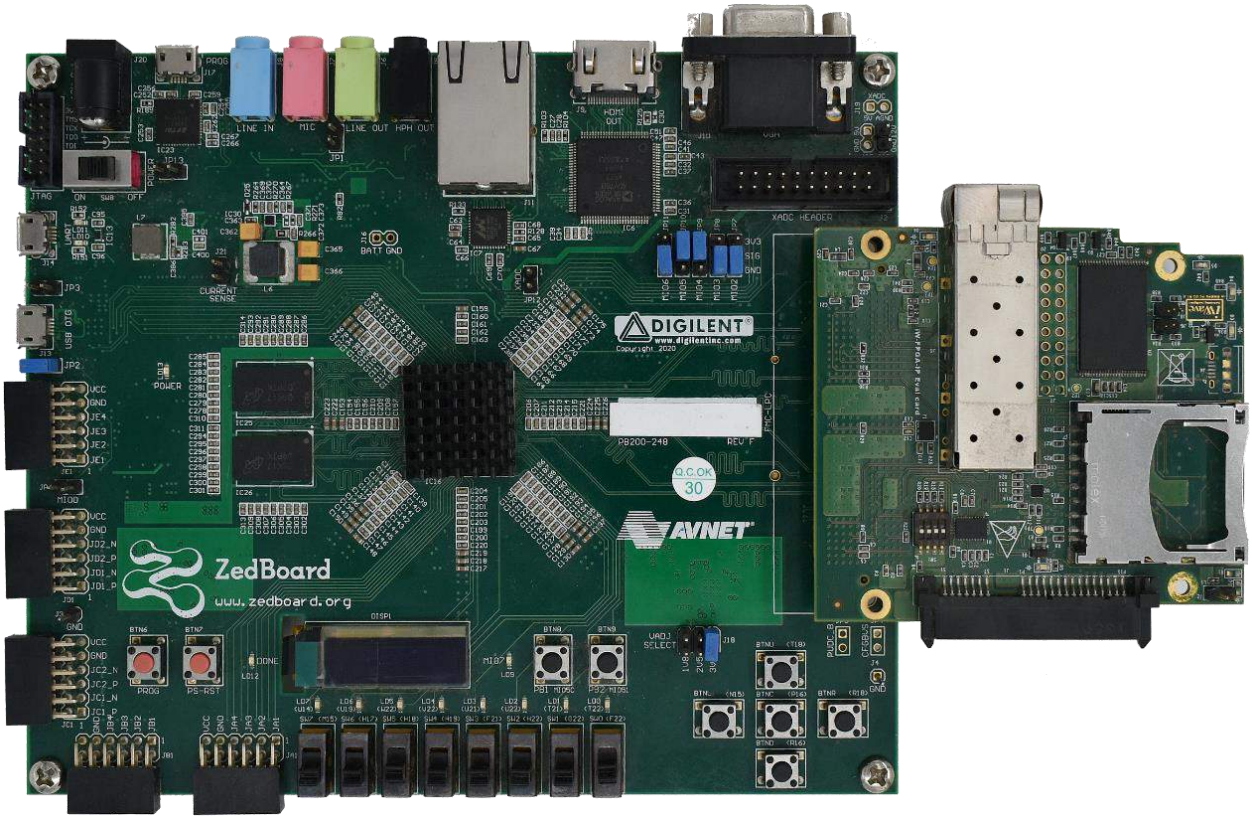
Software User Guide for

Nand Flash Controller



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1. Introduction

1.1 Purpose and scope

This document is the Software User Guide for testing the Nand flash controller. This guide provides detailed information to test the Nand operations and Vitis configuration.

1.2 References

- MICRON NAND flash memory datasheet (MT29F64G08AFAAA).
- Open NAND Flash Interface Specification
- AMBA® AXI™ and ACE™ Protocol Specification

1.3 List of Acronyms

The following acronyms will be used throughout this document.

