SEA-BIRD SCIENTIFIC
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13431 NE 20th Street
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USA

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seabird@seabird.com
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Pressure Test Certificate

Test Date: **2022-04-28**

Description: **Slocum CTD**

Sensor Information:

Model Number: **Slocum**

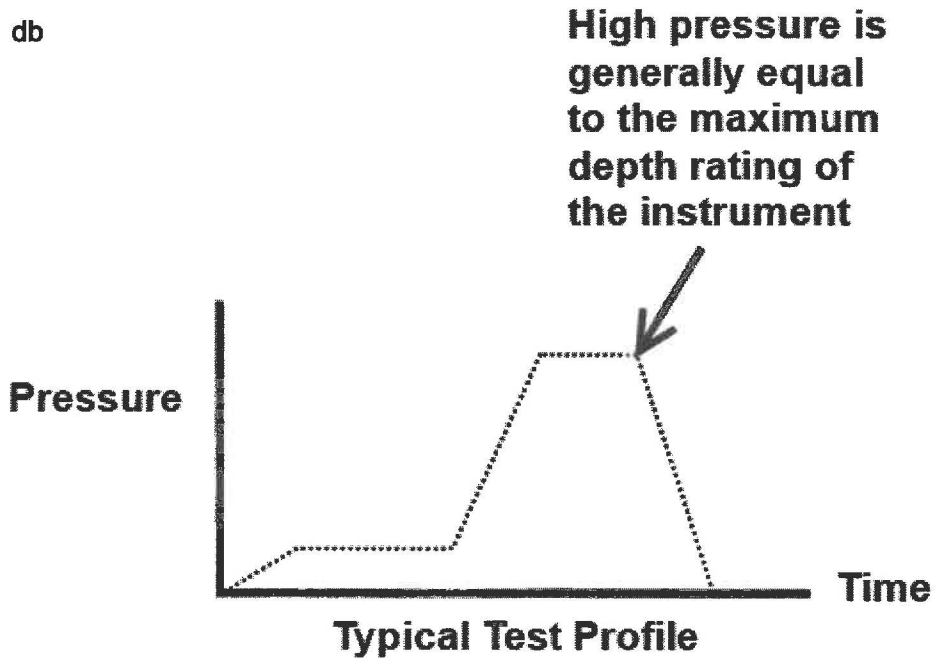
Serial Number: **9807**

Pressure Test Protocol:

Low Pressure Test: **40**	PSI	Held For: **15**	Minutes
High Pressure Test: **40**	PSI	Held For: **15**	Minutes

Passed Test: **True**

Tested By: **db**



Typical Test Profile

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SENSOR SERIAL NUMBER: 9807
CALIBRATION DATE: 29-Apr-22

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 11998509

COEFFICIENTS:

PA0 =	1.179963e-001	PTCA0 =	5.240035e+005
PA1 =	4.459436e-003	PTCA1 =	1.754637e+000
PA2 =	-1.602817e-011	PTCA2 =	-2.773918e-002
PTEMPA0 =	-6.145788e+001	PTCB0 =	2.511929e+001
PTEMPA1 =	5.449367e-002	PTCB1 =	-1.741294e-004
PTEMPA2 =	-6.554641e-007	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.59	527282.6	1579.6	14.63	0.00
301.87	591670.1	1582.6	301.73	-0.01
589.00	656123.6	1583.5	589.00	-0.00
876.13	720571.2	1584.2	876.11	-0.00
1163.29	785060.2	1585.0	1163.26	-0.00
1450.45	849572.0	1586.4	1450.39	-0.00
1163.29	785094.9	1586.1	1163.42	0.01
876.07	720564.9	1586.2	876.08	0.00
588.94	656125.1	1586.2	589.01	0.00
301.78	591671.5	1586.6	301.74	-0.00
14.57	527279.6	1587.5	14.61	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
32.50	1762	527278.00
29.00	1694	527277.20
24.00	1599	527275.40
18.50	1494	527269.60
14.99	1428	527270.20
4.49	1228	527263.00
1.00	1162	527246.80

TEMPERATURE (°C)	SPAN
-4.10	25.12
36.10	25.11

y = thermistor output (counts)

