HY-Programmer User's Manual

Table of Contents

1. Programming Window

1.1 Interface Setup

Click "Options", a window will appear. Click the interface setup, as shown in Figure 1.

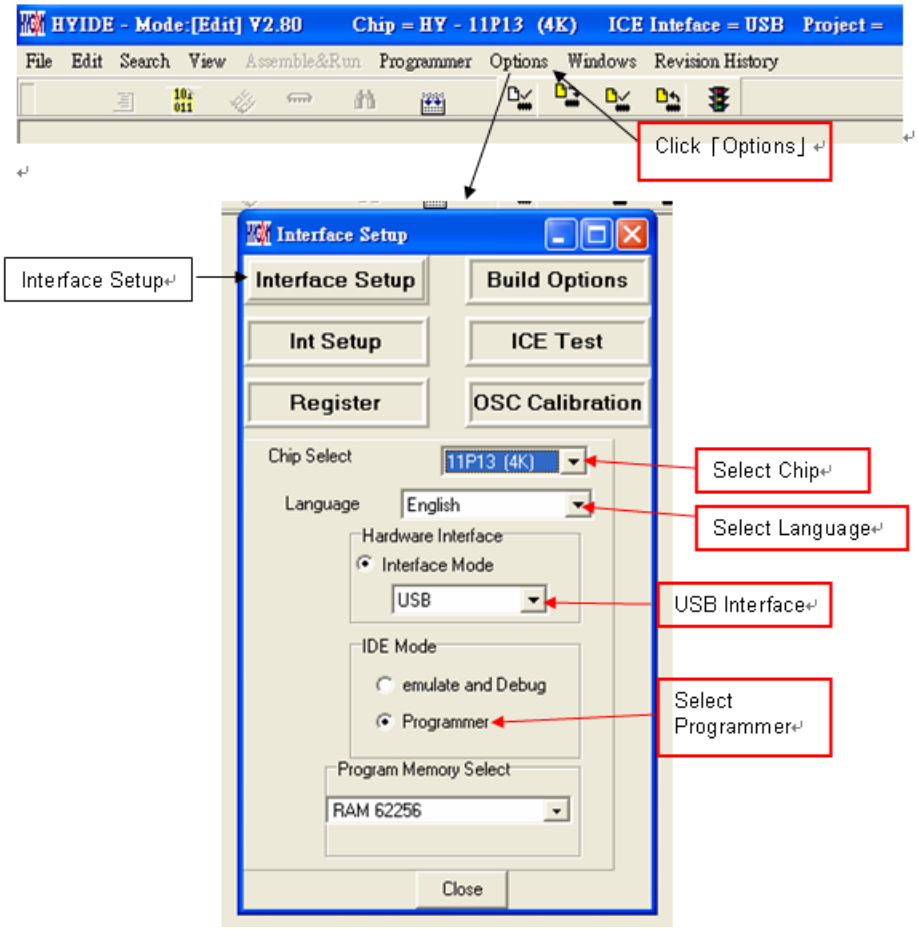


Figure 1

Chip Select → Choose the specific programming IC part no. If programmed IC differs from the selected IC, Blank Check, Program and Verify will fail.

Language → Choose operation interface language, like Chinese or English.
Hardware Interface → USB interface or Parallel Port interface is selectable.
IDE Mode → Program choosing.

When interface setup finished, click "Build Options" to select programming configuration. As described in Figure 2.

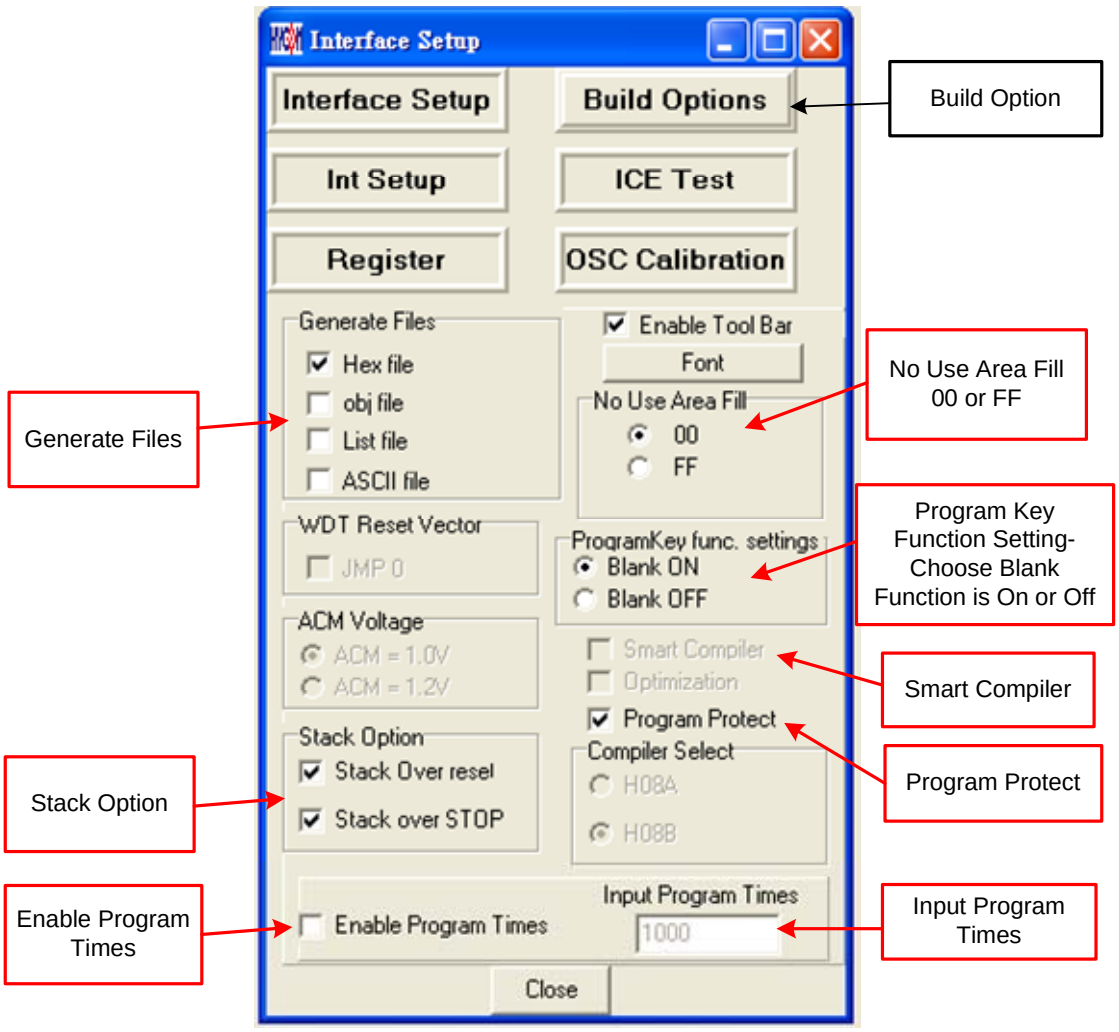


Figure 1

Generate Files → Choose generated file after assembly

Stack Option → Choose whether to reset when stack overflow or stack full after OTP program operation.

No Use Area Fill → Fill up 00 or FF in unused program space after assembly.

ProgramKey Func. Settings → Choose blank function is on or off when using program key under offline programming.

