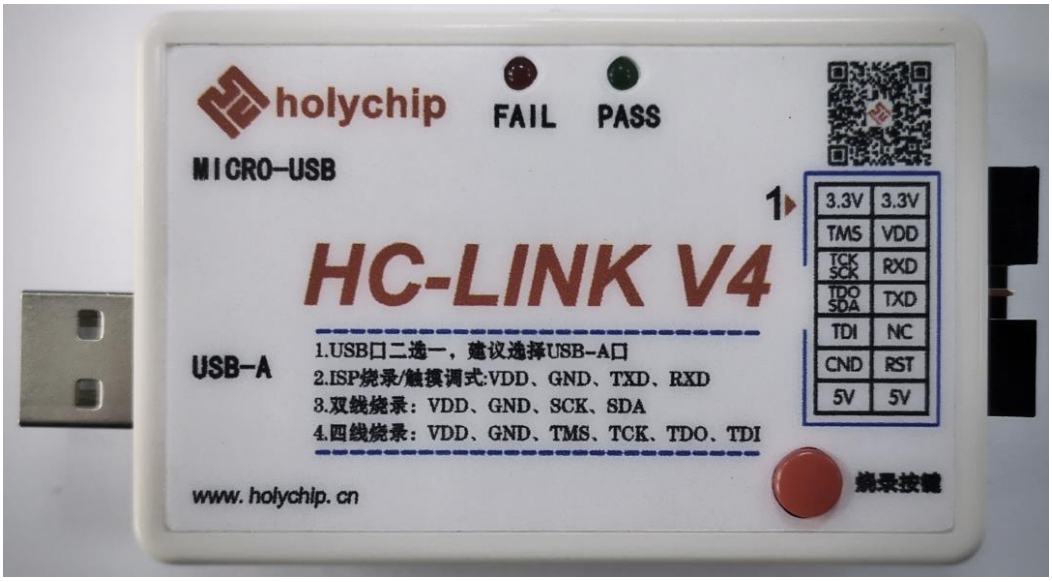
TL0302

8051 DEBUG_HC-LINK-V4_User Manual

Abstract

8051 DEBUG HC-LINK-V4

- USB 2.0 interface, plug and play
- Support Keil C51 integrated compilation environment (C51 uvision4 and above)
- Support single step, full speed operation, up to 4 breakpoints
- Support multiple entry modes
- Encryption bits and code options can be programmed
- Support dual wire simulation function (only support dual wire chip)
- Support online programming (including JTAG, SWD, ISP)
- Support offline burning (including JTAG, SWD, ISP)
- Support touch application debugging



HC-LINK-V4

Contents

1 Software Installation

Please refer to《TL0001_Driver Install Manual》and《8051 DEBUG_HC-LINK-V4_Install Manual》。

