User Manual

Scot

SIERRA WIRELESS

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Document History

Version	Date	Updates
1.00	October 10, 2013	Creation
1.01	December 12, 2013	Excel File creation
1.02	January 23, 2014	Windows Seven case in Installation section Installation for more than one MRM
1.03	February 20, 2014	Memory Full and Memory Write Error in troubleshooting chapter

Contents

1. Overview

A GSM-R Network monitoring feature can be activated on MRM to record GSM measurement and Layer 3 protocol messages. Serving and Neighbors cells parameters are collected periodically in idle mode, listener mode and dedicated mode whereas layer messages are logged synchronously.

The feature offers a record mode, a dump mode and a live tracing mode. Depending on the selected mode, collected data can be stored into MRM internal memory of 10 MBytes and recovered later by FTP/ USB link or if live tracing mode is selected then the data are transmitted in real time on Ethernet/USB interface to a connected computer. The purpose of this document is to help user to configure and handle the **Scot** application, which is the PC trace tool for MRM.

1.1. Abbreviations

- GSM-R: Global System for Mobile – Railway
- MRM: Mobile Radio Module
- Scot: Abbreviation of SGCM Outil de Trace
- GUI: Graphical User Interface
- UI: User Interface
- ASCI: Advanced Speech Calls Items
- GMT: Greenwich Mean Time

2. Prerequisites and Link Setup

2.1. Prerequisites

2.1.1. Compatible Devices

Scot is compatible with MRM GPRM1 and HPRM1. The table below provides the compatibility details of both devices. Scot has been designed only for USB and ETH link.

Device	Serial Link	Internal USB Link	Ethernet Link (TCP)
GPRM1	**NO**	NO (except internal USB available from opened MRM)	YES
HPRM1	**NO**	YES	YES

Figure 1. Device compatibility

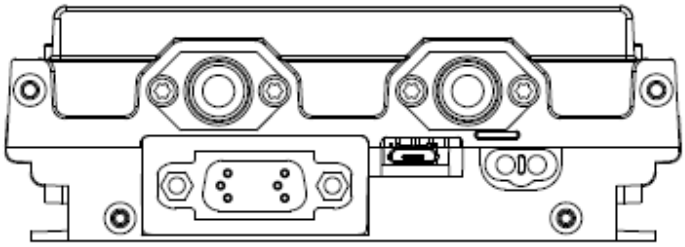


Figure 2. HPRM1, view of the front

2.1.2. Prerequisites for MRM

- Make sure that the latest software is updated on the MRM.
- Make sure that the latest SAGEMCOM USB driver is properly installed on your PC
- Plug the MRM to PC with the provided USB cable
- Check the COM ports
- Install and configure the PC application (SCOT) on Windows Operating System (more details below)

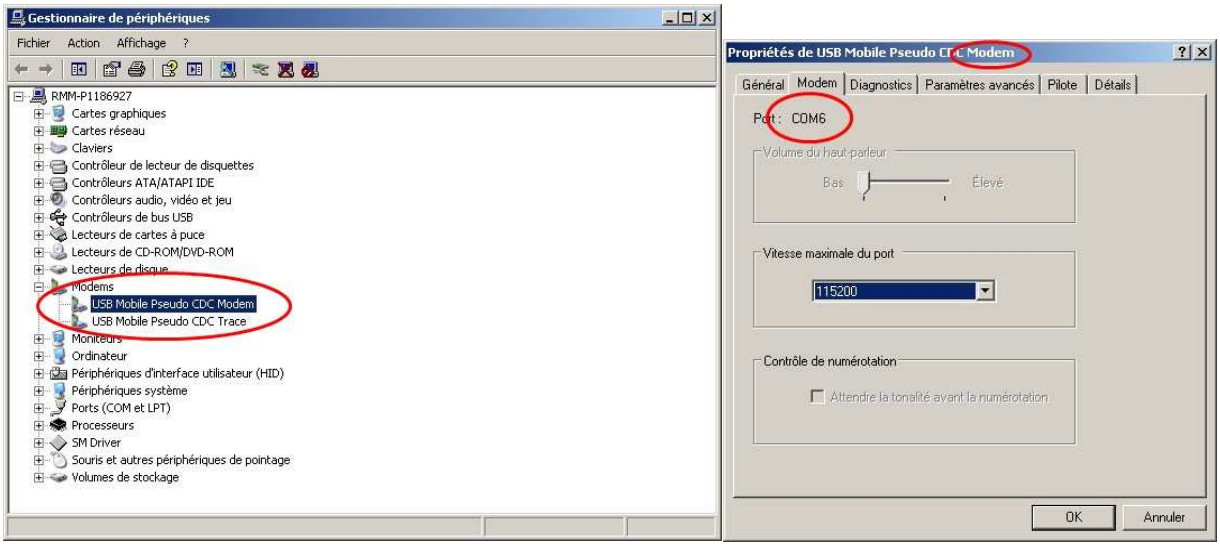
2.2. Link Setup

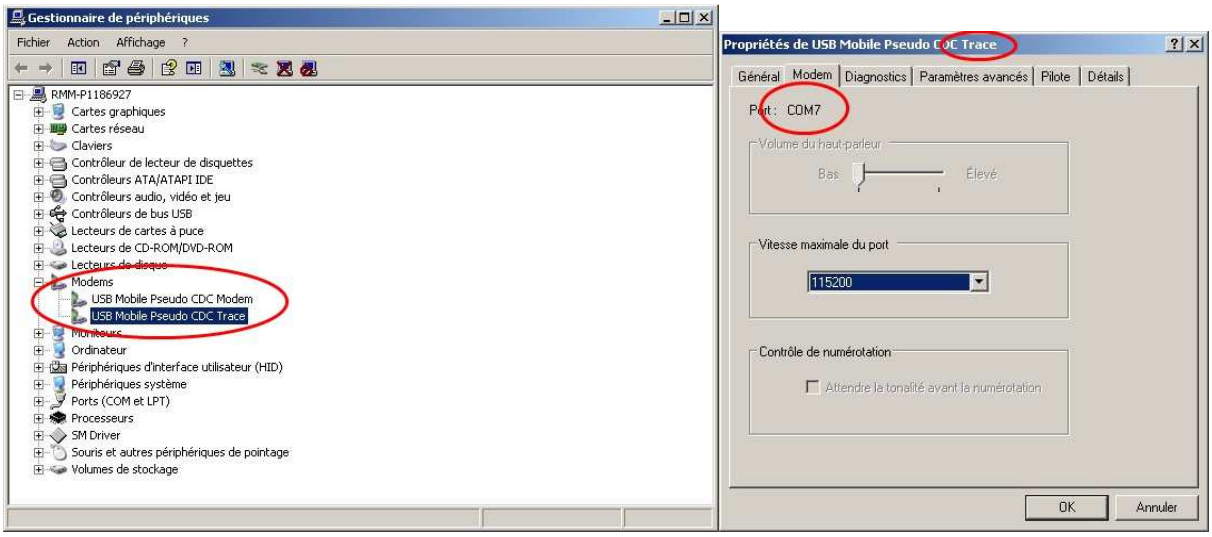
2.2.1. Internal USB

When MRM is linked with internal USB, there are two COM ports:

- Trace port: This port is dedicated to get the trace data from the MRM (i.e. Trace Record or real time traces)
- Modem port: This port is dedicated to send STMA commands to the MRM
- The link speed of both ports is by default 115200 bauds.

In Control Panel, device manager:





2.2.2. Ethernet

Ethernet cable can be plugged either in the front pane or in the back pane. MRM has an internal network Hub.

When MRM is linked with Ethernet link, two TCP ports are used (not configurable):

- Trace port: MRM TCP server port is 9999
- Modem port: MRM TCP server port is 9998

Important:
The USB cable must be unplugged if TCP link is used.
To switch from USB to Ethernet, MRM must be restarted after USB is unplugged.

3. Scot PC Application

Scot is a PC application specifically designed for easily handling the Trace Tool feature of the MRM.

It allows a user to:

- Upload the OT Trace Record from the MRM to a file on the PC with a text format easy to analyze.
- Monitor in real time the GSM-R parameters of trace on a PC screen with a graphical presentation in form of chart, log and table.
- Analyze the raw file of OT or AT trace.

3.1. Hardware Requirement

The hardware requirements for this software are:

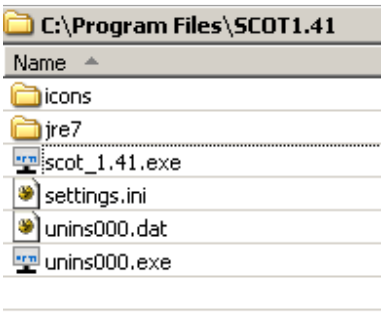
- 1 Go RAM
- Screen resolution higher than 1024x768
- Windows XP or 7 Operating System

3.2. Installation

The program is installed with the setup program "***Scot setup.exe***". To install the Scot software, click on setup exe and follow instructions. The default installation's directory is: "***C\Program Files\SCOTx.yz***".

The xyz letters are version numbers, for example 1.41

The setup process installs the java Runtime Environment JRE7 in the same directory as Scot application Scot_x.yz.exe



The executable Scot_x.yz.exe is configured to use the JRE in the same directory (.\jre7). In this way, there is not interaction with the java environments previously installed in the computer.

Rxtxserial.dll and win32com.dll are added to the directory C:\Program Files\SCOTx.yz\jre7\bin. These dlls are mandatory for Scot to work.

3.2.1. Scot installation on Windows Seven PC

The setup.exe must be launched as administrator.

Windows Seven should be able to execute Scot application.

In case you're not able to launch Scot:

- Right click on Scotx.yz.exe and click on "Troubleshoot compatibility"
- Click on "Troubleshoot Program"
- Select "The program worked in earlier versions of Windows but won't install or run now"
- Select "Windows XP Service Pack 3"
- Click on "Start the program", Scot should be launched
- Close Scot GUI
- Click on "next" and "Yes, save the settings for this program"
- Click on "Close"

After this procedure, Scot application will be launched with Windows XP compatibility.

