

A scenic photograph of a forest stream. Sunlight filters through the dense trees, creating a bright, ethereal atmosphere. The water flows over rocks, creating small cascades and rapids. The overall tone is natural and serene.

Solinst[®]

*High Quality
Groundwater and Surface Water
Monitoring Instrumentation*



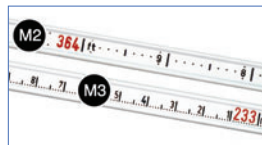
Founded in 1975, Solinst manufactures high quality groundwater monitoring instruments in Georgetown, Ontario. We offer a broad range of innovative and practical hydrogeological and hydrological equipment, designed to give our customers the means to obtain the detailed, accurate, technical information they require.

Research and development is a priority, ensuring a steady improvement in our products and continuous development of up-to-date instrumentation for hydrogeological applications.

Our aim is to produce reliable stock items routinely, yet maintain dynamic research and the ability to produce specialized items to suit particular needs.

At Solinst, we are committed to quality products coupled with superior customer service. We are proud of our highly educated and friendly staff. When a customer calls Solinst, they get assistance, not pressure.

This brochure briefly describes most of our product line. Please call our office or visit our website for more detailed information.



M2: Each 1/100 ft
M3: Each millimeter



up to 6,000 ft (1,800 m)

The 101 Water Level Meter is very sturdy and gives easy-to-read, consistently accurate water level measurements in wells and boreholes.

The tape is permanently marked each 1/100 ft or each millimeter, in lengths up to 6,000 ft (1,800 m). The tape has stranded stainless steel conductors for long life and easy repair. A dog-bone tape design reduces adherence to wet casing. Probes have recessed sensors to minimize false signals. The optional P6 Submersible Probe is leak-proof, which allows submergence to 1000 ft (300 m).

The well balanced reel has a carrying handle, an easy-access battery drawer, and an excellent brake. A 9V battery powers the buzzer and light, which activate when static water is reached.

Power Reels for Water Level Meters can be very useful. They allow faster and less strenuous operation of meters with long tape lengths. They are available in a variety of sizes to suit the cable length and are designed to operate with 110 Volt power. They are also useful for operating pumps with long lengths of tubing.



The **102 Water Level Meter** is low cost and uses accurate, laser marked coaxial cable. It is ideal for use in narrow diameters, as small as 3/8" (10 mm), or when snaking past down-well pumps.

The flexible cable has a heavy duty polyethylene jacket and markings permanently laser etched every 1/100 ft or each millimeter. A stainless steel central conductor adds strength and limits stretch.

Model 102 probes are designed with segmented weights for flexibility. The stainless steel P1 probe is 1/4" (6.4 mm) in diameter, ideal for accessing narrow diameters. The heavier brass P2 probe is 3/8" (10 mm) in diameter, ideal for greater depths.

When the probe enters water, the water completes an electrical circuit powered by a 9V battery, sending a signal back to the reel where a light and clearly audible buzzer are activated. The water level is then determined by taking a reading off the cable at the top of the borehole, casing or tube.

The **102M Mini Water Level Meter** is a very compact and easy to carry meter available in 80 ft and 25 m lengths. The cable is mounted on a convenient small reel that is light-weight and fits easily into a backpack or a mini carrying case. The accurate cable is marked every 1/100 ft. or each millimeter, with a choice of a 102 P1 or P2 probe.



The 122 Interface Meter measures product level and thickness accurately to 1/100 ft or 1 mm. It measures both floating and sinking hydrocarbon, non-aqueous product layers.

The 122 is certified safe for use in explosive environments by the Canadian Standards Association (CSA - Class 1, groups C & D).

A steady tone and light indicate product and intermittent signals indicate water. The Solinst Interface Meter is rugged, field durable and is

easy-to-use. A carrying bag and tape guide are included.

The 122M Mini Interface Meter offers a more portable version of the larger. It is small enough to fit in a backpack, yet rugged and reliable. Available in 65 ft or 20 m lengths.

