Exercise 9-1: Executing Code Based on a Condition

Goal

- Use a Case structure to execute code based on a condition.

Hardware Setup/Scenario

BNC 2120 option

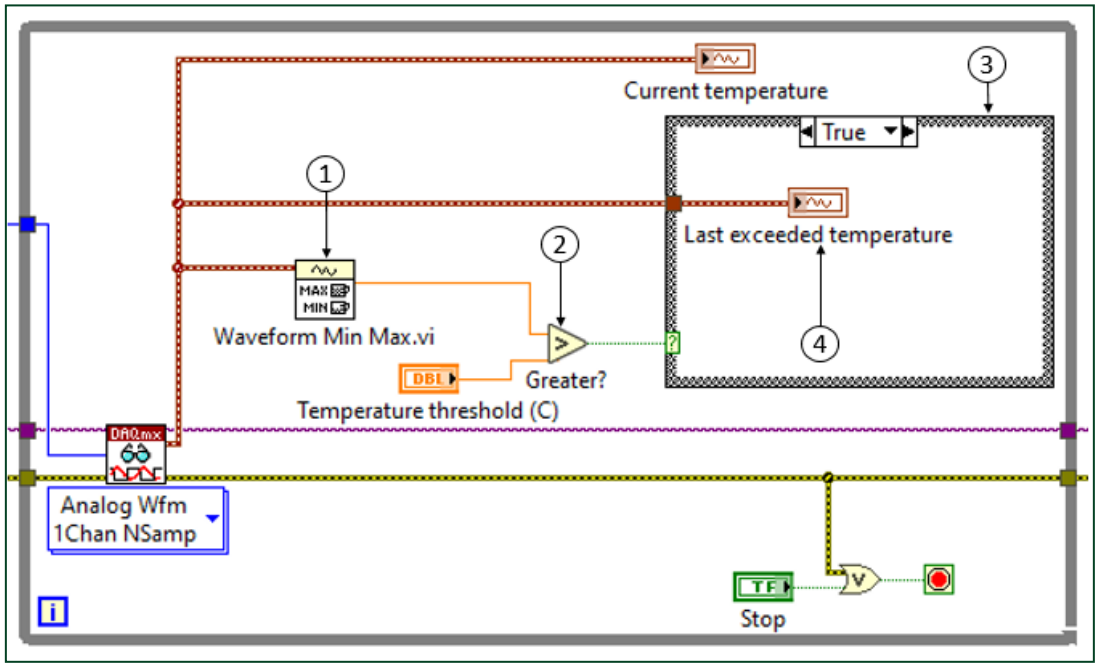
- Make sure, that the thermocouple is connected to the Thermocouple Input Connector (AI1) properly.

Instructions

Execute Code Conditionally Based on a Measurement Result—Conditionally Display Data on a Graph:

1. Open `C:\Exercises\LabVIEW Core 1\Execute Conditional Code\ Execute Conditional Code.lvproj`.
2. From the **Project Explorer** window, open the Condition Based on Measurement Result VI.
3. Explore the VI.
   - Explore the front panel and the block diagram.
   - Set the DAQmx Physical Channel input to **PCI-6221/ai1.**
   - Run the VI.
     - Data will appear on the **Current Temperature** graph.
   - Stop the VI when finished.

4. Modify the VI, as shown in the following figure, to display temperature data on the Last exceeded temperature graph only if the temperature data has exceeded a user-specified threshold.

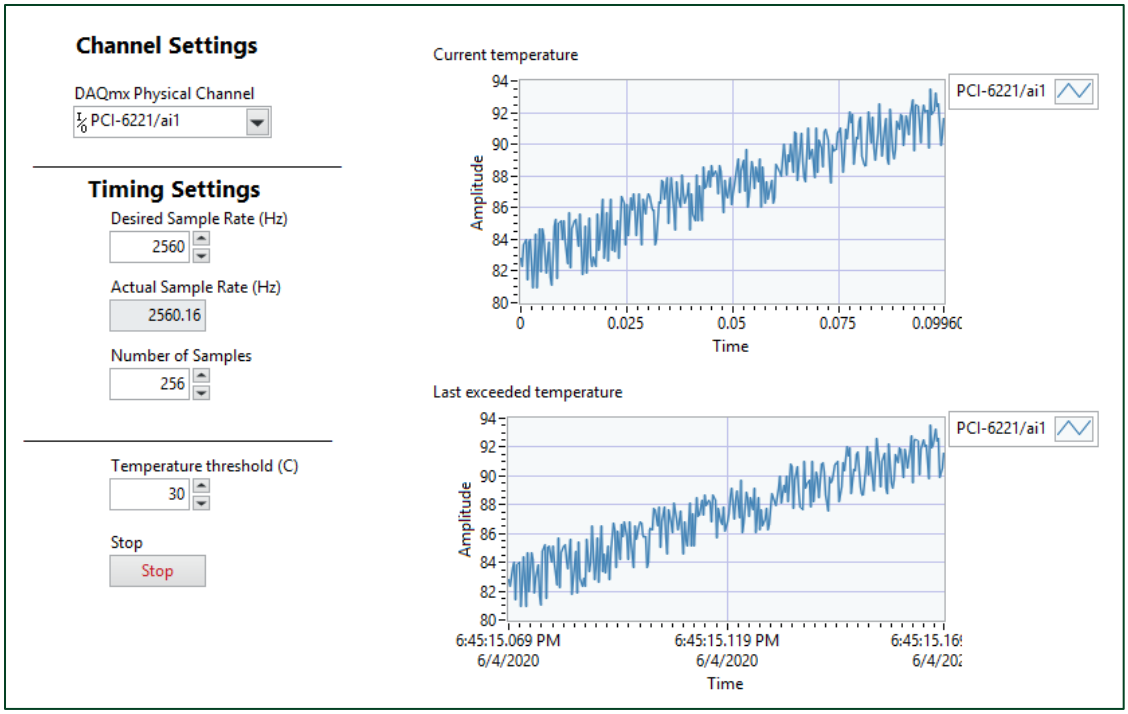


---

1. **Waveform Min Max VI** – The Y max output returns the maximum value of the Y array in the waveform.
2. **Greater** Function – Right-click the **y input of the Greater** Function and select **Create Control.** Rename it Temperature threshold (C).
3. **Case structure** – This VI will use the Case structure to update the **Last exceeded temperature** waveform graph indicator only when the acquired temperature exceeds a threshold.
4. **Last exceeded temperature** indicator – Add a waveform graph indicator to the front panel and wire the corresponding terminal as shown.

