Display Temperature and Limits

Goal

Use Property Nodes to change the properties of front panel objects programmatically.

Scenario

Complete a VI that records temperature to a waveform chart. During execution, the VI performs the following tasks:

- Set the Δx value of the chart to the user-defined value.

- Clear the waveform chart so it initially contains no data.

- Change the color of a plot if the data exceeds a certain value.

- Blink an alarm indicator if the data exceeds a certain value..

Design

Add the following Property Nodes to an existing VI:

Type	Name	Property
Waveform Chart	Temperature	XScale.Multiplier
Waveform Chart	Temperature	History
Waveform Chart	Temperature	Active Plot 0 Plot.Color
Boolean Indicator (LED)	Over Limit	Blinking

NATIONAL INSTRUMENTS™

Implementation

The files that you need to complete this exercise are here:
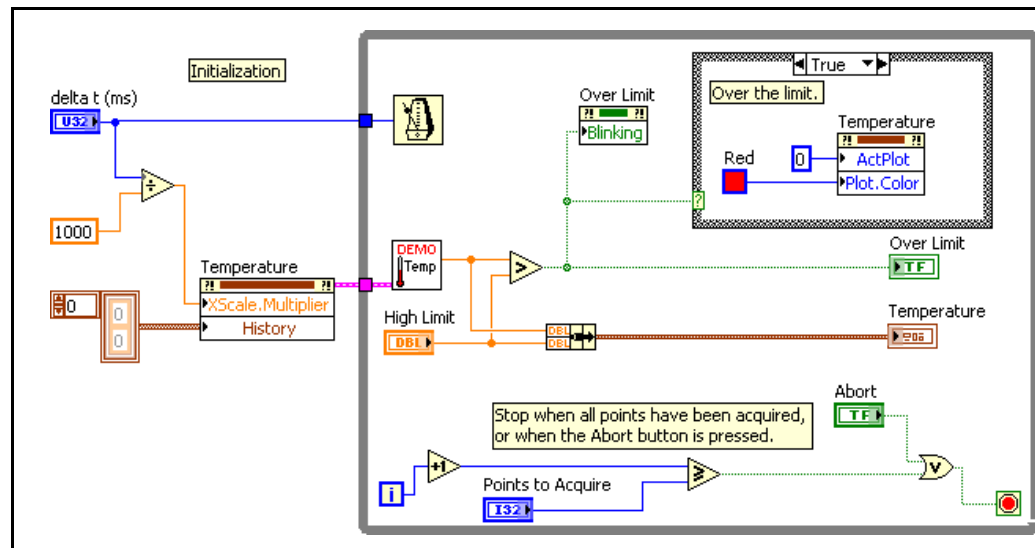`<NI eLearning>\LV Core 2\Property Nodes\Exercise.`

1. Open `Temperature Limit.vi` in the `<Exercise>` directory. The front panel is already created for you.
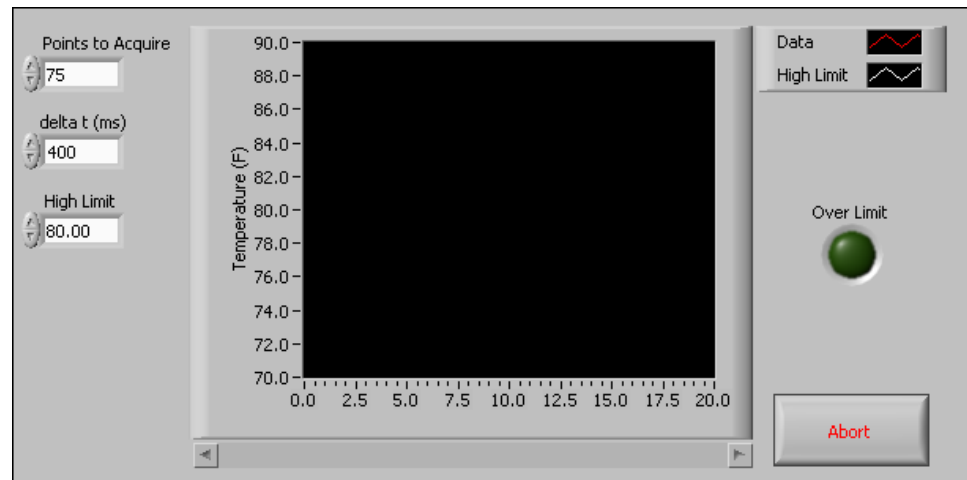
Figure 1. Temperature Limit Front Panel

