



SEA-BIRD

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SERVICE REPORT

Service Request
Date
Sales Order

1005508829
11-OCT-2019
315749641

PRODUCT INFORMATION

Item: SLOCUM.LEGACY
Item Description: (LEGACY) Slocum Glider
Serial: 712-9363

Special Notes

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

Services Performed:

Perform initial diagnostic evaluation.
Performed pressure calibration.
Performed "POST" cruise calibration.
Replaced the lithium back-up battery(s).
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
22096	LITHIUM COIN BATTERY, WITH TABS, BR1632A/HA	1



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SENSOR SERIAL NUMBER: 9363
 CALIBRATION DATE: 25-Sep-19

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

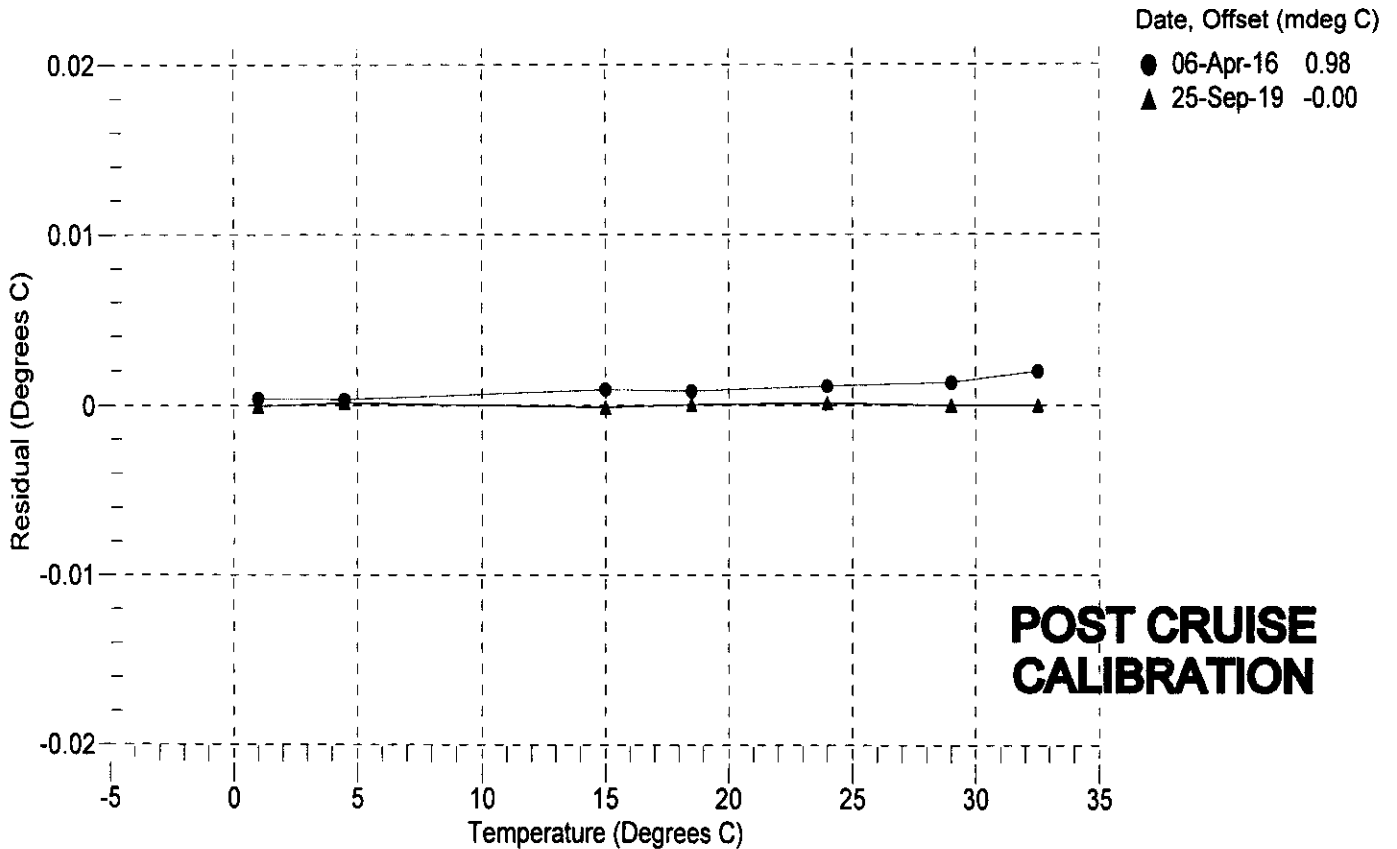
a0 = -1.544817e-004
 a1 = 3.140458e-004
 a2 = -4.869619e-006
 a3 = 2.109982e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	577959.2	0.9999	-0.0001
4.5000	494724.5	4.5001	0.0001
15.0000	316436.5	14.9999	-0.0001
18.5000	274344.3	18.5000	0.0000
24.0000	220535.6	24.0001	0.0001
29.0000	181942.9	29.0000	-0.0000
32.5000	159550.9	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: 9363
 CALIBRATION DATE: 25-Sep-19

