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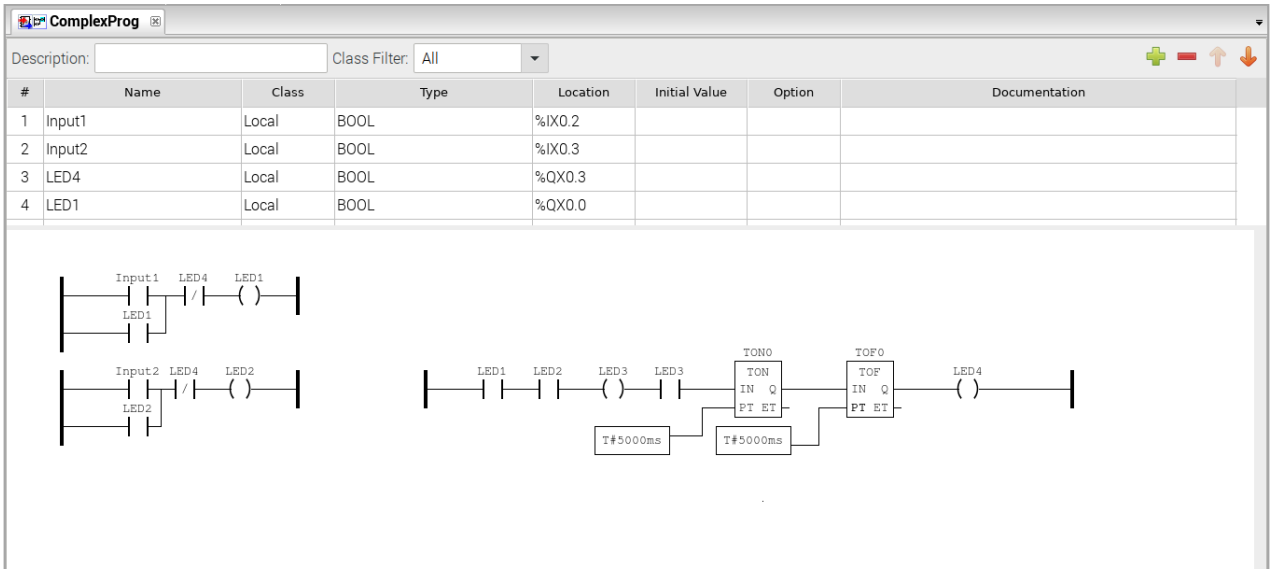
4/4/2023

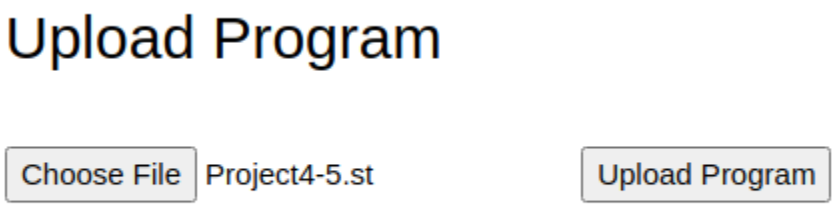
LAB 7 – Custom Program

In this lab we were instructed to re-create the environment we have built throughout all previous labs from the ladder logic to the Programable Logic Controller them to the Human Machine Interface from the most previous lab. This began with the LD program which there is a limited time circuit, with 4 LEDs and the same two buttons.

