Information note

Topic **SARA-R422-01B / SARA-R422S-01B / SARA-R422M10S-01B IP information note**
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1 Affected products

Product name	Ordering code	Type number	Firmware
SARA-R422	SARA-R422-01B	SARA-R422-01B-00	Modem: 01.24 Application: A01.00
SARA-R422S	SARA-R422S-01B	SARA-R422S-01B-00	Modem: 01.24 Application: A01.00
SARA-R422M10S	SARA-R422M10S-01B	SARA-R422M10S-01B-00	Modem: 01.24 Application: A01.00

2 Type

- ☒ Product status change
- ☐ Hardware/component change
- ☒ Firmware/software update
- ☒ Label change
- ☒ Documentation update
- ☒ Certification information
- ☐ Security advisory
- ☐ Other

3 Description

Status of the above listed products has changed from Engineering Samples (ES) to Initial Production (IP). The module labels have been updated to include related certification information.

For the details of the new features and improvements implemented in the IP version of the above listed products, see the appendix.

4 Schedule

Samples:	
IP release date:	27-Sep-2022
Estimated first shipment date:	28-Sep-2022
Documentation (e.g., information note)	Available

5 Certifications

5.1 Certifications achieved

Certification scheme	SARA-R422-01B	SARA-R422S-01B	SARA-R422M10S-01B
RED (Europe)	■	■	■
UKCA (United Kingdom)	■	■	■
FCC (United States) FCC ID	■ XPYUBX20VA01	■ XPYUBX20VA01	■ XPYUBX20VA01
ISED (Canada) Certification number HVIN	■ 8595A-UBX20VA01 SARA-R422	■ 8595A-UBX20VA01 SARA-R422S	■ 8595A-UBX20VA01 SARA-R422M10S
ANATEL (Brazil) Certificate number	■ 05377-21-05903	■ 05377-21-05903	■ 05377-21-05903
NCC (Taiwan) Certificate number	■ CCAI21Y0010BT2	■ CCAI21Y0010AT0	■ CCAI21Y0010CT4
ACMA RCM (Australia)	■	■	■
GITEKI (Japan) [R] certificate number [T] certificate number	■ 003-210249 D210191003	■ 003-210249 D210191003	■ 003-210249 D210191003
KC (South Korea) Certificate number	■ R-C-ULX-SARA-R422S-31B	■ R-C-ULX-SARA-R422S-31B	■ R-C-ULX-SARA-R422S-31B
PTCRB (conformance)	■	■	■
GCF (conformance)	■	■	■
AT&T (MNO)	■	■	■
Verizon (MNO)	■	■	■
Vodafone (MNO)		■	■
Deutsche Telekom (MNO)	■	■	■

5.2 Customer impact and recommended action migrating from “00B” to “01B” versions

The HW / FW changes from the “00B” product versions to the “01B” product versions do not affect RF / EMC properties of the modem.

Certifications available for “00B” product versions are also achieved for the “01B” product versions, and new approvals have been added.

- Country regulatory approvals:
  - The FCC IDs, the ISED Canada, ANATEL Brazil, GITEKI Japan and NCC Taiwan certificate numbers of the “00B” product versions remain valid for the “01B” product versions.
  - The technical documentation for European RED and Australian ACMA RCM regulatory conformity has been updated from the “00B” product versions.
  - The NCC Taiwan regulatory certification for the SARA-R422M10S has been achieved with a new certificate number.
  - The Korean regulatory certification has been added for the “01B” product versions.
  - u-blox recommends that integrators check with their preferred certification body to find out if any action is needed for the regulatory approvals of the host product.

- Conformance approvals:
  - PTCRB and GCF certifications have been updated from the “00B” product versions.
  - u-blox recommends that integrators having a conformance certification in place for the host product should execute the PTCRB ECO/Variant and/or the GCF certification process, due to the use of the new hardware and firmware version of the module in the host product.
- Mobile network operators (MNO) approvals:
  - Vodafone and Deutsche Telekom approvals have been updated from the “00B” product versions, except the Vodafone approval for the SARA-R422.
  - AT&T with FirstNet, Verizon approvals have been added for “01B” product versions.
  - u-blox recommends that integrators having any MNO approval in place for the host product should notify related mobile network operator, due to the use of the new HW and FW version of the module in the host product (no testing is expected, paperwork only).

