Date: September 4, 2019 Tested by: Pablo Campero

# <u>Test 1: Tested CAEN A7030 HV board by setting and monitoring PVs using CSS-BOY screens</u>

#### **Procedure**

- 1. Connected <u>only one</u> A7030TN board to mainframe's slot 0 (15 empty slots).
- 2. Enabled System Advanced Features in GECO 2020.
  - 2.1.System Advanced Logging allows the user to create a log file with desired parameters for each board's channel.
  - 2.2.Enabled GECO logging advanced option for: *V0set, SVmax, I0set, Rup, RDWn, Pw, VMon, IMon, and Trip* parameters for all 36 channels.
- 3. Enabled CAEN EPICS Server Built-in to allow controls and monitoring from EPICS-CSS screens (EPICS Client).
- 4. Verified communication between CAEN EPICS Server and EPICS client.
- 5. Used HV CAEN Expert Controls CSS-BOY screen to set and read above-mentioned parameters.

5.1. Screen runs six JavaScripts to set all 36 channels' above-mentioned parameters simultaneously.

- 5.2. Screen runs two JavaScripts to turn on and turn off (Pw = 1/0) all 36 channels simultaneously.
- SY4527 system specs and set values for each of the three test performed are show in the table 1 below:

	Table – 1: Voltag	ge Ramp Up/Down T	'est	
Mainframe Model	SY4527	Set Voltage		1500 V
Mainframe S/N	400	Set Ramp Up/Down	Rate	25 V/s
Board Model / S/N	A7030TN / 304	Max Current Set		1000 uA
CPU model / SN	A4528 / 760	Load: 0 Ω	Vmax: 1800 V	<b>IMon</b> : ~ 0 uA
<b>Total Channels Tested</b>	36	Total # Ramp Up/Do	wn per channel	15/15

- 7. Took screen shots for initial conditions displayed in GECO 2020 and EPICS/CSS-BOY screens (See attached screenshots for each test).
- 8. Started ramp up for all 36 channels by clicking "*All Turn On/Off*" button on *HV CAEN Expert Controls* CSS-BOY screen.
- 9. Ran HV CAEN Voltage Ramp Test CSS-BOY screen to monitor voltage readouts.
- 10. Saved data log files and screenshots with the results (See attached files and screenshots)

11. Repeated steps 1 through 10 for each of the three test performed. For each test ramped up/down five times.

#### **Results**

#### <u>Test 1.1</u>

- Channel 11, 12, 17 and 18 did not change PV associated with ramp up parameter (*Rup*) to set value 25 V/s after JavaScript to set all channels to same value was executed. See fig.5.
  - 1.1. JavaScript sends the command to set *RUp* value to set value, one time for all channels.
  - 1.2. Verified that nether PVs and GECO values for mentioned channels went to set point. See fig.1 and fig.2.

🚮 corn. cor	ional mol	rol cost																
GEED DELD. DET																		
SYSTEM		S			hvcaentest2				_							BOARDS		
hvcaentest2 Discon	nect Configure	Custom	Name	10Set	- V0Set	IMon	VMon	Pw	Status	RUp	RDWn	Trip	V1Set	11Set	SVMax	<b>^</b>		
		00.000	DSG-Lab	1000.00 uA	1500.00 V	0.974 uA	1.67 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	* Bo	erd00 - A7030TN - [304]	
SY4527 Universal Mult	ICHANNEL	00.001	DSG-Lab	1000.00 uA	1500.00 V	-0.044 uA	0.84 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
129.57.86.124	TSTEM	00.002	DSG-Lab	1000.00 uA	1500.00 V	-0.130 uA	1.35 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		A7030TN Module	
SETTINGS		00.003	DSG-Lab	1000.00 uA	1500.00 V	0.910 uA	1.28 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
ADVANCED FEAT	JRES	00.004	DSG-Lab	1000.00 uA	1500.00 V	-0.108 uA	1.38 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	BdStat	.5	
SCRIPT	G ON	00.005	DSG-LAB	1000.00 uA	1500.00 V	-0.044 uA	1.56 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	HIMax	314/	uA
CRATE TEC	OFF H SYS	00.006	DSG-LAB	1000.00 uA	1500.00 V	-0.060 uA	1.85 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	Temp	26	°C
SESSIONS MAP INF	O INFO	00.007	DSG-LAB	1000.00 uA	1500.00 V	0.902 uA	1.52 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	Cir Ala	m NO	
RESET GEN SIGN FLAG OFG CFG KIL	L CLEAR ALARM	00.008	DSG-LAB	1000.00 uA	1500.00 V	-0.134 uA	1.39 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Channel ON		00.009	DSG-LAB	1000.00 uA	1500.00 V	-0.048 uA	1.93 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
OVV	-	00.010	DSG-LAB	1000.00 uA	1500.00 V	-0.062 uA	1.70 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
ovc		00.011	DSG-LAB	1000.00 uA	1500.00 V	2.916 uA	1.51 V	Off		30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	1		
Trip	•	00.012	DSG-LAB	1000.00 uA	1500.00 V	-0.116 uA	0.70 V	Off		30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan1 e	3432	00.013	DSG-LAB	1000.00 uA	1500.00 V	-0.092 uA	1.21 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
HVFanStat Fan3 B	3397	00.014	DSG-LAB	1000.00 uA	1500.00 V	-0.048 uA	1.34 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan4 e	3254	00.015	DSG-LAB	1000.00 uA	1500.00 V	-0.046 uA	1.31 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan5 😐	3432	00.016	DSG-LAB	1000.00 uA	1500.00 V	-0.042 uA	1.65 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Symbolicitame	SystemOne	00.017	DSG-LAB	1000.00 uA	1500.00 V	-0.046 uA	1.38 V	Off		30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	1		
Each in	1700	00.018	DSG-LAB	1000.00 uA	1500.00 V	-0.088 uA	1.54 V	Off		30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
PWFanStat Fan1 .	1716	00.019	DSG-LAB	1000.00 uA	1500.00 V	-0.010 uA	2.05 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan2 😐	1716	00.020	DSG-LAB	1000.00 uA	1500.00 V	-0.030 uA	1.29 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
DHCPDStatus	Disabled	00.021	DSG-LAB	1000.00 uA	1500.00 V	0.000 uA	1.66 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
		00.022	DSG-LAB	1000.00 uA	1500.00 V	-0.058 uA	1.19 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
		00.023	DSG-LAB	1000.00 uA	1500.00 V	0.922 uA	1.11 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
		00.024	DSG-LAB	1000.00 uA	1500.00 V	-0.126 uA	1.66 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
		00.025	DSG-LAB	1000.00 uA	1500.00 V	-0.020 uA	0.71 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
		•										1				, č		

Fig.1 — GECO2020 screenshot shows channel 11, 12, 17 and 18 with incorrect RUp values (30 V/s)

