**WLINK-SWUT ISP
Operation Manual**
REV. 1.2
September 10, 2013

Revision	Date	Applicant	Description
V1.0	2012/1/10	Derek	1st Version
V1.1	2012/04/17	Derek	1. Modify 1.5 code option setup
V1.2	2013/09/10	Derek	1. Modify

WLINK-SWUT ISP Operation Manual

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Chapter 1 WLINK-SWUT ISP Operation Description

1.1 WLINK-SWUT Description

WLINK-SWUT (Single Wire UART) ISP program can be with WLINK Adapter or WLINK-SWUT Adapter, and burn assembly Hex file in the IC. The connection is through PC USB port to WLINK-SWUT, and changes to SWUT, and then connects to Evaluation Board. Please see Figure 1 as follows.
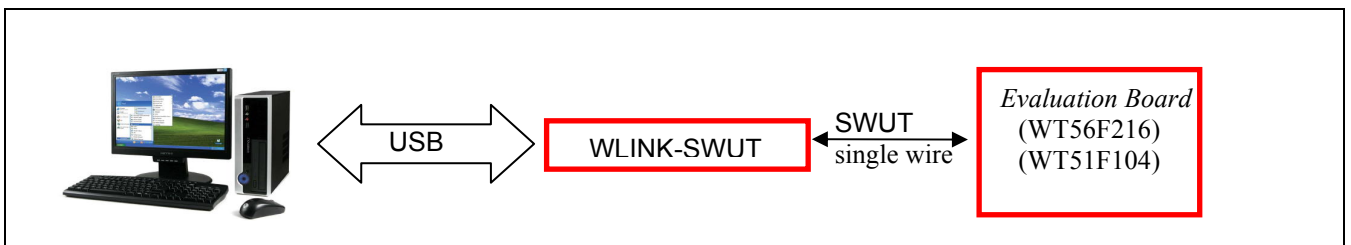
(Figure 1)

Weltrend support programming IC for WLINK-SWUT as following:

| 1	WT56F216
2	WT51F104
3	WT56F108
4	WT51F116
5	WT51F108

【PS】WLINK-SWUT driver installation procedure, please see "WLINK-SWUT Adapter installation Description".

1.2   SWUT ISP Start Procedures

Use WT56F216 IC to precede WLINK-SWUT ISP for example.

According to (Figure 1), connecting PC, WLINK-SWUT and Evaluation Board, and then click SWUT_ISP.exe in the disk to start ISP program.

➢   SWUT ISP Start Figure as flowing (Figure 2):
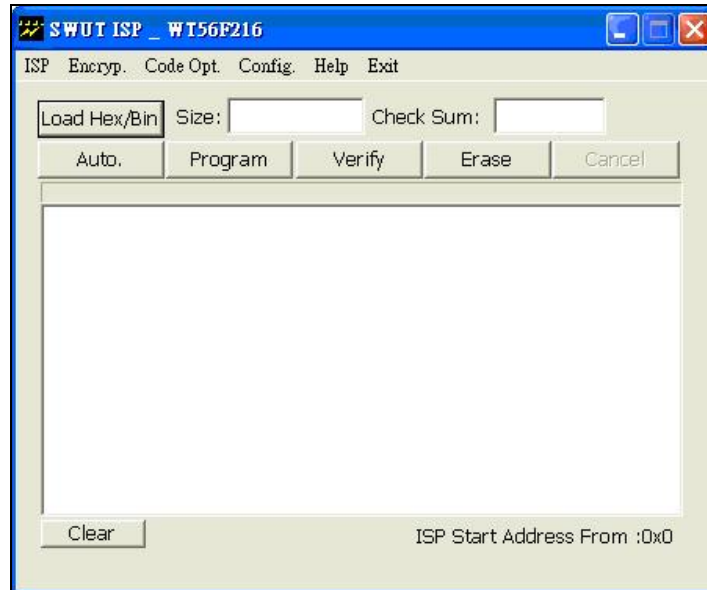
(Figure 2)

➢   SWUT ISP Start Figure Description:
- ◆   ISP: Programming window.
- ◆   Encrypt: Encryption window.
- ◆   Code Opt.: Advanced programming code window.
- ◆   Config.: ComPort and BaudRate window.

