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KCU116 Power Bus Reprogramming

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Caution!

> The Maxim PowerTool software used in this presentation can adjust the power supply outputs on the KCU116

> If used improperly, it can seriously damage your KCU116

> Before making any adjustments not specifically covered in this presentation:
  – Understand the power requirements for Virtex UltraScale+ devices
  – Understand the consequences of the change you are making
  – Understand that the MAX20751E PMBus devices can ONLY be programmed 4 times

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Xilinx KCU116 Board

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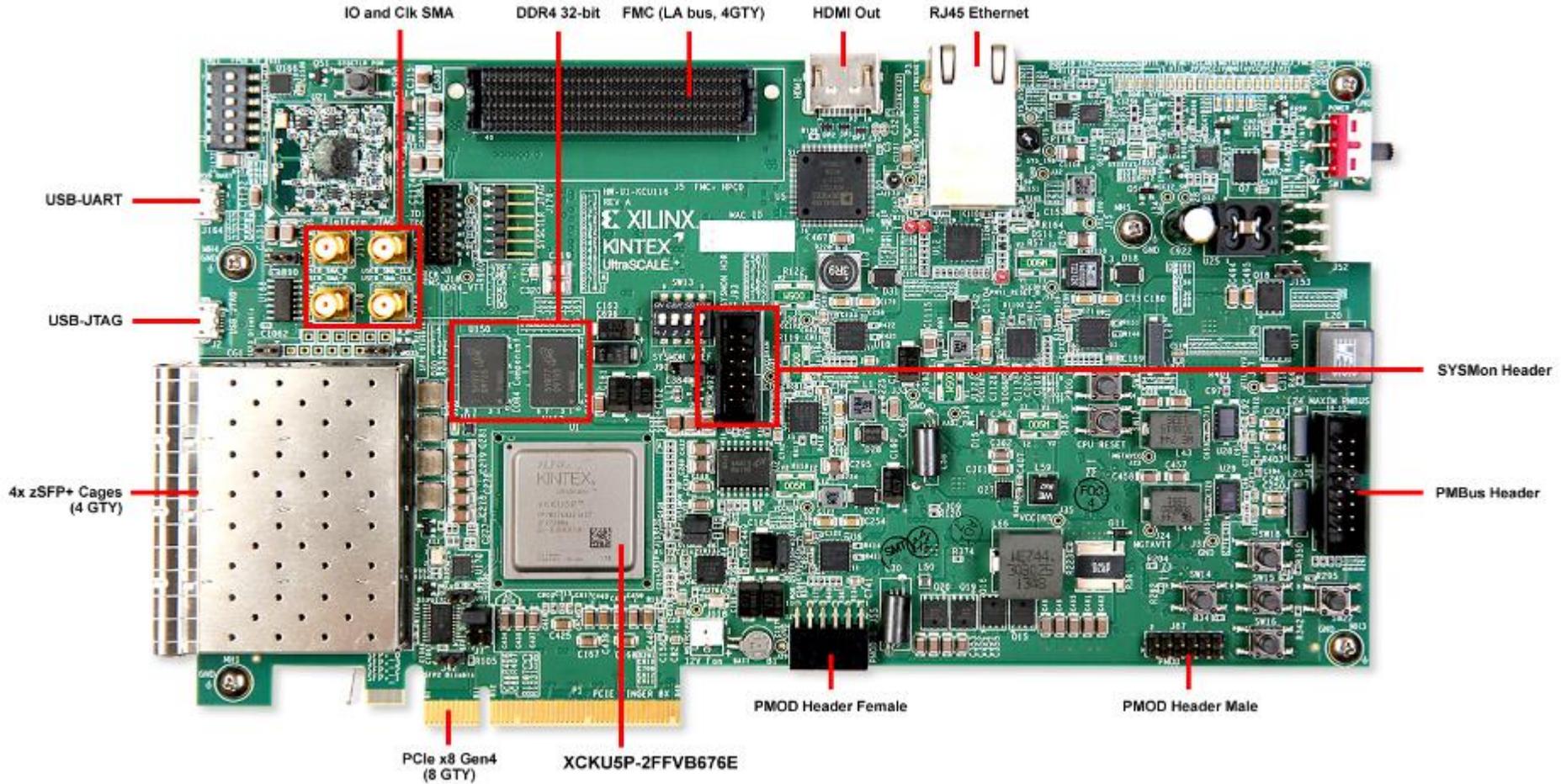
Hardware Requirements

