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TWR99

Writer User Manual

Rev 2.2

AMENDMENT HISTORY

Version	Date	Description
V1.0	Aug, 2010	New Release
V1.1	Sep, 2010	Modify figure of IC pin location.
V1.2	Jan, 2011	1. Add TM57PE10, TM57PE11A OTP IC 2. Add Mass Production Mode page
V1.3	Mar, 2011	1. Add 8-bit: TM57PA10A, TM57ML40, TM56FA40 2. Add Compare File function 3. Add Set Protect 4. Add Read Chip Information 5. Add Production Limit mode Add page 9, 28, 33~42
V1.4	Dec, 2011	1. Add 8-bit: TM57PE15, TM57PA20A, TM57P11 OTP IC 2. Add TWR99 Auto Reset function 3. Add Update F/W and Load data screen 4. Add page 13~15, 45, 46
V1.5	May, 2012	1. Add 8-bit OTP IC: TM57PE11B, TM57PA21 2. Add Download write data and write parameters comparing function 3. Adjust the TM57 series OTP IC write parameters 4. Modify the Independent Firmware version 1.0 to version 1.1 5. Modify the external control signal (to match the semi-automatic machine usage) 6. Modify pages 3, 6, 8, 15, 16, 29, 33, 38
V1.6	Sep, 2012	1. Add 8-bit IC: TM57PE15A, TM57PA21, TM57PA25, TM57MR10, TM57MR20 IC writer function. 2. Modify the TWR99 Writer Firmware (Compatible with previous versions and the new version of the hardware). 3. Improve the TWR99 software, download data file continue to hold problem. 4. Modify of TWR99 Firmware (solve problem: LED lights prompt, and P.10 output signal is different).
V1.7	Jan, 2013	1. Add 8-bit IC: TM57MA21, TM57PA20A, TM57MR10, TM57MR20, TM57P11, TM57P11B, TM57PE11BS, TM57P11C, TM57PE11C, TM57PE11CS, TM57PE12AS, TM57PE15AS, TM57PE15C, TM57PE15CS IC writer function 2. Merge TWR98 TWR99 software program, and is compatible with hardware TWR98/99 Writer 3. Modify the TM57 series IC write ID word program to reduce ID word write error occurred 4. Modify Read IC Information function 5. Modify TM57 series IC program software, to shorten the program time 6. Add FLASH / MTP Series IC operating Blank Check function, will be done Clear all data of the alarm 7. Modify the TM89 series of IC entry mode by sending 42 INT instead of sending 34 INT 8. Modify TM57 Series IC Firmware show version, upgrade to version 1.2

		9. Modify pages 2, 6, 10, 11
V1.8	June, 2013	1. Add 8-bit IC: TM57P11CU, TM57MA20, TM57MA21A, TM57MA21B, TM57FA40A, TM57PE12D, TM57PA11, TM57PE16, TM57PE20A, TM57PT20A IC writer function 2. TM57 series OTP IC Firmware modified to reduce interference problems PA4 pin and Address disorder 3. TM57 series OTP IC parameter is modified to reduce the data write error 4. TM57 series OTP IC, ID Word Bit 12, 13 determine command to modify, to prevent re-write may result LVR problems resulting the low voltage mode can not enter 5. Modify TM57 Series IC Firmware show version, upgrade to version 1.2 6. Modify 8Bit series IC, System CFG Data Description 7. Modify pages 3
V1.9	Dec,2013	1. Add New IC writer function : TM52 series : TM52M5254, TM52M5258, TM52F5284, TM52F5288, TM52F2260, TM52F2261, TM52F2264 TM57 series : TM57PA45, TM57ME16, TM57PA15, TM57PA21B, TM57PA25B, TM57FA40A, TM57FLA80A TM56 series : TM56MH40 TM87 series : TM8793 USB Full Speed series : TMU3115 2. Modify MTP / FLASH series IC, Check ID_mechanism 3. Part of the IC, 25P05 / 25X20 IC store command modification 4. Modify some IC write operating parameters 5. Modify TM57 Series IC Firmware show version, upgrade to version 1.4 6. Modify some software bugs 8. Modify pages 3, 4, 5, 6
V2.0	Aug, 2014	1. Add New IC writer function : TM52 series : TM52F5264, TM52F5268, TM52F5274, TM52F5278 TM57 series : TM57PA16, TM57PT16, TM57PA45, TM57PA28, TM57PA46, TM57PT46, TM57MA25, TM57PA20B, TM57PA20AS, TM57ME16AS 2. strengthen TM52 series IC, ICP program mode capability 3. Part of the IC, 25P05 / 25X20 IC store command modification 4. Add Serial Number function in TM52 series IC

		5. Add (IAP) Write function in TM52 series IC 6. Add TM57MT20 IC trim frequency function 7. solving software in Win7 / Win8 use issues 8. Modify some software bugs 9. Modify pages 3,4
V2.1	Nov, 2014	1. Add New IC writer function : TM52 series : TM52F2280, TM52F2284, TM52F2230, TM52F2234 TM57 series : TM57PE20B, TM57PT20B, 2. TM52 series IC, adding ICP (4 Wire) program mode 3. TM57 Series Touch Key IC Firmware modification 4. Modify some software bugs 5. Modify pages 4
V2.2	Feb, 2015	1. Add New IC writer function : TM57 series : TM57PA16B, TM57PT16B 2. Flash Memory 25P05 / 25X20 IC store command modification (for TM57 serial OTP IC) 3. TM52 series Touch Key IC Firmware modification 4. Software and Firmware version will consistency, automatic updates 5. Modify some software bugs 6. Modify pages 4

CONTENTS

PRODUCT NAME

TWR99

TITLE

USB Writer

FEATURES

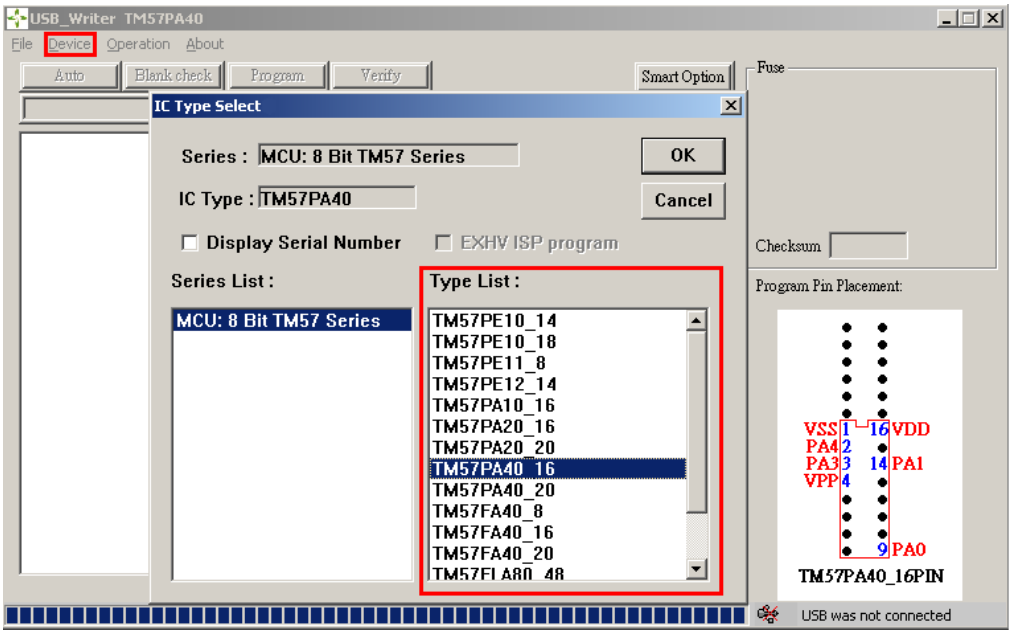
1. USB Interface.
2. The device can be attached to a computer and controlled by software for programming or it can also be operated independently as a stand-alone writer.
3. Both software and firmware can be updated.

1. Support 8-bit series IC

1.1 8-bit TM52 series: Please refer to the Device List in the TWR99 Software.

1.2 8-bit TM56 series: Please refer to the Device List in the TWR99 Software.

1.3 8-bit TM57 series: Please refer to the Device List in the TWR99 Software.



1.4 IC Program Filename Extension:

1.4.1 TM52 series IC Program Extension: *.tenx file

1.4.2 TM56 series IC Program Extension: *.hex file

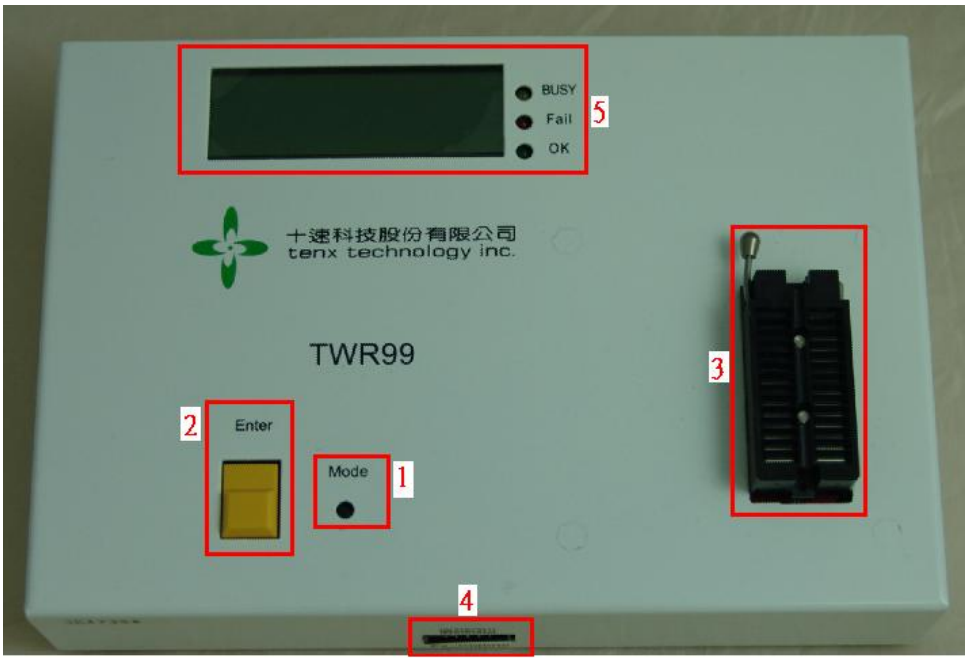
1.4.3 TM57 series IC Program Extension: *.hex file

2. Hardware and PC setup

Step 1: Connect the DC 9V Adapter and USB Cable (mini B Type).

Step 2: Turn the Power on.

3. Hardware Function Description



3.1 Mode button: click once will switch to the next mode (as shown in Table 1)

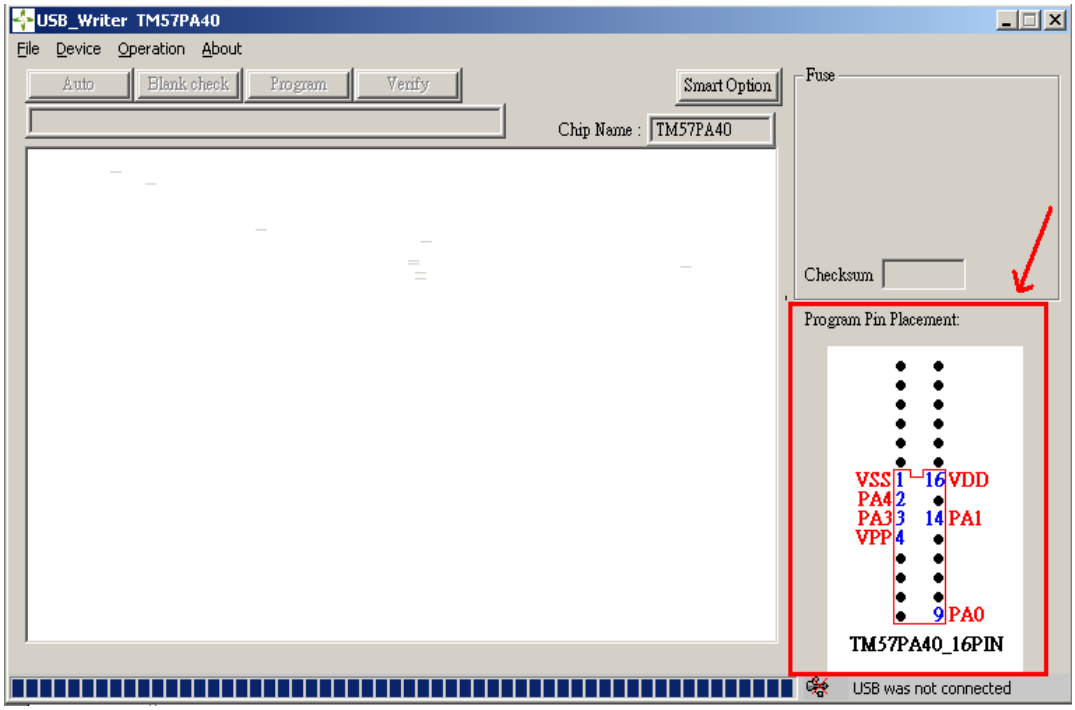
Table 1

NO.	LCD Display mode	Description
1	**CHIP NAME (ex. TM57PA40)**	CHIP NAME
2	**AUTO**	AUTO (Blank check + Program + Verify) function
3	**BLANK CHECK**	BLANKCHECK function (OTP series IC: Blankcheck) (FLASH/MTP series IC: Erase+Blank check)
4	**PROGRAM**	PROGRAM (Program + Verify) function
5	**VERIFY**	VERIFY function
6	**CHECKSUM_EEPROM**	This function is used to check the correctness of the PC download data, which is to be programmed to the EEPROM. It is deemed correct if the Checksum value from EEPROM is equal to the Checksum value from software.
7	**CHECKSUM_O OTP**	This function is used to read back the data from the OTP Chip to do the Checksum calculation. It will be deemed correct only if the Checksum value from OTP chip is equal to the Checksum value from EEPROM.
8	**FW_VERSION**	FW_VERSION => (ex. TM57PA40 : 1.2)

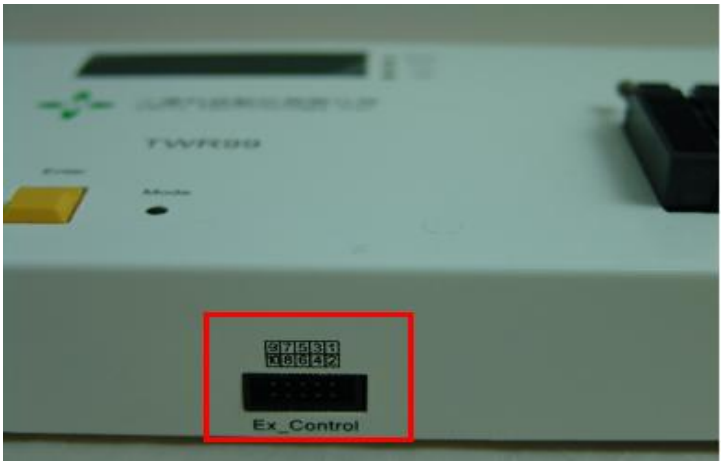
3.2 Enter button: once the mode is selected, press Enter to execute.

3.3 Programming pins for IC type:

Please refer to the Program Pin Placement in the TWR99 software.



3.4 EX_Control: External Control Signal



3.4.1: Signal Name and Pin Location

9:N.C.	7:Result2	5:GND	3:Result0	1:VDD
10:N.C.	8:N.C.	6:GND	4:Result1	2:Start

3.4.2: Signal Function

1. VDD pin => Output Power, +3V
2. Start pin => Input Start signal, Hi Pulse valid (start signal valid width >10 ms)
3. Result0, Result1 and Result2 pins => Output Programming result, the status is as below:

Result2	Result1	Result0	Status
1	0	0	BUSY
0	1	0	FAIL
0	0	1	OK

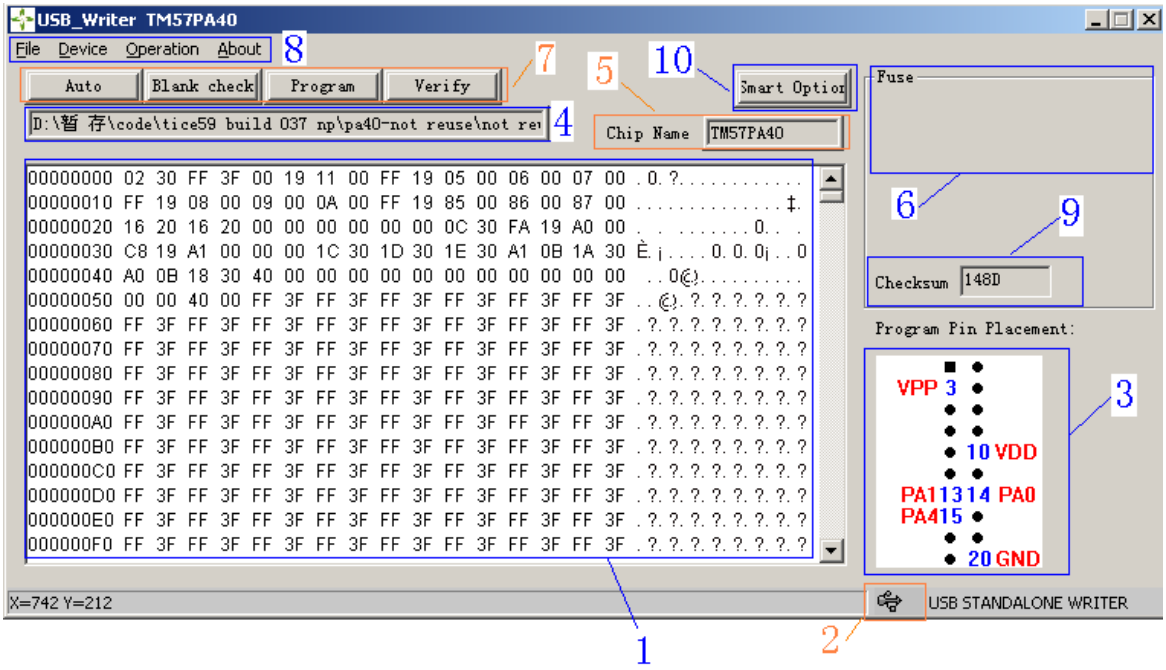
3.5 LCD Panel and LED: Display the programming result.

3.5.1 Yellow LED: the LED blinks when downloading writer file data or during writing process, means it is in busy state.

3.5.2 Red LED: red light ON means writing process fails. When IC is taken away or writing mode is switched to another mode, LED will be switched off.

3.5.3 Green LED: green light ON means the writing process succeeded. When IC is taken away or writing mode is switched to another mode, LED will be switched off.

4. Software Function Guide



1. Display the programming data
2. Display whether the TWR99 Device is connected to PC or not
3. Display OTP IC programming-pins placement (Corresponding to the Hardware programming port)
4. Display the file path and the HEX file name
5. Display the Chip name
6. Display IC Fuse data
7. Program Toolbar:

   7.1: Execute programming instruction (Auto, Blank, Check, Program, Verify, etc... functions, which, just like using the function of "Mode" button on hardware, can be executed directly from the software when TWR99 USB port is connected to the PC)

   7.2: Blank check function

   7.3: Program function (program + verify)

   7.4: Verify function
8. Menu bar:

   8.1: File => Load the HEX file.

