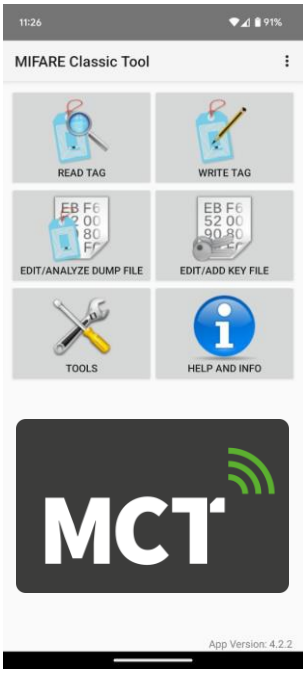
SYNACORP TECHNOLOGIES SDN. BHD. (1310487-K)
No.25 Lorong 1/SS3, Bandar Tasek Mutiara,
14120 Simpang Ampat, Penang, Malaysia.
T: +604.586.0026 F: +604.586.0026
WEBSITE: www.synacorp.my EMAIL: sales@synacorp.my

Copy / Cloning CUID MIFARE 1K Card using MIFARE Classic Tool Apps.



Introduction

This card works the same as the normal IC cards, i.e. MIFARE 1K S50 standard. Only the different is the Sector 0 (Block 0) which is known as the Serial Number / Manufacturers' Block (Chip UID) could be programmed to any UID that user want. In this guide we'll cover step by step on how to write and clone/copy UID from another card.

Objective

To clone/copy a standard MIFARE 1K S50 card UID to the CUID/GEN2 MIFARE card by using MIFARE Classic Tool apps.

