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# HY16F Series Writer Kit Instruction Manual

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# HY16F Series Writer Kit Instruction Manual

## 1. Package Contents

Support HY16F series integrated writer, the following is the HY10000-WK08D integrated writer package description:

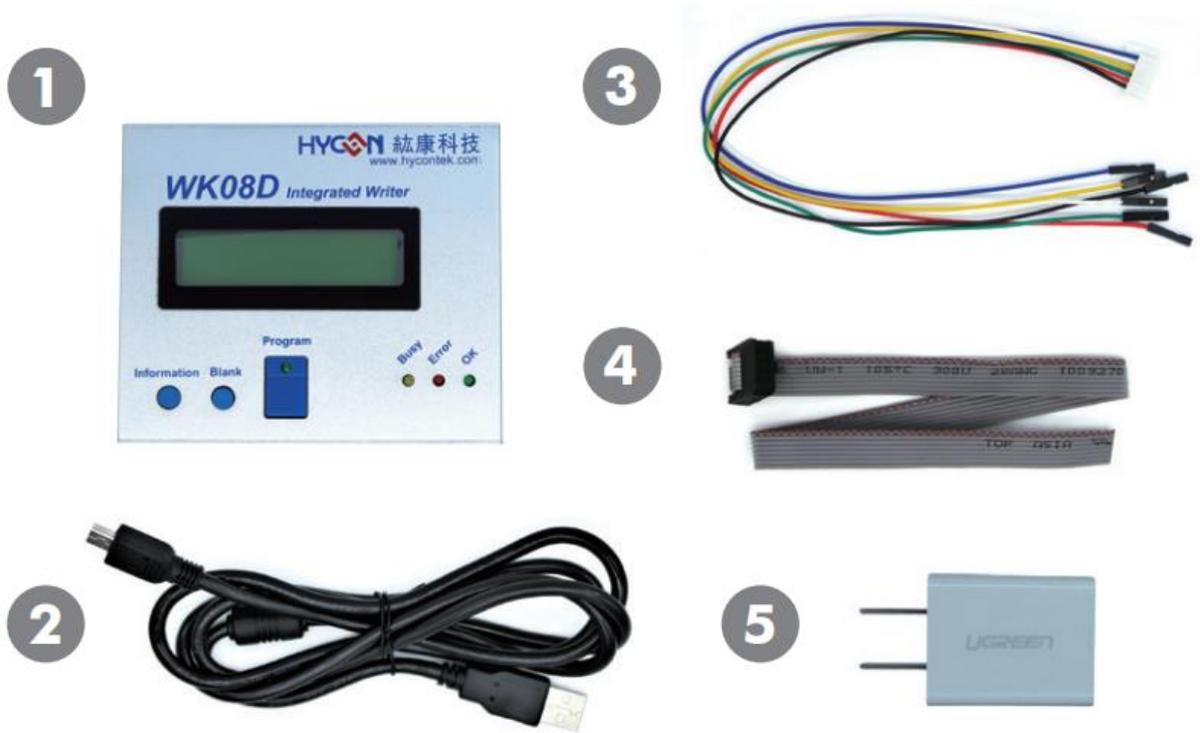


Figure 1-1

<i>Model No.</i>	<i>Part Name</i>	<i>Description</i>	<i>Quantity</i>
HY10000-WK08D	1. HY10000-WK08D	Integrated Writer	1
	2. Cable line	USB Type A to Mini B Cable	1
	3. Programming line	6pin/2.0 (2.0mm pitch)	1
	4. Programming line	4x2pin/2.54 (2.54mm pitch)	1
	5. Power Supply	Output: DC 5V	1

Table 1-1

### 2. Safety Precautions

- Do not place heavy objects on the display panel, in order to avoid damage caused by stress.
- Place the application display boards at steady place, so as to avoid falling damage.
- Do not use this product with the input voltage which is not meeting the electrical specifications, in order to avoid working abnormally or damage.
- Avoid application display boards being touched by liquid, dirt and avoid being exposed to moisture during operation. This application should be kept in a dry environment, so as not to affect the function and performance.
- Remove the power supply when not using it.
- When following status occurred, please remove the power supply immediately, and contact our engineer.
  - Power Supply line is worn or damaged.
  - Power source (battery) connected but no any light on while operating.
  - Component off.

### 3. Writer Introduction

#### 3.1. Writer Introduction

HY16F Writer is mainly for AndeSight IDE compiler generated by the .bin file to burn. Through writer kit application software, download the code to writer. Support on-line application operation to write code to chip and also support off-line writer write code to chip process for mass production.

#### 3.2. Hardware Version Requirement

HY10000-WK08C or HY10000-WK08D integrated writer (hereinafter referred to as WK08x), need to be built to support HY16F products burn **F/W Ver. 3.4** above.

#### 3.3. Software Installation Steps

##### 3.3.1. Software Installation

Minimum System Requirements of operating writer kit application HY16F Writer:

- **PC Hardware Requirement:**

- PC compatible with ( PENTIUM® ) system

- 256MB Memory ( recommend 512MB )

- 500MB Hard disk

- **Operating System Support:**

- Windows XP (32 bit), Windows 7(32 bit/64 bit), Windows 8(32 bit/64 bit),

- Windows 10(64 bit)

- **Apply the following interface modes:**

- USB Port

- **Software Version Support:**

- HY16F Writer V3.3 above

- **Support Chip Product Model:**

- HY16F18X product (HY16F184, HY16F187, HY16F188)

- HY16F19X product (HY16F196, HY16F197, HY16F198)

- HY16F19XB product (HY16F196B, HY16F197B, HY16F198B, HY16F1983)

- HY16F3981

- **Applicable to the following interface modes**

- USB Port with “**HID-compliant device**”

- The HY10000-WK08D's USB Port driver uses the Windows standard

- “**HID-compliant device**” (Figure 3-1), so there is no need to install another USB driver.

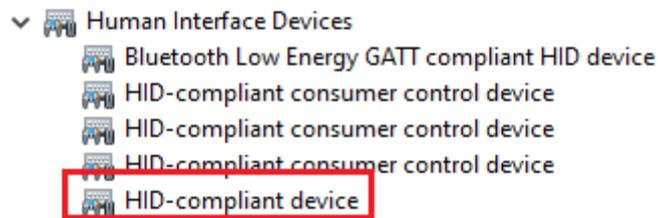
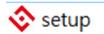


Figure 3-1

- **Program Version Compatibility**

Through the HY16F IDE software version compiled file (bin file), can be downloaded and burned by HY16F Writer software.

- Unzip the HY16F Writer software and execute the Setup.exe executable file.
- Follow the instructions on the screen to perform the installation step by step.

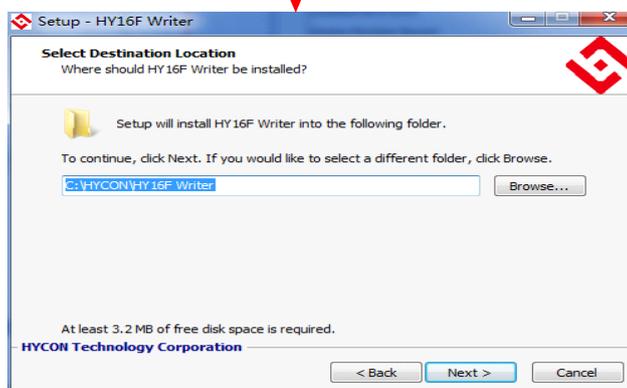
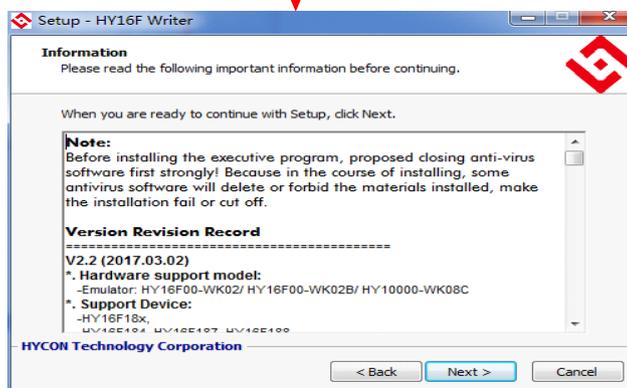
Unzip the HY16F Writer software package  and run it to install the software (the steps are as shown in the figure below). After the installation is completed, directly run the

\\HYCON\HY16F Writer directory  to open the software for operation.

