

Downhole Water Level Dataloggers

Applications

The Model 4573 Series Downhole Water Level Dataloggers accurately monitor and record water levels and temperatures. They are ideally suited for...

- Water level monitoring
- Well monitoring
- Environmental studies
- Waste water treatment
- Flood analysis
- Groundwater monitoring
- Irrigation canals
- Lake and wetland studies
- Storm water studies
- Landfill and hazardous site analysis
- Tidal Studies



• Model 4573-5 Optic USB Base Station.



• Model 4573-6 Waterproof Shuttle.



• Model 4573-1, 4573-2 and 4573-3 Downhole Water Level Dataloggers (left to right).

Operating Principle

The 4573 Series are battery powered downhole water level and temperature dataloggers. They feature a sealed (absolute) durable ceramic pressure transducer, a temperature sensor and a built-in datalogger all contained in a rugged, submersible housing.

The Model 4573 is available with different housings making them well suited for use in a variety of water level applications. The Model 4573-1 has a stainless steel housing and is ideal for recording water levels and temperatures in shallow wells, streams, lakes and freshwater wetlands. For saltwater deployments, such as brackish wetlands and tidal areas, the Model 4573-2, with a Titanium housing, should be used.

The 4573-1 and 4573-2 are available in 4 pressure ranges with measurement accuracies between $\pm 0.075\%$ F.S. and $\pm 0.05\%$ F.S. and are supplied with a 3-point NIST traceable calibration certificate.

For less demanding applications and/or where cost is a consideration, the Model 4573-3 with a polypropylene housing, suitable for use in both fresh and saltwater, can be considered. The Model 4573-3 is available in 3 pressure ranges, with measurement accuracy $\pm 0.1\%$ F.S. but, unlike the Model 4573-1 and 4573-2, it is not supplied with a NIST traceable calibration certificate.

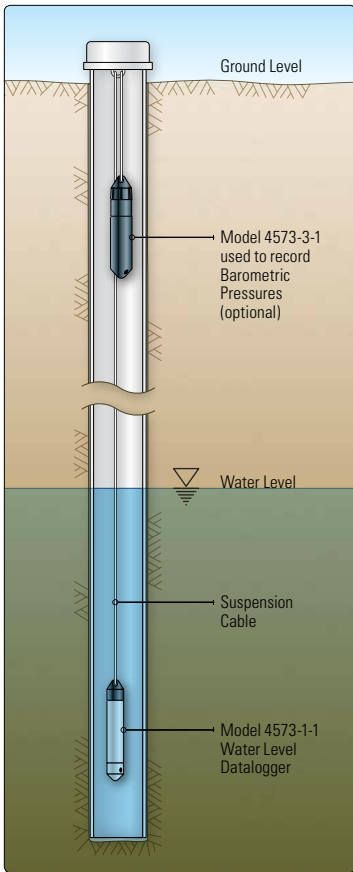
Software

The Model 4573-8 user-friendly software is used to program, and to retrieve and plot data from the Model 4573 Series. Logging intervals ranging from seconds to hours can be set, along with custom scan intervals as may be required. Scans can be programmed to start immediately, or at user defined intervals for specific dates and times. The software also allows the user to check the logger status, filter and export data, and to save changes to graphs in project files.

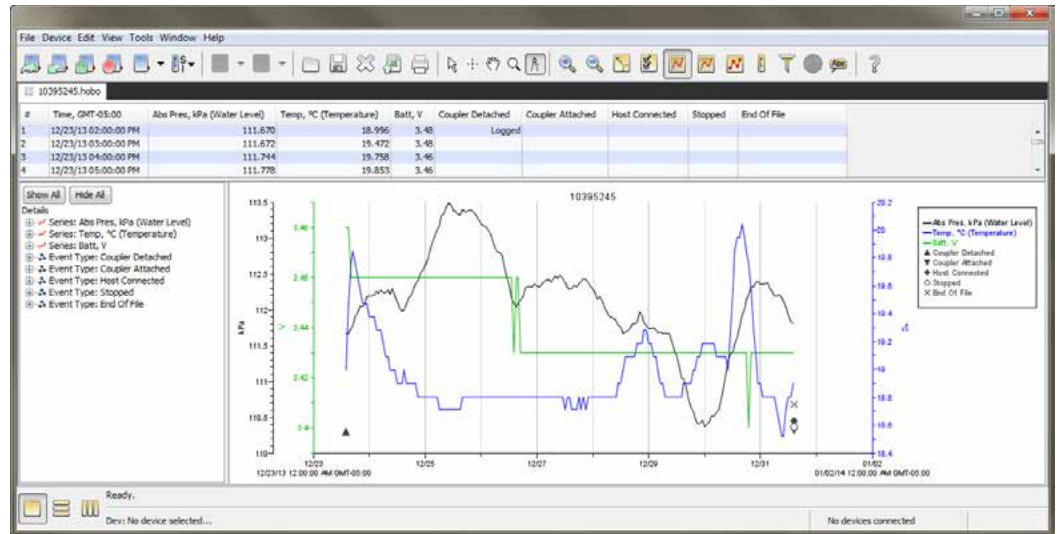
Programming & Data Retrieval

The Model 4573-5 Optic USB Base Station is used to program all models using infrared technology to transfer data thereby allowing the dataloggers to utilize a completely sealed and waterproof design. The Optic USB Base Station connects to the computer via USB and to the Model 4573 Series via appropriate couplers (provided) and converts the USB communication protocol into an infrared protocol used by the dataloggers.

