



Instruction Manual
for the
AquaLogger - 2000
Multiparameter Water Quality
Logger & Utilities
(Lithium and Alkaline Battery Versions)

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1. Introduction

This manual covers the setup, operation and maintenance of the Aquaread AquaLogger-2000 when used in conjunction with an Aquaread Aquaprobe, and should be read in conjunction with the latest revision of the relevant Aquaread Aquaprobe Instruction Manual.

1.1. What does it do?

The Aquaread AquaLogger-2000 is a data logging device for use in conjunction with any model Aquaprobe or the AquaPlus optical DO/EC probe. The AquaLogger-2000 is not however recommended for use with the Aquaprobe AP-7000.

The distance between the AquaLogger-2000 and the Aquaprobe can be up to 100 meters. The AquaLogger-2000 is the same diameter as the Aquaprobe 2000 and can be suspended in a well or borehole above the Probe.

The AquaLogger-2000 is powered by two 'C' cells (see important notes concerning battery types in section 3.1) that can give over 12 months continuous logging, dependent upon logging and event testing rates set. The full memory capacity is 15,000 complete sets of data.

The logging rate can be set between 1 minute and 120 hours (5 days). An event trigger can also be set that will increase the logging rate if a selected parameter changes rapidly.

Setup of the AquaLogger-2000 and data retrieval is done via a USB cable on a PC running LoggerLink utility software. See section 4 for further details.

2. What's in the Box?

The AquaLogger-2000 is supplied with the following:

- The AquaLogger-2000 unit.
- USB Cable for setup and downloading logged data to a PC.

2.1. The AquaLogger-2000 and the Environment

The AquaLogger-2000 is designed to be used outdoors and is rated to IP67, that is to say it is waterproof but it **is not** designed for submersion. Depth and Dissolved Oxygen measurements rely on the ability of the AquaLogger-2000 to read atmospheric pressure. If the unit is submerged, the depth measurement feature will not work and the Dissolved Oxygen readings will be erroneous.

Please note that the flying socket on the AquaLogger-2000 is only waterproof when the associated Aquaprobe plug is fitted. Without the plug fitted, water can enter the socket. Damage caused to the flying socket by water ingress is not covered by your warranty.

You may notice a small hole on the underside of the unit. This is a waterproof vent for the internal barometric sensor. **Do not poke anything in this hole!** Doing so will cause major damage to the vent's waterproof membrane and invalidate your warranty.

2.2. Important Notes Regarding Long-Term Deployment

Aquaprobes should not be deployed and then left for extended periods without regular checking, calibration and maintenance.

The time period between maintenance visits depends heavily upon the deployment conditions. For example, if the Aquaprobe is deployed in clean water, the only necessity should be regular single point calibration of the electrodes. This should be done every 4 – 6 weeks.

If the Aquaprobe is deployed in water that is polluted, silt-laden or heavily affected by algal growth, maintenance visits should be much more frequent.

On all models of Aquaprobe, it is very important to keep the inside of the Probe Sleeve and End Cap clean and free from any build up of algae or silt.

The Probe Sleeve and End Cap form an integral part of the optical measurement system. If they are allowed to become excessively dirty, the accuracy of your readings will be affected.

It is strongly recommended that after initial deployment, maintenance visits are made on a weekly basis in order to assess the rate of fouling. After several weeks, it should be possible to establish the optimum time interval for routine maintenance at any given site.

All ion selective electrodes (ISE) exhibit calibration drift over time. Drift should not be a major problem where the electrodes can be frequently calibrated. However, if the electrodes are to be used in long-term deployment studies, drift is almost certain to occur.

Also remember, in order to achieve accurate readings with ISE electrodes, the Probe needs to be placed in flowing water with a minimum flow rate of 0.3m/s over the electrode. If there is no water flow across an ISE electrode, the ions in the immediate area of the electrode will be depleted and the readings will start to fall.

During long term deployment of ion selective electrodes, the user should obtain grab samples during the course of the deployment for analysis in the laboratory by chemical means and use the results to apply post calibration to the recorded results.

Finally, remember to check the condition of the batteries at every visit. If in doubt, replace them. See LED Indications in section [5.6](#) and Battery Life in section [8.1](#)

3. Battery Installation and Care

3.1. Important Note Concerning Battery Type

AquaLogger units built prior to January 2016 with serial numbers ending in **57** require two **good quality 1.5 Volt** alkaline C size batteries. **DO NOT USE LITHIUM CELLS.**

AquaLogger-2000 units built after January 2016 with serial numbers ending in **67** require two **3.6 Volt** Primary lithium-thionyl chloride (Li-SOCl₂) C size batteries. **DO NOT USE ALKALINE CELLS.** The serial number can be found on a label inside the battery compartment.

