

Build-and-Test Documentation

Lab t2:

Power (off-board sources to the verified PCB supply rails)

- Solder 6 consecutive header pins to FTDI.
 - PWRTTest1: Use a multimeter to verify that JP1 pin 1 is 5V. Use the ground on the FTDI pins for multimeter ground.
- JP1 Wires-Solder at least 2 headers into the JP1's 1 and C position
- Voltage Regulator- Solder the regulator with heatsink facing the board and solder C6(0.1uF) and C7(10uF)
 - PWRTTest2: First redo PWRTTest1 above, if you pass that test then place a jumper between JP1's position 1 header and position C header. Then use the multimeter leaving the GND connected from PWRTTest1 and move the positive lead to connect to the out arm of the regulator which is the arm closest to capacitor C7 you should see 3.3V.
- Solder C7 to stabilize output voltage from voltage regulator
- Solder green power indicator LED(LED4) & 1.5K resistor (R1)
 - PWRTTest3: Plug in FTDI Cable and verify that the light comes on

MCU

- BE CAREFUL AND DON'T BRIDGE THE LEGS TOGETHER (suggest to use a lot of flux and not add any solder between the leg and the pad there is enough solder to make a connection)
- Then you need to solder R0(10KOhm), C0(10uF), C1(0.1uF), C2(0.1uF), C3(0.1uF), C4(0.1uF), C5(0.1uF).
 - MCUTest1: First redo all PWRTTests. Once you get the expected results, you should then place your red lead (from your multimeter) onto pin 10 on the MCU and you should also see 3.3V there.
- Solder reset switch
 - MCUTest2: First program

MCU output LEDs

- LED1 - Red
- LED2- Yellow
- LED3- Green
- R2,R3,R4 1.5K

MCU serial connection to PC (FTDI ↔ MCU)

- Done in Power Build instructions, since FTDI is source of power

MCU programming (ICSP)

- Solder headers into the ICSP holes and JP4
 - Test

MCU inputs (SW1, SW2, SW3, RPG1, and POT)

- SW1 & SW2- Trim legs on switches prior to soldering so that they do not contact each other on the board. The pads are slightly too small for the components. Solder switches onto their respective places on the board.
- SW3- Solder to be performed in 3 seconds within 350 +/- 5 degrees

ADC

- LM60M, C20, C15, R5- Use ADC test code adc_test.c in
\\build\\esos_embeddedF14_33EP512GP806\\task04

Voltage Reference

- LM4128, C16, C21- Use a multimeter to verify that the VREF pin outputs 3.0V and the VIN reads 3.3V

LCD Module

- NHD0208AZ, program the MCU with lcd_test.hex and make sure it is flashing the cursor
- C12, C2000 – use a multimeter to make sure the voltage over each component is 3.3V
- R6, R7 – use a multimeter to make sure the voltage over R6 is 3.3V and over R7 is aprox. 0.178V

I2C

- The SDA and SCL lines for the PIC33 are connected to traces that don't connect to anything. We need to be able to use these pins to communicate with the DS1631. To resolve this issue, the solder mask for these traces must be scraped off and a blue wire must be run from each trace to the corresponding header pins on H2.
- R9, R10 - use a multimeter to ensure that both are pulled up to 3.3V

DAC

- RD0 goes to a header but the header doesn't route to the chip select so we had to blue wire the header to the chip select pin on the DAC
- Solder the leftmost two pads on SJ3, SJ5, SJ6
- Solder the DAC onto U4
- Put capacitors on C100, C101, C102, C103

CAN

- Solder the MAX3051
- Solder leftmost two pads on SJ2
- R8
- Solder the RJ11 connector ports CAN1, CAN2