3.2.2. Multiple instances installation

If you need to perform a live trace on two MRMs or more, you need to make copies of the entire Scot Folder and run one Scot application in each folder.

Example for 2 MRMs:

- Copy "C:\Program Files\SCOT1.46" into "C:\Program Files\SCOT1.46 bis"
- Launch scot_1.46.exe in the original folder "C:\Program Files\SCOT1.46"
- Launch scot_1.46.exe in the new folder "C:\Program Files\SCOT1.46 bis"

Note: if you need to perform a decode raw file, there is no need to clone the folder

3.3. Uninstallation

The application can be easily uninstalled in the control panel or by launching C:\Program Files\SCOTx.yz\unins000.exe

This process removes all file except settings.ini

3.4. User Interface

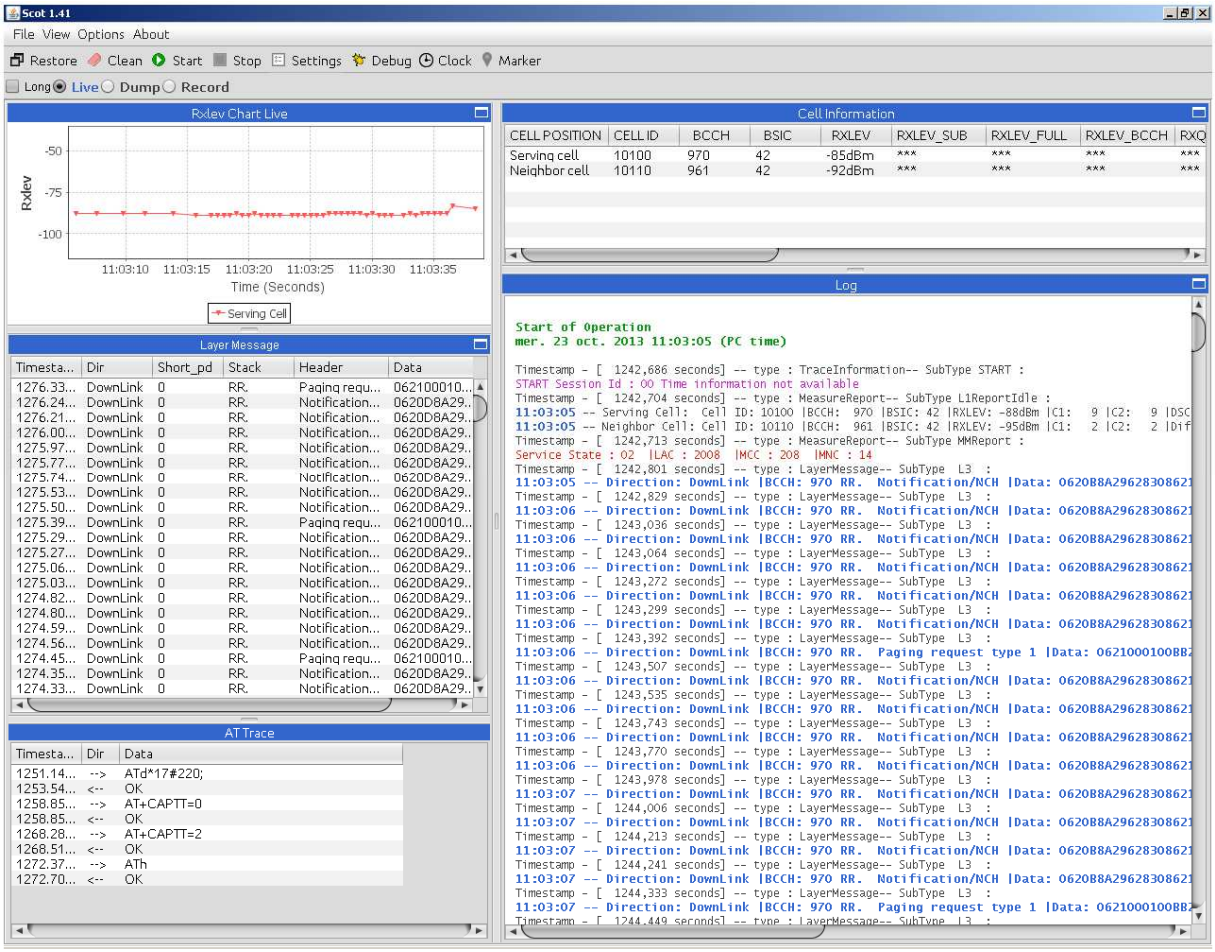


Figure 3. Main Window of Scot in "Live Tracing Mode"

3.4.1. Components of User interface

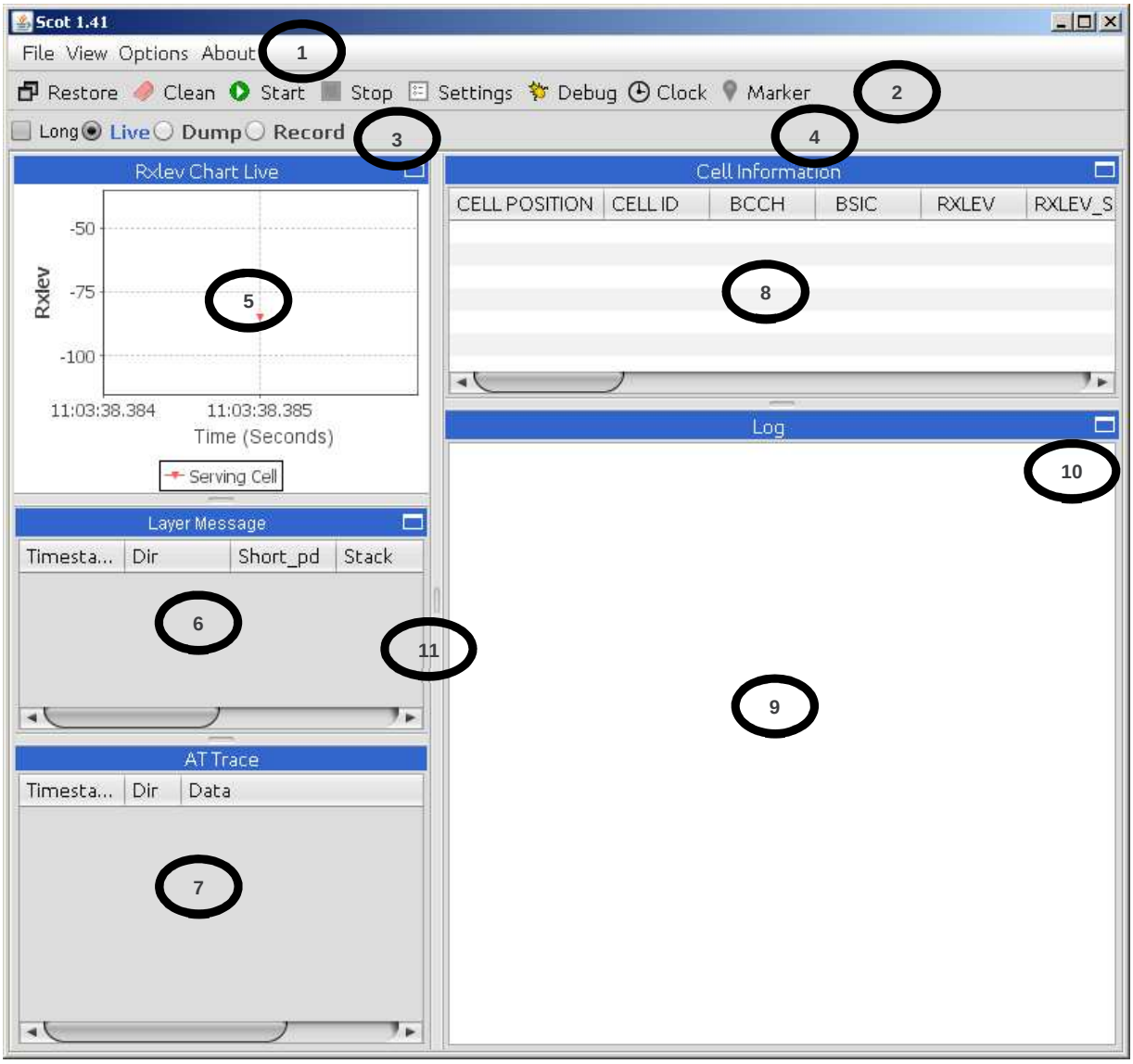


Figure 4. Components of User interface marked on the window in "Live Tracing Mode"

1. Menu bar
2. Tool Bar
3. Mode Switch
4. Progress Bar (absent in live mode) and File Size Information
5. Live Tracing Chart
6. Layer Message table
7. AT command trace table
8. Cell information Table
9. OT Trace Log Screen
10. Maximize/ restore down button
11. Split divider

3.4.2. Menu bar

Menu bar has 4 menus included: “File”, “View”, “Option”, “About”.

3.4.2.1. File menu

File menu contains 2 items:

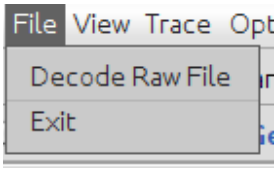


Figure 5. File menu

Decode Raw File:

Open a window to start raw file selecting and decoding process. This function is available when there is no trace or decoding running. It deals with raw files of OT traces and AT Traces. Only “.bin” and “.raw” are allowed.

- “.bin” file is OT trace raw file.
- “.raw” file is AT trace raw file.

Exit:

Exit the Scot application. “Exit” Equivalents to the “close” button of the main window.

3.4.2.2. View menu

View menu contains 2 items:

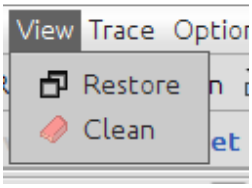


Figure 6. View menu

Restore:

Restore the screen views according to current trace mode. Screens will be resized with a specific scale to adjust the current size of main window. No data changes when user performs the “restore”.

Clean:

Erase the data result on all screens except debug screen.

