

# The Machine Gun Sight I

(Based on the MMO)



**3<sup>rd</sup> Generation Crew Served Weapon Sight**

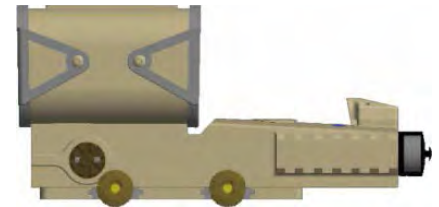
# Background

- IT&T successfully introduced wide field of view (WFOV) red-dot sights for crew-served weapons to SOCOM, USAF, USMC, Army and Navy offering:
  - Reduce time to target engagement
  - Ensure first round hits
  - Increase weapon accuracy
  - Reduce ammunition consumption
  - Reduced collateral damage



- The MGS I design is the result of 10+ years of experience in supplying the **Machine Gun Sights (MGS and MGS<sup>+</sup>)** to various military branches and U.S Foreign Allies.

- Low Cost
- Universal-One sight for all crew-served weapons
- Modular design enables
  - Easy to upgrade
  - Easy to configure for a specific mission
  - Easy support and field maintenance
- Fast target acquisition with improved BDC reticle design



- The MGS I designed and built in USA



# About the MMO Program (Army)

- The US Army was seeking new mounted machine gun optics for various weapon systems. US Army Contracting Command put out a pre-solicitation for optics for:
  - The 7.62x51mm M240B
  - The .50 caliber M2/M2A1 Machine Guns
  - The 40mm Mk19 grenade launcher.
- Project Manager Soldier Weapons (PM SW) were looking for optics which would give faster target acquisition times and increased first burst hit probability for vehicle-mounted automatic weapons.
- ***IT&T has been awarded a contract to bid for the phases of production, part of an \$48,800,000.***
- Maximum quantity: 11,450 optics per single caliber platforms.

*IT&T's primary objective is to increase the efficiency of existing weapons.*

*The MMO I provides faster target acquisition, increased first burst probability of hit and more user capabilities...*



# About IT&T MMO (MGS I)



***Gunners can keep both hands-on Spade Grip!***

- The MMO is designed and developed primarily for crew-served weapons. It is based on the key features of our MGS and MGS+ series with significant improvements resulting from user feedbacks collected from our large customer bases and new requirements.
- The MMO design allows for *quick target acquisition* and simplifies the shooting process-with built-in Bullet Drop Compensation (BDC) red or green selectable reticle.
- ***The hands of the gunner never have to leave the spade grip of the machine gun.***
- The MMO has a very large F.O.V (Field Of View) enabling:
  - Fast One-Shot-One-Hit capability with both-eyes-open aiming capability
  - Improved Situational awareness.
  - Improved accuracy helps to relieve collateral damage concerns
- Additional features offered :
  - Low battery indicator/Status
  - Mil-std 1913/STANAG rails (3)
  - Removable filter holder frame for Anti Reflective Device (Honeycomb)
  - Laser Filter, Sacrificial Window or other filters.

