Shanghai MindMotion Microelectronics Co., Ltd.

MM32-LINK

Quick Start Manual

for MM32 Full Series Microcontroller

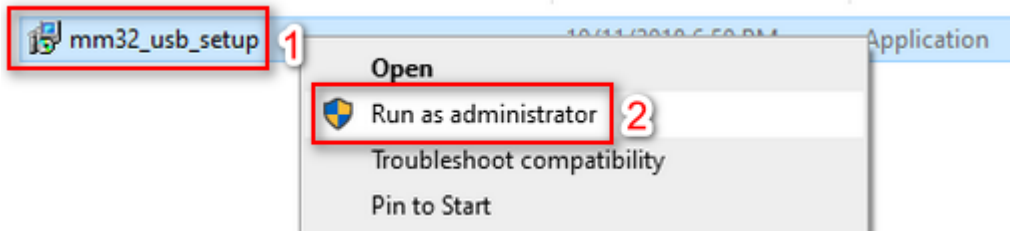
Version: 1.1

We reserve the right to change relevant information without notice.

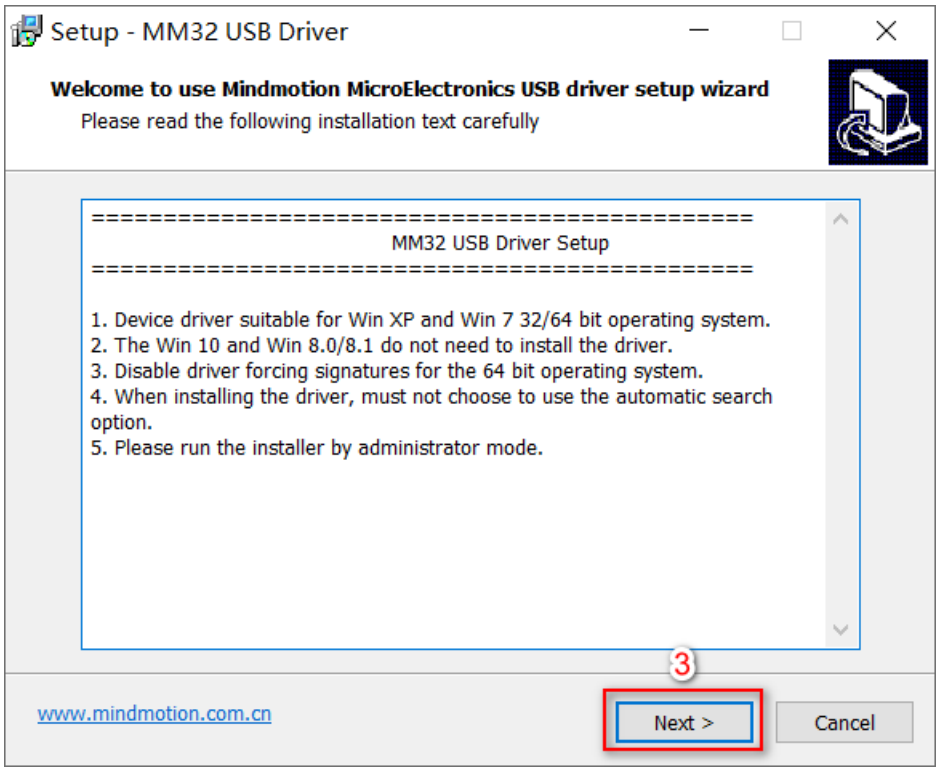
Table of Contents

1. Installation of mm32_usb_setup

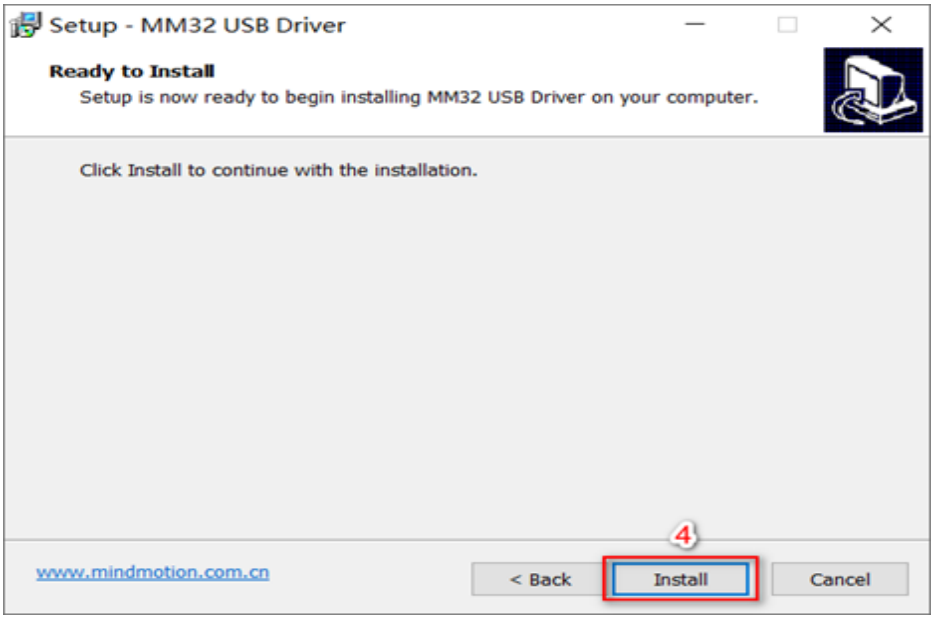
MM32 USB driver is not required for Win10/Win8.0/Win8.1. Please visit the website: http://www.mm32.com.cn to download MM32 USB driver installation package applicable to Win XP, Win7 32/64-bit operating systems, and decompress it into mm32_usb_setup.exe program. Then, right click to run mm32_usb_setup.exe program as administrator (do not connect MM32-LINK to computer before the installation).

