University of Jordan
School of Engineering
Department of Mechatronics Engineering
Automation and Process Control Lab (0908462)
Hard Wiring and Timers Basics

Administrative Policy of the Laboratory

1) You are not allowed to smoke, eat or drink in the Laboratory. You are expected to conduct yourself professionally, and to keep your bench area *clean* and *neat*.

2) You are allowed to discuss the experiment and the results with your colleagues, but cheating and copying is strictly prohibited and will be taken very seriously. The student will earn a **ZERO** in the lab when caught.

3) All questions should be solved in order. Moreover, each student is expected to fully and clearly demonstrate her/his solution whenever required.

4) No one is allowed to leave the lab until she/he has cleaned and arranged her/his bench and turned off the PC she/he used.

5) Always ask your instructor to check your setup before turning the power on.

6) The above mentioned polices should be strictly followed. Note that disregarding any of the rules above will seriously affect your grade!

7) Makeup Midterm: There will be no make-up for the midterm. In case of medical/ or other disabling emergencies, the instructor should be notified before the midterm and his approval for missing the midterm should be obtained before the midterm. If for any reason the instructor could not be reached, the department secretary should be notified before the midterm. The phone number is 535-5000 Extension 23025

8) Class Attendance: Class attendance will be taken. University regulations regarding attendance will be strictly enforced.

9) **You cannot change your lab time, if done zero grade will be considered as that lab mark.**

You can obtain the experiment sheets from the following Internet web site:
https://elearning.ju.edu.jo/

Objective

To be familiar with Electrical Hard-Wired components and Electrical Timer basics.
After you Identifying Hard component & its symbols you can:

- Write any hard wired diagram for any logical expression or system.
- Read & wire any hard wired diagram.

Procedure:

This lab experiment is composed of two parts.

Part 1

Use the control Panel Trainer which is exist in the lab to wire the following:

Exercise 1:

A certain lamp switched ON when pressing on a Pushbutton & switched OFF when released the same Pushbutton.

Draw the circuit before wiring:

Exercise 2:

Use two pushbuttons and one lamp to make **AND gate**

Draw the circuit before wiring:

Exercise 3

Use two pushbuttons and one lamp to Make **OR gate**

Draw the circuit before wiring:

Exercise 4

A certain lamp is switch ON when pressing in a pushbutton & the lamp still on after releasing the Pushbutton.

Draw the circuit before wiring:

Exercise 5

A certain lamp is switch ON when pressing in a pushbutton & the Lamp still on after releasing the pushbutton, then pressing on another Pushbutton to switch off the Lamp

Draw the circuit before wiring:

Exercise 6

Use two pushbuttons and one lamp to make **XOR gate**

Draw the circuit before wiring:

Exercise 7

Use the component you need to satisfy the following Expression:

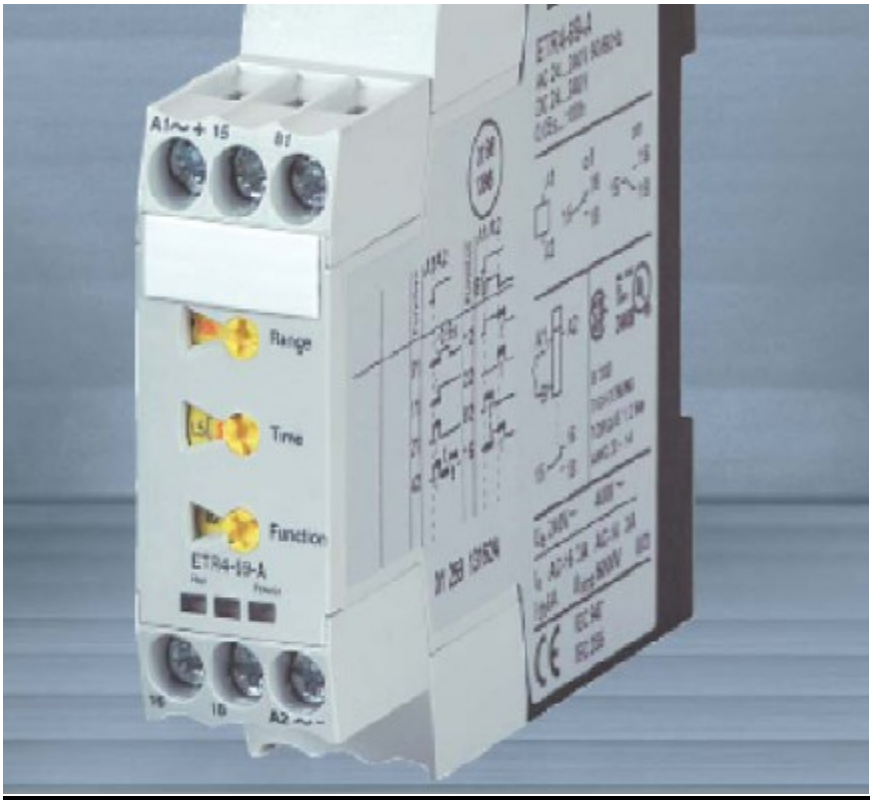
Draw the circuit before wiring:

Part 2 : Timers

Objective: To be familiar with different type of electrical Timer

Exercise 1

Read the data sheet for ETR Timer which is found at the back of the sheet to understand the different type of timers and its timing diagram.



Exercise 2 :

Make calibration for ETR4-69-A timer which is found in the control Panel Trainer to derive the relationship between Time & Range.

Exercise 3:

Design the lighting system which is found in residential building stairs.