Smart Compiler → Choose whether to simplify assembly.

Enable Program Times → Choose whether to enable download program times.

Input Program Times → Input download program times (Maximum: 2147483646. Minimum: 1).

After assembly finished, click "ICE Test" to evaluate test voltage as Figure 3 described (Connect IDE and insert 9V power before clicking "Option").

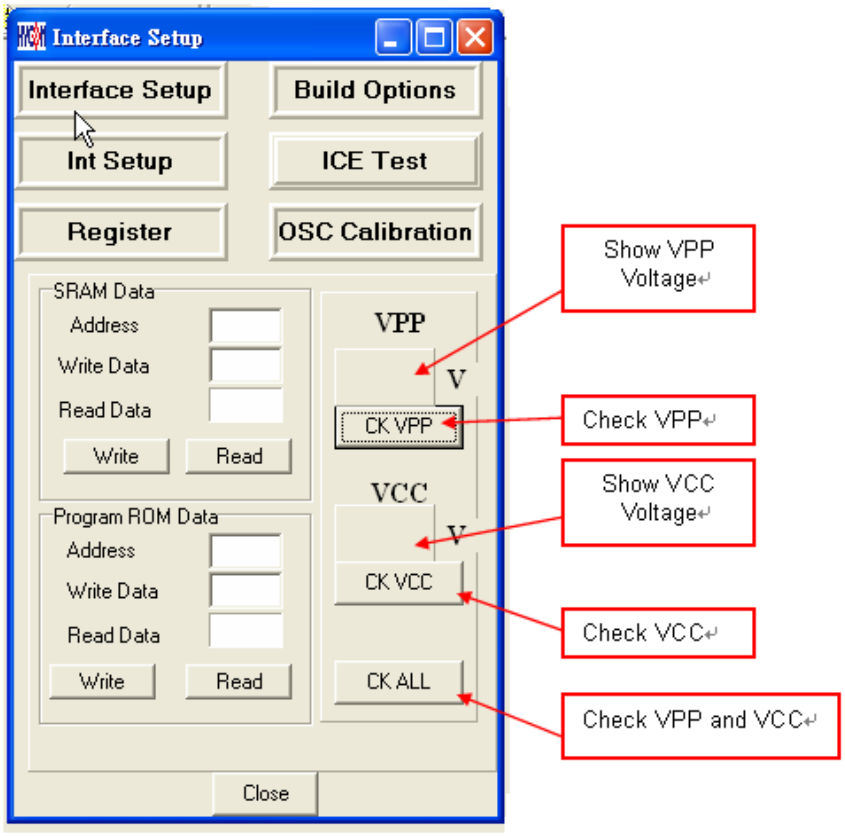


Figure 2

VPP voltage while programming: 5.6<VPP<6.6.

VDD voltage while programming: 2.7<VPP<3.6.

Click "OSC Calibration" for starting Software/Hardware Calibration. Please note this function only can work on the programmer "HY10000-WK05" with the software, HYCON-IDE V.3.0 and future updated version.

Finally, click "Close" after the interface setup is done. All configured arguments will be recorded. If the configuration is opened next time, default value will be written in automatically and the selected programming IC part no. will be shown in topic window as Figure 4 described.

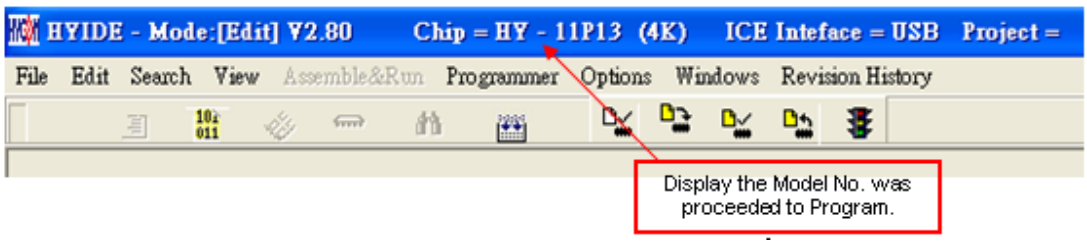


Figure 3

1.2 Operation Procedures

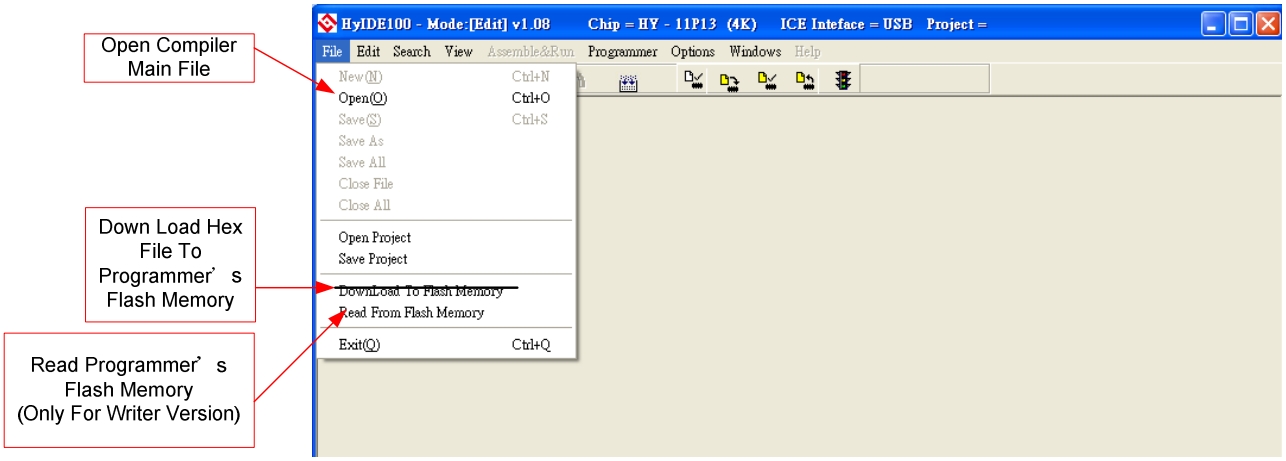


Figure 4

Open → Open the programmed source code main file.
Open Project → Open the saved project.
Save Project → Save the finished project.
*Note: The original "Download file to Flash Memory" function has been cancelled.
HYCON-IDE 3.0 no longer supports Hex File download function. If users would like to download the Hex File, please download it by HY-Hex Loader software and follow the guidance of user manual.