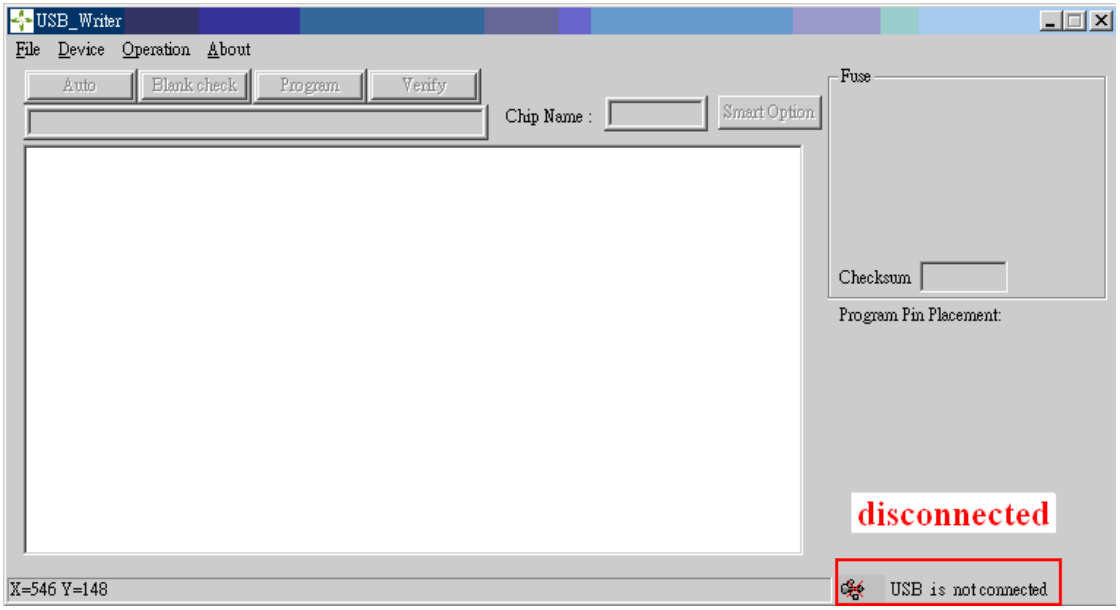
   8.2: Device => Select programming CHIP.

   8.3: Operation => Update Firmware, programming Serial Number, Check for new software version.

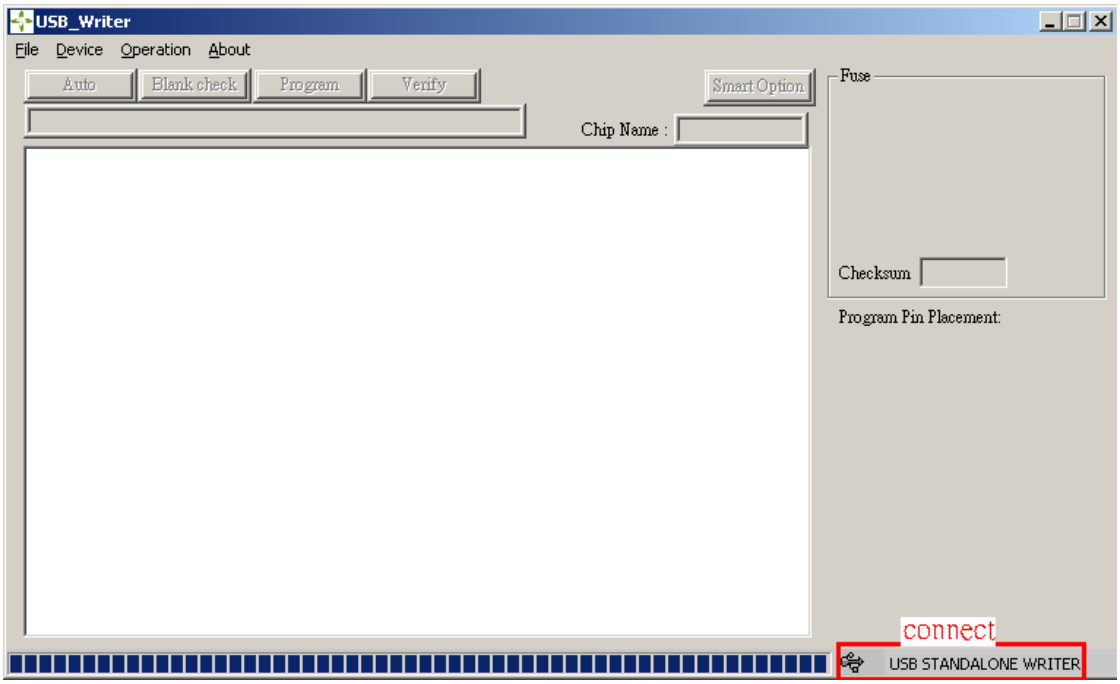
   8.4: About => Display software version.
9. Checksum: Display the Checksum value of the programming file.
10. Smart Option: Display System Configuration definition.

5. TWR99 Software Operation

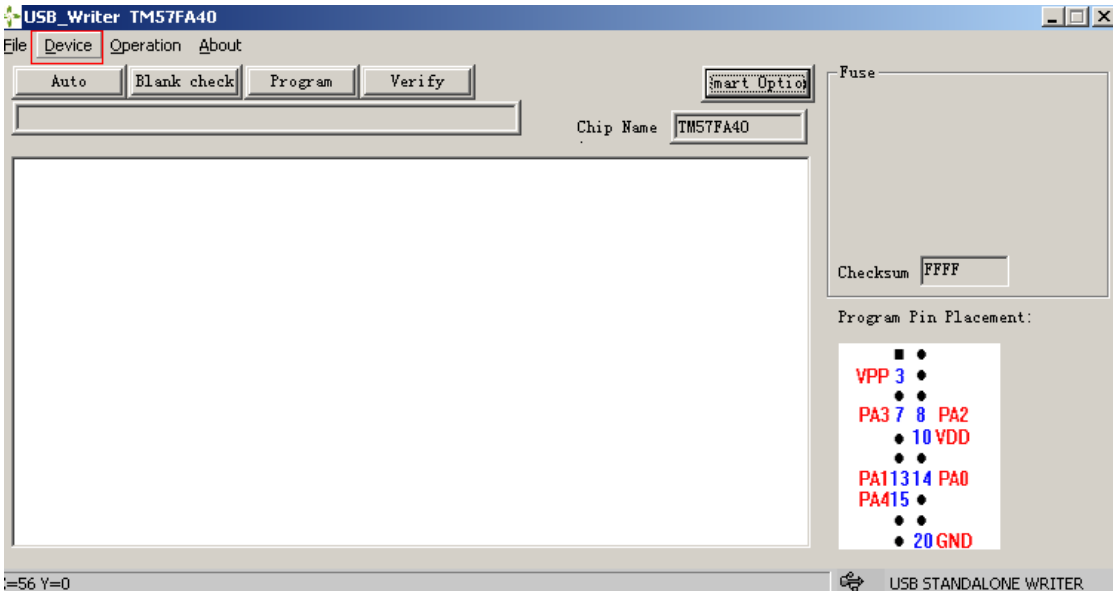
Step 1: Start the TWR99 Software tool.

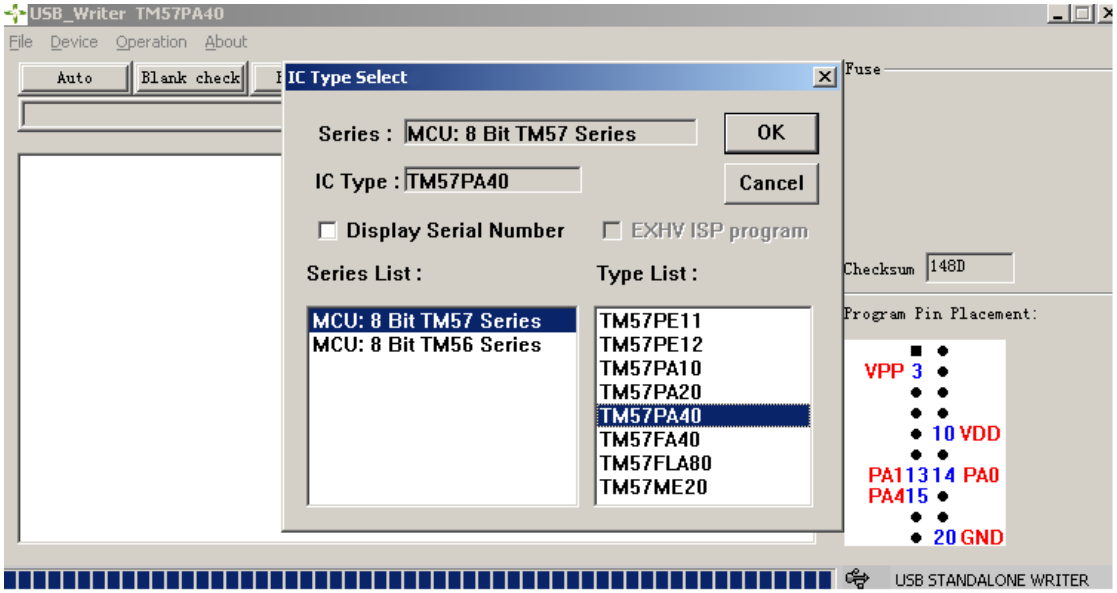


Step 2: The TWR99 writer is open; confirm that the TWR99 Device is connected to PC.

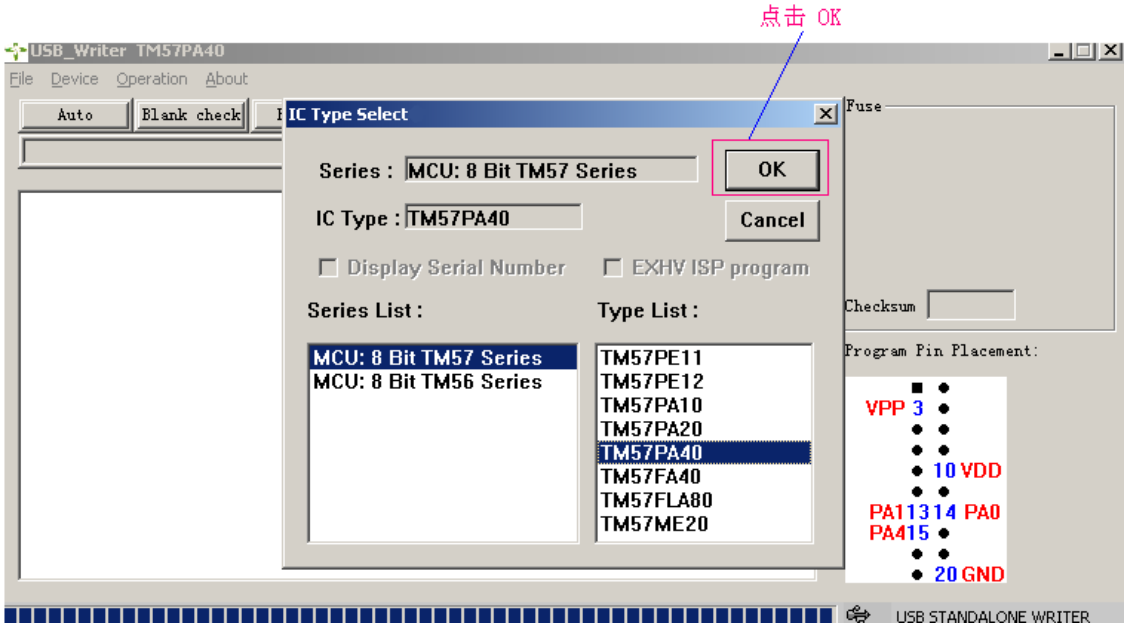


Step 3: Click on Device (Select CHIP)

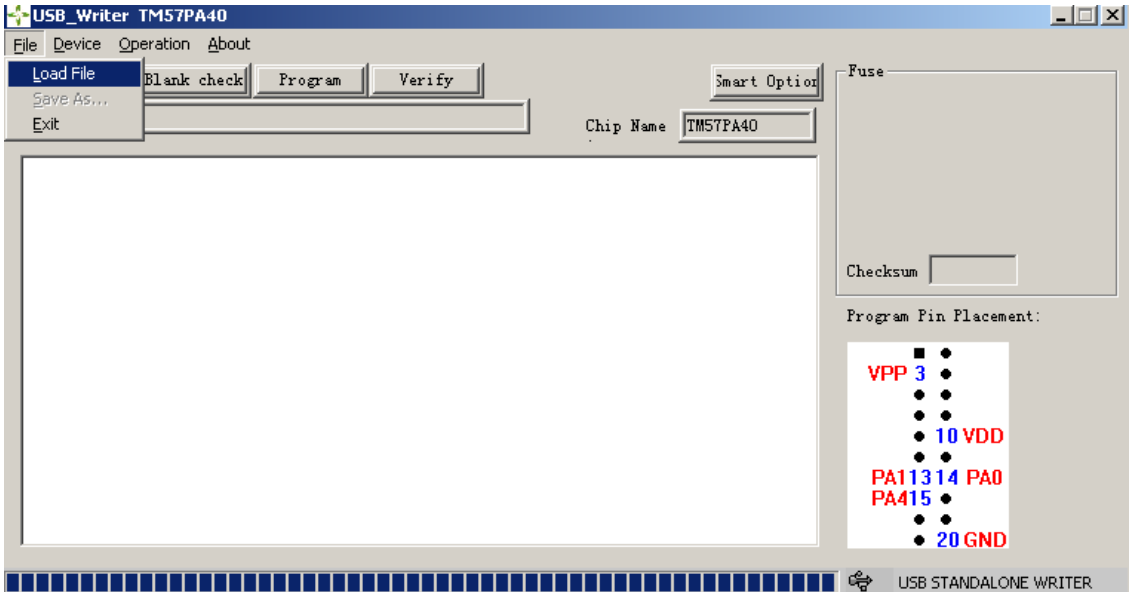




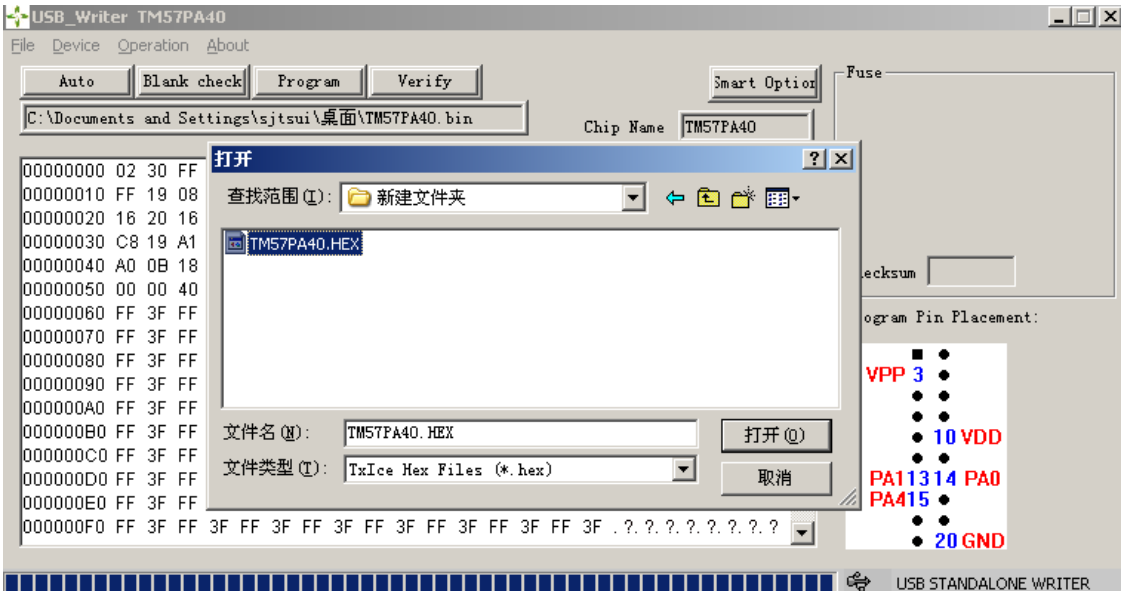
Step 4: Select programming CHIP.



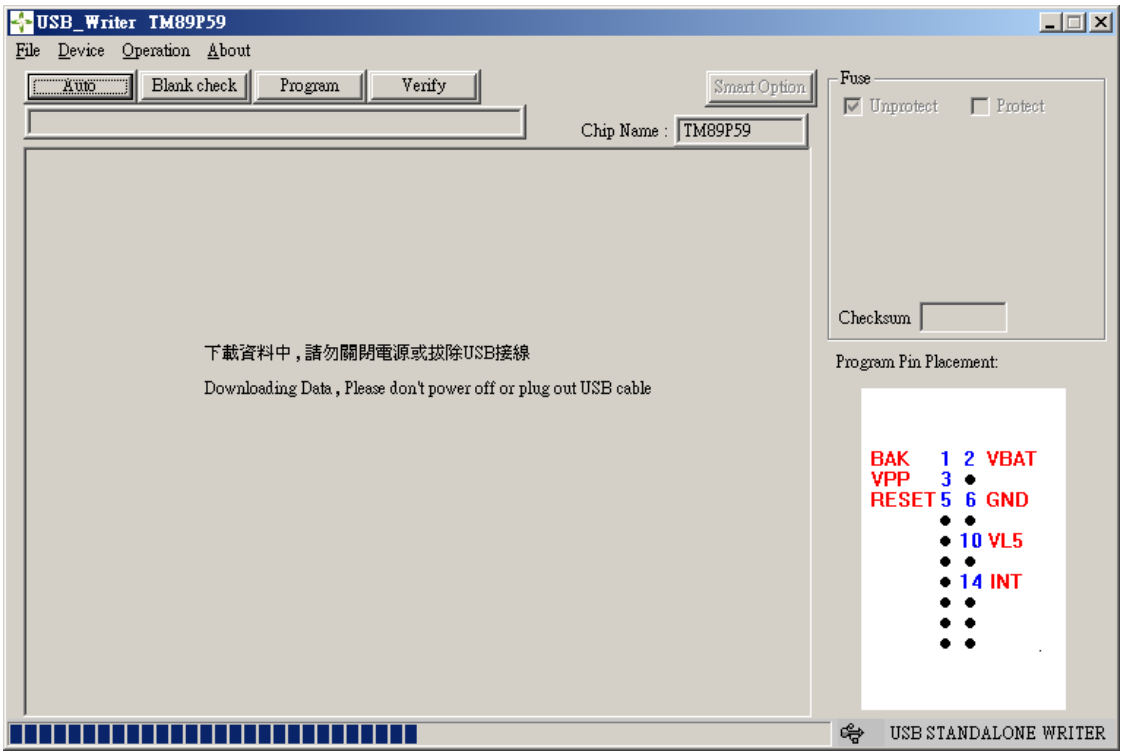
Step 5: Click on “File” => select “Load File”.



