e-Writer32 User's Guide

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Chapter 1 Introduction to the Writer and Installation

The e-Writer32 User's Guide is a writer designed especially for programming the Holtek HT32 series of MCUs. The writer can be used to write program or data to all 32-Bit Flash MCUs designed by HOLTEK SEMICONDUCTOR INC. The writer special features are in its small, light and handy palm size outline. Installation is simple and it is easy to use.

The writer supports an On-Line Programming Mode that needs to connect with a PC and an Off-Line Programming Mode that does not require a PC connection. In the Off-Line Mode, after downloading the programming data to the writer using the HOPE3000FOR32BIT on a PC, the writer can be operated without a PC connection. In the On-Line Mode, a USB cable is required to connect to the PC and writer after which the writer can be operated using the HOPE3000FOR32BIT.

For different MCU package types, the e-Writer32 needs a different e-Socket32. As there is one e-Socket32 type to program the same MCU package type, it is not necessary to change to a different adaptor.

Installation

System Requirement

To use the writer the following devices and systems are required:

- Power: the external power on Off-line mode is depicted as the below table 1-1

Writer / Connector	e-Writer32	Remark
USB Connector	Supported	Use a power adapter with a 5V output voltage and at least 500mA output current. Best to use the power adapter supplied by Holtek.

Table 1-1

- Correct Programming Adapter
- PC with USB port for On-Line Mode
- MS Windows XP/Win7 or compatible window operating system for On-Line Mode
- HOPE3000FOR32BIT software for On-Line Mode

Note: Programming Adapter is consumables, we suggest you to maintain and update regularly

Package Contents

- **e-Writer32**

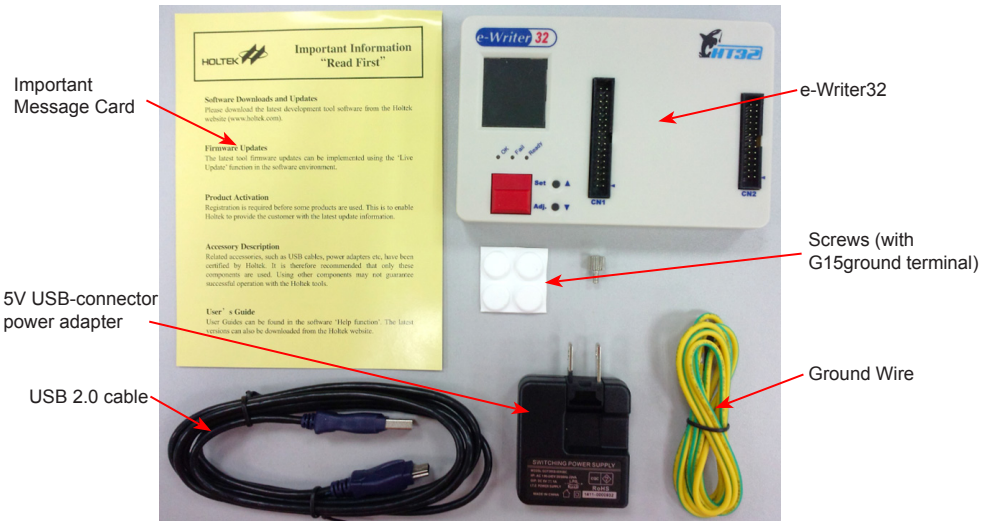

Figure 1-1

Hardware Installation

Connect the e-Writer32 to the PC USB port using the USB cable (Fig. 1-2)

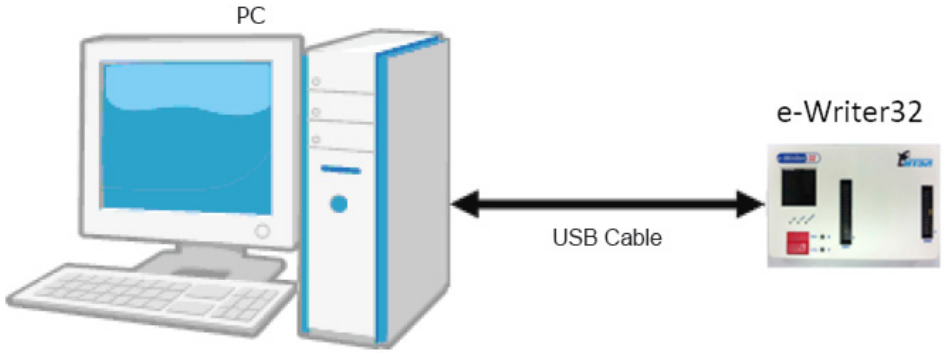

Fig.1-2

Software Installation

- **Step 1**

  Execute the HOPE3000FOR32BIT installing program "HOPE3000FOR32BITV20Build 20141015Install.EXE". As the version and release date of the supplied software may be different from this, use the latest version.

- **Step 2**

  Installation Welcome Window (Fig. 1-3), click the Next button.

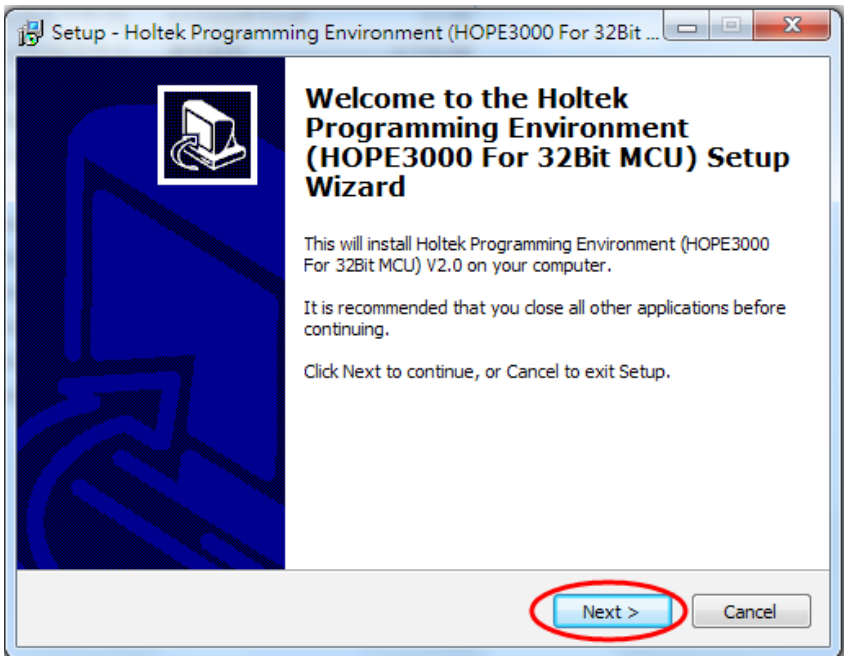

Fig.1-3

- **Step 3**

  Specify the HOPE3000FOR32BIT path (Fig.1-4). It is suggested to use the default path, then click the Next button.

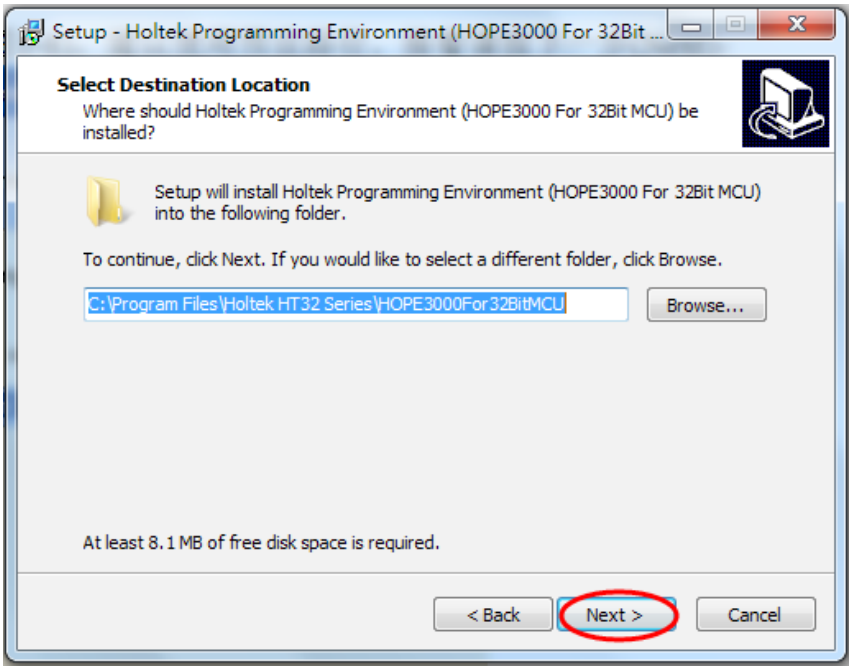

Fig.1-4

- **Step 4**

  Specify the path of the shortcut on Program Files (Fig.1-5), We suggest to use the default path, then click the Next button.

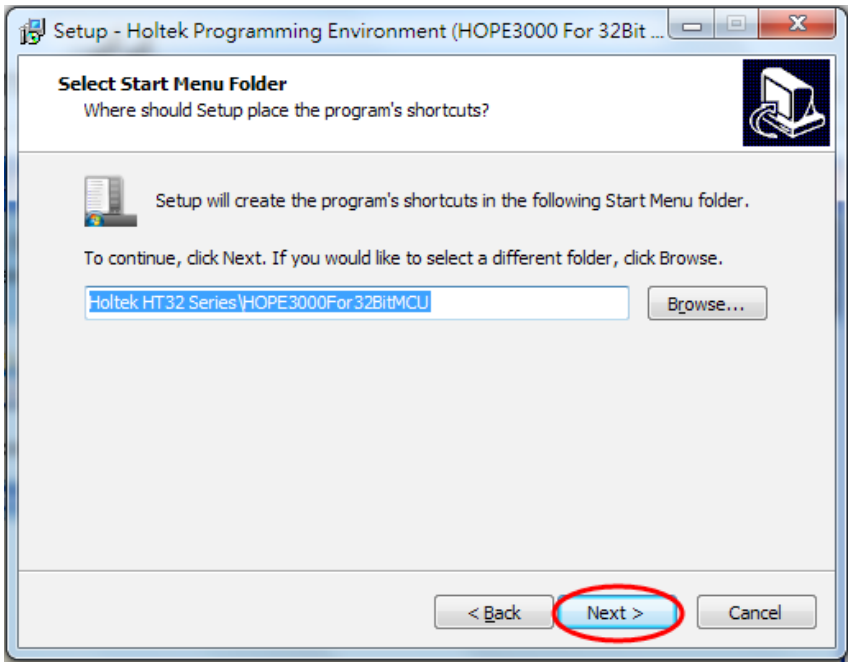

Fig.1-5

- **Step 5**

  Check the option to generate a Desktop shortcut (Fig.1-6). Then click the Next button.

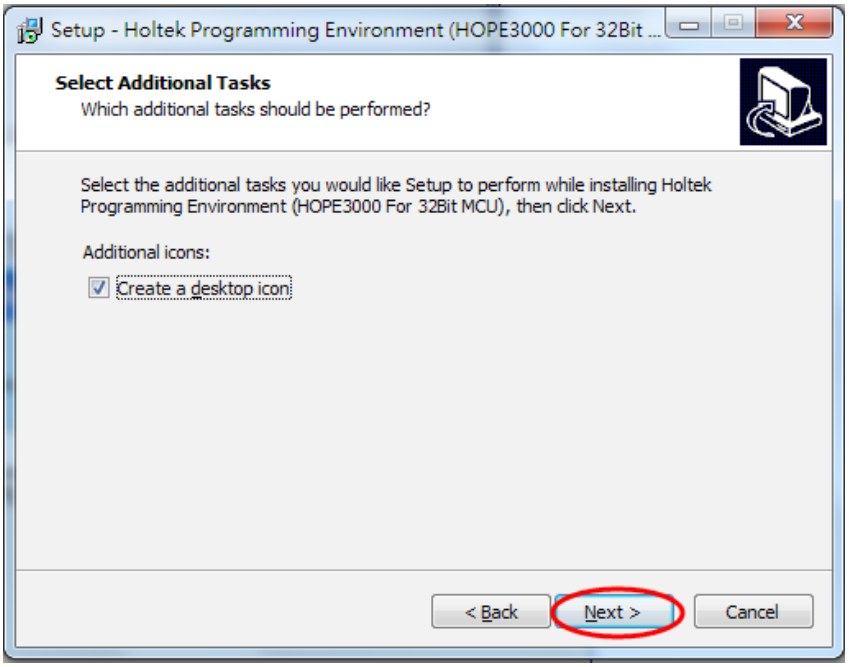

Fig.1-6

- **Step 6**

  Check the installation details and then click the Install button to start the installation process (Fig. 1-7)

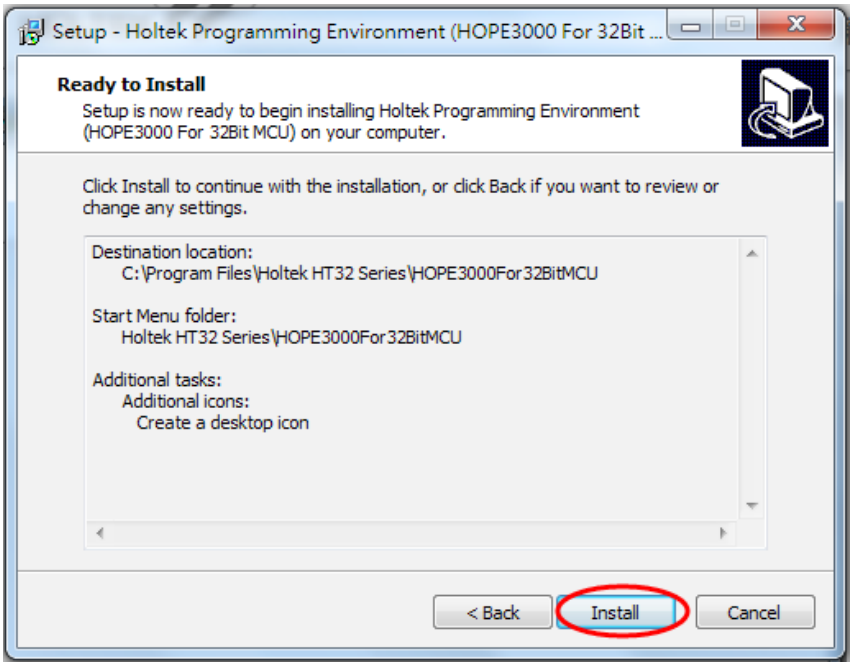

Fig. 1-7

- **Step 7**

  Finish installation. Click the Finish button to exit installation process (Fig. 1-8)

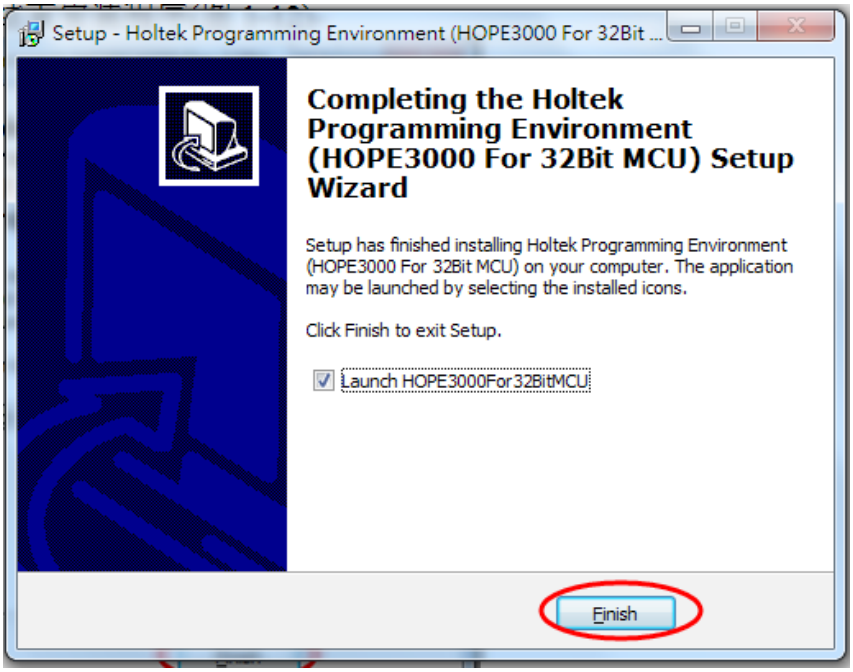

Fig. 1-8

Hardware Configuration

The name of each writer hardware section is shown in Fig. 1-9 (e-Writer32). Table 1-2 explains each item in this figure.

