

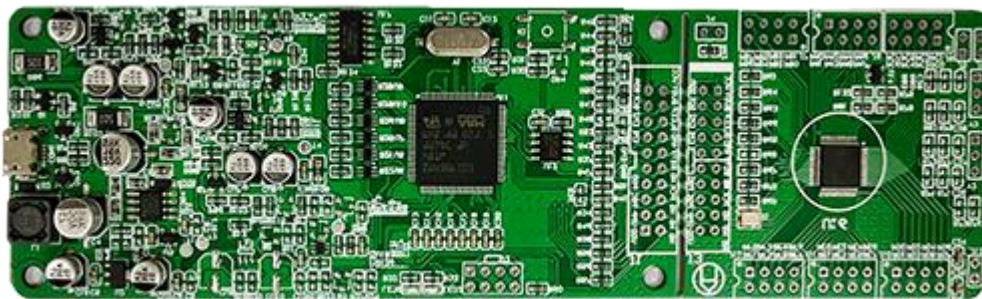
Abstract

OTP Debug Software HC-IDE

- Edit ASM and C code
- Compile ASM and C code (Win XP doesn't support)
- Simulation
- Program

OTP Debug Hardware HC-ICD-V4

- Support On-line Simulation
- Support On-line Programming
- Support Firmware Update
- USB Power Supply



HC-ICD-V4

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1 Software Installation

Please refer to 《TL0001_Driver Install Manual》 and 《TL0101_OTP DEBUG_HC-ICD-V4_Install Manual》 .

2 Hardware Connection



Figure 2-1 HC-ICD-V4 mother board pin configuration diagram

Debug pin:

GND, EM0, EM1, EM2, SCK, SDA, RST, F4M0, SLEEP, BUSY, VCC.

Program pin:

VDD, VPP, PGC, PGD, GND, PCK.

HC-ICD-V4 connects motherboard and daughter board together by default. When program, the program pin of HC-ICD-V4 is directly connected with the program pin of the chip, without breaking off the two boards.

If the customer manually breaks off the two boards, please connect the motherboard to the daughter board with the flat cable or DuPont wire during the simulation.

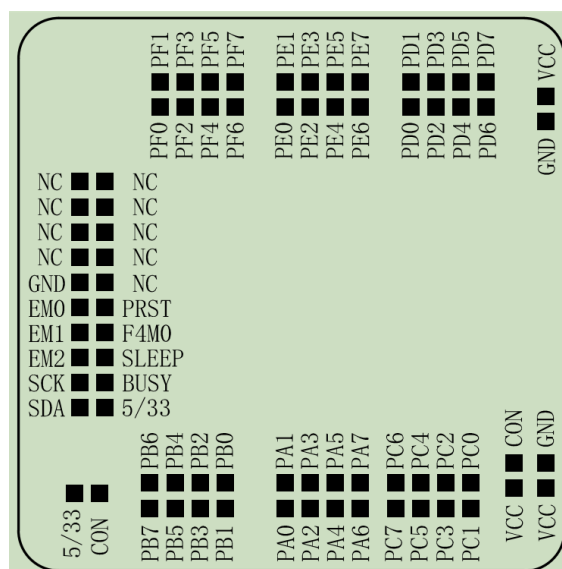


Figure 2-2 HC-ICD-V4 daughter board pin configuration diagram

3 New Project

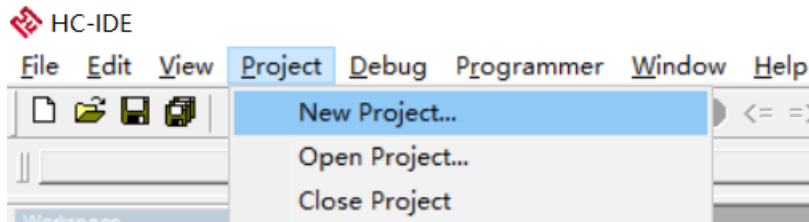


Figure 3-1 click "Project" and "New Project" to create a new project

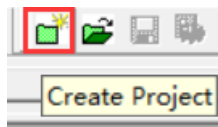


Figure 3-2 click the "Create Project" button in the toolbar to create a new project

