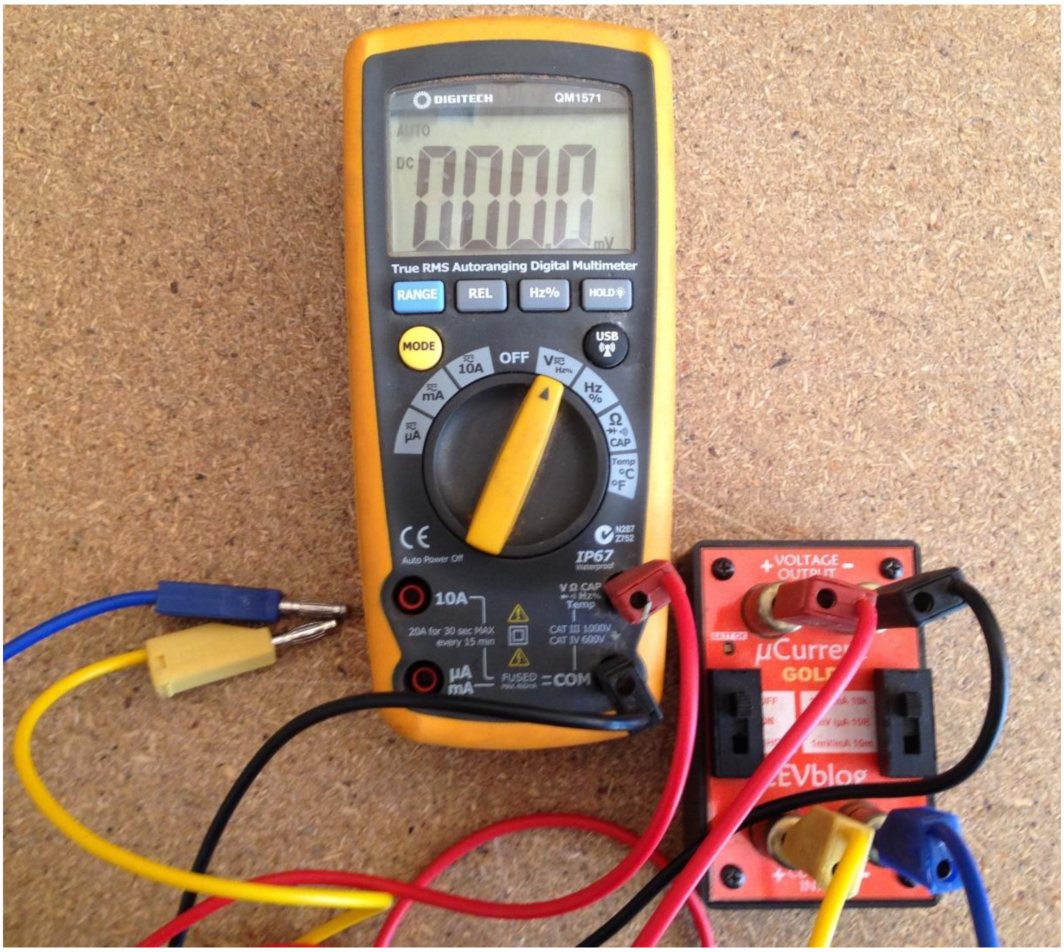
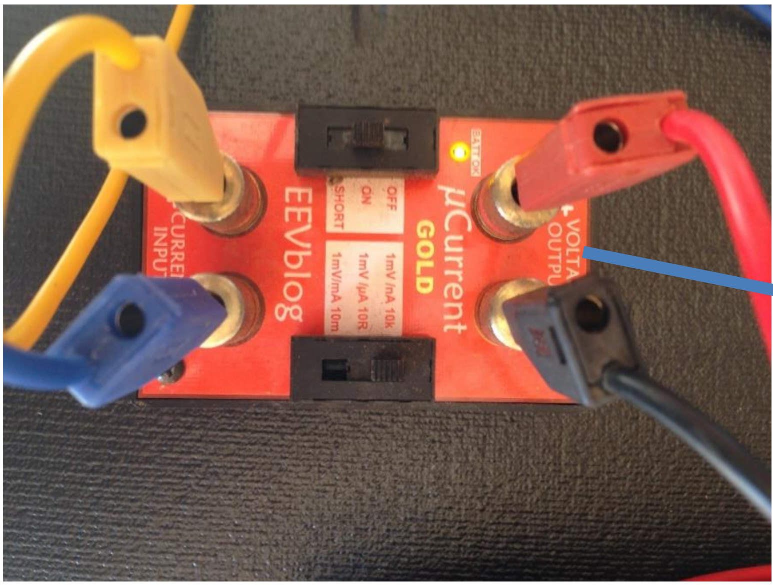
MEA Water: Measurement of voltage or charge for water

