



**SEA-BIRD**  
SCIENTIFIC

**SBE** Sea-Bird  
Electronics

Sea-Bird Electronics  
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## SBE 41-CP ALACE

### Instrument Configuration

Instrument Serial Number: 41-7284  
Instrument Firmware Version: ALACE-CP V 3.0C  
Zero Conductivity Frequency: 2557.55

### 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	4632625	2000m(2000 dBar)
RS232	Oxygen	SBE 63	63-1063	7000m

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SENSOR SERIAL NUMBER: 7284  
CALIBRATION DATE: 31-May-15

SBE 41 TEMPERATURE CALIBRATION DATA  
ITS-90 TEMPERATURE SCALE

## COEFFICIENTS:

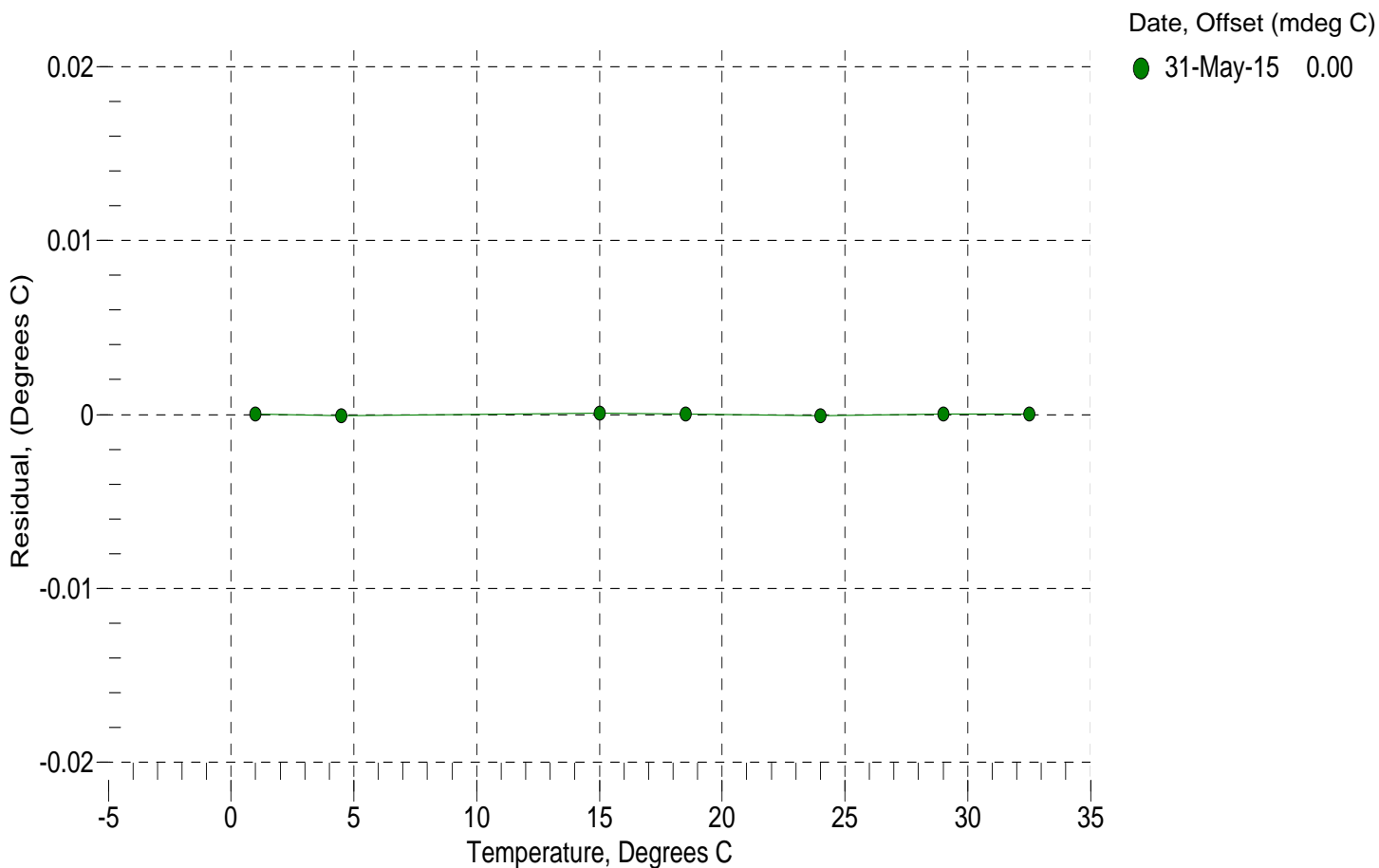
a0 = 5.744268e-005  
a1 = 2.710183e-004  
a2 = -2.190256e-006  
a3 = 1.456506e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	663145.6	1.0000	0.0000
4.5000	565986.9	4.4999	-0.0001
15.0000	358866.0	15.0001	0.0001
18.5000	310232.7	18.5000	0.0000
23.9940	248314.4	23.9939	-0.0001
29.0000	203965.0	29.0000	0.0000
32.5000	178346.0	32.5000	0.0000

