Aquarius Technologies

ULTIMA SERIES

USER MANUAL

REVISION 0 - 1/08/2024

CONTENTS

INTRODUCTION

Congratulations on your purchase of an ULTIMA controller!

The following manual will provide support to ensure longevity and reliable, efficient performance.

SAFETY INFORMATION

Refer AS/NZS 3000 WIRING RULES when installing electrical equipment in and around operating area. Power cover to be removed by Aquarius Technologies Pty Ltd, an authorized service agent or licensed electrician only, and must be replaced before controller is connected to power supply.

DO NOT open controller enclosure except as required for maintenance purposes. Once maintenance is complete, enclosure is to be closed and resealed. If supply cord is damaged, it shall be replaced by Aquarius Technologies Pty Ltd or authorized service agent to avoid a hazard.

This appliance is not intended for use by children or infirm persons unless they have been adequately supervised by a responsible person to ensure they can use the appliance safely. Children should be supervised to ensure they do not play with the appliance.

This marking  indicates product should not be disposed of with other household wastes throughout the EU. To prevent possible harm to environment or human health from uncontrolled waste disposal, recycle responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.

Chemicals used as part of the treatment program may be hazardous. Refer to the Material Safety Data Sheets provided by your chemical supplier and ensure all personnel involved are aware of the handling and safety procedures. It is a requirement to provide protection for accidental spills of chemicals, including any leaks that could develop from pump pressure lines.

Please read and understand all safety warnings on chemical containers before servicing any dosing equipment. Some chemicals will damage materials used in construction of buildings, particularly roofing. Never assume that equipment will not leak, under certain conditions that will occur. It is the responsibility of the installer to ensure that such events do not create damage that should have been avoided by correct site selection and provision of adequate bundling at time of installation.

Wear as a minimum, safety goggles and chemical-resistant gloves when servicing dosing equipment. DO NOT mix acids and oxidising agents as explosion, and/or toxic and lethal gas may be evolved, and/or fire result. Keep all chemical containers sealed and free from contamination.

Salt-water chlorinators draw high currents when operated. ULTIMA is fitted with Normally Open, Normally Closed Relay for activating chlorinator. This relay is suitable to maximum 6.3A. Please consult chlorinator OEM specifications to determine current draw. If greater than 6.3A, relay may only be used to activate a contactor which in turn controls the chlorinator.

The hazardous voltage area of this controller is under protection cover. Only Safety Extra Low Voltage (SELV) is supplied to the accessible circuit boards inside the enclosure. Sensors may be maintained while controller is powered.

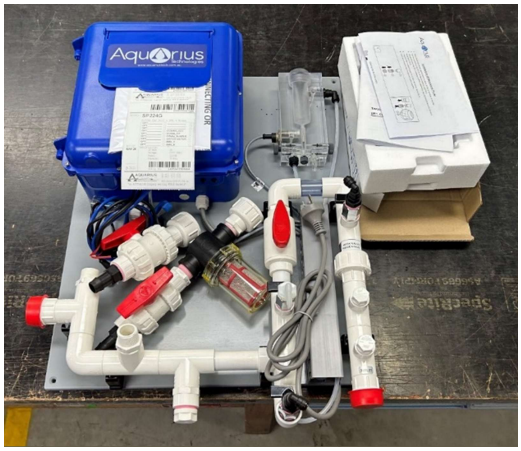
INSTALLATION

UNBOXING & INITIAL INSPECTION

Unpack the equipment. Aquarius Technologies takes all due care when packaging equipment for our customers, and will photograph each package prior to sending out.

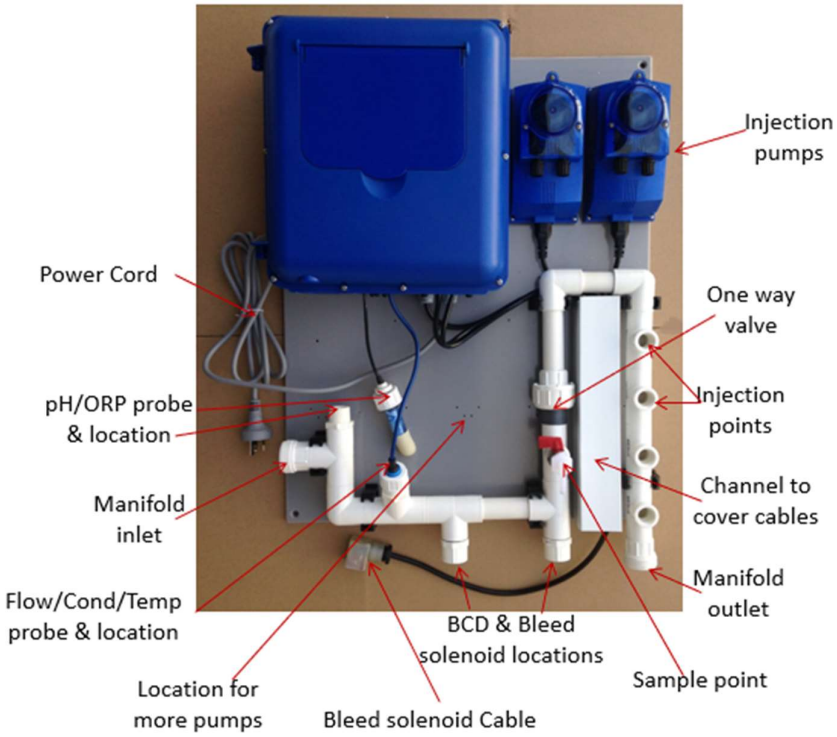
IMPORTANT – COMPONENT CHECKS: Ensure all parts are accounted for, referring to itemised delivery documents, and components are not missing or damaged.

In case of damaged or missing parts, take a photo while items are still in the box and report the fault to the Aquarius Technologies sales team (sales@aquariustech.com.au).

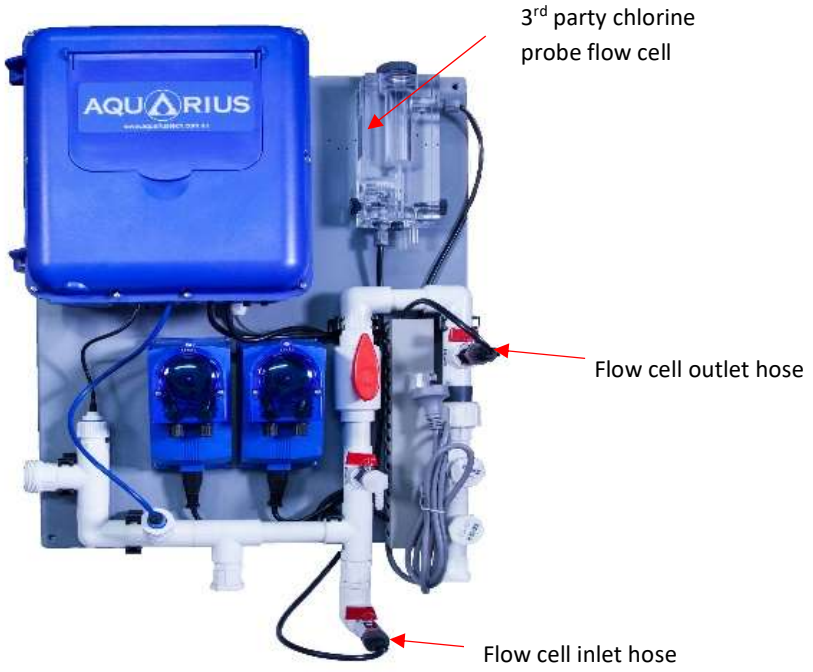


HARDWARE SETUP

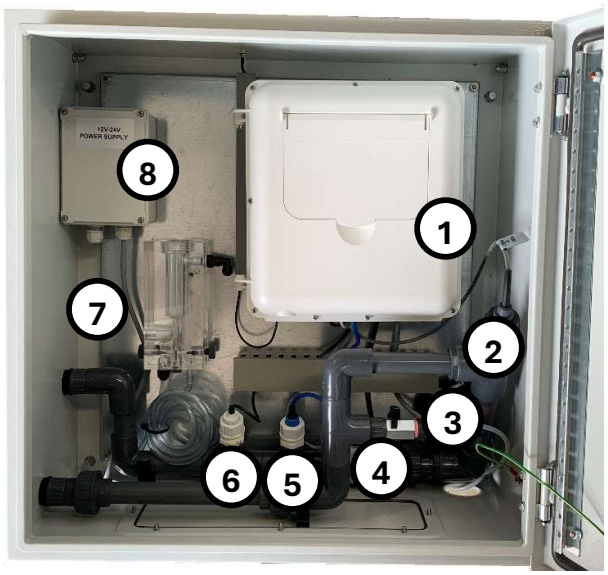
COOLING TOWERS



NOTE: when fitting pH/ORP probe, remove the protective cap from and fit it into the manifold. The other probes are already installed on the manifold.



UNIQ ONLINE CORROSION MONITORING FOR COOLING TOWERS



UNIQ Layout

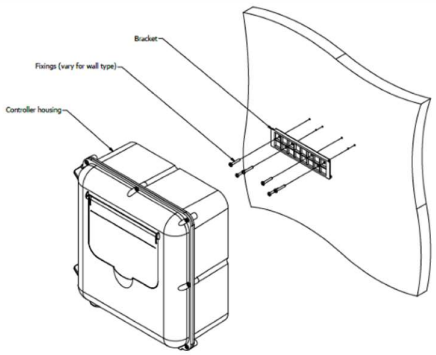
1. UNIQ Controller
2. Aquarius CS/Cu corrosion sensor
3. Sample valve and tube
4. Inline flowmeter controls manifold flow and functions as flow switch
5. FCT sensor
6. pH/ORP sensor
7. Powder coated metal cabinet
8. External 24VDC power supply for 4-20mA sensors

*. Provision for fluorometer for inhibitor monitoring and control (must be ordered separately)

Put the suction line of pumps to the chemical tanks as required and ensure each dose pump's discharge tubing is connected to the injection points provided on the manifold.

MOUNTING THE CONTROLLER

Mount and secure the backboard, manifold and controller to designated area.



Connect a 20 mm line from the circulating pump discharge line, or system common discharge header or condenser, to the inlet of the manifold. Connect a return line from the manifold outlet valve, preferably in PVC pipe to the pump suction or common suction header or to the tower basin.

Install the BLEED solenoid valve on the manifold and plumb the other side to drain.

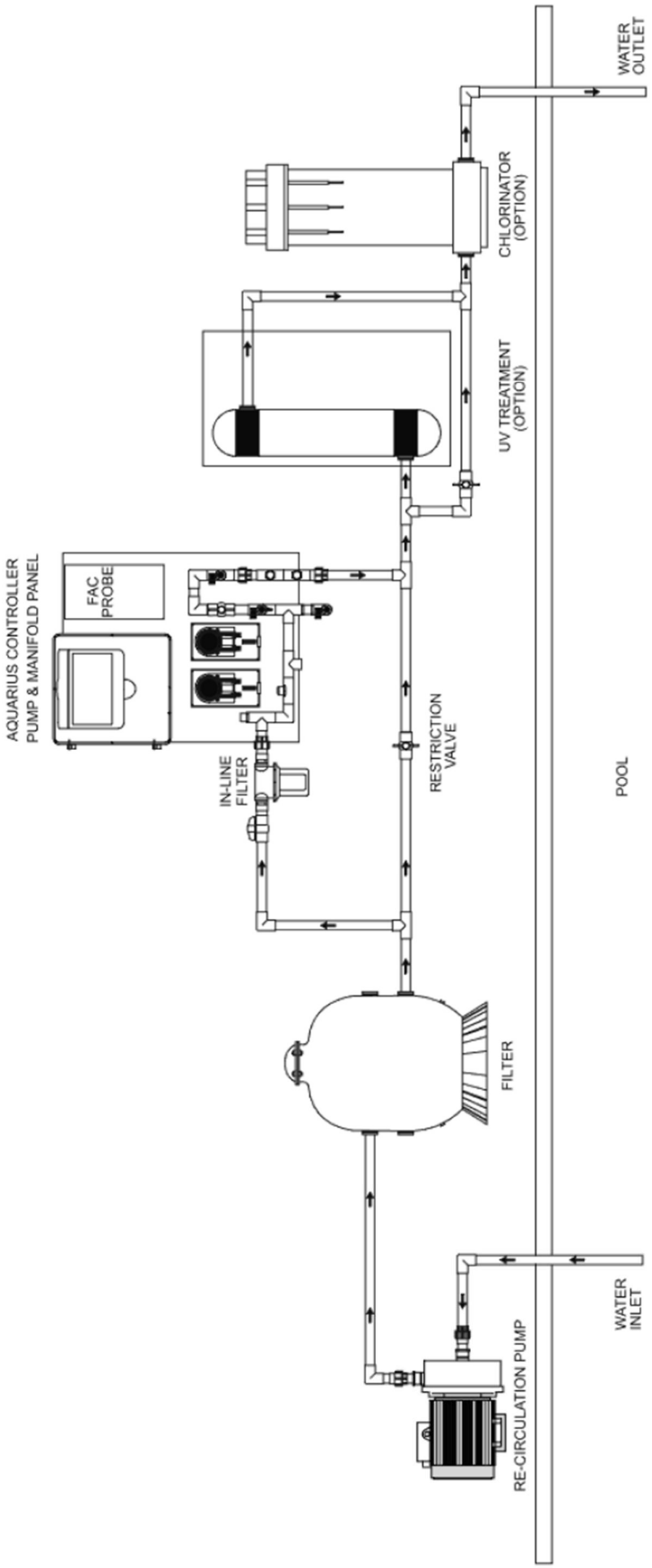
Wait for the glue to dry out, then run a flow of water through the manifold under normal operating pressures. Check the fittings for leaks and repair if need.

Note: A minimum 16 litres/minute supply flow is required to keep the flow switch ON and ensure proper reading of sensors and enough flow in bleed solenoid.

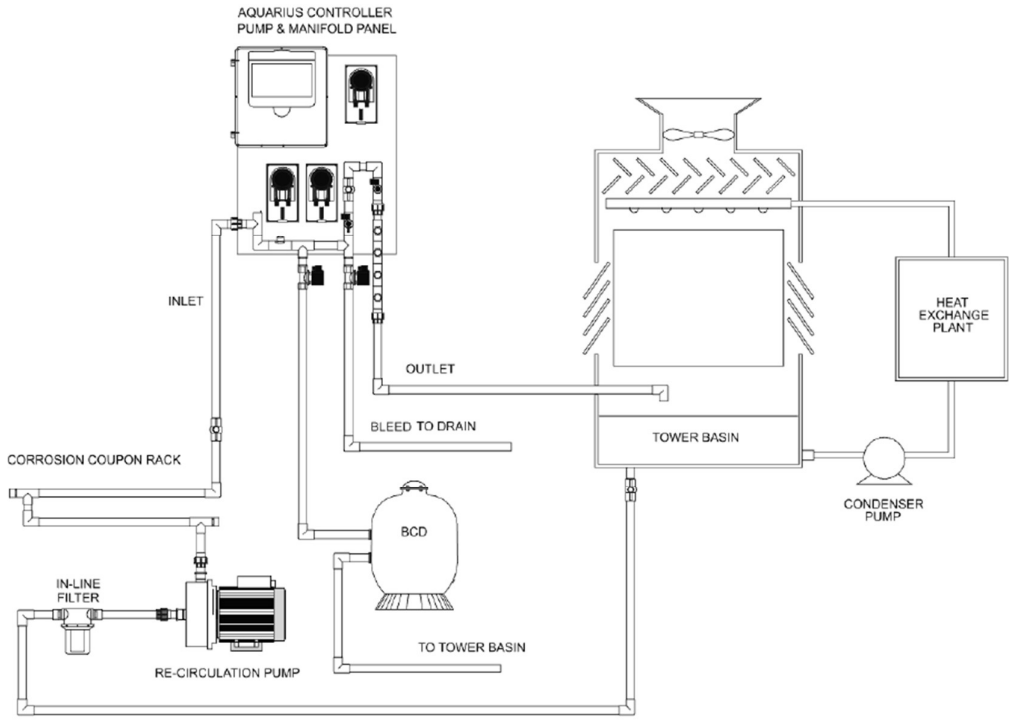
Placement tips:

- Select a suitable location for installation - preferably in close proximity to the main system, protected from the public and environmental factors. Away from heat sources and ideally not be in direct sunlight.
- A minimum floor area of approx. 1.5 m x 0.6 m below the controller is required for the chemical tanks and adequate bunding is provided for the system and chemical drums to prevent spills causing damage
- Allow an extra 180mm clearance above height of ULTIMA controller, to allow controller to slide down onto the mounting clip.
- A minimum 20 mm (3/4”) take-off and in line to supply sample water to the system
- A 220 - 250 VAC 50 Hz @ 10 amps electrician approved connection to power controller
- A wall area of approx. 0.75-meter-wide by 1.0-meter-high is ideal for mounting your controller at eye-level (1.2 to 1.8 meter).

Typical Installation – Swimming Pool

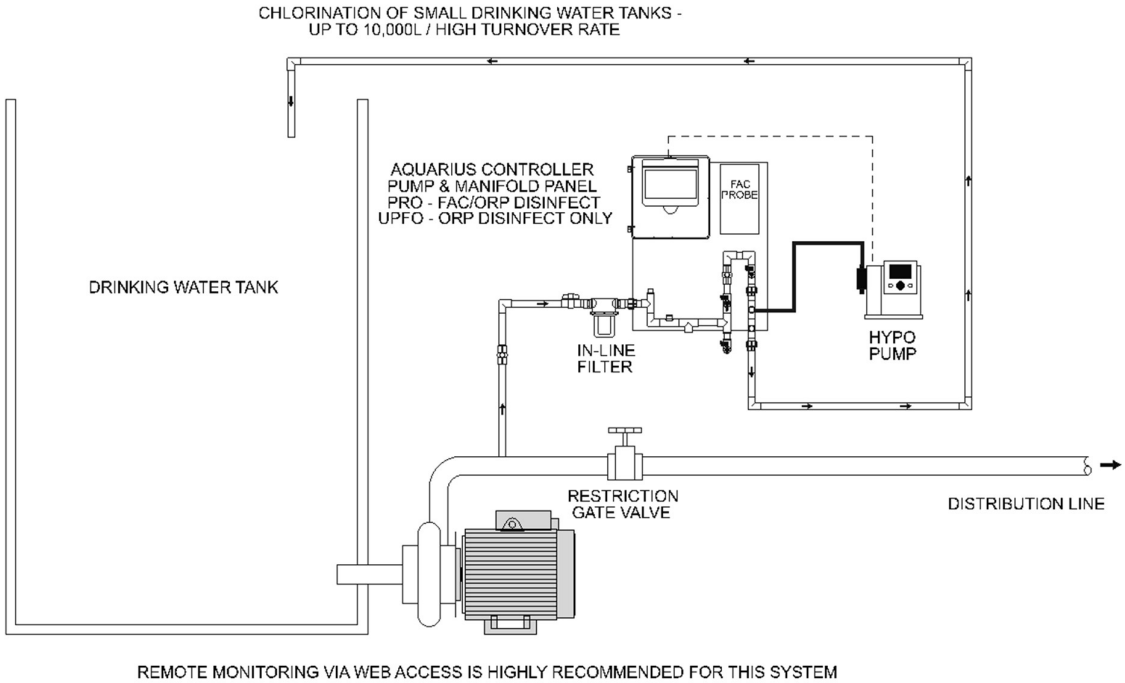


Typical Installation – Cooling Tower

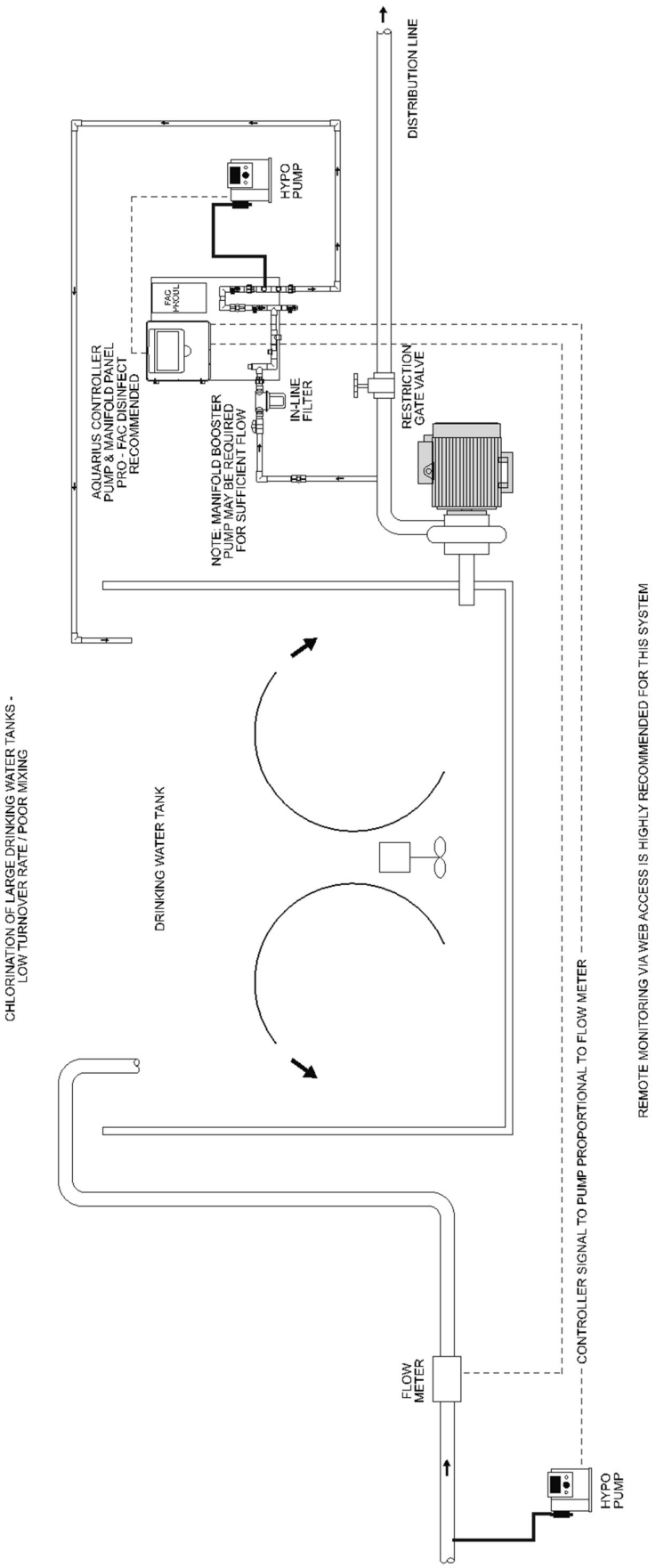


Note: If installing a BCD Feeder, assemble as per OEM instructions and floor mount in the vicinity of the system. Plumb from the BCD solenoid to the inlet of the BCD feeder and from feeder to the system.