2 Hardware Connection

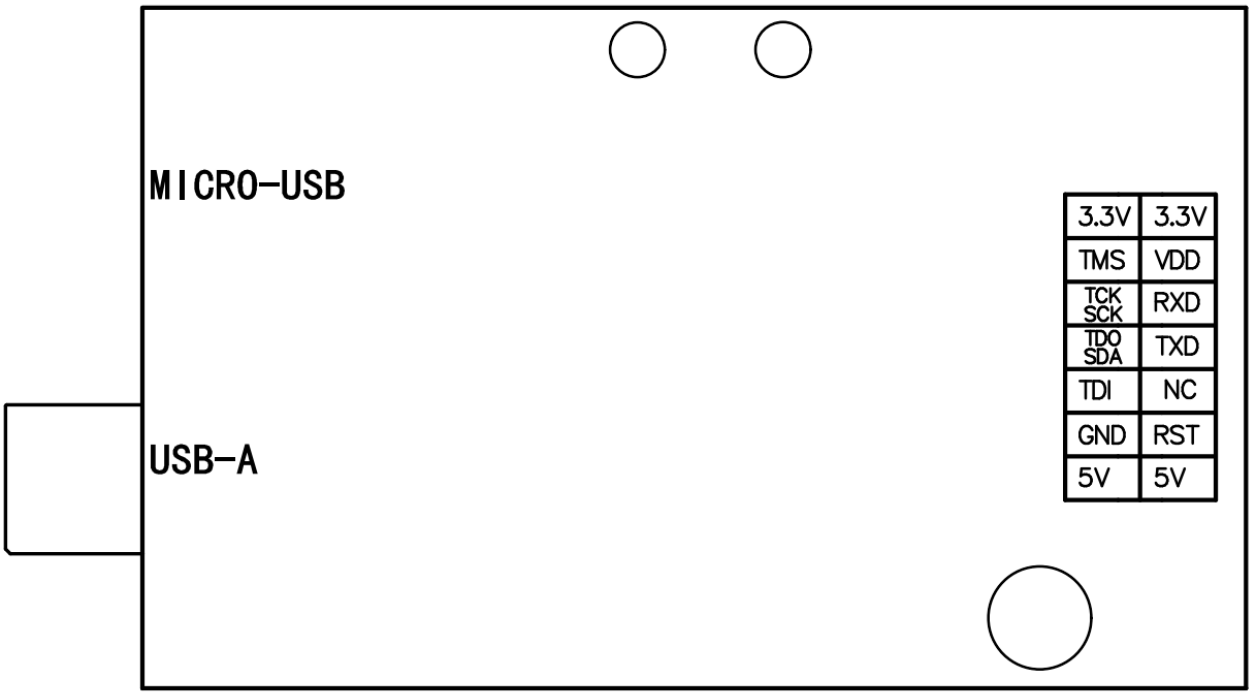


Figure 2-1 HC-LINK-V4 PIN diagram

JTAG DEBUG PIN:
VDD, GND, TCK, TDO, TMS, TDI

SWD DEBUG PIN:
VDD, GND, SCK, SDA

ISP PROGRAM PIN /TOUCH DEBUG PIN:
VDD, GND, TX, RX

3 New Project

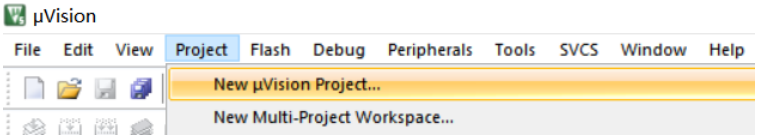


Figure 3-1 after opening keil software, click "project", "new uVision project..." to create a new project

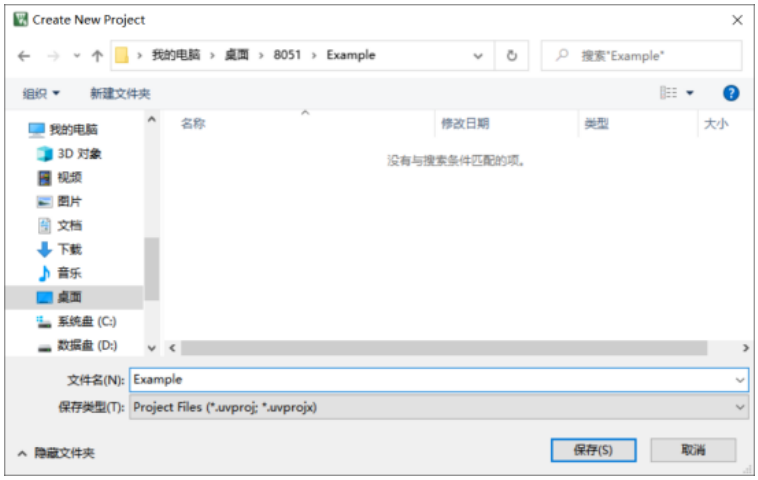


Figure 3-2 New Project dialog box, select the project saving path (no special characters), fill in the project name and click the "save (s)" button

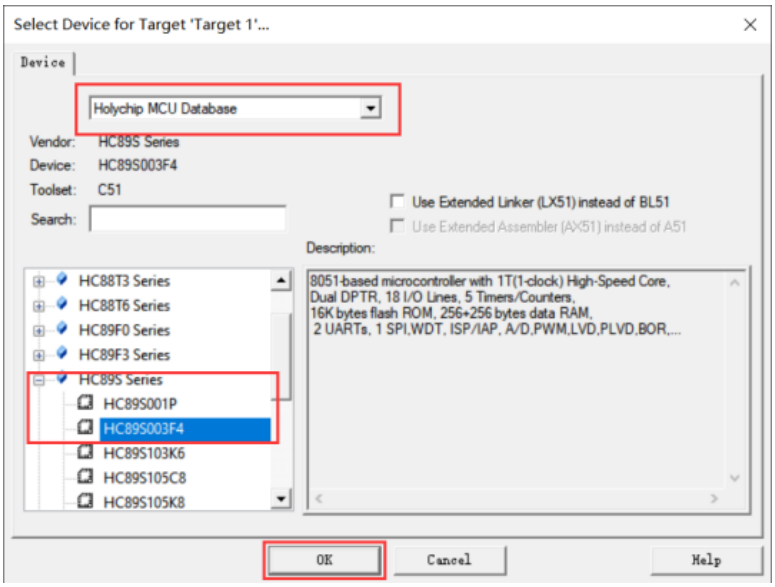


Figure 3-3 new project wizard, select "holychip MCU database", chip series and chip model, and click "OK"

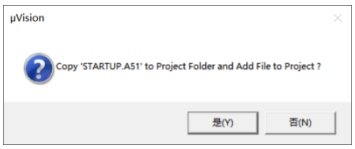


Figure 3-4 new project wizard,
select whether to copy startup.a51 file according to actual needs

