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ASTROtir

Compact **radiation-hard thermal-infrared camera**
with a lifetime of up to 15 years for space applications in LEO and GEO.

Jena-Optronik latest development is a long wave thermal infrared camera for space application, which combines compactness and image correction capabilities with long lifetimes (up to 15 years) in geostationary and lower orbits.

Features

- Exchangeable optics to adapt the field of view to customer needs
- Utilizing a state-of-the-art micro-bolometer
- Electrical circuitry allowing small and lightweight infrared (IR) camera
- Regulated power and SpaceWire Interface
- Optional internal shutter for sun protection, correction and calibration
- FPGA-based camera controller with non-uniformity correction, e.g. bad pixel replacement
- Optional image processing implementable

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ASTROtir Performance

Size comparison: ASTROtir with two different lens options and ASTRO CL, Jena-Optronik's constellation star sensor (left).

Size & Mass	
Width Depth Height	80 mm box & 104 mm box with I/F feets 80 mm 77 mm WFOV & 81 mm NFOV
Mass	Without shutter: <545 g for the wide field of view <595 g for the narrow field of view With shutter: <570 g for the wide field of view <615 g for the narrow field of view
Imaging System Design	
Optics	
Type	refractive
Image Circle	14 mm
F-number	1.2
Focal Length	Wide FoV: 8.5 mm Narrow FoV: 25 mm
Wavelength	8-13 µm
Image Resolution	Variable e.g. • 640 x 480 pixel (rectangular image) • 566 x 566 pixel (square image) • Circular image with 800 pixel in diameter
Frame Rate	10 Fps @ 300 kpxl (kilo pixel)
Field of View	Viewing angles of the image diagonal of about 10mm are • Narrow FoV: 21.7° • Wide FoV: 64° Resulting in FoVs ... ... for a rectangular image with 640x480 pixel resolution • Narrow FoV: 17.3 x 13.1° • Wide FoV: 51° x 38° ... for a square image with 566x566 pixel resolution • Narrow FoV: 17.5 x 17.5° • Wide FoV: 51.2° x 51.2°
Bit depth	> 14 bit
Configuration	FPGA for Camera Control will have capabilities for • NUC correction • Defective pixel correction
Shutter	Optional: modular shutter
General properties	
Interface	SpaceWire
Supply Voltage	5 V
Power	< 7 W
Lifetime	5 years to 15 years design lifetime for LEO or GEO

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