

EC200U&EG91xU Series

QuecOpen(SDK) Log

Capture Guide

LTE Standard Module Series

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About the Document

Revision History

Version	Date	Author	Description
-	2021-12-23	Jensen FANG/ Kevin WANG	Creation of the document
1.0	2022-01-19	Jensen FANG/ Kevin WANG	First official release
1.1	2023-09-08	Ryan YI	<ol style="list-style-type: none">1. Updated the document name based on the unified QuecOpen naming.2. Added applicable modules EG912U-GL and EG915U series.3. Updated the versions of log capture tools.4. Updated the USB driver installation package version and “Ports in Device Manager” picture (Chapter 2.1.1).5. Updated the startup interface of Blue Screen Dump (Figure 14).6. Updated the parameter description of AP log port configuration API (Chapter 4.1).

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1 Introduction

Quectel EC200U and EG91xU family modules support QuecOpen[®] solution. QuecOpen[®] is an embedded development platform based on RTOS, which is intended to simplify the design and development of IoT applications. For more information on QuecOpen[®], see **document [1]**.

This document is applicable to QuecOpen[®] solution based on SDK build environment. It takes EC200U-CN as an example to introduce how to capture log information on the EC200U and EG91xU family modules, including environment setup, log capture tool acquisition and specific operation steps, and dump analysis and saving. During module debugging, issues like abnormal restarts, network registration issues, data service interruptions, or module crashes can be addressed by referring to this document for a comprehensive problem analysis.

1.1. Applicable Modules

Table 1: Applicable Modules

Module Family	Module
-	EC200U Series
EG91xU	EG912U-GL
	EG915U Series

2 Environment Setup

2.1. Software Environment

2.1.1. Driver Installation

The first step in configuring the software environment involves driver installation. In the sections below, we will illustrate this process using the USB driver package *Quectel_Windows_USB_Driver(U)_For_ECM_RNDIS_V1.0.15.zip* as an example. Begin by extracting the package and installing the USB driver according to the provided installation instructions.

NOTE

Please contact Quectel Technical Support (support@quectel.com) to obtain the latest USB driver package.

After the driver is installed, you can check whether the ports work normally in the Device Manager, as shown below:

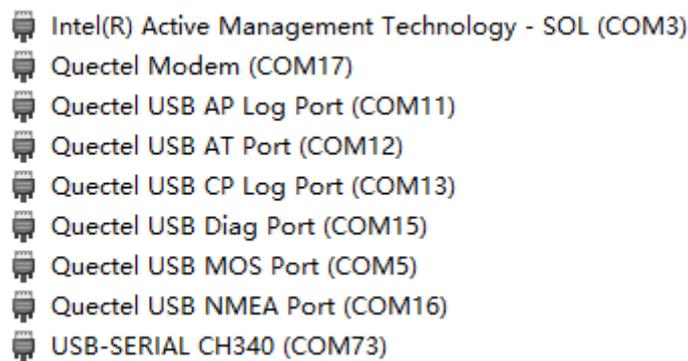


Figure 1: Ports in Device Manager

Among the ports shown in the above figure, Quectel USB AP Log Port is an AP log port and Quectel USB CP Log Port is a CP log port. The USB Serial Port (COM73) in this document is debug UART, which can be used to output AP logs.

2.1.2. Tool Acquisition

The tools mentioned in this document are shown in the following table. Please contact Quectel Technical Support (support@quectel.com) to obtain the latest version of the tools if necessary.

Table 2: Tool Overview

Tool	Description
<i>cooltools-win32_custom_R3.P2.01.001.7z</i>	AP log capture tool, installation-free.
<i>ArmTracer_V6.4.6_User.7z</i>	CP log capture tool, installation-free.
<i>gdb-win32_custom_P3.R2.0.0005.7z</i>	Dump analysis tool.

2.1.3. Log Capture Tool

The AP log capture tool used is *cooltools-win32_custom_R3.P2.01.001.7z*. It is an installation-free tool and can run directly after decompressing. If you use the Debug UART to capture AP log, run *coolwatcher_debughost.exe*. If you use Quectel USB AP Log Port to capture AP log, run *coolwatcher_usb.exe*.

If AP dump analysis is needed, you should place the decompressed subdirectories and files of *gdb-win32_custom_P3.R2.0.0005.7z* in the root directory of *cooltools*.

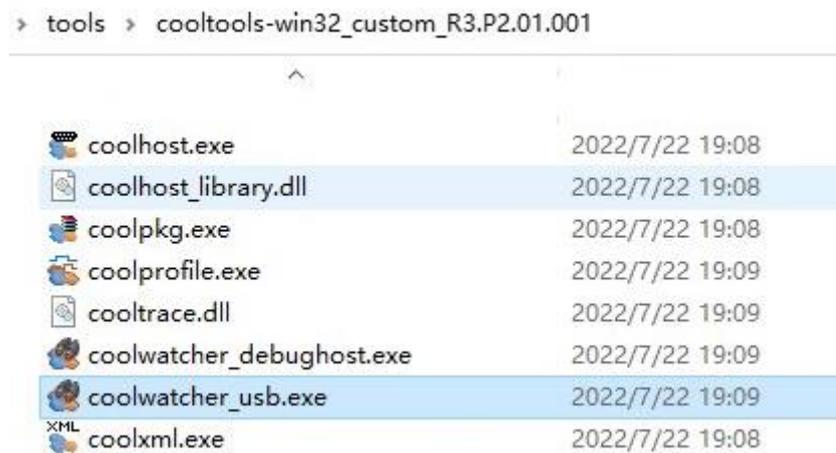


Figure 2: cooltools

The CP log capture tool used is *ArmTracer_V6.4.6_User.7z*. It is an installation-free tool and you can execute *ArmTracer.exe* after decompressing.

