

LNS-200[®] GPS/DR

World's first 7-DOF car navigation module

The **LNS-200[®]** Land Navigation System combines dead reckoning with GPS and odometer on a single, compact board. When GPS signals are limited or not available, such as in urban canyons and tunnels, the **LNS-200[®]** module provides reliable and accurate positioning information. It is an ideal solution for system integrators or OEMs who are adding location capabilities to vehicle navigation, fleet management and asset tracking systems.



LNS-200[®] is integrated with 3-axis gyros, 3-axis accelerometers and car odometer pulse. Its sophisticated GPS/DR algorithm auto calibrates these sensors and optimally blends the sensor inputs and GPS to produce accurate position and velocity outputs in the most hostile GPS environments. DR estimates position based on pitch, roll, yaw attitude and distance traveled since the last known attitude and position. It uses kalman filter to compensate the error of the DR sensors.

Application :

- The field which wants knowing the more accurate location of the vehicle in telematics.
- Navigation function improvement in personal vehicle navigational system.
- Vehicle location tracking which is accurate in vehicle control system such as the taxi, the bus, fleet management and freight transportation.
- Improvement of vehicle location tracking function in insurance company, commercial bank when it occurs vehicle breakdown or vehicle robbery.
- Portable navigation device (PND).

Feature :

- Integrates GPS, 3-axis gyros, 3-axis accelerometers and car odometer
- Time synchronization between GPS and DR
- Provides more accurate 3-D positions when GPS signal is outage
- Small size and low power consumption
- Next-generation RF technology
- Individually calibrated for temperature, 3D misalignment and sensor cross-sensitivity
- Typical DR accuracy < 0.6% of 13 Km tunnel distance traveled
- Warranty 3 years
- OEM PCB module
- **Lead free/RoHS compliant**



Specification

Performance

Angular rate : (x,y,z)	±100 deg/s
Acceleration : (x,y,z)	±2 g
Update rate : GPS Navigation	1 Hz
DR Navigation	1 Hz
Receive type :	50 channels, GPS/SBAS L1 frequency, C/A code
Accuracy :	
Horizontal	< 2.5 m (CEP)
	< 2.0 m (SBAS)
Altitude	< 3.5 m (CEP)
Velocity	< 0.1 m/s
Heading	0.5 deg
1 PPS	30 ns (RMS)
Time-to-first-fix (TTFF) :	
Hot start	< 3 sec
Cold start	32 sec
Warm start	32 sec
Reacquisition	< 1 sec
DR Accuracy	
Horizontal accuracy :	< 0.6% of 13 km tunnel distance traveled
Altitude	< 1.0 m

Protocols

Configurable	NMEA or UBX
NMEA messages	GSV, RMC, GSA, GGA, VTG, and TXT

Power

Prime power	5V DC
Antenna power	3~3.3V DC
Power consumption	< 0.5 W

Interface and Connector

Interface	UART / RS232
Antenna connector	SMB
Power connector	20 pin male(10x2; 2.0mm)

Environmental

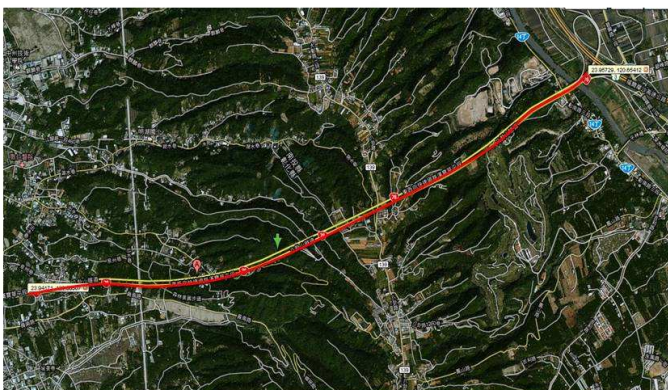
Compensated temperature	- 15°C to +75°C
Operating temperature	- 40°C to +85°C

Others

Dimensions	75 mm x 45 mm x 11.5 mm (without RF connector)
Weight	< 25 g

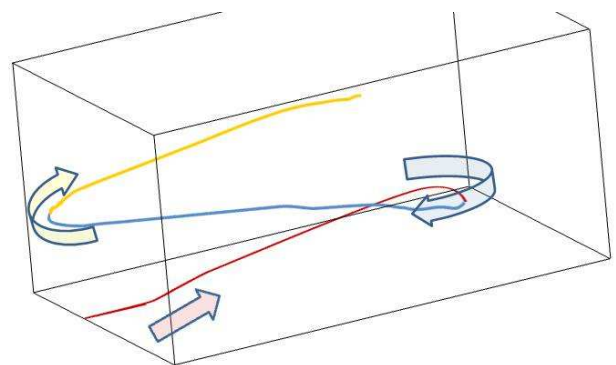
Dynamics

Velocity limit	515 m/s
Altitude limit	18,000 m



LNS-200 testing in the 4.9 km tunnel

Test date : 09/10/2010
Car speed : 70 Km/hr
DR error : 28 m



LNS-200 testing in the Parking lots

Test date : 09/10/2010
Parking lots : 3 Floors
Car speed : 20 Km/hr