



**Sea-Bird Electronics, Inc.**  
 13431 NE 20th Street  
 Bellevue, WA 98005 United States

Phone  
 Fax

+1-425-643-9866  
 +1-425-643-9954  
 www.seabird.com  
**1005503290**  
 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:** 712-9362

**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
CNCRSLOCUM	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 20<sup>th</sup> Street  
 Bellevue, WA 98005  
 USA

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

SENSOR SERIAL NUMBER: 9362  
 CALIBRATION DATE: 13-Dec-17

Slocum Payload CTD TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

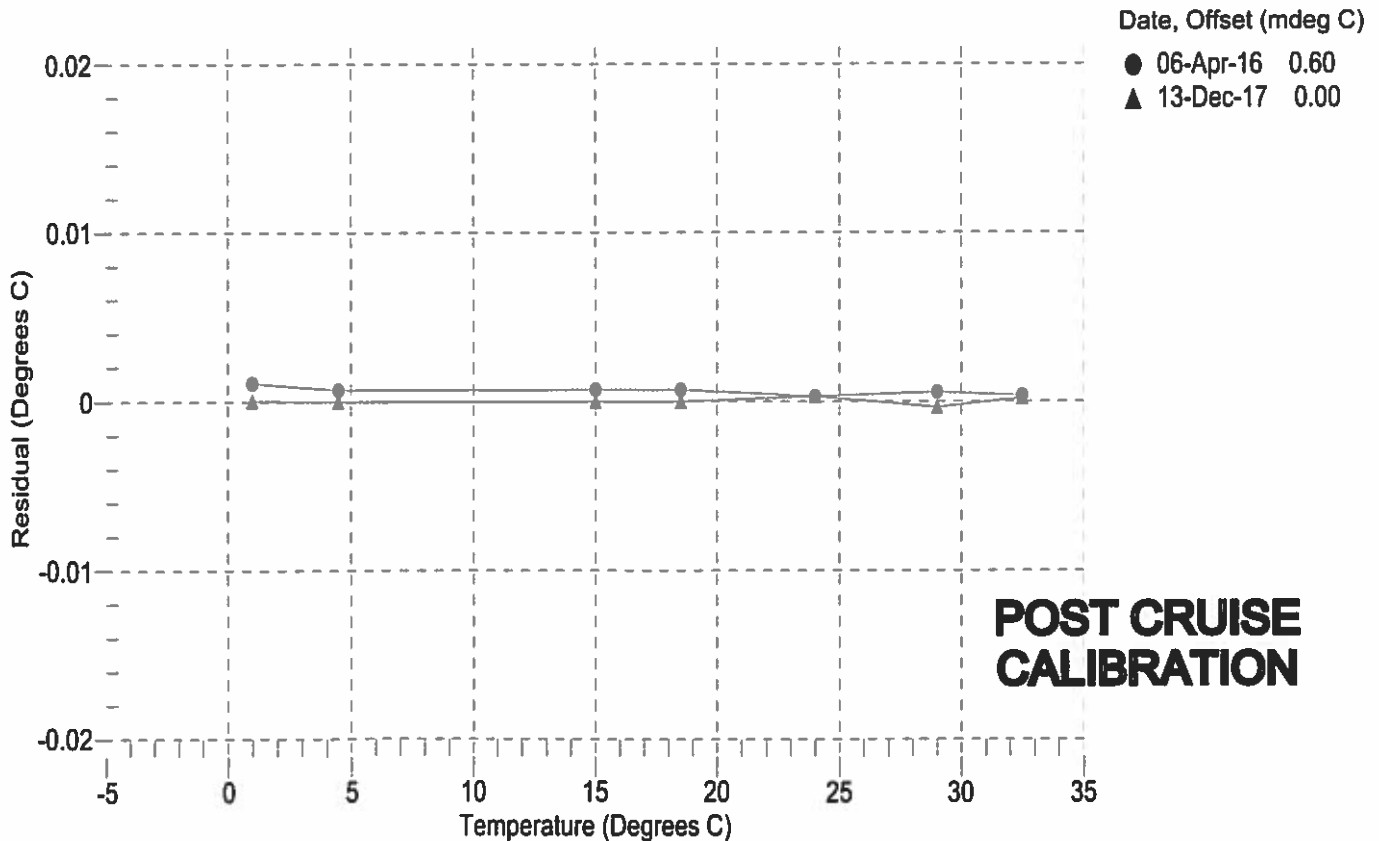
a0 = -1.411676e-004  
 a1 = 3.086136e-004  
 a2 = -4.295354e-006  
 a3 = 1.967765e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	560574.8	1.0000	0.0000
4.5000	480370.3	4.5000	-0.0000
15.0000	308228.2	15.0000	-0.0000
18.5000	267502.5	18.5000	-0.0000
24.0000	215371.4	24.0003	0.0003
29.0000	177931.5	28.9996	-0.0004
32.5000	156177.8	32.5002	0.0002

