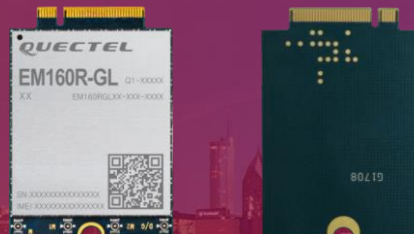


Quectel EM160R-GL

LTE-A Cat 16 M.2 Module



EM160R-GL-AP PCIe Driver Release Notes

LTE-A Module Series

Rev. EM160R-GL-AP_PCIe_Driver_Release_Notes_V1.0.0.31

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1. Driver and Firmware Mapping

This document provides the Release Notes for Quectel PCIe Driver and firmware on EM160R-GL-AP. The mapping of driver and firmware is shown in the table below.

Driver Version	Firmware Version
Quectel_PCl_e_Driver_V1.0.0.31	EM160RGLAPR02A09M4G_07.007.07.007-Verizon&SoftBank &KDDI&DCM EM160RGLAPR02A08M4G_07.007.07.007-AT&T EM160RGLAPR02A07M4G_20.020.20.020-Generic
Quectel_PCl_e_Driver_V1.0.0.30	EM160RGLAPR02A09M4G_06.006.06.006-Verizon&SoftBank &KDDI&DCM EM160RGLAPR02A08M4G_06.006.06.006-AT&T EM160RGLAPR02A07M4G_19.019.19.019-Generic
Quectel_PCl_e_Driver_V1.0.0.29	EM160RGLAPR02A09M4G_05.005.05.005-Verizon&SoftBank &KDDI&DCM EM160RGLAPR02A08M4G_05.005.05.005-AT&T EM160RGLAPR02A07M4G_18.018.18.018-Generic
Quectel_PCl_e_Driver_V1.0.0.28	EM160RGLAPR02A09M4G_04.004.04.004-Verizon&SoftBank &KDDI&DCM EM160RGLAPR02A08M4G_04.004.04.004-AT&T EM160RGLAPR02A07M4G_17.017.17.017-Generic
Quectel_PCl_e_Driver_V1.0.0.27	EM160RGLAPR02A09M4G_03.003.03.003-Verizon&SoftBank &KDDI&DCM EM160RGLAPR02A08M4G_03.003.03.003-AT&T EM160RGLAPR02A07M4G_16.016.16.016-Generic
Quectel_PCl_e_Driver_V1.0.0.26	EM160RGLAPR02A09M4G_02.002.02.002-Verizon&SoftBank EM160RGLAPR02A08M4G_02.002.02.002-AT&T EM160RGLAPR02A07M4G_15.015.15.015-Generic
Quectel_PCl_e_Driver_V1.0.0.25	EM160RGLAPR02A09M4G_01.001.01.001-Verizon&SoftBank EM160RGLAPR02A08M4G_01.001.01.001-AT&T EM160RGLAPR02A07M4G_14.014.14.014-Generic
Quectel_PCl_e_Driver_V1.0.0.24	EM160RGLAPR02A08M4G_01.001.01.001-AT&T EM160RGLAPR02A07M4G_14.014.14.014-Generic
Quectel_PCl_e_Driver_V1.0.0.23	EM160RGLAPR02A07M4G_14.014.14.014
Quectel_PCl_e_Driver_V1.0.0.22	EM160RGLAPR02A07M4G_13.013.13.013
Quectel_PCl_e_Driver_V1.0.0.21	EM160RGLAPR02A07M4G_12.012.12.012
Quectel_PCl_e_Driver_V1.0.0.20	EM160RGLAPR02A07M4G_11.011.11.011

Quectel_PCle_Driver_V1.0.0.19	EM160RGLAPR02A07M4G_10.010.10.010
Quectel_PCle_Driver_V1.0.0.18	
Quectel_PCle_Driver_V1.0.0.17	EM160RGLAPR02A07M4G_09.009.09.009
Quectel_PCle_Driver_V1.0.0.16	EM160RGLAPR02A07M4G_08.008.08.008
Quectel_PCle_Driver_V1.0.0.15	EM160RGLAPR02A07M4G_07.007.07.007
Quectel_PCle_Driver_V1.0.0.14	EM160RGLAPR02A07M4G_06.006.06.006
Quectel_PCle_Driver_V1.0.0.13	EM160RGLAPR02A07M4G_05.005.05.005
Quectel_PCle_Driver_V1.0.0.12	EM160RGLAPR02A07M4G_04.004.04.004
Quectel_PCle_Driver_V1.0.0.11	
Quectel_PCle_Driver_V1.0.0.10	EM160RGLAPR02A07M4G_03.003.03.003
Quectel_PCle_Driver_V1.0.0.9	
Quectel_PCle_Driver_V1.0.0.8	EM160RGLAPR02A07M4G_02.002.02.002
Quectel_PCle_Driver_V1.0.0.7	EM160RGLAPR02A07M4G_01.001.01.001
Quectel_PCle_Driver_V1.0.0.4	EM160RGLAPR02A04M4G_01.001.01.001
Quectel_PCle_Driver_V1.0.0.1	EM160RGLAPR02A03M4G_01.001.01.001
Quectel_PCle_Driver_V1.0.0.0	EM160RGLAPR02A02M4G_01.001.01.001

2. Matters Needing Attention

SN	Item
[1]	Support data only.
[2]	4 GB NAND flash and 2 GB LPDDR4X MCP are supported.