Note: There are equivalents for “restore” and “clean” on the tool bar for easy access.

3.4.2.3. Option menu

Option menu has 5 items:

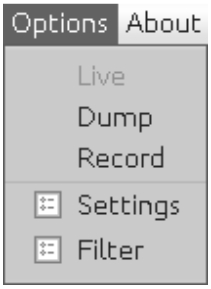


Figure 7. Option menu

Live/Dump/Record:

Switch the trace mode. Only one of the 3 items is available at same time.

Settings:

Launch the settings window to modify the ports settings and output path setting.

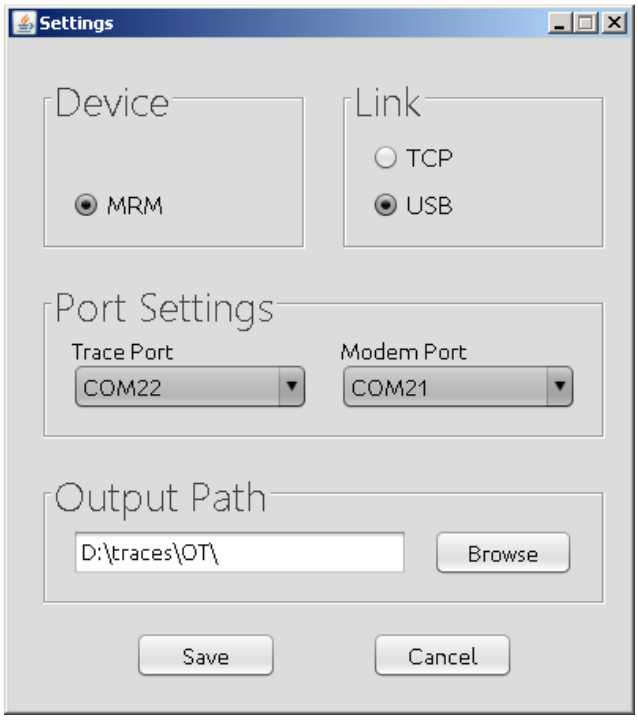
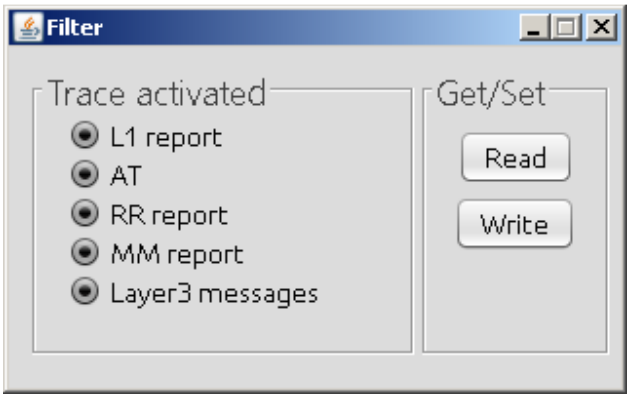


Figure 8. Settings window example

Note: There are equivalents for "Live mode", "Dump mode", "Record mode" and "Settings" on the tool bar for easy access.

Filters:

Launch the Filters window to modify the kinds of traces sent by the MRM:



The Filter window is self-explanatory: click **Read** button to get the filters, choose the required kind of traces and click **Write** Button to save the configuration. The change takes effect immediately, no need to restart the MRM.

This feature is active only if no operation is running otherwise Filter menu is not available.

3.4.2.1. About menu

About menu has 2 items:

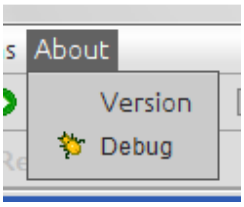
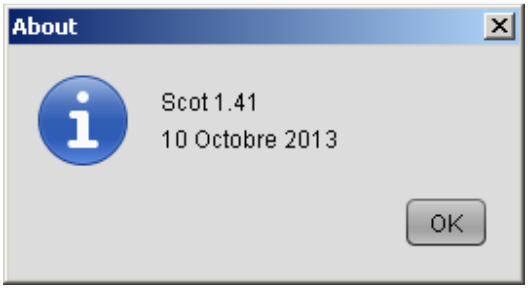


Figure 9. About menu

Version:

This item shows Scot version information.



Debug:

Display/ Hide debug screen.

Note: There is an equivalent for "Debug" on the tool bar for easy access.

3.4.3. Mode Switch

Live radio button is used to observe traces in real time.

Long check Box is used for very long live sessions (no display)

Dump radio button is used to recover MRM trace record file.

Record radio button is used to perform a record session.

Lock check Box is used to control the scrolling in the log screen.

3.4.4. Tool bar

Tool bar view will switch according to the current trace mode:

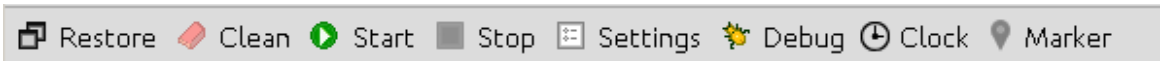


Figure 10. Tool bar in live tracing mode

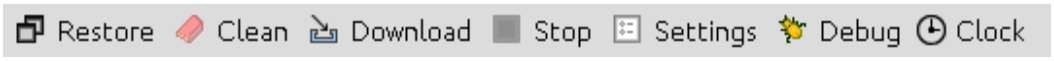


Figure 11. Tool bar in dump mode

Figure 12. Tool bar in record mode

Restore:

Restore the screen views according to current trace mode. Screens will be resized with a specific scale to adjust the current size of main window. No data changes when user performs the “restore”.

Clean:

Erase the data result on all screens except debug screen.

Start:

Start the trace in live tracing mode. This item is available when no trace running and will be disabled when trace is started.

Stop:

Stop the running trace. This item is disabled when no trace is running and it will be enabled only while trace is running.

Download:

Start the download of trace record on MRM in dump mode. This item will be disabled while the download is processing and will be enabled when the process of download is finished.

Settings:

Launch the settings window to modify the ports settings and output path setting.

Debug:

Display/ Hide debug screen.

Clock:

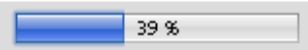
Send a command to synchronize the MRM with the host.

Marker:

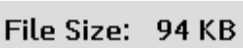
Send a command to add a marker into the trace. The marker number is incremented by the MRM.

3.4.5. Progress bar and File Size Field

Progress bar shows the percentage of downloading in dump mode, or the percentage of memory used in record mode.



File Size Field always displays the number of Kilo Bytes used to store traces into the MRM. It is not displayed in live mode. This information is updated when Scot is launched, and during a record session.



In Long Live tracing mode, the progress bar is indeterminate:

3.4.6. Trace Log Screen

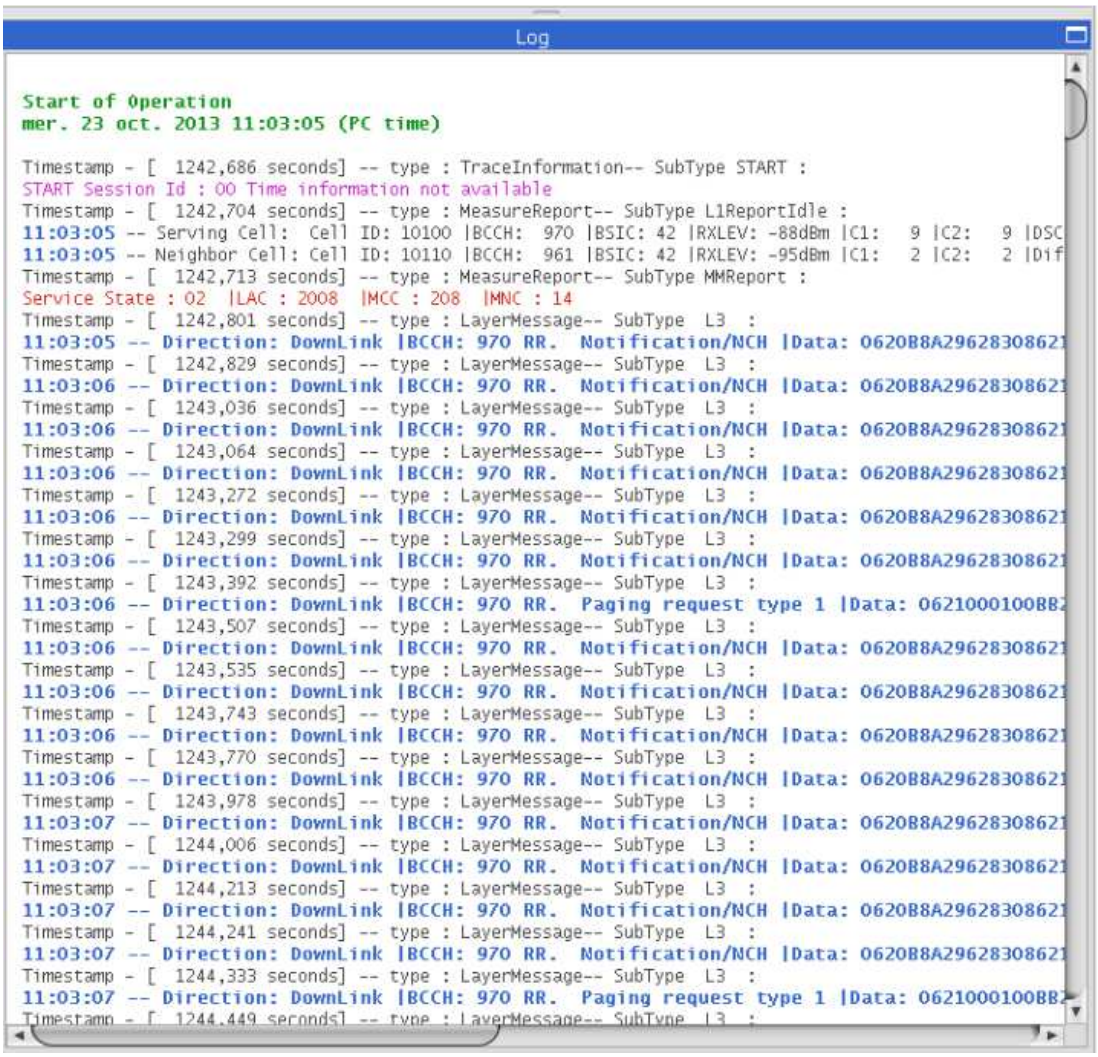
In this screen, messages are displayed in natural order (older messages on the top).

