Discrete Automation Systems

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Task Description

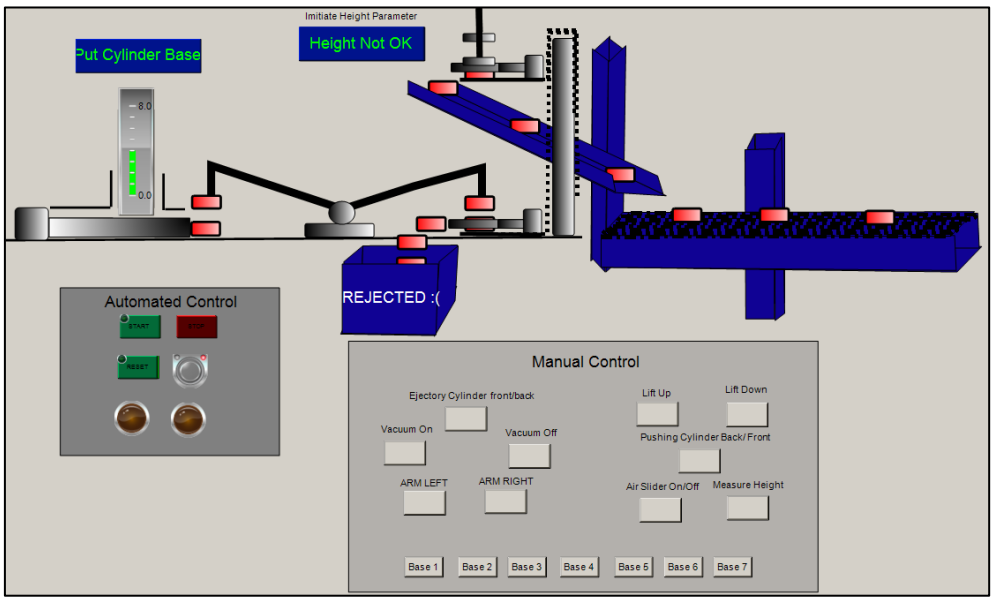
The task of this project was to use Twincat PLC programming software to write a program and create an automated and manual control visualization for the MPS Festo Distribution and Testing stations situation at the FASTory Lab of Tampere University of Technology.

Design

For each station there are two Program Organization Unit (POU). One POU (name ends with "Control") is for the control of different actuator in sequence and the other POU (name ends with "Sensors") is to imitate the sensor outputs which is necessary for creating the visualization. To physically implement a real MPS Festo station only the first one needs to be used. Some timers were used in the first POU to imitate the real world working time of the different actuators. To use the first POU in real PLC all the timer may either be deleted or their times set to zero. In real application it will still work regardless of the timers because the program was carefully designed to be driven by sensor outputs i.e. each event is triggered by a specific sensor output.

