Air Ion Counter AIC2

Operation Overview

During operation, air is drawn in at the top, is measured, and exits at the bottom. Do not block the air intake and exit openings. When operating, the display shows the ion count present in the air, updating twice per second. The 10-foot long ground wire should be used to connect the meter to earth ground for most types of measurements, especially if you are measuring high ion levels.

At power on or when changing polarity, the meter stabilizes for about four seconds, after which ion measurements begin. For accurate readings, avoid measuring near charged plastic such as synthetic fabric (clothing). Excess charges will reduce both positive and negative ion counts in the vicinity.

In a typical environment, ions do not mix well. There can be clusters of negative ions in one area with almost no ions just a few inches away. Thus, it is normal for the ion level to fluctuate irregularly as air is drawn into the meter. To provide a more stable reading, the meter imposes five second averaging. An alternative average of 2 or 14 seconds can be selected.

Ion peak levels are continually saved in the meter. By pressing the "Peak Mode," the saved maximum ion level that occurred (since the last time "Reset Peak" was depressed) is displayed.

"Record", initializes automated recording for later retrieval via the USB port. The AlphaApp PC application provides for retrieval and management of the meter data. The application may be downloaded at: **https://www.alphalabinc.com/alphaapp/**

"Scale" switches the meter's range (maximum reading) between 2 million ions cm^3 (resolution 10 ions cm^3) and 200 million (resolution 1000 ions cm^3).

AIC2 Operation Details

Power Up / Operation

On power up the fan will come on, and the display will indicate "Stabilizing" for about four seconds, at which point ion measurements will begin. To change the desired ion polarity, press "Polarity." Note that when the polarity is changed, the meter re-stabilizes.

Default Range, 2 million ions cm^3

Selected Polarity   Temperature

"Scale" selects the alternative 200 million range on the dual scale model. On the standard (single range) AIC2 the scale is fixed at 2 million. The 200 million scale allows for the measurement of extremely high ion levels, such as the output of an ion generator. A display of 1---.-- indicates over range.
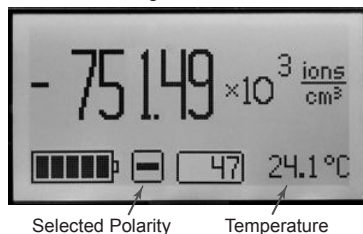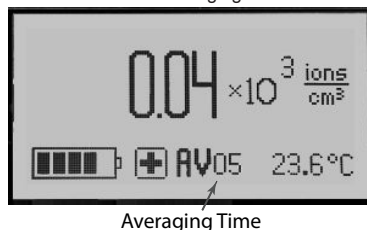
Averaging

The factory default is 5 second averaging. The alternative averaging rates are 2 and 14 seconds. The 14 second averaging greatly reduces the ion level fluctuation caused by uneven mixing of ion levels in the air. However, the longer averaging results in a corresponding delay in the meter's response time.

Default Averaging Time

Averaging Time

To view the current averaging setting, hold down "Scale". Then while continuing to hold "Scale" down, depress "Record". To change the average, follow the same procedure but hold both "Scale" and "Record" down for 10 seconds or until alternative average time appears. Release both keys, and start the procedure again until the level you desire is displayed.

Alternative Averaging Time

Note that although the display of the average will disappear five seconds after depressing any other function, the selected average will continued to be employed until it is changed.

Grounding

To einsure accurate measurements, the meter should be grounded (earthed). The included ground strap is provided for this purpose. Air ions are electrically charged air molecules. Grounding the meter provides the reference for the ion levels. At lower ion levels, holding the meter is sufficient provided that the person holding the meter has not built up a static charge. Occasionlly touching a grounded item, such as a water pipe or the screws on the light switch plate, will insure that the operator is at ground potential. High levels of ions can create a static charges on surfaces, including the meter. If this takes place, the charged surface will repel ions that are the same polarity as the charged surface, resulting in a false (low) ion reading. Grounding the meter will prevent this and ensure a correct reading.

Peak Mode

Pressing "Peak Mode" displays the real time ion levels (top displayed value) as well as the highest ion level measured by the meter since the last time the peak was reset. While in this mode, momentarily pressing "Peak Reset" will reset the peak value. When the peak mode is off, the meter continues to capture the highest ion level measured. When the polarity is changed, the peak value is reset.

