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: 9346
CALIBRATION DATE: 25-Feb-16

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 4417955

COEFFICIENTS:

PA0 =	-8.746166e-002	PTCA0 =	5.242957e+005
PA1 =	4.440338e-003	PTCA1 =	-2.140726e+000
PA2 =	-2.081355e-011	PTCA2 =	5.318007e-002
PTEMPA0 =	1.585424e+002	PTCB0 =	2.517950e+001
PTEMPA1 =	-6.601682e-002	PTCB1 =	-3.000000e-004
PTEMPA2 =	3.789262e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.71	527612.0	2092.0	14.74	0.00
314.99	595242.0	2086.0	315.01	0.00
615.00	662827.0	2085.0	614.90	-0.01
914.85	730443.0	2084.0	914.73	-0.01
1214.90	798193.0	2082.0	1214.97	0.01
1464.91	854605.0	2081.0	1464.82	-0.01
1214.82	798179.0	2082.0	1214.91	0.01
914.87	730501.0	2084.0	914.99	0.01
614.98	662833.0	2083.0	614.93	-0.00
314.94	595238.0	2086.0	314.99	0.00
14.71	527599.0	2084.0	14.68	-0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1931	527617.00
29.00	1985	527616.00
24.00	2062	527595.80
18.50	2148	527611.00
15.00	2202	527613.60
4.50	2366	527621.20
1.00	2420	527625.20

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.18
35.00	25.17

y = thermistor output (counts)

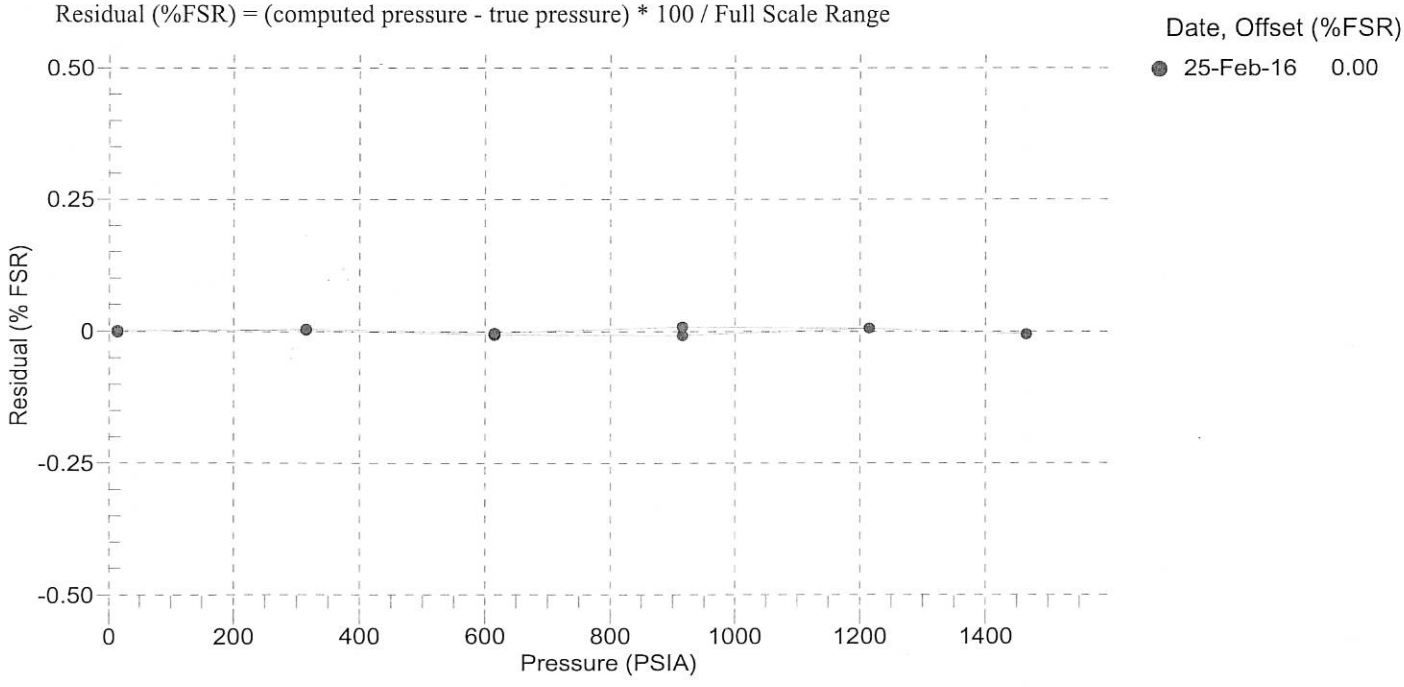
$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

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

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

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

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



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SENSOR SERIAL NUMBER: 9346
CALIBRATION DATE: 12-Mar-16

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

COEFFICIENTS:

```
g = -9.788441e-001
h =  1.414120e-001
i = -2.639053e-004
j =  3.901571e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  2.5299e-007
```

