

# 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: 9214  
CALIBRATION DATE: 27-Jun-14

SLOCUM PAYLOAD CTD  
PRESSURE CALIBRATION DATA  
1450 psia S/N 4174972

**COEFFICIENTS:**

PA0 = 2.407972e-001	PTCA0 = 5.242545e+005
PA1 = 4.592215e-003	PTCA1 = 8.248187e-001
PA2 = -1.428727e-011	PTCA2 = 3.340671e-002
PTEMPA0 = -6.904357e+001	PTCB0 = 2.543975e+001
PTEMPA1 = 5.154758e-002	PTCB1 = -8.500000e-004
PTEMPA2 = -5.318979e-007	PTCB2 = 0.000000e+000

**PRESSURE SPAN CALIBRATION**

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.47	527396.0	1900.0	14.47	-0.00
314.64	592719.0	1905.0	314.65	0.00
614.66	658021.0	1906.0	614.61	-0.00
914.63	723353.0	1907.0	914.59	-0.00
1214.59	788706.0	1908.0	1214.55	-0.00
1464.55	843191.0	1910.0	1464.54	-0.00
1214.60	788730.0	1909.0	1214.66	0.00
914.61	723363.0	1909.0	914.64	0.00
614.63	658027.0	1910.0	614.64	0.00
314.64	592725.0	1910.0	314.67	0.00
14.47	527399.0	1913.0	14.47	-0.00

**THERMAL CORRECTION**

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2012	527491.00
29.00	1941	527482.00
24.00	1840	527469.40
18.50	1729	527455.80
15.00	1659	527449.00
4.50	1448	527433.80
1.00	1378	527430.60
TEMP (ITS90)		SPAN (mV)
-5.00	25.44	
35.00	25.41	

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

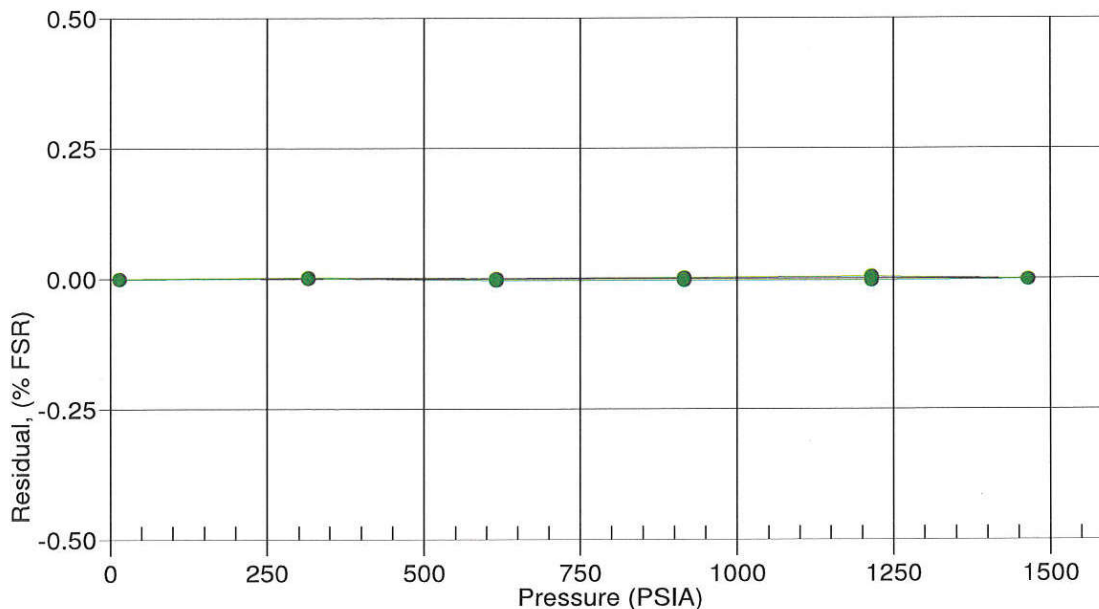
$$x = \text{pressure output} - PTCA0 - PTCA1 * t - PTCA2 * t^2$$