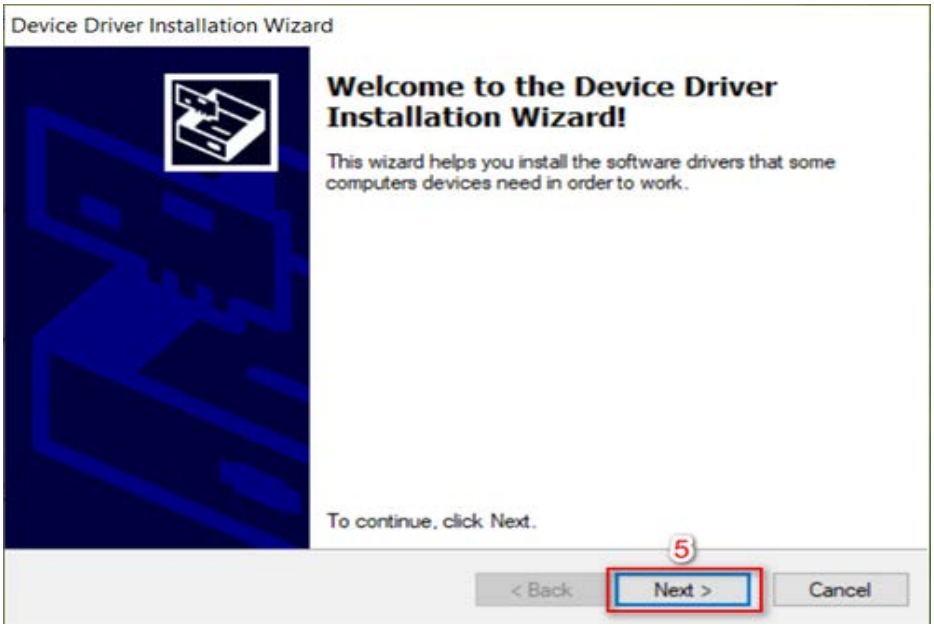


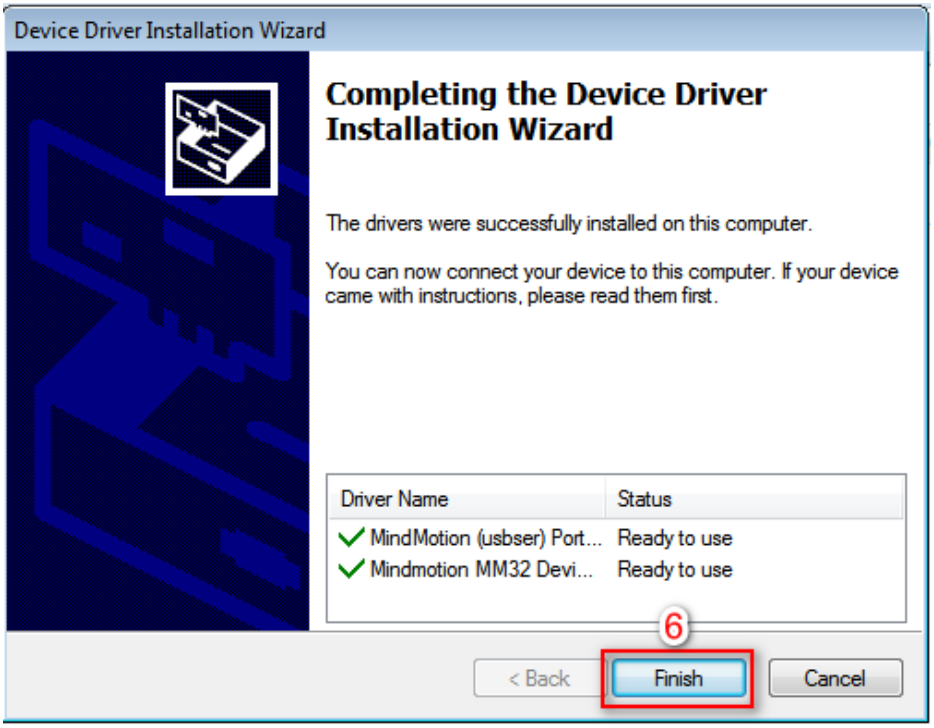
Select the language to be used for the installation, and click Next continuously during the installation.



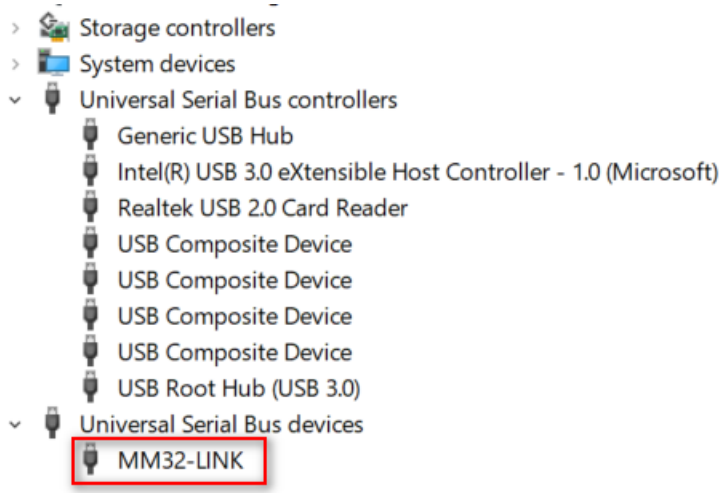
Click Install, then click Next until MM32-LINK USB Driver is installed.


Setup - MM32 USB Driver
Ready to Install
Setup is now ready to begin installing MM32 USB Driver on your computer.
Click Install to continue with the installation.
www.mindmotion.com.cn
4
< Back
Install
Cancel


Device Driver Installation Wizard
Welcome to the Device Driver Installation Wizard!
This wizard helps you install the software drivers that some computers devices need in order to work.
To continue, click Next.
5
< Back
Next >
Cancel

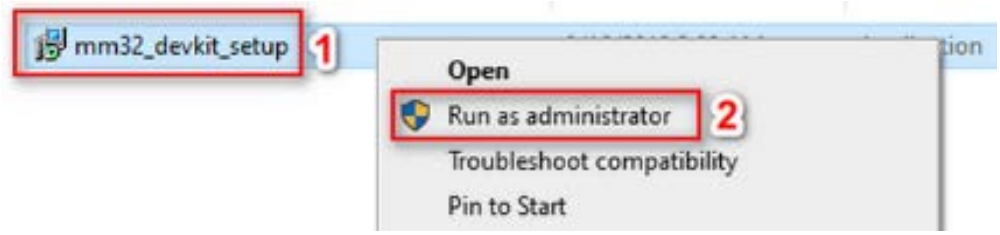


After installing MM32 USB driver, connect MM32-LINK to the computer through USB cables, and check MM32-LINK device in the Device Manager.

