General Atomics Electromagnetic Systems’ (GA-EMS) Laser Communication Terminals (LCTs) are enabling faster, higher fidelity communication transmissions through modern Optical Inter-Satellite Links (OISL). LCTs support vast networking of satellites, the sharing of data and information, and collective on-orbit computing resources in space. GA-EMS’ LCTs are facilitating the next evolution of modular, space-based communications services, providing a more resilient architecture to ensure 24/7 total connectivity from earth, to space, and beyond.
OVERVIEW
GA-EMS’ LCTs enable robust space-to-space, space-to-air, and space-to-ground communications between multiple spacecraft in a variety of orbits. The LCTs improve resiliency and security as well as providing increased satellite crosslink and downlink data rates when compared to legacy radio-frequency (RF) systems.

2021 DEMONSTRATION DATA

LCT
Wavelength: 1550 nm
Data Rate: Up to 5GB per sec
Max Range: 5000 km

SATELLITE
Mission: First Department of Defense contracted inter-satellite LCT payload technology demonstration
Satellites: Two GA-EMS 12U CubeSats
Orbit: Low Earth Orbit (LEO)

OPERATIONAL CHARACTERISTICS
Higher Directivity with Less Power and Lower Mass
The smaller aperture size required for optical communication relative to conventional RF technology, allows for a smaller, lighter LCT package with the additional benefit of less beam spreading.

High Bandwidth
The optical system’s higher carrier frequency increases its information carrying capacity.

Less Crowded Spectrum
Narrow, optical beams reduce interference with adjacent carriers, reducing overall spectrum congestion.

High Security
The highly directional, narrow beam divergence of optical communication has inherent low probability of intercept and detection (LPI/LPD).

Scalable for Cislunar Operation
GA-EMS’ LCTs provide communication throughout the cislunar environment to support Space Domain Awareness and other missions.

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