XILINX
ALL PROGRAMMABLE™

ZCU104 Board Interface Test

June 2018

XTP498

Revision History

Date	Version	Description
06/18/18	3.0	Updated for 2018.2.
04/09/18	2.0	Updated for 2018.1.
03/29/18	1.0	Initial version.

ZCU104 Board Interface Test Overview

- ZCU104 Software Install and Board Setup
- ZCU104 Board Interface Test Setup
- Running the Board Interface Test
- Appendix
- References

Note: This presentation applies to the ZCU104

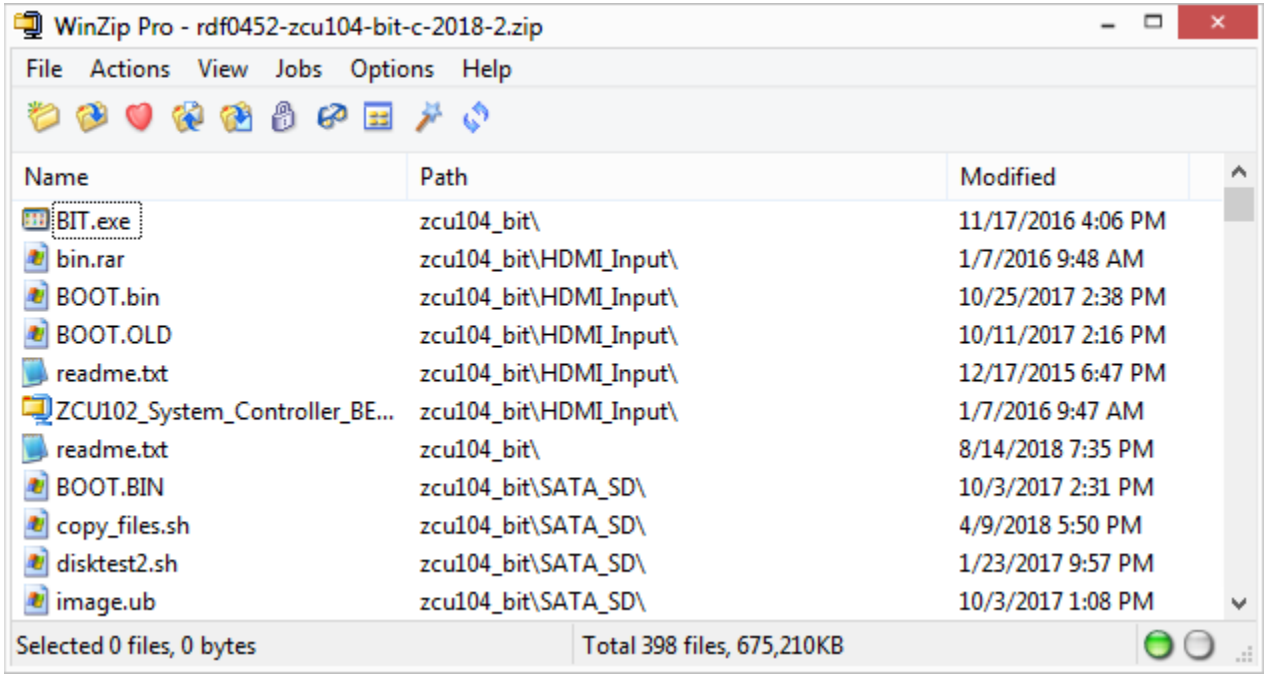
ZCU104 Software Install and Board Setup

- Refer to XTP504 – ZCU104 Software Install and Board Setup for details on:
  - Software Requirements
  - ZCU104 Board Setup
  - UART Driver Install

Note: Presentation applies to the ZCU104

ZCU104 Board Interface Test Setup

- Open the RDF0452 – ZCU104 Board Interface Test Files (2018.2 C) ZIP file
  - Extract these files to your C:\ drive



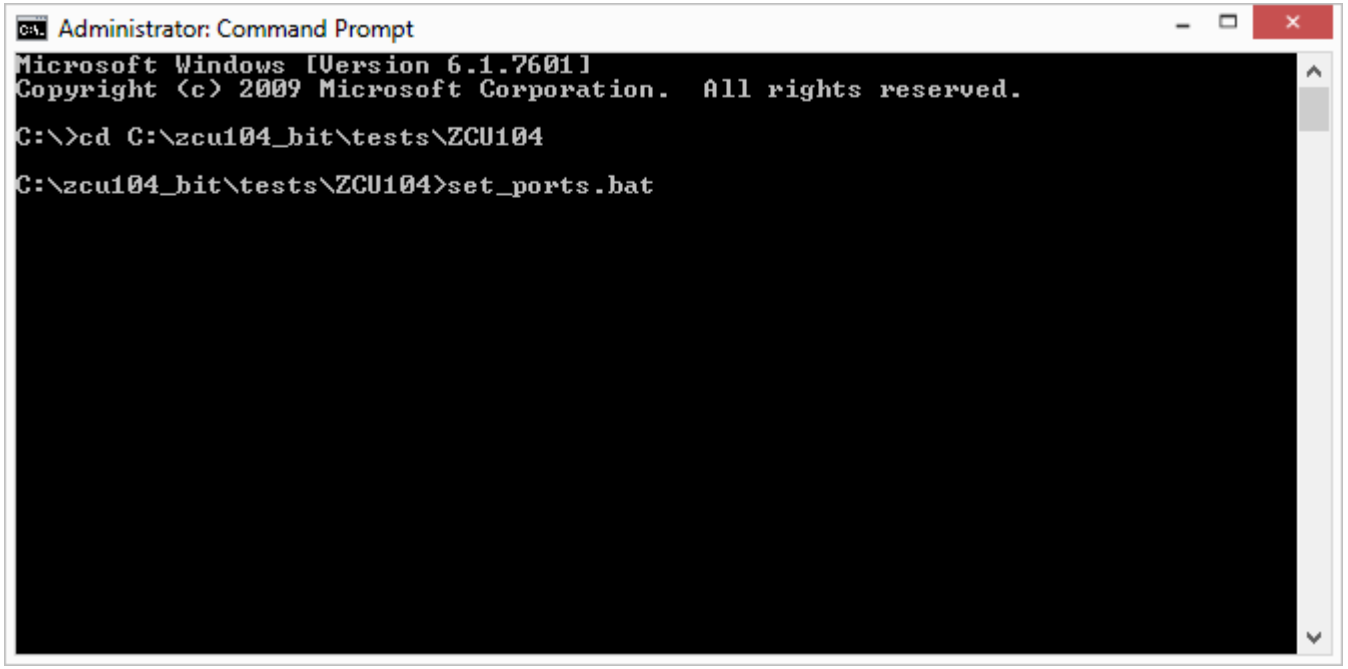
Note: Presentation applies to the ZCU104

ZCU104 Board Interface Test Setup

- Prior to running BIT, the COM ports must be set
- From a Command Prompt, type:

  cd C:\zcu104_bit\tests\ZCU104

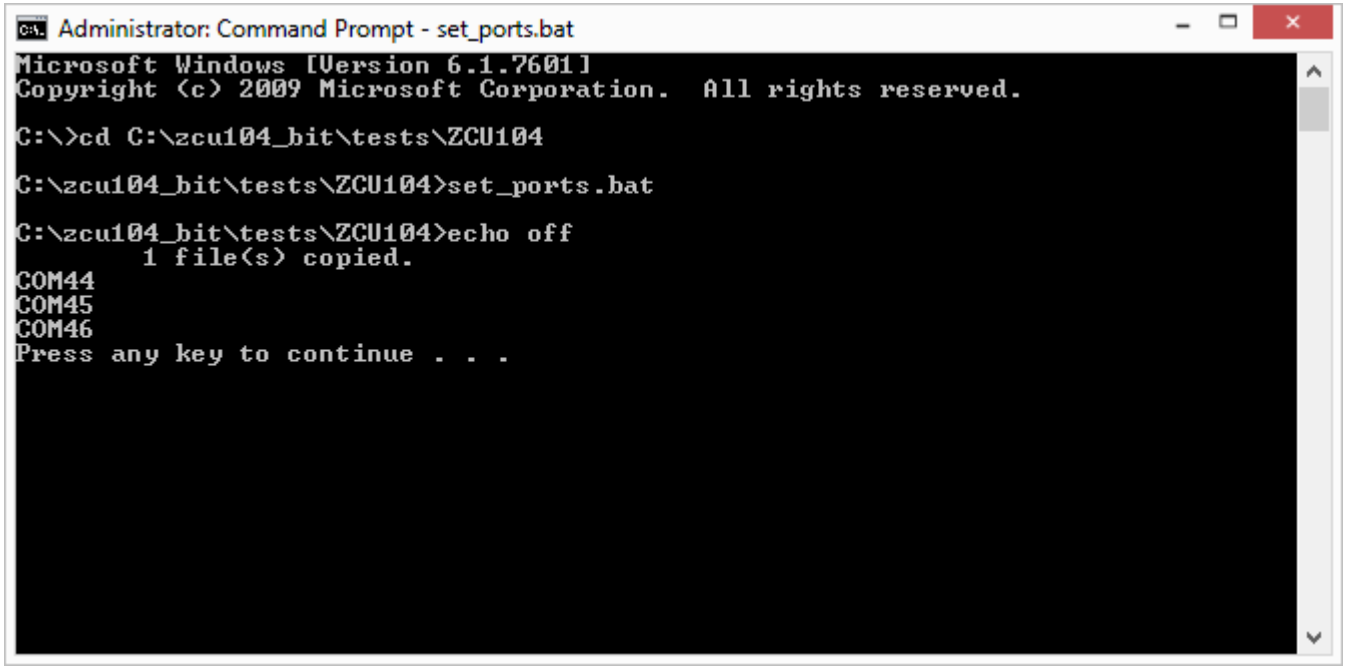
  set_ports.bat



Note: Presentation applies to the ZCU104

ZCU104 Board Interface Test Setup

- This modifies the defaults.json file to match the COM ports as enumerated on your PC
  - In this case, COM Port B is **COM44**, COM Port C is **COM45**, and COM Port D is **COM46**
  - Your PC will enumerate the ports differently for each Xilinx board that uses the FTDI chip
  - Run this script when you connect a new or a different ZCU104 board