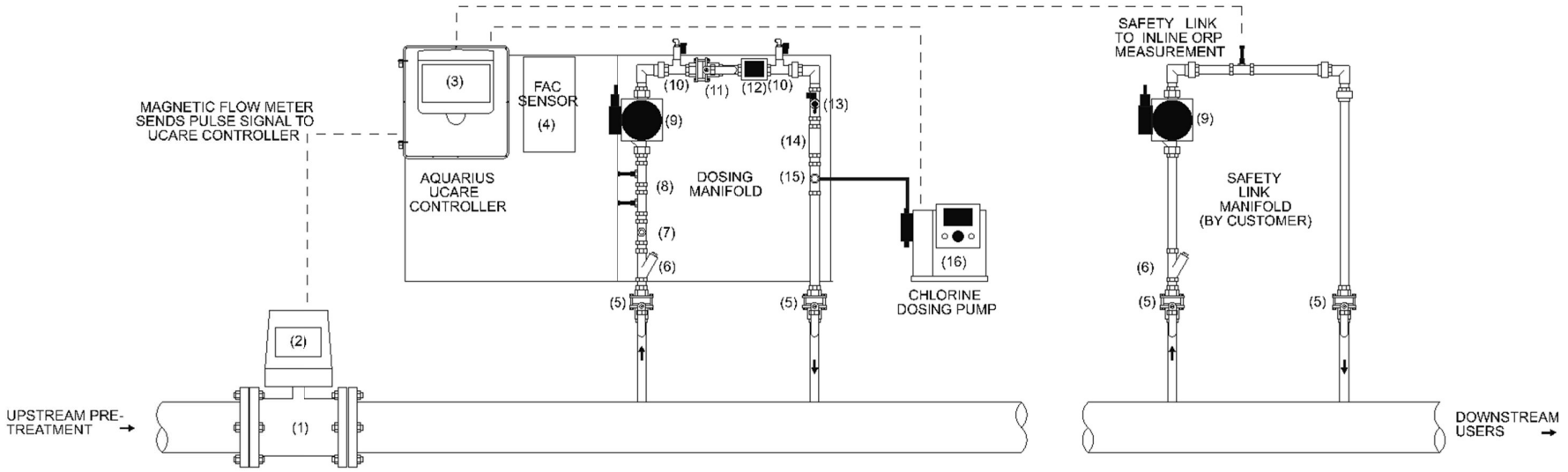
Typical Installation – Potable Water (Small Tanks)



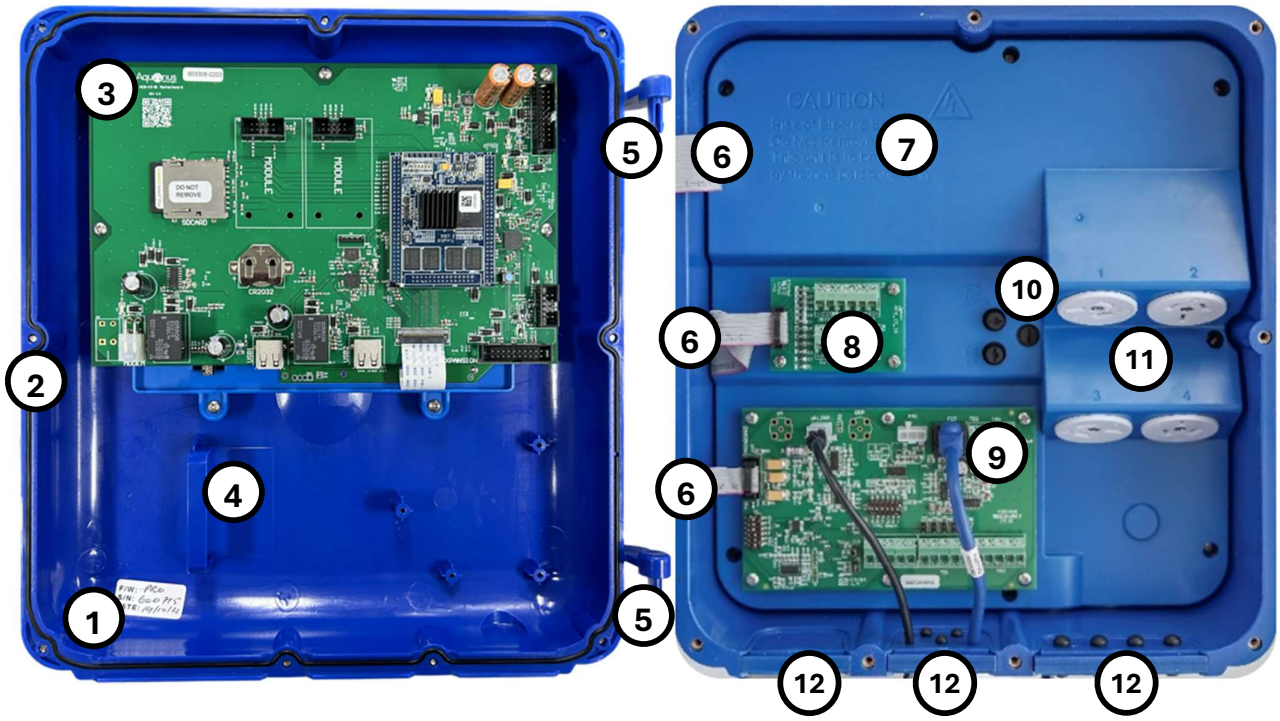
Typical Installation - Potable Water – (Large Tanks)



Potable Water – Inline Dosing (very large tank or no tank storage)

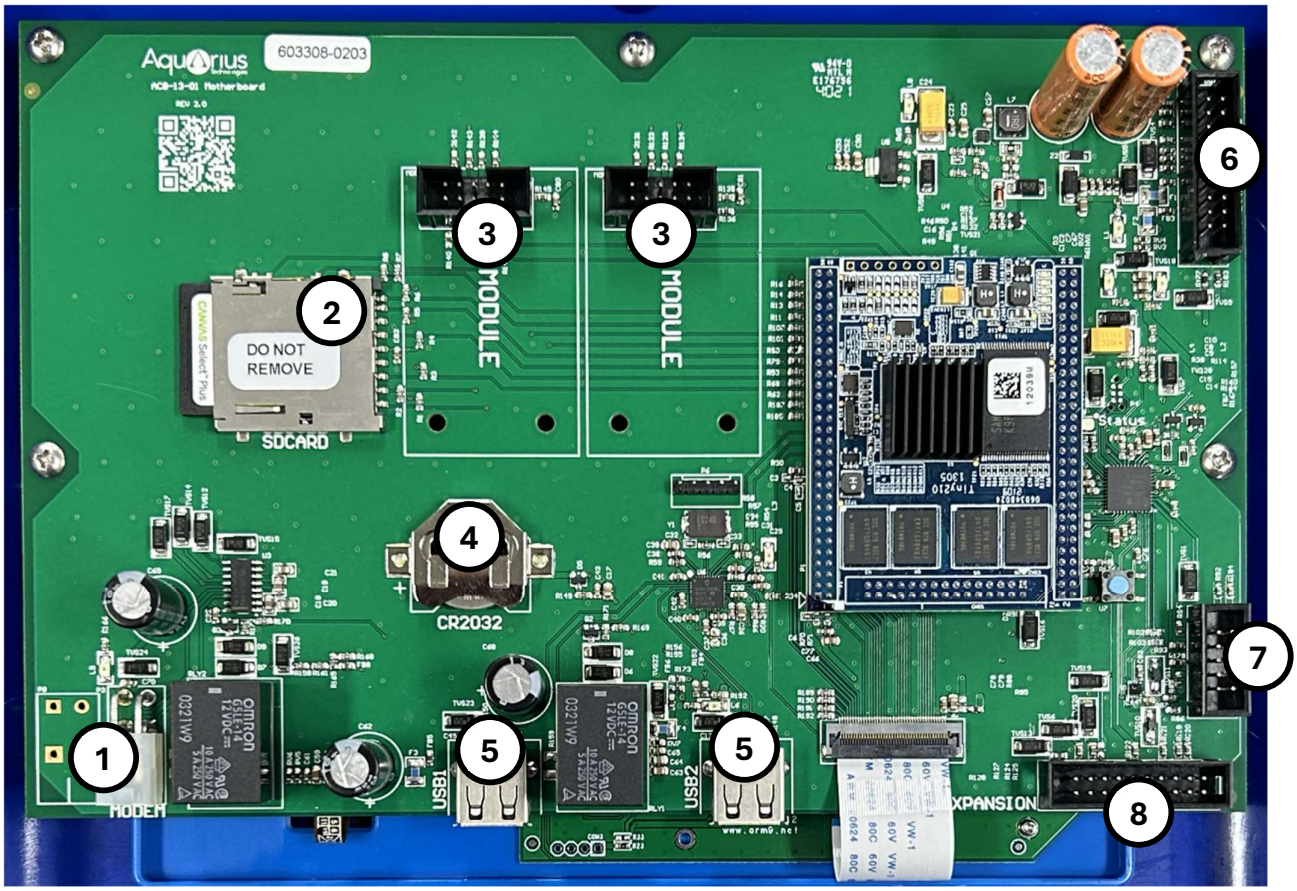


(1) MAGNETIC FLOW METER - THIS MUST BE INSTALLED ON THE MAIN LINE EITHER BEFORE MANIFOLD INLET OR AFTER MANIFOLD INLET.
(2) FLOW METER DISPLAY
(3) CONTROLLER - UCARE. IT IS INSTALLED ON A PVC BACKBOARD (H: 480MM W: 600MM). DOSING MANIFOLD IS MOUNTED ON A SEPARATE BACKBOARD OF SAME DIMENSIONS.
(4) FREE AVAILABLE CHLORINE SENSOR AND ITS FLOW CELL
(5) ISOLATION BALL VALVE
(6) WYE STRAINER
(7) PRESSURE SENSOR
(8) PH + ORP PROBE. PH USED FOR DOSING MANIFOLD, ORP FOR SAFETY LINK MANIFOLD
(9) BOOSTER PUMP (INSTALLED ON THE MANIFOLD)
(10) INLET AND OUTLET TAPS TO THE CHORINE FLOW CELL
(11) LIMITING VALVE. BY PARTLY CLOSING THIS VALVE, THE FLOW WILL BE PUSHED TO THE CHLORINE FLOW CELL
(12) MANIFOLD FLOW METER
(13) WATER SAMPLE POINT
(14) CHECK (NON-RETURN) VALVE
(15) CHLORINE INJECTION POINT
(16) CHLORINE DOSING PUMP - INJECTION POINT IS SHOWN ON THE MANIFOLD



1. Controller ID label
2. Controller casing seal + 9 x captive closing screws
3. Mother board
4. Modem mounting clip
5. Casing hinges (retaining clip on upper hinge)
6. Ribbon type connection cables
7. Electrical hazard/safety information
8. “No-volt” dry contacts
9. Probe board
10. Fuses
11. 240V GPO Outputs
12. Cable glands

MOTHER BOARD



1. Modem power supply/ data Rx/Tx connector
2. SD card slot
3. Isolation board (module) connectors
4. Battery
5. USB port 1 and 2
6. Power cable connector
7. Probe-board power and data cable connector
8. Expansion board cable connector

EXPANSION BOARDS

Expansion boards may be plugged into the expansion board cable connector (see 8 above) to provide additional features. For configuration guidance, please refer to “Expansion Board Configuration” section under System Settings.

MODBUS BOARD – HIGH LEVEL INTERFACE (HLI)

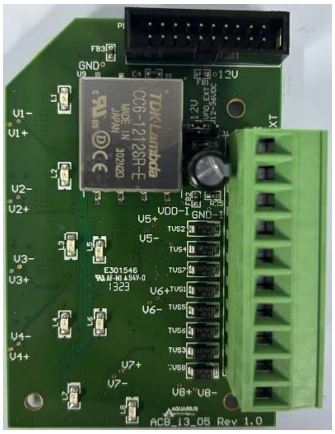
PCB card to enable Modbus RTU capabilities to BMS/DDC systems.

This expansion board enables all data to be transmitted from the ULTIMA controller to a nominated receiver. The ULTIMA acts as the Slave, in the Master/Slave communication.

For more information, refer to equipment manual “ULTIMA Modbus manual”.

4-20MILLIAMP BMS BOARD – LOW LEVEL INTERFACE (LLI)

PCB card to convert 8 x signals to 4-20mA analogue signals for BMS systems.



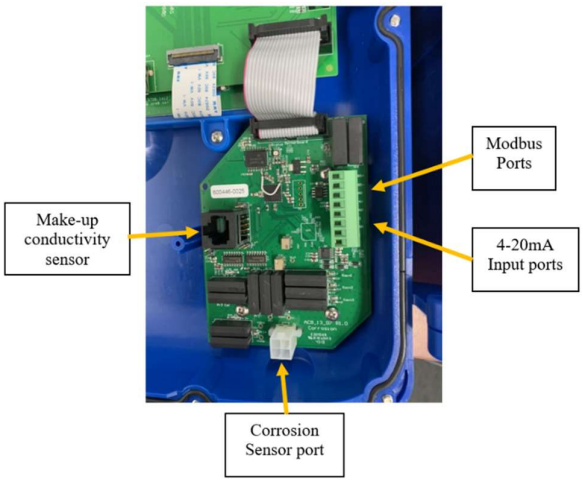
This expansion board provides a local BMS/PLC/SCADA system with 4-20mA signals proportional to measured values along with ON/OFF, clean contact relays for Alarm, Flow and the status of all output relays.

For more information, refer to equipment manual “4-20mA Output Interface for ULTIMA controllers”.

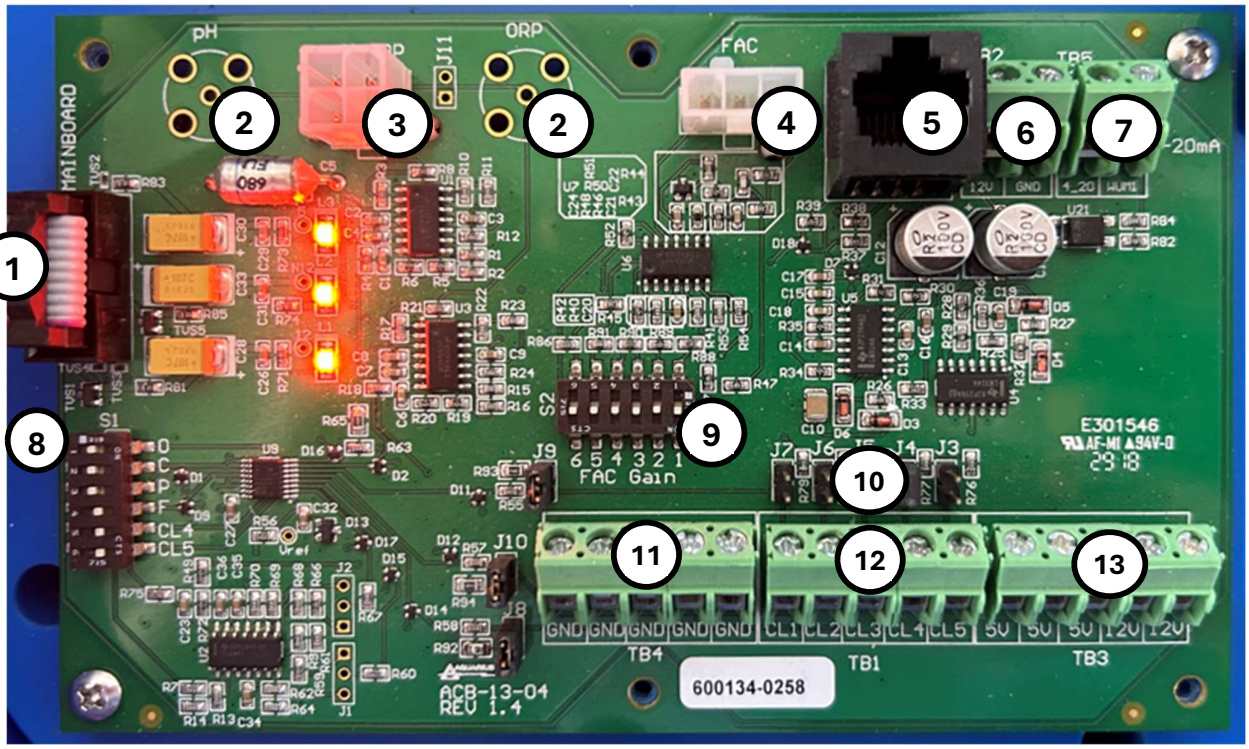
CORROSION BOARD

For use ULTIMA UNIQ systems: PCB card for use with ULTIMA corrosion monitoring system. Requires UNIQ firmware.

This board comes with ports to accommodate corrosion sensor (shown below) and a second PR_FCT probe to measure make-up water conductivity.



PROBE BOARD



1. Power cable connector between Probe board and Motherboard
2. BNC location for external pH/ORP connectors (if fitted)
3. Combination Probe (PR_PHRG) connector
4. FAC* probe connector (default 3-pin type probe)
5. FCT probe (PR_FCT) connector
6. 12V DC and Ground (GND) port at TB2
7. 4-20mA connector and Water meter connector at TB5
8. On-off component dip switches
9. Dip switches for FAC Probe Gain regulation
10. 5 x jumpers for tank alarm sensors connected to the analogue inputs
11. 5 x GND ports at TB4
12. 5 x Analogue inputs at TB1
13. 3 x 5V DC and 2 x 12V DC power supply connectors at TB3

CONNECTING STANDARD SENSORS/PROBES

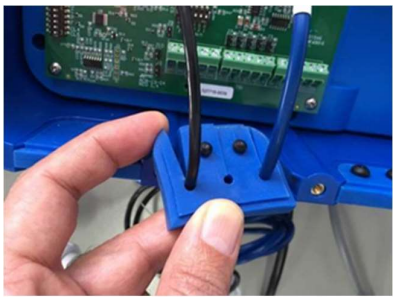
Standard ULTIMA controllers use two probes for measurement:

- PR_FCT Probe: Flow switch/Conductivity/Temperature. Blue connection cable, RJ45 connector.

- PR_PHRG Probe: pH/ORP/Ground Reference (note: for pool systems, use PR_PHRG_AU). Black connection cable, Molex 2x2 / Minifit JR 4-pin connector.

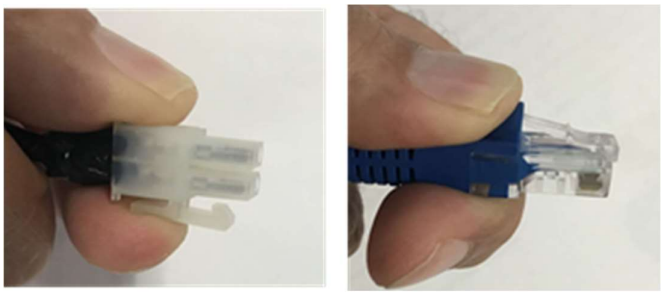
Loosen the 9 captive casing crews on the front cover to open the controller.

