

Water Quality Meters

In-Situ TROLL® 9500 Multiparameter Instrument

The powerful, portable TROLL 9500 Water Quality Instrument is designed for groundwater and surface water monitoring. The unit houses up to nine water quality sensors, internal power, and optional data logger.

FEATURES

Lower Total Cost of Ownership

- Instrument saves time and money by offering long-lasting internal power, automated low-flow sampling, and telemetry accessibility.
- Field-proven sensors and antifouling system reduce maintenance and site visits.
- Intuitive Win-Situ® 4 Software and Flow-Sense Software improve efficiency by simplifying data collection and management.

Reliable, Accurate Operation

- Instrument operates in fresh, waste, and marine waters.
- Instrument offers proven performance. Rigorous third-party testing shows that the TROLL 9500 delivers consistent results.
- Sensors are factory calibrated with NIST®-traceable standards (where applicable).

MODELS

Logging

- **LTS** – LTS stands for “Level, Temperature, and one additional Sensor,” such as conductivity, dissolved oxygen (DO), or pH.
- **Professional** – Offers the highest value for most applications. Allows for several sensors, including conductivity/salinity, DO, ORP, pH, temperature, or depth.
- **Professional XP** – The most capable TROLL 9500 offers features available on the Professional and supports XP or “Extended Parameter” sensors – turbidity, ammonium, chloride, or nitrate.

Non-Logging

- **Profiler** – Ideal for water quality sampling or vertical profiling. Similar to the Professional, but does not include memory or logging capabilities. Data can be logged to a RuggedReader® Handheld PC or laptop.
- **Profiler XP** – Offers the same features as the Profiler with the option to use XP sensors.

SENSOR OPTIONS

Choose from several field-ready sensors. The selected sensor set will determine the diameter of the TROLL 9500 – sub-2 inch or sub-4 inch.

- **Barometric pressure:** Use this sensor to compensate water level and DO values.
- **Conductivity:** Characterize water quality in actual conductivity, specific conductivity, salinity, TDS, or specific gravity.
- **DO:** Choose from the optical Rugged Dissolved Oxygen (RDO®) Sensor or Clark cell.
- **Level/Pressure:** Choose from non-vented and vented sensors that are available for several ranges.
- **Nutrients:** Choose from ion-selective electrodes for ammonium, chloride, or nitrate.
- **pH or pH/ORP:** Extend field use with these durable sensors. The re-buildable pH sensor outlasts traditional sensors.
- **Temperature:** Compensate conductivity, DO, pH, and nutrient data with this fast, accurate sensor.
- **Turbidity or Turbidity/Level:** Comply with ISO standards. The turbidity sensor uses ISO 7027 method. Optional wiper is available for high-fouling sites or for lengthy deployments.



RuggedReader



Optical RDO Sensor



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SPECIFICATIONS

General

Operating Temp.	23 to 122°F (-5 to 50°C)
Storage Temp.	-40 to 140°F (-40 to 65°C)
Dimensions	1.85 in. OD x 21.75 in. (4.7 cm OD x 55.25 cm). With twist-lock hanger: 22.25 in. (56.52 cm). Restrictor: 3.5 in. OD x 8.25 in. long (8.9 cm OD x 21 cm long)
Weight	4.2 lbs. (1.9 kg)
Wetted Materials	PVC, 316L stainless steel, titanium, Acetal, Viton®, nylon. Cable: Tefzel® or polyurethane
Water Tightness Rating	IP-68 with all sensors and cable attached. Battery compartment: IP-67 without the battery cover or cable attached
Output Options	RS485/RS232; SDI-12 (optional with SDI-12 adapter); ASCII streaming mode or binary command
Power	External: 9-16 VDC (optional). Internal: 2 user-replaceable D batteries (use either alkaline or matched pair of lithium). Use only Saft LSH-20 3.6V lithium D cells. Use of any other battery will void the warranty.

