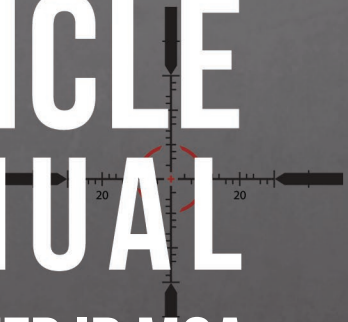
ATHLON OPTICS

RETICLE MANUAL



ATSR 16 FFP IR MOA

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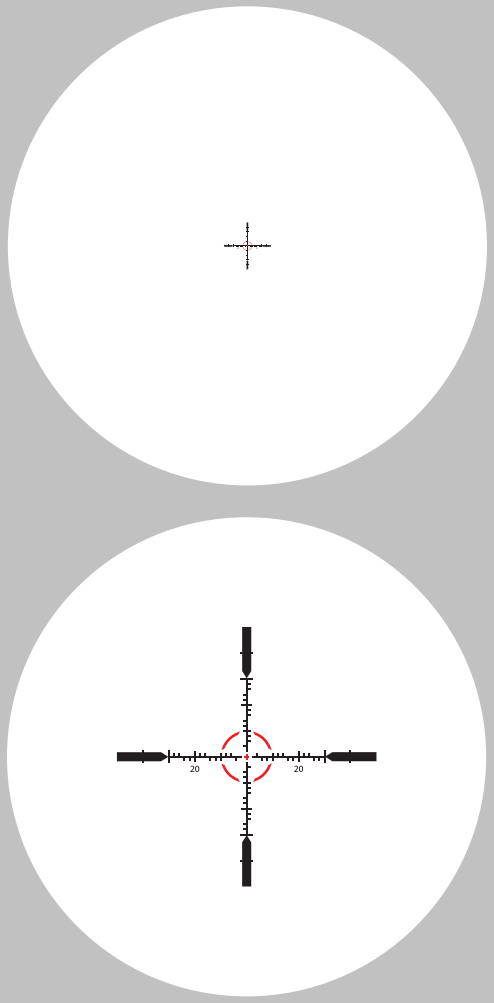
The ATHLON® ATSR 16 FFP IR MOA Reticle

ATSR 16 FFP IR MOA reticle has a 2 moa illuminated center cross and 20 moa illuminated center circle, which help you quickly lock in your target and set holdover positions. The illuminated 20-moa-span center circle and a 2 moa center cross with regular 2 moa incremental hash marks extended to 30 moa at each direction on both vertical and horizontal lines provides a unique two layer visual reference that helps the shooter quickly locate the target and lock it on the center within a blink of an eye. The illuminated portion of the reticle provides excellent low light visibility and the hash marks provide accurate elevation holdovers all the way up to 30 moa with 2 moa marks incremental. The unique design of the 2 moa increments gives you a clear reading of hold over positions

Application: *Short and Mid Range Shooting for both Tactical and Hunting*



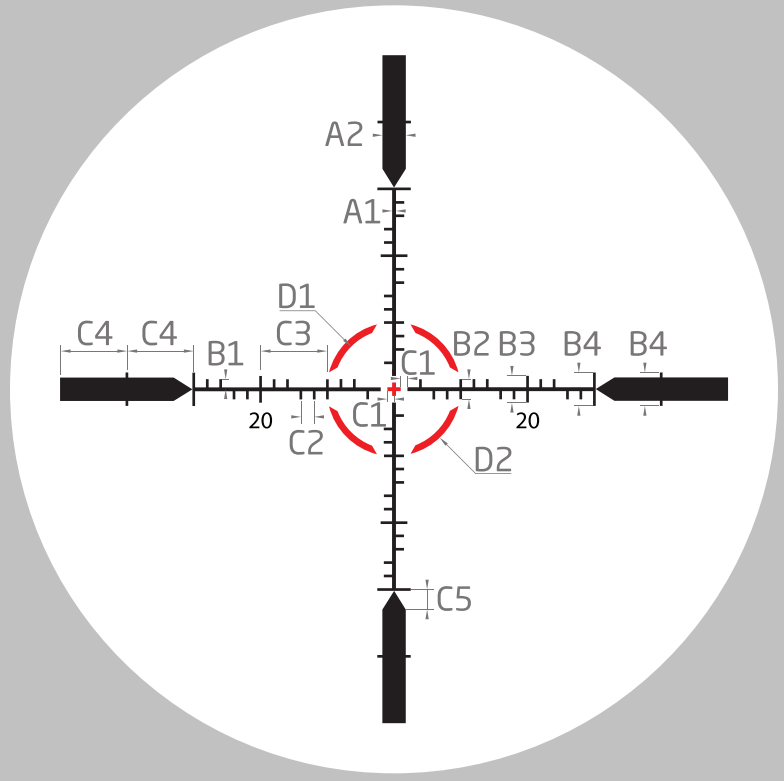
Note: *The reticle image shown above will appear differently among different models due to different magnification and location of the reticle.*