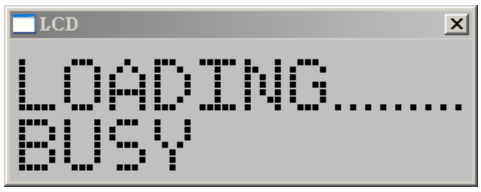
Step 6: Select the HEX file



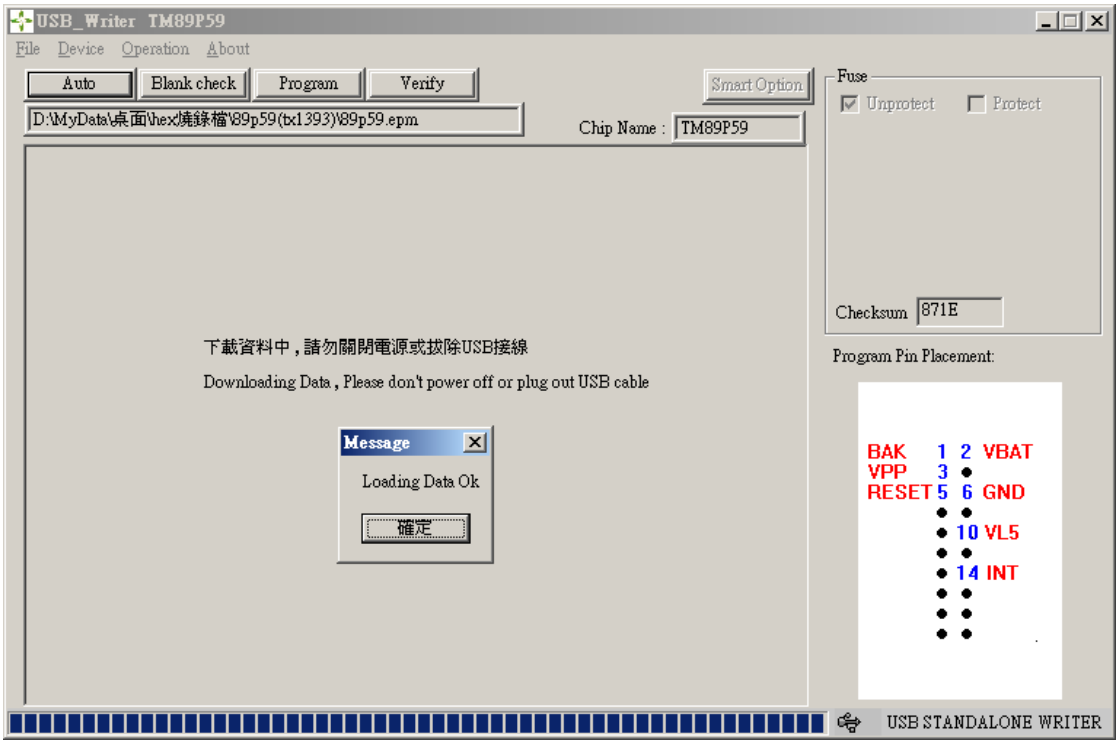
Step 7: Load the file



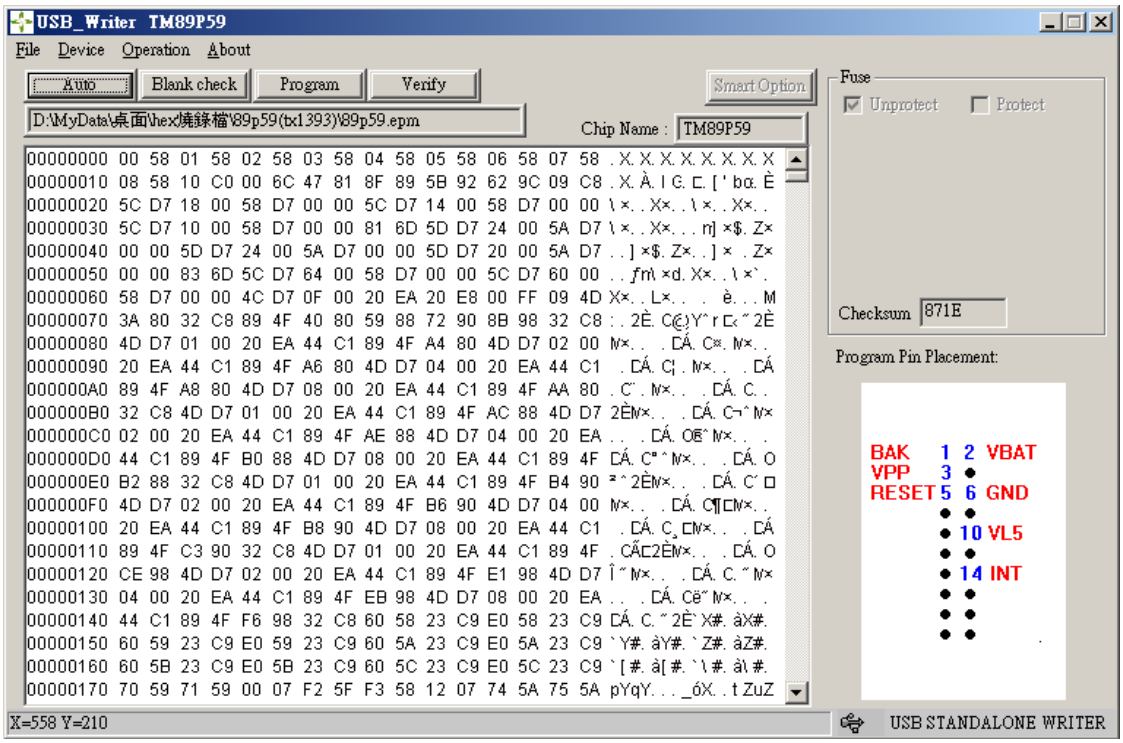
Step 8: When loading the file, the LCD of the writer will display as follows



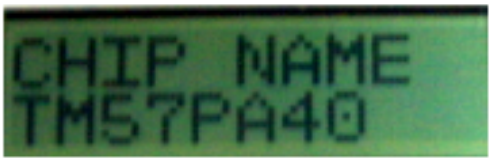
Step 9: The download is completed



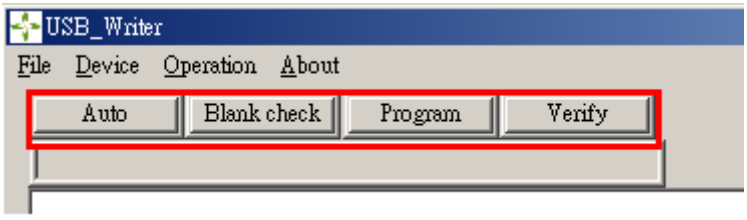
Step 10: Start execution (start loading into hardware)



Step 11: After successfully loading the file, the LCD panel on the writer will display the CHIP NAME.

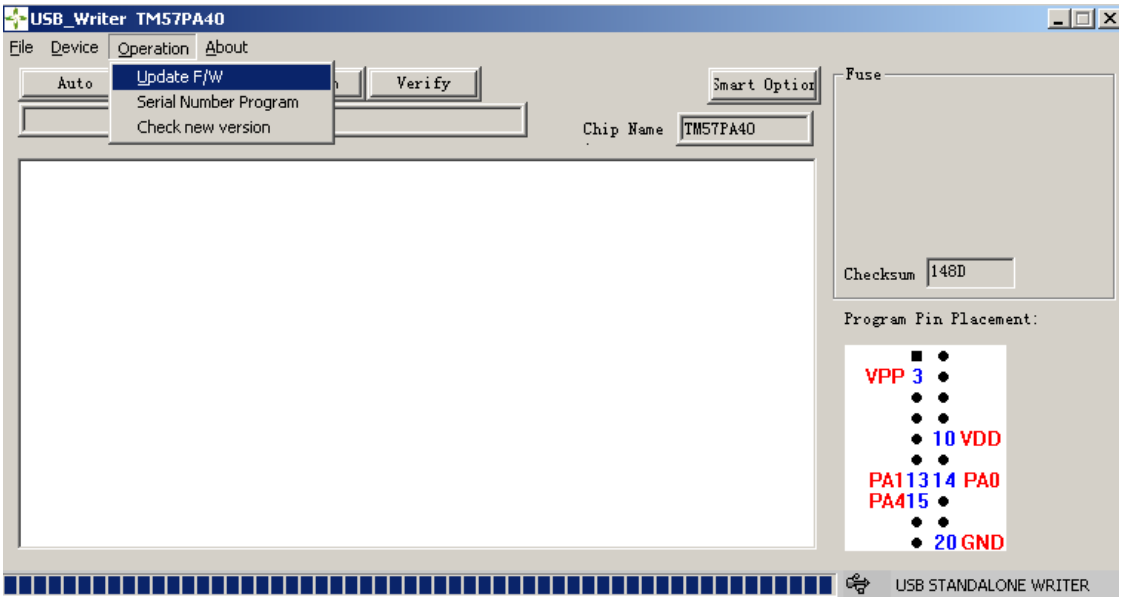


Step 12: Select the function on the toolbar (Auto, Blank, Check, Program, Verify).

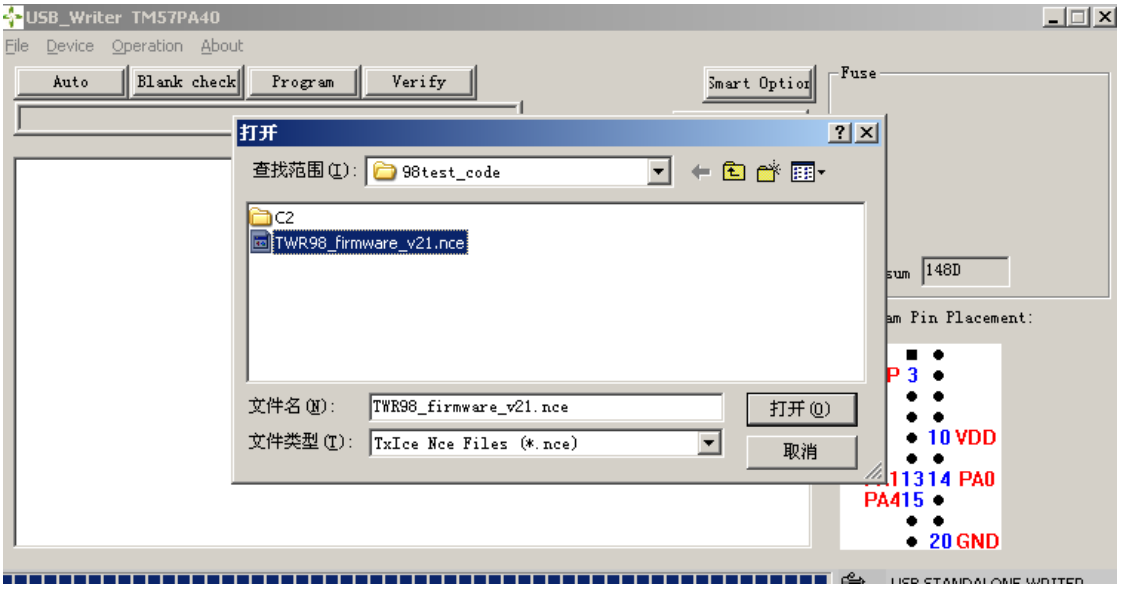


6. Manually Update Firmware Steps

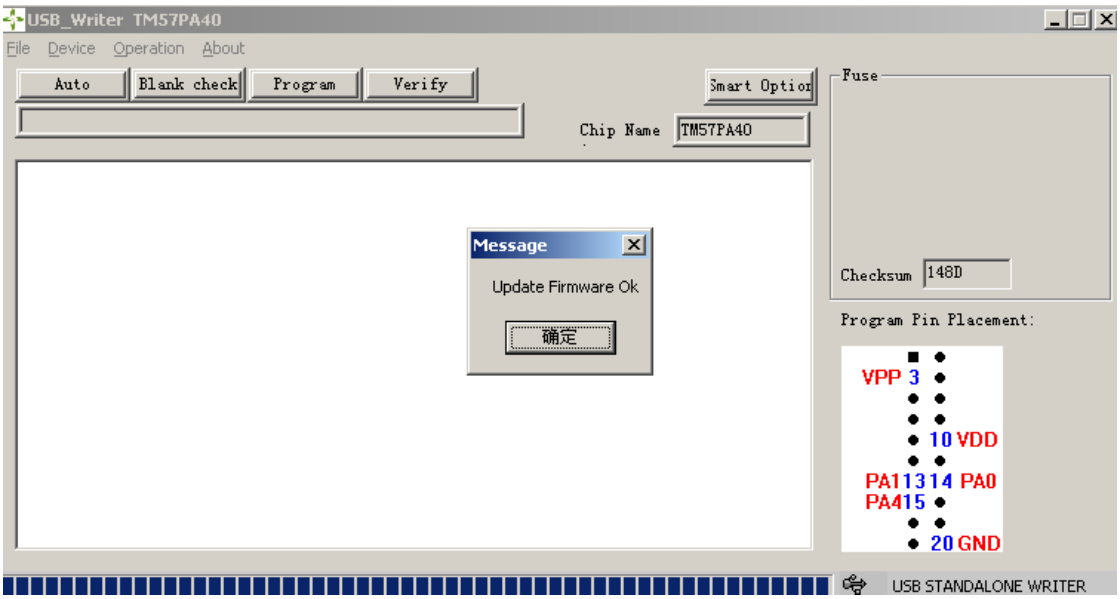
Step 1: Click on “Operation” => select “Update F/W”



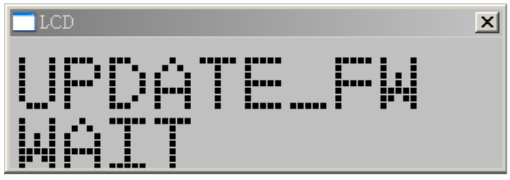
Step 2: Select the file to Update.



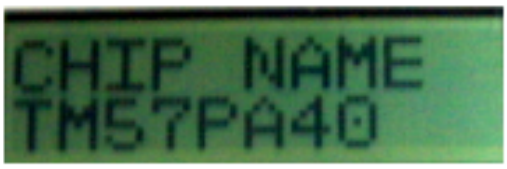
Step 3: Click on “open” (start loading into hardware)



Step 4: During the Updating Firmware period, the LCD will display UPDATE_FW WAIT.



Step 5: After successfully updating Firmware, the LCD will display the CHIP NAME.

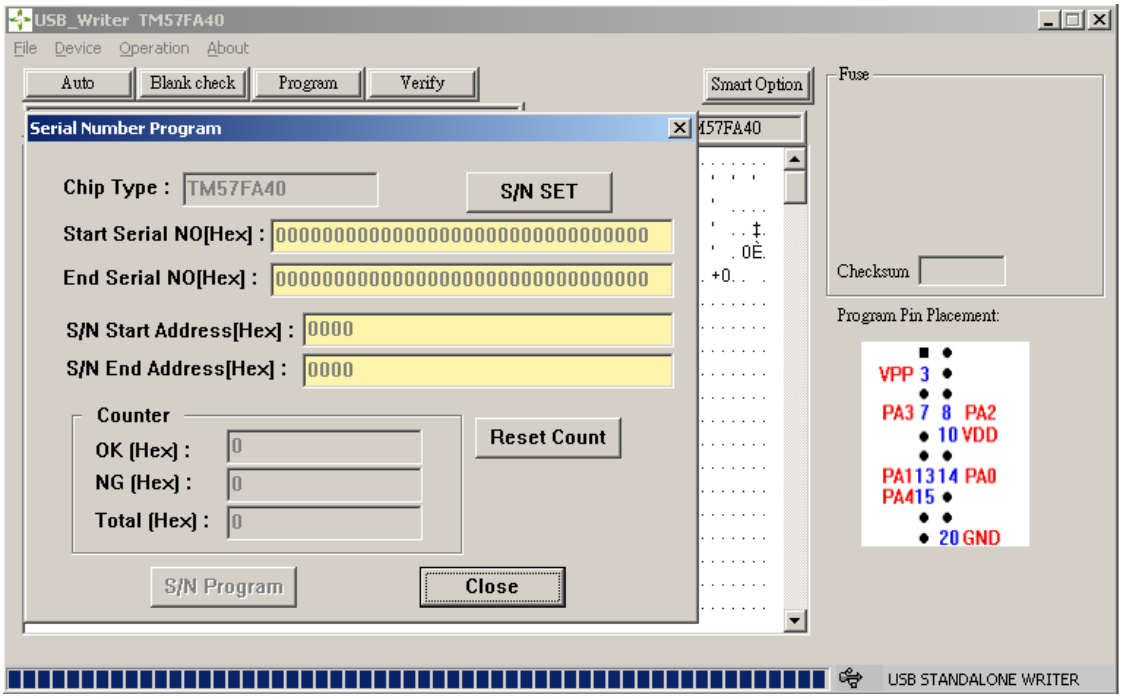


7. Serial Number Programming Set-up Flow

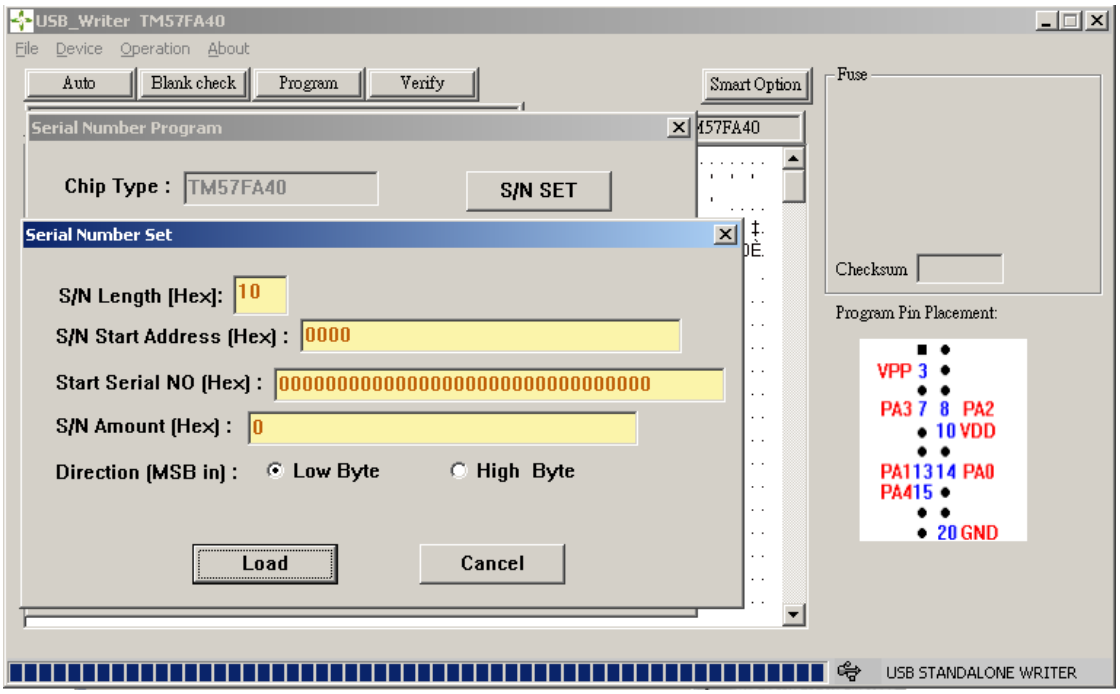
Step 1: Confirm that TWR99 Device is connected to PC.

Step 2: Select Device -> Select CHIP and Click OK (USB: support Low speed and Full speed series)

Step 3: Select Operation -> Serial Number Programming.



Step 4: Select S/N SET=> Setting the Serial Number parameters.



Step 5: Setting the S/N Length[Hex] (range: 0x01~0x10)

Step 6: Setting the S/N Start Address[Hex].

Step 7: Setting the Start Serial NO[Hex].

Step 8: Setting the S/N Amount[Hex] (the amount of OPT IC programming).

