EiGENCOMM
More than connection

Application Notes

AN0050 EPAT UserGuide_V1.0

EigenCOMM Wireless Microcontroller

Review

EPAT is a tools or tools suite for analysis, debugging, commands, etc.。

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No.	Date	Author	Description
V1.0			Initial Version
V1.01			Add Graph
V1.02			Update for new function
V1.03			Socket communication
V1.04			Add more socket communication command
V1.05			Add display lfs content and set font size
V1.06			Add Options
V1.07			Command parameter

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1. About

1.1 Purpose

This document is introduction for EPAT. It's help user to start quickly.

1.2 Abbreviations and Acronyms

Table 1: Abbreviations and Acronyms

Acronym	Description
EPAT	EigenComm Platform Analysis Tools/Toolsets
UE	User Equipment
UART	Universal Asynchronous Receiver/Transmitter
NBIOT	Narrow Band Internet of Things
DB	DataBase
Cat.1	LTE UE-Category 1
JSON	JavaScript Object Notation
TCP	Transmission Control Protocol
XML	Extensible Markup Language
LFS	The little filesystem
API	Application Programming Interface

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2. Summary

2.1 EPAT summary

EPAT：**E**igenComm **P**latform **A**nalysis **T**ools. is used to capture and analyze EigenComm UE Log and debugging UE function.

EPAT offline mode：is used to open UE log and show log with multiple methods and windows. Offline mode can run multiple EPAT processes to open multiple UE log and compare.。

EPAT online mode: is used to capture UE log and show UE status online. Online mode run only one EPAT process since it needs to connect UE devices.

2.2 System Requirements

2.2.1 Hardware Requirements

CPU	Inter Core (Core i3 or above is recommended)
MEMORY	1G（2G or above is recommended）
HardDisk	5120MB free space
Interface	two USB ports (minimum)

2.2.2 Software Requirements

OS	MS windows7，windows8.1，windows10
Runtime	Microsoft Visual C++ 2015 Redistributable Package(x86) (Included in EPAT) or Microsoft Visual Studio 2015

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3. Install

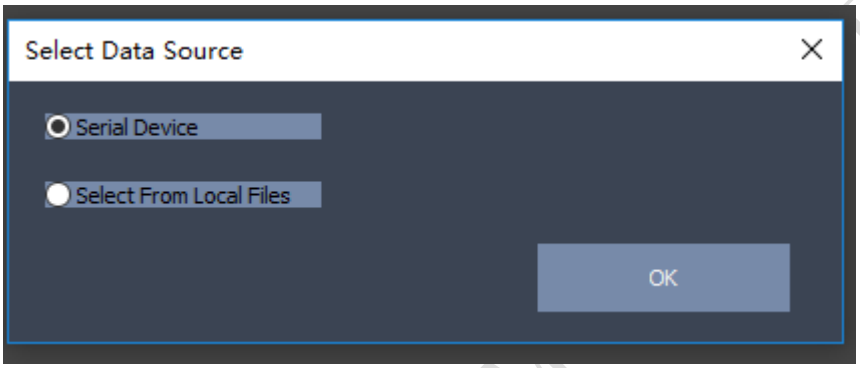
3.1 EPAT Execution

EPAT is green software, It can be directly used after decompression without installation. Run EPAT.exe in EPAT Release \bin folder.

NOTICE: Because EPAT needs VC MFC DLLs, so if first time running EPAT failed, please run vc_redist.x86.exe(in "bin" folder of EPAT release package) to install VC MFC Dlls.

3.2 Mode Selection

Please select a mode in "Select Data Source" dialog as shown in the figure.



If you capture UE Log, please choose "Serial Device".
If you open and show the log from disk, please choose "Select From Local Files".

3.3 Run From CMD

1) –S: silent mode, start EPAT without showing 'Select Data Source' dialog. The running mode is the latest run mode.
2) –B: Option 'Select From Local Files' is selected.
   -C: Option 'Serial Device' is selected.

For example:
-S –B: means run with 'Select From Local Files' mode without showing 'Select Data Source' dialog.
-S –C: means run with 'Serial Device' mode without showing 'Select Data Source' dialog.

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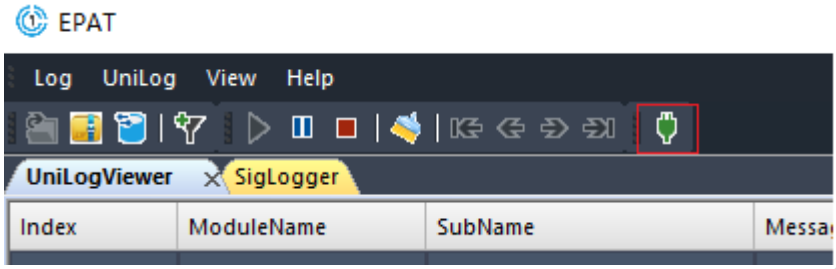
4. Online Mode – Capture Log

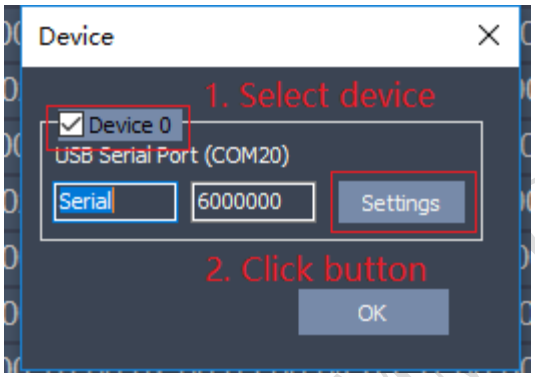
4.1 Connect UE

4.1.1 Device Dialog

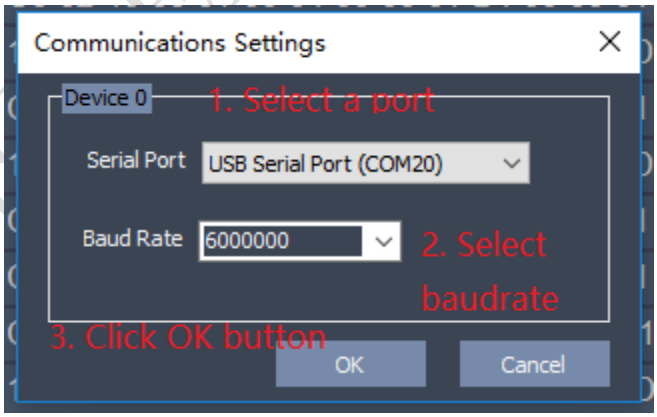
Click “Device Communication” button on the toolbar.



It will open “Device” dialog as shown.



4.1.2 Settings parameters



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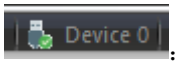
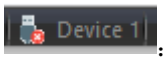
4.1.3 Connection Status

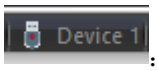
Check connection status on EPAT status bar.



: Means connection successful



: Means connection unchecked



: Means connection failed

4.2 Update DB

4.2.1 DB status

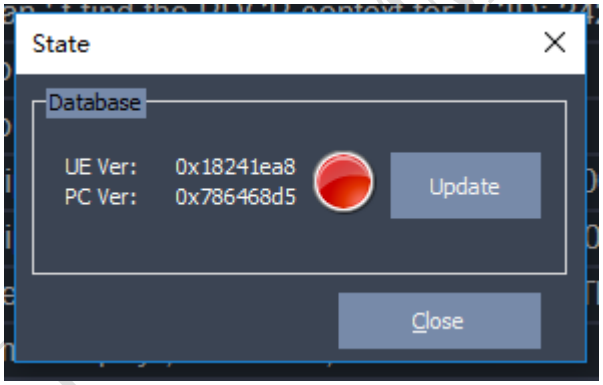
"Database State" button on the toolbar has three states to indicate the matching status of Database.

: Means reading UE DB is failed

: Means DB is mismatching.

: Means DB is matching

State dialog will popup if clicking "Database State" button.



Clicking "Update" button to update database file.

4.2.2 Update Database

Follow the steps below to update the database file.

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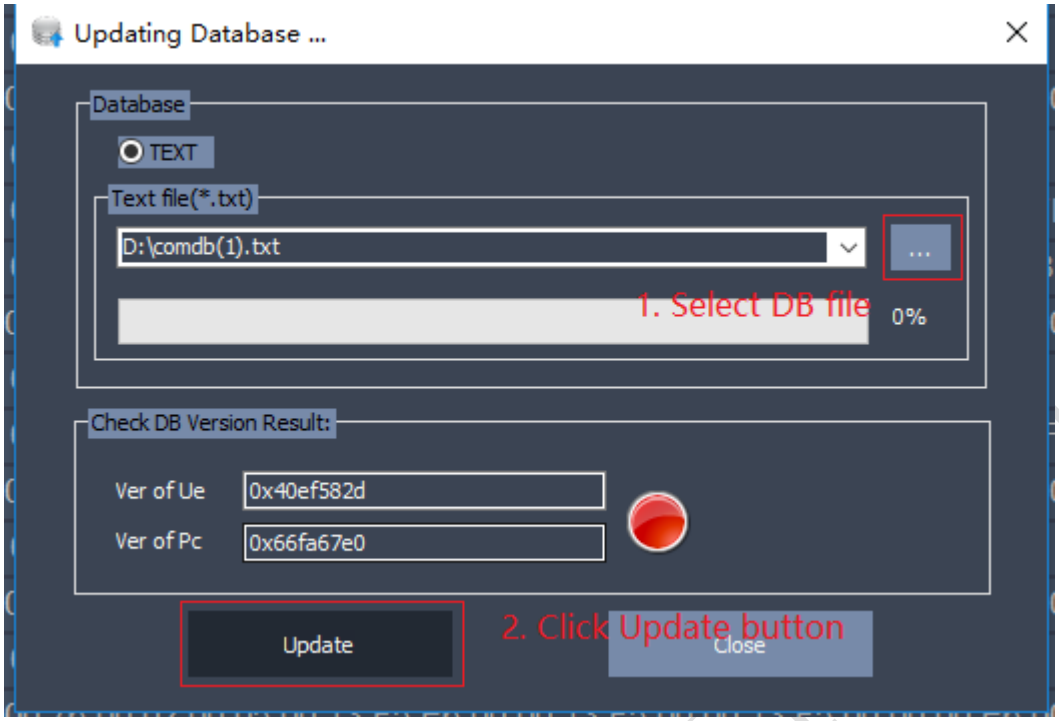

"Check DB Version Result" will display matching status after updating successful.