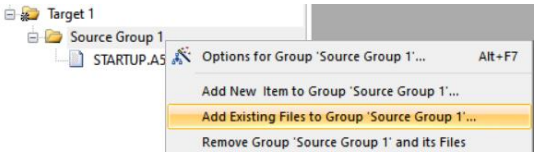


Figure 3-5 To get the source code from the project / keil file window,
right-click to get the project source file

```
#define ALLOCATE_EXTERN
#include <HC89S003F4.h>
```

Figure 3-6 there is and only one allocate defined in all source files_External macro (○ɔ before include < hcxxx. H >)

4 Compile

Figure 4-1 click the "options for targets..." magic wand button in the toolbar

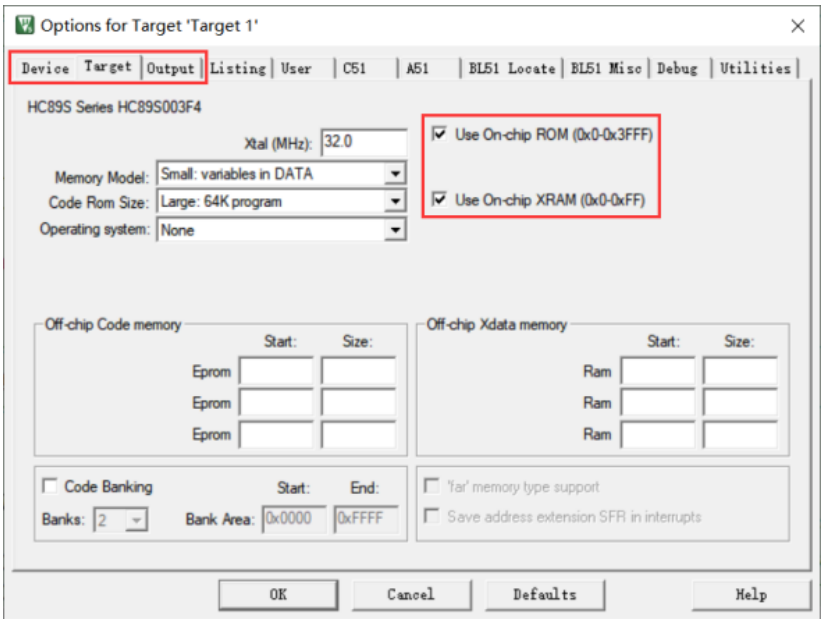


Figure 4-2 "options for targets..." dialog box setting device, target, output

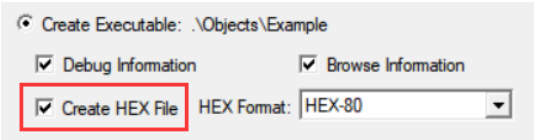


Figure 4-3 check "create hex file" in the output interface of "options for targets..." dialog box

Figure 4-4 click the "build" button in the toolbar

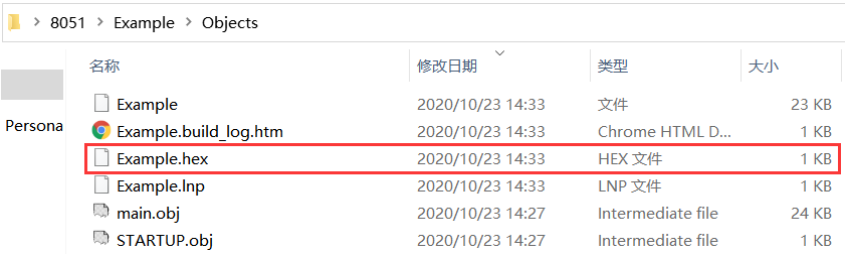


Figure 4-5 After the compilation, the project folder generates the *. Hex file

5 Download

Before the simulation, please connect the USB of hc-link-v4 with the computer, and connect the burn pin of the emulator with the burn pin of the chip. Refer to "2 hardware connection".

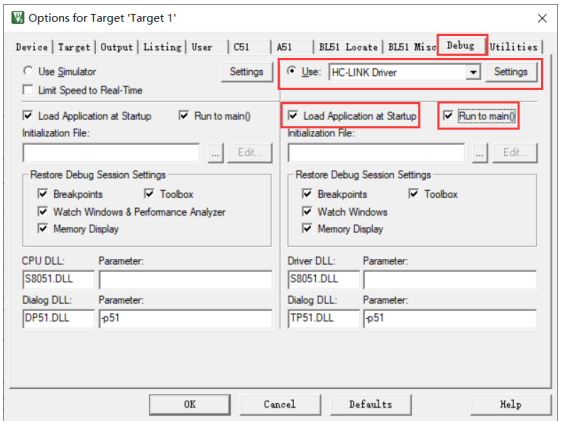


Figure 5-1 "options for targets..." dialog box debug interface, select "hc-link driver"

