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ZCU104 VADJ Setting for CON-FMC

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Abstract

This document contains how to set VADJ in the ZCU104 evaluation board for using CON-FMC properly.

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Introduction

1.1 Environment Setting

- Hardware
 - ZCU104 Evaluation board
 - CON-FMC
- Software
 - Windows 7/10
 - Vivado 2018.3

1.2 Overview

ZCU104 has LPC form factor for using FMC. You can use CON-FMC through this port. See below picture Figure 1 how CON-FMC is connected on the ZCU104 evaluation board.



Figure 1: ZCU104 Evaluation board with CON-FMC

1.3 VADJ Setting

Default VADJ is set to 1.8V stated in UG1267 by Xilinx officially[2]. However, the PG signal for VADJ is disabled when you get started with ZCU104 with a quick board test[6]. Unless the VADJ PG signal turns on, you can't use CON-FMC. When you use ZCU104 with CON-FMC, you can check its availability by 4 LEDs at the side of CON-FMC(see Figure 2). CON-FMC is working accordingly while all 4 LEDs are turned on.

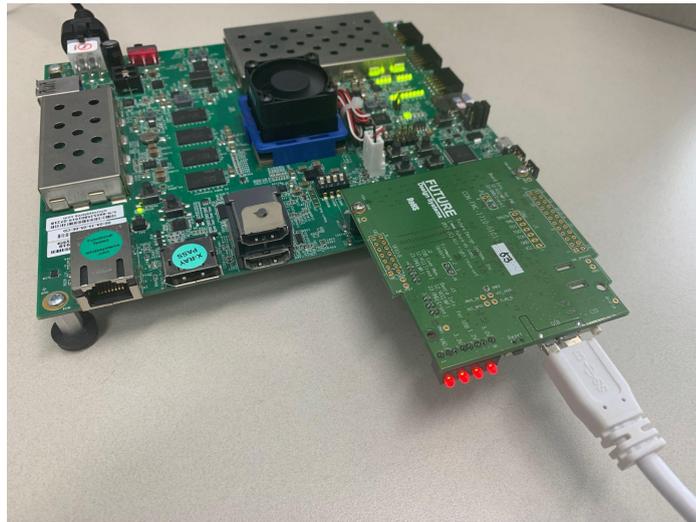


Figure 2: CON-FMC is ready with 4 LEDs lighted on

System Controller GUI(SCUI) supported by Xilinx will help you to set FMC VADJ in ZCU104[3]. This program can be downloaded from the official website of Xilinx. Through this program, you can command PMIC to set VADJ as 1.8V and enable PG. You can download the program from [here](#). Note that the program is dependent on Windows. So make sure that you are using this program on Windows PC.

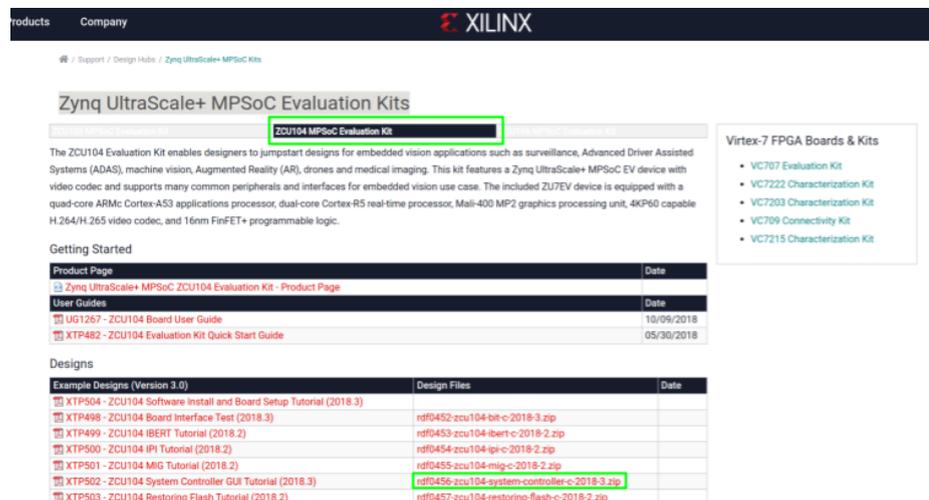


Figure 3: SCUI program can be downloaded from ZCU104 supports

When you extract the zip file you just downloaded like Figure 3, the files will look like Figure 4

