



**SEA-BIRD**  
SCIENTIFIC

**SEA-BIRD ELECTRONICS, INC.**

13431 NE 20<sup>th</sup> Street  
Bellevue, Washington 98005 USA

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www.seabird.com

**SERVICE REPORT**

**Service Request**

**1005500104**

**Date**

**22-OCT-2016**

**PRODUCT INFORMATION**

**Item:** SLOCUM.LEGACY

**Item Description:** (LEGACY) Slocum Glider

**Serial:** 9059

**Special Notes**

Services Requested:

Evaluate/Repair Instrumentation.

Perform Routine Calibration Service.

Replace Antifoulant Device(s).

Problems Found:

No problems found

Services Performed:

Perform 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

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SENSOR SERIAL NUMBER: 9059  
 CALIBRATION DATE: 20-Sep-16

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

**COEFFICIENTS:**

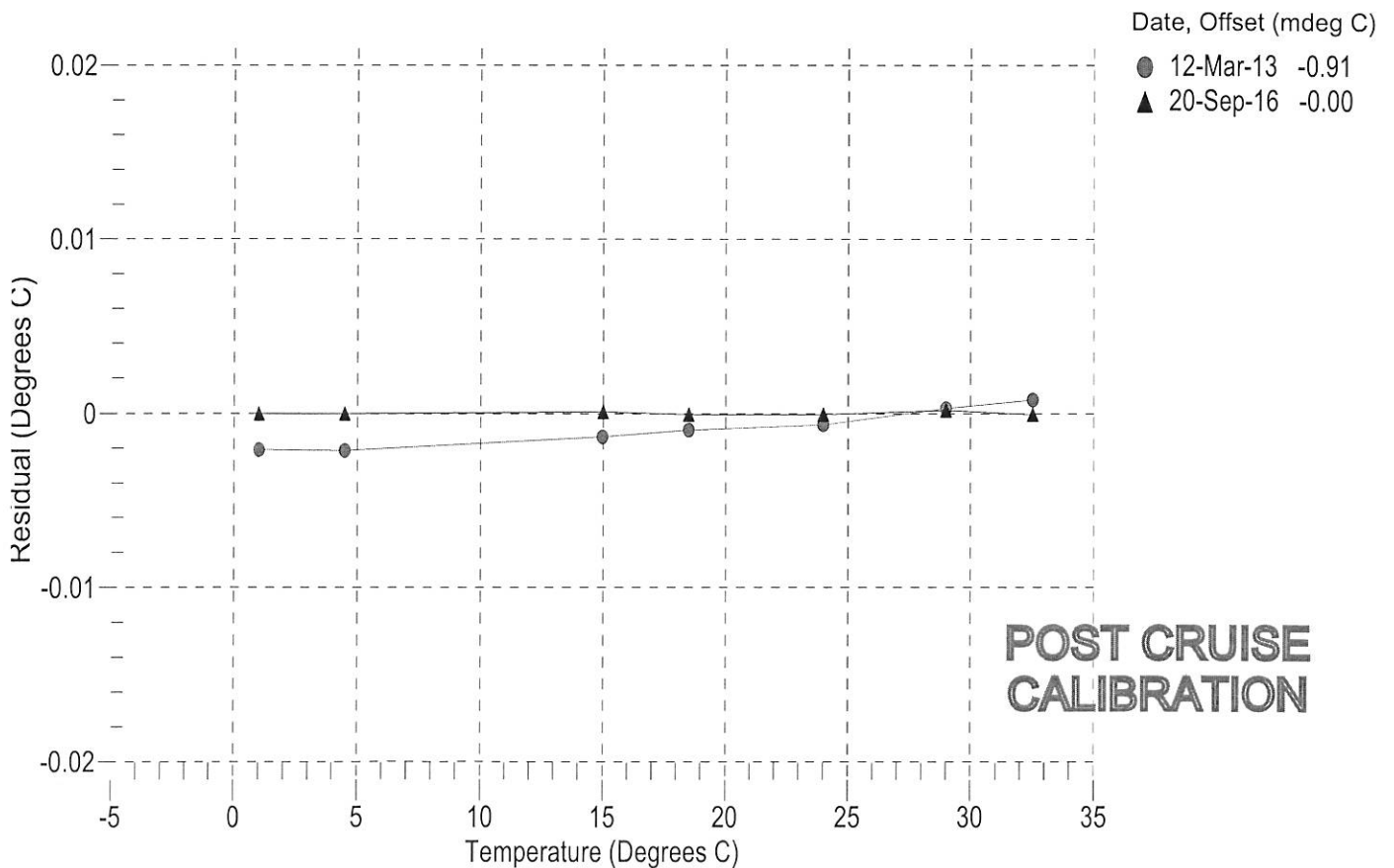
a0 = -1.433661e-004  
 a1 = 3.140492e-004  
 a2 = -5.010160e-006  
 a3 = 2.164577e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	579579.2	1.0000	-0.0000
4.5000	495895.8	4.5000	-0.0000
15.0000	316752.4	15.0001	0.0001
18.5000	274496.0	18.4999	-0.0001
23.9999	220499.2	23.9998	-0.0001
29.0000	181789.4	29.0002	0.0002
32.5000	159344.4	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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SENSOR SERIAL NUMBER: 9059  
CALIBRATION DATE: 20-Sep-16

