

Scaling and Linearizing Example for PAC Control

Release:

2017-08-25 R1.0.1 Updated strategy from PAC Control R8.2b to R8.2f

Included:

- This Microsoft Word document
- A PAC Control R8.2f Basic example strategy (can be used with PAC Control Basic or Pro, versions R8.2f or higher)
- An example thermistor chart for an Omega 44007 thermistor

Overview:

Most applications encounter three general types of linearization: Linear, Polynomial, and Piecewise-Linear. This example strategy includes subroutines for each of these linearization formats.

- *Linear* (also called scaling) is used when the input and output have a linear relationship. Use this subroutine for unscaled data (counts or a different scaling system) to or from a 3rd-party device communicating over either serial or Ethernet (TCP/IP).
- *Polynomial* linearization applies when an input-to-output data relationship is described as a standard polynomial equation. The coefficients of this equation are used by the subroutine to convert the input to output. Use this subroutine for thermocouple tables and non-linear portions of resistive temperature and capacitive devices (for example, devices with very high temperature ranges).
- *Piecewise-Linear* is a very common technique for thermistors/resistive temperature probes or converting a pressure or level high to storage volume. Use this subroutine if you have a SNAP-AIRTD module with an unsupported probe (a probe that is not 100-ohm platinum or, for the SNAP-AIRTD-10, 10-ohm copper) or if you have a SNAP-AIR40K. For the SNAP-AIR40K, use the subroutine to convert resistance to temperature. See the important note, below.

To use the subroutines, export and add the ones you need to your PAC Control strategy (see instructions in Chapter 12 of the PAC Control User's Guide, form #1700).

Important Note for the SNAP-AIR40K-4, SNAP-AIRTD-10 and SNAP-AIRTD: In addition to using the Piecewise-Linear subroutine, you will also need the probe's ohms-to-temperature chart, available either from the probe's manufacturer or distributor. Use the information from the chart to build a look-up table in PAC Control. An example of a look-up table is included in the Powerup chart of the strategy (Block 38). The example is for an Omega 44007 type thermistor; Omega's

datasheet containing its ohms-to-temperature chart is included for reference.