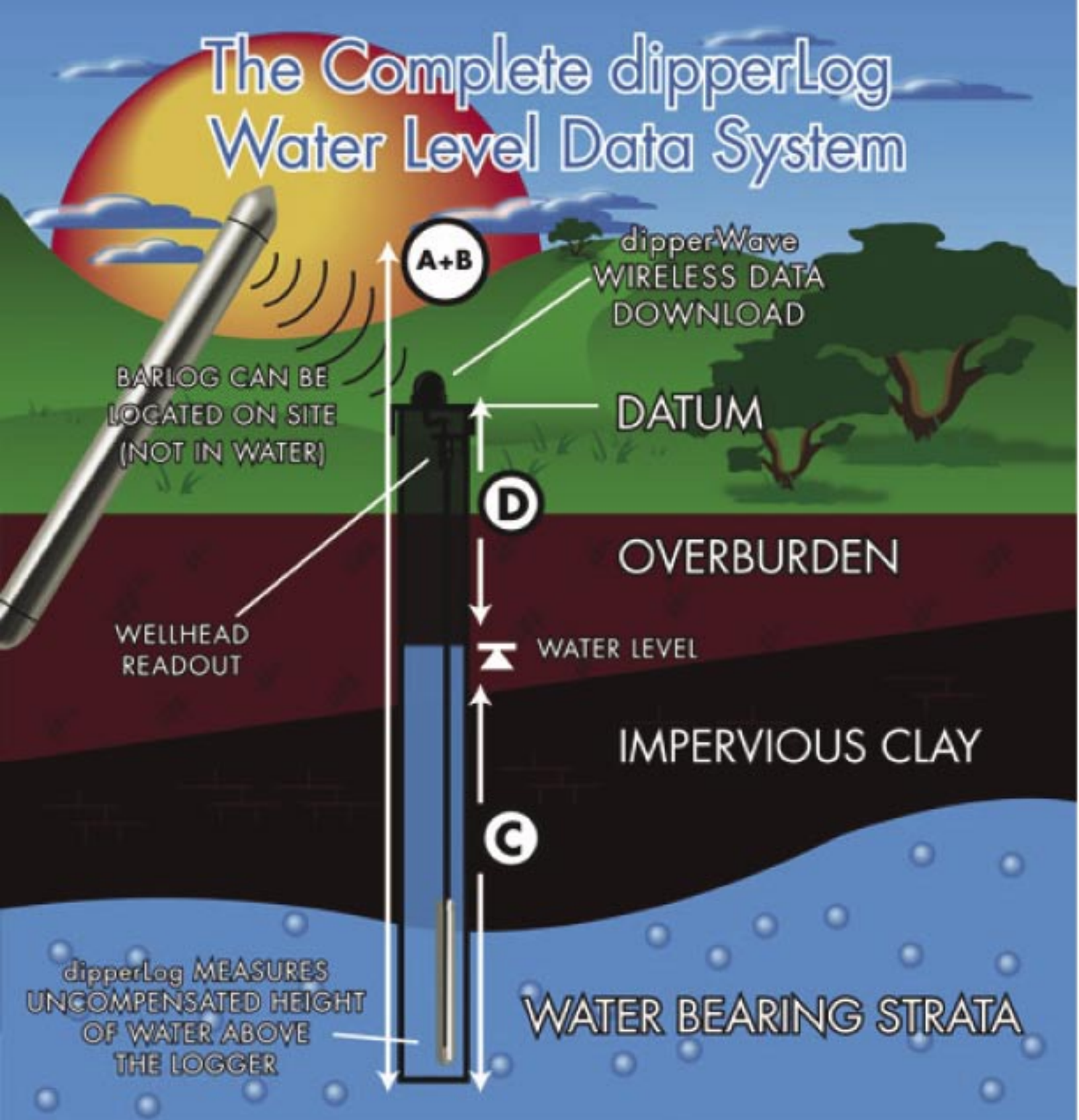
The Complete dipperLog Water Level Data System



