Basic PLC & CX Programmer

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Timer

A timer is activated when its execution condition goes ON and is reset (to S) when the execution condition goes OFF.

Once activated, TIM measures in units of 0.1 second from the S.
If the execution condition remains ON long enough for TIM to time down to zero, the Completion Flag for the TC number used will turn ON and will remain ON until TIM is reset (that is, until its execution condition goes OFF).
Timer

- **Operand Data Areas:**

<table>
<thead>
<tr>
<th></th>
<th>TC Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>000 - 511</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>Set value (word, BCD)</td>
<td>IO, AR, DM, HR, #</td>
</tr>
</tbody>
</table>
Basic Timer: exercise 1

Start

Push Start button

Timer 5 Sec?

No

Yes

Yellow Light ON

End

Start

Push Start button

Timer 5 Sec?

No

Yes

Yellow Light ON

End
Basic Timer: exercise 2

1. Start
2. Select Manual Mode
3. Timer 5 Sec?
4. Yes: Yellow Light ON
5. No: Go to Timer 5 Sec?
6. Green Light ON
7. Select Auto Mode
8. Yellow & Green Light OFF
9. End
Flicker: exercise 3

Start

Push Start button

Timer 1 Sec?

No

Yes

Green Light ON

A

A

Timer 1 Sec?

Green Light OFF

Push Stop

System RESET

End
Flicker: exercise 4

- Start
  - Push Start button
  - Timer 3 Sec?
    - No
      - Green Light OFF
    - Yes
      - Continuous Blinking
      - Push Stop
      - System RESET
      - Yes
      - End
      - No
        - Timer 1 Sec?
          - Yes
            - Green Light ON
          - No
            - A
Timer Application

- **Lab sheet 2 : Exercise 5**

<table>
<thead>
<tr>
<th>Input Assignment</th>
<th>Input Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Start PB</td>
</tr>
<tr>
<td>0001</td>
<td>Stop PB</td>
</tr>
<tr>
<td>0002</td>
<td>Auto/Man Selector</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output Assignment</th>
<th>Output Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>10001</td>
<td>Green Light</td>
</tr>
<tr>
<td>10002</td>
<td>Red Light</td>
</tr>
<tr>
<td>10003</td>
<td>Yellow Light</td>
</tr>
</tbody>
</table>

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Counter

- CNT is used to count down from SV when the execution condition on the count pulse -CP, goes from OFF to ON.
- The present value (PV) will be decremented by one whenever CNT is executed with an ON execution condition for CP and the execution condition was OFF for the last execution.
Timer Application cont...

- Ladder diagram
## Counter

- **Operand Data Areas:**

<table>
<thead>
<tr>
<th>N</th>
<th>TC Number</th>
<th>000 - 511</th>
</tr>
</thead>
<tbody>
<tr>
<td>SV</td>
<td>Set value (word, BCD)</td>
<td>IO, AR, DM, HR, #</td>
</tr>
</tbody>
</table>
The Completion Flag for a counter is turned ON when the PV reaches zero and will remain ON until the counter is reset.

- CNT is reset with a reset input, R.
- When R goes from OFF to ON, the PV is reset to SV.
Basic Counter: exercise 6

1. Start
2. Push Start Button
3. Counter 5 x ?
4. Yes
   - Green Light ON
     - Push Stop Button
     - Green Light OFF
5. No
6. End
Time Delayed 60 sec: exercise 7

Start

Push Start button

Timer 6 Sec?

Yes

No

Counter 10 X?

Yes

A

Yellow Light ON

Push Stop

Push Start

System RESET

End

No

Yes

A
### Counter Application

#### Input Assignment | Input Devices
---|---
0000 | Start PB
0001 | Stop PB
0002 | Auto/Man Selector

#### Output Assignment | Output Devices
---|---
10001 | Green Light
10003 | Yellow Light
10002 | Red Light

![Flowchart](chart.png)
Counter Application cont...

- Ladder diagram
Extra exercise...

MAN MODE
OK PART BLINKING
AUTO MODE
RUN PART BLINKING & OK PART OFF
START PB

NG PART ON & RUN PART OFF
STOP PB
IF STOP PB 5 x
NO
YES
ALL PART OFF OR RESET SYSTEM

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