## Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>07/26/19</td>
<td>11.1</td>
<td>Minor update of details on VADJ and MIG.</td>
</tr>
<tr>
<td>05/29/19</td>
<td>11.0</td>
<td>Updated for 2019.1.</td>
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<tr>
<td>02/25/19</td>
<td>10.1</td>
<td>Updated document format.</td>
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<tr>
<td>12/10/18</td>
<td>10.0</td>
<td>Updated for 2018.3.</td>
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<tr>
<td>06/18/18</td>
<td>9.0</td>
<td>Updated for 2018.2.</td>
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<tr>
<td>04/09/18</td>
<td>8.0</td>
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<tr>
<td>12/20/17</td>
<td>7.0</td>
<td>Updated for 2017.4.</td>
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<tr>
<td>10/09/17</td>
<td>6.0</td>
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<td>04/19/17</td>
<td>4.0</td>
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<td>12/19/16</td>
<td>3.0</td>
<td>Updated for 2016.4.</td>
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<tr>
<td>10/13/16</td>
<td>2.0</td>
<td>Updated for SCUI version 1.1.</td>
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Overview

> Xilinx ZCU102 Board
> Updating the Firmware
> ZCU102 SCUI
  > Clocks
  > Voltages
  > Power
  > FMC
  > GTR MUX
  > EEPROM Data
  > GPIO Commands
  > System Monitor
  > About

> References

Note: This presentation applies to the ZCU102
Xilinx ZCU102 Board

Note: Presentation applies to the ZCU102
ZCU102 Software Install and Board Setup

> Refer to XTP435 – ZCU102 Software Install and Board Setup for details on:
  >> Software Requirements
  >> ZCU102 Board Setup

Note: Presentation applies to the ZCU102
ZCU102 System Controller Files

➢ Open the RDF0382 – ZCU102 System Controller GUI (2019.1 C) ZIP file
   ▷ Extract these files to your C:\ drive
Updating the Firmware
Updating the Firmware

- This System Controller GUI requires the latest version of firmware
- Xilinx recommends all ZCU102 users update their MSP430 firmware to the latest version
- You can determine the firmware version by opening a Terminal, connected to Interface 3:

![Terminal connection interface](image)

Note: Presentation applies to the ZCU102
Updating the Firmware

> In this terminal, after power on, type:
  
  @ver

> The timestamp of the firmware will appear

> Any firmware with a timestamp before Jul 5 2017 should be updated

Note: Presentation applies to the ZCU102
Updating the Firmware

To update the firmware, attach two jumpers across J164 as shown.

Note: Presentation applies to the ZCU102
Updating the Firmware

- Note: Some older ZCU102 boards, such as Rev D.2, do not have J164. For these boards, connect two long jumpers:
  - From J87 (PMOD1), Pin 1 to J92, Pin 11
  - From J87 (PMOD1), Pin 3 to J92, Pin 8

Note: Presentation applies to the ZCU102
Updating the Firmware

- Run the BIT.exe from C:\zcu102_scui\flash_restore

**Note:** Close the Terminal Window before restoring flash
Running the System Controller GUI
Running the System Controller GUI

> From C:\zcu102_scui, double click on BoardUI.exe
> Enter the board serial number and MAC ID
> Click OK

Note: Presentation applies to the ZCU102
Clocks
Setting the clocks

- Select the Set tab underneath the Clocks tab
- Enter 156.25 for the Si5328 and click the Set Si5328 Frequency button (takes a long moment to complete)

Note: Presentation applies to the ZCU102
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 ZCU102
Reading the clocks

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

Note: Presentation applies to the ZCU102
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 0 MHz)

**Note:** Presentation applies to the ZCU102
Restore Default Clock settings

- Return to the Read tab and verify the settings are correct

Note: Presentation applies to the ZCU102
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 ZCU102
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/Si5328 set to 156.25 MHz.

