

Allen Bradley SLC-500 Off-Delay Timer Lab

Upon completion of this lab, the student should be able to:

1. Explain the operation of a TOF timer instruction.
2. Explain how the timer status bits work with a TOF instruction.
3. Change the timer preset values from the data files.
4. Explain how a TON and TOF can be used to control a conveyor motor.

Key in the following program, download it to an SLC-500 processor unit, and follow the instructions that follow.

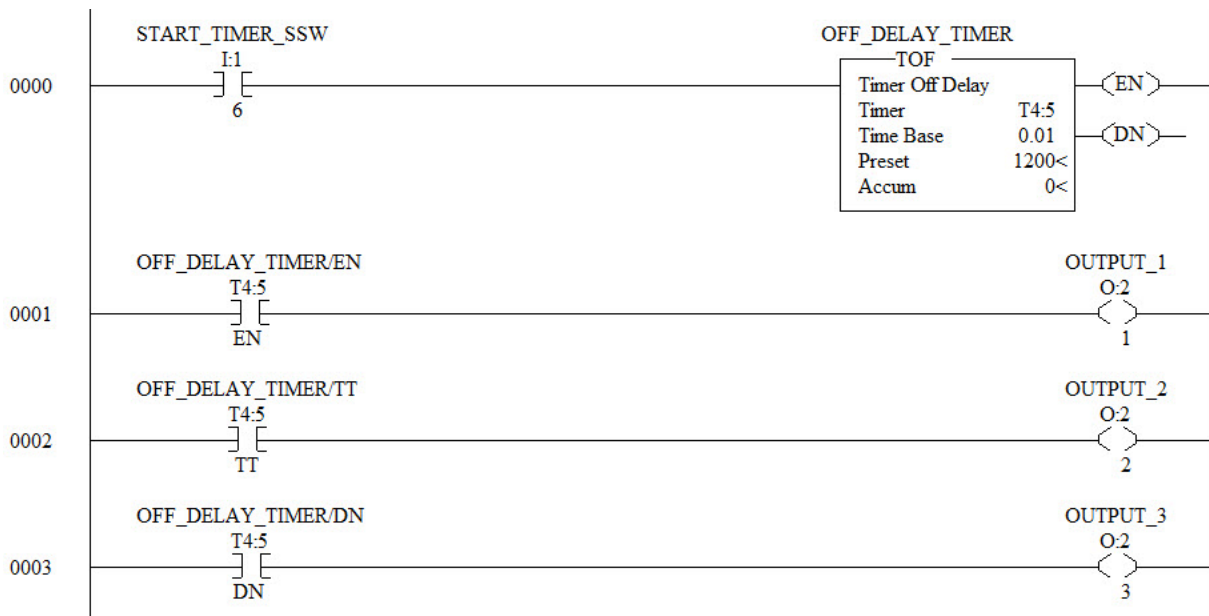


Figure 1. Basic Timer Off-Delay logic program.

1. Go online to the processor and make sure the unit is in the Run Mode.
2. When the PLC is put into the Run Mode, what happens to the accumulated value of the timer?
3. Turn on the START_TIMER_SW input. What outputs turn on in the program? Does the timer start timing?

4. Turn off the START_TIMER_SW input. What happens to the timer? Which outputs are on?
5. When is the T4:5/DN bit on in this program?

6. Once the timer in this program starts timing, how long until it times out?

7. Change the preset value to make the delay 8.5 seconds.

Part Two:

In this portion of the lab exercise, the user will key in a program that will control the motor starter coil of a motor that is running a conveyor. This program will have a delay after the start button is pushed, before the motor will start up, and will have another delay after the stop button is pushed, before the motor stops.

Key in the following program, download it to an SLC-500 processor unit, and follow the instructions that follow.