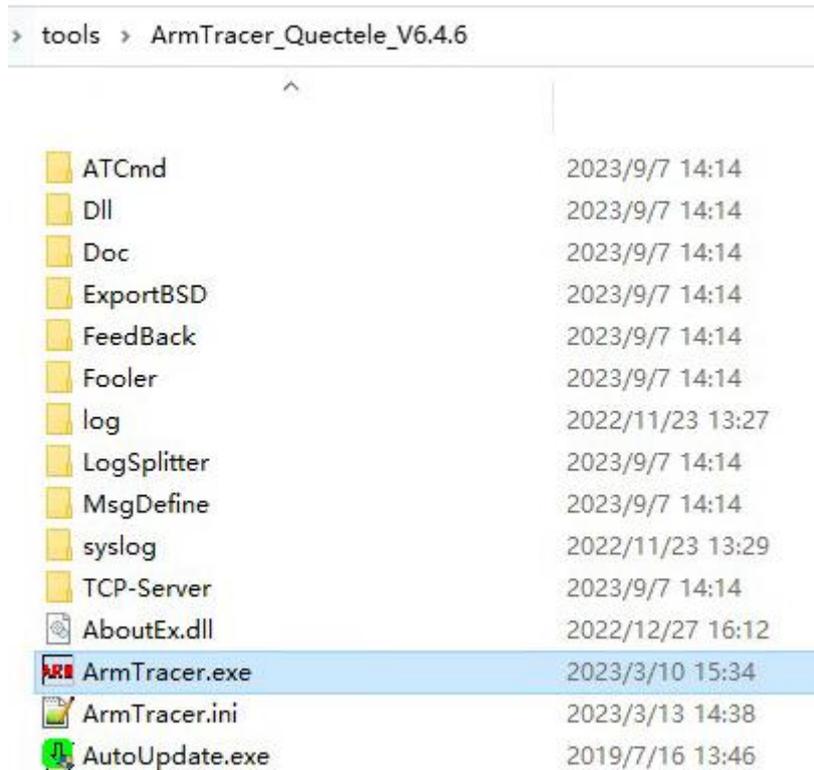


Figure 3: ArmTracer

2.2. Hardware Environment

You can use Quectel EC200U-CN TE-A or your device to capture log.

The default output port of AP log of EC200U-CN module is Quectel USB AP Log Port (currently the log is outputted from Debug UART during the startup of the module). If you use Debug UART to capture AP log, note that the baud rate of Debug UART of the module needs to be set to 921600 bps. However, because RS-232 serial port chip on LTE OPEN EVB does not support 921600 bps, AP log cannot be captured on DB9 of EVB when you use EC200U-CN TE-A. If you must use Debug UART to capture AP log, you need to separately jump a wire to the serial port conversion board supporting 921600 bps. Note that the level of the module is 1.8 V when you jump the wire.

If you use your device for log capture, you need to reserve serial port or USB port for this purpose. To facilitate this, it is recommended to reserve designated test points when you design the hardware circuit, otherwise you need to manually connect a wire to TX and RX pins of the Debug UART when capturing logs.

3 Procedures

3.1. AP Log Capture with cooltools

The procedure of AP log capture with cooltools is explained in this chapter on Debug UART example. Please refer to *Coolwatcher User Guide* in the *cooltools/doc* directory for details.

3.1.1. Configuration in cooltools

After opening cooltools, configure the module type and log port manually. As shown in the figure below, the module type on the left is fixed to “8910”, and the log port (lastcomport) is configured according to the actual port number. Click “OK” to go to the next step after the configuration is completed.

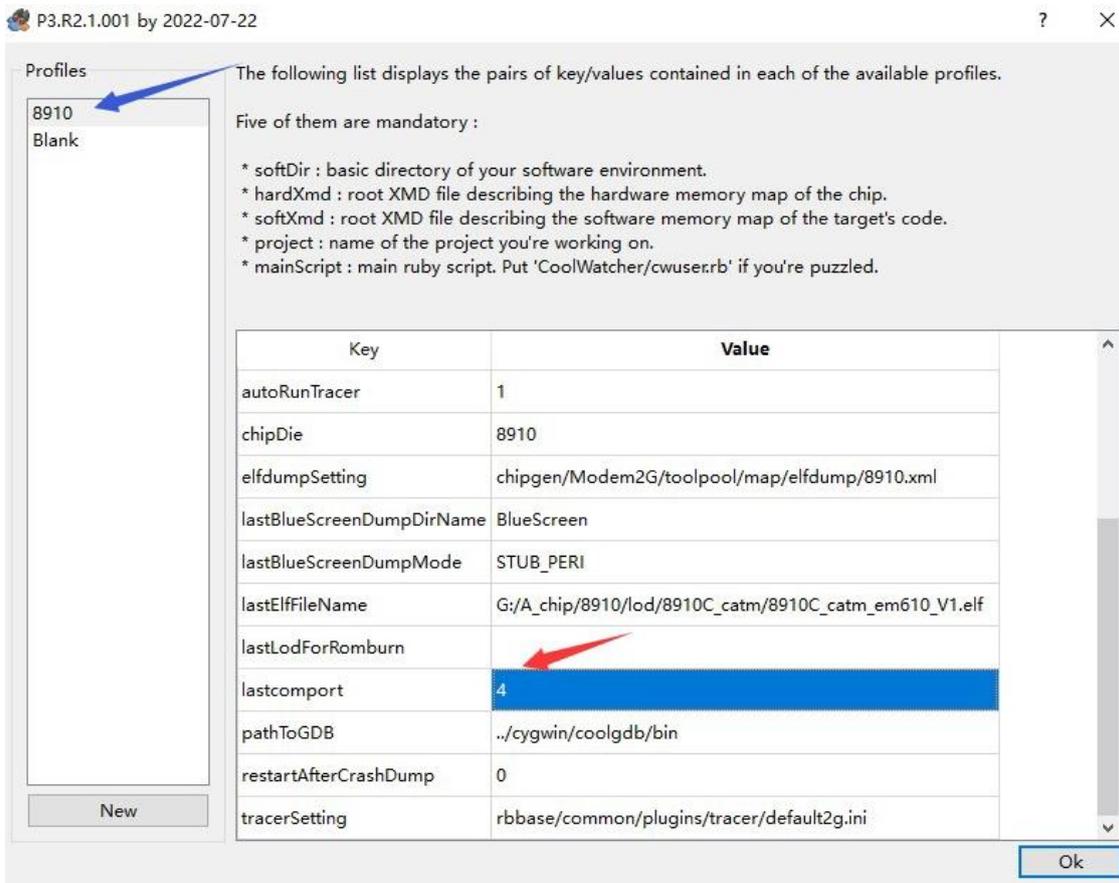


Figure 4: Module Type and Serial Port Configuration in cooltools

If the above configuration fails, the Coolhost window will appear, indicating a potential issue, such as invalid port number. To troubleshoot the issue, you can check port number accuracy in Device Manager and modify it on Coolhost window.

