SENSOR SERIAL NUMBER: 9432
CALIBRATION DATE: 13-Sep-23

Slocum Payload CTD PRESSURE CALIBRATION DATA
1450 psia S/N 10712104

## COEFFICIENTS:

| | | | | |
|---|---|---|---|---|
| PA0 | = | 6.019081e-001 | PTCA0 = | 5.240746e+005 |
| PA1 | = | 4.484418e-003 | PTCA1 = | 9.502923e+000 |
| PA2 | = | -3.556583e-012 | PTCA2 = | -1.625352e-001 |
| PTEMPA0 | = | -7.174735e+001 | PTCB0 = | 2.508912e+001 |
| PTEMPA1 | = | 5.045273e-002 | PTCB1 = | -5.750000e-004 |
| PTEMPA2 | = | -4.263063e-007 | PTCB2 = | 0.000000e+000 |

### PRESSURE SPAN CALIBRATION

| PRESSURE (PSIA) | INSTRUMENT OUTPUT (counts) | THERMISTOR OUTPUT (volts) | COMPUTED PRESSURE (PSIA) | RESIDUAL (%FSR) |
|---|---|---|---|---|
| 14.60 | 527315.0 | 1904.6 | 14.55 | -0.00 |
| 301.09 | 591205.6 | 1907.6 | 301.19 | 0.01 |
| 587.70 | 655072.2 | 1908.2 | 587.70 | 0.00 |
| 874.48 | 718996.2 | 1909.0 | 874.44 | -0.00 |
| 1161.05 | 782894.0 | 1910.0 | 1161.04 | -0.00 |
| 1447.85 | 846859.0 | 1910.4 | 1447.90 | 0.00 |
| 1160.84 | 782842.6 | 1909.8 | 1160.81 | -0.00 |
| 874.19 | 718928.0 | 1910.4 | 874.14 | -0.00 |
| 587.49 | 655020.2 | 1910.4 | 587.47 | -0.00 |
| 300.60 | 591092.2 | 1910.8 | 300.68 | 0.01 |
| 14.60 | 527315.6 | 1911.0 | 14.55 | -0.00 |

### THERMAL CORRECTION

| TEMP (°C) | THERMISTOR OUTPUT (volts) | INSTRUMENT OUTPUT (counts) |
|---|---|---|
| 32.50 | 2104 | 527357.60 |
| 29.00 | 2032 | 527371.10 |
| 24.00 | 1929 | 527367.40 |
| 18.50 | 1817 | 527346.10 |
| 15.00 | 1745 | 527326.40 |
| 4.50 | 1531 | 527265.60 |
| 1.00 | 1460 | 527238.00 |

| TEMPERATURE (°C) | SPAN |
|---|---|
| -5.00 | 25.09 |
| 35.00 | 25.07 |

$y$ = thermistor output (counts)