Remove the centre cable gland and black pin. Insert the probe cable through the hole on the gland and plug the socket into the board. Adjust the cable's length and slide gland back gently.



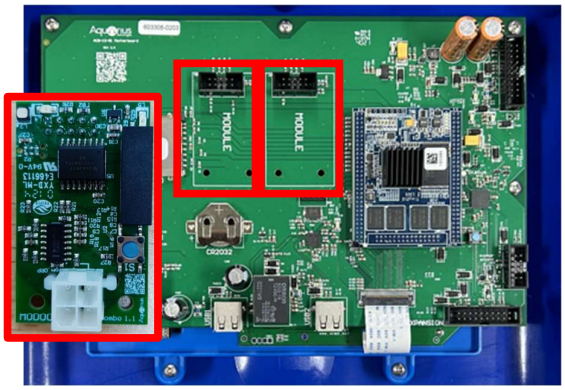
To pull the sensor out, compress the sensor's clip to release it from probe board.

Left: PR_PHRG Probe connection; Right: PR_FCT Probe connection.



Left: PR_PHRG Probe; Right: PR_FCT Probe.

Note: PR_PHRG Probe may also be connected via isolating module on the motherboard (PRO, UCT & UNIQ models only). Connect a pH/ORP module board to a module port on the motherboard as shown, then connect the PR_PHRG probe to the 4-pin connector on the module board.



With ULTIMA, a wide variety of control and monitoring options are available to you.

3rd- party 4-20mA sensors may be fitted to the ULTIMA to achieve additional functionality, including but not limited to:

- Pressure
- Level
- Weight
- Turbidity
- Free and total chlorine
- Dissolved oxygen
- Nitrite/ NOx
- COD analysers
- Colorimetric analysers
- Fluorometers

2- and 3-wire sensors may be fitted. Please consult with the Aquarius Technical team so that we can assist in seamlessly integrating your chosen sensors with your ULTIMA controller.

The ULTIMA can be specified to include facility for 6 x generic 4-20mA inputs within the firmware. These inputs may be configured to desired alarms and setpoints; data trended and logged; and assigned to trigger desired outputs. Several modes of operation are also available.

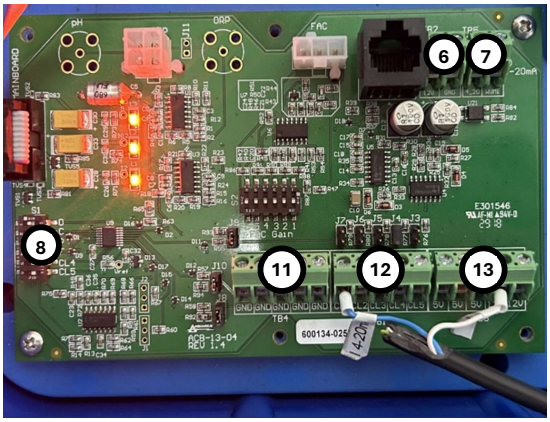
There are a total of 8 available 4-20mA inputs within the ULTIMA hardware.

6 x 4-20mA inputs – Probe Board (PRO, UCT & UNIQ only)

There are 6 available 4-20mA inputs available on the probe board: “CL1-5” at TB1 (12), and “4_20” at TB5 (7).

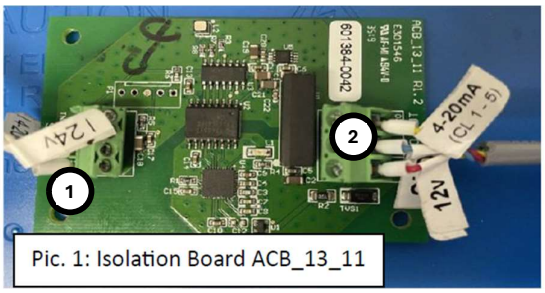
To utilise “CL4” and “CL5”, ensure that corresponding dip switches (8) are turned to the “ON” position.

To provide power to the sensors, 3 x 12V ports and 3 x 5V ports are available- (6) and (13). Ground (GND) ports are also available for each power port – (6) and (11).



In the above picture, a 2-wire sensor is shown wired into probe board, via CL1 generic 4-20mA input, and 12V power supply.

Isolation boards may also be supplied for additional sensor protection. These boards accept sensor wires at (1), and use connection wire at (2) to connect to desired ports on probe board.

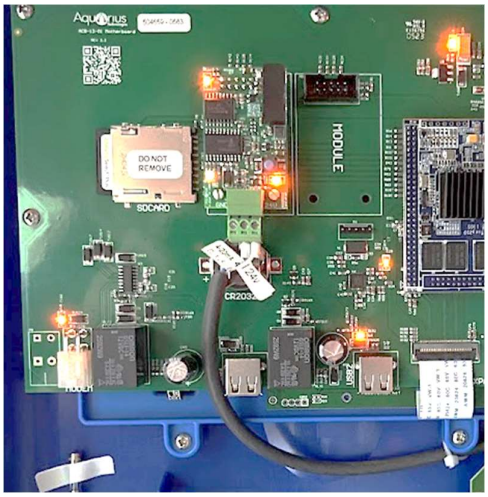


Pic. 1: Isolation Board ACB_13_11

2 x 24VDC / 4-20mA input modules – Mother Board (PRO, UCT & UNIQ only)

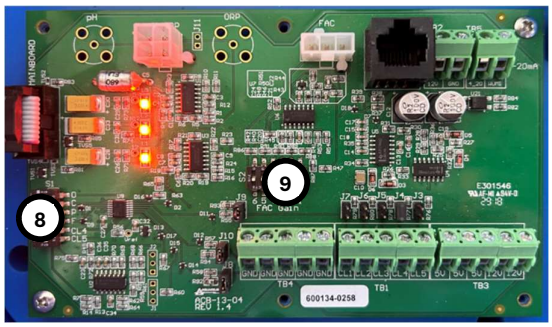
2 x generic modules may be added to the mother board. Each module can accept 1 x 4-20mA input, and provides 24VDC power supply. Here a generic module and 2-wire sensor are shown in position M2.

Additional 24VDC power supply packs can also be included with the ULTIMA. These are supplied with GPO connections, and can be plugged into any compliant 240VAC external power supply, or directly into an available ULTIMA GPO output socket. This provides an external 24VDC power supply to your sensor.



See also: “Generic Inputs” section, for information on configuring sensors within controller settings.

The ULTIMA probe board contains two dip switches: Component Dip Switch (8) and Default FAC Gain Dip Switch (9).



Component Dip Switch

Use component dip switches to enable or disable component inputs.

Left = disabled, right = enabled

Symbol	Component
O	ORP
C	Conductivity
P	pH
F	FAC (default 3-pin)
CL4	Generic Input CL4 (shown in “disabled” position in photo. Must be switched to “enabled” to read from this port.)
CL5	Generic Input CL5 (shown in “disabled” position in photo. Must be switched to “enabled” to read from this port.)

GPO OUTPUTS

Match and connect power points for pumps and functions' outputs by following below table:

Output	Allocated output's function (By Default)
1	pH pump (Acid or Base)
2	ORP pump (eg. sodium hypochlorite) or BCD solenoid
3	Inhibitor pump
4	Bio B pump (can be accessed through "Timers" configuration) OR Chlorinator (via Output 8 + 10A fuse) 
6 *	Conductivity (through cable from bottom of the controller, wired into bleed solenoid/valve)

* Output 5 in early models

CONNECTING DOSING PUMPS AND SOLENOIDS

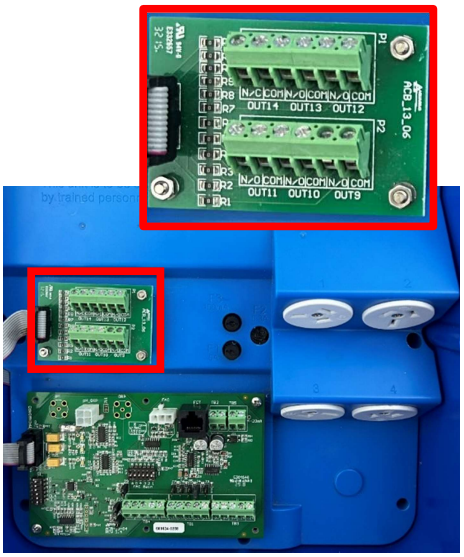
Remove the right cable gland. Remove black pin and insert pump or solenoid cable through gap.

Attention: Never leave the bleed/BCD solenoid cable unplugged when the controller is ON. Check the connection and tighten the screw, cable and make sure connector is sealed.

NO VOLT (DRY CONTACT) OUTPUTS

If using diaphragm pumps for chemical injection, it is recommended to run them using no volt (dry contact) outputs.

- Plug diaphragm pump to a free 240V GPO socket inside the controller (outputs 1 – 4)
- Wire dry contact connector of the pump to any of outputs 9 to 13 (refer to the pump manual to find the dry contact mode if needed). For normal pulse pumps, the dry contact cable can be wired into the “Level Sensor” port of the pump.
- From the function setting page, click on “Output” and select the appropriate dry contact output.
- Change the socket mode to “Forced ON” (refer to output configuration)
- Tick/Untick “Open = Dose” on the dry contact output accordingly. If the dry contact is wired into the pump’s tank level port, the box must remain ticked.



See Example photo below: device is plugged into and powered via GPO 3, and wired into and controlled via dry contact Output 9.

When configuring outputs, GPO 3 must be set to “Forced ON”, and Output 9 configured as required via “Component” mode.

See also: “Output Configuration”.

BEFORE FIRST STARTUP

- Ensure ribbon connection cables are connected securely.
- Ensure solenoid plugs are electrically connected and secured with connecting screw.
- Ensure all plumbing and tubing are connected securely and sealing.

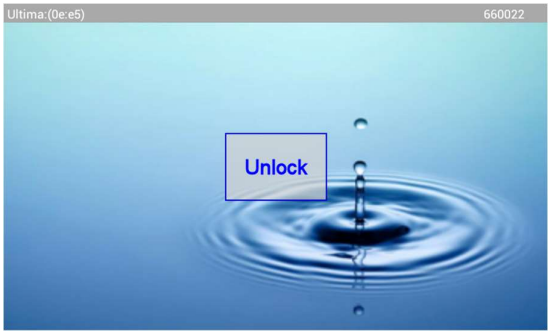
CONTROLLER SETUP

POWER ON

Plug the controller into compliant 240VAC power supply.

Wait for 30-60 seconds until program is fully loaded, and front “Unlock” screen is displayed. The controller is now operational, using default settings.

To navigate controller menu, press 



NOTE: DO NOT OPERATE CONTROLLER WITH DIRTY OR WET FINGERS. DO NOT TOUCH CONTROLLER SCREEN WITH METAL/ SHARP OBJECTS. ALWAYS CLOSE SCREEN COVER AFTER USE.

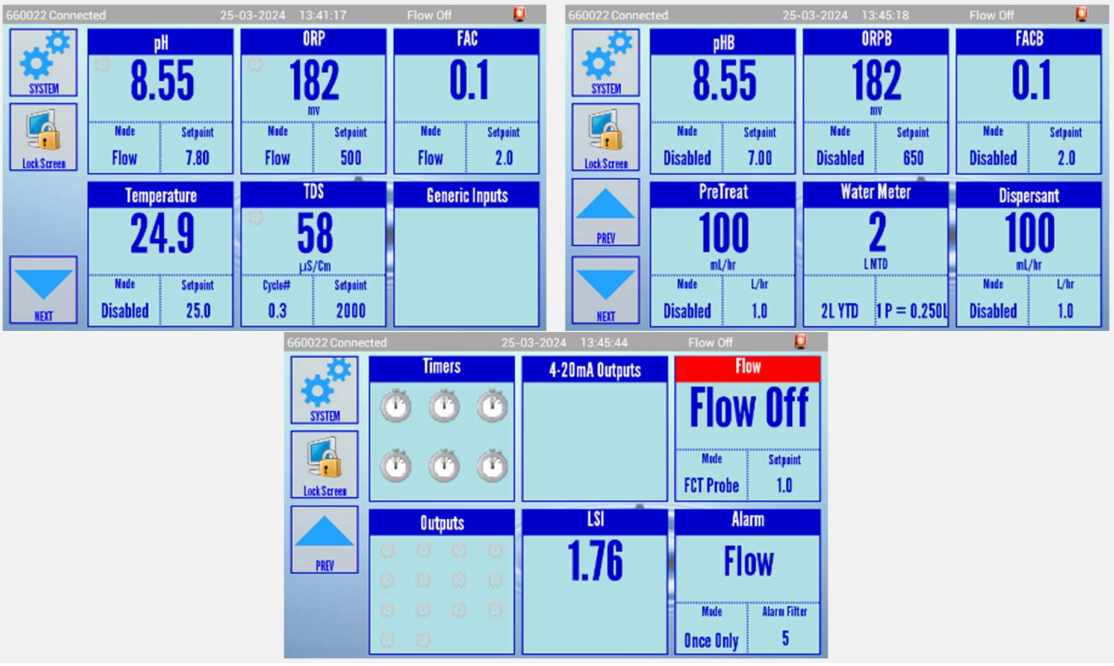
NOTE: IF YOU HAVE CUSTOMISED SETTINGS SAVED ON A USB MEMORY STICK, YOU CAN IMPORT THEM NOW. SEE **Import/Export Settings and Export Data** SECTION IN THIS MANUAL.

NAVIGATING THE CONTROLLER SCREEN

After pressing unlock, the first home menu screen is shown.

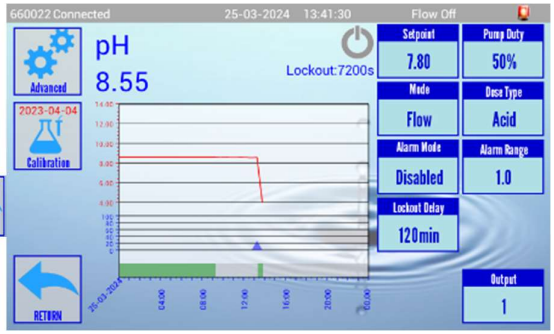
To navigate between screens, press 

or 



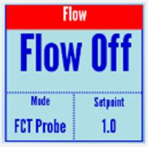
Press on any panel, eg. corresponding screen.

to open up the



To exit a screen and return to the previous menu, press

Alarms: menu screens display different parameters or functions. These are normally blue, but flash red when in the alarm state. On Menu Screen 3 above, the "Flow Off" alarm is active and so the "Flow" panel is flashing red.



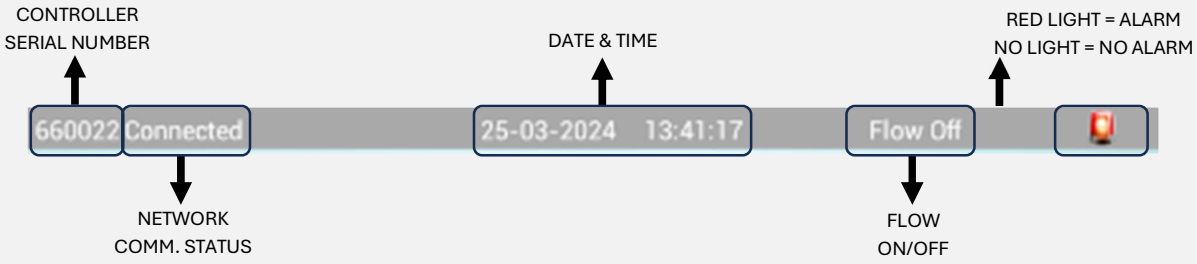
Power symbol: output status. Blue = output is energised. Grey = output is off. May be accompanied by status message.

Lockout symbol: symbol appears when output has exceeded "Lockout Delay" time. See "pH/pHB".

Accessory timer symbol: output status to indicate accessory timer activation of associated function output. Grey Symbol = "AccTimerOff", Blue Symbol = "AccTimerOn".

Forced Off/On: Indicates output mode is set to either "Forced Off" (grey) or "Forced On" (blue).

The grey status bar at the top of the screen gives useful status information:



Press 

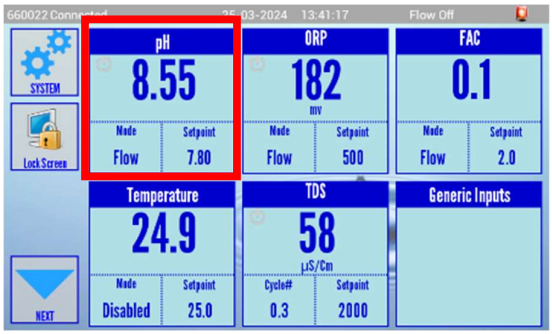
to access and change controller settings.

Press 

to exit the controller menu and lock the screen.

PH/PHB

Select pH or pHB from the main menu. pHB appears on the second menu screen. pHB is a backup function to control pH between two limits using Acid and Base chemical dosing, or to provide secondary/backup dosing control. Ignore this function if not relevant.

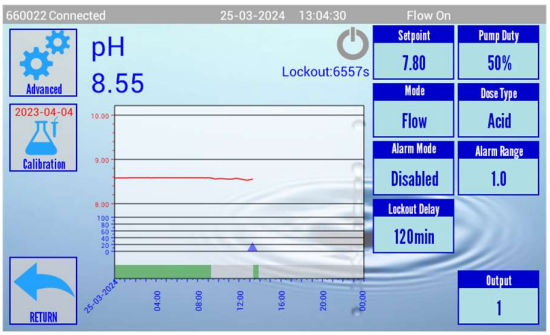


Set point: Manually enter target pH value.

Pump duty: Use to regulate output capacity.

Eg. When pH dosing pump duty is set to 50%, with cycle time 60 seconds, pump runs only **0.5 x 60 seconds = 30 seconds of each minute the pump is activated**. Manually set pump duty up to 100% to prevent pH overshoot or undershoot.

Mode:



Disabled: no pH control

Continuous: continual control of pH, regardless of flow status

Flow: control pH when Flow is ON (default). Dosing will be disabled when flow is OFF.

Dose type: Select Acid or Base chemical dose pH control, depending on chemical used.

Alarm mode:

Disabled: no alarm mode

Plus: triggers alarm when pH is **above set point + alarm range**, eg. 7.80 + 1.0 = >pH 8.80

Minus: triggers alarm when pH is **below set point - alarm range**, eg. 7.80 – 1.0 = <pH 6.80

Plus/Minus: triggers alarm when pH **falls outside setpoint +/- alarm range**, eg. <pH 6.80 and >pH 8.80 **(default)**.

Alarm range: Select the alarm range for pH. Choose from pre-set values in menu.

Lockout delay: Set the delay time in minutes to lock out pH output, if set point is not reached within nominated time. This is a safety feature to protect against chemical release and equipment damage. When lockout has been activated, grey power symbol and lockout time counter is displayed.

Output: Input the number of the output which controls acid/base pump (default: GPO 1)

NOTE: PRESS “SAVE” OR “RETURN” TO SAVE ANY CHANGES IN EACH SCREEN.

Select 

from the function screen:

Cycle Time (Dose Period): Time period whereby the controller decides whether and for how long to dose, to achieve set point.

This decision occurs at the last second of every cycle time. If the decision is taken to run the pump at 20% duty, pump will run for 20% of the next cycle time, eg. with cycle time 1 minute, pump will be on for 12 seconds out of the next minute. This value is dynamic, based on pump duty which will be determined by pump duty and fuzzy. Setting Cycle Time correctly is important to minimise overshoot and undershoot. Default setting = 1 minute.

System response time and dosing equipment characteristics will determine appropriate cycle time. For example, chlorinators, larger dosing equipment or larger water volumes may require a longer cycle time. In general, recommend minimum 10-minute cycle time for chlorinators. For peristaltic dosing pumps, a 1-minute cycle time is acceptable. Smaller cooling towers may respond well with 1-minute cycle time, compared with larger cooling towers with longer response time, requiring extended cycle time.

Safety Min/Max: minimum/maximum pH safety cutout for Accessory Timers. Keep default setting if unsure.

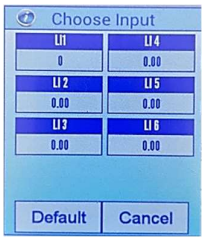
Fuzzy: this is a configurable dynamic control for outputs controlling to a process value (sensor) set point, to give you the ability to tune the control system and minimise overshoot hysteresis. Fuzzy defines a band within which output rate reduces, as process value approaches setpoint. Eg. With fuzzy set to 0.1, on acid pH control, pump duty will dynamically decrease within a band of 0.1 above setpoint pH 7.80 (7.90).

