

# SARA-R42 series



## LTE-M / NB-IoT / EGPRS modules with Secure Cloud

### Built-in foundation and end-to-end security with root of trust

- Power autonomy through positioning in the cloud; integrated u-blox M10 GNSS receiver and CloudLocate
- Software-based configurability within each hardware design
- Simultaneous LTE communication with GNSS positioning
- Guaranteed best coverage with 23 dBm output power
- Cost-effective, power efficient, end-to-end IoT communication with MQTT Anywhere and MQTT Flex



Standard



Professional



Automotive

16.0 × 26.0 × 2.5 mm



### Product description

The SARA-R42 series modules are ideal for mission-critical IoT solutions, as they include a unique and immutable root-of-trust. They support IoT Security-as-a-Service and provide the foundation for a trusted set of advanced security functionalities. The scalable, pre-shared key management system offers best-in-class data encryption and decryption, both on-device as well as from device-to-cloud. Utilizing the latest (D)TLS stack and cipher suites with hardware-based crypto acceleration provides robust, efficient and protected communication.

SARA-R42M10S is pre-integrated with the u-blox M10 GNSS receiver and separate GNSS antenna interface, which provides highly reliable, accurate positioning data simultaneously with LTE communication. CloudLocate, the u-blox positioning cloud service, extends the life of energy-constrained IoT applications. In addition, the module offers unique hybrid positioning, in which the GNSS position is enhanced with u-blox CellLocate® data, providing location always and everywhere. Guaranteed best coverage is built in via 23 dBm LTE output power, eliminating problems at cell edges and unwanted re-transmissions.

The ultra-compact 16 x 26 mm LGA modules offer the ability to make software-based configuration decisions for LTE bands, radio interface and system selection preference, as well as mobile network operator within each hardware variant.

With many interface options and an integrated IP stack, the SARA-R42 modules are targeted to a wide range of data-centric IoT applications, such as smart metering, smart lighting, telematics, asset tracking, remote monitoring, alarm panels, and connected health. With u-blox's communication services – MQTT Anywhere or MQTT Flex – data overhead, time spent on-the-air, and energy consumption can be reduced, thus enabling users to extend device life cycles, lower costs, and improve ROI.

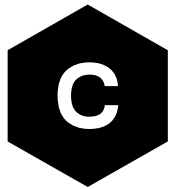
Thanks to the u-blox nested design principle SARA modules are compatible with other u-blox product families, enabling easy migration from 2G, 3G, and 4G. This maximizes the investments of customers, simplifies logistics, and enables very short time-to-market.

	SARA-R422	SARA-R422S	SARA-R422M10S
<b>Grade</b>			
Automotive			
Professional	•	•	•
Standard			
<b>Regions</b>	Global		
<b>Access technology</b>			
LTE bands	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 85		
GSM/EGPRS bands	Q		
LTE data rate	M1/NB2		
LTE power class	23 dBm		
<b>Positioning</b>			
Integrated u-blox GNSS receiver			•
Dedicated GNSS antenna interface			•
External GNSS control via modem		•	
<b>Compatible u-blox services</b>			
IoT Security-as-a-Service		•	•
MQTT Anywhere, MQTT Flex		•	•
AssistNow™ and CellLocate®		•	•
CloudLocate			•
<b>Interfaces</b>			
UART	2	2	2
USB (for diagnostics)	1	1	1
I2C	1	1	1
USIM	1	1	1
GPIO	6	6	6
<b>Features</b>			
Secure boot, updates, production	•	•	•
Root of trust	•	•	•
Jamming detection		•	•
Last gasp		•	•
Antenna detection	•	•	•
LwM2M	•	•	•
FW update via serial (FOAT)	•	•	•
uFOTA	•	•	•
eDRX and power save mode	•	•	•
Deep sleep mode	•	•	•
Dual stack IPv4/IPv6	•	•	•
Embedded MQTT / MQTT-SN		•	•
Embedded TCP/UDP stack	•	•	•
Embedded HTTPS, FTPS		•	•
Embedded TLS / DTLS		•	•
Embedded CoAP/DTLS		•	•
Antenna dynamic tuning		•	•