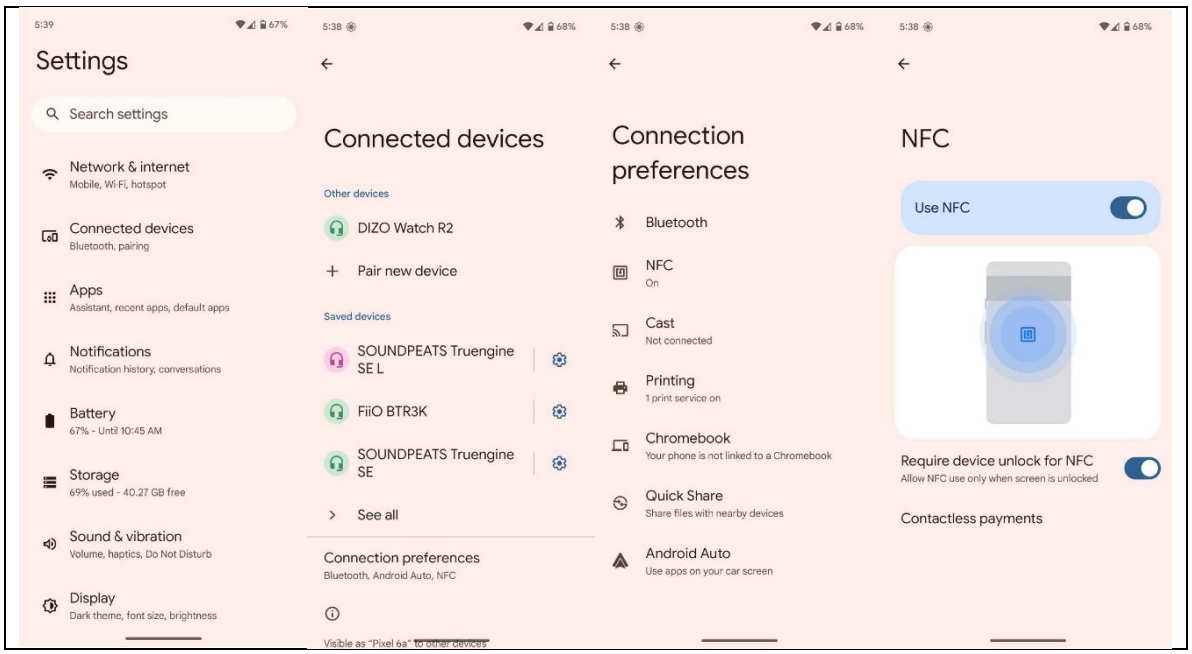
Requirements

1. CUID MIFARE 1K Card (GEN2)
2. MIFARE 1K S50 Card (Standard)
3. Android Smartphone with NFC function;
    a. Not all NFC supported phone can be used. This apps require specific tag technologies.
    b. Make Sure NFC Controller support the "MifareClassic" tag technologies.
    c. Example: *SONY XPERIA ZX1 Compact* do not supported even got NFC.
4. MIFARE Classic Tool apps
    a. Play Store - *https://play.google.com/store/apps/details?id=de.syss.MifareClassicTool*
    b. GitHub - *https://github.com/ikarus23/MifareClassicTool*

A. Reading the card and backup the original data.

Backing up process also known as dumping data. This dump data will be saved on the phone internal storage. This data can be modified and compared with other dump file to check the data differences between both cards.

1. Make sure to enable NFC before using the MIFARE Classic Tool apps. ***Navigate to Settings > Connected devices > Connection preferences > NFC***.