1.2.1 Open File and Assembly

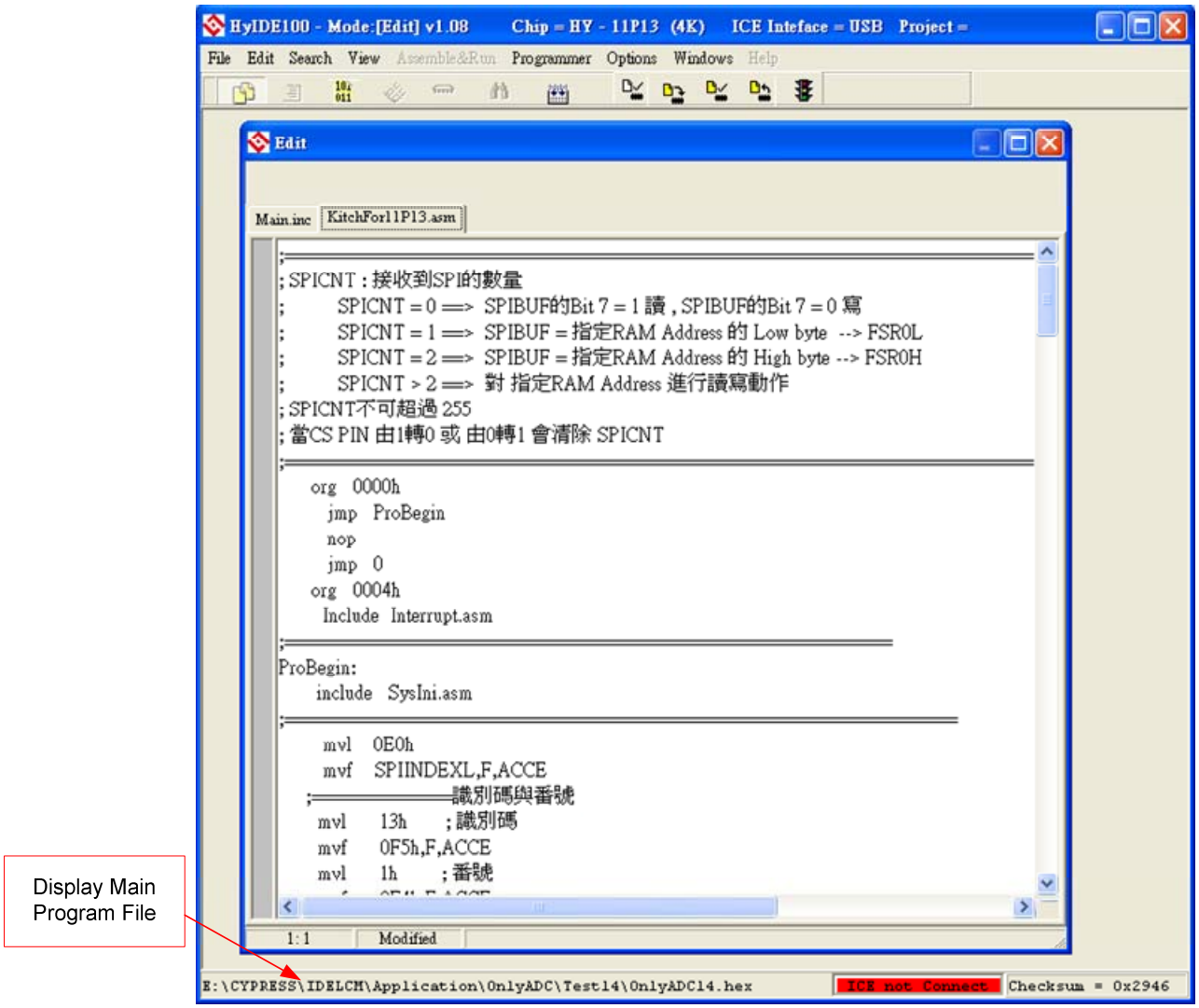


Figure 5

Open source code main file and it will be displayed as the assembly file. If the displayed name differs from main file, points the mouse to the specific file and presses mouse right key. Set this file as the assembly main file as shown in Figure 7.

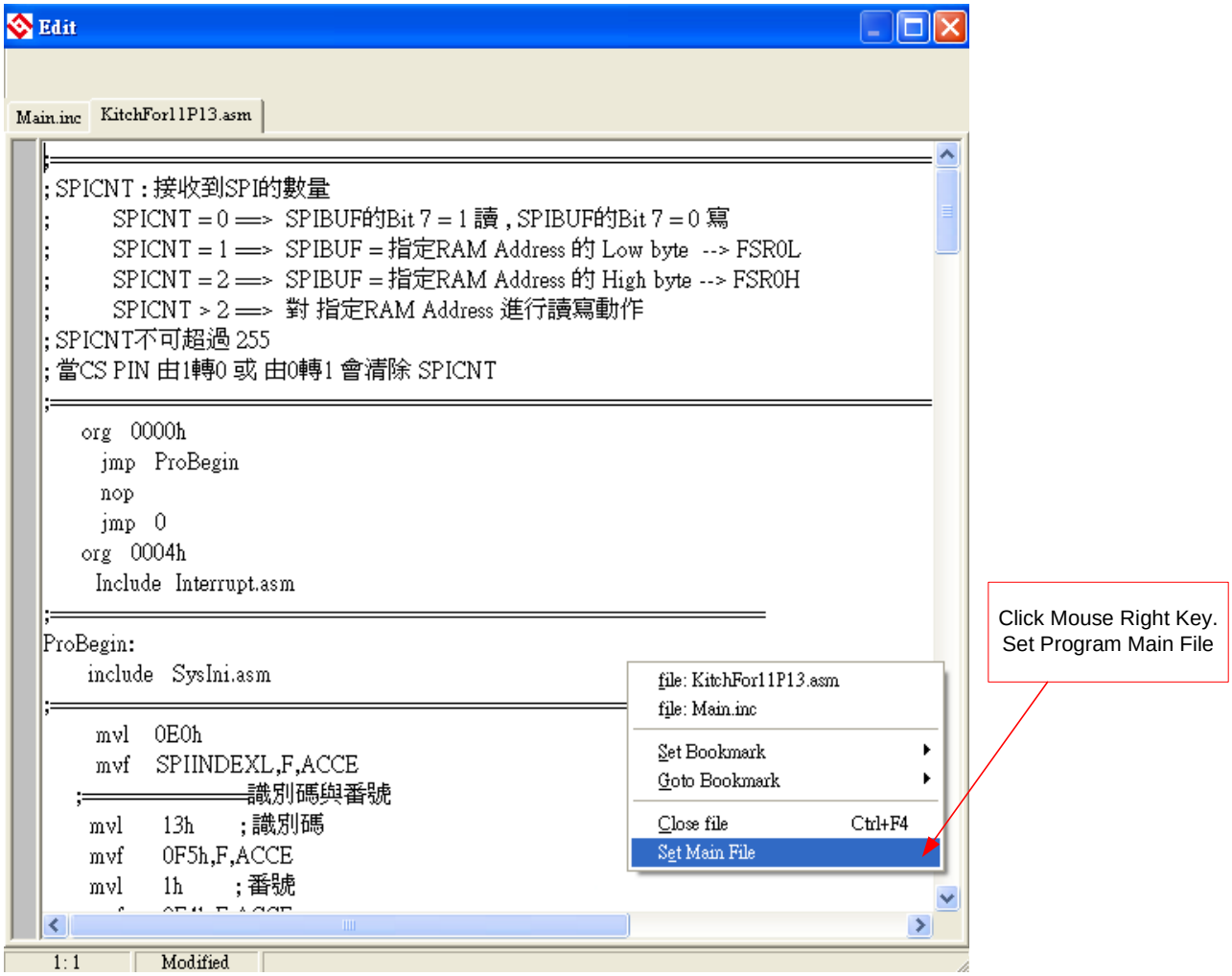


Figure 6

Assembles Source Code and download the file to programmer or IDE Flash Memory, as Figure 8 illustrated.