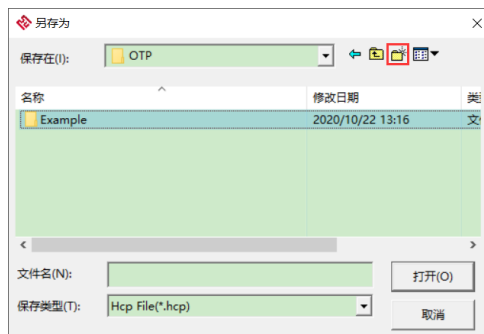


Figure 3-3 New Project dialog box, click the "create new folder" button to create a new folder. Note that there are no special characters in the path

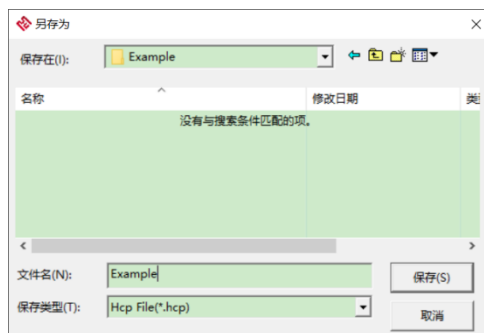


Figure 3-4 New Project dialog box, enter the new "example" folder, fill in the project name and click the "save(s)" button

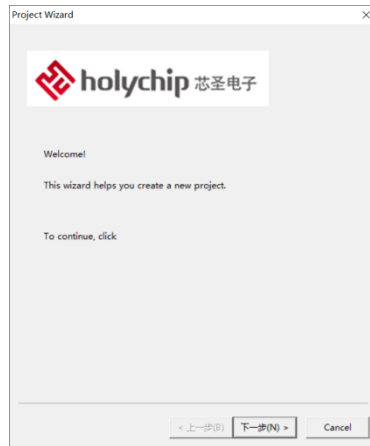


Figure 3-5 new project wizard, welcome interface, click "next(n)" button

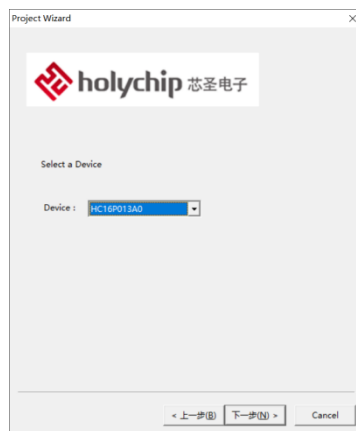


Figure 3-6 new project wizard, select chip model and click "next (n)" button

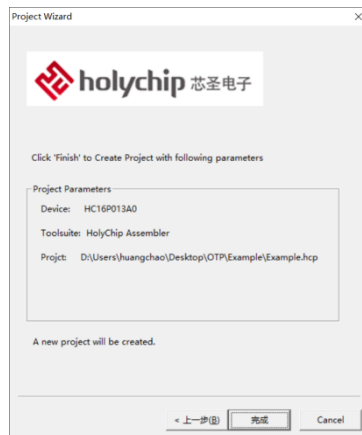


Figure 3-7 new project wizard, confirm the interface, and click "finish" to complete the new project