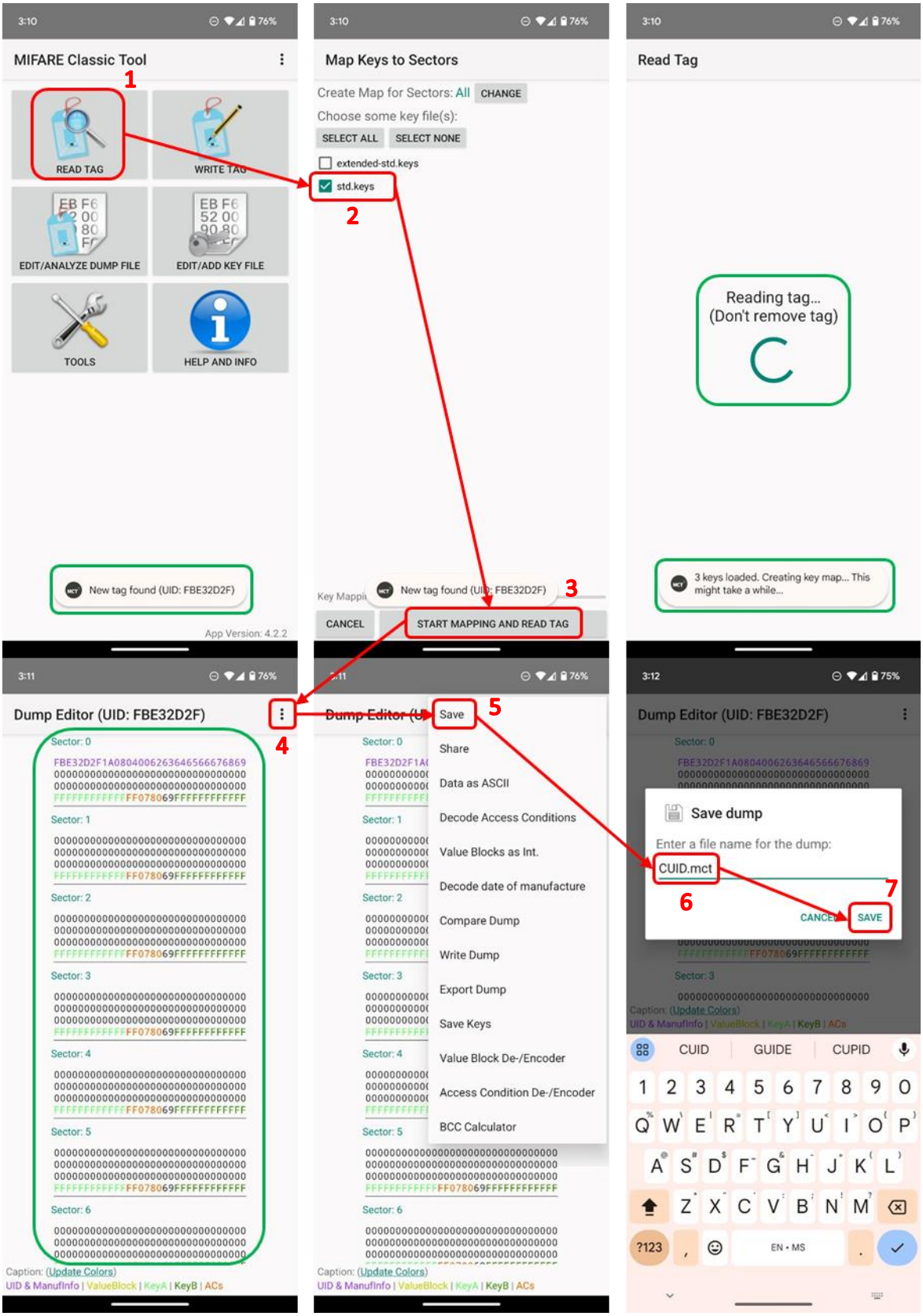


2. NFC communication is very short in range. Do not suddenly move the card away/apart from the phone. This might cause the an interruption or corruption when Reading, Writing and Cloning processes. Each phone might have slightly different placement of NFC antenna.

3. Launch the app and grant any permission if prompted. On the