BC660K-GL&BC950K-GL

Log Capture Guide

NB-IoT Module Series

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About the Document

Revision History

Version	Date	Author	Description
-	2020-12-30	Jacobi RAO	Creation of the document
1.0	2021-03-29	Jacobi RAO	First official release
1.1	2023-04-25	Yance YANG/ Randy LI	Added the applicable module BC950K-GL.

Contents

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1 Introduction

This document is about how to capture logs of the Quectel BC660K-GL and BC950K-GL modules with a BC660K-GL-TE-B, BC950K-GL-TE-B and an EPAT tool. Consult this document to learn about the BC660K-GL-TE-B, BC950K-GL-TE-B the EPAT tool, port configurations for log capture and the concrete steps of capturing and saving logs.

If there is an abnormal restart, network registration error, data service error or even system crash in module debugging, refer to this document to capture logs for cause analyses.

1.1. Declaration of AT Command Examples

The AT command examples in this document are provided to help you familiarize with AT commands and learn how to use them. The examples, however, should not be taken as Quectel's recommendation or suggestions about how you should design a program flow or what status you should set the module into. Sometimes multiple examples may be provided for one AT command. However, this does not mean that there exists a correlation among these examples and that they should be executed in a given sequence.

2 Preparation

This chapter describes the tools, drivers and the runtime environment of EPAT required for capturing logs of the module.

The tools and drivers listed below are required:

- TE-B of the module
- QCOM of version 1.6 or later: Serial port communication tool.
- EPAT: Log capture tool
- USB-UART Driver: Ensure the port is available for use.

NOTE

For the use of the QCOM tool, see ***document [1]***.

2.1. TE-B Key Components

The BC660K-GL-TE-B and BC950K-GL-TE-B are shown in the figures below.

