# ZCU111 System Controller – GUI Tutorial

May 2019

XILINX

XTP517

# Revision History

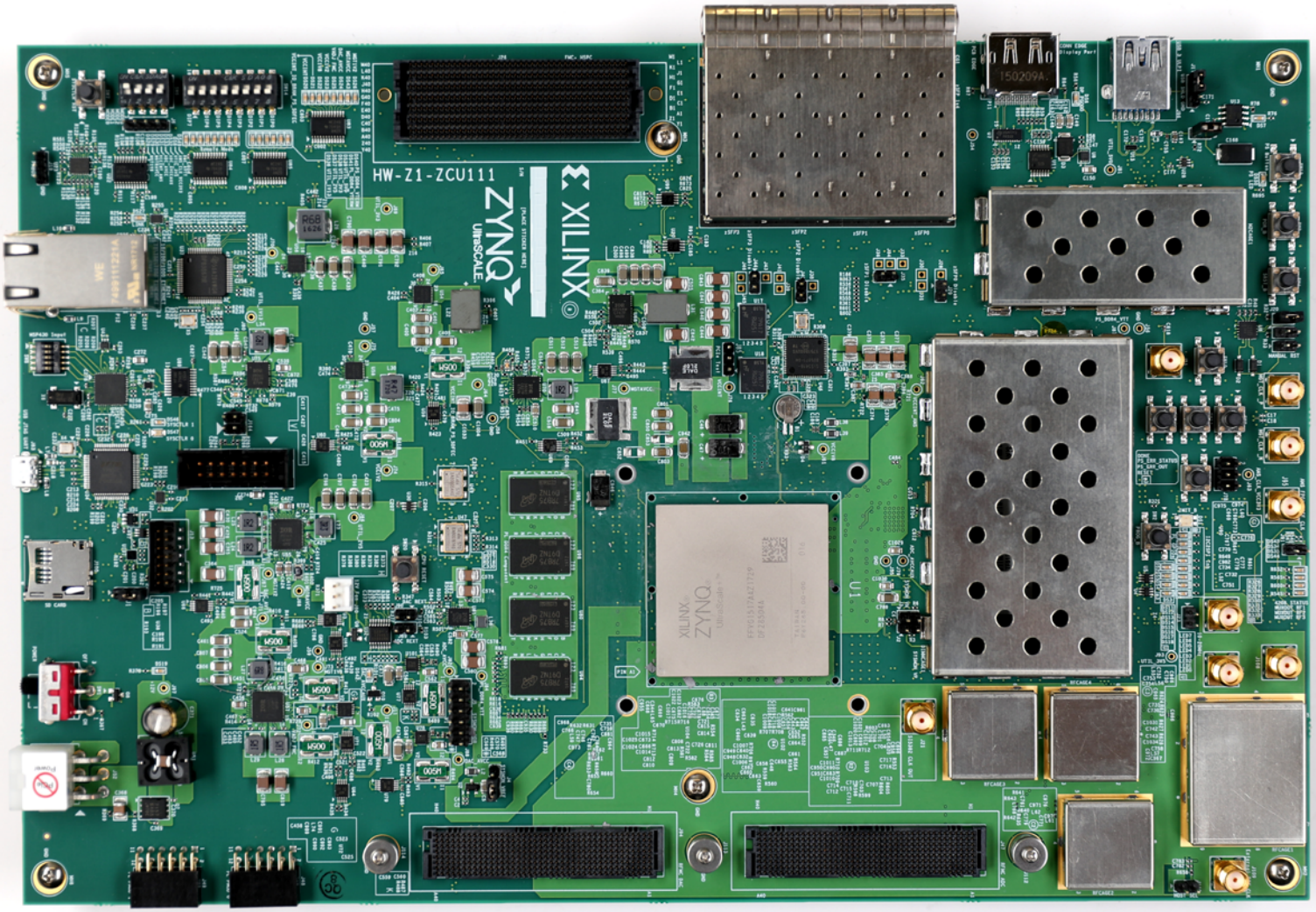
| Date | Version | Description |
|---|---|---|
| 05/29/19 | 3.0 | Updated for 2019.1. |
| 02/21/19 | 2.1 | Updated document format. |
| 12/10/18 | 2.0 | Updated for 2018.3. |
| 09/17/18 | 1.2 | Updated BoardUI to improve the si570 clock interface. |
| 08/06/18 | 1.1 | Minor Update. |
| 07/09/18 | 1.0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

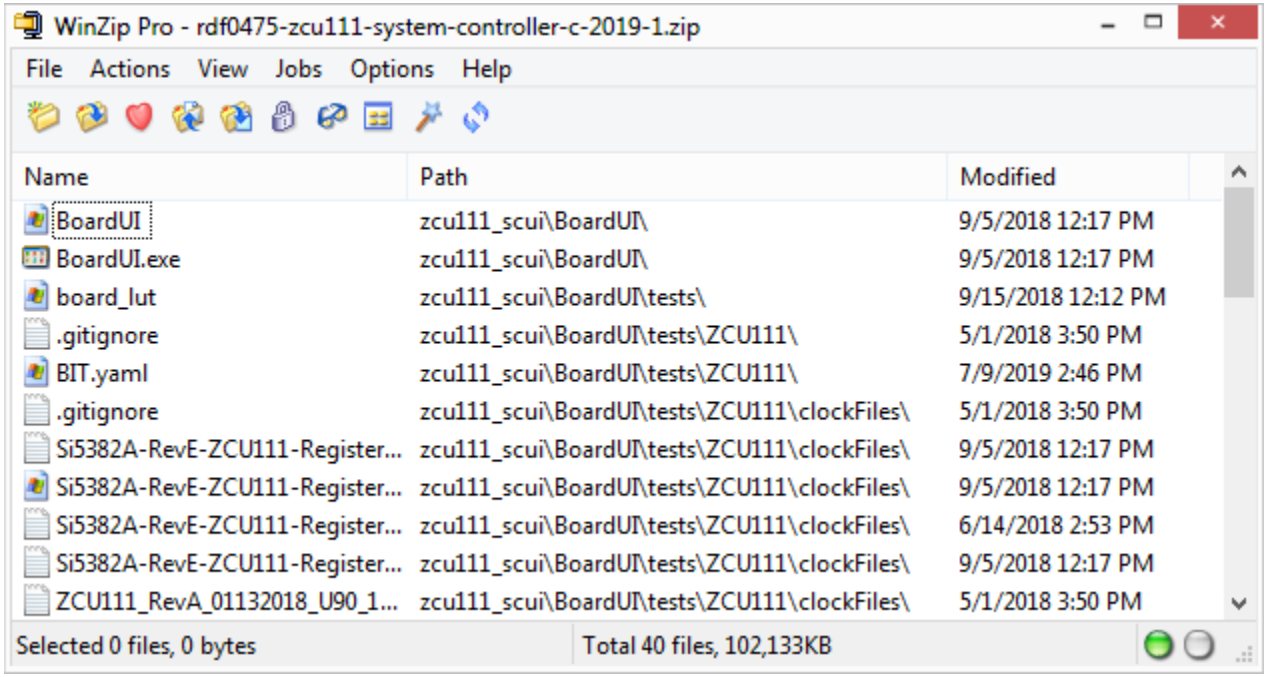
# ZCU111 Software Install and Board Setup

- **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

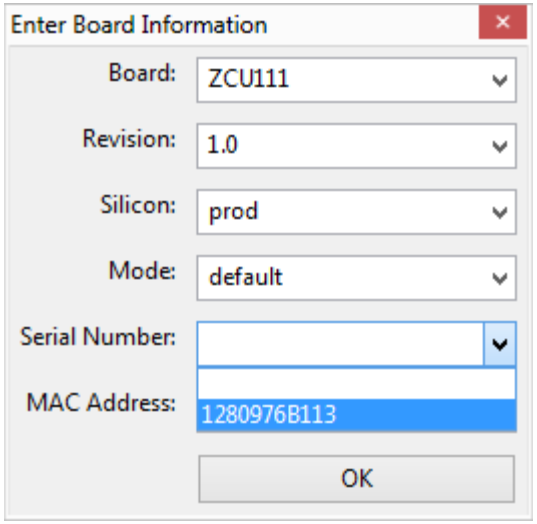



**Note:** Presentation applies to the ZCU111

# 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

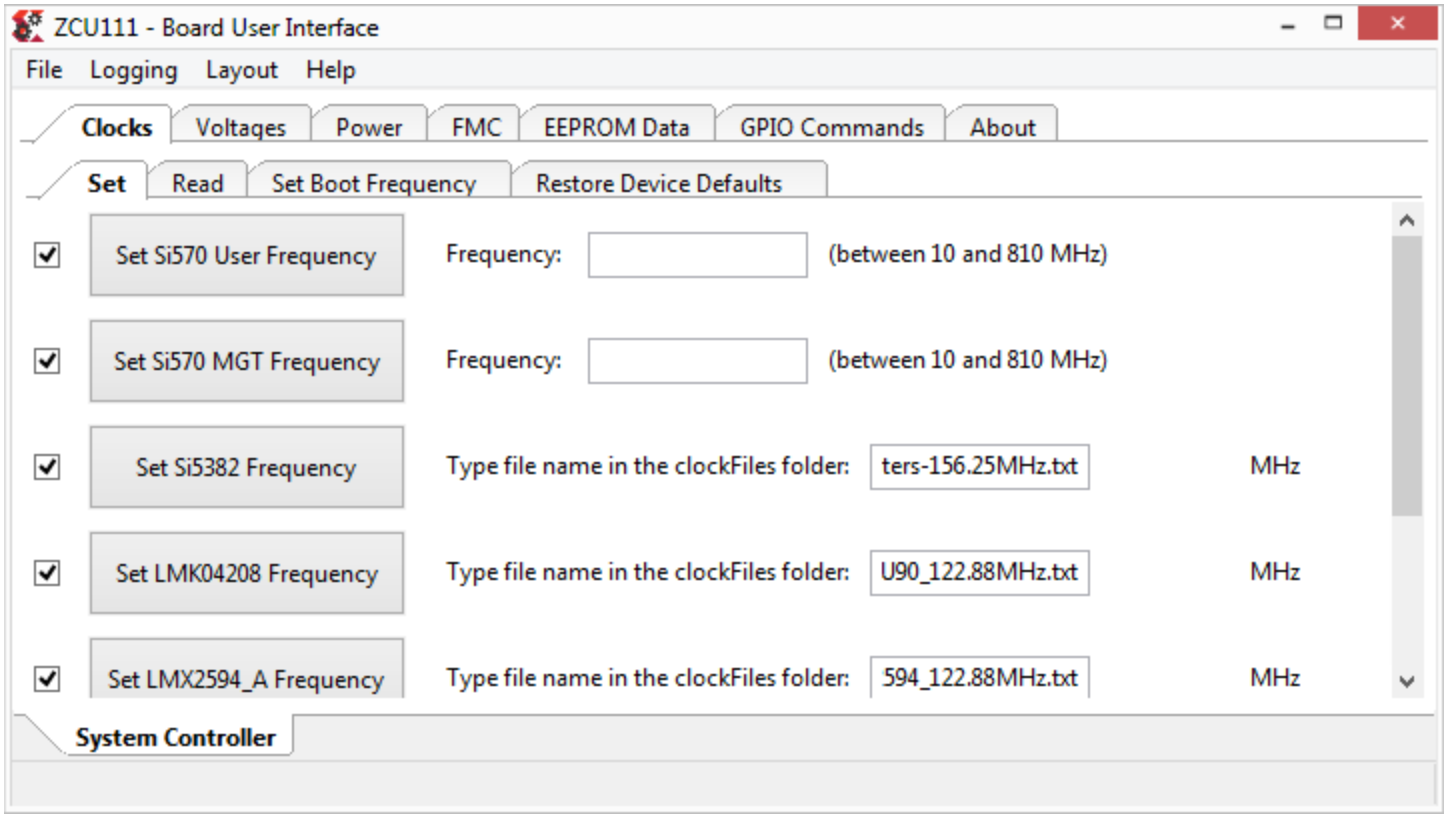




**Note:** Presentation applies to the ZCU111

# Clocks

# Setting the clocks

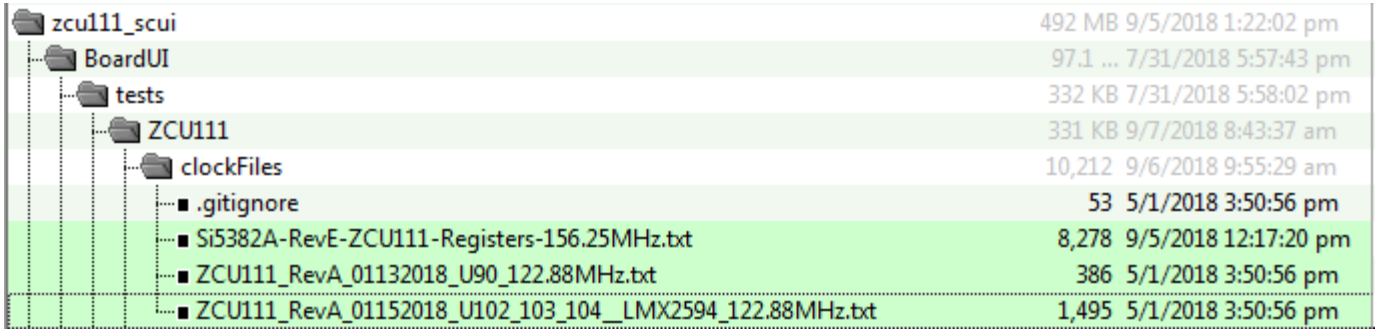
- Select the Set tab underneath the Clocks tab
- The Si5382 and LMK04208 and LMX2594_* Clocks are set via a Si Labs ClockBuilder scripts




