
Kestrel®

# QUICK START GUIDE

## Kestrel Elite & Sportsman
## Weather Meters with Applied Ballistics

## CONTENTS





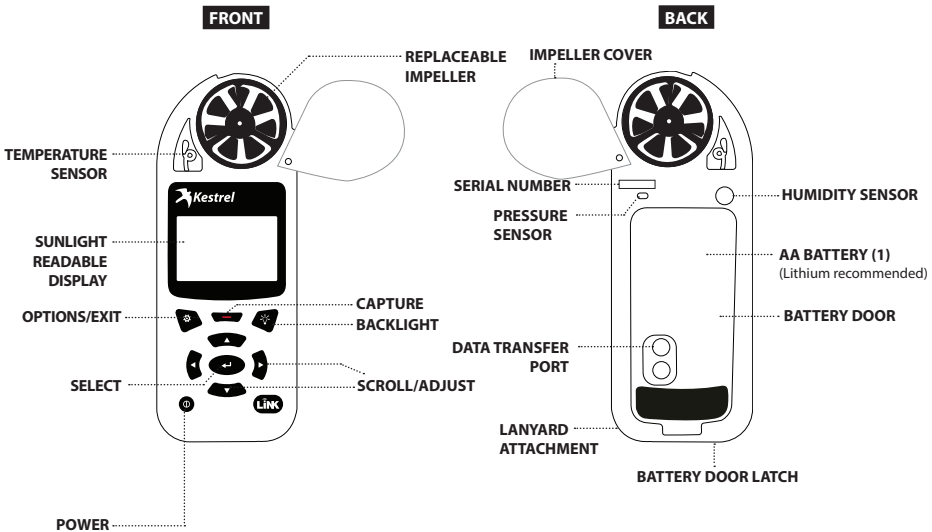
1.800.561.8187 www.itm.com information@itm.com

## MEASUREMENTS AND FEATURES

| Measurements | Icon | Sportsman | Elite |
|---|---|---|---|
| Wind Speed \| Air Speed (mph \| fpm \| m/s \| km/h \| kt) | | • | • |
| Temperature (˚F \| ˚C) | | • | • |
| Wind Chill (˚F \| ˚C) | | • | • |
| Relative Humidity (%) | | • | • |
| Heat Stress Index (˚F \| ˚C) . | HI | • | • |
| Dewpoint Temp (˚F \| ˚C) | DP | • | • |
| Wet Bulb Temp (˚F \| ˚C) | WB | • | • |
| Station Pressure (Absolute Pressure) | | • | • |
| Barometric Pressure (inHg \| hPA \| psi \| mb) | | • | • |
| Altitude, m \| ft | | • | • |
| Density Altitude, m \| ft | D | • | • |
| **Features** | | **Sportsman** | **Elite** |
| LiNK Wireless Connectivity + LiNK Ballistics Mobile App | LiNK | • *(optional)* | • *(optional)* |
| Night Vision Preserving Back Light | NV | • | • |

| Measurements | Sportsman | Elite |
|---|---|---|
| G1/G7 Ballistic Solver | • | • |
| Muzzle Velocity Calibration | • | • |
| Target Range Estimator | • | • |
| Muzzle Velocity-Temperature Table | • | • |
| Spin Drift | • | • |
| Coriollis Correction | • | • |
| Aerodynamic Jump Correction | • | • |
| Gun Memory | **3** | **16** |
| Targets | **1** | **5** |
| Ballistics Data | **Limited** | **Full** |
| AB Custom Drag Models | | • |
| Range Card | | • |
| DSF Calibration | | • |

## GETTING TO KNOW YOUR KESTREL




## BUTTONS

| Button | Name | Function |
|---|---|---|
| ⏻ | POWER | Turns Kestrel on and off. Press for on, hold for two seconds to turn off. |
| ⚙ | OPTIONS/ EXIT | Enter the main Options menu or exit a menu. |
| ↵ | SELECT | Access Settings on any measurement screen or select a menu option to enter its submenu or confirm a task. |
| ▲▼ | UP/DOWN | Scroll up and down through measurement screens or menus. Adjust values when entering text in name menus. |
| ◀▶ | LEFT/RIGHT | Scroll options left and right. Adjust values in combo menus and setting sub-menus. |
| — | CAPTURE | In Weather Mode, manually capture all environmental values. In Ballistics mode, turns on and off continuous wind capture. |
| 💡 | BACKLIGHT | Turn backlight on or off. (Also turns off automatically after one minute.) |

## KESTREL OPTIONS MENU

Most system-wide and weather setup options are accessed from the main Options menu by pressing the ⚙ button from any Weather Measurement Screen or the main Targeting Screen.

