



SEA-BIRD ELECTRONICS, INC.

1808 - 136th Place Northeast, Bellevue, Washington 98005 USA

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Conductivity Calibration Report

Customer:	ExplorOcean		
Job Number:	29758R	Date of Report:	23-Jul-02
Model Number:	SBE 04C	Serial Number:	042289

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 using the program SEACON. 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: Drift since last cal: PSU/month*

Comments:

'CALIBRATION AFTER CLEANING & REPLATINIZING'

performed Not Performed

Date: Drift since last cal: PSU/month*

Comments:

*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 = 2289
 CALIBRATION DATE: 19-Jul-02s

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

GHIJ COEFFICIENTS

g = -1.04108582e+01
 h = 1.38996218e+00
 i = -3.42550982e-03
 j = 3.12641143e-04
 CPcor = -9.57e-08 (nominal)
 CTcor = 3.25e-06 (nominal)

ABCDM COEFFICIENTS

a = 1.75597737e-09
 b = 1.37952781e+00
 c = -1.03849220e+01
 d = -9.60960013e-05
 m = 8.9
 CPcor = -9.57e-08 (nominal)

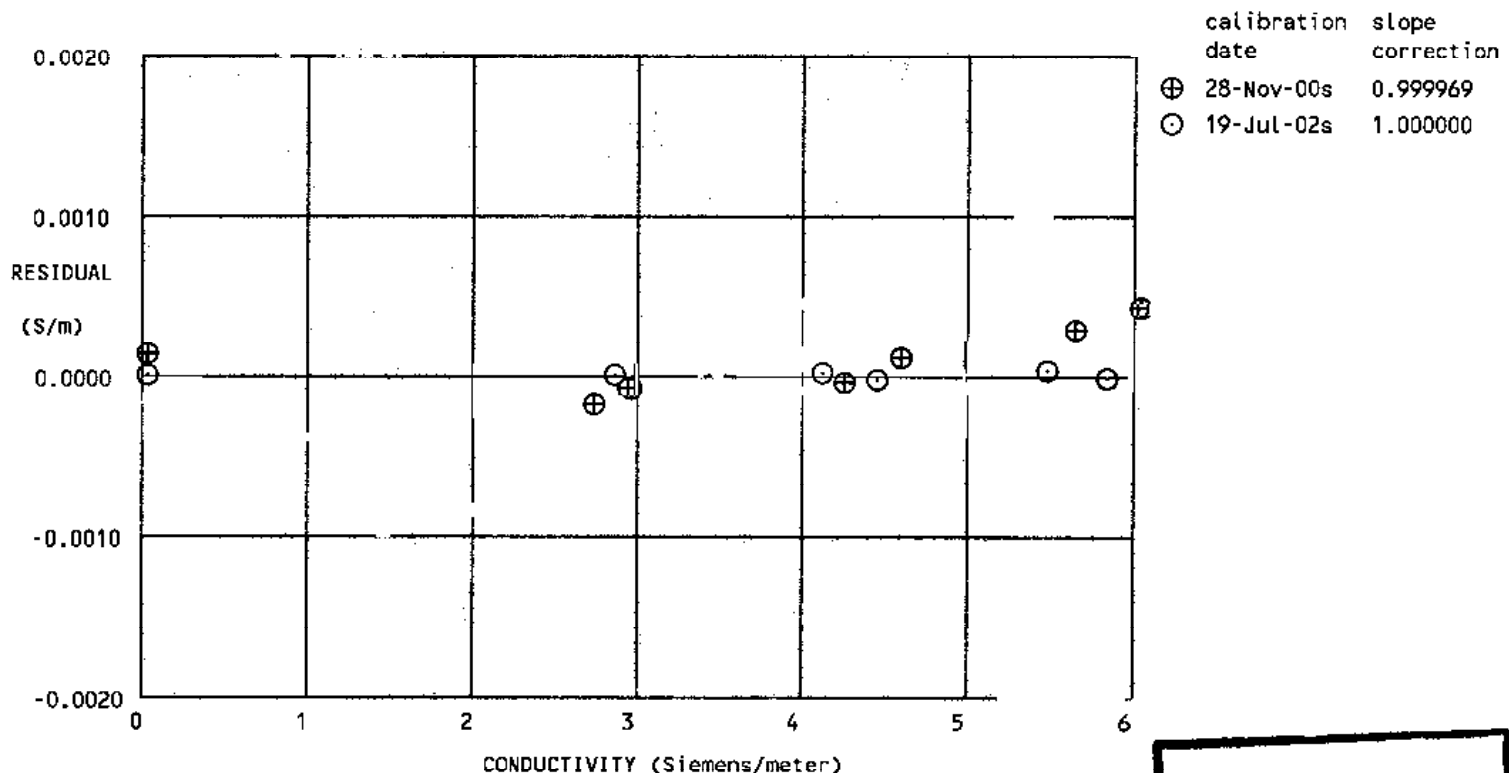
BATH TEMP (ITS-90 °C)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (kHz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
0.0000	0.0000	0.00000	2.74375	-0.00000	-0.00000
0.9998	33.1901	2.84980	5.30876	2.84980	0.00000
14.9998	33.1920	4.09279	6.09793	4.09280	0.00001
18.4998	33.1925	4.42550	6.29223	4.42547	-0.00003
28.9998	33.1923	5.46536	6.86381	5.46539	0.00003
32.4999	33.1915	5.82374	7.04988	5.82372	-0.00002

$$\text{Conductivity} = (g + hf^2 + if^3 + jf^4) / [10(1 + \delta t + \epsilon p)] \text{ Siemens/meter}$$

$$\text{Conductivity} = (af^m + bf^2 + c + dt) / [10(1 + \epsilon p)] \text{ Siemens/meter}$$

t = temperature [deg C]; p = pressure [decibars]; δ = CTcor; ϵ = CPcor;

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



**POST CRUISE
 CALIBRATION**

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SENSOR SERIAL NUMBER = 2289
 CALIBRATION DATE: 28-Nov-00s

SBE 4 CONDUCTIVITY CALIBRATION DATA
 PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

GHIJ COEFFICIENTS

g = -1.04155572e+01
 h = 1.39059478e+00
 i = -3.48012992e-03
 j = 3.08106043e-04
 CPcor = -9.57e-08 (nominal)
 CTcor = 3.25e-06 (nominal)

ABCDM COEFFICIENTS

a = 1.22244435e-09
 b = 1.37965495e+00
 c = -1.03867094e+01
 d = -6.72324198e-05
 m = 9.0
 CPcor = -9.57e-08 (nominal)

BATH TEMP (IPTS-68 °C)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (kHz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
0.0000	0.0000	0.00000	2.74393	0.00000	0.00000
-1.3843	34.1464	2.72366	5.22183	2.72362	-0.00004
1.0840	34.1454	2.93115	5.36392	2.93120	0.00005
15.3044	34.1462	4.22698	6.17700	4.22693	-0.00005
18.8032	34.1452	4.56830	6.37386	4.56835	0.00005
29.3020	34.1460	5.63550	6.95291	5.63548	-0.00002
32.8991	34.1428	6.01307	7.14641	6.01308	0.00001

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

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

t = temperature [deg C]; p = pressure [decibars]; δ = CTcor; ϵ = CPcor;

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

