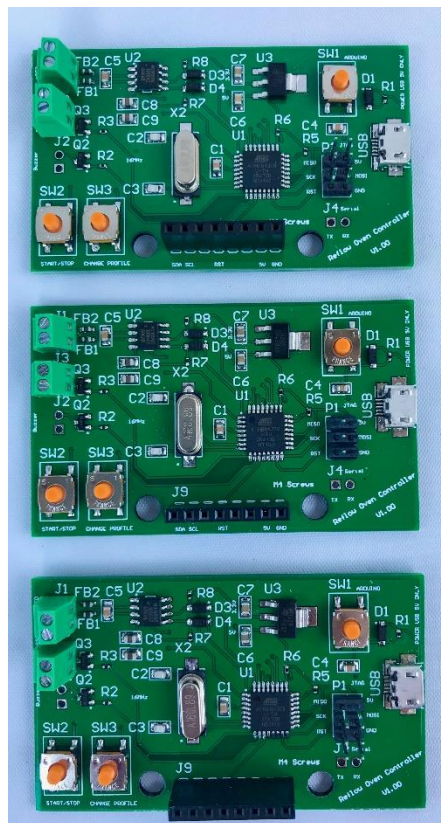


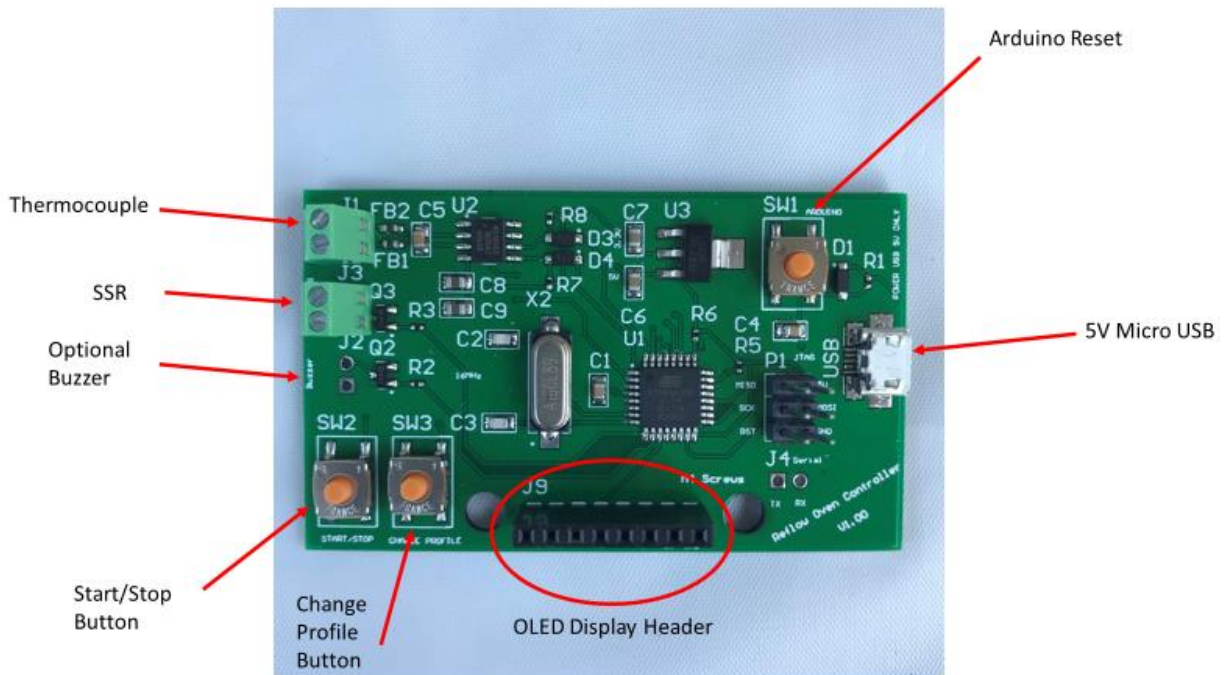
AstroSloth Reflow Oven Controller

User Guide

V1.00

September 17th, 2019

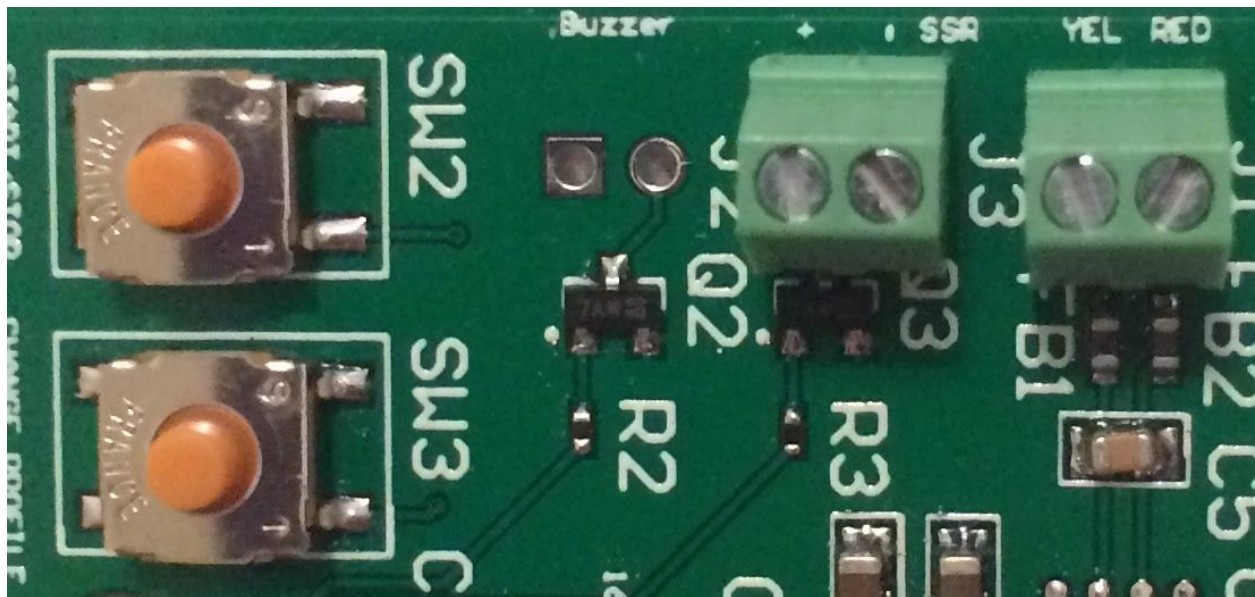




The AstroSloth Reflow Oven Controller is used to simplify your DIY SMT soldering Projects. The controller is set up to fit inside of an enclosure, which is mountable via two M4 screws. Or it can be used as a free-standing module. AC wiring will also have to be completed to connect your Solid-State Relay (SSR) to your reflow oven. **Please note that while the board works with DC voltages, mains power voltages are involved during oven use. High voltages can be lethal and in the worst case may lead to electrocution and possible death. If you are unsure of how to connect the device to mains voltage, please first contact and speak to a licensed electrician who can help you.**

This device is not to be used with conventional cooking ovens but can be used with small toaster ovens rated at 450F/230C.

Wiring:



K-Type Thermocouple:

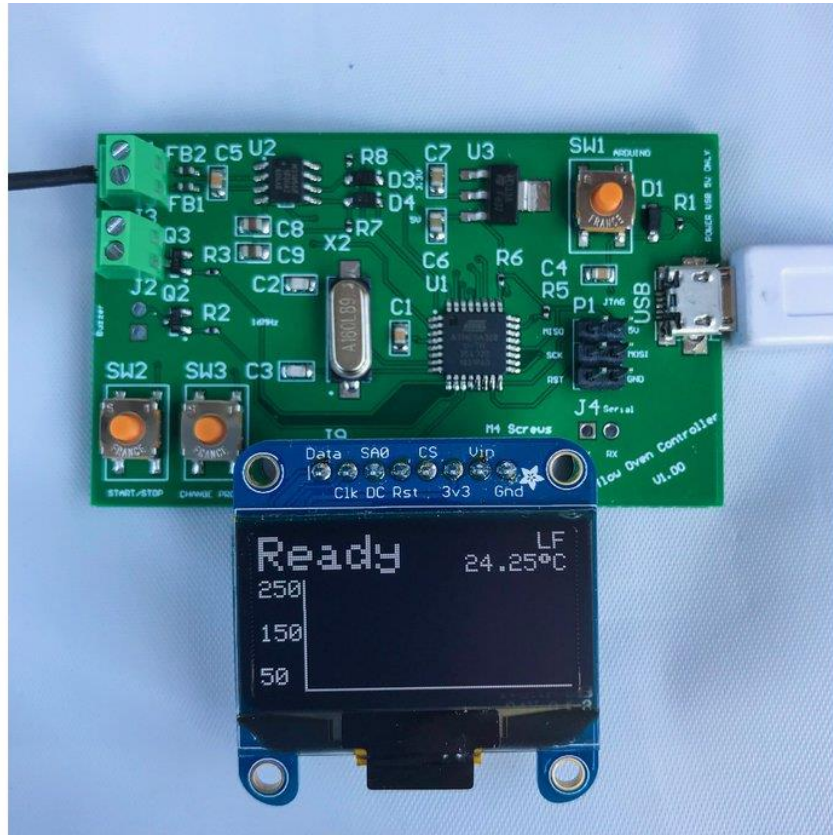
Following the board notation above. Use a small flat head screwdriver to screw the K-type thermocouple into terminal block J1 (far right). The red thermocouple wire should screw into the RED terminal and the yellow thermocouple wire should screw into the YEL terminal. Ensure that there are not any kinks when pulling and placing the thermocouple inside of your oven. If the thermocouple is not connected sufficiently or is kinked the word Error will replace the word Ready on the OLED display until the issue is resolved. A correctly connected thermocouple should gradually increase in temperature, as seen on the OLED, when heat is applied to the free end. If you find that the temperature is decreasing when you touch the free end of the thermocouple, the leads were reversed when screwed into the terminal block and must be corrected.

SSR:

Follow similar methods when screwing the SSR leads into terminal block J3, marked SSR. The positive lead from the SSR will screw into the + marked block. The negative lead from the SSR will screw into the – marked block. Once both sets of wires are screwed in firmly tug them to ensure that they do not come out of the terminal block.

Buzzer:

An optional buzzer (included) can be soldered into terminal J2. If you do not wish to use the buzzer there is no need to solder it in place.



OLED Display:

The Adafruit 1.3" Monochrome OLED display should plug into the J9 header seen as above, where it will display the state of reflow, type of profile, real time temperature in Celsius and the reflow temperature graph. The display works with an I2C configuration. If you purchased your display from elsewhere be sure to solder its J1 and J2 jumpers together. The states are Ready, Preheat, Soak, Reflow, Cool, Complete, Error and Hot. The first six states are apart of the reflow process. The Error state signifies that there is an issue with the thermocouple connection. The Hot state signifies that the oven needs to cool down before use.

5V Power:

When powering the AstroSloth Reflow Oven Controller, it is recommended to use a 5VDC 1-2Amp rated switched mode power supply. Although, the 5VDC micro USB connector can also be powered by a laptop if need be. Please do not plug in anything rated higher than 5V!

Pushbuttons:

There are three buttons located on the board. SW1 (top right corner) is used for a full system reset. SW2 is used as the Start/Stop button for the reflow process. This button is one of two methods to immediately stop the reflow process and the OLED state will change to Ready. The other method involves cutting off the AC supply to the oven. SW3 allows the user to rotate between lead free (LF) and lead based (PB) soldering profiles, before beginning the reflowing process.



Instructions:

- Once the wiring has been deemed safe, the oven and reflow controller are plugged in, thermocouple is secured inside the oven (sensing the air temperature near the center of the oven) and the unreflowed PCBs are closed inside of the oven, select your desired profile type using the CHANGE PROFILE button.
- After selecting your desired reflow profile and the display says that the system is ready, press the START/STOP button to begin the process.
- Follow the reflow states, until the display reads back COOL. Using an oven mitt, open the door to the oven and allow the oven to cool down until the display reads complete. Once complete, remove your boards and inspect them for defects. Only touch your boards at this point.

Things to Check for:

- If you need to stop the process for any reason (i.e. the oven is ramping up too slowly), either press the START/STOP button or remove power to the oven. The display will return to the Ready state and can restart the process anytime you are ready to do so.
- The error state indicates that there is an issue with the thermocouple. Ensure that there are no breaks or kinks in the line and that it is sufficiently contacting its terminal block.