TruTrack Data Logger

Water level / Temperature 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.
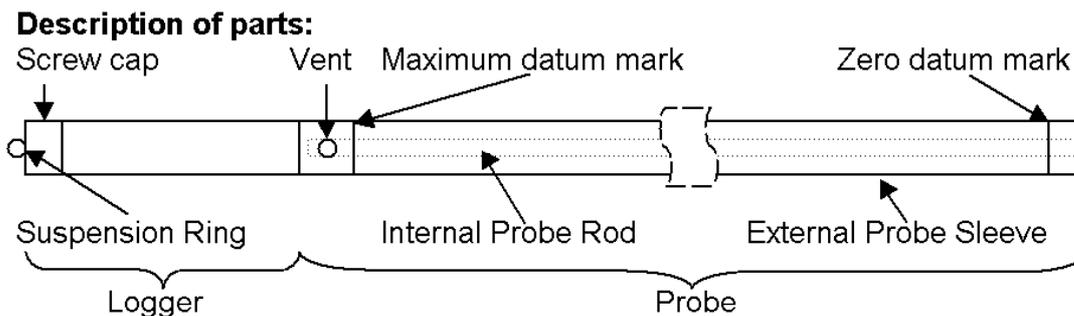- The logger can be started "Now" or started at a given time in the future.

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

WT-HR Dimensions:

Logger	Length	Diameter	Weight
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:

1. From the SWDL-DLC OmniLog software and Download cable kit, **first install the OmniLog software**, then plug the Download cable into a spare USB or serial port on your PC (depending on which type you have).
   The OmniLog has an excellent "Help". This will need to be read to enable successful operation of the OmniLog Data Management Program and gain familiarisation of the many advanced features available.

2. Connect the TruTrack Logger. Under healthy circumstances, a "Logger Control" screen will load. If the "Logger Control" screen does not load, click on the button labelled "Connect to a Logger for the first time". The OmniLog will run a test on the serial ports and advise if the port the logger is connected to is not available, in which case, plug the logger into an available port. (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 if connecting to the pH-HR or mV-HR loggers.

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	0ºC to 70ºC
	Accuracy	±1% Full Scale
	Resolution	±1mm
	Temperature Coefficient	Not Compensated ±0.65mm/metre/ºC Water Temp
		±0.5mm/ºC Air Temp
		Compensated ±0.2mm/ºC
	Note:	Water Height readings can be temperature compensated using water temperature readings.
Internal Temperature:	Sensor Type	Thermister
	Linear accuracy over range	±0.3ºC (0ºC to 70ºC)
	Repeatability	±0.1ºC
	Long term stability	±0.1ºC
External Temperature:	Sensor Type	Thermister
	Sensor Position	Bottom of water height probe
	Working Temperature	0ºC to 70ºC
	Linear accuracy over range	±0.3ºC (0ºC to 70ºC)
	Repeatability	±0.1ºC
	Long term stability	±0.1ºC
Logger:	Working / Storage Temperature	-30ºC to +70ºC
	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 OmniLog 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
		- Average reading
		- Maximum reading
		- Minimum reading
	Battery	One to Five year life depending on usage
		One ½AA 3.6V lithium cell; Factory Replaceable
		The data is retained in the case of battery failure
		Battery Status Monitor in OmniLog software
	Download time	35 seconds for Full Logger
	Case material	304 Stainless tube
		316 Stainless Steel available for special orders (See note*)
	Screw on end cap	Plated brass
		316 Stainless Steel available for special orders (See note*)
	Weight	110g

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A DLC3USB [USB] or DLC3 [RS232] download cable 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.

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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 center 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.
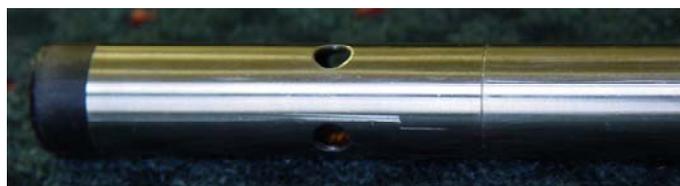

Top Breather Hole and Maximum Datum Mark:
The distance from the top of the probe to the Maximum Datum Mark is as follows:
WT-HR 250 and 500 is 70mm
WT-HR 1000, 1500 and 2000 is 75mm

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 Omnilog 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 Omnilog 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, (eg. 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.