

GR-M02, L1/L5 Dual-band, Multi-satellite Systems, Sub-meter GPS/GNSS Receiver

RoHS
Compliant



Overview

Based on the AG3335 chip by 12nm technology, GR-M02 is able to track signals from all civil navigation systems, i.e. GPS, GLONASS, GALIELO, BEIDOU, QZSS, and NAVIC. In addition, it also tracks L1 and L5 bands simultaneously which allows sub-meter positioning accuracy. Thanks to this capability, positioning becomes easy even in the typical GPS difficult environments.

GR-M02 is a plug-and-play GNSS smart antenna that includes antenna, backup battery, LED, connector, and all circuits necessary for sub-meter positioning.

Applications

- Navigation (autos, trains, boats, pedestrians etc.)
- ELD (Electronic Logging Device)
- 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 positioning satellites
 - L1/L5 dual-band
 - Multi-constellation: GPS, GLONASS, Galileo, BEIDOU, NAVIC, QZSS
 - SBAS ranging (WAAS, EGNOS, MSAS, GAGAN)
- High performance: -165dBm tracking sensitivity
- 12 multi-tone AIC (active interference canceller) in both L1/L5 bands for removing unwanted signals.

- Indoor and outdoor multi-path detection and compensation
- PPS of ± 10 ns 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
- Easy to use: built-in antenna & digital connector
- Backup battery support for faster position fix
- LED for position fix indication
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85°C

Note: ™ Airoha trade mark

Technical Specifications

Receiver Performance Data*

| | |
|---------------|---|
| 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 L5: 1176.45 MHz NAVIC SPS GPS & QZSS: L5 Galileo: E5a BEIDOU: B2a |
| Horizontal Position Accuracy | 1.5m (L1+L5 dual-band) (50% 24hr static, -130dBm) |
| Vertical Position Accuracy | 2.25m (L1+L5 dual-band) (50% 24hr static, -130dBm) |
| Velocity Accuracy | <0.05 m/s (speed, autonomous) (50% @30m/s) |
| Time To First Fix | Autonomous (50% -130dBm) |
| Hot start | 1sec |
| Warm start | 24sec |
| Cold start | 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 38400/115200(default)/921600bps Proprietary PAIR command Proprietary Binary sentence |
| SBAS Support | WAAS, EGNOS, MSAS, GAGAN |
| AGPS/AGNSS | <ul style="list-style-type: none"> EPO data: GPS, GLONASS QEPO data: GPS, GLONASS, GALILEO, BEIDOU EASY: GPS |
| Dynamics | <4g |

Electrical Data

| | |
|----------------------|--|
| Power Supply (VCC) | 3 ~ 5 V |
| Power Consumption | 59mA/average tracking |
| 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 |





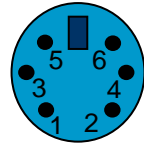

Environmental Data

| | |
|-----------------------|-------------------------------------|
| Operating temperature | -40 ~ 85°C except battery: -20~60°C |
| Storage temperature | -40 ~ 85°C except battery: -40~60°C |
| Vibration | 5Hz to 500Hz, 5g |
| Shock | Half sine 30g/11ms |

Mechanical Data (mm)

40 x 45 x 18.5

Interfaces

| | GR-M02T | GR-M02R | GR-M02U |
|-----|--|---|---|
| |  |  |  |
| |  |  |  |
| Pin | Mini-Din 6-pin PS/2 Male Plug | Mini-Din 6-pin PS/2 Male Plug | USB type A Male Plug |
| 1 | GND | GND | VDD 5V |
| 2 | VCC | VCC | D- |
| 3 | TXD-TTL | TXD-TTL | D+ |
| 4 | NC | RX-RS232 | GND |
| 5 | NC | TX-RS232 | |
| 6 | RXD-TTL | RXD-TTL | |

Ordering Information%

GR-M02X, X=T, R, U etc.

| | |
|---|--------------------------------------|
| T | TTL; mini-din 6-pin male connector |
| R | RS232; mini-din 6-pin male connector |
| U | USB; type A connector |

* Note. According to IC Spec

Navisys Technology Corp.

Tel : +886-3-5632598

Sales contact: sales@navisys.com.tw

Address: 2F, No.56, Park Ave. II, Science-Based Industrial Park, Hsinchu 300, Taiwan (R.O.C.)

<http://www.navisys.com.tw/>

Fax: +886-3-5632597

Technical support: service@navisys.com.tw

% Customization of firmware/hardware are welcome.

* This document is subject to change without notice.