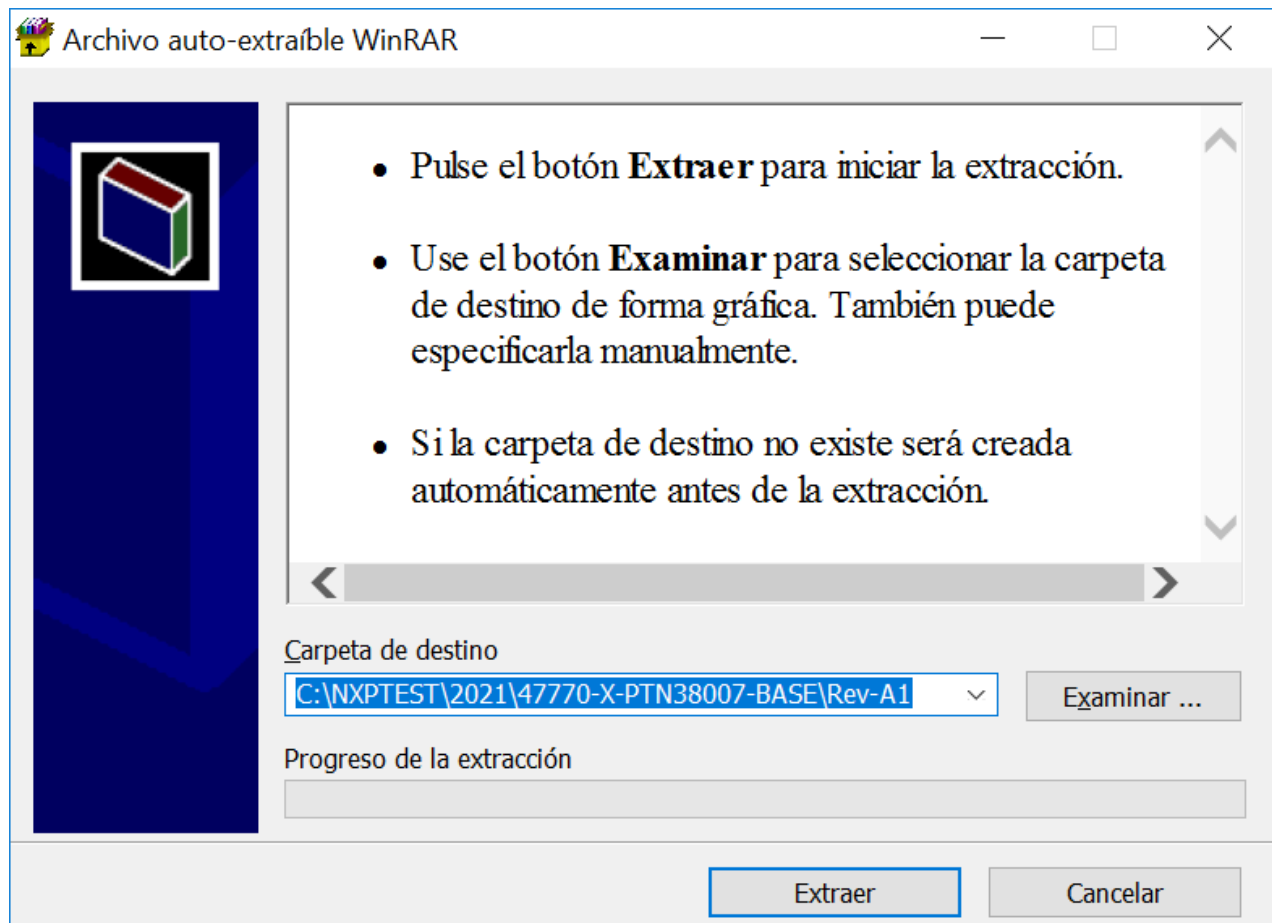
1. Agile is the NXP Database. If you do not know how to login to Agile contact your manager or NXP test engineer.
2. Go to Agile “TFA-00012” Revision “Introductory”, inside the “Attachments” tab get the file “AdbeRdr90_en_US.exe”.
3. Double click the file “AdbeRdr90_en_US.exe” to start acrobat reader installation.
4. Follow the instructions.
5. Done.