Green: matching

Red: mismatching

Grey: Read UE DB failed.

4.3 Start/Pause/Stop/Clear log

4.3.1 Pause

Viewers paused refreshing display but it still keeps on saving ULF Log. This state is used for temporarily browsing current log in views to check UE status.

4.3.2 Stop

Viewers stop refresh display and it stop saving ULF Log. This state is used for user confirmed the current log is wanted and will save the log later.

4.3.3 Start

Resume from "Pause" and "Stop" states. Viewers resume refreshing display and keeping on saving ULF log.

4.3.4 Clear

Viewer clear display and it change to write a new Log file.

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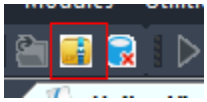
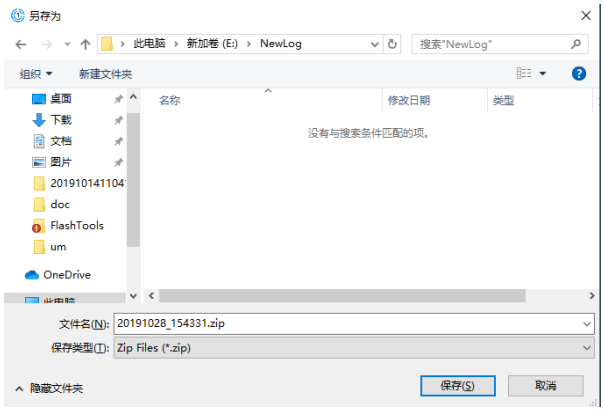
4.3.5 Export/Save Log

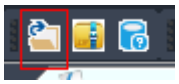


Click “Save” button on the toolbar or Press shortcut key CTRL+S to open “Save as” file dialog.



5. Offline Mode – view Log

5.1 Loading Log file



Click “Open” button on the toolbar or Press shortcut key CTRL+O to select a zip log file from disk. So log file is opened and shown as follow:

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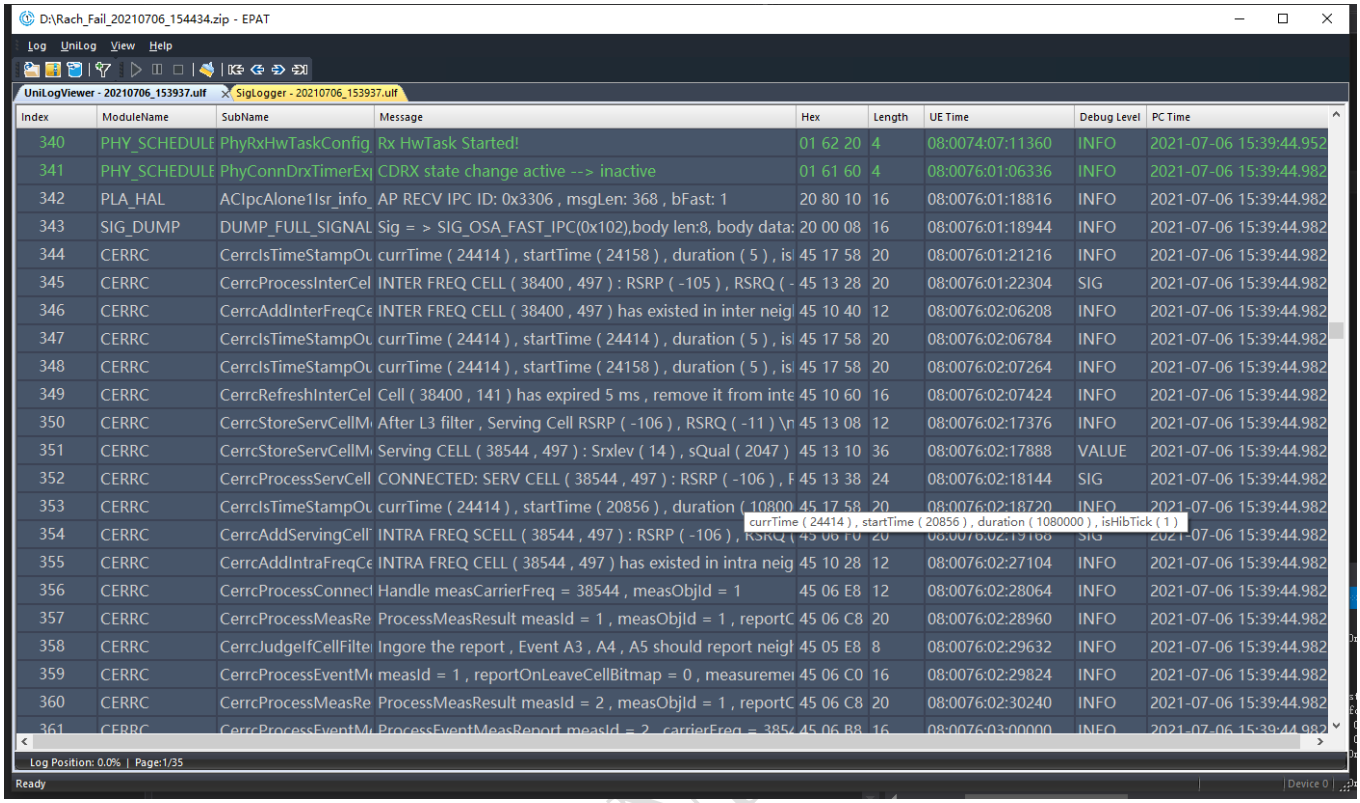
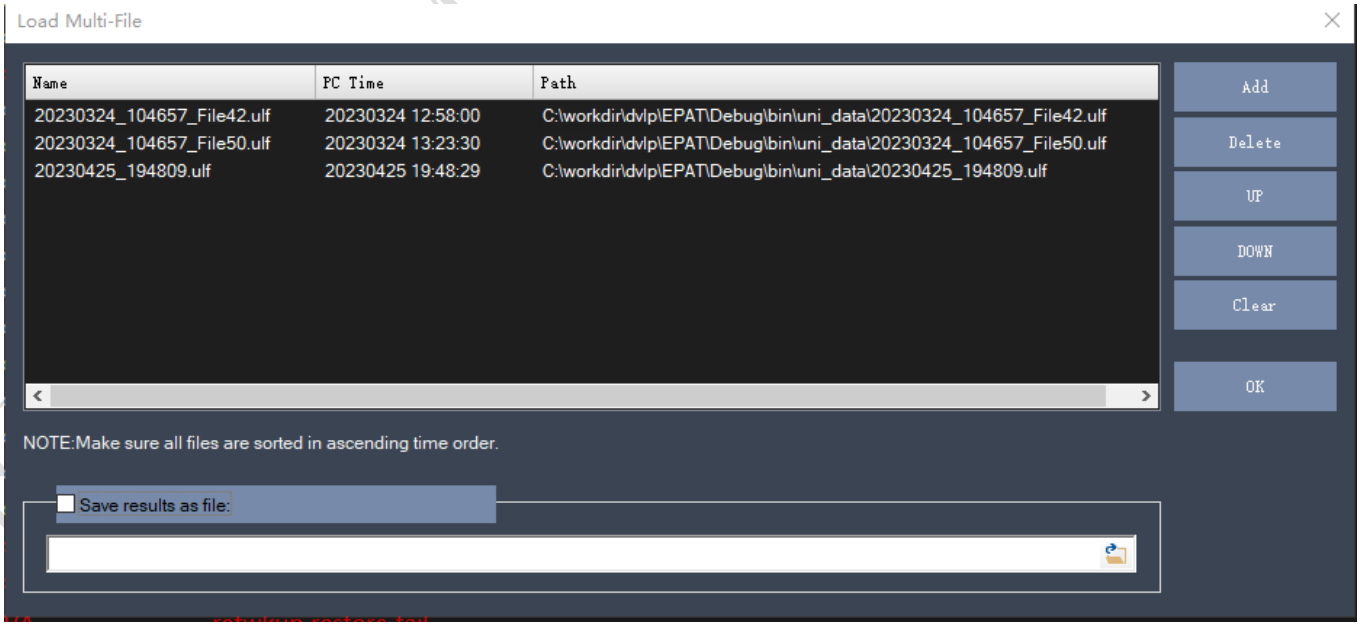


5.2 Open Multiple log Files

Click main menu Log-> Open Multi-Log Files to opening open multi-file dialog is as follow. More than one ulf files or bin files will be opened in current viewer.



1) Add button: Select one or more files to add to list ctrl. The file extend is ulf or bin.
2) Delete button: Delete the selected item in list ctrl.
3) UP button: Move up the selected item in list ctrl.
4) DOWN button: Move down the selected item in list ctrl.

5) Clear button: Clear all items in list ctrl.

