

# NEO/LEA-M8T

Standard Professional Automotive

## u-blox M8 concurrent GNSS timing modules

### Highlights

- Concurrent reception of GPS/QZSS, GLONASS, BeiDou
- Market leading acquisition and tracking sensitivity
- Optimized accuracy and availability with Survey-in and single-satellite timing
- Minimized power consumption with low duty-cycle operation
- Maximized reliability with integrity monitoring and alarms
- Multi-GNSS raw data, IMES message data
- Backward compatible with LEA-5T, LEA-6T and NEO-6T



NEO-M8T:  
12.2 x 16.0 x 2.4 mm



LEA-M8T:  
17.0 x 22.4 x 2.4 mm

### Product description

The NEO-M8T and LEA-M8T concurrent GNSS modules deliver high integrity, precision timing in demanding applications world-wide. Support for BeiDou and GLONASS constellations enables compliance with national requirements. Enhanced sensitivity and concurrent dual-constellation reception extend coverage and integrity to challenging signal environments. Survey-in and fixed-position navigation reduce timing jitter, even at low signal levels, and enable synchronization to be maintained with as few as one single satellite in view. Support for low duty cycle operation reduces power consumption for battery-powered applications.

u-blox timing products include timing integrity measures with Receiver Autonomous Integrity Monitoring (RAIM) and continuous phase uncertainty estimation. They feature high dynamic range radios with both analog and digital interference mitigation, supporting applications in wireless communications equipment.

The M8T timing modules are delivered in u-blox' established LEA and NEO form-factors with standard pin-out, allowing ready migration from previous product generations.

u-blox timing products can make use of u-blox AssistNow or industry standard aiding data. This reduces the time to first fix and delivers exceptional acquisition sensitivity, even on first installation before precise location, time or frequency are known.

u-blox M8 modules use GNSS chips qualified according to AEC-Q100, are manufactured in ISO/TS 16949 certified sites, and are 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	Grade
	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 <sup>2</sup> C 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 Frequency output	Standard Professional Automotive
NEO-M8T	• • R • • • •	• • •	• • • • •	• • • • • • T • • •	•
LEA-M8T	• • R • • • •	• • •	• • • • •	• • • • • T • • • •	•

○ = Optional, not activated per default or requires external components  
C = Crystal / T = TCXO

R = Galileo ready

## Features - GNSS

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 (subject to Firmware upgrade)	
Nav. update rate	Concurrent GNSS: up to 5 Hz	
Position accuracy	2.5 m CEP (Autonomous)	
Acquisition	<b>GPS &amp; GLONASS</b>	<b>GPS &amp; BeiDou</b>
	Cold starts: 26 s	27 s
	Aided cold starts: 2 s	3 s
Sensitivity	Tracking & Nav: -167 dBm	-165 dBm
	Cold starts (aided): -157 dBm	-151 dBm
	(autonomous): -148 dBm	-148 dBm
	Reacquisition: -160 dBm	-160 dBm
Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant	
Oscillator	TCXO	
RTC crystal	Built-In	
Noise figure	On-chip LNA (LEA-M8T) Extra LNA for passive antenna (NEO-M8T)	
Anti jamming	Active CW detection and removal. On-board SAW band pass filter	
Memory	Internal SQI Flash for Firmware update	
Supported antennas	Active and passive	

## Features - Timing

Timing accuracy	Clear sky: ≤ 20 ns
Time-pulse frequency	0.25 Hz – 10 MHz
Time-pulse jitter	±11 ns
Time-mark resolution	21 ns
Integrity reports	RAIM active, phase uncertainty time-pulse rate/duty-cycle

## Features - Power management

Power-save modes	On/off low duty-cycle
Off control	Hardware, message interface
On control	Hardware, wake-on UART activity, Timer (using low power RTC)
Automatic on/off with configurable period (GPS-only)	

## Features - Antenna management

LEA-M8T	Internal antenna bias supply with switching, over-current protection and alarm. Optional input for external open-circuit detection.
NEO-M8T	External with logic-level antenna switching output, filtered continuous supply.

## Support products

EVK-M8T:	u-blox M8 Timing GNSS Evaluation Kit
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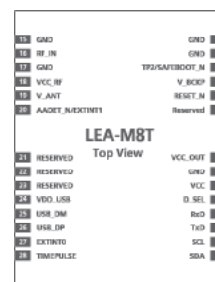
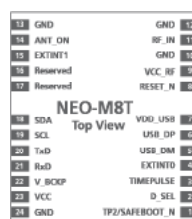
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## Package

NEO-M8T: 24 pin LCC (Leadless Chip Carrier): 12.2 x 16.0 x 2.4 mm, 1.6 g  
LEO-M8T: 28 pin LCC (Leadless Chip Carrier): 17.0 x 22.4 x 2.4 mm, 2.6 g  
Pinouts



## Features - Raw data and IMES

Measurement data	GPS, GLONASS, BeiDou, SBAS and QZSS (Carrier phase; Code phase & pseudo-range; Doppler)
Message data	GPS, GLONASS, BeiDou, SBAS, QZSS L1S and IMES beacons (50/250 bps auto-baud)

## 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	SPI or UART and DDC (I <sup>2</sup> C compliant)
Protocols	NMEA, UBX binary, RTCM
Time-pulse outputs	2
Time-mark inputs	2

## Electrical data

Supply voltage	2.7 V to 3.6 V
Power consumption	15 µA (Battery backup) 30 µA (Software backup) 34 mA @ 3.0 V (Operational, NEO-M8T) 30 mA @ 3.0 V (Operational, LEA-M8T)
Backup Supply	1.4 to 3.6 V

## Ordering information

See datasheet

## Contact us

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