When a live session is started, the log text scrolls automatically to the end so that user can see the last messages in real time.

User can stop the auto-scrolling if the **Lock** check box is checked. In that way any part of the text log can be viewed.

User can copy/paste a part of the text using standard key short cuts CTRL C and CTRL V. It is recommended to use the lock mode to perform this operation.

The log screen has a limited size, so the older messages are not displayed when the maximum size is reached.



3.4.7. Layer Messages Table

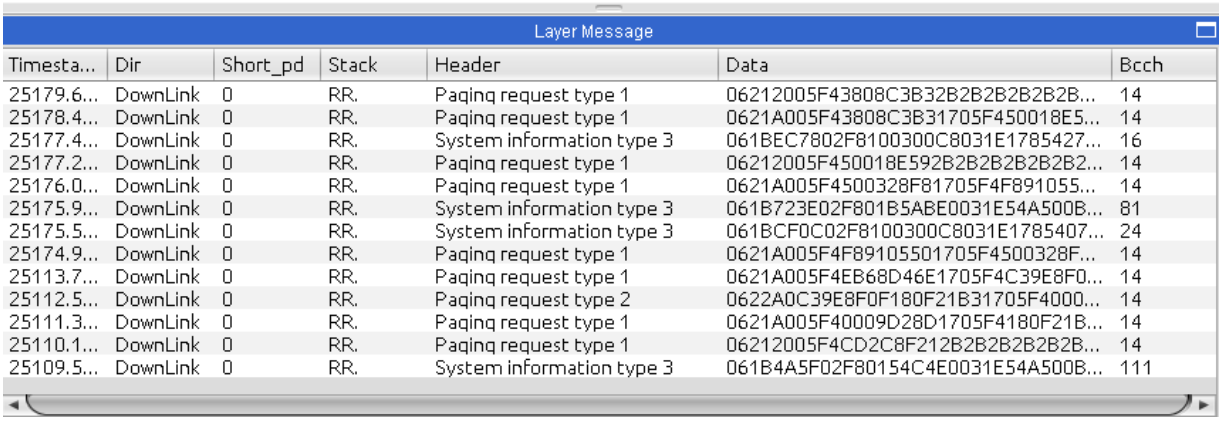
Each layer Message is displayed on one line of the table.

The lasts messages are on the top. In this way, user does not have to scroll down to watch the last messages in real time.

This table has a limited size, so the older messages are not displayed when the maximum size is reached.

Each column can easily be resized.

The data **field** of the messages is displayed in a raw format (hexadecimal) because some parameters are not decoded.



Timesta...	Dir	Short_pd	Stack	Header	Data	Bcch
25179.6...	DownLink	0	RR.	Paging request type 1	06212005F43808C3B32B2B2B2B2B2B...	14
25178.4...	DownLink	0	RR.	Paging request type 1	0621A005F43808C3B31705F450018E5...	14
25177.4...	DownLink	0	RR.	System information type 3	061BEC7802F8100300C8031E1785427...	16
25177.2...	DownLink	0	RR.	Paging request type 1	06212005F450018E592B2B2B2B2B2B2...	14
25176.0...	DownLink	0	RR.	Paging request type 1	0621A005F4500328F81705F4F891055...	14
25175.9...	DownLink	0	RR.	System information type 3	061B723E02F801B5ABE0031E54A500B...	81
25175.5...	DownLink	0	RR.	System information type 3	061BCF0C02F8100300C8031E1785407...	24
25174.9...	DownLink	0	RR.	Paging request type 1	0621A005F4F89105501705F4500328F...	14
25113.7...	DownLink	0	RR.	Paging request type 1	0621A005F4EB68D46E1705F4C39E8F0...	14
25112.5...	DownLink	0	RR.	Paging request type 2	0622A0C39E8F0F180F21B31705F4000...	14
25111.3...	DownLink	0	RR.	Paging request type 1	0621A005F40009D28D1705F4180F21B...	14
25110.1...	DownLink	0	RR.	Paging request type 1	06212005F4CD2C8F212B2B2B2B2B2B...	14
25109.5...	DownLink	0	RR.	System information type 3	061B4A5F02F80154C4E0031E54A500B...	111

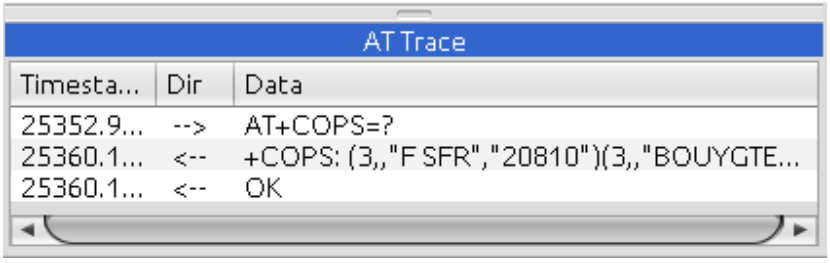
3.4.8. AT messages Table

Each AT message is displayed one line of the table. The messages are in natural order (older messages on the top). This table has a limited size, so the older messages are not displayed when the maximum size is reached.

Before each message, an arrow is written:

- - - > for commands
- < - - for responses
-

Note that carriage returns of the AT responses are removed.



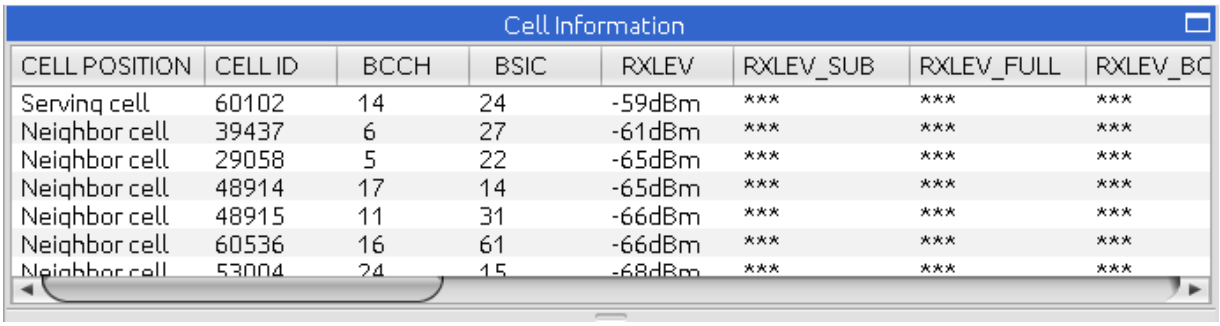
Timesta...	Dir	Data
25352.9...	-->	AT+COPS=?
25360.1...	<--	+COPS: (3,,"F SFR","20810")(3,,"BOUYGTE...
25360.1...	<--	OK

3.4.9. Cells Information Table

In this table, all the parameters (BCCH, RXLEV…) of the serving cell and the neighbors cells are displayed.

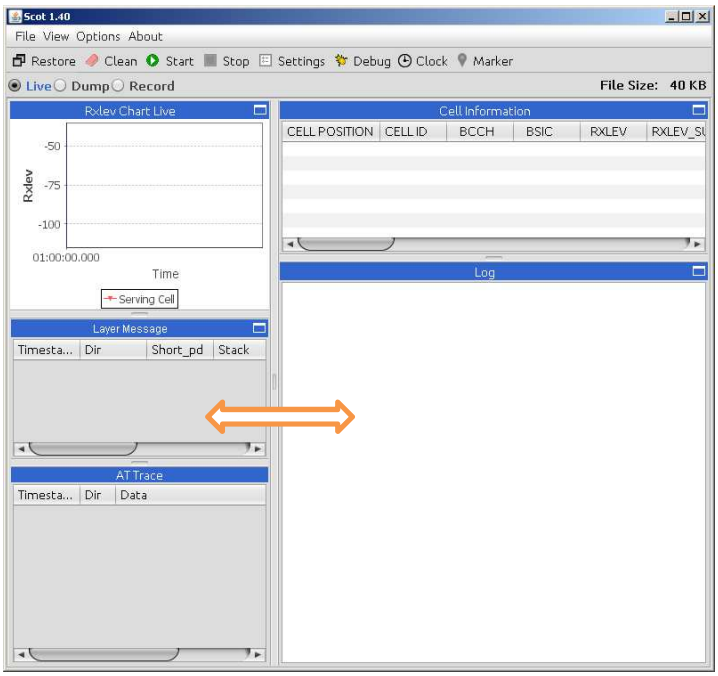
The number of neighbor cells varies from one to six

When an information is missing, *** is displayed.



3.4.10. Split Divider

Drag the dividers to adjust the size of internal screens.



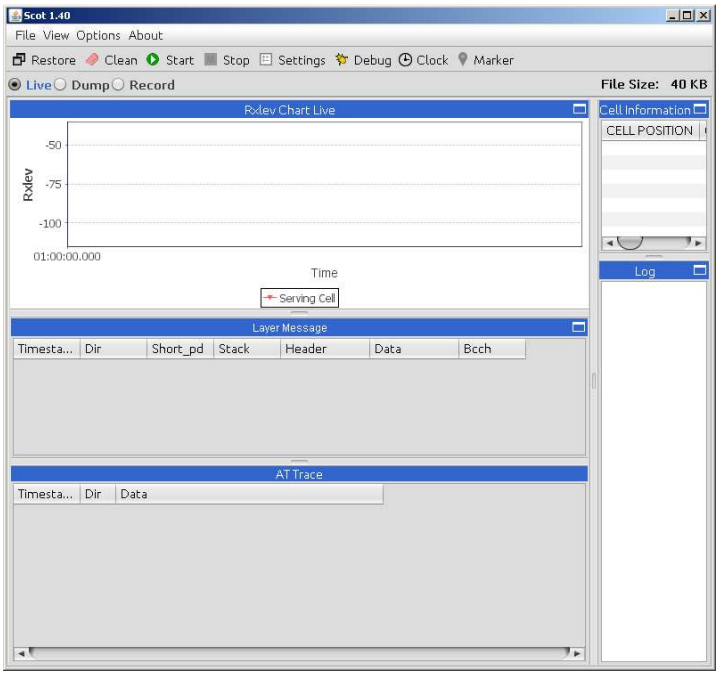


Figure 13. Divider usage example

3.4.11. Restore down and maximize

Click "□" to maximize the one selected screen and "- -"to restore down it. The layout will be restore as it was before maximizing is performed.

