Oxygen Optode 4835

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

Advantages:
- Optical measurement principle
- Lifetime-based luminescence quenching principle
- Long time stability
- More than one year without recalibration
- Low maintenance needs
- User friendly
- Use with Aanderaa SmartGuard/SeaGuard
- Automatically detected and recognized
- Use as stand-alone sensor
- Output format: CANbus AiCaP, RS232
- Operating range: 0-300 meters

Since oxygen is involved in most of the biological and chemical processes in aquatic environments, it is one of the most important parameters needed to be measured. Oxygen can also be used as a tracer in oceanographic studies.

For environmental reasons it is critical to monitor oxygen in areas where the supply of oxygen is limited compared to demand, e.g.

- In shallow coastal areas with significant algae blooms
- In fjords or other areas with limited exchange of water
- Around fish farms
- Areas of interest for dumping of mine or dredging waste

The Aanderaa oxygen optodes 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. A black optical isolation coating protects the complex from sunlight and fluorescent particles in the water. This sensing foil is attached to a sapphire window providing optical access for the measuring system from inside a watertight housing.

The lifetime-based luminescence quenching principle offers the following advantages over electro-chemical sensors:

- Not stirring sensitive (it consumes no oxygen)
- Less affected by fouling
- Measures absolute oxygen concentrations without repeated calibrations
- Better 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 °C.

The SmartGuard and SeaGuard data logger and the smart sensor are interfaced by means of a reliable CANbus interface (AiCaP), using XML for plug and play capabilities.
Securing plate
Sapphire window
Thermistor
Orientation pin
Blue excitation LED
Analog board
Digital board
O-ring 13.1x16
Sensor foot
10 pin Lemo insert

PIN CONFIGURATION
Receptacle, exterior view; pin = ● bushing = ○
CAN_H 4
NCG 3
NCR 9
Gnd 2
Positive supply 1
CAN_L 6
Do not use 8
RS232 RXD 7
RS232 TXD 5
NCE

Operating Principle
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 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 O₂ concentration.

<table>
<thead>
<tr>
<th>Cable from sensor to:</th>
<th>Cable</th>
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</thead>
<tbody>
<tr>
<td>PC with waterproof CSP, RS-232</td>
<td>4865</td>
</tr>
<tr>
<td>Seaguard as sixth sensor on top-end plate</td>
<td>4999</td>
</tr>
<tr>
<td>Seaguard with waterproof top end plate connection</td>
<td>4793</td>
</tr>
<tr>
<td>User furnished data logger, CSP to free end</td>
<td>4762</td>
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</tbody>
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