Note: Presentation applies to the ZCU102.
Voltages
Reading onboard ZCU102 voltages

> Under the Voltages tab, click the Run all checked buttons button
> Observe the ZCU102 voltages
Power
Reading power values using default calibration

> Select the Use Default Calibration tab underneath Power
> Under the PS Side tab, click the Run all button
Reading power values using default calibration

› Under the PL Side tab, click the Run all button

<table>
<thead>
<tr>
<th>Source</th>
<th>Power</th>
<th>Voltage</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCCINT</td>
<td>0.21 W</td>
<td>0.85 V</td>
<td>0.22 A</td>
</tr>
<tr>
<td>VCCBRAM</td>
<td>0.02 W</td>
<td>0.85 V</td>
<td>0.02 A</td>
</tr>
<tr>
<td>VCCAUX</td>
<td>0.33 W</td>
<td>1.79 V</td>
<td>0.19 A</td>
</tr>
<tr>
<td>VCC1V2</td>
<td>0.03 W</td>
<td>1.20 V</td>
<td>0.02 A</td>
</tr>
<tr>
<td>VCC3V3</td>
<td>0.03 W</td>
<td>3.30 V</td>
<td>0.01 A</td>
</tr>
<tr>
<td>VADJ_FMC</td>
<td>0.02 W</td>
<td>1.80 V</td>
<td>0.01 A</td>
</tr>
<tr>
<td>MGTAVCC</td>
<td>0.01 W</td>
<td>0.90 V</td>
<td>0.01 A</td>
</tr>
<tr>
<td>MGTAVTT</td>
<td>0.01 W</td>
<td>1.20 V</td>
<td>0.00 A</td>
</tr>
</tbody>
</table>
Read INA226 Registers

- Select the Get INA226 Registers tab
- Under the PS Side tab, click the Run all button and observe the INA226 Registers settings
Read INA226 Registers

> Select the Get INA226 Registers tab

> Under the PL Side tab, click the Run all button and observe the INA226 Registers settings
Set INA226 Registers

> Select the Set INA226 Registers tab

> Under the PS Side tab, set any desired calibrations

> Review TI INA226 documentation before making changes
Set INA226 Registers

- Select the Set INA226 Registers tab
- Under the PL Side tab, set any desired calibrations
- Review [TI INA226](https://www.ti.com/lit/ds/symlink/ina226.pdf) documentation before making changes
Reading power values using custom calibration

> Select the Use Custom Calibration tab
> Under the PS Side tab, click the Run all checked buttons button (no calibrations were entered in this example)
Reading power values using custom calibration

> Select the Use Custom Calibration tab

> Under the PL Side tab, click the Run all checked buttons button (no calibrations were entered in this example)
Set VADJ

- Select the Set VADJ tab underneath the FMC tab
- Under the Current tab, select the desired VADJ voltage
- PL MIG requires a voltage (1.2 to 1.8V) to operate
- BIT (XTP428) will force VADJ to 1.8 V for any test that needs VADJ
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 ZCU102
Reading FMC EEPROM

> Select the HPC0 or HPC1 tab depending on which FMC slot your FMC card is attached to
> Click the Get EEPROM Data button

Note: Presentation applies to the ZCU102
Reading FMC EEPROM

> The EEPROM data will be displayed in a separate window (XM107 data shown)

Note: Presentation applies to the ZCU102
Setting FMC HPC clocks

- With an optional XM107 FMC card attached, select the XM107 tab
- For the IBERT FMC testing, set 163, and click the Set SI570 button

Note: Presentation applies to the ZCU102
GTR MUX
Set GTR MUX

> Select the GTR MUX tab
> Click the corresponding button for the desired setting

**Note:** Presentation applies to the ZCU102
EEPROM Data
Reading the Board EEPROM Data

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

Note: Presentation applies to the ZCU102
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 ZCU102
System Monitor
Reading the FPGA System Monitor Temperatures

- This test requires a bitstream with System Monitor; you can use the BIST bitstream from the QSPI – see XTP434 for details
- Select Temperatures tab under the System Monitor tab and click Run all
Reading the FPGA System Monitor Voltages

- This test requires a bitstream with System Monitor; you can use the BIST bitstream from the QSPI – see XTP434 for details
- Select the System Monitor tab
- Click Run All and observe the readings
About
Reading version information

- Select the About tab
- Click the Get Version button to get MSP430 Firmware version

Note: Presentation applies to the ZCU102
File Changes
File changes

> If you make changes some of the *.yaml files, you may get this warning. Select Update Checksums and restart GUI to resolve.
References
References

> **Vivado Release Notes**
  > Vivado Design Suite 2019 - Vivado Known Issues

> **Vivado Programming and Debugging**
  > Vivado Design Suite Programming and Debugging User Guide – UG908
Documentation

> Zynq UltraScale+
  >> Zynq UltraScale+ MPSoC

> ZCU102 Documentation
  >> Xilinx Zynq UltraScale+ MPSoC ZCU102 Evaluation Kit
  >> ZCU102 Board User Guide – UG1182

> ZCU102 - Known Issues Master Answer Record