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ASTRO HP

Jena-Optronik's **ASTRO HP** star tracker is an optical head combing the radiation hard Faintstar2 detector with precision optics to provide the highest attitude accuracy in a very compact package.

With this compact and lightweight design, we are responding to customer requirements in an agile market environment that focuses on small and cost-effective high-performance satellites.

The ASTRO HP star tracker is an optical head that combines the best of both: the well-known precision and agility of our autonomous ASTRO APS with the easy-to-integrate centralized ASTROlib software that has already heritage with hundreds of our ASTRO CL.

Features

- Lifetime on orbit >15 years
- 26° Sun Exclusion Angle and full performance with Moon in the field of view
- Latch-up free electronics design that guarantees highest level of availability
- Almost drop-in upgrade for the ASTRO CL star tracker

Highlights

- F/1.0 precision optics from the ASTRO APS3
- State-of-the-Art space qualified coatings
- Exclusively radiation hard-by-design EEE-Parts and optics
- Best-in-Class acquisition speed with an initial acquisition usually in 1 second or quicker
- Outstanding slew-rate makes the ASTRO HP very well suited for gyroless systems
- Superior reliability with extraordinary low failure rate

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ASTRO HP Performance

Layout	
Architecture	Optical head with centralized software
Field of View (circular)	20deg full-cone
Optics	F/1.0 - Focal length 29mm
Image Sensor	FaintStar2 system-on-chip - 1024px x1024px
Performance	
Update Rate (Tracking)	5, 8 Hz
Attitude Accuracy[1] XY / Z @ 1σ	≤ 0.8 / 7 arcsec (T_{DET} = 20°C) @ 0.06°/s ([1] Total Error incl. LSFE, HSFE & temporal noise)
Acquisition Time	< 2 sec Time to first fix (without a priori information; usually better than 1 sec)
Slew Rate in Acquisition	≥ 3.0 deg/sec
Slew Rate in Tracking	≤ 5.0 deg/sec
Magnitude Limit	7.0 mi G0-reference star
Moon in Field of View	No degradation
Reliability	80 FIT (MIL-HDBK-217 @ 30°C baseplate)
Environment	
Operating Temperature	-35°C to +50°C
Storage Temperature	-40°C to +70°C
Random Vibration / Shock	33g / 2000g all axis
Radiation	Up to 15 years in LEO and GEO orbit without additional shielding
Physical	
Nominal Envelope	80 mm x 80 mm x 116 mm
FoV (half cone)	10.0 deg
Sun Exclusion Angle (half cone)	26.0 deg
Mass	≤ 960 g
Interfaces	
Power Supply	4.0V to 5.5 V
Nominal Power Consumption	≤ 1.2 W
Output	Attitude Quaternion and Rate Vector, Status and Health Telemetry (Output from SW Library)
Operational Interface	80 MHz SpaceWire

EN 9100 certified AIRCERT Certification of Management Systems

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