

sentinel-3

→ GMES MEDIUM RESOLUTION LAND AND OCEAN MISSION





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MISSION OBJECTIVES

European global land and ocean monitoring mission. It provides 2 day global coverage Earth observation data (with 2 satellites) for sea and land applications with real-time products delivery in less than 3 hours.

These services include applications such as:

- > sea and land colour data, in continuation of MERIS (Envisat)
- > sea and land surface temperature, in continuation of AATSR (Envisat)
- > sea-surface and land-ice topography, in continuation of Envisat altimetry
- > along-track SAR for coastal zones, in-land water and sea ice topography
- > vegetation products through synergy between optical instruments

MISSION PROFILE

- > Launch: 2013
- > Launch vehicle:
 - S3A: Rockot from Plesetsk; S3B: Vega from Kourou
- > 7 year lifetime (consumables for 12 years)
- > Sun-synchronous orbit @ 814.5 km over geoid
- > Mean LST: 10:00 at Descending Node
- > 27-days repeat cycle (14+7/27 orbits per day)
- > Inclination 98.65°
- > Operational configuration comprises 2 satellites

SATELLITE PLATFORM

- > Gyroless, 3 axis stabilized platform with 3 star tracker heads, 4 reaction wheels and magnetic off-loading
- > Geodetic pointing and yaw steering
- > 8x1N hydrazine thrusters for in-plane & out-of-plane manoeuvres
- > 3 m accuracy real-time onboard orbit determination based on GPS and Kalman filtering
- > Launch Mass: 1250 kg (with maturity and system margins, and fuel)
- > Stowed dimensions (mm): (H) 3710, (W) 2202, (L) 2207
- > Power: 2.1 kW rotary wing with 10 m² triple junction GaAs European solar cells; Li Ion Battery Capacity: 160 Ah
- > Communication links:
 - > 64 kbps uplink, 1 Mbps downlink S-band command and control link (with ranging)
 - > 2 x 280 Mbps X-band science data downlink
 - > 384 Gbit solid state mass memory
- > Autonomy: position timeline and onboard sun ephemeris for greater than 2 weeks nominal autonomous operations

SATELLITE PAYLOAD

OLCI (Ocean and Land Colour Instrument)

- > Swath width: 1270 km, with 5 tilted cameras
- > Spatial sampling: 300 m @ SSP
- > Spectrum: 21 bands [0.4-1.02] μm
- > Radiometric accuracy: 2% abs, 0.1% rel

SLSTR (Sea and Land Surface Temperature Radiometer)

- > Swath width: dual view scan, 1420 km (nadir) / 750 km (backwards)
- > Spatial sampling: 500 m (VIS, SWIR), 1 km (MWIR, TIR)
- > Spectrum: 9 bands [0.55-12] μm
- > Noise equivalent dT : 50 mK (TIR) at 270K

SRAL (Sentinel-3 Ku/C Radar Altimeter)

- > Radar measurement modes: LRM and SAR
- > Tracking modes: closed and open-loop
- > Pulse repetition frequency: 1.9 KHz(LRM), 17.8 KHz (SAR)
- > Total range error: 3 cm

MWR (MicroWave Radiometer)

- > dual 23.8/36.5 GHz
- > Radiometric accuracy 3K absolute (0.6 K relative)

POD (Precise Orbit Determination)

- > GPS, LRR and DORIS (3 cm final accuracy after processing)