**Note:** Presentation applies to the ZCU111

# Setting the clocks

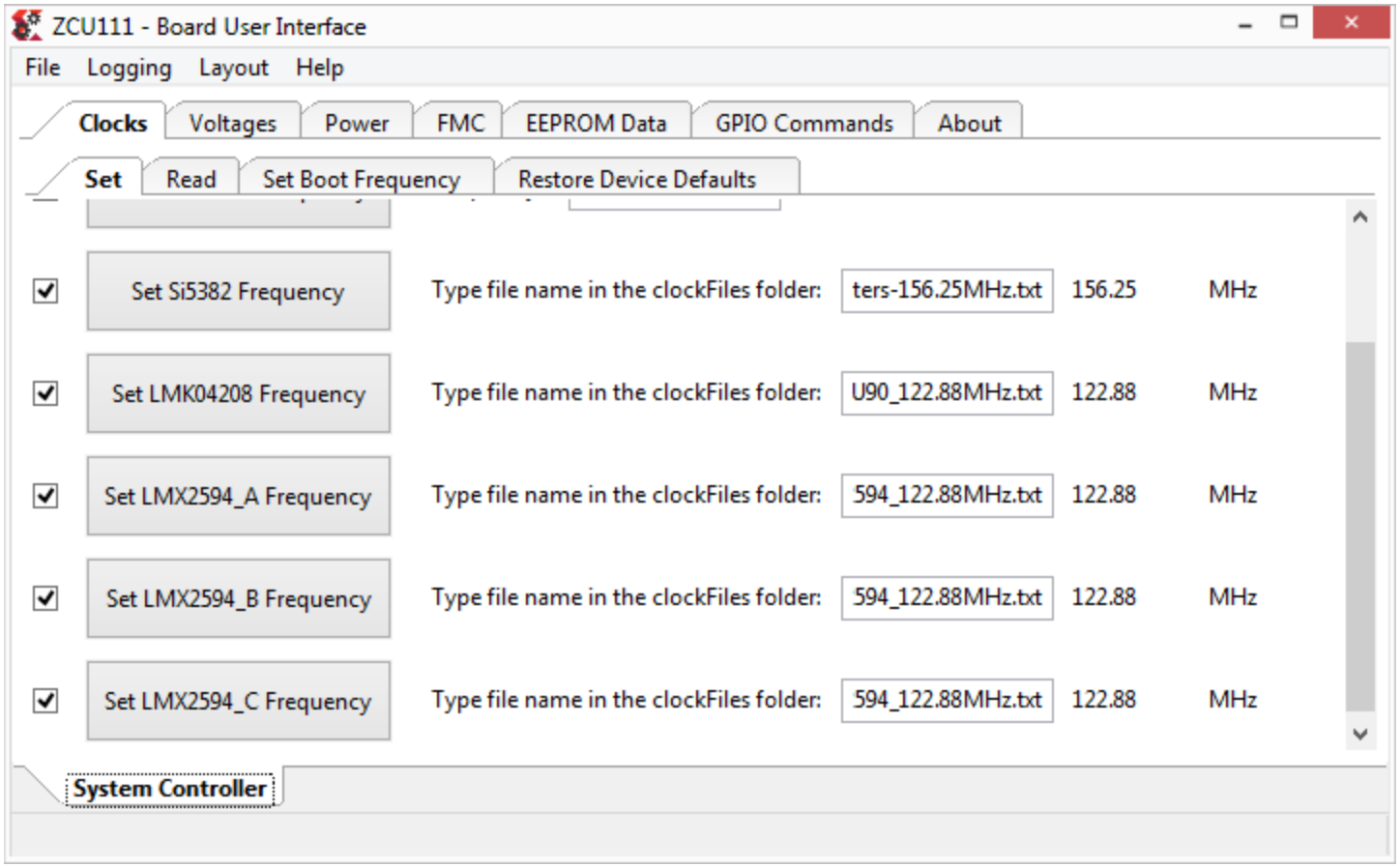
- **The ClockBuilder files are included with RDF0469**




**Note:** Requires the “MHz” in the name

# Setting the clocks

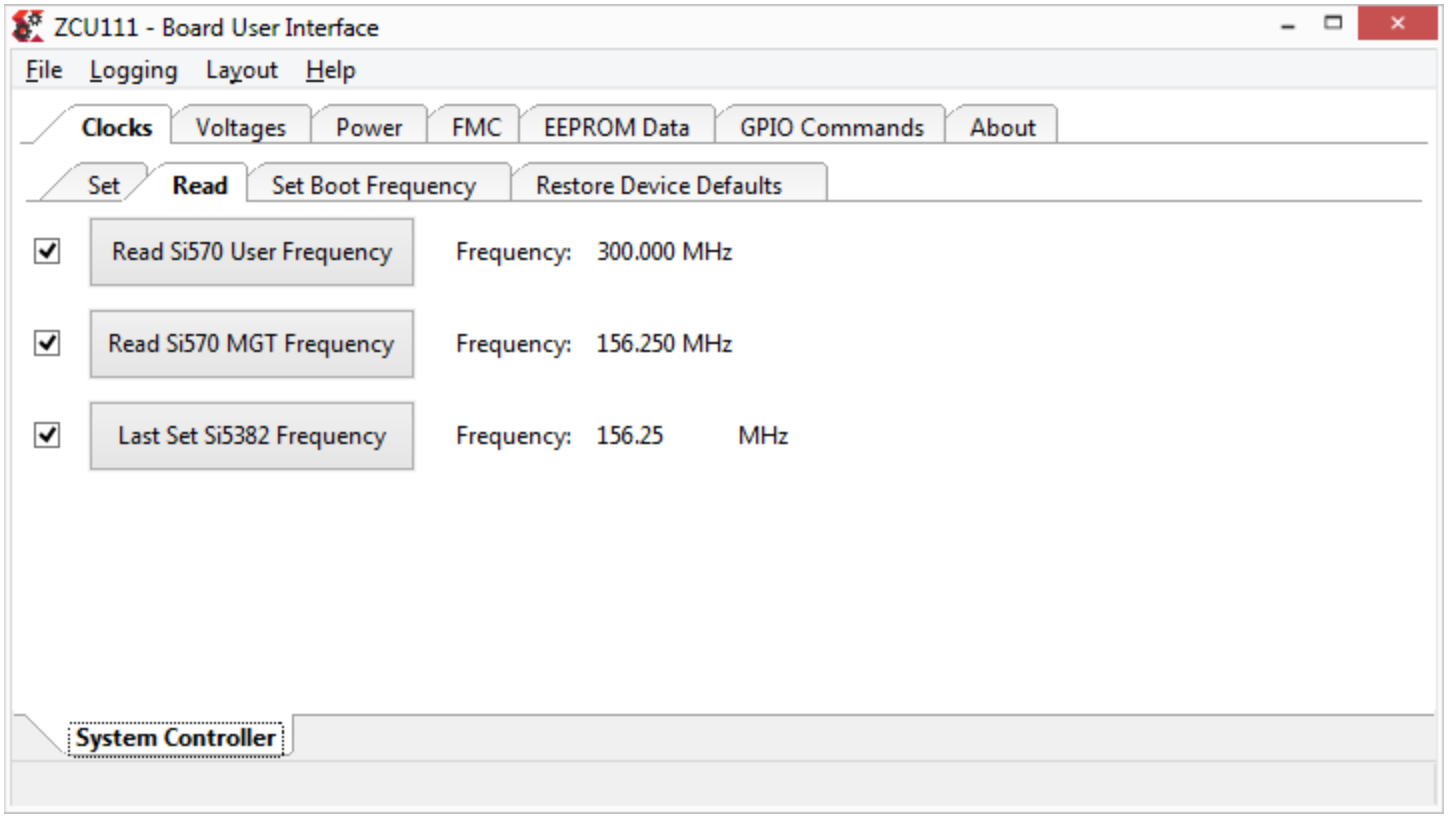
- **Enter the file names as shown below, and press the Set buttons**
  - Si5382A-RevE-ZCU111-Registers-156.25MHz.txt
  - ZCU111_RevA_01132018_U90_122.88MHz.txt
  - ZCU111_RevA_01152018_U102_103_104__LMX2594_122.88MHz.txt




**Note:** Shows the frequency after setting

# Reading the clocks

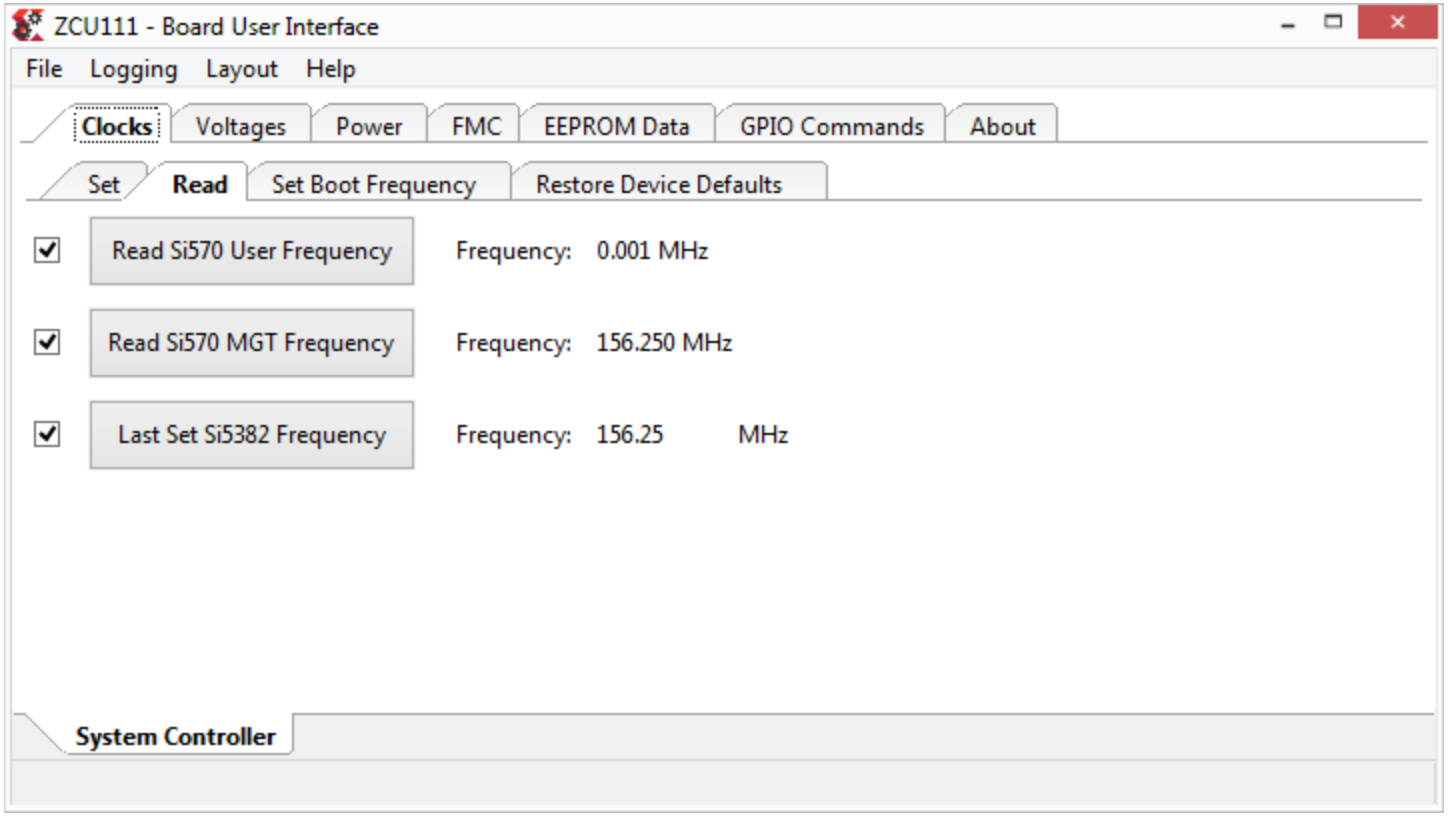
- Select the Read tab
- Click each of the Read buttons and verify the frequencies are set as shown




