u-blox GNSS product overview

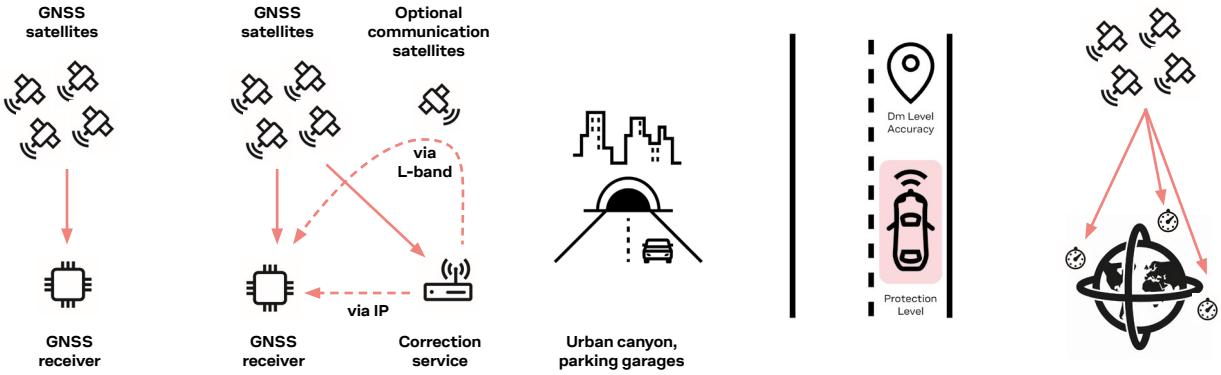
Optimized cost and performance combined with easy integration

Product diversity for all kinds of applications

u-blox is a leading provider in GNSS solutions that are tailored for a wide variety of applications. Because we design our own GNSS chips, we can offer controlled quality, high performance, quick support, and long product life cycles.

Our positioning modules, SIPs (System-in-Package), chips, and smart antenna modules set the benchmark in performance and cost effectiveness, with quick delivery of accurate position data. Our wide portfolio includes solutions focusing on standard precision, high precision, dead reckoning, functionally safe GNSS, and precise timing.

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

u-blox services:

- AssistNow
- CloudTrack

High precision (HPG)

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

Application areas:

- Automotive
- Unmanned vehicles
- High accuracy navigation

u-blox services:

- AssistNow
- PointPerfect

Dead Reckoning (DR)

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

Application areas:

- Road-vehicle navigation
- Autonomous driving

Functionally safe GNSS

Lane level accuracy (dm-level accuracy) plus high integrity via protection level computation

Application areas:

- Safety-critical applications
- Autonomous driving
- ADAS L3 and L4

u-blox services:

- PointSafe

Precise timing

Accurate clock and frequency generation based on satellite positioning technology

Application areas:

- Communication networks
- Data centers
- Power distribution
- Finance applications

Accompanying u-blox services

AssistNow™ provides real-time online Assisted-GNSS with assured global availability. It accelerates GNSS performance and lowers power consumption. Integration is easy.

PointPerfect™ brings high-precision GNSS to mass market by delivering 3-6 cm accuracy and convergence within seconds.

CloudTrack™ is a unique end-to-end asset tracking service that provides the ultimate in ultra-low-power meter-level location and global connectivity for IoT asset tracking devices.

PointSafe™ is composed of an ISO 26262-certified safe correction service and safe on-board position engine software to deliver trusted positioning for next-generation autonomous driving vehicles.

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Form factor and technology 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. For a detailed view of our product offering, see: **www.u-blox.com/product-selector**.

Sizes	Platform or form factor	L1 band	L2 band	L5 band	L6 band	Standard precision	High precision	Dead reckoning	Functionally safe	Precise timing
2.39 x 2.39 mm 4.0 x 4.0 mm 5.0 x 5.0 mm	**u-blox F10/F11** Chip	●		●		●				
2.39 x 2.39 mm 4.0 x 4.0 mm 5.0 x 5.0 mm	**u-blox M10/M11** Chip	●				●				
5.0 x 5.0 mm	**u-blox A9** Chip	●	●	●			●		●	
5.0 x 5.0 mm	**u-blox F9** Chip	●	●	●			●	●		
5.0 x 5.0 mm	**u-blox M8/M9** Chip	●				●		●		
4.5 x 4.5 mm	**MIA** SiP module	●				●				
7.0 x 7.0 mm	**EVA** SiP module	●				●				
9.7 x 10.1 mm	**MAX** Module	●		●		●				
12.2 x 16.0 mm	**NEO** Module	●		●		●	●	●		●
17.0 x 22.0 mm	**ZED** Module	●	●	●	●		●	●	●	●
17.0 x 22.0 mm	**LEA** Module	●	●	●		●				●
9.6 x 14.0 mm	**CAM** Chip antenna module	●				●				
15.5 x 15.5 mm	**SAM** Patch antenna module	●				●				
20.0 x 20.0 mm	**DAN** Patch antenna module	●		●		●				

