

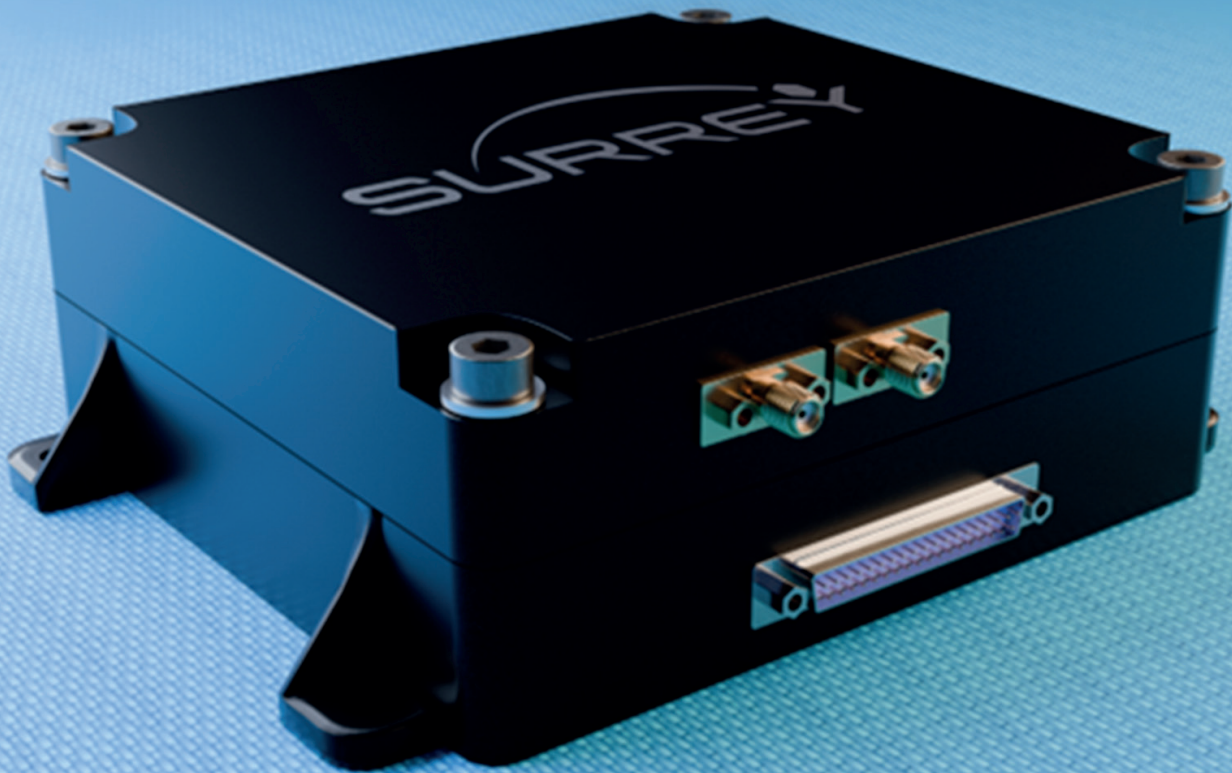


Image credit: SSTL

SGR-Ligo – Space GNSS Receiver

Overview

The SGR-Ligo is SSTL's compact single frequency space GNSS (Global Navigation Satellite System) receiver for providing position, velocity and time to a spacecraft.

The SGR-Ligo is provided with power-supply and interface circuitry in a convenient aluminium module box for integration in small professional satellites in Low Earth Orbit, replacing SGR-07, SGR-10, and SGR-Axio receivers.

It operates off unregulated 28V power bus and incorporates an isolated power supply with EMC filtering and latch-up protection and line drivers for data interfaces. A second antenna port can be accessed for non-Earth pointing applications.