- **MODE**
- **BLUETOOTH**
  - » Bluetooth On/Off
  - » Conct
- **DATA PORT**
- **MEMORY OPTIONS**
  - » Clear Log
  - » Auto Store
  - » Store Rate
  - » Overwrite
- **GRAPH SCALE**
- **DISPLAY**
  - » Auto Shutdown
  - » Contrast
  - » Backlight
- **SYSTEM**
  - » Time & Date
  - » Compass Cal
  - » Measurements
  - » Units
  - » Lang
  - » Batt
  - » Factory Restore
- **ABOUT**
  - » Version
  - » Legal

## KESTREL OPERATING MODES

Your Kestrel Ballistics Weather Meter is both a complete weather meter AND an advanced ballistics calculator. You must select either Weather Mode or Ballistics Mode depending on the functions you desire:

» Weather Measurements, History and Data Logs are accessed in **Weather Mode**.

» The Targeting Screen and all ballistics settings (Target, Wind, Gun, Environment, Range Card, Ballistics, Manage Guns) are accessed in **Ballistics Mode**.

**HOW TO SELECT THE OPERATING MODE:**

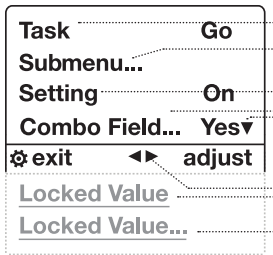
» Select **Mode** under the Options Menu.

» Set **Mode** to **Weather** or **Ballistics.**

*NOTE! You can also "jump" between modes by pressing the BACKLIGHT button twice quickly. You will enter Weather Mode at the last Measurement Screen used, making it convenient to take advanced wind averaging measurements, for example.*

## KESTREL MENU NAVIGATION

### TYPES OF MENU ITEMS




»Tasks are executed by highlighting the field and pressing Select.

»The presence of a submenu is indicated by a "…" following a field.

» Highlight the field and press Select to enter a submenu.

» Adjust a setting by pressing left or right.

» An arrow indicates there are additional fields off screen.

» Adjust the value of a Combo Field by pressing left or right.

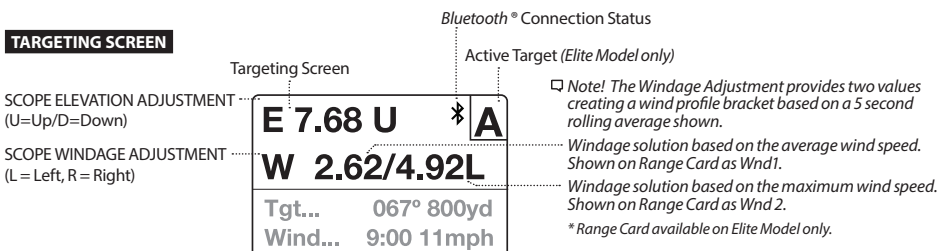
» Enter the Combo Field sub menu by pressing select.

»Navigation buttons indicate available actions on the current screen.

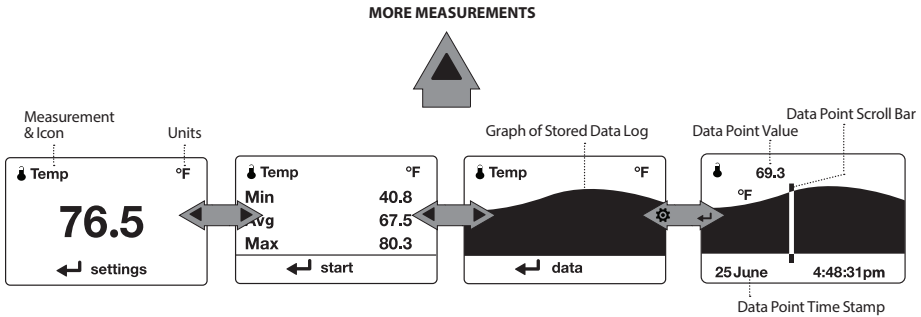
» Locked values are either driven by another value or cannot be edited on the current screen.

» Locked values may have submenus which are entered by pressing select.

### TARGETING SCREEN



## WEATHER MODE SCREENS




**Current Measurement Screen**

Press ↵ SELECT to enter settings menu for that measurement.

**Min Ave Max Screen**

Press ↵ SELECT to start, stop and clear the Min/Avg/Max tracking.

**Data Graph Screen**

Press ↵ SELECT to enter the Data Log Detail Screen to view logged data points.

**Data Points Screen**

Press LEFT/RIGHT to scroll through data points. Press OPTIONS to exit Data Log Details Screen.

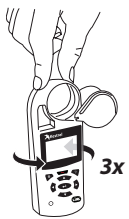
» The ▲▼ UP/DOWN buttons navigate between all weather measurements set to "On" in Options|Measurements.