Novice         Board Model         A7030TN - [5/N: 304]           Ch#         Location         Click to Turm         Status         VMon [V]         Imon [uA]         Vset [V]         Isst [uA]           00         DSG-Lab         ON         OFF         1.67         0.974         1500.00         1500         1000.00         1000           01         DSG-Lab         ON         OFF         0.84         -0.044         1500.00         1500         1000.00         1000           02         DSG-Lab         ON         OFF         1.35         -0.128         1500.00         1500         1000.00         1000           03         DSG-Lab         ON         OFF         1.38         -0.128         1500.00         1500         1000.00         1000           04         DSG-Lab         ON         OFF         1.38         -0.108         1500.00         1500         1000.00         1000           05         DSG-Lab         ON         OFF         1.52         -0.058         1500.00         1500         1000.00         1000           06         DSG-LAB         ON         OFF         1.52         -0.958         1500.00         1500         1000.00         1000	ALL ON/OFF           Vmax [V]         RUp [V/s]         RDwn [V/s]         Trip [s]           et         Readback         Set         Readback         Set         Readback         Set           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         3.0         3.0
Ch#         Location         Click to Turn         Status         VMon [V]         Imon [uA]         Vset [V]         Iset [uA]           00         DSG-Lab         ON         OFF         1.67         0.974         1500.00         1500         1000.00         1000         000           01         DSG-Lab         ON         OFF         0.84         -0.044         1500.00         1500         1000.00         1000           02         DSG-Lab         ON         OFF         1.35         -0.128         1500.00         1500         1000.00         1000           03         DSG-Lab         ON         OFF         1.35         -0.128         1500.00         1500         1000.00         1000           04         OSG-Lab         ON         OFF         1.38         -0.108         1500.00         1500         1000.00         1000           05         DSG-LAB         ON         OFF         1.38         -0.042         1500.00         1500         1000.00         1000           06         DSG-LAB         ON         OFF         1.52         0.906         1500.00         1000.00         1000         1000.00         1000.00         1000.00         1000.00         100	Vmax [V]         RUp [V/s]         RDwn [V/s]         Trip [s]           Readback         Set         Readback         Set         Readback         Set           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         2.0         3.0
00         DSG-Lab         ON         OFF         1.67         0.974         1500.00         1500         1000.00         1000           01         DSG-Lab         ON         OFF         0.84         -0.044         1500.00         1500         1000.00         1000         000 <td< th=""><th>10.00         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         20         3.0</th></td<>	10.00         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         25         3.0         3.0           0.00         1800         1800         25         25         25         20         3.0
01         DSG-Lab         ON         OFF         0.84         -0.044         1500.00         1500         1000.00         1000           02         DSG-Lab         ON         OFF         1.35         -0.128         1500.00         1500         1000.00         1000           03         DSG-Lab         ON         OFF         1.28         0.910         1500.00         1500         1000.00         1000           04         056-Lab         ON         OFF         1.28         0.910         1500.00         1500         1000.00         1000           05         DS6-Lab         ON         OFF         1.38         -0.108         1500.00         1500         1000.00         1000           05         DS6-LAB         ON         OFF         1.85         -0.058         1500.00         1500         1000.00         1000           07         DS6-LAB         ON         OFF         1.39         -0.134         1500.00         1500         1000.00         1000           08         DS6-LAB         ON         OFF         1.93         -0.046         1500.00         1500         1000.00         1000           10         DS6-LAB         ON	0,00 1800 1800 25 25 25 25 3.0 3.0 0,00 1800 1800 25 25 25 25 3.0 3.0
O2         DSG-Lab         ON         OFF         1.35         -0.128         1500.00         1500         1000.00         1000           03         DSG-Lab         ON         OFF         1.28         0.910         1500.00         1500         1000.00         1000         0000         1000	0 00 1800 1800 25 25 25 25 26 20 20
O3         DSG-Lab         ON         OFF         1.28         0.910         1500.00         1500         1000.00         1000	200 20 20 20 20 20 3.0 3.0
O4         DSG-Lab         ON         OFF         1.38         -0.108         1500.00         1500         1000.00         100           05         DSG-Lab         ON         OFF         1.56         -0.042         1500.00         1500         1000.00         100           06         DSG-LAB         ON         OFF         1.85         -0.058         1500.00         1500         1000.00         100           07         DSG-LAB         ON         OFF         1.85         -0.056         1500.00         1500         1000.00         100           08         DSG-LAB         ON         OFF         1.39         -0.134         1500.00         1500         1000.00         100           09         DSG-LAB         ON         OFF         1.73         -0.046         1500.00         1500         1000.00         100           10         DSG-LAB         ON         OFF         1.73         -0.046         1500.00         1500         1000.00         1000           11         DSG-LAB         ON         OFF         1.51         2.916         1500.00         1500         1000.00         1000           12         DSG-LAB         O	0.00 1800 1800 25 25 25 25 3.0 3.0
05         DSG-LAB         ON         OFF         1.56         -0.042         1500.01         1500.11         1000.00         100           06         DSG-LAB         ON         OFF         1.85         -0.058         1500.01         1500.11         1000.00         100	00.00 1800 1800 25 25 25 25 3.0 3.0
06         DSG-LAB         ON         OFF         1.85         -0.058         1500.00         1500         1000.00         100           07         DSG-LAB         ON         OFF         1.52         0.906         1500.00         1500         1000.00         1	0.00 1800 1800 25 25 25 25 3.0 3.0
07         DSG-LAB         ON         OFF         1.52         0.906         1500.00         1500         1000.00         100           08         DSG-LAB         ON         OFF         1.39         -0.134         1500.00         1500         1000.00         100           09         DSG-LAB         ON         OFF         1.93         -0.046         1500.00         1500         1000.00         100           10         DSG-LAB         ON         OFF         1.93         -0.046         1500.00         1500         1000.00         100           11         DSG-LAB         ON         OFF         1.51         2.916         1500.00         1500         1000.00         1000           12         DSG-LAB         ON         OFF         0.69         -0.114         1500.00         1500         1000.00         1000           13         DSG-LAB         ON         OFF         1.21         -0.048         1500.00         1500         1000.00         1000           14         DSG-LAB         ON         OFF         1.31         -0.048         1500.00         1500         1000.00         1000           15         DSG-LAB         ON         OFF<	00.00 1800 1800 25 25 25 25 3.0 3.0
08         DSG-LAB         ON         OFF         1.39         -0.134         1500.00         1500         1000.00         10000         10000         10000	0.00 1800 1800 25 25 25 25 3.0 3.0
09         DSG-LAB         ON         OFF         1.93         -0.046         1500.00         1500.11         1000.00	20.00 1800 1800 25 25 25 25 3.0 3.0
10         DSG-L48         ON         OFF         170         -0.062         1500.00         1500.00         1600.00	00.00 1800 1800 25 25 25 25 3.0 3.0
11         DSG-LAB         ON         OFF         1.51         2.916         150.00         1500         1         1000.00         100           12         DSG-LAB         ON         OFF         0.69         -0.114         1500.00         1500         -1         1000.00         1000         1000           13         DSG-LAB         ON         OFF         1.21         -0.020         1500.00         1500         -1         1000.00         1000           14         DSG-LAB         ON         OFF         1.34         -0.048         1500.00         1500         -1         1000.00         1000	10.00 1800 1800 25 25 25 25 30 30
12         DSG-LAB         ON         OFF         0.69         -0.114         1500.00         1500         1000.00         1000           13         DSG-LAB         ON         OFF         1.21         -0.048         1500.00         1500         1000.00         10000         10000         10000	0.00 1800 1800 30 30 25 25 3.0 3.0
13         DSG-LAS         ON         OFF         1.21         -0.090         1500.00         1500.00         1000.00         100	00.00 1800 1800 30 30 25 25 3.0 3.0
14         DSG-LAB         ON         OFF         1.34         -0.048         1500.00         1500         1000.00         1000.00           15         DSG-LAB         ON         OFF         1.31         -0.044         1500.00         1500         -1         1000.00         1	00.00 1800 25 25 25 25 3.0 <u>3.0</u>
15         DSG-LAB         ON         OFF         1.31         -0.044         1500.00         1500         1000.00         1000           10         DSG-LAB         ON         OFF         1.55         -0.044         1500.00         1500         -         1000.00         1000           17         DSG-LAB         ON         OFF         1.37         -0.044         1500.00         1500         -         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1000.00         1500         1500         1000.00         1500         1500         1500.00         1500         1500.00<	00.00 1800 1800 25 25 25 25 3.0 3.0
17 DSG-48 ON OFF 1.55 -0.028 1500.00 1500 - 1000.00 1500	00.00 1800 1800 25 25 25 25 3.0 3.0
17 DSG-448 ON OFF 1 37 -0.044 1500.00 1500 - 1000 00 1000	0.0.0 1000 1000 25 26 26 20 20
1.37 0.011 1.300.00 1000 1000 1000	00.00 1800 1800 30 30 25 25 3.0 3.0
18 DSG-LAB ON OFF 1.54 -0.088 1500.00 1500 - 1000.00 1000	00.00 1800 1800 30 30 25 25 3.0 3.0
19 DSG-LAB ON OFF 2.05 -0.010 1500.00 1500 10000 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
20 DSG-LAB ON OFF 1.29 -0.026 1500.00 1500 - 1000.00 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
21 DSG-LAB ON OFF 1.65 0.000 1500.00 1500 (1000 1000 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
22 DSG-LAB ON OFF 1.18 -0.054 1500.00 1500 - 1000.00 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
23 DSG-LAB ON OFF 1.11 0.926 1500.00 1500 11000 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
24 DSG-IAB ON OFF 1.65 -0.122 1500.00 1500 + 1000.00 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
25 DSG-LAB ON OFF 0.71 -0.020 1500.00 1500 - 1000.00 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
26 DSG-LAB ON OFF 0.24 0.934 1500.00 1500 11000 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
27 DSG-LAB ON OFF 1.56 0.992 1500.00 1500 - 1000.00 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
28 DSG-LAB ON OFF 1.46 0.008 1500.00 1500 (1000.00 1000)	0.00 1800 1800 25 25 25 25 3.0 3.0
29 DSG-IAB ON OFF 1.56 -0.094 1500.00 1500 - 1000.00 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
30 DSG-LAB ON OFF 1.40 -0.072 1500.00 1500 1000 1000	00.00 1800 1800 25 25 25 25 3.0 3.0
31 DSG-LAB ON OFF 0.38 -0.100 1500.00 1000 1000	20.00 1800 1800 25 25 25 25 3.0 3.0
32 DSG-LAB OFF 1.54 -0.070 1500.00 1000 1000 1000	20.00 1800 1800 25 25 25 25 3.0 3.0
33 DSG-LAB ON OFF 1.03 -0.038 1500.00 1500 1000 1000	20.00 1800 1800 25 25 25 25 3.0 3.0
34 DSG-LAB ON OFF 0.29 0.880 1500.00 1000 1000	20.00 1800 1800 25 25 25 25 3.0 3.0
35 DSG-LAB ON OFF 1.27 0.952 1500.00 1500 + 1000.00 1000	10.00 1800 1800 <u>25</u> 25 <u>25</u> <u>25</u> <u>3.0</u> <u>3.0</u>
Max Current Hrwd 1118 microAm	All Channels
HV- CACIN MAIN Max Voltage Hrvd 3147 Volt VSet VI I Set [uA]	
Board Temperature 27 Celsius 1500.0 1000.0	VMax [V] Rup [V/s] RDown[V/s] Trip [s]
I & V Plots Bd Status Rower Fail Firmwore Brons HV Mac Gat Tomp Cat Upde Temp	VMax [V]         Rup [V/s]         RDown[V/s]         Trip [s]           1800.0         25.0         25.0         3.0

Fig.2 — Expert Controls CSS-BOY screen shows channel 11, 12, 17 and 18 with incorrect RUp values (30 V/s)

 Channel 2 did not ramp down; PV associated with Pw parameter (Power on/off channel) did not change from 1 to 0 after JavaScript was executed as part of *Expert Controls CSS-BOY* screen. See fig.5.

2.1. JavaScript send the command to set Pw to 0 value, command executed once for all channels.

- 2.2. Verified that nether PVs and GECO values went to set point.
- 3. Channel 14 did not ramp up; PV associated with *Pw* parameter did not change from 0 to 1 after JavaScript was executed as part of *Expert Controls CSS-BOY* screen. See fig.5.

