ZCU111 System Controller – GUI Tutorial

May 2019

XILINX

XTP517

Revision History

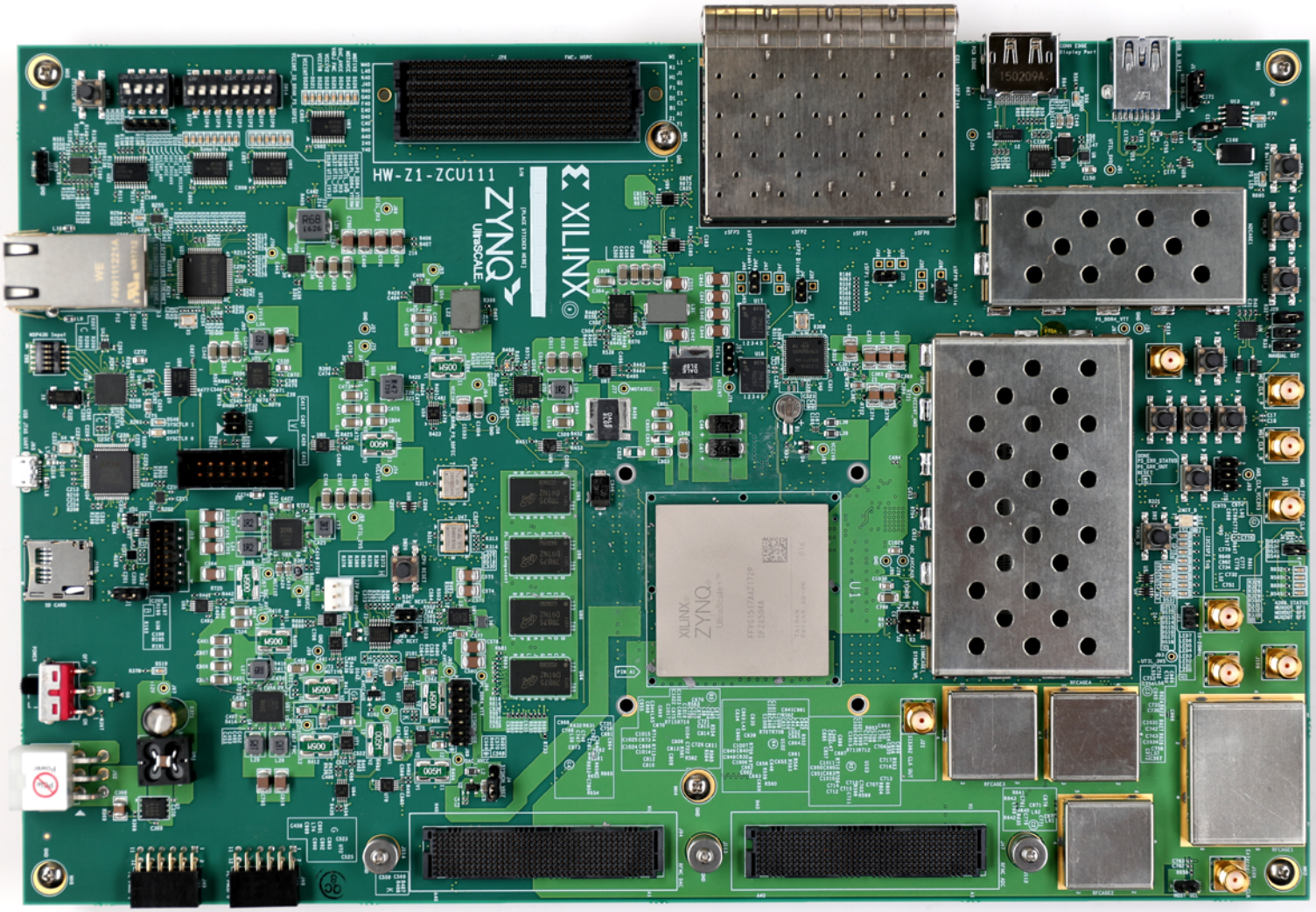
Date	Version	Description
05/29/19	3.0	Updated for 2019.1.
02/21/19	2.1	Updated document format.
12/10/18	2.0	Updated for 2018.3.
09/17/18	1.2	Updated BoardUI to improve the si570 clock interface.
08/06/18	1.1	Minor Update.
07/09/18	1.0	Initial version.

Overview

- **Xilinx ZCU111 Board**
- **ZCU111 SCUI**
  - Running the System Controller GUI
  - Clocks
  - Voltages
  - Power
  - FMC
  - EEPROM Data
  - GPIO Commands
  - About
- **References**

Note: This presentation applies to the ZCU111

Xilinx ZCU111 Board



Note: Presentation applies to the ZCU111

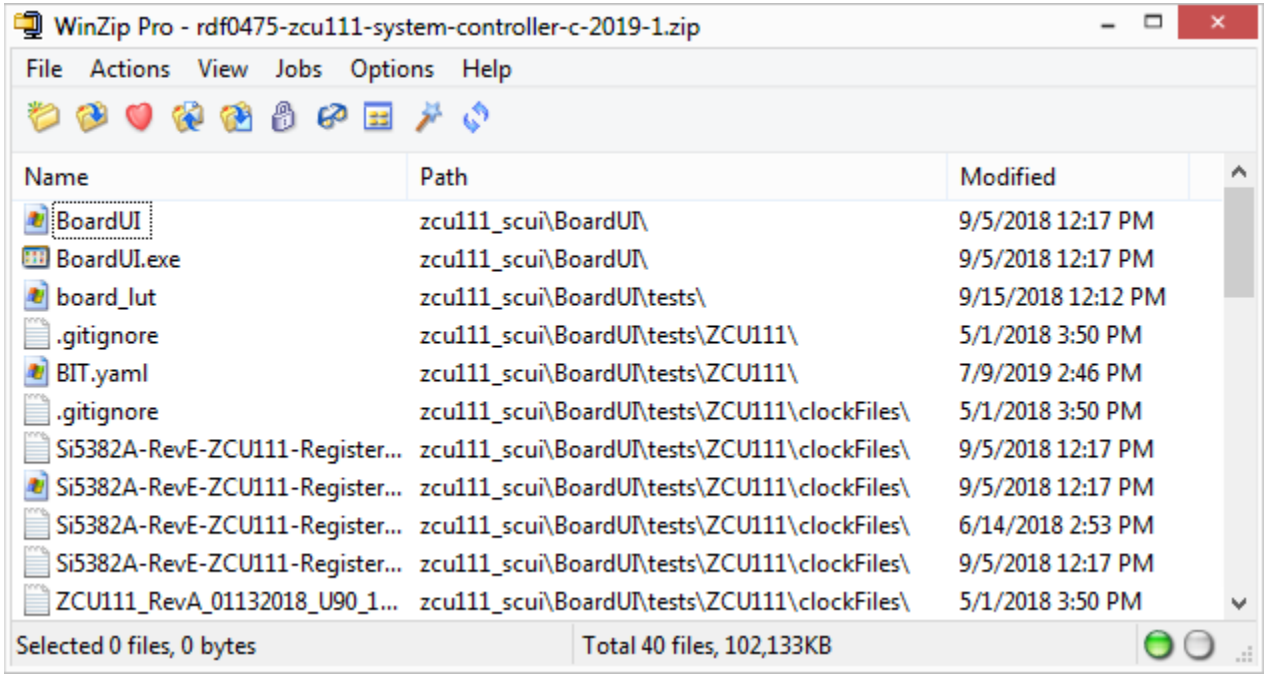
ZCU111 Software Install and Board Setup

- **Refer to XTP518 – ZCU111 Software Install and Board Setup for details on:**
  - Software Requirements
  - ZCU111 Board Setup
  - Balun board attachment
  - UART Driver Install
  - Ethernet Setup
  - Optional Hardware Setup

Note: Presentation applies to the ZCU111

ZCU111 System Controller

- **Open the RDF0469 – ZCU111 System Controller GUI (2019.1 C) ZIP file**
  - Extract these files to your C:\ drive

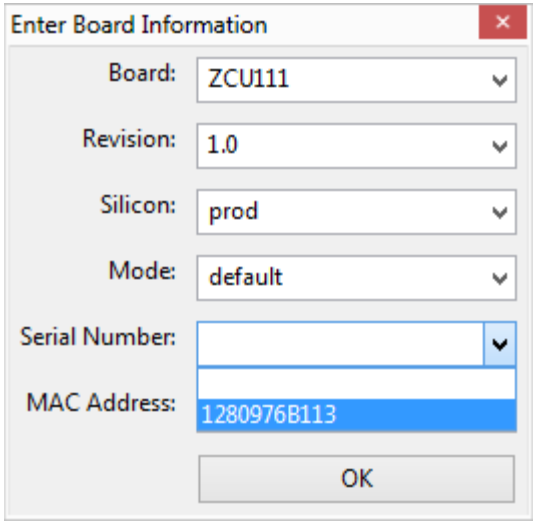


Note: Presentation applies to the ZCU111

Running the System Controller GUI

Running the System Controller GUI

- From C:\zcu111_scui, double click on BoardUI.exe
- BoardUI will list the available serial numbers in a pull-down; select the desired board
- Click OK

