
C3S
OWL
Orbital
Whereabout
Locator
ESSENTIAL WEARABLE
FOR YOUR SATELLITE


# The Challenges of Space Safety for CubeSats

Space traffic has become a critical issue due to the rapid increase in orbiting objects. By 2026, private companies alone are expected to launch around 3,000 new satellites, alongside government and military missions. This surge, combined with existing space debris, increases risks to space operations, potentially causing economic losses and endangering future missions. Collisions between satellites and debris can create more debris, heightening the risk of further collisions. Timely warning systems are essential to ensure space safety.

## ORBITAL WHEREABOUT LOCATOR (OWL)

SCAN ME

The OWL is a GNSS-based subsystem designed for CubeSats to support the early mission phases after the launch. It broadcasts location and telemetry data in VHF range, enabling operators to track the satellite during the most critical moments. Easily integrated into satellite, it transmits identification and position data for immediate tracking after deployment.

# Satellite in Satellite

The OWL beacon transmitter is a compact, independent system attached to host satellites, operating on its own battery to ensure identification even if the host satellite fails. It functions as a small satellite with its own power system, onboard computer, and communications transmitter and fits the CubeSat Design Specification for easy integration.

## Space Segment

KEY SUBSYSTEMS

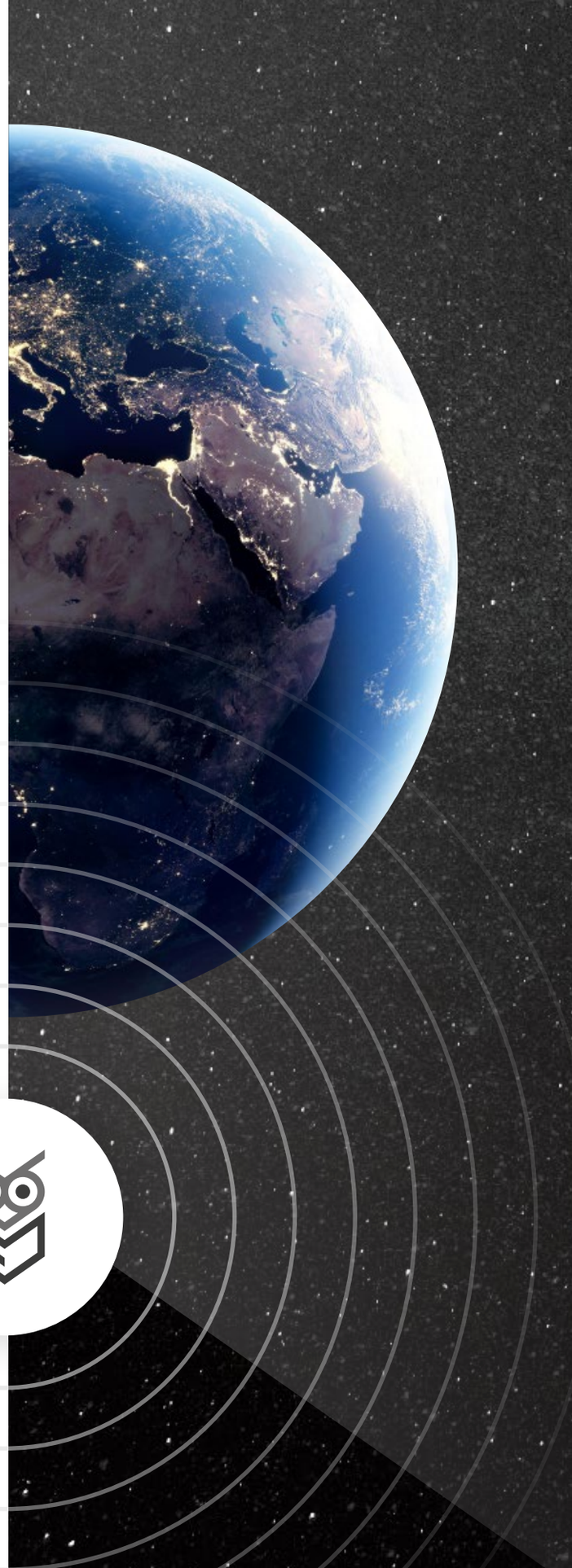
- **OWL-EPS:** Manages power, charging from the host satellite, and provides about one day of battery operation.
- **OWL-COM:** Handles RF communication using a V-dipole antenna and LoRa modulation for long-range communication with low-power ground antennas.
- **OWL-OBC:** Collects data from GNSS, TID sensor, and IMU, and generates beacon frames.
- **OWL-WDT:** Protects against software failures and ensures system recovery after faults.

## Ground Segment

The Ground Segment consists of multiple omnidirectional VHF Ground Stations (GS) that receive signals from the OWL and transmit data to the Mission Operations Center (MOC), which manages all GSs, processes the beacon data, and provides satellite operators with orbit determination services, spacecraft orbital element sets, and ancillary data.

## Key features

- **Independent Operation:** Operates independently from the host satellite for at least 18 hours on its own battery.
- **Compact Design:** Fits perfectly into the Tuna Can of the space- craft, without taking up valuable pay- load space.
- **Plug and play:** simplifying installation can be attached to the host satellite with just four screws.
- **RF Interface:** The COM system imple- ments the radio interfaces to Earth, enabling the transmission of beacon frames to the ground stations.
- **Useful telemetry data:** Beacon messages also transmit on-board measurements, including radiation (TID), angular velocity, and tempera- ture data.
- **On-board data access:** GNSS data and onboard measurements are available to the host satellite if it supports the optional communication.



