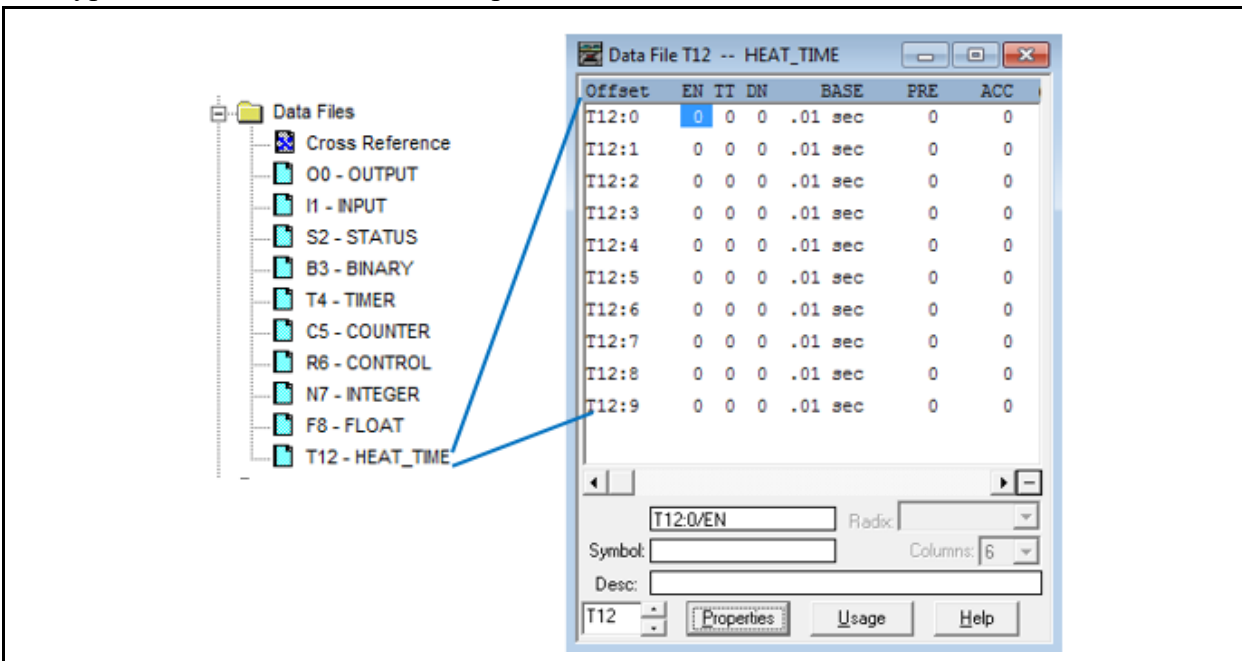
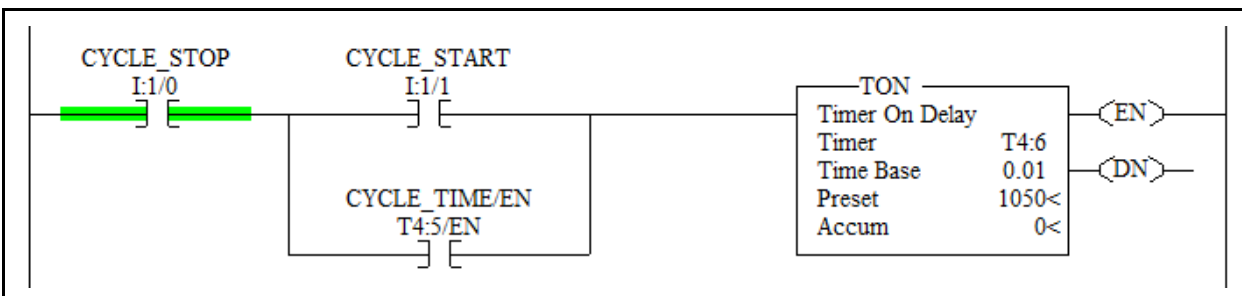


Practice Quiz:

1. T F Though data file #4 is the default timer file, there can be other data files created as timer type of data files in the SLC-500 processor.



