VORTEX®

RAZOR® HD LHT™
RIFLESCOPE

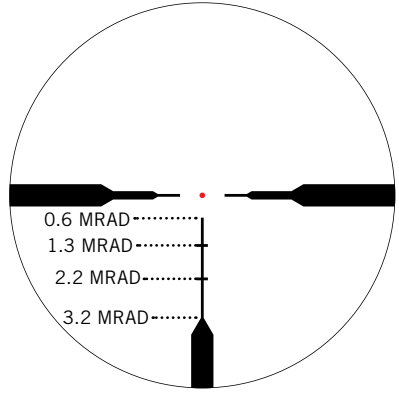
G4i-BDC RETICLE | MRAD
SECOND FOCAL PLANE

RETICLE MANUAL

THE VORTEX® G4i-BDC RETICLE

You have purchased a Vortex® riflescope equipped with the G4i-BDC reticle. This exclusive reticle has been designed to minimize the need for guessing bullet holdover at long distances. By selecting the appropriate reticle markings, a shooter will have a reliable bullet-drop reference for all reasonable distances.

The G4i-BDC reticle can be used effectively with a variety of firearms, including high powered rifles, rimfire rifles, black powder rifles, and slug shotguns. This reticle also provides reference marks which can be used to compensate for bullet drift in windy conditions or to range distances.



G4i-BDC Reticle with
Drop Hash Marks

This model of Vortex® riflescope uses the second focal plane design—the listed BDC yardages will only be valid with the riflescope set at the highest magnification.

RIFLESCOPE ADJUSTMENTS

Using the Reticle for Bullet-drop Compensation

Standard Technique

Rifle/ammo combinations are put into ballistic classes where bullet-drops will be predictable within 2–4". (There will still be a slight variation between individual rifle and load ballistics and the G4i-BDC reticle.)

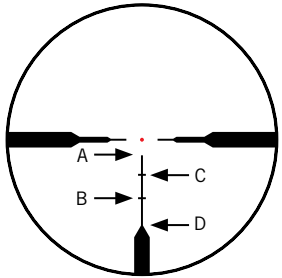
Begin by choosing one of the listed Firearm/Range classes. If your firearm/range doesn't fall exactly into one of these classes, select the class which is most similar. The Vortex® on-line Long Range Ballistic Calculator (LRBC®) is a handy tool to compare your bullet-drop numbers to the ones listed for each class. Find it at vortexoptics.com

After selecting a class, sight in the center dot to the recommended zero range for that class. (Consult the main riflescope owner's manual for information on sighting in the center dot.) Once the rifle has been sighted in, the lower hash marks can be used as aiming points at the corresponding distances listed. For most popular rifles and loads, the hash marks will provide accuracy within 0–4" of your aiming point (depending on the range). If you require greater accuracy from the G4i-BDC reticle, use the Precision Technique detailed in the next section.

Each of these classes will use a different corresponding range to each crosshair hash mark depending on ballistic performance.

Remember the listed ranges will only apply with the scope set at the highest magnification. The center dot and its corresponding zero distance can always be used at ANY magnification.

Class A
(e.g. 30-06, .308, .270)



High Power Big Game Rifle I Moderate Ranges (100–400 yds.) Use 100 yd. zero on center dot.

Bullet drop

Tip of Fine Vertical Post (A):
200 yds. I 4" drop
1st Hash Mark (B):
300 yds. I 13.5" drop
2nd Hash Mark (C): 400 yds. I 30" drop
Tip of Heavy Vertical Post (D): 500 yds. I 55" drop

Class B
(e.g. 300 Win Mag, 7mm Rem Mag)

High Power Big Game and Magnum Rifle I Extended Ranges (100–600 yds.) Use 200 yd. zero on center dot.

Bullet drop

Tip of Fine Vertical Post (A): 300 yds. I 6" drop
1st Hash Mark (B): 400 yds. I 18" drop
2nd Hash Mark (C): 500 yds. I 37.5" drop
Tip of Heavy Vertical Post (D): 600 yds. I 66" drop

Class C
(e.g. .223, 5.56)

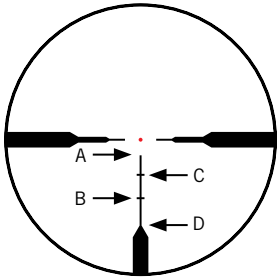
High Velocity, Small Caliber Varmint Rifle I Extended Ranges (100–600 yds.) Use 200 yd. zero on center dot.

Bullet drop

Tip of Fine Vertical Post (A): 300 yds. I 6" drop
1st Hash Mark (B): 450 yds. I 18" drop
2nd Hash Mark (C): 550 yds. I 37.5" drop
Tip of Heavy Vertical Post (D): 650 yds. I 66" drop

Class D

Modern Black Powder Rifle I See note below.
(50–200 yds.) Use 100 yd. zero on center dot.



Bullet drop

Tip of Fine Vertical Post (A):
125 yds. I 2.5" drop
1st Hash Mark (B):
200 yds. I 9" drop
2nd Hash Mark (C):
225 yds. I 17" drop

Class E

.22 LR Rimfire Rifle I Extended Ranges
(25–140 yds.) Use 50 yd. zero on center dot.

Bullet drop

Tip of Fine Vertical Post (A): 60 yds. I 1.2" drop
1st Hash Mark (B): 90 yds. I 4" drop
2nd Hash Mark (C): 120 yds. I 9" drop
Tip of Heavy Vertical Post (D): 140 yds. I 16" drop

Class F

Slug Shotgun and Traditional Black Powder Rifle I See note below
(25–150 yds.) Use 50 yd. zero on center dot.