During battery installation the AquaLogger-2000 must not be connected to an Aquaprobe or a PC. To install the batteries, grasp the knurled section at the top of the AquaLogger-2000 and unscrew the body cap from the AquaLogger-2000 body.

The battery compartment inside the AquaLogger-2000 body has a screw cap. Unscrew the cap from the battery compartment and insert two C cells of the correct type with the positive terminals both facing up. Replace the battery compartment cap. Apply some silicone grease to the thread and O ring then screw the body cap back on to the AquaLogger-2000 body. Be sure to tighten the two halves properly to prevent water entry.

3.2. Choice of Battery Type

Always use good quality batteries of the appropriate type. **Rechargeable batteries should never be used** as these will lose their charge after a month or so of use due to internal current leakage. If the AquaLogger-2000 is to be out of use for a long period, remove the batteries to prevent damage due to possible leakage.

3.3. Battery Life

The life of the primary C cells is dependent upon the logging rate and temperature (see section 8.1). During setup of the AquaLogger-2000 using LoggerLink software, the estimated battery life for new batteries will be displayed and updated as you alter the logging rate settings. Please bear in mind that battery life will be shorter than that indicated at low temperatures if using Alkaline batteries.

3.4. Battery Condition Monitoring

Battery condition is continuously monitored by the AquaLogger-2000. When an Aquaprobe is first connected, if a low battery condition is detected, the blue LED on the base of the AquaLogger-2000 will give four flashes every two seconds. The batteries should be replaced as soon as possible if this indication is given.

If the batteries are too low to operate the unit reliably, the blue LED on the base of the AquaLogger-2000 will give five flashes every two seconds. The unit will not log data if this condition exists. Actual battery voltage can be measured at any time by connecting AquaLogger-2000 to a PC running LoggerLink Logger Utility software.

3.5. Prior to First Use

Prior to first use, the AquaLogger-2000 must be set up. To do this, the AquaLogger-2000 must have batteries fitted and must be connected to a PC running LoggerLink Logger Utility software.

Important: Install the LoggerLink Software BEFORE connecting the AquaLogger-2000 to your PC for the first time.

4. LoggerLink Logger Utility PC Software

LoggerLink Logger Utility is a program designed to run under Microsoft® Windows® XP®, Vista® or 7 on a stand-alone PC with a minimum screen resolution of 1024 x 768, and an available USB 2.0 socket.

4.1. Downloading LoggerLink™ PC Software from the Aquaread® website

The LoggerLink™ PC Software is available for download using the following link:
<http://www.aquaread.co.uk/downloads.php>

From the Aquaread® Downloads page, select 'LoggerLink-AquaLogger Utility'. The software will be downloaded as a .ZIP file.

4.2. Software Installation

Unzip the downloaded .ZIP file into a temporary directory. Browse the temporary directory and click on 'setup.exe'. You will be given the usual Windows® security warnings. Allow the software to install. Once installed, LoggerLink™ will run automatically.

To communicate with the Logger, two further software 'drivers' need to be installed. These are the '**AquaLogger**' driver and a '**USB Serial Port**' driver.

4.3. Driver Installation

Connect the Logger to your PC using the USB cable provided. The 'Found New Hardware' wizard on your PC should activate automatically.

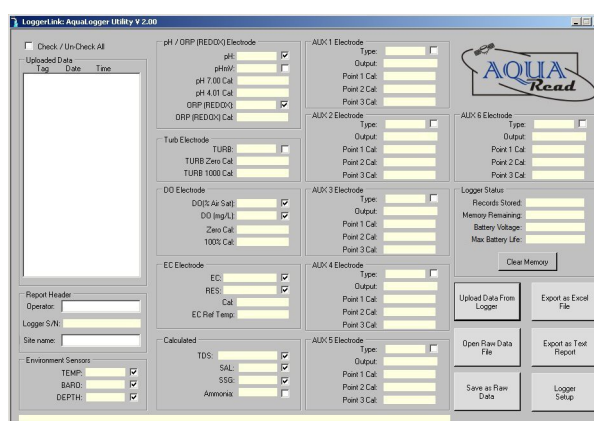
Different versions of Windows® react to plugging USB devices in differently. Earlier versions will give you the option to '**locate and install driver software**'. If this happens, direct Windows® to your temporary directory containing the unzipped download.

If your version of Windows® tries to search the Internet or 'Windows Update' for the drivers, stop the search and direct Windows® to your temporary directory.

If Windows® reports a problem installing the drivers, go to your Windows® Device Manager, locate the 'AquaLogger' device and update the driver forcing Windows® to search your temporary directory for the driver. Repeat this process for the USB Serial Port.

