SEA-BIRD SCIENTIFIC

SBE Sea-Bird Electronics

Sea-Bird Electronics
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98005 USA

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SBE41-CP ALACE

Instrument Configuration

Instrument Serial Number:	41-8687
Instrument Firmware Version:	V 7.2.5
Zero Conductivity Frequency:	2720.16
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	Druck	10173199	2000m(2000 dBar)

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SENSOR SERIAL NUMBER: 8687
CALIBRATION DATE: 31-Jul-16

SBE 41 TEMPERATURE CALIBRATION DATA
ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

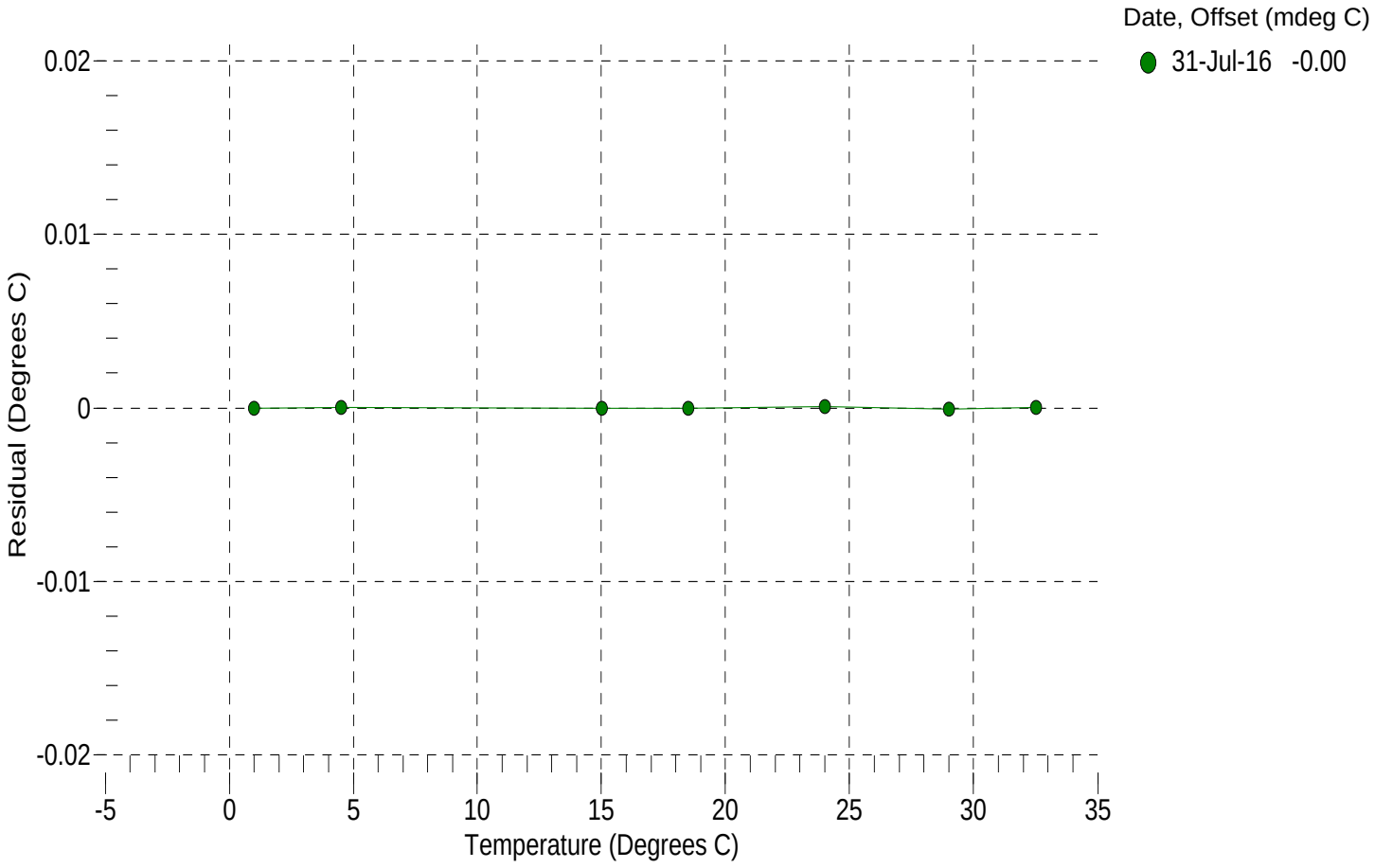
```
a0 = -8.609601e-004
a1 =  2.973702e-004
a2 = -4.084040e-006
a3 =  1.569618e-007
```

