

# **STC Tool Instruction Manual**

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### 1 Overview

U8W/U8W-Mini is a series of programming tools that integrates online download and offline download. STC Universal USB to Serial Port Tool is a programming tool that supports online download and online simulation.

Tool type	Online Download	Offline download	Burner download	Online simulation	Price(CNY)
U8W	support	support	support	Need to set pass- through mode	100 yuan
U8W-Mini	support	support	not support	Need to set pass- through mode	50 yuan
Universal USB to serial port	support	not support	not support	support	30 yuan

### 2 System Programmable (ISP) Process Description



Note: Because [P3.0, P3.1] is used for download/simulation (download/simulation interface is only available [P3.0, P3.1]), it is recommended that users put serial port 1 on P3.6/P3.7 Or P1.6/P1.7, if the user does not want to switch and insists on using P3.0/P3.1 to work or communicate as the serial port 1, be sure to check the "Next cold start, when downloading the program, The program can be downloaded only when P3.2/P3.3 is 0/0". [Note 1] [Note 1]: The programming protection pins of STC15, STC8 and later new chips are P3.2/P3.3, and the programming protection pins of earlier chips are P1.0/P1.1.

### 3 USB type online/offline download tool U8W/U8W-Mini

The application range of U8W/U8W-Min can support all current MCU series of STC, and the Flash program space and EEPROM data space are not restricted. Support includes the following and upcoming STC full series chips:





The offline download tool can be used for downloading without the computer, and can be used for mass production and remote upgrades. The offline download board can support multiple functions such as automatic increment, download limit, and encrypted transmission of user programs.

The following picture shows the front and back views of U8W tools and the front and back views of U8W-Mini:



In addition, some wires and tools are used together as follows, such as: (1) Two-end male USB cable (shown on the left in the figure below) and USB-Micro cable (shown on the right in the

#### figure below):



Note: This USB cable is a USB enhanced cable specially customized by our company, which can ensure that the download can be successful when directly powered by USB. On the market, some relatively low-quality two-end male USB cables have too much internal resistance and cause a large voltage drop (for example, the voltage of the USB when it is empty is about 5.0V. When using a low-quality USB cable to connect U8W/U8W-Mini/U8 /U8-Mini, the voltage to our download board may drop to 4.2V or lower, causing the chip to be in a reset state and fail to download successfully).

(2) The download cable connecting U8W/U8W-Mini to the user system (ie the connecting cable between U8W/U8W-Mini and the target MCU on the user board), such as As shown below:



U8W/U8W-Mini and User systems are independent Power supply cable

U8W/U8W-Mini to The user's system power supply wiring

User system gives U8W/U8W-Mini Power supply cable

#### 3.1 Install U8W/U8W-Mini driver

The U8W/U8W-Mini download board uses a CH340 USB-to-serial universal chip. This saves the trouble that some computers without a serial port must buy a USB to serial port tool to download. But CH340 is the same as other USB-to-serial tools, the driver must be installed before use.

Obtain the driver by downloading the STC-ISP software package

The following is the download location of the STC-ISP software package provided on the STC official website (www.STCMCUDATA.com):

STC-ISP下载编程烧录软件
◆ <u>STC-ISP软件V6.87K版</u>
◆ <u>STC开发/烧录工具说明</u>
STC超强工具包,已含89系
使用该软件的Keil仿真设置向Keil中添加STC器件/头文 件和仿真驱动
◆STC-ISP V6.87K请测试
◆ <u>STC-ISP软件升级原因</u>

◆ STC-ISP V6.87K简化版

After downloading, decompress, the path of CH340 driver installation package is stc-isp-15xx-v6.87K\USB to UART Driver\CH340\_CH341:

ī≯	下载	>	stc-isp-15xx-v6.87K	>	USB to UART Driver	>	CH340 CH341
-							_

名称

🛃 ch341ser

2020/5/9 15:03

Download the driver manually through STC's official website or in the latest STC-ISP download software

修改日期

Download the driver manually on the official website of STC or in the latest STC-ISP download software. The programmer download link of the driver is: U8 USB to serial port driver (http://www.stcmcu.com/STCISP/CH341SER.exe ). The driver address on the website and STC-ISP download software is shown in the figure below: M/W Ontion USW Settings Engrantion Developed + +

SIC-ISP 卜载编柱院录软件	the system the second sheripy the permanan
◆ <u>STC-ISP软件V6.87K版</u>	Download code to US/U7 programmer
使用该软件的Keil仿真设置向Keil中添加STC器件/头文件和仿真驱动	Clean all user data in US/U7 programmer Set USW/U8-5\3V/IAP16F\L2E6152 as control MCU
<ul> <li>+++ht/J具地のJ</li> <li>+STC-ISP V6.87K请测试</li> <li>+STC-ISP V6.87K请///返原因</li> <li>+STC-ISP V6.87K简化版</li> <li>防止被杀毒软件误报错</li> <li>•通用 USB 转 串口工具</li> <li>•U8编程器USB转串口驱动</li> <li>•STC8H实验箱原理图、参考程序</li> <li>-与STC8G系列相通、2020/7/24</li> <li>研发顾问QQ:800003751</li> <li>+以下STC-ISPIE版软件</li> </ul>	Set the highest offline baudrate 115200 Set MAI count 10000 SN Timeout 5 S-VCC vol. 5.0 V ~ PowerOn delay 0.5 x ~ Always supply power for target MCU after ( Always supply power for target MCU after ( Disable auto-detect function while off-lis Auto-Increment force inc even if download Use LED show mode 2 JOV/USD-UART Tool instructions US/UT USD-UART driver (CH340SER) ly Curr. 500mA ~ BIN Hold 40 ms ~
◆ <u>STC-ISP软件V6.87E</u>	U8/U7 Help

#### Install U8W/U8W-Mini driver

After the driver is downloaded to the machine, double-click the executable program and run it. The interface shown in the figure below appears, click the "Install" button to start the automatic driver installation:



◎ 驱动安装(X64) ◎ 驱动安装/卸载	- 🗆 X
选择INF文件:	CH341SER.INF ~
安装	WCH.CN
卸载	01/30/2019, 3.5.2019
帮助	

Then the driver installation successful dialog box pops up, click the "OK" button to complete the installation:

驱动安装/卸	钗	
选择INF文件	- CH341SER . INF DriverSetup	×
安装		1340
卸载	1 驱动安装成功!	19, 3.5.2019
帮助	-	1

Then use the USB cable provided by STC to connect the U8W/U8W-Mini download board to the computer, open the device manager of the computer, and under the port device category, if there is a device similar to "USB-SERIAL CH340 (COMx)", it means U8W/U8W-Mini can be used normally. As shown in the figure below (different computers, the serial port number may be different):

文件(F) 操作(A) 會看(V)	Mittr-0	- u x
▲ 计算机调理输入机 - 算算机正确 - 资 件称比其例 - 通 件称计数例指 - 图 你们的常好。 - 图 你能 - 图 你能的思想。	▼         ●         DESKTOP-38340MC           ●         US5 造植物常常理由           ●         US5 造植物常常理由           ●         量素能物常常理由           ●         量素能物常常理由           ●         量素能物常常           ●         型素能物常常           ●         型素能物常常           ●         型目(COM 相LPT)           ●         US5 SENAL CH340 (COM45)           ●         第二目(COM 相LPT)           ●         US5 SENAL CH340 (COM45)           ●         第二目(COM 相LPT)           ●         US5 SENAL CH340 (COM45)           ●         第四目           ●         US5 SENAL CH340 (COM45)           ●         第四目           ●         US5 SENAL CH340 (COM45)           ●         第四目           ●         第四目           ●         副目           ●         第四日           ●         第四日 <t< th=""><th>第4件 公会管理器 定参操作</th></t<>	第4件 公会管理器 定参操作

Note: When using STC-ISP to download software later, the selected serial port number must be the corresponding serial port number, as shown in the figure below:



MCV Type	STC8H8K64U 🗸	Pins	Auto $\sim$
COM Port	USB-SERIAL CH340 (COM16)	~	Scan
Min Baud	COM10 COM11 COM12	1	0 ~
Address	COM13		e File
0x0000	COM14		
0x0000	USB-SERIAL CH340 (COM16)		OM File
H/W Optio	COM17 COM18 COM19		ac + >
🗹 Progr	COM20 COM21		
🗹 Trim I	COM22 COM23 Toput TRC frequency 24,000		7

### 3.2 U8W function introduction

The main interfaces and functions of U8W tools are described in detail below:



Programming interface: Use different download cables to connect the U8W download board and the user system according to different power supply methods.