4.2 Test Package FSW-47770 REV A1 Agile Location and Installation

The test package is in Agile in “FSW-47770 Rev A1”. The instruction below shows how to get the exe package file from a PC with Agile access.

1. Agile is the NXP Database. If you do not know how to login to Agile contact your manager or NXP test engineer.

2. Go to Agile “**FSW-47770 Rev A1**”, inside the “**Attachments**” tab get the files “**X-PTN38007-BASE Test Package Installer.exe**”.
3. Copy the file to a media ex: USB flash Drive and take it to the test computer.
4. Insert the media to test computer with “**X-PTN38007-BASE Test Package Installer.exe**” file to start the installation.
5. Double click over the “**X-PTN38007-BASE Test Package Installer.exe**” file to begin installation.
6. Click on the **Next** button and follow instructions.



7. Do not change the destination path. It should be “**C:\NXPTTEST\2021\47770-X-PTN38007-BASE\Rev-A1**”.
8. Done.

5 FUNCTIONAL VERIFICATION TEST

Follow the instructions below to perform the test. If any of the test step fails, set aside the board for debugging. Make sure to use a toe tag label to write the failure and attach it to the board.

To abbreviate from now and on **X-PTN38007-BASE** will be replaced with **DUT (Device Under Test)**.
If help is required contact the NXP test engineer.

On Host test PC, open Microsoft excel spreadsheet “**47770-X-PTN38007-BASE-FVT-results_RevA1.xlsx**” located at “**C:\NXPTEST\2021\47770-X-PTN38007-BASE\Rev-A1\Test_Results_A1**”.

NOTE:

Boards Test results are stored in our NXP SharePoint Database, located at:

<https://nxp1.sharepoint.com/teams/ext158/BTD/default.aspx?RootFolder=%2Fteams%2Fext158%2FBTD%2FShared%20Documents%2FTrivo%2F2021%2F47770%2DX%2DPTN38007%2DBASE%2FRev%2DA1&FolderCTID=0x0120005BD234F13DF85C4FB622BCCF46D9F920&View=%7B66386713%2D675F%2D4AA4%2DB984%2D965DDF1E2294%7D>

Follow NXP data storage process to uploaded test result table.

5.1 Circuit Test

5.1.1 Test #1: Visual Inspection Test

1. **PCB Visual check.** Verify that PCB is clean.
2. **PCB Soldering Points.** Soldering quality good, no overlays, no missing solder. **Verify that U305 is soldered down properly.**
3. **IC's polarity.** Verify all IC's are mounted with the right polarity.
4. **Connectors polarity.** Verify that all connectors are mounted with right polarity
5. Open the “**47770-X-PTN38007-BASE_SPREADSHEET.xlsx**” excel spreadsheet and write the test result in the “**Test #1 visual inspection**” section.
6. Done.

5.1.2 Test #2 Short Test

1. Test time. 1 minute.
2. Perform the Short Test between following points and GND J307 Pin 2 with multimeter.

Voltage Rail	Measurement Point	Measured Resistance to GND (Ω) J307 pin 2	Notes and Observations
VBUS_ISP	C305.1	Xx	Pin 1
VBUS_P2	J307.4	Xx	Pin 4
VDD5V0_3	J307.1	Xx	Pin 1
VDD3V3_3	J307.3	Xx	Pin 3
VDD1V8_3	J307.7	Xx	Pin 7

3. Locate the **DNP-47770** file from **C:\NXPTEST\2021\47770-X-PTN38007-BASE\Rev-A1\Docs\TE_doc** for test point locations.
4. Open the “**47770-X-PTN38007-BASE_SPREADSHEET.xlsx**” excel spreadsheet and write the test result in the “**Test #2 Short Test**” section.
5. Done.

