



# Astronode



A low-cost solution to connect equipment all over the world

## What is Astronode?

The Astronode module, which is installed on fixed or mobile remote equipment (containers, fishing beacons, oil drilling, etc.), allows the monitoring of activity thanks to 1.6 GHz bidirectional communication with a network of more than a dozen satellites.

Each satellite passes in low orbit (500 km altitude) at a speed of 7.6 km/s. It is visible to the terminal for 3 to 4 minutes and passes twice a day.

CEA has developed the module's dedicated circuit, which benefits from very specialized signal processing. This low-power circuit can be produced in volume to achieve lower unit costs.

## Applications

Current IoT networks only cover 15% of the planet. Astronode brings this coverage rate to 100%, thanks to the use of a satellite network. All objects and assets located in remote areas can benefit from this solution:

- shipping, navigation, buoys, fishing;
- agriculture and livestock;
- mining and oil or gas operations;
- land transport, logistics and maintenance;
- environmental monitoring.

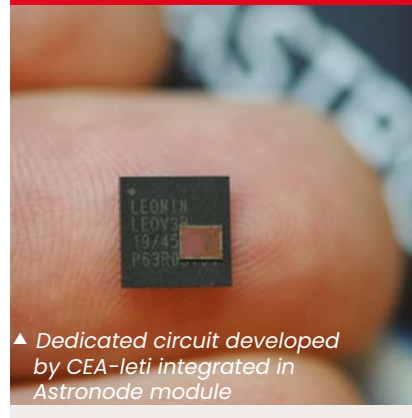
## What's new?

- A dedicated low-cost circuit with minimal external components that incorporates all stages of data transmission: detection of the satellite signal, compensation of the Doppler effect due to its speed, modulation and transmission of messages, demodulation and decoding of the received data;
- very low-power consumption (less than 0.35 W for the module), resulting in a 10-year battery life;
- compact size of the module: 35 mm × 31 mm × 4.1 mm;
- price reduced by a factor of three when compared to competing solutions
- technology developed, transferred and commercialized in only three years (2019 to 2022).



## Key facts

- A CEA patent for integrate circuits
- Astrocast website: [www.astrocast.com/products/astronode-s](http://www.astrocast.com/products/astronode-s)



## What's next?

The Swiss company Astrocast has been marketing the module and its associated services since early 2022. Eighteen satellites are currently in orbit, and there will be more than 60 by the end of deployment.

In order for its partners to develop mixed RF integrated circuits dedicated to other applications, CEA-Leti offers support at all stages of development: specification, design, production and testing of prototypes, industrial tests, improving technological maturity, and transfer to industry.

## Interested in this technology?

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