HERON INSTRUMENTS INC.

dipperLog Software
Version 1.5.0

Heron dipperLog Software Manual

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Thank you for choosing the Heron dipperLog. We are confident you will find it a durable, versatile and cost effective tool which will deliver accurate water level readings for many years over the course of your project. Groundwater professionals have been successfully employing the Heron family of instrumentation to monitor both open waters and boreholes, to perform pump and slug tests, and to complete wetland and tidal studies with excellent results for over 20 years.
This dedicated, intuitive software makes the dipperLog quick and easy to program and launch as well as allowing for simple data recovery. Our software has been tested on Windows 7, Windows 8 and Windows 10 operating systems and is available on our website as a free download.
Your new dipperLog has been inspected and calibrated prior to shipping and is accompanied by a certificate of calibration. A unique Serial Number and measurement range has been etched on the body and embedded in the internal firmware to simplify identification and data management.

dipperLog Options

dipperLog32

The dipperLog ^{32}, the most economical dipperLog in our line-up, has a stainless steel body and transducer with a maximum storage capacity of 32,000 data points. Each data point consists of a date, time, pressure and temperature reading. The dipperLog ^{32} is only available in a 30m/100' range and has a 1 year warranty.

barLog

The barLog is a dipperLog configured to measure barometric pressure fluctuations necessary to compensate your dipperLog data files. The barLog takes readings every 1 hour and has a capacity for 32,000 data points.

dipperLog64

The dipperLog64 is our flagship logger. It offers a memory of 64,000 data points, a choice of pressure ranges and a 3 year warranty.

dipperLogTOUGH

The dipperLogTOUGH is our premium logger with 100% titanium body. When coupled with the Teflon encapsulated O-rings, this logger is suitable for use in the harshest of environments. Offering a memory capacity of 64,000 data points, a choice of 4 pressure ranges, an accuracy of 0.05% FS and a 3 year warranty, this product allows for worry free data collection at all of your projects.

Vented Logger

The vented logger incorporates a gauged transducer that measures pressure exempt from barometric influences. dipperLog VENTED must be deployed on a vented cable. **We now offer a specialized cap that will allow for use without a cable for shallow water or wetland studies.**

4-20 mA Pressure Transmitter

The 4-20 mA Pressure Transducer is easily integrated into an existing SCADA system or with most third party data logger. It will provide a continuous water level reading for your application. It can also be equipped with a digital display. This device is a sensor only and requires an external power source.

Deployment Options*

Suspended Deployment

This is the simplest and most inexpensive method of deploying your dipperLog. Using a braided stainless steel cable or Kevlar string, suspend the dipperLog in the area to be monitored ensuring it is securely anchored to the surface for easy retrieval. If employing this method, no communication is possible with the deployed dipperLog. The dipperLog must be programmed and started prior to installation and then recovered for data retrieval and re-programming.

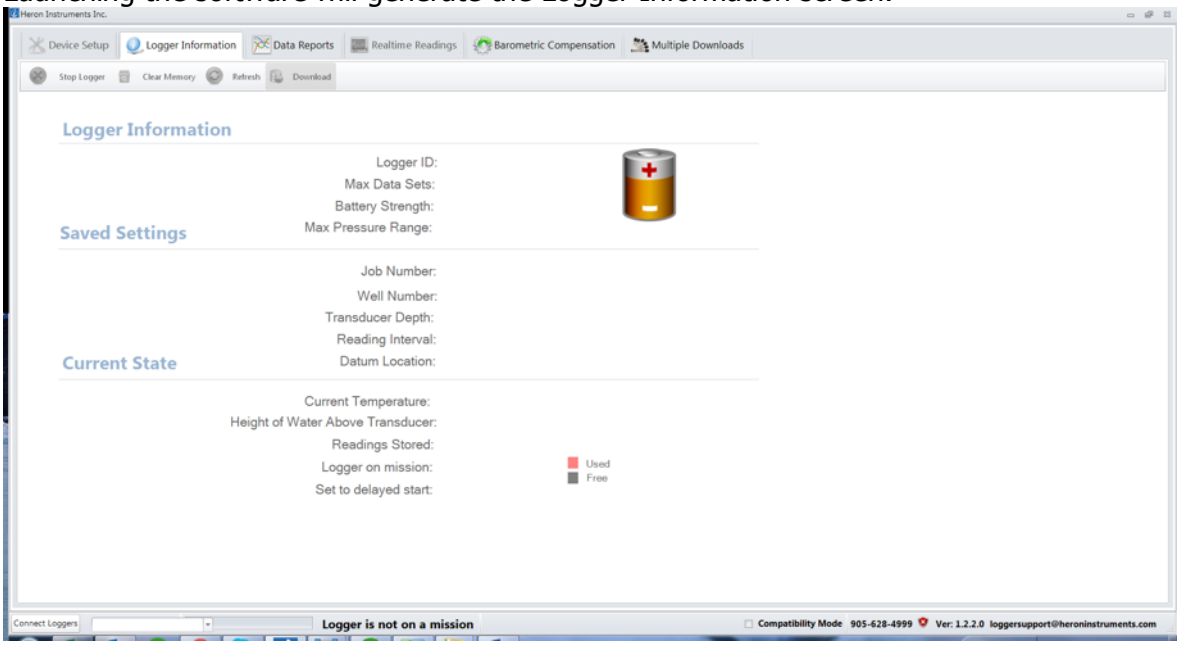
Well Head Readout Option

This is a much less labour intense option. The dipperLog is suspended on a direct read downhole cable enabling communication with the dipperLog from the wellhead. Once deployed the dipperLog never needs to be disturbed. Programming of the dipperLog, downloading of data and stopping and starting data collection can all be done via the communication cable. This cable can be mounted on a reel for portability or to simplify pump or slug tests. Real time display is also available with this configuration.

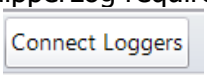
*Refer to our website for further information on deployment

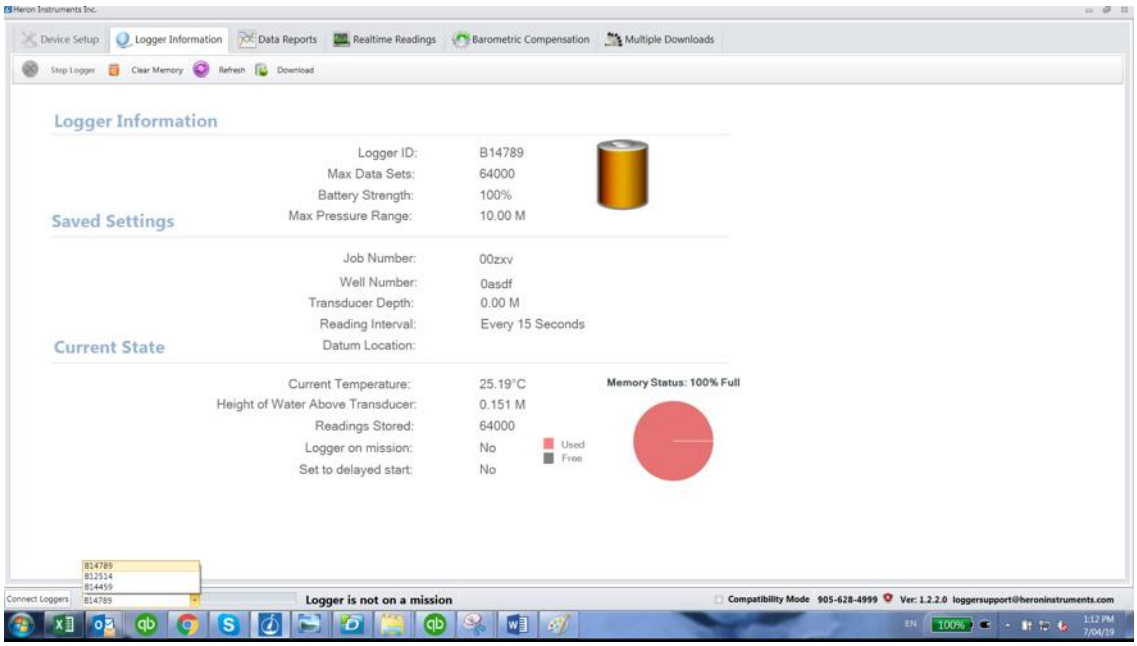
Getting Started

Launching the software will generate the Logger Information screen.

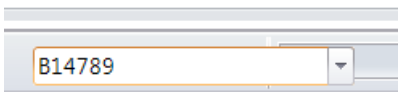


Connect the PC communication cable to your computer and 1 or more dipperLog.
Each dipperLog requires a dedicated cable and USB port.

Select  at bottom left of screen.



A listing of any connected dipperLog is available in the adjacent drop box.

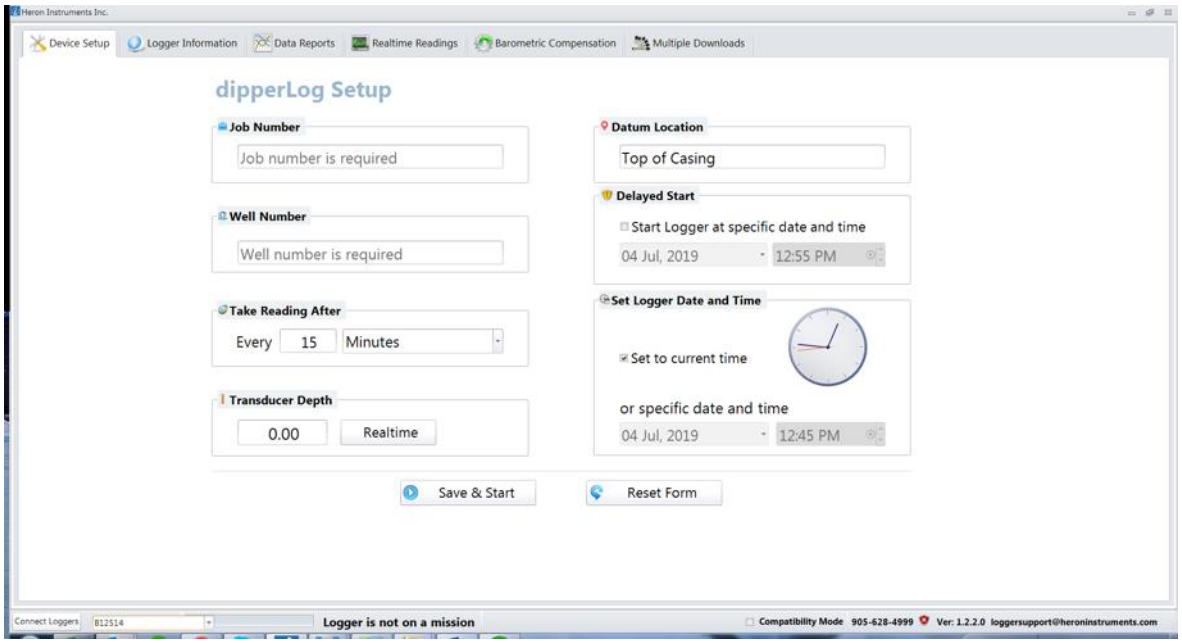


This box shows ID number of the dipperLog whose settings are currently being displayed.
The selected dipperLog information will be displayed.