1.3   SWUT ISP Connect Port Set up

Before setting up, please make sure installing WLINK-SWUT driver or not. (Please see "WLINK-SWUT Adapter installation Description"). Make sure WLINK Adapter or WLINK-SWUT Adapter connect to PC USB Port or not.

Press "Config." in the (Figure2), and then monitor will show configuration dialog (Figure3).
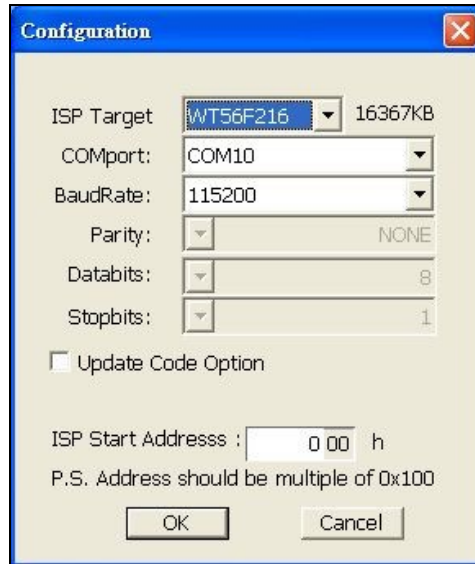
(Figure 3)

➢   ISP Target: Choose ISP target IC code.

➢   ComPort: Please choose WLINK-SWUT connect port.

➢   BaudRate: Choose BaudRate (the default is 115200 bps)

➢   Update Code Option:

  ■   Check: (Figure 5) "Code Option" content will burn in IC in ISP (If firmware has code content, it will override by ISP)

  ■   Not Check: (Figure 5) "Code Option" content will not burn in the IC.

➢   ISP Start Address: Program code start address, the smallest increment is 0x100 byte.

After finishing, press "OK" to completion, and then (Figure 3) will close and back to (Figure 2).

1.4   Encryption Option

In ISP menu, press "Encrypt." then the monitor will show encryption dialog (Figure 4).
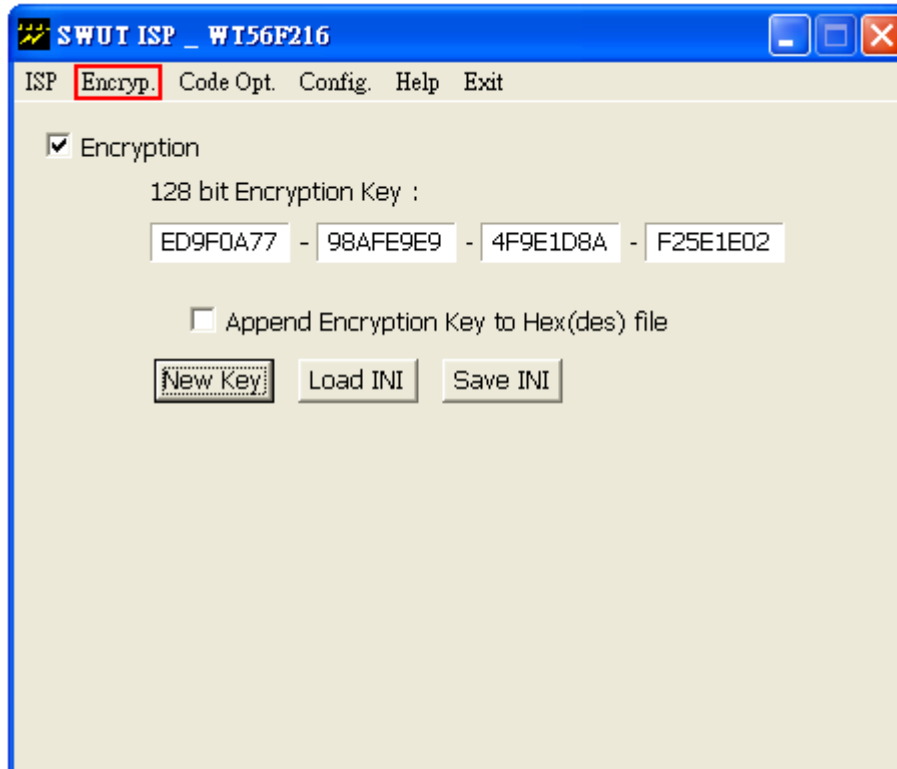
(Figure 4)

➢   Check "Encryption":

Enable encryption function, the program code of programming IC will enable encryption function, and proceed encryption operations with 128 bit key.