▶ Maxim MAXPOWERTOOL002# USB-to-PMBus interface dongle
– Maxim Part Number: MAXPOWERTOOL002#

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Software Requirements

> ## Maxim Digital Power Tool
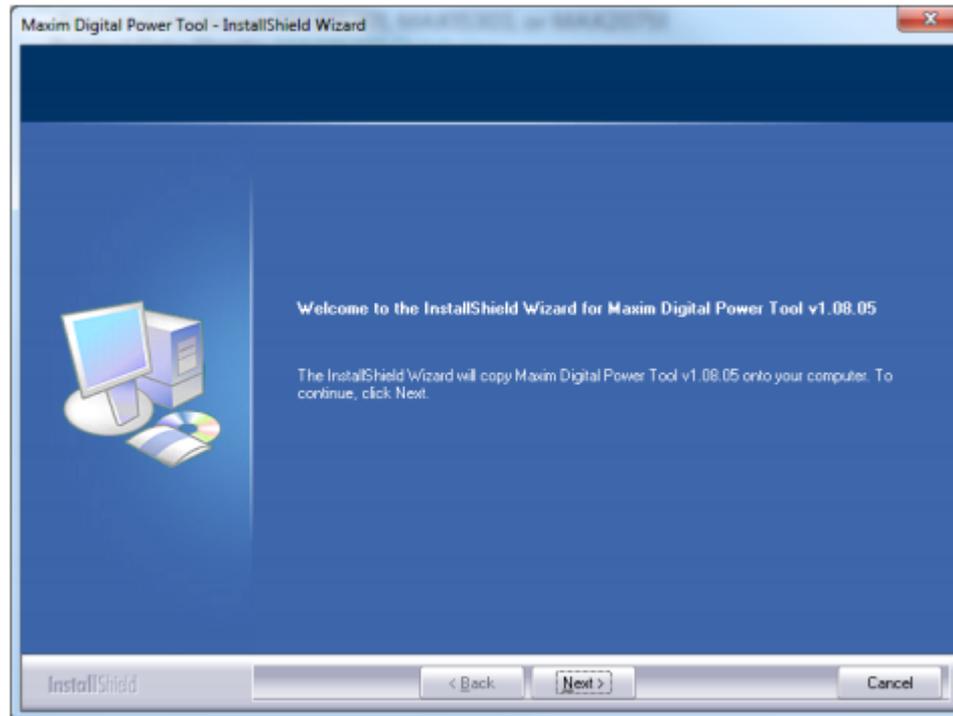
 – Maxim File name: MaximDigitalPowerTool_V2.18.00.exe

 (version subject to change – use latest version available on Maxim website)

 – Download: Latest Release at

http://www.maximintegrated.com/en/design/tools/applications/evkit-software/index.mvp?id=1183/

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Software Setup

❯ Install the Maxim Digital Power Tool

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Connect Maxim Dongle

➤ **On the Maxim Dongle**
  – Connect the Ribbon Cable
  – Connect the USB Cable

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Connect Maxim Dongle

> **Connect the Ribbon Cable to the KCU116 (J84)**
> – Red Stripe towards pin 1
> – Insert the "A" end of the USB cable into a PC USB port (do not use a docking station or USB hub port)
> – Install J153 jumper to inhibit all FPGA rails
>   • Required to update XML file
> – Turn on the KCU116 board

