Congratulations on the purchase of your Kestrel 4100 Pocket Air Flow Tracker! The Kestrel 4100 is our newest and most comprehensive HVAC-specific instrument. It not only measures EVERY major environmental condition easily, accurately and right in the palm of your hand, but now also automatically calculates Volume Air Flow (CFM) and Humidity Ratio (grains).

While the Kestrel 4100 is user-friendly and simple to use, reading the instruction manual is recommended in order to use the Kestrel 4100 to its fullest potential.

NK, manufacturer of Kestrel Pocket Weather Meters, is available to answer questions and provide support. Contact NK by phone: 610.447.1555, fax: 610.447.1577, email: info@nkhome.com, or web: www.nkhome.com.
Kestrel 4100 Pocket Air Flow Tracker

Turning the Kestrel Meter ON and OFF

To turn the Kestrel Meter ON, press and hold the button with the word OFF highlighted. (Note: your unit always operates on battery power.) To turn the Kestrel Meter OFF, hold the button for two seconds. Or, press the button while viewing a chart. A cursor will appear on the most recent data point. Press the button again to exit the button.

Special Functions

Date and Time Setup

The Kestrel 4100 is set up to display 7 Measurements (some are calculations) in 3 Modes. The Modes are displayed below. Use the buttons to scroll through the various Modes. From any mode, you may still scroll to a different Measurement by pressing the button. The current Measurement will be displayed on the screen.

The Kestrel Meter will display a splash screen displaying the model number, the battery indicator, and the code version. This battery indicator will indicate the percentage of battery life remaining, which is helpful in preventing unexpected dead batteries.

The first time that you turn on your Kestrel Meter, as well as after a battery change, you will need to set the date and time. The Introduction Screen will appear for 3 seconds, followed by the Date/Time Setup Screen. Press the button and scroll to the Date/Time Setup menu. Press the button to select Date and Time. Press the button to select the first digit of the year. Use the buttons to scroll to the desired year, then press the button again to exit. Repeat this process for the month, day, and time.

Data Stored (data has been captured and will appear on chart), Full (Overwrite is off and data log is full), or Off (Manual Store button has been disabled). (See the Main Setup Menu section for more information on memory.)

Chart Data

Chart data points for each measurement. If there is no stored data, the axis will appear, but the chart will be blank. (See the following section for information on Chart Navigation.)

Manual Data Storage

To manually store data, press the button. One of the following will appear: Data Stored (data has been captured and will appear on chart), Full (Overwrite is off and data log is full), or Off (Manual Store button has been disabled). (See the Main Setup Menu section for more information on memory.)

Chart Navigation

When viewing the Min/Max/Avg screen for any of these measurements, hold the unit into the wind, and press the button when the screen displays "--average" to begin collecting data for all measurements, and press the button when the screen displays "--stop" to stop collecting data and hold the values on the display. Press the button when the screen displays "--clear" to clear the data. This routine will work simultaneously for all measurements, regardless of which one is displayed while the routine is run. The Max/Avg for these velocity values will not affect any other Min/Max/Avg or stored data.

Backlight

Press the button to activate the backlight. The light will remain activated for one minute. Press the button within one minute to deactivate the light manually.

SPECIAL FUNCTIONS

The screen has four icons that can be customized to display four Measurements. These Measurements can be changed to suit the user’s needs. The Measurements that can be configured are Air Flow, Air Velocity, Dew Point, Humidity, Heat Index, Current Temperature, Custom Measurement, and Chart Mode.

The Measurement features are displayed in the Measurement Setup Menu. These features include: Max/Avg, Manual Data Storage, Date and Time, and Chart. If your Kestrel Meter has been purchased through a retailer or distributor, their specific configuration may override these features.

NAVIGATION

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Backlight

Press the button to activate the backlight. The light will remain activated for one minute. Press the button within one minute to deactivate the light manually.
The Kestrel Meter is capable of measuring RH to a high accuracy: +/- 3% RH between 5 and 95%. To ensure accurate readings, it is important to select the appropriate opening for the measurements. The shape of the opening can be selected by pressing the button to highlight the desired measurement. The options are round or rectangular. Press the - button to decrease and the + button to increase the value. Holding these buttons will increase and decrease the value quickly.

To set the dimensions of the duct or opening, press the DIMENSIONAL SETTING screen will appear with the word SHAPE highlighted. The shape of the opening can be selected by pressing the button. The options are round or rectangular. Press the - button to decrease and the + button to increase the value. Holding these buttons will increase and decrease the value quickly. For rectangular openings, set both the length and the width of the opening.

