CH643 Evaluation Board Reference

Version: V1.1

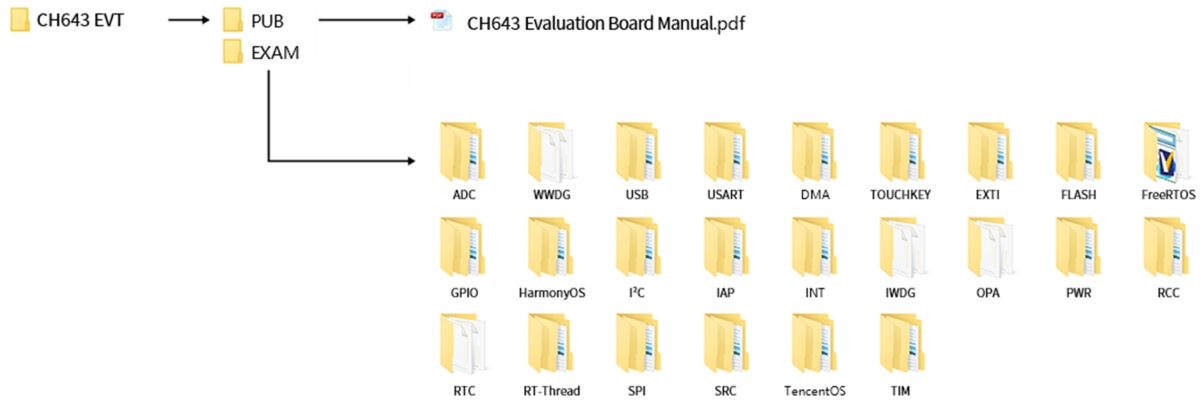
https://wch-ic.com

1. Overview

This evaluation board is applied to the development of the CH643 chip. The IDE uses the MounRiver compiler, with the option of WCH-Link for emulation and download, and provides reference examples and demonstrations of applications related to chip resources.

2. Software Development

2.1 EVT package directory structure



Description:

PUB folder: provides evaluation board manuals.

EXAM folder: Provides software development drivers and corresponding examples for the CH643 controller, grouped by peripheral. Each type of peripheral folder contains one or more functional application routines folders.

2.2 IDE use-MounRiver

Download MounRiver_Studio, double click to install it, and you can use it after installation. (MounRiver_Studio instructions are available at the path: MounRiver\MounRiver_Studio\ MounRiver_Help.pdf and MounRiver_ToolbarHelp.pdf)

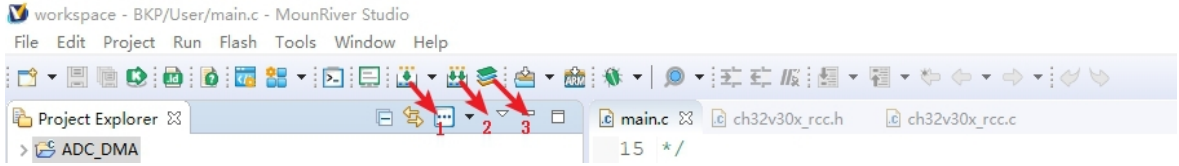
2.2.1 Open project

➢ Open project:

1) Double-click project file directly with the suffix name .wvproj under the corresponding project path.
2) Click File in MounRiver IDE, click Load Project, select the .project file under the corresponding path, and click Confirm to apply it.

2.2.2 Compilation

MounRiver contains three compilation options, as shown in the following figure.



Compile option 1 is Incremental Build, which compiles the modified parts of the selected project.

Compile option 2 is ReBuild, which performs a global compilation of the selected project.

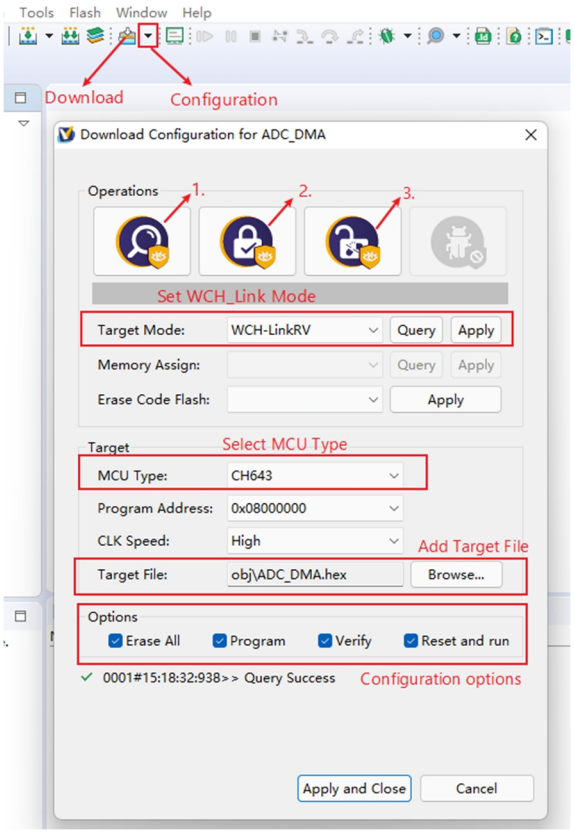
Compile option 3 is All Build, which performs global compilation for all projects.