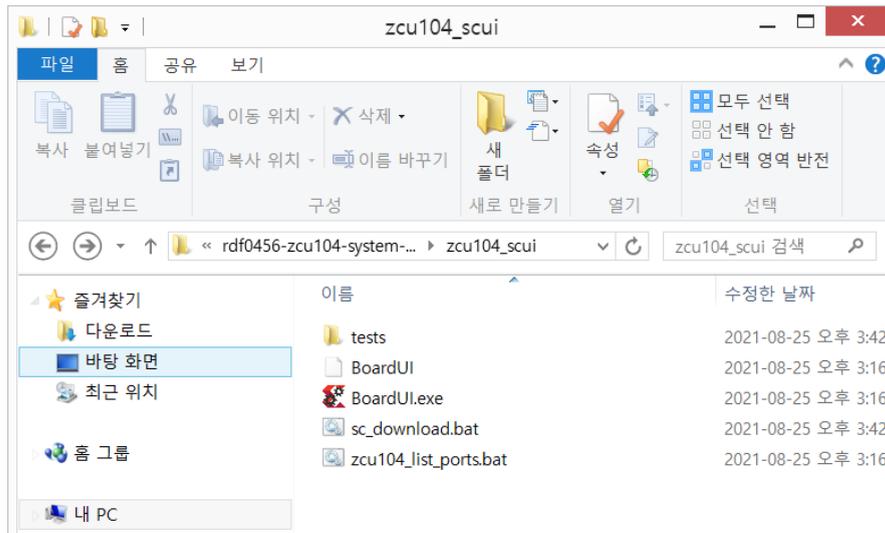


Figure 4: SCUI program directory

Before getting started with the program, you should prepare the ZCU104 evaluation board like Figure 5.

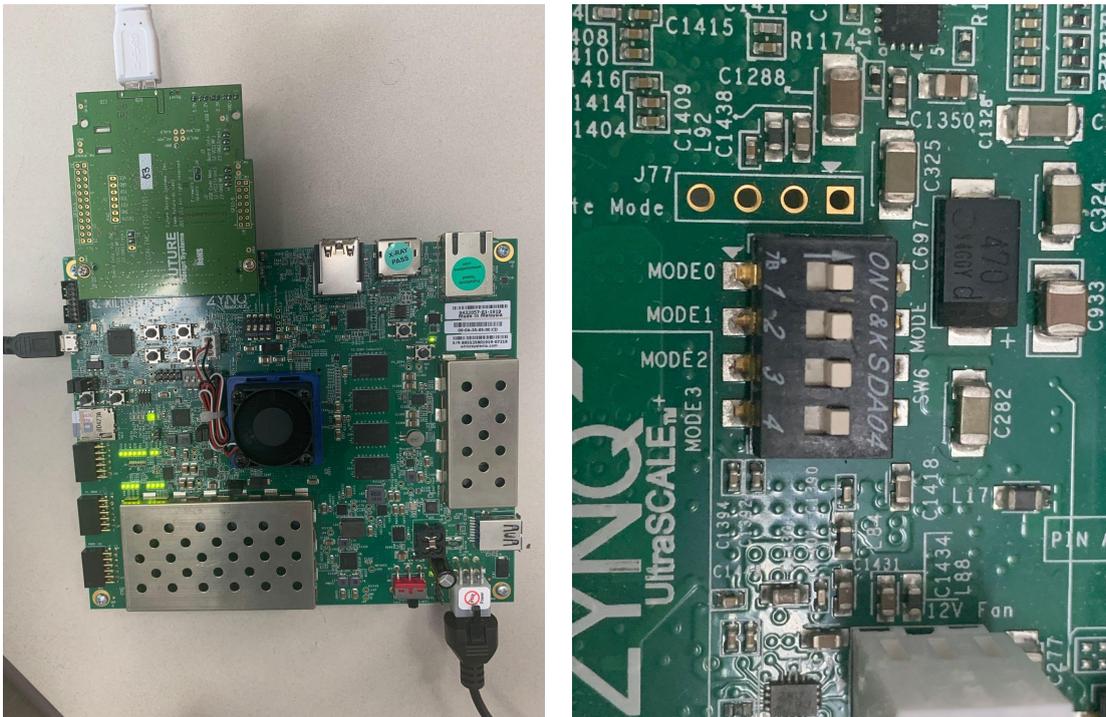


Figure 5: Prepare FPGA(left) and Mode DIP switch (right)

As you can see from the left picture of Figure 5, plug the power and USB-JTAG to ZCU104. Also, you should set the MODE DIP switches to be all on just like the right picture of Figure 5.

