

LNS-260[®]GNSS/DR

Inertial Navigation Module for cars

LNS-260[®] is a high precision inertial **Land Navigation System** for cars, which combines ultra-low noise MEMS 3-axis gyros, 3-axis accelerometer, barometer, odometer and GNSS module on a single, compact board. When GNSS signals are limited or not available, such as in urban canyons and tunnels, **LNS-260[®]** module provides reliable and accurate navigation information. Odometer is used to improve dead reckoning (DR) distance accuracy. All sensors of **LNS-260[®]** module are calibrated over their temperature and compensated for axis alignment in order to make them ideal for demanding applications.



LNS-260[®] sophisticated GNSS/DR algorithm auto calibrates and optimally blends the sensors inputs with kalman filter to generate optimal and accurate position outputs in the most hostile GNSS environments. DR estimates position based on distance traveled since the last known position from GNSS. It is an ideal solution for system integrators who are adding location capabilities to vehicle navigation, fleet management and asset tracking systems. For car navigation system on market, **LNS-260[®]** is the only one that provides 6-axis, 3D navigation position output and DR error is only 6m/km.

Application :

- The field which wants knowing the more accurate location of the vehicle in telemetric.
- Navigation function improvement in personal vehicle navigation system.
- Vehicle location tracking which is accurate in vehicle control system such as taxi, bus, fleet management and freight transportation.
- Improvement of vehicle location tracking function in insurance company, commercial bank when vehicle breakdown or vehicle robbery.
- Autonomous vehicles

Feature :

- System integrates ultra-low noise MEMS sensors, odometer and GNSS module.
- GNSS module provides GPS+GLONASS+BeiDou+Galileo+SBAS+QZSS satellite signals.
- All sensors individually have temperature compensation and axis alignment calibration.
- Provides absolute and relative height data.
- Auto self-calibrate attitude when system fixed and power on.
- The newest and high precision 3D GNSS/DR modules on market.
- **DR error is 0.6% of 2km distance traveled(12m).**
- Low cost and high C/P value.
- Lead free / RoHS compliant.
- 3 years warranty



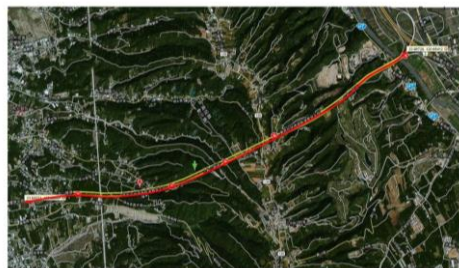
Specification

Sensors	
Angular rate (3-axis)	±100°/s
● Noise density(yaw axis)	0.004°/s/√Hz
● Non linearity(yaw axis)	±0.5% of FS
● Noise density(pitch/roll axis)	0.014°/s/√Hz
● Non linearity(pitch/roll axis)	±1.0% of FS
Acceleration (3-axis)	±2 g/±6 g
● Noise density	50 μg/√Hz
● Non linearity	±0.5% of FS
Barometer	
● Pressure range	300~1,100hPa (9,000m~-500m)
● Resolution of output data	Pressure 0.01 hPa Temperature 0.1°C
GNSS Module	
	u-blox M8N
Channels	72
GPS, SBAS, QZSS, BeiDou	L1, C/A B1
GLONASS	L1, OF
Galileo	E1B/C
Protocols	NMEA 0813, Version 4.0 (V2.3 or 4.1 configurable)
Sensitivity	
● Colds starts	-147 dBm
● Hot starts	-156 dBm
● Reacquisition	-159 dBm
Tracking	
● GPS/GLONASS	-164 dBm
● GPS/BeiDou	-162 dBm
● GPS	-163 dBm
Accuracy	
● Horizontal position accuracy	
Autonomous (50% @ 30 m/s)	2.5 m
SBAS (50% @ 30 m/s)	2.0 m
● Velocity	0.05 m/s
● 1 PPS	30 ns (RMS) 60 ns (99%)

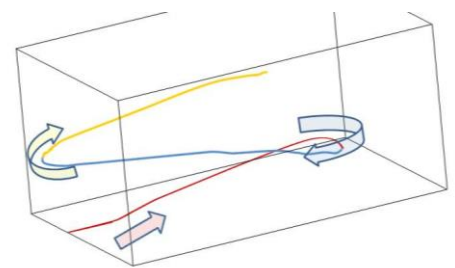
Time-to-first-fix (TTFF)	
Hot start	< 1 s
Cold start	
● GPS/GLONASS	27 sec
● GPS/BeiDou	28 sec
● GPS	30 sec
Dynamics	
Acceleration	≤4g
Velocity	500 m/s
Altitude limit	5,000 m
Update rate	
GNSS navigation	2 Hz
DR navigation	2 Hz
Power	
Prime power	5±5%V DC
Antenna power	3~3.3V DC
Power consumption	< 0.5 W
Interface and Connector	
Interface	UART
Antenna connector	SMA female
Power/ data connector	12-pin Header (6 x 2; 2.0 mm)
Baud rate	4,800~115,200 bps default 115,200 bps
DR error	
Horizontal	0.6% of 2Km distance traveled (6m/km)
Vertical	2.5% of 20m height traveled (<0.5m)
Environment	
Compensated temperature	- 10°C to +70°C
Operating temperature	- 40°C to +85°C
Storage temperature	- 40°C to +85°C
Physical	
Dimensions	70 mm x 50 mm x 11.5 mm (not includes of antenna connector)
Weight	<25 grams



Car speed : 20~60 Km/hr
DR horizontal error : 12m (0.6%)
(2.0km road distance traveled)



Car speed : 70 Km/hr
DR horizontal error : 28m (0.6%)
(4.9km tunnel distance traveled)



Car speed : 20 Km/hr
DR altitude error : <0.5m (2.5%)
(20m high parking house traveled)