

# 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: 9085  
 CALIBRATION DATE: 02-Jun-13

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

COEFFICIENTS:

g = -9.899431e-001  
 h = 1.365737e-001  
 i = -2.436911e-004  
 j = 3.635655e-005

CPcor = -9.5700e-008  
 CTcor = 3.2500e-006  
 WBOTC = 3.0905e-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	2696.16	0.00000	0.00000
1.0000	34.7803	2.97318	5391.93	2.97317	-0.00001
4.5000	34.7607	3.27999	5596.14	3.28001	0.00001
15.0000	34.7189	4.26093	6203.25	4.26093	0.00000
18.5000	34.7104	4.60583	6402.77	4.60584	0.00001
24.0000	34.7011	5.16338	6712.43	5.16337	-0.00002
29.0000	34.6965	5.68490	6989.35	5.68490	-0.00000
32.5000	34.6945	6.05715	7180.27	6.05716	0.00001

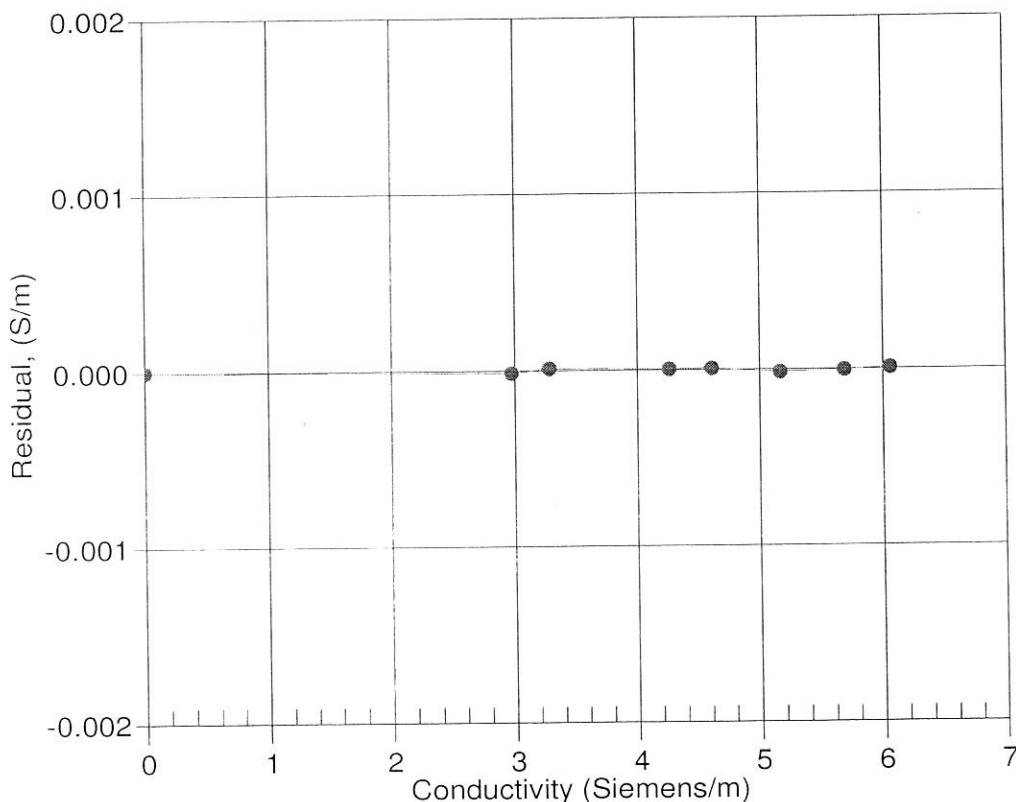
$$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

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

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

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

Date, Slope Correction



● 02-Jun-13 1.0000000

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CALIBRATION DATE: 02-Jun-13

SLOCUM PAYLOAD CTD  
TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

## ITS-90 COEFFICIENTS

a0 = -4.811588e-005  
a1 = 2.957206e-004  
a2 = -3.646061e-006  
a3 = 1.798966e-007