Upon download, your system will automatically calculate the following:

A – Uncompensated height of water above transducer
B – Barlog atmospheric pressure (Automatic)
C – Compensated height of water above transducer
D – Compensated depth of water below datum (top of casing)
– Water depth level relative to mean sea level
– Temperature

Heron dipperLog Groundwater Data Logger

Model: dipperLog
Length Options: Custom lengths
Warranty: 3 years

The dipperLog:

The Heron **dipperLog** is the answer to your long term groundwater level monitoring program. The **dipperLog** measures, records and charts groundwater levels and temperatures over long periods of time. The Heron **dipperLog** is a high resolution, accurate (0.05% F.S.) datalogger available at an extremely economical price. The **dipperLog** has automatic barometric pressure and elevation compensation together with a recalibration facility that allows for changes in groundwater density. Water levels are reported as height of water above the transducer and depth of water below a local datum. Measurements may also be related to sea level once the reduced level of the datum is established. Recording intervals are selected by the user and can range from 1 second to 255 hours.

Using the dipperLog:

Programming the **dipperLog** could not be easier.

- Install the **dipperLog** program onto your computer then connect the logger to the computer using the PC communication cable.
- Select the level of program that you need, beginner or advanced, then simply enter the required information into the boxes on the set up screen.
- While you are setting up the logger the program adjusts automatically for altitude and takes and stores an initial barometric measurement.
- Click '**load information to logger**' and then '**start logger**'. It's that simple.
- For easy reading in the field, the program is displayed on the screen in an extra large format using bold black characters against a yellow background.
- The **dipperLog** time can be synchronized with the computer time or the user can choose to enter a different date and time.
- Battery, memory usage and real time sub screens are provided.
- Visit: www.heroninstruments.com for demo software.

dipperLog Sampling Options:

The Heron **dipperLog** allows the user to select measurement intervals from one second up to 255 hours. A 'log' time reading facility is also included. The first reading starts at one second, there after the time interval doubles with each reading for 255 readings which lasts for nine hours. At this point the logger can be downloaded and reformatted to take a reading every hour without removing the logger from the well. (This feature is available only on direct read loggers).

Rapid real time readings:

In this mode all data points are stored directly onto a laptop. A real time graph is displayed during the recording/measuring period.

There is no limit to the number of data points that can be recorded with this facility.

Applications for the dipperLog:

- Long term groundwater level and temperature monitoring.
- Short term pump and slug testing.
- Tidal studies.
- Monitoring dewatering projects.
- Stream gauging, reservoir and lake levels.
- Long term monitoring of open bodies of water, lakes, ponds, rivers and streams.
- Wet lands monitoring.

Features of the dipperLog:

- Automatic elevation adjustment with short term static barometric compensation.
- Long term automatic barometric compensation with the Heron **barLog**.
- Real time reading of height of water and temperature.
- Rapid real time reading (10 measurements / sec) with text and graphing.
- Compatible with the Heron **dipperWave** wireless remote reading system.
- Easy field recalibration.
- Comprehensive data management system is incorporated into the program.

dipperLog Deployment Options:

- A variety of methods can be use to install the dipperLog.
- The initial logger setup must be made before it is lowered into the water. This is to enable the logger to zero itself to the local altitude and atmospheric pressure by taking a local barometric reading.
- The logger may now be lowered into position in the well.

Submersible dipperLog

- The submersible logger is sealed with the top cap. A cable is attached of sufficient length to allow the logger to be lowered to the desired depth and secured at the top of the well.
- In order to download the logger it must be removed from the well and downloaded directly to a computer.

**Locking well cap available for suspension cable to avoid vandalism and aid in deployment.*

Advantages to using the full submersible **dipperLog**

- Cost effective deployment method.
- **dipperLog** can be locked out of sight to avoid tampering.

