SEA-BIRD SCIENTIFIC

SBE Sea-Bird Electronics

Sea-Bird Electronics
13431 NE 20th Street
Bellevue, Washington
98005 USA

Tel: +1 425-643-9866
seabird@seabird.com
www.seabird.com

SBE41-CP ALACE

Instrument Configuration

Instrument Serial Number:	41-8523
Instrument Firmware Version:	V 7.2.5
Zero Conductivity Frequency:	2622.65
Communications Format:	RS232
Communications Settings:	9600 baud, 8 Data Bits, No Parity

Installed Devices/Sensors

Data Format	*Measurement*	*Sensor Type*	*Serial Number*	*Rating*
Count	Temperature	Internal	N/A	N/A
Frequency	Conductivity	Internal	N/A	N/A
Count	Pressure	Kistler	4964353	2000m(2000 dBar)

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: 8523
CALIBRATION DATE: 01-Jun-16

SBE 41 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

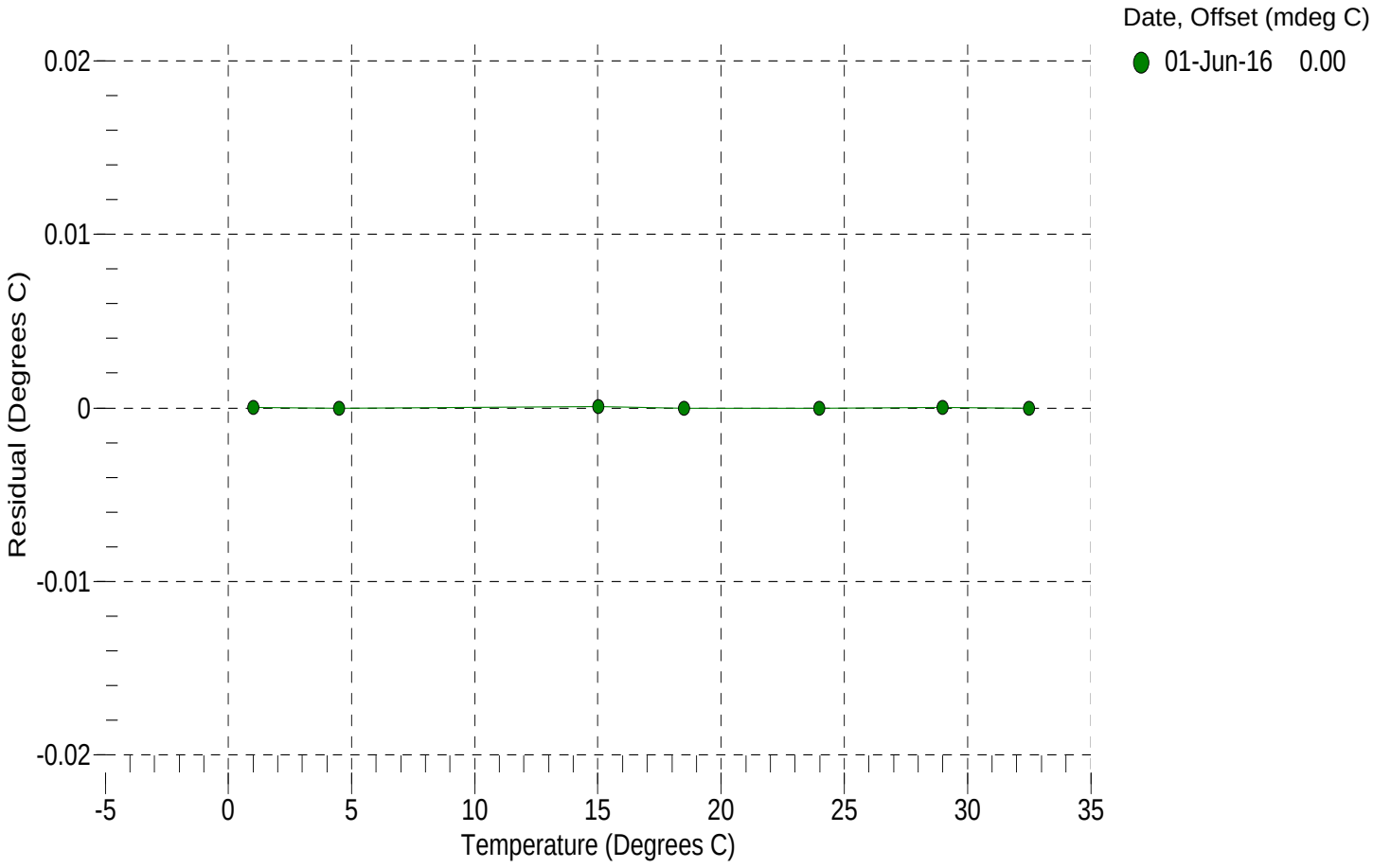
```
a0 = -8.081166e-004
a1 =  2.892201e-004
a2 = -3.595352e-006
a3 =  1.461273e-007
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	14958849.2	1.0000	0.0000
4.5000	12762036.9	4.5000	-0.0000
15.0000	8082459.3	15.0001	0.0001
18.5000	6984558.0	18.5000	-0.0000
23.9940	5587380.7	23.9940	-0.0000
29.0000	4587195.9	29.0000	0.0000
32.5000	4009672.6	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



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: 8523
CALIBRATION DATE: 01-Jun-16

SBE 41 CONDUCTIVITY CALIBRATION DATA
PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

