



الجامعة الهاشمية

Submitted to the
Mechatronics Engineering Department
The Hashemite University

The Project of Automation
(Wire Twisting Machine)

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Introduction

National Cable and Wire Manufacturing Company

started manufacturing since 1985 and produces of all types of low Tension Cables & Wires, Insulated with PVC (Anti Termite, Heat Resistant, LSF-PVC) or XLPE or PE or Rubber (EPR) or (XLLSHF, LSHF HALOGEN FREE). Telephone Cables, Co-axial Cables, Computer Cables, LAN data Cables, instrumentation Cables, O.H. Transmission Lines & ABC Cables (Twisted Cables).

In 1996, the company achieved registration to ISO 9002:1994 then in 2003 the company achieved registration to ISO 9001:2000, and in 2009 the company achieved registration to ISO 9001:2008, (in advance the company achieved the Jordanian quality mark). Therefore, the company will keep an effort to maintain the level of quality it has achieved so far. Thus CABLECO's quality policy is reviewed annually & new directions concerning quality are reflected in this policy & its implementation.

Based on the above we visited "**National Cable and Wire Manufacturing Company**" and we know the factory stages and we saw the production process of the PLC system & spoke with the Maintenance Manager and engineers about the importance of the PLC system and the system's efficiency in the factory.

Stages of the product:

First stage: Wire drawing

Is a metalworking process used to reduce the cross-section of a wire by pulling the wire through a single or series of, drawing die(s).

Second stage: Wire twisting

Is collect more than one wire and wrap them on each other to make wire with a custom cross-section.

Third stage: Insulation of wires

Is makes an external layer to protect the wire and ensure that the current is not connected the outside of the wire consists of more than one type but the most common is PVC.

Fourth stage: Packing

In this stage, the product is packaged after the completion of the previous stages.

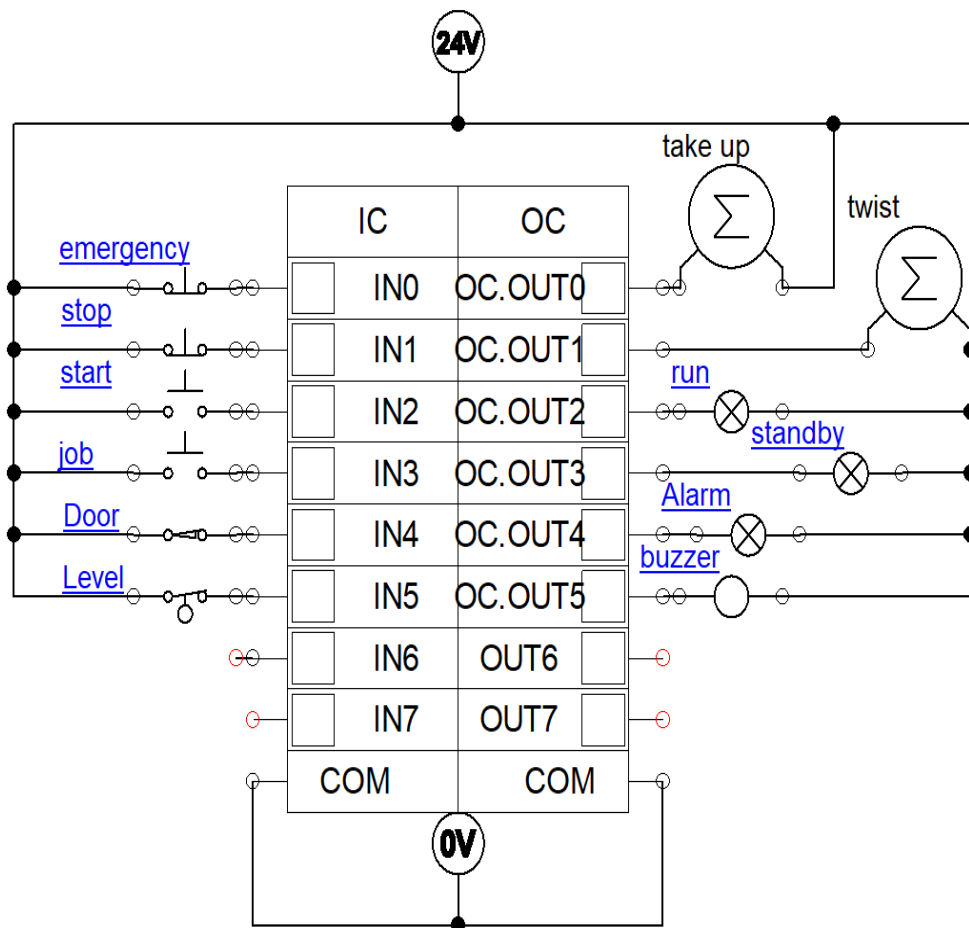
*In this project we Second stage in detail and define the inputs and outputs and we do write the ladder diagram.

