



RETICLE MANUAL

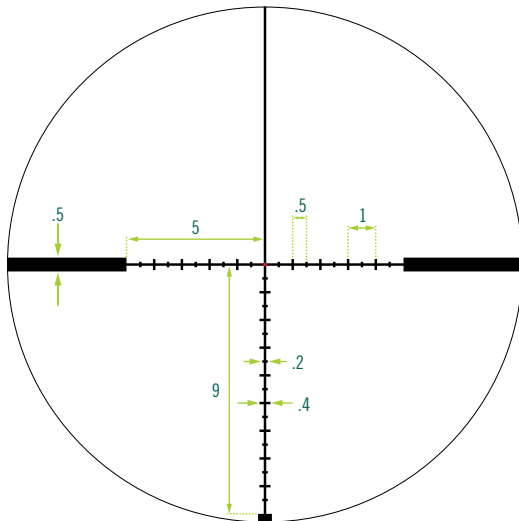
# **VMR-3** **MRAD RETICLE**

**SECOND FOCAL PLANE**

## VMR-3 MRAD RETICLE

Designed to maximize long-distance shooting and ranging abilities, the VMR-3 MRAD reticle can be used to effectively determine ranges, holdovers, windage corrections, and moving target leads. The fine center crosshair subtensions on the VMR-3 MRAD reticle were carefully chosen to provide the optimum balance between precision aiming and low-light visibility.

### Subtension Chart



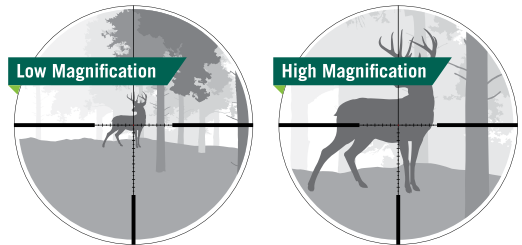
**Note:** The VMR-3 reticle is used in second focal plane (SFP) riflescopes. The MRAD values are valid at the highest magnification on most models. Check your rifle's product manual to validate the subtended magnification of your scope.

### MRAD Subtensions

The VMR-3 reticle is based on Milliradian (MRAD) subtensions. MRAD is an angular unit of measurement used to account for bullet drop, wind corrections, and range estimation. 1 MRAD will correspond to 3.6" for each 100 yards.

### Second Focal Plane Reticles

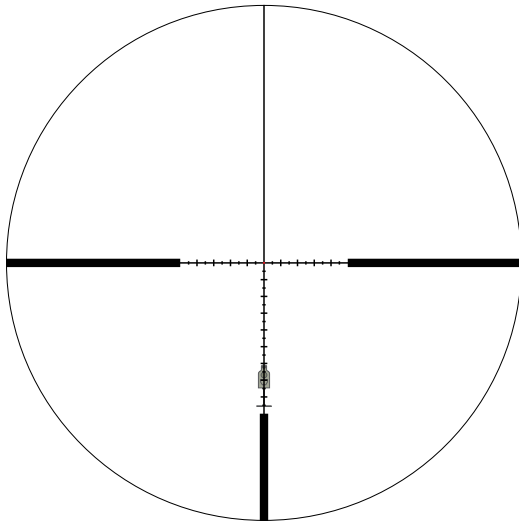
In SFP riflescopes, the listed MRAD subtensions are calibrated to a specific magnification, typically the highest. The shooter can use the center crosshair on any magnification, but when using the hashmarks for longer-range shots or windage corrections, the shooter must be on the calibrated magnification. If the shooter is not on the calibrated magnification, additional calculations must be done to determine the hashmark's value.



### Elevation Holdovers

Correcting for bullet drop is easy with the .5 MRAD hashmarks of the VMR-3 reticle. The shooter uses the bullet's drop in MRAD and holds on the corresponding hashmark.

#### Example



**6.7 MRAD reticle holdover at 800 yds. No wind.**

**Note:** You can also use the reticle like a ruler when sighting-in and while making on-the-fly corrections. Measure the difference between the bullet's point of impact and your point of aim, and either hold on that respective hashmark, or dial in the correction on the turret, using the value of the corresponding hashmark.

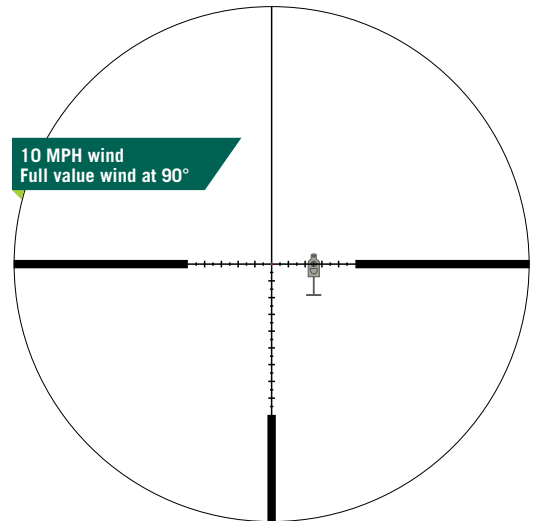
### Windage and Moving Targets

Using the VMR-3 reticle for effective windage and moving target leads will require thorough knowledge of your weapon system's ballistics performance under varying conditions and experience in reading wind and target speed. As a bullet drops, it is important for the shooter to learn a particular weapon's windage/moving target corrections in MRAD rather than inches. Always hold the reticle into the wind.

