

Water Quality Monitor

In-Situ Aqua TROLL® 100 and 200 Instruments

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. The Aqua TROLL 200 adds water level logging.

FEATURES

Rugged, Compact Design

- Use in harsh environments. Titanium construction resists fouling and is chemical- and corrosion-resistant.
- Deploy 1.83-cm (0.72-in.) diameter instruments into narrow wells.

Extended Deployments

- Reduce power consumption. Batteries have a typical life of 5 years when reading every 15 minutes. 8-36 VDC input is compatible with external batteries and solar power.
- Use the TROLL® Shield Antifouling System to reduce biofouling and extend deployments by up to 6 weeks.

Accurate Results

- Use dynamic density compensation to collect accurate water level data in environments where salinity values may vary.
- Receive factory-calibrated instruments that are validated with NIST®-traceable standards.
- Deploy for long-term monitoring. Instruments operate with very low drift.

Flexible Communications

- Integrate into telemetry and SCADA systems. Outputs include standard Modbus/RS485, SDI-12, and 4-20 mA.
- Easily connect to RuggedReader® Handheld PC or PC.
- Use RuggedCable® Systems with titanium twist-lock connectors for quick, reliable connections.
- Simplify instrument setup, automate site management, and view real-time results with Win-Situ® Software.

APPLICATIONS

- Aquifer storage and recovery systems
- Coastal deployments – Saltwater intrusion monitoring, storm surge analysis, and estuary/wetland research
- Remediation site and mine water monitoring
- Stormwater monitoring programs



CALL GEOTECH TODAY (800) 833-7958

Geotech Environmental Equipment, Inc.

