

# Aqua TROLL® 100 and 200

## Conductivity/Salinity, Temperature, Plus Water Level Logging

Conductivity measurements can be used to characterize water quality changes relative to a baseline or to estimate the concentration of contaminants. The In-Situ® Aqua TROLL 100 and Aqua TROLL 200 instruments measure and log conductivity and temperature. For added flexibility, the Aqua TROLL 200 also measures and records water level/pressure.

The In-Situ four-electrode conductivity cell is less subject to fouling and resists electrical field effects from pumps and well casings. The cell design allows for a wide measurement range with a narrow diameter instrument (0.72 in; 18.3 mm).

### Rugged design

- Durable titanium housing resists fouling and safeguards against corrosion, even in the harshest conditions.
- Completely sealed—Withstands pressures up to 500 psi

### Extended deployments

- Internal batteries guaranteed to last for 5 years when reading every 15 minutes. External batteries, solar power, or external 8-36 VDC options are also available.
- Reference electrode compensates for light fouling.
- Use with the TROLL® Shield antifouling system to reduce biofouling and significantly increase deployment time.

### Accurate results

- Dynamic density compensation delivers superior water level accuracy in estuarine and coastal environments where salinity values may vary due to rainfall or tides.
- Instruments are factory-calibrated and validated with NIST®-traceable standards.

### Flexible communications

- SCADA and telemetry-ready units include built-in Modbus/RS485, SDI-12, and 4-20 mA output communications.
- The In-Situ RuggedCable® system includes titanium Twist-Lock connectors for quick, reliable connections.
- Easily connects to a RuggedReader® handheld PC, laptop, or TROLL® Link telemetry system.

### Simplified setup and data acquisition

- Win-Situ® software simplifies instrument setup, automates site management, displays graphical data, and provides real-time data and instrument status.



# Aqua TROLL<sup>®</sup> 100 and 200 SPECIFICATIONS

## Applications

- **Aquifer storage and recovery**
- **Deep saline aquifer studies**
- **Discharge monitoring**
- **Estuary studies**
- **Irrigation return flows**
- **Mine water quality analysis**
- **Remediation projects**
- **Road salt runoff studies**
- **Saltwater intrusion monitoring**
- **Storm surge analysis**
- **Surface water testing**
- **Tide gage monitoring**
- **Tracer studies**
- **Wetlands restoration projects**

### TROLL<sup>®</sup> Shield antifouling system

When used in coastal environments and high-fouling sites, the TROLL Shield antifouling system combats biofouling of the Aqua TROLL instrument and its conductivity cell. Reduced sensor fouling extends instrument deployment by up to 8 weeks and improves instrument accuracy and performance. The TROLL Shield antifouling system includes a copper nose cone and coiled copper guard.



<b>GENERAL</b>	
Operational temp. range	-20° to 65°C (-4° to 149°F)
Storage temperature	-40° to 65°C (-40° to 149°F)
Diameter, OD	0.72 in (18.3 mm)
Length	12.4 in (31.5 cm)
Weight	1.0 lb (0.5 kg)
Output options	Modbus RS485, SDI-12, 4-20mA
Housing	Titanium
Pressure range of operation	0 psi to 500 psi (0–1153 ft)
<b>POWER</b>	
Internal battery	3.6 V Lithium
Battery life	5 years or 200,000 readings <sup>1</sup>
External power	8-36 VDC
<b>LOGGING</b>	
Memory	4MB; 380,000 data points <sup>2</sup>
Log types	Linear, linear average <sup>3</sup> , event <sup>3</sup>
Fastest logging rate	
Linear	1 per minute
Linear average	1 per 2 seconds
Event	1 per second
Maximum number of logs	50
Fastest polling rate— Modbus, SDI-12, 4-20 mA	1 per second
<b>TEMPERATURE</b>	
Range	EPA Method 170.1 -20° to 65°C (-4° to 149°F)
Unit of measure	Celsius or Fahrenheit
Accuracy	±0.1°C
Resolution	0.1°C
<b>CONDUCTIVITY</b>	
Sensor type	Std. Method 2510, EPA Method 120.1 PVC/titanium balanced 4-electrode cell
Range	5 µS/cm to 100,000 µS/cm
Accuracy	< 80,000 µS/cm ±0.5% of reading +1 µS/cm Above 80,000 µS/cm ±1.0% of reading
Resolution	0.1 µS/cm
<b>PARAMETERS SUPPORTED<sup>4</sup></b>	
Actual conductivity	<b>Units</b> <b>Range</b> µS/cm, mS/cm              5–100,000 µS/cm
Specific conductivity <sup>5</sup>	µS/cm, mS/cm              5–100,000 µS/cm
Salinity <sup>6</sup>	PSU                              0–42 PSU
Total dissolved solids	ppm, ppt                      0–82 ppt
Resistivity	Ohms-cm                      10–200,000 Ohms-cm
Density (water salinity)	g/cm <sup>3</sup> 0.98–1.14 g/cm <sup>3</sup>
<b>PRESSURE/LEVEL<sup>7</sup> (Aqua TROLL 200 only)</b>	
Sensor type	Silicon strain gauge
Material	Titanium
Range, non-vented 30; 100; 300; 500 psia	0–35 ft (10.5 m); 0–200 ft (60 m); 0–650 ft (200 m); 0–1100 ft (340 m)
Range, vented 5; 15; 30; 100; 300; 500 psig	0–11.5 ft (3.5 m); 0–35 ft (11m); 0–70 ft (21 m); 0–230 ft (70 m); 0–700 ft (210 m) 0–1150 ft (350 m)
Units of measure	psi, kPa, bar, mbar, mmHg, inHg, cmH <sub>2</sub> O, and in H <sub>2</sub> O, m, mm, cm, in, and ft
Accuracy <sup>8</sup> @15°C	±0.05% full scale (FS)
0 to 50°C	±0.1% FS
-20 to -1 and 51 to 65°C	±0.25% FS
Resolution	±0.005% FS or better
Max. pressure/burst pressure	2X range/3X range

<sup>1</sup> 1 reading = time and date plus all available parameters polled or logged from device

<sup>2</sup> 1 data point = time and date plus one parameter logged

<sup>3</sup> External power or battery pack recommended when using Linear Average or Event Testing

<sup>4</sup> Parameters derived from temperature at 25°C and actual conductivity range of 5 µS/cm to 100,000 µS/cm with a ±0.5% plus 1 µS/cm accuracy

<sup>5</sup> Derived from Standard Methods 2510B

<sup>6</sup> Defined by the Practical Salinity Scale 1978 Standard Methods 2520B

<sup>7</sup> Real-time level compensation based on water density

<sup>8</sup> Accuracy with 4-20 mA output option: ±0.25% FS

### Warranty

The Aqua TROLL 100 and 200 instruments come with a one-year warranty. Warranty on RuggedCable<sup>®</sup> systems is 2 years. Extended warranties available, call for details.



### CALL TO PURCHASE OR RENT



221 East Lincoln Avenue ▪ Fort Collins, CO 80524 USA  
Telephone: 970-498-1500 ▪ Fax: 970-498-1598

**1-970-498-1500 ▪ 1-800-446-7488**  
(international and domestic calls) (toll-free in US and Canada)

**WWW.IN-SITU.COM**

This information is subject to change without notice. Copyright © 2008 In-Situ Inc. All rights reserved. In-Situ, RDO, TROLL, and Win-Situ are trademarks or registered trademarks of In-Situ Inc. Delrin is a registered trademark of E.I. du Pont de Nemours and Company, USA and other countries.