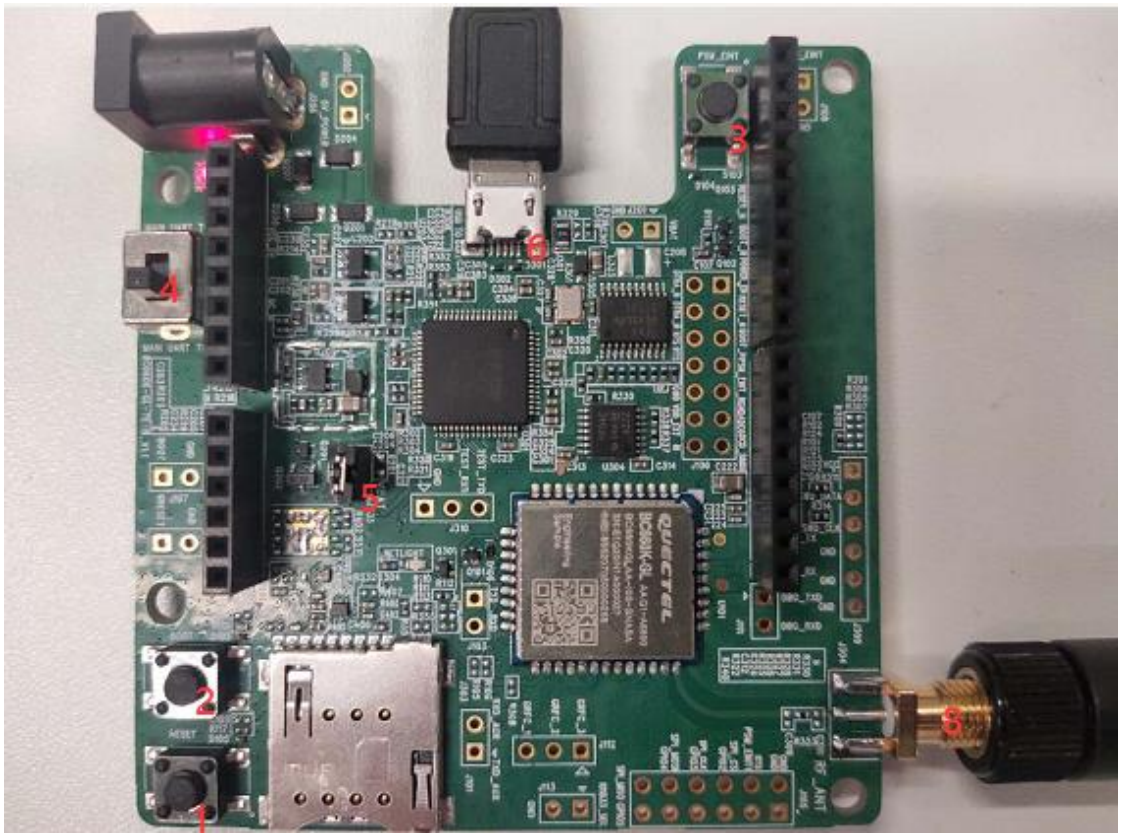

Figure 1: BC660K-GL-TE-B

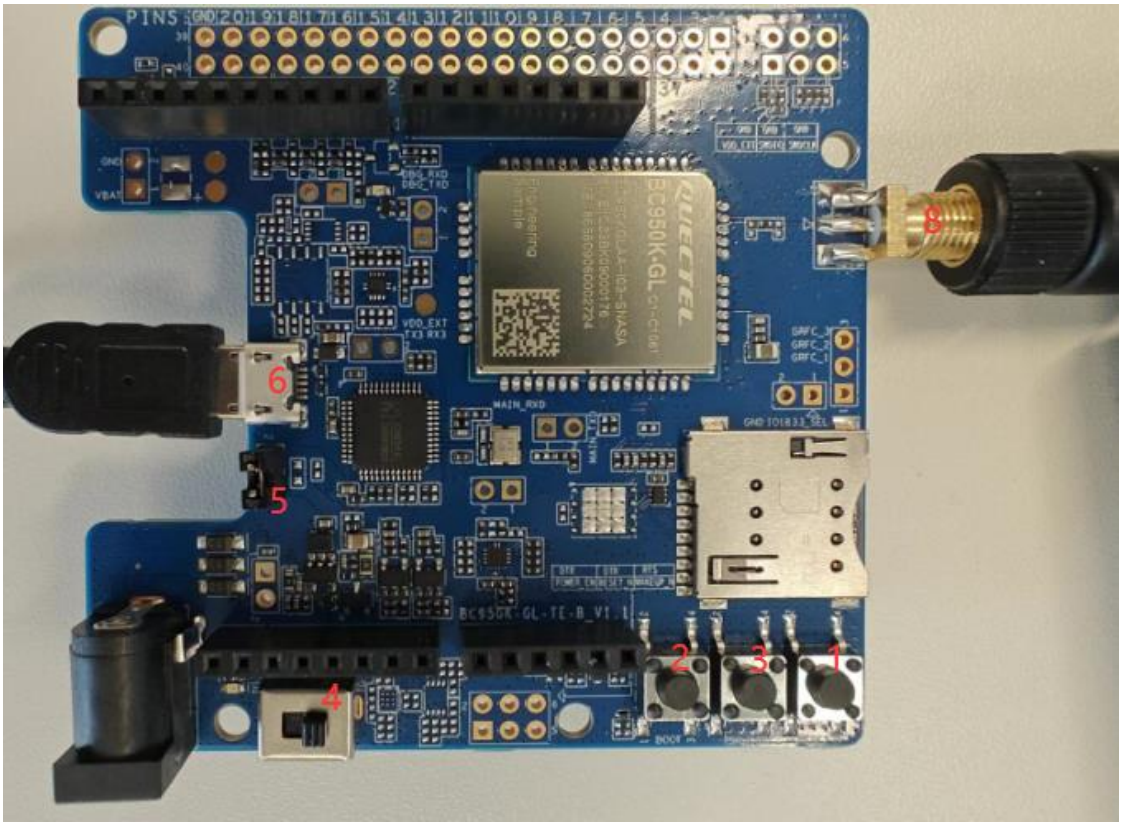

Figure 2: BC950K-GL-TE-B

A brief introduction to BC660K-GL-TE-B and BC950K-GL-TE-B is given below:

Table 1: Introduction to Key Components of BC660K-GL-TE-B and BC950K-GL-TE-B

SN	Components	Description
1	RESET button	Resets the module.
2	BOOT button	Downloads the firmware. Before firmware downloading, it is necessary to press BOOT first and hold it, and press RESET for a while, and then release the RESET and BOOT buttons in turn to trigger the firmware downloading.
3	PSM_EINT button	Wakes up the module from sleep.
4	UART switch	Controls the main serial port to connect the module or the external MCU.
5	Wire jumper cap	Connects the USB port on the TE-B to the module. If the USB port is not connected with the module, when USB is powered, the USIM card cannot be powered.
6	Micro USB port	Converts the UART port to 4 ports through a USB-UART bridge: one for AT command communication; one for log capture; and the rest are reserved.
8	Antenna port	Connects to an external antenna.

See ***document [2]*** and ***[3]*** for details about BC660K-GL-TE-B and BC950K-GL-TE-B.

2.2. EPAT Runtime Environment

EPAT is a log capture tool applicable to the module; it supports online log capture and offline log analyses for problem tracking, locating and module debugging.

For the EPAT to run normally, PC shall meet the requirements below:

1. Hardware Requirements

- CPU: Inter Core (Core i3 or above is recommended)
- Memory: 1 G (2 G or above is recommended)
- Hard Disk: 5120 MB available for use
- Interface: 2 USB ports (minimum)

2. Software Requirements

- Operating system: MS Windows 7, Windows 8.1 or Windows 10
- System operating environment: Microsoft Visual C++ 2015 Redistributable Package (x86) or Microsoft Visual Studio 2015

EPAT is a portable application that does not need to be installed. You can simply copy the package provided by Quectel to your PC, find the EPAT.exe under the Bin folder and double-click it to run the tool.

3 Tool Connection

3.1. Connection Configuration

Connect the module to the PC through the Micro USB port on the TE-B. After the connection completes, the PC will automatically install the USB-UART driver. After the driver is installed, the following 4 ports will appear on the PC:

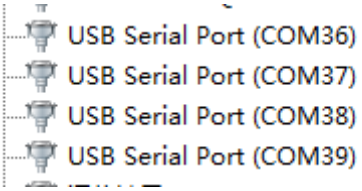

Figure 3: Communication Ports

Generally, the first port, “USB Serial Port (COM36)”, is used for AT communication, and the third port, “USB Serial Port (COM38)”, is used for log capture. Yet the port display order may vary with different PCs.

NOTE

The actual port names may be different from these shown in the figure above due to different drivers installed.

3.2. Connection Status Checking

3.2.1. Module Connection Status

Check the connection status of the module in the lower right corner of the EPAT tool.

Table 2: Module Connection Status

Icon	Status	Description
	Connected	EPAT can communicate with the module and capture logs.
	Unconnected	EPAT cannot find the module and thus cannot capture logs.
	Connection failed	EPAT fails to communicate with the module and thus cannot capture logs.