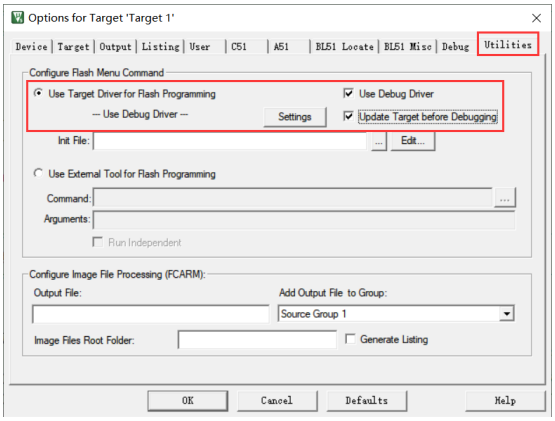


Figure 5-2 "options for targets..." dialog box utilities interface configuration, click "Settings" button

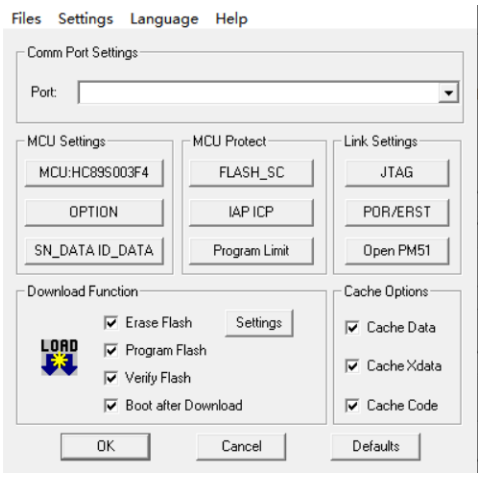


Fig. 5-3 hc-link setting dialog box.

Please refer to "7 hc-link settings" for specific settings. Click "OK" after setting

Figure 5-4 click the "load" button on the toolbar to start downloading

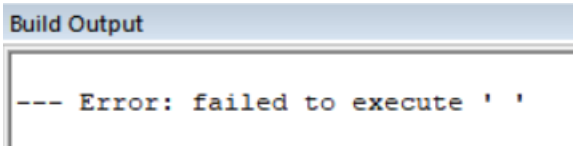


Figure 5-5 the first time to download the "build output" window reported an error and failed to download. Please configure again according to Figure 5-2

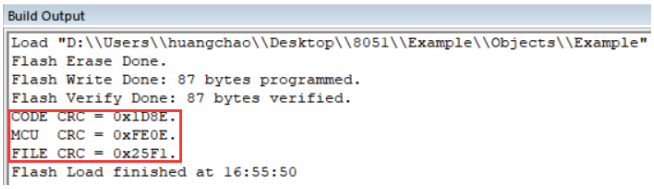


Figure 5-6 the download is successful. The "build output" window displays the download success information. The MCU on the development board will run the currently downloaded program

Figure 5-7 download successful, project file directory generated burning file

6 Debug

Before the simulation, please refer to "5 download" to complete the chip download, and then perform the simulation operation.

Figure 6-1 in the toolbar,
click the "start / stop debug session (Ctrl + F5)" button to enter / exit the simulation mode

Figure 6-2 toolbar breakpoint settings

Insert / remove breakpoints at most
Enable / disable breakpoint (Ctrl + F9): enable / disable breakpoint
Disable all breakpoints: disable all breakpoints
Kill all breakpoints (Ctrl + Shift + F9): delete all breakpoints

Figure 6-3 toolbar

Reset, Run(F5), Stop, Step(F11), Step Over(F10), Step Out(Ctrl+F11), Run to Cursor Line(Ctrl+F10)

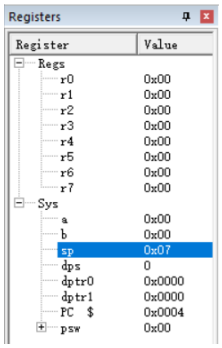


Figure 6-4 registers window, which can be viewed and edited online

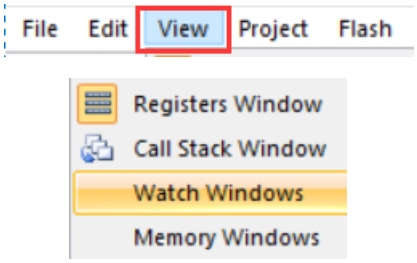


Figure 6-5 more simulation related windows

7 HC-LINK Settings

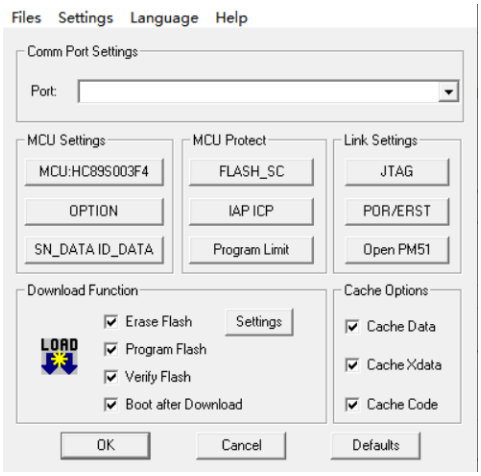


Figure 7-1 HC-LINK setting main interface

7.1 Title Bar

Display the software name and version number of the upper computer, and the firmware name and version number of the lower computer.