Step 9: Setting the S/N Direction[MSB In]

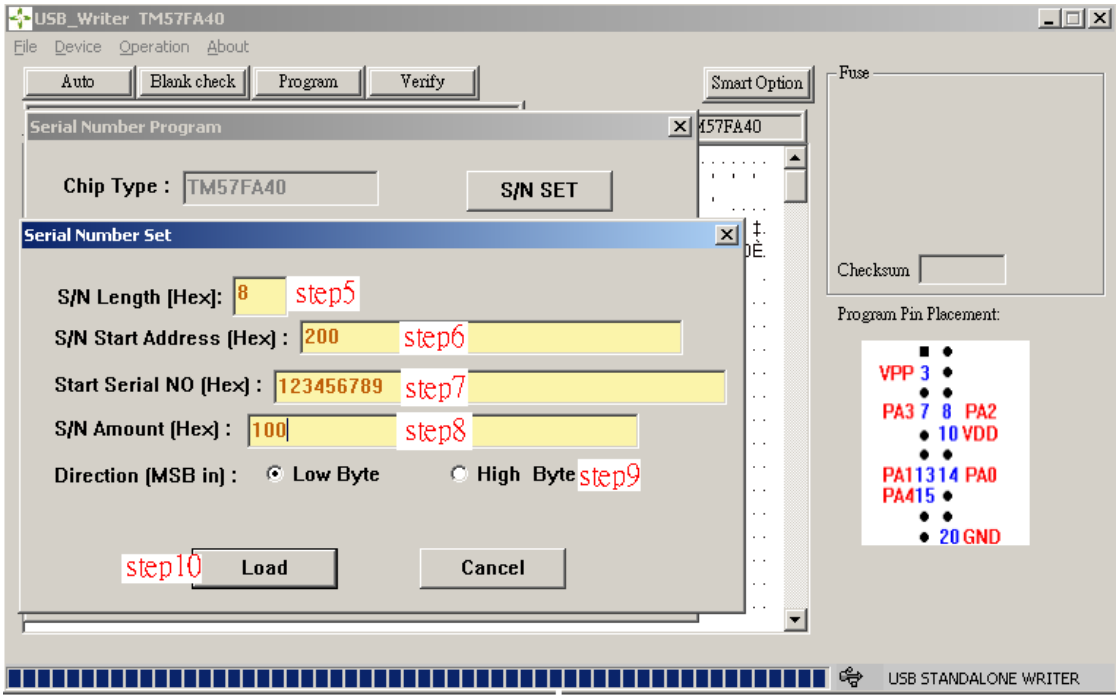
For Example: Serial Number value=12345678

Select “Low Byte” to program the OTP IC location: 12 34 56 78

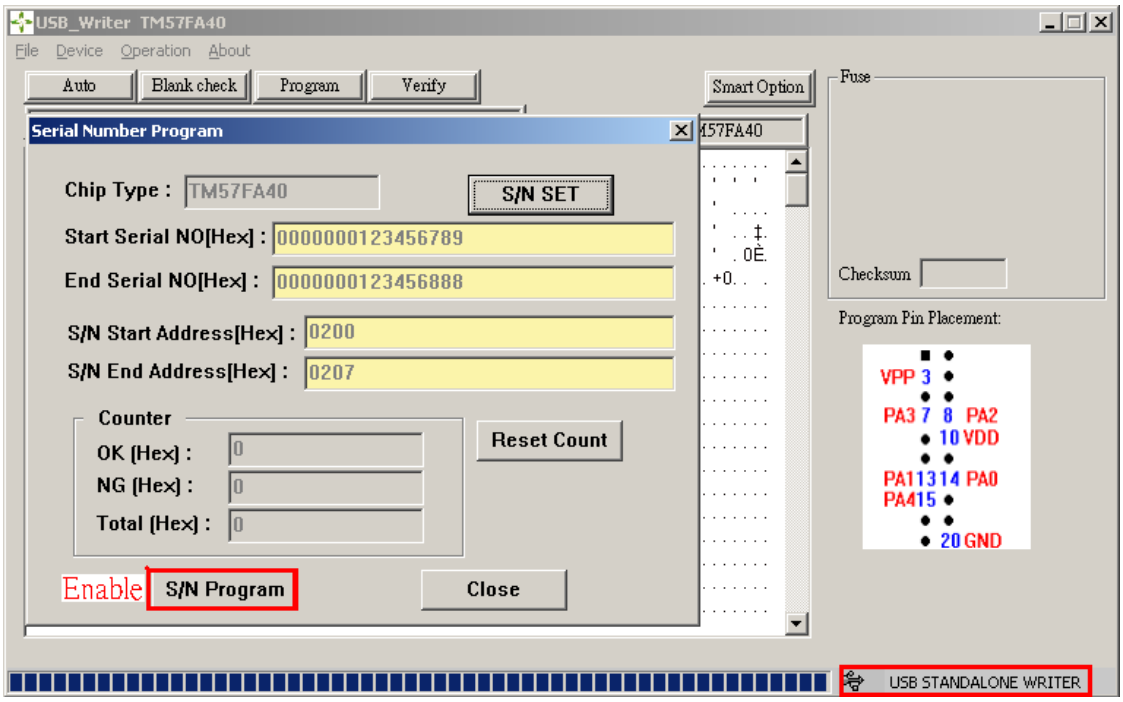
Select “High Byte” to program the OTP IC location: 78 56 34 12

Step 10: After the setting procedure, click the Load button (load the serial configuration data into TWR99, please wait for it to complete)

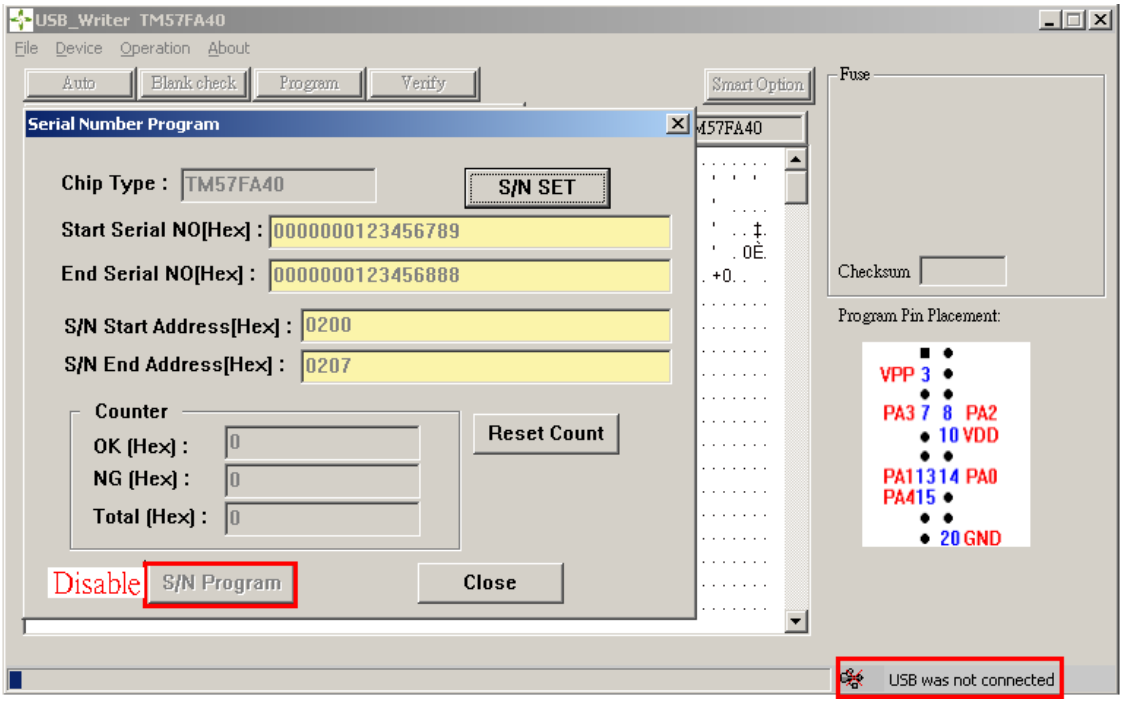
If USB is not connected, the configuration data of serial number cannot be loaded successfully.



Step 10_1: Once data are loaded successfully, the S/N Program button will be enabled.



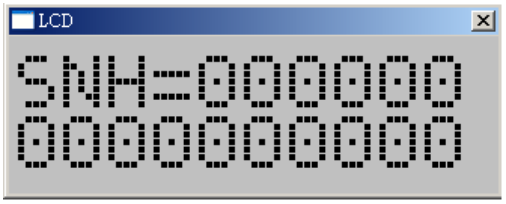
Step 10_2: If the data are not loaded successfully, the S/N Program button will be disabled.



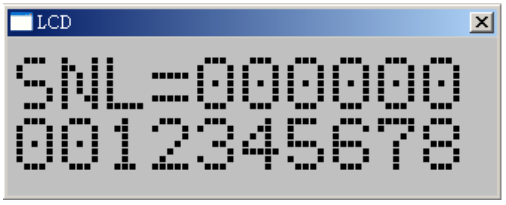
After the above steps are completed, user can choose two modes of operation: to connect to PC and let PC control the programming process or go offline and programmed by using TWR99 independently.

1. Operating guide for using PC to control the programming process:
   a. Click on S/N Program button to start the programming process.
   b. If programming is successful, the count number for "Start Serial NO", "OK", and "Total" will be incremented by 1 automatically.
   c. If programming is fail, the count number for "NG", "Total" will be incremented by 1 automatically.
   d. When the S/N Program button is disabled, it means that the programming process for the serial number is completed. Reset and reload configuration data of S/N from the "S/N SET" window if required.
   e. "Reset Count" button will reset the "OK", "NG", and "Total" count number to zero.
   f. **Attention:** Do not press the "Enter" key on the TWR99 hardware during programming if PC control mode is used.
2. Operating guide for using TWR99 writer for programming independently:
   a. The function for the Mode button is to switch the display value for "Serial Number", "OK", "NG", or "TOTAL".

      a-1: SNH => Display higher order digits of Serial Number (9~16 bytes), but when S/N Length is less than 9, this mode will not display the number.



      a-2: SNL => Display lower order digits of Serial Number (1~8 bytes).



      a-3: OK => Display the number of successful programming.

a-4: NG => Display the number of fail programming.

a-5: TOTAL => Display the total number of programming.

b. The function for the “Enter” key is to execute programming procedure.

c. If programming is successful, the count number for “Serial Number”, “OK”, and “TOTAL” will be incremented by 1 automatically.

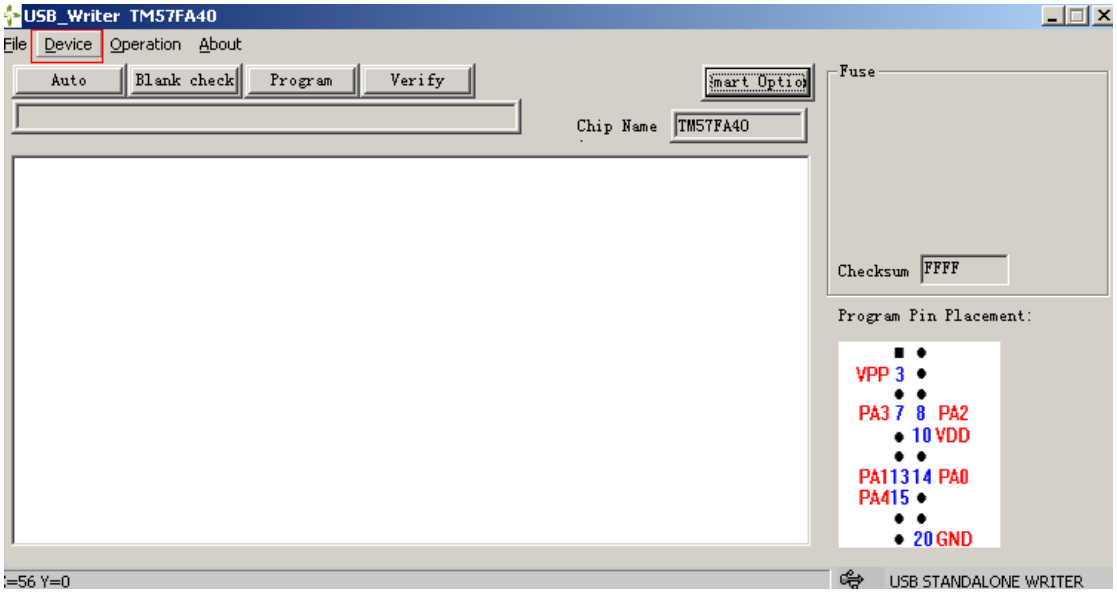
d. If programming is fail, the count number for “NG”, “TOTAL” will be incremented by 1 automatically.

e. When the “Enter” key is disabled, it means that the programming procedure for the serial number is completed. Reset and reload configuration data of S/N from the “S/N SET” window if required.

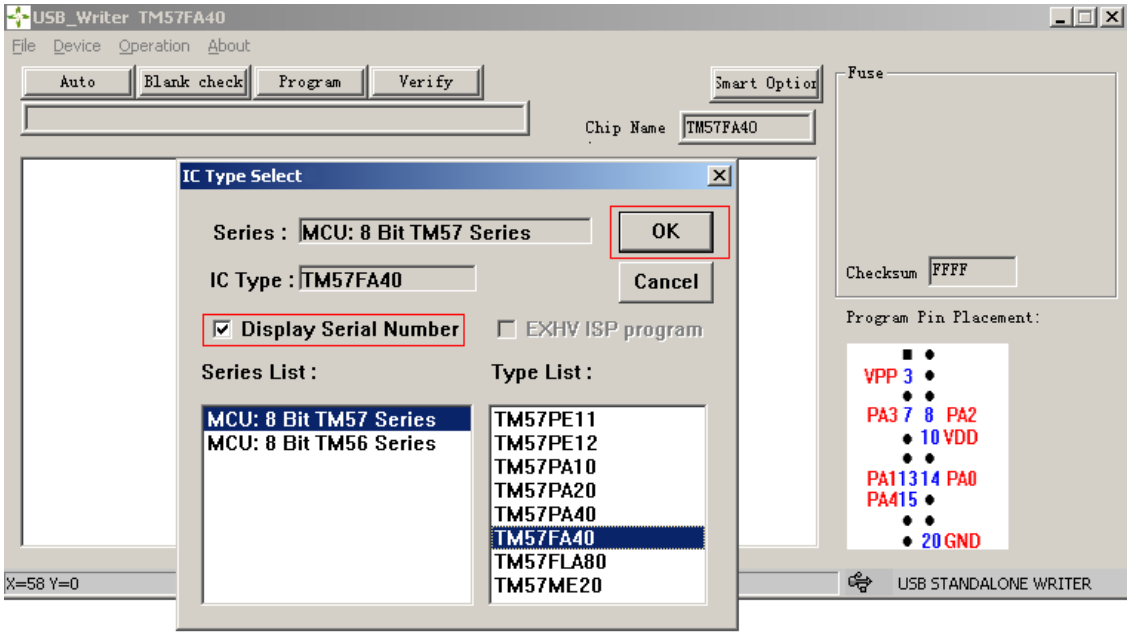
f. **Attention:** if the power of TWR99 is turned off and on again, the serial number will be reset back to the initial value.

8. Set-up and Operations for Programming Serial Number

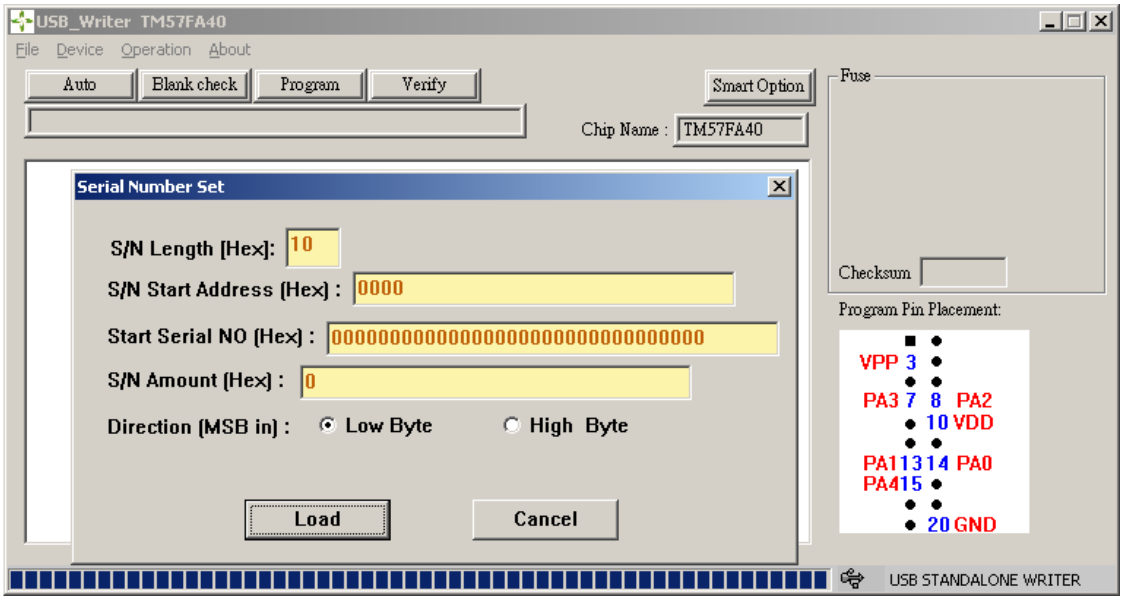
Step 1: Select “Device”:



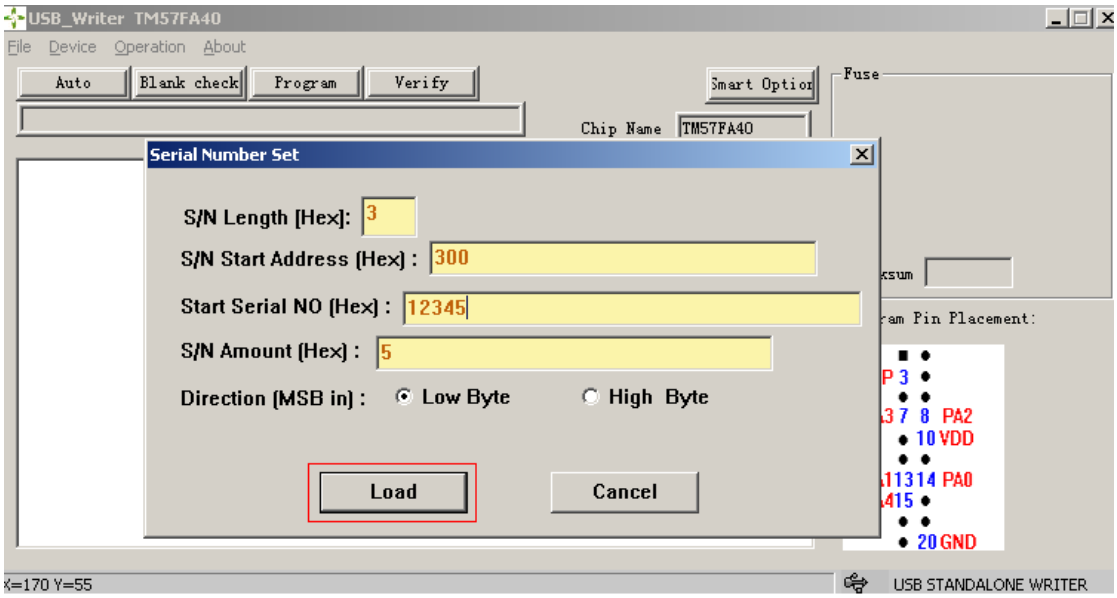
Step 2: After selecting IC type, please enable the “Display Serial Number”, then click on “OK”.



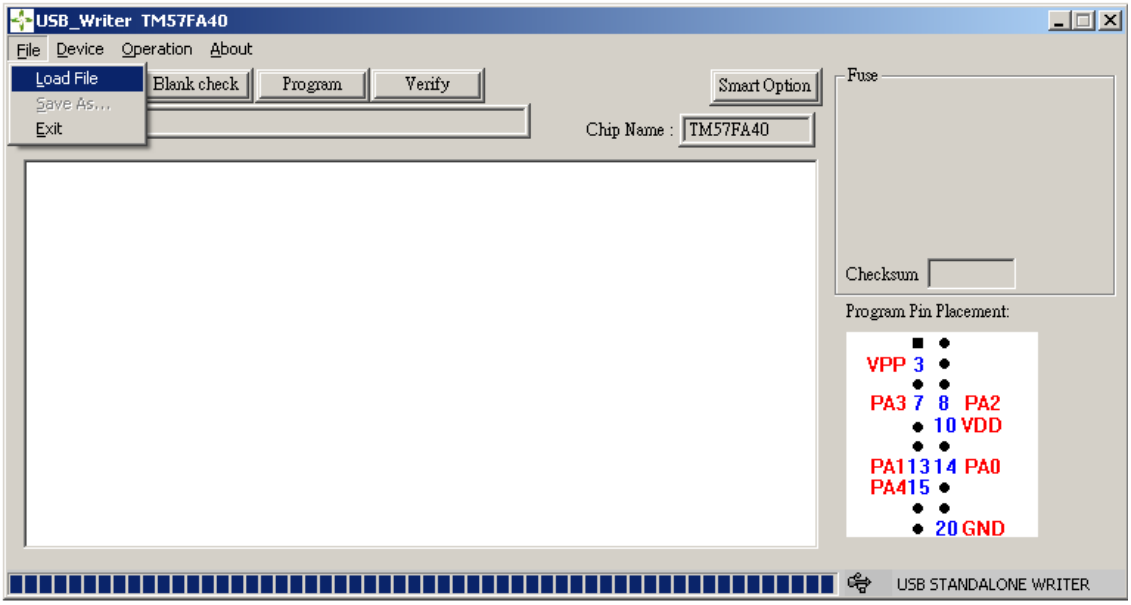
Step 3: Enter “Serial Number Set” setting (Please refer to 7. Serial Number Programming Set-up Flow, step 5~step 9)



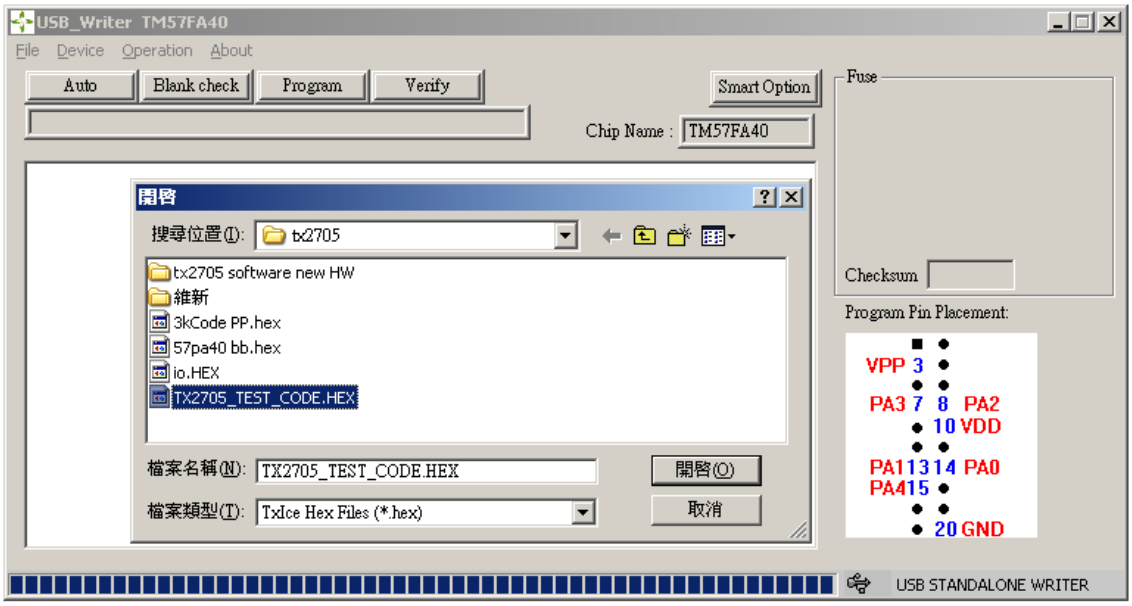
Step 4: After setting the data in “Serial Number Set” window, click on the “Load” button.



