



SEA-BIRD  
SCIENTIFIC

**SBE** Sea-Bird  
Electronics

Sea-Bird Electronics  
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## SBE41-CP ALACE

### Instrument Configuration

Instrument Serial Number: 41-7296  
Instrument Firmware Version: ALACE-CP V 3.0C  
Zero Conductivity Frequency: 2699.00  
Communications Format: RS232  
Communications Settings: 9600 baud, 8 Data Bits, No Parity

### Installed Devices/Sensors

<i>Data Format</i>	<i>Measurement</i>	<i>Sensor Type</i>	<i>Serial Number</i>	<i>Rating</i>
Count	Temperature	Internal	N/A	N/A
Frequency	Conductivity	Internal	N/A	N/A
Count	Pressure	Kistler	4669460	2000m(2000 dBar)

**CAUTION - This instrument is not intended for underwater use**

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SENSOR SERIAL NUMBER: 7296  
CALIBRATION DATE: 07-Jun-15

SBE 41 TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

## COEFFICIENTS:

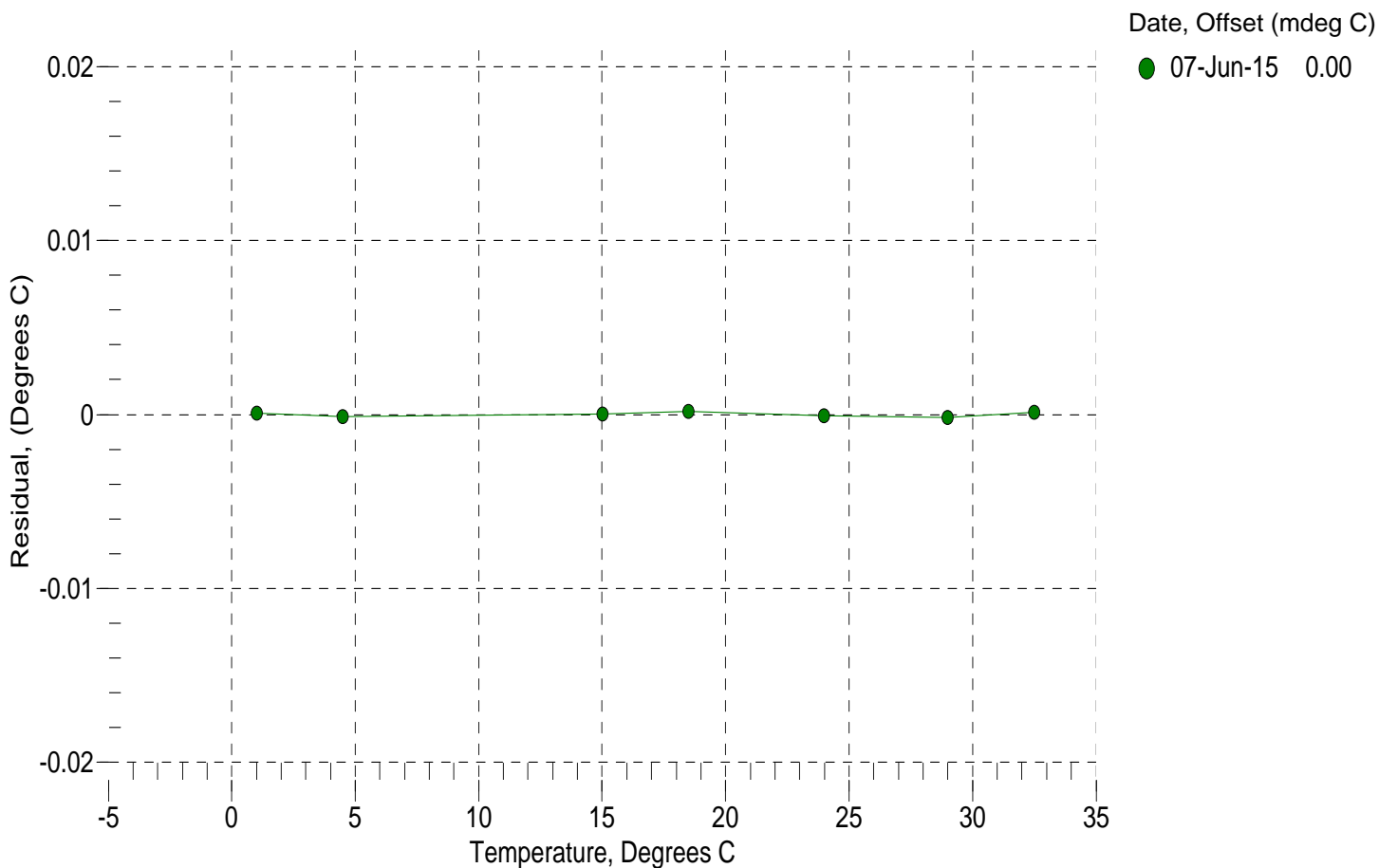
a0 = 2.398518e-005  
a1 = 2.696431e-004  
a2 = -2.150399e-006  
a3 = 1.414836e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	801545.4	1.0001	0.0001
4.5000	683666.9	4.4999	-0.0001
15.0000	432674.2	15.0000	0.0000
18.4999	373816.1	18.5001	0.0002
23.9940	298938.9	23.9939	-0.0001
29.0000	245355.4	28.9998	-0.0002
32.5000	214419.3	32.5001	0.0001

