

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: 9103
 CALIBRATION DATE: 25-Jul-13

SLOCUM PAYLOAD CTD
 TEMPERATURE CALIBRATION DATA
 ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = -8.412406e-005
 a1 = 3.046707e-004
 a2 = -4.376801e-006
 a3 = 1.983478e-007

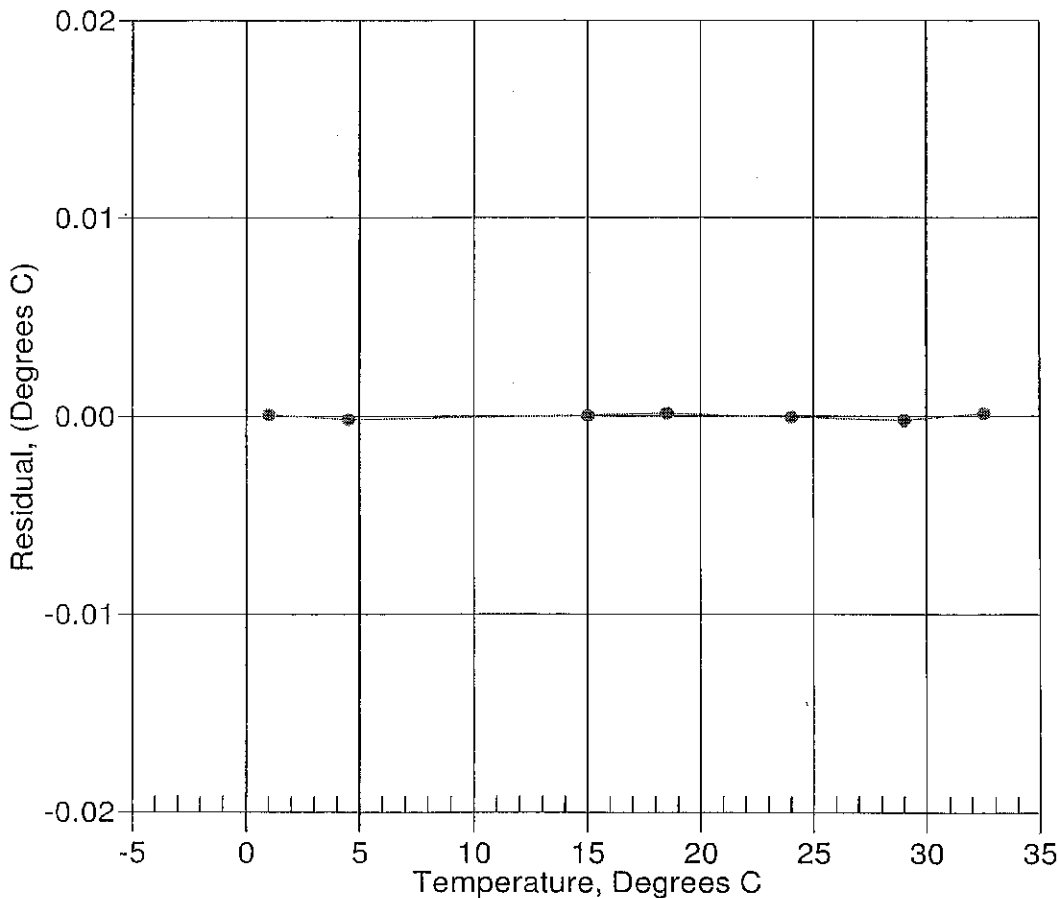
BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
0.9999	571724.8	1.0000	0.0001
4.5000	488600.2	4.4998	-0.0002
15.0000	311039.6	15.0000	0.0000
18.5000	269253.8	18.5001	0.0001
23.9999	215936.8	23.9998	-0.0001
29.0000	177774.4	28.9998	-0.0002
32.5000	155668.4	32.5001	0.0001

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

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

Date, Delta T (mdeg C)

25-Jul-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 = -9.739180e-001
h = 1.369760e-001
i = -2.237447e-004
j = 3.620343e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 3.7452e-007