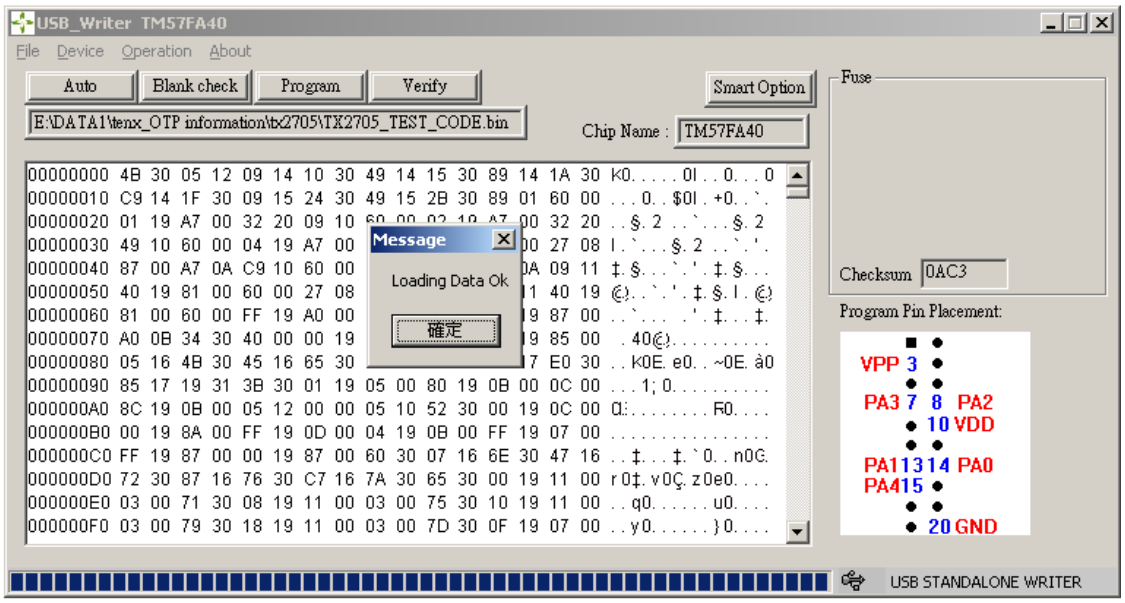
Step 5: Click on “File” -> Select “Load File”



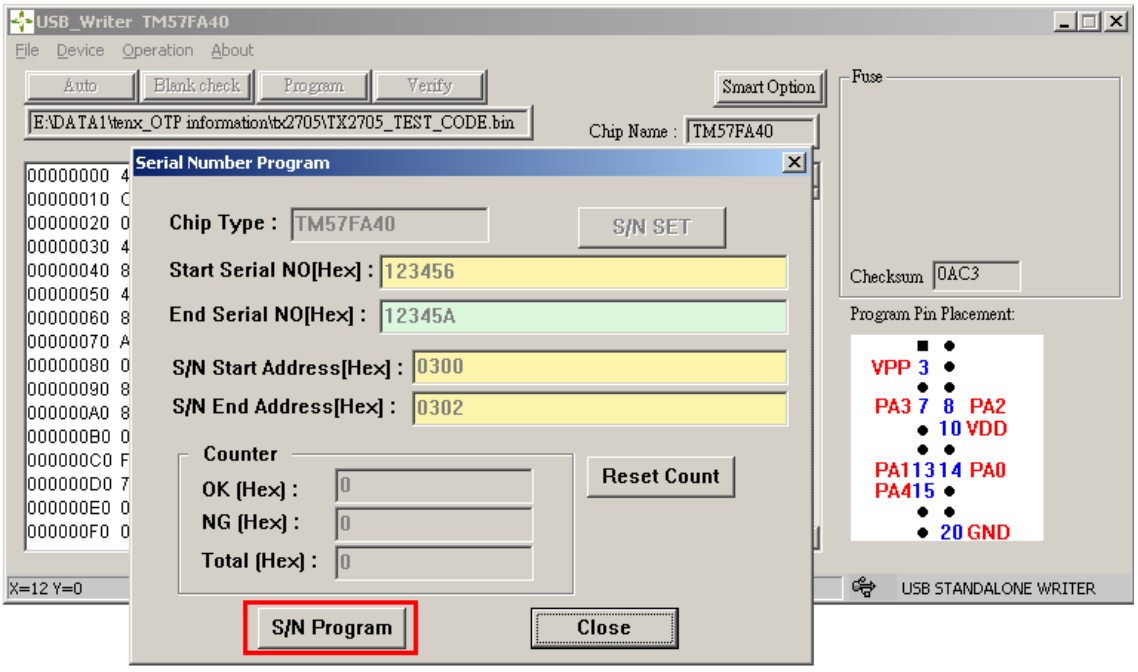
Step 6: Select the HEX file then click on “open” button.



Step 7: Wait until the files are downloaded OK, click on “confirm” button to enter the Serial Number Program mode



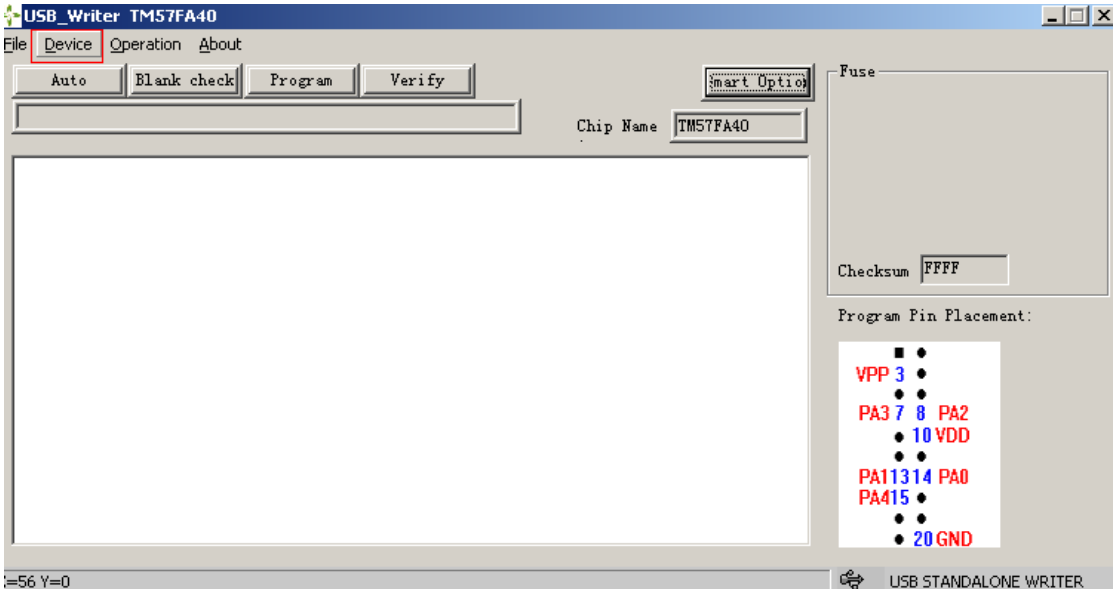
Step 8: Click on “S/N Program” button to start programming process



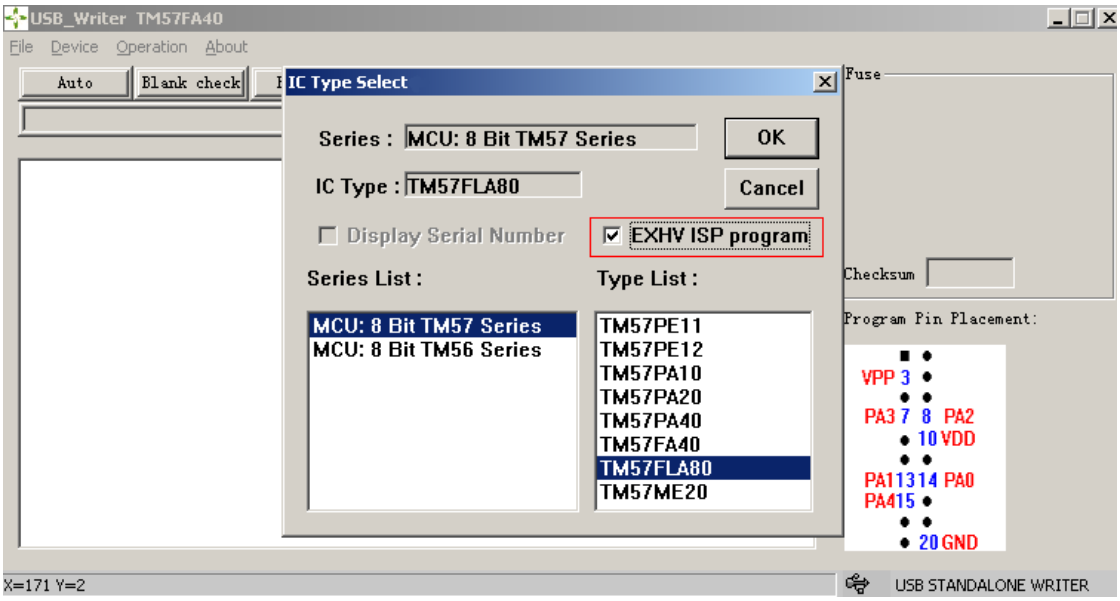
Notes: After the completion of programming process, if programming code + serial number is desired, go back to Step1 and start all over.

9. Programming Guide for EXHV ISP Mode

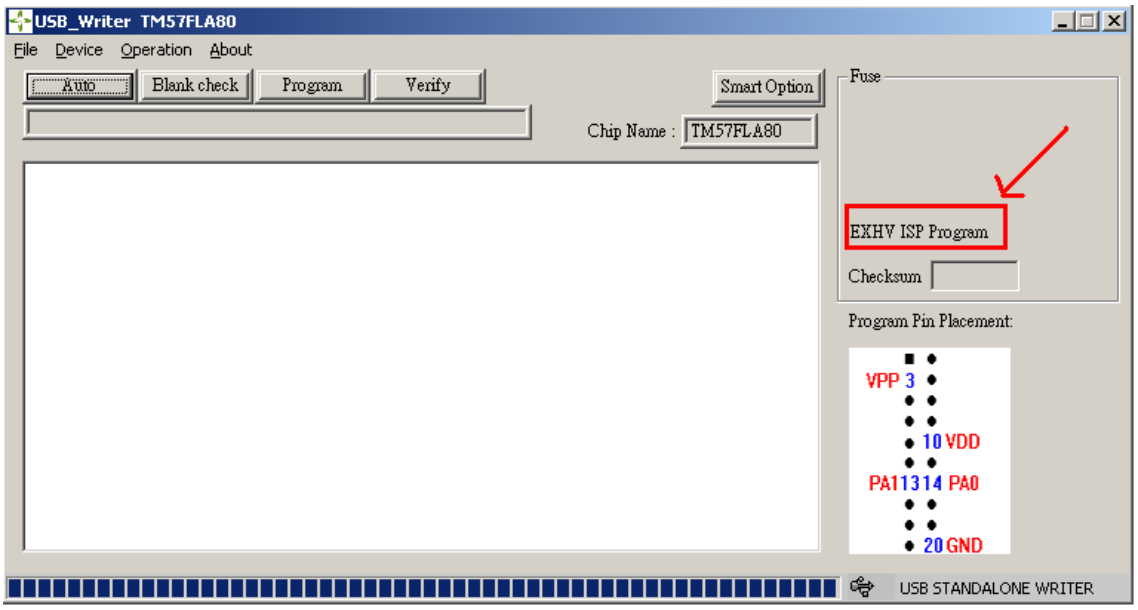
Step 1: Select Device



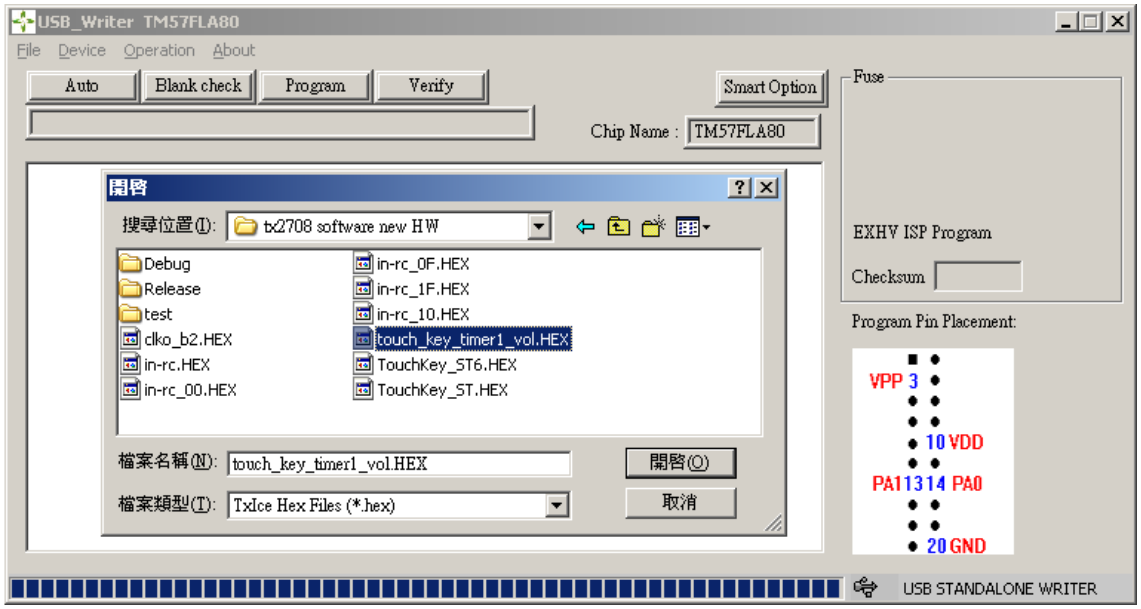
Step 2: Select IC type and check mark “EXHV ISP program”, and then click on “OK”



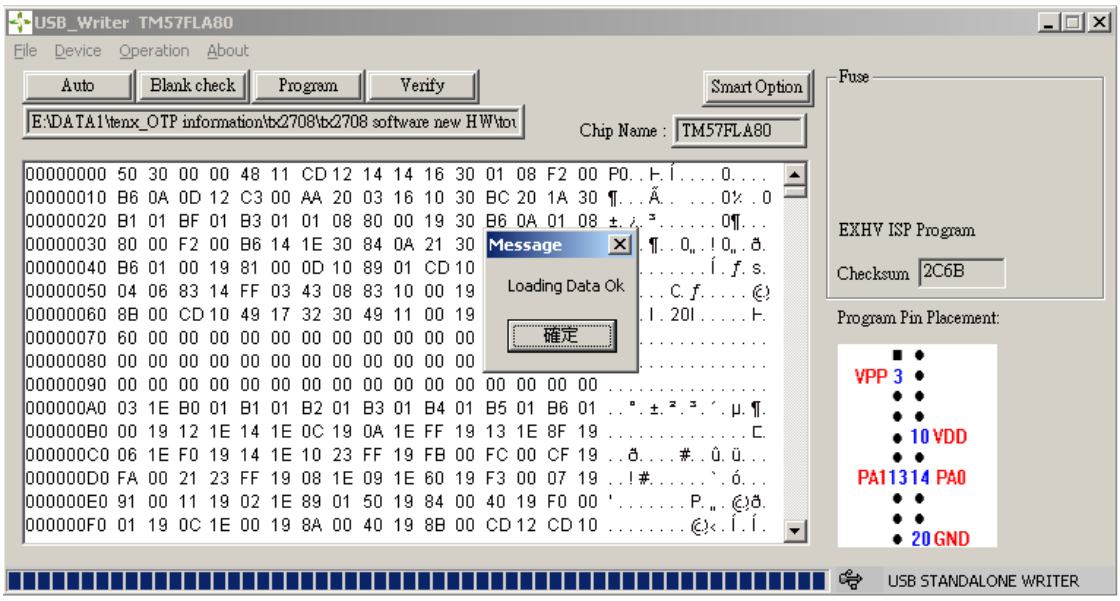
Step 3: The main screen will show “EXHV ISP Program”



Step 4: Click on “File” -> Select “Load File”



Step 5: Wait until files are downloaded OK



10. Error Messages

10.1: VOLTAGE ERROR => The voltage of VPP or VDD is abnormal
(send back TWR99 to tenx for repair).

10.2: EEPROM ERROR => Error for reading the Programming Data
(send back TWR99 to tenx for repair).

10.3: PROTECT => IC data are protected and cannot be read.

10.4: BUSY FAIL =>The IC Programming signals are connected to TWR99 well.

10.5: B FAIL => Blank Test fails

10.6: P FAIL => Programming data fails

10.7: V FAIL => Comparing data fails

10.8: I FAIL => 4-bit series Programming Mode failed

8-bit series ID Programming failed

10.9: D FAIL => Check ID fails

10.10: F FAIL => Programming the FUSE or SYSTEM CONFIG data fails

10.11: NO CHIP => IC or connection is not connected properly. Please confirm whether IC is put properly or the line is connected perfectly.