The smaller the fuzzy number, the more responsive the system. The larger the fuzzy number, the slower the system is to reach setpoint.

Level Sensor (PRO, UCT & UNIQ only): a level sensor configured via Generic Inputs may be linked to pH screen, to provide chemical tank level display. See also “Generic Inputs”.

Output Status (PRO, UCT & UNIQ only): provides the ability to link an additional output to the function, eg. If two pH acid dosing pumps are desired to operate in tandem, the second pump may be assigned an additional output via Output Status. The pump status (on/off) may also be wired back to a BMS/SCADA system to return this information. Select a no-volt (dry contact) output 9-14 as designated output.

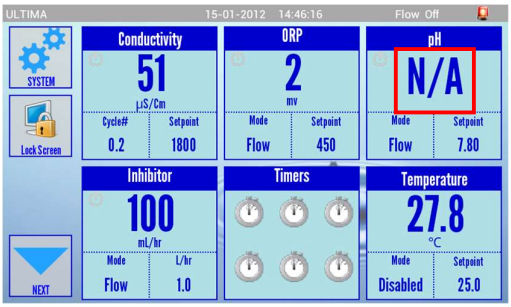
Alarm Status (PRO, UCT & UNIQ only): return alarm status information back to a BMS/SCADA system via a designated no-volt output, similar to Output Status above.

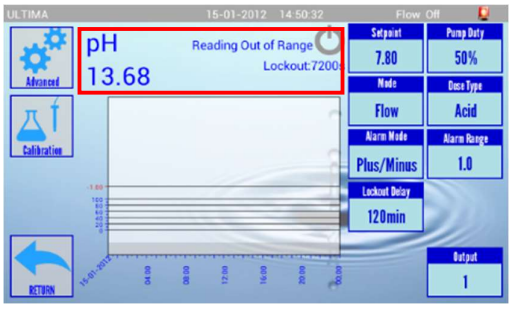


Probe: Select from available inputs to link desired probe to the pH function. When selecting “Probe” button, a “Choose Input” screen will appear as shown.

“Default” setting, at bottom right, is the 4-pin port for the PR_PHRG probe. For advanced models, 6 x Generic Inputs may also be selected. See also “Generic Inputs”.

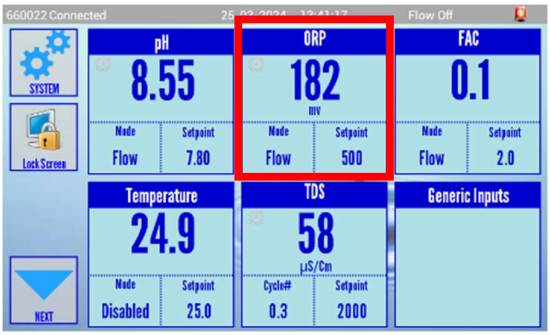
NOTE: ULTIMA measures and controls pH between 4-10. Outside this range, number on main screen will show N/A. Click pH button to see measured number, eg. pH 13.68.





ORP/ORPB

Select ORP or ORPB from the main menu. ORPB appears on the second menu screen. ORPB may be configured to provide control for a secondary secondary/backup dosing output if required. Ignore this function if not relevant.

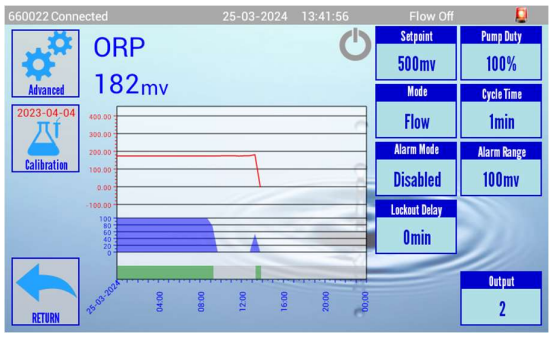


Set point: Manually enter target ORP value.

Pump duty: Use to regulate output capacity for ORP pump or chlorinator. See "pH/pHB".

Mode:

Disabled: no ORP control
Continuous: continual control of ORP, regardless of flow status
Flow: control ORP when Flow is ON (default). Dosing will be disabled when flow is OFF.



Cycle Time (Dose Period): see "pH/pHB – Advanced Features".

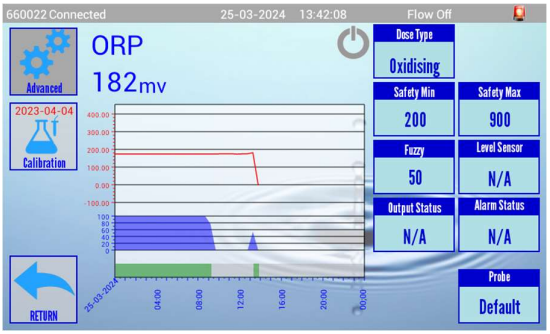
Alarm mode:

Disabled: no alarm mode
Plus: triggers when ORP is **above set point + alarm range**, eg. 500mV + 100 = >600mV
Minus: triggers when ORP is **below set point - alarm range** eg. 500mV - 100 = <400mV
Plus/Minus: triggers alarm when ORP **falls outside setpoint +/- alarm range**, eg. <400mV and >600mV **(default)**.

Alarm range: Select the alarm range for ORP. Choose from pre-set values in menu.

Lockout delay: Set the delay time in minutes to lock out ORP output, if set point is not reached within nominated time. This is a safety feature to protect against chemical release and equipment damage. When lockout has been activated, grey power symbol and lockout time counter is displayed.

Output: Input the number of the output which controls ORP device (default: GPO 2)



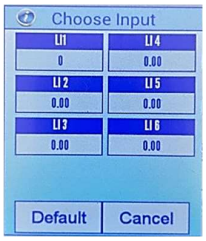
Select  from the function screen:

Dose Type: Select “Oxidising” or “Reducing”, depending on chemical type.

Safety Min & Max: these functions are used only if ORP is set as an accessory timer.

Note: Leave the safety limits on default if not sure.

Fuzzy: see “pH/pHB”.



Level Sensor (PRO, UCT & UNIQ only): see “pH/pHB”.

Output Status (PRO, UCT & UNIQ only): see “pH/pHB”.

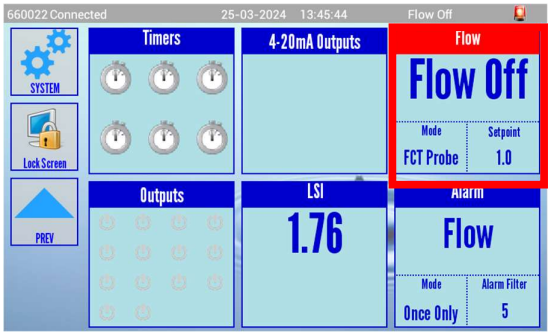
Alarm Status (PRO, UCT & UNIQ only): see “pH/pHB”.

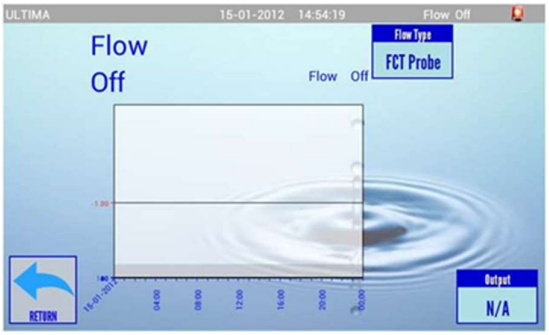
Probe: Select from available inputs to link desired probe to the ORP function. When selecting “Probe” button, a “Choose Input” screen will appear as shown.

“Default” setting, at bottom right, is the 4-pin port for the PR_PHRG probe. For advanced models, 6 x Generic Inputs may also be selected. See also “Generic Inputs”.

FLOW SETTINGS

Select FLOW from the main menu.





Flow is an indication to show if the system in running or it is temporarily halted.

Flow ON indicates flow sensor detects flow. This means the flow rate in the manifold is high enough to activate the sensor.
Flow OFF indicates flow sensor does not detect water flow in the controller manifold.

This status may be cross-linked to each function in ULTIMA via the “Mode” setting.

When Mode **Flow** is selected for a function, eg. pH, power is paused to the output while there is not enough flow in the manifold **(Flow OFF)**.

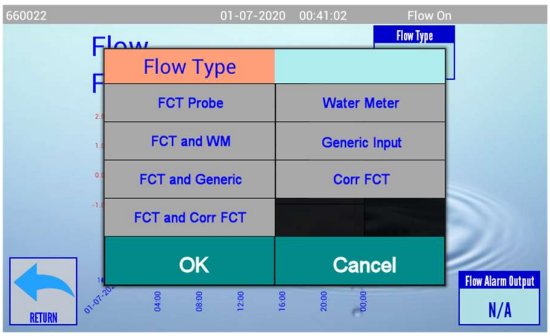
The required flow rate to turn on the flow function depends on the flow switch type. By default, the flow signal comes from Aquarius flow switch (PR_FCT) which requires 12L/min flow to show Flow ON.

Note 1: Flow ON or OFF does not mean there is NO Flow or Flow. A physical check must be done to ensure water is flowing and probe responding correctly.

Note 2: Manifolds normally contain pressurised water, flow from sample line which is located on the manifold doesn’t mean there is a flow through the manifold.

Flow type options are:

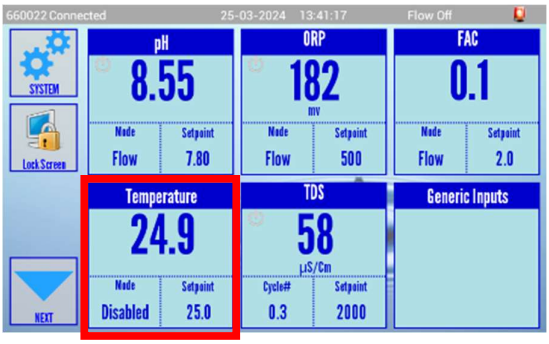
FCT probe (default): receives signals from PR_FCT
Water Meter: receives signal from a water meter and shows flow ON when flow rate measured by the water meter is more than 4L/min
FCT and WM: Flow will be ON when both FCT probe and signals from Water Meter show flow is ON.
Generic Input (PRO, UCT & UNIQ only): This is to set a third-party sensor as a flow switch.
FCT and Generic (PRO, UCT & UNIQ only): Flow will be ON when both FCT probe and signals from Generic Input show flow is ON.

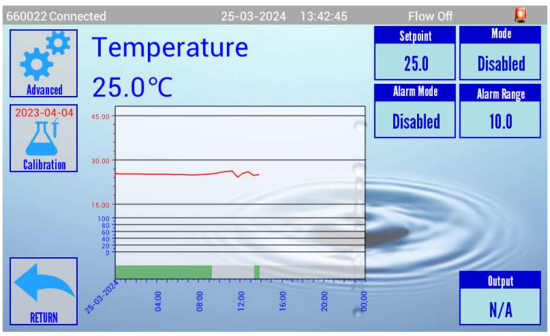


Flow Alarm Output: Designate an output to receive flow status information.

TEMPERATURE

Select Temperature from main menu.





Set point: Manually enter target temperature.
Mode:

Disabled: no temperature control
Continuous: continual control of temperature, regardless of flow status
Flow: control temp when Flow is ON (default). Control will be disabled when flow is OFF.

Alarm mode:

Disabled: no alarm mode
Plus: triggers alarm when temp is **above set point + alarm range**, eg. 25^{O}C+ 10 = >35^{O}C
Minus: triggers alarm when temp is **below set point - alarm range**, eg. 25^{O}C- 10 = >15^{O}C
Plus/Minus: alarms when temp is **outside setpoint +/- alarm range**, eg >35^{O}C and >15^{O}C.

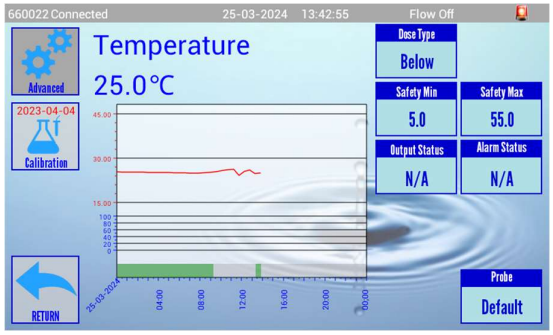
Alarm range: Select the alarm range for temperature. Choose from pre-set values in menu.

Output: Input the number of the output which controls temperature device.

ADVANCED FEATURES

Select 

from the function screen:



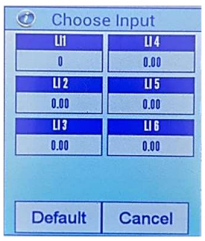
Dose Type: Select “Above” or “Below”, depending on whether cooling or heating output is being linked to this function.

Safety Min & Max: these functions are used only if temperature is set as an accessory timer. Leave on default values if unsure.

Output Status (PRO, UCT & UNIQ only): see “pH/pHB”.

Alarm Status (PRO, UCT & UNIQ only): see “pH/pHB”.

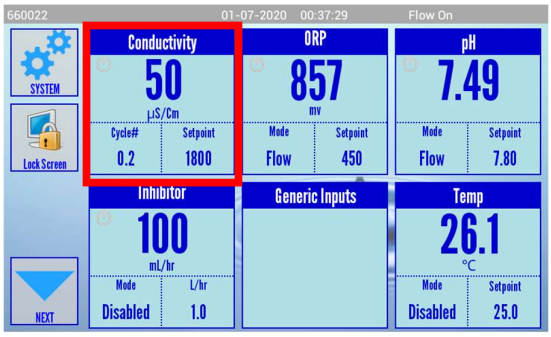
Probe: Select from available inputs to link desired probe to the Temperature function. When selecting “Probe” button, a “Choose Input” screen will appear as shown.

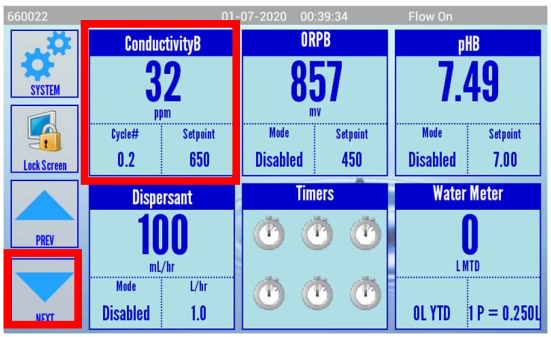


“Default” setting, at bottom right, is the RJ45 port for the PR_FCT probe. For advanced models, 6 x Generic Inputs may also be selected. See also “Generic Inputs”.

CONDUCTIVITY/CONDUCTIVITY B

Select Conductivity/TDS from the main menu. UCT controllers also have Conductivity B function available, to allow measurement of make-up water with separate conductivity probe.

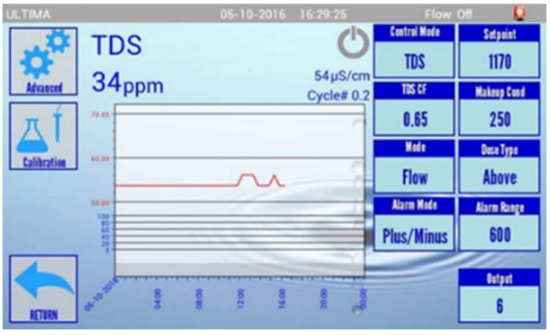




Control Mode: Allows you to select between Conductivity (µS/cm) and TDS (Total Dissolved Solids, ppm) to be shown on the main screen.
Set point: Set the value for your choice of conductivity or TDS set-point.
TDS CF: Conductivity (µS/cm) to TDS (ppm) Conversion factor if required. Default value = 0.65

Makeup Cond: This is used to calculate the Cycle of Concentration and needs to be entered manually for ULTIMA models. Note: A second conductivity sensor can be added on UCT and UNIQ models for make-up and automate this feature.
Mode:

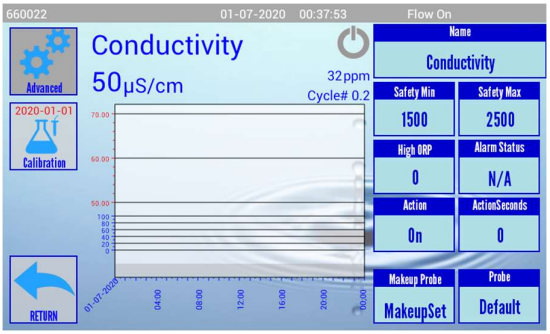
Disabled: No conductivity control
Continuous: Continual conductivity control
Flow: Control conductivity when Flow is ON (default)



Dose type: to open the bleed valve when conductivity is Above (default) or Below the set-point
Alarm mode:

Plus: triggers alarm only when conductivity is above the "set point + alarm range"
Minus: triggers alarm only when conductivity is below the "set point - alarm range"
Plus/Minus: triggers alarm for any of the above situations (default)

Alarm range: Select an alarm range from list
Output: set the output relay for conductivity. By default, bleed cable is now wired to Output 6**.**



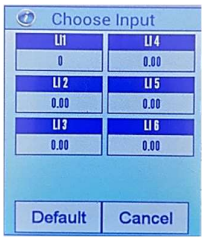
Safety Min: The minimum allowed Conductivity/TDS for pre-bleed function

Safety Max: The maximum allowed Conductivity/TDS for bleed lockout

Note: Safety Min and Safety Max must be at least 15% below or above the set-point.

Set the safety limits before starting the controller. Otherwise, pre-bleed and bleed lockout functions may not work.

High ORP: Additional control measure to halt bleed function in the case that ORP reading reaches a nominated high level.



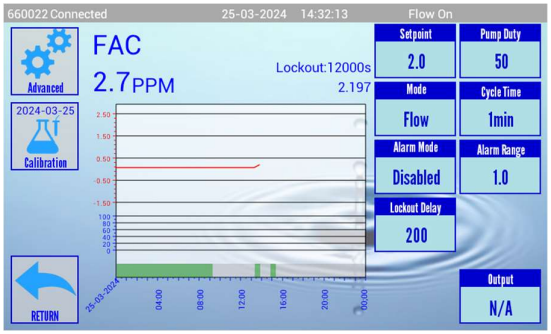
Alarm Status (PRO, UCT & UNIQ only): see "pH/pHB".

Probe: Select from available inputs to link desired probe to the Temperature function. When selecting "Probe" button, a "Choose Input" screen will appear as shown.

"Default" setting, at bottom right, is the RJ45 port for the PR_FCT probe. For advanced models, 6 x Generic Inputs may also be selected. See also "Generic Inputs".

Makeup Probe (PRO, UCT & UNIQ only): select a second probe to measure real-time make-up conductivity.

FAC/FACB (PRO MODELS ONLY)



Free Available Chlorine (FAC) is available for measurement and control on PRO-model ULTIMA controllers.

Set point: Manually enter target FAC value.

Pump duty: Use to regulate output capacity for FAC pump or chlorinator. See “pH/pHB”.

Mode:

Disabled: no FAC control
Continuous: continual control of FAC, regardless of flow status
Flow: control FAC when Flow is ON (default). Dosing will be disabled when flow is OFF.

Cycle Time (Dose Period): see “pH/pHB – Advanced Features”.

Alarm mode:

Disabled: no alarm mode
Plus: triggers when FAC is **above set point + alarm range**, eg. 2.0ppm + 1.0 = >3.0ppm
Minus: triggers when FAC is **below set point - alarm range** eg. 2.0ppm - 1.0 = <1.0ppm
Plus/Minus: triggers alarm when FAC **falls outside setpoint +/- alarm range**, eg. <1.0ppm and >3.0ppm**.**

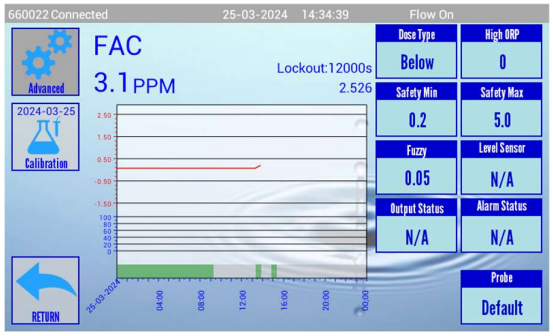
Alarm range: Select the alarm range for FAC. Choose from pre-set values in menu.

Lockout delay: Set the delay time in minutes to lock out FAC output, if set point is not reached within nominated time. This is a safety feature to protect against chemical release and equipment damage. When lockout has been activated, grey power symbol and lockout time counter is displayed.

Output: Input the number of the output which controls FAC chlorination device.

Select 

from the function screen:



Dose Type: Select control mode to activate when process value is "Below" or "Above" setpoint.

High ORP: Additional safety measure to halt FAC control, in the case that ORP reading reaches a nominated high level.

Safety Min & Max: these functions are used only if FAC is set as an accessory timer. Note: Leave the safety limits on default if not sure.