4.4. Running LoggerLink

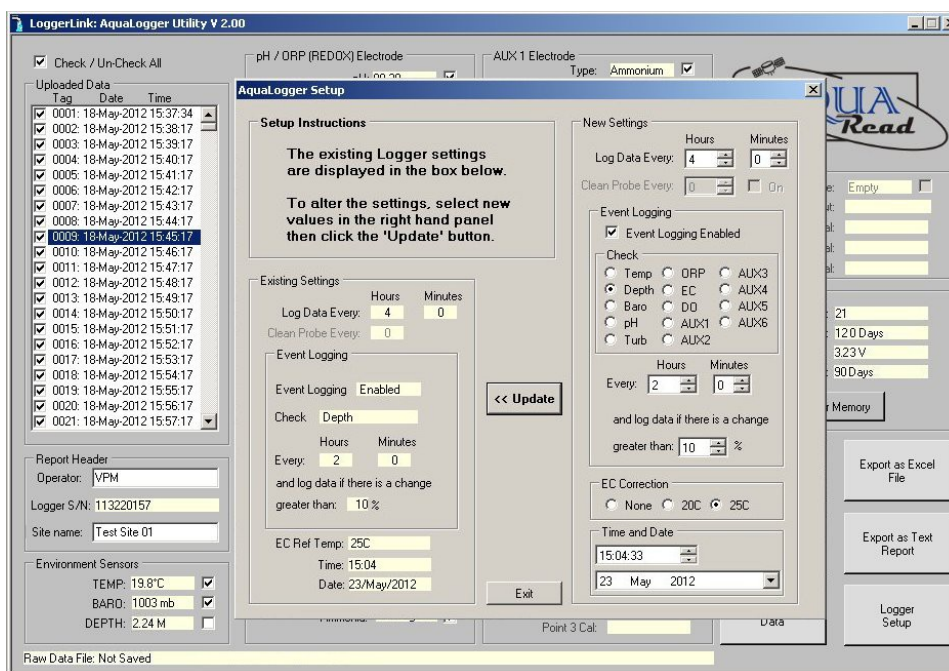
Select LoggerLink from your Programs menu. After an introductory splash-screen has been displayed, the following screen will appear:



4.5. Logger Setup

Prior to first use, the AquaLogger-2000 must be set up. In order to do this, ensure your AquaLogger-2000 has a full set of batteries installed. Connect the AquaLogger-2000 to your PC using the USB cable supplied. The AquaLogger-2000 will switch itself on automatically and the blue LED will light continuously all the time the unit is plugged into your PC.

First click on the button labelled **Upload Data From Logger** to read the Logger's serial number, memory and battery status. Next click on the button labelled **Logger Setup**. The Setup Screen shown below will be displayed.



The existing Logger settings are shown on the left of the screen in the **Existing Settings** box along with the Logger's current time and date. The time and date values do not update in real time. They are a snapshot of the Logger's clock at the time the settings were uploaded.

To alter the Logger's settings and clock, enter the revised values in the **New Settings** box on the right of the screen then click the **<<Update** button.

4.6. Setting the Logging Rate

To set the normal logging rate of the Logger, simply set the hours and minutes values in the two **Log Data Every:** boxes. As you increase or decrease the logging rate, an estimated logging duration (based on a clear memory) will be displayed.

4.7. Event Logging

In addition to regular logging, the AquaLogger-2000 can be set up to log on an event, such as a rapid rise in water level.

In order to activate event logging, first tick the **Event Logging Enabled** tick box. Next select the parameter that you want to use for event logging. In the example above, temperature has been selected.

Next, select the time interval at which the event should be monitored. This value must be

more regular than the normal logging rate. In the example above, the temperature will be monitored every two hours.

Finally, set the trigger point for the event logging, in other words, the amount the value has to change from the previous reading in order to be logged.

So, in the example above, the temperature will be monitored every two hours but will only be logged if it varies by more than 10% from the previous **logged** value.

4.8. EC Correction

The AquaLogger-2000 reads and stores Electrical Conductivity (EC) in an absolute form from the Aquaprobe. Prior to output to LoggerLink, the EC can be corrected to correspond to a reference temperature of either 20°C or 25°C. EC referenced to 25°C is usually preferred in the USA whereas EC referenced to 20°C is generally used throughout Europe.

To choose the way in which EC is reported, simply click one of the three settings within the EC Correction box.

4.9. Setting the Logger Time and Date

When the setup screen is entered, the current time and date from your PC will be inserted in the Time and Date box. To alter these values, simply use your mouse.