***The MMO reduces training time and save ammunition !***

# Benefits of Ballistic Reticles

Hands free  
operation

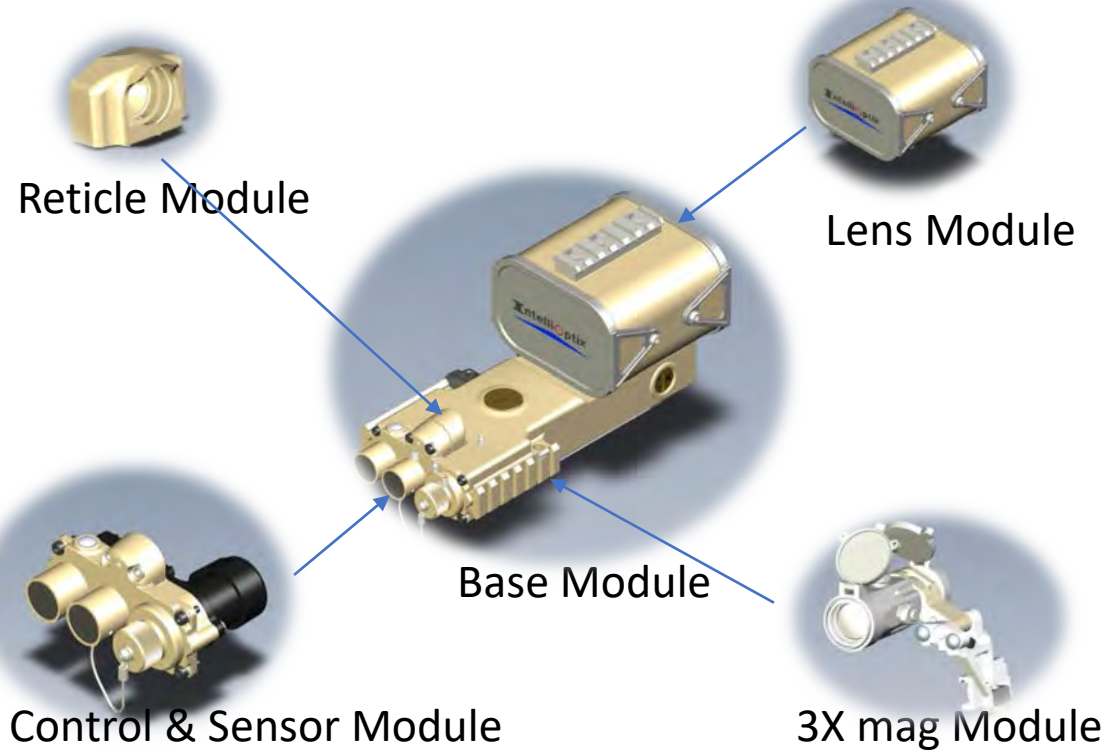
- **A Manual BDC** dial has proven to be difficult to use in combat as it slows down target acquisition time.
- **A manual BDC** dial offers very slow multiple target acquisition and engagement particularly when targets are far apart in range.
- By replacing a BDC dial with a 12.7mm or 7.62mm reticle, the MMO provides hands free operation and eliminates issues from the added weight and dirt accumulation affecting BDC mechanical dial accuracy.
- The MMO has a milliradian scale and stadia lines to assist users in azimuth, elevation, estimating range to engage multiple targets at various ranges.
- ***Without a manual BDC dial, gunners can keep both hands-on Spade Grip and their eyes on target at all time.***



# Main Components



- The MGS I is a **Universal** CSW sight and consists of the following **Modules**:



- **Benefits of Universal/Modular Design**
  - Easy to UPGRADE
  - Easy to Support and Repair
  - Easy to configure for a specific mission

