# GR-701, u-blox7

# Ultra-High Performance

# GPS Mouse Receiver

## Overview

GR-701 is an easy to use, ultra-high performance, low power, industrial grade GPS smart antenna. The built-in u-blox7 chip and our experienced design provide fast acquisitions and excellent tracking performance. It supports either USB, TTL, or RS232-based mini-DIN interface.

## Applications

- High-precision PPS time service
- Automatic vehicle location
- Vehicle navigation device
- Fleet management

## Features

- Based on u-blox7 low power single chip
- High performance: -162dBm+ tracking sensitivity
- GNSS support : either GPS/QZSS (default) or GLONASS
- Up to 10Hz update rate (default 1Hz)
- SBAS (WAAS/EGNOS/MSAS) support
- OMA SUPL compliant AGPS support
- RTCM 2.3 support
- Backup battery support for faster position fix
- External backup power option via I/O pin is available for special application of high working temperature.
- USB/UART TTL/RS232 interface support
- PPS support for timing application, including PPS over USB
- LED for position fix indication
- Built-in magnet
- Compatible with GPSD PPS support (GR-701W)
- Linux/Android support
- Windows **location sensor** support (u-blox USB)
- **IPX7** Waterproof
- Industrial operating temperature range: **-40 ~ 85**℃

## Technical Specifications

### Receiver Performance Data+

| | |
|---|---|
| Receiver Type | 56-channel,<br>GPS & QZSS:L1 C/A,1575.42MHz,<br>GLONASS:L1OF,1598.0625~1605.375MHz<br>SBAS: WAAS, EGNOS, MSAS |
| Horizontal Position Accuracy | Autonomous:2.5m (GPS), 4m (GLONASS)<br>SBAS: 2.0m (GPS)<br>(CEP, 50%, 24-hour static, -130dBm) |
| Velocity Accuracy | <0.1 m/s (speed)<br><0.5° (heading)<br>(50%@30m/s) |
| PPS Signal Accuracy | RMS: 30ns (GPS), 50ns (GLONASS)<br>99%: 60ns (GPS), 100ns (GLONASS) |
| Time To First Fix<br>Hot start<br>Warm start<br>Cold start | Autonomous (All at -130dBm)<br>(50% -130dBm)<br>1sec (GPS), 1sec (GLONASS)<br>28sec (GPS), 25sec (GLONASS)<br>30sec (GPS), 32 sec (GLONASS) |
| Sensitivity | Acquisition: -148 (GPS), -140 (GLONASS) |

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| | |
|---|---|
| (Autonomous) | Tracking: -162 (GPS), -158 (GLONASS) |
| Max. Update Rate | Default: 1Hz, Max. : 10Hz |
| Max. Altitude | 50,000 m |
| Max. Velocity | <1,852 km/hr |
| Protocol Support | NMEA 0183 v2.3(compatible to 3.0)<br>UART: 9600 bps N,8,1;<br>GGA, GLL, GSA, GSV, RMC, VTG, TXT |
| SBAS Support | WAAS, EGNOS, MSAS |

**+ Note. According to IC Spec**

## Electrical Data

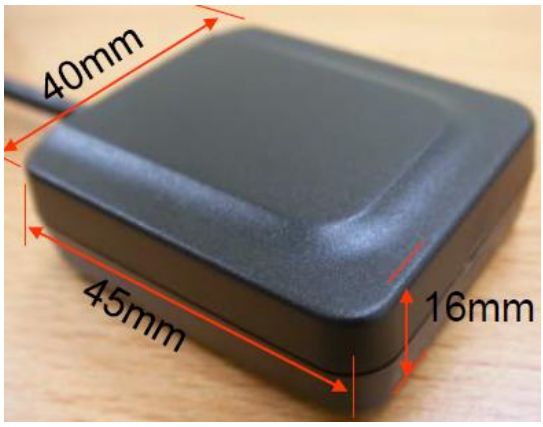
| | |
|---|---|
| Power Supply | 3.3 ~5.5 VDC |
| Power Consumption | 37mA/average tracking (TTL) |

## Environmental Data

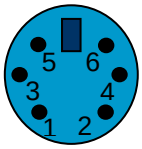
| | |
|---|---|
| Operating temperature | -40 ~ 85℃ (battery: -20 ~ 60℃) |
| Storage temperature | -40 ~ 85℃ (battery: -40 ~ 60℃) |
| Operating humidity | 5% ~ 95% non-condensing |
| Waterproof | IPX7 |

## Other Data

| | |
|---|---|
| Cable Length | 1.5m for GR-701U<br><1m for GR-701T<br>3m for GR-701R |
| Dimension | 40 x 45 x 16 (mm) |




## Interfaces

| | GR-701T | GR-701R | GR-701U/W |
|---|---|---|---|
| |  |  |  |
| |  |  |  |
| **Pin** | Mini-Din 6-pin PS/2 Male Plug | Mini-Din 6-pin PS/2 Male Plug | USB A type Male Plug |
| **1** | GND | GND | VDD 5V |
| **2** | VCC | VCC | D- |
| **3** | TXD-TTL | TX-RS232 | D+ |
| **4** | RXD-TTL | RX-RS232 | GND |
| **5** | $PPS | $PPS | - |
| **6** | PWR_CTRL | PWR_CTRL | - |

$: TTL signal level

The GR-701W makes PPS events visible to a compatible USB host system; they appear as DCD state changes to the PL2303 driver. Time precision will be limited by the USB polling interval, usually 0.5 millisecond

## Ordering Information

GR-701X

| | |
|---|---|
| T | TTL; mini-din 6-pin male connector |
| R | RS-232; mini-din 6-pin male connector |

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| | |
|---|---|
| U | u-blox USB; type A connector |
| W | Prolific USB, PPS connected to DCD; type A connector |

*This document is subject to change without notice.

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