







u-blox cellular module overview

Powerful, easy-to-integrate, comprehensive cellular modules optimize performance and cost while supporting seamless transition between 2G, 3G and 4G technologies

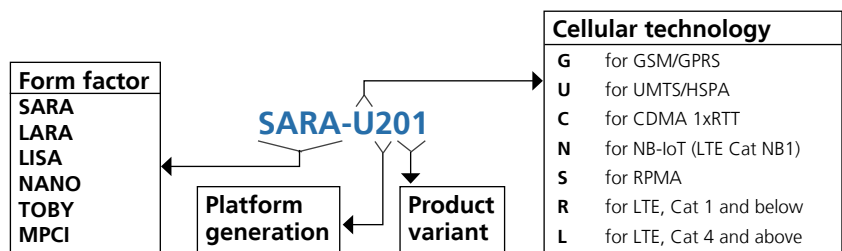
					
SARA series GSM/GPRS, UMTS/HSPA, LTE Cat M1, NB-IoT LGA modules 16.0 x 26.0 x 2.4 / 3.0 mm	LARA series LTE Cat 1 LGA modules 24 x 26 x 2.6 mm	LISA series UMTS/HSPA(+) and CDMA LCC modules 22.4 x 33.2 x 2.6 / 2.7 mm	NANO-S100 RPMA module LGA module 22.9 x 33.0 x 3.6 mm	TOBY series LTE Cat 1 and Cat 4 LGA modules 24.8 x 35.6 x 2.6 mm	MPCI series LTE Cat 4 (mini) PCIe modules 30 x 51 x 3.7 mm

Key features and benefits

- u-blox products are available in three grades optimized for our primary market sectors: automotive, industrial (professional) and consumer (standard).
- Support of all available cellular technologies: GSM/GPRS, UMTS/HSPA(+), CDMA, NB-IoT, RPMA, LTE Cat M1, 1, and 4
- u-blox cellular modules provide an extensive set of features accessible via AT commands to ease development of sophisticated applications
- Flexible variants to meet performance and cost requirements (e.g. global and regional variants, different feature sets)
- Seamless operation with u-blox GNSS positioning modules
- Globally available, free-of-charge and network operator independent, the CellLocate® cellular location service supports indoor positioning
- All u-blox modules are qualified according to the in-vehicle ISO16750 standard and are manufactured at ISO-TS16949 certified sites
- u-blox LGA/LCC modules (except NANO) are pin/pad compatible through u-blox's nested design concept
- Global, highly skilled technical staff provide top class support
- Comprehensive set of worldwide certifications to minimize customer's cost when accessing global markets

Product selection

u-blox cellular modules are available in different form factors and variants to provide flexibility for scaling different cellular technologies to various application and geographical requirements, such as bands support, cost, performance and level of component integration.



Cellular technology selection

M2M applications are very diverse. Different cellular technologies provide data rates ranging from low data rates suited to applications requiring the periodic transmission of few kbytes of information, up to high speed LTE, delivering extremely high data rates and well suited to those applications requiring huge amounts of data transmission (video surveillance, industrial routers, etc.). The comprehensive portfolio of u-blox cellular modules provides the right option for your product development.

Modules	Technology	Uplink	Downlink	Category
SARA-G300, G310, G340, G350	GSM/GPRS	40 kbit/s	80 kbit/s	2G
LISA-C200	CDMA 1xRTT	153 kbit/s	153 kbit/s	
LISA-U200, U201, U260, U270	UMTS/HSPA	5.76 Mbit/s	7.2 Mbit/s	3G
SARA-U201, U260, U270, U280	UMTS/HSPA+	5.76 Mbit/s	21.1 Mbit/s	
LISA-U230	RPMA	15.6 kbit/s	31 kbit/s	4G
NANO-S100	NB-IoT	62.5 kbit/s	27.2 kbit/s	
SARA-N200, N201, N210, N211, N280	LTE Cat M1	375 kbit/s	375 kbit/s	
SARA-R404M	LTE Cat 1	5 Mbit/s	10 Mbit/s	
LARA-R202, R203, R204, R211	LTE Cat 1	5 Mbit/s	10 Mbit/s	4G
LARA-R3121; TOBY-R200, R202	LTE Cat 1	5 Mbit/s	10 Mbit/s	
TOBY-L200, L201, L210, L220, L280	LTE Cat 4	50 Mbit/s	150 Mbit/s	
MPC-L200, L201, L210, L220, L280	LTE Cat 4	50 Mbit/s	150 Mbit/s	4G

GNSS integration

u-blox's unrivalled core competence in cellular and GNSS (Global Navigation Satellite System) technologies brings strong synergies between the two subsystems, both often required together in today's sophisticated applications.

