VORTEX®

PRODUCT MANUAL

ACE™

BALLISTIC WEATHER METER

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SPECIFICATIONS

DISPLAY TYPE	LCD Display
DISPLAY SIZE	2.0"
LENGTH	5.4"
HEIGHT	1.0"
WIDTH	2.4"
WEIGHT (W/BATTERY)	5.7 oz.

ACE™ BALLISTIC WEATHER METER

Reach a higher plateau of precision with the tool you need to call every shot. The Ace™ Ballistic Weather Meter puts real-time ballistics, weather, and wind information at your fingertips. Use it solo or integrate with other Vortex Relay™ products. With a simple, intuitive interface, it delivers instant DOPE adjustments and precise environmental reads for the range, competition, or your next hunt.

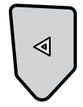
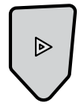
The Ace™ can pair, via Bluetooth®, with your mobile device and the GeoBallistics® App. Scan the QR code below to download the GeoBallistics® App with your Apple or Android device.

The QR code below will also give access to instructional videos.

SCAN QR CODE TO GET STARTED

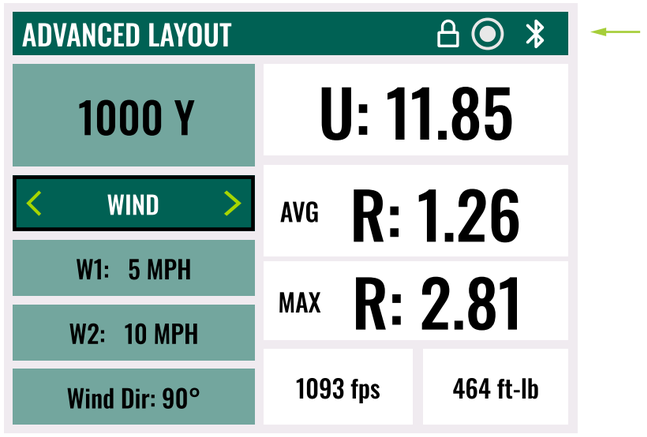
Images are for representation only. Product may vary slightly from what is shown.

BUTTON NAVIGATION

NAME	BUTTON	FUNCTION
BACK ARROW BUTTON		• Navigates Back in the Menu Structure • Navigates to Menu on the Dashboard Screen
CAPTURE BUTTON		• Captures Data for Selected Field
ENTER BUTTON		• Power ON/OFF • Selects Menu Options • Opens Manual Entry and Selection Screens • Saves Manually Adjusted Inputs
UP ARROW BUTTON		• Navigates Up in the Menu Structure and on the Dashboard • Increases Manually Inputted Values
DOWN ARROW BUTTON		• Navigates Down in the Menu Structure and on the Dashboard • Decreases Manually Inputted Values
LEFT ARROW BUTTON		• Navigates Back in the Menu Structure • Toggles through Options on the Dashboard • Navigates Left when Manually Inputting Values
RIGHT ARROW BUTTON		• Navigates Deeper in the Menu Structure • Toggles through Options on the Dashboard • Navigates Right when Manually Inputting Values

ICON KEY

In the top right corner of the Ace™ a variety of icons appear to notify you of different things. See the key below for the meaning of each icon.



NAME	SYMBOL	FUNCTION
BLUETOOTH® ICON		The device is not connected to a Vortex Relay™ Network.
COIN ICON	2	The device is connected to a Vortex Relay™ Network. The number indicates how many devices are on the network. A “1” indicates that the Ace™ is the only device on the network.
LOCK ICON		The device is in Manual Mode for the selected input.
WHITE CAPTURE ICON		The selected input can be captured by pressing the “Capture” button.
GREEN CAPTURE ICON		The Ace™ is actively capturing the selected input.
LOW BATTERY ICON		Battery level is under 25%.

BASIC OPERATION

Battery Installation and Replacement

To insert new batteries, slide down the Battery Cover Release Tab and lift the Battery Cover to open. Insert two new AA batteries, positive (+) side pointing up. Close the Battery Cover and slide the Battery Cover Release Tab up to lock it in place.

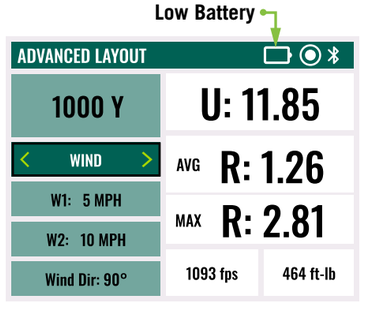
Note: It is recommended to re-calibrate the Ace™ after battery changes. See calibration instructions on pages 10-11.

Power Up

Once the batteries are installed, press and release the “Enter” button to power on the Ace™. The Dashboard will appear. To turn off the Ace™, press and hold the “Enter” button for three seconds. The Ace™ Auto-Shutoff default is five minutes. For instructions to change the Auto-Shutoff setting, see page 49.

Low Battery Icon

The Low Battery Icon displays once the battery reaches 25% life and stays on until there is no power or the battery is replaced.



Compass Calibration

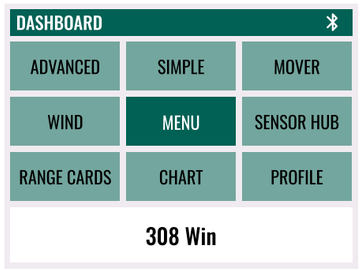
Compass calibration is important for the accuracy of the on-board compass. Read the following steps before beginning calibration. The Ace™ should be calibrated during initial setup and should be re-calibrated every time you significantly change location, typically 30 miles or more, and after battery changes. Calibrate your Ace™ outside and away from large metal structures or objects with the Wind Impeller Cover closed.

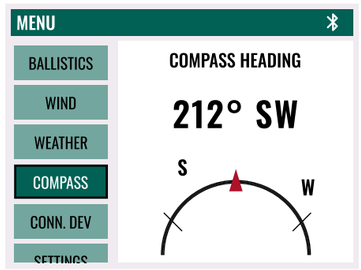
Important: Do not hit any buttons on the Ace™ during this process unless specifically instructed to do so in the following steps.

Scan the QR code for links to a video instruction on how to calibrate your Ace™.

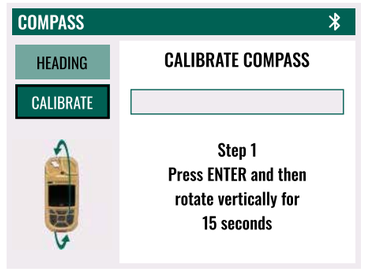
Calibrating the Compass

To navigate to the Compass screen, select “Menu” from the Dashboard. Navigate to and select “Compass” to open the Compass screen. Navigate to “Calibrate” on the Compass screen. Press the “Enter” button to begin the calibration process and follow the steps on the screen when prompted.

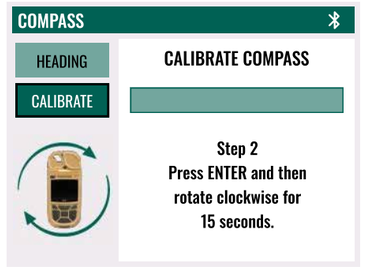




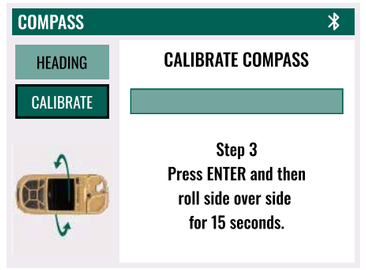
1. Rotate vertically for 15 seconds.



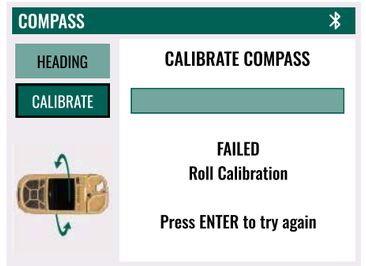
2. Press “Enter”. Rotate clockwise for 15 seconds.



3. Press “Enter”. Roll side over side for 15 seconds.

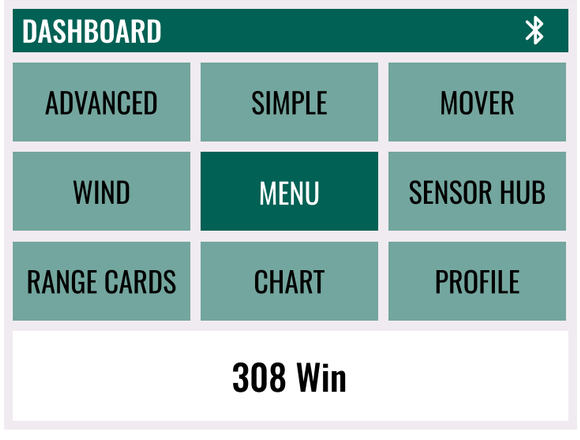


The screen will read “Cal Complete” if the compass has successfully calibrated. If the screen reads “Failed” press the “Enter” button to restart the calibration process until the Ace™ is successfully calibrated.



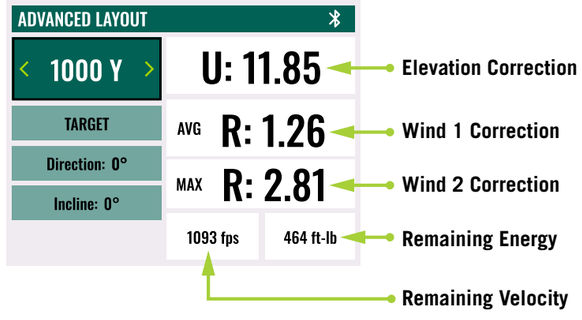
DASHBOARD NAVIGATION

When powering up the Ace™, the first screen you will see is the Dashboard screen. From this screen, you can quickly access multiple Heads-Up Layout screens including Advanced, Simple, Mover, and Wind. You can also quickly access the Menu, Sensor Hub, Range Cards, Chart, and Profile screens.



ADVANCED LAYOUT

This screen functions as a Heads-Up Display showing your solution along with the inputs used to calculate the solution, including Range, Wind, Weather, Rifle Profile, and Target Information. This layout is recommended if you want quick access to all shooting inputs, including Remaining Velocity and Remaining Energy.



Heads-Up Display

The right side of the Advanced Layout features a Heads-Up Display that can be easily referenced while shooting.

Elevation Correction:

The top number is the Elevation Correction. The dial direction will be shown to the left of the number with a “U” for up or a “D” for down.

Windage Corrections:

Wind 1

Beneath the Elevation Correction is the Windage Correction for Wind 1. The dial direction will be shown to the left of the number with an “L” for Left and an “R” for right. The type of Wind Speed measurement will be noted as MIN for minimum Wind Speed, MAX for maximum Wind Speed or AVG for average Wind Speed. Wind type can be set within the Wind portion of the Menu.

Wind 2

The second Wind Correction displayed is the correction for Wind 2. The dial direction will be shown to the left of the number with an “L” for left and an “R” for right. The type of Wind Speed measurement will be noted as MIN for minimum Wind Speed, MAX for maximum Wind Speed or AVG for average Wind Speed. Wind type can be set within the Wind portion of the Menu.

Remaining Velocity

Remaining Velocity displays speed of the bullet at the target. This is displayed in feet per second or meters per second.

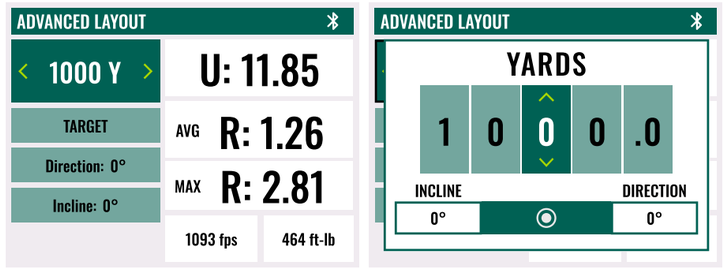
Remaining Energy

Remaining Energy displays the bullet energy at the target. This is displayed in foot-pounds or joules.

Note: The Advanced Layout HUD screen is the only HUD layout that displays Remaining Velocity and Remaining Energy values.

Range

The top left corner of the Advanced Layout shows the Range input. Here you can manually enter Range by toggling left or right to make changes in single unit increments. Pressing and holding the “Left Arrow” or “Right Arrow” button will increase or decrease the Range more rapidly. To make large adjustments to the Range, press “Enter” to open the Range input box. You can also capture Target Direction Angle and Inclination Angle via the Range input box by facing the back of the Ace™ toward your target and pressing the “Capture” button. Press “Enter” to save and close the Range input box.



Range Input Box

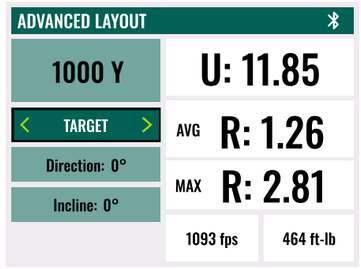
The Ace™ can also receive Range inputs from another Vortex Relay™ device. For instructions on how to connect another Vortex Relay™ device visit page 45.

Beneath the Range portion of the screen is a toggle where you can select between Target, Wind, Weather, and Profile.

Target

From Target, you can view or adjust the Target Direction Angle and Inclination Angle. Pressing the “Capture” button with “Target” selected will capture and update all target inputs.

Note: Pressing the “Enter” button with “Target” selected will open the Shot Details section within the Menu. Instructions on how to utilize this screen can be found on with the Menu section on page 28.



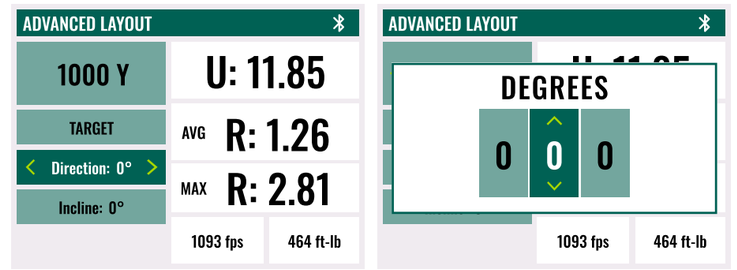
Target Direction Angle

The Target Direction Angle is the shot direction in degrees from due north (ex: north= 0˚, east = 90˚, south = 180˚, and west = 270˚).

Target Direction Angle can be captured using the internal compass by holding the Ace™ up, with the back of the unit facing the target and pressing the “Capture” button with “Direction” selected.

Note: Be sure the Ace™ has been properly calibrated (see pages 10-11) before attempting to use the Capture button to record Target Direction Angle.

The Target Direction Angle can also be manually adjusted by toggling left or right to adjust in 15-degree increments. To make finer adjustments, press the “Enter” button to open the Target Direction Angle input box.



Target Direction Angle Input Box

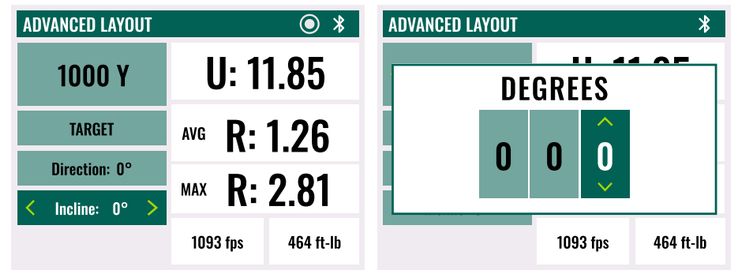
Inclination Angle

The Inclination Angle is your shot angle in degrees from the horizon. (ex: level = 0˚, straight up = 90˚).

Inclination Angle can be captured using the internal inclinometer by holding the Ace™ up, with the back of the unit facing the target and pressing the “Capture” button with “Incline” selected.

The Inclination Angle can also be manually adjusted by toggling left or right to adjust in 1-degree increments. To make large adjustments, press the “Enter” button to open the Inclination Angle input box.

Note: Downhill Inclination Angles are denoted with “-“ sign.



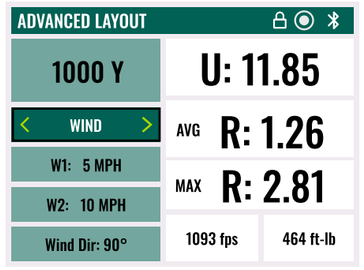
Inclination Angle Input Box

Once all the target variables are entered, navigate back up to Target, then toggle right to continue to Wind.

Wind

From Wind, you can view or adjust the Wind Speed and Wind Direction. Pressing the “Capture” button with “Wind” selected will capture and update all Wind inputs.

Note: Pressing the “Enter” button with “Wind” selected will open the Wind section within the Menu. Instructions on how to utilize this screen can be found on page 39.



Wind Speed

The Ace™ allows you to capture two Wind Speeds and will provide a ballistic correction for each.

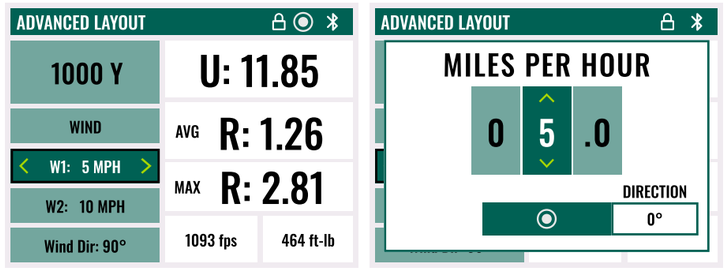
Wind 1

Wind 1 is the primary wind used for ballistic corrections. Wind 1 defaults to capture average Wind Speed. This can be changed to MIN or MAX wind within the Wind section of the Menu.

Wind 2

Wind 2 can be helpful if the wind conditions vary greatly. Wind 2 defaults to capture the MAX Wind Speed. This can be changed to capture MIN or average Wind Speed within the Wind section of the Menu.

Wind Speed can be captured using the internal anemometer by holding the Ace™ into the wind and pressing the “Capture” button with “W1” selected. Pressing and holding the “Capture” button with “W1” selected will capture an average Wind Speed. The same process can be repeated to capture wind for “W2”. The Wind Speed can also be manually adjusted by selecting the value you’d like to edit and toggling left or right to increase or decrease the Wind Speed. To make large adjustments, press the “Enter” button to open the Wind Speed input box.



Wind Speed Input Box

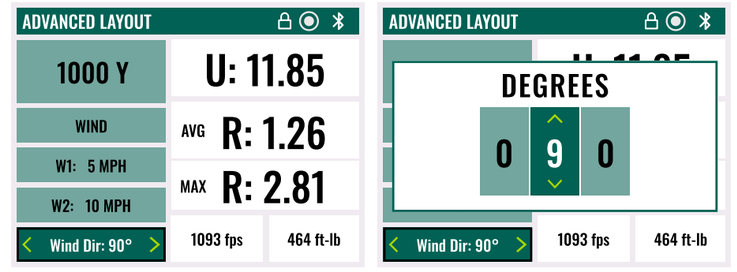
Note: Wind Speed can be displayed in miles per hour (MPH) or meters per second (m/s). This can be adjusted in the Settings Menu.

Wind Direction

Wind Direction can be captured using the internal compass by holding the Ace™ up, with the back of the unit facing into the wind and pressing the “Capture” button with “Wind Direction” selected. Wind Direction is recorded in degrees from due north (ex: north= 0˚, east = 90˚, south = 180˚, and west = 270˚).

Note: Be sure the Ace™ has been properly calibrated (see pages 10-11) before attempting to use the Capture button to record Wind Direction.

The Wind Direction can also be manually adjusted by toggling left or right to adjust in 15-degree increments. To make finer adjustments, press the “Enter” button to open the Wind Direction input box.



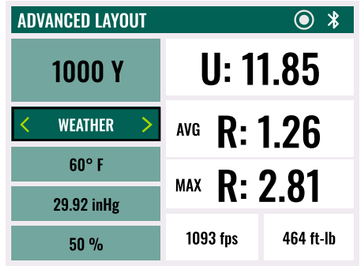
Wind Direction Input Box

Once all the Wind variables are entered, navigate back up to Wind, then toggle right to continue to Weather.

Weather

From Weather, you can view or adjust the Temperature, Pressure, and Relative Humidity. Pressing the “Capture” button with “Weather” selected will capture and update all Weather inputs.

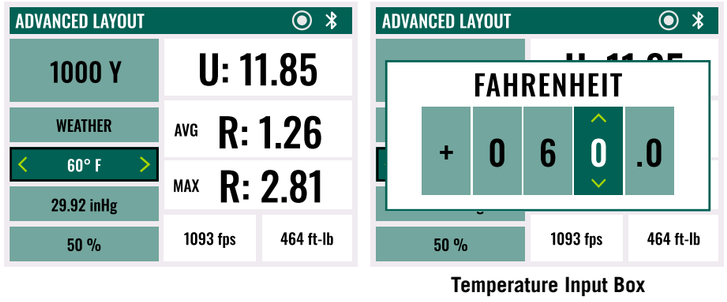
Note: Pressing the “Enter” button with “Weather” selected will open the Weather section within the Menu. Instructions on how to utilize this screen can be found in with the Menu section on page 42.



Temperature

Temperature corresponds to the ambient temperature surrounding you and your equipment. Temperature can be captured using the on-board thermometer by pressing the “Capture” button with “Temperature” selected.

Temperature can also be manually adjusted by toggling left or right to increase or decrease by individual increments. To make large adjustments, press the “Enter” button to open the Temperature input box.



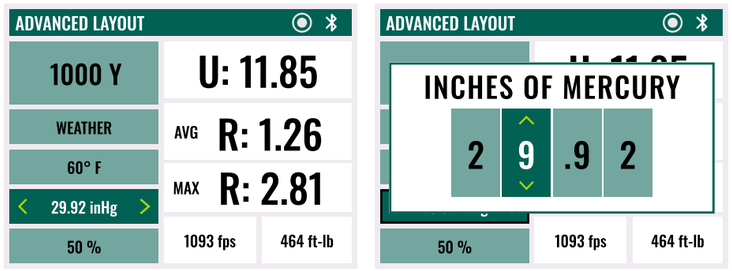
Temperature Input Box

Note: Temperature can be displayed in Celsius (˚C) or Fahrenheit (˚F). This can be adjusted in the Settings Menu.

Pressure

Pressure corresponds to the ambient atmospheric pressure surrounding you and your equipment. This is also known as station pressure. Pressure can be captured using the internal environmental sensors by pressing the “Capture” button with “Pressure” selected.

Pressure can also be manually adjusted by toggling left or right. To make large adjustments, press the “Enter” button to open the Pressure input box.



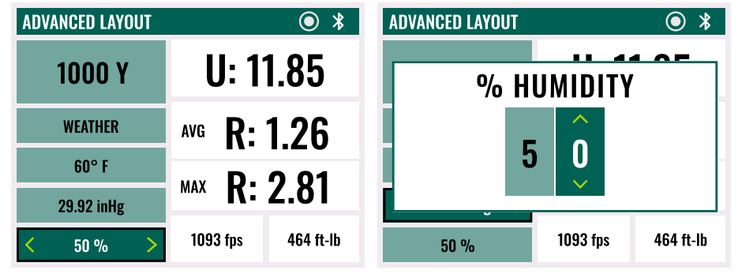
Pressure Input Box

Note: Pressure can be displayed in inches of mercury (inHg) or millibars (mb). This can be adjusted in the Settings Menu.

Relative Humidity

Relative Humidity corresponds to the amount of water vapor present in the air surrounding you and your equipment. Relative Humidity can be captured using the internal environmental sensors by pressing the “Capture” button with “Relative Humidity” selected.

Relative Humidity can also be manually adjusted by toggling left or right to increase or decrease by individual increments. To make large adjustments, press the “Enter” button to open the Relative Humidity input box.



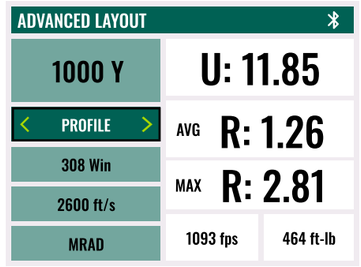
Relative Humidity Input Box

Once all the weather variables are entered, navigate back up to Weather, then toggle right to continue to Profile.

Profile

From Profile, you can view or adjust the Rifle Profile, Muzzle Velocity, and Solution Units.

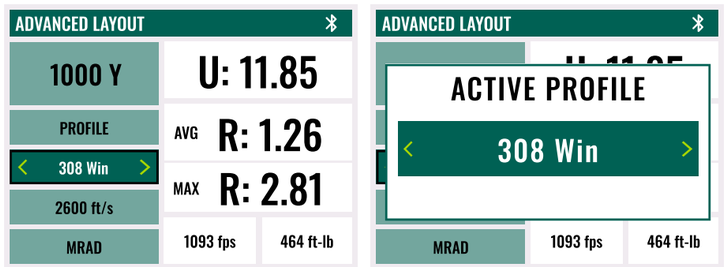
Note: Pressing the "Enter" button with "Profile" selected will open the Edit Profile section within the Menu. Instructions on how to utilize this screen can be found in the Menu section on page 30.



