

IOSHEX interoperability with Space Rider

a new IOS perspective

IOSHEX development

IOSHEX is an orbital module developed by SAB Launch Services and equipped with specific robotic technologies that leverage on the existing SSMS Dispenser basic module (the Hexagon). The SSMS is the payload dispenser for VEGA and VEGA-C developed by SAB, with the purpose to optimize multiple small satellite missions on VEGA and VEGA-C.

IOSHEX will enable to perform IOS operations as part of the service provided by the launcher. To offer an enhanced service, SAB is working together with ESA to have a system able to interoperate with Space Rider, the new reusable in-orbit servicing and reentry automated platform developed by ESA, and foster a European in orbit servicing ecosystem.

In the development of such a spacecraft, many are the technological innovations that present a challenge. New technologies in the field of propulsion, AOCS, GNC and robotics are being developed along with the system.

Interoperability with Space Rider

To achieve the necessary system interoperability, definition of solid process protocols is crucially important. The concept behind IOSHEX – Space Rider interoperability lies in the large variety of operations that IOSHEX could perform, complemented by the flexibility and reentry capability of Space Rider.

IOSHEX core functionalities are tied to a docking system designed ad hoc to berth with Space Rider and robotic appendices with sufficient dexterity to manipulate the content of Space Rider's cargo bay.

Among possible applications in synergy with Space Rider, IOSHEX could handle and exchange Payloads with Space Rider's cargo bay, operate them in orbit, extend their flight operations, transfer materials and items resulting from IOSHEX IOS operations, allow their reentry to ground, collect new items and Payloads from Space Rider subsequent flights. Around this concept is centered a possible IOSHEX – Space Rider interoperability demonstration mission concept in study at SAB. SAB is planning to contribute to the development of sustainable in orbit servicing infrastructures with the development of new cost effective and modular elements while making maximum usage of existing transportation and operation means and hardware, in this respects SAB believe synergy and collaboration between advanced systems such as SSMS and Space Rider, would be the perfect application of this concept aimed to lower the costs and the technical challenges and speed up the blooming of this promising market.

Target markets

16.7 Bn\$

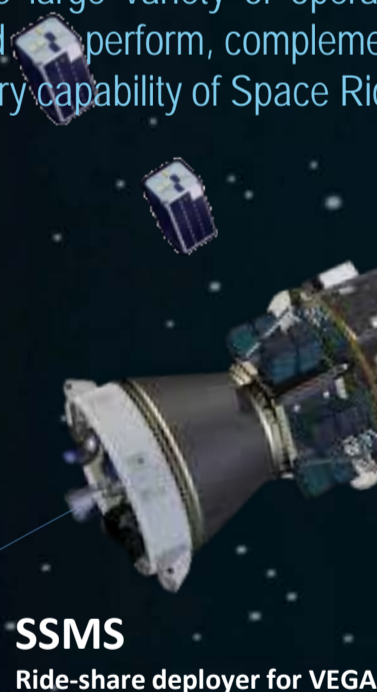
Forecast for the Commercialization of Low Earth Orbit, including commercialization of microgravity experiments, such as bio, pharma, manufacturing. Reference: Deloitte

4.4 Bn\$

2030 forecast for In Orbit Services market, including space situational awareness, last-mile, active debris removal, life extension, and manufacturing and assembly. References: Euroconsult's 1st edition of Space Logistics Markets, European Space Policy Institute, and Markets and Markets

Institutional Support

Currently at SAB two different activities are open in the frame of this project. The phase B of the IOSHEX development is being supported by the ESA Vega Program, while the PoC mission for the cooperation with space rider is under study with the support of the ESA Future Launchers Preparatory Programme.



Marco Mariani, mmariani@sabls.com
Marco Guerzoni, mguerzoni@sabls.com

Fabio Carameli, fabio.carameli@esa.int