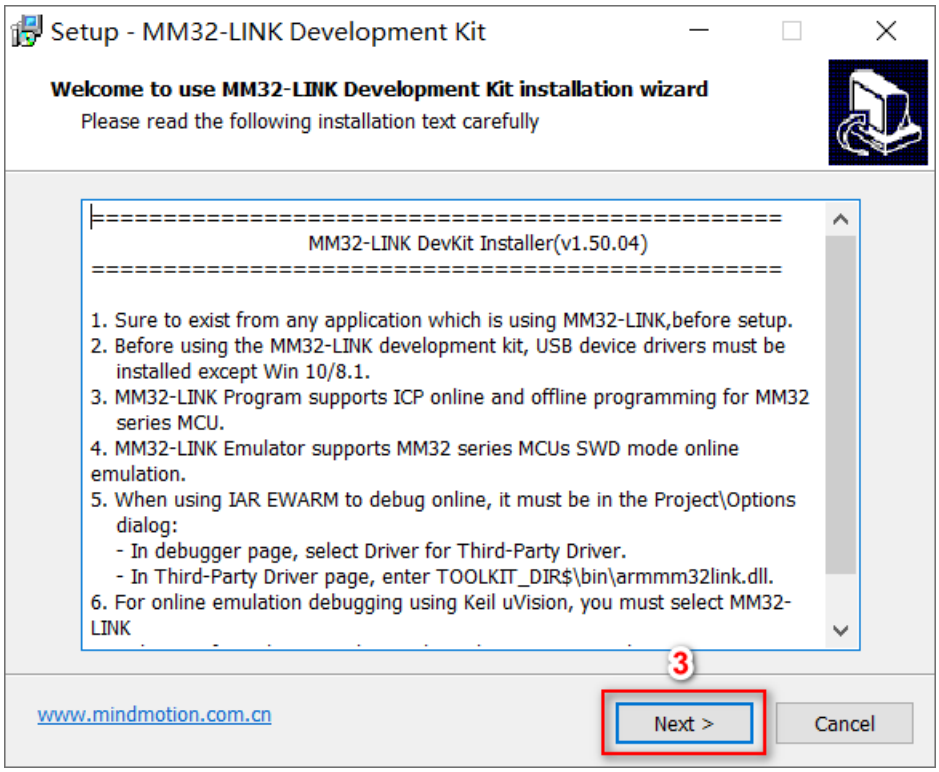


2. Installation of mm32_devkit_setup

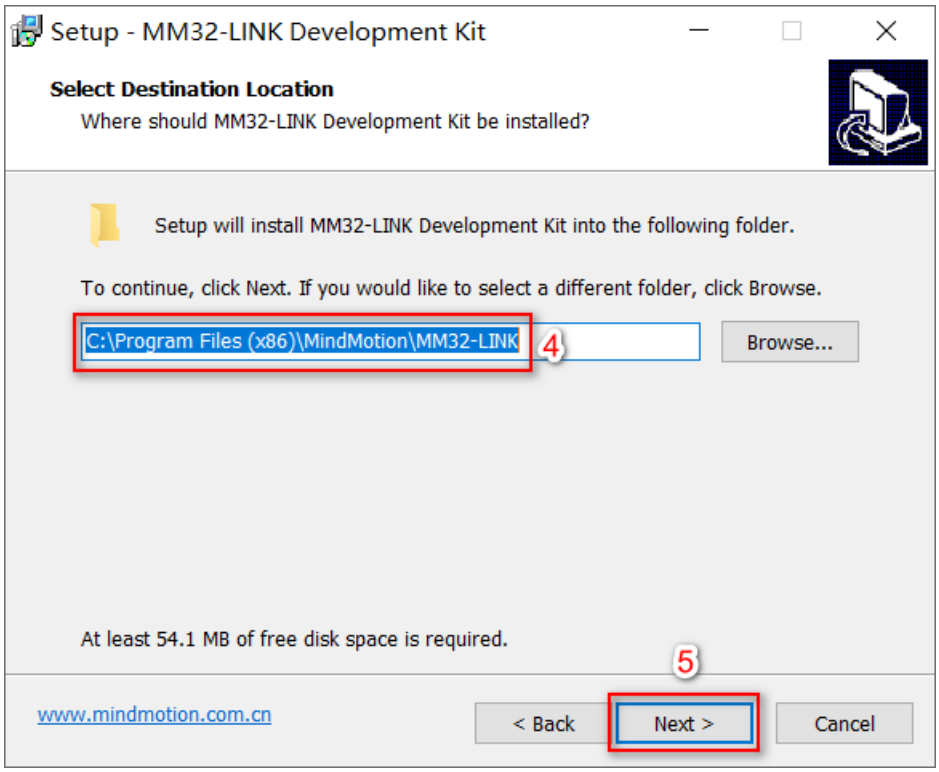
The MM32-Link programming, developing and debugging installation package includes the driver component of MM32-Link KEIL Debugger, driver component of MM32-Link IAR Debugger, MM32Program PC software and instructions for use. Please visit the website: http://www.mm32.com.cn, to download the MM32-Link programming, developing and debugging installation package. Decompress the package and click the file mm32_devkit_setup.exe for installation (right click and select "Run as Administrator").

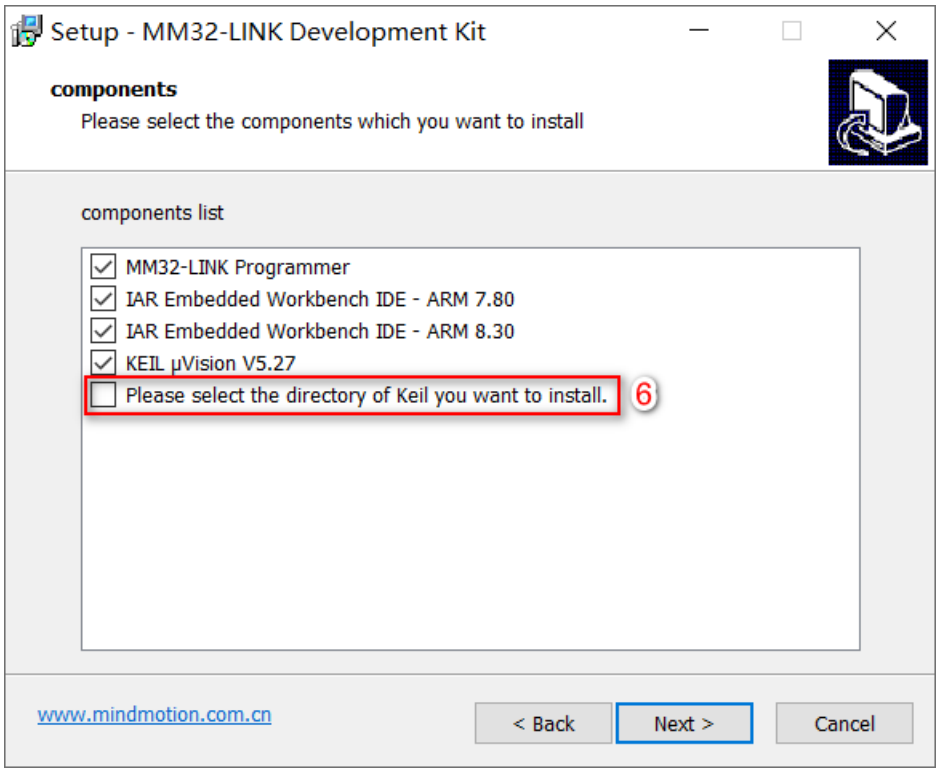


Select the language to be used for the installation, and click Next continuously during the installation.