3.1. JavaScript send the command to set Pw value to 1, command executed once for all channels.

3.2. Verified that nether PVs and GECO values went to set point. See fig.3 and fig.4.

💮 Geco: Ge	neral <mark>co</mark> nt	rol soft	mare																
SYSTEM					hvcaentest2												BOARDS		
hvcaentest2 Disco	nnect Configure	Custom	Name	- 105et	V0Set	IMon	VMon	Pw	Status	RUp	RDWn	Trip	V1Set	11Set	SVMax	-	* Bowd00	- 6 20 20 701 - [20:4]	
		00.007	DSG-LAB	1000.00 uA	1500.00 V	1.008 uA	647.01 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		• 503 000	- wrosoniki - [sord]	
Universal Mu Power Surery	SYSTEM	00.008	DSG-LAB	1000.00 uA	1500.00 V	-0.016 uA	645.59 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			A7020TH	
129.57.86.124		00.009	DSG-LAB	1000.00 uA	1500.00 V	0.068 uA	646.22 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			Module	
SETTINGS		00.010	DSG-LAB	1000.00 uA	1500.00 V	0.050 uA	644.90 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		•		
ADVANCED FEA	TURES	00.011	DSG-LAB	1000.00 uA	1500.00 V	3.058 uA	772.57 V	On	Up	30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	14	BdStatus	2147	
SCRIPT	OG ON	00.012	DSG-LAB	1000.00 uA	1500.00 V	0.016 uA	771.90 V	On	Up	30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		HIMax	1118	uA
CRATE T	OFF	00.013	DSG-LAB	1000.00 uA	1500.00 V	0.028 uA	641.98 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		Temp	30	°C
SESSIONS MAP IP	FO INFO	00.014	DSG-LAB	1000.00 uA	1500.00 V	-0.032 uA	1.34 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		Cir Alarm	NO	
FLAG CFG CFG K	ILL ALARM	00.015	DSG-LAB	1000.00 uA	1500.00 V	0.068 uA	638.52 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	- 1			
Channel ON		00.016	DSG-LAB	1000.00 uA	1500.00 V	0.068 uA	637.04 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
OVV	:	00.017	DSG-LAB	1000.00 uA	1500.00 V	0.066 uA	770.83 V	On	Up	30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
ovc		00.018	DSG-LAB	1000.00 uA	1500.00 V	0.036 uA	769.63 V	On	Up	30 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Trip	•	00.019	DSG-LAB	1000.00 uA	1500.00 V	0.102 uA	632.64 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Fan0 😝 Fan1 😝	3432 3218	00.020	DSG-LAB	1000.00 uA	1500.00 V	0.076 uA	630.09 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
HVFanStat	3397	00.021	DSG-LAR	1000.00 µA	1500.00 V	0.098.uA	640.80 V	On	lin	25 Vos	25 Vos	3.0 sec	0.00 V	101.00.04	1800 V				
Fan4 e	3218	00.022	DSG-LAR	1000.00.04	1500.00 V	0.046	639.71 V	00	lle	25 Vos	25 Vos	3.0 sec	0.00 V	101.00.04	1800 V				
Fan5 😝	3397	00.023	DSG-LAB	1000.00	1500.00 V	1.034	639.86 V	0.	llo	25 Vor	25 Vor	3.0 rec	0.00 V	101.00.04	1900 V				
SymbolicName	SystemOne	00.024	DSG-LAR	1000.00	1500.00 V	-0.016	620 72 V	0.	Up	25 Vor	25 Vor	20 cm	0.00 V	101.00 uA	1900 V				
HVFanSpeed	IH DIM W	00.024	000 140	1000.00	1500.00 V	0.000	(33.13 V	0		25 465	25 Vps	3.0 sec	0.00 V	101.00	1000 V				
Fan0 e PWFanStat Fan1 e	1788 1752	00.025	DSG-LAD	1000.00 UA	1500.00 V	0.082 UA	037.11 V	Un	Up	25 Vps	25 Vps	5.0 sec	0.00 V	101.00 A	1000 V				
Fan2 😖	1716	00.026	DSG-LAB	1000.00 uA	1500.00 V	1.038 uA	657.74 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
DHCPDStatus	Disabled	00.027	DSG-LAB	1000.00 uA	1500.00 V	1.094 uA	635.12 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
		00.028	DSG-LAB	1000.00 uA	1500.00 V	0.120 uA	633.55 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
		00.029	DSG-LAB	1000.00 uA	1500.00 V	0.020 uA	621.40 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
		00.030	DSG-LAB	1000.00 uA	1500.00 V	0.046 uA	629.59 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	. 1			
		00.031	DSG-LAB	1000.00 uA	1500.00 V	0.014 uA	619.44 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
		00.032	DSG-LAB	1000.00 uA	1500.00 V	0.036 uA	648.48 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	-			
		•		_	_								_	_	_	•			
hvcaentest2 129.57.86.12	24																	CONNECTED	999

Fig.3 — GECO2020 screenshot shows channel 14 is off after all channels were set to turn on from JavaScript at CSS screen.

					IESI	HV CA	AEIN - E	xpert C	ontrois	- Slot	0						
1	Novice				I	Board Mo	del A70	30TN - [S/N:	304]						ALI	ON/OF	FF
Ch#	Location	Click to	Status	VMon [V]	Imon [uA]	Vse	t [V]	Iset	[uA]	Vmax	[⊻]	RUp	[V/s]	RDwn	[V/s]	Trip	[s]
	DCC Lab	OFF	ON	1400.81	1 002	Readback	1500	Readback	341	1800	1800	25	361	25	261	2.0	2.0
00	DSG-Lab	OFF	ON	1499.69	-0.008	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
02	DSG-Lab	OFF	ON	1499 74	-0.090	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	20	2.0
02	DSG-Lab	OFF	ON	1499 77	0.958	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
04	DSG-Lab	OFF	ON	1499.78	-0.066	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
05	DSG-LAB	OFF	ON	1499.88	-0.016	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
06	DSG-LAB	OFF	ON	1499.89	0.004	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
07	DSG-LAB	OFF	ON	1499.71	0.932	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
08	DSG-LAB	OFF	ON	1499.73	-0.088	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
09	DSG-LAB	OFF	ON	1499.75	-0.006	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
10	DSG-LAB	OFF	ON	1499.77	-0.024	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
11	DSG-LAB	OFF	ON	1499.56	2.974	1500.00	1500 (	1000.00	1000.00	1800	1800	30	30	25	25	3.0	3.0
12	DSG-LAB	OFF	ON	1499.78	-0.074	1500.00	1500	1000.00	1000.00	1800	1800	30	30	25	25	3.0	3.0
12	DSGJAR	OFF	ON	1499.25	-0.030	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	2.0	2.0
14	DSG-LAB	ON	OFF	6.35	-0.034	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
15	USG-LAB	OFF	ON	1498.19	0.014	1500.00	1500 .	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
16	DSG-LAB	OFF	ON	1497.19	0.010	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
17	DSG-LAB	OFF	ON	1499.84	-0.018	1500.00	1500	1000.00	1000.00	1800	1800	30	30	25	25	3.0	3.0
18	DSG-LAB	OFF	ON	1499.80	-0.054	1500.00	1500 📫	1000.00	1000.00	1800	1800	30	30	25	25	3.0	3.0
19	DSG-LAB	OFF	ON	1494.99	0.060	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
20	DSG-LAB	OFF	ON	1492.61	0.040	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
21	DSG-LAB	OFF	ON	1499.01	0.028	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
22	DSG-LAB	OFF	ON	1498.72	-0.012	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
23	DSG-LAB	OFF	ON	1498.75	0.974	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
24	DSG-LAB	OFF	ON	1498.68	-0.070	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
25	DSG-LAB	OFF	ON	1497.92	0.030	1500.00	1500 - (	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
26	DSG-LAB	OFF	ON	1499.87	0.970	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
27	DSG-LAB	OFF	ON	1496.96	1.040	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
28	DSG-LAB	OFF	ON	1495.15	0.080	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
29	DSG-LAB	OFF	ON	1483.60	-0.012	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
30	DSG-LAB	OFF	ON	1493.80	0.004	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
31	DSG-LAB	OFF	ON	1482.88	-0.018	1500.00	1500 🛟	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
32	DSG-LAB	OFF	ON	1499.77	-0.044	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
33	DSG-LAB	OFF	ON	1489.17	0.040	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
34	DSG-LAB	OFF	ON	1488.19	0.958	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
35	DSG-LAB	OFF	ON	1485.46	1.036	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
	1	Max Curre	ent Hrwd	1118 microAm						All Channel							
HV- CA	EN MAIN	Max Volta	ine Howd	3147 Volt		145-	• 0.4	100	[	\/htm	D/I	Dur	D//el	PD	D//=1		[e]
		Deard Tea	nge i n wu	20 Calaina		VSe	( [v]	r Set	[UA]	VMax	U)	кир	[v/s]	RDOW	i[v/s]	Inp	[S]
		Board Ter	nperature	29 Cetsius	_	15	00.0	100	0.0	180	0.0	25	0.0	25	.0	3.0	0
I & V	V Plots	Bd St Pay Firmw HV1 Te	tatus wer Fail were Errors Max Cal mp Cal mr Temp												Ne	ext Slot :	>
		Ove	r Temp												< Pre	vious S	lot 1

#### TEST HV CAEN - Expert Controls - Slot 0

Fig.4 — Expert Controls CSS-BOY screen shows channel 14 off status after all channels were set to turn on simultaneously



Fig.5 - Voltage Ramp Test CSS-BOY screen shows test 1.1 results. Red rounded rectangles focus the issues found

#### Test 1.2

- 1. Channel 16 did not ramp up; PV associated with *Pw* parameter did not change from 0 to 1 after JavaScript was executed as part of *Expert Controls CSS-BOY* screen. See fig.8.
  - 1.1. JavaScript send the command to set *Pw* value to 1, command executed once for all 36 channels.
  - 1.2. Verified that nether the PV and GECO value went to set point. See fig.6 and fig.7.

