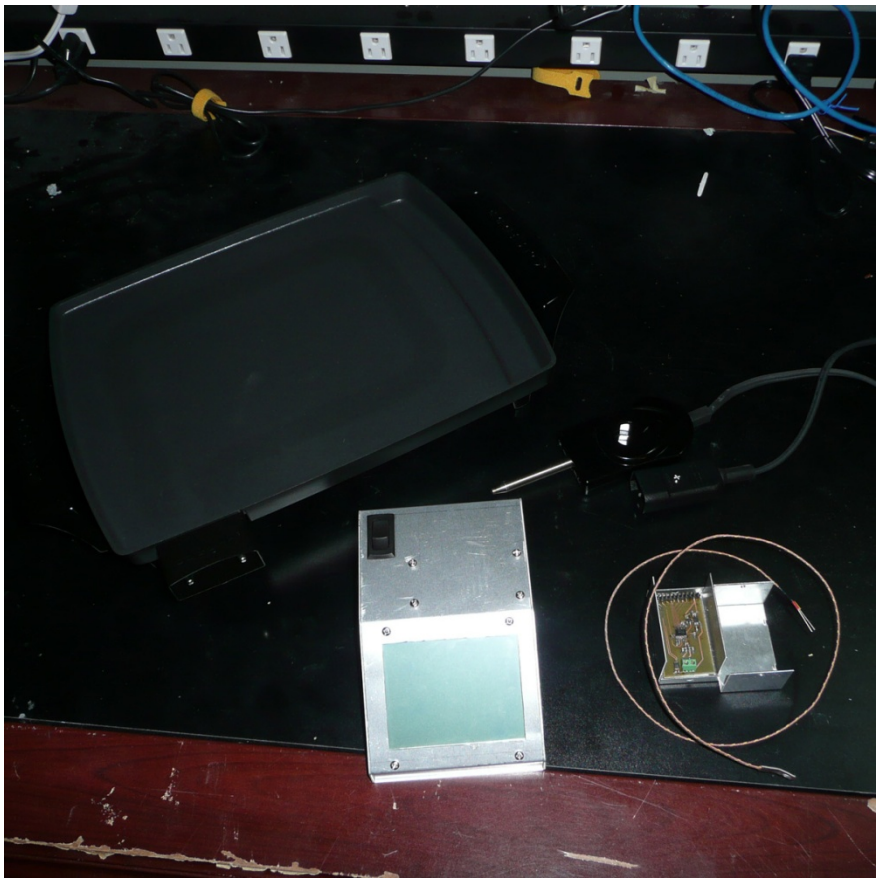
Hardware Design of Griddle Based Soldering System

