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: 9066
CALIBRATION DATE: 11-Apr-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

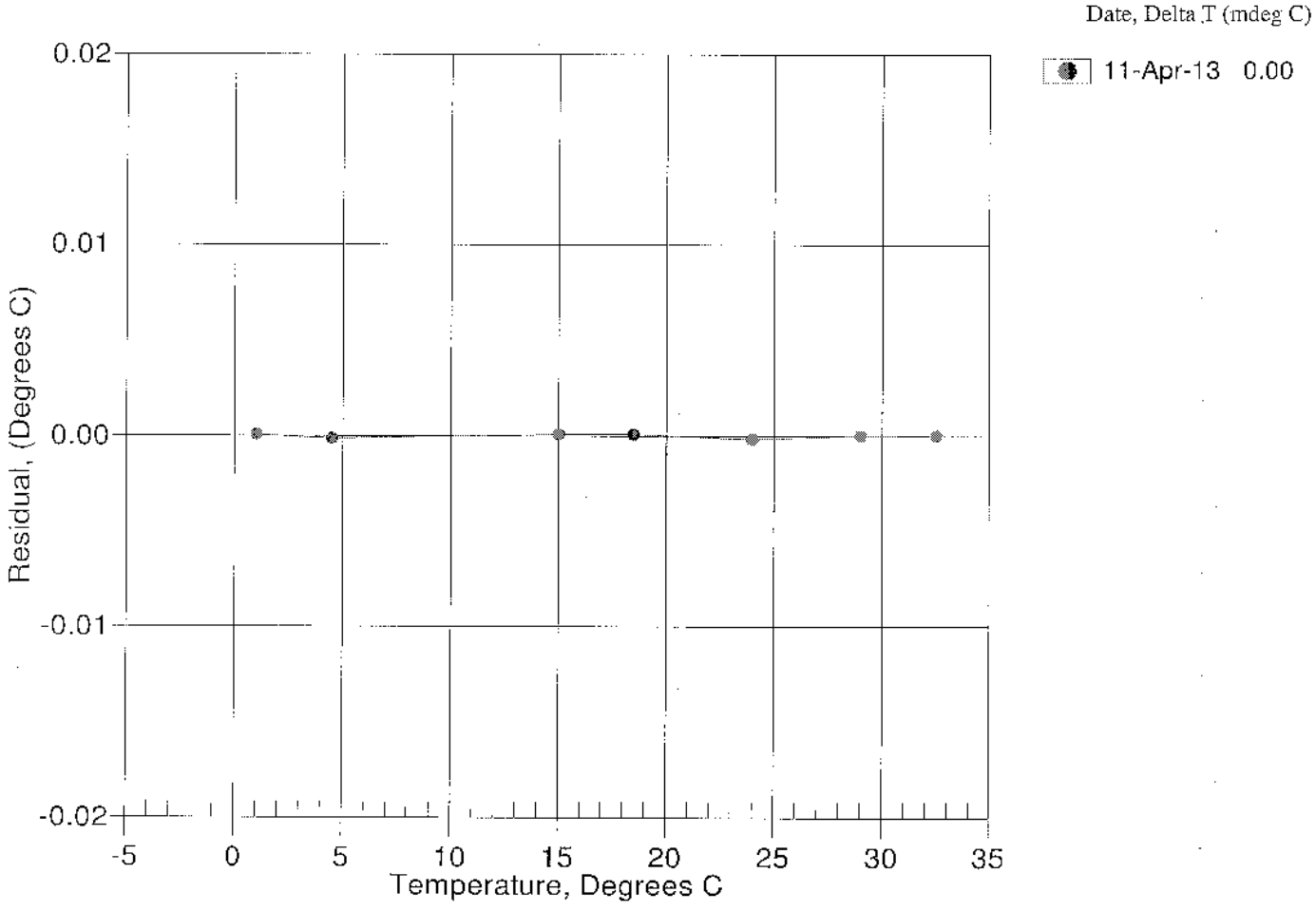
ITS-90 COEFFICIENTS

a0 = -9.081145e-005
a1 = 3.036532e-004
a2 = -4.262464e-006
a3 = 1.960693e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	582300.4	1.0001	0.0001
4.5000	497889.2	4.4999	-0.0001
15.0000	317406.4	15.0001	0.0001
18.5000	274890.4	18.5001	0.0001
24.0001	220606.8	23.9999	-0.0002
29.0000	181726.4	29.0000	0.0000
32.5000	159195.2	32.5000	0.0000

Temperature ITS-90 = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\} - 273.15$ (°C)

Residual = instrument temperature - bath temperature



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CALIBRATION DATE: 11-Apr-13

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

COEFFICIENTS:

g = -9.758777e-001
h = 1.509455e-001
i = -4.224149e-004
j = 3.486791e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBCTC = 1.5039e-006

