Hall C HMS and SHMS Cryogenics Remote EPICS Monitoring

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The Hall C High Momentum Spectrometer (HMS) and the Super High Momentum Spectrometer (SHMS) are continuously monitored to ensure proper operation. This note discusses the development of Web Extensible Display Manager (WEDM) screens for remote monitoring of spectrometers by system experts who are off-site or, though at Jefferson Lab, not in the counting house.

The Allen Bradley PLCs of the HMS and the SHMS transmit signal tags to the Hall C Ethernet subnet, Fig. 1. The Windows 7 PC (Skylla 7) on the Hall C subnet continuously runs the KEPServerEX program that receives the PLC tags and converts them to EPICS process variable (PV) signals.
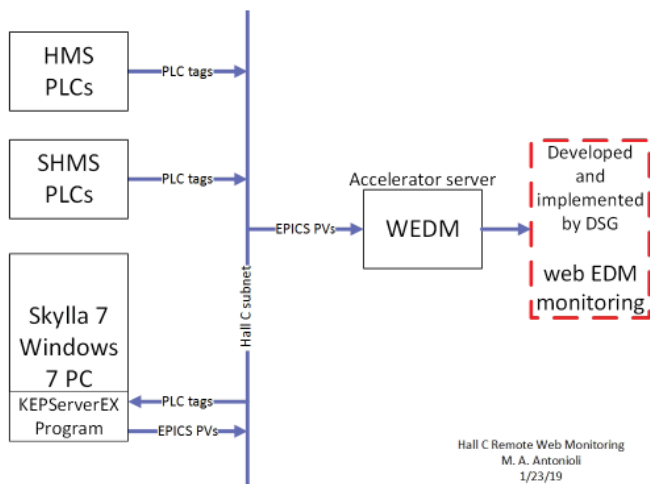

FIG. 1. Hall C software infrastructure for Hall C WEDM.

FIG. 2. Hall C WEDM development.

The EPICS PV signals are received by an Accelerator Division web server computer. The WEDM server parses screen files created with EDM and translates them into HTML equivalent code in real time, allowing existing screen files to work without modification.

The summary of the development procedure for the Hall C WEDM screens is shown in Fig. 2. The PVs to be displayed via WEDM were obtained and, using PV EPICS tools, verified to be available on the subnet. The PV list names were then formatted into comma-separated value (.csv) configuration files.

A python script was developed to automatically generate the EDM monitoring screens using the .csv configuration files. This script facilitates quick and easy generation of EDM screens without the need to manually create them using the EDM program. The script-generated text monitoring screens are consistent and uniform in appearance.

The script-generated monitoring EDM screens for the overall Hall C cryogen supply system and the HMS and SHMS cryogenics were debugged, tested, and uploaded to the JLab Accelerator Division WEDM web server. The screens produced by the 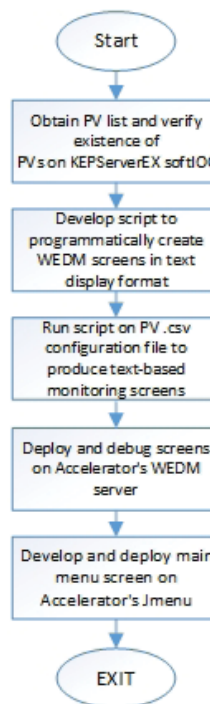WEDM web server were verified with a web browser. Menus to choose between the Hall C screens were produced and added to the Accelerator Jmenu system. Figure 3 shows the Hall C PLC System menu and the corresponding Cryogenics Overview WEDM screen.
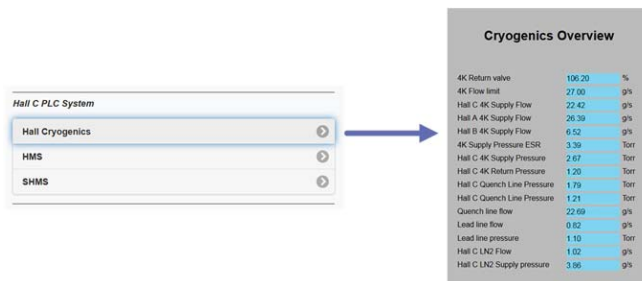

FIG. 3. Hall C PLC system menu and cryogenics overview WEDM screen.

In conclusion, remote web monitoring of the overall Hall C cryogen supply system and the HMS and SHMS cryogenics was developed, debugged, tested, and successfully implemented using the JLab WEDM web server infrastructure.