

# 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: 9055  
 CALIBRATION DATE: 25-Nov-16

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

**COEFFICIENTS:**

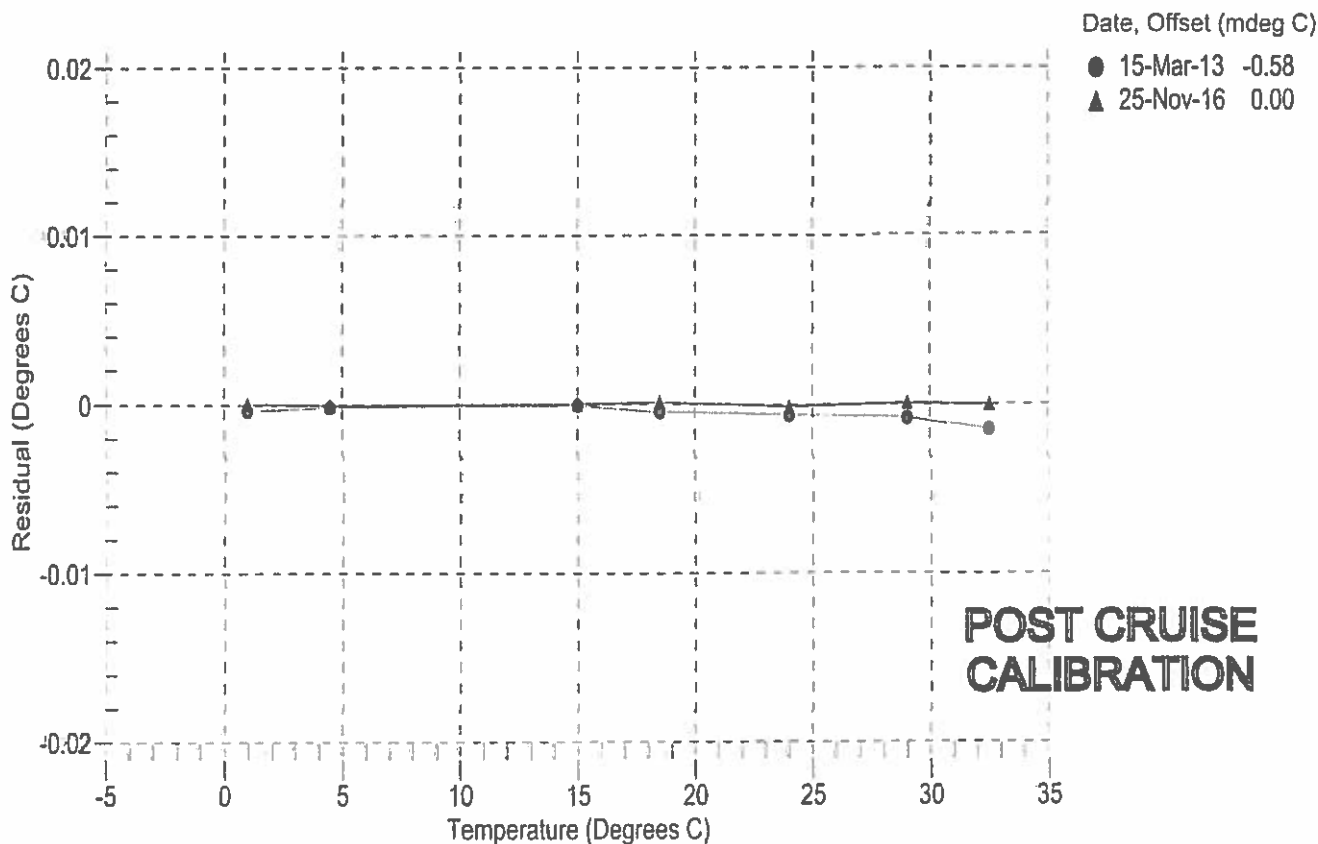
a0 = -1.208150e-004  
 a1 = 3.099550e-004  
 a2 = -4.722125e-006  
 a3 = 2.090189e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0001	576520.2	1.0001	0.0000
4.5000	493174.8	4.4999	-0.0001
15.0000	314812.8	15.0000	0.0000
18.5000	272756.4	18.5001	0.0001
24.0000	219033.6	23.9998	-0.0002
29.0000	180529.8	29.0001	0.0001
32.5000	158208.0	32.5000	-0.0000

n = Instrument Output (counts)

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

$$\text{Residual (°C)} = \text{instrument temperature} - \text{bath temperature}$$



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

**COEFFICIENTS:**

g = -9.727647e-001  
h = 1.292167e-001  
i = -3.303062e-004  
j = 4.015989e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = 1.3332e-006