Table 1 :Acronyms & Abbreviations

Acronyms	Abbreviations
FSBL	First Stage Bootloader
JTAG	Joint Test Action Group
PC	Personal Computer
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus

2. Vitis Configuration

2.1 Xilinx Vitis

This section explains the procedure and detailed information for installing the Xilinx Vitis 2019.2 in the host PC and import the application project.

Refer the below link to install the Xilinx Vitis 2019.2 in the host PC.

https://www.xilinx.com/support/documentation/s_manuals/xilinx2019_2/ug1400-vitis-embedded.pdf

2.2 Import Application Projects

- The Vitis project can be imported to Vitis workspace.
- Vitis project zip file can be found at iW-emfey-PF-01/iW-emfey-PF-01-R1.0/iW-emfey-SF-01-R1.0/iW-emfey-SC-01-R1.0/vitis_export_archive.ide.zip.
- Launch Vitis 2019.2 and select a workspace path for creating Vitis applications.

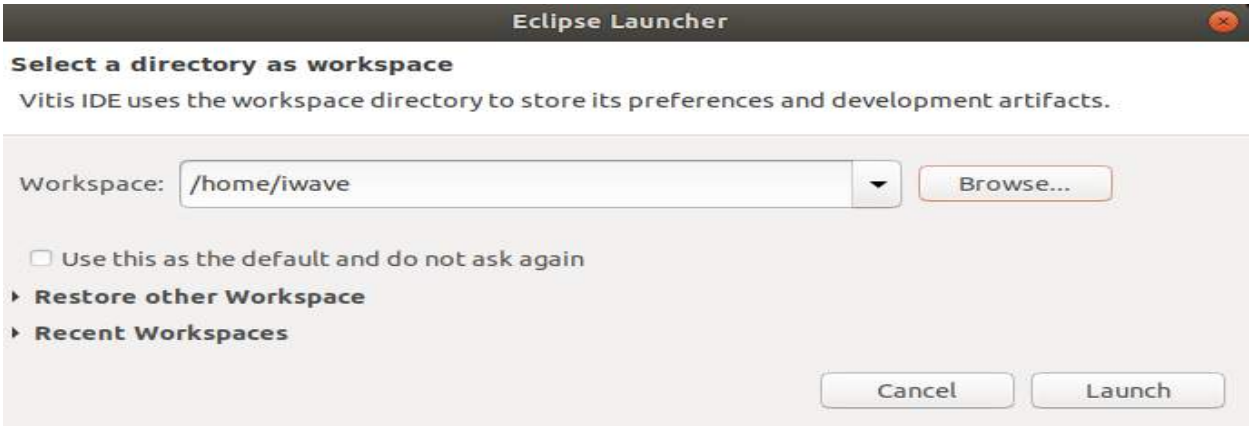

Figure 1 : Importing Application Projects Step#1

- Once Vitis is launched go to File > Import > enable Vitis project exported zip file > click Next.

