

Sea-Bird Electronics, Inc.

13431 NE 20th Street, Bellevue, WA 98005-2010 USA

Phone: (+1) 425-643-9866 Fax (+1) 425-643-9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 9087
CALIBRATION DATE: 11-Jun-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

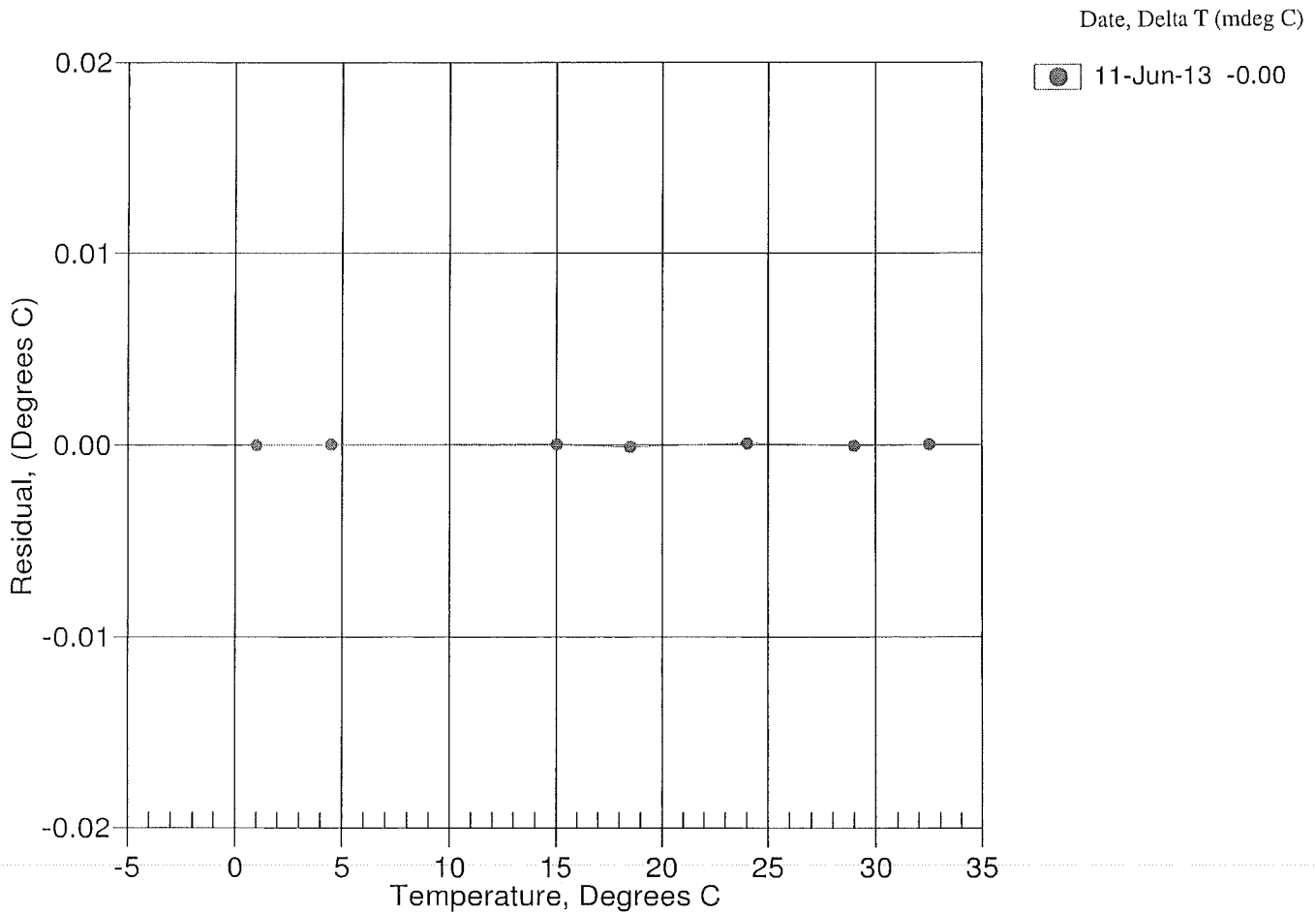
ITS-90 COEFFICIENTS

a0 = -1.143508e-004
a1 = 3.113386e-004
a2 = -4.861518e-006
a3 = 2.100192e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	571384.9	1.0000	-0.0000
4.5000	488297.8	4.5000	0.0000
15.0000	310843.5	15.0000	0.0000
18.5000	269088.0	18.4999	-0.0001
24.0000	215804.1	24.0001	0.0001
29.0000	177672.0	29.0000	-0.0000
32.5000	155585.6	32.5000	0.0000

$$\text{Temperature ITS-90} = 1 / \{ a_0 + a_1[\ln(n)] + a_2[\ln^2(n)] + a_3[\ln^3(n)] \} - 273.15 \text{ (}^\circ\text{C)}$$

Residual = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 9087
 CALIBRATION DATE: 04-Jun-13

SLOCUM PAYLOAD CTD
 PRESSURE CALIBRATION DATA
 1450 psia S/N 3849156

COEFFICIENTS:

PA0 = -1.524198e+000	PTCA0 = 5.240492e+005
PA1 = 4.497260e-003	PTCA1 = -1.456300e+001
PA2 = -1.617807e-011	PTCA2 = -2.688457e-002
PTEMPA0 = -7.196609e+001	PTCB0 = 2.544237e+001
PTEMPA1 = 5.124657e-002	PTCB1 = 8.750000e-004
PTEMPA2 = -5.103379e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.66	527321.0	1870.0	14.68	0.00
314.98	594144.0	1875.0	314.91	-0.01
614.97	660950.0	1876.0	614.90	-0.00
914.99	727813.0	1877.0	915.00	0.00
1215.11	794680.0	1879.0	1214.98	-0.01
1465.10	850458.0	1879.0	1465.10	-0.00
1215.04	794715.0	1879.0	1215.14	0.01
914.99	727830.0	1878.0	915.08	0.01
614.99	660977.0	1879.0	615.03	0.00
315.00	594162.0	1878.0	315.00	0.00
14.66	527314.0	1880.0	14.69	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2082	527185.00
29.00	2010	527240.90
24.00	1909	527318.30
18.50	1797	527407.50
15.00	1727	527462.40
4.50	1515	527620.89
1.00	1445	527670.00

TEMP (ITS90)	SPAN (mV)
-5.00	25.44
35.00	25.47

$$y = \text{thermistor output}; t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$$

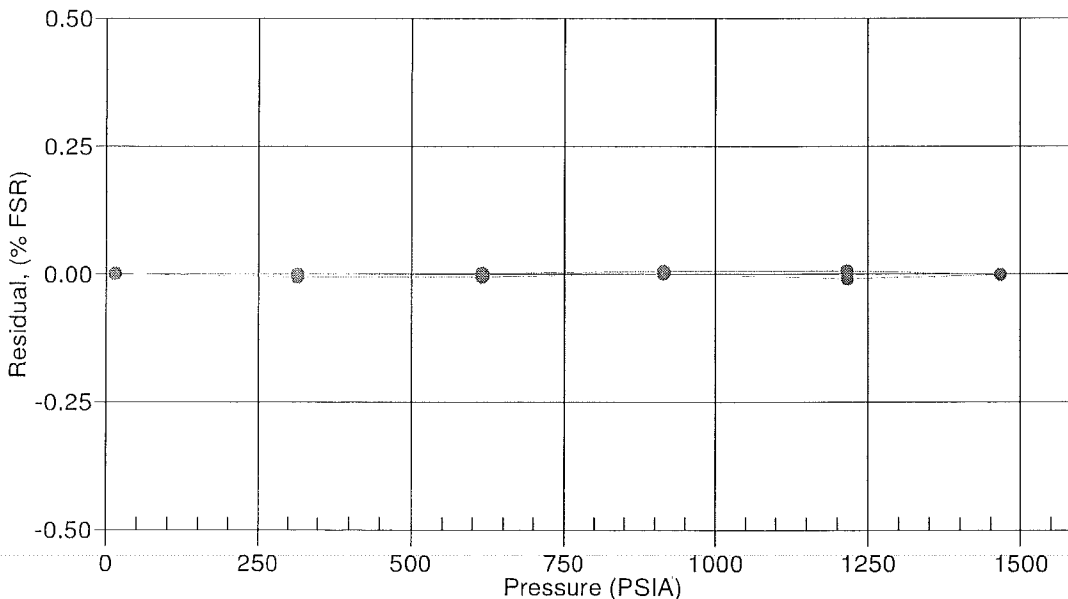
$$x = \text{pressure output} - PTCA0 - PTCA1 * t - PTCA2 * t^2$$

$$n = x * PTCB0 / (PTCB0 + PTCB1 * t + PTCB2 * t^2)$$

$$\text{pressure (psia)} = PA0 + PA1 * n + PA2 * n^2$$

Date, Avg Delta P %FS

● 04-Jun-13 0.00



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SLOCUM PAYLOAD CTD
 CONDUCTIVITY CALIBRATION DATA
 PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.808221e-001	CPcor = -9.5700e-008
h = 1.338461e-001	CTcor = 3.2500e-006
i = -2.341557e-004	WBOTC = -0.0000e+000
j = 3.551202e-005	

BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2710.81	0.00000	0.00000
1.0000	34.8131	2.97572	5441.48	2.97571	-0.00000
4.5000	34.7934	3.28278	5648.02	3.28278	0.00001
15.0000	34.7510	4.26445	6261.95	4.26445	0.00000
18.5000	34.7421	4.60959	6463.65	4.60958	-0.00000
24.0000	34.7323	5.16751	6776.70	5.16751	-0.00000
29.0000	34.7261	5.68921	7056.52	5.68921	0.00001
32.5000	34.7232	6.06159	7249.43	6.06159	-0.00000

$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$

$\text{Conductivity} = (g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p)$ Siemens/meter

t = temperature[°C]; p = pressure[decibars]; $\delta = \text{CTcor}$; $\epsilon = \text{CPcor}$;

Residual = instrument conductivity - bath conductivity