2.2.3 Download/Simulation

➢ Download

1) Debugger download

Connect to the hardware via WCH-Link (see WCH-Link instructions for details, path: MounRiver\MounRiver_Studio\ WCH-Link instructions.pdf), click the Download button on the IDE, and select Download in the pop-up interface, as shown in the figure below.



1 For querying the chip read protection status.

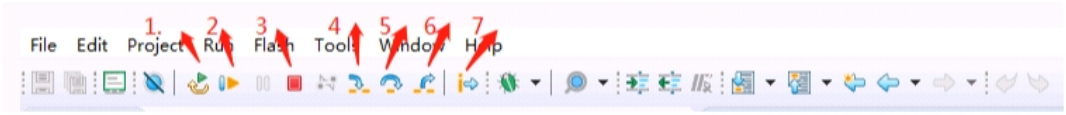
2 For setting the chip read protection and re-powering the configuration to take effect.

3 For lifting the chip read protection and re-powering the configuration to take effect.

➢ Simulation

1) Toolbar description

Click Debug button in the menu bar to enter the download, see the image below, the download toolbar.



Detailed functions are as follows.

(1) Reset: After reset, the program returns to the very beginning.

(2) Continue: Click to continue debugging.

(3) Terminate: Click to exit debugging.

(4) Single-step jump-in: Each time you tap a key, the program runs one step and encounters a function to enter and execute.

(5) Single-step skip: jump out of the function and prepare the next statement.

(6) Single-step return: return the function you jumped into

Instruction set single-step mode: click to enter instruction set debugging (need to use with 4, 5 and 6 functions).

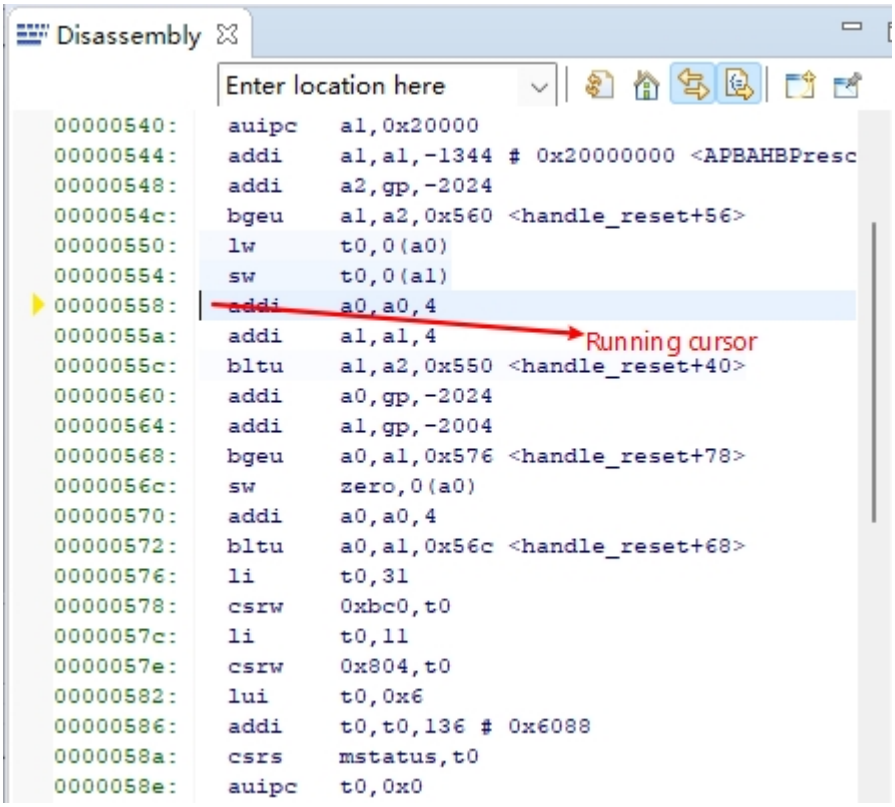
2) Set breakpoints

Double-click on the left side of the code to set a breakpoint, double click again to cancel the breakpoint, set the breakpoint as shown in the following figure;

