NEO-M8 series

Versatile u-blox M8 GNSS modules

Versatile GNSS modules in different variants for easy manufacturing

- Concurrent reception of up to 3 GNSS (GPS, Galileo, GLONASS, BeiDou)
- Industry leading –167 dBm navigation sensitivity
- Security and integrity protection
- Supports all satellite augmentation systems
- Advanced jamming and spoofing detection
- Product variants to meet performance and cost requirements
- Backward compatible with NEO-7 and NEO-6 families

NEO-M8 series
12.2 x 16.0 x 2.4 mm

Product description

The NEO-M8 series of concurrent GNSS modules is built on the high performing u-blox M8 GNSS engine in the industry proven NEO form factor.

The NEO-M8 modules utilize concurrent reception of up to three GNSS systems (GPS/Galileo together with BeiDou or GLONASS), recognize multiple constellations simultaneously and provide outstanding positioning accuracy in scenarios where urban canyon or weak signals are involved. For even better and faster positioning improvement, the NEO-M8 series supports augmentation of QZSS, GAGAN and IMES together with WAAS, EGNOS, MSAS. The NEO-M8 series also supports message integrity protection, geofencing, and spoofing detection with configurable interface settings to easily fit to customer applications.

The NEO-M8M is optimized for cost sensitive applications, while NEO-M8N and NEO-M8Q provide best performance and easier RF integration. The NEO-M8N offers high performance also at low power consumption levels. The future-proof NEO-M8N includes an internal Flash that allows future firmware updates. This makes NEO-M8N perfectly suited to industrial and automotive applications.

The DDC (I²C 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	Category				GNSS					Supply		Interfaces				Features									Grade		
	Standard Precision GNSS	High Precision GNSS	Dead Reckoning	Timing	GPS / QZSS	GLONASS	Galileo	BeiDou	Number of Concurrent GNSS	1.65 V – 3.6 V	2.7 V – 3.6 V	UART	USB	SPI	DDC (I²C compliant)	Programmable (Flash)	Data logging	Additional SAW	Additional LNA	RTC crystal	Oscillator	Built-in antenna	Built-in antenna supply and supervisor	Timepulse	Standard	Professional	Automotive
NEO-M8M	•				•	•	•	•	3	•		•	•	•	•					•	C			1			
NEO-M8N	•				•	•	•	•	3		•	•	•	•	•	•	•	•	•	•	T			1			
NEO-M8Q	•				•	•	•	•	3		•	•	•	•	•			•	•	•	T			1			

C = Crystal / T = TCXO

Features

Receiver type	72-channel u-blox M8 engine GPS/QZSS L1 C/A, GLONASS L10F BeiDou B1I, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN		
Nav. update rate [1]	Single GNSS: up to 18 Hz 2 Concurrent GNSS: up to 10 Hz		
Position accuracy	2.0 m CEP		
		NEO-M8N/Q	NEO-M8M
Acquisition [2]	Cold starts:	26 s	26 s
	Aided starts:	2 s	3 s
	Reacquisition:	1 s	1 s
Sensitivity [2]	Tracking & Nav:	–167 dBm	–164 dBm
	Cold starts:	–148 dBm	–148 dBm
	Hot starts:	–157 dBm	–157 dBm
Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant		
Oscillator	TCXO (NEO-M8N/Q) crystal (NEO-M8M)		
RTC crystal	Built-In		
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		
Raw Data	Code phase output		
Odometer	Integrated in navigation filter		
Geofencing	Up to 4 circular areas GPIO for waking up external CPU		
Spoofing detection	Built-in		
Signal integrity	Signature feature with SHA 256		
Data-logger [3]	For position, velocity, time, odometer data		

1 NEO-M8M/Q
2 For default mode: GPS/SBAS/QZSS+GLONASS
3 NEO-M8N

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]	21 mA @ 3.0 V (Continuous) 5.3 mA @ 3.0 V (PSM, 1 Hz)
Backup Supply	1.4 to 3.6 V

4 NEO-M8M in default mode: GPS/SBAS/QZSS+GLONASS

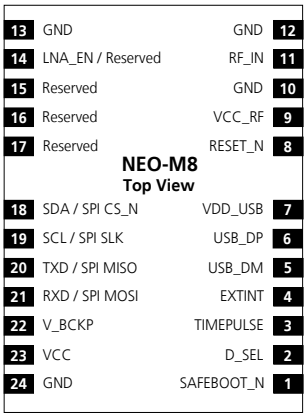
Interfaces

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

Product variants

NEO-M8M	u-blox M8 concurrent GNSS LCC module, crystal, ROM
NEO-M8N	u-blox M8 concurrent GNSS LCC module, TCXO, Flash, SAW, LNA
NEO-M8Q	u-blox M8 concurrent GNSS LCC module, TCXO, ROM, SAW, LNA

Further information

For contact information, see www.u-blox.com/contact-us.

For more product details and ordering information, see the product data sheet.