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	15099561.7	1.0000	-0.0000
4.5000	12888642.8	4.5000	0.0000
15.0000	8174554.3	15.0000	-0.0000
18.5000	7067378.2	18.5000	-0.0000
23.9940	5657564.5	23.9941	0.0001
29.0000	4647734.8	28.9999	-0.0001
32.5000	4064285.1	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



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SENSOR SERIAL NUMBER: 8687
CALIBRATION DATE: 31-Jul-16

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

COEFFICIENTS:

```
g = -1.006129e+000
h =  1.365544e-001
i = -3.239519e-004
j =  4.151111e-005

CPcor = -9.5700e-008
CTcor =  3.2500e-006
WBOTC = -1.3478e-006
```

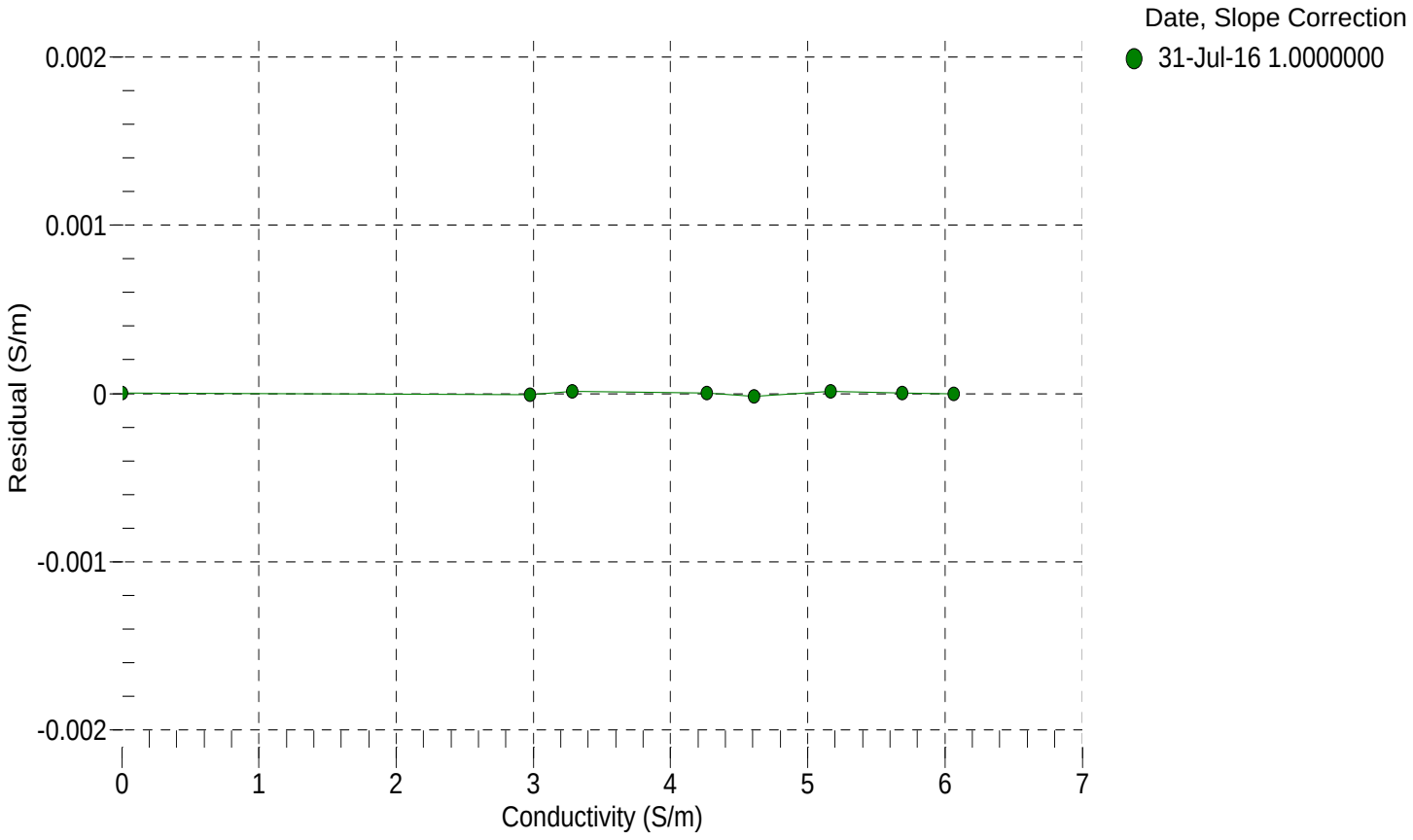
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2720.16	0.00000	0.00000
1.0000	34.8159	2.97593	5410.76	2.97593	-0.00001
4.5000	34.7964	3.28303	5615.01	3.28304	0.00001
15.0000	34.7547	4.26486	6222.38	4.26486	0.00000
18.5000	34.7460	4.61005	6421.99	4.61003	-0.00002
23.9940	34.7366	5.16746	6731.54	5.16747	0.00001
29.0000	34.7315	5.68999	7008.95	5.68999	0.00000
32.5000	34.7279	6.06232	7199.88	6.06231	-0.00000

