Instruction Manual

for the

AquaLogger - 7000

Multiparameter Water Quality

Logger & Utilities

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1. Introduction

This manual covers the setup, operation and maintenance of the Aquaread AquaLogger-7000 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-7000 is a data logging device for use in conjunction with any model Aquaprobe (up to and including the AP-7000) or the AquaPlus optical DO/EC probe.

The AquaLogger-7000 is the same diameter as the AP-7000 and can be suspended in a well or borehole above the Probe.

The AquaLogger-7000 is powered by six standard alkaline 'C' cells that can give over 6 months continuous logging, dependent upon the logging rates and cleaning frequency 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. The AquaLogger-7000 can also be set to send clean commands to an AP-7000 at regular intervals. Please note however, when the battery voltage becomes low, the cleaning function will be suspended.

Setup of the AquaLogger-7000 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-7000 is supplied with the following:

> ➢ The AquaLogger-7000 unit.
> ➢ USB Cable for setup and downloading logged data to a PC.

2.1. The AquaLogger-7000 and the Environment

The AquaLogger-7000 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-7000 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-7000 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 the Aquaprobe model AP-7000, it is very important to keep the cleaning brushes in good condition. The brushes should be replaced as soon as they show any signs of clogging or deterioration.

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

The AquaLogger requires two AAA size batteries and six C size batteries. The two AAA cells provide backup for the unit's clock. The six C cells provide primary power for the unit.

To install the batteries, unscrew the upper part of the AquaLogger body from the lower part at the split-line. Remove the upper part of the AquaLogger body. Following the battery polarity markings inside the battery compartment, insert two AAA cells and six C cells in the two battery holders. Apply some silicone grease to the body threads then screw the two halves back together. Be sure to tighten the two halves properly.

3.1. Choice of Battery Type

Always use good quality Alkaline batteries. **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-7000 is to be out of use for a long period, remove the batteries to prevent damage due to possible leakage.

3.2. Battery Life

The life of the primary C cells is dependent upon the logging rate, cleaning frequency and temperature (see section 8.1.). During setup of the AquaLogger-7000 using LoggerLink software, the estimated battery life will be displayed and updated as you alter the logging rate settings. Please bear in mind that battery life will be much shorter than that indicated at low temperatures.

3.3. Battery Condition Monitoring

Battery condition is continuously monitored by the AquaLogger-7000. When an Aquaprobe is first connected, if a low battery condition is detected, the blue LED on the base of the AquaLogger-7000 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-7000 will give five flashes every two seconds. The unit will not log data if this condition exists. Actual battery capacity and estimated battery life remaining can be measured at any time by connecting AquaLogger-7000 to a PC running LoggerLink Logger Utility software.

3.4. Prior to First Use

Prior to first use, the AquaLogger-7000 must be set up. To do this, the AquaLogger-7000 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-7000 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:
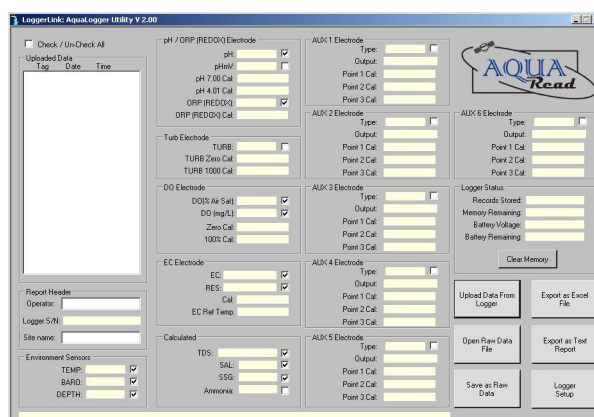
4.5. Logger Setup