Reticle Subtensions

The ATSR 16 FFP IR MOA reticle is based on the minute of angle, a unit of angular measurement, usually shortened to moa. A “moa” is defined as “one minute of an angle”. As a full circle has 360 degrees, and each degree is composed of 60 minutes (60’). thus there are 360 (degrees) x 60 (minutes) = 21,600 minutes in a circle. Since there are 360 degree in a circle, we can get 360 degree/21600 minutes=0.016667o/ minute. If the target is 100 yards (3600 inches) away, we can use a formula, 3600*TAN(RADIANS (.016667)), to get 1.047 inches which means 1 moa equals to 1.047 inches at 100 yards. Many people just round up the 1.047 inches to 1 inch @100 yards. If you are using metric system, formula 100000mm*TAN (RADIANS(.01667)) gets you that 1 moa equals to 29.1mm @100 meters.

The ATSR 16 FFP IR MOA reticle is located at the focal plane in the front of the erector tube which is a key part of achieving variable power inside the riflescope. Size of the first focal plane reticle grows or shrinks at the same ratio with the changing size of the image of your target when you try to zoom in or zoom out. Since the size of the reticle remains constant compared to your target regardless of the magnification, the subtension of the reticle remains valid all the time. The reticle at 1x actually becomes a red dot for effectively engaging short range targets while at 4x it provides finer details for a shooter to locate proper hold over positions for mid targets.

Example



ATSR 16 FFP IR MOA	A1	A2	B1	B2	B3	B4	C1
SUBTENSIONS IN MOA	.4	3.5	1.5	3	4	5	1

C2	C3	C4	C5	D1	D2
2	10	10	3	18	20

Distance Ranging

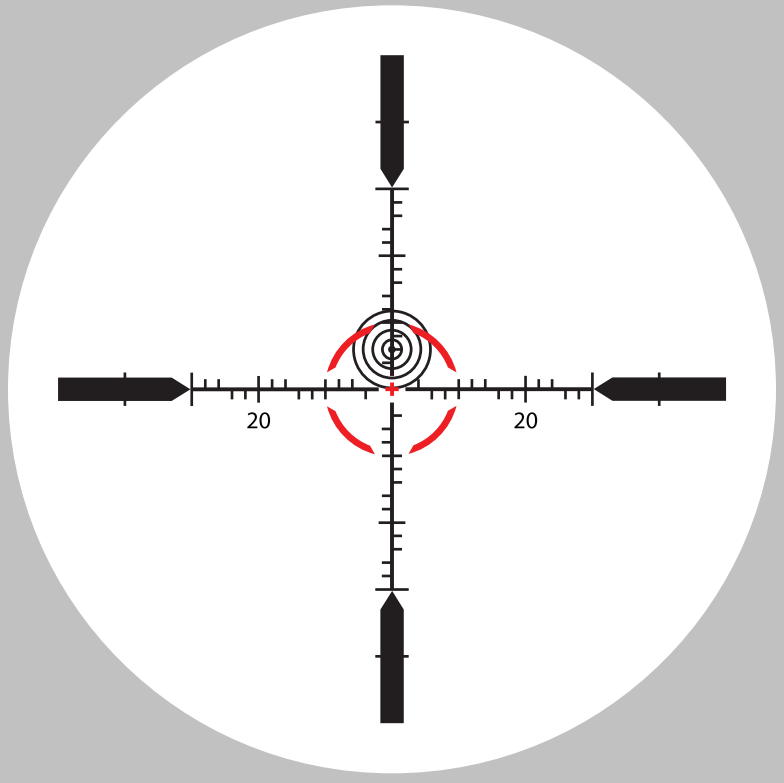
Equations for ranging distance to a target using moas