# Project #TI007

Matt Bommicino



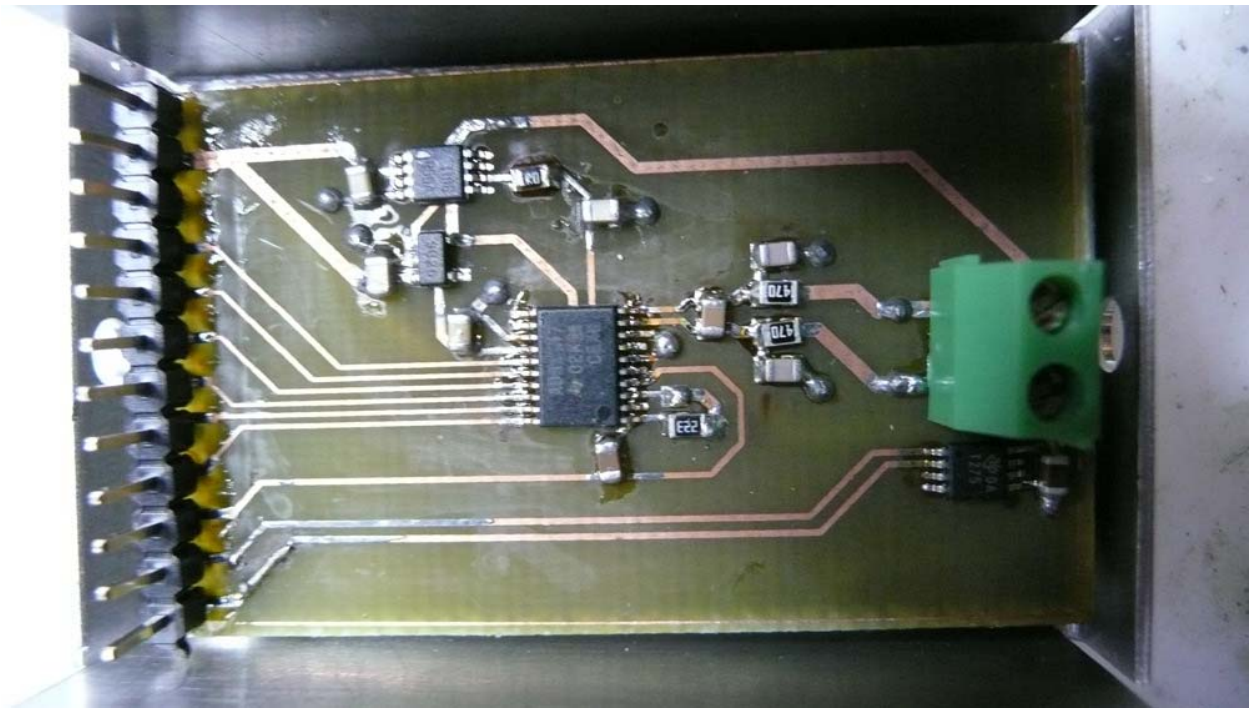
I was looking for a gentler method of soldering certain specialty items that melt easily in an oven. I came across information about using a household griddle to do the job. It was a reasonably good solution but it lacked consistency and precision.

The next phase of this project will focus on software. Due to time constrains and the complexity of this project, this submission deals only with the physical implementation.

A griddle controller interrupts the flow of current from the wall to the griddle, allowing precise control of temperature and time. Feedback is received from a surface mount thermocouple.

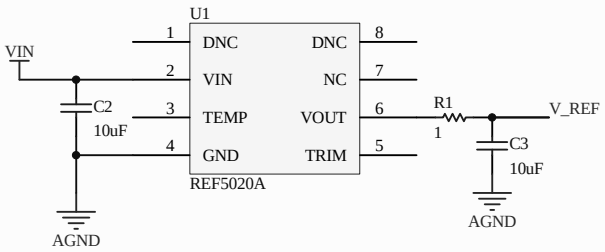
Here is the power outlet of the controller. Power travels in through the right plug and out through the left plug.

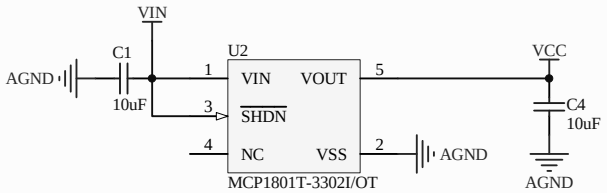
This is the inside of the controller. It contains a TRIAC with an insulated tab, allowing the use of the aluminum enclosure as a heat sink. On the right is the top half of the controller. It includes an LCD breakout board with a touch driver. The power supply is a simple mains transformer configuration. The board also contains the triac driver. For this application,  I used a zero-cross detecting opto isolator to drive the main TRIAC.