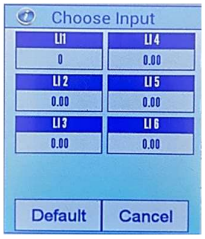
Fuzzy: see "pH/pHB".

Level Sensor (PRO, UCT & UNIQ only): see "pH/pHB".

Output Status (PRO, UCT & UNIQ only): see "pH/pHB".

Alarm Status (PRO, UCT & UNIQ only): see "pH/pHB".

Probe: Select from available inputs to link desired probe to the ORP function. When selecting "Probe" button, a "Choose Input" screen will appear as shown.



"Default" setting, at bottom right, is the 4-pin 

port for the PR_FAC probe.

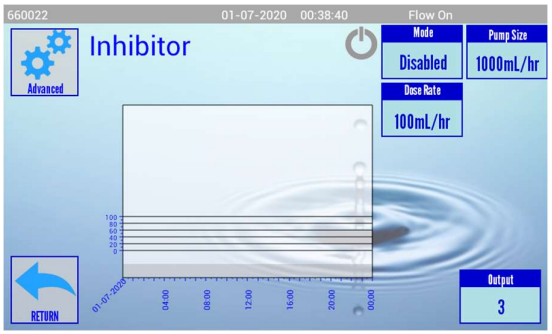
For PRO and ADVANCED models: Aquarius FAC Membrane sensors provide a superior method of measuring FAC, with high accuracy and simple maintenance requirements. These sensors are 2-wire generic sensors, and are configured to the FAC screen via Generic Inputs. See "Generic Inputs" section for more information.

For specific information relating to ULTIMA FAC Membrane sensors, please refer to separate document "**Complete FAC Guide.**"

INHIBITOR / PRETREAT / PRECHLOR / ANTI-OX

Inhibitor function enables dosing control, and has many applications for maintaining accurate concentrations of desired chemicals to your water treatment system. Here are the configuration options **if applicable to your ULTIMA model**:

Mode:



Disabled: no inhibitor dosing

Continuous: continual dosing of inhibitor, regardless of flow

Flow: dose inhibitor when flow is ON

Bleed: dose inhibitor proportional to bleed. Ratio for mode "Bleed" = dose rate/ pump size.

Water meter: Dose requested "PPM" of inhibitor, proportional to water meter reading.

NOTE 1: If dosing proportional to the make-up water flow rate, divide the requested ppm by Cycle of Concentration before inputting to the controller.

Example:

Requested inhibitor concentration: 60ppm

Cycle of Concentration: 5

PPM to input to the controller: 60:5 = 12ppm

NOTE 2: When modes Bleed or Water Meter are used, the inhibitor dosing will be post-bleed. No inhibitor will be dosed when bleed is in progress.

Pump size: Set the flow capacity of inhibitor pump (mL/hr)

Dose rate: input the requested dose rate (mL/hr); applies for modes "Continuous" and "Flow".

Cycle Time/Dose Period: Time period within which dosing pump cycles off and on to achieve nominated dose rate. This feature is designed to allow a dose pump to run for a minimum of two seconds. At very low dose rates, the controller will automatically adjust Cycle Time/Dose Period interval to accurately achieve the nominated dose rate. The Cycle Time/ Dose Period interval will always be automatically adjusted up rather than down, however it can be manually adjusted down provided the dosing pump still runs for a minimum of 2 seconds.

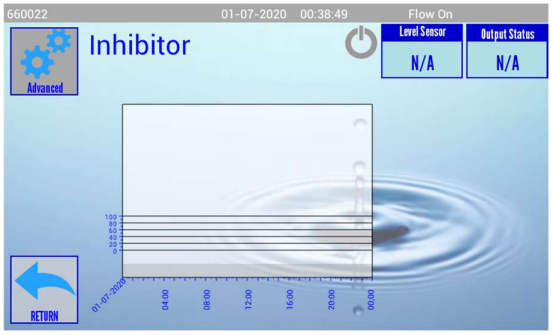
Eg. 1 L/hr peristaltic pump (Pump Size 1000mL/hr) is to dose at a rate of 1mL/hr. In this case, the controller will automatically adjust the Cycle Time/Dose Period to run the pump for 2 seconds every 83 minutes.

Output: Set the output which energises the inhibitor pump

ADVANCED FEATURES

Select 

from the function screen:



Level Sensor (PRO, UCT & UNIQ only): see "pH/pHB".

Output Status (PRO, UCT & UNIQ only): see "pH/pHB".

DISPERSANT

Dispersant configuration if applicable:
Pump size: Set the size of dispersant pump (mL/hr)
Dose rate: input the required dose rate
Mode: Configure when to dose the entered "Dose Rate" of dispersant:

Disabled: No dispersant control

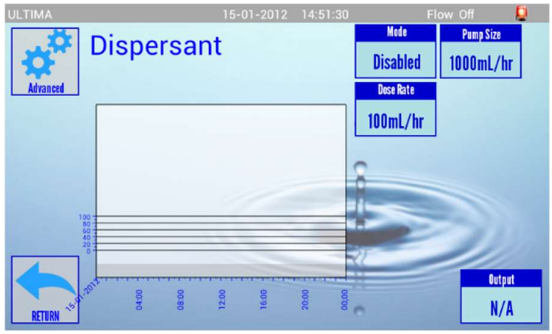
Continuous: Continual periodic dosing, regardless of flow status

Bleed: Periodic dosing when bleed relay is ON. NOTE: this is different with the "Inhibitor" bleed mode.

Flow: when "Flow" is ON

ORP: When "ORP" relay is ON

Inhibitor: When "Inhibitor" relay is ON

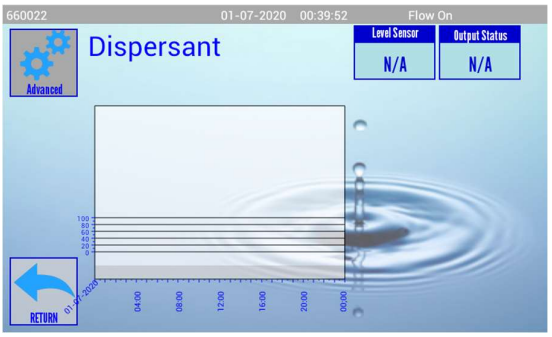


Cycle Time/Dose Period: Set a dose period to suit your cooling tower and pump size to ensure optimal performance. Leave with automatically displayed settings, if not sure. See also "INHIBITOR / PRETREAT / PRECHLOR / ANTI-OX" for more information.
Output: select an output for dispersant.

ADVANCED FEATURES

Select 

from the function screen:



Level Sensor (PRO, UCT & UNIQ only): see "pH/pHB".

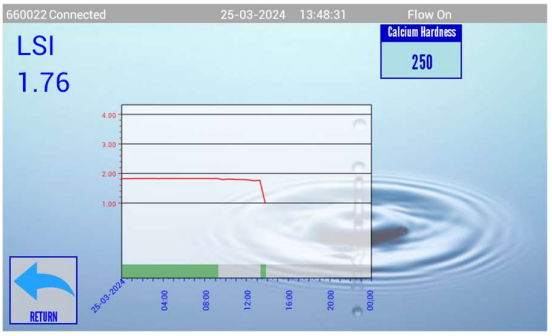
Output Status (PRO, UCT & UNIQ only): see "pH/pHB".

LSI

LSI (Langelier Saturation Index) indicates the calcium carbonate saturation of water.

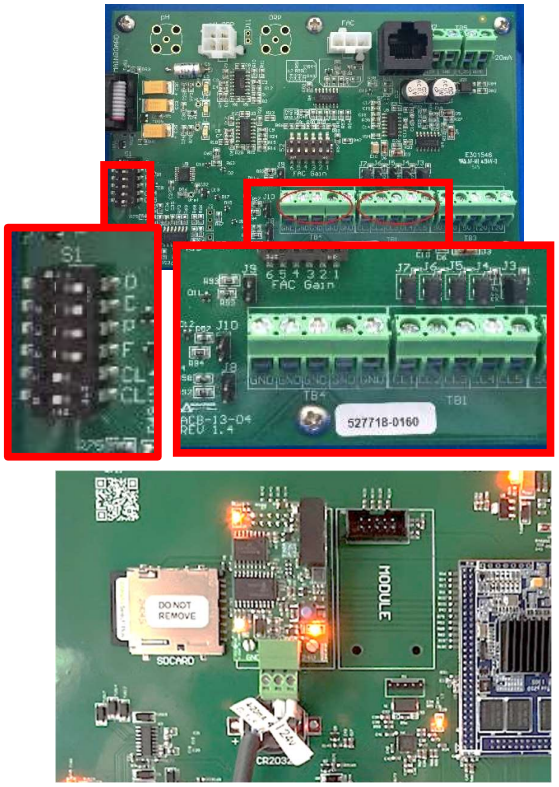
This helps to determine if water is corrosive (negative LSI) or scale-forming (positive LSI). LSI between -0.5 and +0.5 is the widely accepted range.

Input an average calcium hardness value, expressed as CaCO3, into the LSI setting. The assumption is that calcium hardness is almost stable for each cooling tower.



GENERIC INPUTS

ULTIMA controllers with ADVANCED firmware can accept up to 6 x generic input signals for data logging, monitoring and control.



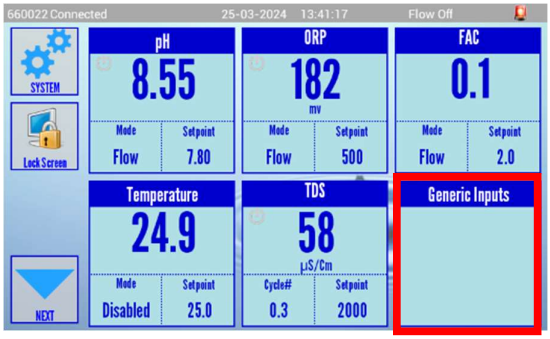
Wiring and installation

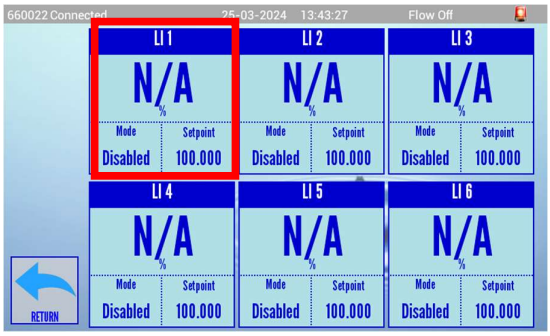
- Ensure device is installed as per OEM instructions.
- Wire sensor to any of the available 4-20mA inputs and 5/12/24VDC power ports inside the ULTIMA.
- Jumper and dip switch settings are shown in below table:

ULTIMA Input ID	Jumper(s) setting
CL1	Remove J7 – Add J9
CL2	Remove J6 – Add J10
CL3	Remove J5 – Add J8
CL4	Remove J4 – Dip Switch On to right
CL5	Remove J3 – Dip Switch On to right
4-20	N/A
M1	N/A - Sensor connected via LHS module, looking from front of controller
M2	N/A - Sensor connected via RHS module, looking from front of controller (see photo)

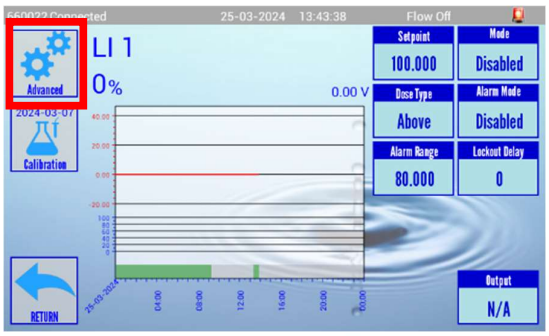
Setup

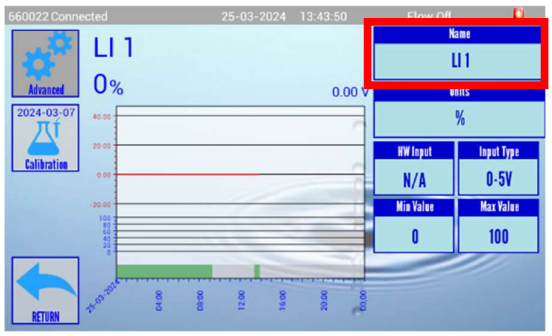
1. Once device is installed as per instructions, close controller up and select “Generic Inputs” from main screen. Select an unused input, eg. LI1.



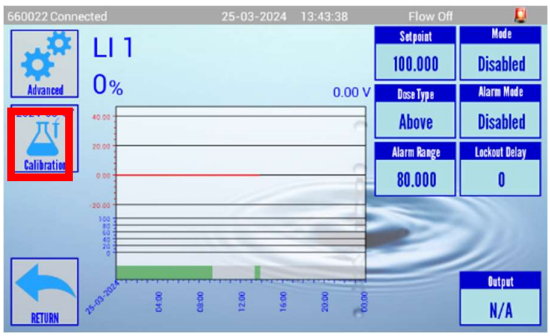


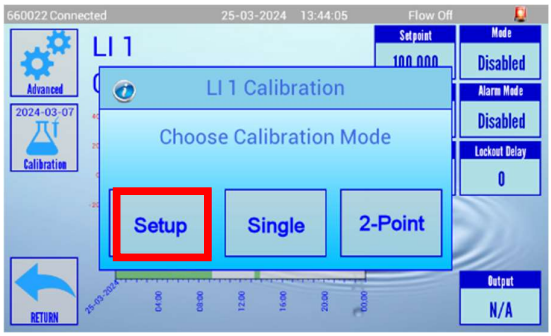
2. Once you have selected your input, then select ‘Advanced’ then ‘Name’ and change the name to i.e., FAC Membrane to identify that in the future.

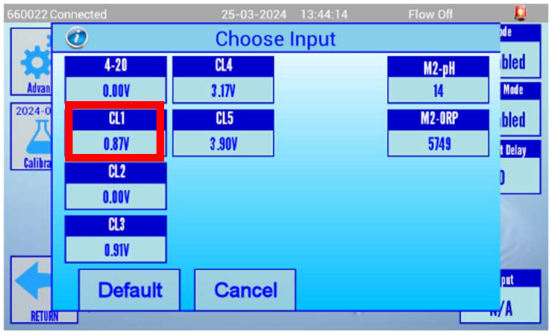




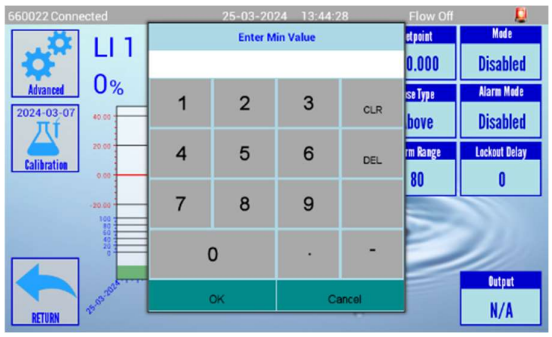
3. Once you have named your Probe press ‘Calibration’ – ‘Setup’ – then select which input the cable has been wired into (i.e., M1, M2, 4-20mv, CL1 – CL5)

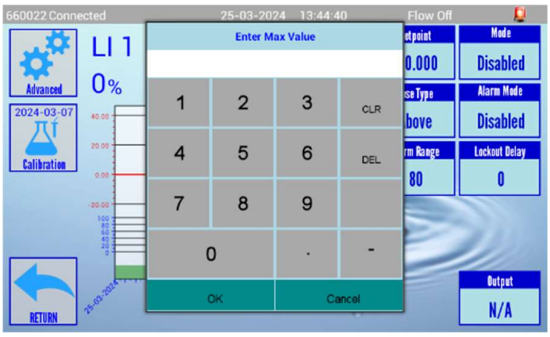


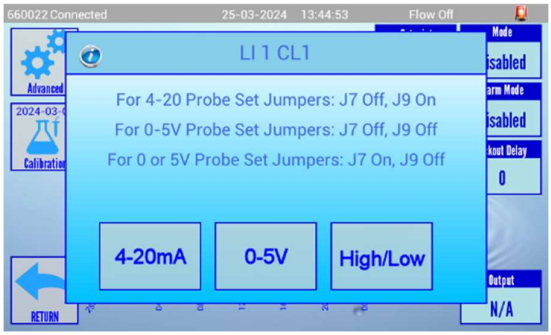




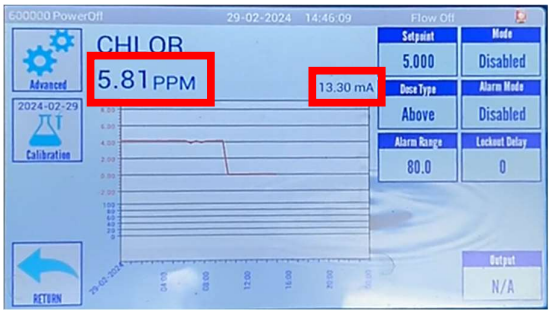
4. Enter your minimum range of the probe and press OK, then enter maximum range of probe and press OK. Check the specifications on your device for this information.
5. Once entered, select the “4-20mA” option from the available options.



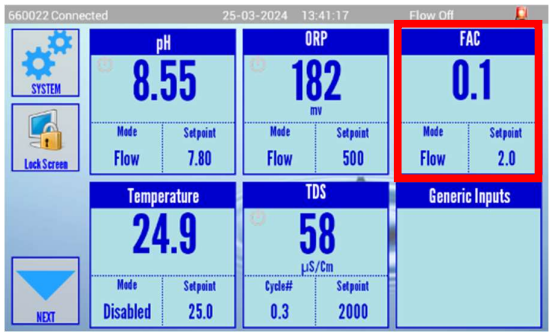




6. Once this is done you should see readings from the probe, and corresponding mA reading between 4-20mA. Note: there may be a delay/ run-in period in achieving correct reading, depending on sensor type. Please refer to “Troubleshooting” section if any issues.



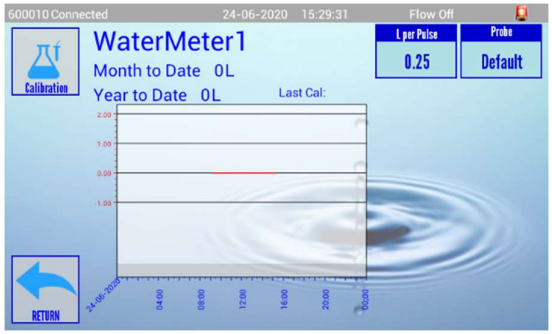
7. Generic Input may now be configured and controlled as per other functions. See “pH/pHB” section for guidance on setting desired outputs, alarms, and control modes.
   In addition to standard modes of Disabled/ Continuous/Flow, two additional modes are available for generic inputs:
   Hourly Volume – to control hourly dosage rate for inhibitor & dispersant applications.
   Pre-treat (PPM) – to maintain accurate concentration (PPM) dosage of water treatment chemicals.
8. For PRO models, FAC/FACB functions are available for controlling on measured chlorine concentration. Generic 4-20mA chlorine sensors may be assigned to these functions. To perform this action, please return to the main menu and select ‘FAC’.
9. Then select ‘Advanced’, then ‘Probe’ and select the name you created i.e., FAC Membrane, which will take values from that input. Now press advanced and finalize the remaining settings for this probe. Refer to “FAC/FACB” section for more information.



WATER METER

Pulse Water Meters can be used with ULTIMA controllers. Wire the water meter to the ports: “Water Meter” and “12V” port on TB2 of the probe board, as shown in the photo. If the water meter is powered, use GND instead of 12V. The polarity of the wires is not important: the wires can be connected either way.

On the Water Meter screen input L/Pulse value. This must be taken from your water meter specs. Example: if the spec shows 4P=1L, you need to enter 0.25L in the box.



LOW LEVEL TANK SWITCH (FOR STANDARD ULTIMA MODELS)

0-5V low level tank switches are supplied in two sizes:

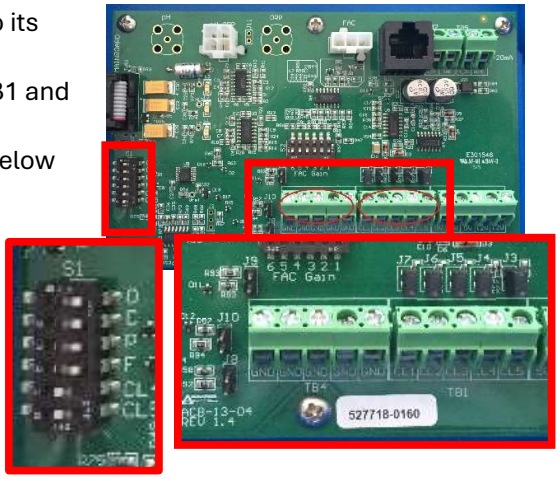
- 500mm with 3m pump suction tube and 3m lead/cable;
- 1000mm with 5m pump suction tube and 3m lead/cable.