# The MGS I Fits a Variety of Weapons (Universal CSW Sight )



M2- 12.7 mm



M240-7.62mm



M134 (Minigun) 7.62mm



Mk19-40mm

*The MGS19  
Mount is  
required*

Program of Record

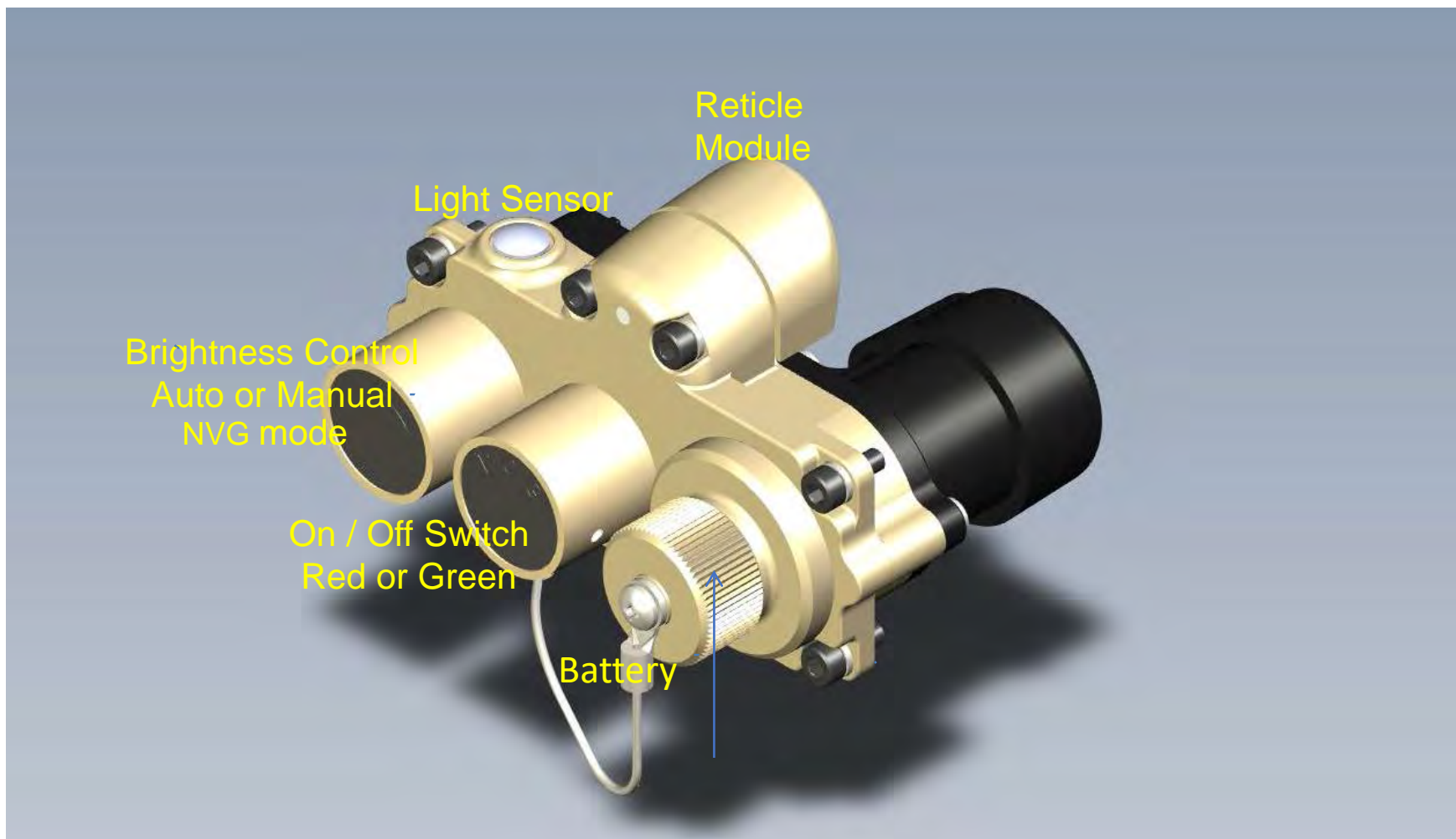


# Main Features



***The MGS I achieves faster target acquisition time and increase first burst probability of hit ( $P(h)$ ) for machine gunners firing from the ground or from vehicle mounted platforms - Stationary or moving.***

