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: 9060
CALIBRATION DATE: 08-Mar-13

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3805658

COEFFICIENTS:

PA0 =	-1.266287e+000	PTCA0 =	5.248416e+005
PA1 =	4.580788e-003	PTCA1 =	-1.204998e+001
PA2 =	-1.463110e-011	PTCA2 =	-1.509298e-002
PTEMPA0 =	-7.179874e+001	PTCB0 =	2.532013e+001
PTEMPA1 =	5.141395e-002	PTCB1 =	2.500000e-005
PTEMPA2 =	-5.255467e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.65	528047.0	1866.0	14.68	0.00
314.97	593594.0	1870.0	314.87	-0.01
614.96	659132.0	1870.0	614.89	-0.01
914.96	724709.0	1871.0	914.96	-0.00
1214.97	790302.0	1872.0	1214.97	-0.00
1465.04	844992.0	1873.0	1465.03	-0.00
1214.96	790297.0	1873.0	1214.95	-0.00
915.03	724731.0	1873.0	915.06	0.00
614.97	659180.0	1873.0	615.12	0.01
315.05	593617.0	1873.0	314.99	-0.00
14.65	528044.0	1873.0	14.69	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2073	527987.10
29.00	2001	528033.50
24.00	1900	528097.20
18.50	1789	528166.50
15.00	1719	528210.80
4.50	1507	528341.10
1.00	1437	528382.60

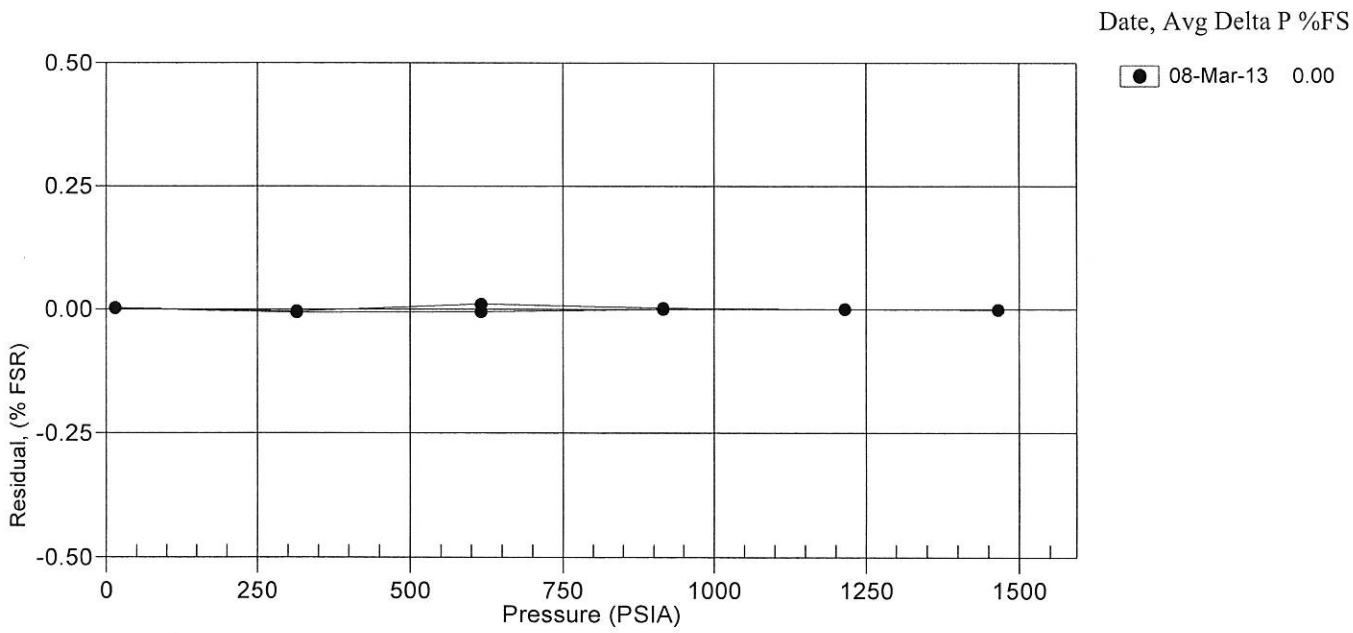
TEMP(ITS90)	SPAN(mV)
-5.00	25.32
35.00	25.32

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

x = pressure output - $PTCA0 - PTCA1 * t - PTCA2 * t^2$

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

pressure (psia) = $PA0 + PA1 * n + PA2 * n^2$



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SENSOR SERIAL NUMBER: 9060
CALIBRATION DATE: 31-May-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

