



**SEA-BIRD**  
SCIENTIFIC

# Product Documentation

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## SBE49 FastCAT CTD Sensor

### Instrument Configuration

Instrument Serial Number: 49-0636  
Instrument Firmware Version: 7.2.5  
Zero Conductivity Frequency: 2675.60  
Communications Format: RS232  
Communications Settings: 9600 baud, 8 Data Bits, No Parity

### Installed Devices/Sensors

<i>Data Format</i>	<i>Measurement</i>	<i>Sensor Type</i>	<i>Serial Number</i>	<i>Rating</i>
Count	Temperature	Internal	N/A	N/A
Frequency	Conductivity	Internal	N/A	N/A
Count	Pressure Sensor	Druck	12351123	350m(350 dBar)

Maximum Depth: **350m**

**CAUTION - The maximum deployment depth will be limited by the measurement range of the pressure sensor, if installed, an attached sensor, if installed, or the housing.**



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SENSOR SERIAL NUMBER: 0636  
 CALIBRATION DATE: 18-Aug-22

SBE 49 TEMPERATURE CALIBRATION DATA  
 ITS-90 TEMPERATURE SCALE

COEFFICIENTS:

a0 = 7.666762e-004  
 a1 = 2.954770e-004  
 a2 = -3.524944e-006  
 a3 = 2.464263e-007

BATH TEMP (° C)	INSTRUMENT OUTPUT (counts)	INST TEMP (° C)	RESIDUAL (° C)
1.0000	784947.305	1.0000	0.0000
4.4999	698346.373	4.4998	-0.0001
15.0000	476027.407	15.0000	0.0000
18.5000	414438.746	18.5000	0.0000
24.0000	329457.237	24.0001	0.0001
29.0000	263673.576	28.9998	-0.0002
32.5000	223454.525	32.5001	0.0001

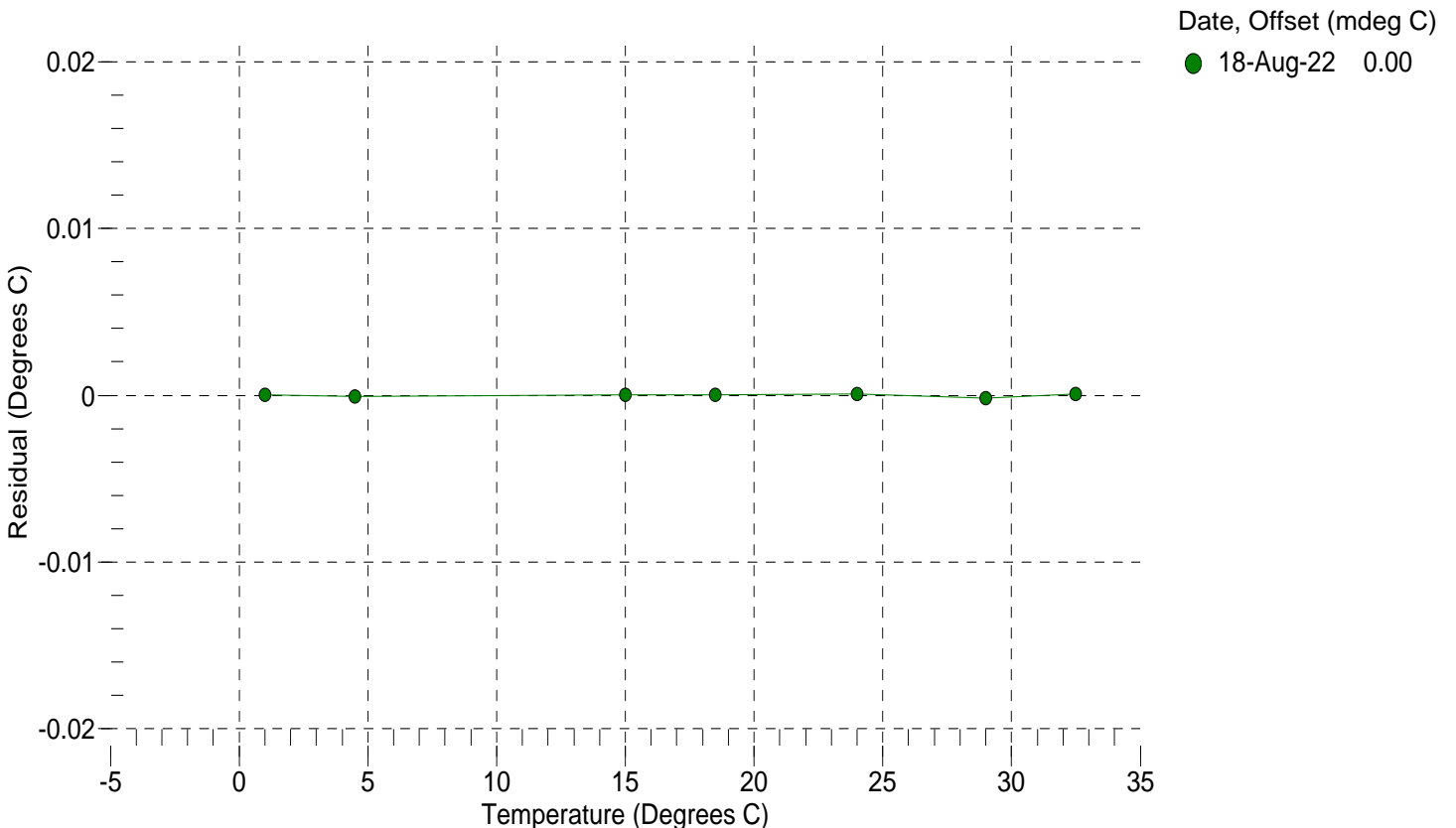
n = Instrument Output (counts)

