AANDERAA
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PRESSURE CERTIFICATE

Product: Oxygen Optode 4831IW
Serial No: 1176
Date: 05.06.2024

Certificate No: 2268212601176

This is to certify that this product has been pressure tested with the following instrument, and we confirm that no irregularities were found during the test:

Autoklav 800 bar – sn: 0210005

Pressure readings:

Pressure (Bar)	Pressure time (hour)
300	1

Date: 05 Jun 2024

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer

Program Version: V5.3.1

Product: Oxygen Optode 4831IW
Serial No: 1176

Visual and Mechanical Checks:
- 1.1 Soldering quality
- 1.2 Visual surface
- 1.3 Galvanic isolation between housing and electronics

Current Drain and Voltages:

2.1	Average current drain at 0.5 Hz sampling (Max.: 33 mA)	24.9	mA
2.2	CANBus Current drain at 0.5 Hz sampling (Max.: 33 mA)		mA
2.3	Current drain in sleep (Max.: 270 μA)	215	μA
2.4	CANBus Current drain in sleep (Max.: 180 μA)		μA
2.5	DSP IO voltage, J4.18 (3.3 ±0.15V)	3.30	V
2.6	DSP Core voltage, J4.17(1.8 ±0.05 V)	1.83	V
2.7	Excitation driver voltage, C4 Analog Board (4.3 ±0.1 V)	4.30	V

Performance test:

		Channel:	Blue		Red	
3.1	Average of Receiver readings (0±150mV)		-9.9	mV	-7.2	mV
3.2	Standard Deviation of Receiver readings (Max.: 45mV/10mV)		1.02	mV	0.45	mV
3.3	Amplitude measurement with non-fluorescence foil (<60mV/650-1200mV)		15.5	mV	811.6	mV
3.4	CANBus Output test					

Function test from 0 to 40°C:

		Channel:	Blue		Red	
4.1	Minimum amplitude measurement (Blue: >550 mV, Red >550 mV)		689.6	mV	640.4	mV
4.2	Maximum amplitude measurement (Blue: <1600 mV, Red <1400 mV)		1080.3	mV	921.1	mV
4.3	Minimum phase measurement (Blue: >32°, Red: >3°)		35.24	°	8.54	°
4.4	Maximum phase measurement (Blue: <45°, Red: <10°)		42.1	°	9.27	°
4.5	Maximum standard deviation of Phase measurement: (< 0.07°)		0.05	°	0.03	°
4.6	Minimum temperature raw data measurement: (<-200 mV)				-504.5	mV
4.7	Maximum temperature raw data measurement: (>450 mV)				703.8	mV

Date: 05 Jun 2024

Sign:
Laila A. Skålnes

Laila Skålnes, Production Engineer
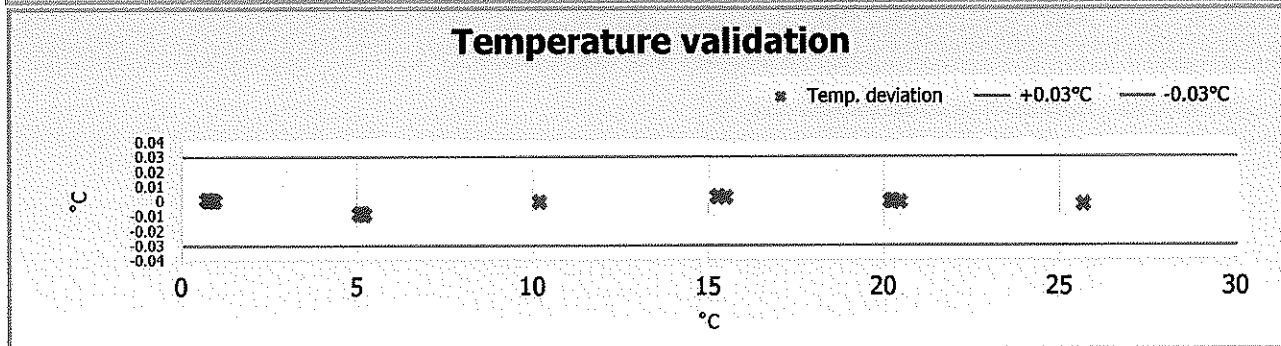
CALIBRATION CERTIFICATE

Form No 830, March 2021

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Certificate no: 4831_1176_00226697
Foil batch no: 2310M

