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Secure Starter Kit User Manual

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1. System Requirement

Before using the Secure Starter Kit, the Prepare the following items, and confirm the system specifications of the computer.

- Windows 10 OS, Microsoft.NET Framework 4.8 (inclusive) or above.
- Secure Starter Kit (Hardware)
- iMO Starter Kit Setup Software installation package

Note : [Microsoft.NET Framework 4.8 Official Download](#)

2. Introduction to Starter Kit

iMO Secure Starter Kit is to evaluate Secure ASIC and SQ75 series Security Processor product, performance and suitability evaluation kit. User via USB port connected to a computer, and with the corresponding software for evaluation and development.

2.1 Hardware appearance

The Secure Starter Kit is powered by the USB port. Plug the Starter Kit into the USB port and turn the PWR switch to the ON position. When the connection to the computer is successful, the power indicator light will be on (green light). When the software is started, it will scan the currently connected IC devices.



Figure 2.1 iMO Secure Starter Kit appearance (with Socket version)

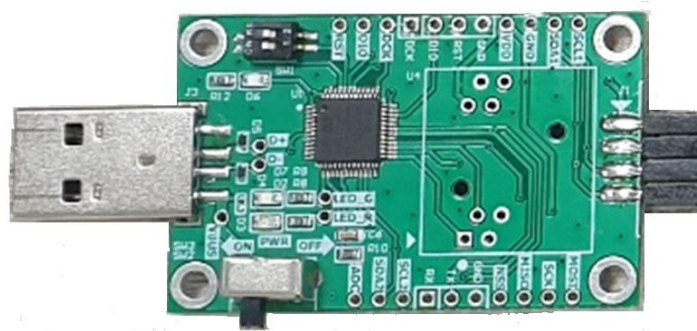


Figure 2.2 iMO Secure Starter Kit appearance (no Socket version, used with EVB, for SQ75 series)

Note: Developed for SQ75 series. Please refer to the hardware setting precautions [appendix](#).

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If developing the IC placed on the Socket, the PWR power switch should be switch to the OFF position before replacing the IC. After the IC is replace, turn the PWR power switch to the ON position again to avoid IC failure caused by live wire operation.

The IC replacement process placed in the socket is as follows

1. Turn the PWR power switch to the OFF position to turn off the power.
2. Replace the next IC.
3. Turn the PWR power switch to the ON position to turn on the power.

2.2 Block Diagram

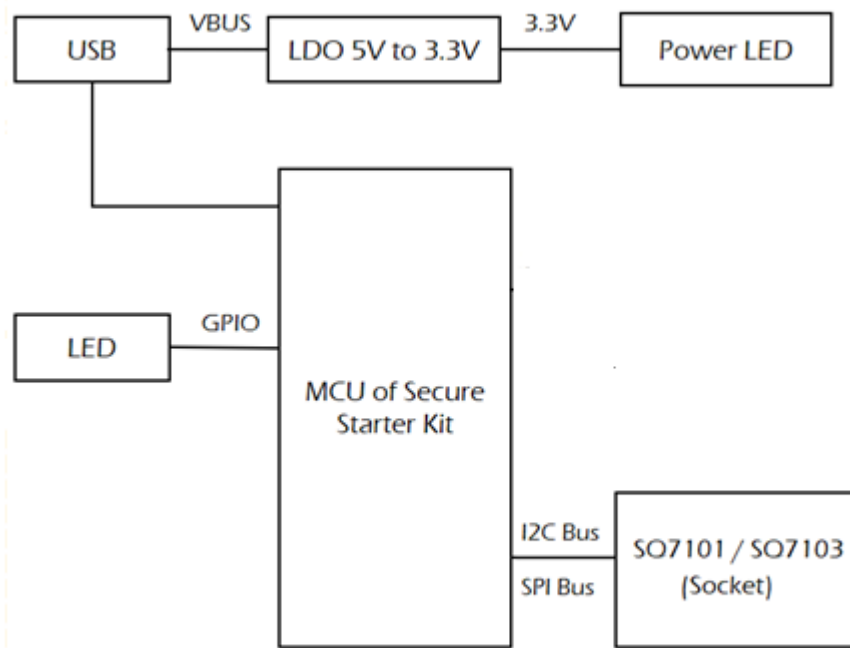
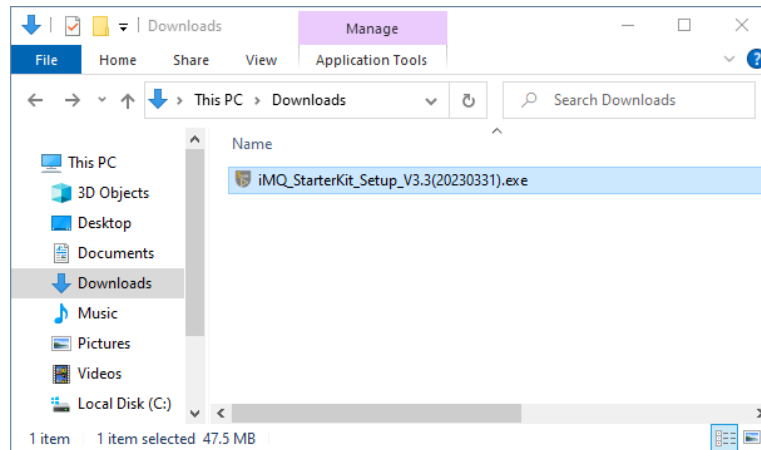


Figure 2.3 iMO Starter Kit Block Diagram

3. StarterKit software installation

3.1 Software Installer

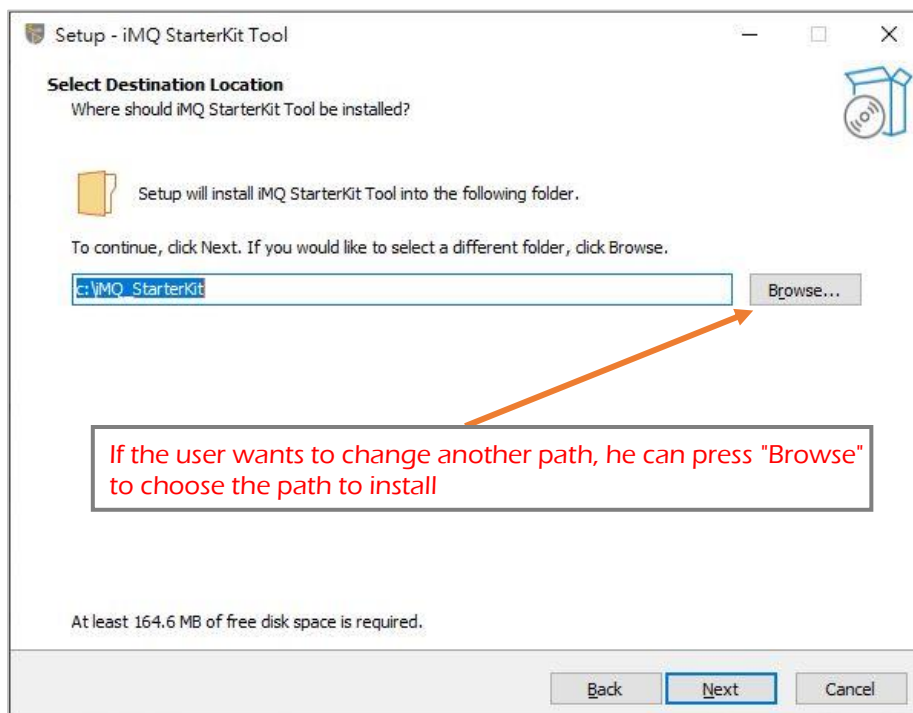
Step 1. Click the iMQ StarterKit Setup installation program to execute the installation.



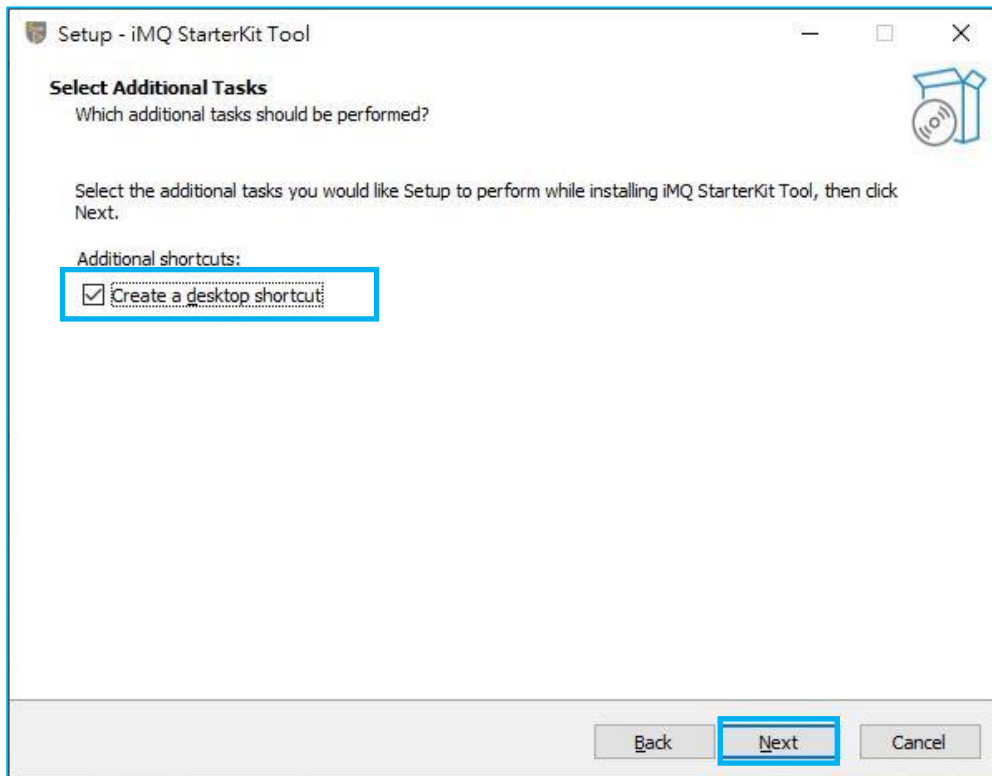
Example: iMQ_StarterKit_Setup_V3.3

Step 2. Select the iMQ StarterKit installation path, Press "Next".

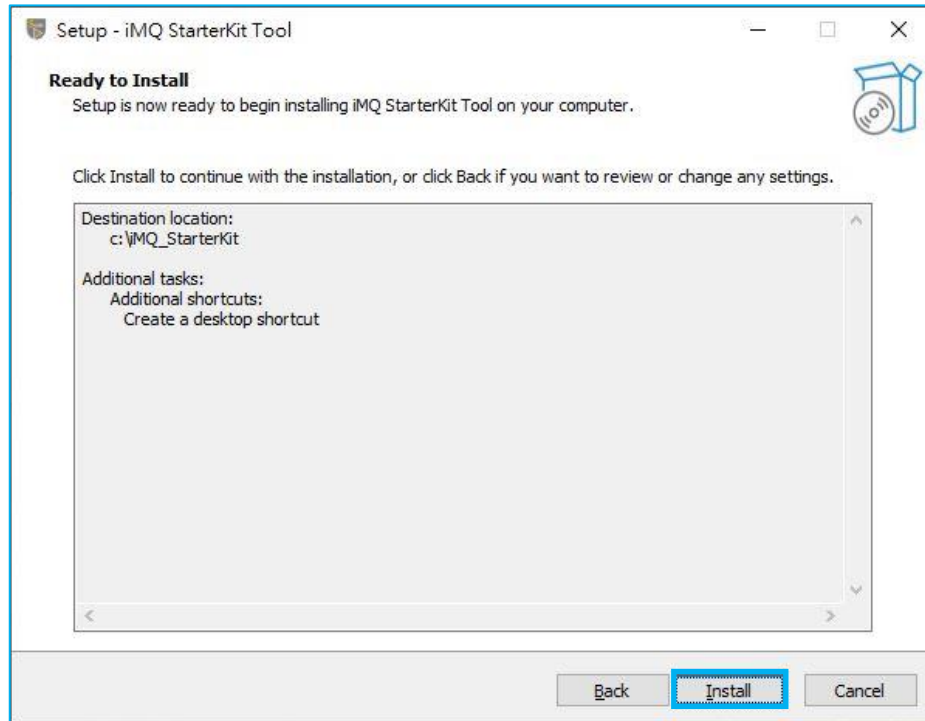
Note: The default path is C:\iMQ_StarterKit



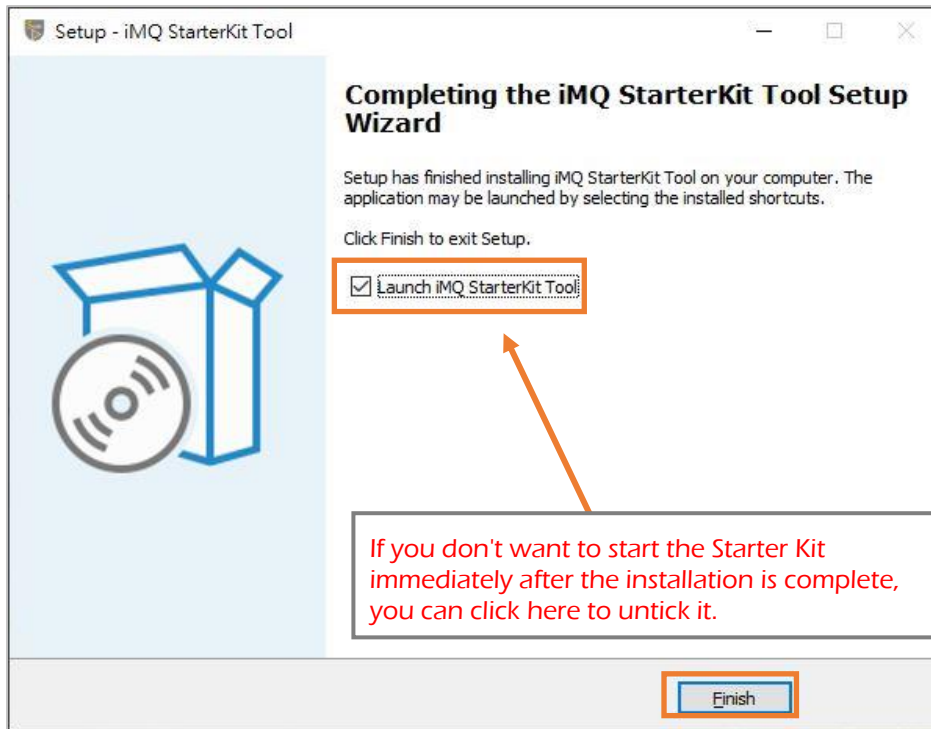
Step 3. After ticking Create a desktop shortcut, Press “Next”.



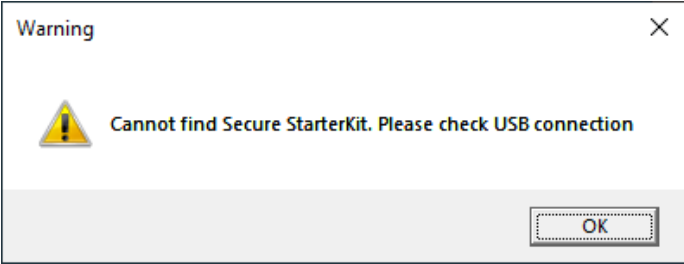
Step 4. This page will reconfirm the installation path and whether to create a shortcut icon. If there is no problem, press "Install" to install.



Step 5. Press "Finish" to complete the installation.



Note: If the Secure Starter Kit is not connected to the computer when the Starter Kit software is executed, you will not be able to enter the main screen for use, and a "Device not connected" warning window will pop up.



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3.2 Software startup

Step 1. Connect the Secure Starter Kit to the computer.

Step 2. Execute iMO Starter Kit software program

Double-click the iMO StarterKit Tool shortcut icon to start software.



Double-click the iMO StarterKit Tool shortcut icon

Step 3. Select SQ71/SQ75 slave device

After the iMQ StarterKit software program detects the connected device, it will be listed for user selection. User selected to configure or read slave device, press "Select Device" to enter the main screen.



Figure 3.1 Using the Secure Starter Kit, and Socket is SQ7101 (I2C) device.

When the device on the Starter Kit Socket is an SPI interface (such as SQ7103), the SQ7103 SPI Socket item will be displayed.

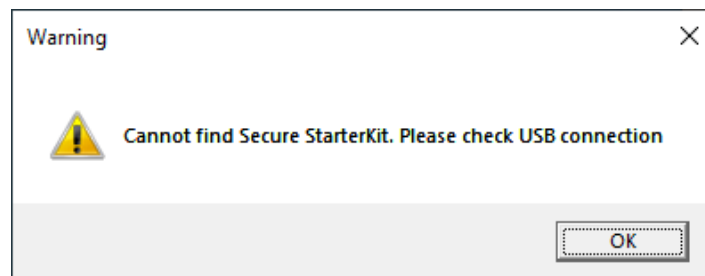


Figure 3.2 Using the Secure Starter Kit, and Socket is SQ7103 (SPI) device.



Figure 3.3 Use the Secure Starter Kit to configure or read the Security Processor with SQ7515 EVB

If the device is not scanned, a prompt screen as shown in the figure below will pop up, and the user can check whether the Secure Starter Kit is connected to the computer.