The Mini gives highly accurate readings of LNAPL or DNAPL product level and thickness in wells and tanks and is CSA approved. The 9V battery offers approximately 300 hours of use.



The **107 TLC Meter** (Temperature, Level, Conductivity) displays accurate measurements of conductivity and temperature on an LCD display that rotates for ease of use. Water levels and probe depth measurements are read off the accurately marked Solinst flat tape.

It is ideal for profiling salt-water intrusion, road salt impairments, tracer tests and to give a general indication of chemical contamination levels.

The TLC Meter uses a 'smart' conductivity sensor with platinum electrodes to read conductivity

from 0 – 80,000 μS with an accuracy of 2% of reading or better. Readings stabilize in 20 seconds.

The flat tape is permanently marked each 1/100 ft or millimeter and is available in lengths up to 300 ft (100 m). The meter comes with a carrying bag and tape guide.



LCD screen rotates for easy reading



The **103 Tag Line** is used to measure the depth to the top of backfill sand or bentonite layers during the completion of a well and to measure the depth to the bottom of a well.

The Tag Line uses polyethylene coated, permanently marked, stainless steel wireline and a choice of stainless steel weights, mounted on a Solinst reel.

Cable markings are accurately laser etched every 10 cm or 1/2 ft. Ideal for use when installing Solinst 403 CMT Multilevel Systems.

The tag weight can be clipped on and off the cable. This allows for the reel mounted, marked cable to be used as a support cable i.e. for bailer, pump and packer deployment.



The 3001 Levellogger® Gold represents the next generation of water level dataloggers. Vastly improved over previous versions, the Levellogger Gold is completely designed, developed and manufactured in-house, in the tradition of all Solinst high quality products. It is ideal for recording water levels in monitoring and production wells, boreholes, lakes, rivers, tanks, harbors, etc.

The Levelloggers have a resolution of 0.002 to 0.0006% FS, an accuracy of 0.05% FS and a memory capacity for 40,000 sets of readings. The datalogger, 10-year battery, pressure transducer and temperature sensor are all factory-sealed within a low-maintenance, small 6" x 7/8" (154 mm x 22 mm) housing, coated with Zirconium Nitride for corrosion resistance. The sealed design makes maintenance and cleaning a snap, and offers protection from power surges caused by pumps or lightning.

The simple software allows sampling to be linear, event-based or user-defined, in intervals from 0.5 seconds upwards. Download options include a full data dump and an 'Append Data' option. There is automatic temperature compensation. The Barologger and the barometric wizard offer the most accurate and easy method to account for barometric pressure. No vented cable or desiccants are needed.

Levelloggers can be installed with direct read cable for instant communications, or suspended on inexpensive wireline/rope from a lockable well cap, whichever best suits each new project. Levelloggers can also connect to an SDI-12 network using the Solinst SDI-12 Interface Cable.



The Optical Reader makes programming the Levellogger easy.



The 3001 Levellogger Junior provides an inexpensive alternative for measuring groundwater and surface water levels. It features a non-volatile memory, with a capacity of 32,000 sets of water level and temperature data points. Accuracy is 0.1% FS, with lifetime calibration. The battery will last 5-years. Readings are linear at a user-defined interval from 0.5 secs. to 99 hrs.

The 3001 Levellogger Gold is a data transfer unit designed for use with all versions of the Solinst Levellogger, Barologger, and Rainlogger. It is used to download and store multiple data files.

The 8 Mb FLASH memory stores up to 1,390,000 LT readings, 930,000 LTC readings, or 34 full Levellogger downloads. It can also be used to display data in real-time, and has optional password protection.



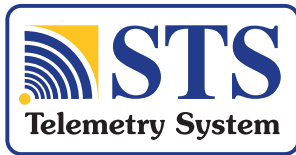
Simply use the cables provided for attachment to a Levellogger, or to a direct read cable, to allow downloading or reprogramming of the Levellogger settings in the field. It comes with cables for USB and RS232 connection to a PC for data transfer.