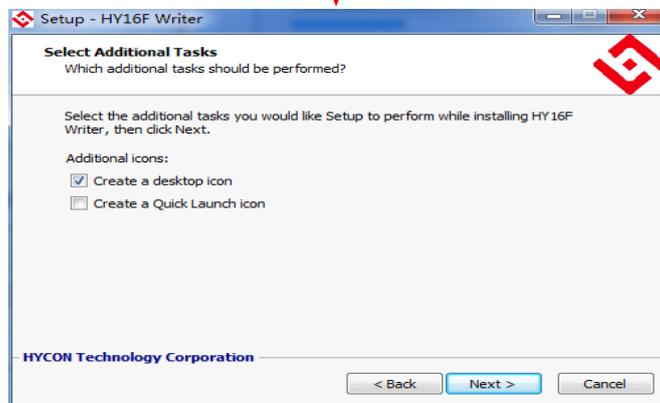
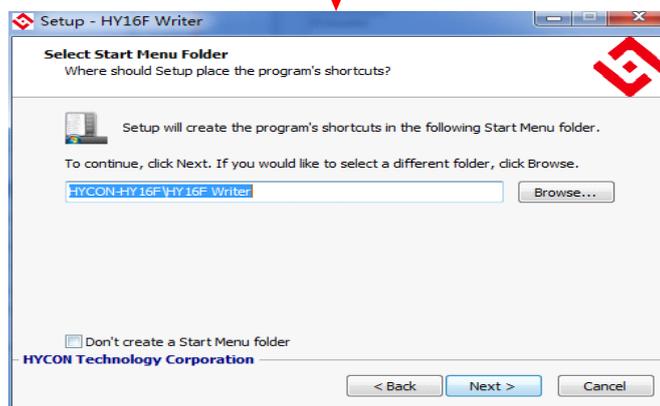
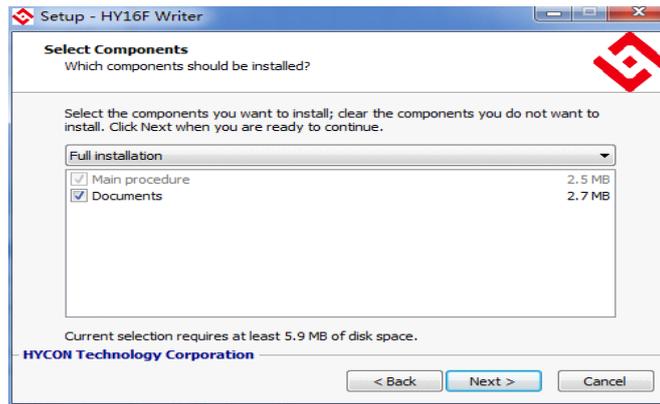
Note: Please run the software as a "system administrator".

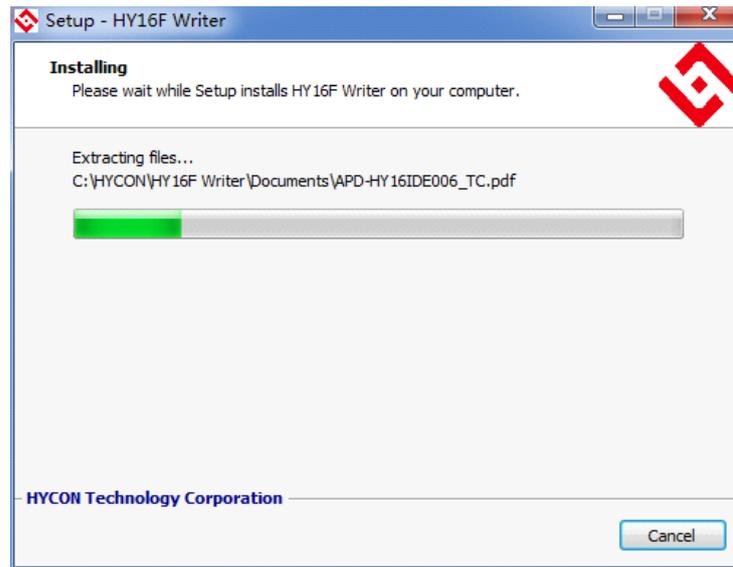
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## 3.3.2. HY16F Writer Software Installation Steps



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### 3.3.3. Uninstall

Please go to settings "Apps and Features" to find HY16F Writer select the removal program.

## 4. Operating Instructions

### 4.1. Writer Introduction

#### 4.1.1. Description of Writer Kit's Button and LED

##### 4.1.1.1. Program Button (External Button)

The program is programmed into the chip, including **checking the Chip model→Erase All→Program→Verify**. During the programming process, pressing the programming button has no effect.

##### 4.1.1.2. Status Indicator LED

**Green LED L1:** Representative of checking and writing action status are normal after writing action is executed.

**Red LED L2:** Representative of any action failure after writing action been executed.

**Yellow LED L3:** Writing process display light. Used with automated writing machine. Light on when writing, otherwise light off.



Name	Description
Programming pin	PIN1: Reset(VPP) PIN2: NC(SCK) PIN3: EDIO(SDI) PIN4: ECK(SDO) PIN5: VDD PIN6: VSS
Status indicator LED	L1: OK (Green LED)
	L2: Error (Red LED)
	L3: Busy (Yellow LED)
USB Port	WK08x writer power input port / data transmission line ports
Program button	Programming button
Blank button	This button is invalid
Information button	Programming Information inquiry

## 4.1.2. The illustration of writer status port and programmed pin

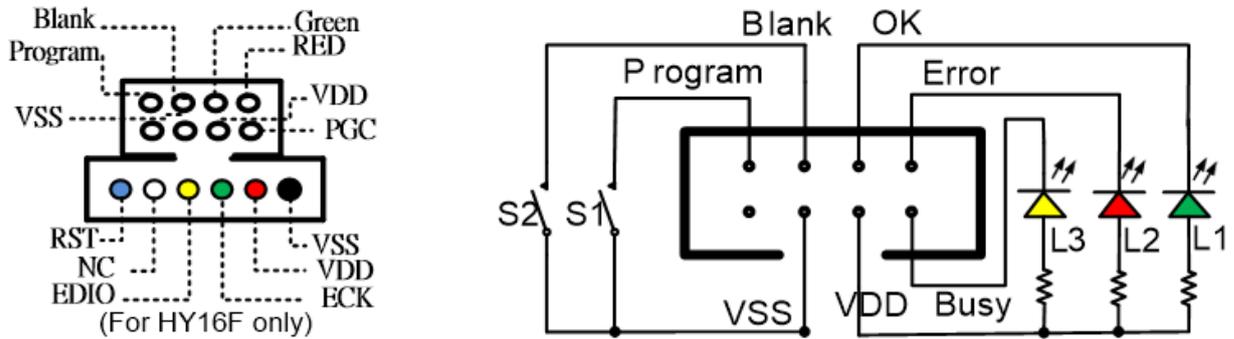


Figure 4-1 WK08D writer port

## 4.2. HY16F Series Programming Area Description

After the project program is compiled through AndeSight IDE, it will generate a Bin File burning code (as shown in Figure 4-2). For some requirements that require partition burning, you can also choose to compile separately to generate the block burning program. code (as shown in Figure 4-3, in which App Bin and Data Bin are distinguished from Bin File), the programming code can be directly burned to the chip's Flash ROM (divided into App Flash ROM and Data Flash ROM), the detailed configuration of the Flash ROM programming area of the chip is shown in Figure 4-4:

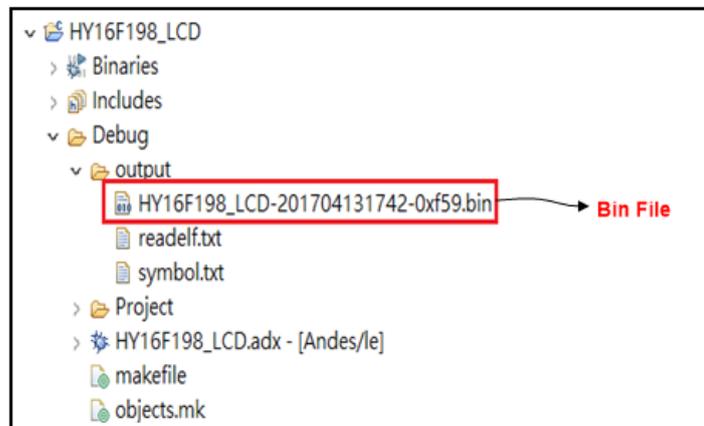


Figure 4-2 Single compiled Bin File

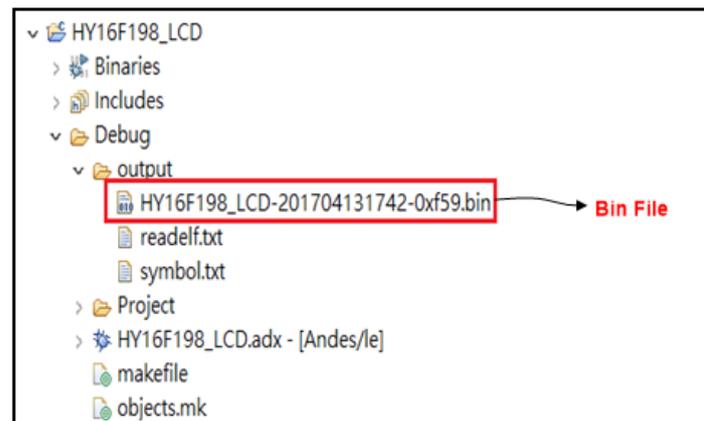


Figure 4-3 Separate compiled Bin File

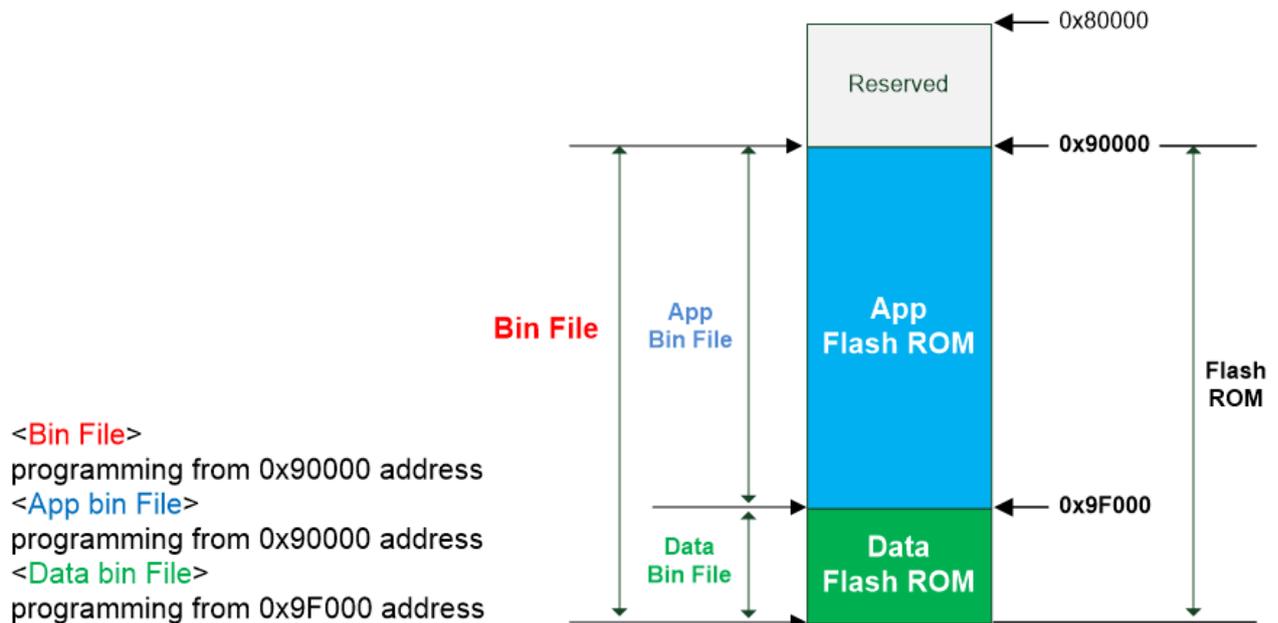


Figure 4-4 Programming area configuration

1. App Bin File: This programmed code is generated by the user application program, programmed in the chip's App Flash ROM area, this code is necessary during the programming.
2. Data Bin File: This programmed code is generated by the user own fixed parameters or calibration parameters, programmed in the chip's Data Flash ROM area, this code is unnecessary, depending on the actual needs of customers.
3. App Bin and Data Bin is separated by the BIN File, the purpose is to do the application of partition programming, if you do not need to do partition programming, you can directly use the BIN file to replace the App Bin file.

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## 4.3. Writer Software Description

HY16F Writer S/W interface function blocks, introduction of functions are as following:

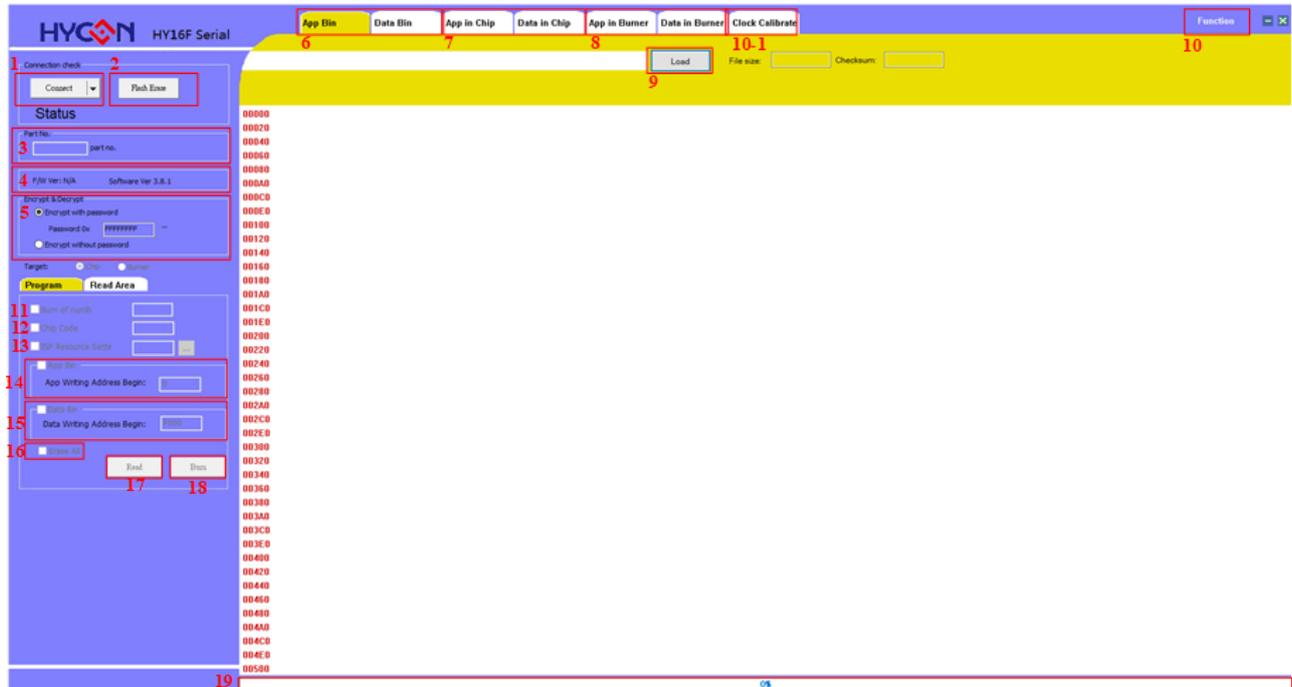


Figure 4-5 Interface function block diagram

### 4.3.1. Connection Interface



Figure 4-6 Connection interface diagram

### (1) Connection status: Connect / Disconnect Button:

Connected is displayed when the USB connection, When the display Disconnect the USB offline, when the chip has encryption protection, the connection will have the following situation:

- When the chip selection model is HY16F18X or HY16F19X:
  - If the chip is hardware encryption, need enter the correct password to decrypt the chip before the normal connection.
  - If the chip is software encryption, through the Flash Erase function to decrypt the chip before the normal connection.
- When the chip selection model is HY16F19XB or HY16F3981:
  - If the chip is hardware encryption, need enter the correct password to decrypt the chip before the normal connection. After the connection, the chip's App ROM will be cleared.
  - If the chip is software encryption, through the Flash Erase function to decrypt the chip before the normal connection.

### (2) Flash Erase Button: Direct erase all data in the chip (Including Flash ROM and decryption)

- When the chip selection model is HY16F18X or HY16F19X:
  - If the chip does not have encryption protection, direct erase chip Flash ROM data.
  - If the chip has been Hardware encryption protection (display Code Protection), need check the password, if the password is error will display Password Error and don't do any action, when the password is correct will erase chip Flash ROM data and decryption, after the completion of the chip is displayed blank message.

- When the chip selection model is HY16F19XB or HY16F3981:

Regardless of whether the chip has encryption protection, through the Flash Erase button (do not need enter password) can directly erase chip Flash ROM data, and decryption at the same time.

### (3) Part No.: display the current chip model, as well as the size of the RAM and APROM.

### (4) Version information: writer F/W version and Writer software version.

- F/W Ver. : displays the current F/W version of WK08x.
- Software Ver. : displays HY16F Writer software Version.

**NOTE:** Before using WK08x, make sure that the Writer has F/W that is loaded to support the HY16F product, detailed F/W loading method can refer to "Integrated Writer's Manual APD-HYIDE013". HY16F Writer V3.8.1 above version, it no longer supports Burner

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Transformer to update Writer's F/W. Please direct use HY16F Writer V3.8.1 option (Update Firmware) to update Writer's F/W.

## (5) Encrypt & Decrypt: Encryption protection function

- Encrypt with password: Hardware encryption function (with password), password input range is 0x0 ~ 0xFFFFFFFF value as hardware protection; default is no password state 0xFFFFFFFF, each time the download program will enter the password into the Burner and Chip; whether the password correct or not determines whether the program can be read out; If forget password, the chip will not be burned repeatedly.
- Encrypt without password: Software encryption function (no password), do not need enter password; if the chip is encrypted, need to manually press the "Flash Erase" button to decrypt.