3.4.12. Debug screen

Click "Debug" to launch the debug screen. Click again to hide it. Click "Close" button and "minimize" button on the debug screen can also hide the screen.

Operation information and debug information will continuously appending on the debug screen whether the screen is hiding or not.

The debug screen will be shown beside the main window of Scot, on the left. User is allowed to move it anywhere. If the screen is hided, it will appear at the default location beside the main window.

User is not allowed to resize this screen.

There is a panel shows current settings of the Scot including Device type, Link type, Modem and Trace port, Trace mode and output path.

The raw data will be displayed byte by byte in Hexadecimal Strings format as shown in figure below.

In settings.ini, you can add:

Debug = X,

X is a debug level. X = 9 will mode will display as many information as possible.

Here is an example of debug screen.

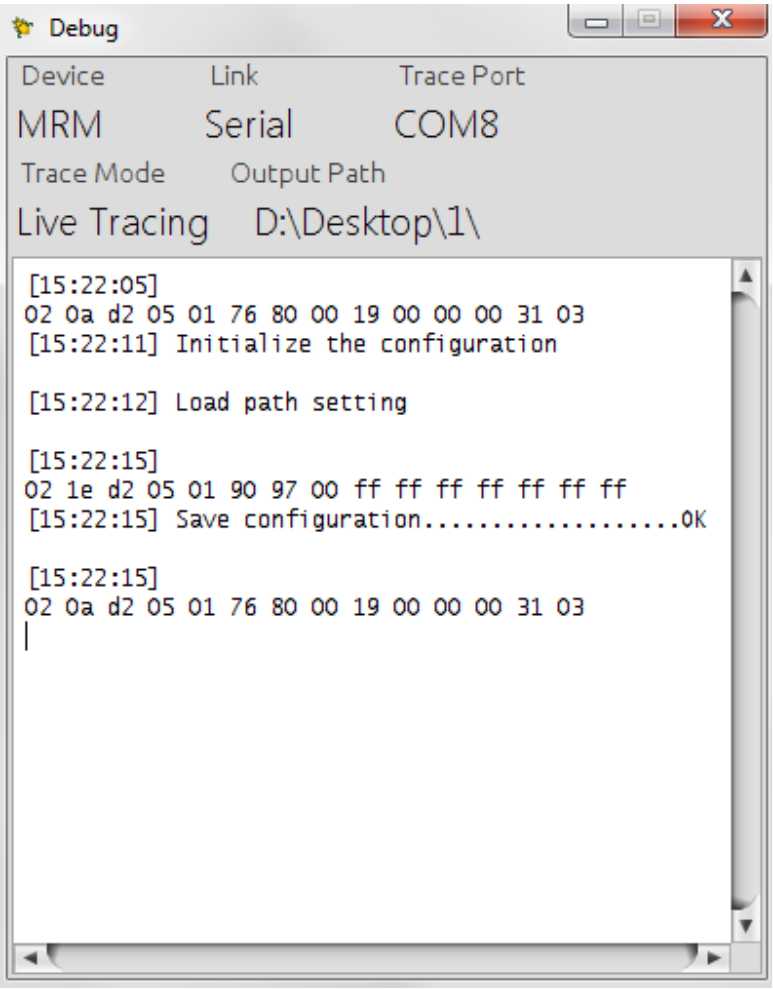


Figure 14. Debug screen

3.5. How to use

This chapter explains the use of Scot PC application. Make sure the application is properly installed. Make sure the latest software is installed on MRM.

3.5.1. First Launch

Scot will create a settings.ini profile in the program directory when the first launch is performed. This file is in charge of holding the parameters of settings. The loss of this file during the usage of Scot will cause errors. Scot will check the validity of settings.ini every time the application launches. The window below means settings.ini file lost or the port settings are no longer available. User should then define the port settings.

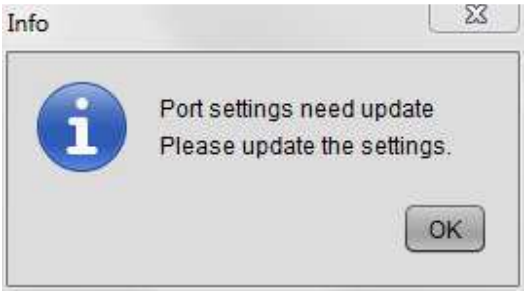


Figure 15. Settings check result

3.5.2. Content of settings.ini file

The content of settings.ini is for example:

```
#settings.ini
#Tue Oct 22 17:31:34 CEST 2013
tracePort=COM10
outputPath=D\:\\traces\\OT\\
device=MRM
modemPort=COM9
link=USB
debug = 0
traceMode=Live
```

tracePort and modemPort: Serial USB ports for traces and commands respectively, must contain “COM” (*)

outputPath: path where log files will be written to

link: USB or TCP

traceMode: Live, Dump or Record

debug: 0 or 9 This is the level for text logs. Hexa-decimal frames received on trace link can be displayed. This let user double check decoding operation performed by scot using protocol doc as a reference.

(*) Generally, trace port = modem port + 1

3.5.3. Port Settings

The port settings are the precondition of performing traces. Click on “Settings” button on the tool bar or select the “Settings” item in “Option” menu to launch settings window.

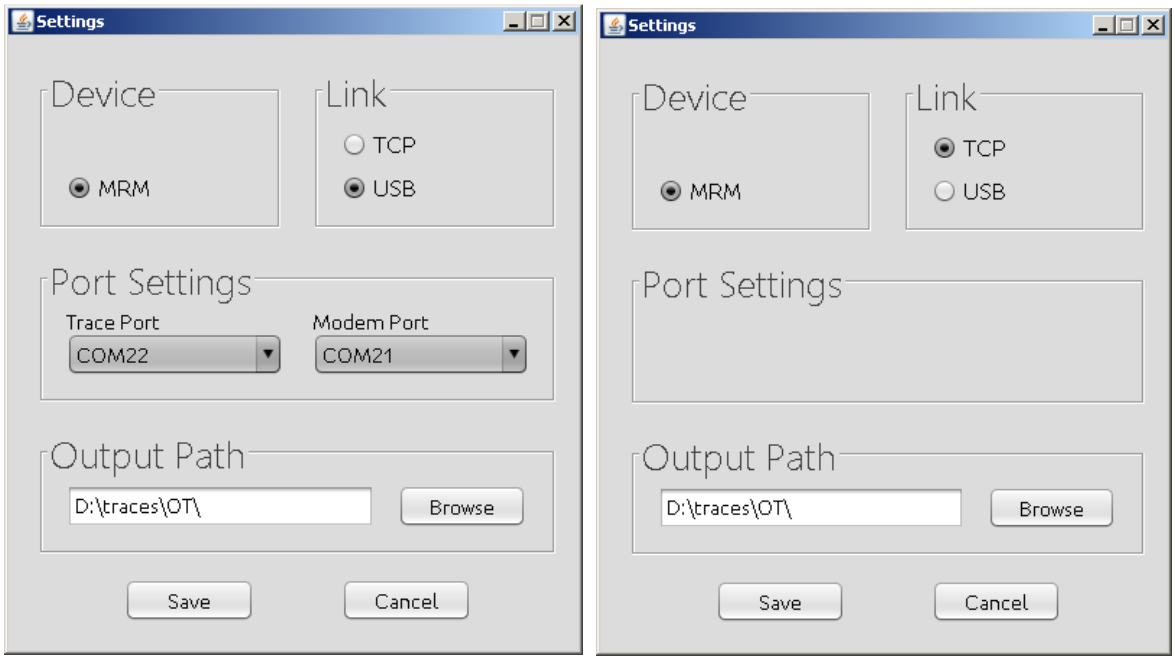


Figure 16. Settings window, USB link view on the left, TCP link view on the right

Select “MRM” option in Device panel. Then select the link type.

- USB link provides options for two ports. Trace port and modem port.
- TCP link does not provides any option

Make sure the link type is exactly the link type you use. The selection will affect the view of the port setting panel. There will be a validation of all parameters when saving the settings. The validation of ports depends on the selection of link type.

User can select the port to use by selecting the item listed in the combo box.

Click “browse” button to choose a directory as output path. User should choose a path, not a file. Raw files and log files will be output to this path. The output path will be checked when saving the settings.