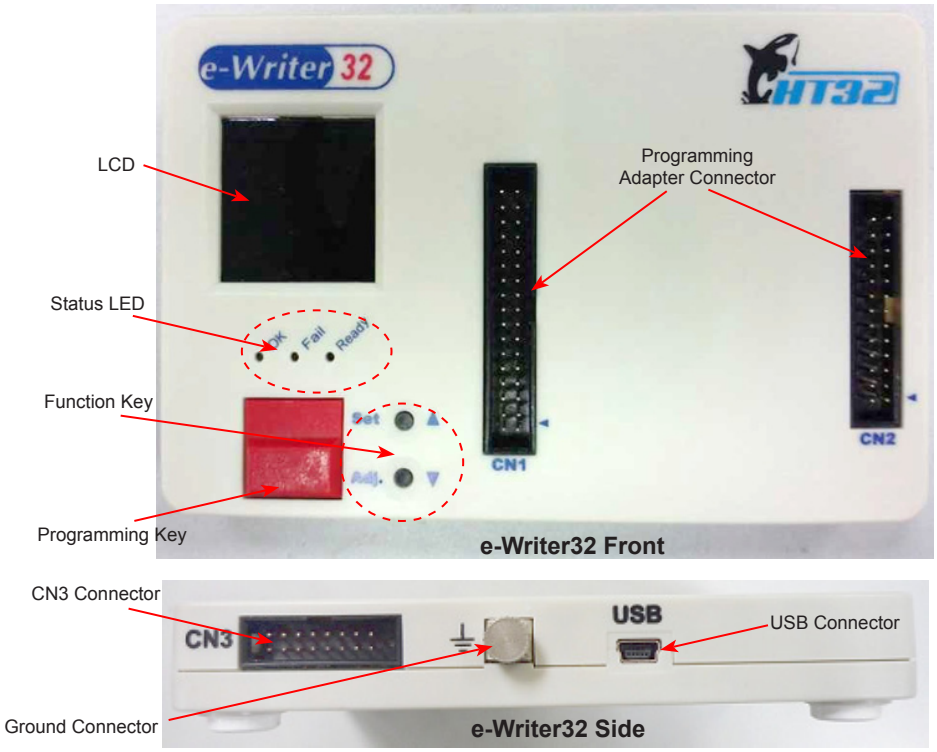

Fig. 1-9

Item	Explanation
Programming Adapter Connector	Programming Pins
OK	Normal Status LED
Ready	Read or Busy Status LED
Fail	Fail Status LED
Programming Key	Off-Line Mode Programming Key
USB Connector	Connect to PC via USB cable (On-Line mode) or Connect to 5V power adapter (Off-Line mode)
LCD	Displays information and to set the writer functions
Function Key	Switch LED pages and to set the writer functions
CN3 Connector	Connector for Handler
Ground Connector	Connector for ground wire

Table 1-2

Chapter 2 Quick Start

Preparation before Programming

Before programming MCU, the Keil µVision or IAR EWARM development system is required to generate an MCU-programming file (.BIN/.HEX…etc). After this the writer and the HOPE3000FOR32BIT can be used to program the MCU. For the details about the Keil µVision or IAR EWARM, please refer to the relevant User's Guide.

Connect the writer to the PC and execute the HOPE3000FOR32BIT program. Then follow the steps below to execute MCU programming.

Case. 1 – Programming an MCU

To program an MCU-programming file (.BIN/.HEX) to a MCU using a PC, use the following steps:

- **Step 1**

Execute the following command in the HOPE3000FOR32BIT: Menu/File/Open (Fig. 2-1)

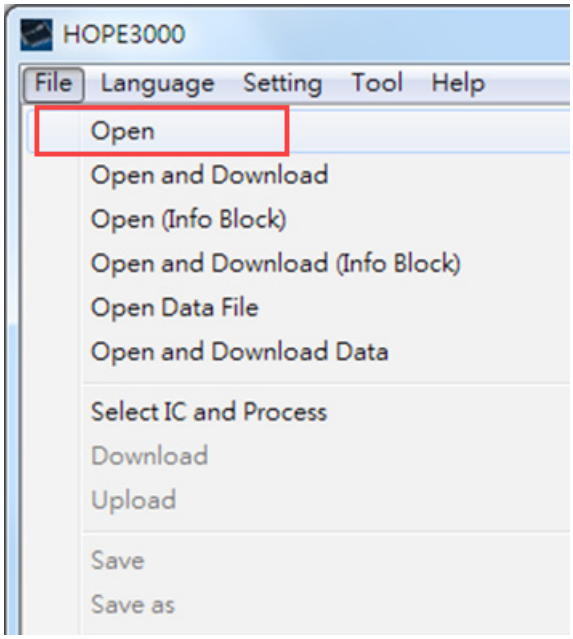

Fig. 2-1

- **Step 2**

  As shown in Fig. 2-2, select the file type (BIN, HEX) firstly (Action 1) then select the file to open (Action 2). Finally click the button of Action 3

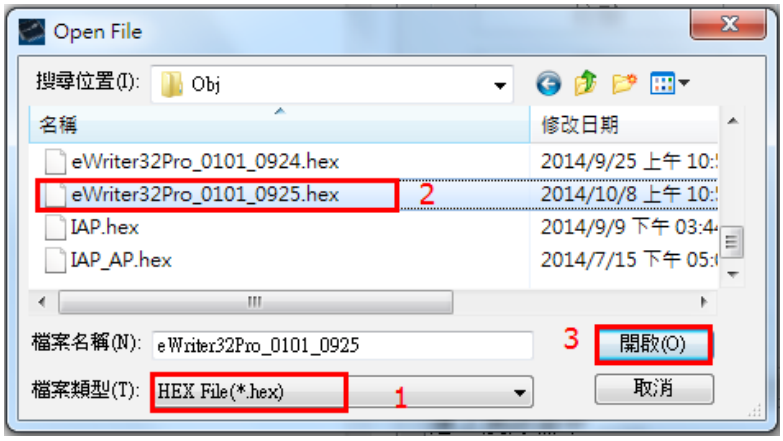

Fig. 2-2

- **Step 3**

  Then download the opened file to the writer (Menu\File\Download) as shown in Fig.2-3.

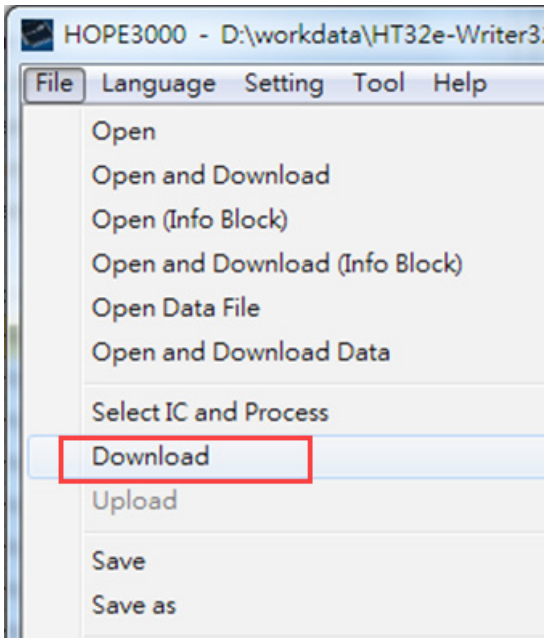

Fig. 2-3

- **Step 4**

  After downloading, if successful, the lower message box will display "Complete and OK" (Fig. 2-4). Then programming can be executed by clicking the buttons "BlankCheck", "Program", "Verify", "Lock" (if locking is required) in Fig. 2-4. In addition, the data in the Flash memory can be cleared by clicking the button "Erase".

  For any problems, refer to Chapter 3 "HOPE3000FOR32BIT Main Function". If an error occurred during programming, refer to Appendix A "System and Error Message" for further information.

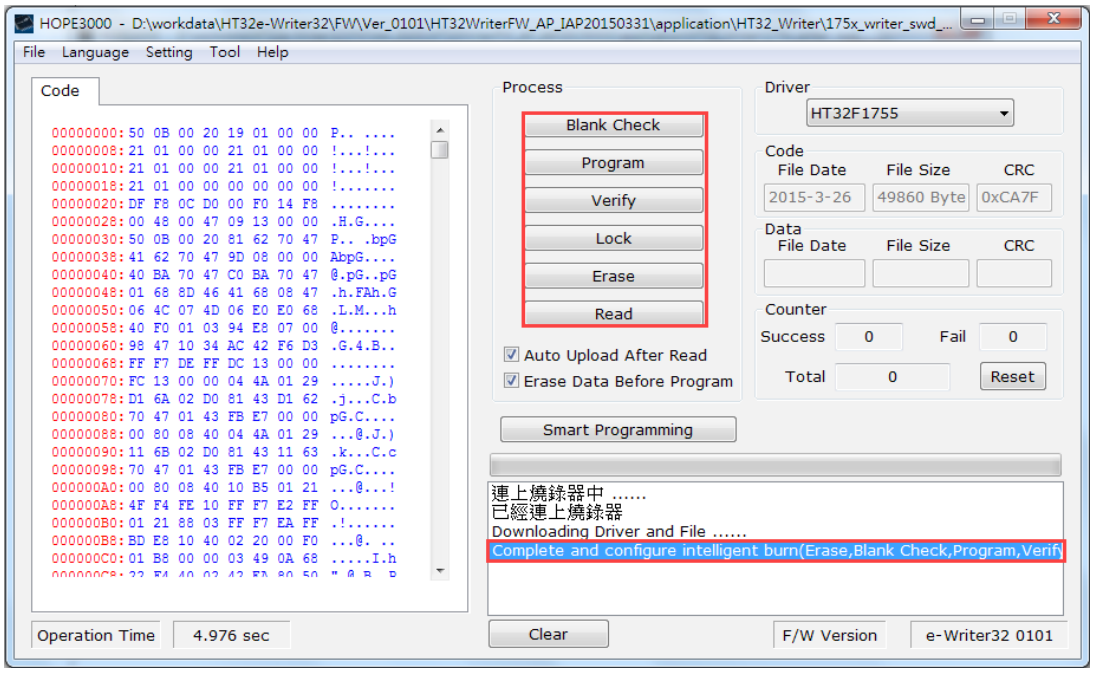

Fig 2-4

Case. 2 – Auto Programming

Case. 1 shows how to implement programming on a PC. However it is still necessary to click the buttons "BlankCheck", "Program", "Verify" ...etc to complete the programming process. There is another method whereby with a single setup on the HOPE3000FOR32BIT, the full programming operation can be executed by only pressing the "Auto" key once. This is suitable for higher volume MCU programming operations. The operating steps are as follows:

- **Step 1 ~ 3**

  Same as steps 1~3 in Case. 1

- **Step 4**

  Click the button "Smart Programming" as shown in Fig. 2-5. Then the Smart Programming UI will appear as shown in Fig. 2-6

- **Step 5**

  In the Smart Programming UI (Fig. 2-6), select the demand programming operations (repeat the Action 1 and 2), and then download these settings to the writer (Action 3)

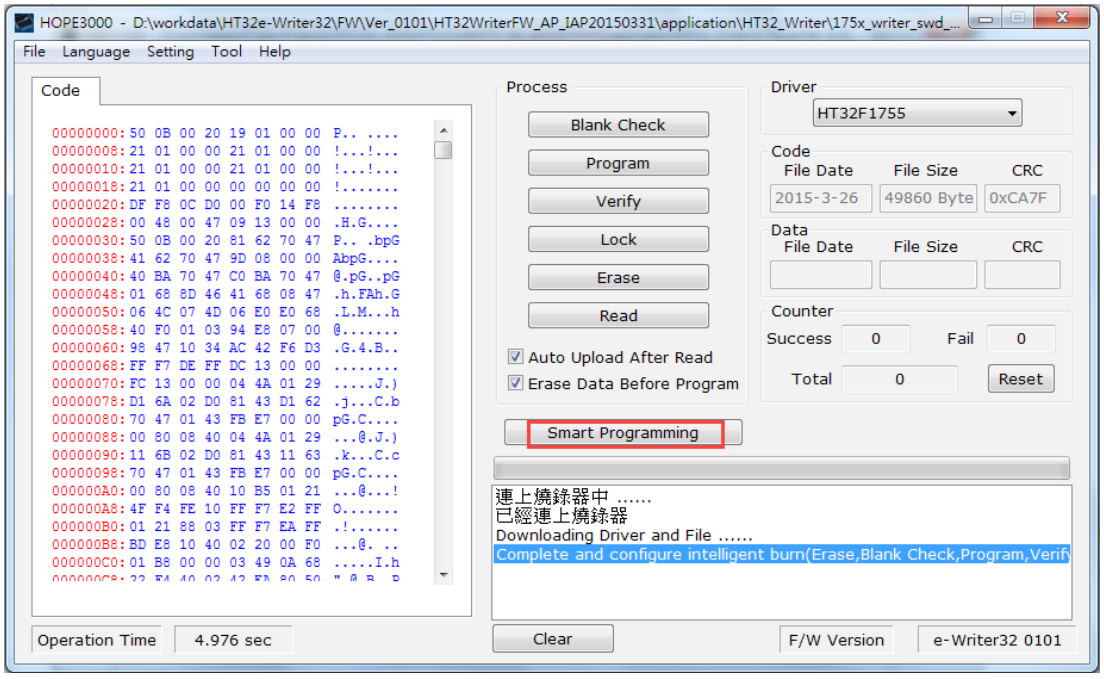

Fig. 2-5

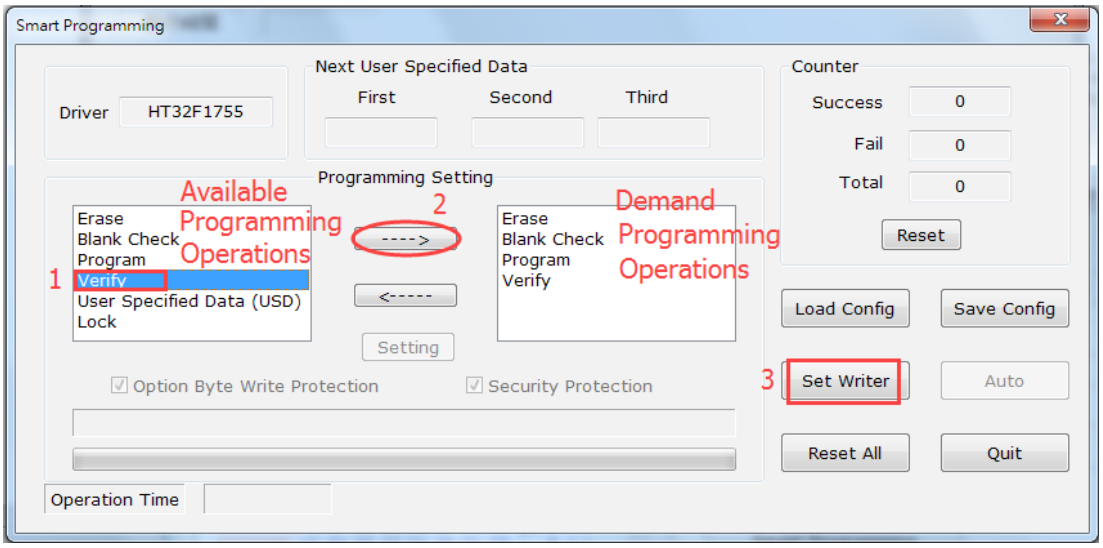

Fig. 2-6

- **Step 6**

  If the download operation has been successful the button "Auto" on the lower right corner of Fig. 2-6 will be shown. By clicking on this button all the selected programming operations will be executed.