3) Interface display

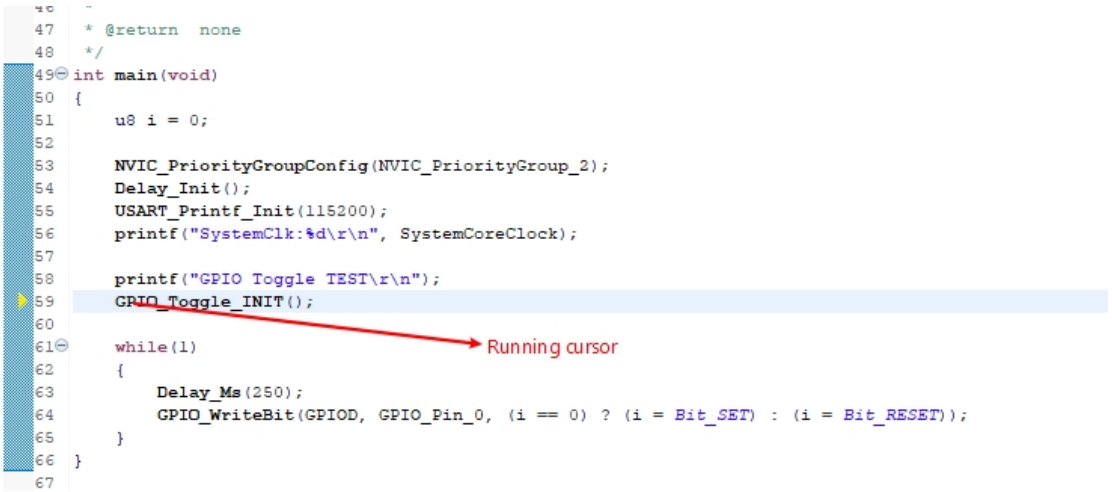
(1) Instruction set interface

Click on the instruction set single-step debugging can enter the instruction debugging, to single-step jump in for example, click once to run once, the running cursor will move to view the program running, the instruction set interface is shown as follows.



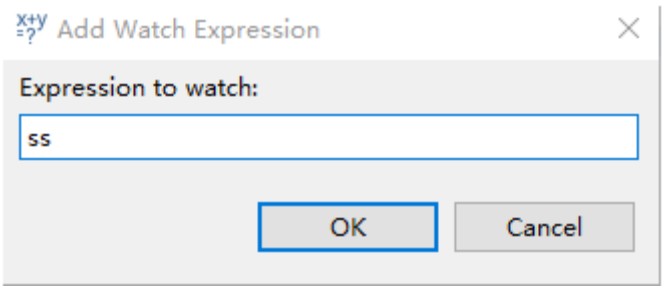
(2) Program running interface

It can be used with instruction set single-step debugging, still take single-step jumping in as an example, click once to run once, the running cursor will move to view the program running, the program running interface is shown as follows.

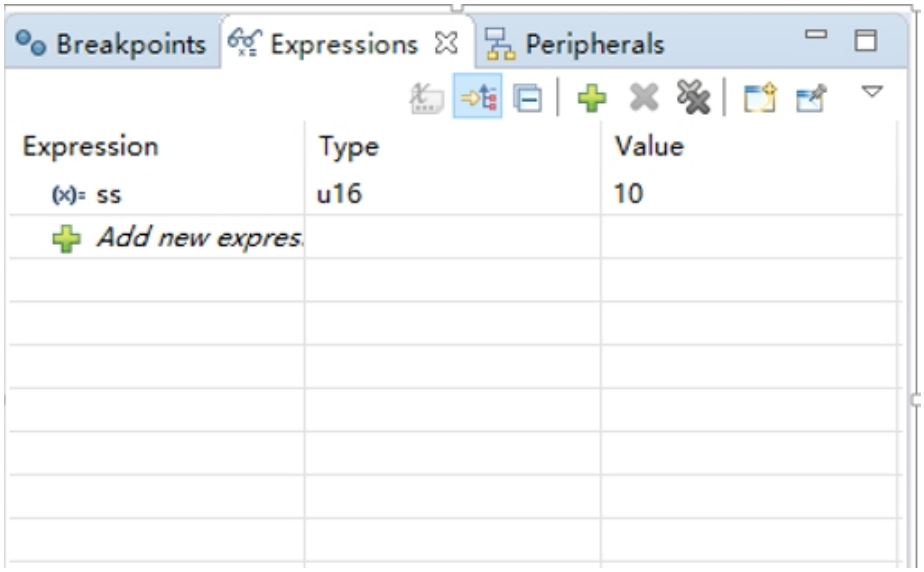


4) Variables

Hover over the variable in the source code to display the details, or select the variable and right-click add watch expression

