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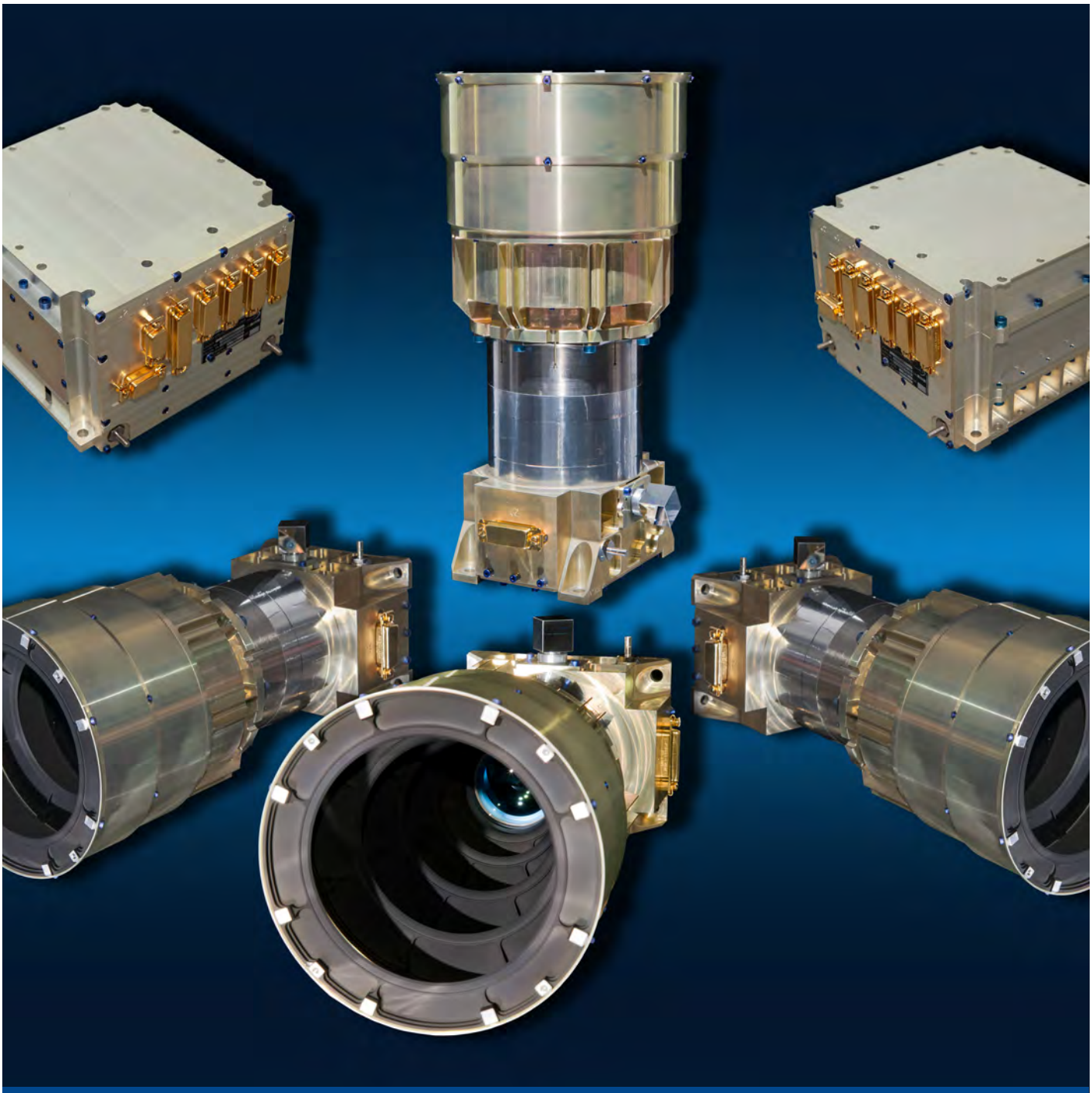

HYDRA

MULTIPLE HEAD STAR TRACKER

- SEPARATE OPTICAL HEADS AND ELECTRONIC UNITS
- VERSATILE, ROBUST, ACCURATE AND FLIGHT PROVEN
- EXTENSIVE AUTONOMY OFFERING A LARGE POTENTIAL FOR AOCS SIMPLIFICATION
- IMPROVED PERFORMANCES, FLEXIBILITY, LOW POWER AND LOW MASS DISSIPATION

HYDRA
MULTIPLE HEAD STAR TRACKER

TECHNICAL SPECIFICATIONS			
Optical Heads (OH)		Environmental Characteristics	
Baffle protecting the lens from direct Sun and Earth illumination		Temperatures	
Lens made of Rad-Hard glasses		Full performance	-20°C to +50°C
HAS-2 APS (CMOS) detector and its Thermo-Electric Cooler		Operating range	-30°C to +60°C
Spacewire interface (MIL 1355) with Electronic Unit		Storage	-40°C to +70°C
Electronic Unit (EU)		Mechanical loads	Random 28 gRMS / Shocks 2000 gSRS
Power Converter supplying the OH and the Processing Unit		Mechanical Interfaces (LEO with 26 Deg SEA)	
Embedded software processing OH's data and computing the attitude		Optical Head	Mass 1.4 kg - Dimensions Ø146.5 mm x H283 mm
Embedded Star Catalog		Electronic Unit (for 3 OH)	Mass 1.8 kg - Dimensions 170 x 146 x 103 mm^3
Typical Attitude accuracy in 3-head configuration		Electrical Interfaces	
BIAS	< 11 arcsec	Typical power consumption	9.5 W for 1 EU and 3 OH @ 20°C
Thermo-elastic Error	<0.055 arcsec/°C	Electrical Consumption	< 1 W per OH @ 20°C
FOV spatial error @ 20°C ± 3°C	<0.5 arcsec @ 3σ three axes	Head dissipation	0.9W @20°C (no Sun)
Pixel spatial error	<2.1 arcsec @ 3σ three axes	Power supply	21 to 52 Volts
Temporal NEA	<0.55 arcsec/vHz @ 3σ three axes	Output data	MIL1553B or RS422
Additional Performance Features		Reliability and Lifetime	
Autonomous Attitude Acquisition in less than 1.5 seconds		1 Optical Head	Level 1: 190 FIT / Level 2: 241 FIT
Attitude tracking up to 3 heads simultaneously	15 Stars per OH	1 Electronic Unit	Level 1: 585 FIT / Level 2: 866 FIT
	Update rate up to 30Hz	LEO 10 years	GEO 18 years
Robustness		Qualified Options	
Angular rate determination	Up to 10 deg/s	Enhanced shielding for GEO mission	
Acquisition from lost in space	Up to 8 deg/s	Baffle with 35 deg Sun Exclusion Angle	
Tracking	Up to 5 deg/s and 8 deg/s2 @16Hz	HYDRA-TC: fully redundant EU version for 2 OH, GEO shielding	
Sun Exclusion Angle	26 deg	HYDRA-M: light LEO version for 1 or 2 OH without Thermo-Electric Cooler	
Earth limb Exclusion Angle	18.5 deg	HYDRA-CP: software hosted into On-Board Computer	
No performance degradation with full Moon in FOV		Up to 4 OH may be connected to 2 EU with up to 8m length cable. Single FOV and blended solution attitude data both available.	
Robust to Sun and Earth blooming on two heads out of three			
Robust to peak Solar Flare in acquisition and tracking			

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 30Hz.

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