  For any problems refer to Chapter 3 "Introduction to HOPE3000FOR32BIT Main Function" or Chapter 4 "Introduction to the HOPE3000FOR32BIT – Smart Programming Function" If any errors occurred during programming, refer to Appendix A "System and Error Message" for further information.

Case. 3 – Programming Serial Numbers or Other Specified Data

To program serial numbers or other data into the Program Memory or Data Memory, use the function "User Specified Data" on Smart Programming. The following steps introduce how to use this function:

- **Step 1~4**

  Same as Steps 1~4 in Case. 2

- **Step 5**

  Same as Actions 1~3 in Fig. 2-11. Add operation "User Specified Data" to the "Demand Programming Operation" List. Then click the button "Setting" (Action 4) in Section "Programming Setting", and the User Specified Setting Window will be shown as in Fig. 2-8

- **Step 6**

  Setup the specified data detail. Fig. 2-8 demonstrates the setting to program data into the address 100H of the Program Memory. The data is generated by the mathematical expression "N+1" and the initial value of N is 22. This means that 22 is the first-programmed IC, 23 for the second one, ...etc. After Action 1~3, click the button "OK" to store these settings and quit this window

  ※ For other details regarding Fig. 2-8, refer to Section "User Specified Data" Setting Window in Chapter 4 "Introduction to HOPE3000FOR32BIT Smart Programming Function"

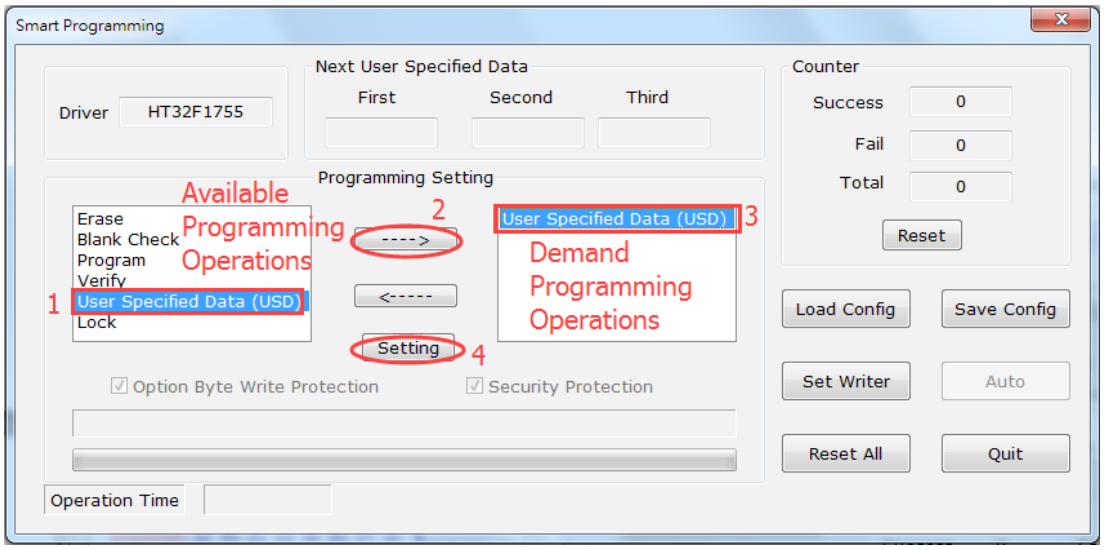
Smart Programming
Next User Specified Data
First
Second
Third
Driver
HT32F1755
Counter
Success
0
Fail
0
Total
0
Reset
Programming Setting
Available Programming Operations
Erase
Blank Check
Program
Verify
User Specified Data (USD)
Lock
1
2
---->
<-----
Setting
4
User Specified Data (USD)
3
Demand Programming Operations
Load Config
Save Config
Set Writer
Auto
Reset All
Quit
Option Byte Write Protection
Security Protection
Operation Time

Fig. 2-7

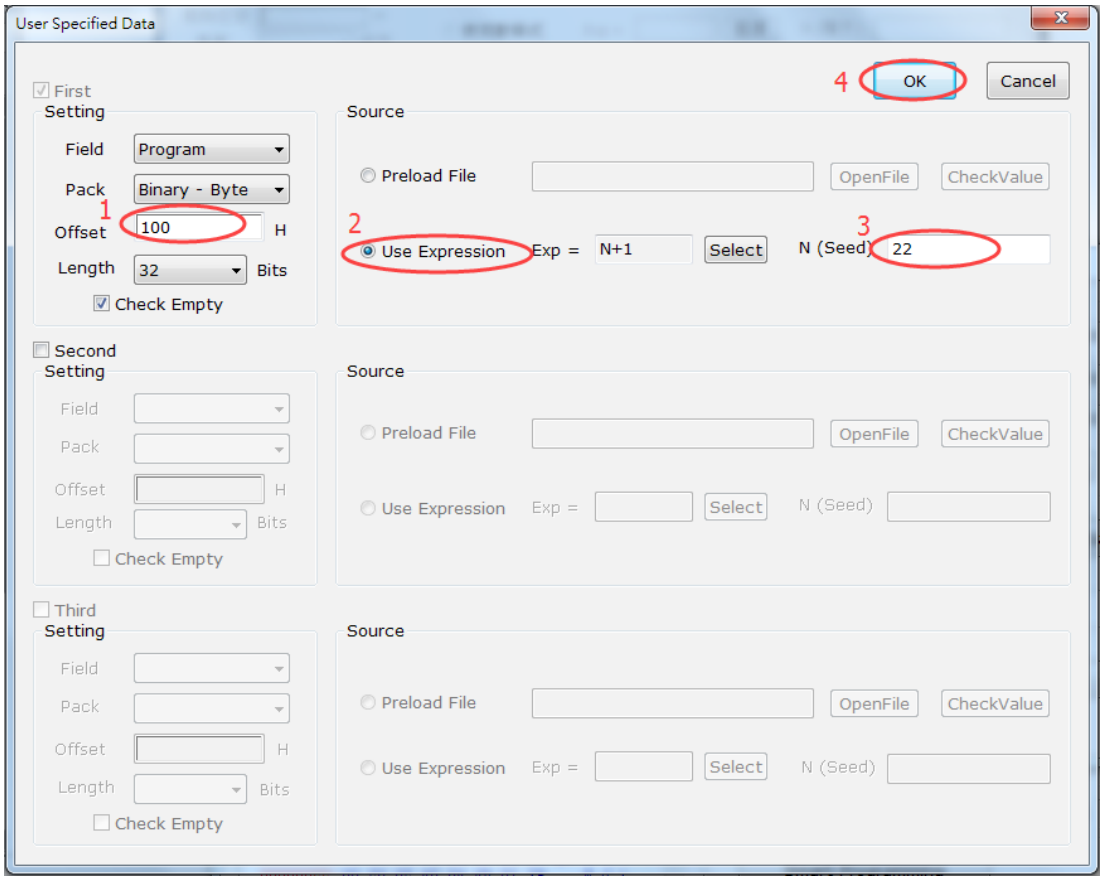
User Specified Data
First
Setting
Field
Program
Pack
Binary - Byte
1
Offset
100
H
Length
32
Bits
Check Empty
Source
Preload File
OpenFile
CheckValue
2
Use Expression
Exp =
N+1
Select
3
N (Seed)
22
4
OK
Cancel
Second
Setting
Field
Pack
Offset
H
Length
Bits
Check Empty
Source
Preload File
OpenFile
CheckValue
Use Expression
Exp =
Select
N (Seed)
Third
Setting
Field
Pack
Offset
H
Length
Bits
Check Empty
Source
Preload File
OpenFile
CheckValue
Use Expression
Exp =
Select
N (Seed)

Fig. 2-8

- **Step 7**

  Download these settings to the writer as shown in Action 1 in Fig. 2-9. The first data record to program is shown in Rectangle 3. Then click the button "Auto" (Action 2) to program. Each programming operation is implemented by a single click. After each programming operation, the record of the next data to program will be shown in Rectangle 3.

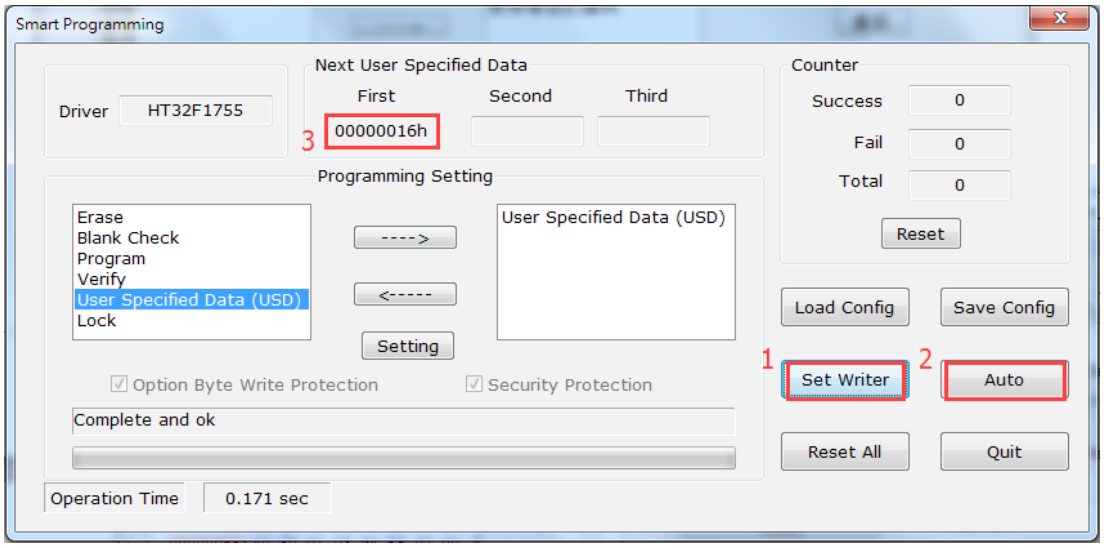

Fig. 2-9

For any problems refer to Chapter 3 "Introduction to HOPE3000FOR32BIT Main Function" or Chapter 4 "Introduction to the HOPE3000FOR32BIT – Smart Programming Function" If any errors occurred during programming, refer to Appendix A "System and Error Message" for further information.

Case. 4 – Standalone Programming – Off-Line Mode

For standalone programming which means to operate the writer without connecting it to a PC, first connect the writer to a PC and download the programming file and operations to the writer. After this pressing the programming key on the writer will execute a programming operation. The details are as follows:

- **Step 1~5**

  Download the programming file and operations to the writer as shown in Steps 1~5 in Case 2

- **Step 6**

  Exit HOPE3000FOR32BIT and remove the USB connection from the writer

- **Step 7**

  Connect the power supply to the writer and turn on the power. At this point the writer will check if the downloaded data in Steps 1~5 is correct. If so then the writer will be in a OK State (the yellow LED will be on); otherwise it will be in a Fail State (the red LED will be on) requiring the data to be downloaded again to the writer (repeat Step 1~5)

  ※Note: The yellow LED must be on before continuing to the next step - OK light

- **Step 8**

  Insert the MCU into the programming adapter. The MCU type must be the same as the MCU type in the downloaded programming file in Step 1~5. Press the Programming Key (Fig. 1-9) on the writer to program the device.

- **Step 9**

  Examine the LEDs and check if the programming operation has been successful.

  If there any problems please refer to Chapter 3 "Introduction to HOPE3000FOR32BIT Main Function" or Chapter 4 "Introduction to HOPE3000FOR32BIT – Smart Programming Function". For errors that have occurred during programming refer to Appendix A "System and Error Message" for more information. For problems regarding the LEDs refer to Appendix B "Writer LED Lights and Status".

Case. 5 – Reading Data from an MCU IC – without using a Programming File

Generally, before reading data from the MCU, it is necessary to open the programming file for that device type or the data in writer for that IC type. A method will now be introduced for situations where no programming file exists for the device type or the data in the writer is not for the present device type. Here data can still be read data from the MCU using the HOPE3000FOR32BIT. The details are as follows:

- **Step 1**

  Execute the command "Menu/File/Select IC and Process" as shown in Fig. 2-10.

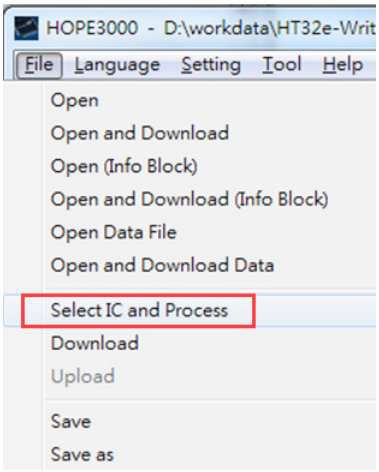

Fig. 2-10

- **Step 2**

  The dialog "IC Select" will then pop up. Select the required IC type from Section "All ICs" (as in Fig. 2-11) and click the button "OK" to quit this window.

