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**SERVICE REPORT**

**Service Request**

**1005508657**

**Date**

19-NOV-2019

**Sales Order**

315794926

**PRODUCT INFORMATION**

**Item:** SLOCUM.LEGACY

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

**Serial:** 9061

**Special Notes**

Services Requested:

Evaluate/Repair Instrumentation.

Perform Routine Calibration Service.

Replace Antifoulant Device(s).

Services Performed:

Performed initial diagnostic evaluation.

Replaced the lithium back-up battery.

Performed "POST" cruise calibration.

Performed pressure calibration.

Installed NEW AF24173 Anti-foulant cylinder.

Item	Item Description	Qty
CAL_SLOCUM	Calibrate SLOCUM conductivity and temperature sensors	1
CNCRTSLOCUM	Confirm & Re-certify Webb SLOCUM Glider CTD	1
REPLACEAF	Extra charge to install one antifoulant device, includes one 801542.1.	1
PCAL_SLOCUM	Calibrate SLOCUM pressure sensor	1

**Unbilled Items**

Item	Item Description	Qty
801542.1	AF24173 ANTI-FOULANT, SINGLE CYLINDER, V2	1
22096	LITHIUM COIN BATTERY, WITH TABS, BR1632A/HA	1



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SENSOR SERIAL NUMBER: 9061  
 CALIBRATION DATE: 21-Aug-19

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = -4.998775e-006  
 a1 = 2.883992e-004  
 a2 = -3.241440e-006  
 a3 = 1.688963e-007

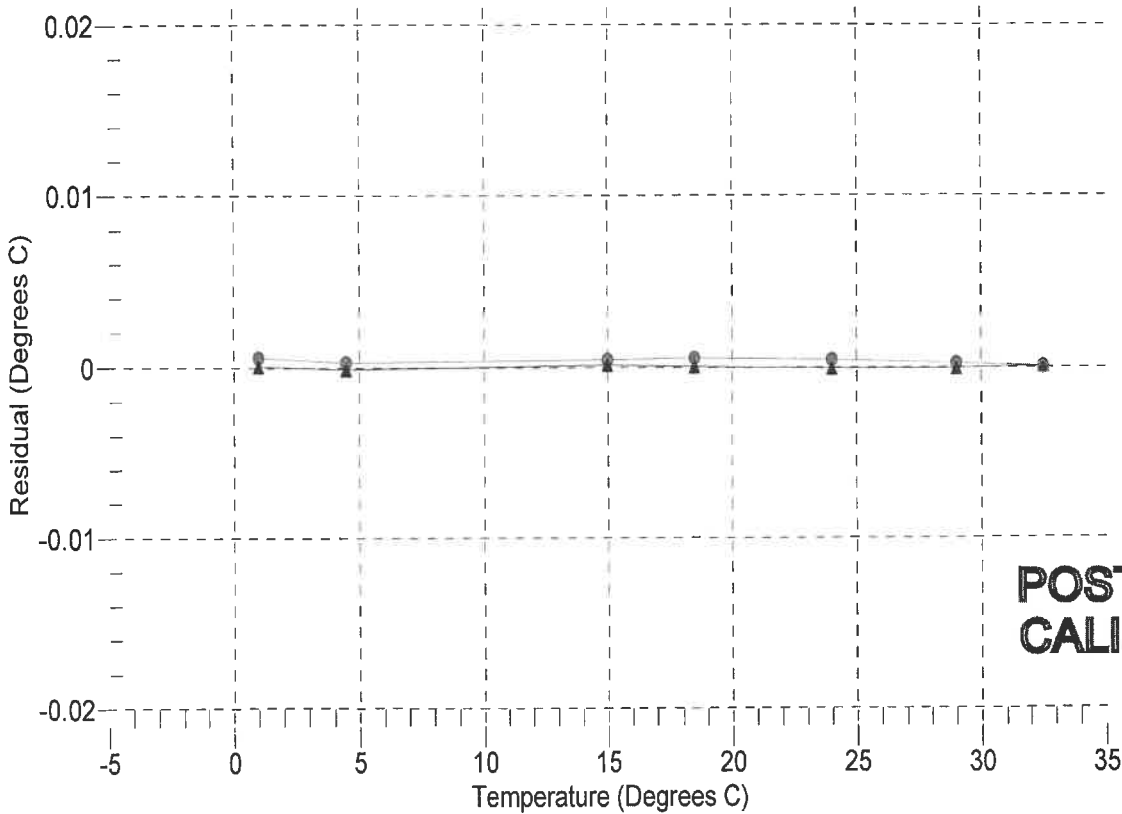
BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	582943.6	1.0001	0.0001
4.5000	497769.6	4.4999	-0.0001
15.0000	316100.2	15.0001	0.0001
18.5000	273418.0	18.5000	0.0000
24.0000	219002.2	23.9999	-0.0001
29.0000	180095.6	28.9999	-0.0001
32.5000	157579.0	32.5001	0.0001

n = Instrument Output (counts)

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

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

Date, Offset (mdeg C)  
 ● 24-Oct-14 0.36  
 ▲ 21-Aug-19 0.00





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SENSOR SERIAL NUMBER: 9061  
CALIBRATION DATE: 21-Aug-19

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

**COEFFICIENTS:**

g = -9.844021e-001	CPcor = -9.5700e-008
h = 1.343603e-001	CTcor = 3.2500e-006
i = -4.138369e-004	WBOTC = 3.6226e-006
j = 4.791711e-005	