main page, place the CUID or MIFARE Card on the back of the phone. Toast notification will apeared displaying **"New tag found (UID: XXXXXXXX)"** when the card is detected.

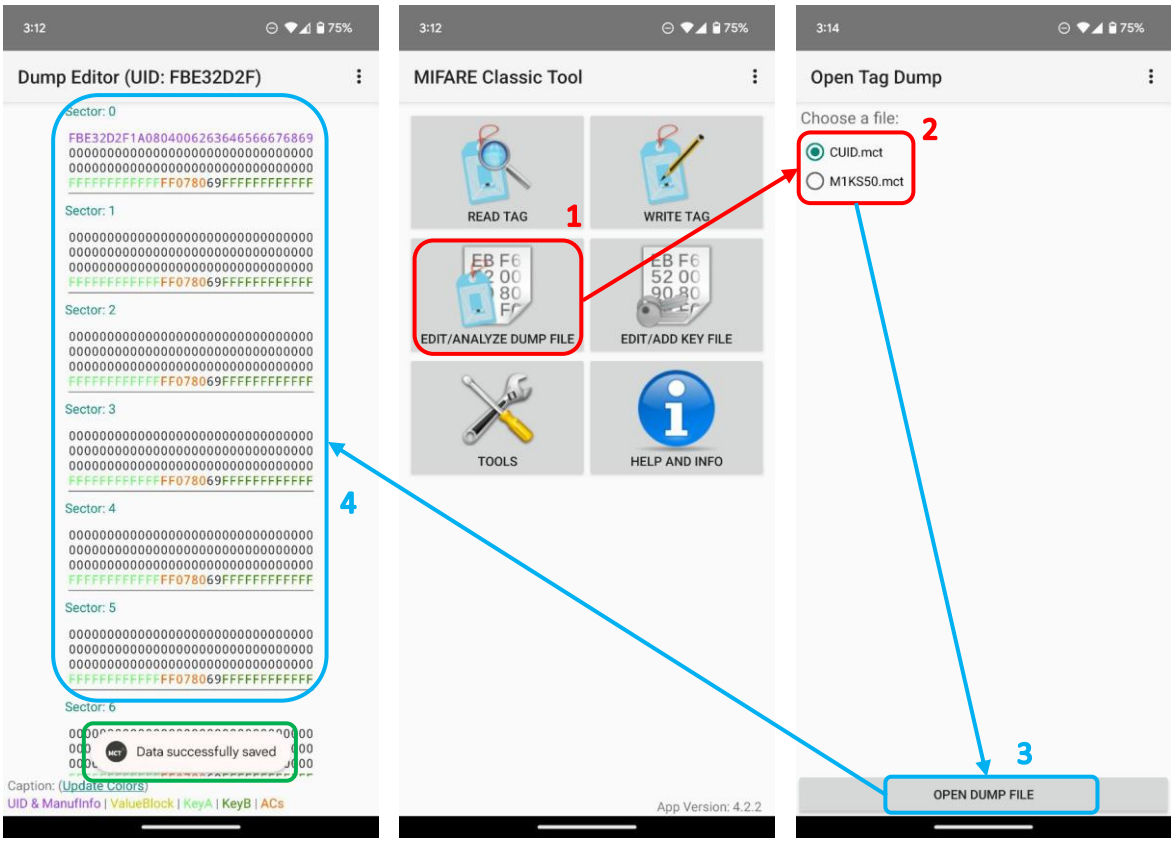
4. Tap on the **'READ TAG'** > select/tick the **'std.keys'** (a collection of default factory MIFARE keys) > tap on the **'START MAPPING AND READ TAG'**.

