SEA-BIRD SCIENTIFIC

SBE Sea-Bird Electronics

Sea-Bird Electronics
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98005 USA

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SBE41-CP ALACE

Instrument Configuration

Instrument Serial Number:	41-7298
Instrument Firmware Version:	ALACE-CP V 3.0C
Zero Conductivity Frequency:	2690.77
Communications Format:	RS232
Communications Settings:	9600 baud, 8 Data Bits, No Parity

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	4645062	2000m(2000 dBar)

CAUTION - This instrument is not intended for underwater use

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SENSOR SERIAL NUMBER: 7298
CALIBRATION DATE: 11-Jun-15

SBE 41 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

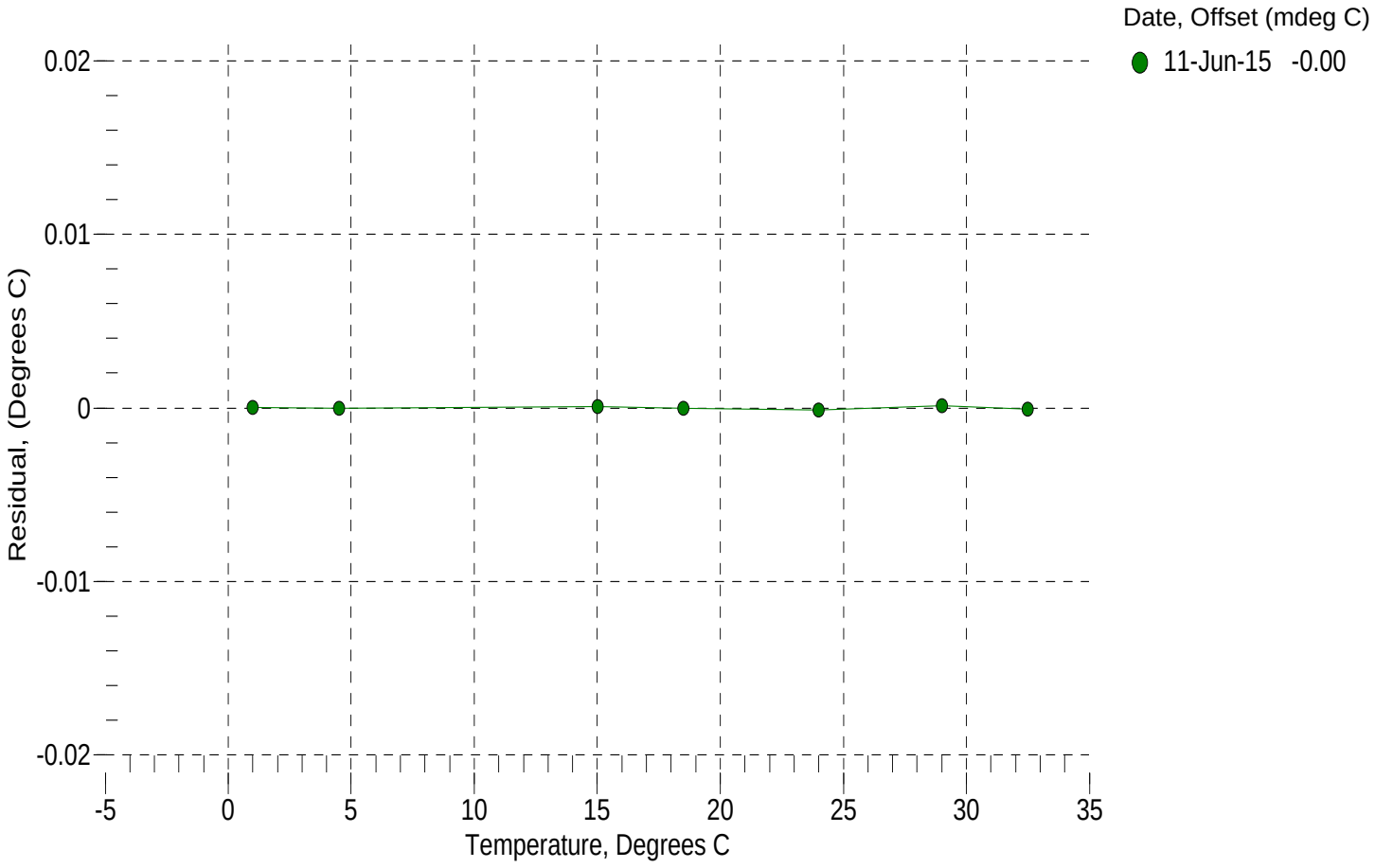
```
a0 =  4.224866e-005
a1 =  2.671954e-004
a2 = -1.963730e-006
a3 =  1.368336e-007
```

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	780233.7	1.0000	0.0000
4.5000	665432.6	4.5000	-0.0000
15.0000	421042.3	15.0001	0.0001
18.5000	363743.0	18.5000	-0.0000
23.9940	290853.0	23.9939	-0.0001
29.0000	238692.6	29.0001	0.0001
32.5001	208586.4	32.5000	-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: 7298
CALIBRATION DATE: 11-Jun-15

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

COEFFICIENTS:

```
g = -9.856301e-001
h =  1.366503e-001
i = -2.983670e-004
j =  3.963815e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC = -5.8836e-007
```