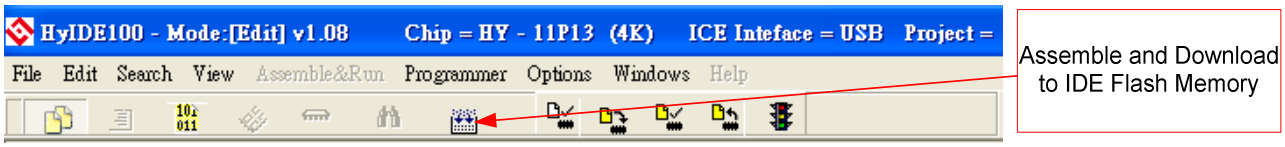


Figure 7

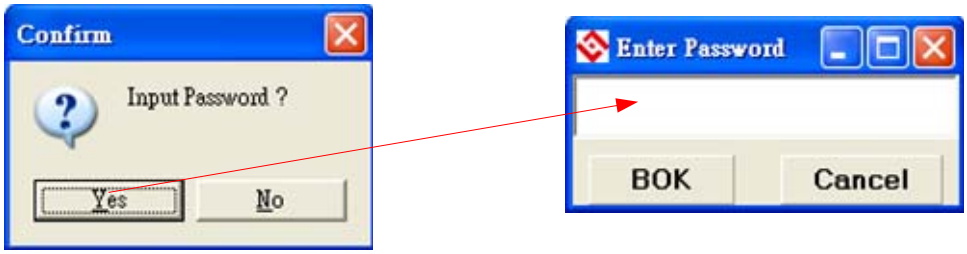


Figure 8

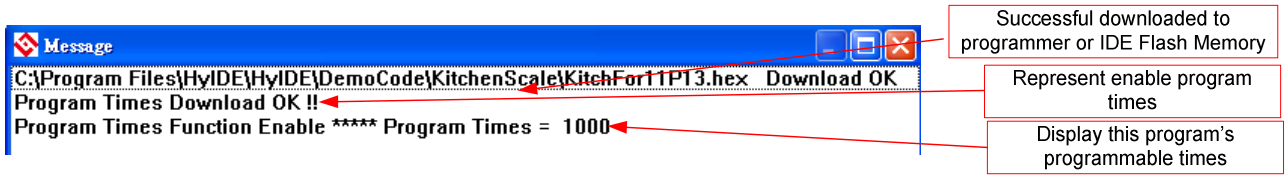


Figure 9

1. When using USB interface, the assembly finished program code will be loaded into programmer or Flash Memory of IDE for mass production programming.

2. Before downloading code to programmer Flash Memory, system may require to enter into password. This function enables users to monitor the code from PC to programmer Flash Memory. Please note that password can only include 6 digits (ASCII Code). In order to protect the code that users developed, the password must be entered before downloading the code into programmer. If the password entering step is cancelled during downloading procedure, it means that the code will not be allowable to be read from programmer.

   Furthermore, once you set the password, it will be the operating password of the programmer. This password has to be entered before you read the code. Please memorize your password to ensure the code can be read in the future.

   In addition, every time a new code is downloaded; the programmer will ask you to enter a new password afresh.

3. If there is enabled program times in the assembly option, information column will display the programming times as shown in Figure 10.

4. After assembling completed, Hex filename and Checksum will be displayed in underneath section, as Figure 11 illustrated.

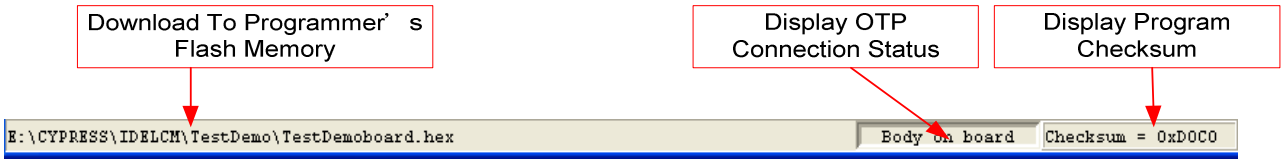


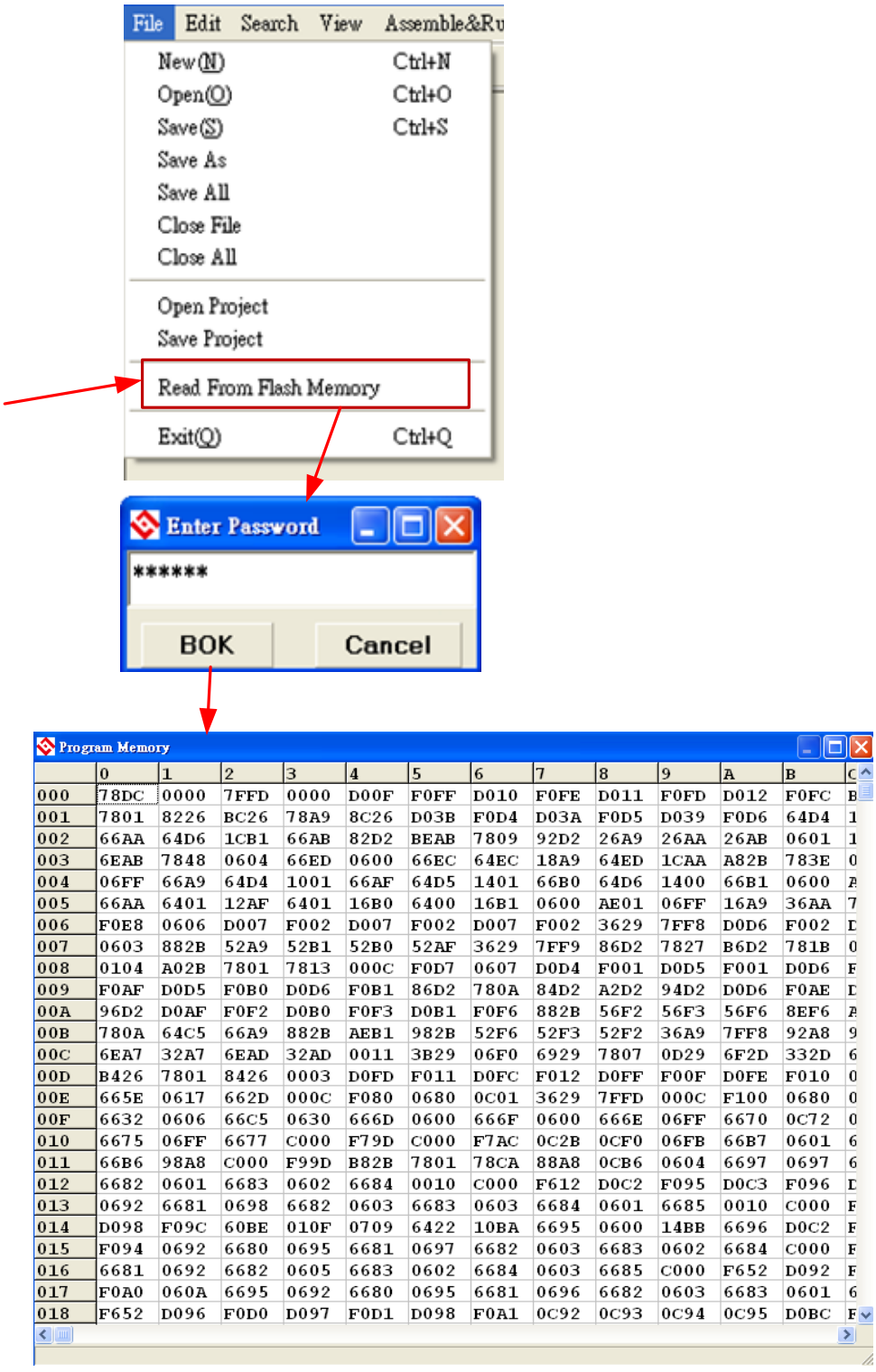
Figure 10

1.2.2 Download Hex File to Programmer or IDE Flash Memory

HYCON-IDE 3.0 no longer supports Hex File download function. If users would like to download the Hex File, please download it by HY-Hex Loader software and follow the guidance of user manual.

