Solinst®

Levelogger 6

Model 3001 Data Sheet



Levelogger® 6

Model 3001

The Levelogger 6 records highly accurate groundwater and surface water level and temperature measurements. It combines a pressure sensor, a temperature detector, a 10-year lithium battery, and a datalogger that stores up to 150,000 data sets. All are sealed within a 22 mm x 160 mm (7/8" x 6.3") stainless steel housing with a corrosion-resistant baked-on coating using polymerization technology. Double o-ring seals provide superior leak protection.

The Levelogger 6 measures absolute pressure using a Hastelloy® pressure sensor. This sensor offers high resolution and an accuracy of 0.05% FS. Readings stay stable even in extreme pressure and temperature conditions. The Hastelloy sensor can withstand 2 times over-pressure without permanent damage. Combined with the durable coating inside and out, the Levelogger 6 has high corrosion and abrasion resistance in harsh environments.

The Levelogger 6 uses a Faraday cage design, which protects against power surges or electrical spikes caused by lightning. Its durable, maintenance-free design, high accuracy, and stability make the Levelogger 6 the most reliable instrument for long-term, continuous water level recording.

Levelogger 6 Features

- **Reliable Connectivity with 2X the Speed:** Mk3 USB-C PC Interface Cable doubles communication speeds and provides in-field diagnostics for Direct Read Cables.
- **Upgraded Electronics:** Enhanced stability and accuracy across temperature ranges, with improved capability to capture subtle data trends.
- **Improved Time Tracking:** Stores date/time stamps to support multiple time zone displays, including local time, GMT, and UTC.
- **Advanced Data Analysis:** Built-in functions to identify minimum, maximum, and average values over user-defined intervals, and filters to screen out noisy data.
- **Streamlined Data Management:** Merge multiple files into a single file for easier long-term monitoring.
- **Data Loss Protection:** Dedicated backup storage for latest 20,000 readings ensures data is never lost.
- **Instant Diagnostics:** Get "up front" diagnostic information and real-time readings immediately upon connection.



Our Commitment and Support

For over 50 years, Solinst Canada Ltd. has delivered exceptional workmanship and an **unwavering commitment to quality** in groundwater and surface water monitoring instrumentation, as such, every Levelogger 6 is the result of ground-up engineering.

We value our relationship with customers as much as the data they collect. When you choose Solinst, you access **industry-leading technical support**. Our experienced team provides unlimited premium help throughout your project. Whether you need technical advice or **field-proven solutions**, you can rely on our high-quality support for your high-accuracy equipment.

Applications Suited to the Levelogger 6

- Aquifer characterization: pumping tests, slug tests, etc.
- Watershed, drainage basin and recharge monitoring
- Stream gauging, lake and reservoir management
- Harbour and tidal fluctuation measurement
- Wetlands and stormwater run-off monitoring
- Water supply and tank level measurement
- Mine water and landfill leachate management
- Long-term water level monitoring in wells, surface water bodies and seawater environments

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Flexible Communication

Existing Desktop Readers, Field Readers, PC Interface Cables and Direct Read Cables work with the Levelogger 6 single-eye optical interface. New Cables have been updated to USB-C connections for easier modern device connectivity.

Levelogger PC Software is streamlined, making it easy to program dataloggers and view and compensate data in the office or the field. Data compensation is made simple: multiple data files can be barometrically compensated simultaneously.

The Levelogger App Interface on your in-field Leveloggers creates a Bluetooth® connection between your dataloggers and the Solinst Levelogger App on your smart device.

The Solinst Readout Unit (SRU) connects to your deployed Leveloggers to display and save real-time, automatically barometrically compensated water level readings. Also an option, the DataGrabber is a field-ready USB data transfer unit.