The Kestrel Air Flow Tracker also features an averaging function that allows you to traverse a duct and the unit automatically averages the CFM. This method may yield more accurate results, especially in ducts with variable airflow or with registers on them. To do so, from the current Air Flow screen, simply press the button to enter the Max/Average screen. Press the - button to decrease store rate frequency. When the max/average screen is highlighted, press the button to select min/max/avg data. Press the - button to decrease store rate frequency. When the max/average screen is highlighted, press the button to select min/max/avg data.

Press the button to return to the Main Setup Menu. Even when measurements are hidden, the Kestrel Meter will display the options for all the measurements on the menu. If a button is disabled, it will be greyed out.

To begin averaging, press the button to begin averaging, and traverse the enclosure and cause inaccurate readings. If your circumstances force you to expose the Kestrel Meter to a large temperature swing prior to taking a relative humidity reading (such as when taking a Kestrel Meter stored inside at 70° F outside to a temperature of 40° F), you must allow sufficient time for the RH value to stabilize. This can take as long as 20 minutes—the greater the temperature change, the greater the time. You can use the logging capability of the Kestrel Meter to confirm that the unit has stabilized to a correct reading: Set the memory options to a relatively short logging interval (20 seconds works well), select the desired measurement, and turn off the Kestrel Meter’s external temperature sensor. Wait for the RH value to stabilize, then turn the Kestrel Meter on. The RH value is stable and can be relied upon to be within the accuracy specifications.

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APPLICATION EXAMPLES

HVAC - Environmental Monitoring

These settings will record conditions every five minutes, for a total storage of almost 7 days. You can monitor the conditions in a laboratory or manufacturing plant, both day and night, to determine if the climate control is working properly. Or you can examine the effect on the environment when employees enter and exit the building.

These settings will require you to press the Manual Store Button in order to store any data at a duct, hood, vent, or other system location. The meter will not store any data automatically. Be sure to record the location and time of data collection when reviewing the data. After storing the conditions at each location, simply review the data and balance the system.

The display can be set to automatically turn off in order to conserve the battery life. Auto Shutdown will only occur after the preset time has elapsed without any button presses. Press the button to return to the Main Setup Menu. The User Screens may also be hidden if not needed.

The units of measure can be adjusted to best suit the application. The following units are available:

- °C Celsius
- °F Fahrenheit
- m/s meters per second
- km/h kilometers per hour
- mph miles per hour
- ft/m feet per minute
- m³/h cubic meters per hour
- L/s liters per second
- Cfm cubic feet per minute
- Cm centimeters
- In inches
- Ft feet
- M meters
- M³/h cubic meters per hour
- M3/s cubic meters per second
- It should be noted that the display cannot be adjusted after the factory default setting has been restored.

Default settings for units of measure, date and time formats, and system settings can be restored. (See the Factory Default Settings section for more information.) Press the button to return to the Main Setup Menu.
To begin averaging, hold the meter in one corner or side of the duct. Press the button to begin the averaging interval. Slowly traverse the duct. Press the button again to stop the averaging. This method can be used with or without averaging.

The maximum and average airflow measurements will be displayed. The volume of air passing through an area for a given period of time is commonly calculated by multiplying the air velocity by the cross-sectional area through which the air is passing. This is referred to as the heat index. The hea index is a practical measure of how hot the current combination of temperature and relative humidity feels to a human body. Higher relative humidity makes it feel hotter because the body's ability to cool itself by evaporating perspiration is reduced.

Relative humidity is the amount of water vapor actually in the air divided by the maximum amount of water vapor the air could hold at that temperature, expressed as a percentage. The difference between the temperature and the dewpoint is referred to as the "temperature/dew point spread." A low temperature/dew point spread indicates high relative humidity, while a large temperature/dew point spread indicates dry conditions.

The cooling effect of combining wind and temperature is called wind chill. The wind chill gives a more accurate reading of how cold it really feels to the human body. The Kestrel Meter's wind chill is based on the National Weather Service standards as of November 1, 2001. Storing data may be uploaded to a PC with the optional Kestrel Interface.

FREQUENTLY ASKED QUESTIONS

What is the most accurate way to measure variable airflow with a Kestrel Air Flow Tracker?