» The ◀▶ LEFT/RIGHT buttons scroll between the three display screens for the measurement.

» The ⚙ OPTIONS button exits the **settings** submenu and Data Log Detail Screen.

## GETTING STARTED

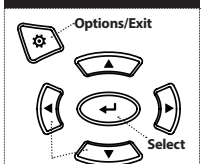
1. **INSTALL BATTERY.** Slide the battery door latch and open door. Insert the provided AA lithium battery as indicated by the label. Replace the battery door, ensuring it "clicks" fully into place.
2. **POWER ON KESTREL.** Press ⏻ to power on Kestrel.
3. **ENTER OPTIONS MENU.** Press ⚙ to enter the Options Menu.
4. **CALIBRATE THE COMPASS.** Scroll to and select **System**. Scroll to and select **Compass Cal**. Follow the on-screen instructions:
   - » Place the base of the Kestrel on a flat surface at least 3 feet from any large metal objects.
   - » Start the calibration routine. Rotate the Kestrel around its vertical axis 3 times, keeping the unit as vertical as possible and taking approximately 10 seconds per full rotation. You may need to restart the routine a few times until you get the timing correct.




*Note! When taking compass readings, keep the Kestrel as vertical as possible for maximum accuracy.*

5. **EXIT OPTIONS MENU.**

**BUTTON QUICK KEY**




## ADDITIONAL SETTINGS

**All additional settings are accessed from the options menu.**

1. **SET AUTO SHUTDOWN.** Scroll to and select **Display**. Scroll to **Auto Shtdwn** and choose a time window after which the Kestrel will shut down without any button presses.
2. **SET BACK LIGHT.** Scroll to and select **Display**. Scroll to **Backlight** and set to either standard **White** or night vision preserving **Red**.
3. **SET DATE AND TIME.** Scroll to and select **System**. Scroll to and select **Time & Date**. Adjust the time and date.
4. **TURN ON/OFF MEASUREMENT SCREENS.** Scroll to and select **System**. Scroll to and select **Measurements**. Set each measurement screen to either **On or Off** as desired.
5. **SET UNITS.** Scroll to and select **System**. Scroll to and select **Units**. To change all units select **Global**, then set **Global to Imperial** or **Metric,** and then scroll to **Apply** and select **Go.** To set units individually, scroll to each measurement type in the **Units** submenu and set to the desired units. Units can also be set in the **Settings** menu for each measurement.

## ALTIMETER AND BAROMETER

The Kestrel employs a stable, accurate pressure sensor to measure station pressure, the unadjusted air pressure in your location.

» To use your Kestrel to measure barometric pressure (station pressure adjusted for local elevation), you must enter a correct reference value for your altitude. Accurate barometric readings require that no elevation changes be made while taking measurements.

» To use your Kestrel to measure altitude changes (changes in station pressure associated with changes in elevation), you must enter a correct reference value for your starting barometric pressure. Accurate altitude readings depend on stable, weather related barometric air pressure while measurements are taken.

» Synched values between the Altitude and Barometer measurement screens allow reference value updates on either screen to automatically update reference values on the other. You cannot use your Kestrel as a barometer and altimeter simultaneously.

**SETTING REFERENCE VALUES ON BARO MEASUREMENT SCREEN:**

» Scroll to the **Baro** measurement screen and select **Settings.**

» Adjust either the Altitude or the Barometric Pressure value to a local, known value obtained from a mapping reference, GPS, or accurate weather station in the same location.

**SETTING REFERENCE VALUES ON ALTITUDE MEASUREMENT SCREEN:**

» Scroll to the **ALTITUDE** measurement screen and select **Settings**.

» Adjust either the Altitude or the Barometric Pressure value to a local, known value obtained from a mapping reference, GPS, or accurate weather station in the same location.

*Note! You should enter new reference values whenever you are using the Altimeter or Barometer functions and your location or the weather conditions have changed.*

*Note! You do NOT need to enter Altimeter or Barometer reference values to obtain accurate ballistics targeting solutions. The ballistics calculator employs the station pressure.*

## CREATING GUN & BULLET PROFILES

**Don't forget! Set your Operating Mode to Ballistics on the Options Menu to use Ballistics features!**

For ease of access, the ballistics Targeting Screen also contains the Ballistics Menu. Simply scroll down from the Targeting Screen to access these settings and submenus:

» Target
» Wind
» Gun
» Environment
» Range Card *(Elite Model only)*
» Ballistics *(Limited on Sportsman model, full on Elite model)*
» Manage Guns

*Note! The back of this guide contains a full Glossary of the terms used. Please read these definitions!*

**CREATE OR EDIT A GUN PROFILE:**

» Scroll to and select **Manage Guns.** Either select an existing gun to edit or select **New Gun**.