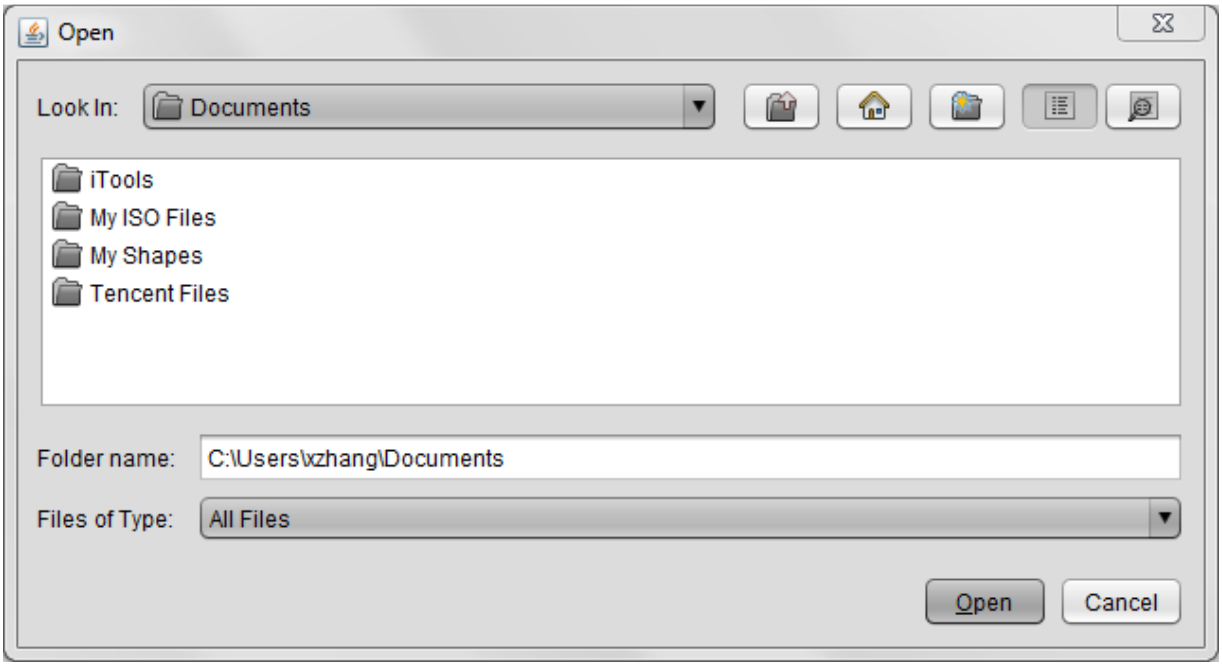


Figure 17. Choose the output path

Click “Save” button to save the parameters in settings.ini. Scot will show the tips if any parameter is not correctly defined.

Figure 18. Bad path example

Click “Cancel” button or the “Close” button to close settings window without making any change.

Click “Minimize” button to minimize the settings window.

When **Save** is pressed, a command is sent to the MRM via the selected link, and the response is checked.

The configuration is OK if no error popup is displayed.

3.5.4. Switch Trace Mode

Select live tracing, Dump or Record to switch the trace mode. This operation can only be made when no trace is running. Only one mode is acceptable at the same time. The option should be checked before starting the trace (START).

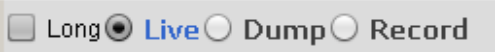


Figure 19. Mode switch buttons, view under tool bar on the left

The mode is by default set to Live Tracing if no switch is performed.

Long check box must be checked in case of a very long live session. In this mode, no traces are displayed.

3.5.5. MRM synchronization

MRM cannot store the horodate permanently. Therefore it is advised to send the horodate to the MRM after it is restarted. The horodate is sent in Start, Stop and Marker messages and Scot display the date and time if it is present.

Prerequisite: no operation is running

- Click **Clock** button.

Example of Start message in log screen:

Fist case, MRM has not been synchronized:

```
Timestamp - [   256,922 seconds] -- type : TraceInformation-- SubType START :
START Session Id : 00 Time information not available
```

Second case, MRM has been synchronized:

```
Timestamp - [  4284,524 seconds] -- type : TraceInformation-- SubType START :
START Session Id : 00 Date : 23-10__13:59:35
```

3.5.6. Start and stop Live Tracing

In live tracing mode, user can click **Start** button to start the live tracing. User will not have access to **Start**, **Settings** and **mode switch** when a trace is running. User will be able to stop the trace by clicking **Stop** button.

Once the trace is started, scot will display decoded data on log screen. Value of serving cell's Rxlev will be shown as a line on the live tracing chart. Current cell information will be displayed on the "cell information" table. AT command trace will be displayed on the AT trace table if happens.

Logs will continuously appending in the end of log screen.

Layer 3 Messages with be displayed most recent first in the Layer Message table. So there is no need for scrolling to see the last messages.

During the trace, data coming from the port will be directly recorded into a raw file, named according to the date, time and trace mode.

Warning ! The TCP connection will be successful only one minute after MRM startup.

Here is an example (20130128_12-6-15Live.txt) of how traces are formatted and recorded in the final log file:

```
Start of Operation
ven. 11 oct. 2013 11:12:24 (PC time)

Timestamp - [  5519,245 seconds] -- type : TraceInformation-- SubType START :
START Session Id : 00 Date : 11-10__11:12:23
Timestamp - [  5519,258 seconds] -- type : MeasureReport-- SubType L1ReportIdle :
11:12:24 -- Serving Cell:  Cell ID: 10100 |BCCH:  970 |BSIC: 42 |RXLEV: -80dBm |C1:  17 |C2:  17 |DSC:  22 |DSC_MAX:  22
11:12:24 -- Neighbor Cell: Cell ID: 10110 |BCCH:  961 |BSIC: 42 |RXLEV: -85dBm |C1:  12 |C2:  12 |Different LAC - Cell Not Barred
Timestamp - [  5519,268 seconds] -- type : MeasureReport-- SubType MMReport :
Service State : 02  |LAC : 2008  |MCC : 208  |MNC : 14
Timestamp - [  5519,291 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:24 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5519,318 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:24 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5519,526 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:24 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5519,554 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:24 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5519,762 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5519,789 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5519,997 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,024 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,163 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Paging request type 1 |Data: 0621OOO1OOEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,232 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,260 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,468 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,495 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,703 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
Timestamp - [  5520,730 seconds] -- type : LayerMessage-- SubType  L3  :
11:12:25 -- Direction: DownLink |BCCH: 970 RR.  Notification/NCH |Data: 062OEB2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B2B
```

Figure 20. Scot log file example 20131011_11-12-23Live.txt

Click “stop” to stop the trace. Log screen will move the cursor to the end of log. Other screen will remain the last state at once. “Stop” button will be disabled and user will have the access to “start”, “settings” and mode switch back. At the same time a log file named according to date, time and trace mode will be generated in the output path as a record of the log screen.

Warning ! The MRM will not detect the disconnection if the ethernet cable is unplugged during any operation. MRM must be restarted in that case.

3.5.7. Scrolling in the log screen

If the **Lock** check box is unchecked (default), the log text scrolls automatically to display the last lines.

If the **lock** check box ix checked, the scrolling of the log screen is stopped. In that way user can easily navigate into the log.

3.5.8. Marker Insertion

During Live or Record sessions, it is possible to add a marker into the traces.

Note that is not allowed to send a marker command if no operation is running.

- Click Marker button

A number is incremented by the MRM each time a Marker Command is sent by the host.

Example of marker in log screen (marker number is 03 here):

```
Timestamp - [  1160,996 seconds] -- type : TraceInformation-- SubType MARKER :
Marker : 03 Session Id : 00 Date : 23-10__14:22:24
```

3.5.9. Recording

In Record Mode, click Record button. When the session is finished, user can stop it by clicking **Stop**.

The recording may be stopped by the MRM if memory is full.

The MRM generates no trace during this operation.

3.5.10. MRM File Erasing

If MRM memory is full, user can erase the content of the MRM memory

- Chose Record Mode
- Click **Erase** button
- Wait for the operation completion (duration depends on file size)

Warning ! Please do not switch off the MRM during this erasing operation !

3.5.11. Download trace record

In Dump mode, click **Download** button to start downloading trace record from MRM.

For performance reasons, only the progress bar will be displayed in this operation, and no decoding is performed at this stage. The raw data are saved into a file for example *20131008_15-49-13Dump.bin*

This file can be decoded via the menu File->Decode Raw File

3.5.12. Decoding raw files

Scot enabled user to decode existing raw file of OT traces and AT traces. Click the “Decode” item in the file menu.

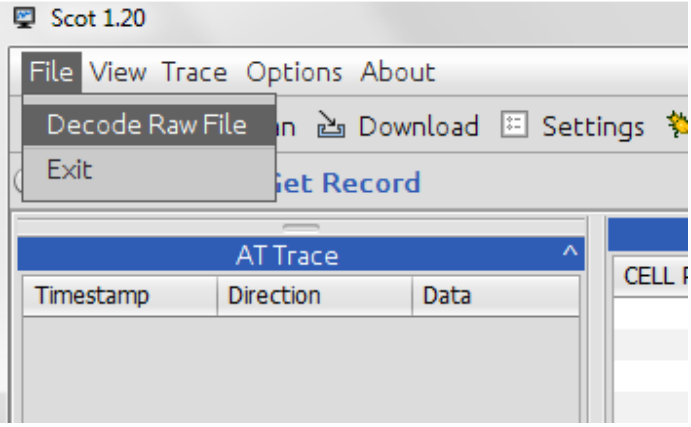


Figure 21. “decode raw file” item in the file menu

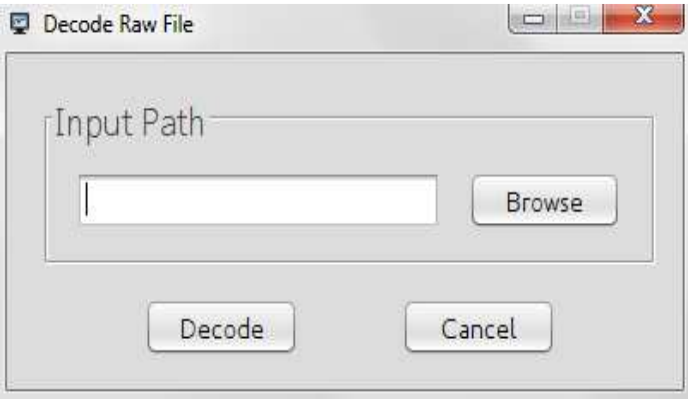


Figure 22. “decode raw file” window

Click “Browse” to choose a raw file. Only “.bin” and “.raw” files are allowed. “Click “Open” in file chooser window to finish choosing.

