Quectel RM502Q-AE

IoT/eMBB-Optimized

5G Sub-6 GHz M.2 Module

RM502Q-AE-AA

Release Notes

5G Module Series

Rev. RM502Q-AE-AA_Firmware_Release_Notes_V1304_01.201.01.201

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Contents

1. Release Content

This document provides the Release Notes for RM502Q-AE-AA. The current firmware includes the following software firmware package.

Package	Version
Firmware	RM502QAEAAR13A04M4G_01.201.01.201

2. Matters Needing Attention

SN	Item
[1]	SA MBIM dialing is supported in Windows 10 1903 and above versions.
[2]	SIM card 2 is disabled due to single-card single-standby function, so there is no ESIM interface displayed.
[3]	The new firmware version cannot be downgraded to versions released before RM502QAEAAR13A03M4G_01.200.01.200, otherwise the module will not be able to work normally.
[4]	To extend the service life of flash, it is recommended that the total number of operations related to powering on/off the module, CFUN switching, SIM card hot swapping, dual-SIM switching, or repeated execution of NVM commands should not exceed 30 times per day.
[5]	It is not recommended to directly modify the pre-set APN profiles. Please create an APN profile after the existed CID number. Suppose you modify the APN profile of IMS, SOS, etc. with added specific attributes, these attributes are hidden after modification, causing the profile to still be unavailable.
[6]	During the FOTA upgrade process, it is necessary to ensure the stable power supply of the module. If the power is disconnected during the upgrade, there is a small probability that the flash will be damaged.
[7]	M.2 module is encapsulated without SPI, and SLIC cannot be mounted on the module.

3. Release History

3.1. Firmware Release History

Firmware Release	Description
RM502QAEAAR13A04M4G_01.201.01.201	Mass production
RM502QAEAAR13A04M4G_01.200.01.200	Mass production
RM502QAEAAR13A03M4G_01.200.01.200	Mass production
RM502QAEAAR13A03M4G_01.001.01.001	Mass production
RM502QAEAAR13A02M4G_01.002.01.002	Only for sample
RM502QAEAAR13A02M4G_01.001.01.001	Mass production
RM502QAEAAR13A01M4G_01.001.01.001	Only for sample

3.2. New Features

RM502QAEAAR13A04M4G_01.201.01.201	
Item	**Brief Description**
GENERAL	Added the following commands: ● **AT+QNWCFG="nr5g_mimo_info"** to enable or disable the querying of 5G UL and DL MIMO information. ● **AT+QRSSI** to obtain the RSSI of the current service network of the module.
RM502QAEAAR13A04M4G_01.200.01.200	
Item	**Brief Description**
/	/
RM502QAEAAR13A03M4G_01.200.01.200	
Item	**Brief Description**
NETWORK	Relevant technical controls have been carried out to restrict normal network registration in regions such as RUS and IRN, thus ensuring that the module can

	be used only for civilian applications.
GENERAL	The new firmware version cannot be downgraded to previous versions, otherwise the module will not be able to work normally.
GENERAL	Added the following AT commands: ● **AT+QNWCFG="ledmode"** to set the blinking mode of the network light. ● **AT+QWDSCFG="operator_reserved_pco"** to configure PCO. ● **AT+QNWCFG="nr5g_4mimo_enable"** to control 4*MIMO of NR5G bands. ● **AT+QNWCFG="nitz_ons"** to query PLMN long name and short name from NITZ.

RM502QAEAAR13A03M4G_01.001.01.001

Item	Brief Description
GENERAL	Enabled 5G function of Commercial-Reliance MBN and modified the MBN date to 202210211.
GENERAL	Added the following AT commands: ● **AT+QMTPE** to support MTPE. ● **AT+QFOTAPID** to configure the Profile ID used in FOTA upgrade.

RM502QAEAAR13A02M4G_01.002.01.002

Item	Brief Description
GENERAL	Added the following AT commands: ● **AT+QSIMCFG="dual_slot_status"** to query related parameters when dual SIM cards were inserted. ● **AT+QCALLCFG="ussd_config"** to configure the URC reporting format of USSD.