Prior to first use, the AquaLogger-7000 must be set up. In order to do this, ensure your AquaLogger-7000 has a full set of batteries installed. Connect the AquaLogger-7000 to your PC using the USB cable supplied. The AquaLo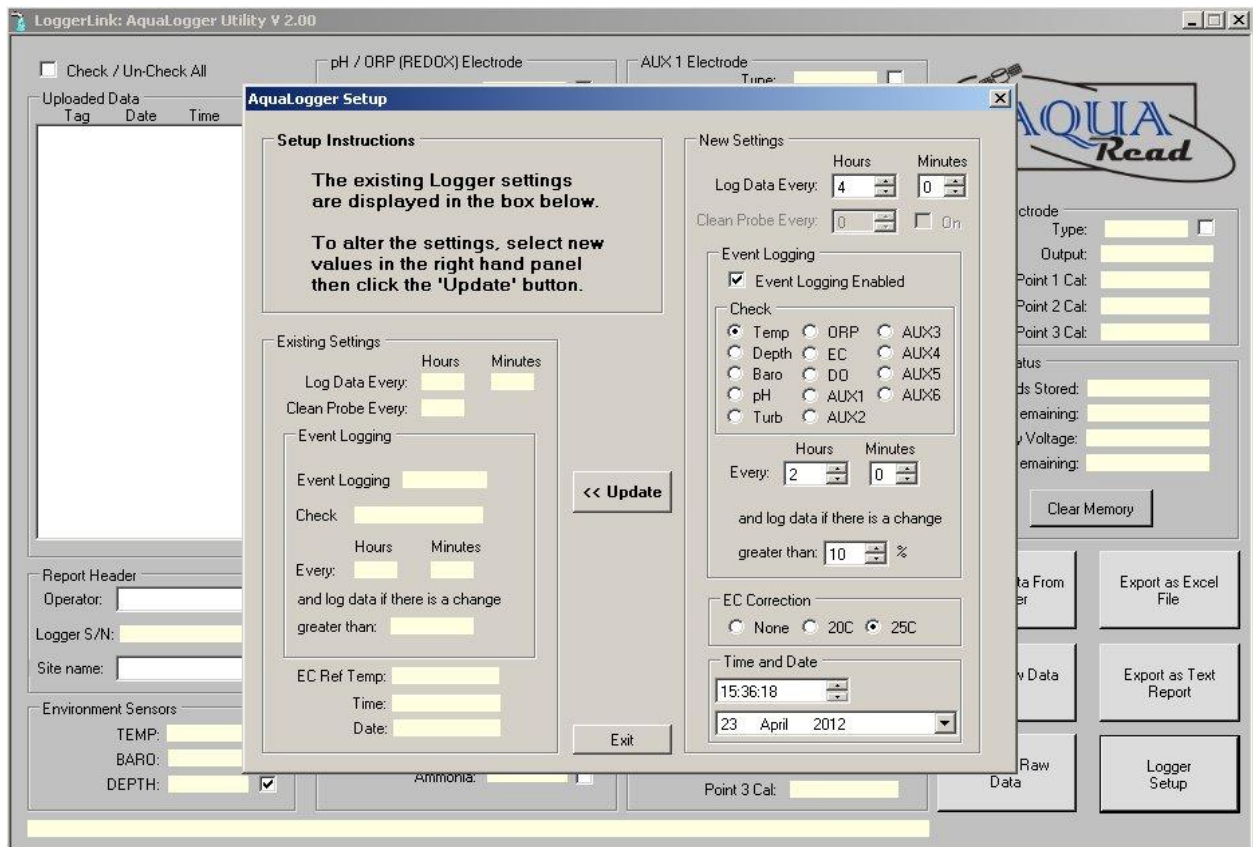gger-7000 will switch itself on automatically and the blue LED will light continuously all the time the unit is plugged into your PC.

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.

4.7. Setting the Cleaning Frequency (when connected to an AP-7000 Only)

To set the probe cleaning frequency, set a value in the **Clean Probe Every:** box and tick the **ON** box. For example, if the **Logging Rate** is set to 2 hour and the **Clean Probe Every**: is set to 4, the probe will be cleaned every four logging cycles (i.e. every eight hours).

4.8. Event Logging

In addition to regular logging, the AquaLogger-7000 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.

4.9. EC Correction

The AquaLogger-7000 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.

4.10. 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.

4.11. 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-7000. The AquaLogger-7000 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 battery life will be shown based on the changes you have made to the settings.

Please note: If you remove the two AAA batteries in the AquaLogger-7000, you will need to re-connect the AquaLogger-7000 to a PC and reset the time and date.