U8W update system program button: used to update U8W tools. When there is a new version of U8W firmware, you need to press this button to update the U8W main control chip (note: you must first set the toggle switch on the update/download selection interface Toggle to upgrade tool firmware).

Offline download user program button: Start offline download button. First, the PC downloads the offline code to the U8W board, and then uses the download cable to connect the user system to the U8W, and then press this button to start the offline download (the user code will also start to download every time the power is turned on).

Update/download selection interface: When you need to upgrade the underlying firmware of U8W, you need to switch this toggle switch to the firmware upgrade tool. When you need to program the target chip through U8W, you need to turn the toggle switch to Burn the user program.

(Please refer to the figure above for the connection of the toggle switch)

Automatic burner/sorter interface: It is a control interface used to control the automatic burner/sorter for automatic production.

#### 3.3 U8W online download instructions

The target chip is installed on the U8W locking base and connected to the computer by U8W for online download First use the USB cable provided by STC to connect the U8W to the computer, and then install the target MCU on the U8W in the direction shown in the figure below:



Then use STC-ISP to download the software to download the program, the steps are as follows:



CV Type STC8H8H64V - F🕗 Auto 🗸	Code Buffer	EEPROM	Buffe	r UA	RT He	lper	HID	Helper	Keil	ICE	Sett	ings	٠
COM Fort USB-SERIAL CH340 (COM14) 🛛 🗸 Soun	00000b	02 00	03 7	5 84	01	7E 44	20	00 E4	18.4	4 75	49	80	-
Min Baud 2400 - 3 Max Baud 115200 -	00010h	78 F9	7E F	8 02	FF (	02 00	19	75 F2	00 7	5 F1	00	05	1
	00020h	80 80	FC F	F FF	FF I	FF FF	FF	FF FF	FF F	E FF	FF	FF	E.
dress Code File	00030h	FF FF	FF F	F FF	FF 1	FF FF	ŦŦ	FF FF	FF F	F FF	FF	FF	
0000 Gerear code parter Gren code rite	00040h	FF FF	FF F	F FF	EE I	FF FF	FF	TE EE	FF F	E FF	FF .	EE	
0000 Clear EEPROM buffer Open EEPROM File	000500	22 22		P PT	22 1		22		77 F		11		
L/W Option USW Sattings Encryption Download + +	00070h	FF FF	FF F	FFF	FF 1	FF FF	FF	FF FF	FF F	F FF	FF	FF	
the occurs and provide the second	00080h	FF FF	FF F	F FF	FF I	FF FF	FF	FF FF	FF F	F FF	FF	FF	
Program OR	00090h	FF FF	FF F	F FF	FF I	FF FF	FF	FF FF	FF F	F FF	FF	FF	
🛛 Iris IRC 🤎	000A0h	FF FF	FF F	F FF	FF 1	FF FF	FF	FF FF	FF F	F FF	FF	EE	
Input TRC Frequency 11,0592 WHr	000B0h	FT FF	FF F	F FF	FF 1	FF FF	FF	FF FF	FF F	F FF	FF	FF	
	000C0h	FF FF	FF F	E EE	TE I	FF FF	22	FF FF	FF F	E EE	EE .	FF	
Goscillator high gain	OCODOR	FF FF	22 2		FF 1	FF 75	22	FE 55	77 F		EI .		
Set user MAYNUM size 0.5 K	000F0h	FF FF	FF F	FFF	FF I	FF FF	FF	FF FF	FF F	FFF	FF	FF	
Enable longer power-on-reset latency													
RESET pin used as I/O port									_				
🛃 Enable Low-Voltage reset	Datal an O	37FA C	harken	. 374	823	8111	BorFF.	er (1	a ar Bu	Fer	Ser		2
LVD detect leve 2 00 V	parabet		neonso				Date		ear ra	i.e.	Dar	CDULLO	-
Hardware enable WDT after power-on-reset Watch-Dog-Timer prescal: 256	Checking targ Board Type Board versi Have 512K B	et MCU USW on: 1.4 ytes ex	3 ternal	Flas	Ь			0					
ownload/Frogram 6 Stop Be-Program	Re-Checking t MCU type: S	arget M TCSHSNS	CV 4V						ta dan				
et 1 ment 11 1 Dallau 2 mar hal	P/W WerSlon	1. 1. 3. 1	20										

1 Select the MCU model;

2 Select the number of pins. When the chip is directly installed on the U8W to download, be sure to select the correct number of pins, otherwise the download will fail;

3 Select the serial port number corresponding to U8W;

4 Open the target file (HEX format or BIN format);

5 Set the hardware options;

6 Click the "Download/Program" button to start burning;

7The step information of the programming process is displayed, and the message "Completed!" is displayed when the programming is completed.

When there is the version number information of the output download board and the corresponding information of the external Flash in the information box, it means that the U8W download tool has been correctly detected.

During the downloading process, the 4 LEDs on the U8W download tool will be displayed in marquee mode. After the download is complete, if the download is successful, All 4 LEDs will be on and off at the same time; if the download fails, all 4 LEDs will be off.

It is recommended that users use the latest version of STC-ISP to download the software (please pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com).

## The target chip is connected to U8W through the user system leads and U8W is connected to the computer for online download

Firstly, use the USB cable provided by STC to connect U8W to the computer, and then connect U8W to the target MCU of the user system through the download line. The connection method is shown in the following figure:



Then use STC-ISP to download the software to download the program, the steps are as follows:

- 1. Select the MCU model;
- 2. Select the serial port number corresponding to U8W;
- 3. Open the target file (HEX format or BIN format);
- 4. Set hardware options;
- 5. Click the "Download/Program" button to start burning;

6. The step information of the programming process is displayed, and the message "Completed!" is displayed when the programming is completed.



U Type STC8H8E64U V Pins Auto V	Code Buffer EEPROM Buffer VART Helper HID Helper Keil ICE Settings
OM Port USB-SERIAL CH340 (COM14) V Soan in Baud 2400 V Max Baud 115200 V Fexs	00000h         02         00         03         75         84         01         7E         44         20         00         E4         1B         44         7A         49         B0         00010h         78         F9         7E         F8         02         FF         02         00         19         75         F2         00         75         F1         00         05         ::           00020h         80         80         FC         FF
0000 Clear code buffer Open Code File 0000 Clear EEPROM buffer Open EEPROM File W Option USW Settings Encryption Download + +	00040h         FF         FF <th< td=""></th<>
Frogram OR Trim IRC Input IRC frequency 11.0592 VMMz Oscillator high gain Set user HEFROM size 0.5 K Enable longer power on reset latency	00080h       FF
RESET pin used as I/O port     Enable Low-Voltage reset     LVD detect leve 2.00 V	DataLen 037FA Checksum 37AB23 FillBuffer ClearBuffer SaveBuffer
Nardware enable WDT after power-on-reset Watch-Dog-Timer prescal. 256	Set frequency: 11.059MHz Adjusted frequency: 11.060MHz Trim error: 0.184%

When there is the version number information of the output download board and the corresponding information of the external Flash in the information box, it means that the U8W download tool has been correctly detected.

During the download process, the 4 LEDs on the U8W download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

It is recommended that users use the latest version of STC-ISP to download the software (please always pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com).

#### 3.4 U8W offline download instructions

The target chip is installed on the U8W socket and locked and connected to the computer via USB to power the U8W for offline download

The steps to use USB to power U8W for offline download are as follows:

(1) Use the USB cable provided by STC to connect the U8W download board to the computer, as shown below:



1. Select the MCU model;

2. Select the serial port number corresponding to U8W;

3. Open the target file (HEX format or BIN format);

4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip working voltage; click the "Download user program to U8/U7 programmer for offline download" button ;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

According to the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W download tool.

It is recommended that users use the latest version of STC-ISP to download the software (please always pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is



strongly recommended that users download the software from the official website http://www.STCMCUDATA.com). (3) Place the target MCU in the U8W download tool in the direction shown in the figure below, as shown in the figure below:



(4) Then press and release the button as shown in the figure below to start offline download:



按下此按钮后松开, 开始脱机下载

During the downloading process, the 4 LEDs on the U8W download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

Offline download plug and play burning function introduction:

1. After completing the above steps (1) and (2), U8W is in the plug-and-play programming state by default when it is connected to the computer and powered on;

2. Put the chip into the programming socket according to the instructions in step (3). While tightening the socket wrench, U8W will automatically start programming;

3. Display the burning process and burning result through the indicator light;

4. After programming is completed, loosen the wrench and take out the chip;

5. Repeat steps 2, 3 and 4 for continuous programming, eliminating the need to press the button to trigger the programming action.

