SEA-BIRD ELECTRONICS, INC.
13431 NE 20th Street
Bellevue, Washington 98005 USA

Phone +1-425-643-9866
Fax +1-425-643-9954
www.seabird.com

SERVICE REPORT

Service Request **1005501447**
Date 25-MAR-2017

PRODUCT INFORMATION

Item: SLOCUM.LEGACY
Item Description: (LEGACY) Slocum Glider
Serial: 9056

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

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

Sea-Bird Electronics, Inc.

13431 NE 20th Street, Bellevue, WA 98005-2010 USA

Phone: (+1) 425-643-9866 Fax (+1) 425-643-9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 9056
CALIBRATION DATE: 26-Feb-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

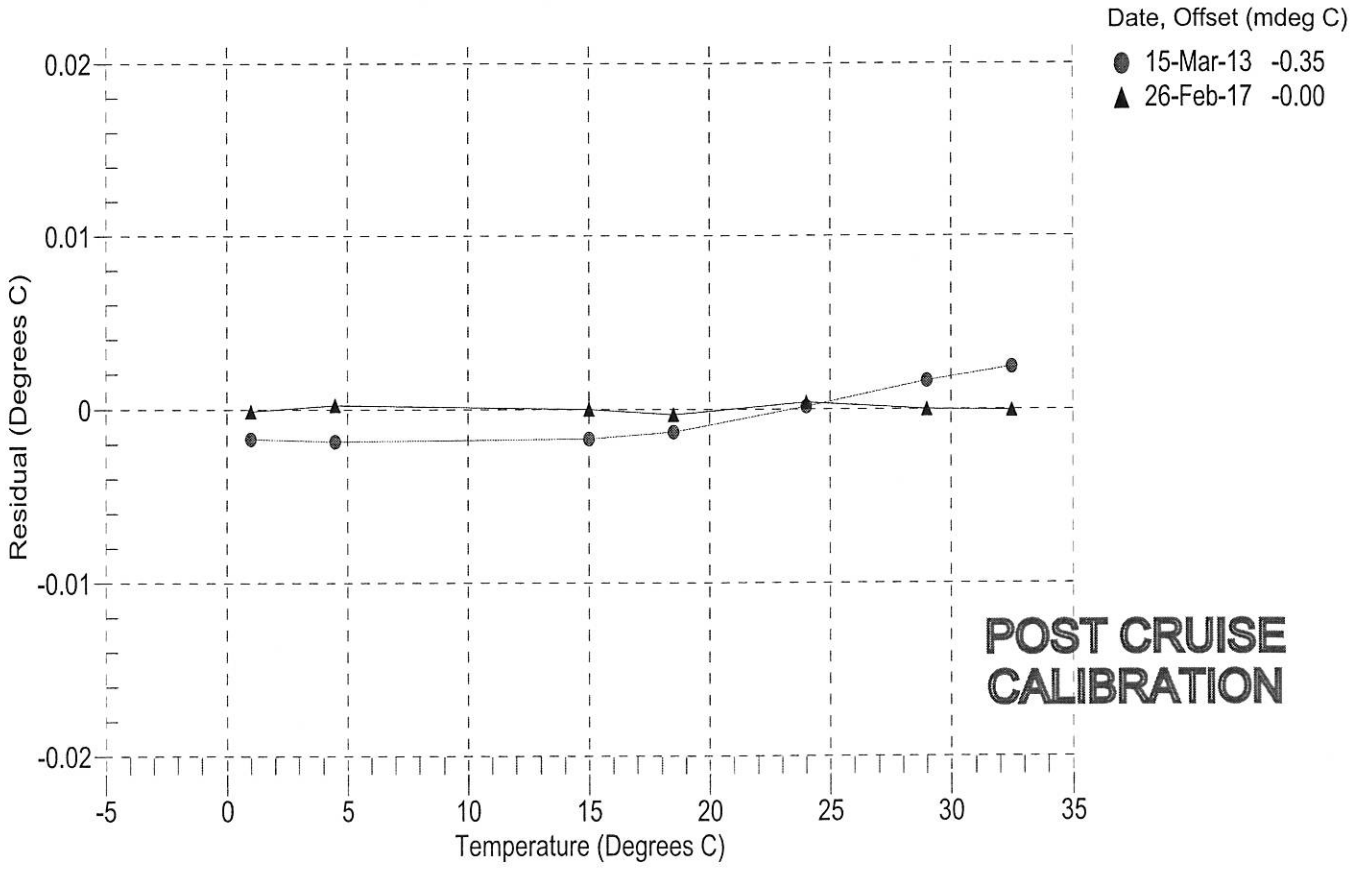
a0 = -1.093713e-004
a1 = 3.088652e-004
a2 = -4.613861e-006
a3 = 2.032910e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	571313.8	0.9999	-0.0001
4.5000	488373.4	4.5002	0.0002
15.0000	311166.4	15.0000	-0.0000
18.4999	269447.0	18.4996	-0.0003
24.0000	216181.8	24.0004	0.0004
29.0000	178054.0	29.0000	-0.0000
32.5000	155962.6	32.4999	-0.0001