$$MV = (n - 524288) / 1.6e+007$$

$$R = (MV * 2.295e+010 + 9.216e+008) / (6.144e+004 - MV * 5.3e+005)$$

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

$$\text{Residual (°C)} = \text{instrument temperature} - \text{bath temperature}$$





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SENSOR SERIAL NUMBER: 0636  
 CALIBRATION DATE: 18-Aug-22

SBE 49 CONDUCTIVITY CALIBRATION DATA  
 PSS 1978: C(35,15,0) = 4.2914 Siemens/meter

COEFFICIENTS:

g = -1.012674e+000      CPcor = -9.5700e-008  
 h = 1.421709e-001      CTcor = 3.2500e-006  
 i = -4.104132e-004  
 j = 5.374977e-005

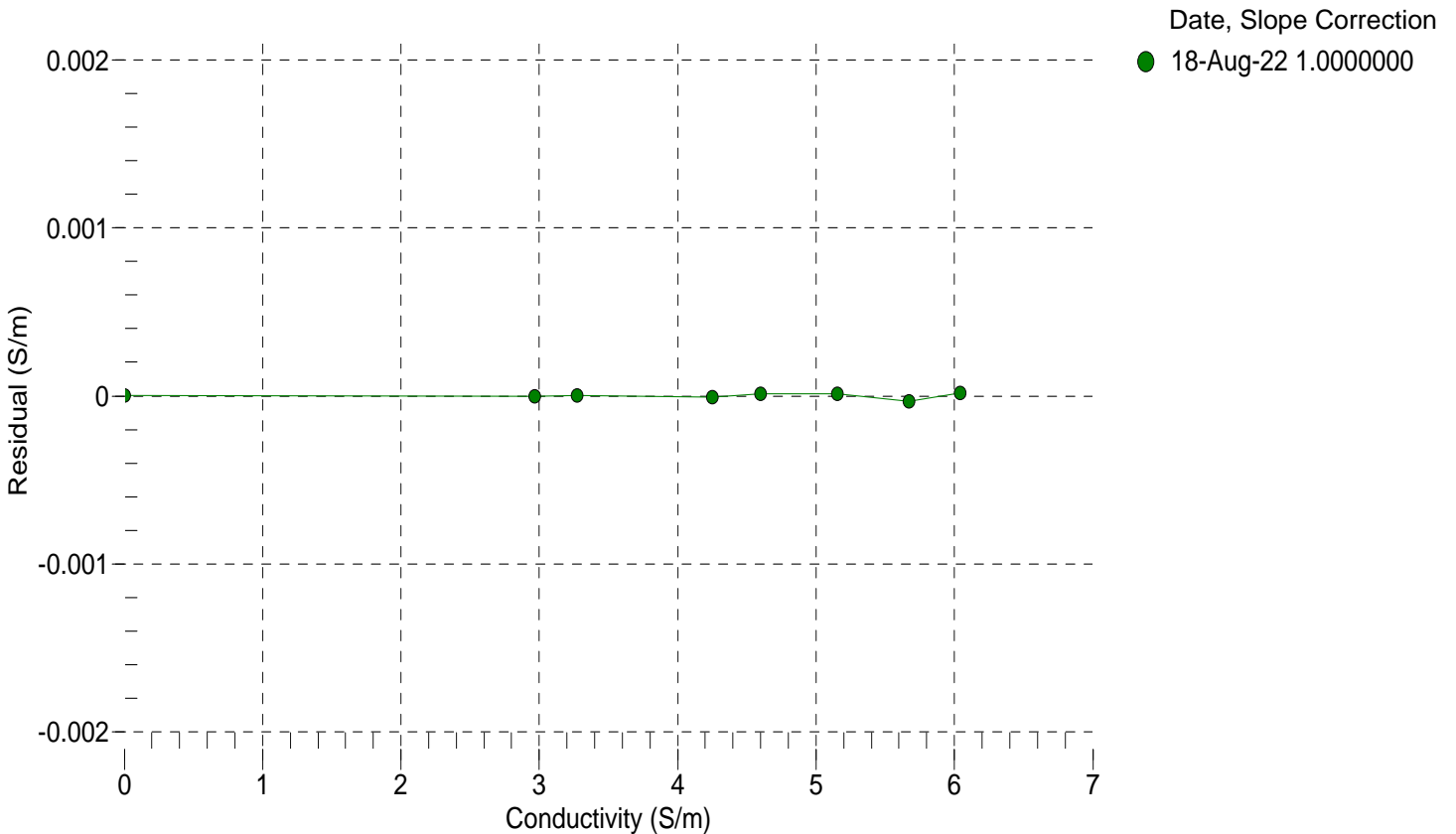
BATH TEMP (° C)	BATH SAL (PSU)	BATH COND (S/m)	INSTRUMENT OUTPUT (Hz)	INSTRUMENT COND (S/m)	RESIDUAL (S/m)
22.0000	0.0000	0.00000	2675.60	0.0000	0.00000
1.0000	34.7037	2.96726	5303.35	2.9673	-0.00000
4.4999	34.6833	3.27340	5502.91	3.2734	0.00000
15.0000	34.6406	4.25233	6096.41	4.2523	-0.00001
18.5000	34.6309	4.59642	6291.40	4.5964	0.00001
24.0000	34.6194	5.15256	6594.00	5.1526	0.00001
29.0000	34.6111	5.67248	6864.39	5.6724	-0.00003
32.5000	34.6019	6.04282	7050.46	6.0428	0.00002