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Sizes	Platform or form factor	L1 band	L2 band	L5 band	L6 band	Standard precision	High precision	Dead reckoning	Functionally safe	Precise timing
30.5 x 43.4 x 3.3 mm	**M2-ZED** Timing card	●	●	●						●
31.7 x 67.2 mm	**RCB** Timing board	●	●	●						●

u-blox GNSS product naming

ZED-X20P

Form factor
CAM
DAN
EVA
LEA
M2-ZED
MAX
MIA
NEO
RCB
SAM
ZED

u-blox platform/generation	
R20	Assured positioning, nav., timing
A20	Functionally safe, all-band GNSS
X20	All-band GNSS
F20	Triple-band GNSS
F10/F11	Dual-band meter-level GNSS
M10/M11	Ultra-low power GNSS
A9	Functionally safe GNSS
F9	Multi-band GNSS
M9	Ultra-robust meter-level GNSS
D9	Differential correction service
M8	Multi-GNSS

Variant	
C	Crystal-based GNSS receiver
D	Dual-antenna GNSS heading receiver
E	GNSS receiver to use with external inertial sensors
F	Time and frequency reference receiver
H	Companion receiver for heading information
K	Automotive high-precision GNSS with RTK and dead reckoning
L	Automotive standard-precision GNSS with dead reckoning
M	Crystal-based GNSS receiver with ROM
N	Standard Precision GNSS receiver with TCXO and flash
P	High-precision GNSS receiver
Q, S	Standard Precision GNSS receiver with TCXO and ROM
R	High-precision GNSS receiver with inertial sensors
T	Time sync receiver
U	Untethered dead reckoning (UDR) with inertial sensors
V	Untethered dead reckoning (UDR) with ADR option and inertial sensors

Product selection guide

u-blox products come in various integration levels catering to 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.

	Chips	SiP modules	Modules	Smart antenna modules
Highlights	• Full flexibility and small PCB footprint with minimized bill of materials for high volumes	• Highly integrated modules in the size of a chip • Low design efforts	• Long form factor lifecycle (investment protection) • Low design efforts • Easy migration between SPG, HPG, and DR products	• Minimized design efforts • Integrated antenna: no radio frequency expertise needed
Product grade	• Automotive • Professional • Standard	• Professional • Standard	• Automotive • Professional • Standard	• Professional
Package size	• 4000 pieces	• 500 to 1000 pieces	• 250 to 500 pieces	• 150 to 500 pieces
Dominant market	• Automotive • Industrial • Consumer	• Industrial • Consumer	• Automotive • Industrial	• Industrial

u-blox GNSS product overview

Advantages to using modules

Quick to market and minimal 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 and 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
Lower engineering cost and investment for testing	• One standard SMD component for simple assembly and production testing • No test infrastructure investment • One-stop technical support (field support and returns)

Product grades

	Standard grade	**Professional grade**	**Automotive grade**	
Environment	Consumer products	Industrial products	Automotive products	Safety critical
Temperature	–20 °C / –40 °C to +65 °C / +85 °C	–40 °C to +85 °C / +105 °C	–40 °C to +85 °C / +105 °C	–40 °C to +105 °C
Reliability by qualification	Optional (modules) JESD47 (chips)	AEC-Q104 subset (modules) AEC-Q100 subset (chips)	AEC-Q104 (modules) AEC-Q100 (chips)	AEC-Q100 (chips) ASIL-B (ISO 26262)
Process levels for design, manufacturing, and testing	• 100% outgoing test • Product traceability • PCN process • Failure analysis	Standard grade, plus: • 100% automatic X-ray optical inspection of modules	Professional grade, plus: • ISO/TS 16949 manufacturing • Automotive test flow • Long product life cycles • PPAP* • 8D failure reporting* • Component traceability* • 0-ppm program* • Automotive PCN process*	Automotive grade, plus: • ISO 26262 certified component • Safety Element Out of Context (SEooC) • ISO 21434 • SOTIF

* = Only offered to first-mount automotive customers

Your benefits in working with u-blox GNSS products

Competent technical support worldwide	• GNSS experts for more than 25 years • World-wide technical support
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	• Broad portfolio for different technologies - Wi-Fi, Bluetooth, and GNSS • Full hardware, support tool, and services offering for a wide range of applications
Security	• u-blox end-to-end hardened security; security-by-design architecture • Superior anti-spoofing and anti-jamming • Galileo OSNMA

Further information

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

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

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