



GROUNDWATER
SOLUTIONS



HydroTerra

Environmental Monitoring Specialists

GROUNDWATER LEVEL MONITORING

Solutions from HydroTerra

hydroterra.com.au



HydroTerra groundwater level monitoring solutions

Introducing the HydroTerra range of groundwater level monitoring solutions starting at manual measurement, onto datalogging measurement and finally to our range of telemetered solutions.

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1. Solinst 101 Water Level Meter



The Solinst 101 Water Level Meter is a robust, hand-operated instrument for measuring the depth to water in wells, boreholes, and tanks. It uses a probe and a flat, non-stretch polyethylene tape with permanent, easy-to-read markings to get an accurate reading when the probe touches water, activating a light and buzzer. Two probe options are available: the general-purpose P2 probe, and the pressure-proof P7 probe, which allows for measuring total well depth. Look for the bright red reel!



There is a range of Water Level Meters available to suit your application. Refer to the table on the next page.

Level Measurement Device		Description	Probe Diameter	Standard Tape/Cable Lengths
101 P7 Water Level Meter		Measure depth to water using flat tape marked each mm or 1/100 ft. 101 P7 Meters use laser-marked PVDF flat tape. Measure total well depth with a P7 Probe (Probe is submersible the full length of the tape)	16 mm (5/8")	30-600 m (100 - 2000 fL)
101 P2 Water Level Meter		101 P2 Meters use heat-embossed polyethylene tape. The P2 Probe is simple to clean and repair.	14 mm (0.55")	30 - 300 m (100 - 1000 FL)
101B Water Level Meter		Measure depth to water using heat-embossed polyethylene flat tape, marked every centimeter. The P1 Probe is leak-proof.	12.7 mm (1/2")	30 m, 60 m, 100 m
101D Water Level DrawDown Meter		Measure depth to water and monitor drawdown using PVDF flat tape, laser-marked each mm or 1/100 ft. Probe is submersible the full length of the tape	16 mm (5/8")	30 - 600 m (100 - 2000 fL)
102 Water Level Meter		Measure depth to water using narrow polyurethane cable, laser marked each mm or 1/100 ft.	P4: 4 mm (0.157") P10:10 mm (3/8")	30 - 300 m (100 - 2000 fL)
102M Mini Water Level Meter			P4: 4 mm (0.157") P10:10 mm (3/8")	25 m (80 ft.)
103 Tag Line		Measure well depths using durable PVDF cable, lasermarked every 5 cm or 1/10 ft., or PVDF flat tape lasermarked every mm or 1/100 ft. (Also useful as a marked support line for sampler, packers and dataloggers)	19 mm (3/4") or 13 mm (1/2")	30 - 300 m (100 - 2000 fL)
105 Well Casing & Depth Indicator		Detect base of steel well casing and measure the total depth of a well or borehole. Measurements are taken using PVDF flat tape laser-marked each mm or 1/100 ft.	22 mm (7/8")	30 - 600 m (100 - 2000 ft.)
201 Water Level Temperature Meter		Measure water level and temperature. Water Level measurements are taken from PVDF flat tape laser-marked each mm or 1/100 ft.	16 mm (5/8")	30 - 600 m (100 - 2000 ft.)
107 TLC Meter		Measure water level, temperature and conductivity. Water Level measurements are taken from PVDF flat tape laser-marked each mm or 1/100 ft	19 mm (3/4")	30 - 300 m (100 - 1000 ft)
122 Interface Meter		Measure water levels and oil/water interfaces. Using the standard 122, levels are taken from PVDF flat tape laser-marked each mm or 1/100 ft. Using the 122M, levels are taken from PVDF cable laser-marked each or 1/100 ft. Intrinsically safe and ATEX Certified.	16 mm (5/8")	15 - 300 m (50 - 1000 ft.)
122M Mini Interface Meter			16 mm (5/8")	Cable: 25 m (80 ft.)

2. Handheld Sonic Water Level Meter



The Solinst 104 is a portable, hand-held sonic water level meter that measures the depth to static water using acoustic pulses. It consists of a control unit and a probe that sits in a well opening, transmitting a sound wave and measuring the time it takes to bounce back from the water's surface. The device is used for simple and quick measurements in wells and pipes without the need to lower any equipment into the water, and it features settings to compensate for factors like well diameter and obstructions for improved accuracy.