Selecting a new ID number from the list display will update the screen to display the new settings.

Logger ID	Serial Number of connected logger
Max Data Sets	Memory capacity
Battery Strength	Remaining battery power %
Max Pressure Range	Calibrated maximum pressure of transducer
Memory Status	Memory space available
Status of dipperLog	**Logger is on a mission**

If dipperLog memory is clear the Device Setup *screen will be displayed.*



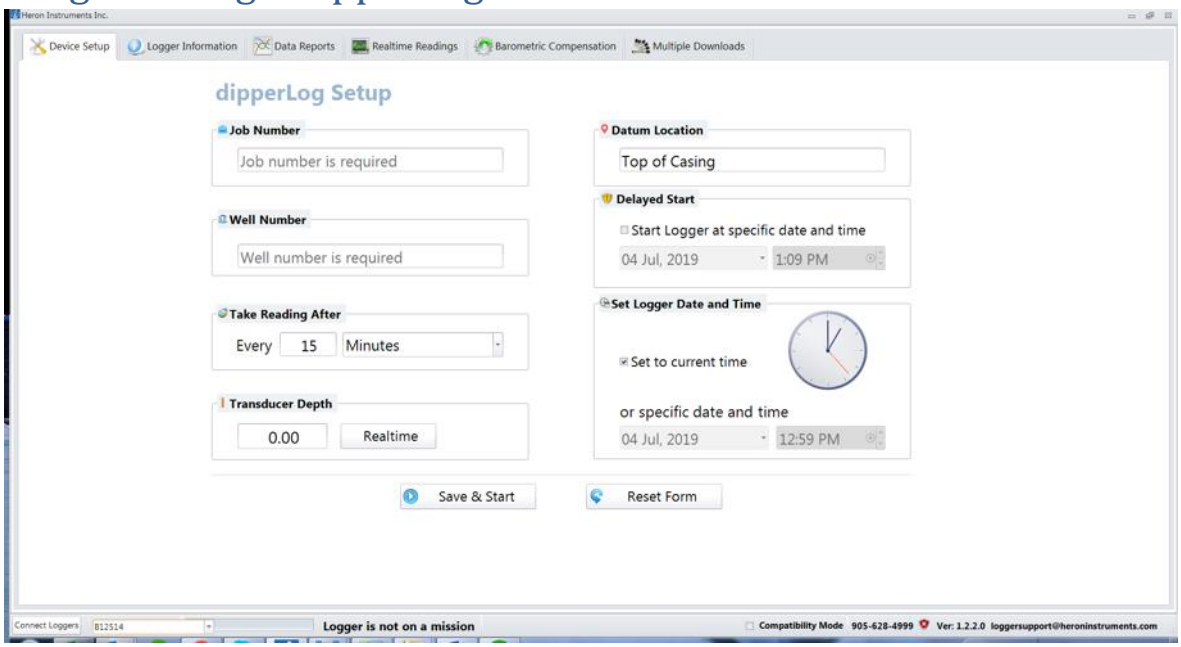
To program a dipperLog navigate to Device Setup .

If this option is not available, Clear Memory

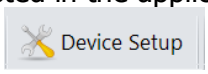
These selections are only accessible on the Logger Information **tab.**

Stop Logger Clear Memory

Programming a dipperLog



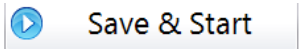
Enter the information requested in the applicable fields

Please Note: All fields in 

screen are mandatory and must be completed before dipperLog mission can be launched.

One exception - the delayed start option

Job Number	Alpha-numeric field – same for all loggers in project 5 character limit
Well Number	Must be a unique alpha-numeric number
Recording Frequency	1 second to maximum of 255 hours
Log time option	First reading at 1 second with 1 second added to each subsequent reading interval for 255 readings.
Transducer Depth	Distance the transducer is suspended below the reference point
Datum Location	Reference point used for transducer depth i.e. top of casing, ground surface, etc.
Delayed Start	Complete this field if you want the recording to start at a future date and time
Set Logger Date and Time	This field allows you to set your logger to a different time or time zone than your computer. i.e. Daylight Savings vs Standard
	Will clear all input on this screen if multiple changes are needed or fields can be changed individually.

Once all fields are completed, select 

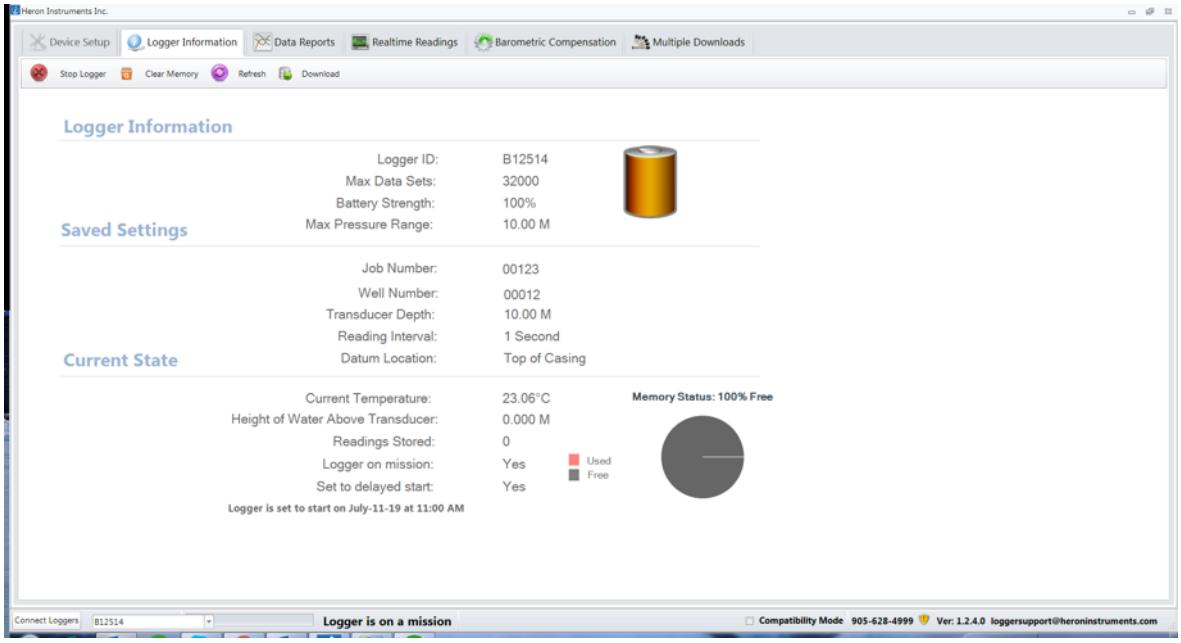
to launch mission.

The default start time is immediately.

Updated Logger Information screen will be displayed showing new status of selected connected dipperLog.

Updated dipperLog Status appears at bottom of screen.

Logger is on a mission



If delayed start option was selected, the screen will display the future start time.

Logger is set to start on July-11-19 at 11:00 AM

To disconnect dipperLog simply unplug PC communication cable.

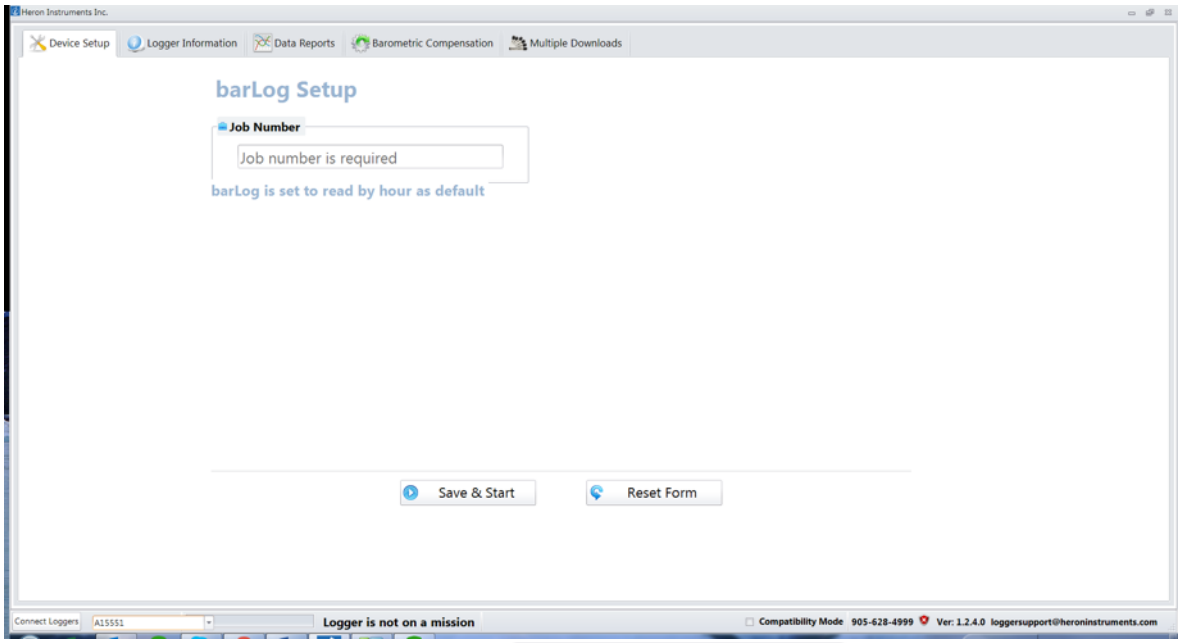
If only a single dipperLog connected, blank logger information screen will be displayed.

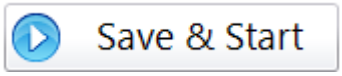
If multiple dipperLog connected, logger information of newly indicated logger will be displayed.