5. Once the apps finished reading all the data from Sector 0 to 16 save the data by tapping the 3-dot menu on the top right of the apps. **'3-Dot Menu'** > '**Save'** > *rename or keep the default naming scheme* > tap on **'Save'** button.



6. Repeat the step if user wanted to backup the other MIFARE cards data as well. This data can be exported to other format as well, example ***JSON, BIN, MFD, DUMP, EML & MCT***.

7. Back to main page to check the saved dump data. Tap on **'EDIT/ANALYZE DUMP FILE'** > Select the saved data that renamed before > Tap on **'OPEN DUMP FILE'** to check.



8. User can check each sector from 0 to 15. Few data displayed with different font colors to indicate whether it is ***UID, ValueBlock, KeyA, KeyB & AccessConditions***.

9. In this guide, both cards the CUID and the Standard MIFARE 1k were backed-up as example. File were renamed as **"CUID"** & **"M1KS50".**

B. Comparing both cards' data.

The UID is a unique number assigned to each MIFARE Classic card. User can check the UID and other data sector differences between both cards.

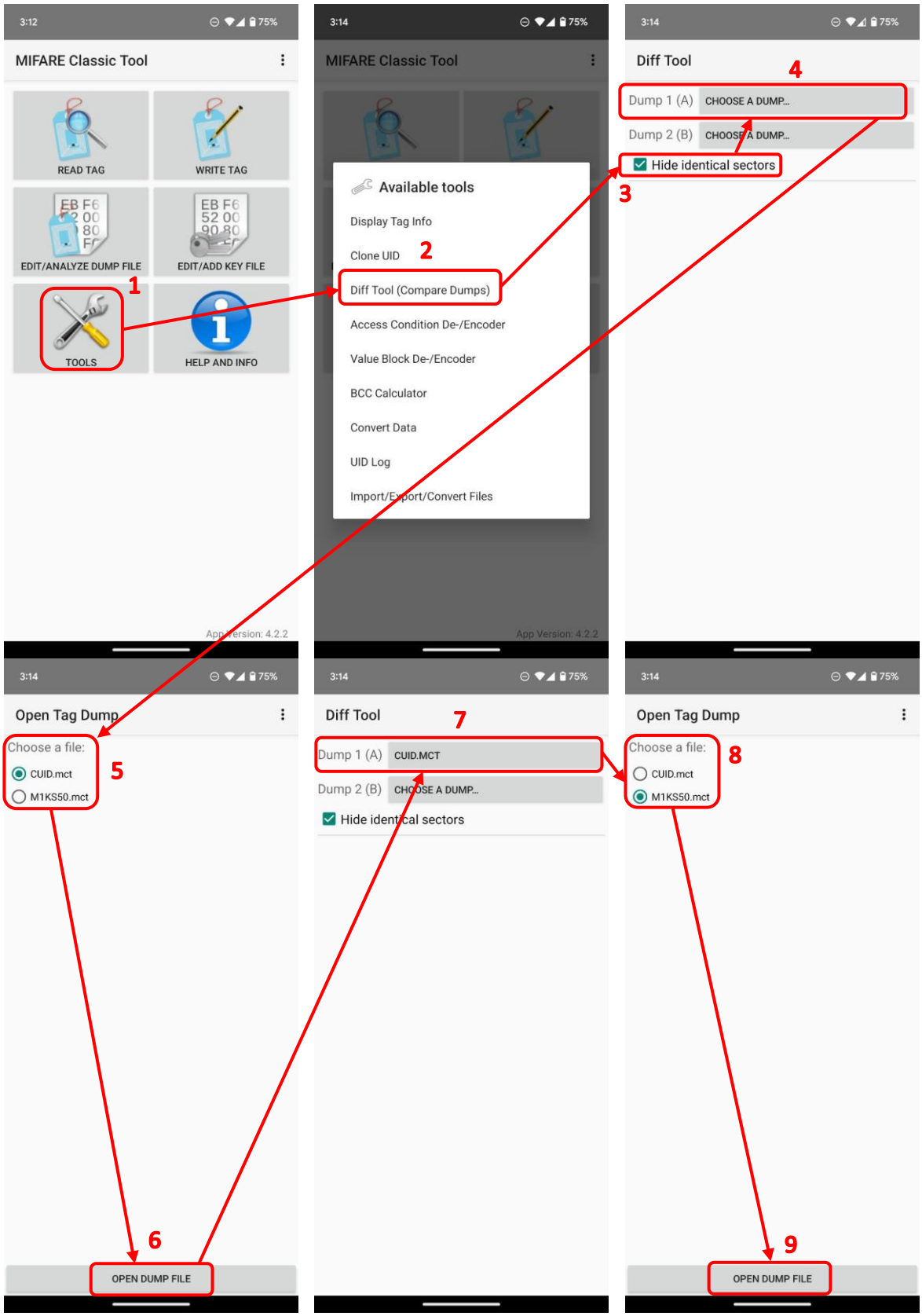
1. Back to the app's main page/menu. Select the **'TOOLS' > 'Diff Tool (Compare Dumps)'**.