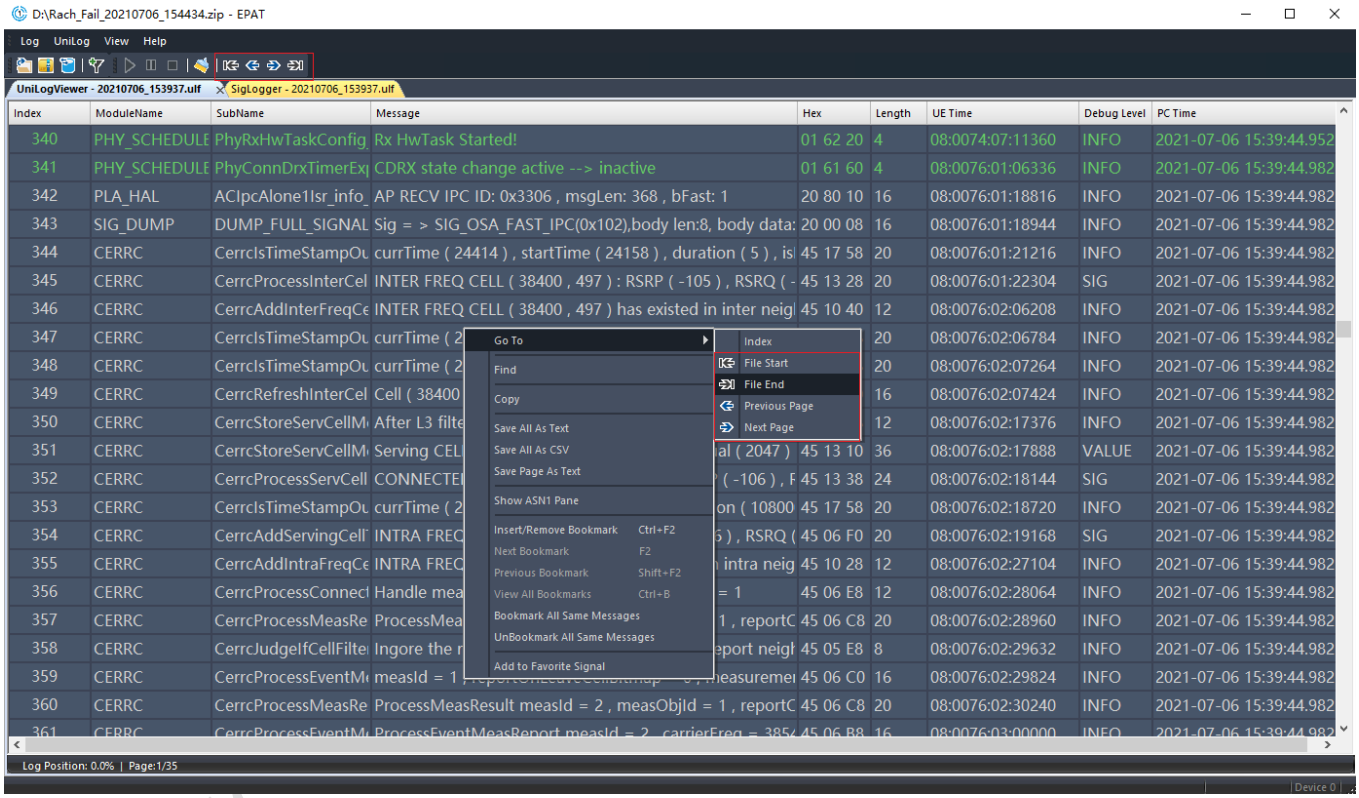
6) OK button: Open all items by order as one file to open in current viewer.

7) Save result as file: Save all item to file that browsed in edit ctrl when opening all items by clicking OK button.

PS：1）、Make sure all files are sorted in ascending time order.

2）、All files type must be ulf file(or bin file).

5.3 Page down/Page up



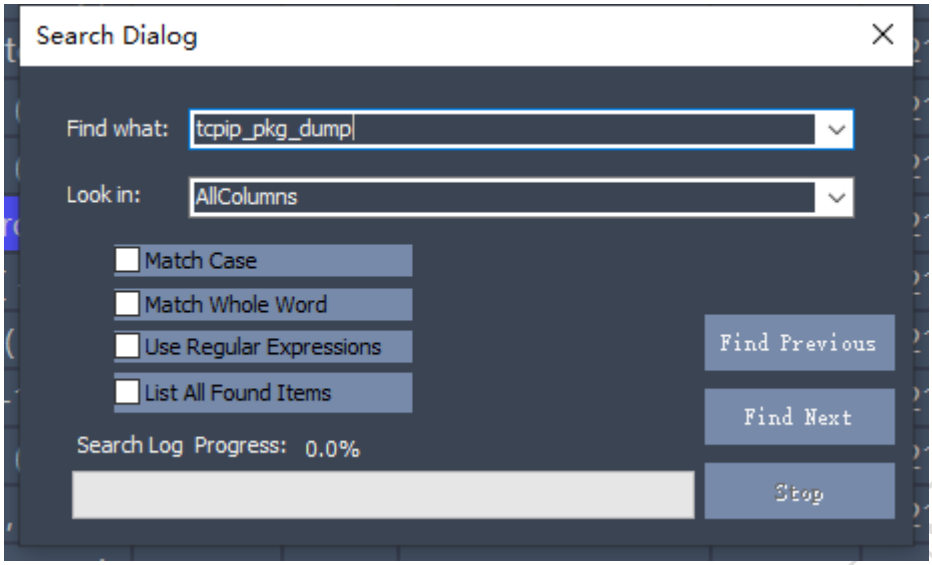
Page down/Page up function is available by selecting toolbar buttons or showing pop menu in view log area.

It include mode as follow:

1. Go to file start.
2. Go to file end.
3. Go to previous page.
4. Go to next page.

5.4 Find

Open “Search dialog” by pop menu “Find” or shortcut key CTRL+F.

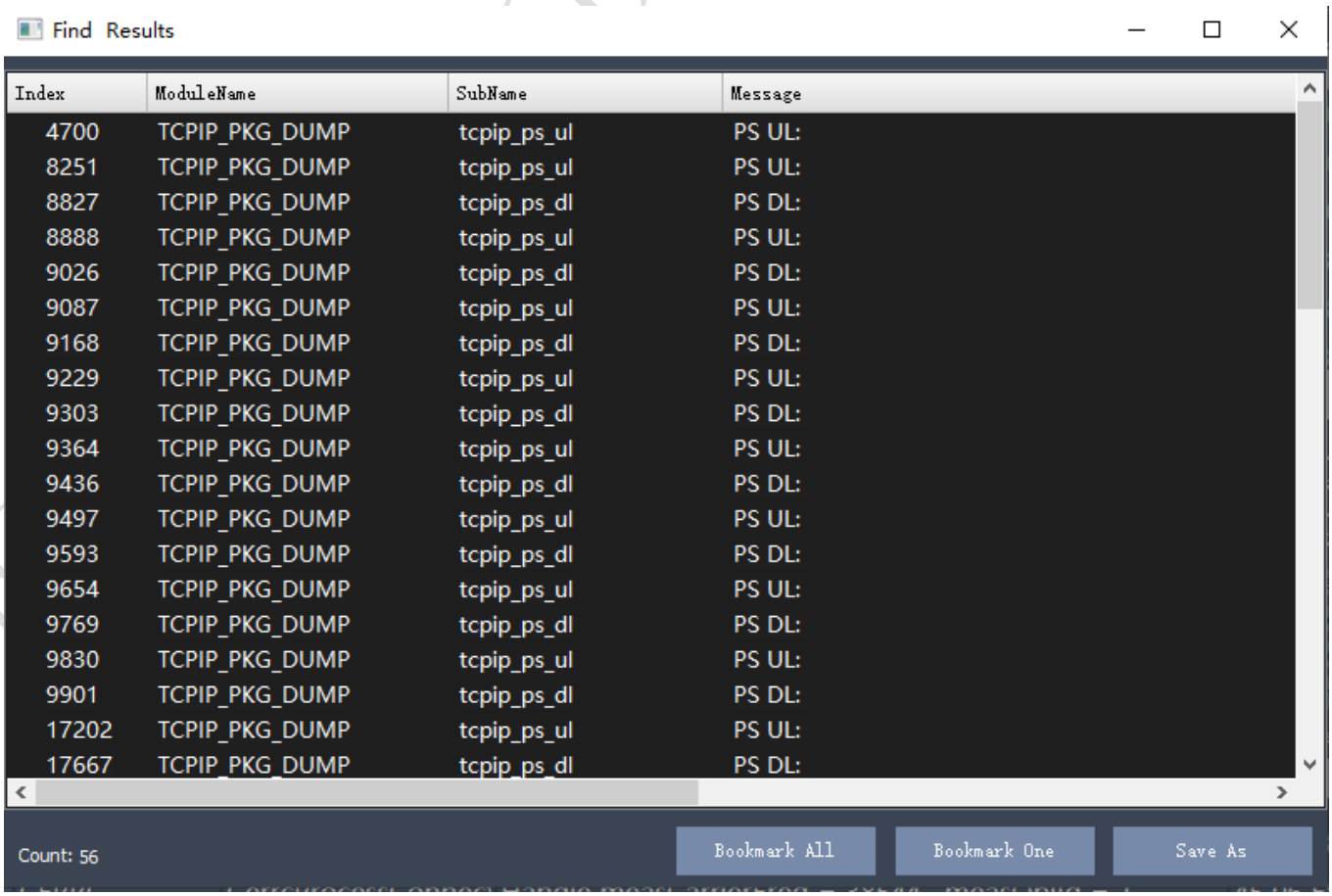


5.4.1 Single Search

To find message by message from the cursor.

5.4.2 Find Result

Check “List All Found Items”, All search results are listed by Find Results dialog.



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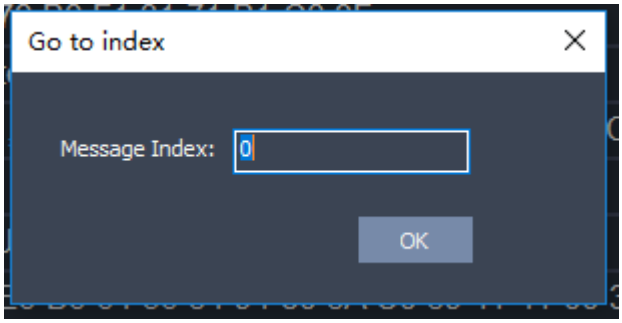
1. Double clicking a signal log. This signal log will get focus in viewer area.
2. Saving all results to csv file by clicking “Save As” button.
3. Bookmark All, make bookmark to all signals.
4. Bookmark One, make bookmark which is selected signal.

5.5 Goto function

Open “Go to index” dialog by pop menu “Goto->Index” or shortcut CTRL+G.



Input log index number in Message Index, the signal log will get focus.

5.6 Log saving

Saving signal log to file by pop menu.