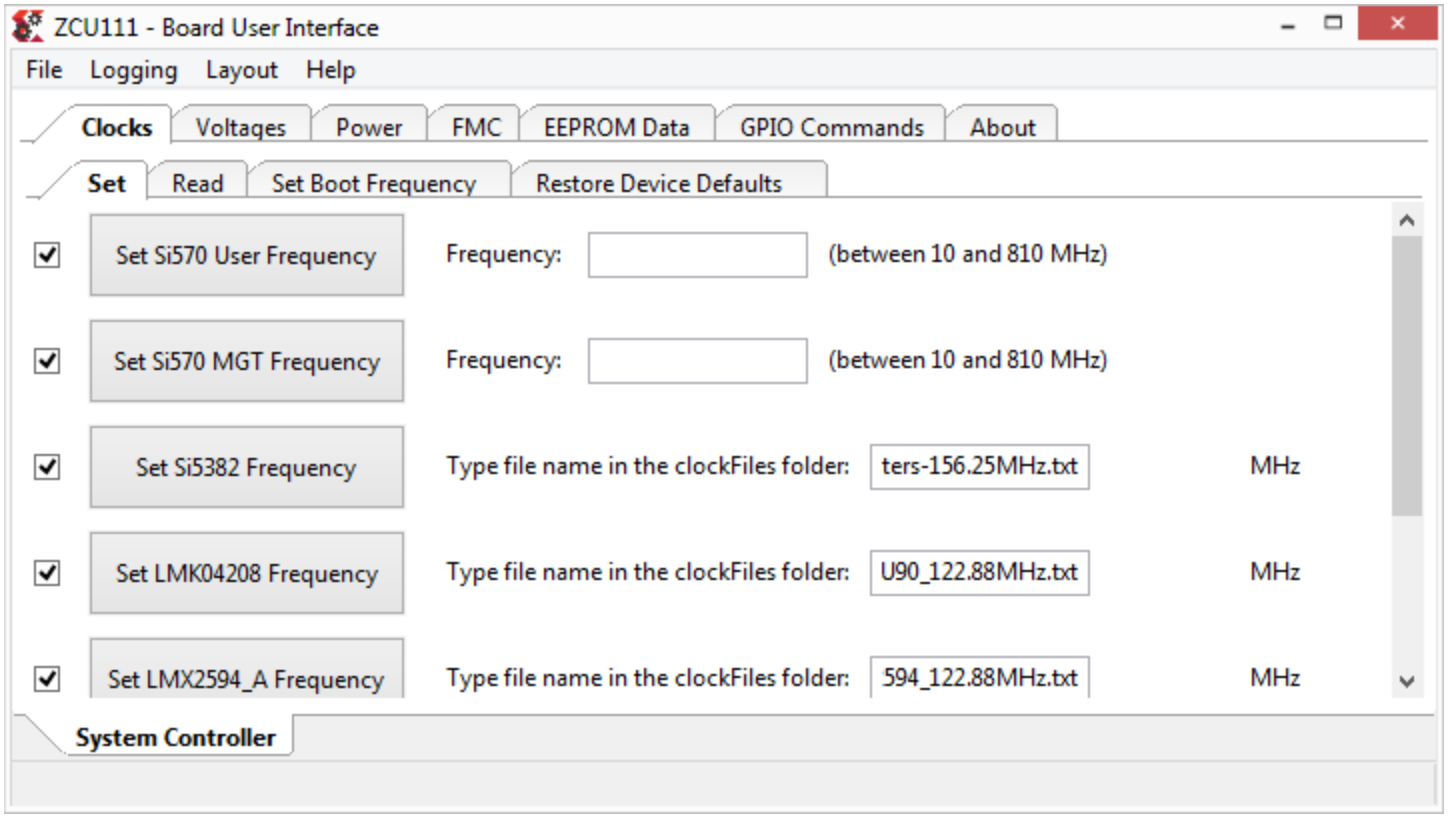


Note: Presentation applies to the ZCU111

Clocks

Setting the clocks

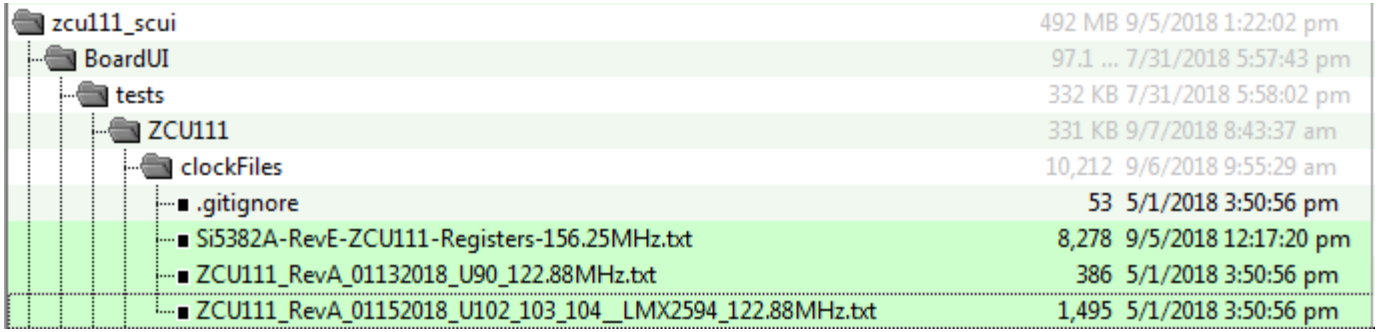
- Select the Set tab underneath the Clocks tab
- The Si5382 and LMK04208 and LMX2594_* Clocks are set via a Si Labs ClockBuilder scripts



Note: Presentation applies to the ZCU111

Setting the clocks

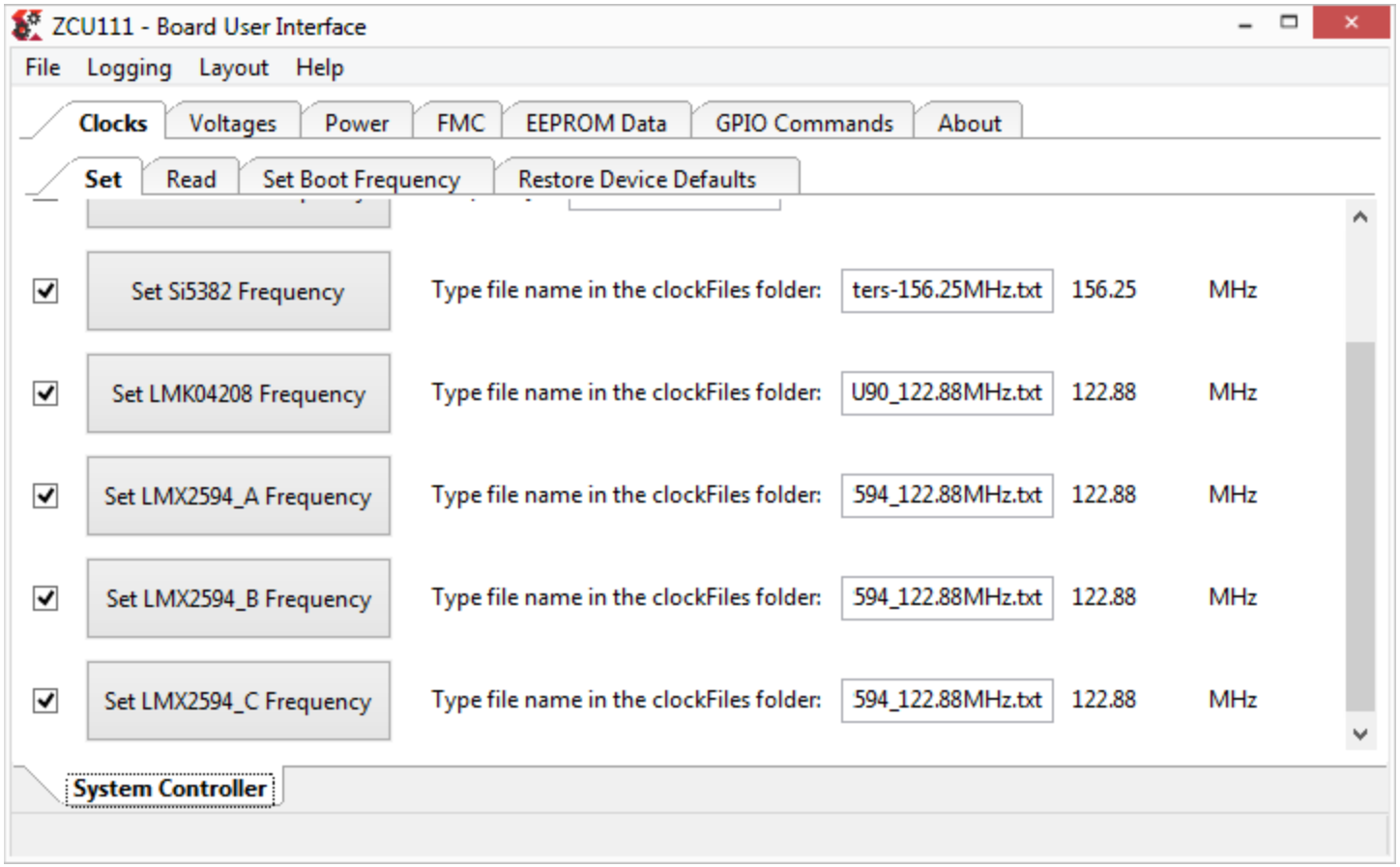
- **The ClockBuilder files are included with RDF0469**



Note: Requires the “MHz” in the name

Setting the clocks

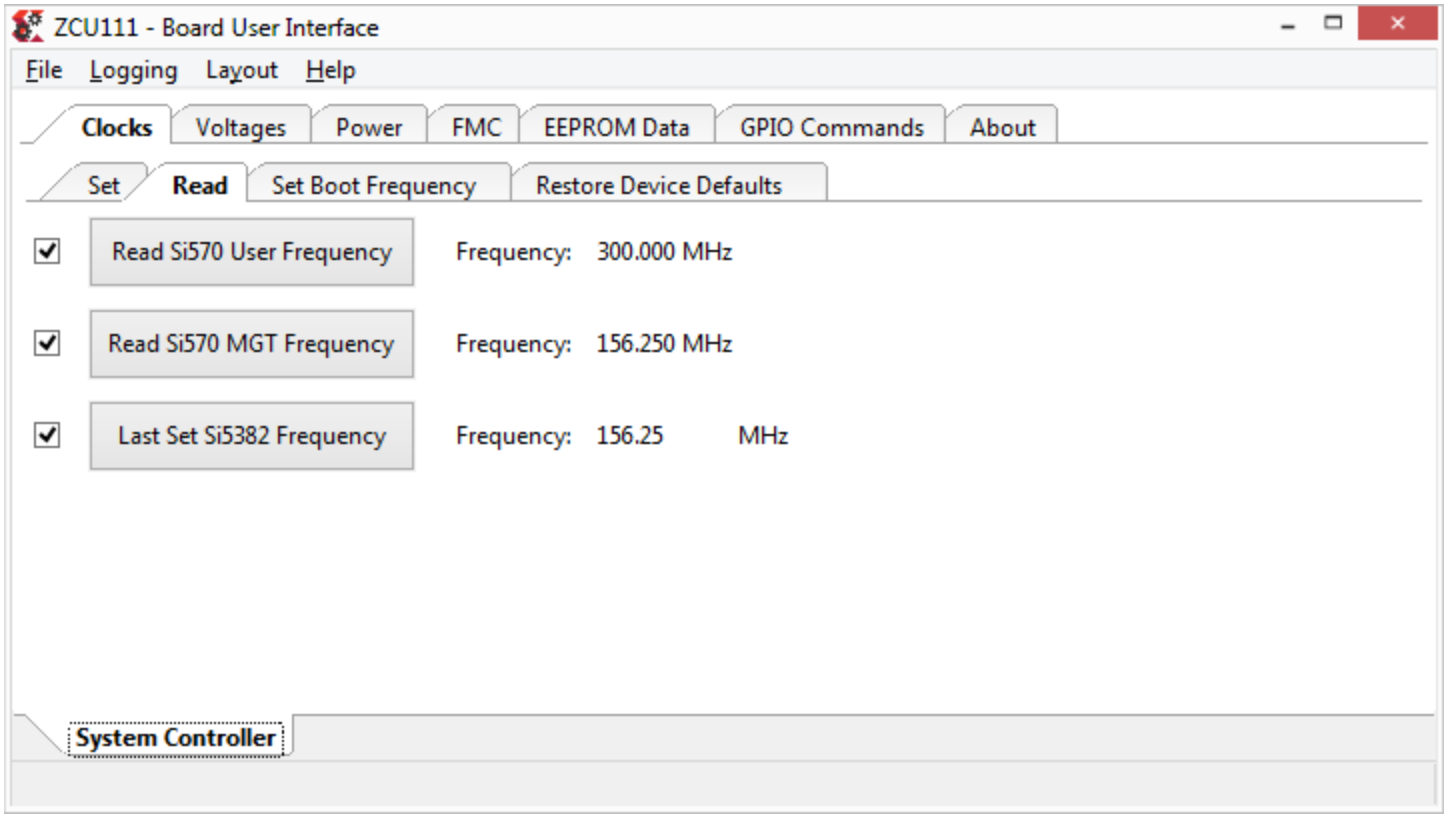
- **Enter the file names as shown below, and press the Set buttons**
  - Si5382A-RevE-ZCU111-Registers-156.25MHz.txt
  - ZCU111_RevA_01132018_U90_122.88MHz.txt
  - ZCU111_RevA_01152018_U102_103_104__LMX2594_122.88MHz.txt



Note: Shows the frequency after setting

Reading the clocks

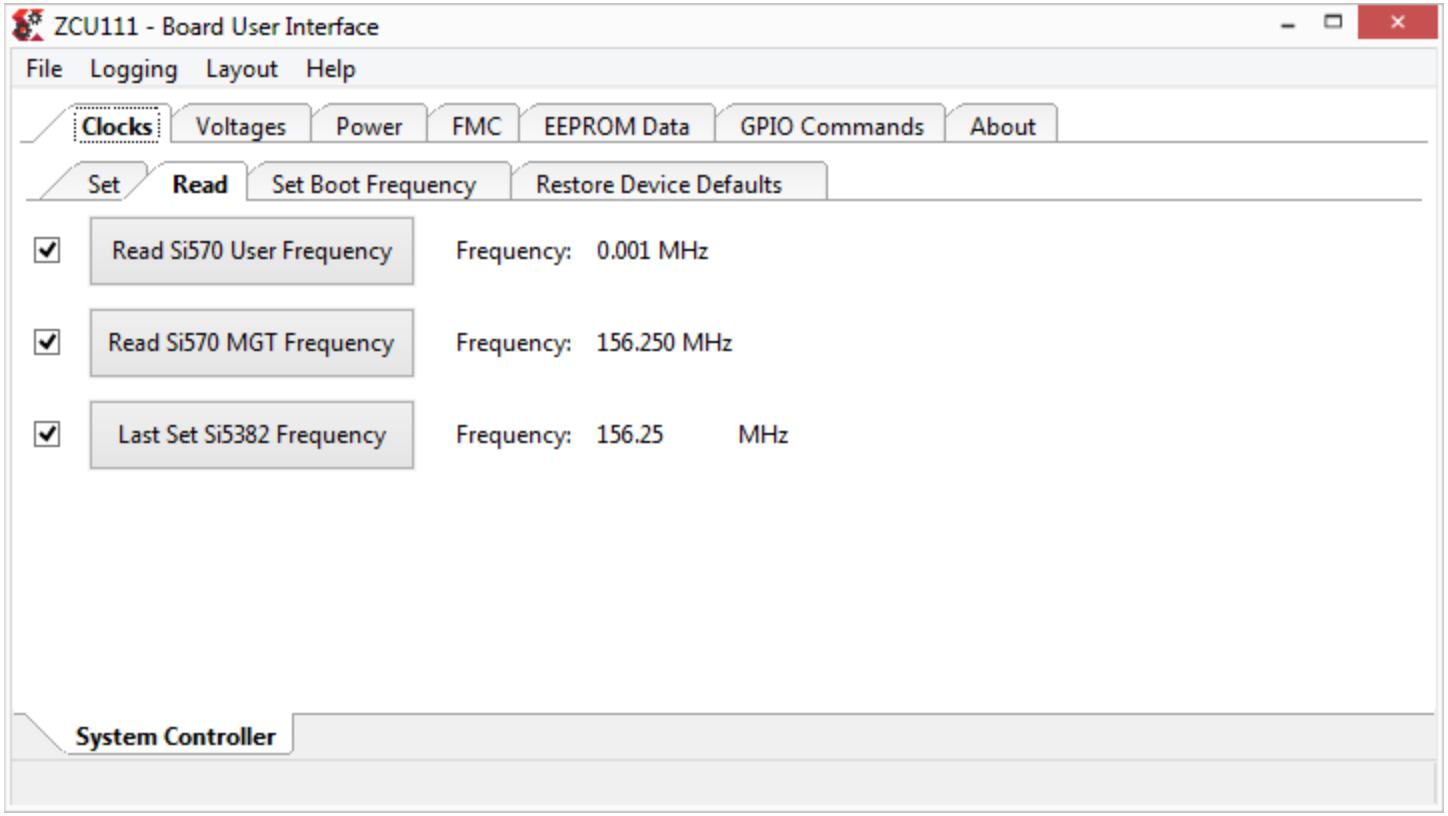
- Select the Read tab
- Click each of the Read buttons and verify the frequencies are set as shown



