



Sea-Bird Electronics, Inc.
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 15-DEC-2017
 314884152

SERVICE REPORT

Service Request
Date
Sales Order



PRODUCT INFORMATION

Item: SLOCUM.50
Item Description: SLOCUM GLIDER CTD, 1000 dBar, DIRECT GROUND
Serial: 712-9349

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	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



Sea-Bird Scientific
 13431 NE 20th Street
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SENSOR SERIAL NUMBER: 9349
 CALIBRATION DATE: 01-Dec-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

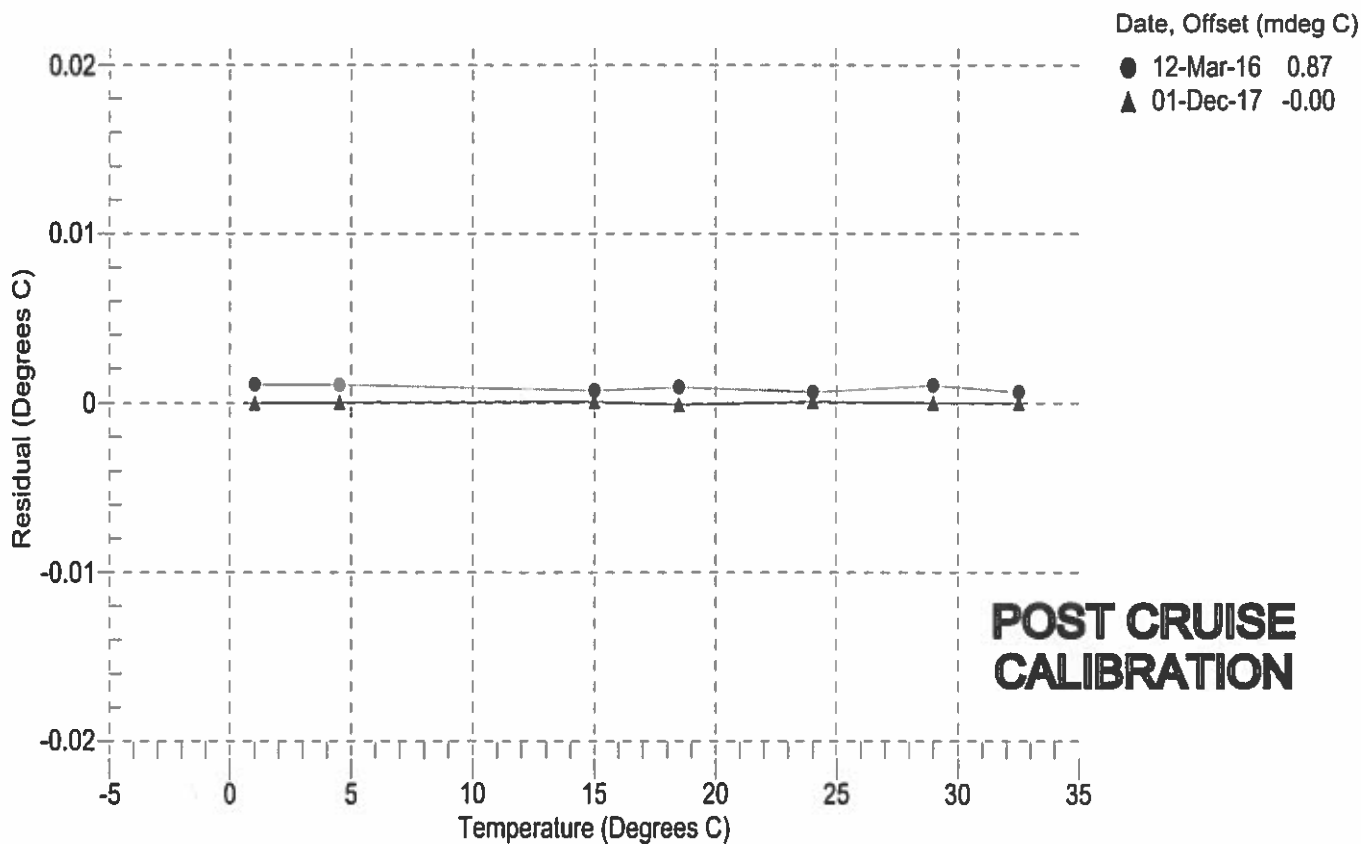
a0 = -1.517104e-004
 a1 = 3.155495e-004
 a2 = -4.993804e-006
 a3 = 2.130706e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	566912.0	1.0000	-0.0000
4.5000	485060.4	4.5000	0.0000
15.0000	309874.7	15.0001	0.0001
18.5000	268558.1	18.4999	-0.0001
24.0000	215761.5	24.0001	0.0001
29.0000	177917.9	29.0000	-0.0000
32.5000	155971.1	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: 9349
CALIBRATION DATE: 01-Dec-17

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

COEFFICIENTS:

g = -9.900682e-001	CPcor = -9.5700e-008
h = 1.438448e-001	CTcor = 3.2500e-006
i = -9.230488e-005	WBOTC = 1.2702e-007
j = 2.709460e-005	

