

NEO-M8L

Standard Professional Automotive

POSITIONING

u-blox M8 ADR modules including 3D sensors

Highlights

- Leading performance under poor signal conditions
- Continuous navigation during signal loss
- Complete solution with integrated 3D sensors
- Automatic configuration of wheel-tick/speed input
- Real-time positioning up to 20 Hz rate
- GPS/QZSS, GLONASS, BeiDou, Galileo
- Zero PPM program for automotive grade NEO-M8L-01A



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 3D positioning for road vehicles.

Incorporating u-blox's latest advancements in multi-GNSS signal processing (now including Galileo), 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 20 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 which adds Galileo to the multi-constellation reception that already includes 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-01A 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	UART	USB	SPI	DDC (I²C 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				
NEO-M8L-01A	ADR	•	•	•	•	3	•	•	•	•	•	•	•	•	•	C	•	1				

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 20 Hz
Position accuracy	2.0 m CEP
ADR position error	(Estimated) 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
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
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-01A	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.