Product Summary

NEO-M8P

u-blox M8 high precision GNSS modules

Centimeter accuracy for mass market applications
- Integrated Real Time Kinematics (RTK) for fast time-to-market
- Small, light, and energy-efficient RTK module
- Complete and versatile solution due to base and rover variants
- World-leading GNSS positioning technology

Product description

The NEO-M8P module combines the high performance u-blox M8 positioning engine with u-blox's Real Time Kinematic (RTK) technology. The NEO-M8P provides cm-level GNSS performance designed to meet the needs of unmanned vehicles and other machine control applications requiring high precision guidance.

u-blox's RTK technology introduces the concept of a "rover" (NEO-M8P-0) and a "base" (NEO-M8P-2) on the M8 platform for stunning cm-level accuracy in clear sky environments. The base station module sends corrections via the RTCM protocol to the rover module via a communication link enabling the rover to output its position relative to the base station down to centimeter-level precision.

The NEO-M8P is ideal for applications that require vehicles to move faster and more accurately, operate more efficiently, and automatically return to base station platforms. Such applications include UAV, unmanned vehicles (e.g. robotic lawn mowers), and Precision Agriculture guidance.

The module enables system integrators to access u-blox's complete end-to-end RTK solution, including the stationary "survey-in" functionality that is designed to reduce the setup time and increase the flexibility of the application.

NEO-M8P includes moving base, allowing both base and rover to move while computing a centimeter-level accurate position between them. Moving base is ideal for UAV applications where the UAV is programmed to follow its owner or to land on a moving platform. It is also well suited to attitude sensing applications where both base and rover modules are mounted on the same moving platform and the relative position is used to derive attitude information for the vehicle or tool.

NEO-M8P modules are compatible with a wide range of communication technologies (Cellular, Wi-Fi, Bluetooth, UHF) enabling the user to select the communication link best suited to their application. With u-blox's RTK technology, integration and software development efforts can be reduced, ensuring a minimal cost of ownership.

u-blox M8 modules use GNSS chips qualified according to AEC-Q100, are manufactured in ISO/TS 16949 certified sites, and fully tested on a system level. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment".

<table>
<thead>
<tr>
<th>Grade</th>
<th>NEO-M8P-0</th>
<th>NEO-M8P-2</th>
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<tbody>
<tr>
<td>Automotive</td>
<td>•</td>
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<tr>
<td>Professional</td>
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<tr>
<td>Standard</td>
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GNSS

- GPS / QZSS
- GLONASS
- Galileo

<table>
<thead>
<tr>
<th>Number of concurrent GNSS</th>
</tr>
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<tbody>
<tr>
<td>2</td>
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Interfaces

- UART 1 1
- USB 1 1
- SPI 1 1
- DDC (I2C compliant) 1 1

Features

- Programmable (Flash) •
- Data logging •
- Carrier phase output •
- Additional SAW •
- Additional LNA •
- RTC crystal •
- Oscillator T
- RTK rover •
- RTK base station •
- Moving base •
- Survey-in and fixed mode •
- Timepulse 1 1

Power supply

2.7 V – 3.6 V

T = TCXO
NEO-M8P

Features

Receiver type 72-channel u-blox M8 engine
GPS L1 C/A, GLONASS L1 OF, BeiDou B1I

Nav. update rate RTK: up to 8 Hz¹
Carrier phase data: up to 10 Hz

Position accuracy¹

- Standalone RTK 2.5 m CEP
- RTK 0.025 m + 1 ppm CEP⁴

Convergence time¹ RTK < 60 sec

Acquisition

- Cold starts: 26 s
- Aided starts: 2 s
- Reacquisition: 1 s

Sensitivity

- Tracking & Nav.: −160 dBm
- Cold starts: −148 dBm
- Hot starts: −156 dBm
- Reacquisition: −158 dBm

Assistance

- AssistNow GNSS Online OMA SUPL & 3GPP compliant

Oscillator TCXO

Noise figure On-chip LNA with extra LNA for lowest noise figure

Anti jamming Active CW detection and removal.
extra onboard SAW band pass filter.

Memory Flash

Supported antennas Active and passive

Moving base For moving base stations, attitude sensing and “follow-me” applications

Survey-in base station For generating sub-meter base station positions (for NEO-M8P-2)²


Environmental data, quality & reliability

Operating temp. −40 °C to +85 °C
Storage temp. −40 °C to +85 °C
RoHS compliant (leaf-free)

Qualification according to ISO 16750

Manufactured and fully tested in ISO/TS 16949 certified production sites

Uses u-blox M8 chips qualified according to AEC-Q100

Interfaces

Serial interfaces 1 UART
1 USB V2.0 full speed 12 Mbit/s
1 SPI (optional)
1 DDC (I²C compliant)

Digital I/O Configurable timepulse
1 EXTINT input for Wakeup
RTK Fix Status
GEOFENCE Status

Timepulse Configurable: 0.25 Hz to 10 MHz

Protocols NMEA, UBX binary, RTCM version 3.x

Electrical data

Supply voltage 2.7 V to 3.6 V

Power 25 mA @ 3.0 V (continuous, GPS only)

Consumption Backup Supply 1.4 V to 3.6 V

Support products

Application board provides reference design, and allows efficient integration and evaluation of u-blox M8 high precision GNSS technology.
C94-M8P Two application boards, each with NEO-M8P-2 (rover and base station functionality), for evaluating RTK applications

Product variants

NEO-M8P-0 u-blox M8 high precision module with rover functionality
NEO-M8P-2 u-blox M8 high precision module with rover and base functionality

Further information

For contact information, see www.u-blox.com/contact-us.
For more product details and ordering information, see the product data sheet.

Package

24 pin LCC (Leadless Chip Carrier): 12.2 x 16.0 x 2.4 mm, 1.6 g

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