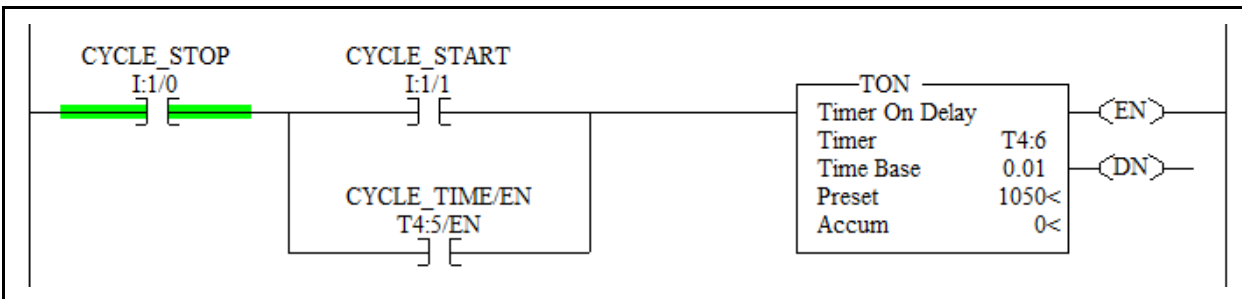
Explanation: Data file #4 is the default timer type data file, but since the data files can be expanded out to up to data file 255, any type of data file can be created except an Output, Input or Status file. There are only 1 of each of these types and they are in data files 0, 1 and 2. In reality, data files 3-9 could be changed to a different type, but most often these are kept as their default type. The reason for so many data files is for data organization. A Controls Designer may design a program for a machine that has 5 major process sections. They may want to keep the timers for each sections in different data files, primarily for troubleshooting. In this example, a T12 data file was created that was 10 elements long (T12:0 to T12:9). Also notice that a timer element is 3 words long: a preset value word, an accumulated value word, and a status word.



- 2_ Based on this rung of logic, how long after the timer gets power, will the .DN bit come on?
- 1.05 seconds
 - 10.5 seconds**
 - 105 seconds

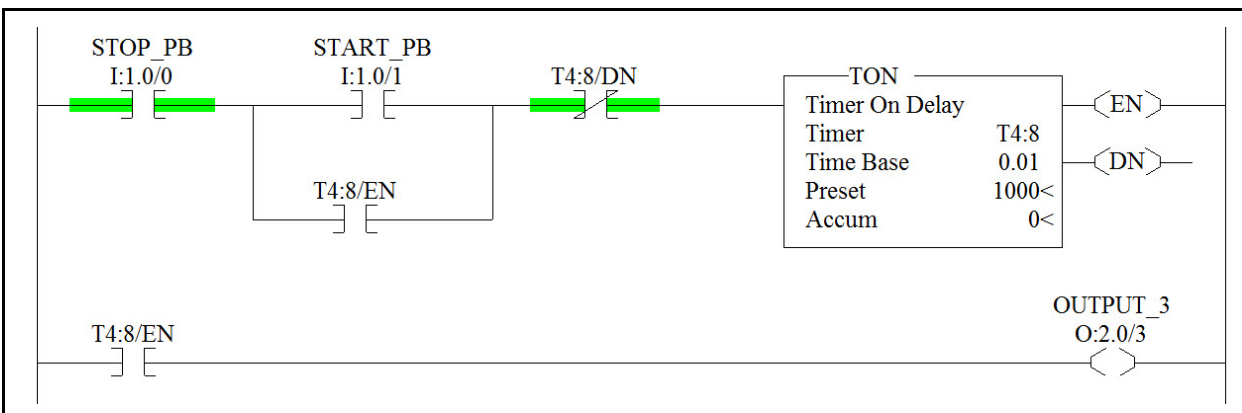
d. 1050 seconds

Explanation: To determine the dwell time for a timer, multiply the Preset value times the time base. 1050 X 0.01 is 10.50 seconds.



3. What address in the SLC-500 memory would the timer accumulated value be stored in?
- T4:6/ACC
 - T4:6/A
 - T4:6.ACC**
 - T4:6:ACC

Explanation: There are three words in every timer element. So for T4:6 timer, there is T4:6.ACC for the accumulated value, T4:6.PRE for the timer preset value, and the status word which uses T4:6/EN, T4:6/TT & T4:6/DN. The colon “:” is the delimiter between the file and the element number. The period “.” is the delimiter between the the element and the word, and the forward slash “/” is the delimiter between the element and the bit. The user can also access any of the bits within the Accumulated value and the Preset value. T4:6.ACC/2 is an example of this.



4. T F When the START_PB is momentarily pressed, there will be a 10 second delay, and then OUTPUT_3 will come on.

Explanation: In this program, when the START_PB is pressed, OUTPUT_3 comes on immediately, then stays on for 10 seconds, then shuts off. The user can see the two instructions

that have highlight. When the START_PB is pushed the TON gets power and latches up through the XIC instruction to keep power on the timer. Since the ENable bit is on, then OUTPUT_3 will come on immediately. When the timer times out, the XIO of the timer done bit will open, resetting the timer, and OUTPUT_3 will shut off.