» Scroll up and select **Gun** to rename the gun. Use the scroll/adjust buttons to enter a new name, then exit the naming menu.

» Set the remaining values in the **Gun** sub menu to match your gun, bullet and scope combination.

» Exit to the **Manage Guns** menu and ensure the new gun is set to **On**.

**A great resource for finding accurate bullet data is www.appliedballisticsllc.com.**

## CREATING TARGETS

**EDIT TARGET:**

» Scroll to and select **Tgt**.

» Set range, angle, target speed, and wind values to match your target.

**EDIT TARGET OR CREATE ADDITIONAL TARGETS: (Elite model only)**

» Scroll to and select **Tgt**.

» Set range, angle, target speed, and wind values to match your target.
The elite model allows up to five targets (A TO E).

» Make sure **Target** is set to **Active.**

» To enable more than one target, or edit other active targets, scroll up to the header named Target and use the left/right buttons to scroll between targets (A through E). Set a target to **Active** to enable it, then edit its values.

» When only one target is active, its range can also be modified directly from the main Targeting Screen by highlighting **Tgt** and scrolling left or right.

» If more than one target is set to **Active,** highlighting **Tgt** in the main Targeting screen and scrolling left or right will scroll between active targets.

## MEASURING WIND

An accurate crosswind measurement requires that the Kestrel "know" both the direction of fire and the wind direction and strength. You may use the Kestrel's built-in compass and wind measuring and averaging features to capture these values:

**CAPTURING THE DIRECTION OF FIRE:**

» Select **Tgt** to enter the Target menu, scroll down and select **DoF,** then scroll down and select **Capture**.
» Follow the on-screen instructions:
  » While holding the Kestrel vertical, point the back of the unit directly towards the target and select **Capture.**
» **DoF** will automatically be populated in the Target menu.

**CAPTURING THE WIND INPUTS:**

» In the Target menu, scroll down and select **WD, WS1, or WS2.**
» Scroll down and select **Capture.**
» Follow the on-screen instructions:
  » While holding the Kestrel vertical, point the back of the unit directly into the wind and select **Capture.**
  » Continue to point the Kestrel into the wind for **at least 5 seconds** to capture a sample of the winds. Select **End Capture**.
» **WD, WS1, WS2** will automatically be populated in the Target menu.

*Note! Selecting Wind in the Ballistics Menu jumps directly to the **WD, WS1, & WS2** entries in the Target Menu.*

*Note! For maximum accuracy of compass readings when capturing DoF and Wind, the Kestrel must be held as vertically as possible – be careful not to tilt it away from you while taking readings.*

*Note! Any time you are using the Kestrel to calculate an elevation hold (including when calibrating muzzle velocity and DSF) a direction of fire plus wind direction and speeds must be input. These inputs contribute to an accurate elevation solution.*

## CALIBRATING MUZZLE VELOCITY

The Muzzle Velocity Calibration function allows you to obtain a more accurate muzzle velocity by combining user input data and actual shot results and calculating the actual bullet speed.

**CALIBRATING MUZZLE VELOCITY:**

» Scroll to and select **Gun** in the Ballistics Menu.
» After accurately inputting all other gun, bullet, and scope parameters, as well as wind values and direction of fire, scroll to **MV** and adjust to your best estimate of your gun's muzzle velocity.
» Select **MV** to enter the MV sub menu. Scroll to and select **Cal MV.**
» The **Cal MV** range is the suggested target distance at which to calibrate. For best results, find a range where you can shoot to between 90% and 100% of the recommended range but no further. Calibrating at less than 90% of the recommended range will lessen accuracy and less than 80% or beyond the recommended range will not be valid.
» Adjust **Range** to match the actual distance to your target where you are shooting. Accuracy here is key! Use a quality ranger finder if you are not on a measured range.
» Apply the suggested elevation hold shown in **Drop** in your scope turrets or reticle.
» Take a number of shots to determine the actual bullet drop. Adjust **Drop** to match the actual observed bullet drop of the bullet at that range. For example, if the point of impact is 1.5 Mils below the bullseye adjust the **Drop** value to be 1.5 Mils greater.
» A new **MV** will be automatically calculated to match the actual impact of your round. (In this example, the **MV** will be decreased.) No chronograph required!
» A (+) or (-) in front of the **MV** value indicates the new **MV** has been calibrated up or down.
» Exit to accept the new **MV** value.

