

Water level / Temperature Data Logger

Logger Model WT-HR mark 3

Three Channel High Resolution (12 bit)
Water level / Temperature Data Logger.

The WT-HR is a Three Channel High Resolution (12 bit) Water Height and Dual Temperature data logger with an internal sensor housed in a rugged 304 stainless steel case. A temperature sensor is located at the bottom of the water probe and another is mounted in the logger so both water and air temperatures can be logged. Logging can be configured to: start on time, immediate start, stop when full, loop around (overwrite oldest data).

Features.

- Temperature can be set to any combination of Point, Average, Maximum & minimum readings.
- Temperature can be logged in high resolution or low resolution mode.
- Low resolution mode is used to increase the number of samples.
- The battery voltage of the logger can be logged if required.
- The logger can be run in either "Stop when memory is Full", "Loop Around" mode or set to stop at a future time.
- The logger can be started "Now" or started at a given time in the future.

Ordering Information. WT-HR Water level / Temperature data logger.

DLC3USB [USB] or DLC3 [RS232] download cable (2m) to connect WT-HR with computer.

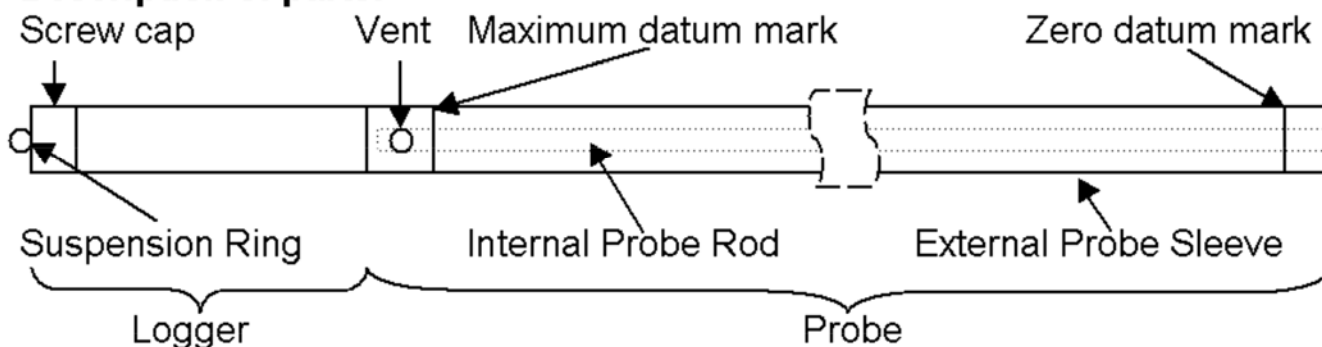
WT-HR Dimensions.

Logger Model	Length	Diameter	Weight
WT-HR-250	515mm	20mm	395gm
WT-HR-500	820mm	20mm	588gm
WT-HR-1000	1320mm	20mm	975gm
WT-HR-1500	1820mm	20mm	1363gm
WT-HR-2000	2320mm	20mm	1750gm

WT-HR Mounting.

The logger should be mounted vertically. If the logger is in a flowing river the flow causes water to rise up on the logger giving high readings so in a river with strong flow the logger should be mounted inside a plastic pipe with holes drilled in it - this way the logger reads the real height of the river. Make sure the logger is mounted in such a way that the bottom holes (water entry ports) do not get blocked by mud or stones.

Description of parts:



Putting into service with Omni7 Data Management software.

1. From the SWDL-DLC Omni7 software and Download cable kit, first install the Omni7 software, then plug the Download cable into a spare USB [standard size] or RS232 serial port on your computer (depending on which type you have). The Omni7 has an excellent "Help". This will need to be read to enable successful operation of the Omni7 Data Management Program and gain familiarisation of the many advanced features available.
2. Connect the data logger to the download cable. Select the correct connection type on the Omni7 screen. Omni7 requires manual connection and disconnection to the data logger using the Green 'Connect' and Red 'Disconnect' buttons. It will not connect to a data logger automatically. (Refer to "Help" for further assistance.)
3. On the "Logger Control" screen, click on "Channel and Probe Setup" button, and check the Battery Condition, plus other configurations.
4. Now click on the "Start Logger" tab for the final configurations, before putting the logger into service.

Specifications.