5. T F The enable bit for a CTU instruction in the SLC-500 is an “EN”.

Explanation: The enable bit for a CTU is the “CU” bit. The enable bit for the CTD is the “CD” bit. There is a “DN” bit with the counters that come on when the accumulated value is equal to or greater than the preset value.

6. T F When a TON instruction is de-energized, the accumulated value remains at the value it had timed up to, until an RES of the same address is energized.

Explanation: A TON instruction accumulated value will reset to zero when it is de-energized. A RESet instruction is not used with a TON. An RTO instruction will retain the accumulated value when it is de-energized. An RES instruction is used with an RTO to reset the accumulated value to zero.

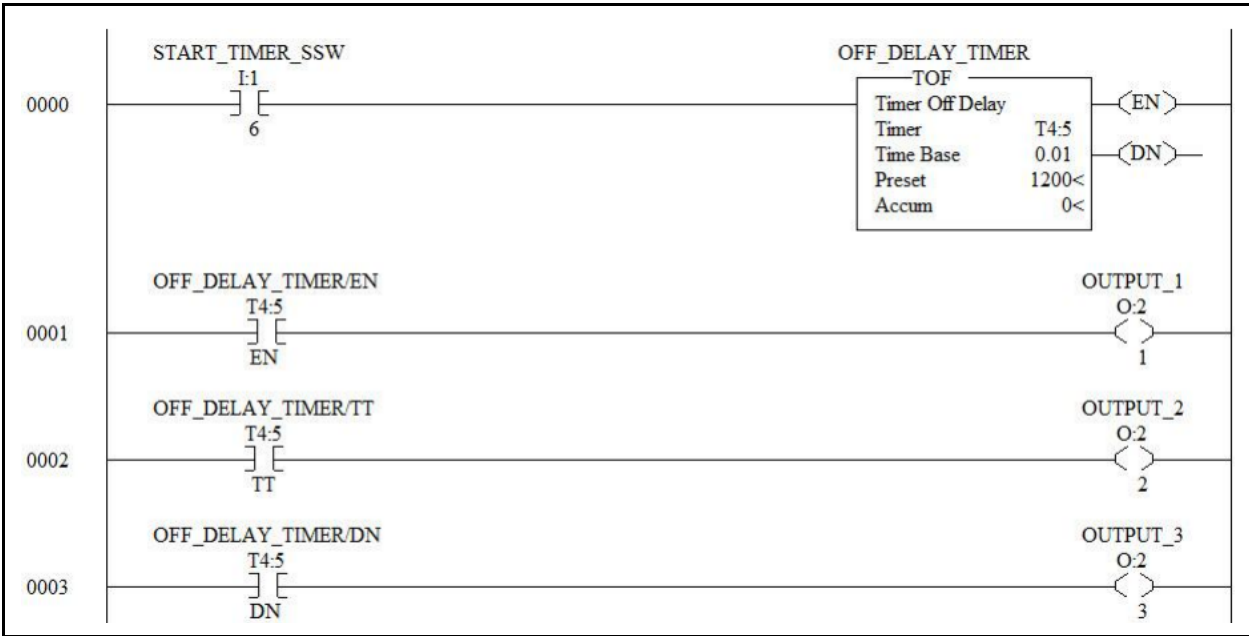
7. T F The “DN” bit of a TOF timer comes on when the accumulated value equals the preset value.

Explanation: The “DN” bit of the TOF comes on when the accumulated value is not equal to the preset value. When the TOF is programmed in, and verified, the accumulated value is adjusted automatically to equal the preset value (DN bit is off). When the TOF is energized, the accumulated value is reset to zero, turning on the DN bit. It remains on until the TOF is shut off, which means it will start timing. After it times out, the DN bit shuts off.