5.1.3 Test #3: Power Test

6. Test time. 1 minute.
7. Set-up.
 - a) Connect the type A to micro USB cable between PC and connector J301 on DUT.

NOTE: J301 sometimes is overheated and the plastic in the middle of the connector might be melted during soldering. If it is hard to insert the cable or see the middle of the connector is melted, replace this connector.

- b) Connect the GND probe from multimeter to J307 Pin 2 on DUT.
8. Check for any sign of overheating.

9. Using the digital multimeter, perform the following measurements:

Voltage Rail	Measurement Point	Expected Voltage (V)	Measured Voltage (V)	Notes
VBUS_ISP	C305.1	5±5%	Xx	
VDD5V0_3	J307.1	5±5%	Xx	
VDD3V3_3	J307.3	3.3±5%	Xx	
VDD1V8_3	J307.7	1.8±5%	Xx	

10. Remove the type A to micro USB cable.

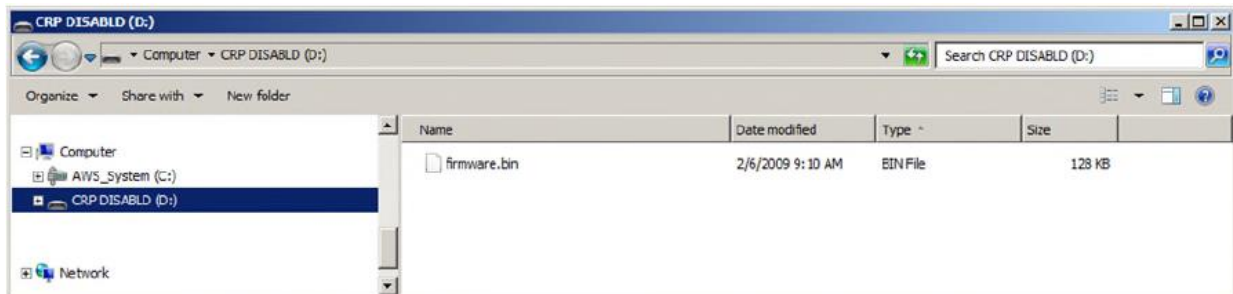
11. Open the “**47770-X-PTN38007-BASE_SPREADSHEET.xlsx**” excel spreadsheet and write the test result in the “**Test #3 Power Test**” section.