4 Open,Save,Close Project

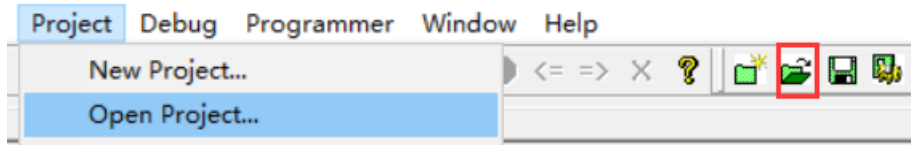


Figure 4-1 open the project from the menu bar or toolbar

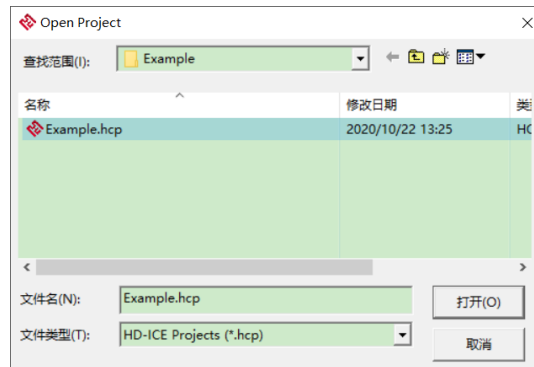


Figure 4-2 Open Project dialog box

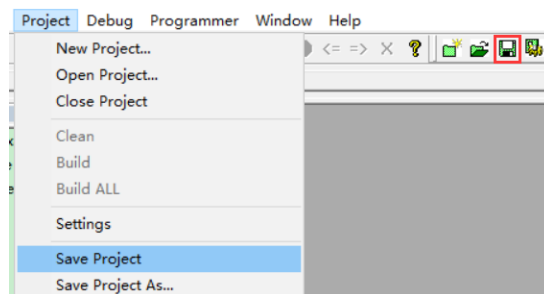


Figure 4-3 save the project from the menu bar or toolbar

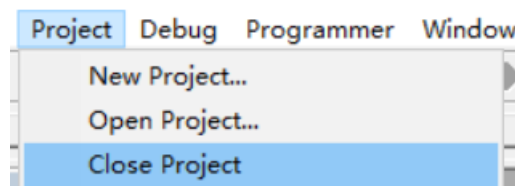


Figure 4-4 close the project from the menu bar

5 Edit

5.1 New File

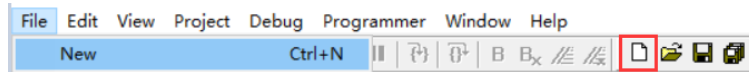


Figure 5.1-1 new a file from the menu bar or toolbar

5.2 Save File

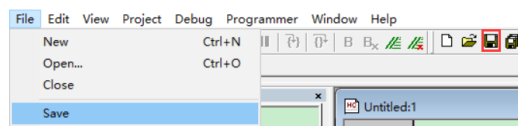


Figure 5.2-1 save the file from the menu bar or toolbar

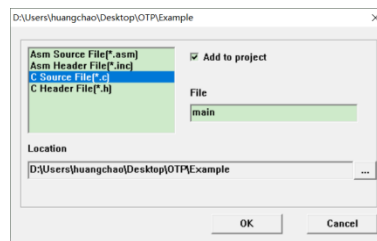


Figure 5.2-2 file save dialog box

Select "Asm Source File (*.asm), Asm Header File (*.inc), C Source File (*.c), C Header File (*.h) to determine the file type; select the "Add to project" radio box to determine whether to add the file to the project; fill in the file name in the edit box; and click "OK" to complete the file creation.

5.3 Add or Delete Source Files, Header Files, Library Files

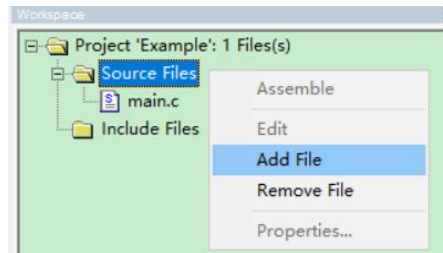


Figure 5.3-1 right click "source files" or "include files" in the "workspace" window to add or delete source files and header files

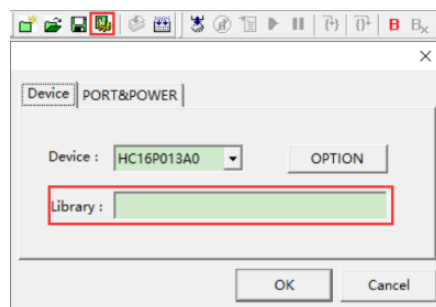


Figure 5.3-2 add or delete library file in setting window (fill in the relative path of library file directly)