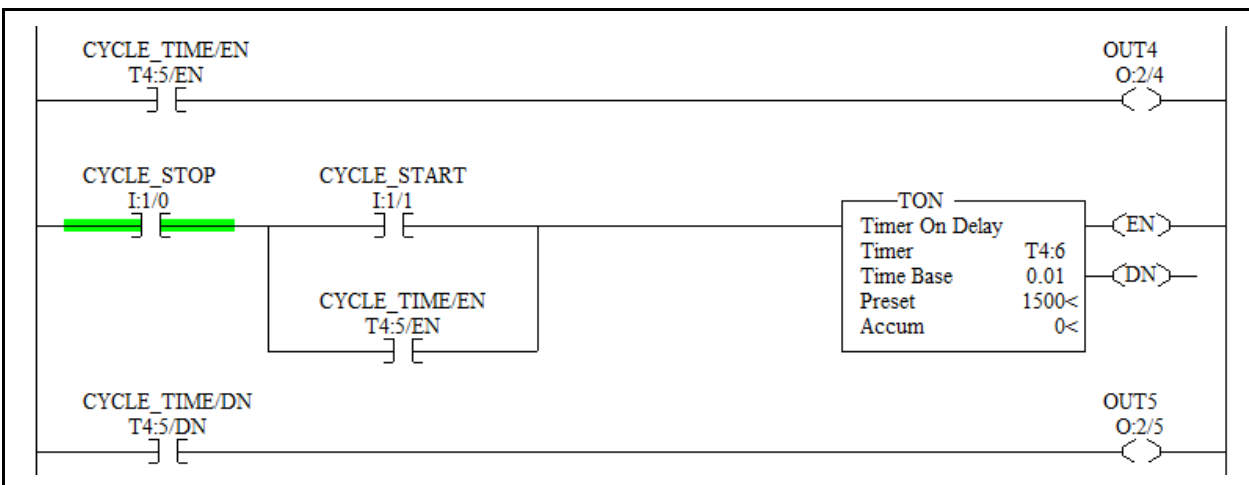
8. Which one of the following values is the highest value for a timer accumulated or preset value in an SLC-500?

- a. 20000
- b. 31000
- c. **32767**
- d. 32768

Explanation: The highest value for a timer accumulated or preset value is 32,767. Zero is the lowest value for a timer value. Negative numbers are not allowed for timer values. The data range for a counter in an SLC-500 is -32768 to +32767.

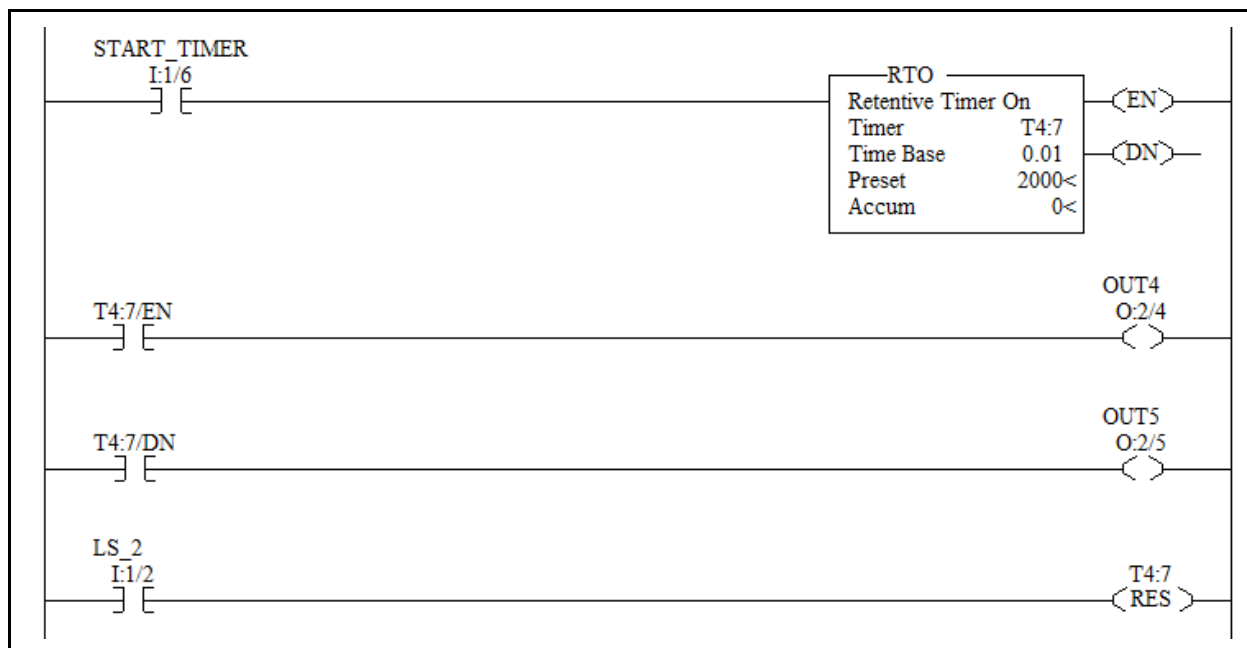


9. **T F** In this PLC program, when the START_TIMER_SSW is turned on, energizing the TOF instruction, OUTPUT_1 and OUTPUT_2 will come on immediately.
 Explanation: When the program is put in, and downloaded, the accumulated value will adjust to equal the preset value in a TOF instruction. When the START-TIMER_SSW comes on, the accumulated value reset to zero, and OUTPUT_1 and OUTPUT_3 come on (On a TOF, the DN bit comes on when the accum is not equal to the preset value). So when the TOF is energized, OUTPUT_1 and OUTPUT_3 come on, then when it is shut off, the timer starts timing and the EN bit goes off. The TT and DN bit are on while the timer is timing, then they shut off.