Note: Presentation applies to the ZCU104

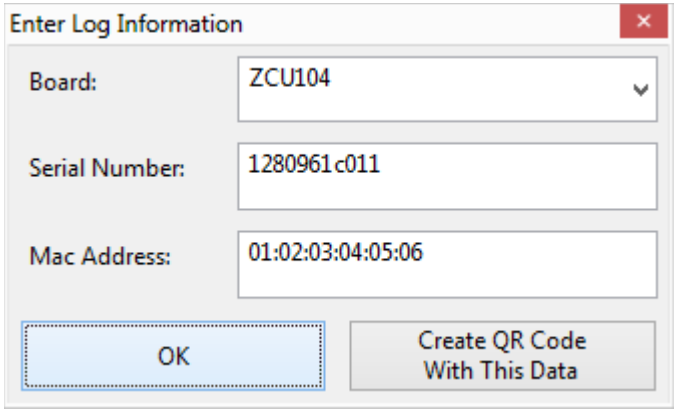
Running the Board Interface Test

- From C:\zcu104_bit, double click on BIT.exe

Note: Presentation applies to the ZCU104

Running the Board Interface Test

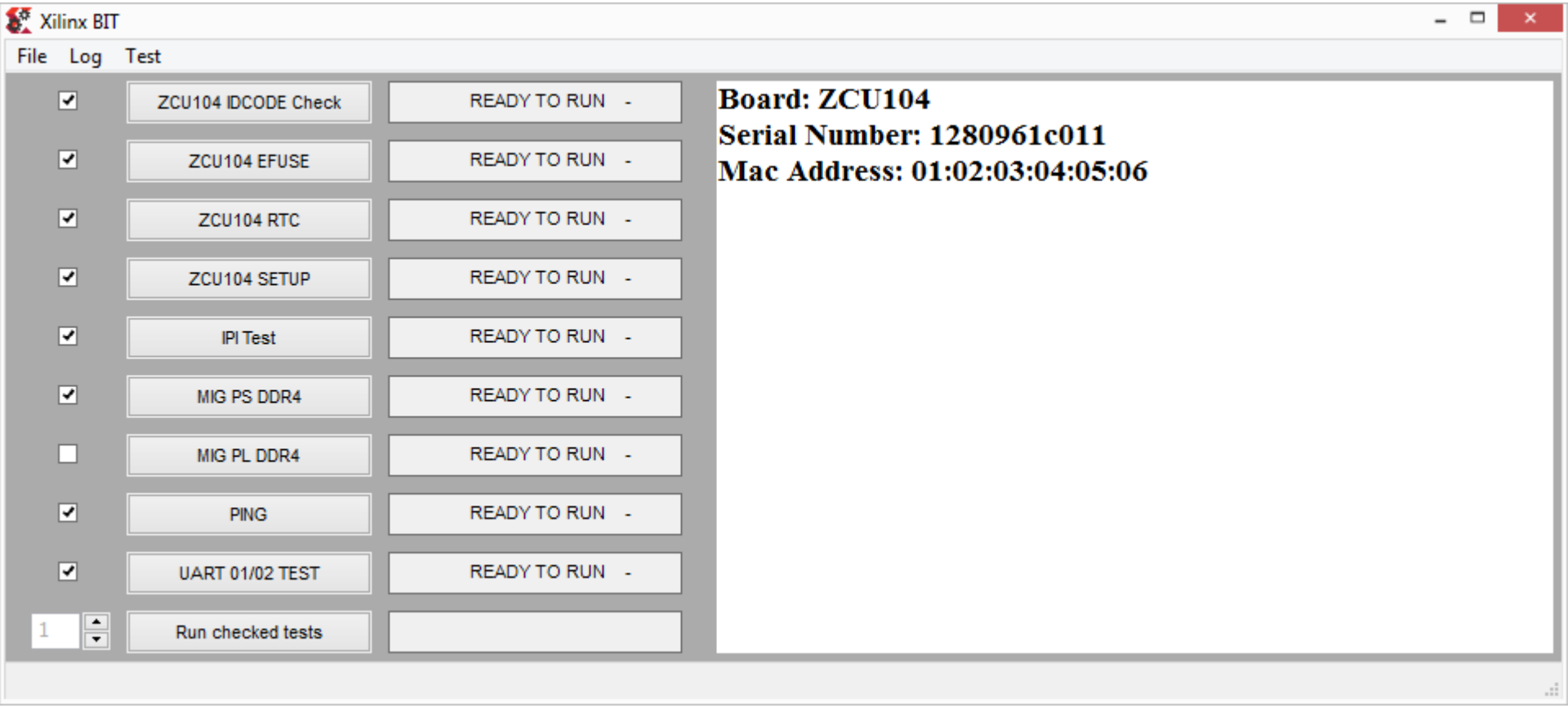
- Enter the Board **Serial Number** and **Mac Address** and click **OK**



Note: Presentation applies to the ZCU104

Running the Board Interface Test

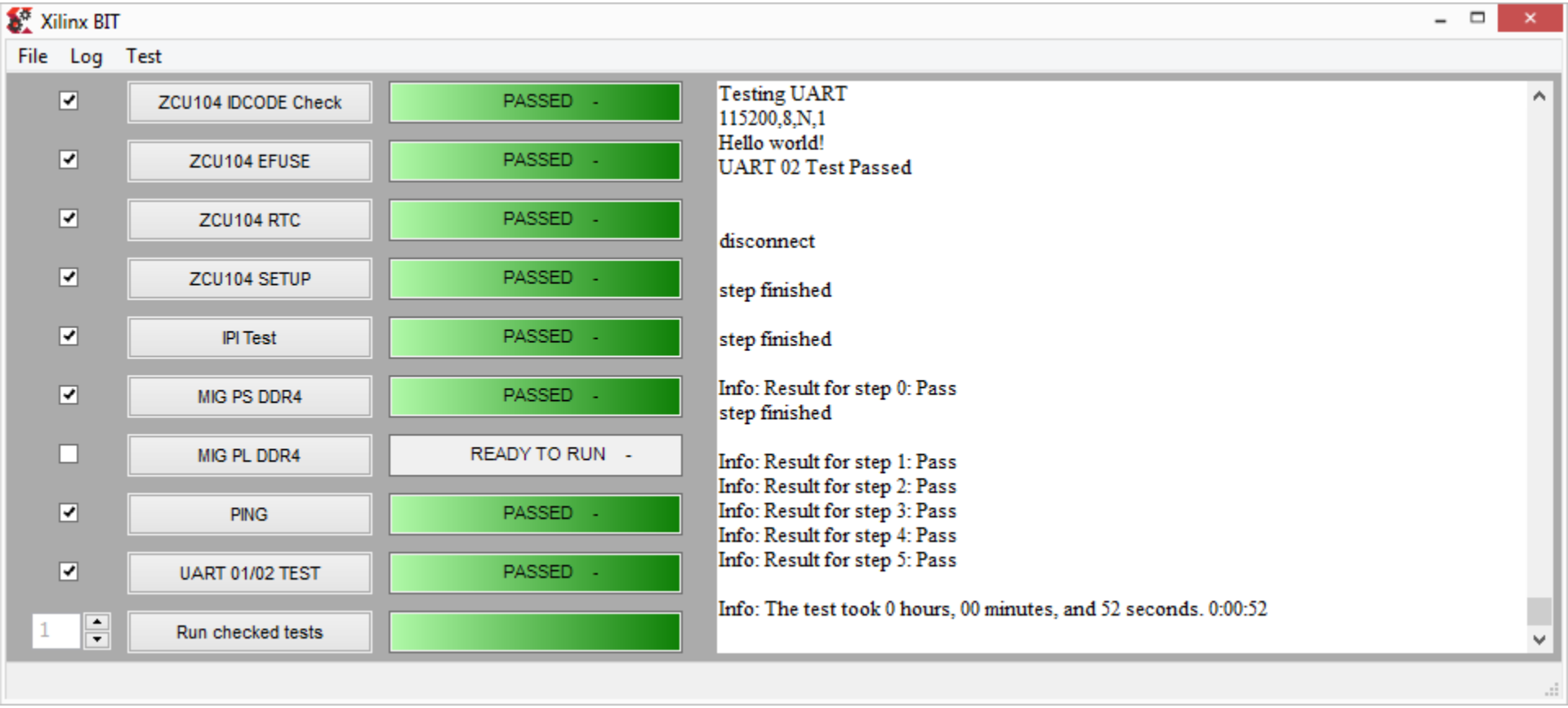
- Click the **Run checked tests** button



Note: Presentation applies to the ZCU104

Running the Board Interface Test

- All selected tests passed



Note: Presentation applies to the ZCU104

Test Details

- Ensure that you have followed all instructions in XTP504, ZCU104 Software Install and Board Setup
- Ensure that no other Terminal program is connected to the ZCU104's COM ports while the Board Interface Test is running
  - See XTP504, for details on COM Ports
- Only one board can be connected to your PC during the test
  - Disconnect any other board UARTs or Programming Cables
- If you missed any set-up instructions and experience problems, then please follow these steps:
  1. Recheck your setup
  2. End any hw_server processes and cycle board power
  3. Open Vivado Hardware Manager and test PC-board JTAG connectivity

Note: Presentation applies to the ZCU104

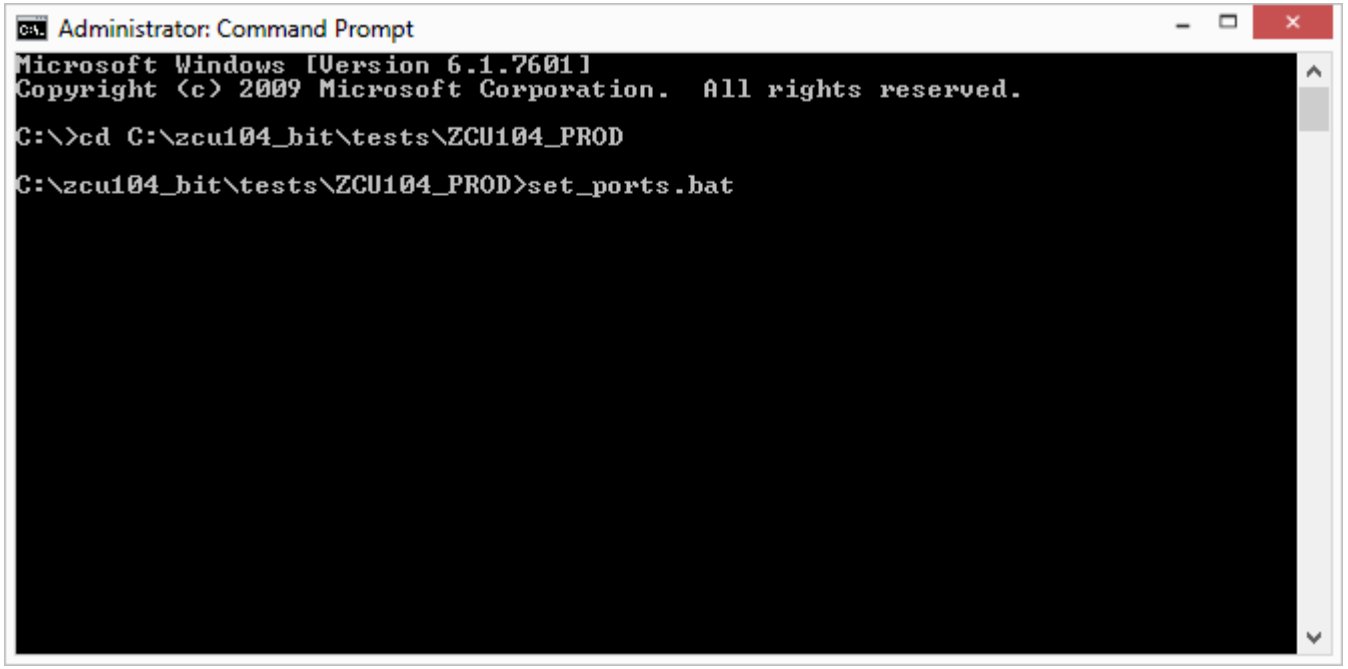
Appendix

ZCU104 Production Board Interface Test Setup

- Prior to running BIT, the COM ports must be set
- From a Command Prompt, type:

cd C:\zcu104_bit\tests\ZCU104_PROD

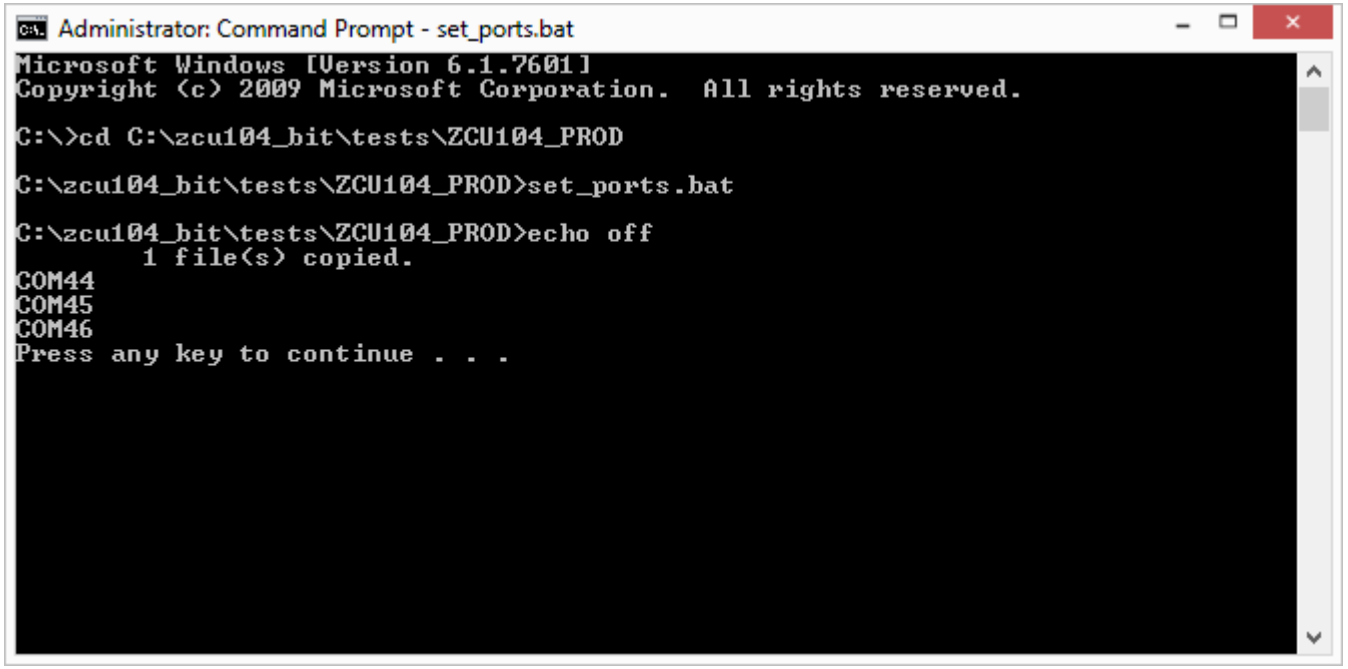
set_ports.bat



Note: Presentation applies to the ZCU104

ZCU104 Production Board Interface Test Setup

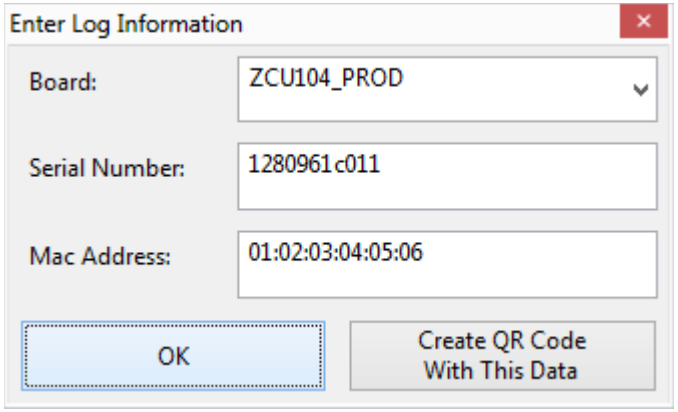
- This modifies the defaults.json file to match the COM ports as enumerated on your PC
  - In this case, COM Port B is **COM44**, COM Port C is **COM45**, and COM Port D is **COM46**
  - Your PC will enumerate the ports differently for each Xilinx board that uses the FTDI chip
  - Run this script when you connect a new or a different ZCU104 board



Note: Presentation applies to the ZCU104

Running the Production Board Interface Test

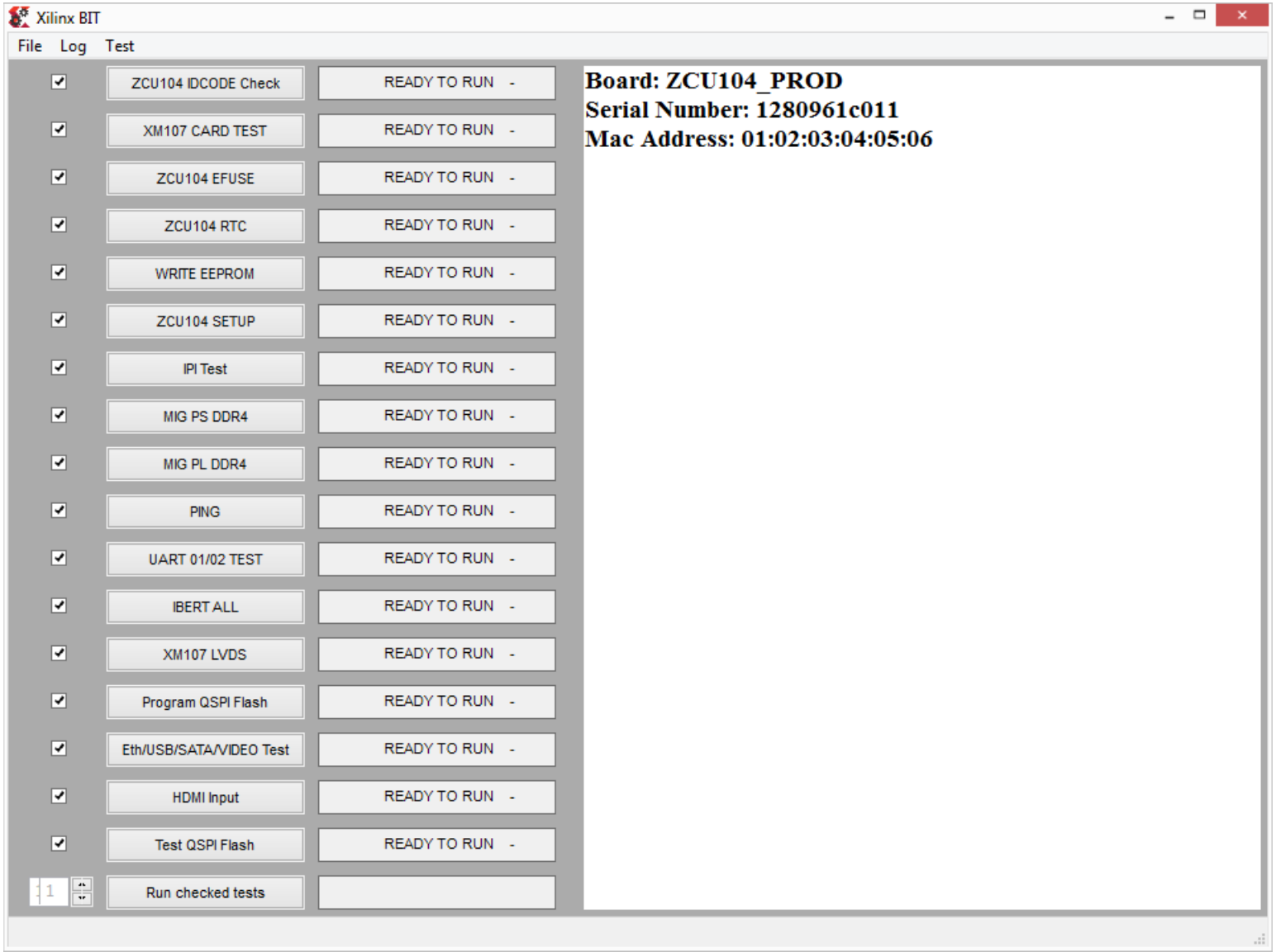
- Select **ZCU104_PROD**
- Enter the Board **Serial Number** and **Mac Address** and click **OK**



