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: | 41-8761 |
| Instrument Firmware Version: | V 7.2.5 |
| Zero Conductivity Frequency: | 2569.09 |
| 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 | Druck | 10300915 | 2000m(2000 dBar) |

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SENSOR SERIAL NUMBER: 8761
CALIBRATION DATE: 10-Aug-16

SBE 41 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

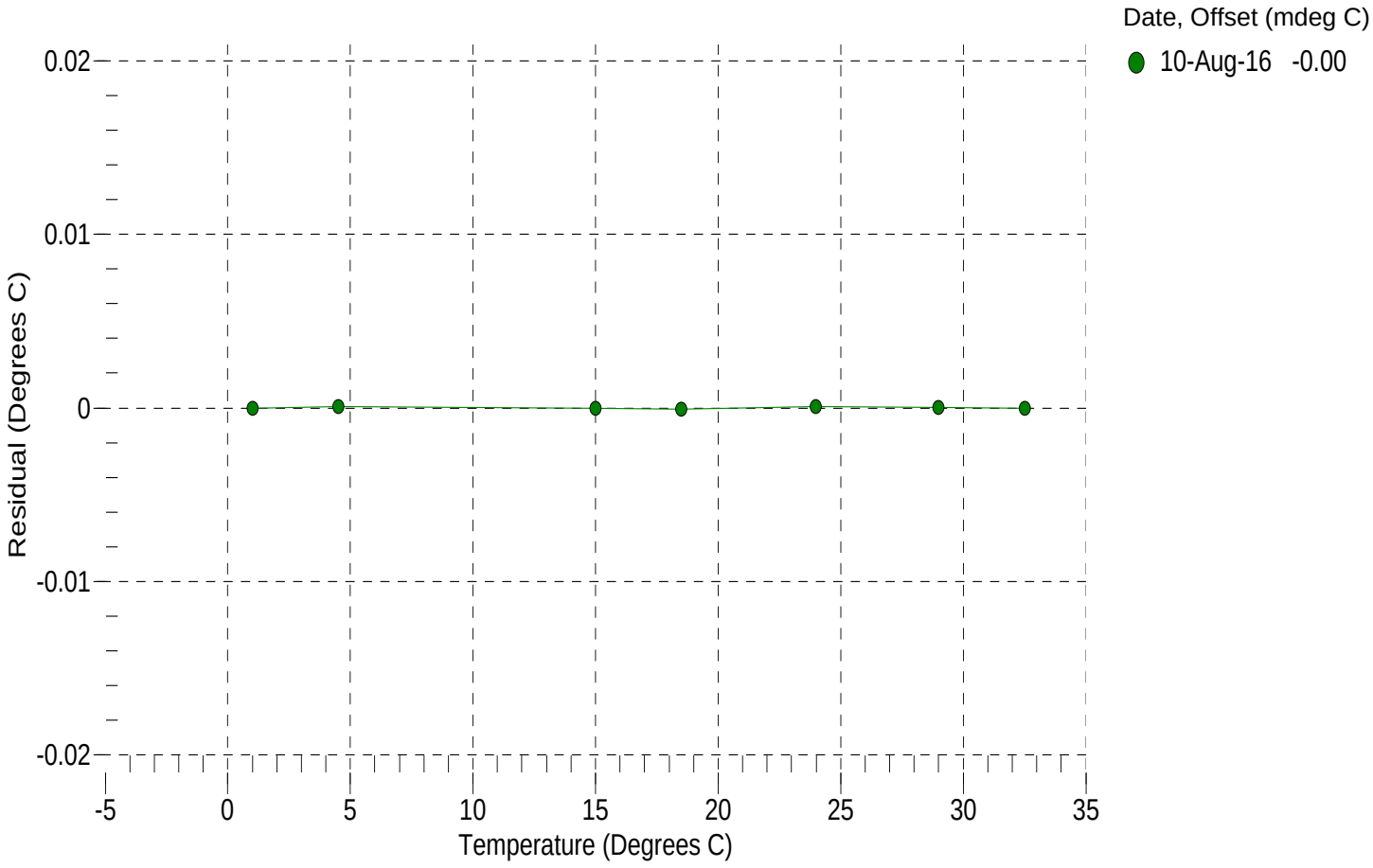
```
a0 = -8.832531e-004
a1 =  3.016783e-004
a2 = -4.373507e-006
a3 =  1.617257e-007
```