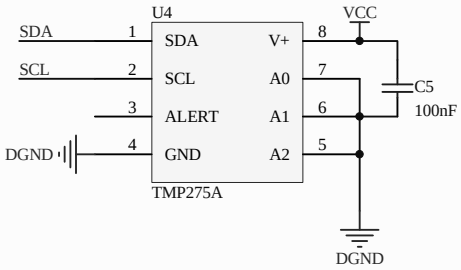


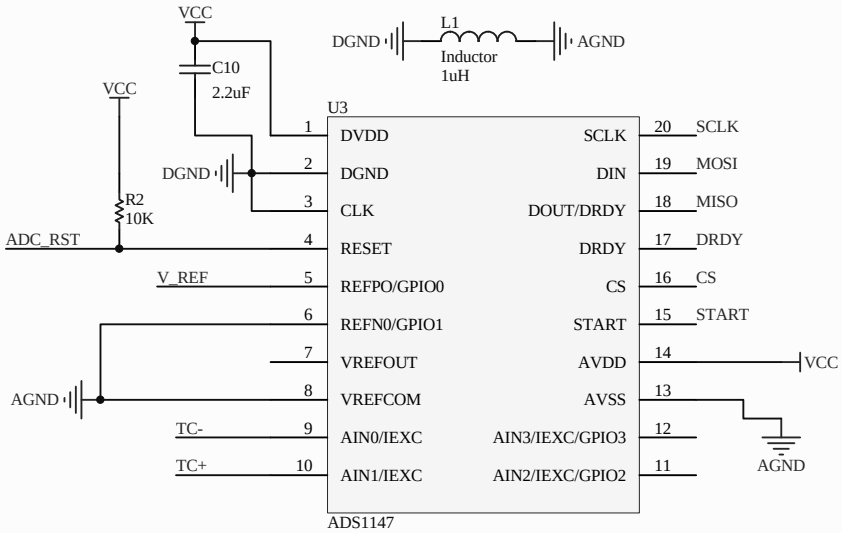
I was concerned that heat dissipated from the TRIAC would cause a significant temperature variation at the point of thermocouple entry. This could cause a second parasitic thermocouple and effect readings. The easy solution was to make a separate module containing the amplification and analog to digital circuitry.

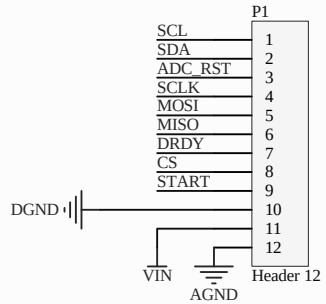
# Analog Module

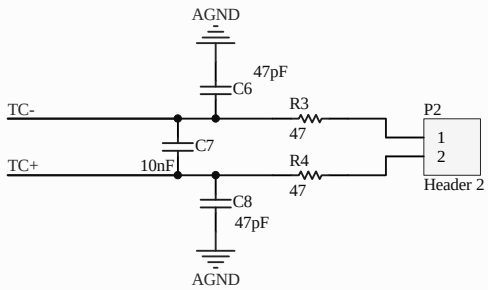
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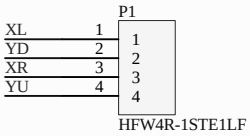
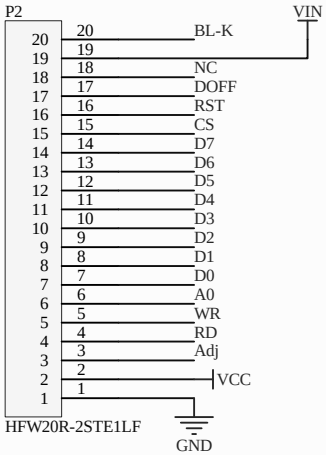
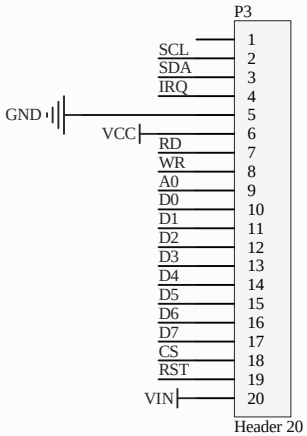
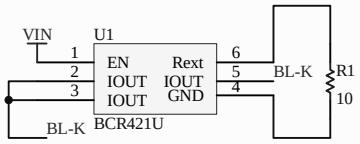
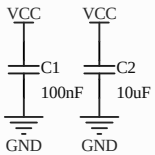
# LCD Board

