HAHA Board Testing Checklist

1 Fixed Voltage Source

The goal of this part is to test that the fixed voltage source for the whole HAHA Board is 3.3V.

Connect the HAHA Board to a USB power supply through a USB cable. Then power on the HAHA Board by pressing the “PWR” button. After doing this, a Red LED will be on, indicating the HAHA Board is powered up. Find the “Test Points” area on the board. Test the Voltage for “5V” and “3.3F” with a voltmeter. The Voltage for “3.3F” should be or close to 3.3V.

2 Adjustable Voltage Source

The goal of this part is to test that the adjustable voltage source can be adjusted and it ranges from 1.5V to 3.6V.

Power on the board. Turn off these two switches: “SWAF” and “SWAF2”. Measure the voltage of the test point “3.3A” in the “Test Points” area. There are two buttons in the “Voltage Adjustment” area marked “SWup” and “SWdown”. Press these two buttons and the voltage should change accordingly.

3 FPGA

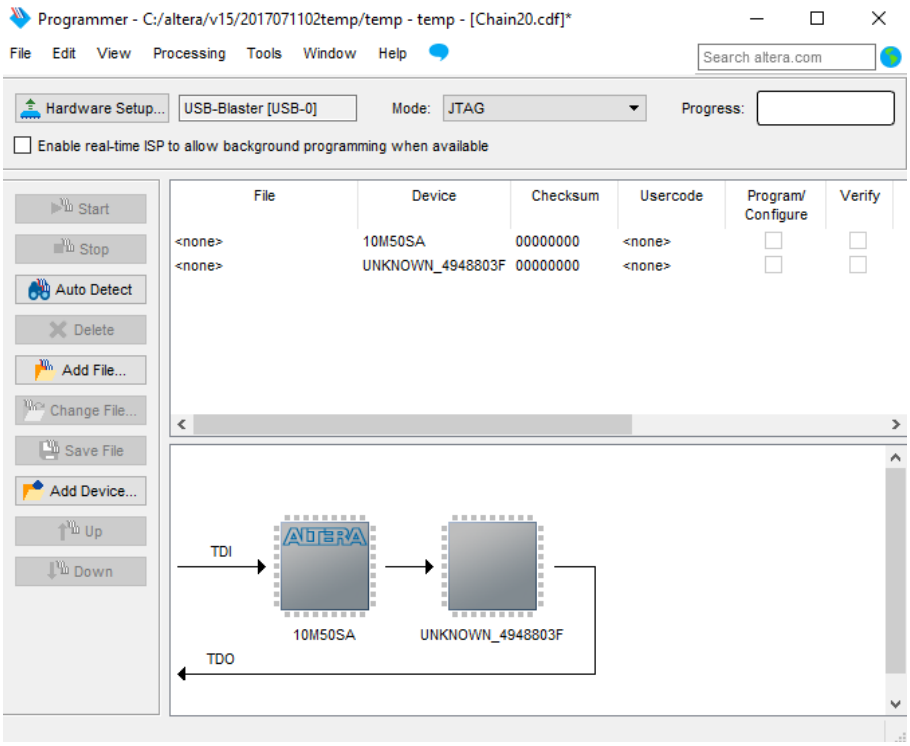
The goal of this part is to test that the FPGA can be detected by the Quartus Programmer and can be programmed successfully.

Install the Quartus software on a computer, it should be version 15 of higher.

Install the drive for the Altera USB blaster on a computer. If you are using the one provided with the board, the version for the drive should be 13.1.

Connect the HAHA Board to the PC through the Altera USB Blaster. The green light on the USB Blaster should be on.

Open the Programmer window from Quartus. Choose the hardware to be USB-Blaster. “Auto Detect” and you should find a JTAG chain with two devices in it.

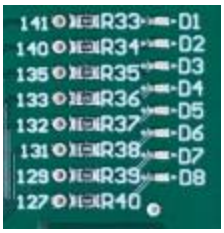


Program the FPGA with any design.

4 LED

The goal of this part is to test that the LEDs can be on and off by programming the FPGA.

Write a design in Quartus which can assign values to the IOs that are connected to these 8 LEDs. Program the FPGA to test.



5 Seven Segment Display

The goal of this part is to test that the seven-segment display can be on and off by programming the FOGA.

Write a design in Quartus which can assign values to the IOs that are connected to these 8 LEDs for the seven-segment display. Program the FPGA to test.

6 Switch

The goal of this part is to test that the switches can provide correct values to the FPGA according to their positions.

Write a design in Quartus which connects the 10 switches to the LEDs mentioned above in the 4th and 5th steps. Program the FPGA to test.

7 Button

The goal of this part is to test that the buttons can provide correct values to the FPGA.

Write a design in Quartus which connects the 3 buttons to the LEDs. Program the FPGA to test.

8 Clock

The goal of this part is to test the clock source for the FPGA.

Write a design in Quartus which connects the clock input pin (88) to another idle IO pin. Program the FPGA. Test the IO pin with an oscilloscope. The frequency for the waveform should be 50MHz.

9 Micro Controller

The goal for this part is to test that the Micro controller can be programmed successfully.

Install Atmel Studio 7 in a computer.

Connect the board to the computer with a USB cable.

Open the “Device Programming” window. Detect the device by reading its signature.

Program the Micro controller with any design.

10 EEPROM

The goal of this part is to test that the EEPROM can be written and read successfully by the Micro controller.

First, program the Micro controller to write a value to a certain address of the EEPROM.

Second, program the Micro controller again to read that value from that certain address. To prove that the value is correct, you should send this value from the Micro controller to the FPGA and let the FPGA to show this value on its peripherals.

11Accelerometer

The goal for this part is to test that the accelerometer can measure the acceleration successfully.

Program the Micro controller so that it read the acceleration value from the accelerometer. To prove that the value is correct, you should send this value from the Micro controller to the FPGA and let the FPGA to show the value on its peripherals. Tilt the board and the value should change accordingly.