**Note:** Presentation applies to the ZCU111

# Reading the clocks

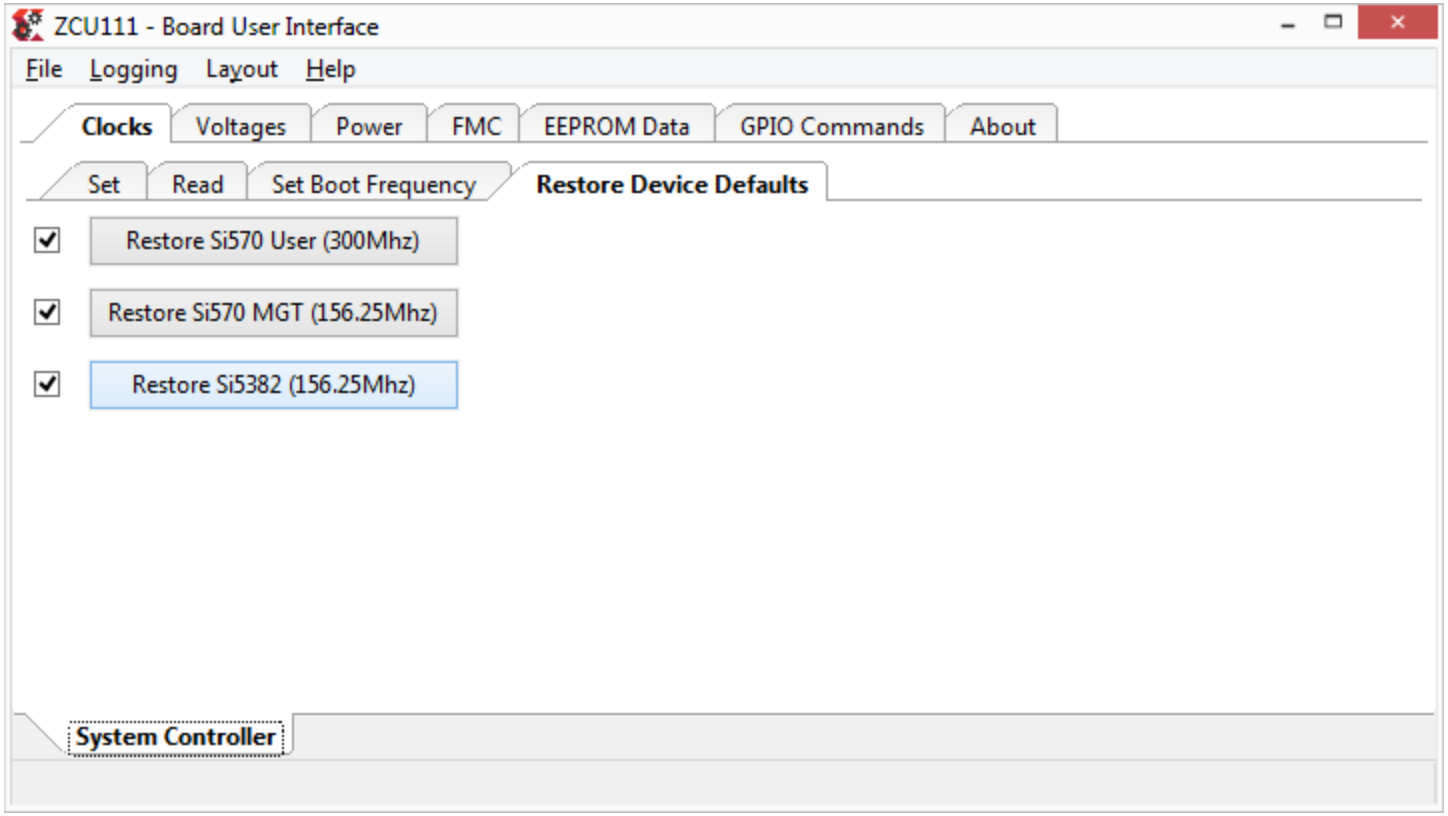
- **If some of the frequencies show up different, you will need to restore the defaults**




**Note:** Presentation applies to the ZCU111

# Restore Default Clock settings

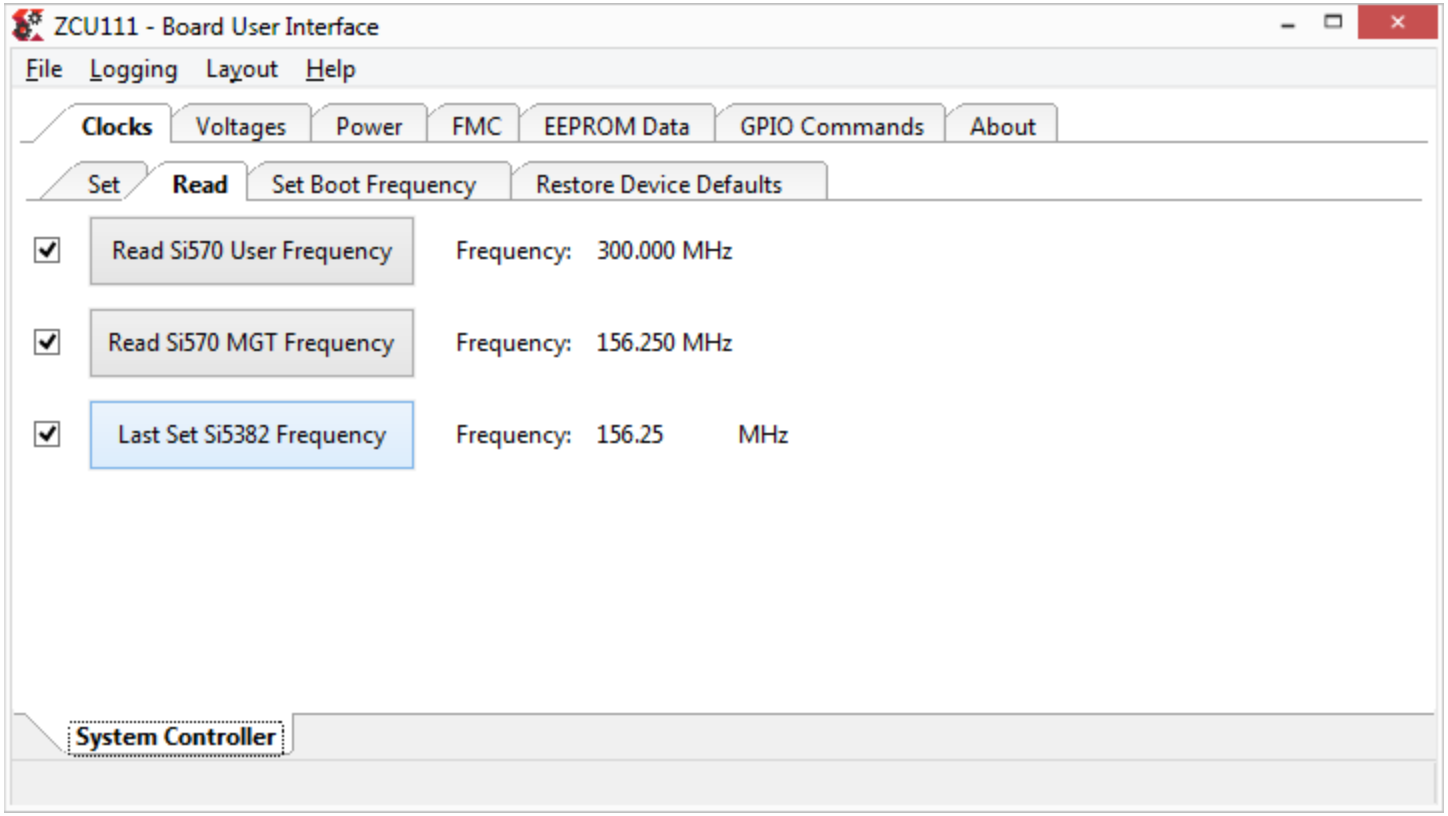
- **Select the Restore Device Defaults tab**
  - Restore the defaults by clicking the button associated with the clock you want to restore (300 MHz, 156.25 MHz, and 156.25 MHz)




**Note:** Presentation applies to the ZCU111

# Restore Default Clock settings

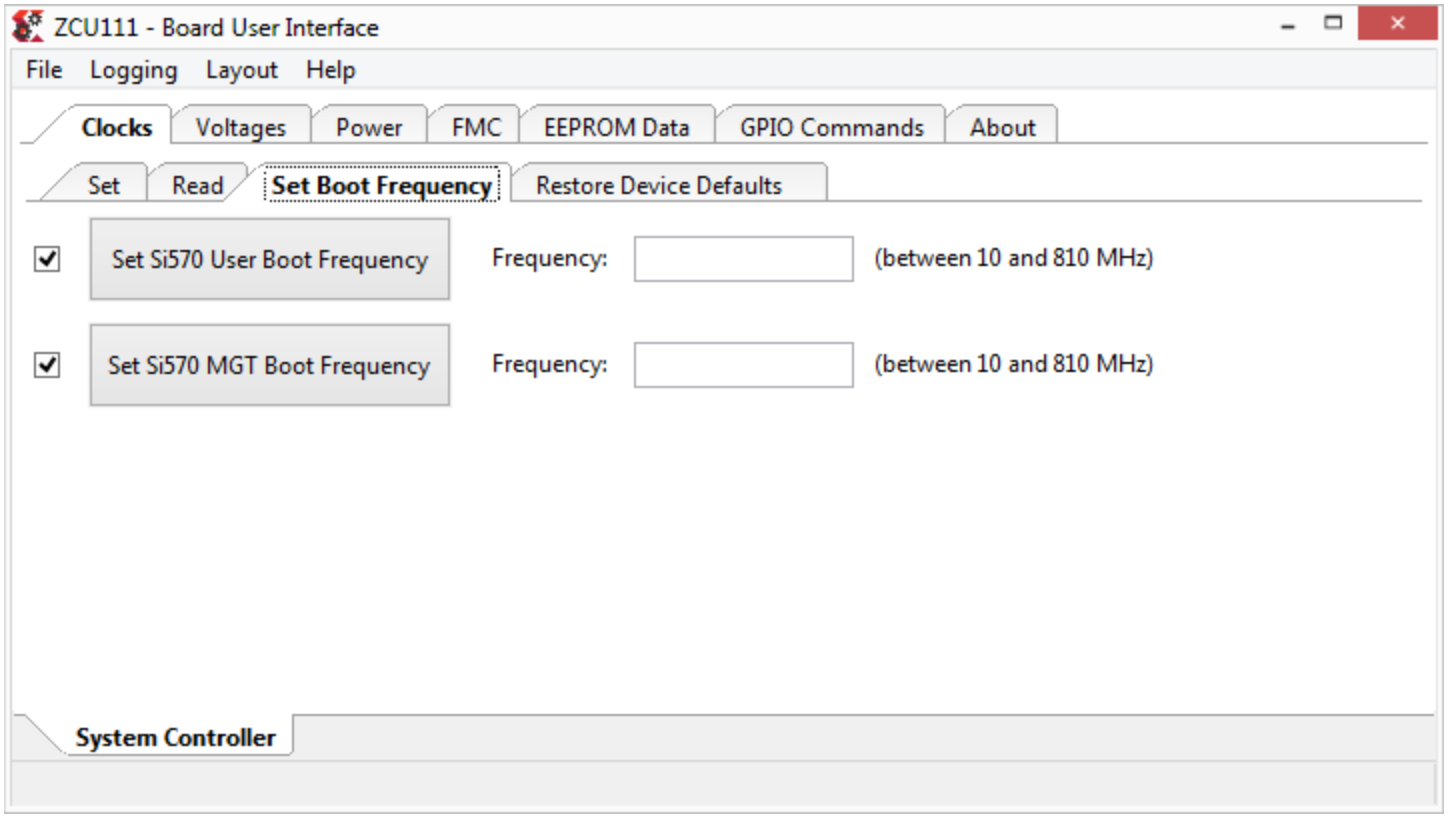
> **Return to the Read tab and verify the settings are correct**




