

# **Standard Operating Procedure for UL tracing and troubleshooting**

**Version Control**

Document Name	Version	Date
SOP for UL tracing troubleshooting	V1.0	22-08-2022

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**Revision History**

Issue	Date	Reason for change
V1.0	22-08-2022	First Release

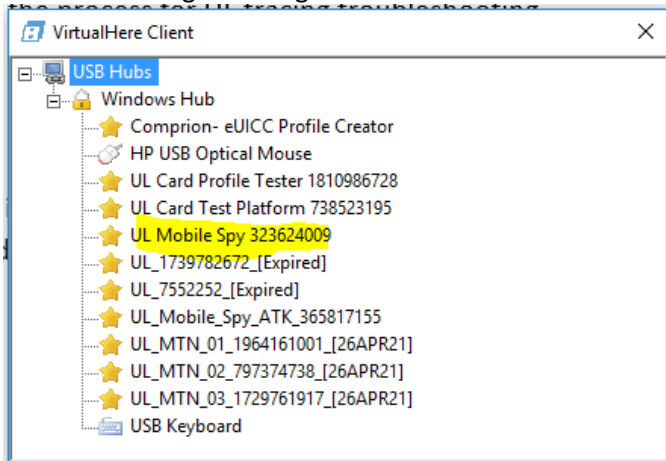
## Introduction

This document outlines the procedure for UL tracing and troubleshooting for UICC and eUICC products.

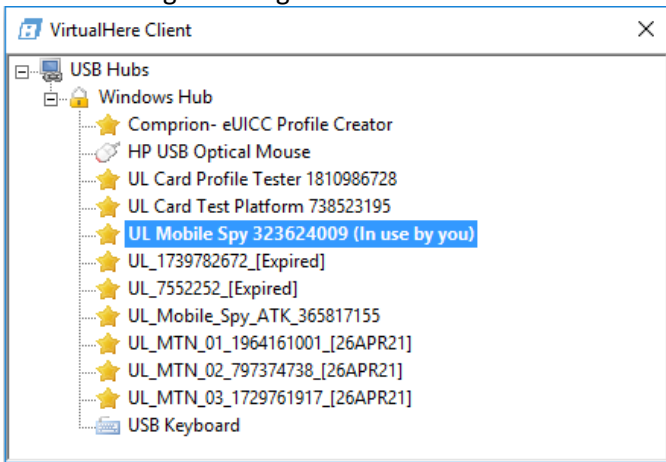
## Procedure

1. Open VirtualHere client on your machine and select the dongle for Mobile Spy. This tool is used to access the shared USB licensed dongle for Mobile Spy tool by UL. Snippet below:

Before selecting the dongle:



After selecting the dongle:

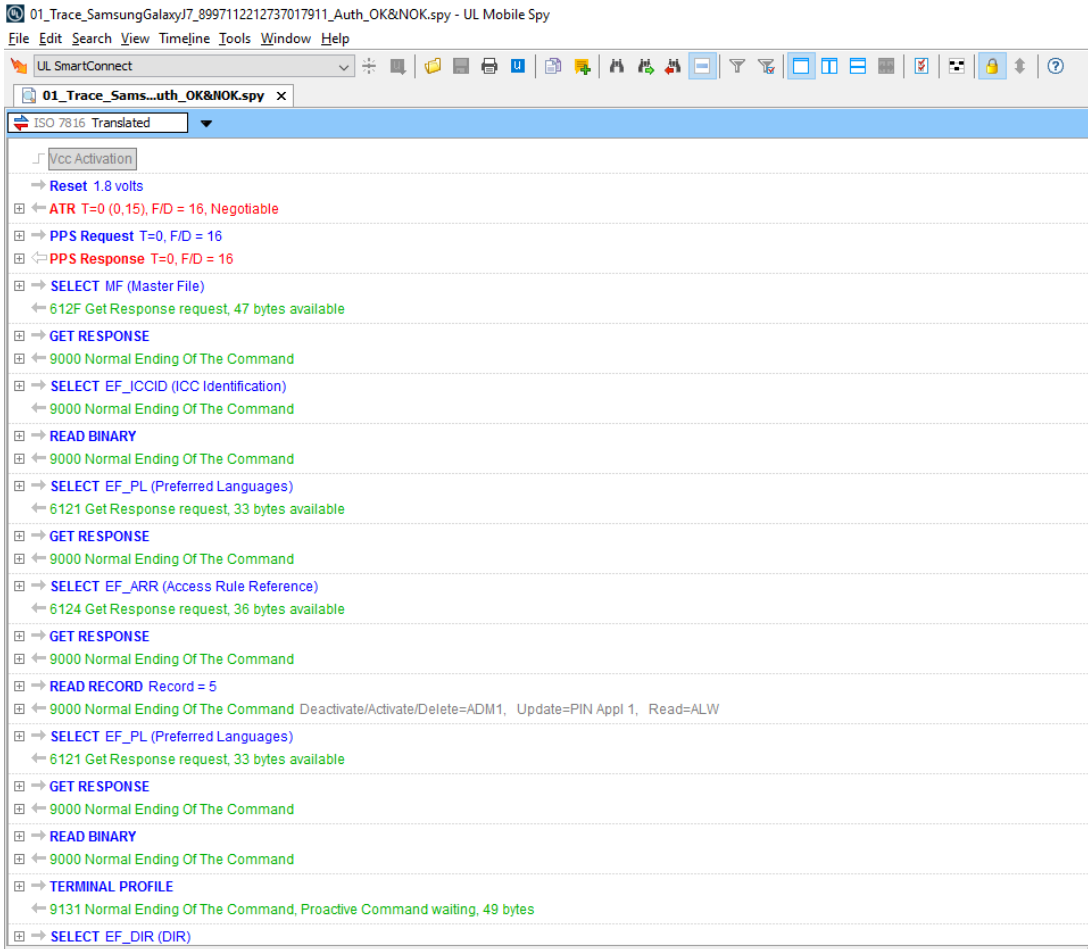


2. Open Mobile Spy software (current version – 3.5.1).
3. Connect the hardware and click on Firebolt icon. Snippet below:

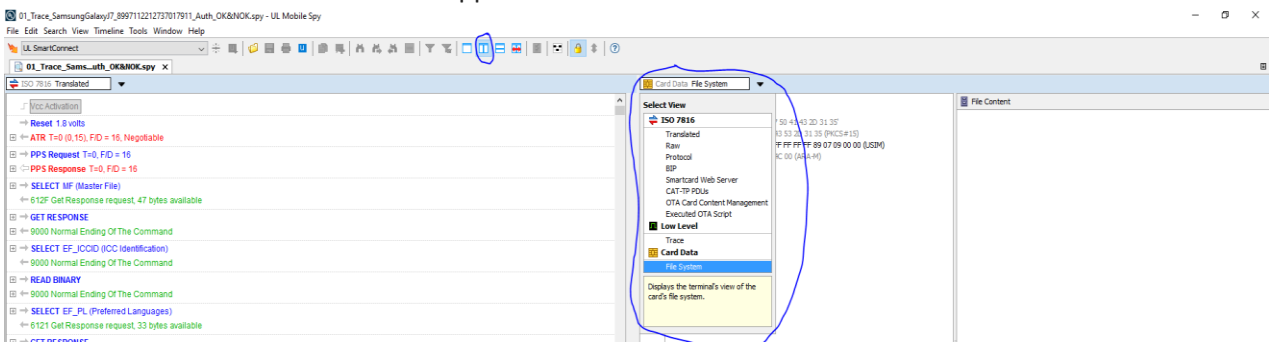


4. If the hardware is connected properly, it will enlist a serial number of the device. Click on OK and proceed.

5. Once the ME is turned ON, the traces will start loading in the trace window. Snippet below:



6. “Split Vertically” option can be used to open another view of the tracing session and accordingly different views of the trace can be selected. Snippet below:



7. It is useful to open “File System” view in this section to check the content of EF’s in parallel, if needed.
8. “Find” option can be used to search for any particular command. For ex: if you want to check for “Authentication”, then “Authenticate” command can be filtered as shown below:

01\_Trace\_SamsungGalaxyJ7\_8997112212737017911\_Auth\_OK&NOK.spy - UL Mobile Spy

File Edit Search View Timeline Tools Window Help

UL SmartConnect

01\_Trace\_Sams...uth\_OK&NOK.spy x

ISO 7816 Translated

Vcc Activation

Reset 1.8 volts

ATR T=0 (0,15), F/D = 16, Negotiable

PPS Request T=0, F/D = 16

PPS Response T=0, F/D = 16

SELECT MF (Master File)

612F GetResponse request, 47 bytes available

GET RESPONSE

9000 Normal Ending Of The Command

SELECT EF\_ICCID (ICC Identification)

9000 Normal Ending Of The Command

READ BINARY

9000 Normal Ending Of The Command

SELECT EF\_PL (Preferred Languages)

6121 GetResponse request, 33 bytes available

GET RESPONSE

9000 Normal Ending Of The Command

SELECT EF\_ARR (Access Rule Reference)

6124 GetResponse request, 36 bytes available

GET RESPONSE

9000 Normal Ending Of The Command

READ RECORD Record = 5

9000 Normal Ending Of The Command Deactivate/Activate/Delete=ADM1, Update=PIN Appl 1, Read=ALW

SELECT EF\_PL (Preferred Languages)

6121 GetResponse request, 33 bytes available

GET RESPONSE

9000 Normal Ending Of The Command

READ BINARY

9000 Normal Ending Of The Command

TERMINAL PROFILE

9131 Normal Ending Of The Command, Proactive Command waiting, 49 bytes

Card Data File System

3F00

File System

MF (Master File)

AID 'A0 00 00 00 18 47 50 41 43 2D 31 35'

A0 00 00 00 63 50 46 43 53 2D 31 35 (PKCS#15)

A0 00 00 00 87 10 02 FF FF FF FF 89 07 09 00 00 (USIM)

A0 00 00 01 51 41 43 4C 00 (ARA-M)

Find

Text

Element Type

Status Word

Logical Channel

Command

Status Word Type

Toolkit Commands

Proactive Commands

Comprehension-TLVs

Envelopes

Phonebook

File System

GSM

Command

Status Word Type

Toolkit Commands

Proactive Commands

Comprehension-TLVs

Envelopes

File System

Include

Command Type

Activate File

Authenticate (EVEN)

Authenticate (OOD)