They come with the following items:

- Drum Weight (Foot Valve) for the suction point of chemicals;
- Suction tube to be fitted to the dosing pump;
- Cable to be wired to the controller;
- A Cap to be put on the chemical drums. The cap can move up or down to adjust the length of the sensor.

Wiring and installation

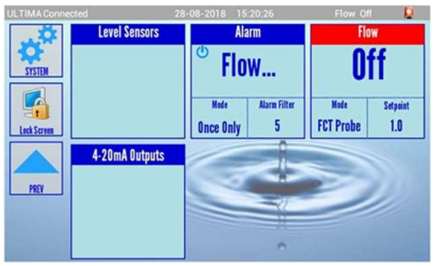
- Place each tank alarms in its chemical and take the tube to its pump suction.
- Wire tank alarm cables to the CL1 – CL5 and GND ports (TB1 and TB4) on the probe board
- Default allocated input and jumper settings are shown in below table:

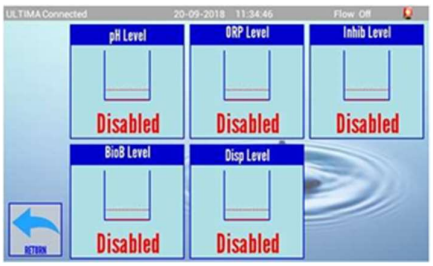


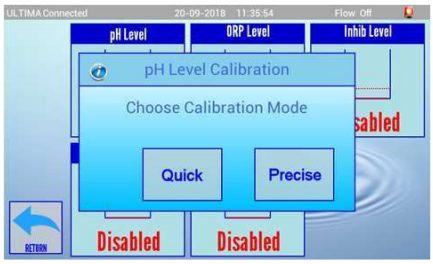
Input	Default Allocation	Jumper(s) setting
CL1	pH	Add J7 – Remove J9
CL2	ORP	Add J6 – Remove J10
CL3	Inhibitor	Add J5 – Remove J8
CL4	Secondary Biocide	Add J4 – Dip Switch Off to left
CL5	Dispersant	Add J3 – Dip Switch Off to left

Setup

For each low level tank alarm, click on the Function as shown in the following screenshots, select **"Precise"** calibration and follow the prompts to calibrate it for 0 (empty) and 100 (full)







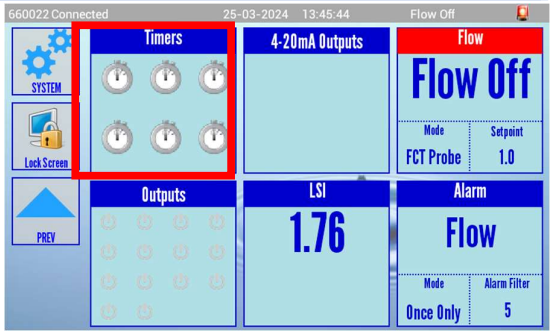
LEVEL SENSORS OR WEIGHT SCALES

0-5V or 4-20mA level sensors can be used with UCT, PRO and UNIQ models only. Refer to the Generic Input instructions for further details.

TIMERS

ULTIMA controllers come with six 7-day timers, allowing for periodic activation of designated outputs.
Example applications for the timer:

- Weekly superchlorination of cooling tower or pool;
- Periodic dosing of non-oxidising biocide to a cooling tower system.



Set the timer

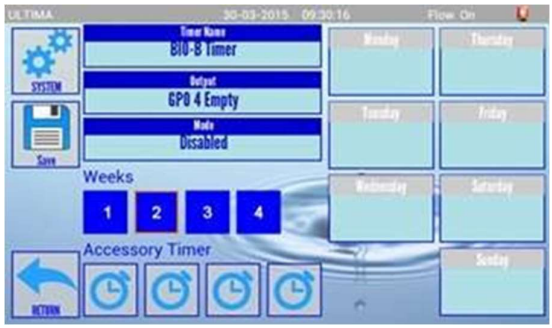
Bio A/ORP and Bio B timers may already be labelled in the list of timers. Select desired timer, and configure settings as required.

Select a free timer.

Timer Name: Give it a proper name, eg. BIO-B Timer.

Output: Select the output for which you would like to set the timer, eg. GPO 4.

Mode*: Select from the following:



- **Disabled:** Timer is not active
- **Timer:** Energise the output when Timer is ON regardless of flow
- **Timer and Flow:** Energise the output when Timer and Flow are ON
- **Timer and Probe:** Energise the output based on its function settings when timer is ON and regardless of Flow
- **Timer, Probe and Flow:** Energise the output based on its function settings when Timer and Flow are both ON

* NOTE: if the output is linked to a parameter, eg. Function pH or ORP, set mode to Disabled. Otherwise, the function and timer will both work individually.

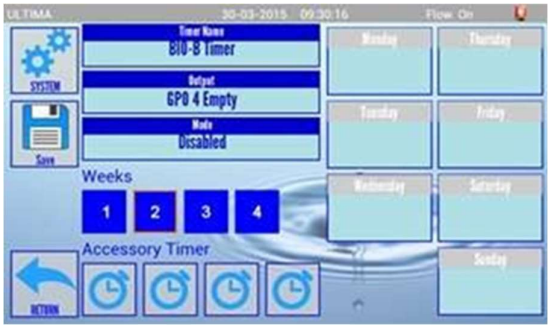
Select a day of the week from the days provided, eg. Sunday.

Tick “Enable” box

Use +/- to set the start time and duration
Press “OK” to save the timer for the selected day only, or
Press “Apply To All” if the same start time and duration are needed for some other days of the week. This will apply the settings to all days of the week but not enabled. For other days, just click on the day and “Enable” the timer (no need to replicate the settings).
Select the weeks accordingly for all weeks, every two weeks of every 4 weeks (they are blue when selected)

ACCESSORY TIMERS

Each timer comes with 4 “Accessory Timers” allowing users to plan other functions related to that timer.



Set the Accessory Timers

Accessory Timers allow 4 other outputs to be interlocked with each main timer. Select an Accessory Timer to get into the settings page.

Output: Select the output to be linked to the timer

Mode:

Disabled: The Accessory Timer is not active

Timer and Safety*: Activate the Accessory Timer when its timer is ON

Timer, Safety* and Flow: Activate the Accessory Timer when Flow and its timer are both ON

* NOTE: “Safety” is a reminder to set the Safety Min and Safety Max for the function if applicable. In particular; this is very important when Accessory Timers are used with Conductivity/TDS.

Type: This is to decide what the accessory timer is going to do.

On Before: Switch the output ON before the main timer turns ON.

Off Before: Switch the output OFF before the main timer turns ON.

On With: Switch the output ON simultaneously when the main timer turns ON

Off With: Switch the output OFF simultaneously when the main timer turns ON

On After: Switch the output ON as soon as the main timer turns OFF

Off After: Switch the output OFF as soon as the main timer turns OFF

Use +/- to set the duration.

Accessory Timers Example for Bio B – Timer

Acc Timer 1 purpose: Pre-Bleed for 15 minutes Output: Conductivity Mode: Timer, Safety and Flow Dur: mm: 15 Type: On Before	**Acc Timer 3 purpose: Bleed Lock out for 4 hours** Output: Conductivity Mode: Timer, Safety and Flow Dur: hh: 4 Type: Off With
Acc Timer 2 purpose: Stop ORP 2 hours before dosing Bio B Output: ORP Mode: Timer, Safety and Flow Dur: hh: 2 Type: OFF Before	**Acc Timer 4 purpose: Keep ORP OFF during Bleed Lock out** Output: ORP Mode: Timer, Safety and Flow Dur: hh: 4 Type: OFF With

OUTPUT CONFIGURATION

ULTIMA series controllers have 14 outputs:

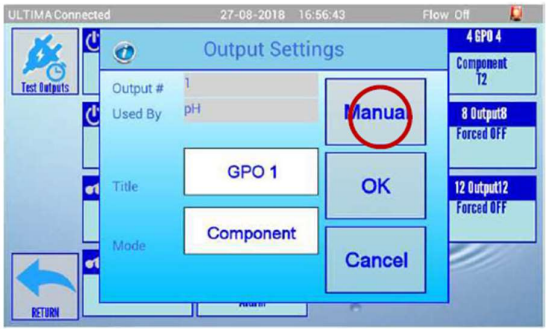
Outputs 1 to 4: 240V output; wired to GPOs 1 to 4 inside the controller box.
Output 5: 240V spare output
Outputs 6&7: 240V output via relay, screw terminal available on the power board. Bleed solenoid cable is wired into the output 6 for conductivity control
Output 8: optional 240V, 10-15A relay; screw terminal available on the power board for hard wire of chlorinators, large pumps etc.
Outputs 9 to 13 are low power (can switch up to 50V/0.5A/2W peak) via a no volt contact for switching dosing pumps or similar applications.
Output 14 is a low power relay that can be used for beacon alarms or other applications (50V/2A). By default, Output 14 is used for common alarm to a BCMS.

Press the output that requires configuring, eg. **"1 Output 1"**:

"Output Settings" menu appears. See example below for Output 1.

Output #: Eg. **"1"**
Used By: this shows the function or timer which this output is assigned to, eg. **"pH"**
Title: Output name. Can be re-named as required by selecting the title box, eg **"Output1"**.
Mode: set the output mode accordingly, eg. **"Component"**. Here are the options:

- **Component:** The output to be controlled by a function or timer, see "**Used By**".
- **Forced OFF:** The output is always OFF regardless of any linked components or timers. The output will only be activated by manual dosing.
- **Forced ON:** The output is always ON regardless of any linked components or timers.



Important Note: Take care when selecting Forced ON or Forced OFF options as this will force the output perpetually ON or OFF, until the mode is changed.

Forced ON can be used to configure pulse pumps. See section "No Volt (Dry Contact) Outputs" in this manual for more information.

TEST OUTPUTS

On the second screen of the controller, click on “Outputs” and then “Test Output” button, as shown.

The following message will appear on the screen: “Press an output to activate it for 10 seconds”. ALL OUTPUTS ARE “FORCED OFF” NOW.

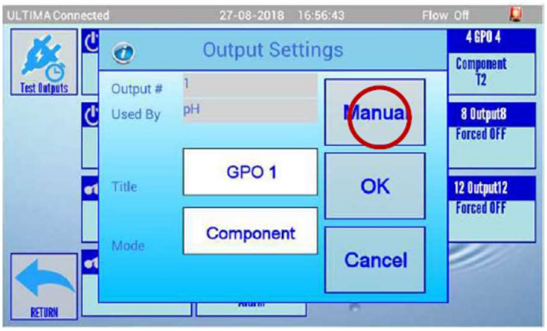
Press outputs one by one and check the associated device is working correctly. A counting down timer shows the remaining test time for each function.

Press “Test Output” to exit test mode. System will exit test mode automatically after 2 minutes.

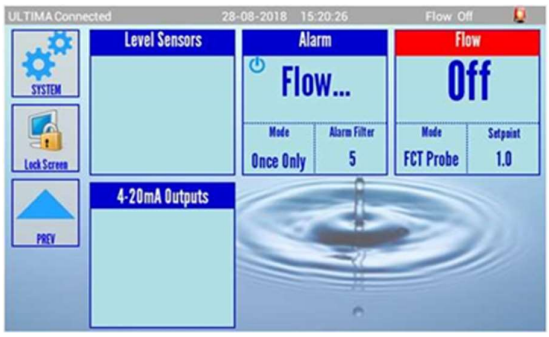
MANUAL DOSING

Temporarily overrides all other settings and turns the output on for the selected duration in minutes and seconds. This may be useful for priming pumps or testing the connection between pumps and control functions as part of the commissioning or to diagnose the issues.

- From “Outputs” screen, press the function which you would like to manually dose.
- Check the output mode is “Component”
- Click on “Manual”
- Input a time (eg. 10 seconds)
- Click on “Start”
- Exit the page
- Press “Stop” to cancel manual dosing.



ALARM SETTINGS



Alarm settings are available under Alarm page:

Alarm filter: The delay to send an alarm after happening. This is to avoid unnecessary alarms in case of spikes. Default filter: 5 minutes.

Mode:

- **Once only:** When alarm happens
- **At time:** Set a time to receive alarm if it is still active
- **Every:** Set how often the same alarm to be repeated if still active

Send Alarm Cleared: tick to receive a message when alarm is cleared

Ignore Flow Alarm: tick to exclude no flow alarms.

Delay Alarm Relay: tick to apply "Alarm Filter" to "common alarm", to minimise nuisance alarms, eg. spikes, being sent to DCS/SCADA/BCMS.

Output: Common alarm may be sent to an output, eg. Light/siren, BCMS etc. When this feature is used, default is Output 14, as shown.

SYSTEM SETTINGS

To access controller settings, press 

The system menu screen appears:

NETWORK SETTINGS

Select  from the System menu to select a network interface (Ethernet, WiFi, Modem or None).

Advanced Settings screen as described above;

Save changes prior to exiting;

Check signal: where antenna is fitted to controller. Press button and roam with antenna to find best signal strength. Typical signal strength between 25-31.

NETWORK INTERFACE: ETHERNET

Use an Aquarius Ethernet adapter to plug the Ethernet cable into either USB port.

Click System, then Network Settings.

Select Ethernet radio button from list. Controller automatically picks up available IP to connect.

Local Network Requirements:

- DHCP enabled, or contact Aquarius for a custom static IP to be set
- If a firewall present:
  - reserve an IP for the MAC address on the network screen of the controller
  - Open TCP port 8883 to comms.aquareporter.com.au (currently 13.75.248.255) for reserved IP

If a controller fails to connect, Export Debug Data.

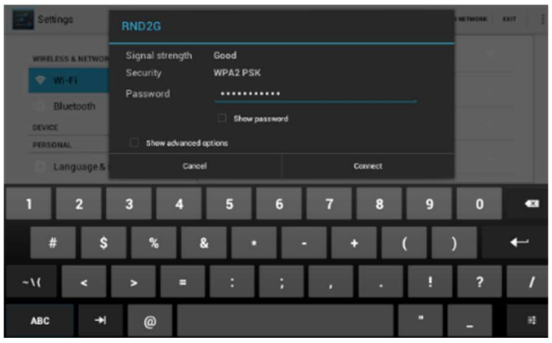
Insert a USB drive, and go to: →  →  → 

Email this file to Aquarius for assistance.

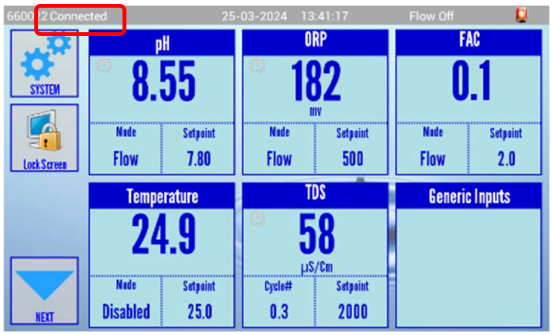
Plug a Wi-Fi adapter to either USB port.

Click System, then Network Settings. Select Wi-Fi from Net Interface list.

- Click Advanced;
- Turn ON Wi-Fi and wait until Wi-Fi is found;
- Select your Wi-Fi, input password and Connect;
- Wait until showing connected;
- Press Exit;
- Check Wi-Fi network name appears against WAP on network screen; Press Save.



A connected message must appear on top left of the screen.
Refer to local network requirements (above) if not connected.



Note: When using Mobile phone, make sure “Personal Hot Spot is On” with your mobile before turning Wi-Fi On from controller. Select your mobile name from list of available Wi-Fi. If there are characters in the network name (eg. Andy’s iPhone), they may need to be removed from the name to join.

Install modem to ULTIMA front panel and mother board as shown, ensuring that valid SIM card is inserted.

For end users located within Australia, Aquarius will offer a Telstra SIM internet plan as standard. However, for international end users or where Telstra coverage is not available, an alternative SIM connected to a suitable local service provider may be used.

Check that motherboard and modem power LEDs are illuminated.

To access modem connectivity screen from the main controller screen, select:

"System" 

→ "Network Settings". 

Ensure "Modem" radio button is selected under "Net Interface".

Network Communication Status appears in the top left corner of the screen, as highlighted.

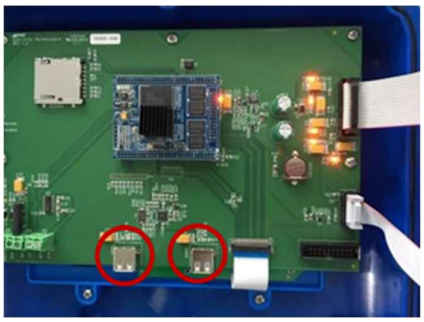
PowerOff (Power to modem turned off for 10 seconds)
PowerOn (Power to modem turned on, wait 10 seconds for startup)
Restore (Restore factory defaults to modem)
Detect (initial commands for modem response) Fail = check cables, send debug file to Aquarius
Chk Model (check modem model) Fail = check cables, send debug file to Aquarius
Chk Sig (check the current signal strength - this can take up to a minute or two as it will repeat until it gets a valid number) Fail = check location/better antenna/modem, send debug file to Aquarius
Read Sim (check sim card details) Fail = check/replace sim card, send debug file to Aquarius
Carrier/Carrier1/Carrier 2 (Connecting to network) Fail = check/replace sim card, send debug file to Aquarius
D1CellInfo (Information for tower it's connecting to) Fail = check/replace sim card/location/better antenna/modem, send debug file to Aquarius

D2CarInfo (Carrier it's connecting to) Fail = send debug file to Aquarius
D3RegInfo (Current registration details Fail = send debug file to Aquarius
D4ScanCars (Find available carriers that modem could connect to) Fail = check signal strength (typical signal strength is between 25-31), send debug file to Aquarius
PPP (Connecting to the Internet) Fail = check/replace sim card, check APN is correct for sim card used, send debug file to Aquarius
Ready (connected to internet) Fail = check/replace sim card, send debug file to Aquarius
Connecting (connected to internet, waiting to connect to server) Fail = contact Aquarius
Sending (Sending data, waiting for a response) This is the normal state while sending data and could appear for a couple of seconds.
Connected Normal connected state while not actively sending data.

Modem Err (No modem response - check cables and power to modem)
No Carrier (No valid carrier found - try a high gain antenna, adjusting the modem position, send debug file to Aquarius)
No SIM (check/replace sim card, send debug file to Aquarius)

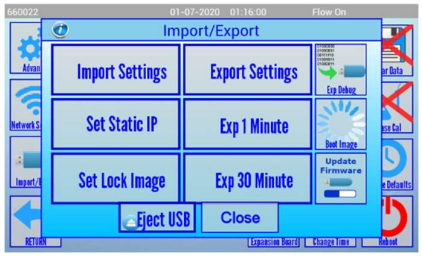
IMPORT/EXPORT SETTINGS AND EXPORT DATA

Plug a USB memory into any of two USB ports on the mother board (inside the panel). If using frequently, consider using USB cable extension to access USB port from glands on the controller box.



Select 

from the System menu.



Export settings: download custom ULTIMA controller settings on a USB memory stick to be imported to another ULTIMA controller or to be kept as a backup.
Import settings: configure ULTIMA controller by uploading custom settings already saved on a USB memory stick (possibly from another ULTIMA controller with the same mode).
Set Static IP: assign IP address via particular network connection. Selecting this with no connection, will clear the Static IP address. Contact Aquarius to generate Static IP file.

Select **Exp Debug** to export a debug data file for further investigation on issue and troubleshooting. Email file to Aquarius for technical assistance.

Select **Update Firmware** to upload ULTIMA firmware updates to the controller via USB. Aquarius will email firmware update files upon request.

Select **Boot Image** to import a custom image/logo to appear when controller powers on.

1. Put a bootanimation.zip file in the base directory of a USB stick
2. Follow menu to Boot Image: 

→ 

→ 

3. Controller will restart with the new boot animation.

If **Boot Image** is selected with no USB memory stick inserted with suitable image file, boot image will be removed, and reverts back to default Aquarius boot image.

Set Lock Image: upload a custom lock image/logo to appear when the controller screen is locked.

1. Put an ultimaLock.jpg file (720x480px) in the base directory of a usb stick
2. Follow menu to Set Lock Image: 

→ 

→ 

3. Controller will display the image on the “Unlock” screen.
4. Repeat steps 2-4 with no USB attached, will remove current lock screen image.

Exp 1min: export data which is logged in 1minute intervals.

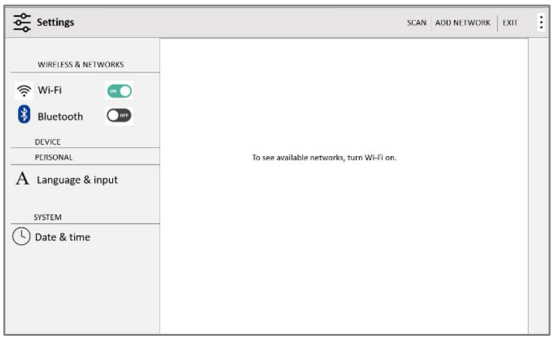
Exp 30min: export data which is logged in 30 minutes intervals.

