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: 9026
CALIBRATION DATE: 26-Aug-12

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

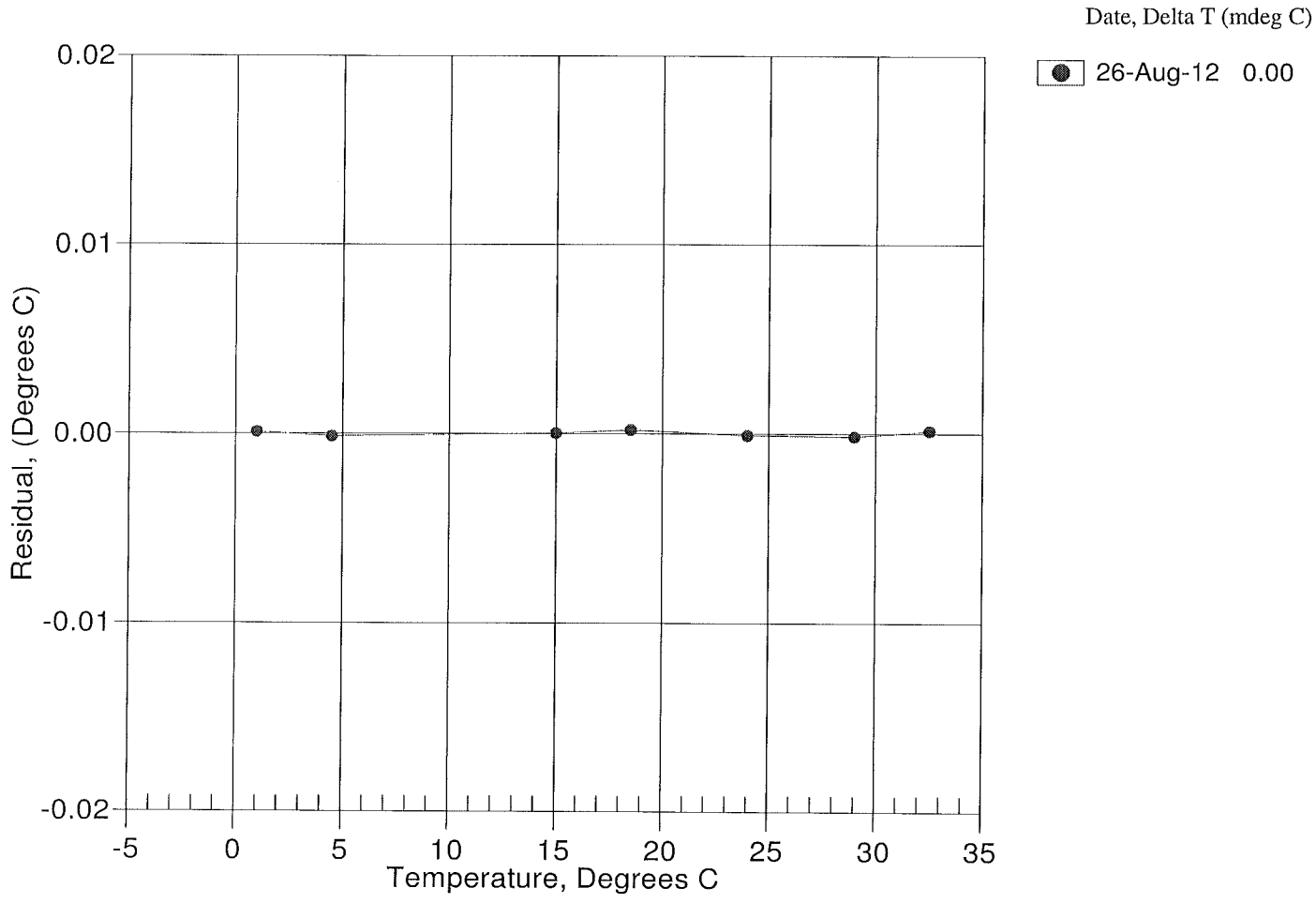
ITS-90 COEFFICIENTS

a0 = -7.154871e-005
a1 = 3.012319e-004
a2 = -4.070747e-006
a3 = 1.903265e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	567674.0	1.0001	0.0001
4.5000	485244.3	4.4998	-0.0002
15.0000	309100.2	15.0000	0.0000
18.5000	267629.6	18.5002	0.0002
24.0000	214702.5	23.9999	-0.0001
29.0000	176808.0	28.9998	-0.0002
32.5000	154852.2	32.5001	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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CALIBRATION DATE: 26-Aug-12

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

COEFFICIENTS:

```
g = -9.846832e-001
h =  1.328303e-001
i = -1.339382e-004
j =  2.688635e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  1.5292e-007
```

