u-blox GNSS product overview
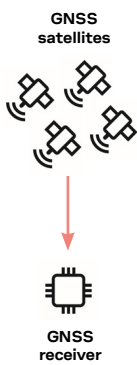
Optimized cost and performance combined with easy integration

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Product diversity for all kinds of applications

u-blox is a leading provider in GNSS solutions that are tailored for every customer's needs. Because we use our own silicon, we can offer controlled quality, high performance, quick support, and stable product life cycles.

Our positioning modules, SiPs, chips, and smart antenna modules set the benchmark in performance and cost effectiveness, with quick delivery of accurate position data. Our wide portfolio includes standard precision, high precision, precise timing, and dead reckoning solutions. We are continually making innovative advancements in accuracy, anti-spoofing, power efficiency, small size, and low cost.
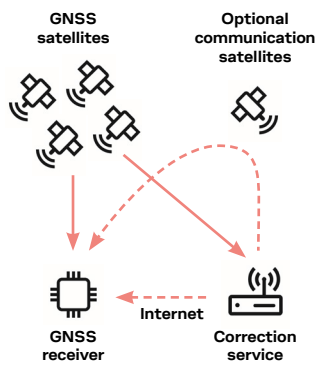
Technologies

Standard precision (SPG)

Meter-level accuracy and low power consumption in cost-efficient products that are suitable for most needs

Application areas:
- Asset tracking
- Telematics
- Navigation
- Wearables and camera

High precision (HPG)

Sub-meter to centimeter-level accuracy using u-blox PointPerfect and third party correction services

Application areas:
- Unmanned vehicles
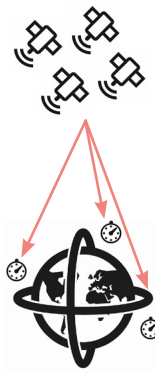- Navigation
- Automotive

Dead Reckoning (DR)

100% positioning coverage even in parking garages, tunnels, and urban canyons

Application areas:
- Road-vehicle navigation
- Autonomous driving

Timing & Frequency

Accurate clock and frequency generation based on satellite positioning technology

Application areas:
- Wireless communication
- Industrial
- Power distribution
- Financial applications

u-blox IoT Location-as-a-Service

Location-as-a-Service ensures reliable, fast position information and delivers accurate assistance and error correction data for IoT devices, even in constrained and challenging environments. GNSS users expect instant position information, which is not often possible under adverse signal conditions; therefore, location, assistance, and correction services become essential functionalities. u-blox offers smart solutions to these challenges:

AssistNow™ provides real-time online Assisted-GNSS backed by our warranty and support. It accelerates GNSS performance and lowers power consumption. Integration is easy.

CellLocate® provides a best-in-class mobile network-based location service with global availability. This end-to-end solution is proven, scalable, and ready to virtually eliminate any "no position scenario".

PointPerfect™ brings high-precision GNSS to mass market by delivering sub-10 cm accuracy positioning within seconds combined with flexible service plans and an easy-to-use delivery platform.

CloudLocate™ delivers cloud-based positioning to extend the life of energy-constrained IoT applications up to 10x vs standard GNSS power-saving approaches.

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u-blox GNSS product overview

Product selection guide

u-blox products come in various integration levels catering to all kinds of needs, from low volume, ease of use scenarios to scalable solutions for customized applications. The product offering includes modules, SiPs, smart antenna modules, and chips. Modules and SiPs provide long-term sustainability using shared form factors and offer easy migration to High Precision, Dead Reckoning and Timing technologies. Smart antenna modules, which integrate all the GNSS technology and antenna, are ideal for those with little GNSS know-how. SiPs (System in Package) are optimized for size, weight, and power. Chips are ideal for highest volumes and need expert GNSS know-how.

	Modules - LCC / LGA	SiP modules	Chips	Smart antenna modules
Highlights	• Form factor roadmap brings longest lifecycle (investment protection) • Minimal design efforts • Easy migration between SPG, HPG, and DR receivers	• Optimized for minimal size, weight, and power • Minimal design efforts	• Economy of scale for highest volume opportunities	• Easy to design-in • No radio frequency expertise needed
Product grade	Automotive, Professional, and Standard	Professional and Standard	Automotive, Professional, and Standard	Professional
Minimum order quantity	250 to 500 pieces	500 to 1000 pieces	4000 pieces	250 pieces
Dominant market	Automotive, Industrial	Industrial, Consumer	Automotive, Industrial, Consumer	Industrial

Product grades

	Standard grade	Professional grade	Automotive grade
Environmental conditions	Consumer environment	Industrial environment	Automotive environment
Temperature	-20 °C to +65 °C	-40 °C to +85 °C	-40 °C to +85 °C (or up to +105 °C)
Product qualification	JESD47 (ICs) Subset of ISO 16750 (modules)	AEC-Q100 (ICs) ISO 16750 (modules)	AEC-Q100 (ICs) Extended ISO 16750 (modules)
Process levels for design, manufacturing, and testing	• 100% outgoing test • Product traceability • PCN process • Failure analysis	Standard grade, plus: • 100% automatic X-ray and optical inspection of modules	Professional grade, plus: • PPAP, long product life cycles, ISO/TS 16949 manufacturing, automotive test flow, automotive PCN process, component traceability, 8D failure reporting, 0-ppm program

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u-blox GNSS product overview

Product selector table

Our form factor roadmap allows for easy migration from older to newer generations and for similar designs with different technologies or levels of precision.