📸 seco: seneral con	trol soft	шаге																
SYSTEM				hvcaentest2												BOARDS		
hycaentest2 Discornect Configure	Custom	Name	10Set	V0Set	IMon	VMon	Pw	Status	RUp	RDWn	Trip	V1Set	11Set	SVMax	-			
	00.004	DSG-Lab	1000.00 uA	1500.00 V	-0.024 uA	863.33 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		<ul> <li>Board0</li> </ul>	3 - A7030TN - [304]	
SY4527 Universal Multichannel	00.005	DSG-LAB	1000.00 uA	1500.00 V	0.046 uA	870.67 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		1		
129.57.86.124	00.006	DSG-LAB	1000.00 uA	1500.00 V	0.040 uA	868.24 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			A7030TN Module	
SETTINGS	00.007	DSG-LAB	1000.00 uA	1500.00 V	0.990 uA	867.66 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
ADVANCED FEATURES	00.008	DSG-LAB	1000.00 uA	1500.00 V	-0.042 uA	865.10 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		BdStatus	2147	
SCRIPT LOG ON	00.009	DSG-LAB	1000.00 uA	1500.00 V	0.046 uA	865.72 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		HIMax	1118 W	A
CRATE TECH SYS	00.010	DSG-LAB	1000.00 uA	1500.00 V	0.026 uA	860.91 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		Temp	27 %	14
SESSIONS MAP INFO INFO	00.011	DSG-LAB	1000.00 uA	1500.00 V	3.014 uA	880.99 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		Cir Alarm	NO	
FLAG CFG CFG KILL ALARM	00.012	DSG-LAB	1000.00 uA	1500.00 V	-0.022 uA	863.79 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Channel ON	00.013	DSG-LAB	1000.00 uA	1500.00 V	-0.002 uA	863.71 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
OW B	00.014	DSG-LAB	1000.00 uA	1500.00 V	0.038 uA	862.25 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
ovc •	00.015	DSG-LAB	1000.00 uA	1500.00 V	0.046 uA	856.64 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Trip	00.016	DSG-LAB	1000.00 uA	1500.00 V	-0.036 uA	2.22 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Fan1 # 3218	00.017	DSG-LAB	1000.00 uA	1500.00 V	0.042 uA	861.68 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
HVFanStat Fan2 # 3397	00.018	DSG-LAB	1000.00 uA	1500.00 V	0.004 uA	862.32 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Fan4 🖶 3254	00.019	DSG-LAB	1000.00 uA	1500.00 V	0.082 uA	860.56 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Fans W 3432	00.020	DSG-LAB	1000.00 uA	1500.00 V	0.058 uA	853.11 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
Symbolicitame SystemOne	00.021	DSG-LAB	1000.00 uA	1500.00 V	0.082 uA	858.93 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
Hyranspeed Cow MLD HL	00.022	DSG-LAB	1000.00 uA	1500.00 V	0.032 uA	857.89 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
PWFanStat Fan1 # 1716	00.023	DSG-LAB	1000.00 uA	1500.00 V	1.016 uA	858.09 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V				
Fan2 🛛 1680	00.024	DSG-LAB	1000.00 uA	1500.00 V	-0.038 uA	858.05 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
DHCPDStatus Disabled	00.025	DSG-LAB	1000.00 uA	1500.00 V	0.062 uA	855.65 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	H			
	00.026	DSG-LAB	1000.00 uA	1500.00 V	1.020 uA	855.79 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
	00.027	DSG-LAB	1000.00 uA	1500.00 V	1.078 uA	854.63 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
	00.028	DSG-LAB	1000.00 uA	1500.00 V	0.096 uA	854.08 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	11			
	00.029	DSG-LAB	1000.00 uA	1500.00 V	0.000 uA	853.94 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	1.8			
	-										1				•			
hvcaentest2 129.57.86.124																	CONNECTED 😝 🖯	0

Fig.6 — GECO2020 screenshot shows channel 16 off after all channels were set to turn-on from JavaScript at CSS screen.

					TEST		EN - E	(pert C	ontrols	- Slot	0						
	Novice					Board Moo	del A70	30TN - [S/N:	304]						AL	L ON/OF	FF
Ch#	Location	Click to Turn	Status	VMon [V]	lmon [uA]	Vset Readback	t <b>[V]</b> Set	lset Readback	[uA] Set	Vmax Readback	[ <b>V]</b> Set	RUp Readback	V/s] Set	RDwn Resdback	[V/s] Set	Trip Readback	[s] Set
00	DSG-Lab	OFF	ON	1401.53	1.044	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
01	DSG-Lab	OFF	ON	1411.97	0.030	1500.00	1500 5	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
02	DSG-Lab	OFF	ON	1412.24	-0.056	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
03	DSG-Lab	OFF	ON	1410.00	0.990	1500.00	1500 5	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
04	DSG-Lab	OFF	ON	1400.90	-0.034	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
05	DSG-LAB	OFF	ON	1408.34	0.032	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
06	DSG-LAB	OFF	ON	1404.95	0.024	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
07	DSG-LAB	OFF	ON	1405.06	0.972	1500.00	1500 ;	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
08	DSG-LAB	OFF	ON	1402.50	-0.058	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
09	DSG-LAB	OFF	ON	1403.21	0.030	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
10	DSG-LAB	OFF	ON	1398.37	0.010	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
11	DSG-LAB	OFF	ON	1418.10	3.000	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
12	DSG-LAB	OFF	ON	1400.72	-0.036	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
13	DSG-LAB	OFF	ON	1400.44	-0.016	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
14	DSG-LAB	OFF	ON	1398.77	0.026	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
15	DSG-LAB	OFF	ON	1393.52	0.026	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
16	DSG-LAB	ON	OFF	2.75	-0.036	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
17	DSG-LAB	OFF	ON	1398.89	0.024	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
18	DSG-LAB	OFF	ON	1400.10	-0.014	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
19	DSG-LAB	OFF	ON	1397.46	0.064	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
20	DSG-LAB	OFF	ON	1389.78	0.050	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
21	DSG-LAB	OFF	ON	1396.07	0.066	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
22	DSG-LAB	OFF	ON	1395.19	0.020	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
23	DSG-LAB	OFF	ON	1395.26	1.000	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
24	DSG-LAB	OFF	ON	1395.39	-0.048	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
25	DSG-LAB	OFF	ON	1393.05	0.054	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
26	DSG-LAB	OFF	ON	1392.59	1.014	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
27	DSG-LAB	OFF	ON	1392.14	1.064	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
28	DSG-LAB	OFF	ON	1390.65	0.082	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
29	DSG-LAB	OFF	ON	1390.17	-0.016	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
30	DSG-LAB	OFF	ON	1392.09	0.004	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
31	DSG-LAB	OFF	ON	1389.35	-0.024	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
32	DSG-LAB	OFF	ON	1388.12	0.004	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
33	DSG-LAB	OFF	ON	1386.04	0.034	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
34	DSG-LAB	OFF	ON	1405.34	0.954	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
35	DSG-LAB	OFF	ON	1381.32	1.028	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
HV- CA		Max Curre	nt Hrwd	1118 microAm						All Channel	s						
	ALT T POINT	Max Volta	ge Hrwd	3147 Volt		VSet	: [V]	l Set	[uA]	VMax	M	Rup	[V/s]	RDow	n[V/s]	Trip	[s]
		Board Tem	nperature	28 Celsius		150	0.0	100	0.0	180	0.0	25	.0	25	.0	3.	0
I & `	V Plots	Bd St. Pow Firmwe HV N Ten Undes Over	atus ere Fail are Errors Max Cal np Cal r Temp r Temp												Ne <pre< th=""><th>ext Slot : evious S</th><th>&gt;</th></pre<>	ext Slot : evious S	>

Fig.7 — Expert Controls CSS-BOY screen shows channel 16 off status after all channels were set to turn-on simultaneously



Fig.8 — Voltage Ramp Test CSS-BOY screen shows test 1.2 results. Red rounded rectangles focus the issues found

#### Test 1.3

- 1. Channel 19 did not ramp up; PV associated with *Pw* parameter did not change from 0 to 1 after JavaScript was executed as part of *Expert Controls CSS-BOY* screen. See fig.13.
  - 1.3. JavaScript send the command to set *Pw* value to 1, command executed once for all channels.
  - 1.4. Verified that nether PV and GECO value went to set point. See fig.9 and fig.10.