Product: 4831
Calibration date: 30.05.2024

Serial no: 1176
Page 1 of 2

Index	Temperature reference(°C)	[O2] Reference(µM)	Temperature raw data(mV)	Phase reading(°)
0	30.440	1.64	-196.280	59.56
1	20.280	0.66	129.047	60.65
2	10.184	0.38	460.647	61.42
3	0.846	0.30	750.627	62.05
4	0.880	20.83	749.613	59.18
5	0.990	38.87	746.347	56.97
6	1.046	59.92	744.700	54.63
7	1.055	108.42	744.440	50.04
8	1.086	144.31	743.513	47.26
9	1.090	221.13	743.400	42.45
10	1.100	322.38	743.127	37.83
11	1.086	416.53	743.533	34.66
12	1.151	519.80	741.640	31.92
13	10.516	15.55	449.900	58.43
14	10.267	32.00	457.953	55.61
15	10.171	48.68	461.067	53.08
16	10.129	81.59	462.400	48.86
17	10.124	119.31	462.593	44.98
18	10.099	167.24	463.400	41.11
19	10.088	250.34	463.700	36.18
20	10.068	333.28	464.400	32.68
21	10.073	416.83	464.200	30.03
22	20.415	12.26	124.633	57.49
23	20.247	25.99	130.147	54.21
24	20.225	42.73	130.873	50.80
25	20.180	65.68	132.320	46.96
26	20.171	96.24	132.600	42.88
27	20.162	137.62	132.900	38.68
28	20.147	200.12	133.400	34.13
29	20.152	265.87	133.300	30.76
30	20.176	333.79	132.460	28.20
31	30.466	10.05	-197.053	56.52
32	30.485	21.41	-197.640	52.85
33	30.497	34.04	-198.027	49.47
34	30.520	56.20	-198.740	44.72
35	30.539	78.28	-199.300	41.05
36	30.553	112.19	-199.760	36.79
37	30.573	166.61	-200.367	32.06
38	30.578	218.67	-200.500	28.97
39	30.559	276.06	-199.920	26.50

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Certificate no: 4831_1176_00226697	Product: 4831	Serial no: 1176
Foil batch no: 2310M	Calibration date: 30.05.2024	Page 2 of 2

Giving these coefficients

Index	0	1	2	3	4	5	6
SVUFoilCoef	2.77554E-03	1.18349E-04	2.21336E-06	2.13649E02	-2.53842E-01	-4.45627E01	4.26918E00
TempCoef	2.42305E01	-3.09123E-02	2.86184E-06	-4.23930E-09	0.00000E00	0.00000E00	

Oxygen validation — O_2 deviation, +2μM/+1.5%, -2μM/-1.5%

Temperature validation — Temp. deviation, +0.03°C, -0.03°C
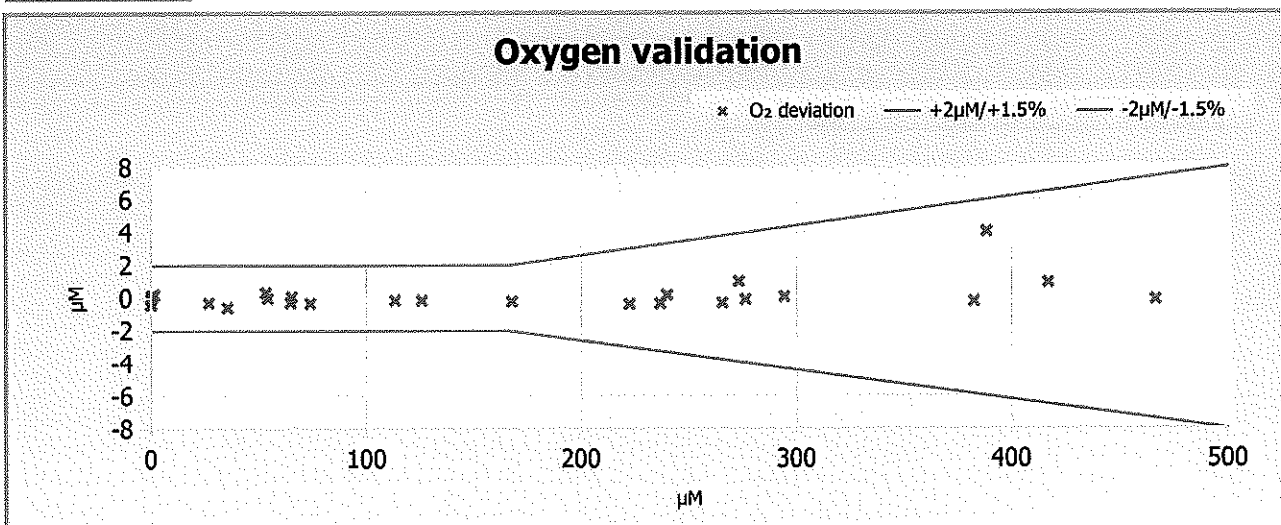
With following settings

