Campbell Data logger verification procedure

Overview

The Campbell datalogger has a variety of measuring modes and capabilities relying on the accuracy of the on-board reference voltage and analogue to digital conversion. A simple test procedure can be undertaken to ensure that the datalogger is still with in manufacturers specification

Test Procedure

The testing of the logger uses the dataloggers own voltage source as a stable reference and a precision multi-meter for voltage verification. The logger is then tested at a number of input voltages and the derived measurement is compared to the reference test meter. The on-board datalogger diagnostics are also checked for errors and developing problems

Required items

- Se Tester Software
- Fluke 287
- Se Tester control Box
- Laptop and Campbell leads
- Logger Check Field Sheet

Testing steps

1. Record the instrument details on the logger check sheet
2. Connect to the logger and download data, save program etc as the test software will clear the memory
3. Enter Terminal mode and record the Mode 11 results, access sequence, <enter>, until returns *, then 7h, returns >, *B accesses mode 1. Check specifically for E08 occurances , that the most recent Os version is loaded and the internal battery is adequate.

TABLE 1.6-1. Description of *B Mode Data

Keyboard Entry	Display ID: Data	Description of Data
* B	01: XXXXX	Program memory Signature. The value is dependent upon the programming entered and the total size and allocation of memory. The signature for the same program will be different in a CR10X and a CR10X-2M. If the program has not been previously compiled, it will be compiled and run.
A	02: XXXXX	Operating System (OS) Signature
A	03: XXXXX	Memory Size, Kbytes (Flash + SRAM)
A	04: XX	Number of E08 occurrences (Key in 88 to reset)
A	05: XX	Number of overrun occurrences (Key in 88 to reset)
A	06: X.XXXX	Operating System version number
A	07: XXXX.	Version revision number
A	08: X.XXXX	Lithium battery voltage (Measured daily. Should be >2.4. See Section 14.11 for replacement.)
A	09: XX	Low 12 V battery detect counter (Key in 88 to reset)
A	10: XX	Extended memory error counter (Key in 88 to reset)
A	11: X.XXXX	Extended Memory time of erase, seconds (Updated only during memory reset or test)

4. Load New logger OS if required
5. Load up the test software. 10x Se Tester.CSI

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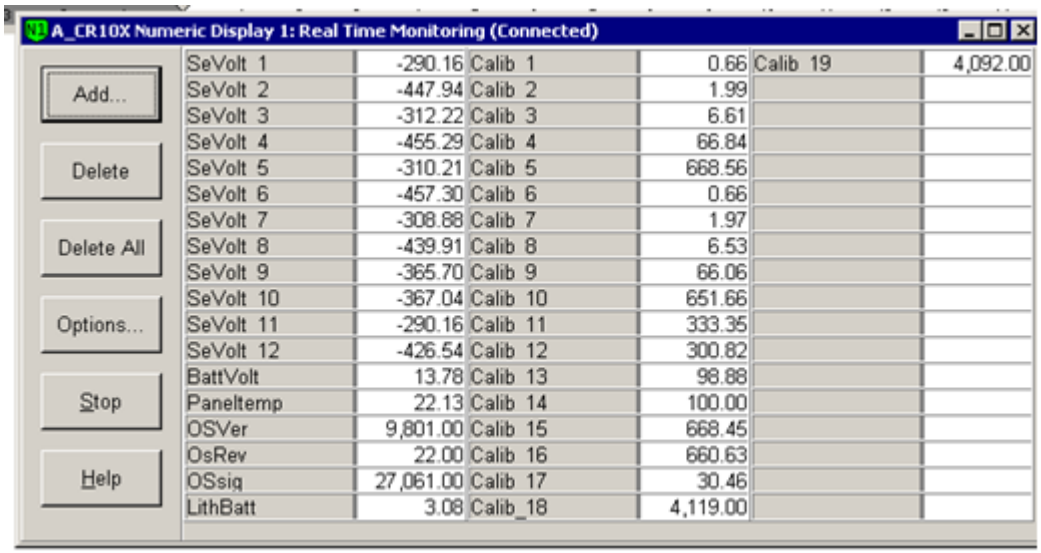
6. Connect the Se Tester control box to the appropriate ports
   Brown – 5v
   Green – gnd
   Blue – Se (1-12)

7. Measure the 5v rail output of the logger with the Fluke 287 and note on the check sheet
8. Connect the Fluke 287 to the Se Tester control Box
9. Using the Numeric Screen record both the Fluke and logger mV readings as you rotate the dial, steps between 0 and 2.5V for each Se channel of interest.



SeVolt 1	-290.16	Calib 1	0.66	Calib 19	4,092.00
SeVolt 2	-447.94	Calib 2	1.99		
SeVolt 3	-312.22	Calib 3	6.61		
SeVolt 4	-455.29	Calib 4	66.84		
SeVolt 5	-310.21	Calib 5	668.56		
SeVolt 6	-457.30	Calib 6	0.66		
SeVolt 7	-308.88	Calib 7	1.97		
SeVolt 8	-439.91	Calib 8	6.53		
SeVolt 9	-365.70	Calib 9	66.06		
SeVolt 10	-367.04	Calib 10	651.66		
SeVolt 11	-290.16	Calib 11	333.35		
SeVolt 12	-426.54	Calib 12	300.82		
BattVolt	13.78	Calib 13	98.88		
Paneltemp	22.13	Calib 14	100.00		
OSVer	9,801.00	Calib 15	668.45		
OsRev	22.00	Calib 16	660.63		
OSsig	27,061.00	Calib 17	30.46		
LithBatt	3.08	Calib_18	4,119.00		

10. Note the Panel temperature
11. check for -99999 faults in the logger internal Voltage calibration, This indicates a hardware failure and will require removal from site
12. Download the data from the logger and label appropriately, i.e. XXX_yyymmdd_snxxxxx_Calib, store in the calibrations folder on hydro sites
13. Test and measure the Auxiliary equipment for each sensor, Voltage dividers and Resistors on 4-20mA sensors
14. Load up the site program again. You may wish to increment the edition number and note the logger calibration check