4.10. Updating the Logger

Once you are satisfied with the new settings you have made and are sure that the time and date are correct, click the **<<Update** button. All the values from the **New Settings** box will be transferred to the AquaLogger-2000. The AquaLogger-2000 will then copy the values back to the **Existing Settings** box. Verify that the new settings have been made correctly, then click the **Exit** button to return to normal operation.

A revised estimated memory and new battery life will be shown based on the changes you have made to the settings.

Please note: If you are using the alkaline battery model of the AquaLogger-2000 and you remove batteries, you will need to re-connect the AquaLogger-2000 to a PC and reset the time and date. If you do not reset the time and date, the AquaLogger-2000 will re-start the clock at the last logged time and date.

The lithium battery model of the AquaLogger-2000 has a built-in battery backup for the real-time clock so re-setting the time and date after replacement of the batteries is not necessary.

4.11. Uploading Data from the AquaLogger-2000

Ensure your AquaLogger-2000 has batteries installed. Connect the AquaLogger-2000 to your PC using the USB cable supplied. The AquaLogger-2000 will switch itself on automatically and the blue LED will light continuously all the time the unit is plugged into your PC.

Click the '**Upload Data From Logger**' button. LoggerLink will search for the AquaLogger-2000 then upload all the available logged data from the Logger to your PC. A progress bar and file counter will be displayed during this process.

Once upload is complete, the memory Tag, date and time for all the logged data that has been uploaded will be displayed in the **Uploaded Data** column on the left of the screen.

LoggerLink: AquaLogger Utility V 2.00

☒ Check / Un-Check All

Uploaded Data

Tag	Date	Time
0001	18-May-2012	15:37:34
0002	18-May-2012	15:38:17
0003	18-May-2012	15:39:17
0004	18-May-2012	15:40:17
0005	18-May-2012	15:41:17
0006	18-May-2012	15:42:17
0007	18-May-2012	15:43:17
0008	18-May-2012	15:44:17
0009	18-May-2012	15:45:17
0010	18-May-2012	15:46:17
0011	18-May-2012	15:47:17
0012	18-May-2012	15:48:17
0013	18-May-2012	15:49:17
0014	18-May-2012	15:50:17
0015	18-May-2012	15:51:17
0016	18-May-2012	15:52:17
0017	18-May-2012	15:53:17
0018	18-May-2012	15:54:17
0019	18-May-2012	15:55:17
0020	18-May-2012	15:56:17
0021	18-May-2012	15:57:17

Report Header

Operator: VPM

Logger S/N: 113220157

Site name: Test Site 01

Environment Sensors

TEMP: 19.8°C ☒

BARO: 1003 mb ☒

DEPTH: 2.24 M ☐

pH / ORP (REDOX) Electrode

pH: 08.38 ☒

pHmV: -80.4 mV ☒

pH 7.00 Cal: 18-May-2012 ☒

pH 4.01 Cal: 18-May-2012 ☒

ORP (REDOX): 83.1 mV ☒

ORP (REDOX) Cal: 18-May-2012 ☒

Turb Electrode

TURB: ☐

TURB Zero Cal: ☐

TURB 1000 Cal: ☐

DO Electrode

DO(% Air Sat): 099.5 % ☒

DO (mg/L): 08.96 mg/L ☒

Zero Cal: 18-May-2012 ☒

100% Cal: 18-May-2012 ☒

EC Electrode

EC: 290 uS/cm ☒

RES: 3.816 Ohm.cm ☒

Cal: 18-May-2012 ☒

EC Ref Temp: 25°C ☒

Calculated

TDS: 188 mg/L ☒

SAL: 00.14 ppt ☒

SSG: 00.0 st ☒

Ammonia: 0.95 mg/L ☒

AUX 1 Electrode

Type: Ammonium ☒

Output: 10.75 mg/L

Point 1 Cal: 18-May-2012 ☒

Point 2 Cal: 18-May-2012 ☒

Point 3 Cal: 18-May-2012 ☒

AUX 2 Electrode

Type: Chloride ☒

Output: 0.00 mg/L

Point 1 Cal: 18-May-2012 ☒

Point 2 Cal: 18-May-2012 ☒

Point 3 Cal: 18-May-2012 ☒

AUX 3 Electrode

Type: Empty ☐

Output:

Point 1 Cal:

Point 2 Cal:

Point 3 Cal:

AUX 4 Electrode

Type: Empty ☐

Output:

Point 1 Cal:

Point 2 Cal:

Point 3 Cal:

AUX 5 Electrode

Type: Empty ☐

Output:

Point 1 Cal:

Point 2 Cal:

Point 3 Cal:

AUX 6 Electrode

Type: Empty ☐

Output:

Point 1 Cal:

Point 2 Cal:

Point 3 Cal:

Logger Status

Records Stored: 21

Memory Remaining: 120 Days

Battery Voltage: 3.23 V

Max Battery Life: 90 Days

Clear Memory

Upload Data From Logger

Export as Excel File

Open Raw Data File

Export as Text Report

Save as Raw Data

Logger Setup

Raw Data File: Not Saved

To view any of the logged data records, simply click on the desired Tag, date and time label as shown above. The data for the highlighted label will be displayed in the individual data boxes, which are grouped by electrode function. Any data that is unavailable or out of range will be displayed as either blanks or dashes. To move up and down the Tag/date/time column, use either your mouse or the cursor up/down keys.

The box on the right of the screen labelled **Logger Status** gives important information concerning the current status of the AquaLogger-2000. The top box shows the total number of records stored in the Logger. The second box shows an estimate of the number of logging days remaining at the current logging rate. The third box shows the current battery voltage and the bottom box shows the maximum battery life **assuming new batteries**, based on the current logging rate.

4.12. On Screen Help

Help has been provided in this software in the form of 'Tool Tips'. If you want to know what a control button does or what a data box displays, simply move your mouse pointer over the item in question. A Tool Tip will appear after a few seconds to give you more information.

4.13. Saving Logged Data

Once a set of logged data has been uploaded from the AquaLogger-2000, it can be saved on your PC as a Raw Data file. These files use a proprietary format and are saved with a .ldf (logger data file) extension.

To save the uploaded data, click the '**Save as Raw Data**' button. You will be asked for a file name in the normal Windows® format. The file name you choose will automatically be given the .ldf extension.

Useful Tip: Once you have saved the logged data, it is a good idea to clear the AquaLogger-2000's memory so next time you log data, you don't get both your old data and new data uploaded to your PC.

4.14. Retrieving Logged Data

Once a Raw Data file has been saved using the above technique, it can be easily retrieved by clicking on the '**Open Raw Data**' button. When a raw data file is opened, it will appear exactly as uploaded data and the file name will be displayed in the box below the Report Header box. The Logger Status box will remain blank.

4.15. Exporting Data

LoggerLink can export data in two different formats. Before exporting data, the actual data to be exported must be selected. First, select which data records you want to export by checking the relevant check-boxes in the Uploaded Data column. You can check or un-check all data records simultaneously by checking or un-checking the 'Check / Un-Check All' box above the Uploaded Data column.

Next, select which individual data classes you want to export by checking or un-checking the check-boxes next to each individual data box. You are now ready to export your data.

4.16. Exporting Text Reports

To export a text report, first fill in the boxes in the group marked **Report Header** on the left of the screen. The Logger's serial number is automatically inserted. This information will be used at the beginning of your report. Next, click on the '**Export as Text Report**' button. You will be asked to specify a file name. A .txt extension will automatically be added.

A report will be generated that consists of a cover page giving the start and end date and time, the total number of readings, an analysis of the highest and lowest readings, the variance between the highest and lowest readings, the average readings and the GLP calibration data for the Aquaprobe used to take the readings. Each block of individual readings, laid out in chronological order, follows this page. This report can be imported into any text editor or word processor package.

Useful Tip: Of the two text editors supplied with Windows®, Microsoft® WordPad is the preferred text editor for viewing LoggerLink Text Reports as this handles text file formatting better than Microsoft® Notepad.

A typical report cover page follows:

LoggerLink Report			
File name:	C:\Test\3 day test 024690136.txt		
Operator name:	G.E.M.		
Company name:	Aquaread Ltd		
Site name:	Test Site 4		
Start date and time:	24-Jul-2010 10:09:33		
End date and time:	27-Jul-2010 13:01:00		
Total number of readings: 877			
Highest readings			
Temp:	19.8C	Tag: 0648	Date: 26-Jul-2010 Time: 15:51:00
Baro:	1020mb	Tag: 0315	Date: 25-Jul-2010 Time: 12:19:00
Depth:	2.43M	Tag: 0316	Date: 25-Jul-2010 Time: 14:19:00
Turb:	05.8 NTU	Tag: 0560	Date: 26-Jul-2010 Time: 08:46:00
pH:	7.63	Tag: 0565	Date: 26-Jul-2010 Time: 09:09:00
pHmV:	-36.3mV	Tag: 0009	Date: 24-Jul-2010 Time: 10:49:01
ORP:	365.7mV	Tag: 0320	Date: 25-Jul-2010 Time: 12:44:00
DO:	79.4% Sat	Tag: 0742	Date: 27-Jul-2010 Time: 01:46:00
EC:	810uS/cm	Tag: 0588	Date: 26-Jul-2010 Time: 10:51:00
RES:	1,445 Ω •cm	Tag: 0285	Date: 25-Jul-2010 Time: 09:49:00
TDS:	526mg/L	Tag: 0588	Date: 26-Jul-2010 Time: 10:51:00
SAL:	0.40ppt	Tag: 0001	Date: 24-Jul-2010 Time: 10:09:33
SSG:	0.0st	Tag: 0001	Date: 24-Jul-2010 Time: 10:09:33
Lowest readings			
Temp:	17.9C	Tag: 0254	Date: 25-Jul-2010 Time: 07:14:01
Baro:	1005mb	Tag: 0838	Date: 27-Jul-2010 Time: 09:46:00
Depth:	2.05M	Tag: 0744	Date: 27-Jul-2010 Time: 09:46:00
Turb:	04.1 NTU	Tag: 0830	Date: 27-Jul-2010 Time: 09:06:00
pH:	7.55	Tag: 0003	Date: 24-Jul-2010 Time: 10:19:01
pHmV:	-40.8mV	Tag: 0556	Date: 26-Jul-2010 Time: 08:24:00
ORP:	354.4mV	Tag: 0820	Date: 27-Jul-2010 Time: 08:16:00
DO:	30.1% Sat	Tag: 0427	Date: 25-Jul-2010 Time: 21:39:00
EC:	782uS/cm	Tag: 0149	Date: 24-Jul-2010 Time: 22:29:01
RES:	1,358 Ω •cm	Tag: 0651	Date: 26-Jul-2010 Time: 18:11:13
TDS:	508mg/L	Tag: 0145	Date: 24-Jul-2010 Time: 22:09:01
SAL:	0.39ppt	Tag: 0017	Date: 24-Jul-2010 Time: 11:29:01
SSG:	0.0st	Tag: 0001	Date: 24-Jul-2010 Time: 10:09:33
Variance Average values			
Temp:	1.9C	18.81C	
Baro:	15mb	1013mb	
Depth:	0.38M	2.25M	
Turb:	1.7 NTU	4.87 NTU	
pH:	0.08	7.60	
pHmV:	4.5mV	-39.09mV	
ORP:	11.3mV	358.45mV	
DO:	49.3% Sat	59.10% Sat	
EC:	28uS/cm	792.2uS/cm	
Res:	87 Ω •cm	1,415.4 Ω •cm	
TDS:	18mg/l	514.4mg/l	
SAL:	0.01ppt	0.391ppt	
SSG:	0.0st	0.00st	
Calibration (GLP) data			
Turb Zero:	24-Jul-2010	Turb 1000:	23-Jul-2010
pH 7.00:	24-Jul-2010	pH 4.01:	23-Jul-2010
DO Zero:	23-Jul-2010	DO 100%:	24-Jul-2010
EC:	24-Jul-2010	ORP:	23-Jul-2010

Blocks of individual readings, laid out in chronological order, follow this cover page. The readings picked out on the cover page can be cross-referenced to the blocks of individual readings using the Tag numbers.

4.17. Exporting Excel® Files

To export an Excel® file, click on the '**Export as Excel File**' button. You will be asked to specify a file name. A .xls extension will automatically be added. Excel® files are exported in a Tab delimited text format. This means that each data field is separated by a Tab, and each data record appears on a new line.

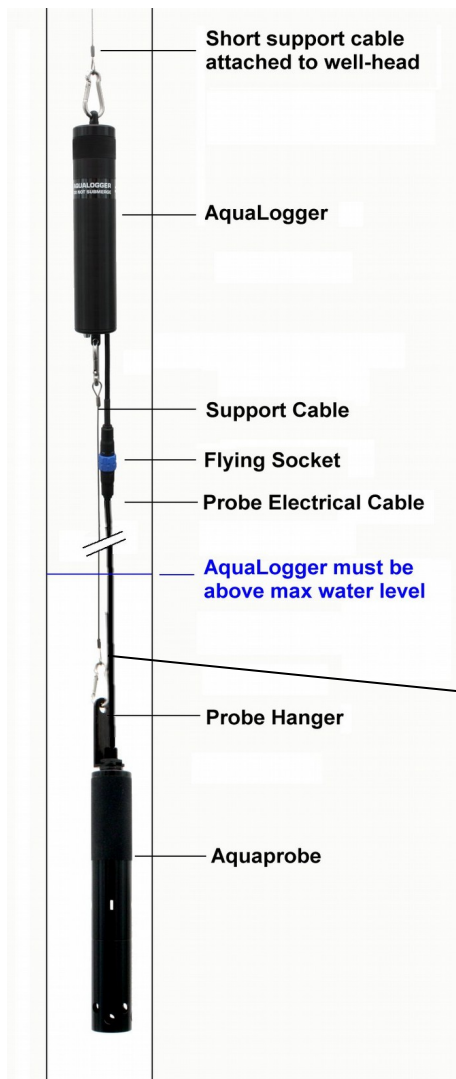
Excel® files are saved with a .xls extension and can be opened directly in Microsoft® Excel®. When opening a .xls file created by LoggerLink for the first time, Excel® may automatically run a 'Text Import Wizard'. Follow the three simple steps to import the file. Save the file afterwards as a 'Microsoft Excel Workbook'.

