SEA-BIRD SCIENTIFIC

SBE Sea-Bird Electronics

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SBE 41-CP ALACE

Instrument Configuration

Instrument Serial Number: 41-7261
Instrument Firmware Version: ALACE-CP V 3.0C
Zero Conductivity Frequency: 2692.22

Installed Devices/Sensors

Data Format	*Measurement*	*Sensor Type*	*Serial Number*	*Rating*
Count	Temperature	Internal	N/A	N/A
Frequency	Conductivity	Internal	N/A	N/A
Count	Pressure	Kistler	4645069	2000m(2000 dBar)

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SENSOR SERIAL NUMBER: 7261
CALIBRATION DATE: 23-Jun-15

SBE 41 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

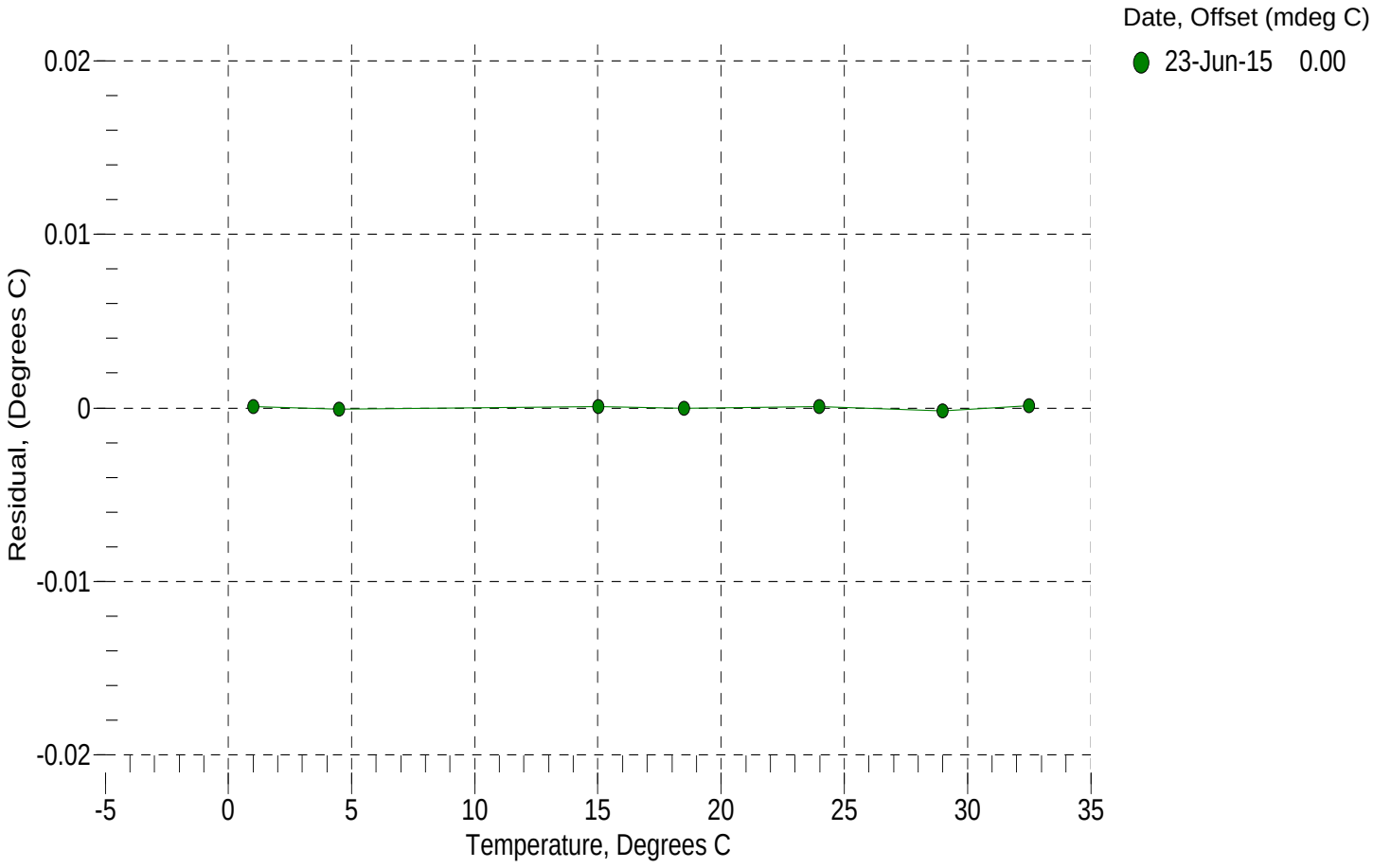
```
a0 =  9.819736e-005
a1 =  2.628965e-004
a2 = -1.592937e-006
a3 =  1.290912e-007
```

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	664683.6	1.0001	0.0001
4.5000	566987.7	4.4999	-0.0001
15.0000	358939.2	15.0001	0.0001
18.5000	310143.5	18.5000	-0.0000
23.9940	248055.3	23.9941	0.0001
29.0000	203619.7	28.9998	-0.0002
32.5000	177960.9	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

n = instrument output



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SENSOR SERIAL NUMBER: 7261
CALIBRATION DATE: 23-Jun-15