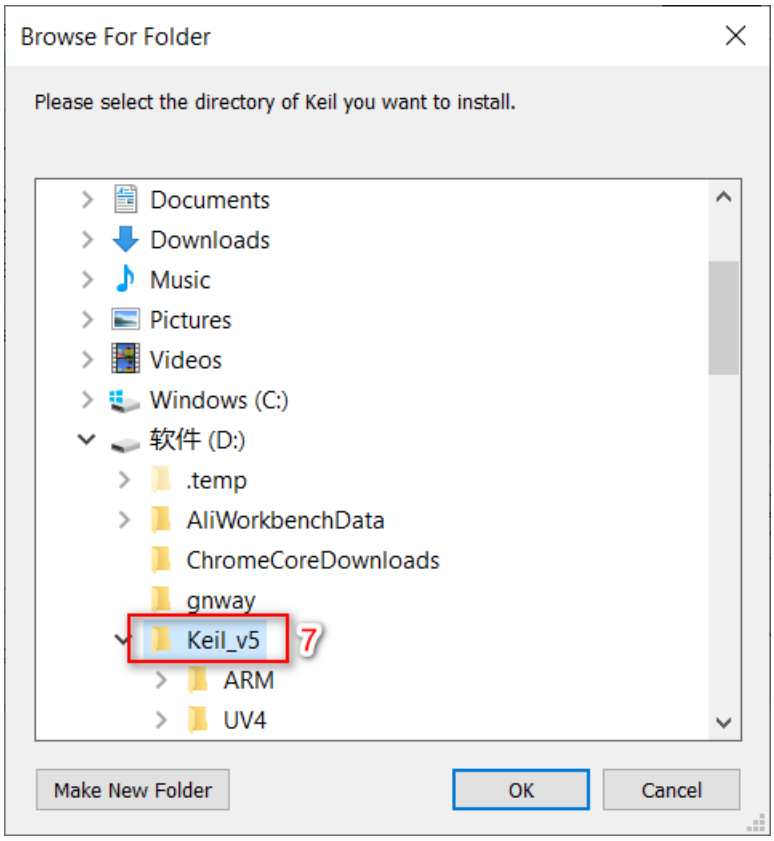


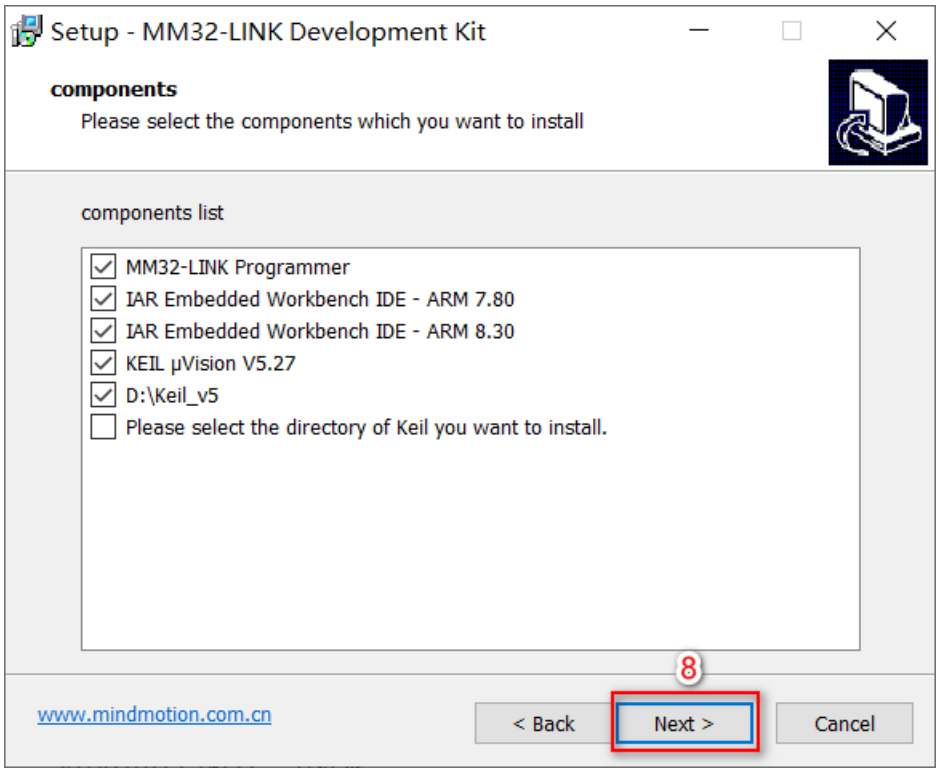
Select the default installation path.



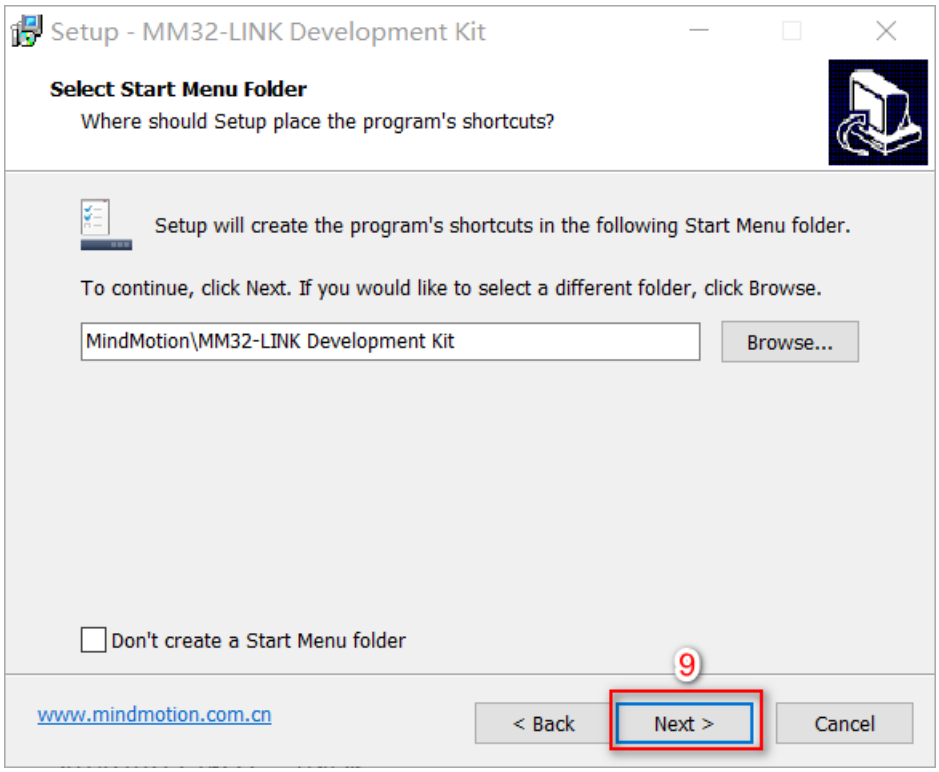


Check the components that need to be installed. If KEIL and IAR have been installed on the computer, the software will automatically identify the directories of installed KEIL and IAR; if the computer is installed with more than one KEIL and IAR, the software can only identify the KEIL directory which is last installed, and other KEIL directories need to be added manually. For example, the installation path of KEIL5 is D:\Keil_v5, and only D:\Keil_v5 needs to be added manually.

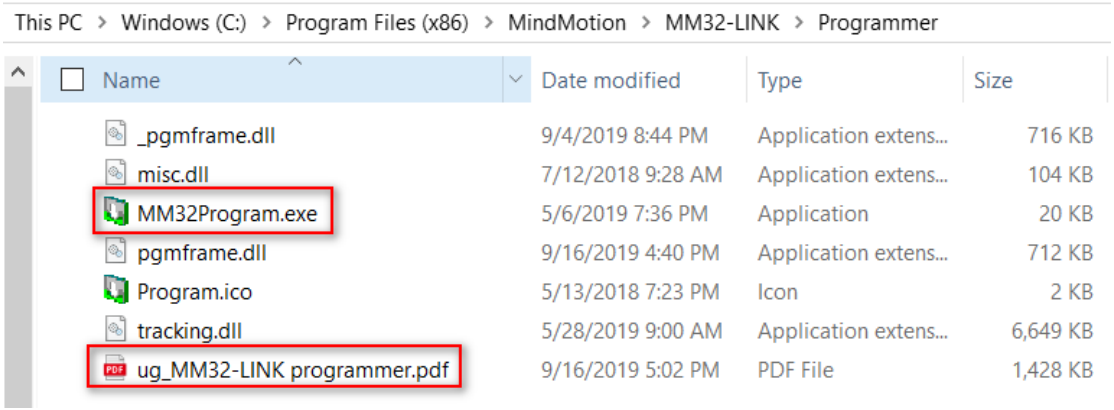




During the installation process, click Next continuously.



After the installation, you can see the MM32Program and ug_MM32-LINK programmerPDF (User Manual) under the installation directory C:\Program Files (x86)\MindMotion\MM32-LINK\Programmer.