---

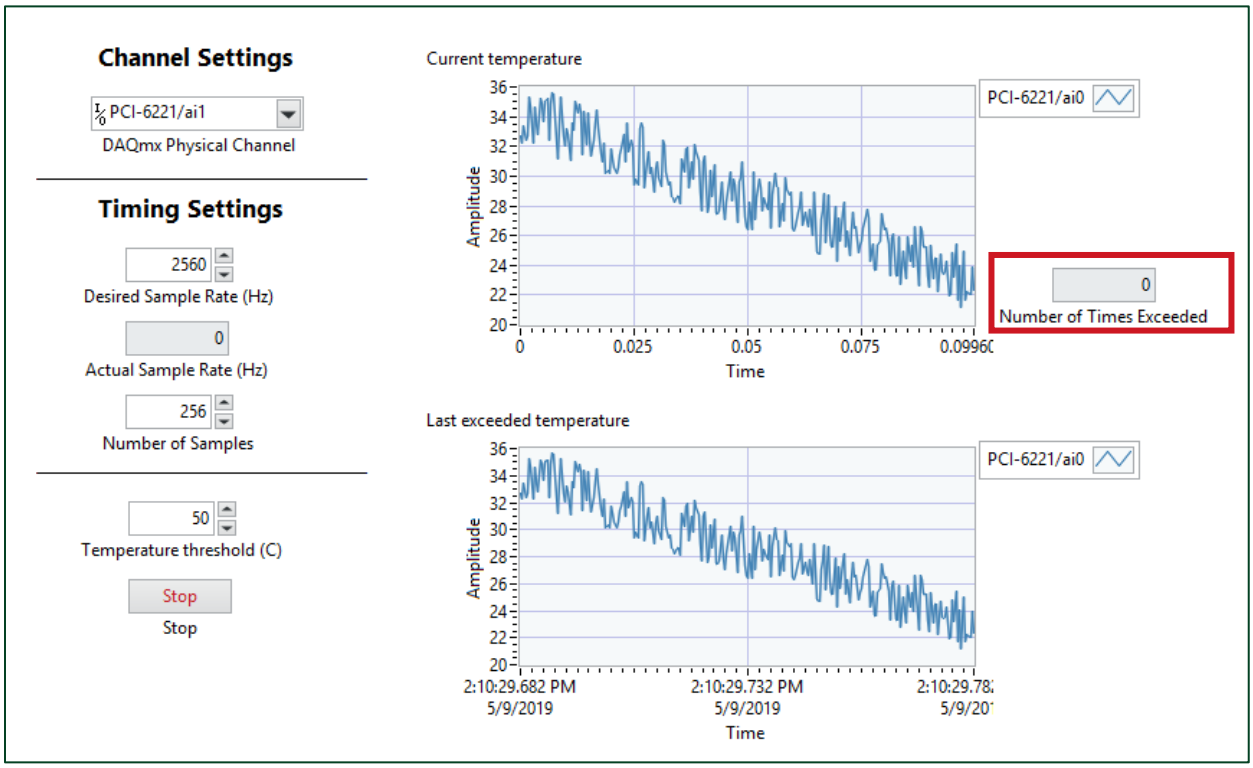
5. Configure the front panel items.
   - Configure the **Last exceeded temperature** waveform graph to show the absolute time, so you can see the exact date and time of when the acquired data last exceeded the threshold.
     - Right-click on the **waveform graph**, then select **X Scale»Formatting.**
     - In the opened window, make sure that the editing mode is set to **Default** and select **Absolute time** in the **Type** section.
   - Wire this indicator as shown in figure above.
6. Arrange the front panel, as shown in the following figure.



7. Set the control values, as shown in the figure above. Otherwise set the values to whatever is appropriate for your hardware setup.
8. **(BNC 2120)** Lower the Temperature threshold to 30. You should be able to exceed the temperature threshold in the next step by firmly pressing the thermocouple.
9. Examine the behavior of the VI.
   - Run the VI.
   - Adjust the value of the **Temperature threshold (C)** control and/or the acquired signal, so that **Current temperature** exceeds **Temperature threshold** from time to time.
   - Notice that every time the **Current temperature** graph contains a value above the **Temperature threshold (C)** control value, that data is passed to the **Last exceeded temperature** graph.
   - Notice that the x-axis of the **Last exceeded temperature** graph shows the absolute date and time of the last temperature waveform that exceeded the threshold.
   - Stop the VI when finished.
10. Select **File» Save All** to save the VI.
11. Close the VI.

Challenge

Add code to the Condition Based on Measurement Result VI to display a running total of number of times the threshold has been exceeded since the VI started running.



- **Hint:** Use a shift register to store the running total. Increment the running total in the Case structure.
- **Solution:** Open `C:\Solutions\Exercise 9-1\[Challenge] Condition Based on Measurement Result with Running Total.vi`

On the Job

In your own applications, do you need to execute code conditionally based on a measurement result? If so, describe it below.

End of Exercise 9-1