## 4.3.2. Program Interface

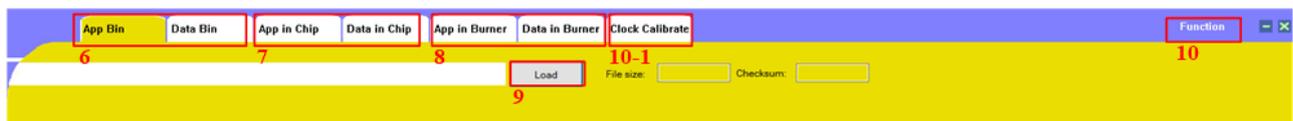
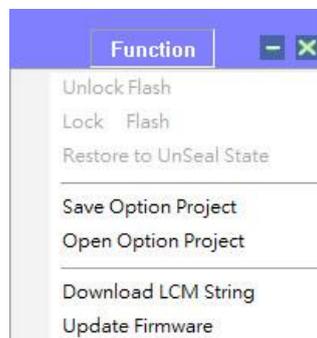


Figure 4-7 Program Interface diagram

Program Interface is classified into three pages

- (6) App Bin & Data Bin: Respectively show the contents of the program to be burned, preset display screen is App Bin.
- (7) App in Chip & Data in Chip: Respectively show Read out the contents of the chip.
- (8) App in Burner & Data in Burner: Read out the contents of the burner.
- (9) Load file: Load the .bin file to be programmed, and displays File size & Checksum.
- (10) Function : There are seven options are as follows:



- I. Unlock Flash: Not open for use.
- II. Lock Flash: Not open for use.
- III. Restore to UnSeal State: Enables the hardware encrypted chip into an unencrypted state.

**NOTE:** HY16F188 and HY16F19X products cannot use this function.

- IV. Save Option Project: Save the project, including the programmed configuration and setting.
- V. Open Option Project: Loading project.
- VI. Download LCM String : Download LCM's display string.  
**Note :** If you encounter no font display on LCD or garbled characters, you can choose to update and download LCM String
- VII. Update Firmware: On-line update WK08D firmware.  
HY16F Writer V3.8.1 above version, recommend user use this way to update WK08D firmware. The user doesn't use HYCON Burner Transformer to update WK08D firmware.

(10-1) Clock Calibrate: Calibrate HAO frequency function. It is the special function. If the user has to use the function, please contact with HYCON staff.

## 4.3.3. Status Interface



Figure 4-8 Status Interface diagram

(11) Burn of number : Set the number of times the burner can be programmed, setting range is from 0 to 99999999.

(12) Chip Code : Rolling code function (the rolling code is programmed in the last 4 bytes of the chip Flash ROM), support off-line programming function, the rolling code will be incremented automatically when programming is successful, the maximum increase to 999999999 will stop; this function can be enabled when the “Chip Code” is selected, the user can set the starting value (range is 1 to 99999999).

**For example:**

Assuming that the user uses the HY16F198B chip to programming, and the current rolling count to 10000, then the programmed address 0xFFFC~0xFFFF of the Flash ROM will display => 0x2710

(13) ISP Resource Setting : Definition of ISP UART Pin & ISP Check Pin.

HY16F Writer V3.3 above version supports ISP Resource Setting. If the user needs an ISP Bootloader function, ISP Resource Setting can enable Bootloader function.

(14) App Bin and address Begin: General programming is to select the App Bin, can enter the starting address of programming (Initial value is 0, do not deliberately change)

(15) Data Bin and address Begin: If you need to program the Data Bin, you can select this function and enter the starting address of programming (The initial value is F000, do not need to deliberately change).

(16) Erase All: Determine whether or not to erase the chip's flash ROM space before programming.

- When Erase All function is selected: Chip's Flash ROM (App ROM and Data ROM) will be cleared before programming, so it is recommended that the Erase All function should be selected when the chip is programmed for the first time.
- When Erase All function isn't selected: Chip's Flash ROM (App ROM and Data ROM) will not be cleared before programming, so it is not necessary to select the Erase All function when you need to separate App Bin and Data Bin as separate actions.

(17) Read Function: According to Target selection to determine HY16F writer software is read-back the programmed code from Chip or Burner.

- When the chip selection model is HY16F18X or HY16F19X:
  - When Target options selection is Chip:
    1. If the chip has not done any encryption protection, can directly read the chip's fully Flash ROM data.
    2. If the chip has been software encryption protection, cannot read the chip's any programmed code.
    3. If the chip has been hardware encryption protection, you have to enter the correct password to read the chip's fully Flash ROM data.
  - When Target options selection is Burner:
    1. If the chip has not done any hardware encryption protection, can directly read WK08x's fully Flash ROM data.
    2. If the chip has been hardware encryption protection, you have to enter the correct password to read WK0xC's fully Flash ROM data, when the password error will show Password read fail and cannot read.
- When the chip selection model is HY16F19XB or HY16F3981:
  - When Target options selection is Chip:
    1. If the chip has not done any encryption protection, can directly read the chip's fully Flash ROM data.
    2. If the chip has been software encryption protection, cannot read the chip's any programmed code.
    3. If the chip has been hardware encryption protection, you have to enter the correct password to read the chip's fully Flash ROM data (App ROM will be cleared before reading).
  - When Target options selection is Burner:
    1. If the chip has not done any hardware encryption protection, can directly read WK08x's fully Flash ROM data.

2. If the chip has been hardware encryption protection, you have to enter the correct password to read WK08x's fully Flash ROM data, when the password error will show Password read fail and cannot read.

(18) Burn Function: According to the Target selection, described as follows

- Target options selection is Chip: The App Bin, Data Bin and encrypted messages are programmed into the chip.  
NOTE: If the chip has been encrypted to protect, you must first decrypt to perform the above actions.
- Target options selection is Burner : Download the App Bin, Data Bin, encryption message, chip model and programmed settings to the WK08x.

(19) Burning status : Display burning progress



Figure 4-9 Burn progress chart

(20) Reading Address Begin & End: This function is the same as the function of read-back the programmed code in Figure 4-8 (17) Read, the difference is that the user can set the read address of the start and end points, as shown below:



Figure 4-10 Read Area Interface diagram

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## 5. Examples of programming operation

Use the HY16F198B chip as an example.

### 5.1. On-line Programming Function

**STEP01:** Open HY16F writer software, click “**Connect**” to connect the WK08x and chip, select the chip type to be programmed according to the Part No. chip model shown.

**STEP02:** Select “Chip”.

**STEP03:** App Bin must be selected, a normal programming need to select the “**Erase All**”.

**STEP04:** Click “**Load**” to load programmed App Bin file, file checksum and other messages will be displayed.

**STEP05:** Click “**Burn**”, if the chip has not done any hardware encryption protection, then it can directly write the program to chip. If chip is in hardware encryption protected status, you have to enter the correct password, after finish programming, it will display the result.

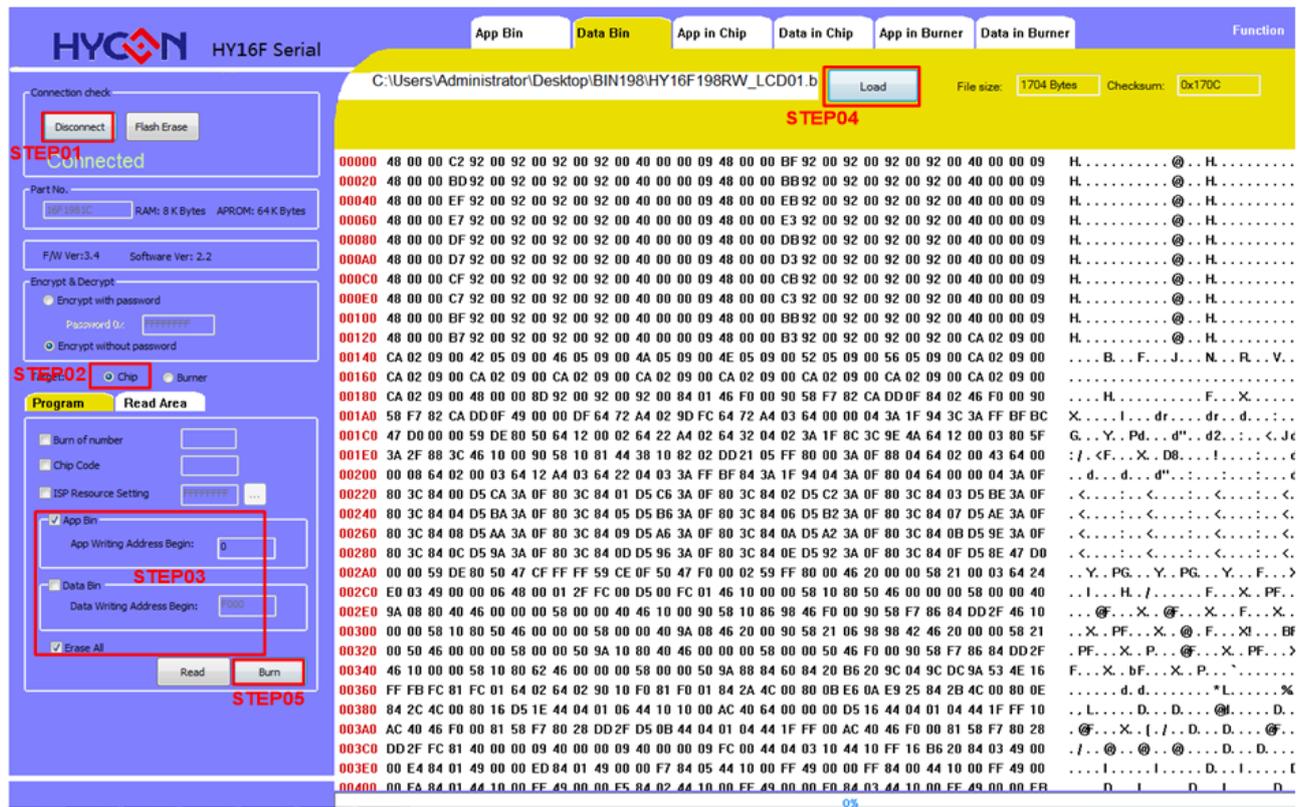


Figure 5-1

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## 5.2. Off-line Programming Function

**STEP01:** Open HY16F writer software, click **“Connect”** to connect the WK08x and chip, select the chip type to be programmed according to the **“Part No”**. chip model shown.

