

SoLID: Test Station for PID Controls

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2022-02

Test Station for PID Controls of SoLID

I continued with the development of PLC code to test PID control over the electric valves that will be used for the Hall A SoLID magnet cryogenic operations. The code under development is part of the proposed PLC test station.

I added code to simulate the behavior of the liquid level sensor readout in sub-routine Liquid Level. Liquid level sensor is commonly installed inside the helium or nitrogen cryogenic reservoirs. The readout of the liquid level is critical for the control of the valves since the opening or closing of the valve depends on a reliable readout of this variable.

The added code simulates the filling and emptying of a tank while a valve is open and its outlet is open. I added conditions to limit the filling and emptying of the tank from 0 to 100%. I implemented timers to control the flow rate for filling so the readout of the liquid level is close to a real scenario.

For the HMI programing required for controls and monitoring, I created and configured the HMI screen to monitor and control liquid level. I started adding the indicators for liquid level, filling, and interlock status. I implemented controls to simulate a tank opening and closing, Fig.1.

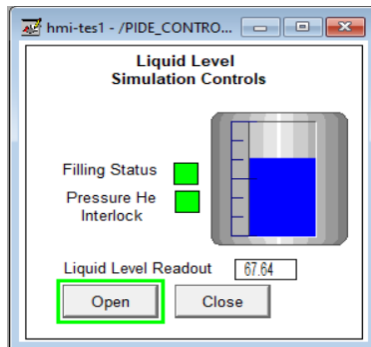


FIG.1. HMI screen under development to simulate the liquid level variable. Screen shows data read from the PLC emulator

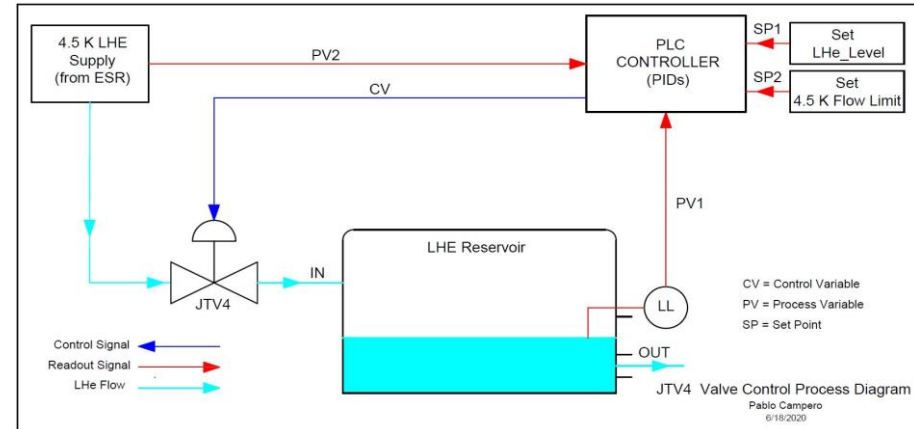
- **Developing PLC code using PID functions to control and monitor electric valves**
- **Developing HMI screen to control and monitor liquid cryogen levels**
- **Plan to implement code and screen to operate electric valves in automatic mode**

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I solved the problem presented last month about the remote access to the PLC software. I added the laptop host name to the list of allowed computers/users by using FactoryTalk Administration Console software. I ran a test accessing PLC programming software remotely and accessed software with no issues.

I had some issues while developing the testing HMI screen for the valve controls and monitoring since I was running FactoryTalk View Studio (HMI development software) in Demo mode with no available license on my computer. Running HMI software in Demo mode allows the user to run the software for a maximum of two hours, after which the software is closed automatically, losing modifications done to the project. Saving must happen before that period to prevent losing any progress. Currently DSG has a standalone license that enables access to the HMI software, which runs on a dongle and can be connected via USB to any computer.

PLC code to operate the valve in automatic mode will be added.



Block diagram of PLC controls for liquid helium in reservoir