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3. Driver Release

3.1. Release Content

This release version currently includes the following contents.

PCIe	
File	Version
MhiHost.inf	V1.0.0.18
qcude.inf	V1.0.0.10
MhiHost.sys	V1.0.0.12
qcude.sys	V1.0.0.6
PCIe UDE Client	
File	Version
qcgss.inf	V1.0.89.2
qcser.inf	V30.0.0.2
QmuxMdm.inf	V1.0.89.5
Qusbccgp.inf	V30.0.0.2
qcgss.dll	V1.0.89.0
qcqmux.sys	V1.0.89.0
qcqmuxusb.sys	V1.0.89.0
qcusbser.sys	V2019.6.11.0
QuectelFwUpdateDriver.inf	V5.0.0.2

3.2. Driver Release History

Version	Description
Quectel_PCl_e_Driver_V1.0.0.31	V1.0.0.31
Quectel_PCl_e_Driver_V1.0.0.30	V1.0.0.30
Quectel_PCl_e_Driver_V1.0.0.29	V1.0.0.29
Quectel_PCl_e_Driver_V1.0.0.28	V1.0.0.28
Quectel_PCl_e_Driver_V1.0.0.27	V1.0.0.27
Quectel_PCl_e_Driver_V1.0.0.26	V1.0.0.26
Quectel_PCl_e_Driver_V1.0.0.25	V1.0.0.25
Quectel_PCl_e_Driver_V1.0.0.24	V1.0.0.24
Quectel_PCl_e_Driver_V1.0.0.23	V1.0.0.23
Quectel_PCl_e_Driver_V1.0.0.22	V1.0.0.22
Quectel_PCl_e_Driver_V1.0.0.21	V1.0.0.21
Quectel_PCl_e_Driver_V1.0.0.20	V1.0.0.20
Quectel_PCl_e_Driver_V1.0.0.19	V1.0.0.19
Quectel_PCl_e_Driver_V1.0.0.18	V1.0.0.18
Quectel_PCl_e_Driver_V1.0.0.17	V1.0.0.17
Quectel_PCl_e_Driver_V1.0.0.16	V1.0.0.16
Quectel_PCl_e_Driver_V1.0.0.15	V1.0.0.15
Quectel_PCl_e_Driver_V1.0.0.14	V1.0.0.14
Quectel_PCl_e_Driver_V1.0.0.13	V1.0.0.13
Quectel_PCl_e_Driver_V1.0.0.12	V1.0.0.12
Quectel_PCl_e_Driver_V1.0.0.11	V1.0.0.11
Quectel_PCl_e_Driver_V1.0.0.10	V1.0.0.10
Quectel_PCl_e_Driver_V1.0.0.9	V1.0.0.9
Quectel_PCl_e_Driver_V1.0.0.8	V1.0.0.8

Quectel_PCle_Driver_V1.0.0.7	V1.0.0.7
Quectel_PCle_Driver_V1.0.0.4	V1.0.0.4
Quectel_PCle_Driver_V1.0.0.1	V1.0.0.1
Quectel_PCle_Driver_V1.0.0.0	V1.0.0.0

3.3. New Features

Quectel_PCle_Driver_V1.0.0.31	
Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_07.007.07.007 EM160RGLAPR02A08M4G_07.007.07.007 EM160RGLAPR02A07M4G_20.020.20.020
Quectel_PCle_Driver_V1.0.0.30	
Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_06.006.06.006 EM160RGLAPR02A08M4G_06.006.06.006 EM160RGLAPR02A07M4G_19.019.19.019
[2]	Supported 22H2 driver logo.
Quectel_PCle_Driver_V1.0.0.29	
Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_05.005.05.005 EM160RGLAPR02A08M4G_05.005.05.005 EM160RGLAPR02A07M4G_18.018.18.018
Quectel_PCle_Driver_V1.0.0.28	
Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_04.004.04.004 EM160RGLAPR02A08M4G_04.004.04.004 EM160RGLAPR02A07M4G_17.017.17.017

Quectel_PCle_Driver_V1.0.0.27

Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_03.003.03.003 EM160RGLAPR02A08M4G_03.003.03.003 EM160RGLAPR02A07M4G_16.016.16.016

Quectel_PCle_Driver_V1.0.0.26

Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_02.002.02.002 EM160RGLAPR02A08M4G_02.002.02.002 EM160RGLAPR02A07M4G_15.015.15.015

Quectel_PCle_Driver_V1.0.0.25

Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A09M4G_01.001.01.001

Quectel_PCle_Driver_V1.0.0.24

Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A08M4G_01.001.01.001
[2]	Added log size limit function in authentication service and firmware update driver service.
[3]	21H2logo was obtained.
[4]	Supported multiple operators.

Quectel_PCle_Driver_V1.0.0.23

Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A07M4G_14.014.14.014.

Quectel_PCle_Driver_V1.0.0.22

Item	Brief Description
[1]	Firmware version: EM160RGLAPR02A07M4G_13.013.13.013.

Quectel_PCle_Driver_V1.0.0.21

Item	Brief Description
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[1] Firmware version: EM160RGLAPR02A07M4G_12.012.12.012.

