RVS 3000-3D

3D version of RVS 3000 - Swiss army knife for space

The updated next generation Rendezvous- and Docking sensor, RVS® 3000-3D, the most diverse LIDAR.

The RVS 3000-3D prototype successfully showed its capabilities for the first time in space during the LIRIS-2 (Laser InfraRed Imaging Sensor) technology demonstration mission. When the last of ESA's ATV (ATV-5 "Georges Lemaître") flew to the International Space Station (ISS) in 2014, it carried LIRIS-2 as one of the technology demonstration payloads.

The idea behind the new technology: the human brain is capable of reconstructing an image of the structure and of the attitude of an object in space, like the ISS, from a point cloud. Thus, the concept was born to equip RVS3000 with an intelligence allowing to determine the attitude of a known object in six degrees of freedom (three translational and three rotational). Thus, like the human brain RVS3000-3D is capable of reconstructing structure and attitude of an object from a point cloud.

The heart of the RVS 3000-3D is the same gimbaled mirror system and the same fiber laser also used in the RVS 3000 sensor together with a new, powerful processing electronics board based on an FPGA (field programmable gate array) that is re-configurable in space. This processing electronics board enables to carry out complex computational operations within seconds – operations that even on powerful computers on Earth may take minutes or even hours.

The RVS 3000-3D enables new mission scenarios. These include for example the unaided determination of the attitude of objects in space or the landing on celestial bodies like Moon or Mars. RVS 3000-3D could detect hazards in the landing zones during the approach and identify safe landing zones. This will enable the safe touch down of astronauts on the surface.

A further advantage is the in-flight re-programmability, i.e. the RVS 3000-3D may be used, for example, first as a docking sensor and later as a landing sensor.

Many further missions are thinkable – like for example robotic servicing missions to satellites and other spacecraft. Our RVS 3000-3D is ready for the future. The future is

already here: The mission MEV-1 of the US technology firm Northrop Grumman Space Systems has shown in February 2020 that a servicing satellite can dock successfully, with the help of RVS3000-3D, to a functional satellite and thus making the extension of its useful lifetime possible.