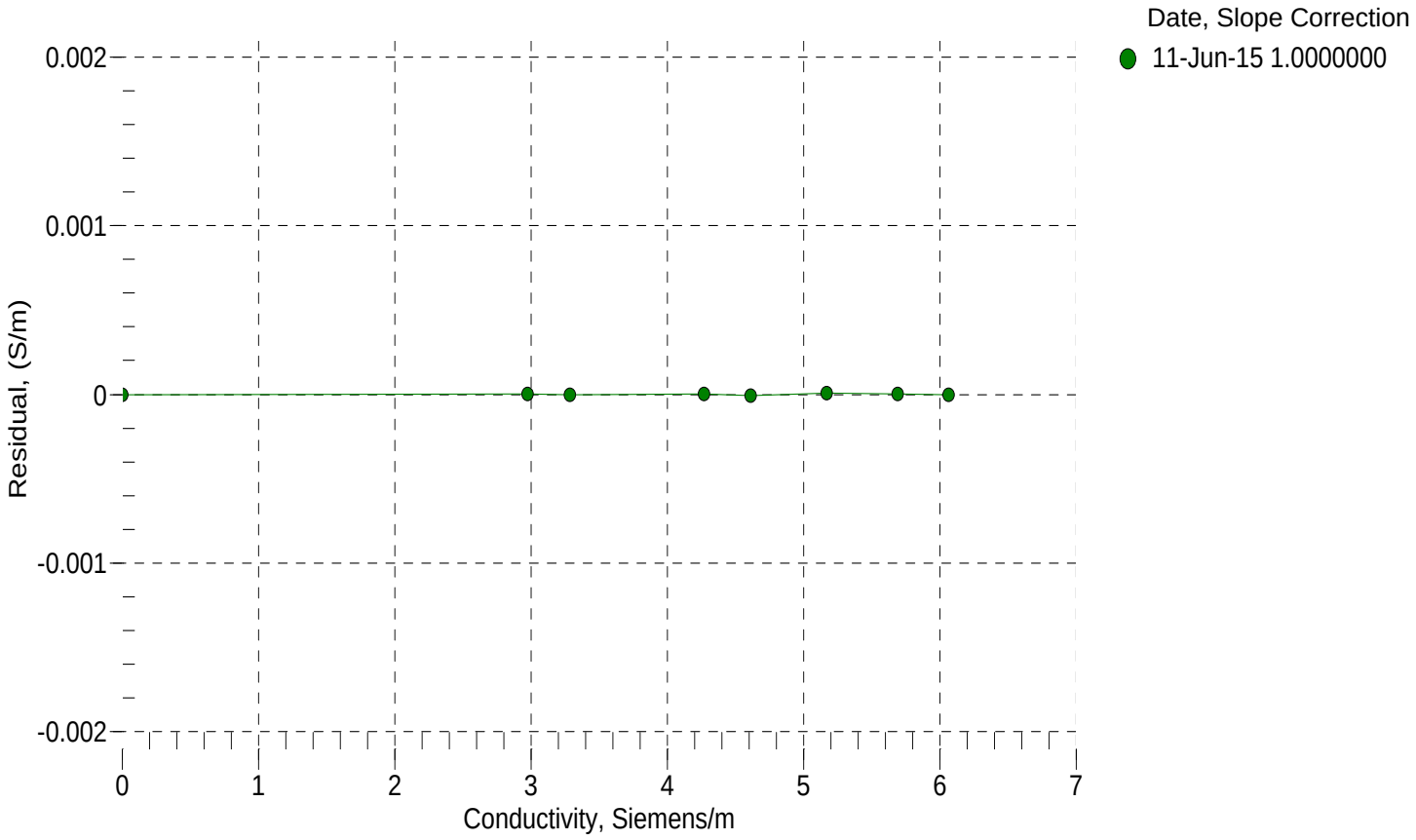
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2690.76	0.00000	0.00000
1.0000	34.8502	2.97859	5395.11	2.97859	0.00000
4.5000	34.8302	3.28591	5599.77	3.28590	-0.00000
15.0000	34.7873	4.26843	6208.25	4.26844	0.00000
18.5000	34.7776	4.61379	6408.13	4.61378	-0.00001
23.9940	34.7670	5.17148	6718.06	5.17149	0.00001
29.0000	34.7610	5.69428	6995.77	5.69428	0.00000
32.5001	34.7573	6.06688	7186.95	6.06687	-0.00000

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: 7298
CALIBRATION DATE: 02-Jun-15

SBE 41 PRESSURE CALIBRATION DATA
2900 psia S/N 4645062

COEFFICIENTS:

PA0 =	9.977793e-002	PTCA0 =	-1.170266e+002
PA1 =	1.412982e-001	PTCA1 =	-5.626529e-001
PA2 =	7.951025e-009	PTCA2 =	2.539145e-002
PTHA0 =	-9.198606e+001	PTCB0 =	1.024663e+002
PTHA1 =	3.779574e-002	PTCB1 =	-8.607053e-003
PTHA2 =	1.161542e-006	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FS
14.61	-12.9	2809.1	14.74	0.00
592.79	4069.2	2812.5	592.80	0.00
1170.47	8147.5	2814.5	1170.61	0.00
1748.31	12224.7	2815.9	1748.52	0.01
2326.06	16298.4	2816.6	2326.22	0.01
2903.84	20368.8	2817.4	2903.71	-0.00
2326.03	16297.1	2817.9	2326.04	0.00
1748.18	12221.7	2818.3	1748.10	-0.00
1170.57	8145.8	2818.1	1170.37	-0.01
592.84	4067.5	2819.0	592.55	-0.01
14.61	-13.3	2819.9	14.64	0.00

THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	3014.20	-0.87
29.00	2936.30	-4.06
23.99	2823.70	-7.79
18.50	2699.40	-11.14
15.00	2619.60	-12.03
4.50	2378.60	-11.27
1.00	2298.20	-9.69

TEMP(ITS90)	SPAN(mV)
-3.92	102.50
35.78	102.16

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