

Orbital systems  
Launchers  
Satellites

**exail**

Exail (formerly iXblue) is a global high-tech company specializing in the design and manufacturing of advanced marine, photonics and autonomy technologies. Exail develops systems for complex applications in extreme environments, from the ocean depths to outer space. Exail was one of the first companies in the world to develop the Fiber-Optic Gyroscope (FOG) technology and is now a recognized leader on this market.

For space application, in partnership with Airbus Defense & Space, Exail has developed the Astrix family, a range of space fiber-optic gyroscopes. Exail also designs and manufactures space grade optical components such as optical modulators, rad-hard fibers, fiber sources and amplifiers.

## COMPETENCIES & CAPABILITIES

With a **dedicated team for space products** for more than 20 years, Exail has end-to-end control of its value chain, from the R&D carried out in its engineering offices through manufacturing in the company's own production shops and quality control.

Production sites have **large clean rooms** for the manufacturing of space components and systems.

Numerous **skillful inertial experts** are available together with **all the required inertial and environmental means** to develop, test and qualify products.

Exail supplies numerous space actors (ESA, CNES, Airbus for instance...) **following ECSS standards**.



## PRODUCTS & SERVICES

### Gyroscope for satellites and space probes:

- The Astrix series: high-performance space fiber-optic gyroscopes for military, scientific and telecom applications, developed in partnership with Airbus Defence & Space for more than 20 years
- Astrix NS: a new, compact and competitive gyroscope for new space

### Inertial navigation system for launchers:

- The safety inertial navigation system for Ariane launchers. It has been qualified in flight since 2020

### LiNbO<sub>3</sub> optical modulators for space applications

- Amplitude and phase LiNbO<sub>3</sub> modulators for laser communication terminals from satellites to satellites and from space to ground
- Phase LiNbO<sub>3</sub> modulators for laser cavity stabilization

### Space grade optical fibers

- SM and PM radiation hardened fibers with a large choice of coatings
- Erbium and erbium/ytterbium doped fibers for sources and amplifiers
- Custom design of space grade optical fibers, as well as fiber sources and amplifiers

## MAJOR SPACE PROJECTS & REFERENCES

Exail works with all major space agencies. Its components and systems have been selected by major space players and are on-board numerous missions like Pleiade, Aeolus, Sentinel 2, MTG, Exomars...

- Astrix gyroscopes are on board **dozens of satellites** representing more than 6 million hours of cumulated flight without incident
- **Pléiade satellites** were the two first satellites using Astrix 200. They were launched in 2011 and are working well since then.
- Exail manufactures **Ariane 5** safety inertial navigation system
- Exail modulators are on board **Sentinel 1a and Sentinel 2a**, the GEO satellite Alphasat and NASA GRACE-FO mission

## CONTACT POINT

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**TURNOVER:** 120 M€

**WORK FORCE:** 650