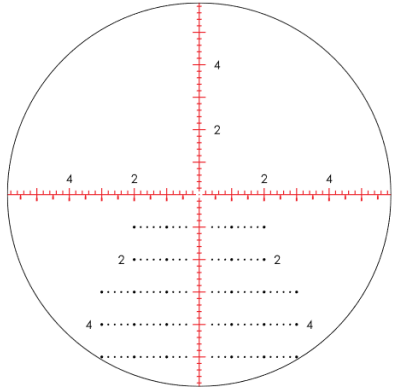
RETICLE MANUAL

EBR-7D
MRAD RETICLE

RAZOR® HD GEN III

VORTEX® EBR-7D MRAD RETICLE

Designed to maximize long-distance shooting and ranging abilities, the EBR-7D MRAD First Focal Plane reticle can be used to effectively determine ranges, holdovers, windage corrections, and moving target leads. Ultra-precision laser etching on the glass reticle ensures that MRAD specifications are kept to the tightest tolerances possible. The precise center dot and fine crosshair subtensions on the EBR-7D MRAD reticle were carefully chosen to provide the optimum balance between precision aiming and low-light visibility. Including windage and elevation holdover dots in the bottom half of the reticle.



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

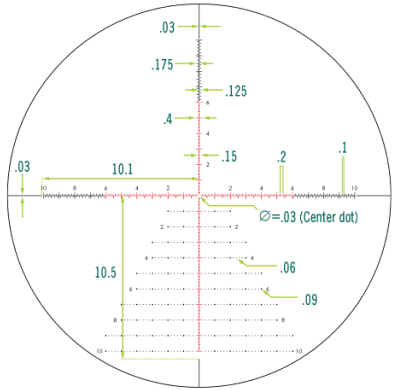
MRAD Subtensions

The EBR-7D MRAD reticle is based on milliradian, or MRAD for short. A MRAD will subtend 3.6 inches at a distance of 100 yards (10cm at 100 meters). This Razor HD riflescope uses 1/10 MRAD adjustments, which subtend .36 inches at 100 yards (1 cm at 100 meters).

First Focal Plane Reticles

In first focal plane riflescopes, the listed MRAD subtensions of the EBR-7D MRAD reticle are valid at all magnification levels. This means the shooter can use the magnification level most appropriate for the situation and still have accurate holdover and windage reference marks. This is also extremely valuable in a high-stress situation, as the shooter does not have to remember to set the scope to one particular magnification to get valid holdovers—an action necessary with second focal plane reticles.

Reticle Subtensions



Subtensions measured in MRAD.
Reticle image shown for representation only.

RANGING

MRAD reticles are effective for ranging using simple formulas:

MRAD Ranging Formulasv

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

$$\frac{\text{Target Size (inches)}}{\text{Measured MRAD}} \times 27.77 = \text{Range (yds.)}$$

$$\frac{\text{Target Size (inches)}}{\text{Measured MRAD}} \times 25.4 = \text{Range (m)}$$

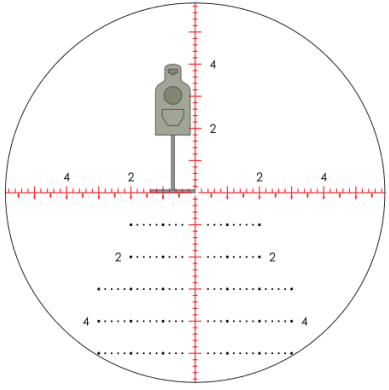
$$\frac{\text{Target Size (m)}}{\text{Measured MRAD}} \times 1000 = \text{Range (m)}$$

$$\frac{\text{Target Size (cm)}}{\text{Measured MRAD}} \times 10 = \text{Range (m)}$$

To use these formulas, you will need to know the measured size of the target or a nearby object. For the most accurate answer, use the longest dimension. If the object is taller than it is wide, it is best to use the objects height in the formula if possible. You will obtain the best results if measured to the nearest 1/10 MRAD.

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

Ranging Example



Ranging a 6' target (2 yds.) at 4 MRAD yields 500 yds.

