aQuaʌonitor™

GreenStar Monitor Quick Start Guide
Revision B September 2015

Thank you for purchasing an Aquamonitor product. Please read this guide carefully and keep it for future reference. The details included in this guide, such as pictures, symbols and descriptions are for reference only and may not exactly represent the physical detail of your item. This is because we are continually updating and improving Aquamonitor products. Therefore features, technical specifications and physical appearance are subject to change.

Safety and Usage Precautions

Please read and understand all instructions contained in this guide prior to installation and use. If clarification or further details are needed, contact us at support@aquamonitor .com.au. This product is a radio transmitting device and may cause interference with sensitive electronic equipment such as wireless, audio, visual, vehicle and medical equipment and systems.

This product is also a radio receiving device and may be affected by other equipment or systems that emit radio frequencies, such as two-way radios, wireless remote controllers and in-home wireless products.

Always ensure safe working conditions during installation. Only use the DC power adaptor that was supplied with the Display. Do not use other types as this may damage the electronics. The Display is not waterproof and contains sensitive electronic circuitry. Use it only in dry, cool environments.

The Display and sensors operate at low radio power levels to ensure good battery life. Locate the Display as close as possible to the sensors to ensure wireless operation. Avoid locating the sensors or Display within or near metallic structures. Ensure that there is clear space around the sensors and Display to allow the radio signals to propagate. Install the sensors in locations away from areas that fill or pool with water.

When replacing batteries please ensure that the battery is the type specified in this guide. The sensors will not operate and may be damaged if the battery voltage is incorrect. Installation of the energy sensor current transformer must be performed by a qualified electrician according to safe work practices.

If this product does not operate normally then refer to the troubleshooting information contained in this guide. There are no operator serviceable parts inside aside from batteries. Please refer servicing and repair to qualified service personnel or request support through the Aquamonitor web site.

There is a range of Aquamonitor sensors to suit a variety of water meters with a pulse output facility. Please check that your water meter is suitable for use with the supplied water meter sensor.

The information contained within this manual is subject to change without notice. Aquamonitor Pty Ltd shall not be liable for errors contained herein or for consequential damages in connection with the furnishing, performance, non-use or use of this guide or of associated information.

General Specifications

|	
Wireless range	50 metres line of sight 30 metres in urban location
Operating temperature	5 to 45 Celsius
RF (radio) Output	10mW approx. 434 MHz
Battery Type	
Water meter sensor	1 x Lithium AA 3.6V ER14505
Energy sensor	1 x Lithium AA 3.6V ER14505
DC Power – Display	5V DC
Energy Sensor current range	0 – 100 Amps

LED Indicators

Sensors	
LED flashes on battery insert	Boot up OK
LED flashes every minute	Wireless connection OK
Display	
All buttons blue	Wake mode
OK button is green	No Alarms
OK button flashing red	Alarm condition

Features

- Three monitoring channels for water meters or energy usage.
- Consumption display: energy and water usage.
- Current cost display: total of water and energy cost per hour.
- Daily and average cost totals display: overall cost and individual cost for water and energy.
- Display of energy usage and 7 day history.
- Display of water usage and 7 day history.
- Totalised and quarterly usage of energy and water and associated cost.
- Graphical display of consumption: 24 hour consumption, weekly consumption.
- Configurable alarms: leak alarm, time alarm (prolonged usage), current (amps) alarm and daily limit alarm.
- Status Bar display of date and time, sensor wireless connection status, and sensor battery level.
- Navigation bar with display of button functions.
- Illuminated buttons for indication of alarms.

Information Display
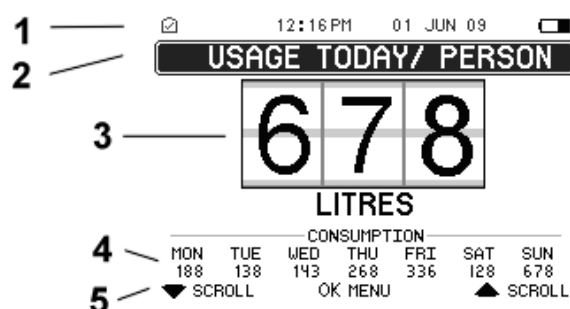
1 - Status Bar with sensor health indicators.
2 - Title Bar, describing the value displayed.
3 - Value displayed, updates every minute.
4 - Seven day history of the displayed value.
5 - Navigation bar showing button functions.

