岱鐠科技股份有限公司
DediProg Technology Co., Ltd.

NuProgPlus Series
User Manual
Universal Programmer and Duplicator

Model: NuProgPlus-U8/NuProgPlus-U16

Please read the instructions carefully before use.

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I. Introduction

This manual will be focusing on the hardware specification and the software quick guide of NuProgPlus-U8/U16. If you would like to know more about the DediWare software, please download it from DediProg website.

https://www.dediprog.com/download

II. Product Information

Model / Functions	ProgMaster-U8	NuProgPlus-U8	NuProgPlus-U16
Supported IC Kinds	Universal (UFS is not supported)	Universal (Support UFS)	
USB Interface	USB2.0	USB3.0	
LCD Keypad Panel	√	√	
Sites	8 Sites	8 Sites	
Socket	8 Sockets	**8 Sockets**	**8 Sockets (16 Sockets for SPI Flash, eMMC, and UFS)**
Power/Pass/Busy/Error LED Indicators	√	√	
Start button	√	√	
Multiple Programmers*	√	√	

Note * Multiple programmers of the same model can be driven by 1 PC

III. System Requirement

CPU:	i5 or above
OS:	Windows 7/8.1/10
USB Port:	USB 3.0
Free Disk Space:	More than 256GB (Depends on the image file size)
CD ROM:	It is necessary for installing the software

V. Product Descriptions

D. LCD Keypad Panel

C. Status LED Indicator

E. Socket Sites

A. Power and System Status LED Indicators

B. Start Button

F. ESD & GND

G. Hand Press Fixture Mounting Hole

F. ESD & GND

H. USB Port

I. Power Connector

J. Power Switch

A. Power and System Status LED Indicators

The System Error LED will turn off after the initialization is done.

B. Start Button

Use Start button to start programming in production mode.

C. Status LED Indicator

Red (Error): Programming fail

Yellow (Busy): In the progress of programming
Green (Pass): Program succeeds

D. LCD Keypad Panel

When the programmer is in the Stand-alone mode, the user can operate programming through the LCD monitor and keypad.

E. Socket Sites

Install the socket adaptor according to different types of IC package.

F. ESD & GND

GND is for programming grounded; ESD is for connecting ESD wrist strap.

G. Hand Press Fixture Mounting Hole

This fixture mounting hole is used exclusively to connect the NuProgPlus with the hand press fixture, enabling semi-automatic programming.
For more details, please refer to the NuProgPlus Hand Press Fixture Manual.

H. USB Interface

Control the DediWare software and the programmer by using the USB3.0 connector, one end connects to the programmer; the other end connects to the USB3.0 port on the computer.

I. Power Connector

Connect with the DC 15V power cable provided by DediProg (Input 100~240V/50~60Hz; Output 15V).
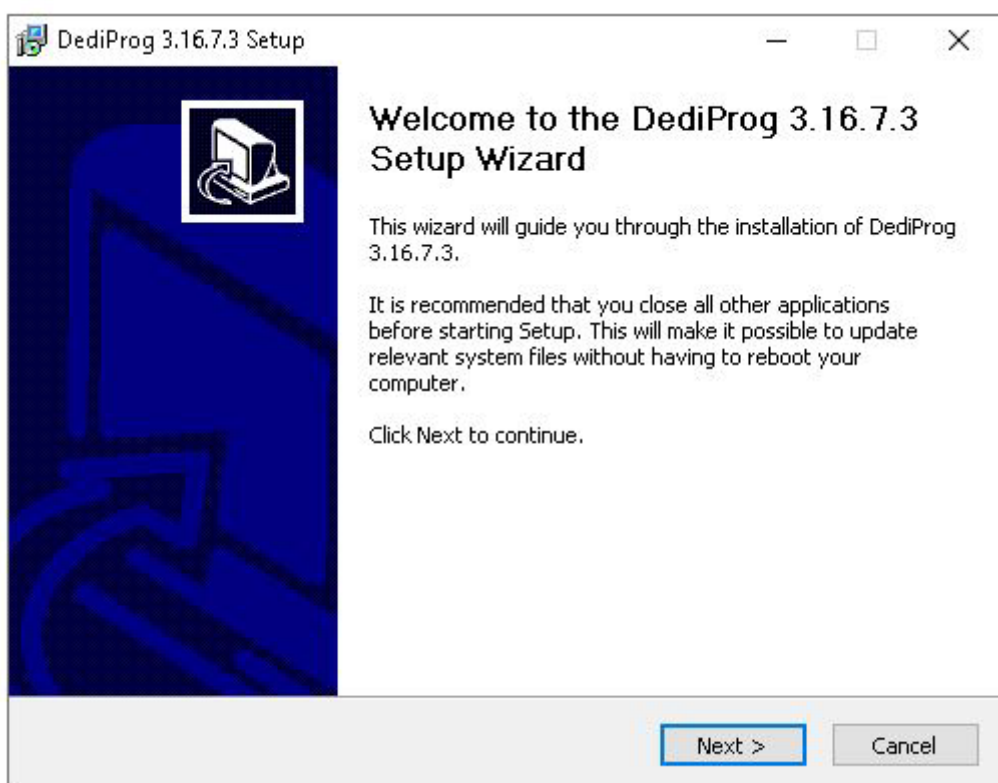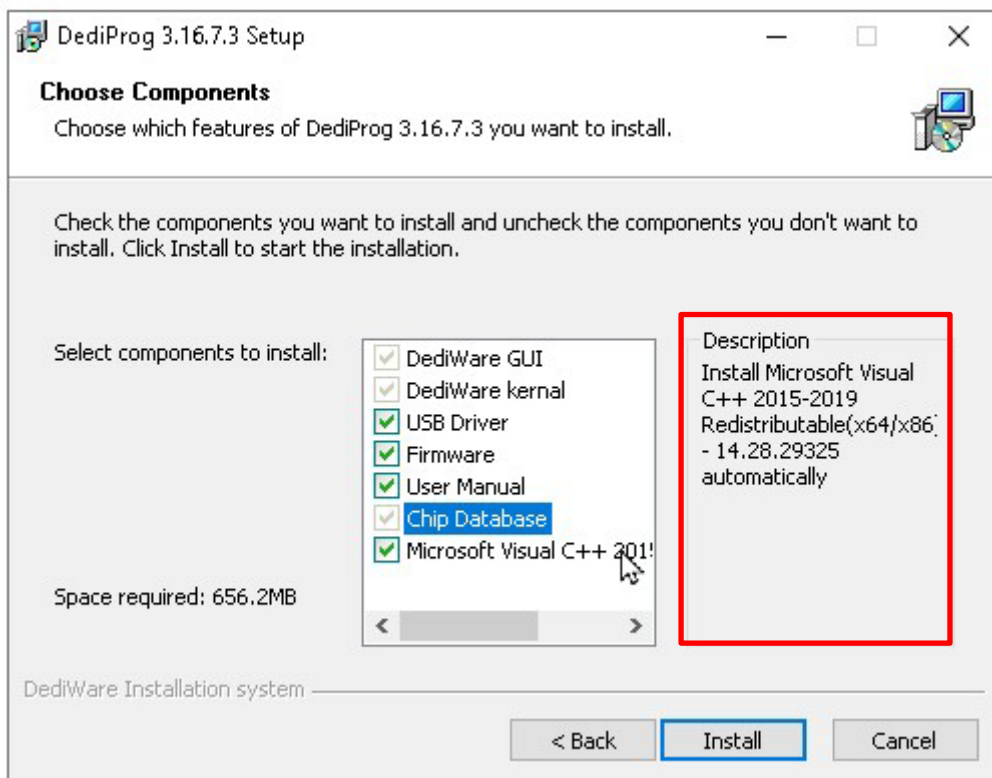
J. Power Switch

VI. DediWare Quick Installation

The software is provided with the purchase of NuProgPlus-U8/U16. The latest version is available on our website. **www.dediprog.com**
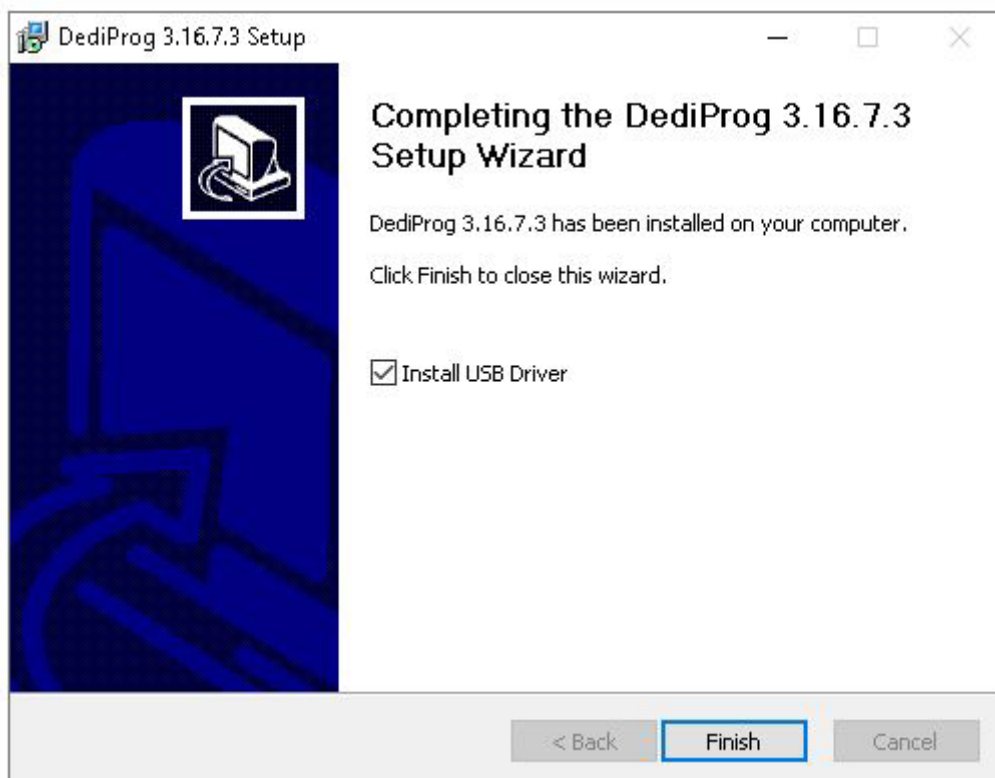
5.1 Software Installation

1. Install DediWare and driver

- ➢ The listed items are expected to be installed; some items can be canceled.
- ➢ Pointing the cursor on the item, it will show the description on the right side.
- ➢ If the PC has not been installed any versions of the DediWare previously, then it is required to install the Chip Database.

