

Sea-Bird Electronics, Inc.

13431 NE 20th Street, Bellevue, WA 98005-2010 USA

Phone: (+1) 425-643-9866 Fax (+1) 425-643-9954 Email: seabird@seabird.com

SENSOR SERIAL NUMBER: 9083

CALIBRATION DATE: 02-Jun-13

SLOCUM PAYLOAD CTD

TEMPERATURE CALIBRATION DATA

ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = -5.903189e-005

a1 = 2.998579e-004

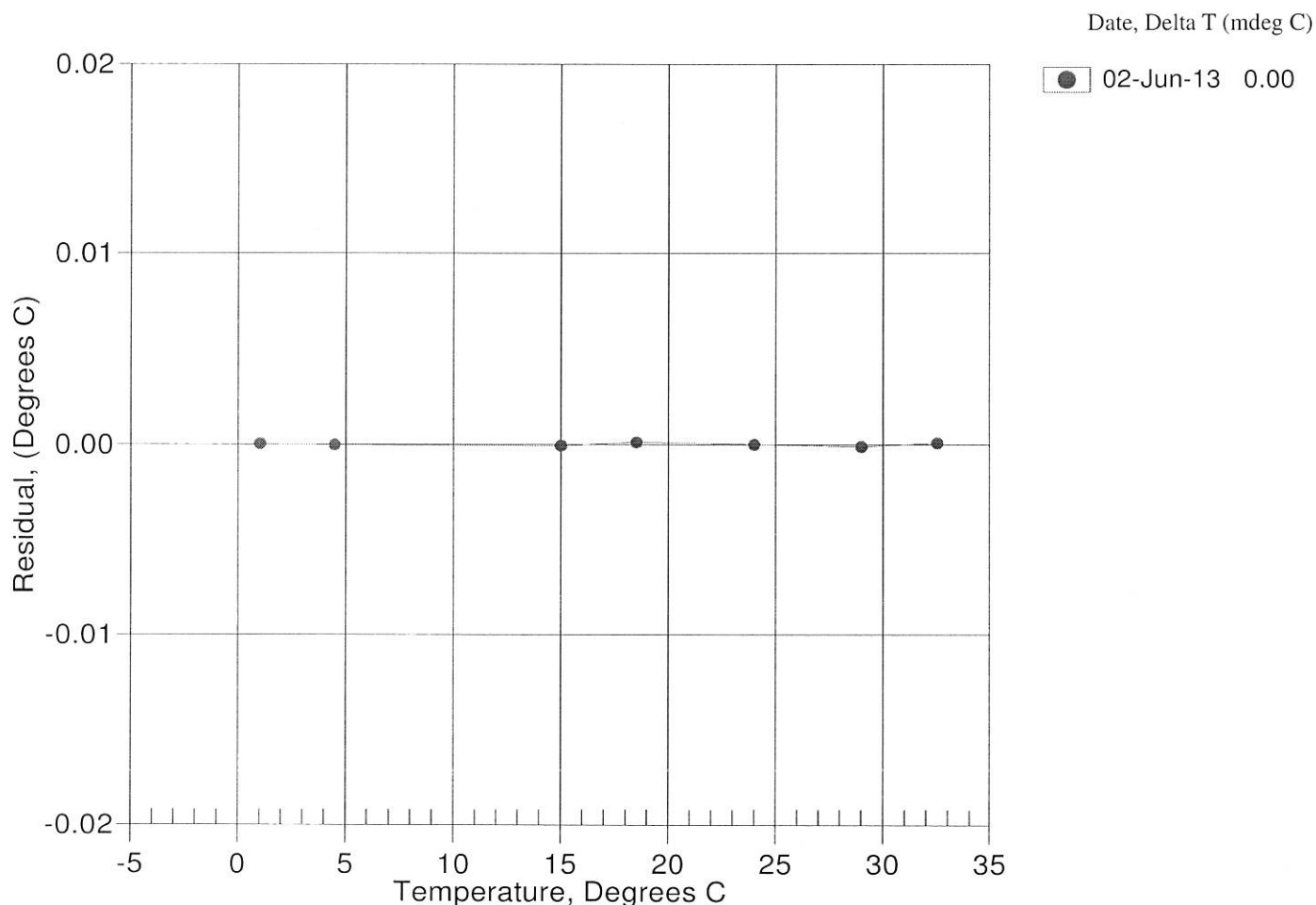
a2 = -4.021232e-006

a3 = 1.889458e-007

BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	568077.8	1.0000	0.0000
4.5000	485380.4	4.5000	-0.0000
15.0000	308811.6	14.9999	-0.0001
18.5000	267274.0	18.5001	0.0001
24.0000	214285.2	24.0000	0.0000
29.0000	176369.6	28.9999	-0.0001
32.5000	154411.6	32.5001	0.0001

Temperature ITS-90 = $1 / \{ a_0 + a_1[\ln(n)] + a_2[\ln^2(n)] + a_3[\ln^3(n)] \} - 273.15$ (°C)