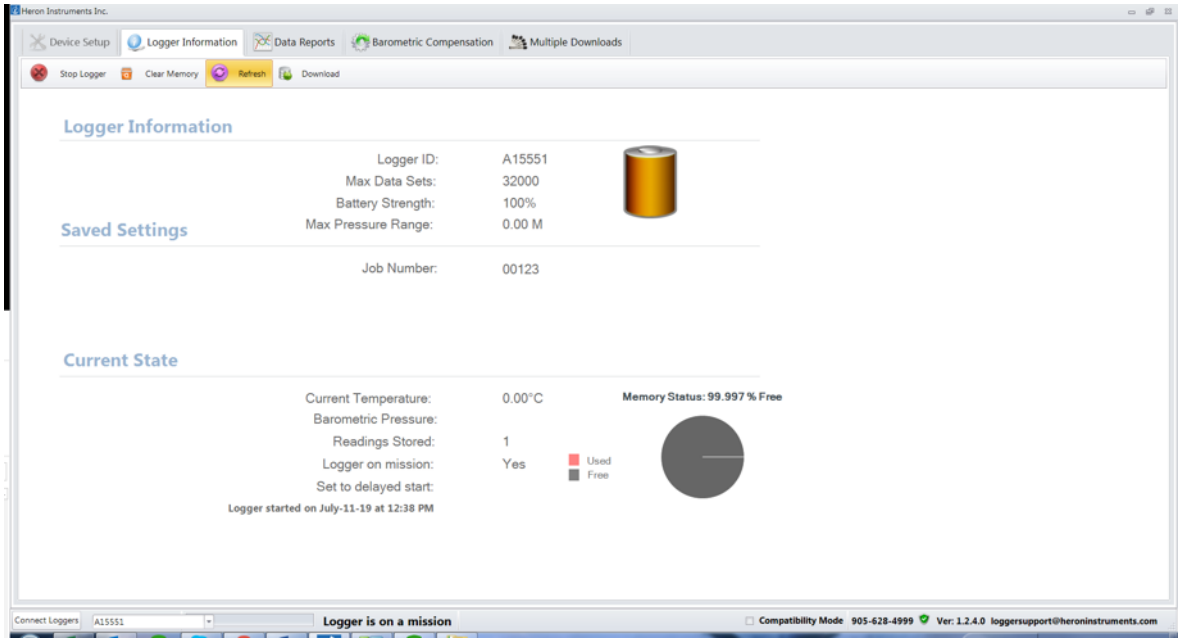
Your dipperLog is now ready to be deployed.

Programming a barLog

When working with a barLog the only information requested at setup is Job Number. One barLog may be used to compensate the data collected by all the deployed dipperLog in the project and is capable of accurately covering a 5 mile radius.



Once Job Number has been entered,  will launch the barLog.

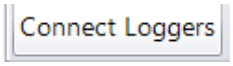


For optimum results, deploy the barLog at a central location on your project.

Downloading Data

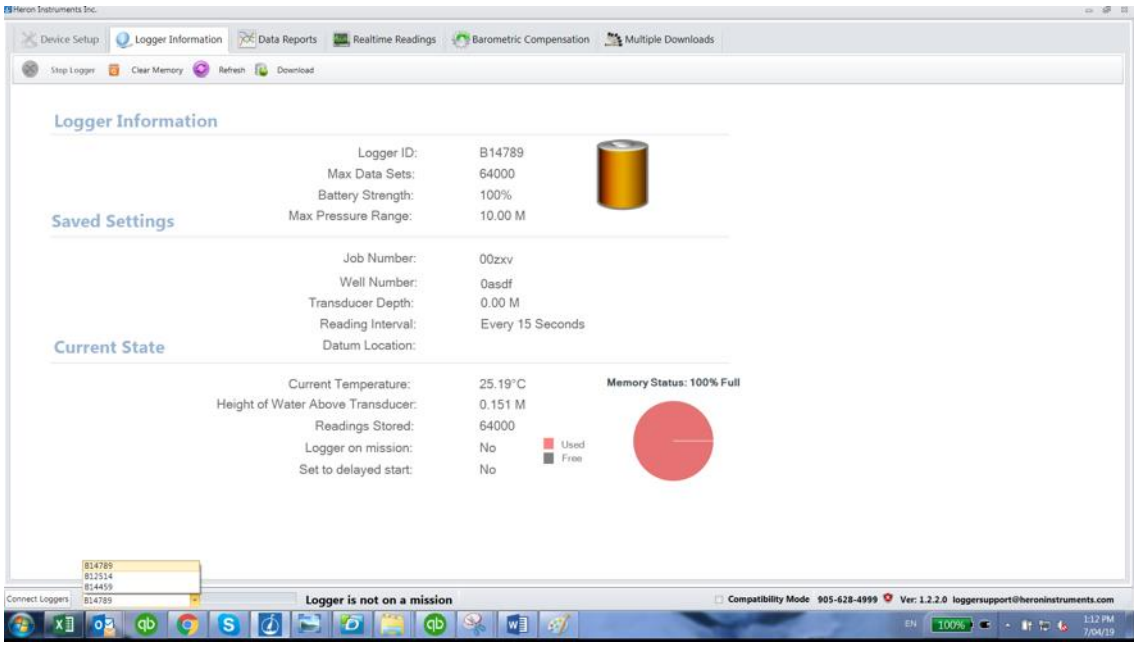
If the dipperLog is deployed on a direct read downhole cable, connect PC communication cable at well head, otherwise retrieve dipperLog from deployment location and connect the PC communication cable directly with the dipperLog.

Launch the software
Connect each PC communication cable to your computer and dipperLog or well head.
Select

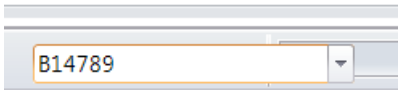


In bottom left corner of screen

The high-lighted dipperLog information will be displayed.

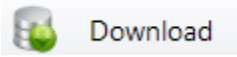


A listing of any connected dipperLog is available in the adjacent drop box.



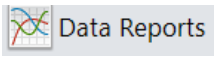
This box shows ID number of the dipperLog whose settings are currently being displayed.
The selected dipperLog information will be displayed.

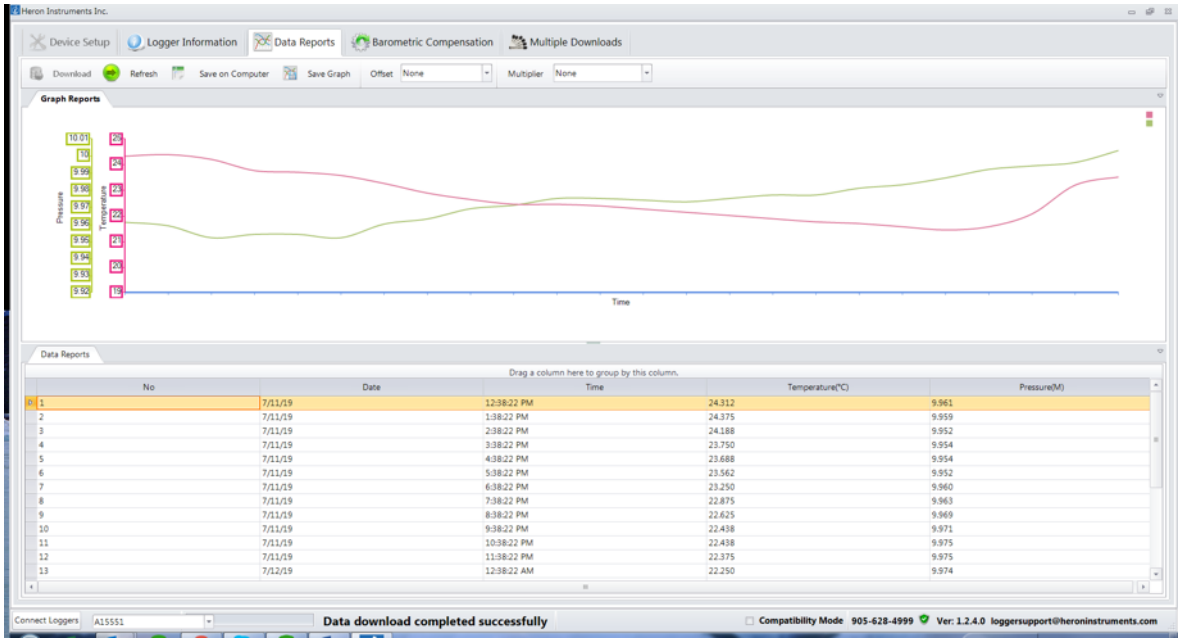
If only one dipperLog connected, that is the ID number and settings which will be displayed.



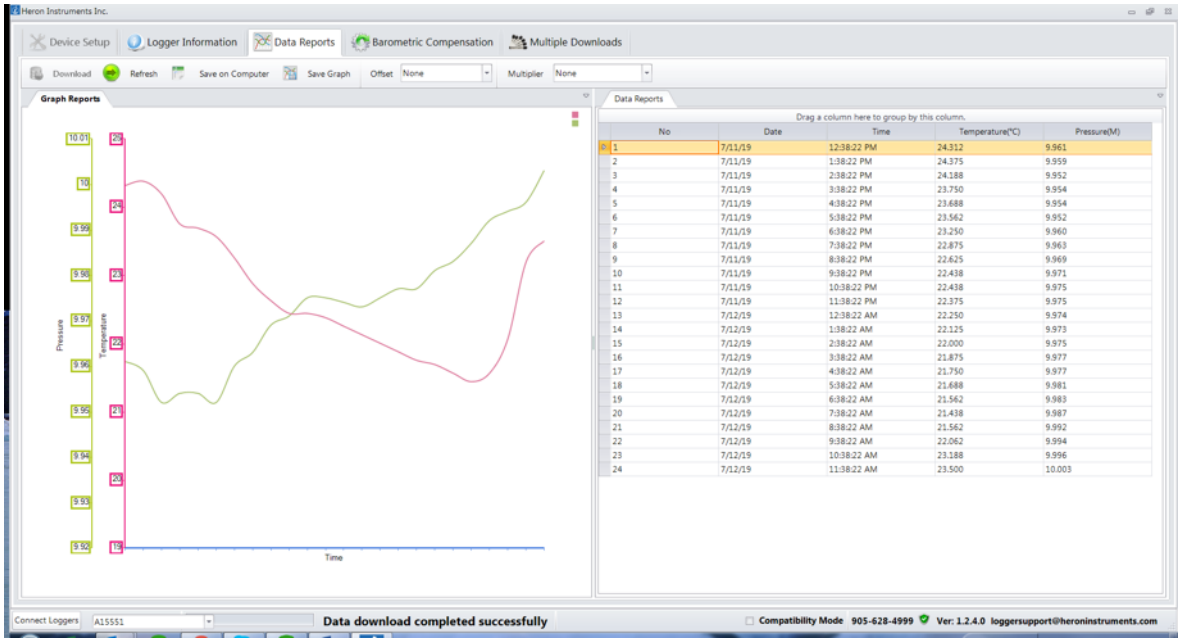
Will initiate the download of data from the displayed dipperLog.

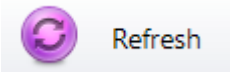
Data in memory will be downloaded and displayed.
Download will not cause the mission to be stopped or paused.
Download will not cause the data to be erased from the memory.
Data will not be saved upon download, this must be done manually.
Pressure and temperature data will be displayed on the same graph.

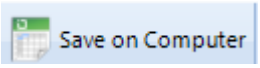
Once completed, tabular  will be displayed showing both a graphical and representation of the collected readings.