**Note:** Presentation applies to the ZCU111

# Setting Clock Boot Frequencies

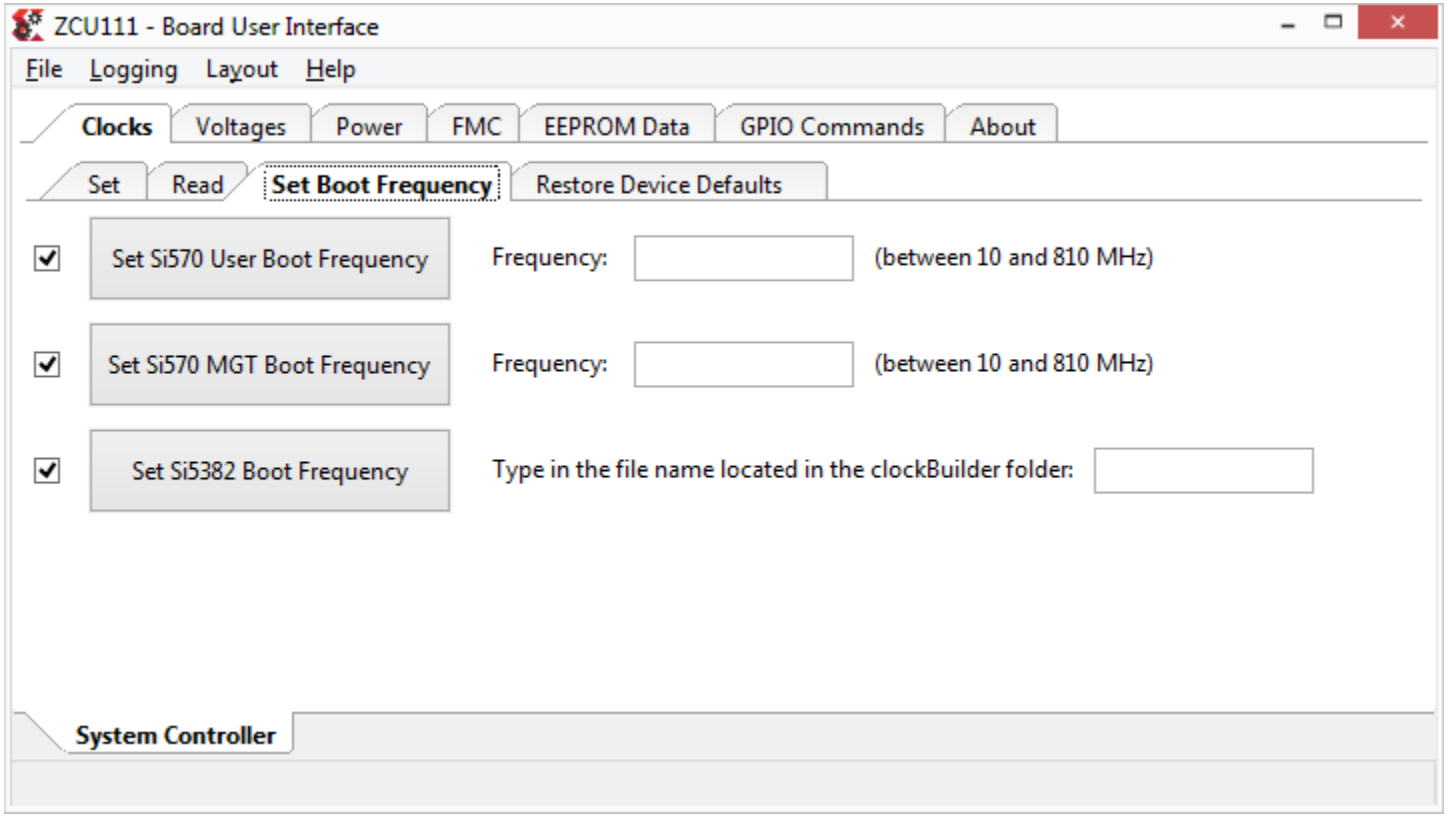
- Select the Set Boot Frequency tab
- Type in your desired boot-up frequency and click the corresponding Set button




**Note:** Presentation applies to the ZCU111

# Setting Clock Boot Frequencies

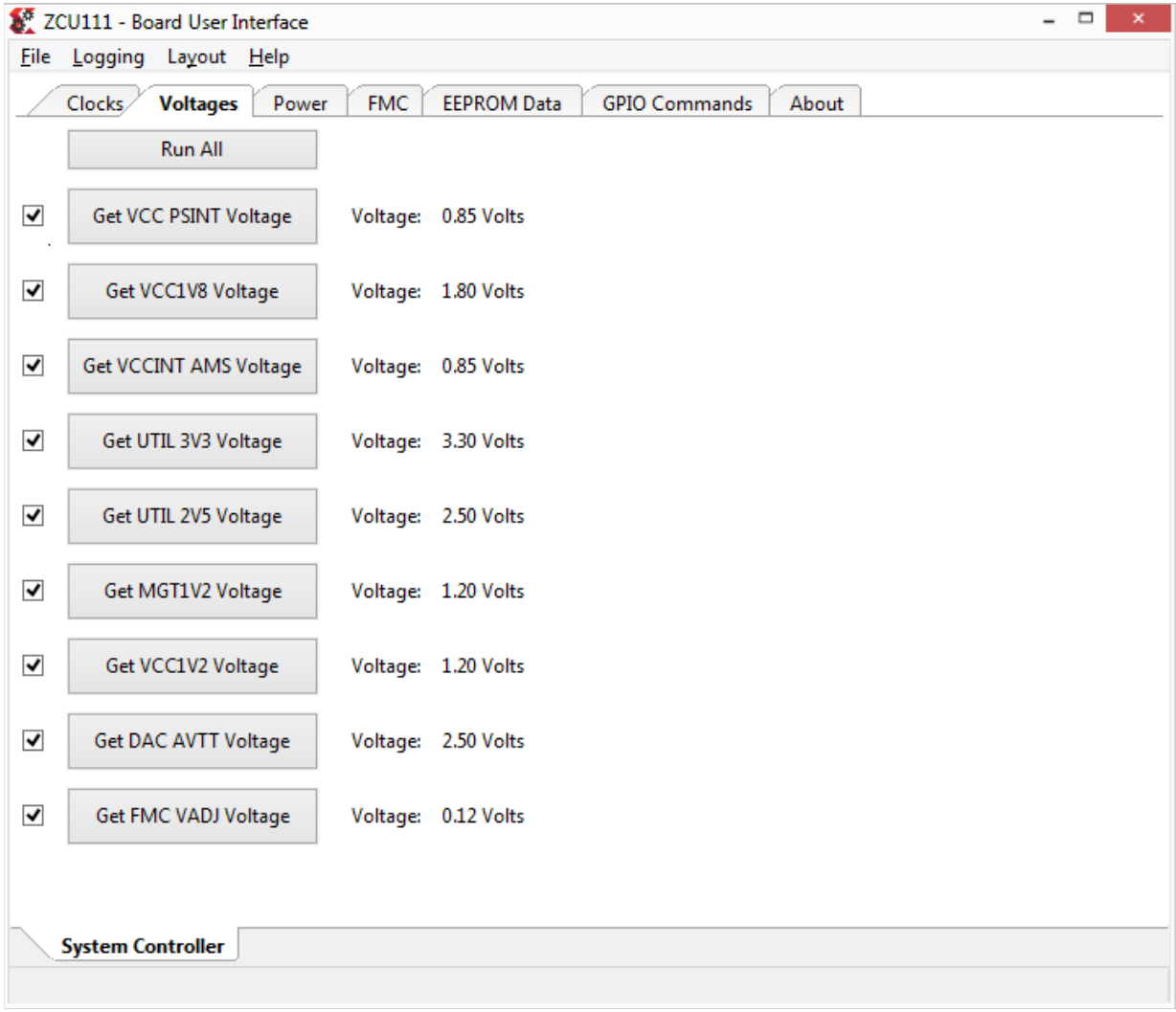
- **Note: The Set Boot Frequency settings will override the Restore Device Defaults at Bootup**
- **The example designs, IBERT, IPI, MIG, etc., expect Si570 User set to 300 MHz, and Si570 MGT set to 156.25 MHz**