2. After installation, three DediWare icons will appear on the desktop. Administrator permission is required to execute the software. If user account is not administrator level, please enable the option "Run this program as an administrator" in the software shortcut.
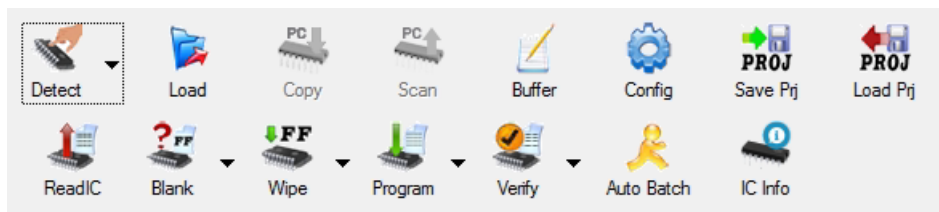
	General Client Run the software for MCU/Flash/EEPROM programming.
	eMMC_UFS Client Run the software for eMMC and UFS programming and duplicating.
	Command Line Interface Supporting the Command line of the StarProg Series Programmers (Please refer to the DediWare Command Line User Manual).

5.2 Install NuProgPlus-U8/U16 Programmer

1. Connect the power cable to the NuProgPlus-U8/U16 programmer

2. Connect the USB cable to the NuProgPlus-U8/U16 programmer

3. Install the socket adaptor, please refer to **VI. Socket Adaptor Installation**

4. Turn on the power of the programmer

5. Place IC into the socket adaptor

6. Open the software and start programming

5.3 Engineering mode for eMMC_UFS Client (For eMMC and UFS IC only)

Engineering Mode Functions

Detect: Select IC type to detect or enter the part number manually. (It is recommended to use Detect first.)
Load: Load the programming file and settings.
Copy / Scan: Not applicable for NuProgPlus-U8/U16.
Buffer: Show the content of the partition.
Config: IC Register Programming settings and Batch settings.
Save Prj: Save as a project folder.
Load Prj: Import the project folder.
ReadIC: Read the contents of the partition and the Register.
Blank: Blank check.
Wipe: Delete the Partition data.
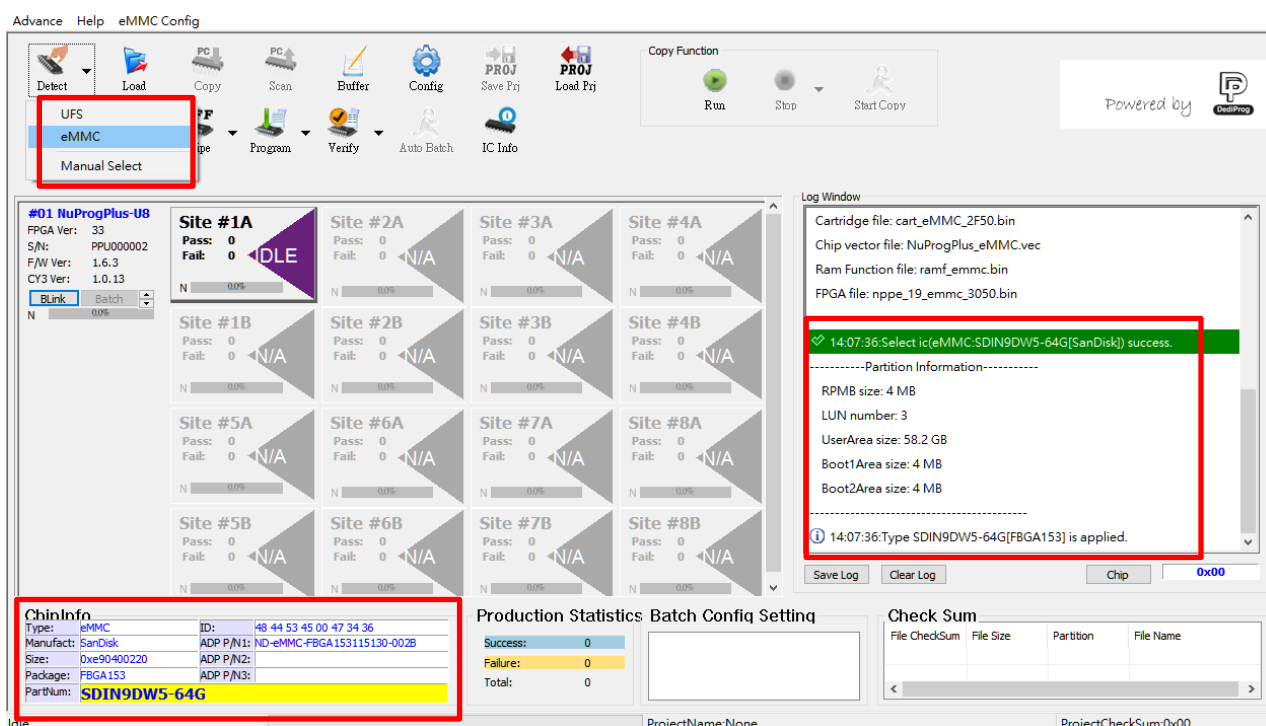**Program:** Program the Partition and the Register.
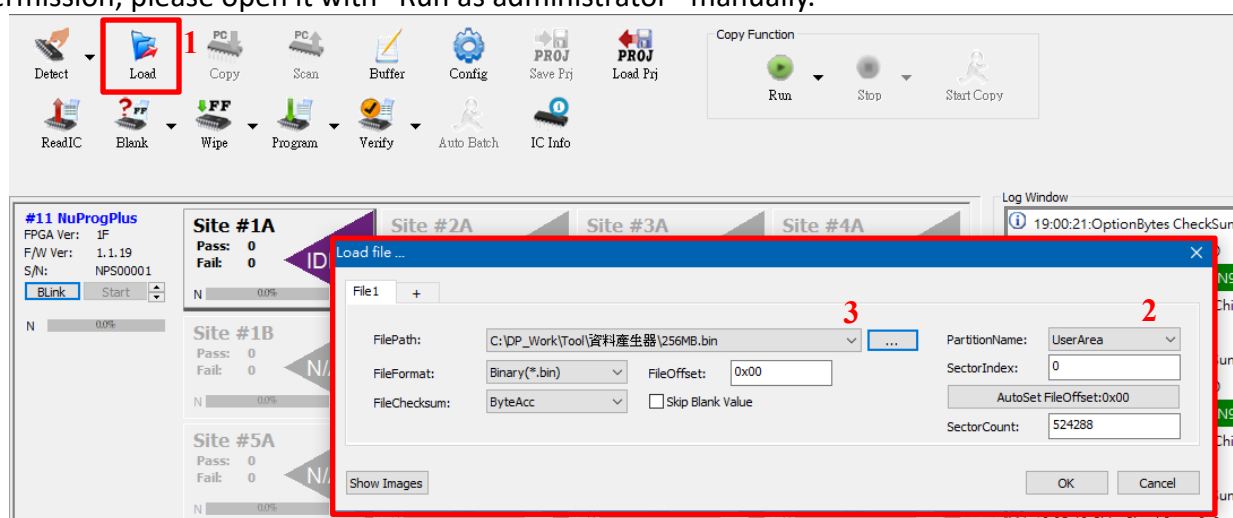**Verify:** Verify the Partition and the Register.
Auto Batch: Run the batch.

5.3.1 eMMC Programming and Settings
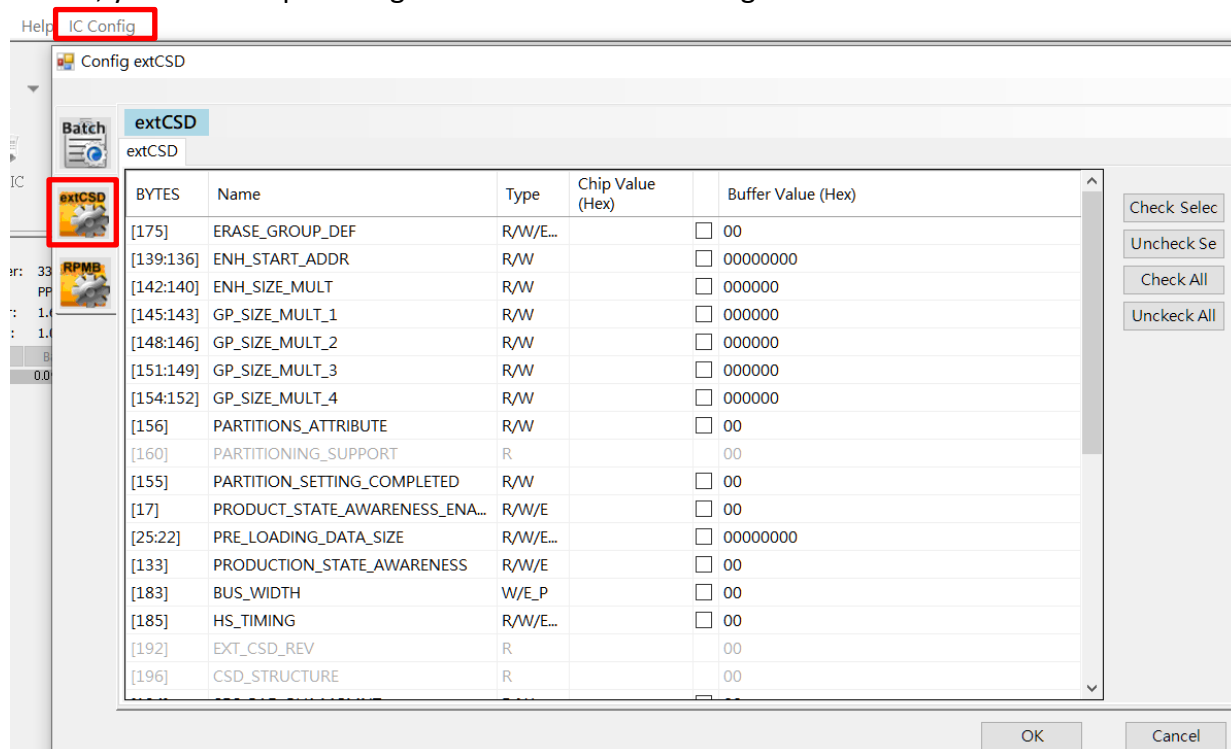
1. Click Detect > eMMC

- After detecting the IC's ID successfully, it will show the model of the eMMC IC and the current Partition quantity and volume in the Log.
- It will show the related information of the eMMC IC and its applicable socket adaptor part number in the ChipInfo section at the bottom.
- If the detection has failed.
    - Please check the IC pin 1 position.
    - Please check if the selected socket has been placed an IC correctly.
    - Please check the IC ball condition to avoid contact fail, or replace with other IC.

2. Load the programming file: Assign the Partition and the programming file for programming. It is required to have administrator permission to execute the software, and if the user account does not have the permission, please open it with "Run as administrator" manually.