*Note! The suggested MV Cal range is the distance where the bullet slows to Mach 1.2. If the suggested range cannot be matched it is better to shoot at a shorter/closer distance rather than further. However, as the MV calibration range decreases, so does MV calibration accuracy. Try to shoot as close to the recommended MV Cal range as possible.*

*Note! If the MV-Temp table has been populated, MV values will be locked by the MV-Temp table and MV values will not be automatically adjusted by the MV Cal procedure above.*

## CALIBRATING DROP SCALE FACTOR (AVAILABLE ON ELITE MODELS ONLY)

The Drop Scale Factor (DSF) function allows you to calibrate the BC of your round beyond the supersonic range of the bullet and maintain accurate solutions out to transonic and subsonic ranges. DSF calibration does not impact the supersonic flight path of the bullet.

**CALIBRATING DSF:**

» Scroll to and select **Gun** in the Ballistics Menu.
» After accurately inputting all other gun, bullet, and scope parameters, as well as **MV**, wind values and direction of fire, scroll to and select **CAL DSF**.
» The **Cal DSF** range is the suggested target distance at which to calibrate. For best results, find a range where you can shoot to at least 90% of the recommended range. Calibrating at less than 90% of the recommended range will lessen accuracy and less than 80% of the recommended range will not be valid. Calibrating DSF at distances beyond the recommended Cal DSF range is ok.
» Adjust **Range** to match the actual distance to your target where you are shooting. Accuracy here is key! Use a quality ranger finder if you are not on a measured range.
» Apply the suggested elevation hold shown in **Drop** in your scope turrets or reticle.
» Take a number of shots to determine the actual bullet drop. Adjust **Drop** to match the actual observed bullet drop of the bullet at that range. For example, if the point of impact is 1.5 Mils below the bullseye, adjust the **Drop** value to be 1.5 Mils greater.
» A new **DSF** value will be automatically calculated to match the actual impact of your round in the transonic or subsonic range.
» A (+) or (-) in front of the **DSF** value indicates the **DSF** value has been calibrated up or down. A **DSF** value of 1 indicates no change to BC in the transonic or subsonic range.
» Exit to accept the new **DSF** value.
» Up to 6 DSF values can be created to calibrate BC through the transonic and subsonic range. Calibrating DSF one time can create more than one DSF Cal value.
» All DSF values can be viewed and deleted in **View DSF**.

*Note! Entering DSF values at a shorter range than a previously entered DSF value will overwrite the longer range value.*

## ENVIRONMENT

Accurate Temperature, Humidity and Pressure measurements are critical to calculating an accurate Targeting Solution. It is important that the values measured by the Kestrel represent the ambient values, and for this the Kestrel needs continuous airflow over its sensors. When using a Kestrel in a position where airflow could be restricted, such as low to the ground or resting on a shooting mat or rock, it is better to make periodic environmental captures to avoid inaccurate measurements.

**HOW TO CAPTURE ENVIRONMENTAL MEASUREMENTS:**

» In the Ballistics Menu, scroll to and select **Environment** then scroll to **Update**.
» Adjust **Update to Yes** and then wave the Kestrel rapidly through the air for 5-10 seconds. If the area allows, and your lanyard is secure, you may also "sling" the Kestrel around by the lanyard.
» Immediately adjust **Update** back to **No** to fix the environmental measurements you have just captured.

*NOTE! Repeat this process every half hour or any time the temperature or pressure changes significantly.*

**HOW TO SET THE LATITUDE:**

Latitude is necessary for accurate Coriolis calculations.

» In the Ballistics Menu, scroll to and select **Environment** then scroll to **Lat.**
» Adjust Lat to match your local latitude.

*NOTE! Latitude default is the middle of North America if no new value is entered. Setting both DoF and Lat to 0 will effectively turn Coriolis correction off.*

## CONTINUOUS WIND CAPTURE

As an alternative to the Wind Capture method described previously, you may mount your Kestrel on a tripod using the Kestrel Vane Mount. The Vane Mount ensures the Kestrel remains oriented into the wind and allows for continuous update of the windage solution. For convenience, this method works best when the firing solution is being displayed on a mobile device using Kestrel LiNK Ballistics.

**HOW TO SET THE KESTREL TO CONTINUOUS WIND CAPTURE**

» Select the correct **Gun** and **Target** and set the Direction of Fire.
» In the Ballistics Menu, highlight **Wind** and press the red Capture button. An arrow will appear next to the **Wind** menu item to indicate the unit is now in *wind capture mode*.
» While in *wind capture mode***,** manual inputs to the unit will be locked and changes in wind speed or direction will automatically update the Targeting Screen Windage solution.
» To close wind capture press the red Capture button again.