A u-blox GNSS module can be connected to the cellular module via a dedicated I²C port. GNSS-related commands are tunneled, allowing the host processor to fully control both subsystems through a single serial interface and user friendly AT commands.

Taking it a step further, the LARA-R3121 module integrates u-blox's leading GNSS technology (based on the u-blox 8 platform) allowing the module to deliver high performance satellite positioning alongside data connectivity.

u-blox cellular modules have the integrated u-blox AssistNow client, giving applications access to the free u-blox assisted GNSS service with no integration effort on the host processor.

The immediate benefits for customers are:

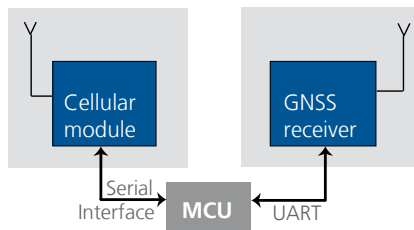
- Better GNSS performance and faster TTFF
- No resources required on customer's microcontroller
- No software integration on microcontroller required

The compatibility table shows u-blox cellular module synergies with GNSS modules.

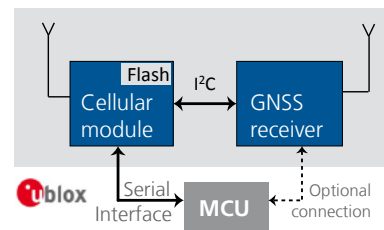
Compatibility Table			
Model	u-blox 7	u-blox 8	u-blox M8
SARA-G300, G310			
SARA-G340, G350	•	•	•
SARA-U2	•	•	•
LISA-U2	•	•	• ¹
LISA-C2	•	•	•
NANO-S1			
SARA-N2	• ²	• ²	• ²
LARA-R2	• ²	• ²	• ²
TOBY-R2	• ²	• ²	• ²
LARA-R3121		• ³	
TOBY-L2			
MPCI-L2			

1) Firmware version 03
2) Future firmware version

3) integrated in the cellular module



Typical solution

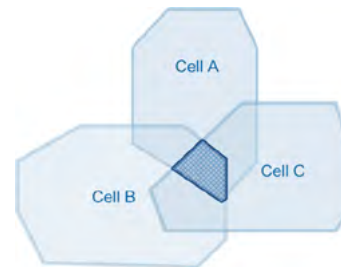


u-blox optimized solution

Cellular location: CellLocate®

Although GNSS is a widespread technology, GNSS positioning is not always possible, particularly in shielded environments such as indoors, enclosed park houses, or when a GNSS jamming signal is present. Augmenting GNSS receiver data with mobile network cell information provides a level of redundancy that can benefit numerous applications.

CellLocate® is u-blox's cellular augmentation solution, which is embedded in its cellular modules. This cellular positioning technology enables stand-alone location estimation based on surrounding GSM/CDMA/UMTS cell information in conjunction with GNSS positioning data to improve and augment positioning.



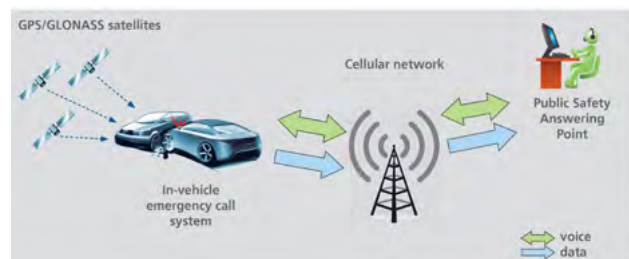
Hybrid positioning based on mobile cell visibility

eCall / ERA GLONASS

Most u-blox cellular modules operating in Europe support the eCall/ERA GLONASS service. u-blox provides know-how and ability to support design-in requirements of GPS/GLONASS and cellular subsystems, comprehensive software support, certification of the wireless modem, forward compatibility with future technologies, as well as the ability to deliver high-quality automotive-grade components in high-volume. u-blox cellular modules in combination with u-blox GPS/GLONASS receivers represent the ideal solution for the easy and fast development of eCall/ERA Glonass ready devices.