Rifle Profile

The Ace™ stores 10 Ballistic Profiles. These profiles can be setup in the Ace™ Ballistics Menu, via the GeoBallistics® App, or via any Vortex Relay™ device. The selected Profile will be displayed in this section.

To change the selected Profile, toggle left or right. The Ace™ comes with 10 preloaded Ballistic Profiles including .308 Winchester®, 6.5 Creedmoor®, .223/5.56, .30-06, .300 Winchester® Magnum, .270 Winchester®, 7mm Remington® Magnum, .243 Winchester®, .22-250 Remington®, and .22 Long Rifle. These preloaded Profiles can be used as is or customized to match your setup. Ballistic solutions on the Heads-Up Display screens will correspond to the selected Profile.

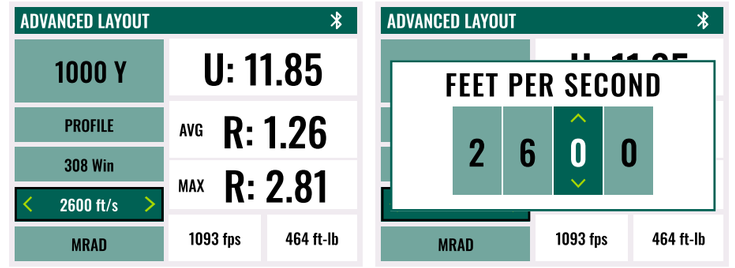


Active Profile Input Box

Muzzle Velocity

Muzzle Velocity is the projectile's speed as it leaves the muzzle. You can find this information on the packaging from most ammunition manufacturers, or their websites. We highly recommend that you use a chronograph to verify this information or utilize the MV Truing tool within the GeoBallistics® App. See page 84 for details.

Muzzle Velocity can be manually adjusted by toggling left or right to increase or decrease by individual increments. To make large adjustments, press the "Enter" button to open the Muzzle Velocity input box.

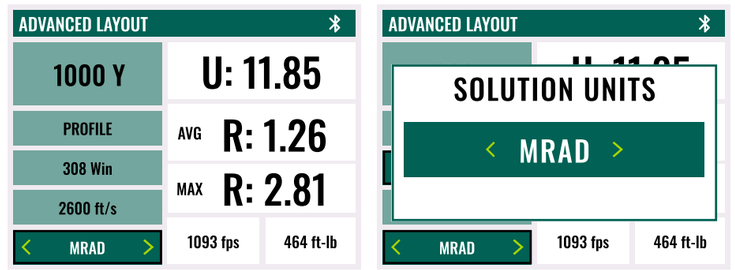


Muzzle Velocity Input Box

Note: The measurement units can be set to feet per second (ft/s) or meters per second (m/s) in the Settings Menu.

Solution Units

Solution Units refer to the unit of measurement your riflescopes turrets are laid out in. This selection will determine which unit of measurement your ballistic solutions are in. You can choose between MRAD, MOA, or inches (IN) by toggling left or right or pressing "Enter" to open the Solution Units input box.

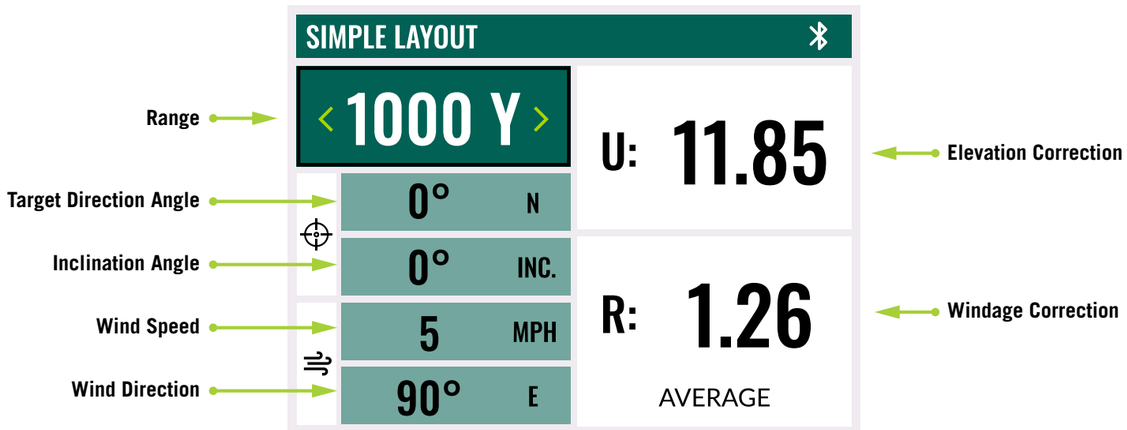


Solution Units Input Box

Press the "Back Arrow" button to return to the Dashboard and continue to the Simple Layout.

SIMPLE LAYOUT

The Simple Layout screen provides a basic Heads-Up Display. The right side of the screen displays the Elevation and Windage Corrections. The direction you dial is signified on the left side of the correction by a “U” for up or “D” for down for elevation and either a “L” for left or “R” for right for windage.



The left side of the Simple Layout screen is a short list of shooting variables that can be edited while shooting including Range, Target Direction Angle, Inclination Angle, Wind Speed, and Wind Direction.

Each of these values can be manually adjusted by navigating to the field and toggling left or right to increase or decrease by individual increments. To make large adjustments, press the “Enter” button to open the input box. Press “Enter” to save adjustments.

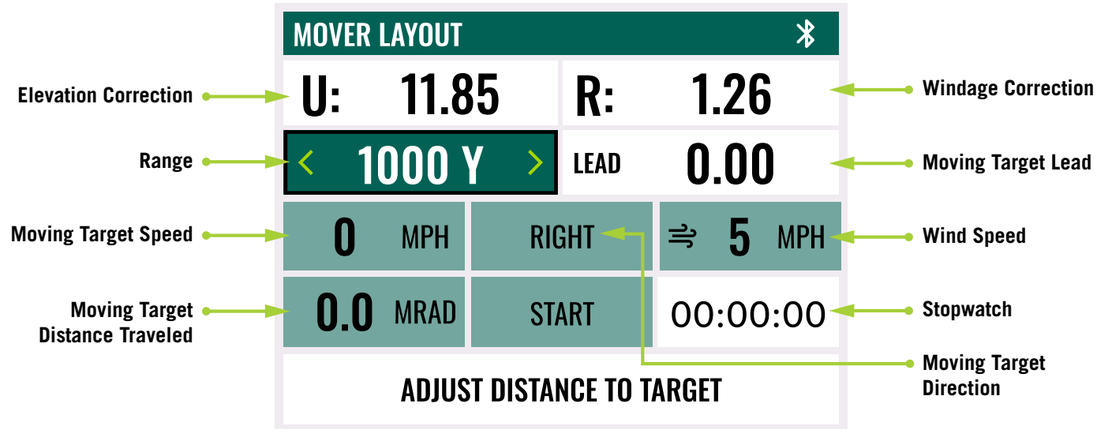
Target Direction Angle and Inclination Angle can be captured using the internal sensors by holding the Ace™ up, with the back of the unit facing the target and pressing the “Capture” button with the value selected you want to capture.

Wind Speed and Direction can be captured using the internal sensors by holding the Ace™ into the wind and pressing the “Capture” button with the value selected you want to capture. Pressing and holding the “Capture” button with “Wind Speed” selected will capture an average Wind Speed.

Press the “Back Arrow” button to return to the Dashboard and continue to the Mover Layout.

MOVER LAYOUT

The Mover Layout screen provides a quick Heads-Up Display including key tools that aid in shooting moving targets. This layout is great for competition shooting where shooting moving targets are required.

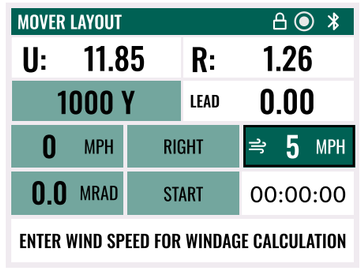


The top of the screen displays Elevation Correction, Windage Correction, Range, and Moving Target Lead. The direction you dial is signified on the left side of the correction by a “U” for up or “D” for down for elevation and either a “L” for left or “R” for right for windage.

The bottom half of the Mover Layout screen displays key shooting variables that can be edited while shooting including Moving Target Speed, Moving Target Direction, Wind Speed, Moving Target Distance Traveled, and a Stopwatch.

Range, Moving Target Speed, Wind Speed, and Moving Target Distance Traveled can be manually adjusted by navigating to the field and toggling left or right to increase or decrease by individual increments. To make large adjustments, press the “Enter” button to open the input box. Press “Enter” to save adjustment. Moving Target Direction can be edited by pressing the “Enter” button with the field selected.

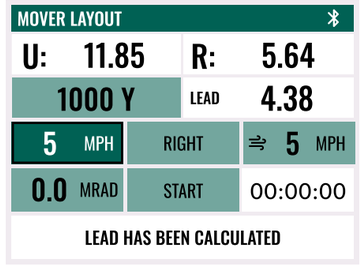
Wind Speed can be captured using the internal anemometer by holding the Ace™ into the wind and pressing the “Capture” button with the “Wind Speed” box selected. Pressing and holding the “Capture” button will capture an average Wind Speed.



Moving Target Leads

If known, a Moving Target Speed can be manually entered to calculate a Moving Target Lead. If unknown or if verification of Moving Target Speed is required, the Mover Layout can perform that calculation.

Note: The Mover Layout is the only HUD screen that will incorporate a Moving Target Lead into your ballistic correction.



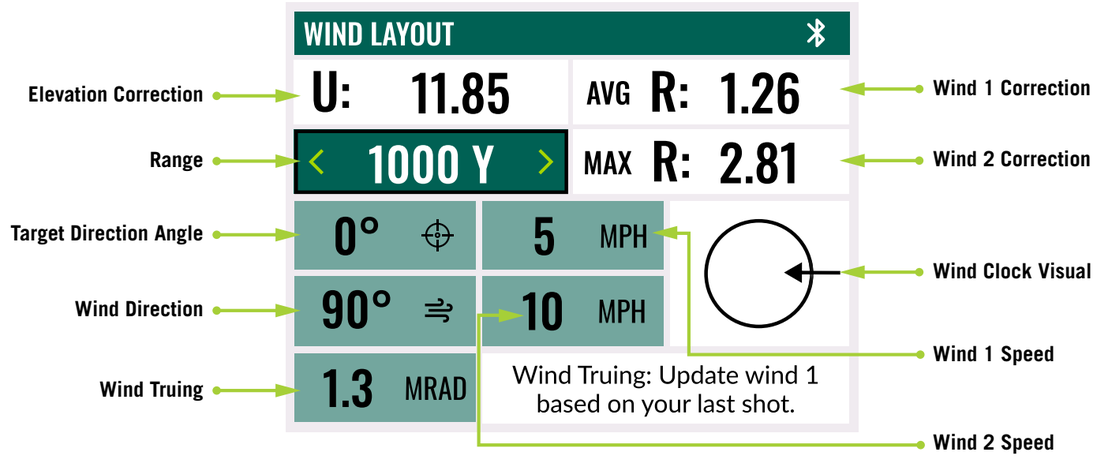
To Measure Moving Target Speed:

1. Set the Moving Target Distance Traveled using your reticle for measurement.
2. Select “Start” to start the Stopwatch when the moving target is centered in your crosshair. Select “Stop” when the moving target reaches the Moving Target Distance Traveled you selected in Step 1.
3. The Moving Target Speed and Moving Target Lead will be calculated based on the time it took the target to travel the set distance.

Press the “Back Arrow” button to return to the Dashboard and continue to the Wind Layout.

WIND LAYOUT

The Wind Layout screen provides a quick Heads-Up Display including key wind features. This layout is great for western hunting, long-range shooting, and competitive shooting where accurate wind reads are vital to success.

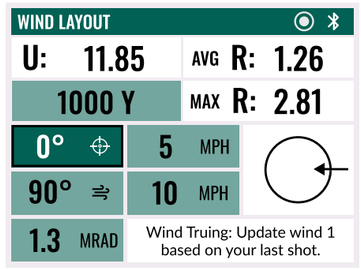


The top of the screen displays Elevation Correction, Windage Corrections for both Wind 1 and Wind 2, along with Range. The direction you dial is signified on the left side of the correction by a “U” for up or “D” for down for elevation and either a “L” for left or “R” for right for windage. The type of Wind Speed measurement will be noted as MIN for minimum Wind Speed, MAX for maximum Wind Speed or AVG for average Wind Speed.

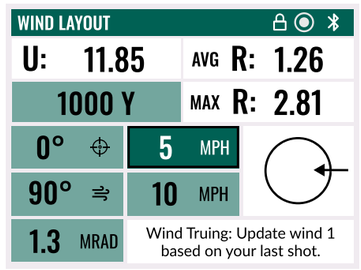
The bottom half of the Wind Layout screen displays key shooting variables that can be edited while shooting including Range, Target Direction Angle, Wind Speed for Wind 1 and Wind 2, Wind Direction along with the Wind Clock Visual, and Wind Truing.

Each of these values can be manually adjusted by navigating to the field and toggling left or right to increase or decrease by individual increments. To make large adjustments, press the “Enter” button to open the input box. Press “Enter” to save adjustment.

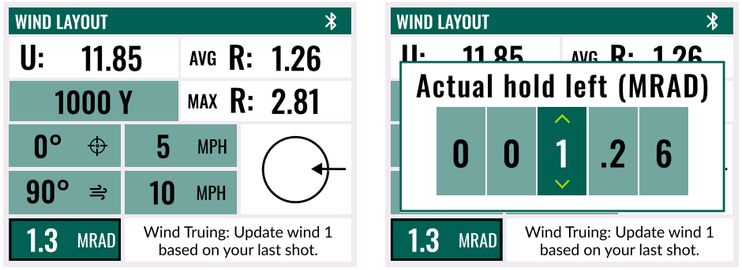
Target Direction Angle can be captured using the internal compass by holding the Ace™ up, with the back of the unit facing the target and pressing the “Capture” button with the “Target Direction Angle” box selected.



Wind Speed can be captured using the internal anemometer by holding the Ace™ into the wind and pressing the “Capture” button with “Wind Speed” selected. Pressing and holding the “Capture” button will capture an average Wind Speed.



The Wind Truing feature gives you the option to true your Wind Speed by inputting the actual observed Windage Correction where the point of aim (POA) was observed equal to the point of impact (POI). By updating this value, the Ace™ will calculate a new Wind 1 so that the Windage Correction matches what you observed for a POI.



Wind Truing Input Box

Press the “Back Arrow” button to return to the Dashboard and continue to the Menu.

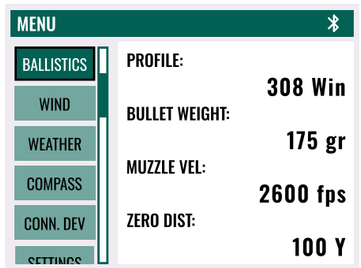
MENU NAVIGATION

From the Menu screen, users can access the Ballistics, Wind, Weather, Compass, Connected Devices, and Settings screens.

Note: Within the Ballistics, Wind, and Weather Menus, values that can be edited will be underlined.

Ballistics

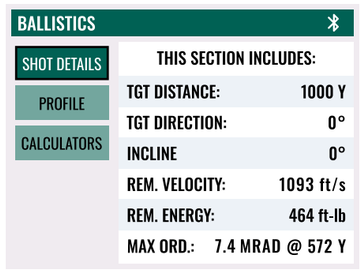
Navigating to Ballistics will show you the high-level details of your selected Profile including Profile, Bullet Weight, Muzzle Velocity, and Zero Distance. Pressing the “Enter” button will open the Ballistics Menu. From the Ballistics Menu, users can view and edit their Shot Details and Profile. Users can also access helpful calculators to utilize in the field from this screen.



Shot Details

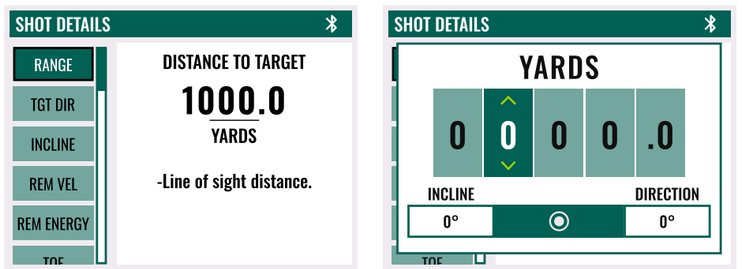
Navigating to Shot Details, users can view Target Distance, Target Direction Angle, and Inclination Angle. Users can also view values for Remaining Velocity, Remaining Energy, Max Ordinate, Spin Drift, and Crosswind Jump.

Selecting “Shot Details” will open the Shot Details screen where users can view more detail and make manual edits on select entries.



Range

Range is the line of sight distance to the target. Range can be measured in yards or meters. To manually adjust Range, press “Enter” to open the Range input box and toggle using the Up and Down Arrow buttons.



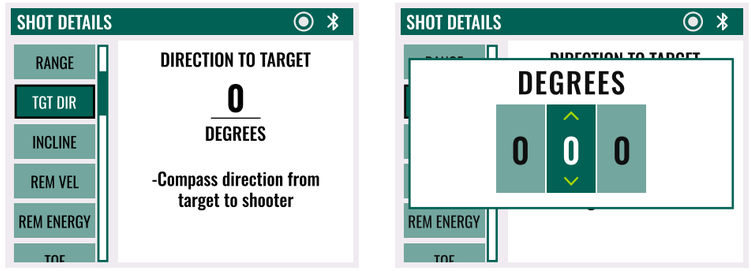
Range Input Box

Target Direction Angle

The Target Direction Angle is the shot direction in degrees from due north (ex: north= 0˚, east = 90˚, south = 180˚, and west = 270˚).

Target Direction Angle can be captured using the internal compass by holding the Ace™ up, with the back of the unit facing the target and pressing the “Capture” button.

The Target Direction Angle can also be manually adjusted pressing the “Enter” button to open the Target Direction Angle input box and toggling up and down.



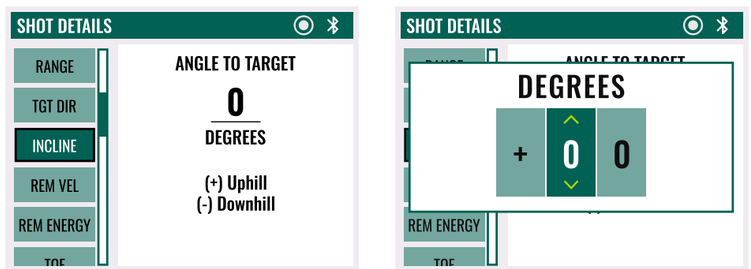
Direction to Target Input Box

Inclination Angle

The Inclination Angle is your shot angle in degrees from the horizon. A positive value denotes an uphill shot, a negative value denotes a downhill shot (ex: level = 0˚, straight up = 90˚).

Inclination Angle can be captured using the internal inclinometer by holding the Ace™ up, with the back of the unit facing the target and pressing the “Capture” button.

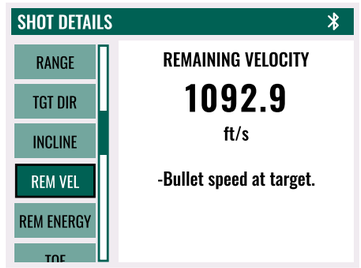
The Inclination Angle can also be manually adjusted by pressing the “Enter” button to open the Inclination Angle input box and toggling up and down.



Angle to Target Input Box

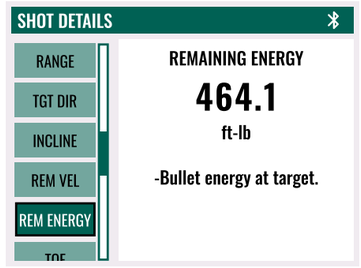
Remaining Velocity

Remaining Velocity displays speed of the bullet at the target. This is displayed in feet per second or meters per second.



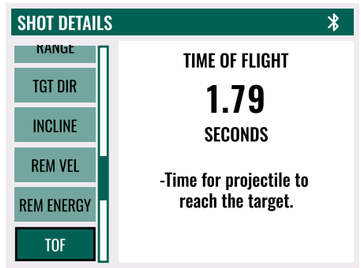
Remaining Energy

Remaining Energy displays the bullet energy at the target. This is displayed in foot-pounds or joules.



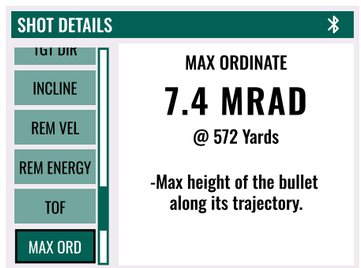
Time of Flight

Time of Flight refers to the time a projectile takes to reach the target. This screen displays that time in seconds.



Max Ordinate

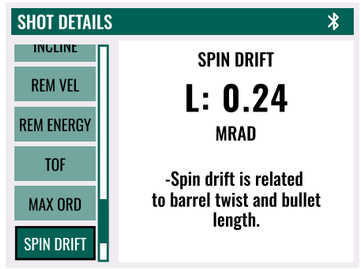
Max Ordinate displays the max height of the bullet along its trajectory. This is displayed in MRAD, MOA, or inches (IN) based on your Active Profile selection.



Spin Drift

Spin Drift is a bullet's drift left or right due to the spin imparted by the Bullet Length in conjunction with the Barrel Twist Rate, and the interaction of gyroscopic and aerodynamic forces. This screen displays the portion of your Windage Correction that is caused by Spin Drift.

Note: The Windage Correction includes this value.

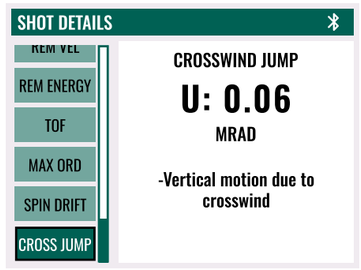


Crosswind Jump

Crosswind Jump refers to the small but measurable +/- vertical influence on a bullet's flight path by a crosswind. The higher the wind velocity, the greater the influence. This screen displays the portion of your Elevation Correction that is caused by Crosswind Jump.

Note: The Elevation Correction includes this value.

Press the "Back Arrow" button to return to the Ballistics screen.

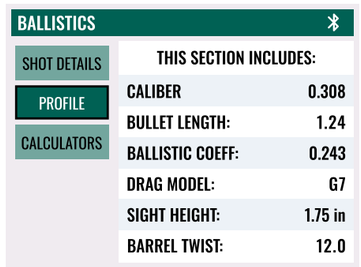


Profile

The Ace™ comes with 10 common default Ballistic Profiles. The Profiles can be used as is or customized to reflect your specific rifle and bullet combination.

Note: The Ace™ must always have 10 Ballistic Profiles. Ballistics Profiles cannot be added or deleted.

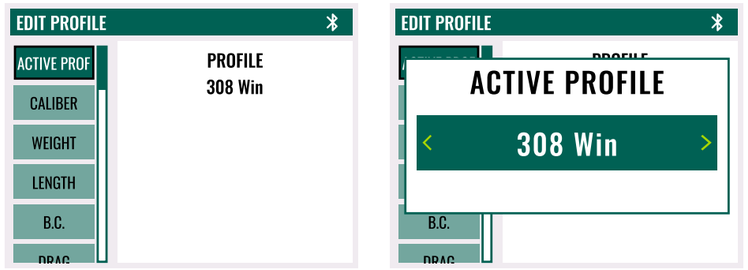
The default Profiles include .308 Winchester®, 6.5 Creedmoor®, .223/5.56, .30-06, .300 Winchester® Magnum, .270 Winchester®, 7mm Remington® Magnum, .243 Winchester®, .22-250 Remington®, and .22 Long Rifle.



By navigating to Profile, you can see a high-level look at the Active Profile including Bullet Caliber, Bullet Length, Ballistic Coefficient, Drag Model, Sight Height, and Barrel Twist Rate. Press "Enter" to enter the Edit Profile screen. From this screen you can select between the 10 default Profiles or edit a Profile to customize it to your setup.

