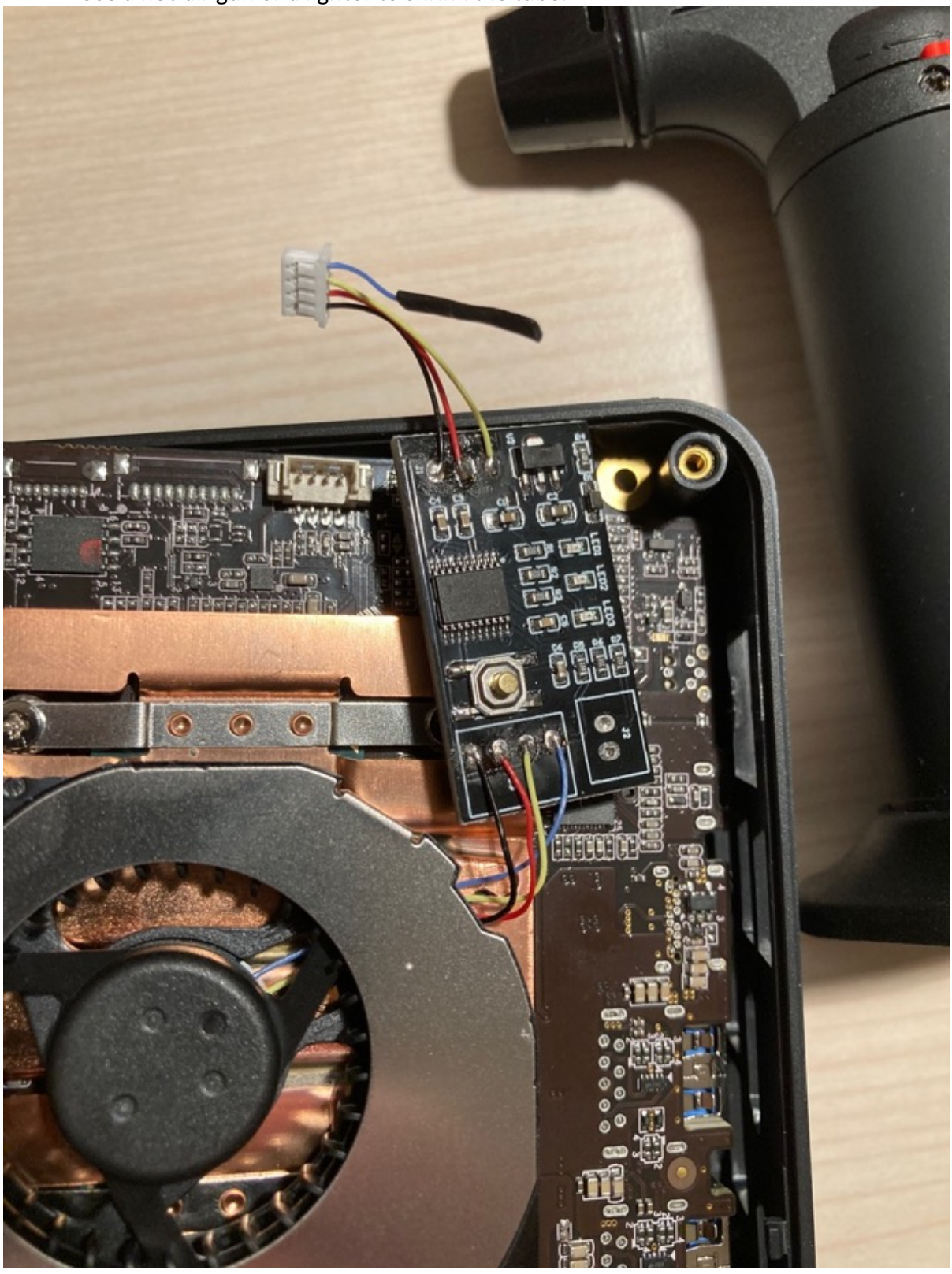
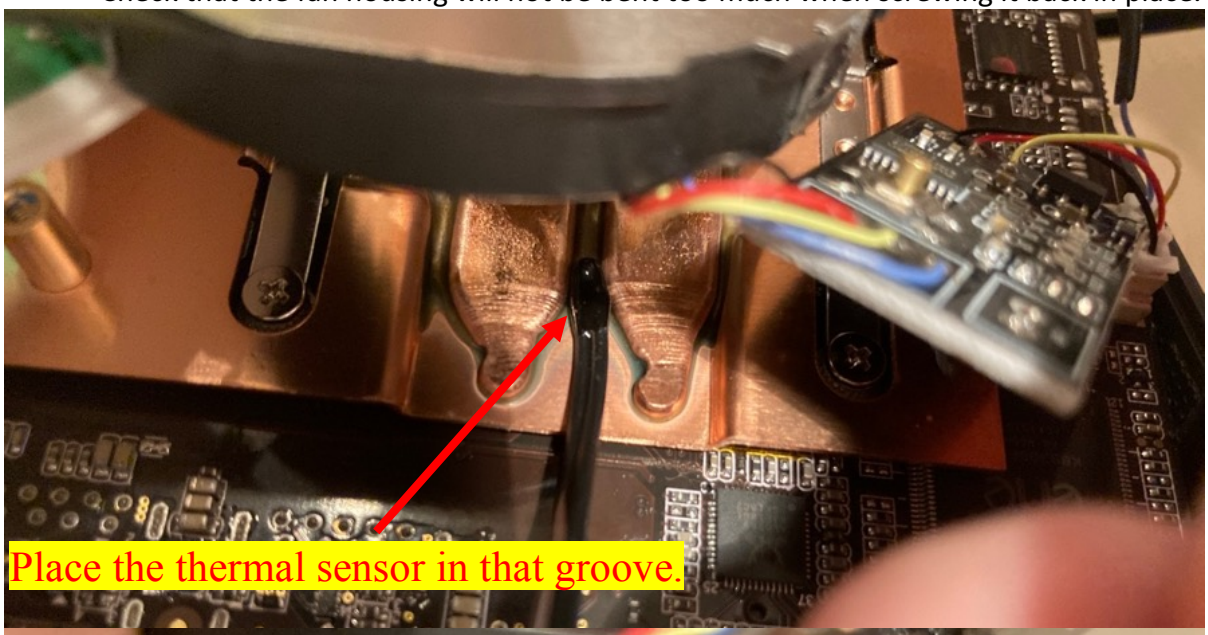
8.)Use shrinking-tube to insulate the blue wire

