Technical notes for the CT_AC1PH_SLD_5V current transducer

The CT_AC1PH_SLD_5V current transducer is a low cost current transducer that was NOT intended to be a highly accurate device, but it can still be very useful when applied to the correct type of applications.

The design intent for this CT was to provide a low cost method to do the following:

1) Monitor the ON/OFF status of AC powered devices. IE. is current flowing or not.
2) Approximate the current flow through a circuit.
3) Detect changes in behavior & current draw of electrical equipment over time
4) Find out what percentage of a total load that sub-loads might be using. Example:
    a. Put one of our CT's on each sub circuit in a building
    b. You can use the CT to find out what percentage of the total load that each sub circuit is using
    c. For instance if you had 4 sub-circuits and our CT's read values of 2A, 3A, 4A, and 5A
        i. Just add all of the readings to find that the total current read by our CT's is 14A.
        ii. Now divide each individual reading by the total to find the percentage that each sub-circuit is using: Ie. 2A/14A = approx 15%. 3A/14A = approx 21%. etc...
    d. AND if you know the total amp draw for the building (from the main meter for instance), then you can even calculate an accurate current reading for each CT. Let's say that the Main meter for the building was reading 15A when we took the CT readings listed above.
        i. For the CT that read 2A, the accurate calculated amp draw is 15% x 15A = 2.25A.
        ii. For the CT that read 3A, the accurate calculated amp draw is 21% x 15A = 3.15A

The sensor outputs a 0-5V signal that is equivalent to the amp draw over the configured range, and in theory it should be linear. In real life applications:

1) The sensor is not accurate when measuring loads in the bottom 10% of the configured range.
    a. Ie. in the 0-10A range it can't accurately measure loads from 0-1A
2) The sensor is not perfectly linear over the rest of the range.

However, the sensor IS consistent & repeatable in its readings (within 5% or so). That means that if the sensor's voltage output is 2.3V when measuring a 5A load once, then the next time it outputs 2.3V, you can be confident that the current load is 5A in that case as well.

Since the CT is consistent & repeatable, you could create a software calibration process to achieve accurate current readings. Here is what we recommend:

1) Use the sensor to measure 5 known current loads across the configured range.
    a. Ie. For the 0-10A range, measure loads at 2A, 4A, 6A, 8A, and 10A
2) Record the voltage output from the sensor at each of the loads. You may end up with something like this:

known load	sensor output
2A	0.8V
4A	1.9V
6A	3.3V
8A	4.1V
10A	4.8V

3) Then use those results as a lookup table for all future readings.
    a. If the sensor is outputting 2.6V for example, then you know that the measured load is approx 5A.
    b. If the sensor is outputting 4.45V, you would record the measured load value as 9A.