1. Choose Append Encryption Key to Hex (des) file

  ◼   Check   "Append Encryption Key to Hex (des) file", 128 bit key will add to new des file, there are three buttons for "New Key", "Load INI" and "Save INI". Figure 7 illustrates the operation procedures.

  ◼   Not Check "Append Encryption Key to Hex (des) file", 128 bit key will not add to new des file.

    ◆   INI File: This file records encryption key, code option and security parameter and users don't set up new parameter encryption.

    ◆   New Key: Make new key from PC automatically, it also can enter new key in this dialog by manual.

    ◆   Load INI: Download existing key from INI. File.

    ◆   Save INI: Save key in the *.in file (The default is WT56F216.ini).

➢   Not Check "Encryption" option, it will burn program code in Plain text.

1.5　Code Option Set up

In ISP Configuration, press "Code Opt.", and monitor will show new configuration (Figure 5).

In the "Config." window, currently only "Enable Customer ID" can be configured, and the rest setting will be configured in program. When enabling Customer ID and tne set the initial ID value, please check "Save INI" button.
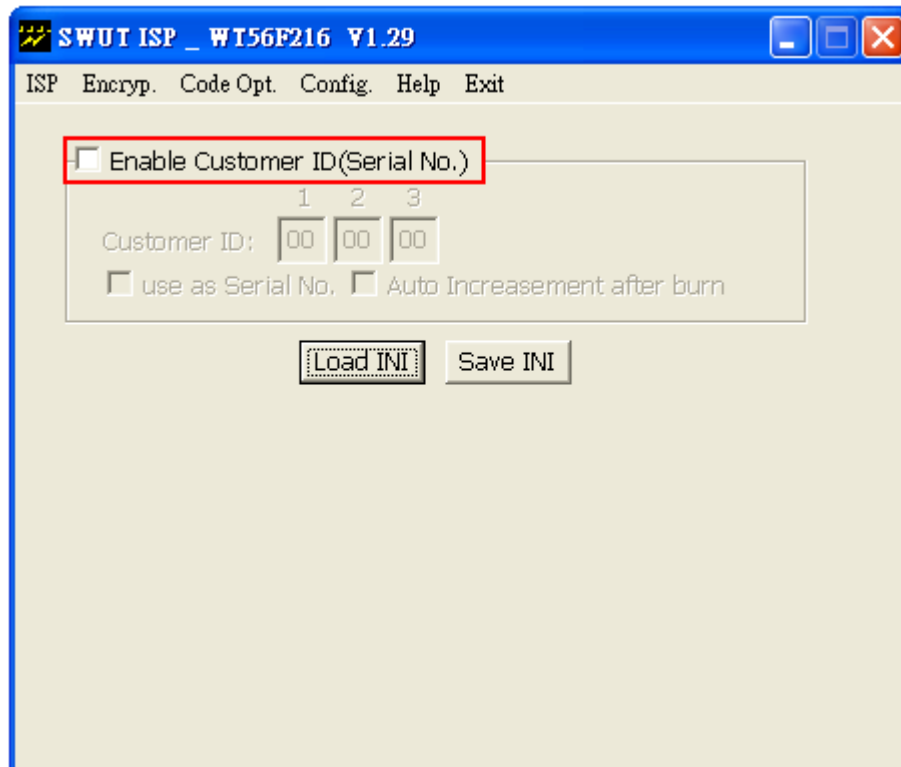
(Figure 5)

➢　Customer ID: This is ID column for customers.