5.4 C Demo Code

//Download more demo code from the website <http://www.holychip.cn/pro.php?id=80>

```
#include <SQ013L.h>
```

```
#define SET_BIT(VAR, BIT) VAR = (VAR | (0x0000000000000001 << BIT))
```

```
#define CLEAR_BIT(VAR, BIT) VAR = (VAR & ~(0x0000000000000001 << BIT))
```

```
#define GET_BIT(VAR, BIT) ((VAR >> BIT) & 0x0000000000000001)
```

```
void main(void)
```

```
{
    TRISB = 0x00;
    PORTB = 0x00;
    PHCON = 0xFF;
    PDCON = 0xFF;
    ODCON = 0x00;
    INTECON = 0x81;
    OPTION = 0x00; //Ftimer0 1/2
    T0 = 126;
    __asm__("clrwdt");//OPTION dialogbox set WDT_EN
    PCON = 0x80; //POR RST
```

```
while (1)
```

```
{
    CLEAR_BIT(PORTB, 1); //PORTB1 = 0
```

```
    __asm
    clrwdt
    sleep
    __endasm;
```

```
    SET_BIT(PORTB, 1); //PORTB1 = 1
```

```
}
```

```
void Intr(void) __interrupt 0
```

```
{
    if(T0IF)
    {
        T0IF = 0;
        T0 = 126; //reset T0
        PORTB0 = !PORTB0;
    }
}
```

5.5 ASM Demo Code

; Download more demo code from the website <http://www.holychip.cn/pro.php?id=80>

```
list p = SQ013L
W      EQU    H'0000'
F      EQU    H'0001'
T0     EQU    H'0001'
STATUS EQU    H'0003'
PORTB  EQU    H'0006'
PCON   EQU    H'0008'
PCLATH EQU    H'000A'
INTECON EQU    H'000E'
INTFLAG EQU    H'000F'
OPTION EQU    H'0041'
TRISB  EQU    H'0046'
```

UDL_main_0 udata

PSAVE res 1

SSAVE res 1

WSAVE res 1

UDATA0 res 1

```
ORG    0000H
NOP
NOP
GOTO MAIN
ORG    0008H
GOTO INTERRUPT
```

MAIN:

```
CLRF  TRISB
CLRF  PORTB
MOVLW 0x81
MOVWF INTECON
CLRF  OPTION
MOVLW 0x7E
MOVWF T0
MOVLW 0x80
clrwdt
MOVWF PCON
```

WHILE_1:

```
clrwdt
sleep
GOTO  WHILE_1
RETURN
```

INTERRUPT:

;SAVE_W_STATUS_PCLATH

```
MOVWF WSAVE
SWAPF STATUS,W
CLRF STATUS
MOVWF SSAVE
BANKSEL PCLATH
MOVF PCLATH,W
CLRF PCLATH
MOVWF PSAVE
```

;END_OF_SAVE_W_STATUS_PCLATH

```
BTFSS INTFLAG,0
GOTO RESTORE_W_STATUS_PCLATH
```

```
BCF INTFLAG,0
MOVLW 0x7E
MOVWF T0
```

```
CLRF UDATA0
BTFSC PORTB,0
INCF UDATA0,F
MOVF UDATA0,W
MOVLW 0x00
BTFSC STATUS,2
MOVLW 0x01
MOVWF UDATA0
RRF UDATA0,W
BTFSS STATUS,0
BCF PORTB,0
BTFSC STATUS,0
BSF PORTB,0
```

RESTORE_W_STATUS_PCLATH:

```
MOVF PSAVE,W
MOVWF PCLATH
CLRF STATUS
SWAPF SSAVE,W
MOVWF STATUS
SWAPF WSAVE,F
SWAPF WSAVE,W
RETFIE
```

end

5.6 Find



Figure 5.6-1 toolbar, print, find
 Print, print or output PDF document
 Find to find in the current document
 Find previous
 Find next
 Find in files to find in multiple documents
 Toggle bookmark to mark the current line
 Goto prev bookmark to find the previous tag
 Goto next bookmark to find the next tag