Quectel_PCle_Driver_V1.0.0.20

Item	Brief Description
------	-------------------

[1] Firmware version: EM160RGLAPR02A07M4G_11.011.11.011

[2] Updated platform-WWAN card table.

Quectel_PCle_Driver_V1.0.0.19

Item	Brief Description
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[1] Updated platform-WWAN card table to support Panther

Quectel_PCle_Driver_V1.0.0.18

Item	Brief Description
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[1] Firmware version: EM160RGLAPR02A07M4G_10.010.10.010

[2] Mhihost driver supports DFX feature.

[3] Supported both Intel and AMD platform.

Quectel_PCle_Driver_V1.0.0.17

Item	Brief Description
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[1] Firmware version: EM160RGLAPR02A07M4G_09.009.09.009

Quectel_PCle_Driver_V1.0.0.16

Item	Brief Description
------	-------------------

[1] Firmware version: EM160RGLAPR02A07M4G_08.008.08.008

[2] Enabled to check the correspondence between the PC and WWAN card by default. The authentication was passed only after passing the correspondence between the PC and WWAN card detection.

Quectel_PCle_Driver_V1.0.0.15

Item	Brief Description
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[1] Supported cleaning up the firmware update driver log automatically if it exceeds 100 MB.

[2] Firmware version: EM160RGLAPR02A07M4G_07.007.07.007

Quectel_PCle_Driver_V1.0.0.14

Item	Brief Description
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[1] Firmware version: EM160RGLAPR02A07M4G_06.006.06.006

[2] Updated UI display to support upgrade protection at battery power of 25%.

Quectel_PCle_Driver_V1.0.0.9

Item	Brief Description
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[1] Created the software component nodes required by eSIM driver.

[2] Added the firmware switch feature in which the versions are for test only.

[3] Supported RS5.

Quectel_PCle_Driver_V1.0.0.7

Item	Brief Description
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[1] Added the release note of firmware update driver.

Quectel_PCle_Driver_V1.0.0.4

Item	Brief Description
------	-------------------

[1] Changed the display name of MBIM NetAdapter.

[2] MhiHost driver supported D3Cold transfer by default.

[3] Deleted filter driver.

[4] Changed Modem Port to At Port.

[5] Added support for new hardware.

[6] Synchronized to Qualcomm 00036.1 baseline code (Qucde).

[7] Added Authentication service function.

Quectel_PCle_Driver_V1.0.0.1

Item	Brief Description
------	-------------------

[1] Changed the display name of MBIM NetAdapter.

[2] MhiHost driver supported D3Cold transfer by default

[3] Deleted filter driver

[4] Changed Modem Port to At Port

[5] Added support for new hardware

Quectel_PCle_Driver_V1.0.0.0	
Item	Brief Description
[1]	The number of USB interfaces could be configured via the registry.
[2]	Modified all device descriptors to those defined by Quectel.
[3]	Modified the hardware ID.

3.4. Improved Features

Quectel_PCle_Driver_V1.0.0.31	
Item	Brief Description
[1]	Replaced COM component technology with Windows Runtime (WinRT) to avoid functional failure caused by the deletion of COM component library by the operating system later than version 22H2.
[2]	Solved the problem that no SHA256 signature was found by a signature check tool.

Quectel_PCle_Driver_V1.0.0.30	
Item	Brief Description
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Quectel_PCle_Driver_V1.0.0.29	
Item	Brief Description
/	/

Quectel_PCle_Driver_V1.0.0.28	
Item	Brief Description
/	/

Quectel_PCle_Driver_V1.0.0.27	
Item	Brief Description
[1]	Related E-service ID: 103126 Added Firstnet MNC-MCC in firmware switch function.
[2]	Fixed HLK TestPowerStates 21H2 case failure in the module. (This case still needs to go with MSFT solution for testing)

Quectel_PCle_Driver_V1.0.0.26

Item	Brief Description
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Quectel_PCle_Driver_V1.0.0.25

Item	Brief Description
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Quectel_PCle_Driver_V1.0.0.24

Item	Brief Description
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- | | |
|-----|---|
| [1] | Related E-service ID: 77070
Solved the problem of qmux BSOD (0x10D). |
| [2] | Modified mhi class to System. |
| [3] | Modified low battery display UI. |
| [4] | Solved the problem of PCIE node YB with a low probability after laptop woke up from hibernation during the upgrade process. |

Quectel_PCle_Driver_V1.0.0.23

Item	Brief Description
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- | | |
|-----|--|
| [1] | Related E-service ID: 93996
Solved the problem of BSOD (0x9F) caused by qcqmux.sys. |
| [2] | Solved the problem of low probability of Mode Switch failure. |
| [3] | Solved the problem that the upgrade window was not displayed at a low probability. |

Quectel_PCle_Driver_V1.0.0.22

Item	Brief Description
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- | | |
|-----|---|
| [1] | Modified QService attribute from 0x00000110 to 0x00000010 |
| [2] | Solved the probabilistic problem of root node YB happened during the upgrade process after the laptop woke up from hibernation. |

Quectel_PCle_Driver_V1.0.0.21

Item	Brief Description
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Quectel_PCle_Driver_V1.0.0.18

