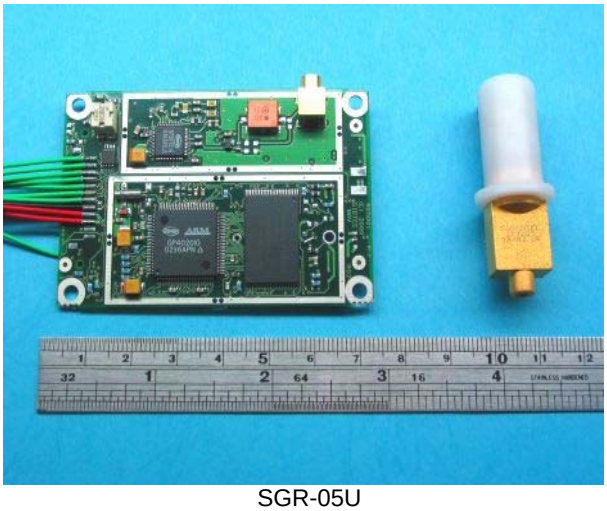
Space GPS Receiver – SGR-05U

(Navigation and Timing)

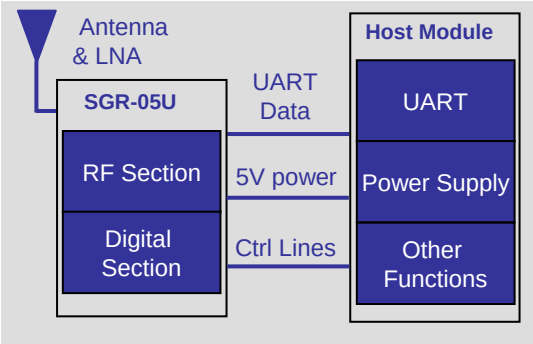
Applications

- Navigation for LEO Missions
- Position, Velocity, Time Determination
- Post-Manoeuvre Orbit Determination
- Payload Data Time Stamping
- Accurate Timing and Synchronisation
- Suitable for Cubesat and Nanosatellite applications

Positioning and timing information can be processed to obtain orbital information. SSTL can provide expertise on orbit determination solutions using the SSTL Space GPS Receiver



SGR-05U



Host module Interfacing to SGR-05U

Features

- 12 Channel L1 C/A code space GPS receiver
- Low-cost commercial based unit
- OEM PCB for integration in host module
- Low power and mass
- Radiation tolerant design
- Active quadrifilar antenna or patch antenna options available

Interfaces

- Power and control
- TM/TC serial data
- 50 Ohm antenna (MCX)
- Pulse-Per-Second

Typical Performance

- Position to 10m (95%)
- Velocity to 15cm/s (95%)
- Time to 500ns
- Typical Time-To-First-Fix (warm) 50 s
- Typical Time-To-First-Fix (cold) 550 s
- 5V Supply, 0.8W
- 70 x 45 x 10mm

Heritage

- 16 receiver units delivered to-date
- Flown on 3 satellites

Option

- Interface module for ground testing

Other SSTL Navigation Products

- SGR-05P (1 Antenna, 12 Channels)
- SGR-07 (1 Antenna, 12 Channels)
- SGR-10 (2 Antennas, 24 Channels)
- SGR-20 (4 Antennas, 24 Channels)
- SGR-GEO Receiver for GEO
- SGR Orbit Determination Solutions
- SGR Attitude Determination Solutions

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Radiation: Core components tested to TID greater than 10kRads(Si)

Antenna: Active quadrifilar antenna weighing 12g with 13x13x40mm dimensions.

Alternative option for better performance is active patch antenna

Performance: Based on circular polar low earth orbit with typical ionospheric and ephemeris error levels on signals.

Specifications:

	Typical	Max
Orbital Position (3-D 95%)	10m	20m
Orbital Velocity (3-D 95%)	0.15m/s	0.25 m/s
Time (95%)	0.5µs	1µs
Time to First Fix (mean)	Warm 50s Cold 550s	Warm 90s Cold 700s
Mass	40g	
Dimensions	70 x 45 x 10mm	
Power	0.8W at 5V	
Temperature	Operating -20ºC to +50ºC	
Random Vibration	$15g_{rms}$ in all axes	
Radiation tolerance	>10kRad (Si)	

Typical Measurement Precision

Pseudo Range	0.9m
Carrier-Smoothed Range	0.15m
Carrier Phase Noise	2 mm
Doppler Velocity	0.5m/s
Carrier Range Rate Velocity	0.03m/s

Flight Software: Extensive flight heritage software used on many missions

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

SSTL is ISO9001:2008 certified

Subsystems are manufactured to:

- ECSS Q-ST-70-08C
- ECSS Q-ST-70-38C

Standard delivery service includes:

- compliance testing
- vibration test
- thermal cycling
- user manual
- test results
- export license and shipping
- thermal vacuum testing available
- unit can be supplied prior to environmental testing

Surrey Satellite Technology Limited

SSTL has launched over 34 satellites gaining almost 200 years in-orbit experience. SSTL draws on its world-class expertise in both small satellite platform technology and high and medium resolution optical instruments. SSTL provides complete turn-key system solutions; spacecraft, ground station, launch, operations and image processing.

SSTL is unique in the space industry; able to design, manufacture and integrate multiple satellites in-house.

Changing the economics of space
www.sstl.co.uk

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