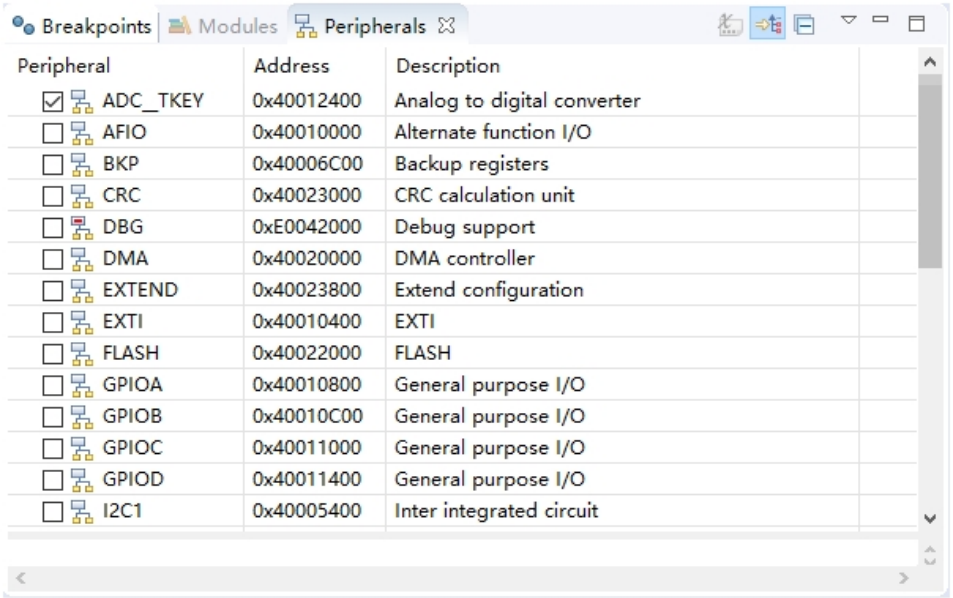


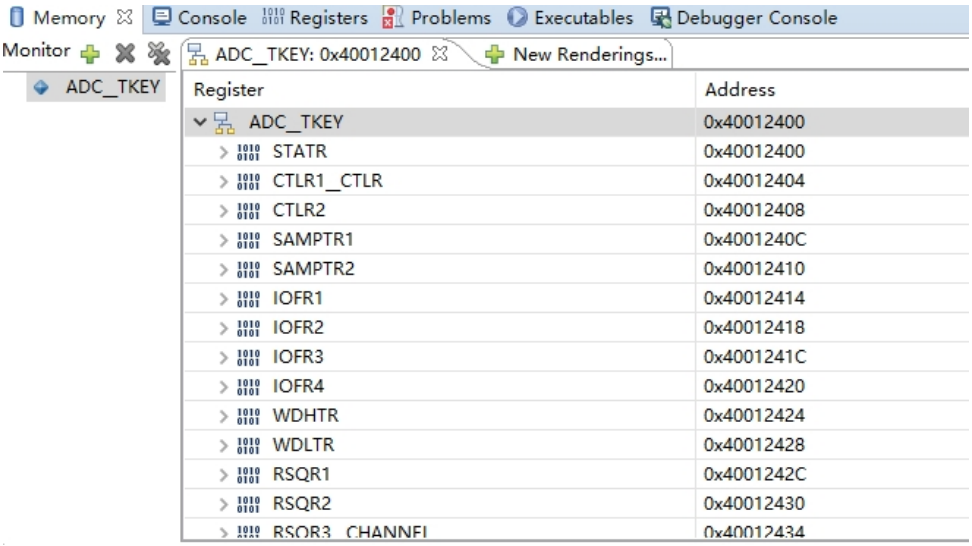
Fill in the variable name, or just click OK to add the variable you just selected to the pop-up.