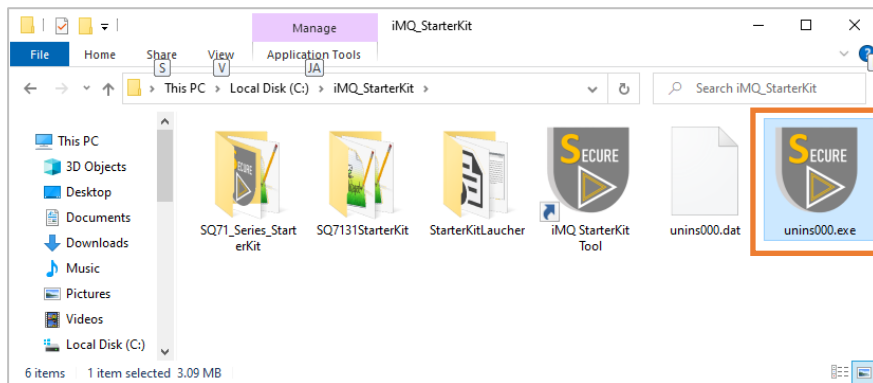


Note: When replacing the IC on the Socket, please make sure that the PWR switch on the Starter Kit is turn off. Please refer to [2.1 Hardware appearance](#)

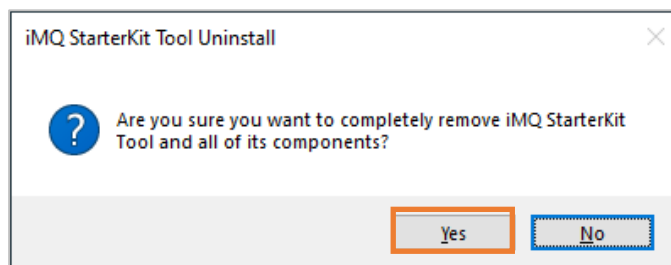
3.3 Software removal (Uninstall)

To completely remove the installed iMQ StarterKit, you can remove it according to the normal removal process or follow the steps below:

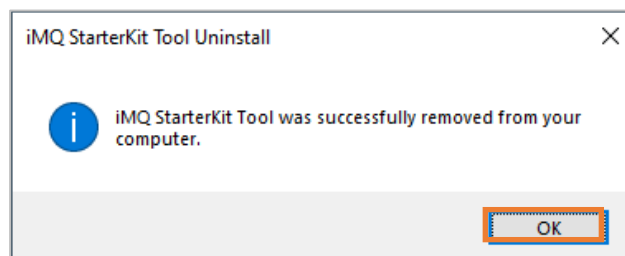
Step 1. Click to execute uninst000.exe from the installation directory



Step 2. Confirm whether you want to remove the StarterKit software



Step 3. Successful removal



4. StarterKit software function description (SQ7101/SQ7103/SQ7515)

The function description in this chapter applies to support symmetric encryption algorithm products. (e.g. SQ7101, SQ7103, SQ7515)

4.1 Software Introduction

The user interface is divided into two windows. The first is the main screen, all build command, sending commands, opening the Memory window, toolbox (Tool), transfer records, etc. are all executed and displayed in this window; The second is the memory window, it must be opened from the main screen to be displayed, and its function is to configure the memory.

4.2 StarterKit main screen

The main screen is divided into four parts, namely:

1. Build Command: Including command packet block, send packet information block, receive return packet information block and execute command button.
2. Tools Bar: Menus for File, Memory, Tool, and About.
3. Status Bar: Displays the connected device, its communication protocols and device addresses.
4. Log: Record the time and content of command transmission and received messages.

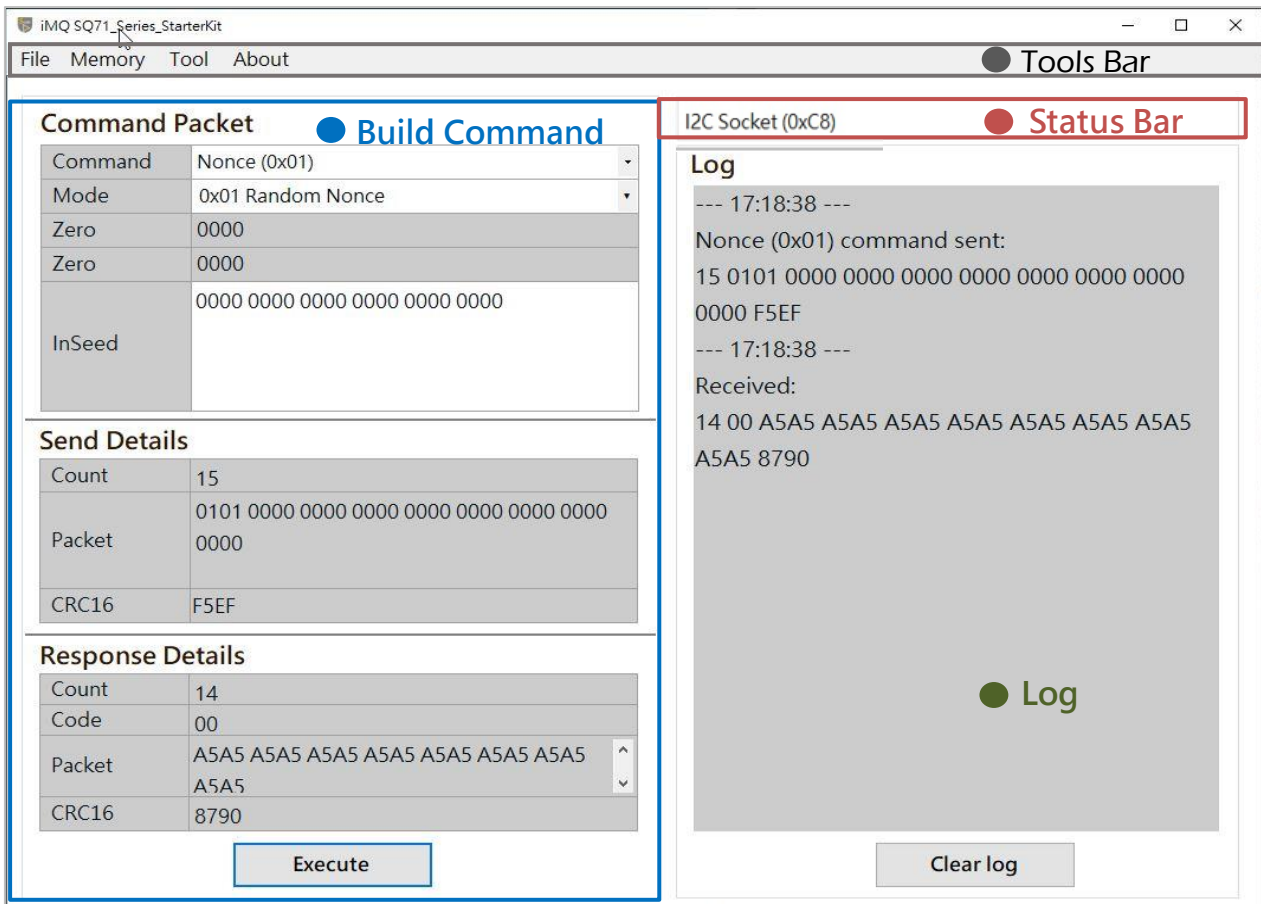


Figure 4.1 StarterKit main screen

4.2.1 Build Command

The Build Command area is divided into three blocks, namely: command packet block, send detail block, response details block and execute button.

- 1. Command packet block:** It is used to select commands, modes, parameters and other settings. Commands are drop-down menus, and there are many commands to choose. The parameters will change according to the command selected by the user.
- 2. Execute button:** After pressing "Execute", the command and parameter in the command packet block will be executed.
- 3. Send details block:** Display the data length, content and CRC check code of the transmitted packet.
- 4. Response details block:** Display the data length, return code, content and CRC check code of the received packet.

Note 1 : All fields are expressed in hexadecimal

Note 2 : The gray background field is read-only information, user cannot modify it; The white background field, it means user can input or select it.

Note 3 : If the IC is in deep sleep mode and has not been woken up, it will ignore any command received through I2C or SPI and return NAK, and the IC will return to the operation mode. When the Host receives the NAK, it has to resend the command to execute.

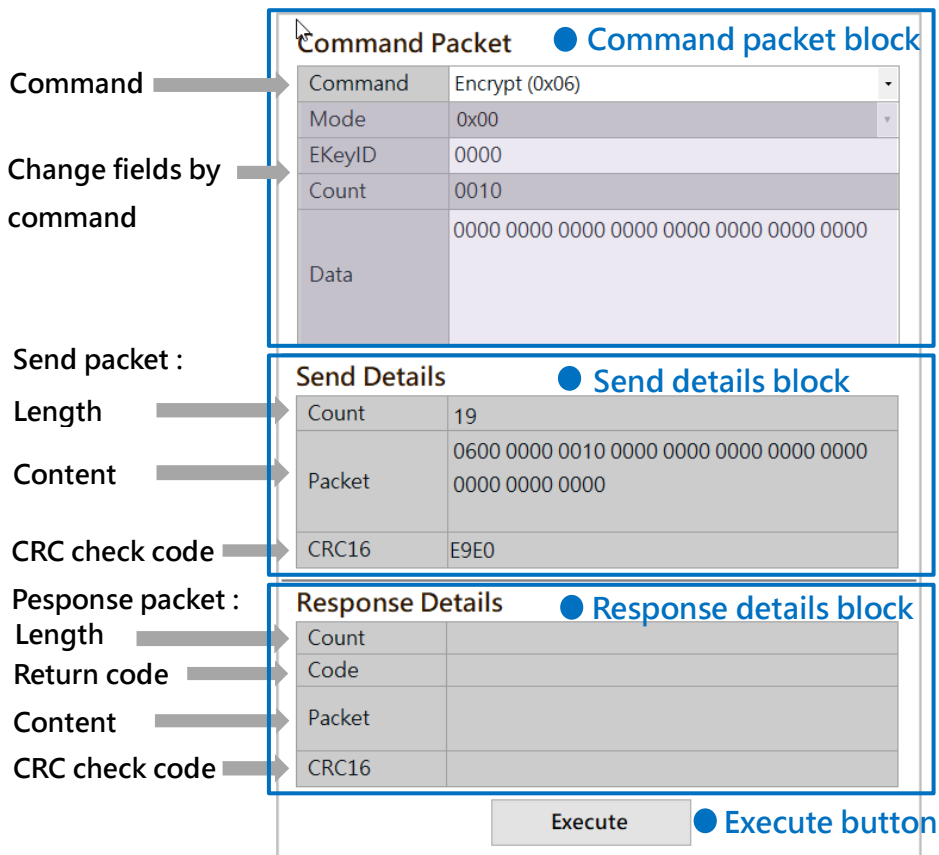


Figure 4.2 Build Command area

4.2.2 Tools Bar

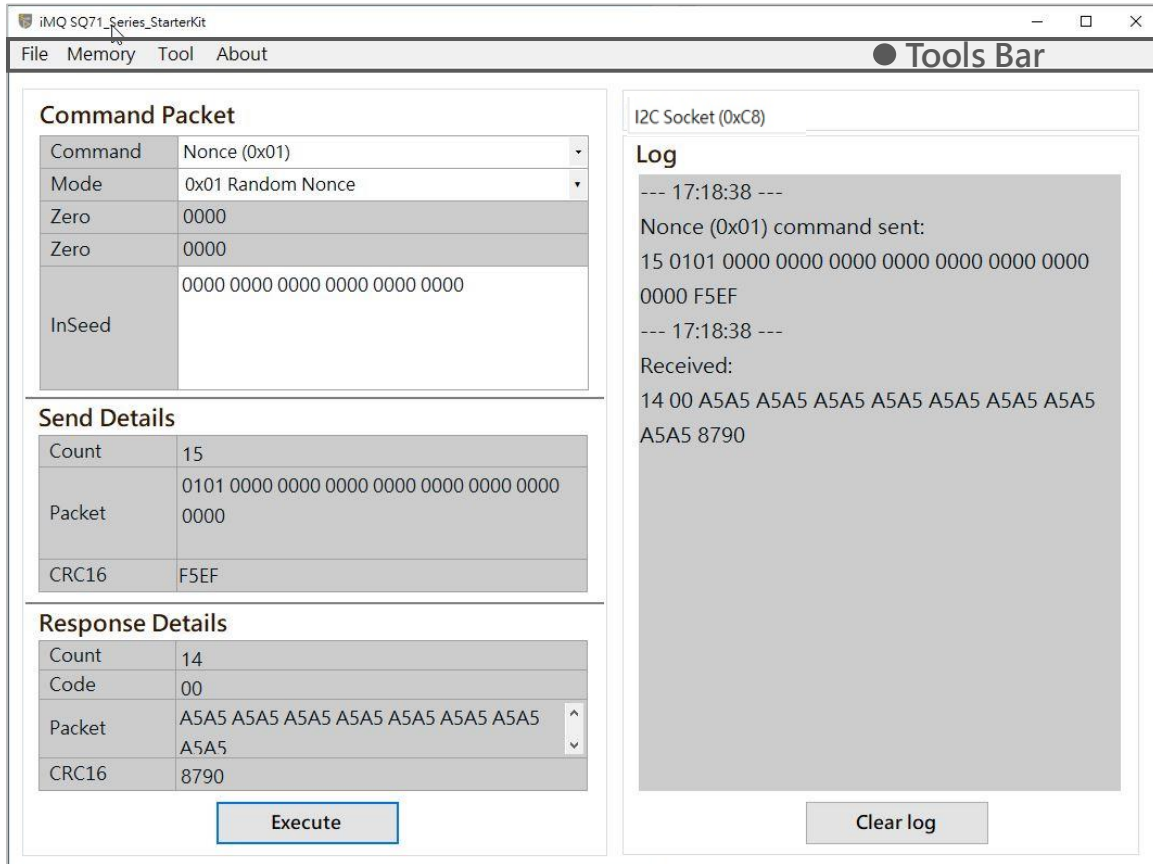


Figure 4.3 Tools Bar

There are menus for File, Memory, Tool, and About on the toolbar, as shown in the figure below:

1. **File menu:** Click File, press Exit to close the main screen and memory window.
File\Exit

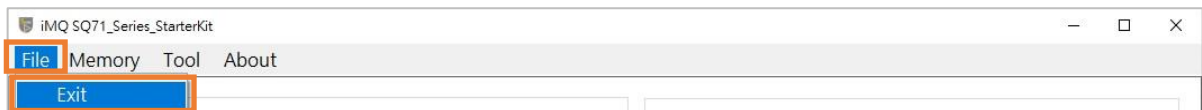


Figure 4.4 Toolbar (File menu)

2. Memory menu: Click Memory, it will pop up memory window after the reading is completed.

Note 1: **Do not remove the Secure Starter Kit from the computer while the reading is in progress.**

Note 2: The memory window will be explained in the following chapter 「[4.3 Memory](#)」

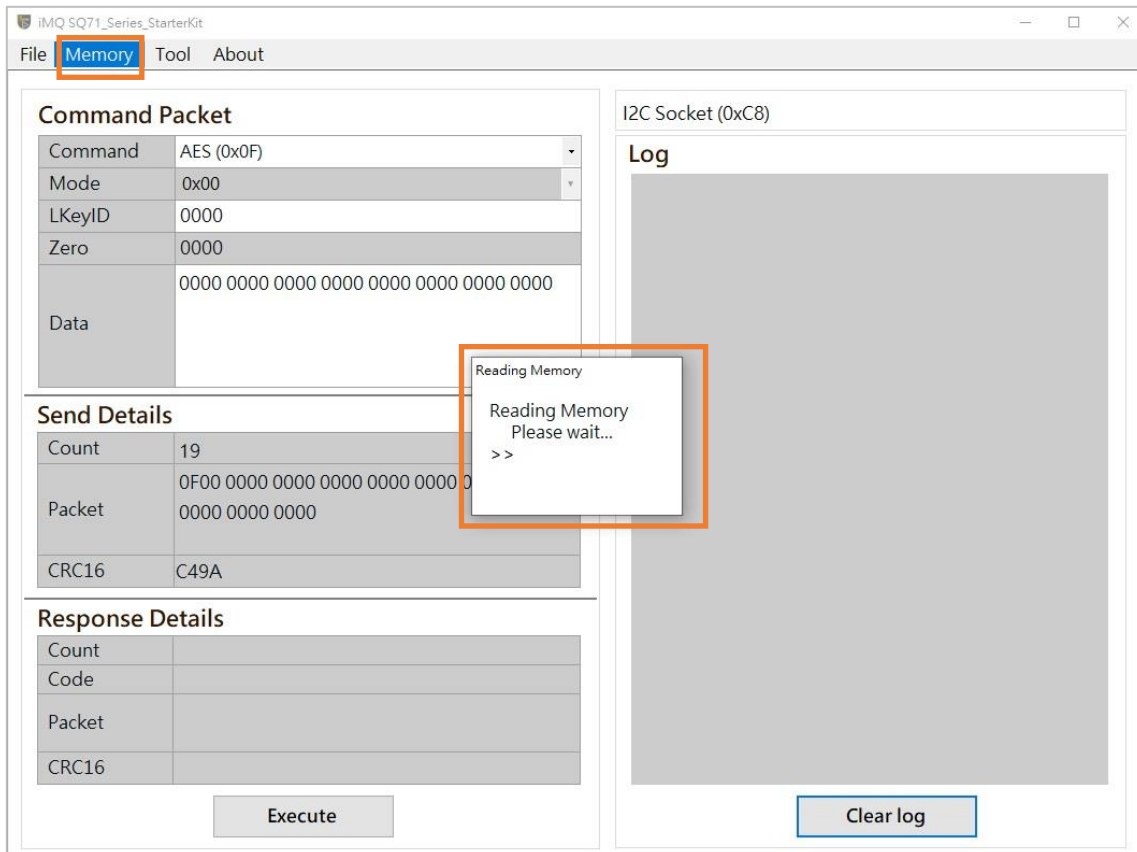


Figure 4.5 Toolbar (Memory menu)

3. Tool menu: Click Tool, and then select XOR to open the XOR calculation.

Tool\XOR

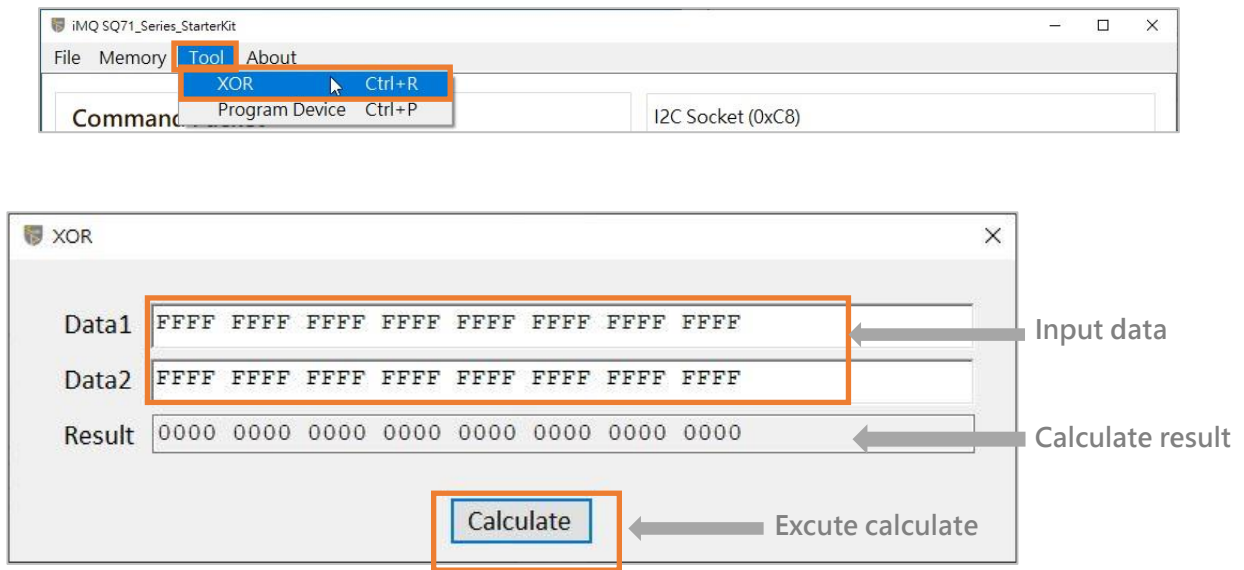


Figure 4.6 Toolbar (Tool menu - XOR)

Note 1: When Data1 and Data2 have different lengths, the effective calculation length will be based on the shorter Data length.
 Note 2: XOR calculation tool for hexadecimal calculation.

