



# EnCase Smartphone Examiner v7.10.00.103

Test Results for Mobile Device Acquisition Tool

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**Homeland  
Security**

Science and Technology

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## Introduction

The Computer Forensics Tool Testing (CFTT) program is a joint project of the Department of Homeland Security (DHS), the National Institute of Justice (NIJ), and the National Institute of Standards and Technology Special Program Office (SPO) and Information Technology Laboratory (ITL). CFTT is supported by other organizations, including the Federal Bureau of Investigation, the U.S. Department of Defense Cyber Crime Center, U.S. Internal Revenue Service Criminal Investigation Division Electronic Crimes Program, and the U.S. Department of Homeland Security's Bureau of Immigration and Customs Enforcement, U.S. Customs and Border Protection and U.S. Secret Service. The objective of the CFTT program is to provide measurable assurance to practitioners, researchers, and other applicable users that the tools used in computer forensics investigations provide accurate results. Accomplishing this requires the development of specifications and test methods for computer forensics tools and subsequent testing of specific tools against those specifications.

Test results provide the information necessary for developers to improve tools, users to make informed choices, and the legal community and others to understand the tools' capabilities. The CFTT approach to testing computer forensics tools is based on well-recognized methodologies for conformance and quality testing. Interested parties in the computer forensics community can review and comment on the specifications and test methods posted on the CFTT Web site (<http://www.cftt.nist.gov/>).

This document reports the results from testing EnCase Smartphone Examiner v7.10.00.103 across supported Android and iOS devices. The images captured from the test runs are available at the CFREDS Web site (<http://www.cfreds.nist.gov/>).

Test results from other tools can be found on the DHS S&T-sponsored digital forensics web page, <http://www.cyberfetch.org/>.

## How to Read This Report

This report is divided into four sections. Section 1 identifies and provides a summary of any significant anomalies observed in the test runs. This section is sufficient for most readers to assess the suitability of the tool for the intended use. Section 2 identifies the mobile devices used for testing. Section 3 lists testing environment, the internal memory and Universal Integrated Circuit Cards (UICC) data objects used to populate the mobile devices and associated media. Section 4 provides an overview of the test case results reported by the tool. The full test data is available at [http://www.cftt.nist.gov/mobile\\_devices.htm](http://www.cftt.nist.gov/mobile_devices.htm).

# Test Results for Mobile Device Acquisition Tool

Tool Tested: EnCase Smartphone Examiner  
Software Version: v7.10.00.103

Supplier: Guidance Software Inc.

Address: 1055 E. Colorado Blvd.  
Pasadena, CA 91106-2375

Tel: (626) 229-9191  
Email: [TechnicalSupport@encase.com](mailto:TechnicalSupport@encase.com)  
WWW: <https://www.encase.com>

## 1 Results Summary

EnCase Smartphone Examiner v7.10.00.103 is designed to review and collect data from smartphone and tablet devices, such as iPhone and iPad. Investigators can process and analyze smartphone device data alongside other types of digital evidence with Guidance Software tools.

The tool was tested for its ability to acquire active data from the internal memory of supported mobile devices and UICCs. Except for the following anomalies, the tool acquired all supported data objects completely and accurately for all mobile devices tested.

### ***Equipment / Subscriber related data:***

- Subscriber related data (i.e., MSISDN) was not reported. (Devices: *Samsung Galaxy S4, Samsung Galaxy S5, HTC One GSM, HTC One CDMA, Nexus 4, iPhone 5, iPhone 5S*)
- Equipment related data (i.e., IMEI, MEID) was not reported. (Devices: *iOS Devices*)

### ***Personal Information Management (PIM) data:***

- Contacts/address book entries were not reported. (Devices: *HTC One GSM, HTC One CDMA*)
- Memos were not reported (Devices: *Samsung Galaxy S4, Galaxy S5, HTC One GSM, HTC One CDMA, Nexus 4 and the Galaxy Note 3*)
- Long Memos were not reported (Devices: *Samsung Galaxy S3*)
- Social media related data was not reported. (Devices: *Samsung Galaxy S3, Galaxy S4, Galaxy S5 and the Nexus 4*)
- Social media related data was partially acquired. (Devices: *HTC One GSM, HTC One CDMA, Galaxy Note 3 and iOS devices*)

***Internet Related Data:***

- Bookmarks were not acquired. (Device: *Samsung Galaxy S4, Galaxy S5, Nexus 4 and the Galaxy Note 3*)

***Case File Data Protection:***

- Contents of the acquired data within a saved case file were modified without warning. (Devices: *Samsung Galaxy S3, HTC One GSM and the HTC One CDMA*)

For more test result details see section 4.