RM502QAEAAR13A02M4G_01.001.01.001

Item	Brief Description
NETWORK	Added **AT+QNWCFG="ul_data_path"** to query the uplink data path.
NETWORK	Added **AT+QNETRC** to query ESM, EMM and NR5GMM error codes and control the corresponding URC reporting.
NETWORK	Added **AT+QNWCFG="clr_rplmn"** to delete the RPLMN information in the SIM card.
DFOTA	Added judgment to limit FOTA URL length to 512 bytes.
DFOTA	Added the function of reporting DFOTA upgrade progress on the Debug port.
GENERAL	Added **AT+QNWCFG="sysmode"** to query Sysmode and Submode.
GENERAL	Supported RTL8211E.
GENERAL	Added **AT+QGPAPN** to obtain the current APN.

GENERAL	Supported NR T+T bands combination.
GENERAL	Disabled the GEA1 algorithm by default.
GENERAL	Added **AT+QSVN** to obtain IMEISV.
GENERAL	Added **AT+QMAP="sfe"** to control the software acceleration functionality.
GENERAL	Added **AT+QNWCFG="rrc_state"** to query the RRC state.
GENERAL	Added **AT+QNWCFG="msisdn"** to query MSISIDN from network.
GENERAL	Added **AT+QIMSCFG="ims_status"** to query the current IMS registration status and configure whether to enable URC reporting of IMS registration status.
SIMCARD	Added **AT+QSIMCFG="ATR"** to query the ATR value.

RM502QAEAAR13A01M4G_01.001.01.001	
Item	**Brief Description**
Secure Boot	Enable the Secure Boot function

3.3. Improved Features

RM502QAEAAR13A04M4G_01.201.01.201	
Item	**Brief Description**
NETWORK	Solved the problem that an error was reported when the length of parameter **<APN>** in **AT+QICSGP** was 63 bytes.
NETWORK	Solved the problem that the invalid value returned after the execution of **AT+QENG** was displayed as -32768 instead of "-".
GENERAL	Solved the problem that DHCP Relay could not be used.

RM502QAEAAR13A04M4G_01.200.01.200	
Item	**Brief Description**
NETWORK	Modified the value of **<SRS_tx_pwr>** in the return result of **AT+QNWCFG="lte_tx_pwr"**.
NETWORK	Solved the problem that the registration status queried with **AT+CREG**/**AT+CEREG**/**AT+CGREG**/**AT+C5GREG** was incorrect in some cases.
NETWORK	Solved the problem that **AT+QNWLOCK** could not take effect in some scenarios.
QMI	Solved the problem that the module could not properly respond to QMI requests from the host in some suspend scenarios.

USB	Solved the problem that there was no response after AT commands were executed via USB AT port when PCIe interface was not recognized.
GENERAL	Solved the problem that there was a sudden change in the Rx traffic value queried by **AT+QGDNRCNT** when the dial-up was disconnected.
GENERAL	Optimized the gateway address assignment policy.

RM502QAEAAR13A03M4G_01.200.01.200

Item	Brief Description
NETWORK	Extended **AT+QNWCFG="ssb_beam_id"** to add **<RSRQ>** and **<PCID>** parameters and obtain all beam information currently measured.
GENERAL	Solved the problem that URC could only be sent through the USB AT port, USB modem port and UART1 because the URC reporting ports were limited.
GENERAL	Solved the problem that incorrect result was returned after the execution of **AT+QROUTINGBH**.
GENERAL	Solved the problem that incorrect values might return by **AT+QCFG="CLAT"**.

RM502QAEAAR13A03M4G_01.001.01.001

Item	Brief Description
GNSS	Solved the problem that **AT+QGPSCFG="glonassnmeatype"** did not take effect after the module was rebooted.
NETWORK	Solved the problem that executing **AT+QNWINFO** under NSA could not return NSA network information.
NETWORK	Optimized the result of **AT+QNWPREFCFG="rat_acq_order"** to ensure that the returned RATs were all supported by the module.
GENERAL	Solved the problem that MBIM YB might occur during USB hot swapping.
GENERAL	Extended **AT+QSINR** to obtain the SINR value in NSA.
GENERAL	Solved the problem that the RSRP and RSRQ values returned by **AT+QSCAN** in some cases were null.
GENERAL	Solved the problem of incorrect SINR value of LTE cells queried by **AT+QENG="servingcell"**.
GENERAL	Solved the problem that the operator information queried by **AT+COPS=?** was incorrect in some cases.
GENERAL	Solved the problem that the module could not work properly after executing **AT+QNWPREFCFG** and then immediately executing **AT+QSCAN**.

