

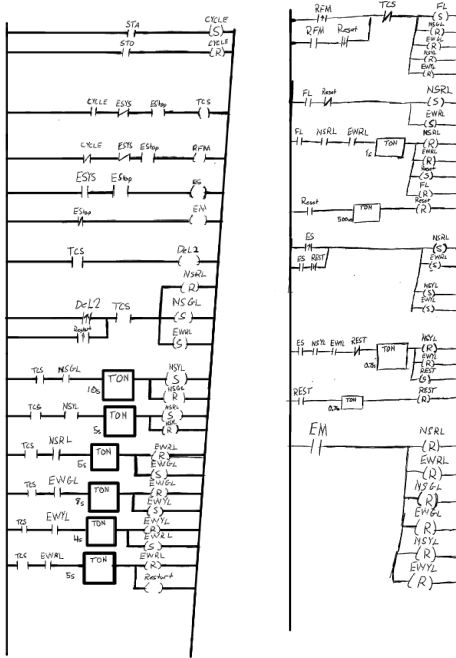
Traffic Control System With HMI

by
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EET275: Intro to PLC
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Lab Objective:

During this lab we were required to simulate a traffic light control system. The traffic light required to be able to switch the traffic lights to different modes. The purpose of this lab was to use the HMI to create different alarms and notifiers. Also in this lab the buttons and switches to switch to different modes were put into the HMI.

Control Systems:



Lab Details:

To begin the lab the ladder logic program from lab 6 opened in CCW, the traffic lights were wired, and the PLC and computer networking was done. After finishing those essential steps in beginning the lab then the tags for the HMI were created for the start push button, stop push button, switch, and e-stop. Once creating the tags the HMI buttons were created and tested. Once confirming that the HMI buttons worked on the traffic lights the next step was creating multiple indicators for what mode was running. Tags were created for each traffic light and each traffic light mode and put color in the indicators to match that of what the traffic light does. IN the HMI two traffic light images were created to show what light should be on and off and the other modes were made to flash on and off the same way they do on the traffic lights.

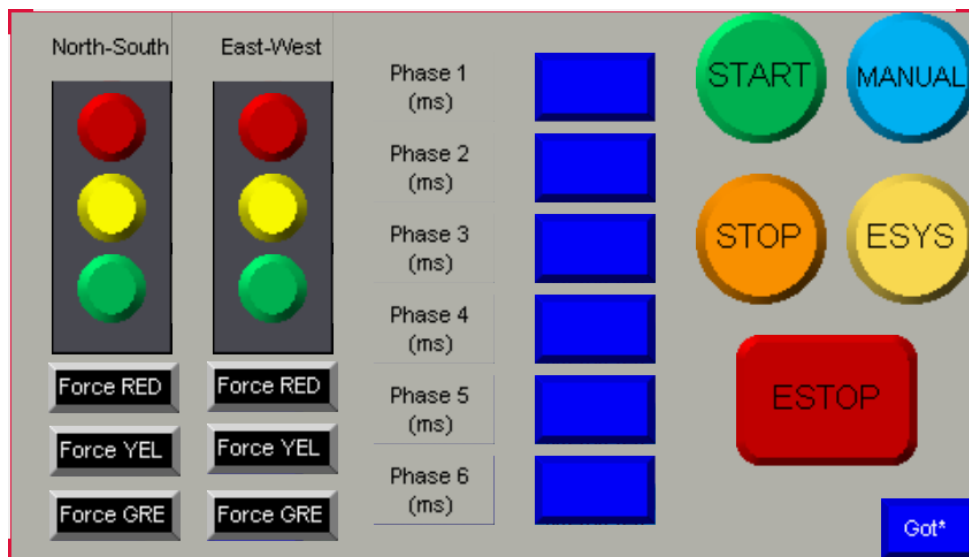
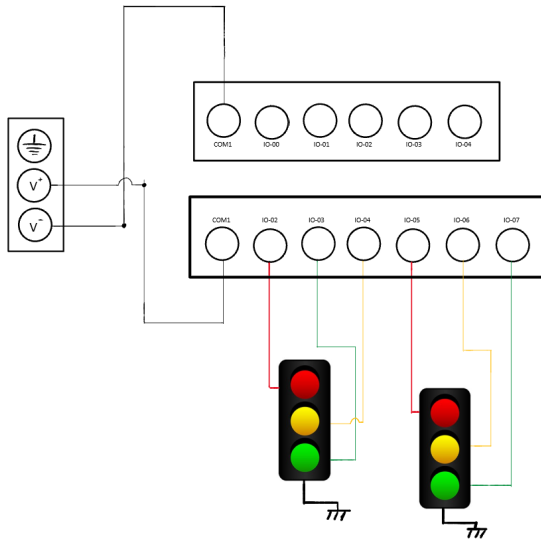
For deliverables 3 the HMI integer keypad was the best way to satisfy the requirements. Using the keypad the set timers in the automatic ladder logic could be set to a different time using the keypad if the mode was set to manual. It was also changed in the ladder logic that each traffic light had a button and could be switched through and continue the cycle through from where the button was pushed with the time selected to keep each light on. The manual and automatic had the same ladder logic structure but was changed for key parts to work manually like the preset time and light that was on but would still cycle through the lights as normal after.

Physical I/O			
Name	Address	Input/Output	Device
NSRL	IO_EM_DO_02	Output	Red Traffic Light
NSGL	IO_EM_DO_03	Output	Green Traffic Light
NSYL	IO_EM_DO_04	Output	Yellow Traffic Light
EWRL	IO_EM_DO_05	Output	Red Traffic Light
EWYL	IO_EM_DO_06	Output	Yellow Traffic Light
EWGL	IO_EM_DO_07	Output	Green Traffic Light

HMI I/O			
Name	Address	Input/Output	Device
STA	IO_EM_D1_00	Input	HMI Button
STO	IO_EM_D1_01	Input	HMI Button
ESYS	IO_EM_D1_02	Input	HMI Button
EStop	IO_EM_D1_03	Input	HMI Button
RFM	IO_EM_DO_00	Output	HMI Pilot Light
ESYS	IO_EM_DO_01	Output	HMI Pilot Light
ESTOP	IO_EM_DO_08	Output	HMI Pilot Light

All the traffic lights were put into the HMI and designed to look like two traffic lights with the same addresses and would activate whenever the physical traffic lights did in the same way.

System Schematic:



Conclusion:

The objective of this lab was to simulate different traffic lights control modes using HMI. During this lab a lot was learned about the HMI capabilities. One capability of the HMI that was used during this lab was entering a number in from the HMI into our ladder logic program. This feature allowed us to set a time of which each light would be on.