Note: Presentation applies to the ZCU104

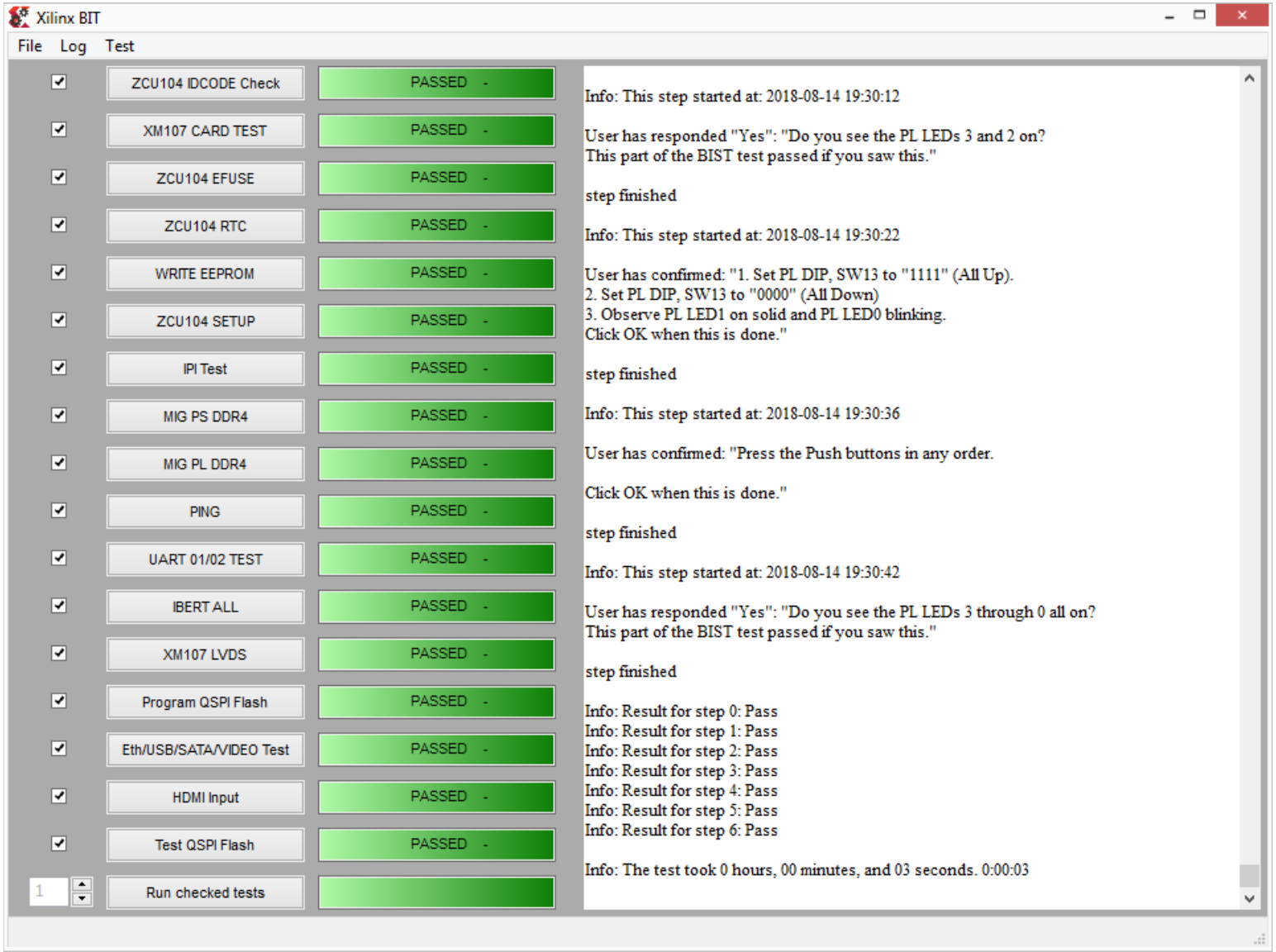
Running the Production Board Interface Test

- Click the **Run checked tests** button



Running the Production Board Interface Test

- All selected tests passed

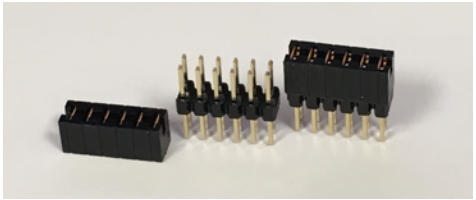


Test Details

- Review the following pages to make sure the board is set up for the Production Board Interface Test
- The FTDI UART flashing test is only used during initial board manufacture, and is not needed again
- Ensure that no other Terminal program is connected to the ZCU104's COM ports while the Board Interface Test is running
  - See XTP504, for details on COM Ports
- Only one board can be connected to your PC during the test
  - Disconnect any other board UARTs or Programming Cables
- If you missed any set-up instructions and experience problems, then please follow these steps:
  1. Recheck your setup
  2. End any hw_server processes and cycle board power
  3. Open Vivado Hardware Manager and test PC-board JTAG connectivity

Note: Presentation applies to the ZCU104

Test Equipment

- This test requires optional equipment
  - Whizz FMC XM107 board 
  - HDMI and DP monitors plus cables
  - 4k HDMI source; tested with NVIDIA 4K Shield 
  - USB Thumb drive; tested with SDCZ43 32GB 
  - SATA Flash drive; tested with TS128GMTS400 
  - DDR4 SODIMM; tested with KVR21SE15S8/4 
  - Two microSD cards, programmed with the contents of SATA_SD, and HDMI_Input
  - Two Ethernet ports on host, set to 192.168.1.2 and 192.168.0.2
    - Tested with: Anker USB to Ethernet adapters 
  - Shunt jumpers on PMODs
    - Suggested MNT-106-BK-G and S2021EC-06-ND; 2ea, combined as shown to the rightmost 

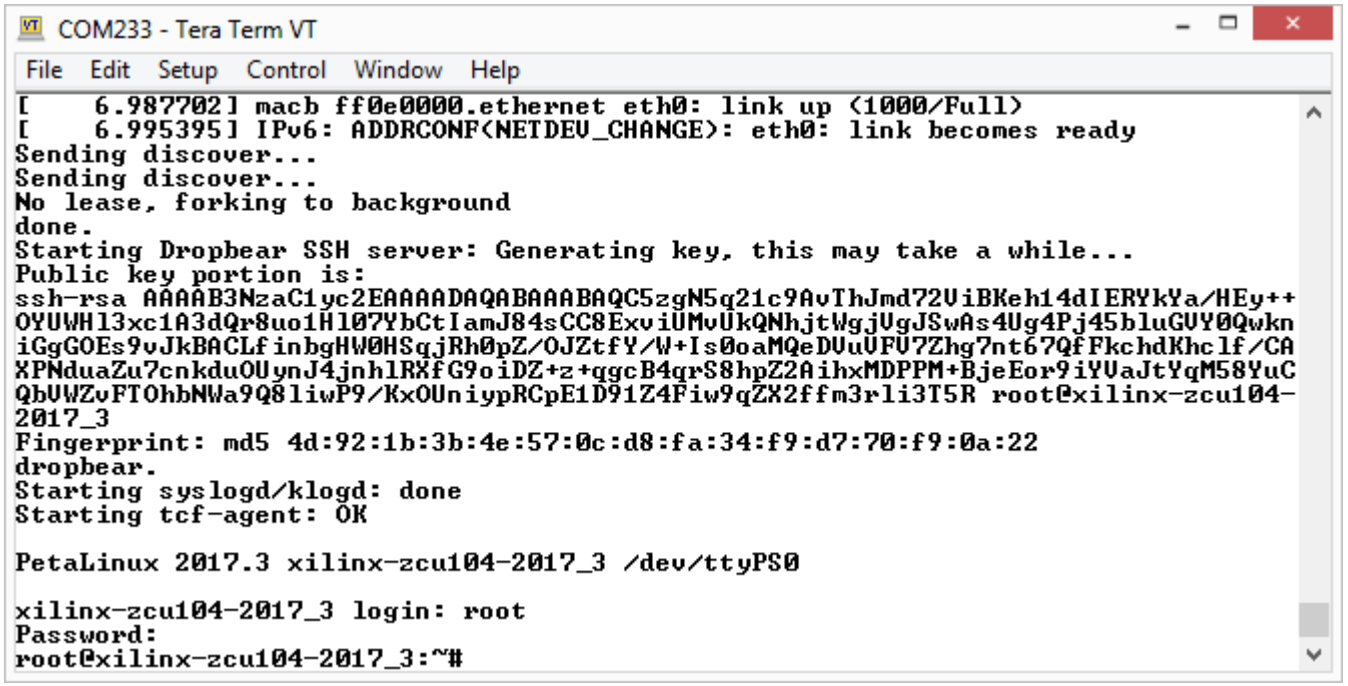
Test Equipment

- This test requires optional equipment
  - EZ-11B or EZ-22B remote power switch, setup to IP address of 192.168.0.12
    - Setup details are available later in this Appendix
    - If this is not available, the following tests will require manual power cycling:
      - XM107 CARD TEST
      - ZCU104 RTC
      - WRITE EEPROM
      - ZCU104 SETUP
      - PING
      - UART 01/02 TEST (twice)
      - XM107 LVDS
      - Program QSPI Flash
      - Eth/USB/SATA/VIDEO Test
      - HDMI Input
      - Test QSPI Flash

Flash SATA Drive Setup

Formatting a Flash SATA Drive

- Insert an SD card with the SATA_SD image into the ZCU104
- Set mode switch SW6 to "**E**" (Up, Down, Down, Down)
- Cycle power and boot Linux
- At the prompt, type "**root**" for the username and password

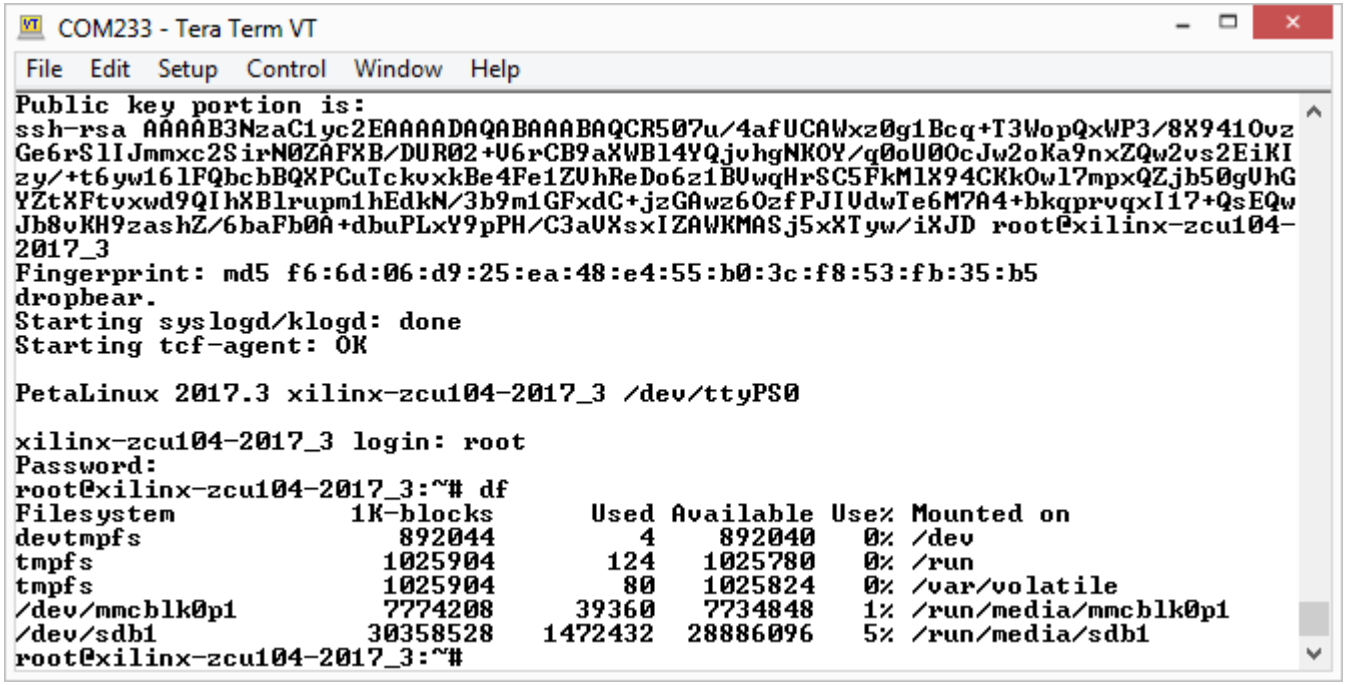


Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

Formatting a Flash SATA Drive

- Type "**df**"
- Notice that /dev/sda1 is missing
- The USB drive, /dev/sdb1, is mounted on /run/media/sdb1
- If the SATA drive were missing, the USB drive would be /dev/sda1

