



# **UFED Touch v4.4.0.1 – Internal Build 4.2.8.36**

Test Results for Mobile Device Acquisition Tool

*July 11, 2016*



**Homeland  
Security**

Science and Technology

This report was prepared for the Department of Homeland Security Science and Technology Directorate Cyber Security Division by the Office of Law Enforcement Standards of the National Institute of Standards and Technology.

For additional information about the Cyber Security Division and ongoing projects, please visit

<http://www.dhs.gov/science-and-technology/cyber-security-division>.

July 2016

**Test Results for Mobile Device Acquisition Tool:**  
UFED Touch v4.4.0.1 – Internal Build 4.2.8.36

## Contents

Introduction.....	1
How to Read This Report .....	1
1 Results Summary .....	2
2 Mobile Devices.....	5
3 Testing Environment .....	6
3.1 Execution Environment .....	6
3.2 Internal Memory Data Objects .....	6
3.3 UICC Data Objects .....	8
4 Test Results .....	8
4.1 Android Mobile Devices.....	10
4.2 iOS Mobile Devices.....	13
4.3 BlackBerry, Windows Mobile, Feature Phones .....	16
4.4 Universal Integrated Circuit Cards (UICCs) .....	20

## 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 Website (<http://www.cftt.nist.gov/>).

This document reports the results from testing UFED Touch v4.4.0.1 across supported Android, iOS devices and feature phone.

Test results from other tools can be found on the DHS S&T-sponsored digital forensics web page, [www.dhs.gov/science-and-technology/nist-cftt-reports](http://www.dhs.gov/science-and-technology/nist-cftt-reports).

## 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.

# Test Results for Mobile Device Acquisition Tool

Tool Tested: Cellebrite Inc.  
Software Version: UFED Touch v4.4.0.1 - Internal Build 4.2.8.36

Supplier: Cellebrite Inc.

Address: 7 Campus Drive, Suite 210  
Parsippany, NJ 07054

Tel: +1 201-848-8552

Fax: +1 201-848-9982

Email: [http://www.cellebrite.com/Contact-Us\\_EN.htm](http://www.cellebrite.com/Contact-Us_EN.htm)

WWW: <http://www.cellebrite.com>

## 1 Results Summary

Cellebrite's UFED Touch is a standalone mobile forensic extraction device that provides support for a variety of mobile devices. UFED Touch has the ability to perform logical, filesystem and physical data extractions across numerous supported mobile and portable GPS devices. Acquired data elements (e.g., contacts/address book entries, call history, calendar, notes/tasks, stand-alone files, application related data, social media data (Facebook, Twitter, LinkedIn) vary across supported mobile devices.

UFED Touch provides the user with:

- Standalone reliability
- Closed platform for forensically sound extractions
- Field mobility in most environments
- Unrivalled device support
- Proprietary hardware, software and boot loaders
- Touch screen and intuitive GUI
- HTML report viewer for onscreen viewing of reports
- Portable – Integrated battery
- All-inclusive field-ready operational kit – smaller, lighter connector tips, external hard drive

UFED Touch offers two solutions: Ultimate or Logical and comes with a range of supporting applications for in-depth decoding, analysis and reporting.

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.

### **Reporting**

- Subscriber and equipment related data (e.g., MISISDN, IMEI, ICCID, IMSI) were partially reported in the generated HTML report. (Devices: *iPad GSM, BlackBerry Q10*)
- Long memos were not reported in the generated HTML report. (Device: *HTC One GSM*)
- Generated reports partially reported acquired *graphic files*, e.g., only the snapshots taken with the device were reported. (Device: *Nexus4*)

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

- Subscriber related data (i.e., MSISDN) was not acquired. (Devices: *BlackBerry Q10, BlackBerry Z10*)
- Subscriber and equipment related data (i.e., MSISDN, IMEI, IMSI, ICCID) was not acquired. (Devices: *Nokia Lumia 920, HTC Win 8x*)

