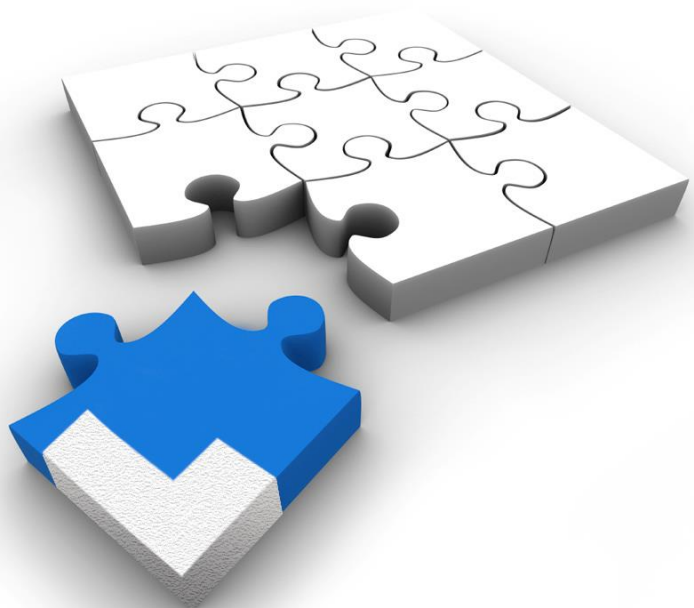


Programming VADJ on ZCU104 using Infineon USB005 programming dongle

Application Note

Version: 1.00

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**Programming VADJ on
ZCU104 using Infineon
USB005 programming
dongle**



August 20th, 2019

CONFIDENTIAL

Version: v1.00



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1 INTRODUCTION

In this document, the procedure to enable VADJ on the Xilinx ZCU104 development board is described. The ZCU104 board does not have an independent system controller device implemented, like for example MSP340 on ZCU102 development board or the Zynq on the KCU105 board. This means, when the board is turned on, there is nothing that will automatically read the EEPROM from the FMC daughter card and then do switches on VADJ. There is a system controller software that can be run on the ZCU104 board, but this is not a good solution, mainly because it does not allow user to store the setting in non-volatile memory, so that would result with loss of all settings after power cycle. This problem and solution is discussed in this application note.

2 TOOLS AND APPLICATIONS

2.1 Infineon's USB005 Programming Dongle

The Infineon's USB005 Programming Dongle (Figure 2.1) provides interface between IR PowIRCenter GUI and the IR Controllers. No external power supply is required, it is only powered by USB 5V connector pin. I2C speeds are up to 400 kHz. Speed can be also set by the IR PowIRCenter GUI. This dongle requires Silicon Labs USBXpress driver which is included in the IR PowIRCenter GUI installation package.



Figure 2.1: Infineon's USB005 Programming Dongle

2.2 PowIRCenter Software Application

PowIRCenter is an Infineon's software for controlling and monitoring multiple digitally enabled Voltage Regulators ICs in a simple graphical user interface (GUI). PowIRCenter is designed for use with Infineon branded digital regulators. This software can be easily installed on any PC in few simple installation steps.

Features:

- Installs on a PC and connects via USB
- Contains all necessary files in a single ZIP file
- Design Wizard to set up initial device configuration
- View and control multiple devices via PMBus/I2C
- Program multiple devices

Requirements:

- At least Windows 7
- USB2.0
- USB005 to I2C Dongle

For detailed information and use of this application, and also for downloading files, please visit Infineon's PowIRCenter online for Quick Start use and User Guide manual:

<https://www.infineon.com/cms/en/product/promopages/power-center-software/>

Simple PowIRCenter installation step requires only unpacking files to defined directory by clicking install button (Figure 2.2)