4.18. Clearing the Logger's Memory

Once the data has been uploaded from the AquaLogger-2000 and saved, the Logger's memory may be cleared by clicking on the **Clear Memory** button, which is located in the Logger Status box.

5. Installing the AquaLogger-2000 and Probe

5.1. Typical Installation

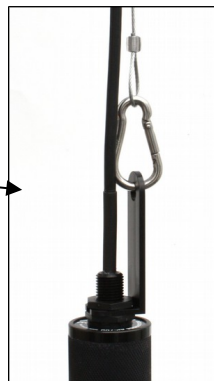


The diagram to the left shows a typical AquaLogger-2000 installation in a borehole.

A short support cable (typically 300mm) should be used to suspend the AquaLogger-2000 assembly from the wellhead.

A longer support cable should be used to suspend the Aquaprobe from the bottom of the AquaLogger-2000 unit.

The Aquaprobe must be submerged in water but **the AquaLogger-2000 must be above the maximum water level at all times.**



Aquaprobe with Probe Hanger, carbine hook and support cable attached.

5.2. Calibrating the Aquaprobe

Prior to first use, the Aquaprobe should be fully calibrated using an Aquaread Aquameter and a set of calibration standards. See the latest revision of the relevant Aquaread Aquaprobe Instruction Manual for calibration procedures.

5.3. Connecting the Aquaprobe

The various models of Aquaprobe are designed to connect to the AquaLogger using an Aquaprobe Extension Cable. The Aquaprobe Extension Cable features high-pressure metal connectors, which incorporate several O-ring seals. Prior to first connection, the seals must be lubricated using the silicone grease supplied.



Seals at AP-2000 end



Seals at AquaLogger-2000 end

Apply a generous smear of grease to the O-rings where indicated above. Be careful not to get any grease inside the connector near the gold contacts. A small smear of grease should also be applied to the threads to allow easy tightening of the collar.

To connect the Extension Cable to the AP-2000, align the coloured dot on the Aquaprobe with the **◀AQUAREAD** logo on the plug body, then press the plug into the socket and tighten the retaining collar fully. Once the Aquaprobe has been connected to the Extension Cable, the AquaLogger can be connected.

To connect the Extension Cable to the AquaLogger, align the two **◀AQUAREAD** logos on the connectors, then press the plug into the socket and tighten the retaining collar.

The AquaLogger-2000 will switch on automatically when the Aquaprobe is connected.

The blue LED will light continuously for five seconds when the probe has been successfully recognised and initialised.

5.4. Important Information Regarding Depth Measurement

Depth is measured in the Aquaprobe model AP-2000-D by a pressure sensor mounted inside the body of the probe. The datum for depth measurement on the Aquaprobe is the top row of holes in the probe sleeve

Depth is calculated by subtracting the barometric pressure being measured in the AquaLogger-2000 from the water pressure being measured in the Aquaprobe. The pressure differential, once corrected for temperature and salinity (water density), is directly proportional to depth.

The depth measurement system uses the EC sensor to detect when the probe has been placed in water. All the time the probe is measuring an EC of zero, the depth will read zero. As soon as an EC value greater than zero is detected, the Logger will start to calculate depth.

For this reason, it is important to ensure the Aquaprobe is connected to the AquaLogger-2000 prior to submerging the probe in water.

5.5. Normal Operation

Directly after connection of an Aquaprobe, the AquaLogger-2000 will take readings at two-second intervals for a period of five minutes. During this period, the LED on the underside of the Logger should give a single flash every two seconds. If the LED flashes more than once every two seconds, refer to section [5.6 LED Indications](#).

After the initial five minutes has elapsed, the Logger will log its first lot of data, then enter a dormant state, waiting for the next programmed logging event.

It is important that you lower the Aquaprobe into the water before this five-minute period has expired, otherwise the initial set of readings will be erroneous. It is also important to lower the Aquaprobe into the water slowly.

During the dormant state, the blue LED will not flash.

