



Since oxygen is involved in most of the biological and chemical processes in aquatic environments, it is a crucial parameter to measure. Oxygen can also be used as a tracer in oceanographic studies. Aanderaa revolutionized oceanographic oxygen monitoring/research with the introduction of oxygen optodes in 2002. Applications range from shallow creeks to the deepest trenches, from tropical to in-ice/in-sediment measurements. More than 150 scientific papers have so far been published using these optodes.

These sensors are based on the ability of selected substances to act as dynamic fluorescence quenchers. The fluorescent indicator is a special platinum porphyrin complex embedded in a gas permeable foil that is exposed to the surrounding water. This sensing foil is attached to a glass window providing optical access to the measuring system from inside a watertight housing. The sensing foil is excited by modulated blue light; the sensor measures the phase of the returned red light. For improved stability the optode also performs a reference

Oxygen Optode 4835

is a compact fully integrated sensor for measuring the O_2 -concentration and temperature in shallow water.

Advantages:

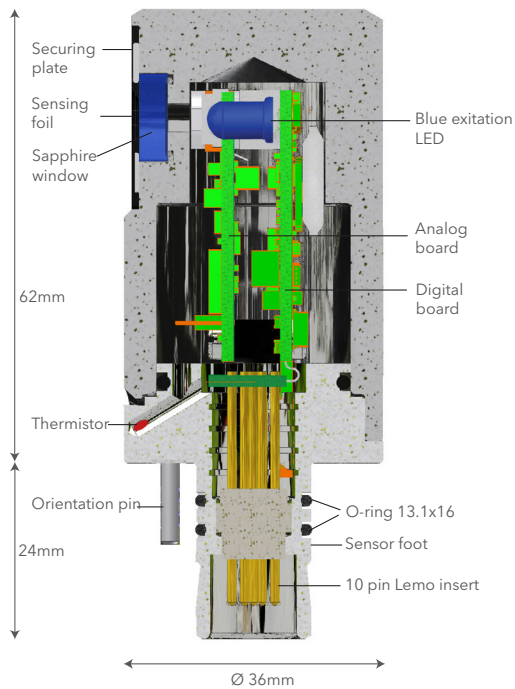
- Optical lifetime-based luminescence quenching measurement principle
- Long time stability with red reference LED
- Low maintenance needs
- Not stirring sensitive (it consumes no oxygen)
- User friendly
- Use with Aanderaa SeaGuard and SmartGuard Platform
- Automatically detected and recognized
- Use as stand-alone sensor
- Output format: CANbus AiCaP, RS232
- Operating range: 0-300 meters

phase reading by use of a red LED that do not produce fluorescence in the foil. The sensor has an incorporated temperature thermistor which enables linearization and temperature compensation of the phase measurements to provide the absolute O_2 -concentration. The lifetime-based luminescence quenching principle offers the following advantages over electro-chemical sensors:

- Less affected by fouling
- Measures absolute oxygen concentration without repeated calibrations
- Excellent long-term stability
- Less affected by pressure
- Pressure behaviour is predictable
- Faster response time

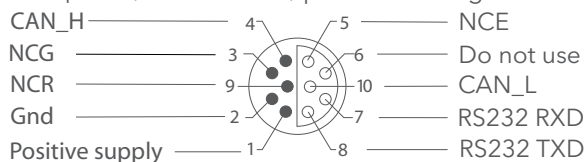
The oxygen optode outputs data in AiCaP CANbus and RS-232. The sensor can present the O_2 concentration in μM , the air saturation in % and the temperature in $^{\circ}C$.

The SeaGuard/SmartGuard datalogger and the Smart Sensor are interfaced by means of a reliable CANbus interface (AiCaP), using XML for plug and play capabilities.



PIN CONFIGURATION

Receptacle, exterior view; pin = • bushing = ◦



Cable from sensor to:	Cable
PC with waterproof SP, RS-232	4865
Seaguard as sixth sensor on top-end plate	4999
Seaguard with waterproof top end plate connection	4793
SmartGuard single sensor with SP	5236
User furnished data logger, CSP to free end	4762

Misleading specifications

When Aanderaa states an absolute accuracy of e.g. ($\pm 5\%$ or $\pm 8 \mu\text{M}$) we mean the accuracy of the sensor in the field over the entire range of oxygen concentrations and temperatures, others might refer to accuracy in the laboratory just after the sensor was calibrated. When Aanderaa give response time in water others refer to response time in air which is much faster. For more information read our Best Practice document on Oxygen Optodes.



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Oxygen:	O ₂ -Concentration Air Saturation
Calibration method:	2-point calibration with fully Winkler calibrated optodes for referencing
Foil:	Stable and rugged WTW foil
Measurement Range:	0 - 1000 μM ¹⁾ 0 - 300%
Calibration Range ²⁾ :	0 - 500 μM 0 - 150%
Resolution:	<0.1 μM 0.05 %
Accuracy:	<8 μM ³⁾ or 5% <5 % ⁴⁾ whichever is greater
Response Time (63%):	<30 sec
Temperature:	
Range:	-5 to +40°C (23 - 104°F)
Resolution:	0.01°C (0.018°F)
Accuracy:	$\pm 0.1^\circ\text{C}$ (0.18°F) ⁵⁾
Response Time (63%):	<10 sec
Output format:	AiCaP CANbus, RS-232
Output parameters:	O ₂ -Concentration in μM , Air Saturation in %, Temperature in °C, Oxygen raw data and Temperature raw data
Sampling interval:	2 sec - 255 min
Supply voltage:	5 to 14Vdc
Current drain:	
Average:	0.16 +48mA/S where S is sampling interval in seconds
Maximum:	100mA
Quiescent:	0.16mA
Operating depth:	0 - 300m (0 - 984.3ft)
Elec. connection:	10-pin receptacle mating plug SP
Dimensions (WxDxH):	Ø36 x 86mm (Ø1.4"x 3.4")
Weight:	118g (4.16oz)
Materials:	Titanium, Hostaform (POM)
Accessories:	Foil Service Kit 5551
(not included):	AiCap extension cable with SP 4793 SP to free end cable 4762 SP to PC cable 4865 Set-up and config Cable 3855 ⁶⁾ /3855A ⁶⁾

- ¹⁾ O₂ concentration in μM = $\mu\text{mol/l}$. To obtain mg/l, divide by 31.25
- ²⁾ other ranges available on request
- ³⁾ requires salinity compensation for salinity variation > 1 mS/cm, and pressure compensation for pressure > 100 meter
- ⁴⁾ within calibrated range 0 - 120% / 0 - 30°C
- ⁵⁾ within calibrated range 0 - 36°C
- ⁶⁾ only for laboratory use

Specifications subject to change without prior notice.



SP Sealing Plug



Foil Service Kit 5551

Aanderaa Data Instruments AS
 Sanddalsringen 5b, P.O. Box 103 Midtun,
 5843 Bergen, Norway
 Tel +47 55 60 48 00
 Fax +47 55 60 48 01