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

- Acquisition of *Contacts* was partially reported i.e., graphic files associated with contact entries. (Devices: *iPhone 5S, Galaxy S4*)
- Acquisition of *Contacts* was partially reported i.e., long contact entries. (Devices: *BlackBerry Q10, BlackBerry Z10*)
- Acquisitions of *Memos* were not successful. (Devices: *Galaxy S5, Galaxy Note3, Nexus4, LG Extravert, HTC One CDMA*)
- Acquisitions of *Long Memos* were partially acquired. (Devices: *Galaxy S3, Galaxy S4, HTC One GSM*)

### **Stand-alone Files:**

- Stand-alone files (i.e., *audio*) were not acquired. Although, graphic and video files were partially acquired (i.e., snapshots and video recorded with the device). (Devices: *Nokia Lumia 920, HTC Win 8x*)
- Stand-alone files (i.e., *graphic, audio, video*) were not acquired. (Device: *LG Extravert*)
- Stand-alone files (i.e., *graphic*) were partially acquired (i.e., snapshots taken with the device). (Device: *Samsung Convoy 3*)

### **Application Data:**

- Application related data (i.e., *pdf files*) was not acquired. (Device: *HTC One CDMA*)

### **Social Media Data:**

- Acquisition of social media data (i.e., *Facebook, Twitter, LinkedIn*) was partially acquired. (Devices: *iPhone 5, iPhone 5s, iPad GSM, iPad CDMA, iPad Mini CDMA, Galaxy S3, Galaxy S4, Galaxy Note 3, HTC One GSM, HTC One CDMA, Nexus 4*)

### **Case File Data Protection:**

- Saved case data was successfully modified and re-opened. (Devices: *Galaxy S3, Galaxy S4, Galaxy Note3, HTC One GSM*)

***Physical Acquisition:***

- Physical Acquisition was not successful. The tool could not read phone memory. (Devices: *Nexus 4, LG Extravert, Samsung Convoy 3*)

***GPS/Location Related Data:***

- Acquisition of GPS related data (i.e., longitude and latitude coordinates, physical address) was not successful. (Devices: *Galaxy S4, Nexus 4*)
- Acquisition of LOCI and GPRLOCI were not reported. (Media: *UICC*)

**NOTES:**

- The generated report is limited in which data elements are present. Data such as *Memos* and *Graphic files associated with contact entries*, may be recovered, but are not included in the report. Also, *Memos* sometimes are acquired as graphic files. They can be found within the file system folders. The tool does not provide a preview pane. In addition to these data elements, *Application Data, Social Media* and *GPS data* are not included in the generated report.
- Hash values for vendor-supported data objects are only present within the generated report (i.e., they are not reported within the preview-pane).
- UFED Touch does not support the Rugby III mobile phone. However, when connection is established, the phone is identified as the Galaxy S4 – using the auto detect feature. Data extraction using auto detect is unsuccessful.
- The Samsung Convoy 3 is incorrectly identified using the auto detect feature. In order to successfully acquire this device, the manufacturer and model of the phone has to be manually selected.
- When attempting to perform a Physical acquisition, the user may have to try few times before successfully completing the data extraction of the device. For instance, there were times were the tool crashed or timed out and showed a message stating memory of the phone could not be read.

For more test result details see section 4.



## 2 Mobile Devices

The following table lists the mobile devices used for testing Cellebrite – UFED Touch.

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/	iOS 6.1.3 (10B329)	04.12.05	GSM
Apple iPad	iPad Air - ME999LL/	iOS 7.1 (11D167)	2.18.02	CDMA
Apple iPad Mini	iPad Mini - ME030LL/	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_10.40.1150.04L	CDMA
Samsung Galaxy Note 3	SM-N900V	Android 4.3	N900V.07	CDMA
Nexus 4	Nexus 4	Android 4.3	JWR66Y	GSM
Nokia	Lumia 920	Windows 8.0.10211.204	1232.5962.1314.0001	GSM
Blackberry	Z10 – STL1004	BB 10.2.1.2174	672849	GSM
Blackberry	Q10	BB 10.2.1.2122	672849	GSM
HTC Win 8x	HTC PM23300	Windows Phone 8.0	3030.0.34101.502	GSM
LG Extravert	LG-VN280	Brew MP v1.0.3	VN28010A	CDMA
Samsung Convoy 3	SCH-U680	Brew MP 1.0.4	V.U680.MJ2	CDMA

**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

Cellebrite – UFED Touch standalone tool, version 4.4.0.1 running on Windows embedded.