1.2.3 Read the Code from Flash Memory

The function of "Read from Flash Memory" helps users to ascertain whether the code of programmer Flash Memory is the same with Download Code. The Password entered must in accordance with the Download Password, so the data will be revealed, as Figure 13 shown.



	0	1	2	3	4	5	6	7	8	9	A	B	C
000	78DC	0000	7FFD	0000	D00F	F0FF	D010	F0FE	D011	F0FD	D012	F0FC	B
001	7801	8226	BC26	78A9	8C26	D03B	F0D4	D03A	F0D5	D039	F0D6	64D4	1
002	66AA	64D6	1CB1	66AB	82D2	BEAB	7809	92D2	26A9	26AA	26AB	0601	1
003	6EAB	7848	0604	66ED	0600	66EC	64EC	18A9	64ED	1CAA	A82B	783E	0
004	06FF	66A9	64D4	1001	66AF	64D5	1401	66B0	64D6	1400	66B1	0600	A
005	66AA	6401	12AF	6401	16B0	6400	16B1	0600	AE01	06FF	16A9	36AA	7
006	F0E8	0606	D007	F002	D007	F002	D007	F002	3629	7FF8	D0D6	F002	D
007	0603	882B	52A9	52B1	52B0	52AF	3629	7FF9	86D2	7827	B6D2	781B	0
008	0104	A02B	7801	7813	000C	F0D7	0607	D0D4	F001	D0D5	F001	D0D6	F
009	F0AF	D0D5	F0B0	D0D6	F0B1	86D2	780A	84D2	A2D2	94D2	D0D6	F0AE	D
00A	96D2	D0AF	F0F2	D0B0	F0F3	D0B1	F0F6	882B	56F2	56F3	56F6	8EF6	A
00B	780A	64C5	66A9	882B	AEB1	982B	52F6	52F3	52F2	36A9	7FF8	92A8	9
00C	6EA7	32A7	6EAD	32AD	0011	3B29	06F0	6929	7807	0D29	6F2D	332D	6
00D	B426	7801	8426	0003	D0FD	F011	D0FC	F012	D0FF	F00F	D0FE	F010	0
00E	665E	0617	662D	000C	F080	0680	0C01	3629	7FFD	000C	F100	0680	0
00F	6632	0606	66C5	0630	666D	0600	666F	0600	666E	06FF	6670	0C72	0
010	6675	06FF	6677	C000	F79D	C000	F7AC	0C2B	0CF0	06FB	66B7	0601	6
011	66B6	98A8	C000	F99D	B82B	7801	78CA	88A8	0CB6	0604	6697	0697	6
012	6682	0601	6683	0602	6684	0010	C000	F612	D0C2	F095	D0C3	F096	D
013	0692	6681	0698	6682	0603	6683	0603	6684	0601	6685	0010	C000	F
014	D098	F09C	60BE	010F	0709	6422	10BA	6695	0600	14BB	6696	D0C2	F
015	F094	0692	6680	0695	6681	0697	6682	0603	6683	0602	6684	C000	F
016	6681	0692	6682	0605	6683	0602	6684	0603	6685	C000	F652	D092	F
017	F0A0	060A	6695	0692	6680	0695	6681	0696	6682	0603	6683	0601	6
018	F652	D096	F0D0	D097	F0D1	D098	F0A1	0C92	0C93	0C94	0C95	D0BC	F

Figure 11

1.3 PC Online OTP Programming

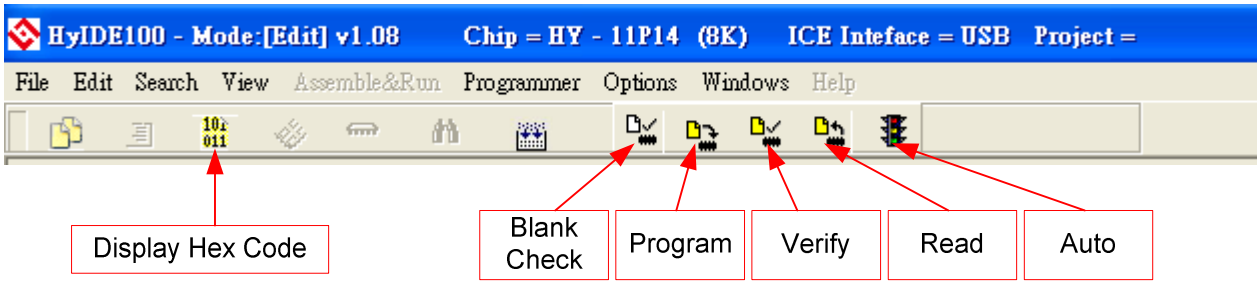


Figure 12

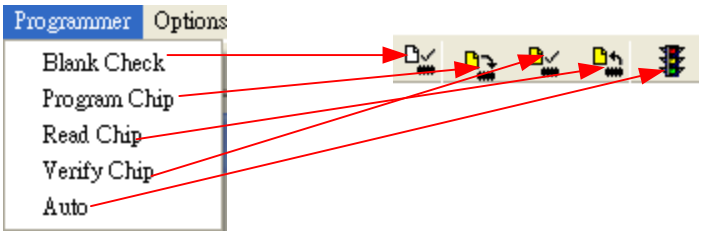


Figure 13

Blank Check, Programming, Verify and Read Commands can be implemented when the programmed file being successfully loaded into programmer or IDE Flash Memory. On the contrary those commands will not be activated if the download failed.

Figure 14

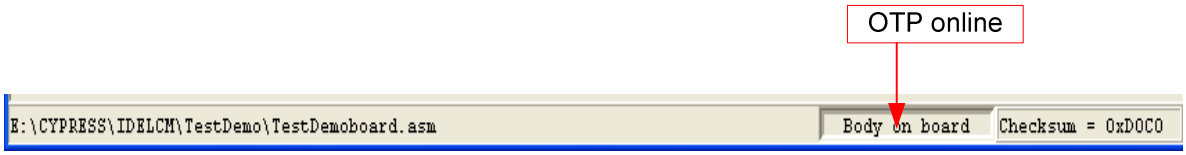


Figure 15

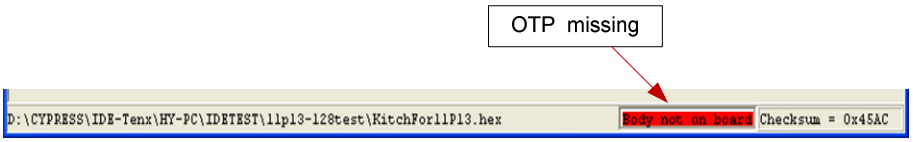


Figure 16

Make sure the selected programming IC part number is the same with the OTP part number in the topic window as Figure 1 described. When programmer executes Blank Check, Programming and Verify commands, Program will check whether the IC part number and OTP programming part number are identical. If the part number is different, the data will not be written into OTP and an error message will be displayed in information column as Figure 16Figure 14described.

