



HYDROCELL 2

USER MANUAL

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Version - 1.0

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1 Revision History

Version	Date	Modifications	Approved by PTL
V1.0	02/08/2010	Original	V CHAPRONT

2 Document Approval

Originator: _____

Date: _____

Your signature signifies that you are the original author of the document, that you are satisfied with the content and presentation, and are submitting it for formal approval.

Checked By: _____

Date: _____

Your signature signifies that you have checked this Functional Design Specification for correctness of content and presentation and that you agree with the technical content of the document.

Approved By: _____

Date: _____

(Project Manager)

Your signature signifies that you have approved this Functional Design Specification as being suitable for dissemination to the purchaser and that the details contained herein will form the basis for detailed system design and implementation.

Approved By: _____

Date: _____

(Purchaser)

Your signature signifies that you have checked this Functional Design Specification against your requirements and give approval for the sub-contractor to proceed with the system design and implementation.

3 Sampling Cycle

When a sample is required, the following cycle is performed:

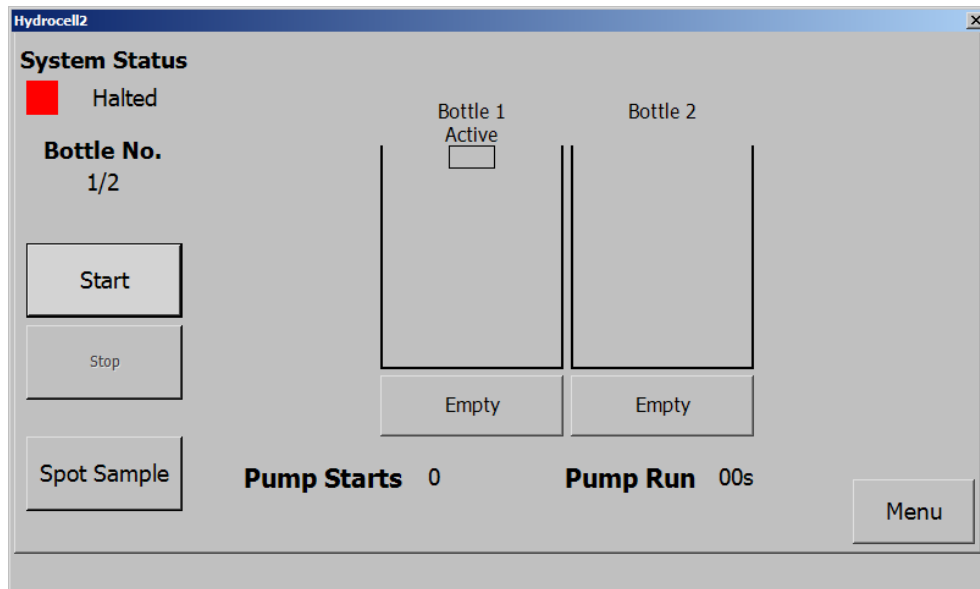
1. Reset the home position: to ensure that the arm has not been moved, we recalibrate its home position. This is done by:
 - (a) Rotate CounterClockwise until the stall is hit;
 - (b) Save the current position as the home.
2. Rotate the arm to the bottle: The bottle at midnight every day;
3. Purge the tube;
4. Add a sample in the bottle;
5. Purge the tube.

4 Design

Some of the option are available only in Engineer Mode.


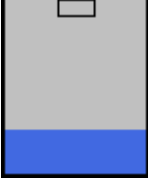

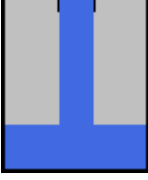
4.1 Run

What: Display the current status of the sampler and the bottles;



Description:

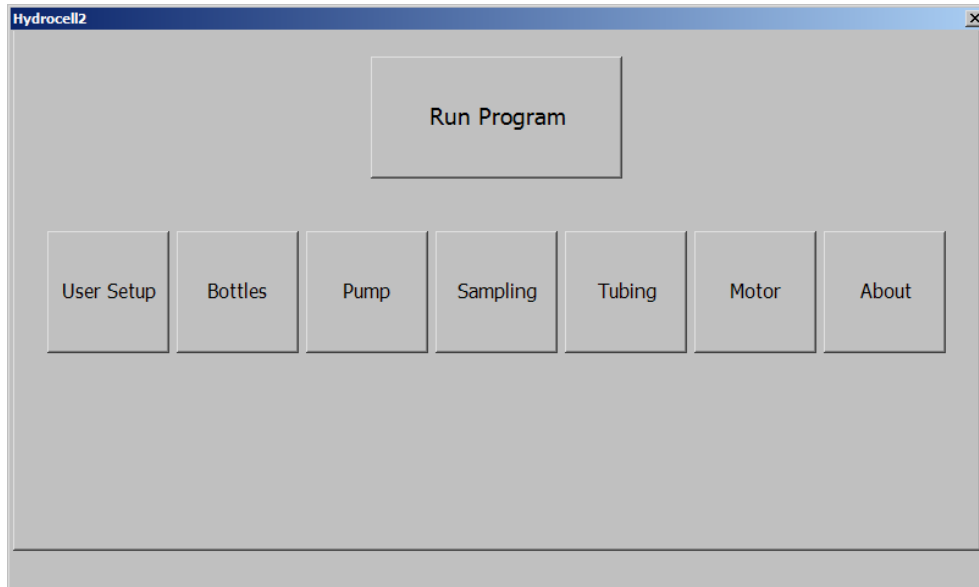
- State: Current status of the sampler. Can be “Runnning”, “Purging”, “Sampling”, “Rotating” or “Halted”;
- Bottle No.: The bottle which will receive the sample on the total number of bottle;
- Start: Start the sampling sequence;
- Stop: Stop the sampling sequence. A password is required to stop;
- Spot Sample: Run a full Sample Cycle (reset home, rotate to current bottle, purge, sample and purge);
- Menu: Display the menu;
- Bottle: A graphical representation of the 4 bottles in the sampler with the expected volume of liquid in each of them and their current state. This is for indication only. When a bottle volume is greater than the full limit, the volume color switch form blue to red. The states are as follow:

State	Representation	Description
Off		The arm is rotating or is on the top of another bottle
Waiting		The arm is on the top of the bottle and the pump is off
Purging		The arm is on the top of the bottle and the pump is purging
Sampling		The arm is on the top of the bottle and the pump is sampling

- Pump Starts: Number of time the pump has started;
- Pump Run: Time during which the pump has been running.

4.2 Menu

What: The menu with buttons to go the different page of the application



Description:

- For each page (except Menu), a button is displayed which redirects to the corresponding page.

4.3 Setup

What:

The screenshot shows a software window titled "Hydrocell2" with a standard Windows-style title bar (minimize, maximize, close buttons). The window contains a form with the following fields:

- Company: [Text Input]
- Site ID: [Text Input]
- Address: [Text Input]
- City/Town: [Text Input]
- Country: [Text Input]
- Postcode: [Text Input]
- Comment: [Text Input]
- Contact: [Text Input]
- Voice No.: [Text Input]
- Fax No.: [Text Input]
- Modem No.: [Text Input]

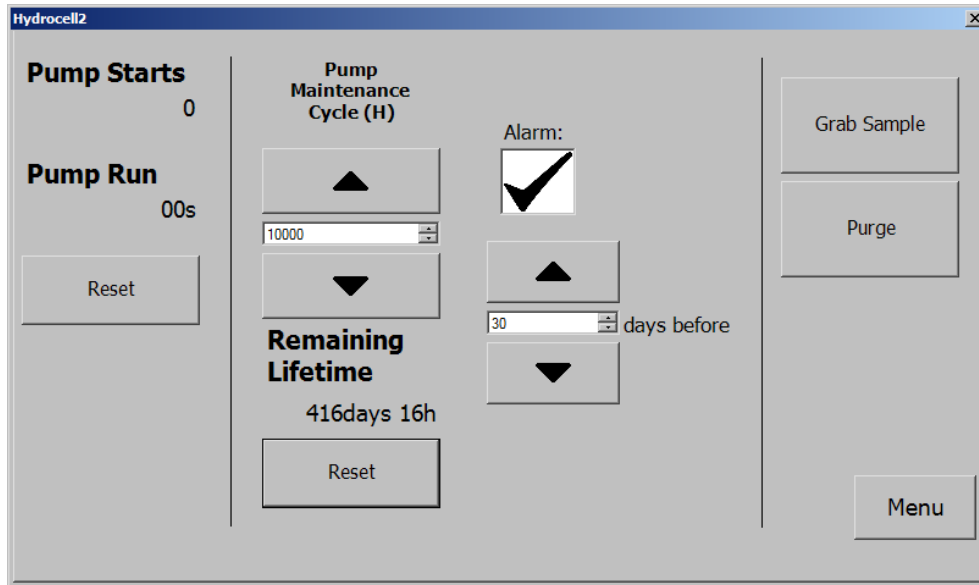
Below the input fields, there is a "User Password" section consisting of four spinners with values 0, 0, 0, and 1. To the right of these spinners is a "Change" button. At the bottom right of the window is a "Menu" button.