4.12. Uploading Data from the AquaLogger-7000

Ensure your AquaLogger-7000 has batteries installed. Connect the AquaLogger-7000 to your PC using the USB cable supplied. The AquaLogger-7000 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-7000 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.

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-7000. 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 an estimated battery life based on the current logging rate.

4.13. 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.

4.14. Saving Logged Data

Once a set of logged data has been uploaded from the AquaLogger-7000, it can be saved on your PC as a Raw Data file. These files use a proprietary format and are saved with a .ldf (**l**ogger **d**ata **f**ile) 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-7000's memory so next time you log data, you don't get both your old data and new data uploaded to your PC.

4.15. 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.

4.16. 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.

4.17. 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.

4.18. 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'.

4.19. Clearing the Logger's Memory

Once the data has been uploaded from the AquaLogger-7000 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-7000 and Aquaprobe

5.1.   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 Aquaprobe Instruction Manual for calibration procedures.

5.2.   Suspending the Aquaprobe

The various models of Aquaprobe are designed to connect to the AquaLogger using an Aquaprobe Extension Cable.

The flying socket an the AquaLogger should not be allowed to support the weight of Aquaprobe models AP-5000 or AP-7000.

If you are installing one of these larger Aquaprobes, loop the Extension Cable back to the suspension eye on the bottom of the AquaLogger and Ty-wrap it in place to take the strain off the in-line plug and socket.

5.3.   Connecting the Aquaprobe

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 with the Aquaprobe.

Seals at Aquaprobe end

Seals at AquaLogger-7000 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 Aquaprobe, 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-7000 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 Aquaprobe models AP-2000-D, AP-5000 and AP-7000 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-7000 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-7000 prior to submerging the probe in water.**

5.5.   Normal Operation

Directly after connection of an Aquaprobe, the AquaLogger-7000 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 four minutes have elapsed, the Logger will command the Aquaprobe to carry out a clean cycle (AP-7000 only).

After a further minutes has elapsed, the Logger will log its first lot of data, then enter a dormant state, waiting for the next programmed logging event. During the dormant state, the blue LED will not flash.

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

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

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

5.6. LED Indications

The AquaLogger-7000 has a single, blue LED positioned on the underside. This LED is used to indicate the status of the AquaLogger-7000 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-7000 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

Note: When the battery voltage becomes low, the cleaning function will be suspended.

6. TROUBLESHOOTING

This section details some of the common difficulties you may encounter when using the AquaLogger-7000, Aquaprobes and LoggerLink software. Try all the suggested remedies. If your problem is still unresolved, contact our Service Department.

Problem	Cause / Remedy
The AquaLogger-7000 LED does not flash when an Aquaprobe is connected.	✓ Batteries are probably dead or incorrectly fitted. Check you have fresh batteries fitted and that they are inserted the correct way round.
The AquaLogger-7000 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-7000.	✓ 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-7000 does not light up when it is connected to a PC.	✓ The batteries in the AquaLogger-7000 may be dead or incorrectly fitted. Check you have fresh batteries fitted and that they are inserted the correct way round. The USB cable **does not** power the AquaLogger-7000. ✓ 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)	77mm x 250mm
Weight (including batteries)	1500g (including batteries)
Data Memory	15,000 full sets including GLP data
Atmospheric Pressure	150mb – 1150mb Accuracy +/- 1mb
PC Interface	USB (cable provided)
Power Supply	6 x Alkaline C cells + 2 x Alkaline AAA cells
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

The life of the batteries is dependent upon logging rate, cleaning frequency and temperature.

The table below gives a number of examples for quick reference. For more detailed information, use LoggerLink software to estimate battery life based on the unit's actual battery voltage.

Logging / Event Testing Rate	Estimated Battery Life at 21°C
Every Minute	1 Week
Every 5 Minutes	1 Month
Every 10 Minutes	2 Months
Every 15 Minutes	3 Months
Every 30 Minutes	6 Months
Every Hour	1 Year

Please Note:

1. **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.**

2. **When the battery voltage becomes low, the cleaning function will be suspended (AP-7000 only).**