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

ASTROlas

Autonomous Laser Threat Detection Sensor

Threats by laser radiation to space-based assets have been reported several times in public news and media in the past years. Hence, such events need to be considered in the risk management of today's satellite owners. Jena-Optronik developed a laser threat detection sensor called ASTROlas, which is able to provide key information (e.g. origin, wavelength and intensity) of such events.

Laser radiation for either tracking or blinding of a satellite or spacecraft is a high risk for sensitive optical instruments. Furthermore, laser radiation is able to degrade the efficiency of solar panels and it is therefore a risk to the overall performance of a satellite or spacecraft.

As an answer to such threats, we developed the autonomous sensor ASTROlas, which allows satellite-based laser threat detection, identification and tracking.

Highlights - ASTROlas features and design parameters:

- Composed of optical head and electronic box
- Radiation-hard as well as compact and robust mechanical design
- Single FPGA for data processing
- Wide field lenses (>100° FoV) optimized for laser detection
- as well as:

Four spectral channels:

- Dedicated lens for laser spot Imaging
- Bandwidth and center wavelength of each channel is adaptable

InGaAs (IndiumGalliumArsenid) detectors:

- Broadband spectral sensitivity resulting in a wavelength range from 0.4 to 1.7µm
- Laser pulse detection capability

System performance criteria:

- Differentiation between pulsed and constant laser beams

- Laser power density determination (radiometry)
- Overlay of 2D-image and detected laser beam