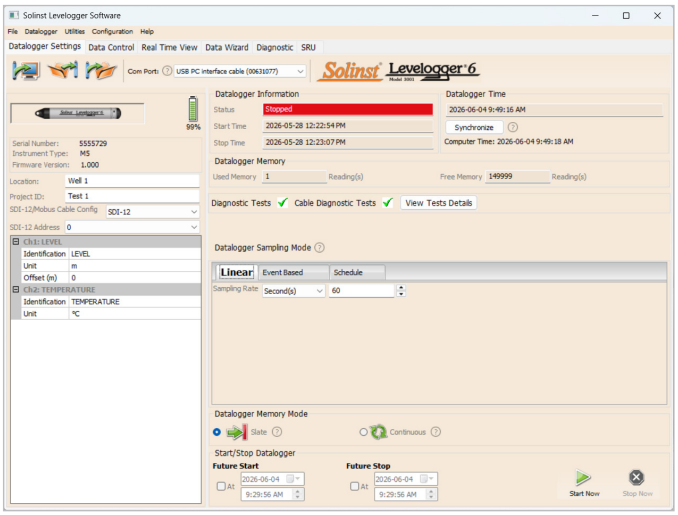
Remote monitoring options include the LevelSender, a simple and compact device that fits right in a 2" well, SolSat Satellite Telemetry, and the RRL Remote Radio Link. In addition, Levelogger 6 Series dataloggers are SDI-12 and MODBUS-compatible via an Interface Cable.

Levelogger Setup Using PC Software

Programming Leveloggers is extremely intuitive. Simply connect to a PC using a Desktop or Field Reader, or PC Interface Cable when a Levelogger is deployed with a Direct Read Cable. Use a single screen to fill in your project information and sampling regime. Settings templates can be saved for easy reuse.

The Levelogger time may be synchronized with the PC clock or set to specific time zones. There are options for immediate start or future start and stop times.

The percentage battery life remaining and the amount of free memory are indicated on the settings screen, along with other helpful diagnostic information.



Convenient Sampling Options

Leveloggers can be programmed with linear, event-based, or a user-selectable sampling schedule. Linear sampling can be set from 1/8 second to 99 hours.

Event-based sampling can be set to record when the level changes by a selected threshold. Readings are checked at the selected time interval, but only recorded in memory if the condition has been met. A default reading is taken every 24 hours if no “event” occurs.

The Schedule option allows up to 30 schedule items, each with its own sampling rate and duration. For convenience, there is an option to automatically repeat the schedule.

Helpful Utilities

The Diagnostic Utility can be used in case of an unexpected problem. It checks the functioning of the program, calibration, backup and logging memories, the pressure transducer, temperature sensor and battery voltage, as well as enabling a Memory Dump, if required. Detailed diagnostic reports can be shared to help with troubleshooting.

A firmware upgrade will be available from time to time, to allow upgrading of the Levelogger 6, as new features are added.

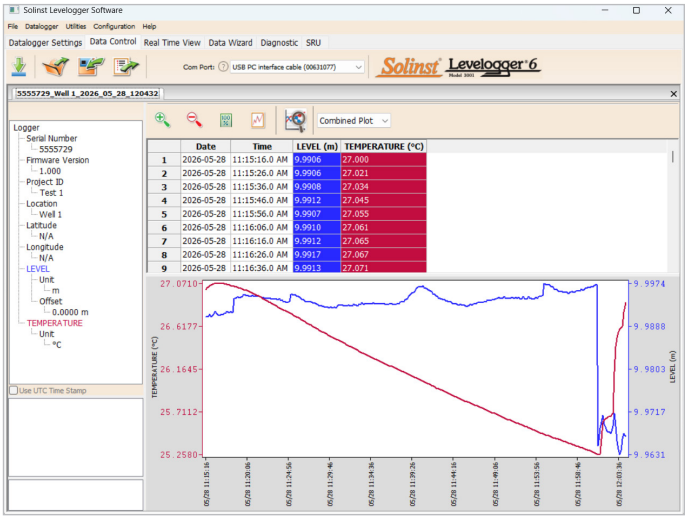
Data Download, Viewing and Export

Data is downloaded to a PC with the click of a screen icon. There are multiple options for downloading data, including 'Append Data' and 'All Data'. The software also allows immediate viewing of the data in graph or table format using 'Real Time View'.