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Check Voltage Levels

➤ Open Maxim GUI version v2.18.00 (or later)

➤ Within the Maxim GUI, go to "Dashboard"

  – This will automatically start scanning the power rails

➤ Please verify that there are a total of 10 voltage rails shown

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Check Voltage Levels

➤ Using the Maxim PowerTool, check that you see something similar to the following (voltages inhibited)
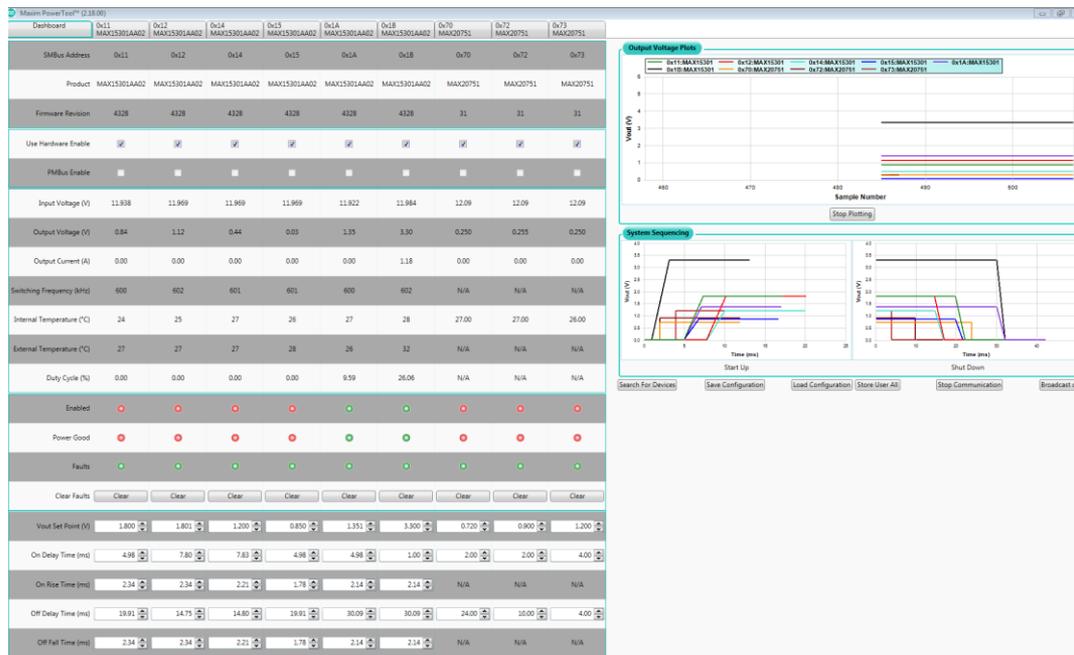
➤ The Power Good LEDs on the KCU116 will not lit up green upon power-up

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Restoring Power Levels

- Unzip the KCU116 XML file:
  - KCU116_RevA_r002_DCR.xml

- Open the MaximDigitalPower GUI

- Verify that all power rails are listed in the GUI:
  - 0x13
  - 0x14
  - 0x15
  - 0x16
  - 0x12
  - 0x17
  - 0x18
  - 0x72
  - 0x73
  - 0x1A

