

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: 9059
CALIBRATION DATE: 12-Mar-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = -1.414339e-004
a1 = 3.138171e-004
a2 = -5.007798e-006
a3 = 2.167583e-007

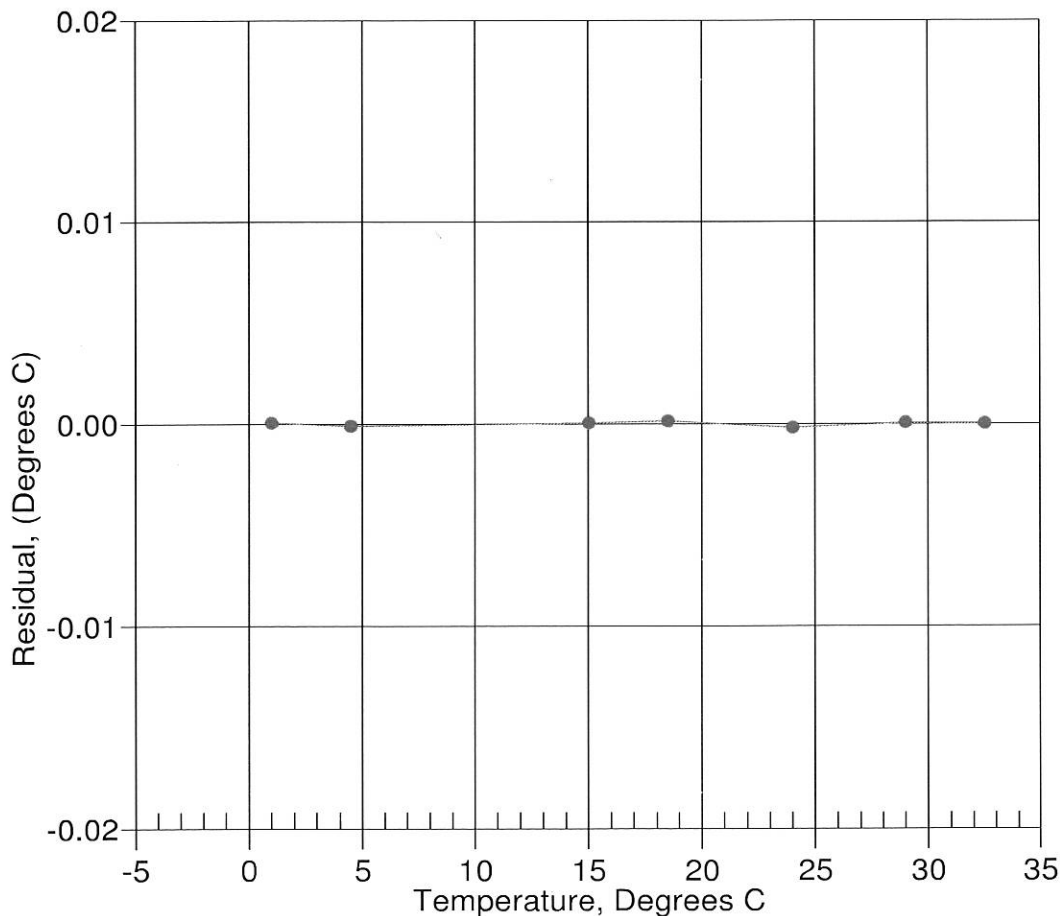
BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	579634.2	1.0001	0.0001
4.4999	495945.6	4.4998	-0.0001
14.9999	316773.0	14.9999	0.0000
18.5000	274506.0	18.5001	0.0001
24.0000	220503.6	23.9998	-0.0002
29.0000	181788.8	29.0001	0.0001
32.5000	159339.4	32.5000	0.0000

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

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

Date, Delta T (mdeg C)

12-Mar-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 = -9.709534e-001
h = 1.349551e-001
i = -3.897382e-004
j = 4.637896e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 1.9210e-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	2689.34	0.00000	0.00000
1.0000	34.9735	2.98812	5431.39	2.98813	0.00002
4.4999	34.9539	3.29641	5638.35	3.29640	-0.00002
14.9999	34.9116	4.28205	6253.41	4.28204	-0.00001
18.5000	34.9023	4.62854	6455.40	4.62854	-0.00000
24.0000	34.8922	5.18867	6768.84	5.18867	0.00001
29.0000	34.8866	5.71253	7048.98	5.71256	0.00002
32.5000	34.8835	6.08638	7242.02	6.08636	-0.00002