5.7 Comments



Figure 5.7-1 toolbar, comment or uncomment selection code

5.8 Font and Background Color Settings

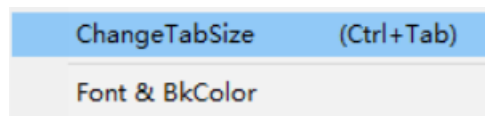


Figure 5.8-1 enter edit menu sample

Change tab size to 4 or 8

Font & Bkcolor modify font and background color

Hold down the "Ctrl" key on the left of the keyboard, move the mouse cursor to the code editing window, and scroll the mouse wheel to enlarge or reduce the font size

6 Compile



Figure 6-1 click the "build" button on the toolbar

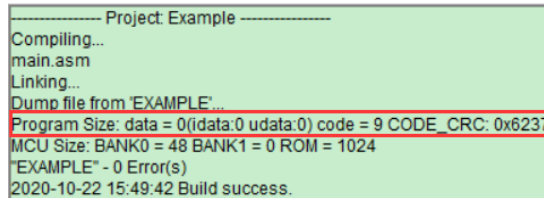


Figure 6-2 "output" window generates compilation link information

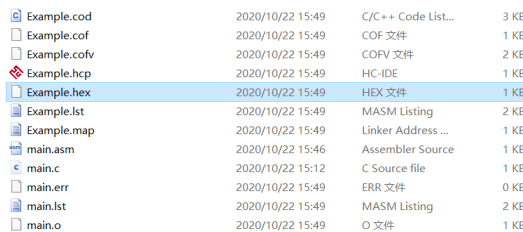


Figure 6-3 generating target *.hex file after compiling

Error/Warning	Reason
error:Missing definition for "STK12",required by "main.o"	There is no main function defined
Undefined identifier 'm'	M not declared
syntax error:token->' }';column 1	A statement before '}' is missing a semicolon
error 102:too few parameters	Insufficient arguments entered when using function
error 0: Duplicate symbol 'a',symbol IGNORED	Variable a is defined repeatedly
10: error:#include expects "FILENAME" or <FILENAME>	Include statement file name without semicolon or angle bracket
syntax error:token->' int';column 9	Variables are defined in the for statement
syntax error:token->' int';column 4	Variable is not declared at the beginning of the function
error 48:cannot assign values to aggregates	Incompatible type in assignment
error 78:incompatible types	Incorrect variable reference
error 33:Attempt to assign value to a constant variable(=)	Constant assignment again
error:Missing definition for symbol "_abcdef", required by "main.o"	The function ABCDEF is declared but not defined
error 65:function 'Test' already has body	Duplicate definition of function test
19:fatal error:test.h:No such file or directory	There is no such file or folder
warning 147:excess elements in array initializer after 'm'	Array out of bounds
warning 110:conditional flow changed by optimizer	Conditions are always false or true
warning 126:unreachable code	Code that will never be executed
warning 59:function 'Test' must return value	Function has no return value
warning 85:in function Test unreferenced function argument:'a'	There is no referenced formal parameter

Table 6-1 common compilation errors / warnings (for reference)

7 Debug

Before the simulation, please connect the USB of HC-ICD-V4 with the computer, and connect the simulation interface with the simulation chip. Refer to "2 hardware connection".