#### 3.2 Internal Memory Data Objects

Cellebrite UFED Touch 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>

<b>Data Objects</b>	<b>Data Elements</b>
	<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>
<b>MMS Messages</b>	
	<i>Incoming Audio</i>
	<i>Incoming Graphic</i>
	<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>
Call Logs	<i>Regular Length - Deleted Number</i>
	<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 (e.g., Android, iOS) and the make and model of mobile devices used for testing Cellebrite UFED v4.4.0.1. Section 4.4 covers Universal Integrated Circuit Cards (UICCs).

The *Test Cases* column (internal memory acquisition/UICC) in sections 4.1 - 4.4 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 Cellebrite UFED Touch v4.4.0.1.

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

- Subscriber related data (i.e., ICCID and IMSI) was not reported in the generated HTML report for the Galaxy S5, and Galaxy Note 3.
- Subscriber related data (i.e., IMSI only) was not reported in the generated HTML report for the Galaxy S3, and HTC One GSM.
- Long memos were not reported in the generated HTML report for the HTC One GSM.
- The generated HTML report did not report all graphic files acquired for the Nexus 4. The graphic files reported were snapshots taken with the Nexus 4 camera.
- Acquisition of PIM Data (i.e. *Contacts - graphic associated with contact entries*) was not successful for the Galaxy S4.
- Acquisition of PIM Data (i.e. *memos*) was not successful for the Galaxy S5, Galaxy Note 3, HTC One CDMA, and Nexus 4.
- Acquisition of PIM Data (i.e. *long memos*) were truncated for the Galaxy S3, Galaxy S4, and HTC One GSM.
- Application Data (i.e., *pdf, text documents*) was not acquired for the HTC One CDMA.
- Social media data was partially acquired (i.e., Facebook, Twitter) for the Galaxy S4.
- Social media data was partially acquired; only the path to the installation package (i.e., LinkedIn) was recovered for the Galaxy S3, and Galaxy S4.
- Social media data was partially acquired (i.e., Facebook) for the Galaxy Note 3.
- Social media data was partially acquired (i.e., Facebook, Twitter, LinkedIn) for the HTC One GSM (only pictures were acquired), Nexus4 (only messages were acquired), and HTC One CDMA.
- Saved case file was successfully modified and re-opened without warning or error. The modified data was present for the Galaxy S3, Galaxy S4, Galaxy Note 3, and HTC One GSM.
- Physical acquisition was not successful for the Nexus4. After the tool attempted to perform a physical acquisition for few hours, the tool stopped and showed the following message: “Cannot red phone memory”.
- GPS related data was not acquired for the Galaxy S4 and Nexus 4.

### NOTES:

- MSISDN data was only present on generated HTML report (i.e., not present in the preview-pane) for the Galaxy S4.
- IMEI was reported twice within the preview pane for the Galaxy S3.

- The tool acquired graphic files associated with contact entries but were found under the Images category instead of being under Phonebook/Contact entries category for the Nexus 4.
- Long and short memos were acquired as a *graphic file* for the HTC One GSM.
- Attachments sent via MMS messages were acquired and categorized under attachments not under MMS messages for the Galaxy S3 and Galaxy S4.
- Application Data could not be extracted from the Galaxy S4 due to a Backup data extraction failure.
- UFED Touch specifies it does not support logical acquisition of Browser History and Bookmarks. However, this information was acquired for the HTC One GSM and HTC One CDMA.
- The majority of the instant messages/conversations from Facebook, for the HTC One GSM, were acquired as graphic files.
- Case file data modified using a hex editor can be re-opened without error or notification to the examiner that the case file has been altered. Upon re-opening the modified case file – the data remains unchanged. This applies to the Galaxy S5, Nexus4, and HTC One CDMA.

See Table 4 below for more details.