To address the issue, enter the COM configuration page, and select the corresponding port (configured as COM4 in this document). Confirm your port selection and click **“Reconnect”** to reconnect the port. Keep in mind that certain parameters are fixed and cannot be modified. Specifically, flow control cannot be modified, the flow control of Debug UART is fixed as XON/XOFF, while that of USB AP Log port is fixed as None. For Debug UART, the baud rate must be set to 921600 bps and remain unchanged. Note that the serial port chip must support 921600 bps. See **Chapter 2.2** for details.

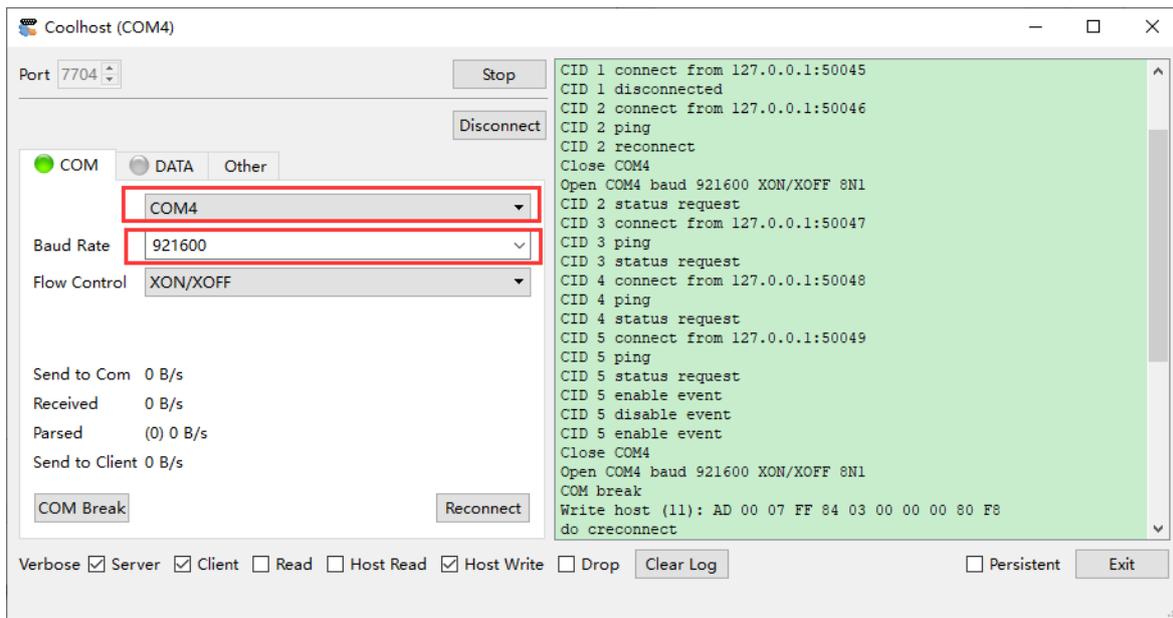


Figure 5: Coolhost Window

NOTE

See **Chapter 4** for details on the methods to configure AP log port.

3.1.2. AP Log Capture

Once you have opened and configured the cooltools, enter the cooltools home page, and select **“Activate Tracer”** in the **“Plugins”** drop-down menu to start the Trace tool plug-in:

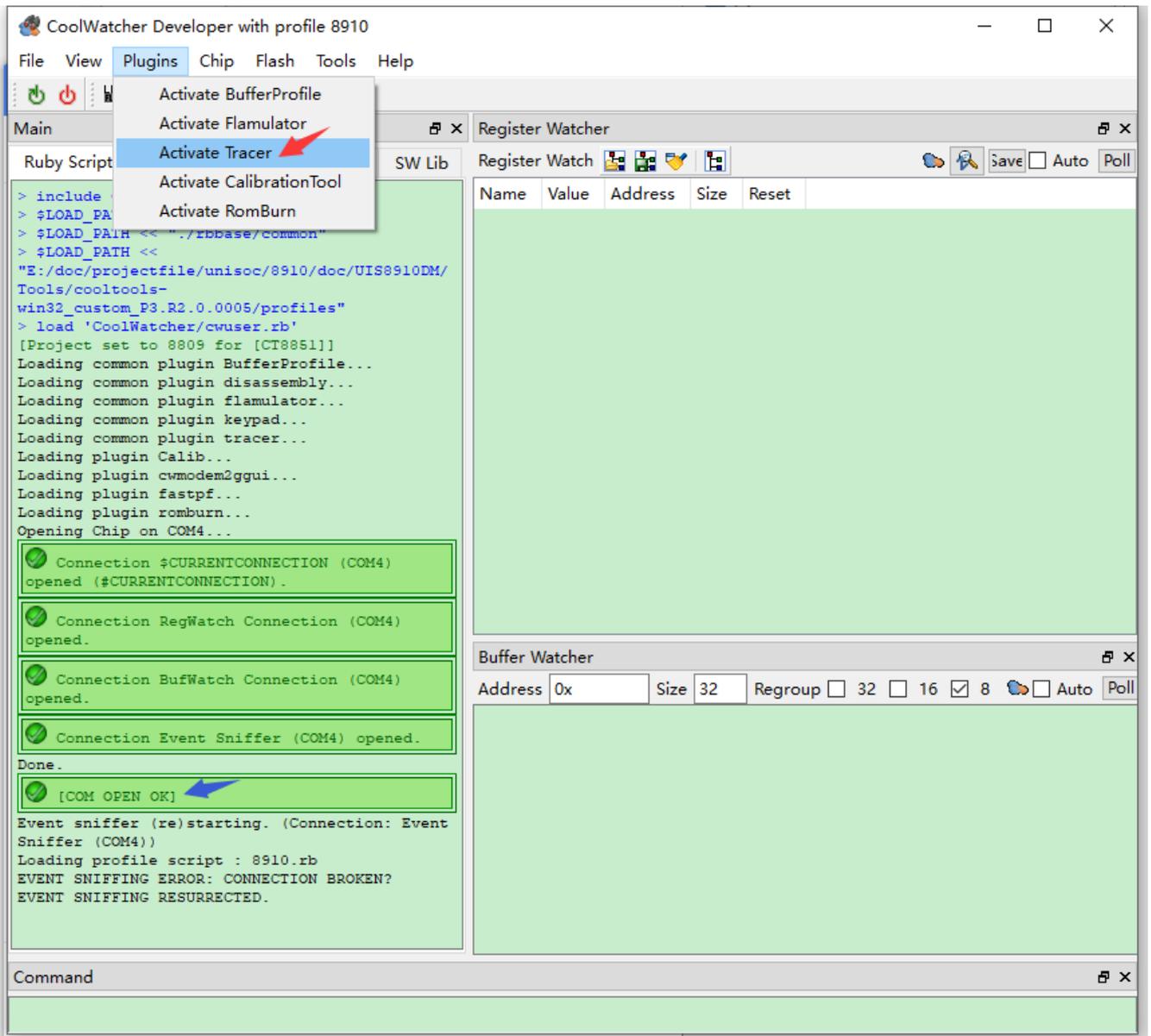


Figure 6: cooltools Home Page

Enter the Trace tool window after starting the Trace tool plug-in, as shows below:

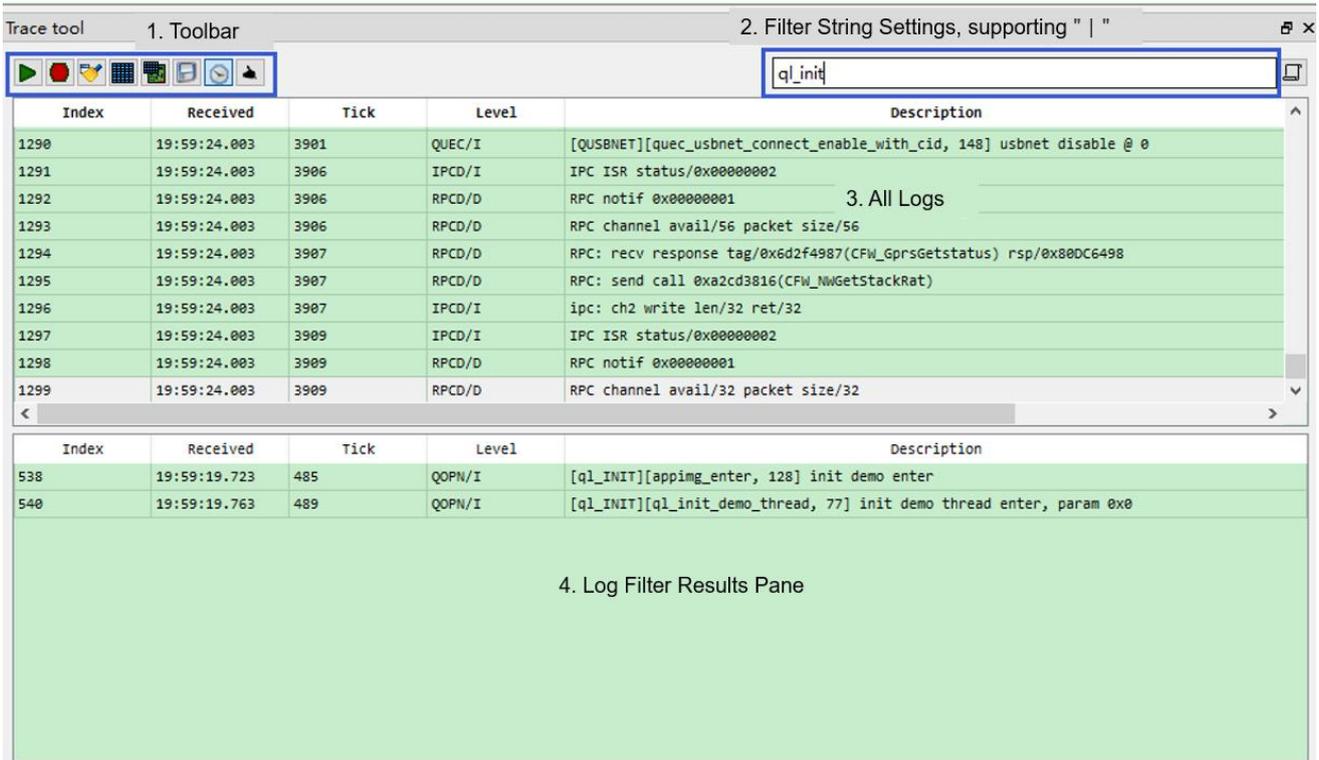


Figure 7: Trace tool Window

The functions of the toolbar icons in the upper left corner from left to right are respectively “Start”, “Stop”, “Clear”, “Set Trace Levels”, “Reapply Trace Levels”, “Save”, “Open/Close the Received column”, and “Enable/Disable Comment”. Additionally, the bar in the upper right corner allows input of keyword strings for log filtering. Multiple keywords can be searched simultaneously by adding “|”.

