

CLD Exercise 3: Action Engine Timer

Objective

Develop a Functional Global Variable (FGV) timer using LabVIEW, either the 'Get Date/Time in Seconds' or the 'Tick Count (ms)' timing VI's, and the given application front panel (Figure 1).

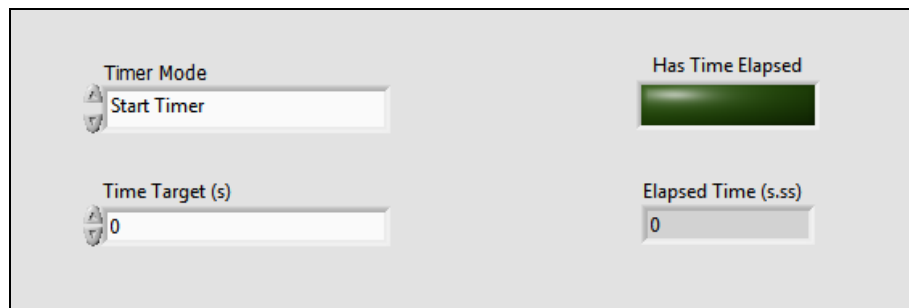


Figure 1. Application Front Panel

General Operation

The timer application must count up from zero to the **Time Target** while displaying the elapsed seconds in the **Elapsed Time** indicator. When the elapsed time has expired, the **Has Time Elapsed** LED must turn ON. The timer must have pause and resume functionality.

Application Terminology

Elapsed Time

This indicator must continuously display the elapsed time in seconds and milliseconds.

Timer Mode

The Enum used for the FGV. This Enum has four values.

- **Start Timer:** Starts timer using the **Time Target**.
- **Read Time:** Calculates the current **Elapsed Time** and **Has Time Elapsed** status.
- **Pause:** Pauses Timing
- **Resume:** Resumes Timing

Time Target

The time in seconds used for the timer application.

Elapsed Time

This indicator must continuously display the elapsed time in seconds.

Has Time Elapsed

This indicator turns ON when the time has expired. It is OFF whenever the time has not yet elapsed.

Initialization

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

- **Timer Mode:** Set to Start Timer
- **Time Target:** Set to 4 seconds
- **Has Time Elapsed:** Set to OFF
- **Elapsed Time:** Set to zero

Operation

Start Timer

Starting the VI must initiate the timing using the **Time Target**.

Read Time

This mode returns the elapsed time in seconds and milliseconds and the **Has Elapsed Time** status.

Pause

This mode must pause the current elapsed time, and maintain the current state of the **Has Elapsed Time** LED. The elapsed time must not increment.

Resume

This state must resume timing starting from the point of the previous elapsed time.

Questions

What is a method that can resolve the bit timer “turnover” event?

Can the **Elapsed Time** be used to implement a running total of time?

Does the day and year matter when using a time stamp?

Challenge Exercise

Develop a timer that uses the ‘*Get Date/Time in Seconds*’ or ‘*Tick Count*’ timer VI’s but does not require pause functionality.

There must be two states, Elapsed and Reset. The time target (**Wait**) is set during start phase, not as a separate state.

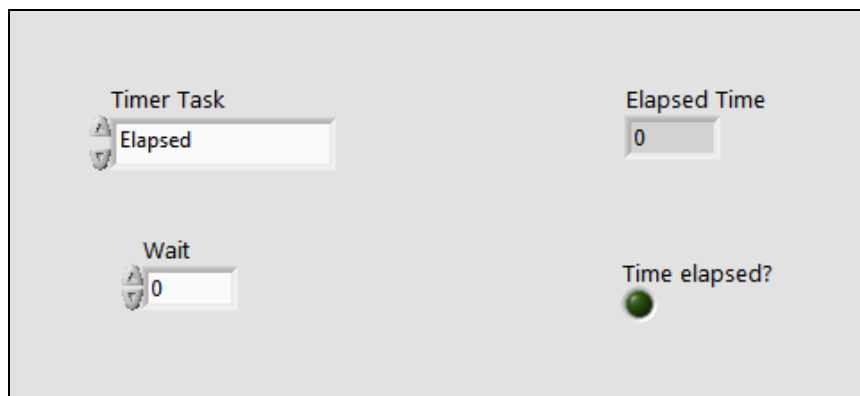


Figure 2. AE timer with no pause, front panel