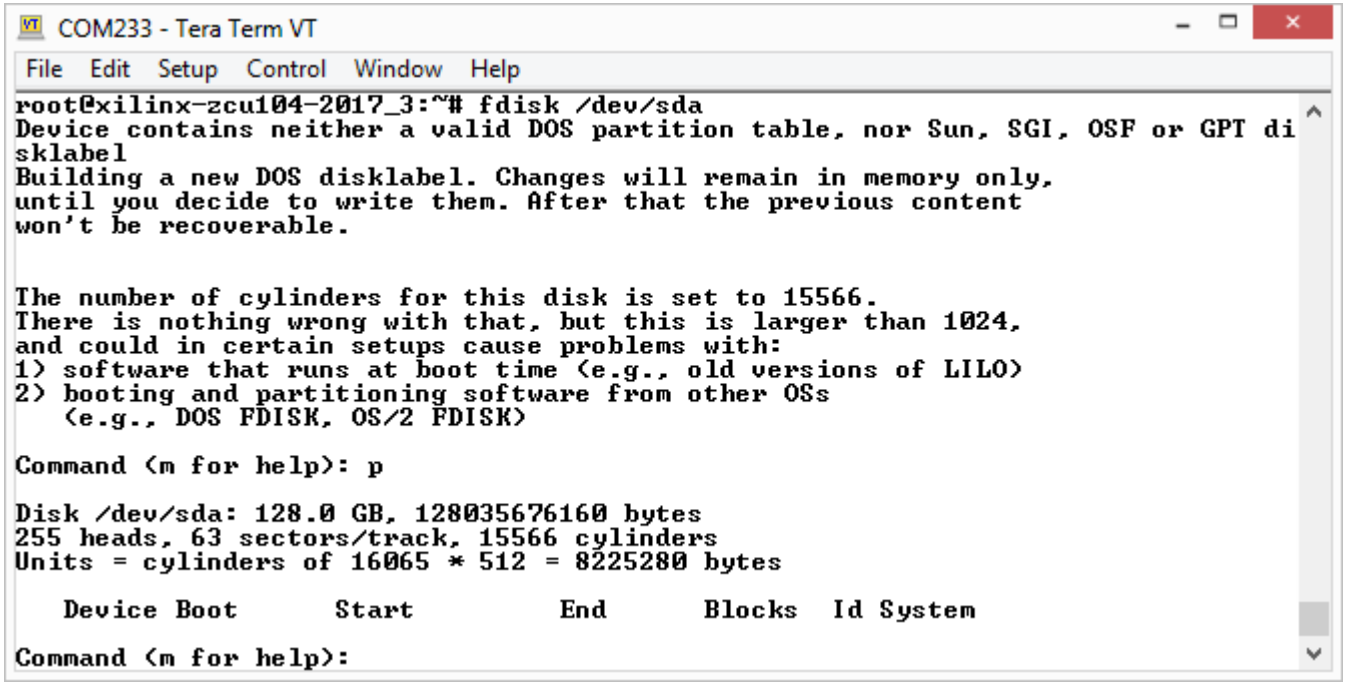


Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

Formatting a Flash SATA Drive

- Type “**fdisk /dev/sda**” to start fdisk on the SATA drive
- Type “**p**” to see the partition table is empty

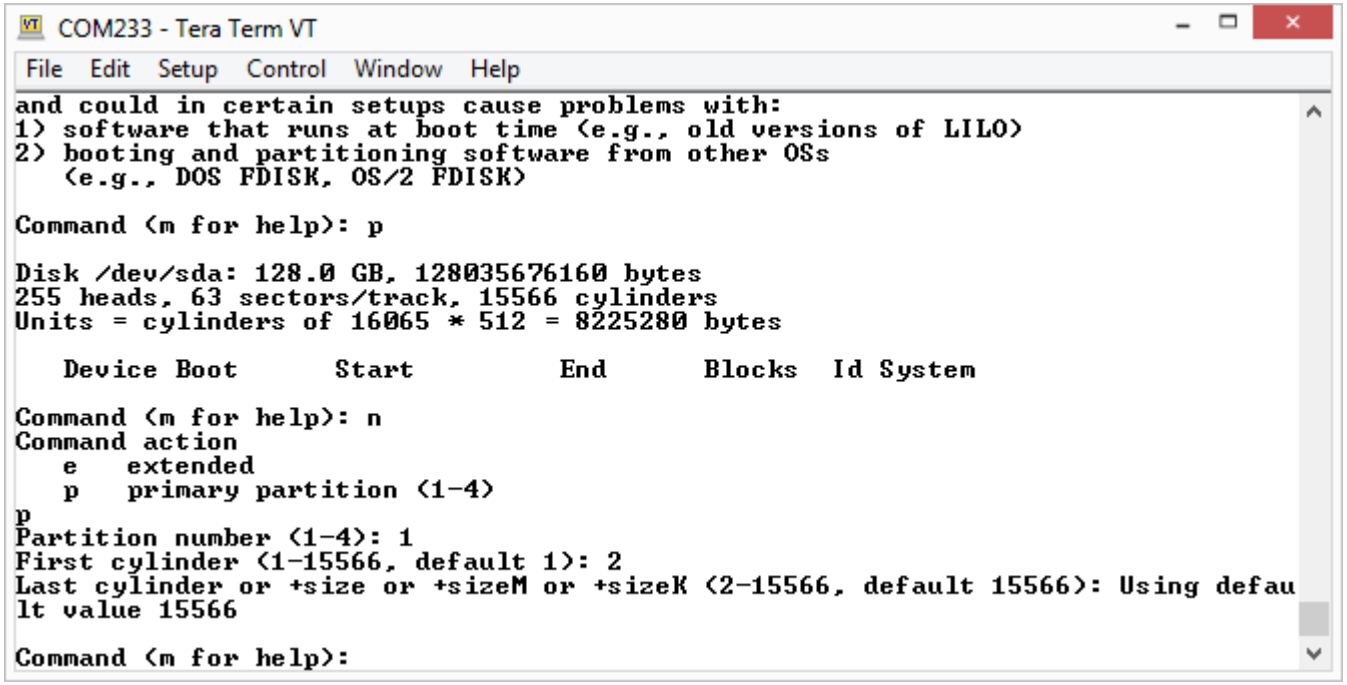


Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

Formatting a Flash SATA Drive

- Type “**n**” to create a new partition
- Type “**p**” for primary partition
- Type “**1**”, followed by “**2**”
- Type **enter** to accept default last cylinder

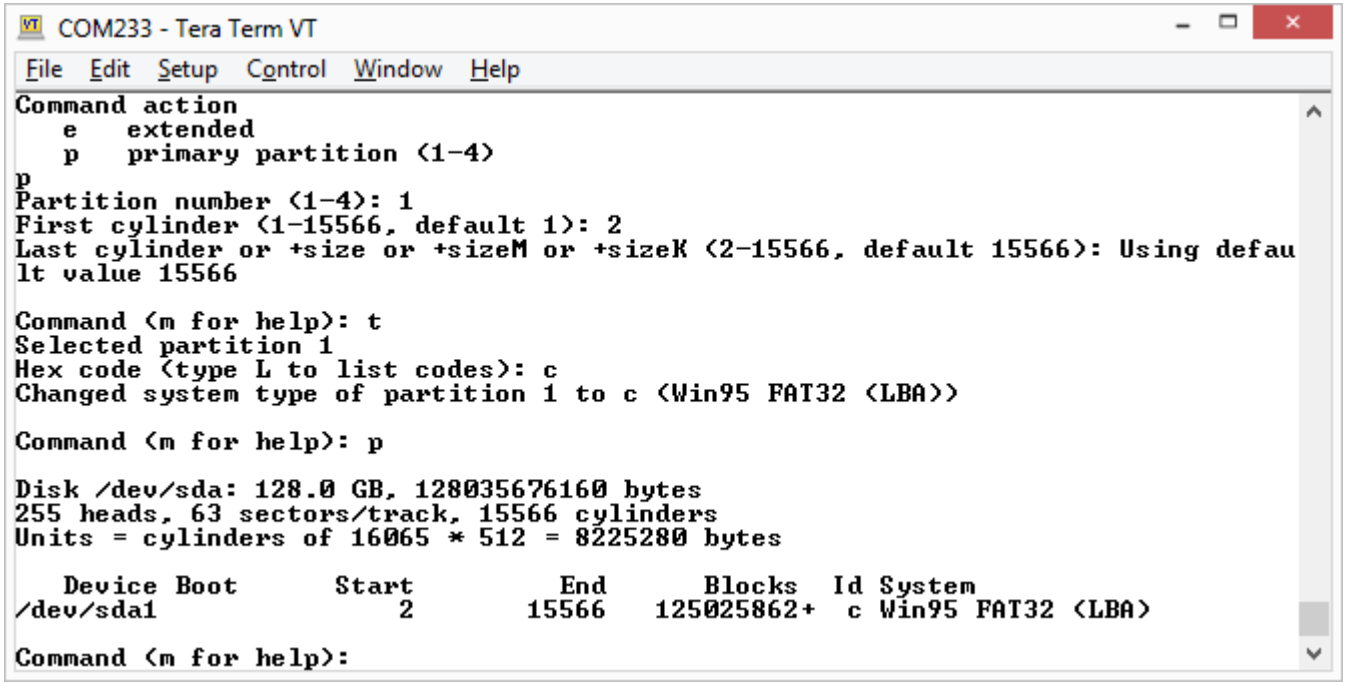


Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

Formatting a Flash SATA Drive

- Type “**t**” to set the partition type
- Type “**c**” set it to “Win95 FAT32 (LBA)”
- Type “**p**” to verify your settings