Active Profile

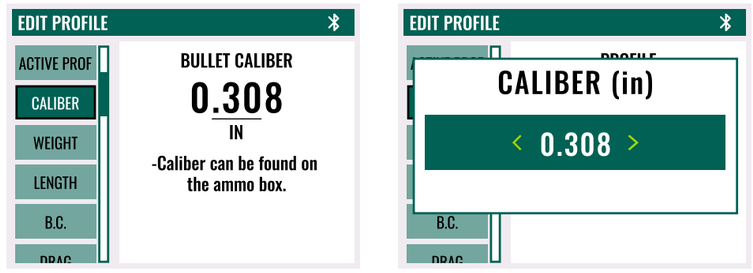
Active Profile displays the active selected Profile. To change the Active Profile, press the "Enter" button to open the Active Profile input box and use the Left and Right Arrow buttons to toggle between Profiles. Press the "Enter" button to save your selection.



Active Profile Input Box

Bullet Caliber (in)

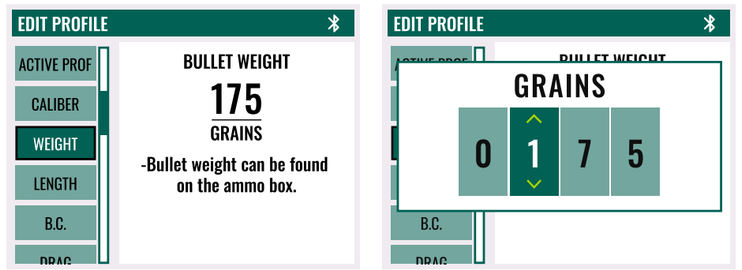
The bullet's diameter in inches. To manually change the Caliber, press "Enter" to open the Caliber input box, and utilize the Left and Right Arrow buttons to toggle between Caliber options. Press the "Enter" button to save your selection.



Bullet Caliber Input Box

Bullet Weight (gr)

The bullet's weight in grains. To manually change the Bullet Weight, press "Enter" to open the Bullet Weight input box and utilize the Up and Down Arrow buttons to increase or decrease the weight. Press the "Enter" button to save.

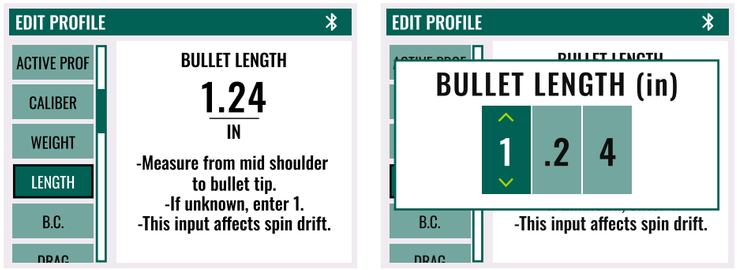


Bullet Weight Input Box

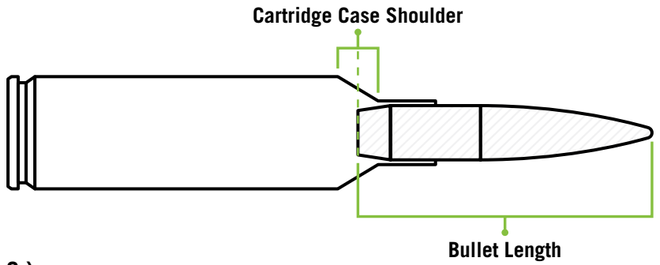
Bullet Length (in)

The bullet's length in inches. To manually change the Bullet Length, press "Enter" to open the Bullet Length input box and utilize the Up and Down Arrow buttons to increase or decrease the length. Press the "Enter" button to save.

Note: To estimate a Bullet's Length, measure from the middle of the cartridge case shoulder to the tip of the bullet. If unknown, enter "1". This value is used to calculate Spin Drift.

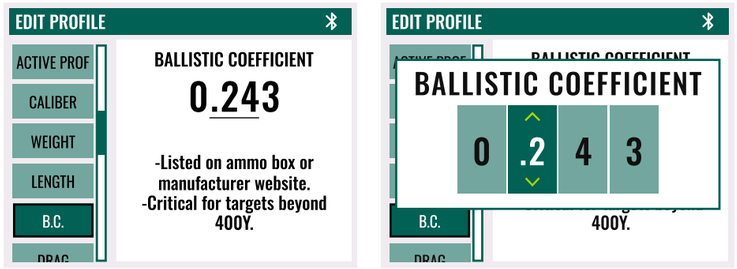


Bullet Length Input Box



Ballistic Coefficient (B.C.)

The bullet's Ballistic Coefficient as it correlates to drag function. This value is critical for targets beyond 400 yards. To manually change the Ballistic Coefficient, press "Enter" to open the Ballistic Coefficient input box and utilize the Up and Down Arrow buttons to increase or decrease the length. Press the "Enter" button to save.



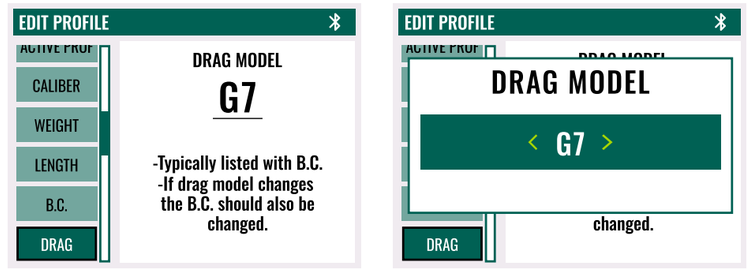
Ballistic Coefficient Input Box

Note: Bullet information can be found on the ammunition's box or on the manufacturer's website.

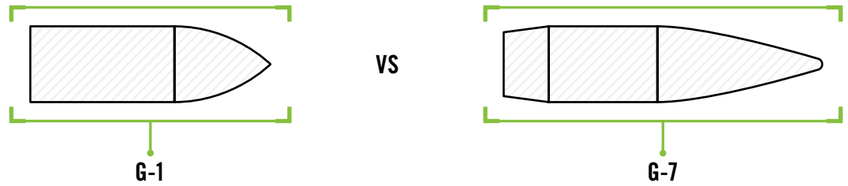
Note: If a bullet has been selected from the GeoBallistics® App's bullet library and has a multi BC, that will display here as "Multi". From Ace™, you can only manually input a single Ballistic Coefficient.

Drag Model – G1 vs G7

This information may be printed on the box if you are using manufactured bullets. If you are using custom loads, use the Drag Model listed on the packaging for your bullet. If the Drag Model is not listed on the packaging, this information can usually be found on the bullet/ammo manufacturer's website. In general, G1 is better for flat-based bullets typically used with pistols and muzzleloaders. G7 is more common and better for longer, boat-tailed bullets which are common for centerfire cartridges.



Drag Model Input Box

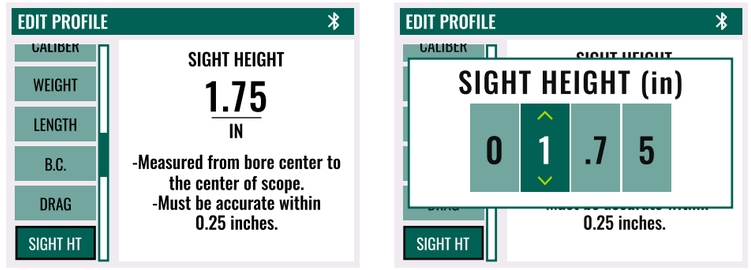


To manually change the Drag Model, press "Enter" to open the Drag Model input box and utilize the Left and Right Arrow buttons to toggle between G1 and G7. Press the "Enter" button to save your selection.

Note: Drag Model options: Multi G1, Multi G7 or CD, can be imported from the GeoBallistics® App. When using these the Ballistic Coefficient will read "Multi" or "1" and the Drag Model will read "Multi G1", "Multi G7" or "CD" based on your selection.

Sight Height

Height from the center of the rifle bore to the center of the optic. The measurement units can be set to standard (inches) or metric (centimeters) in the Settings Menu. To manually change the Sight Height, press “Enter” to open the Sight Height input box and utilize the Up and Down Arrow buttons to increase or decrease the height. Press the “Enter” button to save.

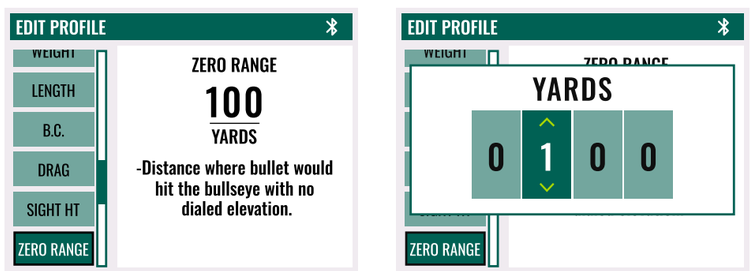


Sight Height Input Box

Note: You can utilize the Sight Height tool within the GeoBallistics® App to measure Sight Height. See instructions on page 83.

Zero Range

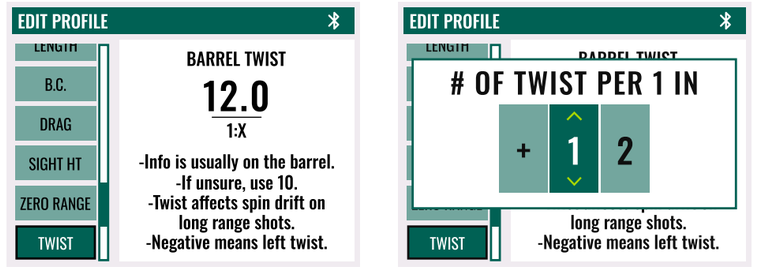
The distance at which you have zeroed your rifle. The measurement units can be set to yards or meters in the Settings Menu. To manually change the Zero Range, press “Enter” to open the Zero Range input box and utilize the Up and Down Arrow buttons to increase or decrease the range. Press the “Enter” button to save.



Zero Range Input Box

Barrel Twist Rate

Barrel Twist Rate is the distance covered for each revolution of the bullet within the barrel. For example, if your barrel is denoted as “1:8”, this means the bullet will complete one full rotation every eight inches and you should enter “8” into this space. This information may be marked on the rifle barrel, or on the manufacturer’s website. To manually change the Barrel Twist Rate, press “Enter” to open the Barrel Twist Rate input box and utilize the Up and Down Arrow buttons to increase or decrease the twist rate. Press the “Enter” button to save.

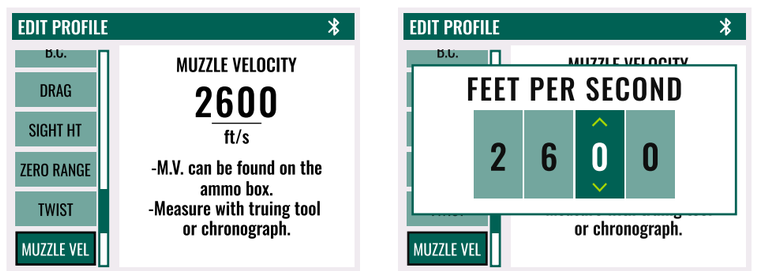


Barrel Twist Rate Input Box

Note: If your barrel has a left-hand twist, you must enter it with a negative or minus sign before the number. If you cannot find the Barrel Twist Rate for your barrel, we recommend inputting 10.

Muzzle Velocity

Muzzle Velocity (MV) is the projectile’s speed as it leaves the muzzle. You can find this information on the packaging from most ammunition manufacturers, or their websites. We highly recommend that you use a chronograph to verify this information. Measurement units can be set to standard (ft/s) or metric (m/s) in the Settings Menu. To manually change the Muzzle Velocity, press “Enter” to open the Muzzle Velocity input box and utilize the Up and Down Arrow buttons to increase or decrease the velocity. Press the “Enter” button to save.

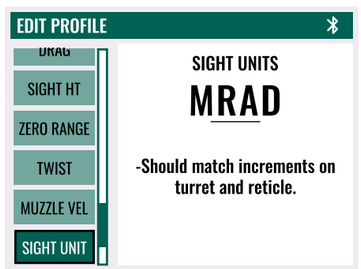


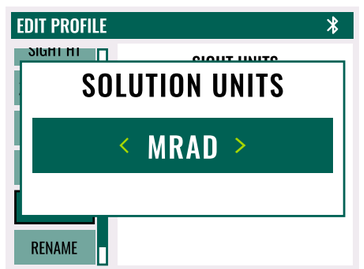
Muzzle Velocity Input Box

An MV Temp Table can be input via the GeoBallistics® App, see page 78 for instructions. If an MV Temp Table is active, the calculated MV will be displayed with a T preceding it. Ex: T2743.

Sight Units

Choose the Sight Units you would like to have your drop chart displayed with MRAD, MOA, or inches. This information will be based off the angular unit of measurement your riflescope's turrets and reticle are laid out in. To edit, press the "Enter" button to open the Solution Units input box and utilize the Left or Right Arrow buttons to toggle between options. Press the "Enter" button to save.

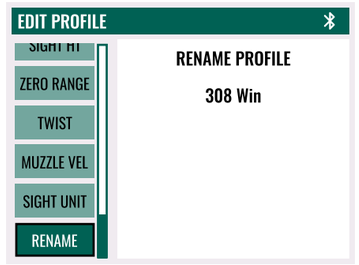


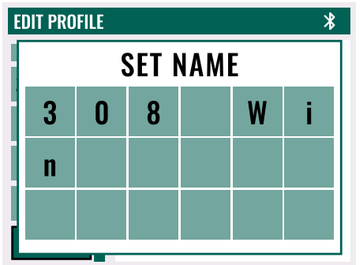


Solution Units Input Box

Rename

You can name your Profile by selecting "Rename". Use the Left and Right Arrow buttons to select with character to edit and the Up and Down Arrow buttons to toggle through keyboard options. Press the "Enter" button to save.





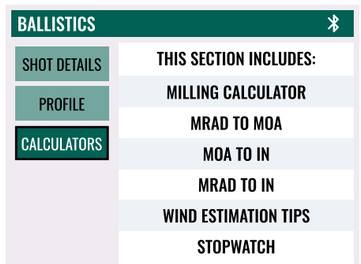
Set Name Input Box

Press the "Back Arrow" button to return to the Ballistics screen.

Calculators

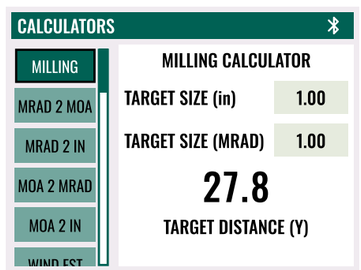
The Ace™ includes several helpful calculators and tools that can be useful in the field.

To utilize, use the Left and Right Arrow buttons to select the field you'd like to edit. Press "Enter" to open the edit screen. Press "Enter" to save your entry.



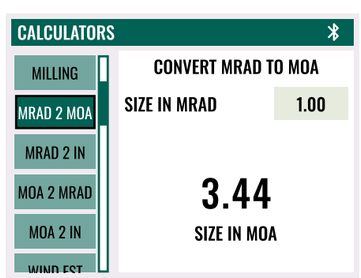
Milling Calculator

The Milling Calculator allows you to estimate distance utilizing target size. To utilize, enter your target size in inches and your target size measured in MOA or MRAD.



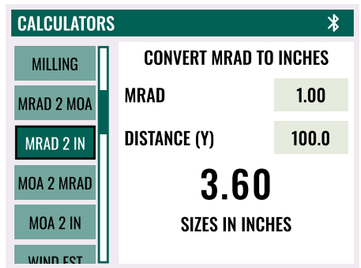
MRAD To MOA Converter

This calculator converts MRAD into MOA.



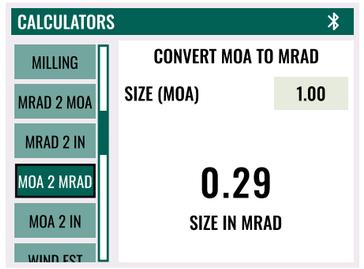
MRAD To Inches Converter

This calculator converts MRAD into inches. To utilize, enter your MRAD measurement and distance.



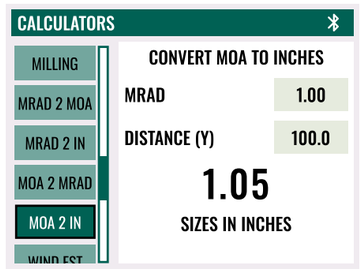
MOA to MRAD Converter

This calculator converts MOA into MRAD.



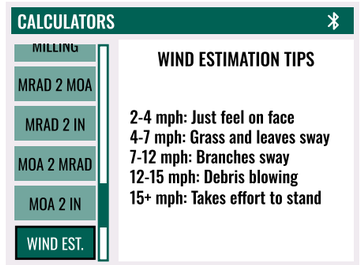
MOA to Inches Converter

This calculator converts MOA into inches. To utilize, enter your MOA measurement and distance.



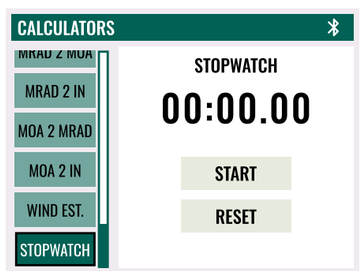
Wind Estimation Tips

Making windcalls in the field can be challenging. This section includes quick tips to help estimate Wind Speed at your target.



Stopwatch

The Ace™ includes a Stopwatch tool. Navigate to “Start” and press “Enter” to start. Press “Enter” again with “Stop” selected to stop. Select “Reset” and press “Enter” to reset the Stopwatch.

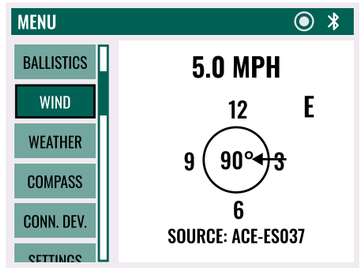


Press the “Back Arrow” button to return to Ballistics screen.

Press the “Back Arrow” button to return to the Menu to update Wind settings.

Wind

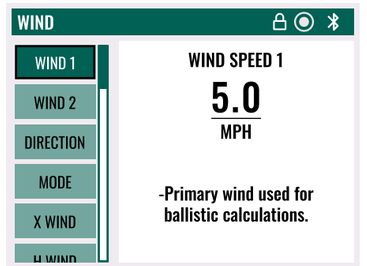
Navigating to the Wind screen will show you the high-level details of your Wind Speed, Wind Direction, and the Wind Source. Pressing the “Enter” button will open the Wind Menu. From the Wind Menu, users can view and edit their Wind Speed, Wind Direction, Wind Mode, and Wind Type. Users can also view their Crosswind Value and Headwind Value.

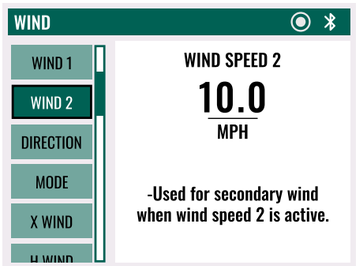


Wind Speed

It is possible to capture two separate Wind Speeds. Wind 1 is the primary wind value and will be used to calculate ballistic corrections. Wind 2 is used for secondary wind value and is visible from the Advanced and Wind Layouts.

From the Wind Menu, Wind Speed can be captured for Wind 1 or Wind 2 using the internal anemometer by holding the Ace™ into the wind and pressing the “Capture” button with the value you want to capture selected. Pressing and holding the “Capture” button will capture an average Wind Speed. The Wind Speed can also be manually adjusted by pressing the “Enter” button to open the Wind Speed input box.

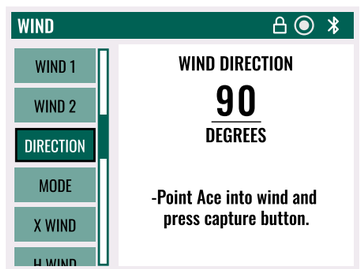




Note: Wind Speed can be displayed in miles per hour (MPH) or meters per second (m/s). This can be adjusted in the Settings Menu.

Wind Direction

Wind Direction can be captured using the internal compass by holding the Ace™ up, with the back of the unit facing into the wind and pressing the “Capture” button with “Wind Direction” selected. Wind Direction is recorded in degrees from due north (ex: north= 0˚, east = 90˚, south = 180˚, and west = 270˚). The Wind Direction can also be manually adjusted by pressing the “Enter” button.

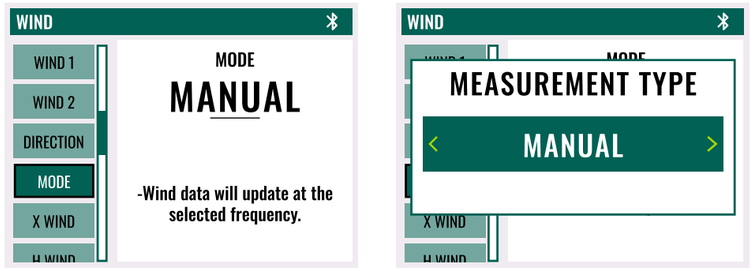


Note: Wind Direction will be the same for Wind 1 and Wind 2.

Note: Be sure the Ace™ has been properly calibrated (see pages 10-11) before attempting to use the Capture button to record Wind Direction.

Wind Mode

The Wind Mode screen displays where the wind data is coming from. In this screen you can select between Internal Sensors or Manual. When Manual is selected, the manually entered wind data will be locked in until manually changed or when the “Capture” button is pressed. To utilize Internal Sensors, press the “Enter” button and toggle between 5 seconds, 15 seconds, 30 seconds, 1 minute, or 5 minutes to select the frequency at which you’d like the internal sensors to take live readings.



Wind Mode Input Box

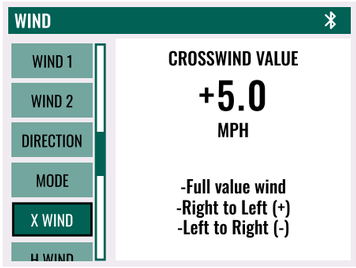
Note: A lock icon will appear in the top right corner of the screen when the device is in Manual Mode. When in Internal Sensors Mode, no icon will be present.

Note: If set to Internal Sensors Mode, and a manual change is made to a wind value, the mode will automatically switch to Manual Mode and lock in the manually inputted value.

Crosswind Value

The X Wind screen will display the portion of the Crosswind Value that is affecting your Windage Correction. This value is calculated based off the direction the wind is coming from in relation to your target.

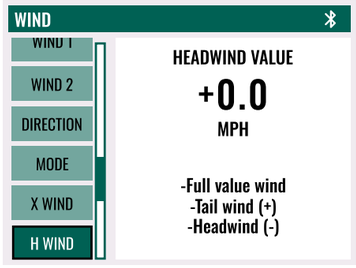
Note: A (+) denotes a right to left wind. A (-) denotes a left to right wind.



Headwind Value

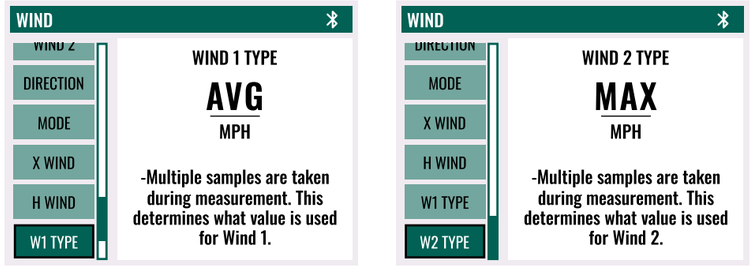
The H Wind screen will display the full Headwind Value for reference.

Note: A (+) denotes a tailwind. A (-) denotes a headwind.



Wind Type

Within the Wind Type screens, you can select which wind type you’d like for the device to capture and utilize in calculating your wind corrections. By pressing “Enter” you can select between AVG, MAX, or MIN Wind. You can select different Wind Types for Wind 1 and Wind 2.



Average Wind

When Average Wind is selected, the Ace™ will calculate the Average Wind Speed from the speeds collected from pressing and holding the “Capture” button. When only using Wind 1, it is recommended to utilize Average Wind.

MAX Wind

When MAX Wind is selected, the Ace™ will utilize the Maximum Wind Speed from the speeds collected while pressing and holding the “Capture” button. MAX Wind Speed can be a great reference point to capture as Wind 2 to record wind gusts.

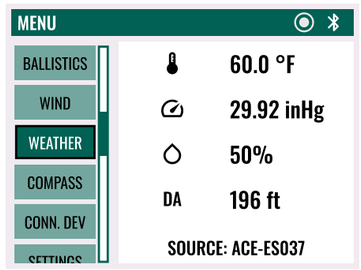
MIN Wind

When MIN Wind is selected, the Ace™ will utilize the Minimum Wind Speed from the speeds collected from pressing and holding the “Capture” button. MIN Wind Speed can be great when used in tandem with MAX Wind Speed to capture the range of wind speeds to determine your wind correction range.