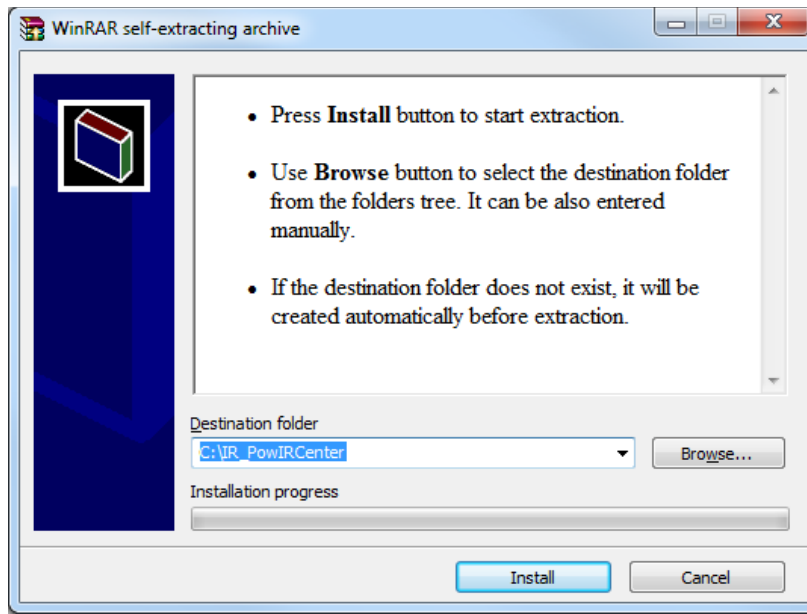


Figure 2.2: PowIRCenter Installation

When the setup is finished user can run application directly from defined directory (Figure 2.2) by running the IR PowIRCenter.exe application. This will start the application and bring up the GUI.

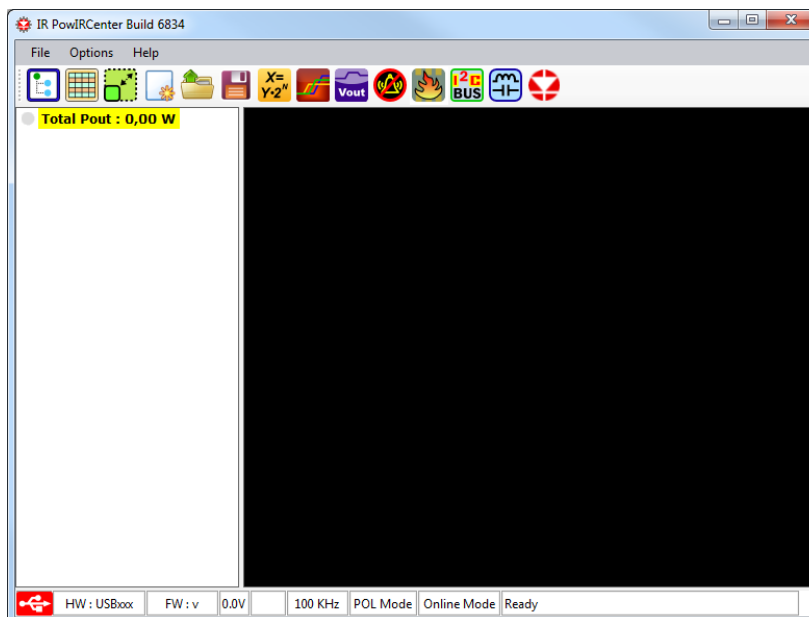


Figure 2.3: IR PowIRCenter GUI Screen

2.3 Enable VADJ on ZCU104 Process

After acquiring the Infineon's USB005 Programming Dongle and successful installation of PowIRCenter software, user can now proceed to with setting up VADJ on Xilinx ZCU104 board. This will set VADJ to 1.8V automatically on power-up (user need to do this only once).