# Control & Sensor Module

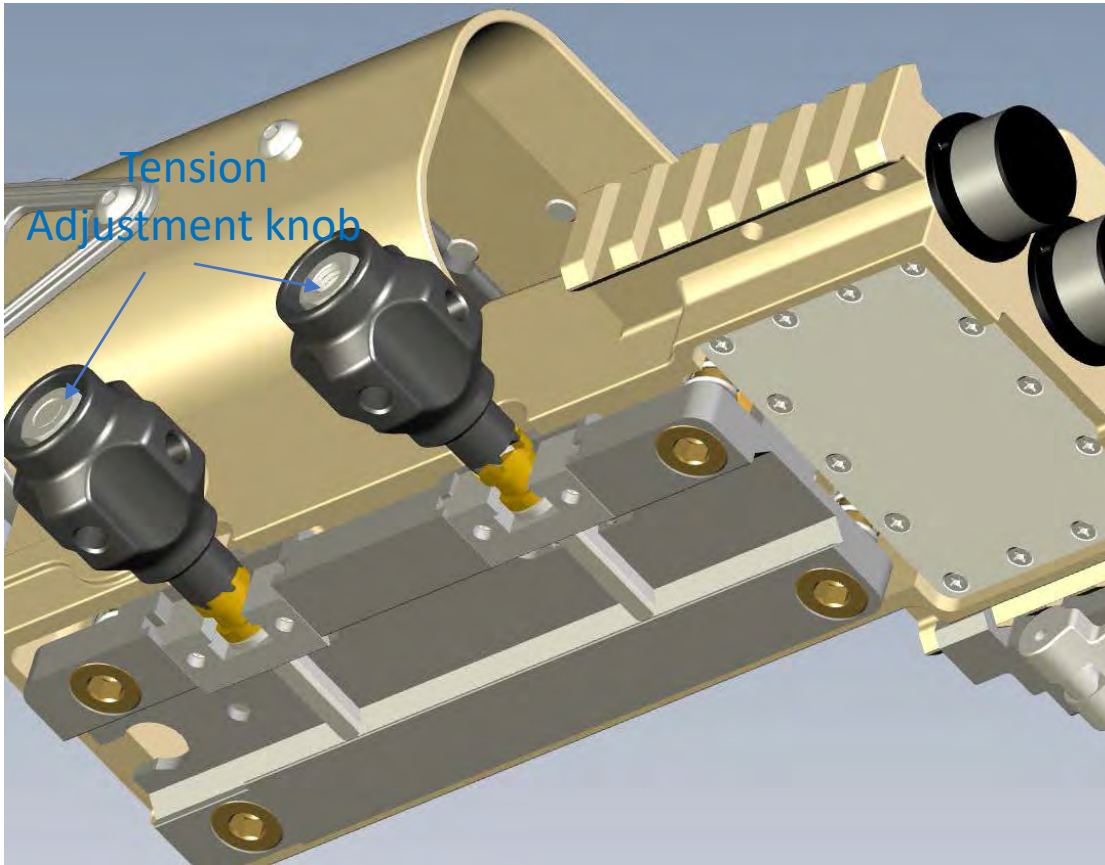


***The MGS I includes an adjustable brightness setting for use with NVGs at night on the low end and in full sun brightness on the high end.***

# *Battery life and low batt indicator*



- A low battery indicator is provided in the FOV of the MMO. The reticle will begin to blink/flash when the battery is low.
- *When the green reticle is first powered on, it will flash from 1 to 3 times.*
  - *3 Flashes: Fully Charged*
  - *2 flashes: Half charges*
  - *1 Flashed: Low*



- The MGS I mounts in a manner that prevents Soldiers from overtightening locking screws to the weapons rail by incorporating a **Torque Limiting Lock System**.
- The Torque Limiting Lock system uses a mechanism which causes the knob to free-spin once it has been tightened to its torque limit as seen in the figure above
- Torque range: 2.5-4Nm