The LTC Levellogger Junior (Level, Temperature, Conductivity) combines a datalogger, 5-year battery, pressure transducer, and temperature and conductivity sensors within a small waterproof housing, 7/8" x 7.5" (22 mm x 190 mm).

The conductivity sensor is a 4-electrode platinum sensor. It auto-ranges from 0 µS/cm to 80,000 µS/cm and has an accuracy of 2% of the reading between 500 - 50,000 µS/cm. The LTC Levellogger Junior is simple to clean and calibrate. Memory is non-volatile and stores up to 16,000 sets of readings.

®Levellogger is a registered trademark of Solinst Canada Ltd.



The 9100 STS Gold Telemetry System provides an efficient method to access remote data instantly that results in long-term savings.

Built for the Levellogger Series, the system combines high quality data loggers, intuitive software and a choice of wireless communication options, to create a remote monitoring solution.

It offers two-way wireless communication and control from your desktop. CDMA and GSM digital cellular, satellite and radio options give the flexibility to suit any project. Systems are suitable for both small and large networks.

Power requirements are kept to a minimum, since the systems use low power electronics and no power when in standby mode. Downloaded data is stored in a Microsoft® Access® Database, and can be exported for use in other programs.

The STS Gold is designed to save costs by enabling the self-management of data, as well as remote collection of the data. Alarm notification, remote firmware upgrades and diagnostic reporting make system maintenance simple.

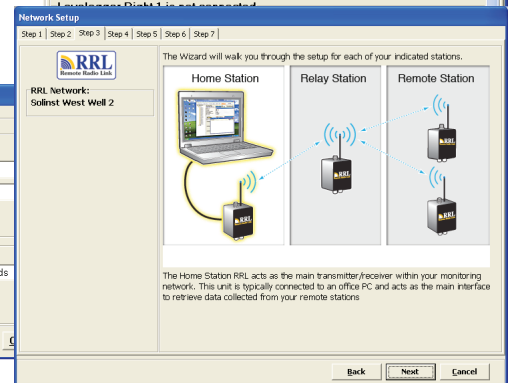
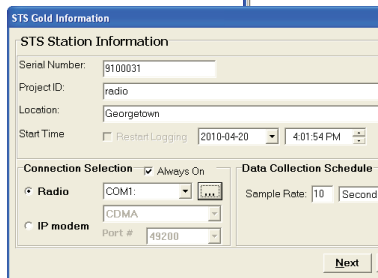
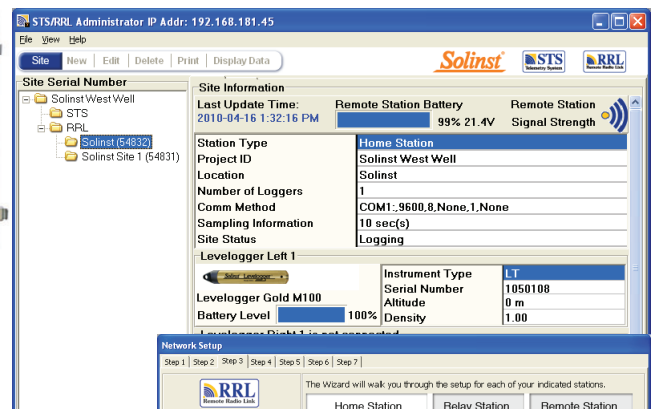


The 3002 Rainlogger is used with Levellogger Software and most standard tipping-bucket rain gauges, with a reed switch output.

The rainfall per sampling period and a five-minute maximum rainfall are logged in non-volatile memory, with up to 40,000 readings. It is excellent for use along side Levelloggers to measure the local precipitation, as well as water level measurements.



