



**Sea-Bird Electronics, Inc.**  
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**1005502610**  
 31-AUG-2017  
 314757956

**SERVICE REPORT**

**Service Request**  
**Date**  
**Sales Order**

**PRODUCT INFORMATION**

**Item:** SLOCUM.50  
**Item Description:** SLOCUM GLIDER CTD, 1000 dBar, DIRECT GROUND  
**Serial:** 712-9353

**Special Notes**

Services Requested:  
 Evaluate/Repair Instrumentation.  
 Perform Routine Calibration Service.

Problems Found:  
 No problems found

Services Performed:  
 Performed initial diagnostic evaluation.  
 Performed "POST" cruise calibration.  
 Performed pressure calibration.  
 Performed complete system check and full diagnostic evaluation.  
 Installed NEW AF24173 Anti-foulant cylinder(s).

Item	Item Description	Qty
CAL_SLOCUM	CALIBRATE SLOCUM CONDUCTIVITY AND TEMPERATURE SENSORS (FRRF)	1
CNCRTSLOCUM	CONFIRM & RE-CERTIFY WEBB SLOCUM GLIDER CTD (FRRF)	1
REPLACEAF	EXTRA CHARGE TO INSTALL ONE ANTIFOULANT DEVICE, INCLUDES ONE 801542.1. (FRRF)	1
PCAL_SLOCUM	CALIBRATE SLOCUM PRESSURE SENSOR (FRRF)	1

**Unbilled Items**

Item	Item Description	Qty
801542.1	AF24173 ANTI-FOULANT, SINGLE CYLINDER, V2	1



Sea-Bird Scientific  
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SENSOR SERIAL NUMBER: 9353  
 CALIBRATION DATE: 30-Aug-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

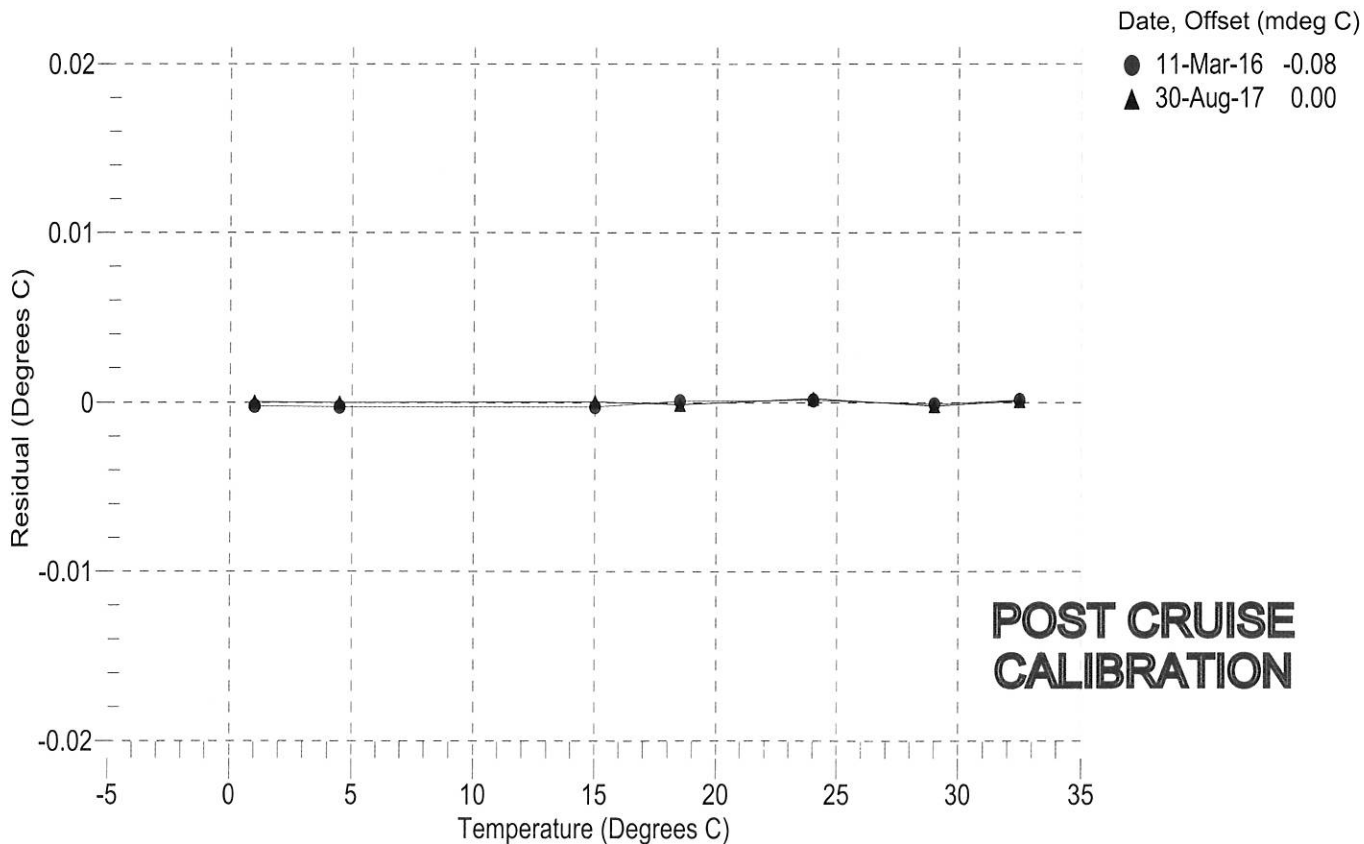
a0 = -1.143200e-004  
 a1 = 3.076335e-004  
 a2 = -4.479386e-006  
 a3 = 2.009506e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	577345.2	1.0000	0.0000
4.4999	493847.0	4.4999	-0.0000
15.0000	315204.4	15.0000	0.0000
18.5000	273093.0	18.4999	-0.0001
24.0000	219295.8	24.0002	0.0002
29.0000	180751.4	28.9998	-0.0002
32.5000	158401.4	32.5001	0.0001