Click “” to open “**Set Trace Levels**” window. Here, you can customize various settings, including automatic log saving, single log file size, log storage directory, row limit for displayed logs, and automated Wireshark log capture, as shown below:

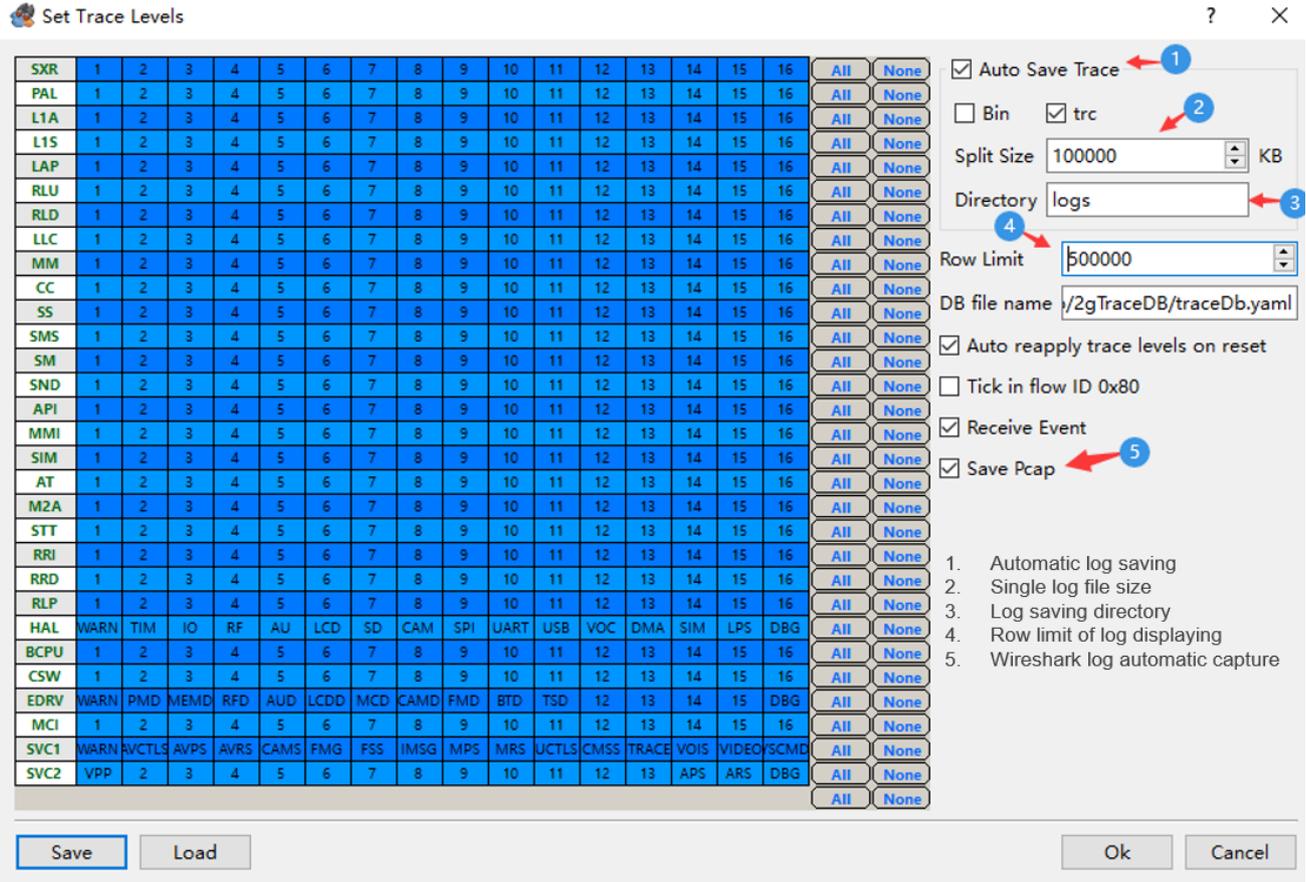


Figure 8: Set Trace Levels

For longer log capturing, it is recommended to set “Split Size” and “Row Limit” to higher values. By default, the log is stored in the *logs* in cooltools directory. You can rename this directory, but keep in mind the available disk space on that location. You can click “Save” to save the log to a customized directory or copy the log from the default directory to the target directory.

NOTE

The default location of Wireshark log is the same as that of the AP log. As a result, the Wireshark log will be automatically captured alongside AP log.

3.2. CP Log Capture with ArmTracer

CP logs, generated by the modem's protocol stack, offer insights into data transmission and network issues. You can analyze and capture CP logs via Quectel USB CP Log Port with ArmTracer. Please refer to *ArmTracer User Guide* in the *ArmTracer/doc* directory for details.

Run *ArmTracer.exe* to open the ArmTracer. Begin by configuring and verifying the log port. Generally, only “**Device Port**” number needs to be configured. If log capture is prolonged, it is recommended to increase the single file size (e.g., to 100 MB) by modifying “**Trace File Size**”. After configuring, click “**OK**” to go to the next step.

If there is no CP log output, check whether the module is in dump state; if not, check whether the log output port matches the port opened by the ArmTracer.