1. Save all log to text file.
2. Save all log to CSV file.
3. Save current page log to text file.

5.7 Synchronizing function

Double click any signal log in the Viewer or SigLogger on the off-line mode, the signal log will get focus in the other UI.

6. Message Filter

Open “Message Filter” dialog by clicking “Message Filter” button on the toolbar.

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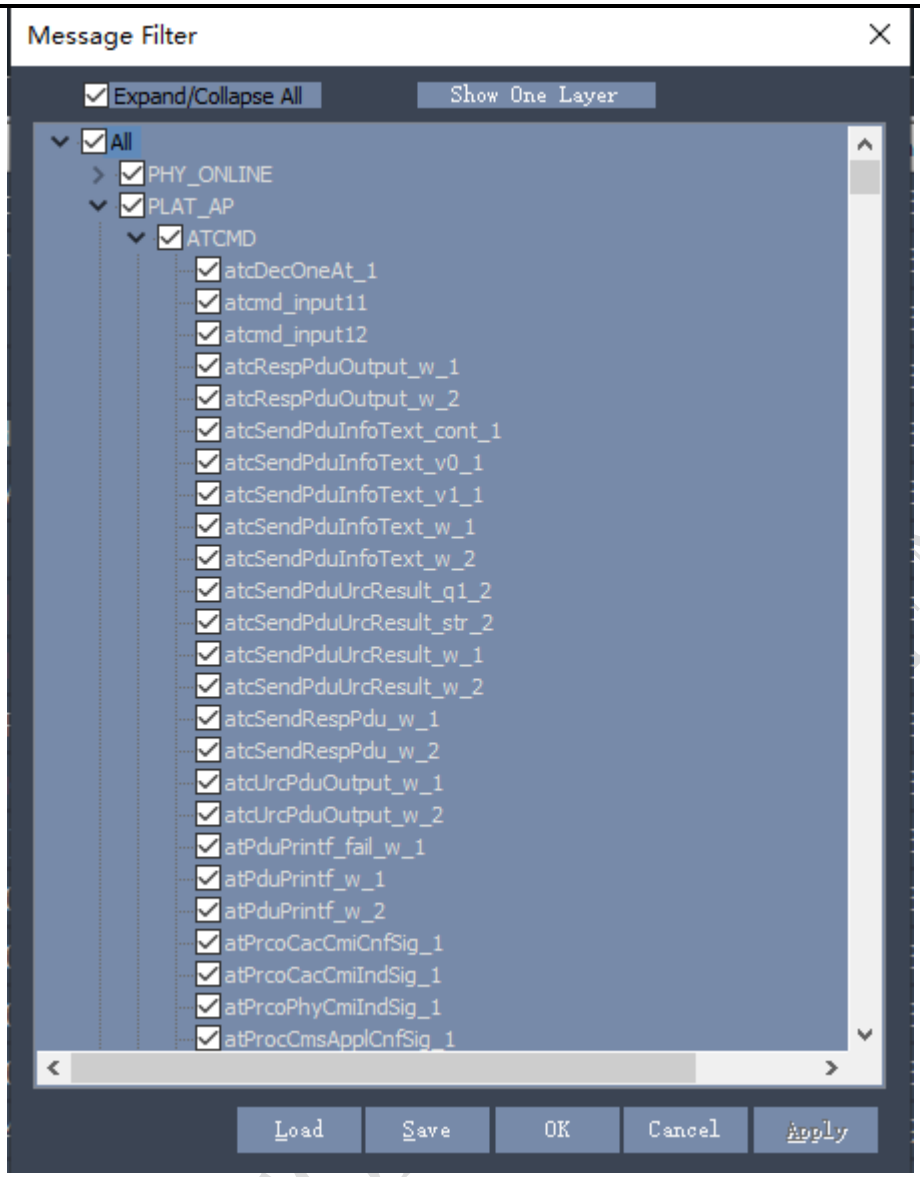

You can check or uncheck some signals. Viewer don't show the log message if signal is unchecked.

6.1 Load

Loading local filter settings file to current dialog.

6.2 Save

Saving current settings to local file.

6.3 OK

Apply current filter settings to EPAT and close this dialog.

6.4 Apply

Apply current filter settings to EPAT.

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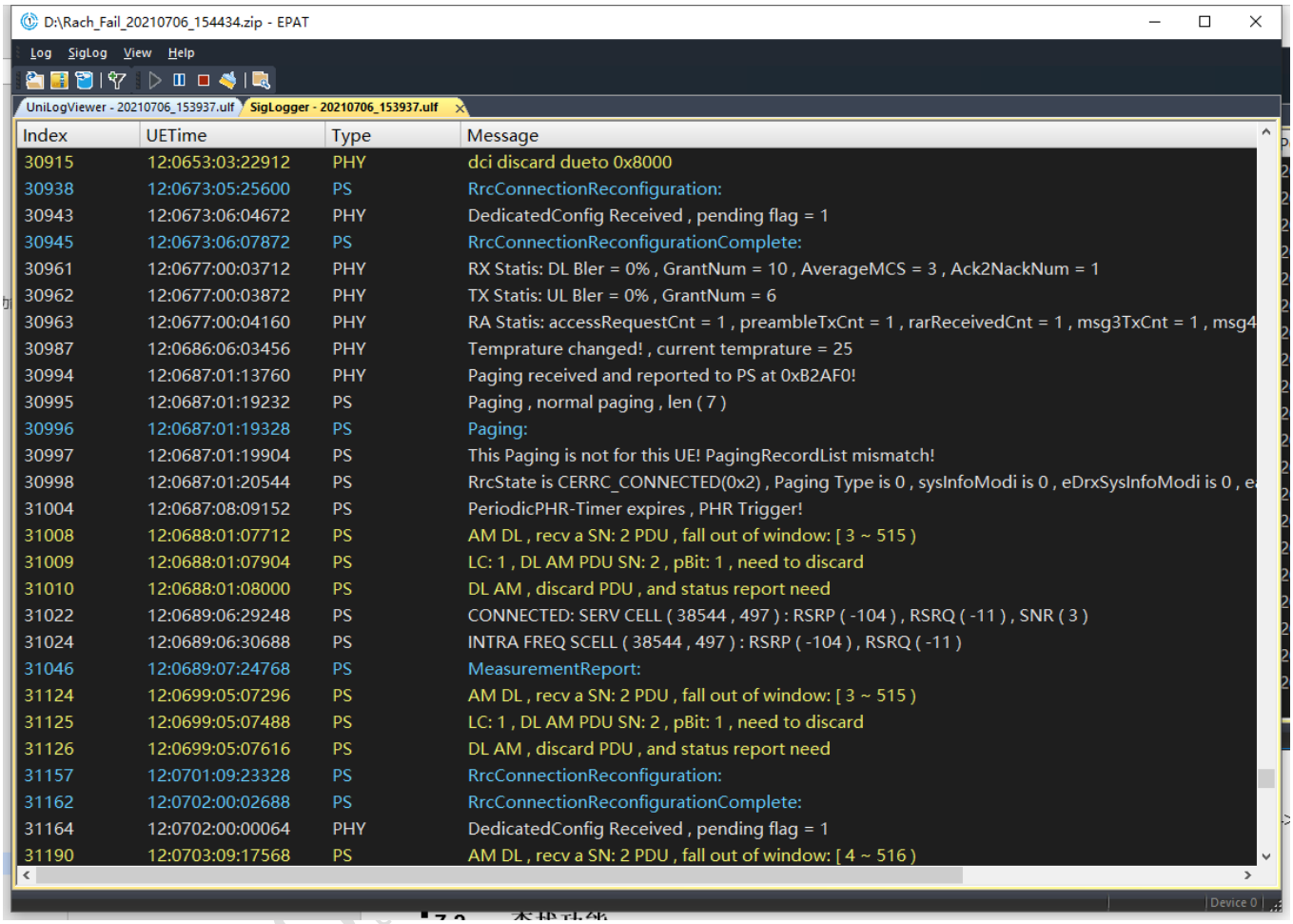
7. SigLog

7.1 View SigLog



View SigLog information by clicking SigLogger Tab. If SigLogger is not visible. Please open it via main menu “view->Siglog”.

If the log display different colors, means the log has a different Log Level.

7.2 Find

Open “SigLog Find” dialog by selecting menu “SigLog->Find” or shortcut key CTRL+F.

