

Product name	Description	Version
MC-1612AD-DR	Dual-frequency Multi-constellation GNSS Untethered dead	0.2
	reckoning module	0.2



1 Introduction

LOCOSYS MC-1612AD-DR is using an Airoha AG3335AD chip, dual-frequency multi-constellation solution GNSS with sensor fusion dead reckoning module. It not only supports GPS, GLONASS, GALILEO, BEIDOU and QZSS, but also has inertial sensors (3-axis accelerometers and 3-axis gyros) to provide untethered dead reckoning function.

In addition to DR, an inertial sensor can detect the vehicular dynamics when it is attached firmly on the vehicle. Consequently, abnormal driving behaviors and the vehicle status can be detected and the alarm status will be enabled to remind the users. No requirement of installation orientation and automatic calibration function make it easy to use. With these features, MC-1612AD-DR can reduce position errors in multipath environment and continue to work where GNSS signals are poor or not available, such as tunnels and indoor parking lots, as well as deliver seamless navigation.

2 Features

- Build on high performance, low-power Airoha AG3335AD chip
- Dual-frequency and multi-constellation satellite signals
- Support GPS, GLONASS, GALILEO, BEIDOU and QZSS
- Capable of SBAS (WAAS, EGNOS, MSAS, GAGAN)
- Support 135-channel GNSS
- Up to 10 Hz update rate
- Built-in TDK-42670-P 6-axis MEMS (3-axis gyroscope and 3-axis accelerometer)
- UDR Mode CEP \leq 3% of distance travelled without GNSS
- Alarm statuses detected by VMDS
- No requirement for installation orientation
- Small form factor 16 x 12.2 x 2.6 mm
- SMD type with stamp holes; RoHS compliant

3 Application

- Automotive navigation
- LBS (location Base Service)
- Vehicle Remote Monitoring







• ITS (Intelligent Traffic System)

Fig 3-1 System block diagram.



Fig 3-2 Typical application circuit



4 GNSS receiver

Frequency	GPS/QZSS: L1 C/A, L5C		
	GLONASS: L1OF		
	GALILEO: E1, E5a		
	BEIDOU: B1I, B2a		
Channels	Support 135 channels		
Update rate	1Hz default, up to 10Hz		
Sensitivity	Cold start	-148dBm	
	Hot start	-155dBm	
	Reacquisition	-158dBm	
	Tracking	-165dBm	
Acquisition Time	Hot start (Open Sky)	1s (typical)	
	Cold Start (Open Sky)	24s (typical)	
Position Accuracy	Autonomous	1.5m CEP ⁽¹⁾	
	UDR mode	$CEP \le 3\%$ of distance travelled without GNSS	
Max. Altitude	< 18,000 m		
Max. Velocity	< 500 m/s		
Protocol Support	115200 bps ⁽²⁾ , 8 data bits, no parity, 1 stop bits (default)		
	NMEA 0183 ver. 4.1	1Hz: GGA, GLL, GSA, GSV, RMC, and VTG	
	Proprietary message	1Hz: PAIRMSG	

<Note>

1. 24hr, static, open sky, demonstrated with good dual-frequency active antennas.

2. Both baud rate and output message rate are configurable to be factory default.

