Charge Monitoring Board circuital setup

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Context

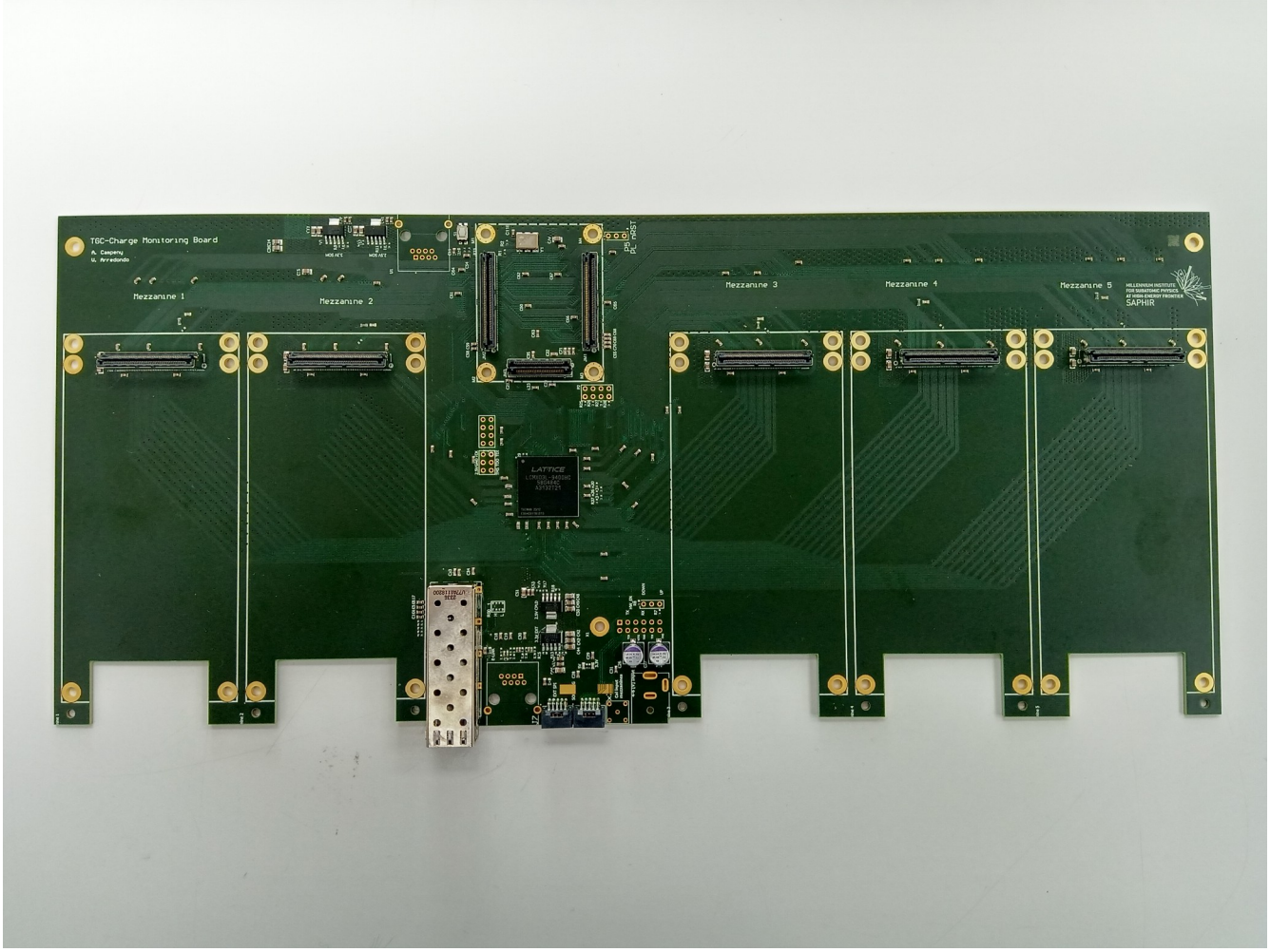
The Charge Monitoring Board (CMB) requires some circuital setup before functioning. CMB's motherboard comes with most of the components soldered, but not some key pin-headers; those pin-headers must be soldered, and some jumpers installed. The mezzanines can accomodate 2 ADC models, and for each ADC model, there are some resistors that must be changed. This document will guide you through these changes, so the Charge Monitoring Board can be set to work.