Level data is automatically compensated for temperature; the temperature data is also downloaded. Barometric compensation of Levelogger data is performed using the Data Wizard, which can also be used to input manual data adjustments, elevation, offsets, density, and adjust for Barometric efficiency.

Use the Data Analysis function to obtain interval-based data (e.g., minimum, maximum, and average values per user-defined interval). Use filters to extract and view critical data only.

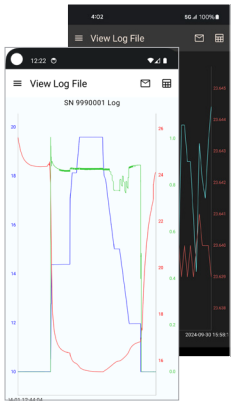
The Levelogger Software allows easy export of the data into a spreadsheet or database for further processing. Merge multiple data files into one to streamline long-term monitoring projects.



Levelogger App Interface

The Levelogger App Interface uses *Bluetooth*® technology to connect your Levelogger to your smart device. With the Solinst Levelogger App, you can download data, view real-time data, program, and stop/start your Leveloggers. Data can be e-mailed from your smart device directly to your office (see Model 3001 Levelogger App Interface data sheets).





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Solinst Readout Unit (SRU)

Connect an SRU to an in-field Levelogger via a Direct Read Cable, or Threaded or Slip Fit Adaptor, to display instant water level readings, Levelogger status, save a real-time logging session, and download data to the SRU memory.



DataGrabber

The DataGrabber is a field-ready data transfer device that allows you to copy data from a Levelogger onto a USB flash key (Dual -C key provided). The DataGrabber is compact and connects to the top end of a Levelogger's Direct Read Cable, or directly to a Levelogger using an adaptor. One push-button downloads all of the data in a Levelogger's memory to a USB device.



Smart In-Field PC Interface Cable

The Mk3 USB-C PC Interface Cable makes using the Levelogger 6 easier and more efficient. It doubles the communication speed of previous PC Interface Cables to 19.2k Baud, drastically reducing the time required to download large datasets, and allowing in-field firmware updates. It also introduces smart hardware diagnostics, including integrated LED indicators for instant status updates and a built-in self-test capability that can automatically detect faults like short-circuits or electrical noise from the connected Direct Read Cable.

- **Double the Speed:** High-speed 19.2k Baud communication for faster downloads.
- **Compatibility:** Backwards compatible to work with previous models.
- **Modern Connectivity:** USB Type-C connector ensures device compatibility.
- **Visual Feedback**: Built-in LEDs show communication status and errors at a glance.
- **Smart Diagnostics:** Integrated self-test to detect Direct Read Cable faults or noisy environments.



Faster and more reliable communication and download speeds with a Mk3 USB-C PC Interface Cable

Standard Cable Deployment

Leveloggers may be suspended on a stainless steel wireline or Kevlar® cord. This is a very inexpensive method of deployment, and if in a well, allows the Levelogger to be easily locked out of sight and inaccessible. Solinst offers wireline and cord assemblies in a variety of lengths.

Solinst 3001 Well Cap Assembly

The 2" Locking Well Caps are designed for both standard and Direct Read Cable deployment options.

The well cap has a convenient eyelet for suspending Leveloggers using wireline or Kevlar cord. The Well Cap insert has two openings to accommodate direct read cables for both a Levelogger and Barologger. Adaptors are available to fit 4" wells.

The cap is vented to equalize atmospheric pressure in the well. It slips over the casing, and can be secured using a lock with a 9.5 mm (3/8") shackle diameter.