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

## COEFFICIENTS:

g = -9.704526e-001  
h = 1.347469e-001  
i = -3.313036e-004  
j = 4.267741e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = 1.9210e-006

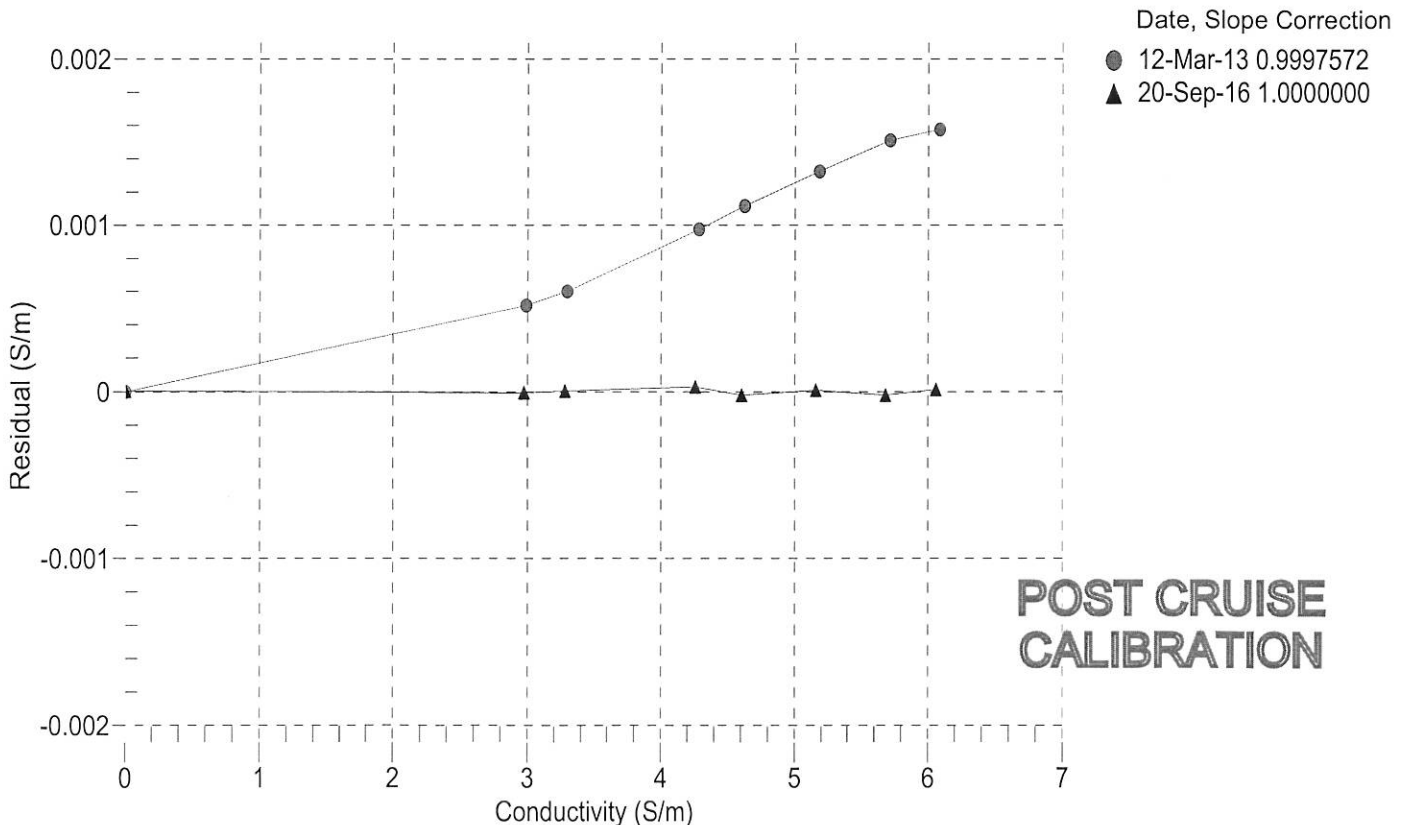
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2689.42	0.00000	0.00000
1.0000	34.7719	2.97253	5420.35	2.97252	-0.00001
4.5000	34.7525	3.27930	5626.67	3.27930	0.00000
15.0000	34.7104	4.25999	6239.76	4.26002	0.00003
18.5000	34.7014	4.60477	6441.10	4.60475	-0.00002
23.9999	34.6914	5.16209	6753.59	5.16209	0.00001
29.0000	34.6862	5.68340	7032.91	5.68338	-0.00002
32.5000	34.6835	6.05545	7225.46	6.05546	0.00001