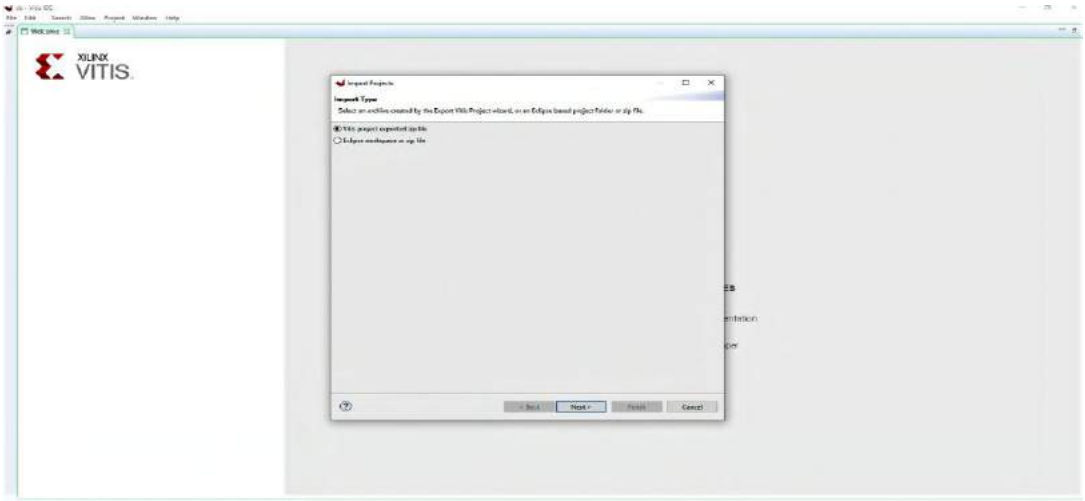

Figure 2: Importing Application Projects Step#2

- Browse for **vitis_export_archive.ide.zip** file and click **Select Folder**.

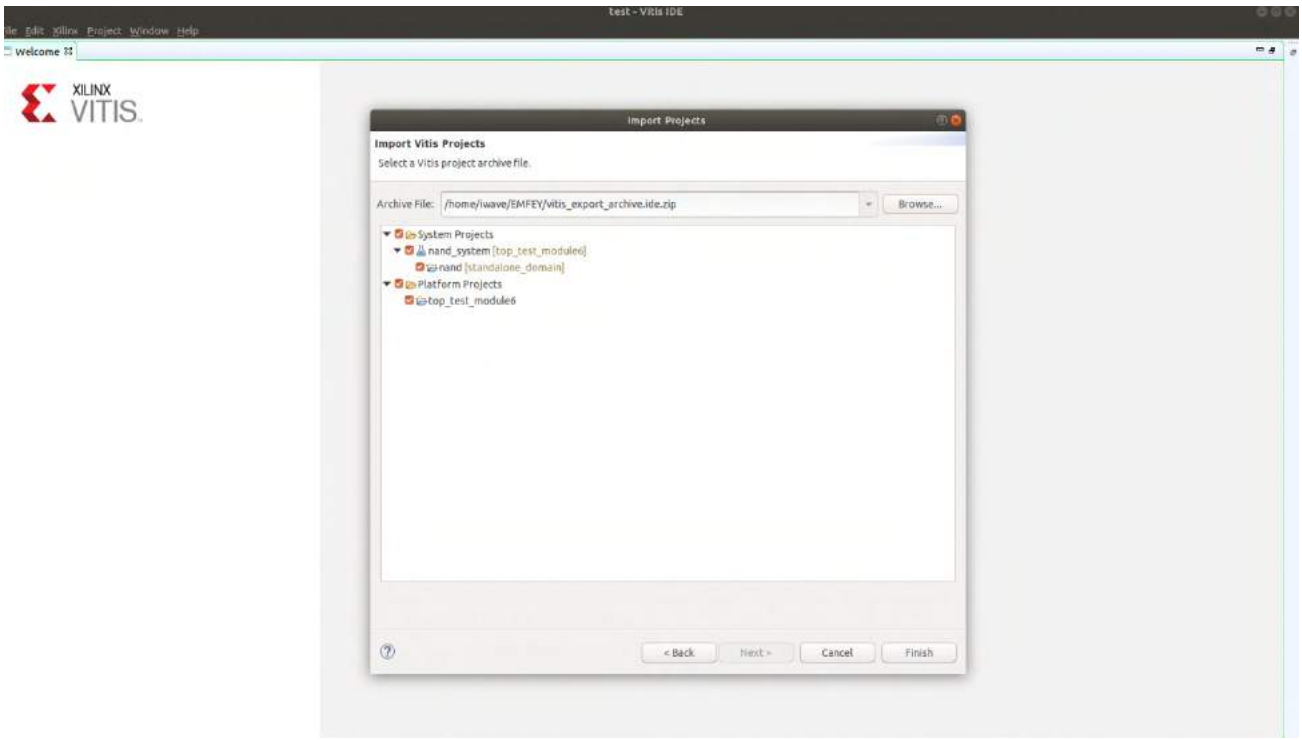

Figure 3: Importing Application Projects Step#3

- Make sure all the required applications are enabled and click on Finish. All the applications will be imported to workspace, these applications can be tested through JTAG programming.
- Source code is available in the path as shown in the image.

