This will be a quick and dirty implementation of a TC and DS1820 interface for the roaster using an Arduino. It will also use the ZC and trigger the Triacs for the heater and the fan.

# Temperature measurements

Works well now, got the DS 1820 and the MCP3424 to provide good temperature measurements. Use the TypeK.h version of the conversion lib and found out that there are no pointers (in contrast to thermocouple.h). Now it works. DS1820 is a small library with no chitchat.

A diagram of a device

AI-generated content may be incorrect.

# Triac

We will try the TriacDimmer lib for the AVR

<https://github.com/AJMansfield/TriacDimmer/blob/master/src/TriacDimmer.cpp>

| \_BV(ICES1) //positive edge 🡪 needs to be taken out as our ZC gives a neg pulse

I then built a little ZC emulation using Timer2 that produces exactly the ZC signal we get from the circuit.

![A device with a screen showing a graph

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The connector seems to be connected like this (no really the unconnected pin is connected to D12), ground is correct, fan to d13 mit R150, heat to d14 mit R150, ZC to D35 (4K7 pullup). The wire to D12 is new, not sure what it does ???; HEAT and FAN are EXCHANGED!!

A diagram of a circuit

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Anyway the ZC signal looks good:

A screenshot of a computer screen

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For 5V a 10K pullup seems ok.

The TRIAC resistors should be higher. IF for the LED should be between ~20mA, using pulses > 100us no correction is needed (we use 200us)

Rled = (5-1.2)/.020 = 190 make it 150. Now we also have to think how to adapt the TriacDimmer library to emulate what we did before:

#define ZC\_LEAD 500 // zero cross signal is about 1000us and leads the actual crossing by approx 500us

#define TRIAC\_PULSE\_WIDTH 2000 // reasonable, but fan might require more

I think these were us, the scope showed that the ZC signal is actually more like 1200us long, but let’s see.

Sketch for drawing …

A close-up of a circuit board

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