STS NEMA 4X Enclosure



STS/RRL Gold Software Screens



The 9200 RRL Gold Radio Telemetry System offers a very simple, inexpensive method of local telemetry. The wireless system is designed to log real-time data from the Levellogger Series of dataloggers. It communicates over distances up to 20 miles (30 km). Distances can also be increased by using some radios as repeaters.

Each remote station is programmed and scheduled using the same intuitive software as the STS Gold Telemetry Systems. Data is stored in a Microsoft Access Database and can be exported for use in other programs, allowing self-management of the data. The RRL is excellent for small, closed loop networks, such as mine sites and landfill monitoring networks.



®Microsoft and Access are registered trademarks of Microsoft Corp.



Dedicated or Portable

The **407 Integra Bladder Pump** has a durable Teflon® bladder ideal for dedication. Solinst offers 316 stainless steel Integra pumps in diameters of 1" and 1.66" (25 mm and 42 mm) and PVC Integra Pumps in 1.66" (42 mm). They are ideal for low flow sampling but can also be used for regular flow sampling. Maximum lift capabilities are 500 ft (150 m) with the

stainless steel models and 100 ft (30 m) with the PVC. Dedicated systems may be purchased pre-assembled for easy installation, complete with well caps and tubing. Portable systems are also available as illustrated. Cart-mounted portable pumps have pneumatic tires and a lowering guide for easy use. LDPE bladders now available for disposable short term applications.



The **408 Double Valve Pump (DVP)** is similar to the Bladder Pump, but without a bladder. It is a gas drive pump suitable for applications of almost any depth and narrow diameters. It is available in stainless steel in 1.66" or 5/8" diameter (42 mm or 16 mm) and in PVC in 1.66" (42 mm). Portable and dedicated versions are available.

The DVP 1.66" (42 mm) converts easily into a Bladder Pump, if desired. All pumps can be quickly disassembled for decontamination, and are operated using the Model 464 Electronic Control Unit below. Pumps may be fitted with pneumatic/hydraulic packers to reduce purge volumes. (See Model 800 Packers.) For narrow diameters use the Model 408M.



The **408M Micro Double Valve Pump** has a remarkably small and flexible design. It is a pneumatic pump similar to a Bladder Pump, but using coaxial Teflon tubing with stainless steel valves and filter for high quality sampling.

It is small enough to fit in 1/2" (13 mm) tubing and all channels of the Solinst CMT System. The Micro DVP is ideal for low flow sampling in narrow applications and operates to depths of up to 240 ft (73 m). A flow rate of 20 – 200 ml/min can be obtained.



The **464 Electronic Control Unit** controls the supply of compressed gas to pneumatic pumps including Solinst Bladder Pumps and Double Valve Pumps. The 464 uses 4 AA batteries lasting 100 hrs of normal use, and provides 125 psi output. It is fully automatic with preset sample modes from low through high flow settings. In addition, up to 99 unique user-created flow rates can be saved in FRAM memory. The Controller can also be operated manually if your

batteries run out in the field, using only a compressed gas source.

The **12 Volt Compressor** is lightweight and compact, ideal for field use. It uses any 12 Volt DC power source, such as a car or truck vehicle battery, and comes with alligator clips. The compressor operates at 125 psi and is equipped with a 2 US gallon (7.6 liter) air tank which is rated to 150 psi.



The **410 Peristaltic Pump** operates to the suction lift limit, allowing vacuum pumping or pressure delivery of liquids or gases. It is ideal for vapor or water sampling from shallow wells and surface water. The Solinst Peristaltic Pump has reversible flow and a variable pumping rate depending on use of either 3/8" or 5/8" (10 mm or 16 mm) silicon tubing.

The power cable is fitted with alligator clips and uses any 12 volt external DC supply. It can deliver from 40 ml/min. almost to 3.5 liters/min. The pump is very compact and easy to use, with a handle and one easy-access control on the top of the pump. The metal case is water resistant and has no grates or openings.