Press the “Back Arrow” button to return to the Menu and continue to Weather Menu.

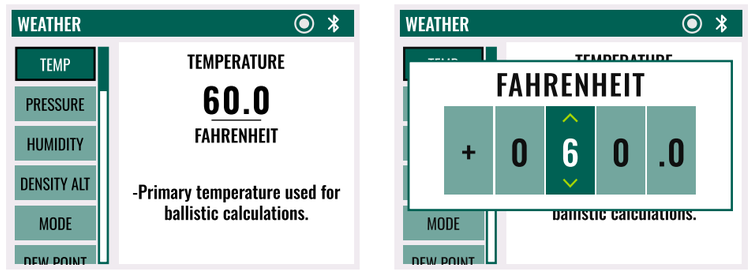
Weather

Navigating to the Weather screen will show you the high-level details of your Temperature, Pressure, Humidity, Density Altitude, and the Weather Source. Pressing the “Enter” button will open the Weather Menu. From the Weather Menu, users can view and edit their Temperature, Pressure, Humidity, and Weather Mode. Users can also view Density Altitude, Dew Point, and Feels Like Temperature from the Weather Menu.



Temperature

Temperature corresponds to the ambient temperature surrounding you and your equipment. The Temperature screen displays the temperature currently being utilized to calculate ballistic corrections. To update, Temperature can be captured using the external thermometer by pressing the “Capture” button or can be manually adjusted by pressing the “Enter” button.

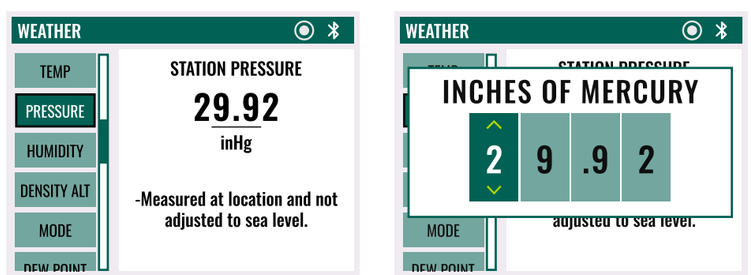


Temperature Input Box

Note: Temperature can be displayed in Fahrenheit (°F) or Celsius (°C). This can be selected in the Settings Menu.

Pressure

Pressure corresponds to the ambient atmospheric pressure surrounding you and your equipment. This is also known as station pressure. The Pressure screen displays the atmospheric pressure currently being utilized to calculate ballistic corrections. To update, Pressure can be captured using the internal barometer by pressing the “Capture” button or can be manually adjusted by pressing the “Enter” button.

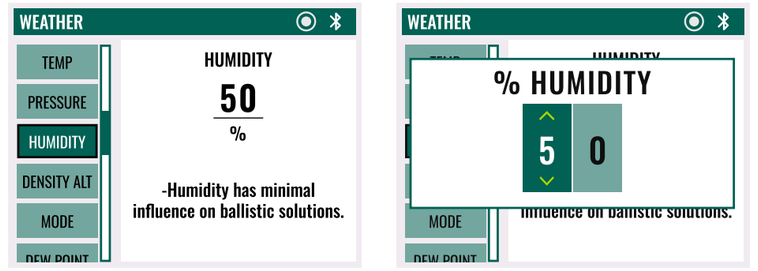


Pressure Input Box

Note: Pressure can be displayed in inches of mercury (inHg) or millibars (mb). This can be selected in the Settings Menu.

Humidity

Humidity corresponds to the amount of water vapor present in the air expressed as a percentage of the amount needed for saturation at the same temperature. The Humidity screen displays the relative humidity currently being utilized to calculate ballistic corrections. To update, Humidity can be captured using the internal hygrometer by pressing the “Capture” button or can be manually adjusted by pressing the “Enter” button.

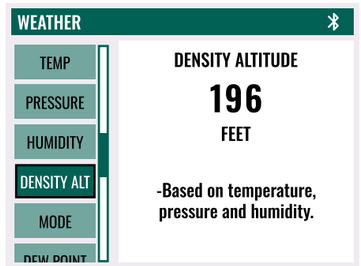


Humidity Input Box

Density Altitude

Density Altitude is a value derived from a combination of Temperature, Pressure, and Relative Humidity and can be used as a quick reference for atmospheric conditions. The Density Altitude screen displays the Density Altitude currently being utilized to calculate ballistic corrections.

Note: Density Altitude can be displayed in feet (ft) or meters (m). This can be selected in the Settings Menu.

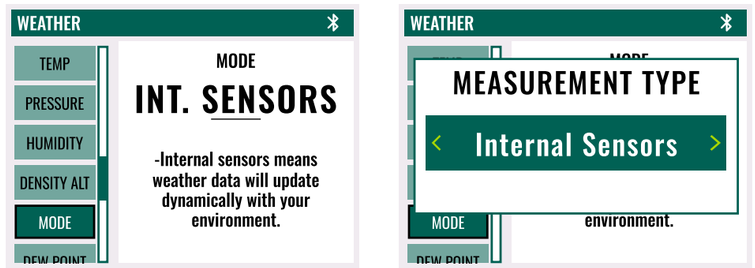


Weather Mode

The Weather Mode screen displays where the weather data is coming from. In this screen you can select between Internal Sensors or Manual. When Internal Sensors is selected, the readings will continually update with sensor readings. When Manual is selected, the manually entered weather data will be locked in until manually changed or when the “Capture” button is pressed.

Note: A lock icon will appear in the top right corner of the screen when the device is in Manual Mode. When in Internal Sensors Mode, no icon will be present.

Note: If the Weather Mode is set to Internal Sensors, and a manual change is made to a weather value, the mode will automatically switch to Manual Mode and lock in the manually inputted value.

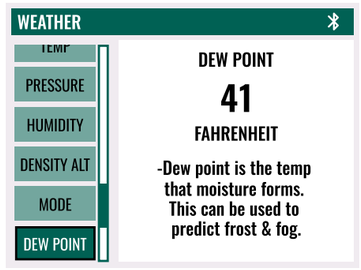


Weather Mode Input Box

Dew Point

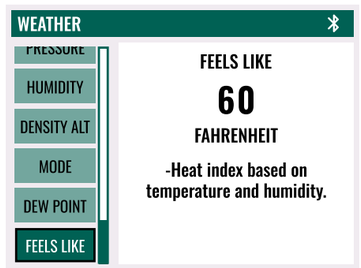
The Dew Point is the temperature at which water vapor can condense. This temperature can be used to help predict fog and frost.

Note: Dew Point can be displayed in Fahrenheit (°F) or Celsius (°C). This can be selected in the Settings Menu.



Feels Like Temperature

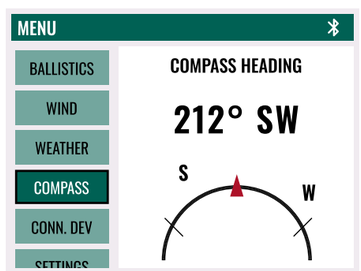
The Feels Like Temperature is how the Wind Speed, Pressure, and Humidity combined with the air Temperature feels on our skin. If it’s hot outside this value is typically referred to as the Heat Index. In colder temperatures this is referred to as Wind Chill.



Press the “Back Arrow” button to return to the Menu and continue to the Compass Menu.

Compass

The Ace™ features an internal compass. The Compass screen will display the current compass heading. Pressing “Enter” to open the Compass screen and will display additional detail surrounding the compass heading and allow the user to calibrate the internal compass. Compass calibration is important for the accuracy of the on-board compass.



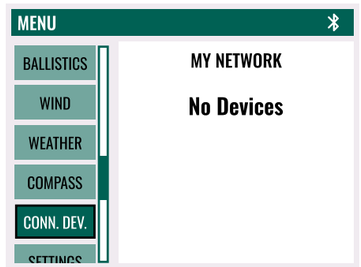
The Ace™ needs to be calibrated during initial setup and should be re-calibrated every time you significantly change location, typically 30 miles or more, or after battery changes. Calibrate your Ace™ outside and away from large metal structures or objects with the Wind Impeller Cover closed.

For instructions on how to calibrate your Ace™ see the “Compass Calibration” section on pages 10-11.

Press the “Back Arrow” button to return to the Menu to update Connected Devices settings.

Connected Devices

The Ace™ Ballistic Weather Meter can connect with other Vortex Relay™ devices to maximize shooting accuracy and efficiency through real-time data sharing. Vortex Relay™ is a closed network that recognizes and remembers every Vortex Relay™ enabled device in your long-range toolkit. Set it up once, and it reliably reconnects every device, every time. Connecting multiple Vortex Relay™ products seamlessly integrates your ballistic tools and transmits information between devices so you don’t have to.



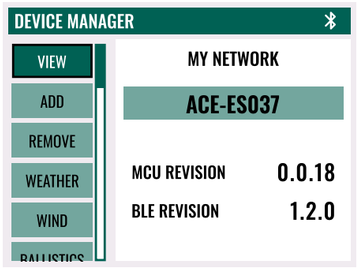
Note: The Ace™ Ballistic Weather Meter is a stand-alone device. Connection to other Vortex Relay™ devices is not required.

Device Manager

Select “Connected Devices” to open the Device Manager. On the Device Manager screen you can see your Device Name, MCU Revision, and BLE Revision. From the Device Manager screen you can view, add, or remove compatible Vortex Relay™ devices to your network and connect to a Vortex Relay™ Bluetooth® Remote. From the Device Manager screen, you can also designate which devices in your network provide Ballistics, Weather, and Wind information.

View

On the View screen, you can view which devices are currently connected via the Vortex Relay™ Network. To show up on the network, the devices must be previously added and turned on. When you select a device, you can see the latest software information.

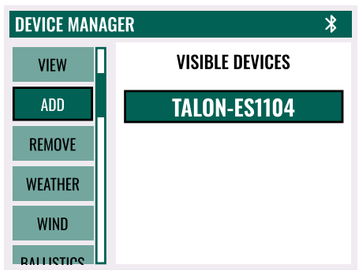


Note: A network is a group of devices and/or mobile applications that communicate to each other. Devices can only be connected to one network at a time.

Note: On the screen, a coin icon (1) with a number will appear to indicate how many devices are on the network. A “1” indicates that the Ace™ is the only device on the network. A “4” would indicate that three other devices are on the network with the Ace™.

Add

The Add screen is where you can add devices to your network. The Ace™ will automatically find all compatible devices on the Vortex Relay™ Network that are turned on and within Bluetooth® range (approximately 30 feet) that are not already connected to another network. Select the device from the list that you wish to add. When the new device joins the network, if the Profiles or Range Cards are different, you will be asked on both devices which device’s information should be used. After a decision is made, the information will be synchronized across all devices on the network to ensure one version of the truth. Repeat to add any additional devices.

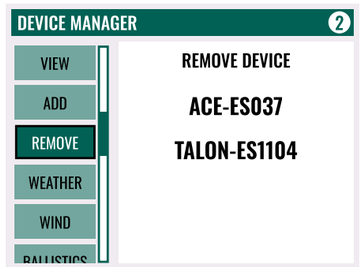


Note: While not required, we do recommend connecting the Ace™ to the GeoBallistics® App at a minimum to create your network. Once it is on your network, it is not discoverable to other nearby Vortex Relay™ devices.

Remove

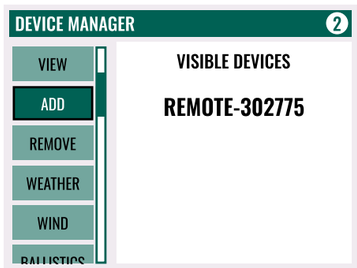
The Remove screen is where you can remove devices from your network. Select the device you wish to remove from the network.

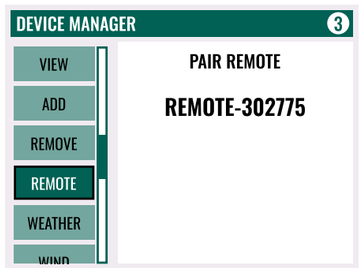
Note: You can remove your Ace™ device from your network if you wish to join another network or if you sell or lend your Ace™ to someone else.

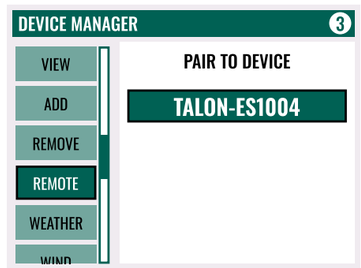


Remote

The Remote screen will appear when a Bluetooth® Remote is added to your network. This screen is where you can control which device your Bluetooth® Remote is paired with. Select your remote, and then select which device you’d like to connect your remote to. Connected devices will be denoted with an arrow.







Blinking Red

- Not On a Network

Blinking Orange

- On a Network
- Not Connected to a Device

Blinking Green

- On a Network
- Communicating With a Device

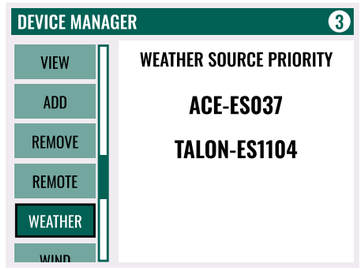
Note: When the Bluetooth® Remote blinks red, it is not on a network. When it blinks orange, it is on a network, but not connected to any other device. When it blinks green, it is on the network and communicating with another device on the network.

Note: You are not able to connect the remote to control the Ace™ or GeoBallistics® App. To manually disconnect the Bluetooth® Remote from a device but keep it on the network, press and hold the remote’s “Left Arrow” button and “Right Arrow” button together for three seconds. The Bluetooth® Remote can also be disconnected from the network manually by pressing and holding the remote’s “Up Arrow” button and “Down Arrow” button together for three seconds.

Weather

Once you have connected your devices to your network, select "Weather" on the Device Manager Menu and select which device you'd like to provide weather information. Weather can be sourced from the Ace™ on-board Environmental Sensors, another Vortex Relay™ device, or from the GeoBallistics® App. The GeoBallistics® App can source weather from local weather stations or third-party weather meters.

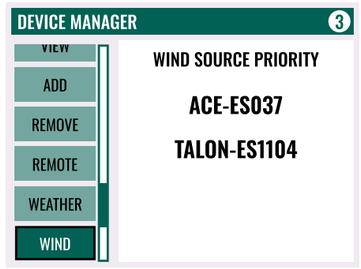
Note: Devices are shown in priority order. This is the order the network will use to determine the Weather Source should not all network devices be present.



Wind

Select "Wind" on the Device Manager Menu and select which device you'd like to provide wind information. Wind data can be sourced from the Ace™ on-board Environmental Sensors, another Vortex Relay™ device or from the GeoBallistics® App. The GeoBallistics® App can source wind data from local weather stations or third-party weather meters.

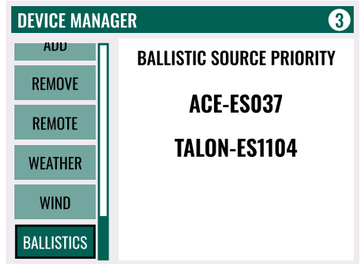
Note: Devices are shown in priority order. This is the order the network will use to determine the Wind Source should not all network devices be present.



Ballistics

Select "Ballistics" on the Device Manager Menu and select which device's on-board solver you'd like to provide ballistics.

Note: Devices are shown in priority order. This is the order the network will use to determine the Ballistic Source should not all network devices be present.



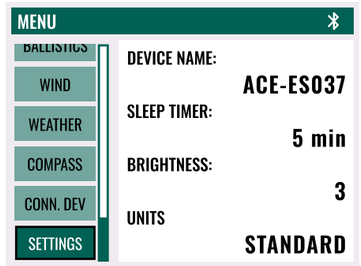
Press the "Back Arrow" button to return to the Menu to update Settings.

Settings Menu

From the Settings Menu you can access and modify Ace™ settings. You can view helpful information about the connected module and device information. Also, the factory reset is available within the Settings Menu.

Settings

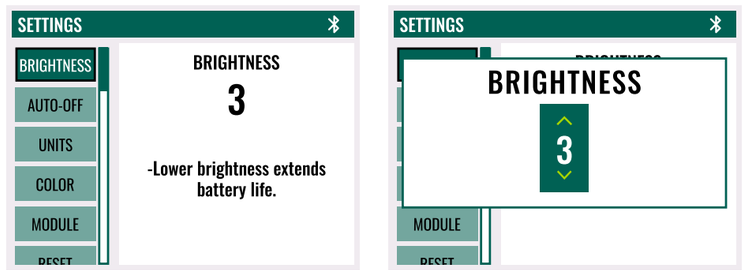
The Ace™ is factory set to Brightness Level 3, an Auto-Shutoff of 5 minutes, Standard Units, and Light Color Scheme.



Brightness Selection

Choose Between Five Brightness Settings

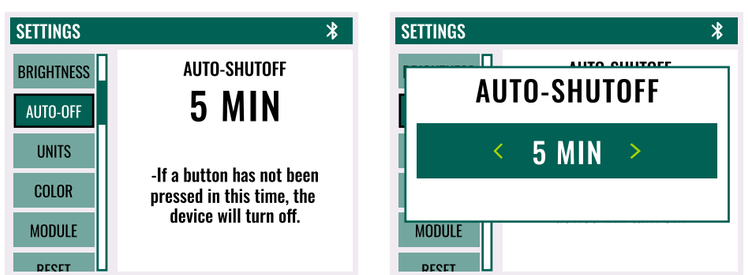
The Ace™ features five brightness settings. Select "Brightness" and toggle through the five settings and select your desired brightness level. Press "Enter" to save your desired brightness level.



Brightness Input Box

Auto-Shutoff Selection

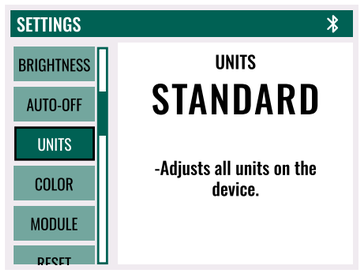
The Ace™ offers six Auto-Shutoff options: 30 seconds, 1 minute, 5 minutes, 10 minutes, 30 minutes, and Always On. Select "Auto-Off" to toggle through the six settings. Press "Enter" to save your desired setting.

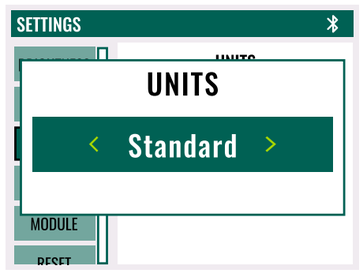


Auto-Shutoff Input Box

Unit Selection

The Ace™ offers the selection of standard or metric units. This will set all applicable Riflescope Units, Weather Units, and Distance Units to that unit of measure. Select “Units” to edit your unit selection. Press “Enter” to save your desired selection.

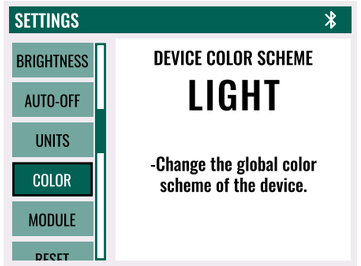


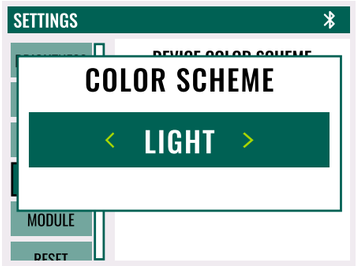


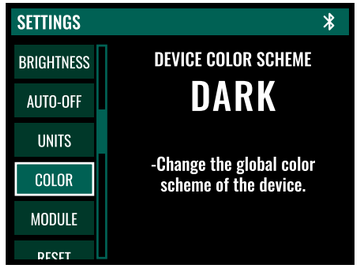
Units Input Box

Color Scheme

The Ace™ offers a Light and Dark Color Scheme. To change the Color Scheme, select “Color” and toggle through options. Press “Enter” to save your desired color choice.





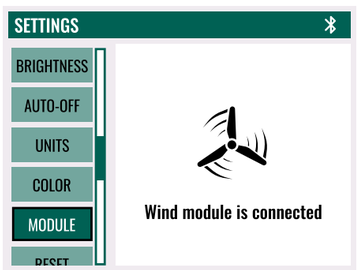


Color Scheme Input Box

Module

From the Module screens, users can see which Module is currently connected to the Ace™. The Ace™ comes with the Wind Module.

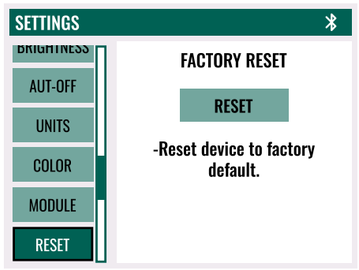
Note: With the Wind Module removed, the Ace™ is no longer waterproof.

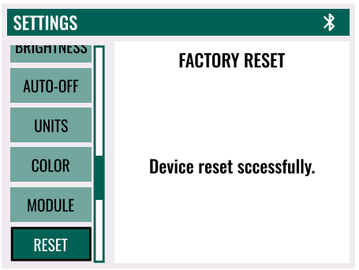


Reset

The Reset screen can be used to restore the Ace™ to factory settings. Select “Reset” to reset the device.

Note: This will clear your Ballistic Charts, Range Cards, Ballistic Profiles, and all other selections made. If you wish to save a copy of your Range Cards and Profiles prior to performing this step, make sure to sync your device with the GeoBallistics® App.



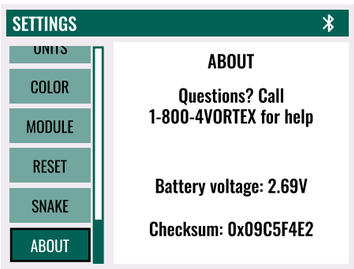


Snake

A little something to keep you entertained during those long hunts or downtime between stages.

About

This screen includes helpful device information should you ever need Technical Support along with the Vortex® Technical Support phone number **1-800-4VORTEX (1-800-486-7839) Ext. 1**.

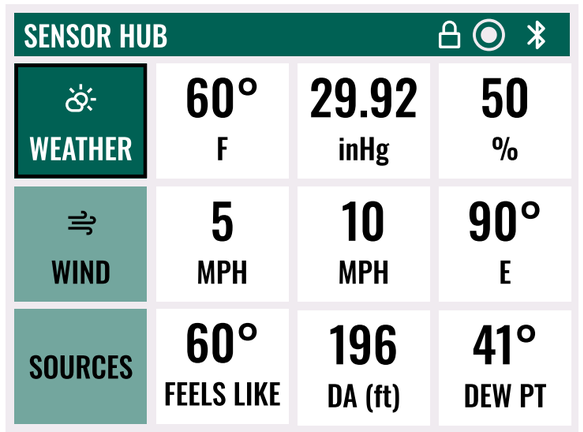


Press the “Back Arrow” button to return to the Menu.

Press the “Back Arrow” button again to return to the Dashboard.

SENSOR HUB

The Sensor Hub screen is a great screen to utilize for a quick reference for weather and wind data. From this screen you can see the current inputs for Temperature, Pressure, Humidity, Wind 1, Wind 2, Wind Direction, Feels Like Temperature, Density Altitude, and Dew Point.



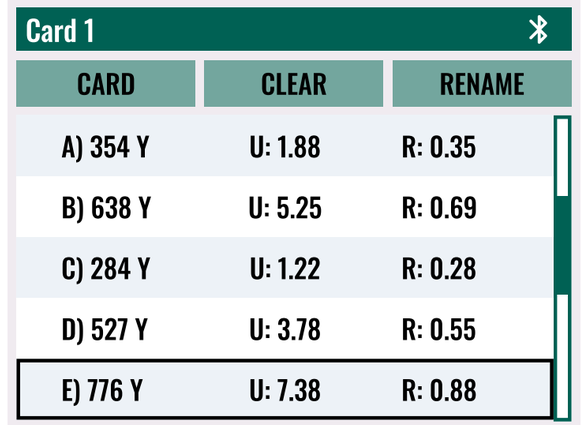
On this screen you can capture all weather inputs by pressing the “Capture” button with “Weather” selected. You can also capture all wind inputs by pressing the “Capture” button with “Wind” selected.

You can also quickly access the Weather Menu, Wind Menu, and Wind and Weather Sources by selecting them on the screen.

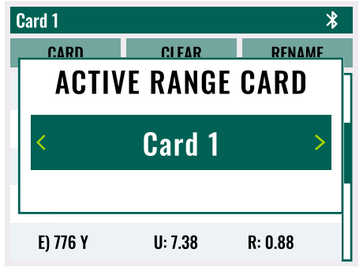
Press the “Back Arrow” button to return to the Dashboard and continue to Range Cards.

