

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: 9024
CALIBRATION DATE: 21-Aug-12

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

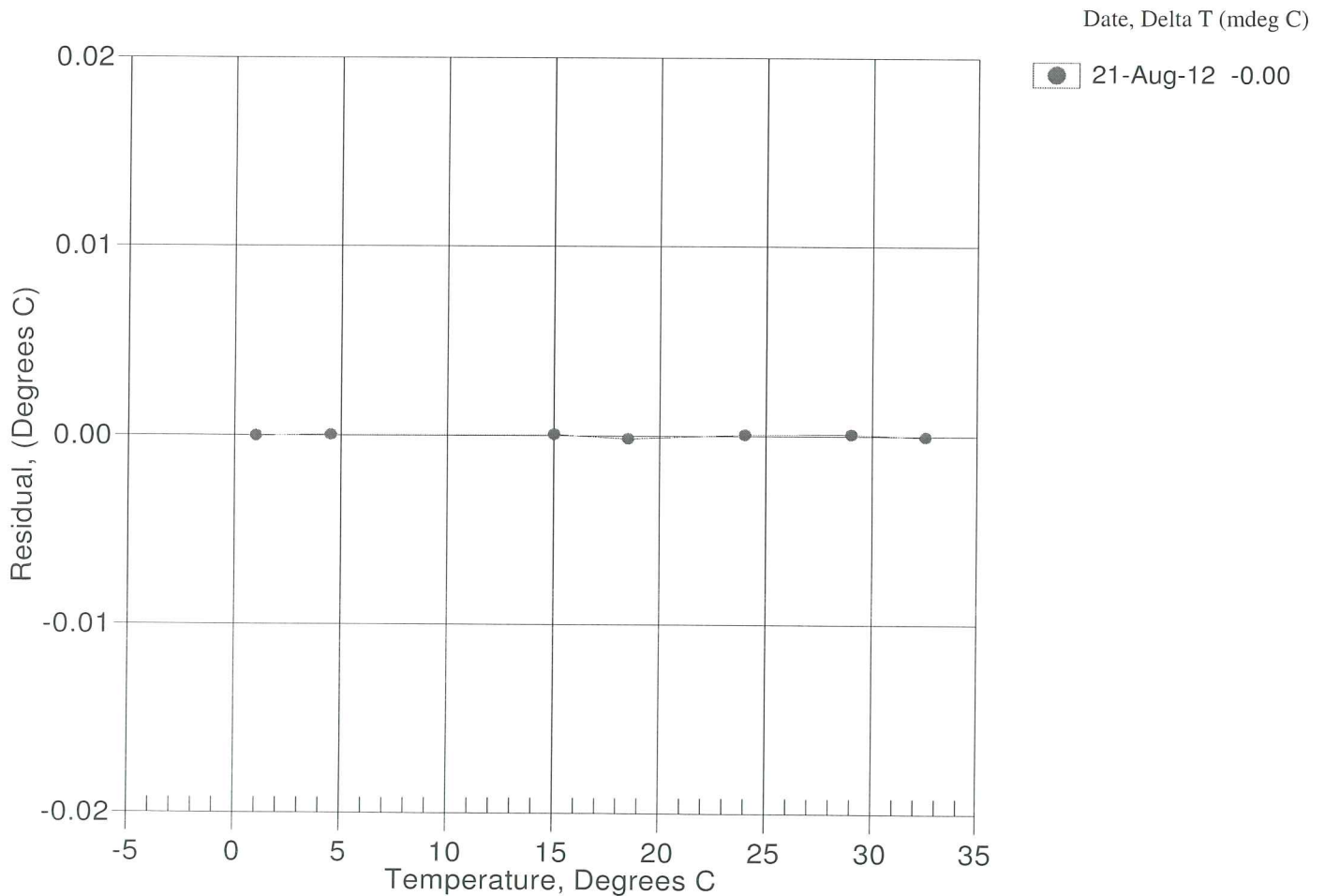
ITS-90 COEFFICIENTS

a0 = -1.345756e-004
a1 = 3.159615e-004
a2 = -5.229818e-006
a3 = 2.207758e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
0.9999	568681.9	0.9999	-0.0000
4.4999	486113.6	4.4999	0.0000
15.0000	309673.6	15.0001	0.0001
18.5000	268135.1	18.4998	-0.0002
23.9999	215111.3	24.0000	0.0001
29.0000	177150.5	29.0001	0.0001
32.5000	155160.0	32.4999	-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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CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.667416e-001
h = 1.332655e-001
i = -1.512049e-004
j = 2.872177e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = -4.9462e-007

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	2695.40	0.00000	0.00000
0.9999	34.9676	2.98765	5446.72	2.98765	-0.00000
4.4999	34.9481	3.29592	5654.34	3.29592	0.00000
15.0000	34.9052	4.28136	6271.30	4.28136	-0.00000
18.5000	34.8959	4.62779	6473.95	4.62778	-0.00000
23.9999	34.8854	5.18776	6788.45	5.18775	-0.00000
29.0000	34.8782	5.71131	7069.53	5.71132	0.00001
32.5000	34.8726	6.08469	7263.15	6.08469	-0.00001