SBE 41 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g = -9.788938e-001
h =  1.356832e-001
i = -3.490640e-004
j =  4.315493e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  3.4045e-007
```

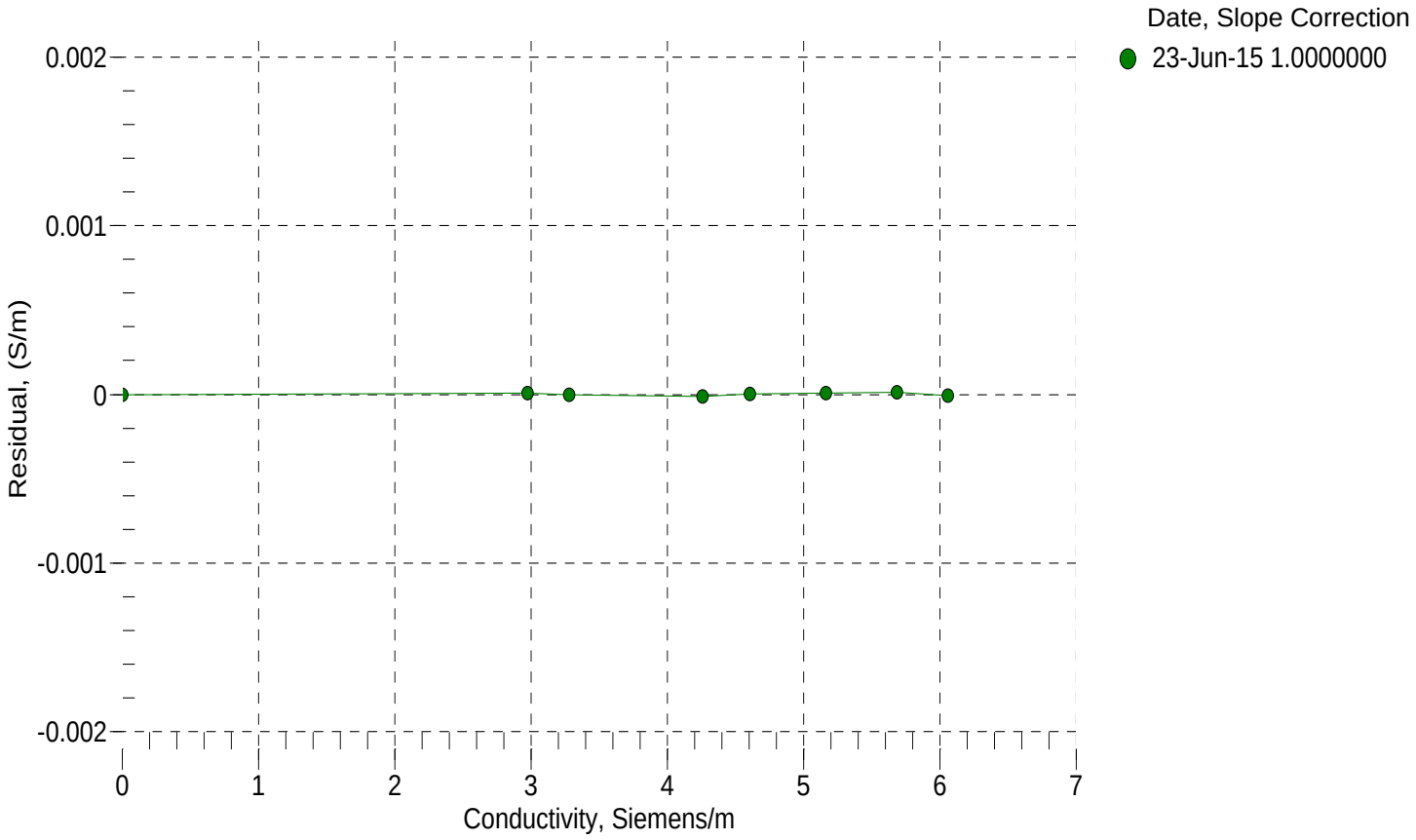
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2692.21	0.00000	0.00000
1.0000	34.7969	2.97446	5410.33	2.97447	0.00001
4.5000	34.7773	3.28141	5615.91	3.28140	-0.00000
15.0000	34.7350	4.26269	6226.98	4.26268	-0.00001
18.5000	34.7260	4.60768	6427.73	4.60768	0.00000
23.9940	34.7163	5.16477	6738.95	5.16478	0.00000
29.0000	34.7109	5.68700	7017.81	5.68701	0.00001
32.5000	34.7082	6.05927	7209.77	6.05926	-0.00001

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: 7261
CALIBRATION DATE: 19-Jun-15

SBE 41 PRESSURE CALIBRATION DATA
2900 psia S/N 4645069

COEFFICIENTS:

PA0 =	-8.203473e-001	PTCA0 =	9.628704e+001
PA1 =	1.402639e-001	PTCA1 =	-7.311859e-001
PA2 =	1.005881e-008	PTCA2 =	2.161287e-002
PTHA0 =	-9.683869e+001	PTCB0 =	1.040088e+002
PTHA1 =	4.042428e-002	PTCB1 =	-6.123426e-003
PTHA2 =	1.089687e-006	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FS
14.67	201.4	2713.6	14.76	0.00
592.83	4316.0	2722.6	592.79	-0.00
1170.50	8426.6	2724.5	1170.60	0.00
1748.26	12534.8	2726.5	1748.43	0.01
2326.01	16639.9	2727.9	2326.16	0.01
2903.64	20739.7	2729.9	2903.50	-0.00
2325.91	16638.1	2730.5	2325.92	0.00
1748.23	12533.0	2731.9	1748.20	-0.00
1170.55	8425.2	2732.2	1170.42	-0.00
592.59	4312.5	2732.7	592.30	-0.01
14.67	201.7	2735.6	14.78	0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2962.90	211.14
29.00	2888.10	208.93
23.99	2780.60	206.94
18.50	2662.10	205.85
15.00	2586.60	205.95
4.50	2356.70	209.24
1.00	2280.40	211.26

TEMP(ITS90)	SPAN(mV)
-3.92	104.03
35.78	103.79

y = thermistor output; $t = PTHA0 + PTHA1 * y + PTHA2 * y^2$

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

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

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