3.2.2. Module Database Status

Check the database (DB) status of the module in the upper left corner of the EPAT tool.

Table 3: Module Database Status

Icon	Status	Description
	DB inaccessible	EPAT fails to compare the Db.txt file with the target firmware since there is no database in the designated path or the path of the database has been changed without rebooting the module. In this case, update the DB file referring to ***Chapter 4.4*** or reboot the device.
	DB mismatched	Db.txt file does not match with the target firmware. In this case, update the DB file referring to ***Chapter 4.4***.
	DB matched	Db.txt file matches with the target firmware and EPAT is ready to capture logs.

4 Log Capture

To ensure the log messages are available for use and easy to analyze, you need to choose the right DB file and make an appropriate calibration of the single board. Please follow the steps below:

Step 1: Confirm that the module has been calibrated.
Step 2: Start the EPAT tool.
Step 3: Configure the baud rate for log capture.
Step 4: Select a database file.
Step 5: Capture the log.
Step 6: Save the log.

4.1. Calibration Confirmation

After connecting the module to the PC, confirm whether the module has been calibrated. All tests and applications of the module shall be performed in this mode, or the module may not work normally.

Run the following commands to check whether the module has been calibrated. If not, calibrate it for for the subsequent tests and applications.

```
AT+QRFSTAT
+QRFSTAT: NOT CALIBRATE      //The module has not been calibrated. Tests cannot be performed.

OK
AT+QRFSTAT
+QRFSTAT: CABLIBRATE         //The module has been calibrated. Tests can be performed and logs
                               captured.
OK
```

NOTE

See ***document [4]*** for details on **AT+QRFSTAT**, which is under development.

4.2. EPAT Startup

The window below pops up when you open EPAT for the first time. Select "**Serial Device**" in the window:

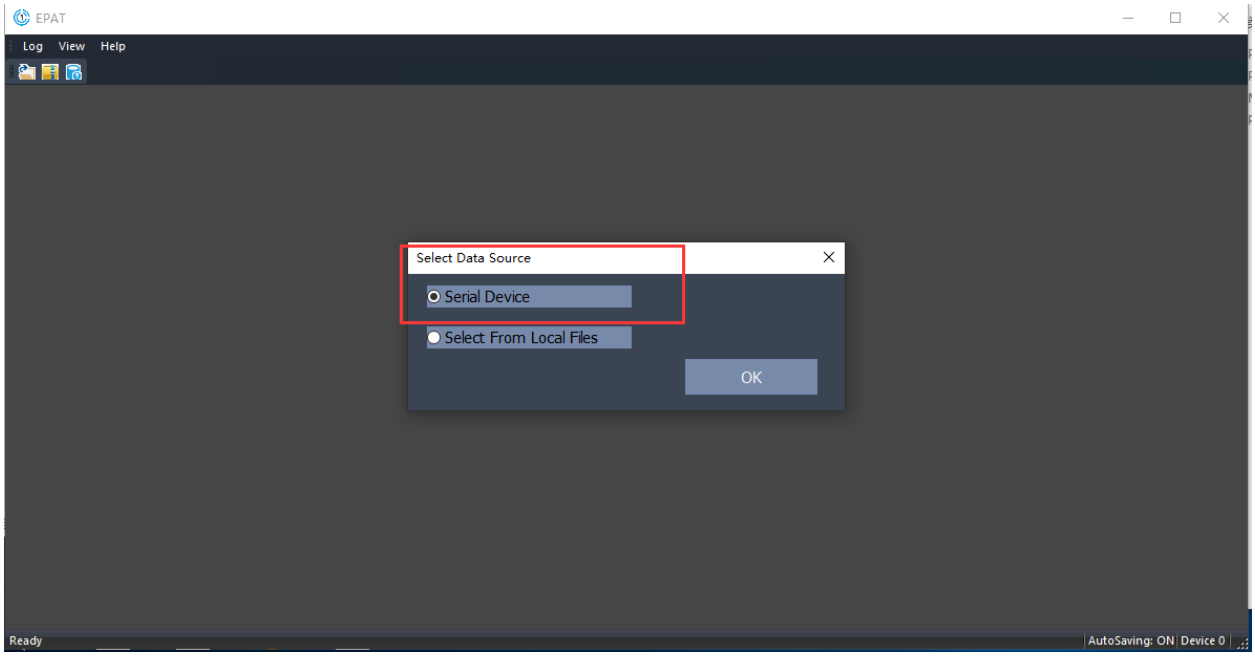

Figure 4: Select Data Resource

If EPAT is not opened for the first time, you need to click the button marked in the red frame below to open the above window:

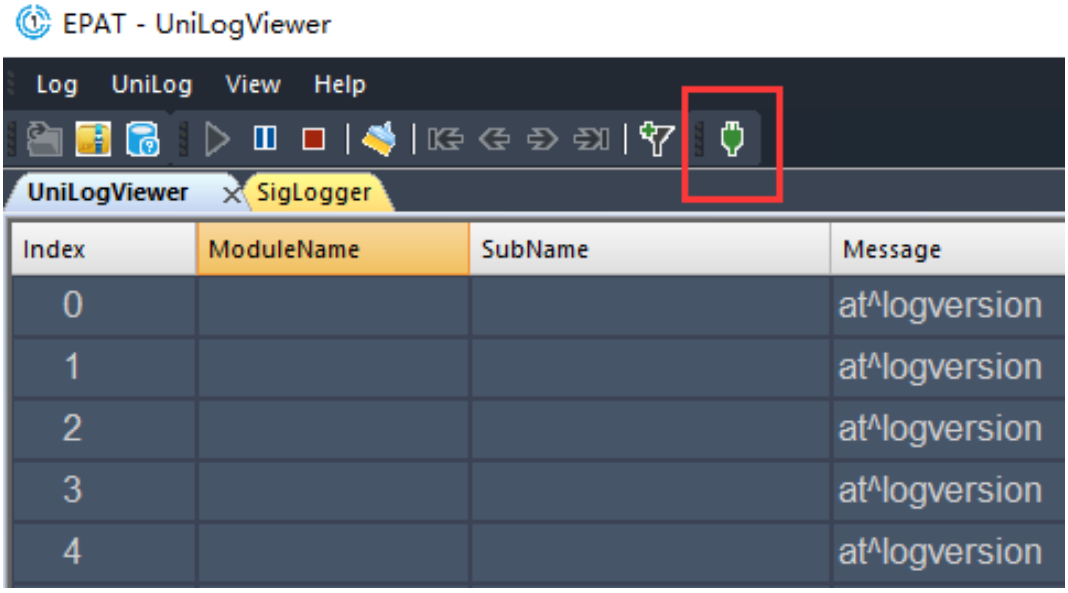

Figure 5: Open the Resource Selection Window

4.3. Logging Port Baud Rate Configuration

It is necessary to select the logging port and a baud rate on EPAT and execute **AT+QCFG** on the PC to configure the baud rate of the logging port while ensuring the configurations are consistent.

After "**Serial Device**" is selected, the window below will appear, click "**Settings**" for port setting.

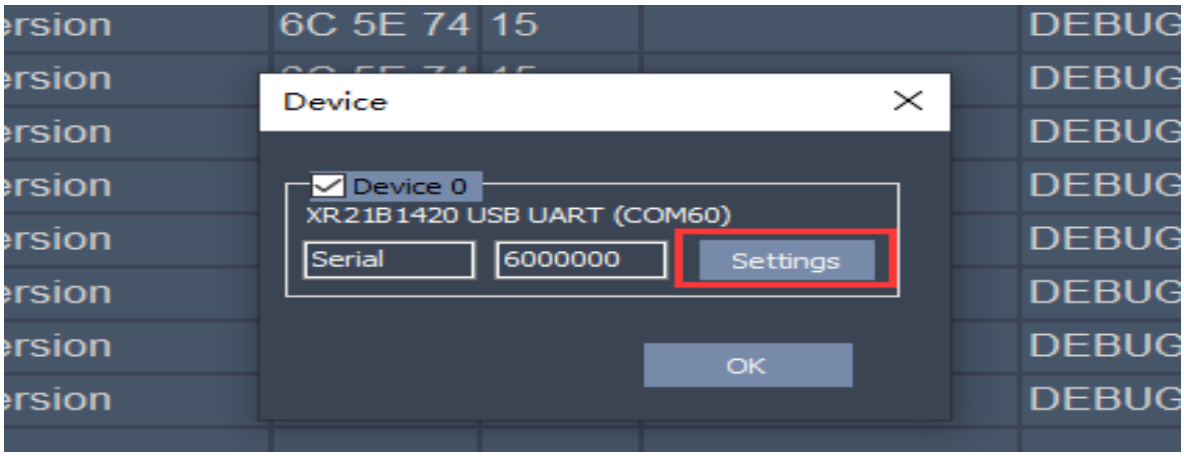

Figure 6: Select Device

Select the logging port and its baud rate:

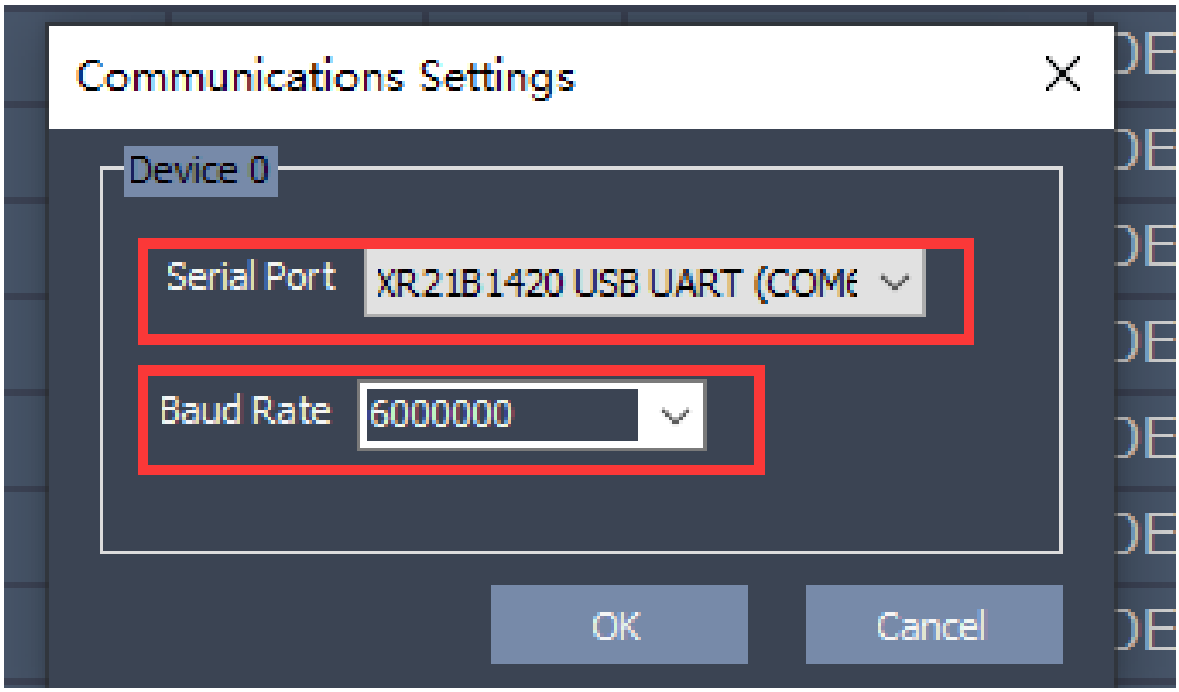

Figure 7: Select Port and Baud Rate

Run the command below on the AT port to set the baud rate of the logging port:

```
AT+QCFG="logbaudrate",6000000          //Set the baud rate to 6 M.
OK
```

