

Marble Imaging selects optical downlink to enable high-throughput Earth observation data retrieval for its first satellite mission

October 21st, 2026

Marble Imaging, Reflex Aerospace, and Odysseus Space announced a joint mission that will mark a major step forward in high-capacity space-to-ground communications for Earth Observation (EO). Scheduled for launch in Q1 2027, Marble Imaging's inaugural satellite, built and integrated by Reflex Aerospace, will rely on Odysseus Space's Cyclops™ Laser Communication as a Service solution to retrieve the large volumes of data generated by its very high-resolution EO payload.



Marble Imaging's first satellite Marble Sat-1 "Morgana"

This satellite is the first of Marble Imaging's planned constellation of 20+ satellites, designed to deliver high-quality optical imaging data to support faster, better-informed decision-making across government and commercial applications. From the outset, Marble Imaging identified downlink capacity as a key system driver, with data volumes exceeding what conventional radio-frequency (RF) communications could support.

"Laser communication unlocks the downlink speeds needed for the massive data volumes of next-generation Earth observation satellites, while offering inherently more secure data transfer, critical in the current environment. We're excited to incorporate this technology on our first satellite with our partner Odysseus Space", said Robert Hook, CEO of Marble Imaging.

Optical communications enabling a new class of Earth observation missions

To meet these requirements, Marble Imaging selected Odysseus Space's Cyclops™ Laser Communication as a Service solution. On this first mission, Cyclops™ will provide the optical downlink service, enabling the retrieval of large daily data volumes generated by the very high-resolution payload.

Cyclops™ is delivered as a fully managed solution, including the space terminal with access to optical ground stations and end-to-end operational services, from pass planning to data delivery.

The commercial Cyclops™ service is designed to operate at data rates of up to 10 Gbps, enabling the downlink of at least 1 TB of data per satellite per day under typical operational conditions, and supporting future satellites and constellation deployments with increasing throughput demands.



Odysseus Space's Laser Communication Terminal for data downlink, Cyclops-DTE

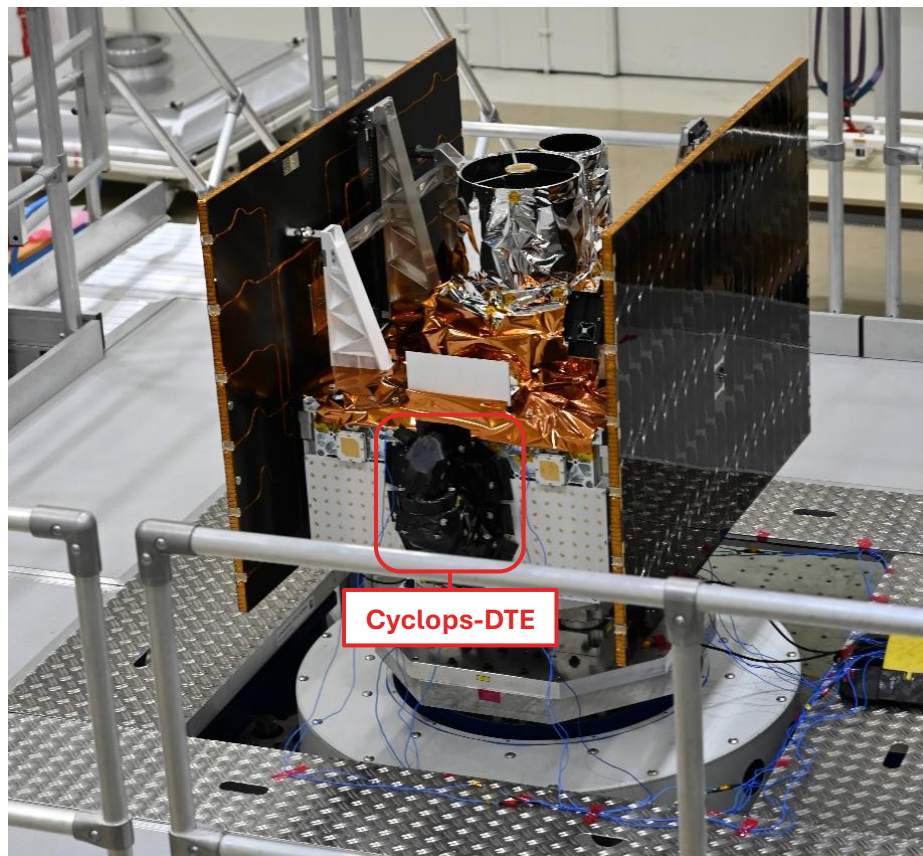
Optical communications are redefining the status quo for EO missions. By going beyond the typical 1–2 Gbps limits of radio-frequency systems, satellites no longer need to be designed around restrictive bandwidth constraints, enabling significantly higher data volumes while dramatically reducing the cost per delivered bit. In addition to throughput, optical links offer inherent advantages in terms of security and resilience, thanks to their highly directional, interception-resistant beams, as well as license-free operation outside regulated spectrum.