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

COEFFICIENTS:

g = -9.816363e-001
 h = 1.282534e-001
 i = -1.257072e-004
 j = 2.611185e-005

CPcor = -9.5700e-008
 CTcor = 3.2500e-006
 WBOTC = 4.2143e-007

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	2768.15	0.00000	0.00000
1.0000	34.8514	2.97868	5554.55	2.97868	0.00000
4.5000	34.8317	3.28603	5765.28	3.28603	-0.00000
15.0000	34.7891	4.26863	6391.73	4.26864	0.00001
18.5000	34.7804	4.61412	6597.57	4.61411	-0.00001
24.0000	34.7709	5.17262	6917.09	5.17262	0.00000
29.0000	34.7657	5.69496	7202.76	5.69496	0.00000
32.5000	34.7551	6.06652	7399.64	6.06765	0.00113

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

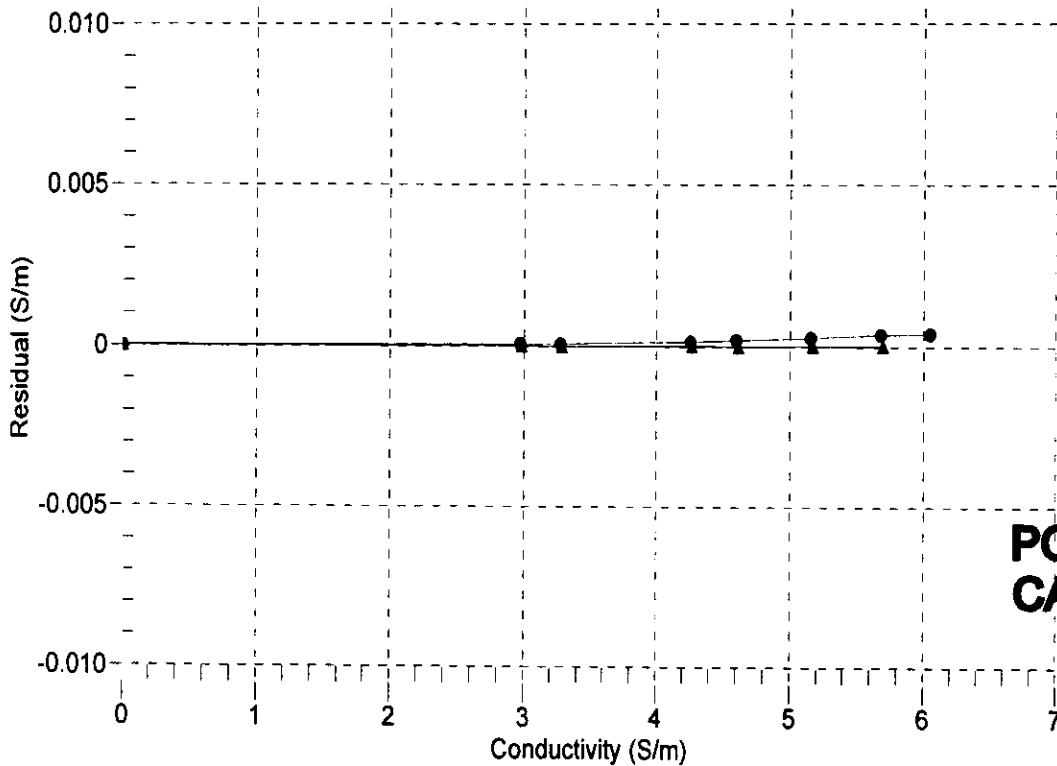
t = temperature (°C); p = pressure (decibars); δ = CTcor; ϵ = CPcor;

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

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

Date, Slope Correction

- 06-Apr-16 0.9999505
- ▲ 25-Sep-19 1.0000000



**POST CRUISE
 CALIBRATION**



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SENSOR SERIAL NUMBER: 9363
 CALIBRATION DATE: 24-Sep-19

Slocum Payload CTD PRESSURE CALIBRATION DATA
 1450 psia S/N 10087785

COEFFICIENTS:

PA0 = 4.256203e-001	PTCA0 = 5.244308e+005
PA1 = 4.544782e-003	PTCA1 = 1.173212e+001
PA2 = -2.595578e-011	PTCA2 = -3.179286e-001
PTEMPA0 = 1.393646e+002	PTCB0 = 2.505087e+001
PTEMPA1 = -6.703286e-002	PTCB1 = -2.500000e-005
PTEMPA2 = -7.408834e-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)
14.62	527651.0	1672.0	14.63	0.00	32.50	1567	527657.60
314.86	593687.0	1670.0	314.64	-0.02	29.00	1618	527660.90
614.87	659807.0	1674.0	614.79	-0.01	24.00	1690	527677.50
914.84	725952.0	1673.0	914.84	-0.00	18.50	1768	527698.90
1214.84	792137.0	1668.0	1214.84	0.00	15.00	1819	527733.20
1464.79	847308.0	1667.0	1464.75	-0.00	4.50	1969	527633.00
1214.82	792143.0	1667.0	1214.87	0.00	1.00	2019	527611.70
914.85	725963.0	1668.0	914.90	0.00			
614.88	659829.0	1671.0	614.90	0.00	TEMPERATURE (°C)	SPAN	
314.91	593745.0	1673.0	314.90	-0.00	-5.00	25.05	
14.63	527653.0	1674.0	14.64	0.00	35.00	25.05	

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-Sep-19 0.00

