APPLICATION NOTE

Setpoint Ramp Operation for Lake Shore Temperature Controllers

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For any questions about setpoint ramp operation, contact the Lake Shore Service Department at service@lakeshore.com or call +1 614-891-2243 (press 2 for Service).

Following are some notes to assist you in using the setpoint ramp feature in Lake Shore temperature controllers.

A setpoint ramp differs from a temperature ramp in controlling the temperature rise. This means that when you enter a new setpoint, the controller will begin to change the setpoint at whatever increment you have configured, starting where the setpoint is currently set. Once you have completed a setpoint ramp experiment, the setpoint should be reset to the current control sensor temperature before starting another setpoint ramp experiment.

Here is an example of how it works when a 100 K setpoint and a 1 K/m ramp rate are required:

1. Set the setpoint to zero (0) and configure the setpoint ramp to 1 K/m.

2. Enter a new setpoint of 100 K (it will take 100 minutes for the setpoint to actually reach 100 K).

   The setpoint will start changing by 1 K each minute. The controller will show 1 K at 1 minute, 2 K at 2 minutes, etc., until it reaches 100 K at 100 minutes.

   NOTE: Your actual temperature should rise close to the same rate, though by how much depends on your system and PID settings.

3. When the system reaches 100 K, make your measurements. Then turn off the heater to allow the system to cool down.

It is important to note that the setpoint will remain at the last value that was entered, which in the above case would be 100 K. When you want to perform another ramp from the current temperature and do not change the setpoint to the current temperature, whatever new setpoint you enter will immediately be 100 K. This will start to change to the new value at whatever ramp rate is defined. If your current temperature is below 100 K, the heater will turn on at whatever output the PID values determine, which can be up to 100% depending on the difference between the current temperature and 100 K. This may cause a temperature rise much greater than the desired 1 K/m. The easiest way to reset the setpoint is to:

1. Disable setpoint ramp and enter a setpoint that is just below the current sample temperature.

2. Re-enable the setpoint ramp and enter a new setpoint to start the ramping.

   NOTE: If the heater was turned off, set a new heater range prior to entering the new setpoint.

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