Cellebrite UFED Touch v4.4.0.1								
Test Cases – Internal Memory Acquisition		Mobile Devices 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	NA	NA	NA	NA	NA	NA	NA
	Generated Reports	Partial	As Expected	Partial	Partial	Partial	As Expected	Partial
Equipment/ User Data	IMEI	As Expected	As Expected	NA	As Expected	As Expected	NA	As Expected
	MEID/ESN	NA	NA	As Expected	NA	NA	As Expected	NA
	MSISDN	As Expected	Partial	As Expected	As Expected	As Expected	As Expected	As Expected
PIM Data	Contacts	As Expected	Partial	As Expected	As Expected	As Expected	As Expected	As Expected
	Calendar	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected

**Cellebrite UFED Touch v4.4.0.1**

Test Cases – Internal Memory Acquisition		Mobile Devices Platform: Android						
		Galaxy S3 GSM	Galaxy S4 GSM	Galaxy S5 CDMA	Galaxy Note 3 CDMA	HTC One GSM	HTC One CDMA	Nexus 4 GSM
PIM Data	To-Do List/ Tasks	NA	NA	NA	NA	NA	NA	NA
	Memos	Partial	Partial	Not As Expected	Not As Expected	Partial	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	NA	As Expected	As Expected	As Expected	Not 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	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	History	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
Social Media Data	Facebook	As Expected	Partial	As Expected	Partial	Partial	Partial	Partial
	Twitter	As Expected	Partial	As Expected	As Expected	Partial	Partial	Partial
	LinkedIn	Partial	Partial	As Expected	As Expected	Partial	Partial	Partial

Cellebrite UFED Touch v4.4.0.1								
Test Cases – Internal Memory Acquisition		Mobile Devices Platform: Android						
		Galaxy S3 GSM	Galaxy S4 GSM	Galaxy S5 CDMA	Galaxy Note 3 CDMA	HTC One GSM	HTC One CDMA	Nexus 4 GSM
Acquisition	Acquire All	NA	NA	NA	NA	NA	NA	NA
	Selected All	As Expected	As Expected	NA	As Expected	NA	As Expected	NA
	Select Individual	NA	NA	As Expected	NA	As Expected	NA	As Expected
Case File Data Protection	Modify Case Data	Not As Expected	Not As Expected	As Expected	Not As Expected	Not As Expected	As Expected	As Expected
Physical Acquisition	Readability	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	Not As Expected
	Deleted File Recovery	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected	Not As Expected
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	Not As Expected	As Expected	As Expected	As Expected	As Expected	Not As Expected

Table 4: Android Mobile Devices

## 4.2 iOS Mobile Devices

The internal memory contents for iOS devices were acquired and analyzed with Cellebrite UFED Touch v4.4.0.1.

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

- Partial subscriber and equipment related data (i.e., IMSI only) were reported in the generated HTML report for the iPad GSM.
- *Graphic files* associated with contact entries for the iPad GSM, and iPad Mini GSM were not reported in the generated HTML report.
- PIM Data was partially acquired for the iPhone 5S, graphic files associated with contact entries were not acquired.
- Social media data was partially acquired; only the path to the application installation package (i.e., LinkedIn) was acquired for the iPad CDMA.
- Social media data was partially acquired (i.e., Facebook) for the iPad CDMA.



- Social media data was partially acquired; only the path to the installation package (i.e., Facebook) was acquired for the iPhone5s and the iPad Mini CDMA.
- Social media data was partially acquired (i.e., Facebook, Twitter, LinkedIn) for the iPad GSM.
- Social media data was partially acquired; only the path to the application installation package (i.e., Twitter) was acquired for the iPad Mini GSM.
- Social media data (i.e., Facebook, LinkedIn) was partially acquired was acquired for the iPad Mini GSM.
- Social media data was partially acquired; only the path to the application installation package (i.e., Facebook, LinkedIn) was acquired for the iPhone 5 GSM.
- Social media data was partially acquired (i.e., Twitter) for the iPhone 5 GSM.