M1 = LTE Cat M1 (300 kb/s DL, 375-1200 kb/s UL)  
NB2 = Cat NB2 (125 kb/s DL, 140 kb/s UL)

Q = Quad-band

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## Features

LTE	<b>3GPP Release 13 LTE Cat M1 and NB1</b> <b>3GPP Release 14 LTE Cat M1:</b> Uplink TBS of 2984b, ClOT optimizations, and Release Assistance Indication (RAI) <b>3GPP Release 14 LTE Cat NB2:</b> Higher data rate (TBS of 2536b), mobility enhancement (RRC connection re-establishment), two HARQ processes, release assistant, random access on non-anchor carrier Cat M1 half-duplex, 375 kb/s DL, 1200 kb/s UL Cat NB1 half-duplex, 27.2 kb/s DL, 62.5 kb/s UL Cat NB2 half-duplex, 125 kb/s DL, 140 kb/s UL
GSM	3GPP Release 12 EGPRS MSC12
SMS	MT/MO PDU / text mode SMS over SG/NAS

## Compatible with u-blox services

Communication	MQTT Anywhere <sup>1</sup> MQTT Flex <sup>1</sup>
Location	AssistNow <sup>1</sup> CellLocate <sup>1</sup> CloudLocate <sup>2</sup>
Security	Design Security: Local data protection <sup>1</sup> End-to-End Security: Secure communication (D)TLS <sup>1</sup> , E2E symmetric key management system (KMS) <sup>1</sup> , E2E data protection <sup>1</sup> Foundation: Security root of trust, Secure boot, Secure updates, Secure production, Anticlone Detection & Rejection

## Software features

Protocols	Dual stack IPv4 and IPv6 Embedded TCP/IP, UDP/IP, FTP, HTTP Embedded secure MQTT, MQTT-SN <sup>1</sup> Embedded HTTPS, FTPS, TLS, DTLS <sup>1</sup>
Device mgmt.	OMA LwM2M
GNSS interfaces	Integrated u-blox M10 chip with concurrent GNSS (GPS, GLONASS, BeiDou, Galileo) <sup>2</sup> Dedicated GNSS antenna interface <sup>2</sup> Direct access to u-blox GNSS via module
Functionalities <sup>1</sup>	Antenna dynamic tuning Last gasp Jamming detection
Firmware upgrade	Via UART uFOTA client/server solution (Firmware upgrade over the air)

## Electrical data

Power supply	3.8 V nominal, range 3.2 V to 4.5 V
Power consumption	Power save mode: 3 $\mu$ A Active idle mode: 0.1 mA

1 = except for SARA-R422

2 = only on SARA-R422M10S

## Further information

For contact information, see [www.u-blox.com/contact-u-blox](http://www.u-blox.com/contact-u-blox).

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

## Package

96 pin LGA: 16.0 x 26.0 x 2.5 mm, < 3 g

## Environmental data, quality & reliability

Operating temperature -40 °C to +85 °C

RoHS compliant (lead-free)

Qualification according to ISO 16750

Manufactured in ISO/TS 16949 certified production sites

## Certifications and approvals – planned

SARA-R42 series ANATEL, FCC, IFETEL, ISED, NCC, RCM, RED, GCF, PTCRB, Deutsche Telekom, Vodafone, AT&T<sup>3</sup>, Verizon<sup>3</sup>, KC<sup>3</sup>, GITEKI<sup>3</sup>

3 = available from ordering code 01B onwards

## Interfaces

Serial	2 UART 1 USB, for diagnostics 1 DDC (I2C)
GPIO	Up to 6 GPIOs, configurable
(U)SIM	Supports 1.8 V and 3.0 V, SIM toolkit

## Support products

EVK-R422M10S Evaluation kit for SARA-R42 series

## Product variants

SARA-R422	LTE-M, NB-IoT and EGPRS module for multi-regional use
SARA-R422S	Secure Cloud LTE-M, NB-IoT and EGPRS module for multi-regional use
SARA-R422M10S	Secure Cloud LTE-M, NB-IoT and EGPRS module with integrated M10 GNSS receiver for multi-regional use

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