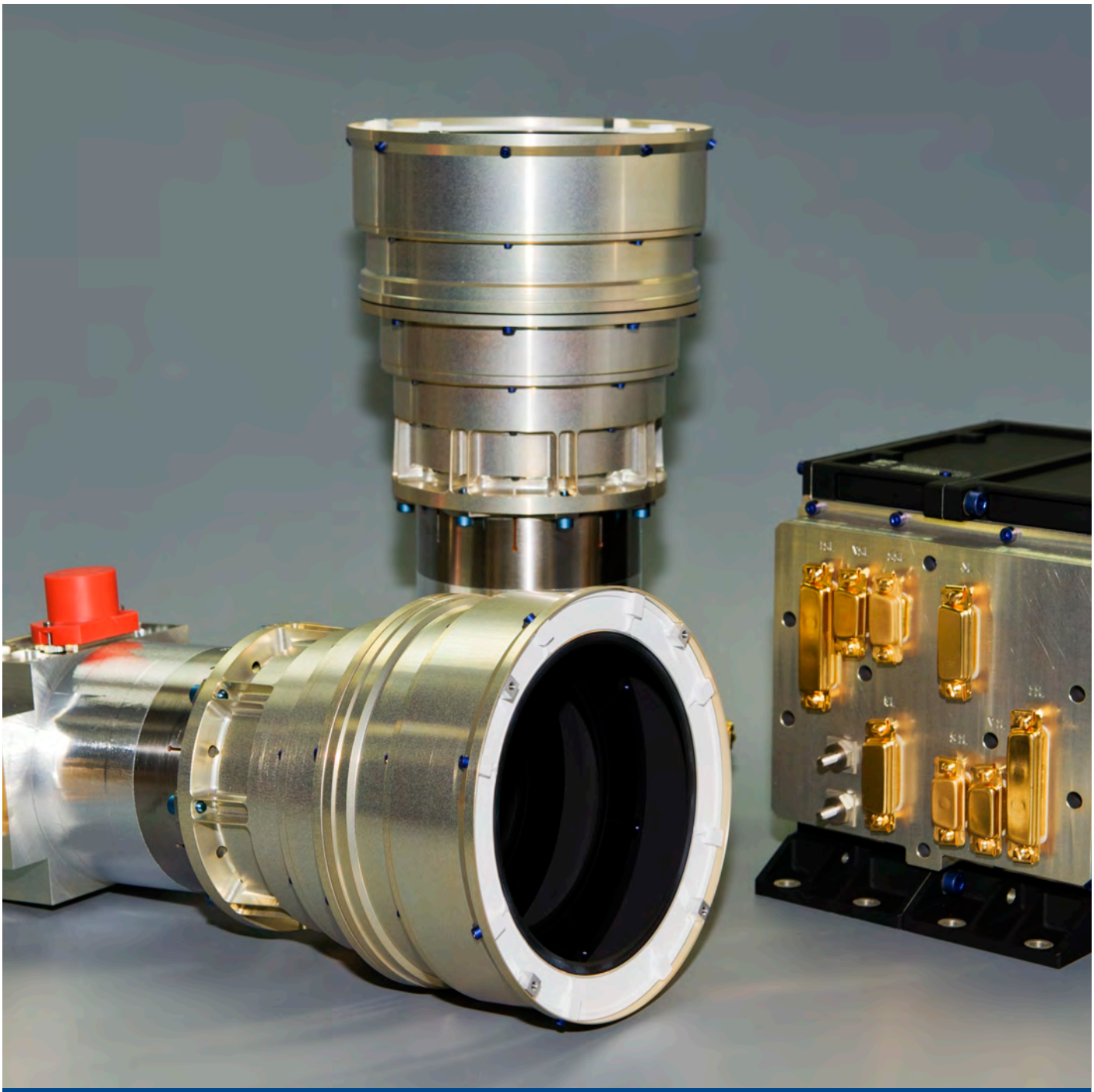
sodern
arianeGROUP



HYDRA-TC

TWO HEADS STAR TRACKER

- SEPARATE OPTICAL HEADS AND ELECTRONIC UNITS
- VERSATILE, ROBUST, ACCURATE AND FLIGHT PROVEN
- FULLY REDONDANT ELECTRONICS
- DESIGNED FOR 18-YEAR GEO SATCOM