## CONNECTING TO DEVICES USING LINK

If your Kestrel is marked LiNK on the bottom front label, it can be connected wirelessly to other LiNK-compatible devices. LiNK is powered by *Bluetooth* Smart®, also known as *Bluetooth*® LE, which is available in most iOS devices released after 2014 and Android devices released after 2015, as well as in a USB Dongle available from Kestrel that supports connectivity to Windows and Mac OS devices. LiNK-enabled Kestrel units can connect to mobile devices running Kestrel LiNK Ballistics allowing you to view your targeting solutions remotely, build and manage gun profiles, access the Applied Ballistics custom drag models and install firmware updates. LiNK-enabled units can can be run wirelessly to computers using the Kestrel Dongle. On Windows PC's use the Applied Ballistics Profile Loader to create and install gun profiles and access the Applied Ballistics custom drag model library. (Applied Ballistics custom drag models can only be used in Elite model Kestrel meters.)

**CONNECTING TO A COMPUTER, MOBILE PHONE OR TABLET:**

» On your phone or tablet, follow the links at **www.kestrelballistics.com** to locate Kestrel LiNK Ballistics for iOS or Android in the App or Play store and install on your mobile device.

**OR**

» On your computer, follow the links at **www.kestrelballistics.com** to locate the Applied Ballistics Profile Loader for Windows and install on your computer. Insert your Kestrel USB Dongle (available separately) into an open USB port.

» On the Kestrel, open the Options Menu and select **Bluetooth**. Set **Bluetooth** to **On**. Set **Conct** to **PC/Mobile mode,** the Kestrel's Status will change to **Available**, indicating that it is available for pairing with a computer or mobile device.

» Ensure the computer or mobile device is searching and in range. When **Status** changes from **Available** to **Connected**, the pairing is active and your Kestrel is ready to communicate.

**CONNECTING TO A NEW LINK-COMPATIBLE DEVICE: (SUCH AS A RANGE FINDER)**

» Follow directions for your LiNK-compatible Device to power it on and put it in pairing mode.

» On the Kestrel, open the Options Menu and select **Bluetooth**. Set **Bluetooth** to **On**.

» Set **Conct** to **Device.**

» Scroll to **Name** and select **New**, then wait for the list of available devices in range to populate.

» Select a device from the available list. Once connected, the settings menu for that device will open, allowing you to manage the device's settings.

» Exit to the Bluetooth menu**. Status** should indicate **Connected**, meaning the pairing is active and your Kestrel is ready to communicate.

**CONNECTING TO/ADJUSTING A PREVIOUSLY PAIRED LINK-COMPATIBLE DEVICE:**

» Follow the directions for connecting to a new device except instead of selecting **New** in the **Name** field, scroll left or right to find the desired device.

» **Status** will change to **Searching**. If the device is in range and in active pairing mode, a connection will be made and **Searching** will change to **Connected,** indicating that the pairing is active and your Kestrel is ready to communicate.

**BLUETOOTH CONNECTION INDICATOR:**

» When connected to any LiNK compatible device, a ᛒ icon will appear in the Targeting screen in the upper right.

» If the paired device goes to sleep or if the connection is lost, the ᛒ icon may disappear but waking the device up or returning within range should automatically reestablish the connection and the icon should reappear.

*Note! LiNK range is typically 100 ft/30M line of sight. Shorter distances should be expected if there are obstacles such as walls or metal enclosures. Range is also impacted by the signal strength of the other device.*

**CONNECTING TO COMPUTERS USING USB CABLE**

All Kestrel 5 Series units can connect to a computer via the Data Transfer Port using the USB Data Transfer Cable available separately. Kestrel LiNK software is available for Windows and Mac for downloading logged weather data and installing firmware updates. Applied Ballistics Profile Loader is available for Windows only and can be used to create and install gun profiles and access the Applied Ballistics Custom Drag Model Library. (Applied Ballistics Custom Drag Models can only be used in Elite units.)

**CONNECT YOUR KESTREL METER TO YOUR COMPUTER USING THE DATA TRANSFER CABLE:**

» On your computer, follow the links at **www.kestrelballistics.com** to download Kestrel LiNK for PC or Mac. Install.

**OR (Windows only)**

» Follow the links at **www.kestrelballistics.com** to download the Applied Ballistics Profile Loader to a PC. Install.

» On your Kestrel in the main Options menu, scroll to and select **Data Port** and set to **On**.

» Insert the USB Data Transfer Cable into a USB port and plug into the Data Transfer Port on the back of the Kestrel unit.

» Follow the directions in the Kestrel LiNK or Applied Ballistics Profile Loader program to confirm the connection and perform program actions.

## WEATHER GLOSSARY

**DIRECTION –** Compass heading in true or magnetic North.

**WIND SPD –** Wind Speed is the measurement of the wind passing through the impeller. For greatest accuracy, point the back of the Kestrel directly into the wind.