The methods for **measuring the charge in static water and to measure the charge in water flowing through an inline device (ie. or to locate the negative and positive ends of a device)** are as follows. *Notes about the differences in the terms of **Charge, Current and Voltage** are in the Notes Section at the end of this paper*.

The methods to **measure the voltage in water that is output from a MEA device** (either inline while the water is flowing or as static water in a container) are as follows:

1. Stand the millivolt meter (mVolt) up on its stand (unfold on the back of the meter)
2. Hook up the red and black cords to the millitvolt meter (identify as black negative and red positive sockets).
3. The negative (black) and positive (red) cords from the millivolt meter cords are connected to the **output** sockets (red and black) of the **noise reducer and signal amplifier (uCurrent)** and input cords of this unit are connected to the measurement probes within the water being measured. These probes will be either on an inline device for measuring water flowing through the device, or to probes inserted in a glass container for measuring static water.
4. Turn on the mVolt meter by turning the dial to V and then turn on the uCurrent device to ON & BATT CHECK (a yellow/green light will come on). See image below.

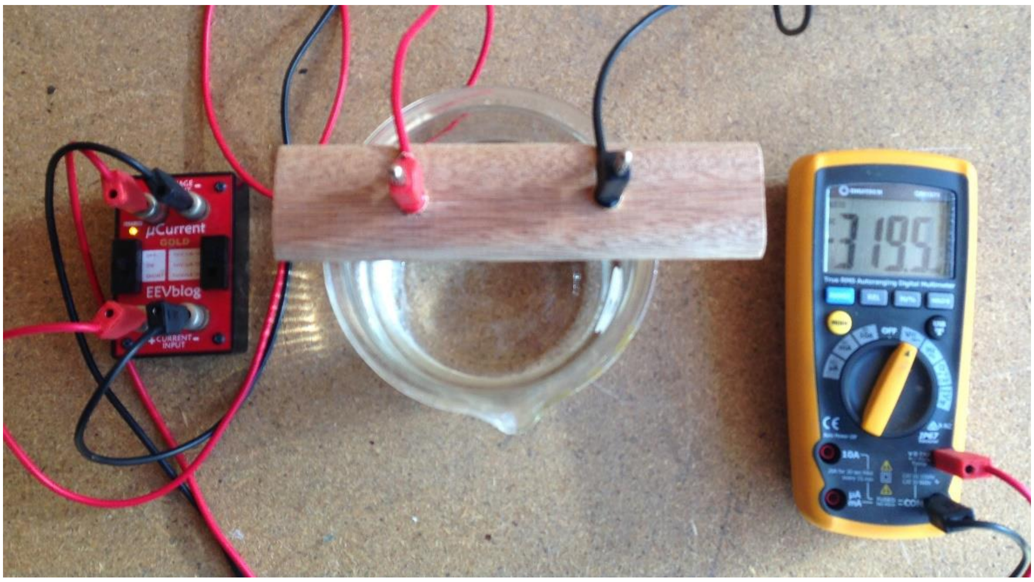




Connected to Voltmeter

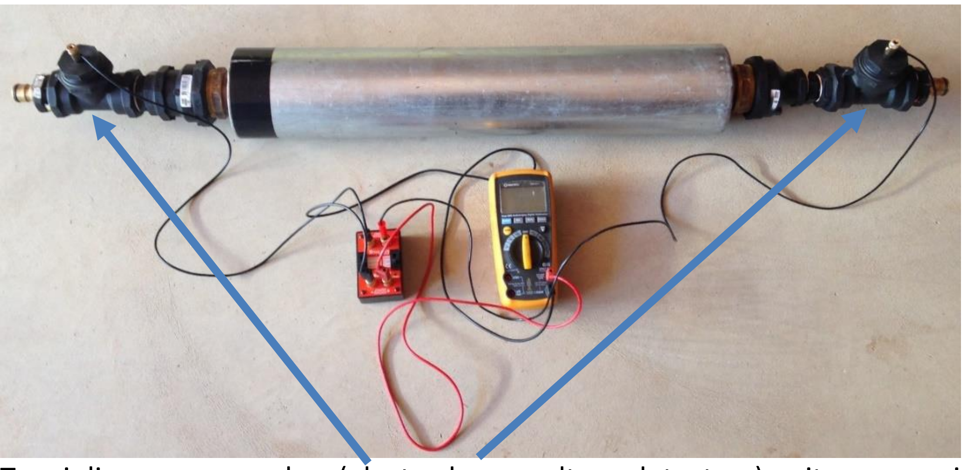
The method to measure the voltage of MEA water from a container (ie. still water in a beaker) is as follows.