RM502QAEAAR13A02M4G_01.002.01.002

Item	Brief Description
NETWORK	Solved the problem that the SINR value of 5G secondary cell under NSA queried with **AT+QENG="servingcell"** was incorrect.

GENERAL	Optimized the processing logic of **AT+QCAINFO** so that there were returned value only after executing the command when the network is connected.
GENERAL	Solved the problem of not supporting the query of the uplink frequency of LTE under NSA with **AT+QNWCFG="freq_info"**.
GENERAL	Solved the problem that the return value of **AT+QNWCFG="ctrl_plane_dly"** was incorrect in NSA mode.
GENERAL	Extended **AT+QENDC** to add parameter and to support URC reporting.
DFOTA	Solved the problem that after the module was upgraded by DFOTA, after downloading the differential package, the USB port could not be recognized after the port was disconnected, and solved the problem that after the upgrade was completed, the USB port could be recognized, and the upgrade progress was not reported by URCs during the whole process.

RM502QAEAAR13A02M4G_01.001.01.001

Item	Brief Description
NETWORK	Solved the problem that incorrect PLMN information was returned after executing **AT+QSCAN**.
NETWORK	Extended **AT+QSCAN** to support querying more parameters under LTE.
NETWORK	Solved the problem that after disabling NSA, you can still query the NSA information with **AT+QENG**.
NETWORK	Extended **AT+QCAINFO** to support NSA and SA.
NETWORK	Optimized **AT+QRSRP** to support querying RSRP under NSA.
NETWORK	Solved the problem that **AT+QNWCFG="lte_band_priority"** reported an error when the LTE band priority was not configured.
NETWORK	Solved the problem that the camped cells of **AT+QENG="servingcell"** was not displayed when the SIM card was not inserted.
NETWORK	Extended **AT+QCAINFO** to add parameters **<ul_configured>**, **<ul_bandwidth>** and **<ul_earfcn>**.
NETWORK	Solved the problem of abnormal return values when executing **AT+QENG="servingcell"** under NSA.
NETWORK	Solved the problem of abnormal return values when executing **AT+QCAINFO**.
NETWORK	Solved the problem that the MCC and MNC returned by **AT+QNETINFO="servingcell"** were invalid values.
NETWORK	Optimized **AT+QRSRP** by returning -32768 to indicate an invalid value.
NETWORK	Solved the problem that **AT+QENG="servingcell"** returned an invalid **<ARFCN>** under NSA.
NETWORK	Optimized the judgment of **AT+COPS** on the ENDC registration result.
NETWORK	Solved the problem that **AT+QSCAN=3,1** did not display 5G cell information in some cases.

NETWORK	Solved the problem that **AT+QSCAN** could not get LTE cell information.
NETWORK	Displayed **AT+QSCAN** to support querying LTE cell bandwidth information and 5G cell SSB SCS information.
GENERAL	Solved the problem that the MPDN rule was not deleted when the module was powered off, which affected the module configuration when it was powered on the next time.
GENERAL	Solved the probabilistic problem of frequent network disconnection and reconnection caused by frequent dial-up failures in private network.
GENERAL	Solved the problem that the AT port could not work properly after configuring to report the URC through all ports.
GENERAL	Extended **AT+QGPAPN** to support querying IP address and other information.
GENERAL	Modified **AT+QGPAPN** to adapt it to NSA.
GENERAL	Optimized the IMEI anti-tampering function.
GENERAL	Solved the problem that only one APN could be queried through **AT+QGPAPN** after multiple data call under SA.
GENERAL	Solved the problem that the configuration would be rewritten after configuring **<enable>** of **AT+QCFG="pdp/duplicatechk"** and then restarted the module.
GENERAL	Solved the problem of incorrect APN configurations for 5G-ATT and Telstra_Australia_Commercial MBN.
GENERAL	Solved the problem that no URC **+C5GREG: <stat>** was reported when the module switched from LTE to NR5G after configuring **AT+C5GREG=1**.
GENERAL	Optimized the compatibility of the module with the RTL8125 PHY.
GENERAL	Solved the problem that **<APN_name>** returned by **AT+QNWCFG="lte_ambr"** was x.
GENERAL	Solved the problem that the caller number could not be recognized under the German network.
GENERAL	Updated the MBN of Telstra_Australia_Commercial, and the updated date was 202201111.
GENERAL	Solved the problem of **AT+QSPN** returning wrong information on limited service.
GENERAL	Optimized the command set of **AT+QETH** to support Ethernet PHY attribute configurations of PCIe interface.
GENERAL	Modified the Tx power of B38/B40/B41/B42/B43 to 26 dBm compliant to PC2.
GENERAL	Solved the problem that **<stat>** of the currently registered operator in the returned result of **AT+COPS=?** was incorrect when the module was registered on 5G SA.
GENERAL	Optimized **AT+QMAP="LANIP"** to make it take effect immediately.
GENERAL	Solved the problem that **AT+QNWCFG="clr_rplmn"** could not clear RPLMN when you used certain SIM cards.

