

NORTHROP GRUMMAN*Electronic Systems*

Electro-Optical Module (EOM)

Common EO Tester in Use by the Navy, Army and Air Force



U.S. Navy CASS EOSS+



U.S. Army IFTE/EOTS

U.S. military forces today are primarily used for expeditional low level conflicts where precision strike engagements are frequently the only acceptable response. As Desert Storm and Operation Allied Force showed, photonic weapon systems – forward looking infrared (FLIR), laser and TV sensor systems – in precision strike warfare increase weapon accuracy, mission success and survivability, while minimizing collateral damage.

To ensure that these complex weapons systems are mission ready, Northrop Grumman has developed the Electro-Optical Module (EOM) which provides highly automated, accurate, reliable and

repeatable test results. In addition to diagnosing the problem, the EOM automatically notifies the user how and where to fix the problem.

The EOM is a building block that can be used to construct a test solution for the field, factory or depot. It is currently being used in the Electro-Optical Subsystem (EOSS+) for the U.S. Navy's Consolidated Automated Support System (CASS) and has been adopted by the U.S. Army's Integrated Family of Test Equipment (IFTE). In addition, the U.S. Air Force will use the EOM for the EO Commercial Test Equipment (CTE) at the EO Depot in Warner Robins AFB.

Electro-Optical Module (EOM)

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Electro-Optical Stimulus and Measurement Functions

Laser Transmitters

- Maximum Energy Input: 300 mJ With Attenuator or Rhomboid
- Minimum Energy Input: 50 μ J Without Attenuator or Rhomboid
- Aperture: 5" Diameter Maximum
- Divergence: 130 to 1000 μ rad
- Wavelength: 1.064 μ m (1.54, 1.57 μ m)
- Pulse Repetition Frequency (PRF): Single Shot, 8 to 20 Hz
- Angle of Regard: 0 \pm 10 mrad [Relative to the Test Program Set (TPS) Reference Mirror]
- Polarization: Unpolarized to Linearly Polarized, Any Angle
- Maximum Peak Power Density: 600 MW/cm² With Attenuator or Rhomboid 1 MW/cm² Without Attenuator or Rhomboid
- Beam Alignment Range: 0 to 10 mrad Due to the Unit Under Test (UUT)

Laser Receivers

- Sensitivity Ranges: 1 x 10⁻¹⁰ to 1 x 10⁻⁶ W/cm²
- Range Gate: 0.5 to 60 km
- Apertures, Separate or Coaxial: 0.5" to 5.0" Diameter
- Wavelength: 1.064 μ m (1.54, 1.57 μ m)

Laser Trackers

- Sensitivity Ranges: 1 x 10⁻¹⁰ to 1 x 10⁻⁶ W/cm²
- Range Gate: 0.5 to 60 km
- Apertures : 0.5" to 5.0" Diameter
- Acceptance PRF: Single Shot, 8 to 20 Hz
- Wavelength: 1.064 μ m (1.54, 1.57 μ m)

Forward-Looking Infrared Systems

- Aperture: 10" Maximum

- Source Spatial Frequency: 0.2 to 20 Cycles/mrad
- Spectral Bands: 3 to 5 μ m, 7 to 12 μ m
- Video Output: RS-343, RS-170, Digital Video
- Effective Source Temperature at UUT Entrance Aperture : 280 to 340K (Δ T = -10° to +40°C)
- Target Slewing for Video Trackers: <12 mrad/sec Azimuth, <6 mrad/sec Elevation

TV Vidicon Sensors

- Spectral Band: 0.6 to 1.1 μ m
- Video Output: RS-343, RS-170 and Digital Video
- Effective Source Radiance at TPS Entrance Aperture: 20 to 20,000 μ W/cm²/sr
- Source Spatial Frequencies: 0.2 to 30 Cycles/mrad
- Target Slewing for Video Trackers: <12 mrad/sec Azimuth, <6 mrad/sec Elevation

Performance Measurement Capability

Laser Transmitter/Receivers

Divergence, Interval, Amplitude, Energy, Alignment, Satellite Beam, AGC/TPG, Gain, Position, Range, Multiboresight

- Power: 1,400 W Peak
- Electrical Interface: Ethernet: VXI; IEEE-488
- Weight: EO Module: 270 lb
- Size: 28" (L) x 19" (W) x 26" (H)

For more information, please contact:

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TV Sensors

MTE, Gain, Dynamic, Range, Distortion, Tilt, Uniformity

- Environmental
 - Temperature: Operating 10° to 40°C, Nonoperating -40° to +85°C
 - Altitude: Transport 1,000 to 40,000 ft Operating 1,000 to 15,000 ft
 - Vibration: per MIL-T-28800E
 - Mechanical Shock: 20 g
- State of the Art Radiometric Thermal Source (\pm 0.05° C Δ T)

IR Sensors

MTE, MRT, NEDT, Uniformity, SITE, Distortion, Tilt, FOV, Channel Integrity

- Extremely Accurate High Output Visual Source (\pm 3.7% at 20,000 μ W/cm²/sr)
- Highly Accurate Polarization Insensitive Laser Source/Detector (\pm 9% Energy, \pm 15% Amplitude)
- High Resolution FPA Camera With Anti-Blooming Capability (Laser Divergence Measurements and Alignment)
- All-Reflective Optical Collimator