Mohamed Cherif Messaadia University, Souk Ahras Faculty of Science and Technology

Department of Electrical Engineering Subject: Microprocessor and Microcontroller

Level: 3rd year

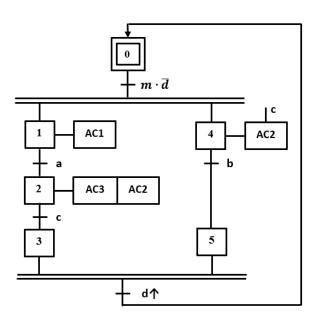


April 29, 2025 Duration: 01:30H Specialty: Control

Lab Exam

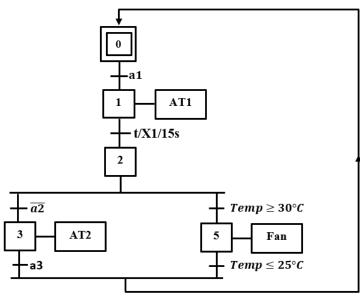
Exercise 01: (08.0 pts)

Translate the Grafcet below into an equivalent Ladder Diagram (LD) program for the S7-1200.



Exercise 02: (12.0 pts)

Translate the Grafcet below into an equivalent Ladder Diagram (LD) program for the S7-1200.





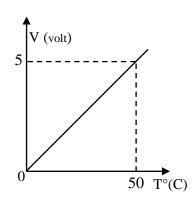


Fig2. The temperature sensor curve

Note:

- The address of the analog input is **IW64**, and it can acquire a voltage input ranging from **0 to 10V**.
- You can use either the **TON** or **TP** timer.
- The back of the page contains a brief reminder of some key concepts.

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Timers

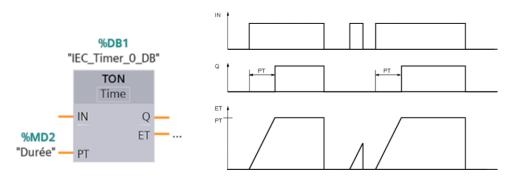


Figure.1. Operating principle of the TON timer.

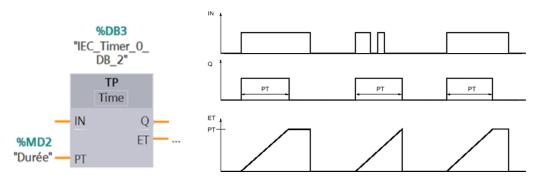
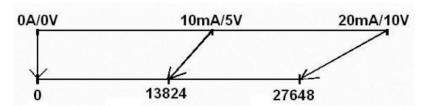


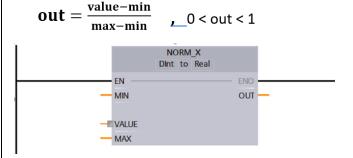
Figure.2. Operating principle of the TP timer.

Analog-to-digital conversion

The conversion of analog signals for PLC processing is the same for both analog inputs and outputs. Typical digitized value ranges include the following:

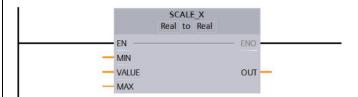


The 'Normalize' instruction uses the following equation:



The 'Scale' instruction uses the following equation:

$$out = value \cdot (max - min) + min$$



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