Description:

- Configuration:
 - Save: Save the current configuration and the run time data to the default file;
 - Export: Save the current configuration and the run time data to a chosen file;
 - Import: load the current configuration and the run time data from a chosen file;
- User Password: Change the user password;
- Menu: Return to the menu

4.4 Pump

What: Configure the pump

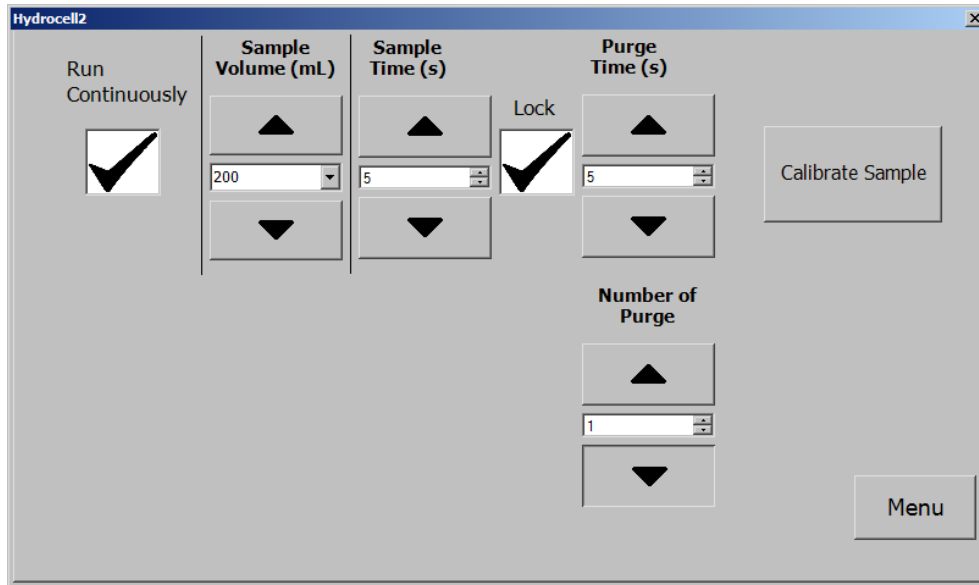


Description:

- Pump Starts: Number of time the pump has started;
- Pump Run: Time length during which the pump has been running;
- Reset: Reset the Pump Starts and the Pump Run to 0;
- Pump Maintenance Cycle: Time between two service of the pump;
- Remaining Lifetime: Time before the next service of the pump;
- Alarm: Enable an alarm to be displayed a number of specified days before the next pump maintenance;
- Days Before: Number of days before the next maintenance for the alarm;
- Grab Sample: Take a sample in the current bottle;
- Purge: Purge the tube;

