



SEA-BIRD

**SEA-BIRD ELECTRONICS, INC.**

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

Phone +1-425-643-9866  
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www.seabird.com

**SERVICE REPORT**

**Service Request**  
**Date**

**1005501814**  
**06-MAY-2017**

**PRODUCT INFORMATION**

**Item:** SLOCUM.LEGACY  
**Item Description:** (LEGACY) Slocum Glider  
**Serial:** 9087

**Special Notes**

Services Requested:  
Evaluate/Repair Instrumentation.  
Perform Routine Calibration Service.  
Replace Antifoulant Device(s).

Services Performed:  
Perform initial diagnostic evaluation.  
Performed pressure calibration.  
Performed "POST" cruise calibration.  
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

**Unbilled Items**

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

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SENSOR SERIAL NUMBER: 9087  
 CALIBRATION DATE: 28-Apr-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

**COEFFICIENTS:**

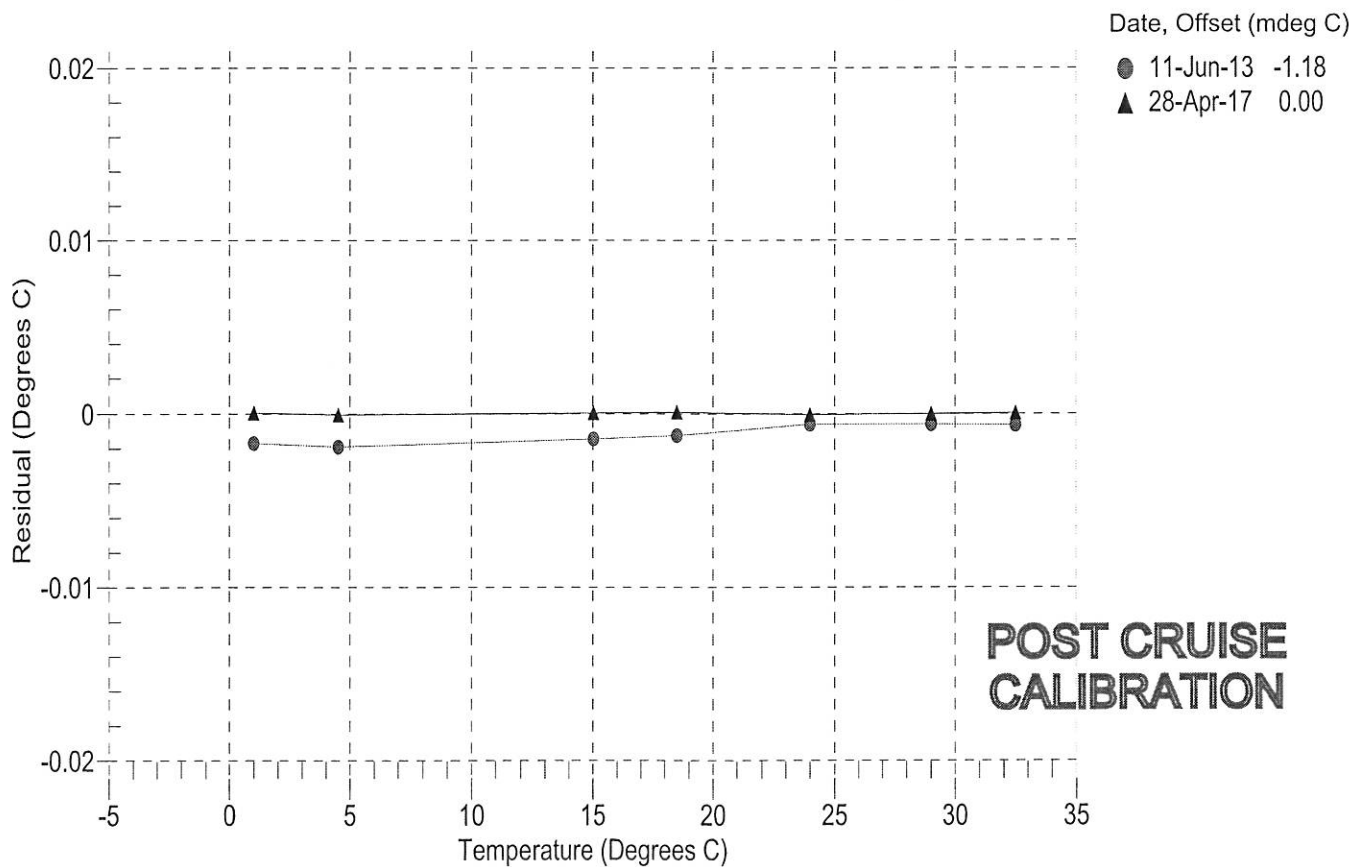
a0 = -3.762442e-005  
 a1 = 2.929702e-004  
 a2 = -3.397682e-006  
 a3 = 1.711934e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	571339.8	1.0000	0.0000
4.5000	488258.0	4.4999	-0.0001
15.0000	310824.4	15.0000	0.0000
18.5000	269073.2	18.5001	0.0001
24.0000	215799.4	23.9999	-0.0001
29.0000	177667.8	29.0000	-0.0000
32.5000	155581.6	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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SENSOR SERIAL NUMBER: 9087  
 CALIBRATION DATE: 28-Apr-17

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

**COEFFICIENTS:**

g = -9.810277e-001  
 h = 1.338926e-001  
 i = -2.488021e-004  
 j = 3.721529e-005