The cords for this measurement with have a jack on one end and an alligator clip on the other end. Place one copper probe (3mm copper coils) with the red cord (+) attached and the other copper probe with the black cord (-) attached into the water of the glass container (as shown in the photo below). These cords are from the input sockets on the uCurrent unit. Since the direction of the current flow in the beaker is generally not known, thereore the black and red cords may have to be rotated in order produce the negative charge. Also, it can help by stirring the water anti-clockwise before inserting the probe (electrode) unit, to direct the current flow.



The bottom and top probes in the image above have a copper wire (3mm diameter) extending from the electrode (probe) connector through to the central column. A separation of the top and bottom probes by about 5-6 cm seems to provide less interference or more stability in the reading. Usually a stable reading is obtained after about 1 minute where it may fluctuate between negative and positive before settling down to a steady (negative charge) measurement state.

The method to **measure a voltage of MEA water in line** with flowing water through a MEA device is as follows:



Two inline copper probes (electrodes or voltage detectors) units are required for this measurement, as illustrated in the image above.

Attach the positive cord (usually red) with the probe unit at the water input end socket. Attach a negative (usually black) cord to the output probe unit. These probe units are attached to the input end of the uCurrent device and the output end of the uCurrent unit is attached to the Voltmeter as shown above.

The construction of the measuring unit (electrodes) is illustrated in the image below.

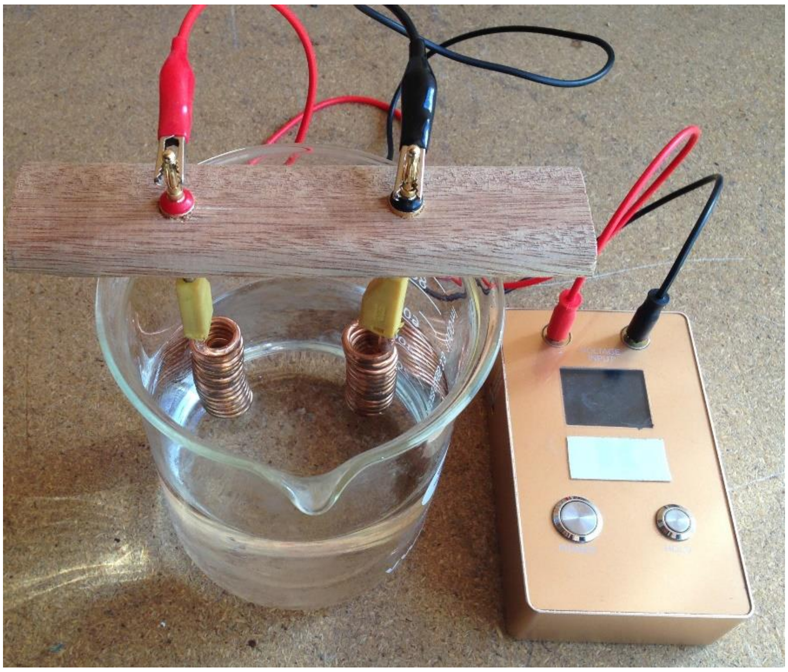
The electrode (3mm copper coil) should be long enough to fit just above the bottom of the unit and wthin the flow of the water. Bannana or alligator connectors from the UCurrent device can be used to attach to the copper electrode.