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



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SENSOR SERIAL NUMBER: 8687
CALIBRATION DATE: 29-Jul-16

SBE 41 PRESSURE CALIBRATION DATA
2900 psia S/N 10173199

COEFFICIENTS:

PA0 =	4.065309e-001	PTCA0 =	6.902344e+003
PA1 =	3.929651e-004	PTCA1 =	5.356709e+001
PA2 =	-3.138668e-013	PTCA2 =	-3.518171e-001
PTHA0 =	3.055490e+002	PTCB0 =	2.516563e+001
PTHA1 =	-6.025287e-005	PTCB1 =	3.250000e-004
PTHA2 =	-1.358444e-012	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (counts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)
14.61	44197.8	4281086.2	14.65	0.00
591.04	1513481.7	4279551.8	591.15	0.00
1167.38	2985710.1	4278493.8	1167.44	0.00
1743.61	4461414.6	4277546.0	1743.72	0.00
2319.85	5940343.5	4276476.8	2319.90	0.00
2896.11	7422751.0	4275552.6	2896.05	-0.00
2319.84	5940260.9	4275723.4	2319.86	0.00
1743.59	4461116.3	4275841.6	1743.60	0.00
1167.35	2985098.2	4275919.2	1167.19	-0.01
590.91	1512362.0	4276092.8	590.70	-0.01
14.60	44179.4	4275719.0	14.64	0.00

THERMAL CORRECTION

TEMP (°C)	THERMISTOR OUTPUT (counts)	INSTRUMENT OUTPUT (counts)
32.50	4144458.40	46291.70
29.00	4193370.40	46244.94
23.99	4263120.00	46090.62
18.50	4339506.00	45823.40
15.00	4388050.60	45627.93
4.50	4533136.80	45218.80
1.00	4581308.60	45005.60

TEMPERATURE (°C)	SPAN (mV)
-5.00	25.16
35.00	25.18

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