

# NEO-M8 series

## u-blox M8 concurrent GNSS modules

### Highlights

- Concurrent reception of GPS/QZSS, GLONASS, BeiDou
- Industry leading -167 dBm navigation sensitivity
- Product variants to meet performance and cost requirements
- Combines low power consumption and high sensitivity
- Simple integration with u-blox cellular modules
- Backward compatible with NEO-7, NEO-6 and NEO-5 families



NEO-M8 series:  
12.2 x 16.0 x 2.4 mm

### Product description

The NEO-M8 series of standalone concurrent GNSS modules is built on the exceptional performance of the u-blox M8 GNSS (GPS, GLONASS, Galileo, BeiDou, QZSS and SBAS) engine in the industry proven NEO form factor.

The NEO-M8 series provides high sensitivity and minimal acquisition times while maintaining low system power. The NEO-M8M is optimized for cost sensitive applications, while NEO-M8N and NEO-M8Q provide best performance and easier RF integration. The NEO form factor allows easy migration from previous NEO generations. Sophisticated RF-architecture and interference suppression ensure maximum performance even in GNSS-hostile environments.

The NEO-M8 combines a high level of robustness and integration capability with flexible connectivity options. The future-proof NEO-M8N includes an internal Flash that allows

simple firmware upgrades for supporting additional GNSS systems. This makes NEO-M8 perfectly suited to industrial and automotive applications.

The DDC (I<sup>2</sup>C compliant) interface provides connectivity and enables synergies with most u-blox cellular modules. For RF optimization the NEO-M8N/Q features an additional front-end LNA for easier antenna integration and a front-end SAW filter for increased jamming immunity.

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	Type	Supply	Interfaces	Features
	GPS / QZSS GLONASS Galileo BeiDou Timing Dead Reckoning Precise Point Positioning	2.7 V – 3.6 V 1.65 V – 3.6 V Lowest power (DC/DC)	UART USB SPI DDC (I <sup>2</sup> C compliant)	Programmable (Flash) Data logging Additional LNA Additional SAW filter RTC crystal Internal oscillator Antenna supply Antenna short circuit detection / protection Antenna open circuit detection pin Timepulse output External interrupt / Wakeup
NEO-M8N	• • R •	• •	• • Sel •	• • ++ ++ • T ○ ○ ○ • •
NEO-M8Q	• • •	• •	• • Sel •	• • ++ ++ • T ○ ○ ○ • •
NEO-M8M	• • •	• •	• • Sel •	• • + + • C ○ ○ ○ • •

R = Galileo ready with future firmware  
+ = Suitable for most application (no additional component needed)  
++ = Additional onboard component for better performance

Sel = Select for either SPI or UART/DDC by HW configuration pin (D\_SEL)  
○ = Optional or requires external components  
C = Crystal / T = TCXO

## Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F, BeiDou B1 SBAS L1 C/A: WAAS, EGNOS, MSAS Galileo-ready E1B/C (NEO-M8N)	
Nav. update rate <sup>1</sup>	Single GNSS:	up to 18 Hz
	Concurrent GNSS:	up to 10 Hz
Position accuracy <sup>2</sup>	2.0 m CEP	
Acquisition <sup>2</sup>	Cold starts:	26 s
	Aided starts:	2 s
	Reacquisition:	1.5 s
Sensitivity <sup>2</sup>	Tracking & Nav:	-167 dBm
	Cold starts:	-148 dBm
	Hot starts:	-156 dBm
Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) <sup>3</sup> AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant	
Oscillator	TCXO (NEO-M8N/Q), Crystal (NEO-M8M)	
RTC crystal	Built-In	
Noise figure	On-chip LNA (NEO-M8M). Extra LNA for lowest noise figure (NEO-M8N/Q)	
Anti jamming	Active CW detection and removal. Extra onboard SAW band pass filter (NEO-M8N/Q)	
Memory	ROM (NEO-M8M/Q) or Flash (NEO-M8N)	
Supported antennas	Active and passive	
Odometer	Travelled distance	
Data-logger	For position, velocity, and time (NEO-M8N)	

<sup>1</sup> For NEO-M8M/Q

<sup>2</sup> For default mode: GPS/SBAS/QZSS+GLONASS with TCXO

<sup>3</sup> NEO-M8M/Q: requires host integration

## Electrical data

Supply voltage	1.65 V to 3.6 V (NEO-M8M) 2.7 V to 3.6 V (NEO-M8N/Q)
Power consumption <sup>4</sup>	23 mA @ 3.0 V (continuous) 5 mA @ 3.0 V Power Save Mode (1 Hz, GPS mode only)
Backup Supply	1.4 to 3.6 V

<sup>4</sup> NEO-M8M

## Interfaces

Serial interfaces	1 UART 1 USB V2.0 full speed 12 Mbit/s 1 SPI (optional) 1 DDC (I <sup>2</sup> C compliant)
Digital I/O	Configurable timepulse 1 EXTINT input for Wakeup
Timepulse	Configurable 0.25 Hz to 10 MHz
Protocols	NMEA, UBX binary, RTCM

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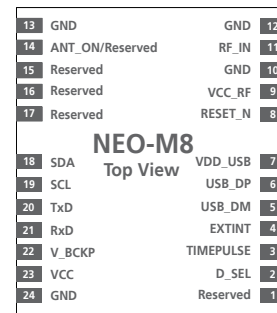
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## Package

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

Pinout



## Environmental data, quality & reliability

Operating temp.	-40° C to 85° C
Storage temp.	-40° C to 85° C (NEO-M8N/Q) -40° C to 105° C (NEO-M8M)

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

## Support products

u-blox M8 Evaluation Kits:

Easy-to-use kits to get familiar with u-blox M8 positioning technology, evaluate functionality, and visualize GNSS performance.

EVK-M8N: u-blox M8 GNSS Evaluation Kit,  
with TCXO, supports NEO-M8N/Q

EVK-M8C: u-blox M8 GNSS Evaluation Kit,  
with crystal, supports NEO-M8M

## Ordering information

NEO-M8M-0	u-blox M8 Concurrent GNSS LCC Module, crystal, ROM, 12.2x16 mm, 250 pcs/reel
NEO-M8N-0	u-blox M8 Concurrent GNSS LCC Module, TCXO, flash, SAW, LNA, 12.2x16 mm, 250 pcs/reel
NEO-M8Q-0	u-blox M8 Concurrent GNSS LCC Module, TCXO, ROM, SAW, LNA, 12.2x16 mm, 250 pcs/reel

Available as samples and tape on reel

## Contact us

For contact information, see [www.u-blox.com/contact-us](http://www.u-blox.com/contact-us).