Residual = instrument temperature - bath temperature



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

COEFFICIENTS:

g = -9.817727e-001
h = 1.278316e-001
i = -4.322062e-004
j = 4.655900e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 2.9371e-006

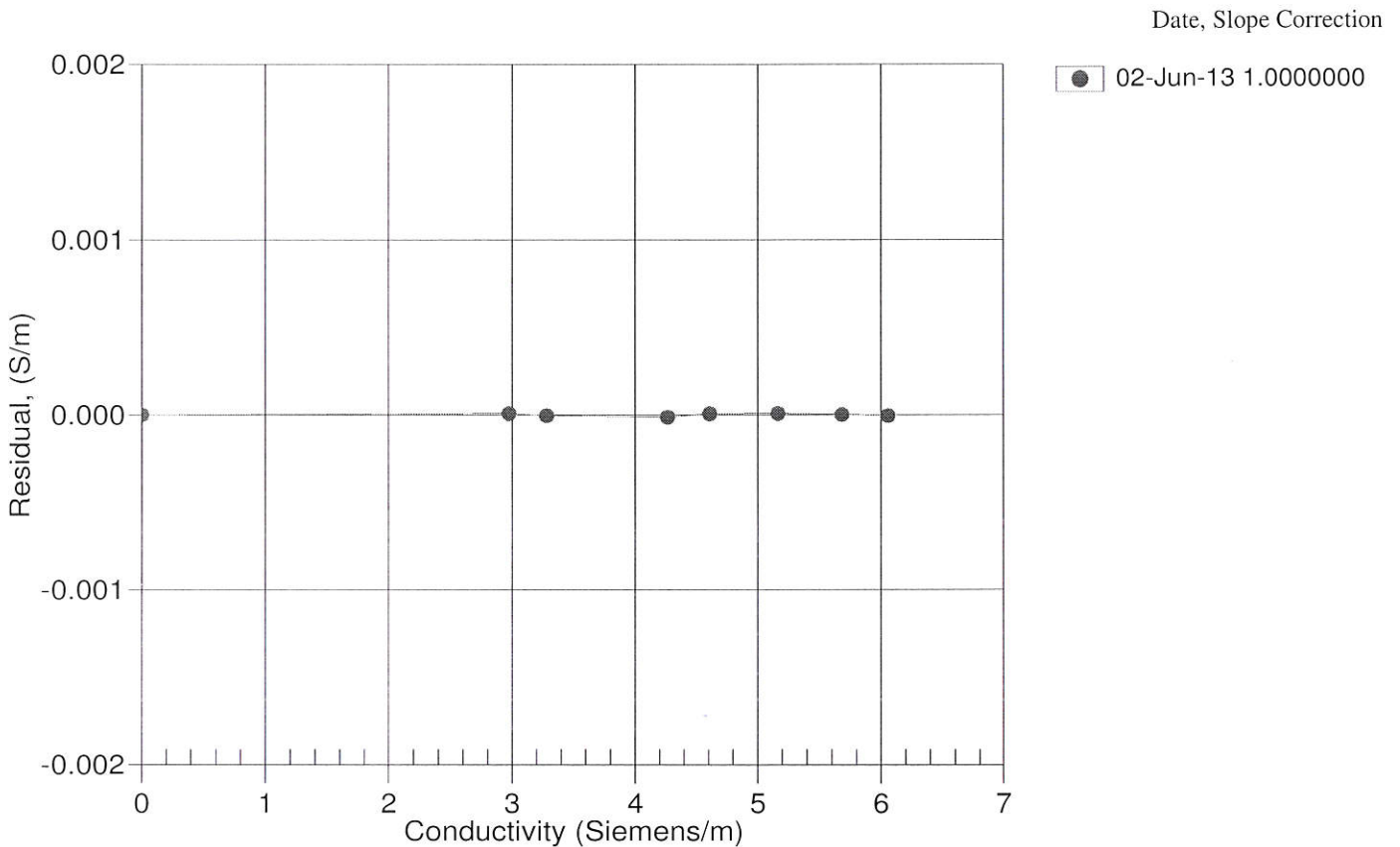
BATH TEMP (ITS-90)	BATH SAL (PSU)	BATH COND (Siemens/m)	INST FREQ (Hz)	INST COND (Siemens/m)	RESIDUAL (Siemens/m)
22.0000	0.0000	0.00000	2780.40	0.00000	0.00000
1.0000	34.7803	2.97318	5583.31	2.97319	0.00001
4.5000	34.7607	3.27999	5795.35	3.27999	-0.00000
15.0000	34.7189	4.26093	6425.60	4.26091	-0.00001
18.5000	34.7104	4.60583	6632.66	4.60584	0.00001
24.0000	34.7011	5.16338	6953.94	5.16339	0.00001
29.0000	34.6965	5.68490	7241.14	5.68490	0.00000
32.5000	34.6945	6.05715	7439.10	6.05714	-0.00001