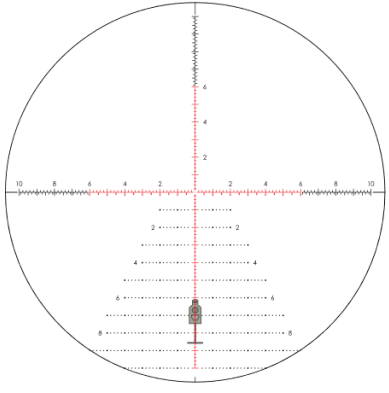
$$\frac{2}{4\ \text{MRAD}} \times 1000 = 500\ \text{yds.}$$

Elevation Holdovers

Once the distance has been calculated using the EBR-7D MRAD reticle or a laser rangefinder, the reticle can be used for rapid holdover correction for bullet drop of the cartridge being used. To get the most benefit out of the EBR-7D reticle equipped riflescope, Vortex Optics highly recommends shooters learn their bullet drop numbers in MRAD rather than inches.

Since both the reticle and turrets are scaled in MRAD, it is easy to line up your bullet drop/wind hold with the corresponding MRAD hashmark on the reticle. If the shooter prefers to dial the turret, instead of holding over on the reticle, knowing the bullet drop/wind hold in MRAD will allow for much faster adjustments as MRAD can be quickly read on the elevation knob.

Example



6.7 MRAD correction for 800 yd. shot. No wind.

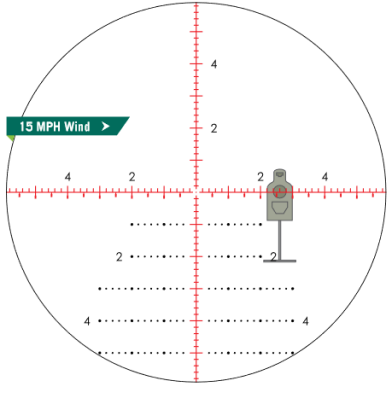
Windage and Moving Targets

The EBR-7D MRAD reticle is highly effective when used for wind and moving target leads. Using the reticle for windage and moving leads will require thorough knowledge of your weapon system's ballistic performance under varying conditions and experience in reading wind strengths and target speeds. As a bullet drops, it is important for the shooter to learn a particular weapon's windage/moving target corrections in MRAD. Always hold the reticle into the wind.

Basic Windage Correction on Center Crosshair

When dialing elevation, use the horizontal crosshair for windage or moving lead corrections.

Example

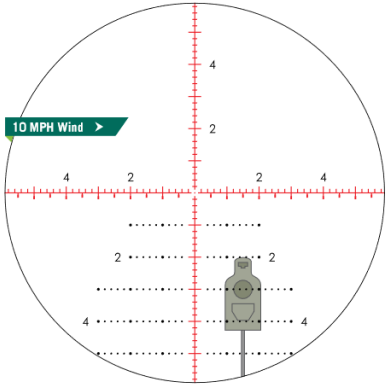


2.6 MRAD correction for 15 mph wind at 700 yds. Elevation already dialed into turret.

Basic Windage Correction Using Drop Line on Reticle

When using the reticle for elevation correction rather than dialing, the MRAD marks on the horizontal crosshair can still be used to help visually reference windage corrections. Remember to hold the reticle into the wind.

Example



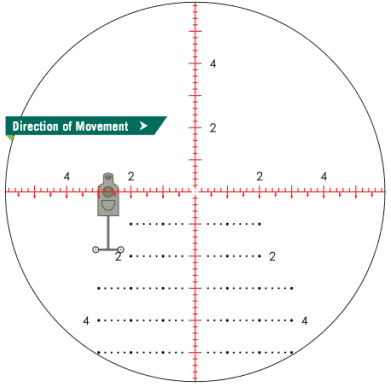
1.5 MRAD correction for 10 mph wind using 3 MRAD drop line at 500 yds.

Basic Moving Lead Correction

When estimating moving target leads, use the MRAD marks on the horizontal crosshair. Estimating moving leads will require knowing yardage distance, wind speed, moving target speed, and total bullet flight times including rifle lock time. Bullet flight times can be roughly calculated based on FPS velocities or a ballistic calculator.

Note: Correctly estimating moving leads is very difficult and requires considerable practice and knowledge beyond the scope of this manual.

Example



2.7 MRAD correction for a target moving at 3 mph at 800 yds. No wind. Elevation already dialed into turret.

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the product. Absolutely free.

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