5) Peripheral registers

In the lower left corner of IDE interface Peripherals interface shows a list of peripherals, tick the peripherals will display its specific register name, address, value in the Memory window.





Note:

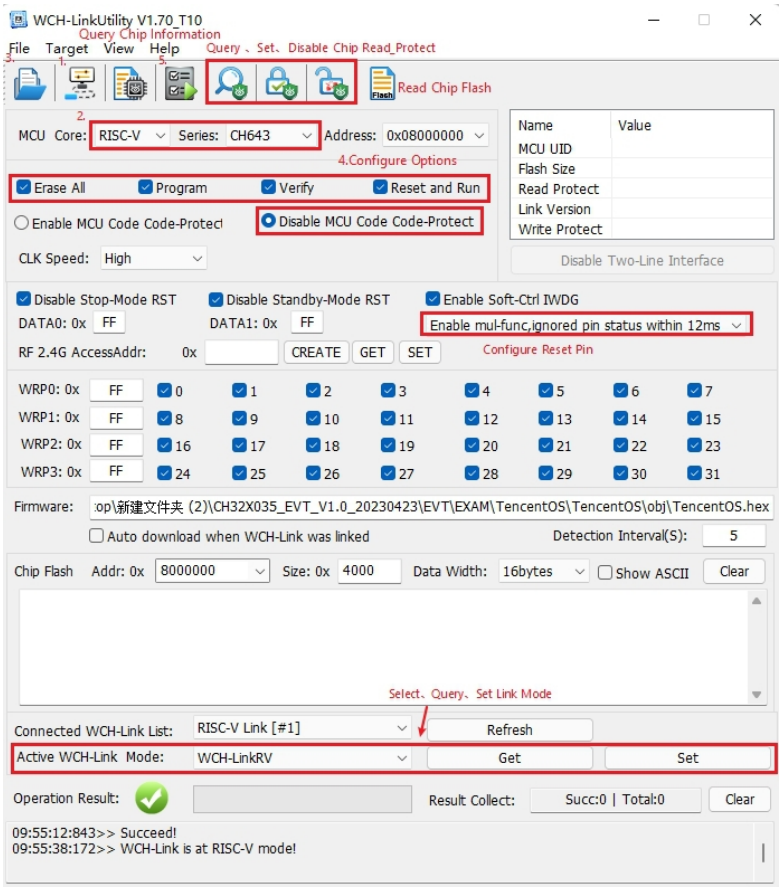
(1) When debugging, click the icon in the upper right corner to enter the original interface.

(2) For documentation to access the compiler, click F1 to access the help documentation for detailed instructions.

3. WCH-LinkUtility.exe Download

The download process for the chip using the WCH-LinkUtility tool is:

1) Connect WCH-Link
2) Select chip information
3) Add firmware
4) If the chip is read protected, you need to release the chip read protection.
5) Execute


WCH-LinkUtility V1.70_T10
Query Chip Information
File Target View Help
Query 、Set、Disable Chip Read_Protect
Read Chip Flash
MCU Core: RISC-V Series: CH643 Address: 0x08000000
4.Configure Options
Erase All Program Verify Reset and Run
Enable MCU Code Code-Protect
Disable MCU Code Code-Protect
CLK Speed: High
Name Value
MCU UID
Flash Size
Read Protect
Link Version
Write Protect
Disable Two-Line Interface
Disable Stop-Mode RST
Disable Standby-Mode RST
Enable Soft-Ctrl IWDG
DATA0: 0x FF
DATA1: 0x FF
Enable mul-func,ignored pin status within 12ms
RF 2.4G AccessAddr: 0x CREATE GET SET
Configure Reset Pin
WRP0: 0x FF
WRP1: 0x FF
WRP2: 0x FF
WRP3: 0x FF
Firmware: :op\新建文件夹 (2)\CH32X035_EVT_V1.0_20230423\EVT\EXAM\TencentOS\TencentOS\obj\TencentOS.hex
Auto download when WCH-Link was linked
Detection Interval(S): 5
Chip Flash Addr: 0x 8000000 Size: 0x 4000 Data Width: 16bytes Show ASCII Clear
Select、Query、Set Link Mode
Connected WCH-Link List: RISC-V Link [#1] Refresh
Active WCH-Link Mode: WCH-LinkRV Get Set
Operation Result:
Result Collect: Succ:0 | Total:0 Clear
09:55:12:843>> Succeed!
09:55:38:172>> WCH-Link is at RISC-V mode!

