Source: http://www.jena-optronik.com

RVS 3000

The state of the art in rendezvous and docking sensors for space

RVS® 3000 is gaining more and more ground as standard solution in space.

The resupply vehicle Cygnus NG-11, built by the US technology firm Northrop Grumman Space Systems, successfully docked to the International Space Station (ISS) in April 2019.

It had the Jena-Optronik rendezvous and docking sensor RVS 3000 onboard. This was the maiden flight of RVS 3000 – and already during this first flight, our customer relied on RVS 3000 as operative sensor. RVS 3000 worked perfectly well and enabled flawlessly and automatically the approach maneuver.

RVS 3000 is able to measure range and bearing of the resupply vehicle towards the ISS from a distance of 1500 meters. It sends out laser pulses, which are directed in a scanning pattern towards the ISS. The scanning pattern is generated with the help of a gimbal mounted mirror. Retro reflectors mounted on the ISS at known locations return the pulses to the RVS 3000. Using both the time gap between sending & receiving the pulse back and the orientation of the gimballed mirror allows to determine the distance towards the ISS, the relative speed of the resupply vehicle towards the ISS, and the bearing towards ISS. This information is crucial to guide the resupply vehicle safely and precisely towards a position where it can be captured by the ISS robotic arm.

Rendezvous and docking sensors will in the future be used as well for larger measurement distances and for non-cooperative targets (no retro-reflectors). Such mission scenarios include for example on-orbit servicing or planetary landing. The more powerful RVS 3000-3D variant of our sensor enables such scenarios. The RVS 3000-3D is also an excellent choice if it comes to direct docking to the ISS without the use of the ISS robotic arm.