

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: 9082
CALIBRATION DATE: 02-Jun-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

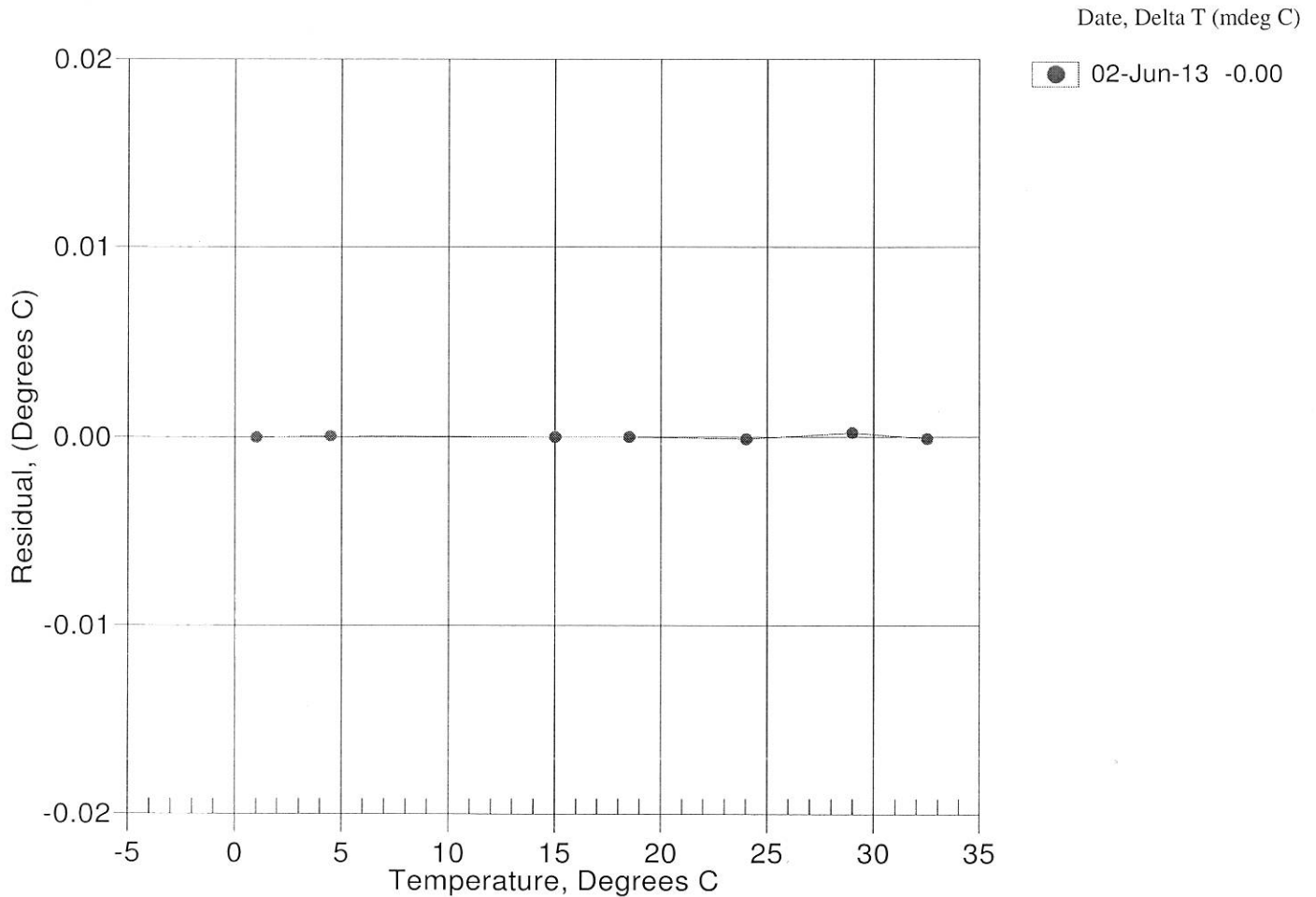
ITS-90 COEFFICIENTS

a0 = -7.892911e-005
a1 = 3.057898e-004
a2 = -4.540641e-006
a3 = 2.022513e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	571075.4	1.0000	-0.0000
4.5000	487731.0	4.5000	0.0000
15.0000	309920.8	15.0000	-0.0000
18.5000	268128.4	18.5000	-0.0000
24.0000	214838.6	23.9999	-0.0001
29.0000	176727.2	29.0002	0.0002
32.5000	154671.4	32.4999	-0.0001