4. WCHISPTool.exe Download

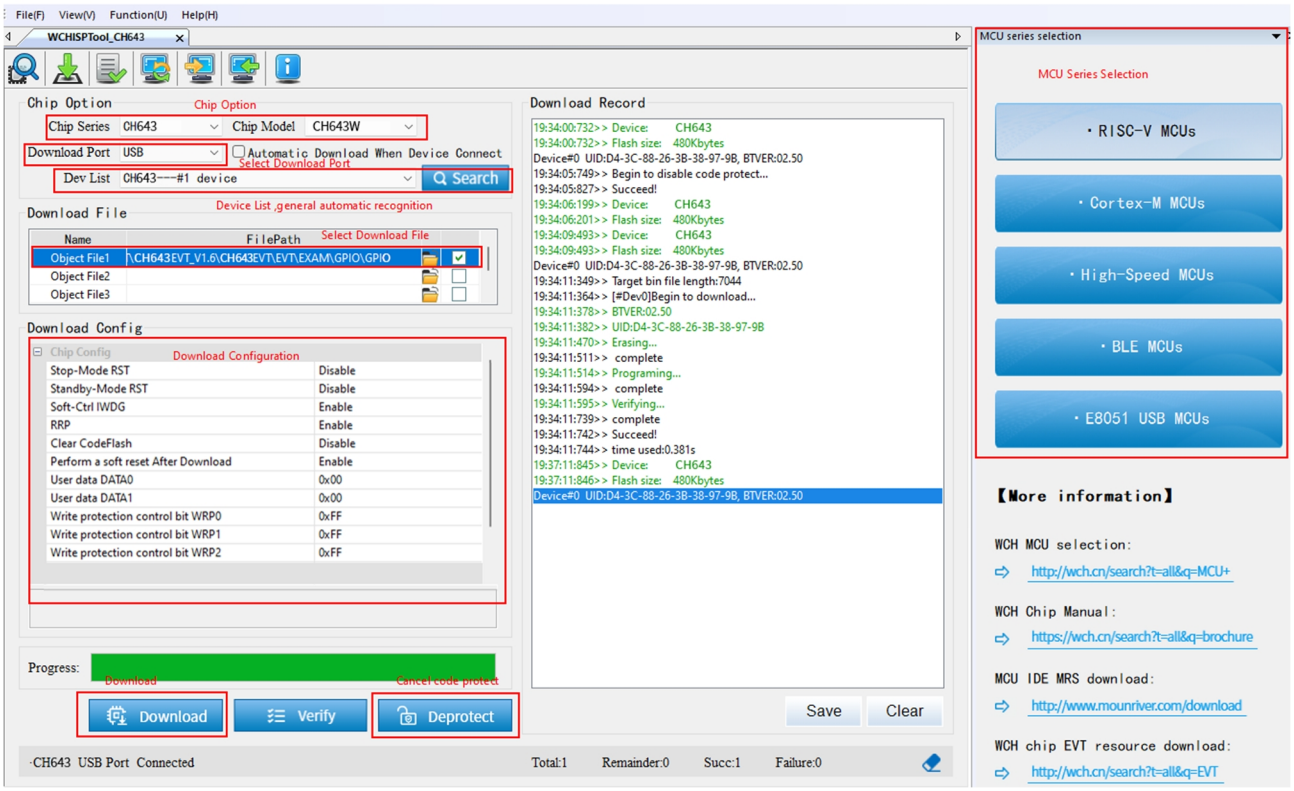
The WCHISPTool tool is used to download the chip, supporting both USB and serial port. the USB pins are PC16 (DM), PC17 (DP), and the serial port pins are PA2 (TX), PA3 (RX). The download process is:

(1) PC17 is connected to VCC, PC16 is connected to ground, and the PC is connected via serial port or USB.

(2) Open the WCHISPTool tool, select the appropriate download method, choose to download the firmware, check the chip configuration and click download.

(3) Ground PC17, reapply power and run APP program.

The WCHISPTool tool interface is shown in the following figure.



1. Select MCU series and chip model
2. Select USB or the serial port download mode
3. Identify the device, usually automatically, if it fails to identify, you need to select manually
4. Select the firmware, select the downloaded .hex or .bin target program file
5. Configure the download according to the requirements
6. Click download

5. Statement of attention

1) If you use WCH-Link to download, refer to WCH-Link instructions for specific switching mode. Detailed inquiries\questions can be logged in the following.

WCH official website: https://www.wch-ic.com/

WCH-LINK instructions for use: https://www.wch-ic.com/products/WCH-Link.html