## 2 Mobile Devices

The following table lists the mobile devices used for testing EnCase Smartphone Examiner v7.10.00.103.

| Make                  | Model                 | OS                  | Firmware                      | Network |
|-----------------------|-----------------------|---------------------|-------------------------------|---------|
| Apple iPhone          | 5                     | iOS 6.1.4 (10B350)  | 3.04.25                       | GSM     |
| Apple iPhone          | 5s                    | iOS 7.1 (11D167)    | 2.18.02                       | CDMA    |
| Apple iPad            | iPad 2 - MD065LL/A    | iOS 6.1.3 (10B329)  | 04.12.05                      | GSM     |
| Apple iPad            | iPad Air - ME999LL/A  | iOS 7.1 (11D167)    | 2.18.02                       | CDMA    |
| Apple iPad Mini       | iPad Mini - ME030LL/A | iOS 6.1.3 (10B329)  | 3.04.25                       | GSM     |
| Apple iPad Mini       | iPad Mini - MF075LL/A | iOS 7.0.4 (11B554a) | 1.03.01                       | CDMA    |
| Samsung Galaxy S3     | SGH-1747              | Android 4.1.2       | 1747UCDMG2                    | GSM     |
| Samsung Galaxy S4     | SGH-M919              | Android 4.2.2       | M919UVUAMD                    | GSM     |
| Samsung Galaxy S5     | SM-G900V              | Android 4.2.2       | G900V.05                      | CDMA    |
| HTC One               | HTCC6525LV W          | Android 4.2.2       | 0.89.20.0222                  | GSM     |
| HTC One               | HTC One               | Android 4.1.2       | 4A.17.3250.20_10.40.1150.0 4L | CDMA    |
| Samsung Galaxy Note 3 | SM-N900V              | Android 4.3         | N900V.07                      | CDMA    |
| Nexus 4               | Nexus 4               | Android 4.3         | JWR66Y                        | GSM     |

Table 1: Mobile Devices

## 3 Testing Environment

The tests were run in the NIST CFTT lab. This section describes the selected test execution environment, and the data objects populated onto the internal memory of mobile devices and UICCs.

### 3.1 Execution Environment

EnCase Smartphone Examiner v7.10.00.103 was installed on Windows 7 v6.1.7601.



### 3.2 Internal Memory Data Objects

Encase Smartphone Examiner v7.10.00.103 was measured by analyzing acquired data from the internal memory of pre-populated mobile devices. Table 2 defines the data objects and elements used for populating mobile devices provided the mobile device supports the data element.

| Data Objects         | Data Elements                  |
|----------------------|--------------------------------|
| Address Book Entries |                                |
|                      | <i>Regular Length</i>          |
|                      | <i>Maximum Length</i>          |
|                      | <i>Special Character</i>       |
|                      | <i>Blank Name</i>              |
|                      | <i>Regular Length, email</i>   |
|                      | <i>Regular Length, graphic</i> |
|                      | <i>Regular Length, Address</i> |
|                      | <i>Deleted Entry</i>           |
|                      | <i>Non-ASCII Entry</i>         |
| PIM Data             |                                |
| Datebook/Calendar    | <i>Regular Length</i>          |
| Memos                | <i>Maximum Length</i>          |
|                      | <i>Deleted Entry</i>           |
|                      | <i>Special Character</i>       |
|                      | <i>Blank Entry</i>             |
| Call Logs            |                                |
|                      | <i>Incoming</i>                |
|                      | <i>Outgoing</i>                |
|                      | <i>Missed</i>                  |
|                      | <i>Incoming - Deleted</i>      |
|                      | <i>Outgoing - Deleted</i>      |
|                      | <i>Missed - Deleted</i>        |
| Text Messages        |                                |
|                      | <i>Incoming SMS - Read</i>     |
|                      | <i>Incoming SMS - Unread</i>   |
|                      | <i>Outgoing SMS</i>            |
|                      | <i>Incoming EMS - Read</i>     |
|                      | <i>Incoming EMS - Unread</i>   |
|                      | <i>Outgoing EMS</i>            |
|                      | <i>Incoming SMS - Deleted</i>  |
|                      | <i>Outgoing SMS - Deleted</i>  |
|                      | <i>Incoming EMS - Deleted</i>  |
|                      | <i>Outgoing EMS - Deleted</i>  |
|                      | <i>Non-ASCII SMS/EMS</i>       |
| MMS Messages         |                                |
|                      | <i>Incoming Audio</i>          |
|                      | <i>Incoming Graphic</i>        |