Button Operation – Navigation Bar

- The function of each button is shown on the navigation bar (see item 5 in the above figure).
- The first button press will activate the backlight and illuminate the buttons (blue). If there is an alarm then the alarm sound will be cancelled.
- Pressing OK will activate the menu system which allows display of graphs and changes to settings.

Menu Guide

24HR Graph:

Bar graphs for the past 24 hour period are displayed for each sensor: 1 bar for each hour of consumption

Weekly Graph:

Bar graphs for the past 7 days hour period are displayed for each sensor: 1 bar for each day of consumption.

General Setup:

Time: current time of day in 24 hour format.

Date: current date.

Day: current day of week.

Sound: turns the sound on or off.

Reset Totaliser: clears all the totalised values for energy and water consumption. This would be used if moving the monitor to a new site. The logged data is retained.

Reset All Data*: clears the internal memory and the stored data as well as the totalisers.

Meter Setup (Energy):

Daily Limit: an alarm can be generated when the energy consumption today exceeds this setting.

Amps Alarm: an alarm is raised if the measured electrical current exceeds the set value.

Factor: this is an adjustment factor to calibrate the energy reading.

Voltage: the nominal mains voltage.

CT Amps: the energy sensor is supplied with a Current Transformer and the rated value of the full scale current is entered here.

Cost per kWh: this can be obtained from your energy statement, cents per kWh.

Serial Number: See below.

Meter Setup (Water):

Daily Limit: an alarm can be generated when the water consumption today exceeds this setting.

Leak Alarm: set this to the period that the premises is unattended (usually 8 hours). If no consumption occurs within the (8 hour) period every day then there is no alarm.

Time Alarm: allows an alarm to be raised if there is continuous consumption for the set period of time. For example, when set to 20 min, an alarm would be raised if a hose was left running for more than 20 minutes.

Pulse Volume: this setting is used to convert the pulses from the water meter output to litres and must be set at installation time. See *Determining Pulse Volume*.

Cost per KL: this can be obtained from your water statement, cents per kilolitre.

Serial Number: See below.

Serial Number:

Every sensor has a unique serial number that needs to be entered into the Display to allow a wireless connection to be made between the sensor and Display. The serial number is located inside the battery cover of each sensor. To install a new sensor enter the serial number using the Display menu system.

NOTE: If the serial number is incorrect then a wireless connection cannot be established between the sensor and the Display.

FAQs and Troubleshooting

Battery Replacement

Energy and water meter sensors contain a battery that can be replaced by removing the two outer screws that secure the battery cover to the housing. When replacing batteries, check that the battery polarity is correct as shown on the inside of the battery cover.

Suitable Batteries

Use only Lithium AA 3.6V with a capacity of 2.1Ah (2100mAh) or greater. These batteries are widely used for computer memory backup. Suitable replacement models can be purchased from battery shops and computer stores and include:

- ER14505

Battery Performance

The following tips will help to ensure good battery life:

- Keep the Display powered on. When the Display is off the sensors scan for a wireless connection more often and therefore consume more power.
- Use only the recommended type, voltage and capacity (mAh rating) of battery.
- Locate the sensor in a cool, dry environment.

Battery Status Indication

The Status Bar (see Information Display) shows a battery icon representing the lowest battery health of all connected sensors. The battery status of each sensor is shown individually on the Status screen.

*Reset All Data:

The Display stores internal data to allow display of information such as the quarterly consumption. When the Reset All Data function is used then all internal stored information including quarterly, weekly and daily consumption figures will be erased. It is recommended to only use this function when the Display is moved to a new site or installation.

Water Meter Resolution:

The Aquamonitor works by detecting 'pulses' from the water meter. Some meters produce a pulse for every 2.5 litres of water flow. This means the Aquamonitor may not receive an updated reading if less than 2.5 litres of water is used. This is due to the construction of the water meter and not to the function or operation of the Aquamonitor.