$$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$$

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

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

$$\text{Residual} = \text{instrument conductivity} - \text{bath conductivity}$$



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SENSOR SERIAL NUMBER: 9083
 CALIBRATION DATE: 30-May-13

SLOCUM PAYLOAD CTD
 PRESSURE CALIBRATION DATA
 1450 psia S/N 3846552

COEFFICIENTS:

PA0 = 2.089193e-001
 PA1 = 4.538118e-003
 PA2 = -1.550273e-011
 PTEMPA0 = -7.387732e+001
 PTEMPA1 = 4.969106e-002
 PTEMPA2 = -3.318576e-007

PTCA0 = 5.255029e+005
 PTCA1 = 1.663325e+000
 PTCA2 = -6.517432e-003
 PTCB0 = 2.563737e+001
 PTCB1 = -3.725000e-003
 PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.63	528712.0	1950.0	14.67	0.00
314.95	594660.0	1954.0	314.83	-0.01
614.96	660613.0	1956.0	614.89	-0.00
915.00	726617.0	1956.0	915.04	0.00
1215.00	792607.0	1957.0	1215.00	-0.00
1465.02	847620.0	1957.0	1464.95	-0.00
1215.00	792621.0	1957.0	1215.06	0.00
915.00	726622.0	1957.0	915.07	0.00
614.96	660630.0	1957.0	614.97	0.00
314.90	594675.0	1956.0	314.90	0.00
14.64	528716.0	1957.0	14.68	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	2172	528772.80
29.00	2100	528772.80
24.00	1996	528765.40
18.50	1883	528755.00
15.00	1811	528748.60
4.50	1594	528738.40
1.00	1522	528727.40
TEMP (ITS90)		SPAN (mV)
-5.00	25.66	
35.00	25.51	

$$y = \text{thermistor output}; t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$$

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

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

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

Date, Avg Delta P %FS

30-May-13 -0.00