Note: Presentation applies to the ZCU111

Reading the clocks

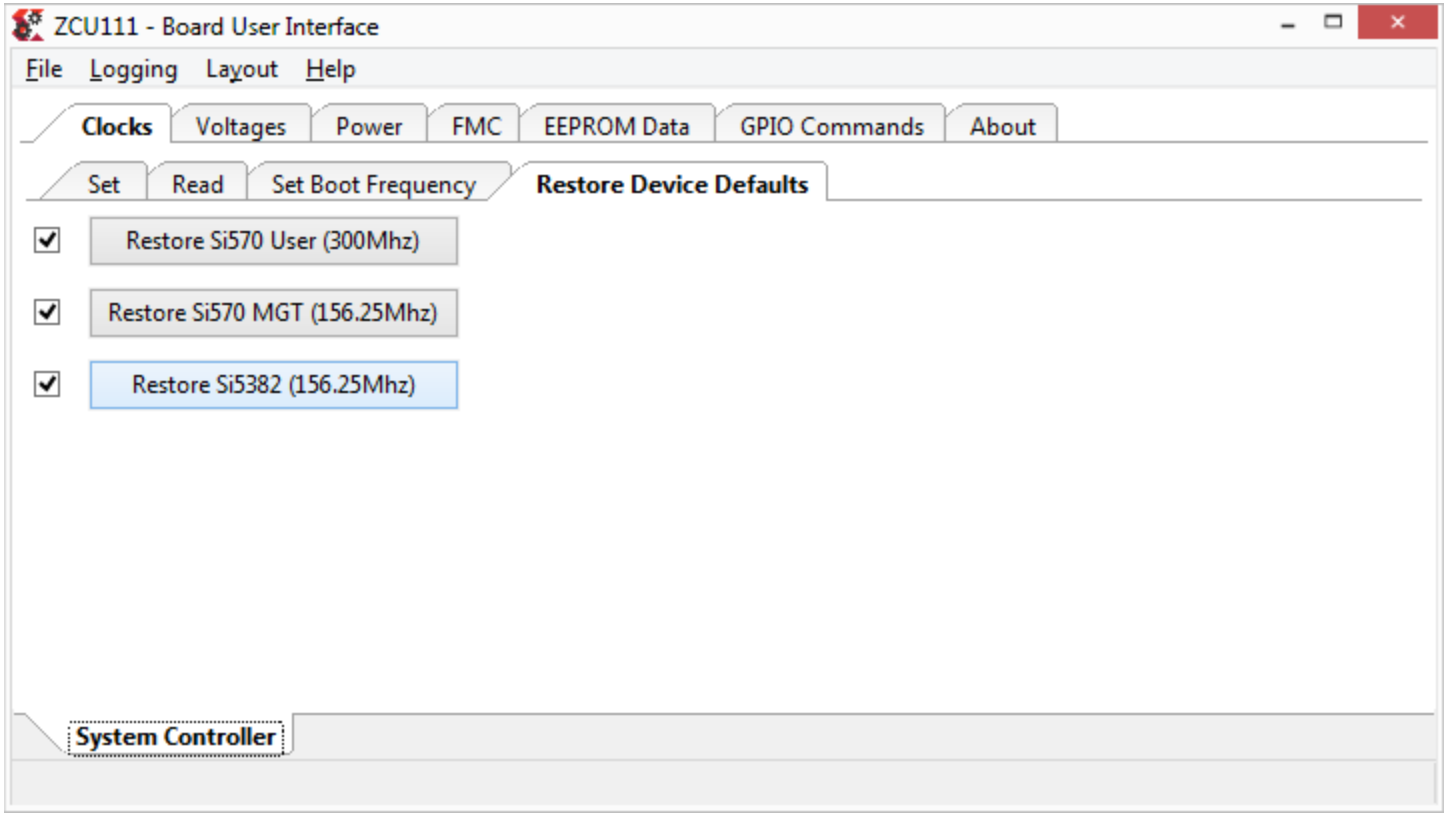
- **If some of the frequencies show up different, you will need to restore the defaults**



Note: Presentation applies to the ZCU111

Restore Default Clock settings

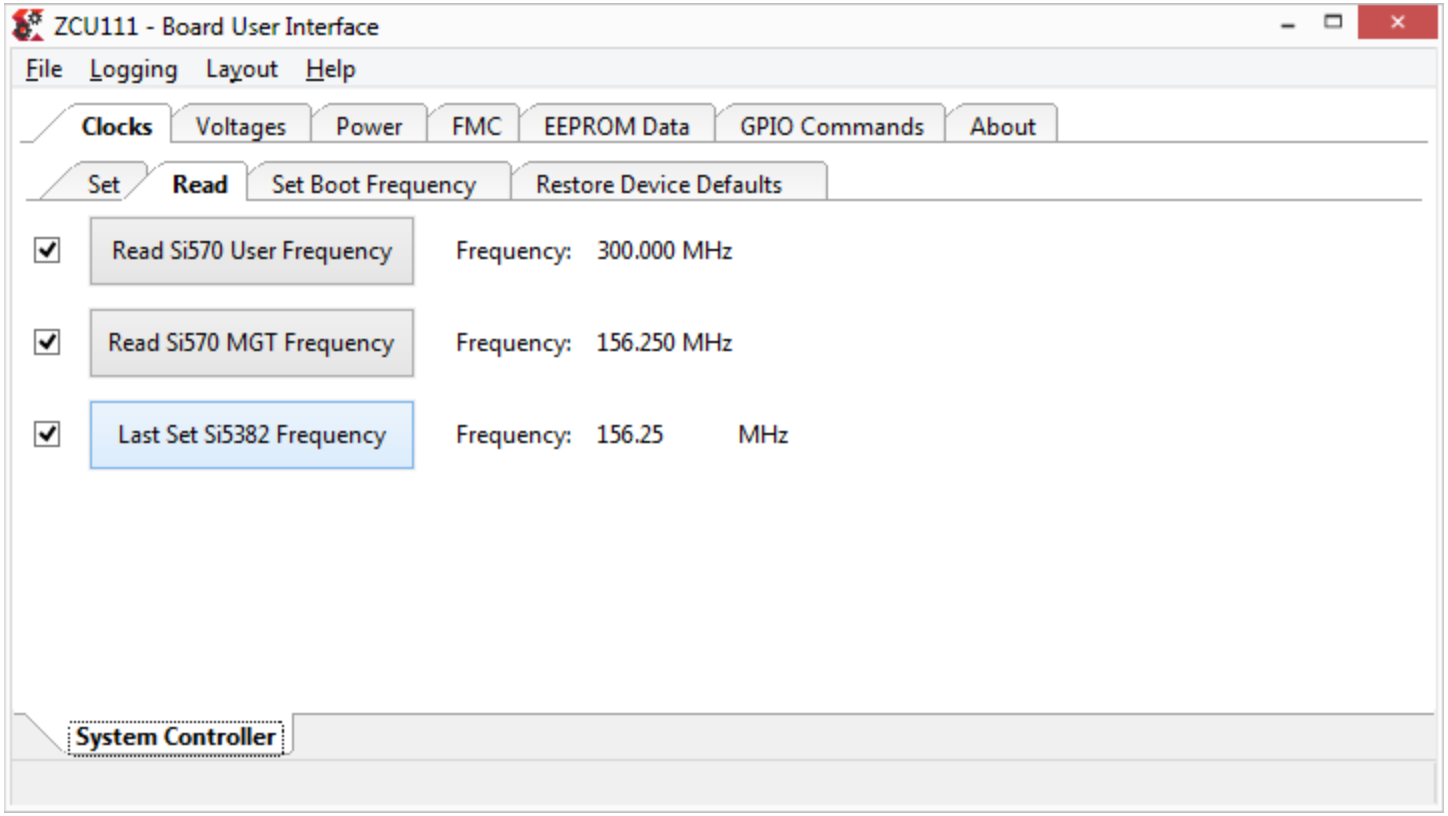
- **Select the Restore Device Defaults tab**
  - Restore the defaults by clicking the button associated with the clock you want to restore (300 MHz, 156.25 MHz, and 156.25 MHz)



Note: Presentation applies to the ZCU111

Restore Default Clock settings

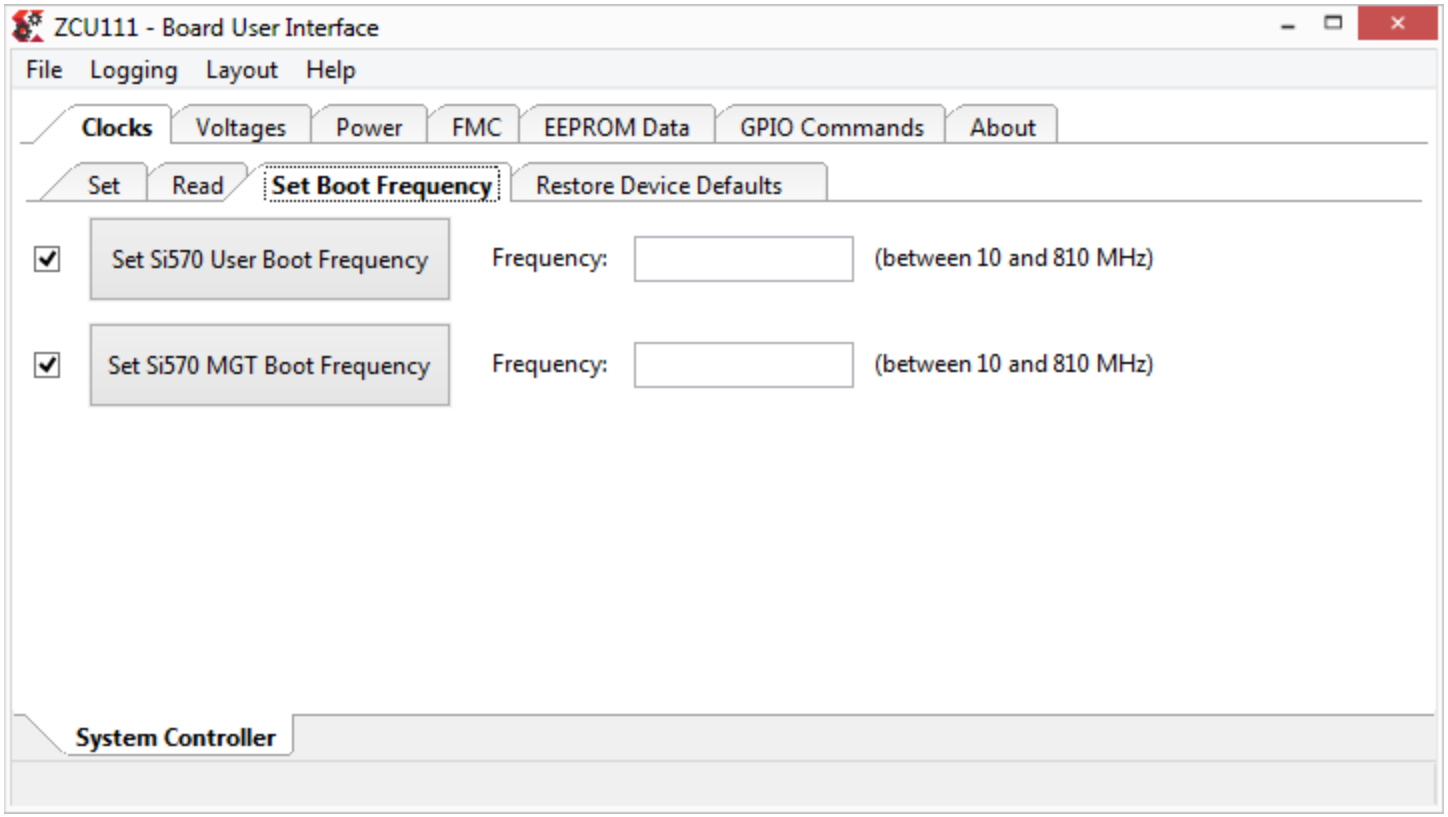
> **Return to the Read tab and verify the settings are correct**