- **File1:** It is the configuration tab of the first programming file, you can click "+" to add other tabs for other files. If you would like to delete the unnecessary tabs, just right click on the tab twice.
- **FilePath:** It is the file path and the file name; you can use "…" to search the file. If the file in on the external PC, then please create a network drive and use it to open the file. It does not support IP or shortcut methods.
- **FileFormat:** eMMC can only read by binary method.
- **FileChecksum:** The calculation method for file Checksum.
- **FileOffset:** The starting address reading from the file (hexadecimal).
- **Skip Blank Value:** It will skip the empty area in programming process, which will help to reduce the programming time (recommended).
- **PartitionName:** The Partition that needs to be programmed.
- **SectorIndex:** The programming starting sector index of the eMMC IC (Decimal).
- **SectorCount:** It is the accounts for the sectors of the programming file (Decimal).
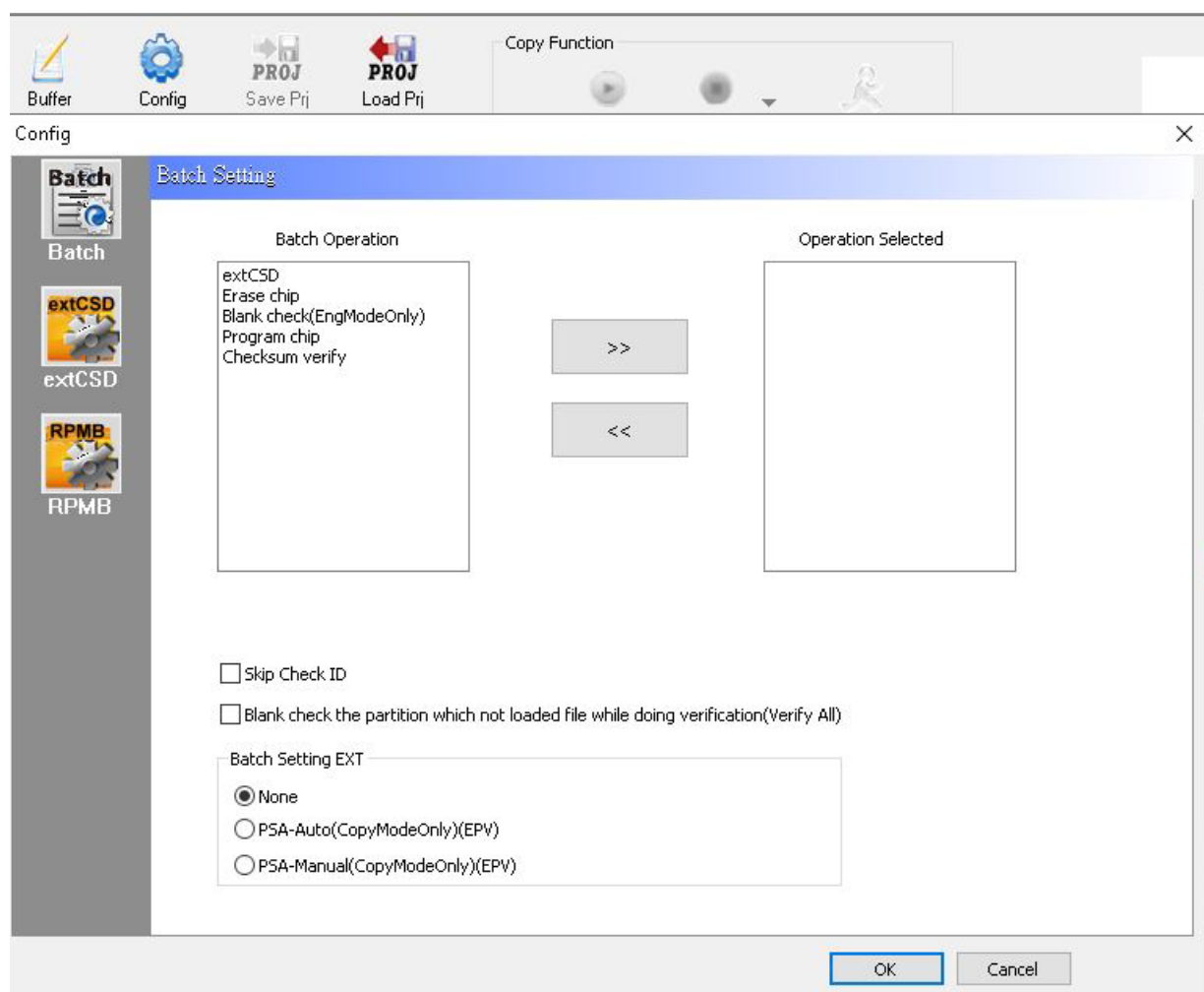- **Show Images:** List the configurations of all the programming files.

If you need to activate the EUDA (Enhanced User Data Area) or the GPP0~3 (General Purpose Partitions), please complete the related configuration settings on ExtCSD first, and then after writing, use the Detect IC to get the new Partition(s) configuration again.

3. If needed, you can set up the Register on ExtCSD in IC Config.

➢ Check the needed items for programming and set up the values.
➢ Before setting up the values, please delete all the previous values first.
➢ It will not save the unchecked items.
➢ **Check Selected:** Click on anywhere in the column that you want to select, and then it will check all the boxes at once after you click Check Select
➢ **Uncheck Selected:** Click on anywhere in the column that you want to cancel, and then it will cancel the boxes at once after you click Uncheck Selected.
➢ **Check All:** Check all the columns at once.
➢ **Uncheck All:** Cancel all the columns at once.
➢ Some registers can only be written for once, after it has been written successfully, then it will not be able to change again. If you have any concerns regarding each Register's values of the eMMC ExtCSD, please get the correct values from the IC supplier.
➢ If Register 134~156 need to be programmed, Register 175 must be set to 1.
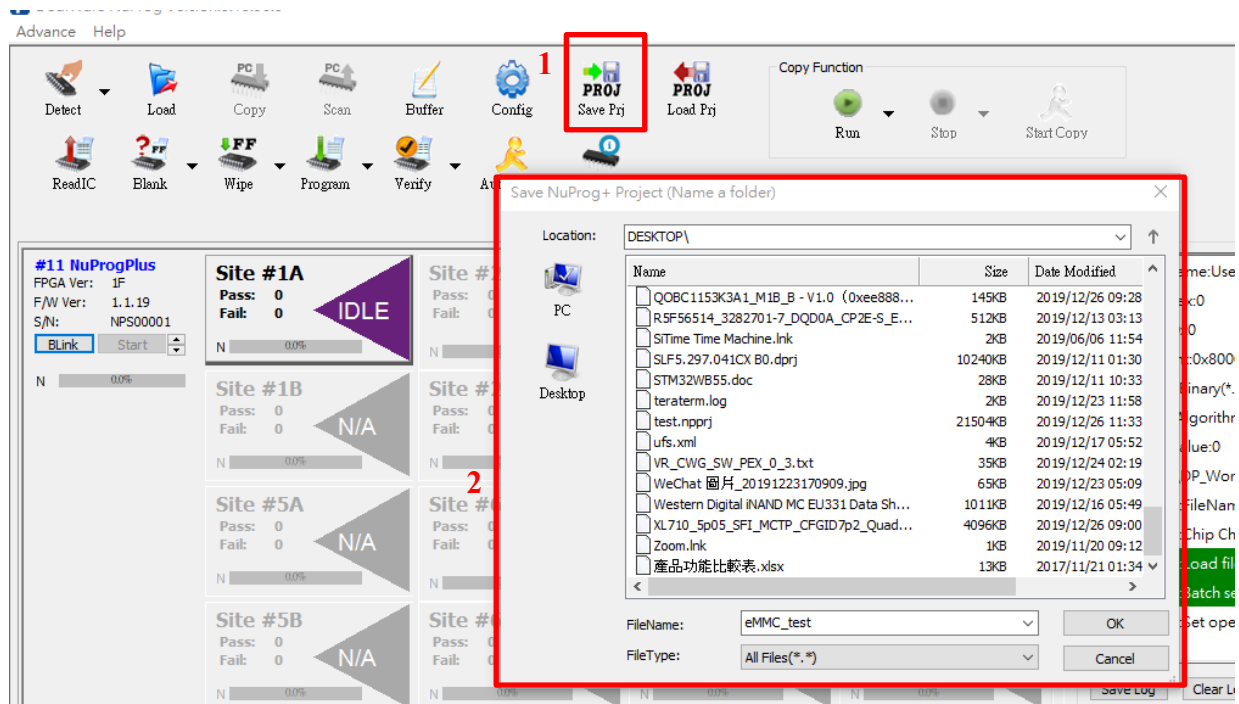
4. Set up the Batch Operation.

Basic Options

➢ **extCSD:** Program and verify ExtCSD register.
➢ **Erase Chip:** Delete all the Partition data.
➢ **Blank check (EngModeOnly):** Blank check and it can only be executed in the engineering mode.
➢ **Program chip:** Program the Partition.
➢ **Checksum verify:** Verify the Partition.

Advance Options

➢ **Skip Check ID:** Not execute ID check
➢ **PSA-Auto:** Activate PSA-Auto programming function. The Batch mode will be fixed to EPV, and only can run in the copy mode.
➢ **PSA-Manual:** Activate PSA-Manual programming function. The Batch mode will be fixed to EPV, and only can run in the copy mode.
➢ If you have any concerns about the PSA application methods and conditions of the eMMC, please contact with the IC supplier.

5. Save as the project folder.

Name the project and it will generate a project folder after clicking OK, which will save all the required settings and content for programming. Please name the project by English character, number and underscore (_), and do not use space or other symbols.
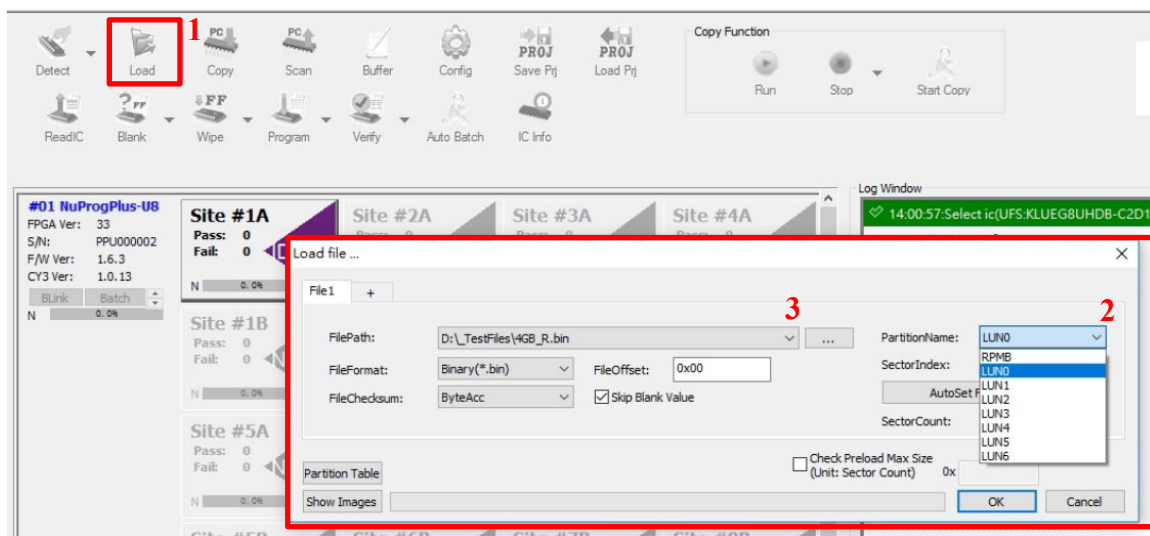
5.3.2 UFS Program and Settings

1. Click Detect > UFS

2.