Press **Eject USB** when import/export is complete and before removing USB memory stick.

ADVANCED SETTINGS

Select 

from the System menu.



This will bring up an Android menu.

From this screen:

- Wi-Fi: to turn on Wi-Fi and set its settings;
- Language & input: completely available for English & Chinese language;
- System date & time:
  - The following settings can be checked:
  - For the web connected controllers: “Automatic date and time” and “Automatic Time Zone” must be ticked. No other changes in settings are required.
  - For non-web controllers: the time zone to be “Casablanca”.

IMPORTANT: THE ABOVE SETTINGS ARE SET FROM FACTORY. CONTACT AQUARIUS PRIOR TO CHANGING. DO NOT SET DATE & TIME SETTINGS VIA “ADVANCED” SETTINGS MENU.

SET PASSWORD

Three levels of access available using one password:
Unlocked – access control disabled, full access to controller. All boxes unticked.

“Screen Lock Password” – requires a password to access the controller.
"ReadOnly Login" – allows calibration and read-only access to all data and settings without a password.

RESTORE DEFAULTS

Wipes all controller settings and restores factory settings.

NOTE: PLEASE CONSULT AQUARIUS PRIOR TO USE.

CHANGE TIME

Set date & time if different (not available when network interface is ticked: time set automatically via network)

ERASE CAL

Erase calibrations on all controller functions

REBOOT

Power cycle controller off & back on without cutting power

CLEAR DATA

Clear all controller data, in case excessive data is slowing down controller

EXPANSION BOARD CONFIGURATION

Configure Modbus

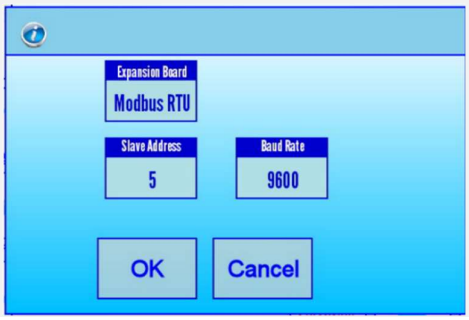
Refer to "ULTIMA MODBUS Manual" for minimum system requirements.
Ensure that MODBUS PCB card is installed and wired as per "Expansion Boards" section of this manual, and "ULTIMA MODBUS Manual".

From the main screen, Select "System" 

then "Expansion Board":

In the Expansion Board dialog, you can see three settings.
Expansion Board = *{None, 4-20, Modbus RTU, Corrosion}*
Slave Address = *{1-240}*
Baud Rate = *{9600,19200,38400}*

Choose Modbus RTU, your desired slave address and baud rate to configure the ULTIMA.



Configure BMS

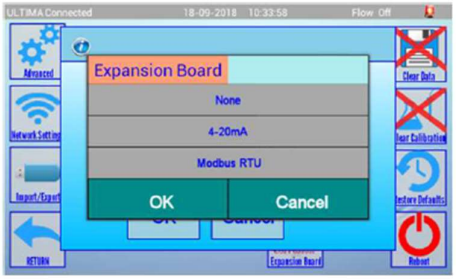
Refer **manual** "4-20mA Output Interface for ULTIMA controllers" for minimum system requirements.

Ensure that BMS PCB card is installed and wired as per "Expansion Boards" section of this manual, and "4-20mA Output Interface for ULTIMA controllers".

From the main screen, Select "System" 

then "Expansion Board":

Select Expansion board. From the list, select 4-20mA; disregard slave address & baud rate.



Press OK to confirm and Exit.

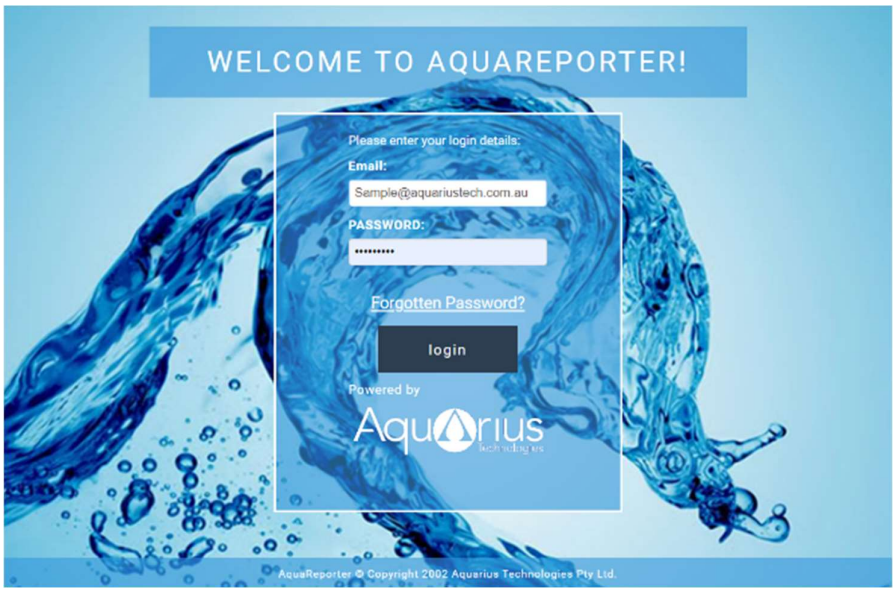
Further information on configuring 4-20mA outputs is available separately in the manual "4-20mA Output Interface for ULTIMA controllers".

AQUAREPORTER

Aquarius ULTIMA controllers with remote web access are monitored online via AquaReporter. Once your controller is connected to the internet, contact your Aquarius Sales representative to assign the controller to appropriate users.

When a controller is assigned to you, you will receive an invitation via email to access AquaReporter.

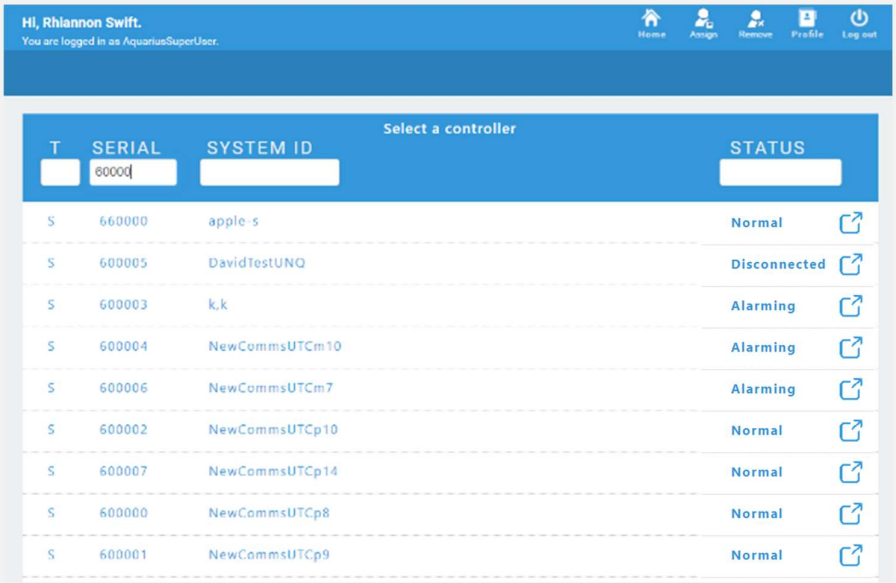
Using the instructions in the email, login to the AquaReporter site at **https://aquareporter.com.au/**



The first screen that appears shows a list of controllers to which you have been granted access. This is the "List Controllers" view.

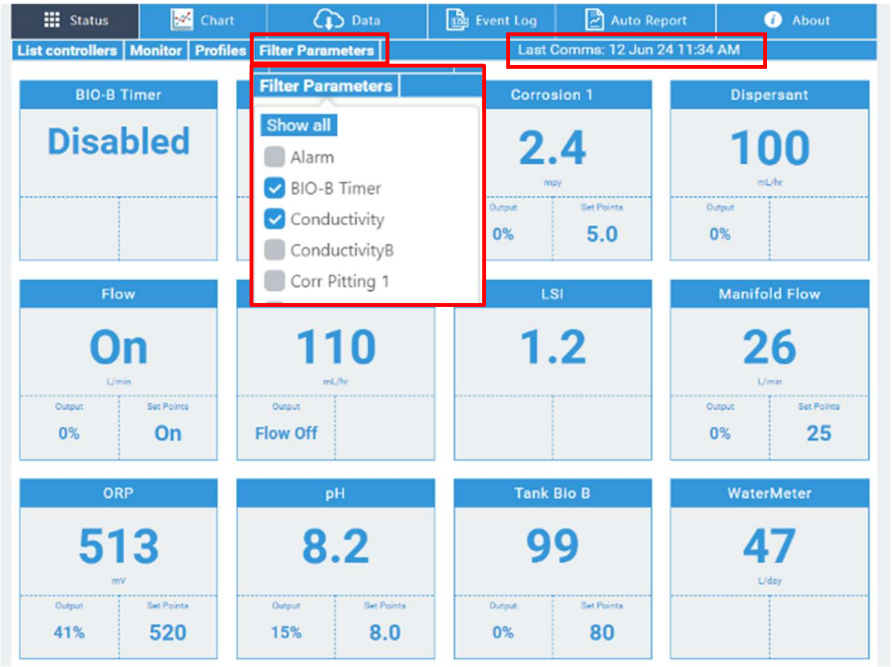
Controllers assigned to you will be visible on the home page. Controllers may also be searched by serial number, and System ID, assigned by the customer.

Controller connection and operating status is visible in the right-hand column of each listed controller. Click on the listed controller to access the controller details. This is the "Status" view.



In the “Status” view, the controller component functions are mirrored from the controller to your computer screen. Connection status and “Last Comms” time and date are visible as highlighted.

In this view, select “Filter Parameters” drop-down to show/hide parameters as desired.



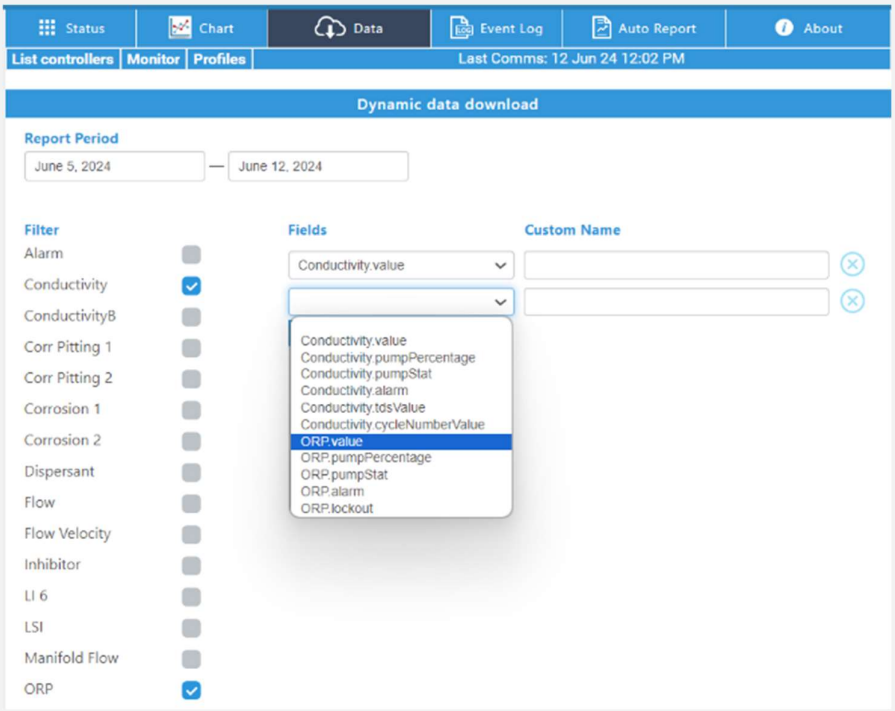
Click on any parameter in the “Status” view, to access settings and trends for that parameter.

Trends can be adjusted, displayed and downloaded from this screen. All settings may be adjusted remotely. Clicking “Save Settings” will push the new settings to the controller in the field. Assigned outputs are fixed and unable to be altered via AquaReporter.

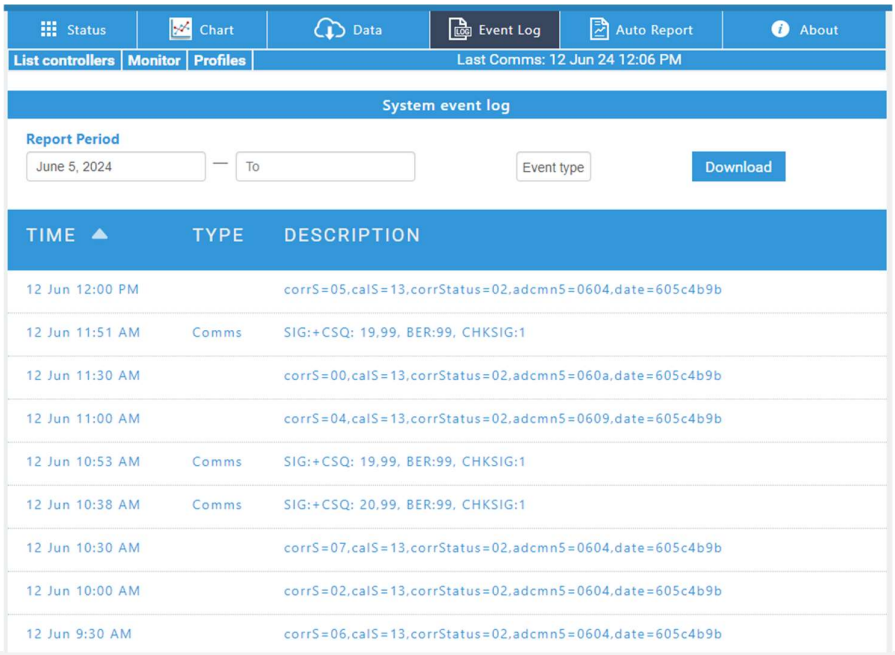
Navigate to the "Chart" view to create, display and download custom charts. Select desired parameters from the right hand column to display and compare trends. Start and end date can be adjusted from the top drop downs. Hit "Refresh" to update the chart.

Sliders to the left and right of the graphs will adjust the zoom of the y-axes.

Navigate to "Data" view to select desired fields and date range, and download as a .csv data file.

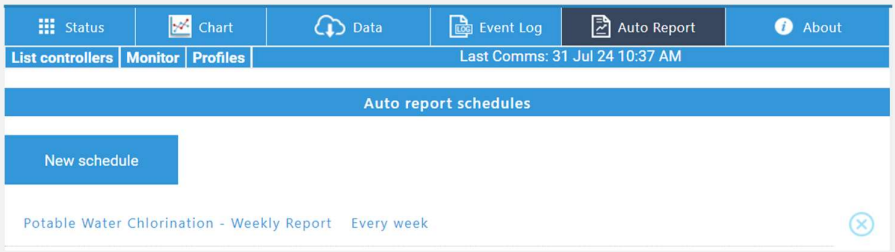


Select “Event Log” view to view and download event messages. Messages can be filtered according to type eg. Comms, power, alarms, calibration, other. Use the “Report Period” function to filter event messages within a specific date range.



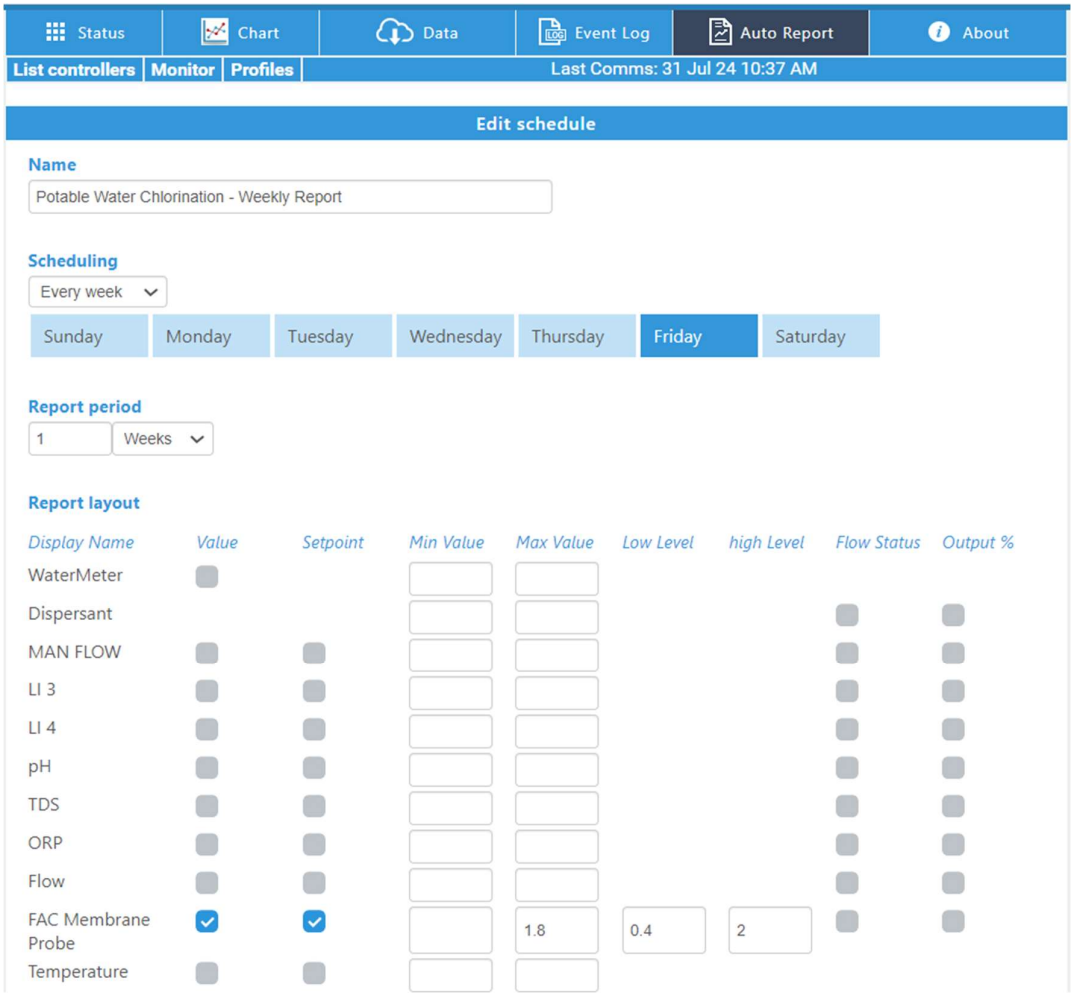
The “Auto Report” function allows users to create and schedule customisable periodic reports, which are sent to designated email recipients.

To view, edit or create a new report schedule, access “Auto Report” view.

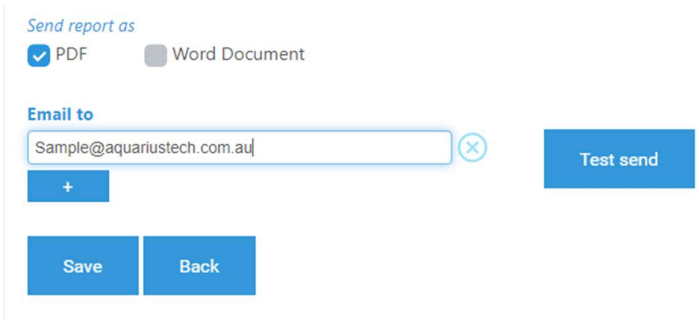


The "Auto Report" function allows users to create and schedule customisable periodic reports, which are sent to designated email recipients. To view, edit or create a new report schedule, access "Auto Report" view.

Click on "New Schedule" to build a new report, or click on an existing listed report to edit details including scheduling frequency and day of the week and report content.

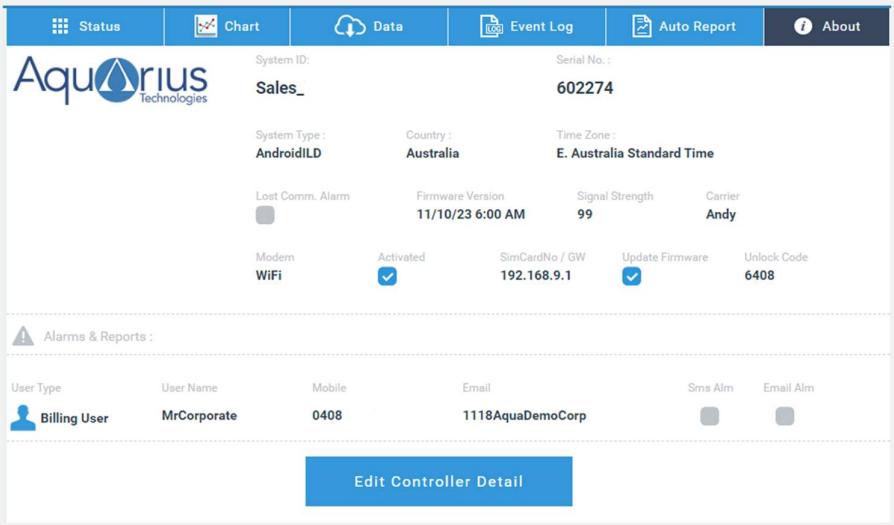


Scroll down to the bottom of the page to select report format and enter recipients. When creating a new report schedule, enter your email address and press "Test send" to receive a trial version of the report to review. Hit "Save" to save your changes, or "Back" to exit screen without saving.