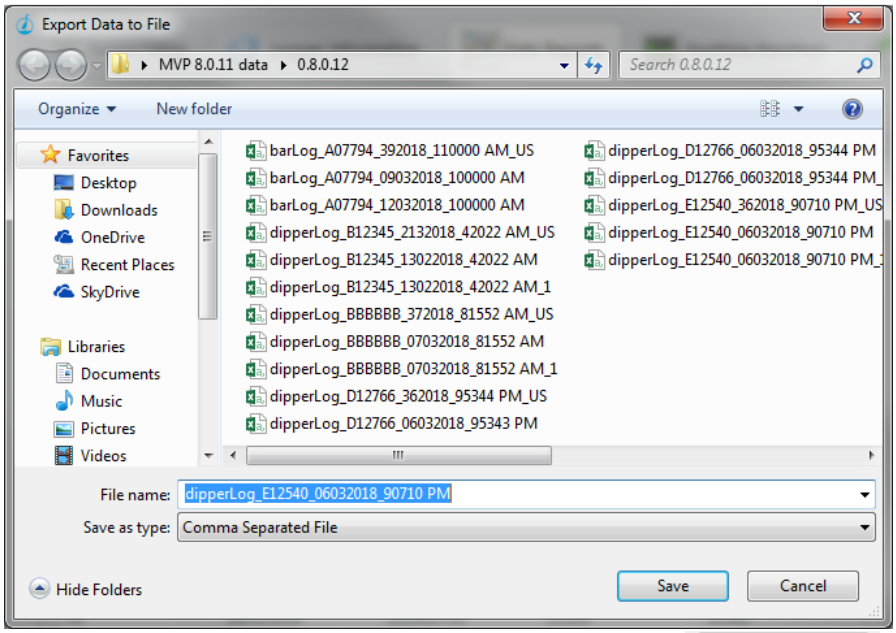


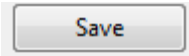
These screen may be customized to show this data in a variety of layouts.



 Re-downloads data incorporating any newly recorded data points since last download.

 allows you to designate the location where the data is saved.



Navigate to desired location, name the data set and 

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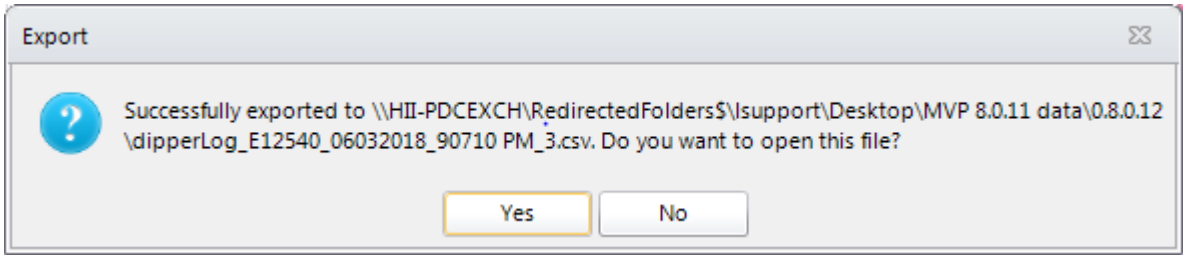
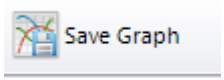
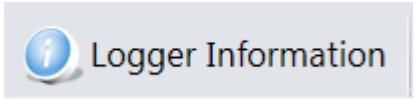
If you wish to save the data as a .txt file, select "text (tab delimited)" from dropdown menu in "Save as type" field



You may now view the data in an Excel spread sheet or text file if desired.



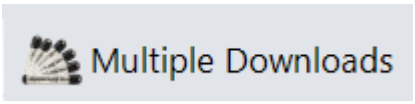
will allow you to save the graph at your specified location.

dipperLog is now ready to be re-deployed or return to 

for further options.

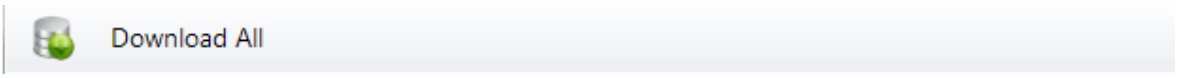
Multiple Downloads

If you have multiple dipperLog connected and listed in the text box on your screen

Select 

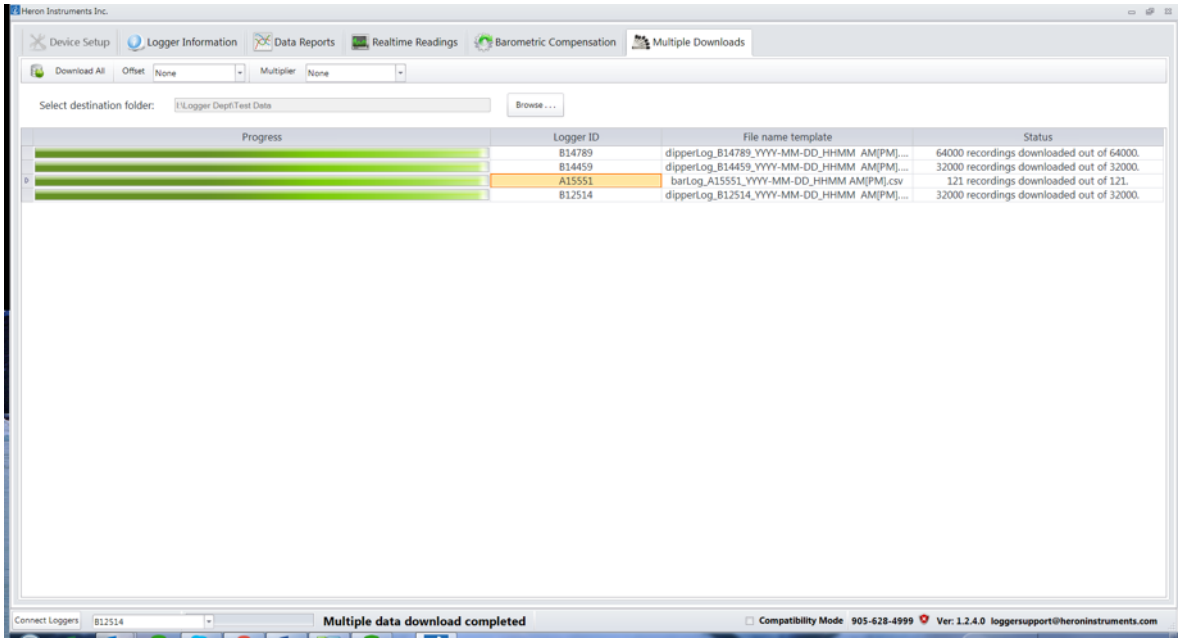
Browse to desired data storage location. You can create a new folder for data.
Download will not proceed until destination folder selected.

THEN



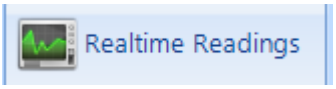
All dipperLog listed on left will be downloaded simultaneously, with individual progress bars indicating the speed of the download.

Once all downloads have been completed, the data files in CSV format will be exported to the designated destination folder with no further input from you.

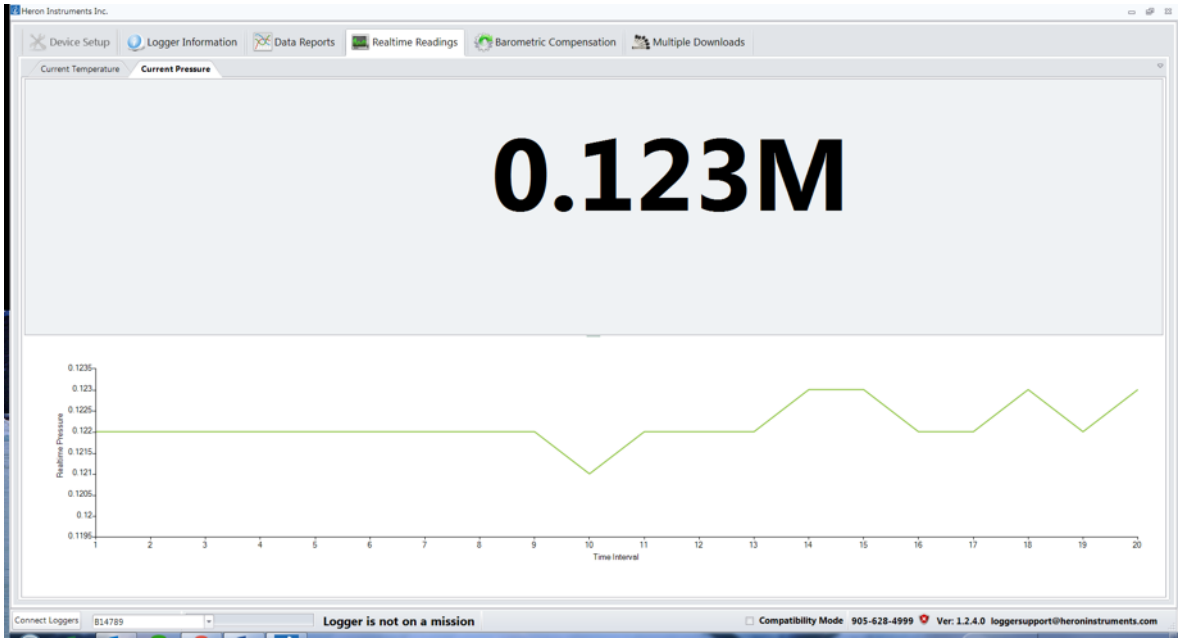


If data needed in Text format, dipperLog must be downloaded and saved individually or saved using the "Save as TXT" option on the barometric compensation screen.

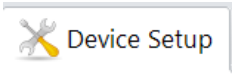
Realtime Readings

Navigating to the tab 

will launch a graphical display of current measurements.
Data will be plotted until a maximum of 20 data points is reached.
The graph will then update every second eliminating earlier readings since no more than 20 data points can be displayed at any time.



This data will not be recorded and is intended for display purposes only.
You may choose to display pressure readings, temperature readings or both.
Navigating to another screen will stop the display.

