January 2026

Test Results for Drone Data Collection & Analysis Tool:

Cellebrite UFED v7.68.0.809

Introduction

A The purpose of this document is to provide users with measurable assurance that the tools used in drone forensic investigations produce accurate and reliable results. To this end, the document presents a comprehensive summary and documentation of the test results obtained from evaluating drone data collection and analysis tools, based on the *Drone Forensic Tool Testing Specification*.

This document aims to verify how well each tool satisfies the functional requirements expected in real-world environments and to clearly record the performance and limitations observed during each functional operation. The primary objectives are:

(1) to systematically validate the collection and analysis capabilities provided by each tool and present the results objectively, and

(2) to identify tool-specific characteristics and areas requiring improvement based on the findings from the testing process.

This report presents the test results for the drone forensic tool **Cellebrite UFED**, conducted on **six supported drone models**, including the DJI Spark.

The document is written using a standardized template and structured format, ensuring that anyone can reproduce the testing process and produce consistent result reports. This design enables the report to serve not only as a standalone research output, but also as a reusable reference for future validation activities or follow-up studies.

How to Read This Report

The report is divided into five sections.

- **Section 1** summarizes the key test results, highlighting representative anomalies observed during execution.
- **Section 2** lists the primary equipment used in testing (drone devices, control apps, firmware versions, etc.).
- **Section 3** outlines the test environment and the data objects populated into each drone device.
- **Section 4** presents the detailed execution results for each test case across all tools.
- **Section 5** provides the requirement-satisfaction results for each drone model based on the outcomes described in Section 4.

Test Results for Drone Data Collection & Analysis Tool

Tool Tested: Cellebrite UFED

Software Version: v7.68.0.809

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1   Results Summary

Cellebrite UFED was evaluated in this test on its ability to collect and analyze data from six supported drone models, including the DJI Spark. Cellebrite UFED is a commercial, integrated drone forensic tool that provides both data acquisition and analysis capabilities within a unified platform.

The scope and format of the data reported by UFED varied depending on the supported drone models. The key findings are summarized below (see **Section 4** for detailed results).

Key Findings:

- (All models) Failed to collect or analyze communication/network data and cloud data; failed to collect or recover deleted data; did not support logical acquisition of selected folders or files.
- (DJI Spark) Failed to collect and analyze media files; physical acquisition was not supported.
- (DJI Mavic Air) Failed physical image acquisition; failed analysis and visualization of flight logs; failed to collect and analyze media files.
- (DJI Phantom 4 Pro V2) Successful collection and analysis except for the common failure items listed above.
- (DJI Mavic Pro) Failed to collect and analyze device identification information; failed analysis and visualization of flight logs.
- (DJI Mavic 2 Pro) Failed physical image acquisition; failed to collect and analyze device identification information; failed analysis and visualization of flight logs; failed to collect and analyze media files.
- (DJI Mini 3 Pro) Not supported for drone data collection and analysis (unsupported model).

Please refer to **Section 4** for detailed test results.

2   Drone Devices

Table 1 lists the drone models used in testing the drone forensic tool.

Table 1. Drone devices for tool testing

Vendor	Model (Release Year)	OS (Mobile)	Control App (Version)	Firmware Version (Drone / Controller)	Serial Number (Drone / Controller)
DJI	Spark (2017)	Android 14 (Galaxy S21)	DJI Go 4 (4.3.62)	Drone: 01.00.1000 Controller: 01.00.0600	Drone: 0ASUE7X0010214 Controller: 0J0CE830014PAQ
DJI	Mavic Air (2018)	Android 14 (Galaxy S21)	DJI Go 4 (4.3.62)	Drone: 01.00.0620 Controller: 01.03.0050	Drone: 0K13GBV00DY039 Controller: 0K2UF6800300QS
DJI	Phantom 4 Pro V2 (2018)	Android 14 (Galaxy S21)	DJI Go 4 (4.3.62)	Drone: 01.00.5200 Controller: 01.00.7017	Drone: 0HCCE7601103ZV Controller: 0HCCE7601103ZV
DJI	Mavic Pro (2016)	Android 14 (Galaxy S21)	DJI Go 4 (4.3.62)	Drone: 01.04.0500 Controller: 01.04.0500	Drone: 08Q1F820020065 Controller: 08RDE7H00101WT
DJI	Mavic 2 Pro (2018)	Android 14 (Galaxy S21)	DJI Go 4 (4.3.62)	Drone: 01.00.0797 Controller: 01.00.0770	Drone: 163CGCHR0A6M8P Controller: 1DUCGC8R0280JZ
DJI	Mini 3 Pro (2022)	Android 10 (RM330)	DJI Fly (1.12.0)	Drone: 01.00.0700 Controller: 04.01.0000	Drone:1581F4XFC23580071C93 Controller: 5HAZKBH0035933

3   Testing Environment

The tests were conducted in and around Korea University's Science Campus, located at 145 Anam-ro, Seongbuk-gu, Seoul, Republic of Korea. This section describes the selected execution environment as well as the data populated into the memory of each drone device.

3.1   Execution Environment

Cellebrite UFED was installed and tested on a desktop workstation equipped with an Intel Core i7-8700 processor, 32 GB of RAM, and running Windows 11 Pro (version 24H2).

