

100 Gbps Optical Ground Station

Connecting Space with High-Capacity Optical Links

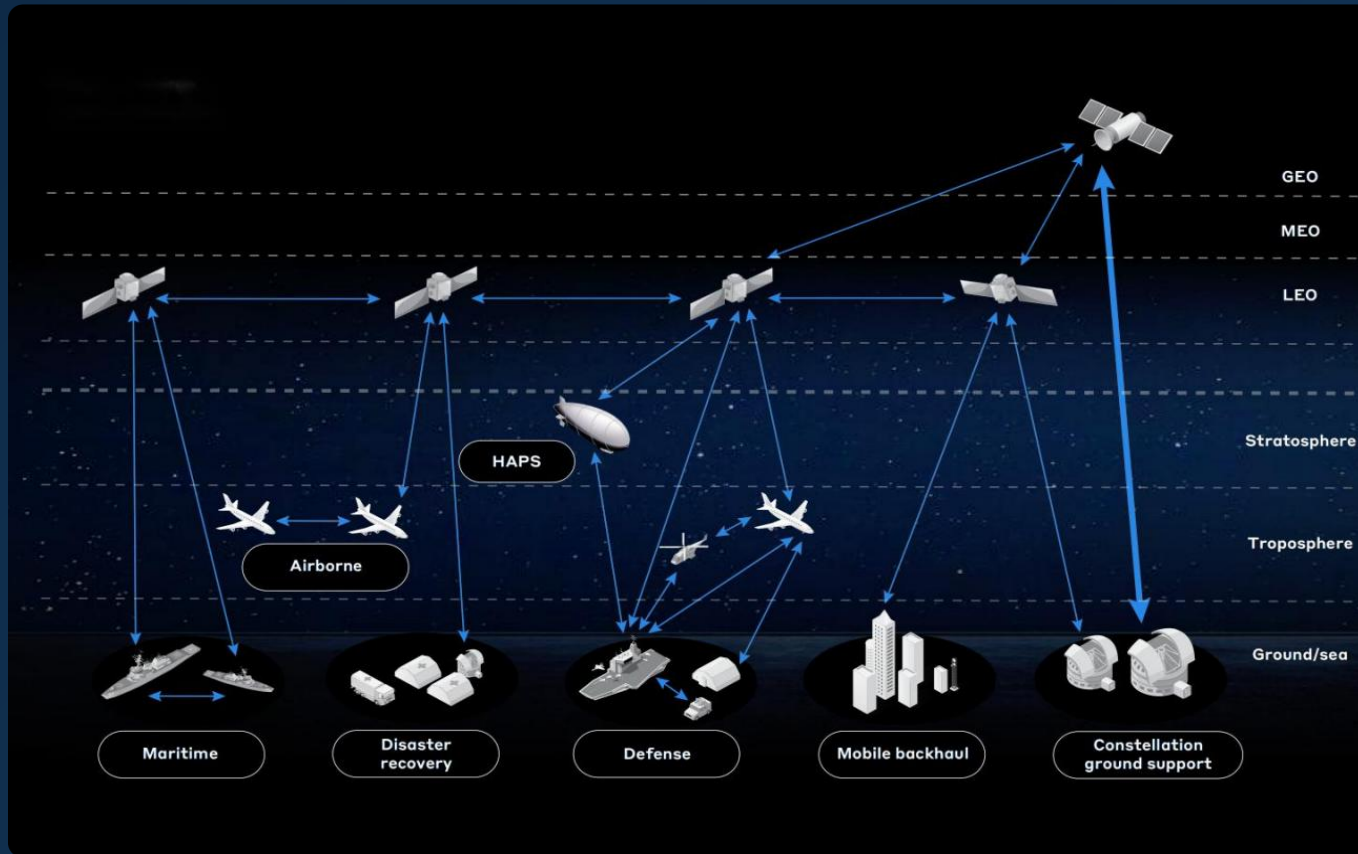
Adaptive Optics · Optical Mode Diversity · Precision PAT

High-Speed · High-Sensitivity · Turbulence-Resilient · Network-Ready



laser communications

Space data traffic is growing exponentially. RF spectrum is congested, licensed, and costly. Laser communications delivers massive license-free bandwidth with ultra-secure, low-latency links — across GEO, MEO, LEO, airborne, and ground networks.



Ultra-High Throughput
100 Gbps+ space-to-ground links.

End-to-End Security
Low detection & interception,
anti-jamming

License-Free
No RF spectrum license required

Low-Latency
Supports real-time mission
applications

The Challenge

100 Gbps Is More Than a Data Rate

As satellite constellations generate ever-increasing volumes of data, optical ground stations must deliver not only higher throughput, but also stable and reliable links under challenging atmospheric conditions.

01 Atmospheric Turbulence

Atmospheric turbulence distorts the optical wavefront and can degrade received signal quality and link stability.



