

Test Station for PID Controls of SoLID

I am developing 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.

PID control over the valves is critical for cryogenic operations to keep the magnet at superconducting temperatures. DSG is involved in the testing of the instrumentation; instrumentation is controlled and monitored by a PLC controller.

I installed software to facilitate the testing of the PID controls:

- RSLogix 5000 to generate the control program using the PIDE instruction to set up configurations and control logic required to mimic current in the magnet's control program
- RSLogix 5000 Emulator to simulate input and output signals
- Factory Talk View Studio to program and create human machine interface screens to allow control and monitoring and to generate the local data archiver to store the data for the set and output valve position values.

I created a new PLC project, configured the PLC emulated controller, and added generic modules to simulate input and output modules to the virtual PLC chassis running on RSLogix 5000 Emulate software.

For the HMI programing required for controls, monitoring, and archiving of the generated data, I created and configured the HMI server and testing client, added a new Rockwell Automation Device Server to set up communication between the HMI server and RSLogix5000 emulator (PLC controller emulated). I tested communications between the PLC emulated controller and the HMI by creating testing PLC tags, Fig. 1.

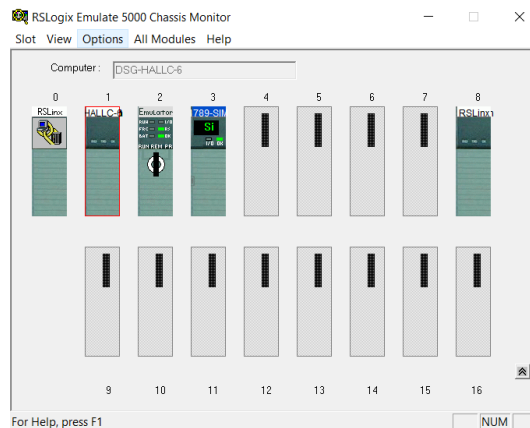


FIG.1. Emulated controller and added modules running

I found issues connecting RSLogix 5000 Emulate software with RSLinx Classis software. To solve these issues, I installed both software with the same version and configurations in DSG-HALLC-6 PC and then connected with no problem. Another issue I found is remote access to PLC and HMI software; the solution is to add the laptop host name to the list of allowed users while logging in the computer at the Lab.

I added a main routine and sub-routines to mimic Hall A SoLID magnet controls over the valves, setting up the same configurations and values for the PIDE add-on instructions used to perform the PID control on the valves.

I plan to add a newly acquired laptop host name to the list of allowed users to solve license issues and to be able to remotely access PLC and HMI software. I will continue developing the code for main PLC routines.