# 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

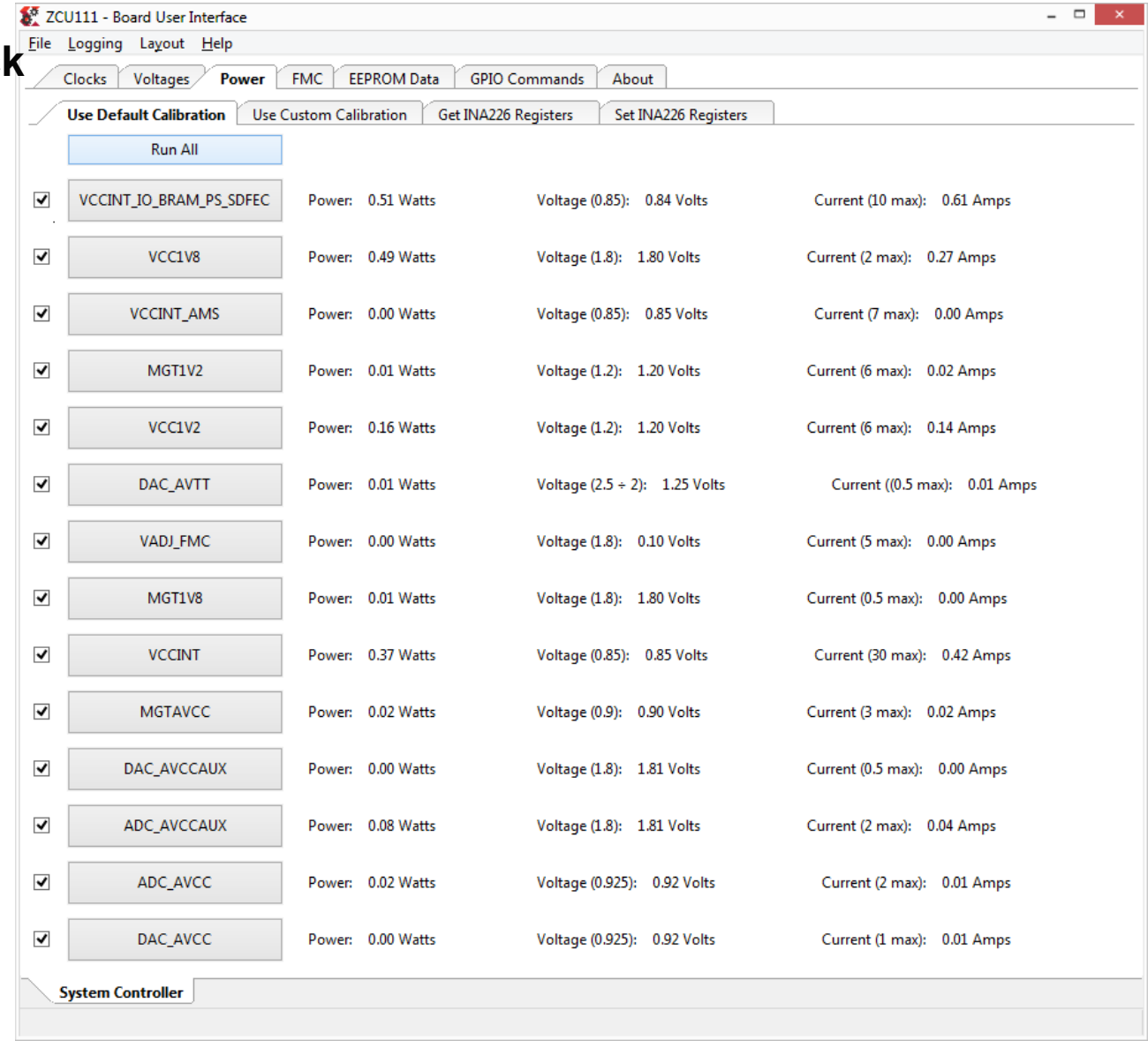



**Note:** Presentation applies to the ZCU111

# Power

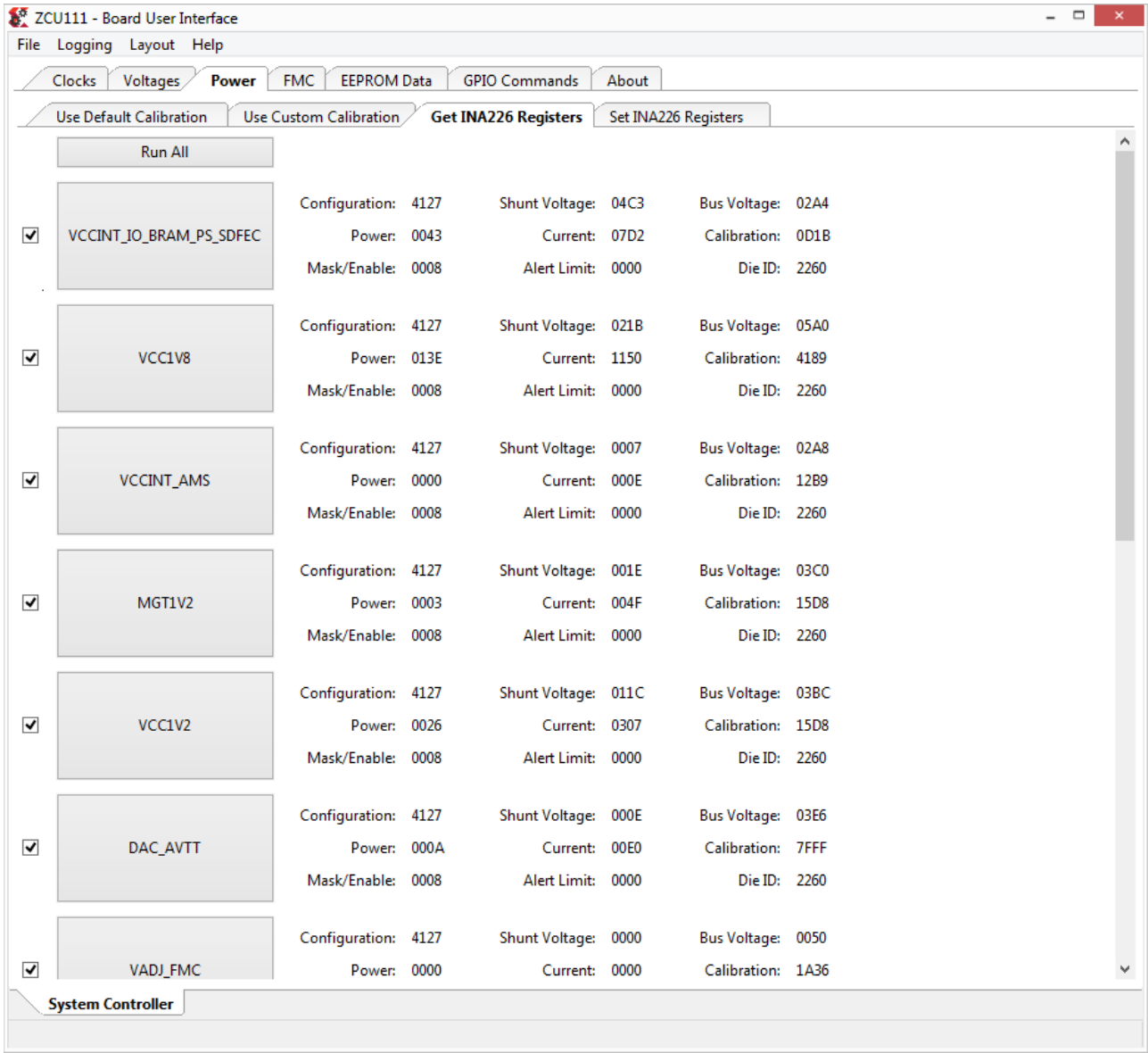
# Reading power values using default calibration