Item	Brief Description
[1]	Solved the problem of BSOD caused by disabling and then enabling ude driver when capturing module logs.
[2]	Solved the problem that there was only Quectel PCI Express after module reboot.
Quectel_PCle_Driver_V1.0.0.17	
Item	Brief Description
[1]	Related E-service ID: 84984 Solved the problem of unlocking failure after waking up from hibernation on 19H2 system.
[2]	Related E-service ID: 85033 Solved the problem that the Nano machine cannot be authenticated.
[3]	Solved the problem that the null pointer of authentication service program could not work normally.
[4]	Related E-service ID: 85391 Solved the problem of Diag Port after firmware update
Quectel_PCle_Driver_V1.0.0.16	
Item	Brief Description
[1]	Solved the problem that the highspeed USB Composite Device (UDE) device can be rejected abnormally.
[2]	Updated the date and version information of the ude,inf driver.
[3]	Solved the problem of qcqmux.sys driver BSOD.
Quectel_PCle_Driver_V1.0.0.15	
Item	Brief Description
[1]	Solved the problem of low probability of UnLock failure.
[2]	Optimized QService code about exception
[3]	Updated Qcqmux and qcgnss driver code.
[4]	Solved the problem of UI size mismatch.
Quectel_PCle_Driver_V1.0.0.14	
Item	Brief Description
[1]	Solved the low probabilistic problem of PCIE YB caused by the module not being ready in the stress test of restarting the laptop.
[2]	Optimized QService code.

Quectel_PCle_Driver_V1.0.0.12

Item	Brief Description
[1]	Modified authentication service name.
[2]	Solved the problem of BSOD caused by uninstalling ude driver after releasing the event.
[3]	Solved the problem that GNSS driver report error caused the driver to fail to be disabled, and finally caused upgrade failure with the upgrade tool.
[4]	Solved the problem of UI size mismatch.

Quectel_PCle_Driver_V1.0.0.9

Item	Brief Description
[1]	Solved the problem of BSOD caused by ResetMHI.
[2]	Solved the problem that the module could not continue upgrading after module rebooting if Windows update was interrupted.
[3]	Solved the problem of BSOD after Sahara port captures dump logs successfully and then switching Sahara port to another serial port.
[4]	Optimized the existence time of DM port after update with the firmware update driver.
[5]	Disabled UDE device in the printer list.

Quectel_PCle_Driver_V1.0.0.8

Item	Brief Description
[1]	Solved the problem that there was a small probability of BSOD when qcode.sys returned to D0 state from low power consumption state.
[2]	Renamed the name of the authentication service.
[3]	Solved the problem that QService could not be started.
[4]	Solved the problem of unexpected firmware upgrade after rebooting or hibernating.

Quectel_PCle_Driver_V1.0.0.7

Item	Brief Description
[1]	Decreased the probability of module dump during log capturing.
[2]	Solved the problem of BSOD caused by mhihost calling the uninstalled UDE driver.

Quectel_PCle_Driver_V1.0.0.4

Item	Brief Description
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[1]	Optimized power management function
[2]	Fixed BSOD (after entering D3Cold, device Restart).
[3]	Reduced BSOD probability when capture qxdm logs.
[4]	Fixed BSOD (mhi transfer have incorrect chain flag)

Quectel_PCle_Driver_V1.0.0.1

Item	Brief Description
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[1]	Optimized power management function
[2]	Fixed BSOD (after entering D3Cold, device Restart).

Quectel_PCle_Driver_V1.0.0.0

Item	Brief Description
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4. Firmware Release

4.1. Release Content

The current release includes the firmware package.

Package	Version
Firmware	EM160RGLAPR02A09M4G_07.007.07.007
	EM160RGLAPR02A08M4G_07.007.07.007
	EM160RGLAPR02A07M4G_20.020.20.020

4.2. Firmware Release History

Firmware Release	Description
EM160RGLAPR02A09M4G_07.007.07.007	Mass production
EM160RGLAPR02A08M4G_07.007.07.007	
EM160RGLAPR02A07M4G_20.020.20.020	
EM160RGLAPR02A09M4G_06.006.06.006	Mass production
EM160RGLAPR02A08M4G_06.006.06.006	
EM160RGLAPR02A07M4G_19.019.19.019	
EM160RGLAPR02A09M4G_05.005.05.005	Mass production
EM160RGLAPR02A08M4G_05.005.05.005	
EM160RGLAPR02A07M4G_18.018.18.018	
EM160RGLAPR02A09M4G_04.004.04.004	Mass production
EM160RGLAPR02A08M4G_04.004.04.004	
EM160RGLAPR02A07M4G_17.017.17.017	
EM160RGLAPR02A09M4G_03.003.03.003	Mass production
EM160RGLAPR02A08M4G_03.003.03.003	
EM160RGLAPR02A07M4G_16.016.16.016	
EM160RGLAPR02A09M4G_02.002.02.002	Mass production
EM160RGLAPR02A08M4G_02.002.02.002	
EM160RGLAPR02A07M4G_15.015.15.015	
EM160RGLAPR02A09M4G_01.001.01.001	Mass production
EM160RGLAPR02A08M4G_01.001.01.001	Mass production
EM160RGLAPR02A07M4G_14.014.14.014	Mass production