Click Tool, and then select Program Device to open the Program Device window.

Tool\Program

Note 3: The program device window will be explained in the following chapter 「[4.4 Program Device](#)」



4. About menu: Click About to view software, firmware, and Secure StarterKit hardware versions information.



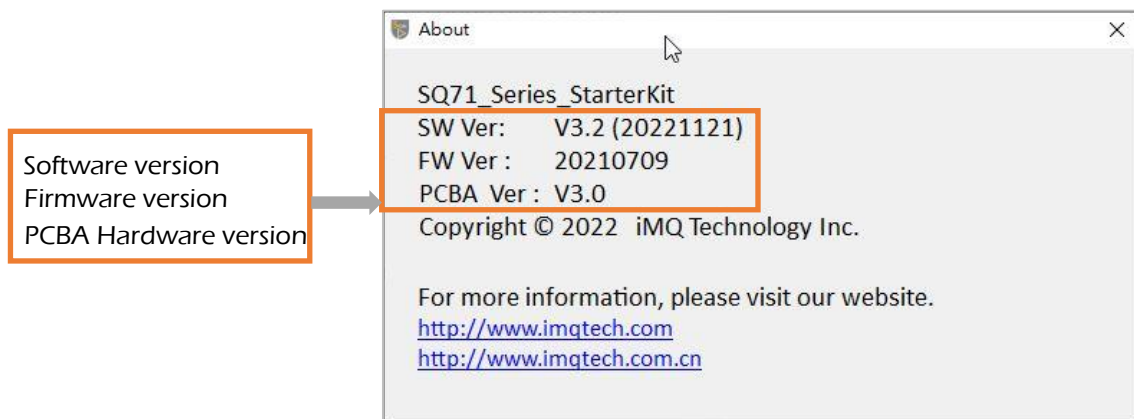
Figure 4.7 Toolbar (About menu)

Note 1: **Do not remove the Security Starter Kit from your computer while viewing the version.**

Note 2: When a new version of iMQ StarterKit is released, it will be released on the following website:

<http://www.imqtech.com/>

<http://www.imqtech.com.cn/>



4.2.3 Status Bar

The communication protocol and device address of the device connected to StarterKit will be displayed on the status bar. As shown in the figure below, the communication protocol is I2C, and the device I2C address is 0xC8.

Note 1: The communication protocol and device address displayed on the status bar are the same as the slave device selected by the user before entering the main screen.

Note 2: After entering the main screen, if you change the communication address of the device, you must re-plug the Secure Starter Kit and restart the Starter Kit program, the new device address will take effect.

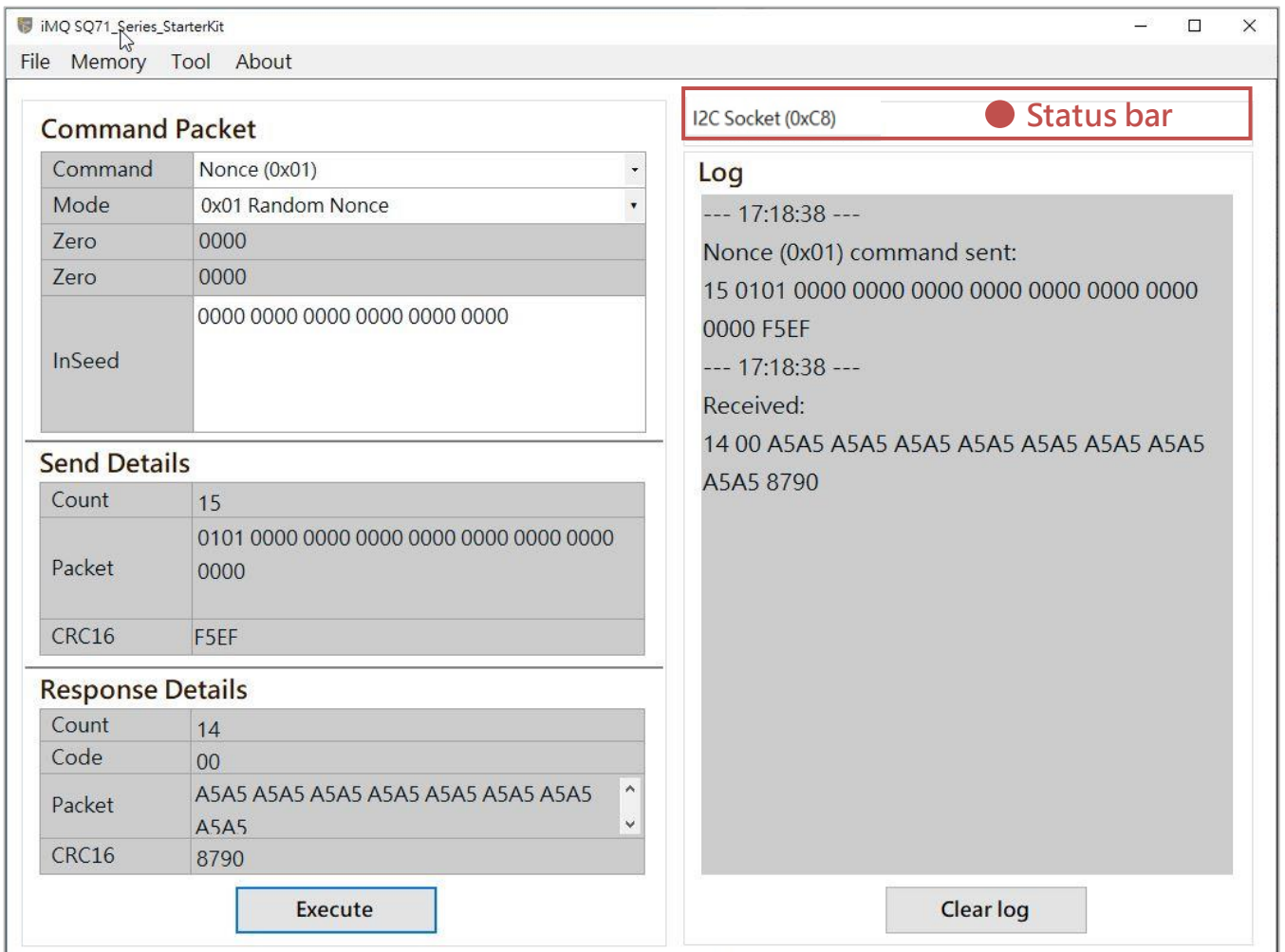


Figure 4.8 Status bar

If the slave device is an SPI device (such as SQ7103), the status bar will display "SPI Socket".

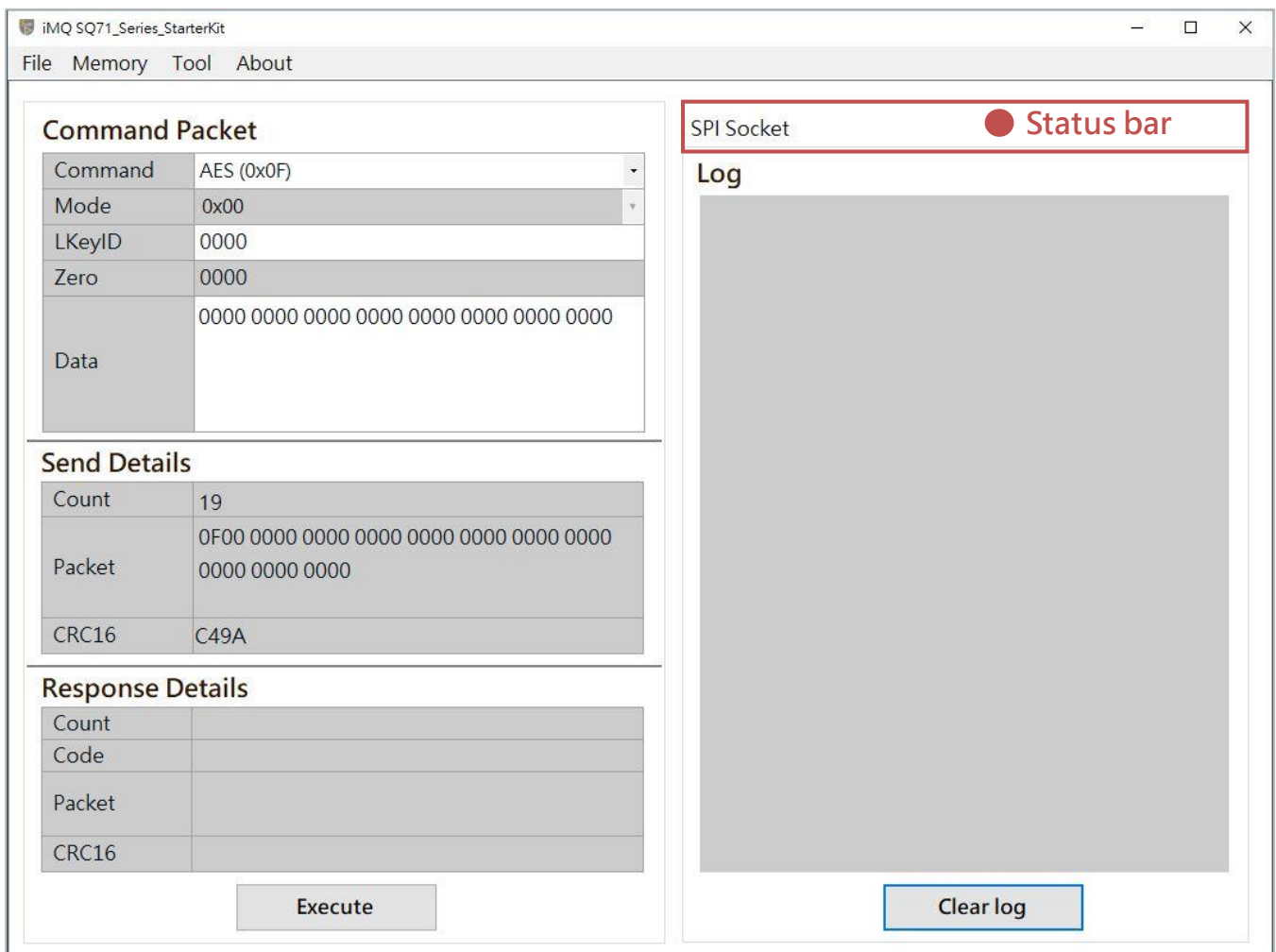


Figure 4.9 Status bar (SPI device)

4.2.4 Log

This area records the time and content of command sending and receiving packet messages.

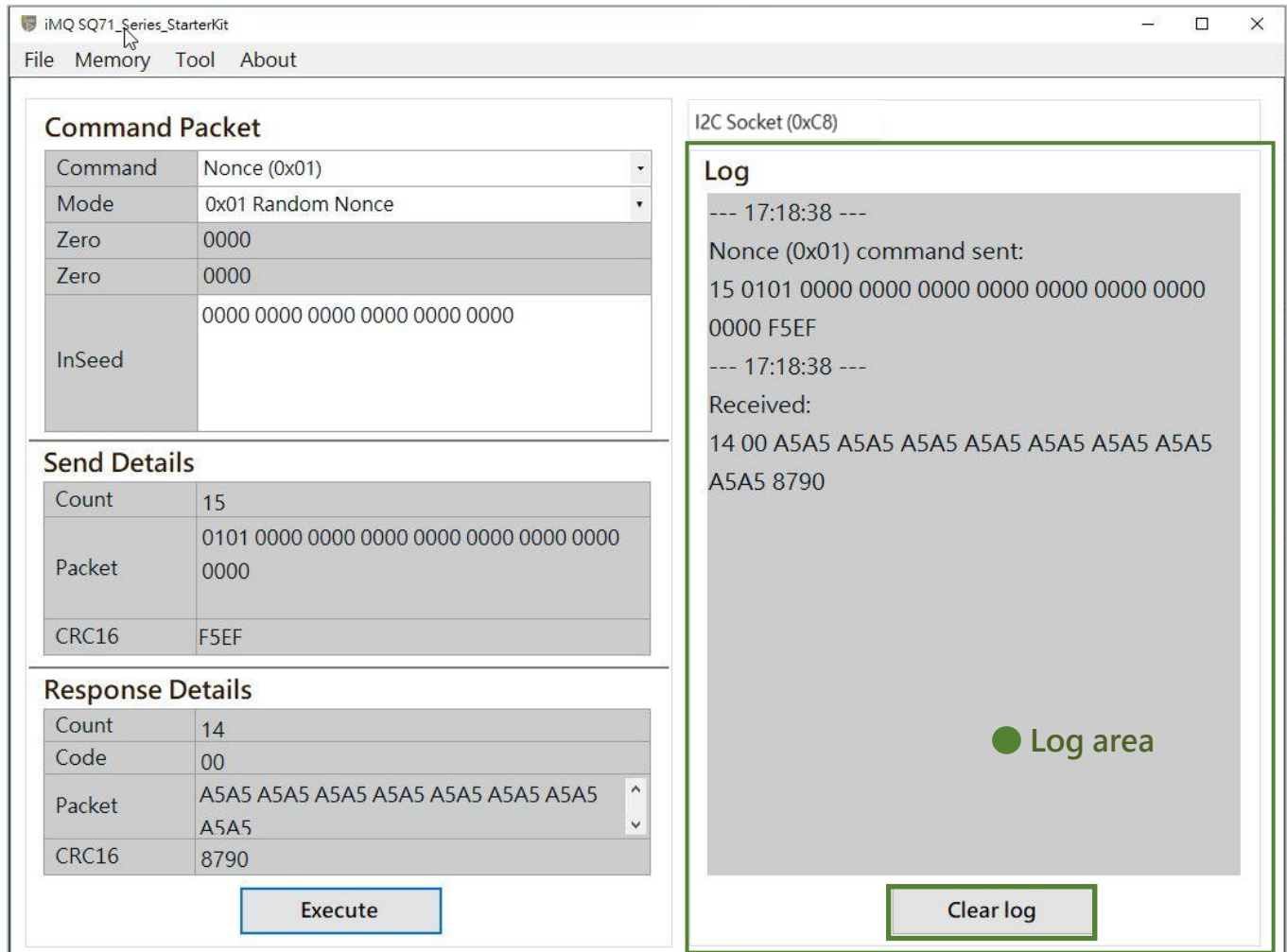


Figure 4.10 Log area

Note 1: If there are too many logs, users can click the "Clear Logs" button to clear the logs.

Note: After the log is cleared, it cannot be restored!

4.2.5 AES-256 support

Support AES-256 key, AES-256 option appears on some Command windows item, check to enable/disable the support for AES-256 key.

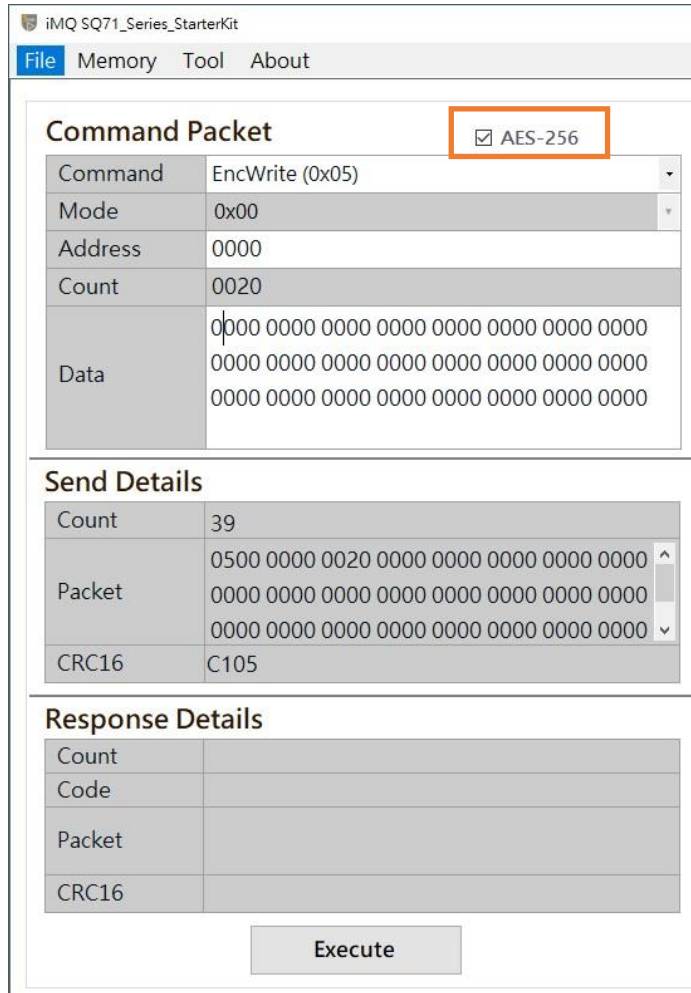


Figure 4.11 Enable AES-256

To enable AES-256, you must first set Byte-4 of the key configuration in the Memory page, and select "Yes" for the AES256 field.