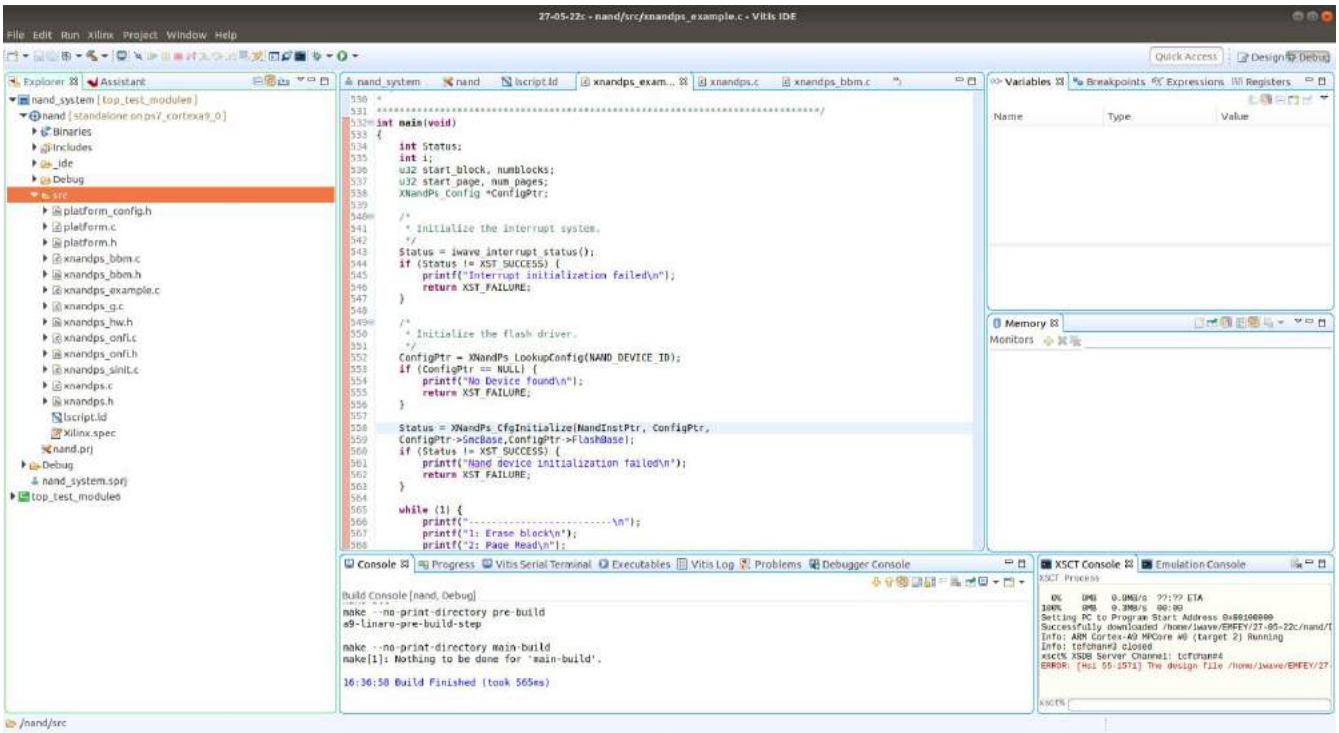

Figure 4: Opening the source code

- Build a Vitis Application by press Ctrl-B on your keyboard.

2.3 JTAG Programming

This section explains the step-by-step procedure to program the binaries into platform using JTAG Programmable Cable.