RANGE CARD

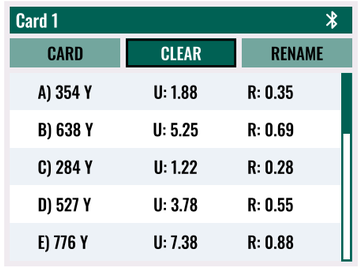
A Range Card can help provide quick and accurate ballistic solutions that can be used again and again. The Ace™ has the capability to store 10 Range Cards. Within each Range Card, 10 targets can be stored. On this screen, you can edit any of the 10 default Range Cards or access any saved Range Cards.

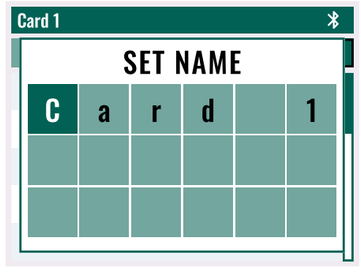


At the top of the screen, you can select between saved Range Cards by selecting “Card” and toggling left and right through the list. You can select “Clear” to clear out any saved values. You can name your Range Card by selecting “Rename”. Use the Left and Right Arrow buttons to select which character to edit and the Up and Down Arrow buttons to toggle through keyboard options.



Active Range Card Input Box





Set Name to Range Card Input Box

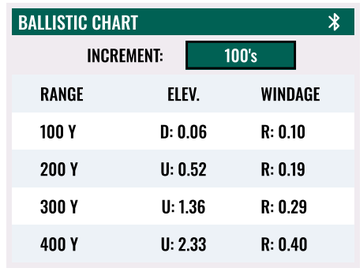
Within the Range Card, the first column displays Range. Ranges can entered from a connected Vortex Relay™ laser rangefinder or be manually entered by selecting with the “Enter” button and toggling up and down. The second column is the Elevation Correction denoted with “U” for up or “D” for down, and the third column is the Windage Correction relative to Wind 1, denoted with “L” for left and “R” for right. The ballistic solutions will be in MOA, MRAD, or inches, whichever you’ve selected. Solutions will automatically update as the Range is modified. Use the Up Arrow and Down Arrow buttons to scroll through targets A-J.

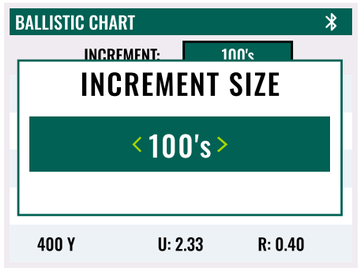
Note: The Range Card will save the Range, Inclination Angle, and Target Direction Angle. If you update your wind or weather parameters or your Profile, your Range card and Ballistic Solutions will automatically update accordingly.

Press the “Back Arrow” button to return to the Dashboard and continue to Ballistic Chart.

CHART

Ballistic Charts are a great quick reference when shooting at known distances or shooting ranges. On this screen, you will see a chart with ballistic solutions at given Range increments for your selected Profile. At the top of the screen, you can select between 10, 25, 50, or 100 (yard or meter) increments for your chart's layout. Within the chart you will see the Elevation and Windage Correction for each distance. The Elevation Correction will be denoted with "U" for up or "D" for down and the Windage Correction, relative to Wind 1 will be denoted with "L" for left and "R" for right. The ballistic solutions will be in MOA, MRAD, or inches (IN), whichever you've selected when setting up your Profile. Use the Up Arrow and Down Arrow buttons to scroll up and down the screen.





Increment Size Input Box

Note: If you update your wind or weather parameters or your Profile, your Ballistic Chart and ballistic solutions will automatically update accordingly.

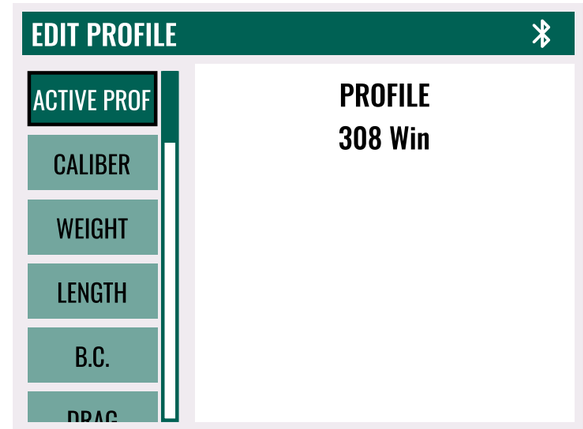
Press the "Back Arrow" button to return to the Dashboard and continue to Profile.

PROFILE

The Profile section of the Dashboard allows for quick access to select, view, and edit your Active Profile. The Ace™ comes with 10 common default Ballistic Profiles. The Profiles can be used as is or customized to reflect your specific rifle and bullet combination.

Note: The Ace™ must always have 10 Ballistic Profiles. Ballistic Profiles cannot be added or deleted.

The default Profiles include .308 Winchester®, 6.5 Creedmoor®, .223/5.56, .30-06, .300 Winchester® Magnum, .270 Winchester®, 7mm Remington® Magnum, .243 Winchester®, .22-250 Remington®, and .22 Long Rifle.



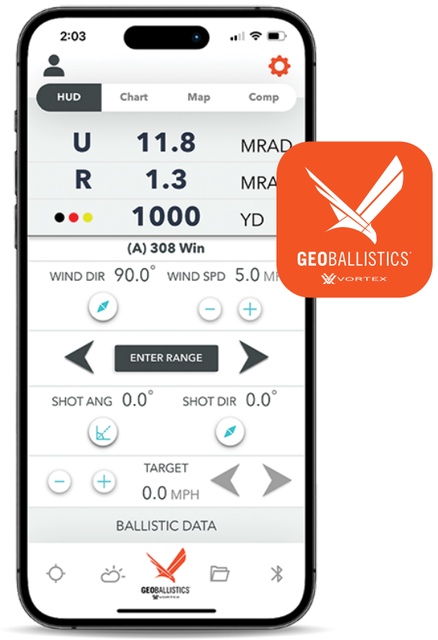
From the Edit Profile screen, you can view and edit the Active Profile inputs including Bullet Caliber, Bullet Weight, Bullet Length, Ballistic Coefficient, Drag Model, Sight Height, Zero Range, Barrel Twist Rate, Muzzle Velocity, Sight Units, and you can Rename the profile.

For more information regarding these inputs and how to find or measure them, see the Profile section of the Menu on pages 75-76.

GEOBALLISTICS® APP

While use of the GeoBallistics® App is not required, it can be a great tool for quick edits and inputs and offers additional features. Go to your device's app store and download the GeoBallistics® App.

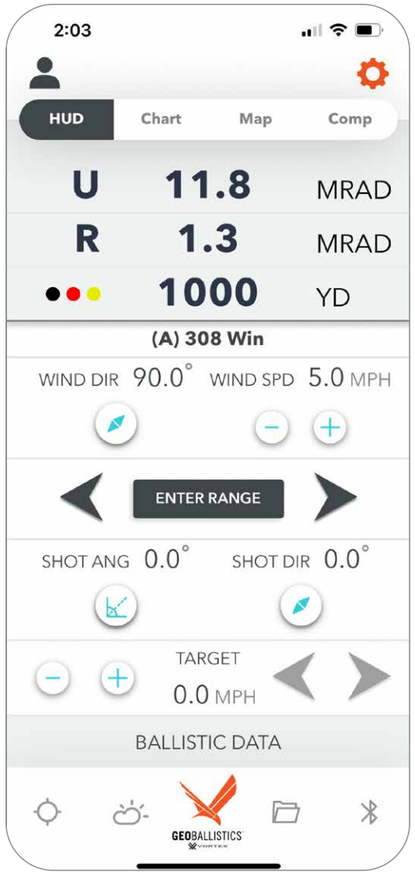
SCAN QR CODE TO GET STARTED



NAVIGATING THE GEOBALLISTICS® APP

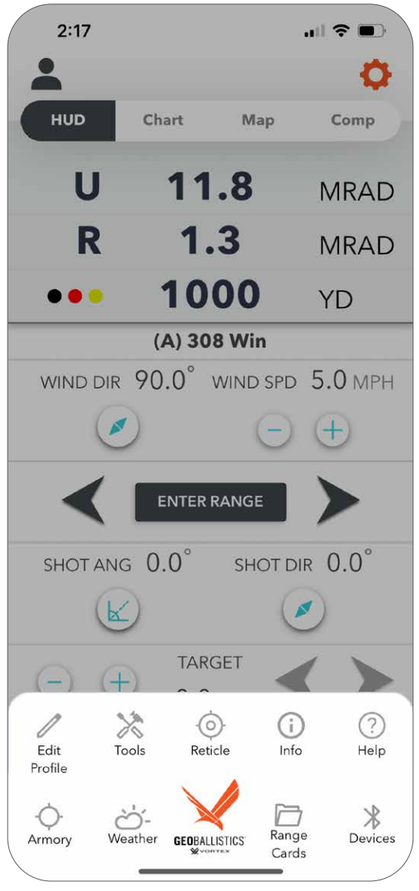
From the main screen of the GeoBallistics® App, you will see these main icons:

ICON	NAME	FUNCTION
	Account	On the Account page you may log into your account to access your Profiles and Range Cards.
	App Settings	On the App Settings page you may customize your app experience by selecting preferences, units, and more.
	Armory	On the Armory page you can create, edit, delete, and sort profiles to be used for your ballistic devices. You can also create and store your rifles, bullets, optics, and muzzle devices for use within Profiles.
	Atmospherics	On the Atmospherics page you may view and input weather data, connect to a weather meter, or select a nearby airport to pull weather data from.
GEOBALLISTICS VORTEX	**Quick Access Menu**	Pressing the GeoBallistics® logo provides quick-access to features including Edit Profile, Tools, Reticle View, Info, and Help.
	Range Cards	On the Range Cards page you may save your range card data created in the GeoBallistics® App.
	Manage Devices	On the Manage Devices page you may connect compatible devices to the GeoBallistics® App and edit your preferences with each device.



By pressing the GeoBallistics® Logo you can open the Quick Access Menu. From this menu you can access the Edit Profile, Tools, Reticle View, GeoBallistics® Info and Help screens by clicking on the icons below:

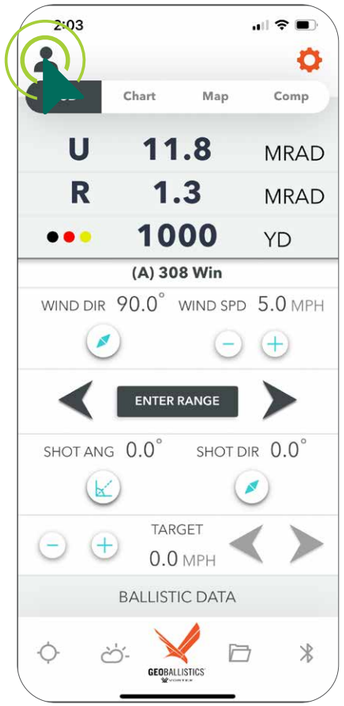
ICON	NAME	FUNCTION
Edit Profile	**Edit Profile**	On the Edit Profile page you can access and make quick edits to the Active Profile.
Tools	**Tools**	On the Tools page you can access calculators for Target Distance, Target Size, and a MOA/MRAD conversion.
Reticle	**Reticle View**	On the Reticle View page you can see your ballistic correction holdovers on your reticle for the Active Profile.
Info	**GeoBallistics® Info**	On the GeoBallistics® Info page you can see high level app navigation information.
Help	**Help**	On the Help Center page you can access Vortex® Contact information and FAQs for common issues.



Creating an Account

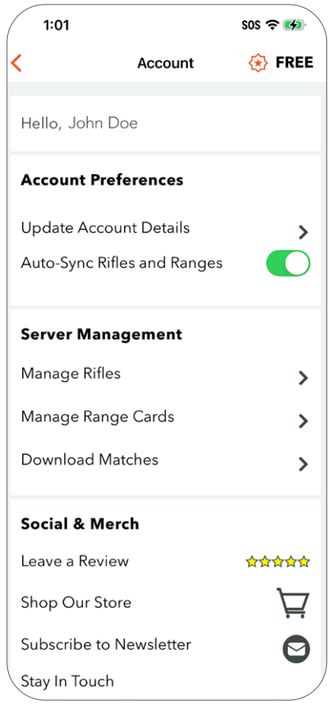
Although it is not required, we recommend creating an Account on the GeoBallistics® App. Doing so will ensure your data is backed up should anything ever happen to your device or app.

1. To create an account, select the icon from the top left corner of the Home screen.
2. Click the “Register” link from the Account Page.
3. Once you’ve registered and created an Account, you will be able to manage your Account Preferences.



STEP 1

STEP 2



STEP 3

GeoBallistics® App Main Screens

Across the top of the main screen of the GeoBallistics® App, there are four tabs: HUD, Chart, Map, and Comp. See the App Settings Menu section on page 69 for more information regarding how to select which tab is your default when first opening the GeoBallistics® App.

HUD Tab

From the HUD tab, you will see your ballistic solution displayed in either MOA, MRAD, or inches based on your preferences.

You will also see wind and target information based on data collected from either the Ace™, GeoBallistics® App, another Vortex Relay™ device, a third-party weather meter, or selected airport data. Here you may also click any buttons below each data point to capture measurements from your mobile device. Wind Speed can be changed manually. Below is the Enter Range button. This button can be used to manually enter Range from the app and push it to the Ace™. Clicking either the Left or Right Arrow next to this button will manually change the Range value.

You can tap on the respective icons to have your phone measure Shot Angle and Shot Direction. Double tapping the icons will zero out these values.

For Target, you may select the speed and direction of a moving target to add this data to your ballistic solution.

On the bottom of the screen is Ballistic Data. This is based on information from your selected Profile. See pages 75-76 for more information about Profiles.

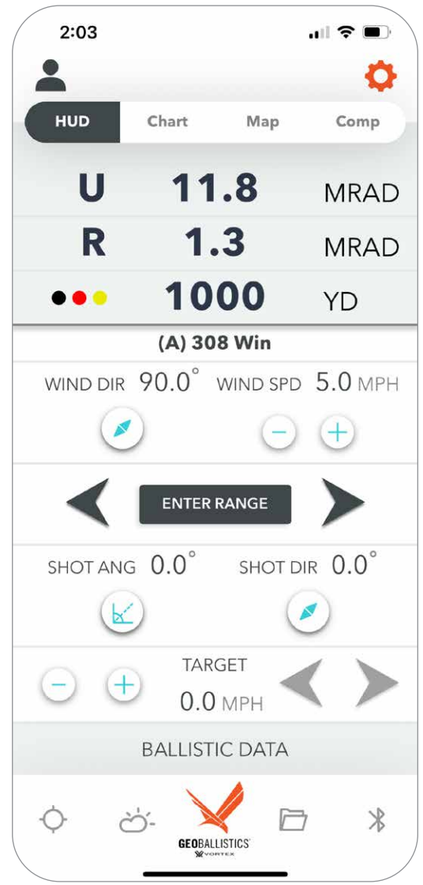


Chart Tab

From the Chart tab, you will see data for Shot Angle, Shot Direction, and Range. Here you may also manually input this data to change your ballistic solution.

Shot Angle°

This displays your Shot Angle in degrees from the horizon (ex: level = 0°, straight up = 90°).

Shot Direction°

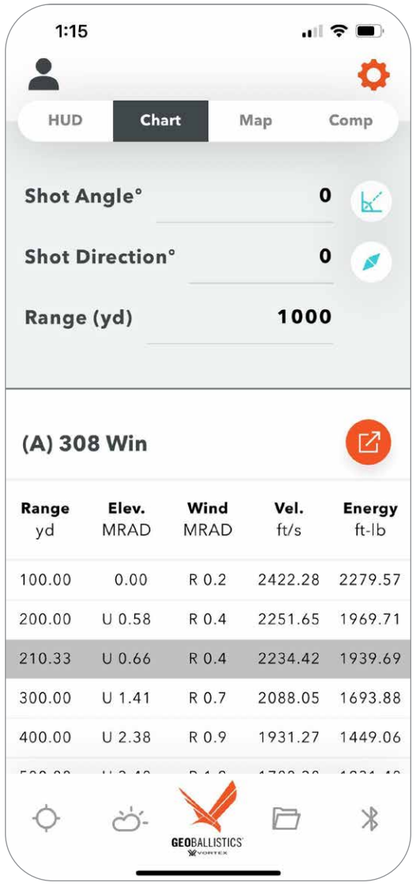
This displays Shot Direction in degrees from due north (ex: north = 0°, east = 90°, south = 180°, west = 270°).

Range

This displays the maximum chart distance either manually entered or the ranged distance in either yards or meters.

You will also see a chart containing ballistic information based on your selections. You can modify the range increments and units on the App Settings page. If values are set for the GeoBallistics® Overlays within your Profile, you will see gray, red, and yellow highlighted rows to denote those values within the chart. See the GeoBallistics® Overlays section on page 85 for more information.

You may export the chart data using the button.



Map Tab

From the Map tab, you may locate your current position by clicking .

While on this tab, you can use the shooter icon to drop a pin to denote your location and the target icon to drop pins for your target's locations. You may also use a Vortex Relay™ laser rangefinder to range a target, which will then drop a pin on the map representing that target's position.

Use your finger to move the cursor around the Map screen. You will be shown the distance and direction of that point from your position if you have dropped the shooter position pin. If you have dropped target pins, you may click on each one to name them and to see the calculated ballistic solution, additional information, or delete the target.

If your target position is far enough to show your GeoBallistics® Overlays, they will appear using a black dot (Max Vital Range), red dot (Energy Threshold), and yellow dot (Velocity Threshold). The line will also change color (dashed black, red, or yellow) to indicate you are beyond that threshold. You can save the pin positions to your Range Card folders by clicking the save icon or export them to your Comp tab by clicking the export icon. You can also change the map view to either terrain, standard, hybrid, or satellite view by pressing the map icon .

Comp Tab

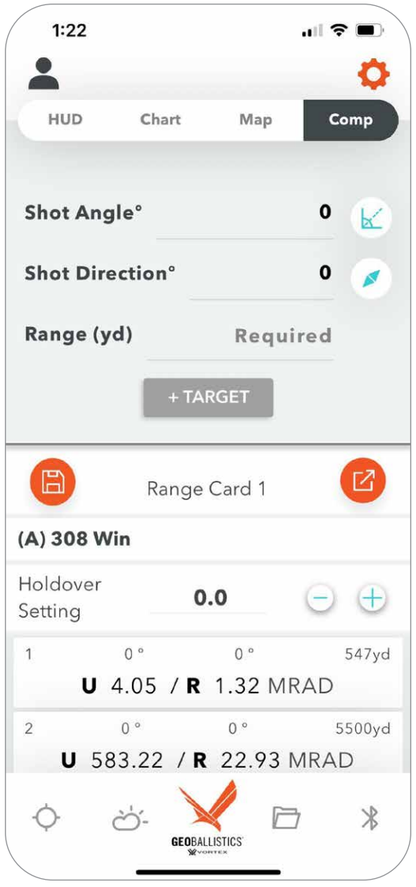
From the Comp tab, you may manually enter Shot Angle, Shot Direction, and Range. This information can also be populated with data from the Ace™.

On this screen, you can build Range Cards. Range Cards built on the Comp tab will automatically update to the Ace™ or any other devices on the network when connected.

Changing Profile, weather, or wind information will automatically update your Range Card solutions. Ensure these inputs are updated to ensure accurate solutions. The selected Profile is shown next to the (A-J) designation depending on how your Profiles are sorted.

Once the desired values for Shot Angle, Shot Direction, and Range are populated, press the + TARGET button to save the ballistic solution for that target. You will see the ballistic solution appear at the bottom of the screen.

Repeat this process for additional targets if desired. By clicking the "Edit" button, you can modify the input parameters for an individual target entry by clicking the box next to the entry or all entries at once by clicking the box next to "Select All Targets". You may also re-order the target entries by either pressing the Up and Down Arrows or by typing the order number in the space provided. Click "Save" to save your changes. You can also click "Clear" to delete all target entry data.



Once you have at least one target entry saved, you may modify the Holdover Setting by clicking ⊖ or ⊕ or by manually entering the desired value. This setting can be used to set the elevation value on your reticle that you plan to use as a holdover. For example, if you have targets that call for Elevation Corrections of 3.0, 4.2, and 5.5 MRAD, you can set the holdover correction to 3.0 and hold center, 1.2, and 2.5 MRAD.

Once you've created your Range Card, you can save the data to your Range Card folders by clicking save or export the data to several options by clicking . Range Cards saved to the Vortex Relay™ Range Cards Folder will be automatically synced with your Ace™.

PAIRING THE ACE™ TO THE GEOBALLISTICS® APP

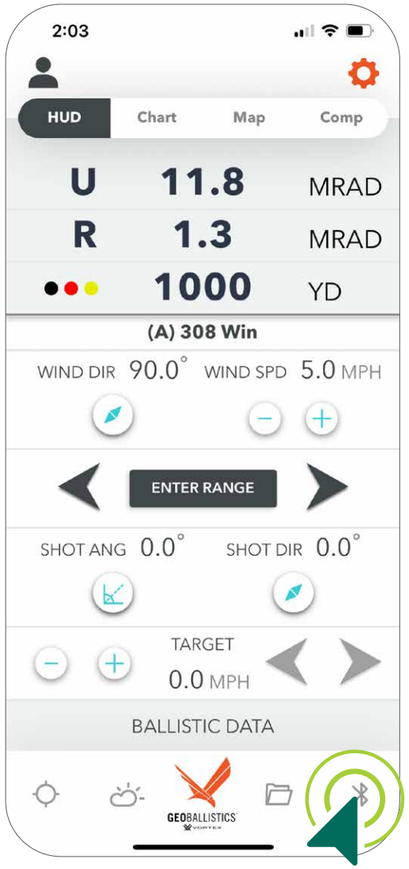
To pair your Ace™ with your mobile device, ensure the Bluetooth® on your mobile device is turned on and the GeoBallistics® App has been allowed access to your mobile device's location services.

Pairing the Ace™ to the GeoBallistics® App

1. Power on the Ace™. Ensure the Bluetooth® icon is visible on the top right corner of the screen.

   Note: If the Bluetooth® icon is not visible, click on the "Join an Existing Network" pop-up on the GeoBallistics® App.

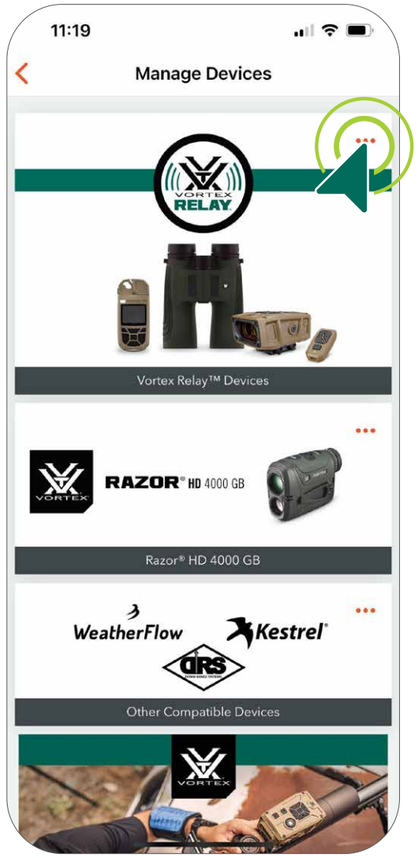
2. Open the GeoBallistics® App and select the Bluetooth® symbol in the lower right-hand corner of the screen.

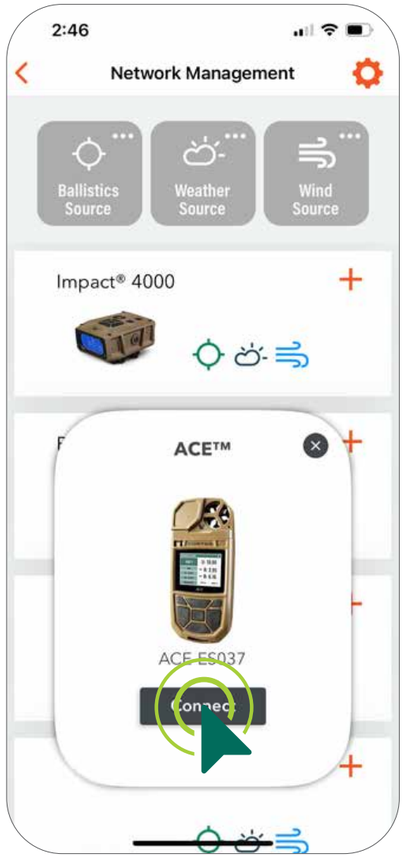


3. Select the Vortex Relay™ tile.
4. You should be prompted with a Ace™ pop-up. Click "Connect".

   Note: If not prompted, press the + icon next to the Ace™ image. Tap on your Ace™ referencing the last four digits of the serial number on the back of your Ace™. This will connect the unit with the GeoBallistics® App.

