GR-M01, Concurrently Track All Civil Navigation Systems, GPS/GNSS Smart Antenna

RoHS Compliant



Overview

Based on the AG3335 chip by 12nm technology, GR-M01 is able to **concurrently track L1** signals from **all civil navigation systems**, i.e. GPS, GLONASS, GALIELO, BEIDOU, QZSS, and SBAS **in a small & compact dimension**. Thanks to this capability, positioning becomes easy and accurate even in the typical GPS difficult environments.

GR-M01 is a plug-and-play GNSS smart antenna that includes antenna, LED, connector, and all circuits necessary for G3B high quality positioning.

=G3B: GPS/GLONASS/GALILEO/BEIDOU

Applications

- Navigation (autos, trains, boats, pedestrians etc.)
- ELD (Electronic Logging Device)
- Speeding (trace analysis)
- Timing (precise clock, FEMTO cell, traffic lights etc.)

Features

- Based on the 12nm technology AG3335 chip
- 135 channels, tracks all civil navigation systems
- Concurrent tracking of all civil navigation systems
  - Multi-constellation: GPS, GLONASS, GALILEO, BEIDOU, QZSS, SBAS
  - SBAS ranging (WAAS, EGNOS, MSAS, GAGAN)
- Small, 40 x 45 x 16 only, in mm
- Compact with IPX7 Waterproof
- High performance: -165dBm tracking sensitivity
- Support of smart jammer detection on GPS, GLONASS, Galileo, BEIDOU bands.
- 12 multi-tone AIC (active interference canceller) for removing unwanted signals.
- Indoor and outdoor multi-path detection and compensation
- PPS of ±10ns accuracy with adjustable duty cycle
- Up to 10Hz update rate
- RTCM ready (v2.3 and v3.3)
- AGPS/AGNSS
  - EPO™ (Extended Prediction Orbit) orbit prediction
  - EASY™ (Embedded Assist System) self-generated orbit prediction
- LOCUS™ logger function
- All-in-one, plug-n-play smart antenna
  - Built-in G3B= GNSS antenna
  - Connector, cable length could be customized
  - Built-in LED for position fix indication
  - UART/RS232/USB option
  - Backup battery option
- Built-in magnet
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85℃

Note: ™ Airoha trade mark

Technical Specifications

Receiver Performance Data+

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Receiver Type	135 channels, L1: 1602 MHz: GLONASS:L1OF 1575.42 MHz GPS & QZSS: L1 C/A SBAS: L1 QZSS L1 SAIF Galileo: E1 (E1B+E1C) 1561.098 MHz BEIDOU B1I
Horizontal Position Accuracy	2.5m (50% 24hr static, -130dBm)
Vertical Position Accuracy	3.75m (50% 24hr static, -130dBm)
Velocity Accuracy	<0. 05 m/s (speed, autonomous) (50%@30m/s)
Time Pulse Signal Accuracy	± 10 ns clear sky, 1-sigma
Time To First Fix Hot start Warm start Cold start	Autonomous (50% -130dBm) 1sec 24sec 24sec
Sensitivity (Autonomous)	Acquisition: -148dBm Tracking: -165dBm
Max. Update Rate	10Hz (default 1Hz)
Max. Altitude	<18,000 m
Max. Velocity	<1,852 km/hr
Protocol Support	NMEA V3.01 & V4.10 GGA, GSA, GSV, RMC, VTG UART: N-8-1 9600(default)/115200/921600bps Proprietary PAIR command Proprietary Binary sentence
SBAS Support	WAAS, EGNOS, MSAS,GAGAN
AGPS/AGNSS	● EPO data: GPS, GLONASS ● QEPO data: GPS, GLONASS, GALILEO, BEIDOU ● EASY: GPS
Dynamics	<4g

+ Note. According to IC Spec

Electrical Data

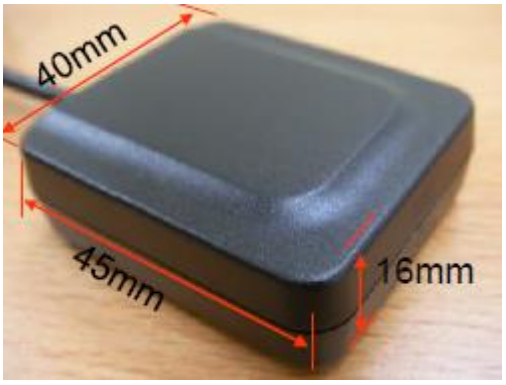
Power Supply (VCC)	3.3 ~ 5 V (TTL, RS232) 4.5 ~ 5.5 V (USB)
Power Consumption (Average Tracking)	75±5mA/USB, 50 SVs used in fix
Backup Power (V_BAT)	2~5 V
TTL I/O	V_{IH}: 2~3.15V, V_{IL}: 0~0.8V V_{OH}: >2.1V, V_{OL}< 0.72V

Environmental Data

Operating temperature	-40 ~ 85℃ w/o battery -20~60℃ w/ battery
Storage temperature	-40 ~ 85℃ except battery: -40~60℃
Operating humidity	5% ~ 95% non-condensing
Waterproof	IPX7

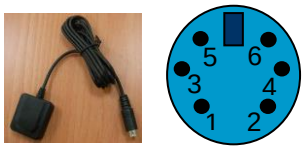
Mechanical Data (mm)

40 x 45 x 16



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Interfaces/ Ordering Information%

GR-M01 P/Q/R/T	GR-M01U
	 
Mini-Din 6-pin PS/2 Male Plug	USB type A, Male Plug

Pin	GR-M01P	GR-M01Q	GR-M01R	GR-M01T	GR-M01U
1	GND	GND	GND	GND	VDD 5V
2	VCC	VCC	VCC	VCC	D-
3	TX-RS232	TX-RS232	-	TXD-TTL	D+
4	RX-RS232	RX-RS232	RX-RS232	PWR_CTL	GND
5	1PPS-TTL	1PPS-RS232&	TX-RS232	1PPS-TTL	-
6	-	-	-	RXD-TTL	-

& Please be noted that the RS232 line transceiver would introduce 0.3 us pulse skew to the 1PPS signal of RS232 model.

% Customization of firmware/hardware are welcome.

* This document is subject to change without notice.

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