

CLD Exercise 1: Elapsed Time Express VI Timer

Objective

Develop a simple timer application using the Elapsed Time Express VI and the given application front panel (Figure 1).

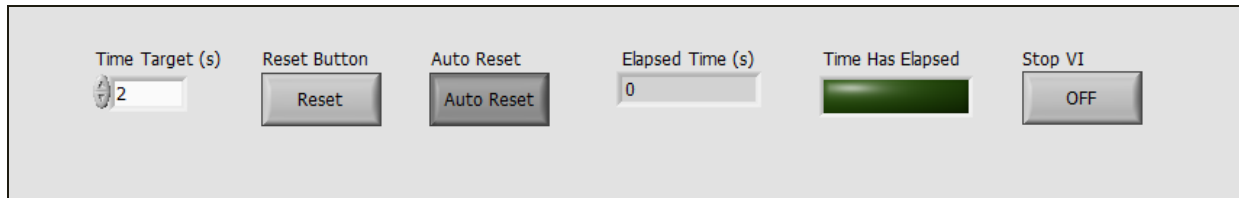


Figure 1. Application Front Panel

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 **Time Has Elapsed** LED must turn ON. The **Reset** and **Auto Reset** buttons are used to control the timer.

Application Terminology

Reset

When the **Reset** button is pressed, the timer must start timing at zero.

Elapsed Time

This indicator must continuously display the elapsed time in seconds.

Time Target

The time in seconds for the timer application.

Time Has Elapsed

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

Auto Reset

The default value for the **Auto Reset** button is ON. When the **Auto Reset** button is ON the timer must immediately begin a new timing cycle on expiration of **Elapsed Time**.

When the **Auto Reset** button is OFF, the timer must continue to count elapsed time and keep the **Time Has Elapsed** indicator ON.

Stop VI

This action stops the application immediately.

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 2 seconds
- **Auto Reset:** Set to ON
- **Reset:** Set to OFF
- **Time Has Elapsed:** Set to OFF
- **Elapsed Time:** Set to Zero

Operation

VI Run

The VI must start timing, the **Elapsed Time** counts up and the **Time Has Elapsed** LED must be OFF.

When the **Time Target** is reached, the **Time Has Elapsed** LED must turn on.

If the **Auto Reset** is ON:

- The **Time Has Elapsed LED** turns ON
- The timer must reset to zero and begin counting up
- The **Time Has Elapsed LED** turns OFF

If the **Auto Reset** is OFF:

- The **Time Has Elapsed LED** turns ON
- The timer continues counting up

Set Time Target

When the **Time Target** is changed the timer must immediately respond to the new value of the **Time Target**.

Set Auto Reset

When the **Auto Reset** button is pressed the application must immediately respond.

- If **Time Has Elapsed** is OFF, the application must continue operation regardless if the Auto Reset is on or off.
- If **Auto Reset** is changed to ON while the **Time Has Elapsed** is ON, the timer begins a new timing cycle.
- If **Auto Reset** is changed to OFF while the **Time has Elapsed** is ON, the timer must continue operation with the time elapsed.

Questions

For what types of timing is the Elapsed Time Express VI well suited?

What are the consequences of this Elapsed Time Express VI being re-entrant?