Solinst 104

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3. Fixed Sonic Water Level Meter



The ENO Scientific Well Watch 700 measures water levels using sound waves, with no risk of contamination. It can measure water levels down to 2,000m, up to 75cm well diameter and operates even with submersible pumps in place. It will easily integrate with SCADA systems through a range of communication options and includes an internal datalogger that will store up to 25 million data points. Ideal for remote applications or for wells with significant infrastructure or even applications where caustic water conditions exist.



ENO Scientific
Well Watch 700



4. Leveloggers

Leveloggers are pressure-based dataloggers used to measure and record water levels in groundwater and surface water. They work by measuring absolute pressure, which is a combination of water pressure and atmospheric pressure. The actual water level is determined by using the datalogger's software to automatically compensate for atmospheric pressure fluctuations with the help of a separate barometric pressure sensor (Barologger). This allows for continuous, automated monitoring in applications like flood and drought studies, watershed recharge, and lake monitoring.



There are a number of deployment options available for leveloggers ranging from suspension on a cable through through to real-time telemetered systems. Here is a summary of these options.

4a. Wireline / Kevlar Cord Deployment

Use this method when you wish to minimize up-front costs, and pre-program Leveloggers in the office. Lower into the well, suspended on wireline or Kevlar cord.



Stainless Steel Wireline Cable Spool and Hook



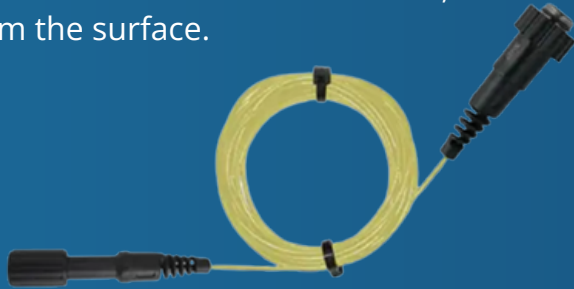
Spool of Kevlar Cord

Add some well caps to assist with the suspension of the wireline / Kevlar Cord in standard 50mm or 100mm wells.



4b. Direct Read Cable Deployment

This method is suitable when you wish to have direct communication to your Levellogger when it is deployed. Rather than removing the Levellogger every time you wish to access the recorded data, connect to the cable and download data quickly from the surface.



When a Direct Read Cable is deployed, a number of in-field communication options become available simplifying the data download process:

1st Option: Use your PC with a PC Interface Cable.



Connecting your PC to the Direct Read Cable via the PC Interface cable, enables you to program, view or download logger data.

2nd Option: The Levellogger 5 App Interface.



Levellogger 5 App Interface connected to an L5 Direct Read Cable provides a wireless Bluetooth® connection between the Levellogger and the Solinst Levellogger App on your iOS or Android™ smart device, for programming or downloading data. Quick, simple and easy to collect data on a flexible platform.

3rd Option: DataGrabber 5



This is a simple, inexpensive, portable data transfer device for use in the field. With one push-button, all of the data stored in a connected Solinst datalogger is copied to a USB flash drive key. The data can then be opened using Levellogger PC Software for viewing, saving and performing data compensations.

5. Dataloggers with Telemetry

Welcome to the world of real-time data!. Would you like to know what is happening with groundwater level or even water quality at a remote location?

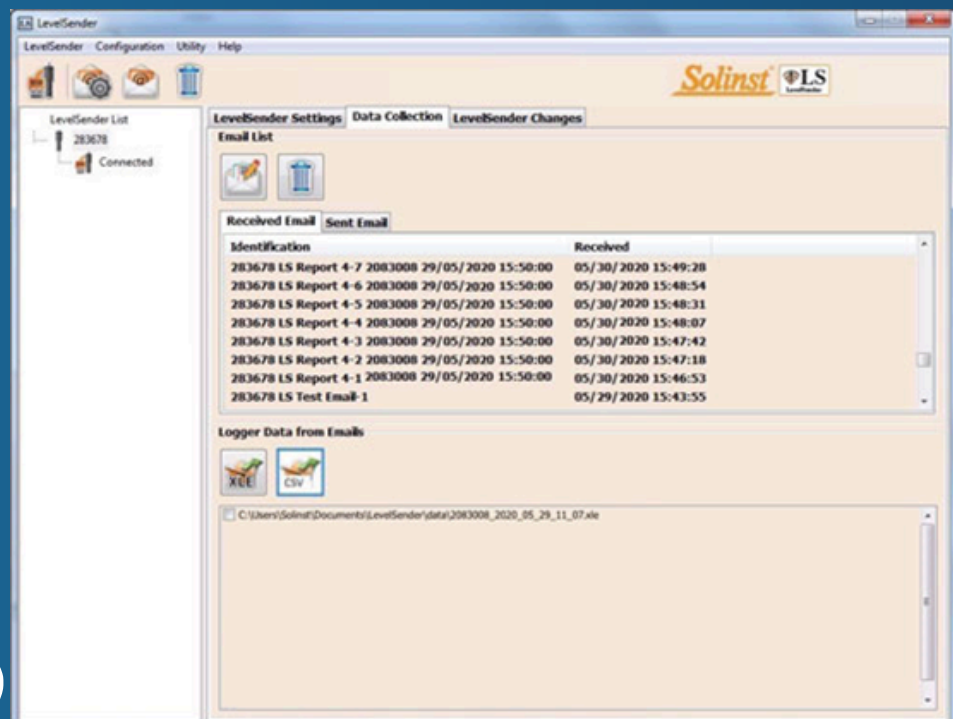
Traditionally, you would drive to the site and download historical data to tell you what had happened historically. With the benefit of telemetry, you can see in real time what is happening and can quickly act if there is a significant event. Here are some options:

5a. Solinst LevelSender Cellular Telemetry

The Solinst 9500 LevelSender 5 is a compact, cellular telemetry system that wirelessly sends data from Solinst dataloggers to a remote online platform. It's designed to automate the collection of water level data from remote sites, reducing the need for manual site visits and allowing for features like high and low-level alarms and remote data access.



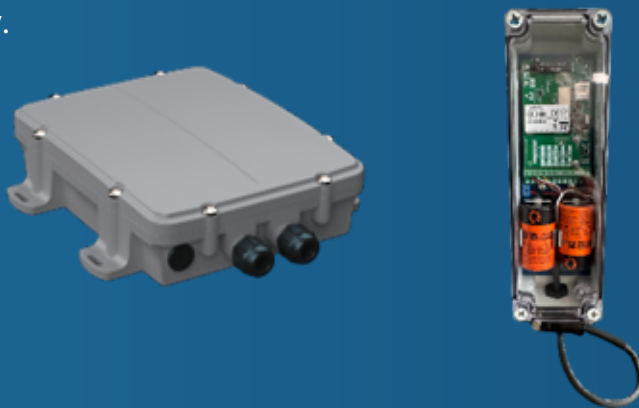
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5b. HydroTerra Stygo1 Cellular Telemetry

Stygo 1 is a cellular IoT sensor hub with multiple integrated sensor options including water level, electrical conductivity, pH, turbidity and temperature monitoring. Ultra-low power consumption - only requires D cell batteries. Connectivity is provided via Telstra's Cellular LTE-M/NB-IoT Network. The hubs are waterproof with an ultra-rugged IP68 housing. Depending on your requirements other bespoke options can include a feature-rich array of 9 inputs/outputs and multiple sensor connectivity.

Multiple form factors suitable for pole mount, monument mount or mounting on a floating buoy.



5c. HydroTerra Stygo3 Solar Powered Cellular Telemetry

Stygo 3 is a Groundwater 4G Cellular Solar Powered IoT Sensor Hub with multiple integrated sensor options including groundwater level, electrical conductivity, pH, turbidity and temperature monitoring. Various mounting options includes bracket/pole, direct install to groundwater monuments/standpipe cover and buoy mount. Ultra-low power with light weight solar power.



5d. Aquatel Cellular Smart Telemetry Device

Aquatel is a smart telemetry device designed for water level sensors and water quality probes. It features long battery life, a GPS receiver and a barometric pressure sensor for location and compensation. Designed for the AquaRead range of Leveline Sensors and water quality probes, the Aquatel enables quick plug and play setup and remote configuration via a Smartphone. Constructed with carbon fibre and aluminium, it is designed to simplify setup, lengthen deployment and optimise data management.



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5e. HydroTerra Neon Cellular / Satellite Telemetry and Remote Logger

For complex applications with significant on-site processing requirements, the Neon Remote Telemetry / Logger is the ideal solution. Multiple sensors including water level and water quality are supported simultaneously through Modbus, SDI-12, Analog channels and digital inputs. Complex on-board calculations can be performed in addition to the control of external equipment. Additionally, bi-directional communication is available allowing for remote changes to be implemented. This is the ideal solution for more demanding applications.

Note: Supports both 4G cellular and satellite communications via Iridium.



