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: 9219
CALIBRATION DATE: 30-Jul-14

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

COEFFICIENTS:

```
g = -9.815294e-001
h =  1.442087e-001
i = -2.650806e-004
j =  4.065385e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  4.7841e-007
```

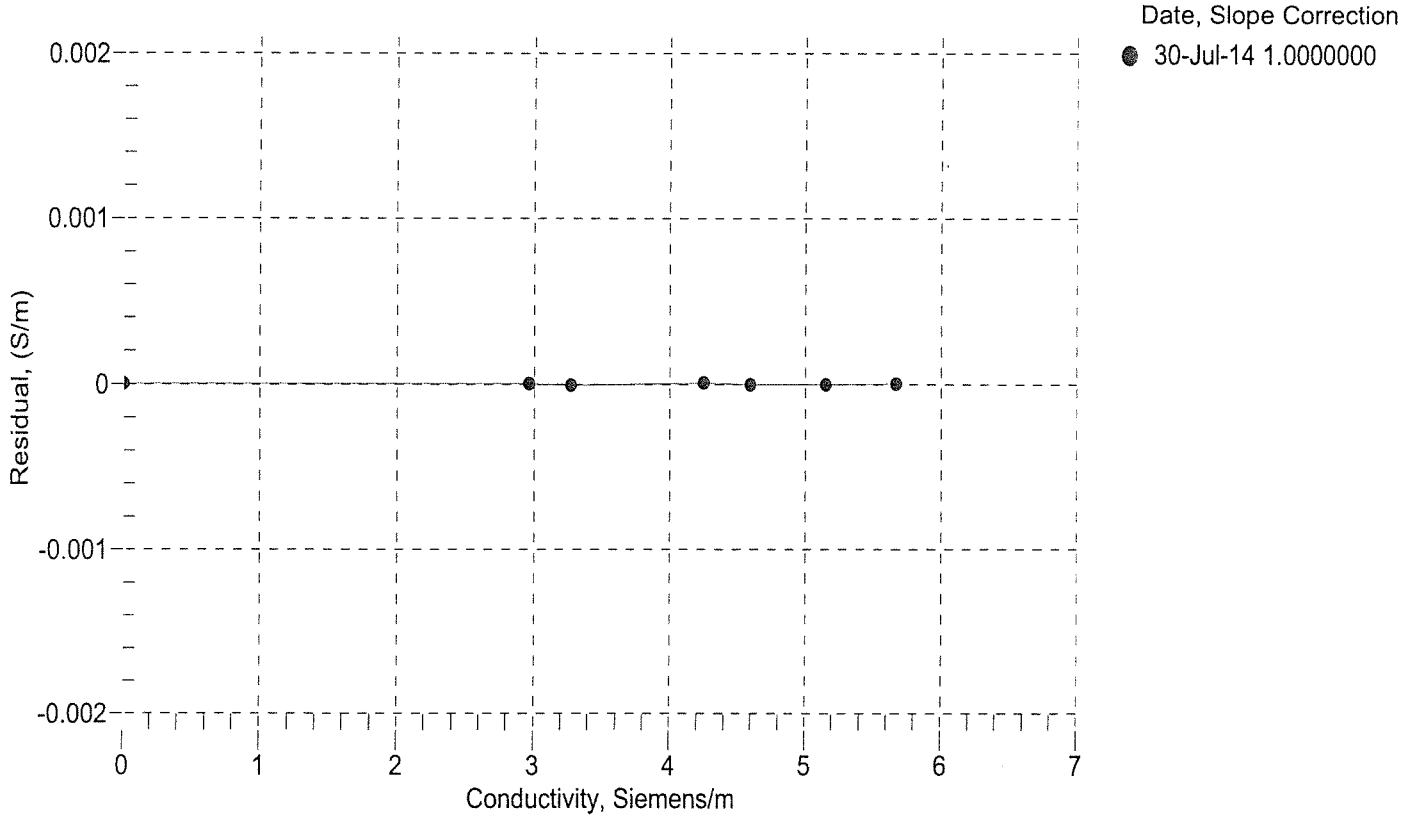
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2612.64	0.00000	0.00000
1.0000	34.6705	2.96469	5236.09	2.96469	0.00000
4.4999	34.6504	3.27060	5434.64	3.27059	-0.00001
15.0000	34.6076	4.24871	6024.98	4.24872	0.00001
18.5000	34.5989	4.59263	6218.96	4.59263	-0.00000
24.0000	34.5896	5.14862	6520.06	5.14861	-0.00000
29.0000	34.5847	5.66864	6789.27	5.66864	0.00000
32.5001	34.5820	6.03975	6974.77	6.03959	-0.00016

f = INST FREQ * sqrt(1.0 + WBOTC * t) / 1000.0

Conductiv ity = $(g + h * f^2 + i * f^3 + j * f^4) / (1 + \delta * t + \varepsilon * p)$ Siemens / meter

t = temperatur e[°C)]; p = pressure[decibars]; δ = CTcor; ε = CPcor;