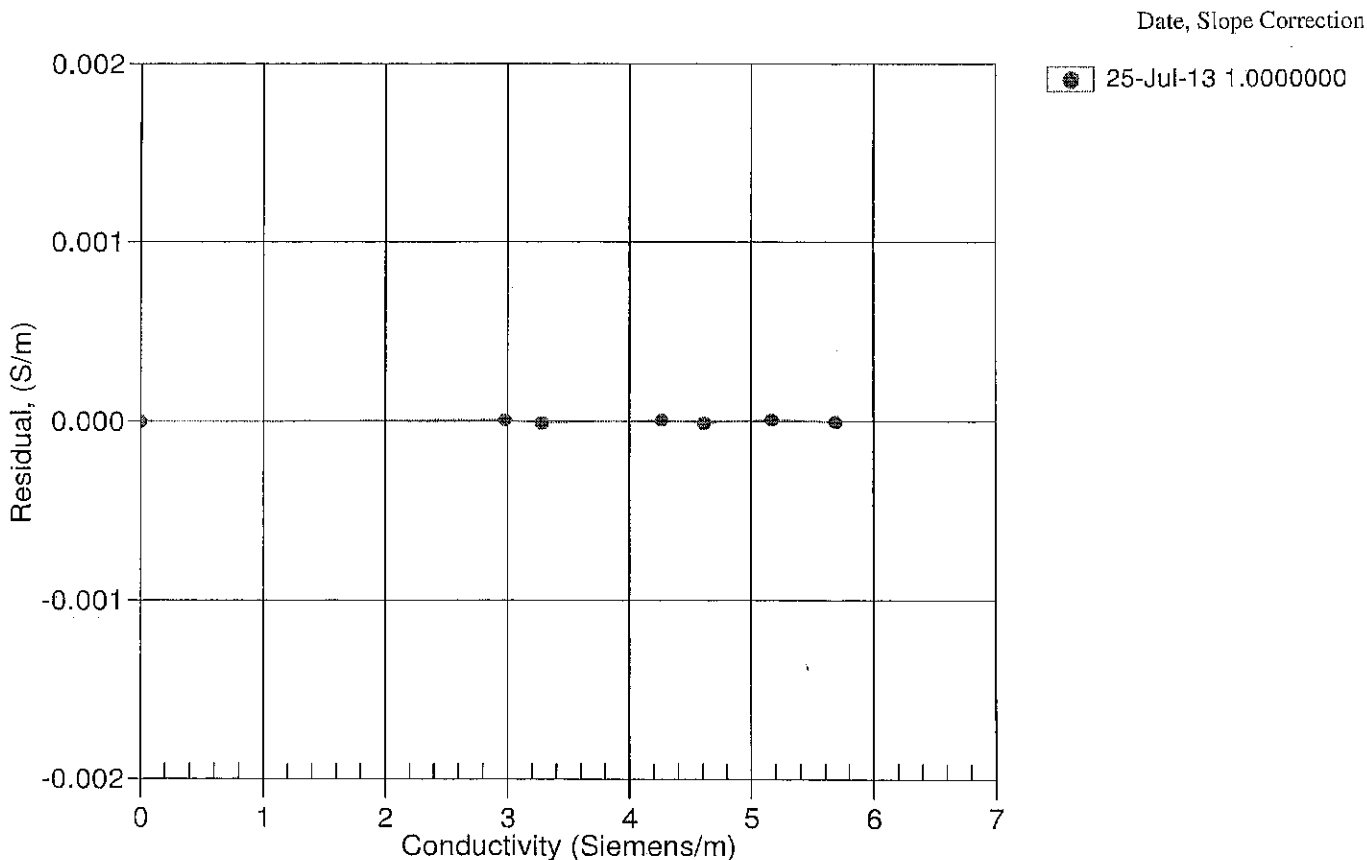
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2669.78	0.00000	0.00000
0.9999	34.7828	2.97337	5371.27	2.97337	0.00001
4.5000	34.7628	3.28017	5575.40	3.28016	-0.00001
15.0000	34.7198	4.26103	6182.17	4.26103	0.00001
18.5000	34.7103	4.60582	6381.46	4.60581	-0.00001
23.9999	34.6995	5.16316	6690.76	5.16317	0.00001
29.0000	34.6932	5.68442	6967.25	5.68442	-0.00000

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

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

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

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9103
CALIBRATION DATE: 22-Jul-13

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3912713

COEFFICIENTS:

PA0 = 2.627737e-001	PTCA0 = 5.251740e+005
PA1 = 4.495685e-003	PTCA1 = 2.232960e+000
PA2 = -1.627348e-011	PTCA2 = 1.778445e-002
PTEMPA0 = -6.943296e+001	PTCB0 = 2.530875e+001
PTEMPA1 = 5.161590e-002	PTCB1 = -2.500000e-004
PTEMPA2 = -4.520043e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.63	528430.0	1797.0	14.65	0.00
314.93	595219.0	1800.0	314.89	-0.00
614.93	661973.0	1802.0	614.84	-0.01
914.94	728789.0	1802.0	914.92	-0.00
1214.93	795619.0	1804.0	1214.91	-0.00
1464.96	851340.0	1803.0	1464.93	-0.00
1214.95	795636.0	1804.0	1214.99	0.00
914.92	728807.0	1804.0	915.00	0.01
614.90	661993.0	1804.0	614.93	0.00
314.86	595221.0	1804.0	314.90	0.00
14.63	528426.0	1806.0	14.62	-0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2010	528499.40
29.00	1940	528489.00
24.00	1840	528473.80
18.50	1730	528455.60
15.00	1660	528445.40
4.50	1451	528419.80
1.00	1381	528410.80

TEMP (ITS90)	SPAN (mV)
-5.00	25.31
35.00	25.30

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

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

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

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

Date, Avg Delta P %FS

● 22-Jul-13 -0.00