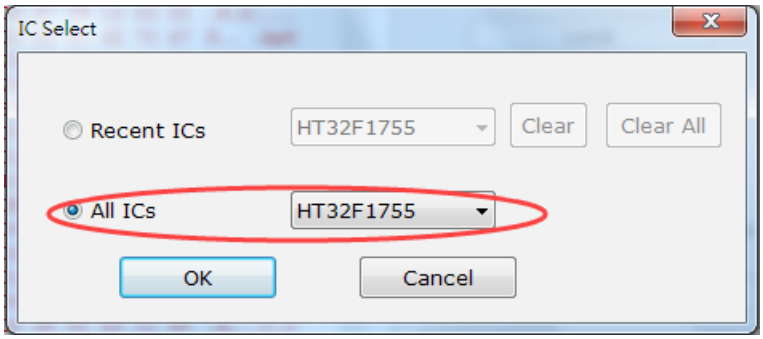

Fig. 2-11

- **Step 3**

  Then HOPE3000FOR32BIT will download the driver for that IC type to the writer. If successful, then parts of the buttons in the Section "Process" will be enabled as shown in Fig. 2-16. Now the "Read" button can be clicked to read data from the MCU directly. Then execute the command "Menu/ File/ Upload" to upload and show the data on the HOPE3000FOR32BIT.

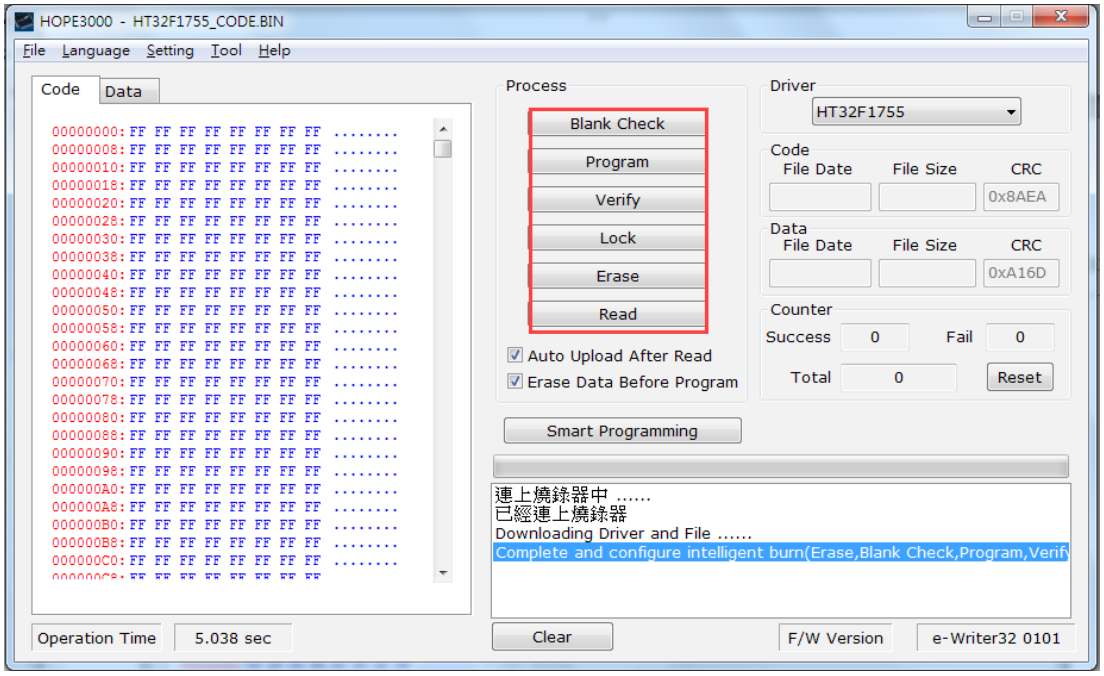

Fig. 2-12

For any problems refer to Chapter 3 "Introduction to HOPE3000FOR32BIT Main Function". If any errors occur during programming refer to Appendix A "System and Error Message" for more information.

Case. 6 – Updating the Writer Firmware via a PC

The e-Writer32 has a function to update its firmware using a PC. Ensure that the HOPE3000 FOR32BIT is the latest version before updating.

- **Step 1**

Execute "Menu/Tool/F/W Update" to start the F/W update window (as shown by the red circle in the upper section in Fig.2-13). Note the F/W version before updating on the right lower corner of Fig.2-13.

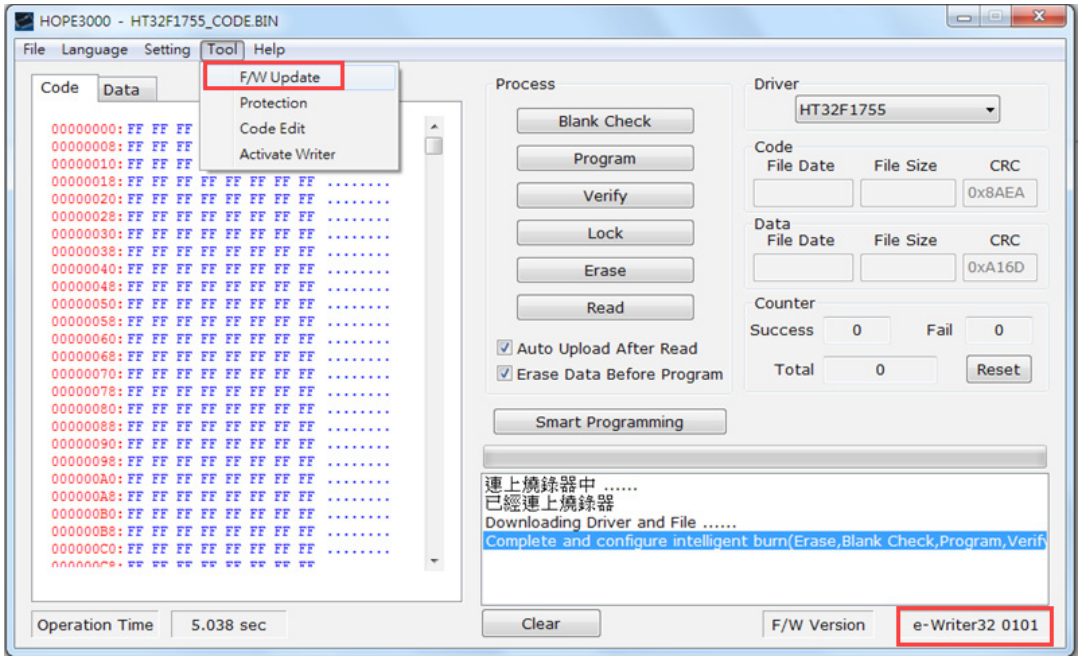

Fig. 2-13

- **Step 2**

Fig. 2-14 is the F/W update window. Click "Start" button to start the F/W update.

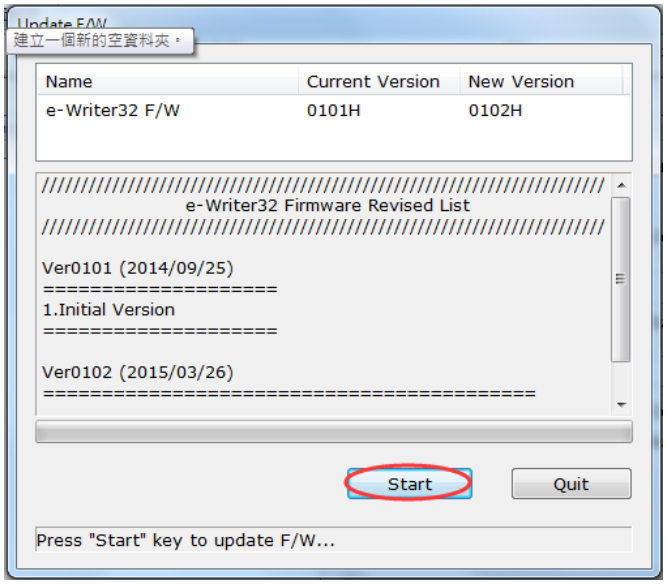

Fig. 2-14

- **Step 3**

  If the writer is connected, then the F/W update process starts.

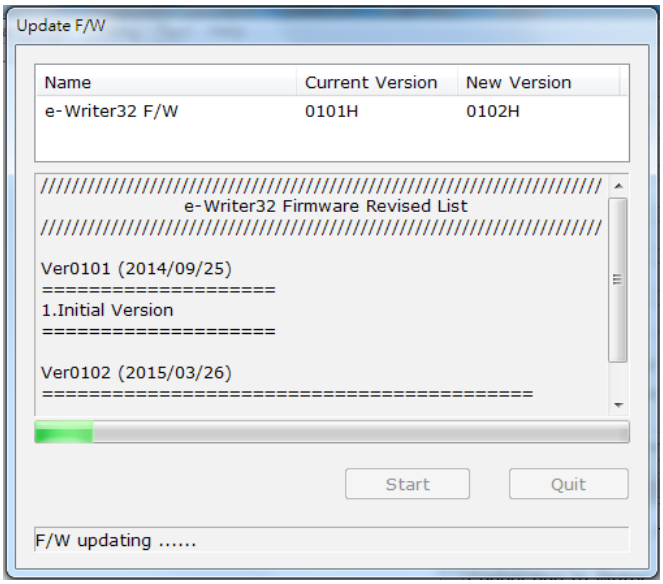

Fig. 2-15

※ If the window, as seen Fig. 2-16, appeared after clicking "Start", it means that the F/W version is the same as or newer than the one on HOPE3000FOR32BIT. It is therefore suggested not to update as it will update to an older F/W version.

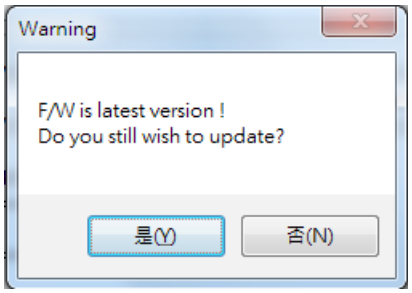

Fig. 2-16

- **Step 4**

  If the update was successful, the F/W update window will show "Update F/W OK" (see Fig. 2-17). Then the HOPE3000FOR32BIT will power on the writer automatically and after it is connected, the updated F/W version will be shown on the right lower corner as shown in Fig. 2-17.

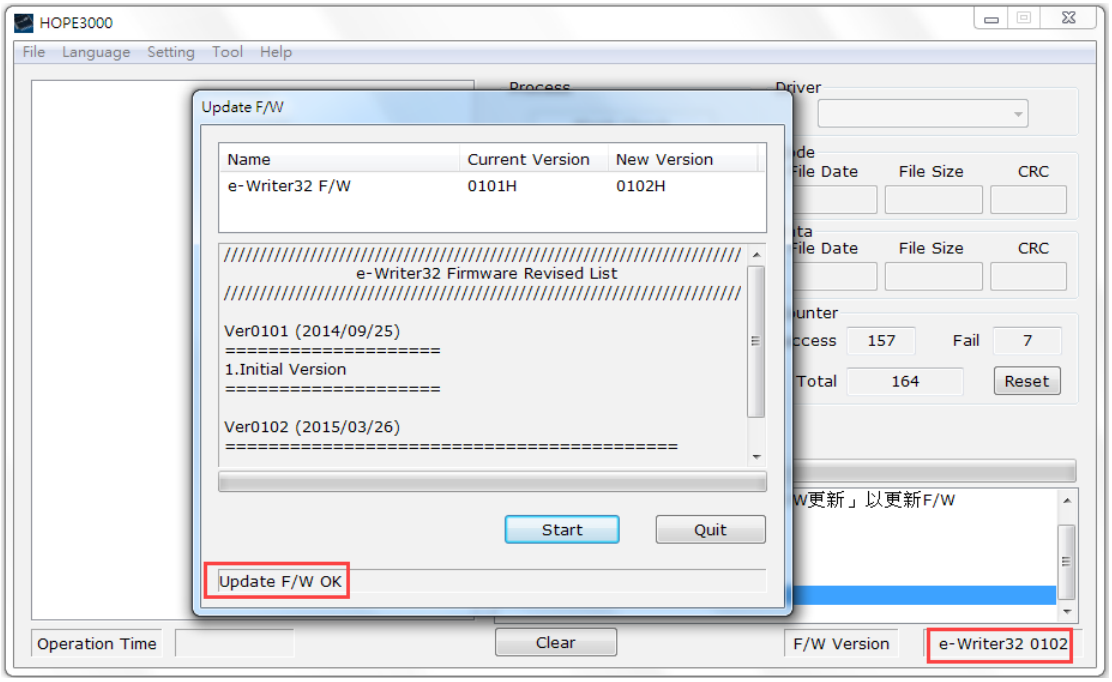

Fig. 2-17

For any problems, refer to Chapter 3 "HOPE3000FOR32BIT Main Function". If an error occurred during programming, refer to Appendix A "System and Error Message" for further information.

Case. 7 – Registering and Activating the Writer

A new e-Writer32 needs to be first activated otherwise programming operations will not be possible. To activate the writer, a registration code must first be obtained for that writer. The following steps show how to register and activate e-Writer32.

- **Step 1**

Execute "Menu/Tool/Activate Writer" to show the "Writer Activation" window. Note that when the writer is not activated, a warning message will show on the lower right corner of Fig.2-18

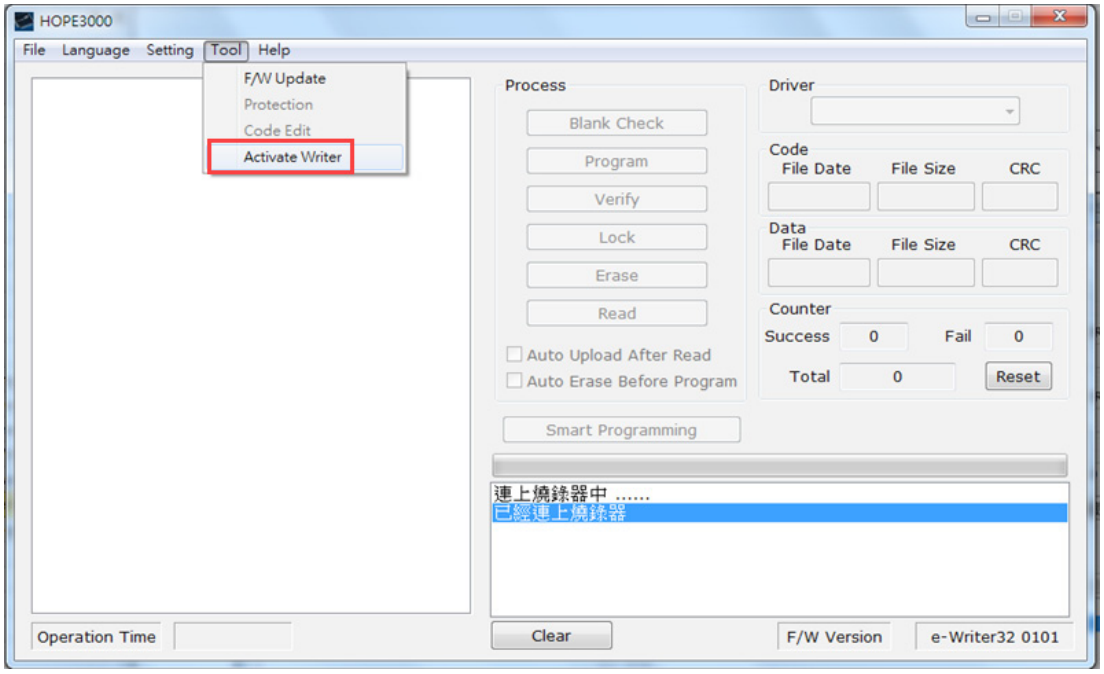

Fig. 2-18

- **Step 2**

Fig. 2-19 is the "Writer Activation" window. The red rectangle shows the detected Writer ID. Click the button "Get Register Code" to register this writer. If the registration code has already been obtained then jump to step6 to activate the writer.