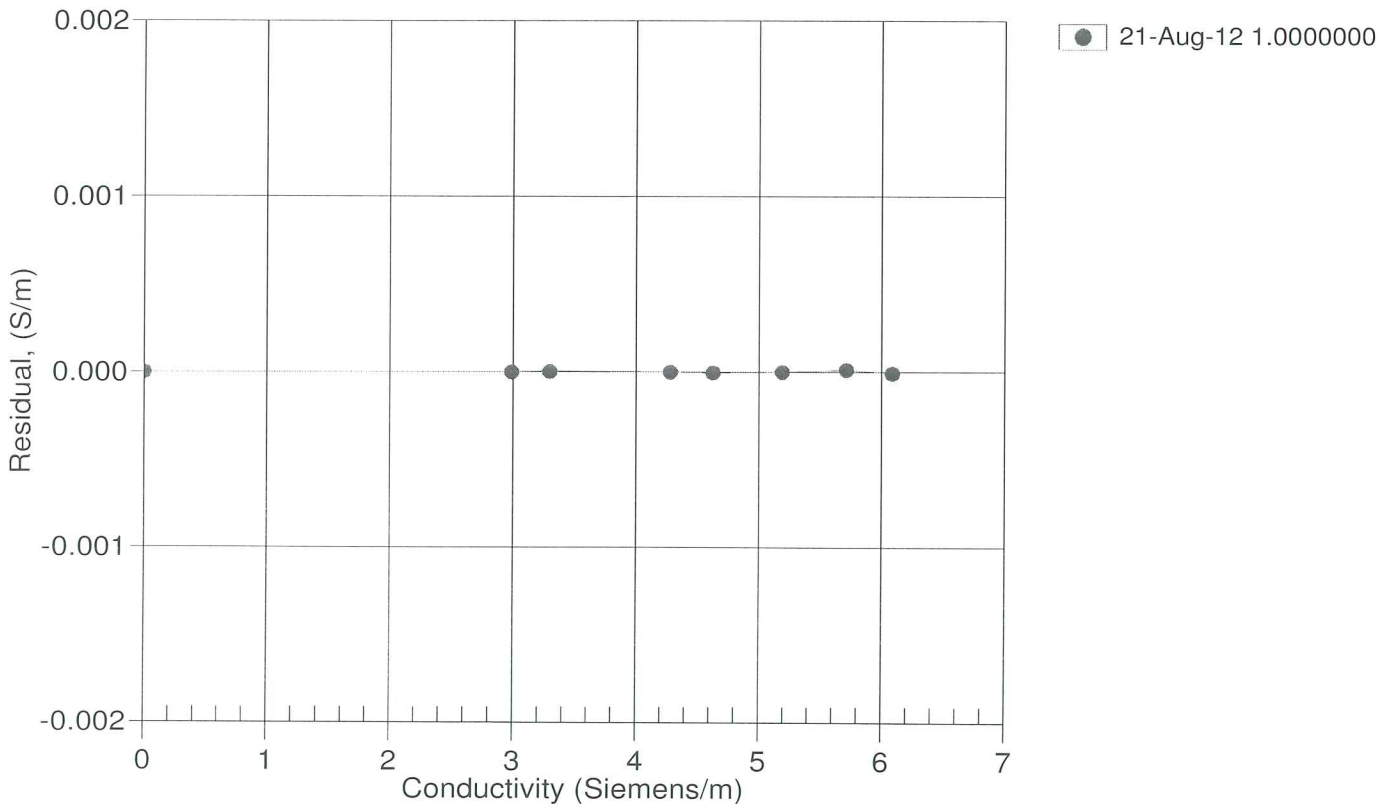
$$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

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

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

Residual = instrument conductivity - bath conductivity

Date, Slope Correction



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CALIBRATION DATE: 16-Aug-12

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3647165

COEFFICIENTS:

PA0 = 6.211874e-003
PA1 = 4.569827e-003
PA2 = -2.434759e-011
PTEMPA0 = -6.869473e+001
PTEMPA1 = 5.244894e-002
PTEMPA2 = -6.733394e-007

PTCA0 = 5.234678e+005
PTCA1 = -5.433910e-001
PTCA2 = 2.450267e-002
PTCB0 = 2.520525e+001
PTCB1 = -3.500000e-004
PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.57	526662.0	1777.0	14.61	0.00
314.95	592379.0	1780.0	314.90	-0.00
614.94	658080.0	1781.0	614.91	-0.00
914.87	723822.0	1783.0	914.90	0.00
1214.84	789605.0	1783.0	1214.86	0.00
1464.84	844450.0	1783.0	1464.79	-0.00
1214.85	789607.0	1784.0	1214.87	0.00
914.88	723828.0	1784.0	914.93	0.00
614.94	658083.0	1784.0	614.93	-0.00
314.95	592384.0	1784.0	314.92	-0.00
14.58	526660.0	1784.0	14.60	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	1980	526721.20
29.00	1909	526717.80
24.00	1809	526713.70
18.50	1700	526710.90
15.00	1630	526709.60
4.50	1421	526713.20
1.00	1352	526710.70

TEMP (ITS90)	SPAN (mV)
-5.00	25.21
35.00	25.19

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

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

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

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

Date, Avg Delta P %FS

● 16-Aug-12 0.00