2. On the **'Diff Tool'** page, Tick/Mark the **'Hide identical sector'** box.

3. Next on the **'Dump 1 (A)'**, tap the **'CHOOSE A DUMP…'** and choose any the 1st card data dump that backed-up previously.

4. After 1st card selected, select the 2nd card data dump. Select the **'CHOOSE A DUMP…'** on the **'Dump 2 (B)'** section.

5. In this guide, the CUID card were selected on **'Dump 1 (A)'** and M1KS50 were selected for **'Dump 2 (B)'**.

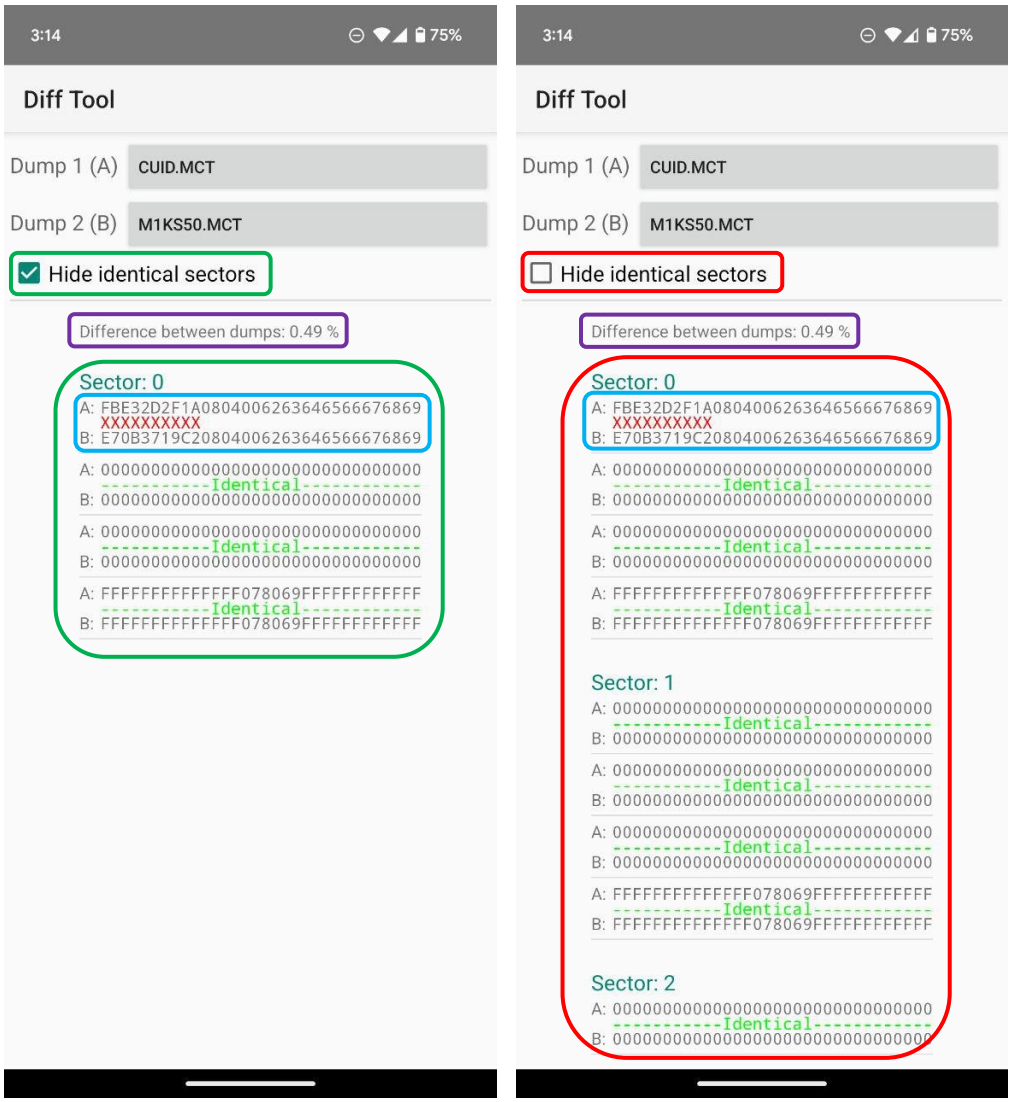


6. Once both **'Dump 1 (A)'** and **'Dump 2 (B)'** selected a result of comparison will display as in picture attached below.

7. The **'Hide identical sector'** function will ease user for finding the differences between both cards. It's will hide all Sector and Block that have the same data & only shows the others that different.

8. Both cards used in this guide is brand new, so there are no data in it except the **UID**. Since **UID** serial number is unique, each card is different from one another.

9. The differences between both dump data will be marked with '**X**' and the identical/same data will be marked with '**---Identical---**'.



C. Clone / Copy / Duplicate the MIFARE Classic 1k S50 to CUID card.

Cloning a MIFARE Classic 1k S50 card involves creating an identical copy of the card's data. This step is already covered before by simply using the Dump process (A).

Before cloning both 4-byte NUID are different	
MIFARE 1K S50	**Copy**
E70B3719C2080400626364656667686 9	FBE32D2F1A080400626364656667686 9

1. Dump the main card data (A), in our cases the card saved as ***'M1KS50.mct'***.

2. Back to the apps main page, tap on the '**WRITE TAG**' section, a new list will be shown. Select the **'Write Dump (Clone)'**. Tick/mark the **'Show Options'** and the **'Advanced: Enable writing to manufacturer block'** boxes.

3. Then the next page will prompt user to select the dump file created before. Select the dump files, in our cases the ***'M1KS50.mct'*** and tap on the **'SELECT DUMP'** button.

4. When the **'Write Sectors'** windows pop-ups show, select the sectors that user need to copy. Tap on **'SELECT ALL'** to copy all card sectors.

5. After selecting the sectors, put the CUID card on the back of the phone. Once card detected it'll show the toast notification. Tap on the **'OK'** button.