Levelogger 2" Locking Well Cap Installations (See Well Caps data sheet for more details)

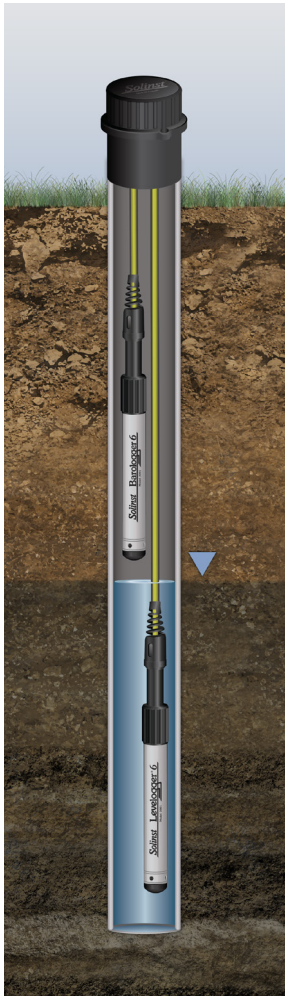
Direct Read Cables

When it is desired to get real-time data and communicate with Leveloggers without removal from the water, they can be deployed using Direct Read Cables. This allows viewing of data, downloading, and programming in the field using a portable PC, or Solinst Levelogger App Interface. You can view and save data to an SRU, or just download data with a DataGrabber.

Leveloggers can be connected to an SDI-12 or MODBUS datalogger using the Solinst SDI-12/MODBUS Interface Cable attached to a Direct Read Cable.

Cable Specifications

Direct Read Cables are available for attachment to any Levelogger in lengths up to 1500 ft. The 3.175 mm dia. (1/8") coaxial cable has an outer polyurethane jacket for strength and durability. The stranded stainless steel conductor gives non-stretch accuracy.



Barologger and Levelogger installed in Well Using Direct Read Cables

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Accurate Barometric Compensation

Leveloggers measure absolute pressure (water pressure + atmospheric pressure) expressed in feet, meters, centimeters, psi, kPa, or bar.

The most accurate method of obtaining changes in water level is to compensate for atmospheric pressure fluctuations using a Barologger 6, avoiding time lag in the compensation.

The Barologger is set above high water level in one location on site. One Barologger can be used to compensate all Leveloggers in a 30 km (20 mile) radius and/or with every 300 m (1000 ft.) change in elevation.

The Levelogger Software Data Wizard automatically produces compensated data files using synchronized data files from the Barologger and Leveloggers on site.

The Barologger 6 uses pressure algorithms based on air rather than water pressure, giving superior accuracy.



Synchronize and Simplify Barometric Compensation Across Entire Site

The recorded barometric information can also be very useful to help determine barometric lag and/or barometric efficiency of the monitored aquifer.

The Barologger 6 records atmospheric pressure in psi, kPa, or mbar. When compensating submerged Levelogger 6, 5, Edge, or Junior data, Levelogger Software can recognize the type of Levelogger and compensate using the same units found in the submerged data file (e.g. feet or meters). This makes the Barologger 6 backwards compatible.

LevelSender Telemetry

The LevelSender is a simple, low cost cellular telemetry system designed to send data from Leveloggers in the field to the Solinst Cloud, or via FTP to a location of your choice (email and SMS are also options). There is two-way communication between the LevelSender and Home Station, allowing remote updates. LevelSender stations are compact in design, which allows them to be discreetly installed inside a 2" (50 mm) well (see Model 9500 data sheet).



SolSat Satellite Telemetry

The SolSat Satellite Telemetry uses Iridium satellite technology to provide global connectivity for your remote water monitoring projects. The SolSat is simple to set up with Solinst dataloggers using an intuitive and secure Wi-Fi App on your smart device. The SolSat features a built-in barometer, solar panel and a compact weatherproof enclosure for deployment almost anywhere.