### The target chip is connected to U8W by the user system lead and connected to the computer via USB to supply power to U8W for offline download.

The steps for offline download using USB to supply power to U8W are as follows:

(1) Use the USB cable provided by STC to connect the U8W download board to the computer, as shown below:



(2) Set up in the STC-ISP download software according to the steps shown in the figure below: It is recommended that users use the latest version of STC-ISP to download the software (please always pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com).

CV Type STC8H8K64U V Pins Auto v	Code Buffer EEPROM Buffer VART Helper HID Helper Keil ICE Settings
COM Port USB-SERIAL CH340 (COM14) Soan Min Baud 2400 Max Baud 115200 dress 0000 Clear code buffer Open Code File 0000 Clear EEPROM buffer Open EEPROM File (W Opt USW Settings Encryption Download + + Bownload code to US/U7 programmer	00000h         02         00         03         75         84         01         7E         44         20         00         E4         18         44         7A         49         B0           00010h         78         F9         7E         F8         02         FF         02         00         19         75         F2         00         75         F1         00         05           00020h         80         80         FC         FF         FF
Clean all user data in US/U7 programmer Set USW/US-5\3V/IAP15F\L2N6152 as control MCU Set the highest offline baudrate 115200 ~ Set MAX count 10000 SN Timeout 5 S-VCC vol. 5.0 V ~ PowerOn delay 0.5 s ~ Always supply power for target MCU after ( Always supply power for target MCU after (	000A0h FF
Disable auto-detect function while off-lir Auto-Increment force inc even if download Use LED show mode 2 JOW/USW-Mini/General USD-UART Tool instructions	Nave 512K Bytes external Flash Prepare for download OK ! [1.782"] Programming user code OK ! [2.984"]
ownload/Program Stop Be-Program	Complete (2022-02-22 17:13:26)

- 1. Select the MCU model;
- 2. Select the serial port number corresponding to U8W;
- 3. Open the target file (HEX format or BIN format);
- 4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip operating voltage;

Click the "Download user program to U8/U7 programmer for offline download" button;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

According to the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W download tool.



(3) Then use the cable to connect the computer, connect the U8W download tool and the user system (target MCU) as shown in the figure below, and press the button shown in the figure and release it to start offline downloading:



During the downloading process, the 4 LEDs on the U8W download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

### The target chip is connected to U8W by the user system lead, and the user system supplies power to U8W for offline download

(1) Firstly, use the USB cable provided by STC to connect the U8W download board to the computer, as shown below:



(2) Set up in the STC-ISP download software according to the steps shown in the figure below:

It is recommended that users use the latest version of STC-ISP to download the software (please always pay attention to the updates of the STC-ISP download software on the STC official website



http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com).

e <u>O</u> perate <u>I</u> ool	solanguage	Supply Information	Selection £	<u>AD. D</u>	ownlo	ad	Simp	lified	Chine	ese	Eng	lish			
ICU Type STC8H8K64	W	✓ Pins Auto ✓	Code Buffer	EEPRON	Buff	er U	ART B	felper	HII	Hel	per	Keil	ICE	Setting	
COM Fort USB-SERIA Min Baud 2400 ddress cOOOO Clear o cOOOO Clear B K/W Opt UBW Set Download co Clean all uses Set UBW/UB-5\3V/J Set the highest o Set MAX count 100 S-VCC vol. 5.0	L CH340 (COM) Max code buffer EEPROM buffer ttings Encryp ode to US/U7 p r data in US/U IAP15F\L2N6152 offline baudra 000 SH T 0 V ~ PowerOn	<ul> <li>Soan</li> <li>Baud 115200</li> <li>Open Code File</li> <li>Open ZEPROM File</li> <li>tion Download • •</li> <li>rogrammer</li> <li>7 programmer</li> <li>as control MCU</li> <li>te 115200 ~</li> <li>te 115200 ~</li> <li>insout 5</li> <li>delay 0.5 s ~</li> </ul>	00000h 00010h 00020h 00050h 00050h 00050h 00050h 00050h 00050h 00000h 00000h 00000h 00000h 00000h	02 00 78 F5 80 80 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	0 03 7 7E E FE E FE E FE E FE E FE E FE E FE	5 84 8 02 F FF F FF F FF F FF F FF F FF F FF F	4 01 2 FF 7 FF 7 FF 7 FF 7 FF 7 FF 7 FF 7 FF	7E 4 02 0 FF F FF F FF F FF F FF F FF F FF F	4 20 0 19 F FF F FF F FF F FF F FF F FF F FF F	00 75 FF FF FF FF FF FF FF FF FF FF FF FF	E4 1 F2 0 FF F F FF F F FF F F FF F F FF F F	B 44 0 75 F FF F FF F FF F FF F FF F FF F FF F	7A F1 FF FF FF FF FF FF FF FF FF FF FF	49 B0 00 05 FF FF FF FF	-
Always supply p Always supply p Disable auto-de	ower for targ ower for targ stect function	et MCU after « et MCU after « while off-liz	DataLen G	037FA (	hecks	an 37	7 <b>AB</b> 23	¥i]	lBuf	fer	Cle	arBuf	fer	SaveBui	fer
Auto-Increment Use LED show mo JSW/USW-Mini/Gener	force inc eve de 2 al USB-WART T	n if download	Have 512K B Prepare for d Programming u	lytes e lownloa iser co	tterna d de	OK !	sh		[1.78 [2.98	2"] 4"]			6		
Download/Program	Stop	Re-Program	Complete !(	(2022-0	2-22 1	7:13:	26)								
Check MCU	Help	Delsy 3 ser 🗸													_
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1. Select the MCU model;

2. Select the serial port number corresponding to U8W;

3. Open the target file (HEX format or BIN format);

4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip operating voltage;

Click the "Download user program to U8/U7 programmer for offline download" button;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

According to the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W download tool.

(3) Then connect U8W to the user system as shown in the figure below, supply power to the user system, and then start offline downloading:



During the downloading process, the 4 LEDs on the U8W download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

### The target chip is connected to U8W by the user system lead, and U8W and the user system are independently powered for offline download

(1) Firstly, use the USB cable provided by STC to connect the U8W download board to the computer, as shown below:



(2) Set up in the STC-ISP download software according to the steps shown in the figure below:

It is recommended that users use the latest version of STC-ISP to download the software (please always pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com).



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Set USW/U8-5\3V/IAB	P15F\L2K61S2 az	control MCU	000C0h	FF	FF 1	FF 1	FF	E FE	FF	FF	FF	FF F	FF	FF	FF	FF F	Ŧ	
Set the highest off	line baudrate	115200 ~	000D0h	TT	FF I	FF 3	FF	F FF	FF	FF	FF	FF F		FF	FF	FF F	Ŧ	
Sat MAY count 10000	SN Time	unt 5	000E0h	FF	FF I	FF I	FF	F FF	FF	FF	FF	FF F	T FF	FF	FF	FF F	Ŧ	
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1. Select the MCU model;

2. Select the serial port number corresponding to U8W;

3. Open the target file (HEX format or BIN format);

4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip operating voltage;

Click the "Download user program to U8/U7 programmer for offline download" button;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

According to the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W download tool.

(3) Then connect U8W to the user system as shown in the figure below, and press the button shown in the figure first and then release it, ready to start offline download, and finally power on/on the user system to download the user program Officially begin:



During the downloading process, the 4 LEDs on the U8W download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

### 3.5 U8W-Mini's function introduction

The main interfaces and functions of the U8W-Mini tool are described in detail below:



Programming interface: According to different power supply methods, use different download cables to connect the U8W-Mini download board and the user system.

U8W-Mini update system program button: used to update U8W-Mini tools. When there is a new version of U8W firmware, you need to press this button to update the U8W-Mini main control chip (note: you must first select update/download The toggle switch on the interface is moved to the upgrade tool firmware).

Offline download user program button: Start offline download button. First, the PC downloads the offline code to the U8W-Mini, and then uses the download cable to connect the user system to the U8W-Mini, and then press this button to start the offline download (the user will also start downloading immediately every time the power is turned on Code).

Update/download selection interface: When you need to upgrade the underlying firmware of U8W-Mini, you need to move this toggle switch to the firmware of the upgrade tool. When you need to program the target chip through U8W-Mini, you need to Toggle the switch to burn the user program. (Please refer to the figure above for the connection of the toggle switch)

USB interface: The USB interface has the same function as the Micro-USB interface. Users can connect one of them to the computer as needed.