4.5 Sampling

What: Configure the sampler. **Modifiable only in Engineer Mode.**

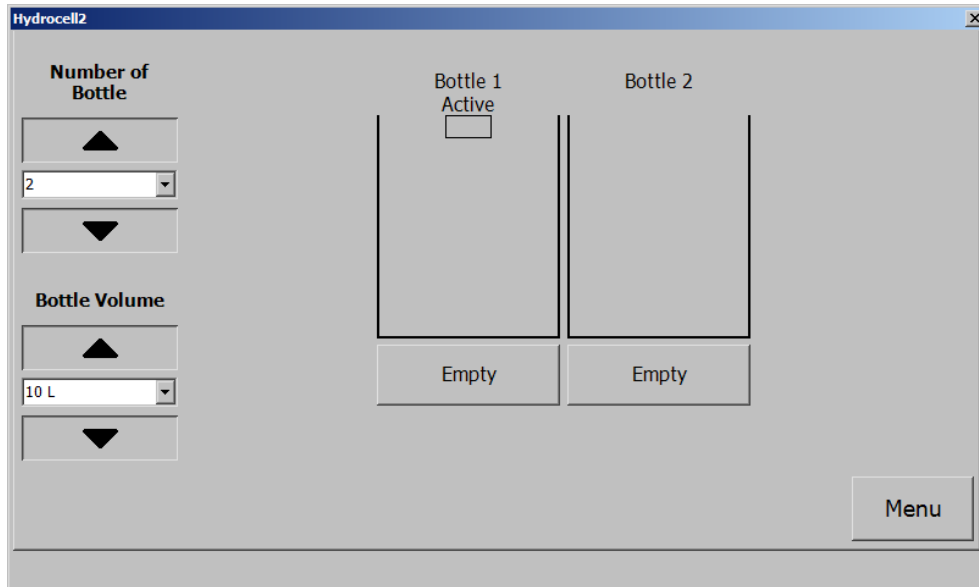


Description:

- Run Continuously:
 - If not checked: When the sample reach the fourth bottle, it will automatically stop when this one is full or at the end of the current day.
 - If checked: The sample will not stop and will assume that the bottles have been emptied.
- Sample Volume: Volume in millilitre of a sample;
- Lock: Keep the purge time equal to the sample time;
- Sample Time: Time in second for which the pump run to grab a sample;purge the tube;
- Number of Purge: Number of purge before a sample and after it;
- Calibrate Sample: Perform a simple sample cycle (purge, sample, purge).

4.6 Bottles

What: Configure the bottle. **Modifiable only in Engineer Mode.**



Description:

- Number: Number of bottle in the sampler;
- Volume: Volume of each bottle in liter;
- Bottle: Graphical representation of the bottle with the expected volume of liquid. For indication only;
- Empty: Empty the bottles.

4.7 Tubing

What: Configure the tube

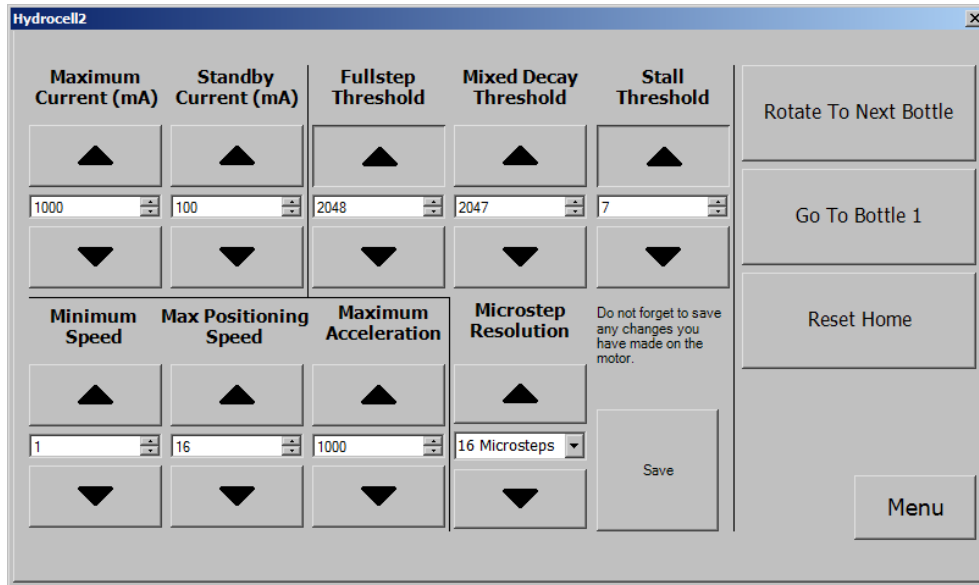
The screenshot shows a software window titled "Hydrocell2" with a grey background. At the top left, the word "Life" is displayed. To its right, the text "Installation Date:" is followed by three columns labeled "Day", "Month", and "Year". Each column contains a numeric input field with up and down arrow buttons. Below these fields is a dropdown menu currently set to "Quarterly". To the right of the date fields is an "Alarm:" section with a checked checkbox and a numeric input field set to "30", followed by the text "Alert 30 days before". Below the date fields and the alarm section are four more numeric input fields with up and down arrow buttons. In the bottom right corner of the window is a button labeled "Menu".

