

Lab 3

PID Control Using Defaults settings of Proportional, Integral, and Derivative Tuning Constants on the Chamber Air Temperature

Purpose.

Using the default settings of the PID controller set in the program:

- 1) Observe the response of the Control system to a Step change in Set Point.
- 2) Observe the response of the control system to a disturbance

Procedure

- 1) Download Arduino IDE and load the code [Complete Temperature Control C/C++ Code](#)
- 2) Make sure 12 VDC power supply plugged in. Connecting the computer USB port to the Arduino Nano will power up the LCD Display and Nano , however the power to the heater requires the 12VDC power supply.
- 3) On the Arduino IDE menu, go to Tools and click on Serial Plotter. This will open up the serial plotter screen on the PC.
- 4) Set the controlled variable to LM35L (Chamber Air Temperature) by clicking On the Infra Red Remote LM35L key
- 5) Set the Disturbance potentiometer to 100%. This setting will not change throughout this lab. It is part of the process and will not be used as a disturbance. Its effect is to create a more rapid step response (faster process dynamic).
- 6) Adjust the Set Point Pot from 0 to 35 deg C. Try to do this in a step wise manner rather than incremental adjusting the Set Point.
- 7) Describe the steady state response to the Set Point Change
 - a. First Pk is 38 deg . First crossing Set Point after approximately 400 secs.
 - b. Stabilizes but a very long time to steady state. More than 40 minutes.