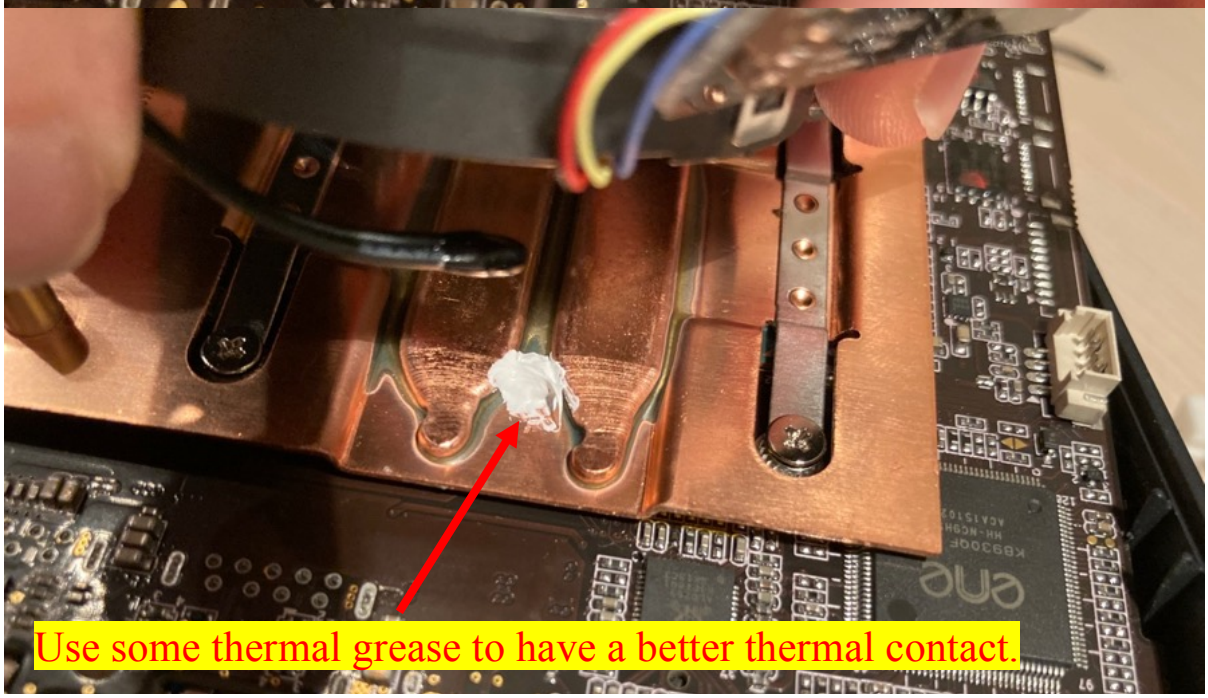
- Put a small piece of shrinking tube over the blue wire (the PWM wire from U57)
- Use a hot-air gun or a lighter to shrink the tube.



