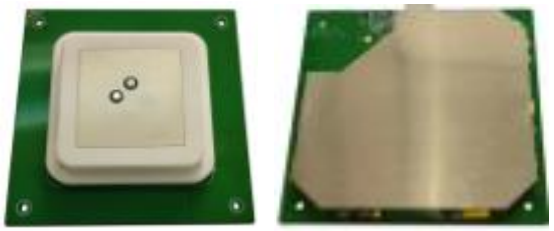
GM-901, Centimeter-level L1/L2 Dual-band GNSS Smart Antenna Module

RoHS Compliant



Overview

GM-901 is equipped with high-sensitivity, high precision engine of **u-blox ZED-F9P**, GNSS multi-band antenna, wire-to-board connector, and backup battery.

Mounted with wide-band antenna, this module supports dual band L1/L2 GPS/GLONASS/BEIDOU/Galileo/QZSS satellite systems simultaneously in one design.

This module exhibits fast RTK fix, reliable performance, high update rate for highly dynamic applications and centimeter accuracy in a small and energy-efficient way.

This all-in-one module allows just plug and play, fast time to market with outstanding performance.

Applications

- UAV
- Automatic farming
- Machine control
- Robotic guidance

Features

- *Based on ZED-F9P high precision module.*
- ***All-in-one cm-level smart antenna module***
- *USB/RS232/UA*RT TTL options
- Built-in L1/L2 band antenna and circuits supporting multiple constellations simultaneously
  - GPS+Galileo+GLONASS+BeiDou
  - SBAS, QZSS
- DGNSS RTCM 10403.3 version 3 messages support for RTK fix.
- High sensitivity+:-167dBm tracking/-148dBm acquisition
- Up to 8Hz update rate for quad-GNSS constellation or 15Hz for dual-GNSS constellation.
- Windows location sensor support
- OMA SUPL compliant A-GPS support
- SBAS (WAAS, EGNOS, MSAS, GAGAN) support
- Excellent EMI protection

Technical Specifications

Receiver Performance Data+

Supported GNSS Constellations	u-blox ZED-F9P GPS/SBAS/QZSS: (MHz) L1 C/A (1575.42), L2C (1227.60) GLONASS: (MHz) L1OF (1602+k*0.5625, k= -7,…,5,6), L2OF (1246+k*0.4375, k= -7,…,5,6), Galileo: (MHz) E1-B/C (1575.42), E5b (1207.140) BeiDou: (MHz) B1I (1561.098) B2I (1207.140)
Position Accuracy (RTK baseline up to 20km; 24 hours static)	Horizontal: RTK: 1 cm+1ppm CEP SBAS: 1 m CEP PVT: 1.5 m CEP Vertical: (result with 1km baseline) RTK: 1 cm+1ppm R50

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Velocity Accuracy	<0.05 m/s (speed) <0.3° (heading) (50% @ 30 m/s for dynamic operation)
Time Pulse Signal	0.25Hz...10MHz RMS: 30ns, 99%: 60ns
Time To First Fix (TTFF) Hot start Aided start Cold start	Autonomous (All at -130dBm) 2sec (GPS+Glonass+Galileo+BeiDou) 2sec (GPS+Glonass+Galileo+BeiDou) 25sec (GPS+Glonass+Galileo+BeiDou)
Sensitivity	GPS+Glonass+Galileo+BeiDou Acquisition: -148 dBm Reacquisition: -160 dBm Tracking & navigation: -167 dBm
Max. Update Rate RTK Convergence Time	a. GPS+Glonass+Galileo+BeiDou b. GPS+BeiDoui c. GPS RTK: 8Hz@a, 15Hz@b, 20Hz@c PVT: 10Hz@a, 25Hz@b, 25Hz@c RAW: 20Hz@a, 25Hz@b, 25Hz@c <10s@a&b, <30s@c Depends on atmospheric conditions, baseline length, multipath conditions, satellite visibility and geometry
Moving Base RTK Performance	a. GPS+Glonass+Galileo+BeiDou b. GPS+BeiDoui c. GPS Max. update rate: 8Hz@a, 10Hz@b, 10Hz@c Heading accuracy: 0.4°@a,b,c
Max. Altitude	50,000 m
Max. Velocity	500 m/s
Protocol Support	NMEA 0183 up to v 4.11, ASCII GGA, GLL, GSA, GSV, RMC, VTG, TXT UBX: u-blox proprietary, binary RTCM 3.3: binary

Default Settings	UART1 & 2: 38400bps, N-8-1 UART1: NMEA, UBX, RTCM 3.3 enabled Only NMEA output UART2: RTCM 3.3 enabled, No output, NMEA disabled, UBX not supported
Augmentation System Support	QZSS: Support L1S SLAS Correction data broadcasted on L1 SBAS: WAAS, EGNOS, MSAS, GAGAN DGNSS: RTCM 10403.3 ● Rover mode messages: (RTCM) 1001~1012, 1033, 1074, 1075, 1077, 1084, 1085, 1087, 1094, 1095, 1097, 1124, 1125, 1127 ● Base mode messages: (RTCM) 1005, 1074, 1077, 1084, 1087, 1094, 1097, 1124, 1127, 1230, 4072.0, 4072.1
Dynamics	< 4g

+ Note. According to IC Spec

Electrical Data

Power Supply	3.3 ~ 5.5 VDC
Power Consumption (10Hz update rate)	118mA/average tracking (USB) # of SVs tracked: L1: 37, L2: 27

Environmental Data

Operating temperature	-40 ~ 85℃ except battery: -20~60℃
Storage temperature	-40 ~ 85℃

Mechanical Data:

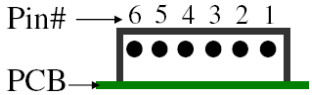
70x70x12.3 (mm)

Interfaces – RF & Digital connectors

* I-PEX RF connector option for external antenna

*** 6-pin Wire to Board connector, pitch 1.0mm**

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Pin	Name	Function	I/O
1	GND	Ground	Input
2	VCC	Power supply, 3.3~5.5V	Input
3	TX1/TXD1/D+	Serial data output 1 or USB D+	Output
4	RX1/RXD2/D-	Serial data input 2 or USB D-	Input
5	TX2/TXD2	Serial data output 2	Output
6	RX2/RXD2	Serial data input 2	Input

LED Indication

Green LED for GNSS fix	**ON**, position not fixed, **Blinking**, position fixed, **OFF**, power is OFF
Orange LED for RTK fix	**ON**, RTK fixed **Blinking**, RTK under fixing **OFF**, not in RTK mode, i.e. RTCM correction data is not available.

*This document is subject to change without notice.

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