# SEA-BIRD ELECTRONICS, INC.

**13431 NE 20th Street Bellevue, Washington 98005 USA**
**Phone: (425) 643-9866 Fax: (425) 643-9954 www.seabird.com**


## *Conductivity Calibration Report*

| | | | |
|---|---|---|---|
| **Customer:** | The University of Alaska, Fairbanks | | |
| **Job Number:** | 71684 | **Date of Report:** | 2/15/2013 |
| **Model Number** | SBE 04C | **Serial Number:** | 042251 |

***Conductivity sensors are normally calibrated 'as received', without cleaning or adjustments, allowing a determination of sensor drift. If the calibration identifies a problem or indicates cell cleaning is necessary, then a second calibration is performed after work is completed. The 'as received' calibration is not performed if the sensor is damaged or non-functional, or by customer request.***

***An 'as received' calibration certificate is provided, listing the coefficients used to convert sensor frequency to conductivity. Users must choose whether the 'as received' calibration or the previous calibration better represents the sensor condition during deployment. In SEASOFT enter the chosen coefficients. The coefficient 'slope' allows small corrections for drift between calibrations (consult the SEASOFT manual). Calibration coefficients obtained after a repair or cleaning apply only to subsequent data.***

**'AS RECEIVED CALIBRATION'** ☑ Performed ☐ Not Performed

**Date:** 2/5/2013 **Drift since last cal:** 0.0000 **PSU/month***

**Comments:**

**'FINAL CALIBRATION'** ☑ Performed ☐ Not Performed

**Date:** 2/14/2013 **Drift since 28 Oct 11** 0.0000 **PSU/month***

**Comments:**
The O-rings were replaced.

****Measured at 3.0 S/m***

***Cell cleaning and electrode replatinizing tend to 'reset' the conductivity sensor to its original condition. Lack of drift in post-cleaning-calibration indicates geometric stability of the cell and electrical stability of the sensor circuit.***

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SENSOR SERIAL NUMBER: 2251
CALIBRATION DATE: 05-Feb-13

SBE4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Seimens/meter

GHIJ COEFFICIENTS

```
g = -1.03693659e+001
h =  1.36649072e+000
i = -2.55554462e-003
j =  2.46614978e-004
CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

ABCDM COEFFICIENTS