➤ After detecting the IC's ID successfully, it will show the internal ID of the UFS IC and the current Partition quantity and volume in the Log.

➤ It will show the related information of the UFS IC and its applicable socket adaptor part number in the ChipInfo section at the bottom.

➤ If the detection has failed.

  ■ Please check the IC pin 1 position.

  ■ Please check if the selected socket has been placed an IC correctly.

  ■ Please check the IC ball condition to avoid contact fail, or replace with other IC.

3. Load the programming file: Assign the Partition and the programming file for programming.
4.

- ➤ **File1:** It is the configuration tab of the first programming file, you can click "+" to add other tabs for other files. If you would like to delete the unnecessary tabs, just right click on the tab twice.
- ➤ **FilePath:** It is the file path and the file name; you can use "…" to search the file. If the file in on the external PC, then please create a network drive and use it to open the file. It does not support IP or shortcut methods.
- ➤ **FileFormat:** UFS can only read by binary method
- ➤ **FileChecksum:** The calculation method for file Checksum.
- ➤ **FileOffset:** The starting address reading from the file (hexadecimal)
- ➤ **Skip Blank Value:** It will skip the empty area in programming process, which will help to reduce the programming time (recommended).
- ➤ **PartitionName:** The Partition that needs to be programmed
- ➤ **SectorIndex:** The programming starting sector index of the UFS IC (Decimal).
- ➤ **SectorCount:** It is the accounts for the sectors of the programming file (Decimal).
- ➤ **Show Images:** List the configurations of all the programming files.

If there is no available Partition(s) for the UFS IC to set up the programming file, then please complete Partition(s) configuration settings, and after writing, use Detect IC to get new Partition(s) configuration again.
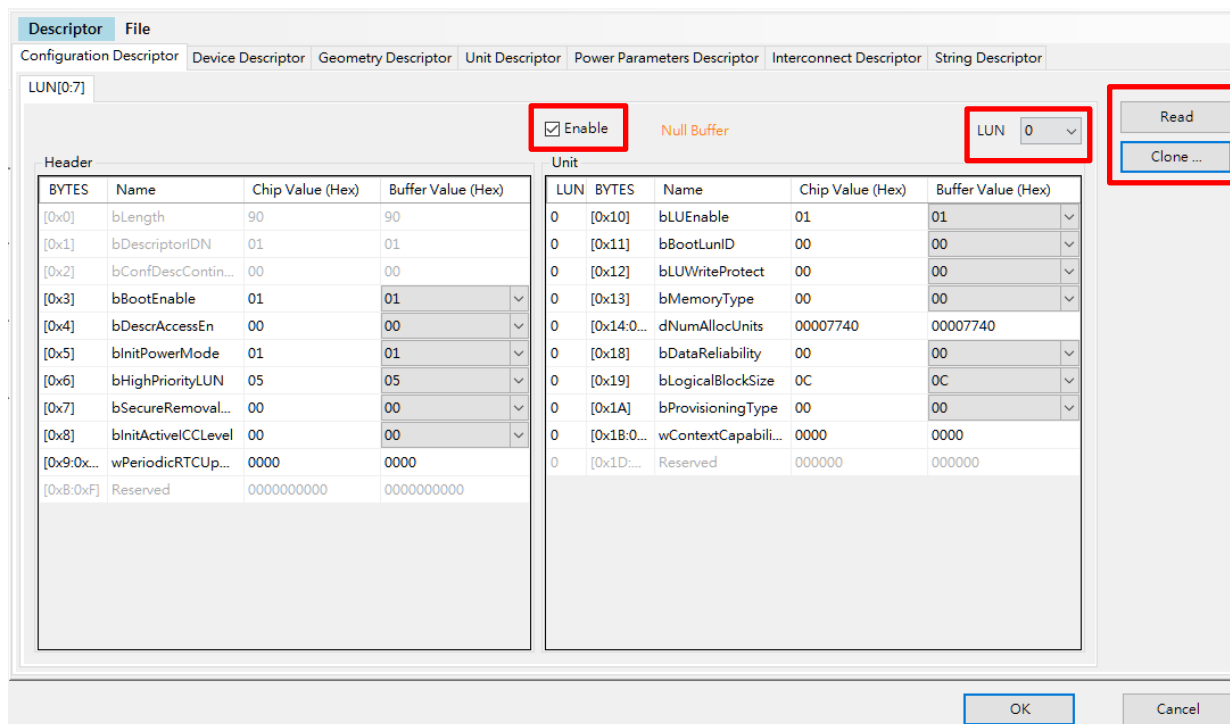
Set up the UFS Partition(s) configuration according to the UFS IC datasheet in the Configuration Descriptor. If you have any concerns regarding the UFS Configuration Descriptor values, please get the correct value from the IC supplier.

3. If needed, you can set up the Registers of the Descriptor/Attribute/Flag on ExtCSD in IC Config.

- ➢ Configuration Descriptor are for the UFS IC Partition(s) configurations, it can set up maximum of eight partitions (LUN0~LUN7)
- ➢ Attribute and Flag are for setting up the UFS IC attributes.
- ➢ Some registers can only be written for once, after it has been written successfully, then it will not be able to change again. If you have any concerns regarding each Register's values of the UFS Descriptor/Attribute/Flag, please get the correct values from the IC supplier.

Configuration Descriptor

- ➤ **Read:** Read the values from the IC and show on the Chip Value column.
- ➤ **Clone:** It will copy the values in the Chip value column to the corresponding Buffer Value column.
- ➤ **Enable:** It will save the settings for the Buffer Value.
- ➤ **Null Buffer:** It means the software has not saved any settings yet.
- ➤ **LUN:** Choose the LUN.
- ➤ Before setting, please execute Enable, Read and Clone in order, and then change the fields that need to be adjusted.
- ➤ After settings, it will only be activated after running Program Descriptor.
- ➤ File function can save the Buffer Values as CSV file, or import the CSV file to the Buffer Value.

Attributes

- ➤ Check the needed items for programming and set up the values.
- ➤ Before setting up the values, please delete all the previous values first.
- ➤ The unchecked items in the Buffer value setting will not be saved.
- ➤ **Check Selected:** Click on anywhere in the column that you want to select, and then it will check all the boxes at once after you click Check Select.
- ➤ **Uncheck Selected:** Click on anywhere in the column that you want to cancel, and then it will cancel the boxes at once after you click Uncheck Selected.
- ➤ **Check All:** Check all the columns at once.
- ➤ **Uncheck All:** Cancel all the columns at once.
- ➤ **Read:** Read the values from the IC and show on the Chip Value column.
- ➤ **Clone:** It will copy the values in the Chip value column to the corresponding Buffer Value column.
- ➤ Partial columns are set up by bit method.
- ➤ File function can save the Buffer Values as CSV file, or import the CSV file to the Buffer Value.

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Flag

IDN	Name	Type	Chip Value	V	Buffer Value
1	fDeviceInit	R/W	0	☑	0: Device initialization completed or not started yet.
2	fPermanentWPEn	R/WO	0	☑	0: Permanent write protection disabled.
3	fPowerOnWPEn	R/W	0	☑	0: Power on write protection disabled.
4	fBackgroundOpsEn	R/W	1	☑	1: Device initiated background ops. is enabled.
6	fPurgeEnable	W		☑	0: Purge operation is disabled.
8	fPhyResourceRemoval	R/W	1	☑	1: The dynamic capacity operation shall commence upon device EndPointReset or
9	fBusyRTC	R	0		0: Device is not executing internal operation related to RTC.
11	fPermDisableFwUpdate	R/WO	0	☑	0: The UFS device firmware may be modified.

Buttons: Check, Uncheck, Check All, Uncheck All, Read, Clone...

- ➤ Check the needed items for programming and set up the values.
- ➤ Before setting up the values, please delete all the previous values first.
- ➤ The unchecked items in the Buffer value setting will not be saved.
- ➤ **Check Selected:** Click on anywhere in the column that you want to select, and then it will check all the boxes at once after you click Check Select.
- ➤ **Uncheck Selected:** Click on anywhere in the column that you want to cancel, and then it will cancel the boxes at once after you click Uncheck Select.
- ➤ **Check All:** Check all the columns at once.
- ➤ **Uncheck All:** Cancel all the columns at once.
- ➤ **Read:** Read the values from the IC and show on the Chip Value column.
- ➤ **Clone:** It will copy the values in the Chip value column to the corresponding Buffer Value column.
- ➤ File function can save the Buffer Values as CSV file, or import the CSV file to the Buffer Value.

Flag	File		Type	C
IDN (Hex)		Export Buffer		
		Import		
1	fDeviceInit		R/W	
2	fPermanentWPEn		R/WO	

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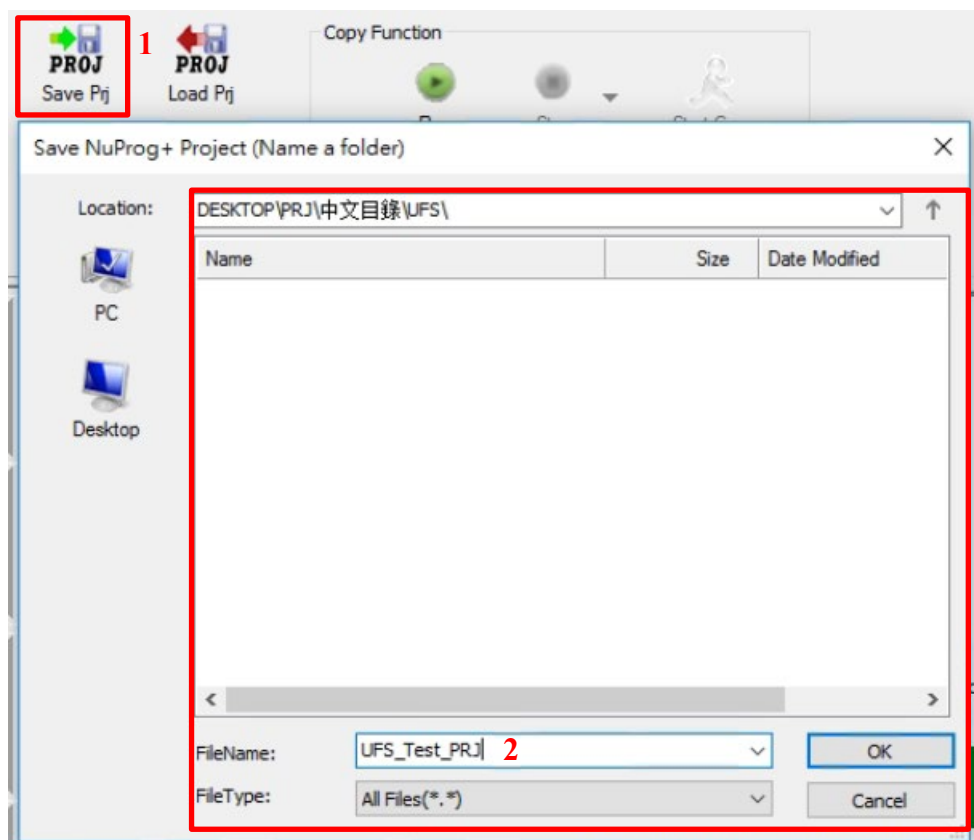4. Set up the batch operation mode for programming.