Setting the VADJ requires the following steps.

1. Download program in the FPGA for the SCUI
2. Through SCUI, set VADJ to 1.8V and enable PG
3. Finally, store this user command to PMIC to set this permanently.

1.3.1 Program Download in FPGA

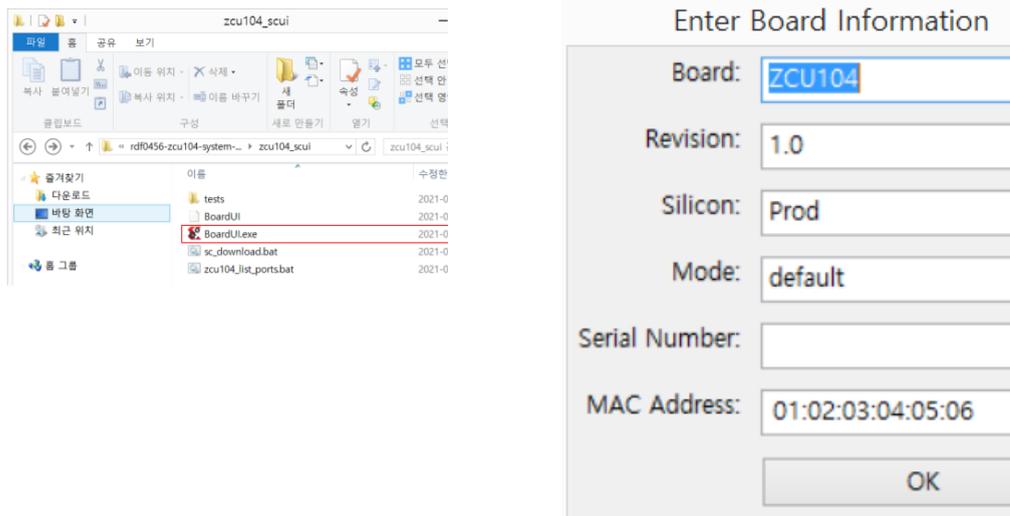


Figure 6: 'BoardUI.exe' file and its window

Double click the 'BoardUI.exe' to get started which you can see from the left picture of Figure 6. When the program is on, you may see the window like right picture of Figure 6. Click the downside arrow at the 'Serial Number' row. You may see some numbers which are unique numbers for each ZCU104 boards. When you click yours, then click 'OK' to proceed.

First thing you need to do is click 'About' tab at the top. Then click 'Program System Controller'. It will automatically program the FPGA and run the 'sc.elf' file for this SCUI program. When the process is done, you will notice that the progress bar is filled with green and 'PASSED' is shown just like the right picture of Figure 7.