Temperature ITS-90 =  $1 / \{a_0 + a_1[\ln(n)] + a_2[\ln^2(n)] + a_3[\ln^3(n)]\} - 273.15$  (°C)

Residual = instrument temperature - bath temperature

n = instrument output



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SENSOR SERIAL NUMBER: 7296  
CALIBRATION DATE: 07-Jun-15

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

## COEFFICIENTS:

g = -9.871681e-001  
h = 1.359192e-001  
i = -2.473047e-004  
j = 3.592591e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = 1.8523e-007

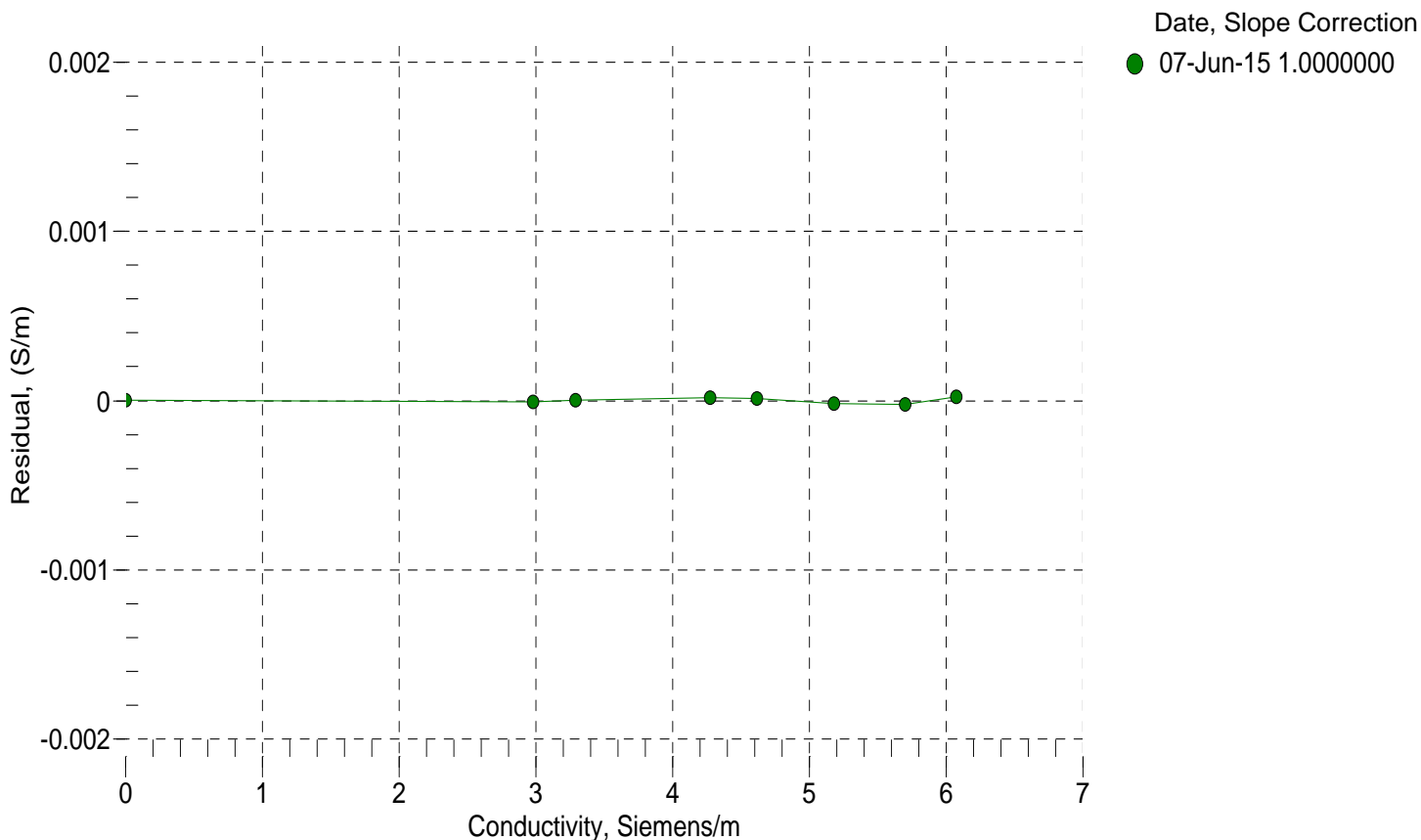
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2699.00	0.00000	0.00000
1.0000	34.9087	2.98311	5410.38	2.98310	-0.00001
4.5000	34.8889	3.29090	5615.58	3.29090	0.00000
15.0000	34.8464	4.27491	6225.62	4.27493	0.00002
18.4999	34.8370	4.62081	6426.02	4.62082	0.00001
23.9940	34.8266	5.17937	6736.74	5.17935	-0.00002
29.0000	34.8206	5.70294	7015.18	5.70292	-0.00002
32.5000	34.8162	6.07597	7206.82	6.07600	0.00002