| BATH TEMP (° C) | INSTRUMENT OUTPUT (counts) | INST TEMP (° C) | RESIDUAL (° C) |
|---|---|---|---|
| 1.0000 | 15557476.5 | 1.0000 | -0.0000 |
| 4.5000 | 13271231.1 | 4.5001 | 0.0001 |
| 15.0000 | 8402340.0 | 15.0000 | -0.0000 |
| 18.5000 | 7260248.7 | 18.4999 | -0.0001 |
| 23.9940 | 5807038.8 | 23.9941 | 0.0001 |
| 29.0000 | 4766972.7 | 29.0000 | 0.0000 |
| 32.5000 | 4166496.7 | 32.5000 | -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: 8761
CALIBRATION DATE: 10-Aug-16

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

COEFFICIENTS:

```
g = -1.021110e+000
h =  1.555065e-001
i = -4.575802e-004
j =  5.721569e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  1.2973e-007
```

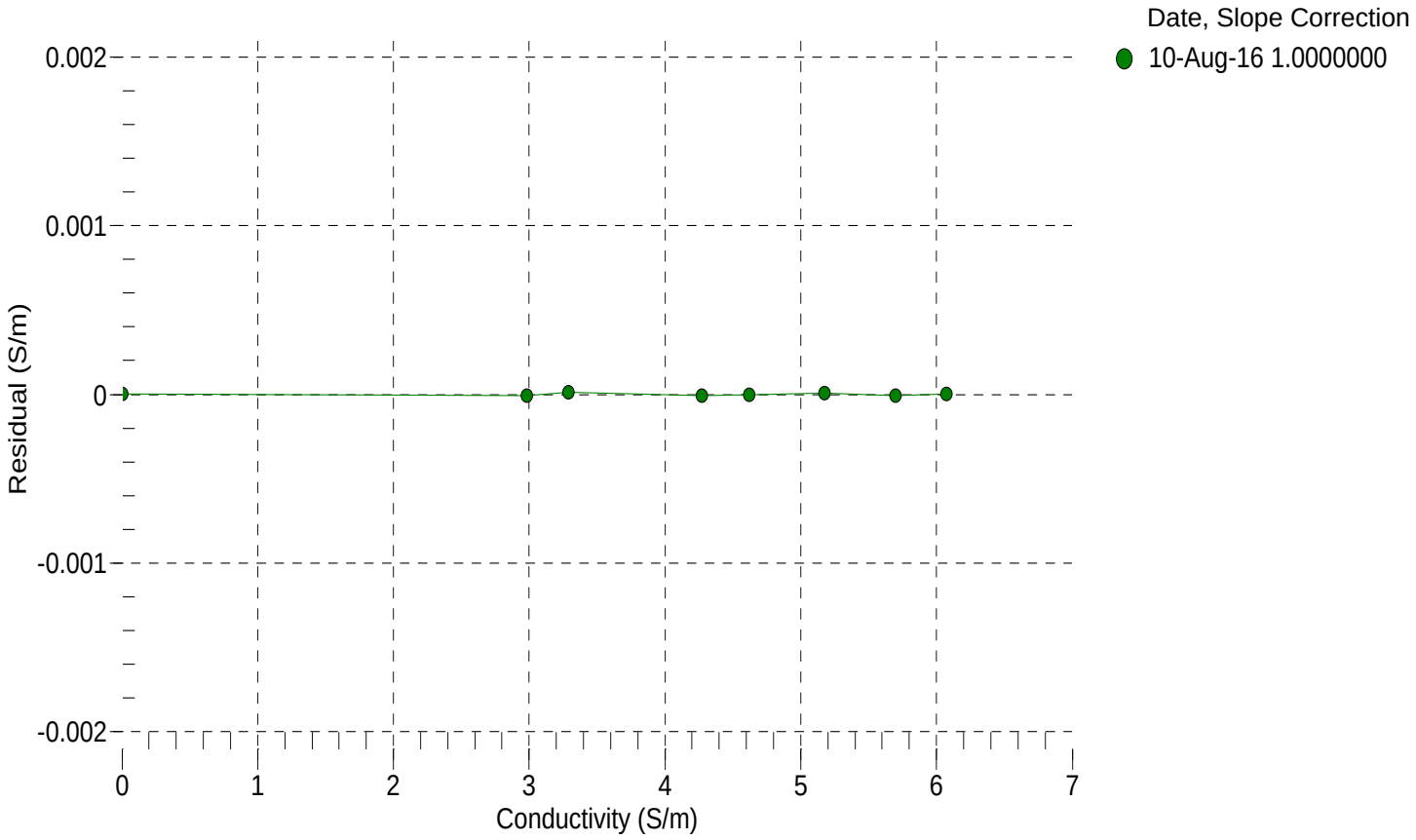
| BATH TEMP (° C) | BATH SAL (PSU) | BATH COND (S/m) | INSTRUMENT OUTPUT (Hz) | INSTRUMENT COND (S/m) | RESIDUAL (S/m) |
|---|---|---|---|---|---|
| 22.0000 | 0.0000 | 0.00000 | 2569.09 | 0.00000 | 0.00000 |
| 1.0000 | 34.8805 | 2.98093 | 5086.89 | 2.98092 | -0.00001 |
| 4.5000 | 34.8600 | 3.28844 | 5278.30 | 3.28845 | 0.00001 |
| 15.0000 | 34.8172 | 4.27171 | 5847.69 | 4.27171 | -0.00001 |
| 18.5000 | 34.8081 | 4.61740 | 6034.85 | 4.61740 | -0.00000 |
| 23.9940 | 34.7980 | 5.17558 | 6325.08 | 5.17559 | 0.00001 |
| 29.0000 | 34.7923 | 5.69883 | 6585.20 | 5.69882 | -0.00001 |
| 32.5000 | 34.7881 | 6.07163 | 6764.24 | 6.07163 | 0.00000 |