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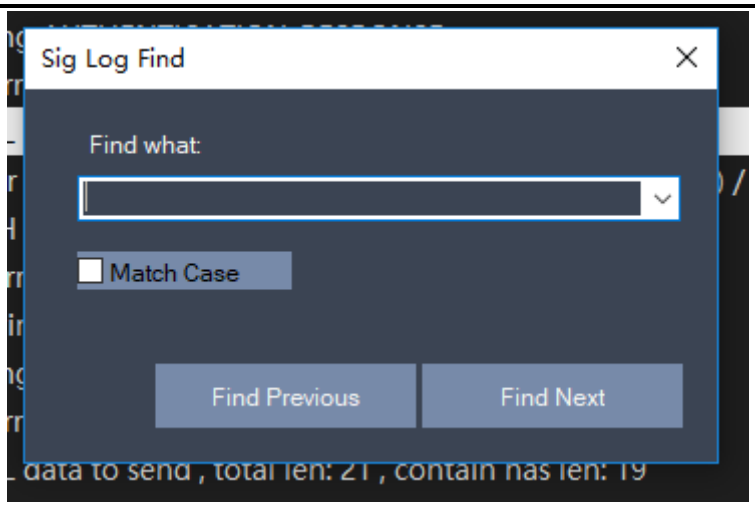
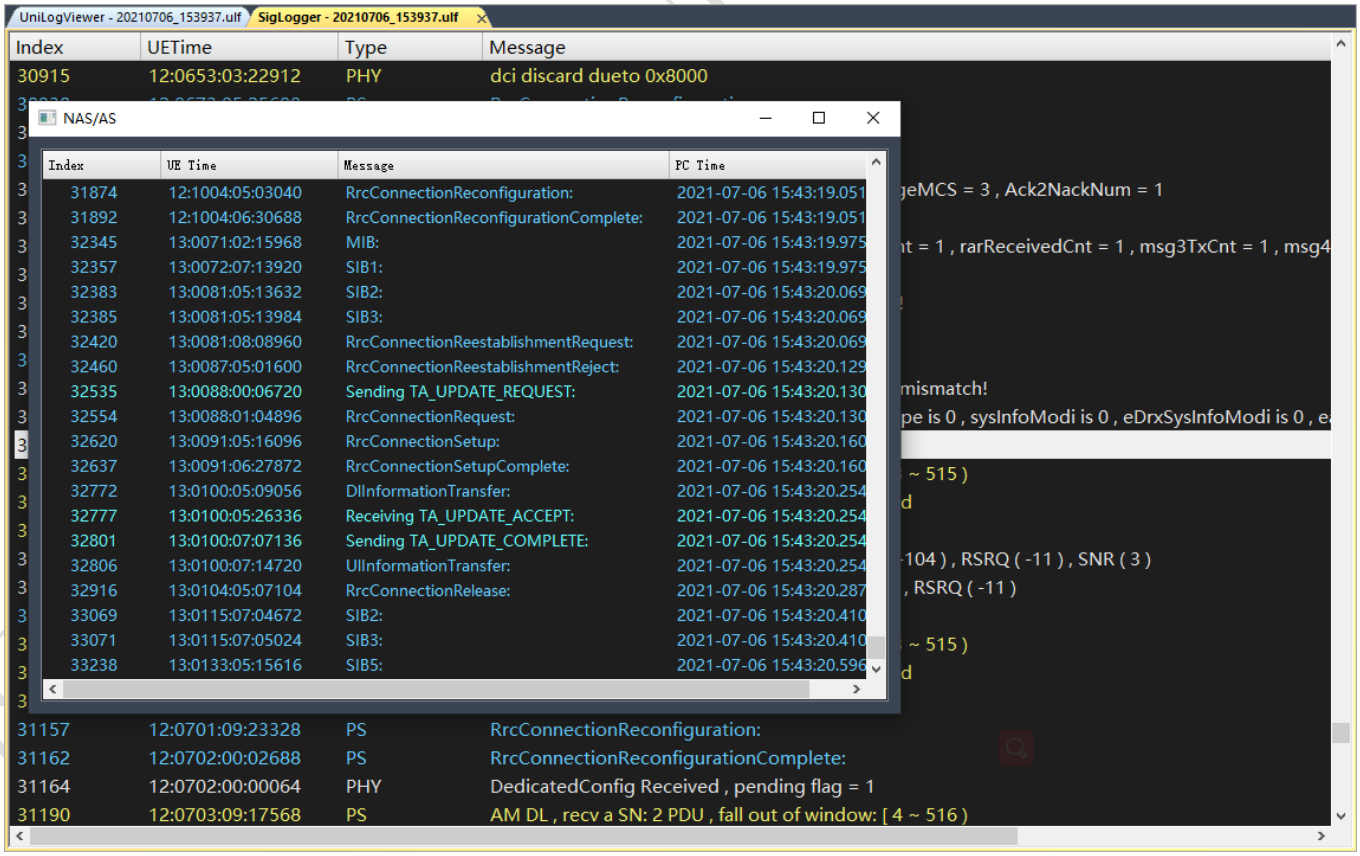


7.3 Export Pcap

Export data as pcap format to file from current log file by clicking menu “SigLog->Export As pcap file”.

7.4 Show Protocol Signalling

Open dialog what show protocol signal only by click menu “SigLog->Only Show Protocol Signalling”.



7.5 Show Favorite Signalling

Open Favorite dialog by clicking menu “SigLog->Only Show Favorite Signalling”.

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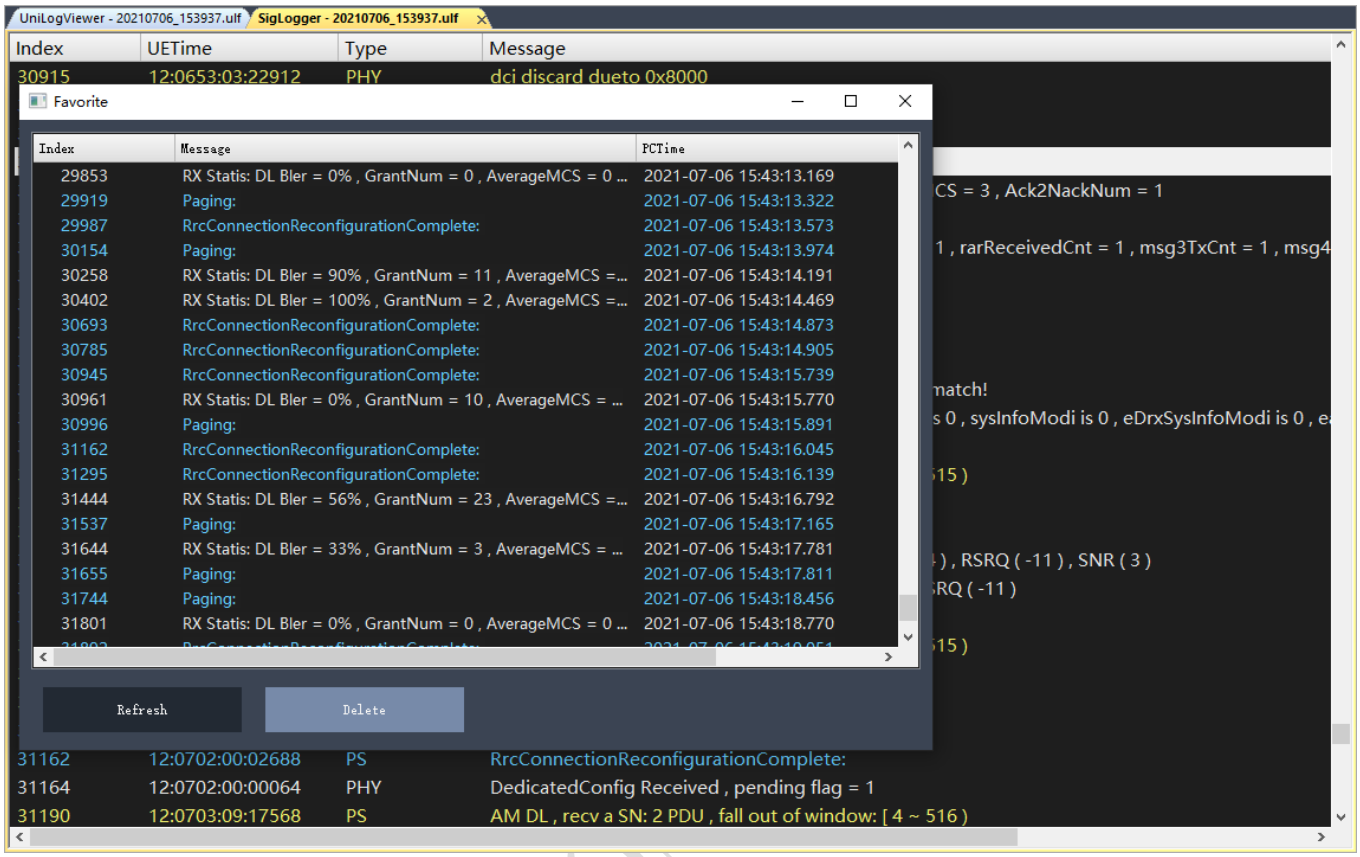


7.5.1 Delete

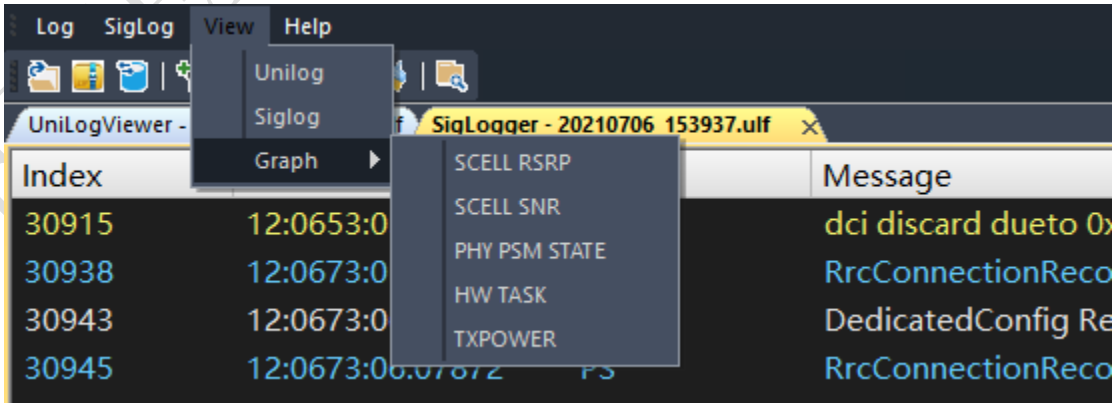
Select a signal and click ‘Delete’ button in this dialog so this signal will removed from favorite.