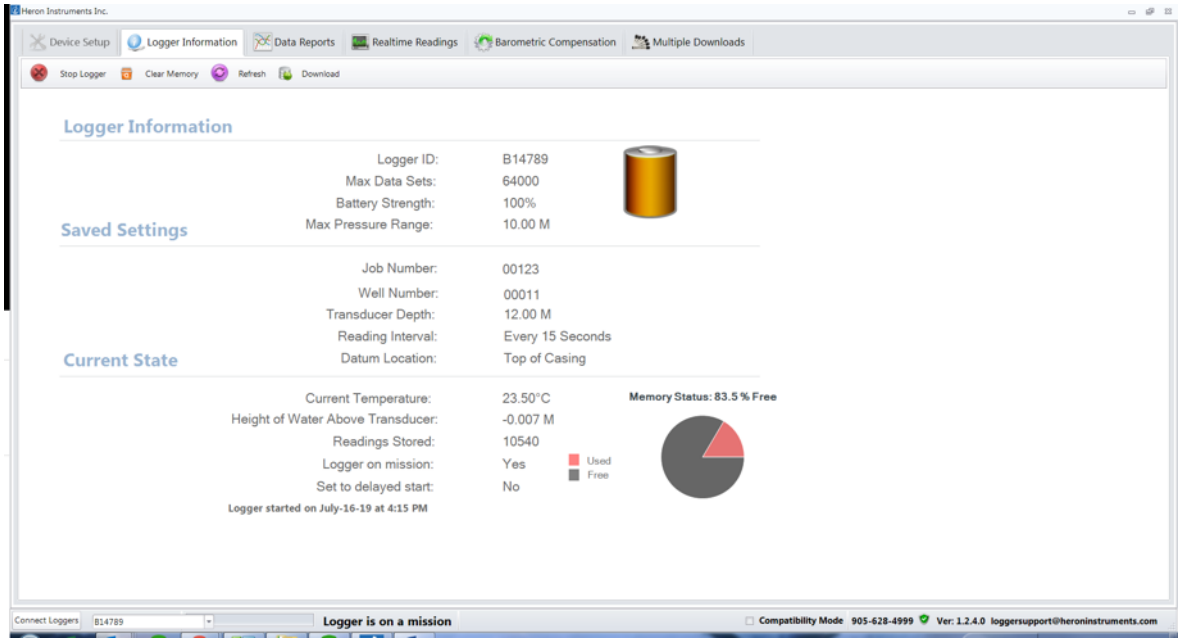


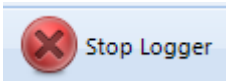
screen will generate an instantaneous water head reading by selecting

-0.001

These readings represent Head of Water values.

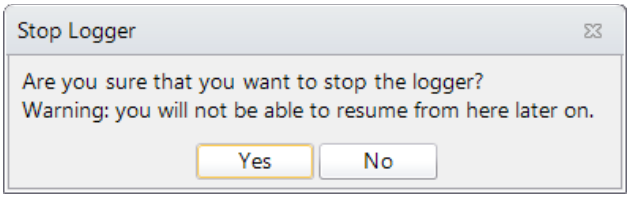
Stopping a dipperLog

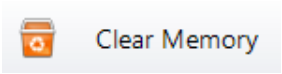




will stop data recording.

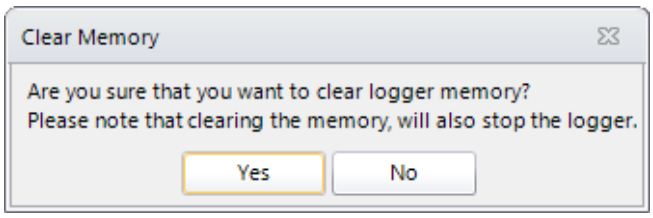
Once stopped, the dipperLog may not be restarted until memory cleared and all settings re-programmed.



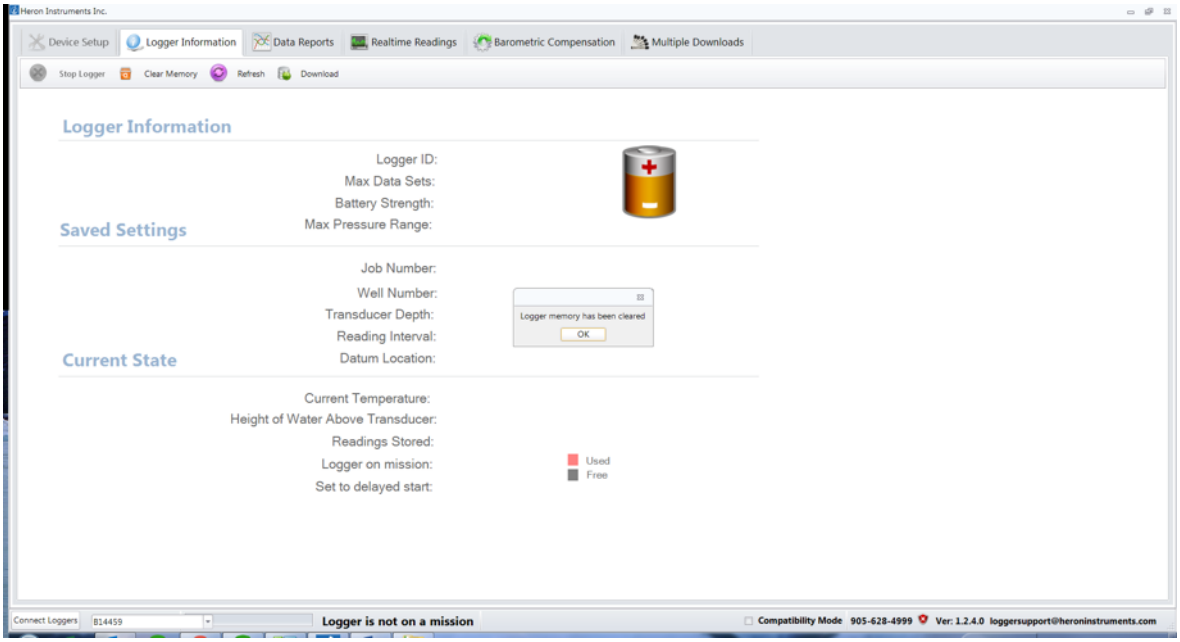
After stopping mission 

clears all information in memory.

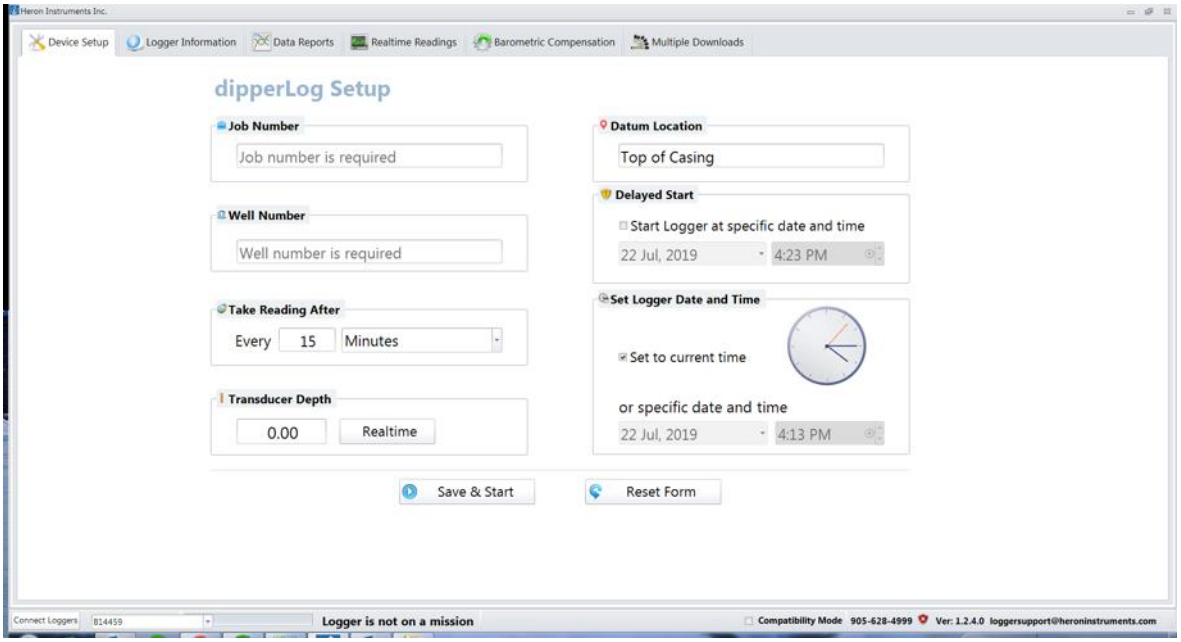
If logger not previously stopped, this operation will also stop the mission.



WARNING: If memory is cleared before downloading and saving the data, all recorded data will be erased and *unrecoverable*.



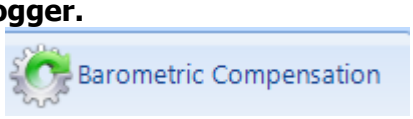
Device setup screen will be displayed with all data fields cleared.



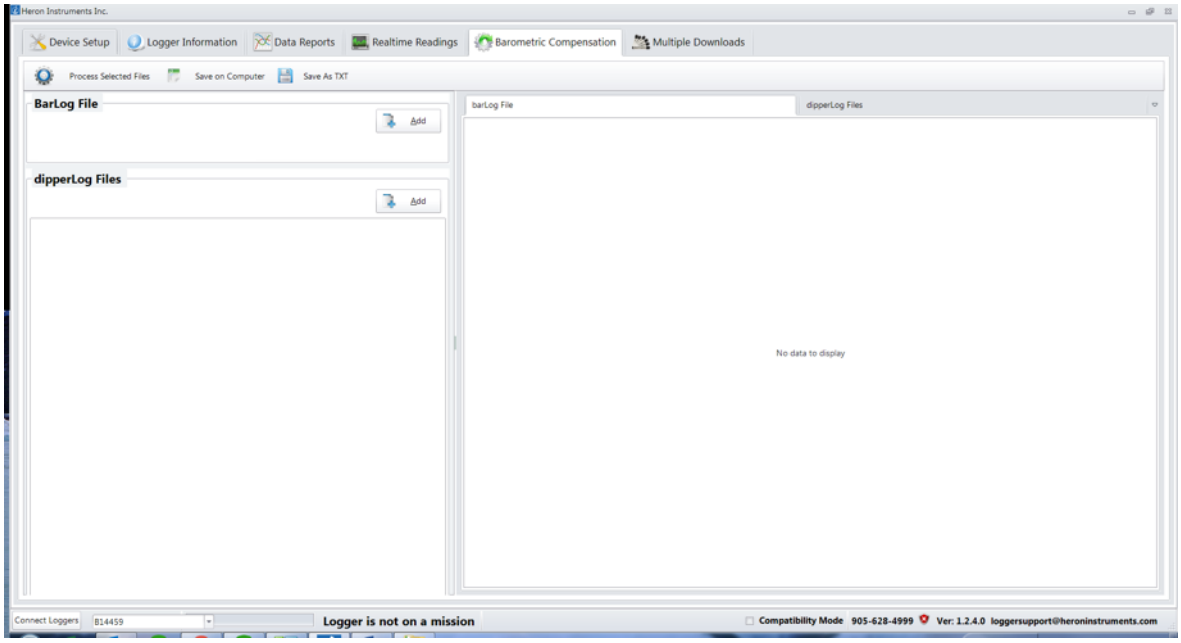
dipperLog is now ready to be re-programmed and re-deployed.

Barometric Compensation

This operation can be done at any time. It is not necessary to be connected to any logger.