Well Head Readout dipperLog

- For this installation the logger is attached to a three conductor Kevlar reinforced cable.
- A well head readout unit is attached to the top of the cable with a provision to secure the unit to the top of the well.
- The cable lengths must be specified at the time of ordering. They are fitted and sealed during manufacture.
- All data downloads and logger parameters can be made without removing the logger from the well, after initial setup.

**Locking Well cap available for direct read down hold cable, to avoid vandalism.*

Advantages of using the Well Head Readout **dipperLog**

- Capacity to retrieve real time readings.
- Downloading does not require removal from the water.
- Non-vented cable ensures no moisture leaks.

dipperLog On A Reel

- The **dipperLog** on a reel incorporates the well head readout connection.
- These units can be fitted with graduated cables for convenience.
- The cable lengths must be specified at the time of ordering. They are fitted and sealed during manufacture.
- Durable padded carry case included.

Advantages of using the **dipperLog** on a reel

- Capacity to retrieve real time reading
- Mounted on a reel for easy transport and deployment on short-term tests.
- The third hand well casing hanger allows for hands free, easy downloading.
- Ideal unit for pump tests.

Using the Heron barLog: Barometric Compensation:

The **dipperLog** measures absolute pressure (water pressure + atmospheric pressure).
To measure the height of the water column only it is necessary to subtract the atmospheric pressure. This is referred to as 'barometric compensation'.
With the **dipperLog**, barometric compensation is a fully automated process.

The dipperLog has two methods for barometric compensation.

First method: Without the barLog.

- Each time the logger is "set up" it takes a barometric pressure reading. This reading also takes into account the altitude of the logger.
- This reading is stored in the logger memory and will be used to compensate automatically each reading taken by the logger until it is re-launched.
- This one time reading is also a default reading and will compensate automatically any reading taken in the absence of a Heron **barLog**.

Second method: Using the barLog.

- When a Heron **barLog** is used it will be given a job number that will correspond with the job number given to the loggers on the site.
- The **barLog** takes a reading of the barometric pressure every hour.
- The Heron **dipperLog** program will compensate automatically any **dipperLog** that has the same job number as the **barLog**.
- The program will search its files and compensate according to the date and time matches between the **dipperLog** and the **barLog**.
- This is a fully automated operation.
- The uncompensated measurements are given in a column in the text file. These readings may be compensated manually if required.

dipperLog Download and Data Management:

Ease of use and versatility are evident in this function.

- Connect the **dipperLog** to the computer as before during the setup procedure.
- Select '**download data**'.
- The data appears as a text and / or CSV file that gives you a variety of options, including graphing, choice of file locations, and an email ready file.
- The measurement units can be changed and datum elevation added.

Barometric compensation is automatic.
If a Heron **barLog** has not been used, the compensation will default to the initial value measured automatically during the setup.
The **barLog** may be downloaded at any time during data collection.
*An example of the effort Heron has made to make the program ultra user friendly is that the program can be operated without using the mouse or cursor. Each instruction on the program has one character underlined. Press **Alt** and the key for that **character** and the program responds.*

Options:

dipperWave System

The dipperWave system is a state of the art local wireless remote downloading system.

This advanced feature allows you to use the **dipperWave** wireless communication system.

With the **dipperWave** installed you can download and change the logger parameters from as far away as as 1000yds / 1 km without even approaching the well.