**STEP02:** Select **“Burner”**.

**STEP03:** App Bin must be selected, a normal programming need to select the **“Erase All”**.

**STEP04:** Click **“Load”** to load programmed App Bin File, File Checksum and other messages will be displayed.

**STEP05:** Click **“Burn”**, The BIN File will be downloaded to WK08x writer, PASS is displayed after download is complete.

**STEP06:** After the HY16F writer software is turned off, the chip can be programmed by the Program button on the WK08x writer, While programming, L3 (Busy) light on. After programming, L3 light off and light on L1 (OK) or L2 (Error).

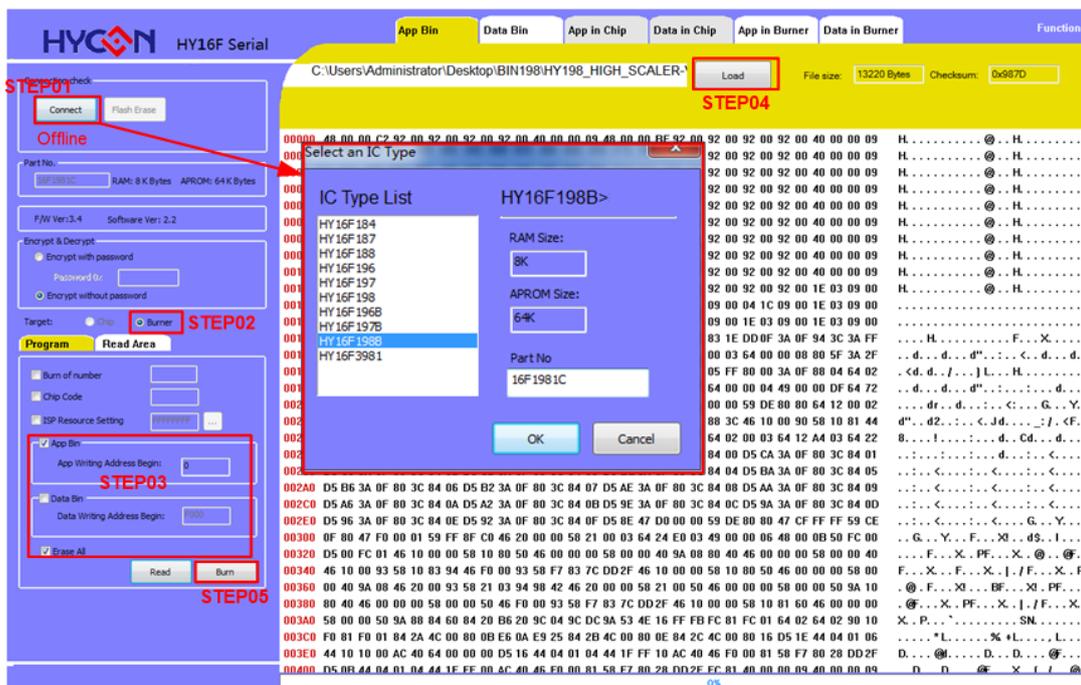


Figure 5-2



Figure 5-3



Figure 5-4

# HY16F Series Writer Kit Instruction Manual

## 5.3. Off-line Programming Function

**STEP01:** Open the HY16F Writer software to connect WK08x and chip.

**STEP02:** Enter the correct Password (if the password is wrong, it will not be able to connect to the chip), if there is no password, do not write.

**STEP03:** Click “connect” button, program will sent the password data to let chip examine, if pass the examination it will display “Password Protection”. If IC examination fails, it will display “Chip Error”, after pass the examination, you can reset the password data.

**STEP04:** Click “Chip” to set read chip mode, choose to read “App Bin”.

**STEP05:** Click “Read” button, the software will switch to “App in chip” display window.

**STEP06:** The Read Chip function mainly compares the Load's BIN file with the chip's Flash ROM

- When the comparison is passed, it will display “Equal” in the Chip screen.
- When the comparison is not passed, it will display “Not equal”.

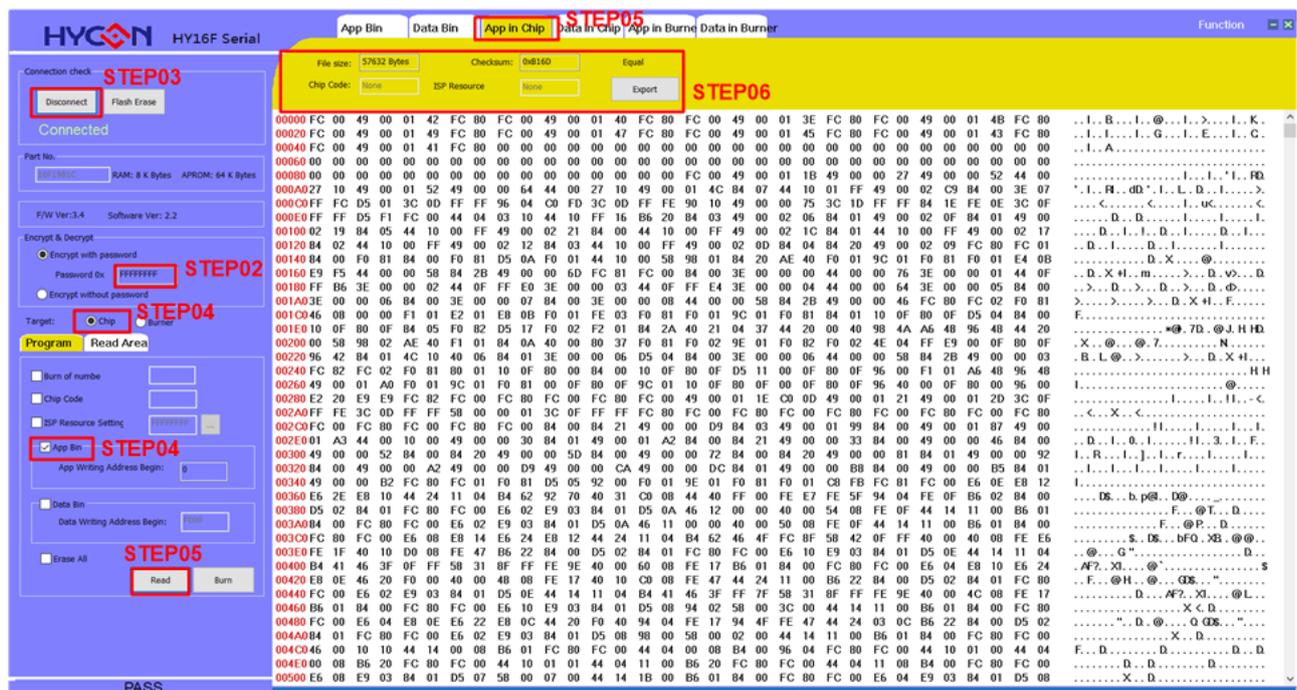


Figure 5-5

**NOTE:**

If use Debug Tool programming (chip that hasn't be programmed before), and load it via writer kit, the default will load whole Flash ROM code. Therefore the checksum is not a correct checksum value; If use Debug Tool programming (chip that has been programmed before) and load it via writer kit, the default will load App Flash ROM code from last time that programmed. Therefore the Checksum's measurement value is not correct checksum value of the chip; So the checksum of the chip which is programmed by Debug Tool can not be used as a reference.

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## 5.4. Read Burner Function

**STEP01:** Open the HY16F Writer software to connect WK08x and chip.

**STEP02:** Input correct Password (If the password is wrong, it can't connect to chip).

**STEP03:** Click **“connect”** button, program will sent password data to let chip examine, if pass the examination it will display **“Password Protection”**. If IC examination fails, it will display **“Chip Error”**, after pass the examination, you can reset the password data.