$$\frac{\textit{Height of Target (Inches) x 100}}{\textit{MOA Reading on Reticle}} = \textit{Distance to Target (Yards)}$$

$$\frac{\textit{Height of Target (CM) x 34.4}}{\textit{MOA Reading on Reticle}} = \textit{Distance to Target (Meters)}$$

As the height of target and moa reading on the reticle are two key variables in this equation, you have to get an accurate value for those two as much as possible. First all you want to put your ri le on a steady rest so you can get an accurate reading of the target height on the reticle. If needed using the smallest measurement on the reticle to get the most accurate readings. Second use your best knowledge on the height of the target, such as 72 inch high fence or 45 inch shoulder high of white tail deer, to give a value of the target height. Once you got the reading on reticle and your estimate of the target height, you can just simply use above equations to calculate the distance to your target.

Example



Reading a 3-foot target (36 inches) at 12 moas gives 300 yards

$$\frac{\textit{36 inches x 100}}{\textit{12 moas}} = \textit{300 yards}$$

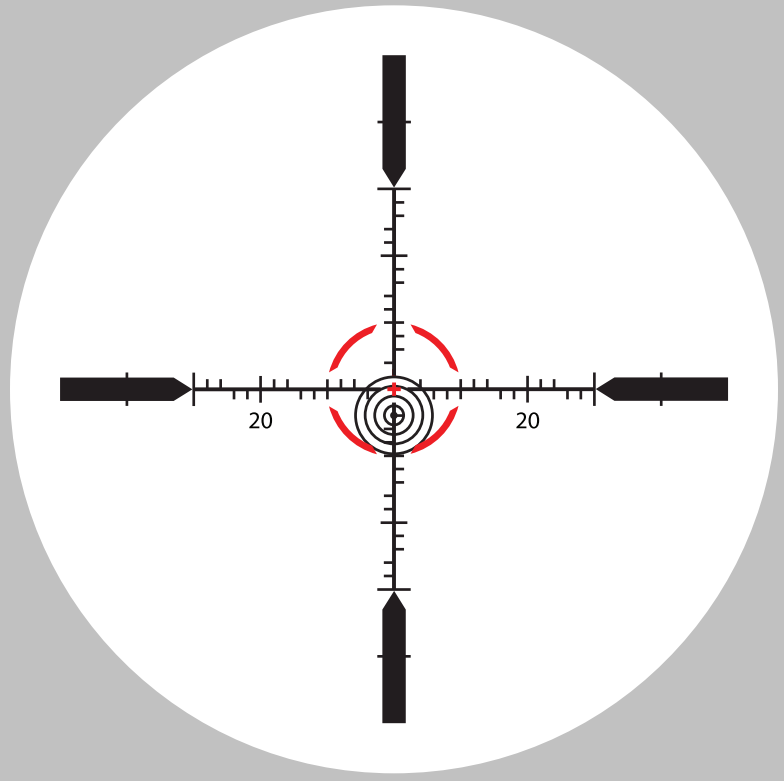
Holdover For Compensating Bullet Drop

To be able to use the elevation holdovers effectively, you have to know the distance to your target and bullet trajectory (bullet drop in inches or moas). Since many bullet ballistic charts highlight bullet drops in inches and 1moa equals to 1.047 (rounded up to 1 inch) at 100 yards, 2 inches at 200 yards, and 10 inches at 1000 yards, etc, we can use those to calculate the holdover position in moa on this reticle.

For example, under no wind condition, if you knew your target is at 300 yards and your ammo has a 12 inch bullet drop at that distance, you want to use 4 moa holdover point. Here is how you got the 4 moa: since 1 moa equals to 1 inch x 3 = 3 inches at 300 yards, and then 4 moas equal to 4 x 3 inches =12 inches at 300 yards, you want to hold the 4 moa drop point to compensate the 12 inch bullet drop.