- Connect the JTAG programmable cable between the JTAG connector in the carrier board and Host PC.
- To edit the settings for a launch configuration, select a build target and click the Run button to open the Run Configurations dialog box.

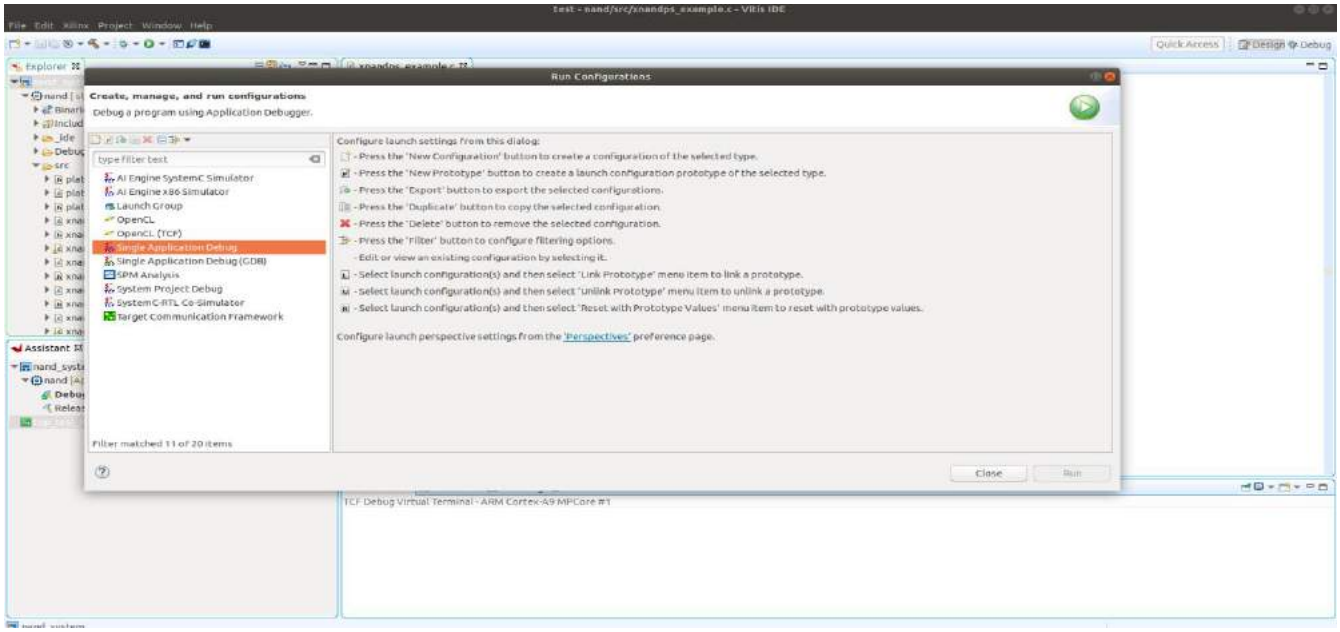

Figure 5: Run Configurations

- Click on Single Application Debug option it will display the options as shown in the image.