6 Firmware update

- It is not possible to upgrade the “00B” modules to the “01B” IP firmware.
- The “01B” modules with ES firmware can be upgraded to the IP firmware by the u-blox EasyFlash tool, FOAT and FOTA procedures. See section 2.6.2 of the u-blox SARA-R4 series system integration manual [3] for details of the hardware requirements to perform the firmware update over USB using the u-blox EasyFlash tool. For more details on FOTA / FOAT limitations on engineering sample, see the ES sample delivery note [8].
- An IP unit cannot be downgraded with the engineering sample firmware.
- Notes, depending on which firmware update procedure is used to update “01B” modules:
  - For FW update, except by EasyFlash: “AT+CFUN=16” must be issued after the FW update is completed, and before setting any configuration.
  - For uFOTA FW update only: “AT+CFUN=16” must be issued after the FW update is completed, and before setting any configuration. This also includes the AT+ULWM2M=0 command, which is required to re-enable the LwM2M client and conclude the uFOTA campaign properly.

6.1 Firmware update packages and md5 signature

Product / delivery	Filename	md5sum
SARA-R422-01B		
EasyFlash v13.05	SARA-R422-01B-00-IP-0124A0100-006K00.dof	aeb1aa85c1e41ff70bb6ac380f9e17c2
FOTA/FOAT 01.21,A01.08 to 01.24,A01.00 uFOTA ID: 1766	SARA-R422-01B-00-ES-0121A0108-006K00_SARA-R422-01B-00-IP-0124A0100-006K00.upd	764cc2e5c9589a021d43262bd1bd5af2
FOTA/FOAT 01.24,A01.00 to 01.24_ENG0299,A01.00 uFOTA ID: 1764	SARA-R422-01B-00-IP-0124A0100-006K00_SARA-R422-01B-00-XX-0124ENG0299A0100-006K00.upd	15cceef9f3aa28af4c3970ef3655c57b
FOTA/FOAT 01.24_ENG0299,A01.00 to 01.24,A01.00 uFOTA ID: 1765	SARA-R422-01B-00-XX-0124ENG0299A0100-006K00_SARA-R422-01B-00-IP-0124A0100-006K00.upd	2b4788c2790ac5a7e931df7695b80ca5

Product / delivery	Filename	md5sum
SARA-R422S-01B		
EasyFlash v13.05	SARA-R422S-01B-00-IP-0124A0100-007K00.dof	d87162269b59d62e1ee1b1893b6849c7
FOTA/FOAT 01.21,A01.08 to 01.24,A01.00 uFOTA ID: 1758	SARA-R422S-01B-00-ES-0121A0108-007K00_SARA-R422S-01B-00-IP-0124A0100-007K00.upd	89a5aa59ff02a73b7ec6552c5ae277b8
FOTA/FOAT 01.24,A01.00 to 01.24_ENG0299,A01.00 uFOTA ID: 1762	SARA-R422S-01B-00-IP-0124A0100-007K00_SARA-R422S-01B-00-XX-0124ENG0299A0100-007K00.upd	a4c9e76faa792c32b836d5198a517007
FOTA/FOAT 01.24_ENG0299,A01.00 to 01.24,A01.00 uFOTA ID: 1763	SARA-R422S-01B-00-XX-0124ENG0299A0100-007K00_SARA-R422S-01B-00-IP-0124A0100-007K00.upd	3b2747d89ba79f8726d24cd971b644e8
SARA-R422M10S-01B		
EasyFlash v13.05	SARA-R422M10S-01B-00-IP-0124A0100-005K00.dof	ae949e77ccbb6644665e6250c5228cda
FOTA/FOAT 01.21,A01.08 to 01.24,A01.00 uFOTA ID: 1757	SARA-R422M10S-01B-00-ES-0121A0108-005K00_SARA-R422M10S-01B-00-IP-0124A0100-005K00.upd	0749b82761f281e32f93eab5354c1c0d
FOTA/FOAT 01.24,A01.00 to 01.24_ENG0299,A01.00 uFOTA ID: 1760	SARA-R422M10S-01B-00-IP-0124A0100-005K00_SARA-R422M10S-01B-00-XX-0124ENG0299A0100-005K00.upd	03b4c524d9d415559733f9b5bc196179
FOTA/FOAT 01.24_ENG0299,A01.00 to 01.24,A01.00 uFOTA ID: 1761	SARA-R422M10S-01B-00-XX-0124ENG0299A0100-005K00_SARA-R422M10S-01B-00-IP-0124A0100-005K00.upd	0e9ef388afeed9289fd61455d32762c4

For the FW packages, contact u-blox technical support, www.u-blox.com/support.