To achieve ultimate precision, it is always a better idea to develop your own D.O.P.E (Data of Previous Engagement)chart so that you can refer back to it for specific bullet drop compensation under different ambient environment and weather condition.

Example

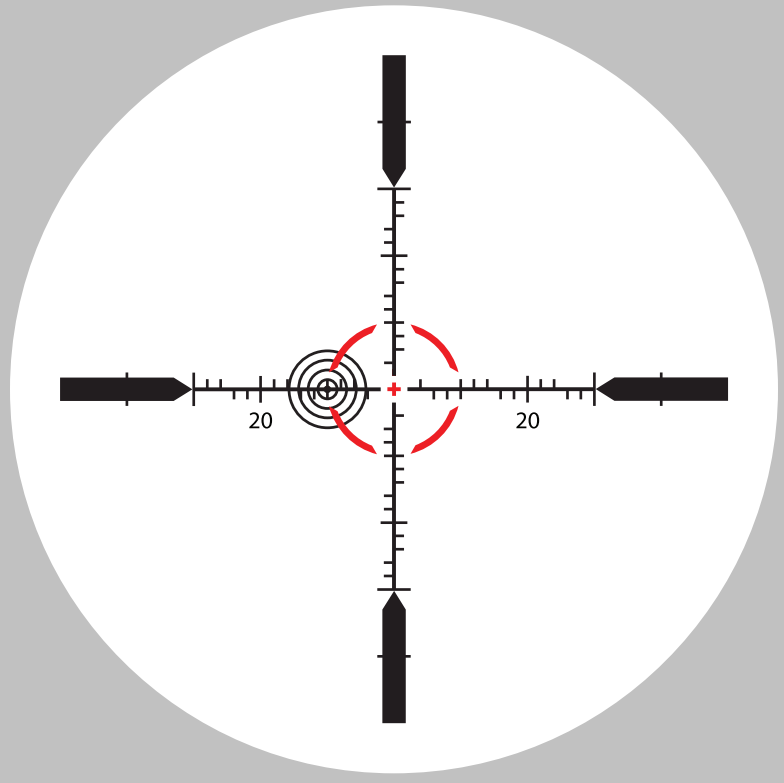


4 moa /12 inch holdover for a target at 300 yards out. No wind.

Holdover for Wind Correction and Moving Target

The flying time of a bullet, the velocity and direction of the wind and the "slippery-ness" of the bullet expressed in BC (Ballistic Coefficient) determine your holdover for wind correction. Once again you have to understand the impact of those three factors on your bullet's flying path in terms of inches or mils and calculate how much holdover you have to hold, and then finding the corresponding holdover position on the reticle is a much easier task to accomplish.