Index	0	1	2	3
PhaseCoef	-1.60800E00	1.00000E00	0.00000E00	0.00000E00

Index	0 (Offset)	1 (Slope)
ConcCoef	0.00000E00	1.00000E00
Salinity	0.00	
Firmware Version	5.3.1	

Date:30.05.2024

Tor-Ove Kvalvaag

Tor-Ove Kvalvaag, Calibration Engineer

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unit N/A
optode 4831 Configuration
serial# 1176

02/11/2025      adam.ritterbush@teledyne.com


622.71  63.2    219.435 99.052  22.286  28.147  29.755  38.428  8.674   565.1
622.61  63.2    219.477 99.073  22.287  28.144  29.752  38.428  8.676   565.0
Product Name    4831    1176    Oxygen Optode
Product Number  4831    1176    4831
Serial Number   4831    1176    1176
SW ID   4831    1176    1940031
SW Version      4831    1176    5       3       1
HW ID 1 4831    1176
HW Version 1    4831    1176
HW ID 2 4831    1176
HW Version 2    4831    1176
HW ID 3 4831    1176
HW Version 3    4831    1176
System Control  4831    1176    0       0       0
Production Date 4831    1176
Last Service    4831    1176
Last Calibration        4831    1176
Calibration Interval[Days]      4831    1176    0
Node Description        4831    1176    Oxygen Optode #1176
Owner   4831    1176
Baudrate        4831    1176    9600
Flow Control    4831    1176    Xon/Xoff
Enable Comm Indicator   4831    1176    Yes
Comm Timeout    4831    1176    1 min
Salinity[PSU]   4831    1176    35.00
-4.239299E-09   0.000000E+00    0.000000E+00    -3.091232E-02   2.861841E-06
0.000000E+00    4831    1176    0.000000E+00    0.000000E+00    0.000000E+00
0.000000E+00    4831    1176    1.000000E+00    0.000000E+00    0.000000E+00
0.000000E+00    4831    1176    -1.608000E+00   1.000000E+00    0.000000E+00
FoilID  4831    1176    2310M
-4.449771E-06   8.465012E-07    -3.143506E+02   2.051116E+006   -2.987026E-03
0.000000E+001   0.000000E+00    0.000000E+004   0.000000E+00    0.000000E+001
0oilPoly0egT    3831    4176    5       0       0       0       0       0
0oilPoly0egO    0831    0176    0       0       0       0       0       0
2.136493E+02    -2.538421E-01   -4.456272E+01   4.269177E+00    2.213362E-06
ConcCoef        4831    1176    0.000000E+00    1.000000E+00
NomAirPress[hPa]        4831    1176    1013.25
NomAirMix       4831    1176    0.20946
CalDataSat[Deg] 4831    1176    0.00    0.00
CalDataAPress[hPa]      4831    1176    1013.250
CalDataZero[Deg]        4831    1176    0.000   0.000
Enable RedReference     4831    1176    Yes
RedReference Interval   4831    1176    1
Mode    4831    1176    Smart Sensor Terminal
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Enable Sleep      4831      1176      No
Enable Polled Mode          4831      1176      No
Enable Text      4831      1176      No
Enable Decimalformat        4831      1176      Yes
Analog TempLimit[Deg.C] 4831  1176      -5.00      35.00
Analog ConcLimit[uM]        4831      1176      0.00      800.00
Analog SatLimit[%]          4831      1176      0.00      200.00
Analog PhaseLimit[Deg.] 4831  1176      10.00      70.00
Analog Output      4831      1176      O2Concentration
Analog1 Coef       4831      1176      0.000000E+00      1.000000E+00
Analog2 Coef       4831      1176      0.000000E+00      1.000000E+00
Enable AirSaturation        4831      1176      Yes
Enable O2Content            4831      1176      No
Enable Rawdata   4831      1176      Yes
Enable Temperature          4831      1176      Yes
Enable HumidityComp         4831      1176      Yes
Enable SVUformula           4831      117⌷6      Yes
Enable Burn-In Mode         4831      1176      No
Interval[s]      4831      1176      2.000
Location          4831      1176
Geographic Position         4831      1176      60.323605,5.37225⌷
Vertical⌷ Position         4831      1176
Reference        4831      1176
#
623.6    63.1    219.582 99.126    22.290    28.138    29.746⌷ 38.427    8.681    564.8
621.5    63.0    219.571 99.123    22.292    28.138    29.746    38.420    8.⌷674    565.2
```