



Optical **RDO® PRO-X** Dissolved Oxygen Probe

In-Situ® Inc.'s Rugged Dissolved Oxygen (RDO) PRO-X Probe uses breakthrough optical technology to measure dissolved oxygen (DO) in demanding environments. The RDO PRO-X Probe easily integrates into a variety of aquaculture management systems. By continuously monitoring and controlling DO levels, aquaculturists can improve feed conversion ratios, minimize fish stress, and reduce fish disease and mortality.

Minimizes Risks

- **Reports real-time conditions**—Fast response to oxygen and temperature changes.
- **Provides accurate results**—Remains stable over long-term deployments—not susceptible to drift for up to 12 months.
- **Withstands harsh conditions**—Abrasion-resistant foil resists fouling and damage from turbulent waters. Inert construction will not corrode in high salinity environments.

Maximizes Efficiency

- **Reduces calibration tasks**—Probe holds its calibration during long-term deployments. Sensor cap is pre-loaded with calibration coefficients, thus eliminating setup errors.
- **Minimizes maintenance**—Eliminates replacement of membranes and electrolyte solution. Insensitive to common interferences that degrade membrane-based sensors.

Saves Money

- **Reduces energy expenses**—Probe uses minimal power. Allows more efficient operation of aerators or pumps.
- **Reduces labor costs**—Compared to traditional galvanic or polarographic sensors, the RDO PRO-X Probe requires infrequent calibration and minimal maintenance.
- **Simplifies integration**—Integrates directly into SCADA and PLC systems. Includes integral Modbus/RS485, 4-20 mA, and SDI-12 signal outputs. Requires 8 to 36 VDC. For a local process controller and display, use the In-Situ Con TROLL® PRO System.
- **Eliminates costly equipment**—External transmitters and controllers are not required.

Applications

- Hatchery operations
- Inland pond production
- Open pen production
- Recirculating systems
- Seawater pond production

Optical RDO® PRO-X Dissolved Oxygen Probe Specifications



RDO PRO-X Oxygen Probe

Sensor type & cap	Optical dissolved oxygen sensor Uses the RDO-X Sensor Cap
Range, DO	0 to 50 mg/L
Accuracy, DO	±0.1 mg/L, 0 to 8 mg/L; ±0.2 mg/L, 8 to 20 mg/L; ±10% of reading, 20 to 50 mg/L
Resolution, DO	0.01 mg/L
Response time, cap	T90: <45 sec. T95: <60 sec. @ 25° C
Range, temp.	0° to 50° C (32° to 122° F)
Accuracy, temp.	±0.1° C typical
Resolution, temp.	0.01° C
Salinity comp.	Fixed or real-time capable
Barometric comp.	Fixed or real-time capable
Methods	EPA-approved In-Situ® RDO methods 1002-8-2009, 1003-8-2009, 1004-8-2009 Standard Methods 4500-O

Environmental Ratings

Pressure 150 psi from 0° to 50° C; 300 psi @ 25° C

Depth 689 ft (210 m) @ 25° C

Operating temp. Probe: 0° to 50° C (32° to 122° F)

Storage temp. Sensor cap: 1° to 60° C (33° to 140° F), in factory container

Probe: -5° to 60° C (23° to 140° F)

Compliance Heavy industrial, IEC 61000-6-2:2005

IP rating IP-67 with cap off; IP-68 with cap installed

Chemical Ratings

Interferences

Alcohols >5%; hydrogen peroxide >3%; sodium hypochlorite (commercial bleach) >3%; gaseous sulfur dioxide; gaseous chlorine

General Ratings

Comm. output Modbus/RS485, SDI-12, 4-20 mA

Power requirements 8 to 36 VDC

Power consumption Maximum: 50 mA at 12 VDC

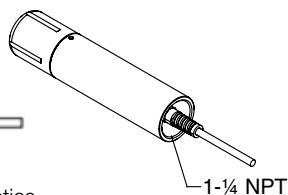
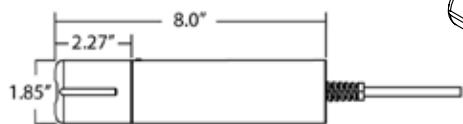
Cable lengths Modbus and 4-20 mA: Up to 1219 m (4000 ft)

SDI-12: Up to 61 m (200 ft)

Int. mounting thread 1-1/4 NPT

Warranty Probe: 3 years from date of shipment

Cap: 2 years in typical applications



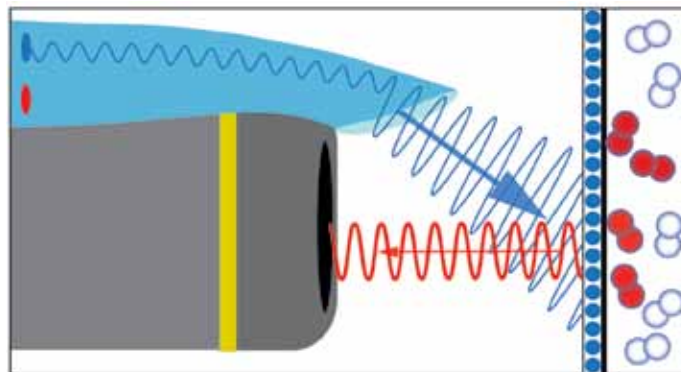
Specifications are subject to change without notice.

Key Advantages

- **Automatic setup**—To eliminate programming errors, the RDO PRO-X Cap is pre-loaded with factory calibration coefficients, serial number, expiration clock, and manufacture date.
- **Fast response**—With patented signal processing, the probe responds quickly and maintains stability, even in dynamically changing conditions.
- **Long-lasting calibration**—The probe maintains calibration and operates with no drift over long-term deployments.
- **Sensor health diagnostics**—Advanced sensor diagnostics allow you to evaluate sensor performance and alert you to maintenance intervals.

Technology

The low-maintenance RDO PRO-X Probe measures DO and provides extremely stable, accurate results. When the probe initiates a reading, a blue LED emits blue light, which excites lumiphore molecules in the sensing element. Excited lumiphore molecules emit red light, which is detected by a photodiode. Oxygen molecules quench the excited lumiphore molecules and prevent the emission of red light—a process called “dynamic luminescence quenching.” Determination of DO concentration by luminescence quenching has a linear response over a range of concentrations.



Lumiphore molecules are excited by blue light and then emit red light, which is detected by a photodiode. Optical electronics report DO concentration in mg/L.

Offerings

- **Simplified integration**—Use in conjunction with the Con TROLL® PRO System or with SCADA/PLC systems
- **Flexible power requirements**—Uses 8 to 36 VDC input
- **Integrated communication protocols**—Industry standard Modbus over RS485, SDI-12, or 4-20 mA 3-wire current loop
- **Compliance certified**—CE, FCC Class B heavy industrial immunity and emissions certifications
- **Cable or twist-lock options**—10 m or custom lengths

Call to purchase—www.in-situ.com

221 East Lincoln Avenue, Fort Collins, Colorado, U.S.A. 80524

1-800-446-7488 (toll-free in U.S.A. and Canada)

1-970-498-1500 (U.S.A. and international)

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