

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: 9056
CALIBRATION DATE: 15-Mar-13

SLOCUM PAYLOAD CTD
TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

ITS-90 COEFFICIENTS

a0 = -1.355568e-004
a1 = 3.158285e-004
a2 = -5.221068e-006
a3 = 2.207027e-007

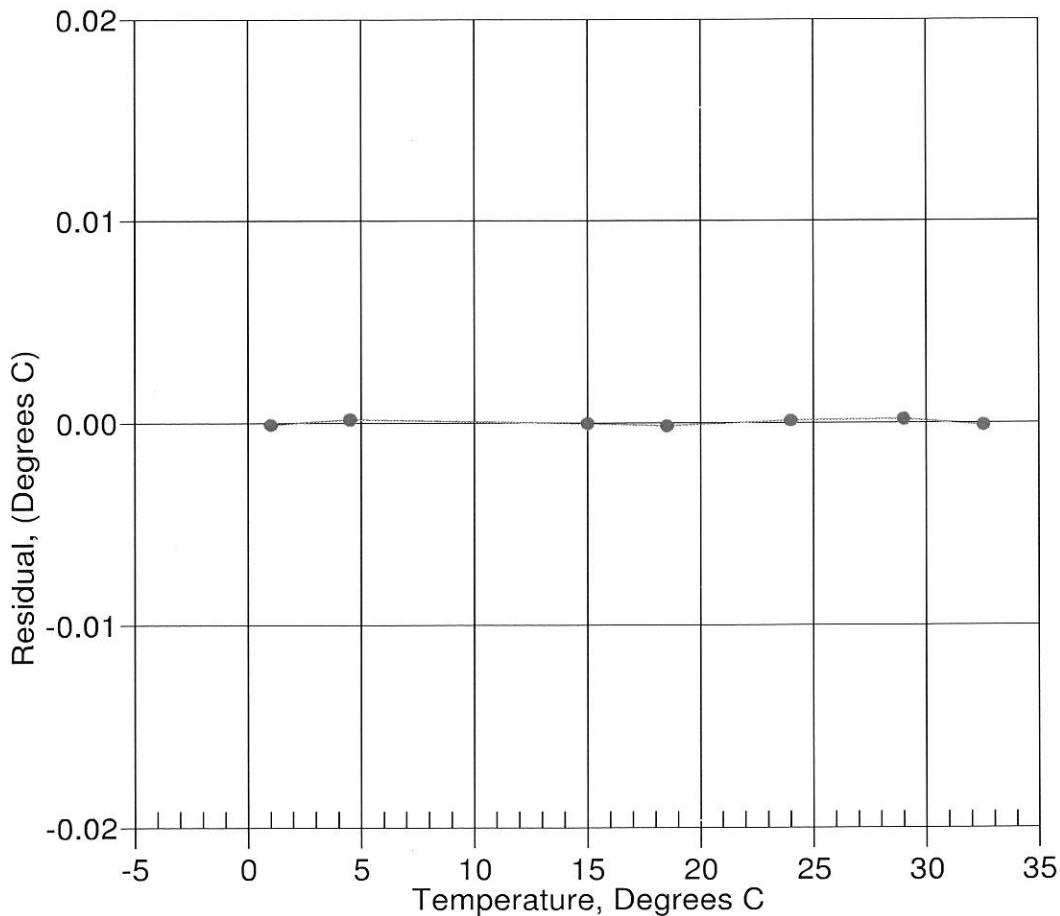
BATH TEMP (ITS-90)	INSTRUMENT OUTPUT	INST TEMP (ITS-90)	RESIDUAL (ITS-90)
1.0000	571354.6	0.9999	-0.0001
4.4999	488420.6	4.5001	0.0002
15.0000	311188.4	15.0000	-0.0000
18.5000	269456.8	18.4998	-0.0002
24.0000	216183.6	24.0001	0.0001
29.0000	178043.0	29.0002	0.0002
32.5000	155948.0	32.4999	-0.0001

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

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

Date, Delta T (mdeg C)

15-Mar-13 -0.00



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: 9056
 CALIBRATION DATE: 15-Mar-13

