



# IN-SITU

RDO® Titan Process Probe



## Optical RDO® Titan Dissolved Oxygen Probe



Environmental professionals, aquaculturists, and NPDES permit holders use In-Situ® Inc.'s Rugged Dissolved Oxygen (RDO) Titan Probe for long-term monitoring and process control.

The RDO Titan Probe uses optical technology for measuring DO in demanding process environments.

The U.S. Environmental Protection Agency (EPA) has approved In-Situ Inc.'s RDO methods for use in Clean Water Act programs. Visit the In-Situ website to learn more about using breakthrough optical technology at your facility.

### Simple Design

- Automates setup and reduces user error—Calibration coefficients and expiration clock are loaded into sensor cap.
- Eliminates membranes and filling solutions
- Flexible communications—Standard Modbus/RS485 output

### Cost Effective

- Integrates into control and alarm systems with open communications protocols and flexible power options
- Eliminates the need for a costly transmitter or controller
- Includes probe with detachable cable. Cable is available in custom lengths.

### Robust Construction

- Resists abrasion and photobleaching effects
- Withstands high salinity environments—Corrosion-resistant materials used to construct probe body and sensor
- Insensitive to interferences that plague membrane-based sensors (hydrogen sulfide, chloride, ammonium, and others)

### Low Maintenance

- Requires infrequent calibration
- Includes diagnostic tools to help you evaluate sensor health
- Operates with very low drift for long periods of time
- Responds quickly to oxygen and temperature changes
- Delivers consistent, reproducible results (<0.05 mg/L)

### Applications

- Municipal/industrial water and wastewater treatment
- Food/beverage process control
- Aquaculture settings
- Dam discharge monitoring
- Stormwater management

## RDO Titan Oxygen Probe

<b>Sensor type</b>	Optical DO probe uses Classic Sensor Cap
<b>Range, DO</b>	0 to 50 mg/L
<b>Accuracy, DO</b>	±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
<b>Resolution, DO</b>	0.01 mg/L
<b>Response time, cap</b>	T90: <45 sec. T95: <60 sec. @ 25° C
<b>Range, temp.</b>	0° to 50° C (32° to 122° F)
<b>Accuracy, temp.</b>	±0.1° C typical
<b>Resolution, temp.</b>	0.01° C
<b>Salinity comp.</b>	Fixed or real-time capable
<b>Barometric comp.</b>	Fixed or real-time capable
<b>Methods</b>	EPA-approved In-Situ® RDO methods 1002-8-2009, 1003-8-2009, 1004-8-2009 Standard Methods 4500-O

### Environmental Ratings

<b>Pressure</b>	150 psi from 0° to 50° C; 300 psi @ 25° C
<b>Depth</b>	689 ft (210 m) @ 25° C
<b>Operating temp.</b>	Probe: 0° to 50° C (32° to 122° F)
<b>Storage temp.</b>	Sensor cap: 1° to 60° C (33° to 140° F), in factory container Probe: -5° to 60° C (23° to 140° F)
<b>Compliance</b>	Heavy industrial, IEC 61000-6-2:2005
<b>IP rating</b>	IP-67 with cap off; IP-68 with cap installed

### Chemical Ratings

<b>Interferences</b>	Alcohols >5%; hydrogen peroxide > 3%; sodium hypochlorite (commercial bleach) > 3%; gaseous sulfur dioxide; gaseous chlorine
----------------------	--

### General Ratings

<b>Diameter</b>	2.8 cm (1.1 in.) OD x 16.8 cm (6.6 in.) with restrictor; not including cable
<b>Weight</b>	114 g (4 oz.)
<b>Wetted materials</b>	Titanium, Delrin®, Nylon, PC/PMMA
<b>Comm. output</b>	Modbus/RS485, SDI-12, 4-20 mA
<b>Power requirements</b>	8 to 36 VDC
<b>Power consumption</b>	Maximum: 50 mA at 12 VDC
<b>Cable lengths</b>	Modbus: Up to 1219 m (4000 ft)
<b>Warranty</b>	Probe: 3 years from date of shipment
<b>Cap shelf life</b>	36 months
<b>Cap life</b>	12 months typical



Specifications are subject to change without notice.

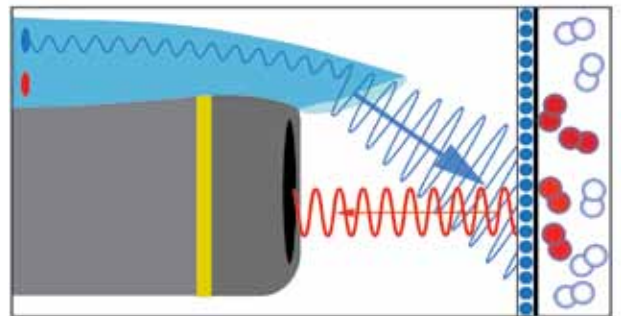
Delrin is a registered trademark of E.I. du Pont de Nemours and Company.

## Key Advantages

- **Automatic setup**—To eliminate programming errors, the RDO Classic 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 Titan 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
- **Compliance certified**—CE, FCC Class B heavy industrial immunity and emissions certifications
- **Detachable cable**—Available in custom lengths