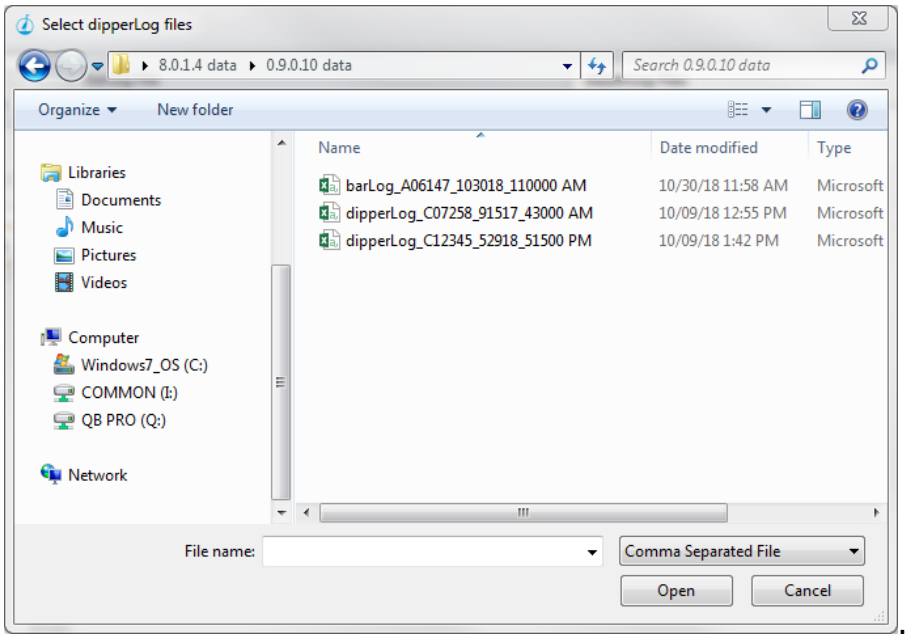
Select 

tab.



Select 

in either barLog or dipperLog section and navigate to location where downloaded data sets are saved,



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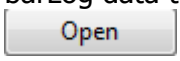
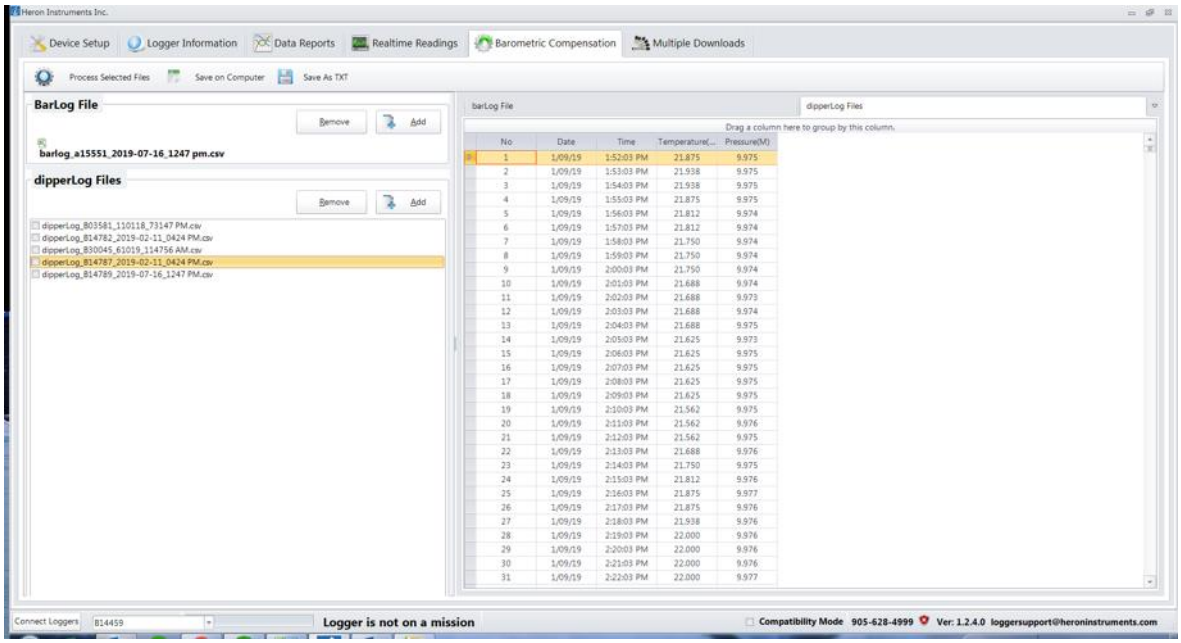
Select barLog data to be used in compensation or dipperLog data to be compensated.

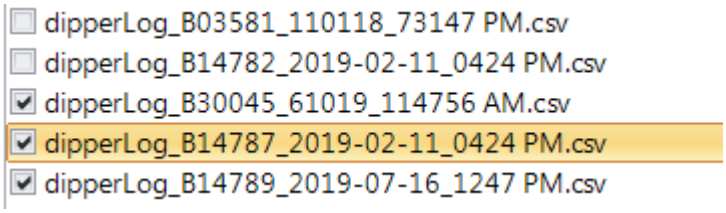
Select  to import files.

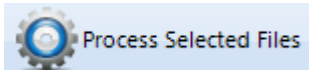
Please Note: barLog and dipperLog files must be imported separately.



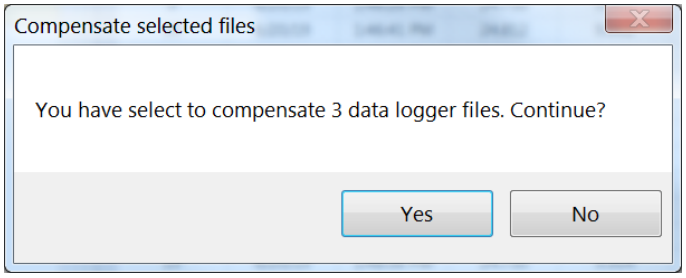
Data sets may be viewed in table on right when highlighted.

Select data sets to be compensated by placing check mark in the corresponding box.

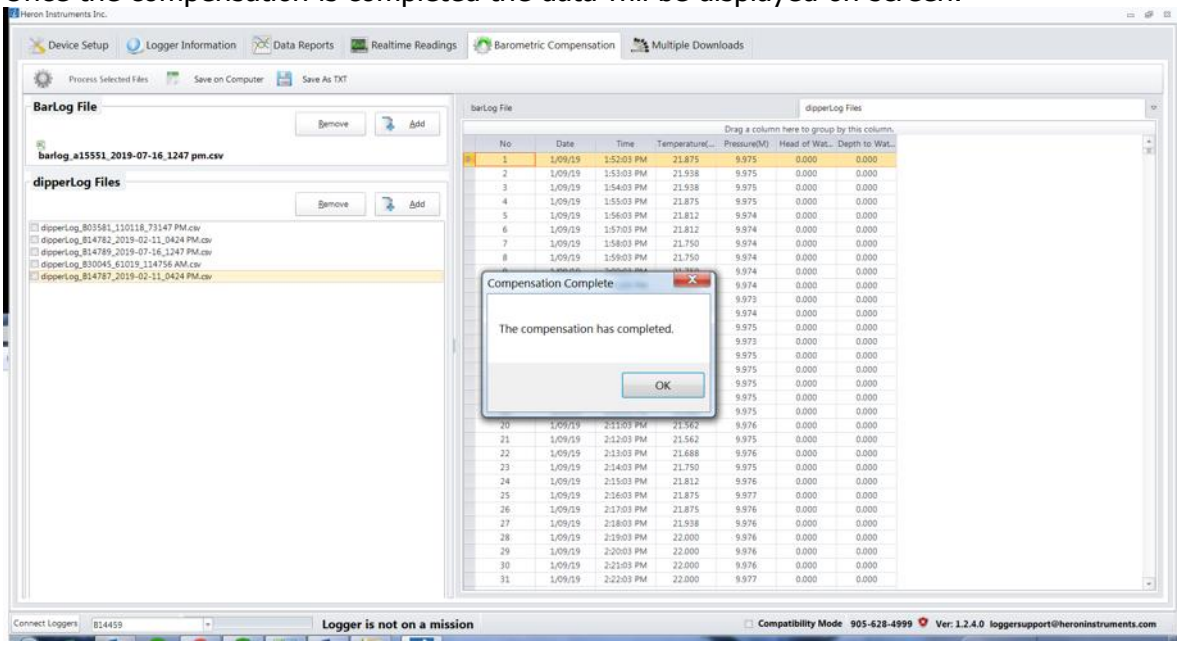


Select  to begin compensation.

You will be asked to confirm operation.



Once the compensation is completed the data will be displayed on screen.



The compensated data will now display 2 additional columns of values:

Head of Water – Pressure recorded with the barometric pressure removed

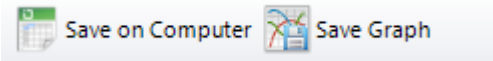
Depth to Water – Transducer depth entered less head of water

The depth to water reading can be verified with a Heron Instruments dipper-T water level meter.

Saving your data

After data download

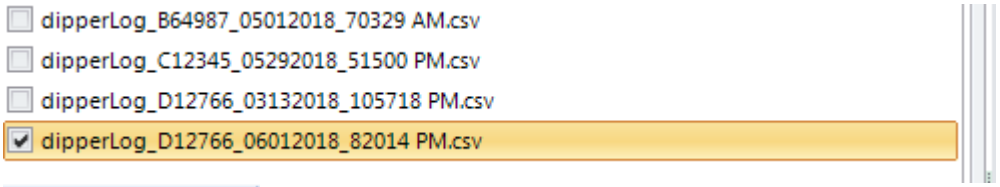
You may opt to save either the data in tabular format or as a graph by selecting the appropriate option on the page header.

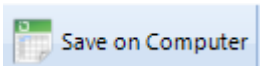


The Save on Computer option will save the data as a CSV file. To save it as a TXT file, simple chose that option in the save as type field when selecting destination.

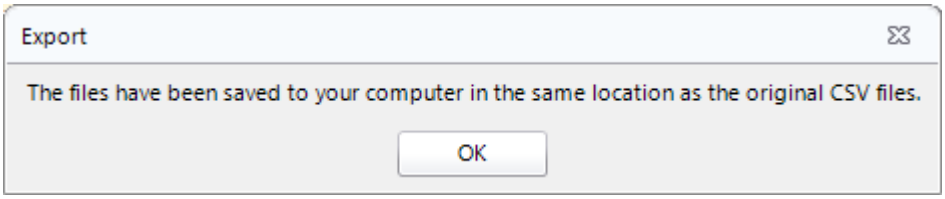
After Barometric Compensation

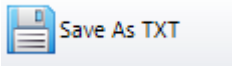
Select files to be exported by placing check mark in appropriate box





will overwrite any previously saved "CSV" data set with the compensated data file.





will overwrite any previously saved "TEXT" data with the compensated data file.

After compensation all data is saved in the same location data was uploaded from before the compensation.

Your actual measured pressure values will still be viewable in the Pressure column displayed in the data.

If the compensation is redone at a later date and time, the software will only refer to the actual pressure measured and re-do all the calculations with the new barLog data.

After Multiple Download

Once all downloads have been completed, the data files will be exported to the designated folder in CSV format with no further input from you.