In the Figure 5, enable "Use as Serial NO." the "Auto Increasement after burn"（in the Figure 6）option will be opened，then press "Auto Increasement after burn" and press "Save INI"，the setting content will be saved and showed "S/N Last:000000" in the ISP window（as Figure 7 demo）．Press "Auto Increasement after burn"，every time, after programming success "Customer ID:" and "S/N Last: 000000" increment by one automatically, and the value of "S/N Last: 000000" will be saved in *.INI.
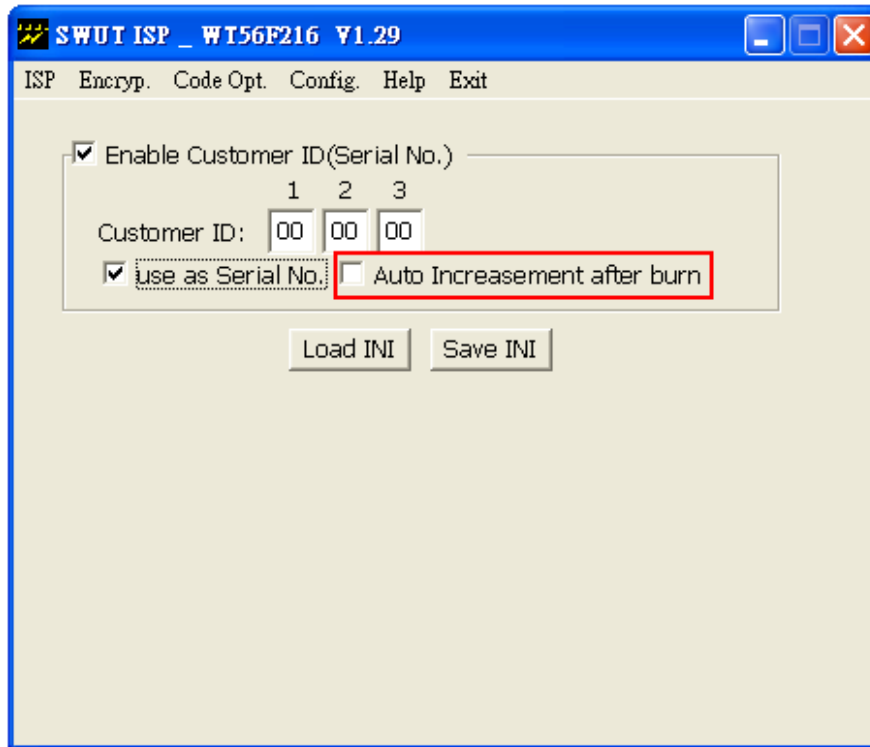
(Figure 6)
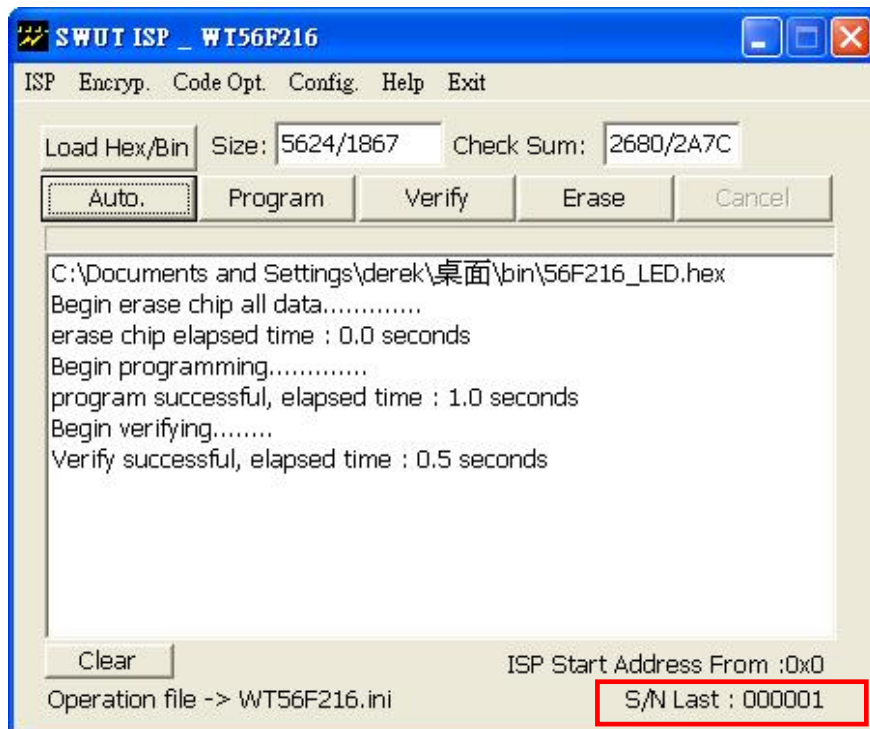
(Figure 7)

➢ Save INI: Save code option data to *.ini file.

➢ Load INI: Load code option data from *.ini file.

➢ WT56F216 code option description:

Code option data is in 16K bite Flash ROM, the address is **3FF9H ~ 3FFFH**, and save in customer ID and IC configuration. WT56F216 will load automatically in each reset (Please see IC SPEC).