#### 3.6 U8W-Mini online download instructions

The target chip is connected to the U8W-Mini through the user system lead, and the U8W-Mini is connected to the computer for online download

Firstly, use the USB cable provided by STC to connect the U8W-Mini to the computer, and then connect the U8W-Mini to the target MCU of the user system through the download cable. The connection method is shown in the following figure:



Then use STC-ISP to download the software to download the program, the steps are as follows:



EU Type STC8H8E64U V Pins Auto V	Code Buffer EEPROM Buffer VART Helper HID Helper Keil ICE Settings
COM Fort USB-SERIAL CH340 (COM12) Scan Min Baud 2400 Max Baud 115200 ddress c0000 Clear code buffer Open Code File c0000 Clear EEPROM buffer Open ZEPROM File H/W Option USW Settings Encryption Download + + Program OR Trie IRC Input IRC frequency 11.0592 MHz Set user EEPROM size 0.5 K Enable longer power-on-reset latency RESET pin used as I/O port	00000h       02       00       03       75       84       01       7E       44       20       00       E4       18       44       7A       49       B0         00000h       78       F9       7E       F8       02       FF       02       00       19       75       F2       00       75       F1       00       05         00020h       80       80       FC       FF       FF<
Enable Low-Voltage reset     LVD detect leve 2.00 V	DataLen 037FA Checksum 37AB23 FillBuffer ClearBuffer SaveBuffer
Download/Program 5 Step Re-Program	Checking target MCU Board Type USW-Mini Board version 1.43 Nave 512K Bytes external Flash Re-Checking target MCU MCU type: STCENERGAU F.W. sersion 7.3.12U

1. Select the MCU model;

- 2. Select the number of pins. When the chip is directly installed on the U8W-Mini to download, be sure to select the correct number of pins, otherwise the download will fail;
- 3. Select the serial port number corresponding to U8W-Mini;
- 4. Open the target file (HEX format or BIN format);

5. Set the hardware options;

6. Click the "Download/Program" button to start burning;

7. The step information of the burning process is displayed, and the message "Completed!" is displayed when the burning is completed.

When there is the version number information of the output download board and the corresponding information of the external Flash in the information box, it means that the U8W-Mini download tool has been correctly detected.

During the downloading process, the 4 LEDs on the U8W-Mini download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

It is recommended that users use the latest version of STC-ISP to download the software (please pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software on the official website http://www.STCMCUDATA.com).

#### 3.7 U8W-Mini offline download instructions

### The target chip is connected to the U8W-Mini by the user system lead and connected to the computer via USB to power the U8W-Mini for offline download.

The steps for offline download using USB to power the U8W-Mini are as follows:

(1) Use the USB cable provided by STC to connect the U8W-Mini download board to the computer, as shown below:



- 1. Select the MCU model;
- 2. Select the serial port number corresponding to U8W-Mini;
- 3. Open the target file (HEX format or BIN format);
- 4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip working voltage; click the "Download user program to U8/U7 programmer for offline download" button ;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

Follow the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W-Mini download tool.

It is recommended that users use the latest version of STC-ISP to download the software (please pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is



strongly recommended that users download the software from the official website http://www.STCMCUDATA.com). (3) Then use the cable to connect the computer, connect the U8W-Mini download tool and the user system (target MCU) as shown in the figure below, and press the button shown in the figure and release it to start offline downloading :



During the downloading process, the 4 LEDs on the U8W-Mini download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

### The target chip is connected to the U8W-Mini by the user system lead, and the U8W-Mini is powered by the user system for offline download.

(1) Firstly, use the USB cable provided by STC to connect the U8W-Mini download board to the computer, as shown below:



(2) Set up in the STC-ISP download software according to the steps shown in the figure below:



le Operate Tools anguage Supply Informatic	on Selection (	AD.	Do	wnk	oad	S	imp	lifie	d C	hine	se	Eng	glist	1			
MCU Type STC8H8E64U 🗸 Pins Auto 🗸	Code Buffer	EEPF	MOR	Buf	fer	UA	RT )	felp	er'	HID	Help	er.	Kei	1 10	E Se	etting	s •
COM Fort USB-SERIAL CH340 (COM14) V Soan	000005	02	00	03	75	84	01	78	44	20	00.1	74 1	8	11 7	5 4	9 80	T
Min Baud 2400 ~ 2 Max Baud 115200 ~	00010h	78	F9	7E	F8	02	FF	02	00	19	75	F2 (	00	75 F	1 0	0 05	1
	00020h	80	80	FC	FF	FF	FF	FF	FF	FF	FF	FF 1	FF I	FF F	E E	F FF	1.
oress	00030h	FF	FF	FF	FF	FF	FF	FF	FF	ŦŦ	FF 1	FF 1	FE I	FF E	F F	F FF	
conn Creat code ballet Code lite	00040h	FF	TF	FF	EF	FF	EE	FF	FF	FF	EE I	TE I	TE I	FF F	EE	E FE	
20000 Clear EEPROM buffer Open EEPROM File	00050h	22	77	77	11	11	22	11	22	22	FF :				5 5	F FF	
L/W Opt 10 VBW Settings Encryption Download * *	00070h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	TE	FF F	FF	FFF	
	00080h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF I	FF F	FF	F FF	
Bownload code to US/U7 programmer	00090h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF 1	FF I	FE I	FF F	F F	F FF	
Clean all user data in US/U7 programmer	000A0h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF I	TE 1	FF F	E E	F FF	
Sat USW/U8-5\3V/IAP15F\12W61S2 as control MCU	000B0h	II	FF	TT	FF	FF	TF	FF	FF	TT	FF	FF I	E I	FF F	F F	F FF	
Set the bid on office bud ats 115200	000C0h	TT	FF	52	FF	FF	22	FF	11	77	FF			77 7	F F	F FF	
Set the highest offine saddrate 115200	OCOECH	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	TF 1	FF F	EE	FFF	
Set MAX count 10000 SH Timeout 5	000F0h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF I	FF F	E F	F FF	
S-VCC vol. 5.0 V ~ PowerOn delay 0.5 s ~																	
Always supply power for target MCU after (			_	_	-	_	_		_	_	-	_	-				
Always supply power for target MCU after (	DataLen (	037FA	Ch	eck	sun	37A	<b>B</b> 23	7	111	Buff	er	Cle	ar Bi	iffer	S	aveBu	ffer
Disable auto-detect function while off-lin						-	-	-					_		_		
Auto-Increment force inc even if download	Have 512K	Butat		-	-11	F1	h.										1
Ulter LED show mode 2	HATE STEEL	-years							112		-						
BW/BBW-Mini/General USB-HART Tool instructions	Prepare for o	downlo	oad	***	03				1	, 78 98	2~			-			
	an og aming t	dis-en	o o a e	-						2	1			6	1		
Download/Program Stop Re-Program	Complete 1	(2022-	-02-	02	17-1	13-2	63										
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Check MLU Relp Delsy 5 Sev V	Contraction of the second	104		-	-	-	-	-	-	-	-	-	-		_	_	_

1. Select the MCU model;

2. Select the serial port number corresponding to U8W-Mini;

3. Open the target file (HEX format or BIN format);

4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip working voltage; click the "Download user program to U8/U7 programmer for offline download" button ;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

Follow the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W-Mini download tool.

It is recommended that users use the latest version of STC-ISP to download the software (please pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com) Software used).

(3) Then connect U8W-Mini to the user system as shown in the figure below. Once the user system is powered on, it will start offline downloading:



During the downloading process, the 4 LEDs on the U8W-Mini download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

# The target chip is connected to U8W-Mini by the user system lead, and U8W-Mini and the user system are independently powered for offline download.