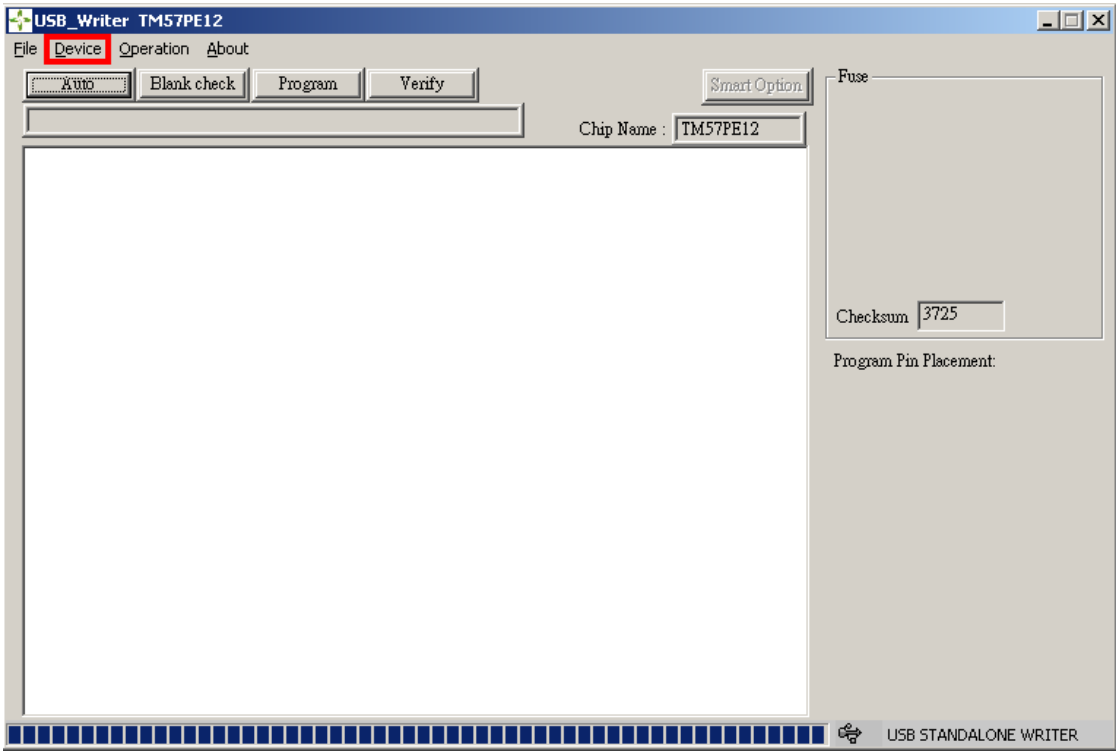
10.12: E FAIL => Writer Checksum data comparing error

10.13: ENTRANCEF => Check IC enters write mode fail

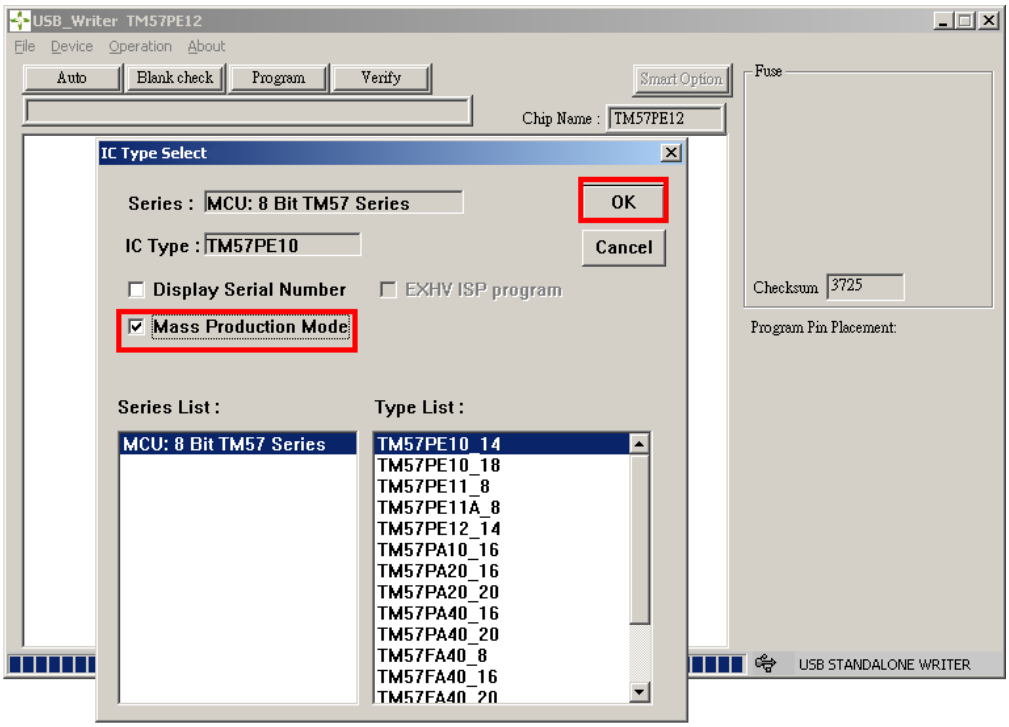
11. Programming Guide for Mass Production Mode

This function contains only Auto mode, which records OK and NG counts, and checksum display, there are no other functions, so it is recommended to be used in mass production.

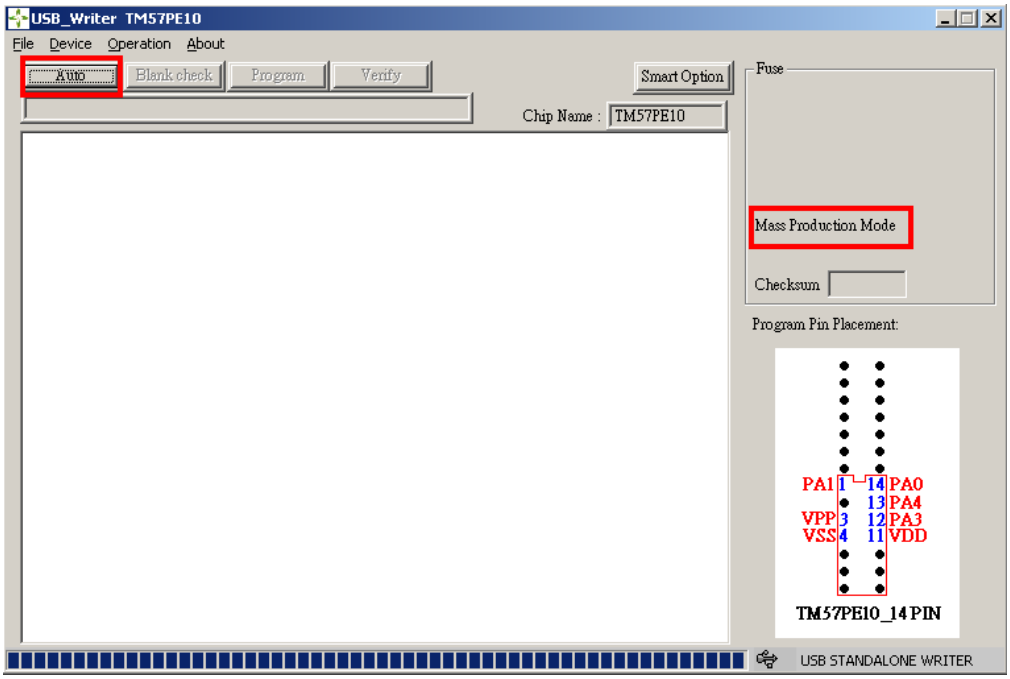
Step 1: Select Device



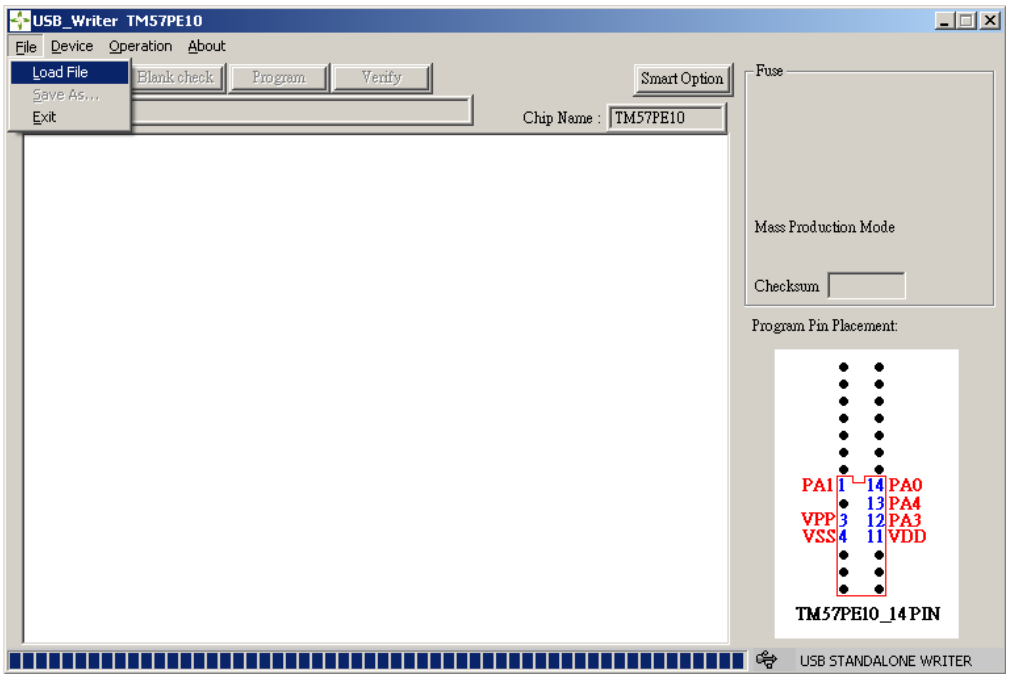
Step 2: Select IC type and enable the “Mass Production Mode”, and then click on “OK”



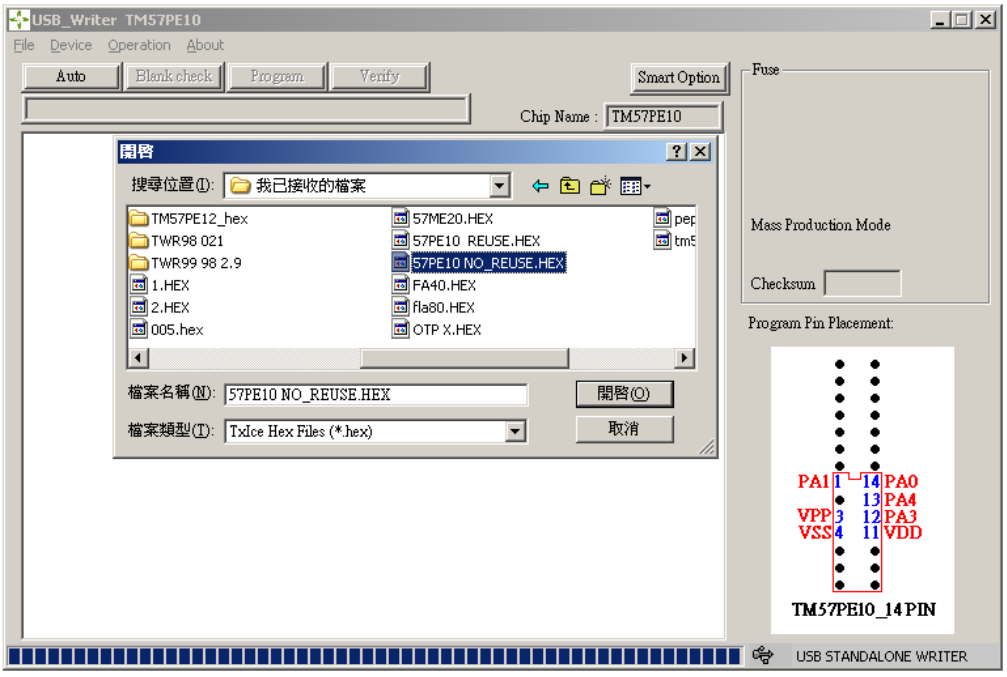
Step 3: The main screen will show “Mass Production Mode” and Enable Auto function



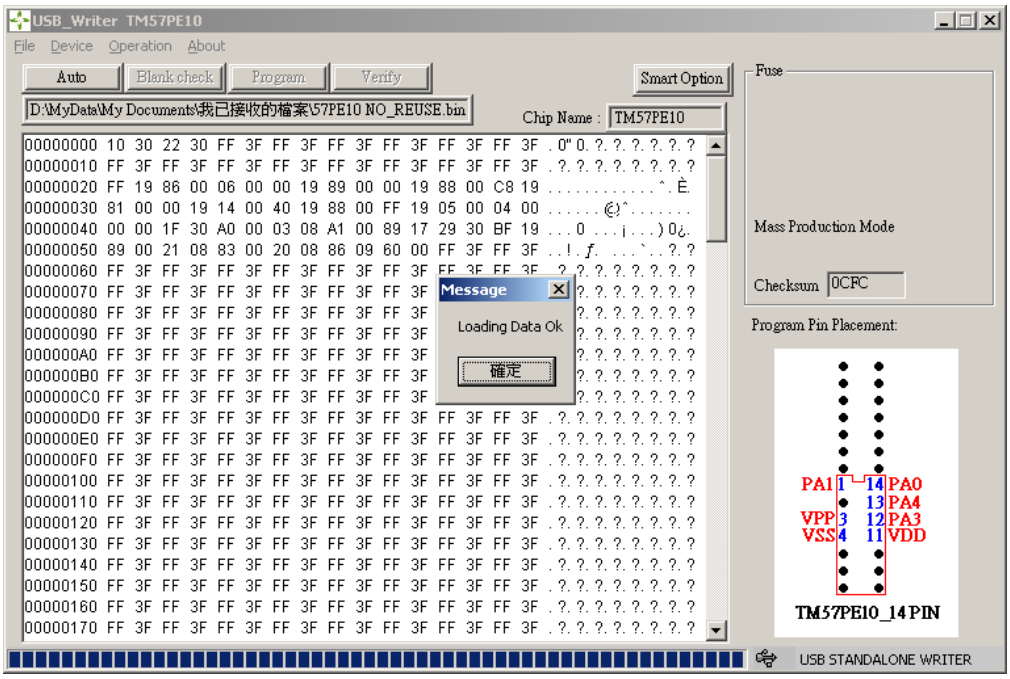
Step 4: Execute File -> Load File



Step 5: Select the programming files then click on “open” button.

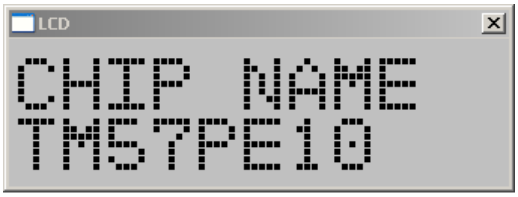


Step 6: Wait until the files are downloaded OK



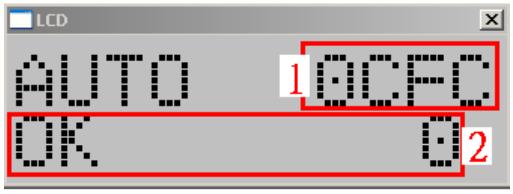
Step 7: Hardware Display and Operate:

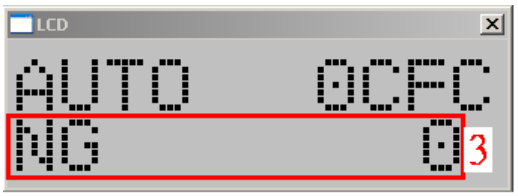
a. Display CHIP NAME (Hold 2 sec Display)



b. Display Auto Mode: (Mode button: click once will change OK and NG Display)

1. Display Checksum
2. Display the counting number that the programming procedure is successful.
3. Display the counting number that the programming procedure is not successful.





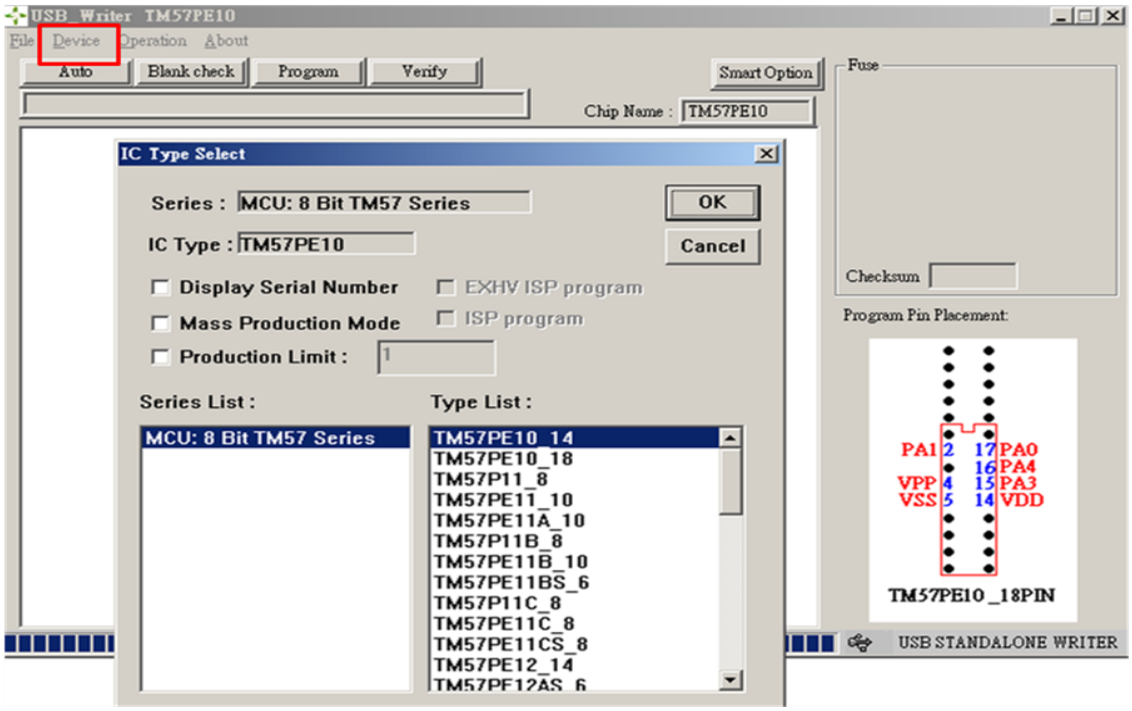
c. Display Firmware version and Checksum_E information (Press the Mode button more than 3 seconds to get the information).

d. Enter button: press Enter to execute.

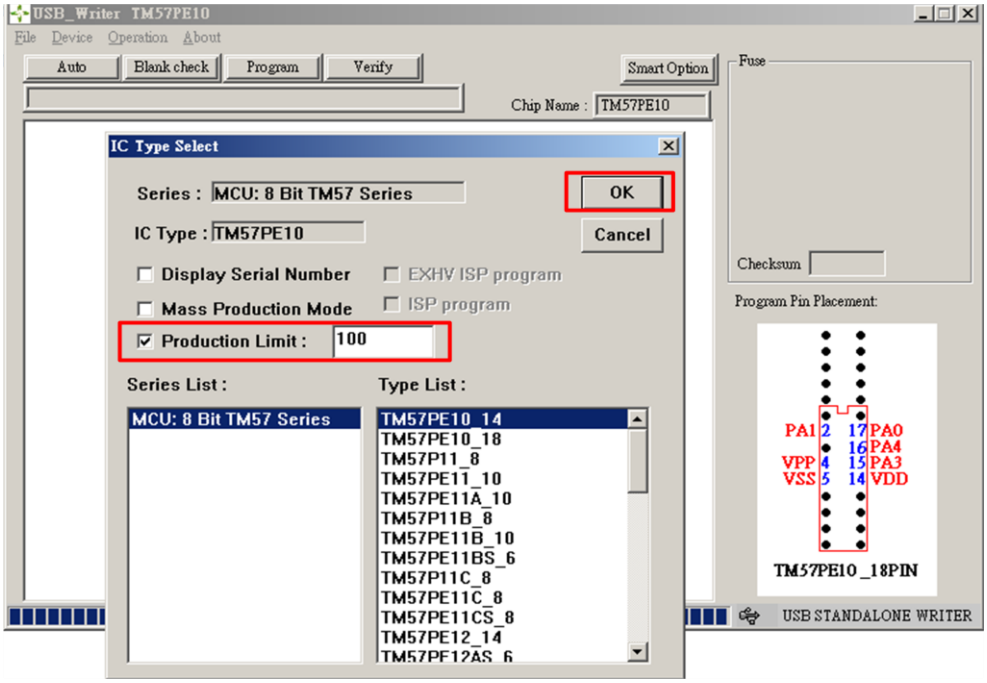
12. Production Limit Mode Writer Operation

This function contains only Auto mode, which records OK and NG counts, and checksum display, there are no other functions, so it is recommended to be used in mass production.

