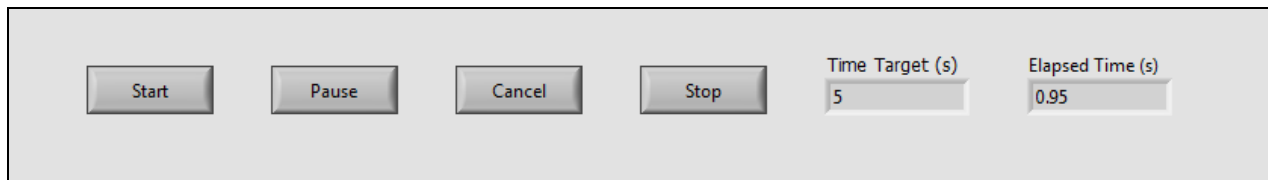# CLD Exercise 14: Timer Application With File Time Targets

Objective

Develop a state machine that loads time target values from a file, runs a timer for the duration of each the times, and has pause and cancel functionality. Use the given application front panel (Figure 1).

Figure 1. Application Front Panel

General Operation

When the **Start** button is pushed the application reads the data file. Next, the application runs a timer step for the duration of each time value loaded from the file. When the **Pause** button is switched on, the timer must pause and display the elapsed time at the time of the pause. Upon switching off the **Pause** button, the timer must continue from the point of the previous elapsed time. The current run time can be canceled, causing the next time step to start. If the application is in pause when the **Cancel** button is pressed, the timer cancels the pause and current step, and resumes timing at the start of the next step. After all the time steps have been run, or canceled, the application sits in idle waiting for the next push of the start button.

Application Terminology

Target Time

The time (in seconds) used by the timer application for each step. These values are loaded from the CSV file.

Timing Step

This step is not required to perform any action other than timing. The step runs until the step time has elapsed. The application must be responsive to UI events.

Step Time

The time (seconds) for the timer application.

Initialization

The application must initialize as shown in Figure 1, and the front panel controls and indicators must be in the following states.

- **Time Target:** Set to zero
- **Elapsed Time:** Set to zero

Operation

VI Run

The application waits in idle until the **Start** button is pushed. When pushed, the application reads the data file and begin timing with the first step time. When time elapses, the application moves to the next step. When all the times have elapsed or been canceled, the application waits in idle until the **Start** button is pressed.

Press Pause

The Action depends on the ON/OFF state of the button.

> **ON:**
> - Pause the current elapsed time
> - Maintain the current **Elapsed Time**

> **OFF:**
> - This state must resume timing starting from the point of the previous elapsed time.

Press Cancel

- Resume any paused operation
- Move to the next step