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

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

Date, Avg Delta P %FS

27-Jun-14 -0.00



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

**COEFFICIENTS:**

g = -9.958201e-001	CPcor = -9.5700e-008
h = 1.493609e-001	CTcor = 3.2500e-006
i = -2.477966e-004	WBOTC = 3.5453e-007
j = 3.975261e-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	2585.33	0.00000	0.00000
1.0000	34.7117	2.96787	5155.32	2.96791	0.00003
4.5000	34.6918	3.27413	5350.16	3.27410	-0.00003
15.0000	34.6476	4.25310	5929.63	4.25308	-0.00002
18.5000	34.6360	4.59702	6119.95	4.59704	0.00002
24.0000	34.6226	5.15299	6415.37	5.15299	0.00000
28.9999	34.6160	5.67318	6679.68	5.67321	0.00003
32.5000	34.6122	6.04441	6861.87	6.04439	-0.00002

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

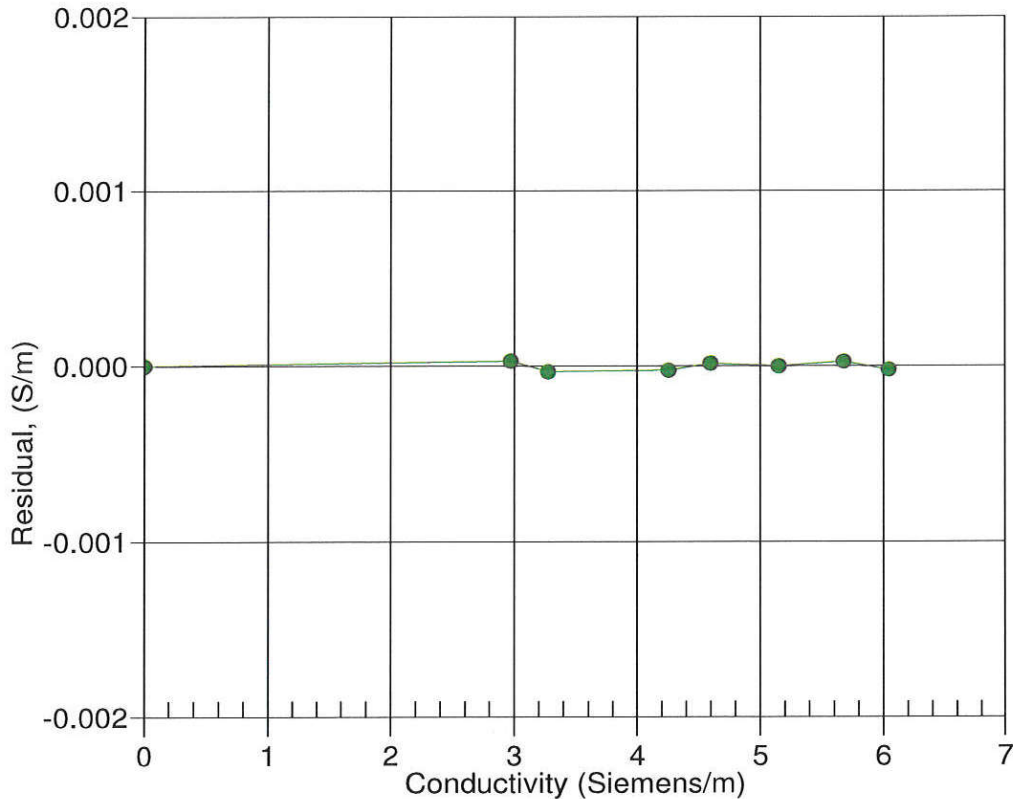
$$\text{Conductivity} = (g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p) \text{ Siemens/meter}$$

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

Residual = instrument conductivity - bath conductivity

Date, Slope Correction

29-Jun-14 1.0000000



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SLOCUM PAYLOAD CTD  
TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

## ITS-90 COEFFICIENTS

a0 = -1.657841e-004  
a1 = 3.194952e-004  
a2 = -5.447582e-006  
a3 = 2.292560e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	574254.8	1.0001	0.0001
4.5000	491482.0	4.4998	-0.0002
15.0000	314166.8	15.0000	0.0000
18.5000	272313.4	18.5002	0.0002
24.0000	218823.6	23.9999	-0.0001
28.9999	180465.0	28.9997	-0.0002
32.5000	158211.0	32.5002	0.0002

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