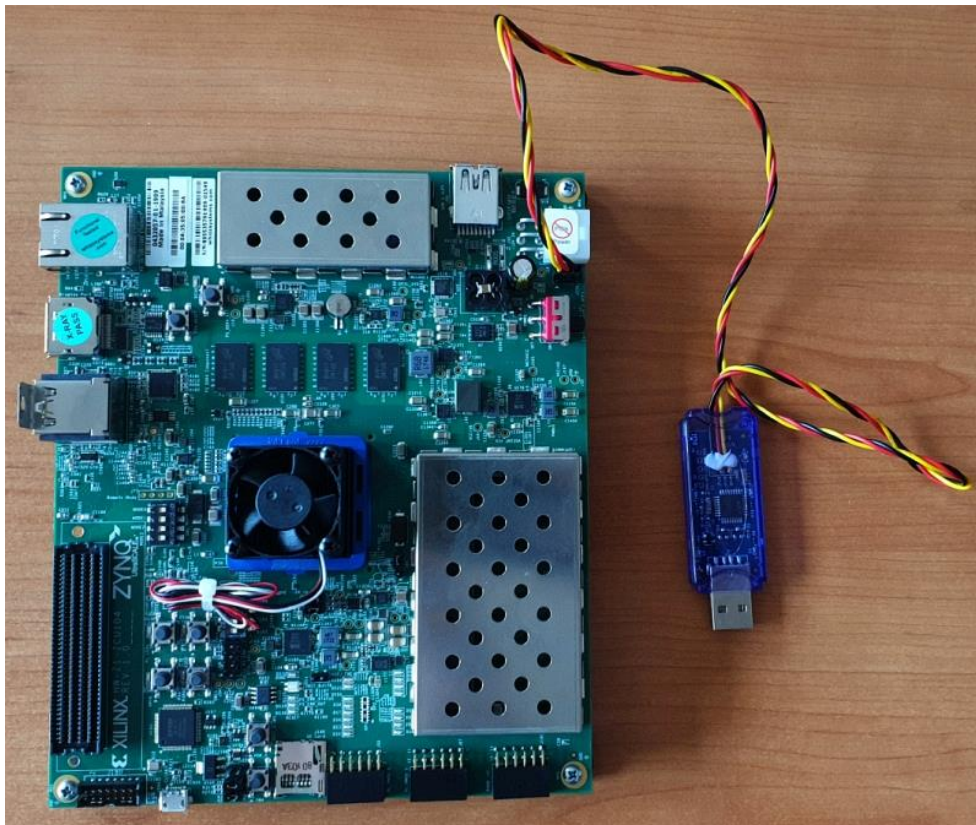


Figure 2.4: ZCU104 and USB005 Dongle Connection

Procedure:

1. User plugs the USB005 dongle into J175 on ZCU104 (located near the power connector). The pinout of the dongle cable and J175 are reversed. The black cable is GND and must line up with the pin 3 of the J175 header (GND on the dongle is labeled pin 1).
2. User now starts up the PowIRCenter application.
3. In the top left corner, click the button "Auto Populate Devices". Two IRPS5401 devices will appear. The one with I2C address 0x14, and PMUBus address 0x44 is the one that generates VADJ.
4. User can click on the "Switcher D" for the device that generates VADJ. Please notice that the "VOUT_COMMAND" command has value of 1.801V – here user checks this to make sure that right switcher is modified.
5. Next step is to click on the "01 OPERATION" command, setting it to "On" and click "Write". The VADJ power good LED should turn on at this point. Note that by default, the voltage will

- be already configured for 1.8V, but if user needs to configure it to a different value, that setting should be made first with the "VOUT_*" commands (there are more than one to set).
6. Clicking on the "02 ON_OFF_CONFIG" command, setting it to "Respond to EN pin only" and then clicking the "Write" button.
 7. Clicking on the "15 STORE_USER_ALL" command (in the dropdown menu) and clicking "Write". This will store the current settings into the non-volatile memory so that they will be used the next time user power-cycles the board.
 8. User can now close software and power cycle the ZCU104 board.

If everything went ok during the procedure, user can now check and see that the VADJ is powered up and set to 1.8V. Also, when other FMCs is used, with different VADJ setting, this procedure must be run again accordingly to defined needs.

3 REVISION HISTORY

Version	Date	Author	Approved by	Note
1.00	20.08.2019.	A. Popović	R. Končurat	Initial Xylon release