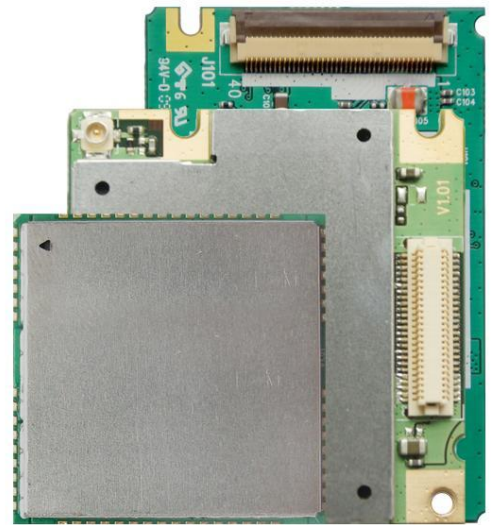# QUECTEL

Quectel Cellular Engine

GSM Module Firmware Upgrade User Guide for Production

GSM_Module_FW_Upgrade_
UGD_for_Production_V1.0

Document Title	GSM Module Firmware Upgrade User Guide for Production
Version	1.0
Date	2011-01-27
Status	Release
Document Control ID	GSM_Module_FW_Upgrade_UGD_for_Production_V1.0

General Notes

Quectel offers this information as a service to its customers, to support application and engineering efforts that use the products designed by Quectel. The information provided is based upon requirements specifically provided for Quectel by the customers. Quectel has not undertaken any independent search for additional relevant information, including any information that may be in the customer's possession. Furthermore, system validation of this product designed by Quectel within a larger electronic system remains the responsibility of the customer or the customer's system integrator. All specifications supplied herein are subject to change.

Copyright

Contents

0. Revision history

Revision	Date	Author	Description of change
1.0	2011-01-24	Tony PEI	Initial

1. Introduction

This document describes how to upgrade standard firmware and OpenCPU firmware.

1.1. Reference

Table 1: Reference

SN	Document name	Remark
[1]	FW_Upgrade_Tool_Lite_UGD_V1.1	User guide for firmware upgrade lite tool
[2]	GSM_FW_UPGRADE_AN01_V1.01	GSM firmware upgrade application notes
[3]	OPEN_CPU_DGD_V1.1	OpenCPU Development Guide

1.2. Terms and abbreviations

Table 2: Terms and abbreviations

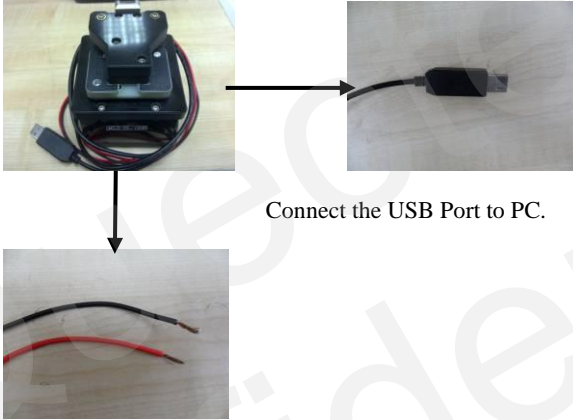| Abbreviation	Description
Core bin	The firmware bin provided by Quectel
App bin	The application bin file developed by Customer