Energy Sensor Measurement:

The Energy Sensor measures electrical current using a split core current transformer. Electrical current readings are multiplied by a nominal ac voltage to calculate energy usage. A factor can be entered to allow for calibration and power factor differences

Pre-Installation

Please read and understand the Safety and Usage Precautions in this guide prior to installation.

Installing the Display

Choose a location for the Display, which must be within wireless range of the sensors. The wireless range will depend on the presence of objects, such as walls and vegetation between the Display and each sensor.

The Display can be wall mounted using the wall bracket. To place it on a bench remove the wall bracket and rotate the foot-stand outwards.

Wireless range is usually best when the sensor and Display are located away from the ground and the antenna is not sitting on a surface.

Step 1: Unpack the Display and connect the DC plug pack to the Display and switch the power on at the wall.

Step 2: Referring to the Menu Guide (on the front page), enter the menu system by pressing the OK button. Use the menu to set the number of users, energy and water meter settings and alarms. The date and time can also be changed if needed. Refer to the following page for pulse volume setting.

Battery Insertion
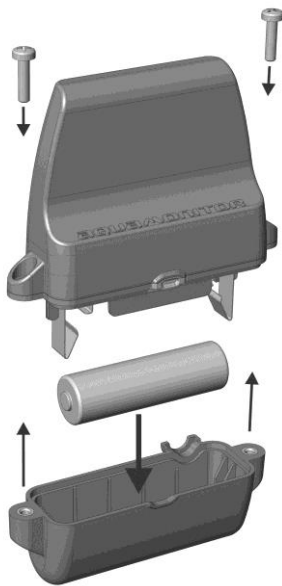
Step 3: Unpack the Energy or Water Meter sensors and install new 3.6 volt Lithium AA battery in the sensors by removing the two outer screws and sliding off the battery compartment.

Check the polarity (+ and -) which is shown inside the battery cover. ***Drop the battery into to cover first then fit the cover to the sensor.*** As the compartment is refitted, check that the LED indicator on the sensor flashes briefly. If the LED indicator does not flash then check the orientation and type of battery used.
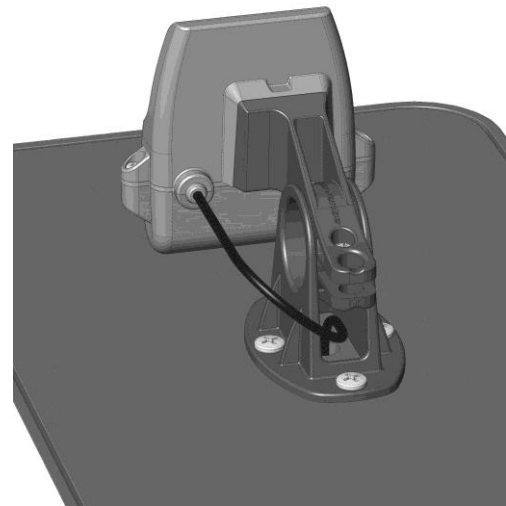
Step 4: Observe the Display after a few minutes to check that a wireless connection has been established for each sensor.
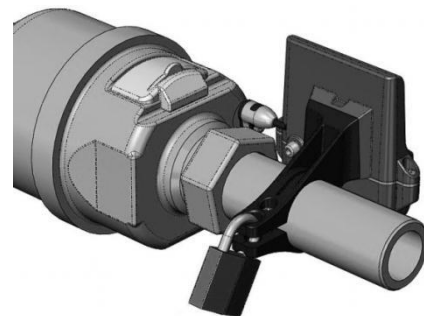
Sensor Installation

Mounting the Sensors

Each sensor is supplied with a bracket (as shown above) that can be used for surface mounting or for pipe mounting. A surface mounting example is shown below.

Alternately the mounting foot can be removed so that the sensor bracket can clip over a pipe. Remove the mounting bracket screw and slide the bracket off the mounting foot. Then slide the bracket over the pipe and refit and tighten the screw. A padlock may also be fitted for security, as shown.