**STEP04:** Click **“Chip”** to set read Burner mode, choose to read **“App Bin”**.

**STEP05:** Click **“Read”** button, the software will switch to **“App in chip”** display window.

**STEP06:** Read Burner functions: Burner and loaded BIN files for comparison.

- When the comparison is passed, it will display **“Equal”** in the Burner screen.
- When the comparison is not passed, it will display **“Not equal”**.

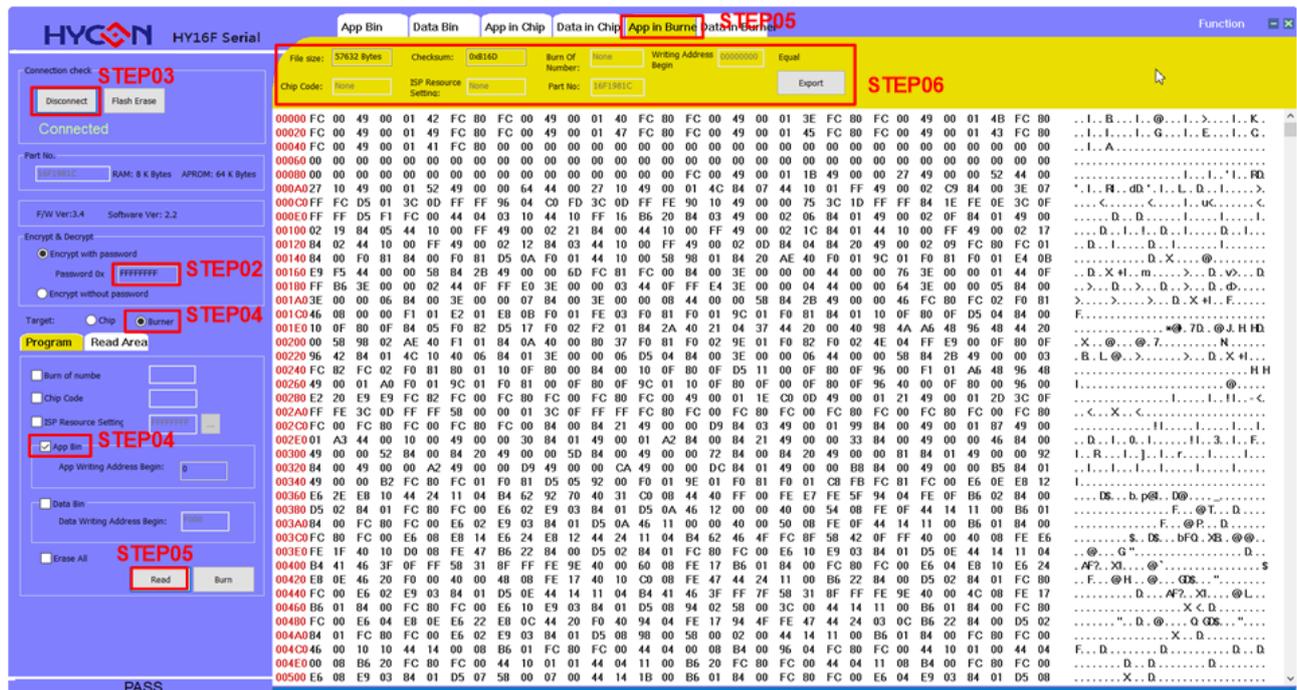


Figure 5-6

## 5.5. ISP Resource Setting Function

HY16F3981 chip as an example in the chapter. User can Enable or Disable the HY16F3981 ISP Bootloader function. Please refer to the picture below. Select the ISP mode as “**Timeout Entry**” mode, and click “Enable ISP”, and click ISP UART port as “PT2.0&PT2.1”. The ISP Resource Setting information will be 01000355.

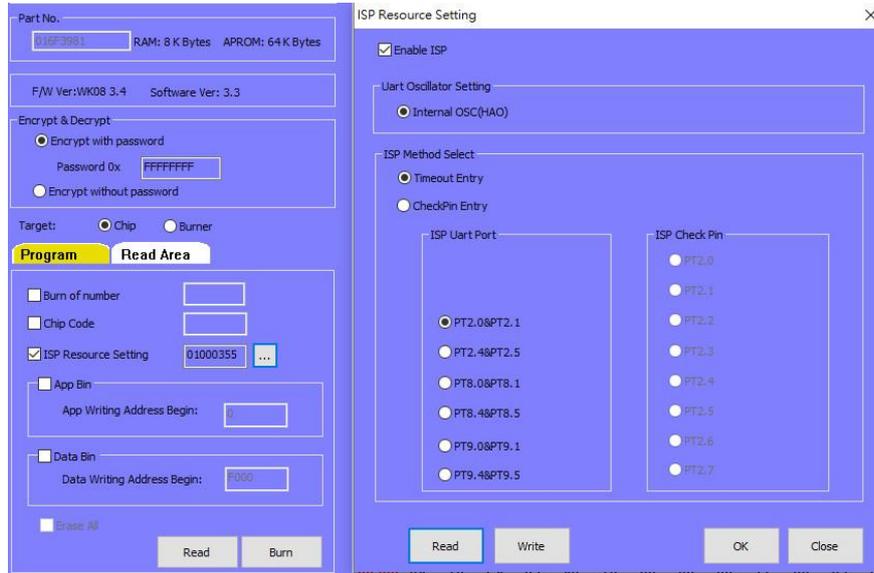


Figure 5-6

If select “**CheckPin Entry**” mode, click ISP UART port as “PT2.0&PT2.1” and ISP Check Pin as “PT2.2”. The ISP Resource Setting information will be 01030355.

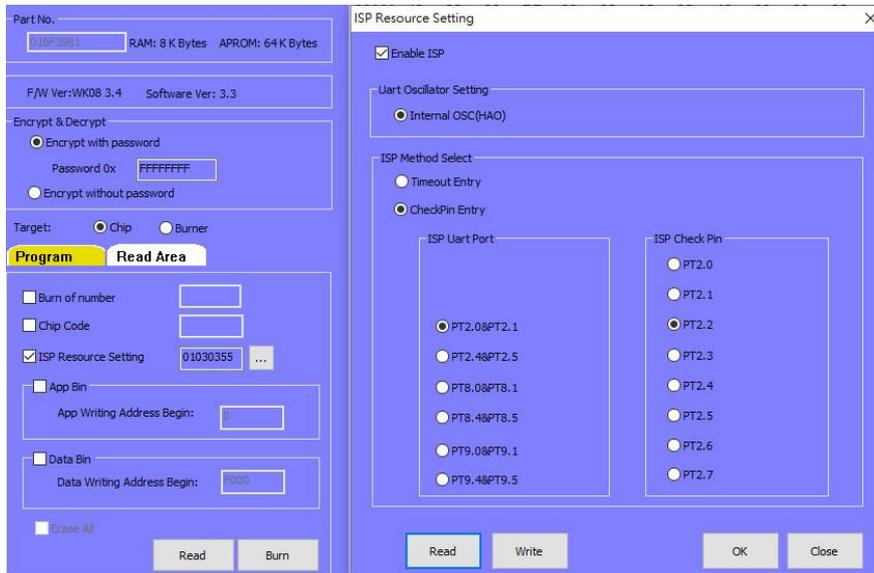


Figure 5-7

In the same setting, if unchecked the Enable ISP function, the ISP Resource Setting information will be 01030300.

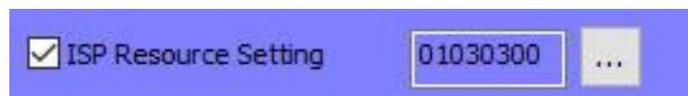


Figure 5-8

## 5.6. Update Firmware Function

HY16F Writer V3.8.1 above version, recommend user use this way to update WK08D firmware. The user doesn't use HYCON Burner Transformer to update WK08D firmware. Below is the guideline to use "Update Firmware" function to update WK08D firmware.

**Step1:** Connect the HY10000-WK08D and open the software. Function, select the Update Firmware.

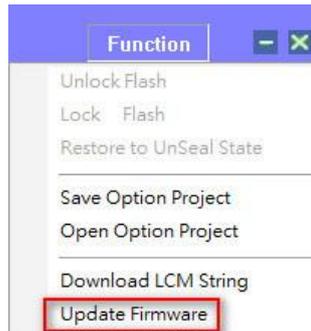


Figure 5-9

**Step2:** Enter the operation page, Update Firmware. Click Update button, it will jump next operation page.

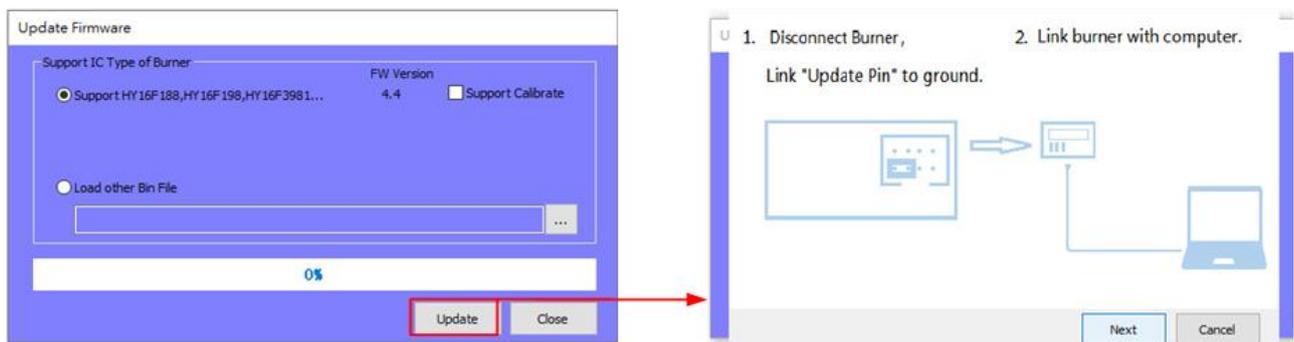


Figure 5-10

1. Disconnect Burner: Please be noted WK08D Hardware. Remove (Disconnect) the USB port, and prepare the "short jump" and short it on "Update Pin", refer to the picture below.