Description:

- Life: Expected life time of the tube;
- Installation Date: Date of the installation of the current tube;
- Alarm: If enabled, an alarm is enabled when the tube life time is almost finished;
- Alert n days before: If an alarm is enabled, an alert will be sent n days before the end of the tube lifetime;

4.8 Motor

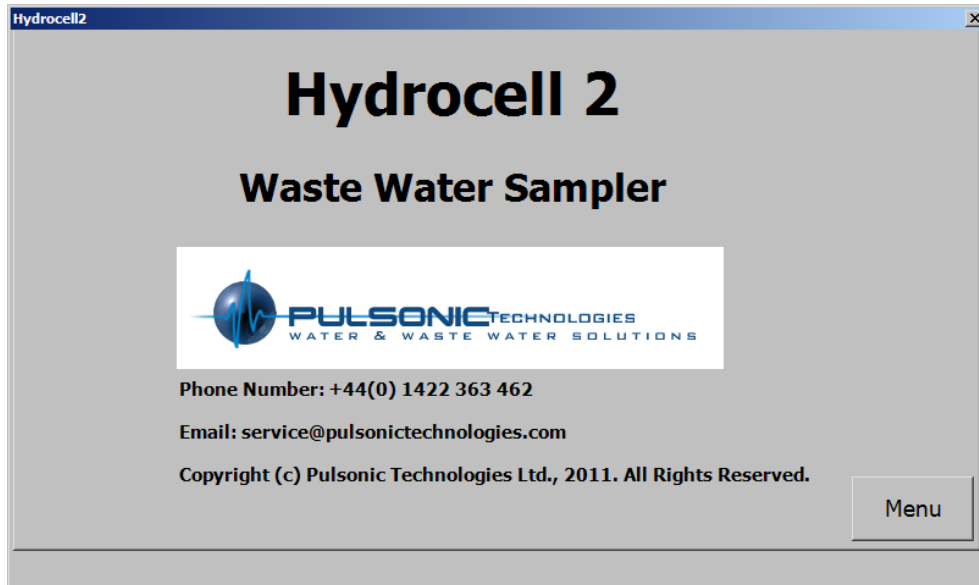
What: Configure the motor. **Modifiable only in Engineer Mode.**



- Maximum Current:
- Standby Current: Current when the motor is not rotating. The higher it is, the more difficult it will be to manually move the arm. This value is used only when the pump is purging or sampling. When it is not, the standby current of the motor is 0mA;
- Fullstep Threshold: When exceeding this speed the driver will switch to real full step mode. Setting a full step threshold allows higher motor torque of the motor at higher velocity;
- Mixed decay threshold: If the actual velocity is above the threshold, mixed decay will be used;
- Stall threshold: The motor will be stopped if the load value exceeds the stall detection threshold;
- Minimum Speed: Should always be set to 1 to ensure exact reaching of the target position;
- Max Positioning Speed:
- Maximum Acceleration: The limit for acceleration and deceleration;
- Microstep Resolution:
- Save: Send the current value to the motor.
- Rotate Bottle: Rotate the arm to the next bottle. This does not change the current saved bottle. So when the sampling is resumed, the arm will rotate to its correct bottle.
- Reset Home: Reset the home position.

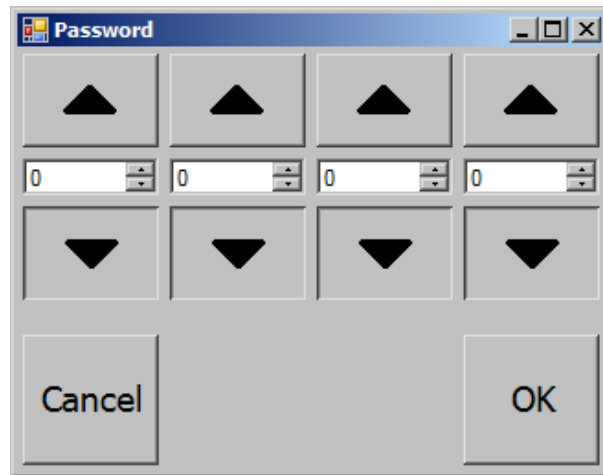
4.9 About

What: Information about the software and Pulsonic Technologies Limited



4.10 Password

What: A form to input a password to log on.



5 Log

The Hydrocell uses 2 different log file to record event. A new file is created each monday and is used for the following week. The files are:

1. logInfoWeek*N*: Contains date and time of sampler, rotation to new bottle, bottle full, bottle emptied and volume of bottles;
2. logErrorWeek*N*: Contains date and time of different error such as lost connection to the motor, arm stuck, etc.