

17th IAA SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND
DEVELOPMENT (D3)Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and
Development (1)

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MISSION AND SYSTEM DESIGN FOR EROSS PROJECT: THE EUROPEAN ROBOTIC ORBITAL
SUPPORT SERVICES**Abstract**

The European Robotic Orbital Support Services (EROSS) project aims at developing and integrating the key European robotic building blocks to demonstrate and enable an autonomous solution for performing servicing tasks in orbit and many future rendezvous missions.

EROSS intends to assess and demonstrate the capability of the on-orbit servicing spacecraft to perform medium and close-range rendezvous, to grasp, capture and manipulate the satellite to be serviced. This latter is considered collaborative as it is designed with specific features to ease the capture phase and to perform servicing operations such as refuelling and payload transfer or replacement.

The project embeds key European Technologies by leveraging on actuators, sensors, software frameworks and algorithms developed in previous European Projects. EROSS focuses on boosting the maturity of these key building blocks and increasing their functionalities and performances in a synergetic way to enable their fast implementation on a space mission.

The current paper aims at presenting the mission scenario and the overall system design for both the servicer and the serviced satellites for such cooperative rendezvous missions. The different key building blocks will also be introduced, such as the sensors, the capture and docking interfaces, and the Guidance Navigation Control (GNC) subsystem for both the platform and robotic payload. The mission and system specifications are presented for the overall solution at a functional level, along with the subsystems key performances required for the main tasks foreseen: rendezvous, capture, refuelling, payload replacement, and data transfer.

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