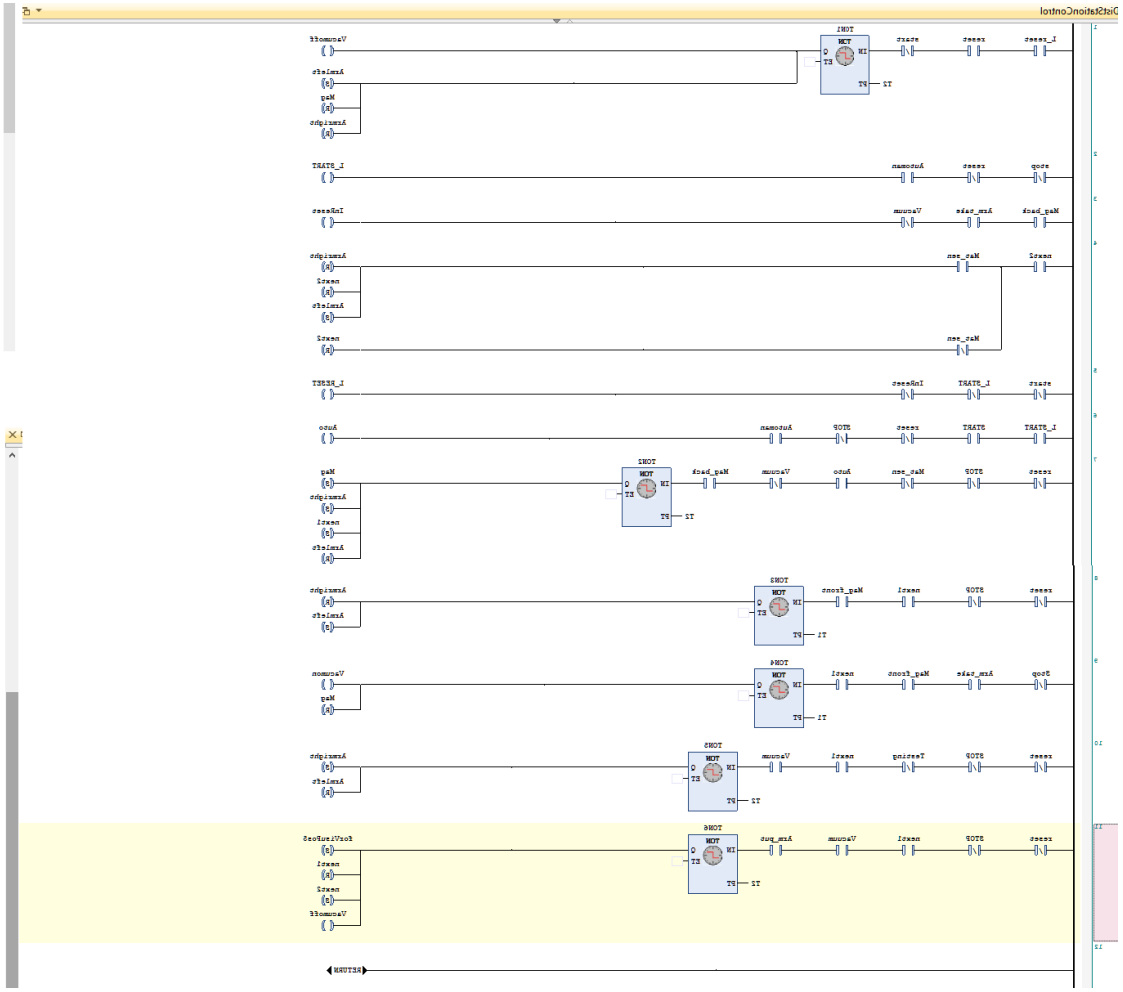
In my design I have used a Boolean variable called H_Meas to start the height measurement. In the visualization a button labelled "Imitate height Parameter" was used to switch toggle Work_OK. The light barrier sensors were not drawn in the visualization as because they are all static relative to their holder.

