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# ASTRO CL star tracker

The rad-hard **ASTRO CL star tracker** from Jena-Optronik meets the specific requirements for the New Space economy in terms of cost, high volume production and performance.

Jena-Optronik is one of the leading suppliers for the space industry with a broad customer base and reliable partner in national and international projects. The product range covers Attitude and Orbit Control System sensors including star trackers (star sensors) and LIDAR systems.

ASTRO CL has been developed to meet the specific requirements for the "new space" market in terms of low cost, radiation robustness, high volume production and performance.

All applied parts and materials are consequently radiation hard and latch-up free by design.

The unit is able to withstand radiation critical orbits used by state-of-the-art constellations.

It can serve as star tracker or navigation camera system up to 18 years lifetime in geo orbits.

EEE-parts level is selectable from constellation grade (baseline) to high-rel.

# ASTRO CL Star Tracker Performance

| | |
|---|---|
| **Performance** | |
| Update Rate (Tracking) | 5 Hz (8 Hz possible on demand) |
| Attitude Accuracy XY / Z @ 3σ | ≤ 6 / 48 arcsec (default)<br>≤ 12 / 72 arcsec (Low Accuracy Mode[1] ) |
| Thermal Stability | ≤1 arcsec/K |
| 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 | ≤ 3.0 deg/sec |
| Magnitude Limit | 5.8 mi |
| Moon in Field of View | No Degradation |
| **Environment** | |
| Operating Temperature | -35°C to +40°C (+50°C reduced performance) |
| Storage Temperature | -40°C to +70°C |
| Random Vibration / Shock | 33g all axis / 2000g @1600 Hz |
| Radiation | Up to 10 years in LEO and 15 years GEO orbit without additional shielding |
| **Physical** | |
| Nominal Envelope | 60 x 60 x 110 mm |
| FoV | 25 deg |
| Sun Exclusion Angle | 32 deg (26 deg on demand) |
| Earth Exclusion Angle | 28.6 deg (Baffle EEA)[2] |
| Mass | ≤ 305g |
| **Physical** | |
| Power Supply | 4.0 - 5.5 V |
| Nominal Power Consumption | ≤ 1.0 W |
| Output | Attitude Quaternion and Rate Vector, Status and Health Telemetry[3] |
| Operational I/F | 80MHz SpaceWire |

1) This is an optional mode, which requires minimum OBC processing performance.
2) On demand, a smaller EEA can usually be guaranteed based on orbit-specific straylight analysis.
3) Output from Jena-Optronik SW Library.





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