



# IN-SITU® AQUA TROLL 700

Multiparameter Sondes

**THE AQUA TROLL 500, 600, 700 AND 800 ARE FULLY CUSTOMIZABLE MULTIPARAMETER SONDES WITH INTERCHANGEABLE SENSORS AND SMARTPHONE INTERFACE THAT DELIVER ACCURATE DATA AND ENABLE SIMPLIFIED CALIBRATION, PANORAMIC DATA AND REPORT CREATION.**

These flexible instruments are ideal for spot checking and profiling when paired with a Wireless TROLL Com and the VuSitu app, and for continuous, remote monitoring when used with VuLink telemetry and HydroVu data services.

The Aqua TROLL 500 and 600 are five-port multiparameter sondes, including four sensor ports and a wiper port. The Aqua TROLL 700 and 800 are seven-port multiparameter sondes, including six sensor ports and a wiper port. There is an option to have an automatic antifouling wiper to ensure data accuracy.

All four sondes are available in vented and non-vented options and are compatible with the complete range of Aqua TROLL sensors.

**SIMPLIFY DATA COLLECTION WITH EQUIPMENT DESIGNED TO BE RELIABLE, COST EFFECTIVE AND EASY TO USE.**



#### AVAILABLE SENSORS:

- Rugged Dissolved Oxygen (RDO®)
- Temperature
- Conductivity
- pH/ORP
- Turbidity
- Chlorophyll a
- Phycocyanin (BGA-PC)
- Phycoerythrin (BGA-PE)
- FDOM
- Crude Oil
- Rhodamine WT
- Fluorescein WT
- Ammonium (ISE)
- Chloride (ISE)
- Nitrate (ISE)

#### APPLICATIONS

- LAKE, STREAM AND WETLAND MONITORING
- COASTAL DEPLOYMENTS
- STORMWATER MANAGEMENT
- DAM MONITORING
- LOW-FLOW GROUNDWATER SAMPLING
- REMEDIATION AND MINE WATER MONITORING
- SURFACE WATER SPOT SAMPLING AND PROFILING
- AQUACULTURE

**RUGGED IN GROUNDWATER AND CORROSION RESISTANT IN SURFACE WATER AND MARINE ENVIRONMENTS, THE AQUA TROLL PORTFOLIO IS DESIGNED TO ADDRESS COMMON PROBLEMS WITH MULTIPARAMETER MONITORING INSTRUMENTATION. IT OFFERS**

**A SHARED ECOSYSTEM**

Reduce complexity and cost with equipment that works together. All Aqua TROLL products use the same ecosystem—from handheld to cable to communication.

**3D FACTORY CALIBRATION**

In-Situ performs a multi-point factory calibration on every sensor, to ensure that the sensor is linear across its full range and simplify calibration for the user.

**LOW-MAINTENANCE DEPLOYMENT**

Keep labor and equipment costs down with advanced passive and active antifouling on all sensors and 6+ month battery life.

**ENHANCED RELIABILITY**

In-Situ equipment is designed to withstand use in the harshest environments. Features designed to prevent breakage or failure include:

- Interlocking sensors for greater stability
- Titanium restrictor
- Fully potted sensors
- Redundant SD card storage
- Multi-chamber design

**BUILT-IN ERROR PREVENTION**

Prevent the most common damage or loss with:

- Spring-loaded screws that keep screws in place
- Slip-clutch wiper to prevent motor damage
- Smart sensors that fit in any port
- Wet-mate connectors that prevent water damage
- Anti-roll bumpers to keep equipment stationary

**MINI CALIBRATION CUP**

These sondes use only 50 ml (Aqua TROLL 500/600) and 100 ml (Aqua TROLL 700/800) of solution for calibration, reducing calibration cost by 5x over traditional methods and saving thousands of dollars in calibration solution per year.

**FAST-RESPONSE SENSORS**

Aqua TROLL sensors were designed to support spot-checking and profiling applications where sensor response time is critical. The temperature sensor uses an extended thermistor and insulated barriers; RDO® has optional fast-response formulation; and a round bulb increases surface area and improves response time on the pH sensor.