The following table shows the Inputs and Outputs of the Second stage {Wire twisting}:

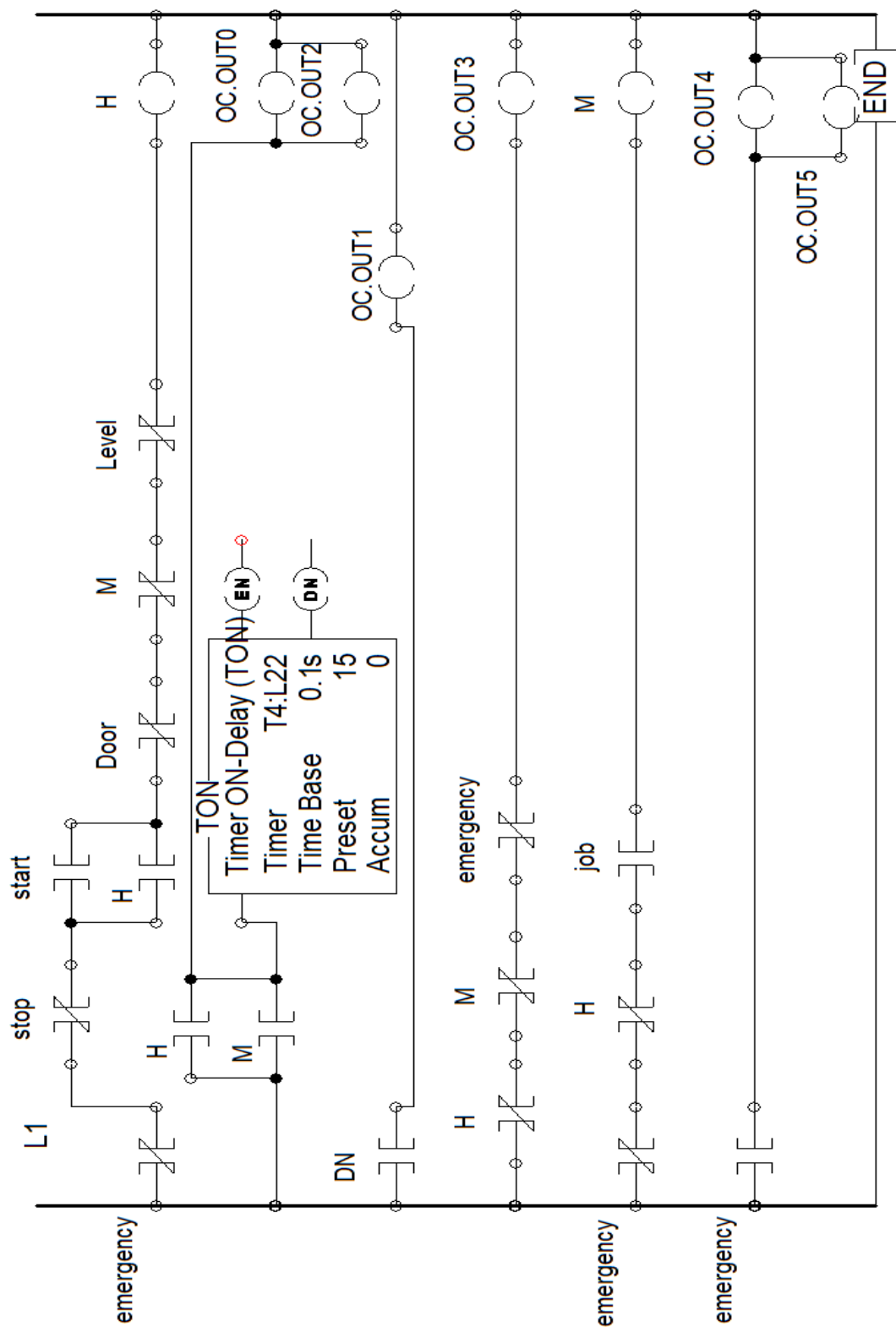
| Inputs | |
|------------------|-------------------|
| Start switch | Level switch |
| Stop switch | Job switch |
| Emergency switch | Door Limit switch |

| Outputs | |
|-----------------------|----------------------------|
| Take up motor | Standby Pilot light yellow |
| Twist motor | Emergency Alarm light |
| Run Pilot light green | Emergency buzzer |