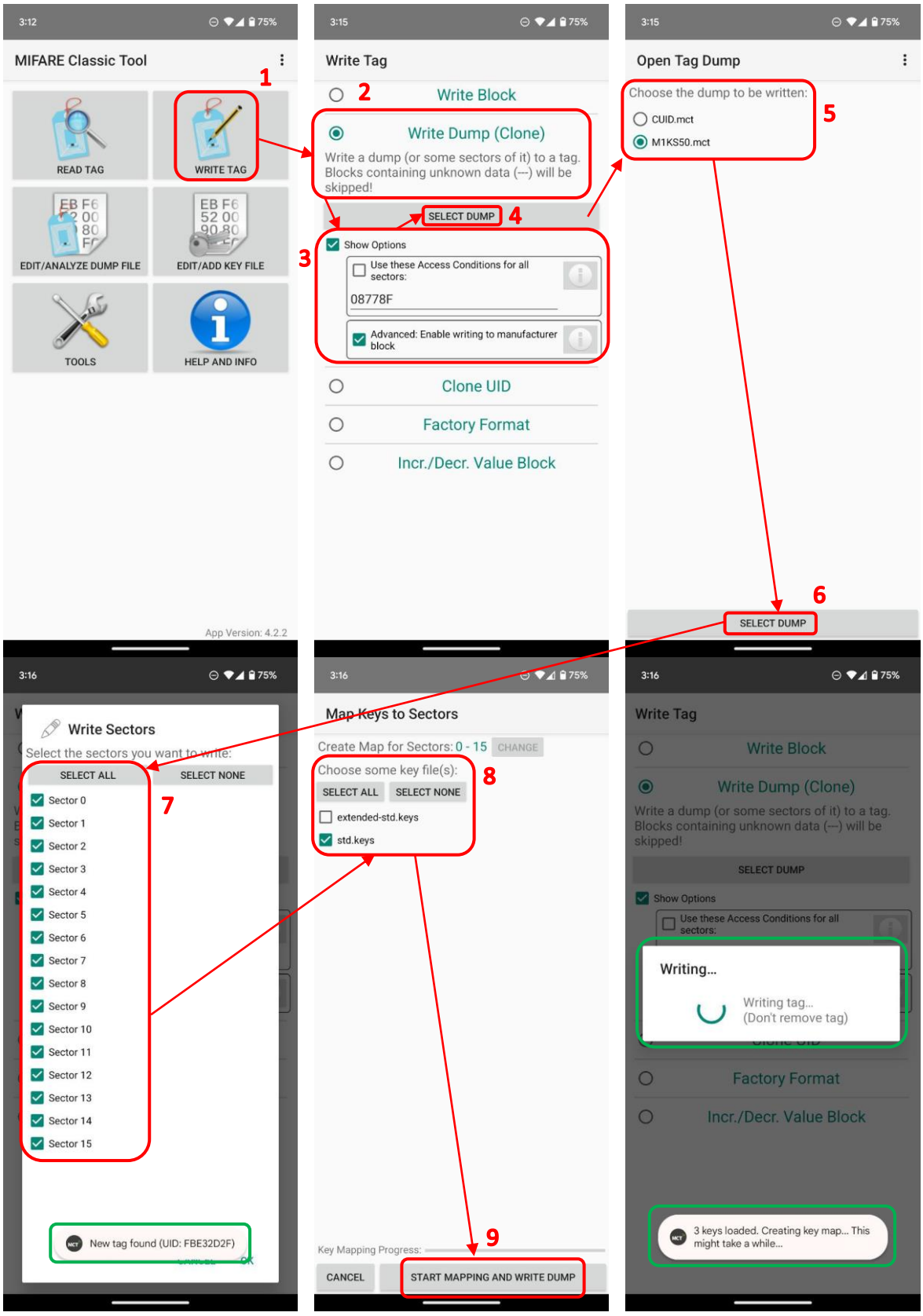
6. On the next page, tick/mark the **'std.keys'** box and then tap on the **'START MAPPING AND WRITE DUMP'** button to begin the cloning process. Keep the card & phone steady when these processes start.

7. Once cloning completed the apps will automatically goes back to main pages/menu. The toast notification messages will show **'Data successfully written'**.