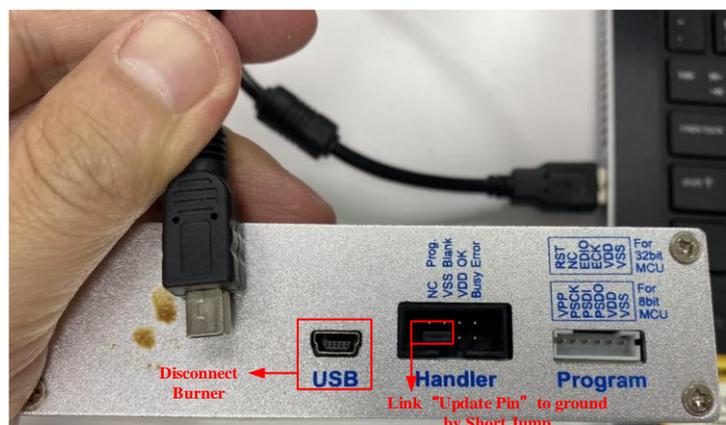


Figure 5-11

- Link burner with computer: re-connect the USB port, this step is equal to do power on for WK08D. Because the “Update Pin” have connected to ground (VSS), the WK08D enter F/W update mode.

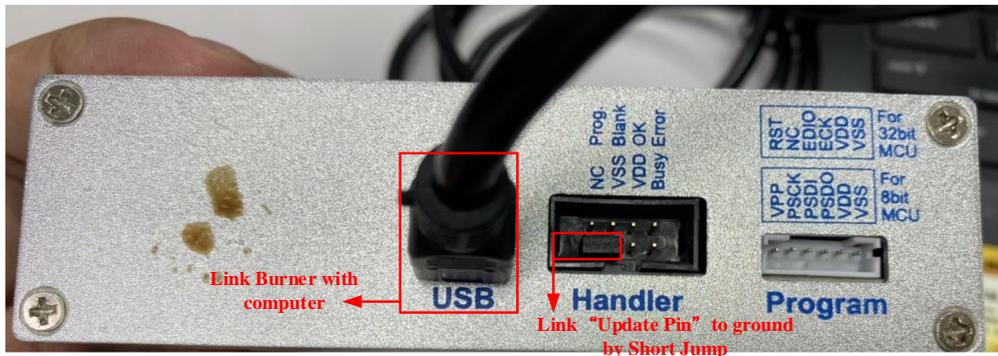


Figure 5-12

**Step3:** Click Next button, execute FW updating and waiting until to 100%.

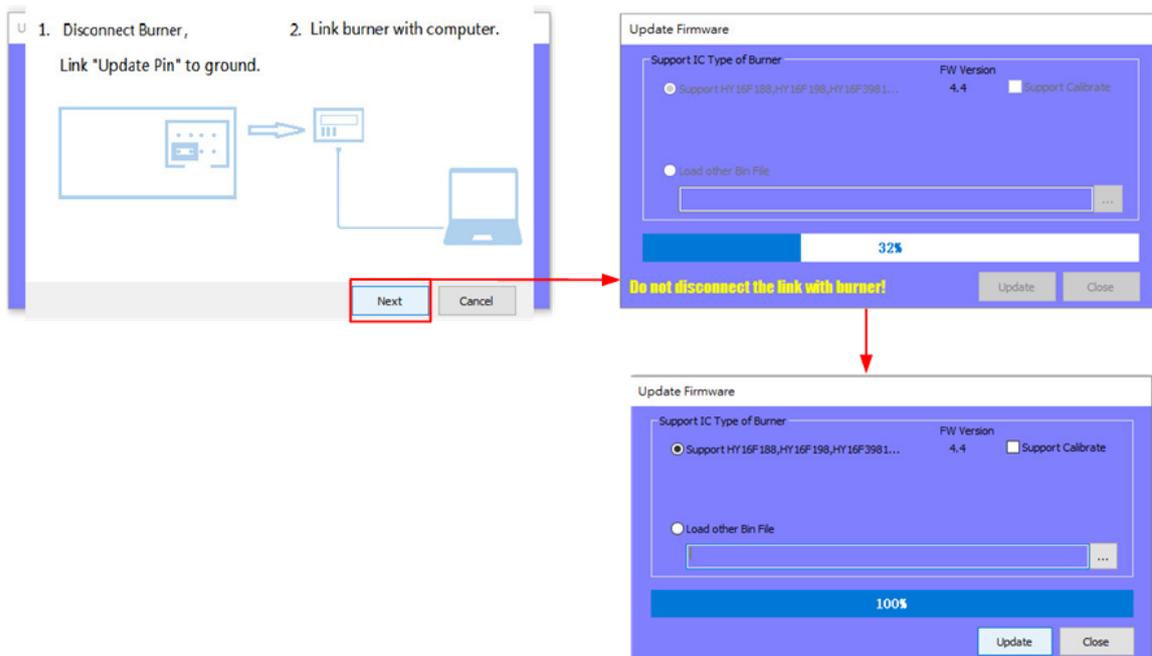


Figure 5-12

**Step4:** After the update is completed to 100%, press the Close button, on the hardware side, remember to remove the short-circuit jumper of the writer. At this time, the writer has left the FW update mode and can work in the normal mode.

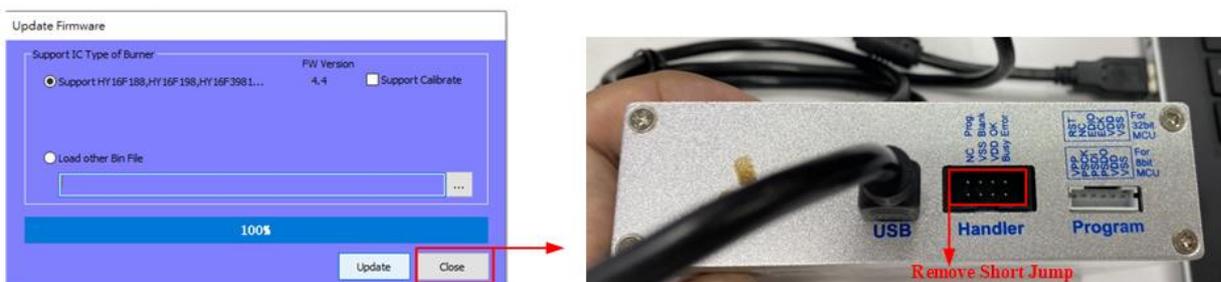


Figure 5-13

**Step5:** Click Connect button, check F/W Ver. The user can check “F/W Ver.” by On-line or Off-line mode, refer to the pictures below.

EX: “Software Ver. 3.8.1” adapt to “F/W Ver. WK08 4.4” Version.

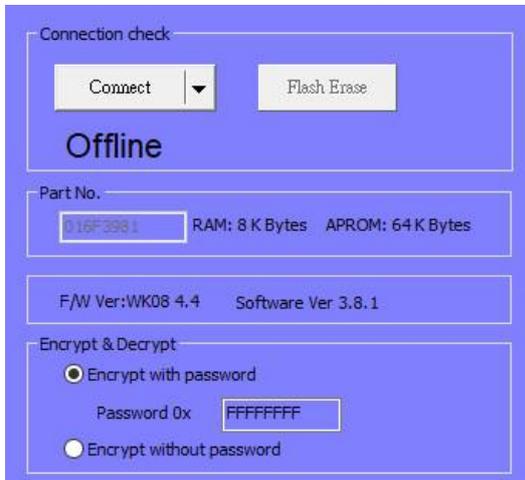


Figure 5-14



Figure 5-15

Note: If WK08D no enter F/W update mode, click Update button to make the firmware update abnormal. And it will display the error message. EX: **“No such USB device”** or **“Send sync packno cmd fail”**, the update status stops on the 0%. If user struggling in FW update abnormal condition, please check the step1~4 in detail again.