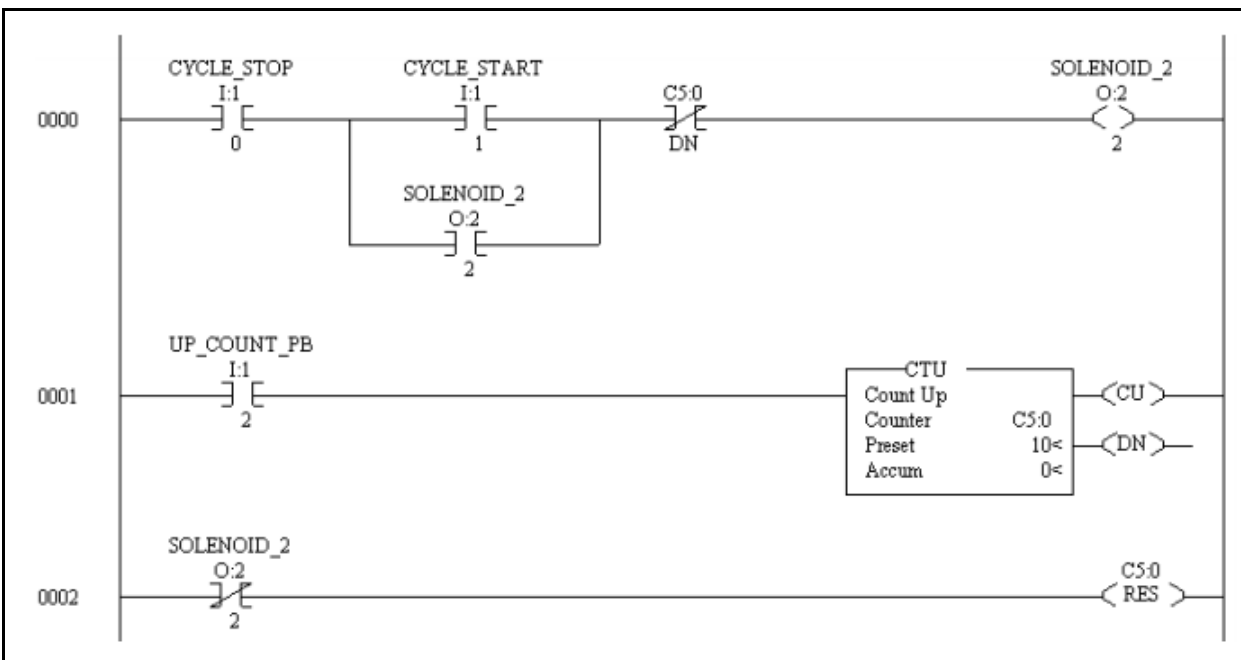
10. **T F** In this program, when the CYCLE_START is momentarily pushed, OUT4 comes in immediately, and OUT5 comes on 150 seconds later.

Explanation: When the CYCLE_START is momentarily pushed, OUT4 does come on immediately, and OUT5 comes on 15 seconds later.



11. In this program, if the START_TIMER input is turned on for 7 seconds, then the input is shut off, what will be the accumulated value?
- 70
 - 700**
 - 7000
 - 0

Explanation: If the timer times for 7 seconds, the accumulated value will be 700. When the input (START_TIMER) is shut off, the accumulated value remains at 700. When LS_2 is actuated, the RES instruction is energized, then the accumulated value will reset to 0.



12. What value in the Counter Accumulated value, in this PLC program will shut off SOLENOID_2, after the CYCLE_START was pushed?

- a. 0
- b. 9
- c. 10**
- d. 11

Explanation: When the CYCLE_START is pushed, SOLENOID_2 will come on. Then after the UP_COUNT_PB is pulsed 10 times, and the accumulated value is 10, the CTU done bit comes on, which will shut SOLENOID_2. When SOLENOID_2 shuts off, the XIO of that address in the last rung, resets the CTU accumulated value back to zero.

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