

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: 9064
CALIBRATION DATE: 21-Apr-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

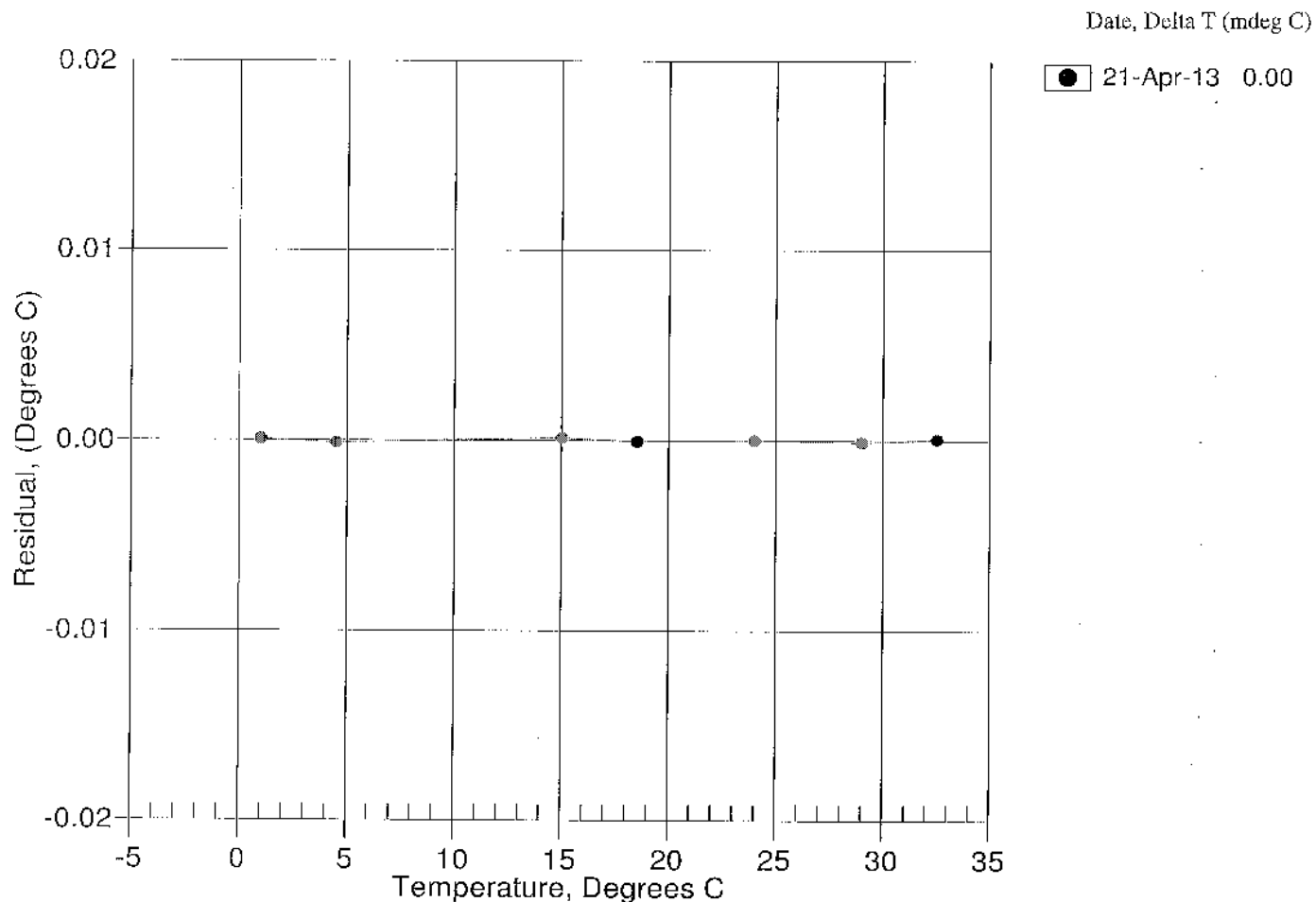
ITS-90 COEFFICIENTS

a0 = -8.553954e-005
a1 = 3.080841e-004
a2 = -4.759395e-006
a3 = 2.078062e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
0.9999	574412.0	1.0000	0.0001
4.5000	490441.2	4.4999	-0.0001
15.0105	311236.4	15.0106	0.0001
18.5254	269032.8	18.5253	-0.0001
24.0000	215695.8	24.0000	-0.0000
29.0000	177369.4	28.9999	-0.0001
32.5000	155191.4	32.5001	0.0001

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

Residual = instrument temperature - bath temperature



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

COEFFICIENTS:

g = -9.852769e-001	CPcor = -9.5700e-008
h = 1.370555e-001	CTcor = 3.2500e-006
i = -3.897782e-004	WBOTC = -7.2199e-007
j = 4.729713e-005	