### Basic Windage Correction Holdovers

When dialing elevation, use the horizontal stadia line for windage or moving target lead corrections.

#### Example

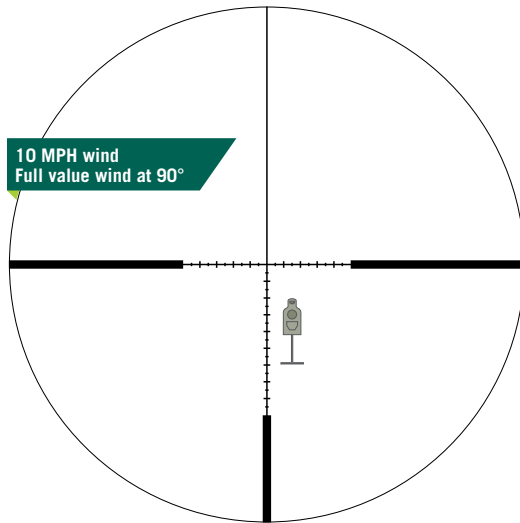


**2.6 MRAD correction for 15 mph wind.**

### Basic Windage and Elevation Correction Holdovers

When using the reticle for elevation correction rather than dialing, you can still use the MRAD hashmarks on the horizontal stadia line to help visually reference windage corrections. Remember to hold the reticle into the wind.

#### Example



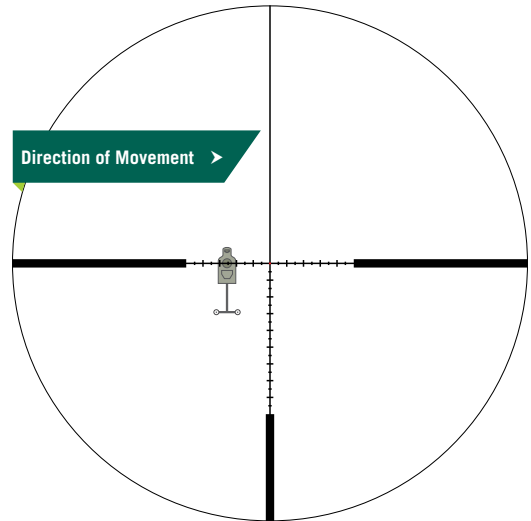
3 MRAD elevation correction at 500 yds.,  
1.5 MRAD windage correction for 10 mph wind.

### Basic Moving Target Lead Correction

When estimating moving target leads, use the MRAD marks on the horizontal stadia line. Estimating moving target leads will require knowing distance, wind speed, moving target speed, and total bullet flight time (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 difficult and requires practice and knowledge beyond the scope of this manual.

#### Example



2.7 MRAD correction for a target moving 3 mph.

## RANGING

MRAD measurements are effective for ranging using a simple formula. To use this formula, the shooter needs to know the size of the target or nearby object in yards, inches, meters, or cm.

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

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

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

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

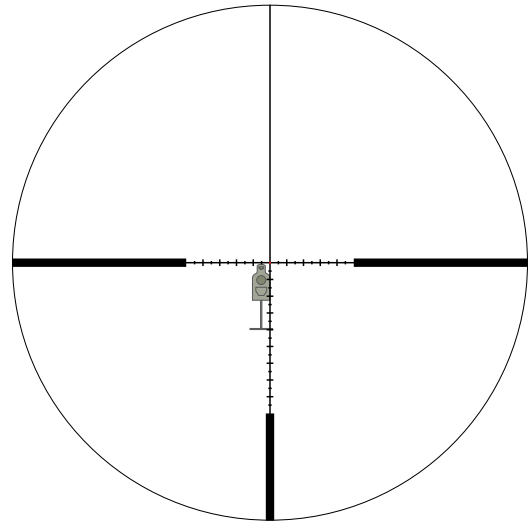
$$\frac{\text{Target Size (cm)}}{\text{Measured MRAD}} \times 10 = \text{Range (m)}$$

For the most accurate solution, use the longest dimension. If the object is taller than it is wide, it is best to use the object's height in the formula.

Using either the vertical or horizontal MRAD scale, place the reticle on a target of known dimensions and read the number of MRAD spanned. 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 firmly braced using a rest or bipod when measuring. Once you have an accurate MRAD reading, use the formula to calculate the distance.

### Example



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

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



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M-00357-0

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