   Note: If the Ace™ is already on a network, you will be prompted to join the existing network automatically.





The GeoBallistics® App and Ace™ are now connected. This is denoted by a blue Bluetooth® symbol next to the Ace™ on the GeoBallistics® App. Also, a Vortex Relay™ 

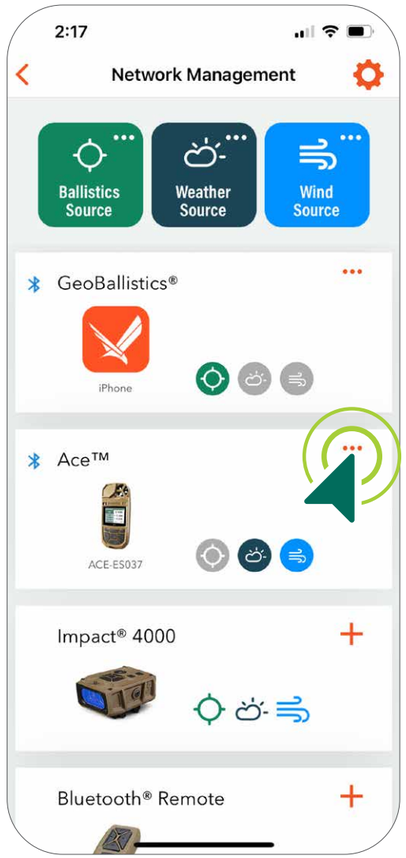
icon with the number of devices on the network with appear while on the main screens of the GeoBallistics® App.

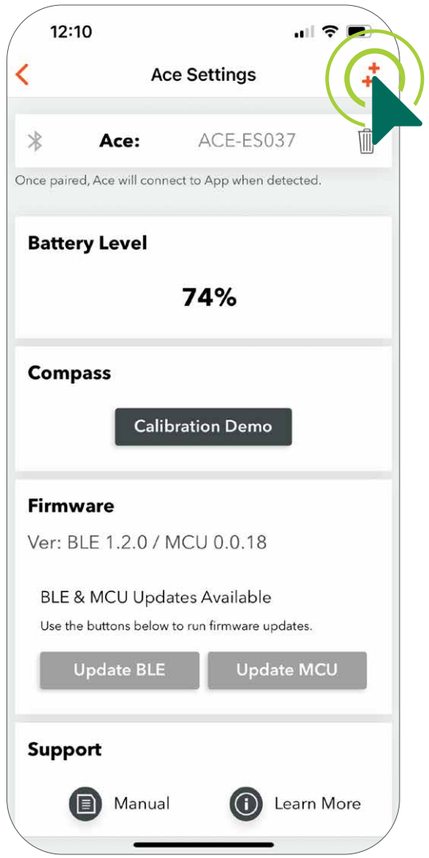
Note: Follow the same process to add additional Vortex Relay™ devices to your network.

Adding a Second Ace™ to Your Network

If you need to add a second Ace™ device to your network, you can do so by following the same instructions above. If you are not prompted, you can add it manually by following the instructions below.

1. Select the ellipses ••• next to the Ace™ on the Network Management page to open Ace™ Settings.
2. Select the + icon on the top right corner of the page.
3. Ensure your Ace™ is on and select it from the list.



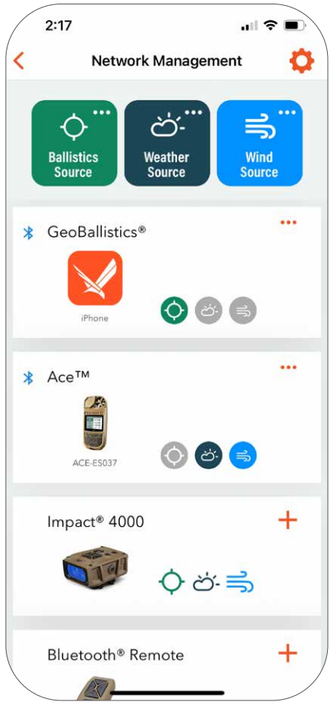


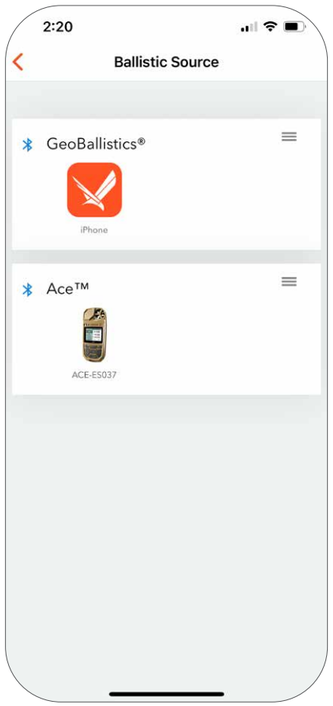
4. 4. Your Ace™ is now connected.

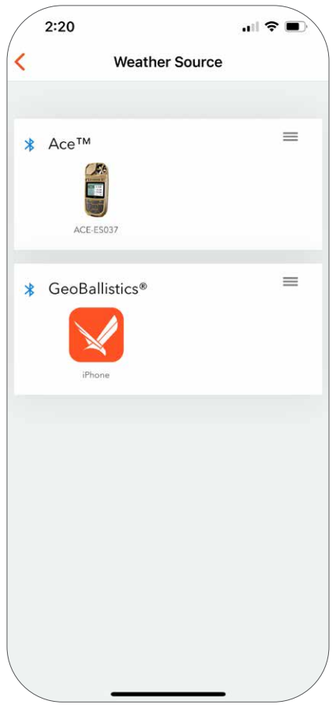
Choosing Data Sources

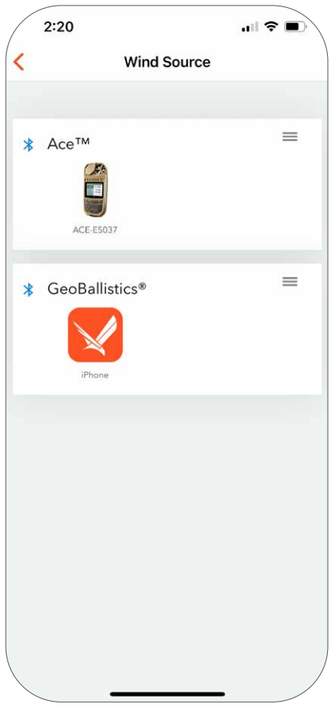
You can customize where your ballistic, weather, and wind information are coming from on your network. To do so, from the Network Management screen, select the ballistics icon next to the device you would like to calculate your ballistic solution. Select the weather icon next to the device you would like to provide weather and the wind icon next to the device you would like to provide wind information.

You can establish a priority as to which devices will provide which information by selecting the Ballistics Source, Weather Source, and Wind Source icons at the top of the page. The priority would come into effect if one of your devices was not present or not connected to the network.









ACE™ SETTINGS MENU

Bluetooth® Connection Status

If your Ace™ is connected it will be denoted by a blue Bluetooth® symbol. If your device is not connected, the symbol will appear gray.

Disconnecting a Device from the Network

To disconnect a device from the network from the Ace™ Settings Menu, simply click the trash can icon next to the device name.

Battery Level Indicator

The Ace™ battery level will be displayed in this section of the Ace™ Settings Menu.

Compass

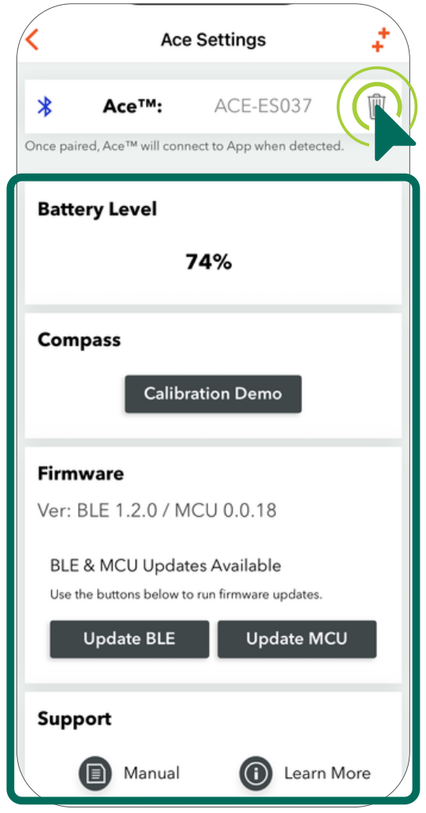
To calibrate the compass, press the “Calibration Demo” button. Follow the on-screen prompts or see pages 10-11 for step-by-step calibration instructions.

Firmware

This section shows the latest firmware version for Ace™. If there is an update available, it will be listed in this section. You will also be automatically prompted if it is detected that you have an older version of software on your device. Press the “Update” button to update to the latest version. Read and follow all prompts. Do not turn your devices off during this process.

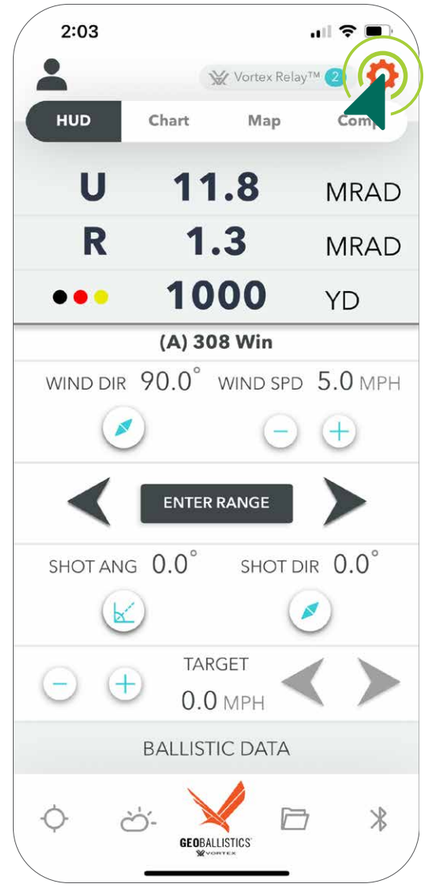
Support

This section has more information about the product.



APP SETTINGS MENU

To navigate to the App Settings Menu, select the settings icon in the upper right-hand corner of the screen. While in the App Settings Menu you will be able to change App Preferences, Ballistic Preferences, Mobile Sensors, Chart Increments, Distance Units, Rifle Profile Units, and Weather Units.



At the top of the App Settings screen, you'll see HUD, Chart, Map, and Comp. By selecting one of these options, that will be the default when opening the app.

App Preferences

Auto-Locate

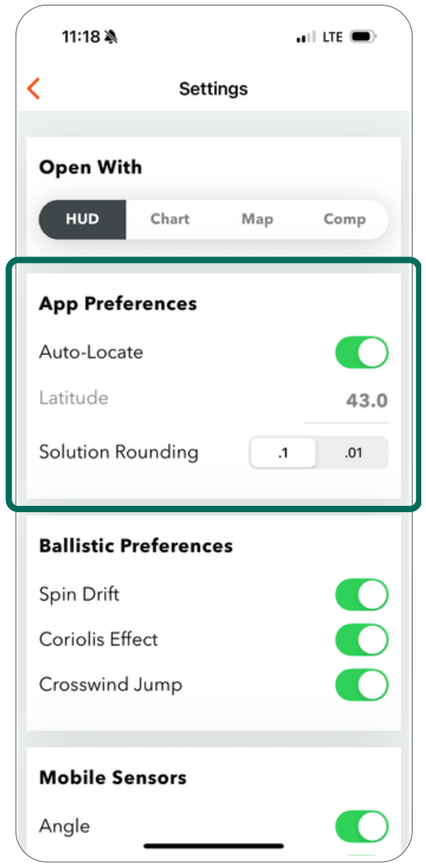
Auto-Locate will use your mobile device's latitude for ballistic calculations.

Latitude

Latitude allows for manual entry of latitude. This is disabled if Auto-Locate is on.

Solution Rounding

Solution Rounding allows you to set how many decimal places you would like the app solution to display.



Ballistic Preferences

For the most accurate ballistic solution, it is recommended to have Spin Drift, Coriolis Effect, and Crosswind Jump enabled.

Spin Drift

Spin Drift is a bullet's drift left or right due to the spin imparted by the Bullet Length in conjunction with Barrel Twist Rate, and the interaction of gyroscopic and aerodynamic forces.

The Ace™ accounts for the effect of Spin Drift on the bullet when solving for your ballistic solution. To turn Spin Drift ON/OFF, tap the toggle icon.

Coriolis Effect

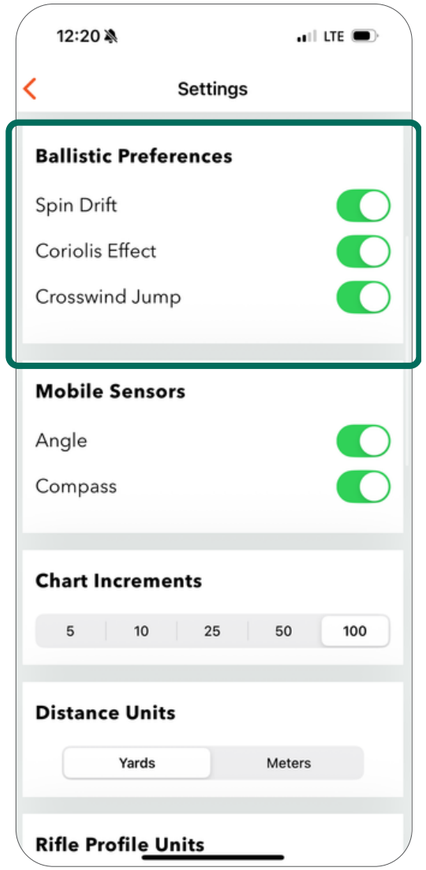
Coriolis Effect is the effect that Earth's rotation will have on long-range shot precision, moving the target slightly away from the bullet's intended point of impact during the time of flight.

The Ace™ accounts for the effect of Coriolis Effect on the bullet when solving for your ballistic solution. To turn Coriolis Effect ON/OFF, tap the toggle icon.

Crosswind Jump

Crosswind Jump refers to the small but measurable +/- vertical influence on a bullet's flightpath by a crosswind. The higher the wind velocity, the greater the influence.

The Ace™ accounts for the effect of Crosswind Jump on the bullet when solving for your ballistic solution. To turn Crosswind Jump ON/OFF, tap the toggle icon.



Note: The GeoBallistics® App should be the Ballistics Source if you wish for Spin Drift, Coriolis Effect, and Crosswind Jump to not be accounted for in your ballistic solution.

Mobile Sensors

Angle

Angle turns ON/OFF the mobile inclination angle sensor to determine the angle of the target. Tap the icon to toggle ON/OFF.

Compass

Compass turns ON/OFF the mobile compass sensor to determine the direction of the target. Tap the icon to toggle ON/OFF.

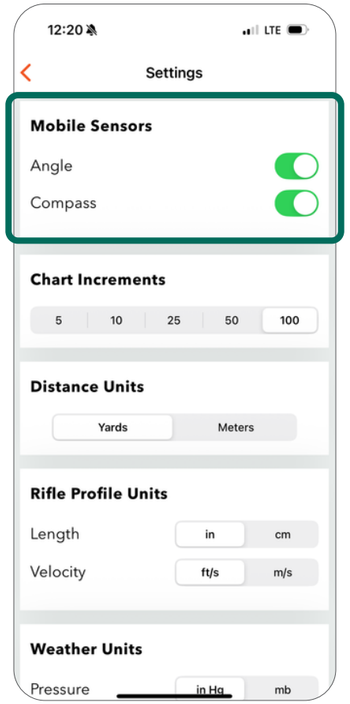
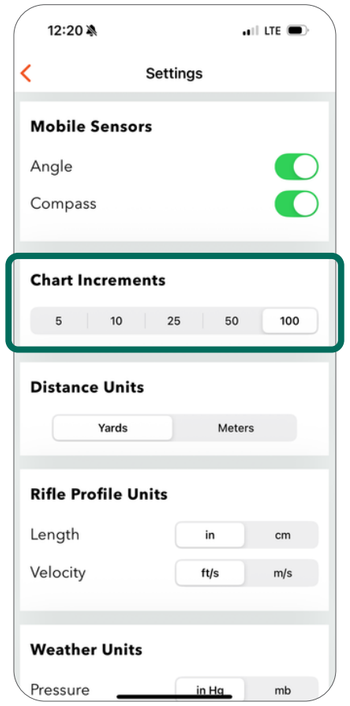


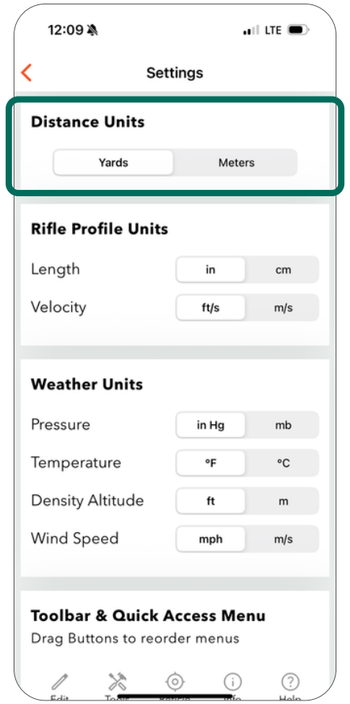
Chart Increments

Tap on the distance increments you wish the chart to be laid out in. (5, 10, 25, 50, or 100 yds./m)



Distance Units

The distance to the target can be displayed in yards or meters. Select the desired distance option from the menu.



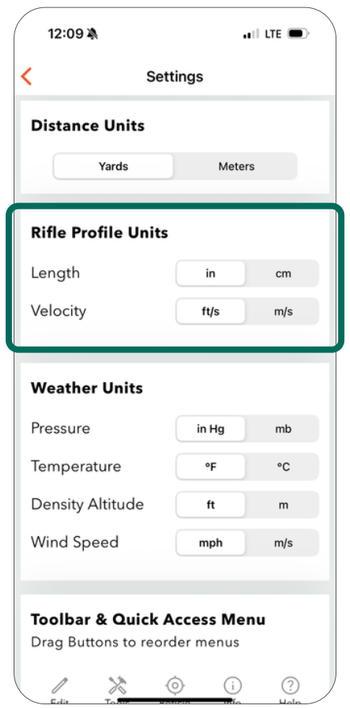
Rifle Profile Units

Length

The measured Sight Height, Elevation Offset, Windage Offset, and Vital Size can be displayed in either inches (in) or centimeters (cm). Select the desired option in the menu.

Velocity

The measured Muzzle Velocity and Velocity Threshold can be display in either feet per second (ft/s) or meters per second (m/s). Select the desired option in the menu.



Weather Units

Pressure

Pressure corresponds to the ambient atmospheric pressure surrounding you and your equipment. Atmospheric pressure can be displayed in inches of mercury (in Hg) or millibars (mb). Select the desired option in the menu.

Temperature

Temperature corresponds to the ambient temperature surrounding you and your equipment. Temperature can be displayed in Fahrenheit (°F) or Celsius (°C). Select the desired option in the menu.

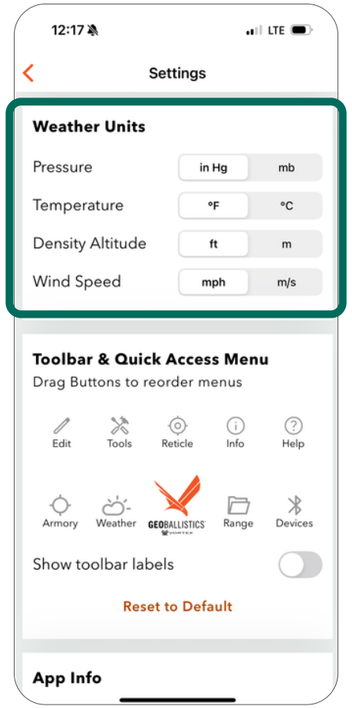
Density Altitude

Density Altitude is a value derived from a combination of Temperature, Pressure, and Relative Humidity and can be used as a quick reference for atmospheric conditions. The Density Altitude can be displayed in feet (ft) or meters (m). Select the desired option in the menu. It will display in both the app and the Ace™.

Wind Speed

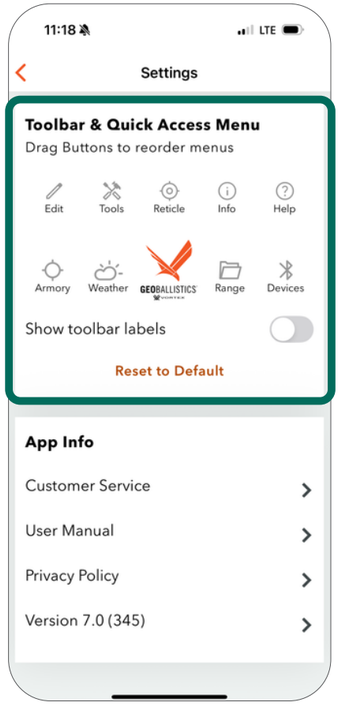
Wind Speed corresponds to the wind speed at your measurement device. Wind Speed can be displayed in miles per hour (mph) or meters per second (m/s). Select the desired option in the menu.

Note: Weather units do not have to agree between the GeoBallistics® App and the Ace™.



Toolbar & Quick Access Menu

From the Toolbar & Quick Access Menu section you can drag and reorder the menus based on your preferences. You can also choose whether the toolbar icons are labeled or not within this section. To reset to the App defaults, click “Reset to Default.”



RIFLE & AMMUNITION PROFILES

You must have 10 Profiles loaded into the Ace™ at all times. These Profiles can be set up in the Ace™ or via the GeoBallistics® App.

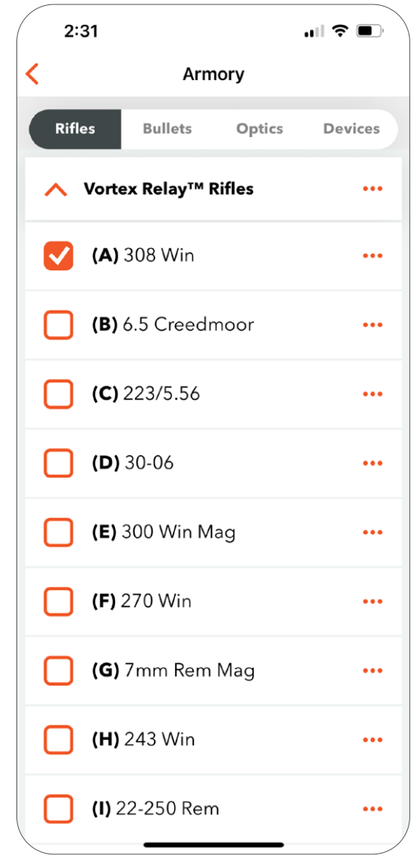
Default Profiles

The default Profiles include .308 Winchester®, 6.5 Creedmoor®, .223/5.56, .30-06, .300 Winchester® Magnum, .270 Winchester®, 7mm Remington® Magnum, .243 Winchester®, .22-250 Remington®, and .22 Long Rifle.

Syncing Profiles to the Ace™

After connecting the Ace™ to your app, the Profiles will automatically sync between the Ace™ and your app. The app and the Ace™ will automatically be synced anytime changes are made to the Ballistic Profiles and are saved. To view the Profiles currently synced between your device and the Ace™, navigate to the Armory page by selecting the ⌖ icon on the lower left corner of the main screen. The currently synced Profiles will be annotated with A-J before their names in the Vortex Relay™ Rifles folder.

Note: If a change is made to a Profile on either the Ace™ or on your app when they are not connected, upon reconnection, you will be notified that there is a discrepancy and asked which device’s information you’d like to use.

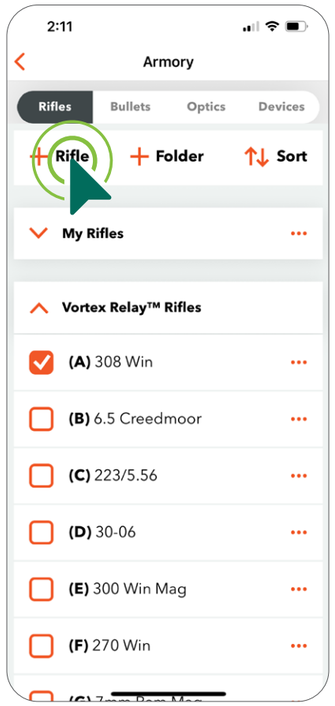


Creating Custom Ballistic Profiles

Custom Ballistic Profiles can also be created in the GeoBallistics® App. The bullet library will be periodically updated with the latest ballistic information from GeoBallistics®.