EM160RGLAPR02A07M4G_13.013.13.013	Mass production
EM160RGLAPR02A07M4G_12.012.12.012	Mass production
EM160RGLAPR02A07M4G_11.011.11.011	Mass production
EM160RGLAPR02A07M4G_10.010.10.010	Mass production
EM160RGLAPR02A07M4G_09.009.09.009	Only for sample
EM160RGLAPR02A07M4G_08.008.08.008	Only for sample
EM160RGLAPR02A07M4G_07.007.07.007	Only for sample
EM160RGLAPR02A07M4G_06.006.06.006	Only for sample
EM160RGLAPR02A07M4G_05.005.05.005	Only for sample
EM160RGLAPR02A07M4G_04.004.04.004	Only for sample
EM160RGLAPR02A07M4G_03.003.03.003	Only for sample
EM160RGLAPR02A07M4G_02.002.02.002	Only for sample
EM160RGLAPR02A07M4G_01.001.01.001	Only for sample
EM160RGLAPR02A04M4G_01.001.01.001	Only for sample
EM160RGLAPR02A03M4G_01.001.01.001	Only for sample
EM160RGLAPR02A02M4G_01.001.01.001	Only for sample
EM160RGLAPR02A01M4G_01.001.01.001	Only for sample

4.3. New Features

EM160RGLAPR02A09M4G_07.007.07.007
 EM160RGLAPR02A08M4G_07.007.07.007
 EM160RGLAPR02A07M4G_20.020.20.020

Item	Brief Description
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GENERAL	Added three IMSIs 44020865, 44020945 and 44020835 for SBM_PC APN. Set the default APN as plus.4g.
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EM160RGLAPR02A09M4G_06.006.06.006
 EM160RGLAPR02A08M4G_06.006.06.006
 EM160RGLAPR02A07M4G_19.019.19.019

Item	Brief Description
/	/
EM160RGLAPR02A09M4G_05.005.05.005	
EM160RGLAPR02A08M4G_05.005.05.005	
EM160RGLAPR02A07M4G_18.018.18.018	
Item	Brief Description
/	/
EM160RGLAPR02A09M4G_04.004.04.004	
EM160RGLAPR02A08M4G_04.004.04.004	
EM160RGLAPR02A07M4G_17.017.17.017	
Item	Brief Description
/	/
EM160RGLAPR02A09M4G_03.003.03.003	
EM160RGLAPR02A08M4G_03.003.03.003	
EM160RGLAPR02A07M4G_16.016.16.016	
Item	Brief Description
GENERAL	Enabled the Multi-IMSI support for Truphone.
EM160RGLAPR02A09M4G_02.002.02.002	
EM160RGLAPR02A08M4G_02.002.02.002	
EM160RGLAPR02A07M4G_15.015.15.015	
Item	Brief Description
GENERAL	Supported Windows 11 OS.
EM160RGLAPR02A09M4G_01.001.01.001	
Item	Brief Description
/	/
EM160RGLAPR02A08M4G_01.001.01.001	
Item	Brief Description
GENERAL	Added support for AT&T MTU new requirement in 13340 v21.2.
GENERAL	Supported Verizon IoT Security functionality.
GENERAL	Disabled HPUE functionality of B41 for Japanese operators.
GENERAL	Supported Rakuten operator.

EM160RGLAPR02A07M4G_14.014.14.014

Item	Brief Description
/	/

EM160RGLAPR02A07M4G_13.013.13.013

Item	Brief Description
/	/

EM160RGLAPR02A07M4G_12.012.12.012

Item	Brief Description
/	/

EM160RGLAPR02A07M4G_11.011.11.011

Item	Brief Description
/	/

EM160RGLAPR02A07M4G_10.010.10.010

Item	Brief Description
Related E-service ID: 80924/80927 Supported AMD platform. Fixed the issue that device all lost or device YB in s0i3 stress test.	

GENERAL

EM160RGLAPR02A07M4G_09.009.09.009

Item	Brief Description
/	/

EM160RGLAPR02A07M4G_08.008.08.008

Item	Brief Description
/	/

EM160RGLAPR02A07M4G_07.007.07.007

Item	Brief Description
GENERAL Added W_Disable pin detection and processing mechanism.	

EM160RGLAPR02A07M4G_06.006.06.006

Item	Brief Description
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/ /

EM160RGLAPR02A07M4G_05.005.05.005

Item	Brief Description
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/ /

EM160RGLAPR02A07M4G_04.004.04.004

Item	Brief Description
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/ /

EM160RGLAPR02A07M4G_03.003.03.003

Item	Brief Description
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GENERAL	Supported reporting signal strength change is the change exceeded 10 dBm.
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GENERAL	Supported importing DPR TX power table with the tool.
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EM160RGLAPR02A07M4G_02.002.02.002

Item	Brief Description
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MBIM	Added an MBIM message to synchronize firmware version information of the module to the host.
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GENERAL	Supported importing SAR table through the tool.
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GENERAL	Disabled reporting URC by default.
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EM160RGLAPR02A07M4G_01.001.01.001

Item	Brief Description
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GENERAL	Added AT+QNWCFG="attach_apn" to control the APN selected for network registration.
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ESIM	Added AT+QSIMCFG="OS" to query the software version of Gemalto eSIM.
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GENERAL	Supported entering flight mode by pulling down W_DISABLE1 Pin.
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GENERAL	Added the solution on PTCRB test case failure.
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EM160RGLAPR02A04M4G_01.001.01.001

Item	Brief Description
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GENERAL	Supported FCC 2-way authentication and enabled this feature by default.
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LowPower	Supported D3 Cold.
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EM160RGLAPR02A03M4G_01.001.01.001

Item	Brief Description
GENERAL	Added secure boot feature and disabled it by default.
GENERAL	Added AT command AT+QCFG="fcc_enable" to enable the FCC 2-way authentication function.
GENERAL	Added AT command AT+QPCIE="id" to configure PCIE ID for the fused module.
SIMCARD	Disabled the hot-plugging feature of SIM card 2 by default.