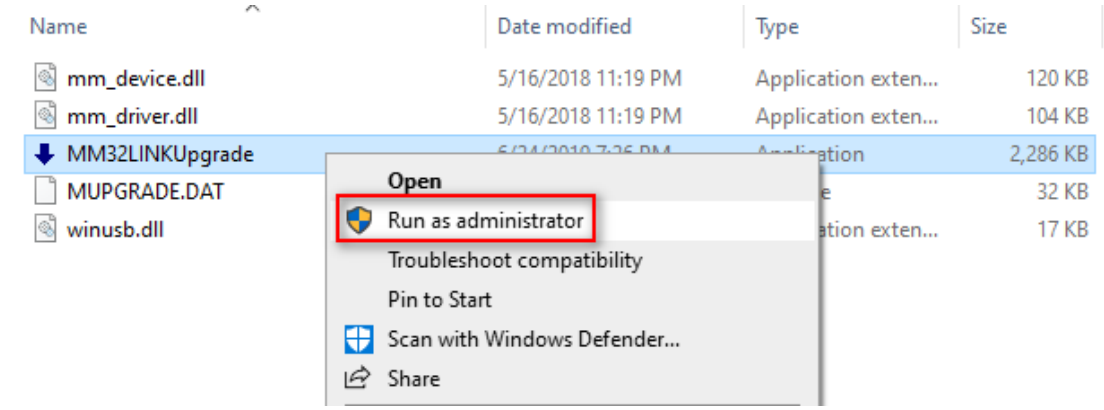


You can see MM32LINKCM3.dll files under the KEIL installation directory C:\Keil_v5\ARM\BIN.

You can see armmm32link.dll files under the IAR installation directory C:\Program Files (x86)\IAR Systems\Embedded Workbench 8.0\arm\bin.

3. Firmware Upgrade of MM32-LINK

Visit the website: http://www.mm32.com.cn to download Upgrade v1.36, the MM32-Link firmware upgrade package, and insert MM32-LINK to ensure MM32-LINK is not occupied by KEIL, IAR or MM32LINK program. Then, right click MM32LINK Upgrade.exe and click Run as Administrator.



4. Connection mode between programmer and target object

4.1 Online ICP connection mode

The online ICP connection mode between the MM32-LINK programmer and the MM32-MiniBoard is as shown in Figure 1, and the connection interface is a 20-core simulation socket.

Figure 1: Online ICP Connection Mode

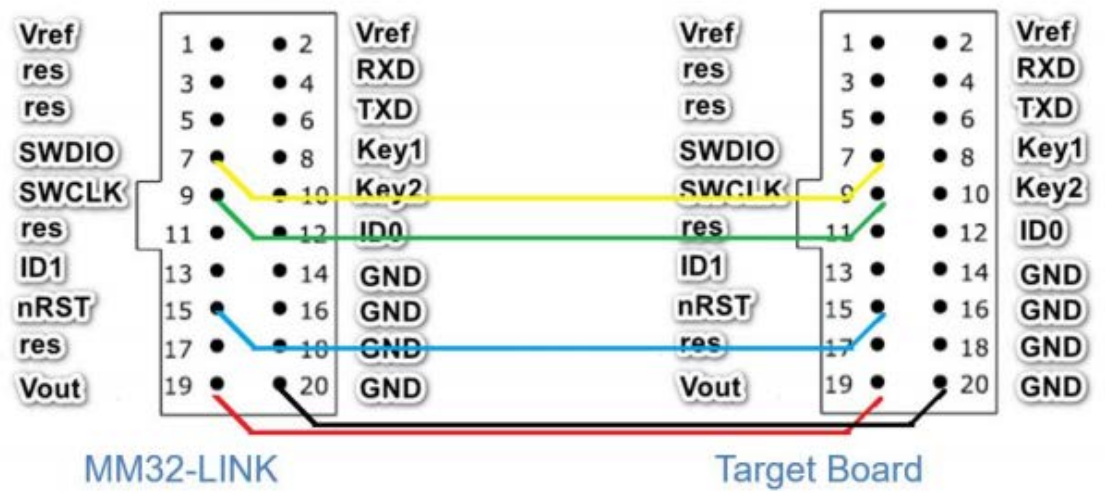


Figure 2: Connection between MM32-LINK and Target Board

During the downloading and debugging in KEIL and IAR, the external power supply mode is adopted for the target board, and MM32-LINK and the target board shall be connected to nRST, SWDIO, SWCLK and GND pins; the target board is powered by MM32-LINK, and MM32-LINK and the target board shall be connected to nRST, SWDIO, SWCLK, Vout and GND pins, of which the Pin Vout enables outputting 3.3 V or 5 V voltage through software configuration (refer to the following voltage output configuration for details).

4.2 Offline ICP connection mode

The offline ICP connection mode between the MM32-LINK programmer and MM32-MiniBoard is as shown in Figure 3, which requires the offline programming adapter for connection. The left figure shows the connection using ICP-Adapter and the right figure shows the connection by APM-Adapter.

Figure 3 Offline ICP Connection Mode

The connection interface between the programming adapter and MM32-MiniBoard is a 6-core programming socket, and the pin wiring is as shown in Figure 4.