(1) Firstly, use the USB cable provided by STC to connect the U8W-Mini download board to the computer, as shown below:



(2) Set up in the STC-ISP download software according to the steps shown in the figure below:



e Operate Tools	iguage Sup	oply Information	Selection	AD.	Do	wnk	oad	S	imp	litte	d Ci	hine	se	Eng	lish				
CU Type STC8H8K64U	~	Pins Auto 🗠	Code Buffer	EEPI	BOM	Buf	fer	UAI	RT )	felp	er'	HID	Help	er.	Kei	l ICE	Set	tings	•
COM Port USB-SERIAL CH34	o (com14)	V Scan	000005	53	0.0	0.2	76	0.4	01	78	3.8	20	00.1	2.4		1.78		80	Ť
Win Band 2400	May Band	115200 ~	00010h	78	F9	7E	F8	02	FF	02	00	19	75	F2 (	0 7	5 F1	00	05	1
			00020h	80	80	FC	FF	FF	FF	FF	FF	FF	FF	FF 1	T E	F FF	FF	FF	1
dress		0.1.011	00030h	FF	FF	FF	FF	FF	FF	FF	FF	ŦŦ	FF 1	FF I	E E	F FF	FF	FF	
0000 Clear code bu	ffer 😶 Up	en Lode File	00040h	FF	FF	FF	FF	FF	FF	FF	FF	FF	EE 1	TE I	F F	F FF	TT	FF	
0000 Clear EEPROM	buffer Ope	n EEPROM File	00050h	EF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FI	F FE	FF	FF	
40 0 . 0 100 Cashing	1-	· · · (414)	00060h	EE.	2F	22	FF	m	FF	FF	FF	FF	EE I		F I	F FF	EE	FF	
/W Upt www oow Settings	Encryption	Download *	000708	22	11		22	11	22	11	22	11				7 77	11	11	
Bownload code to	18/17 progra	maer	00050h	FF	FF	88	FF	FF	FF	FF	FF	FF	FF 1	FF 1	F 1	5 22 7 79	FF	22	
Class all area data	1. 10 /17		000A0h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	E E	T FF	FF	FF	
Liean all user data	in 00/07 pro	granner	000B0h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF 1	FF I	F F	T FF	FF	FF	
Set U8W/U8-5\3V/IAF15F	L2N6152 az e	control MCU	000C0h	FF	FF	ŦŦ	FF	FF	FF	FF	FF	ŦŦ	FF I	FZ I	Ŧ F	T FF	TT	FF	
Set the highest offline	baudrate 11	15200 🗸	000D0h	TT	FF	FF	FF	FF	FF	FF	FF	FF	FF :	FF 1	E E	T FE	FF	FF	
Set MAX count 10000	SH Timeou	at 5	OCOEOh	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	EF 1	F F	F FF	FF	FF	
S-VCC val 5.0 V ~	PowerOn dela	w 0.5 s v	00020h	11	rr.	11	TT.	11	22	m	rr	n	rr :		r 1	1 11	11	22	
Always supply some (	an target W	W after a			_	_	_	_	_	_	_	_	_	_	-				
CALVAYS SUPPLY POVEL 1	or carger mo	o arter c								11.							1.00	to Press Printer	
Always supply power t	or target ML	U after (	DataLen	037FA	Ch	eck	sun	3/A	823	1	111	Butt	er	Cle	ar Bu	tter	Sa	veBut	ter.
Disable auto-detect f	function whil	e off-lir	10																
Auto-Increment force	inc even if	download	Have 512K H	Bytes	ext	ern	al I	las	h										
Use LED show mode 2			Deserve Free	1			03		1		T.	20	.*1						
JBW/USW-Mini/General USE	-UART Tool i	instructions	Programming v	down	code		. 01	KI			2	. 98	4			-			
								-	•							•			
ownload/Program Sto	p Be	-Program	Complete !!	(2022	-02-	22	17:1	13:2	6)										
Chash MCH Hal	. 1	alay 3 ser																	
Check BLO Rel	P		0.9990 (1990)	125					-										

1. Select the MCU model;

2. Select the serial port number corresponding to U8W-Mini;

3. Open the target file (HEX format or BIN format);

4. Set the hardware options;

5. Select the "U8W Offline/Online" tab, set the offline programming options, pay attention to the S-VCC output voltage matches the target chip working voltage; click the "Download user program to U8/U7 programmer for offline download" button ;

6. The step information of the setting process is displayed, and the prompt "Completed!" is displayed after the setting is completed.

Follow the steps in the above figure, after the operation is completed, if the download is successful, it means that the user code and related setting options have been downloaded to the U8W-Mini download tool.

It is recommended that users use the latest version of STC-ISP to download the software (please pay attention to the updates of the STC-ISP download software on the STC official website http://www.STCMCUDATA.com. It is strongly recommended that users download the software from the official website http://www.STCMCUDATA.com). (3) Then connect U8W-Mini to the user system as shown in the figure below, and press the button shown in the figure first and then release it, ready to start offline download, and finally power on/on the user system to download The user program officially starts:



During the downloading process, the 4 LEDs on the U8W-Mini download tool will be displayed in marquee mode. After the download is complete, if the download is successful, the 4 LEDs will be on and off at the same time; if the download fails, all the 4 LEDs will be off.

### 3.8 Make/Update U8W/U8W-Mini

The process of making U8W/U8W-Mini download master is similar. To save space, the following uses U8W as an example to describe how to make U8W download master. Before making the U8W download master, you need to dial the "Update/Download Selection Interface" of the U8W download board to "Upgrade Tool Firmware", as shown in the figure below:



Then click the "Set U8W/U8-5V/U8-3V as the offline download master chip" button on the "U8W Offline/Online" page in the STC-ISP download program, as shown in the figure below: (Note: Be sure to select The serial port corresponding to U8W)



MCV Type STC8H8K64V	<ul> <li>Pins i</li> </ul>	kuto ~	Code Buffer	EEPP	OM B	ffer	UAR	T He	lper	HID	Helpe	r Ke	il IC	E Se	tings	•
COM Fort USB-SERIAL CH340 (COM Min Baud 2400 Max ddress x0000 Clear code buffer x0000 Clear EEPROM buffer H/W Opt 2 USW Settings Encry Bownload code to US/U7 ; Clean all user data in US/ Set USW/US-5\3V/IAP15F\L2E6153	2) Baud 115200 Open Code Open EEPBO option Downlo- programmer 07 programmer 2 az control	Soan File M File	00000h 00010h 00020h 00030h 00040h 00050h 00050h 00050h 00050h 00050h 00050h	02 78 80 EF FF FF FF FF FF FF FF FF	00 0. 59 71 80 50 55 51 55	3 75 5 F8 7 FF 7 FF 7 FF 7 FF 7 FF 7 FF 7 FF 7	84 02 FF FF FF FF FF FF FF FF FF FF	01 7 FF 0 FF F FF F FF F FF F FF F FF F FF	E 44 2 00 F FF F FF F FF F FF F FF F FF F FF	20 19 FF FF FF FF FF FF FF FF FF FF	00 E4 75 F2 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	1B 00 FF FF FF FF FF FF FF FF	44 7 75 E EF E FF E FF E FF E FF E FF E FF E F	A 49 1 00 F FF F FF F FF F FF F FF F FF F FF	B0 05 FF FF FF FF FF FF FF FF FF FF FF	1
Set the highest offline baudre Set MAX count 10000 SH 1 S-VCC vol. 5.0 V ~ PowerOn Always supply power for targ	te 115200 Simeout 5 a delay 0.5 get MCU after get MCU after	~ <u>5</u> ~ ( c	000D0h 000E0h 000F0h DataLen	TT FT ET	FF F FF F FF F	f FF F FF F FF	FF FF FF 37AI	FF F FF F FF F	T FF F FF F FF F FF	FF FF FF Baff	FF FF FF FF FF FI	FF FF FF	FF F FF F FF F	F FF F FF F FF	FF FF FF weBuff	fer
Use LED show mode 2 JBW/UBW-Mini/General USB-UART 1	n if downlow cool instruct	id tions	Set frequ Adjusted Trim erro	uency fregu or: 0.	11. ( lency 250%	жэмн 11.	z 087 <b>M</b> 0	(x								
Download/Program Stop	Re-Progra	A	Complete !!	(2022-	02-23	17:	27:04	1)								

When the following screen appears, it indicates that the U8W control chip is made:



🔊 STC-ISP (V6.88L) (Sale	s: 0513-5	5012928) Web:www	.STCMCUDATA.com (Support QQ:800003751) STC: Th 🛛 🛛 🛛
File Operate Tools	Language	Supply Informatio	n Selection &D. Download Simplified Chinese English
MCU Type IAP15F2R61S2		- Pins Auto -	Code Buffer WART Helper HID Melper Keil ICE Settings STC Math Libras
COM Fort USB-SERIAL C	H340 (COM4	) - Soun	
Min Baud 2400 ~	Max	Baud 115200 ~	
Address Ox0000 🖾 Clear code	buffer	Open Code File	
Ox0000 🔄 Clear EEPE	OM buffer	Open MEFROM File	
H/W Option USW Settin	gs Encrys	tion Download + +	
Set the highest offl Set MAX count 10000 S-VCC vol. 5.0 V Always supply powe	in.	and switch S2 to o	lownload mode f
Always supply powe Disable autordeter	r for targ t function	et MCU after : while off-lin	DataLan 00000 Checksum 000000 FillBuffer ClearBuffer SaveBuffer
Auto-Increment for Use LED show mode JON/USV-Mini/General	ce inc eve 2 USB-VART I	n if download	MEU ID : F56CC414018FD2 MEU type: IAP15F2R61S2 F/W version: 7.2.5T
Download/Frogram	Stop	Re-Frogram	Complete (2022-02-22 17:37:50)
Chack MCU	Help	Delsy 3 set v	
Auto reload the tare	t file	Re-Count Infin -	
Reload and download	when targe	t file is modified	aleans Projec Release Help Get HDD-SN Beep PassTimes 10986 Less