Meter Calibration / Re-zeroing

Calibration establishes the zero point when no ions are present. Calibration is not necessary each time the meter is used. If there has been a major temperature variation or if the meter has not been used for a long period, the meter's zero point should be verified. To do so, depress "Standby", preferably from the most sensitive 2 million (__ x10^3 scale). In standby, the meter's ion sensor remains active, but the fan is turned off. After

stabilizing, the ion count should gradually drop to 0.00 +/- 0.06. Residual air ions and ambient noise will cause the reading to fluctuate by about two to six (least significant digit) counts. If the meter does not settle near 0.00, the meter needs to be re-calibrated. For instance if the meter settles at a reading of -0.15, the meter's zero point has an offset of -0.15, which would be eliminated if re-calibrated. It is advisable to be in the normal 5 second averaging before going into standby. In 5 second averaging, the ion count will settle to zero in 10 to 20 seconds. In 14 second averaging settling takes more time. To come out of standby mode, depress "Standby" or any other function key.

To re-establish the meter's zero point, press "Calibrate". During the calibration process the zero reference point for both scales is established. During the process, a self-test is also conducted. Calibration typically takes 50 to 60 seconds, during which a status bar indicates the calibration progress. It is normal for the status bar to increment in steps at 10 to 15 second intervals.

Calibration and self test errors: If the zero point cannot be determined, a calibration timeout message will appear. This is caused by high wind, close proximity to a strong static or electrical field, or extremely high levels of ions. If this error occurs, cover the intake or place the meter in a different position/location. Other possible errors include "Excessive Offset" or "Low Sensitivity." These errors are an indication of sensor contamination or moisture condensation. These errors can usually be resolved by blowing compressed air through the air intake, or in the case of condensation, allowing the meter to dry out.

Power Options and Battery Level

Operation time with the installed 4 AA alkaline batteries is typically 16 hours. To access the batteries, remove the two screws on the battery cover at the back of the meter. The meter may be operated with a 6 or 9VDC, 200mA regulated or unregulated power adapter with a 2.1mm barrel plug, positive center. Note that if the battery level drops below the level required for the internal processor, the display will be blank; however, the backlight of the display may still be illuminated. If this occurs, replace the batteries. Note that the power adapter does not charge the batteries. You can use rechargeable AA batteries, but they must be charged outside of the meter with an appropriate charger.

Battery Level: Each missing bar represents a drop of approximately 20% of battery's usable capacity.

Data Recording / USB

With the data recording function, measurements may be recorded for later upload to a PC/Laptop. When "Record" is pressed, the current displayed measurement is saved into non-volatile memory and a record number is momentarily displayed. Up to 9,999 records or record sets may be saved. The software application AlphaApp provides the user with the ability to retrieve recorded data and delete saved data. The AlphaApp application also allows the option of configuring the meter to record a stream of measurements at a specified interval. When configured to record a stream of measurements, pressing "Record" turns on the record function indicated by the display of the record set number. In this mode measurements are continually saved at the configured interval until "Record" is pressed a second time, at which time the recording stops and the set number is no longer displayed. When attached to a PC/Laptop, the AlphaApp application also allows for the real-time streaming of the meter's measurements.

Peak Mode Data Recording: When recording in peak mode, only the peak levels are recorded. No real time levels are recorded.
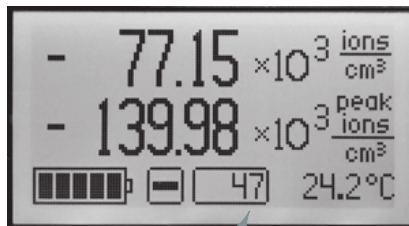
Record or Set #

AlphaApps USB Utility
Download at: **https://www.alphalabinc.com/alphaapp/**

- Real time ion level data and plotting
- Upload/view/plot prerecorded data
- Selectable Ion measurement/record intervals; 0.5, 1.0, 2.5, 5, 10, 15, 30, or 120 seconds
- 96 hours of nonvolatile storage in the AIC2 at the 1 second measurement interval
- Ion level verses time graphs with optional selectable automatic scaling and time compression
- Plotted graphs and data tables may be saved for later retrieval
- Table data (which is comma-delimited) can be pasted into a spreadsheet