n = Instrument Output (counts)

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

Residual (°C) = instrument temperature - bath temperature





**SEA-BIRD**  
SCIENTIFIC

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SENSOR SERIAL NUMBER: 9353  
CALIBRATION DATE: 30-Aug-17

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

**COEFFICIENTS:**

g = -9.856654e-001  
h = 1.309019e-001  
i = -1.409478e-004  
j = 2.746292e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = 9.1032e-008

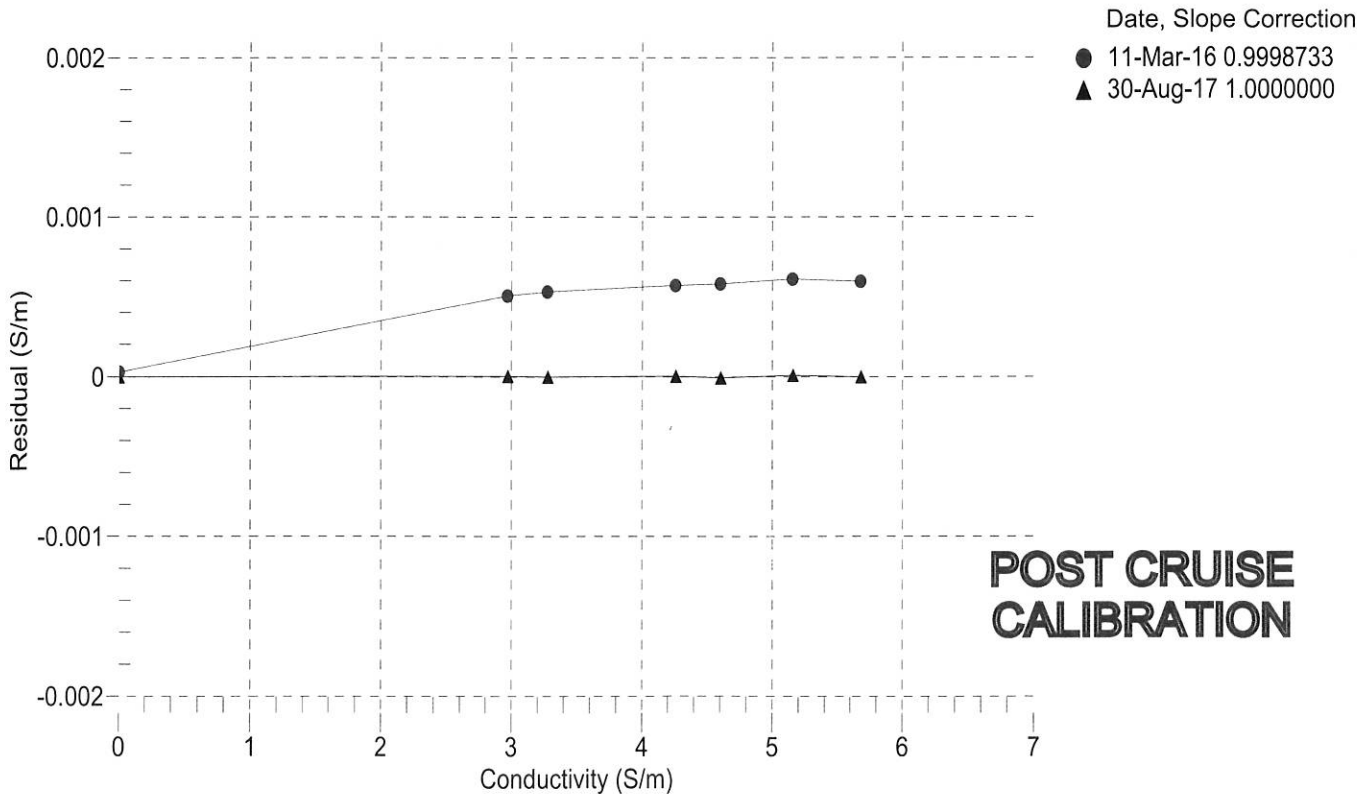
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2745.93	0.00000	0.00000
1.0000	34.7586	2.97150	5497.04	2.97150	0.00000
4.4999	34.7382	3.27807	5705.26	3.27807	-0.00000
15.0000	34.6949	4.25829	6324.44	4.25830	0.00000
18.5000	34.6858	4.60292	6527.90	4.60291	-0.00001
24.0000	34.6758	5.16003	6843.74	5.16004	0.00001
29.0000	34.6705	5.68112	7126.16	5.68112	-0.00000
32.5000	34.6675	6.05297	7320.77	6.05282	-0.00015

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

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

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

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