After the production is completed, do not forget to dial the "Update/Download Selection Interface" of U8W back to the "Burn User Program" mode, and power on the U8W download tool again, as shown in the figure below: (Otherwise, programming will not be performed normally )



### 3.9 U8W/U8W-Mini set through mode (can be used for simulation)

To use U8W/U8-Mini for simulation, you must first set U8W/U8-Mini to pass-through mode. The method of U8W/U8W-Mini to realize USB to serial port pass-through mode is as follows: 1. First, the U8W/U8W-Mini firmware must be upgraded to v1.37 and above;

- After U8W/U8W-Mini is powered on, it is in normal download mode. At this time, press and hold the Key1 (download) button on the tool and do not release it. Press the Key2 (power) button again, and then release the Key2 (power) button. Then release the Key1 (download) button, U8W/U8W-Mini will enter the USB to serial port pass-through mode. (Press Key1→ Press Key2 → Release Key2 → Release Key1);
- 3. The U8W/U8W-Mini tool that enters the pass-through mode is just a simple USB to serial port and does not have the offline download function. If you need to restore the original functions of U8W/U8W-Mini only need to press the Key2 (power) button separately again.

### 3.10 Reference circuit of U8W/U8W-Mini

USB online/offline download board U8W/U8W-Mini provides users with the following common control interfaces:

Pin function	Port	Function description
Power control pin	P2.6	Low effective
Download communication	P1.0	Serial port RXD, connect to the TXD of the target chip (P3.1)
pin	P1.1	Serial port TXD, connect to RXD of target chip (P3.0)
Programming button	P3.6	Low effective
	P3.2	LED1
	P3.3	LED2
display	P3.4	LED3
	P5.5	LED4
	P2.4	Flash CE Pin
External serial Flash	P2.2	Flash SO Pin
control pin	P2.3	Flash SI Pin
	P2.1	Flash SCLK Pin
	P3.6	Start signal
Automatic burning tool	P1.5	Completion signal
Sorter signal	P5.4	OK signal (good signal)
	P3.7	ERROR signal (defective product signal)
Buzzer (BEEP) control	P2.5	High effective (sound at high level)

Reference circuit diagram for power control part:



Reference circuit diagram of Flash control part:



This Flash memory is required when the user program is larger than 41K The reference circuit diagram of the button part:



Reference circuit diagram of the buzzer part:



LED display part reference circuit diagram:



Reference circuit diagram of serial port communication pin connection part:



### 4 STC Universal USB to Serial Tool

### 4.1 Appearance of STC Universal USB to Serial Tool



Back:



4.2 STC general USB to serial tool layout diagram



Here, the "power switch" needs to be explained:

The function of this button is the same as the self-locking switch. When the switch button is pressed for the first time, the switch is turned on and held, that is, self-locking. When the switch button is pressed for the second time, the switch turns off the power. In view of the characteristics of self-locking switches that are easily damaged during use, we have designed a set of circuits that use light touch switches to replace self-locking switches to increase the service life of the tools.

For STC microcontrollers, if you want to perform ISP download, you must receive the serial port command at poweron reset to start executing the ISP program, so the correct steps to download the program to the MCU using the STC universal USB to serial tool are: 1. Use STC universal USB to serial port tool to connect the MCU to be burned with the computer;

2. Open STC's ISP to download the software;

3. Select the MCU model;

4. Select the serial port corresponding to the STC Universal USB to Serial Tool;

5. Open the target file (HEX format or BIN format);

6. Click the "download/program" button in the ISP download software;

7. Press the "power switch" on the STC Universal USB to Serial Tool to power the MCU, and the download can start. [Cold start burning]

In addition, the USB interface has the same function as the Micro-USB interface, and the user can connect one of the interfaces to the computer as needed.

The 0V signal pin of the programming interface has a 470 ohm resistor grounded. It can be downloaded only when P1.0/P1.1=0/0 or P3.2/P3.3=0/0 is set. You can set P1.0, P1 .1 or P3.2, P3.3 are connected to the 0V signal pin.

### 4.3 STC Universal USB to Serial Tool Driver Installation

STC general USB to serial port tool uses CH340 USB to serial chip (can plug in crystal oscillator, more accurate), just download the general CH340 serial driver and install it. The following is the CH341SER serial driver provided by STC official website (www.STCMCUDATA.com) Download location:

STC-ISP下载编程烧录软件
 <u>STC-ISP软件V6.87K版</u>
 <u>STC开发/烧录工具说明</u>
 STC超强工具包,已含89系
 使用该软件的Keil仿真设置向Keil中添加STC器件/头文件和仿真驱动
 STC-ISP V6.87K请测试
 <u>STC-ISP软件升级原因</u>

◆<u>STC-ISP V6.87K简化版</u>

After downloading, decompress, the path of CH340 driver installation package is stc-isp-15xx-v6.87K\USB to UART Driver\CH340\_CH341:

i 》下载 》 stc-isp-15xx-v6.87K 》 USB to UART Driver 》 CH340 CH341

名称

修改日期

🛃 ch341ser

2020/5/9 15:03

Take the CH341SER serial port driver provided by STC official website as an example, double-click the "CH341SER.exe" installation package, and click the "Install" button on the pop-up main interface to start installing the driver:



选择INF文件	DriverSetup	<
安装		1340
卸载	1 驱动安装成功!	19, 3.5.2019
帮助	-	

# 4.4 Use STC universal USB to serial port tool to download program to MCU

1. Use the STC universal USB to serial port tool to connect the MCU to be burned to the computer:



2. Open the STC-ISP software;

3. Select the model corresponding to the burning chip;

4. Select the serial port number recognized by the STC universal USB to serial tool (when the STC universal USB to serial tool is correctly connected to the computer, the software will automatically scan and identify the serial port named "USB-SERIAL CH340 (COMx)", the specific COM The number will vary from computer to computer). When multiple USB-to-serial cables are connected to the computer, they must be selected manually;

5. Load the burning program;

- 6. Set burning options;
- 7. Click the "Download/Program" button;

e <u>Operate</u> <u>I</u> ools anguage <u>Supply</u> Infor	mation S	election £	AD.	Do	wnlo	ad	Si	imp	lifie	d C	hine	se	En	glisł	1			
NCU Type STC8H8K64U V Pins Au	to - Cod	le Buffer	EEPR	XOM :	Buff	er i	UAB	RT H	alp	er'	HID	He]	per	Kei	1 10	E Se	ttings	•
COM Port USB-SERIAL CH340 (COM12) V S	can	00000h	02	00	03	75	84	01	7E	44	20	00	E4	18	44 7	<b>4</b> 49	BO	T
Min Baud 2400 🗸 🧐 Max Baud 115200	~	00010h	78	F9	7E	F8	02	FF	02	00	19	75	12	00	75 F.	1 00	05	21
ldress .		000205	50	20	FF I		22 77		22	22	77	11	TT	FF 1	72 E. FF F	: :: : ::	22	
20000 🛛 🔽 Clear code buffer 🙆 🛛 Open Code F	ile	00040h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF F	F FF	FF	
20000 Clear EEPBOM buffer Onen FFFROM	711.	00050h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF F	F FF	FF	
open azrike		00060h	FF	FF	TE	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF F	F FF	FF	
H/W Option USW Settings Encryption Download		00070h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF 1	FF F	F FE	FF	
Promo OR		00080h	EE .	FF	FF	FF	FF	FF	11	FF	FF	FF	FF	FF I	FF F		FF	
	1	000305	22	77 77	77 77		77 77	FF	77	TT	22	10	22	FF 1	FF F		FF	
Iris IR.		000B0h	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF F	F FI	FF	
Input IRC frequency 11.0592 VMHz		000COh	FF	FF	FF	FF	FF	FF	77	FF	ŦŦ	FF	FT	FF 1	FF F	F FE	FF	
🕑 Oscillator high gain		000DOh	IT	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	EE I	FF F	F FI	FF	
Set user EEPROM size 0.5 K 🗸 🗸		OGOEOh	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF I	FF F	F	FF	
Enable longer power-on-reset latency		000500	22	EE .	11		11	22	11	27	11	m	11		(r r)	1 11	22	
RESET pin used as I/O port	* I I I			_	_	_	_	_	_	_	_	_	_	-				
Rnahle Low-Voltage reset			19784				274	000	1							1.0		100
TVD detect lans 2 00 V		DataLen U	JJITA	Ch	ecks	un	SIR	023	1	111	Butt	er	CI.	ear bi	itter	5	webuti	er
□ Hardware enable WDT after power-on-reset Watch-Dog-Timer prescal 256 ✓	MCU Abou Qr	Type : ST it this MC dy versio	CSH5B W: m B	064U and	late	rs	app	orț	IMA	. R	īÇ,	TFT	Eury	otio	ns.			
Download/Program S Stop Re-Frogram	Oper	S simulat file "D:	\Demo	∑ o \De	nly no.ł	sup	OK	ted !	by	¥ 41 :	sion	В	and .	Late	0			
Check MCU Help Delay 3 se		0-11101															_	
Be-Count Infi	D:\I	leno\Deno.	hex															
wato reload the target file	Contract of Contract					1111						1						