# Torque Limiting Lock (TTL) System



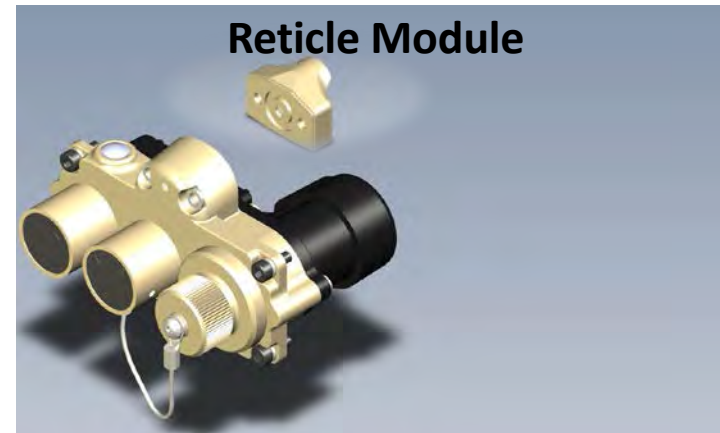
Use Hex Key



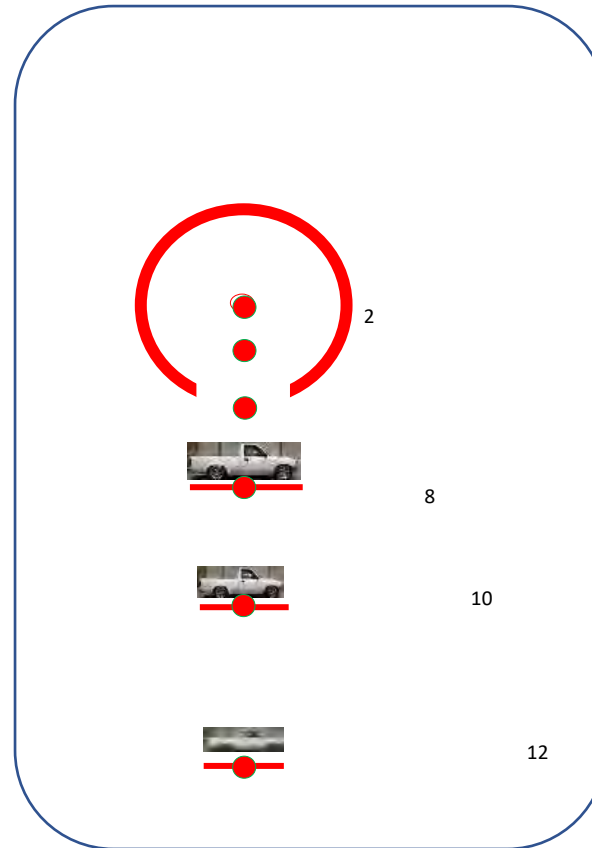
# Ballistic Reticle



- The MGS I designed to accept various dedicated caliber reticles with *milliradian scale and stadia lines for estimating the range or a multi caliber reticle* and they replace manual BDC Dials for quick target acquisition, tracking and engagement for static and moving targets.
- The removable Reticle Module can be easily replaced with other type of reticles.
  - 7.62 Mil Dot Reticle (B-type)
  - 12.7 Mil Dot Reticle(C-type)
  - 20mm Mil dot reticle (D-type)
  - 40mm Mil Dot Reticle (F-Type)
  - Other reticles available upon request
- The new reticle within the optic has a reference aim point that allows the user to adjust their point of aim based on a ballistic solution of the M240 or M2/M2A1 or the MK 19.



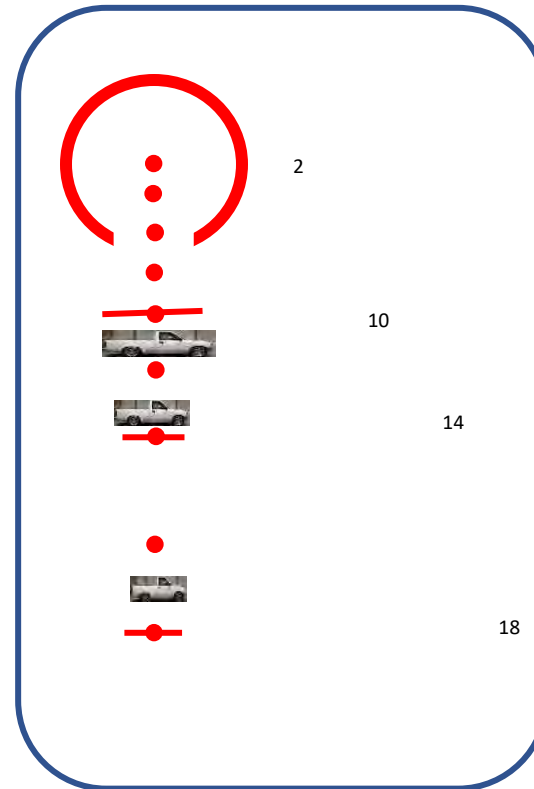
# 7.62 mm Mil Dot Reticle (Red or Green Selectable)



*Note: Width of hash marks = 5 m at that range (~ length of technical vehicle)*

***The MGS I has a milliradian scale or additional reticle that will assist users in azimuth, elevation, estimating range and engaging targets at various ranges.***

# 12.7mm Mil Dot Reticle (Red or Green Selectable)











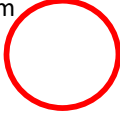



**Note: Width of hash marks = 5 m at that range (~ length of technical vehicle)**

Ranges

***The MGS I has a milliradian scale or additional reticle that will assist users in azimuth, elevation, estimating range and engaging targets at various ranges.***

# Range Estimation

Using the circle reticle, the range of various targets can be estimated. Figures below shows some common targets and estimated ranges, based on the reticle circle size of 35 MOA.