f = Instrument Output (Hz) / 1000.0

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

Conductivity (S/m) = (g + h \* f<sup>2</sup> + i \* f<sup>3</sup> + j \* f<sup>4</sup>) / (1 + δ \* t + ε \* p)

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





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SENSOR SERIAL NUMBER: 0636  
 CALIBRATION DATE: 15-Aug-22

SBE 49 PRESSURE CALIBRATION DATA  
 508 psia S/N 12351123

COEFFICIENTS:

PA0 =	-3.381952e-002	PTCA0 =	5.231707e+005
PA1 =	1.542184e-003	PTCA1 =	1.392728e-001
PA2 =	4.794478e-012	PTCA2 =	-5.718698e-002
PTEMPA0 =	-6.286549e+001	PTCB0 =	2.502575e+001
PTEMPA1 =	5.383540e+001	PTCB1 =	-4.500000e-004
PTEMPA2 =	-1.075556e+000	PTCB2 =	0.000000e+000

PRESSURE SPAN CALIBRATION

THERMAL CORRECTION

PRESSURE (PSIA)	INSTRUMENT OUTPUT (counts)	THERMISTOR OUTPUT (volts)	COMPUTED PRESSURE (PSIA)	RESIDUAL (%FSR)	TEMP (°C)	THERMISTOR OUTPUT (volts)	INSTRUMENT OUTPUT (counts)
14.53	532570.0	1.7	14.51	-0.00	32.50	1.84	533222.85
104.67	591018.0	1.7	104.71	0.01	29.00	1.77	533234.64
204.72	655767.0	1.7	204.68	-0.01	24.00	1.67	533249.14
304.68	720500.0	1.7	304.65	-0.00	18.50	1.56	533261.57
404.64	785209.0	1.7	404.63	-0.00	15.00	1.49	533267.99
504.61	849889.0	1.7	504.61	-0.00	4.50	1.28	533278.32
404.69	785259.0	1.7	404.71	0.00	1.00	1.22	533278.68
304.74	720564.0	1.7	304.75	0.00			
204.77	655836.0	1.7	204.78	0.00			
104.80	591079.0	1.7	104.81	0.00			
14.52	532565.0	1.7	14.51	-0.00			

	TEMPERATURE (°C)	SPAN
	-5.00	25.03
	35.00	25.01

y = thermistor output (counts)

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

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

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

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

$$\text{Residual (\%FSR)} = (\text{computed pressure} - \text{true pressure}) * 100 / \text{Full Scale Range}$$

Date, Offset (%FSR)

● 15-Aug-22 0.00