🍈 seco: seneral cont	rol soft	tware															
SYSTEM				hvcaentest2			-								BOARDS		
hvcaentest2 Disconnect Configure	Custom	Name	I0Set	V0Set	IMon	VMon	Pw	Status	RUp	RDWn	Trip	V1Set	11Set	SVMax	· Boar	d00 - A7030TN - [304]	1
SY4527 Universal Multichannel Power Supply System	00.009 00.010	DSG-LAB DSG-LAB	1000.00 uA 1000.00 uA	1500.00 V 1500.00 V	-0.012 uA -0.052 uA	1499.75 V 1499.78 V	On On	Up Up	25 Vps 25 Vps	25 Vps 25 Vps	3.0 sec 3.0 sec	0.00 V 0.00 V	101.00 uA 101.00 uA	1800 V 1800 V		A7030TN	1
129.57.86.124	00.011	DSG-LAB	1000.00 uA	1500.00 V	2.956 uA	1499.56 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		Module	
SETTINGS	00.012	DSG-LAB	1000.00 uA	1500.00 V	-0.084 uA	1499.80 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
ADVANCED FEATURES	00.013	DSG-LAB	1000.00 uA	1500.00 V	-0.058 uA	1499.84 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	BdStatus HVMax	; 3147 V	I
SCRIPT LOG	00.014	DSG-LAB	1000.00 uA	1500.00 V	-0.018 uA	1499.76 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	HIMax	1118 uA	
SESSIONS CRATE TECH SYS	00.015	DSG-LAB	1000.00 uA	1500.00 V	-0.032 uA	1499.88 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	Cir Alam	28	I
RESET GEN SIGN	00.016	DSG-LAB	1000.00 uA	1500.00 V	-0.026 uA	1499.84 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			4
FLAG CFG CFG NILL ALARM	00.017	DSG-LAB	1000.00 uA	1500.00 V	-0.022 uA	1499.84 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Channel ON 9 OVV 9	00.018	DSG-LAR	1000.00 ++4	1500.00 V	-0.058 uA	1499.82 V	00	Un	25 Voc	25 Vot	3.0 sec	0.00 V	101.00	1800 V			
UNV .	00.019	DSG-LAB	1000.00 uA	1500.00 V	-0.002 uA	3.15 V	Off		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
OVC *	00.020	DSG-LAB	1000.00 uA	1500.00 V	-0.030 uA	1499.82 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan0 0 3432	00.021	DSG-LAB	1000.00 uA	1500.00 V	0.010 uA	1499.78 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan1 9 3289	00.022	DSG-LAB	1000.00 uA	1500.00 V	-0.028 uA	1499.72 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
HVFanStat Fan3 9 3432	00.023	DSG-LAB	1000.00 uA	1500.00 V	0.936 uA	1499.76 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan5 0 3397	00.024	DSG-LAB	1000.00 uA	1500.00 V	-0.096 uA	1499.59 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
SymbolicName SystemOne	00.025	DSG-LAB	1000.00 uA	1500.00 V	-0.026 uA	1499.79 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
HVFanSpeed LOW MID HI	00.026	DSG-LAB	1000.00 uA	1500.00 V	0.956 uA	1499.91 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
Fan0 0 1823	00.027	DSG-LAB	1000.00 uA	1500.00 V	1.016 uA	1499.83 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
PWFanStat Fan1 # 1716 Fan2 # 1716	00.028	DSG-LAB	1000.00 uA	1500.00 V	0.026 uA	1499.96 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
DHCPDStatus Disabled	00.029	DSG-LAB	1000.00 uA	1500.00 V	-0.068 uA	1499.69 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
	00.030	DSG-LAB	1000.00 uA	1500.00 V	-0.060 uA	1499.83 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
	00.031	DSG-LAB	1000.00 uA	1500.00 V	-0.072 uA	1499.80 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
	00.032	DSG-LAB	1000.00 uA	1500.00 V	-0.048 uA	1499.78 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
	00.033	DSG-LAB	1000.00 uA	1500.00 V	-0.020 uA	1499.81 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
	00.034	DSG-LAB	1000.00 uA	1500.00 V	0.902 uA	1499.82 V	On	Up	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V			
	1				_			_		_				•			
hvcaentest2 129.57.86.124																CONNECTED 😝 😡 (	9

Fig.9 — GECO2020 screenshot shows channel 19 is off after all channels were set to turn-on from JavaScript at CSS screen.

									perce	ontrous	3101	0						
	Novice					Board Mo	del 🛛	4703	0TN - [S/N:	304]						AL	L ON/O	FF
Ch#	Location	Click to Turn	Status	VMon [V]	lmon [uA]	Vset Readback	t [V] Set		lset Readback	[uA] Set	Vmax Readback	: <b>[V]</b> Set	RUp Readback	[V/s] Set	RDwn Readback	[V/s] Set	Trip Readback	[s] Se
00	DSG-Lab	OFF	ON	1117.30	1.050	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.4
01	DSG-Lab	OFF	ON	1126.74	0.046	1500.00	1500	÷	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
02	DSG-Lab	OFF	ON	1124.44	-0.046	1500.00	1500	÷	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.(
03	DSG-Lab	OFF	ON	1123.38	0.996	1500.00	1500	1	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
04	DSG-Lab	OFF	ON	1120.18	-0.024	1500.00	1500	1	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
05	DSG-LAB	OFF	ON	1140.72	0.038	1500.00	1500	1	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
06	DSG-LAB	OFF	ON	1139.06	0.034	1500.00	1500	1	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
07	DSG-LAB	OFF	ON	1118.42	0.980	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
08	DSG-LAB	OFF	ON	1111.06	-0.048	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
09	DSG-LAB	OFF	ON	1117.72	0.040	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
10	DSG-LAB	OFF	ON	1117.66	0.002	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
11	DSG-LAB	OFF	ON	1116.04	3.004	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
12	DSG-LAB	OFF	ON	1115.51	-0.022	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
13	DSG-LAB	OFF		1114.09	-0.008	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
14	DSG-LAB	OFF	ON	11134.23	0.032	1500.00	1500	-	1000.00	1000.00	1800	1800	20	25	25	25	3.0	2.
10	DSG-LAB	OFF	ON	1112.56	0.030	1500.00	1500		1000.00	1000.00	1800	1000	25	25	25	25	3.0	2
15	DSG-LAB	OFF		1112.56	0.030	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
19	DSG-LAB	OFF	ON	1106.03	-0.010	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	2
19	DSG-LAB	ON	OFF	1.61	0.002	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
20	DSG-LAB	OFF	ON	1110.66	0.012	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
21	DSG-LAB	OFF	ON	1109.53	0.062	1500.00	1500	÷ (	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
22	DSG-LAB	OFF	ON	1109.86	0.012	1500.00	1500	÷	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
23	DSG-LAB	OFF	ON	1109.92	0.996	1500.00	1500	÷ [	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
24	DSG-LAB	OFF	ON	1108.78	-0.044	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
25	DSG-LAB	OFF	ON	1107.56	0.026	1500.00	1500	÷	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
26	DSG-LAB	OFF	ON	1107.55	1.010	1500.00	1500	÷.	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
27	DSG-LAB	OFF	ON	1128.28	1.062	1500.00	1500	1	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
28	DSG-LAB	OFF	ON	1102.06	0.076	1500.00	1500	÷	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
29	DSG-LAB	OFF	ON	1098.25	-0.016	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
30	DSG-LAB	OFF	ON	1099.03	-0.010	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
31	DSG-LAB	OFF	ON	1094.39	-0.022	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
32	DSG-LAB	OFF	ON	1080.03	0.004	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
33	DSG-LAB	OFF		1005.52	0.030	1500.00	1500		1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
34	DSG-LAB	OFF	ON	1087.50	1.016	1500.00	1500	-	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.
30	DSG-DAB	Un	OIN	1003.07		100.00	1500		1000.00	1000.00	1000	1000	25	25	23	25	5.0	
HV- CA		Max Curre	nt Hrwd	1118 microAm							All Channel	s						
		Max Volta	ge Hrwd	3147 Volt		VSe	t [V]		l Set	[uA]	VMax	(M)	Rup	[V/s]	RDow	m[V/s]	Trip	• [s]
		Board Ten	nperature	28 Celsius		150	00.0		100	0.0	180	0.0	25	5.0	25	5.0	3	0
I & Ramp	V Plots	Bd St Pow Firmwo HV N Ter Unde	atus ver Fail are Errors Max Cal mp Cal r Temp													N	ext Slot	>

Fig.10 — Expert Controls CSS-BOY screen shows channel 19 off status after all channels were set to turn-on simultaneously

- 2. Channel 2 did not ramp down; PV associated with *Pw* parameter did not change from 1 to 0 after JavaScript was executed as part of *Expert Controls CSS-BOY* screen. See fig.13.
  - 2.1. JavaScript send the command to set Pw to 0 value, command executed once for all channels.
  - 2.2. Verified that nether PV and GECO values went to set point. See fig.11 and fig.12.