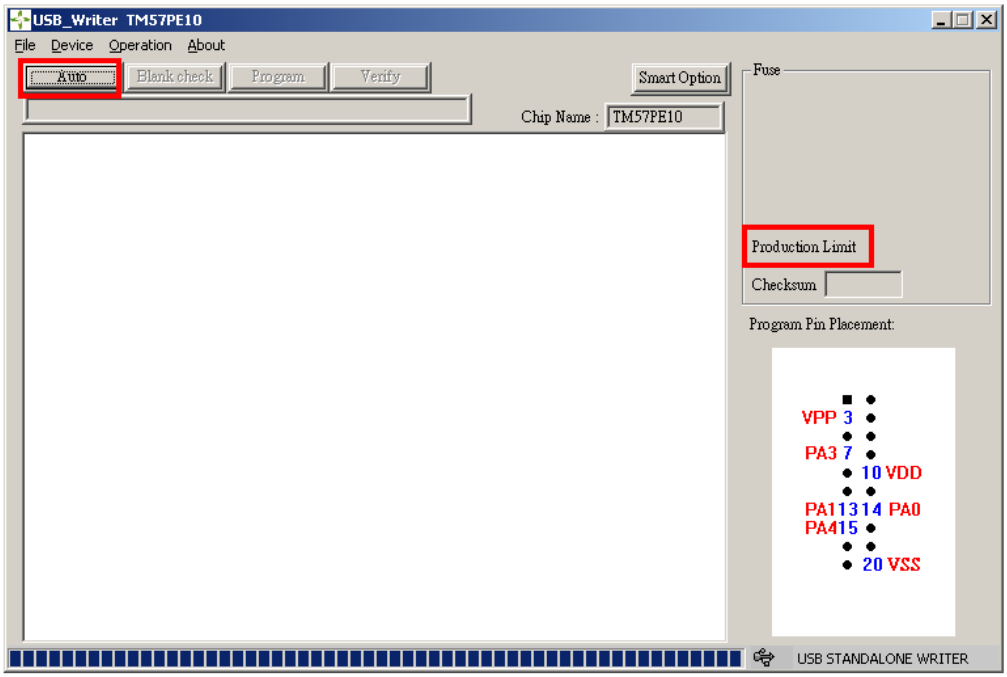
Step 1: Select Device



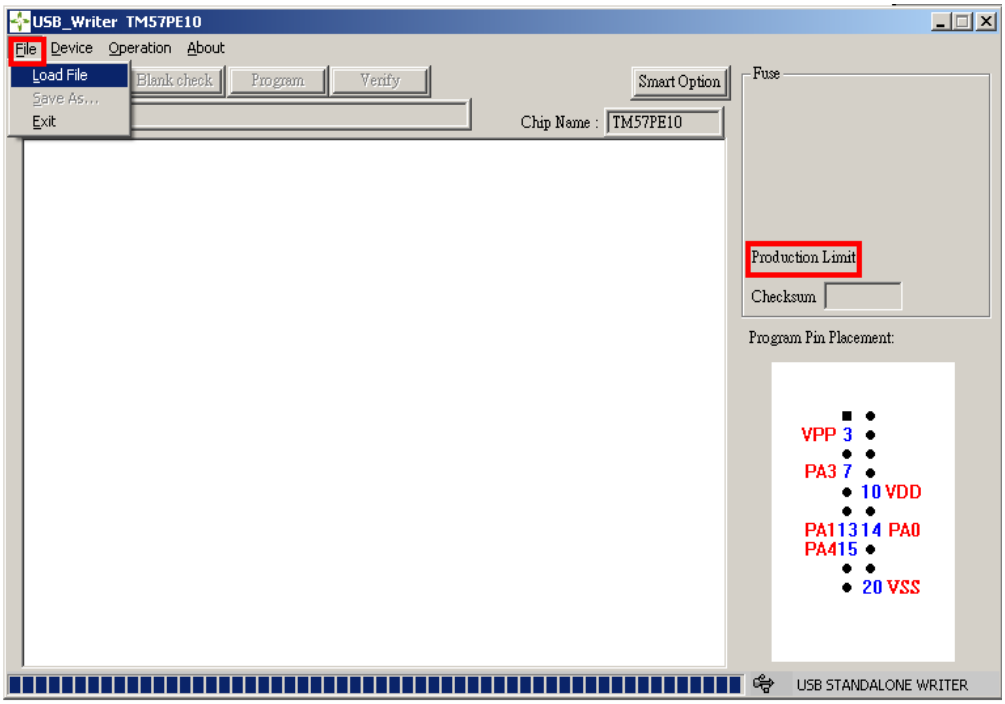
Step 2: Select IC and enable the Production Limit Mode to set the writer counts (1~99999999), then press OK.



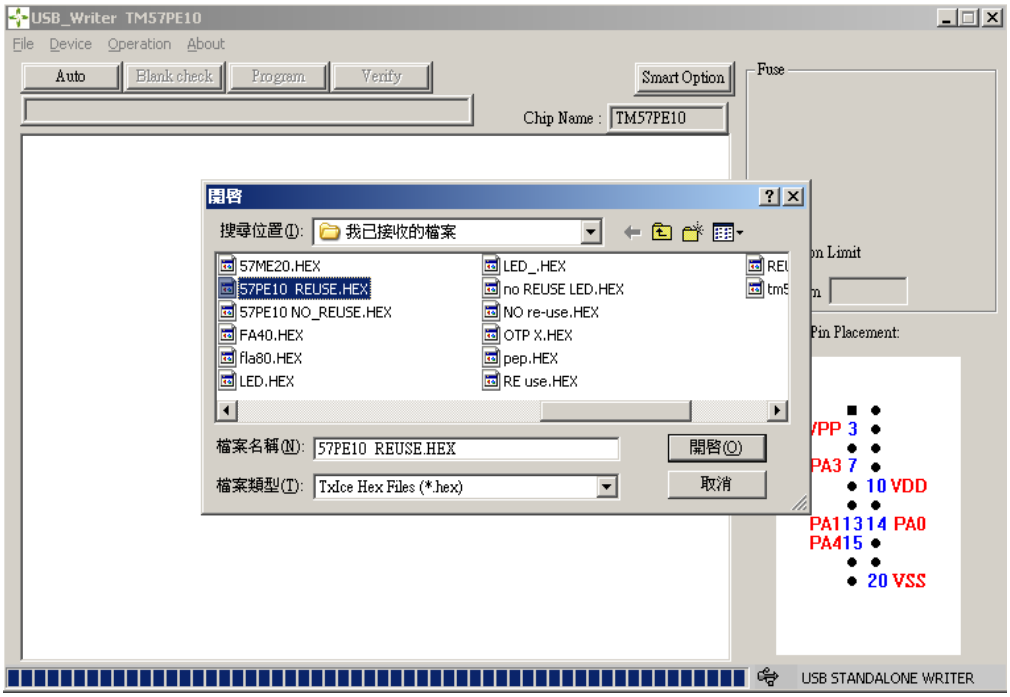
Step 3: Main window will show “Production Limit Mode” and enable “Auto” function



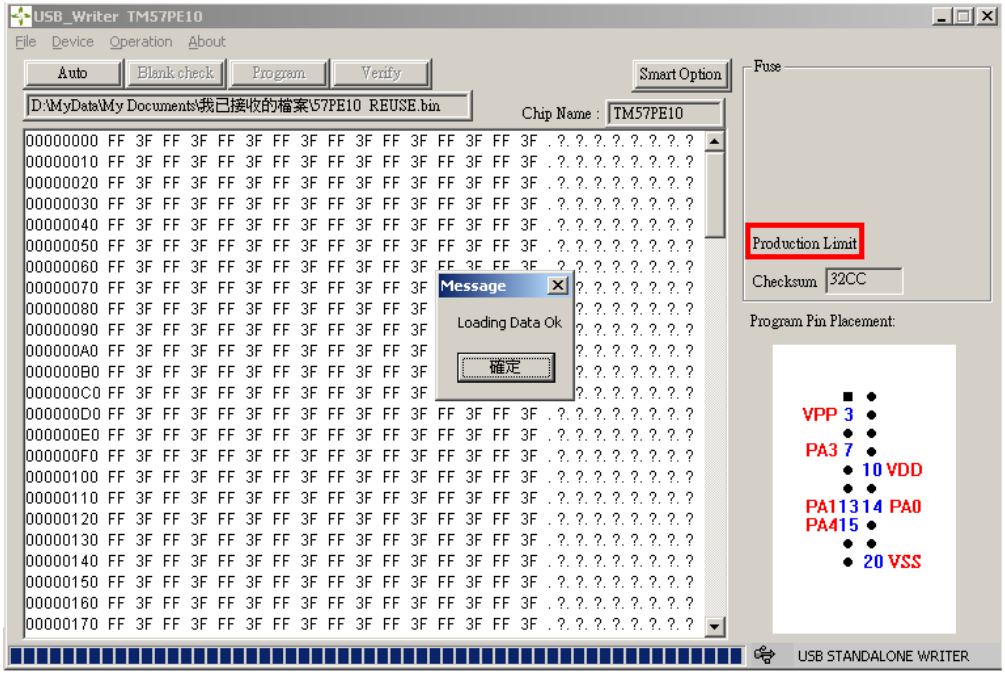
Step 4: Select File -> Load File



Step 5: Select the writer file, then press “open” button



Step 6: Wait file download OK

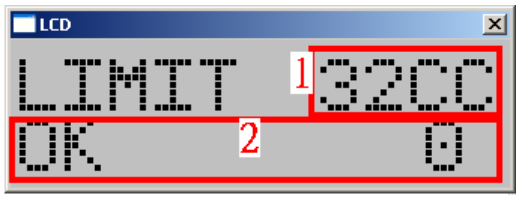


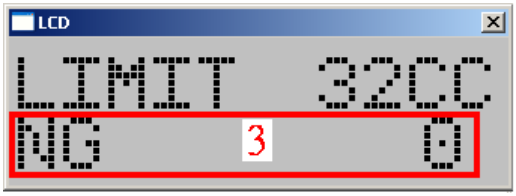
Step 7: Hardware display and operation:

a. Display CHIP NAME (holds for 2 secs display)

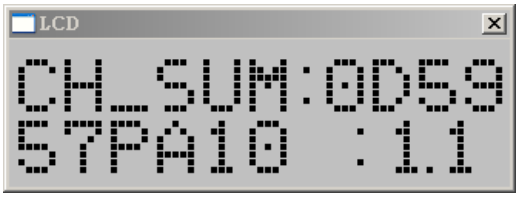
b. Display Limit mode: (hardware mode button can only switch to OK and NG display)

1. Checksum
2. Write OK count
3. Write NG count





c. Display Firmware version and Checksum_E information (Press the Mode button more than 3 seconds to get the information)



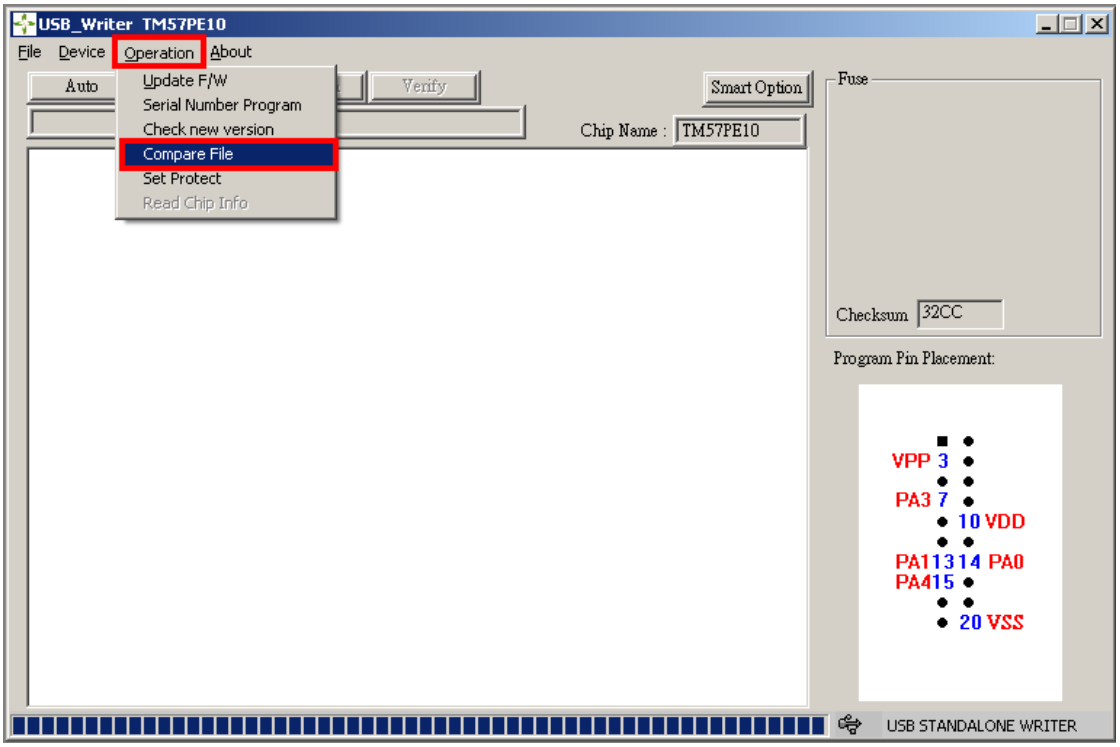
d. Enter button: execute writing process

e. When OK count reaches the writing limit setting, TWR99 will not continue to execute

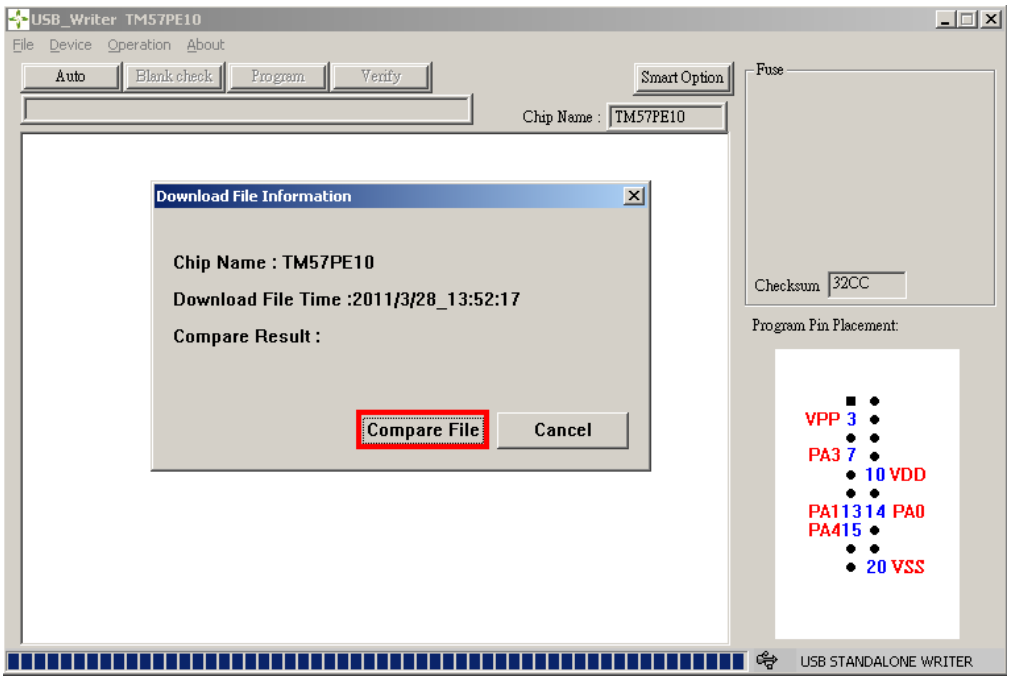
13. Compare File Function Operation

Display TWR99 register data, “IC Name”, “Download File Time”, and “Compare File Result”.

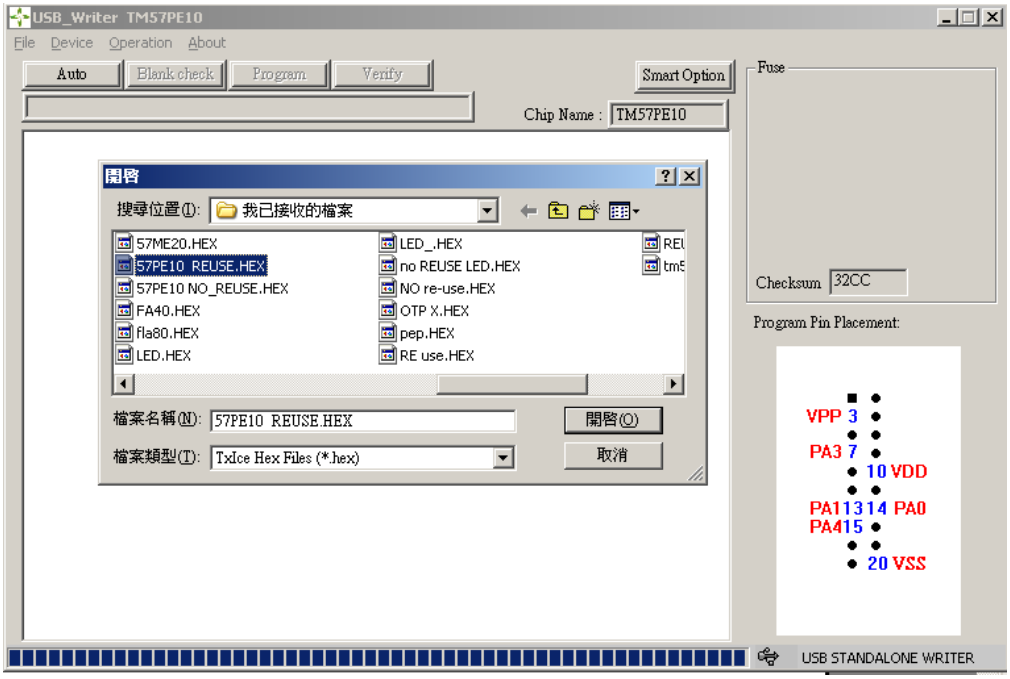
Step 1: Select Operation -> Compare File



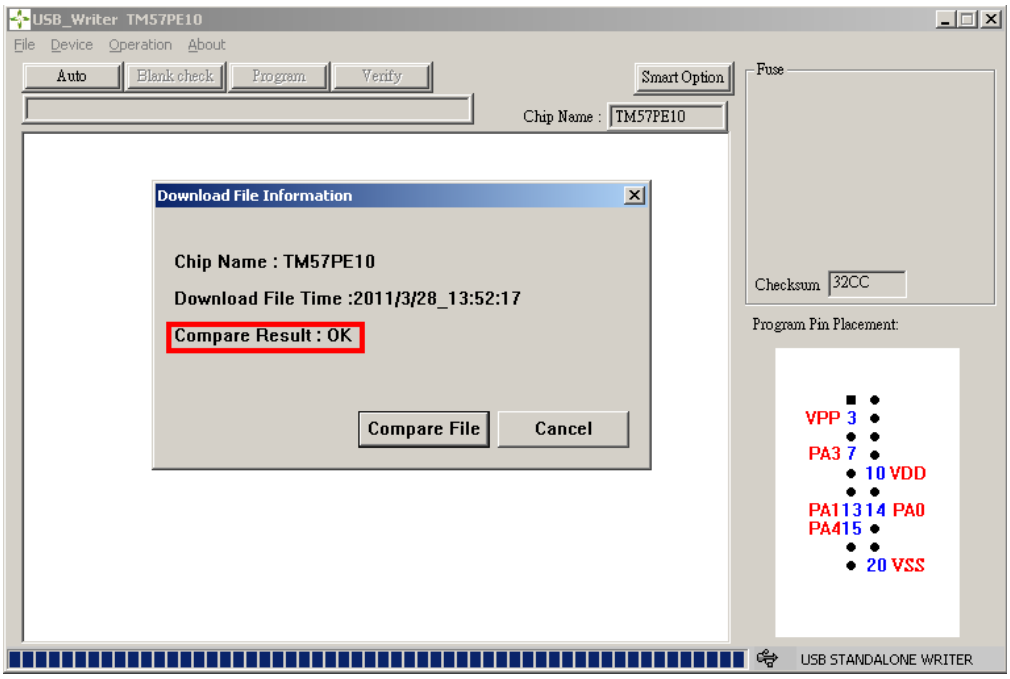
Step 2: Download File information window shows up

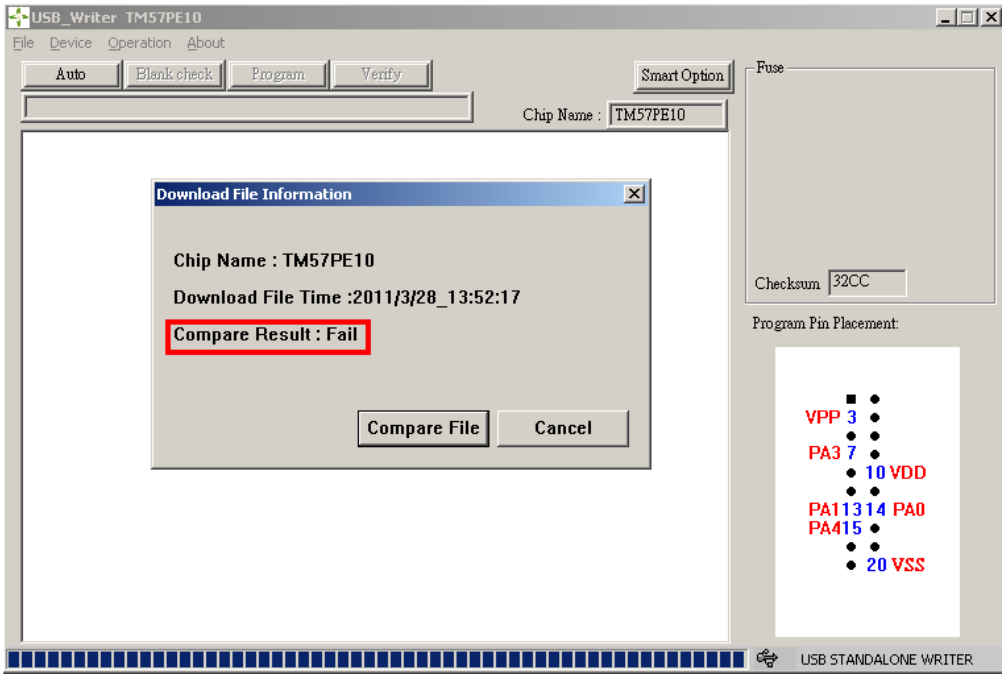


Step 3: Press “Compare File” button, select the file to be compared, then press “Open” button.