Note: Presentation applies to the ZCU111

Setting Clock Boot Frequencies

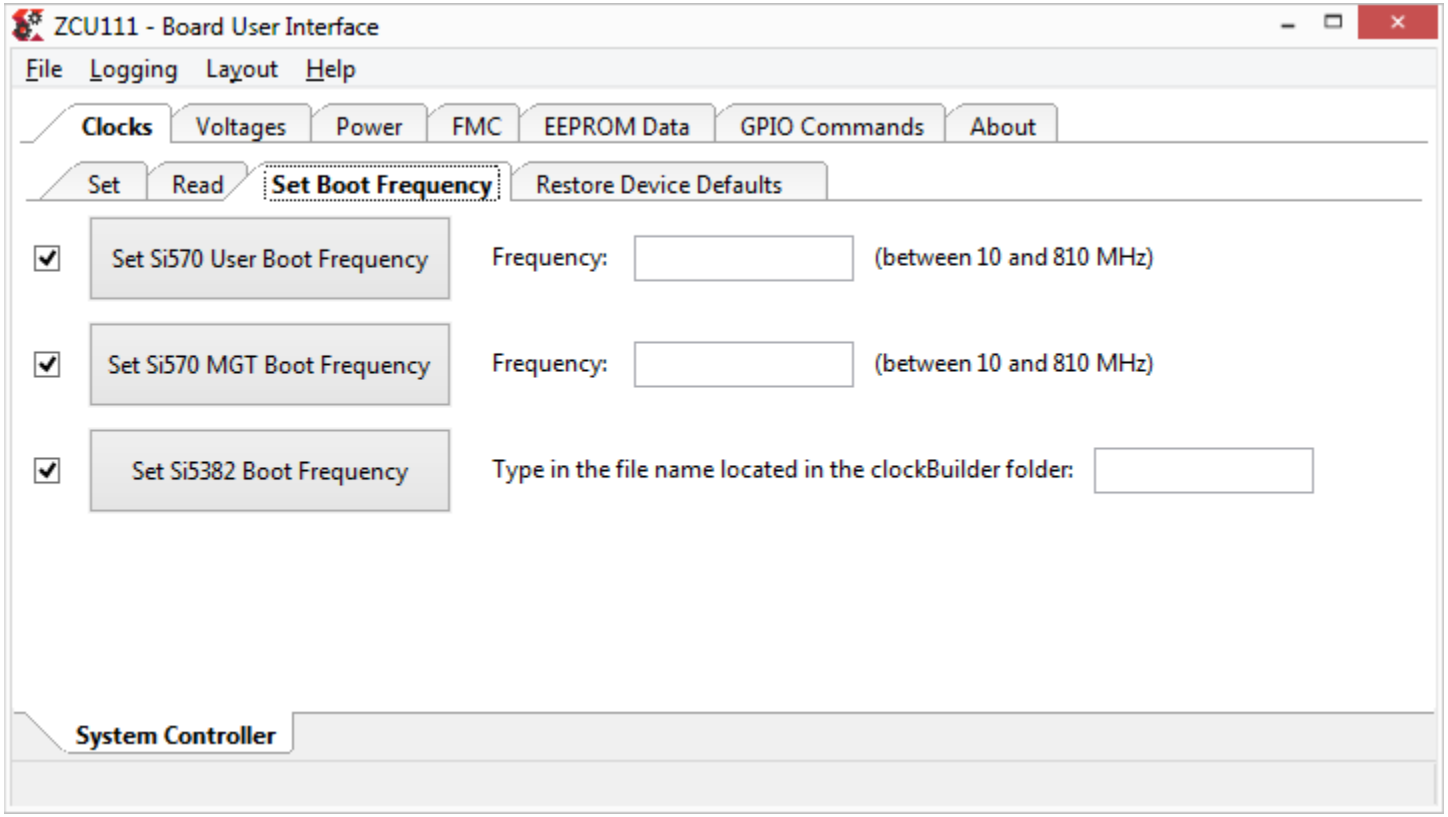
- Select the Set Boot Frequency tab
- Type in your desired boot-up frequency and click the corresponding Set button



Note: Presentation applies to the ZCU111

Setting Clock Boot Frequencies

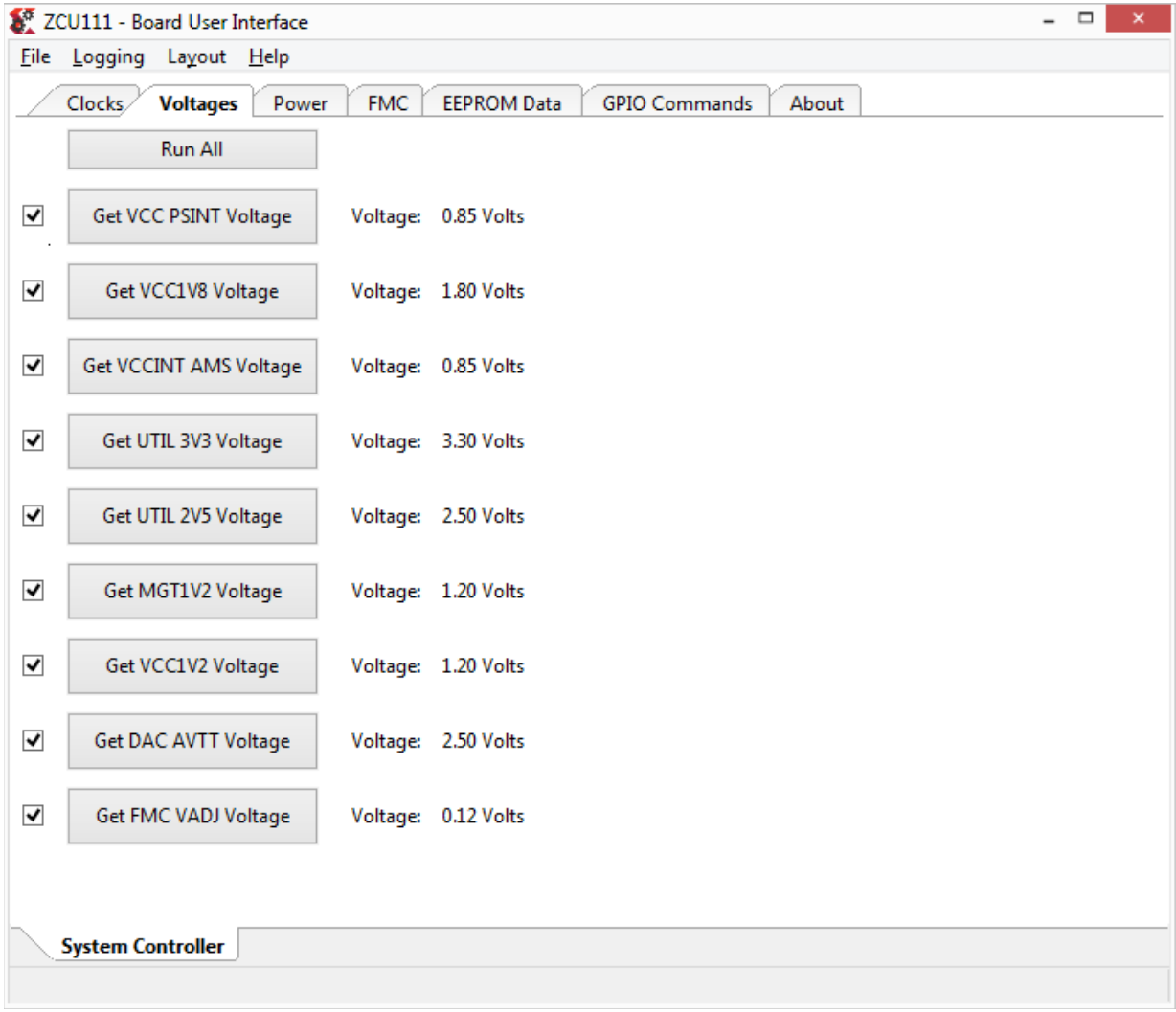
- **Note: The Set Boot Frequency settings will override the Restore Device Defaults at Bootup**
- **The example designs, IBERT, IPI, MIG, etc., expect Si570 User set to 300 MHz, and Si570 MGT set to 156.25 MHz**



Voltages

Reading onboard ZCU111 voltages

- **Under the Voltages tab, click the Run All button**
- **Observe the ZCU111 voltages**
  - IF VADJ is not showing 1.8 V, refer to the FMC section