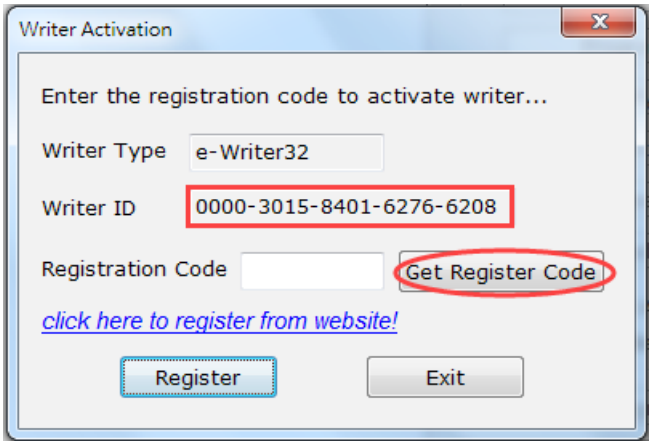

Fig. 2-19

- **Step 3**

Fig. 2-20 is the registration sheet showing the three necessary fields. In the email field, fill in a valid email address to obtain an email containing the registration code. Do not enter another person's mail address to prevent misuse of the registration code. The other fields should also be filled in for our postal records. Your entered information will be protected by HOLTEK. When finished click the button "Submit".

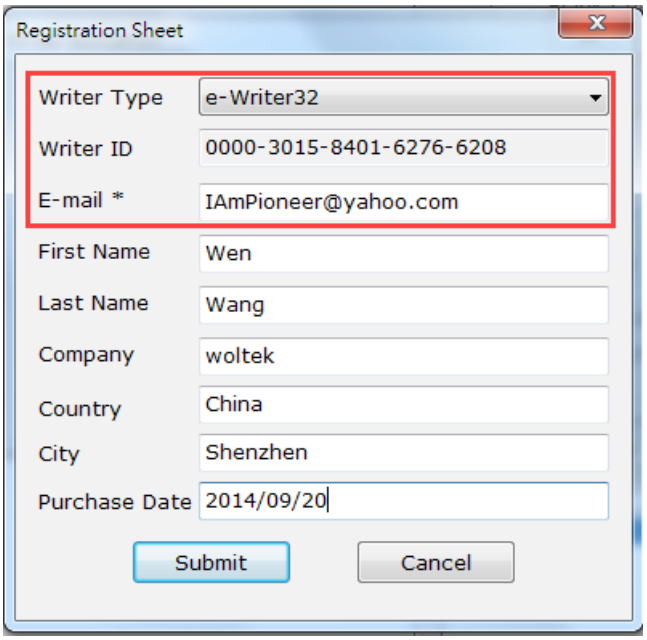

Fig. 2-20

- **Step 4**

If the registration is successful, the Fig. 2-21 dialog will appear after which a registration mail will be sent to the provided mailing address. If the registration fails, try step. 3 again. If it still cannot be registered successfully contact HOLTEK to resolve the problem.

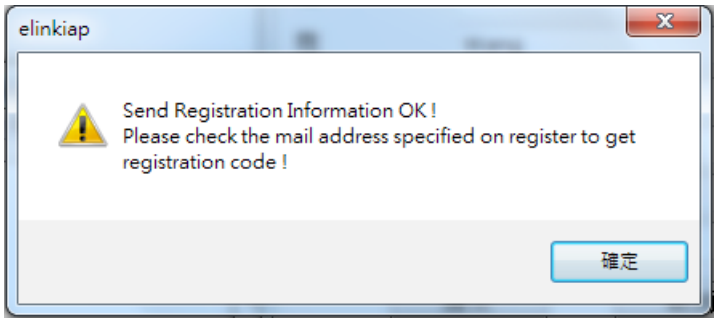

Fig. 2-21

- **Step 5**

If the specified email address is correct, then an email will be received from HOLTEK with the title "Holtek Tools Registry Key"

Fig. 2-29

After opening the mail the registration code will be seen in as shown by the red rectangle in Fig. 2-23 (Fig. 2-23 shows part of the full registration email)

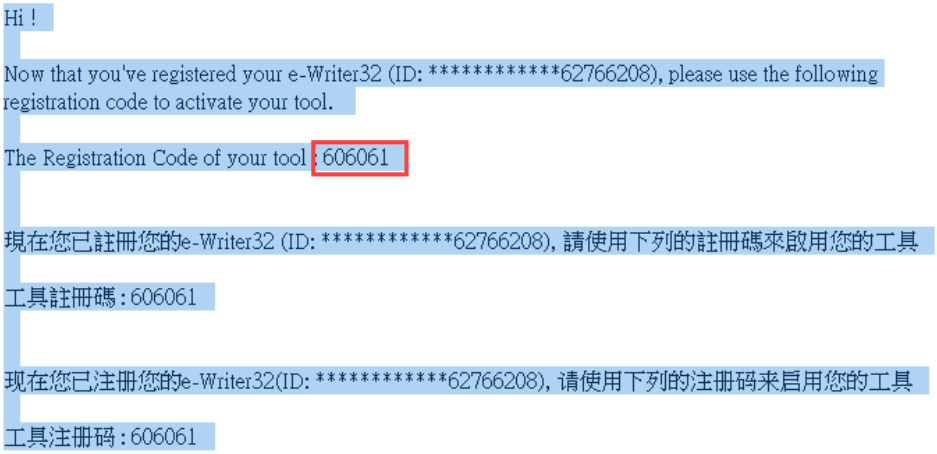

Fig. 2-23

- **Step 6**

Fill in the registration code in the "Writer Activation" window of the HOPE3000FOR32BIT (red rectangle 1 in Fig. 2-24) and click the button "Register" to activate the writer.

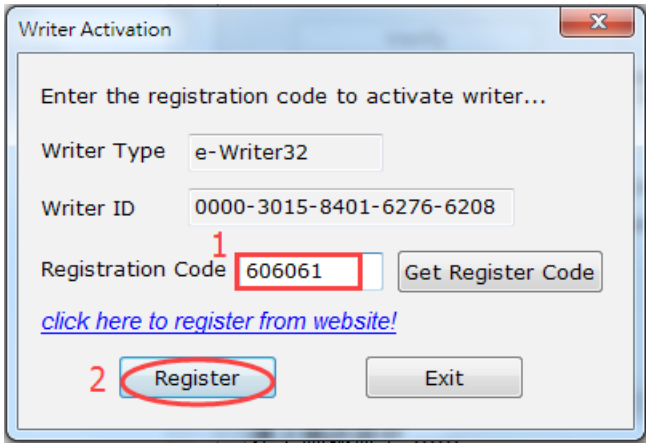

Fig. 2-24

- **Step 7**

  If the activation is successful, then a success message will appear as shown in Fig. 2-25. After this, the writer is now ready for programming. If the activation fails check that the registration code has been entered correctly in Step. 6 or try again from Step. 1. If the problem cannot be resolved then contact HOLTEK to resolve the problem.

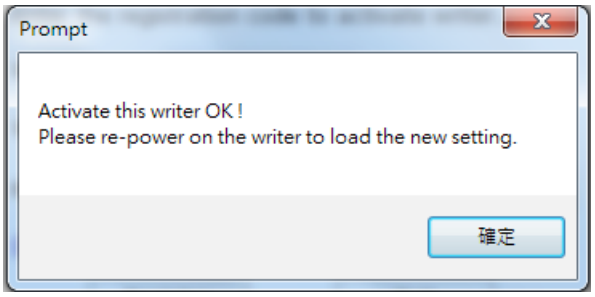

Fig. 2-25

For any problems, refer to Chapter 3 "HOPE3000FOR32BIT Main Function". If an error occurred during programming, refer to Appendix A "System and Error Message" for further information.

Case. 8 – Using external digital signals to control e-Writer32 programming

The following describes two methods of using external digital signals to control e-Writer32 programming. These two methods are "Connects a button to e-Writer32" and "use digital signal to control e-Writer32 programming". These two methods are the same as pushing the red programming button on the e-Writer32, however the last method can also obtain the program result.

- **Connect an external button:**

  Connect a button to Pin2/Pin4 of e-Writer32 CN3 directly, as in Fig. 2-26, 2-27

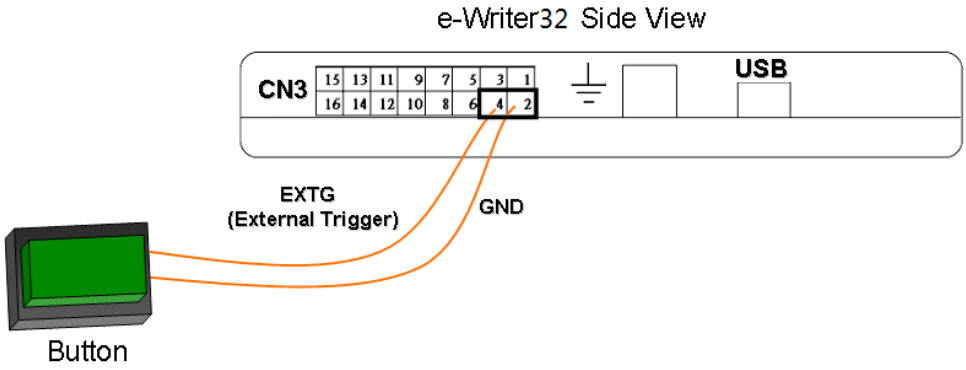

Fig. 2-26

Fig. 2-27

- **Digital Signal Control**

The operation for using digital signals to control e-Writer32 programming is: connect using the method of Fig.2-28 and input the control signal timing.

1. Hardware Connection Diagram

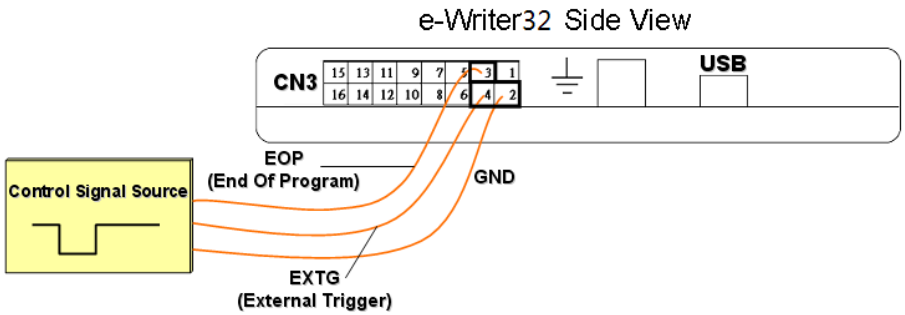

Fig. 2-28

※ If the program result is required then refer to Appendix C "e-Writer32 CN3 Definition" to connect to the corresponding BIN1~BIN7 pins. Then follow step. 3 of the following section "Usage & Control Signal Timing" to see how to obtain it.

2. Usage & Control Signal Timing

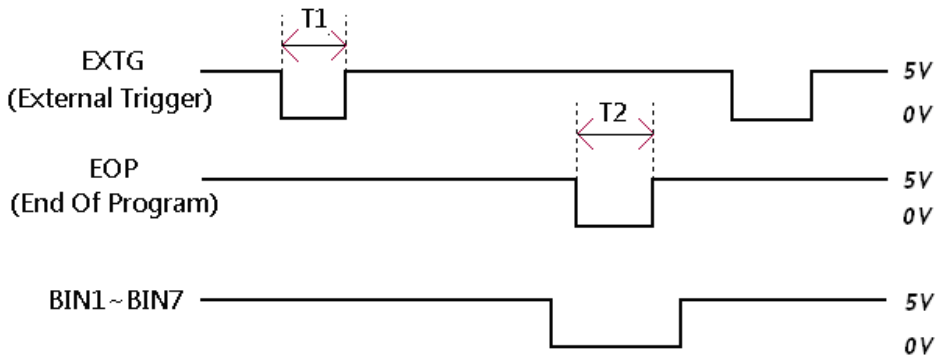

Fig. 2-29 Control Signal Timing diagram

T1: e-Writer32 "External Trigger" low pulse, 10ms < T1 < 500ms

T2: e-Writer32 "End Of Program" low pulse, 12ms < T2 < 100ms

The usage is as follows:

1) Input a low pulse on the EXTG pin to start programming as shown by T1 in Fig. 2-29. This operation is the same as pushing the red programming button on the e-Writer32.

2) The EOP pin can then be polled continuously. If a low pulse is detected, as shown by T2 in Fig. 2-29, then this means that the programming is finished.

3) During the EOP low pulse (as shown by T2 in Fig. 2-29 check the status of BIN1~BIN7 to get the programming result. For example, if BIN1 is low during T2 this means PROGRAM OK. However if BIN4 is low during T2 this means PROGRAM FAIL because the device is not blank.

Chapter 3 HOPE3000FOR32BIT Main Function

The main task of theHOPE3000FOR32BIT Main UI is to handle operations to program the entire IC. This UI is divided into six sections as shown in Fig. 3-1. The following introduces the section details.

