AANDERAA
a xylem brand

Oxygen Optode 4831/4831F

is a compact fully integrated sensor for measuring the O_2 concentration.
Fast Response Foil (4831F, refer overleaf)

Advantages:

- Optical measurement principle
- Lifetime-based luminescence quenching principle
- Long time stability
- More than one year without recalibration
- Low maintenance needs
- Small size and weight
- Stand-alone sensor
- Output format: RS232, 0-5V
- Three depth ranges maximum 6000 meter

Since oxygen is involved in most of the biological and chemical processes in aquatic environments, it is one of the most important parameters 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.

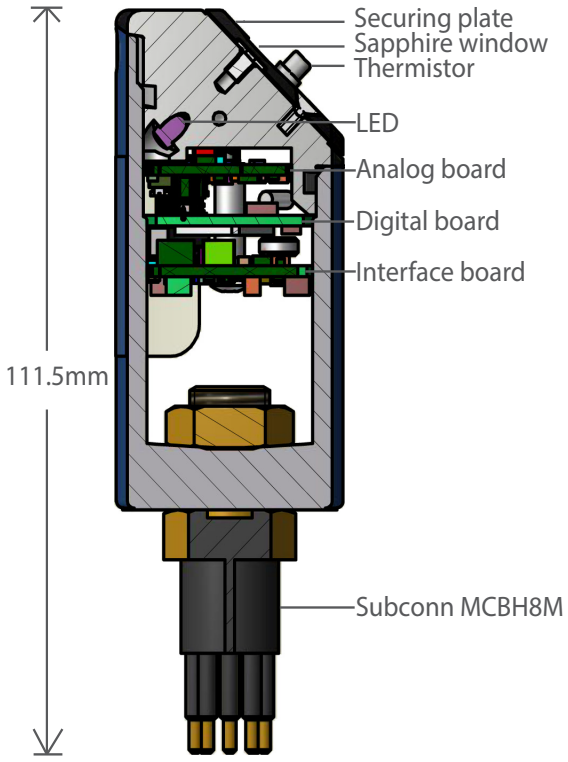
- In shallow coastal areas with significant algae blooms
- In fjords or other areas with limited exchange of water
- Around fish farms
- Areas of interest for dumping of mine or dredging waste

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. For the standard version 4831 a black optical isolation coating protects the complex from sunlight and fluorescent particles in the water. This sensing foil is mounted on a sapphire window providing optical sampling from inside a watertight housing.

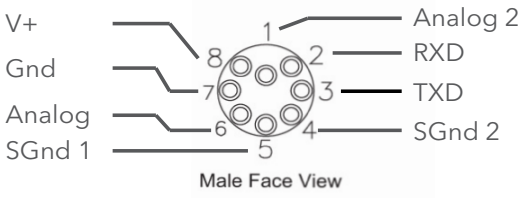
The lifetime-based luminescence quenching principle offers the following advantages over electro-chemical sensors:

- Not stirring sensitive (it consumes no oxygen)
- Less affected by fouling
- Measures absolute oxygen concentration without repeated calibrations
- Better long-term stability
- Less affected by pressure
- Pressure behaviour is predictable
- Faster response time

The oxygen optode outputs data in RS-232 and analog 0-5V. The sensor can present the O_2 concentration in µM, Air Saturation in % and Temperature in °C.



PIN CONFIGURATION SUBCONN MCBH8



Foil Service Kit 4733/4733O/4794. PSt$_3$

Oxygen:	O_2 Concentration	Air Saturation
Measurement Range:	0 – 500 µM[1]	0 - 150%
Resolution:	<1 µM	0.4 %
Accuracy:	<8 µM or 5%[2]	<5 %[3]
Multipoint Calibration:	<2.5 µM or 1.5%[2]	<1.5 %[3]
	(available for additional cost)	
Response Time (63%):	**4831F** (with fast response foil) <8 sec	
	4831 (with standard foil) <25 sec	
Temperature:		
Range:	-5 to +40°C (23 - 104˚F)	
Resolution:	0.01°C (0.018°F)	
Accuracy:	±0.03°C (0.18°F)[4]	
Response Time (63%):	<2 sec	
Output format:	RS-232, 0-5V	
Output Parameters:		
RS-232:	O_2 Concentration in µM, Air Saturation in %, Temperature in °C, Oxygen raw data and Temperature raw data	
Analog channel 1:	O_2 Concentration in µM, or Air Saturation in %,	
Analog channel 2:	Temperature in °C	
Sampling interval:	2 sec – 255 min	
Supply voltage:	5 to 14 Vdc	
Current drain:		
Average:	0.16 +48 mA/S where S is sampling interval in seconds	
Maximum:	100 mA	
Quiescent:	0.16 mA	
Operating depth:	**SW:** 0-300m (0 - 984ft)	
	IW: 0 – 3000m (0 – 9,845ft)	
	DW: 0 - 6000m (0 - 19,690ft)	
Elec. connection:	8 pin Subconn MCBH8M	
Dimensions (WxDxH):	Ø36 x 111.5mm (Ø1.4"x 4.4")	
Weight:	217g (7.65oz)	
Materials:	Epoxy coated Titanium, PA	
Accessories:	Foil Service Kit 4733/4733O (standard)/ 4794(fast)	

(1) O_2 concentration in µM = µmol/l. To obtain mg/l, divide by 31.25
(2) requires salinity compensation for salinity variations > 1mS/cm, and pressure compensation for pressure > 100meter
(3) within calibrated range 0 - 120% / 0 - 30°C
(4) within calibrated range 0 - 36°C for standard version and 0 - 30°C for multipoint version

Specifications subject to change without prior notice.

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 performes a reference phase reading by use of a red LED that does 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.

Sensing Foil Considerations

The standard sensing foil is protected by an optical isolation layer which makes the foil extra rugged and insensitive to direct sunlight. The fast response sensing foil is not equipped with this layer; ambient light intensity higher than 15000 lux may cause erroneous readings. To avoid potential bleaching the fast response foil should be protected from ambient light when storing the sensor. We recommend the standard foil in applications where fast response time is not needed.

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Let's Solve Water

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