NOTES

1. It is strongly recommended to set the baud rate to 3 M or higher. Otherwise, a lot of log messages may be lost, resulting in failures in later problem analyses.
2. For the details about **AT+QCFG**, see ***document [4]***.

4.4. Database File Selection and Updating

Different firmware versions require different database files to decode the firmware correctly, so it is necessary to select the correct database file before capturing logs.

Click the icon in the upper left corner of EPAT to open the database window, as follows:

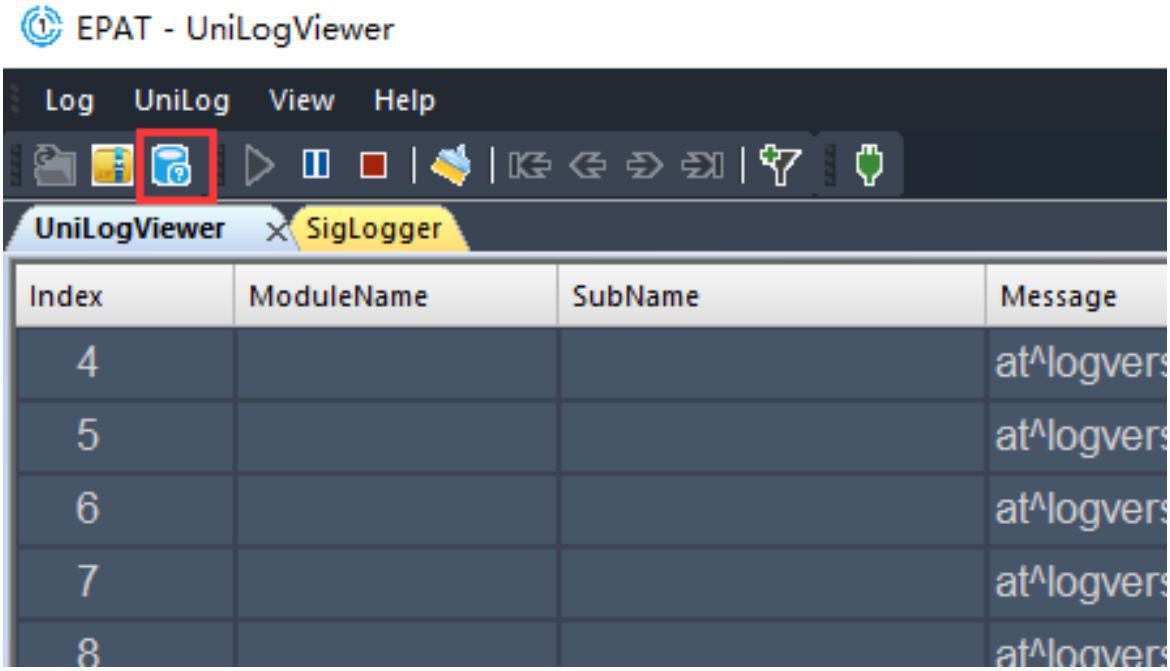

Figure 8: Open the Database Window

In the pop-up window, click "**Update**" to update the database file:

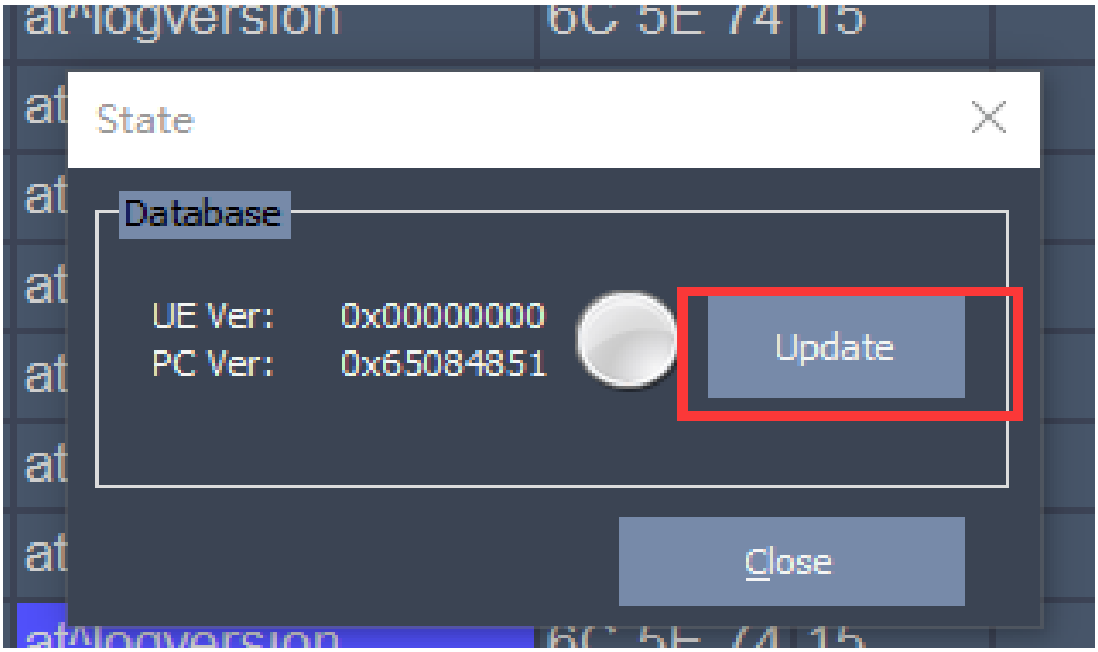

Figure 9: Update the Database File

Select a path to store the database file. Click "**Update**" to update the database, and then wait for the update to complete.

