Hello Leo. I hope you are well; we will send you a report on the firmware development so far.

Due to the large number of requirements, the firmware development has been carried out in different sections to test the components separately, to be ensure about their correct operation and answer the question that the developed circuit is viable to implement everything in the requirements, so, the product developed so far consists:

General:

• LEDS

• Dynamic visualization on 7-segment display (A single decoder to turn on/off the 3 displays, this is to get lower implementation cost)

• Watchdog -> Firmware running

PID:

• PID controller implementation

• Easily adjustable PID constants (Kp, Kd and Ki)

• Selection of setpoint as variable before compiling

Note: AutoPID was discarded because the library gave us a very aggressive response in the tuning process.

Temperature:

• Temperature measurement for the PID control loop

• Temperature reading in ° F or ° C (Thermocouple)

• Temperature sensor reading for mic safety

Buttons and menu:

• Determine button pressed (Button 1, 2 or both)

• Determine if button press was short or long

The challenge for firmware development at this moment could be found in these last two items described, the use of buttons to implement the menu, there is an important part and it is to distinguish which button is pressed and how long it is pressed, from this information it is you are setting:

Menu:

• Setpoint selector

• Brightness adjustment (LEDs, displays)

• Change measurement ° C <-> ° F (The measurement is made, pending how to determine what measure to present)