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: 9353
CALIBRATION DATE: 11-Mar-16

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

COEFFICIENTS:

```
g = -9.852893e-001
h =  1.308156e-001
i = -1.272570e-004
j =  2.686007e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  9.1032e-008
```

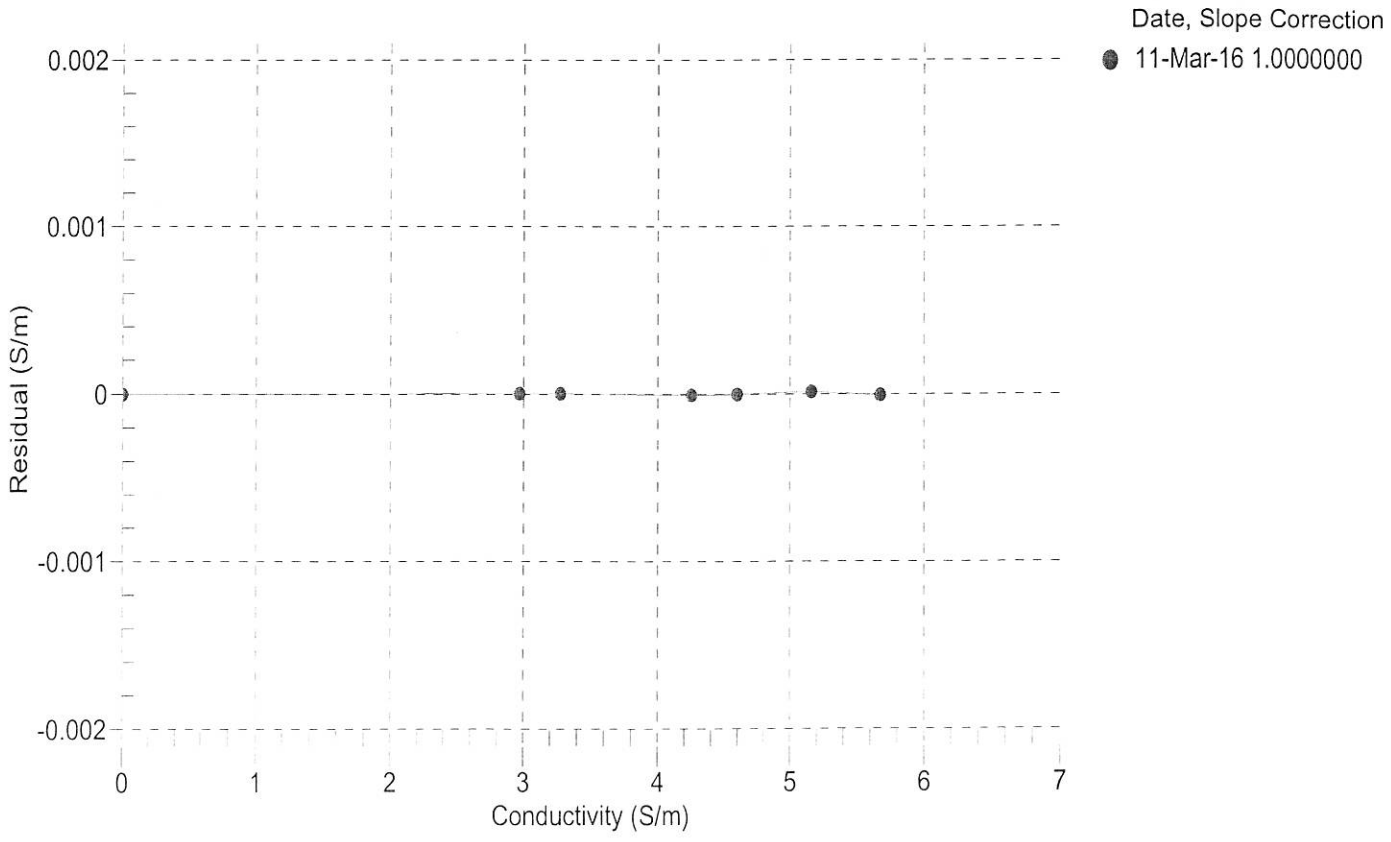
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2745.97	0.00000	0.00000
1.0000	34.7105	2.96778	5494.81	2.96778	0.00000
4.5000	34.6907	3.27404	5702.93	3.27404	0.00000
15.0000	34.6483	4.25318	6321.71	4.25317	-0.00001
18.5000	34.6394	4.59743	6525.05	4.59742	-0.00000
24.0000	34.6296	5.15391	6840.69	5.15393	0.00001
29.0000	34.6245	5.67443	7122.93	5.67442	-0.00001
32.5000	34.6222	6.04596	7317.49	6.04584	-0.00012

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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SENSOR SERIAL NUMBER: 9353
CALIBRATION DATE: 12-Feb-16

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 4449854

COEFFICIENTS:

PA0 =	1.187379e-001	PTCA0 =	5.244773e+005
PA1 =	4.589555e-003	PTCA1 =	3.750621e+000
PA2 =	-1.996881e-011	PTCA2 =	-1.154652e-001
PTEMPA0 =	1.495120e+002	PTCB0 =	2.510188e+001
PTEMPA1 =	-6.161058e-002	PTCB1 =	-2.500000e-005
PTEMPA2 =	-1.297175e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.66	527673.0	2051.0	14.67	0.00
314.89	593083.0	2046.0	314.79	-0.01
614.99	658514.0	2045.0	614.83	-0.01
914.96	723968.0	2044.0	914.80	-0.01
1214.94	789498.0	2041.0	1214.96	0.00
1464.47	843988.0	2041.0	1464.41	-0.00
1214.83	789493.0	2040.0	1214.94	0.01
914.86	724002.0	2041.0	914.96	0.01
614.77	658535.0	2045.0	614.92	0.01
314.80	593105.0	2044.0	314.89	0.01
14.66	527675.0	2046.0	14.68	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1892	527658.50
29.00	1948	527731.75
24.00	2029	527694.25
18.50	2117	527705.25
15.00	2173	527712.50
4.50	2342	527692.50
1.00	2399	527689.25

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.10
35.00	25.10

y = thermistor output (counts)

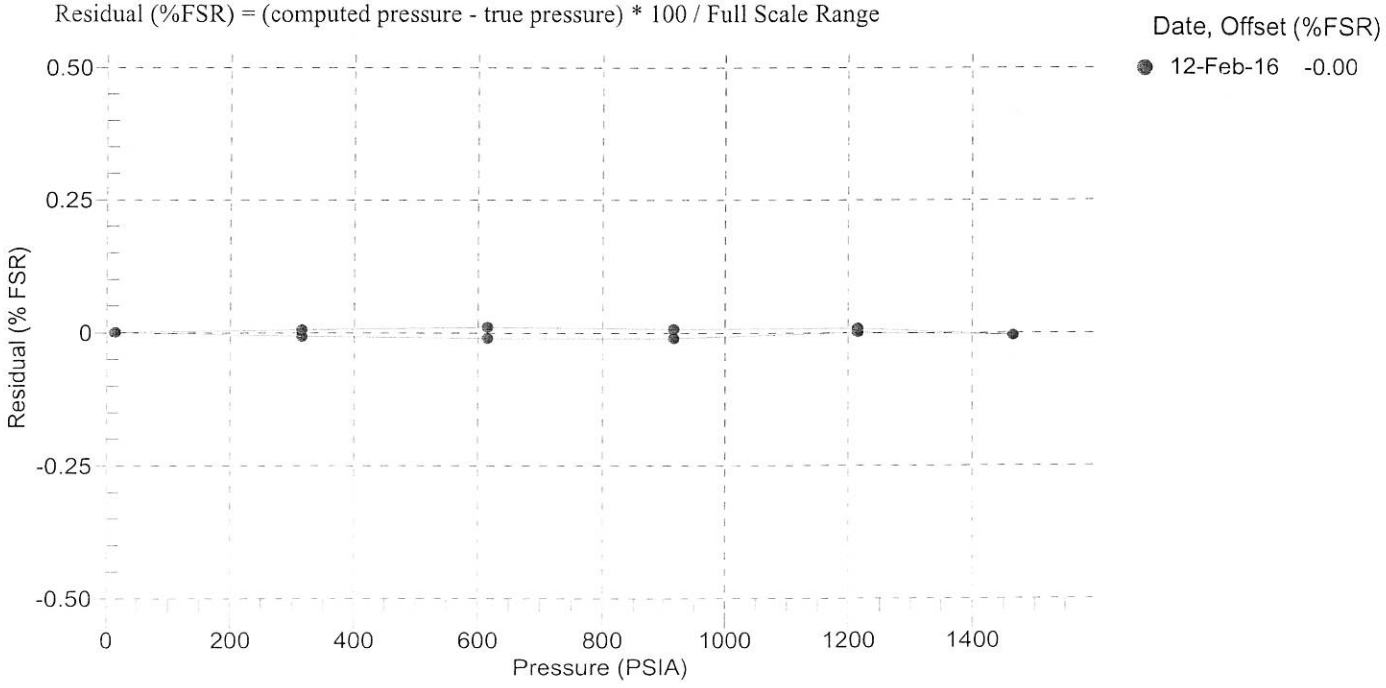
$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

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

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

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

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



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CALIBRATION DATE: 11-Mar-16

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = -1.371503e-004
a1 = 3.130767e-004
a2 = -4.911443e-006
a3 = 2.123671e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	577351.0	1.0000	-0.0000
4.5000	493850.0	4.5000	0.0000
15.0000	315208.5	14.9999	-0.0001
18.5000	273090.8	18.5001	0.0001
24.0000	219296.5	24.0001	0.0001
29.0000	180750.8	28.9998	-0.0002
32.5000	158401.3	32.5001	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