Basic Options

➢ **Write Flag:** Program and verify Flag register.
➢ **Write Attribute:** Program and verify Attribute register.
➢ **Write Descriptor:** Program and verify Descriptor register.
➢ **Wipe LUN:** Delete all Partitions' data
➢ **Blank check (EngModeOnly):** Blank check and it can only be executed in the engineering mode.
➢ **Program chip:** Program the Partition.
➢ **Checksum verify:** Verify the Partition.

Advance Option

➢ **Skip Check ID:** Not execute ID check
➢ PSA: Activate PSA programming function. The Batch mode will be fixed to EPV, and only can run in the copy mode.
➢ If you have any concerns about the UFS PSA application methods, please contact with the IC supplier.
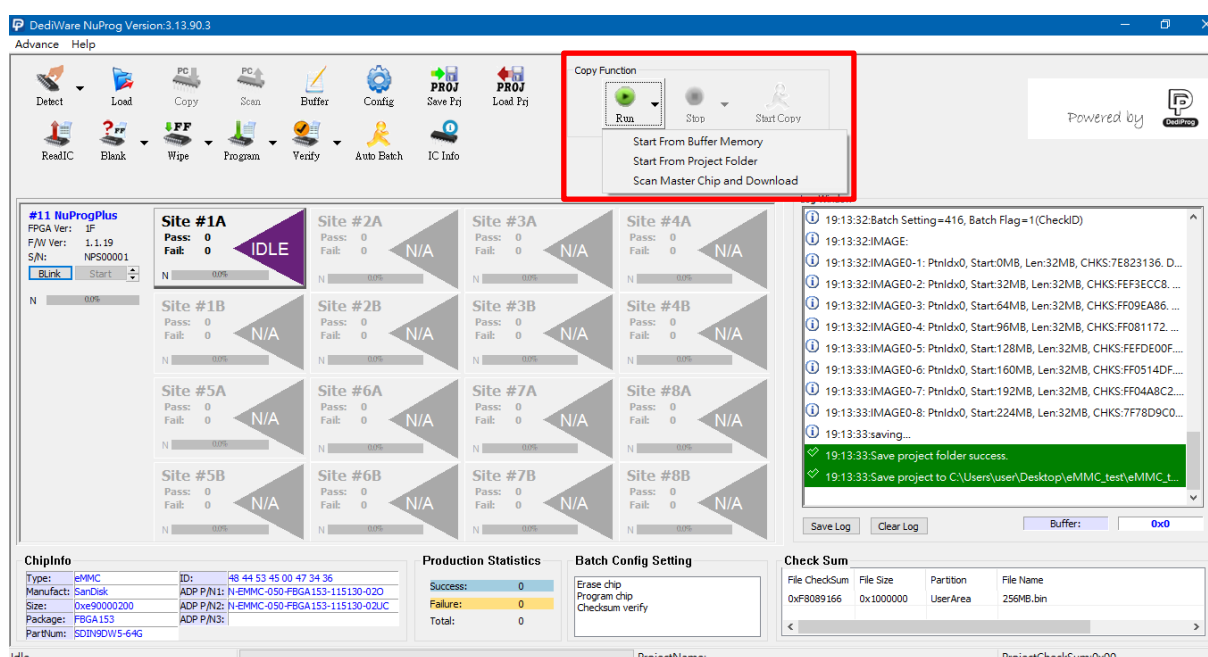
5. Save as Project Folder.

Name the project and it will generate a Project Folder after clicking OK, which will save all the required settings and content for programming. Please name the project by English character, number and underscore (_), and do not use space or other symbols.

5.4 The Copy Mode of eMMC_UFS Client (For eMMC & UFS IC only)
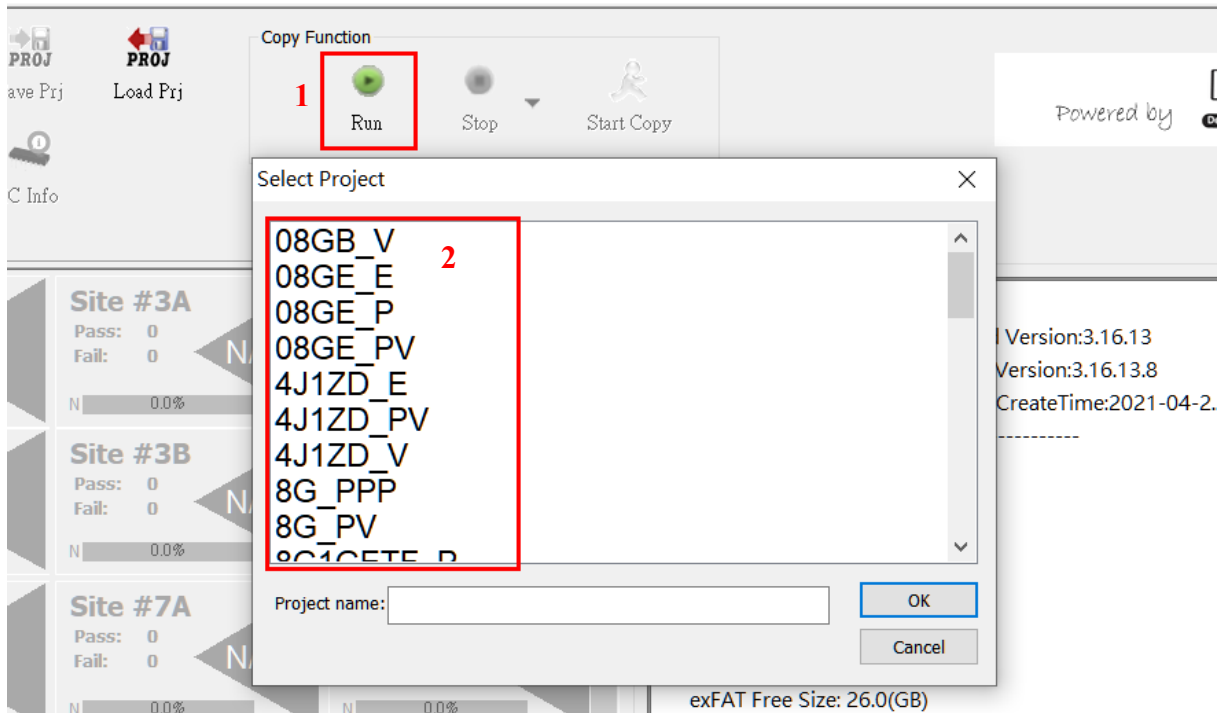
After creating a project folder, save it to the computer that the other programmer is connected, and click Run, and then there will be three options.

- **Start From Buffer Memory**: Select a project folder from the programmer and execute.

- **Start From Project Folder**: Select a project folder from the computer, download the selected project folder to the programmer and execute. And then the next time using this, then you can just select the Start From Buffer Memory to save the loading time.

- **Scan Master Chip and Download**: Read the master IC and generate a project folder according to the assigned socket's location. The project file will be saved to the programmer and execute directly.
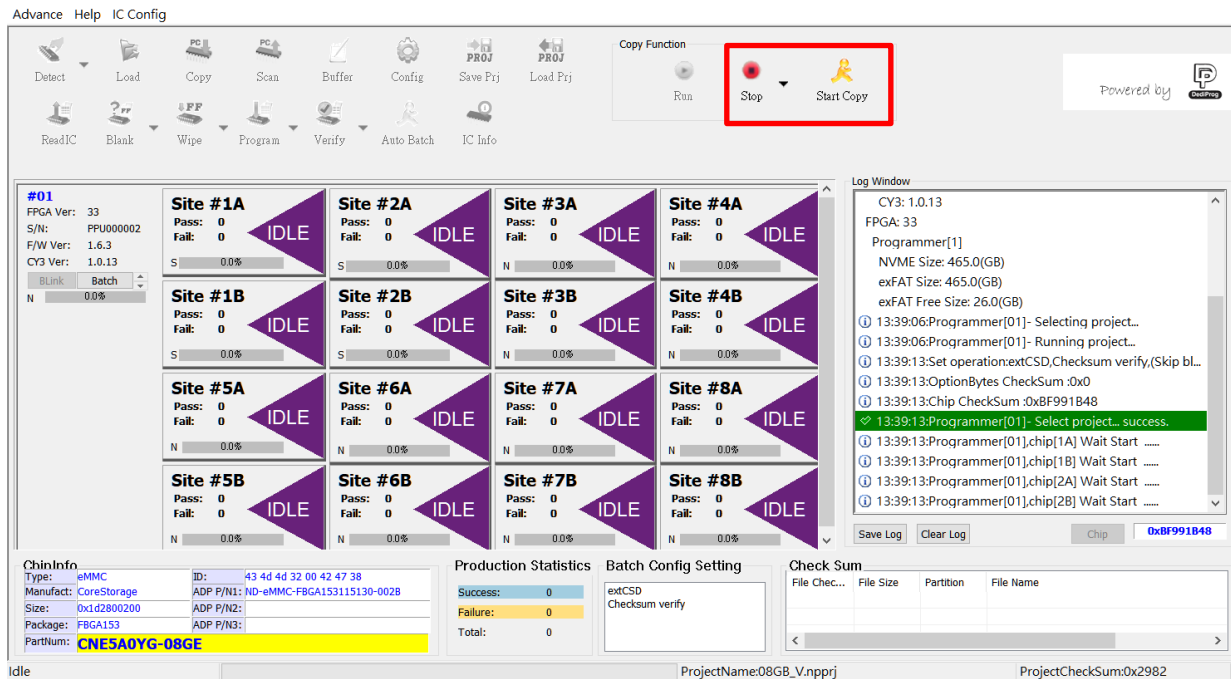
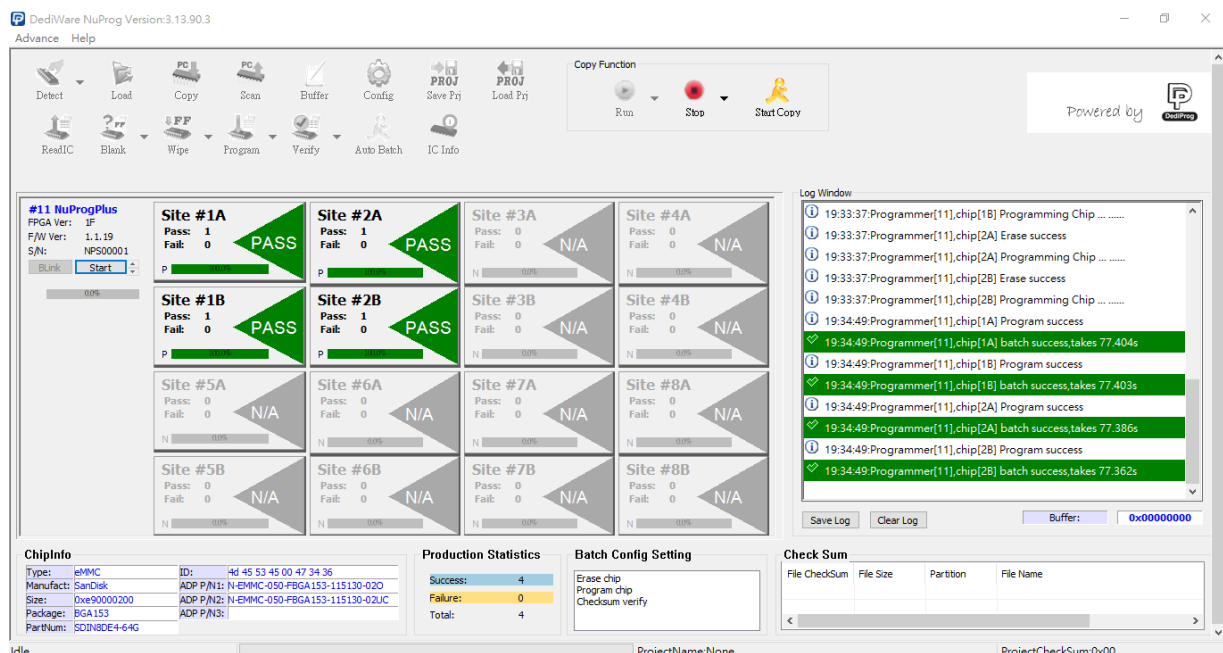## 5.4.1 Start from Buffer Memory