GENERAL	Solved the problem that the SIM card could not be recognized after enabling Secure Boot and deleting the simlock configuration file.
GNSS	Solved the problem of no NMEA sentence output when **AT+QGPS=2** was entered in the situation that the return value <plane> of **AT+QGPSCFG="plane"** was 0.
GNSS	Solved the problem that the GNSS function was disabled after the module woke up from sleep.
LWM2M	Solved the problem that LwM2M could not start normally after you executed **AT+CFUN=1,1** and the module was rebooted.
SIMCARD	Solved the problem that the SMS center address remained the same when you switched the SIM cards to a different operator in hot-swap mode.
SIMCARD	Solved the problem of returning ERROR due to insufficient QMI memory resources after executing **AT+CGLA**.
SIMCARD	Solved the problem of failure to open the SIM channel when the eSIM did not activate the profile.
USB	Solved the problem that the USB GSI interface failed to connect to the IPA pipe with low probability.

RM502QAEAAR13A01M4G_01.001.01.001

Item	Brief Description
/	/

3.4. Known Issues

Item	Bug Description
/	/

NOTE

Verification Environment is shown below. For more details, please contact Quectel Technical Support.
For Windows,
USB Driver: Quectel_LTE&5G_Windows_USB_Driver_V2.2.4.zip
Qflash Tool: QFlash_V5.3

For Linux,
QMI_WWAN Driver: Quectel_Linux&Android_QMI_WWAN_Driver_V1.2.2.zip
GobiNet Driver: Quectel_Linux&Android_GobiNet_Driver_V1.6.3.zip
PCIE Driver: Quectel_Linux_PCIE_MHI_Driver_V1.3.5.zip

QFirehose Tool: Quectel_LTE&5G_QFirehose_Linux&Android_V1.4.5.3.zip
Quectel-CM Tool: Quectel_QConnectManager_Linux_V1.6.0.26.zip
QLog Tool: Quectel_QLog_Linux&Android_V1.5.zip

4. Functions List

Category	Item	Supported Version (Since)	Note
Basic Function	SMS	RM502QAEAAR13A01M4G_01.001.01.001	/
	NETWORK	RM502QAEAAR13A01M4G_01.001.01.001	/
Protocol Function	QMI	RM502QAEAAR13A01M4G_01.001.01.001	/
	LwM2M	RM502QAEAAR13A02M4G_01.001.01.001	/
Interface Function	USB	RM502QAEAAR13A01M4G_01.001.01.001	/
	MBIM	RM502QAEAAR13A01M4G_01.001.01.001	/
	RmNet	RM502QAEAAR13A01M4G_01.001.01.001	/
	PCIE	RM502QAEAAR13A01M4G_01.001.01.001	/
Locate Function	AGPS	RM502QAEAAR13A01M4G_01.001.01.001	/
Upgrade Function	DFOTA	RM502QAEAAR13A01M4G_01.001.01.001	/
SIM Function	(U)SIM Detection	RM502QAEAAR13A01M4G_01.001.01.001	/
Special Function	RF RX FTM	RM502QAEAAR13A01M4G_01.001.01.001	/
	RF TX FTM	RM502QAEAAR13A01M4G_01.001.01.001	/
	Low Power	RM502QAEAAR13A01M4G_01.001.01.001	/
	Thermal Mitigation	RM502QAEAAR13A01M4G_01.001.01.001	/
5G Function	5G	RM502QAEAAR13A01M4G_01.001.01.001	/

About Quectel

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