

SG147

SEA-BIRD ELECTRONICS, INC.
 1808 136th Place N.E., Bellevue, Washington, 98005 USA
 Phone: (425) 643 - 9866 Fax (425) 643 - 9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 0074
 CALIBRATION DATE: 18-Dec-09

GliderAPL TEMPERATURE CALIBRATION DATA
 ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

g = 4.28347015e-003
 h = 6.26851881e-004
 i = 2.21201004e-005
 j = 2.13699244e-006
 f0 = 1000.0

IPTS-68 COEFFICIENTS

a = 3.64763813e-003
 b = 5.87631415e-004
 c = 1.54197062e-005
 d = 2.13845091e-006
 f0 = 2855.453

BATH TEMP (ITS-90)	INSTRUMENT FREQ (Hz)	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
0.9999	2855.453	0.9998	-0.00014
4.4999	3088.440	4.5002	0.00026
15.0000	3869.832	14.9998	-0.00025
18.5000	4159.104	18.5000	0.00000
24.0000	4644.085	24.0001	0.00014
29.0000	5118.216	29.0001	0.00009
32.5000	5469.465	32.4999	-0.00010

Temperature ITS-90 = $1/\{g + h[\ln(f_0/f)] + i[\ln^2(f_0/f)] + j[\ln^3(f_0/f)]\} - 273.15$ (°C)

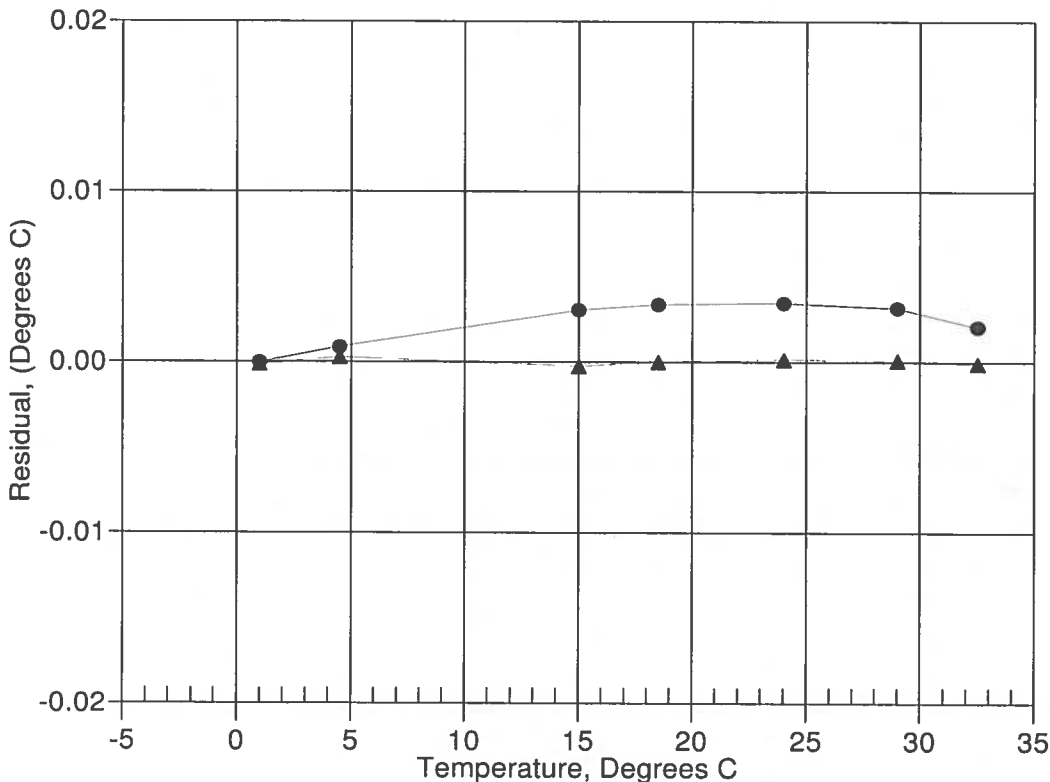
Temperature IPTS-68 = $1/\{a + b[\ln(f_0/f)] + c[\ln^2(f_0/f)] + d[\ln^3(f_0/f)]\} - 273.15$ (°C)

Following the recommendation of JPOTS: T_{68} is assumed to be $1.00024 * T_{90}$ (-2 to 35 °C)

Residual = instrument temperature - bath temperature

Date, Offset(mdeg C)

- 09-Apr-09 2.27
- ▲ 18-Dec-09 -0.00





SEA-BIRD ELECTRONICS, INC.

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

Phone: (425) 643-9866 Fax: (425) 643-9954 www.seabird.com

Temperature Calibration Report

Customer:	SEAGLIDER FABRICATION CENTER		
Job Number:	57001	Date of Report:	12/18/2009
Model Number:	GLIDER	Serial Number:	0074 Glider T/C Assembly

Temperature sensors are normally calibrated 'as received', without adjustments, allowing a determination sensor drift. If the calibration identifies a problem, 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 coefficients to convert sensor frequency to temperature. 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 'offset' allows a small correction for drift between calibrations (consult the SEASOFT manual). Calibration coefficients obtained after a repair apply only to subsequent data.

