GM-801, u-blox8

Ultra-High Performance

GNSS Smart Antenna Module

RoHS Compliant





Overview

GM-801 is an easy to use, ultra-high performance, low power GNSS smart antenna module with patch antenna for AVL/handheld applications. The built-in u-blox8 chip and our experienced design provide fast acquisitions and excellent tracking performance.

GM-801 supports multiple satellite positioning systems – GPS, GLONASS, BeiDou, Galileo[&~], QZSS, IMES[&~], and SBAS.

GM-801 supports not only RS232/TTL/USB options; the built-in battery could also be omitted if external backup power is preferred.

Applications

- Automatic vehicle location
- Driving recorder
- Navigation
- GPS clock and digital camera
- Child/elderly/personal locator and security system

Features

- Based on u-blox M8 low power single chip
- Multi-satellite positioning systems support
  - GPS/QZSS/**GLONASS** (**GM-8013**)
  - GPS/QZSS/**BeiDou** (**GM-8014**)
- SBAS (WAAS, EGNOS, MSAS) support
- Higher update rate option (default 1Hz), up to
  - 10 Hz for GPS&GLONASS or GPS&BEIDOU
  - 18 Hz for GPS only
- Sensitivity
  - Acquisition: -148dBm
  - Tracking: -167dBm
- Low power: 40mA at continuous tracking
- RTCM 2.3 support
- A-GPS support, OMA SUPL/3GPP TS25.171 (GSM/UMTS) compliant
- Easy to use: built-in antenna & digital connector
- Built-in 25x25x4 (mm) patch antenna [Option of 25x25x2 (mm) patch available]
- Backup battery support for faster position fix
- External backup power option via I/O pin is available for special application of high working temperature.
- LED for position fix indication
- Windows **location sensor** support
- Linux/Android support
- Fully EMI shielded
- Industrial operating temperature range: -40 ~ 85℃

Technical Specifications

Receiver Performance Data[+]

Receiver Type	72-channel u-blox M8 engine GPS, SBAS: L1 C/A: 1575.42MHz, QZSS: L1 C/A, L1 SAIF[&]: 1575.42MHz Galileo[&~]: E1 B/C: 1575.42MHz, GLONASS: L1OF:1598.0625~1605.375MHz BeiDou (or BD): B1: 1561.098 MHz

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	SBAS:WAAS, EGNOS, MSAS, GAGAN[&]
Horizontal Position Accuracy	2.5m (Autonomous) 2.0m (WAAS) (including SBAS & QZSS; CEP, 50% 24hr static, -130dBm, >6 SVs)
Velocity Accuracy	0.05 m/s (speed) <0.3° (heading) (50%@30m/s)
Time Pulse Signal Accuracy	30ns (RMS) <60ns (99%)
Time Pulse Frequency	0.25 Hz ~ 10 MHz
Time To First Fix Hot start Cold start	Autonomous, (50% -130dBm) 1 s GPS&GLONASS, 1s GPS & BD 26 s GPS&GLONASS, 27s GPS & BD
Sensitivity (Autonomous)	GPS&GLONASS -148dBm (acquisition) -167dBm (tracking) GPS&BD -148dBm (acquisition) -165dBm (tracking)
Navigation. Update Rate	Max. 10Hz, GPS & GLONASS or GPS & BeiDou Max. 18Hz, single GNSS; e.g. GPS only Default 1Hz
Max. Altitude	50,000 m
Max. Velocity	<1,852 km/hr or 515 m/s
Protocol Support	UART: N,8,1; bauds 1200, 2400, 4800, 9600 (default), 19200, 38400, 57600, 115200 bps; USB: Baud rate selectable NMEA 0183 v2.3 and V4.x GGA, GLL, GSA, GSV, RMC, VTG, TXT
Augmentation	SBAS(WAAS, EGNOS, MSAS, GAGAN[&])
Support	QZSS, IMES[&~]
RTCM 2.3	Messages 1, 2, 3, 9
Dynamics	<4g

[+]: According to GNSS IC spec using GPS & GLONASS
[&]: Since FW3.01
[~]: Default disabled

Electrical Data

Power Supply	3.3 ~ 5.5 V
Power Consumption	40mA/average tracking
Backup power	3.3 V
TTL I/O	V_{IH}: 2.31~3.8V, V_{IL}: 0~0.66V V_{OH}: ≥ 2.8V, $V_{OL:}$ ≤ 0.4V
USB I/O	V_{IH}: 2.0~3.3V, V_{IL}: 0~0.8V V_{OH}: ≥ 2.9V, V_{OL}≤ 0.3V
Protocols	NMEA, u-blox Binary

Environmental Data

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

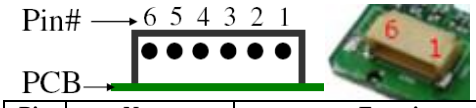
Mechanical Data

26*28*7.9 mm or 26*28*5.9 mm



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6-pin Interface, pitch 1.0mm



Pin	Name	Function	I/O
1	GND	Ground	Input
2	VCC	Power supply	Input
3	$TX/D+	Serial data output or USB D+	Output
4	$RX/D-	Serial data input or USB D-	Input
5	PPS $& (VBAT, option)	Pulse Per Second signal (External backup power)	Output (Input)
6	PWR_CTRL	Power control, high/floating: ON, low: OFF	Input

$ TTL or RS232 depending on the model number

& Please be noted that the RS232 line transceiver would introduce 0.3us pulse skew to the PPS signal of RS232 model. TTL level customization is available.

Ordering Information, GM-8013X, 8014X

Built-in backup battery

Pin	GM-801P	GM-801R	GM-801T	GM-801U
1	GND	GND	GND	GND
2	VCC	VCC	VCC	VCC
3	TX-RS232	TX-RS232	TXD-TTL	D+
4	RX-RS232	RX-RS23	RXD-TTL	D-
5	PPS-TTL	PPS-RS232	PPS-TTL	-
6	PWR_CTRL	PWR_CTRL	PWR_CTRL	-

External backup power via option of pin VBAT:

Where X=	Q	S	V
RS232	Y	-	-
TTL	-	Y	-
USB	-	-	Y

* Models other than R/T/U require MOQ.

*This document is subject to change without notice.

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