2650 East 40th Avenue • Denver, Colorado 80205

(303) 320-4764 • **(800) 833-7958** • FAX (303) 322-7242

email: sales@geotechenv.com website: www.geotechenv.com

Water Quality Monitor

In-Situ Aqua TROLL® 100 and 200 Instruments

SPECIFICATIONS

| Temperature Ranges¹ | Operational: -5 to 50°C (23 to 122°F) Storage: -40 to 65°C (-40 to 149°F) Calibrated: 0 to 50°C (32 to 122°F) | | | | | | | | | | | | | | |
|--|---|-----------------------|--------------------------------------|---|--------------------------|---|------------------------|-------------------------------------|------------------------|-------------------------------------|--------------------------|------------------------------------|---------------------------|--|----------------------------|
| Max. Pressure for Aqua TROLL 100 | 500 psi (1153 ft.) | | | | | | | | | | | | | | |
| Diameter | 1.83 cm (0.72 in.) | | | | | | | | | | | | | | |
| Length | 31.5 cm (12.4 in.) | | | | | | | | | | | | | | |
| Weight | 0.5 kg (1.0 lb.) | | | | | | | | | | | | | | |
| Materials | Titanium body and sensors, Delrin nose cone, and PVC conductivity cell | | | | | | | | | | | | | | |
| Output Options | Modbus/RS485, SDI-12, 4-20 mA | | | | | | | | | | | | | | |
| Battery Type & Life² | 3.6 Volt lithium; 5 years or 2 million readings ³ | | | | | | | | | | | | | | |
| External Power | 8-36 Volts DC | | | | | | | | | | | | | | |
| Memory | 4.0 MB Data Records ⁴ 190,000 Data Logs 50 | | | | | | | | | | | | | | |
| Log Types⁵ | Linear, Linear Average, and Event | | | | | | | | | | | | | | |
| Fastest Logging Rate | Linear: 1 per minute. Linear Average: 1 per minute. Event: 1 per second | | | | | | | | | | | | | | |
| Fastest Output Rate | 1 per second | | | | | | | | | | | | | | |
| CONDUCTIVITY SENSOR TYPE | Balanced 4-electrode cell | | | | | | | | | | | | | | |
| Methods | EPA Method 120.1; Standard Methods 2510 | | | | | | | | | | | | | | |
| Range | 5 to 100,000 µS/cm | | | | | | | | | | | | | | |
| Accuracy | ±0.5% of reading + 1 µS/cm when reading less than 80,000 µS/cm ±1.0% of reading when reading above 80,000 µS/cm | | | | | | | | | | | | | | |
| Resolution | 0.1 µS/cm | | | | | | | | | | | | | | |
| Parameters Supported⁶ | <table border="1"> <thead> <tr> <th>Range</th> <th>Units</th> </tr> </thead> <tbody> <tr> <td>Actual Conductivity: 5 to 100,000 µS/cm</td> <td>µS/cm, mS/cm</td> </tr> <tr> <td>Specific Conductivity⁷: 5 to 100,000 µS/cm</td> <td>µS/cm, mS/cm</td> </tr> <tr> <td>Salinity⁸: 0 to 42 PSU</td> <td>PSU</td> </tr> <tr> <td>Total Dissolved Solids: 0 to 82 ppt</td> <td>ppt, ppm</td> </tr> <tr> <td>Resistivity: 10 to 200,000 Ohms-cm</td> <td>Ohms-cm</td> </tr> <tr> <td>Density (Water Salinity): 0.98 to 1.14 g/cm³</td> <td>g/cm³</td> </tr> </tbody> </table> | Range | Units | Actual Conductivity: 5 to 100,000 µS/cm | µS/cm, mS/cm | Specific Conductivity ⁷ : 5 to 100,000 µS/cm | µS/cm, mS/cm | Salinity ⁸ : 0 to 42 PSU | PSU | Total Dissolved Solids: 0 to 82 ppt | ppt, ppm | Resistivity: 10 to 200,000 Ohms-cm | Ohms-cm | Density (Water Salinity): 0.98 to 1.14 g/cm ³ | g/cm ³ |
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| Density (Water Salinity): 0.98 to 1.14 g/cm ³ | g/cm ³ | | | | | | | | | | | | | | |
| PRESSURE/LEVEL SENSOR TYPE⁹ | Piezoresistive. Pressure/level are available only on the Aqua TROLL 200. | | | | | | | | | | | | | | |
| Range | <table border="1"> <thead> <tr> <th>Absolute (non-vented)</th> <th>Gauged (vented)</th> </tr> </thead> <tbody> <tr> <td>30 psia: 10.9 m (35.8 ft.)</td> <td>5 psig: 3.5 m (11.5 ft.)</td> </tr> <tr> <td>100 psia: 60.0 m (197 ft.)</td> <td>15 psig: 11 m (35 ft.)</td> </tr> <tr> <td>300 psia: 200.7 m (658.7 ft.)</td> <td>30 psig: 21 m (69 ft.)</td> </tr> <tr> <td>500 psia: 341.3 m (1120 ft.)</td> <td>100 psig: 70 m (231 ft.)</td> </tr> <tr> <td></td> <td>300 psig: 210 m (692 ft.)</td> </tr> <tr> <td></td> <td>500 psig: 351 m (1153 ft.)</td> </tr> </tbody> </table> | Absolute (non-vented) | Gauged (vented) | 30 psia: 10.9 m (35.8 ft.) | 5 psig: 3.5 m (11.5 ft.) | 100 psia: 60.0 m (197 ft.) | 15 psig: 11 m (35 ft.) | 300 psia: 200.7 m (658.7 ft.) | 30 psig: 21 m (69 ft.) | 500 psia: 341.3 m (1120 ft.) | 100 psig: 70 m (231 ft.) | | 300 psig: 210 m (692 ft.) | | 500 psig: 351 m (1153 ft.) |
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| Burst Pressure | Maximum 2x range; burst > 3x range | | | | | | | | | | | | | | |
| Accuracy & Resolution¹⁰ | <table border="1"> <tbody> <tr> <td>Accuracy @ 15°C:</td> <td>±0.05% full scale (FS)¹¹</td> </tr> <tr> <td>Accuracy 0 to 50°C:</td> <td>±0.1% FS¹²</td> </tr> <tr> <td>Resolution:</td> <td>0.005% FS or better</td> </tr> </tbody> </table> | Accuracy @ 15°C: | ±0.05% full scale (FS) ¹¹ | Accuracy 0 to 50°C: | ±0.1% FS ¹² | Resolution: | 0.005% FS or better | | | | | | | | |
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| Resolution: | 0.005% FS or better | | | | | | | | | | | | | | |
| Units of Measure | Pressure: psi, kPa, bar, mbar, mmHg, inHg, cmH ₂ O, inH ₂ O Level: mm, cm, m, in, ft. | | | | | | | | | | | | | | |
| TEMPERATURE SENSOR | | | | | | | | | | | | | | | |
| Method | EPA Method 170.1 | | | | | | | | | | | | | | |
| Accuracy & Resolution | Accuracy: ±0.1°C; Resolution: 0.01°C or better | | | | | | | | | | | | | | |
| Units of Measure | Celsius or Fahrenheit | | | | | | | | | | | | | | |
| WARRANTY | 2 years. Up to 5-year extended warranties available – please call for details. | | | | | | | | | | | | | | |

TROLL® Shield Antifouling System Extends Deployments

When used at coastal and high-fouling sites, the TROLL Shield Antifouling System fights biofouling of the Aqua TROLL Instrument and its conductivity cell. Reduced sensor fouling extends deployments by up to 6 weeks and improves instrument accuracy and performance. Use the coiled copper guard with both the Aqua TROLL 100 and 200 Instruments. Use the copper nose cone with the Aqua TROLL 200. For optimum performance, replace the guard every 6 months.



- ¹ Temperature range for non-freezing liquids
 - ² Typical battery life when used within the factory-calibrated temperature range
 - ³ 1 reading = date/time plus all available parameters polled or logged from device
 - ⁴ 1 data record = date/time plus 3 parameters logged (no wrapping) from device
 - ⁵ External power or battery pack is recommended when using Linear Average or Event logging modes.
 - ⁶ Parameters derived from temperature at 25°C and actual conductivity range of 5 to 100,000 µS/cm with a ±0.5% + 1 µS/cm accuracy
 - ⁷ Derived from Standard Methods 2510B
 - ⁸ Defined by the Practical Salinity Scale 1978; Standard Methods 2520B
 - ⁹ Real-time level compensation based on water density
 - ¹⁰ Accuracy with 4-20 mA output option: ±0.25% FS
 - ¹¹ Across factory-calibrated pressure range
 - ¹² Across factory-calibrated pressure and temperature ranges
- Specifications are subject to change without notice.
- Delrin is a registered trademark of E.I. du Pont de Nemours and Company.
- NIST is a registered trademark of the National Institute of Standards and Technology.



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 2650 East 40th Avenue • Denver, Colorado 80205
 (303) 320-4764 • **(800) 833-7958** • FAX (303) 322-7242
 email: sales@geotechenv.com website: www.geotechenv.com