'AS RECEIVED CALIBRATION'

Performed Not Performed

Date: 12/18/2009

Drift since last cal: -0.00328 Degrees Celsius/year

Comments:

'CALIBRATION AFTER REPAIR'

Performed Not Performed

Date:

Drift since Last cal: Degrees Celsius/year

Comments:

SEA-BIRD ELECTRONICS, INC.

1808 136th Place N.E., Bellevue, Washington, 98005 USA

Phone: (425) 643 - 9866 Fax (425) 643 - 9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 0074
CALIBRATION DATE: 18-Dec-09

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

GHIJ COEFFICIENTS

g = -9.83354337e+000
h = 1.09985631e+000
i = -1.20278138e-003
j = 1.74471648e-004
CPcor = -9.5700e-008 (nominal)
CTcor = 3.2500e-006 (nominal)

ABCDM COEFFICIENTS

a = 1.72702100e-005
b = 1.09643031e+000
c = -9.82228792e+000
d = -8.44096246e-005
m = 4.7
CPcor = -9.5700e-008 (nominal)

BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (kHz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2.99288	0.00000	0.00000
0.9999	34.7263	2.96900	5.99715	2.96899	-0.00001
4.4999	34.7057	3.27531	6.22465	3.27532	0.00001
15.0000	34.6620	4.25468	6.90117	4.25467	-0.00001
18.5000	34.6526	4.59899	7.12352	4.59899	0.00000
24.0000	34.6422	5.15558	7.46871	5.15559	0.00001
29.0000	34.6364	5.67616	7.77739	5.67615	-0.00001
32.5000	34.6327	6.04758	7.99019	6.04759	0.00001

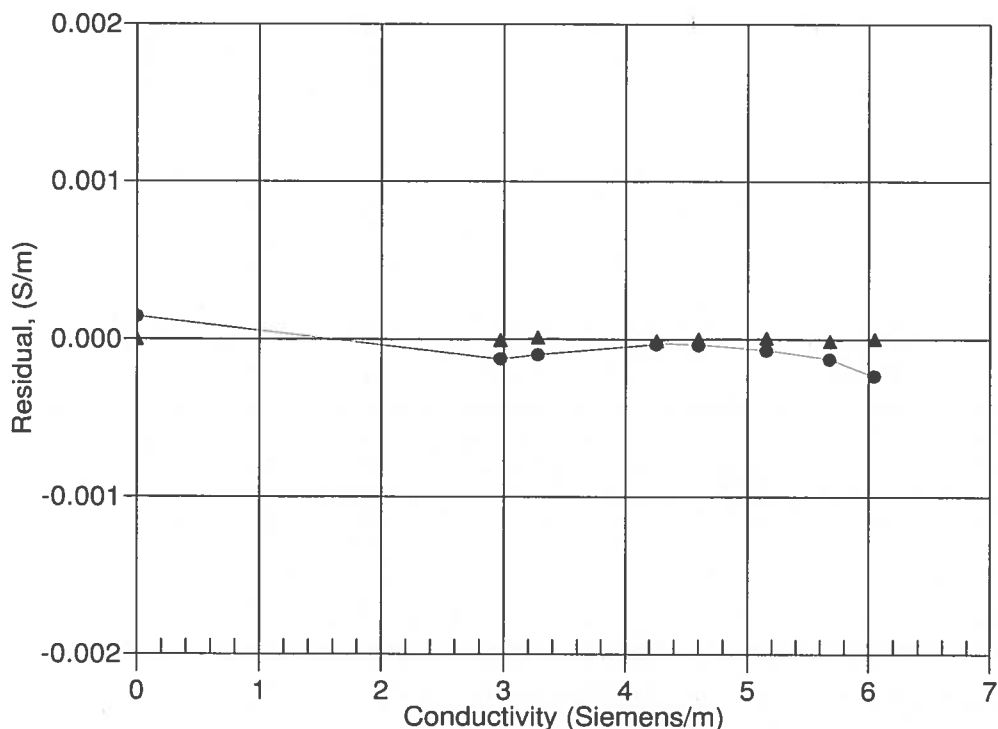
Conductivity = $(g + hf^2 + if^3 + jf^4) / 10(1 + \delta t + \epsilon p)$ Siemens/meter

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

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

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

Date, Slope Correction



● 09-Apr-09 1.0000227
▲ 18-Dec-09 1.0000000



SEA-BIRD ELECTRONICS, INC.

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

Phone: (425) 643-9866 Fax: (425) 643-9954 www.seabird.com

Conductivity Calibration Report

Customer:	SEAGLIDER FABRICATION CENTER		
Job Number:	57001	Date of Report:	12/18/2009
Model Number:	GLIDER	Serial Number:	0074 Glider T/C Assembly

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.