EM160RGLAPR02A02M4G_01.001.01.001

Item	Brief Description
NETWORK	Disabled roaming.
GENERAL	Added AT+QLOG to save specific system log.
GENERAL	Added Commercial-DCM and Commercial-KDDI certification related NV configurations.
GENERAL	Configured Pin68 to 2x2MIMO when Pin68 was in high/float level, and 4x4MIMO when Pin68 was in low level.
GENERAL	Added limitation to LTE band 1/3/7/20/38/46 in Commercial-EE MBN.
GENERAL	Added the limitation to the bands of Verizon certification.
MBIM	Added SMS report feature in MBIM.
GENERAL	Enabled hot-plugging for SIM1 and disabled hot-plugging for SIM2.
GENERAL	Added Commercial-DCM MBN.
GENERAL	Added power difference configuration to meet Japan certification requirements.
GENERAL	Supported AT command AT+QCERTIOP to configure APN.
GENERAL	Added AT command AT+QCFG="lte4x4mimo/swmethod" to switch MIMO.
GENERAL	Added Commercial-TMO MBN.
GENERAL	Added AT command AT+QRSRP to query the RSRP of every antenna.
GENERAL	Supported PCIE D3HOT mode.
GENERAL	Added Commercial-DCM and Commercial-SBM certification related requirements.
GENERAL	Supported registering to band 17 through MFBI+Band 12.
GENERAL	Added AT command AT+QESIM="lpamode" to configure LPA mode.

4.4. Improved Features

EM160RGLAPR02A09M4G_07.007.07.007	
EM160RGLAPR02A08M4G_07.007.07.007	
EM160RGLAPR02A07M4G_20.020.20.020	
Item	Brief Description
NETWORK	E-service ID: 126131
	Solved the problem that the network icon was off but PC could still access to the network normally when the PC was restarted after the cellular network was turned off.
NETWORK	Solved the problem of no internet access when a Cosmote SIM card was inserted.
NETWORK	Solved the problem of no internet access when a T-mobile CZ SIM card was inserted.
EM160RGLAPR02A09M4G_06.006.06.006	
EM160RGLAPR02A08M4G_06.006.06.006	
EM160RGLAPR02A07M4G_19.019.19.019	
Item	Brief Description
NETWORK	Solved the problem that the modem did not work normally when speed test was performed on Linux.
GENERAL	Solved CVE-2022-26147 that code was executed as root through AT commands on the module.
GENERAL	Improved the module recovery mechanism for AMT.
EM160RGLAPR02A09M4G_05.005.05.005	
EM160RGLAPR02A08M4G_05.005.05.005	
EM160RGLAPR02A07M4G_18.018.18.018	
Item	Brief Description
NETWORK	E-service ID: 114176
	Solved the problem that the cellular showed locked state after resuming from S4.
NETWORK	Solved the problem of no internet access when a Wind3 SIM card was inserted.
EM160RGLAPR02A09M4G_04.004.04.004	
EM160RGLAPR02A08M4G_04.004.04.004	
EM160RGLAPR02A07M4G_17.017.17.017	
Item	Brief Description
SIMCARD	Solved the problem that TIM SIM card showed could not access the internet.
SIMCARD	Solved the problem that Telekom SIM card could not access the internet.

SIMCARD	E-service ID: 104354 Solved the problem that YB was displayed with the Verizon Static SIM card.
SIMCARD	Solved the problem that the module showed no service when a Vodafone IT SIM card was inserted.
GENERAL	E-service ID: 107615 Solved the problem of SoftBank IoT failure.
EM160RGLAPR02A09M4G_03.003.03.003	
EM160RGLAPR02A08M4G_03.003.03.003	
EM160RGLAPR02A07M4G_16.016.16.016	
Item	Brief Description
NETWORK	Solved the problem that the cellular showed no service and the IP address changed during ping stress test.
NETWORK	E-service ID: 103062 / 103052 / 102203 Fixed the problem of cellular disconnection when performing Hibernation test on 21H2.
GENERAL	Solved the problem that the signal strength bar showed 5 bars to 1–2 bar randomly.
GENERAL	Modified the APN of Telstra from telstr.wap to telstra.internet for supporting IPv6/IPv4.
GENERAL	E-service ID: 102155 Solved the problem that the Linux Modem Manager could not detect the module after the module was powered on sometimes.
GENERAL	E-service ID: 102107 Solved the problem that the Linux terminal showed error message when performing module shutdown or power-on.
GENERAL	Fixed HLK TestBaseStationInfo 21H2 case failure in the module. (This case still needs to go with MSFT errata for testing)
EM160RGLAPR02A09M4G_02.002.02.002	
EM160RGLAPR02A08M4G_02.002.02.002	
EM160RGLAPR02A07M4G_15.015.15.015	
Item	Brief Description
/	/
EM160RGLAPR02A09M4G_01.001.01.001	
Item	Brief Description
LwM2M	Optimized LwM2M mechanism to perform full registration on Mobile IOT TC13.03.
EM160RGLAPR02A08M4G_01.001.01.001	
Item	Brief Description
LwM2M	Solved the problem that full registration did not occur after rebooting the module in Verizon caseTC13.03.