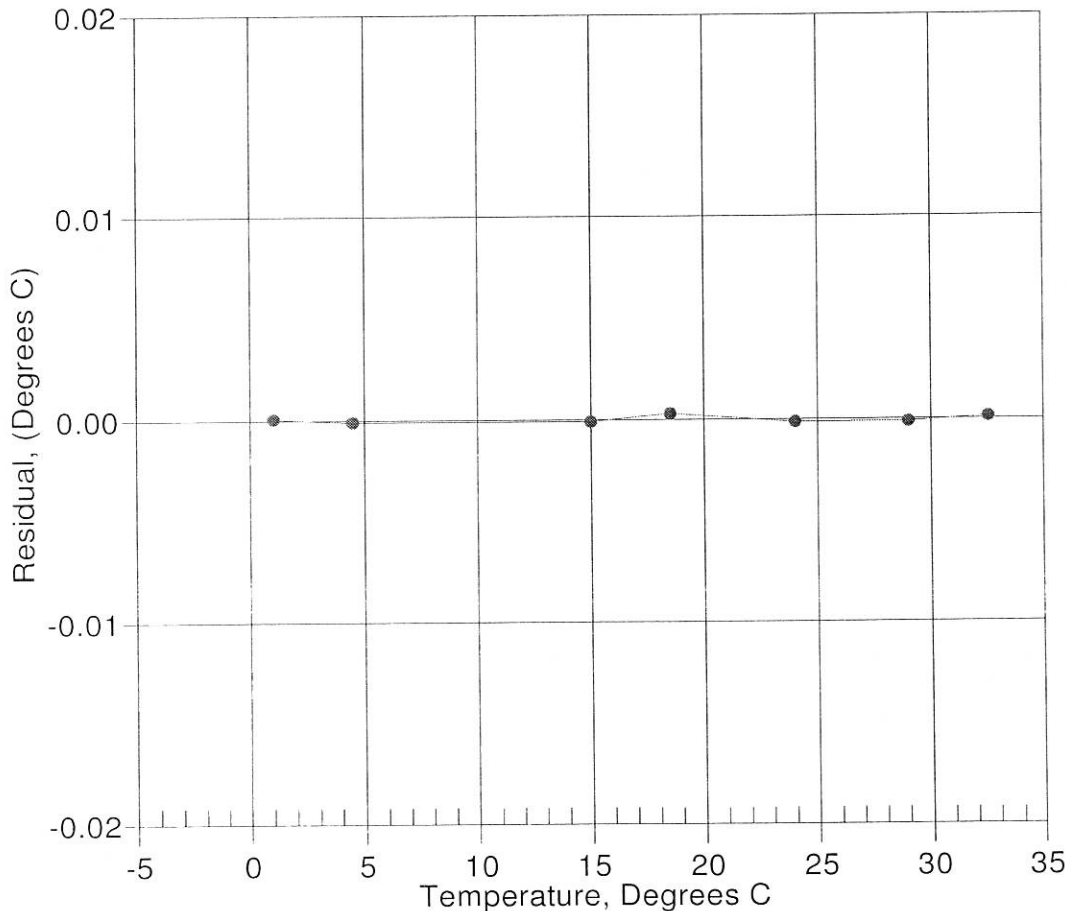
BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	566315.2	1.0001	0.0001
4.5000	484140.8	4.4999	-0.0001
15.0000	308506.0	14.9999	-0.0001
18.5000	267140.6	18.5003	0.0003
24.0000	214343.8	23.9999	-0.0001
29.0000	176534.0	28.9999	-0.0001
32.5000	154624.6	32.5001	0.0001

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

Residual = instrument temperature - bath temperature

Date, Delta T (mdeg C)

02-Jun-13 0.00



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SENSOR SERIAL NUMBER: 9085  
 CALIBRATION DATE: 30-May-13

SLOCUM PAYLOAD CTD  
 PRESSURE CALIBRATION DATA  
 1450 psia S/N 3846544

**COEFFICIENTS:**

PA0 = 1.807127e-001	PTCA0 = 5.245903e+005
PA1 = 4.492846e-003	PTCA1 = 1.808882e+000
PA2 = -1.638462e-011	PTCA2 = -3.258806e-003
PTEMPA0 = -7.353084e+001	PTCB0 = 2.545600e+001
PTEMPA1 = 5.181910e-002	PTCB1 = -6.000000e-004
PTEMPA2 = -7.004422e-007	PTCB2 = 0.000000e+000

**PRESSURE SPAN CALIBRATION**

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.63	527851.0	1888.0	14.67	0.00
314.95	594646.0	1891.0	314.84	-0.01
614.96	661445.0	1893.0	614.89	-0.00
915.00	728298.0	1894.0	915.03	0.00
1215.00	795145.0	1894.0	1215.00	0.00
1465.02	850871.0	1895.0	1464.96	-0.00
1215.00	795156.0	1895.0	1215.05	0.00
915.00	728305.0	1895.0	915.06	0.00
614.96	661464.0	1895.0	614.97	0.00
314.90	594659.0	1894.0	314.90	0.00
14.64	527854.0	1896.0	14.68	0.00

**THERMAL CORRECTION**

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2106	527912.00
29.00	2034	527910.60
24.00	1933	527903.40
18.50	1821	527890.60
15.00	1750	527882.20
4.50	1538	527868.80
1.00	1467	527860.20

TEMP (ITS90)	SPAN (mV)
-5.00	25.46
35.00	25.43

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

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

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

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

Date, Avg Delta P %FS

● 30-May-13 -0.00