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9219
CALIBRATION DATE: 24-Jul-14

Slocum Payload CTD PRESSURE CALIBRATION DATA
FSR: 1450 psia S/N 4207702

COEFFICIENTS:

PA0 =	8.527699e-002	PTCA0 =	5.247330e+005
PA1 =	4.573464e-003	PTCA1 =	-7.329107e-001
PA2 =	-1.562777e-011	PTCA2 =	5.811989e-002
PTEMPA0 =	-6.705521e+001	PTCB0 =	2.539013e+001
PTEMPA1 =	5.190892e-002	PTCB1 =	-1.175000e-003
PTEMPA2 =	-5.425366e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FS
14.66	527939.0	1774.0	14.70	0.00
314.94	593523.0	1777.0	314.89	-0.00
614.87	659078.0	1778.0	614.83	-0.00
914.95	724702.0	1779.0	914.94	-0.00
1214.91	790315.0	1780.0	1214.87	-0.00
1464.83	845013.0	1780.0	1464.80	-0.00
1214.87	790328.0	1779.0	1214.93	0.00
914.86	724697.0	1780.0	914.92	0.00
614.90	659100.0	1780.0	614.93	0.00
314.94	593526.0	1779.0	314.91	-0.00
14.66	527934.0	1781.0	14.67	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	1958	528003.40
29.00	1888	527998.20
24.00	1787	527986.60
18.50	1677	527972.80
15.00	1608	527968.40
4.50	1399	527967.60
1.00	1330	527967.00

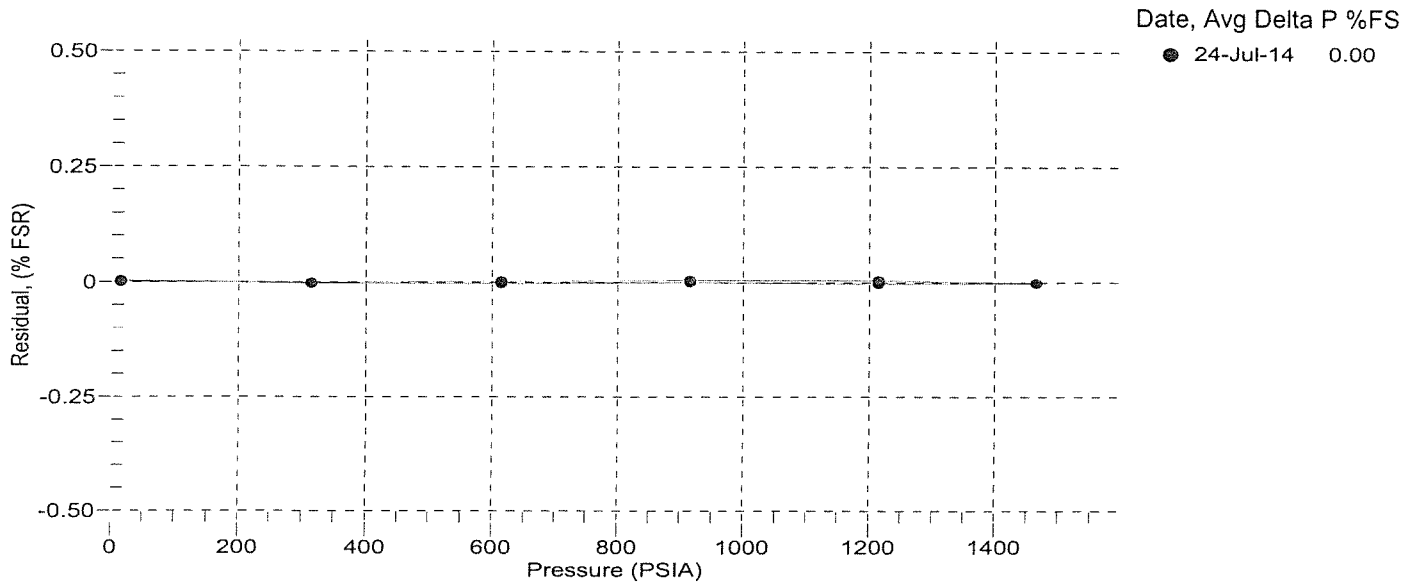
TEMP (ITS90)	SPAN (mV)
-5.00	25.40
35.00	25.35

y = thermistor output; $t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

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

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

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



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SENSOR SERIAL NUMBER: 9219
CALIBRATION DATE: 30-Jul-14

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = -1.784228e-004
a1 = 3.230894e-004
a2 = -5.742494e-006
a3 = 2.350562e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	580743.4	1.0000	0.0000
4.4999	496747.6	4.4999	-0.0000
15.0000	317024.2	15.0000	-0.0000
18.5000	274654.4	18.5000	0.0000
24.0000	220535.2	24.0000	0.0000
29.0000	181758.4	28.9999	-0.0001
32.5001	159277.2	32.5001	0.0000

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

Residual = instrument temperature - bath temperature

n = instrument output