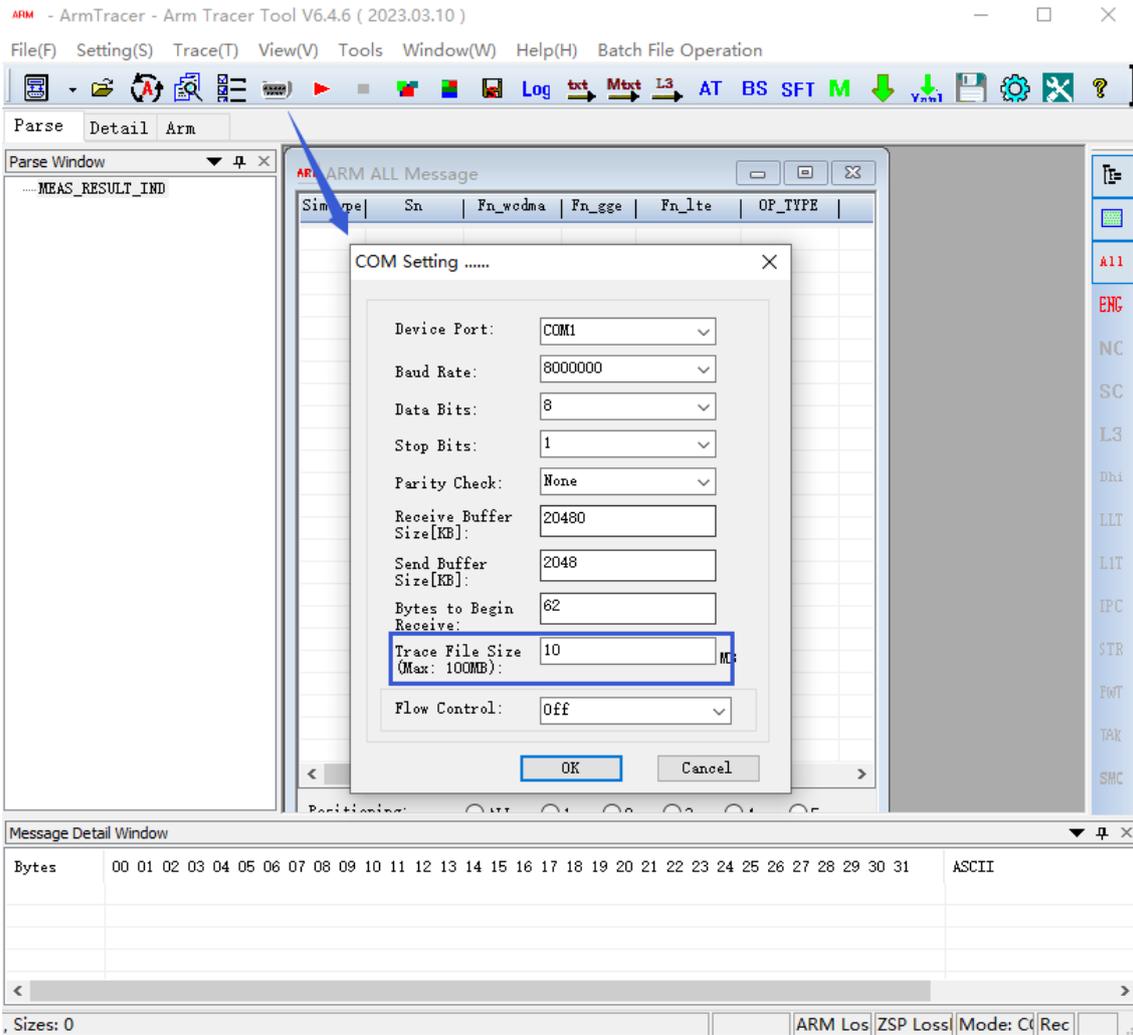


Figure 9: Open and Configure ArmTracer

Then click “” in the toolbar and the “**log setting.....**” dialog box will pop up, as shown in the following figure. Alternatively, you can click “” to access the same dialog box. After the configuration is completed, ArmTracer will start capturing logs.

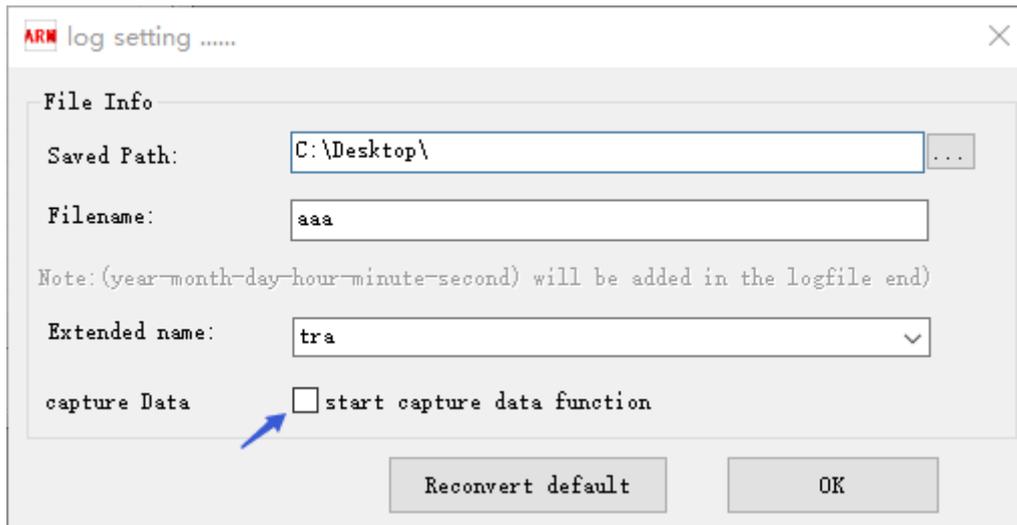


Figure 10: Log File Parameter Configuration

Enabling the “**start capture data function**” option in the “**log setting.....**” dialog box initiates the reception and storage of log data, without real-time decoding and display. This is useful when dealing with extensive data or abnormal log saving.

ArmTracer automatically saves the log according to the configured “**Trace File Size**”. When the log capture stops before reaching the configured size, some log information may not be saved. To address this, click “” in the toolbar to manually save the log.

To enable ArmTracer to automatically detect the CP port and save the CP log after module booting, open the *ArmTracer.ini* file in the decompressed ArmTracer package directory, add “**Quectel USB CP Log Port**” to “**DeviceList**”, and set “**DeviceSel**” to “**Quectel USB CP Log Port**”, as shown below:

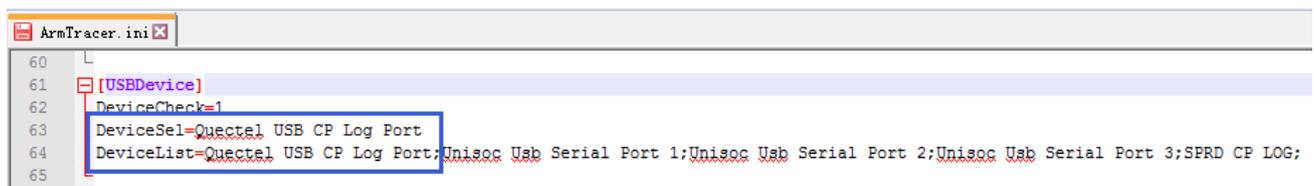


Figure 11: ArmTracer.ini File Configuration

Restart ArmTracer and click “” in the toolbar and “**Software Setting**” dialog box will pop up. Within this dialog box, select “**Quectel USB CP Log Port**” from “**USB Device Description**” drop-down menu, tick “**Automatic Detect CP Port**” and click “**OK**”.

