



## Frequently Asked Questions

### T120 & T120D Temperature Sensors

1. What is the purpose of the internal switch?

**Answer:** *The internal switch on the T120 is used to configure the sensor for a current (mA) output or a DC voltage output. Place the switch in the “mA” position when connecting the sensor to the Falcon.*

2. The Falcon input configuration page has GAIN and OFFSET parameters. What is their purpose?

**Answer:** *The Falcon inputs are generic to allow connection to many different sensors. The GAIN and OFFSET settings in the Falcon are used to calibrate the Falcon to a specific sensor. The T120 and T120D sensors have an internal jumper to select a sensing range of 50-95°F or 32-122°F. The 50-95°F position requires a GAIN of 11 and OFFSET of 39. The 32-122°F position requires a GAIN of 22 and an OFFSET of 11. The Falcon manual lists the correct GAIN and OFFSET numbers for a variety of sensors. The manual also shows a formula which can be used to calculate the GAIN and OFFSET.*

3. Do I need to connect the T120 “COMMON” terminal to the Falcon “EXTERNAL GND”?

**Answer:** *No. This connection is only required when the sensor is configured for a DC voltage output signal. The Falcon requires a current (mA) signal from the sensor which does not use the “COMMON” terminal on the sensor. Just connect the sensor “PWR” to the Falcon Ch+ and the sensor “T OUT” to the Falcon CH-.*

4. What size of wire do I need to connect the T120 to the Falcon? Does it need to be shielded?

**Answer:** *22 AWG twisted pair works well. Shielded 22 AWG twisted pair is better, but there is not an easy way to terminate multiple shields at the Falcon end.*

5. The temperature sensor does not seem to be accurate, how can I test the sensor to see if it is working properly?

**Answer:** *First, note whether the sensor is within room temperature range (+/-15°). If the room feels normal and the sensor is reading <55°F or >85°F, you can assume there is a wiring error, the sensor switch is set to volts, or the GAIN and OFFSET settings are incorrect. Next, compare the T120 reading to a thermometer reading. In order to get a true comparison, the thermometer needs to be better than +/-0.5°F accurate and placed alongside the T120 sensor. This is important since temperatures can vary several degrees across a data center. Also note that the T120 is very quick to respond to temperature*



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*changes. If the T120 is placed in the air stream, its reading may fluctuate several degrees as the CRAC units turn on and off maintaining room temperature.*

6. How do I convert the Falcon temperature reading to display degrees Celsius instead of degrees Fahrenheit?

**Answer:** *First, convert the T120 temperature range of 50-95°F to degrees Celsius which equals 10-35°C. Using the formulas in the Falcon manual, calculate the GAIN and OFFSET using Celsius values.*

$$\text{GAIN} = (\text{Sensor Range}) / 4 = (35-10)/4 = 6.25 \text{ (round to 6).}$$

$$\text{OFFSET} = \text{Sensor Low End} - \text{GAIN} = 10 - 6 = 4$$

*If you are using the 32-122°F (0-50°C) range, GAIN = 13 and OFFSET = -13.*