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

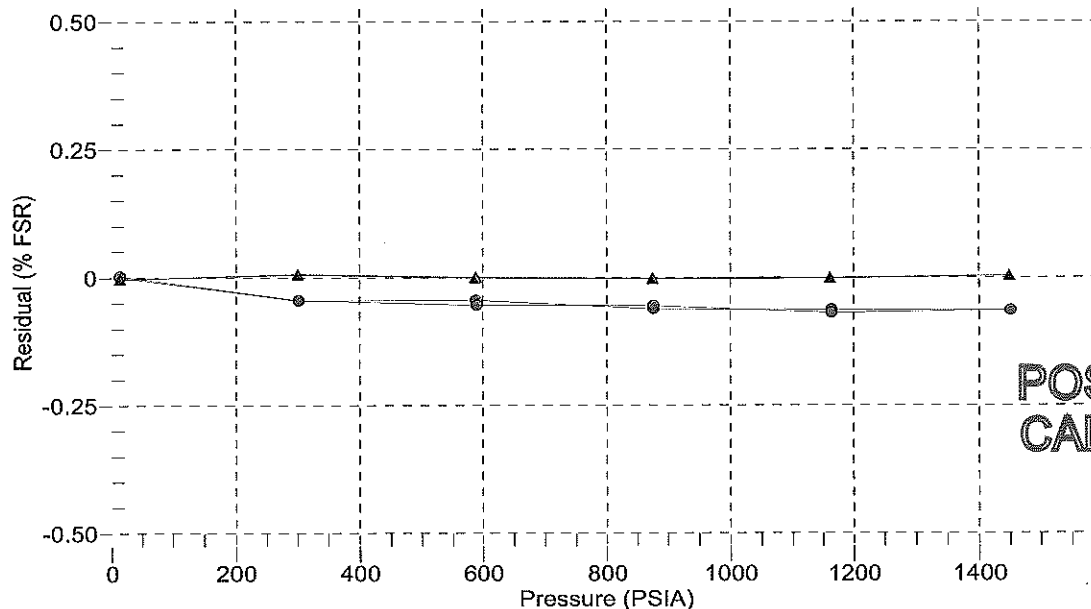$x$ = instrument output - PTCA0 - PTCA1 * t - PTCA2 * $t^2$

$n = x * \text{PTCB0} / (\text{PTCB0} + \text{PTCB1} * t + \text{PTCB2} * t^2)$

pressure (PSIA) = PA0 + PA1 * n + PA2 * $n^2$

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



| Date, | Offset (%FSR) |
|---|---|
| ● 17-Feb-20 | -0.05 |
| ▲ 13-Sep-23 | -0.00 |

POST CRUISE CALIBRATION
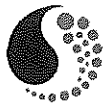
SENSOR SERIAL NUMBER: 9432
CALIBRATION DATE: 06-Oct-23

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

COEFFICIENTS:

g = -1.015767e+000
h = 1.316907e-001
i = -5.807597e-005
j = 2.173235e-005

CPcor = -9.5700e-008
CTcor = 3.2500e-006
WBOTC = 1.5002e-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 | 2777.21 | 0.00000 | 0.00000 |
| 1.0000 | 34.4923 | 2.95090 | 5481.31 | 2.95090 | 0.00000 |
| 4.4999 | 34.4824 | 3.25630 | 5687.61 | 3.25630 | -0.00000 |
| 15.0000 | 34.4660 | 4.23316 | 6301.55 | 4.23315 | -0.00001 |
| 18.5000 | 34.4648 | 4.57674 | 6503.47 | 4.57675 | 0.00001 |
| 23.9999 | 34.4660 | 5.13223 | 6816.99 | 5.13224 | 0.00001 |
| 29.0000 | 34.4692 | 5.65183 | 7097.43 | 5.65183 | 0.00000 |
| 32.5000 | 34.4703 | 6.02244 | 7290.69 | 6.02243 | -0.00001 |