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



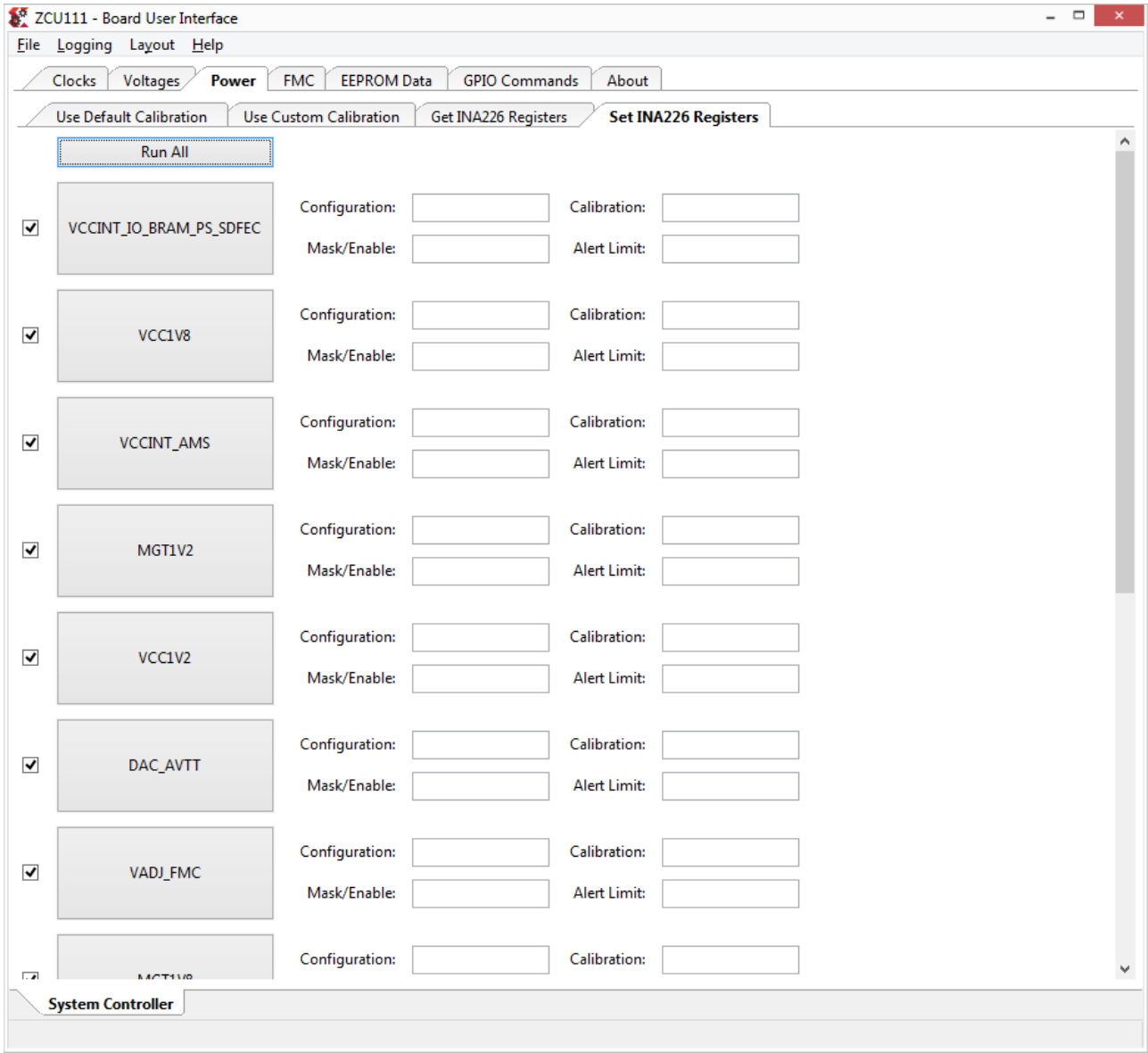
# Read INA226 Registers

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



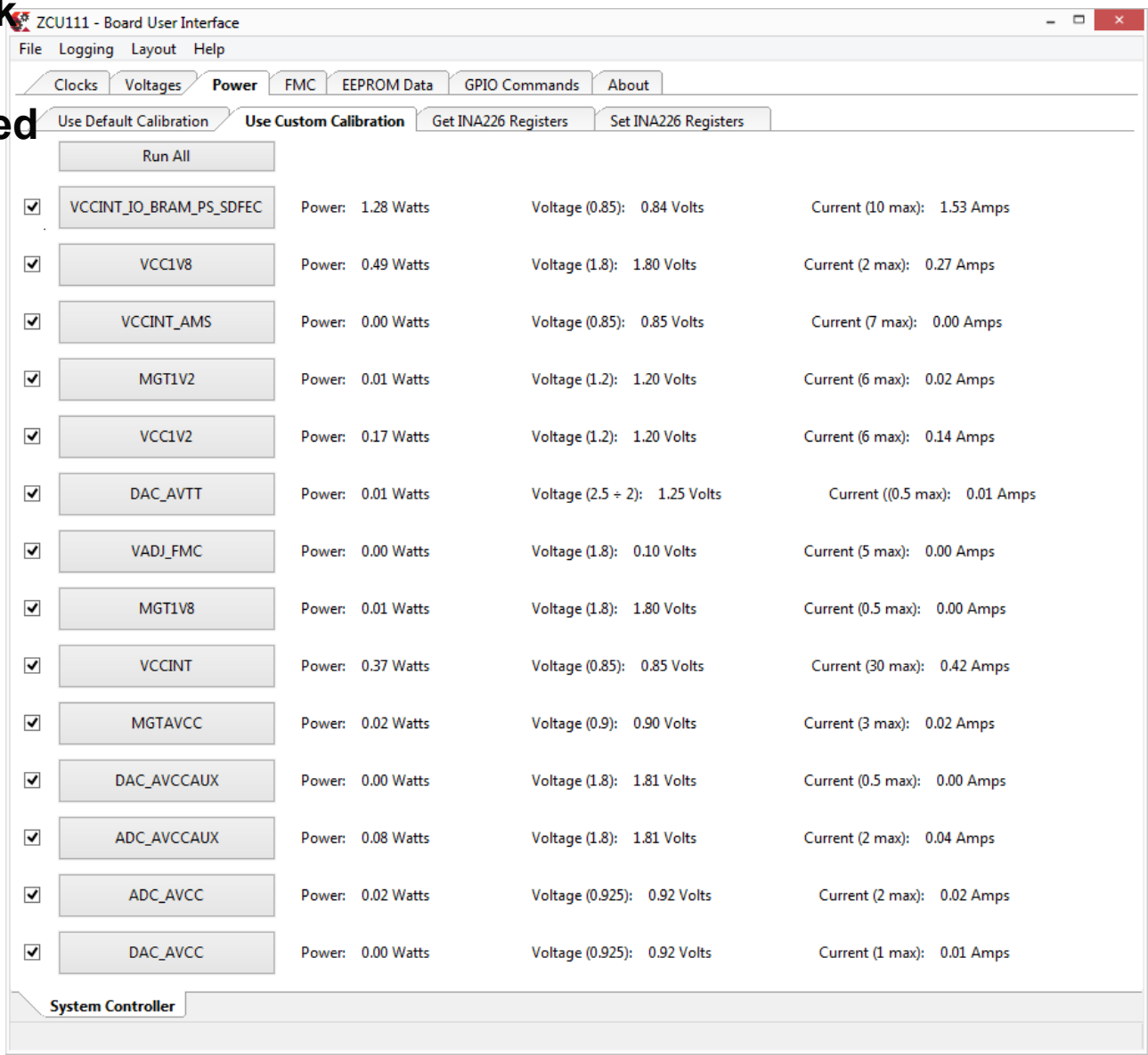
# Set INA226 Registers

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



# Reading power values using custom calibration

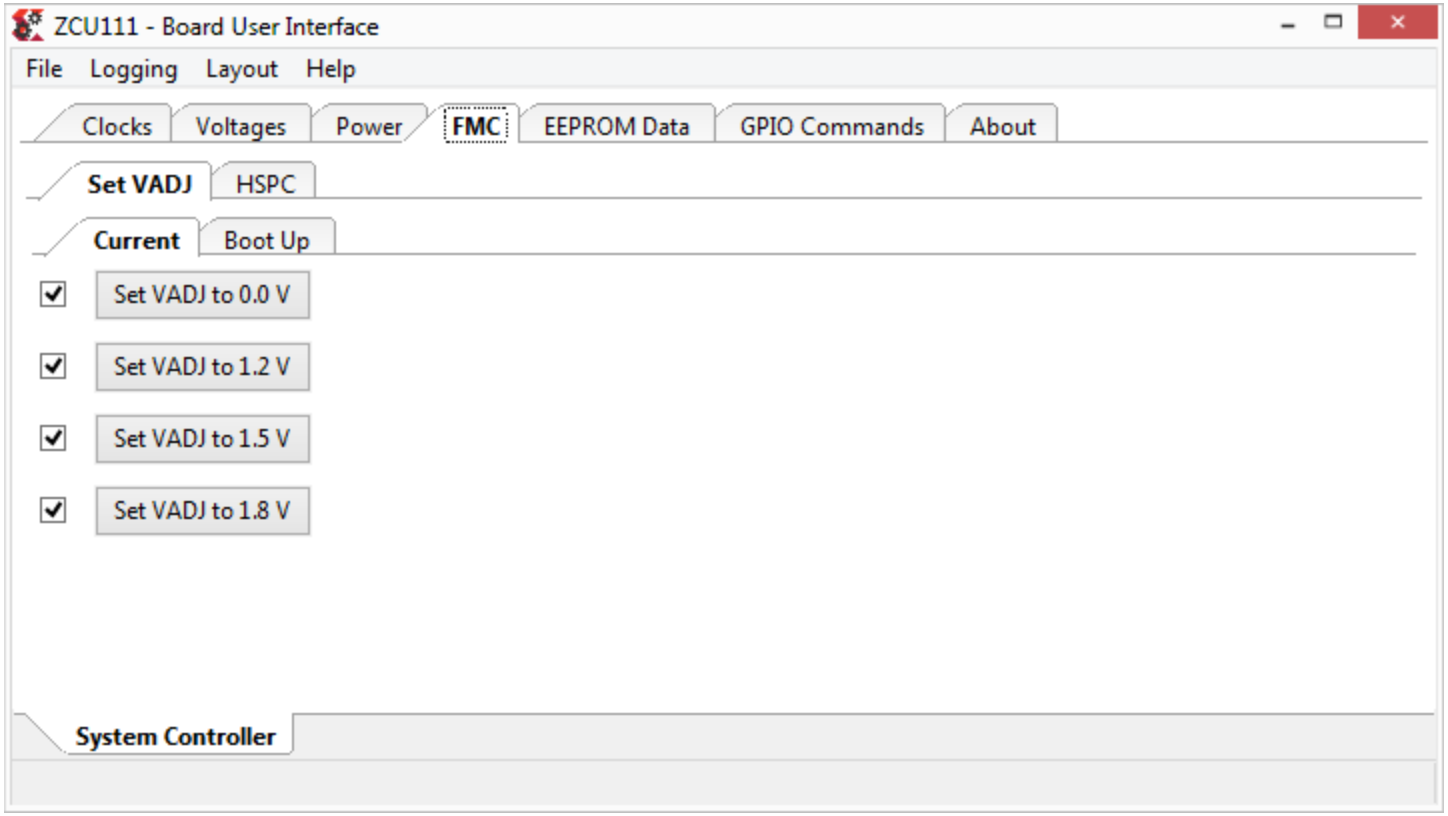
- **Select the Use Custom Calibration tab and click the Run All button (no calibrations were entered in this example)**



# FMC

# Set VADJ

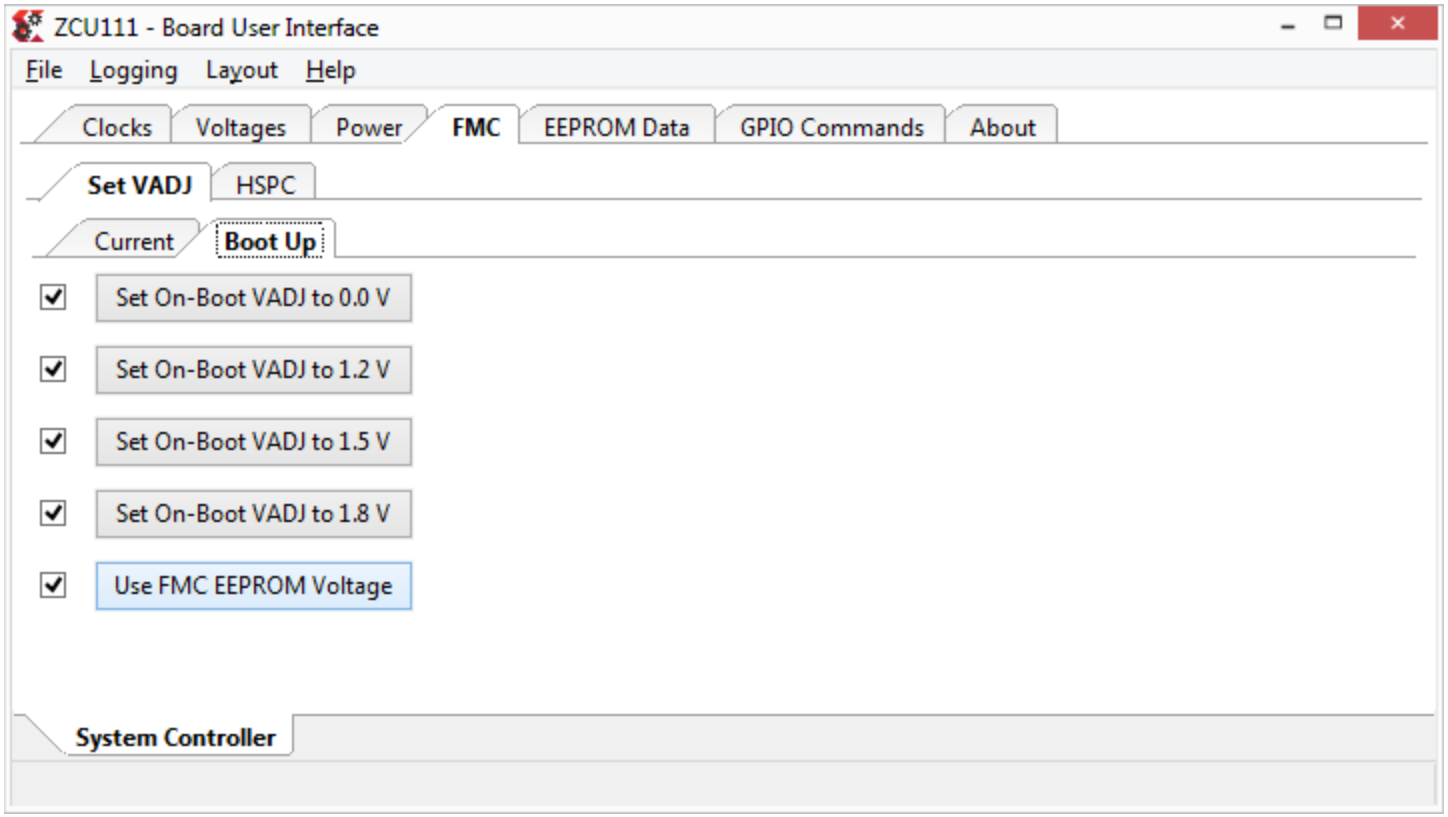
- Select the Set VADJ tab underneath the FMC tab
- Under the Current tab, select the desired VADJ voltage
- Some BIT tests expect 1.8 V




**Note:** Presentation applies to the ZCU111

# Set Boot-Up VADJ

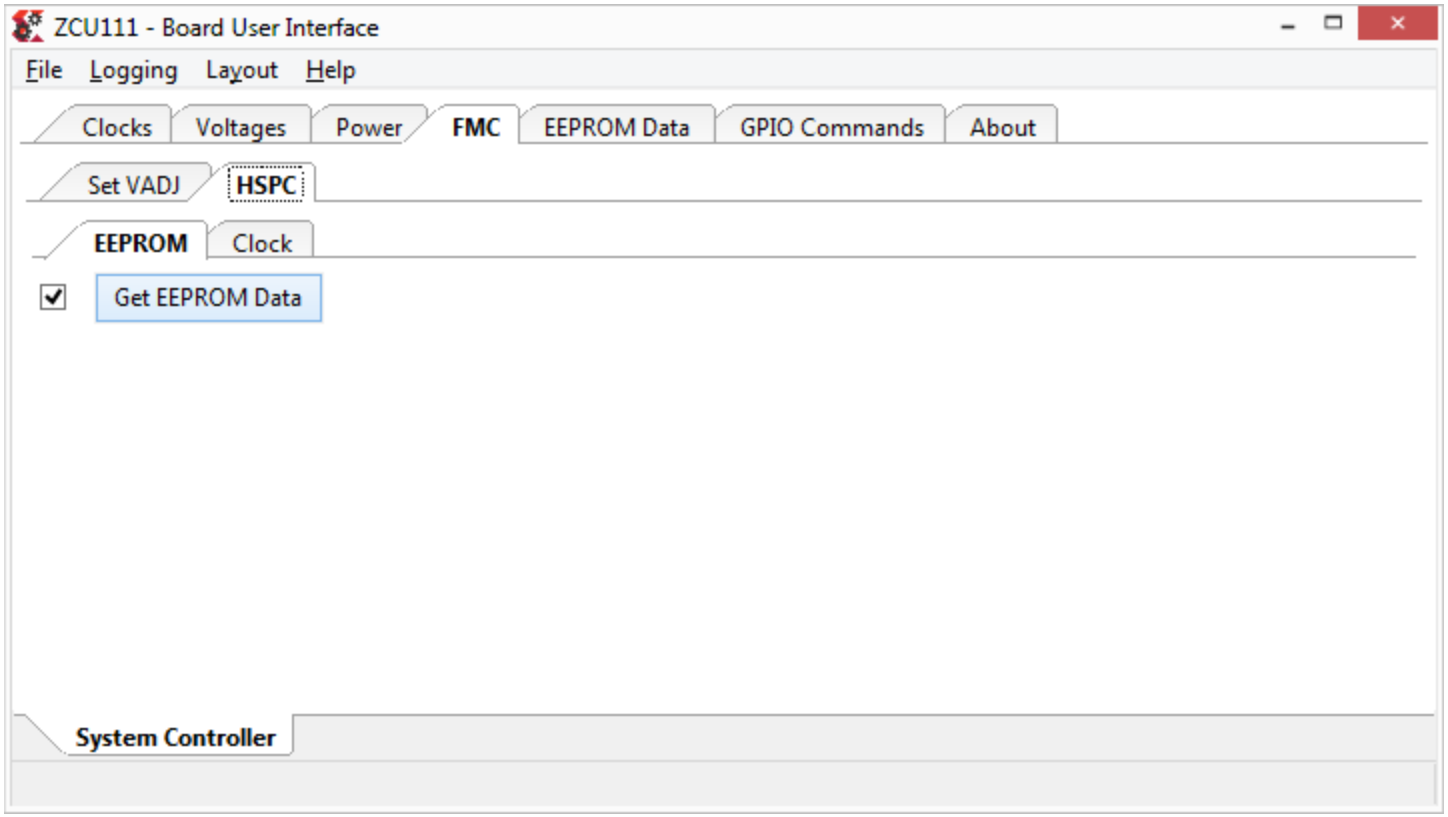
- Select the Boot-up tab and choose the desired power-on voltage
- The default, Use FMC EEPROM Voltage, will set 1.8 V unless you attach an FMC card with a different setting