12. Done.

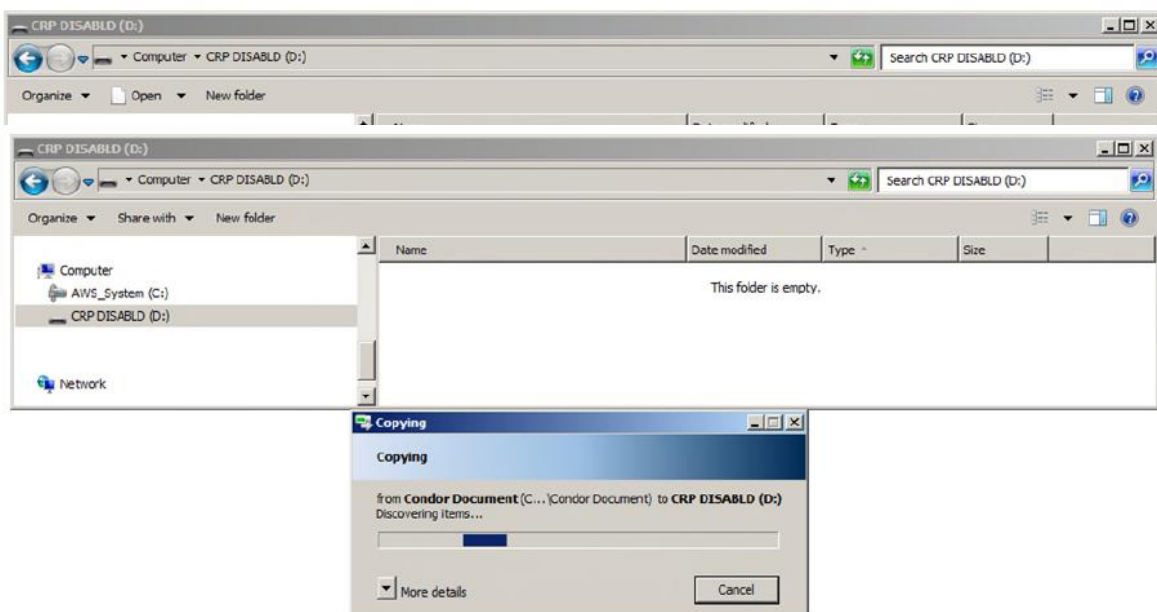
5.2 Functional Test

5.2.1 Firmware Downloading

1. Test time 1 minute.
2. Connect micro USB cable to DUT on J301 first, without plug into the PC.
3. Locate SW302 ISP Switch on DUT and hold it down while plug in the micro USB cable to the PC.
4. Release SW302 switch, and on your PC, you will see a disk drive “**CRP DISABLD**” show up under “**computer**”.



- Right click "**firmware.bin**" in the "**CRP DISABLD**" driver and select Delete. Select "**Yes**" when a pop-up window ask to confirm deleting the file.