🍈 Geco: Ge	neral <mark>co</mark> n	trol soft	tware														
SYSTEM					hvcaentest2											BOARDS	
hvcaentest2 Disco	onnect Configure	Custom	Name	10Set	- V0Set	IMon	VMon	Pw	Status	RUp	RDWn	Trip	V1Set	11Set	SVMax		a anonimi (no d)
		00.000	DSG-Lab	1000.00 uA	1500.00 V	0.900 uA	403.93 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	· board.	0 - #7050114 - [504]
SY4527 UNIVERSAL MU POWER SUBRY	SYSTEM	00.001	DSG-Lab	1000.00 uA	1500.00 V	-0.140 uA	405.45 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		\$7030TH
129.57.86.124		00.002	DSG-Lab	1000.00 uA	1500.00 V	-0.084 uA	1499.75 V	On		25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		Module
SETTINGS	5	00.003	DSG-Lab	1000.00 uA	1500.00 V	0.852 uA	405.20 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
ADVANCED FEA	TURES	00.004	DSG-Lab	1000.00 uA	1500.00 V	-0.164 uA	404.69 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	BdStatus HVMax	3147 V
SCRIPT	LOG ON	00.005	DSG-LAB	1000.00 uA	1500.00 V	-0.116 uA	405.96 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	HIMax	1118 uA
CRATE T	OFF ECH STS	00.006	DSG-LAB	1000.00 uA	1500.00 V	-0.110 uA	407.79 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	Temp	30 ℃
DESET CENISICAL	NFO INFO	00.007	DSG-LAB	1000.00 uA	1500.00 V	0.842 uA	406.29 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V	CP Alarm	NJ NJ
FLAG CFG CFG K	GLL ALARM	00.008	DSG-LAB	1000.00 uA	1500.00 V	-0.196 uA	407.48 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Channel ON		00.009	DSG-LAB	1000.00 uA	1500.00 V	-0.106 uA	408.54 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
UNV		00.010	DSG-LAB	1000.00 uA	1500.00 V	-0.132 uA	408.47 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
OVC		00.011	DSG-LAB	1000.00 uA	1500.00 V	2.864 uA	408.64 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Trip Euro		00.012	DSG-LAB	1000.00 uA	1500.00 V	-0.172 uA	410.66 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Fan1 e	3289	00.013	DSG-LAB	1000.00 uA	1500.00 V	-0.144 uA	410.86 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
HVFanStat Fan2 9	3361 3468	00.014	DSG-LAB	1000.00 uA	1500.00 V	-0.106 uA	412.64 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Fan4 e	3218	00.015	DSG-LAB	1000.00 uA	1500.00 V	-0.120 uA	412.08 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Sumbulictiame	Surtem One	00.016	DSG-LAB	1000.00 uA	1500.00 V	-0.110 uA	413.82 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
HitianSpeed		00.017	DSG-LAB	1000.00 uA	1500.00 V	-0.104 uA	412.51 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Fact H	1788	00.018	DSG-LAB	1000.00 uA	1500.00 V	-0.150 uA	412.79 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V _		
PWFanStat Fan1 9	1716	00.019	DSG-LAB	1000.00 uA	1500.00 V	-0.076 uA	414.07 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Fanz u	1716	00.020	DSG-LAB	1000.00 uA	1500.00 V	-0.114 uA	416.03 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
Unuruateus	UISADIED	00.021	DSG-LAB	1000.00 uA	1500.00 V	-0.094 uA	415.38 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
		00.022	DSG-LAB	1000.00 uA	1500.00 V	-0.120 uA	416.18 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
		00.023	DSG-LAB	1000.00 uA	1500.00 V	0.858 uA	418.66 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
		00.024	DSG-LAB	1000.00 uA	1500.00 V	-0.174 uA	419.22 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
		00.025	DSG-LAB	1000.00 uA	1500.00 V	-0.112 uA	421.69 V	Off	Down	25 Vps	25 Vps	3.0 sec	0.00 V	101.00 uA	1800 V		
		•				1						1				1	
hycaentest2 129,57,86,12	24																

Fig.11 — GECO2020 screenshot shows channel 2 stayed on after all channels were set to turn off from the JavaScript at CSS screen.

					TEST	HV CA	AEN - E>	(pert C	ontrols	- Slot	0						
	Novice					Board Mo	del A70	30TN - [S/N:	304]						AL	ON/O	FF
Ch#	Location	Click to Turn	Status	VMon [V]	Imon [uA]	Vse Readback	t [V] Set	lset Readback	[uA] Set	Vmax Readback	: [V] Set	RUp Readback	[V/s] Set	RDwn Readback	[V/s] Set	Trip Readback	[s] Set
00	DSG-Lab	ON	OFF	903.14	0.930	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
02	DSGLab	OFF	ON	1499 74	-0.084	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	20	20
02	DSG-Lab		OFF	904.32	0.884	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
04	DSG-Lab	ON	OFF	904.06	-0.128	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
05	DSG-LAB	ON	OFF	905.20	-0.086	1500.00	1500 -	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
06	DSG-LAB	ON	OFF	906.36	-0.074	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
07	DSG-LAB	ON	OFF	905.41	0.870	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
08	DSG-LAB	ON	OFF	906.56	-0.160	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
09	DSG-LAB	ON	OFF	907.76	-0.072	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
10	DSG-LAB	ON	OFF	907.69	-0.098	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
11	DSG-LAB	ON	OFF	907.83	2.898	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
12	DSG-LAB	ON	OFF	909.57	-0.142	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
13	DSG-LAB	ON	OFF	909.78	-0.108	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
14	DSG-LAB	ON	OFF	911.26	-0.076	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
15	DSG-LAB	ON	OFF	910.92	-0.084	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
16	DSG-LAB	ON	OFF	912.52	-0.076	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
17	DSG-LAB	ON	OFF	911.77	-0.078	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
18	DSG-LAB	ON	OFF	912.29	-0.122	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
19	DSG-LAB	ON	OFF	913.18	-0.048	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
20	DSG-LAB	ON	OFF	914.70	-0.088	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
21	DSG-LAB	ON	OFF	914.15	-0.054	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
22	DSG-LAB		OFF	915.14	-0.086	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
23	DSG-LAB	ON	OFF	917.68	0.886	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
24	DSG-LAB	ON	OFF	921.05	-0.078	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
25	DSG-LAB	ON	OFF	923.04	0.896	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
20	DSG-LAB	ON	OFF	924.60	0.964	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
28	DSG-LAB	ON	OFF	926.95	-0.014	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
29	DSG-LAB	ON	OFF	928.19	-0.118	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
30	DSG-LAB	ON	OFF	927.55	-0.100	1500.00	1500	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
31	DSG-LAB	ON	OFF	930.83	-0.126	1500.00	1500 :	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
32	DSG-LAB	ON	OFF	933.67	-0.106	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
33	DSG-LAB	ON	OFF	936.75	-0.082	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
34	DSG-LAB	ON	OFF	937.76	0.856	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	- 25	25	25	3.0	3.0
35	DSG-LAB	ON	OFF	939.97	0.922	1500.00	1500 🗧	1000.00	1000.00	1800	1800	25	25	25	25	3.0	3.0
		Max Curre	ent Hrwd	1118 microAm						All Channel	s	_				_	
HV-CA	AEN MAIN	Max Volta	ige Hrwd	3147 Volt		VSe	t M	I_Set	: [uA]	VMax	M	Rup	[V/s]	RDow	n[V/s]	Trip	[s]
		Board Ter	nperature	30 Celsius		15	00.0	100	0.0	180	0.0	25	.0	25	.0	3.	0
I &	V Plots	Bd St Pov Firmw HV 1 Te Unde	atus ver Fail are Errors Max Cal mp Cal r Temp r Temp												Ne	ext Slot	>
		Ove	- temp												< Pre	would S	101

Fig.12 — Expert Controls CSS-BOY screen shows channel 02 on status after all channels were set to turn off simultaneously



Fig.13 - Voltage Ramp Test CSS-BOY screen shows test 1.3 results. Red rounded rectangles focus the issues found

#### **Summary:**

- 1. Noticed channels randomly did not turn on/off after executing JavaScript (to turn on/off 36 channel simultaneously) on *HV CAEN Expert Controls* CSS-BOY screen.
- 2. Some channels' parameters randomly did not get the set value on the first attempt after running the JavaScripts.
- 3. No changes of the PVs values; all PVs keep initial set point values during the test.
- 4. No discrepancies between GECO2020 and EPICS PVs.

## <u>Test 2: Tested CAEN A7030 HV board using GECO2020 Script Advanced Feature</u> <u>Procedure:</u>

- 1. Wrote script in GECO 2020 to automate voltage test on CAEN-A7030TN board.
  - 1.1. System Advanced Features in GECO 2020 allows enhancement functionalities to create scripts.
  - 1.2. Script set initial conditions/parameters, and ramps up/down 36 channels simultaneously to the set voltage parameters 100 times.
- 2. Enabled EPICS server to monitor via EPICS client.
- 3. Verified proper communications between CAEN EPICS Server Built-in and EPICS client (CSS screen).
- 4. Bellow table 2 shows the conditions and set parameters for the test.

	Table 2	: Voltage Ramp Up	/Down Test	
Mainframe Model	SY4527	Set Voltage		1500 V
Mainframe S/N	400	Ramp Up/Down R	ate	250 V/s
<b>Board Model</b>	A7030TN	Max Current Set		1000 uA
Board S/N	304	Load: $0 \Omega$	Vmax: 1800 V	<b>IMon:</b> ~ 0 uA
CPU model / SN	A4528/760	Total time to test 3	6 channels	3200 s
<b>Total Channels Tested</b>	36	Total # Ramp Up/	Down per channel	100/100

- 5. Ran *Voltage Ramp Test Slot 0 CSS-BOY* screen only to monitor automated test.
- 6. Took screen shots for initial conditions displayed in GECO 2020 and EPICS/CSS-BOY screen. See attached screenshots.
- 7. Ran developed script developed in GECO 2020.
- 8. Ran *HV CAEN Voltage Ramp Test CSS-BOY* screen <u>only to monitor</u> voltage readouts during the 100 cycles.
- Saved data log files and screenshots with the results (See attached files and screenshots)
   9.1. Documented all results and pictures for the test.
- 10. Repeated steps 1 thorough 9 for test 2.1 and test 2.2. Note data log file not recorded for test 2.1

#### **Results:**

#### Test 2.1

- 1. All channels monitored and controlled by GECO2020 and SSH appears to be ok, while monitored EPICS PVs presented issues during the test (100 ramps up/down completed).
- PV associated with turn on/off status parameter ("Pw") for all 36 channels did not update while monitoring automated test with EPICS *Voltage Ramp Test –CSS-BOY screen*
  - 2.1. Verified discrepancy between GECO 2020 and EPICS PVs. See fig.13
  - 2.2. Verified discrepancy between Secure Shell Connection (ssh terminal) and EPICS PVs. See
    - fig.14.

