

SEA-BIRD ELECTRONICS, INC.
 1808 136th Place N.E., Bellevue, Washington, 98005 USA
 Phone: (425) 643 - 9866 Fax (425) 643 - 9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 5150
 CALIBRATION DATE: 12-Apr-07

SBE19plus TEMPERATURE CALIBRATION DATA
 ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = 1.307670e-003
 a1 = 2.536673e-004
 a2 = 7.562725e-007
 a3 = 1.121774e-007

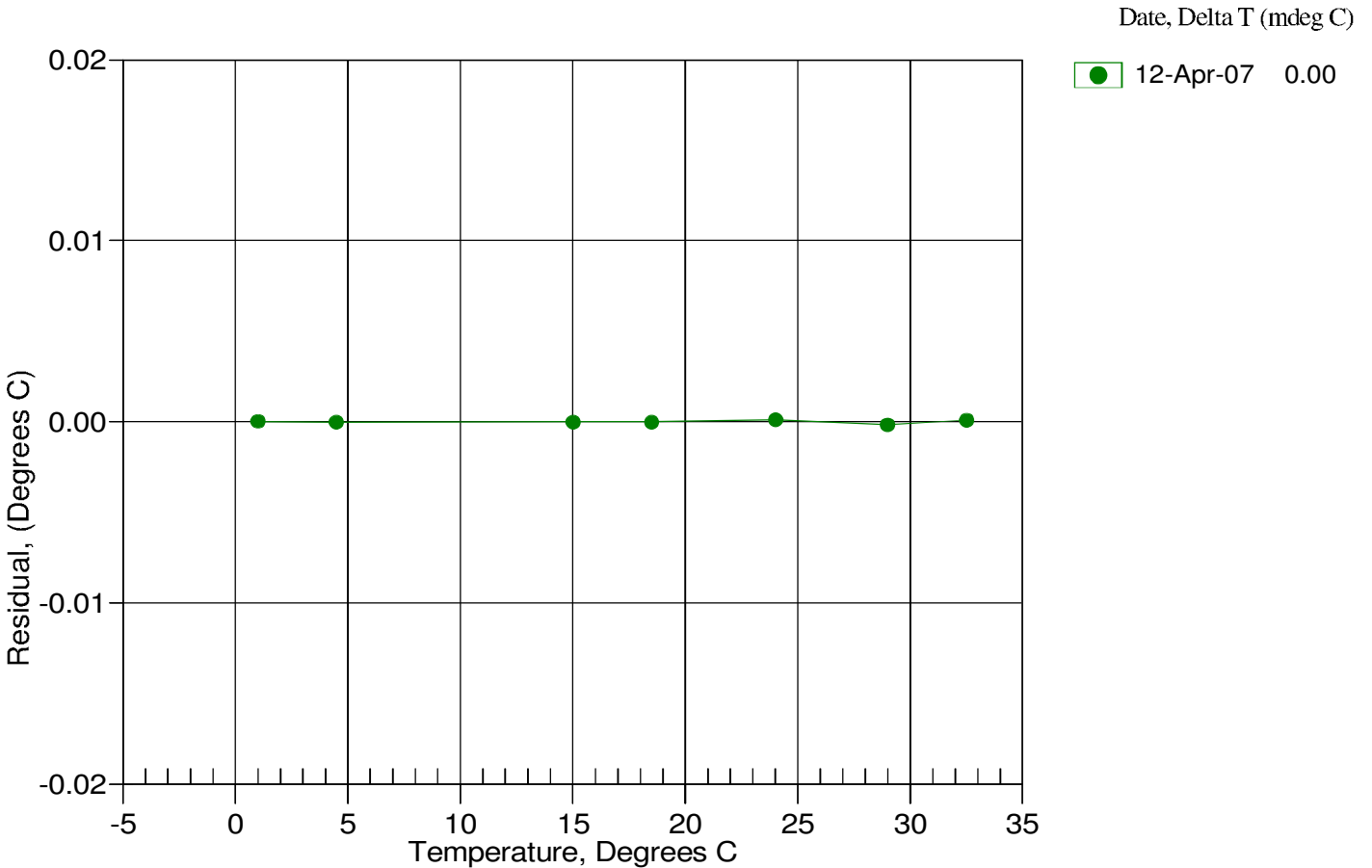
BATH TEMP (ITS-90)	INSTRUMENT OUTPUT(n)	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0001	607479.390	1.0001	0.0000
4.5000	537787.153	4.5000	-0.0000
15.0000	365875.508	15.0000	-0.0000
18.5000	320019.492	18.5000	-0.0000
24.0000	258009.831	24.0001	0.0001
29.0000	211024.441	28.9999	-0.0002
32.5000	182741.678	32.5001	0.0001

$MV = (n - 524288) / 1.6e+007$

$R = (MV * 2.900e+009 + 1.024e+008) / (2.048e+004 - MV * 2.0e+005)$

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

Residual = instrument temperature - bath temperature



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SBE19plus CONDUCTIVITY CALIBRATION DATA
 PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.878497e-001
 h = 1.527379e-001
 i = -3.132961e-004
 j = 4.713150e-005