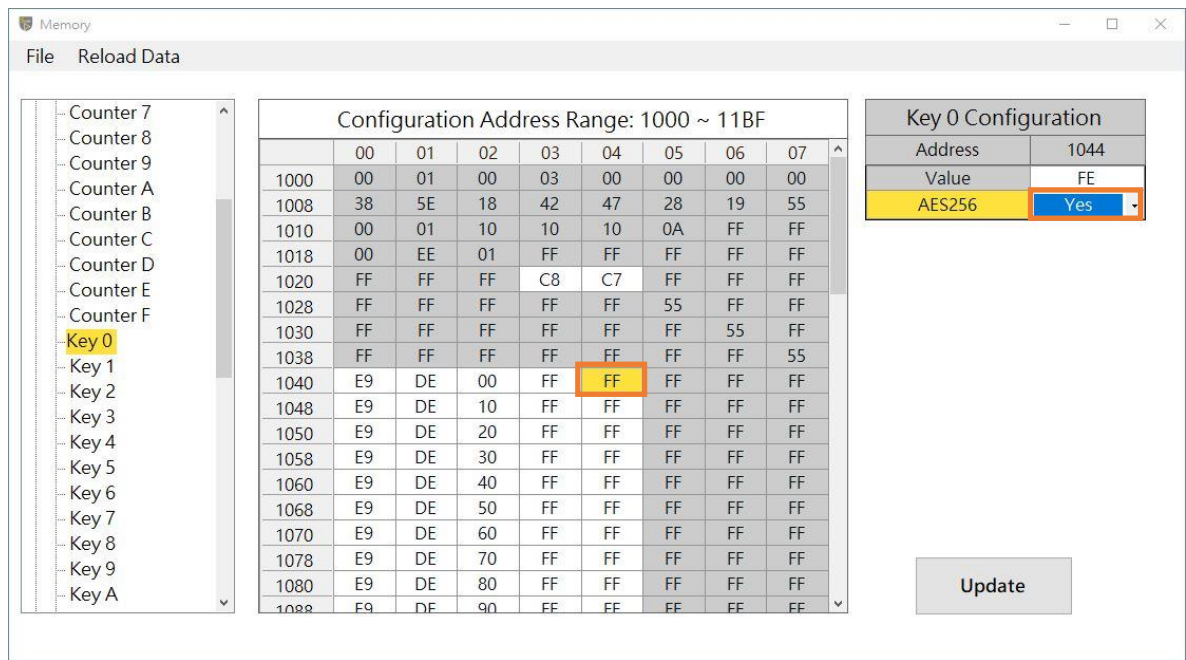


Figure 4.12 AES256 field selected as "Yes"

4.3 Memory

Click "Memory", and the memory window will pop up after the reading is completed.

Note: Do not remove the Secure Starter Kit from the computer while the reading is in progress.

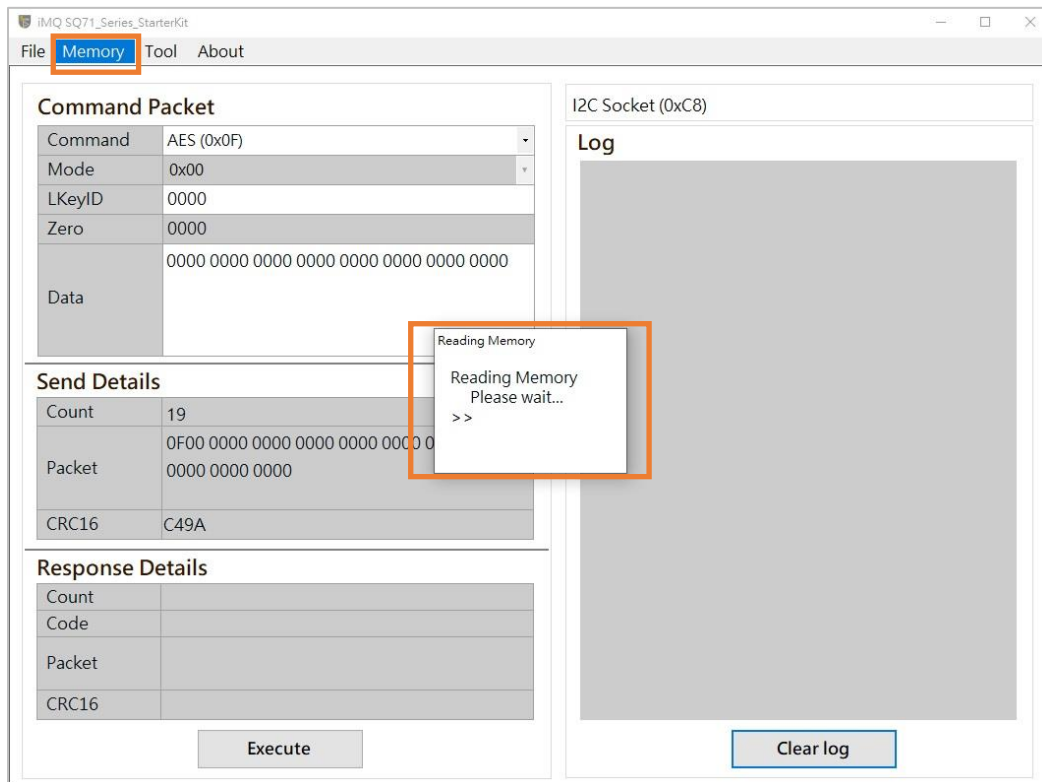


Figure 4.13 Click Memory on the main screen

The memory window can be divided into memory configuration block, configuration menu block and tool bar, which will be explained in the following chapters.

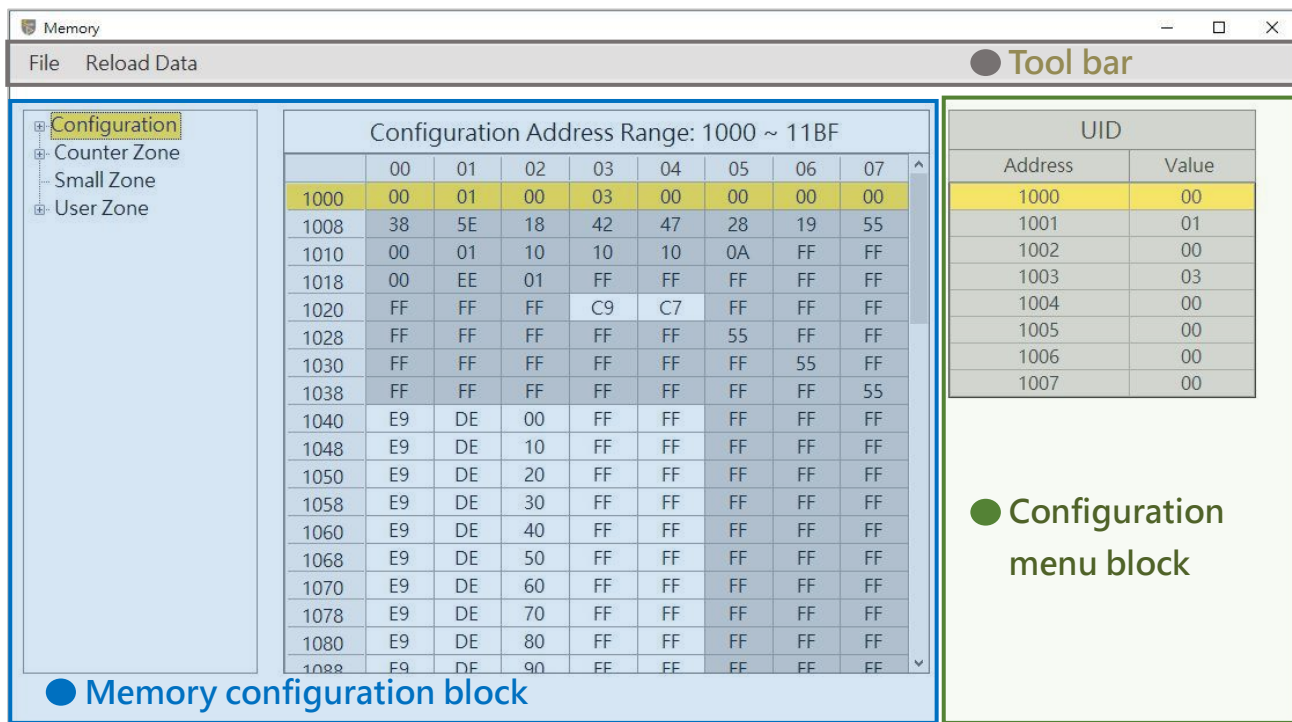


Figure 4.14 Memory window

4.3.1 Memory configuration

The left side displays each memory zone that can be viewed, and the user can select to view. The memory data of the zone is displayed in the middle field (expressed in hexadecimal).

Note 1: If the user wants to modify the configuration, first select the memory address to be modified, and then modify it in the configuration menu displayed on the far right.

Note 2: If the field has a gray background, it means read-only (Read-only) information, and the user cannot change its settings.

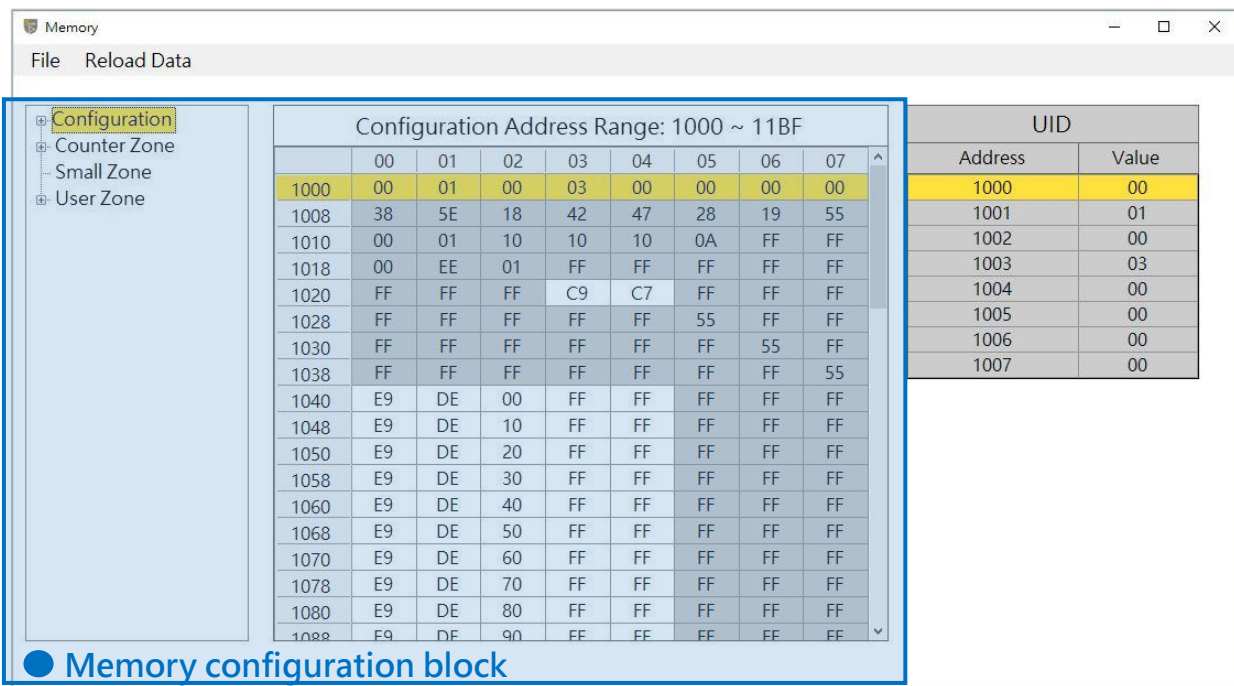


Figure 4.15 Memory configuration block

4.3.2 Configuration menu

The configuration menu is divided into configuration zone and other zones.

- Configuration: Set the configuration of chip, key, user area and counter.
- Other zones: User Zone, Counter Zone and Small Zone.

4.3.2.1 Configuration update

After selecting the address to be modified in the memory configuration block, the configuration menu corresponding to the address will be displayed. The following steps take configuring Key 0 as an example.

Step 1. At memory configuration block (the leftmost field) select Configuration\Key 0.

Step 2. At memory configuration block (middle field) select the address to modify the configuration.

Key 0 configuration address is 0x1040.

Step 3. Configure in the configuration menu

Click the configuration field, and the options available for configuration will be listed, and user can configure according to your needs.

Step 4. Confirm update configuration

After pressing "Update", the newly configured options will be written to Device, and the new configuration values will be displayed on Value.

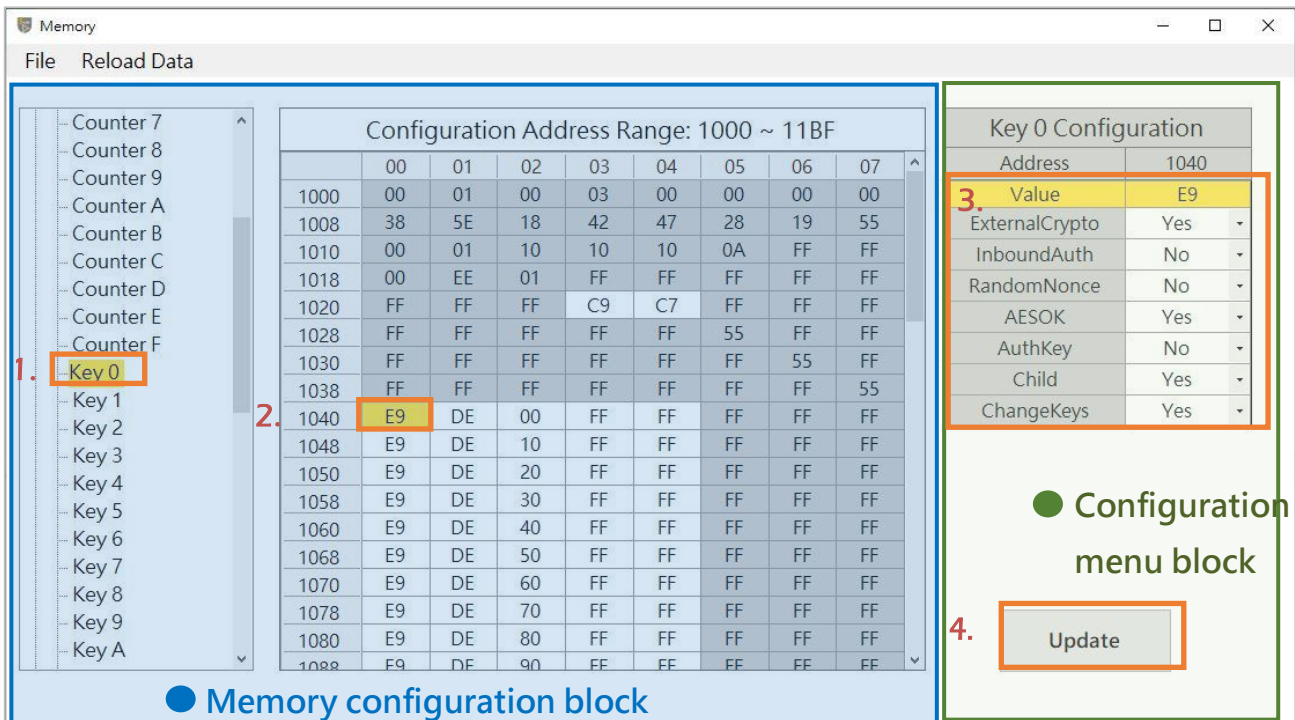


Figure 4.16 Configuration update

4.3.2.2 Other zones update

After selecting the address to be modified in the memory configuration block, a continuous section will be automatically selected, and the value of the continuous section will be displayed on the right configuration menu. The user double-clicks the Value field in the configuration menu, and the window for updating the value will pop up. The window shows the starting address of the continuous zone and all the values of the zone, and the value can be modified directly. After modification, click the "Update" button to write to the device. The following steps take modifying the data of User Zone00 as an example.

Step 1. At memory configuration block (the leftmost field) select User Zone\User Zone 00.

Step 2. At memory configuration block (middle field) select the address to modify the configuration.

User Zone address is 0x0000~0x00FF, a total of 256 bytes.

Step 3. Double-click the Value field to be modified in the configuration menu.

Click the Value field to modify the configuration, and the window for updating the value will pop up.

Step 4. Enter new value in the update value window

After pressing "OK", the new value update is displayed in the configuration menu.

Step 5. Confirm update configuration

After pressing "Update", the new value will be written to Device.

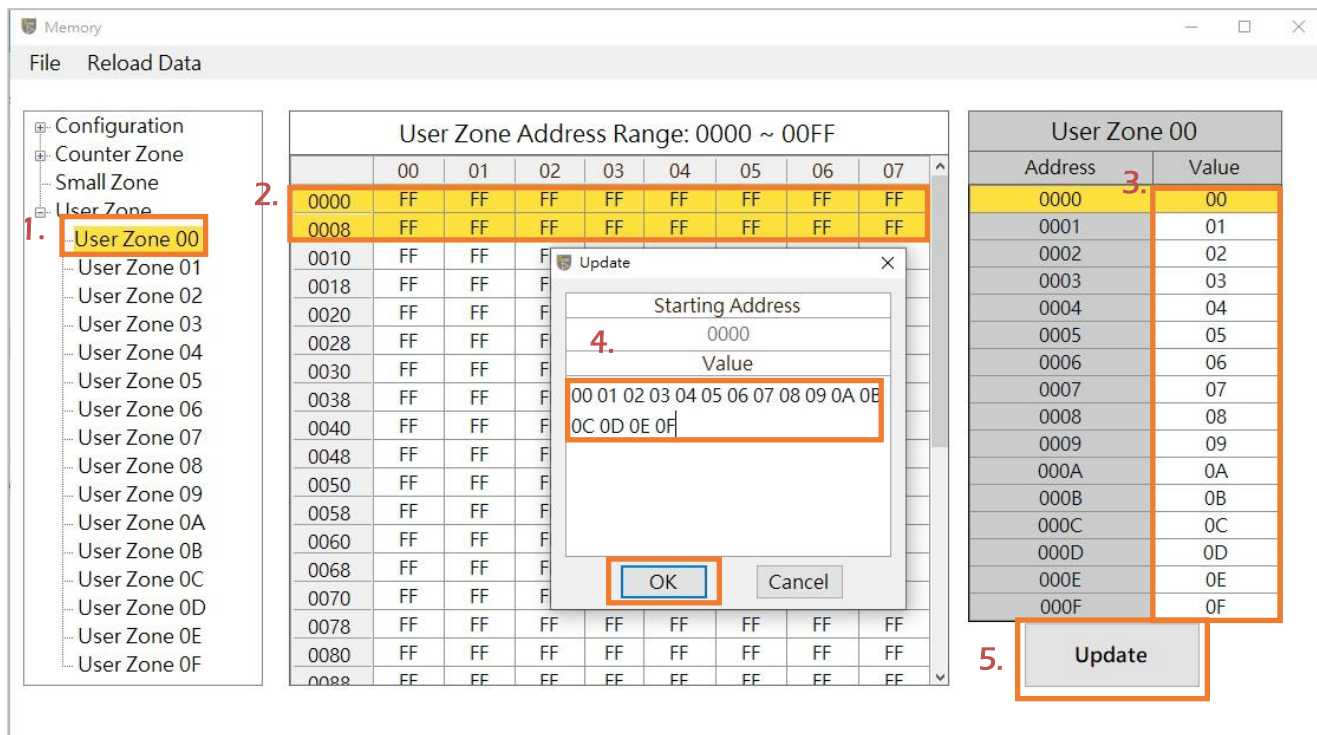


Figure 4.17 User Zone update

4.3.3 Tool Bar

There are File and Reload Data menus on the toolbar, as shown in the figure below:

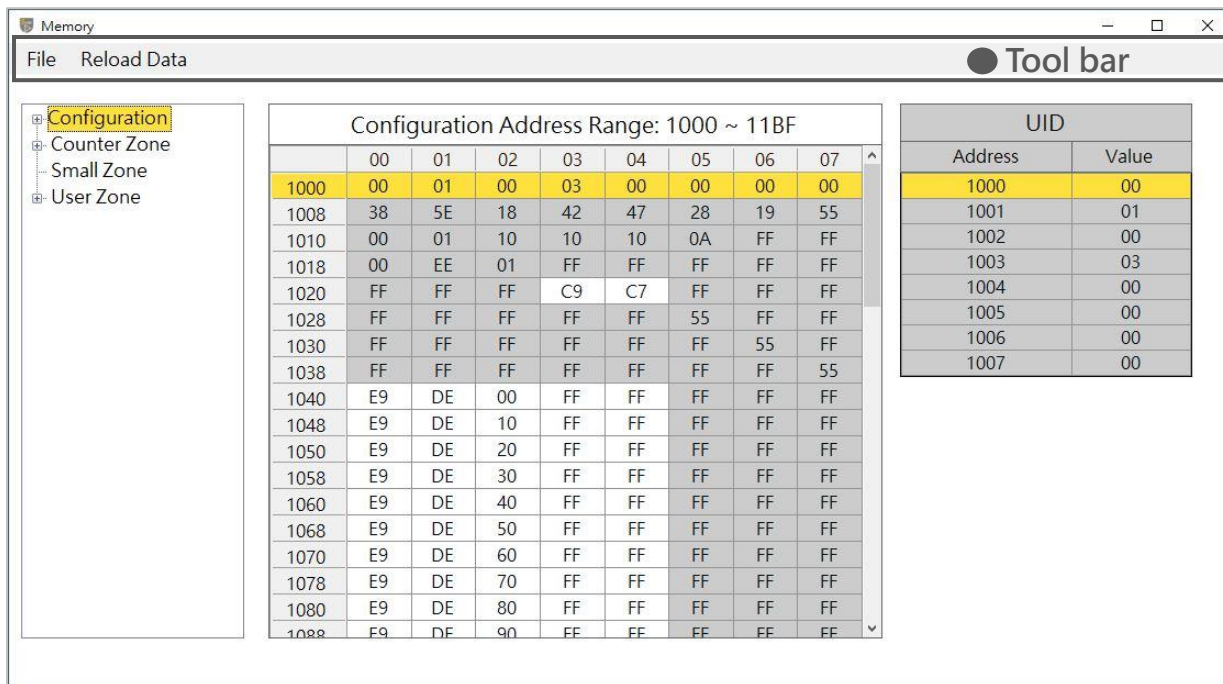


Figure 4.18 Tool bar

4.3.3.1 File menu

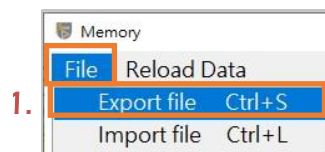
Click File to export or import the data of the device memory block.

a. Export file

Can export device memory configuration data.

Step 1. At tool bar select File\ Export Data

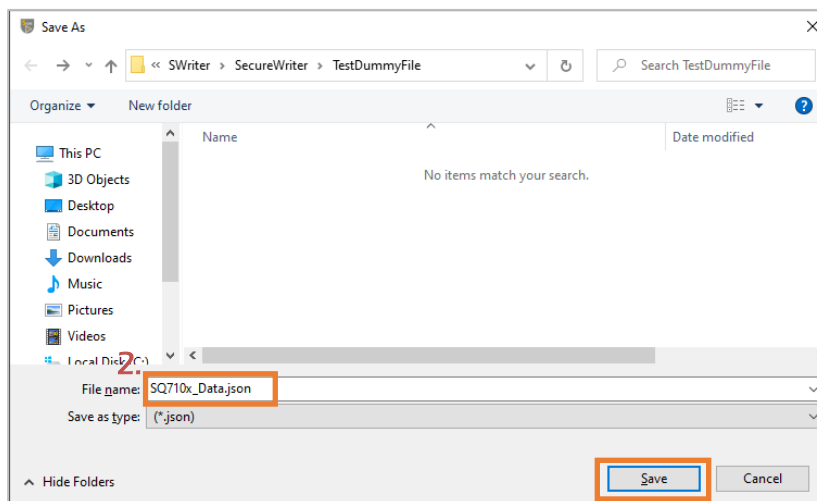
The export file format is .Json format.



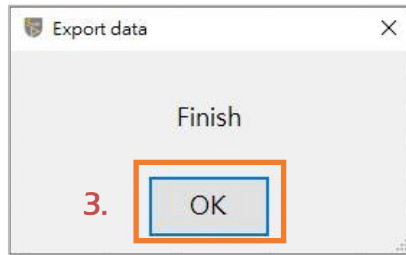
Step 2. After selecting the save path, press Save

You can choose the save path, use the default file name or name it yourself.

Note: The default export file name is SQ710x_Data.json, and user can name it.



Step 3. After exporting the data, the Export Finish message box will pop up, press OK.

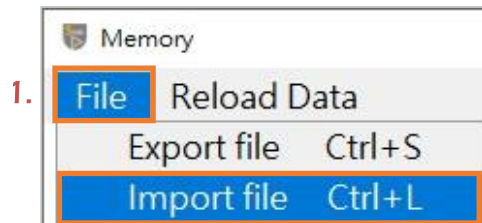


b. Import Data

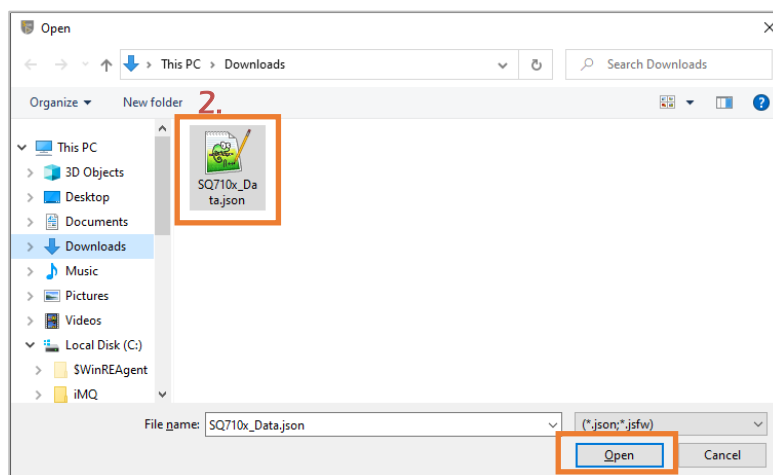
Can import previously exported configuration data.

Step 1. At tool bar select File\Import Data

The import file format is .Json format.

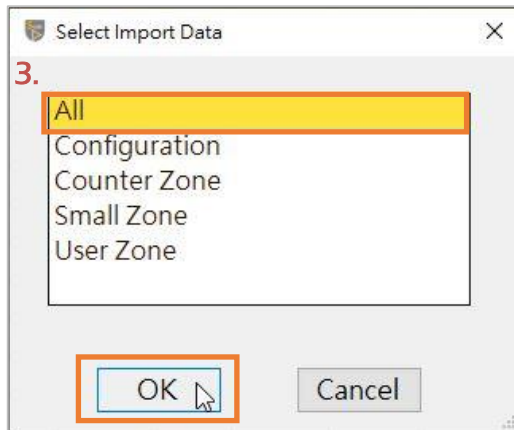


Step 2. After selecting the .json/.jsfw file to be loaded, click "Open"

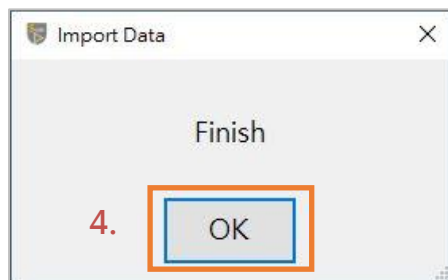


Step 3. Popup display memory zone list for user to select the zone to import

The user can choose to import a single zone or all zones. In the following example, after selecting "All", press OK to import the data of all zones.



Step 4. After importing the data, the Import Finish message box will pop up, press OK.



Note: After the import is finished and press OK, it will automatically execute reload data.

c. Reload Data

Reload device all memory configuration data and display on screen.

Step 1. At Tool bar click Reload Data.

Reload device all memory configuration data.

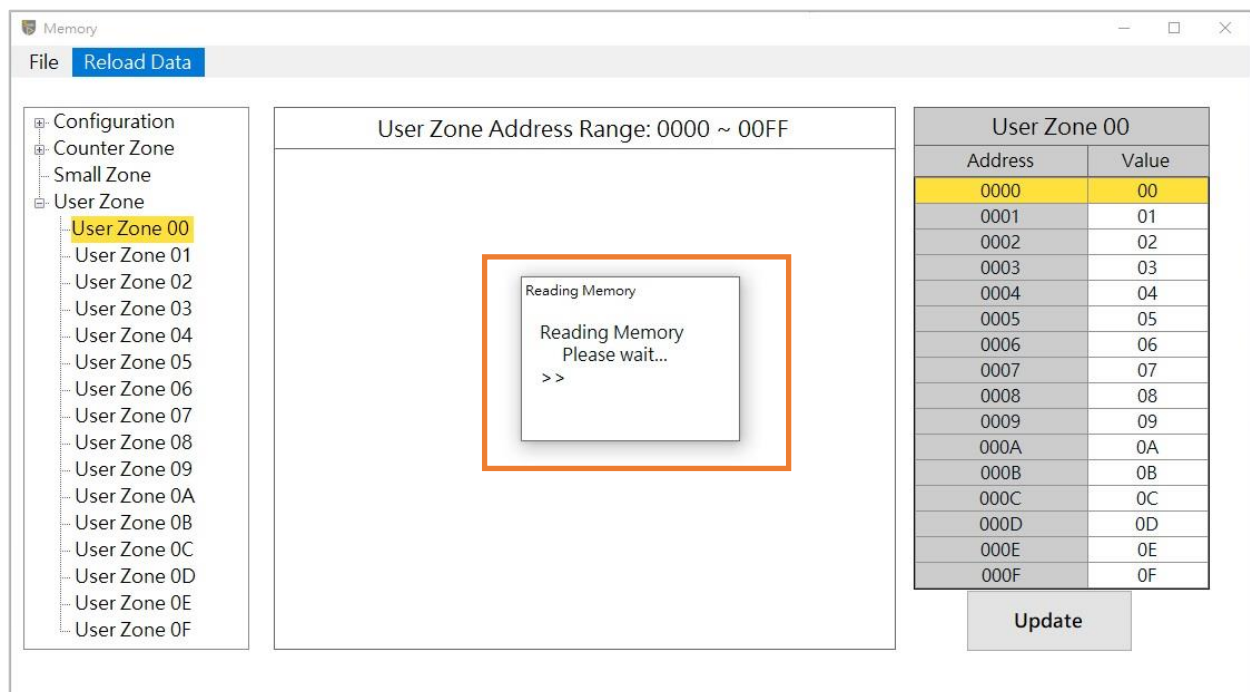


Step 2. Wait for the reload to complete

Note 1: **Do not remove the Secure Starter Kit from the computer while the data is being read.**

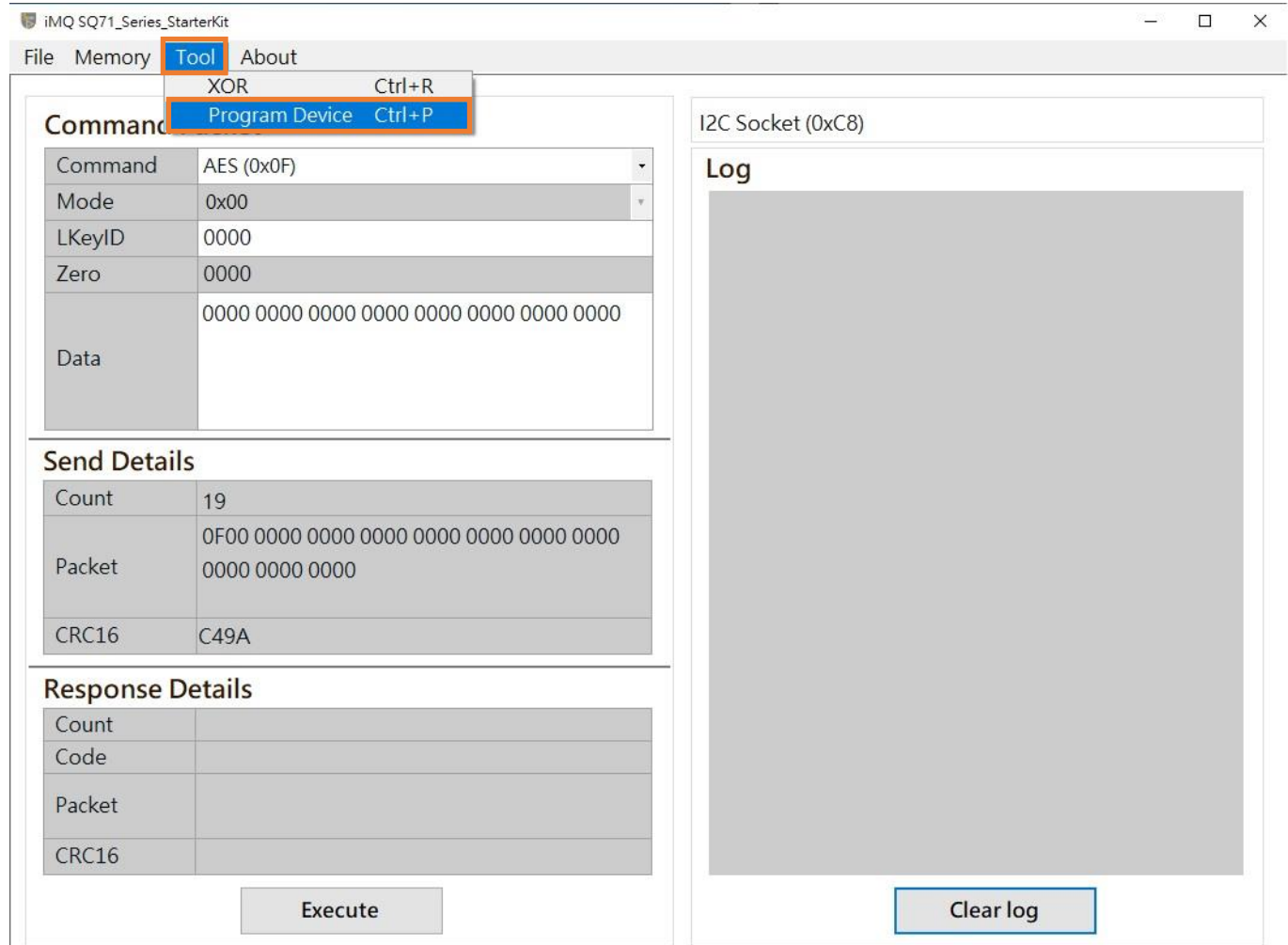
Note 2: After modifying any configuration on the memory window, you must press "Reload Data", and the data on the window will display the updated value.

Note 3: The shortcut key for the "Reload Data" button is "Ctrl+r"



4.4 Program Device

After clicking Tool \ Program Device, the program device window will pop up. This function can only program Socket devices.



The program device window can be divided into memory configuration, function options, tool bar, and log window are described in the following sections.

File
Tool bar

Configuration	User Zone	Small Zone	Counter Zone
Address	00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F		
1000	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 01		
1010	00 01 10 10 10 0A FF FF 00 EE 01 FF FF FF FF FF		
1020	FF FF FF C9 C7 FF FF FF FF FF FF FF FF 55 FF FF		
1030	FF FF FF FF FF FF 55 FF FF FF FF FF FF FF FF 55		
1040	E9 DE 00 FF FF FF FF FF FF E9 DE 10 FF FF FF FF FF		
1050	E9 DE 20 FF FF FF FF FF FF E9 DE 30 FF FF FF FF FF		
1060	E9 DE 40 FF FF FF FF FF FF E9 DE 50 FF FF FF FF FF		
1070	E9 DE 60 FF FF FF FF FF FF E9 DE 70 FF FF FF FF FF		
1080	E9 DE 80 FF FF FF FF FF FF E9 DE 90 FF FF FF FF FF		
1090	E9 DE A0 FF FF FF FF FF FF E9 DE B0 FF FF FF FF FF		
10A0	E9 DE C0 FF FF FF FF FF FF E9 DE D0 FF FF FF FF FF		
10B0	E9 DE E0 FF FF FF FF FF FF E9 DE F0 FF FF FF FF FF		
10C0	00 00 0F 55 FF FF FF FF 00 01 1F 55 FF FF FF FF		
10D0	00 02 2F 55 FF FF FF FF 00 03 3F 55 FF FF FF FF		
10E0	00 04 4F 55 FF FF FF FF 00 05 5F 55 FF FF FF FF		
10F0	00 06 6F 55 FF FF FF FF 00 07 7F 55 FF FF FF FF		
1100	00 08 8F 55 FF FF FF FF 00 09 9F 55 FF FF FF FF		
1110	00 0A AF 55 FF FF FF FF 00 0B BF 55 FF FF FF FF		
1120	00 0C CF 55 FF FF FF FF 00 0D DF 55 FF FF FF FF		
1130	00 0E EF 55 FF FF FF FF 00 0F FF 55 FF FF FF FF		
1140	01 00 FF FF FF FF FF FF 01 11 FF FF FF FF FF		

Lock Configuration
 Lock Key Memory
 Lock SmallZone

Program

Export log

Clear log

Log window

4.4.1 Memory configuration

The Tab Page displays each memory zone that can be viewed. After the user clicks, it will switch to the corresponding memory zone page. The value of the memory zone is displayed in the middle field (expressed in hexadecimal).