**UPGRADE FROM A 500 TO A 600 AND FROM A 700 TO AN 800 IF YOU NEED...**

- **INTERNAL BATTERY POWER**  
Two Alkaline D-cell batteries provide internal power to the instrument for continuous deployment (6+ months depending on logging rates and wiper) without external power
- **INTERNAL LOGGING**  
Record data logs to internal memory of the sonde
- **MICRO SD CARD FOR BACKUP LOGGING**  
Record backup logs to the micro SD card for a second data source in case something happens to the onboard memory (flooded instrument, etc.)
- **HIGHER MAXIMUM DEPLOYMENT DEPTH RATING**  
Up to 100M with the Aqua TROLL 500, 200M with the Aqua TROLL 600 and 250M with the Aqua TROLL 700/800



| GENERAL  | AQUA TROLL 500 MULTIPARAMETER SONDE  | AQUA TROLL 600 MULTIPARAMETER SONDE   | AQUA TROLL 700 MULTIPARAMETER SONDE  | AQUA TROLL 800 MULTIPARAMETER SONDE  |
|--|--|---|--|--|
| <b>OPERATING TEMPERATURE (NON-FREEZING)</b>                    | -5 to 50° C (23 to 122° F)<br>ISE: Ammonium & Nitrate 0 to 40° C (32 to 104° F); Chloride 0 to 50° C (32 to 122° F)  |   |  |  |
| <b>STORAGE TEMPERATURE</b>                                     | Components w/o fluid: -40° C to 65° C (-40° to 149° F) (non-freezing water); pH/ORP: -5° C to 65° C (-23° to 149° F); Ammonium/Nitrate: 0 to 40 ° C (32° to 104° F); Chloride: 0 to 50° C (32° to 122° F)  |   |  |  |
| <b>DIMENSIONS</b>  | Diameter: 4.7 cm (1.860 in) OD<br>Length: 46 cm (18.145 in) (inc. connector)<br>Length With bail: 59 cm (23.25 in)   | Diameter: 4.7 cm (1.85 in) OD<br>Length: 60.2 cm (23.7 in) (inc. connector)<br>Length With bail: 72.9 cm (28.7 in)  | Diameter: 7.2 cm (2.84 in) OD<br>Length: 48.7 cm (19.16 in)<br>Length With Bail: 61.67 cm (24.28 in)   | Diameter: 7.2 cm (2.84 in) OD<br>Length: 63.7 cm (25.08 in)<br>Length With Bail: 74.7 cm (29.42 in)  |
| <b>WETTED MATERIALS</b>  | Polyphenylsulfone, Polycarbonate, Acetal, EPDM/Polypropylene TPV, FKM Fluoroelastomer, Titanium, Fluorocarbon Coating, Ceramic, Inconel, Acrylic Adhesive Film, Nylon, Polyurethane Adhesive, Graphite, PC/PMMA Blend, Acrylic, Sapphire, PVC, Platinum, Glass | Polycarbonate, Acetal, EPDM/Polypropylene TPV, FKM Fluoroelastomer, Titanium, Fluorocarbon Coating, Ceramic, Inconel, Acrylic Adhesive Film, Nylon, Polyurethane Adhesive, Graphite, PC/PMMA Blend, Acrylic, Sapphire, PVC, Platinum, Glass | Buna-N, Noryl, Nylon, Polyphenylsulfone, Polycarbonate, Acetal, EPDM/Polypropylene TPV, FKM Fluoroelastomer, Titanium, Fluorocarbon Coating, Ceramic, Acrylic Adhesive Film, Polyurethane Adhesive, Graphite, PC/PMMA Blend, Acrylic, Sapphire, PVC, Platinum, Glass | Buna-N, Noryl, Nylon, Polyphenylsulfone, Polycarbonate, Acetal, EPDM/Polypropylene TPV, FKM Fluoroelastomer, Titanium, Fluorocarbon Coating, Ceramic, Acrylic Adhesive Film, Polyurethane Adhesive, Graphite, PC/PMMA Blend, Acrylic, Sapphire, PVC, Platinum, Glass |
| <b>WEIGHT <sup>1</sup></b>                                     | 0.978 kg / 2.15 lbs (includes instrument, sensors, restrictor and bumpers)   | 1.45 kg / 3.2 lbs (includes all sensors, batteries, and bail)   | 2.25 kg / 4.96 lbs (includes sensors and bail)   | 3.23 kg / 7.12 lbs (includes sensors, batteries and bail)  |
| <b>MAX PRESSURE RATING</b>                                     | Up to 150 PSI  | Up to 350 PSI   | Up to 350 PSI  | Up to 350 PSI  |
| <b>OUTPUT OPTIONS</b>  | RS-485/MODBUS, SDI-12, Bluetooth®  |   |  |  |
| <b>READING RATES</b>   | 1 reading every 2 seconds  |   |  |  |
| <b>DATA LOGGING</b>  | Use external datalogger or telemetry   | 50 logs (defined, scheduled to run, or stored)  | Use external datalogger or telemetry   | 50 logs (defined, scheduled to run, or stored)   |
| <b>LOGGING RATE</b>  | N/A  | 1 minute to 99 hours  | N/A  | 1 minute to 99 hours   |
| <b>ENVIRONMENTAL RATING</b>                                    | IP68 with all sensors and cable attached<br>IP67 without the sensors or cable attached   |   |  |  |
| <b>INTERNAL MEMORY <sup>2</sup></b>                            | N/A  | 16 MB   | N/A  | 16 MB  |
| <b>MICRO SD CARD <sup>3</sup></b>                              | N/A  | 8+ GB micro SD card included, user replaceable  | N/A  | 8+ GB micro SD card included, user replaceable   |
| <b>INTERNAL POWER</b>  | N/A  | 2 internal user-replaceable Alkaline D batteries  | N/A  | 2 internal user-replaceable Alkaline D Batteries   |
| <b>BATTERY LIFE <sup>4</sup></b>                               | N/A  | > 6 months typical with wiping<br>> 9 months typical with no wiping   | N/A  | > 6 months typical with wiping<br>> 9 months typical with no wiping  |
| <b>EXTERNAL POWER VOLTAGE</b><br><b>EXTERNAL POWER CURRENT</b> | 8-36 VDC; 0.1 mA typical<br>Measurement: 16 mA typical; 45 mA max  | 8-36 VDC (not required for normal operation); 0.1 mA typical<br>Measurement: 16 mA typical; 45 mA max   | 8-36 VDC; 0.1 mA typical<br>Measurement: 16 mA typical; 45 mA max  | 8-36 VDC (not required for normal operation); 0.1 mA typical<br>Measurement: 16 mA typical; 45 mA max  |
| <b>HEX SCREW DRIVER</b>  | 1.3 mm, 0.050 in   |   |  |  |
| <b>COMMUNICATION DEVICE</b>                                    | TROLL Com or Wireless TROLL Com  |   |  |  |
| <b>CABLE OPTIONS</b>   | Vented or non-vented polyurethane or vented Tefzel®  |   |  |  |
| <b>LCD DISPLAY</b>   | Integrated display shows status of sonde, sensor ports, connectivity, power information, battery capacity and data log status (battery capacity and data log status only apply to the AT600 and AT800.   |   |  |  |
| <b>SOFTWARE</b>  | Android™: VuSitu through Google Play and Amazon® App Store<br>iOS: VuSitu through Apple® App Store, HydroVu  |   |  |  |
| <b>CERTIFICATIONS</b>  | CE, FCC, WEEE, RoHS Compliant  |   |  |  |

