

Holographic Technology

Holographic sights work by using hologram technology housed in a durable construct designed for performance in extreme conditions.

What Makes a Hologram

A hologram records and reconstructs the light field that bounces off a 3-dimensional object. This is done in a way that allows depth information to be preserved. The recording also includes many viewing directions simultaneously. That way, the viewer can change perspective by moving their head.

A good analogy is the recording and playback of sound:

- Sound waves (like those in music) are encoded and recorded on a disk
- A device is used to decode the information on the disc, which reconstructs the original sound waves
- The human ear can hear those sound waves

Holography uses a recording of the pattern of interference an object makes on light.

- A device records the light field that was reflected off an object scene
- The data is recorded as refractive index variations on a clear window
- To decode the recording, laser light is directed at the hologram recording on the clear window
- There on the window, the recorded light field is reconstructed and is visible to the human eye

The reconstructed light field is so complete and accurate that the viewer cannot tell whether the 3-dimensional image he sees is live or holographic.

How a Holographic Sight Operates

The holographic sight uses laser-driven holographic technology. It constructs a 2 or 3-dimensional image of a reticle, and the laser illuminates the hologram. Then the viewer looking through the sight window can see the reticle image in the distance, at the target plane.

The projection of the reticle appears...

- Only to the user
- In the window of the sight

The reticle image can be...

- Any pattern and shape
- 2-dimensional or 3-dimensional
- Any size: from as small as the human eye can resolve, to as large as desired for achieving high aiming accuracy without magnification

Onboard Computer Controls

Holographic weapon sights (HWS) use state-of-the-art



digital electronics, including an onboard microprocessor. These components give the operator precise control of the illumination laser, including...

- Scrolling through brightness levels (to adjust for low light to bright sunlight)
- Automatically checking battery power indicators
- Programming auto shutdown features

Heads-Up Display

In holography, all of the information required to reconstruct the reticle image is recorded everywhere in the heads-up display window. This is the technology that fighter pilots use for target acquisition. It creates an accurate image of a target even in poor-visibility conditions like rain, snow, darkness or cloud cover.

The heads-up display of a holographic sight provides the user with 2-eyes-open shooting. This eliminates blind spots and tunnel vision, and maximizes peripheral vision.

Durable Design

Durability is an important function of HWS. The sights are designed and built to be resistant to water, fog, shocks and extreme temperatures.

- **Optical cavity** – Enclosed and sealed with state-of-the-art aerospace composite material to keep out water and fog
- **Components** – Hardened and corrosion resistant
- **Electronics** – Encapsulated in shock-absorbing resin compound to remain fully operational and hold zero in Military Specifications (MIL-SPEC) drop tests
- **Acceleration Tested** – Functions with 2,500 Gs of acceleration in less than 0.5 milliseconds
- **Heads-Up Display** – 3-layers of laminate and glass, further protected by a rugged, roll-bar-style hood

Even if the window is shattered or is partially obstructed by mud, snow or rain, it can still function. As long as the operator can see through any portion of the window, the entire reticle pattern remains visible on the target.

No Revealing Light Signature

All external optical surfaces of the HWS are flat and have anti-reflective coatings so no glare elimination filters are needed.

The projected reticle is visible to only the operator. Even GEN-III night vision equipment cannot detect the muzzle-side signature of the HWS operator's position.

Night Vision Compatible

Night vision (NV) settings are available on some EOTech holographic weapon sights. The NV button transitions the reticle to a light spectrum below what is seen by the naked eye. These sights in NV mode...

- Are fully compatible with all generations of night vision intensifier tubes
- Allow the operator to change the brightness intensity of the holographic reticle
- Eliminate halo effect while viewing through an image intensifier tube



- Provide enhanced, effective weapon aiming in complete darkness
- Differ from IR laser pointer systems

There are 20 daylight brightness settings on an EOTech HWS. In addition, the night vision mode has 10 additional distinct brightness settings that compensate for...

- Ambient environment
- Variances in sensitivity of the image intensifier tubes
- Differences in light-gathering sensitivity of the human eye, from user to user

Just as an EOTech HWS without night vision emits no muzzle-side signature, the EOTech HWS in night vision mode is also not detectable by enemy night vision surveillance systems, making it an effective stealth system.

Typically, a monocular night vision system and the HWS are mounted in tandem on the receiver of the weapon. The holographic reticle can also be witnessed with a head-mounted or helmet-mounted monocular night vision image intensifier system. This works even with a partial cheekweld on the weapon's stock.