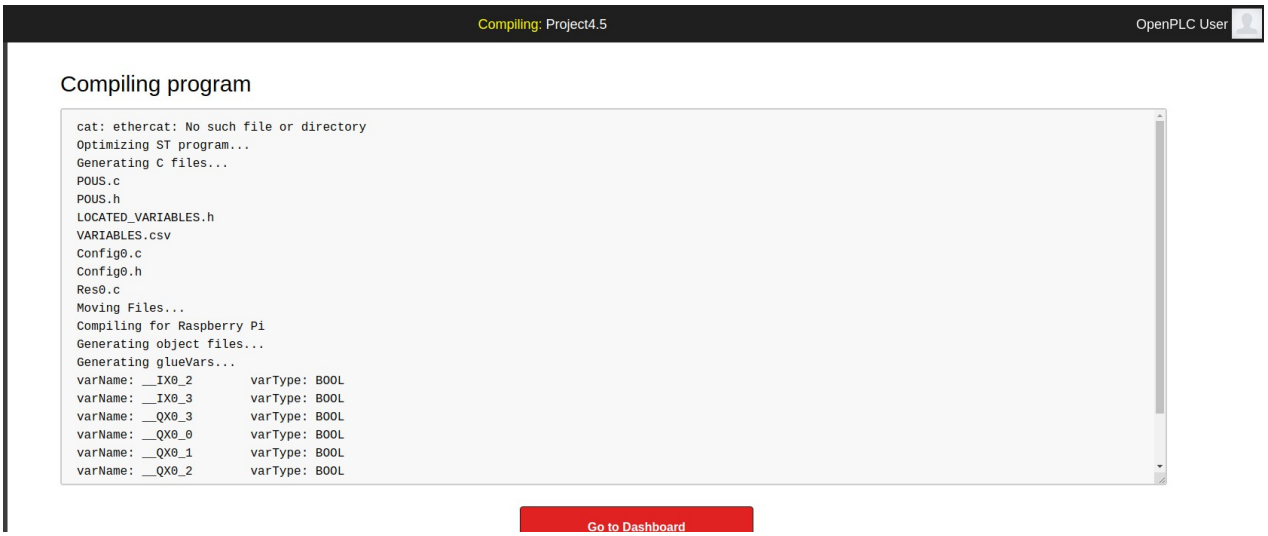


Here the buttons are in their own separate light circuit that controls a single LED, in the larger circuit, when the two LEDs are active it will power on a third led which will activate a timer for 5 seconds which will activate the 4th LED which kills LEDs 1,2,3 then shutting off after 5 seconds.

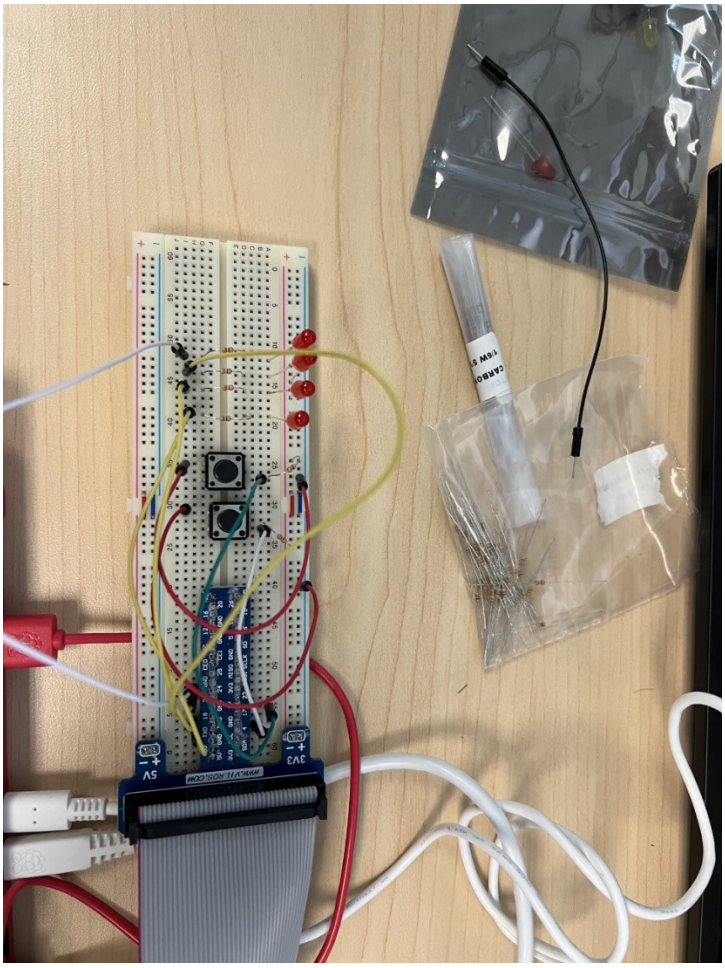
Next, we will download using the large orange arrow and upload this code to openplc and compile it.



After this is done will press on this program which will begin its compiling in order to launch and use this program on openplc.



