SYSGO
EMBEDDING INNOVATIONS

# Space Solutions

## Safe & Secure Embedded Software

**ECSS**
**up to Category A**

**Common Criteria**
**EAL 5+**

# Space Avionics Systems for Future Missions

## Connected, Protected, Certifiable

In the rapidly evolving Space industry, the demand for **reliable**, **safe**, and **secure software solutions** is paramount. SYSGO offers cutting-edge real-time operating systems (RTOS) and hypervisor technologies tailored for the embedded market. Since 1991, SYSGO has grown to become Europe's premier provider of certifiable RTOS, with a strong focus on **Safety & Security** in Space applications.

**PikeOS**, our certified flagship product, ensures safe and secure operations in critical applications. **PikeOS for MPU** is designed for medium-sized hardware platforms.

## Use Cases

- **Remote Operations:** Spacecraft, once deployed, require remote management and updates. Over-the-air updates ensure systems remain current without physical intervention
- **Harsh Environmental Conditions:** Exposure to extreme temperatures and cosmic radiation can impact system integrity. Robust architecture designed to withstand such adversities maintains optimal performance
- **Data Management & Communication:** Efficient dara handling and reliable exchange with ground stations via advanced data buffering and secure communication protocols ensure seamless information flow

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## Certifications and Standards

Ensuring Safety, Security, and compliance is at the core of our development process. Our solutions are rigorously designed to meet and exceed the demands of global standards in critical domains. Key certifications and standards we adhere to include:

- **ECSS-E-ST-40C & ECSS-Q-ST-80C:** We comply with the European Cooperation for Space Standardization (ECSS) guidelines, ensuring high-integrity software development (ECSS-E-ST-40C) and strict software product assurance (ECSS-Q-ST-80C) for spaceborne applications
- **ARINC 653 for Space Systems:** We implement the partitioned architecture, enabling safe consolidation of multiple critical functions such as satellite telemetry & control, payload management, and real-time communication on a single, secure system
- **A(M)C 20-193 / CAST-32A:** We tackle multi-core challenges in Safety-critical applications by adhering to A(M)C 20-193 (formerly known as CAST-32A), tackling resource contention, timing predictability, and determinism which are crucial for mission reliability in Space environments

SYSGO ensures that Space manufacturers and engineers can rely on our software supporting everything from Low-Earth Orbit (LEO) constellations to interplanetary exploration.

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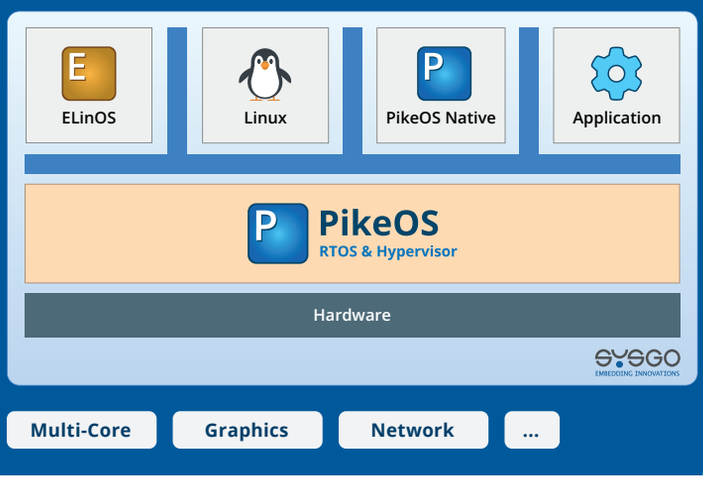

# Safe & Secure Operations

## The Future of Intelligent Systems

PikeOS provids a robust foundation for modern spaceborne computing, supporting the transition to modular, scalable, and certifiable software architectures. Its microkernel architecture ensures high performance, Safety, and Security, making it ideal for satellites, deep-space exploration, Space stations, and autonomous spacecraft.

## Key Features

- **Hardware Compatibility:** Support for a wide range of processors, including x86, ARM, SPARC, PowerPC, and RISC-V, making it adaptable to radiation-hardened (Rad-Hard) and high-reliability Space hardware
- **Mixed-Criticality:** Strict partitioning allows mission-critical functions (attitude control, fault detection or navigation) to run alongside non-critical applications (payload data processing or machine learning) on the same hardware
- **Guest OS:** Can host various guest operating systems, such as ELinOS, Linux, POSIX, etc., facilitating diverse application deployments
- **Certifiability:** Designed to meet rigorous certification standard such as ECSS-Q-ST-80C, ensuring compliance with international Safety and reliability requirements
- **ITAR-free:** As European company, our products have no export restrictions enabling unrestricted global deployment

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## Why choose SYSGO?

- **Engineering Excellence:** Combining expertise with cutting-edge technology to meet the evolving demands of modern embedded, performant, and connected systems
- **Cutting-Edge Solutions:** Driving advancements in satellites, deep-space exploration, onboard AI, and real-time Space system management with certifiable, fault-tolerant software architectures
- **Long-Term Support:** Ensuring stability with extended product life cycles, continuous updates, and dedicated technical assistance

## Our Commitment to Excellence

At SYSGO, we deliver more than just software: We provide mission confidence and reliability. With our solutions, spacecraft, satellites, and deep-space missions achieve unprecedented levels of Safety, Security, and reliability. Together with our customers and partners, we are shaping the future of Space innovation, ensuring that critical systems remain operational, resilient, and secure in the most challenging environments.

**Thales Alenia Space:** „We are very happy to be able to use PikeOS for MPU because we were looking for a solution that would enable to execute applications with mixed criticality while addressing the increased threat level against space applications.“

## For a Safe & Secure Operation

In today's modern Space industry, Safety, Security, and reliability are essential. SYSGO's certifiable real-time solutions provide the strong foundation for mission-critical applications, next-generation technologies for autonomous spacecraft, deep-space probes, onboard AI, and secure satellite communications.

With decades of expertise and a commitment to innovation, we help you meet the highest industry standards while enabling next-generation technologies. Partner with SYSGO to build systems that are not only powerful but also safe, secure, and future-ready.

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**info@sysgo.com** **www.sysgo.com**


### HQ - Sales Office Germany

**SYSGO GmbH**
Am Pfaffenstein 8
55270 Klein-Winternheim
Germany

+49 6136 99480

### Sales Office France

**SYSGO S.A.S.**
26-28 Avenue de Winchester
78100 Saint-Germain-en-Laye
France

+33 1 30 09 12 70

### Sales Office Czech Republic

**SYSGO s.r.o**
Zelený pruh 1560/99
14000 Praha 4 - Braník
Czech Republic

+420 222 138 111 0


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