Address	Bit Number	Description
3FF9H	7-0	Customer ID 1, mapping to XFR: CSM_ID1 0x0D[7:0]
3FFAH	7-0	Customer ID 2, mapping to XFR: CSM_ID2 0x0E[7:0]
3FFBH	7-0	Customer ID 3, mapping to XFR: CSM_ID3 0x0F[7:0]
3FFCH	7-0	Flash memory content protection: = 10H flash memory cannot be read = 00H flash memory cannot be written into

➢ WT51F104 code option description:

Code option data is in 4K bite Flash ROM, and address is **0FF8H ~ 0FFFH**, save customer ID and IC configuration.
In each reset, WT51F104 will load automatically (Please see IC SPEC).

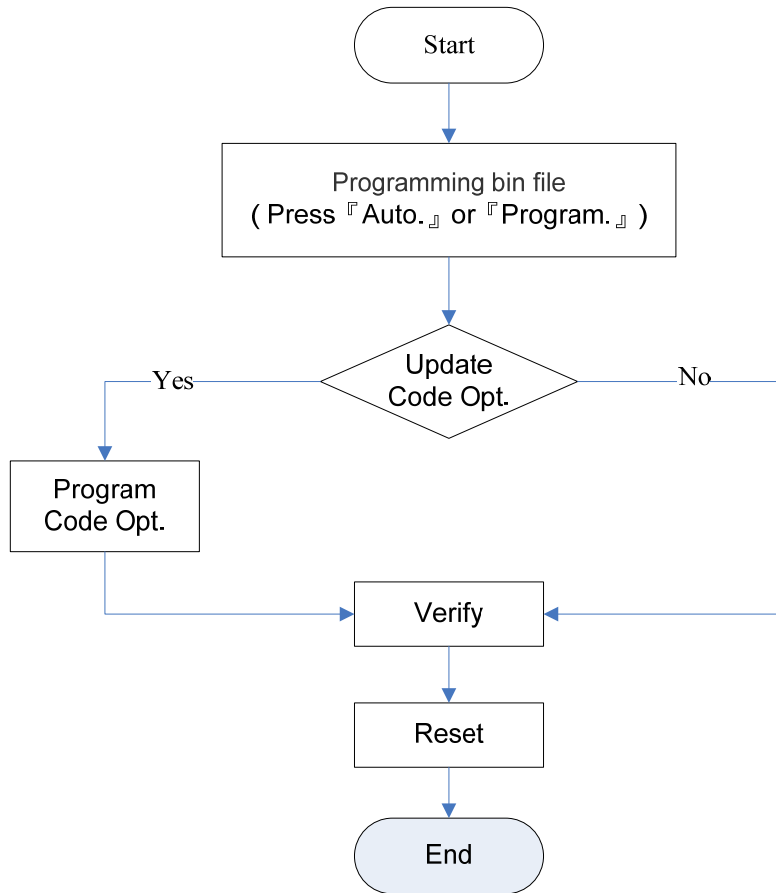| Address	Bit Number	Description
0FF9H	7-0	Customer ID 1, mapping to XFR: CSM_ID1 0x0D[7:0]
0FFAH	7-0	Customer ID 2, mapping to XFR: CSM_ID2 0x0E[7:0]
0FFBH	7-0	Customer ID 3, mapping to XFR: CSM_ID3 0x0F[7:0]
0FFCH	7-0	Flash memory content protection: = 10H flash memory cannot be read = 00H flash memory cannot be written into