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Maxim PowerTool

➤ Expand the Maxim GUI so that you can see the "Load Configuration" button on the GUI
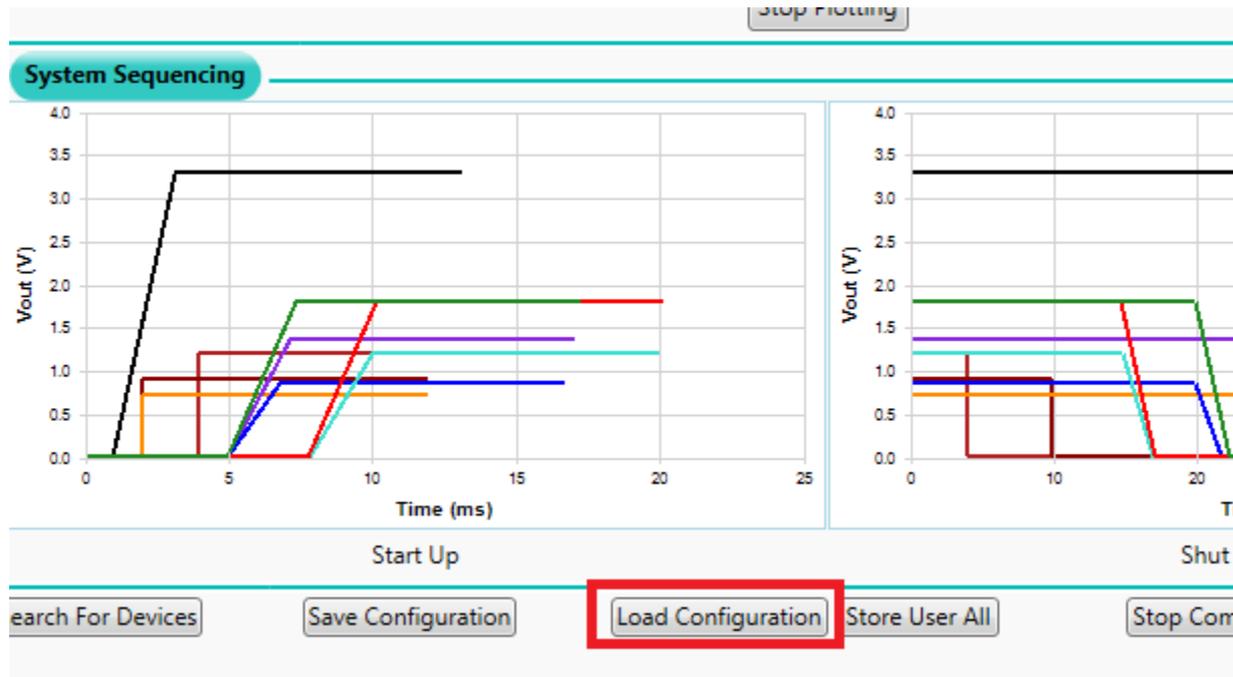
➤ Click "Load Configuration" and browse to where you have saved the appropriate XML file

➤ Load the XML file

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Maxim PowerTool

- Once the XML has been programmed in, the GUI will prompt you to say that the controllers must be re-loaded

- The "Task completed, devices will be reloaded" dialog box will appear, indicating that the XML file has been loaded in all the devices

- Click "OK" and the GUI will rescan all of the regulators on the board and repopulate them

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Maxim PowerTool

➤ You might need to click the "Search for Devices" button to refresh the controller information
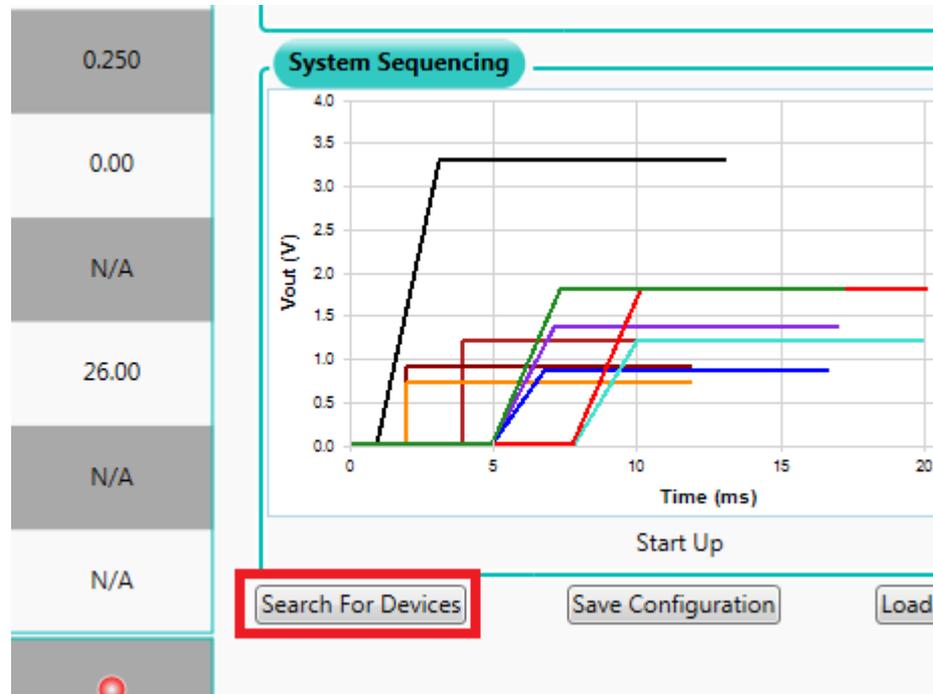
Maxim PowerTool