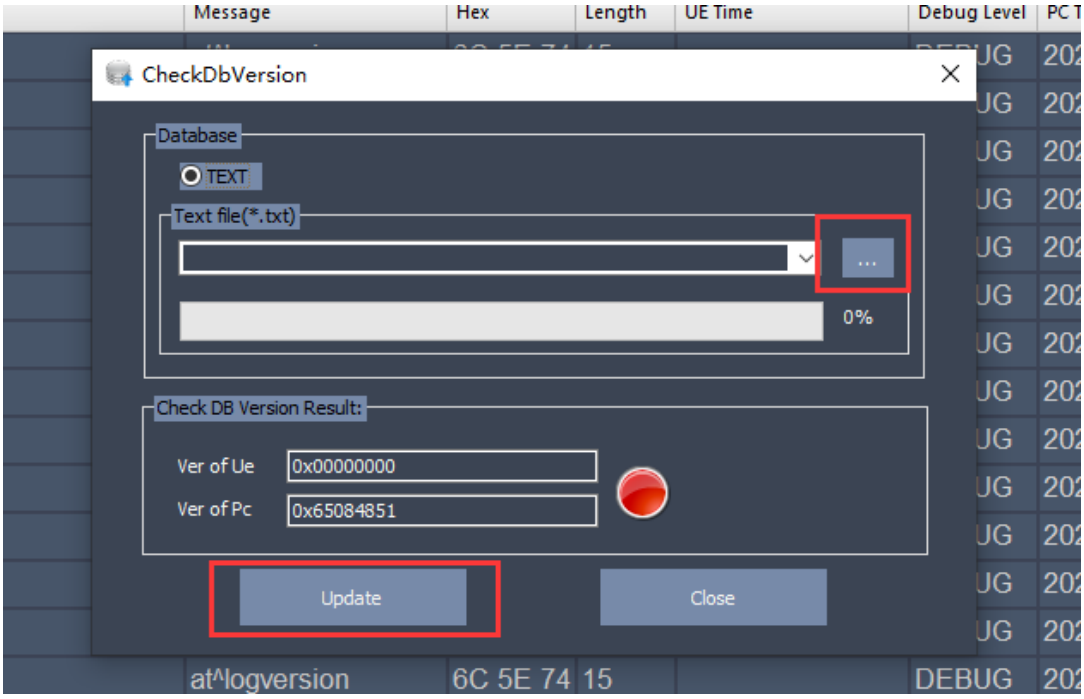

Figure 10: Select Database File Path

4.5. Log Capture

Click the start/pause/stop/clear icons in the upper left corner to control log capture flow.

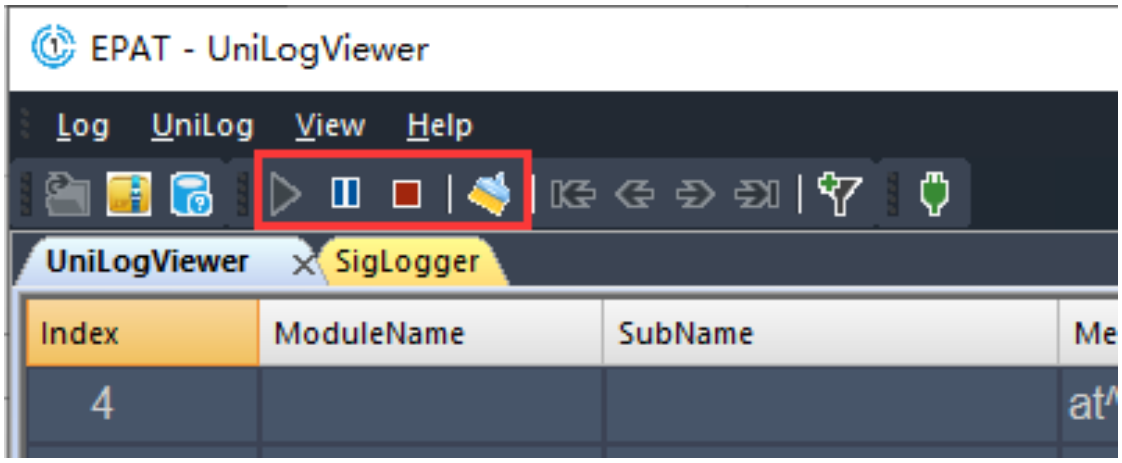

Figure 11: Icons to Control Log Capture

Table 4: Introduction to EPAT Icons

Icon	Function	Description
	Start/Resume	Start capturing logs or resume capturing logs after a pause. The viewer refreshes the logging page automatically.
	Pause	Pause log capture for a view of the logs. You can continue to capture logs later.
	Stop	Stop log capture. At this time, you cannot add new logs to the log file.
	Clear	Clear the captured logs in display.