1.6 ISP Flow chart

Chapter 1.2 to 1.5 describes WLINK-SWUT ISP program function and register set up. (Figure9) describes Encryption.
procedure for load Intel hex file.
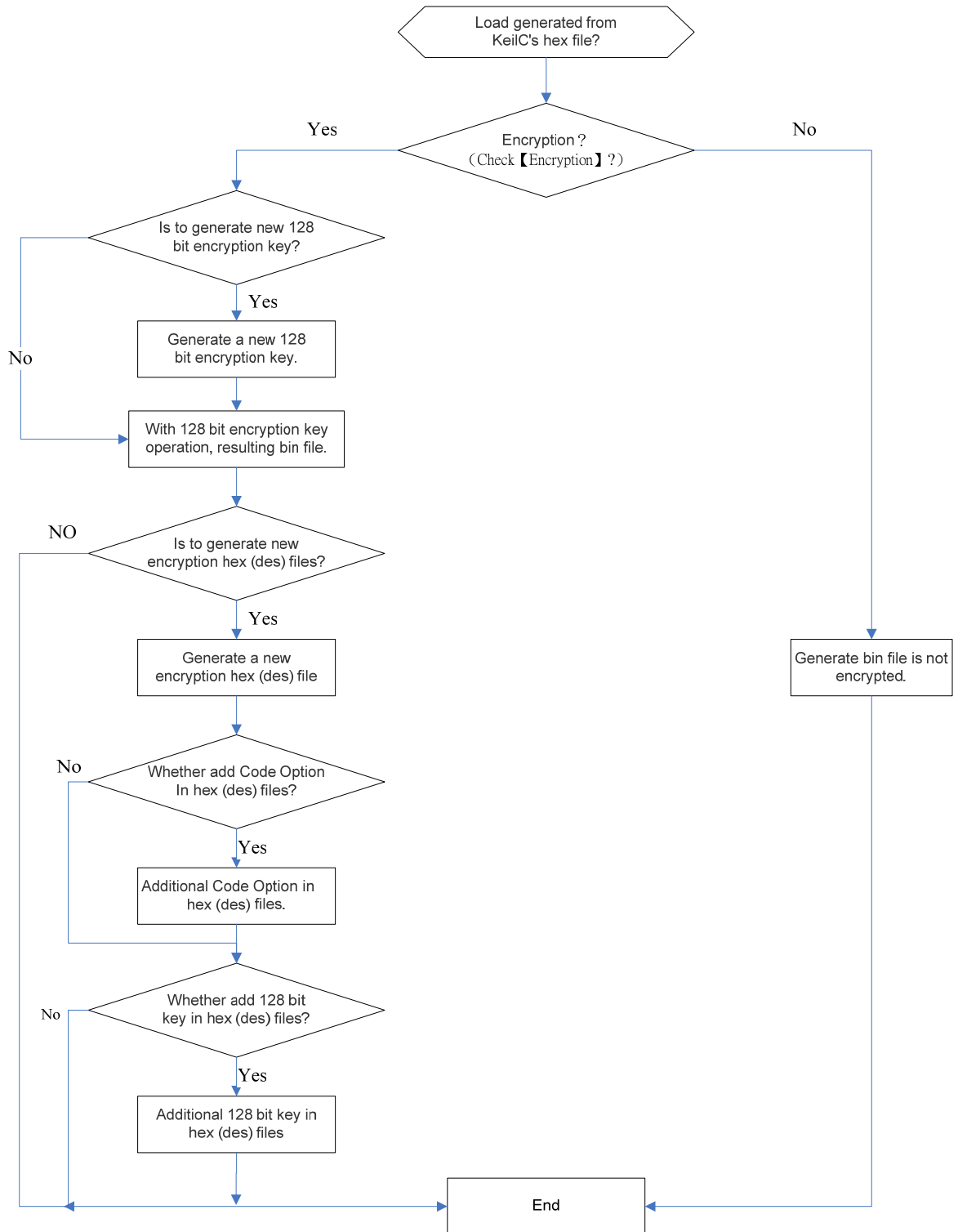
(Figure 9)

Figure 10 describes completed programming procedure.

```
                           ┌─────────────┐
                           │    Start    │
                           └─────────────┘
                                  │
                                  ▼
                  ┌──────────────────────────────────┐
                  │       Programming bin file        │
                  │ ( Press『Auto.』or『Program.』)   │
                  └──────────────────────────────────┘
                                  │
                                  ▼
         Yes                 ◇ Update ◇                 No
    ┌───────────────────────◇ Code Opt. ◇──────────────────────┐
    │                        ◇         ◇                        │
    ▼                                                           │
┌─────────────┐                                                 │
│  Program    │                                                 │
│  Code Opt.  │                                                 │
└─────────────┘                                                 │
    │                  ┌─────────────┐                          │
    └─────────────────▶│   Verify    │◀─────────────────────────┘
                       └─────────────┘
                              │
                              ▼
                       ┌─────────────┐
                       │    Reset    │
                       └─────────────┘
                              │
                              ▼
                       ┌─────────────┐
                       │     End     │
                       └─────────────┘
```