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SENSOR SERIAL NUMBER: 9353  
 CALIBRATION DATE: 25-Aug-17

Slocum Payload CTD PRESSURE CALIBRATION DATA  
 1450 psia S/N 4449854

COEFFICIENTS:

PA0 =	-3.026033e-002	PTCA0 =	5.245079e+005
PA1 =	4.590549e-003	PTCA1 =	-2.653125e-002
PA2 =	-2.511966e-011	PTCA2 =	-1.186129e-002
PTEMPA0 =	1.508528e+002	PTCB0 =	2.510188e+001
PTEMPA1 =	-6.286787e-002	PTCB1 =	-2.500000e-005
PTEMPA2 =	1.888536e-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)
14.65	527700.0	2054.0	14.65	0.00	32.50	1893	527701.20
314.91	593119.0	2051.0	314.85	-0.00	29.00	1950	527706.80
614.93	658547.0	2050.0	614.88	-0.00	24.00	2030	527713.00
914.91	724021.0	2050.0	914.90	-0.00	18.50	2119	527726.20
1214.88	789531.0	2047.0	1214.87	-0.00	15.00	2175	527695.20
1464.88	844163.0	2046.0	1464.86	-0.00	4.50	2344	527723.20
1214.88	789542.0	2048.0	1214.92	0.00	1.00	2401	527715.00
914.89	724028.0	2052.0	914.93	0.00			
614.88	658556.0	2051.0	614.92	0.00			
314.89	593134.0	2054.0	314.92	0.00	TEMPERATURE (°C)	SPAN (mV)	
14.65	527702.0	2053.0	14.66	0.00	-5.00	25.10	
					35.00	25.10	

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)

● 25-Aug-17 -0.00