Example

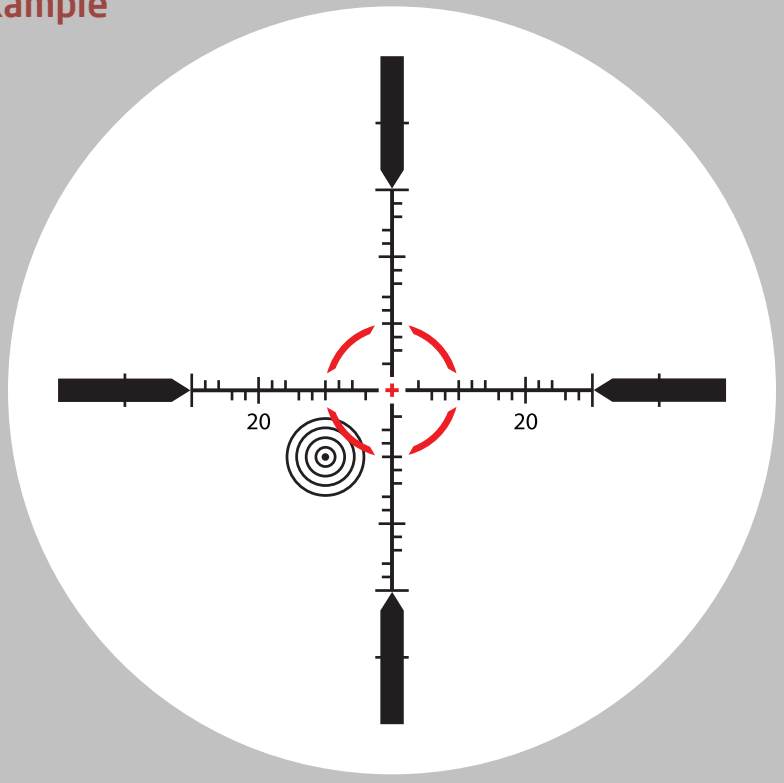


10 moa wind correction for 20 mph wind from right to left at 500 yards. Elevation turret has been dialed up to compensate bullet drop, just simply use center horizontal cross line to holdover for wind correction

Use visual cross point for wind correction and bullet drop

As an alternative, you can use a virtual cross point formed by hash marks on both horizontal and vertical cross lines to holdover bullet drop and wind correction.

Example

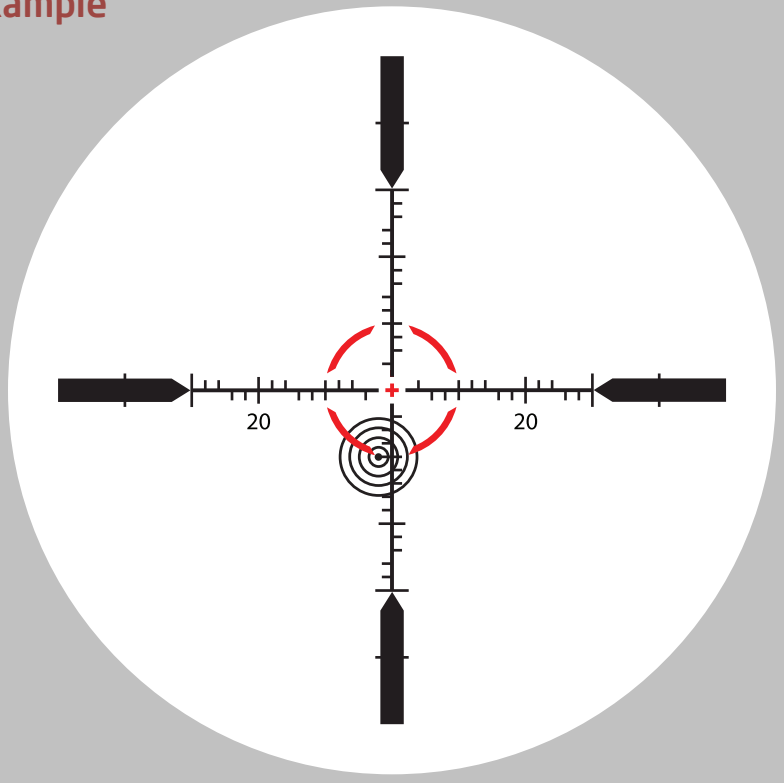


Use 10 moa for 60 inch bullet drop for a target at 600 yards, 10 moa wind correction for 20 mph wind from right to left.

Hold lead correction for a moving target

Distance to your target, moving speed of your target, bullet flying time, wind direction are the key factors that determine how much holdover you need to hold for a moving target. As a rule of thumb, you always hold the lead for the net distance of your target moved (add or subtract holdover for wind correction) during the time span your bullet traveled.

Example



2 moa lead holdover for a moving target traveling from left to right at 600 yards. Bullet flight time is 1 second during which the target traveled 1 foot. No wind.

THE ATHLON GOLD MEDAL LIFETIME WARRANTY*

Your Athlon product is not only warranted to be free of defects in materials and workmanship for the lifetime of the product. Athlon will also repair or replace, at no charge to you, your product if you should damage it through normal use. No receipt is needed, no registration is required. This is a commitment that Athlon Optics will be the best product you can buy for your money.

**This warranty does not cover damages caused by deliberate damage, misuse, theft or maintenance provided by someone other than the Athlon Authorized Service Department.*

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