If users intend to find out whether the part number is correct before programming, point the cursor to "IC Connection Status Display" and click the mouse left key. If the selected IC is correct, a message will show up as Figure 17. If it is incorrect, the message will be displayed as Figure 18. If

"Enable Program Times" has been marked up, the spare program times will display in the message column as illustrated Figure 19Figure 17.

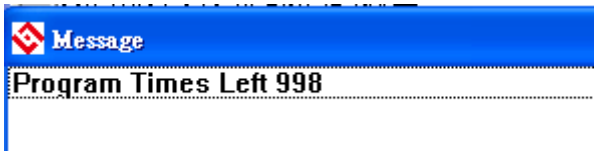


Figure 17

1.3.1 Blank Check

The internal code of Blank ICs that have yet been programmed is 0xFFFF. The purpose of checking the IC is to make sure the OTP address content is 0xFFFF.

If the IC selection is correct and the content is empty, a message will appear as

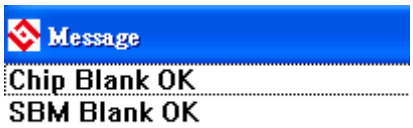


Figure 18

If the IC selection is incorrect or the content is not empty, a message will show up as Figure 21 described.

Figure 19

1.3.2 Program

The purpose of programming is to write Compiler accomplished program into IC OTP. When programming is completed and the IC is assembled as finished goods, programmer can operate the program as users commanded.

Program the downloaded or assembly finished Hex file (displayed at the bottom of the column) in the selected IC and verify the correctness of the programming content (please refer to Chapter 1.2.1 or 1.2.2 for programming procedures).

If the selected IC is correct and the programming succeeds, message will appear at the information column as Figure 22 illustrated. If "Enable Program Times" is ticked up, the enable program times will minus 1 and the program times left will be revealed in the message column.

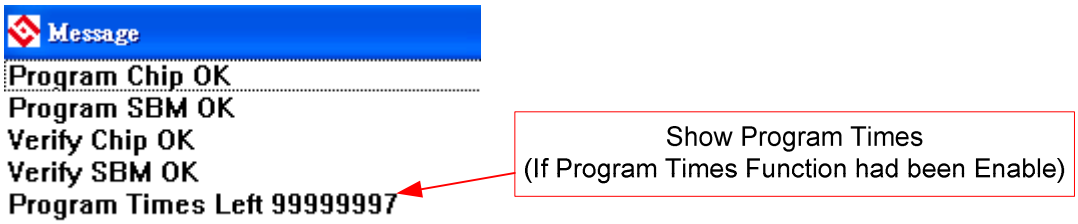


Figure 20

If the IC selection is incorrect or the programming fails, a message will show up as Figure 23.

Figure 21

1.3.3 Verify

The purpose to verify programming IC is to compare if the program written into IC OTP equals to the program downloaded to programmer or IDE Flash Memory.

Verify programming IC content consistency with the downloaded or assembled Hex file (displayed at the bottom of the column). If the IC is protected by program, this verification is ineffective or the comparison failed.

If IC selection and program verification is success, a message will appear as Figure 24.

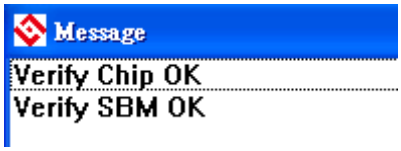


Figure 22

If IC selection is incorrect or the program verification miscarries, a message will pop up as Figure 25.

Figure 23

1.3.4 Read

The purpose to read the IC is to verify the consistency of OTP Checksum and programmed Hex file. To read IC content, the procedures are illustrated as Figure 26. Its content will reveal at "Display Code" window.

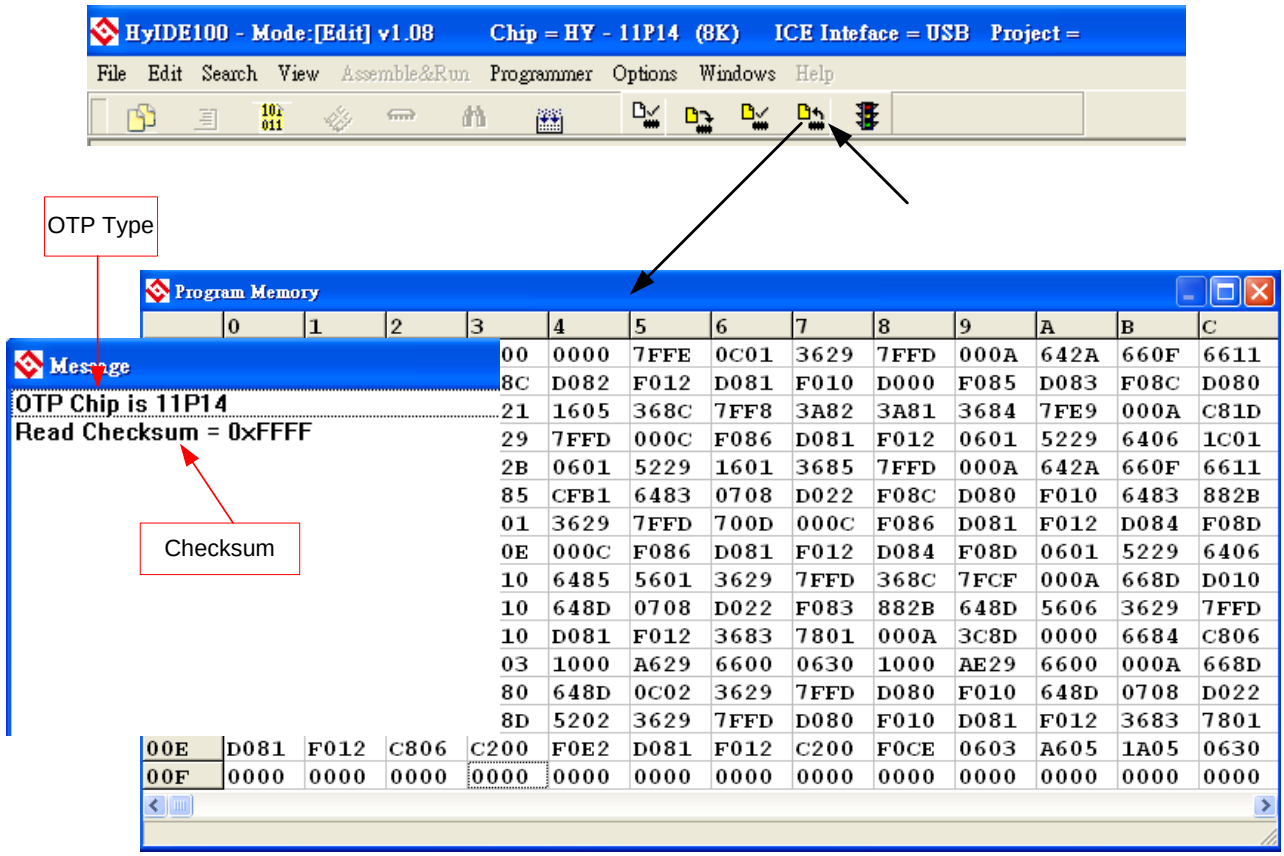


Figure 24

1.3.5 AUTO

Auto integrates Blank Check, Program and Verify function. If user selects Auto, it will first check whether the IC is blank, then to program and verify.