NETWORK	Solved the problem of incorrect PLMN queried through AT+QENG="servingcell" in the presence of shared base station.
EM160RGLAPR02A07M4G_14.014.14.014	
Item	Brief Description
GENERAL	Solved the problem of module no response when executing force TX/RX AT command in WCDMA mode.
EM160RGLAPR02A07M4G_13.013.13.013	
Item	Brief Description
MBIM	Solved the problem that EUT still showed "CMCC" instead of roaming carrier when inserting a China Mobile USIM.
GENERAL	Modified IMS of CT MBN to 1 to support sending and receiving SMS over IMS.
GENERAL	Solved the problem of probabilistic BSOD in the upgrade process of the one-click firmware upgrade tool.
NETWORK	Related E-service ID: 86880 Solved the problem that EUT with EE SIM card showed "Disconnected" resume from S4 and Shutdown/Turn-on (fail rate: 1/20).
EM160RGLAPR02A07M4G_12.012.12.012	
Item	Brief Description
NETWORK	Modified to allocate MTU value by the network, and set Ue_Usage_Setting value to data centric as AT&T required.
MBIM	Related E-service ID: 70645 Solved the problem that random "IPConfig Returned Null" is encountered after resuming from S4.
MBIM	Related E-service ID: 82678 Solved the problem of showing unnecessary option "ModernProvisionedProfile##cmnet/cmwap" in windows settings after manually adding a wrong APN.
GENERAL	Related E-service ID: 82331 Solved the problem of Drift3:W10:20H2:HLK:System-PnP with IO before and after test fail w/ BSOD C1.
EM160RGLAPR02A07M4G_11.011.11.011	
Item	Brief Description
MBIM	Related E-Service ID: 85645 Solved the problem of MBIM YB caused by ping request timeout when performing S0i3 test.
GENERAL	Related E-Service ID: 84629 Solved the problem of device lost in the stress test of warm start.(FR:1/220 trial)

GENERAL	Related E-Service ID: 84028 Solved the following problem: Jaguar/Panther-1: BSOD "0xdeaddead" was encounter during ATS S4 Long Run Test (FR:1/1 trial; 1/1machine)
	EM160RGLAPR02A07M4G_10.010.10.010
Item	Brief Description
GENERAL	Solved the problem of GFIT TC5.2.5 failure by modifying NV configurations of Verizon MBN.
GENERAL	Related E-service ID: 85138 Solved the problem that SoftBank Carrier cellular connection was UMTS after resuming from OS fast shutdown.
	Related E-service ID: 84745 Solved the problem that the Windows could not recognize changes in the SIM card if the SIM card change with S4/S5.
MBIM	
EM160RGLAPR02A07M4G_09.009.09.009	
Item	Brief Description
GENERAL	Related E-service ID: 83083 Solved the problem that thermal throttling threshold configured by AT+QCFG="thermal/modem" did not take effect.
	Related E-Service ID: 85138 Solved the problem that SoftBank carrier cellular connection was UMTS after resuming from OS fast shutdown.
GENERAL	
EM160RGLAPR02A07M4G_08.008.08.008	
Item	Brief Description
GENERAL	Solved the probabilistic problem that the module could not work normally in laptop rebooting.
GENERAL	Modified the configured parameters of AT+QCFG="thermal/modem" to be saved after firmware upgrade.
NETWORK	Solved the problem of abnormal display of cellular in roaming network.
M160RGLAPR02A07M4G_07.007.07.007	
Item	Brief Description
MBIM	Solved the problem that the module failed to reboot after DPR called the module to reboot and cause PCIe YB.
GENERAL	Changed the first APN of DCM MBN to mopera.net by default.
GENERAL	Solved the problem that KDDI AU carrier could not attach to network automatically after setting the APN manually.
EM160RGLAPR02A07M4G_06.006.06.006	

Item	Brief Description
GENERAL	Solved the problem of network disconnection in the stress test of module rebooting.
EM160RGLAPR02A07M4G_05.005.05.005	
Item	Brief Description
NETWORK	Solved the problem that KDDI AU SIM card could not automatically register the network after configuring APN.
EM160RGLAPR02A07M4G_04.004.04.004	
Item	Brief Description
MBIM	Solved the problem of MBIM disconnection in the stress test of waking up from hibernation.
LowPower	Solved the problem that it needed 3 minutes to enter low power mode after configuring the power to D3cold and the laptop to airplane mode.
GENREAL	Merged the Qualcomm patch of Skipping PA off to solve the problem of PTCRB AGPS.
GENERAL	Solved the problem that it needed 3 minutes to enable SAR after module booting.
EM160RGLAPR02A07M4G_03.003.03.003	
Item	Brief Description
GENERAL	Solved the probabilistic problem of module dump in the stress test of waking up from hibernation, no service occurs probabilistically.
GENERAL	Solved the problem that KDDI would detach from the network if the PLMN was transferred to temporary forbidden PLMN list.
GENERAL	Solved the problem of module crash in force TX/RX test after entering FTM mode in 10 seconds.
EM160RGLAPR02A07M4G_02.002.02.002	
Item	Brief Description
MBIM	Reduced the probability of MBIM dial-up failure when the module was in hibernation mode.
GENERAL	Solved the problem that the device could not be identified when the module restarted.
GENERAL	Solved the problem that KDDI could not register to the network.
GENERAL	Solved the problem that the SIM card could not be recognized if the SIM_PWR exceeded 30mA.
EM160RGLAPR02A07M4G_01.001.01.001	
Item	Brief Description