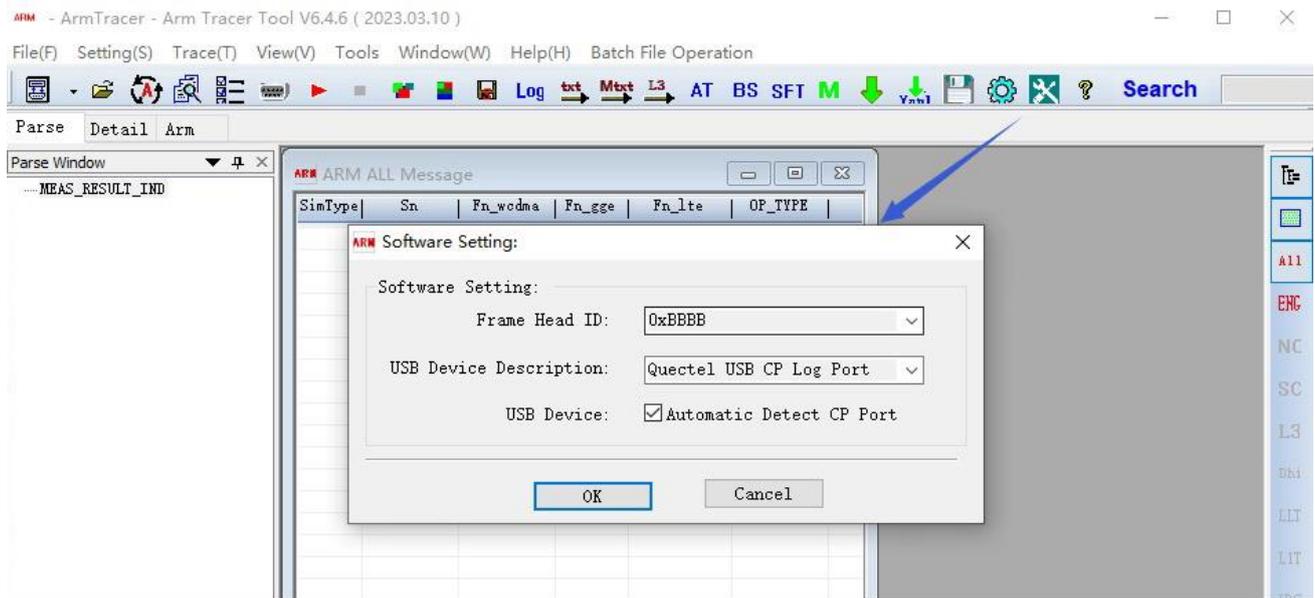


Figure 12: Automatic Detect CP Port

After modifying ArmTracer software configuration, you can reset “**Device Port**” and “**Trace File Size**”, as shown in **Figure 9**. Click “▶” to start capturing CP logs. In this setting, CP log is automatically saved when the module shuts down. When the module boots next time, ArmTracer will automatically detect the CP port and save the log.

3.3. AP Dump Analysis and Saving

This chapter explains how to analyze and save the AP dump. For information about how to analyze CP dumps, please contact Quectel Technical Support (support@quectel.com).

3.3.1. GDB Analysis of AP Dump

In the event of an AP dump, click “**Tools**” in the navigation bar, select “**GDB Launcher**” in the drop-down menu and perform real-time analysis with the software version ELF file. Please refer to *Coolwatcher User Guide* in the *cooltools/doc* directory for details.

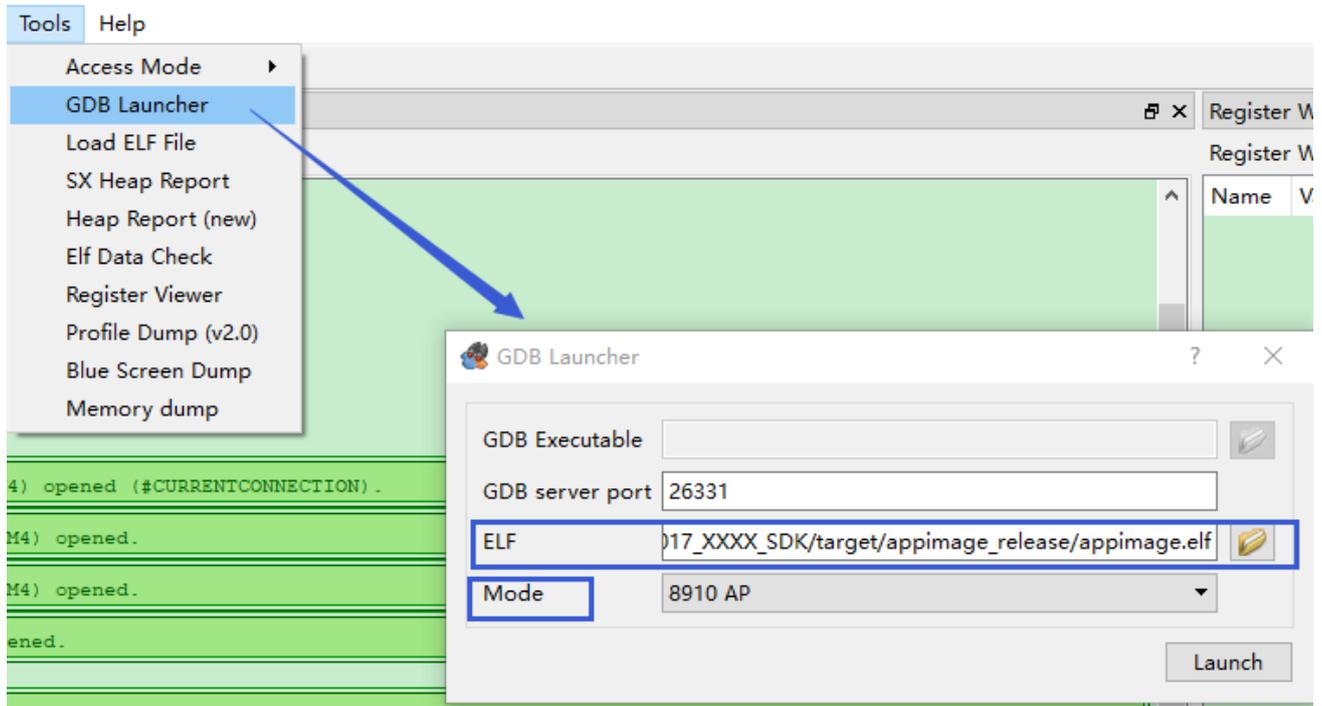


Figure 13: Launch GDB

In the “**GDB Launcher**” dialog box, select the “**ELF**” file corresponding to the software version package, select “**8910 AP**” for “**Mode**”, and click “**Launch**” to start analyzing.