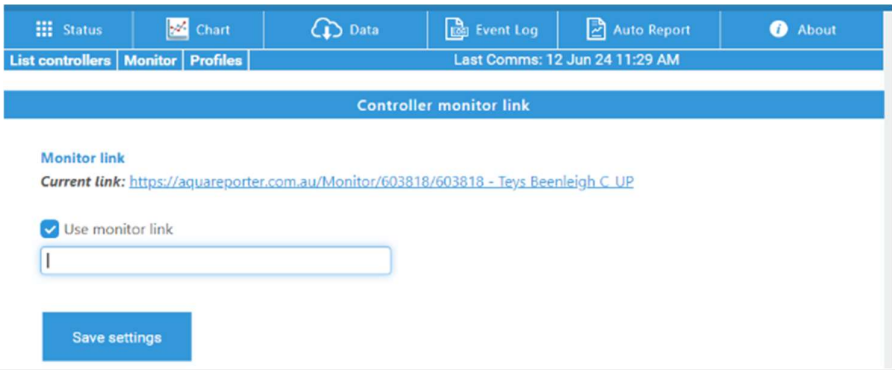


Access the "About" view to view communications and administration details for your controller.

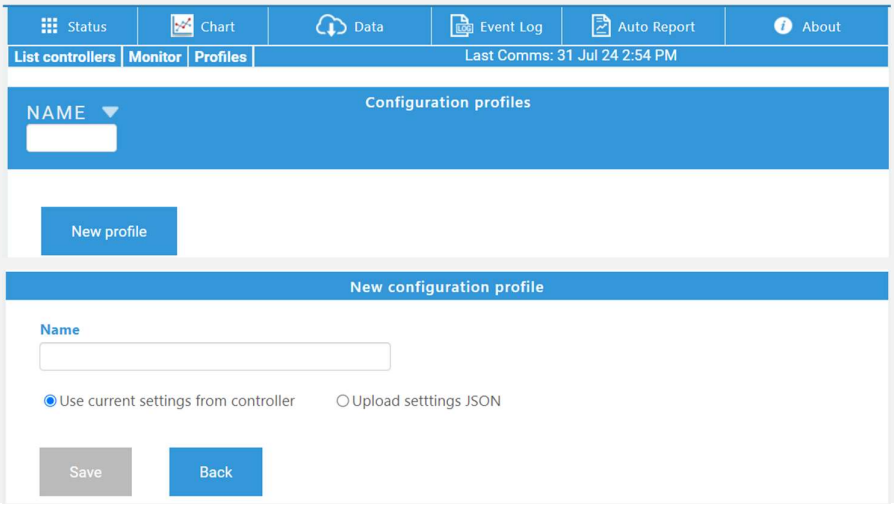
In this view, select "Edit Controller Detail" button to assign additional users to the controller, and select "SMS Alm" and/or "Email Alm" to send them alerts when controller is in alarm status.



Select "Monitor" button to generate a URL to monitor this controller, which can be sent to other parties not registered in AquaReporter and allow them to monitor the controller.



"Profiles" function allows multiple controller settings .JSON files to be saved and pushed to your controller as needed. This feature is helpful for cases where multiple control modes are required for one controller. Contact Aquarius team to discuss optimal advice for your application.



CLEANING

Refer to separate "Aquarius Controller Maintenance and Parts List" manual for further details.

- All sensors should be inspected, cleaned and calibrated as necessary every month.
- Fouling of sensors can lead to inaccurate readings. Sensors should be cleaned and calibrated regularly using the following procedures. For optimum results and continued accuracy, the complete operation of the controller system should be verified at least on a monthly service basis.
- All sensors age with time and temperature, and have a typical life span of 12-36 months depending on the application in which they are operating and should be replaced accordingly.
- Where fitted, flow sensors and wire strainers should be checked for correct operation and cleaned of any debris every month, so they work efficiently.
- Injection non-return valves and pumps should be cleaned and checked at least monthly.
- Sodium hypochlorite is highly alkaline and may lead to scale formation on its dose injector. This may require acid cleaning on a frequent basis.
- On the peristaltic dose pumps, the squeeze tubes and roller block should be checked at least annually and should be replaced every 12-24 months. More regular maintenance may be required for the larger 3.0 l/hr pumps, due to increased pumping rates.
- Chemical suction and discharge tubes should be inspected monthly and replaced as necessary.

Cleaning Sensor/Probe

Isolate flow to the manifold. Remove the sensors from the manifold by loosening the lock nut and withdrawing the sensor from the manifold.

Flow/Conductivity/Temp Probe Cleaning: (PR_FCT Probe)

Abrade the sensor surface with 300–400 grade wet–and–dry paper until the surface is clean, the two carbon electrode surfaces are clearly visible, and the surface wets out freely. Ensure flow paddle is free from debris. Rinse the sensor in fresh water. Note: Don't touch electrodes with bare hands.

pH/ORP Probe Cleaning: (PR_PHRG Probes) and **FAC Probes** if applicable

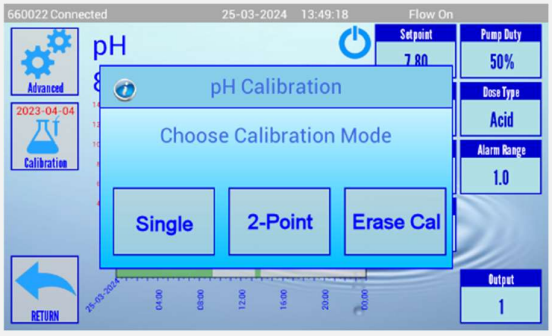
Rinse the sensors in fresh water and remove any visible fouling. This should be done carefully by lightly scrubbing with a soft brush (a soft tooth brush or similar). Place the sensors in the Electrode Cleaner solution for about 5 minutes to completely dissolve any trace of inorganic foulants then remove and rinse thoroughly in fresh water.

CALIBRATION

Important: Apply Cleaning Sensor/Probe procedure before any calibration.

- The probe must be calibrated if measurements are different with standard solutions.
- Check and calibrate **Temperature** before any calibration of Conductivity, pH or ORP.
- If measurements are too far from controller readings, perform a multi-stage calibration by inputting a number not more than 40% away from the current reading at each stage.
- Stability for calibration's test normally takes minimum 15 seconds.
- Contact the Aquarius team to order relevant calibration and cleaning solutions.

Calibration	Procedure
Temperature	1. Apply cleaning Flow/Conductivity/Temp probe procedure. 2. Put the probe in a solution with measured temperature, wait until temperature reading become stable. 3. Go to Temperature page, select "Calibration" button and then "Single" for single-point calibration. 4. Input the temperature (actual measured temperature) then push OK. 5. Push Save or Return to Save.
Conductivity	1. Apply cleaning Flow/Conductivity/Temp probe procedure. 2. Put the probe in a standard conductivity solution or manually measured conductivity and wait until measurements is stable. 3. Go to TDS/ Conductivity page, select "Calibration" button and then "Single" for single-point calibration. 4. Input the standard (1413) value or manually measured conductivity then push OK. 5. Push Save or Return to Save.
pH	1. Apply cleaning pH/ORP probe procedure, using mild acid for better cleaning. Rinse well. 2. Put the probe in the solution and wait until measurements is stable 3. Go to pH page, select "Calibration" button . Select from the following options: a) **Single:** Input pre-measured solution value and press OK. NOTE: Single point calibration is not recommended. For best results, use 2-point calibration method. OR b) **2-Point:** Two-point calibration using 7.01 and 4.01 buffer solutions, rinse the probe with fresh water after each step and shake probe to dispose of existing water c) **Erase Cal:** wipes all previous calibrations. 4. Push Save or Return to Save. Select any option and then "Cancel" to return to the main pH screen without making changes.



ORP	1. Apply cleaning pH/ORP probe procedure, also use a mild acid for better cleaning and rinse well 2. Put the probe in the solution and wait until measurements is stable 3. Go to ORP page, select "Calibration" button . Select from the following options: a) **Single:** Input pre-measured solution value and press OK. NOTE: Single point calibration is not recommended. For best results, use 2-point calibration method. OR b) **2-Point:** Two-point calibration using 250mV and 475mV solutions, rinse the probe with fresh water after each step and shake probe to dispose of existing water c) **Erase Cal:** wipes all previous calibrations. 4. Push Save or Return to Save
Level Sensor and Weight Scales	1. Go to "Generic Inputs" section for advice on setup. For 3rd-party level sensors with independent configuration method, no further calibration is required. 2. To calibrate, select the desired Generic Input function and then "Calibration". 3. Select "2-point" calibration and follow the instructions. In this step calibrate the sensor between 0 – 100% range (empty and full status) Continue calibration by selecting "Single" and inputting the percentage of the level or weight to reach accurate value.
Low Level Tank Switch	4. Refer to "Low Level Tank Switch" section of this manual for further details.

RECOMMENDED MAINTENANCE SCHEDULE

Task	Monthly	3M	6-12M	24M
Clean FCT, pH/ORP & FAC* Probe Verify Flow ON/OFF switch Test Outputs (Inspect Pumps/Solenoids Operation) Check/Clean Injectors Inspect Suction/Discharge Tubing	✓			
Verify / Calibrate Temperature Verify / Calibrate pH and ORP Calibrate FAC* Probe Check Solenoid valves Inspect Corrosion *		✓		
Service Peristaltic Pump (using AP Service Kit) Inspect Pumps*			✓	
Overhaul Peristaltic Pump(using AP Overhaul Kit)				✓

*if applicable

TROUBLESHOOTING

Location	Issue	Possible Cause	Action
Power	Black screen / mother board power does not work	Mother board power supply	1. Ensure that the plug is securely connected to the power outlet. 2. Please check if the cable connecting the power board and motherboard is properly connected. Check if 150mA fuse is blown. If 150mA fuse blows, power will not be supplied to the mother board, core board and probe board.
	Modem power problem	Mother board	1. Check if the mother board power LED is turned on. If the power LED on the motherboard modem does not light up, it indicates that the motherboard may need to be replaced.
	Probe board power does not work	Probe board	1. Please check if the cable connecting the mother board and probe board is properly connected. Verify that all three LEDs on the probe board have equal brightness. If the brightness of the LEDs on the probe board is not equal, there may be an issue with the probe board.
	GPO power does not work	GPO power supply	1. Ensure that the plug is securely connected to the power outlet. 2. Check if the 5A fuse is blown. 1. Verify if the relay functions when pressing GPO14 in GPO test mode. (Outputs → Test Outputs → Press "14 Output 14" → Relay click sound.) If the relay is silent, replace the power board.
	Fuse blowing	Short circuit	1. Power off controller 2. Disconnect all devices plugged in or wired to Outputs 1-14; (excepting GPO 6 which is hard-wired) 3. Disconnect modem power/comms plug 4. Replace blown fuse/s 5. Power on controller. If fuse continues to blow, power board may have an issue. Contact Aquarius for further assistance. 6. Go to Outputs → Test Outputs. Whilst "Test Outputs" mode is selected, this will hold off all outputs until selected. Test each output in turn. If fuse continues to blow, power board may have an issue. Contact Aquarius for further assistance. 7. Systematically re-connect and test each output. If fuse blows, identify which output device was the cause. Faulty device requires replacement. Re-connect modem. If fuse blows, modem is faulty and requires replacement.

Location	Issue	Possible Cause	Action
Screen	Black screen (OFF)	No electricity	Try another power supply
	Black screen (OFF)	Mother board power supply	1. Ensure that the plug is securely connected to the power outlet. 2. Please check if the cable connecting the power board and motherboard is properly connected. Check if 150mA fuse is blown. If 150mA fuse blows, power will not be supplied to the mother board, core board and probe board.
	Screen locked on image loading	Core board issue	If issue persists after powering on, contact Aquarius for further assistance.
	Screen locked on Aquarius logo	Core board issue	If issue persists after powering on, contact Aquarius for further assistance.
	Screen shows rainbow pattern	Touch screen issue	If issue persists after powering on, contact Aquarius for further assistance.
	Touch screen not working	Touch screen issue	If issue persists after powering on, contact Aquarius for further assistance.
GPO	GPO 1-4 do not work	GPO power supply	2. Ensure that plug is securely connected to the power outlet. 3. Check if 5A fuse is blown. 4. Verify if the relay functions when pressing GPO14 in GPO test mode. (Outputs → Test Outputs → Press "14 Output 14" → Relay click sound.) If the relay is silent, replace the power board.
	Solenoid valve (GPO 6) does not work	Power board / solenoid valve	1. Check if 5A fuse is blown. 2. Verify if the relay functions when pressing GPO 6 in GPO test mode. (Outputs → Test Outputs → Press "6 Output 6" →The solenoid valve's LED illuminates If the LED on the solenoid valve fails to light up, the issue may lie with either the power board or the solenoid valve.
	GPO 8 does not work	Power board / power supply	1. Ensure that the plug is securely connected to the power outlet. 2. Check if the 10A fuse is blown. 3. Verify if the relay functions when pressing GPO 8 in GPO test mode. (Outputs → Test Outputs → Press "8 Output 8" → Relay click sound.) If the relay is silent, replace the power board.
	Dry connectors do not work	Power board / dry connector	1. Check if the 5A fuse is blown. 2. Verify if the relay functions when pressing GPO 14 in GPO test mode. (Outputs → Test Outputs → Press "14 Output 14" → Relay click sound.) If the relay is silent, replace the power board or dry connector.

Location	Issue	Possible Cause	Action
Outputs	pH/ORP locked, pumps/ devices not dosing to set point	Timer lockout function	Open the pH or ORP function page, press on any settings and press enter/save. This will reset the timer lockout.
	Controller on, outputs not working.	Fuse or power board	1. Go to Outputs → Test all Outputs. If none of outputs work, then open controller door and inspect power cables and connections. 2. Check or replace F1: 2A /5A fuse which protects the power board. If problems persist, power board may be faulty. Contact Aquarius for further assistance.
	Controller on, individual output/s not working.	Power board	1. Go to Outputs → Test suspect Outputs. If outputs not working, open controller door and inspect power cables and connections. 2. Check or replace F1: 2A /5A fuse which protects the power board. If problems persist, power board may be faulty. Contact Aquarius for further assistance.
	Controller on, individual output/s stay ON.	Power board	1. Go to Outputs → Test Output 2. All outputs should temporarily be switched OFF to verify relays working correctly. If output/s stay ON during "Test Output" mode, relays may be faulty requiring power board replacement. Contact Aquarius for further assistance.
	Outputs working, connected pumps/ devices not working	Pump/ equipment error or fault	1. For Aquarius Peristaltic pumps: pump may be faulty. Consult Contact Aquarius for further assistance. For third-party pumps: consult equipment User Manual for troubleshooting guidance. Contact Aquarius for further assistance.
	Bio B pump/timer not working	Output configuration error	1. Go to Outputs → Test Output assigned to Bio B. If pump does not power on, match and connect power points for pumps and functions' outputs or change the output in the Bio B timer setting menu
Module	Value shows out of range	Signal to module	1. Ensure sensor connection is secure. 2. Thoroughly clean the sensor area. Check the operation of the module in the panel. Go to Generic Inputs → Calibration → Check the module → Press the blue button on the module for a duration of 10 seconds. Go back to the Generic Inputs screen and verify if the value has changed. **The module will operate normally if there is a change in the value of generic inputs.**
	Value incorrect	Signal to module	1. Ensure that the sensor connection is secure. 2. Thoroughly clean the sensor area. Check the operation of the module in the panel. Go to Generic Inputs → Calibration → Check the module → Press the blue button on the module for a duration of 10 seconds. Go back to the Generic Inputs screen and verify if the value has changed. The module will operate normally if there is a change in the value of generic inputs.

Location	Issue	Possible Cause	Action
Sensor/ Probe	No flow (Flow OFF)	Not enough flow	Check if there is enough flow in the manifold (minimum flow rate: 12L/min)
	Flow reading incorrect/cycling	Bent/ damaged leaf switch	1. Isolate flow in manifold. 2. Remove the PR_FCT probe, push the metal leaf to contact the body. This must turn the Flow "On". if Yes, Adjust the metal leaf to stay closer to the sensor. If No, PR_FCT probe is faulty and needs replacement.
	Conductivity / temperature shows zero or unable to calibrate	Faulty probe	Replace PR_FCT probe
	pH/ORP unable to be calibrated	Faulty probe	Replace PR_PHRG probe
	Value shows out of range	Signal to probe board	1. Ensure sensor connection is secure. 2. Thoroughly clean the sensor area. 3. Reset the calibration settings. Verify that all three LEDs on the probe board have equal brightness. If the brightness of the LEDs on the probe board is not equal, there may be an issue with the probe board. Contact Aquarius for further assistance.
	Probe error message	Signal to mother board	1. Ensure cables connecting mother board and probe board are checked. Ensure status LED on mother board is GREEN. If LED is RED, it indicates communication problem between mother board and probe board.
	FAC Sensor value incorrect	Signal to probe board	1. Ensure sensor connection is secure. 2. Soak FAC sensor in chlorine for approximately 30 minutes, then clean. Verify all three LEDs on probe board have equal brightness. If brightness of the LEDs on the probe board is not equal, there may be an issue with the probe board. Contact Aquarius for further assistance.
	pH/ORP sensor value incorrect or unstable	Signal to probe board	1. Ensure sensor connection is secure. 2. Thoroughly clean the sensor area. 3. Reset calibration settings. 4. Check if 4G modem LED is on when connected. (if 4G modem experiences power issues, it will affect the entire board). Verify all three LEDs on the probe board have equal brightness. If brightness of three LEDs on probe board is not equal, there may be an issue with the probe board. Contact Aquarius for further assistance.

Location	Issue	Possible Cause	Action
Modem	Modem problem	Modem power	1. Check the mother board power LED is turned on. If the power LED on the motherboard modem does not light up, it indicates that the mother board needs to be replaced. 2. Check the modem device LED is turned on. If the power LED on the motherboard lights up but the power LED on the modem device does not, the modem must be replaced. If the power LEDs on both the mother board and modem are lit but communication is not possible, check both devices.
	Modem problem	Comms error	1. Check antenna connection, 2. Compare signal with your mobile phone Please refer to “Network Interface – Modem” section of this manual.
WiFi / Ethernet	WiFi / Ethernet problem	Comms Error	Please refer to “Network Interface – WiFi / Ethernet” section of this manual.

MANUFACTURER'S PRODUCT WARRANTY

Aquarius Technologies Pty Ltd manufactures a quality range of equipment under high standards and warrants shipment of its manufacture to be free of defects in either material or workmanship.

The manufacturer's liability is limited to repair or replacement of any failed equipment or part thereof, if proven to be defective in either material or workmanship upon the manufacturer's examination. No warranty applies to consumable items.

This warranty does not include removal or installation costs and in no event shall the manufacturer's liability exceed its selling price of such equipment or part. Aquarius Technologies Pty Ltd disclaims all liability for damage to its products through improper installation, maintenance, corroded items or boards due to improper tightening of controller lid, use or attempts to operate such products beyond their functional capacity, intentionally or otherwise, or any unauthorised repair. Removal of barcodes voids warranty on all items.

Aquarius Technologies Pty Ltd will not be responsible for any consequential or other damages, injuries, or expense through use of its products. This warranty is in lieu of any other warranty, either expressed or implied. Aquarius Technologies Pty Ltd make no warranty of fitness or merchantability. No agent of ours is authorised to provide any warranty other than that above. This warranty does not exclude any condition or warranty implied by the Trade Practices Act 1974 or separate State Laws in Australia and is in addition to any other right that the original purchaser or any subsequent purchaser may have under Australian law.

Should a unit fail to function normally, please contact our Customer Service Department by phone or email quoting model and serial number, for initial discussion of the problems encountered.

MODEL:	
SERIAL NUMBER:	

TECHNICAL SUPPORT & CONTACTS

MAIN OFFICE: 19 OVERLORD PLACE, ACACIA RIDGE, QLD, AUSTRALIA 4110

PHONE: +617 3274 4750

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CONTACT AQUARIUS TECHNOLOGY SERVICE TEAM FOR FURTHER ASSISTANCE.