➤ Once the engineer is satisfied that values are loaded, the "Store User ALL" button in the Dashboard tab will store configuration in the NVM (non-volatile memory) of each device

– A warning message will appear, and warn you that the MAX20751 has a limited number of write cycles remaining

– If you press "cancel", it will avoid updating the MAX20751

– Why? If the MAX20751 rail is as it should be, there is no need to waste a program cycle on this

➤ IMPORTANT: Do not power off the board

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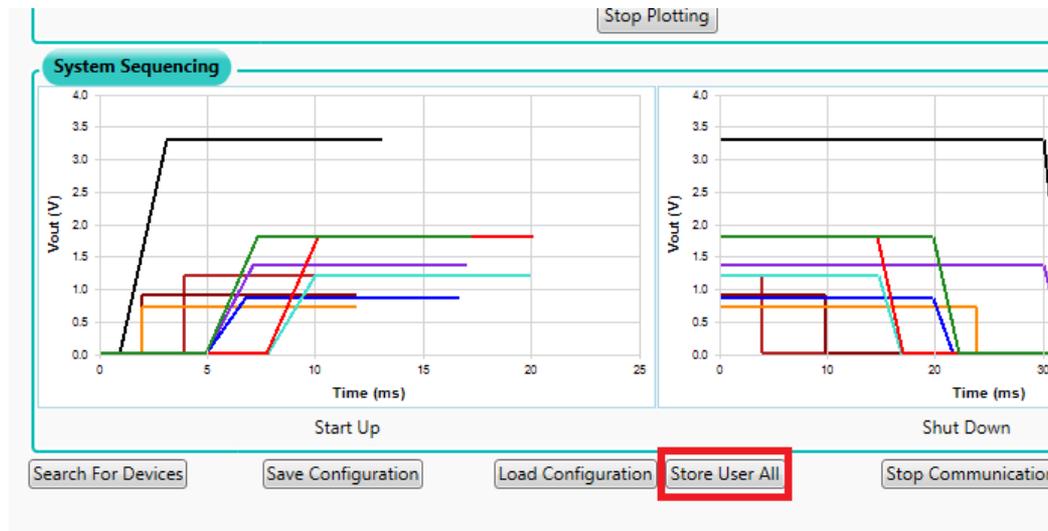
Maxim PowerTool

➤ Power off the KCU116

➤ Remove jumper J153

➤ Wait 30 seconds

➤ Power on the KCU116 once more to verify

➤ If the Dashboard does not refresh automatically:
  – Click the "Search for Devices" button

➤ Verify that all Power Good LEDs on the KCU116 are on

➤ Verify that the FPGA power good LED is green

➤ Open the Maxim PowerTool GUI to verify the correct voltages on 12V (Input Voltage) and all FPGA rails (Output Voltage)

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