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:	41-9092
Instrument Firmware Version:	V 7.2.5
Zero Conductivity Frequency:	2577.79
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	4940442	2000m(2000 dBar)

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SENSOR SERIAL NUMBER: 9092
CALIBRATION DATE: 21-Oct-16

SBE 41 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

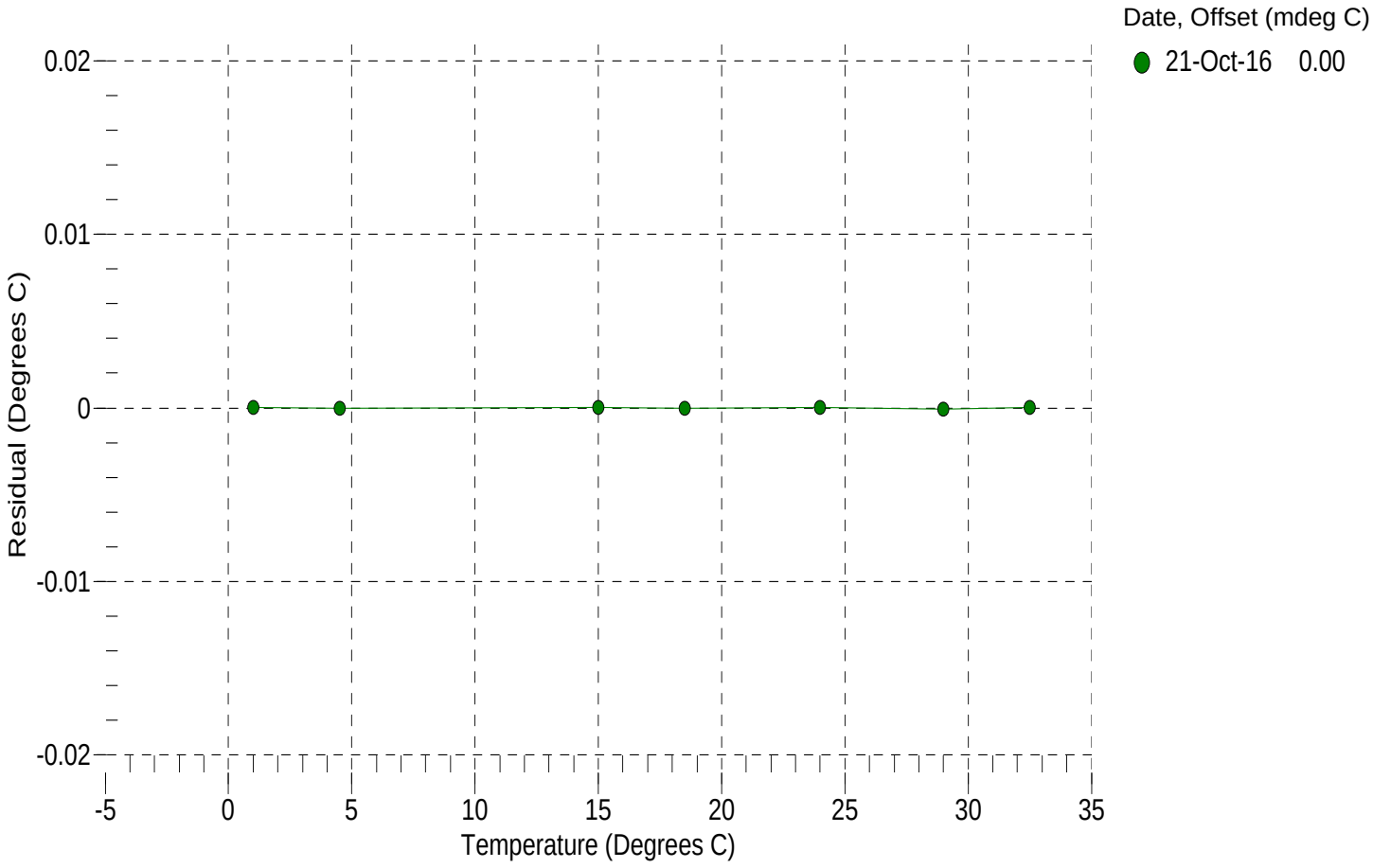
```
a0 = -8.071831e-004
a1 =  2.877650e-004
a2 = -3.520043e-006
a3 =  1.432282e-007
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	15789986.8	1.0000	0.0000
4.5000	13464087.0	4.5000	-0.0000
15.0000	8514492.1	15.0000	0.0000
18.5000	7354462.8	18.5000	-0.0000
23.9940	5879110.9	23.9940	0.0000
29.0000	4823738.0	28.9999	-0.0001
32.5001	4214626.3	32.5001	0.0000

n = Instrument Output (counts)

Temperature ITS-90 (°C) = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature



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SENSOR SERIAL NUMBER: 9092
CALIBRATION DATE: 21-Oct-16

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

COEFFICIENTS:

```
g = -1.000889e+000
h =  1.512352e-001
i = -3.630236e-004
j =  4.931893e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC = -1.2606e-006
```

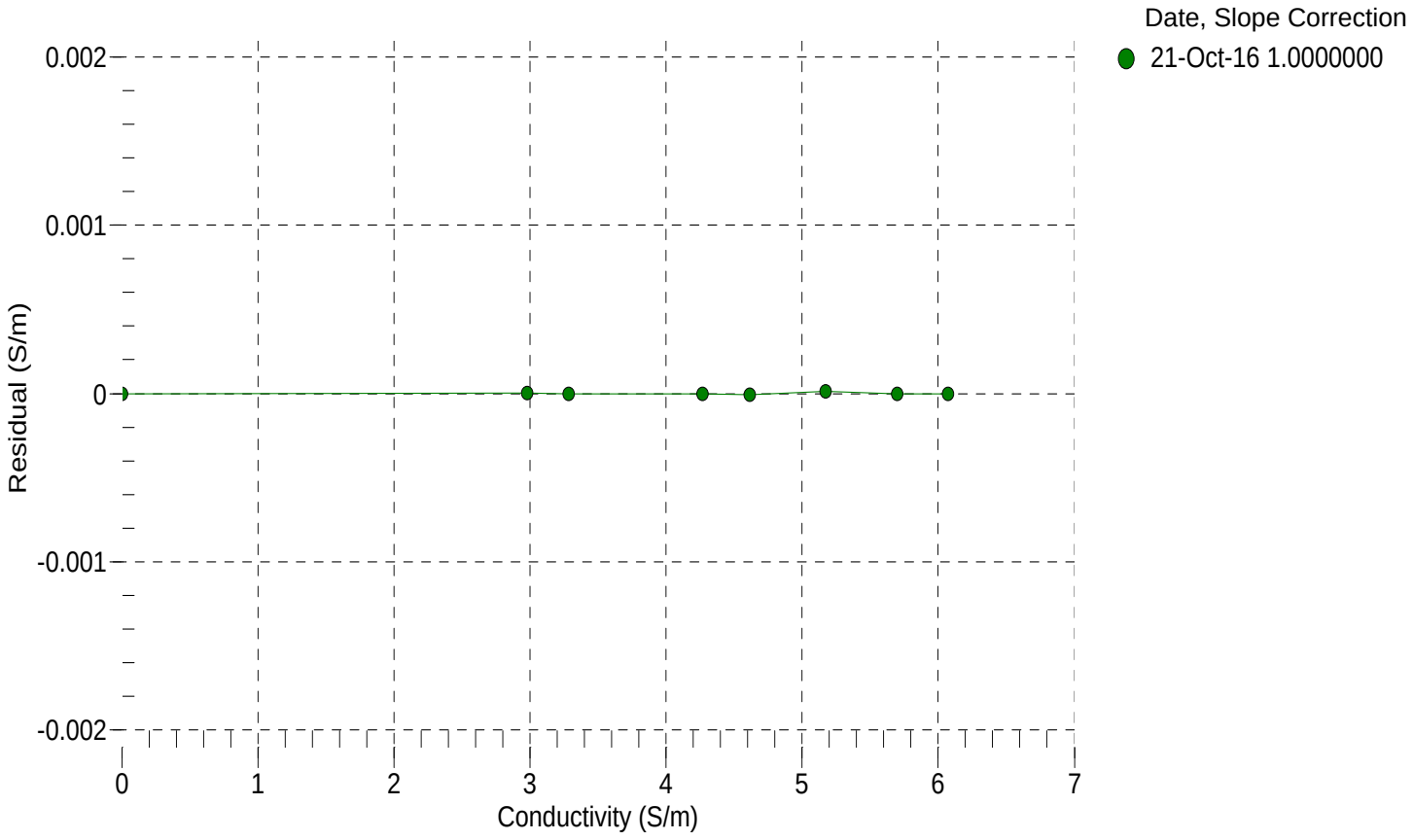
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2577.79	0.00000	0.00000
1.0000	34.8617	2.97948	5139.80	2.97948	0.00000
4.5000	34.8421	3.28692	5334.11	3.28692	-0.00000
15.0000	34.8001	4.26984	5911.92	4.26983	-0.00000
18.5000	34.7914	4.61542	6101.82	4.61542	-0.00001
23.9940	34.7819	5.17345	6396.28	5.17347	0.00001
29.0000	34.7770	5.69661	6660.18	5.69661	-0.00000
32.5001	34.7749	6.06960	6841.92	6.06959	-0.00000

f = Instrument Output(Hz) * sqrt(1.0 + WBOTC * t) / 1000.0

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9092
CALIBRATION DATE: 18-Oct-16

SBE 41 PRESSURE CALIBRATION DATA
2900 psia S/N 4940442

COEFFICIENTS:

PA0 =	-6.247949e-001	PTCA0 =	-6.429550e+003
PA1 =	3.916486e-004	PTCA1 =	-2.533008e+002
PA2 =	1.147450e-013	PTCA2 =	8.301950e+000
PTHA0 =	3.187078e+002	PTCB0 =	1.036676e+002
PTHA1 =	-9.005338e-005	PTCB1 =	-8.929476e-003
PTHA2 =	2.733559e-012	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (counts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.61	31015.4	3718316.4	14.69	0.00
590.43	1497812.6	3715719.2	590.50	0.00
1166.35	2963529.2	3714708.4	1166.39	0.00
1742.31	4428401.2	3713823.8	1742.44	0.00
2318.24	5891686.0	3713011.8	2318.37	0.00
2894.16	7353116.7	3712076.2	2894.07	-0.00
2318.29	5891450.0	3711866.2	2318.29	0.00
1742.20	4427586.0	3711513.8	1742.14	-0.00
1166.46	2963204.7	3711204.8	1166.27	-0.01
590.21	1496858.5	3710965.6	590.13	-0.00
14.61	30783.8	3710210.6	14.58	-0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (counts)	INSTRUMENT OUTPUT (counts)
32.50	3563820.80	35282.60
29.00	3613186.40	34397.98
23.99	3684894.20	33474.05
18.50	3763680.00	32909.00
15.00	3814113.60	32816.18
4.50	3966726.60	33774.52
1.00	4018093.80	34520.99

TEMPERATURE (°C)	SPAN (mV)
-3.82	103.70
35.66	103.35

y = thermistor output (counts)

$t = PTHA0 + PTHA1 * y + PTHA2 * y^2$

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

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

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

Residual (%FSR) = (computed pressure - true pressure) * 100 / Full Scale Range