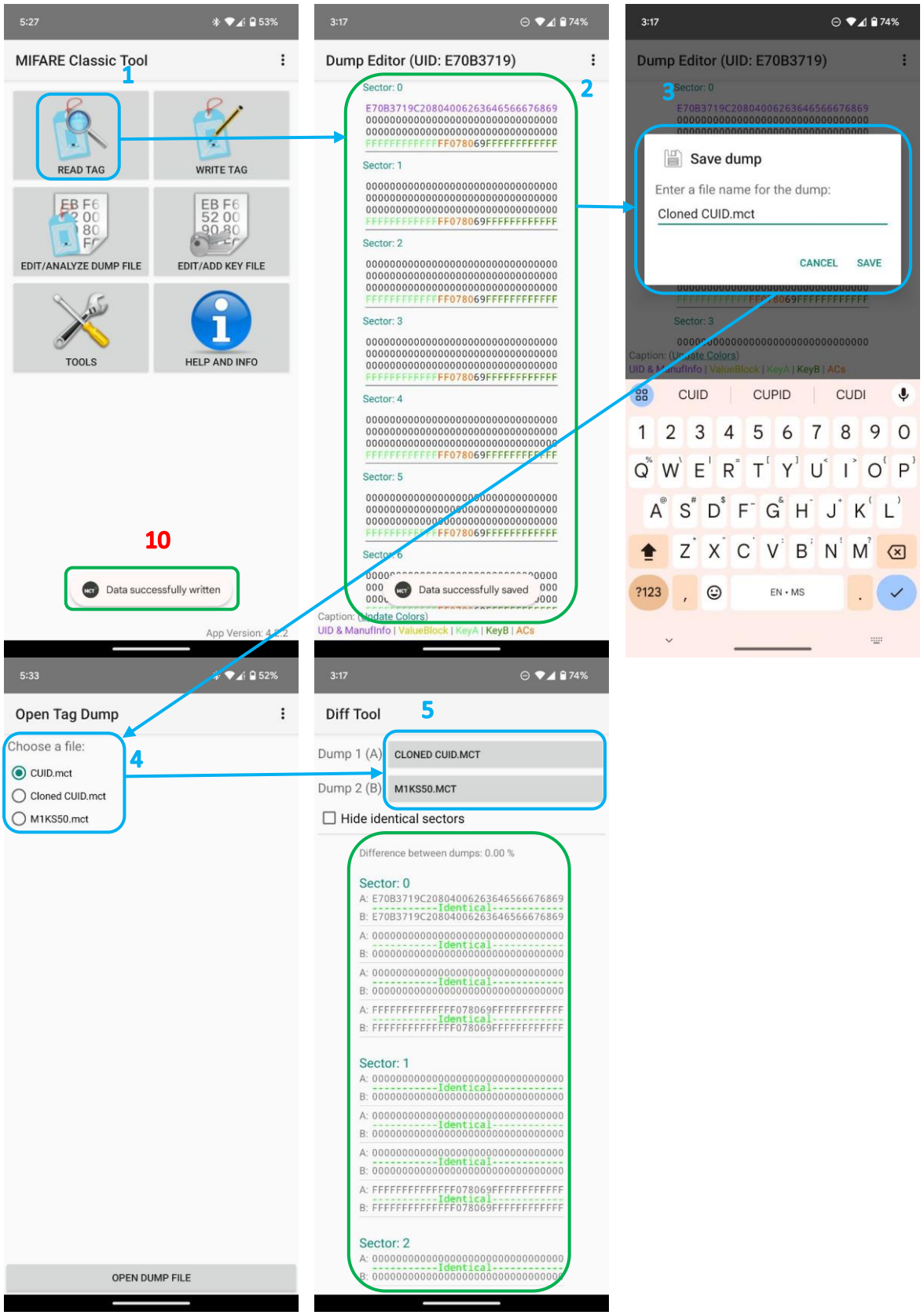
8. Remove the card from phone and re-read the card data using the guide A. User can compare (Guide B) the new dump data of the CUID card with the Standard one, the data should be the same.

After cloning both 4-byte NUID will become same	
MIFARE 1K S50	**Copy**
E70B3719C2080400626364656667686 9	E70B3719C2080400626364656667686 9

Cloning process



Comparison


MIFARE Classic Tool
READ TAG
WRITE TAG
EDIT/ANALYZE DUMP FILE
EDIT/ADD KEY FILE
TOOLS
HELP AND INFO
Dump Editor (UID: E70B3719)
Save dump
Enter a file name for the dump:
Cloned CUID.mct
CANCEL
SAVE
Data successfully written
Data successfully saved
Open Tag Dump
Choose a file:
CUID.mct
Cloned CUID.mct
M1KS50.mct
OPEN DUMP FILE
Diff Tool
Dump 1 (A)
CLONED CUID.MCT
Dump 2 (B)
M1KS50.MCT
Hide identical sectors
Difference between dumps: 0.00 %