

# 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: 9174  
CALIBRATION DATE: 02-May-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

### COEFFICIENTS:

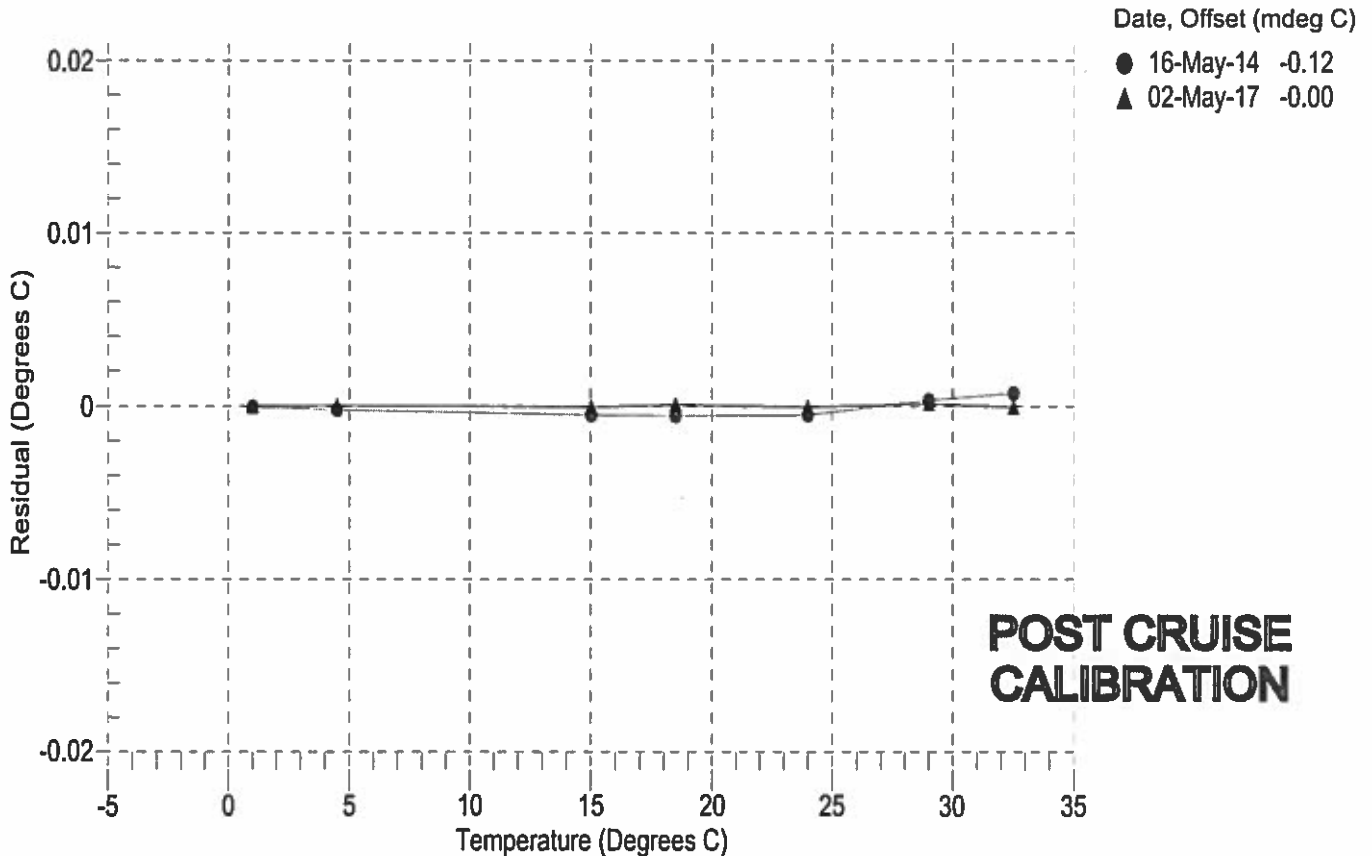
a0 = -1.267905e-004  
a1 = 3.096493e-004  
a2 = -4.592785e-006  
a3 = 2.036399e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	576186.2	1.0000	-0.0000
4.5000	492959.6	4.5000	0.0000
15.0000	314846.4	14.9999	-0.0001
18.5000	272837.4	18.5001	0.0001
24.0001	219167.0	24.0000	-0.0001
29.0000	180695.6	29.0001	0.0001
32.5000	158388.4	32.4999	-0.0001

n = Instrument Output (counts)

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

Residual (°C) = instrument temperature - bath temperature



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

## COEFFICIENTS:

g = -1.011149e+000  
h = 1.602193e-001  
i = -2.750041e-004  
j = 4.582049e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = -3.3388e-008