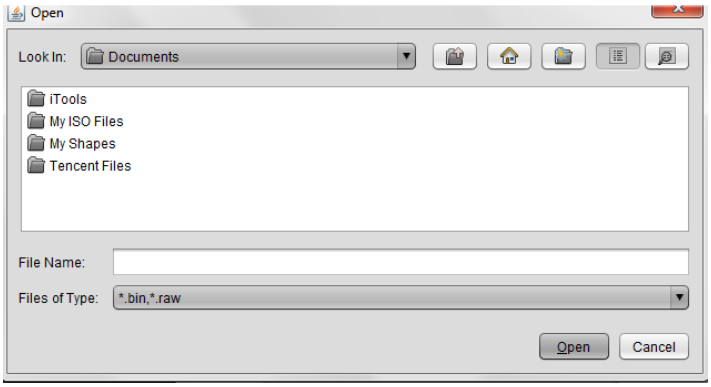


Figure 23. File chooser window

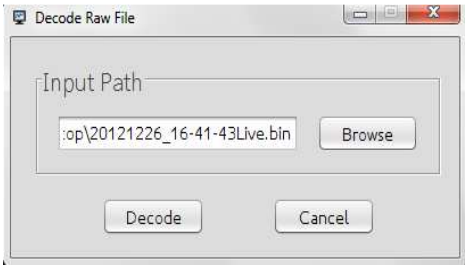


Figure 24. "decode raw file" window

Click "Decode" button to start decoding file.

Cell Information zone is relevant only in live tracing mode, this window is left blank in decode raw file mode. The log window is in black color for performance reasons.

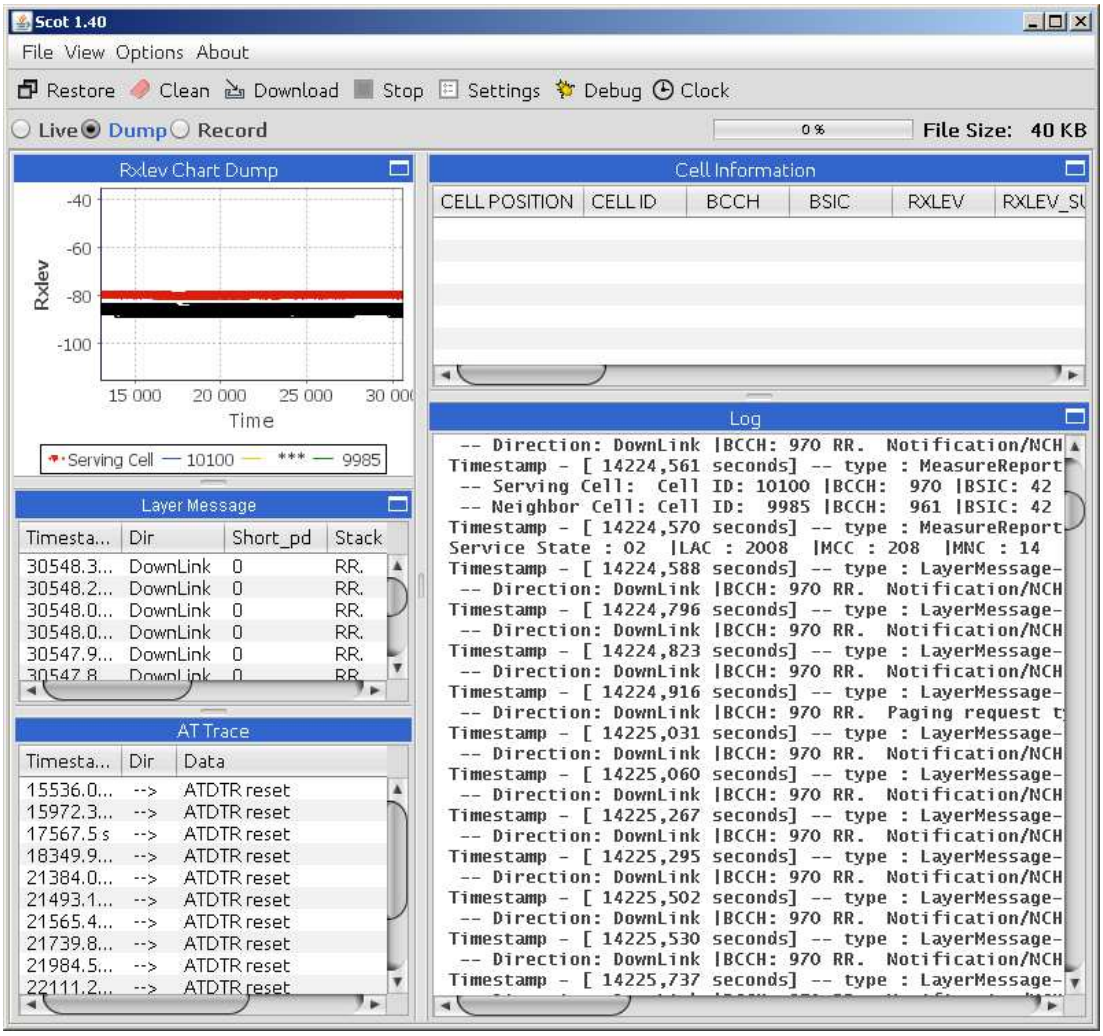


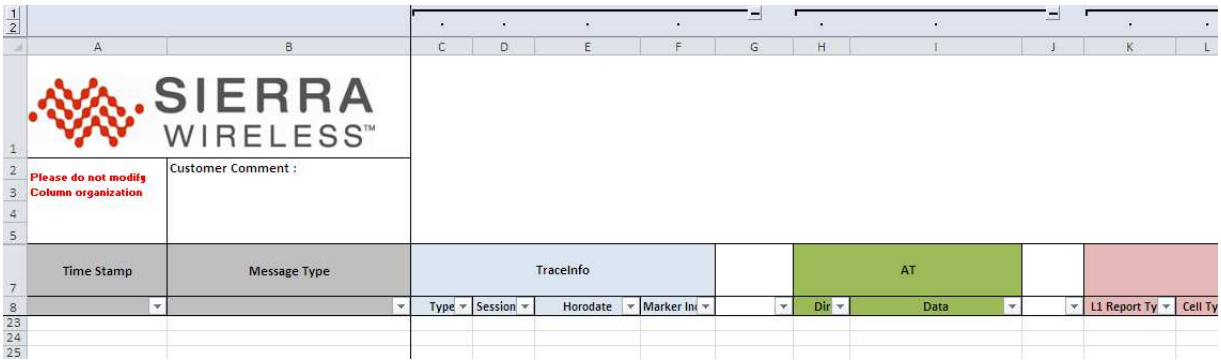
Figure 25. Main windows after decoding of a very big file

3.5.13. Excel Template File

In the root of Scot, ***Template_TracingFeature.xlsx*** is used as a template for the generation of an excel file after a live session or a decode raw file session.

User is allowed to change the format of any cell, but not to add a column.

It is strongly recommended to save a copy of this file before any modification.



3.5.14. Output Files generated by Scot

After a Live Session, the whole content of the log screen is copied in a .txt file. The binary content of the trace is stored in a .bin file.

These two files are placed in the directory specified in the Output Path field of the Settings Window.

Examples:

20131004_13-43-59Live.bin

20131004_13-43-59Live.txt

The format is *yyyymmdd_hh-mm-ssLive* with:

- *yyyy*: year
- *mm*: month
- *hh*: hour
- *mm*: minute
- *ss*: second

An excel file is also created, for example:

20131210_10-55-12Live.xlsx

After a Record session, no binary file is generated as MRM does not send any trace. Only the log text file is created, example:

20131023_15-31-39Record.txt

The format is the same as in live sessions except “Live” is replaced with “Record”

After a Dump session, the files have other names. Examples:

20131009_11-8-36Dump.bin

20131009_11-8-36Dump.txt

The format is the same as in live sessions except “Live” is replaced with “Dump”

After a Decode Raw File session, two files are created, for example:

20131210_10-54-43decodeRaw.xlsw

20131210_10-54-43decodeRaw.txt

3.5.15. Charts

In Live tracing mode, only the Rxlev of the Serving Cell is displayed.