| <b>Data Objects</b>           | <b>Data Elements</b>            |
|-------------------------------|---------------------------------|
|                               | <i>Incoming Video</i>           |
|                               | <i>Outgoing Audio</i>           |
|                               | <i>Outgoing Graphic</i>         |
|                               | <i>Outgoing Video</i>           |
| <b>Application Data</b>       |                                 |
|                               | <i>Device Specific App Data</i> |
| <b>Stand-alone data files</b> |                                 |
|                               | <i>Audio</i>                    |
|                               | <i>Graphic</i>                  |
|                               | <i>Video</i>                    |
|                               | <i>Audio - Deleted</i>          |
|                               | <i>Graphic - Deleted</i>        |
|                               | <i>Video - Deleted</i>          |
| <b>Internet Data</b>          |                                 |
|                               | <i>Visited Sites</i>            |
|                               | <i>Bookmarks</i>                |
| <b>Location Data</b>          |                                 |
|                               | <i>GPS Coordinates</i>          |
| <b>Social Media Data</b>      |                                 |
|                               | <i>Facebook</i>                 |
|                               | <i>Twitter</i>                  |
|                               | <i>LinkedIn</i>                 |

**Table 2: Internal Memory Data Objects**

### 3.3 UICC Data Objects

The table below (Table 3) provides an overview of the data elements populated on Universal Integrated Circuit Cards (UICCs).

| Data Objects                      | Data Elements                          |
|-----------------------------------|--|
| Abbreviated Dialing Numbers (ADN) |  |
|                                   | <i>Maximum Length</i>                  |
|                                   | <i>Special Character</i>               |
|                                   | <i>Blank Name</i>                      |
|                                   | <i>Non-ASCII Entry</i>                 |
|                                   | <i>Regular Length - Deleted Number</i> |
| Call Logs                         |  |
|                                   | <i>Last Numbers Dialed (LND)</i>       |
| Text Messages                     |  |
|                                   | <i>Incoming SMS - Read</i>             |
|                                   | <i>Incoming SMS - Unread</i>           |
|                                   | <i>Non-ASCII SMS</i>                   |
|                                   | <i>Incoming SMS - Deleted</i>          |
|                                   | <i>Non-ASCII EMS</i>                   |
|                                   | <i>Incoming EMS - Deleted</i>          |

Table 3: UICC Data Objects

## 4 Test Results

This section provides the test cases results reported by the tool. Sections 4.1 – 4.3 identify the mobile device operating system type (i.e., Android, iOS) and the make and model of mobile devices used for testing EnCase Smartphone Examiner v7.10.00.103. Section 4.3 covers Universal Integrated Circuit Cards (UICCs).

The *Test Cases* column (internal memory acquisition/UICC) in sections 4.1 - 4.3 are comprised of two sub-columns that define a particular test category and individual sub-categories that are verified when acquiring the internal memory for supported mobile devices and UICCs within each test case. Each individual sub-category row results for each mobile device/UICC tested. The results are as follows:

*As Expected:* the mobile forensic application returned expected test results – the tool acquired and reported data from the mobile device/UICC successfully.

*Partial:* the mobile forensic application returned some of data from the mobile device/UICC.

*Not As Expected:* the mobile forensic application failed to return expected test results – the tool did not acquire or report supported data from the mobile device/UICC successfully.

*NA*: Not Applicable – the mobile forensic application is unable to perform the test or the tool does not provide support for the acquisition for a particular data element.

## 4.1 Android Mobile Devices

The internal memory contents for Android devices were acquired and analyzed with EnCase Smartphone Examiner v7.10.00.103.

All test cases pertaining to the acquisition of supported Android devices were successful with the exception of the following.