n = Instrument Output (counts)

Temperature ITS-90 (°C) = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



Sea-Bird Electronics, Inc.

13431 NE 20th Street, Bellevue, WA 98005-2010 USA

Phone: (+1) 425-643-9866 Fax (+1) 425-643-9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 9056
CALIBRATION DATE: 26-Feb-17

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

COEFFICIENTS:

```
g = -9.850771e-001
h =  1.365074e-001
i = -5.065597e-004
j =  5.490522e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  2.4111e-006
```

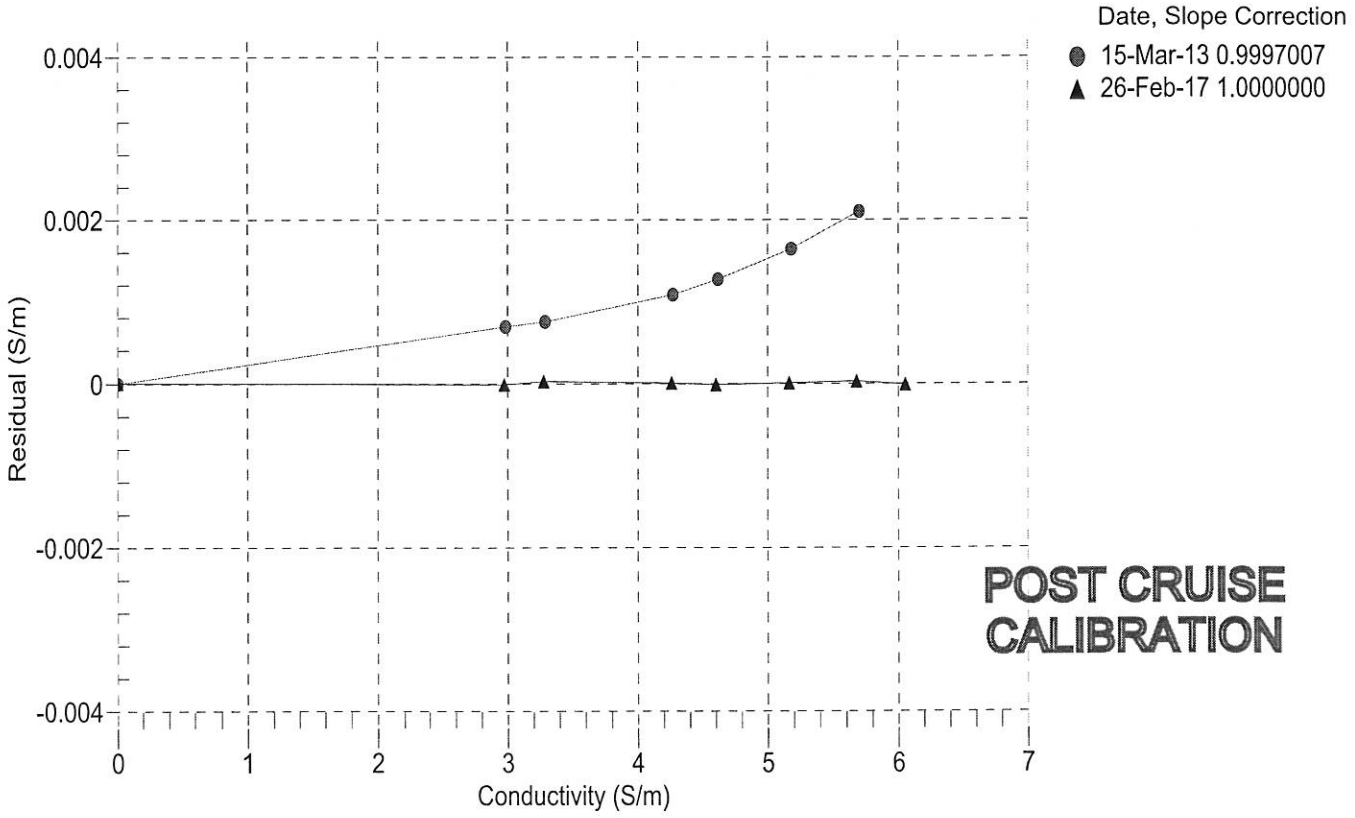
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2695.81	0.00000	0.00000
1.0000	34.7492	2.97078	5405.70	2.97076	-0.00002
4.5000	34.7297	3.27736	5610.88	3.27738	0.00003
15.0000	34.6876	4.25749	6220.62	4.25749	0.00000
18.4999	34.6792	4.60213	6420.94	4.60211	-0.00002
24.0000	34.6702	5.15929	6731.84	5.15929	0.00000
29.0000	34.6660	5.68047	7009.77	5.68049	0.00002
32.5000	34.6642	6.05246	7201.31	6.05245	-0.00001