# The Future Role of OWL in Managing Orbital Congestion

As the widespread adoption of automobiles in the early 20th century spurred the development of traffic management systems, the growing congestion in space and the increasing number of satellites will soon necessitate similar solutions for the orbital environment. The OWL is poised to be a key player in this future space traffic infrastructure.

The development of the OWL is ongoing, with upcoming advancements set to include **inter-satellite communication** (ISL), enhanced computational capabilities, and autonomous operation via its **integrated solar panel**.

Compact and easily integrable with a variety of spacecraft, OWL with its flight heritage, is already an essential component of next-generation space traffic management, offering a reliable, scalable solution to the challenges of space sustainability.

MASS

**less than 130 g**

DIMENSIONS

**59 x 64 x 36 mm**

BASED ON THE

**RILDOS standard LoRa module**

COMES WITH

**an integrated GNSS module, battery and an optional dosimeter**

IT CAN

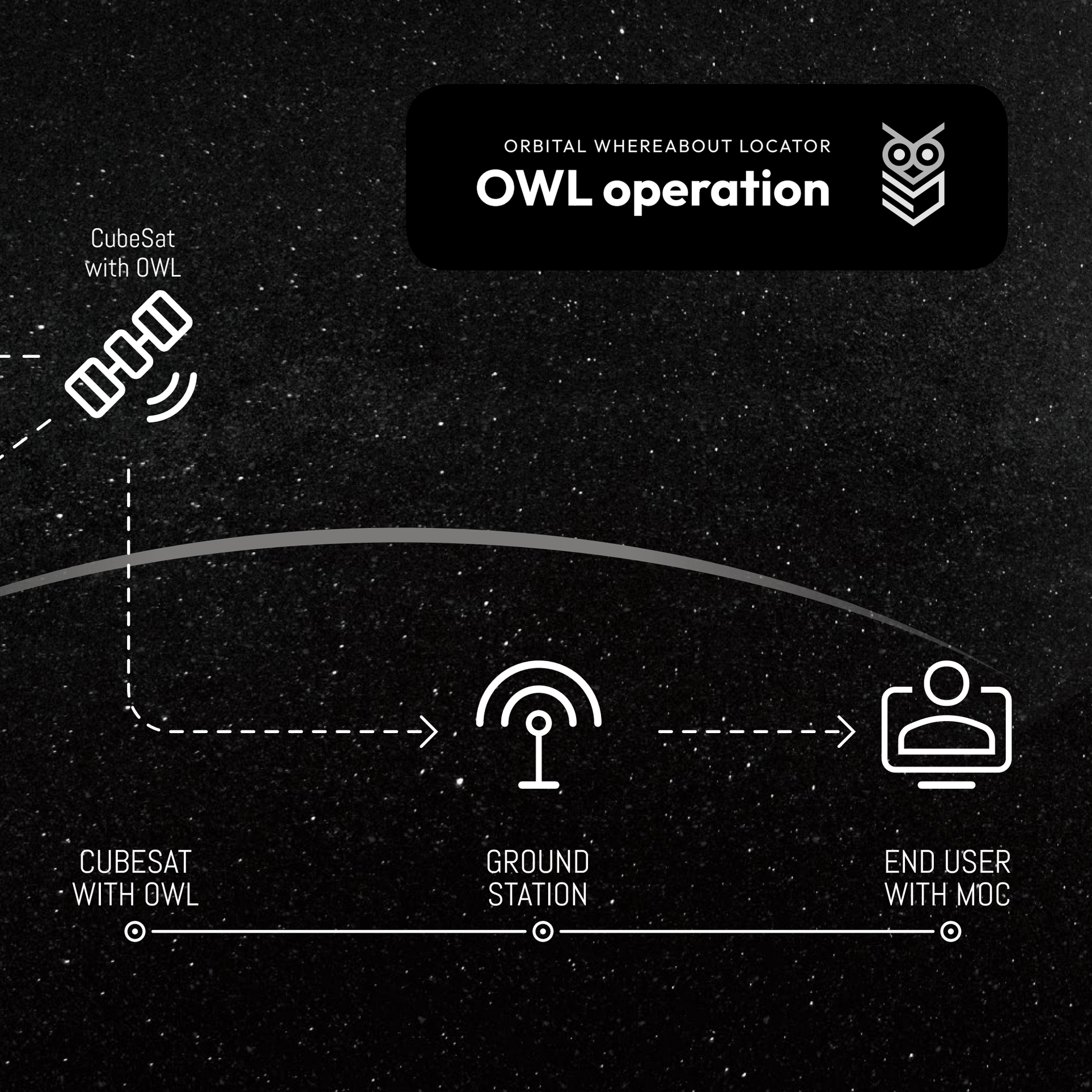
**independentily measure TID and per-axis angular velocity**

YOU CAN HAVE

**onboard access to the GNSS data of the OWL**

ORBITAL WHEREABOUT LOCATOR

# OWL operation

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