

# 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: 9102  
CALIBRATION DATE: 16-Jul-13

SLOCUM PAYLOAD CTD  
PRESSURE CALIBRATION DATA  
1450 psia S/N 3912712

**COEFFICIENTS:**

PA0 = 2.047604e-001	PTCA0 = 5.248826e+005
PA1 = 4.530173e-003	PTCA1 = 1.101685e+000
PA2 = -1.921471e-011	PTCA2 = 2.531237e-002
PTEMPA0 = -6.993227e+001	PTCB0 = 2.534875e+001
PTEMPA1 = 5.167440e-002	PTCB1 = -1.650000e-003
PTEMPA2 = -4.923582e-007	PTCB2 = 0.000000e+000

**PRESSURE SPAN CALIBRATION**

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.55	528084.0	1809.0	14.56	0.00
314.92	594289.0	1812.0	314.82	-0.01
615.04	660503.0	1814.0	614.96	-0.01
914.94	726717.0	1815.0	914.92	-0.00
1215.07	792995.0	1816.0	1215.01	-0.00
1464.97	848224.0	1816.0	1464.94	-0.00
1214.96	793001.0	1815.0	1215.04	0.01
914.93	726735.0	1815.0	915.00	0.00
614.92	660505.0	1818.0	614.97	0.00
314.84	594300.0	1818.0	314.87	0.00
14.55	528087.0	1819.0	14.57	0.00

**THERMAL CORRECTION**

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2021	528183.20
29.00	1951	528175.00
24.00	1850	528162.90
18.50	1740	528150.40
15.00	1670	528142.50
4.50	1461	528127.10
1.00	1391	528122.30

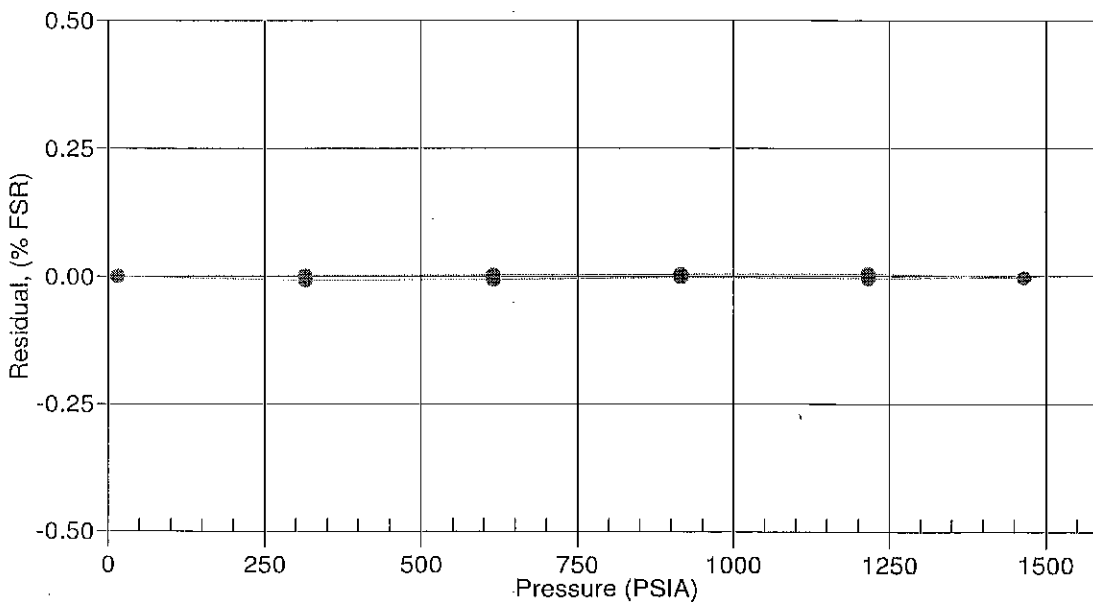
  

TEMP (ITS90)	SPAN (mV)
-5.00	25.36
35.00	25.29

$y = \text{thermistor output}; t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$   
 $x = \text{pressure output} - PTCA0 - PTCA1 * t - PTCA2 * t^2$   
 $n = x * PTCB0 / (PTCB0 + PTCB1 * t + PTCB2 * t^2)$   
 $\text{pressure (psia)} = PA0 + PA1 * n + PA2 * n^2$

Date, Avg Delta P %FS

● 16-Jul-13 0.00



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SENSOR SERIAL NUMBER: 9102  
CALIBRATION DATE: 19-Jul-13

