

# NAVILEO - GNSS Receiver

On-demand <10cm real time satellite positioning

SYDERAL SWISS  
ELECTRONICS & SOFTWARE



NAVILEO addresses the specific requirements of the NewSpace market, offering **On-demand <10cm real time satellite positioning** to the Smallsats.

It **reduces operational risks** with a dependable, future proof and low capex solution while offering a state-of-the-art autonomous navigation solution.

Using **commercial and rad-tolerant components**, easy to customize and upgrade, NAVILEO is reliable for any **LEO/GTO/GEO application**.

NAVILEO offers **high performance** by processing multiple constellations (currently GPS and Galileo) and two frequencies (L1/E1 and L5/E5a) and implementing an on-board orbital filter.

## Main Advantages of NAVILEO

- **On-demand** <10cm real time satellite positioning.
- **Dependable** via processing Multi-GNSS and multi-frequencies and ITAR free solution.
- Use of **High sensitivity** acquisition and tracking engines for active or passive antennas, combined with commercial and rad-tolerant components allow to **Lower expenditure**.
- **Improved performance** and reliability guaranteed by On-board orbital propagator and Ionosphere-free combination processing.
- Highly customizable and **upgradable with the mission** via In-flight upgradability.

Performance characteristics	
Number of channels	48
Antenna inputs	1 (2 in option); supports both active and passive antenna(s)
Signals and frequencies	GPS L1C/A and L5/Q Galileo E1b and E5a Beidou B1C and B2a in the future
Acquisition sensitivity (dBHz, for $P_d=0.9$ )	28 (L1); 31 (E1b)
Tracking sensitivity (dBHz)	20 (L1, E5a); 22 (L5); 24 (E1B)
Warm / cold TTF <sup>1</sup>	< 20 s / < 100 s
Typical pos. accuracy <sup>1</sup>	< 5 m (3D rms) < 10 cm on-demand (3D rms)
Typical vel. Accuracy <sup>1</sup>	4 mm/s (3D rms)
PPS signal (RS-422)	< 50 ns rms
TM/TC	UART, CAN (other interfaces possible). Fully compliant with PUS/CCSDS standard.
Update rate	1Hz
Physical characteristics	
Power / voltage	8 W typical at 5 VDC
Mass	~1300 gr
Dimension	234 x 121 x 62.7 mm <sup>3</sup>
Operating temperature	-25°C - +60 °C
Lifetime	Min. 5 years in LEO

<sup>1</sup> for a typical LEO orbit (800 km altitude)

## FUGRO SPACESTAR™

SpaceStar is the next generation technology for the provision of high-accuracy real-time navigation services in Low Earth Orbit (LEO)

SpaceStar is based upon Fugro's proven Precise Point Positioning (PPP) technique, including multi-constellation and multi-frequency GNSS technology with real-time GNSS orbit/clock corrections delivered via L-band signal from geostationary (GEO) satellites.

SpaceStar allows to obtain sub-decimetre absolute positioning and nanosecond-level timing, on board a LEO satellite and in real-time without additional ground-infrastructure for the satellite operator.