4.6. Log Saving

4.6.1. Manual Log Saving

In EPAT, click "**Save**" on the toolbar or press the **CTRL** + **S** shortcut key to select in the pop-up window a path to save logs, as follows:

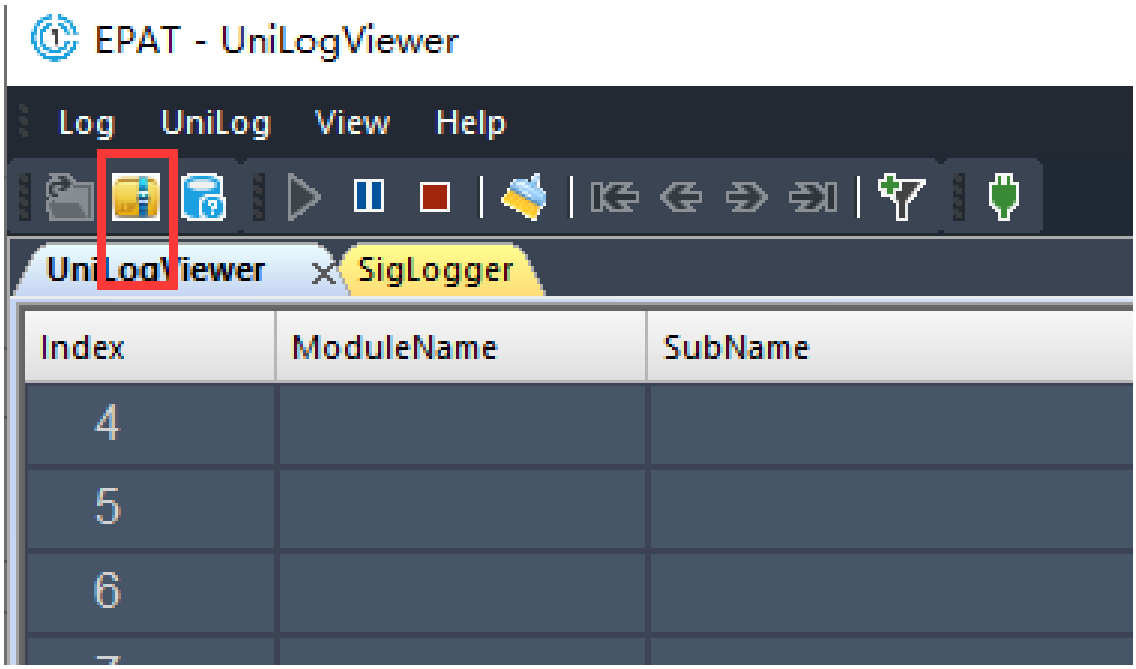

Figure 12: Save Logs Manually

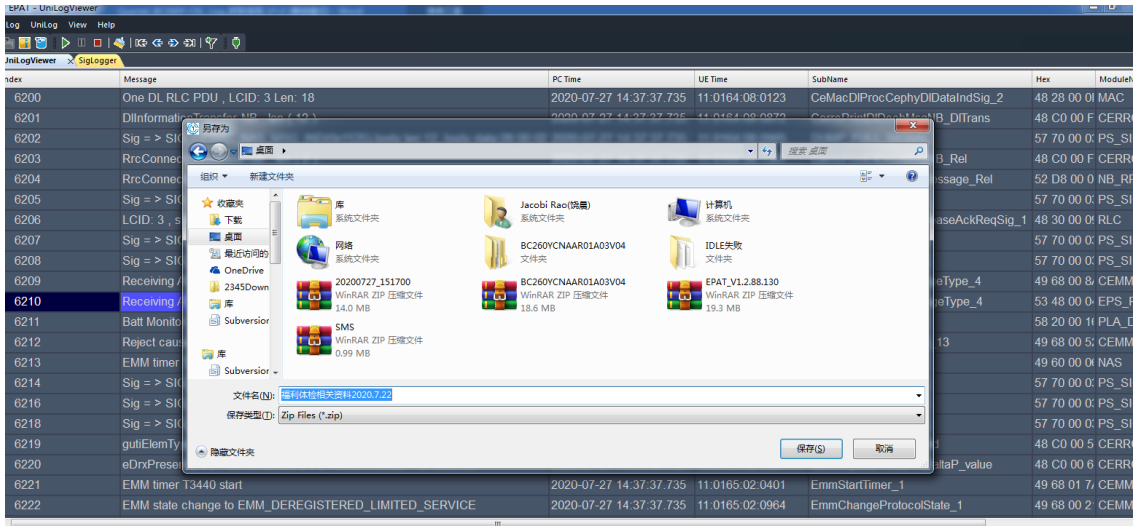

Figure 13: Select Log Saving Path

The window below indicates that the log file has been saved successfully. The current time will be used by default as the name of the log file, you can modify it for identification.

Figure 14: Manual Log Saving Successful

4.6.2. Automatic Log Saving

Click "**Log**"→"**Preference**" on the main menu of EPAT, and you can enable automatic log saving in the pop-up window.