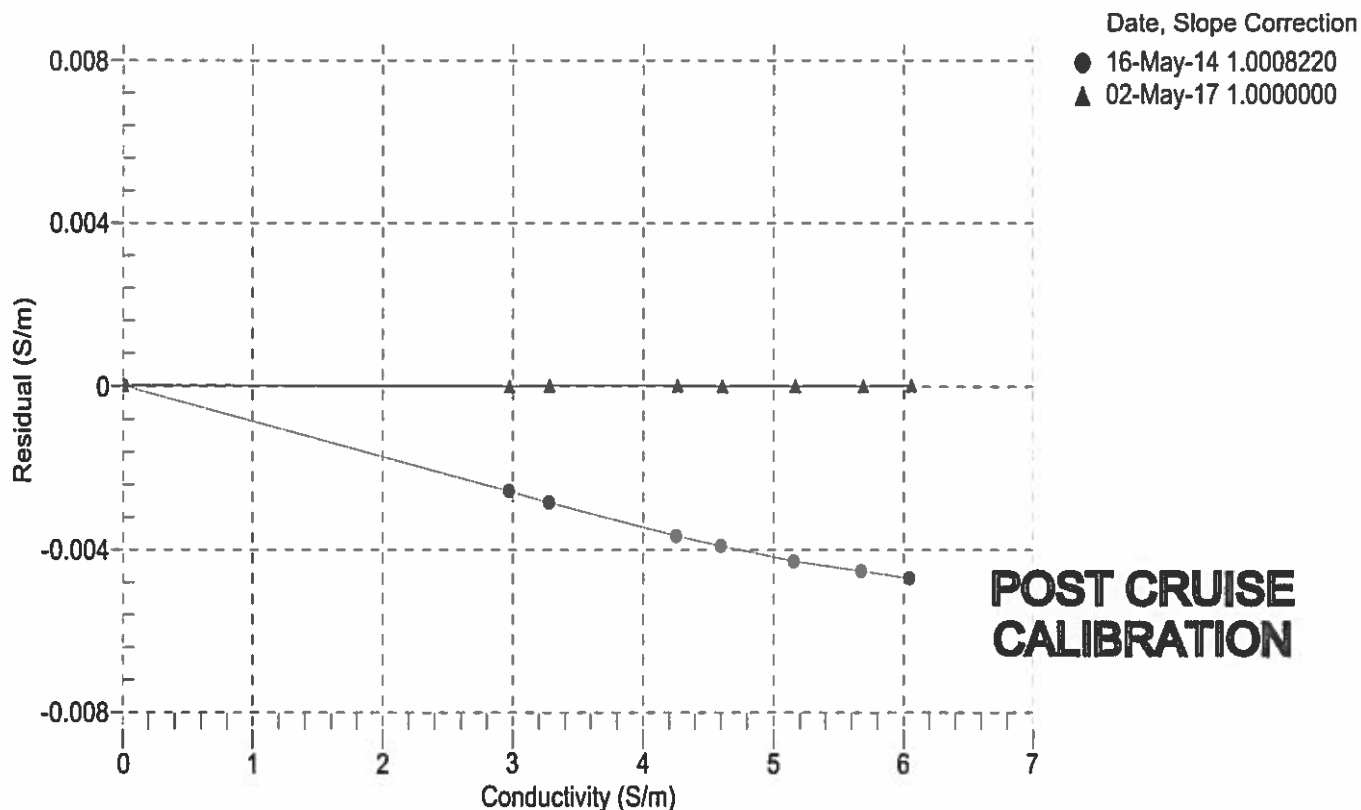
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2515.33	0.00000	0.00000
1.0000	34.8123	2.97566	4991.93	2.97565	-0.00001
4.5000	34.7928	3.28273	5180.06	3.28273	0.00001
15.0000	34.7508	4.26443	5739.58	4.26443	0.00000
18.5000	34.7421	4.60959	5923.51	4.60959	-0.00000
24.0001	34.7325	5.16755	6209.05	5.16754	-0.00000
29.0000	34.7272	5.68937	6464.40	5.68936	-0.00000
32.5000	34.7237	6.06167	6640.42	6.06167	0.00000

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

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = (g + h \* f<sup>2</sup> + i \* f<sup>3</sup> + j \* f<sup>4</sup>) / 10 (1 + δ \* t + ε \* p)

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



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SENSOR SERIAL NUMBER: 9174  
CALIBRATION DATE: 28-Apr-17

Slocum Payload CTD PRESSURE CALIBRATION DATA  
1450 psia S/N 4145037

**COEFFICIENTS:**

PA0 = 1.638043e-001	PTCA0 = 5.250379e+005
PA1 = 4.533814e-003	PTCA1 = 8.734617e-001
PA2 = -1.834354e-011	PTCA2 = 2.870885e-002
PTEMPA0 = -7.156681e+001	PTCB0 = 2.625262e+001
PTEMPA1 = 5.161280e-002	PTCB1 = 1.250000e-004
PTEMPA2 = -6.224649e-007	PTCB2 = 0.000000e+000

**PRESSURE SPAN CALIBRATION**

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)	TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
14.75	528305.3	1883.1	14.81	0.00	32.50	2068	528348.60
301.51	591562.2	1883.9	301.49	-0.00	29.00	1997	528341.00
588.79	654980.0	1884.1	588.76	-0.00	24.00	1895	528330.00
876.00	718432.5	1884.4	876.03	0.00	18.50	1783	528318.60
1163.21	781905.5	1884.9	1163.25	0.00	15.00	1713	528307.40
1450.28	845358.8	1885.4	1450.23	-0.00	4.50	1501	528295.80
1163.21	781903.9	1884.9	1163.24	0.00	1.00	1431	528292.20
875.98	718429.1	1884.7	876.01	0.00			
588.76	654977.2	1884.4	588.74	-0.00			
301.52	591552.6	1884.1	301.45	-0.00			
14.75	528292.1	1884.1	14.75	-0.00			

**THERMAL CORRECTION**

TEMPERATURE (°C)	SPAN (mV)
-5.00	26.25
35.00	26.26

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)  
● 28-Apr-17 -0.00