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

$t$ = temperature (°C);   $p$ = pressure (decibars);   $\delta$ = CTcor;   $\varepsilon$ = 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
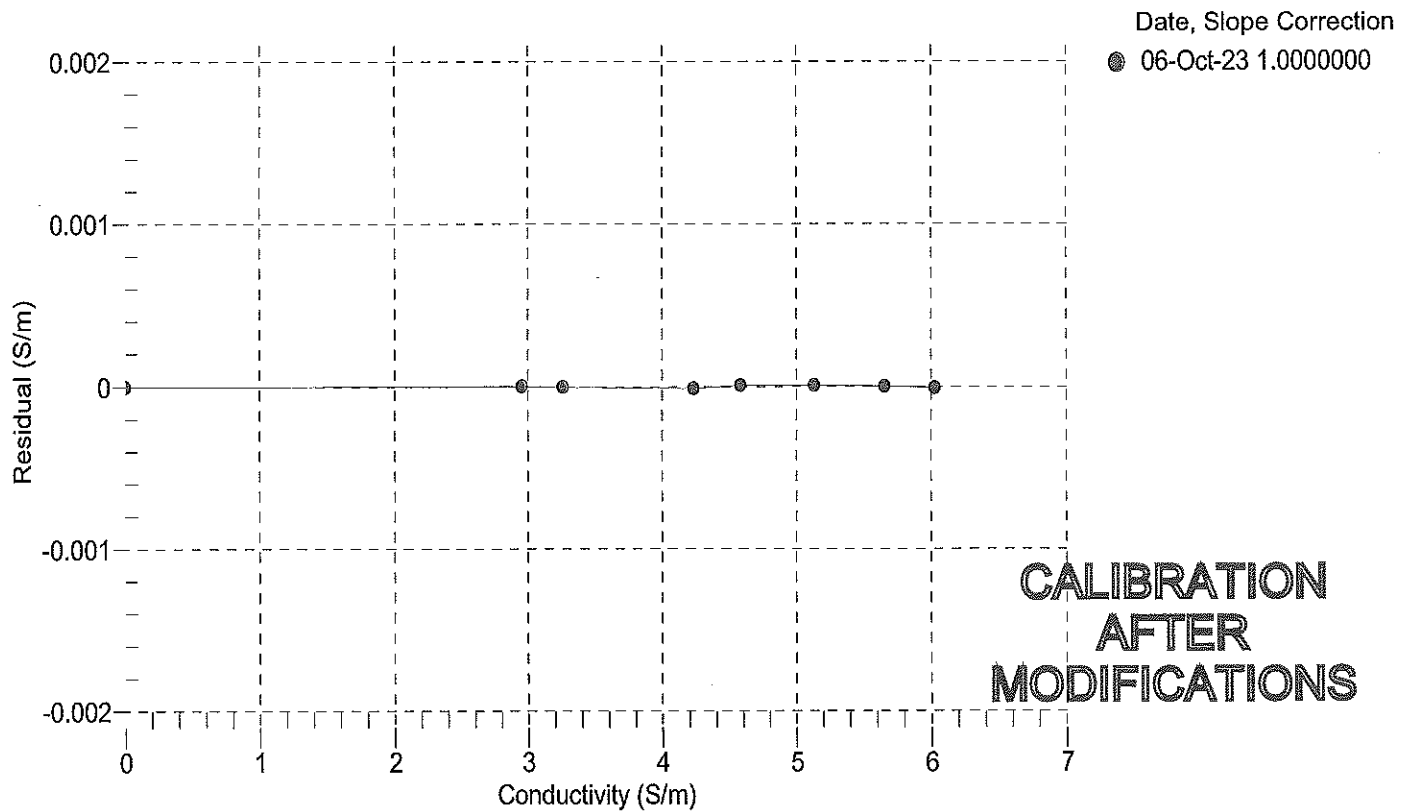
Date, Slope Correction
● 06-Oct-23 1.0000000



CALIBRATION
AFTER
MODIFICATIONS

1

SENSOR SERIAL NUMBER: 9432
CALIBRATION DATE: 06-Oct-23

Slocum Payload CTD TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:
$a0 = -1.744314e-004$
$a1 = 3.172436e-004$
$a2 = -5.021960e-006$
$a3 = 2.167475e-007$

| BATH TEMP (° C) | INSTRUMENT OUTPUT (counts) | INST TEMP (° C) | RESIDUAL (° C) |
|---|---|---|---|
| 1.0000 | 560617.6 | 1.0000 | 0.0000 |
| 4.4999 | 480379.8 | 4.4999 | -0.0000 |
| 15.0000 | 308161.6 | 15.0001 | 0.0001 |
| 18.5000 | 267426.1 | 18.4998 | -0.0002 |
| 23.9999 | 215282.0 | 24.0000 | 0.0001 |
| 29.0000 | 177832.0 | 29.0000 | -0.0000 |
| 32.5000 | 156080.5 | 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

Date, Offset (mdeg C)

⬤ 06-Oct-23  -0.00



POST CRUISE
CALIBRATION

1