| SENSOR                                  | ACCURACY                 | RANGE  | RESOLUTION/PRECISION | RESPONSE TIME          | UNITS OF MEASURE  | METHODOLOGY             |
|---|--------------------------|--|----------------------|------------------------|---|-------------------------|
| <b>PRESSURE (OPTIONAL)<sup>11</sup></b> | ±0.1% FS from -5 to 50°C | <b>AQUA TROLL 500</b> Non-Vented or Vented<br>0-9 m (0-30 ft)<br>0-30 m (0-98 ft)<br>0-76 m (0-250 ft)<br>0-100 m (0-328 ft)<br><br><b>AQUA TROLL 600</b> Non-Vented or Vented<br>0-9 m (0-30 ft)<br>0-30 m (0-98 ft)<br>0-76 m (0-250 ft)<br>0-200 m (0-650 ft)<br><br><b>AQUA TROLL 700/800</b> Non-Vented or Vented<br>0-10 m (0-33 ft)<br>0-30 m (0-98 ft)<br>0-100 m (0-328 ft)<br>0-250 m (0-820 ft) | 0.01% full scale     | T63<1s, T90<1s, T95<1s | Pressure: psi, kPa, bar, mbar, inHg, mmHg<br>Level: in, ft, mm, cm, m, cmH2O, inH2O | Piezoresistive; Ceramic |