Real Time Example
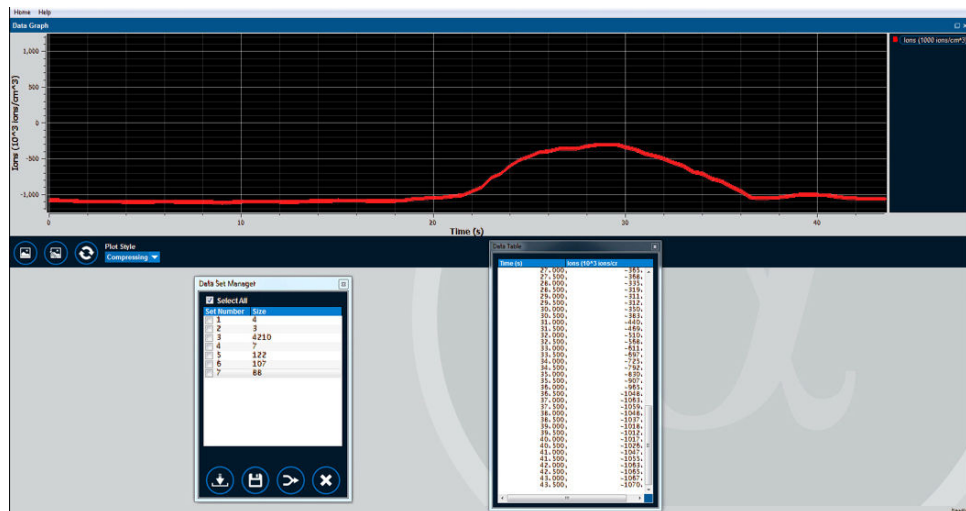
Prerecorded Data Upload Example

SPECIFICATIONS	
Ion Polarity	Positive or Negative Ions - selectable
Ion Range	2 Million or 200 Million Ions cm^3 - selectable
Ion Resolution	10 Ions/cm^3 (2M Scale), 100 Ions/cm^3 (200M Scale)
Ion Accuracy	+/- 20%, repeatability 5%
Averaging	5 or 14 seconds - selectable
Peak Value	Continually saved Peak value display - selectable Peak value reset - selectable
Real Time Data Output	Micro USB Port
Data Recording	On command or automatic at selectable intervals Up to 9,999 records - non-volatile memory
PC Application AlphaApp	Real time data plotting and record retrieval
Temperature	Displayed in Celsius, 1% accuracy
Calibration	Zero reference verification and Self Test- selectable
Environmental	-1° C to 43° C, 0-90% RH non-condensing Wind **,**< 15 km/hr (9 mph)
Power - Internal	Battery - 4 AA Alkaline (~16 hour life) Consumption 75mA, 17mA in standby mode Battery condition continually displayed
Power - External	6 to 9VDC regulated or unregulated Power Jack, 2.1mm positive center 9VDC regulated, 200mA Adapter included
Size	7.63 x 4 x 1.75 inches (194 x 102 x 45 mm)
Desk Stand	Retractable - Integrated into the bottom of the meter
Display	Graphic 64x128 pixels, Backlit , 1.3x2.5 inches (35x64mm)
Weight	20 oz (567 g)

Removable Shield

Remove when using the 200 million ions /__ $\times 10^6$ scale.

This shield minimizes the interference of electric fields when measuring low levels of ions . When measuring high ion levels (200 million ions (__ $\times 10^6$) scale, it is important that the shield be removed, otherwise high concentrations of ions can be significantly dissipated before reaching the internal ion sensor.   In the 200 million ion scale, the meter is not sensitive to electric fields.
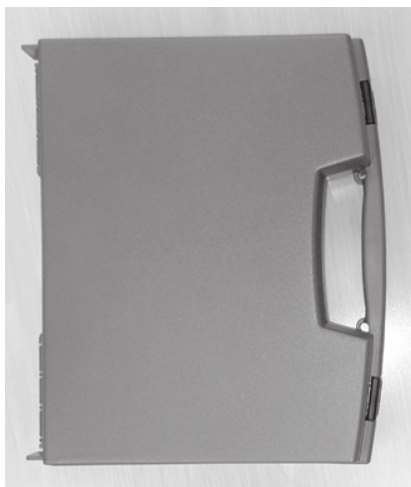
Optional Carrying Case
10.6 x 11.8 x 2.7 inches (27 x 30 x 6.8cm)

Warranty: The warranty period is one year from date of delivery.

Designed and manufactured in the USA by
AlphaLab Inc., 3005 South 300 West, Salt Lake City, UT 84115
www.alphalabinc.com Tel (801)487-9492 Fax (801)487-3877