7.5.2 Add

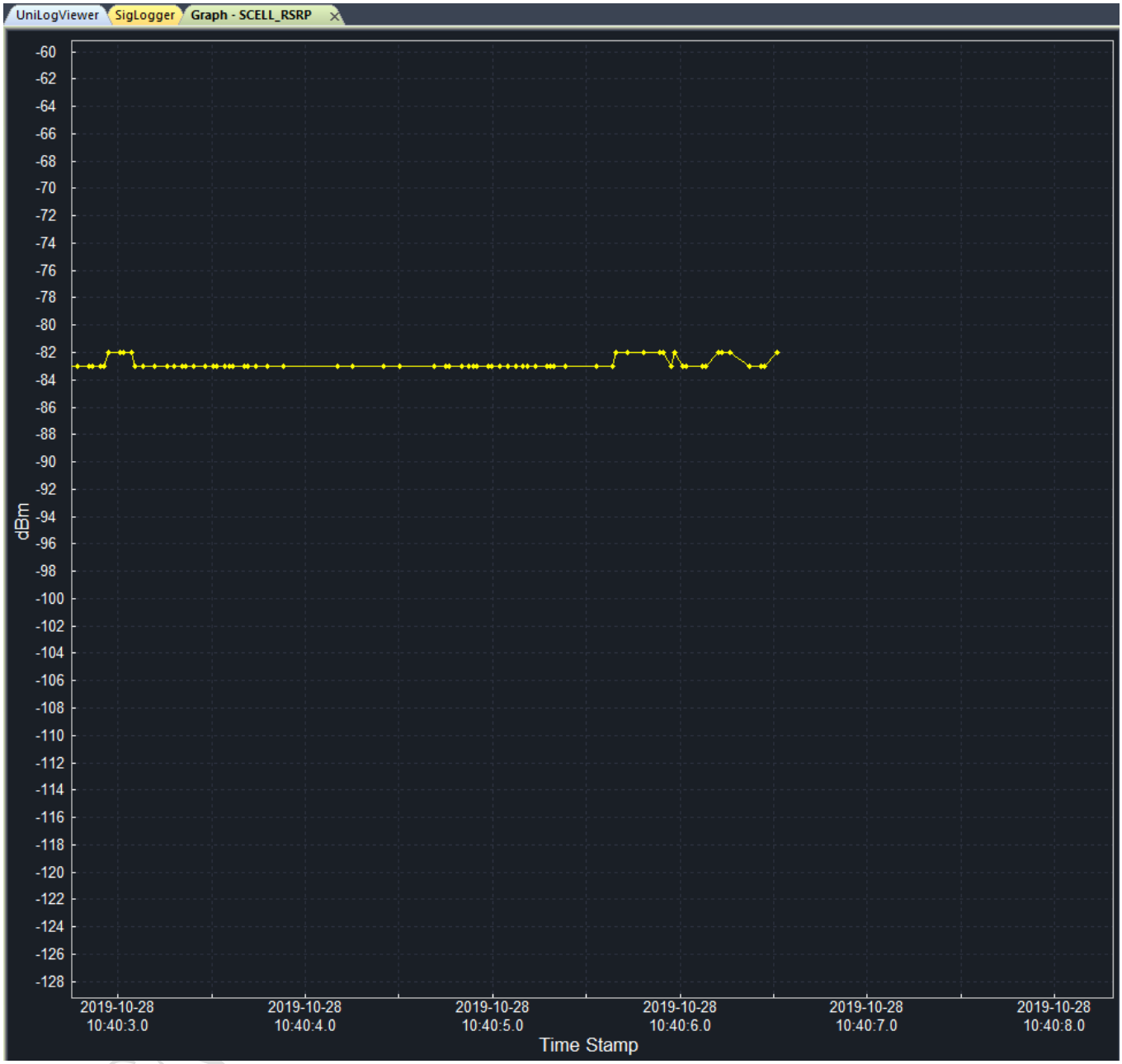
Select a signal and add it to favorite by pop menu “Add Favorite Signal” in viewers.

8. Graph

Graph SCELL-RESRP, SCELL-SNR, PHY-PSM-STATE, HW-TASK and TXPOWER are available.

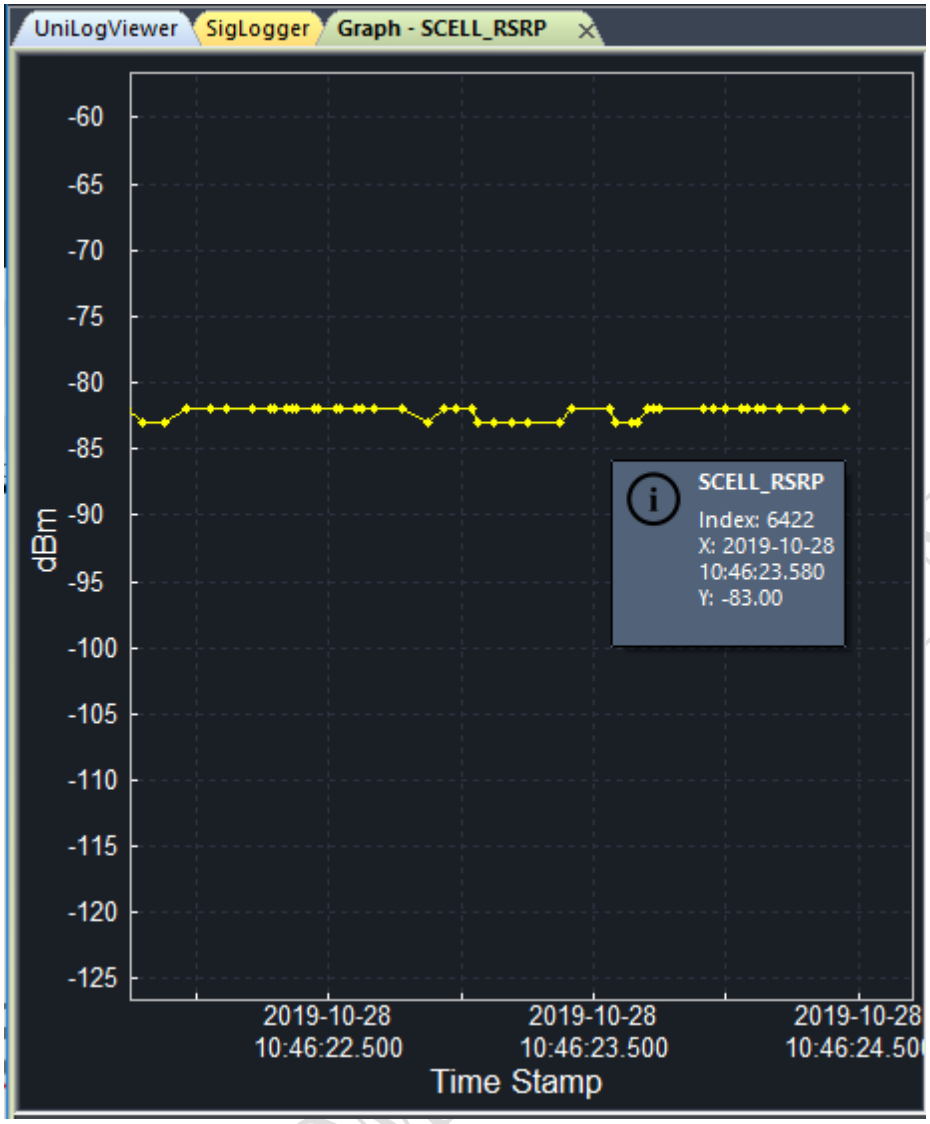


Take SCELL RSRP as an example, the graph is as follow:



8.1 Show point information

Move mouse cursor to point, point information tips window will be displayed after 0.5 second. Tips window containing message index, X value, Y value.



8.2 Scaling and Dragging

8.2.1 Scaling

Move mouse on Graph's axes area, click and scroll mouse wheel to zoom in or zoom out axes.

8.2.2 Dragging

Move mouse on Graph's axes area, Press and hold the left mouse button to drag the current area up, down, left, and right.

9. Options

9.1 Save

Click main menu Log->Options to opening options dialog is as follow. The default page is save option page on Log file.

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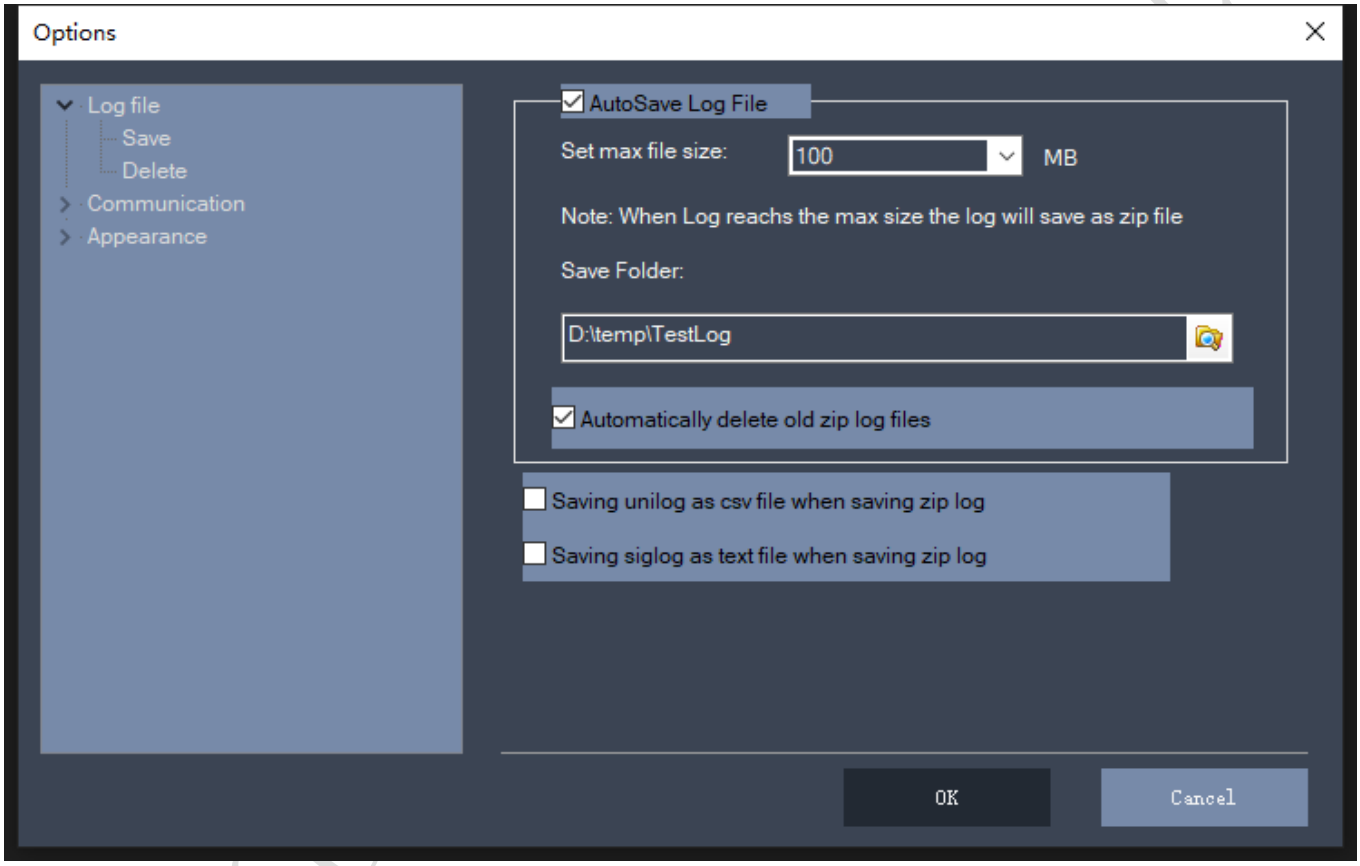
9.1.1 AutoSave

1. Check “AutoSave Log File”, Select a value at “Set max file size” combo box. Means the log will save as zip log file automatically when log size reach the max size.
2. Choose save folder in the disk.
3. If option ‘Automatically delete old zip log files’ is checked, the old zip log files saved automatically will be deleted if the count of files exceeds to number. Default number is 50.