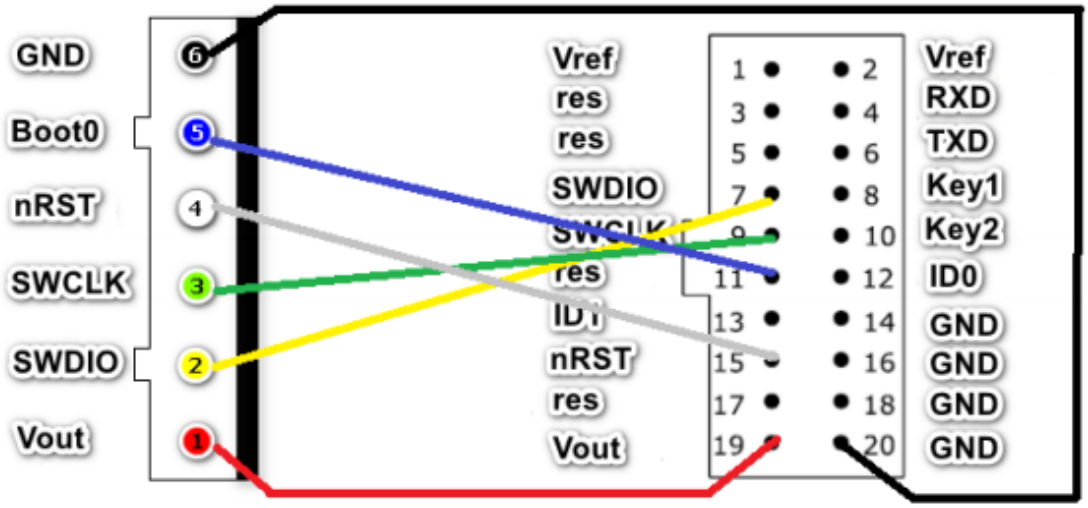
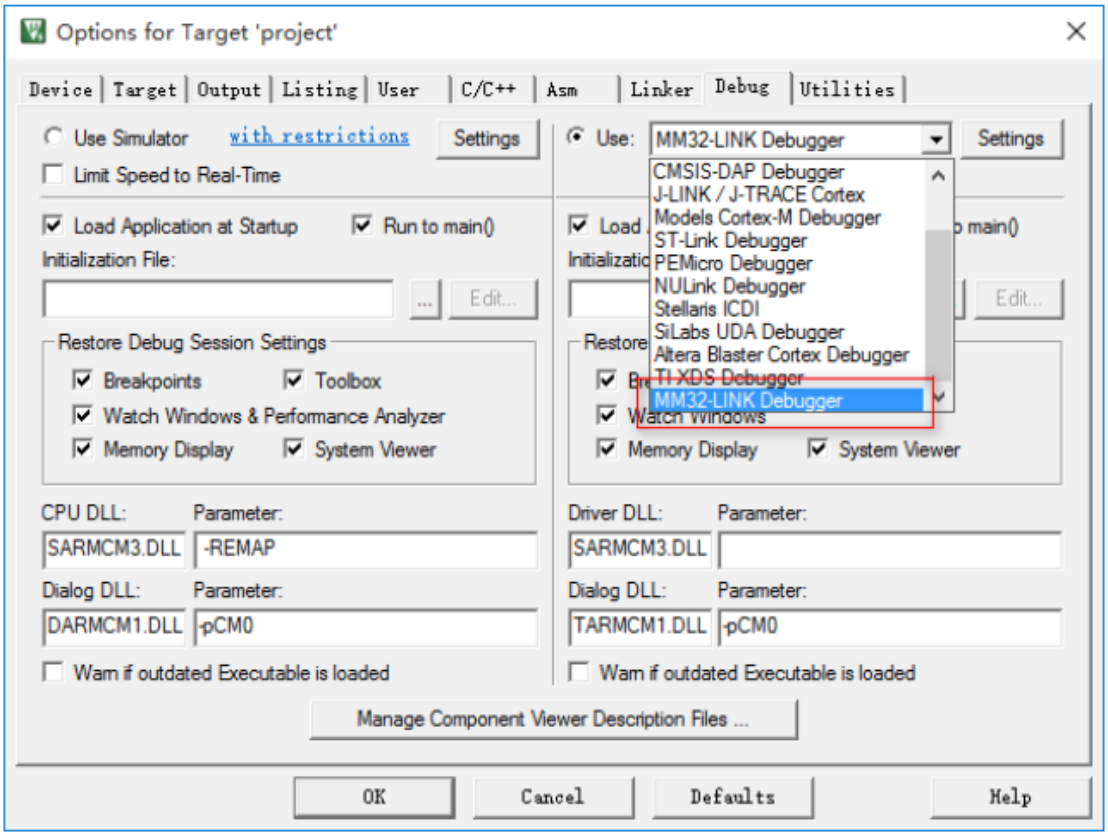


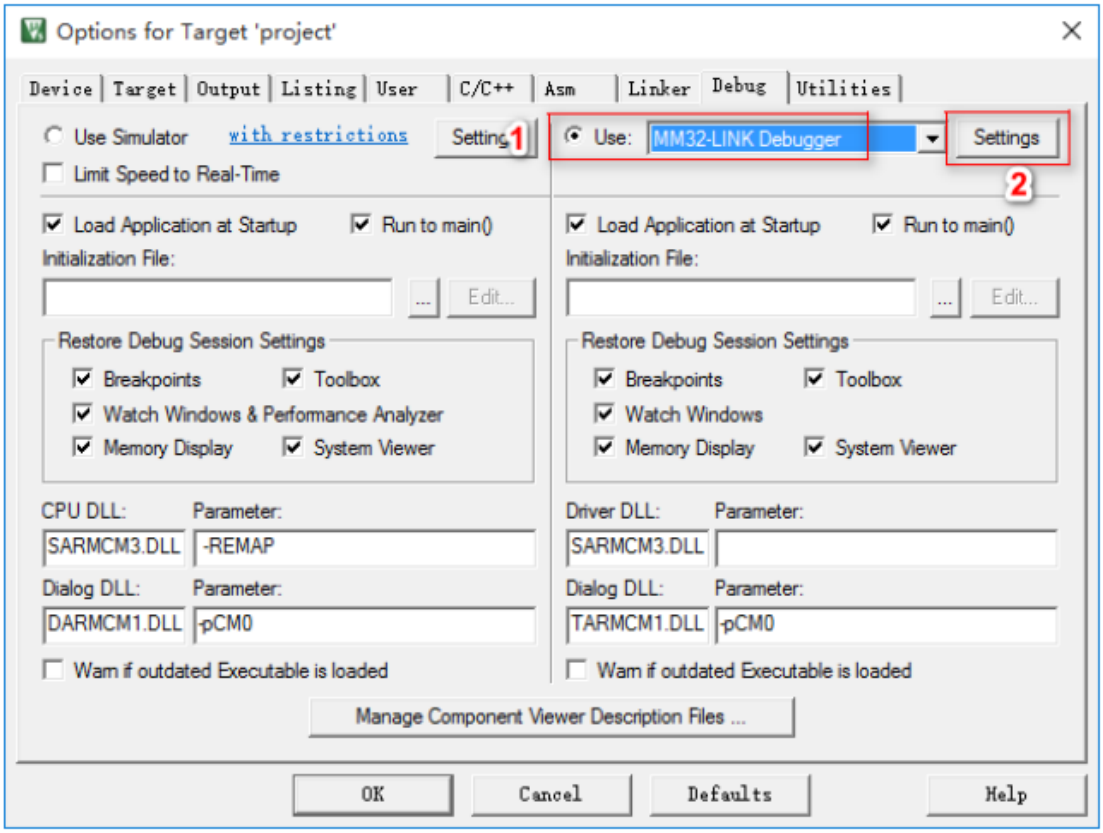
Figure 4 Wiring between Programming Socket and Target Board