8. When the prompt box in the lower right corner displays "Checking target MCU...", press the "power switch" on the STC universal USB to serial port tool to power on the MCU, and then start downloading [Cold Start Programming]; Checking target MCU...

			v

9. Wait for the download to end. If the download is successful, the prompt box in the lower right corner will display "Complete!"



MCU Type STC8H8K64U	1	Pins	Auto ~	Code Buffer	EEPP	OM B	uffer	- UA	RT I	Helpe	r HI	D He	lper	Kei	il IC	E Se	ttines	•
COM Fort USB-SERIAL Min Baud 2400 ddress x0000 Clear co x0000 Clear EE H/W Option UBW Sett	CH340 (COM Max de buffer PROM buffer tings Encry	2) Baud 11520 Open Cod Open EEPR otion Downlo	Soan 0 ~ e File OM File oad • •	00000h 00010h 00020h 00030h 00040h 00050h 00060h 00060h 00080h	D2 78 80 FF FF FF FF FF FF	00 0 F9 7 80 E FF E FF E FF E FF E FF E	3 75 E FO C FI F FI F FI F FI F FI F FI	5 84 5 02 7 FF 7 FF 7 FF 7 FF 7 FF 7 FF 7 FF	01 FF FF FF FF FF FF FF FF	7E 4 02 ( FF 1 FF 1 FF 1 FF 1 FF 1 FF 1 FF 1 FF	14 20 10 19 77 77 77 77 77 77 77 77 77 77 77 77 77 77	00 75 FF FF FF FF FF FF	E4 F2 FF FF FF FF FF FF FF	1B	44 71 75 E. FE EI FE EI FE E FE E FE E FE E	49 00 F FF F FF F FF F FF F FF F FF	B0 05 FF FF FF FF FF FF FF	1
<ul> <li>Tris IRC Input IRC :</li> <li>Oscillator high Set user EEFROM</li> <li>Enable longer po</li> <li>RESET pin used a</li> <li>Enable Low-Volta</li> </ul>	frequency 11 gain size 0.5 wer-on-reset s I/0 port se reset	0592 VM K v latency	(z	00080h 00000h 00000h 00020h 000F0h		FF 1 FF 1 FF 1 FF 1 FF 1	T FI T FI T FI T FI T FI	FFF FFF FFF FFF FFF	FF FF FF FF FF	FT I FT I FT I FT I	T FT T FT T FT T FT T FT	FF FF FF FF	EF EF EF EF	FF I FF I FF I FF I FF I	FF FI FF FI FF FI FF FI FF FI	F FF F FF F FF F FF	EF FF FF FF FF	
LVD detect leve Hardware enable Watch-Dog-Timer	2.00 V WDT after po prescal 256	wer-ob-tese	et 2	Set frequ Adjusted	iency frequer: 0.	11. iency 282%	059M	Hz . 0900	Offic				1000			1.00		
Download/Program	Stop	Re-Progr	sn	Complete !!	(2022-	02-2	2 17	:45:2	3)									
Check MCU Auto reload the tax	Help	Delay 3 Re-Count 1	se:∨ Infi:∨	D:\Demo\Demo.	hez													_

### 4.5 Use STC universal USB to serial port tool to simulate user

#### code

The current STC simulation is based on the Keil environment, so if you need to use the STC universal USB to serial port tool to simulate user code, you must install the Keil software.

After the Keil software is installed, you also need to install the STC simulation driver. The installation steps of STC's simulation driver are as follows:

Firstly, open STC-ISP to download the software;

Then click the "Add MCU Type to Keil / Add STC ICE driver to Keil" on the "Keil ICE settings" page in the functional area on the right side of the software:



ile Operate Tools Faudnade Snbbia Intormation	n Selection AD. Download Simplified Chinese English 👝
MCU Type STC8H8E64U V Pins Auto V	Code Buffer EEPROM Buffer WART Halmer HID Malmer Keil ICE Settings
COM Box+ USB-SERTAL CH340 (COM12)	
	Add MCU type to Keil ICE Document
Min Baud 2400 V Max Baud 115200 V	STCB/STC15 series ICE settings
ddress	MCU Type STC8H8H64U
ACCORD Clear code builer Open code File	O Simulate via USB
JECOOO Clear EEFROM buffer Open EEFROM File	Cat target Will an TCP
H/W Option USW Settings Encryption Download	Set target mos as and
Program OR	PC RS232 Target ↔Pin2 ↔P3.1 ↔
Irin IRC	RXD Fin3 FXD
Input IRC frequency 11.0592 VMHz	
🔜 Oscillator high gain	GND GND GND
Set user EEPROM size 0.5 K 🗸	→ →
Enable longer power-on-reset latency	Vrage:
RESET pin used as I/O port	1. rrepare one object chip 2. Set it as ICE mcu
🕑 Enable Low-Voltage reset	3. Connect the chip with FC according to the above connection
LVD detect leve 2.00 V 🗸	
Hardware enable WDT after power-on-reset	
Watch-Dog-Timer prescal. 256 -	Set frequency: 11.059MHz
	. Trin error: 0.282%
Beenland/Program	
Fourtoentrol as cost	Complete (2022-02-22 17:45:23)
Check MCU Help Delay 3 sev	
Auto reload the target file Re-Count Infi v	D; \Demo\Demo, hex
Reload and download when target file is modified	elease Projec Release Help Get MDD-SN Beep PassTimes 10988 Rese
fter pressing, the following screen will appear	
lic文件夹	×
Please location at Keil directiry (eg. C:\Keil)	
-	
> 🦲 Keil	
Y Keil_v5	
Keil_v5	
<ul> <li>Keil v5</li> <li>C251</li> <li>C51</li> <li>DATIONTS</li> </ul>	
<ul> <li>Keil v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> </ul>	
<ul> <li>Kell v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> </ul>	
<ul> <li>Keil_v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> <li>LenovoQMDownload</li> <li>MSOCarbe</li> </ul>	
<ul> <li>Keil_v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> <li>LenovoQMDownload</li> <li>MSOCache</li> <li>OneDriveTemp</li> </ul>	
<ul> <li>Keil v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> <li>LenovoQMDownload</li> <li>MSOCache</li> <li>OneDriveTemp</li> <li>PerfLogs</li> </ul>	
<ul> <li>Keil v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> <li>LenovoQMDownload</li> <li>MSOCache</li> <li>OneDriveTemp</li> <li>PerfLogs</li> <li>Program Files</li> </ul>	
<ul> <li>Keil v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> <li>LenovoQMDownload</li> <li>MSOCache</li> <li>OneDriveTemp</li> <li>PerfLogs</li> <li>Program Files</li> <li>Program Files (x86)</li> </ul>	
<ul> <li>Keil v5</li> <li>C251</li> <li>C51</li> <li>DATASHTS</li> <li>UV4</li> <li>LenovoQMDownload</li> <li>MSOCache</li> <li>OneDriveTemp</li> <li>PerfLogs</li> <li>Program Files</li> <li>Program Files (x86)</li> <li>ProgramData</li> </ul>	

Locate the directory to the installation directory of the Keil software, and then confirm. After the installation is successful, the following prompt box will pop up:



You can see the following files in the relevant directory of Keil, which means that the driver is installed correctly.