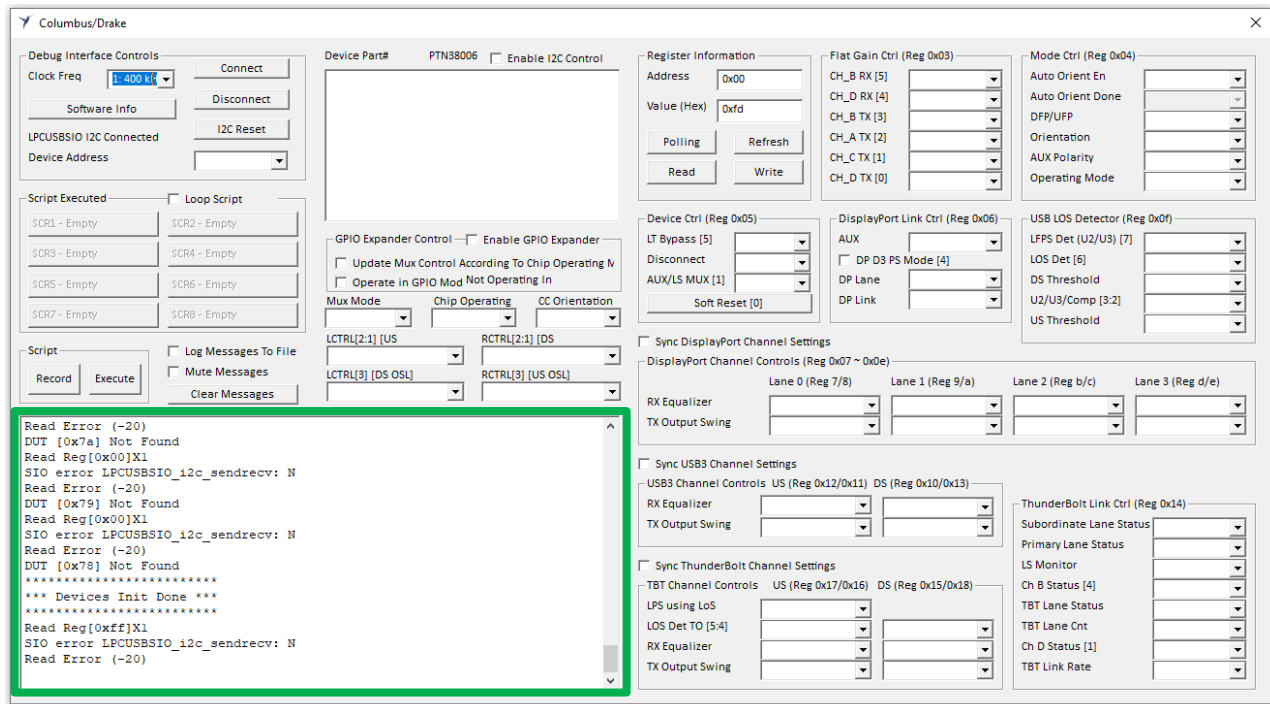


- Go to **C:\NXPTEST\2021\47770-X-PTN38007-BASE\Rev-A1\Software\Firmware** and locate the new firmware "**hid_sio_bridge.bin**", and drag the bin file into "**CRP DISABLD**" folder.
- You Should see the new binary file appear in the "**CRP DISABLD**" drive. The firmware update is completed.
- The new firmware is now running on DUT.
- Remove the Micro USB cable.
- Open the "**47770-X-PTN38007-BASE-FVT-results_Rev A1.xlsx**" excel spreadsheet and write the test results in the "**Firmware Downloading**" section.
- Disconnect the Micro-USB cable from DUT.
- Done.

5.2.2 Connection Test

- Test time 1 minute.
- Connect micro USB cable to DUT on J301 and PC USB port.
- Go to **C:\NXPTEST\2021\47770-X-PTN38007-BASE\Rev-A1\Software\GUI** and double click on the GUI "**Columbus.exe**"
- The GUI will run.

5. Check the window in green color (below).



6. Scroll the window text to the beginning and look for the following strings :

- Checking LPCUSBSIO Cable...
- **1 device(s) found:**
- **Device version: LPCUSBSIO v2.25 (Feb 14 2020 13:45:44)/FW 2.10 (Feb 18 2020 16:46:59) →version doesn't matter.**
- Configuring I2C Master

```

Checking Aardvark I2C/SPI Cable...
There is no Aardvark device installed
Checking LPCUSBSIO Cable...
1 device(s) found:
Device version: LPCUSBSIO v2.25 (Feb 14 2020 13:45:44)/FW 2.10 (Feb 18
2020 16:46:59)
Configuring I2C Master
Clock Frequency = 1: 400 kHz
Clock Frequency = 1: 400 kHz
SIO error LPCUSBSIO_i2c_sendrecv: N
Read Error (-20)
Read Error (-20)
SIO error LPCUSBSIO_i2c_sendrecv: N
Read Error (-20)
Read Error (-20)
SIO error LPCUSBSIO_i2c_sendrecv: N
Read Error (-20)