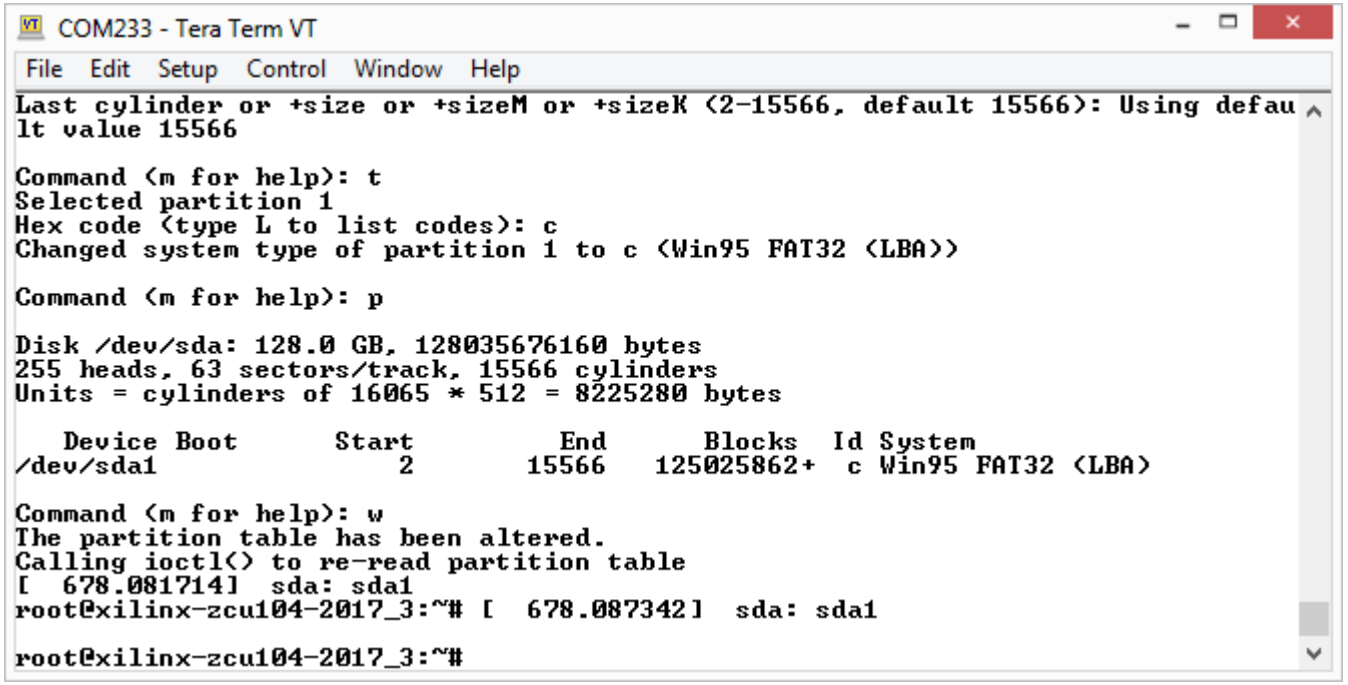


Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

Formatting a Flash SATA Drive

- If everything is correct, type “**w**” to write the partition
- Otherwise, type “**q**” to quit without making any changes

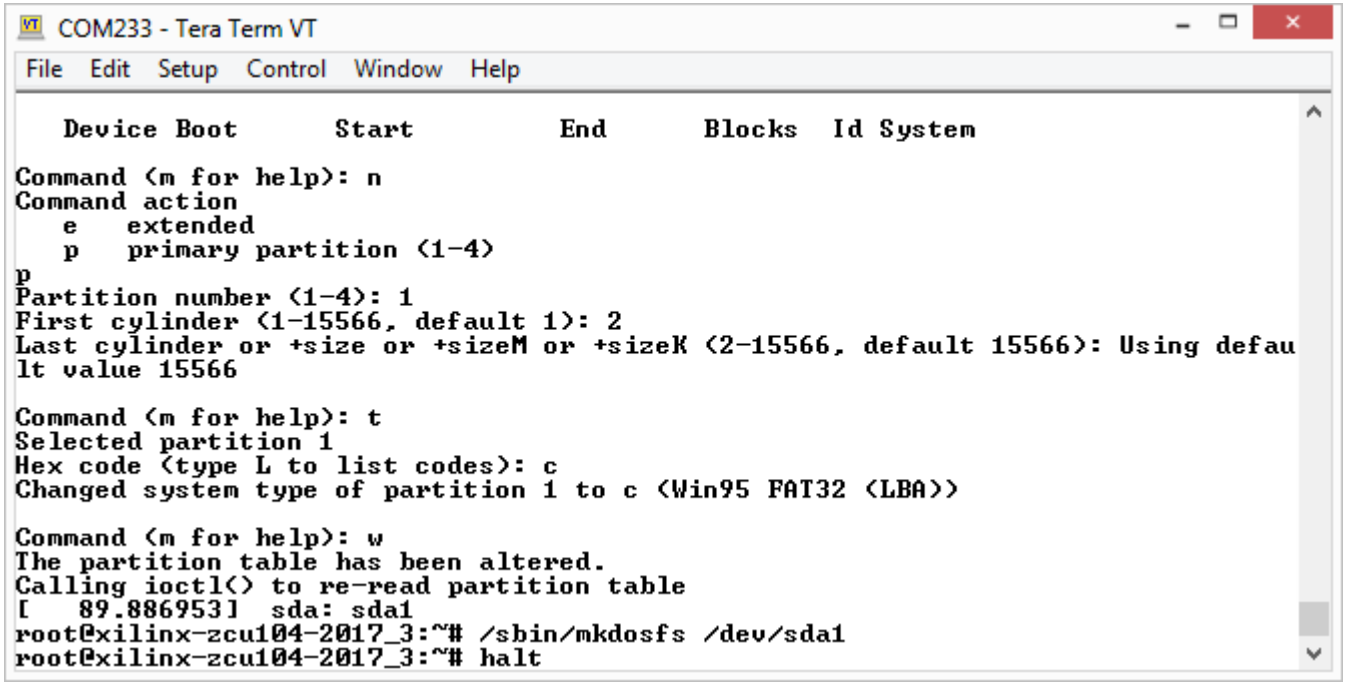


Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

Formatting a Flash SATA Drive

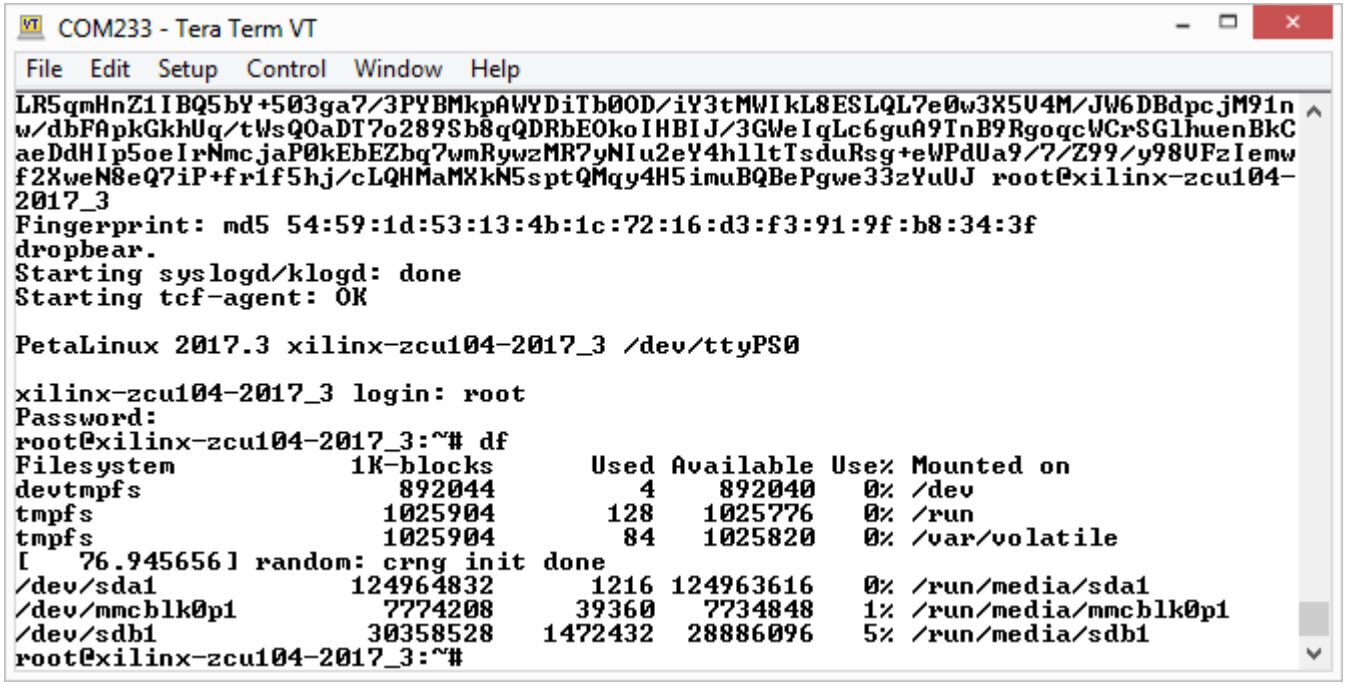
- Type "**/sbin/mkdosfs /dev/sda1**" to add the dos file system
- Type "**halt**"; when it says "reboot: Power down", cycle power and log in again



Note: Presentation applies to the ZCU104

Flash SATA Drive Setup

- Formatting a Flash SATA Drive
  - Type “**df**” to see SATA mounted drive
  - SATA disk is now ready to use in full test