Change PIN

Deactivate File

Disable PIN

Enable PIN

Envelope

Fetch

Get Challenge

Get Identity

Get Response

Increase

Manage Channel

Manage Secure Channel

Read Binary

Read Record

Retrieve Data

Include All

Remove All

Include Selection

Remove Selection

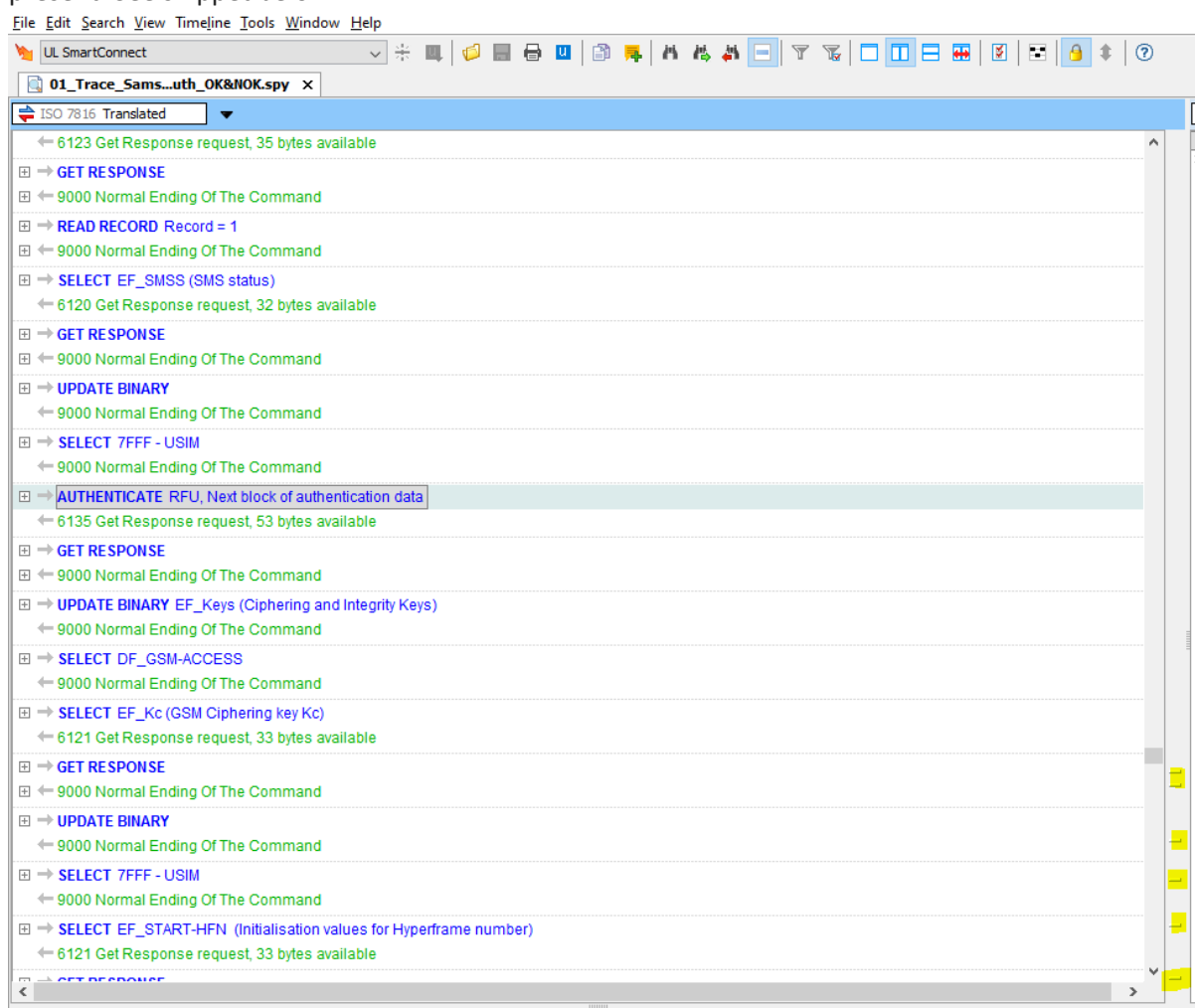
Find

Cancel

Raw Secure Channel Decrypted Data Inspections Annotations Specifications

File Control Parameters Specifications

9. This would highlight the trace with small pointers on the right side, wherever the “Authenticate” command is present. See snippet below:

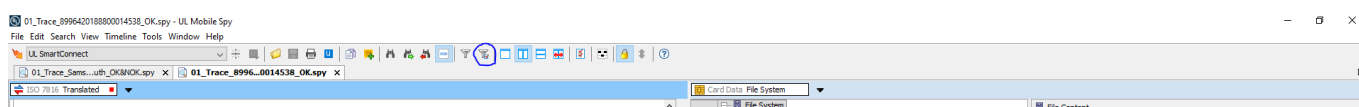


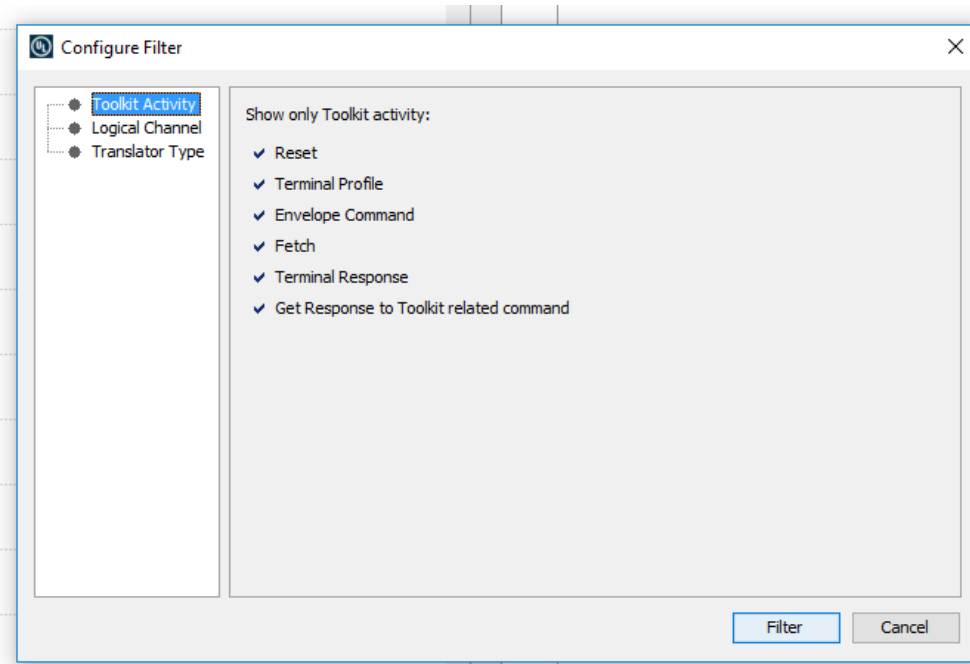
10. To navigate to these different sections in the trace, ‘F3’ can be used.

11. If the authentication has failed, a typical error would be shown as below:



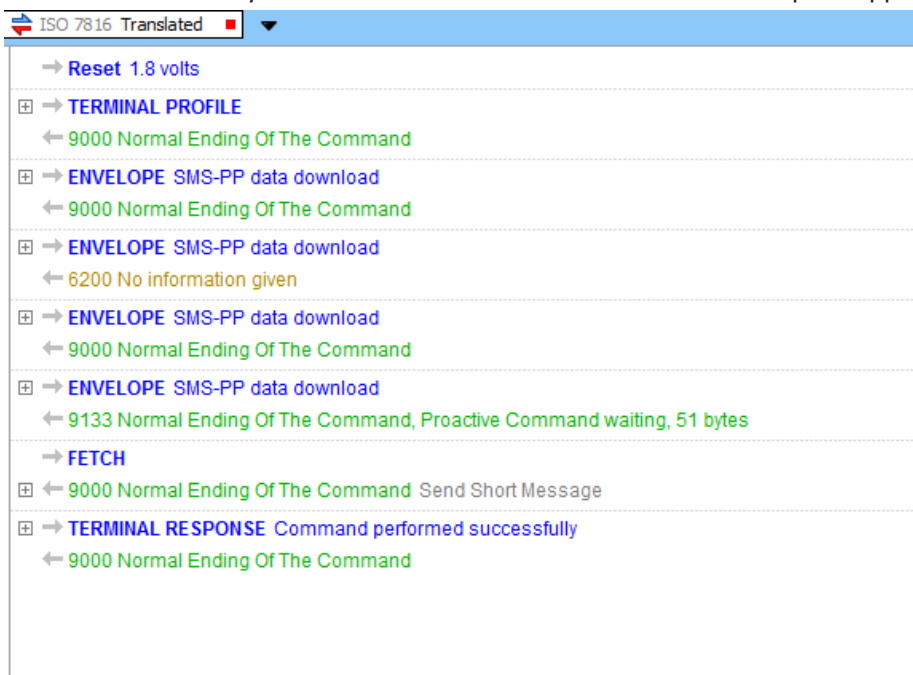
12. Another useful option is to filter out “Toolkit Activity” in the trace which basically captures all the proactive commands in progress. This can be done by using the “Configure Filter” button. Snippet below:






Select “Toolkit Activity” and “Filter” option and the trace logs will be filtered.