Water Height:	Sensor Type	Capacitive		
		304 Stainless Steel outer		
		316 Stainless Steel available for special orders (See note*)		
	Working Temperature	0°C to 70°C		
	Accuracy	±1% Full Scale		
	Resolution	±1mm		
	Temperature Coefficient	Not Compensated	±0.65mm/metre/°C Water Temp	
			±0.5mm/°C Air Temp	
		Compensated	±0.2mm/°C	
Note: Water Height readings can be temperature compensated using water temperature readings.				
All WT-HR loggers are fully calibrated in our factory before dispatch.				
Internal Temperature:	Sensor Type	Thermister		
	Linear accuracy over range	±0.3°C (0°C to 70°C)		
	Repeatability	±0.1°C		
	Long term stability	±0.1°C		
External Temperature:	Sensor Type	Thermister		
	Sensor Position	Bottom of water height probe		
	Working Temperature	0°C to 70°C		
	Linear accuracy over range	±0.3°C (0°C to 70°C)		
	Repeatability	±0.1°C		
Logger:	Working / Storage Temperature	-30°C to +70°C		
	Sampling Rate	1 second minimum, 10 hours maximum; in 1 second intervals		
	Storage capacity	64,000 8 bit samples; 32,000 12 bit samples		
	Alarms	Two independent Alarms		
		Triggered on any combination of six user configurable Alarm Conditions		
		One alarm can be configured to dial a PocketPager		
		Alarms can be visually checked using the Omni7 software		
	Start modes	Start immediately		
		Start on date/time		
	Stop modes	Stop when memory is full		
		Stop on date/time		
		Loop around (continues logging)		
	Logging modes	Each channel can be set to log any combination of:		
		- Point readings	- Maximum reading	
		- Average reading	- Minimum reading	
	Warning:	When using the Average, Maximum or Minimum reading(s), the logger reads the attached sensor(s) every second. This will reduce battery life.		
	Battery	One to Five year life depending on usage as above		
		Using the logger in temperatures below -5°C (23°F) will reduce battery life		
		One ½AA 3.6V lithium cell; Factory Replaceable		
		The data is retained in the case of battery failure		
		Battery Status Monitor in Omni7 software		
	Download time	35 seconds for Full Logger		
	Case material	304 Stainless tube		
		316 Stainless Steel available for special orders (See note*)		
		Plated brass		
	Weight	110g		
	Size	<i>Logger</i>	<i>Length</i>	<i>Diameter</i>
		WT-HR-250	515mm	20mm
		WT-HR-500	820mm	20mm
		WT-HR-1000	1320mm	20mm
		WT-HR-1500	1820mm	20mm
		WT-HR-2000	2320mm	20mm
				<i>Weight</i>
				395gm
				588gm
				975gm
				1363gm
				1750gm

A **DLC3USB [USB]** or **DLC3 [RS232]** **download cable (2m)** is required to connect the WT-HR to a computer.

Note*: The standard version of Water Logger is constructed from 304 Stainless. If the logger is used in brackish water that is warm, it can pit and corrode the stainless. We recommend the use of the version made from 316 stainless for such applications.

The Anatomy of the WT-HR range.



Cap and Communication socket:

There is a screw on knurled cap on the top of the WT-HR logger. This has a suspension ring that can be used to suspend loggers down wells or pipes. The cap is removed to attach a download cable and recover data.

Logger section:

The logger section of the WT-HR is a 20mm diameter stainless steel tube 170mm in length. There is a three pin communication socket at one end and a 16mm long, 6mm diameter threaded rod at the other.

This threaded rod has a cable running through it.

The cable has a temperature sensor on the end for monitoring water temperature.



Probe and Logger to probe connection:

The Probe consists of a outer tube and an inner rod. The Inner Rod screws on to the 16mm long, 6mm diameter threaded rod protruding from the Logger. The temperature sensor with cable runs down the centre of the inner tube so that the temperature sensor sits at the bottom of the inner tube. The Outer Tube screws directly onto the logger.