Visualization

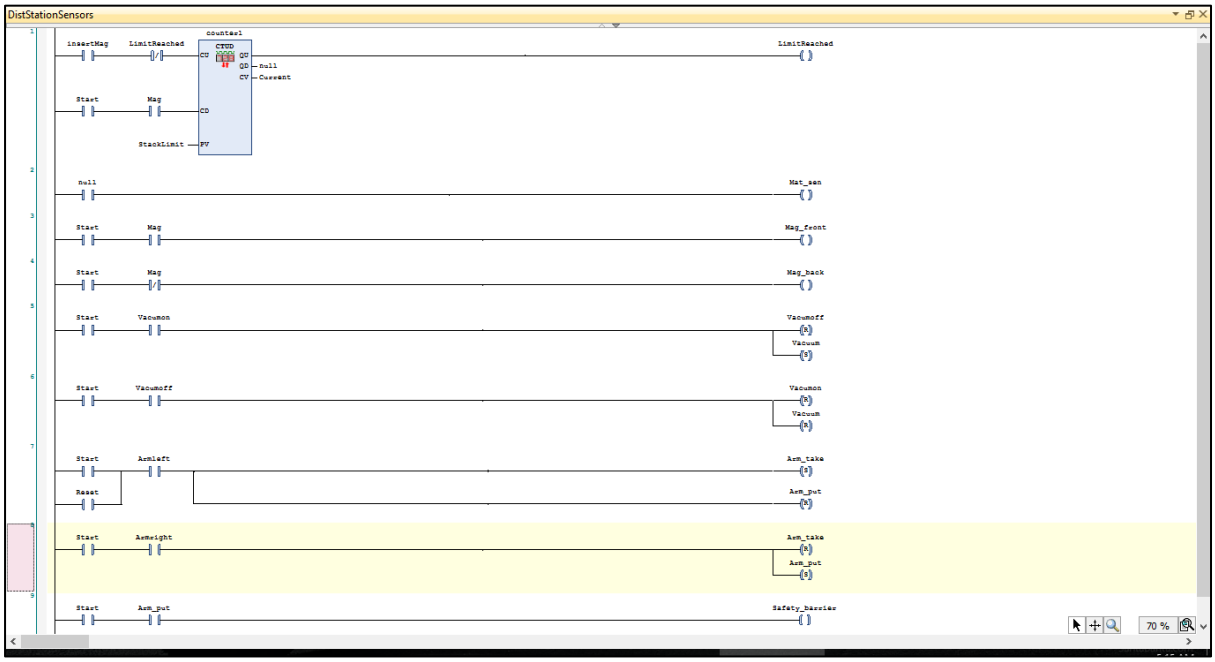


Ladder Logics

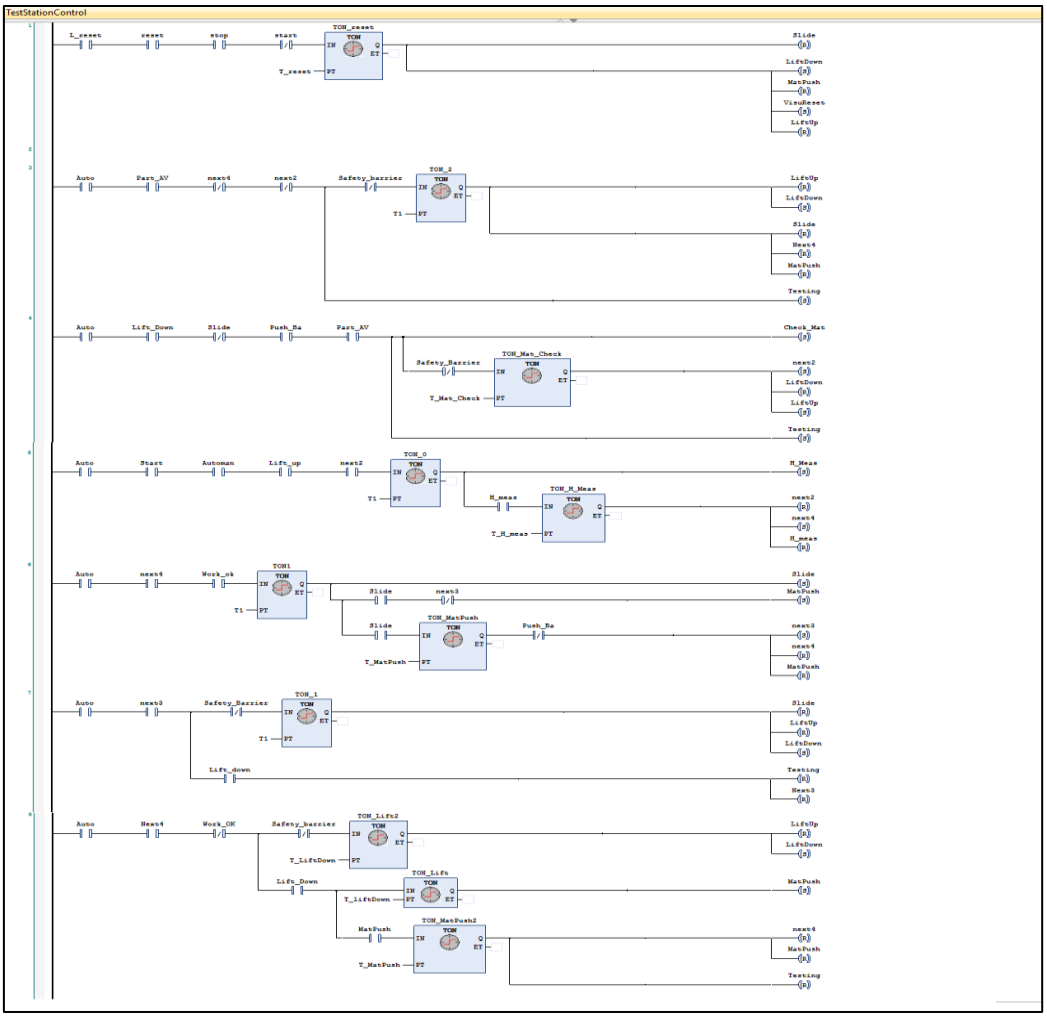
DistributionStationControl.TcPOU



DistributionStationSensors.TcPOU



TsetingStationControl.TcPOU



TestingStationSensors.TcPOU