

OVERVIEW

The LDT-5910C 32W Thermoelectric Temperature Controller provides the user with the ability to quickly setup the temperature controller by using one of the preset values. To optimize the temperature controller, the user can manually adjust the PID values. This technical note describes the process of configuring the PID control of the LDT-5910C for preset operation or manual operation.

PRESET PID CONTROL

The LDT-5910C has twelve predefined gain values including six ILX mount gain values. When selecting a mount, the LDT-5910C automatically configures the PID values, sensor type, and current limit.

To set a preset:

1. Press the MODE button until the PRESET LED is illuminated.
2. Press the SELECT button then using the ADJUST knob highlight the PRESET value.
3. Press the SET button to select the displayed preset.

If the preset gains do not provide the optimized thermal stability required, the values can be automatically loaded into the manual PID control for optimization.

MANUAL PID CONTROL

The LDT-5910C has the ability to manually adjust the PID values. It also has the ability to load the preset value into the manual PID control to allow the user to start with the preset value that maybe close to optimal the PID value for the thermal load.

To adjust PID values manually:

1. Press the MODE button until the MANUAL LED is illuminated.
2. Press the SELECT button and the current P value will be displayed. To adjust the P value, press the SET button then use the ADJUST knob. To move to the next value, press the SELECT button and then the SET button to adjust the next value.

To load preset PID values for adjustment:

1. Press the MODE button until the MANUAL LED is illuminated.
2. Press the SELECT button until "Adjust Preset PID" is displayed. Press the SET button to enter the Preset sub-menu.
3. Using the SELECT button or ADJUST knob to cycle until the desired preset is displayed. To load the preset values, press the SET button. The values can now be adjusted by using the SELECT button, ADJUST knob and SET button.

PID AUTO-TUNE

The LDT-5910C also has the ability of determining the optimal PID terms for your thermal load.

To start an auto-tune:

1. Using the MODE SELECT button first place the LDT-5910C in either T or R SNSR mode.
2. Using the ADJUST knob set the temperature or resistance to the desired set point.
3. Press the MODE button until the AUTO LED is illuminated.
4. To enable auto-tune press the SELECT button then the SET button.
5. When the auto-tune completes successfully the optimized PID terms will be loaded into the manual and PID control can be further adjusted to be optimized for the thermal load.
6. If the auto-tune function fails, an error will be displayed and may require the user to manual determine the PID values, see Application Note #20 PID Control Loops in Thermoelectric Temperature Controllers for further information.