```
a =  4.33100765e-008
b =  1.35894146e+000
c = -1.03510924e+001
d = -8.08453944e-005
m =  7.3
CPcor = -9.5700e-008 (nominal)
```

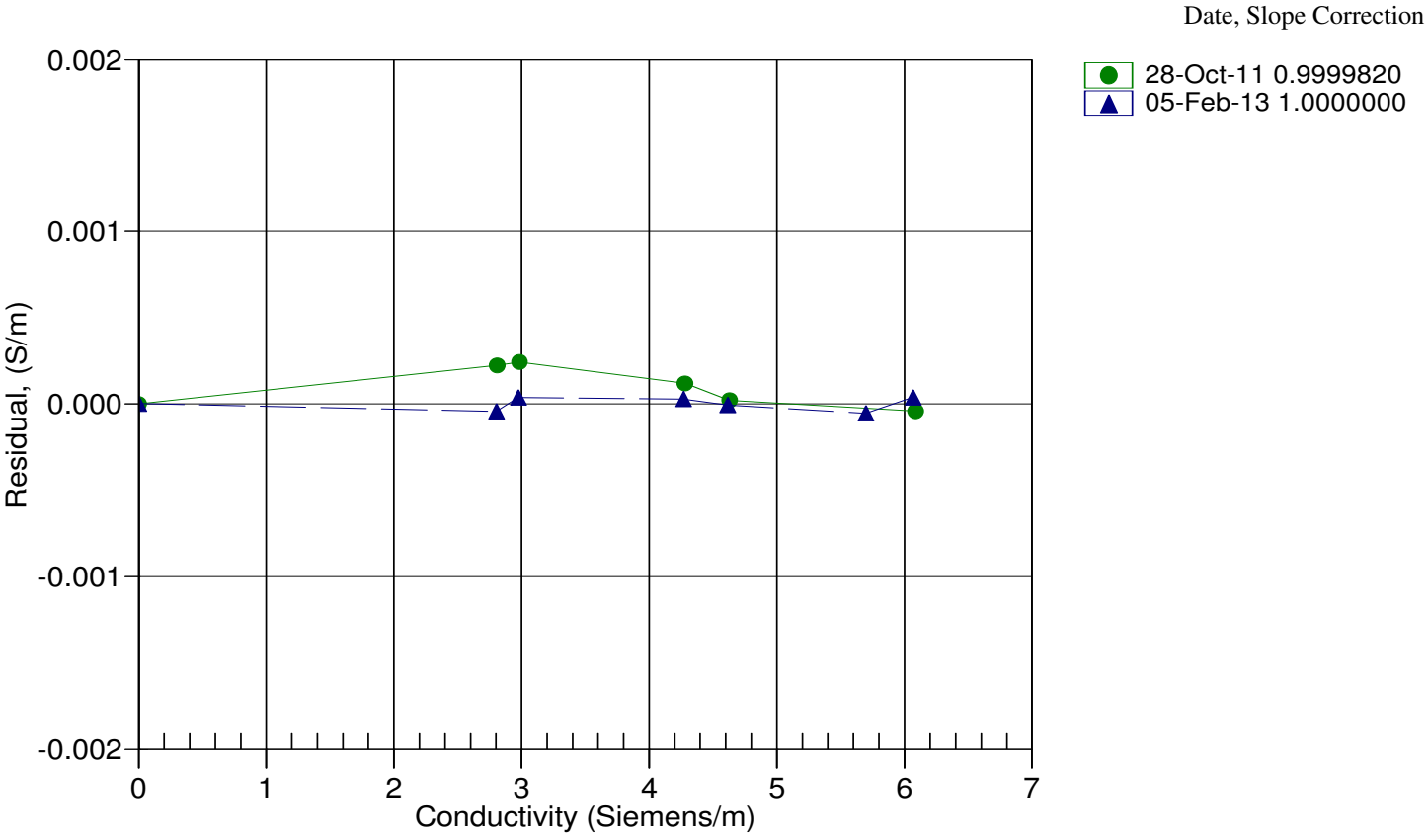
| BATH TEMP (ITS-90) | BATH SAL (PSU) | BATH COND (Siemens/m) | INST FREO (kHz) | INST COND (Siemens/m) | RESIDUAL (Siemens/m) |
|---|---|---|---|---|---|
| 0.0000 | 0.0000 | 0.00000 | 2.75992 | 0.00000 | 0.00000 |
| -0.9999 | 34.7797 | 2.80191 | 5.31310 | 2.80187 | -0.00004 |
| 1.0001 | 34.7795 | 2.97313 | 5.43034 | 2.97316 | 0.00004 |
| 15.0001 | 34.7796 | 4.26760 | 6.24511 | 4.26762 | 0.00003 |
| 18.5001 | 34.7795 | 4.61402 | 6.44555 | 4.61402 | -0.00001 |
| 29.0001 | 34.7762 | 5.69650 | 7.03477 | 5.69645 | -0.00005 |
| 32.5001 | 34.7654 | 6.06813 | 7.22589 | 6.06817 | 0.00004 |

Conductivity = $(g + hf^2 + if^3 + jf^4) / 10(1 + \delta t + \varepsilon p)$ Siemens/meter

Conductivity = $(af^m + bf^2 + c + dt) / [10 (1 + \varepsilon p)$ Siemens/meter

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

Residual = (instrument conductivity - bath conductivity) using g, h, i, j coefficients



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SENSOR SERIAL NUMBER: 2251
CALIBRATION DATE: 14-Feb-13

SBE4 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Seimens/meter

GHIJ COEFFICIENTS

```
g = -1.03640220e+001
h =  1.36497866e+000
i = -2.18416202e-003
j =  2.22626091e-004
CPcor = -9.5700e-008 (nominal)
CTcor =  3.2500e-006 (nominal)
```

ABCDM COEFFICIENTS

```
a =  2.97748265e-007
b =  1.35866389e+000
c = -1.03487405e+001
d = -7.67633272e-005
m =  6.4
CPcor = -9.5700e-008 (nominal)
```

| BATH TEMP (ITS-90) | BATH SAL (PSU) | BATH COND (Siemens/m) | INST FREO (kHz) | INST COND (Siemens/m) | RESIDUAL (Siemens/m) |
|---|---|---|---|---|---|
| 0.0000 | 0.0000 | 0.00000 | 2.75989 | 0.00000 | 0.00000 |
| -0.9999 | 34.7339 | 2.79857 | 5.31084 | 2.79853 | -0.00003 |
| 1.0001 | 34.7336 | 2.96958 | 5.42798 | 2.96961 | 0.00004 |
| 15.0001 | 34.7343 | 4.26263 | 6.24215 | 4.26262 | -0.00000 |
| 18.5001 | 34.7340 | 4.60864 | 6.44245 | 4.60864 | 0.00001 |
| 29.0001 | 34.7316 | 5.69002 | 7.03136 | 5.69000 | -0.00002 |
| 32.5002 | 34.7223 | 6.06147 | 7.22244 | 6.06148 | 0.00001 |

Conductivity = $(g + hf^2 + if^3 + jf^4) / 10(1 + \delta t + \varepsilon p)$ Siemens/meter

Conductivity = $(af^m + bf^2 + c + dt) / [10 (1 + \varepsilon p)$ Siemens/meter

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

Residual = (instrument conductivity - bath conductivity) using g, h, i, j coefficients