```
g = -9.848185e-001
h =  1.437778e-001
i = -3.493180e-004
j =  4.651261e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC = -1.0484e-006
```

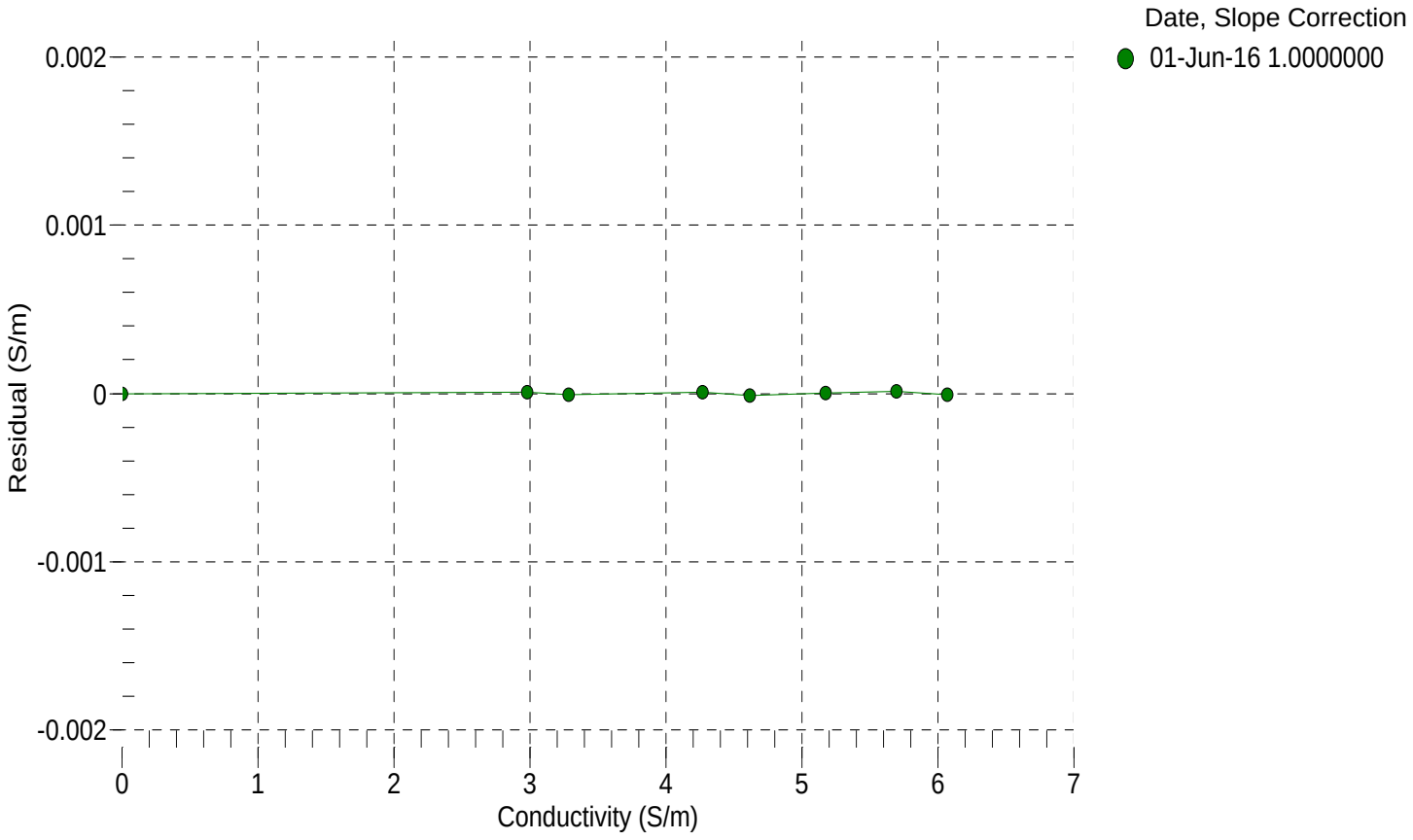
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2622.65	0.00000	0.00000
1.0000	34.8776	2.98070	5261.85	2.98071	0.00001
4.5000	34.8577	3.28824	5461.53	3.28823	-0.00001
15.0000	34.8148	4.27145	6055.15	4.27145	0.00001
18.5000	34.8058	4.61713	6250.17	4.61712	-0.00001
23.9940	34.7959	5.17531	6552.54	5.17531	0.00000
29.0000	34.7907	5.69860	6823.50	5.69861	0.00001
32.5000	34.7883	6.07166	7010.06	6.07165	-0.00001

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

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

Conductivity (S/m) = $(g + h * f^2 + i * f^3 + j * f^4) / 10 (1 + \delta * t + \varepsilon * p)$

Residual (Siemens/meter) = 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: 8523
CALIBRATION DATE: 25-May-16

SBE 41 PRESSURE CALIBRATION DATA
2900 psia S/N 4964353

COEFFICIENTS:

PA0 =	-6.036893e-001	PTCA0 =	-1.627429e+004
PA1 =	3.887877e-004	PTCA1 =	-2.700696e+002
PA2 =	1.096428e-013	PTCA2 =	9.096757e+000
PTHA0 =	3.079513e+002	PTCB0 =	1.042469e+002
PTHA1 =	-8.418192e-005	PTCB1 =	-6.846971e-003