```

7. If Firmware was not downloaded correctly you will see the bellow message:

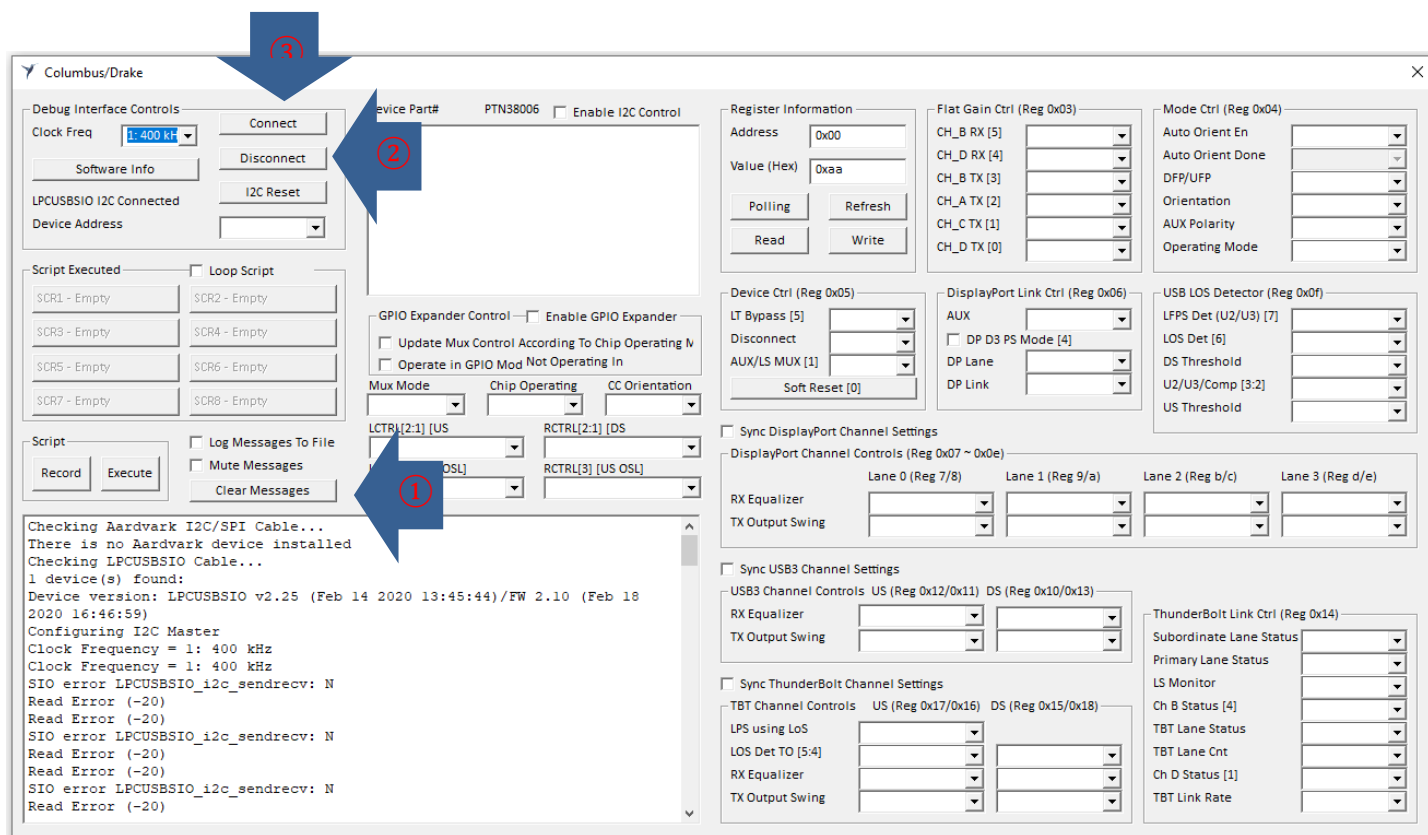
- Checking LPCUSBSIO Cable...
- **There is no LPCUSBSIO device installed**

```
Checking Aardvark I2C/SPI Cable...
There is no Aardvark device installed
Checking LPCUSBSIO Cable...
There is no LPCUSBSIO device installed
```

8. **If this happen**, go to section 5.2.1 and re-flash the firmware.

9. To test the next board, you don't need to close the GUI and re-start it again. Do the following:

- Connect next board's micro USB connection.
- Click "Clear Messages"
- Click "Disconnect"
- Click "Connect":



16. You can scroll back to beginning to check messages.

17. Open the "47770-X-PTN38007-BASE-FVT-results_Rev A1.xlsx" excel spreadsheet and write the test results in the "Connection Test" section.

18. Done.

6 FINAL SWITCH/JUMPER SETTINGS

6.1 Final switch settings

The final switch setting **MUST** be the same as assembly drawing **ASY-47770 Latest Revision**

6.2 Final jumper settings

Set the jumpers according to ASY-47770 latest revision (Default setting).

The final jumper setting **MUST** be the same as assembly drawing **ASY-47770 Latest Revision**.

END OF TEST DOCUMENT