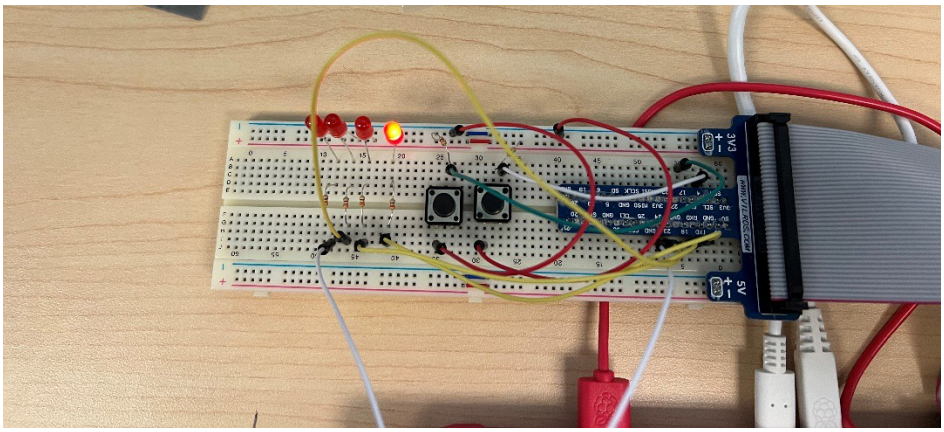
After compiling we can run the program and test the circuit which works correctly. The next step or before this previous step is to build the circuit. I only had to add 3 more LEDs to the board in order to match my program.



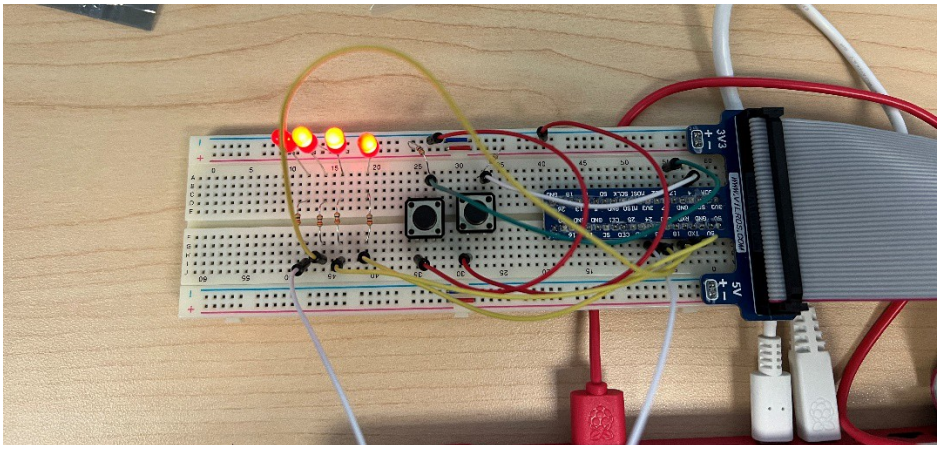
Here it is, the wires from the output pin rows to the top of the board which are bridged by a resistor to the LED. The two buttons have not changed.

Next is to run the program and here are the results on the breadboard.

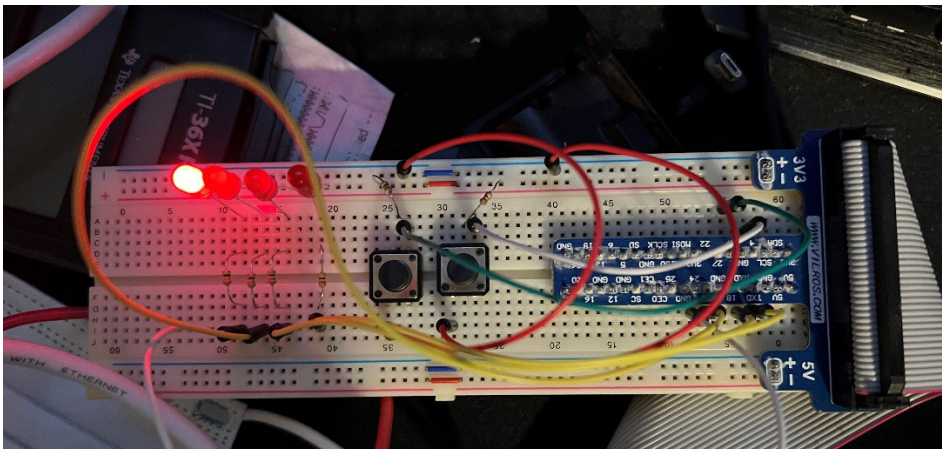
LED 1 after button 1 is pressed



LED 2 after button 2, LED 1 and 2 being on activates LED 3.