“The throughput we enable allows our customers to unlock new business models that were previously out of reach due to technical limitations or prohibitive costs. For missions generating large volumes of data, we reduce the cost by a factor of ten while managing the entire service from

pass planning to data delivery, and providing the space terminal with no upfront cost,” said Jordan Vannitsen, CEO of Odysseus Space.

A scalable platform for constellation growth

The satellite was manufactured by Reflex Aerospace, which also performed the integration of Odysseus Space’s laser communication terminal onto its high-performance satellite platform. Marble Sat-1 recently successfully passed its vibration testing and flight qualification, a major milestone before launch.



Fully integrated Marble Sat-1 satellite, on its testing platform

“Secure, high-throughput communications are a critical requirement for next-generation satellite constellations. Space-to-ground laser communication enables data downlink rates and security levels far beyond what traditional RF systems can deliver,” said Walter Ballheimer, CEO of Reflex Aerospace. “We are delighted that Marble Imaging and Odysseus Space have chosen our high-performance satellite platforms for this mission. Together, we are setting new benchmark for made-in-Europe secure satellite communications.”

The first six months of the mission will be dedicated to an in-orbit demonstration phase, validating both Marble Imaging’s satellite and Odysseus Space’s optical downlink service, including space and ground segments. Following this phase, the mission will transition into full commercial operations for the remainder of its lifetime.

To support Marble Imaging's future constellation and other customer missions, Odysseus Space plans to enable access to a global network of up to 50 optical ground stations within five years, leveraging both its own infrastructure and partner-operated stations to ensure scalable, resilient, and geographically diverse coverage.

Marble Imaging

Marble Imaging is a big-data EO company founded in August 2023 in Bremen, Germany, building its constellation of Very High Resolution (VHR) satellites to provide up to hourly EO data and analytics for time critical insights of our planet. The data and derived EO-based analytics will be vital in supporting rapid decision-making with regard to defence, climate security, crises & disaster management, green and sustainable energy transitions, infrastructure and mobility and much more. Marble Imaging already offers advanced data analysis services, including object detection for situational intelligence, terrain analysis and trafficability assessment, coastal asset monitoring, and land cover classification.

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Odysseus Space

Founded in Luxembourg in 2019, Odysseus Space provides Laser Communication as a Service for space-to-ground data transfer. Its Cyclops™ solution addresses the bandwidth, security, and cost challenges faced by satellite operators. Cyclops™ is a subscription-based, end-to-end service that can include the laser terminal on board the satellite and provides access to a global network of optical ground stations, enabling downlink speeds of up to 10 Gbps and 1 TB per day.

Cyclops™ has been developed with the support of the Luxembourg Space Agency (LSA) and the European Space Agency (ESA), whose programs contributed to bringing this next-generation optical communication service to market. www.odysseus.space

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Reflex Aerospace

Reflex Aerospace is a manufacturer of high-performance, payload-specific platforms for commercial and defense applications. Based in Berlin and Munich, the company specializes in applying modern manufacturing techniques to reduce lead times and improve performance for critically important space infrastructure. Reflex Aerospace is committed to enhancing Europe's strategic autonomy through innovation, speed, and sovereign capability development.

More information can be found at www.reflexaerospace.com.