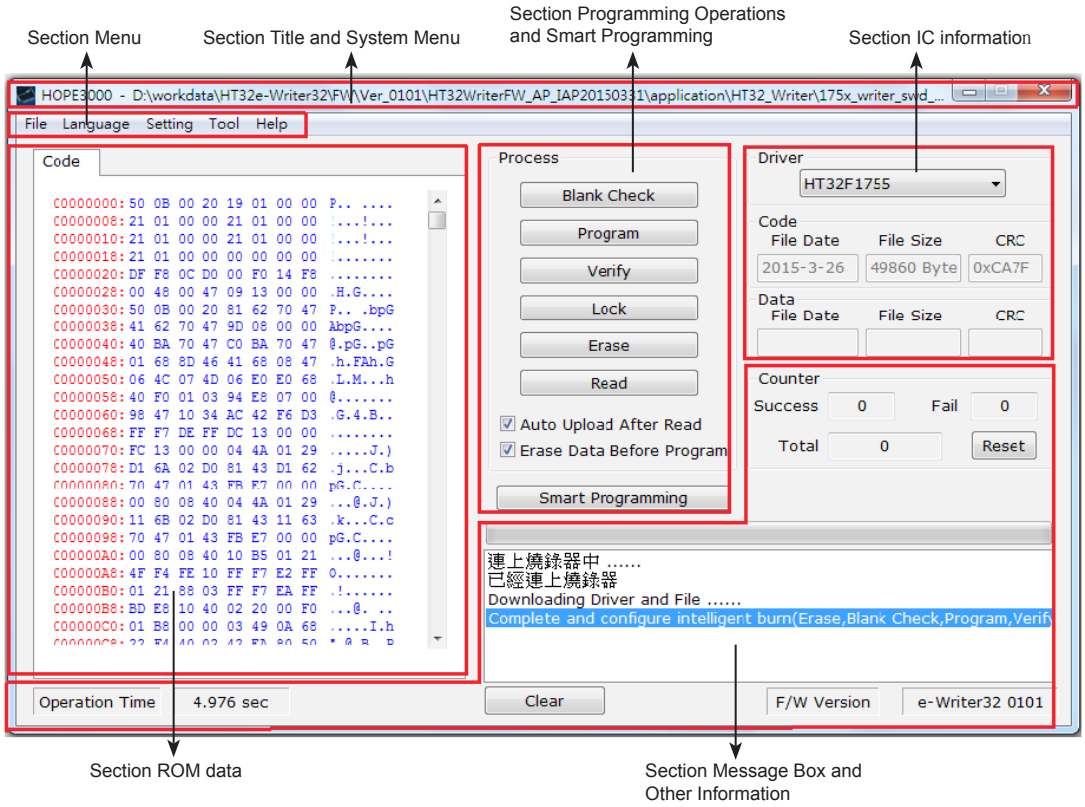

Fig. 3-1

Section Menu

File Menu

Fig. 3-2 shows the File Menu commands.

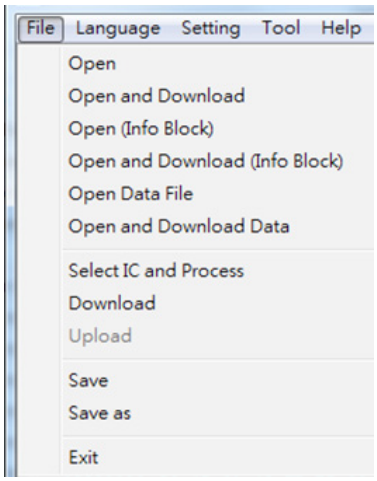

Fig 3-2

- Open
  Open the programming file. After executing this command, the program switches its UI to the proper file type. It supports the following file types:
  BIN - Flash MCU
  HEX - Flash MCU
- Open and Download
  Open the programming file and download it to writer
- Open - Info Block
  Open the programming file in the Block type
- Open and Download - Info Block
  Open the programming file in the Block type and download it to the writer.
- Open
  Open the programming file. The BIN (Flash MCU) programming file is only supported at the present time.
- Open and Download
  Open the programming file and download it to the writer
- Select IC and Process
  Using this command, allows the operations "BlankCheck", "Lock IC", "Erase" or "Read" to be selected by only selecting the required device type without first opening any programming file. When executing this command, a dialog "Select IC" pops up as shown in Fig 3-12. For details about this dialog, refer to the section "Select IC Dialog" of "Other Function" in this chapter.
- Download
  Download the opened programming file to the writer
- Upload
  Upload the data in the writer, which includes the programming file, to the HOPE3000FOR32BIT MCU program. After uploading the program prompts to be saved.

- Save
  Save the data in the HOPE3000FOR32BIT UI as a file, which will replace the original file.
- Save As
  Save the data in the HOPE3000FOR32BIT UI as a file with a different name.
- Exit
  Exit the HOPE3000FOR32BIT program.

Language Menu

Supported languages include Traditional Chinese/Simplified Chinese/English (as in Fig. 3-3). After selecting, the UI language is changed immediately.

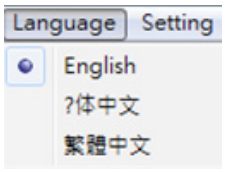

Fig. 3-3

Setup Menu

- Lock Upload
  This is used to prevent the reading back of data in the writer using the Upload function. After checking this option, "Menu/File/Download" needs to be activated to download this setting to the writer.

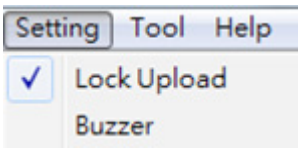

Fig. 3-4

- Buzzer

This setting can adjust the buzzer volume for which there are three selections: Loud/Low/Mute

Tool Menu

Fig. 3-5 shows the Tool Menu commands.

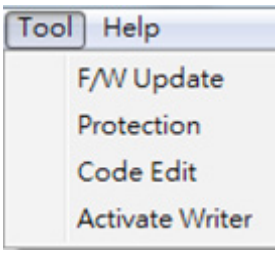

Fig. 3-5

- F/W Update
  Update the F/W via the PC. For the update steps refer to Case.6 "Update Writer F/W via PC" in Chapter 2 "Quick Start".
- Protection
  Prevents as specific page from being written to.

- Code Edit
  Modify the programming file original data. When using this function users do not need to return to the Keil µVision or IAR EWARM to compile again to modify parts of data. The data can be modified in this window and then click "OK".
  ※ After modifying, it is necessary to execute "Menu/File/Download" to download the modified data to the writer
- Activate Writer
  Register and activate the writer. The writer cannot be used until it is first activated.

Help Menu

Fig. 3-6 shows the Help Menu commands.

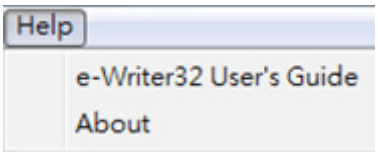

Fig. 3-6

- e-Writer32 User's Guide
  Open the e-Writer32 User's Guide . Its language is the same as the HOPE3000FOR32BIT
- About
  Show the version and copyright information of the HOPE3000FOR32BIT as shown in Fig.3-7. Rectangle 1 in this figure shows the HOPE3000FOR32BIT version number, released date and driver file version. Rectangle 2 shows the version of the current writer firmware and the writer ID.

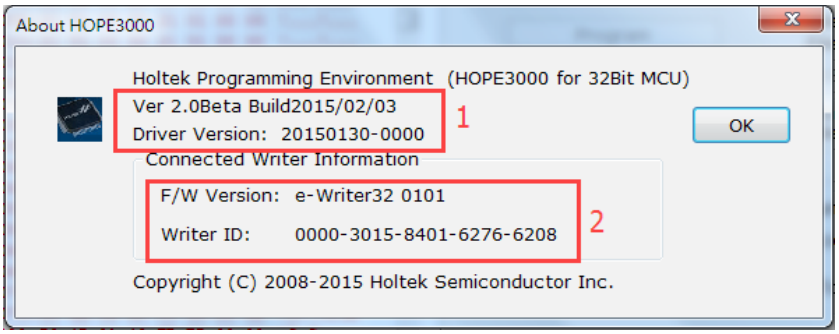

Fig. 3-7

Section ROM Data

This displays the contents of the programming file. It can display the Code (Program) and the data of the two ROM sections. In Fig. 3-8, in the rectangle on the left side, is shown the address of the ROM section. On the right side is the data in the ROM section. Furthermore, the range "----" in this figure represents the IC locked part.

In the part "ROM section data" (the rectangle on the right side), there are two colours to identify if the data in the HOPE3000FOR32BIT is the same as that in the writer. The following explains these two conditions:

- When the data in the HOPE3000FOR32BIT is the same as that in the writer.
  The colour in the part "ROM section Data" is blue and the buttons of the programming operations like "BlankCheck" are enabled. This means that you programming operations can be executed.

- When the data in the HOPE3000FOR32BIT is different from that in the writer.
  The colour on the part "ROM section Data" is red and the buttons of the programming operations like "BlankCheck" are all disabled.
  This means that programming operations cannot be executed until the data in the HOPE3000FOR 32BIT is the same as that in the writer. This is done by executing the commands "Download", "Upload" or "Select IC and Process" on "Menu/File".

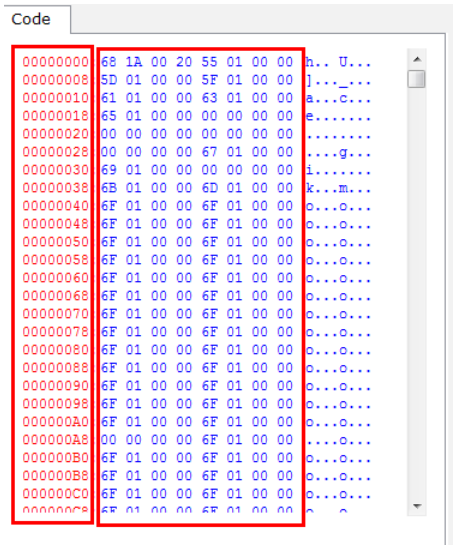

Fig. 3-8

Section Message Box and Other Information

This section is divided into several sections (as in Fig. 3-9) which will now be introduced.

- Counter
  Count the successful, failed and total counts for the IC-programming. These three values are stored in the Windows Registry. Clicking the button "Reset" will clear all these three values to 0.
- Execution Time
  Show the time required to execute the writer related operations such as Download, Program. Usually, this is used to measure the programming time.
- F/W Version
  Show the writer type (e.g. e-Writer32) and F/W version in this location when the writer is connected.
- Progress Bar
  Show the download progress status, upload or programming operations.
- Message Box
  Show the execution result of any operation or the writer status.

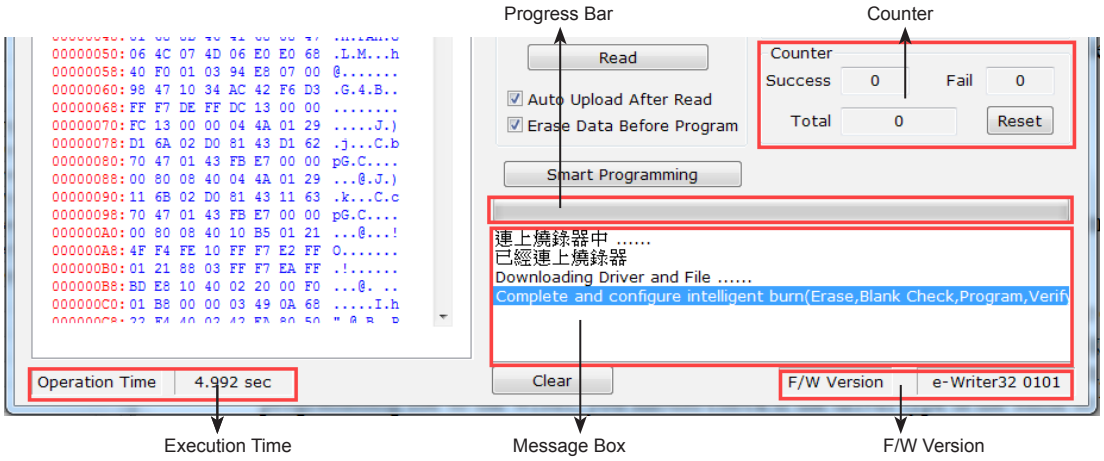

Fig. 3-9

IC Information

As can be seen in Fig. 3-10, there are sections: Driver, Code and Data.

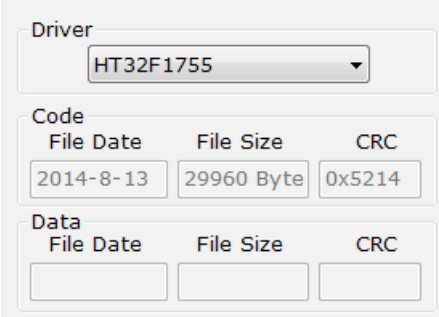

Fig. 3-10

- **Driver**

  Show the driver type. The driver type is the IC type in the opened file or selected in the command "Menu/File/Select IC and Process". For example, in Fig. 3-10, the driver type is HT32F1755. In addition, before downloading the programming file to the writer, check if the driver type is the same as the IC type in the program.

  ※ Note: the IC driver information is recorded and each IC type has its own driver. When downloading, the driver and the programming file are been downloaded at the same time.

- **Code**

  Show the Code(Program) creation date, data length and checksum

- **Data**

  Show the data file creation date, data length and checksum

Section Programming Operations and Smart Programming

This includes several basic programming operations, BlankCheck, Program, Verify, Lock, Erase, Read, Smart Programming and two programming settings as shown in Fig. 3-11. The following describes the command details:

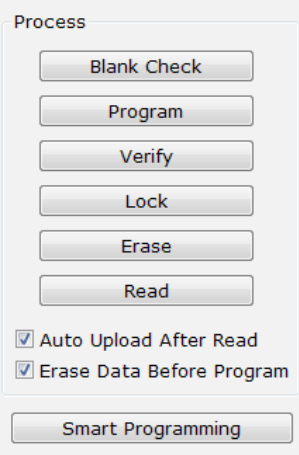

Fig. 3-11

- **BlankCheck**

  Check if the IC in the writer has been programmed which is to check if the IC is empty. The result is displayed in the Message Box

- **Programming**

  Program the data in the writer to the IC. This operation contains a "Verify" function when it is executed. A "Verify" operation can also be executed later as a double check. The result is displayed in the Message Box. In addition, only after downloading the programming file to the writer is this button enabled.

- **Verify**

  Check if the data in the IC is the same as that in the writer. The result is displayed in the Message Box. In addition, only after downloading the programming file to the writer is this button enabled.

- **Lock**

  Lock to prevent the data in the IC from read out. This function is used to protect the IC data. Usually after executing the "Program" operation, the "Lock IC" function would be used to protect the IC data.

- **Erase**

  Erase the data in the IC to make a blank IC.

- **Read**

  Read the data in the IC to the writer. After this operation, the command "Menu/File/Upload" can be executed to upload the data to the HOPE3000FOR32BIT.

- **Smart Programming**

  Start the "Smart Programming" UI. For details refer to Chapter 4 "Introduction to HOPE3000 FOR32BIT – Smart Programming Function".

- **Auto Upload After Read**

  After executing the "Read" operation an "Upload" operation is executed automatically.

- **Erase Data Before Program**

  Select this to "Erase" before "Program".

Other Function

"IC Select" Dialog

This dialog pops up after executing the command "Menu/File/ IC Select" (Fig. 3-12). It is used to select the required IC type for which the available selection can be from either one of the two sources shown below:

- **From Recent ICs**

  Select from the recent used IC types. Clicking the "Clear" button removes the selected IC type from the recently used IC type list. For example, in Fig. 3-12, clicking this button will remove HT32F1755 from the list and clicking "Clear All" will clear all types on the list.

- **From All ICs**

  Select from all of the supported IC types.

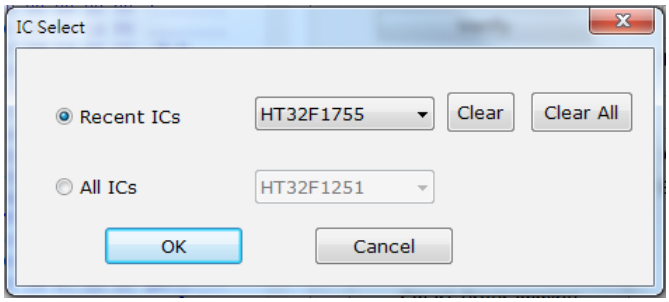

Fig. 3-12

Chapter 4 Introduction to the HOPE3000FOR32BIT Smart Programming Function

Smart Programming is an advanced function. Relative to the basic functions on the HOPE3000 FOR32BIT Main UI which execute programming operations on the entire IC on the PC side, it can also execute three main functions "Auto Programming", "Partial Programming" and "Programming User Specified Data". On-Line Programming can be chosen to operate the writer on the PC side or Off-Line Programming can be chosen to operate the writer independently. The Smart Programming UI is divided into four main sections as shown in Fig 4-1. The following introduces the details of these sections.