9.)Place the thermal sensor

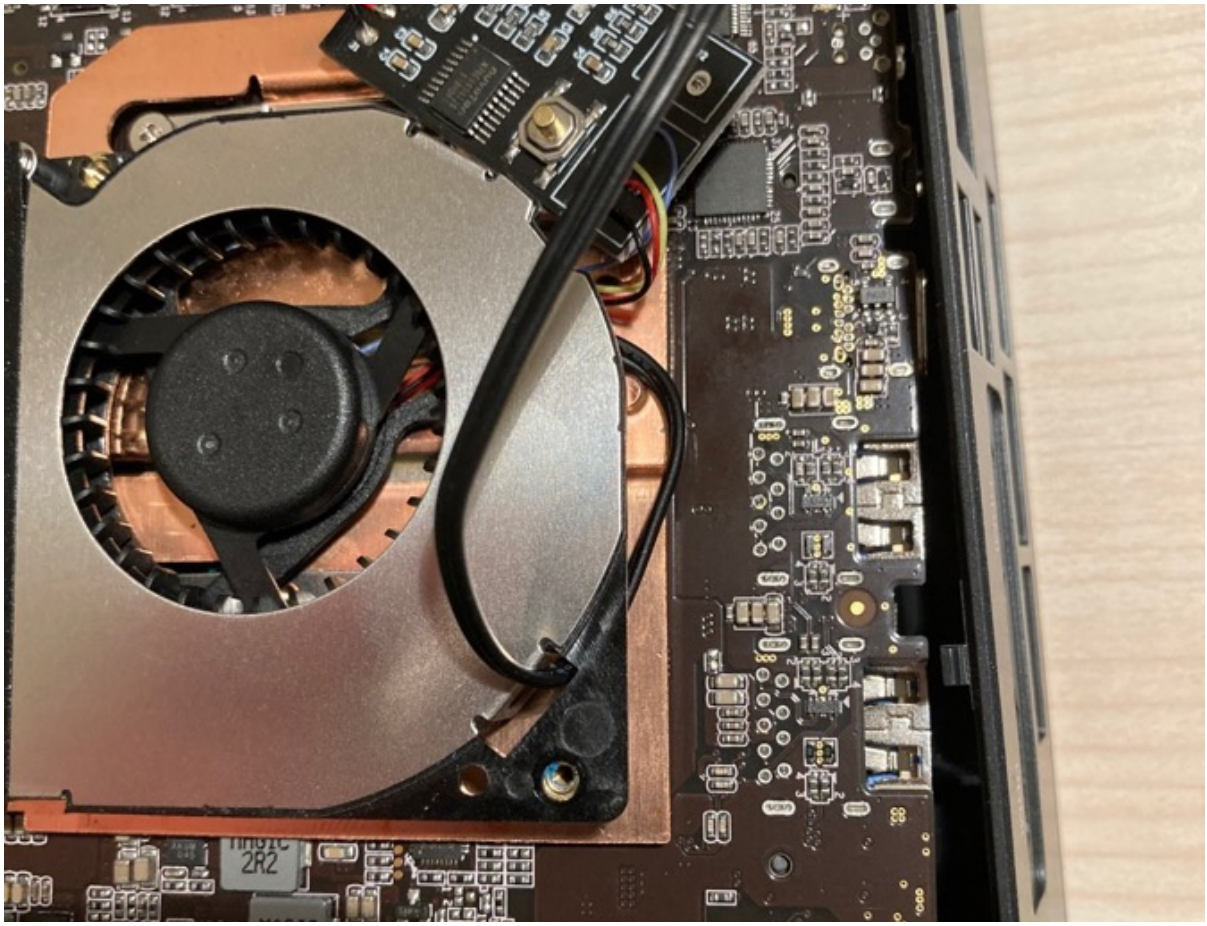
- Lift the fan, put some thermal grease in the groove as on the photo.
  Don't put too much, just enough to fill the gap a bit.
- Place the thermal sensor in such a way that it fits best.
  It will be held in place by the fan when it's screwed later because the sensor is slightly thicker than the gap is.
- Make sure you position the sensor well, then put the fan back.
- Check that the fan housing will not be bent too much when screwing it back in place.