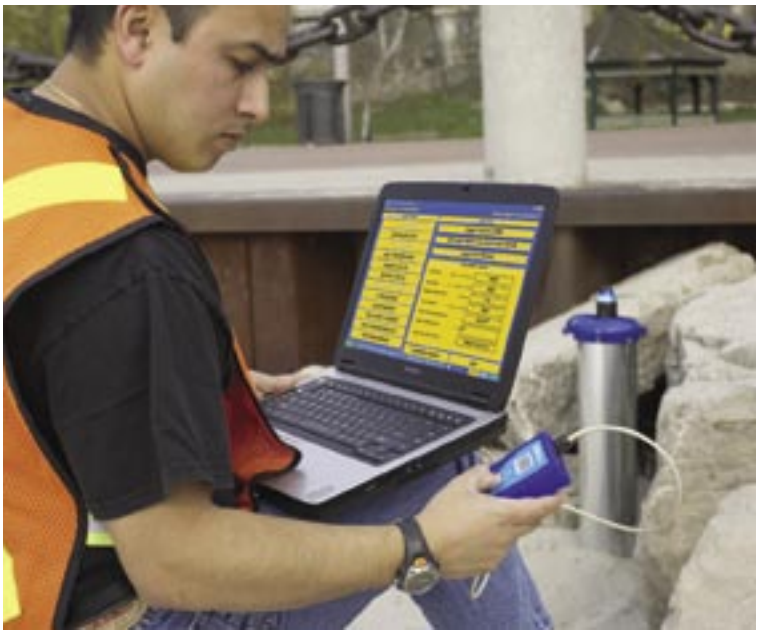
The **dipperWave** is a time saving economical way to operate your **dipperLog**.

There is no need to approach the well, remove well caps or connect cables.

The **dipperWave** works in all weather conditions and in darkness.

This system will download a **dipperLog** with a full set of 32000 data points in approximately five minutes–without leaving your truck or office!

Each **dipperWave** well head transmitter has a unique three digit address. Just select the address on the hand held base transmitter, wait 15 seconds for contact to be established and download the data directly onto your laptop. Logger parameters may be changed at this point.



TufTab Ultra-Mobile Computer:

Tough, lightweight and designed for business on the go, the **eo TufTab™ v7112XT** is the ultra-mobile computing solution built for professionals who are constantly on the road or in non-traditional working environments The reinforced, tough plastic and rubberized casing provides a sturdy and balanced feel for engaging in fieldwork, data collection and other professions that demand a tougher-than-usual working environment. Designed to withstand more extreme environmental conditions than a standard PC, the IP53 rated **eo TufTab™ v7112XT** includes protection from rain, dust, humidity, extreme temperatures and vibration. Where ever your work takes you, a rugged **eo TufTab™** is the best mobile solution for your demanding ultra-mobile computing needs. Equiped with Heron **dipperLog** software.

* *Ask Heron about our cable management options.*

dipperLog Depth Ranges:

dipperLog type	Maximum height of water column	Accuracy typical +/-	Resolution +/-
A	Barometric	0.05% FS	0.024% FS
B	35F 10M	0.05% FS	0.024% FS
C	100F 30M	0.05% FS	0.024% FS
D	200F 60M	0.05% FS	0.024% FS
E	400F 120M	0.05% FS	0.024% FS

dipperLog Technical Specifications:

Transducer	Piezoresistive Silicon 316LSS
Ranges	Min. 35F/10m Max 400FT/120m
Accuracy (Typical)	0.05% net FS
Accuracy (Max. error)	0.10% net FS
Resolution	0.024% net FS
Temperature Sensor	IC Temp. Sensor
Temperature Accuracy	±0.5%
Resolution	0.062511˚C
Transducer Temp. Compensation Range	-20˚C to +85˚C
Temperature Response Time	10 seconds
Battery Life	10 yrs (use dependent)
Clock Accuracy	±1 minute month
Operating Temperature	-20˚C to 80˚C
Memory	Non-volatile eeprom
Maximum # Readings	32,000 sets
Communication	USB, RS232
Size	8.5" (215mm) x 0.75" (20mm)
Weight	246gm
Wetted Materials	Stainless steel, viton
Variable Sampling Mode	Linear real time rapid data (10 readings sec) 1 sec to 255hrs
Barometric Compensation	Semi Automatic or **barLog**

Note: *Quoted accuracy values are given by the transducer manufacturer. Greater resolution does not improve the accuracy.*