| SENSOR   | ACCURACY  | RANGE                           | RESOLUTION/PRECISION   | RESPONSE TIME  | UNITS OF MEASURE  | METHODOLOGY   |
|--|---|---------------------------------|--|--|---|---|
| TEMPERATURE <sup>6</sup>   | ± 0.1° C  | -5 to 50° C (23 to 122° F)      | 0.01° C  | T63<2s, T90<15s, 95<30s  | Celsius or Fahrenheit   | EPA 170.1   |
| BAROMETRIC PRESSURE  | ± 1.0 mbars   | 300 to 1,100 mbar               | 0.1 mbar   | T63<1s, T90<1s, T95<1s   | Pressure: psi, kPa, bar, mbar, inHg, mmHg   | Silicon strain gauge  |
| pH <sup>7</sup>  | ±0.1 pH unit or better  | 0 to 14 pH units                | 0.01 pH  | T63<3s, T90<15s, 95<30s  | pH, mV  | Std. Methods 4500-H+/EPA 150.2                                      |
| ORP <sup>8</sup>   | ±5 mV   | ±1,400 mV                       | 0.1 mV   | T63<3s, T90<15s, 95<30s  | mV  | Std. Methods 2580   |
| CONDUCTIVITY <sup>9</sup>  | ±0.5% of reading plus 1 µS/cm from 0 to 100,000 µS/cm; ±1.0% of reading from 100,000 to 200,000 µS/cm; ±2.0% of reading from 200,000 to 350,000 µS/cm | 0 to 350,000 µS/cm              | 0.1 µS/cm  | T63<1s, T90<3s, T95<5s   | Actual conductivity (µS/cm, mS/cm); Specific conductivity (µS/cm, mS/cm); Salinity (PSU); Total dissolved solids (ppt, ppm); Resistivity (Ohms-cm); Density (g/cm3) | Std. Methods 2510/ EPA 120.1 ±1,400 mV                              |
| TDS (DERIVED FROM CONDUCTIVITY AND TEMP)   | --  | 0 to 350 ppt                    | 0.1 ppt  | --   | ppt, ppm  | --  |
| SALINITY (DERIVED FROM CONDUCTIVITY AND TEMP)  | --  | 0 to 350 PSU                    | 0.1 PSU  | --   | PSU, ppt  | Std. Methods 2520B  |
| RUGGED DISSOLVED OXYGEN (RDO) WITH RDO-X <sup>10</sup> OR RDO FAST CAP   | ±0.1 mg/L<br>±2% of reading   | 0 to 20 mg/L<br>20 to 60 mg/L   | 0.01 mg/L  | RDO-X: T63<15s, T90<45s, T95<60s<br>Fast Cap: T63<3s, T90<30s, T95<45s | mg/L, % saturation, ppm   | EPA-approved In-Situ Methods: 1002-8-2009, 1003-8-2009, 1004-8-2009 |
| TURBIDITY  | ±2% of reading or ±0.5 NTU, FNU, whichever is greater   | 0 - 4,000 NTU<br>0 - 1,500 mg/L | 0.01 NTU (0 - 1,000);<br>0.1 NTU (1,000 - 4,000)<br>0.1 mg/L | T63<1s, T90<1s, T95<1s   | NTU, FNU<br>ppt, mg/L   | ISO 7027  |
| TSS (DERIVED FROM TURBIDITY) <sup>11</sup>   | --  | 0 to 1,500 mg/L                 | 0.1 mg/L   | --   | ppt, mg/L   | --  |
| AMMONIUM (NH4 + -N) <sup>12,13</sup><br>RATED TO 25 m DEPTH<br>-Unionized Ammonia, Total Ammonia (derived from Ammonium & pH sensor) | ±10% or ±2 mg/L w.i.g. (specs valid for freshwater)   | 0 to 10,000 mg/L as N           | 0.01 mg/L  | T63<1s, T90<10s, T95<30s   | mg/L, ppm, mV   | --  |
| NITRATE (NO3 - - N) <sup>9</sup><br>RATED TO 25 m DEPTH  | ±10% or ±2 mg/L w.i.g. (specs valid for freshwater)   | 0 to 40,000 mg/L as N           | 0.01 mg/L  | T63<1s, T90<1s, T95<1s   | mg/L, ppm, mV   | Std. Methods 4500 NO3-D   |
| CHLORIDE (CL -) <sup>9</sup>   | ±10% or ±2 mg/L w.i.g. (specs valid for freshwater)   | 0 to 150,000 mg/L as Cl         | 0.01 mg/L  | T63<1s, T90<1s, T95<1s   | mg/L, ppm, mV   | Std. Methods 4500 Cl-D  |