3.3.2. AP Dump Saving

Use cooltools to save dump file for offline analysis. Click “**Tools**” in the navigation bar, select “**Blue Screen Dump**” in the drop-down menu, and configure the ELF file and output path in the pop-up window. Please refer to *Coolwatcher User Guide* in the *cooltools/doc* directory for details. The Blue Screen Dump startup steps are shown in the following figure:

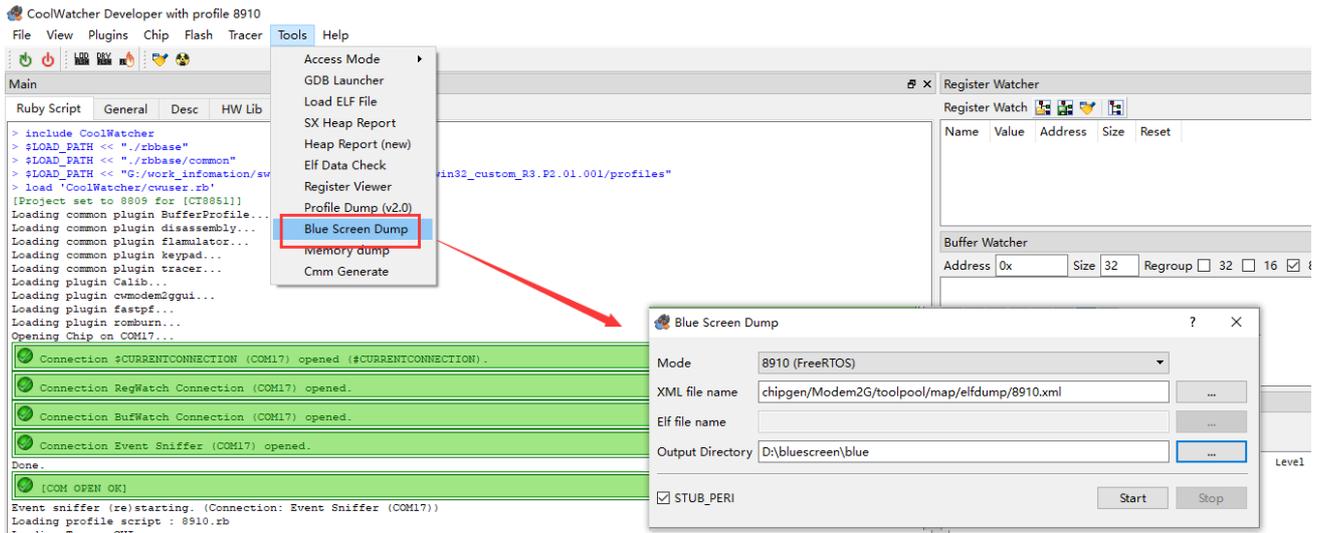


Figure 14: Start Blue Screen Dump

3.3.3. Offline Analysis of AP Dump

Please refer to **Chapter 4.5** and **Chapter 4.7** in *Coolwatcher User Guide* in the *cooltools/doc* directory for analysis.

4 AP Log Port Configuration

4.1. AP Log Port Configuration API

4.1.1. ql_log_set_port()

This function configures AP log port.

- **Prototype**

```
ql_errcode_log_e ql_log_set_port(ql_log_port_e dst_port)
```

- **Parameter**

dst_port:

[In] The AP log port to be set.

- 0 Disable AP log port
- 1 Debug Port
- 2 USB AP Log Port (default)
- 4 SDMMC
- 5 NAND flash
- 6 4-wire SPI NOR flash
- 7 6-wire SPI NOR flash

- **Return Value**

<code>QL_LOG_SUCCESS</code>	Successful execution
<code>QL_LOG_PORT_SET_ERR</code>	Failed execution
<code>QL_LOG_INVALID_PARAM_ERR</code>	Parameter error

4.2. AP Log Port Configuration AT Command

4.2.1. AT Command Introduction

4.2.1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on the command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on the command line. When an optional parameter is not given in a command, the new value equals to its previous value or the default settings, unless otherwise specified.
- **Underline** Default setting of a parameter.

4.2.1.2. AT Command Syntax

All command lines must start with **AT** or **at** and end with **<CR>**. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. In tables presenting commands and responses throughout this document, only the commands and responses are presented, and **<CR>** and **<LF>** are deliberately omitted.

Table 3: Types of AT Commands

Command Type	Syntax	Description
Test Command	AT+<cmd>=?	Test the existence of corresponding Write Command and return information about the type, value, or range of its parameter.
Read Command	AT+<cmd>?	Check the current parameter value of a corresponding Write Command.
Write Command	AT+<cmd>=<p1>[,<p2>[,<p3>[...]]]	Set user-definable parameter value.
Execution Command	AT+<cmd>	Return a specific information parameter or perform a specific action.

4.2.2. AT+QDBGCFG="tracecfg" Configure AP Log Port

AT+QDBGCFG="tracecfg" Configure AP Log Port

Write Command AT+QDBGCFG="tracecfg",<type>,<port>	Response OK Or ERROR
Maximum Response Time	300 ms
Characteristics	This command takes effect after the module is booted. The configuration will be saved automatically.

Parameter

<type>	Integer type. Log type. 0 AP log 1 CP log
<port>	Integer type. Serial port number. When <type> is 0: 0 No AP log is outputted. 1 Debug UART 2 USB AP log port When <type> is 1: 0 CP UART 2 No CP log is outputted. 5 USB CP log port

5 Appendix References

Table 4: Related Document

Document Name
[1] Quectel_EC200U&EG91xU_Series_QuecOpen(SDK)_CSDK_Quick_Start_Guide

Table 5: Terms and Abbreviations

Abbreviation	Description
AP	Application Processor
API	Application Programming Interface
CP	Communication Processor
EVB	Evaluation Board
GDB	GNU Debugger
IoT	Internet of Things
RTOS	Real-Time Operating System
SDMMC	Secure Digital/MultiMedia Card
USB	Universal Serial Bus