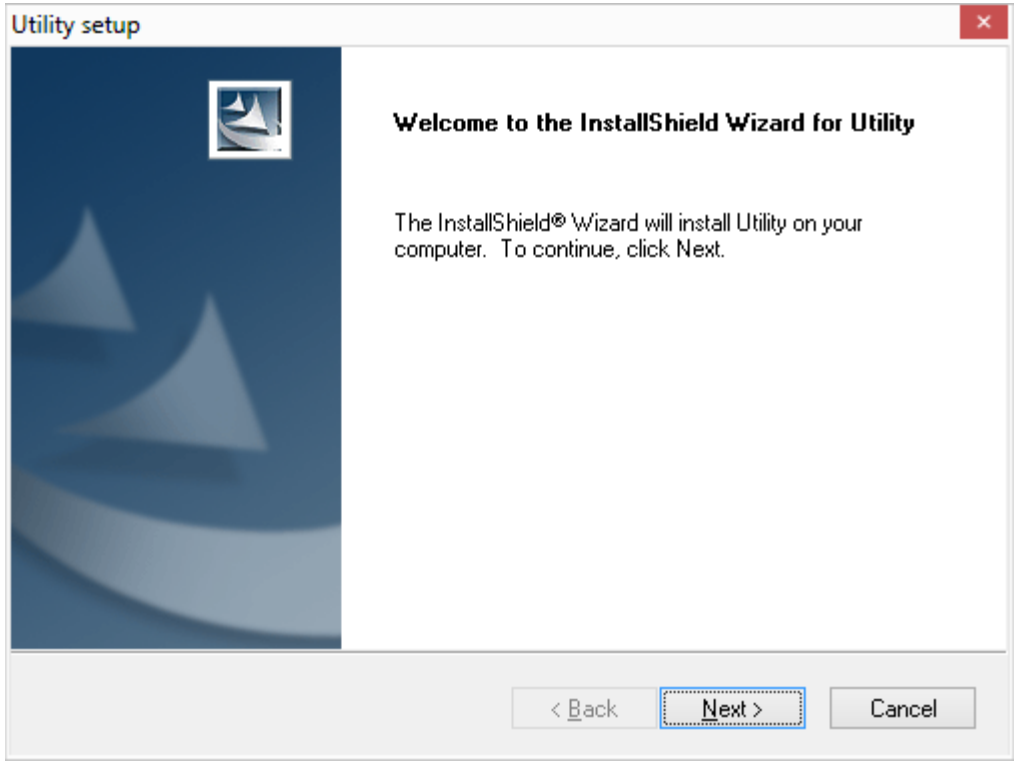


Note: Presentation applies to the ZCU104

EZ-11B Setup

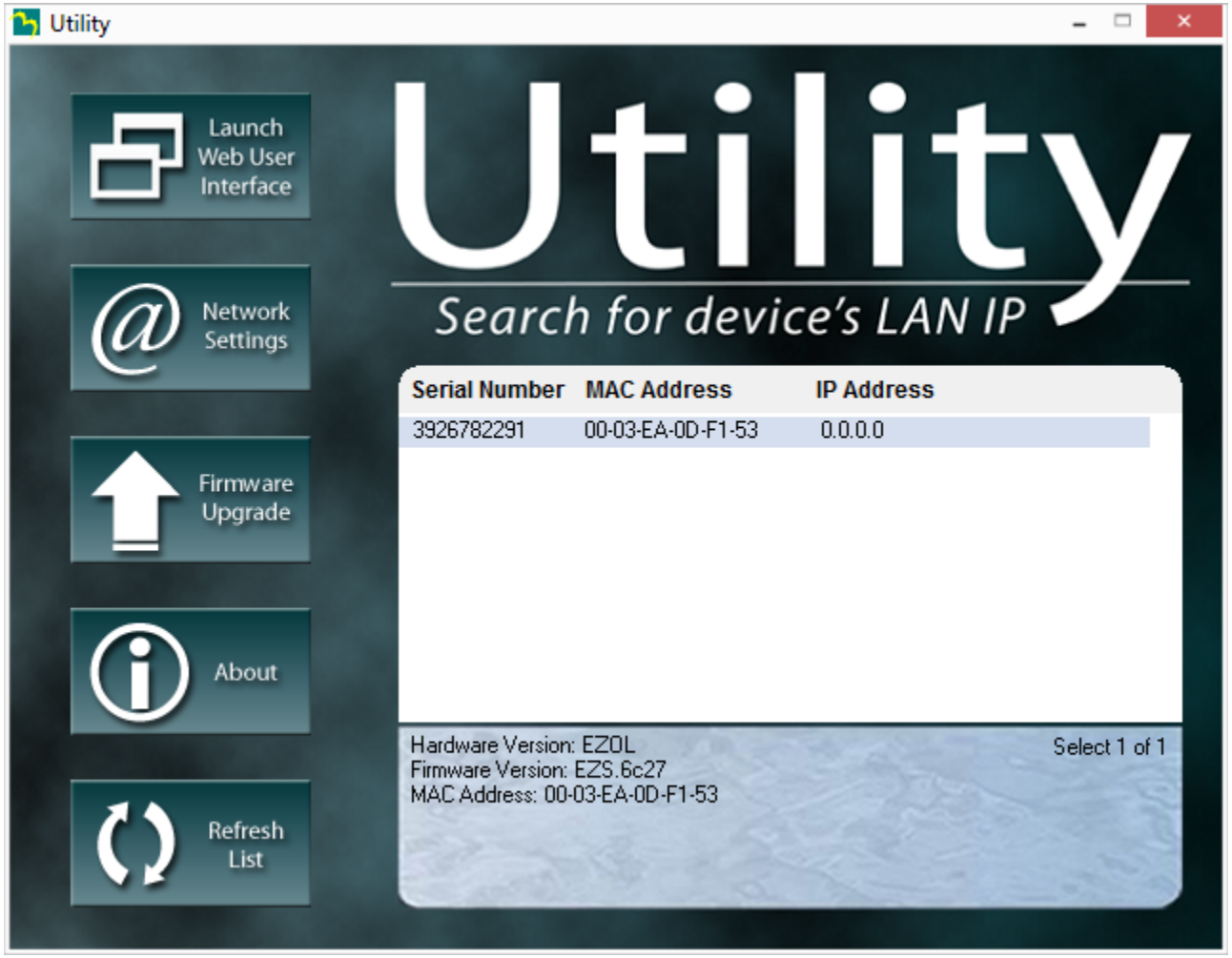
- How to setup an EZ-11B (or EZ-22B) for use in Production tests
  - Connect EZ-11B to Power
  - Connect Ethernet cable (192.168.0.2)
  - Install EZ-11B Utility (one time install)

    C:\zcu104_bit\tests\ZCU104_PROD\bat\utility.exe



EZ-11B Setup

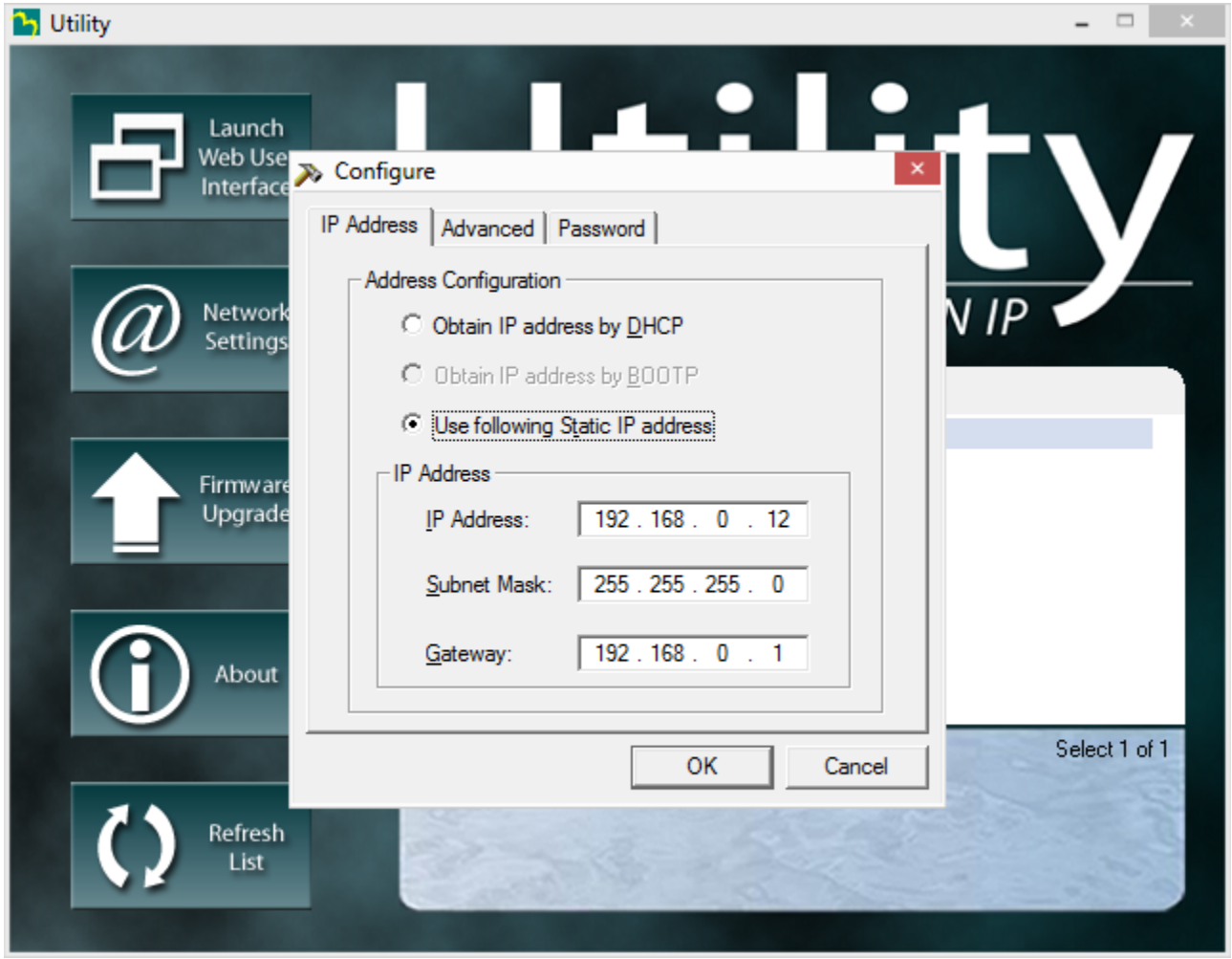
- Run Utility from the Start menu and it will detect an unconfigured EZ-11B attached to the host