7.2 Menu Bar

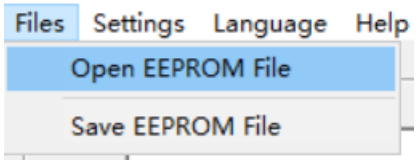


Figure 7.2-1 open / save EEPROM file

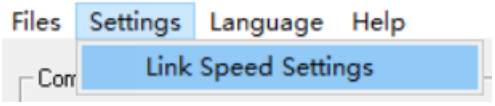


Figure 7.2-2 This speed setting is not recommended for users to modify the default value (if there is no special setting in the software)

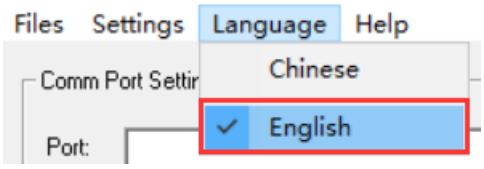


Figure 7.2-3 language settings, simplified Chinese / English switching

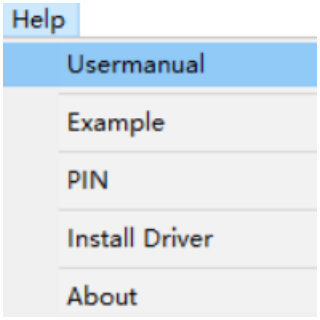


Figure 7.2-4 "help" menu, user manual, chip routine, pin diagram, driver installation, about