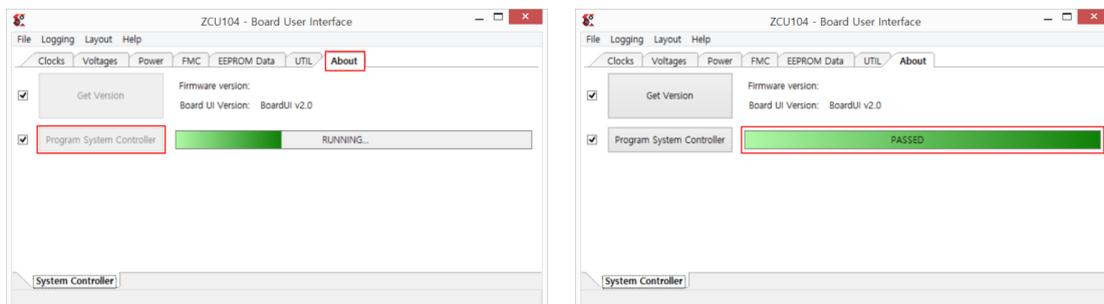


Figure 7: Program System Controller

1.3.2 VADJ Setting and Enable

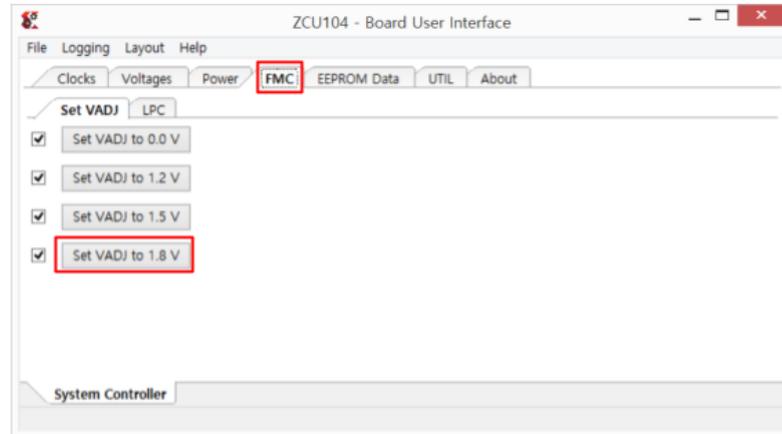


Figure 8: Set VADJ to 1.8V

Now, click 'FMC' tab on the top to set the VADJ voltages. You may see the 'Set VADJ to 1.8V' like Figure 8. For your information, our CON-FMC works accordingly at least 1.8V VADJ. So It is recommended to set the VADJ more or equal than 1.8V.

1.3.3 Store user command in PMIC through SCUI

This step is not required but recommended. It is already stated, the default setting is that VADJ PG is disabled. That means it will be disabled after a power cycle whether you set the VADJ to 1.8V or others. So you will need to do step 1.3.1 and 1.3.2 again every time you turn on the board. However, if you store your command in PMIC which is conducted in 1.3.2, you can avoid this circumstance.

To do this, click 'UTIL' and follow these steps carefully. You can see the example at Figure 9

1. Put '04' at the blank of the right of 'Set MUX'
2. Click 'Set MUX'
3. Put '44' at the right of 'Address' and put '15' at the right of 'Data to Write' in 'IIC Write'
4. Click 'IIC Write'

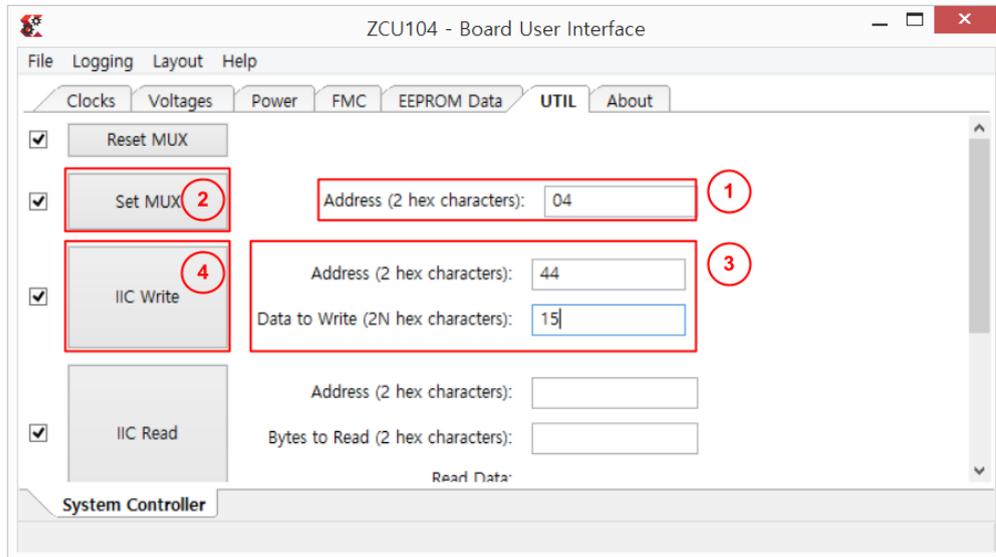


Figure 9: PMbus Command to store User setting

After completing the above steps right after 1.3.2, the VADJ is always 1.8V and PG is always up even if the power is applied again. Now, the VADJ setting for using CON-FMC is completed.

References

- [1] Future Design Systems, FDS-TD-2018-03-001-CON-FMC-User-Manual
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- [3] Xilinx, ZCU104 System Controller – GUI Tutorial (XTP502)
- [4] Infineon, IRPS5401 PMIC Datasheet, [Website], https://kr.mouser.com/datasheet/2/196/Infineon_IRPS5401M_DataSheet_v02_06_EN-1732004.pdf
- [5] Infineon, IRPS5401 command set, [Website], https://www.infineon.com/dgdl/Infineon-DC-DC_IPOL_IRPS5401_PMBus_Command_Set-AdditionalTechnicalInformation-v01_03-EN.pdf?fileId=5546d46262b31d2e01632da2900d341f

Revision History

- 2021.08.30: Version 0 Revision 0 is released by Chae Eon Lim, celim@future-ds.com

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