13. This can be useful if you want to troubleshoot OTA sessions. Example snippet below:



14. In the above, the SMS-PP can be selected and expanded to see the contents of the SMSPP sent toward the ME/SIM card. Snippet below:


ISO 7816 Translated

Filter: On

→ Reset 1.8 volts

+

→

TERMINAL PROFILE

← 9000 Normal Ending Of The Command

+

→

ENVELOPE SMS-PP data download

← 9000 Normal Ending Of The Command

+

→

ENVELOPE SMS-PP data download

← 6200 No information given

+

→

ENVELOPE SMS-PP data download

← 9000 Normal Ending Of The Command

+

→

ENVELOPE SMS-PP data download

← 9133 Normal Ending Of The Command, Proactive Command waiting, 51 bytes

→ FETCH

+

←

9000 Normal Ending Of The Command Send Short Message

+

→

TERMINAL RESPONSE Command performed successfully

← 9000 Normal Ending Of The Command

Header

80 C2 00 00

Lc

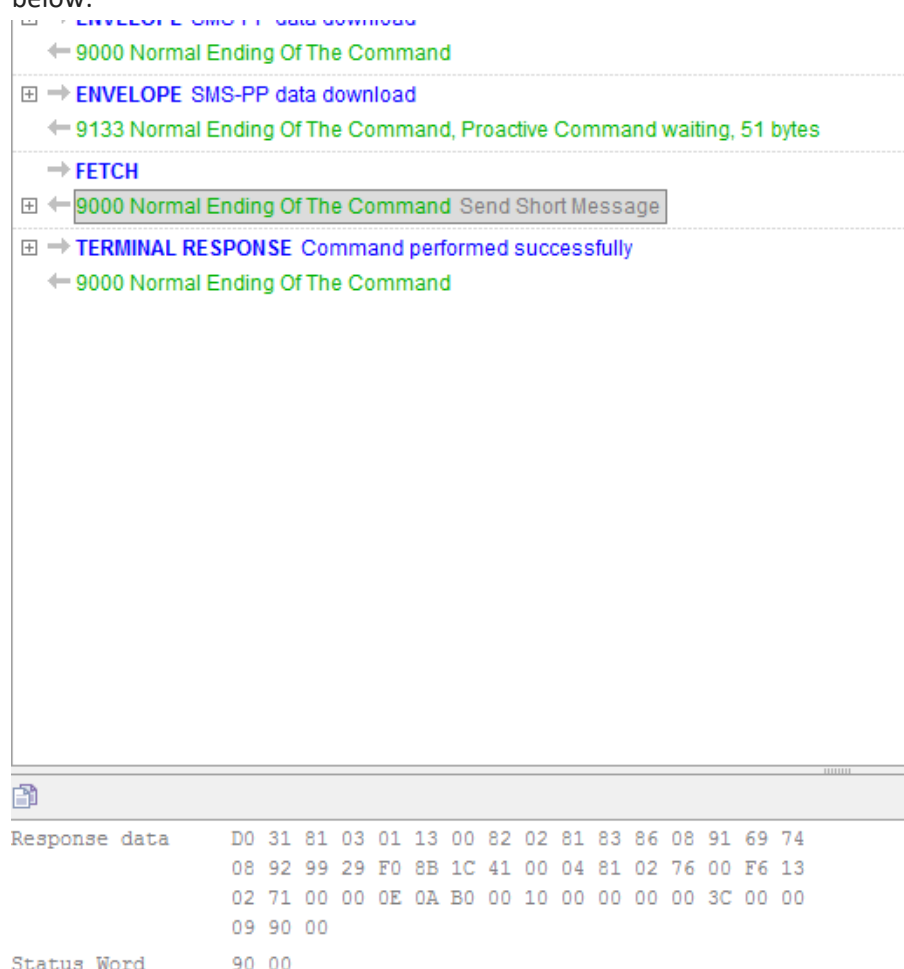
35

Command Data

D1 33 82 02 83 81 06 08 91 69 74 08 92 99 29 F0  
 8B 23 44 04 81 02 76 7F F6 22 20 42 21 92 63 61  
 14 05 00 03 CB 02 02 47 A8 A6 3D C5 B4 CA A3 0E  
 12 BE 33 7E C5