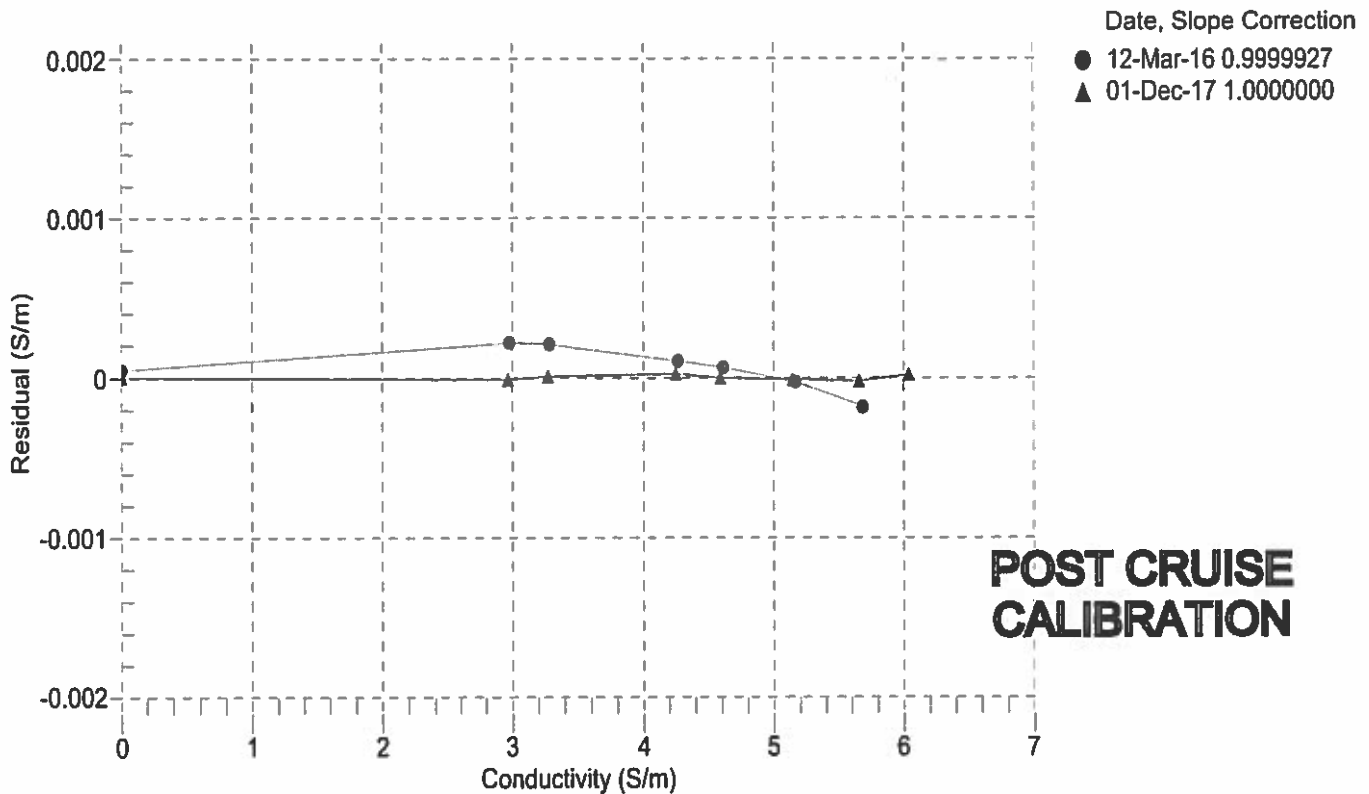
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2624.03	0.00000	0.00000
1.0000	34.6688	2.96456	5238.57	2.96454	-0.00001
4.5000	34.6478	3.27039	5436.67	3.27040	0.00001
15.0000	34.6038	4.24829	6025.81	4.24832	0.00002
18.5000	34.5936	4.59200	6219.37	4.59200	-0.00000
24.0000	34.5829	5.14773	6519.94	5.14772	-0.00001
29.0000	34.5772	5.66755	6788.77	5.66753	-0.00002
32.5000	34.5739	6.03848	6974.13	6.03850	0.00002

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

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: 9349
CALIBRATION DATE: 30-Nov-17

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 4436163

COEFFICIENTS:

PA0 =	2.814382e-001	PTCA0 =	5.253052e+005
PA1 =	4.610449e-003	PTCA1 =	6.947598e+000
PA2 =	-2.851753e-011	PTCA2 =	-1.912140e-001
PTEMPA0 =	1.421480e+002	PTCB0 =	2.533587e+001
PTEMPA1 =	-6.590702e-002	PTCB1 =	-2.500000e-005
PTEMPA2 =	3.572381e-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)
14.68	528499.9	1849.1	14.73	0.00	32.50	1679	528496.90
300.65	590533.5	1847.8	300.62	-0.00	29.00	1733	528543.10
588.10	652960.4	1846.6	588.10	-0.00	24.00	1810	528534.70
875.49	715418.0	1844.9	875.50	0.00	18.50	1896	528548.20
1162.86	777916.9	1843.1	1162.86	-0.00	15.00	1950	528539.20
1450.21	840450.0	1841.2	1450.16	-0.00	4.50	2113	528516.00
1162.94	777947.5	1842.6	1163.00	0.00	1.00	2167	528488.70
875.55	715438.1	1844.7	875.59	0.00			
588.08	652949.9	1845.2	588.05	-0.00			
300.67	590532.6	1845.4	300.61	-0.00	TEMPERATURE (°C)	SPAN	
14.67	528489.2	1845.7	14.68	0.00	-5.00	25.34	
					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)

● 30-Nov-17 0.00