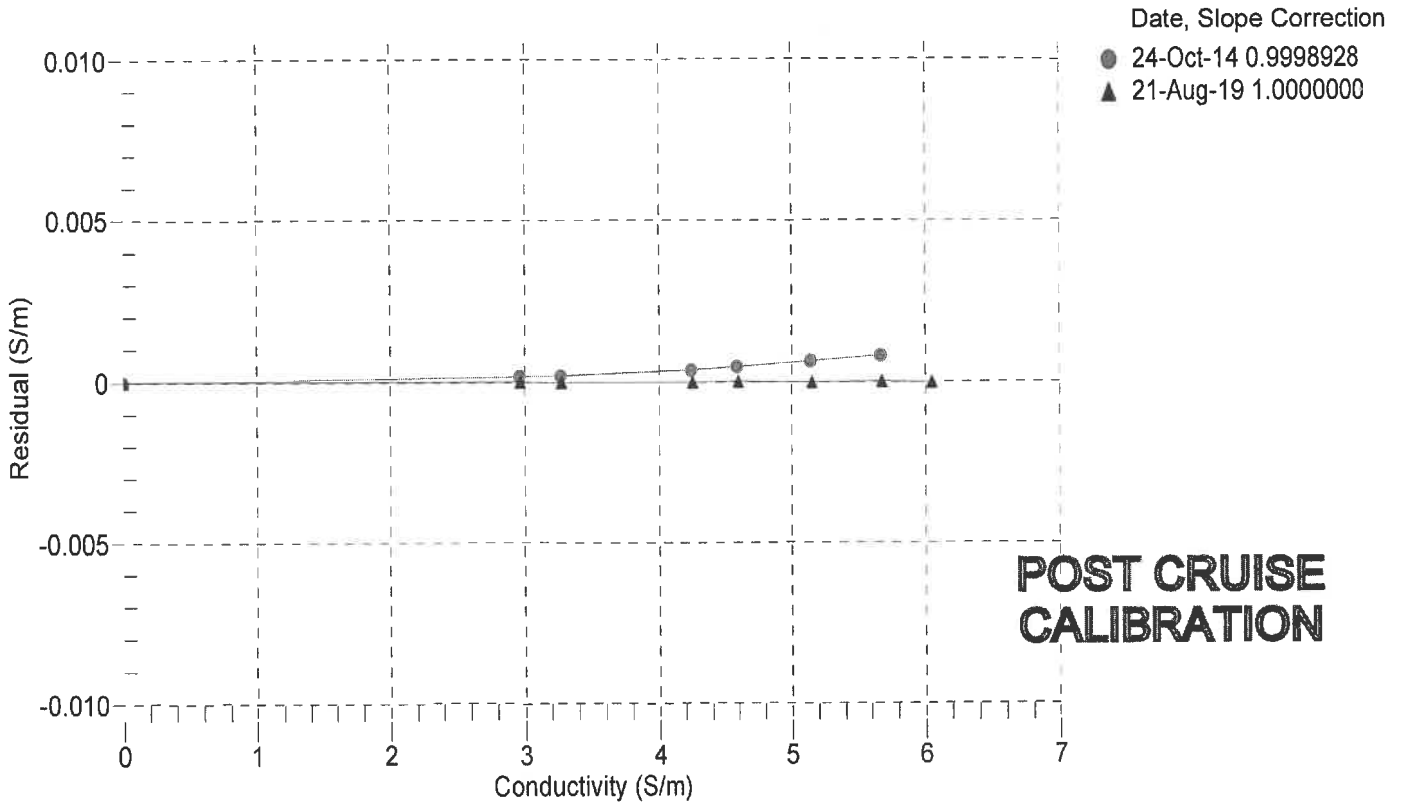
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2714.45	0.00000	0.00000
1.0000	34.7227	2.96873	5441.08	2.96873	0.00000
4.5000	34.7030	3.27509	5647.46	3.27508	-0.00000
15.0000	34.6615	4.25463	6260.97	4.25463	-0.00000
18.5000	34.6529	4.59903	6462.52	4.59903	0.00001
24.0000	34.6438	5.15580	6775.31	5.15579	-0.00001
29.0000	34.6387	5.67649	7054.91	5.67650	0.00000
32.5000	34.6355	6.04802	7247.56	6.04802	-0.00000

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

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

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

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





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CALIBRATION DATE: 19-Aug-19

Slocum Payload CTD PRESSURE CALIBRATION DATA  
1450 psia S/N 3819470

COEFFICIENTS:

PA0 =	6.136547e-001	PTCA0 =	5.260160e+005
PA1 =	4.768708e-003	PTCA1 =	6.139004e+000
PA2 =	-1.938626e-011	PTCA2 =	-2.405678e-002
PTEMPA0 =	-7.287132e+001	PTCB0 =	2.555325e+001
PTEMPA1 =	4.986273e-002	PTCB1 =	-1.550000e-003
PTEMPA2 =	-3.197091e-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)
14.61	529097.7	1935.6	14.73	0.01	32.50	2143	529194.20
301.09	589089.0	1939.1	301.12	0.00	29.00	2071	529178.80
588.28	649267.8	1939.9	588.27	-0.00	24.00	1968	529157.20
875.56	709502.2	1940.0	875.55	-0.00	18.50	1854	529127.40
1162.81	769754.0	1940.5	1162.77	-0.00	15.00	1783	529104.80
1450.11	830062.2	1940.8	1450.12	0.00	4.50	1567	529048.20
1162.83	769778.5	1939.8	1162.89	0.00	1.00	1496	529027.80
875.84	709545.4	1939.6	875.76	-0.01			
588.38	649306.1	1939.0	588.46	0.01	TEMPERATURE (°C)	SPAN	
302.57	589436.7	1939.1	302.78	0.01	-5.00	25.56	
14.61	529042.6	1939.0	14.46	-0.01	35.00	25.50	

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-Aug-19 -0.00