4.4.1.1 Configuration

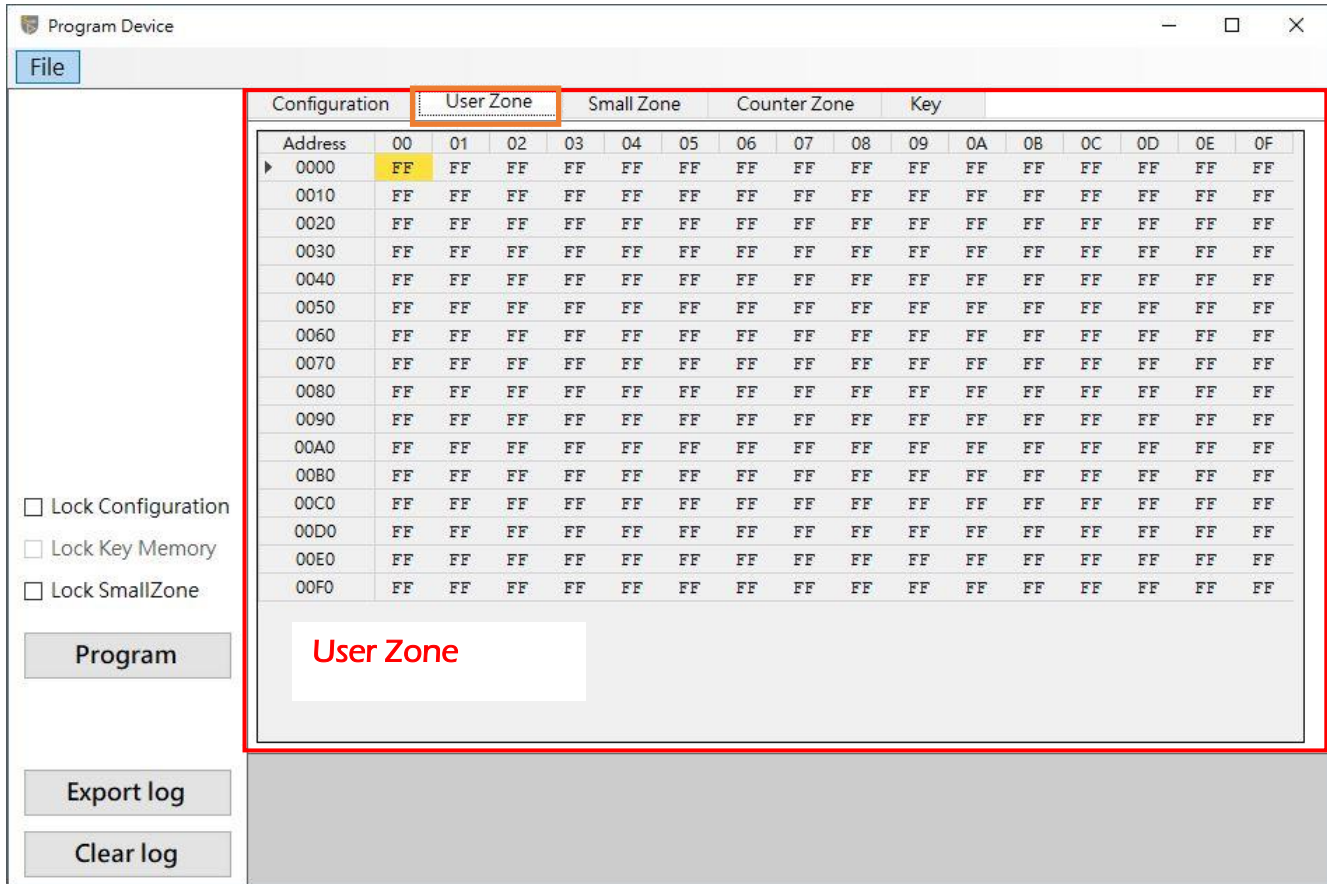
This page can set the configuration of chip, key, user zone and counter zone. User can directly click on the field to edit, but if the field background is gray, it means read-only information.

The configuration address range is 0x1000 ~ 0x11BF.

Address	User Zone			Small Zone		Counter Zone			Key							
	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
1000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01
1010	00	01	10	10	10	0A	FF	FF	00	EE	01	FF	FF	FF	FF	FF
1020	FF	FF	FF	C9	C7	FF	FF	FF	FF	FF	FF	FF	FF	55	FF	FF
1030	FF	FF	FF	FF	FF	FF	55	FF	FF	FF	FF	FF	FF	FF	FF	55
1040	E9	DE	00	FF	FF	FF	FF	FF	E9	DE	10	FF	FF	FF	FF	FF
1050	E9	DE	20	FF	FF	FF	FF	FF	E9	DE	30	FF	FF	FF	FF	FF
1060	E9	DE	40	FF	FF	FF	FF	FF	E9	DE	50	FF	FF	FF	FF	FF
1070	E9	DE	60	FF	FF	FF	FF	FF	E9	DE	70	FF	FF	FF	FF	FF
1080	E9	DE	80	FF	FF	FF	FF	FF	E9	DE	90	FF	FF	FF	FF	FF
1090	E9	DE	A0	FF	FF	FF	FF	FF	E9	DE	B0	FF	FF	FF	FF	FF
10A0	E9	DE	C0	FF	FF	FF	FF	FF	E9	DE	D0	FF	FF	FF	FF	FF
10B0	E9	DE	E0	FF	FF	FF	FF	FF	E9	DE	F0	FF	FF	FF	FF	FF
10C0	00	00	0F	55	FF	FF	FF	FF	00	01	1F	55	FF	FF	FF	FF
10D0	00	02	2F	55	FF	FF	FF	FF	00	03	3F	55	FF	FF	FF	FF
10E0	00	04	4F	55	FF	FF	FF	FF	00	05	5F	55	FF	FF	FF	FF
10F0	00	06	6F	55	FF	FF	FF	FF	00	07	7F	55	FF	FF	FF	FF
1100	00	08	8F	55	FF	FF	FF	FF	00	09	9F	55	FF	FF	FF	FF
1110	00	0A	AF	55	FF	FF	FF	FF	00	0B	BF	55	FF	FF	FF	FF
1120	00	0C	CF	55	FF	FF	FF	FF	00	0D	DF	55	FF	FF	FF	FF
1130	00	0E	EF	55	FF	FF	FF	FF	00	0F	FF	55	FF	FF	FF	FF
1140	01	00	FF	FF	FF	FF	FF	FF	01	11	FF	FF	FF	FF	FF	FF

4.4.1.2 User Zone

This page can edit the content of the User Zone, users can directly click on the field to edit.
 The User Zone address range is 0x0000 ~ 0x00FF.



4.4.1.3 Small Zone

This page can edit the content of the Small Zone, users can directly click on the field to edit. The Small Zone address range is 0x1300 ~ 0x15FF.

The screenshot shows the 'Program Device' application window. The main area is a table with the following structure:

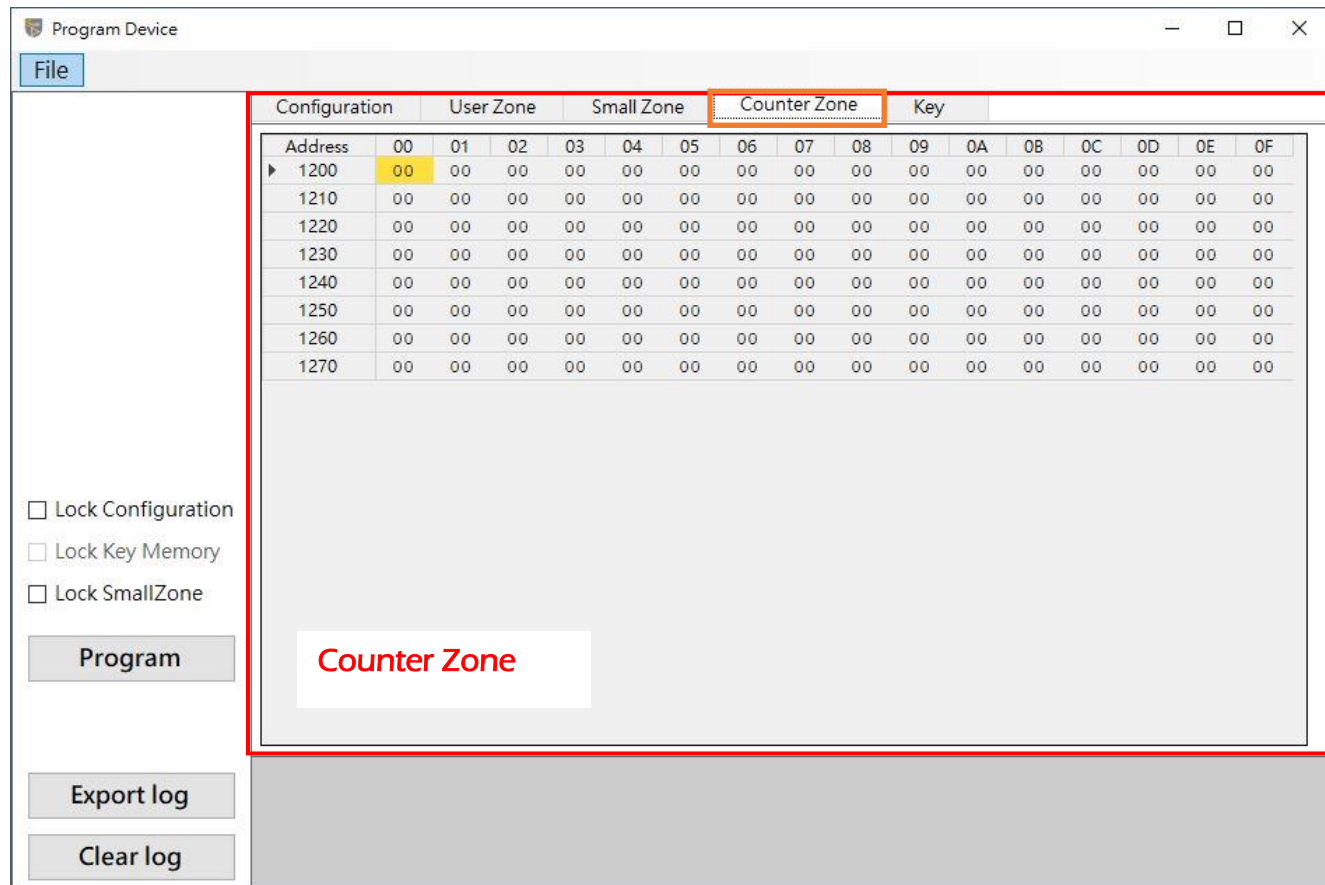
Configuration	User Zone	Small Zone	Counter Zone	Key												
Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
1300	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1310	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1320	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1330	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1340	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1350	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1360	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1370	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1380	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1390	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
13A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
13B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
13C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
13D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
13E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
13F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1400	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
					FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
					FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
					FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
1440	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

On the left side of the interface, there are three checkboxes: Lock Configuration, Lock Key Memory, and Lock SmallZone. Below these are three buttons: 'Program', 'Export log', and 'Clear log'. A red box highlights the 'Small Zone' column header and the data rows in the table. A red label 'Small Zone' is overlaid on the table.

4.4.1.4 Counter Zone

This page can edit the content of the Counter Zone, users can directly click on the field to edit.

The Counter Zone address range is 0x1200 ~ 0x127F.

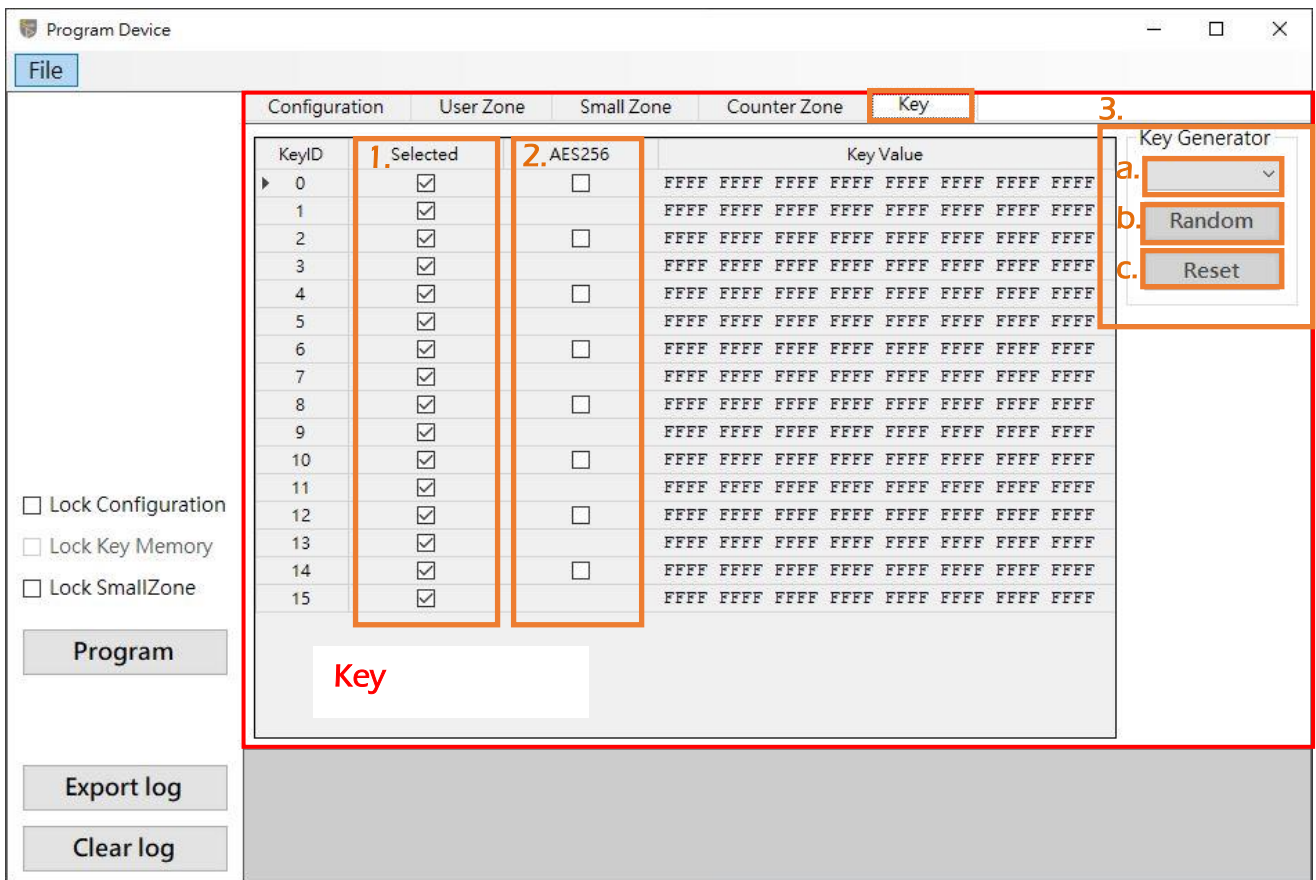


4.4.1.5 Key

This page can edit the content of the Key, users can directly click on the field to edit.
 The Key address range is 0xF200 ~ 0xF2FF.

The function of each field is described as follows:

1. **Selected:** When checked, it means that the key is enabled and the key can be edited. The key will be written when program.
2. **AES256:** When checked, it means to enable AES256, and the Key Value can input a value of 256 Bits. (If the AES256 enabled, the memory location of the next key will be used when writing to the IC, so when this field is checked, the content of the next key will be closed and the user cannot edit it.)
3. **Key Generator:** You can use this function to randomly generate Key Value or reset it.
 - a. Select the target Key.
 - b. Generate the Key Value of the target Key as a random number. (It can only be clicked when the target Key is enabled)
 - c. Reset the Key Value of the target Key to all 0xFF. (It can only be clicked when the target Key is enabled)



4.4.2 Function options

Program Device
_ □ ×

File

Function options

1.

Lock Configuration

Lock Key Memory

Lock SmallZone

2. Program

3. Export log

4. Clear log

Configuration	User Zone			Small Zone			Counter Zone			Key						
Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
1000	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01
1010	00	01	10	10	10	0A	FF	FF	00	EE	01	FF	FF	FF	FF	FF
1020	FF	FF	FF	C9	C7	FF	FF	FF	FF	FF	FF	FF	FF	55	FF	FF
1030	FF	FF	FF	FF	FF	FF	55	FF	FF	FF	FF	FF	FF	FF	FF	55
1040	E9	DE	00	FF	FF	FF	FF	FF	E9	DE	10	FF	FF	FF	FF	FF
1050	E9	DE	20	FF	FF	FF	FF	FF	E9	DE	30	FF	FF	FF	FF	FF
1060	E9	DE	40	FF	FF	FF	FF	FF	E9	DE	50	FF	FF	FF	FF	FF
1070	E9	DE	60	FF	FF	FF	FF	FF	E9	DE	70	FF	FF	FF	FF	FF
1080	E9	DE	80	FF	FF	FF	FF	FF	E9	DE	90	FF	FF	FF	FF	FF
1090	E9	DE	A0	FF	FF	FF	FF	FF	E9	DE	B0	FF	FF	FF	FF	FF
10A0	E9	DE	C0	FF	FF	FF	FF	FF	E9	DE	D0	FF	FF	FF	FF	FF
10B0	E9	DE	E0	FF	FF	FF	FF	FF	E9	DE	F0	FF	FF	FF	FF	FF
10C0	00	00	0F	55	FF	FF	FF	FF	00	01	1F	55	FF	FF	FF	FF
10D0	00	02	2F	55	FF	FF	FF	FF	00	03	3F	55	FF	FF	FF	FF
10E0	00	04	4F	55	FF	FF	FF	FF	00	05	5F	55	FF	FF	FF	FF
10F0	00	06	6F	55	FF	FF	FF	FF	00	07	7F	55	FF	FF	FF	FF
1100	00	08	8F	55	FF	FF	FF	FF	00	09	9F	55	FF	FF	FF	FF
1110	00	0A	AF	55	FF	FF	FF	FF	00	0B	BF	55	FF	FF	FF	FF
1120	00	0C	CF	55	FF	FF	FF	FF	00	0D	DF	55	FF	FF	FF	FF
1130	00	0E	EF	55	FF	FF	FF	FF	00	0F	FF	55	FF	FF	FF	FF
1140	01	00	FF	FF	FF	FF	FF	FF	01	11	FF	FF	FF	FF	FF	FF

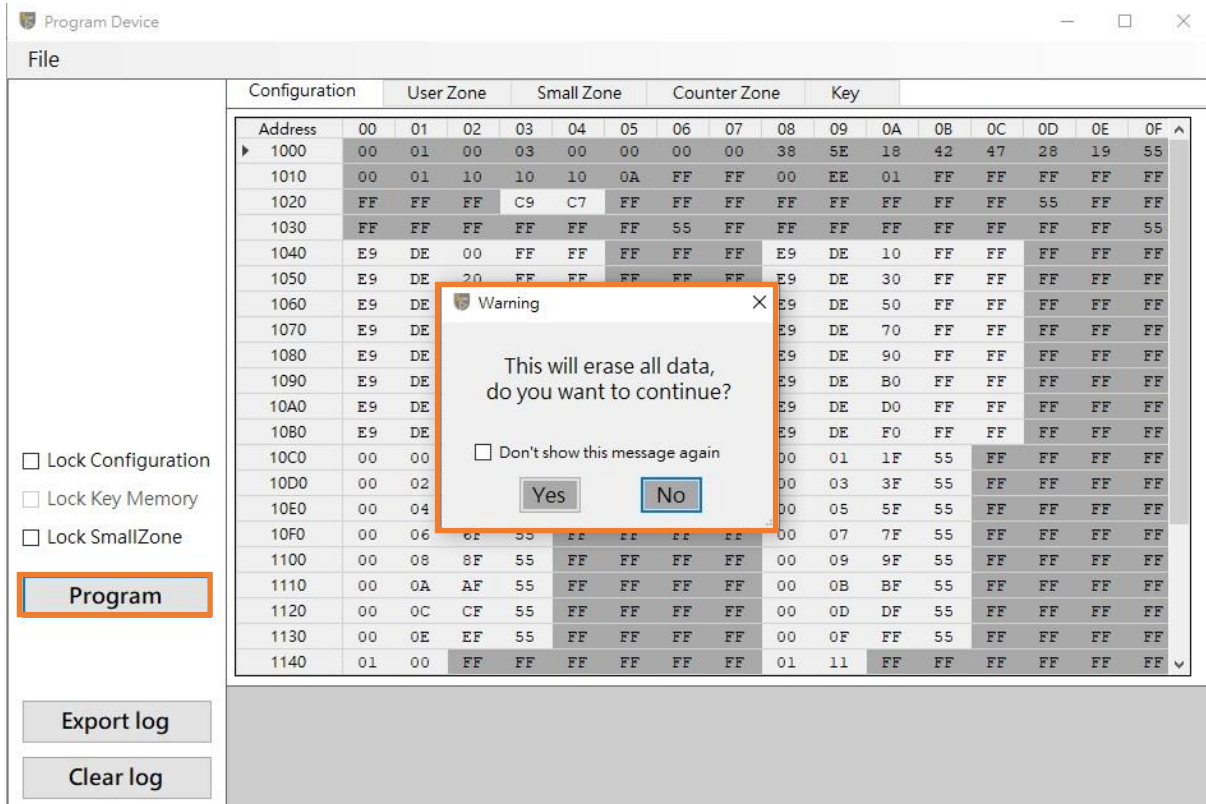
Function options are divided into 4 parts :

1. **Lock options:** User can select the memory zone to be locked. After the program is completed, it will be locked according to the checked items.
 - a. **Lock Configuration:** Configuration zone can no longer be written after locking, you can only use Block Read command to read.
 - b. **Lock Key Memory:** Key Memory Key memory can no longer be written after locking. (Lock Configuration must be locked before Lock Key Memory.)
 - c. **Lock Small Zone:** Small zone can no longer be written after locking, you can only use Block Read command to read.

