

u-blox M8 and u-blox 7: a comprehensive approach to multi-GNSS positioning

**Two u-blox GNSS platform generations address
all market requirements**

Whitepaper by:

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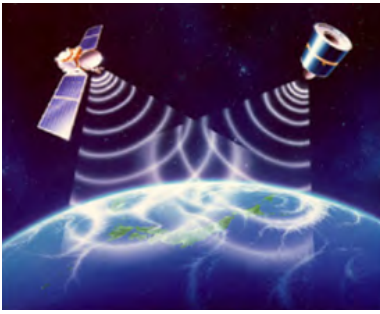
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Executive Summary

With the launch of the new u-blox M8 semiconductor platform, u-blox once again establishes its leadership in embedded global satellite positioning. Combining advanced chip technology, sophisticated software algorithms, true concurrent GNSS satellite reception and multi GNSS aiding services, u-blox M8 sets the new benchmark for satellite navigation and positioning.



The u-blox M8 concurrent, multi-GNSS platform supports two satellite systems concurrently for optimum positioning performance



*UBX-M8030:
Concurrent, high-performance positioning*



*UBX-G7020:
Low-power, low-cost positioning*

Covering the complete range of positioning requirement

The u-blox M8 concurrent, multi-GNSS receiver platform complements the u-blox 7 single GNSS platform, offering new solution alternatives depending on application needs – whether that be for high performance, low power, or low cost. The two platforms are based on the [UBX-M8030](#) concurrent-GNSS, and [UBX-G7020](#) single-GNSS chip families. The chips form the basis of u-blox' popular [MAX](#), [NEO](#) and [LEA](#) GNSS module series (for an overview of all modules, [Click here](#) to download u-blox' GNSS module selector guide PDF).

u-blox M8: high performance positioning

u-blox M8 acquires and tracks two GNSS systems concurrently – default is GPS and GLONASS. Concurrent reception of GPS and BeiDou or even concurrent GLONASS and BeiDou reception can be selected on-the fly.

Optimized signal reception circuitry in combination with software algorithms and advanced tracking and search engines capitalize on the quality, and not only the quantity, of satellites used, providing optimal solutions in GNSS hostile environments.

With market leading -167 dBm dynamic sensitivity, 1 second TTFF and 2 meter positioning accuracy, u-blox M8 is the perfect solution for performance critical applications like car navigation, drive recorder or emergency call systems. For such applications, high performance is key. By utilizing the new u-blox Multi GNSS AssistNow service and local satellite augmentation services (SBAS, QZSS), u-blox M8 provides even more accurate position information within seconds - virtually anywhere.

u-blox M8 is the first mass produced stand-alone receiver to include BeiDou reception. With the concurrent reception of GPS and BeiDou, a sensitivity of -165 dBm has been achieved, making u-blox M8 the best performing GPS/BeiDou receiver on the market.

All in all, u-blox M8 is the perfect choice for high performance positioning applications, bringing the increased performance of concurrent GNSS reception to practical application. By applying an external SQI flash, u-blox M8 is also future-proof, as firmware updates easily can be made, for example adding Galileo when it becomes fully operational.

u-blox 7: low-power, low-cost positioning










In case of less critical applications requirements where the important key parameters are low power and low cost, u-blox 7 is the perfect answer. u-blox 7 is optimized for low-cost, low-power applications where single-GNSS reception is sufficient. u-blox 7 is one of the lowest power multi-GNSS receiver platform on the market, particularly attractive for small battery powered devices like asset and vehicle tracking boxes. In case of rural or suburban areas, the u-blox 7 single GNSS reception is more than sufficient to provide accurate and reliable positioning information. u-blox 7 supports single reception of either GPS or GLONASS, selectable on start-up by command.

Platform comparison table

	u-blox M8 high performance	u-blox 7 low power, low cost
Supported GNSS	GPS, GLONASS, BeiDou, QZSS, SBAS	GPS, GLONASS, QZSS, SBAS
Reception path	Concurrent; 2 RF paths	Sequential; 1 RF path
Navigation Sensitivity	-167 dBm	-162 dBm
Navigation Sensitivity Single GNSS	-166 dBm	-162 dBm
Current Consumption w/ single GNSS	17.5 mA @ 3V	16.3 mA @ 3V
Current Consumption w/ concurrent GNSS reception	25 mA @ 3V	NA
Power Save Mode, 1 Hz update rate, GPS only	4.9 mA @ 3V	4.3 mA @ 3V
AssistNow offline validity	35 days (GPS/QZSS/GLONASS)	14 days (GPS)
AssistNow autonomous validity	6 days (GPS/QZSS/GLONASS)	3 days (GPS)

u-blox GNSS modules

u-blox chips are at the heart of our industry-standard GNSS module families which are designed to satisfy size versus feature requirements of a large range of applications: EVA, MAX, NEO and LEA.

Standalone positioning modules		
	EVA-7M (7.0 x 7.0 mm)	Smallest GNSS module
	MAX-7 (9.7 x 10.1 mm)	GPS/GLONASS/QZSS LCC modules: lowest power
	MAX-M8 (9.7 x 10.1 mm)	GPS/GLONASS/BeiDou/QZSS LCC modules: highest performance
	NEO-7 (12.2 x 16.0 mm)	GPS/GLONASS/QZSS LCC modules: lowest power, feature-rich
	NEO-M8 (12.2 x 16.0 mm)	GPS/GLONASS/BeiDou/QZSS LCC modules: highest performance, feature-rich
	LEA-M8S (17.0 x 22.4 mm)	GPS/GLONASS/BeiDou/QZSS LCC module: LEA form factor
Positioning modules with integrated antenna		
	PAM-7Q (22.0 x 22.0 mm)	GPS antenna module
	CAM-M8Q (9.6 x 14.0 mm)	GPS/GLONASS/BeiDou/QZSS antenna module
Precise Point Positioning modules		
	NEO-7P (12.2 x 16.0 mm)	Precise Point Positioning GNSS module

u-blox GNSS receiver modules are complemented by two GNSS antenna modules: [PAM-7Q](#) GPS and [CAM-M8Q](#) multi-GNSS satellite receivers. These modules include an integrated antenna for maximum functionality: just add power for a complete standalone positioning solution.

All u-blox GNSS products continue to leverage the synergies with our broad portfolio of GSM, UMTS, CDMA and LTE cellular modules to enable location awareness, including support for our unique [CellLocate](#) hybrid indoor positioning system.

With our comprehensive portfolio of GNSS chips and modules, our goal is simple: to support your product innovation while making it easy to upgrade from one product generation to the next.

For more information about u-blox' ranges of GNSS positioning [chips](#), [modules](#) and [aiding services](#), visit www.u-blox.com

About u-blox

Swiss-based u-blox (SIX:UBXN) is the global leader in wireless and positioning semiconductors for the automotive, industrial and consumer markets. Our solutions enable people, vehicles and machines to locate their exact position and wirelessly communicate via voice, text or video.

With a broad portfolio of chips, modules and software solutions, u-blox is uniquely positioned to allow OEMs to develop innovative solutions that enable mobility quickly and cost-effectively. With headquarters in Thalwil, Switzerland, u-blox is globally present with offices in Europe, Asia and the USA. (www.u-blox.com)

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