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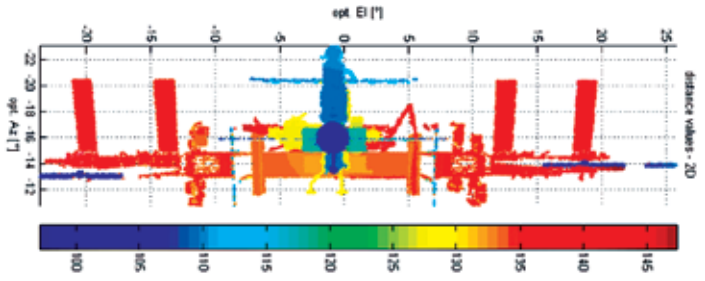
RVS™ 3000

ready for the next rendezvous

The advanced 3D imaging LIDAR for rendezvous and docking.
Acquisition, tracking and imaging of both cooperative and non-cooperative targets.
More powerful than RVS at reduced mass and size.



ISS scan (simulated)

Jena-Optronik's RVS (Rendezvous and Docking Sensor) is the most frequently used LIDAR sensor for docking to the International Space Station ISS.

Numerous flight models have been delivered to customers in the United States, Japan and Europe. All flight models being used in orbit delivered a flawless , fully reliable performance.

Based on the RVS success story Jena-Optronik has developed the next generation of Rendezvous and Docking Sensors, RVS 3000 and RVS 3000-3D.

RVS 3000 and RVS 3000-3D

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The new RVS 3000 builds on the experience gained during RVS development, manufacturing, test and operation. It retains the software and data interface as the previous RVS for optional compatibility, but improves upon the existing RVS in several key elements:

- Compact design – roughly the size of the RVS optical head alone
- Reduced mass and power consumption
- Simplified spacecraft integration by an one-box-design covering optical head and electronics, as well as optical and electrical cabling in between
- Increased operating range
- Operation with non-cooperative targets for generation of 3D point cloud data (RVS 3000-3D)

RVS 3000 is available in two variants for different application scenarios:

- The standard and cost-effective RVS 3000 for rendezvous and docking to cooperative targets, e.g. ISS
- The more powerful RVS 3000-3D for rendezvous and docking to non-cooperative targets and space robotics applications, like 3D point cloud imaging.

The advanced RVS 3000 technology includes a highly accurate range finder technology, a lightweight scan mirror with fully digital control and a high performance yet robust laser source operating at the eye-safe wavelength of 1.5µm.

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All autonomous and precise dockings of **European ATV (Automated Transfer Vehicle)** to the International Space Station ISS were made possible by a suite of four sensors. Two of them were Jena-Optronik's RVS TGM (Telegoniometer).
The ATV-5 mission pioneered the first application of a RVS 3000 prototype, called "LIRIS-2" by ESA.

Two Rendezvous- and Docking Sensors RVS each have successfully enabled the fully automated berthings of all **Japanese HTV** (HII-Transfer Vehicle) with the ISS.

In addition to ATV and HTV, the **US spacecraft "Cygnus"** is using the highly accurate opto-electronic sensors from Jena-Optronik. This unmanned cargo logistics spacecraft precisely approaches the ISS with the help of Rendezvous- and Docking Sensors from Jena-Optronik.

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RVS 3000 and RVS 3000-3D performance

	RVS 3000	RVS 3000-3D
Scan Parameter		
Field of View	40° x 40° ... 1° x 1°	40° x 40° ... 1° x 1°
Line of Sight 3σ noise	< 0.05°	< 0.05°
Laser		
Wavelenght	1.5 µm (eye safe < 10 mW)	1.5 µm (up to 350 mW) scalable without modification of laser beam characteristics
Operating Range Cooperative Targets		
Range min.	< 1m	< 1m
Range max.	1.5 km	10 km
Operating Range Non-cooperative Targets		
Range min.	< 1m	< 1m
Range max.	> 100 m	> 1.5 km
Power Consumption		
Average	30 W	40 W
Maximun	50 W	85 W
Mechanical Interface		
Mass	12.4 kg	12.4 kg ... 14 kg depending on radiation shielding
Dimensions	265 mm x 340 mm x 213 mm	265 mm x 342 mm x 218 mm
Electrical Interface		
Power nominal	28 V	28 V
Data Interface	MIL-1553B	MIL-1553B, SpaceWire
Output Data		
	Relative position data to target (Azimuth, Elevation, Range)	Relative position data to target (6-DOF), 3D point cloud image data

Do you want to benefit from our experience? Provide us with your specific needs for your LIDAR application and we will make RVS 3000 the ideal sensor solution for your successful mission.

EN 9100 certified AIRCERT Certification of Management Systems

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