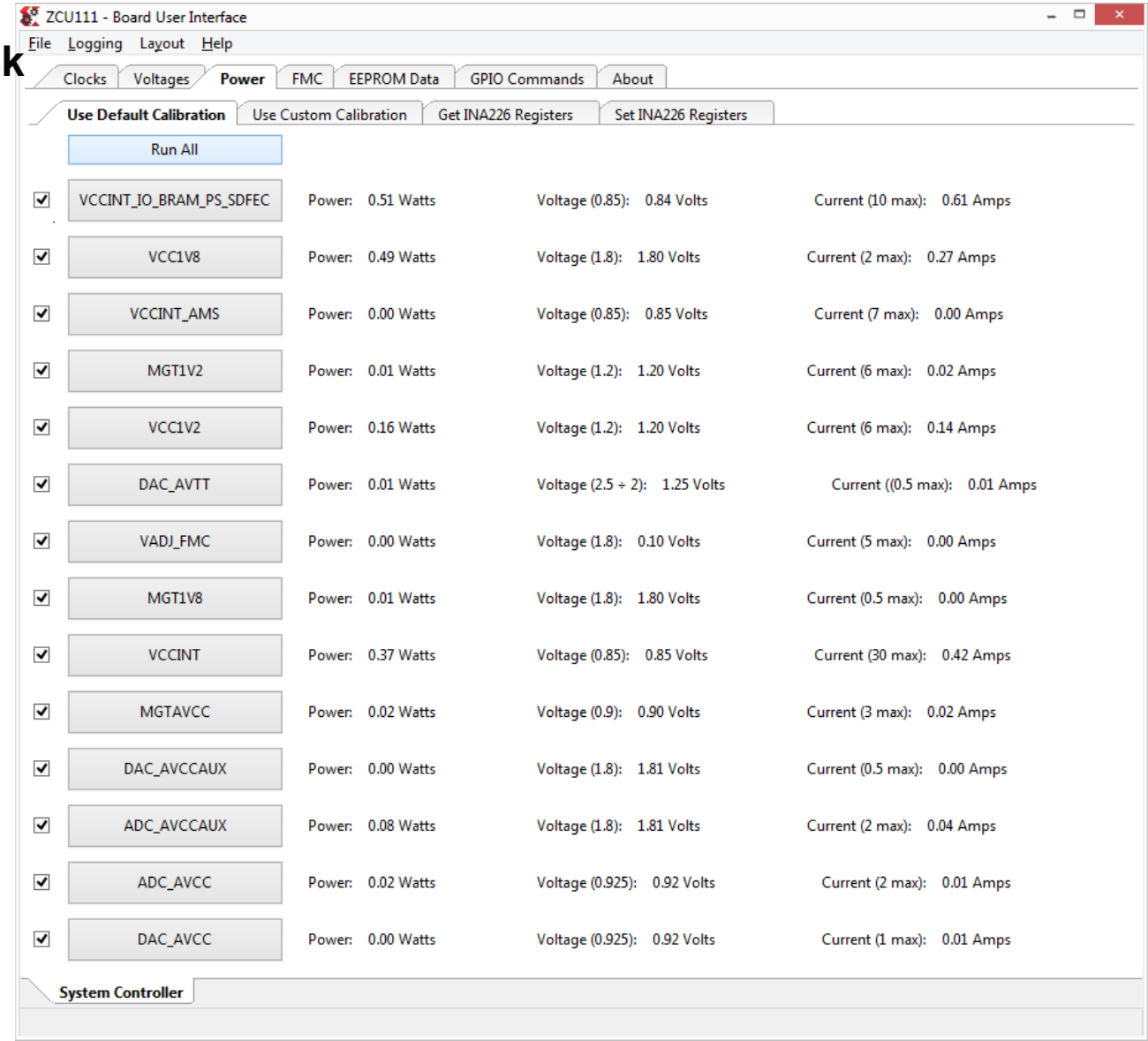


Note: Presentation applies to the ZCU111

Power

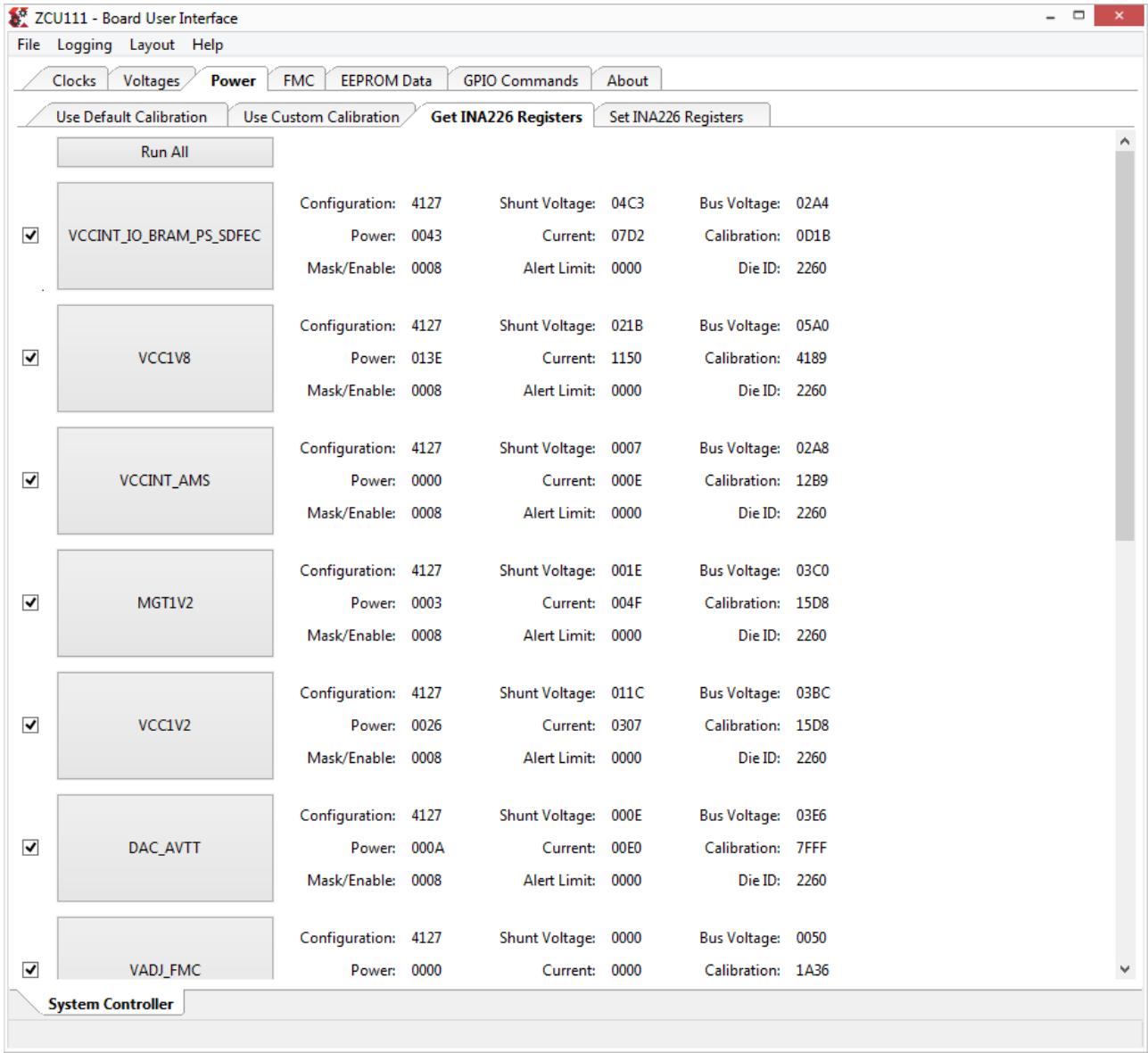
Reading power values using default calibration

- **Select the Use Default Calibration tab underneath Power, click the Run All button**



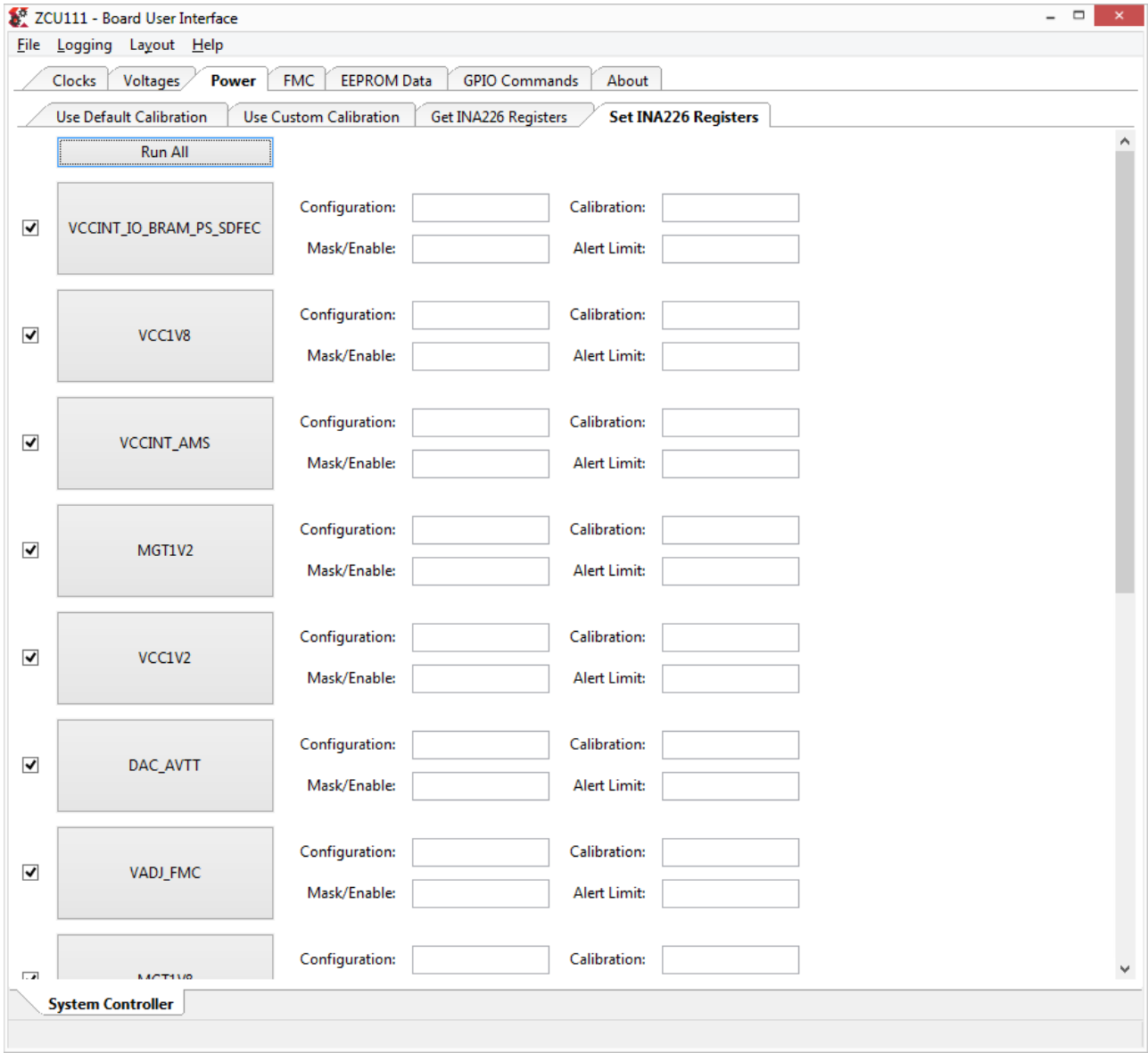
Read INA226 Registers

- Select the Get INA226 Registers tab and click the Run All button
- Observe the INA226 Registers settings



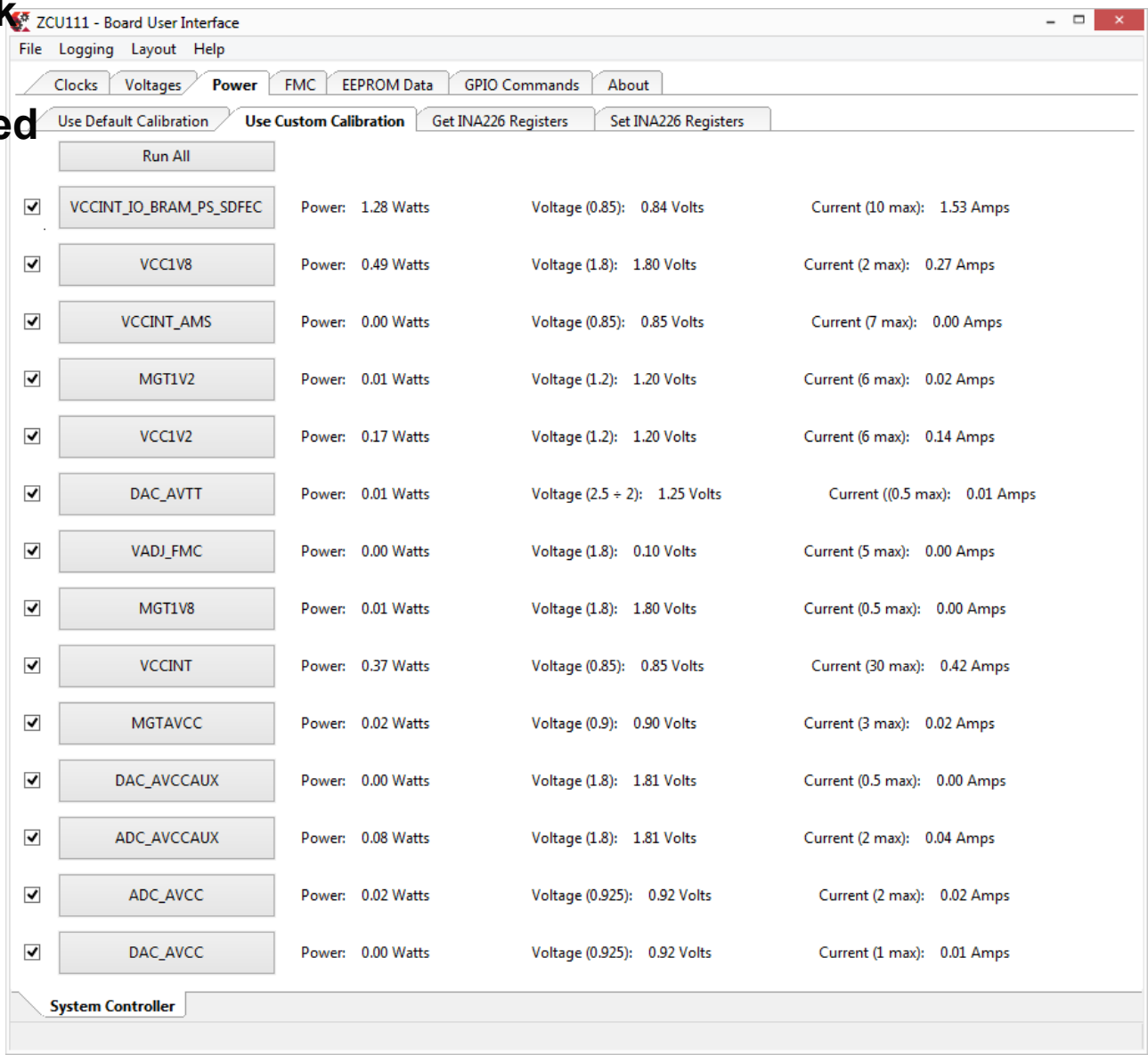
Set INA226 Registers

- Select the Set INA226 Registers tab and set any desired calibrations
- Review TI INA226 documentation before making changes