**CROSWND –** Crosswind uses the internal compass and a user selected heading to calculate the crosswind component of the full wind.

**HEADWND –** Headwind uses the internal compass and a user selected heading or target direction to calculate the headwind component of the full wind.

**TEMP –** Ambient Temperature is the temperature measured at the thermistor. For best results, ensure the thermistor is not exposed to direct sunlight and is exposed to good airflow.

**CHILL –** Wind Chill is a calculated value of the perceived temperature based on temperature and wind speed.

**HUMIDITY –** Relative Humidity is the amount of moisture currently held by the air as a percentage of the total possible moisture that the air could hold.

**HEAT INDEX –** Heat Index is a calculated value of the perceived temperature based on temperature and relative humidity.

**DEW POINT –** Dew Point is the temperature at which water vapor will begin to condense out of the air.

**WET BULB –** Wet Bulb is the lowest temperature that can be reached in the existing environment by cooling through evaporation. Wet Bulb is always equal to or lower than ambient temperature.

**BARO –** Barometric Pressure is the local station (or absolute) pressure adjusted to mean pressure. An accurate reading depends on a correct altitude input and unchanging altitude while measuring.

**ALTITUDE –** Altitude is the vertical distance associated with given atmospheric pressure. An accurate reading depends on correct initial barometric pressure input and stable barometric pressure while measuring.

**STATION –** Station Pressure (Absolute Pressure) is the pressure exerted by the atmosphere at the location.

**DENS ALT –** Density Altitude is the altitude at which the density of the theoretical standard atmospheric conditions (ISA) would match the actual local air density.

## TARGET MENU

**Active –** Setting a target to active makes it selectable in the main target screen.(Not available in Sportsman models)

**TR –** Target Range is the distance from the muzzle of the rifle to the target.

**DoF –** Direction of fire is the direction from the position of the shooter to the target.

**Ideg –** Inclination is the angle above or below horizontal from the position of the shooter to the target.

**Icos –** Inclination Cosine is the cosine of the angle above or below horizontal from the position of the shooter to the target.

**TS –** Target Speed is the speed of the target perpendicular to the direction of fire.

**TD –** Target Direction is the direction of travel of the target perpendicular to the direction of fire.

**WD –** Wind Direction is the direction the wind is coming from in relation to the direction of fire.

**WS1 –** Wind Speed 1 is a five second rolling average wind speed.

**WS2 –** Wind Speed 2 is a five second rolling maximum wind speed.

## GUN MENU

**MV –** Muzzle Velocity is the speed of the bullet as it leaves the muzzle. MV can be measured with a chronograph or calculated using the MV Cal function. An MV estimate is often provided by cartridge manufacturers or in reloading manuals.

**DM –** A Drag Model is the known aerodynamic drag profile of a standard projectile against which an actual bullet is referenced. Ballistics coefficients based on G1 drag models are more widely available, ballistic coefficients based on G7 drag models are more representative of a typical hollow tip, boat tail bullet. (Applied Ballistics Custom Drag Models – Using one of the Applied Ballistics custom drag models replaces the use of a standard projectile drag model and it's associated BC. When a custom drag model is used, the BC value appears as a 1. Applied Ballistics custom drag models can only be used in Elite units.)

**BC –** A Ballistic Coefficient is a ratio that represents the ability of the bullet to overcome air resistance and maintain velocity while in flight in comparison to a standard projectile. Be sure to match the G1/G7 drag model setting to the BC value you are using. G1 BCs can not be used with G7 drag models and vice-versa.

**BW –** Bullet Weight is the weight of the bullet measured in grains or grams.

**BD –** Bullet Diameter is the diameter of the bullet measured in inches or millimeters. (Note! Ensure bullet diameter is correct. The given name of a bullet's caliber does not always match its actual diameter, for example 300WM is actually .308", not .300")

## GUN MENU CONT'D

**BL –** Bullet Length is the length of the bullet measured in inches or millimeters. Automatically calculated from bullet weight. May be overriden if actual bullet length is known.

**ZR –** Zero Range is the distance from the muzzle to the target at which the rifle was zeroed.

**BH –** Bore Hight (Scope Height) is the distance from the center axis of the rifle barrel to the center axis of the scope. This can be measured from the top of the bolt to the middle of the windage turret plus half the diameter of the bolt.

**ZH –**Zero Height is a modification to impact elevation at zero range, often used when adding a suppressor or using a subsonic load. (Not available in Sportsman models)

**ZO –** Zero Offset is is a modification to impact windage at zero range, often used when adding a suppressor or using a subsonic load. (Not available in Sportsman models)

**RT –** Rifle Twist is the distance it takes for the rifling of your barrel to make one full rotation. RT is often provided by the gun or barrel manufacturer. It an also be measured by marking a tight fitting cleaning rod and measuring the insertion distance required to make one full rotation.