When a logging event is imminent, the Logger will leave its dormant state and take readings every two seconds for a period of twenty seconds.

During this time, the blue LED will flash every two seconds. At the end of the twenty-second reading period, the readings will be logged and the Logger will re-enter the dormant state.

5.6. LED Indications

The AquaLogger-2000 has a single, blue LED positioned on the underside. This LED is used to indicate the status of the AquaLogger-2000 by flashing at various rates. The chart below shows the possible combinations and what they mean.

Sequence	What it means	Action
Single flash	Everything is normal	No action required
Double flash	AquaLogger-2000 can not read the Probe	See Troubleshooting below
Three flash	The memory is full	Download data and clear memory
Four flashes	Battery Voltage is getting low	Replace the batteries
Five flashes	Battery Voltage is too low for reliable operation and the unit is no longer logging	Replace the batteries

6. TROUBLESHOOTING

This section details some of the common difficulties you may encounter when using the AquaLogger-2000, Aquaprobes and LoggerLink software. Try all the suggested remedies. If your problem is still unresolved, contact our Service Department.

Problem	Cause / Remedy
The AquaLogger-2000 LED does not flash when an Aquaprobe is connected.	✓ Batteries are probably the incorrect type, dead or incorrectly fitted. Check you have fresh batteries of the correct type fitted and that they are inserted the correct way round. See section 3.
The AquaLogger-2000 LED gives a double flash when the Aquaprobe is connected.	✓ Probably a poor connection. Disconnect the Aquaprobe plug, ensure there is no debris or moisture in the plug and socket, then re-connect the plug ensuring it is fully inserted and that the screw collar is fully tightened.
The LoggerLink software can not find the AquaLogger-2000.	<ul style="list-style-type: none"> ✓ The USB drivers may not be properly installed. Reinstall the USB drivers carefully following the instructions. ✓ There may be a problem with the USB socket on the PC, try an alternative socket.
The LED on the AquaLogger-2000 does not light up when it is connected to a PC.	<ul style="list-style-type: none"> ✓ The batteries in the AquaLogger-2000 may be the incorrect type, dead or incorrectly fitted. Check you have fresh batteries of the correct type fitted and that they are inserted the correct way round. See section 3. The USB cable does not power the AquaLogger-2000. ✓ There may be a problem with the USB socket on the PC, try an alternative socket.
Battery electrolyte leakage detected in the battery compartment.	✓ Remove and discard the batteries immediately. Thoroughly clean the battery compartment and terminals. If the battery terminals are corroded, contact our Service Department for return instructions.

7. DECLARATION OF CONFORMITY

The manufacturer declares that the equipment described herein is in compliance with the essential requirements and other relevant provisions of Directives 2004/108/EC and 1999/5/EC.

8. Technical Specification

Dimensions (Dia x Length)	44mm x 250mm (1.73" x 9.84")
Weight (including batteries)	420g (14.8oz)
Data Memory	15,000 full sets including GLP data
Atmospheric Pressure	150mb – 1150mb Accuracy +/- 1mb
PC Interface	USB (cable provided)
Power Supply	2 x C cells (Battery type dependant on build date)
Battery Life	Dependent upon logging rate and temperature. See table below
Operating Temperature	-20°C to +70°C
Protection Class	IP67

8.1. Battery Life

AquaLogger units built prior to January 2016 with serial numbers ending in **57** require two **good quality 1.5 Volt** alkaline C size batteries. **DO NOT USE LITHIUM CELLS.**

AquaLogger-2000 units built after January 2016 with serial numbers ending in **67** require two **3.6 Volt** Primary lithium-thionyl chloride (Li-SOCl₂) C size batteries. **DO NOT USE ALKALINE CELLS.**

The serial number can be found on a label inside the battery compartment.

The table below gives a number of expected battery life examples for the two different model AquaLoggers (Alkaline battery model or Lithium battery model) when used in conjunction with an Aquaprobe AP-2000. For more detailed information, use LoggerLink software to estimate battery life based on the unit's actual logging rate.

Logging / Event Testing Rate	Alkaline Battery Powered Model Estimated Battery Life at 21°C	Lithium Battery Powered Model Estimated Battery Life
Every Minute	1 Week	2 Weeks
Every 5 Minutes	1 Month	2.5 Months
Every 10 Minutes	2 Months	4 Months
Every 15 Minutes	3 Months	6 Months
Every 30 Minutes	6 Months	1 Year
Every Hour	1 Year	2 Years

Please Note: When cold, alkaline batteries will not perform to their full specification. For this reason, the battery life estimations shown above and in the LoggerLink Software will be significantly shorter (by up to 50%) at lower temperatures. Lithium batteries are not affected by cold temperatures.