Select the project file name for execution.

After it is finished, it will show "Select project success" in the Log window, meanwhile, the Run icon will turn grey, and the Stop, Start Copy will be available.
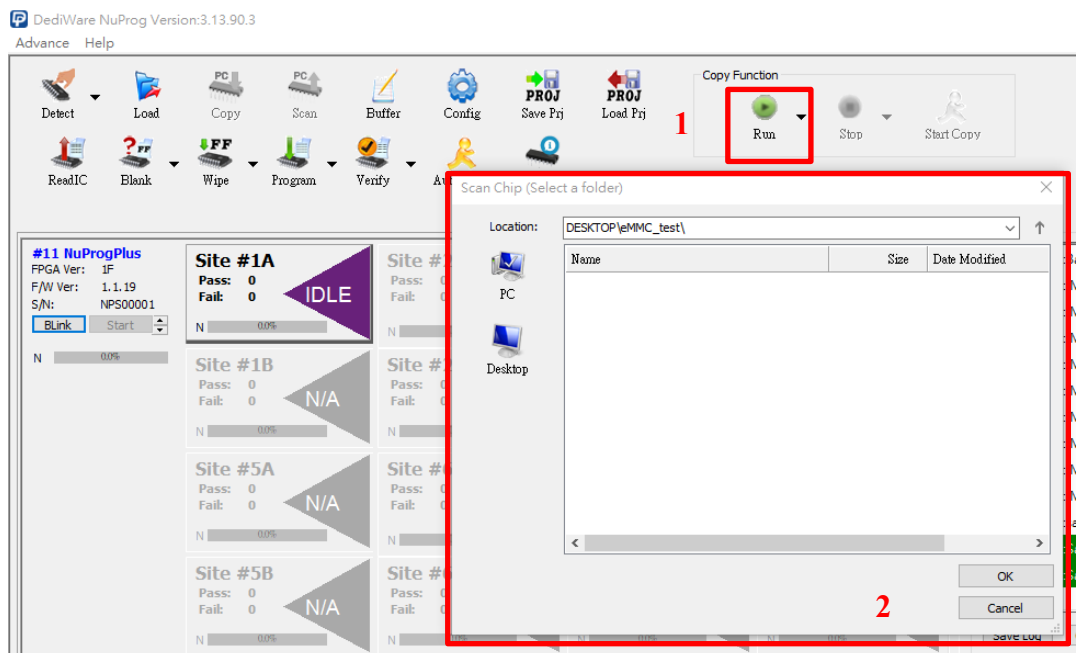
Click "Start Copy" or press the Start Button on the programmer, then it will start programming on the socket sites that are installed with the socket adaptors. If the socket sites are not installed with the socket adaptor, then it will be in grey, which will be N/A. The result will show after finishing programming, and the corresponding lights will be on
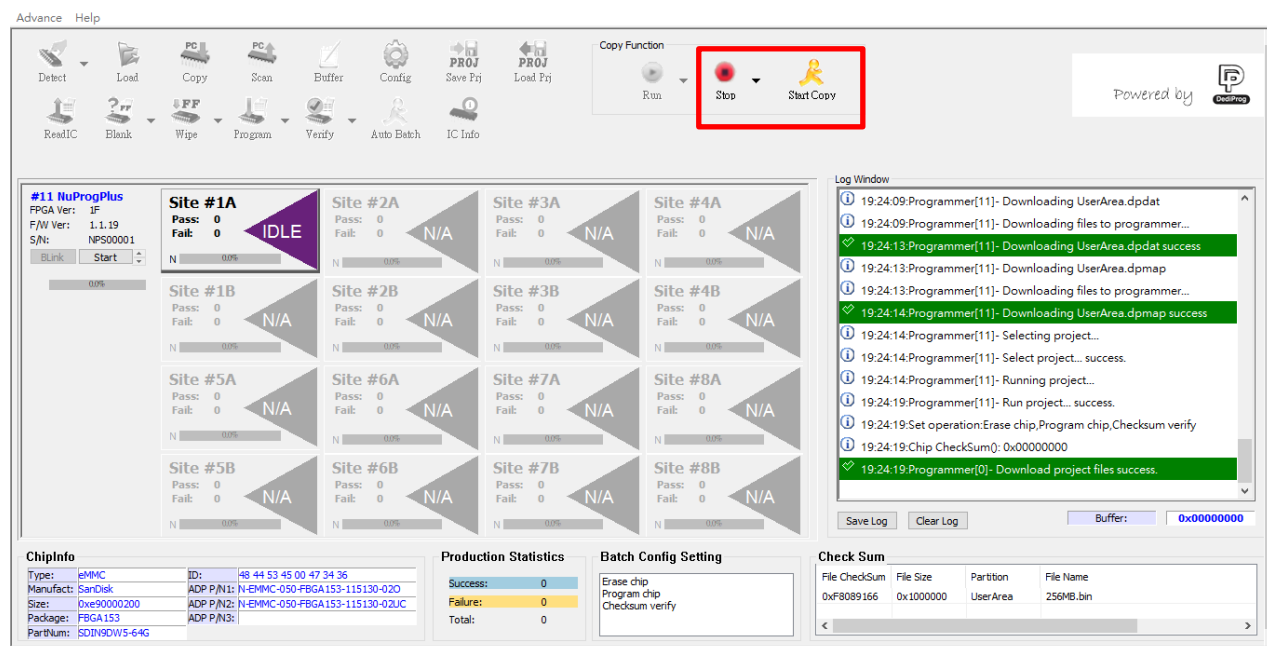