PTHA2 =	1.947758e-012	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (counts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.68	21455.7	3717658.6	14.69	0.00
591.16	1501389.9	3713643.2	591.15	-0.00
1167.55	2980045.9	3712321.4	1167.61	0.00
1743.87	4457270.2	3710979.0	1744.00	0.00
2320.30	5933473.7	3710118.4	2320.47	0.01
2896.61	7407122.9	3709366.4	2896.43	-0.01
2319.97	5932562.3	3708214.0	2320.13	0.01
1743.82	4456519.9	3708226.4	1743.72	-0.00
1167.25	2978568.7	3708266.4	1167.04	-0.01
590.76	1500071.0	3708179.4	590.63	-0.00
14.68	21799.7	3707665.6	14.79	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (counts)	INSTRUMENT OUTPUT (counts)
32.50	3566480.20	26043.80
29.00	3616255.40	25075.99
23.99	3687655.80	24026.04
18.50	3766586.60	23352.29
15.00	3817091.00	23218.03
4.50	3969772.80	24179.02
1.00	4019846.40	25003.90

TEMPERATURE (°C)	SPAN (mV)
-4.32	104.28
37.76	103.99

y = thermistor output (counts)

$t = PTHA0 + PTHA1 * y + PTHA2 * y^2$

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

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

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

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