The **425 Discrete Interval Sampler** is excellent for obtaining representative groundwater samples from below product layers, or for sampling within floating or sinking product layers, and also for sampling at discrete depths in a well. The reel mounted stainless steel sampler has a convenient

sample release device and is easy to decontaminate without the need for tools. It is pressurized with a hand pump before entering the well. No water flows through the sampler on the way down the well. When the pressure is released, the sampler fills directly from the sampling zone.



The **404 Waterra Pump** is ideal for dedication. The system includes a simple footvalve and length of polyethylene tubing, which is very inexpensive. Sampling to depths of 100 ft (30 m) can be performed by hand, or with the inexpensive hand pump handle,

and to 250 ft (75 m) with an electric or gasoline pump controller. The Waterra Pump is suitable for purging, sampling and developing wells. It easily handles heavily laden, silty water. A variety of footvalve sizes, surge blocks, filters and 4 tubing sizes are available.

®Teflon is a registered trademark of DuPont Corp.

Why Multilevels?

Contaminant plumes usually display considerable variations in concentration over small vertical distances. Conventional monitoring wells can be ineffective in defining plumes because long well screens mix water samples of varying concentrations. Worse yet, ambient flow of groundwater in conventional monitoring wells

can spread contamination within the aquifer. Multilevel systems provide groundwater samples from multiple depth-discrete levels (ports) optimizing the amount of information obtained in a single monitoring hole. A transect of Multilevel Systems across a site more clearly identifies the area of maximum concentration.

The **403 CMT® Multilevel System*** provides the simplicity and low cost of a bundle-type installation, with the benefits of backfilling or sealing around a single tube.

The CMT offers low cost multilevel monitoring up to 7 zones in a single tube, with no joints. The narrow 3-Channel System is ideal for installation using direct push rigs. For such installations, bentonite and sand cartridges are available to give reliable seals between zones. Fast installation ensures the hole is not left open to deteriorate or contaminate.

The CMT System uses continuous polyethylene multichannel tubing which is custom-built on site with screened intervals at desired sampling zones. Reliable seals and sand packs can be

placed around the single tube using standard backfill methods, or using pre-formed cartridges in the 3-Channel System.

The CMT Multilevel allows detailed 3-D water levels and water samples at an affordable cost. Detailed transect monitoring of plumes using CMT Systems enable zones of high concentrations to be identified quickly, simply, and at less cost. This gives data that allows better decision-making.

Water levels can be accurately established and samples taken using small diameter portable equipment available from Solinst. If preferred, a sampling tube can be dedicated to a channel that is not needed for water level monitoring. Special wellhead seals are also available to allow vapor sampling in the system.



3-Channel Sand & Bentonite Cartridges



7 and 3-Channel CMT® with Wellhead



The Micro Double Valve Pump



Tag Line



CMT Installation at UK Chlorinated Solvents Site (Source: Waterra, UK)

* Patented ©CMT is a registered trademark of Solinst Canada Ltd

The **401 Waterloo Multilevel System*** allows detailed groundwater monitoring from many zones in one borehole, without cross-contamination between monitoring zones. When a number of systems are used at one site, a detailed 3-dimensional picture can be obtained for a more accurate assessment of hydrogeological parameters.

with dedicated Transducers, Bladder Pumps and/or Double Valve Pumps. Alternatively, a port may be fitted with a monitoring tube that is left open for use with narrow diameter portable equipment, such as the 102 or Mini 102 Water Level Meter and a narrow diameter Waterra Pump, a Peristaltic Pump or the Micro Double Valve Pump.



Monitoring Dedicated Instruments

In 3" to 4" bedrock boreholes and pre-cased wells, Waterloo packers give permanent seals to isolate discrete zones. In overburden, Systems can be placed within pre-cased holes with packers, or installed using standard tremie placement of bentonite seals and sand packs.