f = Instrument Output(Hz) * sqrt(1.0 + WBOTC * t) / 1000.0

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

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

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



Sea-Bird Electronics, Inc.

13431 NE 20th Street, Bellevue, WA 98005-2010 USA

Phone: (+1) 425-643-9866 Fax (+1) 425-643-9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 9056
CALIBRATION DATE: 22-Feb-17

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 3806514

COEFFICIENTS:

PA0 =	-1.807734e-001	PTCA0 =	5.245200e+005
PA1 =	4.614206e-003	PTCA1 =	-1.886116e+000
PA2 =	-1.849638e-011	PTCA2 =	8.101812e-004
PTEMPA0 =	-6.901078e+001	PTCB0 =	2.521537e+001
PTEMPA1 =	5.183566e-002	PTCB1 =	8.750000e-004
PTEMPA2 =	-4.692761e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.70	527707.0	1774.0	14.70	-0.00
314.97	592844.0	1774.0	314.94	-0.00
614.96	657954.0	1774.0	614.91	-0.00
914.93	723106.0	1775.0	914.91	-0.00
1214.95	788300.0	1774.0	1214.95	0.00
1464.92	842637.0	1774.0	1464.90	-0.00
1214.90	788294.0	1774.0	1214.92	0.00
914.93	723120.0	1773.0	914.98	0.00
614.94	657965.0	1773.0	614.96	0.00
314.93	592849.0	1773.0	314.97	0.00
14.70	527709.0	1772.0	14.71	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1995	527876.20
29.00	1924	527888.60
24.00	1824	527898.80
18.50	1715	527904.00
15.00	1645	527908.20
4.50	1437	527932.80
1.00	1367	527937.80

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.21
35.00	25.25

y = thermistor output (counts)

$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

$x = \text{instrument output} - PTCA0 - PTCA1 * t - PTCA2 * t^2$

$n = x * PTCB0 / (PTCB0 + PTCB1 * t + PTCB2 * t^2)$

$\text{pressure (PSIA)} = PA0 + PA1 * n + PA2 * n^2$

Residual (%FSR) = (computed pressure - true pressure) * 100 / Full Scale Range