2. Introduction of upgrading instruments

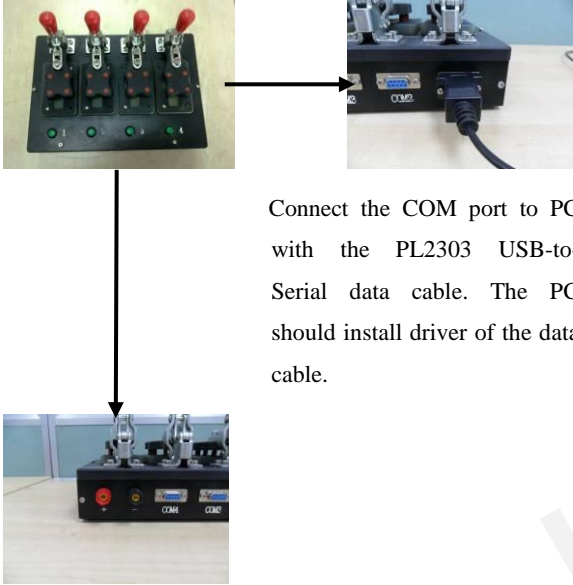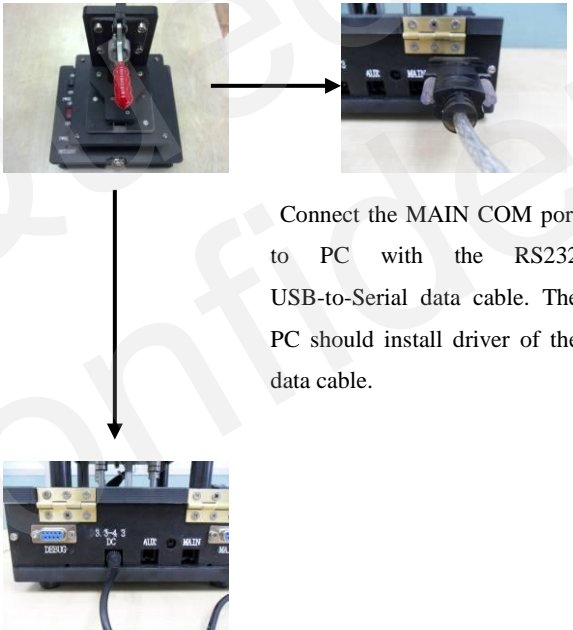Customer can select fixture or their own host board to upgrade the module.

There are three fixtures available for production.

◆Single downloading fixture

◆Multi downloading fixture

◆Function testing fixture

Single downloading fixture and function testing fixture can upgrade one module at one time. Multi downloading fixture can upgrade four modules at one time.

No.	Type	Graphical Representation	Characteristics
1	Single Downloading Fixture	 Connect the USB Port to PC. The red line should be connected to the positive of the power supply and the black should be connected to the negative. The output voltage of the power supply should be 3.8V to 4.2V.	With Data Cable; Power Supply is necessary

2	Multi Downloading Fixture	Connect the COM port to PC with the PL2303 USB-to-Serial data cable. The PC should install driver of the data cable. The red connector should be connected to the positive of the power supply and the black should be connected to the negative. The output voltage of the power supply should be 3.8V to 4.2V.	Power Supply and Data Cable (4) are necessary
3	Function Testing Fixture	Connect the MAIN COM port to PC with the RS232 USB-to-Serial data cable. The PC should install driver of the data cable. Connect the DC port to power socket with DC 5V Power Supply.	DC 5V Power Supply (6) and Data Cable (5) are necessary

4	PL2303 USB-to-Serial data cable.		Cooperate With Multi Downloading Fixture (2)
5	RS232 USB-to-Serial data cable		Cooperate With Function Testing Fixture (3)
6	DC 5V Power Supply		Cooperate With Function Testing Fixture (3)

3. Upgrading steps

Section 3.1 describes how to upgrade with fixture and section 3.2 describes how to upgrade in host board.

3.1. Upgrade with fixture

3.1.1.   Required equipments

Equipment	Quantity	Requirements
PC	1	WinXp/Win2000,With USB Port and Data Cable Driver
Fixture	1	Single or Multi
Data Cable	1	Cooperate with the suitable fixture
Power Supply	1	Cooperate with the suitable fixture

3.1.2.   Downloading tool and steps

If customer selects single downloading fixture or function testing fixture to upgrade the firmware, that is, upgrade one module at one time, the "Firmware_Upgrade_Tool_Lite" is available. User can upgrade it step by step as the document [1]FW_Upgrade_Tool_Lite_UGD_V1.1.

If customer selects multi-downloading fixture, the tool "Firmware_Upgrade_Tool_Multi" is provided. For the convenience of description, this tool is called "multi-ports tool" in this document. Compared with the Lite Tool, this tool can select multi-ports and then upgrade multi-modules simultaneously.

This document only introduces how to upgrade firmware using multi-ports tool.

 Upgrading Steps with multi-ports tool:
a)   Get firmware that will be upgraded
There are two kinds of bin file for OpenCPU module: Core bin and App bin. Core bin is the firmware bin file provided by Quectel. App bin is the bin file developed by OpenCPU and provided by Customer.