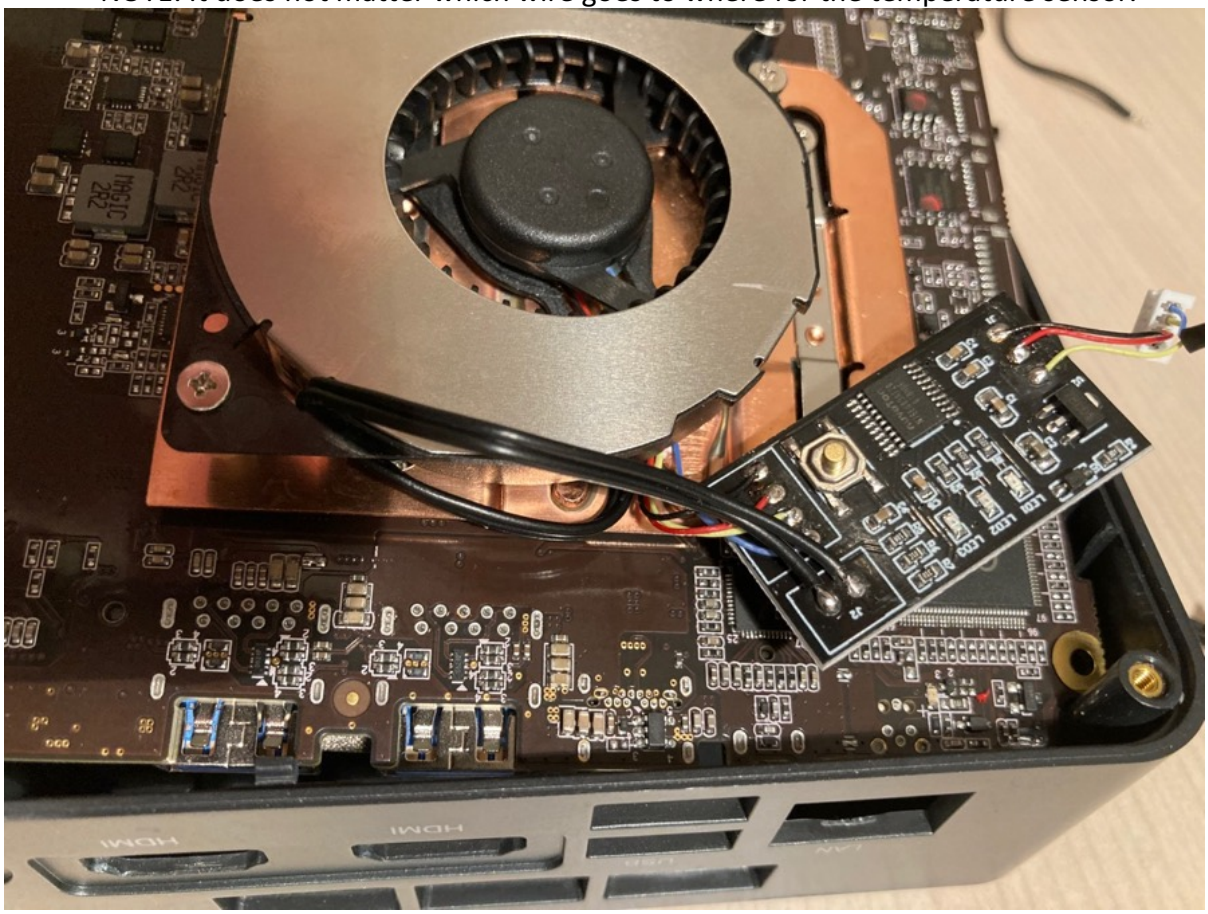
10.) Route the sensor wire though the slot-hole of the fan

