

GPS-SBAS Receiver for Space Application

< 10m

3D POSITION ACCURACY

< 20 cm/s

3D VELOCITY ACCURACY

10 km/s

3D VELOCITY LIMIT

< 100ns

1PPS ACCURACY

GPS-SBAS

CONSTELLATIONS SUPPORTED

20k rad

RADIATION TOLERANCE

< 0.5 W

POWER CONSUMPTION

1,000 kms

ALTITUDE LIMIT

PRODUCT OVERVIEW

The ACC-GPS-NANO-NR is a GPS-SBAS receiver with a 32-Channel High Performance GPS-SBAS engine to provide unmatched performance in the Space.

KEY PERFORMANCE FEATURES

- **Space Heritage:** Deployed as part of customer's payload and operated successfully for the complete mission duration.
- **Reliable Navigation:** Accurate Determination of Orbital Position, Velocity and Time even during high dynamics endured by a vehicle orbiting in LEO.
- **Compact and Rugged Design:** Hardware designed and qualified against space environmental stress profile with power consumption less than 0.5W.

UTILITY

- Accurate Determination of Orbital Position and Time.
- Position or/and Time Stamping of Payload Data.
- Designed for satellites that are operating in the LEO region considering the altitude and velocity of the satellite.



PHYSICAL & ELECTRICAL

Dimensions 81mm X 73mm X 21mm

Weight 165 gms (Approx.)

Supply Voltage 3.3V DC

Board-to-Board Interface 25 pin D-sub male connector

RF connector SMA female connector

Specifications of ACC-GPS-NANO-NR

System Specifications

Channels	32 Channels (GPS, SBAS) - 16 acquisition and 16 tracking	
Cold Start TTFF (without almanac, time or position)	120 s, open sky	
Reacquisition	10 s	
Position Accuracy (horizontal)	10m, 1 σ	
Velocity Accuracy	0.2m/s, 1 σ	
Update rate	1 Hz	
Dynamics	Velocity: 10000 m/s	Acceleration: 2 g
Sensitivity (acquisition)	-136 dBm	
Sensitivity (tracking)	-145 dBm	
Reference Oscillator stability	0.5 ppm	

Input Messages

Proprietary ASCII	Reset, Communication port setting, Message configuration, Version query
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Output Messages

NMEA Ver 4.10 (OFF by default)	GGA, RMC, GSV, VTG, GSA, ZDA, GLL
Proprietary binary (ON by default)	As defined in the ICD (contains position, speed, date & time, fix type, satellites in view, satellite elevation, satellite azimuth, satellite signal strength, range of satellite to receiver antenna)

Environmental

Operating Temperature	-10 ⁰ C to +50 ⁰ C
Storage temperature	-40 ⁰ C to +85 ⁰ C
Vibration	14g _{RMS} (random)
Altitude	1000 Km
Radiation (TID)	20 krad

Mechanical

Dimensions (without considering connectors and mounting fins)	81mm X 73mm X 21mm
Weight	165 gms (Approx.)
Board-to-Board Interface	25 pin D-sub male connector
RF connector	SMA female connector

1PPS

1PPS Jitter	100 ns
1PPS pulse width	5 ms

Electrical

Power Consumption per Path (@ 3.3 V)	< 0.5 W
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Host Communication over UART

Configuration	TX, RX
Baud Rate	4800-115200 bps; default: 115200 bps
Message Formats	8 data bits, 1 start bit, 1 stop bit,

Antenna (Desirable Specifications)

Frequency	GPS L1 band (1575.42 MHz)
Bandwidth	20MHz
Gain	26dB
Noise Figure	<2dB
RF connector	SMA male connector