Figure 5-16

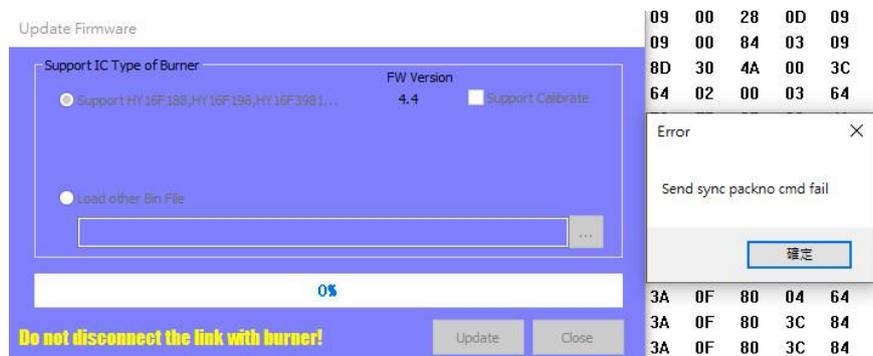


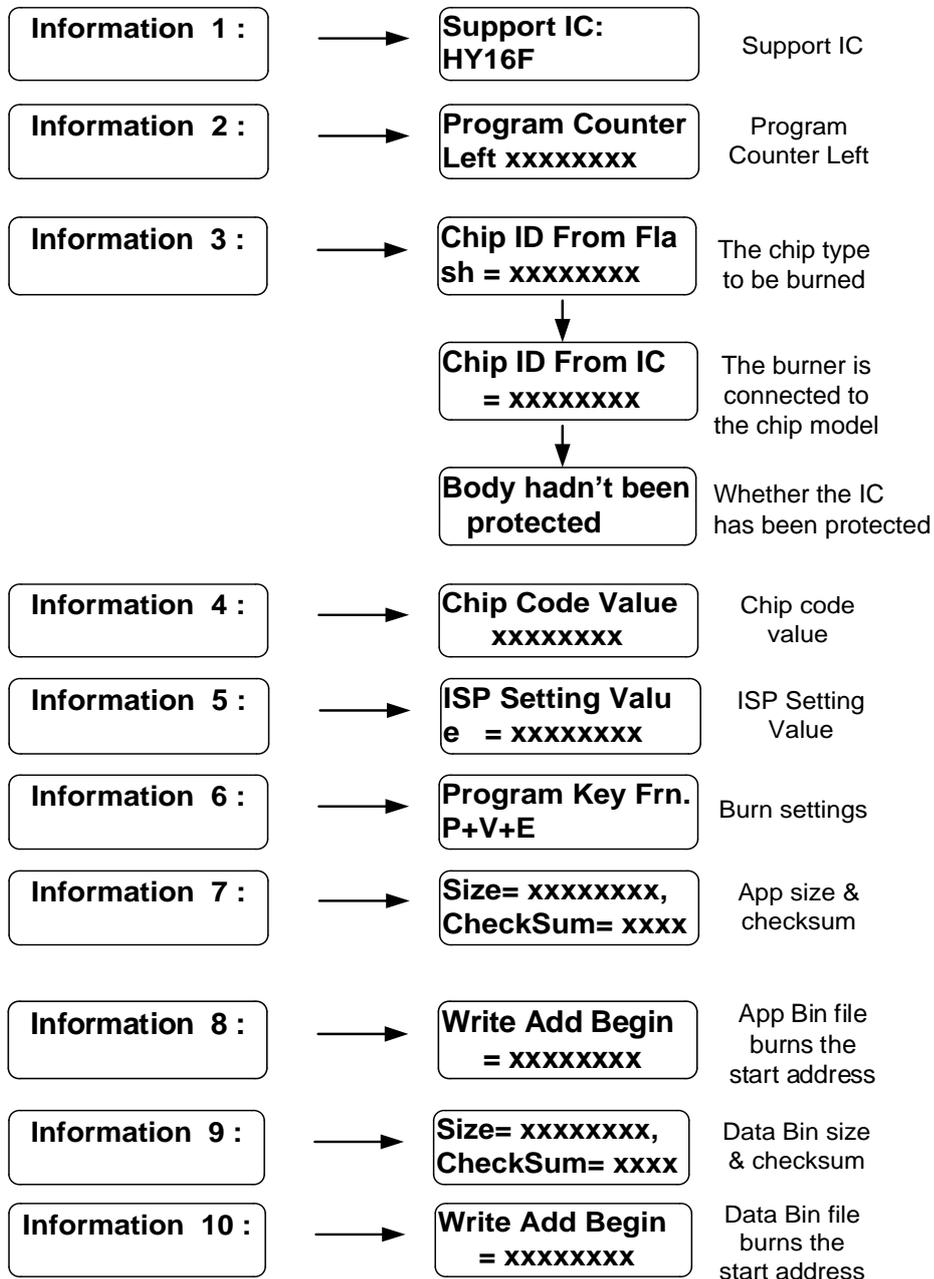
Figure 5-17

## 6. Writer Display Information Description

For HY10000-WK08x integrated writer the following information:

### 6.1. Writer Configuration Information

Information button is pressed, Display a variety of information parameters



### 6.2. Error Message

In the process of using the writer, if an error message is displayed, please refer to the following instructions.

**Error 1:  
VDD =XXX**

VDD voltage error

Error 1 means Writer kit VDD voltage error

**Error 2:  
VPP =XXX**

VPP voltage error

Error 2 means Writer kit VPP voltage error

**Error 3:  
Chip ID ERROR**

The connected IC  
does not match  
the code

Error 3 means the bin file not match with chip ID, please confirm information 3 Chip ID from Flash.

**Error 4:  
Blank Fail!**

Blank fail

Error 4 means the chip is not blank, the chip has been programmed.

**Error 5  
Program Fail!**

Program fail

Error 5 means programming failure, please check the Writer kit connector (short or wrong connection), or return to HYCON.

**Error 6  
Verify Fail!**

Verify fail

Error 6 means verification failure after finish programming, please check the Writer kit connector (short or wrong connection), or return to HYCON.

**Error 7  
Protect Fail!**

Protect fail

Error7 means Protect failure.

**Error 8  
Program Count=0**

Burn count = 0

Error 8 means that the program count is zero. It need to re-download the bin file or re-setting the program count to the Writer kit.

**Error 11 Chip  
ID Mismatch**

The connected IC does not match the programmed code

Error 11 means the connected IC does not match the programmed code. The connected IC have to match the Chip ID, otherwise it can't be programmed.

**Error 12 Com  
munication Error**

Communication error

Error 12 means communication error, please check the Writer kit connector (short or wrong connection), or return to HYCON, For HY16F.

**Error 13 IC Is  
Encrypted**

IC has been protected

Error 13 means that the chip is Encryption, For HY16F.

**Error 14  
Passwore Error**

Password error

Error 14 means that the currently password in the Writer kit not the same with connection IC, For HY16F.

**Error 15 Chip  
Code Write Error**

Chip code write error

Error 15 means the chip code write error. In general case, it only be occurred on the abnormal communication, For HY16F.

**Error 16  
Erase Fail!**

Erase fail

Error 16 means the chip erase failure, For HY16F.

**Error 17 Update  
Info Page Fail**

Update fail

Error 17 means the information page update failure, For HY16F.

# HY16F Series Writer Kit Instruction Manual

## 7. Revisions

The following describes the major changes made to the document, excluding the punctuation and font changes.

Date	Version	Page	Summary of Changes
	V01	ALL	First version release
	V02	ALL	Add installation steps and composing
	V03	ALL	Writing software version updated
	V04	ALL	Writing software version updated
	V05	ALL	<ol style="list-style-type: none"> <li>1. ALL software update installation instructions contain requirements increase Writing Address Begin, Reading Address Begin function, update the AP illustration.</li> <li>2. Data bin file imports add functionality.</li> <li>3. Added WK08C Burner instructions, software interface description.</li> <li>4. Flash Erase button &amp; read description</li> </ol>
	V08	ALL	<ol style="list-style-type: none"> <li>1. Added Encrypt &amp; Decrypt features and instructions.</li> <li>2. Update the VISIO diagram to add an error message description.</li> <li>3. Remove the HY16F00-WK02B Writer message.</li> <li>4. Synchronize with Chinese version (V08).</li> <li>5. Strengthen the overall operating instructions.</li> </ol>
2017/06/06	V09	16	<ol style="list-style-type: none"> <li>1. Update the “Chip Code” operating instructions.</li> </ol>
2020/04/14	V10	All	<ol style="list-style-type: none"> <li>1. Add 5.5 section: ISP Resource Setting description</li> <li>2. Add description and explanation on 6.2 section “Error Message”</li> </ol>
2021/06/15	V11	All	<ol style="list-style-type: none"> <li>1. Update the pictures 4-5, 4-6, 4-7. Update and fix the description of Function in Chapter 4.3.2.</li> <li>2. Add 5.6 section : Update Firmware description.</li> </ol>
2023/02/02	V12	All	<ol style="list-style-type: none"> <li>1. Update picture 1-1, correct picture 4-1, add picture 3-1.</li> </ol>