In this position the voltmeter will usually show a 0.000 value which is the static value when no water is flowing through the water conditioner device, albeit that voltage can exist without current. When water is pumped through the device the value will record between -200 to -500mV (millivolts) or higher to -1000mV (= -1V) with the inline device; and this negative value identifies the input end of the device, and the end where the positive is attached. If the voltmeter value is positive (+) then turn the MEA water device around and reattach the probe cords to the voltage detector units on the inline device.

Conclusion

While there is currently no commercial device to measure water voltage, the methods described above were devised by Resonate Reseasrch Pty Ltd and are only experimental, and evolving. However, the measurements are accurate and stable.

A combination of the Voltmeter and UCurrent device is currently under development and evaluation. See image below:



Additional Notes:

1. There is a difference between **current, charge and voltage** and these terms are important in understanding the measurement results. **Current** is the rate at which electric charge flows past a point. That is, current flows from the inline device to the UCurrent unit. **Voltage** is the potential difference in charge between two points in an electric field. Voltage is the energy *per unit **charge***. Voltage (due to the magnets in the MEA water device) is the cuase and current is its effect. Voltage is created by structured water and this generates currnet, and this is why voltage can be measured in still, (no-flowing) negatively charged (structured) water that is held in a beaker or other measurement containers. The Voltmeter is measuring mV of charge (1000mV = 1 Volt) that is output from the UCurrent unit. The magnetic array and power in the MEA water device creates a magnetic field that produces current. The stonger the gauss of the magnets, along with the unique magnet arrangement

and array in a MEA water device, the stonger the negative charge (measured as -mV) in the water.

2. Once water is restructured using a Phion MEA Water conditioner, then the water will have permanent **current due to the structure of the electrons**. MEA structured water always has negative voltage or charge and therefore has current, regardless of whether the water is still or flowing.
3. Structured water will be influenced by external charge (either – or +). For example, the human body can emit up to about -50mV (and sometimes greater), and thereore any person standing over or very close to the measurement system can influence the measurement. Also, electrical systems, like computers, electrical wires, etc. can also have an impact. Current from the Voltmeter and the UCurrnet device can also affect the measurement. Therefore use long wire leads to position the measurement devices at least 0.5 -1m away from the still water container.
4. If MEA (treated/ conditioned) water is being collected in a container for ongoing testing of voltage/charge, then the water needs to be running through the device for at least 5-10 minutes to reach its **maximum (stable) charge value**. Collection of water from a MEA water device in less than 5 minutes of flow may produce a false (lower) reading. This may not apply in a situation where the water is constantly held in the MEA device (ie. an installed device) and the water is already fully charged.
5. The collected samples (ie. still water) should be tested immediately, or if the water is stored, then separate the treated water from the no-treated water, as the treated water can condition (change the charge or voltage through a process called entrainment) of any untreated water if the container is too close, say within 200mm- 500mm. If the samples are being transported, it is critical to keep them separated or transport them separately. Also, if samples are being sent to a laboratory for chemical testing, the samples need to be kept separate or sent in for testing at separate times. This is energy exchange process between containers is called entrapment.
6. Test the water in a glass beaker using at least 1- 1.5L of the water. Samples of water less than this volume may produce a false reading.
7. The voltage value in the water can start with either a negative of positive value on the voltmeter, and the values can fluctuate about for up to 3 minutes before they to settle into a stable value reading (very low fluctuation)
8. The water charge or value can be affected by any magnets close to the water container, the measurement rods in the water are touching or are too far apart, and any other form of electrical or raditation interference (perhaps test outside a building)
9. Label all samples with a time/date and the type of treatment (eg. device used)
10. Store the tested samples with at least a separation of at least 0.50- 1m between the containers/bottles.
11. Weather conditions can change the value of voltage readings. For example, on a very windy day there are significantly more positive ions (protons) in the air and this can cause a negative water charge value to move to a more positive charge. While it is best to undertake measurments outside and away from any electrical influence, there maybe times when it is best to move inside. Howver, avoid areas with Wi-Fi, and other electrical current interferences that can affect water values and decrease the negative charge in still waters. Also, there is a high probability that sun-spot activity over periods of time can cause fluctuations (higs and lows) in the measurement. This is a general observation from measuringthe voltage of water over a period since 2012, and observing these fluctions that seem to be linked to sun-spot activity peaks and troughs.