After the execution succeeded, a message will be displayed as Figure 27 displayed. If the option, "Enable Program Times" is ticked up, the program permitted times will reduce 1 and the program times left will be shown in the message column.

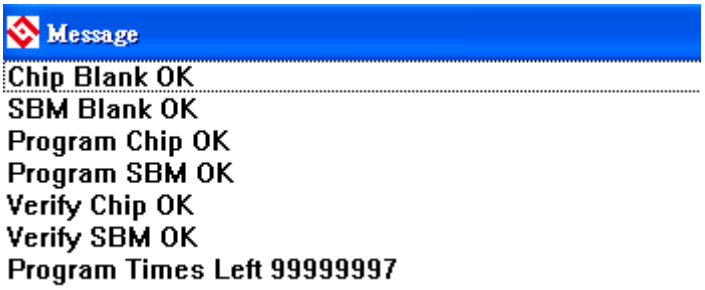


Figure 25

If any function fails, the whole process will stop and display an error message in the message column.

1.4 Offline Programming

1.4.1 Program Description

As the development process evolves to mass-production, the programmer can be used alone when programming on the production line. It is not necessary to connect the programmer to the PC.

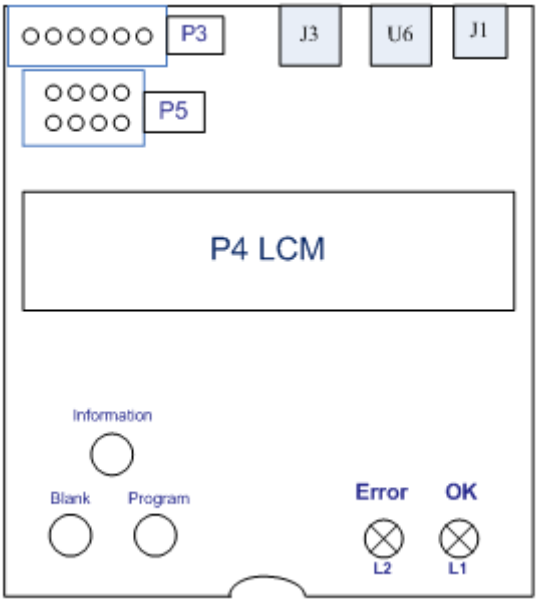


Figure 26

J1 → DC Jack, 9V input.

*Notice: the case is 9V; the core is Ground (VSS).

U6 → USB port, users use this port to connect to PC.

J3 → IDE port, connecting HY-ICE.

P3 → Program PIN output. PIN and OTP is connected.

Output pin from left to right is VSS, VDD, SDO, SDI, SCK and VPP.

P5 → Extend programming port.

Output pin from left to right is Green LED, Red LED, Blank Check Button, and Programming Button. For detailed connecting circuit, please refer to Figure 29 and the definition can be referred to Figure 30.

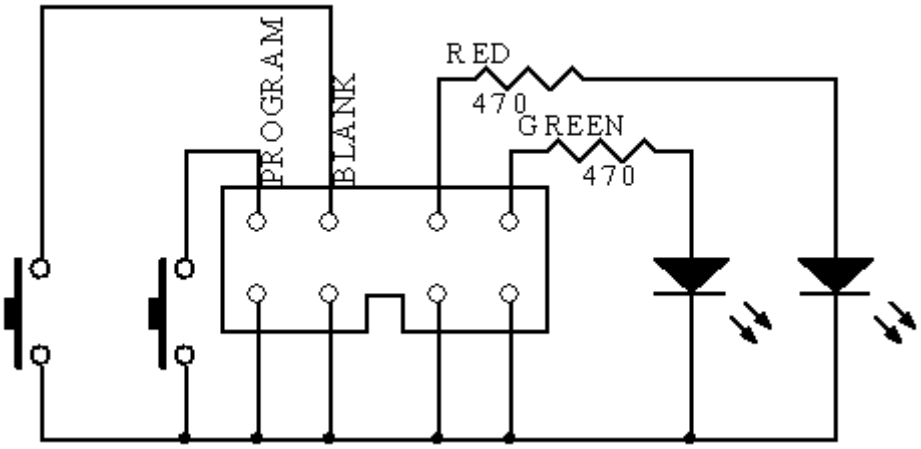


Figure 29

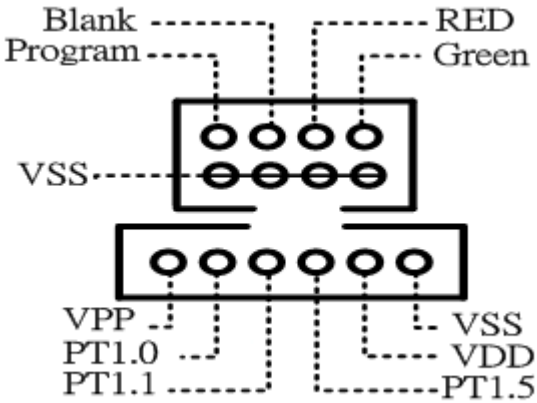


Figure 30

L1 → Success message light display, green LED.

L2 → Error message light display, red LED.

S1 → Program button, for offline program operation.

S2 → Blank Check button, for offline operation.

S3 → Information button.

To implement offline operation, Hex file must be firstly downloaded to programmer Flash Memory.

S2 Button can check if the IC is blank.

S1 Button is programming button. Its procedures are: Blank Check → Program → Verify. If "Program Protection" of "Assemble Option" is ticked up before downloading data to Flash Memory, program protection will be executed after Verify completed. If "Program Protection" is not ticked up, it will stop after Verify accomplished.

If any failure or error happened during execution procedures, L2 Red LED will be lightened up. On the contrary, L2 Green LED will be lighted up if success.

***Notice 1: Under offline programming, the programming status can be determined by checking LCM. If check sum has been shown on LCM and LCM has stop working, the programming procedure is completed. (This issue has been corrected on HY10000-WK02B)**
***Notice 2: When programming function is implemented, make sure 9V adapter is connected before connecting USB line. Do not plug out 9V Adapter whist PC operating, or else it may result in PC crash.**

1.4.2 Program Times Restriction

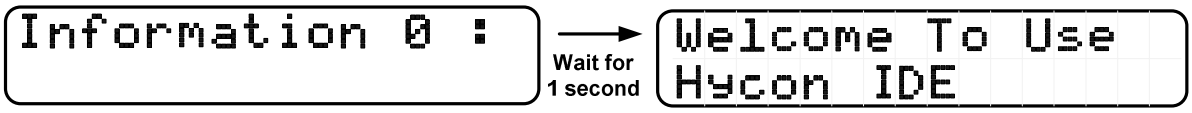
The menu of "Assemble Option" in interface setup has an option of "Enable Program Times" as described Figure 2. This option restricts the permitted program times of download program.

This is a safety mechanism that restrains the permitted program times, preventing it from over-programming on the production line.