2. Open the block diagram of the VI. A portion has been created for you. Figure 2 shows an example of the final block diagram.

Figure 2. Temperature Limit Block Diagram

3. Modify the VI so that it sets the Δx value of the chart to the Δt (ms) value input by the user.

❑ Right-click the **Temperature** indicator and select **Create»Property Node»X Scale»Offset and Multiplier»Multiplier** from the shortcut menu to create a Property Node.

❑ Place the new Property Node to the left of the While Loop.

❑ Right-click the **Temperature** Property Node and select **Change All To Write** from the shortcut menu.

❑ Divide **delta t (ms)** by `1000` to determine the X-Scale Multiplier, as shown in Figure 2.

4. Modify the VI to clear old data from the Temperature chart before starting the temperature acquisition.

💡 **Tip** To clear a waveform chart from the block diagram, send an empty array of data to the History Data property.

❑ Resize the Property Node to two terminals.

❑ Select the **History Data** property in the second terminal.

❑ Verify that the History Data property is set to Write.

❑ Right-click the **History Data** property and select **Create»Constant** from the shortcut menu.

❑ Wire the Property Node as shown in Figure 2.

5. Modify the VI so that when the VI acquires data, it turns the Data trace red and the Over Limit LED blinks when the temperature exceeds the limit value.

❑ Right-click the **Temperature** indicator and select **Create»Property Node»Active Plot** from the shortcut menu to create another Property Node.

❑ Place the new Property Node in the True case of the Case structure.

❑ Resize the Property Node to show two terminals.

❑ Click the second terminal and select **Plot»Plot Color**.

❑ Right-click the Property Node and select **Change All To Write** from the shortcut menu.

❑ Wire a **numeric constan**t with a value of 0 to the Active Plot property to select the first plot on the Temperature chart.

❑ Wire the **Red** color box constant to the Plot Color property to set the plot color to red when the data rises above the High Limit.

❑ Create a copy of the Property Node by pressing <Ctrl> while selecting and dragging the Property Node.

Tip Do not use the clipboard (**Edit»Copy** or <Ctrl-C>) to create a copy of the Property Node. This creates a different type of Property Node that will not be linked to the Temperature graph.

❑ Place the copy of the Property Node in the False case of the Case structure, as shown in Figure 3.

❑ Wire a **numeric constant** with a value of 0 to the Active Plot property to select the first plot on the Temperature chart.

❑ Wire the **Green** color box constant to the Plot Color property to set the plot color to green when the data is below the High Limit.
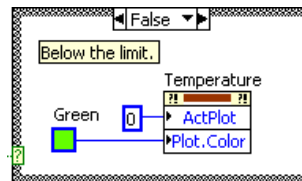
Figure 3. False Case in the Temperature Limit VI

6. Modify the VI so that when the VI acquires data, the Over Limit LED blinks when the temperature exceeds the limit value.

❑ Right-click the Over Limit indicator and select **Create»Property Node»Blinking** from the shortcut menu.

❑ Place the new Property Node inside the While Loop.

❑ Right-click the Property Node and select **Change All To Write** from the shortcut menu.

❑ Wire the Property Node as shown in Figure 2.

7. Save the VI.

Test

1. Run the VI to confirm that it behaves correctly.

2. Close the VI.

End of Exercise

Notes