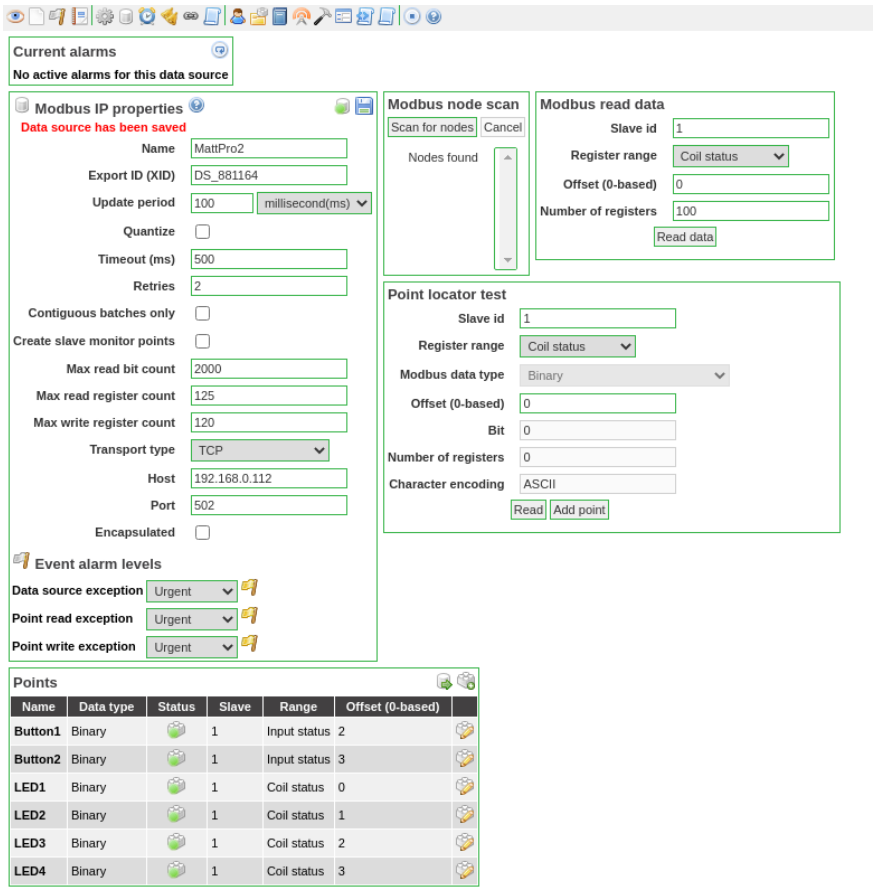


LED 4 after the 5 seconds



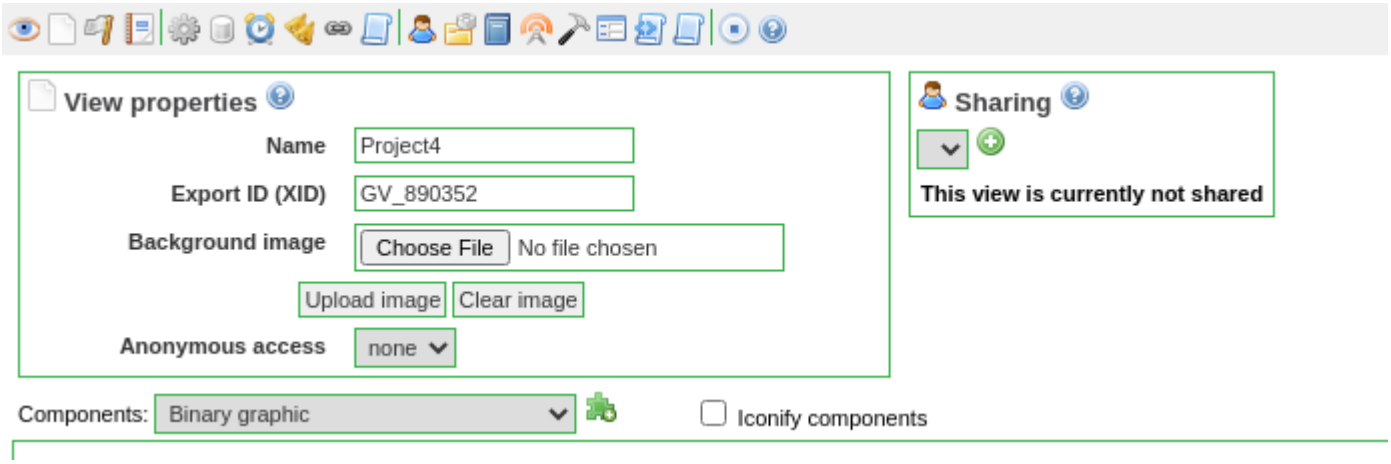
With this verification the next step is the creation of the HMI with the ScadaBR service.