5.4.2 Start From Project Folder
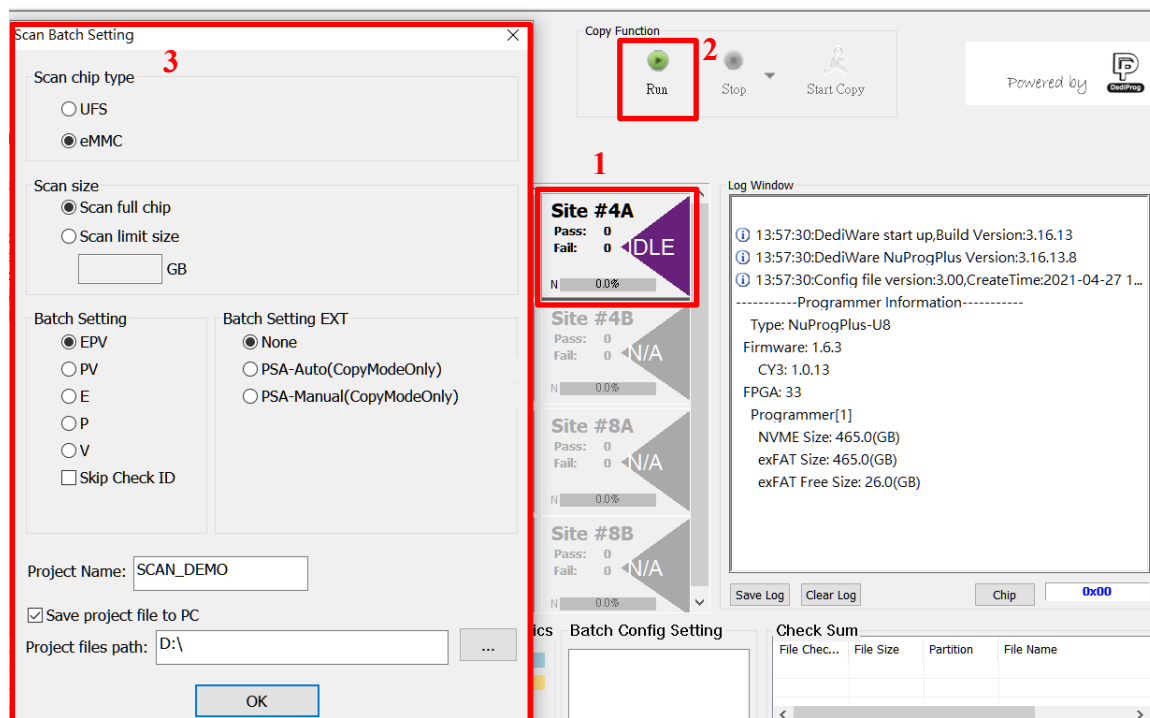
Load the project file.

After it is finished, it will show "Download project files success" in the Log window, meanwhile, the Run icon will turn grey, and the Stop, Start Copy will be available.
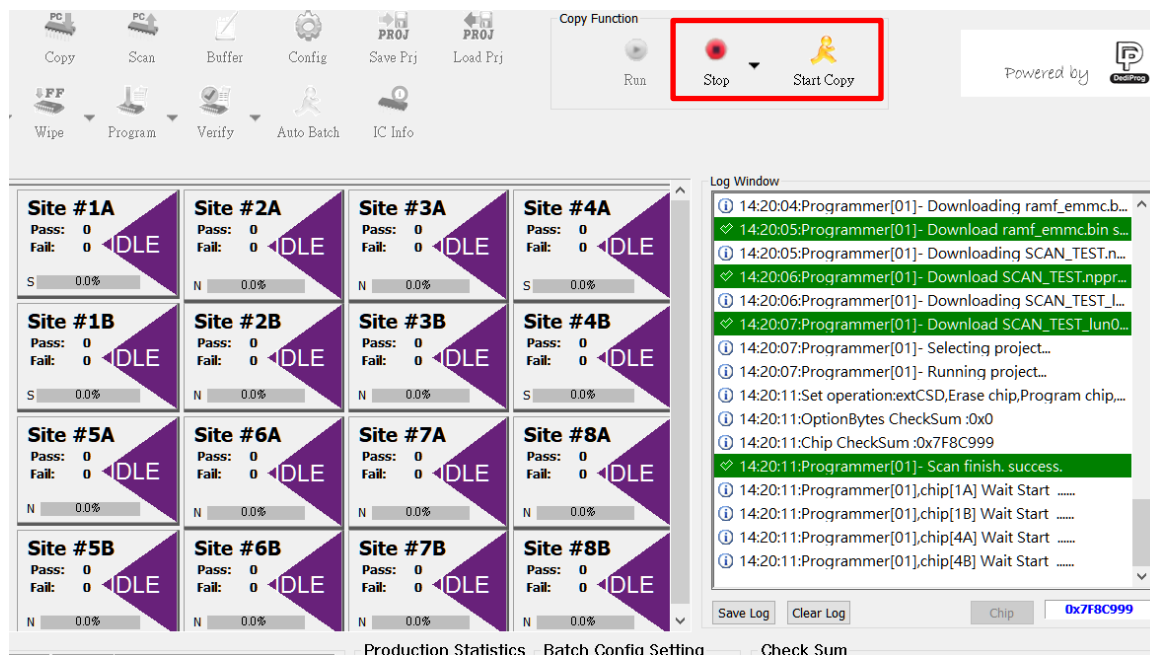

5.4.3 Scan Master Chip and Download

First, select the programming site where the master IC is placed, and then open the function to scan the master IC and set up the related values.

> ➢ Scan chip type: Master IC type
> ➢ Scan Size: Scan Range (Start from Address 0x0).
> ➢ Batch Setting: Batch Operation Mode
> ➢ Batch Setting EXT: PSA or Specific Batch Operation Mode

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- ➤ Skip Check ID: The ID of the IC that are not going to be compared
- ➤ Project Name: Programming Project Folder name. Please name the project by English character, number and underscore (_), and do not use space or other symbols.
- ➤ Save project file to PC: Save the project folder on PC at the same time

After it is finished, it will show "Scan finish success" in the Log window, meanwhile, the Run icon will turn grey, and the Stop, Start Copy will be available.

5.5 eMMC_UFS Client Common Functions

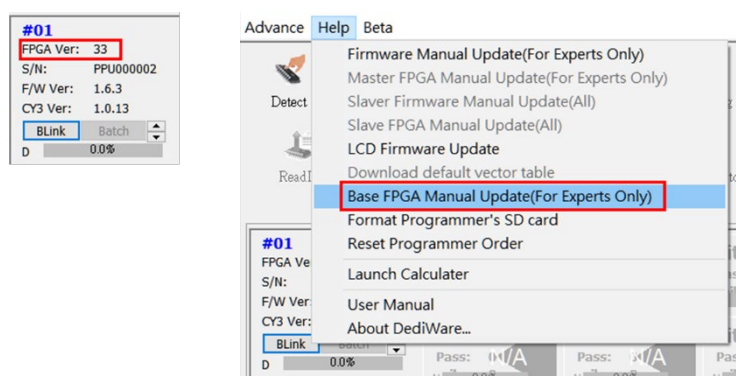### 5.5.1 The way to update the FW/FPGA

NuProgPlus programmers needs four FW/FPGA inside.

1. Baseboard FPGA
The file format is "Base_Vxx.bin", for example Base_V33.bin
(General Client and eMMC_UFS Client share the same Baseboard FPGA)

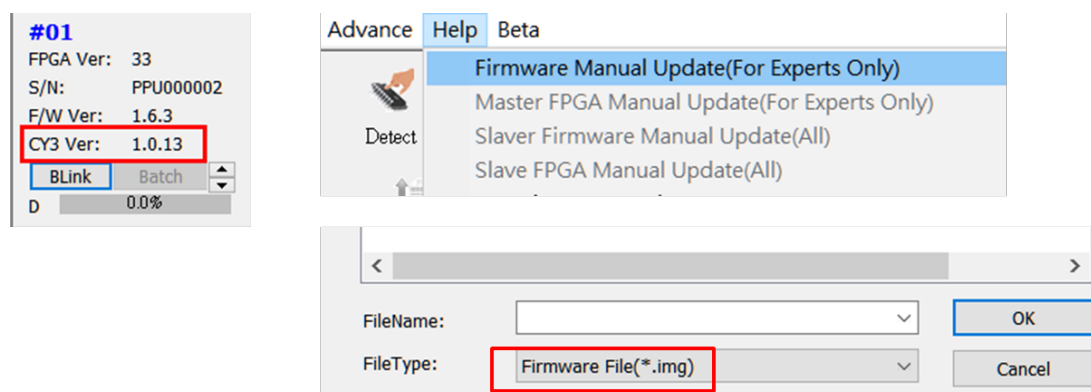The version number and the update functions of the Baseboard FPGA in eMMC_UFS Client

2. CY3 FW
The file format is "NuProgPlus_Vx.x.x.img", for example NuProgPlus_V1.0.13.img
(General Client and eMMC_UFS Client share the same CY3 FW)

The version number and the update functions of the CY3 FW in eMMC_UFS Client

Switch the File Type to ".img" and select the FW for update.

3. Dedicated NPPG FW for General Client

The file format is "NPPG_x_x_x(DBG).bin" or "NPPG_x_x_x(LCD).bin"

NPPG_x_x_x(DBG).bin) is for the NuProgPlus programmers that are installed in the automated systems. (Tip: The last number of the version number will be an odd number.)

NPPG_x_x_x(LCD).bin is for the manual NuProgPlus-U8/U16 programmers, which support Standalone mode. (Tip: The last number of the version number will be an even number.)
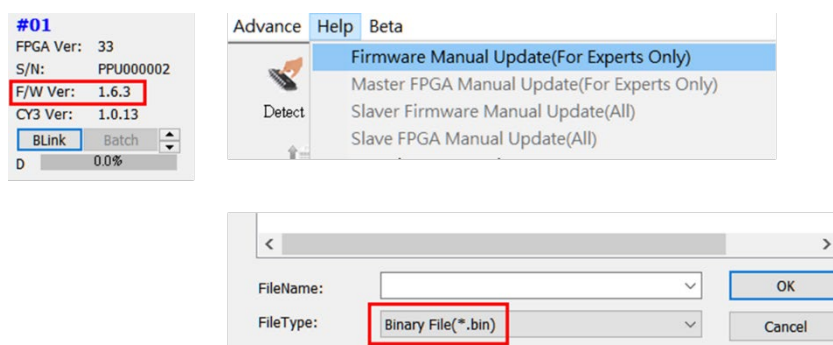
4. Dedicated NPPEU FW for eMMC_UFS Client

The file format is "NPPEU_x.x.x(TRACE).bin" or "NPPEU_x.x.x(LCD).bin".

NPPEU_x.x.x(TRACE).bin is for the NuProgPlus programmers that are installed in the automated systems. (Tip: The last number of the version number will be an odd number.)

NPPEU_x.x.x(LCD).bin is for the manual NuProgPlus-U8/U16 programmers, which support Standalone mode. (Tip: The last number of the version number will be an even number.)
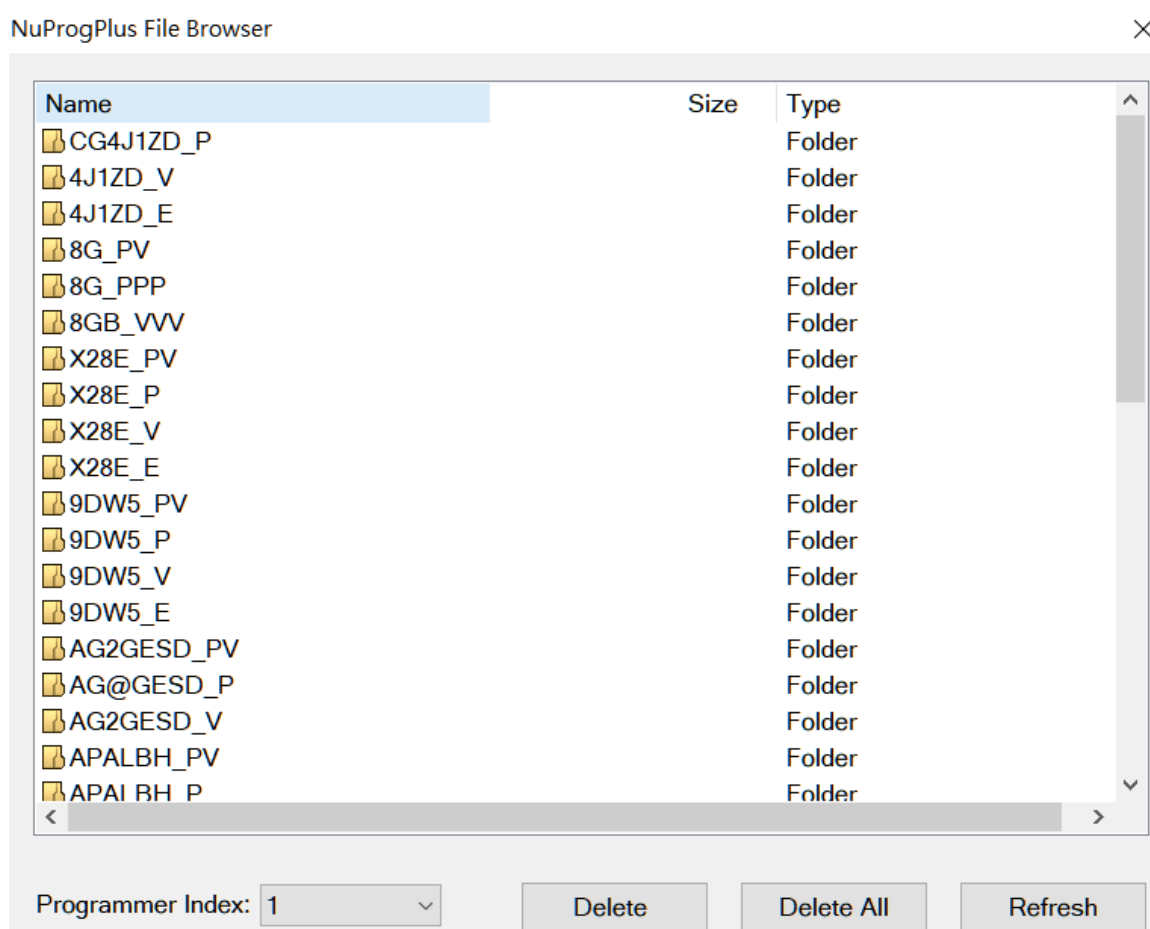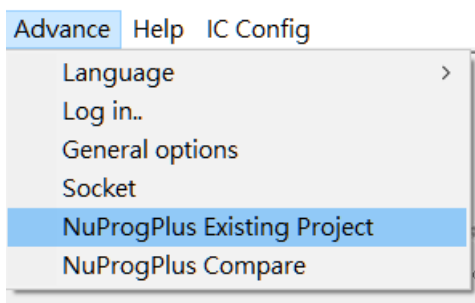
The version number and the update functions of the NPPEU FW in eMMC_UFS Client

Switch the File Type to ".img" and select the FW for update.