3.2 Drone Data Objects

Cellebrite UFED was evaluated by collecting and analyzing drone devices preconfigured according to the *Start Guide for Populating Drone Test Devices*. **Table 2** defines the data objects and elements used to populate each drone, applicable only when the target drone model supports the corresponding data element.

Table 2. Drone Memory Data Objects and Elements

Data Object		Data Elements
Drone Identification Information		Manufacturer, Aircraft Model Name, Aircraft Serial Number (S/N), Aircraft Firmware Version, Remote Controller Model Name, Remote Controller Serial Number (S/N), Remote Controller Firmware Version
Drone Control Application Data		Application Name, Application Version, User Account Information
Flight Logs		Flight Path GPS Data (Latitude, Longitude, Altitude), Flight Start Location, Flight End Location, Flight Start Time, Flight End Time, Flight Duration, Flight Speed, Flight Mode
System Logs		Takeoff Time, Landing Time, Return-to-Home (RTH) Initiation Time, Error Types (e.g., RC disconnection, low battery)
Media Data	Photos	Storage Location (Internal / External / Cloud), File Name / Extension, File Size, Capture Time, Image GPS Data (Latitude, Longitude, Altitude), Resolution, Shutter Speed
	Videos	Storage Location (Internal / External / Cloud), File Name / Extension, File Size, Video Length, Capture Time, Video GPS Data (Latitude / Longitude / Altitude), Video Resolution, Shutter Speed, Frame Rate, Video Encoding Format
Communication / Network Information	Wi-Fi	Aircraft SSID, PSK (Password), Aircraft IP Address, Bandwidth / Speed, Encryption Type
	Bluetooth	Device Name, MAC Address
	Proprietary Protocol	Protocol Type, Version, Connection Information

4 Test Results

This section presents the execution results of the test cases as reported by the drone forensic tool (Cellebrite UFED). The tables below summarize the results for each drone device. Test outcomes are categorized into four result types:

As Expected: The drone forensic tool returned the expected test result and successfully acquired and reported the data from the drone device.

Partial: The drone forensic tool returned only part of the expected data from the drone device.

Not As Expected: The drone forensic tool did not return the expected test result and failed to successfully acquire or report the data.

Not Applicable (NA): The drone forensic tool does not support the acquisition of the corresponding data type.

4.1 Detailed Test Results

Test Cases:		DJI Spark	DJI Mavic Air	DJI Phantom 4 Pro V2	DJI Mavic Pro	DJI Mavic 2 Pro	DJI Mini 3 Pro
DR-01. (Drone Image File Generation)	DR-01-LOG-ALL	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
	DR-01-LOG-SELECTED	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
	DR-01-PHY	*NA*	*Not As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*NA*
DR-02. (Viewing Artifacts from Drone Image Files)	DR-02-IMG-LOG	*Partial*	*Partial*	*Partial*	*Partial*	*Partial*	*NA*
	DR-02-IMG-PHY	*NA*	*Not As Expected*	*Not As Expected*	*As Expected*	*Not As Expected*	*NA*
DR-03. (Interruption Notification)	DR-03-COL	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
	DR-03-ANY	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-04. (Image file integrity)	DR-04-INT	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-05. (Deleted file recovery)	DR-05-COL	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*
	DR-05-ANY	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*
DR-06. (Flight path visualization)	DR-06-TIMELINE	*As Expected*	*Not As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*NA*
	DR-06-FILTERED	*As Expected*	*Not As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*NA*
DR-07. (Cloud data collection and analysis)	DR-07-COL	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*

	DR-07-ANY	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	NA
	DR-07-EXP	Not As Expected	Not As Expected	Not As Expected	Not As Expected	Not As Expected	NA
DR-08. (Report generation)	DR-08-COL	As Expected	As Expected	As Expected	As Expected	As Expected	NA
	DR-08-ANY	As Expected	As Expected	As Expected	As Expected	As Expected	NA

5 Requirement Satisfaction Evaluation

This section presents the requirement satisfaction levels derived from the test case results reported by the drone forensic tool (Cellebrite UFED). The evaluation is based on the requirements defined in the *Drone Forensic Tool Testing Specification.*

The tables below show the degree to which each tool satisfied the specified requirements for each drone device. The satisfaction scale follows the same criteria used in **Section 4**.

Requirements:	DJI Spark	DJI Mavic Air	DJI Phantom 4 Pro V2	DJI Mavic Pro	DJI Mavic 2 Pro	DJI Mini 3 Pro
DR-CR-01	*Partial*	*Partial*	*Partial*	*Partial*	*Not As Expected*	*NA*
DR-CR-02	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-CR-03	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-CR-04	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-CR-05	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-RO-01	*NA*	*Not As Expected*	*As Expected*	*As Expected*	*Not As Expected*	*NA*
DR-RO-02	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*
DR-RO-03	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
DR-RO-04	*As Expected*	*Not As Expected*	*As Expected*	*Not As Expected*	*Not As Expected*	*NA*
DR-RO-05	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*
DR-RO-06	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*
DR-RO-07	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*Not As Expected*	*NA*
DR-RO-08	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*As Expected*	*NA*