CPcor = -9.5700e-008  
 CTcor = 3.2500e-006  
 WBOTC = -0.0000e+000

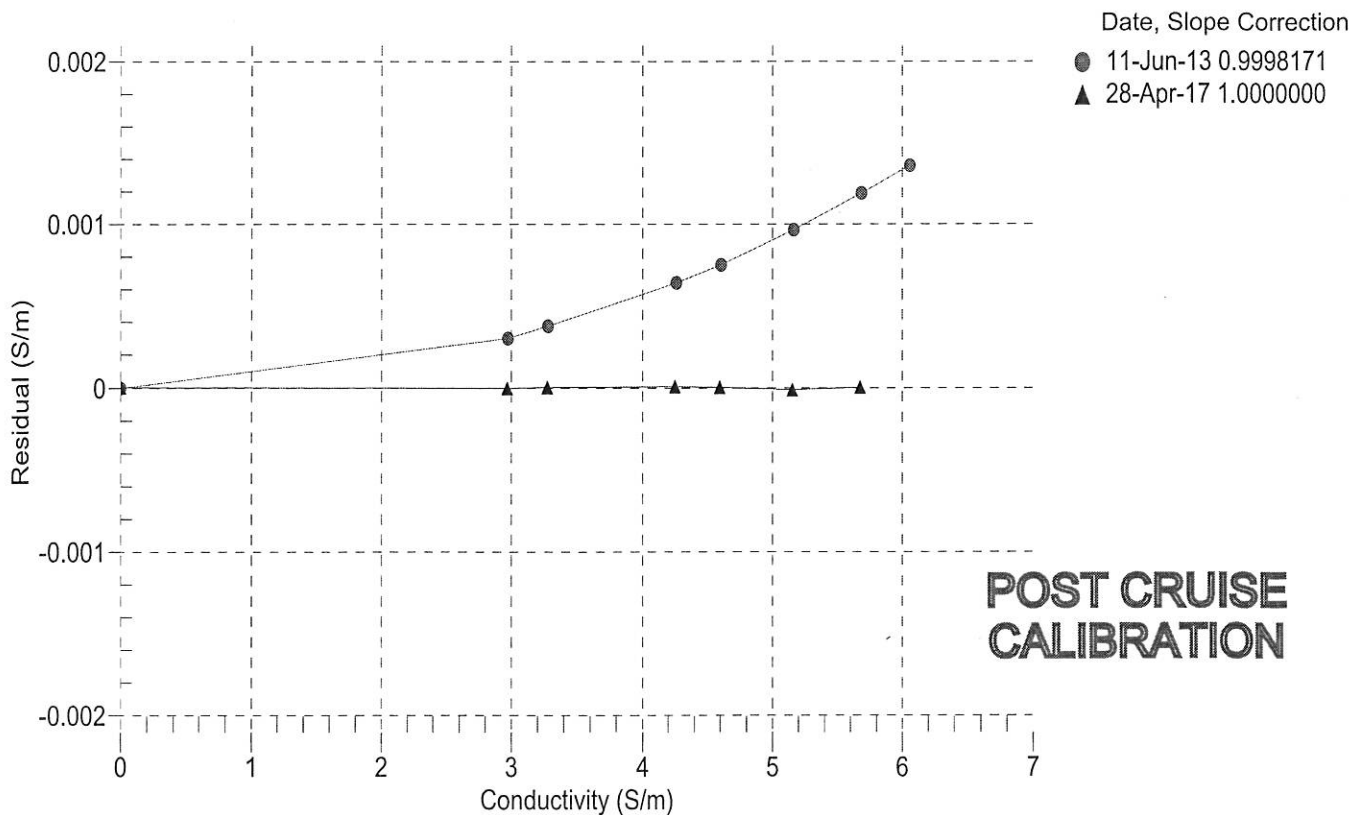
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2710.90	0.00000	0.00000
1.0000	34.7294	2.96924	5436.83	2.96924	-0.00000
4.5000	34.7100	3.27568	5643.08	3.27568	0.00000
15.0000	34.6684	4.25539	6256.19	4.25539	0.00001
18.5000	34.6595	4.59981	6457.60	4.59981	0.00000
24.0000	34.6497	5.15658	6770.18	5.15657	-0.00001
29.0000	34.6438	5.67724	7049.61	5.67724	0.00000
32.5000	34.6395	6.04864	7241.99	6.04838	-0.00025

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

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

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

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



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SENSOR SERIAL NUMBER: 9087  
CALIBRATION DATE: 24-Apr-17

Slocum Payload CTD PRESSURE CALIBRATION DATA  
1450 psia S/N 3849156

**COEFFICIENTS:**

PA0 = -1.622788e+000	PTCA0 = 5.240225e+005
PA1 = 4.497613e-003	PTCA1 = -1.496120e+001
PA2 = -2.123641e-011	PTCA2 = -2.747596e-002
PTEMPA0 = -7.218063e+001	PTCB0 = 2.544237e+001
PTEMPA1 = 5.147763e-002	PTCB1 = 8.750000e-004
PTEMPA2 = -5.784809e-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)
14.47	527253.1	1891.9	14.52	0.00	32.50	2082	527192.00
301.48	591109.9	1892.8	301.40	-0.01	29.00	2011	527249.60
588.74	655101.8	1893.0	588.71	-0.00	24.00	1909	527331.40
875.95	719124.9	1893.4	875.99	0.00	18.50	1797	527418.80
1163.18	783174.2	1893.6	1163.21	0.00	15.00	1728	527477.60
1450.34	847227.4	1893.9	1450.28	-0.00	4.50	1515	527640.40
1163.17	783174.3	1893.5	1163.21	0.00	1.00	1445	527690.40
875.90	719113.7	1892.8	875.94	0.00			
588.74	655102.4	1892.8	588.71	-0.00			
301.47	591118.6	1892.3	301.44	-0.00			
14.47	527247.3	1892.3	14.49	0.00			

**THERMAL CORRECTION**

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.44
35.00	25.47

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)

● 24-Apr-17 -0.00