If you don't need update Core bin, you can skip the Core Update-related steps.
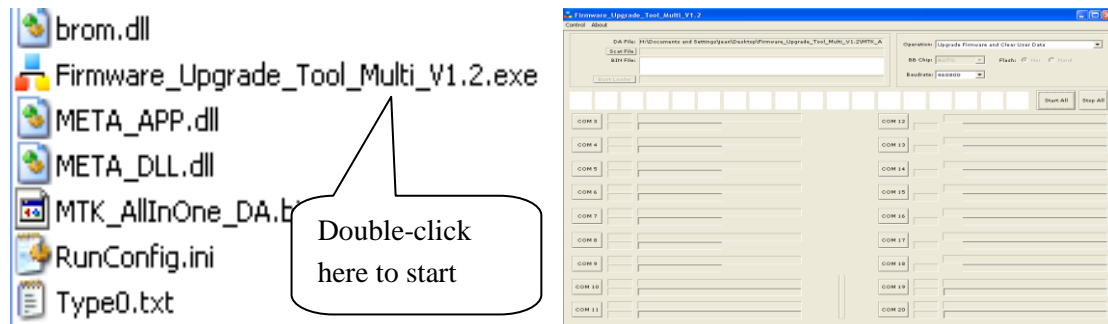
b)   Start the multi-ports tool as Figure 1:

Figure 1: Start the tool

c)   Set "Scat File" as figure 2.

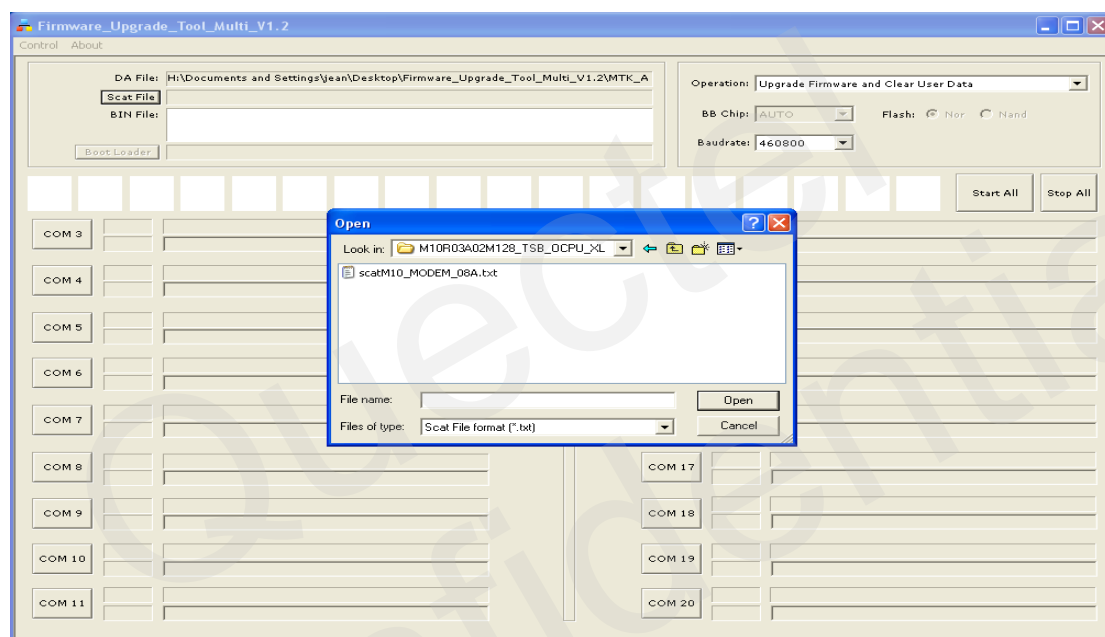Once the scat txt file is selected, the corresponding bin file will be shown in the "ROM file".

Figure 2: Set the Scat File

d)   Configure "Operation" and "Baudrate"

There are three choices for "Operation":

1)   Upgrade Firmware and Clear User Data

2)   Upgrade Firmware Only

3)   Clear User Data Only

Note:

1) For standard application, it's recommended to select "Upgrade Firmware and Clear User Data" to download Core bin.

2) For OpenCPU application, if user needs to upgrade both core bin and app bin, it's recommended to select "Upgrade Firmware and Clear User Data" to download Core bin at first, then select "Upgrade Firmware Only" to download App bin. If user just wants to upgrade app bin, it's recommended to select "Upgrade Firmware and Clear User Data".

3) It's recommended to select baudrate as "460800" if the serial port supports.