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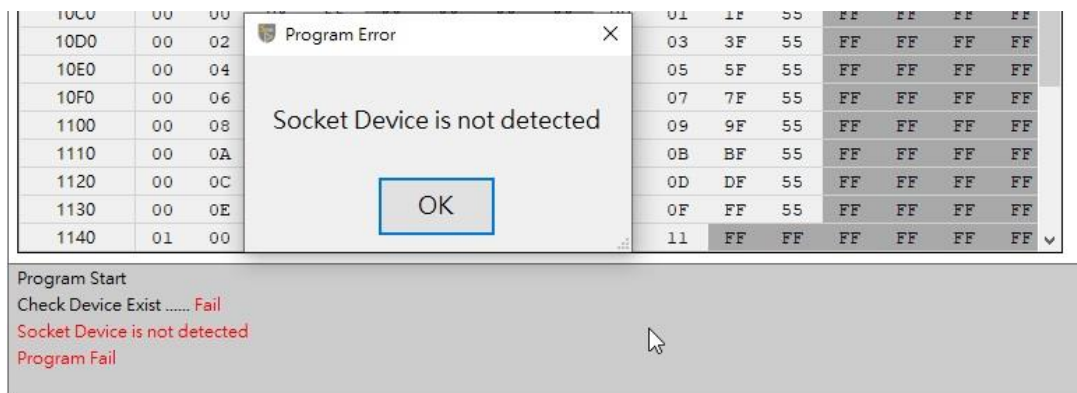
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2. **Program:** After the user clicks, a confirmation window will pop up, and the program process will start after clicking "Yes".

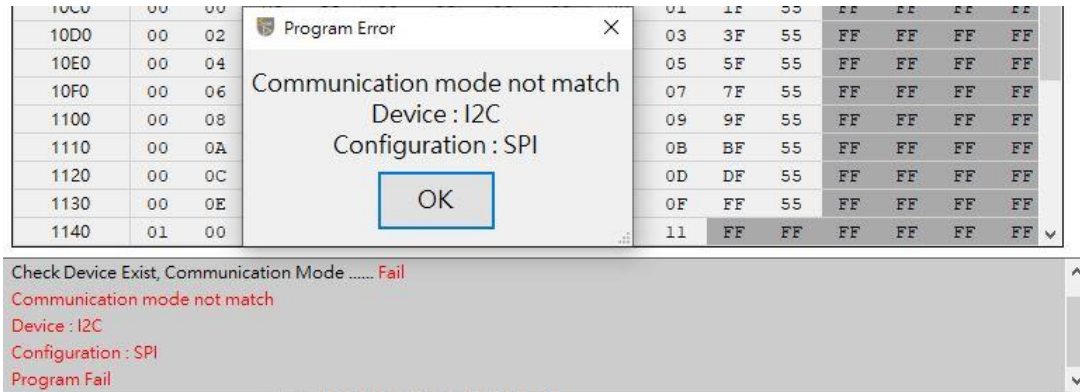


The program process is as follows:

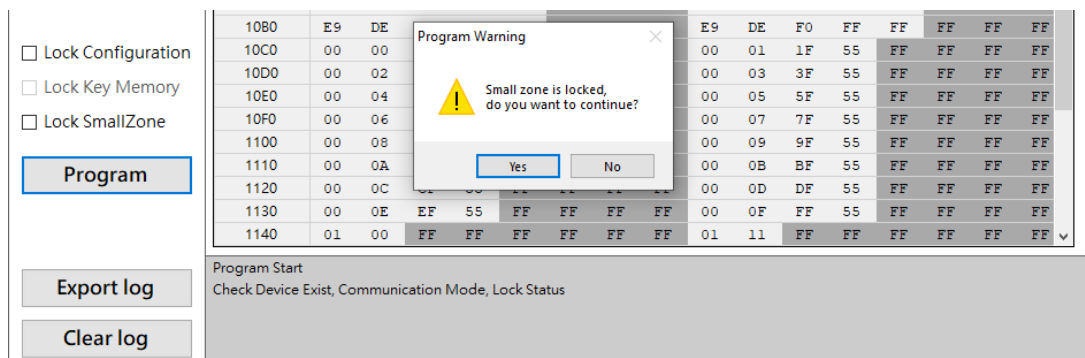
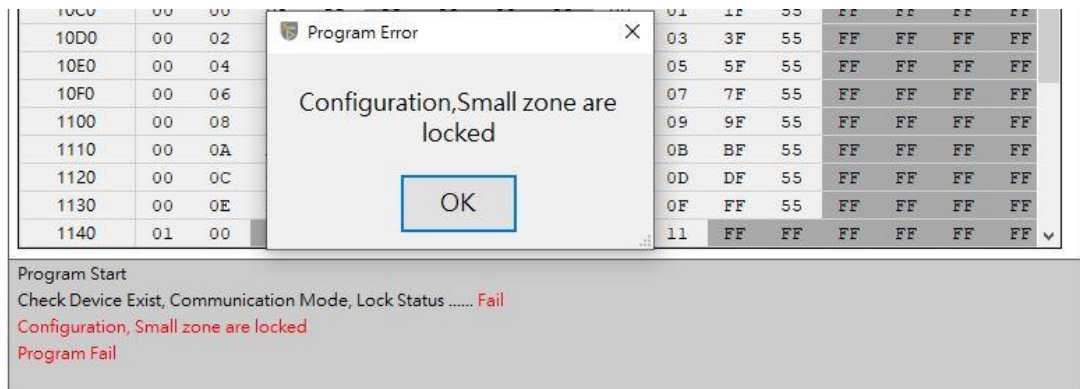
- a. Check if the Socket device exists, when the device does not exist, an error window will be displayed and the programming will stop.



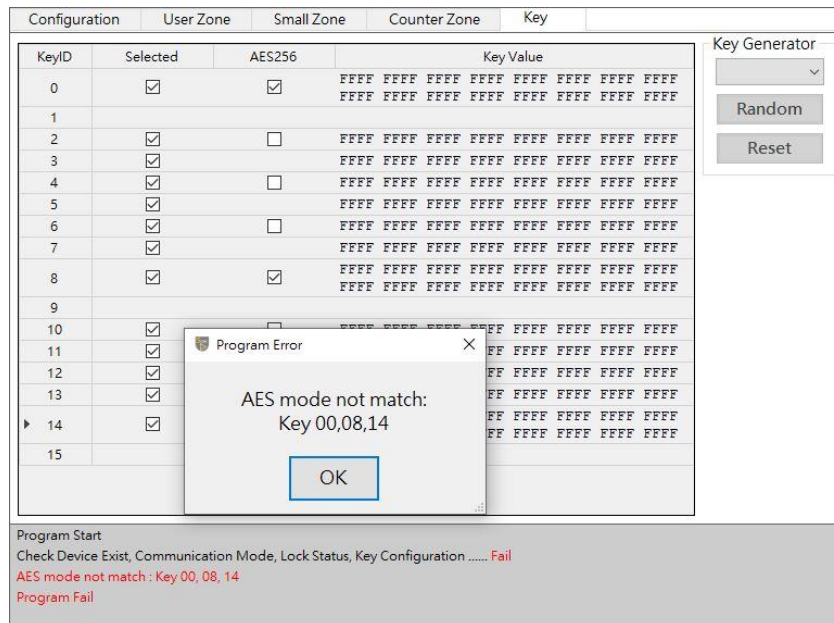
- b. Check that the communication mode of the device matches the configuration settings, if there is a mismatch, an error window will be displayed and the programming will stop.



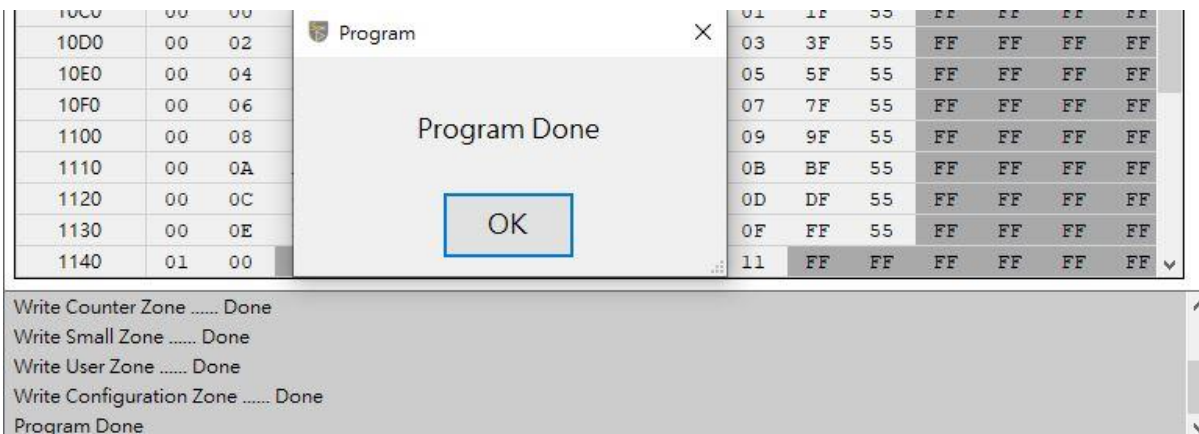
- c. Check if the device is locked. When the Configuration is locked, an error window will be displayed and the programming will stop. When only the Small zone is locked, ask the user whether to continue programming other parts except the Small zone.



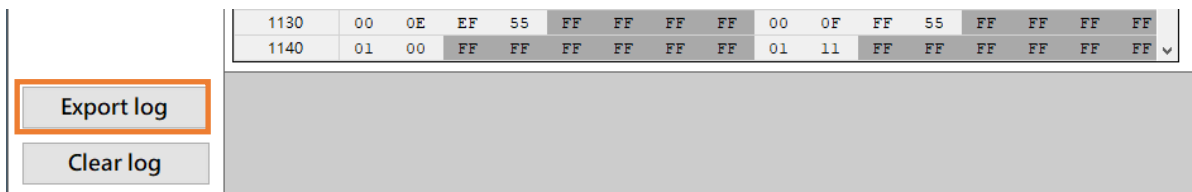
- d. Check whether the enable status of Key AES256 matches the setting in Configuration, if there is a mismatch, an error window will be displayed and the programming will stop.



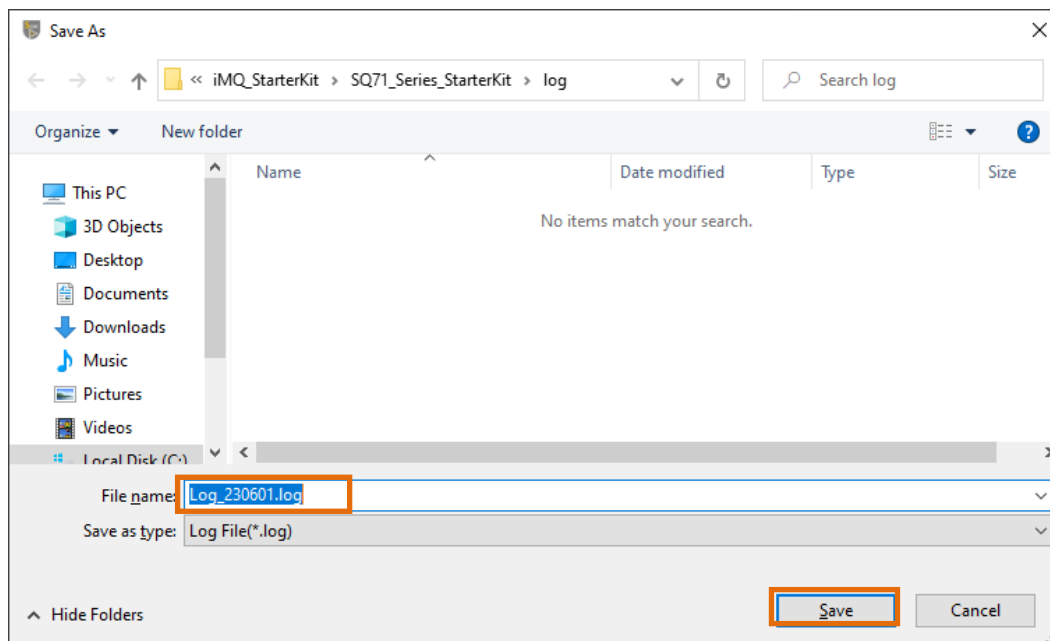
- e. Write Key AES256 settings to Key configuration memory.
- f. Write Key Value.
- g. Write Counter Zone, Small Zone and User Zone.
- h. Finally, write Configuration.
- i. Check whether the user has checked the Lock options, and lock according to the lock options.
- j. Program is complete.



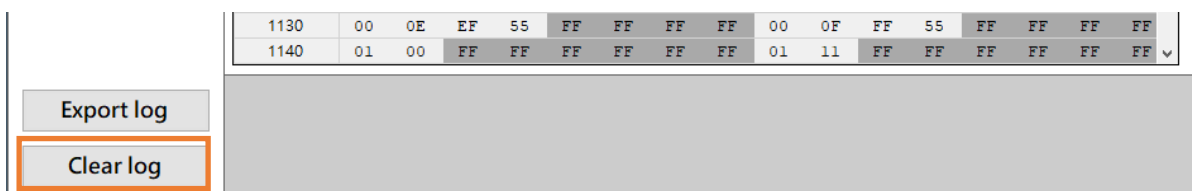
3. Export log: Users can click this button to export the content of the Log Window into a .log file.



Select the save path and file name, the default file name is “Log_YYMMDD.log” (YYMMDD is the current date)

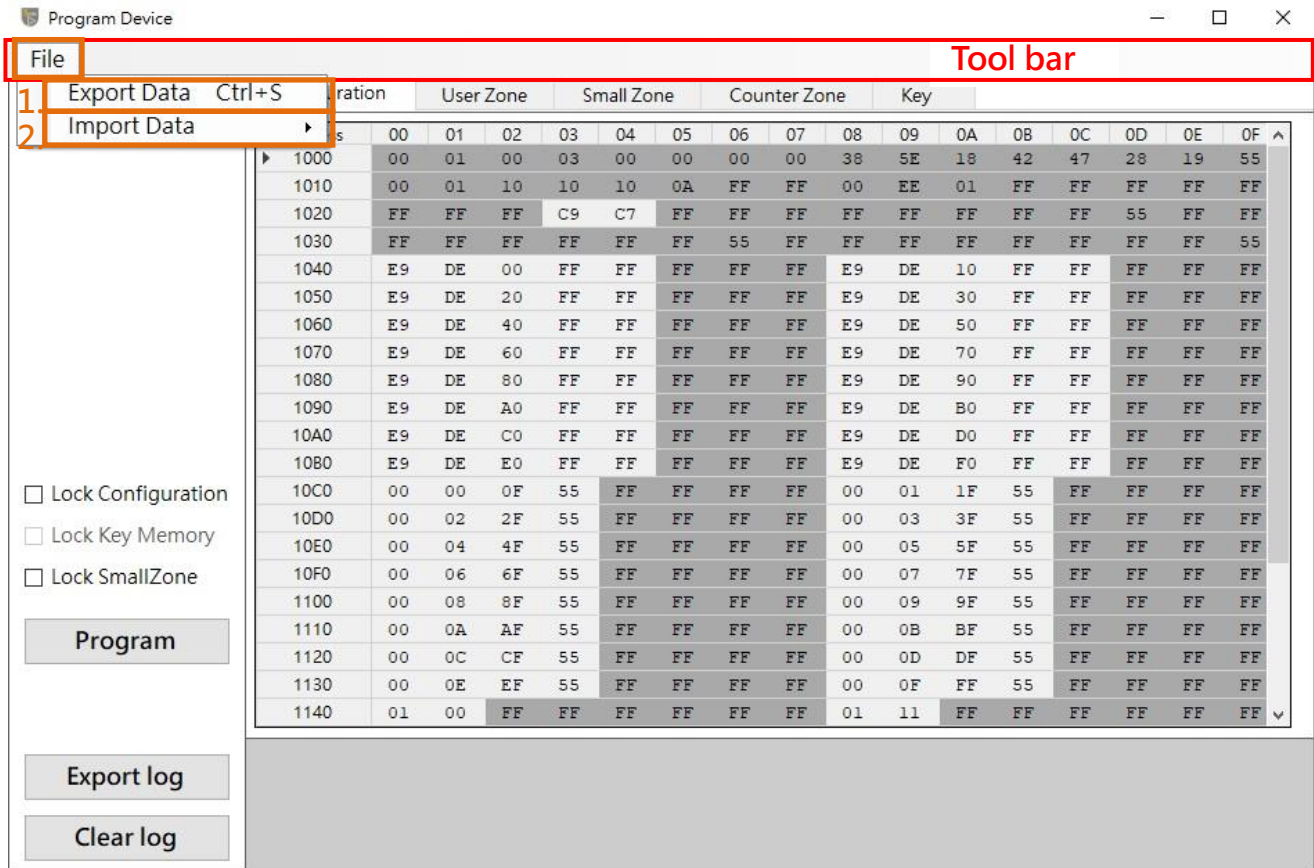


4. Clear log: Users can click this button to clear the content of the Log Window.



4.4.3 Tool Bar

There is a File menu on the toolbar, as shown in the figure below:

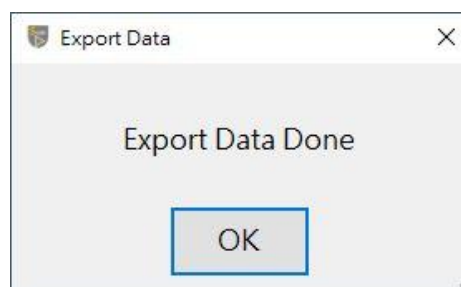
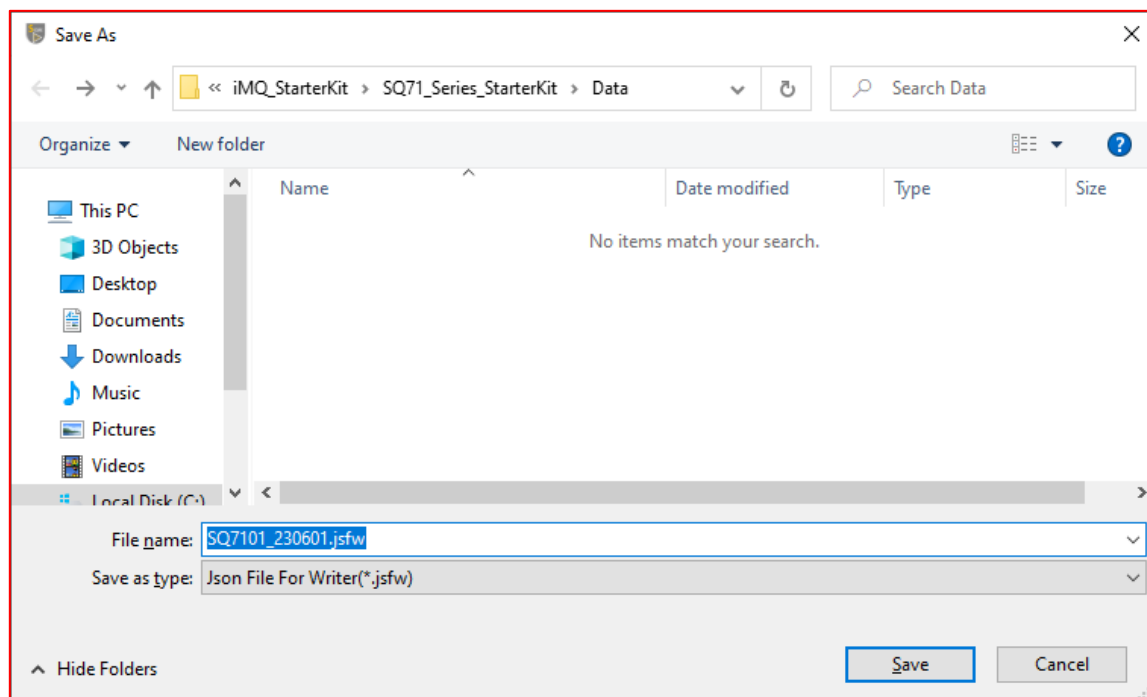


1. Export Data

After clicking Export Data, all the data in the memory configuration (Configuration, User Zone, Small Zone, Counter Zone and Key Value) can be exported into a file in .Json format (The file extension is .jsfw).



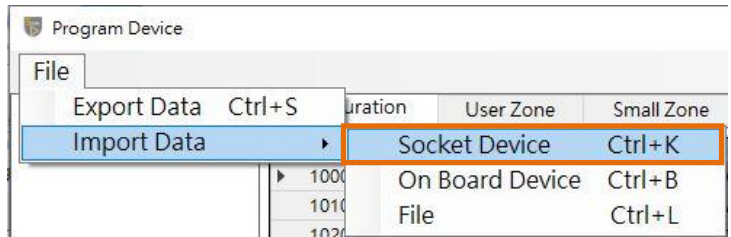
Select the save path and file name, the default file name is "SQ710x_YYMMDD.jsfw" (YYMMDD is the current date)



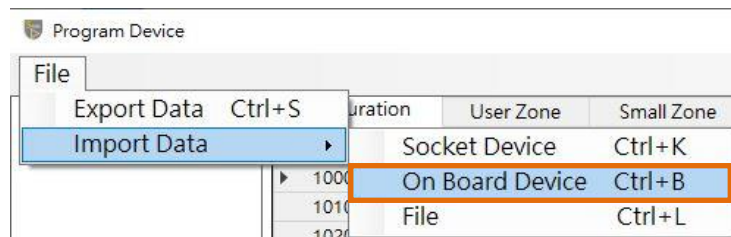
2. Import Data

After clicking Import Data, select the source of the memory configuration data to be imported.

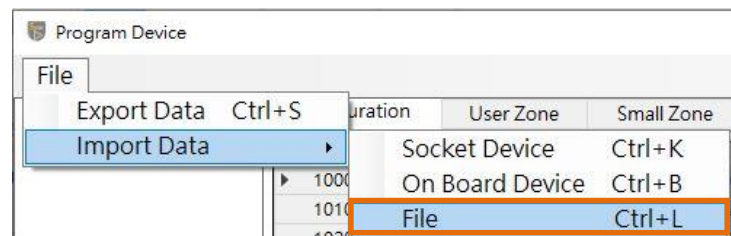
- a. **Socket Device: Import memory configuration data from the currently connected Socket Device.**

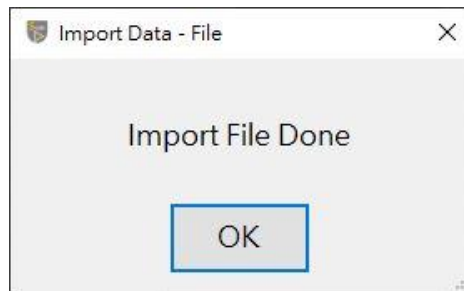
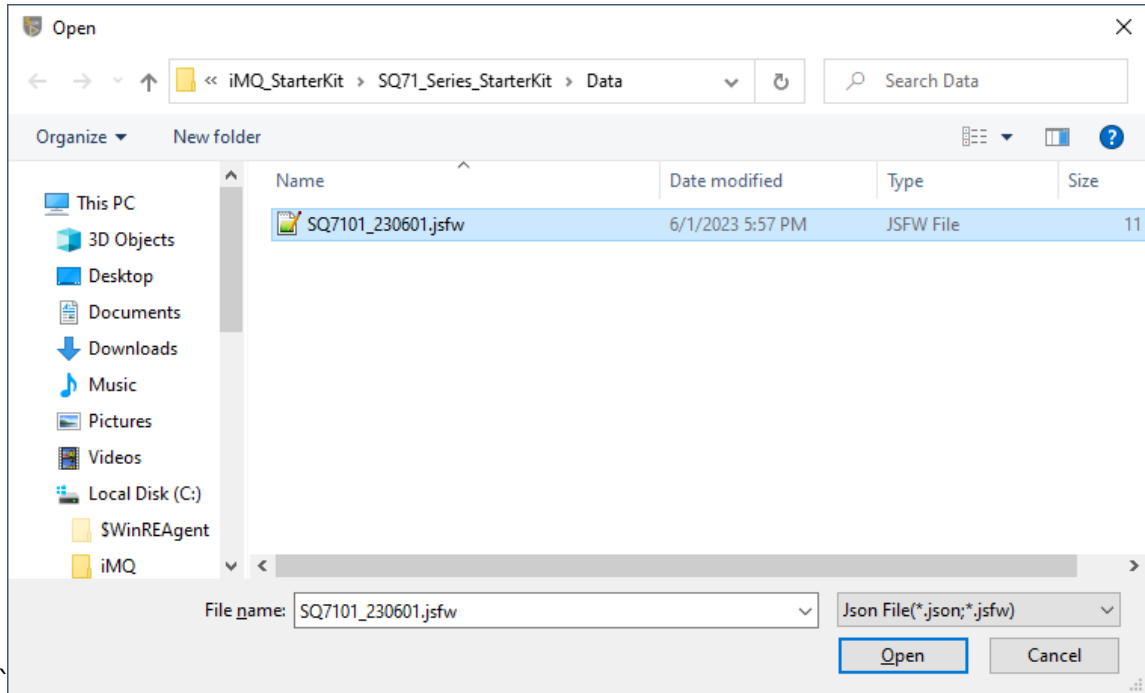


- b. **On Board Device: Import memory configuration data from the On Board Device. (This feature is currently not supported, it is reserved to be enabled in the future.)**



- c. **File: From the previously exported .Json format file (The file extension is .json/.jsfw) Import data.**





If the import data fails to be read, an error message will be displayed, and the address where the error occurred and related information will be recorded in the Log Window, and the fields that failed to be read will be displayed in red fonts for users to identify and modify.

Program Device
- □ ×

File

Lock Configuration
 Lock Key Memory
 Lock SmallZone

Program

Export log

Clear log

Configuration	User Zone				Small Zone				Counter Zone				Key			
Address	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
0000	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0010	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0030	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0040	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0050	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0060	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0070	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0080	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
0090	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
00F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

Import Socket Device Data Fail

Send: 0A 10 0B 01 C8 09 10 00 00 10 00 10 91 D4

Received: 00 04 04 91 4F

RWConfig Error: Access to the specified user zone is not permitted due to the configuration.

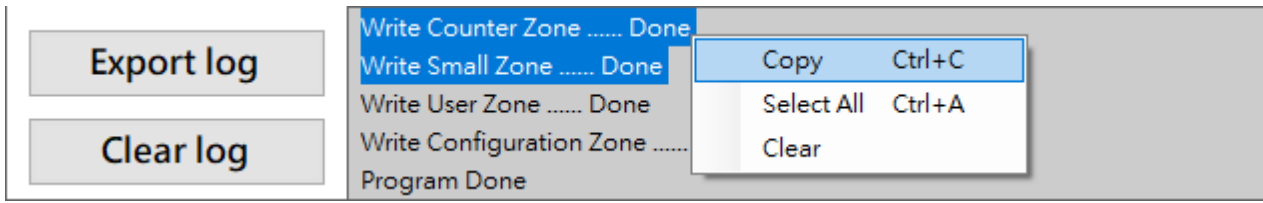
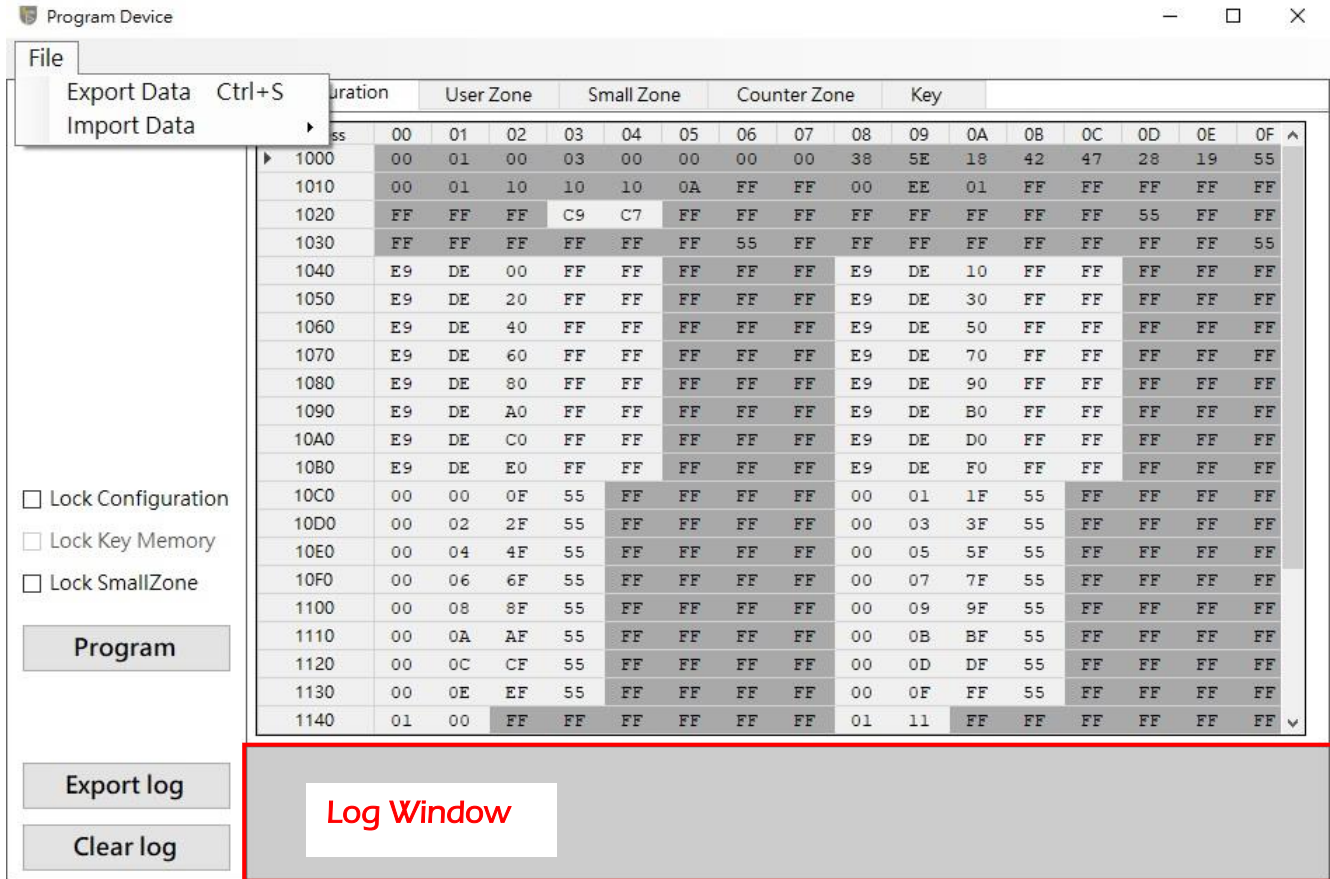
Block Read Error : 0x0010

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4.4.4 Log Window

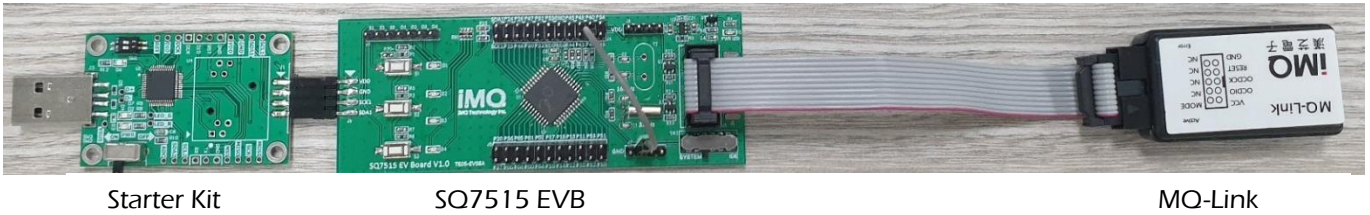
Log Window will automatically record the operation status, programming status and error information. User can use the mouse to select, copy, select all, or clear the contents of the Log Window or use the Export log button to export the Log file, or use the Clear log button to clear the contents of the Log Window



Appendix A: Hardware settings precautions for prototyping SQ7515

To develop general functions and Security Processor for SQ7515, the following hardware is required:

- Starter Kit (Left)
- SQ7515 EVB (Middle)
- MQ-Link (Right)



A.1 Security Processor application development for SQ7515

1. Confirm that P42 (reset) and GND on the SQ7515 EVB is shorted (EVB V1.1 uses Jumper to complete).
2. Confirm that the slide switch on the SQ7515 EVB switch to the system setting.
3. Use MQ-link to connect SQ7515 EVB for power supply, and connect the other side of MQ-link to PC as power source (Before this step, the EVB is power off).
4. The Starter kit is connected to the SQ7515 EVB, and the other end of the Starter kit is connected to the PC.
5. Open the GUI software on the PC and start setting the Security processor key or Config.

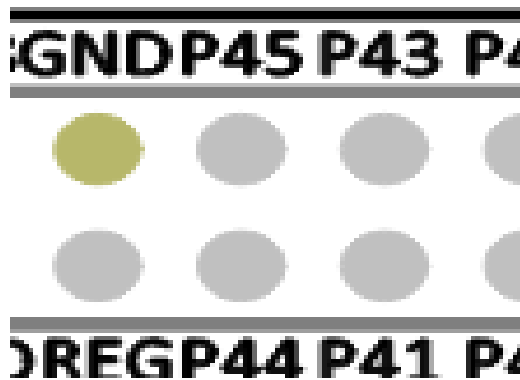


Figure A.1 EVBV 1.1 Add a Reset grounding jumper

No. : TDUM02- TE002-EN	Name: Secure Starter Kit User Manual	Version : V1.5
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A.2 Host Processor application development for SQ7515 (using IDE)

1. Confirm that P42 (reset) and GND on the SQ7515 EVB is open (EVB V1.1 uses Jumper to complete).
2. Confirm that the slide switch on the SQ7515 EVB switch to the IDE setting.
3. Connect the MO-link to the SQ7515 EVB, and connect the other side of the MO-link to the PC.
4. Open the IDE software and develop the application.

Note1: If you want to execute the StarterKit GUI to develop the Security Processor after executing the IDE first, the system must be powered on again. (according to the setting in A.1)

Note2: For IDE software function description, please refer to "MO-LINK User Manual".

No. : TDUM02- TE002-EN	Name: Secure Starter Kit User Manual	Version : V1.5
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Change history

Version	Approved Date	Description
V1.5	2022/11/23	<ol style="list-style-type: none">1. "SO71 Series Secure Starter Kit User Manual" rename to "Secure Starter Kit User Manual"2. "CH3 StarterKit software installation" updated3. "CH4.2.1 Build Command" updated4. "CH4.2.2 Tool bar" updated
V1.0	2021/01/15	First release