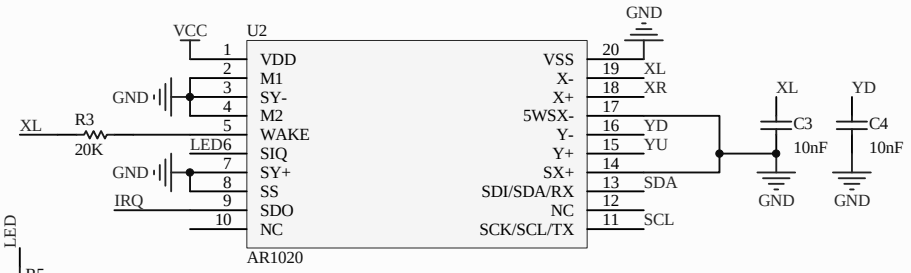


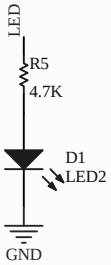



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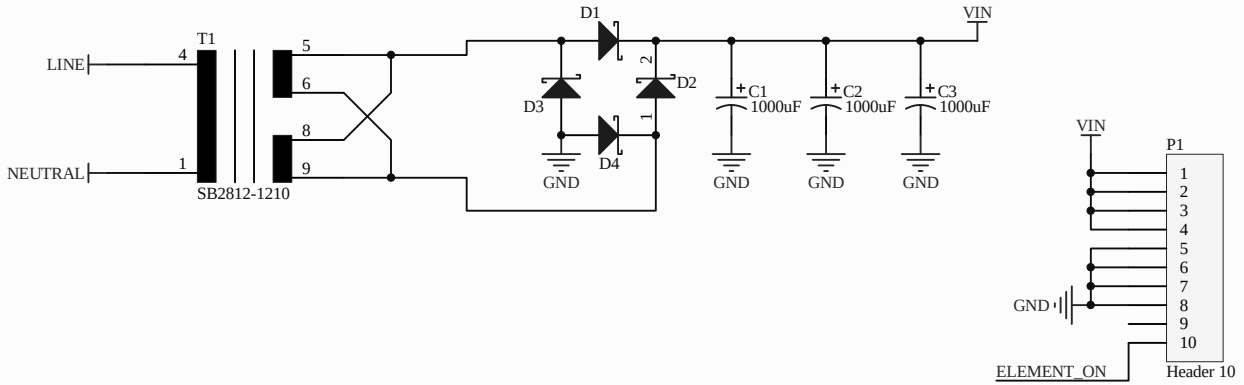
# Power Board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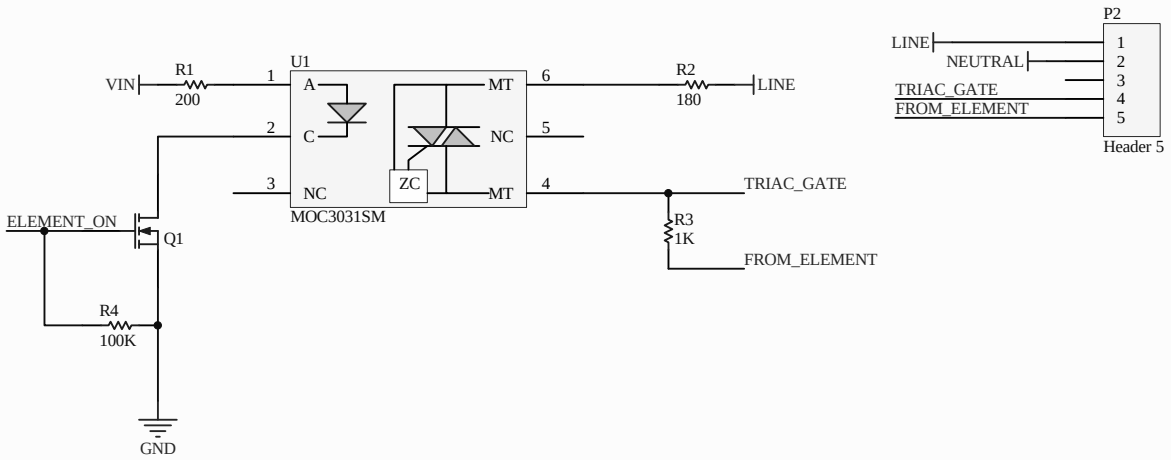
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