- Cut off the white connector of the thermal sensor.
- To add a bit of strain relief to the sensor wire, route it through the slot-hole of the fan. This ensures that the thermal sensor will not move out of place over time while the fan is turning.
- Check that the thermal sensor is still at the correct place – in the groove.



11.) Solder the sensor wire to the controller board

- Now solder the sensor wires to the board as seen on the photo.
  NOTE: It does not matter which wire goes to where for the temperature sensor.



12.) Stick the controller-board to the heatsink

- Cut some double-sided sticky-tape and put it on the back of the controller-board.
- Now position the controller-board and stick it to the heat-sink.
  NOTE: make sure none of the wires are puled tight – leave some room!

13.) Check the completed assembly

- Make sure all the wires are properly soldered.
- Make sure the correct colors are soldered to the right places
- Check if the thermal sensor is placed properly and has not slipped.
- Plug in the fan connector into the main-board.
- Check if none of the wires is under tension

14.) Configuring the fan controller

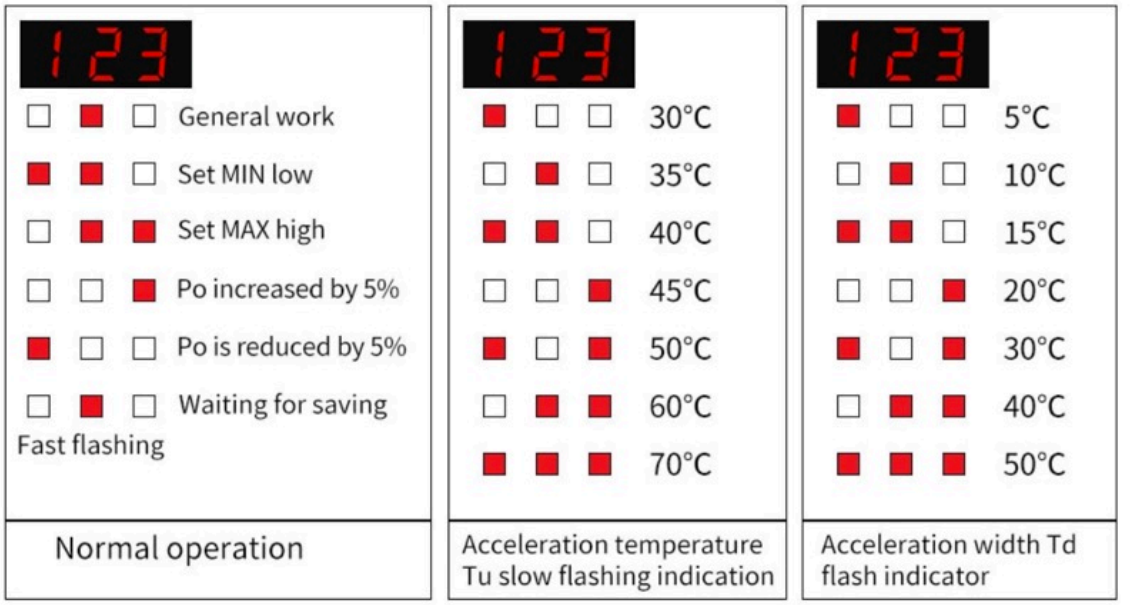
- **Be sure you have double-checked all wiring! You could damage your U57!**
- While the U57 is open, connect the power-cable.
- Make sure the construction is stable enough so you can safely press the button on the fan controller while the U57 is open, running.
- Boot the PC – check if the fan starts turning (it should work in default configuration!)
  ATTENTION! Immediately power of the PC is the fan is not turning,
  if something is getting hot or you see smoke somewhere!
- If the fan does not turn very fast, make sure you are not operating the U57 too long, it may overheat!