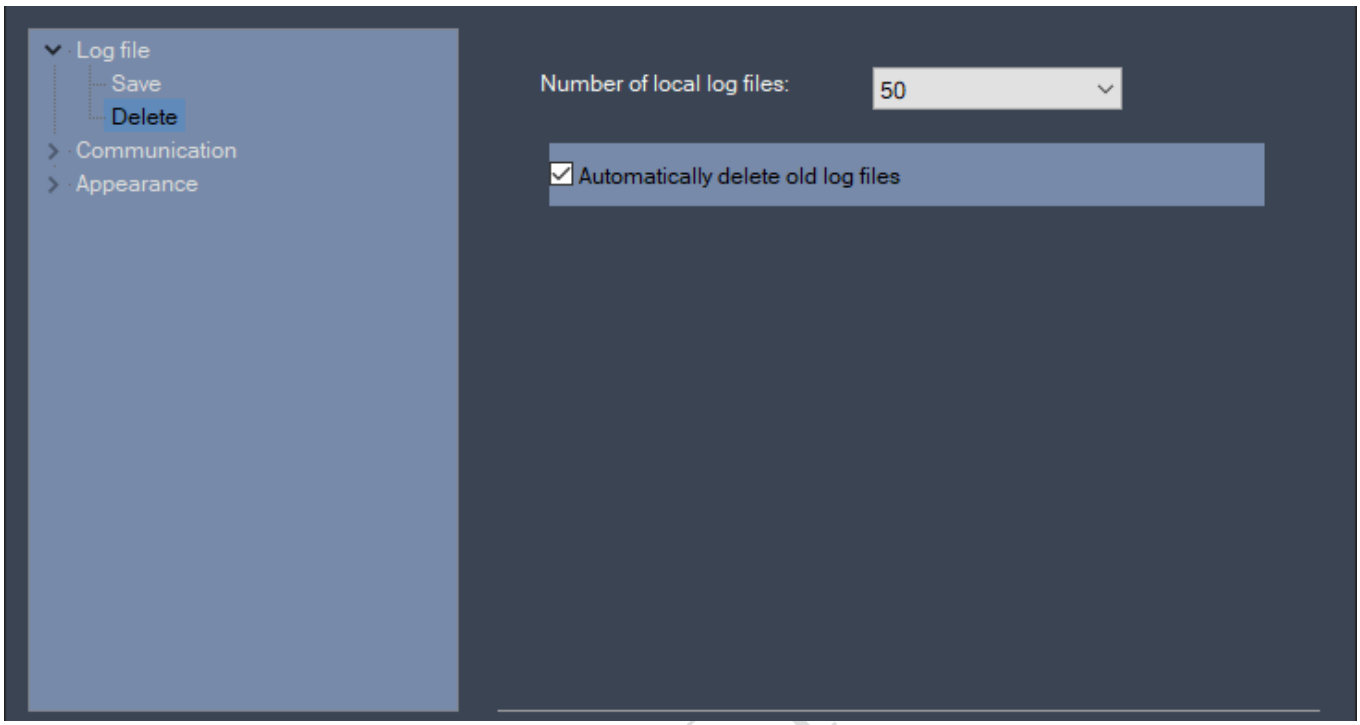
9.1.2 Text format log

1. If option ‘Saving unilog as csv file when saving zip log’ is checked, the unilog data is saved as a csv file with the same directory and name as the zip log file While saving the zip log file.
2. If option ‘Saving siglog as text file when saving zip log’ is checked, the siglog data is saved as a text file with the same directory and name as the zip log file While saving the zip log file.

9.2 Delete

Select Log file->Delete, the option page is as follow.

If option ‘Automatically delete old log files’ is checked, select a value at ‘Number of local files’ combo box. The local log files will be deleted automatically if the count of files exceeds the number value.

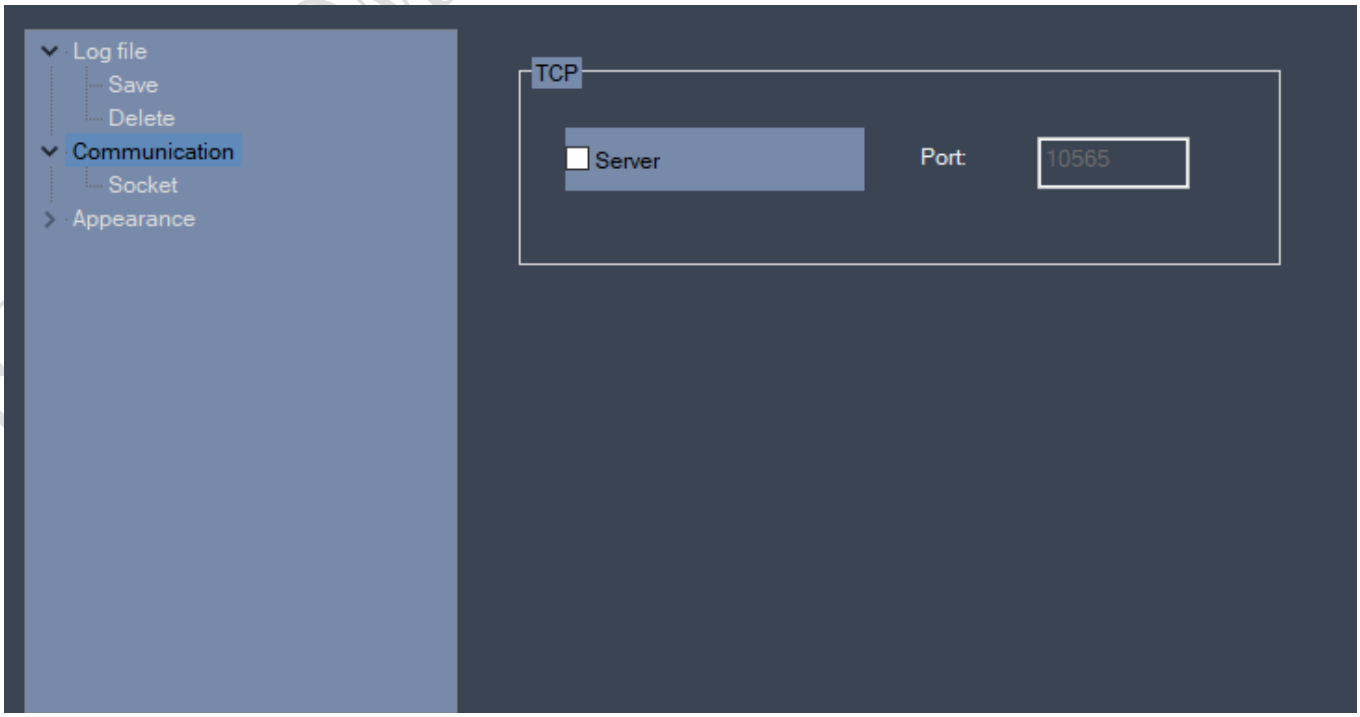


9.3 Socket

Select Communication or Socket, the page is as follow.

If option ‘Server’ in TCP is checked, TCP service will start as server. Otherwise, TCP service will be closed.

PS: the port number is from 10549 to 10630.



9.4 Font Size

Select Appearance or Font Size, the page is as follow.

选择 Appearance 分类下的 Font Size 选项，则显示配置页如下图：

选择合适的 font size 后，此改变将被应用到当前所有正在显示的界面。包括 UnilogViewer、SigLogViewer 和其他可见的 pane 等。

Change the value of font size in combobox. So UnilogViewer, SiglogViewer and other available UIs(Dialog, pane etc.) will be changed.

10. RamDump function

10.1 RamDump

EPAT will read ramdump information and open RamDump dialog automatically when UE encounter Assert or HardFault

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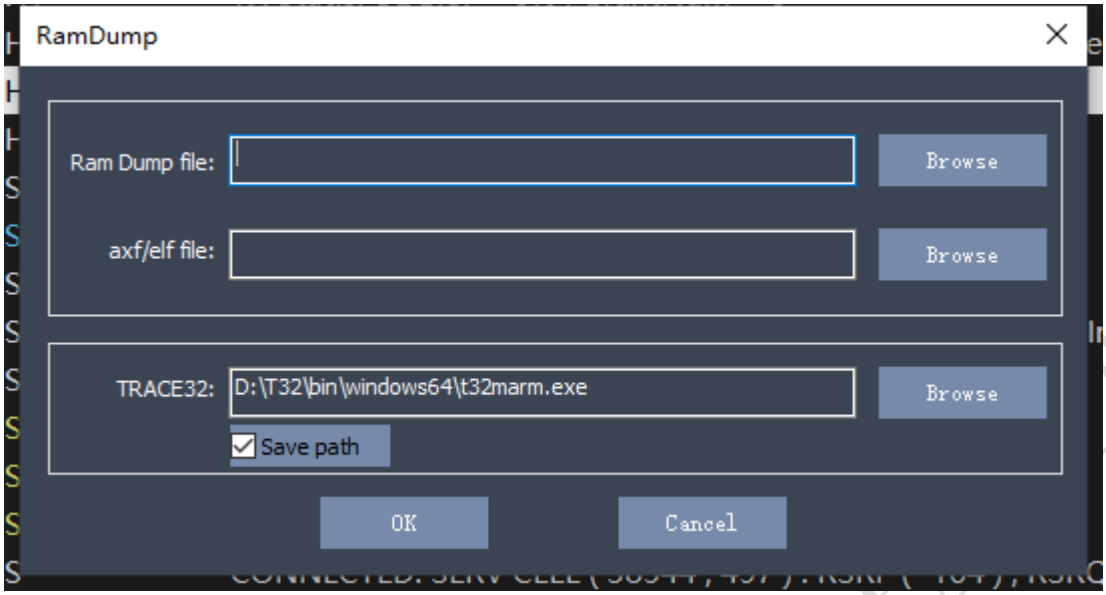