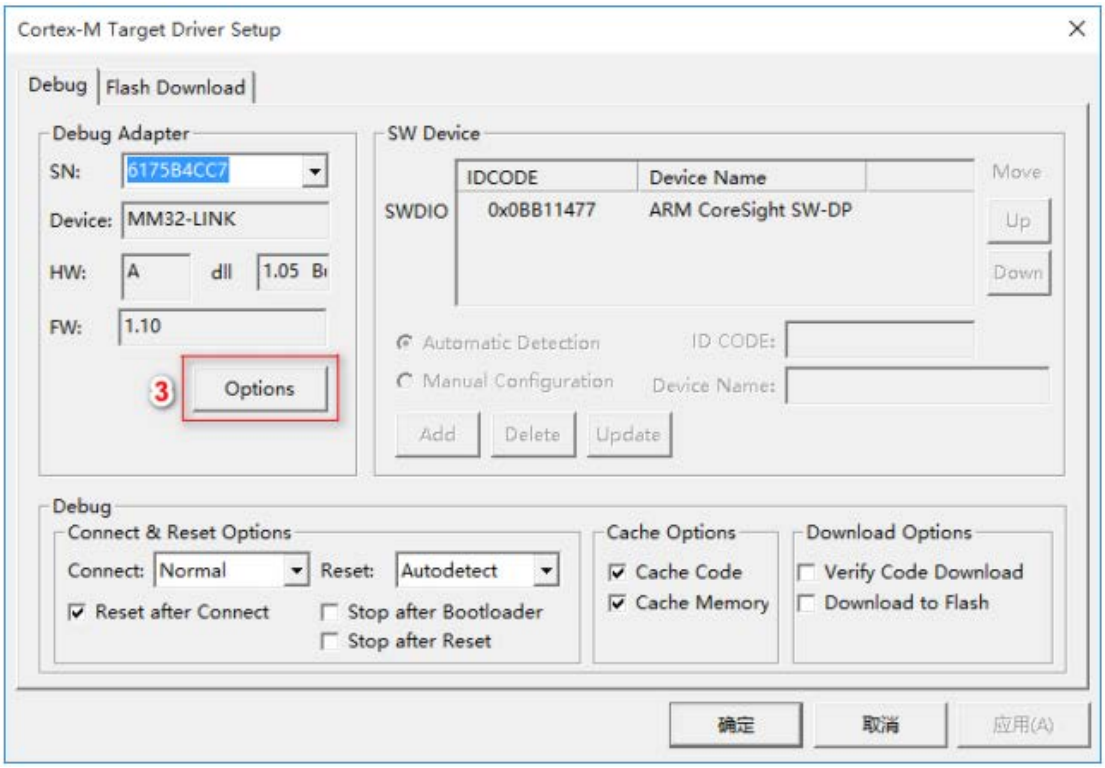
5. Online debugging mode of MM32-LINK

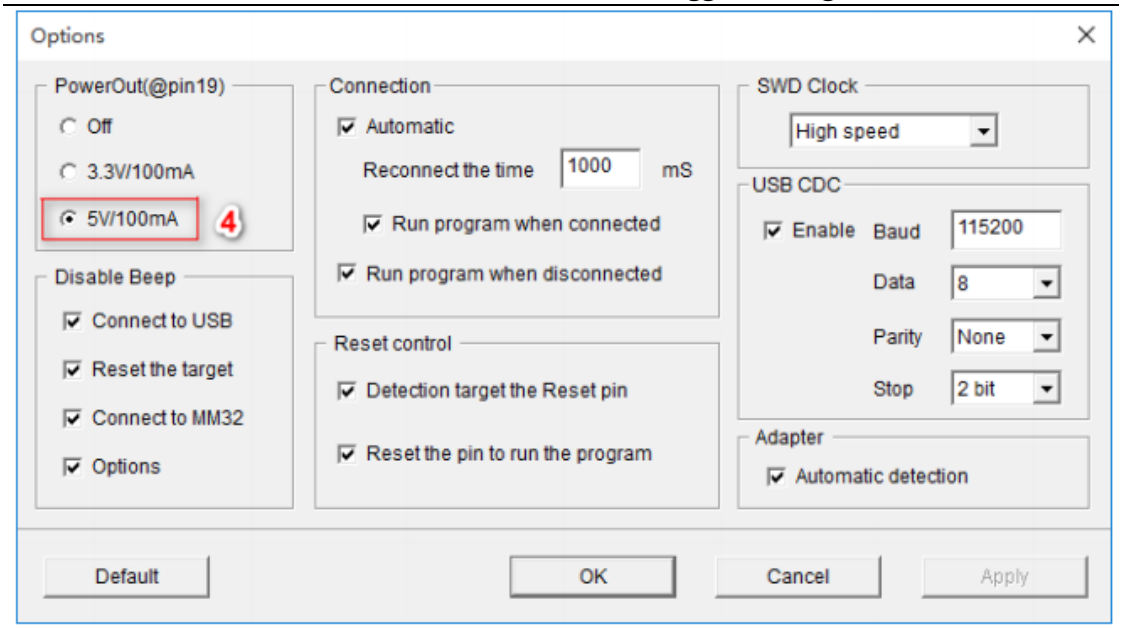
5.1 Debugging under Keil

Keil: select MM32-LINK Debugger from the Options\Debug drop-down list.



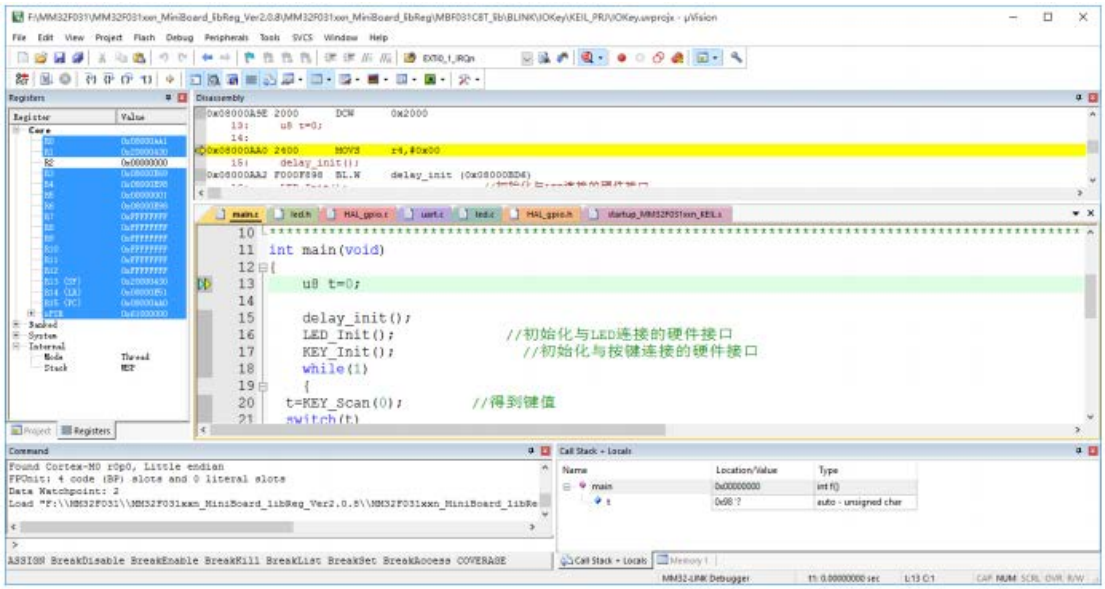

Options for Target 'project'
Device
Target
Output
Listing
User
C/C++
Asm
Linker
Debug
Utilities
Use Simulator
with restrictions
Setting
1
Use:
MM32-LINK Debugger
Settings
2
Limit Speed to Real-Time
Load Application at Startup
Run to main()
Initialization File:
Edit...
Restore Debug Session Settings
Breakpoints
Toolbox
Watch Windows & Performance Analyzer
Watch Windows
Memory Display
System Viewer
CPU DLL:
Parameter:
SARMCM3.DLL
-REMAP
Dialog DLL:
DARMCM1.DLL
-pCM0
Driver DLL:
TARMCM1.DLL
Warn if outdated Executable is loaded
Manage Component Viewer Description Files ...
OK
Cancel
Defaults
Help


Cortex-M Target Driver Setup
Debug
Flash Download
Debug Adapter
SN:
6175B4CC7
Device:
MM32-LINK
HW:
A
dll
FW:
1.10
3
Options
SW Device
IDCODE
Device Name
SWDIO
0x0BB11477
ARM CoreSight SW-DP
Move
Up
Down
Automatic Detection
ID CODE:
Manual Configuration
Device Name:
Add
Delete
Update
Debug
Connect & Reset Options
Connect:
Normal
Reset:
Autodetect
Reset after Connect
Stop after Bootloader
Stop after Reset
Cache Options
Cache Code
Cache Memory
Download Options
Verify Code Download
Download to Flash
确定
取消
应用(A)