Water Meter Sensor Installation

The Aquamonitor GreenStar Display allows for connection of a maximum of three water meters. Each water meter sensor is designed to work with a pulse-output water meter. Most common water meters have a facility for an electronic pulse output from the meter, such as a reed switch probe. The number and frequency of the pulses depends on the water flow rate and the pulse value of water meter. No part of the Aquamonitor comes in direct contact with the water. There are many types of water meters and the following section applies to Elster V100 meters which are commonly found in many countries. Instructions to suit other meters are supplied with the package to suit your meter.

Locating and Inserting the Probe:

The hole for inserting the probe is positioned next to the V100 water meter counter (or register), on the top shoulder of the meter body, protected with a removable plastic plug.

Remove and discard the plastic plug and check that the hole is free of debris. Insert the probe into the hole and align with screw hole. Fit the M3 screw to align and fasten the probe within the meter body.

For installation of the sensor enclosure, try to position the sensor away from nearby objects and walls but still close enough that the probe can be inserted in the meter. The sensor can be pipe mounted: the bracket is designed to fit 25 to 30 mm diameter pipes using the supplied rubber insert and 30 to 35mm tubes without the insert. Alternately the pipe mount bracket can be clipped onto the surface mount bracket to allow the sensor to be mounted on a wall or lid.
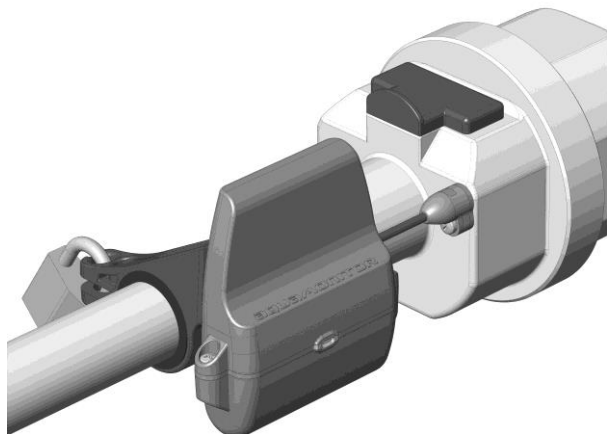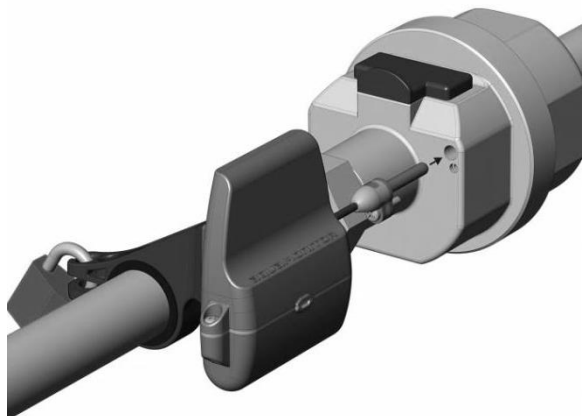
Determining the Pulse Volume

For water meters such as V100 types, the rotating display counter has a small magnet fitted within the end roller. As the counter rotates the Aquamonitor probe detects magnetic 'pulses' for each revolution of the end roller. The volume of water per pulse is a function of the water meter and the Aquamonitor is designed to work with a range of values.

Some models of water meters produce one pulse for every 5 litres of water flow whilst others provide one pulse for every 0.5 litres of water. The Aquamonitor counts both rising and falling edges of the pulse and so the pulse volume is half that of the meter rated pulse value. Enter the pulse volume at the water meter setup menu to ensure that the Aquamonitor displays an accurate reading of the water consumed – as detailed below:

If your V100 water meter counter has four red rollers as shown in the figure below, then enter 250 as the pulse volume, meaning 250 ml per pulse.
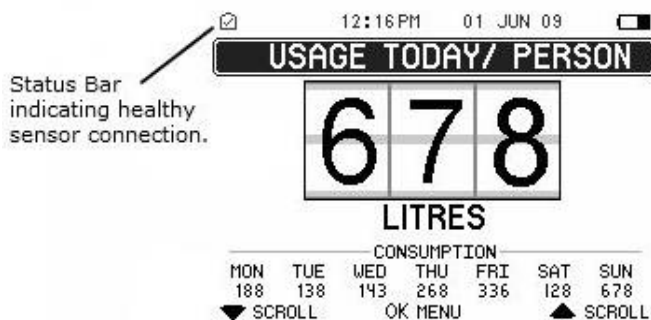
4	3	2	1	0	0	0	0