Note: Presentation applies to the ZCU104

EZ-11B Setup

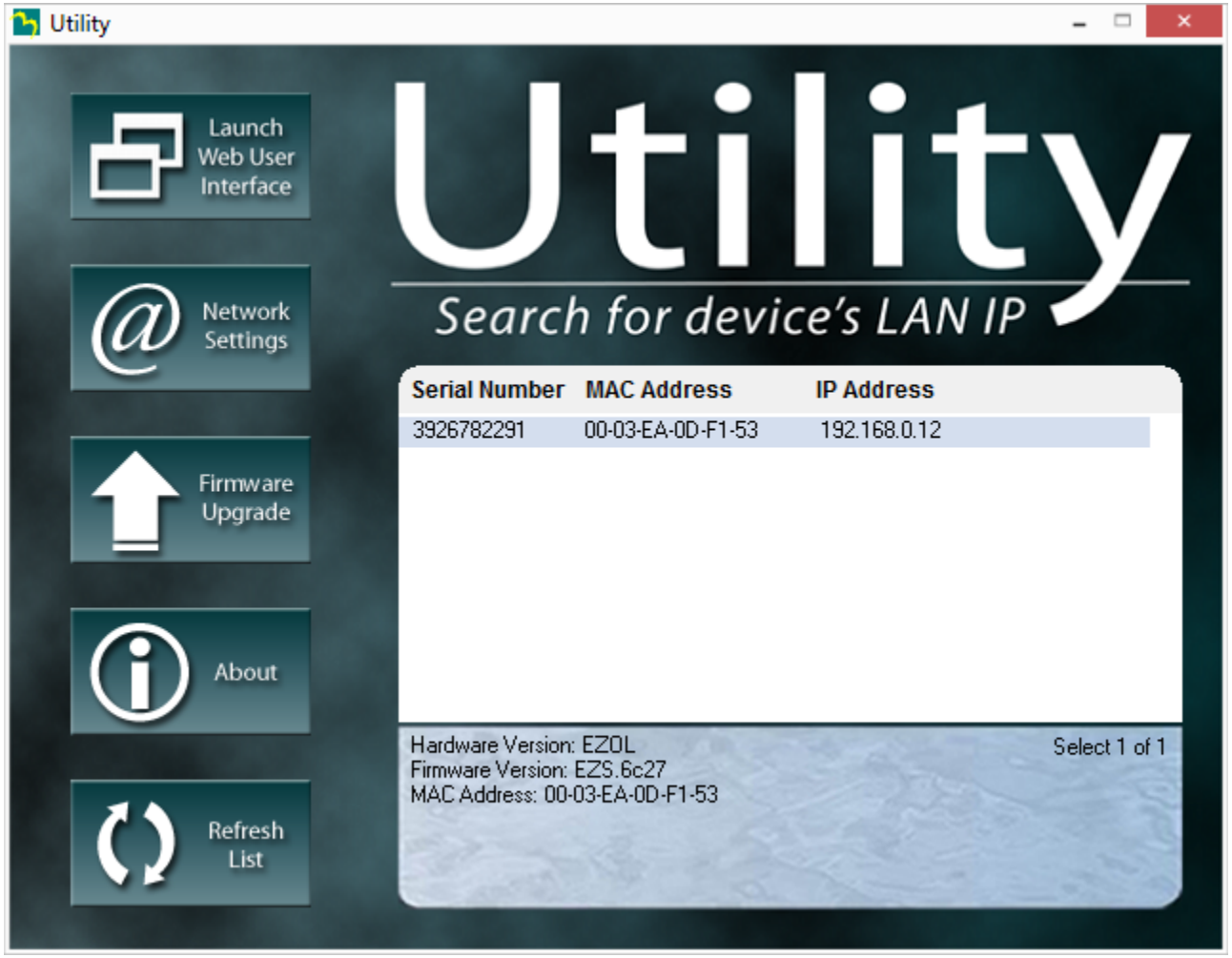
- Click Network settings and set to 192.168.0.12



Note: Presentation applies to the ZCU104

EZ-11B Setup

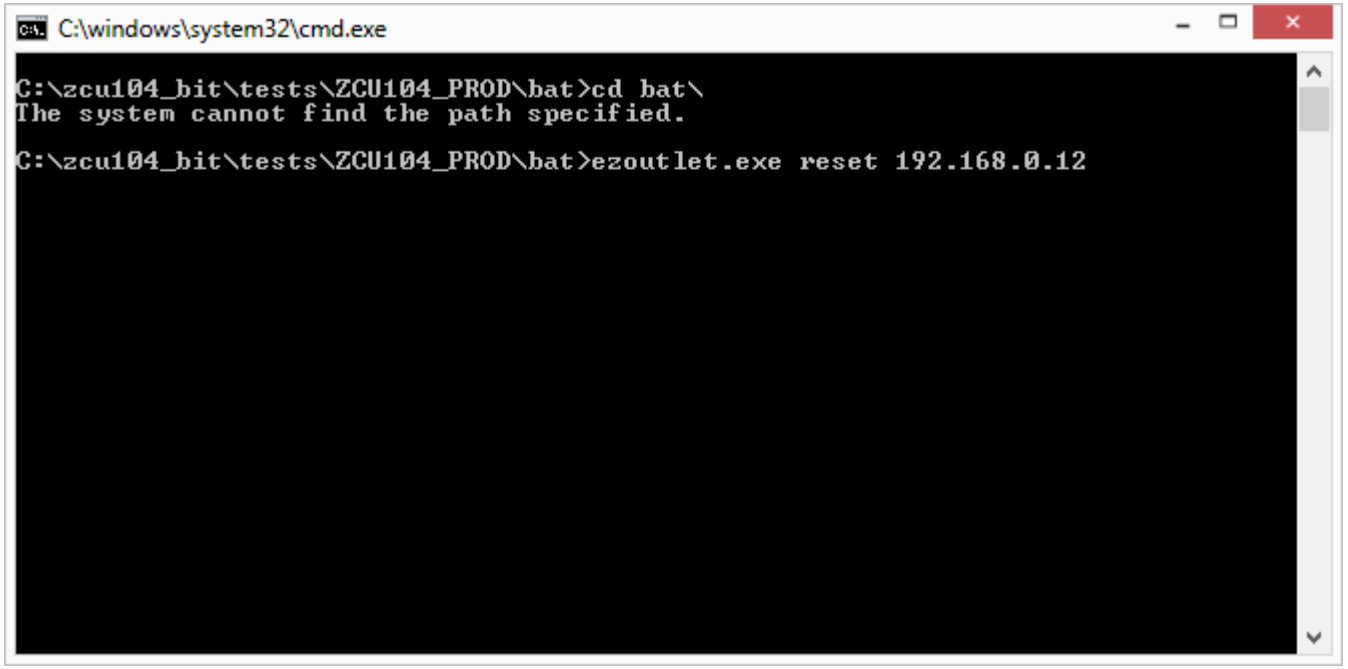
- Setup is done:



Note: Presentation applies to the ZCU104

EZ-11B Setup

- Test the EZ11-B
  - To test, connect Board power supply to outlet on EZ11B and run "**cycle_power.bat**" in test folder.
  - Power should go off for a few seconds then turn on again
  - BIT will call this during the test to cycle power



Note: Presentation applies to the ZCU104

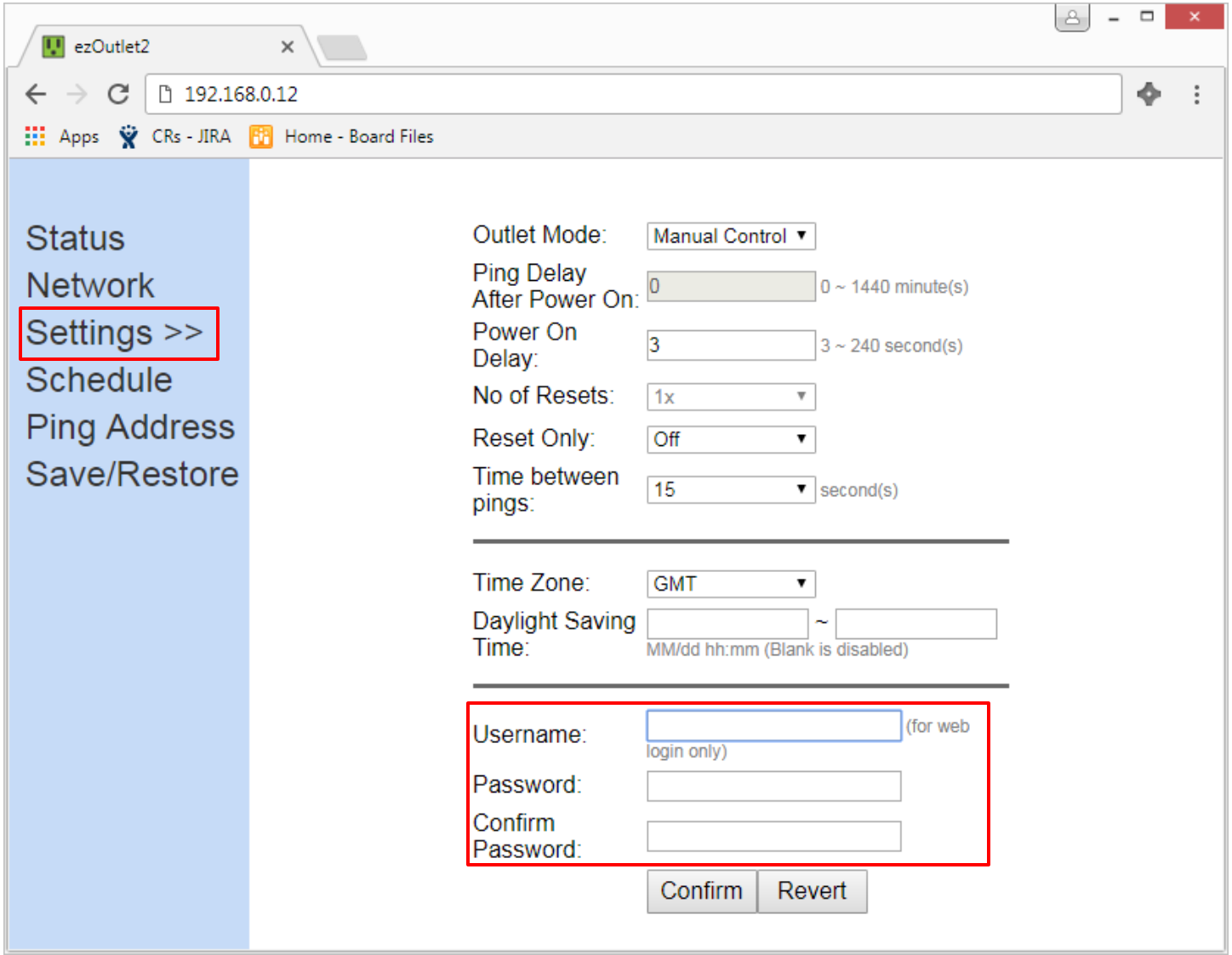
EZ-22B Setup

- If using the new EZ-22B (replacement for the EZ-11B)
  - Click Launch Web User Interface

Note: Presentation applies to the ZCU104

EZ-22B Setup

- Under **Settings**, clear the **Username**, **Password**, and **Confirm Password** fields, click **Confirm**; will now work same as EZ-11B



References

References

- Vivado Release Notes
  - Vivado Design Suite User Guide - Release Notes – UG973
    - https://www.xilinx.com/support/documentation/sw_manuals/xilinx2018_2/ug973-vivado-release-notes-install-license.pdf
  - Vivado Design Suite 2018 - Vivado Known Issues
    - https://www.xilinx.com/support/answers/70860.html
- Vivado Programming and Debugging
  - Vivado Design Suite Programming and Debugging User Guide – UG908
    - https://www.xilinx.com/support/documentation/sw_manuals/xilinx2018_2/ug908-vivado-programming-debugging.pdf

Documentation

Documentation

- Zynq UltraScale+
  - Zynq UltraScale+ MPSoC
    - http://www.xilinx.com/products/silicon-devices/soc/zynq-ultrascale-mpsoc.html
- ZCU104 Documentation
  - Xilinx Zynq UltraScale+ MPSoC ZCU104 Evaluation Kit
    - https://www.xilinx.com/products/boards-and-kits/zcu104.html
  - ZCU104 Board User Guide – UG1267
    - https://www.xilinx.com/support/documentation/boards_and_kits/zcu104/ug1267-zcu104-eval-bd.pdf
  - ZCU104 Evaluation Kit Quick Start Guide User Guide – XTP482
    - https://www.xilinx.com/support/documentation/boards_and_kits/zcu104/xtp482-zcu104-quickstart.pdf