n = Instrument Output (counts)

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

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





Sea-Bird Scientific  
 13431 NE 20<sup>th</sup> Street  
 Bellevue, WA 98005  
 USA

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

SENSOR SERIAL NUMBER: 9362  
 CALIBRATION DATE: 13-Dec-17

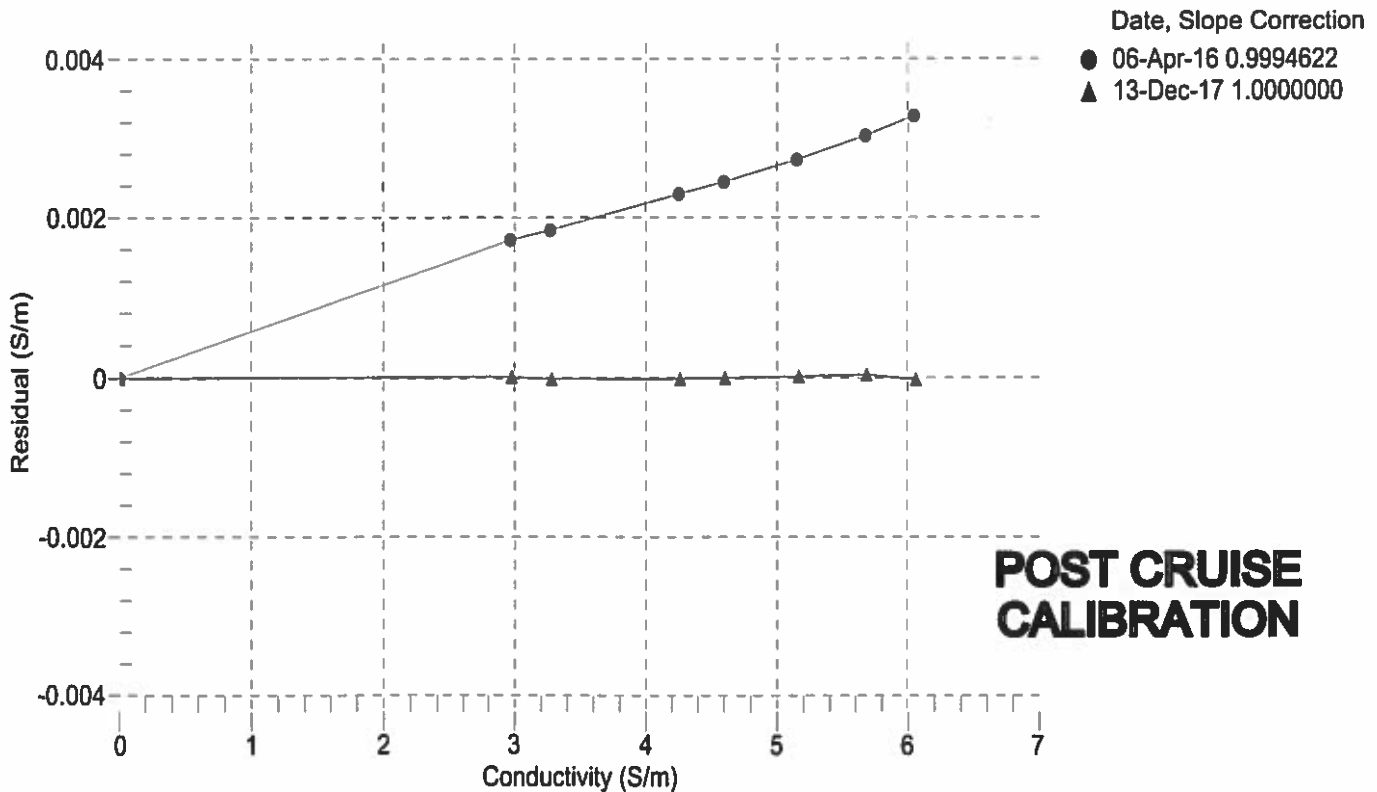
Slocum Payload CTD CONDUCTIVITY CALIBRATION DATA  
 PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -9.909560e-001      CPcor = -9.5700e-008  
 h = 1.477871e-001      CTcor = 3.2500e-006  
 i = -2.864464e-004      WBOTC = 4.4980e-007  
 j = 4.181211e-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	2593.50	0.00000	0.00000
1.0000	34.8100	2.97548	5186.98	2.97550	0.00002
4.5000	34.7903	3.28251	5383.43	3.28250	-0.00002
15.0000	34.7481	4.26413	5967.64	4.26412	-0.00001
18.5000	34.7390	4.60922	6159.61	4.60921	-0.00001
24.0000	34.7289	5.16706	6457.59	5.16707	0.00001
29.0000	34.7228	5.68873	6724.00	5.68876	0.00003
32.5000	34.7184	6.06085	6907.54	6.06082	-0.00002