After turning on the ScadaBR VM with a bridged network connection we can open its local site with its IP. Next is to create a new data source for the project and add the IP of the pi and the locations of our input and outputs on the GIPO.

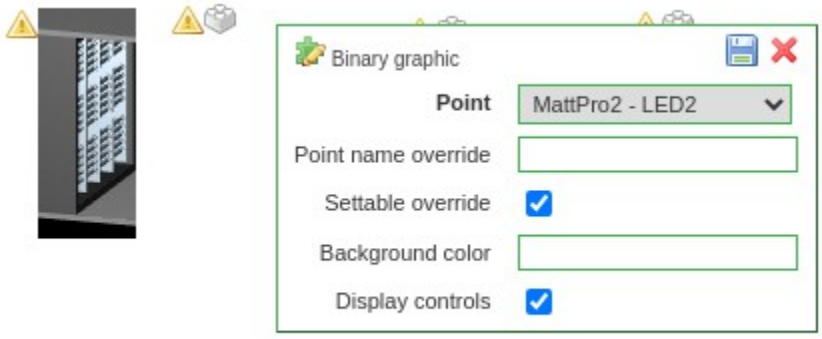


After completing, as always change the status of the points to green from red to enable monitoring of the points added. Then change source status itself at the top of the page to green

from red. In the next section of the lab is in the graphical view where we created a new view with binary graphics

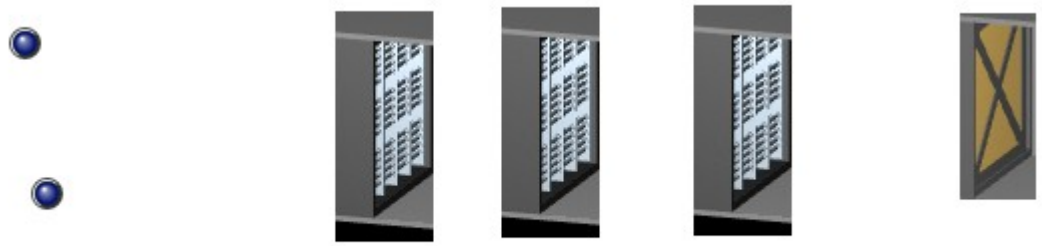


After adding the components, we need we will set them to what we want, for this lab also select the settable override and display on the points. This will allow us to set the object to on or off with 1 and 0 respectably which also activates it on the circuit without pressing the physical button.

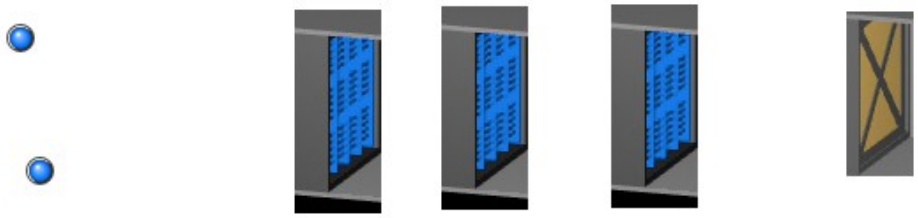


Check the two boxes.

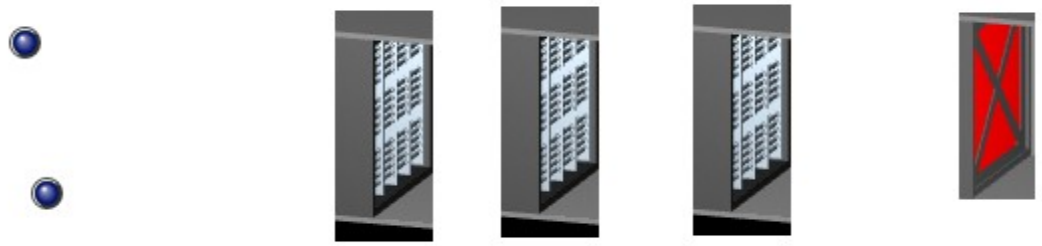
Here are the graphics for the HMI I chose at off



It displays this for the three LEDs on after pressing both buttons. Note both buttons were set to on for this picture.



Then when LED 4 turns on, negating the button's circuits.



The entire infrastructure has been set up and recreated in this Lab from the program to a new data source and HMI. Completing what took 2 weeks of class in a single lab.