

NEO-M8L

Standard Professional Automotive

POSITIONING

u-blox M8 ADR modules with 3D sensors

Continuous accurate navigation under all signal conditions

- Integrated 3D sensors with speed information from vehicle
- Continuous navigation during signal loss
- Automatic configuration of wheel-tick/speed input
- Real-time positioning up to 30 Hz rate
- GPS/QZSS, GLONASS, BeiDou, Galileo
- Zero PPM program for automotive grade NEO-M8L-02A



NEO-M8L
12.2 x 16.0 x 2.4 mm

Product description

The NEO-M8L 3D Automotive Dead Reckoning (ADR) modules combine GNSS, inertial sensing, and speed information from the vehicle to provide continuous and accurate positioning for Telematics, navigation and Vehicle-to-Everything applications.

Incorporating u-blox's latest advancements in multi-GNSS signal processing, the latest version of NEO-M8L delivers the ideal solution where navigation performance is the priority, regardless of GNSS signal quality or availability. In addition to the on-board sensors, NEO-M8L further eases installation with automatic configuration of speed or wheel-tick inputs, and compensation for in-vehicle antennas.

The intelligent combination of GNSS and sensor measurements enables accurate, real-time positioning, speed and heading information at rates up to 30 Hz, as essential for smooth and responsive interactive display. Access to native, high rate sensor data enables host applications to make full use of the receiver's assets.

The NEO-M8L includes u-blox's latest generation GNSS technology with multi-constellation reception including Galileo, GPS, GLONASS, BeiDou and QZSS. The module provides high sensitivity and fast GNSS signal acquisition and tracking.

UART, USB, DDC (I2C compliant) and SPI interface options provide flexible connectivity and enable simple integration with most u-blox cellular modules.

NEO-M8L modules use GNSS chips qualified according to AEC-Q100 and are manufactured in ISO/TS 16949 certified sites. Qualification tests are performed as stipulated in the ISO16750 standard: "Road vehicles – Environmental conditions and testing for electrical and electronic equipment".

The NEO-M8L-02A automotive grade module adheres to automotive industry standard quality specifications and production flow.

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 3.0 V – 3.6 V	UART USB SPI DDC (I ² C compliant)	Programmable (Flash) Data logging Additional SAW Additional LNA RTC crystal Oscillator Built-in sensor Timepulse	Standard Professional Automotive		
NEO-M8L-0	ADR	• • • •	3	•	• • • •	• • • • • C • 1	Professional		
NEO-M8L-02A	ADR	• • • •	3	•	• • • •	• • • • • T • 1	Automotive		

ADR = Automotive Dead Reckoning / UDR = Untethered Dead Reckoning

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	Up to 30 Hz	
Position accuracy	Autonomous	2.5 m CEP
	with SBAS	1.5 m CEP
ADR position error	2 % of distance travelled without GNSS	
Acquisition	Cold starts:	26 s
	Aided starts:	3 s
	Reacquisition:	1 s
Sensitivity	Tracking & Nav:	-160 dBm ¹
	Cold starts:	-148 dBm
	Hot starts:	-157 dBm
Assistance	AssistNow GNSS Online AssistNow GNSS Offline (up to 35 days) AssistNow Autonomous (up to 6 days) OMA SUPL & 3GPP compliant	
Oscillator	Crystal (NEO-M8L-0) TCXO (NEO-M8L-02A)	
RTC	Built-in	
Sensor	Onboard 3D accelerometer and 3D gyroscope	
Supported antennas	Active or passive antenna	
Raw Data	Code phase output	
Navigation outputs	Position, speed, acceleration, heading, heading rate, attitude, time	
Data-logger	For position, velocity, time, and odometer data	

¹ Limited by FW for best DR performance

Electrical data

Supply voltage	2.7 V to 3.6 V (NEO-M8L-0) 3.0 V to 3.6 V (NEO-M8L-02A)
Power consumption	29 mA @ 3.0 V (Continuous, default concurrent mode)
Backup Supply	1.4 to 3.6 V

Interfaces

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

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Package

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

Pinout

13	GND	NEO-M8L	GND	12
14	LNA_EN	TOP VIEW	RF_IN	11
15	FWD		GND	10
16	RESERVED		VCC_RF	9
17	RESERVED		RESET_N	8
18	SDA / SPI CS_N		VDD_USB	7
19	SCL / SPI CLK		USB_DP	6
20	TXD / SPI MISO		USB_DM	5
21	RXD / SPI MOSI		WHEELTICK	4
22	V_BCKP		TIMEPULSE	3
23	VCC		D_SEL	2
24	GND		SAFEBOOT_N	1

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

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-M8L u-blox M8 3D Dead Reckoning GNSS Evaluation Kit; supports NEO-M8L modules

Product variants

NEO-M8L-0	u-blox M8 GNSS LCC module with 3D Dead Reckoning and onboard sensors, Professional Grade
NEO-M8L-02A	u-blox M8 GNSS LCC module with 3D Dead Reckoning and onboard sensors, Automotive Grade

Further information

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

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