Logging

Data Logging	16 programmable tests (defined, scheduled to run, or stored). Logging modes: Linear, Linear Average, Event
Memory	4 MB (222,000 data records ¹)

Standard Sensors	Accuracy	Range	Depth Rating	Response Time	Methodology
Barometric Pressure	±0.3% FS	16.5 psia	Meets highest rating	<30 sec per 100 ft. (30 m) of cable	Silicon strain gauge
Level, Depth, Pressure	±0.1% FS or better Sensor accuracy: -5 to 50°C	15, 30, 100, or 300 psi	<i>Non-vented</i> 30 psia: 35.76 ft. (10.90 m) 100 psia: 197.2 ft. (60.11 m) 300 psia: 658.6 ft. (200.7 m) <i>Vented</i> 15 psig: 34.61 ft. (10.55 m) 30 psig: 69.21 ft. (21.10 m) 100 psig: 230.7 ft. (70.32 m) 300 psig: 692.1 ft. (211.0 m)	Instantaneous in thermal equilibrium	Silicon strain gauge (non-vented or vented)
Conductivity	Low: ±0.5% or 2 µS/cm High: ±0.5% + 2 µS/cm	Low: 5 to 20,000 µS/cm High ² : 150 to 112,000 µS/cm	Low: Meets highest rating High: Meets highest rating	Low: Instantaneous High: Instantaneous	Std. Methods 2510, EPA 120.1 Std. Methods 2510, EPA 120.1
Dissolved Oxygen <i>RDO® Sensor</i> ^{3,4}	±0.1 mg/L ±0.2 mg/L ±10% of reading	0 to 8 mg/L 8 to 20 mg/L 20 to 50 mg/L	150 psi from 0 to 50°C 300 psi @ 25°C	T90: <45 sec. T95: <60 sec. T90: <45 sec. T95: <60 sec. T90: <45 sec. T95: <60 sec.	<i>EPA-approved In-Situ Methods</i> 1002-8-2009, 1003-8-2009, 1004-8-2009
<i>Clark Cell</i>	±0.2 mg/L	0 to 20 mg/L 0 to 200% saturation	807 ft. (246 m)	1-mil membrane: 1-2 min. @ 25°C 2-mil membrane: 90 sec. to 3 min.	Std. Methods 4500-0 G, EPA 360.1
pH (single) or pH/ORP (combo)	pH: ±0.1 pH unit ORP: ±5.0 mV	pH: 0 to 12 pH units ORP: ±1400 mV	pH: 692 ft. (211 m) pH/ORP: 692 ft. (211 m)	pH: <15 sec., pH 7 to pH 4 ORP: <15 sec.	pH: Std. Methods 4500-H ⁺ , EPA 150.2 ORP: Std. Methods 2580
Temperature	±0.1°C	23 to 122°F (-5 to 50°C)	Meets highest rating	<30 sec.	EPA 170.1

Extended Parameter (XP) Sensors

Ammonium (NH₄⁺)	±10%	0.14 to 14,000 ppm N	46 ft. (14 m)	T98: <60 sec., 1.4 to 14 ppm N	Std. Methods 4500-NH ₄ D, EPA 350.3
Chloride (Cl⁻)	±15%	0.35 to 35,500 ppm Cl	231 ft. (70 m)	T98: <60 sec., 3.54 to 35.45 ppm Cl	Std. Methods 4500-Cl ⁻ D
Nitrate (NO₃⁻)	±10%	0.14 to 14,000 ppm N	46 ft. (14 m)	T98: <60 sec., 1.4 to 14 ppm N	Std. Methods 4500-NO ₃ D
Turbidity	±5% or 2 NTU/FNU	0 to 2,000 NTU/FNU	346 ft. (105 m)	Instantaneous (5 sec. for first reading)	ISO 7027 ⁵

Warranty TROLL 9500 and all sensors (excluding RDO & ISE sensors) come with a 1-year warranty. RDO Sensor: 3-year warranty. ISE sensors: 90-day warranty. RuggedCable® System: 2-year warranty.

Notes
¹ A single data record includes time stamp, temperature, RDO, pH, and conductivity logged in Linear or Linear Average mode.
² Full operating range: 70 to 200,000 µS/cm. ³ Full operating range: 0 to 50 mg/L. ⁴ Known interferences: Alcohols >5%; hydrogen peroxide >3%; sodium hypochlorite (commercial bleach) >3%; gaseous sulfur dioxide; gaseous chlorine; organic solvents (e.g., acetone, chloroform, methylene chloride, etc.), which may swell the sensing element (foil matrix) and destroy it.
⁵ pH sensor and pH/ORP sensor temperature range: 0 to 50°C.

Specifications are subject to change without notice.

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