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

t = temperature (°C); p = pressure (decibars); $\delta$ = CTcor; $\varepsilon$ = 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: 8761
CALIBRATION DATE: 02-Aug-16

SBE 41 PRESSURE CALIBRATION DATA
2900 psia S/N 10300915

COEFFICIENTS:

| | | | |
|---|---|---|---|
| PA0 = | 4.862287e-001 | PTCA0 = | 9.710666e+003 |
| PA1 = | 3.934830e-004 | PTCA1 = | 5.261508e+001 |
| PA2 = | -3.063956e-013 | PTCA2 = | 1.535408e-001 |
| PTHA0 = | 3.107920e+002 | PTCB0 = | 2.514450e+001 |
| PTHA1 = | -6.022825e-005 | PTCB1 = | -1.000000e-004 |
| PTHA2 = | -1.432512e-012 | PTCB2 = | 0.000000e+000 |

PRESSURE SPAN CALIBRATION

| PRESSURE (PSIA) | INSTRUMENT OUTPUT (counts) | THERMISTOR OUTPUT (counts) | COMPUTED PRESSURE (PSIA) | RESIDUAL (%FSR) |
|---|---|---|---|---|
| 14.66 | 47105.7 | 4344903.4 | 14.72 | 0.00 |
| 591.51 | 1514564.7 | 4341077.4 | 591.49 | -0.00 |
| 1168.17 | 2985296.5 | 4339973.0 | 1168.23 | 0.00 |
| 1744.85 | 4459454.0 | 4338900.4 | 1744.98 | 0.00 |
| 2321.62 | 5936966.8 | 4337859.6 | 2321.71 | 0.00 |
| 2898.24 | 7417206.7 | 4336598.6 | 2898.16 | -0.00 |
| 2321.52 | 5936496.1 | 4336403.6 | 2321.53 | 0.00 |
| 1744.80 | 4458864.9 | 4335788.0 | 1744.75 | -0.00 |
| 1167.91 | 2984272.1 | 4335824.2 | 1167.82 | -0.00 |
| 591.12 | 1513277.9 | 4335868.6 | 590.97 | -0.00 |
| 14.67 | 47176.9 | 4331254.4 | 14.72 | 0.00 |

THERMAL CORRECTION

| TEMP (°C) | THERMISTOR OUTPUT (counts) | INSTRUMENT OUTPUT (counts) |
|---|---|---|
| 32.50 | 4200897.80 | 49380.50 |
| 29.00 | 4249249.00 | 49261.22 |
| 23.99 | 4318312.80 | 48991.47 |
| 18.50 | 4393878.60 | 48582.93 |
| 15.00 | 4441926.60 | 48321.10 |
| 4.50 | 4585385.40 | 47803.03 |
| 1.00 | 4633103.00 | 47635.98 |

| TEMPERATURE (°C) | SPAN (mV) |
|---|---|
| -5.00 | 25.15 |
| 35.00 | 25.14 |

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