- Subscriber related data (i.e., MSISDN) was not acquired for the Samsung Galaxy S4, Galaxy S5, HTC One GSM, HTC One CDMA and the Nexus 4.
- Acquisition of PIM Data (i.e., *Contacts*) was not acquired for the HTC One GSM and the HTC One CDMA.
- Acquisition of PIM Data (i.e., *Memos*) was not acquired for the Samsung Galaxy S4, Galaxy S5, HTC One GSM, HTC One CDMA, Nexus 4 and the Galaxy Note 3.
- Acquisition of PIM Data (i.e., *Long Memos*) was not acquired for the Samsung Galaxy S3.
- Social media related data was not acquired for the Samsung Galaxy S3, Galaxy S4, Galaxy S5 and the Nexus 4.
- Social media related data was partially acquired for the HTC One GSM (i.e., Facebook and Twitter), HTC One CDMA (i.e., Facebook) and the Galaxy Note 3 (i.e., Facebook).
- Bookmarks for visited Internet URLs were not acquired for the Samsung Galaxy S4, Galaxy S5, Nexus 4 and the Galaxy Note 3.
- The EnCase evidence file was modified with a hex editor and re-opened without warning for the Samsung Galaxy S3, HTC One GSM, and the HTC One CDMA.

See Table 4 below for more details.

| EnCase Smartphone Examiner v7.10.00.103  |                   |                                 |               |                |                    |             |              |             |
|--|-------------------|---------------------------------|---------------|----------------|--------------------|-------------|--------------|-------------|
| Test Cases – Internal Memory Acquisition |                   | Mobile Device Platform: Android |               |                |                    |             |              |             |
|  |                   | Galaxy S3 GSM                   | Galaxy S4 GSM | Galaxy S5 CDMA | Galaxy Note 3 CDMA | HTC One GSM | HTC One CDMA | Nexus 4 GSM |
| Connectivity                             | Non Disrupted     | As Expected                     | As Expected   | As Expected    | As Expected        | As Expected | As Expected  | As Expected |
|  | Disrupted         | As Expected                     | As Expected   | As Expected    | As Expected        | As Expected | As Expected  | As Expected |
| Reporting                                | Preview-Pane      | As Expected                     | As Expected   | As Expected    | As Expected        | As Expected | As Expected  | As Expected |
|  | Generated Reports | As Expected                     | As Expected   | As Expected    | As Expected        | As Expected | As Expected  | As Expected |

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| Test Cases – Internal Memory Acquisition |                      | Mobile Device Platform: Android |                 |                 |                    |                 |                 |                 |
|--|----------------------|---------------------------------|-----------------|-----------------|--------------------|-----------------|-----------------|-----------------|
|  |                      | Galaxy S3 GSM                   | Galaxy S4 GSM   | Galaxy S5 CDMA  | Galaxy Note 3 CDMA | HTC One GSM     | HTC One CDMA    | Nexus 4 GSM     |
| Equipment/<br>User Data                  | IMEI                 | As Expected                     | As Expected     | NA              | NA                 | As Expected     | NA              | As Expected     |
|  | MEID/ESN             | NA                              | NA              | As Expected     | As Expected        | NA              | As Expected     | NA              |
|  | MSISDN               | As Expected                     | Not As Expected | Not As Expected | As Expected        | Not As Expected | Not As Expected | Not As Expected |
| PIM Data                                 | Contacts             | As Expected                     | As Expected     | As Expected     | As Expected        | Not As Expected | Not As Expected | As Expected     |
|  | Calendar             | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | To-Do List/<br>Tasks | NA                              | NA              | NA              | NA                 | NA              | NA              | NA              |
|  | Memos                | Partial                         | Not As Expected | Not As Expected | Not As Expected    | Not As Expected | Not As Expected | Not As Expected |
| Call Logs                                | Incoming             | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Outgoing             | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Missed               | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| SMS Messages                             | Incoming             | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Outgoing             | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| MMS Messages                             | Graphic              | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Audio                | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Video                | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| Stand-alone Files                        | Graphic              | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Audio                | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Video                | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| Application Data                         | Documents            | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Spreadsheets         | NA                              | NA              | NA              | NA                 | NA              | NA              | NA              |
|  | Presentations        | NA                              | NA              | NA              | NA                 | NA              | NA              | NA              |
| Internet Data                            | Bookmarks            | As Expected                     | Not As Expected | Not As Expected | Not As Expected    | As Expected     | As Expected     | Not As Expected |
|  | History              | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |

| EnCase Smartphone Examiner v7.10.00.103  |   |                                 |                 |                 |                    |                 |                 |                 |
|--|---|---------------------------------|-----------------|-----------------|--------------------|-----------------|-----------------|-----------------|
| Test Cases – Internal Memory Acquisition |   | Mobile Device Platform: Android |                 |                 |                    |                 |                 |                 |
|  |   | Galaxy S3 GSM                   | Galaxy S4 GSM   | Galaxy S5 CDMA  | Galaxy Note 3 CDMA | HTC One GSM     | HTC One CDMA    | Nexus 4 GSM     |
| Social Media Data                        | Facebook                                  | Not As Expected                 | Not As Expected | Not As Expected | Partial            | Partial         | Partial         | Not As Expected |
|  | Twitter                                   | Not As Expected                 | Not As Expected | Not As Expected | Not As Expected    | Partial         | Not As Expected | Not As Expected |
|  | LinkedIn                                  | Not As Expected                 | Not As Expected | Not As Expected | Not As Expected    | Not As Expected | Not As Expected | Not As Expected |
| Acquisition                              | Acquire All                               | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Selected All                              | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
|  | Select Individual                         | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| Case File Data Protection                | Modify Case Data                          | Not As Expected                 | As Expected     | As Expected     | As Expected        | Not As Expected | Not As Expected | As Expected     |
| Physical Acquisition                     | Readability                               | NA                              | NA              | NA              | NA                 | NA              | NA              | NA              |
|  | Deleted File Recovery                     | NA                              | NA              | NA              | NA                 | NA              | NA              | NA              |
| Non-ASCII Character                      | Reported in native format                 | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| Hashing                                  | Hashes reported for acquired data objects | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |
| GPS Data                                 | Coordinates (Long/Lat)                    | As Expected                     | As Expected     | As Expected     | As Expected        | As Expected     | As Expected     | As Expected     |

**Table 4: Android Mobile Devices**

## 4.2 iOS Mobile Devices

The internal memory contents for iOS devices were acquired and analyzed with EnCase Smartphone Examiner v7.10.00.103.

All test cases pertaining to the acquisition of supported iOS devices were successful with the exception of the following.

- Subscriber related data (i.e., MSISDN) was not acquired for the iPhone 5 (GSM) and iPhone 5S (CDMA) devices.
- Equipment related data (i.e., IMEI, MEID) was not acquired for all iOS devices.

- Social media data was partially acquired (i.e., information pertaining to the installation and paths for data storage of the applications) for all iOS devices.

See Table 5 below for more details.

| <b>EnCase Smartphone Examiner v7.10.00.103</b>  |                      |                                    |                            |                            |                            |                            |                            |
|---|----------------------|------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| <b>Test Cases – Internal Memory Acquisition</b> |                      | <i>Mobile Device Platform: iOS</i> |                            |                            |                            |                            |                            |
|   |                      | <i>iPhone 5<br/>GSM</i>            | <i>iPhone 5S<br/>CDMA</i>  | <i>iPad<br/>GSM</i>        | <i>iPad Air<br/>CDMA</i>   | <i>iPad Mini<br/>GSM</i>   | <i>iPad Mini<br/>CDMA</i>  |
| <b>Connectivity</b>                             | Non Disrupted        | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
|   | Disrupted            | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
| <b>Reporting</b>                                | Preview-Pane         | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
|   | Generated Reports    | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
| <b>Equipment/<br/>User Data</b>                 | IMEI                 | <i>Not As<br/>Expected</i>         | <i>NA</i>                  | <i>Not As<br/>Expected</i> | <i>NA</i>                  | <i>Not As<br/>Expected</i> | <i>NA</i>                  |
|   | MEID/ESN             | <i>NA</i>                          | <i>Not As<br/>Expected</i> | <i>NA</i>                  | <i>Not As<br/>Expected</i> | <i>NA</i>                  | <i>Not As<br/>Expected</i> |
|   | MSISDN               | <i>Not As<br/>Expected</i>         | <i>Not As<br/>Expected</i> | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  |
| <b>PIM Data</b>                                 | Contacts             | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
|   | Calendar             | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
|   | To-Do List/<br>Tasks | <i>NA</i>                          | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  |
|   | Memos                | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
| <b>Call Logs</b>                                | Incoming             | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  |
|   | Outgoing             | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  |
|   | Missed               | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  | <i>NA</i>                  |
| <b>SMS<br/>Messages</b>                         | Incoming             | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
|   | Outgoing             | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
| <b>MMS<br/>Messages</b>                         | Graphic              | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |
|   | Audio                | <i>As<br/>Expected</i>             | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     | <i>As<br/>Expected</i>     |