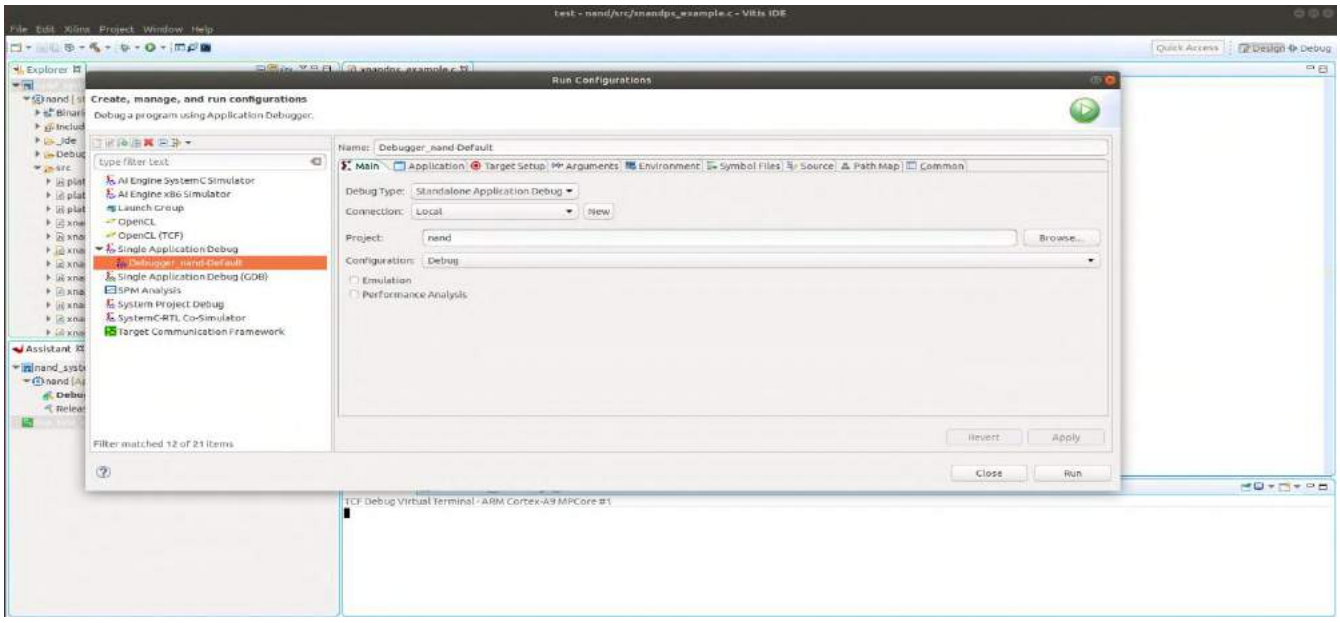

Figure 6: Run configurations - Main

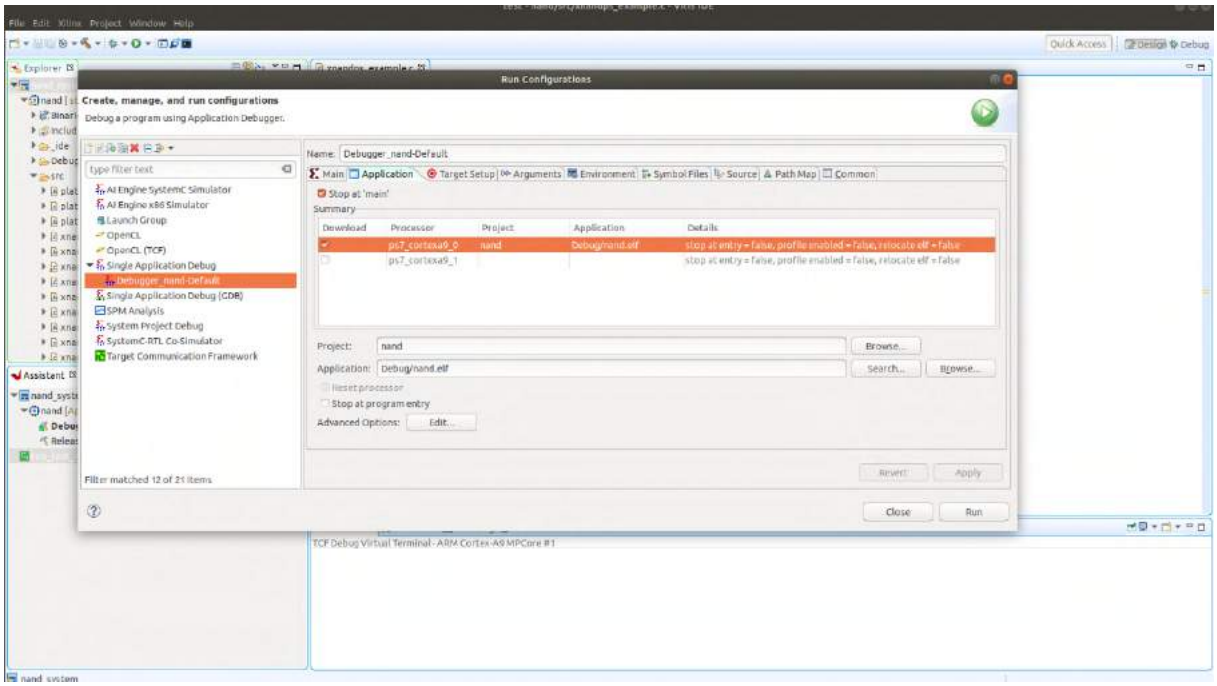

Figure 7: Run configurations - Application