7.3 Select Port

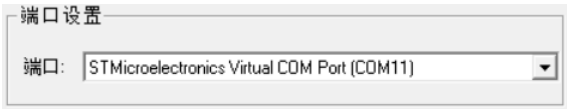


Figure 7.3-1 select device port

7.4 Select MCU

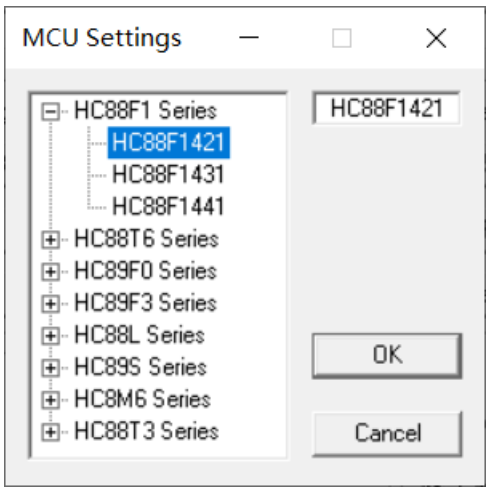


Figure 7.4-1 mcu selection

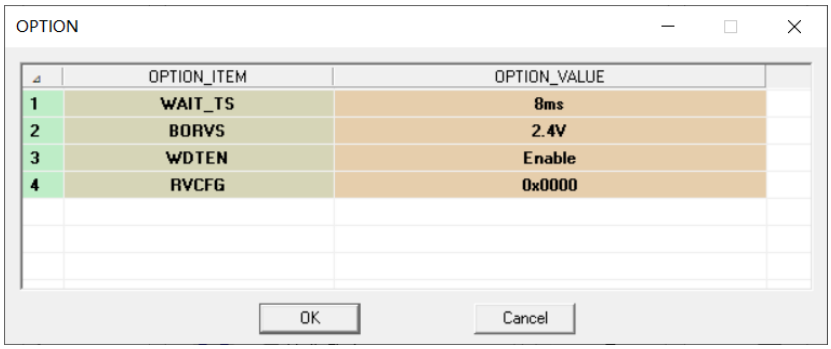


Figure 7.4-2 option settings. Please refer to the chip data manual for details

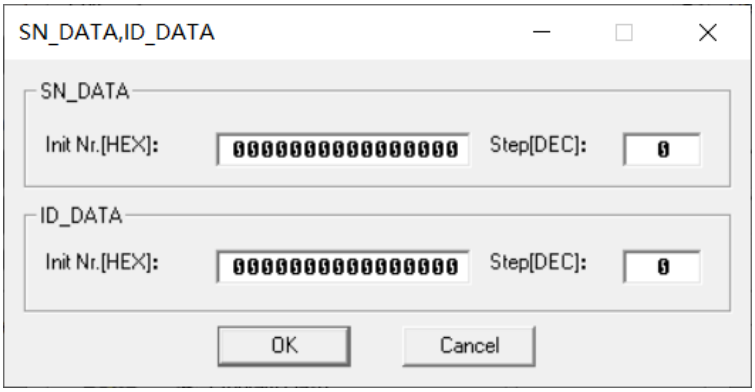


Figure 7.4-3 SN_DATA、ID_DATA refer to the datasheet for details

7.5 MCU Protection

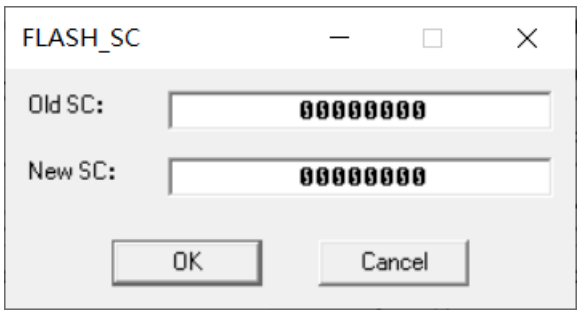


Figure 7.5-1 FLASH_SC settings, hexadecimal input, please refer to the datasheet for details

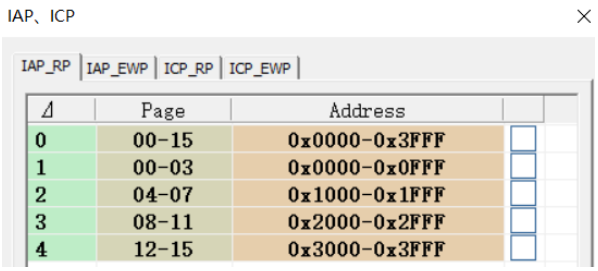


Figure 7.5-2 IAP and ICP settings, please refer to the datasheet for details

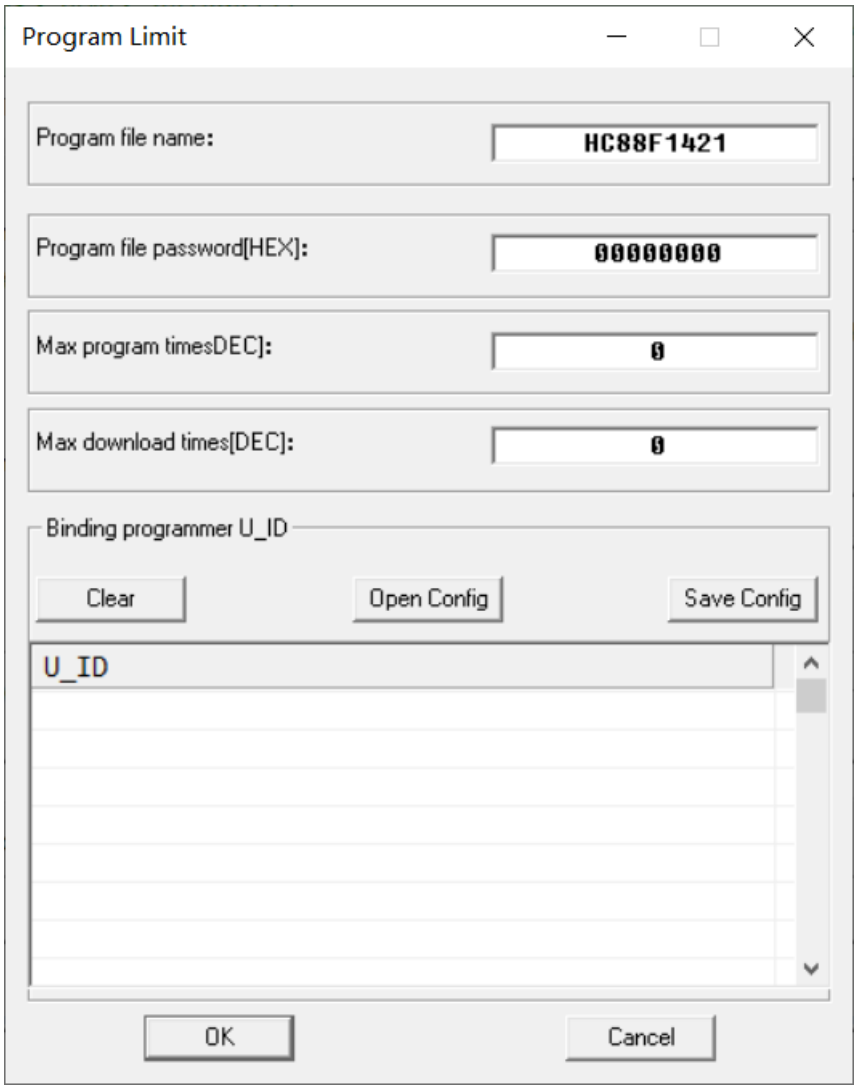


Figure 7.5-3 "program limit" setting

"Program file name":