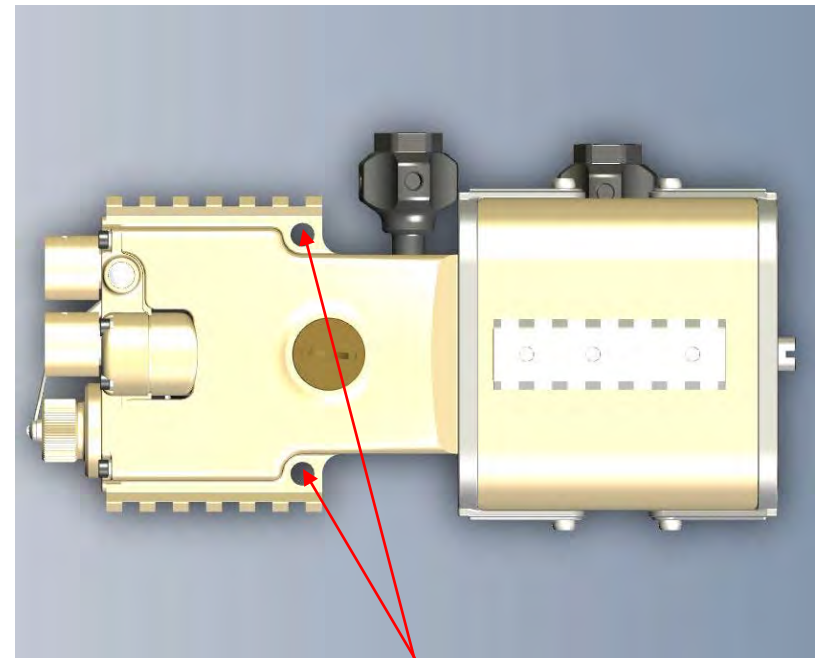
target	Target fills 100%	Target fills 50%	Target fills 25%
Car (1.5 m high)	~150 m 	~300 m 	~600 m 
Humvee /Toyota Pickup (2 m high)	~200 m 	~400 m 	~800m 
Soldier (~2 m high)	~200 m 	~400 m 	~800 m 
Truck (3 m high)	~300 m 	~600 m 	~1200 m 





*Steel retention cable*

***Designed to be mounted safely on ground vehicles, patrol boats or rotary wing aircraft platforms with securing holes for safety steel retention cables.***