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5f. Stygo 6 Wildeye Cellular 4G IoT logger

The newest addition to our range. The Stygo 6 is a revolutionary device that connects meters & sensors directly to your phone - out of the box. Connect your Stygo 6 Wildeye to any compatible meter or sensor in 4G coverage and continuously monitor sensors and meters, control remote pumps and valves, and generate alerts and reports. Wildeye comes with a website subscription that allows you to view data on graphs, dashboards or map views, and to configure and control your fleet of devices. The Stygo 6 device is IP68 rated making it suitable for challenging applications where it can even be submerged at times. It supports a wide range of power inputs with either ultra long-life internal batteries or a rechargeable version from solar panels, battery packs or mains power.



5g. Solinst SolSat 5 Satellite Telemetry

SolSat 5 Satellite Telemetry is an advanced telemetry system that leverages Iridium satellite technology to provide global connectivity for your remote water monitoring projects. The SolSat 5 is simple to set up with Solinst dataloggers using an integral, secure Wi-Fi App on your smartphone or laptop.

SolSat 5 Satellite Telemetry connects to one Solinst Levellogger 5 datalogger or LevelVent 5. The built-in barometric sensor allows for automatically compensated water level data from the field. Along with water level, temperature, conductivity, or barometric data, battery voltage from the remote SolSat 5 is received with each data report.



5h. Stygo 4 Myriota FlexSense Low Power Nanosatellite IoT

The FlexSense is a great solution for remote locations lacking 4G/5G coverage. FlexSense is a low-power, cost-effective, direct-to-orbit IoT device that uses Myriota's UltraLite LEO nanosatellite constellation. Built to withstand the elements, FlexSense's tough, UV-resistant enclosure and weather-proof 3m cable ensure it can handle whatever nature throws its way. With an IP67 rating, it offers complete protection from dust particles and can withstand short immersion in water up to 1m, keeping your monitoring steady in any setting. Ideal for level monitoring in remote wells where the cost of site visits is time-consuming and expensive.



6. Locating Telemetry Devices and Some Considerations

Here are some common locations for placing telemetry devices and things you may need to consider.

6a. Pole Mount

This is a good option for many applications and is suited for most of HydroTerra's range of fixed telemetry units. Advantages are that the telemetry device is high with best exposure to 4G / satellite signals and unlikely to be submerged underwater. Also, pole can be used for mounting a solar panel and/or a directional antenna. Considerations are visibility in high traffic areas where theft and vandalism could be an issue.



6b. Well Monument Mount

The telemetry device can be mounted either inside the well monument or attached to the outside. Outside mounting is suitable when a solar panel is attached – e.g. the Stygo 3 unit or for satellite telemetry where a clear view to the sky is needed. When security is an issue, a telemetry device such as the Stygo1 monument mount can be used. This is hidden away in a locked monument and if the monument is constructed of plastic, cellular telemetry will continue to operate. Alternatively, a small external antenna can be installed on the outside of a metal monument.



6c. Under a Gatic Cover

This is probably one of the more difficult locations and presents a number of challenges. Signal reception under a metal gatic cover is likely to be seriously degraded. Limited space and submergence in water following rainfall events can be an issue. Gatic covers are often located in a heavily trafficked area and this can also pose problems.

However, there are certainly some solutions available. Suitable rugged antennas are available for mounting on top of gatic covers. There are also non-metal gatic covers certified for traffic areas that allow telemetry devices to operate successfully underneath. Finally, we can offer a range of devices that are small, IP68 rated and have a very long battery life. These are very well suited to such difficult locations.



Marketplace & Rental



Product Sales

Most suitable equipment and consumables for customer applications

Rental Services

Short-term monitoring equipment supply

Workshop, Support & Training



Workshop

Scheduled maintenance, calibration services and repairs in HydroTerra's Workshop.

Webinars and Training

held regularly to facilitate education



Field Services

Site Collection



Undertaking field measurements and analysing collected samples in a lab



Site Data Management

Generating publishable quality coded data files of known provenance



Site Reporting

Reporting on the sites operational and environmental compliance



DataStream™

Monitoring Systems



System Design

Developing monitoring plan and monitoring system design



System Specification

Specifying measurement points, equipment choices and data reporting



System Supply

Sourcing best software, hardware, hosting and telco options



Configure and Test

On selected systems design, calibration and alarm setup



System Install

Building and installing monitoring and sampling systems onsite.



System Oversight

Overseeing the monitoring system to ensure measurements are being captured and reported.




System Maintenance

Implementing the maintenance programs scheduled and unscheduled needs.



System Training

Deliver training programs to site operators enabling in-house maintenance and reporting.



Need the right solution for your
Surface water flow or discharge
monitoring application?

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Today!

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