4) Section 4 provides the upgrading reference time for different memory size and baudrate.

e)   Properly connect data cable, power supply and the fixture as Figure 3:

Figure 3: Connection with fixture

f)   Put the module on the fixture according to the **right direction** as Figure 4:

Figure 4: Put the module on the fixture

g)   Turn on the power switch and the pwrkey switch as Figure 5

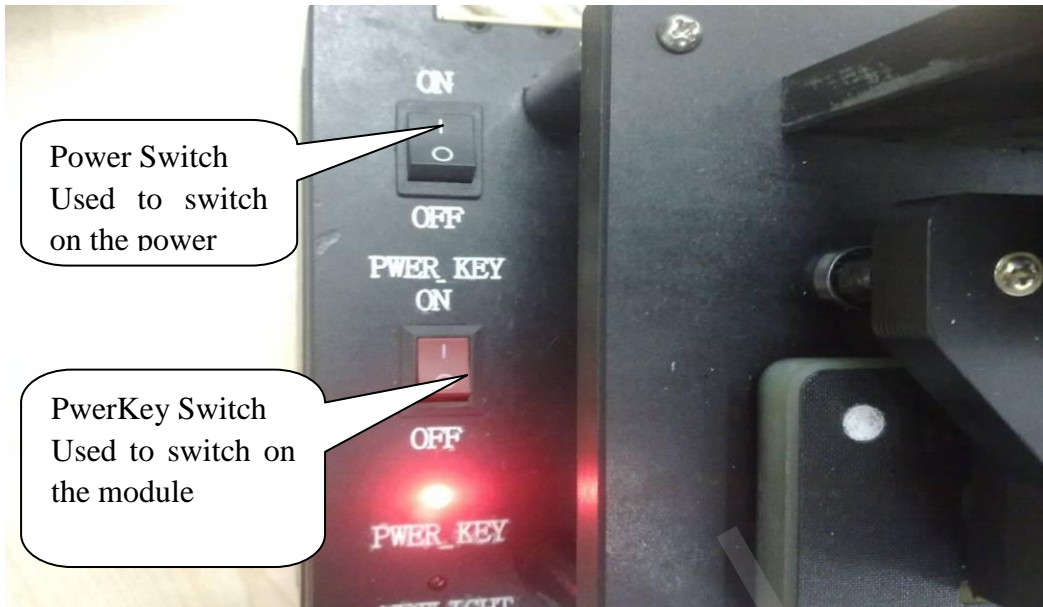**Figure 5: Turn on the power switch and the pwrkey switch**

h) Click the "Start All" button and push the fixture down, the tool will start to download software. When downloading is complete, the tool will prompt "PASS" or "FAIL" as figure 6 for com port connected with fixture.
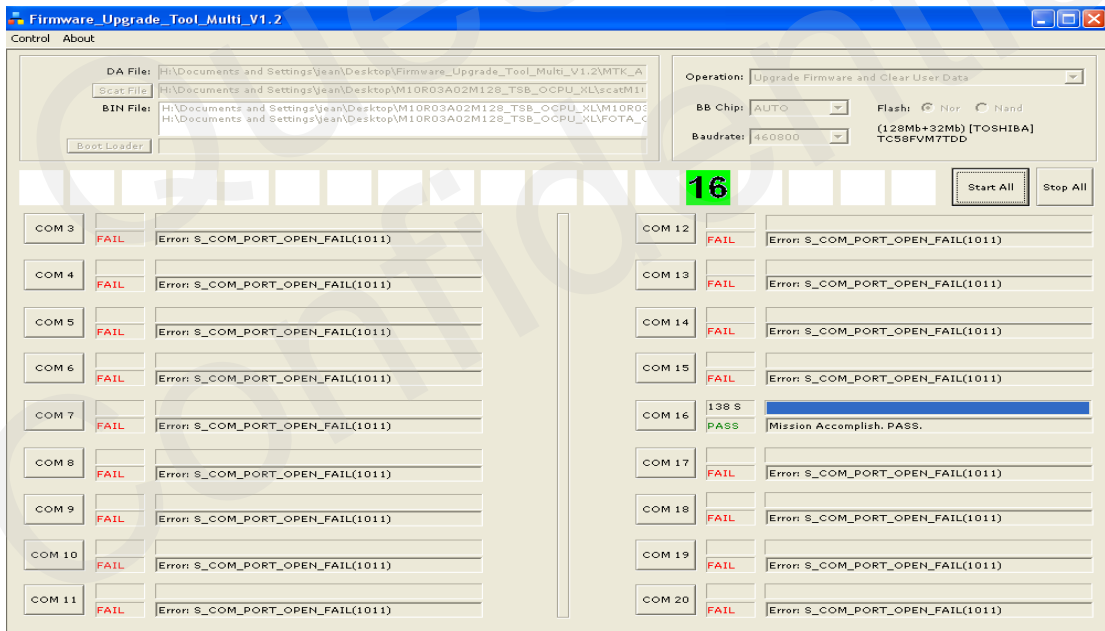