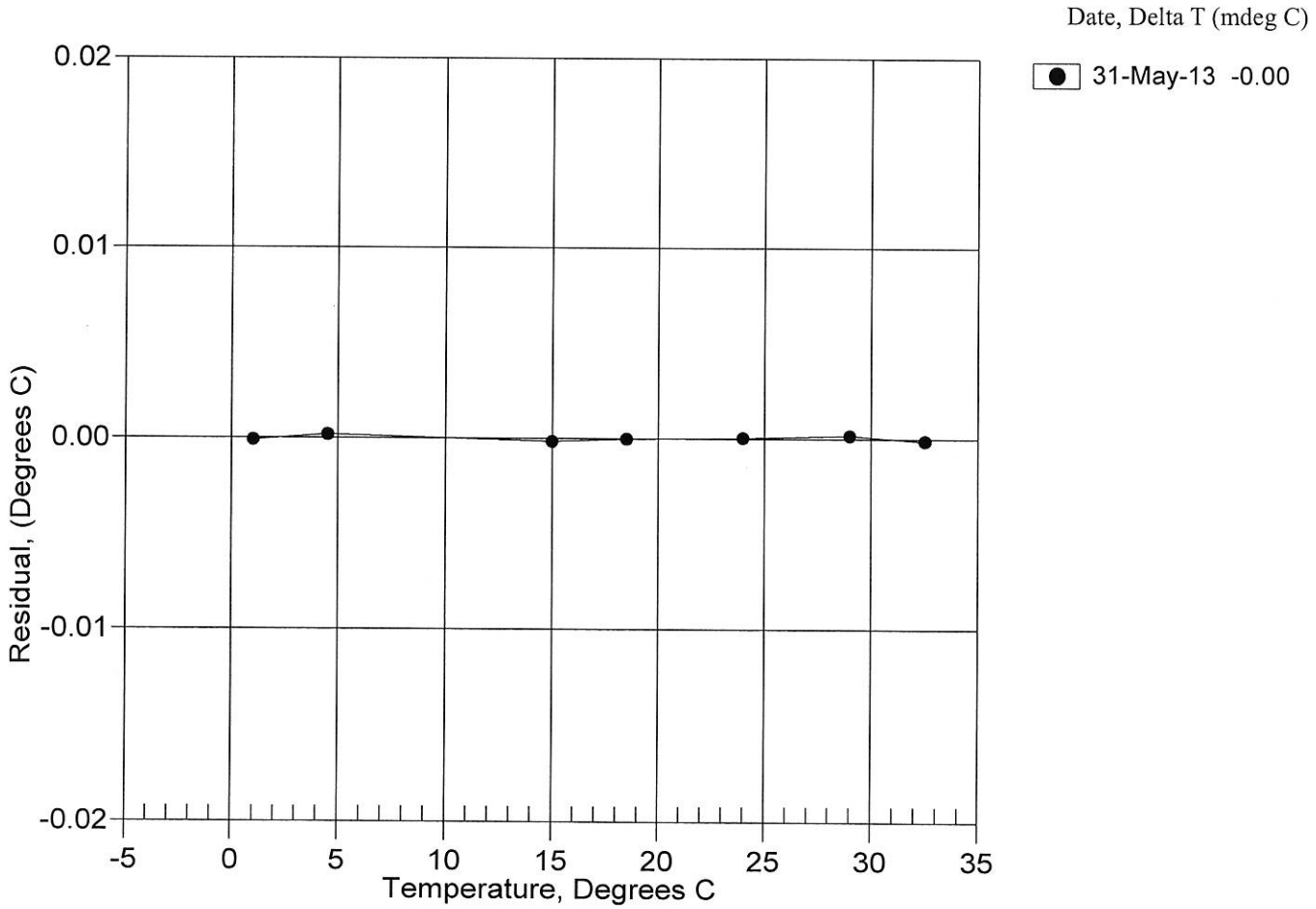
ITS-90 COEFFICIENTS

a0 = -9.688467e-005
a1 = 3.080132e-004
a2 = -4.647427e-006
a3 = 2.049510e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
0.9999	572953.0	0.9998	-0.0001
4.5000	489549.3	4.5002	0.0002
15.0000	311490.9	14.9999	-0.0001
18.5000	269600.7	18.5000	-0.0000
24.0000	216159.2	24.0000	0.0000
29.0000	177919.4	29.0002	0.0002
32.5000	155777.6	32.4999	-0.0001

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

Residual = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 9060
CALIBRATION DATE: 31-May-13

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

COEFFICIENTS:

```
g = -9.902037e-001
h =  1.323388e-001
i = -3.136565e-004
j =  3.986343e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  1.5807e-006
```

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	2741.15	0.00000	0.00000
0.9999	34.8131	2.97571	5485.10	2.97570	-0.00001
4.5000	34.7932	3.28276	5692.90	3.28277	0.00001
15.0000	34.7505	4.26439	6310.64	4.26439	-0.00001
18.5000	34.7413	4.60949	6513.60	4.60950	0.00000
24.0000	34.7312	5.16736	6828.60	5.16737	0.00000
29.0000	34.7256	5.68913	7110.22	5.68913	-0.00000

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

Conductivity = $(g + hf^2 + if^3 + jf^4) / (1 + \delta t + \varepsilon p)$ Siemens/meter

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

Residual = instrument conductivity - bath conductivity