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

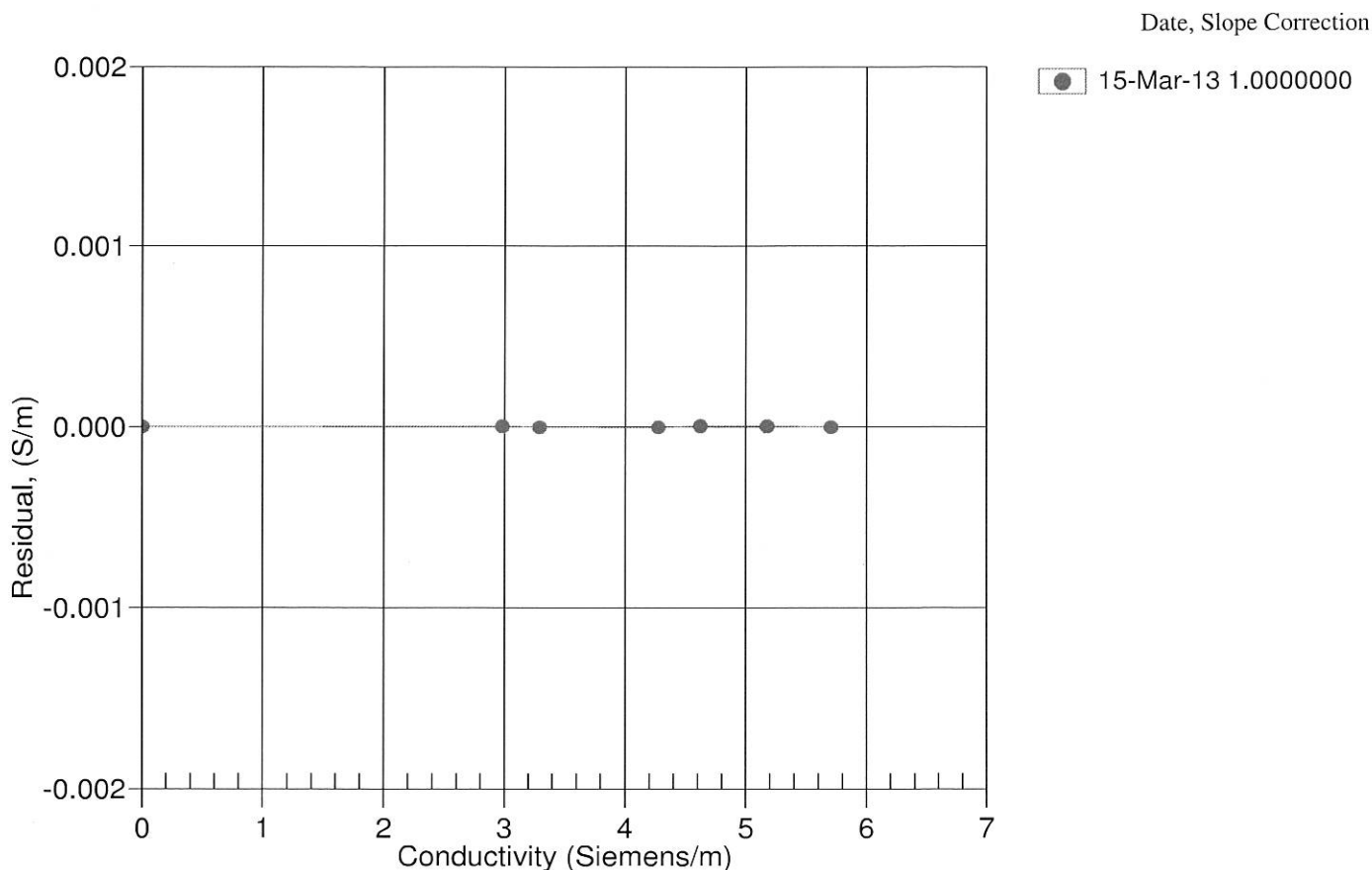
COEFFICIENTS:

g = -9.832001e-001	CPcor = -9.5700e-008
h = 1.359317e-001	CTcor = 3.2500e-006
i = -3.503310e-004	WBOTC = 2.4111e-006
j = 4.269465e-005	

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	2695.66	0.00000	0.00000
1.0000	34.8831	2.98113	5413.25	2.98113	0.00000
4.4999	34.8631	3.28869	5618.80	3.28869	-0.00000
15.0000	34.8199	4.27201	6229.83	4.27200	-0.00001
18.5000	34.8106	4.61769	6430.57	4.61770	0.00000
24.0000	34.8004	5.17652	6742.11	5.17652	0.00000
29.0000	34.7945	5.69915	7020.60	5.69915	-0.00000

$f = \text{INST FREQ} * \text{sqrt}(1.0 + \text{WBOTC} * t) / 1000.0$
 Conductivity = $(g + hf^2 + if^3 + jf^4) / (1 + \delta t + \epsilon p)$ Siemens/meter
 t = temperature[°C]; p = pressure[decibars]; $\delta = \text{CTcor}$; $\epsilon = \text{CPcor}$;

Residual = instrument conductivity - bath conductivity



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: 9056
 CALIBRATION DATE: 08-Mar-13

SLOCUM PAYLOAD CTD
 PRESSURE CALIBRATION DATA
 1450 psia S/N 3806514

COEFFICIENTS:

PA0 = -1.338345e-001	PTCA0 = 5.246199e+005
PA1 = 4.616207e-003	PTCA1 = -1.879269e+000
PA2 = -2.118384e-011	PTCA2 = 3.330497e-002
PTEMPA0 = -6.918951e+001	PTCB0 = 2.521537e+001
PTEMPA1 = 5.211050e-002	PTCB1 = 8.750000e-004
PTEMPA2 = -5.591536e-007	PTCB2 = 0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE PSIA	INST OUTPUT	THERMISTOR OUTPUT	COMPUTED PRESSURE	ERROR %FSR
14.65	527809.0	1793.0	14.69	0.00
314.97	592910.0	1796.0	314.88	-0.01
614.96	658018.0	1798.0	614.92	-0.00
914.96	723175.0	1799.0	915.00	0.00
1214.97	788351.0	1799.0	1214.99	0.00
1465.04	842697.0	1800.0	1464.99	-0.00
1214.96	788347.0	1800.0	1214.97	0.00
915.03	723196.0	1800.0	915.09	0.00
614.97	658038.0	1799.0	615.01	0.00
315.05	592932.0	1800.0	314.98	-0.00
14.65	527810.0	1801.0	14.70	0.00

THERMAL CORRECTION

TEMP ITS90	THERMISTOR OUTPUT	INST OUTPUT
32.50	1994	527855.40
29.00	1924	527858.40
24.00	1824	527856.60
18.50	1714	527859.40
15.00	1645	527860.40
4.50	1436	527876.80
1.00	1367	527879.80

TEMP (ITS90)	SPAN (mV)
-5.00	25.21
35.00	25.25

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

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

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

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

Date, Avg Delta P %FS

● 08-Mar-13 -0.00