SLOCUM PAYLOAD CTD  
TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

### ITS-90 COEFFICIENTS

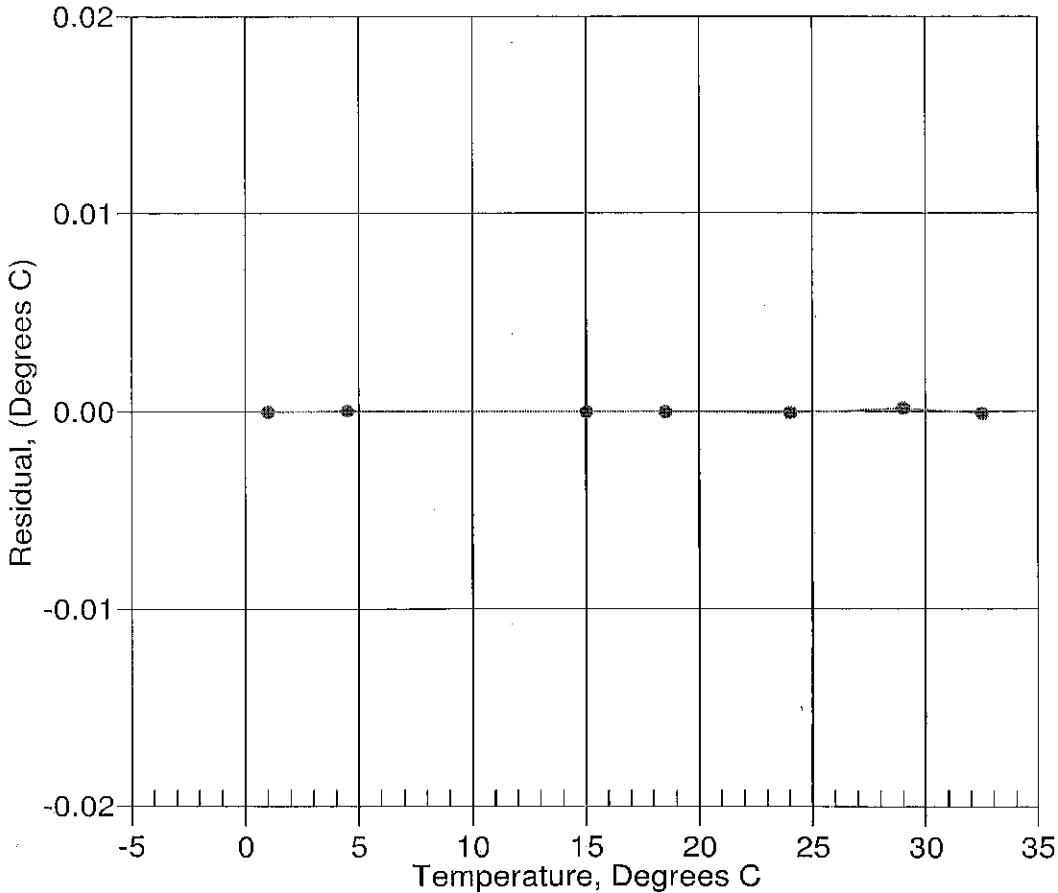
a0 = -8.653481e-005  
a1 = 3.027119e-004  
a2 = -4.188865e-006  
a3 = 1.968238e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	569602.6	1.0000	-0.0000
4.4999	487348.9	4.4999	0.0000
15.0000	311259.6	15.0000	-0.0000
18.5000	269720.2	18.5000	-0.0000
23.9999	216641.4	23.9998	-0.0001
29.0000	178588.5	29.0002	0.0002
32.5000	156524.3	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

Date, Delta T (mdeg C)



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

COEFFICIENTS:

g = -9.831351e-001	CPcor = -9.5700e-008
h = 1.361122e-001	CTcor = 3.2500e-006
i = -2.168231e-004	WBOTC = -1.2386e-007
j = 3.421521e-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	2690.88	0.00000	0.00000
1.0000	34.8820	2.98104	5400.14	2.98105	0.00000
4.4999	34.8624	3.28864	5605.08	3.28863	-0.00000
15.0000	34.8198	4.27200	6214.32	4.27200	0.00000
18.5000	34.8105	4.61768	6414.48	4.61768	-0.00000
23.9999	34.8003	5.17650	6725.14	5.17650	0.00000
29.0000	34.7943	5.69912	7002.88	5.69912	-0.00000

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

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

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

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

Date, Slope Correction

