

# MINI STD/CTD Calibration Certificate

Certificate no: **4062**

Instrument model: **SD208**

Serial number: **1366**

Owner: **ECOSISTEMA**

Calibrated date: **2017-08-30** Certificate issued date: **2017-08-30** Env. temp (degr. C): **19**

Calibrated by: **Sensordata a.s and SAIV A/S** Bergen Norway

## Calibration procedure:

Conductivity and temperature are calibrated by setting the MINI STD/CTD instrument in raw data mode and keeping it in three 200 l stirred, temperature stabilised calibration baths. Raw conductivity and temperature data are recorded with bath temperature and bath conductivity as measured by reference temperature\* and conductivity\*\* instruments. Calibration coefficients A1, B1, C1 for temperature and A3, B3, C3, D3 for conductivity are calculated from least square equations included in the MINISOFT software packet. Output temperature and conductivity from calibrated instrument must correspond with reference readings within  $\pm 3/1000$  degr. C and  $\pm 3/1000$  mmho/cm. Pressure is calibrated by connecting to a reference DWT\*\*\* and successively generate 6 pressures from 1 bar to FS. Pressure coefficients A2, B2, C2, D2 are calculated from least squares equations included in the instruments software. Output CTD data must correspond to data from reference instruments within specified accuracy.

TEMPERATURE degr. C			CONDUCTIVITY mmho/cm			PRESSURE dbar		
Bef. cal.	After cal.	Reference	Bef. cal.	After cal.	Reference	Bef. cal.	After cal.	Reference
	19.612	19.611		50.483	50.481		10.02	10.01
	12.162	12.162		34.382	34.381		100.12	100.13
	0.413	0.411		9.473	9.472		200.26	200.26
							300.39	300.39
							400.53	400.52
							500.66	500.65

All calibration coefficients are shown on attached calibration sheet

## Working references:

Temperature\* Falmouth Scientific Model OTM S-112 S/N 1377-09JUL96 Accuracy  $\pm 2/1000$  deg.C  
 Conductivity\*\* Falmouth Scientific Model OCM S-112 S/N 1354-09JUL96 Accuracy  $\pm 2/1000$  mmho/cm  
 Pressure\*\*\* Budenberg DWT Model 280L S/N 9050 Accuracy 0.008% FS (600 bar)

## Traceable references:

### Temperature:

#### Subreference 1:

General Oceanics ATB 1250 temp. bridge serial no 1235  
 (Working ref. is controlled by subref.1 four times per year)  
 (Subref.1 is controlled by subref.2 twice per year)

#### Subreference 2:

Distilled water tripple point cell at  $+0.010$  degr.C  
 Phenoxybenzene tripple point cell at  $+26.868$  degr.C

### Conductivity:

#### Subreference 1:

Neil Brown Cond./Temp. transfer standard mod. CT-2 serial no.3  
 (Working reference is controlled by subref.1 four times per year)  
 (Subref.1 is controlled by subref.2 four times per year)  
 (Subref.2 is controlled by subref.3 four times per year)

#### Subreference 2:

Guildline Portasal 8410 Portable Salinometer serial no.59

#### Subreference 3:

Ocean Scientific International Standard Seawater

### Pressure:

#### Subreference:

Pressure reference at FIMAS Coastal Base Calibration Center

Control frequency Calibration equipment: Once per year

Calibrated by

Signature

**STEINAR IVERSEN**  
 .....  
**S. Iversen**  
 .....

Date 17-08-30  
Time 13-59-41 GMT  
CALIBRATION SHEET SD208 Serial no.1366

Temperature (T) Deg.C:  
A1+1.4970465122E-03 B1+2.5853497433E-04  
C1+2.5120801290E-07

Pressure (P) decibar:  
A2-2.9028669286E-01 B2+1.2048979125E-04  
C2+9.2669205535E-12 D2-2.3472656152E-17  
E2+3.1855208655E-23 F2-2.2134449438E-29  
G2+6.1889925399E-36

Conductivity (C) mmho/cm:  
A3-2.7725646888E-01 B3+1.1946057330E-03  
C3+0.0000000000E+00 D3+0.0000000000E+00

Turbidity (0-62.5 FTU)  
AT-7.1622707765E-12 BT+2.5000000000E-02  
CT+6.9388939039E-18 DT-1.6940658945E-21

Turbidity (0-62.5 FTU)  
AT-7.1622707765E-12 BT+2.5000000000E-02  
CT+6.9388939039E-18 DT-1.6940658945E-21

Oxygen (OX) in per cent:  
V 35.9750274933078

Pressure sensor mathem.comp.coeff.  
K0-7.8767259777E+01 K1+2.04152251451E-01  
K2-1.95463150690E-04 K3+6.24851204406E-08  
L0+1.18119862727E+01 L1-3.22778233718E-02  
L2+3.06369205588E-05 L3-9.68924407506E-09  
M0-6.51443641251E-01 M1+1.84738044348E-03  
M2-1.74361319916E-06 M3+5.47727357521E-10  
N0+1.71010251638E-02 N1-4.84839922172E-05  
N2+4.57498001986E-08 N3-1.43683116732E-11  
O0-2.30614671865E-04 O1+6.53673056047E-07  
O2-6.16687152592E-10 O3+1.93645593238E-13  
P0+1.53594018232E-06 P1-4.35309898724E-09  
P2+4.10638496170E-12 P3-1.28933629561E-15  
Q0-3.99128230209E-09 Q1+1.13115611711E-11  
Q2-1.06702310464E-14 Q3+3.35023681164E-18

X1-3.6194968922E-01 X2+1.0144672132E-04  
X3-3.0566853106E-12 X4+1.7934046594E-18  
S1+2.1116097646E+02 S2+1.7565041137E-04  
S3+2.7448521127E-08 S4-9.6451893104E-14  
S5+1.7939984766E-19 S6-1.6846008494E-25  
S7+6.2694173170E-32 Y4+1.3779275607E-01  
Y5+2.3760057331E-03 Y6+3.6897966138E-12  
Y7+1.6981325708E-18 PC+2.2000000000E-02

## ***SERVICE REPORT***

***No: 060917-03***

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**Instrument:** *SD208*

**Ser. No** *1073 (500m)*

**Date received:** *22.08.2017*

**Customer :** *Ecosistema Ltd  
Buin 367  
Puerto Montt  
Chile*

**Ref:**

*Christian Salomon, Tel: 65 271 42 78/ 99194270*

**Reported :** *"Probe failed"*

**Remarks:** *CTD, SN1073 "stuck" and coefficients were messed up – result of open the battery lid without following the procedure for change of battery (chapter 8 in Operating Manual). After reset of the coefficients the unit worked ok and was put on a 3 day- test with extreme temperature ( high and low). After 24 hours the unit failed on extreme temperature and the conclusion is that there is a component failure. SN1073 will be replaced by a new unit SN1366 - WARRANTY*

**Service**      - *Checked all functions (OK)*  
                    - *Calibration (Calibration Certificate No: 4062)*

**Returned :** *06.09.2017*

**sign.**

*Monica S. Kolding*  
**Monica S. Kolding**