

Testing of CAEN SY4527 and A7435SN High Voltage Modules

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A test stand for the CAEN SY4527 and A7435SN high voltage modules, which are to be used in Hall C, was set up to verify whether the output voltages of the channels with respect to the set voltages thereof, were within manufacturer’s specification.

The test stand consisted of a CAEN SY4527 power supply crate, eight CAEN A7435SN high voltage modules, a Keithley 2001 multimeter, a Pintek HVP40 high voltage probe, and a PC with LabVIEW code, developed to automate testing and data-logging, Fig. 1.

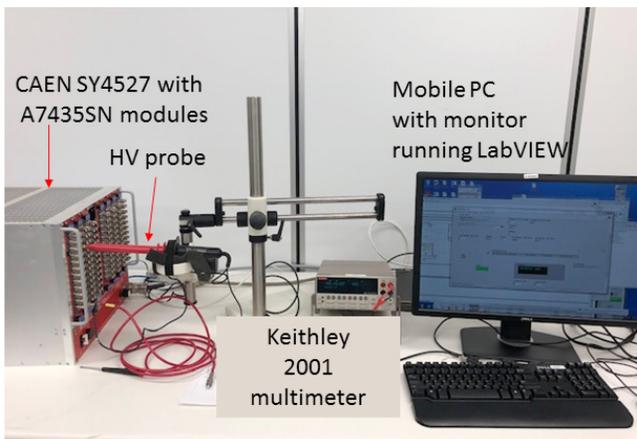


FIG. 1. CAEN SY4527/A7435SN high voltage test stand.

To confirm that the channels of the modules could output the correct voltage, V_{set} (the set voltage) for all channels of all the modules was set to 100 V and the output voltage of each channel of every module was measured with a digital multimeter.

Measurements showed that three modules had issues; module #62 stopped communicating and channels of modules #64 and #73 did not output the right voltage. These three modules were repaired by CAEN.

To verify the specification that the monitored output voltage V_{mon} is $\pm 0.3\%$ or ± 1 V of V_{set} , for each channel, V_{set} was varied from 0 V to 999.9 V (the multimeter has a voltage limitation of 1100 V) in steps of 50 V, with a dwell time of 25 s at each step. V_{set} and the associated V_{mon} and V_{meas} – output voltage measured with a Keithley 2001 multimeter, were read and logged to a text file at a kHz rate. V_{meas} validated V_{mon} .

Results of data analysis, using the LabVIEW analysis program, indicated that for all V_{set} , V_{mon} and V_{meas} are within manufacturer’s specification, Figs. 2 and 3.

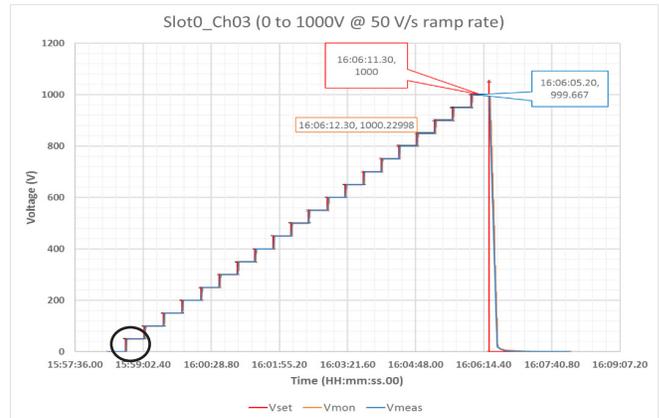


FIG. 2. No load measurement of Slot0_Ch03. Voltage was set from 0 V to 1000 V. Measurement shows set voltage, monitored voltage, monitored current, and measured voltage. Detail of circle in Fig. 3.

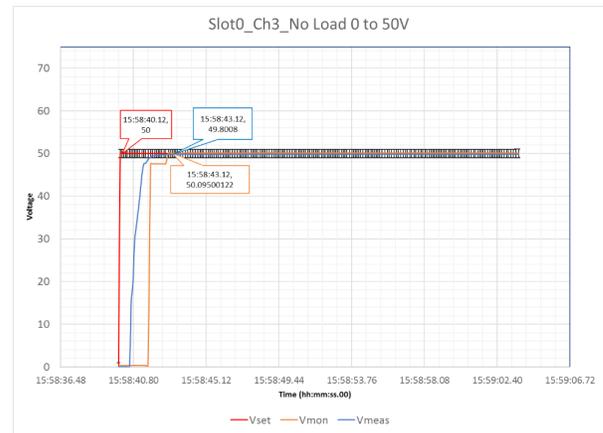


FIG. 3. Detail of Slot0_Ch03 from 0 V to 50 V. The error bars are based on the measured output voltage vs. set voltage specification of $\pm 0.3\%$ or ± 1 V. At this voltage level, the error is $\sim \pm 1$ V.