**RTd –** Rifle Twist Direction is the rotational direction of the rifle twist. A right hand twist (most common) is clockwise from behind the rifle.

**Eunit –** Elevation Unit is the unit of measure used in a scope and reticle for elevation, either TMOA, SMOA, or Mil.

**Eclck –** Elevation Clicks is a user settable ratio of number of clicks of the elevation turret per TMOA, SMOA, or Mil.

**Wunit –** Windage Unit is the unit of measure used in a scope and reticle for windage, either TMOA, SMOA, or Mil.

**Wclck –** Windage Clicks is a user settable ratio of number of clicks of the windage turret per TMOA, SMOA, or Mil.

**DSF –** Drop Scale Factor is a truing value of the ballistic coefficient applied at transonic and subsonic speeds. (Not available in Sportsman models)

**TMOA –** True Minute Of Angle is a measure of one actual minute of angle. 1 TMOA = 1.047" at 100 yards. Most MOA scopes are TMOA.

**SMOA –** Shooters Minute Of Angle is a simplified approximation of one minute of angle where 1 SMOA = 1" at 100 yards.

**Mil –** Milliradian is a measure of angle using the USMC definition of 6283 mils = 1 circle, or 1 mil = 3.438 MOA.

**CLIK –** Click is the value of each click of the turret where the user selects the number of clicks equal one TMOA, SMOA, or Mil, based on the turrets of their scope.

## ENVIRONMENT MENU

**Update –**Setting Update to Yes inputs live measurements for temperature, pressure, and relative humidity into the ballistic solver. Selecting No for Update captures current environmental inputs and makes them user editable.

**Lat –** Latitude. Can be found on a map or internet search for your area .

**Temp –** Ambient Temperature is the temperature measured at the external temperature sensor.

**SP –** Station Pressure (Absolute Pressure) is the pressure exerted by the earth's atmosphere at any given point.

**RH –** Relative Humidity is the amount of moisture currently held by the air as a percentage of the total possible moisture that the air could hold.

**Dalt -** Density Altitude is the altitude at which the density of the theoretical standard atmospheric conditions (ISA) would match the actual local air density.

**SpnDft –** Spin Drift is a correction for lateral drift caused by the change to the bullets axis of rotation as it follows the arc of its trajectory. (Not available in Sportsman models)

**Wcap –** Wind Capture toggles between applying the windage correction to just the currently selected target or to all targets.

## BALLISTICS/RANGE CARD MENU

**Range Card is available on Elite Model only.**

**Range –** Range is the distance to target

**Elv –** Elevation is the vertical correction needed to hit a target at a given range.

**Wnd1 –** Windage 1 is the horizontal correction needed to hit a target at a given range and **average** measured wind speed.

**Wnd2 –** Windage 2 is the horizontal correction needed to hit a target at a given range and **maximum** measured wind speed.

**Lead –** Lead is the horizontal correction needed to hit a target moving left or right at a given speed.

**RemV –** Remaining Velocity is the amount of a bullet's initial velocity retained at a given distance.

**RemE –** Remaining Energy is the amount of a bullets initial energy retained at a given distance.

**Rtrns –** Transonic Range is the distance traveled by the bullet at which it slows to transonic speed (Mach 1.2).

## BALLISTICS/RANGE CARD MENU CONT'D

**Additional Ballistics data available on Elite Model only:**

**vCor –** Vertical Coriolis Correction is the amount of the elevation solution attributed to the Coriolis effect.

**hCor –** Horizontal Coriolis Correction is the amount of the windage solution attributed to the Coriolis effect.

**SpnD –** Spin Drift is the amount of the windage solution attributed to the spin drift.

**AerJ** - Aerodynamic Jump is the amount of the elevation solution attributed to aerodynamic jump.

**ToF –** Time Of Flight is the time required for a bullet to reach its target at a given range.

**MaxO –** Max Ordinate is the maximum height above the axis of the barrel that a bullet will reach.

**Drop –** Drop is the total drop the bullet experiences.

**Rsub –** Subsonic Range is the distance traveled by the bullet at which it slows to subsonic speed (<Mach 1).

## IMPELLER REPLACEMENT

*Press only the sides of the impeller when removing and inserting to avoid damaging the precision hub bearing. [Figure 1].*

» Press FIRMLY on the impeller module to remove it.

» Insert the new impeller so the side that has the small triangle (close to the perimeter) faces the front of the Kestrel when installed.

*Figure 1*

» Orient one "arm" of the module straight up . [Figure 2]. The impeller can be pushed in from either side.

*Figure 2*