*Holes for steel retention cable*



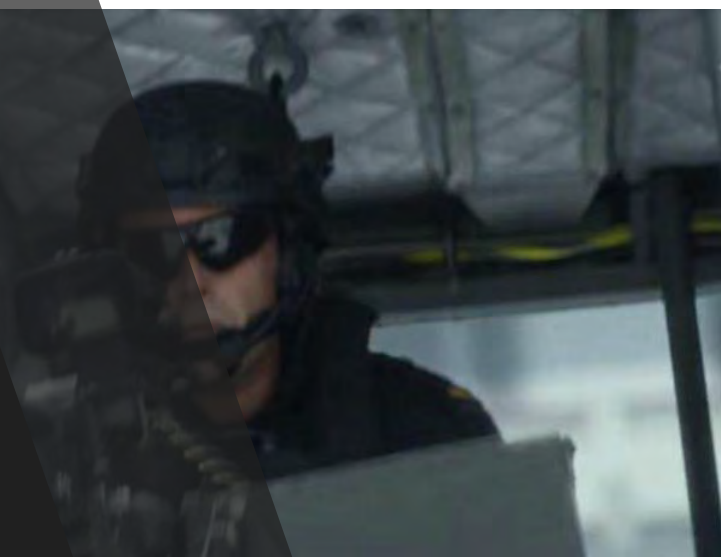
# Specifications



Model	MGS1-M1X	MGS1-L1X
Calibers	7.62 / 12.7/40/20	12.7/40/ 20
Dimensions[L x W x H]	~8.6x 4.3 x 4.5 in (220x110x115mm)	9 x 5.7 x 5.1 in (229x145x130mm)
Weight	~2.2 Lbs (~ 1.4kg)	~4 Lbs (~ 2 kg)
Lens Size (actual)	~3.4x 2 in [87 x 53 mm ]	4.7 x 2.7in [120 x 70mm]
Locking system	Torque Limit Lock (>3.5Nm)	Torque Limit Lock (>3.5Nm)
Color	Tan	Tan
Total Field of View	~80m at 200m [>25 degrees]	~80m at 200m [>25 degrees]
Azimuth/Elevation Adjustment	~0.5 MOA/click	~0.5 MOA/click
Eye Relief	Unlimited	Unlimited
Red Dot or Green Dot Size	Dot = 3 MOA Circle = 35 MOA	Dot = 3 MOA Circle = 35 MOA
LED colors	Red or Green selectable	Red or Green selectable
Night vision	3 settings	3 settings
Brightness Adjustments	8 settings+ (On/off)	8 settings+(On /off)
Magnification-Option	3X or 3-8X Variable	3X or 3-8X Variable
Power Supply	1 type 123 3V lithium	1 type 123 3V lithium
Battery Life ~1000+ hr	~1000 hr	~1000 hr
Battery life and low batt indicator	Yes	Yes
Mounting	1 MIL-STD-1913 rail & 2 mag rails	1 MIL-STD-1913 rail & 2 Mag rails
Operational Temperature	-41°C to +71 °C	-41°C to +71 °C

***The MGS I is designed to survive in operational military environments in accordance with MIL-STD-810G.***

# Options



# Options: Magnifiers

- *We offer:*
  - 3X
  - 5X
  - 3-8X Variable
- *2 rails for magnifiers*
  - Right
  - Left
- *Variable 3-8X magnifier provides gunners with the ability to recognize targets at 1000 meters.*



# Option: 3X magnifier specifications

Model	MMG-300
Magnification	3X
Eye Relief	70mm
Parallax	1 MOA (.298 Artillery Mil) @ 1000m
Resolution	15 SOA
Field of View	6.8 degrees
Transmission	400nm ~1000nm, Greater than 90%
Eyepiece focus	-0.5 (min 0~max -1)
Exit pupil diameter	7.7mm
weight	240g
dimensions	107mmX 38mmX 38mm
Storage temperature	-51°C to 75°C
Operation temperature	-45°C to 75°C
Humidity	95%
Anti-Reflection Coatings	All optical surfaces
Lens/Dust Covers	Front and back
Submersion	1 meter for a one-hour period.
Shock/Drop	3ft drop
Sealing & Purging	Purged with dry nitrogen.
Altitude	25,000ft



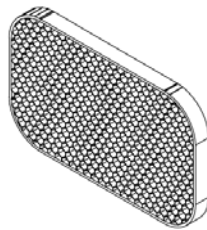
# Option: Honeycomb

- The MGS I incorporates anti-reflective device (Honeycomb) to minimize the chance of detection by the enemy observers.

Honeycomb



Lens Covers



# Option: Larger Lens Body

(Model: MGS-L1X)

- **IntelliOptix also offers a larger lens body for the MGS+ to increase FOV.**
  - Lens size: 120mmx 70mm
  - Quick module replacement



**NSN : 1220-01-659-7903 (Large Lens)**

# Option: Modular M2 Mounts

- Patent Pending
- Modular Design
- Quickly upgrade the US Army mounts into:
  - Single Rail (M2M-S)
  - Tri Rail (MTM-T)



Tri Rail



Single Rail Mount



NSN 5855-01-045-5482



# Installation on the M2A1 -12.7 mm machine gun with the M2 mount



**M2 mount**



**MGS+ with 3X mag**

# Installation on the M134 Minigun



Picatinny rail



Picatinny rail

*The M134 installs on top of a Picatinny rail.*



## Option: Soft Bag

- The MGS+ could be supplied with a soft, water resistant carrying case that will keep contents dry and protected from incidental damage.
- The case shall provide storage space for the weapon sight with lens covers, mount assembly, batteries, operator's manual, and lens cleaning material and Technical Manual.
- The carrying case attachment is compatible with standard issue All-Purpose Lightweight Carrying Equipment (ALICE) and Modular Lightweight Load-bearing Equipment (MOLLE) attachments.





**IT&T**

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