RRL Remote Radio Link

The RRL Remote Radio Link is ideal for closed-loop, short range applications up to 30 km (20 miles)—ideal for mine sites, landfills, and golf courses. Fits in a 2" (50 mm) well. Barometrically compensated water levels can be obtained and reported using the built-in barometer. Connect up to two dataloggers. (See Model 9200 data sheet).



Levelogger 6 Specifications

Level Sensor:	Piezoresistive Silicon with Hastelloy Sensor
Accuracy:	± 0.05% FS (Barologger 6: ± 0.05 kPa)
Stability of Readings:	Superior, low noise
Resolution:	0.001% FS to 0.0006% FS
Units of Measure:	m, cm, ft., psi, kPa, bar, °C. °F (Barologger 6: psi, kPa, mbar, °C, °F)
Normalization:	Automatic Temperature Compensation
Temp. Comp. Range:	0° to 50°C (Barologger 6: -10 to +50°C)
Temperature Sensor:	Platinum Resistance Temperature Detector (RTD)
Temp. Sensor Accuracy:	± 0.05°C
Temp. Sensor Resolution:	0.003°C
Battery Life:	10 Years – based on 1 reading/minute
Clock Accuracy (typical):	± 1 minute/year (-20°C to 80°C)
Operating Temperature:	-20°C to 80°C
Maximum # Readings:	150,000 sets of readings
Dedicated Backup Memory:	20,000 sets of most recent readings
Memory Mode:	Slate and Continuous
Communication:	Optical high-speed: USB, SDI-12, MODBUS*; 9600 bps, 57600 with USB Desktop/Field Reader, 19.2k with Mk3 USB-C PC Interface Cable
Size:	22 mm x 160 mm (7/8" x 6.3")
Weight:	146 grams (5.2 oz)
Corrosion Resistance:	Baked-on coating using polymerization technology (inside and out)
Other Wetted Materials:	Delrin®, Viton®, 316L stainless steel, Hastelloy, PFAS-free PTFE coating
Sampling Modes:	Linear, Event & User-Selectable with Repeat Mode, Future Start, Future Stop, Real-Time View
Measurement Rates:	1/8 sec to 99 hrs
Barometric Compensation:	Software Wizard and one Barologger 6 in local area (approx. 30 km/20 miles radius)

* SDI-12 and MODBUS communication requires a surface Interface Cable for operation.

Models	Full Scale (FS)	Accuracy	Resolution
Barologger	Air only	± 0.05 kPa	0.002% FS
M5	5 m (16.4 ft.)	± 0.3 cm (0.010 ft.)	0.001% FS
M10	10 m (32.8 ft.)	± 0.5 cm (0.016 ft.)	0.0006% FS
M20	20 m (65.6 ft.)	± 1 cm (0.032 ft.)	0.0006% FS
M30	30 m (98.4 ft.)	± 1.5 cm (0.049 ft.)	0.0006% FS
M100	100 m (328.1 ft.)	± 5 cm (0.164 ft.)	0.0006% FS
M200	200 m (656.2 ft.)	± 10 cm (0.328 ft.)	0.0006% FS

Low Cost Datalogging: See Levelogger 6 Junior data sheet.
Vented Dataloggers: See Model 3250 LevelVent 6 data sheet.
Conductivity Datalogging: See Levelogger 6 LTC data sheet.
Rainfall Datalogging: See Model 3002 Rainlogger 6 data sheet.





Versatile Submersible Water Level Transmitter:

Solinst also offers the Model 301 Water Level Temperature Sensor for communication using MODBUS, SDI-12, and 4-20mA interchangeably with just one probe. It provides continuous, stable water level and temperature readings with options for absolute (non-vented) and gauged (vented) pressure sensor setups. The Water Level Temperature Sensor is easy to integrate into existing monitoring systems, e.g. SCADA or PLC, and used to measure hydrostatic liquid levels long-term in industrial, municipal, and environmental applications. (See Model 301 WLT Sensor data sheet.)

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