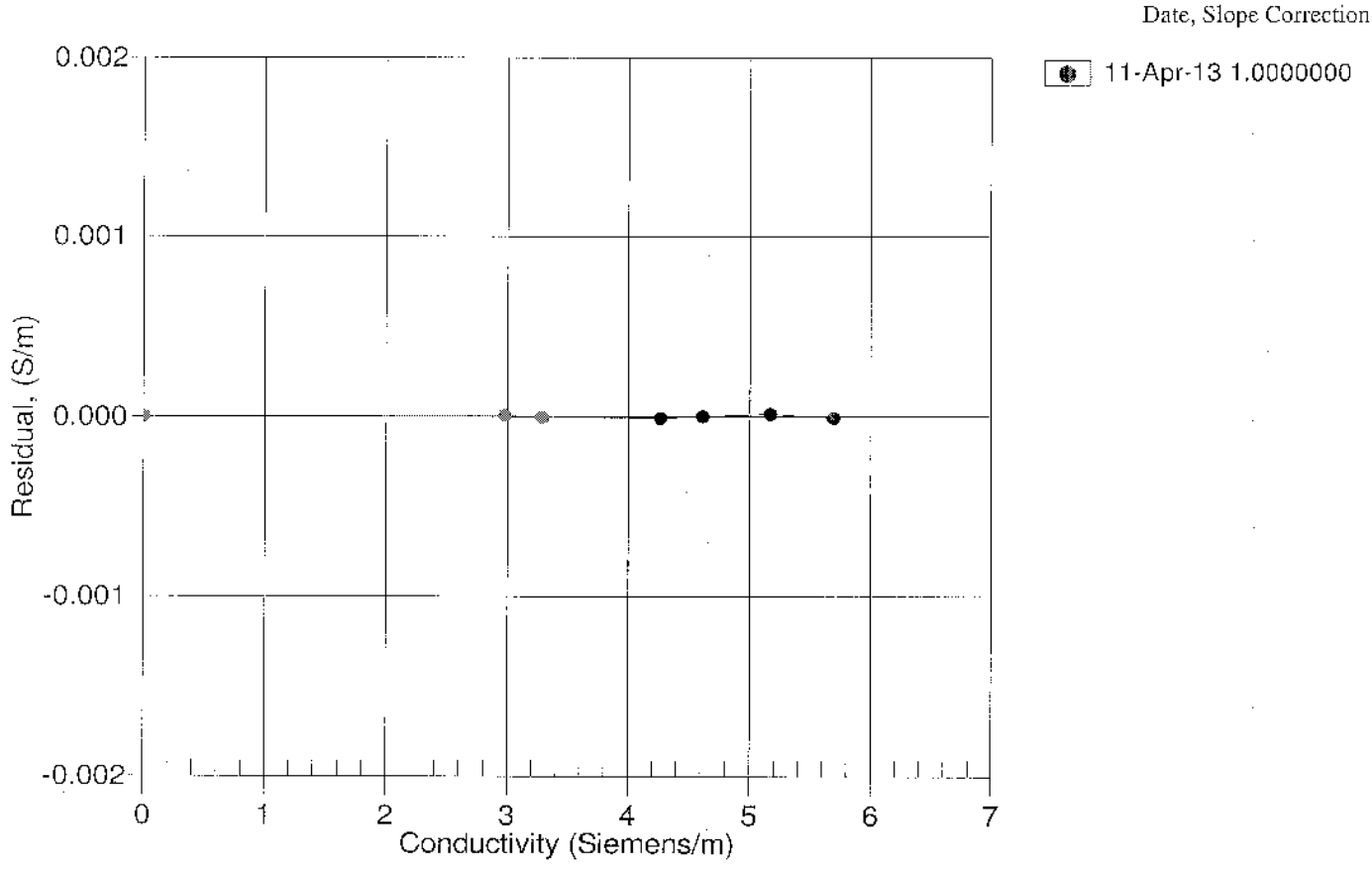
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2548.68	0.00000	0.00000
1.0000	34.8378	2.97763	5129.99	2.97763	0.00001
4.5000	34.8180	3.28487	5325.08	3.28486	-0.00000
15.0000	34.7753	4.26712	5904.89	4.26711	-0.00001
18.3000	34.7660	4.61242	6095.35	4.61242	0.00000
24.0001	34.7557	5.17062	6390.90	5.17063	0.00001
29.0000	34.7494	5.69259	6655.03	5.69259	-0.00001

f = INST FREQ * sqrt(1.0 + WBOTC * t) / 1000.0

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

t = temperature[°C)]; p = pressure[decibars]; δ = CTcor; ε = CPcor;

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9066
CALIBRATION DATE: 08-Apr-13

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3819475

COEFFICIENTS:

PA0 =	3.454005e-002	PTCA0 =	5.245939e+005
PA1 =	4.600039e-003	PTCA1 =	-2.732939e+000
PA2 =	-1.535458e-011	PTCA2 =	1.400702e-001
PTEMPA0 =	-7.462555e+001	PTCB0 =	2.536362e+001
PTEMPA1 =	4.983728e-002	PTCB1 =	-6.750000e-004
PTEMPA2 =	-3.781723e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.66	527784.0	1962.0	14.69	0.00
314.93	593022.0	1963.0	314.89	-0.00
614.93	658246.0	1964.0	614.89	-0.00
914.94	723507.0	1965.0	914.93	-0.00
1214.94	788787.0	1965.0	1214.93	-0.00
1464.99	843212.0	1965.0	1464.95	-0.00
1214.91	788794.0	1965.0	1214.97	0.00
914.88	723510.0	1965.0	914.95	0.00
614.93	658256.0	1965.0	614.94	0.00
314.95	593031.0	1964.0	314.93	-0.00
14.66	527782.0	1965.0	14.68	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2186	527886.00
29.00	2113	527873.60
24.00	2010	527851.20
18.50	1896	527828.40
15.00	1824	527816.40
4.50	1607	527822.60
1.00	1535	527829.40

TEMP(ITS90)	SPAN(mV)
-5.00	25.37
35.00	25.34

y = thermistor output; $t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

x = pressure output - $PTCA0 - PTCA1 * t - PTCA2 * t^2$

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

pressure (psia) = $PA0 + PA1 * n + PA2 * n^2$