15. The PoR (if requested) and sent by the card can be seen in the 'Fetch – Send Short Message' section. Snippet below:



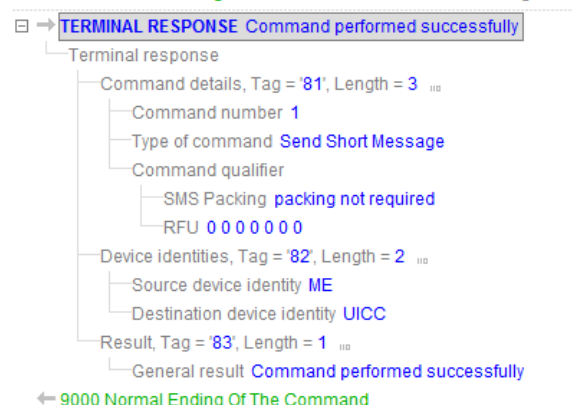
Response data

D0	31	81	03	01	13	00	82	02	81	83	86	08	91	69	74
08	92	99	29	F0	8B	1C	41	00	04	81	02	76	00	F6	13
02	71	00	00	0E	0A	B0	00	10	00	00	00	00	3C	00	00
09	90	00													

Status Word

90	00
----	----

16. All the commands can be expanded using the "+" button next to each command. Sample snippet below:



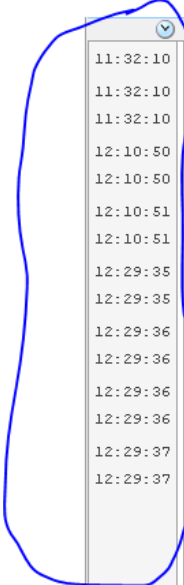
Terminal response

- Command details, Tag = '81', Length = 3
  - Command number 1
  - Type of command Send Short Message
  - Command qualifier
    - SMS Packing packing not required
    - RFU 0 0 0 0 0 0
- Device identities, Tag = '82', Length = 2
  - Source device identity ME
  - Destination device identity UICC
- Result, Tag = '83', Length = 1
  - General result Command performed successfully

← 9000 Normal Ending Of The Command

17. If timing statistics is needed, then it can be viewed as below:

- Right click and select 'View Preferences'.
- Check the option 'System Time' and click on 'OK'.
- The system time will appear in the trace as below:



Filter: On	
11:32:10	→ <b>Reset 1.8 volts</b>
11:32:10	→ <b>TERMINAL PROFILE</b>
11:32:10	← 9000 Normal Ending Of The Command
12:10:50	→ <b>ENVELOPE SMS-PP data download</b>
12:10:50	← 9000 Normal Ending Of The Command
12:10:51	→ <b>ENVELOPE SMS-PP data download</b>
12:10:51	← 6200 No information given
12:29:35	→ <b>ENVELOPE SMS-PP data download</b>
12:29:35	← 9000 Normal Ending Of The Command
12:29:36	→ <b>ENVELOPE SMS-PP data download</b>
12:29:36	← 9133 Normal Ending Of The Command, Proactive Command waiting, 51 bytes
12:29:36	→ <b>FETCH</b>
12:29:36	← 9000 Normal Ending Of The Command Send Short Message
12:29:37	→ <b>TERMINAL RESPONSE</b> Command performed successfully
12:29:37	← 9000 Normal Ending Of The Command

<b>TITLE</b>	SOP_for_UL_tracing_troubleshooting_v1.0
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<b>DOCUMENT ID</b>	79e172c93c7862153cc4f386d1ddb970ecb1e60d
<b>AUDIT TRAIL DATE FORMAT</b>	DD / MM / YYYY
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## Document history



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