Reading power values using custom calibration

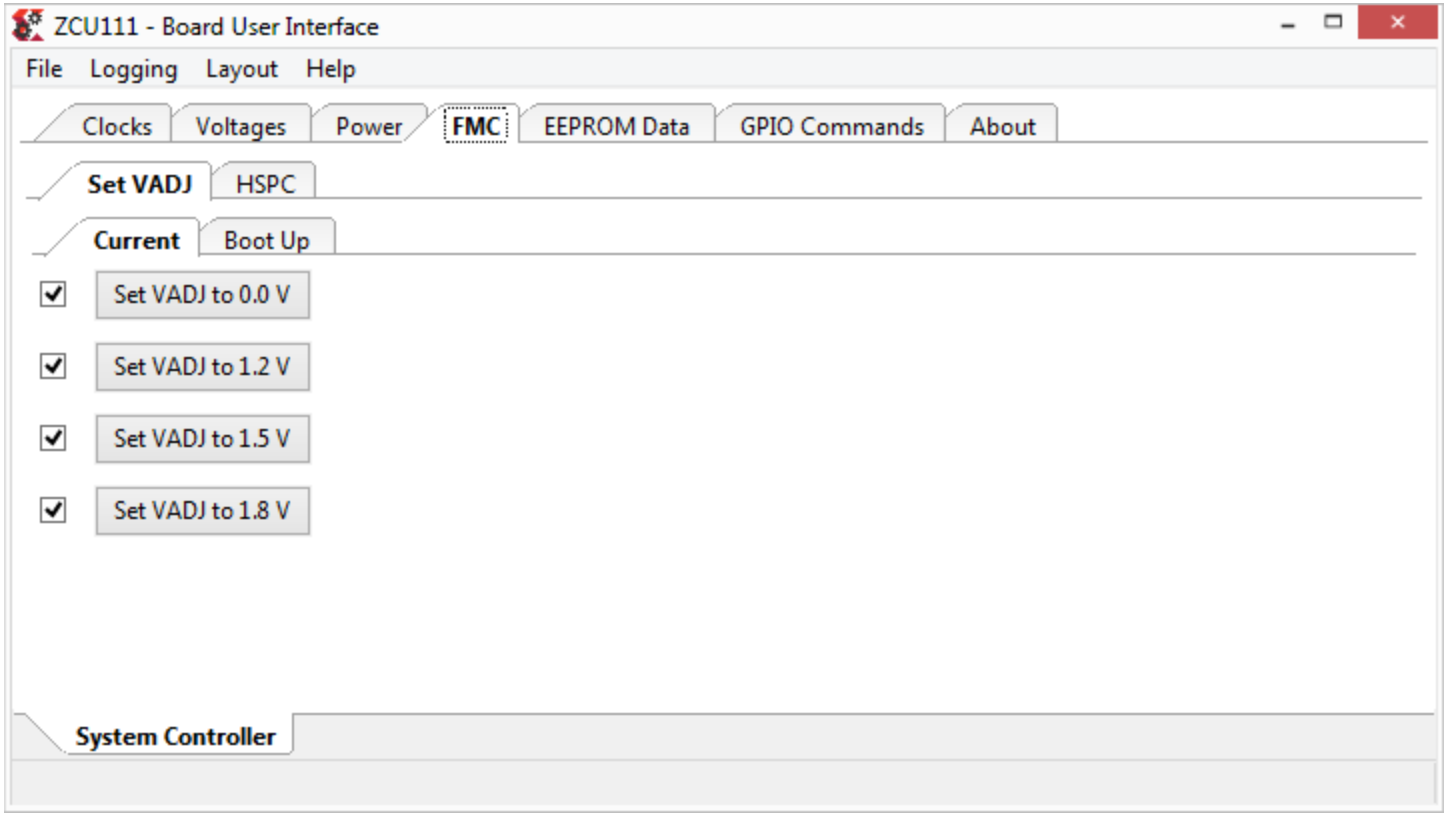
- **Select the Use Custom Calibration tab and click the Run All button (no calibrations were entered in this example)**



FMC

Set VADJ

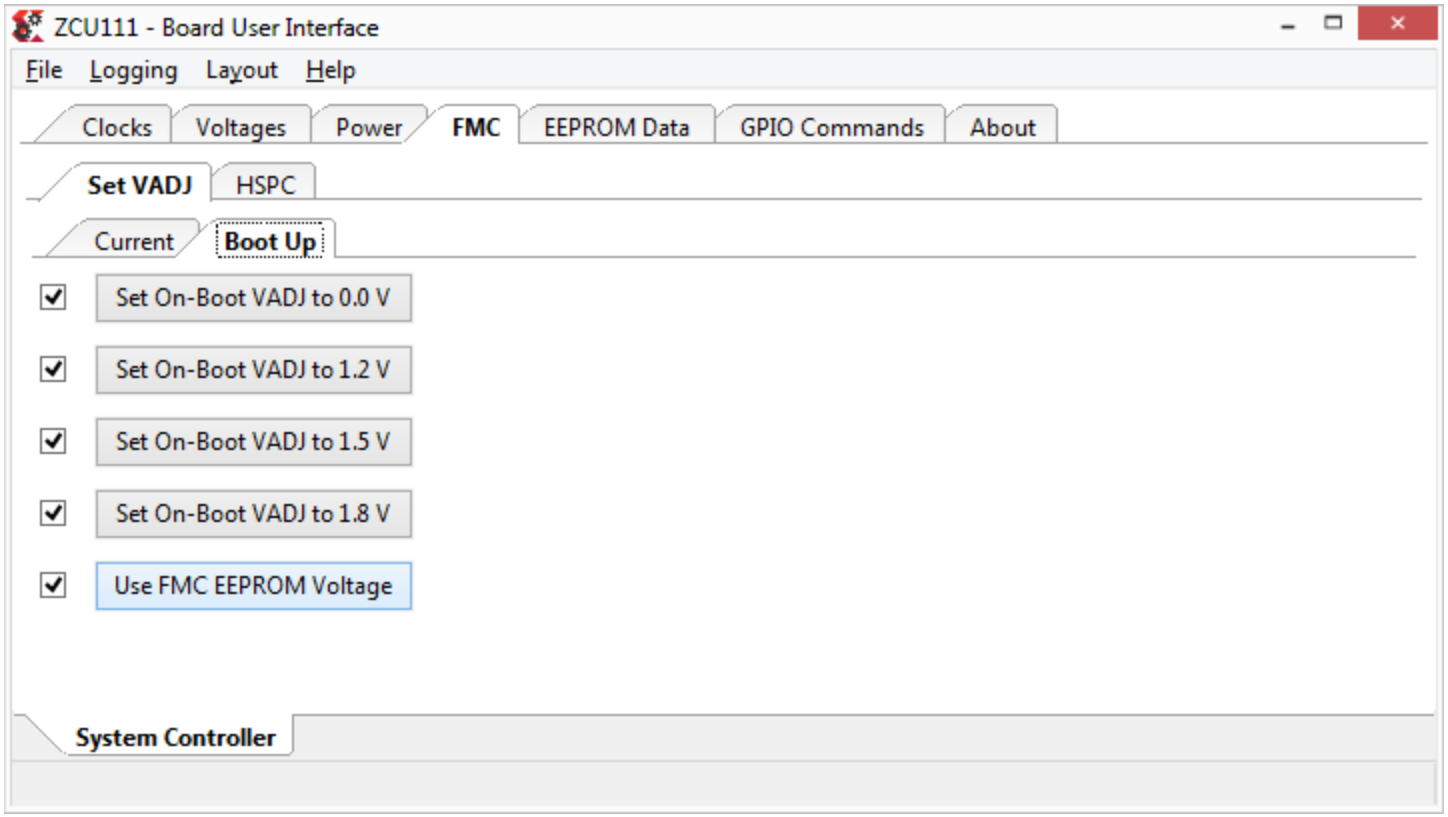
- Select the Set VADJ tab underneath the FMC tab
- Under the Current tab, select the desired VADJ voltage
- Some BIT tests expect 1.8 V



Note: Presentation applies to the ZCU111

Set Boot-Up VADJ

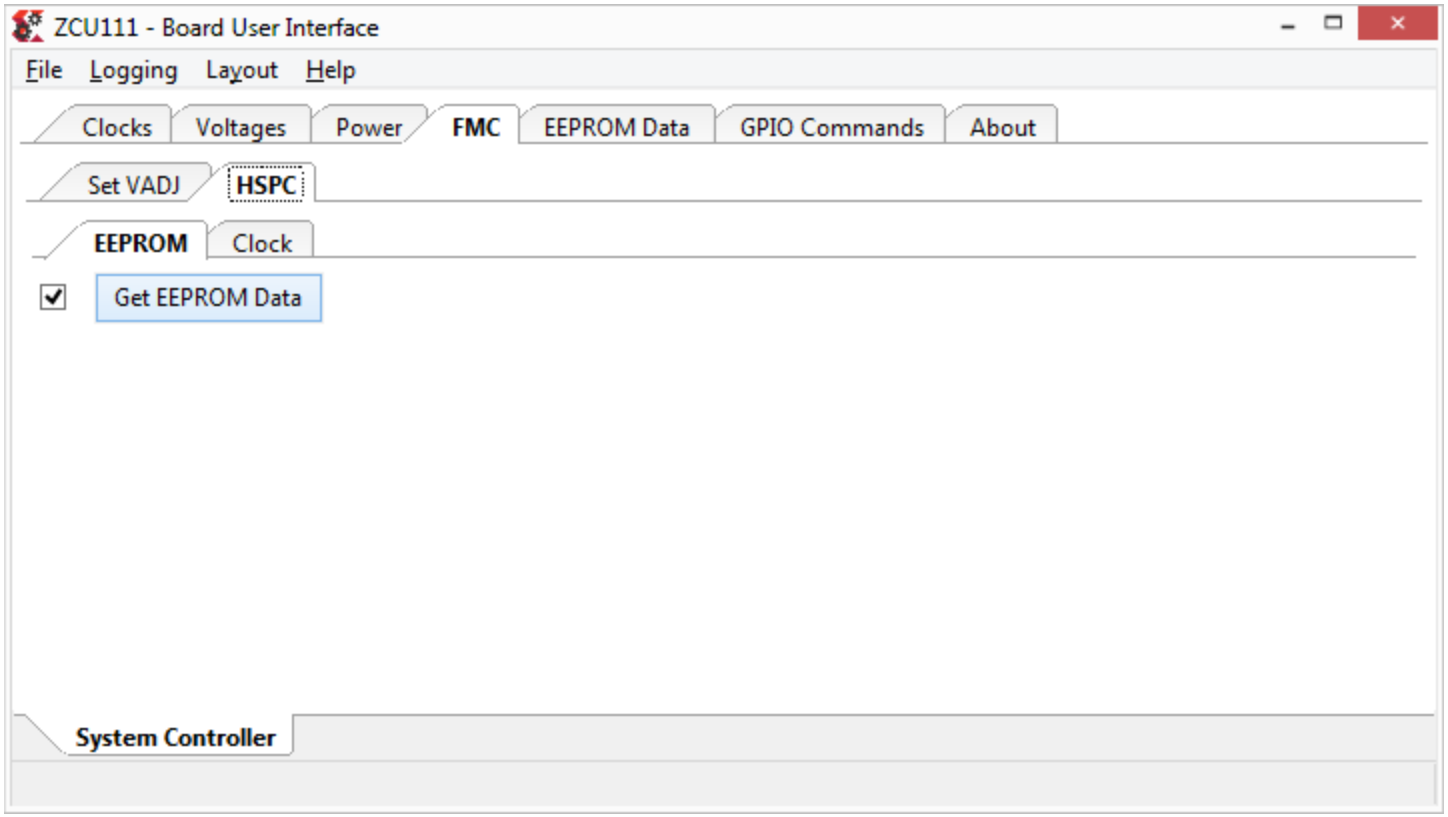
- Select the Boot-up tab and choose the desired power-on voltage
- The default, Use FMC EEPROM Voltage, will set 1.8 V unless you attach an FMC card with a different setting