**Note:** Presentation applies to the ZCU111

# Reading FMC EEPROM

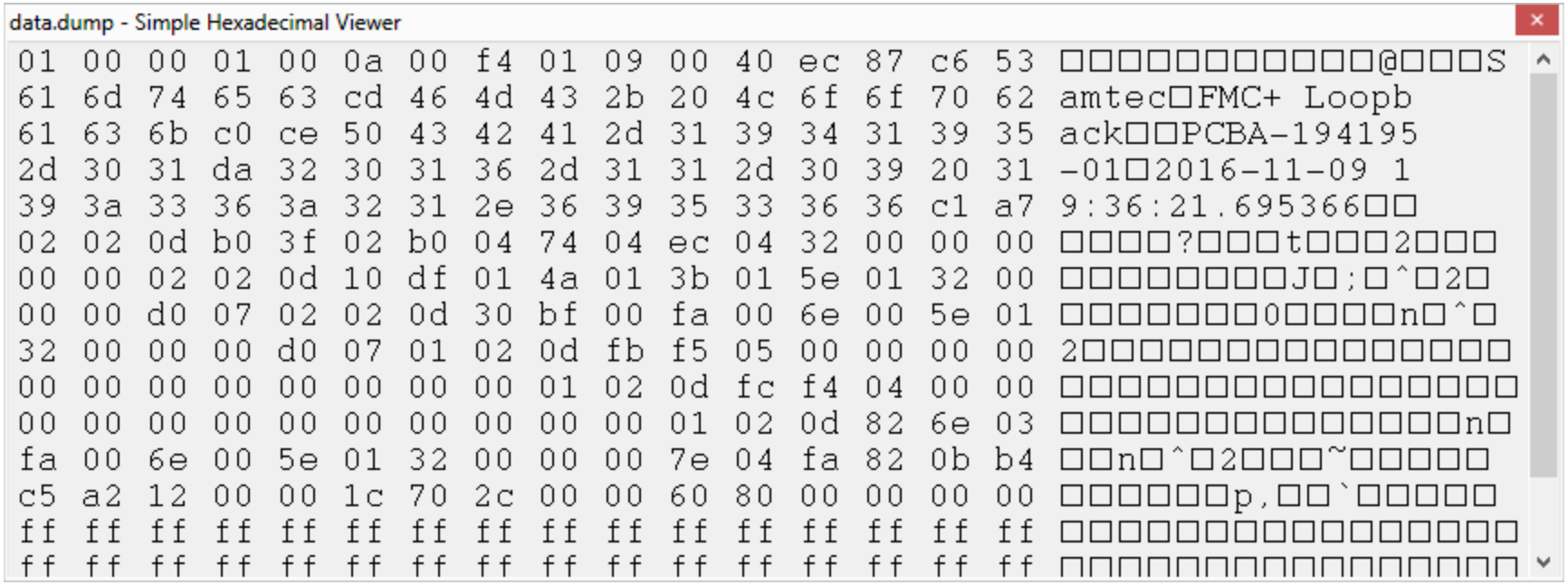
- With an optional FMC+ card attached, select the HSPC tab
- Click the Get EEPROM Data button




**Note:** Presentation applies to the ZCU111

# Reading FMC EEPROM

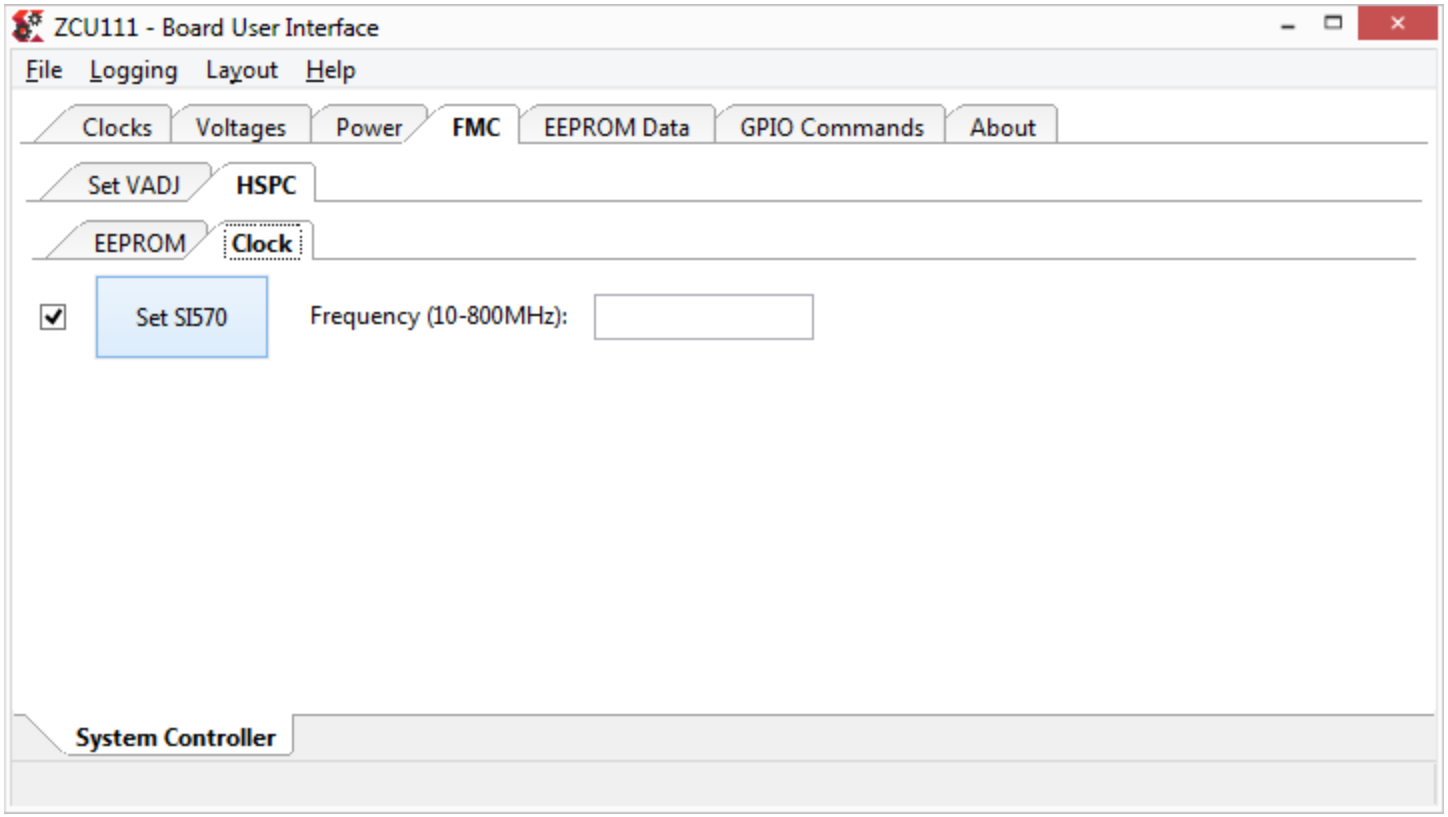
- **The EEPROM data will be displayed in a separate window (Samtec HSPC card data shown)**




