Product Summary

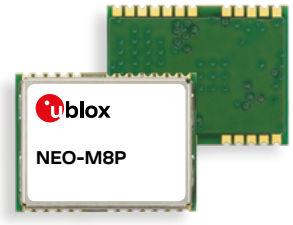
NEO-M8P

u-blox M8 high precision GNSS modules

Standard

Professional

Automotive



12.2 × 16.0 × 2.4 mm

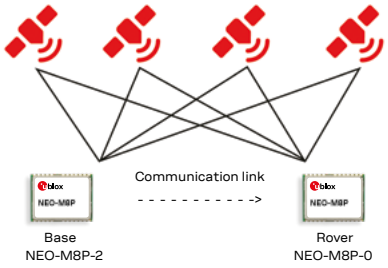
Centimeter accuracy for mass market applications

- 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 Baseline support, allowing both Base and Rover to move while computing a centimeter-level accurate position between them. Moving Baseline 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".

Product selector

Model	Category				GNSS					Supply	Interfaces				Features									Grade		
	Standard Precision GNSS	High Precision GNSS	Dead Reckoning	Timing	GPS/QZSS	GLONASS	Galileo	BeiDou	Number of concurrent GNSS	2.7 V – 3.6 V	UART	USB	SPI	DDC (I²C compliant)	Programmable (flash)	Data logging	Carrier phase output	Additional SAW	Additional LNA	RTK rover	Moving Baseline support	Base station with survey-in	Timepulse	Standard	Professional	Automotive
NEO-M8P-0		•			•	•		•	2	•	•	•	•	•	•	•	•	•	•	•	•		1		•	
NEO-M8P-2		•			•	•		•	2	•	•	•	•	•	•	•	•	•	•	•	•	•	1		•	

NEO-M8P

Features

Receiver type	72-channel u-blox M8 engine GPS L1 C/A, GLONASS L1OF, BeiDou B1I	
Nav. update rate	RTK: Carrier phase data:	up to 8 Hz[1] up to 10 Hz
Postition accuracy[2]	Standalone RTK	2.5 m CEP 0.025 m + 1 ppm CEP[3]
Convergence time[2]	RTK	< 60 sec
Acquisition Cold starts: Aided starts: Reacquisition:	 26 s 2 s 1 s	
Sensitivity Tracking & Nav.: Cold starts: Hot starts: Reacquisition:	 −160 dBm −148 dBm −156 dBm −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 baseline support	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)	

1 Limited to 5 Hz for multi-GNSS RTK and to 4Hz in moving baseline configuration
2 Depends on atmospheric conditions, baseline length, GNSS antenna, multipath conditions, satellite visibility, and geometry
3 ppm limited to baselines up to 10 km

Electrical data

Supply voltage	2.7 V to 3.6 V
Power Consumption	25 mA @ 3.0 V (continuous, GPS only)
Backup Supply	1.4 V to 3.6 V

Package

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

Environmental data, quality & reliability

Operating temp.	−40 °C to +85 °C
Storage temp.	−40 °C to +85 °C

RoHS compliant (lead-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

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 station 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.