Top Breather Hole and Maximum Datum Mark:



The distance from the top of the probe to the Maximum Datum Mark is as follows:

WT-HR 250 and 500 is 70mm

WT-HR 1000, 1500 and 2000 is 75mm

Maximum and Zero Datum Marks:

WT-HR 250 Zero to Maximum Datum is 250mm

WT-HR 500 Zero to Maximum Datum is 500mm

WT-HR 1000 Zero to Maximum Datum is 1000mm

WT-HR 1500 Zero to Maximum Datum is 1500mm

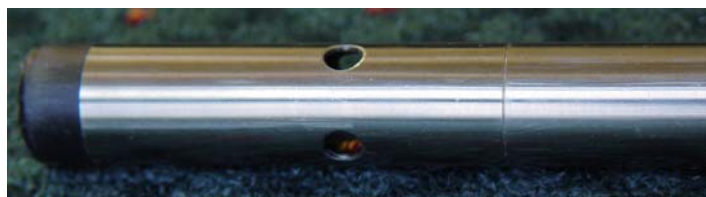
WT-HR 2000 Zero to Maximum Datum is 2000mm

Bottom Water Entry Port and Zero Datum Mark:

The distance from the Zero Datum Mark to the bottom of the probe:

WT-HR 250 and 500 is 35mm

WT-HR 1000, 1500 and 2000 is 75mm



Compensating for Temperature Coefficients.

The WT-HR water height probe has a small negative temperature coefficient with respect to water temperature. If the probe is sitting in 1 metre of water and experiences a water temperature increase of 1°C, the logger will report a water height decrease of 0.65mm. If you log water temperature, the Omni7 software can compensate the logged water height value to correct the small negative temperature coefficient of the probe.

In addition to this, the logger has a small positive temperature coefficient with respect to air temperature. If a probe is sitting at 0mm of water and experiences an air temperature increase of 1°C, the logger will report a water height increase of 0.5mm. If you log air temperature, the Omni7 software can compensate the logged water height value to correct the small positive temperature coefficient of the logger.

Logging both water and air temperature, as well as water height, decreases the number of samples you can store in the logger. If the air and water temperature are going to be reasonably constant, (e.g. down a well) you can log water height only. You can also log water height only if your required accuracy is greater than 10mm. The water temperature has a larger coefficient than the air temperature, so if you can only afford to log one temperature it is recommended that you log water temperature.

If you attempt to start the logger without selecting both water and logger temperatures a warning message will appear.

Removing the Probe from the Logger.

Removing the Logger from the Outer tube:

Hold the outer tube and unscrew the logger anti clockwise. When the logger is free of the outer tube separate them by about 30mm by pulling the Logger and inner rod up out of the outer tube. Note the small black O-ring between the logger and the outer tube.

Removing the Inner rod from the Logger:

Now hold the Inner Rod between the fingers of one hand and screw the logger anti-clockwise off the inner rod. When the logger is free, withdraw the cable and temperature sensor from the inner tube. Keep the Logger, Outer Tube and Inner Rod together. They have been calibrated together and if a logger is connected to a different outer or inner it should be recalibrated.



Removing the Inner Rod from the Outer Tube:

Be very careful of the black insulating covering on the outside of the inner rod. This covering is very delicate and will cause the WT-HR to malfunction if it is damaged. There is a plastic spacer attached to the bottom of the inner rod. The inner rod can be withdrawn from the outer tube being careful not to scrape the black insulation covering on the inside of the outer tube.

Reconnecting the Probe to the Logger:

Carefully slide the inner rod down into the Outer tube.

Feed the temperature sensor with cable down into the inner rod. Screw the logger onto the inner rod. Check that the small black O-ring is sitting in the threaded end of the logger. Screw the outer tube onto the logger.

WT-HR Maintenance.

The water height probe should be cleaned every six months or more frequently in dirty, salty or polluted water. Remove the probe from the logger as detailed above. Clean the outer tube with hot water and a lint free cloth. Carefully clean the inner rod by hand rubbing warm water (30degC or less) up and down its length.

Calibration.

All WT-HR loggers are fully calibrated in our factory before dispatch.

Recalibration once a year is recommended - follow the maintenance instructions above.

The probe should be soaked for 24 hours before recalibration.

The recalibration should be carried out at a similar temperature to where the logger is to be used.

Follow the instructions in the Omni7 help file (Calibration Procedures > Water Level Calibration).

Product Liability. This information describes our products. It does not constitute guaranteed properties and is not intended to affirm the suitability of a product for a particular application. Due to ongoing research and development, designs, specifications, and documentation are subject to change without notification. Regrettably, omissions and exceptions cannot be completely ruled out. No liability will be accepted for errors, omissions or amendments to this specification. Technical data are always specified by their average values and are based on Standard Calibration Units, unless otherwise specified. Each product is subject to the 'Conditions of Sale'.

Warning: These products are not designed for use in, and should not be used for patient connected applications. In any critical installation an independent fail-safe back-up system must always be implemented.

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