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

$$\text{Residual} = \text{instrument temperature} - \text{bath temperature}$$



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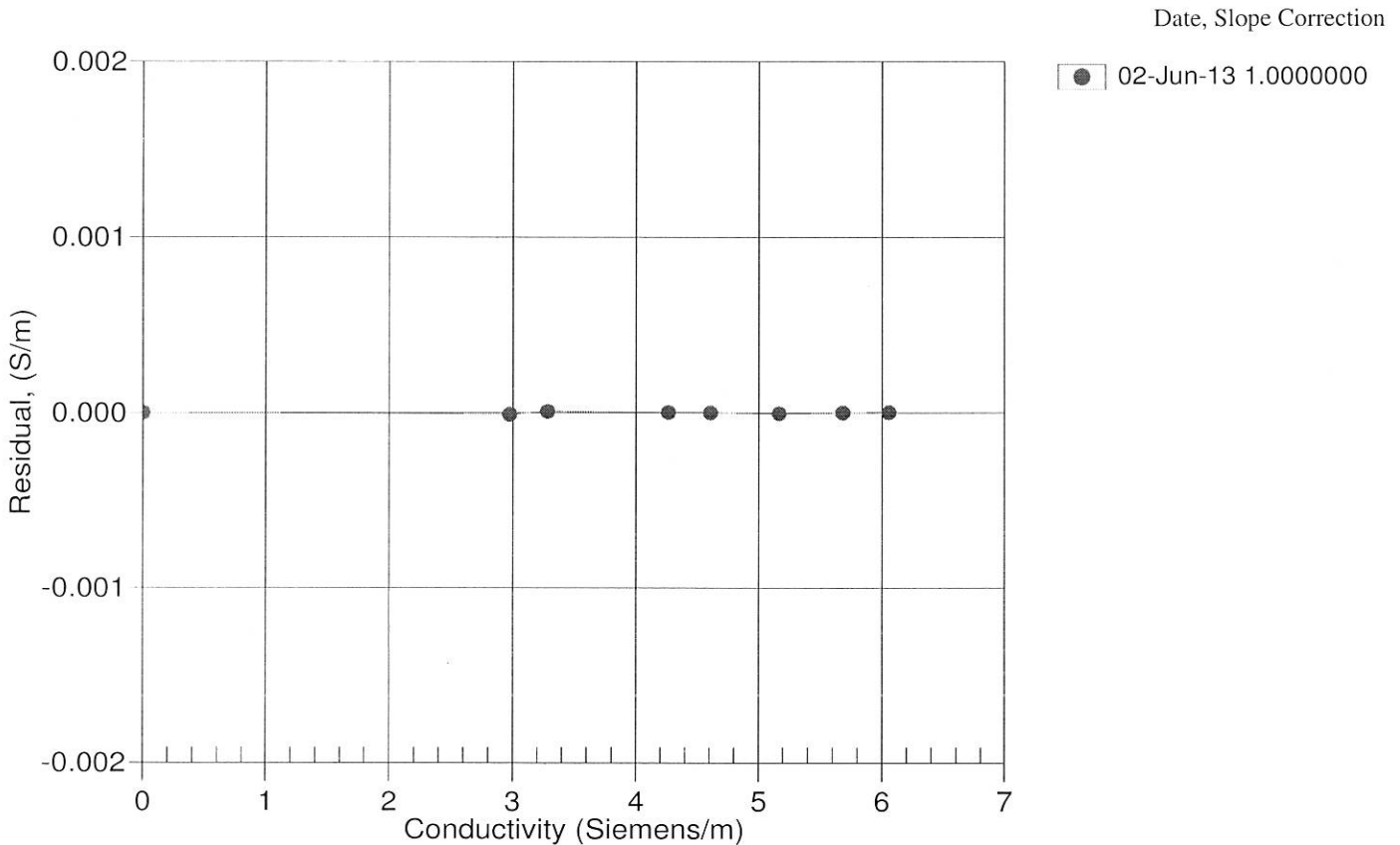
SLOCUM PAYLOAD CTD
 CONDUCTIVITY CALIBRATION DATA
 PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.701752e-001	CPcor = -9.5700e-008
h = 1.301073e-001	CTcor = 3.2500e-006
i = -3.169006e-004	WBOTC = 1.2788e-006
j = 3.970108e-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	2736.66	0.00000	0.00000
1.0000	34.7803	2.97318	5516.77	2.97317	-0.00001
4.5000	34.7607	3.27999	5726.79	3.28000	0.00001
15.0000	34.7189	4.26093	6350.94	4.26093	0.00000
18.5000	34.7104	4.60583	6555.97	4.60584	0.00000
24.0000	34.7011	5.16338	6874.13	5.16338	-0.00001
29.0000	34.6965	5.68490	7158.57	5.68490	-0.00000
32.5000	34.6945	6.05715	7354.63	6.05715	0.00000

f = INST FREQ * sqrt(1.0 + WBOTC * t) / 1000.0
 Conductivity = (g + hf² + if³ + jf⁴) / (1 + δt + εp) Siemens/meter
 t = temperature[°C]; p = pressure[decibars]; δ = CTcor; ε = CPcor;
 Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9082
 CALIBRATION DATE: 30-May-13

SLOCUM PAYLOAD CTD
 PRESSURE CALIBRATION DATA
 1450 psia S/N 3859875

COEFFICIENTS:

PA0 = 1.417929e-001	PTCA0 = 5.244908e+005
PA1 = 4.566921e-003	PTCA1 = 1.020066e+000
PA2 = -1.886136e-011	PTCA2 = 2.273550e-002
PTEMPA0 = -7.185045e+001	PTCB0 = 2.525588e+001
PTEMPA1 = 5.143161e-002	PTCB1 = 3.750000e-004
PTEMPA2 = -5.744621e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.63	527709.0	1859.0	14.68	0.00
314.95	593475.0	1866.0	314.84	-0.01
614.96	659255.0	1866.0	614.90	-0.00
915.00	725087.0	1867.0	915.03	0.00
1215.00	790918.0	1867.0	1215.00	0.00
1465.02	845800.0	1868.0	1464.95	-0.00
1215.00	790932.0	1867.0	1215.07	0.00
915.00	725091.0	1867.0	915.05	0.00
614.96	659270.0	1868.0	614.97	0.00
314.90	593487.0	1868.0	314.89	-0.00
14.64	527706.0	1868.0	14.67	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2077	527774.00
29.00	2006	527767.00
24.00	1904	527755.60
18.50	1793	527744.40
15.00	1722	527736.40
4.50	1510	527724.00
1.00	1440	527717.80
TEMP (ITS90)	SPAN (mV)	
-5.00	25.25	
35.00	25.27	

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

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

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

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

Date, Avg Delta P %FS

30-May-13 -0.00