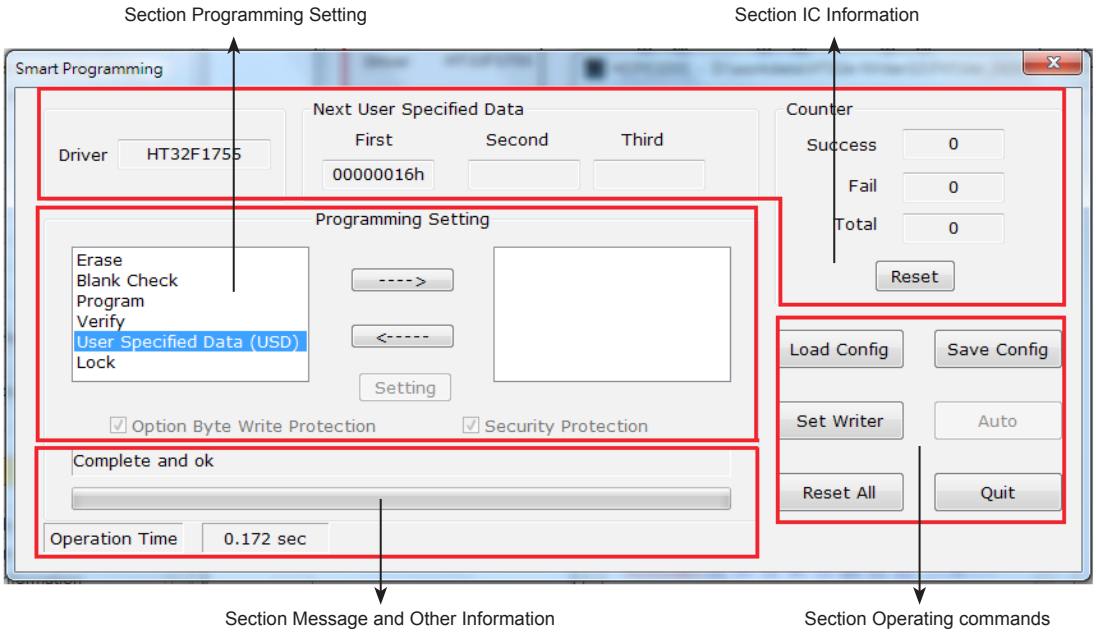

Fig. 4-1

Section IC Information

The Section IC Information, as shown by the rectangle in Fig. 4-2, is divided into the following three items:

- **Driver**

  This is the same as the field "Driver" on the HOPE3000FOR32BIT Main UI. It is the IC type in the opened programming file or is selected using the command "Menu\File\Select IC and Process".

- **Next User Specified Data**

  Show the value of the current user specified data to program. It can show three groups at the most using "User Specified Data" Dialog.

- **Counter**

  This is the same as the field "Counter" on the HOPE3000FOR32BIT Main UI. It shows the successful, failed and total counts. Clicking the "Reset" button will clear these three values to zero.

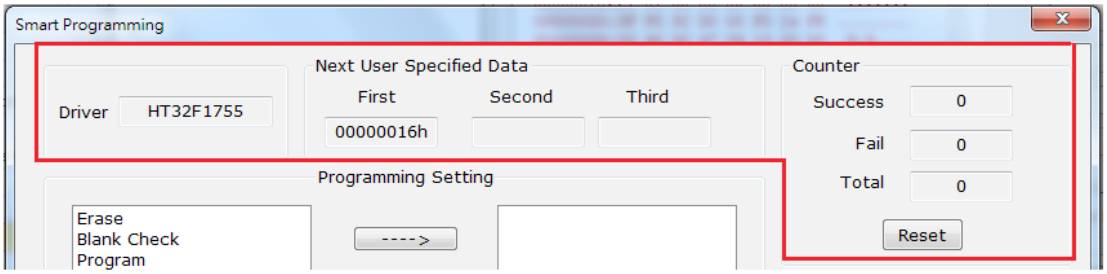

Fig. 4-2

Section Operating Commands

The Section Operating Commands, as shown in Fig. 4-3, has six commands whose details are as follows:

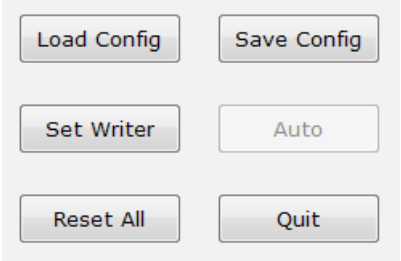

Fig. 4-3

- **Load Config**

  Load the Smart Programming Configuration file (.SPC).

- **Save Config**

  Save all the settings on the Smart Programming UI as a file (.SPC).

- **Set Writer**

  Download the settings on the Smart Programming UI to the writer.

- **Auto**

  Execute the programming operations set on the Smart Programming UI.

- **Reset All**

  Restore all the settings on the Smart Programming UI.

- **Quit**

  Quit the Smart Programming UI and return to the HOPE3000FOR32BIT Main UI

Section Programming Settings

The Section Programming Settings is the section where the Smart Programming settings are setup. After setting, click the button "Set Writer" to download these settings to the writer. These settings can then be executed by clicking the button "Auto" (On On-Line mode) or pressing the programming key on the writer (On Off-Line mode). This section is divided into three parts (Fig. 4-4) whose details are as follows:

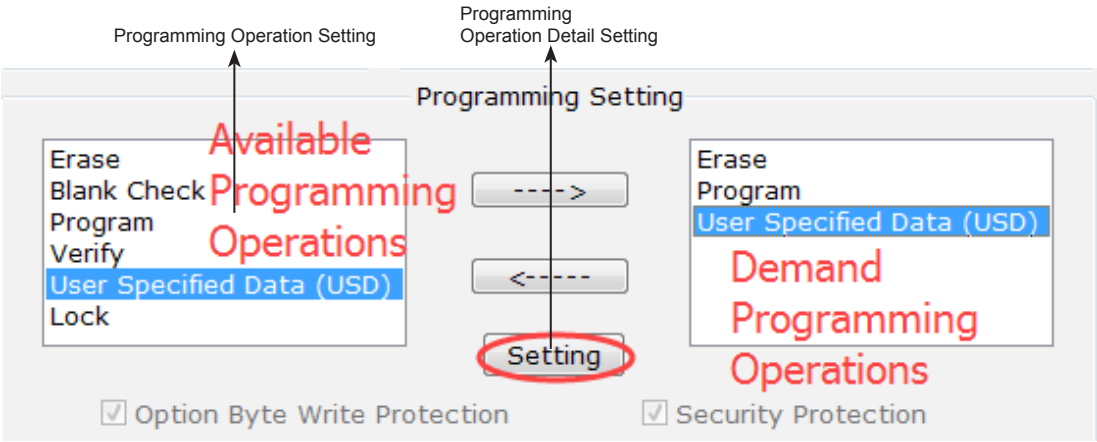

Fig. 4-4

- **Programming Operation Setting**

  This part is used to set the demand programming operations with a maximum of six operations. These are "Erase", "BlankCheck", "Program", "Verify", "User Specified Data" and "Lock".

  On the left side, the "Available Programming Operations" list lists all the supported operations. On the right side, the "Demand Programming Operations" list lists all the operations selected. Clicking the button "----->" will add the operation selected from the left list to the right list and clicking the button "<------" will to remove the operation selected from the right list.

- **Programming Operation Detail Setting**

  This part is used to set the detailed setting for each programming operation. It only supports the detailed settings in the "User Specified Data".

  This setting appears when selecting "User Specified Data". After clicking the button "Setting", the "User Specified Data Setting Window" pops up as shown in Fig. 4-6.

  For the details of the "User Specified Data Setting Window", refer to the section "User Specified Data Setting Window" in this chapter.

Section Message and Other Information

As shown in Fig. 4-5, this section is divided into three parts:

- **Message**

  Shows the execution result of any operation or the writer status.

- **Progress Bar**

  Shows the progress when setting the writer or executing auto-programming.

- **Execution Time**

  Shows the time to execute the commands related to the writer such as "Set Writer", "Auto" or others. This information is usually used to measure the programming time.

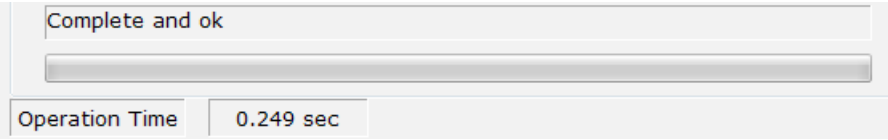

Fig. 4-5

User Specified Data Setting Window

This window is used to set the user specified data as shown in Fig. 4-6. "User Specified Data" is a single data record to be programmed into the specified address in the ROM section. Its value is decided by the user. This function is usually applied to the program serial number or other special data. It is directed at the Program Memory and Data Memory and at most three groups of different data can be programmed at any one time.

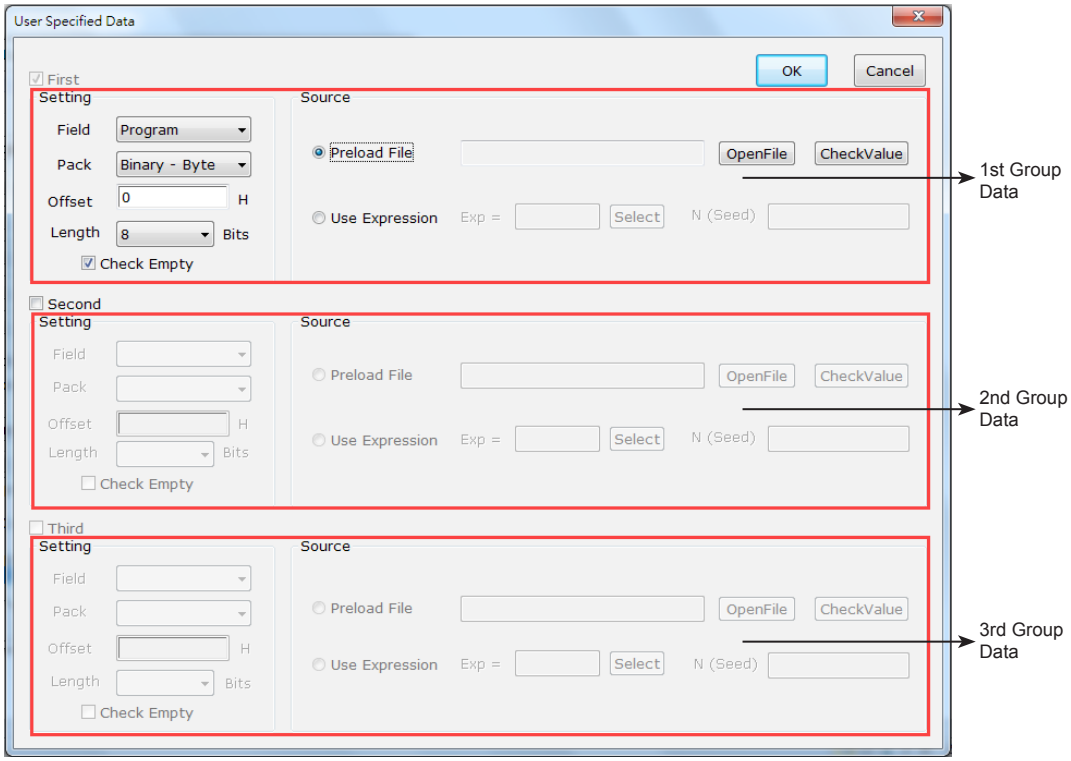

Fig. 4-6

The following introduces the definitions and how to use these settings. As shown in Fig. 4-7, each group of settings is divided into a left and right part. The left part is used to set the form, length and address of data in the Program Memory section and the right part is to set the data source. The details are shown below:

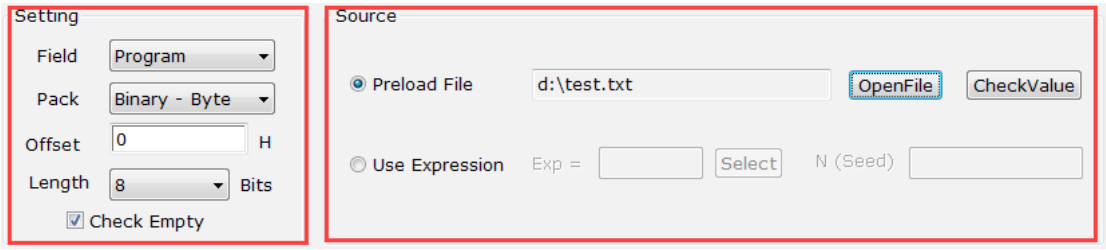

Fig. 4-7

(A) Setting - the left part in Fig. 4-7

- Field
  The ROM section where data is written - now support both Program ROM and Data ROM.
- Pack
  The form of the written data in ROM section. It has the following two types:
  Binary – Byte → This data is written to each low byte in a binary form (no encode) from the specified address until it reaches the data length boundary.
  BCD – Byte → This data is written to each low byte in a BCD encoded format from the specified address until it reaches the data length boundary.
- Offset
  The start address of the ROM section where the data is written.
- Length
  This is the length of the data. There are four kinds: 8, 16, 24 and 32 bits. Any portion of data larger than this length is discarded.
  For example, for preloaded data of 12345678H but with a specified data length of 24 bits, only 345678H will be valid for this data record.
- Check Empty
  Check if the programming range is empty first before programming this data record. If not empty, an error message will be generated during programming.

The following shows several practical setting examples:

EX 1. For a data record of 345678H and length of 24 bits, programmed from a start address of 100H in the Program ROM with a Binary pack– Byte, then the actual programming condition will be:

100H → 0078H

101H → 0056H

102H → 0034H

EX 2. For a data record of 12345678H (BCD code is 305419896H) and length of 32 bits, programmed from a start address of 200H in the Program ROM with a BCD pack – Byte, then the actual programming condition will be:

200H → 0096H

201H → 0098H

(B) Data Source - the right part in Fig. 4-7

※Note: the following method "Preload File" and "Use the Custom Expression" have a restriction whereby the total data record count is about 900 records. However, "Use the Expression" does not have this restriction..