After the burning file is downloaded to the burner, the project file name displayed on the burner display screen

"Burn file anti change password [hex]":

Hc-pm51 software will switch to the mass production mode after loading the burning file. This mode does not allow the customer to modify the configuration. It needs to switch to JTAG / SWD / ISP mode to modify. When switching mode, the password needs to be verified. Hex means hexadecimal

"Chip burn limit [Dec]":

The maximum number of times to burn a chip is Dec, 0 is no limit

"File download limit"

The maximum allowable number of times to download the burning device is Dec, 0 means no limit of download times

"Binding device u_ID":

Burning files are only allowed to be downloaded to these burners in the list

7.6 JTAG/SWD Communication Mode

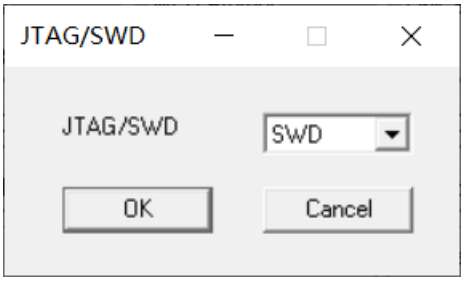


Figure 7.6-1 JTAG / SWD communication mode selection

7.7 RST Mode, Power Supply Mode

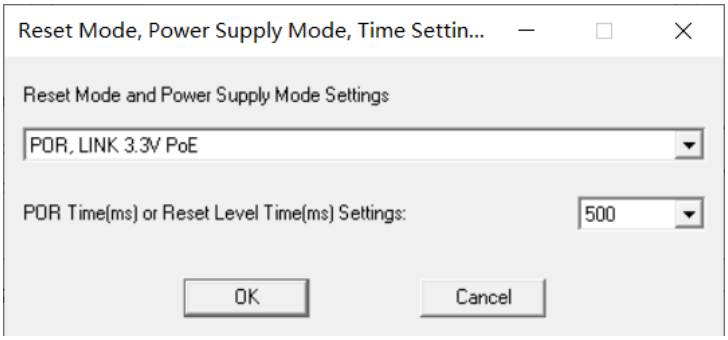


Figure 7.7-1 selection of reset mode and power supply mode, setting of power down time / reset level duration (MS)

Reset mode	Power supply mode	Hardware connection	External voltage
Power on reset	Link 3.3V power supply	JTAG: VDD, GND,TCK,TDO,TMS,TDI SWD: VDD,GND,SCK,SDA	0V
	Link 5.0V power supply		0V
	External 3.3v/5.0v power supply		3.3V/5.0V
External reset	Link 3.3V power supply	JTAG: VDD,GND,TCK,TDO,TMS,TDI,RST SWD: VDD,GND,SCK,SDA,RST	0V
	Link 5.0V power supply		0V
	External 3.3v/5.0v power supply		3.3V/5.0V
	Link independent power supply, target board independent 3.3V power supply	JTAG: GND,TCK,TDO,TMS,TDI,RST SWD: GND,SCK,SDA,RST	3.3V
	Link independent power supply, target board independent 5.0V power supply		5.0V

Table 7.7-1 reset mode, power supply mode, hardware connection and external power supply voltage

Power on reset, external 3.3v/5.0v power supply operation method:

For the first download, first click the download button, and then supply power to the external system. In the future, each download does not need to power on or off the system, but directly click the download button.

7.8 Offline Program

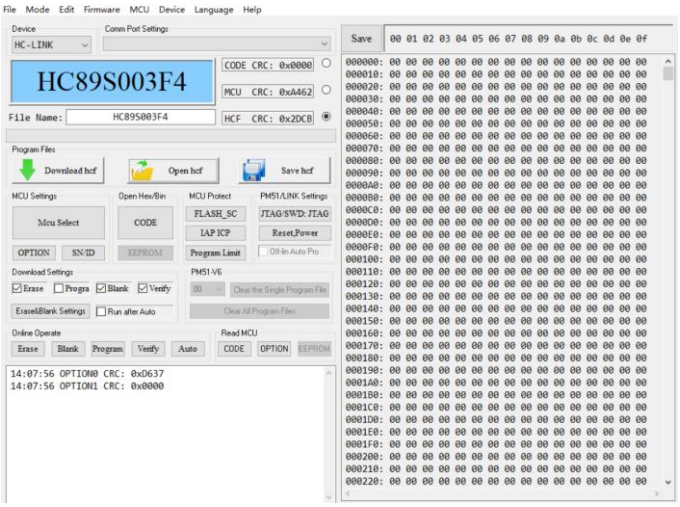


Figure 7.8-1 enter the main interface of hc-link setting, click "open pm51" button to open hc-pm51 software Please refer to "8051 burning" for details_HC-PM51-V5_User manual

