

High-Resolution Compact Earth Observation Platform (HCEOP)

The High Resolution Compact Earth Observation Platform is specifically designed as primary passenger for medium sized launchers as Dnepr and Rockot, leaving sufficient space under the fairing for the accommodation of several small secondary passengers.

The compact design is optimized to provide all the necessary resources (mass, volume, power and data handling/storage) for a compact multiple mirror, high resolution optical imaging payload in a near-noon sun-synchronous orbit.

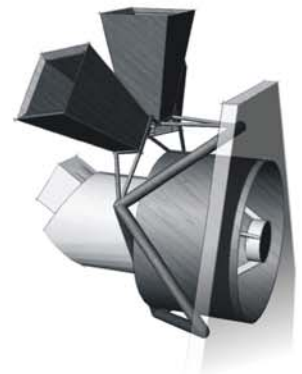
The design of the reference optical camera exhibits the following main characteristics:

- 45 cm aperture diameter
- Focal length of 3.15 m (folded via two mirrors)
- F-number of 7.0
- MTF of 0.17

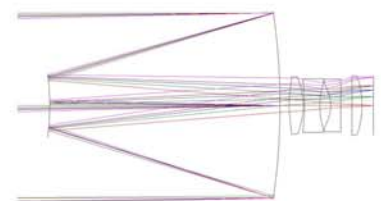
The design of the instrument as covered in detail in a separate STI product information sheet provides GSD sampling of 2 m with an upgrade capability to 1 m.



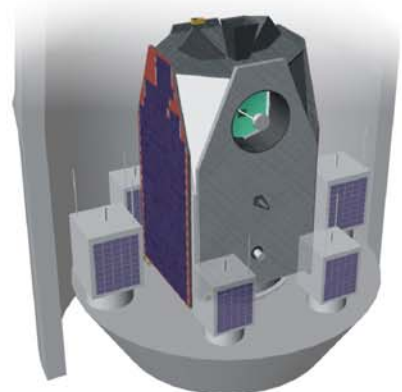
Satellite accommodation concept



Instrument isostatic mounting assembly with directly co-aligned star tracker heads



Optic design for a 2 m GSD Earth observation camera



Accommodation of the HCEOP as primary passenger in a DNEPR launcher

Mission Information			
Life Time	5 ... 7 years	Typical Launcher	Primary Payload on Dnepr, Rockot, Vega
Orbit Altitude	~ 450 km	Orbit Type	Sun-synchronous LTAN = 1200 ± 1.5 hrs
Platform Design			
Redundancy	Full 1F Tolerant	Standards	ECSS Compatible
Operations	Typically 72 hours autonomous operation (time-tagged); flexible operation due to high degree of system re-programmability and re-configurability		
Physical Properties			
Dimensions	Length: 1050 mm / Width: 1150 mm / Height: 2050 mm		
Mass	Instrument: ~ 100 kg	Bus: ~ 270 kg	Cold Gas: ~ 30 kg
	Total: ~ 400 kg		
Thermal Control			
Type	Passive system using thermistors and heaters in combination with on-board thermal control application software.		
Data Handling Performance			
Processor	LEON 2, 64 MHz, 44 MIPS		
Data Storage	8 Gbit (Housekeeping & Ancillary Data), 128 GBit User Data		
Software	ESA PUS compatible		
Power System Characteristics			
Power Bus Type	Unregulated 28 V		
S/A Regulator	Sequential Shunt Regulator		
Avg. Payload Power	~ 100 W	Peak Payload Power	~ 200 W
Avg. Satellite Power	~ 200 W	Peak Satellite Power	~ 400 W
S/A Cells	GaAs Triple Junction	S/A Peak Power	~ 460 W
Battery Cells	Lithium-Ion	Name Plate Capacity	24 Ah
Attitude & Orbit Control			
Type	Three axes stabilized, LVLH (Operation & Safe Mode)		
Sensors	Coarse Earth/Sun Sensor Magnetometer 3-Head Star Tracker Gyroscope GPS Receiver	Actuators	Magnetorquer (3-axes) Reaction Wheels (4x) Cold Gas Propulsion
Pointing Accuracy	< 30 arcsec	Pointing Knowledge	< 20 arcsec
Position Knowledge	< 25 m		
RF Communication (S-Band)			
Uplink Data Rate	Up to 256 kbps	Downlink Data Rate	Up to 1 Mbps
Ranging	Optional		
RF Communication (X-Band)			
Downlink Data Rate	150 Mbps	Antenna Type	Low Gain, Range Compensation