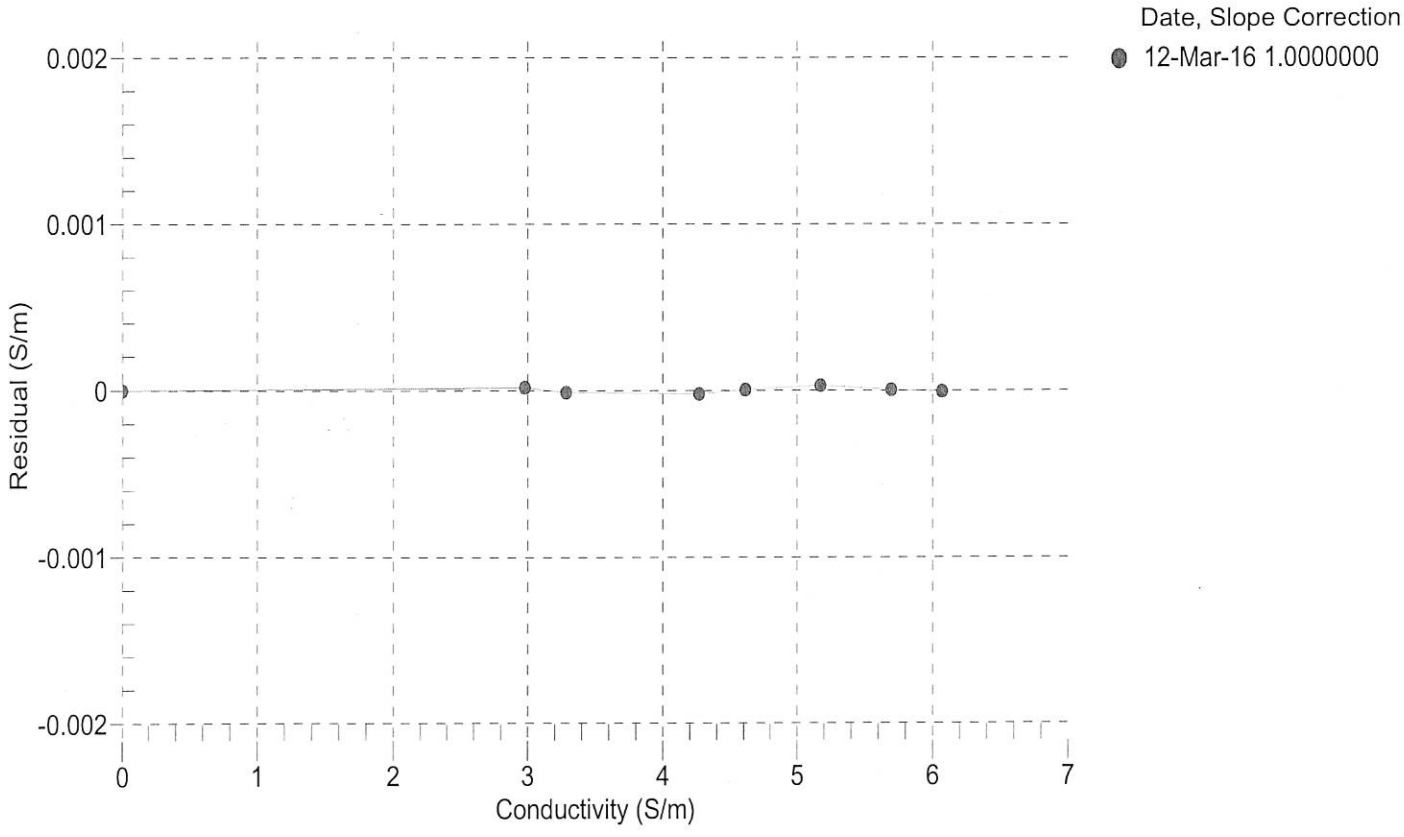
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2634.91	0.00000	0.00000
1.0000	34.8442	2.97812	5295.49	2.97814	0.00002
4.5000	34.8246	3.28543	5496.66	3.28542	-0.00001
15.0000	34.7825	4.26791	6094.72	4.26788	-0.00002
18.5000	34.7737	4.61333	6291.22	4.61333	0.00000
24.0000	34.7640	5.17171	6596.20	5.17173	0.00003
29.0000	34.7587	5.69395	6868.84	5.69395	0.00000
32.5000	34.7557	6.06662	7056.76	6.06661	-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



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CALIBRATION DATE: 12-Mar-16

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = -1.548716e-004
a1 = 3.140998e-004
a2 = -4.852971e-006
a3 = 2.130362e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	562603.4	1.0000	-0.0000
4.5000	481926.2	4.5001	0.0001
15.0000	308870.6	14.9999	-0.0001
18.5000	267953.4	18.5000	0.0000
24.0000	215602.4	24.0001	0.0001
29.0000	178019.6	28.9999	-0.0001
32.5000	156196.2	32.5000	0.0000

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