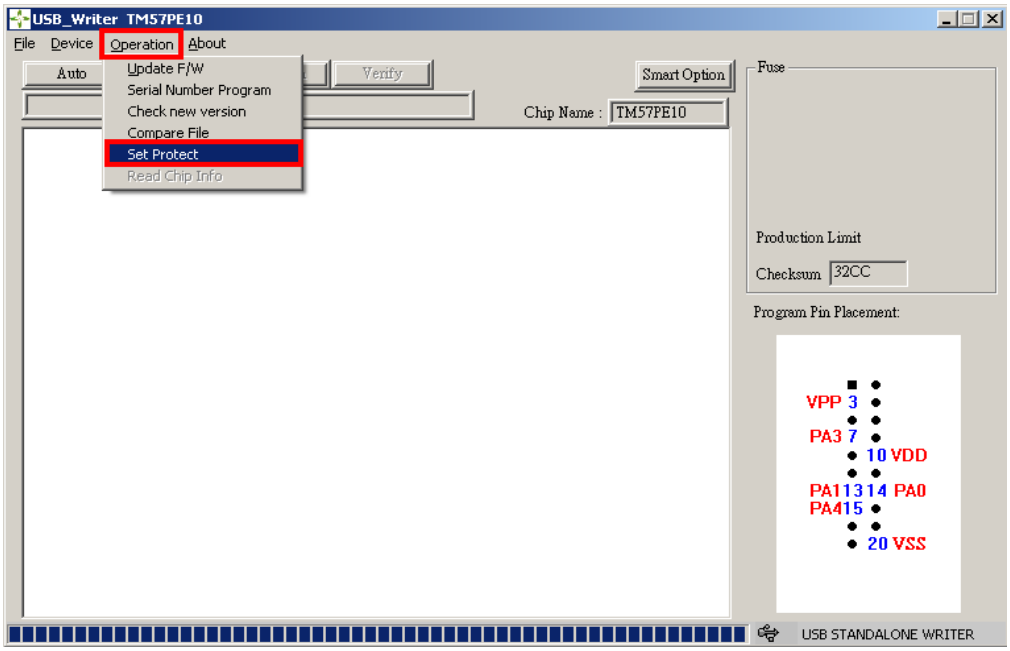
Step 4: Wait for compare result:



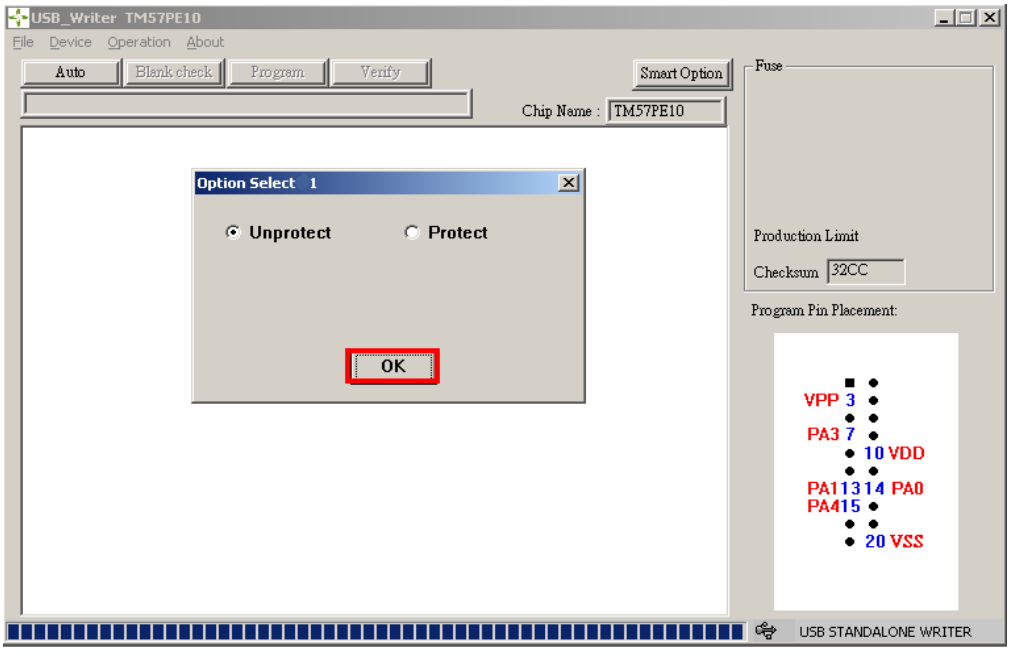


14. Set Protect Function Operation

Step 1: Select Operation -> Set Protect



Step 2: Option Select 1 window shows up



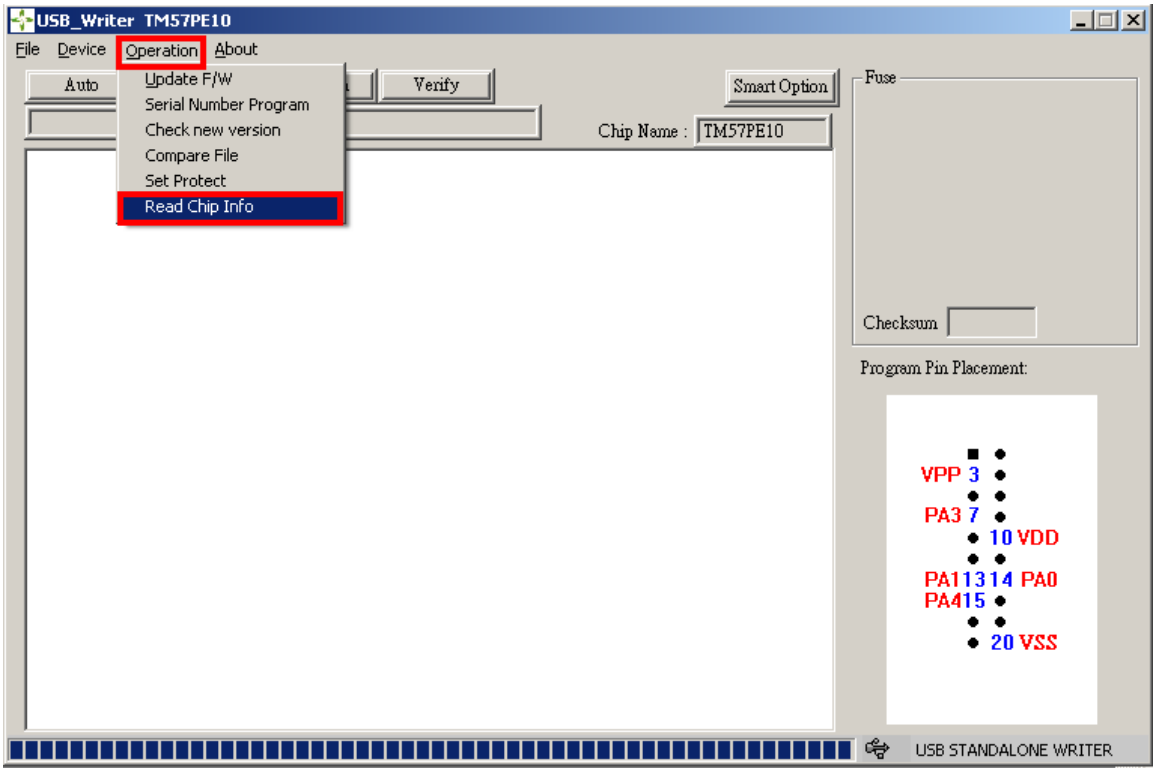
Step 3: Select Unprotect or Protect, then press “OK” button, wait for the setting completes

15. Read Chip Info Function Operation

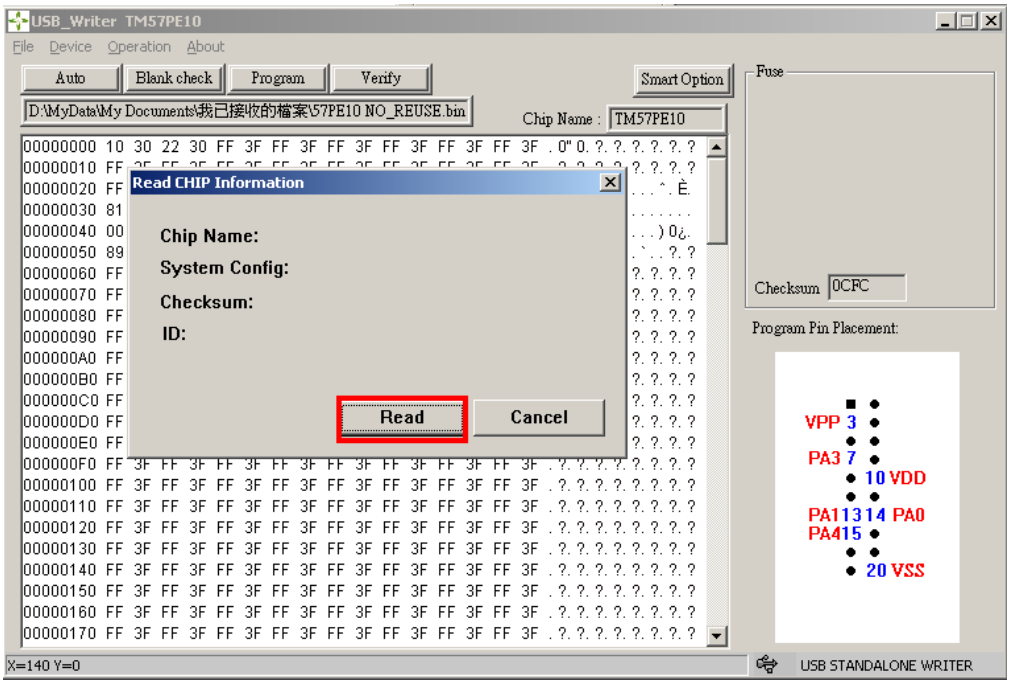
Note: It does not support Mass Production and Production Limit mode

Read Target IC info, “system config”, “checksum”, “ID”.

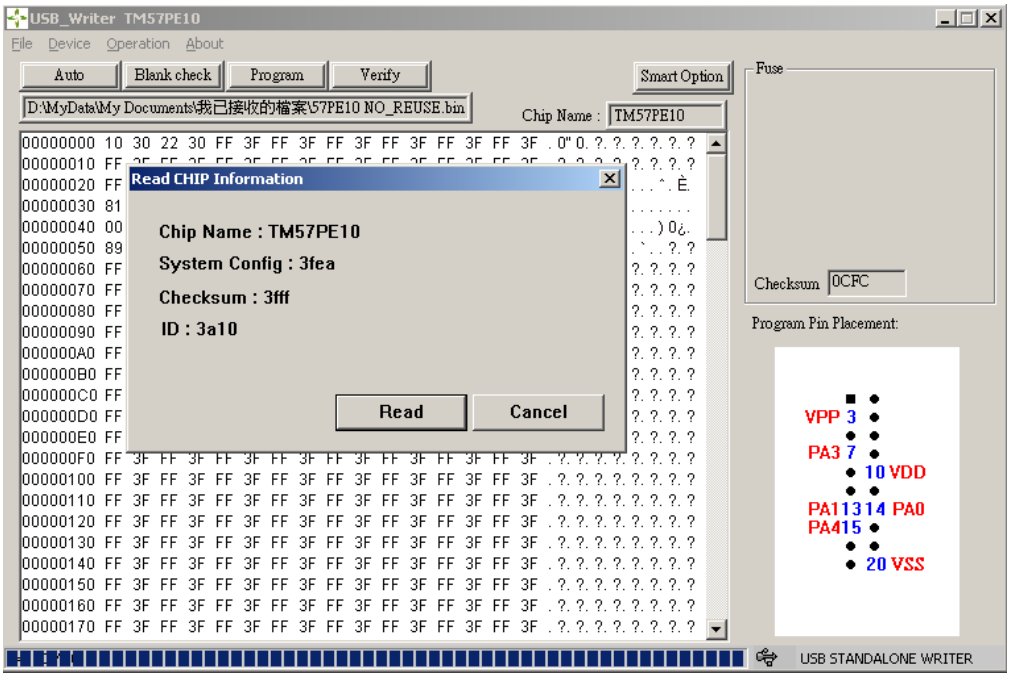
Step 1: Select Operation -> Read Chip Info



Step 2: Read chip information window shows up



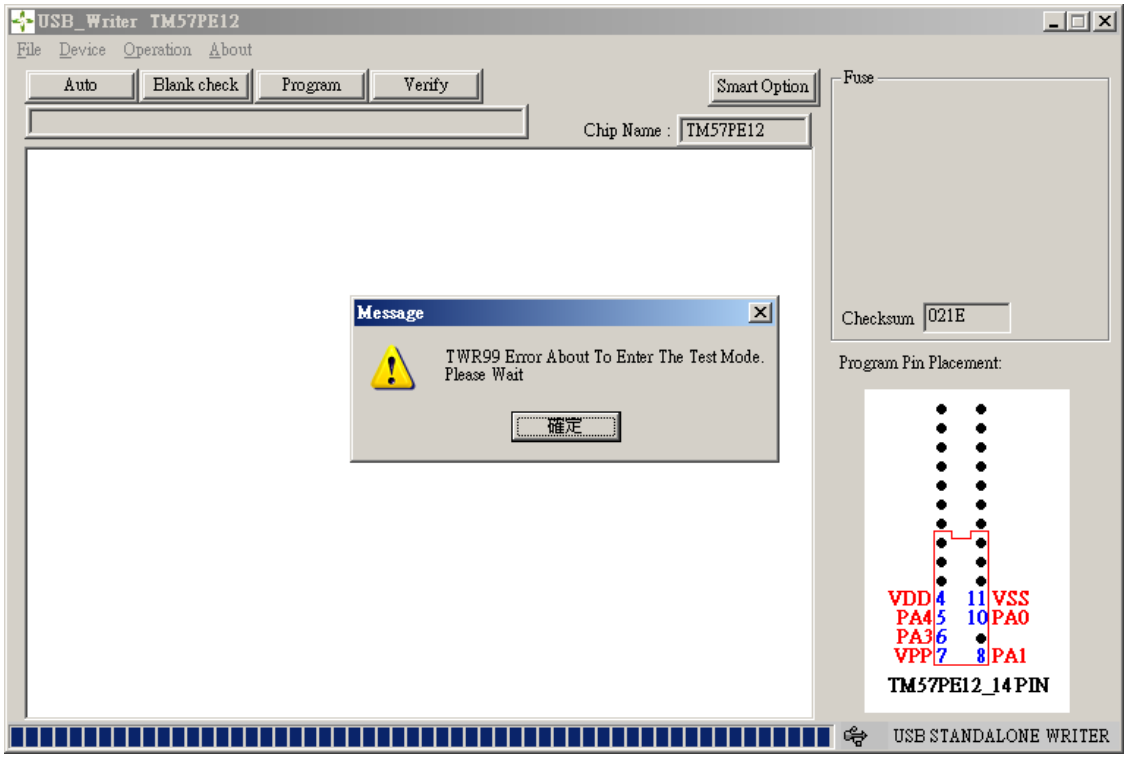
Step 3: Press “Read” button, start reading



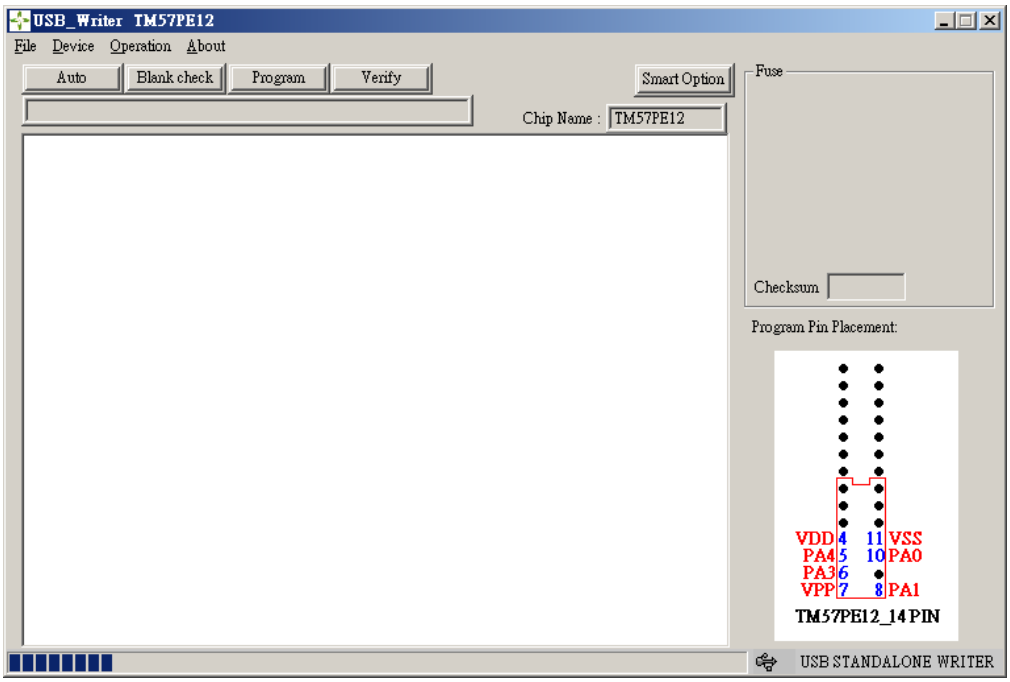
16. Reset Operation

During TWR99 operation, if Firmware is error because of abnormal shutdown or crash, software will automatically reset Firmware after the device is rebooting.

Step 1: Press the Enter key, function performs Reset Firmware



Step 2: Executing Reset Firmware (Do not power off or unplug the USB cable)



Step 3: Execution is complete, please re-select the IC