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

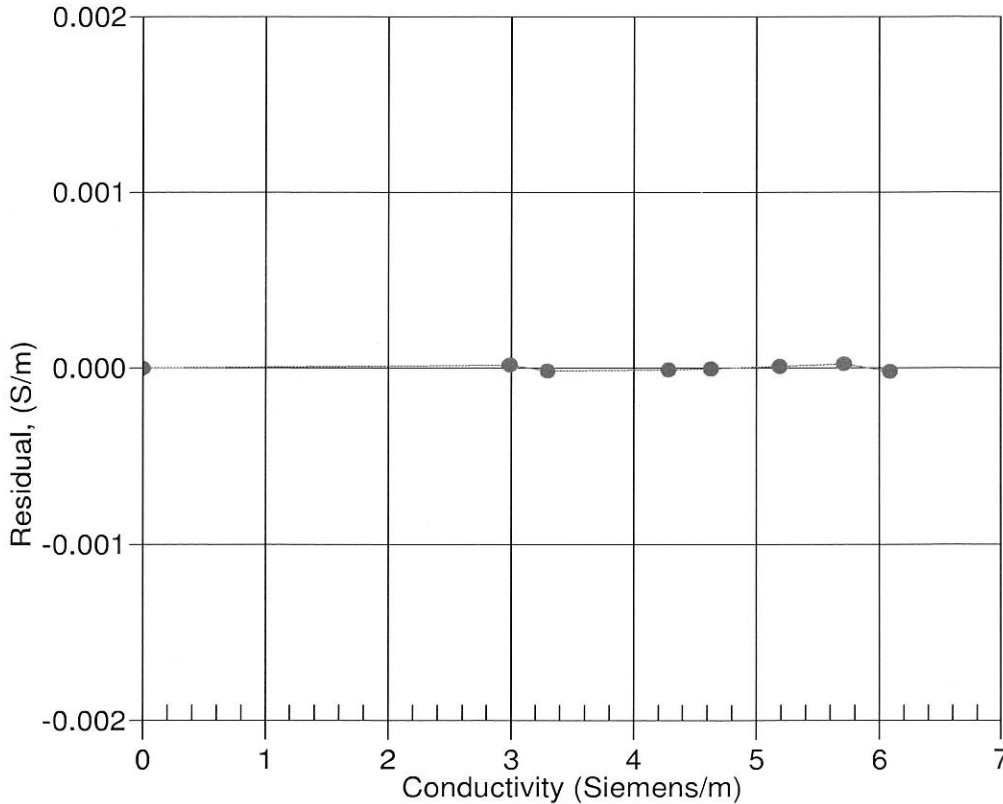
$$\text{Conductivity} = (g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p) \text{ Siemens/meter}$$

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

Residual = instrument conductivity - bath conductivity

Date, Slope Correction

● 12-Mar-13 1.0000000



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SENSOR SERIAL NUMBER: 9059
 CALIBRATION DATE: 05-Mar-13

SLOCUM PAYLOAD CTD
 PRESSURE CALIBRATION DATA
 1450 psia S/N 3806522

COEFFICIENTS:

PA0 = 3.380269e-001	PTCA0 = 5.251447e+005
PA1 = 4.592856e-003	PTCA1 = 2.403428e+000
PA2 = -1.998345e-011	PTCA2 = 4.039182e-002
PTEMPA0 = -6.937198e+001	PTCB0 = 2.535088e+001
PTEMPA1 = 5.092925e-002	PTCB1 = -4.250000e-004
PTEMPA2 = -1.886257e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.50	528299.0	1802.0	14.50	-0.00
314.78	593673.0	1808.0	314.77	-0.00
614.84	659027.0	1809.0	614.78	-0.00
914.89	724436.0	1809.0	914.87	-0.00
1214.93	789872.0	1811.0	1214.91	-0.00
1464.96	844431.0	1810.0	1464.95	-0.00
1214.91	789882.0	1810.0	1214.95	0.00
914.89	724451.0	1810.0	914.93	0.00
614.87	659049.0	1810.0	614.88	0.00
314.80	593689.0	1809.0	314.84	0.00
14.50	528302.0	1811.0	14.51	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2015	528438.20
29.00	1945	528423.80
24.00	1846	528399.80
18.50	1737	528378.40
15.00	1667	528360.60
4.50	1458	528332.40
1.00	1389	528320.00

TEMP (ITS90)	SPAN (mV)
-5.00	25.35
35.00	25.34

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

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

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

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

Date, Avg Delta P %FS

● 05-Mar-13 0.00