Data Files

Header

Logger ID	E12540	
Reading Stored		32000
Unit of Measurement	M	
Job Number		99999
Well Number		99999
Transducer depth	10M	
Calibration Factor 1		919
Calibration Factor 2		12565
Sampling interval	1 Second	
Start Date	March-06-18 at 12:13:51 PM	

The above example of the data set header lists the information specific to this data set. The highlighted information is stored in the firmware of the dipperLog and cannot be edited. The balance of the information is user input or system defined.
The following is an example of the data saved from the barometric compensation screen.

No	Date	Time	Temp(°C)	Pressure(M)	Head of Water(M)	Depth to Water(M)
1	06-03-2018	12:13:51 PM	23.25	10.382	0.04	9.96
2	06-03-2018	12:13:52 PM	23.25	10.361	0.019	9.981
3	06-03-2018	12:13:53 PM	23.25	10.371	0.029	9.971
4	06-03-2018	12:13:54 PM	23.25	10.361	0.019	9.981
5	06-03-2018	12:13:55 PM	23.25	10.371	0.029	9.971
6	06-03-2018	12:13:56 PM	23.25	10.361	0.019	9.981
7	06-03-2018	12:13:57 PM	23.25	10.371	0.029	9.971
8	06-03-2018	12:13:58 PM	23.25	10.371	0.029	9.971
9	06-03-2018	12:13:59 PM	23.25	10.371	0.029	9.971
10	06-03-2018	12:14:00 PM	23.25	10.361	0.019	9.981
11	06-03-2018	12:14:01 PM	23.25	10.371	0.029	9.971
12	06-03-2018	12:14:02 PM	23.25	10.361	0.019	9.981
13	06-03-2018	12:14:03 PM	23.25	10.361	0.019	9.981
14	06-03-2018	12:14:04 PM	23.25	10.371	0.029	9.971
15	06-03-2018	12:14:05 PM	23.25	10.361	0.019	9.981
16	06-03-2018	12:14:06 PM	23.25	10.371	0.029	9.971
17	06-03-2018	12:14:07 PM	23.25	10.371	0.029	9.971
18	06-03-2018	12:14:08 PM	23.25	10.371	0.029	9.971
19	06-03-2018	12:14:09 PM	23.25	10.371	0.029	9.971
20	06-03-2018	12:14:10 PM	23.25	10.371	0.029	9.971
21	06-03-2018	12:14:11 PM	23.25	10.371	0.029	9.971

"No" represents the location of the reading in the data set.
"Date" indicates the date the measurement recorded.
"Time" indicates the time of day the measurement taken.
"Temperature" is the recorded temperature of the surrounding environment.
"Pressure" represents the pressure the transducer measured.

- If using a vented dipperLog, this would be the pressure exerted by the liquid above the transducer excluding barometric pressure.
- If using a non-vented dipperLog, this is the pressure exerted by everything above the transducer.

If you have not completed the barometric compensation in the software, the Head of Water and Depth to Water columns will not be present in your data. These values are calculated as part of the compensation process.

"Head of Water" is the pressure recorded minus the barometric pressure recorded by the assigned barLog. It represents the height of the liquid above the transducer.

* If you have a vented and non-vented logger in the same location, the compensated height recorded by the non-vented unit should agree with the uncompensated height recorded by the vented unit.

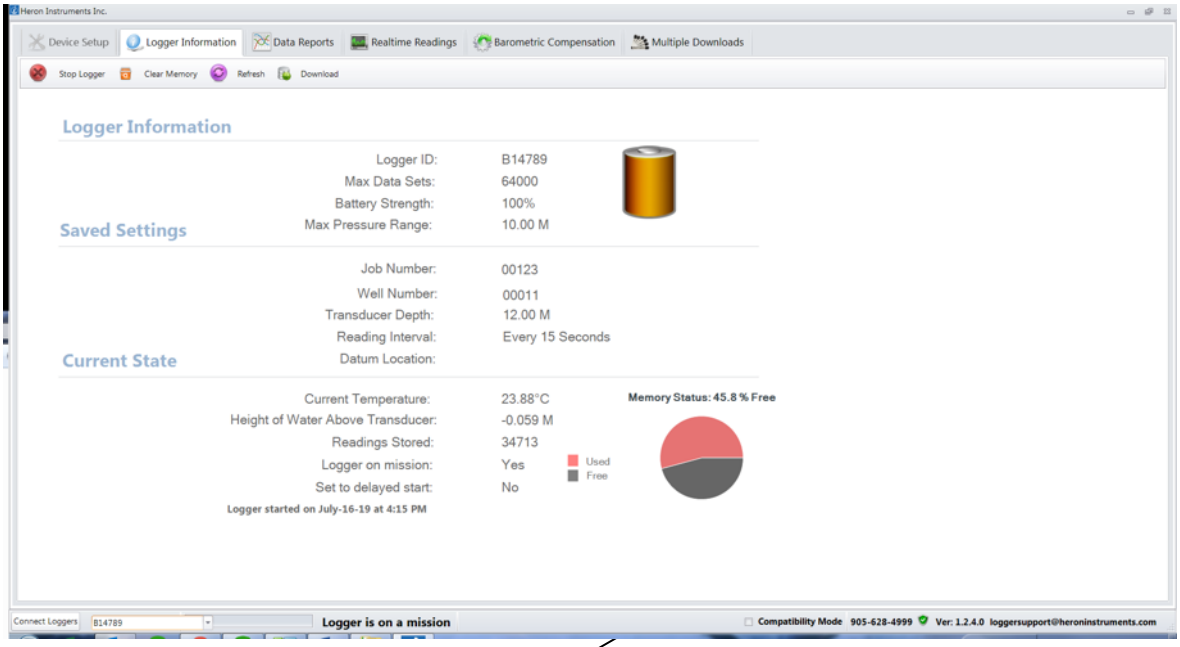
"Depth to Water" is the depth to the water based on the user input depth of the transducer below the reference point minus the compensated height previously calculated.

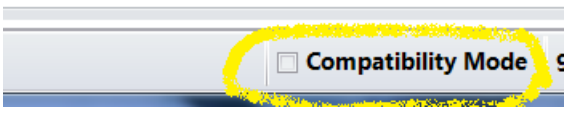
The units of measure are determined by the settings of your computer and will be displayed in the header of each column, either feet or meters of water.

Please Note: If you are using a **Vented dipperLog** in your project, no barometric compensation will be required. The pressure reading recorded will be your Head of Water measurement.

Legacy Series II dipperLog

If you have any of our older "Series II" dipperLog, this software package is backwards compatible and will work with these dipperLog. The older technology incorporated in these units is much slower and cannot communication at the increased speed of today's dipperLog. In order to communicate and download data from these older dipperLog you must adjust the response time of the software.



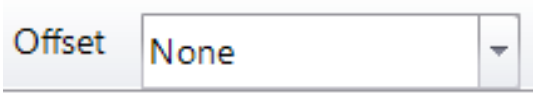


By placing a check in this box, found at the bottom of the screen, the software will be slowed enough to enable this communication.

WARNING: If this box is checked when communicating with the dipperLog NANO, dipperLog 32, dipperLog 64, dipperLog TOUGH, or dipperLog VENTED the communication will be extremely slow.

Advanced Features

PLEASE NOTE: **When using these features in the "Data Reports" tab, the adjustments can be made at any time, before downloading the data or while viewing the data after download.**
When using these features in the "Multiple Download" tab, the adjustments must all be selected prior to download.



This feature is used to offset the recorded data by one of the following values:

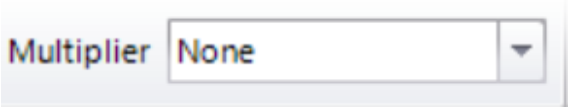
First Reading: In cases where no barLog data is available but your dipperLog was started before placement in well, this option allows you to use that first recorded barometric pressure reading to compensate all subsequent data points. This will not adjust your data for barometric influences over the time of the recordings, it will simply remove a constant value representing an approximate barometric pressure.

Last Reading: This option works the same way as the "First Reading" choice with the exception of using the last recorded data point for the calculations. If your dipperLog recorded the first data point when submerged because of a delayed start, this allows you to use the last reading as an alternate barometric pressure value.

Programmed Value: This selection will use the saved "barometric" value that the dipperLog stores when initially started. This is the same value that is used to calculate the Real Time reading value.

This stored value will change every time the dipperLog is re-programmed and re-started.

Custom Value: When this option is selected a new field becomes available which enables the user to enter a constant value by which to offset the recorded values in memory. This could be an average barometric pressure reading from a local weather station or news channel.



Low Level: This selection will multiply all downloaded all readings by 0.9

Custom Value: This option allows you to select a constant value by which to adjust your readings. Since 1 is the specific gravity of clean water, the software calculates the height of water using 1 as the density. This option allows you to make the necessary adjustment when the fluid you are monitoring has a density of more or less than 1, i.e. seawater or brackish water.

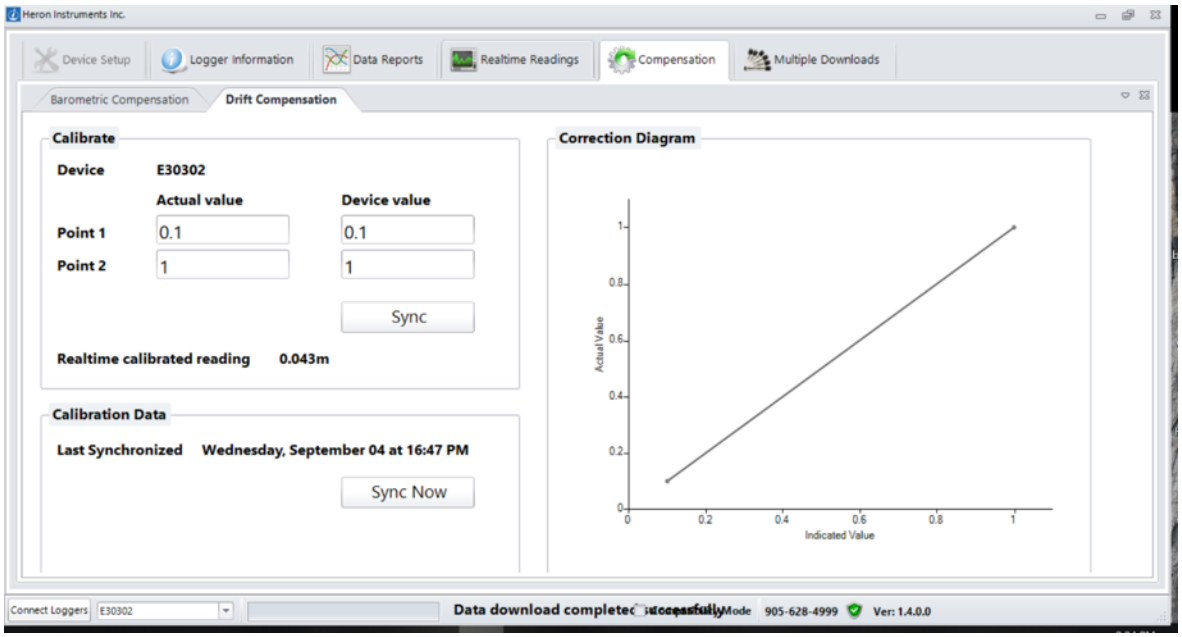
"While density of pure water at 4 degrees Celsius is equal to 1, the density of seawater ranges over somewhat higher values, which vary with proximity to shores, rivers, etc., as well as with geographic location & depth. Representative average values are 1.026–1.028,"

Van Nostrand's, Scientific Encyclopedia 7th edition. Canada, 1989: 2046.