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: 7284  
CALIBRATION DATE: 31-May-15

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

## COEFFICIENTS:

g = -9.828087e-001  
h = 1.508076e-001  
i = -3.379646e-004  
j = 4.727918e-005

CPcor = -9.5700e-008  
CTcor = 3.2500e-006  
WBOTC = -9.7741e-008

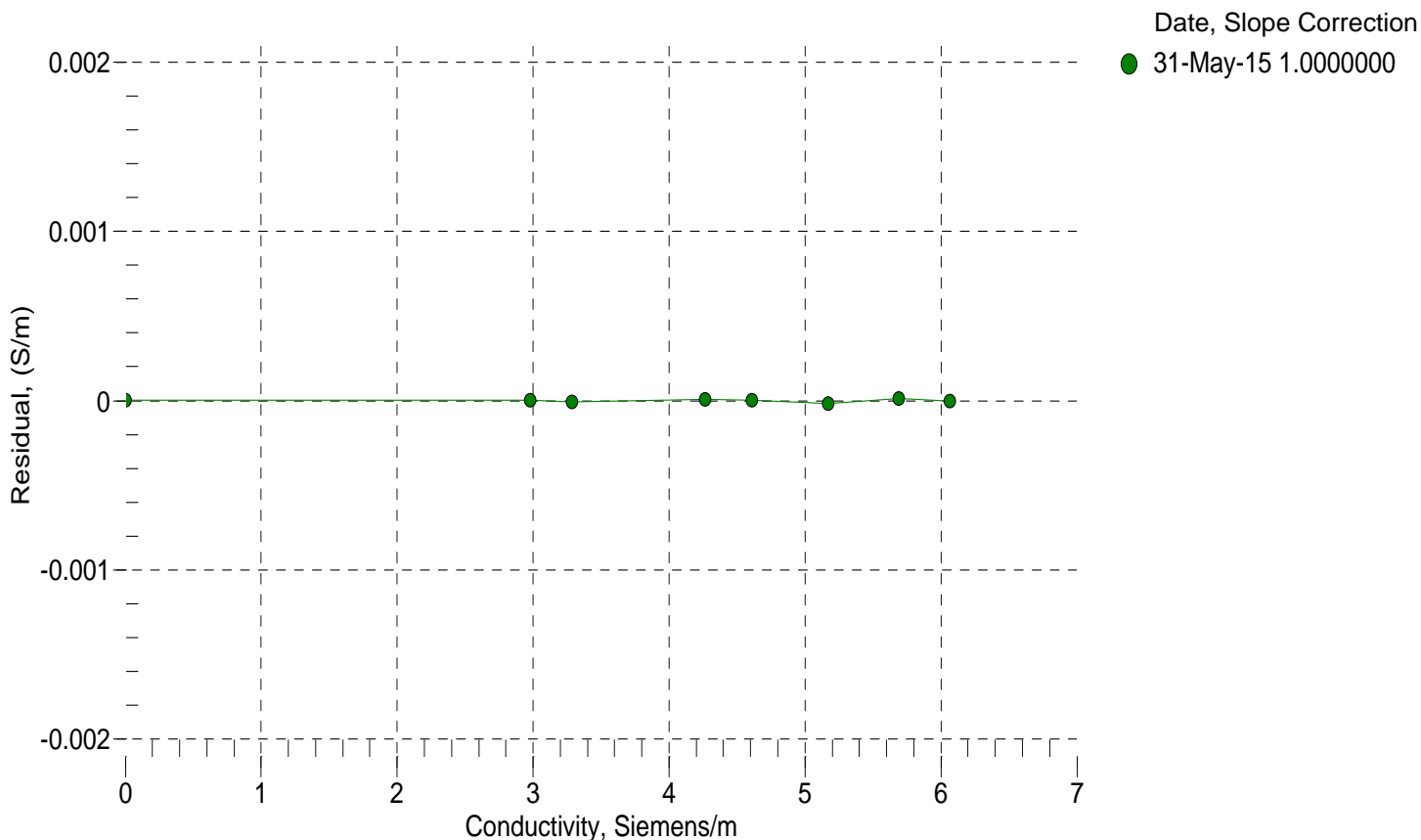
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2557.55	0.00000	0.00000
1.0000	34.8287	2.97692	5132.48	2.97693	0.00000
4.5000	34.8092	3.28412	5327.33	3.28411	-0.00001
15.0000	34.7675	4.26626	5906.61	4.26627	0.00001
18.5000	34.7589	4.61158	6096.95	4.61158	0.00000
23.9940	34.7497	5.16919	6392.05	5.16917	-0.00002
29.0000	34.7452	5.69198	6656.54	5.69200	0.00001
32.5000	34.7438	6.06478	6838.69	6.06477	-0.00000