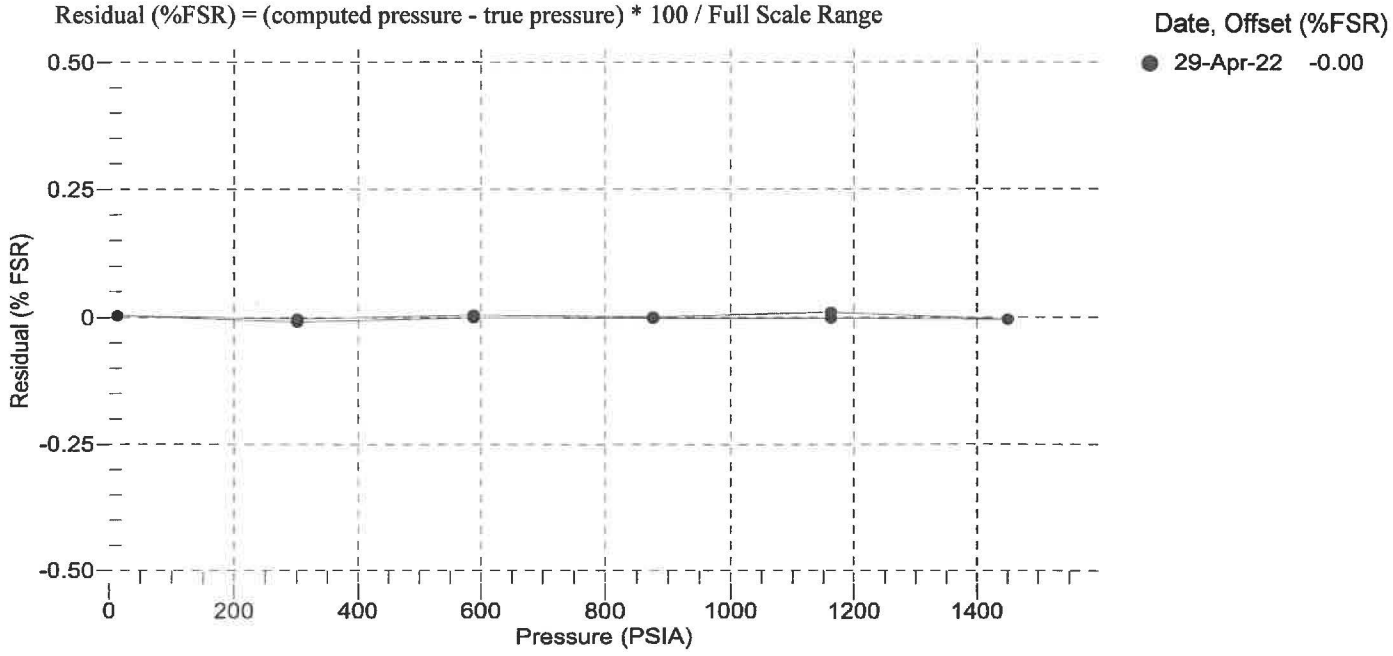
$t = PTEMPA0 + PTEMPA1 * y + PTEMPA2 * y^2$

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

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

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

Residual (%FSR) = (computed pressure - true pressure) * 100 / Full Scale Range



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SENSOR SERIAL NUMBER: 9807
CALIBRATION DATE: 06-May-22

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

COEFFICIENTS:

```
g = -1.004803e+000
h =  1.518585e-001
i = -5.415939e-004
j =  6.396567e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC =  4.5207e-007
```