**NOTES:**

- Generated reports (i.e., HTML or PDF reports) include *twitter chat conversations* and *graphic files* associated with contact entries only when a *File System Acquisition* is performed.
- The tool does not support acquisition of SMS and MMS for the iPad GSM and iPad Mini GSM. However, they were acquired as chats.
- The tool acquired SMS and MMS messages for the iPad GSM, iPad Mini CDMA, and iPad Mini GSM even though its extraction was not supported.
- Social Media (i.e., Twitter) messages were acquired as graphic files for the iPad GSM.
- Case file data modified using a hex editor can be re-opened without error or notification to the examiner that the case file has been altered. Upon re-opening the modified case file – the data remains unchanged. This applies to the iPhone 5 GSM, iPhone 5S, iPad GSM, iPad CDMA, iPad Mini GSM, and iPad Mini CDMA.
- Deleted data (i.e., *memos and SMS/EMS*) was recovered for the iPad GSM, iPad CDMA, iPad Mini GSM, and iPad Mini CDMA.

See Table 5 below for more details.

Cellebrite UFED Touch v4.4.0.1							
Test Cases – Internal Memory Acquisition		Mobile Devices Platform: iOS					
		iPhone 5 GSM	iPhone 5S CDMA	iPad GSM	iPad Air CDMA	iPad Mini GSM	iPad Mini CDMA
Connectivity	Non Disrupted	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
Reporting	Preview-Pane	NA	NA	NA	NA	NA	NA

**Cellebrite UFED Touch v4.4.0.1**

<b>Test Cases – Internal Memory Acquisition</b>		<i>Mobile Devices Platform: iOS</i>					
		<i>iPhone 5 GSM</i>	<i>iPhone 5S CDMA</i>	<i>iPad GSM</i>	<i>iPad Air CDMA</i>	<i>iPad Mini GSM</i>	<i>iPad Mini CDMA</i>
<b>Reporting</b>	Generated Reports	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
<b>Equipment/ User Data</b>	IMEI	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
	MEID/ESN	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>
	MSISDN	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>PIM Data</b>	Contacts	<i>As Expected</i>	<i>Partial</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Calendar	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	To-Do List/ Tasks	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Memos	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
<b>Call Logs</b>	Incoming	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Outgoing	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Missed	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>SMS Messages</b>	Incoming	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
	Outgoing	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
<b>MMS Messages</b>	Graphic	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Audio	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Video	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
<b>Stand-alone Files</b>	Graphic	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Audio	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Video	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
<b>Application Data</b>	Documents	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Spreadsheets	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>

Cellebrite UFED Touch v4.4.0.1							
Test Cases – Internal Memory Acquisition		Mobile Devices Platform: iOS					
		iPhone 5 GSM	iPhone 5S CDMA	iPad GSM	iPad Air CDMA	iPad Mini GSM	iPad Mini CDMA
<b>App. Data</b>	Presentations	NA	NA	NA	NA	NA	NA
<b>Internet Data</b>	Bookmarks	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
	History	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
<b>Social Media Data</b>	Facebook	Partial	Partial	Partial	Partial	Partial	Partial
	Twitter	Partial	As Expected	Partial	As Expected	Partial	As Expected
	LinkedIn	Partial	As Expected	Partial	Partial	Partial	As Expected
<b>Acquisition</b>	Acquire All	NA	NA	As Expected	NA	NA	NA
	Selected All	NA	As Expected	NA	NA	As Expected	As Expected
	Select Individual	As Expected	NA	NA	As Expected	NA	As Expected
<b>Case File Data Protection</b>	Modify Case Data	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
<b>Physical Acquisition</b>	Readability	NA	NA	NA	NA	NA	NA
	Deleted File Recovery	NA	NA	NA	NA	NA	NA
<b>Non-ASCII Character</b>	Reported in native format	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
<b>Hashing</b>	Hashes reported for acquired data objects	As Expected	As Expected	As Expected	As Expected	As Expected	As Expected
<b>GPS Data</b>	Coordinates (Long/Lat)	As Expected	NA	As Expected	As Expected	As Expected	As Expected

Table 5: iOS Mobile Devices

### 4.3 BlackBerry, Windows Mobile, Feature Phones

The internal memory contents for the BlackBerry, Windows Mobile and feature phones were acquired and analyzed with Cellebrite UFED Touch v4.4.0.1.