Figure 7-1 click the settings button in the toolbar

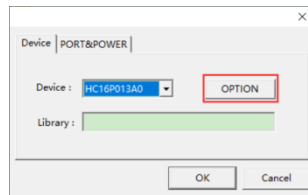


Figure 7-2 setting dialog box, click option button

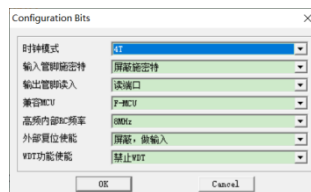


Figure 7-3 Configuration Bits, refer the MCU datasheet please

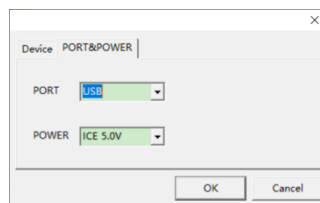


Figure 7-4 port and power settings dialog box, select the correct device port and set the power supply mode



Figure 7-5 toolbar simulation related buttons

From left to right are the following buttons:

1. "Download (F7)" button to enter the simulation mode
2. "Stop debug session" button to exit the simulation mode
3. "Reset (F4)" button, chip reset
4. "Run (F5)" button, execute at full speed
5. "Halt (Shift + F5)" button, pause execution
6. "Step into (F11)" button, execute sentence by statement
7. "Step over (F10)" button, step by step
8. Button "toggle breakpoint (F9)" to generate a breakpoint
9. "Clear all breakpoint (F8)" button to clear all breakpoints

Address	SFR Name	Hex	Bin
0002	PC	0006	-
0003	SP	00	00000000
0000	W	D8	11011000
0000	INDF	00	00000000
0001	TO	55	01010101
0002	PCL	08	00001000
0003	STATUS	1E	00011110
0004	FSR	C0	11000000
0006	PORTB	01	00000001
0007	GPR	1C	00011100
0008	PCON	B8	10111000
0009	IOCB	00	00000000
000A	PCLATH	00	00000000
000B	PDCON	FF	11111111
000C	ODCON	00	00000000
000D	PHCON	FF	11111111
000E	INTECON	78	01111000
000F	INTFLAG	00	00000000
0041	OPTION	3F	00111111
0046	TRISB	00	00000000

Figure 7-6 "SFR" window, view SFR register

Name/Address	Value
0x20	0xfb

Figure 7-7 "watch" window, view ram variables, input address directly for variables defined by "equ" pseudo instruction

Level	Return
0	07FF
1	07FF
2	07FF
3	07FF
4	077F

Figure 7-8 "stack" window to view the stack

Address	0000	0001	0002	0003	0004	0005	0006	0007	0008	0009	000A	000B	000C	000D	000E	000F
[000000]	0000	18C6	1886	3C06	0000	3806	0000	2003	0002	0000	0000	0000	0000	0000	0000	0000
[000010]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000020]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000030]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000040]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000050]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000060]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000070]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000080]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[000090]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[0000A0]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[0000B0]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[0000C0]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
[0000D0]	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000

Figure 7-9 "memory" window, viewing RAM / ROM data
 By default, only the first three lines of data are displayed. Double click the left mouse button in the window to view all the data

8 Program

Before program, please connect the USB of HC-ICD-V4 with the computer, and connect the program interface with OTP chip.

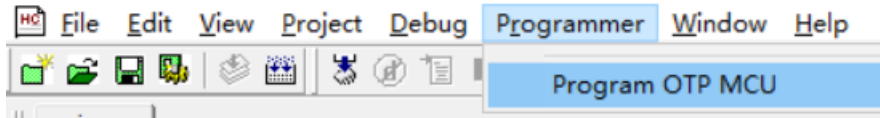


Figure 8-1 in the menu bar, click "programmer" and "program OTP MCU" to open hc-pm18 software