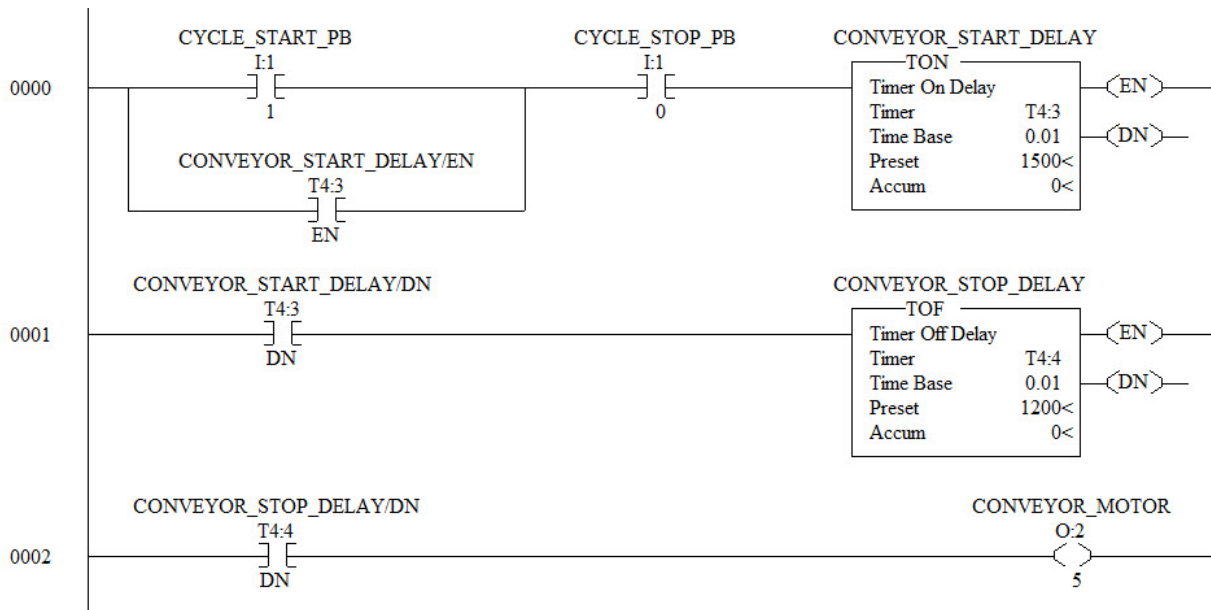


Figure 2. A delay-on and delay-off type of program.

1. Go online to the processor and make sure the unit is in the Run Mode.
2. Does the CYCLE_STOP_PB instruction in rung 0 have highlight? Explain!

3. Momentarily push the CYCLE_START_PB input. Does the CONVEYOR_MOTOR output come on right away? Explain!
4. Does the TON instruction start timing when this input is actuated, or does the TOF instruction start timing?
5. Press the CYCLE_STOP_PB input. Does the CONVEYOR_MOTOR output turn off right away?

What timer instruction starts timing?

When does the CONVEYOR_MOTOR output shut off?

6. Change the preset value of the TON so the timer times for 16.5 seconds.
7. Change the preset value of the TOF so the timer times for 14.5 seconds.

Modify the program:

Draw the logic to the program in part two of this lab that will turn on an output (O:2/7) to indicate the time after the stop button is pushed and the motor starter drops out.

Add this logic to the program offline and download it, then test it.

Questions:

1. When does the TON done bit come on?
2. When does the TOF done bit come on?
3. When a TOF instruction receives power, what happens to the accumulated value of the timer?
4. Why is it that when the processor goes into the Run Mode, the accumulated value of the TOF timer is changed to equal the preset value?
5. How would the user change the value in the preset of the TON timer in the program in Part Two of the lab?
6. How does the user turn off the symbols when viewing the ladder logic?
7. What values must the presets of the TON and TOF timers be in order to have a 9 second delay for the motor to start, and then a 17.5 second delay for the motor to shut off once the stop button is pushed in the second program?

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