For remote deployments and/or for data retrieval in the field the Model 4573-6 Waterproof Shuttle can be used. The Waterproof Shuttle provides convenient readout and re-launching of the Model 4573 dataloggers with an Optic USB interface, and is waterproof to 20 m (66 ft). It can also be used as a base station.



• Typical installation used to compensate for barometric pressure changes.



• 4573-8 Data Recorder Software screen shot.

Barometric Corrections

The Model 4573 Series record absolute pressure, which includes atmospheric pressure and water head. Atmospheric pressure changes with weather and altitude and left uncompensated can result in errors of 0.6 m (2 ft) of water or more. To compensate for barometric pressure changes, a second low pressure unit (Model 4573-3-1) can be deployed in the same well or at the same location as the water level of interest, but above the water, in air (see inset left).

Barometric pressure readings are generally consistent across a region (except during fast-moving weather events), so one Model 4573-3-1 Downhole Water Level Datalogger recording barometric pressures located within 15 km (10 miles) of the submerged 4573 Series Downhole Water Level Dataloggers can be used without significantly degrading the accuracy of the compensation. (The Model 4573-8 includes a Barometric Compensation Assistant for easy and accurate barometric compensation).

Technical Specifications

Model	4573-1/2-1	4573-1/2-2	4573-1/2-3	4573-1/2-4	4573-3-1	4573-3-2	4573-3-3
Range	0-4 m (0-13 ft) 0-145 kPa (0-21 psia)	0-9 m (0-30 ft) 0-207 kPa (0-30 psia)	0-30 m (0-100 ft) 0-400 kPa (0-58 psia)	0-75 m (0-250 ft) 0-850 kPa (0-123 psia)	0-4 m (0-13 ft) 0 to 145 kPa (0-21 psia)	0-9 m (0-30 ft) 0 to 207 kPa (0 to 30 psia)	0-30.6 m (0-100 ft) 0 to 400 kPa (0 to 58 psia)
Factory Calibrated Range (0° to 40°C; 32° to 104°F)	69 to 145 kPa (10-21 psia)	69 to 207 kPa (10-30 psia)	69 to 400 kPa (10-58 psia)	69 to 850 kPa (10-123 psia)	69 to 145 kPa (10-21 psia)	69 to 207 kPa (10-30 psia)	69 to 400 kPa (10-58 psia)
Accuracy	±3 mm (0.01 ft) (±0.075% F.S.)	±5 mm (0.015 ft) (±0.05% F.S.)	±15 mm (0.05 ft) (±0.05% F.S.)	±38 mm (0.125 ft) (±0.05% F.S.)	±4 mm (0.013 ft) (±0.1% F.S.)	±10 mm (0.03 ft) (±0.1% F.S.)	±30 mm (0.1 ft) (±0.1% F.S.)
Resolution	1.4 mm (0.06 in)	2.1 mm (0.084 in)	4.1 mm (0.156 in)	8.7 mm (0.336 in)	1.4 mm (0.06 in)	2.1 mm (0.084 in)	4.1 mm (0.156 in)
Burst Pressure	310 kPa (45 psia), 18 m (60 ft) depth	310 kPa (45 psia), 18 m (60 ft) depth	500 kPa (72.5 psia), 40.8 m (134 ft) depth	1200 kPa (174 psia), 112 m (368 ft) depth	310 kPa (45 psia), 18 m (60 ft) depth	310 kPa (45 psia), 18 m (60 ft) depth	500 kPa (72.5 psia), 40.8 m (134 ft) depth
Temperature Range ¹	-20° to 50°C (-4° to 122°F)				-20° to 50°C (-4° to 122°F)		
Temperature Accuracy	±0.37° @ 20°C (±0.67° @ 68°F), ±0.44° from 0° to 50°C (±0.79° from 32° to 122°F)				±0.37° @ 20°C (±0.67° @ 68°F), ±0.44° from 0° to 50°C (±0.79° from 32° to 122°F)		
Temperature Resolution (10 bit)	0.1° @ 20°C (0.18° @ 68°F)				0.1° @ 0°C (0.18° @ 68°F)		
Temperature Response time	3.5 minutes (to 90% in water)				10 minutes (to 90% in water)		
Real-Time Clock	±1 minute per month 0° to 50°C (32° to 122°F)						
Battery	2/3 AA, 3.6 Volt lithium, factory-replaceable						
Battery Life (Typical Use)	5 years with 1 minute or greater logging interval						
Memory (Non-volatile)	64K bytes memory (approximately 21,700 pressure and temperature samples)						
Weight	4573-1: approximately 210 g (7.4 oz); 4573-2: approximately 140 g (4.8 oz)				Approximately 154 g (5.4 oz)		
Material	316 SS (4573-1-1/2/3/4); Titanium (4573-2-1/2/3/4)				Polypropylene (4573-3-1/2/3)		
Dimensions (L×Ø)	150 mm × 24.6 mm (5.9 × 0.97 in); hole in mounting bail 6.3 mm (0.25 in)				152.4 mm × 31.8 mm (6.0 × 1.25 in); hole in mounting bail 6.3 mm (0.25 in)		

¹Temperature range for storage and data retrieval. Not intended for use in ice.