In Dump mode, neighbors serving cells are also displayed

3.5.15.1. RxLev Charts - reselection scenario

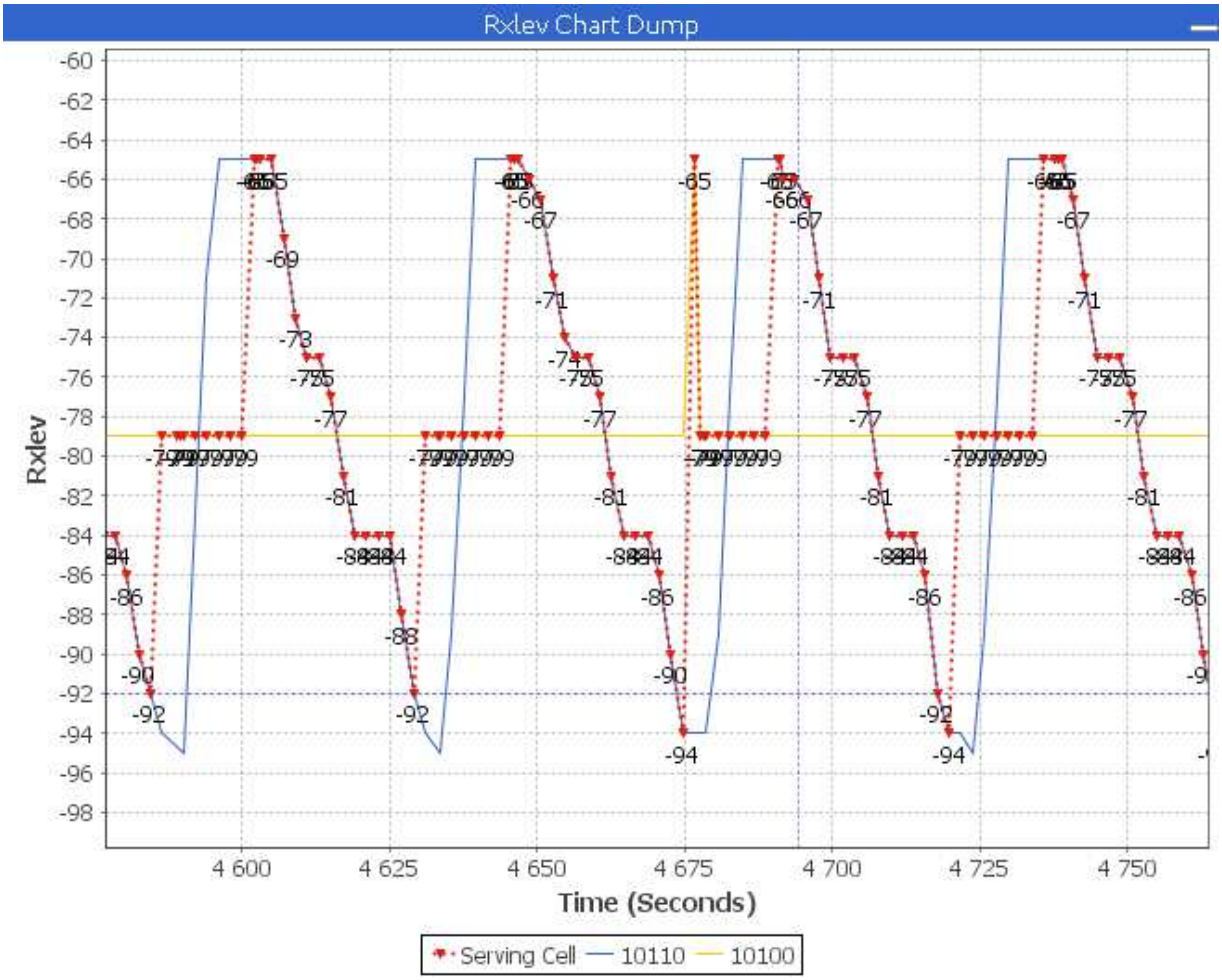


Figure 26. Example of a chartt after a raw file decoding, reselection scenario

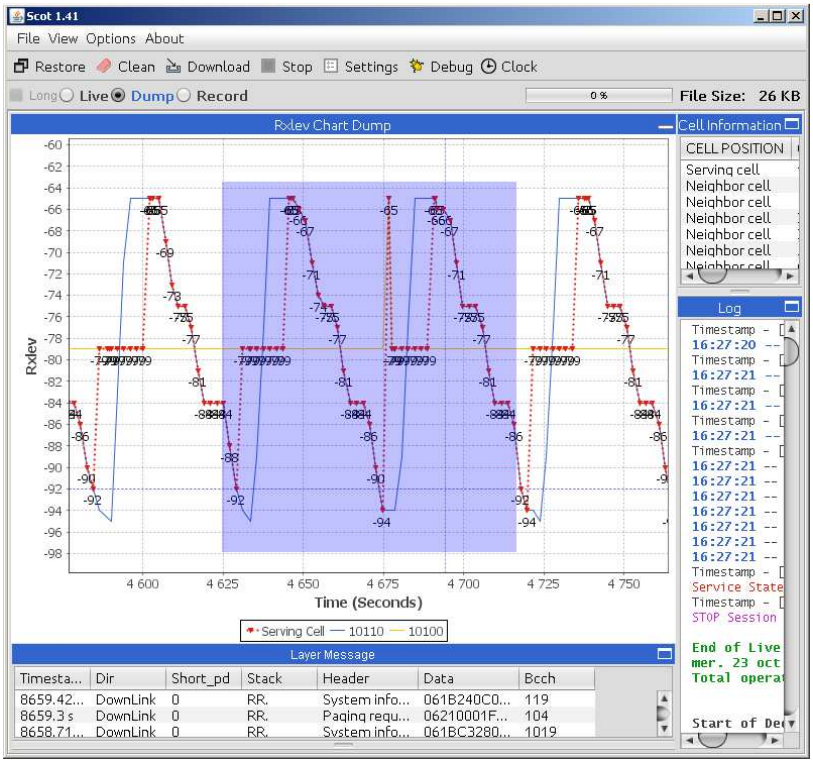
The dotted red line underline the Rxlev value of current serving cell. In this scenario we control level of two cell ID (10110 and 10100) to induce reselection. The doted red line will therefor switch from one cell to another.

Blue line display Rxlev for Cell ID 10110.

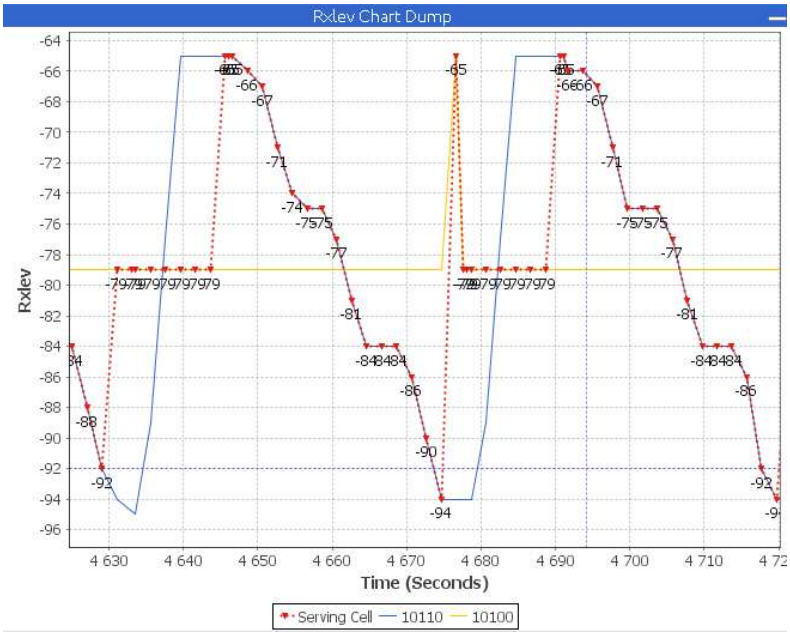
Yellow line display Rxlev for Cell ID 10100.

3.5.15.2. Zooming in charts

In the chart screen, user can easily select a zone area to zoom:



After:



3.5.15.3. Charts when decoding multi sessions raw files

In case of multi sessions, a simple algorithm is implemented in order to display all the sessions on the same graph, this is for avoiding overlays. The Chronologic order is respected: the first session is displayed on the left and last session on the right.

The time stamp of the first session is not changed. In the following sessions, the timestamp of the first trace, START, is set to the next thousand seconds after the STOP of the preceding session, plus the real timestamp modulo one thousand. The following points of the session are shifted in the graph with the same offset.

In the graph, the markers STOP and START are followed by the real timestamp. In that way it's easy to link the graph with the log text.

Example:

1st session: START TS = 5124.65 STOP TS = 11574.26

2nd session: START TS = 3684.98 STOP TS = 27418.69

3rd Session: START TS = 6874.54 START TS = 47521.85

On the graph:

1st session: NEW START TS = 5124.65 NEW STOP TS = 11574.26

2nd session: NEW START TS = 12684.98 NEW STOP TS = 36418.69

3rd Session: NEW START TS = 37874.54 NEW START TS = 78521.85

To find the original time stamp:

2nd session: subtract 12000-3000 = 9000 to the new TS on the graph

3rd session: subtract 37000-6000 = 31000 to the new TS on the graph

4. Troubleshooting

4.1.1. Impossible to configure USB Ports

Problem: You are not able to start a trace because USB ports are not configured correctly.

Solution: Many USB configuration problems can be resolve with these steps

- Close Scot application
- Determinate the right COM ports to use. See Control Panel -> Device Manager -> Modems. There should be “USB mobile pseudo CDC Modem” for commands and “USB mobile pseudo Trace” for traces.
- Edit the settings.ini file in the same directory as Scot executable. Write the right values for tracePort and modemPort. Check that link=USB
- Restart Scot, you should be able to start a live tracing

4.1.2. Error when starting a session with TCP Link

Problem: An error occurs after starting a session with TCP Link

Solution: You must wait on minute after the MRM startup before starting a TCP session.

- Close Scot application
- Restart MRM
- Wait one Minute
- Restart Scot, you should be able to start a live tracing

4.1.3. No traces with TCP Link

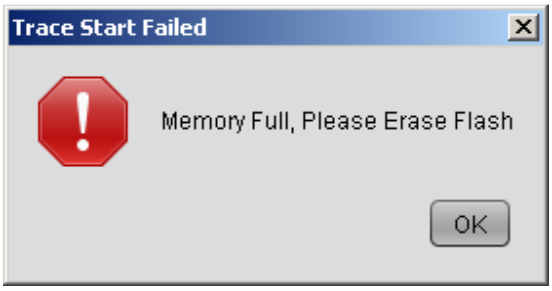
Problem: Using TCP link, no traces are displayed when you click on START button, it means that MRM is in a bad state.

Solution:

- Close Scot application
- Restart MRM
- Wait one Minute
- Restart Scot, you should be able to start a live tracing

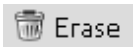
4.1.4. Impossible to start a recording session

Problem: after the Record Button is clicked, a pop up window is displayed with “Memory Full, Please Erase Flash” or “Memory Write Error, Please Erase Flash”” text.



Or

Solution:

- Erase the MRM File in flash by clicking the dustbin button: 

4.1.5. Impossible to add markers when Scot is started during a record session

Problem: You cannot click on Marker button because a record session is running inside the MRM while Scot is opened.

Solution:

- Close Scot application
- Scot will ask you if you want to stop recording, click Yes
- You can consider STOP frame as a kind of marker
- If you really want to add a marker, restart Scot, start a new record session and click the marker button

4.1.6. After a long live tracing session, traces are displayed but stop after a short delay

Problem: You click on START button in live tracing mode. Some traces are displayed but they stop. This problem may happen after long live tracing sessions.

If you plan to start a very long live session, use the checkbox **Long** near Live radio button. In this mode no traces will be displayed but the log files will be correctly written.

Solution:

- Close Scot application
- Flush traces using another application able to read serial ports like hyperterminal
- Restart Scot, you should be able to start a live tracing again.