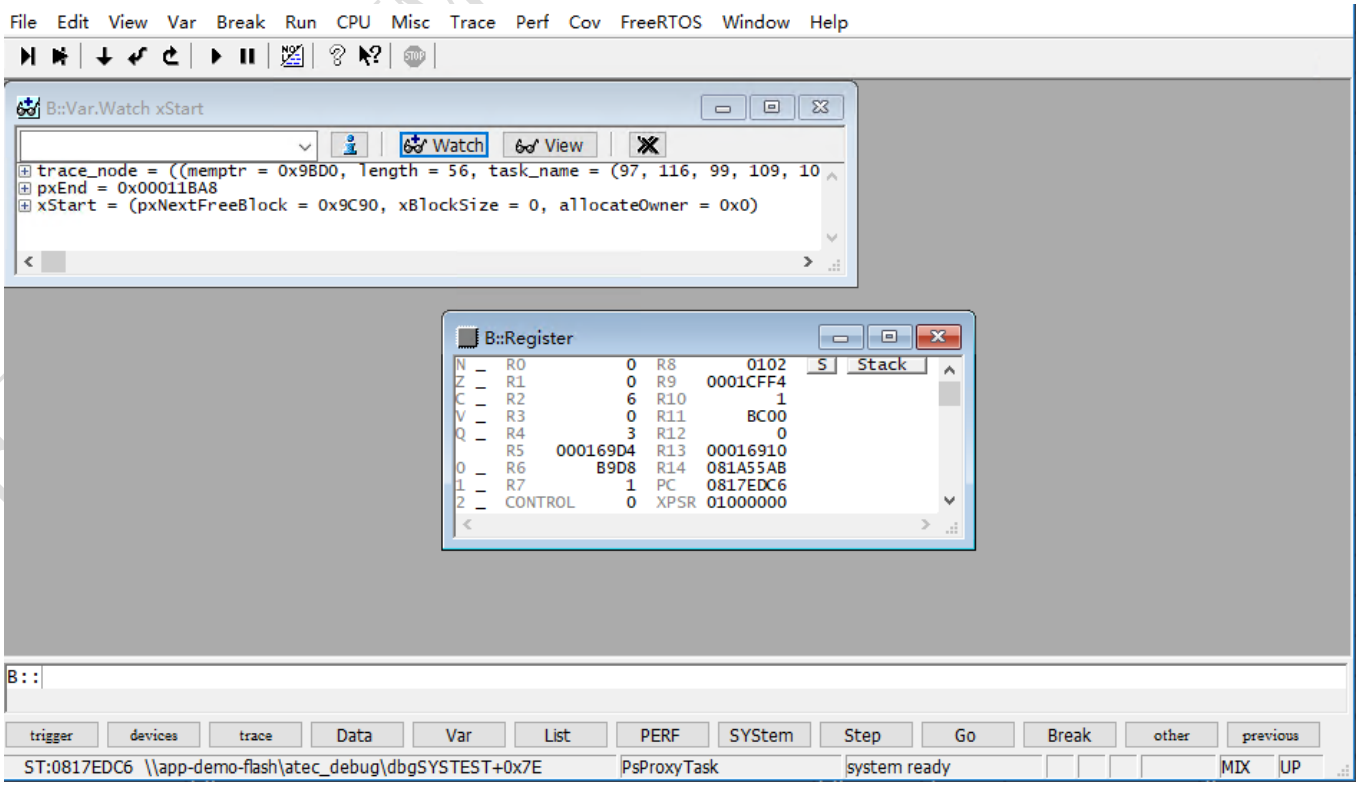
1、 Ram Dump File：By default, the Dump file generated is in the current directory. If it is not correct, you can use “Browe” button to select the correct Dump file.

2、 Axf/elf File: Axf/elf file corresponding to the firmware in the device.

3、 TRACE32：Select the TRACE32 execution file installed on the local computer by clicking “Browse” button.

4、 Run TRACE32 by clicking “OK” button.

The result of running TRACE32 are as follow:



10.2 Save RamDump file

The RamDump Files are stored by default in the folder ramdump of the current running directory. The associated ramdump files will be saved to zip file when saving zip log through UI or socket api.

11. Socket communication

Other applications can call function or module by socket.

11.1 Enable Socket

Refer to chapter 9.3 Socket.

11.2 Package format

The sent data package is in json(JavaScript Object Notation) format. Returns 'Response:OK' if the command is executed correctly, otherwise returns 'Response:<root cause>'.

The available function are as follows:

11.2.1 Start

EPAT will start to recode log if old state is pause or stop after receiving the command.

The command is like ‘start’ command in main toolbar.

```
{
        "settings": [{
                "action": "start",
                "option": ""
        }]
}
```

11.2.2 Pause

EPAT will pause log displaying after receiving the command.

The command is like ‘pause’ command in main toolbar.

```
{
    "settings": [{
            "action": "pause",
            "option": ""
    }]
}
```

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11.2.3 Stop

EPAT will stop saving log data after receiving the command.

The command is like ‘stop’ command in main toolbar.

```
{
        "settings": [{
                "action": "stop",
                "option": ""
        }]
}
```

11.2.4 Update database file

Use the database file that the value of ‘option’ to update file used by current application.

```
{
  "settings": [{
                "action": "updatedb",
                "option": "C:\\image\\20211014110416\\comdb1.txt"
  }]
}
```

11.2.5 Save

```
{
        "settings": [{
                "action": "save",
                "option": ""
        }]
}
```

If the value of ‘option’ is empty:

1. Log file is saved to auto-save folder if function ‘Auto save log files’ is enable (refer to 4.4).
2. Log file is saved to folder ‘bin/autolog’ if function ‘Auto save log files’ is disable.

```
{
        "settings": [{
                "action": "save",
                "option": "D:\\Test-029-31.zip"
        }]
```

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}

If the value of 'option' isn't empty, log file is saved as this path and name. If the file already exists, it will be overwritten.

11.2.6 Set UART and baudrate

Open the specified serial port at the specified baud rate.

```
{
    "settings":[{
            "action":"setuart",
            "option":{
                    "com":"3",
                    "baudrate":"3000000"
                }
        }]
}
```

11.2.7 Set the automatic file saving size and path

Set the specified file size and save path when autosave logs. If the autosave feature is not enabled in the current settings, this command turns on it. For more details, please refer to 4.4.1.

```
{
    "settings":[{
            "action":"setsavesizeanddir",
            "option":{
                    "size":"30",
                    "dir":"D:\\savelog"
                    }
        }]
}
```

11.2.8 Save log to text file in page siglogger

Saving current log data to text file when running state is pause or stop.

```
{
    "settings": [{
            "action": "savesiglogtotxt",
            "option": "D:\\usb_press.txt"
        }]
}
```

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11.2.9 Open log file and save as csv

Open a local log file and save as csv file.

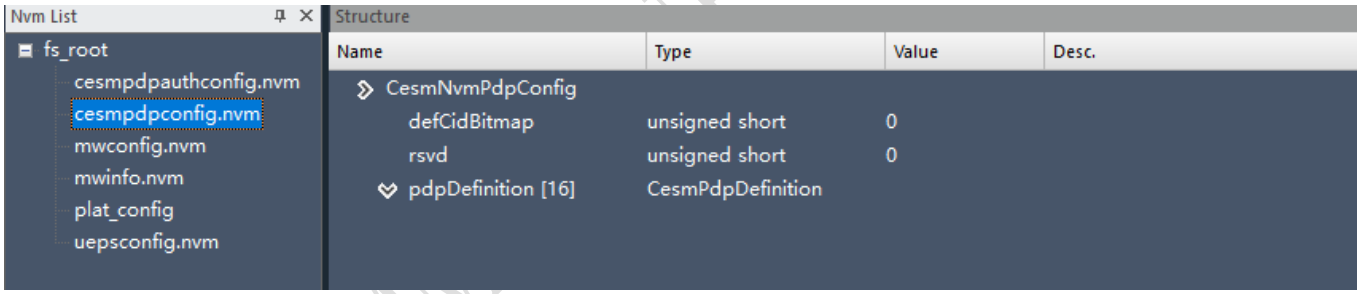
```
{
        "settings": [{
                "action": "opensavecsv",
                "option": "D:\\20201023_103350-specchar.zip||D:\\testSaveCsv.csv"
        }]
}
```

The option's value is the local log file and save the CSV file name, use between "||" separated.

12. LFS File

12.1 View

Clicking menu Unilog->Open FS to open lfs file in Unilog page. The file list will be displayed at Nvm List pane. The file content will be displayed in Structure pane.



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13. Contact US

Founded in February 2017, Shanghai Eigencomm Technologies Co., Ltd. is based in Zhangjiang Hi-tech Park of Shanghai. With a focus on the research, development and distribution of cellular communication, Eigencomm is dedicated to making the best cellular IoT chips in the world.

We boast glorious history, deep expertise and rich experience in cellular communication chips field, which makes us one of the few boutique players in the world to develop proprietary cellular modems achievable only by the big names like Qualcomm, HiSilicon, Samsung, MTK and Unisoc.

Eigencomm has self-developed all its core technologies and IP, including algorithms & architecture, radio frequency, baseband, SoC, protocol stack software, platform & application software and hardware, to offer turnkey solutions to our clients. To provide communication solutions to the “Internet of Everything”, Eigencomm is gradually developing a full range of cellular communication products under various communication standards and transmission rates.

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