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

- Partial subscriber and equipment related data (i.e. ESN) were reported in the generated HTML report for the BlackBerry Q10.
- Subscriber related data (i.e., MSISDN) was not reported in the generated report for the LG Extravert.
- Subscriber related data (i.e., MSISDN, IMEI, IMSI, ICCID) was not acquired for the Nokia Lumia 920 and HTC Win 8x.
- Subscriber related data (i.e., MSISDN) was not acquired for the BlackBerry Z10 and BlackBerry Q10.
- PIM Data (i.e., *long contact entries*) was partially acquired (i.e., truncated) for the BlackBerry Z10 and BlackBerry Q10.
- PIM Data (i.e., *Memos*) was not acquired for the LG Extravert.
- Stand-alone audio files were not acquired for the Nokia Lumia 920 and HTC Win 8x.
- Stand-alone graphic and video files were partially acquired for the Nokia Lumia 920 and HTC Win 8x.
- Stand-alone graphic, audio and video files were not acquired for the LG Extravert.
- Stand-alone graphic files were partially acquired for the Samsung Convoy3.
- Physical Acquisition was not successful for the LG Extravert and Samsung Convoy3. After the tool attempted to perform a physical acquisition for few hours, the tool stopped and showed the following message: “Cannot read phone memory”.

#### NOTES:

- The Auto-detect feature could not be used to identify the LG Extravert and the HTC Win 8x.
- The tool only supports acquiring graphic, audio and video files for the Nokia Lumia 920 and HTC Win 8x.
- In order to perform a Physical Acquisition on the Nokia Lumia 920, the user must pay attention to the instructions. **IMPORTANT:** the battery should NOT be fully charged; the charge must be between **12 – 17%** in order for it to work.
- The tool acquired graphic files associated with contact entries but were found under the Images category instead of being under Phonebook/Contact entries category for the LG Extravert.
- Graphic files taken using the BlackBerry Q10’s camera were acquired even though the tool specifies that acquisition of the graphic files are not supported.
- The tool did not acquire stand-alone files (i.e., *downloaded graphic, video, audio files*) but it acquired these when taken with the phone’s camera.
- Case file data modified using a hex editor can be re-opened without error or notification to the examiner that the case file has been altered. Upon re-opening the modified case file – the data remains unchanged. This applies to the LG Extravert, BlackBerry Q10, BlackBerry Z10 and Samsung Convoy3.
- The tool was not able to perform a File System extraction for the BlackBerry Q10.

See Table 6 below for more details.

## Cellebrite UFED Touch v4.4.0.1

Test Cases – Internal Memory Acquisition		Mobile Device Platforms: Windows, Blackberry, Feature Devices					
		BBerry Z10 GSM	BBerry Q10 GSM	Nokia Lumia 920	HTC Win 8x	LG Extravert	Samsung Convoy 3
Connectivity	Non Disrupted	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
	Disrupted	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
Reporting	Preview-Pane	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Generated Reports	<i>As Expected</i>	<i>Partial</i>	<i>As Expected</i>	<i>As Expected</i>	<i>Partial</i>	<i>As Expected</i>
Equipment/ User Data	IMEI	<i>NA</i>	<i>NA</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>NA</i>	<i>NA</i>
	MEID/ESN	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
	MSISDN	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
PIM Data	Contacts	<i>Partial</i>	<i>Partial</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
	Calendar	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	To-Do List/ Tasks	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Memos	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>Not As Expected</i>	<i>NA</i>
Call Logs	Incoming	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>
	Outgoing	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>
	Missed	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>
SMS Messages	Incoming	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
	Outgoing	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>

