

TH7

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October 27, 2018

Abstract

This leaflet describes the TH7 generic thermocouple reader pi-hat/PCB for the raspberry pi.

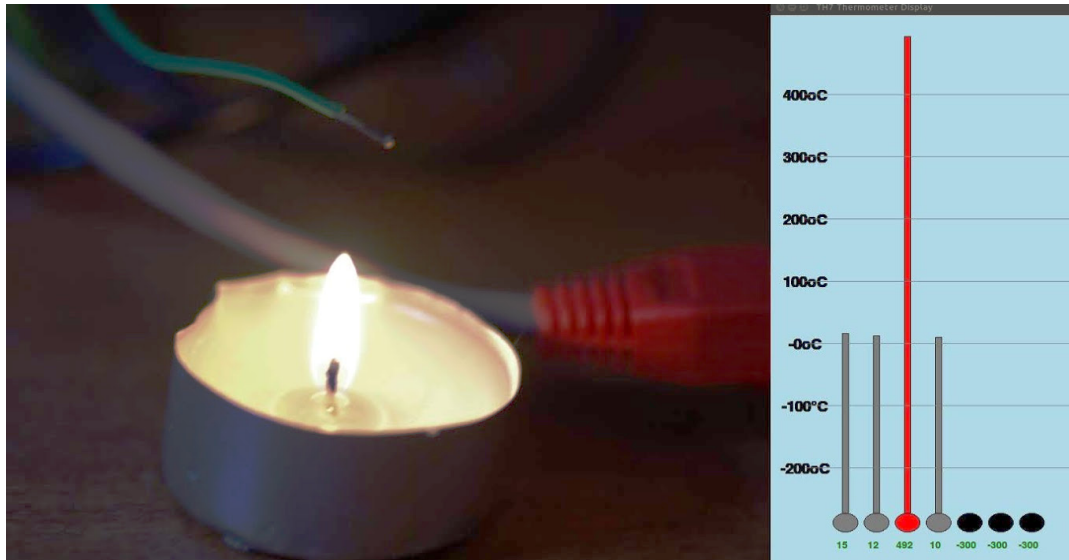


Figure 1: Thermocouple over a tea light flame at circa 500°C .

1 TH7 description

The TH7 is a raspberry pi hat (see figure 3 with on board PCB temperature measurement that provides seven thermocouple inputs. Uncalibrated this gives a typical accuracy of $\pm 2^{\circ}\text{C}$. It also provides two user programmable LEDs and displays the supply voltage to the pi.

The TH7 is a generic thermocouple reader, and therefore should work with any thermocouple. Software defines its micro-volt to temperature and cold junction compensation characteristics. Software support has been written for the 'k' type only currently.

1.1 Characteristics

The TH7 offers:

- Full cold junction compensation;
- Loss of/disconnection of thermocouple detection;
- Seven inputs;
- Uses the raspberry pi standard python SPI interface;
- Python coding examples (<https://github.com/robin48gx/TH7>);
- Two user Programmable LEDS;
- On chip PCB temperature measurement;
- Can be used as a general micro-volt reader with a $\approx -6000\mu V \rightarrow 40000\mu V$ range.

2 Instructions

2.1 Connection to terminal block

Connect the thermocouples using the hital tech connectors and ensure the wires make contact with the connector metal clamps (see figure 2).

2.2 Connection to the device being measured

Always apply insulation to the thermocouples (i.e. do not ground them). Epoxy resin is often useful for gluing thermocouples to devices under long term temperature test.

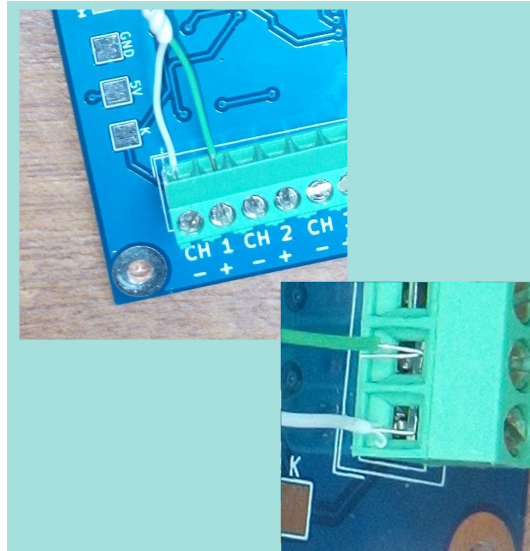


Figure 2: Wiring European standard 'k' type thermocouples Wiring (green is plus and the green and white is minus; other countries may use different colour schemes). If the thermocouple is inserted with incorrect polarity it will read incorrectly and temperature from it will be seen to go down when heat is applied to it.

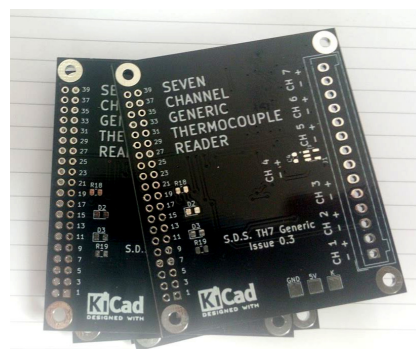


Figure 3: TH7 thermocouple interface PCB/pi Hat