Warning: this guide does not include references to the Trenz board used by the Charge Monitoring Board.

Charge Monitoring Board setting to work

Charge Monitoring Board motherboard

Most probable, from the PCB assembly service, you will receive a Charge Monitoring Board motherboard like the following one.



You will have most of the components already soldered, but the ones not present (and that you must solder) are:

A) 1 power jack connector
    1. Like this one: https://www.digikey.com/en/products/detail/switchcraft-inc/RAPC10PS/3909335?s=N4IgTCBcDaIMoGECMBOALABgLQDkAilAugL5A
        1. Digikey part number: SC1940-ND

B) 2 RJ-45 connectors

C) 1 Single female Lemo connector
    1. Like this one: https://www.digikey.com/en/products/detail/lemo/EPL-00-250-NTN/2786110
        1. Digikey part number: 1124-1008-ND

D) Pin-headers
    1. In particular, with footprint HDR1X3 and HDR2X3.

When you had soldered all those components, you must use jumpers to connect the following pins in the pin-headers:

1. In pin-header labeled as “HW_EN” and “R8”, connect the central pin to the pin labeled as “UP”
    1. This connection will enable the hardware.

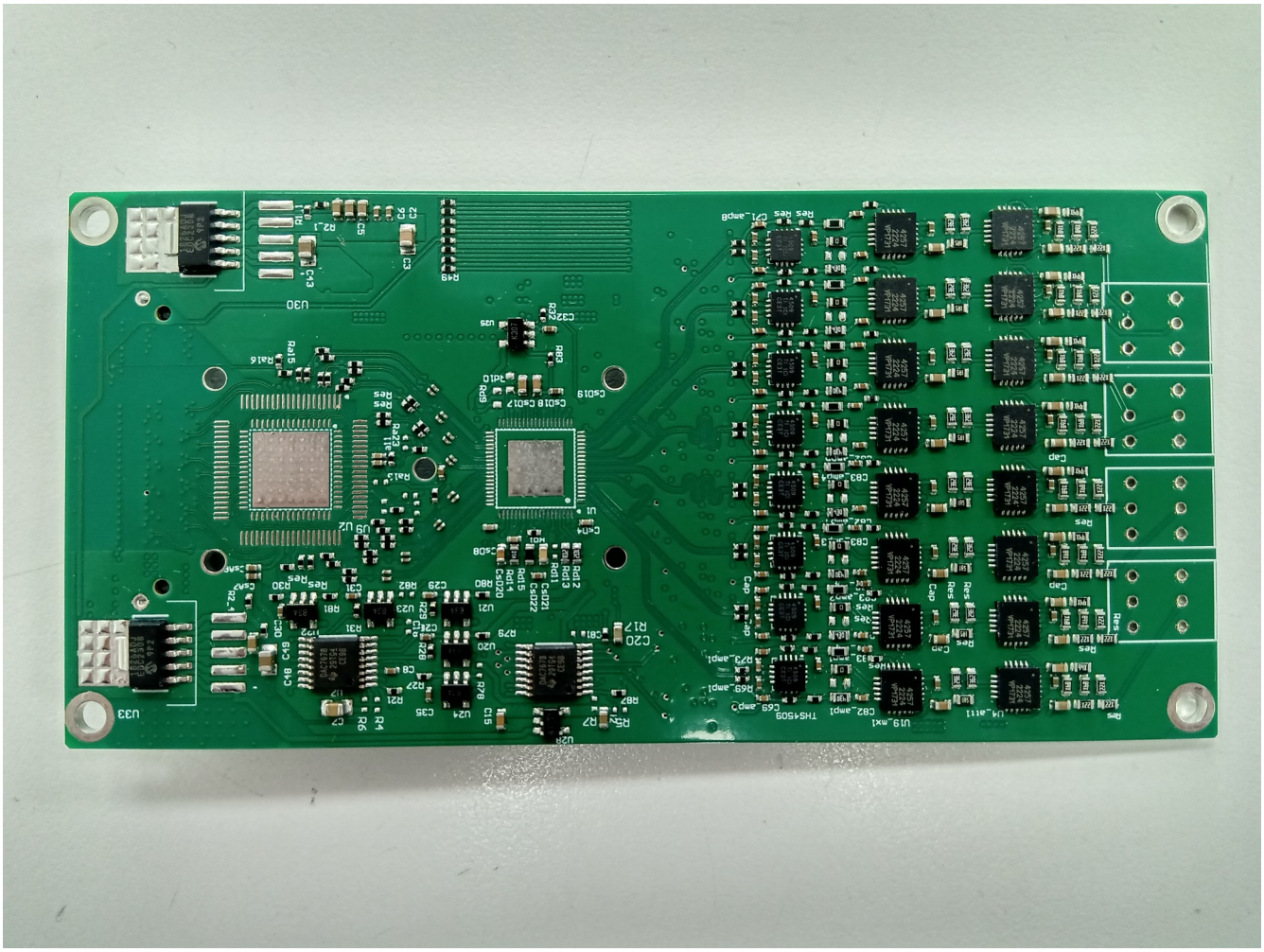
Additionally, when the CMB motherboard is under operation, there must be decided how to tie the system reset header. This header is used as a hardware reset pin for the Programmable Logic, and can be connected by:

1. Pin-header labeled as “P5”, connect with a jumper the nRST pin to ground.
    1. This connection is a neg-reset, so connecting nRST pin to ground will enable the Trenz’s Programmable Logic.

However, while you are programming the devide and running tests on it, pin-header P5 can be left floating

Charge Monitoring Board mezzanines setting for ADC5296

The mezzanines come, from the PCB assembly service, as it is seen in the following image.



The components that are missing, and that you must solder in the mezzanines, are:

A) ADC

B) DRS4

C) 4 double female Lemo connectors

1. Like this: https://www.digikey.com/en/products/detail/lemo/EPY-00-250-NTN/3597388
    1. Digikey part number: 1124-1358-ND

And the following changes must be made:

1. Voltage regulator U31:

    1. Locate the voltage regulatro called U31 in the Altium schematic; look for in sheet called “power.SchDoc (Designator)”.
    2. Locate the resistors R1_3 and R2_3 .
    3. Set the value of those resistors to: R1_3 = 33 kΩ and R2_3 = 10 kΩ.
2. Resistor Ra27
    1. Ra27 value must be infinite (open circuit).
3. Resistor Ra9
    1. Ra9 value must be 49,9 Ω.
4. Resistor Ra14
    1. Here there is an error in Altium, becuase this resistor is connecting a pin called NC with a DC voltage, and pins NC should not be connected to voltages.
    2. Because of that, this resistor must have value infinite (open circuit).
5. Resistor Ra28
    1. Ra28 value must be 0 Ω.

Charge Monitoring Board mezzanines setting for ADC5282

CAUTION: The following instructions are based on the Altium’s design, but have not been tested.

The instructions to set the mezzanines are the same for this ADC, the only difference is that the resostor values are different. The values for this ADC are:

1. Voltage regulator U31:
    1. Locate the voltage regulatro called U31 in the Altium schematic; look for in sheet called “power.SchDoc (Designator)”.
    2. Locate the resistors R1_3 and R2_3 .
    3. Set the value of those resistors to: R1_3 = 91 kΩ and R2_3 = 13 kΩ.
2. Resistor Ra27
    1. Ra27 value must be 0 Ω.
3. Resistor Ra9

    1. Ra9 value must be infinite (open circuit).
4. Resistor Ra14
    1. Ra14 value must be infinite (open circuit).
5. Resistor Ra28
    1. Ra28 value must be infinite (open circuit).

Versions

Date	Comment
2024/09/12	Original version
2024/09/23	The role of pin-header P5 is updated, reflecting that this is a system reset, and that during programming and operation this pin can be left floating.