![sodern arianeGroup logo]

HYDRA-CP

Hydra-CP stands for Centralized Processing

STAR TRACKER OPTICAL HEAD WITH SOFTWARE HOSTED IN SPACECRAFT'S ON BOARD COMPUTER

- **BEST IN CLASS PERFORMANCE**

- **ENABLE MASS & COST OPTIMIZATION AT PLATFORM LEVEL**

- **VERSATILE, ROBUST, ACCURATE AND FLIGHT PROVEN SINCE 2014**

- **INHERITED FROM OUR 50 YEARS OF EXPERIENCES WITH STAR TRACKERS**

HYDRA-CP

STAR TRACKER OPTICAL HEAD WITH SOFTWARE HOSTED

GENERAL DESCRIPTION	
OPTICAL HEAD (OH)	
Baffle protection for direct Sun and Earth illumination	
Lenses made of Rad-Hard glasses	
HAS-2 (CMOS) detector with Thermo-Electric Cooler	
Connected to the spacecraft's processor through SpaceWire interface with up to 8 m length cable	
CENTRALIZED SOFTWARE	
Software integrated in the spacecraft processor. Can be made available for any processor	
Operating frequency up to 10 Hz according to host processor performances	
Embedded Star Catalog and Algorithms inherited from 50 years of experiences and Hydra Star Tracker	

TECHNICAL SPECIFICATIONS

ENVIRONMENTAL CHARACTERISTICS

Operating temperature range (°C)	- 30 / + 60	
Storage temperature (°C)	- 40 / + 70	
Mechanical environment (in/out of plane)	Random 30 gRMS	Shocks 2350 gSRS
OH size (mm, including baffle)	166 x 160 x 283 (height)	
EU size (mm)	No Electronic Unit, centralized software	
OH mass (kg, including baffle)	1.4	
EU mass (kg)	No Electronic Unit, centralized software	

RELIABILITY, AVAILABILITY AND LIFETIME

EEE parts class for OH	Level 1, level 2 in option
EEE parts class for EU	No Electronic Unit, centralized software
Reliability for OH (MIL-HDBK-217F method)	190 FIT (lvl 1), 241 FIT in option (lvl 2) @30°C
Reliability for EU (MIL-HDBK-217F method)	No Electronic Unit, centralized software
Lifetime (years)	10 in LEO / 18 in GEO

ELECTRICAL INTERFACES

OH Power supply (V)	4.5 to 7
EU Power supply (V)	No Electronic Unit, centralized software
OH Power consumption (W, typ/max)	0.8 / 1
EU Power consumption (W, typ/max)	No Electronic Unit, centralized software
EU Output data	No Electronic Unit, centralized software
Output rate (Hz)	8 or 10

PERFORMANCES AND ROBUSTNESS

Bias (worst case)	< 11 arcsec
Thermo-elastic Error (worst case)	< 0.055 arcsec/°C
Low Frequency spatial (FOV) error XY / Z @ 3σ	0.6 / 4.6 arcsec
High Frequency spatial (Pixel) error XY / Z @ 3σ	3.4 / 27 arcsec
Temporal noise on XY / Z @ 3σ	2.3 / 18 arcsec
Time from lost-in-space (typ)	2.2 s
Slew rate in Acquisition	5 deg/s
Slew rate in Tracking	8 deg/s
Acceleration in Acquisition	2 deg/s²
Acceleration in Tracking at 10 Hz	2.5 deg/s²
Full Moon in the Field of View	No performance degradation
Baffle Sun Exclusion Angle	26 deg
Baffle Earth Exclusion Angle	18.5 deg
Solar flare Acquisition/Tracking	Robust

EXCEPTIONAL ROBUSTNESS
Hydra can survive high mechanical loads
and performs under very harsh conditions :
High slew rates, temperature, protons, stray-light…

EMBEDDED FDIR FUNCTIONS
Hydra Star Tracker delivers accurate attitude
in any situations thanks to multiple heads
autonomous management

CONTACT

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