You could also adjust your data for altitude using this option. Simply define a factor based on the height above sea level of your job site and enter it in the custom value field.

Drift Compensation

Located on the Compensation tab, this screen gives the user the ability of fine tune their readings. You can correct the values for any drift which may have occurred over time and also reduce the calibrated range of readings for greater accuracy.



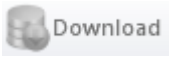
1. Select the minimum and maximum point of the range desired
   - Both values must be within the logger's original range
2. Enter the real time reading of the dipperLog at both these points
3. Select "Sync" to establish correct calibration factor

This correction can be applied by activating the drift compensation on the Data Reports tab at any time; however, it must be selected before download on the Multiple Download tab for it to be applied to the data.

The Sync Now button will cause this calibration factor to be uploaded to the cloud where it can be accessed and applied to any data downloaded from this dipperLog. The calibration data of the last synchronization will be displayed when this option is exercised.

Frequently Asked Questions

Q. Where is the data download button?

A. On both the Logger Information and Data Reports tab the 

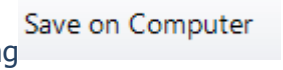
button is in the header bar. The 

option is only available on Multiple Downloads tab.

Q. Does the software have a dedicated data base?

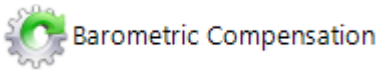
A. No, you must establish your own location for the downloaded data to be saved.

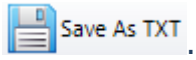
Q. Once I have downloaded my data where is it saved?

A. You must establish the location where you want the data to be saved after selecting 

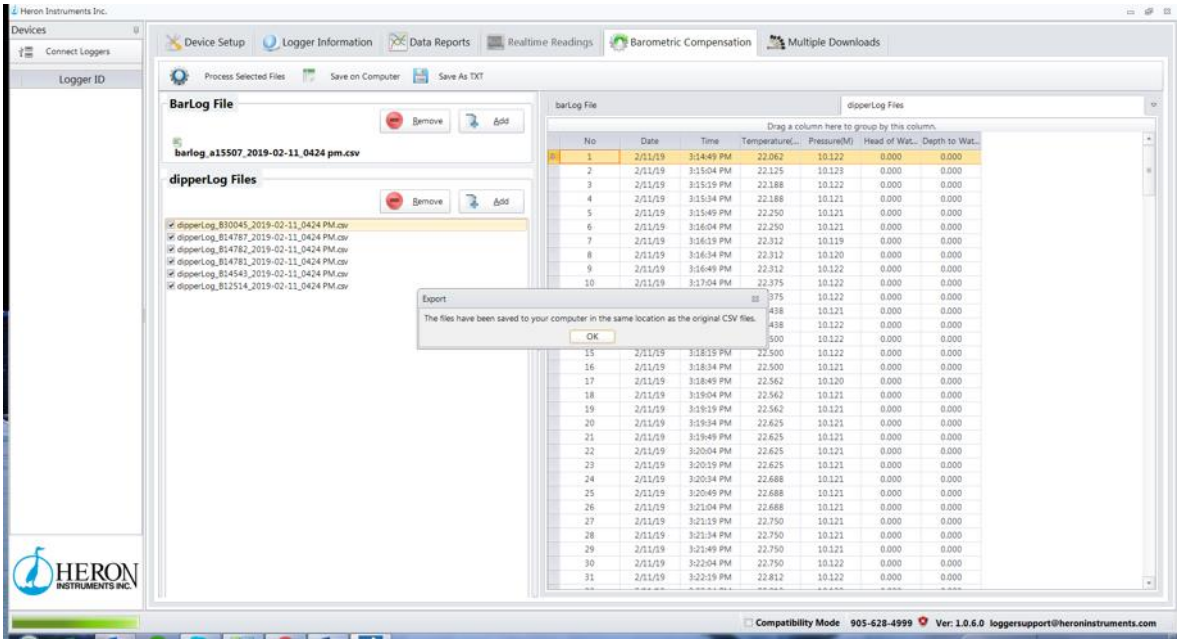
. You can opt to save in "text" format at this time. **In the case of multiple downloads**, you must indicate this location prior to downloading and the data is saved automatically. The default format is "CSV".

Q. Can I save my data as a text file?

A. Yes. Go to the 

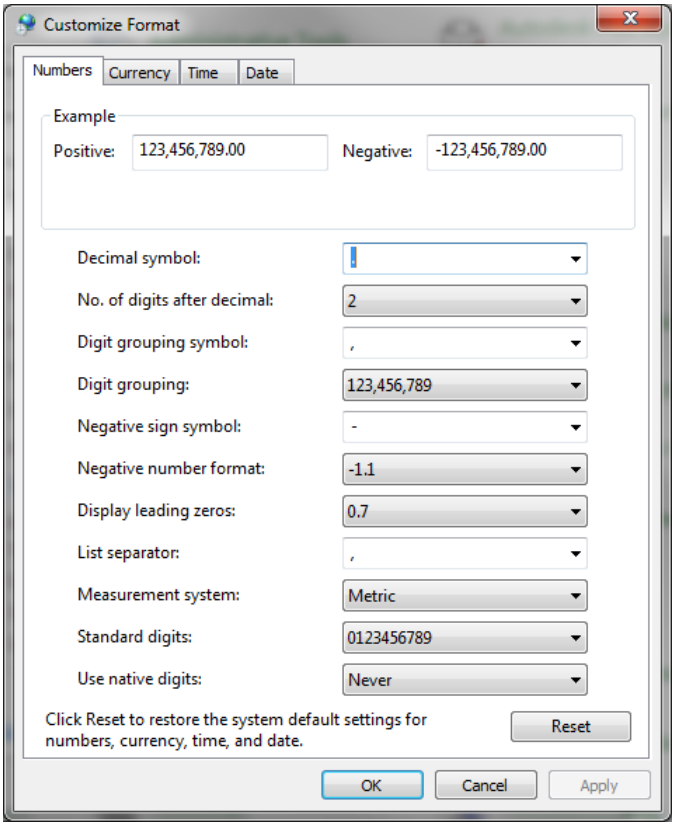
screen. Add the file you wish to save as text and the data will be displayed. Select the file to be saved by checking the box then 

. You do not need to compensate your data to perform this operation. You can save multiple data sets at the same time.



Q. Can I change my units of measure in the software?

A. The software displays the data in the units designated in your computer settings. If you go to the control panel of your computer, select Region and Language and then select Additional Settings, you will access the format screen.
The software will use whatever units are selected in this template.



Because the display units are determined by your computer settings and not the software, if someone sends you a file of dipperLog data that they downloaded and saved in metric, if your computer settings indicate imperial units, the data will be converted when the file is opened. The data will always be displayed in your measurement system of choice.
You can also change them in the Excel spreadsheet after the data has been saved. If done through Excel you do not have to adjust your computer settings and can select units not available as an option in computer settings.

Q. What units are available in the software?

A. You may choose between metric and imperial units in your computer format. For other units such as PSI, you must make the change using Excel.

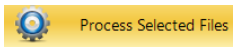
Q. Why do I only have pressure measurements?

A. Your data has not been compensated for barometric pressure effects. Once this compensation has been performed the height of water and depth to water calculations will be performed and values displayed.

Q. How do I compensate my data?

A. Refer to Barometric Compensation on page 17

Q. Must I have a barLog data set to compensate my data?

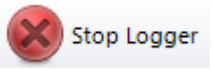
A. To perform an accurate compensation a barLog data set should be used. If no barLog data is available, by indicating the data sets you wish to compensate and then selecting 

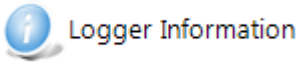
the software will perform the compensation calculations using the first recorded pressure value as the default barometric pressure. This procedure assumes the dipperLog was not started while submerged.

Q. May I compensate multiple data sets at the same time?

A. Yes, however a separate compensation must be performed with each barLog data set as only one can be chosen at any time.

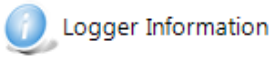
Q. Will downloading my data stop my dipperLog?

A. No. You must manually stop the recording by using 

on the 

screen.

Q. Will downloading my data clear the memory of the dipperLog?

A. No. Return to the 

screen. Once there you may choose to 

. This action will stop the dipperLog if not done previously.

Q. When the memory is full will the dipperLog overwrite with the new data?

A. No, when the memory is full the dipperLog will stop recording.

Q, How long will it take to fill the memory?

A. A dipperLog with a maximum capacity of 32,000 data points will be full in:

8.9 hours	taking 1 second readings
5 ½ days	taking 15 second readings
22 days	taking 1 minute readings
3 ½ months	takings 5 minute readings
11 months	taking 15 minute readings
22 months	taking 30 minute readings
3.6 years	taking 1 hour readings

Q. Can I reproduce the graph in the software when the dipperLog is not connected?

A. No. Once the dipperLog has been disconnected the graph must be created either by downloading the data again or using Excel or some other third party software application to recreate it.

Q. What operating systems is the software compatible with?

A. The software will work on Windows 7, Windows 8 & Windows 10.

Q. Will my current loggers work with this new software?

A. Yes. All dipperLog are compatible with this software. If you are using some of our older models as pictured and are having trouble connecting please refer to page 23 for additional instructions.

Q. Do I require a separate barLog for each dipperLog deployed?

A. No, you can compensate multiple dipperLog data sets with a single barLog. To guarantee accuracy, the barLog should be deployed within 5 km of the dipperLog and at a similar elevation. We recommend an optimal ratio of 1 barLog for every 10 dipperLog deployed.

Q. Are the batteries in the dipperLog replaceable?

A. No. Once the battery in the dipperLog is dead the entire unit must be replaced.

Q. Is any data in memory lost when battery dies?

A. No. The dipperLog has an internal non-volatile memory. Heron Instruments is usually able to retrieve the data from dipperLog with dead batteries. A service fee may be charged for this service.

Q. How many dipperLog can I connect at one time?

A. As many as you have PC communication cables connected.

Q. Where can I find which dipperLog are connected?

A. The drop down box in the lower left corner of the Logger Information Screen will display the listing of connected dipperLog. The highlighted Serial Nunber is the information displayed on the screen.