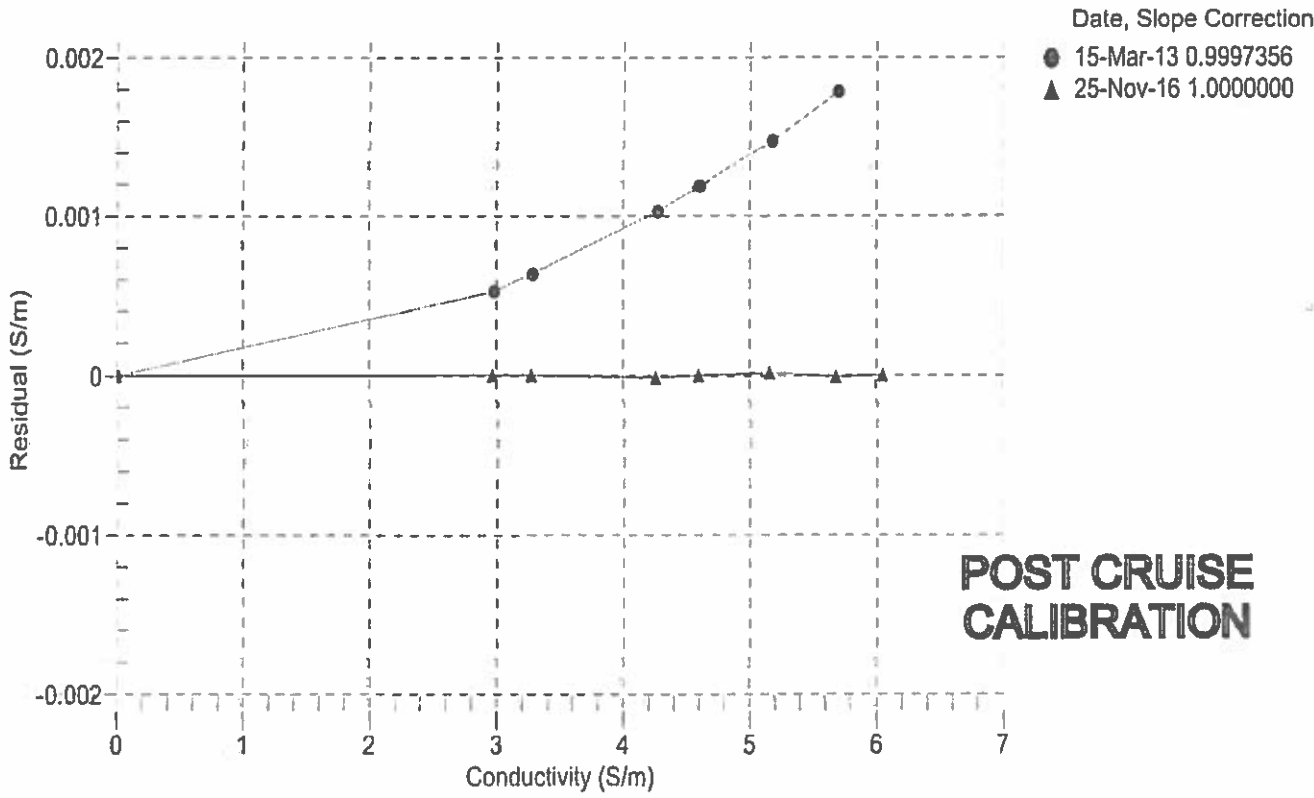
BATH TEMP (°C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2750.15	0.00000	0.00000
1.0001	34.7551	2.97124	5537.53	2.97124	0.00000
4.5000	34.7353	3.27783	5748.17	3.27784	0.00000
15.0000	34.6939	4.25818	6374.30	4.25817	-0.00001
18.5000	34.6852	4.60285	6579.98	4.60285	0.00000
24.0000	34.6759	5.16004	6899.16	5.16006	0.00002
29.0000	34.6712	5.68122	7184.48	5.68121	-0.00001
32.5000	34.6693	6.05325	7381.19	6.05325	0.00000

$f = \text{Instrument Output(Hz)} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$

t = temperature (°C); p = pressure (decibars);  $\delta = \text{CTcor}$ ;  $\epsilon = \text{CPcor}$ .

$\text{Conductivity (S/m)} = (g + h * f^2 + i * f^3 + j * f^4) / 10 * (1 + \delta * t + \epsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9055  
CALIBRATION DATE: 22-Nov-16

Slocum Payload CTD PRESSURE CALIBRATION DATA  
1450 psia S/N 3806523

**COEFFICIENTS:**

PA0 = -1.149281e-001	PTCA0 = 5.244710e+005
PA1 = 4.510408e-003	PTCA1 = -1.680827e+000
PA2 = -1.668415e-011	PTCA2 = 2.417449e-002
PTEMPA0 = -7.170689e+001	PTCB0 = 2.525625e+001
PTEMPA1 = 5.203473e-002	PTCB1 = -3.500000e-004
PTEMPA2 = -5.203007e-007	PTCB2 = 0.000000e+000

**PRESSURE SPAN CALIBRATION**

**THERMAL CORRECTION**

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)	TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
14.53	527697.0	1851.0	14.56	0.00	32.50	2044	527710.20
314.73	594235.0	1852.0	314.68	-0.00	29.00	1974	527720.00
614.34	660660.0	1853.0	614.16	-0.01	24.00	1874	527723.60
914.59	727326.0	1853.0	914.56	-0.00	18.50	1765	527717.20
1214.53	793930.0	1854.0	1214.55	0.00	15.00	1695	527721.20
1464.55	849454.0	1853.0	1464.51	-0.00	4.50	1487	527738.60
1214.65	793960.0	1853.0	1214.68	0.00	1.00	1417	527742.40
914.68	727376.0	1853.0	914.79	0.01			
614.71	660796.0	1852.0	614.77	0.00	TEMPERATURE (°C)	SPAN (mV)	
314.71	594261.0	1852.0	314.80	0.01	-5.00	25.26	
14.52	527684.0	1853.0	14.50	-0.00	35.00	25.24	

y = thermistor output (counts)

$$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$$

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

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

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

$$\text{Residual (\%FSR)} = (\text{computed pressure} - \text{true pressure}) * 100 / \text{Full Scale Range}$$

Date, Offset (%FSR)

● 22-Nov-16 -0.00

