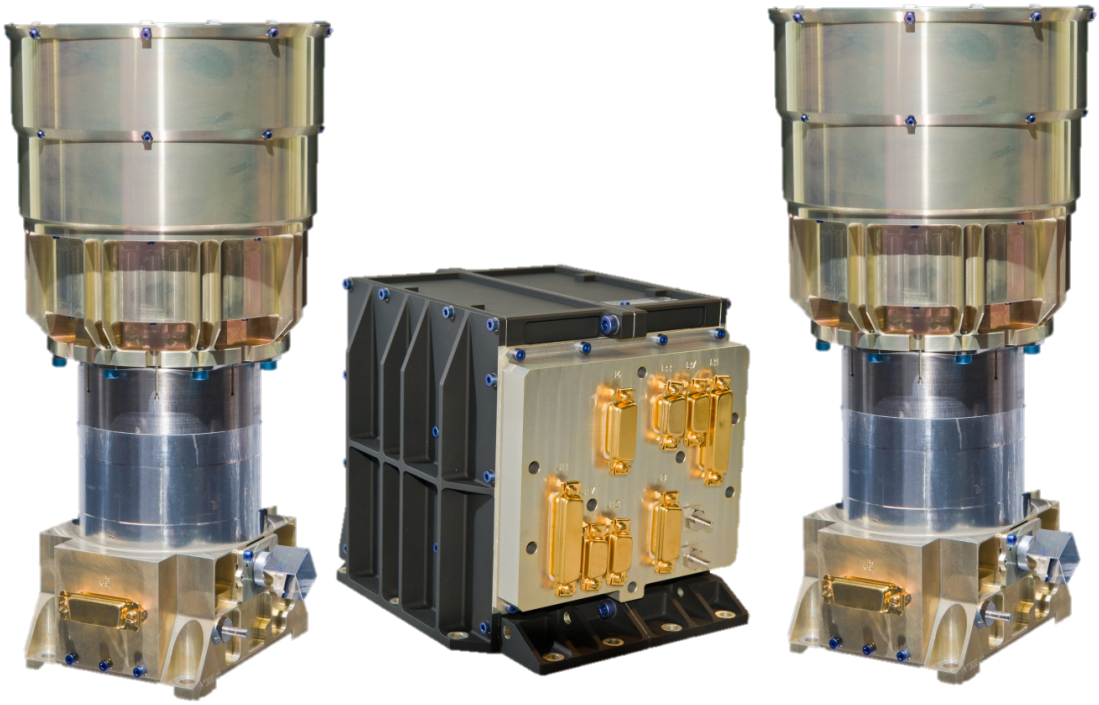
HYDRA-TC



Hydra-TC means Two Channels

TWO OPTICAL HEADS & ONE REDONDANT ELECTRONIC UNIT

- BEST IN CLASS PERFORMANCE
- OPTIMAL FOR GEO MISSIONS
- VERSATILE, ROBUST, ACCURATE AND FLIGHT PROVEN SINCE 2015
- INHERITED FROM OUR 50 YEARS OF EXPERIENCES WITH STAR TRACKERS

HYDRA-TC

MULTIPLE HEAD STAR TRACKER OPTIMIZED FOR GEO MISSIONS

WITH FULLY REDONDANT ELECTRONIC UNIT

GENERAL DESCRIPTION
OPTICAL HEAD (OH)
Baffle protection for direct Sun and Earth illumination
Up to 2 Optical Heads may be connected to 1 redundant Electronic Unit
Lenses made of Rad-Hard glasses
HAS-2 (CMOS) detector with Thermo-Electric Cooler
Connected to the Electronic Unit (EU) through SpaceWire interface (MIL 1355)
ELECTRONIC UNIT (EU)
Fully redundant Electronic Unit version with shielding for 2 Optical Heads with internal-cross-strapping
Embedded software processing OH's data and computing the attitude
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)	194 x 166 x 159 (height)	
OH mass (kg, including baffle)	1.4	
EU mass (kg)	3.9 (fully redundant)	
RELIABILITY, AVAILABILITY AND LIFETIME		
EEE parts class for OH	Level 1, level 2 in option	
EEE parts class for EU	Level 1, level 2 in option	
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)	512 FIT (lvl 1), 736 FIT in option (lvl 2) @30°C	
Lifetime (years)	10 in LEO / 18 in GEO	
ELECTRICAL INTERFACES		
OH Power supply (V)	Supplied by EU	
EU Power supply (V)	21 to 52	
OH Power consumption (W, typ/max)	0.8 / 1	
EU Power consumption (W, typ/max)	6 / 7	
EU Output data	MIL1553B or RS422	
Output rate (Hz)	8, 10 or 16	

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/s^2
Acceleration in Tracking at 16 Hz	7 deg/s^2
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

SODERN
Email : sales-department@sodern.fr
Phone : + 33 1 45 95 70 00

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