

Python Program for Backup and Restore of Hall C EPICS High Voltage Process Variables

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This note discusses the backup and restore (B/R) program written in Python to serve as a CSS-compatible program that saves or loads EPICS process variables (PVs).

The high voltage EPICS controls and monitoring system in Hall C is being updated from Tcl/Tk to CS-Studio (CSS) [1]. To replace the Tcl/Tk system, a CSS-compatible B/R program is required, which enables channel configurations to be saved and loaded later, as needed. Because CSS has the ability to execute system commands and scripts through widgets, a Python program that uses the *pyepics* module (an interface to the Channel Access library for Python) was developed to perform B/R functions—HV B/R.

Rather than allowing users to select the detectors to back up, when HV B/R executes, it backs up all HMS and SHMS high voltage channels to ensure that there is always a backup of all channels. The resulting backup file can be used to rebuild all CSS-BOY high voltage controls and monitoring GUIs.

The difference in execution time for the backup or restore of high voltage channels of any one detector or all high voltage channels of all detectors is small; whether there are 30 PVs or 5000 PVs, the program completes execution in less than three seconds.

The backup GUI, Fig. 1, allows users to enter a comment in the text box and then execute HV B/R in backup mode by clicking Run Backup. The resulting output file name contains the date and time of the backup to avoid any ambiguity about which file is most recent and eliminates the possibility of overwriting a previous backup file.

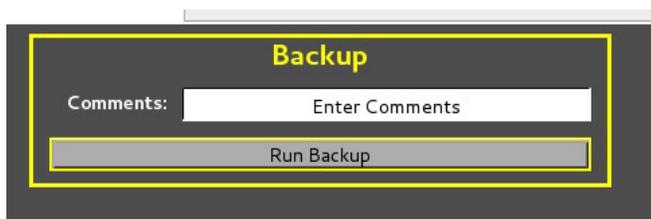


FIG. 1. HV B/R backup CSS-BOY GUI.

The restore GUI, Fig. 2, allows users to select the file to be used for restoration using a file browser drop-down menu. The restoration file can also be selected by manually typing in the file name in the text box, or by leaving the file selection blank to restore from the most recent backup file.

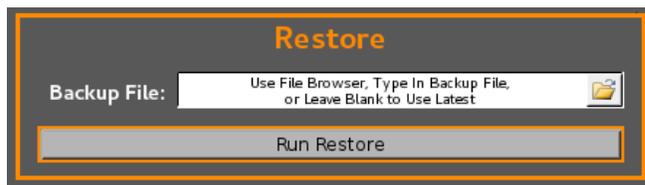


FIG. 2. HV B/R restore CSS-BOY GUI.

In summary, HV B/R, a Python backup and restore program, is executed using CSS-BOY GUIs. All program GUIs and scripts have been successfully tested on a simulated EPICS IOC and on the CAEN SY4257 test station. All components will be packaged and included in the new CSS-BOY high voltage controls and monitoring program.

[1] A. Hoebel, et al. *Displaying with CSS-BOY EPICS High Voltage Process Variables of the Hall C High Momentum Spectrometer*, DSG Note 2019-11, 2019.