Benefits

- Compact Unit for Position, Velocity and Time for small satellites in LEO
- For post-launch, manoeuvre orbit determination and synchronisation
- Compact, low mass, low power
- GPS and Galileo signals provides improved RFI rejection
- COTS-based, radiation mitigation

Features

- Accepts unregulated 28V power
- Uses 1 or 2 antenna ports
- Single active antenna provided
- 24 tracking channels
- GPS L1 C/A code, Galileo E1OS
- RS422, CAN interfaces
- Fast Time to First Fix

SGR-Ligo – Space GNSS Receiver

Active Patch Antenna: Compact single frequency antenna with integrated filtered LNA provided with SGR-Ligo

Dual Antenna Capability: One antenna port is used by default, but second port can be accessed to increase visibility for non-Earth pointing missions

RF Interference Mitigation: The receiver uses Galileo as well as GPS providing improved tolerance to moderate levels of interference. The SGR-Ligo provides an interference warning to the user when in-band RFI passes a threshold, and coasts position and time during this period.

Radiation Mitigation: Test results available from core component testing. SEE mitigation from EDAC protected memory and electronic fuse protection.

Non-Volatile Memory: Almanacs and Orbital Elements also stored in non-volatile memory to enable fast Time to First Fix (TTFF)

Flight Software: Extensive flight heritage, proprietary SSTL GNSS engine and software used on missions for 12+ years

User Interface: PC software and cables provided for receiver monitoring, control and data processing

Flight Heritage:

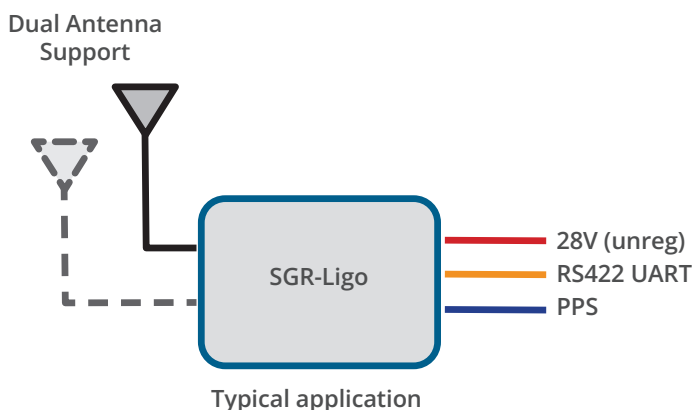
OEM core unit flight heritage: VESTA-1, ELSA-D
Integrated version: Hotsat-1,2, HydroGNSS-1,2, others
Interface board: Flight heritage from Ceria project

Related GNSS products:

SGR-Ligo-OEM: The SGR-Ligo is available as single board without housing, powered off regulated 5V supply.

SGR-Ligo-CDHS: The SGR-Ligo is available integrated within SSTL Core-DHS avionics suite (SGR-Ligo-CDHS)

SGR-ReSI-Z: The SGR-ReSI is a dual frequency GNSS scientific payload for remote sensing the Earth and atmosphere, with heritage on ESA HydroGNSS mission



Characteristics	Values
Receiver Dimensions	120 x 105 x 50 (mm)
Power at 28 V	1.6 W (Unreg. supply 16-34 V)
Receiver Mass	Approx. 800 g
Antenna Dimensions	50 x 50 x 20 (mm)
Antenna Mass	55 g
TM/TC Interface	RS422 UART, CAN
PPS Interfaces	RS422, LVDS
Temperature	-20°C to +50°C operating -30°C to +60°C non-operating
Random Vibration	Test to 15 grms in all axes
Radiation	Approx 5 kRad (Si), core components tested to 10 kRads. SEE and SEL mitigation EDAC protected memory

Characteristics	Values
Number of Channels	24
Number of Antennas	1 or 2
Frequency Band	1575 MHz (L1/E1)
Signals	GPS L1 C/A and Galileo E1OS
Typical Position*	5 m
Typical Velocity*	10 cm/s
TTFF (NVRAM)*	120 s
Time (UTC)*	200 ns

*Accuracies validated through controlled simulations. Values have a dependency on altitude, attitude, antenna visibility and ionosphere.

SSTL designs, manufactures and operates high-performance satellites, subsystems and ground systems for space agencies, international governments, and commercial customers worldwide.

Our satellite platforms are designed to fly remote sensing, navigation and communication payloads in LEO, MEO and GEO orbits and beyond. Our innovative approach to low-cost spacecraft engineering is changing the economics of space.