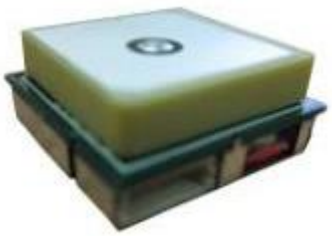
# GM-721, Compact,

# High Performance

# GNSS Smart Antenna Module

RoHS Compliant



## Overview

GM-721 is a compact module equipped with the latest **u-blox 7** low-power, high-sensitivity engine, GNSS antenna, and wire-to-board connector. The all-in-one design allows quick plug and play.

GM-721 supports either GPS/QZSS or GLONASS. It default works with GPS and QZSS.

Based on our experienced design, GM-721 provides not only excellent GPS performance but also quality and delivery assurance.

## Applications

- Driving Recorder
- Automatic vehicle location
- Vehicle navigation device
- School Bus / Transit / Police / Fleet / POS

## Features

- Compact, small, all-in-one module
  - 20.1 x 20.1 x 8.2 (mm), including patch antenna (18x18x4) and connector
  - Connect to main board via a 6-pin connector
- Backup power for faster position fix.
- GNSS support: either GPS/QZSS (default) or GLONASS
- SBAS (WAAS, EGNOS, MSAS) support
- TTL or USB support
- High sensitivity+:-162dBm tracking/-148dBm acquisition (GPS)
- Up to 10Hz update rate (default 1Hz)
- OMA SUPL compliant
- A-GPS support
- LED for position fix indication.
  - Blinking: position fixed.
  - Otherwise, unfixed
- Windows **location sensor** support
- Excellent EMI protection

## Technical Specifications

### Receiver Performance Data+

| | |
|---|---|
| Receiver Type | 56-channel u-blox 7 engine<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% @ 30 m/s) |
| Time Pulse Signal Accuracy | RMS: 30ns (GPS), 50ns (GLONASS)<br>99%: 60ns (GPS), 100ns (GLONASS) |
| Time To First Fix (TTFF) | Autonomous (All at -130dBm) |
| Hot start | 1sec (GPS), 1sec (GLONASS) |
| Warm start | 28sec (GPS), 25sec (GLONASS) |
| Cold start | 29sec (GPS), 30 sec (GLONASS) |
| Sensitivity, | |

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| | |
|---|---|
| dBm (Autonomous) | Acquisition: -148 (GPS), -140 (GLONASS)<br>Tracking: -162 (GPS), -158 (GLONASS) |
| Navigation. Update Rate | Max. 10Hz<br>Default 1Hz |
| Max. Altitude | 50,000 m |
| Max. Velocity | 500 m/s |
| Protocol Support | UART: N,8,1; bauds 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps;<br>USB: baud rate selectable<br>NMEA 0183 v2.3 (compatible to 3.0)<br>GGA, GLL, GSA, GSV, RMC, VTG, TXT |
| Dynamics | < 4g |

**+ Note. According to IC Spec**

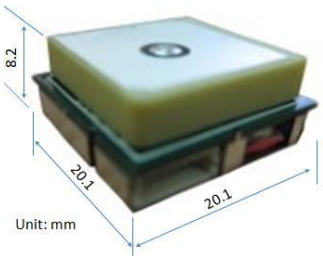
## Electrical Data

| | |
|---|---|
| Power Supply | 3.1 ~ 5.5 V (TTL) |
| Backup power | 1.5 ~ 3.5V |
| Power Consumption | 40 mA / average tracking<br>13.5uA / backup power (module disabled) |
| USB I/O (V) | $V_{IH}$: 2 ~ VCC, $V_{IL}$: 0 ~ 0.8<br>$V_{OH}$: >= 2.8, $V_{OL}$<= 0.3 |
| Digital I/O (V) | $V_{IH}$: 0.7*VCC ~ VCC+0.5<br>$V_{IL}$: 0 ~ 0.2*VCC<br>$V_{OH}$: >= VCC-0.4,<br>$V_{OL}$<= 0.4 |

## Environmental Data

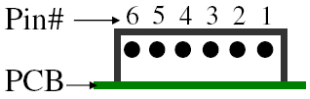
| | |
|---|---|
| Operating temperature | -40 ~ 85℃ |
| Storage temperature | -40 ~ 85℃ |

## Mechanical Data – 20.1 x 20.1 x 8.2 (mm)




**Tolerance : ± 0.25 mm**

## 6-pin Interface, pitch 1.0 mm




### GM-721A/U

| Pin | Name | Function | I/O |
|---|---|---|---|
| 1 | GND | Ground | Input |
| 2 | VCC | Power supply | Input |
| 3 | TXD/D+ | TTL level serial data output (from GPS) / USB positive | Output / I/O |
| 4 | RXD/D- | TTL level serial data input (to GPS) / USB negative | Input / I/O |
| 5 | 1PPS | Time Pulse Per Second | Output |
| 6 | V_BAT | Backup power | Input |

### GM-721B/V

| Pin | Name | Function | I/O |
|---|---|---|---|
| 1 | GND | Ground | Input |
| 2 | VCC | Power supply | Input |
| 3 | TXD/D+ | TTL level serial data output (from GPS) / USB positive | Output / I/O |
| 4 | RXD/D- | TTL level serial data input (to GPS) / USB negative | Input / I/O |
| 5 | PWR_CTL | Power control; floating or high: ON Low : OFF | Input |
| 6 | V_BAT | Backup power | Input |

### GM-721N without on board LED

| Pin | Name | Function | I/O |
|---|---|---|---|
| 1 | GND | Ground | Input |
| 2 | VCC | Power supply | Input |
| 3 | TXD | TTL level serial data output (from GPS) | Output |
| 4 | RXD | TTL level serial data input (to GPS) | Input |
| 5 | 1PPS | Time Pulse Per Second | Output |
| 6 | V_BAT | Backup power | Input |

## Ordering Information

**GM-721X** (X=A,B etc.)

| Feature \ Model | A | B | U | V |
|---|---|---|---|---|
| TTL | Y | Y | - | - |
| USB | - | - | Y | Y |
| PPS | Y | - | Y | - |
| Power Control | - | Y | - | Y |

*This document is subject to change without notice.

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