

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: 9058
CALIBRATION DATE: 15-Mar-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = -5.485353e-005
a1 = 2.962416e-004
a2 = -3.632072e-006
a3 = 1.785752e-007

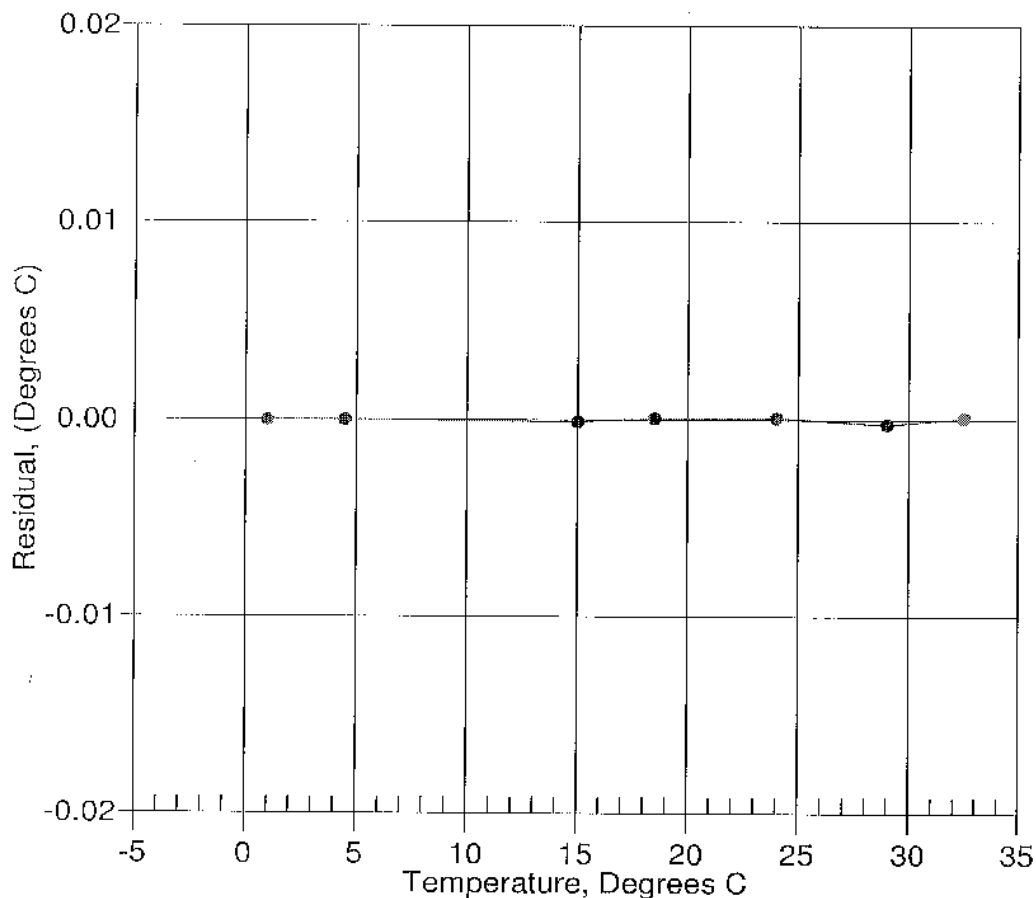
BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	567189.6	1.0000	0.0000
4.4999	484942.6	4.4999	-0.0000
15.0000	309129.8	14.9999	-0.0001
18.5000	267717.6	18.5001	0.0001
24.0000	214847.6	24.0001	0.0001
29.0000	176985.8	28.9998	-0.0002
32.5000	155041.2	32.5001	0.0001

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

Residual = instrument temperature - bath temperature

Date, Delta T (mdeg C)

15-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:

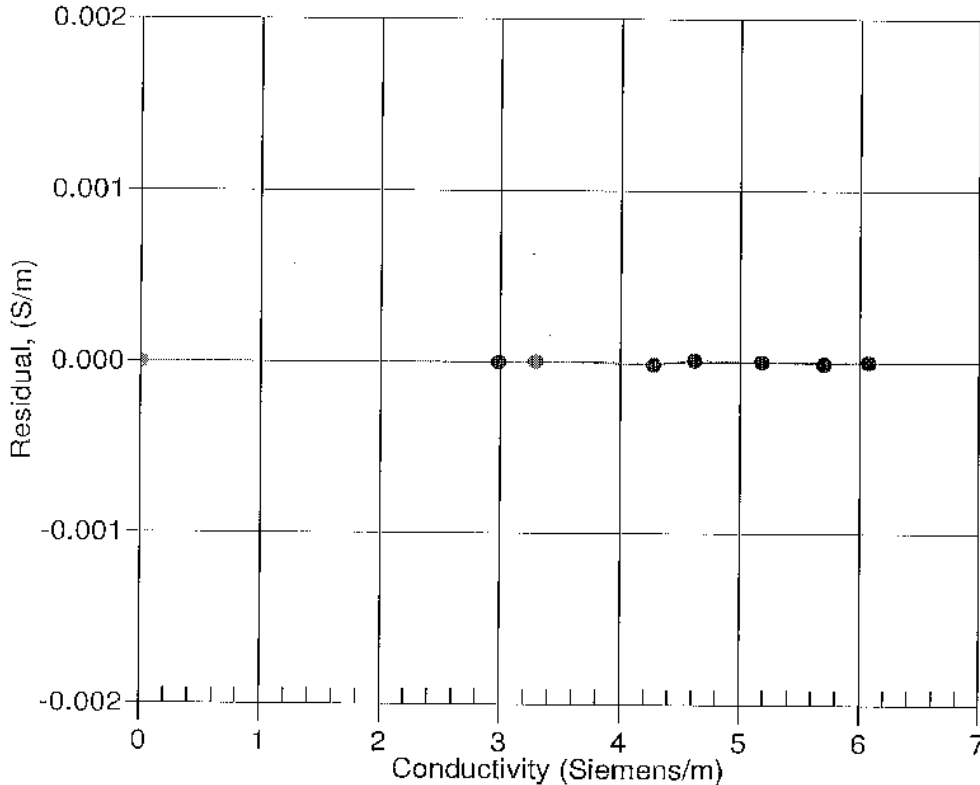
g = -9.862683e-001	CPcor = -9.5700e-008
h = 1.321655e-001	CTcor = 3.2500e-006
i = -3.789418e-004	WBOTC = 1.8253e-006
j = 4.408728e-005	

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	2739.02	0.00000	0.00000
1.0000	34.8831	2.98113	5494.54	2.98113	-0.00000
4.4999	34.8631	3.28869	5703.03	3.28870	0.00000
15.0000	34.8199	4.27201	6322.78	4.27199	-0.00001
18.5000	34.8106	4.61769	6526.38	4.61771	0.00001
24.0000	34.8004	5.17652	6842.34	5.17653	0.00000
29.0000	34.7945	5.69915	7124.77	5.69914	-0.00001
32.5000	34.7915	6.07215	7319.46	6.07216	0.00000

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



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SENSOR SERIAL NUMBER: 9058
CALIBRATION DATE: 08-Mar-13

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3805657

COEFFICIENTS:

PA0 = 5.948109e-002	PTCA0 = 5.252298e+005
PA1 = 4.536691e-003	PTCA1 = 1.277427e+000
PA2 = -1.659471e-011	PTCA2 = -1.196268e-002
PTEMPA0 = -7.072971e+001	PTCB0 = 2.520600e+001
PTEMPA1 = 5.187247e-002	PTCB1 = 2.600000e-003
PTEMPA2 = -5.098047e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.65	528485.0	1826.0	14.69	0.00
314.97	594826.0	1830.0	314.88	-0.01
614.96	661163.0	1831.0	614.91	-0.00
914.96	727543.0	1831.0	914.98	0.00
1214.97	793939.0	1832.0	1214.98	0.00
1465.04	849298.0	1832.0	1465.00	-0.00
1214.96	793937.0	1832.0	1214.97	0.00
915.03	727569.0	1832.0	915.10	0.00
614.97	661186.0	1832.0	615.01	0.00
315.05	594854.0	1831.0	315.01	-0.00
14.65	528484.0	1833.0	14.68	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2030	528544.00
29.00	1961	528545.40
24.00	1860	528539.80
18.50	1750	528535.20
15.00	1680	528531.60
4.50	1472	528524.60
1.00	1402	528515.80

TEMP (ITS90)	SPAN (mV)
-5.00	25.19
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

08-Mar-13 -0.00