02 Precision Pointing

At high data rates, even small pointing errors can significantly impact the optical link.



03 Link Reliability

High-capacity optical communication requires stable acquisition, tracking, reception and rapid recovery.



04 Network Scalability

A single ground station is not enough for continuous access to LEO satellites. Multiple geographically distributed stations are required to build a resilient optical ground network.



The challenge is not raw throughput — it is sustained link availability.

Applications

Laser communications are essential for operational use

01 Secure Mission Connectivity

High-security optical ground links deliver low-signature, high-capacity connectivity for defense, government, and mission-critical applications.



02 High-Resolution Data Downlink

Optical ground stations enable fast, high-volume downlink of Earth observation data, supporting high-resolution and time-sensitive missions.



03 Optical Ground Station Services

Flexible optical ground infrastructure provides on-demand access to high-capacity downlink services, without the need for dedicated ground assets.



04 High-Capacity Data Relay

High-throughput optical links and low-latency data relay enable next-generation satellite constellations and global data networks.



Optical satellite communications deliver secure, high-capacity connectivity for mission operations.

600 mm Optical Ground Station

Integrated Optical Ground Station for LEO Laser Communications

Optical System

600 mm Telescope — 600 mm large-aperture receive telescope
1550 nm — High-capacity free-space optical communication.

Tracking & Acquisition

Precision PAT — Fast target acquisition, high-precision pointing, stable satellite tracking, rapid re-acquisition.

Atmospheric Compensation

Adaptive Optics — Real-time atmospheric turbulence correction.
Optical Mode Diversity — Improves link robustness under dynamic propagation conditions.

Communication

Optical Receiver & Demodulation — High-sensitivity optical reception and signal processing.
Up to 100 Gbps — High-capacity data downlink.

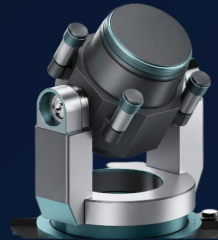
Control & Network

Central Control & NMS — Mission Planning, Orbit Prediction, Station Monitoring, Remote Operations, Multi-Station Management.

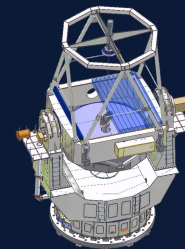


Product Structure: Built for Operations

An integrated optical ground station designed for remote operations, automation, and seamless network integration



Telescopes



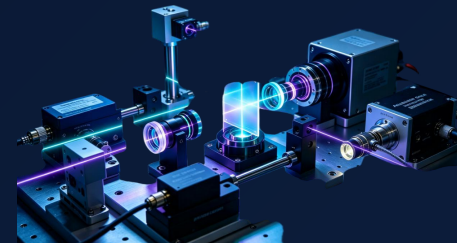
PAT



Infrastructure



DataCommunication
& control



Adaptive Optics

Adaptive Optics continuously measures and corrects atmospheric wavefront distortion to improve optical coupling and received signal quality.



Optical Mode Diversity

Optical Mode Diversity provides multiple optical modes or channels to improve link robustness under dynamic atmospheric propagation conditions.

Global Optical Ground Network

From One Ground Station to a Global Optical Network

Distributed Optical Infrastructure for Continuous Space Connectivity

01

Ground Station

600 mm · 100 Gbps

Every station provides:

- High-Capacity Optical Links
- Mode Diversity
- Adaptive Optics
- Precision PAT

02

Intelligent Network

Network OS

- Mission Scheduling
- Orbit Prediction
- Weather Intelligence
- Station Monitoring
- Remote Operations

03

Global Optical Network

Weather-Diverse Ground Stations

Distributed OGS locations provide:

- Increased satellite access
- Higher network availability
- Weather diversity
- Reduced downtime
- Automated station selection
- Scalable constellation support

Building the Global Optical Ground Station Network

Key Specifications

Category	Specification
Satellite orbital altitude	500–1000 km
Communication data rate	100 Gbps +
Modulation scheme	DPSK, BPSK, QPSK, OOK and other modulation formats
Pointing Range	Azimuth: -350° to +350°; Elevation: 20° to 85°
Receiving telescope aperture	600 mm
Transmitting aperture	120–160 mm
Uplink optical power	4 channels, 10–20 W per channel
Maximum tracking speed	Azimuth: $\geq 20^\circ/\text{s}$; Elevation: $\geq 10^\circ/\text{s}$
Fine tracking residual error	$\leq 2 \mu\text{rad}$
Number of deformable mirror actuators	Approx. 200 units

Let's Build the Future

of Space Laser Communications Together

OptiVeraX

Commercial aerospace company building the global optical ground station network that empowers space laser communication and the space economy.

600 mm Laser Communication Ground Station
Up to 100 Gbps · $\leq 2 \mu\text{rad}$ fine tracking · $> 99\%$ availability