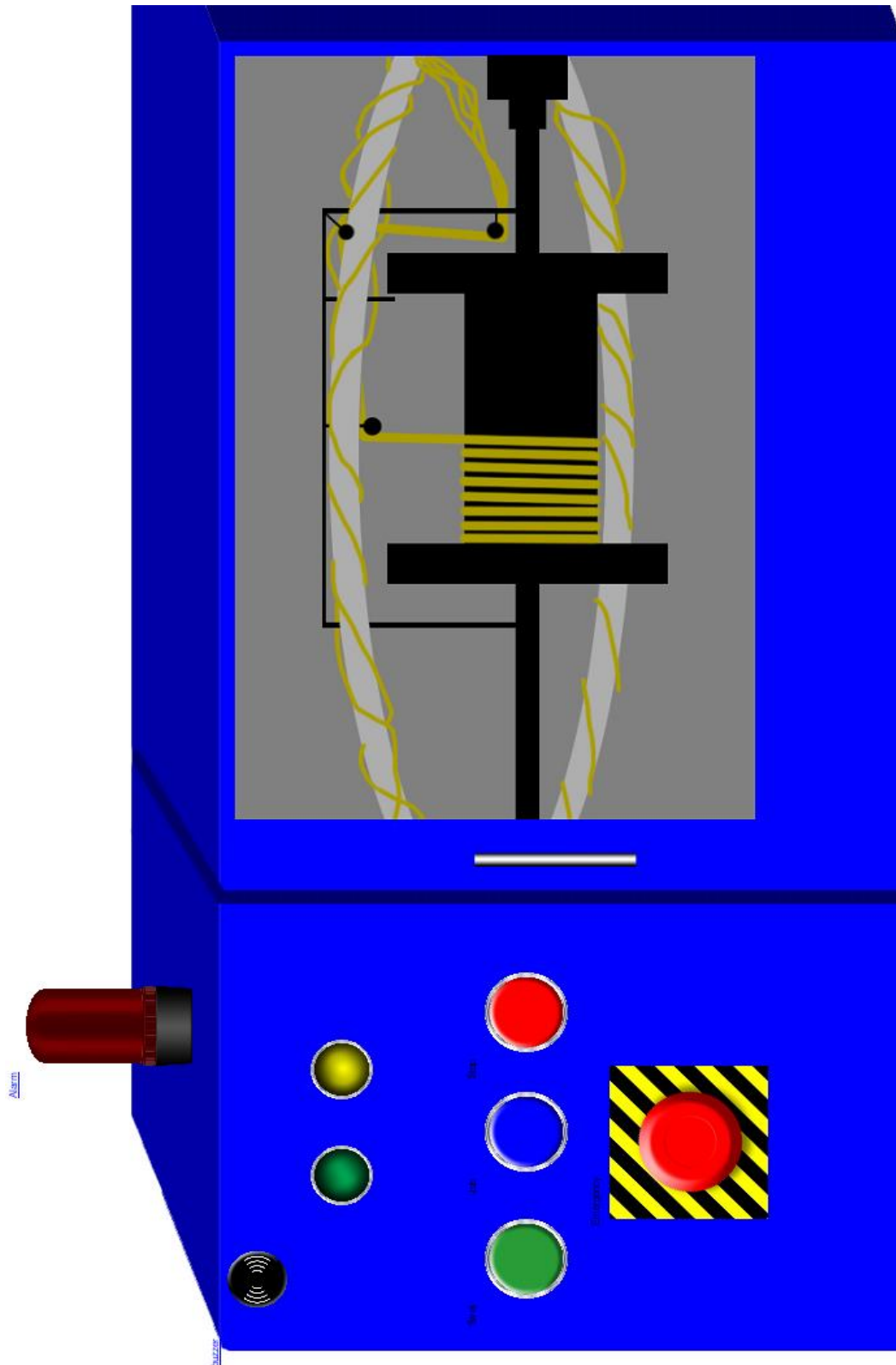
The input & output of second stage {Wire twisting}:



The ladder diagram of the second stage {Wire twisting}:



The graphical representation of the second stage {Wire twisting}:



Discussion and conclusion

1. Learned the analysis and characterization of symbols to ladder diagram.
2. Decrease the time in maintenance.
3. Change the function of any part of the machine easily.
4. Make a graphical representation of the ladder diagram.
5. Break the barrier of fear of work and factory.