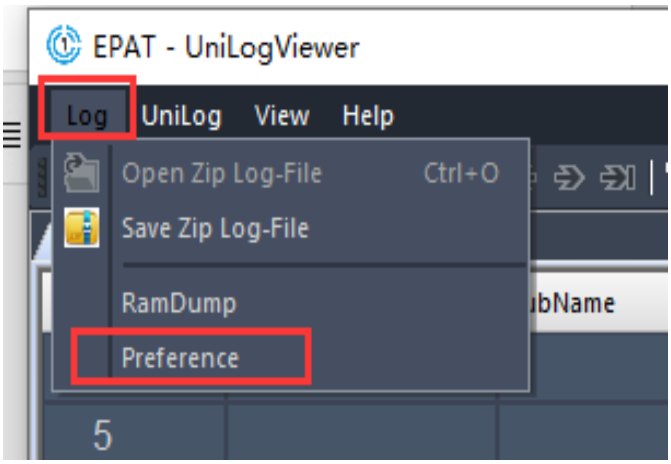

Figure 15: Enable Automatic Log Saving

Check "**AutoSave Log File**" in the pop-up window, and set the size (cannot exceed 1000 MB) of the log file to be saved automatically and the path to which the file is saved, click "**OK**" to save the configurations.

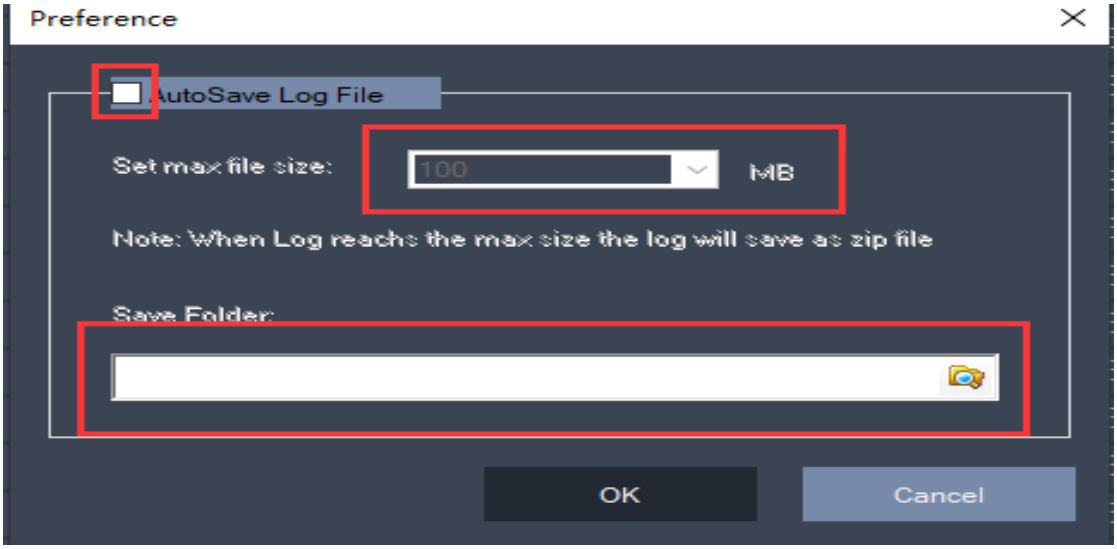

Figure 16: Automatic Log Saving Configurations

The window below indicates that the log file has been saved successfully.

Figure 17: Automatic Log Saving Successful

5 FAQs

5.1. How to solve the problem of DB file mismatch?

The DB file is used to decode the log messages. If it does not match with the target firmware, it will cause decoding errors or exceptions, which are hard to detect, thus bringing difficulties to problem analyses. Therefore, it is important to ensure that the DB file matches with the target firmware. If it does not match, please update the DB file referring to ***Chapter 4.4***.

5.2. How to get the DB file?

Generally, the DB file is included in the firmware package and in the file name "comdb.txt". If you don't have the firmware package, or cannot find the DB file therein, or you get a mismatched DB file, please contact Quectel Technical Support.

5.3. Can the baud rate of the logging port be modified?

Yes, you can modify it referring to ***Chapter 4.3***. The default baud rate for log capture is 6 M. Note that the baud rate of the logging port should be modified both on EPAT and using **AT+QCFG="logbaudrate"**. For details on this command, see ***document [4]***.

5.4. What to do when the module cannot connect to PC?

When the module connects to a PC, Windows system will search for and install a USB-UART driver for the connection. If the PC is not connected to the network, the driver cannot be downloaded. In this case, you need to download the driver on another PC and install it on the PC to be used for the log capture. If the PC fails to find any appropriate driver, please download a diver detection tool, such as Driver Magician, DriverMax, etc., to search for the driver automatically, or contact Quectel Technical Support for support.

5.5. What to do when the module cannot connect to EPAT?

If the module cannot connect to EPAT, check whether it is connected to the PC correctly.

If it is connected to the PC correctly, check whether the port selected for log capture is correct.

If the port is incorrect, try other ports to find the correct one.

If you have tried all ports and still cannot find a suitable one, check whether the baud rate is correct.

If the baud rate set on EPAT is inconsistent with the baud rate set with **AT+QCFG**, garbled data may be output.

If the USB-UART bridge chip does not support the baud rate you configured, nothing will be output. To solve that, you need to modify the configuration so that the baud rate adapts to the chip.

6 Appendix References

Table 5: Related Documents

Document Name
[1] Quectel_QCOM_User_Guide
[2] Quectel_BC660K-GL-TE-B_User_Guide
[3] Quectel_BC950K-GL-TE-B_User_Guide
[4] Quectel_BC660K-GL&BC950K-GL_AT_Commands_Manual

Table 6: Terms and Abbreviations

Abbreviation	Description
DB	Database
FAQ	Frequently Asked Questions
NB-IoT	Narrow Band Internet of Things
PC	Personal Computer
SIM	Subscriber Identification Module
UART	Universal Asynchronous Receiver/Transmitter
UE	User Equipment
USB	Universal Serial Bus
(U)SIM	(Universal) Subscriber Identity Module