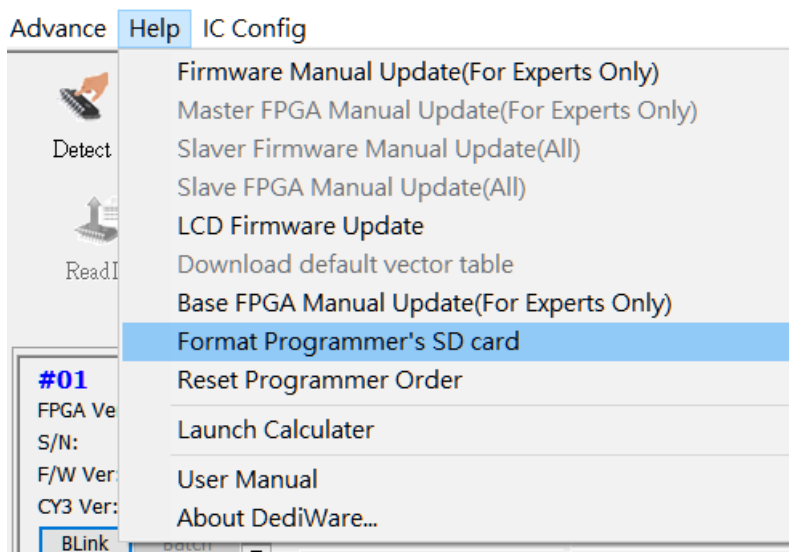## 5.5.2 Manage the eMMC/UFS PRJ on the NuProgPlus-U8/U16

NuProgPlus-U8/U16 programmers can store multiple eMMC/UFS PRJ, you can use the below functions to delete the selected PRJ or all the PRJ.

> ➢ Programmer Index: Select a programmer
> ➢ Delete: Delete the selected project folder
> ➢ Delete All: Delete all the project folders
> ➢ Refresh: Read the project folder again

5.5.3 Format the Buffer Memory on the NuProgPlus-U8/U16

It can format the Buffer Memory of all connected NuProgPlus-U8/U16 at once.

5.6 General Client (For Flash/EEPROM and MCU only)

The software instruction for Flash, EEPROM, and MCU, please refer to the DediWare user manual.
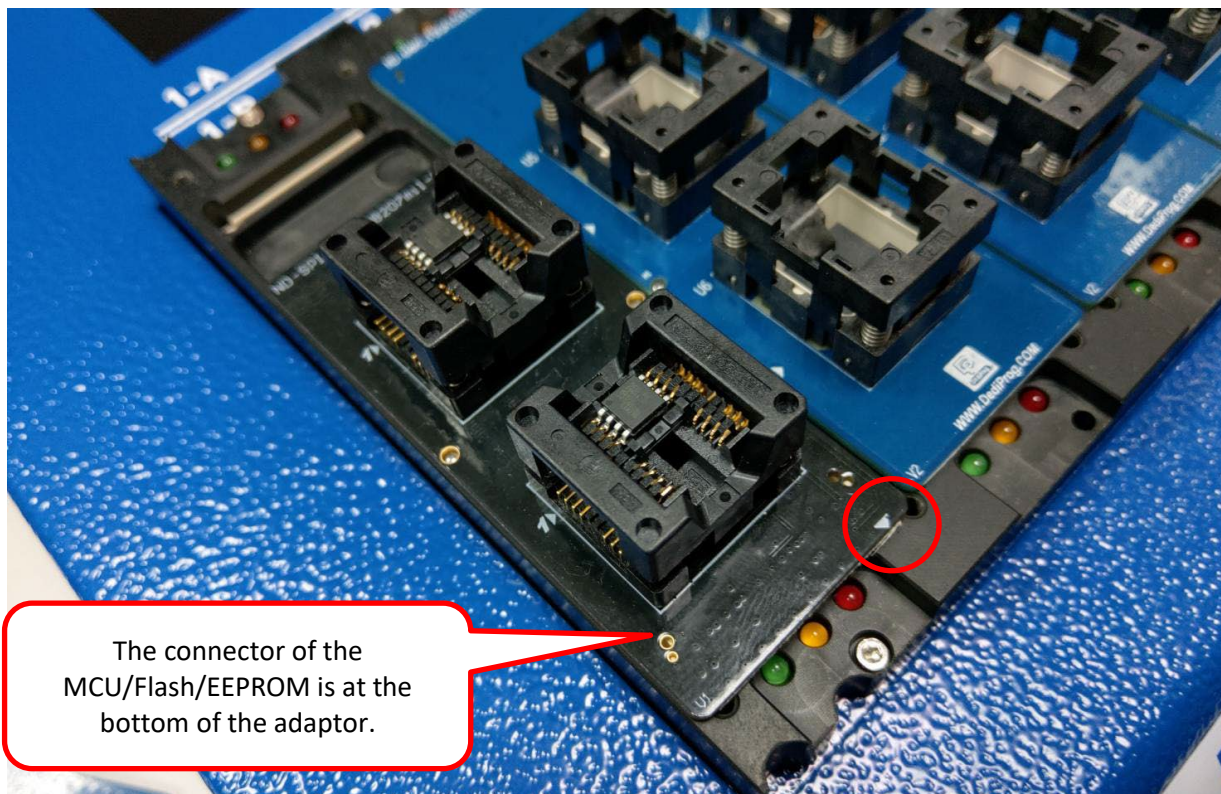
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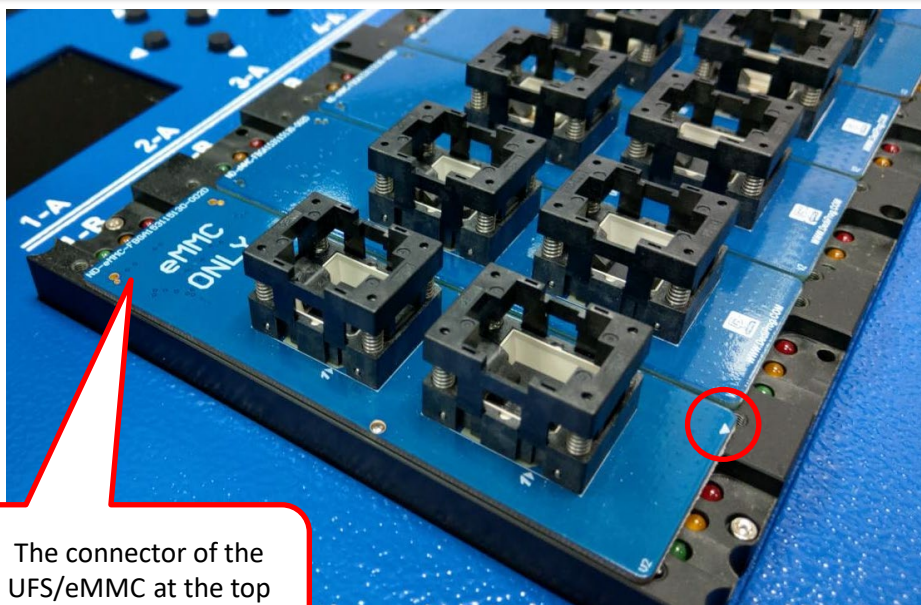# VII. Socket Adaptor Installation

How to install socket adaptor to a programmer?
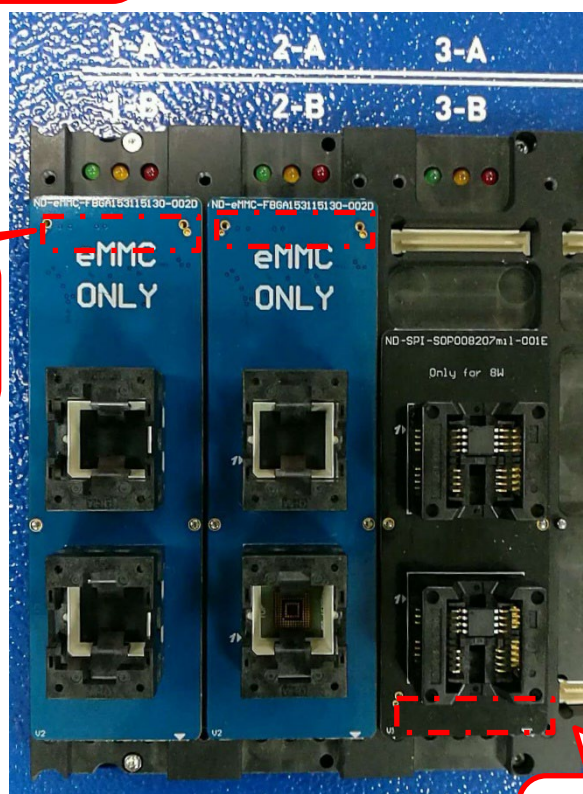
There is a triangle at the bottom of the socket adaptor.

Install the socket adaptor according to the below figure. If the connections are normal, then it is ready for programming.

The connector of the MCU/Flash/EEPROM is at the bottom of the adaptor.

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The connector of the UFS/eMMC at the top of the adaptor.

The connector of the UFS/eMMC at the top of the adaptor.

The connector of the MCU/Flash/EEPROM is at the bottom of the adaptor.

Note:
1. Improper installation may cause the damages.
2. Pick up the IC directly by hand may produce dirt or statics which may cause errors during the programming process. Therefore, please use IC picker for pickups.

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VIII.   Revision History

Date	Version	Description
2019/12/28	1.0	Initial
2021/06/22	1.1	Update chapter 5 software installations and eMMC_UFS programming guide.
2022/01/22	1.2	Modify model name to NuProgPlus-U8/U16.
2025/03/28	1.3	Product photo updated.

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