| SENSOR                  | LINEARITY  | INSTRUMENT DETECTION LIMIT    | RANGE                    | DISPLAY RESOLUTION | RESPONSE TIME          | DEFAULT UNIT(S) | DERIVED PARAMETERS                                      |
|-------------------------|--|-------------------------------|--------------------------|--------------------|------------------------|-----------------|---|
| Chlorophyll a           | R2>0.999 for serial dilutions of Chl a in MeOH across full range   | 0.1 µg/L<br>Chl a in MeOH     | 0-100 RFU<br>0-1000 µg/L | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU             | Chlorophyll a concentration<br>Chlorophyll a cell count |
| Phycocyanin (BGA-PC)    | R2>0.999 for serial dilutions of PC standard across full range     | 1.0 µg/L<br>PC standard       | 0-100 RFU<br>0-1000 µg/L | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU             | Phycocyanin Concentration                               |
| Phycocerythrin (BGA-PE) | R2>0.999 for serial dilutions of PE standard across full range     | 0.5 µg/L<br>PE standard       | 0-100 RFU<br>0-1000 µg/L | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU             | Phycocerythrin Concentration                            |
| FDOM                    | R2>0.999 for serial dilutions of Quinine Sulfate across full range | 0.5 µg/L<br>Quinine Sulfate   | 0-100 RFU<br>0-3000 µg/L | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU             | FDOM Concentration<br>CDOM Concentration                |
| Crude Oil               | R2>0.999 for serial dilutions of PTSA across full range            | 1.0 µg/L<br>PTSA <sup>a</sup> | 0-100 RFU<br>0-3000 µg/L | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU             | Crude Oil Concentration                                 |
| Rhodamine WT            | R2>0.999 for serial dilutions of RWT across full range             | 0.5 µg/L<br>Rhodamine WT      | 0-100 RFU<br>0-1000 µg/L | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU, µg/L       |   |
| Fluorescein WT          | R2>0.999 for serial dilutions of FWT across full range             | 0.2 µg/L<br>Fluorescein WT    | 0-100 RFU<br>0-500 µg/L  | 0.001 RFU          | T63<1s, T90<1s, T95<1s | RFU, µg/L       |   |

**NOTES:** <sup>1</sup>Weight includes sonde, sensors, wiper, batteries (600 and 800 only), and bail. <sup>2</sup>For 30 parameters >100,000 data records, > 3 years at 15 min. interval. A single data record includes timestamp, temperature, RDO, pH, ORP, turbidity and conductivity logged in Linear or Linear Average mode. <sup>3</sup>Log data recorded to SD card in comma delimited variable (CSV) file format. Greater than 32 GB not supported. <sup>4</sup>Logging all sensors at 15 min interval on 2 D Alkaline batteries. Battery life dependent on site conditions and wiping. <sup>5</sup>Dependent on display and wiping. <sup>6</sup>Typical system response with instrument, sensors and restrictor when changing approximately 15°C in moderate flow. <sup>7</sup>Response time at thermal equilibrium. <sup>8</sup>Accuracy from calibration standard @ 25C, response-at thermal equilibrium immediately following calibration measuring from air to +400 mV. <sup>9</sup>Accuracy at calibration points. <sup>10</sup>RDO sensor full range 0-60 mg/L, 0-600% sat. EPA-approved method under the Alternate Test Procedure Process. <sup>11</sup>User-defined reference. <sup>12</sup>Between 2 calibration points immediately following proper conditioning and calibration. Varies on site conditions and environmental interferents. See sensor summary sheet for potential interferences. <sup>13</sup>Average response; can be longer with increasing concentrations of ammonium. <sup>14</sup>Typical performance across full temperature and pressure calibrated range. <sup>15</sup>Extended warranty option for sonde only (1 to 3 year extension for up to 5 years total). Specifications are subject to change without notice.

**WARRANTY:** 2 year - Sonde, RDO and Sensor Cap, Temperature/Conductivity, Temperature Only, Turbidity, Chlorophyll a, pH/ORP, Phycocyanin (BGA-PC), Phycocerythrin (BGA-PE), Rhodamine WT, Wiper; 1 year - Chloride ISE, Accessories; 90 Days - Nitrate and Ammonium ISE Sensors; See warranty policy ([www.in-situ.com/warranty](http://www.in-situ.com/warranty)) for full details.