7 Tools

- m-center v02.07.00 – Download from u-blox.com: m-center
- EasyFlash 13.06 – Download from u-blox.com: EasyFlash

8 Related documentation

[1] u-blox SARA-R4 series AT commands manual, UBX-17003787
[2] u-blox SARA-R4 series data sheet, UBX-16024152
[3] u-blox SARA-R4 series system integration manual, UBX-16029218
[4] u-blox SARA-R42 series application development guide, UBX-20050829
[5] u-blox SARA-R4 / SARA-R5 GNSS implementation application note, UBX-20012413
[6] u-blox SARA-R4 / SARA-R5 FW update application note, UBX-20033314
[7] u-blox SARA-R4 / SARA-R5 internet applications development guide, UBX-20032566
[8] u-blox SARA-R422-01B, SARA-R422S-01B, SARA-R422M10S-01B ES sample delivery note, UBX-22015134
[9] u-blox SARA-R4 / SARA-R5 series LwM2M objects and commands application note, UBX-18068860
[10] u-blox SARA migration guide application note, UBX-19045981
[11] u-blox M10 SPG 5.10 protocol version interface description, UBX-21035062
[12] u-blox M10 ROM 5.10 release notes, UBX-22001426

Appendix

A Improvements and added features compared to “00B” product version

A.1 Hardware

- The antenna dynamic tuning feature is added to provide more efficient antenna designs over a wide bandwidth:
  - The new “01B” product versions include two output pins, **I2S_TXD** and **I2S_WA**, that can optionally be used in real time to control an external antenna tuning IC. The output value of these two pins change dynamically according to the actual cellular band in use by the module
  - Customers who do not intend to use the antenna dynamic tuning feature do not need to perform any HW change to their current design implemented for the “00B” product version
- The u-blox M10 GNSS receiver is integrated in the SARA-R422M10S-01B module, replacing the u-blox M8 GNSS receiver integrated in previous SARA-R422M8S-00B module. This replacement significantly improves power consumption and position availability thanks to concurrent reception of up to 4 GNSS. It also adds GNSS hot start capability as long as the module does not enter deep-sleep mode or does not switch-off.
  - Customers who intend to use the GNSS feature with the new SARA-R422M10S-01B product version do not need to perform any HW change to their current design implemented for the previous SARA-R422M8S-00B product version.

A.2 Firmware

A.2.1 New features

- Antenna dynamic tuner enable/disable command.
- [u-blox ID 2565_2, 215_3][CA-130719]: New AT command +UURCCONF added for configuration of URC over AT terminals
- AT&T and Verizon MNO profiles.
- LTE Bands 18 and 19 are enabled.

A.2.2 Improvements

AT interface

- [u-blox ID 2586_2, 315_3][CA-152045][CA-158369]: Unexpected error result code returned and AT interface stuck.
- [u-blox ID 2565_2, 215_3][CA-130719]: New +UURCCONF AT command added for configuration of URC over AT terminals.

Internet suite

- [u-blox ID 1673_2, 160_3][CA-117259]: In direct link if last character is “+” it is not sent out.
- [u-blox ID 2341_2, 169_3]: In +USODL, uplink, both in UDP and TCP, if host application enters +++ immediately after the data is sent to the UART interface, the last part of the data sent to direct link internal application might be lost if it was buffered and not yet sent to the protocol stack.

Registration/Network services

- [u-blox ID 2352_2, 171_3]: PDP context activation blocked (+CGACT returns an error result code) at max 30 successful / 60 unsuccessful attempts per hour even if RPM is not active.

File system

- [u-blox ID 2340_2, 6_3][CA-132130]: The module generates an exception if the +UDWNFILE AT command with other tags is used before +UDWNFILE with "FOAT" tag.

SIM indication

- [u-blox ID 1193_2, 152_3]: The information about the SIM detection is not provided by the +CIND / +CMER AT commands.
- [u-blox ID 1423_2, 157_3]: The +CIEV: 12 URC (SIM indication) is not issued when the SIM is removed and inserted again.

B Improvements and added features compared to "01B" ES version

B.1 Hardware

No change.

B.2 Firmware

B.2.1 New features

- No new features

B.2.2 Improvements

LwM2M

- LwM2M is enabled by default only for VZW MNO profile.

AT interface

- [u-blox ID 699_3]: +UURCCONF should block URCs also for not initialized AT ports.

Serial driver:

- Improve reliability of UART interface.