After ticking up "Enable Program Times", key in the program times in the column below "Input Program Times" (maximum is 99999999, minimum is 1). This argument will be written into EEPROM of the programmer after the compiler programmed file is downloaded to Flash Memory. Afterwards, the enabled program times will reduce 1 each time when programming completed. If the value reduced to 0, the programming action may not be executed. At this time, an error signal (Red LED) will be lighted up but Blank Check still operates normally.

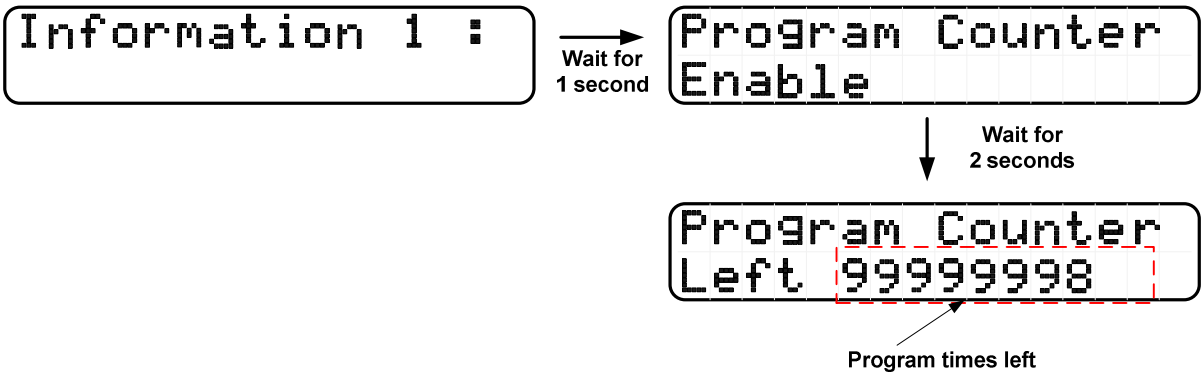
1.5 Information Button

- Press Information button, displaying HYCON IDE message



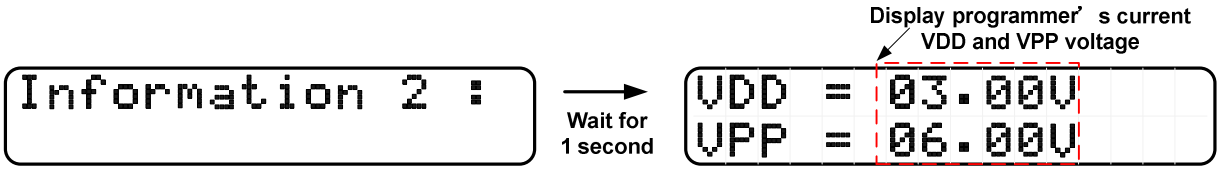
- Press Information button again, displaying Program Counter Times message

1. If Program Counter Times is enabled.



2. If Program Counter Times is disabled.

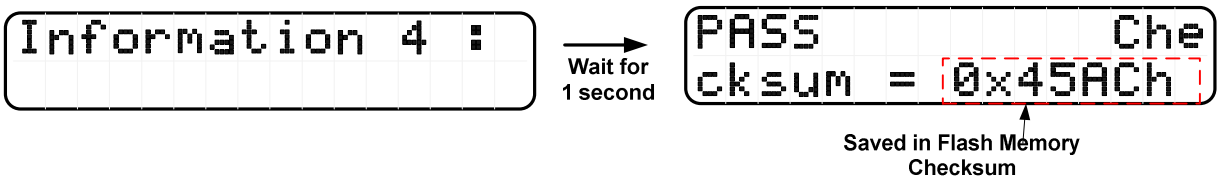
- Press Information button again, displaying VDD and VPP voltage.



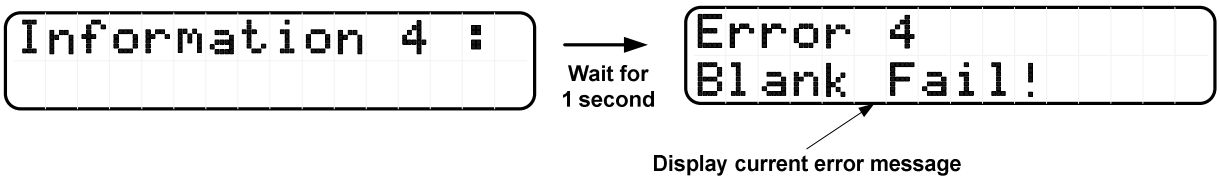
- Press Information button again, OTP ID and Flash stored ID.

- Press Information button again, displaying error message.

1. If there is no error message.

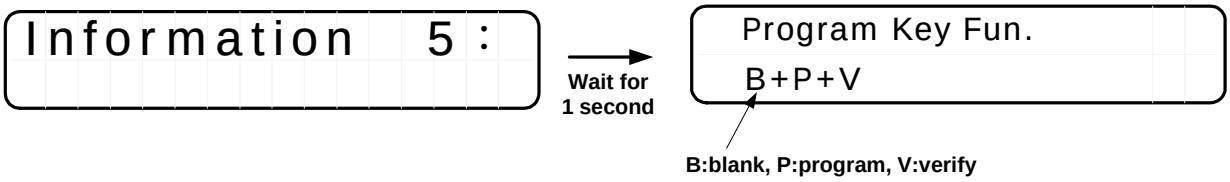


2. If there is error message.

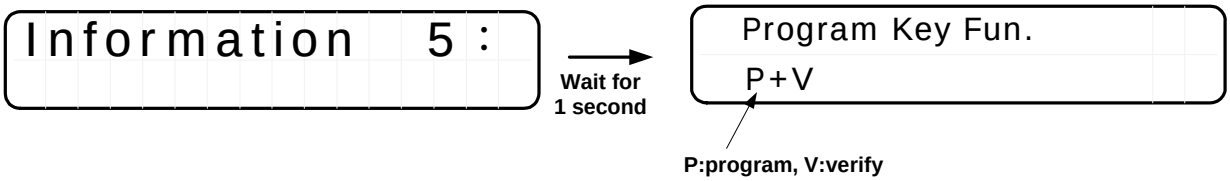


- Press Information button again, displaying if the blank function is enforced when using program key

1. If the blank function is on.

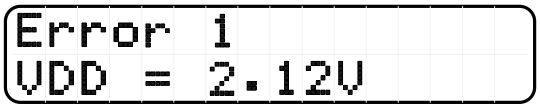


2. If the blank function is off.



1.6 Error Message

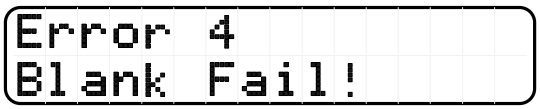
- VDD Error



- VPP Error

- OTP ID Error

- Blank Fail



- Program Fail

- Verify Fail

- Protect Fail

- Program Counter left zero

2. Revision History

Major differences are stated thereinafter:

Version	Page	Revision Summary
V01	ALL	First edition
V02	8	Add the description of password.
	15-16	Add the description of P5-Extend programming port.
V03	3-5	Update the figures and add the description of "OSC Calibration".
V04	17-18	Add a note for attention when offline programming.
V05	ALL	Add the description of blank check function and related information
		Delete the description of downloading hex file to programmer from HYIDE.