7.9 Program Settings

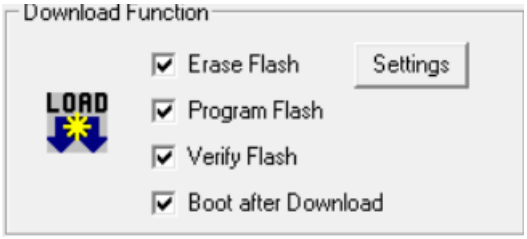


Figure 7.9-1 program settings

Configure whether to "erase", "burn", "verify" and "power on after downloading"

Erase can be set to "full erase" or "erase by page"

7.10 Cache Options

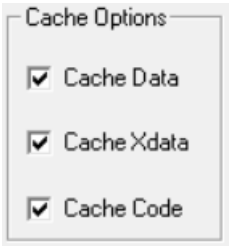


Figure 7.10-1 cache options settings

It is recommended to check all of them during simulation to speed up the simulation. This setting does not affect burning

It is recommended not to check if there is an IAP write operation

8 Software&Firmware Update

8.1 Software Update

Each time the upper computer software is opened, it will automatically connect to the Xinsheng 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 Xinsheng official website (http://www.holychip.cn) Download the latest software.

8.2 Firmware Update

When downloading burning files in 3.2, 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-link-v4 with the computer. Refer to figure 7.8-1 to open hc-pm51 software.

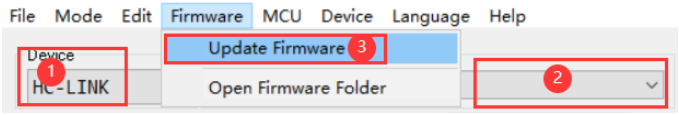


Figure 8-1 select hc-link for the device, select the correct device port for the port, and click "firmware" and "update firmware" in the menu bar

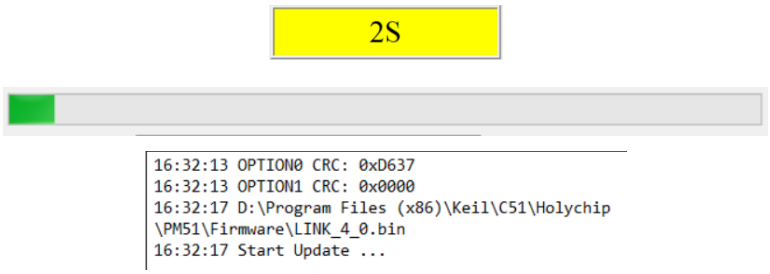


Figure 8-2 during firmware update

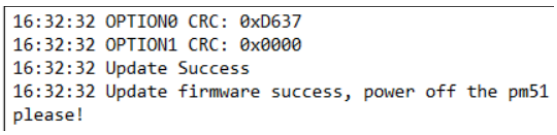


Figure 8-3 firmware update successful

9 USB to UART

HC-LINK-V4 can switch between simulator and serial port tool by sending command. The command is as follows:

Voltage, LED lamp setting command: 70 CMD

Enter "USB to serial" mode command: 31 baudrate0 baudrate1 baudrate2 baudrate3

Exit "USB to serial" mode command: 32 53 54 4f 50

notes:

CMD bit3: 0 means LED1 is off, 1 means LED1 is on

CMD bit2: 0 means LED2 is off, 1 means LED2 is on

CMD Bit1 bit 0:00 is 0V, 01 is 3.3V, 10 is 5.0V

Baudrate0: the low byte of baudrate low word

Baudrate1: high byte for baudrate low word

Baudrate2: low byte for baudrate high word

Baudrate3: high byte for baudrate high word

example:

5.0V voltage, LED1 on, LED2 off command: 700a

3.3V voltage, LED1 off, LED2 on command: 7005

Enter "USB to serial" mode, set 250000 baud rate command: 3190 D003 00

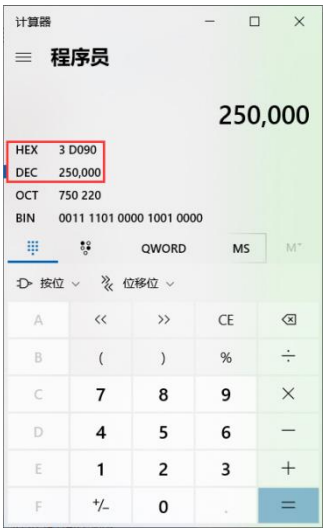


Figure 9-1 conversion of decimal number to hexadecimal number of calculator

10 Version Description

Version	Date	describe
Ver1.00	2020/10/14	First edition

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Holychip