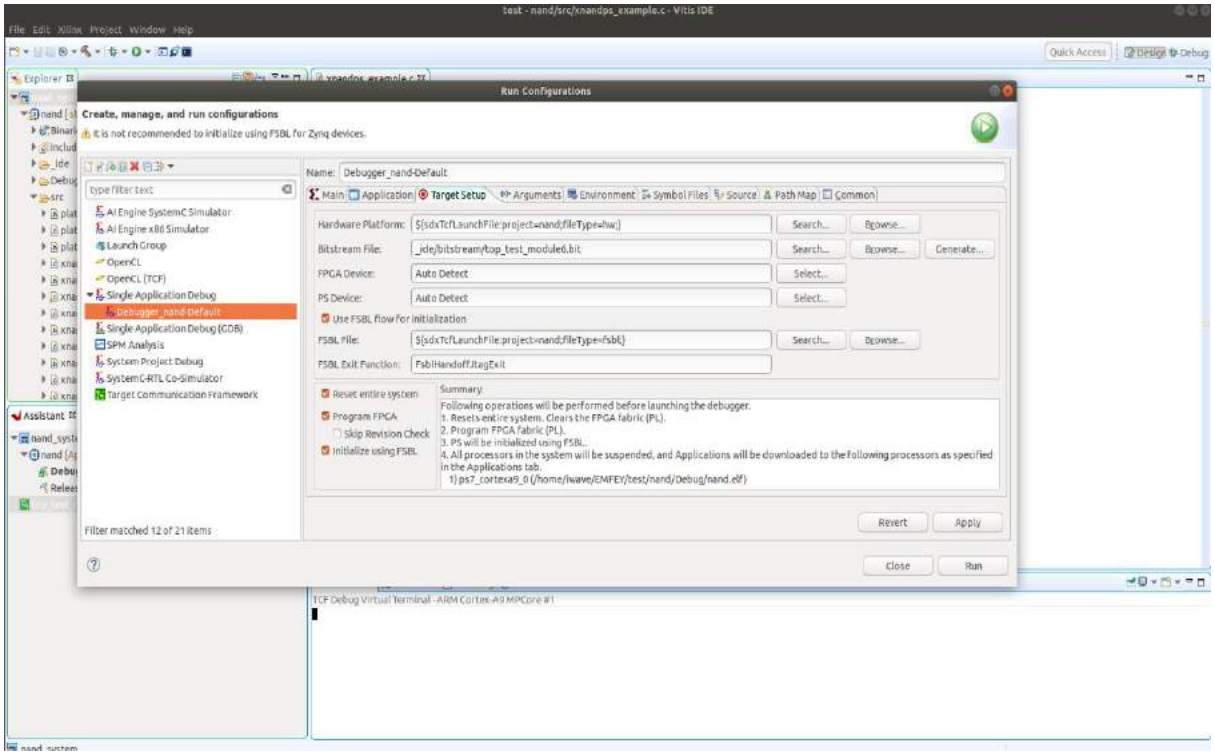

Figure 8: Run configurations – Target Setup

- Select the Use FSBL flow for initialization option in Target Setup
- Click Apply and Run to start the application.

