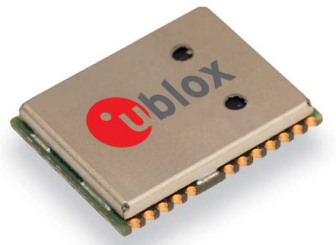
NEO-M8 series

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^2C 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	Raw Data	1.65 V – 3.6 V	2.7 V – 3.6 V	Lowest power (DC/DC)	UART	USB	SPI	DDC (I^2C compliant)	Programmable (Flash)	Data logging	Additional SAW	Additional LNA	RTC crystal	Internal oscillator	Active antenna / LNA supply	Active antenna / LNA control	Antenna short circuit detection / protection pin	Antenna open circuit detection pin	Timepulse output	Frequency output	External interrupt / Wakeup
NEO-M8N	•	•	R	•						•	•	•	•	Sel	•	•	•	•	•	•	T	o	•			•		•
NEO-M8Q	•	•		•						•	•	•	•	Sel	•			•	•	•	T	o	•			•		•
NEO-M8M	•	•		•					•		•	•	•	Sel	•					•	C	o				•		•

o = Optional, not activated per default or requires external components
Sel = Select for either SPI or UART/DDC by HW configuration pin (D_SEL)

R = Galileo supported in future firmware version
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[1]	Single GNSS: up to 18 HZ Concurrent GNSS: up to 10 Hz
Position accuracy	2.0 m CEP
Acquisition[2]	Cold starts: 26 s Aided starts: 2 s Reacquisition: 1 s
Sensitivity[2]	Tracking & Nav: –167 dBm Cold starts: –148 dBm Hot starts: –156 dBm
Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days)[3] 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)

[1] For NEO-M8M/Q
[2] For TCXO receiver with GPS/SBAS/QZSS+GLONASS mode
[3] 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[4]	23 mA @ 3.0 V (continuous) 5 mA @ 3.0 V Power Save Mode (1 Hz, GPS only)
Backup Supply	1.4 to 3.6 V

[4] NEO-M8M

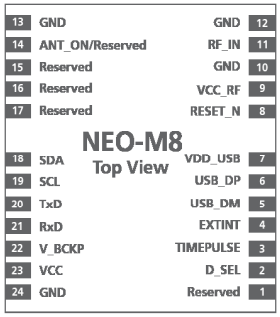
Interfaces

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

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.