CPcor = -9.5700e-008
 CTcor = 3.2500e-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	2547.26	0.0000	0.00000
1.0001	34.8368	2.97755	5101.53	2.9776	0.00000
4.5000	34.8164	3.28474	5294.86	3.2847	-0.00000
15.0000	34.7728	4.26684	5869.68	4.2668	-0.00001
18.5000	34.7633	4.61210	6058.55	4.6121	-0.00000
24.0000	34.7527	5.17021	6351.69	5.1702	0.00002
29.0000	34.7466	5.69219	6613.75	5.6922	-0.00001
32.5000	34.7416	6.06444	6794.30	6.0644	0.00000

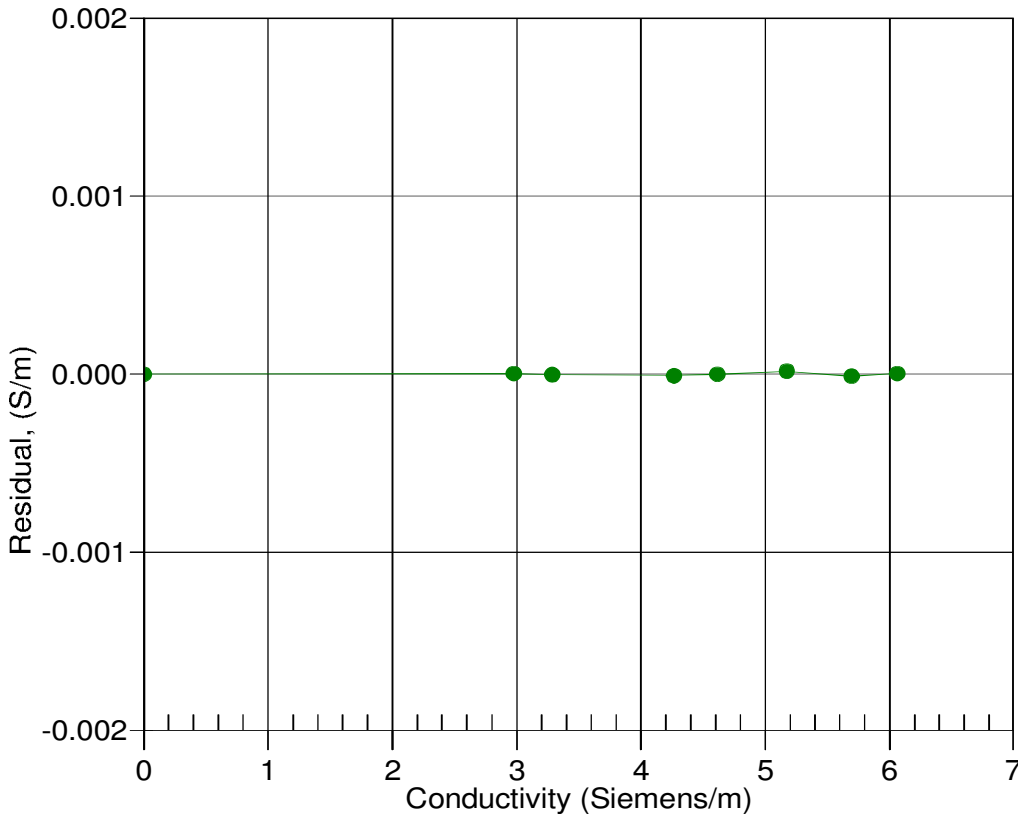
$f = \text{INST FREQ} / 1000.0$

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

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

Residual = instrument conductivity - bath conductivity

Date, Slope Correction



12-Apr-07 1.0000000

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SENSOR SERIAL NUMBER: 5150
 CALIBRATION DATE: 10-Apr-07

SBE19plus PRESSURE CALIBRATION DATA
 10000 psia S/N 227495

COEFFICIENTS:

PA0 = 1.941052e+001	PTCA0 = 5.242070e+005
PA1 = 1.107023e-001	PTCA1 = 9.072749e+000
PA2 = -1.075960e-009	PTCA2 = 1.024348e-002
PTEMPA0 = 5.938303e+001	PTCB0 = 2.766000e+001
PTEMPA1 = -5.964830e+001	PTCB1 = 4.833333e-003
PTEMPA2 = 1.425784e+001	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.73	524351.0	0.8	14.76	0.00
2002.27	542369.3	0.8	2001.96	-0.00
3989.48	560392.6	0.8	3989.08	-0.00
5976.75	578429.1	0.8	5976.92	0.00
7964.10	596467.5	0.8	7964.26	0.00
9951.77	614513.8	0.8	9951.74	-0.00
7964.05	596464.2	0.8	7963.89	-0.00
5976.38	578424.1	0.8	5976.29	-0.00
3989.12	560397.9	0.8	3989.60	0.00
2001.89	542370.3	0.8	2001.97	0.00
14.73	524353.4	0.8	14.80	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	0.52	524485.12
29.00	0.59	524447.88
24.00	0.71	524402.44
18.50	0.86	524348.31
15.00	0.97	524316.73
4.50	1.38	524221.63
1.00	1.54	524185.25
TEMP (ITS90)	SPAN (mV)	
0.00	27.66	
30.00	27.81	

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

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

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

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

Date, Avg Delta P %FS

10-Apr-07 0.00