Understanding how to "configure" the controller with just one button is a bit tricky. But I found a nice Youtube video explaining how the thing works.

Please watch the video first!! This will help you a lot!!
https://www.youtube.com/watch?v=NBcCFYZhU_0

Just a few hints from my side:

- The controller starts in "normal operation" – LED #2 is constantly on.
  Pressing the button will change the minimum PWM setting.
- A single press INCREASES value.
- A double press DECREASES value.
  (NOTE: don't press too quickly, it needs a bit pause between the 2 presses to work reliable!)
- LONG press enters the menu:
  Slow blinking of LED #2 means: you're in "acceleration temperature" menu
  Fast blinking of LED #2 means: you're in "temperature delta" menu.
- Waiting for approx. 30s saves the setting & leaves the menu again – you're then back in "normal operation" where you can set the minimum PWM level again.
  LED #2 is constantly on.



T<=Tu:PWM=Po

T>Tu: PWM increases with temperature

T>(Tu+Td):PWM(%)=100

Normal operation:

Click the button, the bottom line output will increase by 5%, double-click the button, the bottom line output will be reduced by 5%, and the value will be changed for 20 seconds. After the middle indicator stops flashing, the parameters will be saved automatically; long press the button to enter the temperature control setting.

Temperature control setting:

Accelerate the temperature control setting (slow flash) by clicking and double-clicking to respectively raise and lower the setting value, long press to enter the acceleration width setting;

Acceleration width setting (flash) also click to double-click to change the value, long press to save and exit the temperature setting.

The bottom line is 20%, the acceleration temperature is 35°C, and the acceleration width is 15°C. When the probe temperature is lower than 35°C, the output signal is always 20%. When the probe temperature exceeds 35°C, the controller smoothly increases the output signal according to the temperature rise,accelerate;

When the probe temperature reaches or exceeds 50 ° C (35 + 15), the controller outputs the full speed signal, the fan full speed, specifically to the actual fan speed, depending on the specific performance of the fan can be slightly different.

I was ending up using the following settings on my U57:

Po - Minimum PWM:	**3 ticks higher than “min level” -> should be 35%**
Tu - Acceleration temperature:	**40°C (LEDs 1 + 2 are ON, LED 3 is OFF)**
Td – temperature delta:	**50°C (LEDs 1 + 2 + 3 are ON)**

NOTE: the actual values depend on your environment and fan-controller.
Play a bit and see for yourself what’s satisfying your needs.
With my settings, the fan was running between approx. 35% PWM and probably up to 50% under high CPU stress. My CPU core temperature never climbed above 60°C while the fan was still operating very silent. Normally you could barely hear the fan.

15.) Final step before assembly

- Before you put the mainboard back in the U57 housing, I would recommend you are removing the plastic foils stuck on the inside at the air-inlet openings.
- They are placed to avoid too much dust is getting into the housing - but they also block quite a bit of the airflow, reducing the cooling performance.
- I am operating the U57 as Windows TV-box in a relatively clean living-room and I do not care so much about the dust which gets collected over time as the U57 is not operating so often.
- The noise level decreased a bit and cooling performance increased a lot by removing the foils.
- **ATTENTION! When assembling again, take care not to damage the WIFI cabling!!**

16.) Future thoughts

- This DIY hack is not my preferred solution, but I decided to go this way because Beelink support was unresponsive. I would have appreciated more interaction with Beelink and solve the real root-cause: the firmware on the embedded controller (EC), an “ENE KB930” IC. It controls the fan PWM, has multiple analog inputs for temperature sensors etc. This 8051 based device just needs to be programmed correctly – which is feasible, but it’s hard without access to some source-code.
- If you followed the above instructions and you left the blue wire attached to the fan connector and used some shrinking tube to insulate it, you could undo this DIY hack again in the future and update your U57 BIOS/EC firmware when a fix is available from Beelink.