To measure CFM, you need to first enter the duct size and shape. The simplest way to measure CFM is to hold the meter in the airflow. However, if the duct has variable airflow, it is more accurate to use the Kestrel Meter's averaging mode. Enter your duct dimensions, then press the button to start averaging, and traverse the duct. After a few seconds, you will see the button again to stop the averaging. This method can be used with or without averaging.

What is the best way to take accurate temperature and humidity readings?

Avoid taking measurements in direct sunlight, and be sure there is airflow over the sensors. Especially if you expose the Kestrel Meter to large temperature swings prior to taking a reading (such as taking a Kestrel Meter from the indoors to the outdoors in the winter), air flow over the sensors is necessary to measure accurate temperature and humidity readings. You can ensure airflow by placing the Kestrel Meter in...
Kestrel® 4100 Pocket Air Flow Tracker

Customer Service

The values to stabilize and accurate readings to be displayed.

Kestrel Pocket Weather Meters Warranty

NK does not believe in "disposable electronics." We know that Kestrel Meters don't typically lead pampered lives, and we understand that your Kestrel Meter may see rough handling, so the Kestrel Pocket Weather Meters warranty is designed to give you peace of mind.

We request that you contact NK if you feel your product is not working properly. We can often solve product issues by phone or e-mail, saving you the time and expense of returning the unit. If we require the product to be returned, we will issue a Return Authorization to expedite the handling of your warranty claim.

Why does my screen turn black in the heat? Why does screen become sluggish or blank in the cold?

The liquid crystal display used in Kestrel Meters has an operational temperature range of 14.0 to 131.0°F (–10.0 to 55.0°C). Above this temperature, the whole screen will turn black. Below this temperature, the liquid crystals may become sluggish or blank. The Kestrel Meter will display a value, but the readings will not be accurate water speed.

The following issues do not result from a manufacturing defect and are not covered under this warranty:

- Damage due to improper use or neglect (including corrosion, impact damage, modifications or additions to the Meter, abuse of the Meter, etc.)
- Improper calibration, offset, or zero drift
- Mechanical failures (including switches, batteries, etc.)
- Worn or damaged parts

The Kestrel 4100 is covered by the following US patents: 5,783,753, 5,939,645, 6,257,074, and 7,059,170.

Why doesn't my Kestrel Meter match the local Weather Report?

Obtaining a weather report from a local television station, airport or internet site will give you the weather where the reading was obtained. The nature of microclimates and weather fronts is such that they are varied, and even locations as close as a mile apart can have different weather readings. You can certainly use these weather reporting services for good estimates of what the conditions will be, but for the most accurate readings at your particular location, the Kestrel Meter is better.

Your warranty period will be measured from your date of purchase. The best way to ensure full warranty coverage and support is to register your Kestrel Meter with us within 30 days of purchase. Details are on the registration card that came with your product or on our website. If you do not register and cannot provide proof of purchase, your warranty period will be measured from our date of manufacture, determined by serial number.

Accurate readings are a function of environmental factors. The Kestrel Meter measures and records data, but the accuracy of the data depends on the environment. If you are in a sheltered area, the readings may be quite different from what you would expect if you were in an open area. If you are in a fast-moving airflow, the readings may be quite different from what you would expect if you were in a calm area. The Kestrel Meter is measuring the conditions right where you are. The nature of microclimates and weather fronts is that they are varied, and even locations as close as a mile apart can have different weather readings. You can certainly use these weather reporting services for good estimates of what the conditions will be, but for the most accurate readings at your particular location, the Kestrel Meter is better.

We also offer full factory service on every product we manufacture for as long as we make the product (and as long after as component availability permits). If we can't repair a product, we will offer you a brand-new replacement under our Customer Care Program (even for accidental damage and misuse). Cost of repairs and other important information can be found on our website.

Visit www.kestrelweather.com for more information and pricing for these services.
Kestrel Pocket Air Flow Trackers are designed and manufactured in the USA by:

NIELSEN-KELLERMANN

Please register your Kestrel Meter at www.KestrelWeather.com

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Need Help?
Our NK Knowledge Center has answers to many common questions, along with tips and tricks for using NK products. It's available 24-7 at www.nkhome.com/knowledgecenter/

For email assistance with the installation or operation of your NK product, write techsupport@nkhome.com.

For help with an apparent malfunction, or to arrange or inquire about a repair, write repairs@nkhome.com.

Or call 800.784.4221 (610.447.1555 outside of the USA), Monday to Friday, 9 to 5, East Coast Time.