3. Getting Start with Application

This section provides the information about how to run the different Nand operations.

- Connect UART to micro-USB cable from board to the PC.
- Open the Tera Term UART terminal.
- Power ON the Board, program the binaries into platform using JTAG Programmable Cable (Refer 2 section) and wait until the command prompt appears as shown below

Figure 9: Application overview

3.1 Erase block

- Enter '1' to perform the NAND erase operation
- Enter the start block to erase
- Enter the number of blocks to erase

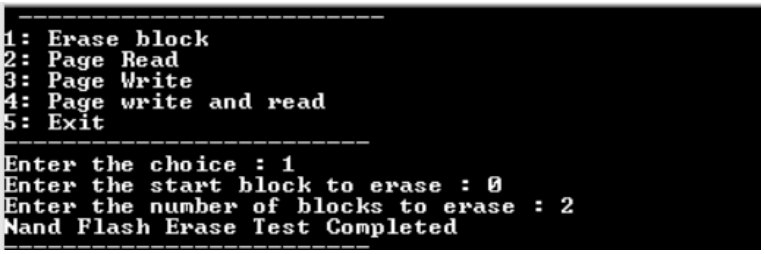

Figure 10: Page Erase

Note:

- Start block should be start from 0 to 8191
- Addition of start block and number of blocks should not exceed total number of blocks (8192).
  start_block + number_blocks <= 8192

3.2 Page Read

- Enter '2' to perform the Nand read operation
- Enter the start page to read
- Enter the number of pages to read

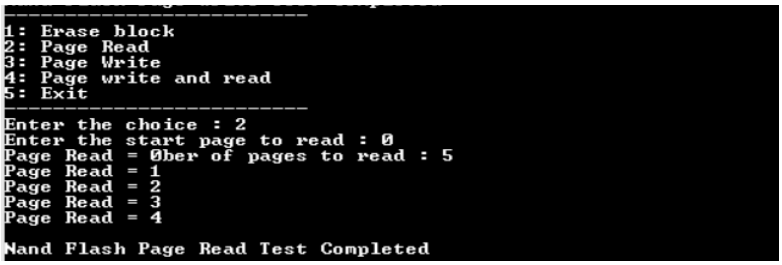

Figure 11: Page Read

Note:

- Start page should be start from 0 to 1048575
- Addition of start page and number of pages should not exceed total number of pages (1048576).
  start_page + number_pages <= 1048576

3.3 Page Write

- Enter '3' to perform the Nand write operation
- Enter the start page to write
- Enter the number of pages to write

Figure 12: Page Write

Note:

- Start page should be start from 0 to 1048575
- Addition of start page and number of pages should not exceed total number of pages (1048576).
  start_page + number_pages <= 1048576

3.4 Page Write and Read

- Enter '4' to perform the Nand write and read operation
- Enter the start page to write and read
- Enter the number of pages to write and read

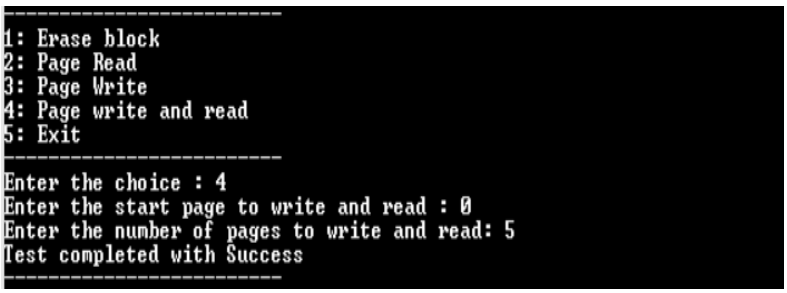

Figure 13: Page Write and Read

Note:

- Start page should be start from 0 to 1048575
- Addition of start page and number of pages should not exceed total number of pages (1048576).
  start_page + number_pages <= 1048576

3.5 Exit

Enter ‘5’ to quit the application

Figure 14: Exit

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