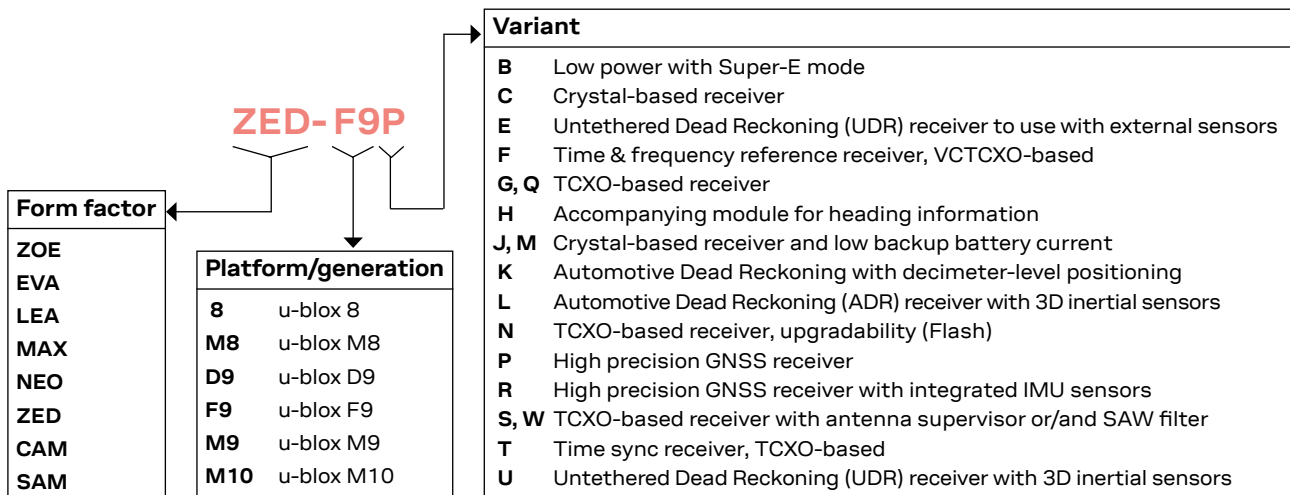| Category	Product	Form	Precision	Technology	Interfaces	Multi-band	Upgradable	Automotive
SiP module	4.5 X 4.5 mm	ZOE	meter level	SPG	UART SPI DDC		Yes	
SiP module	7.0 x 7.0 mm	EVA	meter level	DR SPG	UART USB SPI DDC		Yes	
Module	MAX-M8 9.7 x 10.1 mm	MAX	meter level	SPG	UART DDC			
Module	NEO-M8 12.2 x 16.0 mm	NEO	dm level meter level	DR HPG SPG Timing	UART USB SPI DDC		Yes	Yes
Module	ZED-F9P 17.0 x 22.0 mm	ZED	cm level nanoseconds	DR HPG SPG Timing	UART USB SPI DDC	Yes	Yes	
Module	LEA-M8S 17.0 x 22.0 mm	LEA	nanoseconds	Timing	UART USB SPI DDC	Yes	Yes	
Smart antenna module	CAM-M8 9.6 x 14.0 mm	CAM	meter level	SPG	UART SPI DDC			
Smart antenna module	SAM-M8Q 15.5 x 15.5 mm	SAM	meter level	SPG	UART DDC			
Chip	2.99 X 3.21 mm	47-pin WL-CSP	meter level	SPG	UART USB SPI DDC			
Chip	4.0 X 4.0 mm	28-pin QFN	meter level	SPG	UART SPI DDC			
Chip	5.0 X 5.0 mm	40-pin QFN	meter level	DR SPG	UART USB SPI DDC		Yes	Yes

For a detailed view of our product offering, refer to our guided product selector:

www.u-blox.com/guided-product-selector

u-blox GNSS product overview

Advantages to using modules

	Quick to market & no design risk	• Plug and play – just connect an antenna and power • No radio frequency or hardware qualification needed • Fully qualified, tested, and certified
	Future proof & reduced supplier base	• Pin-to-pin and software compatibility across generations • Only one supplier for functional block, thus reducing sourcing complexity • High quality components for consistent performance and lowest ppm
	Low engineering cost & no capital investment	• One standard SMD component for simple assembly and production testing • No test infrastructure investment • One-stop technical support (field support and returns)

u-blox positioning product naming

ZED- F9P

Form factor

ZOE
EVA
LEA
MAX
NEO
ZED
CAM
SAM

Platform/generation

8	u-blox 8
M8	u-blox M8
D9	u-blox D9
F9	u-blox F9
M9	u-blox M9
M10	u-blox M10

Variant

B	Low power with Super-E mode
C	Crystal-based receiver
E	Untethered Dead Reckoning (UDR) receiver to use with external sensors
F	Time & frequency reference receiver, VCTCXO-based
G, Q	TCXO-based receiver
H	Accompanying module for heading information
J, M	Crystal-based receiver and low backup battery current
K	Automotive Dead Reckoning with decimeter-level positioning
L	Automotive Dead Reckoning (ADR) receiver with 3D inertial sensors
N	TCXO-based receiver, upgradability (Flash)
P	High precision GNSS receiver
R	High precision GNSS receiver with integrated IMU sensors
S, W	TCXO-based receiver with antenna supervisor or/and SAW filter
T	Time sync receiver, TCXO-based
U	Untethered Dead Reckoning (UDR) receiver with 3D inertial sensors

u-blox values and promise

	Competent technical support worldwide	• Over 20 years of R&D in GNSS technology • Lifetime support and maximum competence
	Quick time to market	• Short and reliable delivery times • Module form factor consistency
	High quality	• Global leader in positioning and wireless communication • In-house chip technology
	Broad spectrum of solutions	• Strong synergies between technologies - Wi-Fi, V2X, cellular, and positioning • Hardware, software, services, and solutions
	Security	• Advanced spoofing and jamming detection • End-to-end trust of domain

Further information

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

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