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

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

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

$$\text{Residual (Siemens/meter)} = \text{instrument conductivity} - \text{bath conductivity}$$



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SENSOR SERIAL NUMBER: 9059  
CALIBRATION DATE: 19-Sep-16

Slocum Payload CTD PRESSURE CALIBRATION DATA  
1450 psia S/N 3806522

**COEFFICIENTS:**

PA0 = 2.911547e-001	PTCA0 = 5.251544e+005
PA1 = 4.593558e-003	PTCA1 = 2.232807e+000
PA2 = -2.402126e-011	PTCA2 = 2.213933e-002
PTEMPA0 = -6.988114e+001	PTCB0 = 2.535088e+001
PTEMPA1 = 5.154437e-002	PTCB1 = -4.250000e-004
PTEMPA2 = -3.749851e-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)
14.63	528349.0	1816.0	14.69	0.00	32.50	2016	528459.00
314.94	593696.0	1819.0	314.86	-0.01	29.00	1946	528449.60
614.94	659605.0	1821.0	617.41	0.17	24.00	1846	528432.40
914.95	724466.0	1822.0	914.95	-0.00	18.50	1737	528413.80
1214.94	789894.0	1826.0	1214.88	-0.00	15.00	1667	528400.80
1464.92	844465.0	1825.0	1464.89	-0.00	4.50	1458	528376.00
1214.92	789910.0	1825.0	1214.96	0.00	1.00	1389	528366.80
914.92	724480.0	1825.0	915.01	0.01			
614.91	659079.0	1825.0	615.00	0.01			
314.93	593674.0	1825.0	314.76	-0.01	TEMPERATURE (°C)	SPAN (mV)	
14.64	528350.0	1825.0	14.69	0.00	-5.00	25.35	
					35.00	25.34	

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)

● 19-Sep-16 0.00