To Create a Custom Ballistic Profile:

1. Select ⌖ from the main screen, then select + **Rifle** on the Rifles screen.

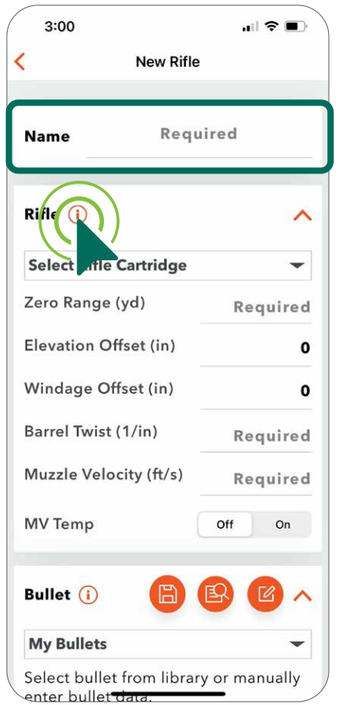


2. Select the Folder you wish to add the Profile to. “Vortex Relay™ Rifles” is the only folder that Profiles can be synced to your Ace™.

   Note: You can change folders after the Profile is created.

3. Name the Profile and complete the following information.

   Note: Press the information icon ⓘ next to each section for more information on how to find, measure, and input each of the values.



Rifle Information

Cartridge

Select your Rifle Cartridge from the drop-down menu of options.

Zero Range

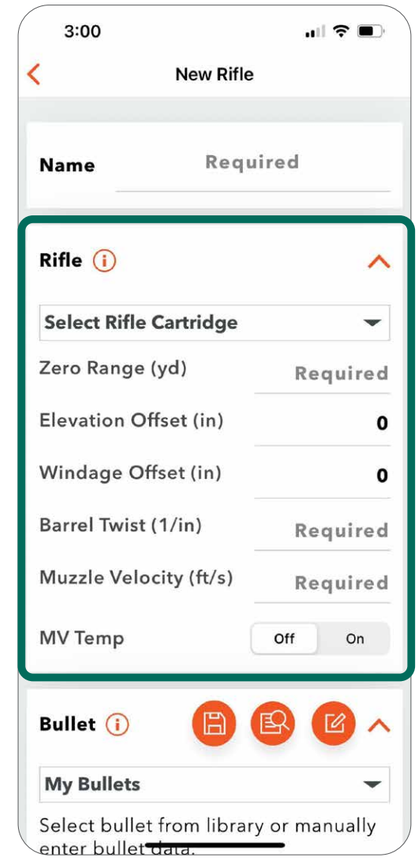
The distance at which you have zeroed your rifle. The measurement units can be set to standard (yards) or metric (meters) in the Settings Menu.

Elevation Offset

Vertical offset from the point of aim at your zero distance. For example, you entered 100 yards for your Zero Range and at 100 yards your point of impact is 1 inch high, enter “1” here, if your point of impact is 1 inch low, enter “-1” here. The measurement units can be set to standard (inches) or metric (centimeters) in the Settings Menu.

Windage Offset

Horizontal offset from the point of aim at your zero distance. For example, you entered 100 yards for your Zero Range and at 100 yards your point of impact is 1 inch right, enter “1” here, if your point of impact is 1 inch left, enter “-1” here. The measurement units can be set to standard (inches) or metric (centimeters) in the Settings Menu.



Barrel Twist Rate

Barrel Twist Rate is the distance covered for each revolution of the bullet within the barrel. For example, if your barrel is denoted as “1:8”, this means the bullet will complete one full rotation every 8 inches and you should enter “8” into this space. This information may be marked on the rifle barrel, or on the manufacturer’s website. Update the Barrel Twist Rate to match your rifle.

Note: Use a negative or minus sign in front of the entered value to denote lefthand twist. If the twist direction is not known, do not use a negative or minus sign which will denote righthand twist.

Muzzle Velocity

Muzzle Velocity is the projectile’s speed as it leaves the muzzle. You can find this information on the packaging from most ammunition manufacturers, or their websites. We highly recommend that you use a chronograph or use the MV Truing Feature to verify this information. The measurement units can be set to standard (ft/s) or metric (m/s) in the Settings Menu.

MV Temp (Optional)

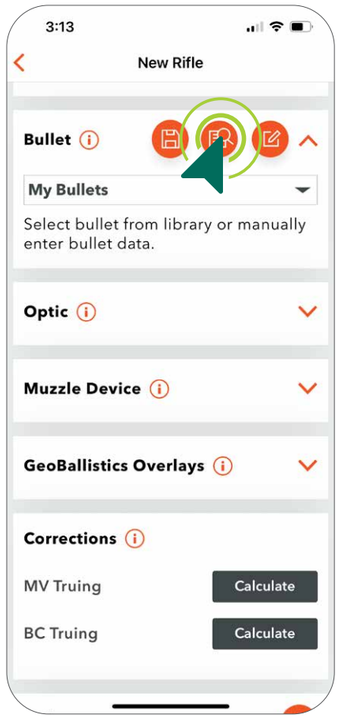
Muzzle Velocity Temperature (MV Temp) allows you to add recorded Muzzle Velocity as it correlates to the ambient temperature at the time of the shot. This can be important to fine tuning your ballistic solution. MV Temp is defaulted to off, but it may be turned on by toggling the switch to on. After you have toggled the MV Temp on, Muzzle Velocity will be “Disabled” in the field above. You can enter a custom Muzzle Velocity temperature table. The use of a chronograph is required for this information. Enter the Muzzle Velocity measured, and the temperature at which it was measured. It is required to enter at least two temperatures with corresponding Muzzle Velocities. For best results, each temperature entry should increase/decrease by at least 10 degrees. If only using two measurements, they should be close to the minimum and maximum expected temperatures expected. The measurement units can be set to standard (°F) or metric (°C) in the Settings Menu.

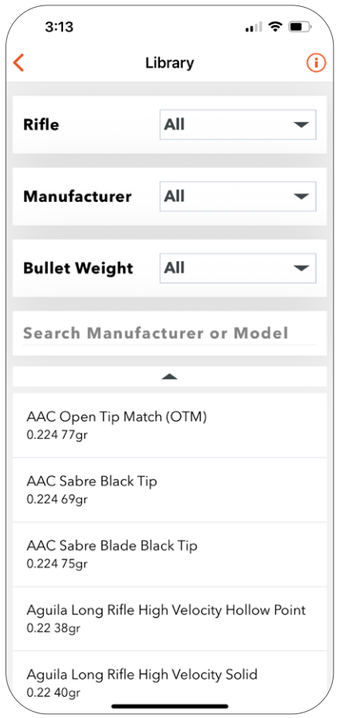
Note: You can import the latest temperature reading received by the app by selecting the “+ current” button.

Bullet Information

Find your bullet in the bullet library by selecting the icon. Select your Rifle, Manufacturer, and Bullet Weight from the drop-down lists. Then, select the exact bullet you are using. This information can be found on your ammunition box.

You can access any previously saved bullets from your Armory by selecting from the My Bullets drop-down list.





Bullet data may also be added manually by selecting the icon and inputting the following:

Caliber (in):

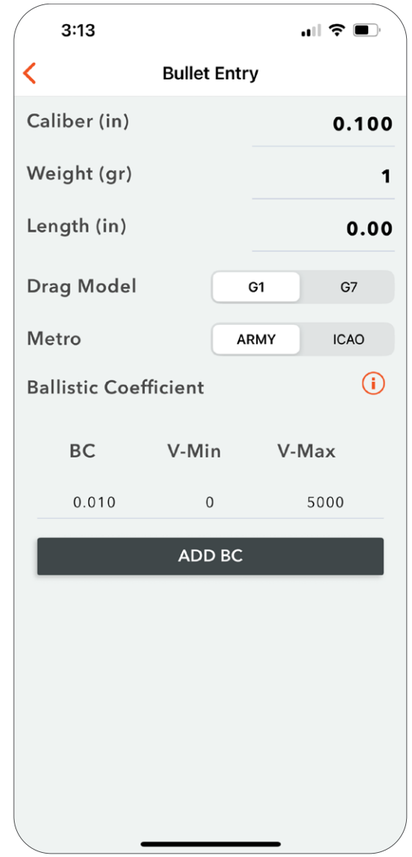
The bullet’s diameter in inches.

Weight (gr):

The bullet’s weight in grains.

Length (in):

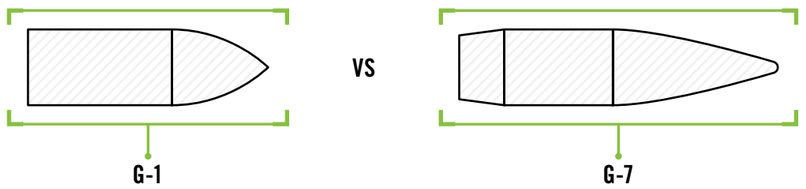
The bullet’s length in inches.



Drag Model – G1 vs. G7 vs. Drag Coefficient

This information may be printed on the box if you are using manufactured bullets. If you are using custom loads, use the Drag Model listed on the packaging for your bullet. If the Drag Model is not listed on the packaging, this information can usually be found on the bullet/ammo manufacturer’s website.

In general, G1 is better for flat-based bullets typically used with pistols and muzzleloaders. G7 is more common and better for longer, boat-tailed bullets which are common in centerfire cartridges.



A Custom Drag Model is a more refined way of modeling drag for bullets because it uses the actual measured drag of a specific bullet in a ballistic solver. The app provides access to the full bullet library including custom curve data on nearly all commercially available bullets. We recommend always selecting a Custom Drag Model when available as it will provide the most accurate solution.

Note: Drag Model options: Multi G1, Multi G7, or CD can be imported from the GeoBallistics® App. When using these, the Ballistic Coefficient will read “Multi” or “1” and the Drag Model will read “Multi G1”, “Multi G7”, or “CD” based on your selection.

Meteorological Standard (Metro) – Army vs. ICAO

This will be a standard set of atmospheric conditions used to calculate the aerodynamic drag on the projectile. This choice only applies to manual bullet entries. Using the bullet library will automatically populate Army or ICAO. For manual bullet entries, if you know the atmospheric standard that was used to calculate your bullet's Ballistic Coefficient, select it here. If you do not know which standard is used by a manufacturer, choosing a bullet from that manufacturer in the library will let you know which standard that manufacturer uses. The difference between the two atmospheric standards is very slight but using the correct standard for your bullet Ballistic Coefficient will yield slightly improved ballistic numbers at long ranges.

Ballistic Coefficient:

The bullet's Ballistic Coefficient as it correlates to the drag function.

These values can be found on the cartridge box or on the manufacturer's website.

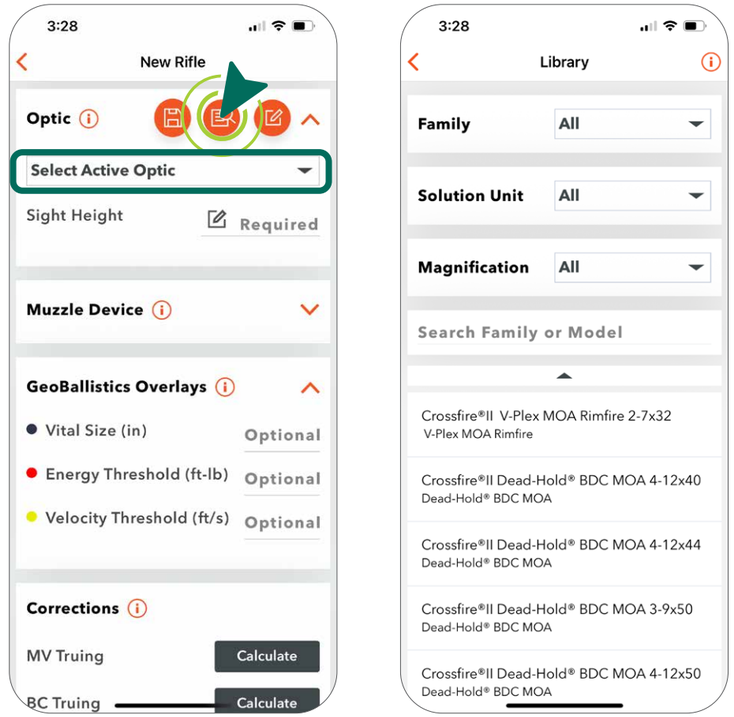
Once you've input all your bullet information, you can save your bullet to your Armory for quick access in the future by pressing the save icon. You can also build and save bullets directly from the Armory page for future use within Profiles.

Note: The ballistic solution provided by the Ace™ is only as reliable as the following data provided by the user. Please contact Vortex Optics at **1-800-4VORTEX (1-800-486-7839) Ext. 1** with any questions.

Optic Information

Find your Vortex® optic from the Vortex Optic library by selecting the icon. Select your Optic Family, Solution Unit, and Magnification from the drop-down lists. Then, select the exact optic you are using. This information can be found on your riflescope.

You can access any previously saved optics from your Armory by selecting from the Select Active Optic drop-down list.



Optic data may also be added manually by selecting the icon and inputting the following on the next page:

Optic Name

Enter a name for your optic.

Solution Units

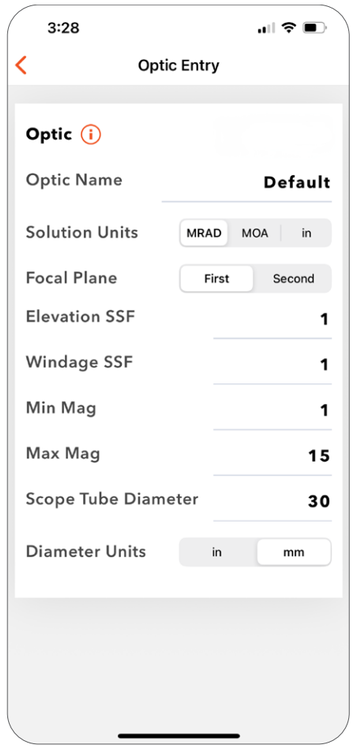
Choose the Solution Unit you would like to have your drop chart displayed with. MRAD, MOA, or inches. This information will be based off the angular unit of measurement your riflescope's turrets and reticle are laid out in.

Focal Plane

Select if your optic is first focal plane or second focal plane. First focal plane reticles scale with magnification, and their subtension values remain accurate across the magnification range. Second focal plane reticles remain visually constant in size and weight across the magnification range and their subtension values are only accurate at one magnification, typically the highest.

Elevation SSF (Sight Scale Factor)

Elevation Sight Scale Factor is used to account for any inconsistencies in turret tracking, specifically the elevation turret. Default is set at "1.00," indicating there is no tracking inconsistency. SSF is calculated by taking the elevation dialed divided by the actual point of impact change. For example, if 20 MOA is dialed, but the point of impact changes by 19 MOA, the correction factor is 20/19 = 1.052.



Windage SSF (Sight Scale Factor)

Windage Sight Scale Factor is used to account for any inconsistencies in turret tracking, specifically the windage turret. Default is set at "1.00," indicating there is no tracking inconsistency. SSF is calculated by taking the windage dialed divided by the actual point of impact change. For example, if 20 MOA is dialed, but the point of impact changes by 19 MOA, the correction factor is 20/19 = 1.052.

Min Mag

Enter the minimum magnification of your riflescope. This can typically be found on the riflescope's eyepiece.

Max Mag

Enter the maximum magnification of your riflescope. This can typically be found on the riflescope's eyepiece.

Tube Size

Enter diameter or your riflescope's main tube.

Diameter Units

Select between inches (in) or millimeters (mm) for the measurement of your riflescope's main tube diameter.

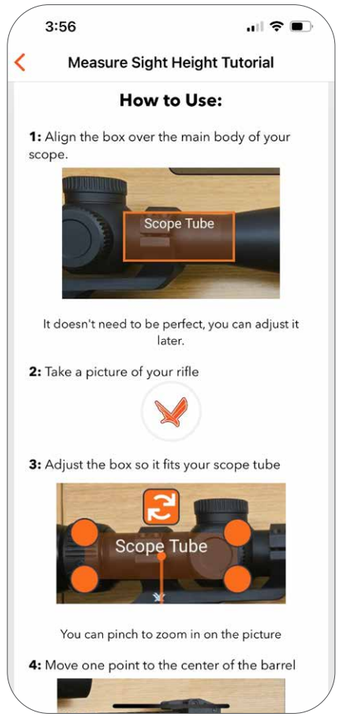
Sight Height

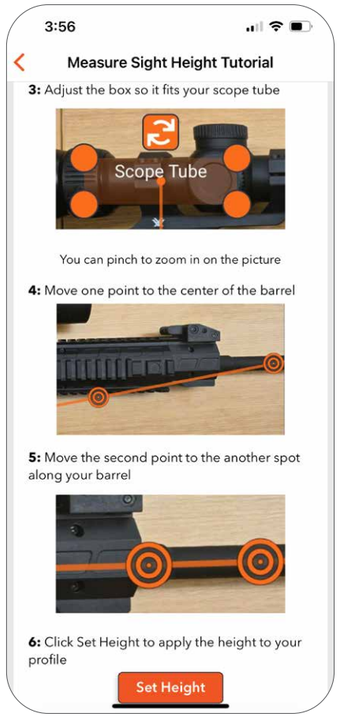
Height from the center of the rifle bore to the center of the optic. The measurement units can be set to standard (inches) or metric (centimeters) in the Settings Menu.

If you are not able to physically measure your Sight Height, you can utilize your device's camera to measure this dimension by pressing the edit button next to Sight Height.

This will open the Measure Sight Height Tool. Read the How to Use instructions and then press the "Continue" button to begin.

How to Use:



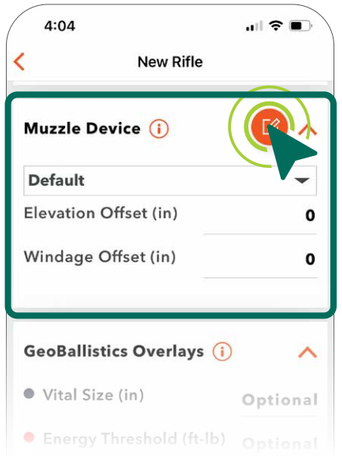


Once you've input all your bullet information, you can save your optic to your Armory for quick access in the future by pressing the save icon. You can also build and save Optics directly from the Armory page for future use within Profiles.

Note: If you plan to change between optics on the same rifle setup, you can easily choose between Optics saved in your Armory within your Profile without building separate Profiles for each optic.

Muzzle Device

Within the Profile you can add in your muzzle device information to account for offsets incurred by the device. Muzzle Device data may be added manually by selecting the icon and inputting the following:



Device Name

Enter a name for your muzzle device.

Elevation Offset

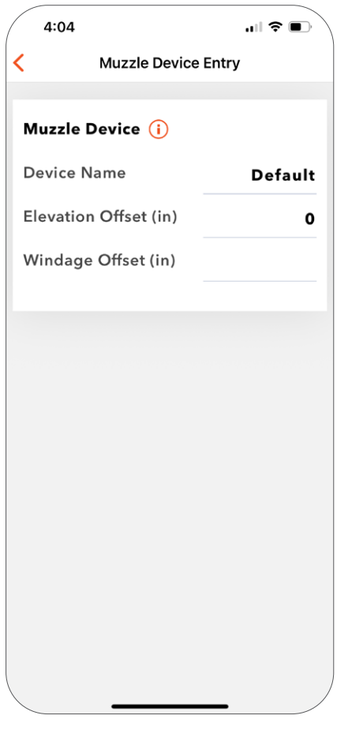
Vertical offset from the point of aim at your zero distance with your muzzle device installed. For example, you entered 100 yards for your Zero Range and at 100 yards your point of impact is 1 inch high, enter “1” here, if your point of impact is 1 inch low, enter “-1” here. The measurement units can be set to standard (inches) or metric (centimeters) in the Settings Menu.

Windage Offset

Horizontal offset from the point of aim at your zero distance with your muzzle device installed. For example, you entered 100 yards for your Zero Range and at 100 yards your point of impact is 1 inch right, enter “1” here, if your point of impact is 1 inch left, enter “-1” here. The measurement units can be set to standard (inches) or metric (centimeters) in the Settings Menu.

You can also access any previously saved muzzle device from your Armory by selecting from the Select Active Device drop-down list.

Once you’ve input all your muzzle device information, you can save your device to your Armory for quick access in the future by pressing the save icon . You can also build and save muzzle device’s directly from the Armory page for future use within Profiles.



Note: If you plan to change between muzzle devices on the same rifle setup, you can easily choose between muzzle devices saved in your Armory within your Profile without building separate Profiles for each device.

Note: If you are not using a muzzle device, leave this section blank.

GeoBallistics® Overlays (Optional)

Vital Size

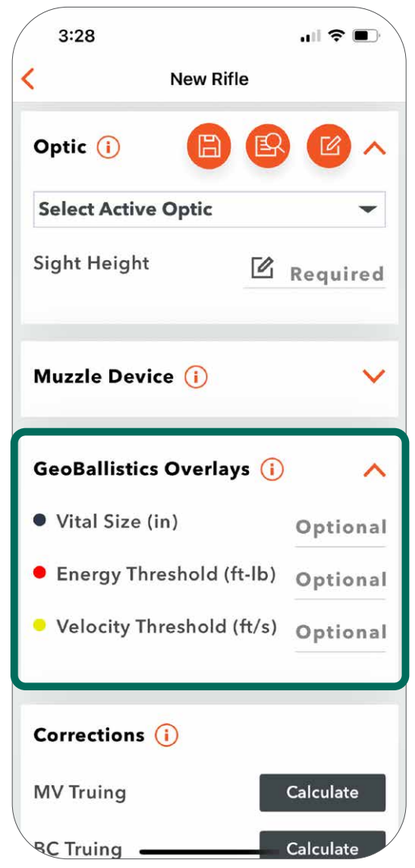
For Vital Size, estimate the diameter of the vital area of your target and enter here. The ballistic solver will take this value into account when calculating and displaying your ballistic solution in the GeoBallistics® App. If the point of aim (POA) is in the middle of the vital area, the GeoBallistics® App will show the range at which your bullet drop will be outside of the vital area. This is denoted by a black overlay on the ballistics chart.

Energy Threshold

The Energy Threshold, the desired bullet energy at impact to perform an ethical shot, may be entered and then the ballistic solver will take this into account when calculating and displaying the solution on the GeoBallistics® App. This is denoted by a red overlay on the ballistics chart.

Velocity Threshold

The Velocity Threshold, the desired bullet velocity at impact to perform an ethical shot, may be entered and then the ballistic solver will take this into account when calculating and displaying the solution on the GeoBallistics® App. This is denoted by a yellow overlay on the ballistics chart.



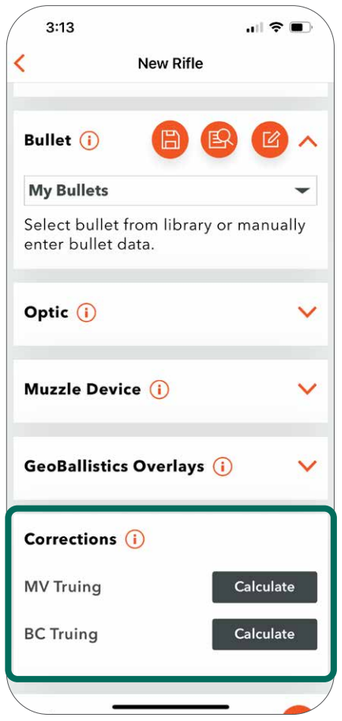
Corrections (Optional)

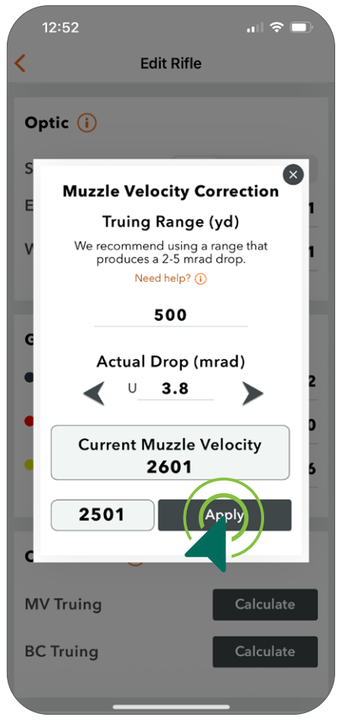
MV Truing

The MV Truing Correction can be used to fine tune the ballistic solver by calculating your Muzzle Velocity based on your rifle, riflescope, and ammunition. This process updates the predicted Muzzle Velocity with an observed drop that was built from your personal equipment. Before starting, make sure all Profile and environmental data are accurate and up to date. We recommend performing truing at a range that produces a 2-5 MRAD drop (7-17 MOA drop) for accurate results.