- Preload File
  Taking the file values (include several user-specified data records) as the user specified data. Then the file can have one of the following formats:

- [.BIN] — Binary file. Each N-Bit number in file is considered as one record of the user specified data where N is the specified data length.
  For example, if the data (hexadecimal number) in a file is: 12 34 56 78 9A BC CD and its data length is 24 bits,
  Then the 1st data record is 563412H,
  the 2nd data record is BC9A78H,
  the 3rd data record is 0000CDH (fill in zeros for the insufficient parts)
- [.TXT] — Text file. The number in each line of the file is considered as one user specified data record which can be binary, decimal or hexadecimal.
  For example, if the number in a file is 123456789H
  10000000B
  55555
  and its data length is 16 bits, then
  the 1st data record is 6789H (the excess part is discarded),
  the 2nd data record is 0080H,
  the 3rd data record is D903H
  Usage — as shown in Fig. 4-8, click the button "Open" to load the file. In addition, click the button "CheckValue" to check each generated data record as shown in Fig. 4-11.

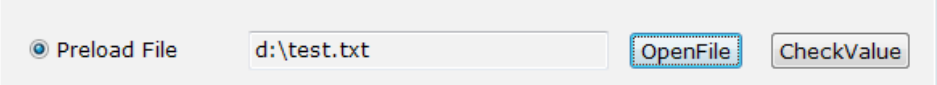

Fig. 4-8

- Use Expression
  The specified data source comes from the calculation result of a mathematical polynomial. The result value of each calculation is the value of N on the next record. It supports the following two expressions "N+1" and "N-1":
  - Use the Expression "N+1" or "N-1": the data is generated from the expression "N+1" or "N-1". It is only necessary to set the initial value of N to generate any amount of data records. This is well suited to applications that require a high quantity of data records not from the calculation of the complicated expression. Note that it does not detect an "N+1" overflow or an "N-1" underflow.
    Usage — In the figure below, click the "Select" button to select the expression firstly as shown in Fig. 4-10 and then fill the initial value of N in the location "N=".
    ※As shown in Fig. 4-9, the generated data is1, 2, 3, 4, 5.....

Fig. 4-9

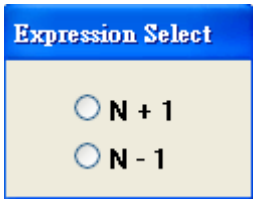

Fig.4-10

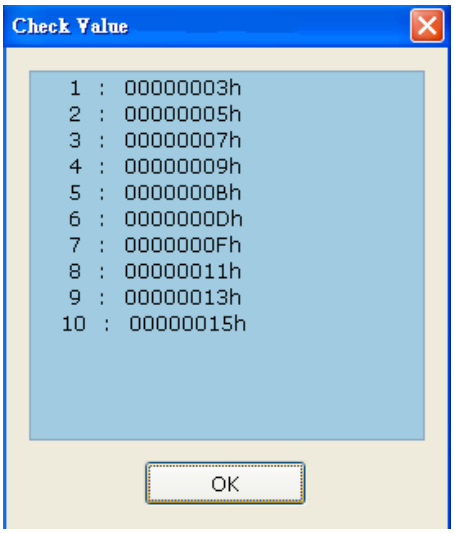

Fig. 4-11

Appendix A System and Error Messages

System Error Messages

- **ERR_0001: No language file found !**

  HOPE3000FOR32BIT language file is missing, please reinstall HOPE3000FOR32BIT

- **ERR_0002: Error occurred when loading a language file !**

  Cannot load the HOPE3000FOR32BIT language file. Reboot the PC and then run the HOPE3000 FOR32BIT again. If the error occurs again, reinstall the HOPE3000FOR32BIT.

- **ERR_0003: Failed to find**

  Cannot find the specified file. Check if the file exists and check that the specified path is correct or if it is being used by another program.

- **ERR_0004: Invalid file format or failed to find driver!**

  The opened file format is invalid or the IC type in the file is not supported. Check if the programming file is generated from the HT-IDE3000 or other HOLTEK official software and that the version of the HOPE3000FOR32BIT supports that IC type. Check this by referring to the document "Supported IC List" in the "Manual" directory under the root directory of the HOPE3000FOR32BIT.

- **ERR_0005: Failed to load the data in the writer ! Download the file again.**

  Unable to upload because the data in the writer is damaged or for some other reason. Download the programming file again.

- **ERR_0006: Find no EFORMATtoDDF.DLL !**

  System file is missing. Reinstall the HOPE3000FOR32BIT program.

- **ERR_0007: Load EFORMATtoDDF.DLL failed !**

  Cannot load the HOPE3000FOR32BIT system file. Reboot the PC and execute the HOPE3000 FOR32BIT again. If the error occurs again, reinstall the HOPE3000FOR32BIT.

- **ERR_0008: Find no DLLFORFUN.DLL !**

  The system file is missing. Reinstall the HOPE3000FOR32BIT.

- **ERR_0009: Load DLLFORFUN.DLL failed !**

  Unable to load the HOPE3000FOR32BIT system file. Reboot the PC and execute the HOPE3000FOR32BIT again. If the error occurs again, reinstall the HOPE3000FOR32BIT.

- **ERR_0010: Invalid SPC file format !**

  The opened Smart Configuration Setting File (.SPC) format is incorrect. Ensure that this file has been generated by the HOPE3000FOR32BIT.

- **ERR_0011: This SPC file version cannot be used in this program version !**

  The version of the opened Smart Programming Configuration File (.SPC) is not supported for this version of the HOPE3000FOR32BIT. Use the proper HOPE3000FOR32BIT version to open this file or set the Smart Programming Setting again.

- **ERR_0012: Driver type mismatched ! Driver type in File is**

  The driver type on the opened Smart Programming Configuration File (.SPC) is different from the current used driver type. Ensure that the .SPC file is correct.

- **ERR_0024: Save file failed !**

  Save file failed. Reboot the PC and execute the HOPE3000FOR32BIT again.

- **ERR_0025: Download language file to console failed !**

  Download the language file to Console failed. Check if the Console is connected to the writer then reboot the PC and execute the HOPE3000FOR32BIT again. If the error occurs again reinstall the HOPE3000FOR32BIT.

- **ERR_0026: Download driver failed !**

  The driver download has failed. Reboot the PC and execute the HOPE3000FOR32BIT again. If the error occurs again reinstall the HOPE3000FOR32BIT.

- **ERR_0027: The data in the writer is invalid ! Please re-download file.**

  Unable to upload because the data in the writer is damaged or for some other reason. Download the programming file again.

- **ERR_0028: The specified IC is invalid !**

  The HOPE3000FOR32BIT cannot identify the specified IC type. Reboot the PC and execute the HOPE3000FOR32BIT again. If the error occurs again reinstall the HOPE3000FOR32BIT.

- **ERR_0029: The driver type in the writer is not supported !**

  This version of the HOPE3000FOR32BIT does not support this driver type (IC type) uploaded from the writer. Use the version of the HOPE3000FOR32BIT that supports that driver type and upload again.

- **ERR_0030: Find or load driver failed !**

  Error occurred when loading the driver. Reboot the PC and execute the HOPE3000FOR32BIT again. If the error occurs again reinstall the HOPE3000FOR32BIT.

- **ERR_0031: ROM data checksum error !**

  Unable to upload because the data in the writer is damaged or for some other reason. Download the programming file again.

- **ERR_0032: Obtain next user specified data failed !**

  Cannot obtain the next user specified data. Reboot PC and then execute the HOPE3000FOR32BIT again.

- **ERR_0034: Not supported F/W version !**

  This version of the HOPE3000FOR32BIT cannot support the writer F/W version. Use the proper HOPE3000FOR32BIT version that support this F/W version.

- **ERR_0035: Find or Load HDumpOpt32.DLL Failed !**

  Lose the system file or load it failed. This error results in the "Option Table" function not being executed. Reboot the PC and then execute the HOPE3000FOR32BIT again. If the error occurs again reinstall the HOPE3000FOR32BIT.

- **ERR_0036: Find or Load DllForUI.DLL Failed !**

  Lose the system file or load it failed. Reboot the PC and then execute the HOPE3000FOR32BIT again. If the error occurs reinstall the HOPE3000FOR32BIT.

- **ERR_0037: Find no HOPrint32.EXE !**

  Lose the system file or load it failed. This error results in the "Option Table" function note being executed. Reboot the PC and then execute the HOPE3000FOR32BIT again; If the error occurs again reinstall the HOPE3000FOR32BIT.

- **ERR_0038: Update F/W Failed ! (SID-XX)**

  Error occurs when updating F/W. Reboot the PC and then execute the HOPE3000FOR32BIT. If the error occurs again reinstall the HOPE3000FOR32BIT. If the problem occurs again contact an agent or Holtek for further help. Provide the SID number in error message.

- **ERR_0039: Invalid F/W ! Please execute "Menu\Tool\FW Update" firstly !**

  The writer F/W is invalid. Please execute "Menu\Tool\FW Update" to update F/W firstly.

- **ERR_0040: The selected IC package on writer is not supported !**

  The IC package in the writer is not supported in this version of the HOPE3000FOR32BIT. Select another package

- **ERR_0041: Find or Load ToolRegProcess.DLL Failed !**

  Cannot load the HOPE3000FOR32BIT system file. Reboot the PC and then run the HOPE3000FOR 32BIT again. If the error occurs again reinstall the HOPE3000FOR32BIT.

Writer Error Messages

Most errors on the writer result from the incorrect operation of the hardware. In the first instance take note of the following points:

- Check that the writer is properly connected - connect to the PC for the On-Line mode or to a power adapter for the Off-Line mode.
- Check that the programming adapter type is correct.
- Check that the IC is properly located in the programming adapter and that the bar is pulled down and that the IC type is correct.
- Try a different IC.
- For any problem reboot the PC power on the writer and try again.

The following are the writer error messages and their explanations:

- **Chip is not Blank**

  IC has been programmed.

- **Program Error**

  Error occurs during programming.

- **Verify Error**

  The data in the IC is different from the data in the writer.

- **Lock IC Error**

  Error occurred when locking the IC.

- **Read Error**

  Error occurred when reading the IC.

- **Writer User Data Error**

  Examination of the programming data failed when the writer powers on. Download the programming data again.

- **No Auto Operation is set**

  No auto programming operations are set therefore no Off-Line programming is possible. If Off-Line programming is not required ignore this message.

- **Erase Error**

  Error occurred when erasing the IC

- **Download to Writer Error**

  Error occurred when downloading the programming file from the PC to the writer.

- **Upload to PC Error**

  Error occurred when uploading the programming file from the writer to the PC.

- **User Specified Data Exceeded**

  The user specified data has exceeded. Set again the user specified data.

- **Writer Flash Timeout**

  The writer flash does not respond during downloading. Download the data again. If the problem occurs again, contact an agent or Holtek for further help.

- **Writer F/W is too old**

  The F/W version of writer is too old to use with this version of the HOPE3000FOR32BIT. Contact an agent or Holtek to update the F/W.

- **Chip is Locked**

  IC is locked. No programming operation can be executed except for "Erase".

- **Test Flash Error**

  A writer hardware error occurred during downloading. Download the data again. If the problem occurs again, contact an agent or Holtek for further help.

- **The address where user specified data is about to be written to in the IC is not empty**

  Check if the IC is empty or if the user specified data setting is correct.

- **Data Checksum Error**

  Check for data errors when uploading or downloading. Download the data again.

- **Timeout**

  Writer has timed out, power on the writer again.

- **Writer is Busy**

  Writer is busy, power on the writer again.

e-monitor Error Message

The meaning and processing method for of the e-monitor error messages is the same as the Writer error messages. When an error occurs, check the item list beginning with the "Writer Error Message" section in this chapter.

The following are error messages together with their explanation:

- **IC is NOT Blank**

  IC has programmed.

- **Program Error**

  Error occurs when programming the IC.

- **Verify Error**

  The data in the IC is different from the data in the writer.

- **Lock Fail**

  Error occurs when locking the IC.

- **Read Error**

  Error occurs when reading the IC.

- **User Data Error**

  Examination of the system data has failed when the writer powers on. Download the programming data again.

- **No Auto Setting**

  No auto programming operations have been set therefore Off-Line programming cannot be executed. To it is not required to execute Off-Line programming, ignore this message.

- **Erase Error**

  Error occurs when erasing the IC.

- **Download Fail**

  Error occurs when downloading the programming file from the PC to the writer.

- **USD Exceeded**

  The user specified data has exceeded. Reset the user specified data.

- **Flash Timeout**

  The writer flash does not respond during downloading. Download the data again. If the problem occurs gain contact an agent or Holtek for further help.

- **Check Device Err**

  Error occurs when checking the IC.

- **Chip is Locked**

  IC is locked. No programming operations can be executed except for the operation "Erase".

- **USD Target Dirty**

  Please check if the IC is empty or the user specified data setup is correct.

- **Data Chksum Err**

  Check for data errors when uploading or downloading. Download the data again.

Appendix B Writer LED Lights and Status

The writer supplies three LED lights to represent the result of the programming by the status of LED light.

The status of LED light is:

ON: LED is turned on

OFF: LED is turned off

Fast Flash: LED flashes for each 0.25 second

Slow Flash: LED flashes for each 0.5 second

Below table B-1 lists the definitions for the status of each LED light.

Yellow LED (OK)	Green LED (Ready)	Red LED (Fail)	Definition
During Writer is Power On			
OFF	OFF	Fast Flash	The Flash in writer is damaged
Slow Flash	OFF	OFF	Power on OK. Standalone (Smart) Programming Setting is set and Standalone Programming is available.
OFF	OFF	Fast Flash	Power on OK. Standalone (Smart) Programming Setting is NOT set and Standalone Programming is NOT available.
During Normal Operation			
OFF	Slow Flash	OFF	The programming operation is executing (Busy)
Slow Flash	OFF	OFF	Operation OK or writer is standby
OFF	OFF	Fast Flash	Operation Fail
OFF	OFF	Fast Flash	User specified data exceeds

Table B-1

Appendix C e-Writer32 CN3 Pin Definition

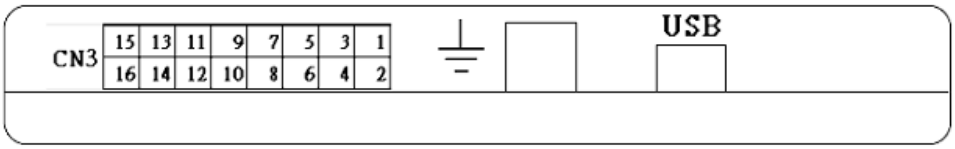

Fig. C-1

e-Writer32 CN3			
Pin	**Name**	**Definition**	**Direction**
1	EXPWI/ USBPWO	External Power Input / USB Power Output	—
2	GND	Ground	—
3	EOP	End Of Program	e-Writer32→
4	EXTG	External Trigger	e-Writer32←
5	BIN2	IC is locked	e-Writer32→
6	BIN1	Blank Check/Program/Verify/Erase OK	e-Writer32→
7	BIN7	Lock IC failed	e-Writer32→
8	—	N/A	—
9	BIN4	IC is not blank	e-Writer32→
10	BIN3	Erase failed	e-Writer32→
11	BIN6	Verify failed	e-Writer32→
12	BIN5	Program failed	e-Writer32→
13	—	N/A	—
14	SDA	I^2C SDA - Reserved	e-Writer32↔
15	—	N/A	—
16	SCL	I^2C SCL - Reserved	e-Writer32→

Table C-1