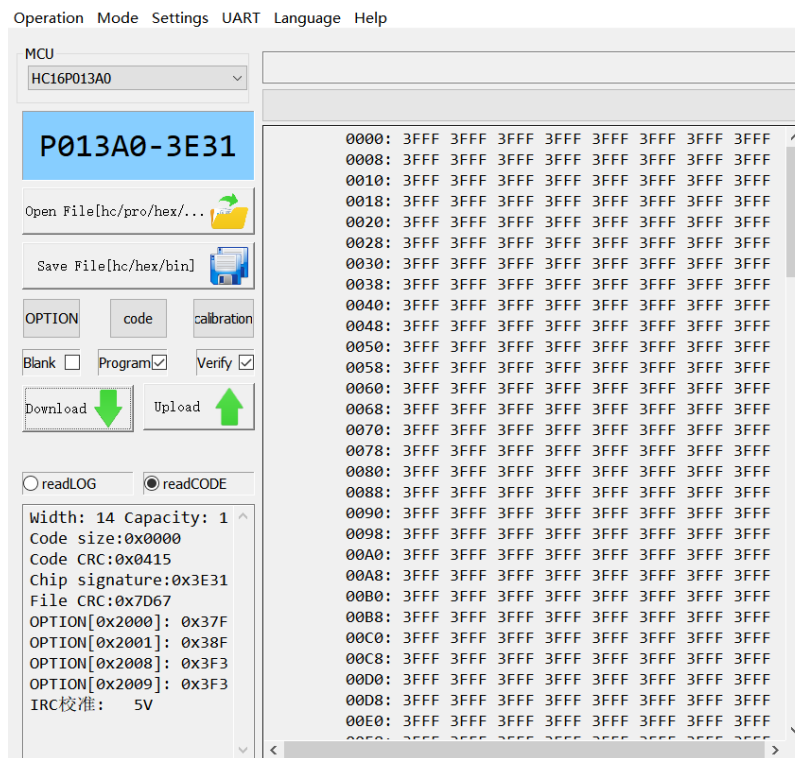


Figure 8-2 HC-PM18 software interface

Select the chip model, open the hex file, configure option, and click the download button to start HC-ICD-V4 the chip. After successful HC-ICD-V4, pass and HC-ICD-V4 green lights are displayed on the main interface status bar of the upper computer, and fail and HC-ICD-V4 red lights are displayed on the main interface status bar of the upper computer after HC-ICD-V4 failure. For more HC-ICD-V4 configurations, please refer to 《OTP PROGRAM-HC-PM18-V5_User Manual》.

9 Software and Firmware Update

9.1 Software Update

Each time the upper computer software is opened, it will automatically connect to the Holychip official website. If the official website software is updated, the upper computer software will automatically pop up the software update prompt window, and the user can go to the Holychip official website (<http://www.holychip.cn>) Download the latest software.

9.2 Firmware Update

When the chip is burned online, the upper computer software will automatically check whether the firmware of the lower computer is the latest version. If the firmware does not match, the upper computer software will prompt the user to update the firmware.

Before firmware update, please connect the USB of HC-ICD-V4 with the computer. Refer to figure 8-1 to open HC-PM18 software.

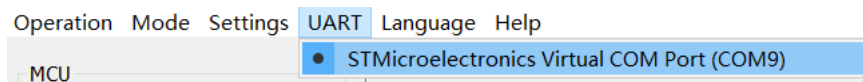


Figure 9.2-1 "port" in the menu bar to determine the device port

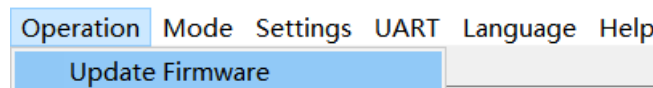


Figure 9.2-2 menu bar "operation", click "update firmware"

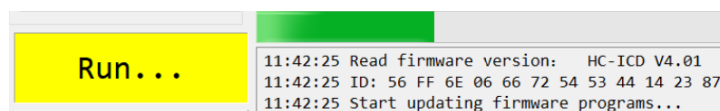


Figure 9.2-3 firmware update, running

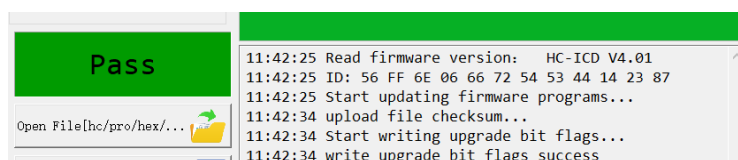


Figure 9.2-4 firmware update is successful, HC-ICD-V4 LED is off first and then on

10 Version Description

Version	Date	Describe
Ver1.00	2020/11/6	First edition

IMPORTANT NOTICE – PLEASE READ CAREFULLY

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