

LabVIEW Course

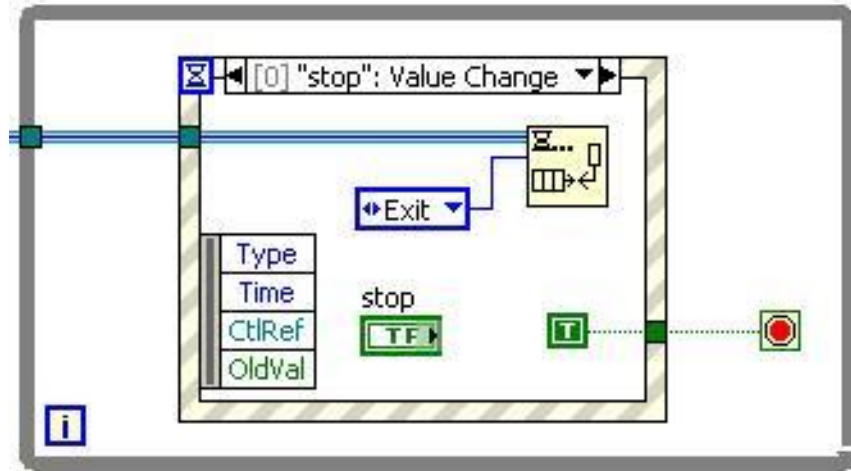
Exercise 17

G Boorman 2011

Exercise 17 – Measuring CPU-Time; Adding an Event Structure

This exercise uses the *Queued Pedestrian Lights Second Loop.vi* produced at the end of Exercise 16 to make CPU-time measurements and then adds an Event Structure to reduce CPU time taken by this VI.

- 1) Open the Windows Task Manager and choose the 'Performance' tab. The instantaneous CPU time is displayed in the 'CPU Usage' window and the 'CPU Usage History' displays the last minute's CPU usage for each processor core.
- 2) Run *Queued Pedestrian Lights Second Loop.vi* and watch the CPU Usage for one of the cores approach 100%. This is caused by the loop containing the 'Stop' control. The loop is polling the 'Stop' control as fast as it can – it's running in an unrestrained mode.
- 3) Add a 'Wait' function to this loop, with a delay of 5ms, and then check the CPU usage again. It should be much reduced, barely above the 'background' level.
- 4) Remove the Case structure in the upper loop (right-click on the border and do 'Remove Case Structure'). Delete the wire from the 'Stop' control to the Loop condition and any broken wires. Remove the Wait function.
- 5) Add an Event structure around the 'Enqueue Element at opposite End' and the constant.
- 6) Right-click the Selector Label of the Event structure and select 'Edit Events Handled by this Case...'. Choose 'Stop' in the Event Sources pane and 'Value Change' in the Event pane. Click 'OK'.
- 7) Move the 'Stop' control into this Event case. Add a Boolean True constant to this case and wire it the Loop condition of the While loop.



- 8) Check the VI works and save it.
- 9) Check the CPU usage is very low. Use probes to investigate the flow of data in the diagram.

End of Exercise