$$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

$$\text{Conductivity} = (g + h * f^2 + i * f^3 + j * f^4) / (1 + \delta * t + \epsilon * p) \text{ Siemens / meter}$$

t = temperatur e[°C]; p = pressure[decibars];  $\delta$  = CTcor;  $\epsilon$  = CPcor;

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 7296  
CALIBRATION DATE: 02-Jun-15

SBE 41 PRESSURE CALIBRATION DATA  
2900 psia S/N 4669460

## COEFFICIENTS:

PA0 = -5.468716e-001	PTCA0 = 1.941563e+002
PA1 = 1.410344e-001	PTCA1 = -6.480900e-001
PA2 = 1.158063e-008	PTCA2 = 2.058076e-002
PTHA0 = -9.633340e+001	PTCB0 = 1.038442e+002
PTHA1 = 4.013647e-002	PTCB1 = -3.637971e-003
PTHA2 = 1.119683e-006	PTCB2 = 0.000000e+000

## PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FS
14.61	298.2	2770.6	14.69	0.00
592.79	4392.6	2773.3	592.81	0.00
1170.47	8481.4	2774.8	1170.55	0.00
1748.31	12568.7	2776.1	1748.45	0.01
2326.06	16652.0	2776.8	2326.19	0.00
2903.84	20731.3	2777.8	2903.74	-0.00
2326.03	16650.8	2778.0	2326.02	-0.00
1748.18	12566.6	2778.2	1748.16	-0.00
1170.57	8480.5	2778.6	1170.42	-0.01
592.84	4391.3	2779.5	592.62	-0.01
14.61	298.1	2780.5	14.65	0.00

## THERMAL CORRECTION

TEMP ITS90	PRESS TEMP	INST OUTPUT
32.50	2964.80	308.92
29.00	2889.50	306.82
23.99	2782.10	304.56
18.50	2663.30	303.37
15.00	2587.20	303.15
4.50	2357.00	305.73
1.00	2280.20	307.68

TEMP(ITS90)	SPAN(mV)
-4.38	103.86
37.48	103.71

$$y = \text{thermistor output}; t = \text{PTHA0} + \text{PTHA1} * y + \text{PTHA2} * y^2$$

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

$$n = x * \text{PTCB0} / (\text{PTCB0} + \text{PTCB1} * t + \text{PTCB2} * t^2)$$

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

