

Archiving Hall A Electromagnetic Calorimeter’s Heater System Data

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This note presents the electromagnetic calorimeter’s (ECAL’s) heater system data archiving process using the MySQL Archiver (MyA).

Research and development using LabVIEW for heater control and monitoring of the six-module ECAL operated successfully from Nov.—Dec., 2023; see ECAL in [DSG Notes & Talks](#). The software logged data from 44 process variables (PVs), including temperatures of the lead glass blocks, on an SD card.

Figure 1 is the schematic of the PID control system. LabVIEW-shared PVs, updated once per loop execution, have a storage location in the cRIO memory.

For control and monitoring with EPICS, LabVIEW’s shared data are input to updated, prefixed EPICS PVs located in the folder that contains the EPICS client input-output (I/O) server.

The EPICS client I/O server has access to EPICS records hosted on the I/O controller adacfs. Each EPICS record name is the file path to the memory location reserved for the data to be stored, Table I and Fig. 2. The value of each EPICS shared variable is aliased to the PV listed in the EPICS client I/O server.

A LabVIEW VI, ECAL EPICS Channel Display, Fig. 3, sends data from the LabVIEW shared variable to the EPICS shared variable and displays the data on the front panel.

To conclude, EPICS control and monitoring and MyA archiving of the six-module ECAL prototype heater controls and monitoring system have been successfully implemented and tested.

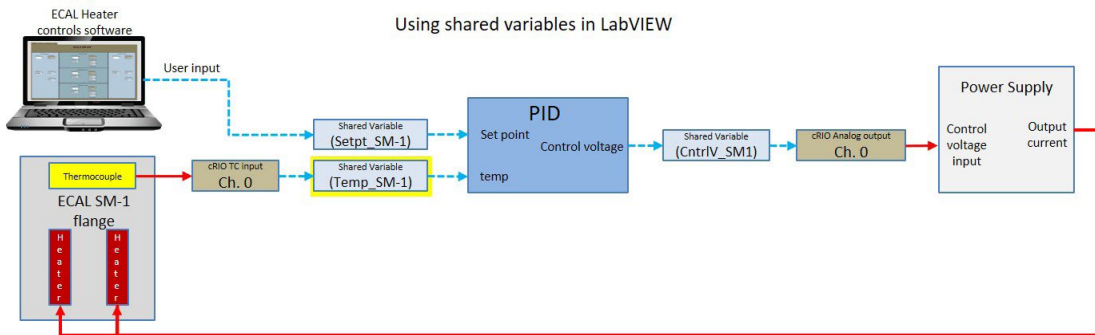


FIG. 1. Shared PV Temp_SM-1 (yellow box) is the temperature data from a thermocouple (ch#0 of the cRIO) that is input to the PID.

LabVIEW shared variable	EPICS shared variable	EPICS PV record name
Setpt_SM-1	EPICS_Setpt_SM-1	HAECAL:HEATCON:SETPT:Setpt_SM-1
Temp_SM-1	EPICS_Temp_SM-1	HAECAL:HEATCON:TEMP:Temp_SM-1
CntrlV_SM-1	EPICS_CntrlV_SM-1	HAECAL:HEATCON:CV:CntrlV_SM-1

TABLE I. Naming system of PVs.