HYDRA-TC
TWO HEADS STAR TRACKER

TECHNICAL SPECIFICATIONS	
Optical Heads (OH)	
Baffle protecting the lens from direct Sun and Earth illumination	
Lens made of Rad-Hard glasses	
HAS-2 APS (CMOS) detector and its Thermo-Electric Cooler	
Spacewire interface (MIL 1355) with Electronic Unit	
Electronic Unit (EU)	
Fully redondant architecture with internal cross-strapping	
Power Converter supplying the OH and the Processing Unit	
Embedded software processing OH's data and computing the attitude	
Embedded Star Catalog	
Typical Attitude accuracy in 2-head blended solution (EOL 15 years in GEO)	
BIAS	< 11 arcsec
Thermo-elastic Error	<0.055 arcsec/°C
FOV spatial error @ 20°C ± 3°C	<0.6 arcsec @ 3σ three axes
Pixel spatial error	<3.1 arcsec @ 3σ three axes
Temporal NEA	<0.8 arcsec/vHz @ 3σ three axes
Additional Performance Features	
Autonomous Attitude Acquisition in less than 2.5 seconds	
Attitude tracking up to 2 heads simultaneously	15 Stars per OH
	Update rate up to 16Hz
Robustness	
Acquisition from lost in space	Up to 8 deg/s
Tracking	7 deg/s and 2.3 deg/s2 @10Hz
Sun Exclusion Angle	26 deg
Earth limb Exclusion Angle	18.5 deg
No performance degradation with full Moon in FOV	
Robust to Sun and Earth blooming on one head with two heads operating	
Robust to peak Solar Flare in acquisition and tracking	

Environmental Characteristics		
Temperatures		
Full performance	-20°C to +60°C	
Operating range	-30°C to +60°C	
Storage	-40°C to +70°C	
Mechanical loads	Random 30 gRMS	Shocks 2350 gSRS
Mechanical Interfaces		
1 Optical Head	Mass 1.4 kg - Dimensions Ø146.5 mm x H283 mm	
1 Electronic Unit	Mass 3.9 kg - Dimensions 194 x 166 x 159 mm^3	
Electrical Interfaces		
Typical power consumption	8 W for 1 EU and 2 OH @ 20°C	
Electrical Consumption	< 1 W per OH @ 20°C	
Head dissipation	0.9W @20°C (no Sun)	
Power supply	21 to 52 Volts	
Output data	MIL1553B or RS422 (AC/CS16 protocol)	
Reliability and Lifetime		
1 Optical Head	Level 1: 190 FIT	Level 2: 241 FIT
1 Electronic Unit	Level 1: 512 FIT	Level 2: 736 FIT
GEO 18 years	GTO 6 months	
Qualified Options		
Enhanced shielding for GEO mission		
Baffle with 35 deg Sun Exclusion Angle		
HYDRA-M: light LEO version for 1 or 2 OH without Thermo-Electric Cooler		
HYDRA-CP: software hosted into On-Board Computer		
2 OH may be connected to a fully redondant EU with up to 8m length cable. Single FOV and blended solution attitude data both available.		

EXCEPTIONAL ROBUSTNESS

› Hydra can survive high mechanical loads and performs under very harsh conditions: dynamic, protons, stray-light...

EMBEDDED FDIR FUNCTIONS

› Hydra autonomously manages any situation and the sensor always delivers accurate attitude data in operating domains with selectable update rates up to 16Hz.

CONTACT
SALEM BELMANA
Email: salem.belmana@sodern.fr
Phone : + 33 1 45 95 71 83 / + 33 6 15 02 27 37

Sodern
20 Avenue Descartes
94450 Limeil-Brévannes
France
www.sodern.com