Bullet drop

Tip of Fine Vertical Post (A): 75 yds. I 1.5" drop
1st Hash Mark (B): 100 yds. I 4.5" drop
2nd Hash Mark (C): 125 yds. I 9.4" drop

NOTE: Due to the tremendous differences in currently available black powder and shotgun slug loads, these numbers should be viewed as only a representative sample. It is very important to learn the ballistics of the particular loads you use and match up the correct drop MRAD and yardages.

Precision Technique

If you wish to get the very best accuracy, you can get more detailed ballistic data for your load of ammunition using the Vortex Long Range Ballistic Calculator (LRBC®) located at vortexoptics.com.

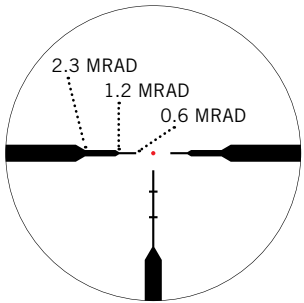
LRBC® Input your max shooting distance and the yardage increments you would like displayed. Input your load and environmental conditions, and you can review a ballistics table that details the Velocity, Elevation and Windage adjustments needed, Time of Flight and Energy (ft-lbs) at various yardage increments. In the LRBC® table, locate the closest MRAD measurements to the G4i-BDC reticle MRAD hash marks (e.g. 0.6, 1.3, 2.2, 3.2) to find the corresponding yardage for each BDC hash mark.

Using the Reticle for Wind Drift Compensation and Ranging

The G4i-BDC reticle incorporates methods for wind drift correction and range estimation on the horizontal crosshair. As in using the holdover hash marks, the scope must be set at its highest magnification.

Correcting for wind drift can be accomplished using the line width changes on the horizontal crosshair as reference points. See image for MRAD subtensions.

Shooters familiar with the wind drift numbers of particular ammunition can use these line width changes to help estimate proper windage hold-off once the correct range and wind are known or estimated.



Use the online Vortex® Long Range Ballistic Calculator (LRBC®) to learn wind drift numbers for your loads.

MRAD reticles are very effective for ranging using simple formulas. The distance to the target will be in the same unit of measure used for the actual size of the target. For instance: If the target is measured in yards, the distance will be in yards. If measured in meters, the distance will be in meters. Or, if measured in inches, the distance will be in inches.

MRAD Ranging Formulas

$$\frac{\text{Target Size (yds.) x 1000}}{\text{MRAD Read}} = \text{Range (yds.)}$$

$$\frac{\text{Target Size (m) x 1000}}{\text{MRAD Read}} = \text{Range (m)}$$

$$\frac{\text{Target Size (in.) x 27.8}}{\text{MRAD Read}} = \text{Range (yds.)}$$

To use these formulas, you will need to know the measured size of the target or a nearby object. Using either the vertical or horizontal crosshairs, place the reticle on the target of known measurement and determine the MRAD measurement on the reticle.

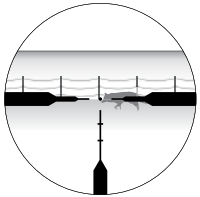
Accurate measuring will depend on a very steady hold—the rifle should be solidly braced using a rest, bipod, or sling. Once you have an accurate MRAD reading, use any of the listed ranging formulas to calculate distance.

Maximum accuracy in ranging will be obtained by calculating exact MRAD measurements—MRAD should be estimated in tenths if possible.

A shooter can compare a target object of known dimension (at shooting distance) to either the vertical or horizontal hash mark spacing and roughly estimate the range.

Remember, hash marks on the vertical crosshair are spaced at 0.6 MRAD, 1.3 MRAD, and 2.2 MRAD. The top of the bottom vertical heavy crosshair is 3.2 MRAD from center. Horizontal crosshair line width changes are 0.6, 1.2, and 2.3 MRAD.

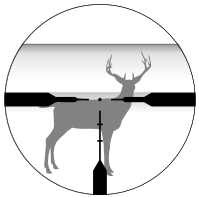
EXAMPLE: Ranging a Coyote



Most coyotes are about 3' long (or 1 yard). While hunting, you see a coyote and range it with your scope set at highest power. You see the coyote's body nearly covers the distance from the center dot to the edge of the heavy part of the horizontal crosshair (2.3 MRAD). Using the simple formula, you can estimate the coyote's distance at 435 yds.

$$\frac{\text{1 yd. x 1000}}{\text{2.3 MRAD Measured on Reticle}} = \frac{1000}{2.3} = 435 \text{ yds}$$

EXAMPLE: Ranging a Deer



You spot a deer and turn your scope to its highest power and range him. While looking through the scope, you see the distance from the top of his back to the bottom of his chest (usually about an 18" depth on a mature buck) spans from the center dot to the 1st hash mark down (1.3 MRAD) on the reticle. Using the formula, you can then estimate the deer's distance at 385 yds.

$$\frac{\text{18" x 27.8}}{\text{1.3 MRAD Measured on Reticle}} = \frac{499.9}{1.3} = 385 \text{ yds.}$$

A Note About Long-Range Hunting

Vortex Optics believes strongly in responsible, ethical hunting and a word should be said about long range shooting at game. Although reticles like the Vortex® G4i-BDC can make long distance shots much easier, there are still many other variables—such as wind—affecting every shot. It is important for hunters shooting at long distances to learn their personal effective range, particularly in windy conditions, and to not shoot at game beyond those distances. Please be responsible—the keys are knowing your rifle, ammunition, and your own abilities!

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