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

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

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

Residual = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 7284  
CALIBRATION DATE: 28-May-15

SBE 41 PRESSURE CALIBRATION DATA  
2900 psia S/N 4632625

**COEFFICIENTS:**

PA0 = 3.390558e-001	PTCA0 = -1.761344e+000
PA1 = 1.410339e-001	PTCA1 = -4.293872e-001
PA2 = 8.877546e-009	PTCA2 = 2.442462e-002
PTHA0 = -9.825764e+001	PTCB0 = 1.029895e+002
PTHA1 = 4.155414e-002	PTCB1 = -8.497876e-003
PTHA2 = 8.445562e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION					THERMAL CORRECTION		
PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FS	TEMP ITS90	PRESS TEMP	INST OUTPUT
14.65	102.9	2742.1	14.79	0.00	32.50	2967.70	117.92
592.68	4191.5	2744.9	592.62	-0.00	29.00	2892.30	114.14
1170.27	8277.3	2746.0	1170.37	0.00	23.99	2784.60	109.87
1747.83	12360.3	2747.1	1748.02	0.01	18.50	2665.30	106.45
2325.45	16440.8	2748.2	2325.62	0.01	15.00	2589.30	105.18
2902.90	20515.9	2749.2	2902.76	-0.00	4.50	2359.60	104.56
2325.36	16438.9	2749.6	2325.36	-0.00	1.00	2282.80	105.72
1748.23	12361.6	2749.9	1748.21	-0.00			
1170.11	8274.4	2749.8	1169.96	-0.01	TEMP(ITS90)	SPAN(mV)	
592.45	4188.5	2750.3	592.19	-0.01	-3.82	103.02	
14.65	102.6	2753.1	14.70	0.00	35.02	102.69	

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

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

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

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