<b>(</b> ) GECO2020									C CS-Studio @dsg-b-linux1.jlab.org				-	
File Settings Groups Window Help									Elle Edit Search <u>C</u> S-Studio Window Help					
📸 seco: seneral co	ntrol softu	Jare							😁 🖩 🛛 🖬 🕶 🖉	1 1 🖬 🔹 🖬	A -			
SYSTEM				hvcaentest2					HVCAEN-7030TN-Expert_slot0.c	pi		•	1 90% <b>-</b> 🗇 - 🔿	
Invegentest2 Disconnect Configure	^ Custom	lame -	- 10Set	V0Set	IMon	VMon	Pw	Status		TES	T HV CAEN - E	pert Control	s - Slot O	
-	00.000	DSG-Lab	1000.00 uA	1500.00 V	0.992 uA	1499.87 V	On	Up	Novice		Board Model A7	30TN - [S/N: 304]		
SY4527 UNIVERSAL MULTICHANNEL	00.001	DSG-Lab	1000.00 uA	1500.00 V	-0.008 uA	1499.73 V	On	Up	Ch# Location Click to Sta	tus VMon [V] Imon	[uA] Vset [V]	lset [uA]	Vmax [V] RUp [V/s	
129.57.86.124	00.002	DSG-Lab	1000.00 uA	1500.00 V	-0.084 uA	1499.76 V	On	Up	00 DSG ab 0N 0	1499.87 0.9	92 100.00 100 ;	1000.00 1000.00	1800 1800 10 1	
SETTINGS	00.003	DSG-Lab	1000.00 uA	1500.00 V	0.956 uA	1499.80 V	On	Up	01 DSG ab 0N 0 02 DSG ab 0N 0	1499.73 -0.0	084 100.00 100 ÷	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
ADVANCED FEATURES	00.004	DSG-Lab	1000.00 uA	1500.00 V	-0.062 uA	1499.78 V	On	Up	03 DSG ab 0N 0 04 DSG ab 0N 0	1499.80 0.9 1499.78 -0.0	$100.00 100 \div$	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
	00.005	DSG-LAB	1000.00 uA	1500.00 V	-0.012 uA	1499.91 V	On	Up	OS DSG-AB ON O	1499.91 -0.0	112 100.00 100 + 100 + 100.00 100 + 100.00 100 + 100.00 + 100.00 + 100.00 + 1000 + 100 +	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
	00.006	DSG-LAB	1000.00 uA	1500.00 V	-0.014 uA	1499.91 V	On	Up	07 DSG-AB ON O 08 DSG-AB ON O	1499.69 0.9 1499.75 -0.0	034 100.00 100 ÷	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
SESSIONS MAP INFO INFO	00.007	DSG-LAB	1000.00 uA	1500.00 V	0.934 uA	1499.69 V	On	Up	09 DSG-AB 0N 0 10 DSG-AB 0N 0	1499.75 -0.0	006 100.00 100 ÷	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
RESET GEN SIGN FLAG CFG CFG KILL ALARM	00.008	DSG-LAB	1000.00 uA	1500.00 V	-0.096 uA	1499.75 V	On	Up	11 DSG-AB ON 0 12 DSG-AB ON 0	1499.59 2.9 1499.79 -0.0	062 100.00 100 ÷	1000.00 1000.00 1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
Channel ON 9	00.009	DSG-LAB	1000.00 uA	1500.00 V	-0.006 uA	1499.75 V	On	Up	13 DSG-AB ON O 14 DSG-AB ON O	1499.85 -0.0 1499.78 -0.0	050 100.00 100 ÷	1000.00 1000.00 1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
OW 9	00.010	DSG-LAB	1000.00 uA	1500.00 V	-0.038 uA	1499.79 V	On	Up	15 DSG-AB ON 0 16 DSG-AB ON 0	1499.89 -0.0 1499.85 -0.0	020 100.00 100 + 010 100.00 100 +	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
OVC 9	00.011	DSG-LAB	1000.00 uA	1500.00 V	2.962 uA	1499.59 V	On	Up	17 DSG-AB ON 0 18 DSG-AB ON 0	1499.87 -0.0 1499.80 -0.0	010 100.00 100 ÷	1000.00 1000.00 1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
Trip 4	00.012	DSG-LAB	1000.00 uA	1500.00 V	-0.068 uA	1499.79 V	On	Up	19 DSG-AB ON 0 20 DSG-AB ON 0	1499.86 0.0 1499.86 -0.0	024 100.00 100 + 020 100.00 100 +	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
Fan1 0 3397 Fan1 0 3289	00.013	DSG-LAB	1000.00 uA	1500.00 V	-0.050 uA	1499.85 V	On	Up	21 DSG-AB ON 0 22 DSG-AB ON 0	1499.79 0.0 1499.73 -0.0	20 100.00 100 : 022 100.00 100 :	1000.00 1000.00	1800 1800 10 1 1800 1800 10 1	
HVFanStat Fan2 H 3361	00.014	DSG-LAB	1000.00 uA	1500.00 V	-0.012 uA	1499.78 V	On	Up	23 DSG-AB 0N 0	1499.78 0.9 1499.61 -0.0	756 100.00 100 ÷	1000.00 1000.00	1800 1800 10 1 1800 1800 250 2	
Fan4 9 3254	00.015	DSG-LAB	1000.00 uA	1500.00 V	-0.020 uA	1499.89 V	On	Up	25 DSG-AB 0N 0	1499.82 -0.0	014 1500.00 1500 +	1000.00 1000.00	1800 1800 250 25 1800 1800 250 25	
Pan5 ⊌ 3397	00.016	DSG-LAB	1000.00 uA	1500.00 V	-0.010 uA	1499.85 V	On	Up	27 DSG-AB 0N 0	1499.86 1.0	26 1500.00 1500 ÷	1000.00 1000.00	1800 1800 250 25 1800 1800 250 25	
Symbolicivame SystemOne	•								29 DSG-AB ON O	1499.70 -0.0	048 1500.00 1500	1000.00 1000.00	1800 1800 250 2 1800 1800 250 2	
nvranspeed tow with hi	<b>e</b>								31 DSG AB ON O	1499.83 -0.0	060 1500.00 1500 :	1000.00 1000.00	1800 1800 250 2	
Script Execution									32 DSG AB ON O	1499.82 -0.0	008 1500.00 1500 ÷	1000.00 1000.00	1800 1800 250 2 1800 1800 250 2	
a k s									34 DSG-48 0N 0	1499.98 0.9	184 1500.00 <b>1500</b> ·	1000.00 1000.00	1800 1800 250 2 1800 1800 250 2	
WALT 15000 MS OK									HV- CAEN MAIN Max Current How	1118 microAm	1	A	l Channels	
SET [Pw] for [0{0,1,2,3,4,5,6,7,8,9,10,11,1: WAIT 16000 ms OK	2, 13, 14, 15, 16, 17, 18, 19,	20,21,22,23,24,25,	26,27,28,29,30,31,32	2,33,34,35}] to [1]	. OK				Max Voltage Hrws Board Temperatur	3147 Volt 29 Celsius	VSet [/] 1500.0	1 Set [uA]	VMax [V] Rup [V/s 1800.0 250.0	
SET [Pw] for [0{0,1,2,3,4,5,6,7,8,9,10,11,1: WAIT 16000 ms OK	2, 13, 14, 15, 16, 17, 18, 19,	20,21,22,23,24,25,	26,27,28,29,30,31,32	2,33,34,35}] to [0]	OK				5. campero@dsp-b-linux1:~		-		- 0	
3C1 μmg 100 μ(ν), <i>i</i> , <i>i</i>								Re-attach 55 Fullscreen Stay or	top 📔 Duplicate 🧭	Q Q 💾 🚔 🖡 Hi	de toolbar			
WAT 18000 msOK SET IPM for follo (1.2, 3.4, 5.6, 7.8, 9. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35) to [1]OK								[campero@dsg-b-linux1 ~]\$						
WAIT 16000 ms OK SET [Pw] for [0(0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35]] to [0] OK								[campero@dg.b.linux1 ~]\$						
WAIT 16000 ms OK SET [Pw] for [0{0,1,2,3,4,5,6,7,8,9,10,11,1] WAIT 16000 ms	2, 13, 14, 15, 16, 17, 18, 19,	20,21,22,23,24,25,	26,27,28,29,30,31,32	2,33,34,35}] to [1]	. ок				[campero@dsg-b-linux1 ~]\$ car hvcaentest2:00:000:Pw	2019-09-03 08:04	2:00:000:Pw 4:31.571528 Off DISABL	E NO_ALARM		
hvcaentest2 129.57.86.124									campara .					

**Fig. 13** – Discrepancies between GECO2020 values and PVs showed in CSS screen only for *Pw* parameters. Noticed that also used EPICS basic command "*camonitor*" to monitor and verified that *Pw* PVs did not update during this test.



Fig. 14 – Discrepancies between SSH values and PVs showed in CSS screen only for Pw parameters. Noticed that also used EPICS basic command "camonitor" to monitor and verified that *Pw* PVs did not update during this test.

3. Noticed that Pw PV readout for channel 17 had an update latency of ~ 8 s while ramping to set voltage, only in one cycle. This issue was recover by itself in next cycle. See fig.15.



Fig.15 - Zoomed view of Voltage Ramp Test CSS-BOY screen shows channel 17 latency of 8 s to ramp up



Fig.16 - Voltage Ramp Test CSS-BOY screen shows 100 cycles of voltage ramp up/downs

#### Test 2.2

- Similar issues as test 2.1; during this test found that the discrepancy between GECO 2020/SSH and EPICS PVs for *Pw* parameter disappear after CSS-BOY screen is refreshed or "*camonitor*" EPICS commands is re-executed. See fig.17 and 18.
  - 1.1. Noticed that only this *Pw* PV has this issue. The rest of the monitored PVs (Vmon, Vmax, IMon, etc) during the test did not fail, when *camonitor* EPICS command was executed once in the Host PC (EPICS client).