Figure 6: Finish upgrading

Note: When the tool prompts "FAIL", please check the connection of the fixture and repeat step g to i.

3.2. Upgrade with host board

Please refer to document [2]GSM_FW_UPGRADE_AN01_V1.01 about how to design and upgrade.

For standard application, it's recommended to select "Upgrade Firmware and Clear User Data" to download Core bin.

For OpenCPU application, if user needs to upgrade both core bin and app bin, it's recommended to select "Upgrade Firmware and Clear User Data" to download Core bin at first, then select "Upgrade Firmware Only" to download App bin. If user just wants to upgrade app bin, it's recommended to select "Upgrade Firmware and Clear User Data".

4. Time consumption for upgrading

The following table is the reference time (Unit: Second) of upgrading for different memory size and bin file size, baudrate and operation.

Table 3: Upgrading reference time

File size	Baudrate	Core bin，clear user data	App bin, not clear user data	App bin, clear user data
normal memory size (32+08 Mb) Core bin: 2,826,332 bytes App bin: 1,872 bytes	460800	180s	25s	47s
	230400	221s	27s	50s
	115200	362s	25s	49s
big memory size (128+32 Mb) Core bin: 2,936,180 bytes App bin: 1,740 bytes	460800	145s	25s	44s
	230400	232s	26s	49s
	115200	354s	26s	50s

5. Recommended process

To ensure the efficiency, customer can arrange one worker to upgrade core bin and app bin at the same time. The core bin upgrading process will take one computer that can be used to upgrade 4 or more modules at the same time. So, the average upgrading time will be reduced. To upgrade app bin, it is enough to use one computer to upgrade single module.
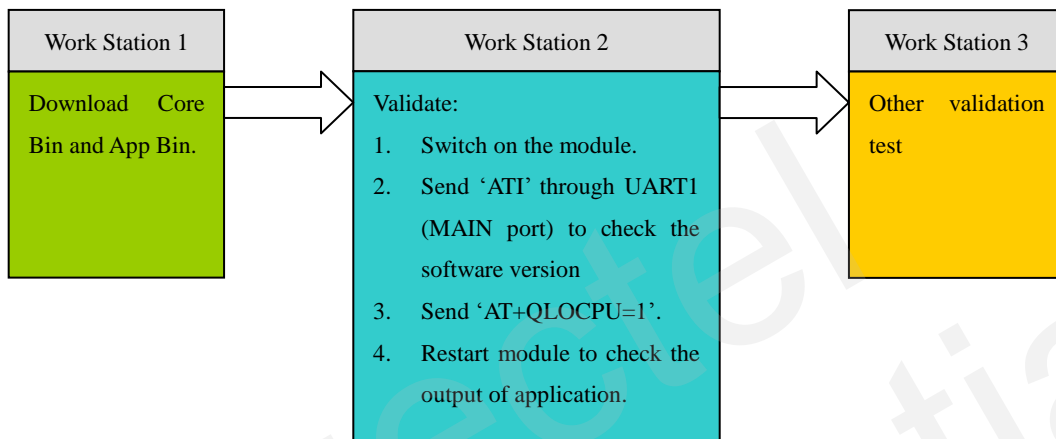
Work Station 1	Work Station 2	Work Station 3
Download Core Bin and App Bin.	Validate: 1. Switch on the module. 2. Send 'ATI' through UART1 (MAIN port) to check the software version 3. Send 'AT+QLOCPU=1'. 4. Restart module to check the output of application.	Other validation test

Figure 7: Recommended Process for OpenCPU

Shanghai Quectel Wireless Solutions Co., Ltd.

Room 501, Building 9, No.99, TianZhou Road, Shanghai, China 200233

Tel: +86 21 5108 2965

Mail: info@quectel.com