Note: Presentation applies to the ZCU111

Reading FMC EEPROM

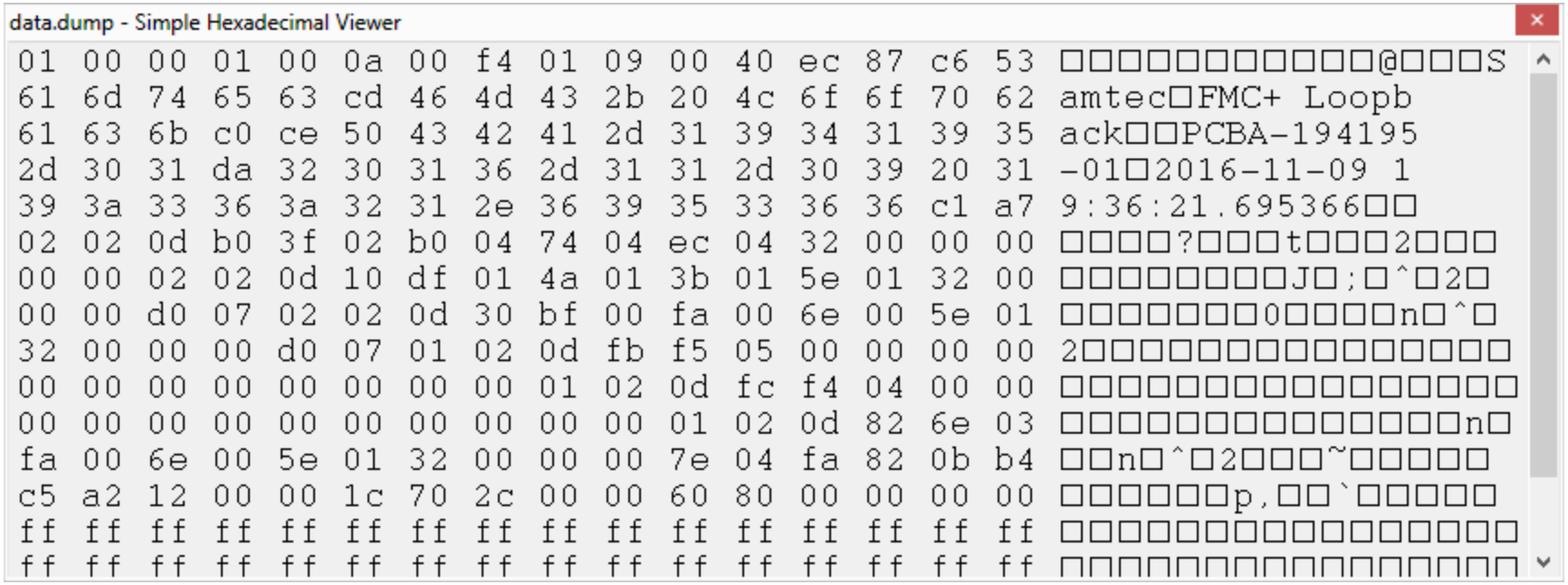
- With an optional FMC+ card attached, select the HSPC tab
- Click the Get EEPROM Data button



Note: Presentation applies to the ZCU111

Reading FMC EEPROM

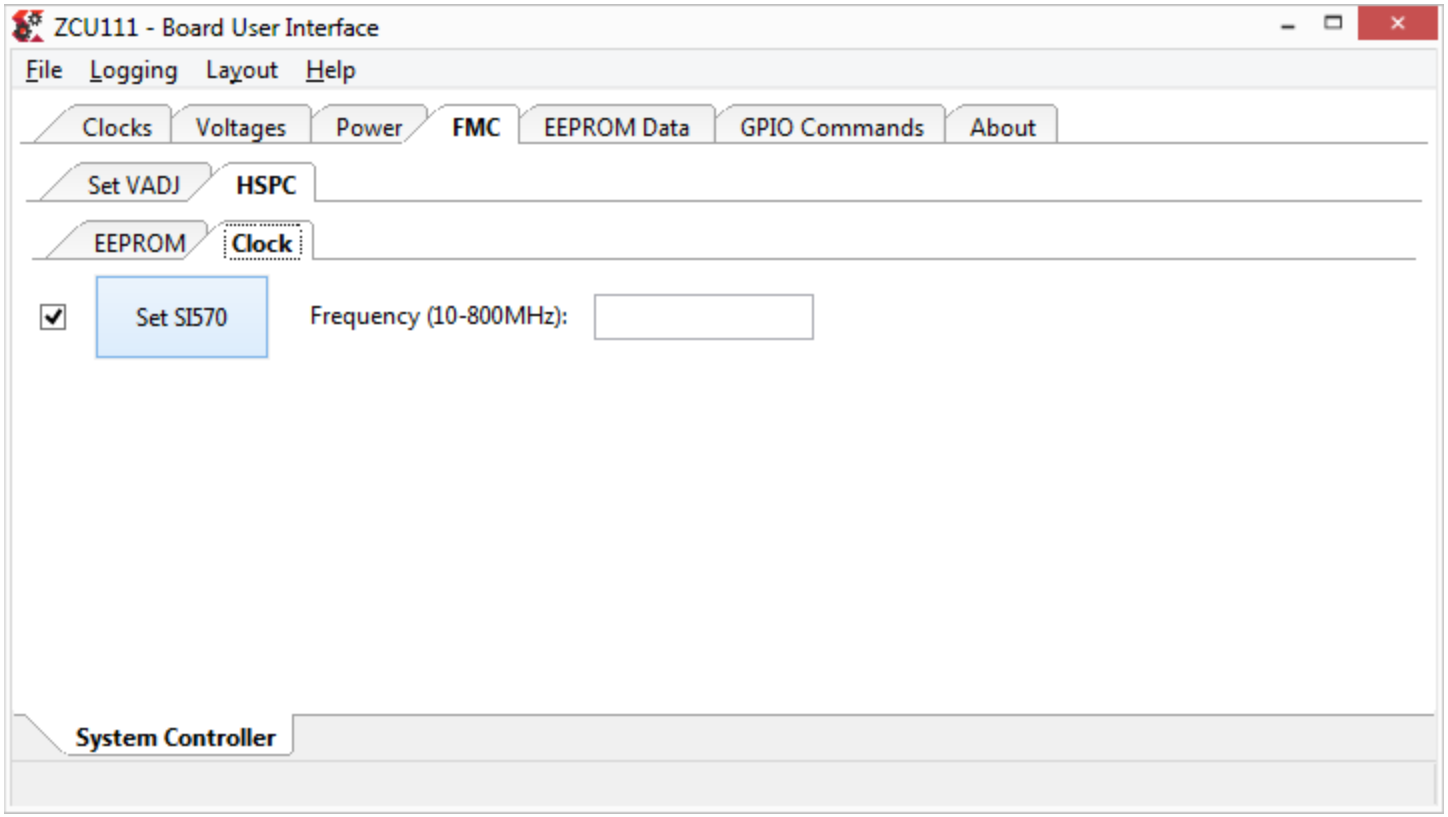
- **The EEPROM data will be displayed in a separate window (Samtec HSPC card data shown)**



Note: Presentation applies to the ZCU111

Setting FMC HPC clocks

- Select the Clock tab and set the HSPC clock as desired
- The default frequency is 156.25 MHz
- Any changes must be repeated after a power cycle