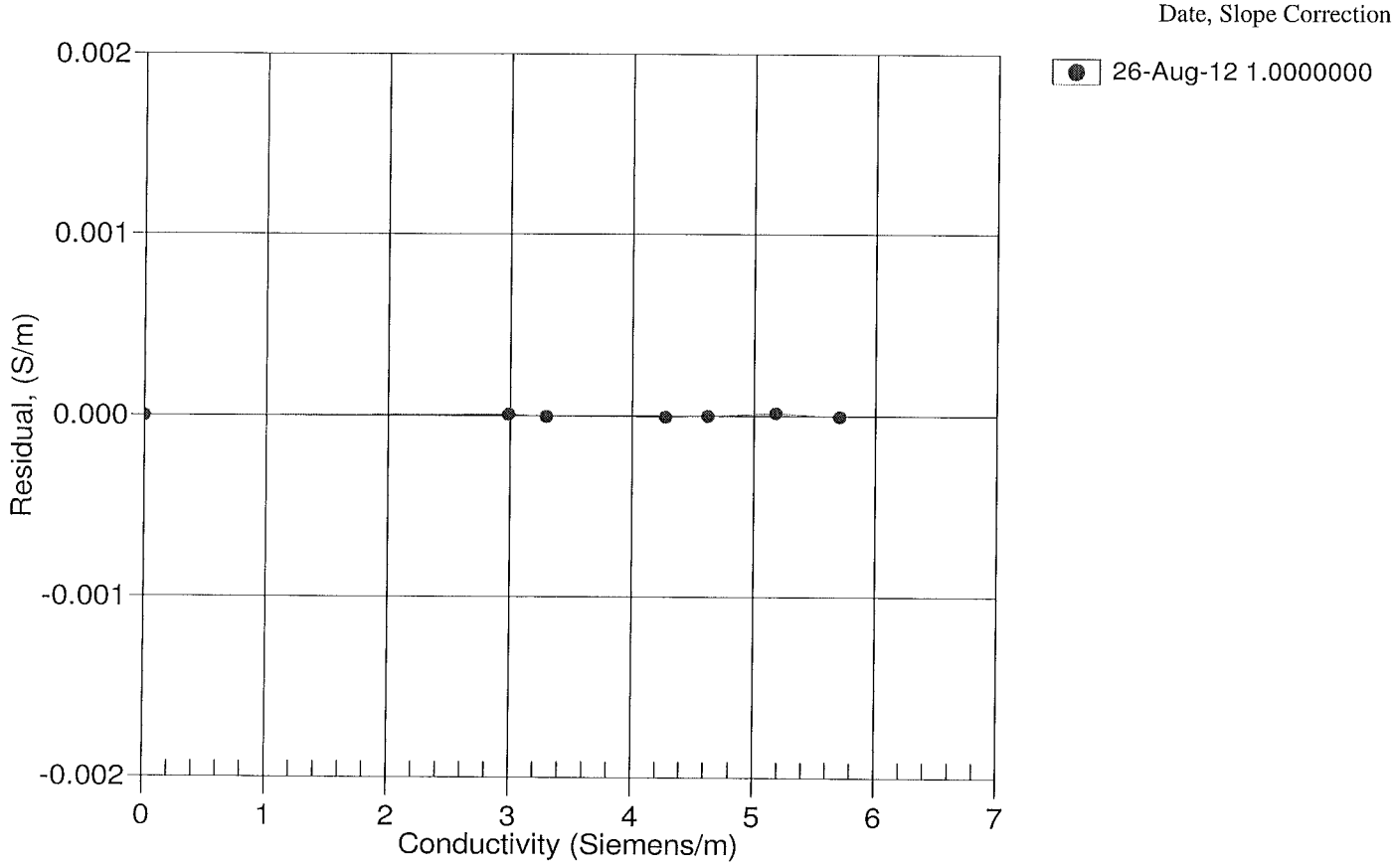
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2724.39	0.00000	0.00000
1.0000	34.9189	2.98390	5464.54	2.98390	0.00001
4.5000	34.8996	3.29181	5671.86	3.29180	-0.00000
15.0000	34.8574	4.27612	6288.17	4.27611	-0.00001
18.5000	34.8482	4.62214	6490.68	4.62214	-0.00000
24.0000	34.8375	5.18143	6804.97	5.18144	0.00001
29.0000	34.8294	5.70422	7085.83	5.70422	-0.00001

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



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SENSOR SERIAL NUMBER: 9026
CALIBRATION DATE: 23-Aug-12

SLOCUM PAYLOAD CTD
PRESSURE CALIBRATION DATA
1450 psia S/N 3653217

COEFFICIENTS:

PA0 =	-7.071768e-003	PTCA0 =	5.246603e+005
PA1 =	4.559772e-003	PTCA1 =	-3.236157e-001
PA2 =	-2.014527e-011	PTCA2 =	8.776718e-003
PTEMPA0 =	-7.094159e+001	PTCB0 =	2.534362e+001
PTEMPA1 =	5.113391e-002	PTCB1 =	-2.750000e-004
PTEMPA2 =	-4.895939e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.65	527883.0	1831.0	14.70	0.00
315.11	593752.0	1834.0	315.02	-0.01
615.07	659589.0	1837.0	615.03	-0.00
915.00	725463.0	1837.0	915.02	0.00
1214.95	791359.0	1839.0	1214.94	-0.00
1464.94	846305.0	1839.0	1464.89	-0.00
1214.91	791362.0	1839.0	1214.95	0.00
914.97	725466.0	1840.0	915.04	0.00
615.03	659589.0	1840.0	615.03	-0.00
315.04	593752.0	1840.0	315.03	-0.00
14.65	527872.0	1841.0	14.65	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2064	527904.90
29.00	1993	527906.60
24.00	1891	527904.90
18.50	1779	527903.70
15.00	1709	527902.80
4.50	1497	527908.30
1.00	1426	527905.40

TEMP(ITS90)	SPAN(mV)
-5.00	25.34
35.00	25.33

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) = $PA0 + PA1 * n + PA2 * n^2$