If the meter has thee red rollers as show below, enter 2500 as the pulse volume, meaning 2500 ml per pulse.
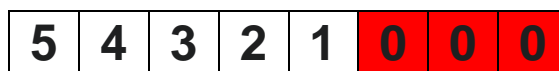
5	4	3	2	1	0	0	0

Checking the Wireless Connection

Allow a few minutes then check the wireless connection to the sensor by checking the status bar on the Display. The status bar will show one small icon for each connected sensor. The Status screen also shows the wireless connection status and in more detail: the number of bars shows the success rate of communications between Display and sensor.

Status Bar indicating healthy sensor connection.

12:16PM   01 JUN 09
USAGE TODAY/ PERSON
678
LITRES
CONSUMPTION
MON	TUE	WED	THU	FRI	SAT	SUN
188	138	143	268	336	128	678

▼ SCROLL   OK MENU   ▲ SCROLL

At first power on the Display searches for a reliable wireless channel and it can take a few minutes to establish communications with the sensor. If the wireless status is poor after a few minutes then try moving the Display to a different location. Often the wireless range can be improved by small changes in position, and particularly by raising the sensor above the ground. Wireless range is usually best when the Display antenna (a thin black wire at the rear of the unit) is not in contact with a metal or stone bench top. The wall mount bracket can be used to fit the display up and away from the bench.

With the Display powered on, the LED on the sensor will flash briefly every minute when the wireless connection is good

Energy Sensor Installation

The Energy Sensor is designed to measure the electrical consumption at a selected point in the building. Usually the point will be the incoming mains supply so that the energy of the whole building, house, or apartment may be monitored.

Energy is calculated by measuring electrical current flow and then multiplying by a fixed voltage and factor. The *voltage* is the normal AC mains supply voltage and is typically 240 or 110. A setting is also provided for a *factor* which allows the user to calibrate the Aquamonitor to adjust for the effects of power factor and current transformer accuracy.

The Aquamonitor energy sensor is normally supplied with a current transformer with a 100 ampere current range. However it is possible to use the sensor with current transducers of other ranges. Please contact Aquamonitor technical for further details.

Locating and Fitting the Current Transformer

The current transformer is a split core style for easy fitting. Lift the clip to open the transformer as shown. Fit the transformer over a single phase wire and clip the transformer together to secure.

For installation of the energy sensor enclosure, try to position the unit away from nearby objects and walls. It can be pipe mounted: the bracket is designed to fit 25 – 30 mm diameter pipes using the supplied rubber insert and 30- 35mm without the insert. Alternately the pipe mount bracket can be clipped onto the surface mount bracket to allow the sensor to be mounted on a wall or lid.

Energy Sensor Menu items

The settings for the energy sensor relate to the scaling and adjustment of the current measurement and to a fixed voltage setting that is used to convert the measured current to energy.

The *CT Amps* setting must match the value shown on the current transformer, which is normally 100 amps full-scale.

The *voltage* setting is normally 110, 120, 230 or 240 depending on the country of installation.

The *factor* setting allows the system to be calibrated to a greater degree of accuracy.

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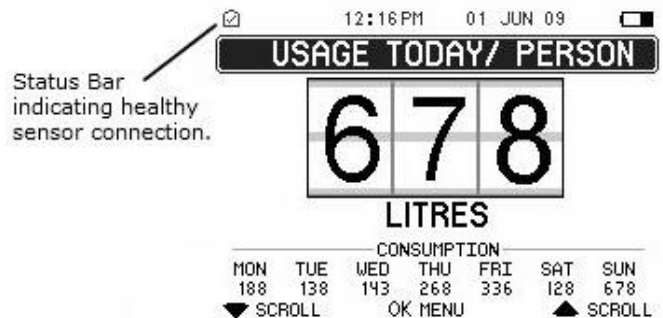
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