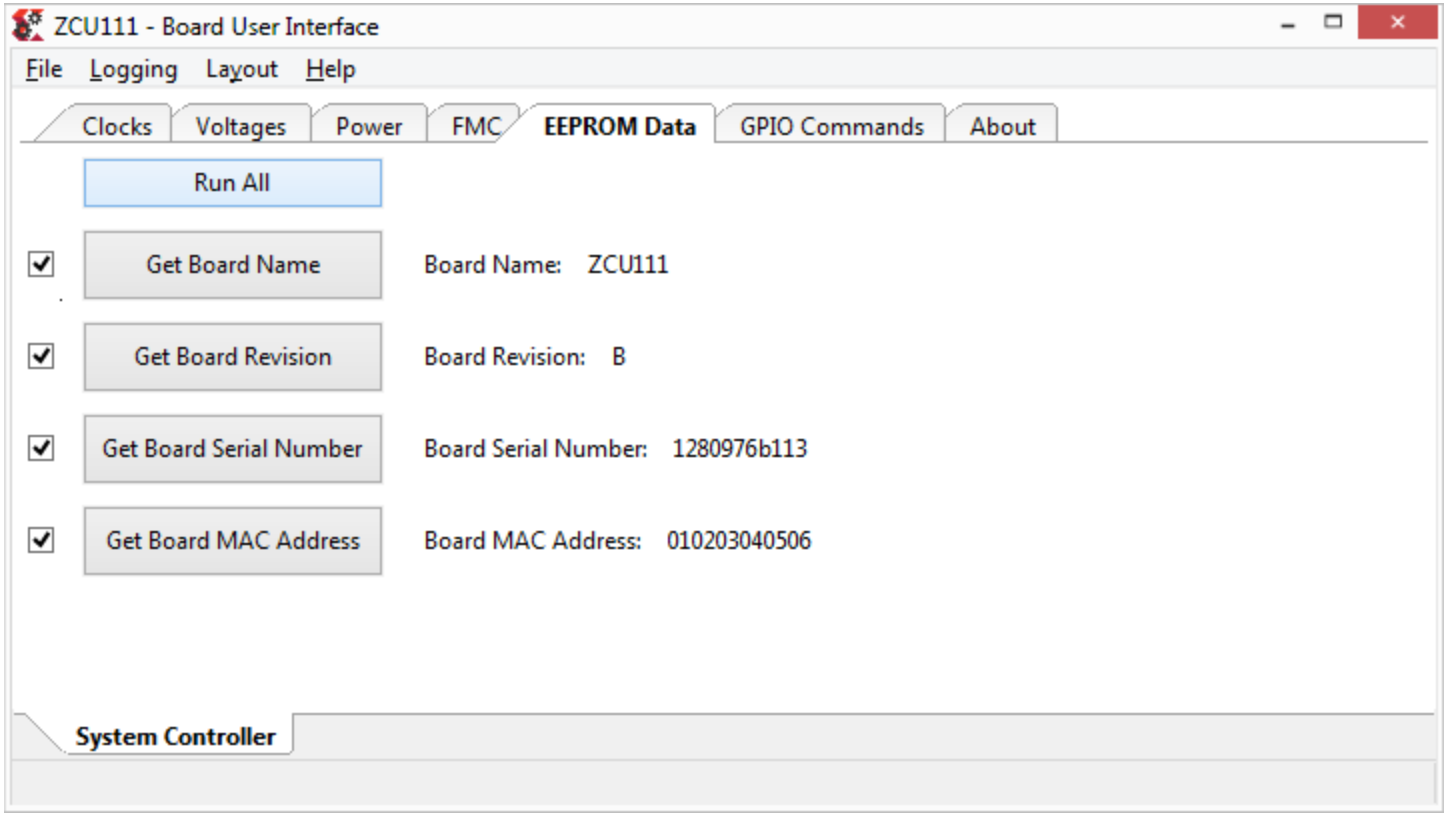


Note: IBERT uses the default clock of 156.25 MHz

EEPROM Data

Reading the Board EEPROM Data

- Select the EEPROM Data tab
- Click the Run All button

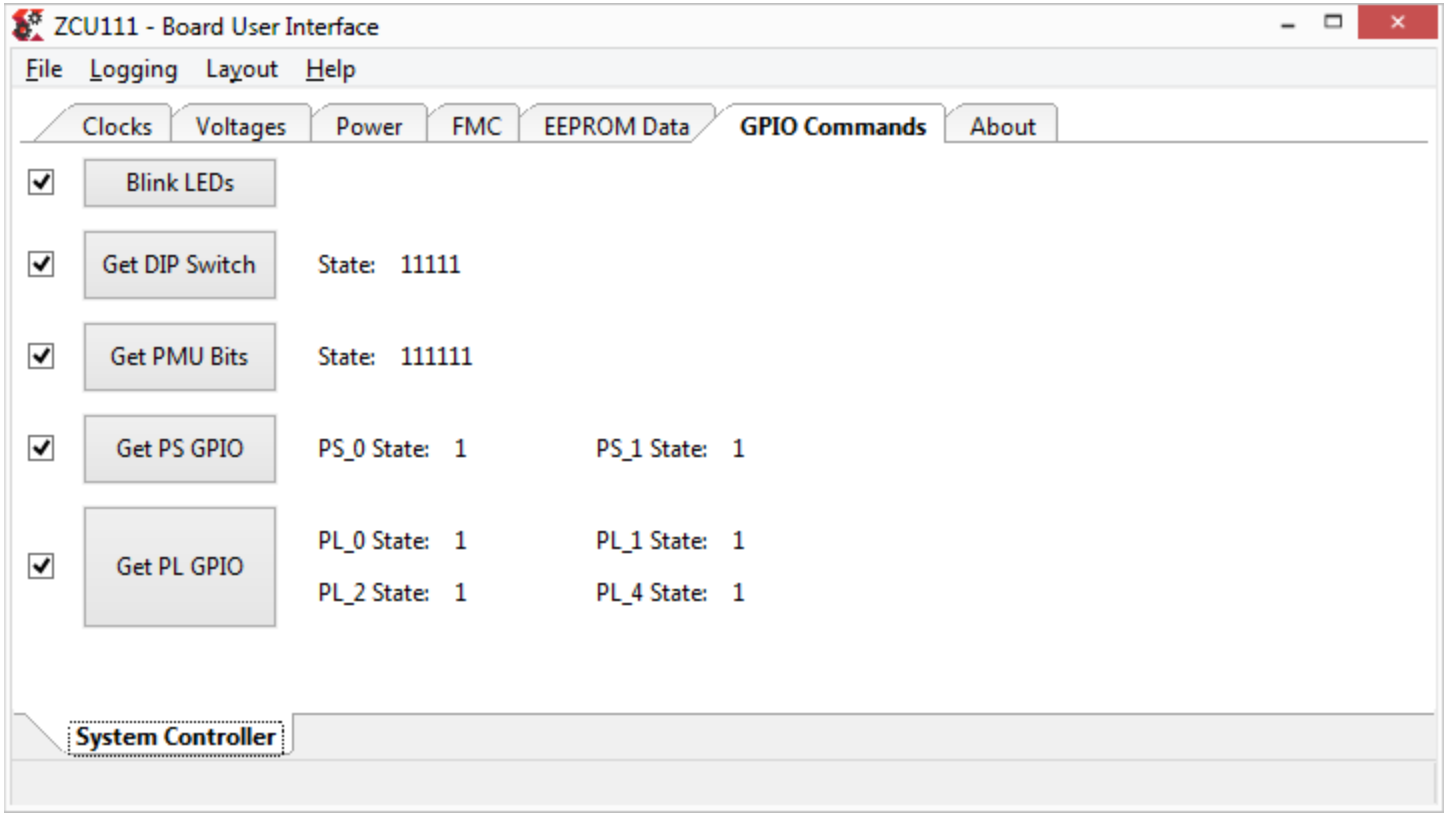


Note: Presentation applies to the ZCU111

GPIO Commands

Set GPIOs

- Select the GPIO Commands tab
- Click the button for the operation you would like to perform.

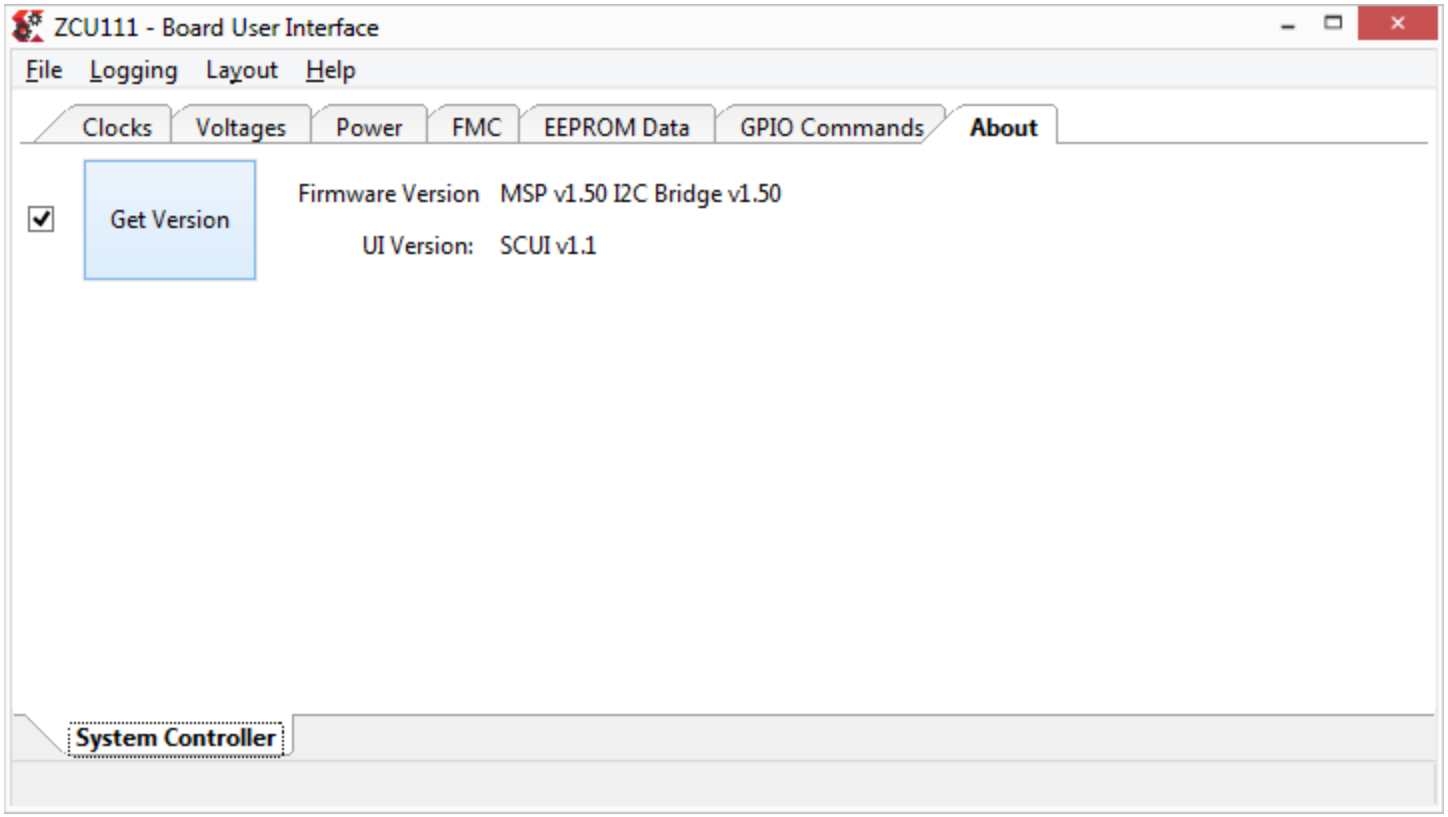


Note: Presentation applies to the ZCU111

About

Reading version information

- Select the About tab
- Click the Get Version button to get System Controller Firmware version

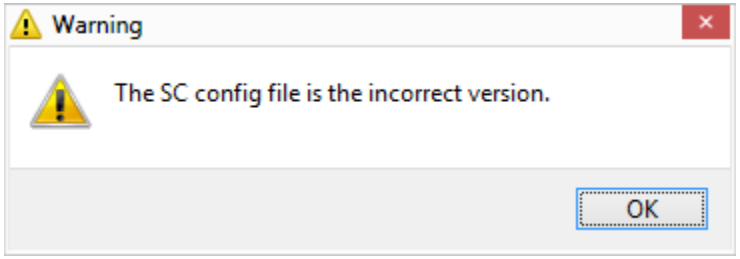


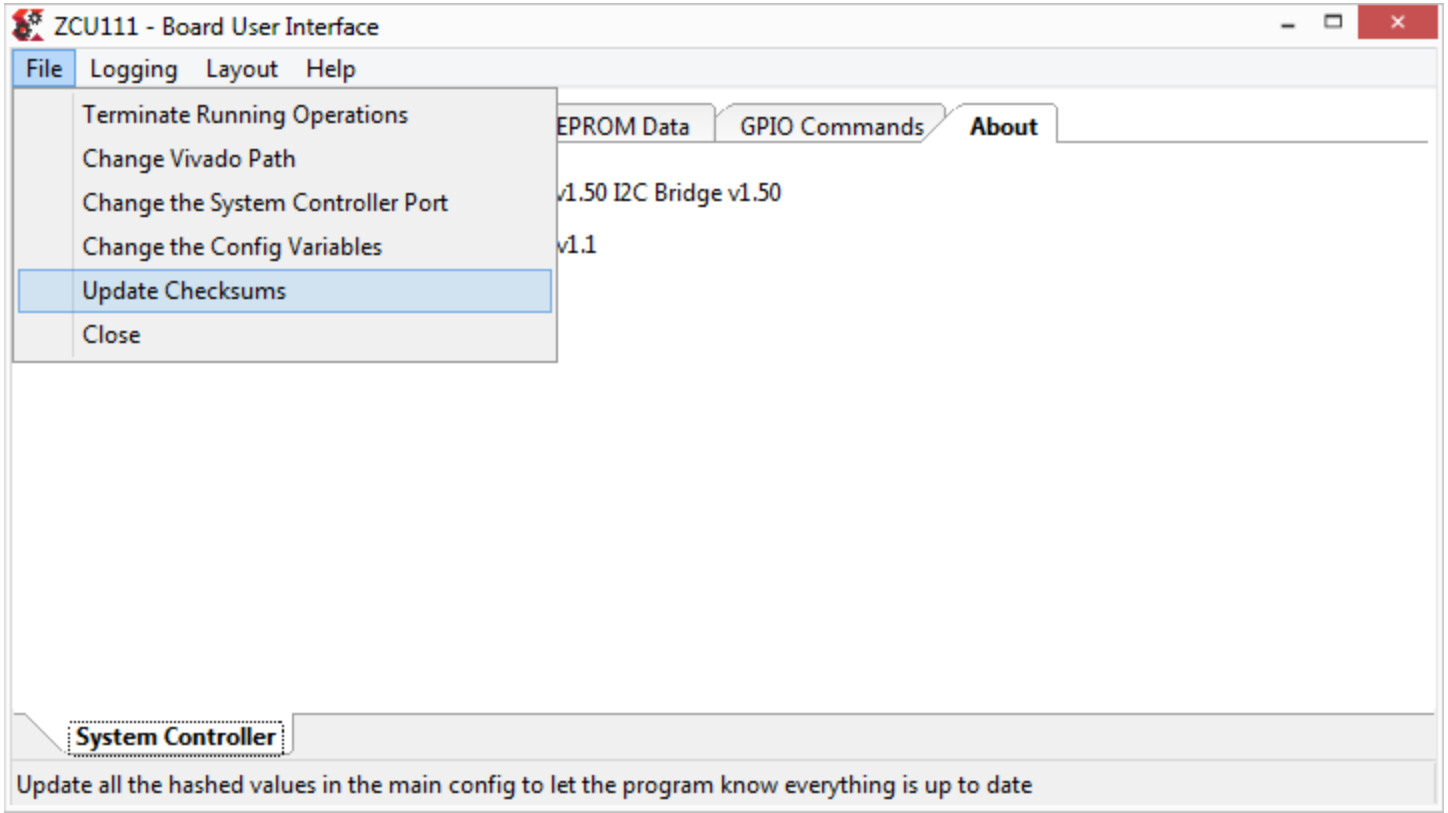
Note: Presentation applies to the ZCU111

File Changes

File changes

- **If you make changes some of the *.yaml files, you may get this warning. Select Update Checksums to resolve.**





References

References

- **Vivado Release Notes**
  - Vivado Design Suite User Guide - Release Notes – UG973
    - https://www.xilinx.com/support/documentation/sw_manuals/xilinx2019_1/ug973-vivado-release-notes-install-license.pdf
  - Vivado Design Suite 2019 - Vivado Known Issues
    - https://www.xilinx.com/support/answers/72162.html
- **Vivado Programming and Debugging**
  - Vivado Design Suite Programming and Debugging User Guide – UG908
    - https://www.xilinx.com/support/documentation/sw_manuals/xilinx2019_1/ug908-vivado-programming-debugging.pdf

Documentation

Documentation

- **Zynq UltraScale+**
  - Zynq UltraScale+ RFSoC
    - https://www.xilinx.com/products/silicon-devices/soc/rfsoc.html
- **ZCU111 Documentation**
  - Xilinx Zynq UltraScale+ RFSoC ZCU111 Evaluation Kit
    - https://www.xilinx.com/products/boards-and-kits/zcu111.html
  - ZCU111 Board User Guide – UG1271
    - https://www.xilinx.com/support/documentation/boards_and_kits/zcu111/ug1271-zcu111-eval-bd.pdf
  - ZCU111 Evaluation Kit Quick Start Guide User Guide – XTP490
    - https://www.xilinx.com/support/documentation/boards_and_kits/zcu111/xtp490-zcu111-quickstart.pdf
  - ZCU111 - Known Issues Master Answer Record
    - https://www.xilinx.com/support/answers/70958.html