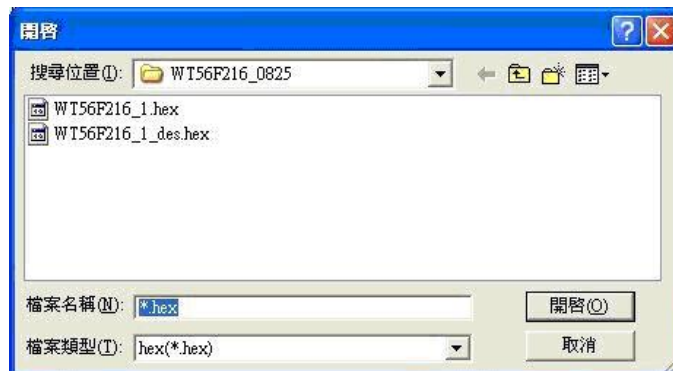(Figure 10)

➢ File Erase, Program, and verification:

There are five buttons in SWUT_ISP.exe ISP window (Figure 2), there are "Load Hex/Bin", "Auto", "Program", "Verify", and "Erase" functions. Before using these functions, it needs to follow (Figure 9) procedure to set up registers. After confirming registers, please start programming procedure (Figure 10). In SWUT_ISP.exe, there are functions for IC program, verification, and erase in ISP windows

The following are the function introduction.

■ Load Hex/Bin: This button is choosing program file.

■ Erase: Press this button and it will erase IC Flash ROM, and clear IC Flash ROM to 0xFF.

■ Program: This button is programming specific file (*.Hex or *.Bin) to IC. Because program Hex file or Bin file to IC, it must load file first. Press (Figure 2) "Load Hex/Bin", if choose encryption, and monitor will show (Figure 11) window., and then have new key or old key, press "OK", then monitor will show (Figure 12)window. Then choose programming file, press "Start", it will load file automatically. Then (Figure 12) window will close, and monitor will show (Figure 13) window. Press "Program" and program file in the IC.
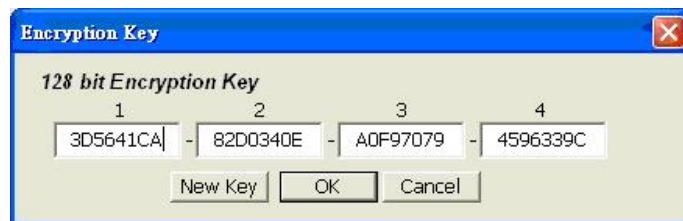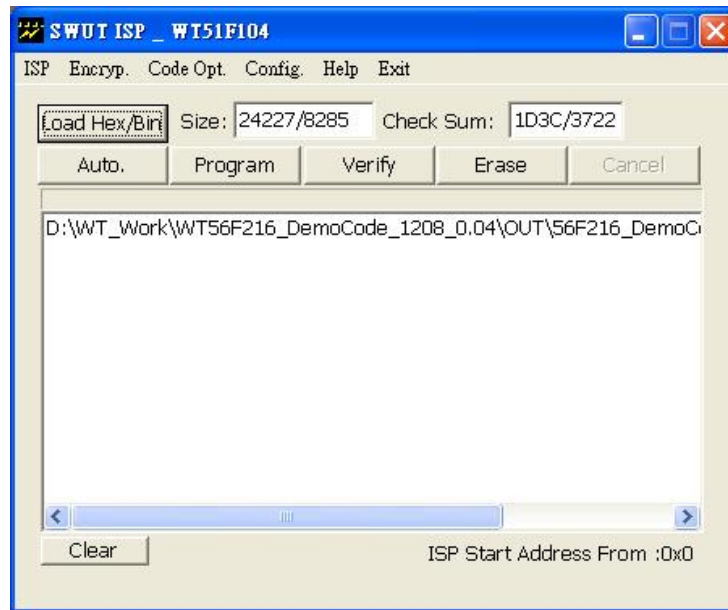

(Figure 11)

(Figure 12)

➢ Verify: This function is comparing with programming code in IC, and check the consist. Adjust the specific file programming in IC . (It must press "Load Hex/Bin" to load comparison file).

➤ Auto: This button combines "Erase", "Program", and "Verify" functions. Press this button; it will proceed erasing in IC, and programming specific file to IC. After programming, it will read internal programmed and comparing with specific file. If any errors in comparison procedure, window will show error message and stop operation.

(Figure 13)