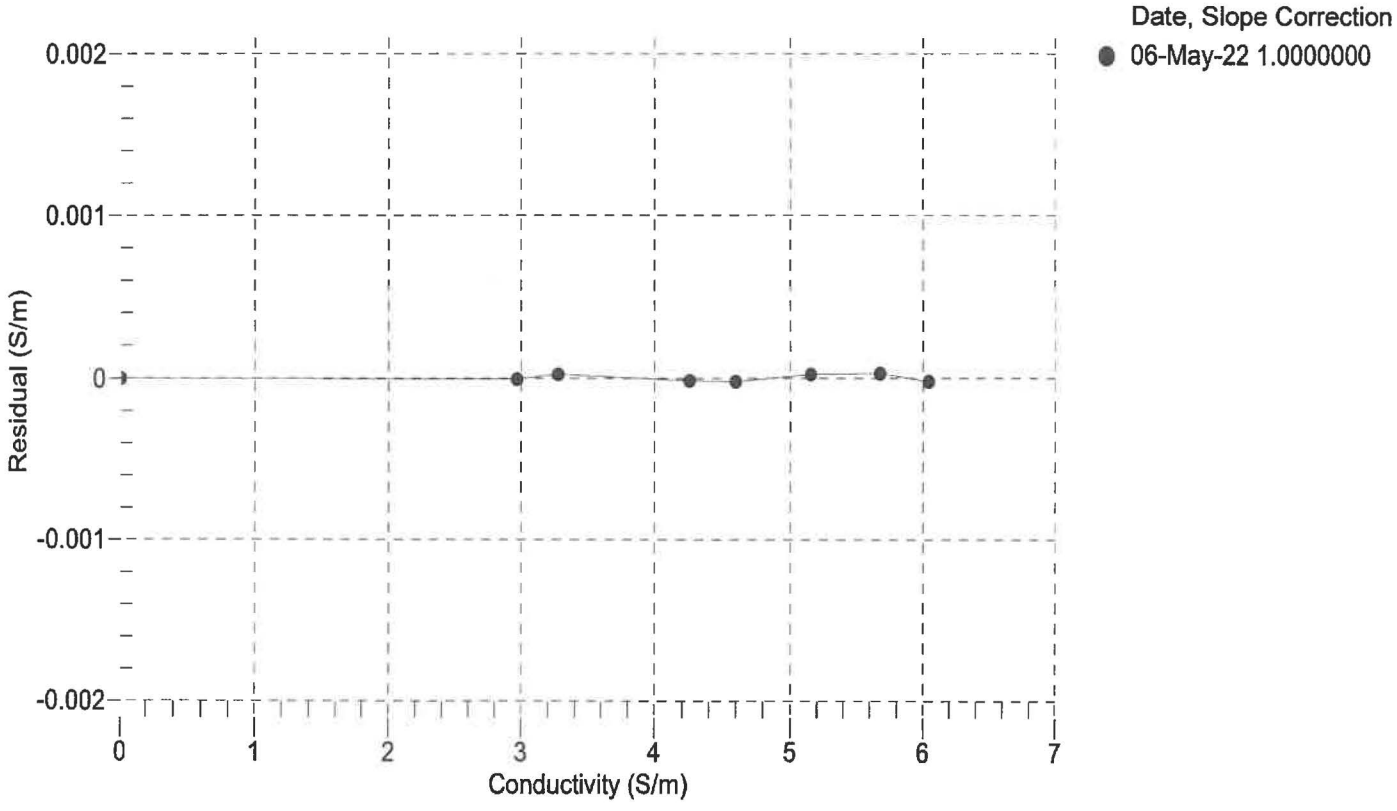
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2580.55	0.00000	0.00000
1.0000	34.7243	2.96885	5133.89	2.96884	-0.00001
4.4947	34.7039	3.27469	5327.39	3.27471	0.00002
14.9924	34.6602	4.25374	5903.48	4.25373	-0.00002
18.5000	34.6497	4.59865	6093.17	4.59863	-0.00002
24.0000	34.6380	5.15503	6386.98	5.15505	0.00002
29.0000	34.6286	5.67503	6649.47	5.67505	0.00003
32.5000	34.6158	6.04497	6829.81	6.04495	-0.00002

f = Instrument Output(Hz) * sqrt(1.0 + WBOTC * t) / 1000.0

t = temperature (°C); p = pressure (decibars); δ = CTcor; ε = CPcor;

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = instrument conductivity - bath conductivity



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SENSOR SERIAL NUMBER: 9807
CALIBRATION DATE: 06-May-22

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = -6.099263e-005
a1 = 2.998808e-004
a2 = -4.012071e-006
a3 = 1.887700e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	568966.0	1.0000	-0.0000
4.4947	486300.6	4.4947	0.0000
14.9924	309510.8	14.9923	-0.0001
18.5000	267819.8	18.5000	0.0000
24.0000	214751.6	24.0001	0.0001
29.0000	176775.4	28.9999	-0.0001
32.5000	154780.2	32.5000	0.0000

n = Instrument Output (counts)

Temperature ITS-90 (°C) = $1/\{a0 + a1[ln(n)] + a2[ln^2(n)] + a3[ln^3(n)]\} - 273.15$

Residual (°C) = instrument temperature - bath temperature