Fig.17 – Screenshot shows discrepancies between GECO values and EPICS PVs (*Pw*) monitored in CSS screen and *camonitor* command executed – <u>Before</u> CSS screen refreshment and re-send command.

( GECO2020				🖸 CS-Studio @dsg-b-linux1,ilab.org — 🗆	×
File Settings Groups Window Help				Elle Edit Se <u>a</u> rch <u>C</u> S-Studio Window Help	
🝈 seco: seneral control softw	аге				2
SYSTEM	hvcaentest2	_		🚰 HVCAEN-7030TN-Expert_slot0.opi 🔍 🔍 🔍 🗢 🖛 😁	
A Outron	IMen VMen	Pw Status	RUn	TEST HV CAEN - Expert Controls - Slot 0	
hvcaentest2 Disconnect Configure	1.008 uA 1499.85 V	On Up	250 Vps	Novice Board Model A7030TN - [5/N: 304] ALL ON/OFF	11
SY4527 University Multicounnel 00.001	0.000 uA 1499.7 8 V	On Up	250 Vps	Ch#         Location         Click t         Status         VMon         V]         Imon         Location         Visat         V/I         RDwn [V/s]         Trip [s]	11
Power Supply System	-0.074 uA 1499.77 V	On Up	250 Vps	O         DSG-Lab         O         1499         7         1.008         1500.00         1000.00         1000.00         1800         250         250         250         3.0         3.0           O         DSG-Lab         O         1409         7         1.008         1500.00         1000.00         1000.00         1800         250         250         250         3.0         3.0	11
129.57.86.124 00.003	0.968 uA 1499.7 8 V	On Up	250 Vps	OI         DSG-Lab         OF         ON         1499.0         0.002         1500.00         1000.00         1800         1800         250         250         250         3.0         3.0           02         DSG-Lab         OF         ON         1499.7         7         -0.074         1500.00         1000.00         1800         1800         250         250         250         3.0         3.0	11
00.004	-0.058 uA 1499.8 V	On Up	250 Vps	03         DSGLab         04         250-Lab         04         100.00         1000.00         1000.00         1800         1800         250         250         250         3.0         3.0           04         DSG-Lab         04         1499.1         -0.054         1500.00         1500 ±         1000.00         1800         1800         250         250         250         3.0         3.0	11
ADVARCED FEATORES 00.005	-0.008 uA 1499.92 V	On Up	250 Vps	06         DSG-LAB         07         0/M         1499         0         -0.008         1500.00         1500         1000.00         1800         1250         250         250         250         250         3.0         3.0           06         DSG-LAB         01         0.010         1500.00         1500         1000.00         1800         1800         250         250         250         3.0         3.0           06         DSG-LAB         01         1000.00         1500         1000.00         1800         1800         250         250         250         3.0         3.0	11
SCRIPT LOG OFF 00.006	0.010 uA 1499.9 V	On Up	250 Vps	OF         DSG-LAB         OF         ON         1499.5         C.946         1500.00         1500.10         1000.00         1800         1800         250         250         250         3.0         3.0           08         DSG-LAB         OF         ON         1499.5         -0.084         1500.00         1500.10         1000.00         1800         1800         250         250         250         3.0         3.0	11
SESSIONS CRATE TECH SYS MAP INFO INFO 00.007	0.948 uA 1499.74 V	On Up	250 Vps	Og         DSG-LAB         Of         ON         1499         7         0.004         1500.00         1500         1000.00         1800         1800         250         250         250         3.0         3.0           10         DSG-LAB         OF         ON         1499         7         0.004         1500.00         1500         1000.00         1800         1800         250         250         250         3.0         3.0           10         DSG-LAB         OF         ON         1499         8         -0.024         1500.00         1000.00         1000         1800         1800         250         250         250         3.0         3.0	11
RESET GEN SIGN KILL CLEAR ALARM 00.008	-0.082 uA 1499.74 V	On Up	250 Vps	11 DSG-LAB OF ON 1499.8 2.984 1500.00 1500 1000.00 1000.00 1800 250 250 250 250 3.0 3.0 12 DSG-LAB OF ON 1499.0 -0.056 1500.00 1500 1000.00 1000.00 1800 1800 250 250 250 3.0 3.0 3.0	11
Channel ON 00.009	0.002 uA 1499.75 V	On Up	250 Vps	13         DSG-LAB         of         ON         1499         o         -0.032         1500.00         1500         1000.00         1800         1800         250         250         250         3.0         3.0           14         DSG-LAB         of         ON         1499         9         -0.032         1500.00         1500         1000.00         1800         1800         250         250         250         3.0         3.0           14         DSG-LAB         of         ON         1499         9         -0.002         1500.00         1000.00         1000.00         1800         250         250         250         3.0         3.0           14         DSG-LAB         of         ON         1499         9         -0.002         1500.00         1000.00         1000.00         1800         250	11
0W 900.010	-0.022 uA 1499.70 V	On Up	250 Vps	15 DSG448 VV UN 149 11 0.014 1500.00 1500 1000.00 1000.00 1800 250 250 250 250 3.0 50	-
OVC # 00.011	2.980 uA 1499. <mark>5</mark> V	On Up	250 Vps	Terminal Sessions View X server Tools Games Settings Macros Help	<u>۲</u>
Trip ** 00.012	-0.060 uA 1499.82 V	On Up	250 Vps	🚇 🔆 🐮 🝕 👷 🕮 Y 📟 🛎 🏕 🙆 🛛 🛛 🐼 🔮	2
Fan0 0 3432 Fan1 0 3289 00.013	-0.036 uA 1499.85 V	On Up	250 Vps	Session Servers Tools Games Sessions View Split MultExec Tunneling Packages Settings Help X server Exi	Ł
HWFanStat Fan2 ↔ 3397 Fan3 ↔ 3468 00.014	-0.006 uA 1499.81 V	On Up	250 Vps	Quick connect I 1.campero@ds: 2.Home 3.campero@ds: X 4.Home 5.admin@hvcae	0
Fan4 0 3218 00.015	-0.008 uA 1499.53 V	On Up	250 Vps	Saved sessions	<u>^</u>
SymbolicName SystemOne			350 17	Camperologisg-o-tituxi -/s     [camperologisg-o-tituxi -/s     [camperologisg-o-tituxi -/s	
HVFanSoeed LOW MID HI				I camperologiagio - Linuxi - Jo       I camperologiagio - Linuxi - Jo       I camperologiagio - Linuxi - Jo	
n Srint Even line				camper (odsg/or cition 1 - ) \$	
			_	COMI (Communications Por Communications Por Communications Por Communications Por Communications Por Communications Por	
- <b>2</b> + >			_	t appero@dsg-b-linux1 ~]s	
WALT 16000 ms OK SET [Pw] for [0{0,12,34,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20 WALT 16000 ms OK	0,21,22,23,24,25,26,27,28,29,30,31,32,3	3,34,35}] to [1] OK		8     Nal D EPICS     I camper o@dsg-b-Linux1 ~> \$       I camper o@dsg-b-Linux1 ~> \$	
SET [Pw] for [0{0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20 WAIT 16000 ms OK	0,21,22,23,24,25,26,27,28,29,30,31,32,3	3,34,35}] to [0] OK		halgw [campero@dsg-b-linux1 ~]\$	
SET [Pw] for [0{0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20 WAIT 16000 ms OK	0,21,22,23,24,25,26,27,28,29,30,31,32,3	3,34,35}] to [1] OK		<pre>bin4 [campero@dsg-b-linux1 ~]\$ (campero@dsg-b-linux1 ~)\$</pre>	
SET [Pw] for [U(0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 WAIT 16000 ms <b>OK</b> SET [Pw] for [0/01 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	0,21,22,23,24,25,26,27,28,29,30,31,32,3	3,34,35)] to [0] OK		S jabi2 [€ imperiodsg-0-thttp://www.second.com/second/	
WAIT 16000 ms OK SET [Pw] for [0{0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20	0,21,22,23,24,25,26,27,28,29,30,31,32,3	3,34,35}] to [0] OK		Icampero@dsg-b-linux1 ~}s camonitor hvcaentest2:00:000:Pw ↓ taentest2:00:000:Pw 2019-09-05 15:53:52.771682 On DISABLE NO_ALARM	
WAIT 16000 ms OK SET [Pw] for [0[0,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20] WaIT 16000 mc	0,21,22,23,24,25,26,27,28,29,30,31,32,3	3,34,35}] to [1] OK		C     S     INDECISTEDED VEDSTON - Disase e novel Mohal/Term hu e herrition to the nonfessional edition hara- http://indusytam.wohatal/.nat	~
hucaentest2 129,57,86,124					ro
	1 89 🔿 📂 🚓		~ 🖬	A 10 4 845 PM	

**Fig.18** – Screenshot shows discrepancies between GECO values and EPICS PVs (*Pw*) monitored in CSS screen and *camonitor* command executed – <u>After</u> CSS screen refreshment and re-send command.

2. Noticed that Pw PV readout for channel 17 had an update latency of ~ 8 s while ramping to set voltage. Issue occurred two times and it was recover by itself in next cycles. See fig.19



Fig.19 – Zoomed view of Voltage Ramp Test CSS-BOY screen shows channel 17 latency of 8 s to ramp up