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<sup>2</sup> + i \* f<sup>3</sup> + j \* f<sup>4</sup>) / (1 + δ \* t + ε \* p)  
 Residual (Siemens/meter) = instrument conductivity - bath conductivity





Sea-Bird Scientific  
 13431 NE 20<sup>th</sup> Street  
 Bellevue, WA 98005  
 USA

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

SENSOR SERIAL NUMBER: 9362  
 CALIBRATION DATE: 11-Dec-17

Slocum Payload CTD PRESSURE CALIBRATION DATA  
 1450 psia S/N 10087783

COEFFICIENTS:

PA0 =	-1.864662e+000	PTCA0 =	5.251788e+005
PA1 =	4.519326e-003	PTCA1 =	-4.328126e+000
PA2 =	-2.476964e-011	PTCA2 =	-6.187837e-001
PTEMPA0 =	1.303877e+002	PTCB0 =	2.510788e+001
PTEMPA1 =	-6.967371e-002	PTCB1 =	-2.500000e-005
PTEMPA2 =	-7.665480e-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)
14.77	528435.9	1522.1	14.72	-0.00	32.50	1384	528082.20
301.27	591835.9	1521.8	301.14	-0.01	29.00	1433	528238.90
588.50	655472.0	1521.0	588.44	-0.00	24.00	1502	528419.40
875.74	719145.6	1519.1	875.71	-0.00	18.50	1579	528585.70
1162.95	782858.0	1517.6	1162.96	0.00	15.00	1627	528675.50
1450.14	846596.2	1516.5	1450.12	-0.00	4.50	1772	528848.50
1163.03	782885.7	1518.5	1163.08	0.00	1.00	1821	528874.60
875.77	719167.7	1520.1	875.80	0.00			
588.49	655486.4	1520.6	588.51	0.00			
301.60	591962.4	1520.7	301.73	0.01			
14.77	528457.0	1520.3	14.83	0.00			

THERMAL CORRECTION

TEMPERATURE (°C)	SPAN
-5.00	25.11
35.00	25.11

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)

● 11-Dec-17 -0.00