Internet suite

- [u-blox ID 1913_2, 84_3]: The +UDCONF=10 AT command does not work.
- [u-blox ID 2685_2, 608_3][CA-167487]: Module is not responding to incoming socket connection (AT+USOLI).
- [u-blox ID 2693_2, 746_3][CA-168331]: HTTPS response is truncated if the header line is greater than 512 bytes.
- [u-blox ID 2714_2, 718_3][CA-139775]: UDP listening: support of multiple connections and handling of matching Dst/Src port numbers.
- [u-blox ID 628_3][CA-172026]: Improvements in handling of socket closure events.

Connectivity

- [u-blox ID 1881_2, 51_3][CA-129845]: MUX MSC packets do not indicate the RI line status.
- [u-blox ID 2244_2, 75_3]: The AT&K command on MUX is impacting the UART flow control (CTS line) and not MUX flow control (MSC packets).
- [u-blox ID 2530_2, 207_3][CA-152779]: Extended UART interface capabilities to support 921600 bit/s.
- [u-blox ID 2797_2, 786_3][CA-171504]: RING line movements have been improved in order to properly handle multiple events happening within 1 second (AT+URINGCFG).
- [u-blox ID 2486_2, 91_3][CA-137398]: Missing RING indications when applying AT+URINGCFG=3 command.

Registration/Network services

- [u-blox ID 2675_2, 64_3][CA-166622]: +UCIND not properly working in enabling/disabling URCs.
- [u-blox ID 692_3][CA-169454]: +CIEV URC reports roaming condition with a SIM registered on its HPLMN.
- [u-blox ID 2537_2, 615_3][CA-152045]: +CSQ implementation in LTE Cat M1 networks (misalignments with +CESQ).
- [u-blox ID 2768_2, 680_3][CA-169078]: +COPS operator name format wrong in UCS2 format.

Positioning

- [u-blox ID 2756_2, 787_3, 818_3][CA-172026]: Improved the I2C driver to reduce its execution time by optimizing and speeding up the implementation of reading routines which are related to the access of low level buffers used for storing data coming from I2C interface.
- [u-blox ID 1981_2, 216_3][CA-166621]: Implement AT+UGPRF=512 to disable extended scan for database feeding in AssistNow Online (power consumption optimization).
- [u-blox ID 447_3][CA-170267]: Cannot enable some configurations that include Beidou constellation on SARA-R422M10S (AT+UGPS).
- [u-blox ID 2626_2, 437_3][CA-162172][CA-163393]: Missing +UUGIND: 4,x within 50 s when AT+UGPS=1,5,3 has been used.
- [u-blox ID 2684_2, 596_3][CA-166260]: Aiding data are not passed correctly to the GNSS module.
- [u-blox ID 2736_2, 737_3][CA-170812]: URCs shall not be sent to the AUX UART/MUX GNSS tunneling port.

C Known limitations

Internet suite

- [u-blox ID 2114_2]: If linger time is not set, the +USOCL AT command answers after 30 s.

Registration/Network services

- [u-blox ID 1270_2, 155_3]: The AT+COPS=1 does not return a final result code if issued in airplane mode (+CFUN: 0 or 4).
- [u-blox ID 792_2, 103_3]: When the jamming level is close to the threshold level, redundant and toggled jamming indications can be issued because the jamming condition is periodically cleared. If the jamming level is high, the indications of jamming detection are more consistent.
- [u-blox ID 867_2]: +CGEV URC are discarded in +CGEREP: 1,1 when AT commands are pending for contexts activation/deactivation. Workaround: issue the AT+CGEREP=2,1.
- [u-blox ID 2097_2, 139_3]: +CEINFO read command stuck after passing from LTE Cat. M1/NB1 to GSM.

System features

- [u-blox ID 1293_2]: UDP packets are not sent when the last gasp feature is triggered on 2G RAT. A PDP context shall be activated before.

File system

- [u-blox ID 2173_2, 325_3]: Maximum user file system size shall be limited to 640 kB.

Positioning

- [u-blox ID 1208_2, 153_3]: With a multi-hypothesis response (<response_type>=2), the +UULOC URC is not correctly formatted.

D Usage notes

On SARA-R422M10S, only the internal GNSS receiver can be used for GNSS activities. No external GNSS receiver is supported.

The implementation of the +UGBX AT command does not change, but protocol commands must be changed due to differences between M8 and M10. For more details, see u-blox M10 SPG 5.10 protocol version interface description [11], and u-blox M10 ROM 5.10 release notes [12].