## EnCase Smartphone Examiner v7.10.00.103

| Test Cases – Internal Memory Acquisition |   | Mobile Device Platform: iOS |                   |                |                  |                  |                   |
|--|---|-----------------------------|-------------------|----------------|------------------|------------------|-------------------|
|  |   | iPhone 5<br>GSM             | iPhone 5S<br>CDMA | iPad<br>GSM    | iPad Air<br>CDMA | iPad Mini<br>GSM | iPad Mini<br>CDMA |
|  | Video                                     | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| Stand-alone Files                        | Graphic                                   | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
|  | Audio                                     | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
|  | Video                                     | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| Application Data                         | Documents                                 | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
|  | Spreadsheets                              | NA                          | NA                | NA             | NA               | NA               | NA                |
|  | Presentations                             | NA                          | NA                | NA             | NA               | NA               | NA                |
| Internet Data                            | Bookmarks                                 | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
|  | History                                   | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| Social Media Data                        | Facebook                                  | Partial                     | Partial           | Partial        | Partial          | Partial          | Partial           |
|  | Twitter                                   | Partial                     | Partial           | Partial        | Partial          | Partial          | Partial           |
|  | LinkedIn                                  | Partial                     | Partial           | Partial        | Partial          | Partial          | Partial           |
| Acquisition                              | Acquire All                               | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
|  | Selected All                              | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
|  | Select Individual                         | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| Case File Data Protection                | Modify Case Data                          | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| Physical Acquisition                     | Readability                               | NA                          | NA                | NA             | NA               | NA               | NA                |
|  | Deleted File Recovery                     | NA                          | NA                | NA             | NA               | NA               | NA                |
| Non-ASCII Character                      | Reported in native format                 | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| Hashing                                  | Hashes reported for acquired data objects | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |
| GPS Data                                 | Coordinates (Long/Lat)                    | As<br>Expected              | As<br>Expected    | As<br>Expected | As<br>Expected   | As<br>Expected   | As<br>Expected    |

**Table 5: iOS Mobile Devices**

### 4.3 Universal Integrated Circuit Cards (UICCs)

The internal memory contents for Universal Integrated Circuit Cards (UICCs) were acquired and analyzed with Encase Smartphone Examiner v7.10.00.103.

All test cases pertaining to the acquisition of UICCs were successful.

See Table 7 below for more details.

| <b>EnCase Smartphone Examiner<br/>v7.10.00.103</b> |   |  |
|--|---|--|
| <b>Test Cases – UICC<br/>Acquisition</b>           |   | <i>Universal<br/>Integrated<br/>Circuit Card</i> |
| <b>Connectivity</b>                                | Non Disrupted                                   | <i>As Expected</i>                               |
|  | Disrupted                                       | <i>As Expected</i>                               |
| <b>Equipment/<br/>User Data</b>                    | Service Provider<br>Name (SPN)                  | <i>As Expected</i>                               |
|  | ICCID   | <i>As Expected</i>                               |
|  | IMSI  | <i>As Expected</i>                               |
|  | MSISDN  | <i>As Expected</i>                               |
| <b>PIM Data</b>                                    | Abbreviated<br>Dialing Numbers<br>(ADNs)        | <i>As Expected</i>                               |
|  | Last Numbers<br>Dialed (LNDs)                   | <i>As Expected</i>                               |
|  | SMS Messages                                    | <i>As Expected</i>                               |
|  | EMS Messages                                    | <i>As Expected</i>                               |
| <b>Location<br/>Related Data</b>                   | LOCI  | <i>As Expected</i>                               |
|  | GPRSLOCI  | <i>As Expected</i>                               |
| <b>Acquisition</b>                                 | Acquire All                                     | <i>As Expected</i>                               |
|  | Selected All                                    | <i>As Expected</i>                               |
|  | Select Individual                               | <i>As Expected</i>                               |
| <b>Case File Data<br/>Protection</b>               | Modify Case Data                                | <i>As Expected</i>                               |
| <b>Password<br/>Protected SIM<br/>Acquire</b>      | Acquisition of<br>Protected SIM                 | <i>As Expected</i>                               |
| <b>PIN/PUK<br/>Attempts</b>                        | PIN attempts<br>reported                        | <i>As Expected</i>                               |
|  | PUK attempts<br>reported                        | <i>As Expected</i>                               |
| <b>Non-ASCII<br/>Character</b>                     | Non-ASCII<br>characters                         | <i>As Expected</i>                               |
| <b>Hashing</b>                                     | Hashes reported<br>for acquired data<br>objects | <i>As Expected</i>                               |

**Table 6: Universal Integrated Circuit Cards**