Since in the default state, the main control chip of STC is not an emulation chip and has no emulation function, if simulation is needed, the main control chip of STC needs to be set as an emulation chip. The steps of making a simulation chip are as follows:

Firstly, use STC universal USB to serial port tool to connect the MCU to the computer;

Then open STC's ISP to download the software, and select the serial port number corresponding to the serial port tool in the serial port number drop-down list;

Select the MCU model;

Select the IRC frequency of the user program to run, and the frequency selected when making the simulation chip is consistent with the frequency set by the simulated user program, in order to achieve the real running effect.



COM Fort USB-SERIAL CH340 (COMI Min Baud 2400 2 Max Address Dx0000 Clear code buffer Dx0000 Clear EEPROM buffer H/W Option UBW Settings Encryp Program OR Trim IRC Input IRC frequency 24 Oscillator high gain Set user EEPROM size 0.5 Enable longer power-on-reset RESET pin used as I/O port Enable Low-Voltage reset LVD detect leve 2.00 V	2) Soan Baud 115200 V Open Code File Open ZEFBOM File tion Download + +	Add MCU type to Keil Add STC ICE driver to Keil STC8/STC15 series ICE settings MCU Type STC8H88264U Simulate via COM P3.0/P3.1 ~ Simulate via USB Set target MCU as ICE FC Fin2 F3.1 Target FC Fin3 Fin5 F3.0 F3.0 FXD Fin5 F3.0 F3.0 Simulate via USB Usage: 1 · Frepare one object chip 2 · Set it as ICE acu 3 · Connect the chip with FC according to the above connection
Watch-Bog-Timer prescal, 256	~	Set frequency: 11.059MMr Adjusted frequency: 11.090MMr Trim error: 0.282W
Download/Program Stop	Re-Program	Complete !(2022-02-22 17:45:23)
Check MCU Help	Delay 3 se v Re-Count Infi v	D: \Demo\Demo.hex

Then click the "Set target MCU as ICE" button on the "Keil ICE Settings" page in the right functional area of the software, After pressing, the following screen will appear:





Next, you need to press the "power switch" on the STC Universal USB to Serial Tool to supply power to the MCU [cold start], and you can start to make the simulation chip.

If the setting is successful, the following screen will appear:



MCV Type STC8H8K64U	] - Pins Auto -	Code Buffer EEPROM Buffer VART Helper	HID Helper Keil ICE Settings
COM Fort USB-SERIAL CH340 (COM Min Baud 2400 Max Address Dx0000 Clear code buffer bx0000 Clear EFFROM buffer	12) Soan Baud 115200 Soan Open Code File	Add MCU type to Keil Add STC ICE driver to Keil STC8/STC15 series MCU Type STC8H8E64U	nt ICE settings Simulate via COM P3.0/P3.1 ~ Simulate via USB
H/W Option 1998 Sattings From	open Ernow File	Set target MC	V az ICE
<ul> <li>Frogram UR</li> <li>Trim IRC</li> <li>Toront TBC Frogram 24</li> </ul>	000	Fin2     F3.1       Fin3     F3.0       TXD     F3.0	1
<ul> <li>Inpit In: Frequency IX</li> <li>Oscillator high gain Set user EEFROM size</li> <li>Enable longer power-on-reset</li> <li>RESET pin used as I/O port</li> <li>Enable Low-Voltage reset</li> <li>LVD detect leve 2 00 V</li> <li>Mondours enable MDT offer a</li> </ul>	K v t latency	Unage: I · Frepare one object chip 2 · Set it as ICE meu 3 · Connect the chip with FC according	to the above connection
<ul> <li>Input In: Frequency IX</li> <li>Oscillator high gain Set user EEPROM size</li> <li>0.5</li> <li>Enable longer power-on-reset</li> <li>RESET pin used as I/O port</li> <li>Enable Low-Voltage reset LVD detect leve 2.00 V</li> <li>Hardware enable WDT after power of the set o</li></ul>	K v t latency owermonmreset	Set frequency: 24.000MMz Adjusted frequency: 23.995MMz Trin error: -0.020%	to the above connection
Oscillator high gain Set user EEPROM size 0.5 Enable longer power-on-reset RESET pin used as I/O port Enable Low-Voltage reset LVD detect leve 2.00 V Hardware enable WDT after po Watch-Dog-Timer prescal-256 Bownload/Program Stop	K v t latency owermonmreset	GND Pin5	to the above connection

At this point, the simulation chip has been made successfully.

Next we open a project for simulation:

File Edit View Project Mach De	nag Pergeberah Teolik SVC3. Window Help	
0.0000000000000000000000000000000000000	P === P = = = = = = = = = = = = = = = =	
④ 🖾 🖉 🕸 • 🗐 🗐 Tarpet	□ 承   ▲ % ◆ 字 曲	
Project 4 🖬	Benac	• x
© ** Project Deme	1/	
	26 afr PT = UMPD: 25 afr PIMI = UMPD: //PMMI.m.PMMU.m. =00>Standard, Ul>pust-pull	
2n. Q. O. R	We have a set of the second seco	
Build Output		• 0
	Securities U10.527	Lat man Scitt Date And

Then make the following project settings:

#### An additional note:

When a C language project is created and the startup file "STARTUP.A51" is added to the project, there is a macro

definition named "IDATALEN", which is used to define the size of IDATA. The default value is 128, which is 80H in hexadecimal, and it is also the size of IDATA that needs to be initialized to 0 in the startup file. So when IDATA is defined as 80H, the code in STARTUP.A51 will initialize the RAM of 00-7F of IDATA to 0; similarly, if IDATA is defined as 0FFH, it will initialize the RAM of 00-FF of IDATA to 0.



The IDATA size of the STC8H series microcontroller we selected is 256 bytes (00-7F DATA and 80H-FFH IDATA), but because the last 17 bytes of RAM have written ID numbers and related test parameters, If users need to use this part of data in the program, they must not define IDATALEN as 256.

Press the shortcut key "Alt+F7" or select "Option for Target 'Target1'" in the menu "Project" to configure the project in the "Option for Target 'Target1'" dialog box:

Step 1. Enter the project setting page and select the "Debug" setting page;

Step 2. Select the hardware emulation "Use ... " on the right;

Step 3. Select "STC Monitor-51 Driver" item in the simulation driver drop-down list;

Step 4. Click the "Settings" button to enter the serial port settings screen;

Step 5: Set the port number and baud rate of the serial port. The serial port number should be the serial port corresponding to the STC universal USB to serial port tool. The baud rate is generally 115200 or 57600.

Make sure to complete the simulation settings.

The detailed steps are shown in the figure below:



-		1		-	
C Use Simula	tor	Settings	Use: STC M	Ionitor-51 Driver	<ul> <li>Settings</li> </ul>
Limit Speed	to Real-Time		2	3	4
Load Applic	cation at Startup 🔽 T	arget Setup	>	at Startup	Run to main()
Restore Debu Breakpo Watch Memory	ug Session Settings oints 🔽 Toolbo Windows & Performance Display	COM Port CO Baudrate 111 Set U7/U8 US ATTN : This optic using U7/U8 as 1	5 M6 5200 B-UART on is valid only for ICE testing board.	ssion Settings Toolb ws ay	pox
CPU DLL:	Parameter:	Otherwise maybe	e connect fail.	rameter:	
S8051.DLL		ок 6	Cancel	]	
Dialog DLL:	Parameter:		Dialog DLL:	Parameter:	
DP51.DLL	-pDP8051		TP51.DLL	-p51	

After finishing all the above work, you can press "Ctrl+F5" in Keil software to start simulation debugging. If the hardware connection is correct, you will enter a debugging interface similar to the following, and display the current simulation driver version number and the current simulation monitoring code firmware version number in the command output window, as shown in the following figure:

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Driver version Firmeare version and "Dollheem(\o	: V1.1 V3.2 Djecta	0 \\Demo#	Name • 16	Location/Value Type Cdb/0003	

During the simulation debugging process, you can perform multiple operations such as resetting, running at full speed, single stepping, and setting breakpoints.

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As shown in the figure above, multiple breakpoints can be set in the program, and the maximum number of breakpoint settings currently allowed is 20 (in theory, any number can be set, but setting too many breakpoints will affect the speed of debugging).

### 5 Application circuit diagram

### 5.1 U8W tool application reference circuit diagram



### 5.2 STC Universal USB to Serial Tool Application Reference Circuit

#### Diagram