Cellular modules supporting eCall/ERA GLONASS:

- SARA-G340, SARA-G350
- SARA-U201, SARA-U270
- LISA-U200, LISA-U201, LISA-U270



Vehicle emergency call concept

Why choose a u-blox cellular module?

Module form factor consistency

u-blox adheres to a core design philosophy: maintain form factor and software compatibility between different cellular technologies to allow customers to easily upgrade their products or create product variants. Our customers benefit: they can protect their investments by developing a single PCB that can host different cellular modules using the same footprint.

Technology ownership

In-house cellular expertise at u-blox, as well as our end-to-end management of the entire module manufacturing processes and the availability of the protocol stack source code, give us full control over features, quality and production. This enables us to react quickly to customer requirements and to offer our customers exactly the right feature set, cellular technology options, smooth upgrade path, excellent and highly competent support, technology know-how, and a clearly defined and transparent product roadmap extending years into the future.

First class technical support

u-blox provides effective customer support through all the stages of development. This is possible through our global technical support network with excellent and highly competent local support and our top class technical documentation. Software and hardware design review allow our customers to proceed smoothly through product development and deployment, thus achieving the shortest time to market.

Automotive quality and reliability

- u-blox design-centers and manufacturing sites adhere to the industry's strictest standards: ISO/TS 16949, ISO 9001, ISO 14001 and ISO/IEC 80079-34 quality standards
- Stringent product change notification process with advanced notification. Smooth end-of-life
- In-house reliability and test equipment
- Our modules are ISO 16750 qualified, automotive end-of-life (ELV) compliant
- Zero defect strategy (e.g. testing of functions within tolerance, ongoing reliability tests, X-Ray inspection)
- Fully qualified performance and component selection

u-blox is a reliable supplier

- Lowest ppm level during customer production and in the field
- Very short delivery lead time due to multiple well-stocked locations
- Flexible, responsive delivery for small, medium and high volume shipment
- Financially solid company
- Fast and convenient availability of samples and kits – samples and pre-production quantities can be purchased directly from our online shop: www.u-blox.com/en/online-shop.html

Evaluation kits: take the next step!

u-blox provides comprehensive, easy-to-use evaluation kits and tools for gaining familiarity with cellular products, evaluating functionality, and performance. Each cellular evaluation kit also includes a u-blox GNSS module.

- **m-center**: powerful cellular module evaluation software for Windows; free-of-charge from u-blox
- **EVK-G31/G35**: evaluation kits for SARA-G3 series GSM/GPRS modules
- **EVK-C20**: evaluation kit for LISA-C200 series CDMA 1xRTT module
- **EVK-U26/U27**: evaluation kits for SARA-U260/SARA-U270 series UMTS/HSPA GSM/GPRS modules
- **EVK-U20/U23**: evaluation kits for LISA-U2 series UMTS/HSPA GSM/GPRS modules
- **EVK-U201SARA**: evaluation kit for SARA-U201 UMTS/HSPA GSM/GPRS module
- **EVK-S10NANO**: evaluation kit for NANO-S100 RPMA module
- **EVK-N2xx**: evaluation kits for SARA-N2 series NB-IoT (LTE Cat NB1) modules
- **EVK-R404M**: evaluation kit for SARA-R404M LTE Cat M1 module
- **EVK-R2xx**: evaluation kits for TOBY-R2 and LARA-R2 series LTE Cat 1 modules
- **EVK-R3121**: evaluation kit for LARA-R3121 LTE Cat 1 modules
- **EVK-L20/L21/L22/L23/L24**: evaluation kits for TOBY-L2 series LTE Cat 4 UMTS/HSPA GSM/GPRS modules
- **C030 application board**: NB-IoT and 2G/3G mbed-enabled IoT starter kit with a SARA-N211 or SARA-U201 cellular module and a MAX-M8Q GNSS module. Powered by an integrated ARM® mbed™ compatible Cortex-M4 host MCU.
- **C027 application board**: Internet of Things evaluation kit with a LISA-U2, LISA-C2, or SARA-G3 cellular module and a MAX-M8Q GNSS module. Based on ARM Cortex-M3 CPU, supported by extensive ARM mbed resources.

Contact us!

For more information, please contact the u-blox sales representative nearest you: www.u-blox.com/en/contact-us.html
For support information, visit our website at www.u-blox.com/en/support-section.html