To Utilize MV Truing:

1. Press “Calculate” next to MV Truing.
2. Enter a Truing Range. An expected drop will populate based on your Profiles and inputs.
3. Enter the Actual Drop that you observed at your Truing Range. An updated Muzzle Velocity will be calculated.
4. Select “Apply” to utilize the calculated Muzzle Velocity. To keep your Current Muzzle Velocity, press the “X” in the top right corner to exit.



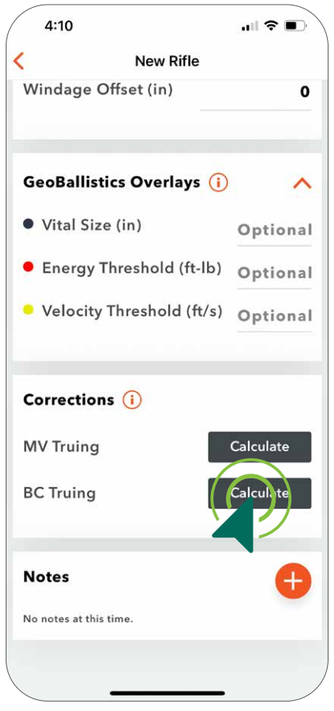


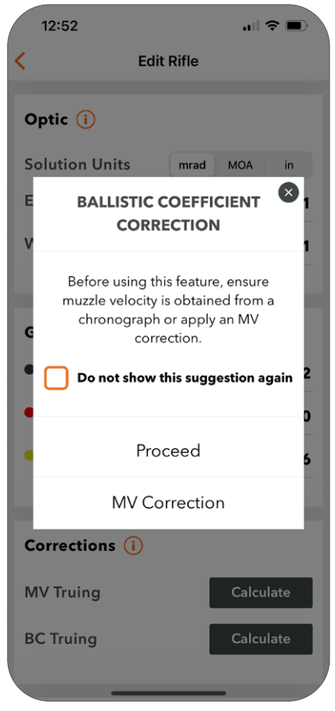
BC Truing

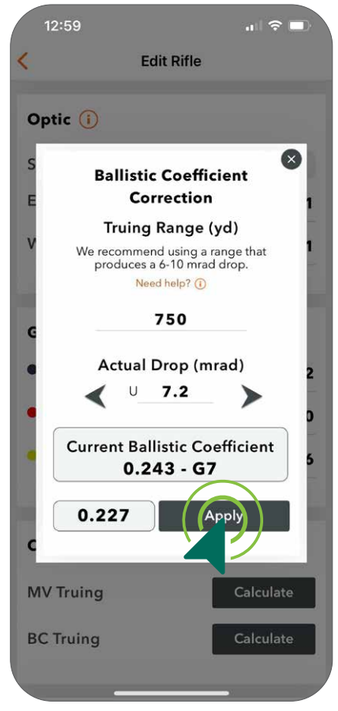
The BC Truing Correction can be used to fine tune the ballistic solver by calculating your Ballistic Coefficient based on your rifle, riflescope, and ammunition. This process updates the predicted Ballistic Coefficient with an observed drop that was built from your personal equipment. Before starting, make sure you have an accurate Muzzle Velocity input (from a chronograph or via MV Truing) and make sure all Profile and environmental data are accurate and up to date. For BC Truing, we recommend performing truing at a range that produces a 6-10 MRAD drop (21-34 MOA drop) for accurate results.

To Utilize BC Truing:

1. Press “Calculate” next to BC Truing.
2. If you have obtained your Muzzle Velocity via chronograph or MV Truing, press “Proceed”. If not, that must be done before proceeding.
3. Enter a Truing Range. An expected drop will populate based on your Profiles and inputs.
4. Enter the Actual Drop that you observed at your Truing Range. An updated Ballistic Coefficient will be calculated.
5. Select “Apply” to utilize the calculated Ballistic Coefficient. To keep your Ballistic Coefficient, press the “X” in the top right corner to exit.



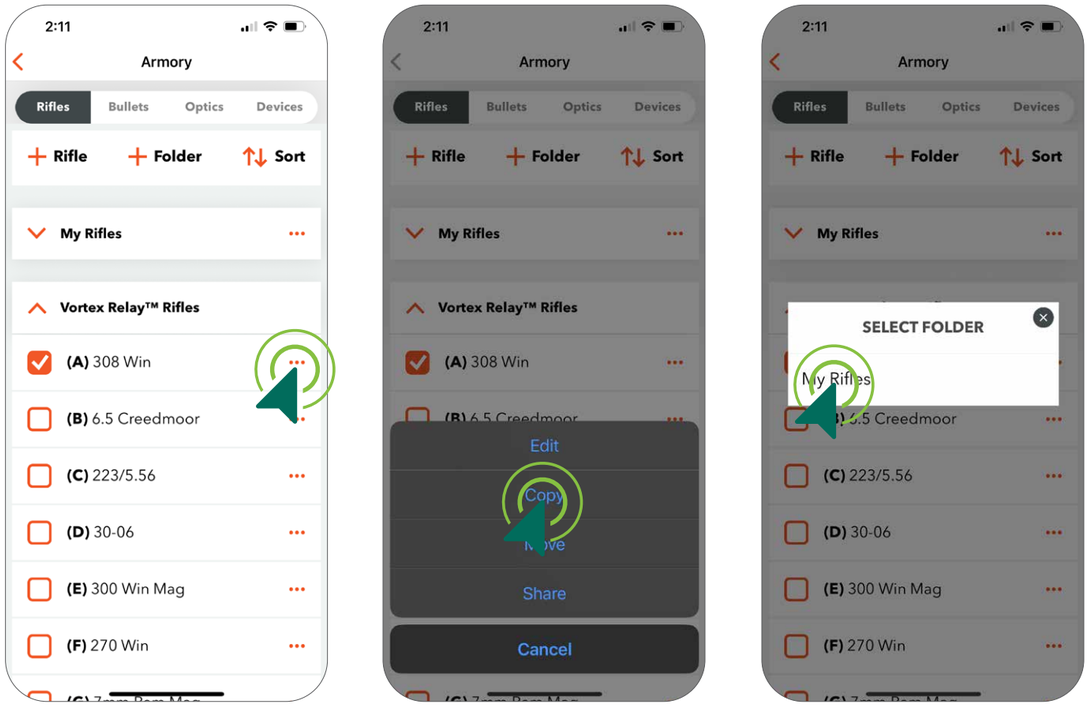




Coping a Profile

To Copy a Profile:

1. While in the Rifles section, select the Profile that you wish to duplicate by tapping the ellipsis ••• on the right of the Profile.
2. Select “Copy”.
3. Select the folder you wish to add the Profile to.
4. Once a Profile has been copied, the Profile will automatically rename with the addition “(copy)” at the end of the Profile name. If desired, rename the Profile using the steps in the following section.

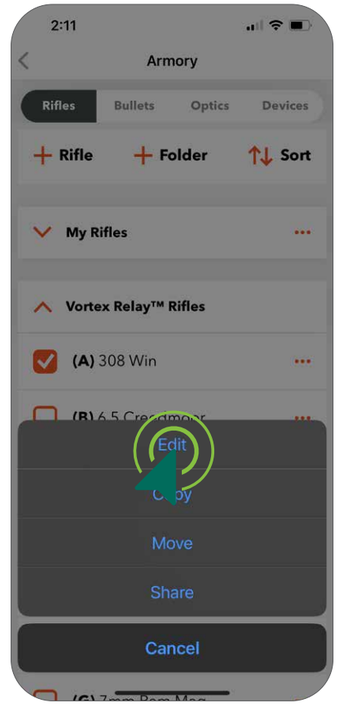


Editing a Profile

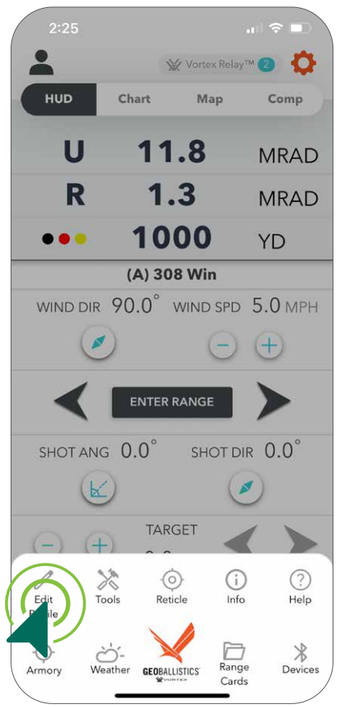
Profiles can be edited to update specific data to represent the ballistic information most accurately for your firearm and ammunition.

To Edit a Ballistic Profile:

1. Press the ellipsis ••• and select “Edit”.
2. Update the data points for your firearm and ammunition.
3. The edits will save automatically when you exit the Profile.



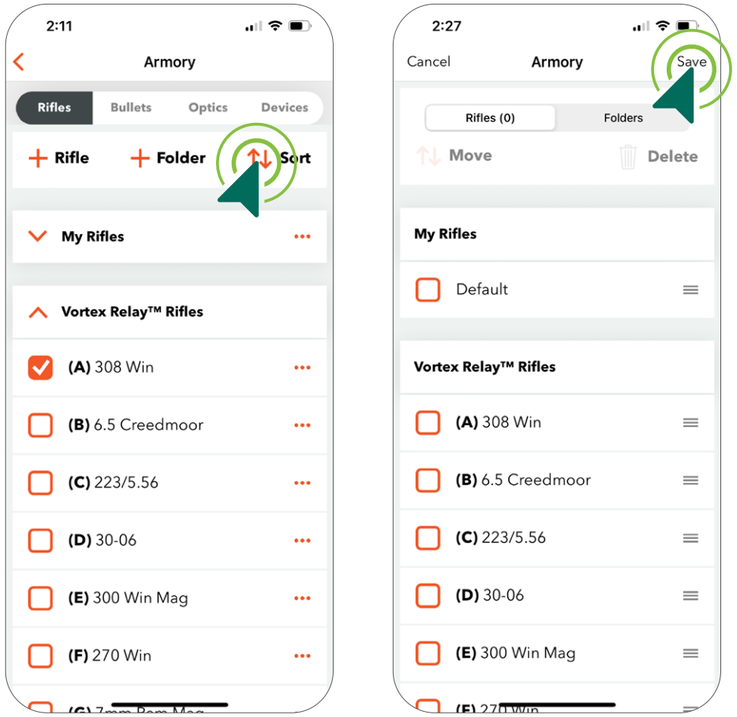
You can also quickly access and edit the Active Profile by clicking the GeoBallistics® logo from the main screen and clicking the Edit Profile icon.



Setting Up & Switching Profiles in the GeoBallistics® App

You can change the identifier (A-J) assigned to a Profile in the GeoBallistics® App. Only Profiles in the Vortex Relay™ Rifles folder can be assigned an identifier.

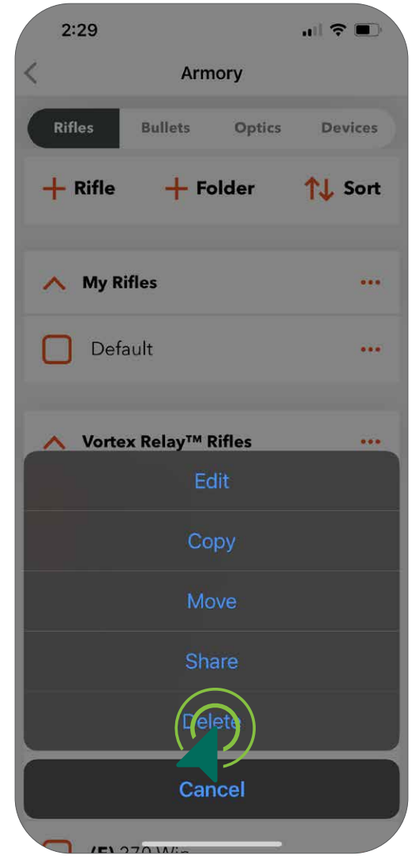
1. At the top of the Rifle Screen select the ↑↓ **Sort** icon.
2. Press and drag the Profile to the desired location. The top Profile in Vortex Relay™ Rifles will be identified as (A), the second Profile will be (B), and the third Profile will be (C) etc.
3. Once the Profiles are identified correctly and are in the correct folder, tap “Save” in the top right-hand corner.
4. The Profile will automatically sync to the Ace™ the next time it is connected to the GeoBallistics® App.



Deleting a Profile in the GeoBallistics® App

While in the Rifles section, select the ellipsis ••• next to the Profile that you wish to delete. Select “Delete”.

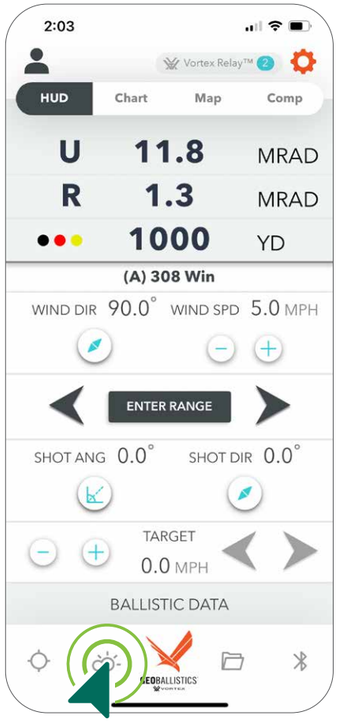
Note: It is required to always have 10 Profiles saved in the Vortex Relay™ Rifles folder.

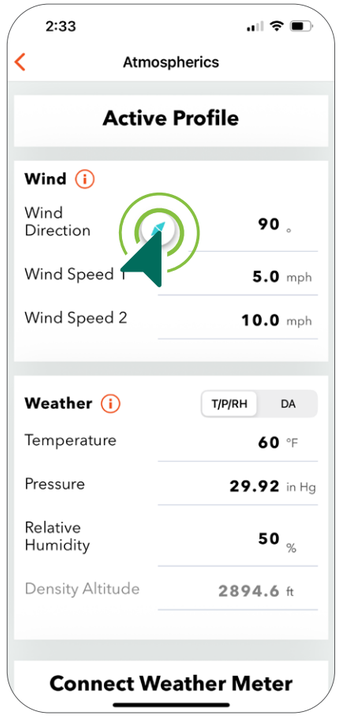


ENTERING WEATHER IN GEOBALLISTICS® APP

Wind

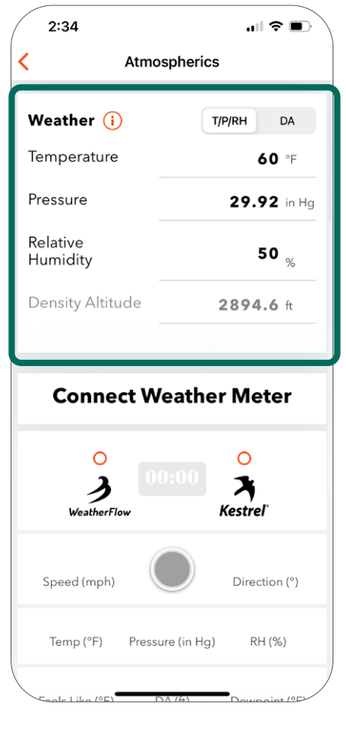
1. Select the ⛅ from the main page on the GeoBallistics® App to view the Atmospherics page.
2. Under Active Profile, press the 🧭 button while facing into the wind to capture wind bearing.
3. Input Wind Speed.





Weather

Ambient Temperature, Absolute Pressure, and Relative Humidity can be manually entered, or obtained by the Ace™ Ballistic Weather Meter, another Vortex Relay™ device, third-party weather meters, or a nearby airport. Density Altitude can be manually entered or obtained from the Ace™ when connected to the GeoBallistics® App.

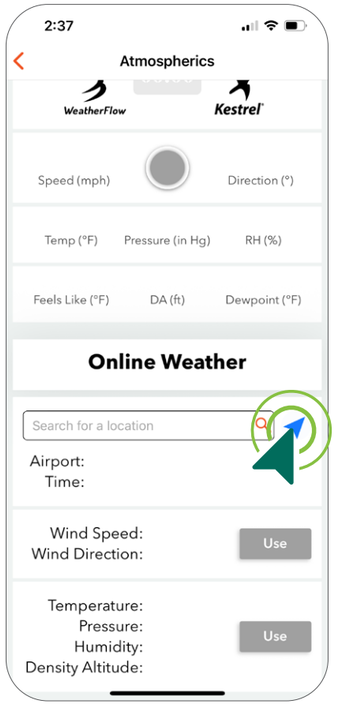


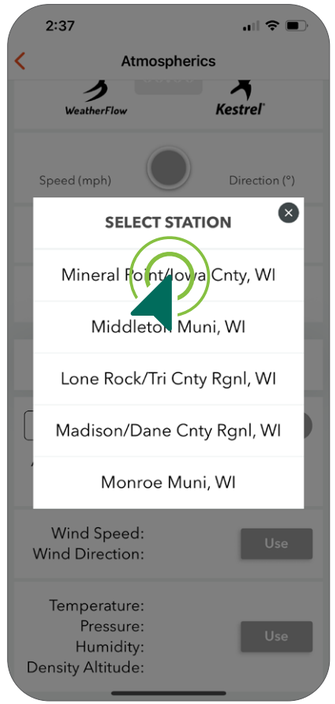
Connect Weather Meter

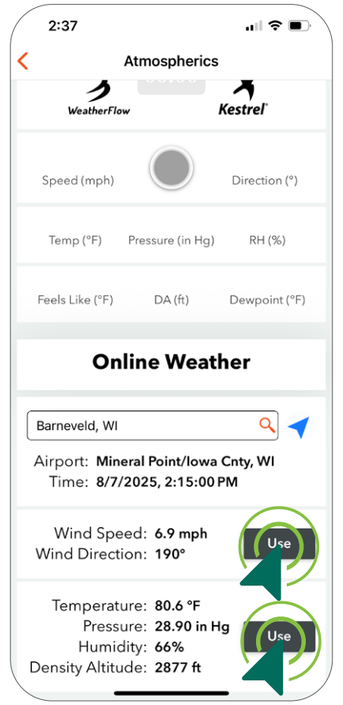
This section will display live environmental data measured from your Kestrel® or WeatherFlow® once it is connected to the app. Refer to the “Third Party Weather Devices” section. Hold the green button 🟢 to collect and lock in the weather meter environmental data into your Active Profile displayed above.

Online Weather

Tap the arrow to select a nearby airport as your Weather Source or utilize the search bar to manually search for a location. The drop-down menu will display the nearest airports. Once selected, you can tap “Use” next to the Wind Speed/Direction Data and the Temperature, Pressure, Humidity, and Density Altitude Data that was obtained from the selected airport. This data will then be displayed under Active Profile.







MAINTENANCE

Cleaning

Your Ace™ requires very little routine maintenance other than periodically cleaning the exterior lenses. The exterior may be cleaned by wiping with a soft cloth. When cleaning the lenses, be sure to use products that are specifically designed for use on coated optical lenses.

- Be sure to blow away any dust or grit on the lenses prior to wiping the surfaces.
- Using your breath, a small amount of water or pure alcohol, can help remove stubborn dried water spots.

Storage

If possible, avoid storing your Ace™ in direct sunlight or any very hot location for long periods of time. It is recommended to remove the batteries if storing for and extended period of time.

TROUBLESHOOTING GUIDE

The Ace™ will not show up in the GeoBallistics® App in my device.

- Bluetooth® modules of a certain age may not be able to communicate with modern devices. Devices such as iPhone 6 and older, or Android 4.0 and older, may not work with the Ace™.

I have paired my Ace™ with my GeoBallistics® App, but they are not communicating.

- If you have successfully paired before, and the device and Ace™ will not communicate, ensure your mobile device's Bluetooth® is on. If it is, toggle Bluetooth® OFF and ON.

My compass will not calibrate.

- If the compass will not calibrate, ensure you are calibrating the compass outside and away from buildings, cell towers, or other structures, with the Wind Impeller Cover closed.
- If the Ace™ calibration is off, then repeat the calibration. The Ace™ may need to be recalibrated when changing geographic location, typically 30 miles or more, or after changing batteries.

INDEX

Default Profiles

BULLET	.308 WIN	6.5 CREEDMOOR®	223/5.56	30-06	300 WIN MAG
Bullet Weight	175gr	140gr	55gr	165gr	180gr
Bullet Diameter	0.308 in	0.264 in	0.224 in	0.308 in	0.308 in
Bullet Length	1.24 in	1.38 in	0.75 in	1.17 in	1.24 in
Barrel Twist	12 (1:12)	8 (1:8)	12 (1:12)	10 (1:10)	10 (1:10)
Drag Function	G7	G7	G7	G7	G7
METRO	ICAO	ICAO	ICAO	ICAO	ICAO
Ballistic Coefficient	0.243	0.326	0.131	0.204	0.246
RIFLE					
Latitude	43	43	43	43	43
Muzzle Velocity	2600 ft/s	2710 ft/s	3240 ft/s	2800 ft/s	2960 ft/s
Sight Height	1.75 in	1.75 in	2.70 in	1.75 in	1.75 in
Zero Range	100 yds.	100 yds.	100 yds.	100 yds.	100 yds.
Elevation Offset	0	0	0	0	0
Windage Offset	0	0	0	0	0
Elevation SSF	1	1	1	1	1
Windage SSF	1	1	1	1	1
Elevation Units	MRAD	MRAD	MOA	Inches	MOA
Windage Units	MRAD	MRAD	MOA	Inches	MOA

BULLET	270 WIN	7MM REM MAG	243 WIN	22-250 REM	22 LR
Bullet Weight	130gr	160gr	100gr	55gr	40gr
Bullet Diameter	0.277 in	0.284 in	0.243 in	0.224 in	0.224 in
Bullet Length	1.24 in	1.40 in	1.03 in	0.82 in	0.48 in
Barrel Twist	10 (1:10)	10 (1:10)	10 (1:10)	14 (1:14)	16 (1:16)
Drag Function	G7	G7	G7	G7	G1
METRO	ICAO	ICAO	ICAO	ICAO	ICAO
Ballistic Coefficient	0.223	0.236	0.183	0.12	0.121
RIFLE					
Latitude	43	43	43	43	43
Muzzle Velocity	3100 ft/s	2950 ft/s	2960 ft/s	3680 ft/s	1255 ft/s
Sight Height	1.75 in	1.75 in	1.75 in	1.75 in	1.75 in
Zero Range	100 yds.	100 yds.	100 yds.	100 yds.	50 yds.
Elevation Offset	0	0	0	0	0
Windage Offset	0	0	0	0	0
Elevation SSF	1	1	1	1	1
Windage SSF	1	1	1	1	1
Elevation Units	Inches	MOA	MOA	Inches	Inches
Windage Units	Inches	MOA	MOA	Inches	Inches

COMPLIANCE

United States

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Contains FCC ID: SQGBL654

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

CAN ICES-3B/NMB-3B

Contains IC: 3147-BL654

Australia and New Zealand

Japan

Class B ITE

この装置は、クラスB 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。 VCCI－B

Translation:

This is a Class B product based on the standard of the VCCI Council. If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

NOTICE

Virtual Patent Marking Notice by Vortex Optics

This product may be protected by patents in the U.S. and elsewhere for Vortex Optics. **http://vtx.legal** website is provided to satisfy the virtual patent marking provisions of various jurisdictions including the virtual patent marking provisions of the America Invents Act and provide notice under 35 U.S.C. §287(a). Please visit **http://vtx.legal** to view list of products that may be covered by one or more U.S./Foreign patents or published patent applications.

VIP WARRANTY®

VIP® WARRANTY

OUR UNCONDITIONAL PROMISE TO YOU.

We promise to repair or replace
the product. Absolutely free.

- **Unlimited.**
- **Unconditional.**
- **Lifetime Warranty.**

You do not have to register, save the box, or a receipt for the Warranty to be honored.

Learn more at VortexOptics.com

service@VortexOptics.com • 1-800-4VORTEX

Note: *The VIP® Warranty does not cover loss, theft, deliberate damage, or cosmetic damage not affecting product performance.*

For additional and latest manuals, visit **VortexOptics.com**