The System is modular to allow ports to be located accurately at desired monitoring zones. The zones are permanently isolated by the packers or seals and each port is individually connected to the surface. Ports can be fitted

Ports, packers and casing lengths are assembled, as needed, into a water-tight PVC or stainless steel casing string. The modular Waterloo System allows complete customization to each application. Systems can be installed on an angle or vertically. A drilling rig is not necessarily required during installation. Monitoring is fast and efficient, especially if dedicated equipment is used.

Multilevel Systems decrease long term project costs, while increasing the amount of valuable data. High resolution monitoring allows for more detailed site and risk assessments and evaluations.



Packer



Ports

* Patented



The **615 Drive-Point Piezometers** are cost-effective for initial site investigations, plume delineations, and as low-cost mini well points. They are excellent for groundwater or soil gas sampling,

underground storage tank monitoring, and as sparge points. The stainless steel piezometer point has a 50 mesh screen, uses 3/4" NPT pipe and a sampling tube if higher quality samples are required.



The **601 Standpipe Piezometer** is a low cost piezometer, excellent for taking water level measurements. The PVC tip is suitable for pushing into very loose sands at the base of a borehole, or

for backfilling in place within test pits and pre-augered holes. It uses a porous polyethylene filter inside a perforated PVC tip which connects to the surface with 3/4" (19 mm) ID PVC extensions.



The **660 Drive-Point Profiler** allows collection of groundwater samples from multiple points, at discrete zones, in a single drive. This allows a detailed vertical profile with only one drive of the rig. The profiler tip is connected to a Peristaltic Pump

which flushes the profiler tip with de-ionized water during driving to prevent cross contamination and is reversed to obtain a sample. It allows detailed plume delineation quickly and inexpensively. An expendable grout tip is available to allow easy decommissioning.



The **429 Stainless Steel Point-Source Bailer** has an easy sample release device and dual check valves top and bottom. The check valves prevent water at other depths from mixing with the sample during retrieval.

Point-Source Bailers are available in 0.5", 1", 1.5" and 2" diameters (12.7, 25.4, 38.1, 50.8 mm), and lengths from 1 ft to 4 ft (305 mm and 1220 mm). The Solinst Tag Line with marked cable can be used to facilitate the raising and lowering of the bailer.



The **428 Disposable Bailer** is a low cost bailer made of translucent HDPE (high density polyethylene). The standard bailer is 1.5" x 3 ft (38 mm x 915 mm) and holds more than one liter. A narrow 3/4" (19 mm) bailer holds over 250 ml.

For ease of use, the top and bottom of the bailer are tapered and a sample release device is included. An optional low flow Sample Release Device is available for the standard 1.5" (3.8 mm) bailer.



The **800 Low Pressure Packers** are simple, inexpensive and inflate with a hand pump. They come as single or straddle packers and can be lowered into the well on low density polyethylene tubing or a rigid PVC pipe. The gland is made of black carbon reinforced rubber.

The packers are available in sizes to fit wells and boreholes from 1.9" – 4.5" (48.3 – 114.3 mm). The smaller packer has a gland length of 23" (584 mm) and the larger 30" (762 mm). Maximum pressure for the smaller packer is 50 psi (345 kPa) and the larger 30 psi (205 kPa). The Solinst Tag Line can be used as a marked safety line, if desired.



The **703 Waterloo Emitter™** is a simple, low cost device for the controlled release of oxygen or other amendments to encourage and sustain the growth of microorganisms required for in-situ bioremediation of contaminated groundwater.

Ideal for the diffusion of oxygen to enhance the bioremediation of BTEX and MTBE. Emitters provide immediate bioavailability of molecular oxygen for aerobic biodegradation enhancement, with no loss of amendment gas due to bubbling.

Available to fit 2", 4" and 6" (50, 100 and 150 mm) wells and boreholes, the Emitters are easy to install and remove. They do not require constant monitoring and attention or electricity.

The 2" (50 mm) system can also be installed through larger direct push casing. Almost any appropriate fluid (gas or liquid) can be used with the Waterloo Emitter diffusion technology to apply specific chemicals to a groundwater plume.