Allen Bradley CompactLogix
Counters Instructions Lab

Objective: Upon completion of this lab exercise, the student should be able to:
1. Explain the operation of the CTU instructions.
2. Explain the operation of the Allen Bradley Counter instruction status bits.
3. Explain how the RES instruction affects the Counter data values.
4. Identify one application for a CTU instruction in an industrial environment
5. Change the data values of a CTU/CTD instruction while online.

Allen Bradley Counter Basics:

Counter Instruction:
CTU stands for Count UP. The CTU instruction when energized will increase the accumulated value of the counter address by one.
CTD stands for Count Down. The CTD instruction when energized will decrement the accumulated value of the counter address by one. CTD are seldom used, but are usually used with a CTU in a pair.
RES stands for Reset. The RES instruction when energized will reset the Accumulated value and status bits of a Counter.

Status Bits:
DN – Done Bit – This bit is "on" when the Acc value is equal to or greater than the PRE value.
CU – CTU Enable – This bit is "on" when the CTU instruction has power on it.
CD – CTD Enable – This bit is "on" when the CTD instruction has power on it.
OV – Overflow Bit – This bit is "on" when the Acc value of the counter goes greater than +32767.
UN – Underflow Bit – This bit is "on" when the Acc value of the counter goes less than –32,768.

PROCEDURE:

1. Key in the following PLC program using RSLogix5000 software and save it to a local drive. Download the new program into the CompactLogix processor. Put the PLC into the RUN mode and go Online to it with the program panel to complete the following procedure.

Figure 1. A CompactLogix program using a CTU instruction.
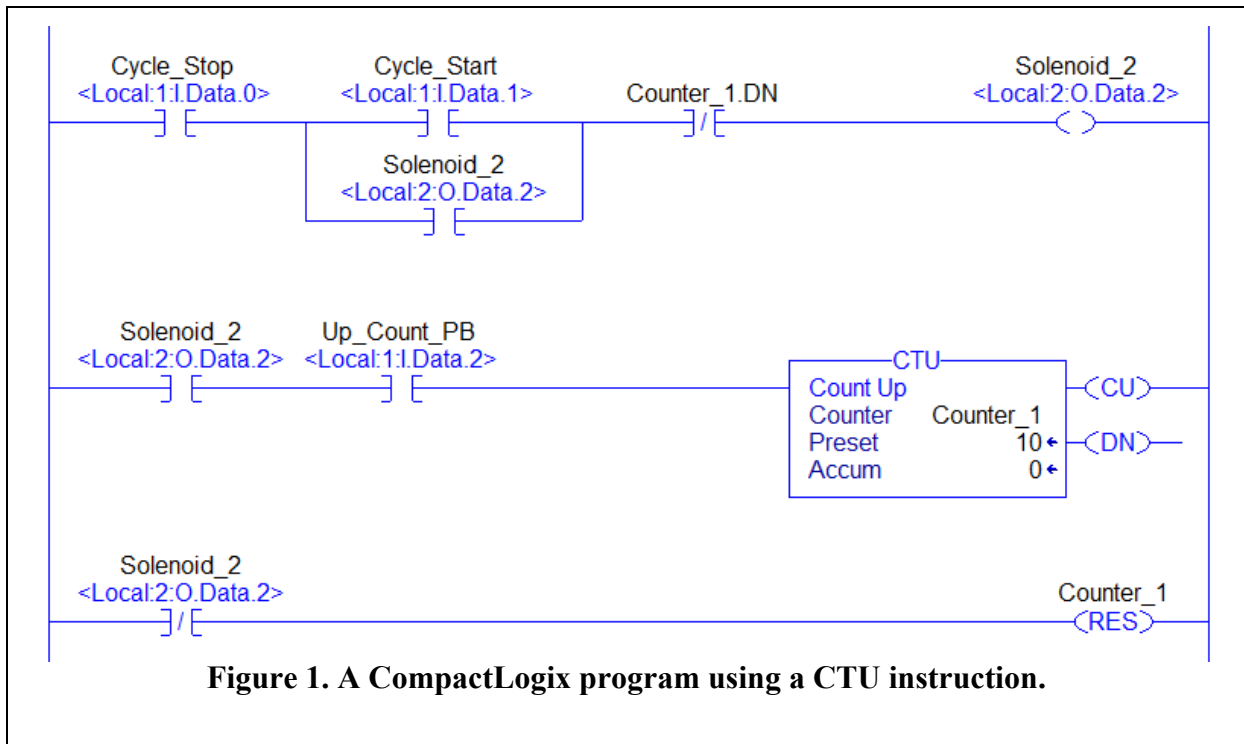
2.   Push the **Cycle_Start** input.

Does **Solenoid_2** come on?

The output should stay on due to the hold in programming

3.   What physical Output address is Solenoid_2 and alias tag for?

4.   Push the **Up_Count_PB** ten times.

Did Solenoid_2 shut off?   Explain!

5.   Did the Counter Accumulated value reset to Zero?

6.   Change the **Preset** value of the counter to **15**.

7.   Can the counter be pulsed up if **Solenoid_2** is off?   Explain!

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