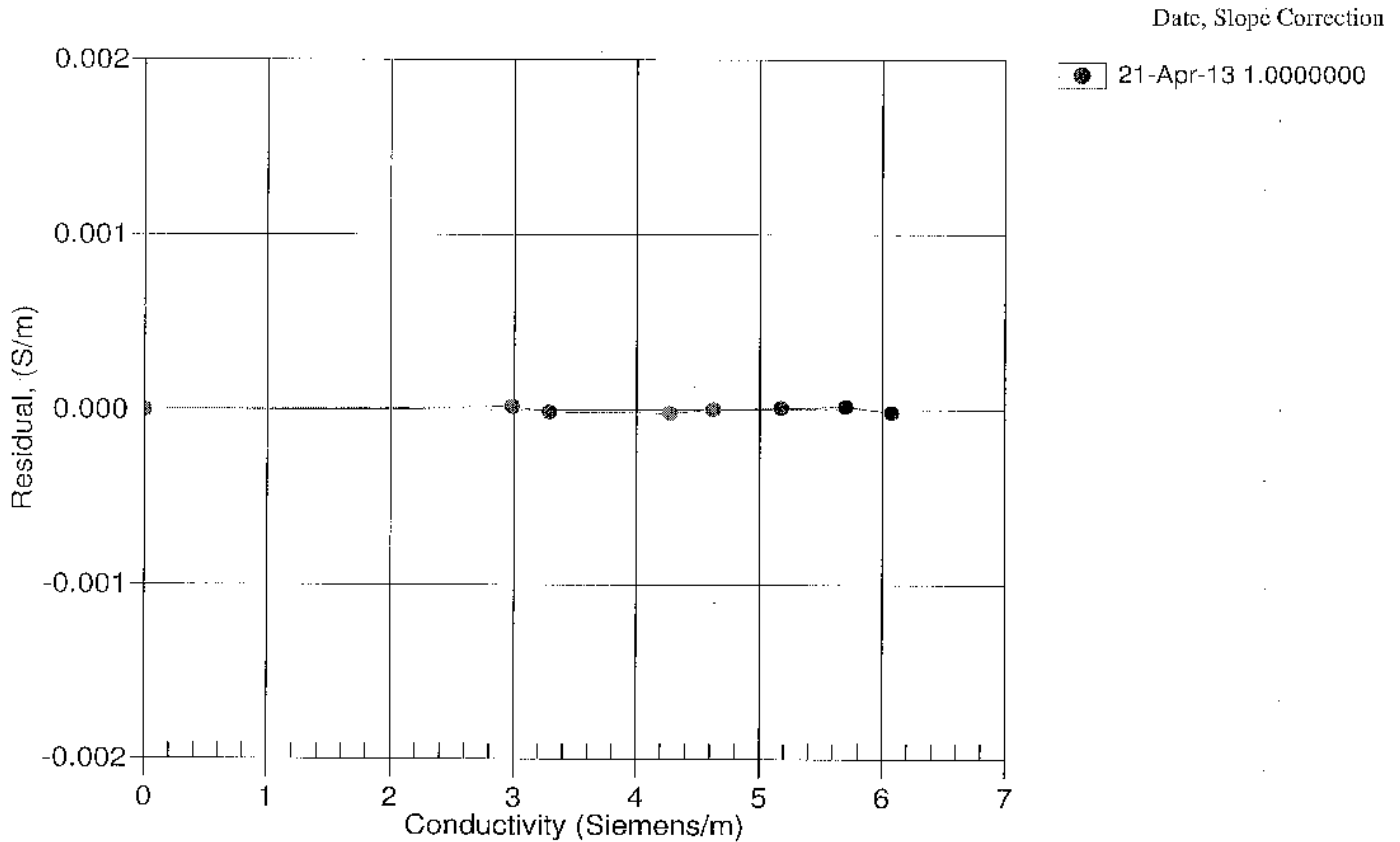
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2688.16	0.00000	0.00000
0.9999	34.8920	2.98181	5394.40	2.98183	0.00002
4.5000	34.8720	3.28946	5599.13	3.28945	-0.00001
15.0105	34.8278	4.27390	6208.24	4.27388	-0.00002
18.5254	34.8184	4.62116	6409.01	4.62117	0.00000
24.0000	34.8059	5.17725	6717.66	5.17726	0.00001
29.0000	34.8004	5.70001	6995.01	5.70003	0.00002
32.5000	34.7976	6.07310	7186.17	6.07308	-0.00002

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

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

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

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9064
 CALIBRATION DATE: 08-Apr-13

SLOCUM PAYLOAD CTD
 PRESSURE CALIBRATION DATA
 1450 psia S/N 3819473

COEFFICIENTS:

PA0 = 3.127759e-001
 PA1 = 4.576474e-003
 PA2 = -1.143505e-011
 PTEMPA0 = -7.240112e+001
 PTEMPA1 = 5.099772e-002
 PTEMPA2 = -4.798451e-007

PTCA0 = 5.256829e+005
 PTCA1 = 3.221034e+000
 PTCA2 = -8.745932e-003
 PTCB0 = 2.550363e+001
 PTCB1 = -1.075000e-003
 PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.64	528880.0	1880.0	14.65
314.88	594428.0	1883.0	314.86
614.84	659938.0	1883.0	614.79
914.80	725483.0	1884.0	914.78
1214.89	791074.0	1884.0	1214.88
1464.95	845739.0	1884.0	1464.92
1214.88	791081.0	1883.0	1214.91
914.77	725501.0	1883.0	914.86
614.85	659947.0	1884.0	614.83
314.90	594441.0	1883.0	314.91
14.65	528882.0	1884.0	14.66

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2099	528980.00
29.00	2027	528975.40
24.00	1923	528962.60
18.53	1814	528943.20
15.01	1743	528930.20
4.50	1530	528902.80
1.00	1459	528890.20

TRMP (ITS90)	SPAN (mV)
-5.00	25.51
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