MBIM	Solved the problem of Telecom SIM card S4/S5 UN-Pin failure.
MBIM	Solved the problem of MBIM icon YB due to memory leakage after switching between ALL PORT mode/MBIM + GPS mode.
GENERAL	Modified the maximum TX value of some bands.
GENERAL	Optimized authentication logic to solve the problem of probabilistic authentication failure after the module woke up from sleep.
GENERAL	Optimized firehose upgrade strategy to continue the upgrading process even after an upgrading failure.

EM160RGLAPR02A04M4G_01.001.01.001

Item	Brief Description
GENERAL	Reduced the probability of module crash caused by abnormal IPA in stress test.
GENERAL	Updated ICCID and PLMN of Commercial-Sprint MBN.
GENERAL	Solved the problem that the module firmware information displayed incorrectly.
GENERAL	Solved the problem of memory leak and module dump after receiving the short message.
LowPower	Solved the problem that the current consumption exceeded 16 MA after the module was suspended in the flight mode without a SIM card.
NETWORK	Solved the problem of terminal DM test failure due to no information reported on the DM platform.
SIMCARD	Solved the problem that after unlocking the PIN of the SIM card in the MBIM network card, MBIM would be automatically connected after the module woke up from sleep and it was expected that the PIN needs to be unlocked again before MBIM was connected.

EM160RGLAPR02A03M4G_01.001.01.001

Item	Brief Description
NETWORK	Fixed the problem that the RSRP values of RX2 and RX3 of WCDMA and LTE returned by AT+QSRP were incorrect.
NETWORK	Solved the problem of no URC report when the module received ETWS.
GENERAL	Incorporated Qualcomm patch to solve the problem that the module did not support 4*4MIMO.
GENERAL	Configured the first APN of Commercial-Sprint MBN to r.ispsn.
NETWORK	Solved the problem that the module could not register to the network automatically after rebooting if an invalid cell was locked with AT+QNWLOCK .

EM160RGLAPR02A02M4G_01.001.01.001

Item	Brief Description
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GNSS	Solved the problem that the PCIE port could not output NMEA sentence.
GENERAL	Configured FGI bit 27/28/29 in AT&T MBN to 0.
GENERAL	Solved the problem that MBN could not be selected through PLMN.
GNSS	Solved the problem that AT+QGPSCFG="outport","usbhmea" did not take effect.
GENERAL	Configured network type to MBIM by default.

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4.5. Function List

Category	Item	Supported Version(Since)	Note
Basic Function	SMS	EM160RGLAPR02A01M4 G_01.001.01.001	/
	FILE	EM160RGLAPR02A01M4 G_01.001.01.001	Support UFS File
Protocol Function	QMI	/	Not supported currently
	NITZ	EM160RGLAPR02A01M4 G_01.001.01.001	/
Special Function	DSSS	EM160RGLAPR02A02M4 G_01.001.01.001	/
	SIM Detection	EM160RGLAPR02A01M4 G_01.001.01.001	/
	MBIM	EM160RGLAPR02A01M4 G_01.001.01.001	/
	LowPower	EM160RGLAPR02A04M4 G_01.001.01.001	/
	ESIM	EM160RGLAPR02A03M4 G_01.001.01.001	/
	Win10 SMS	EM160RGLAPR02A03M4 G_01.001.01.001	/

5. Known Issues

Item	Bug Description
[1]	There is a small probability of failure to obtain the App version number on RS5.
[2]	On the 19H2 system, probabilistically it takes more than 1 minute to authenticate successfully after disabling the network, and laptop S4 and wakeup.
[3]	SIMCARD hot-swap function does not work.
[4]	There is probability that the firmware cannot be successfully upgraded in Win11 if the user performs S4/Power off during upgrading process. (Firmware Update can keep upgrading after Laptop restart).

NOTE

1. You can use the QModeSwitich.exe tool to switch driver modes.
2. For latest platform-WWAN card table, please contact Quectel Technical Supports (support@quectel.com).
3. Verification Environment is shown below.
For Windows,
Windows system: Win11 22H2 22621
MBIM switch tool: QSwitchPortTool_x64_V1.0.16
PCIe Driver: Quectel_EM160R-GL_Driver_Win10x64_v1.0.0.31.zip
PCIe QFlash Tool: QFLASH_PCIE_1.1
Qlaptop Tool: Qlaptop_Tool_V1.57

About Quectel

Quectel Wireless Solutions is the leading global supplier of cellular and GNSS modules, with a broad product portfolio covering the most recent wireless technologies of 5G, LTE/LTE-A, NB-IoT/LTE-M, UMTS/HSPA(+), GSM/GPRS and GNSS. As a professional IoT (Internet of Things) technology developer and cellular module supplier, Quectel is able to provide one-stop services for IoT cellular modules. Quectel products have been widely applied in IoT/M2M fields including smart payment, telematics and transport, smart energy, smart cities, security, wireless gateways, industry, healthcare, agriculture, and environment monitoring.