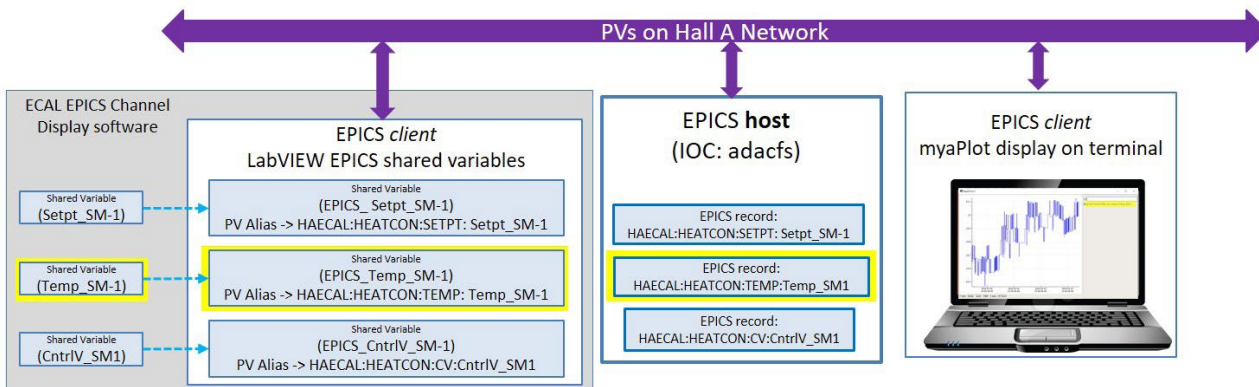


FIG. 2. The example shared variable Temp_SM-1 is used to update the EPICS process variable HEATCON:TEMP:Temp_SM1 on the IOC adacfs, which is plotted on the terminal using myaPlot. All of the activity is on the Hall A Network.

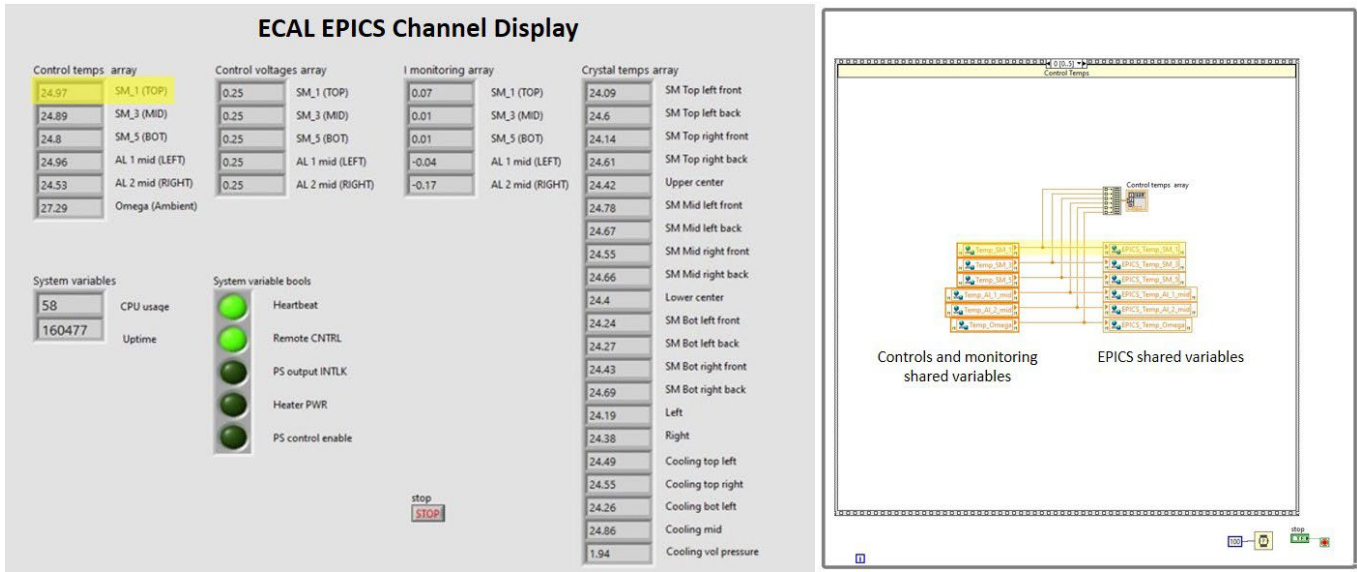


FIG. 3. The monitoring panel (left) and programming panel (right) of the ECAL EPICS Channel Display LabVIEW VI. The LabVIEW VI shared variables update their EPICS counterpart.