**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

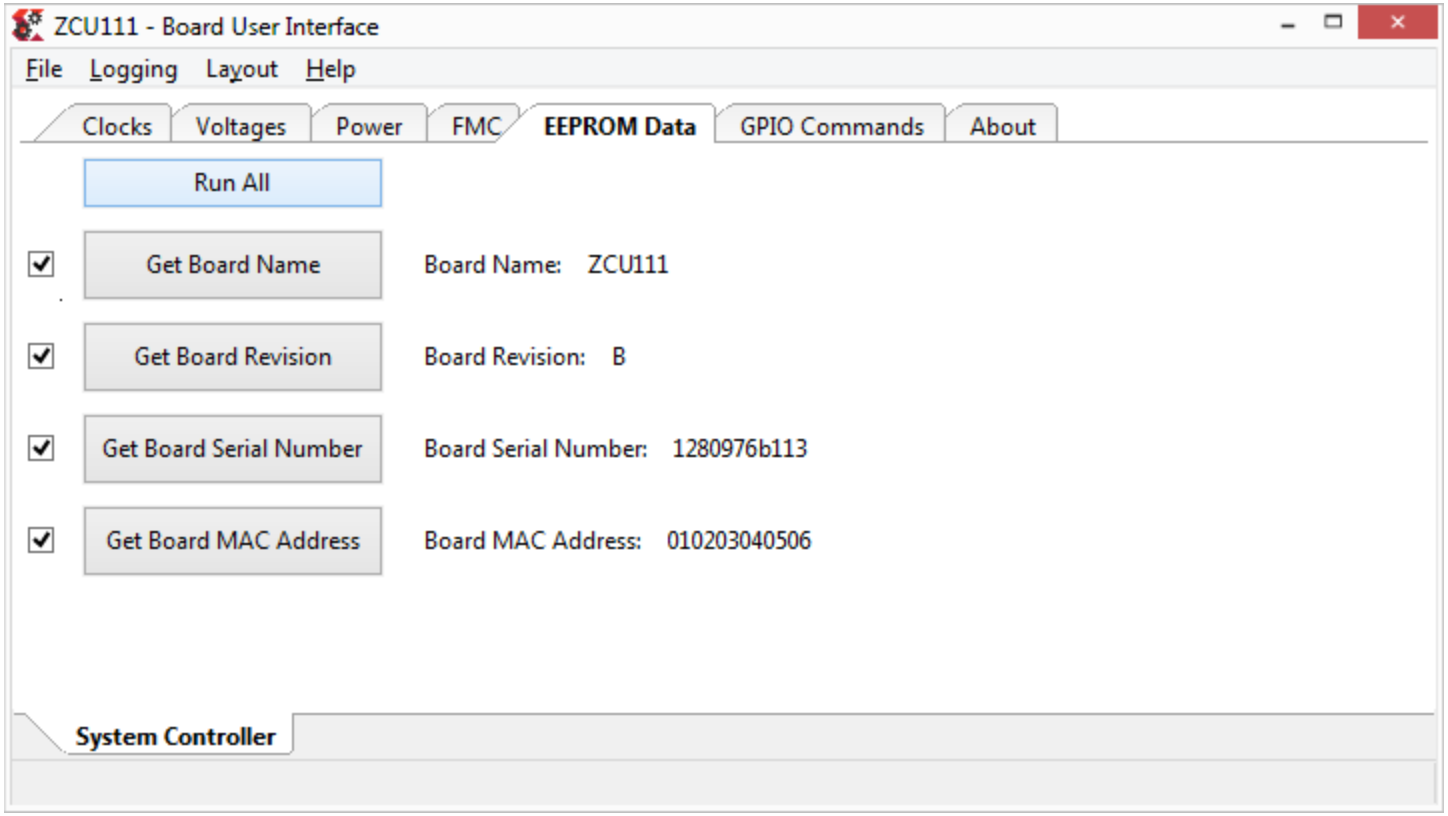



**Note:** IBERT uses the default clock of 156.25 MHz

# EEPROM Data

# Reading the Board EEPROM Data

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

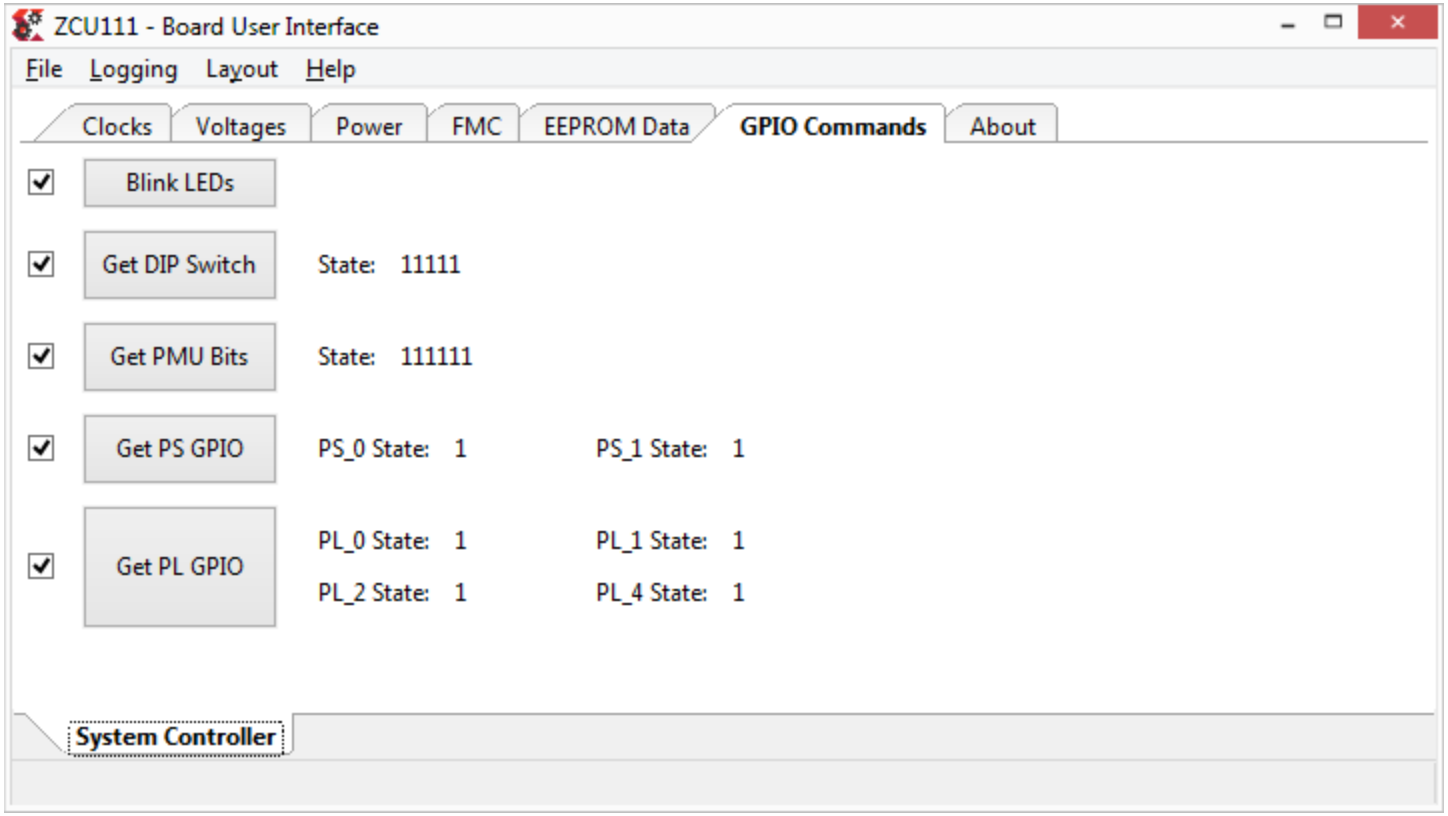



**Note:** Presentation applies to the ZCU111

# GPIO Commands

# Set GPIOs

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

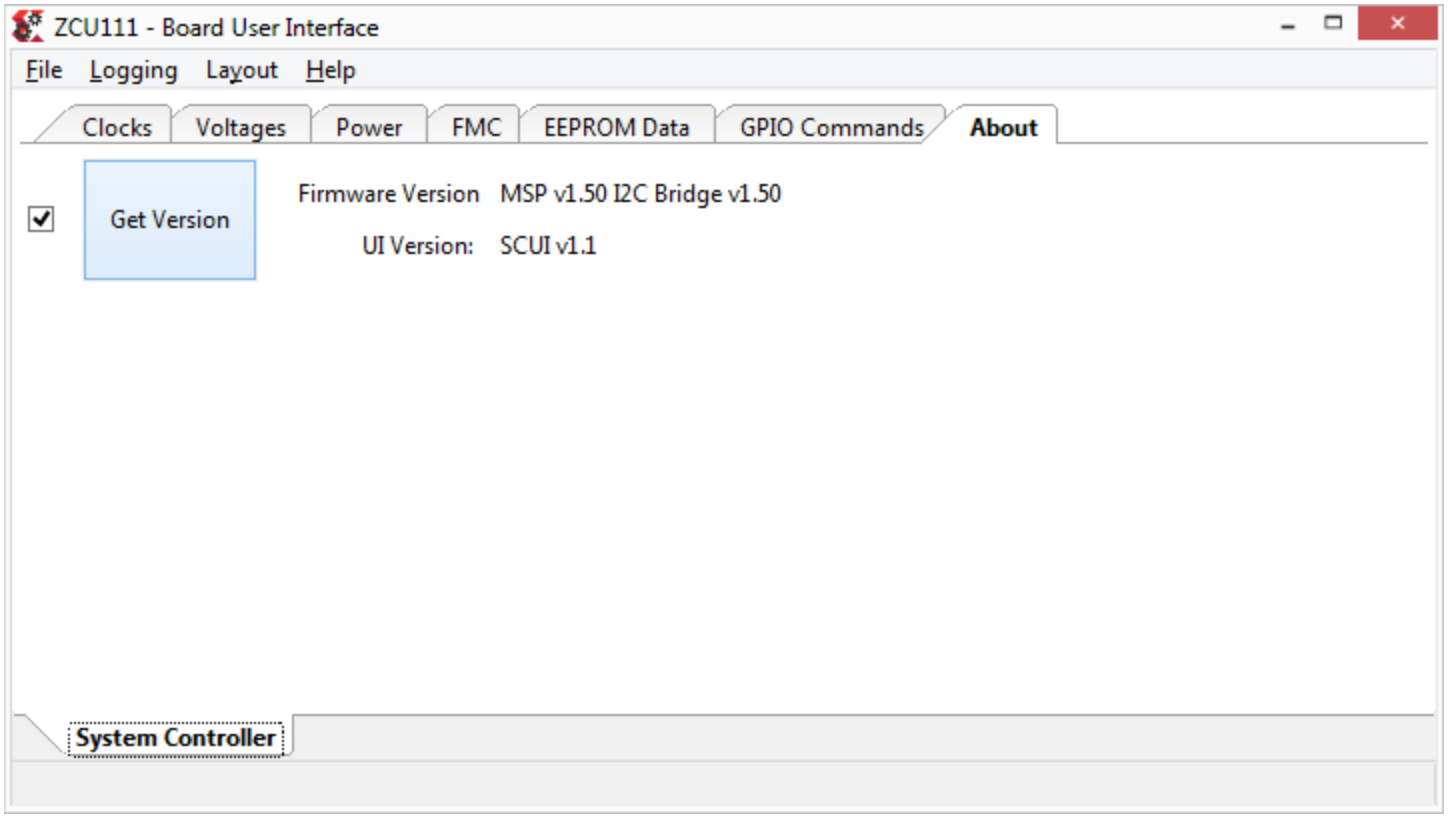



**Note:** Presentation applies to the ZCU111

# About

# Reading version information

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

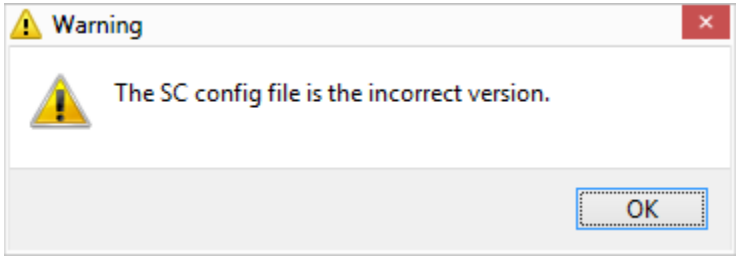


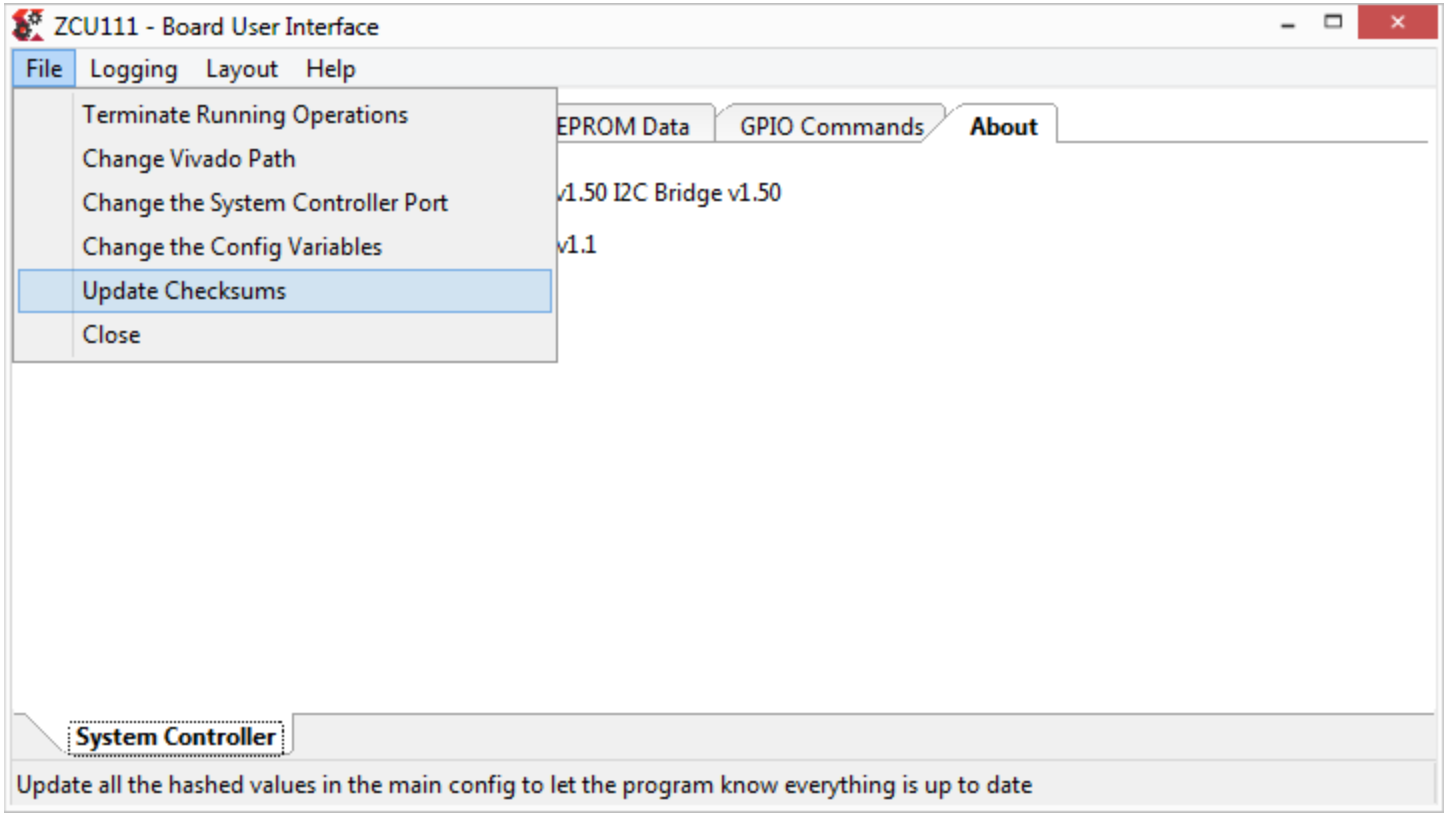

**Note:** Presentation applies to the ZCU111

# 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