**Cellebrite UFED Touch v4.4.0.1**

<b>Test Cases – Internal Memory Acquisition</b>		<i>Mobile Device Platforms: Windows, Blackberry, Feature Devices</i>					
		<b>BBerry Z10 GSM</b>	<b>BBerry Q10 GSM</b>	<b>Nokia Lumia 920</b>	<b>HTC Win 8x</b>	<b>LG Extravert</b>	<b>Samsung Convoy 3</b>
<b>MMS Messages</b>	Graphic	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Audio	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Video	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>Stand-alone Files</b>	Graphic	<i>NA</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>	<i>Partial</i>
	Audio	<i>NA</i>	<i>NA</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>Not As Expected</i>	<i>NA</i>
	Video	<i>NA</i>	<i>NA</i>	<i>Partial</i>	<i>Partial</i>	<i>Not As Expected</i>	<i>NA</i>
<b>Application Data</b>	Documents	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Spreadsheets	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Presentations	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>Internet Data</b>	Bookmarks	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	History	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>Social Media Data</b>	Facebook	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Twitter	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	LinkedIn	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>Acquisition</b>	Acquire All	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
	Selected All	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>
	Select Individual	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>
<b>Case File Data Protection</b>	Modify Case Data	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>
<b>Physical Acquisition</b>	Readability	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
	Deleted File Recovery	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>NA</i>	<i>Not As Expected</i>	<i>Not As Expected</i>
<b>Non-ASCII Character</b>	Reported in native format	<i>As Expected</i>	<i>As Expected</i>	<i>NA</i>	<i>NA</i>	<i>As Expected</i>	<i>As Expected</i>
<b>Hashing</b>	Hashes reported for acquired data objects	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>	<i>As Expected</i>

Cellebrite UFED Touch v4.4.0.1							
Test Cases – Internal Memory Acquisition		Mobile Device Platforms: Windows, Blackberry, Feature Devices					
		BBerry Z10 GSM	BBerry Q10 GSM	Nokia Lumia 920	HTC Win 8x	LG Extravert	Samsung Convoy 3
GPS Data	Coordinates (Long/Lat)	NA	NA	NA	NA	NA	NA

Table 6: Windows 8.0 Devices

#### 4.4 Universal Integrated Circuit Cards (UICCs)

The internal memory contents for Universal Integrated Circuit Cards (UICCs) were acquired and analyzed with Cellebrite UFED Touch v4.4.0.1.

All test cases pertaining to the acquisition of UICCs were successful with the exception of the following:

- Acquisition of location related data (i.e., LOCI, GPRSLOCI) was not reported.

#### NOTES:

- Case file data modified using a hex editor can be re-opened without error or notification to the examiner that the case file has been altered. Upon re-opening the modified case file – the data remains unchanged for all UICCs.

See Table 7 below for more details.

Cellebrite UFED Touch v4.4.0.1		
Test Cases – UICC Acquisition		Universal Integrated Circuit Card
Connectivity	Non Disrupted	As Expected
	Disrupted	As Expected
Equipment/ User Data	Service Provider Name (SPN)	NA
	ICCID	As Expected
	IMSI	As Expected

<b>Cellebrite UFED Touch v4.4.0.1</b>		
<b>Test Cases – UICC Acquisition</b>		<i>Universal Integrated Circuit Card</i>
<b>Equip/User Data</b>	MSISDN	<i>As Expected</i>
<b>PIM Data</b>	Abbreviated Dialing Numbers (ADNs)	<i>As Expected</i>
	Last Numbers Dialed (LNDs)	<i>As Expected</i>
	SMS Messages	<i>As Expected</i>
	EMS Messages	<i>As Expected</i>
<b>Location Related Data</b>	LOCI	<i>Not As Expected</i>
	GPRSLOCI	<i>Not As Expected</i>
<b>Acquisition</b>	Acquire All	<i>NA</i>
	Selected All	<i>As Expected</i>
	Select Individual	<i>As Expected</i>
<b>Case File Data Protection</b>	Modify Case Data	<i>As Expected</i>
<b>Password Protected SIM Acquire</b>	Acquisition of Protected SIM	<i>As Expected</i>
<b>PIN/PUK Attempts</b>	PIN attempts reported	<i>As Expected</i>
	PUK attempts reported	<i>As Expected</i>
<b>Non-ASCII Character</b>	Non-ASCII characters	<i>As Expected</i>
<b>Hashing</b>	Hashes reported for acquired data objects	<i>As Expected</i>

**Table 7: Universal Integrated Circuit Cards**