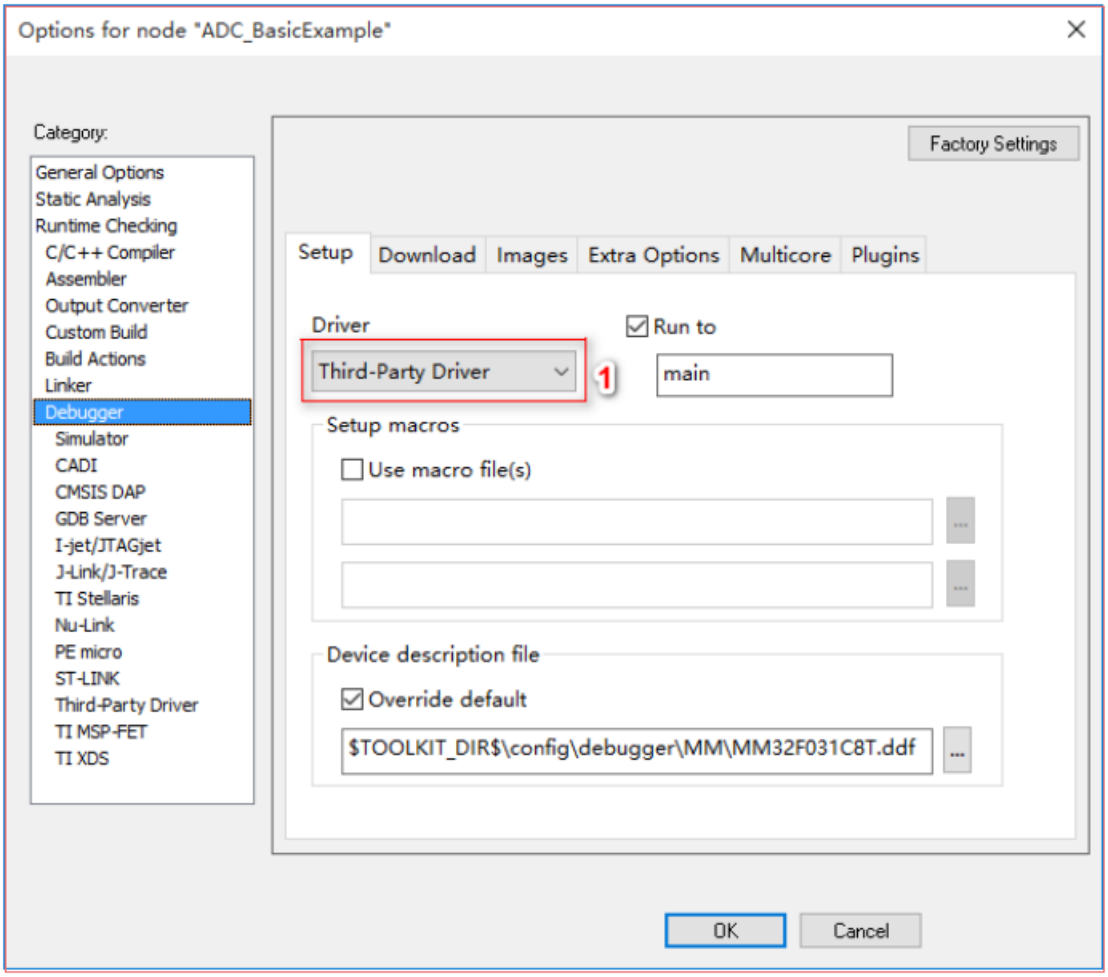
After achieving the output of 5 V power by following Steps 1, 2, 3 and 4, click Debug or Ctrl+F5 for downloading and debugging after compiling in KEIL project.

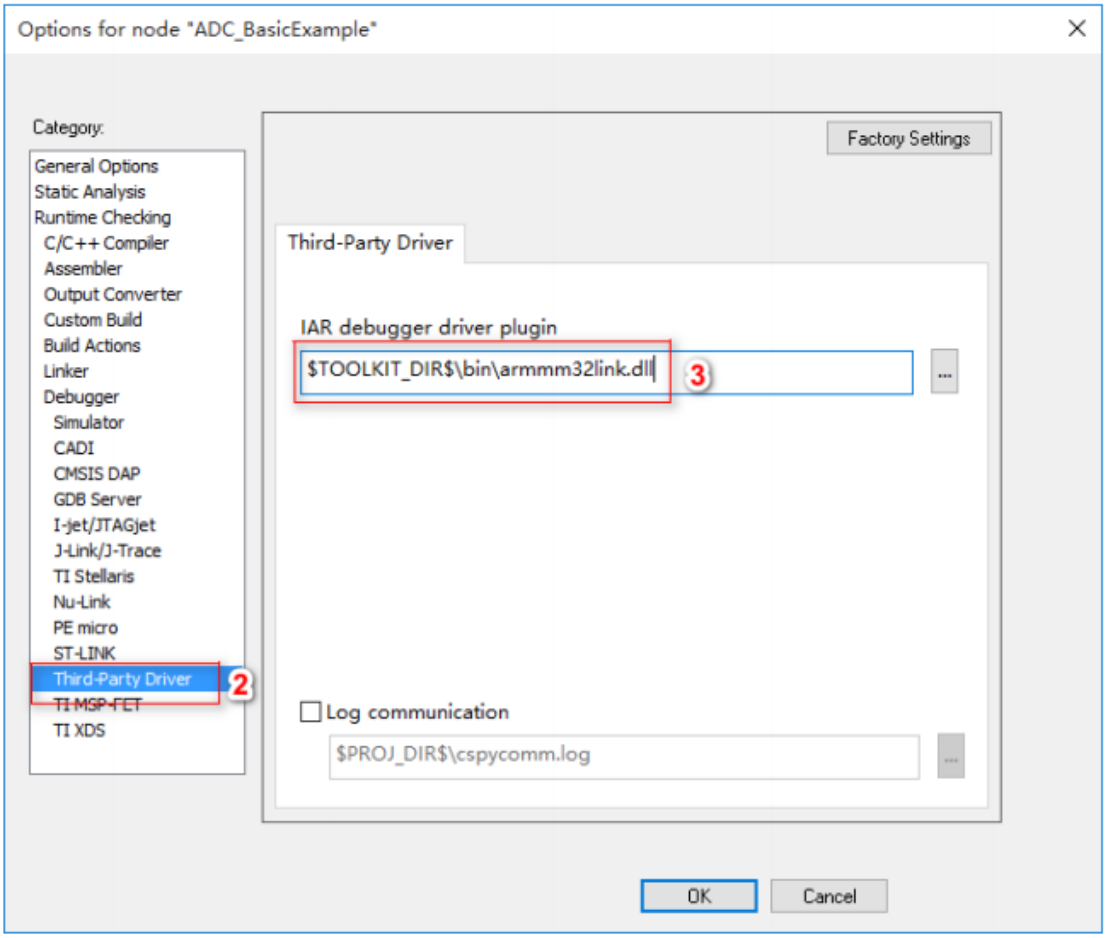
Then, enter the KEIL debugging interface:



5.2 Debugging under IAR

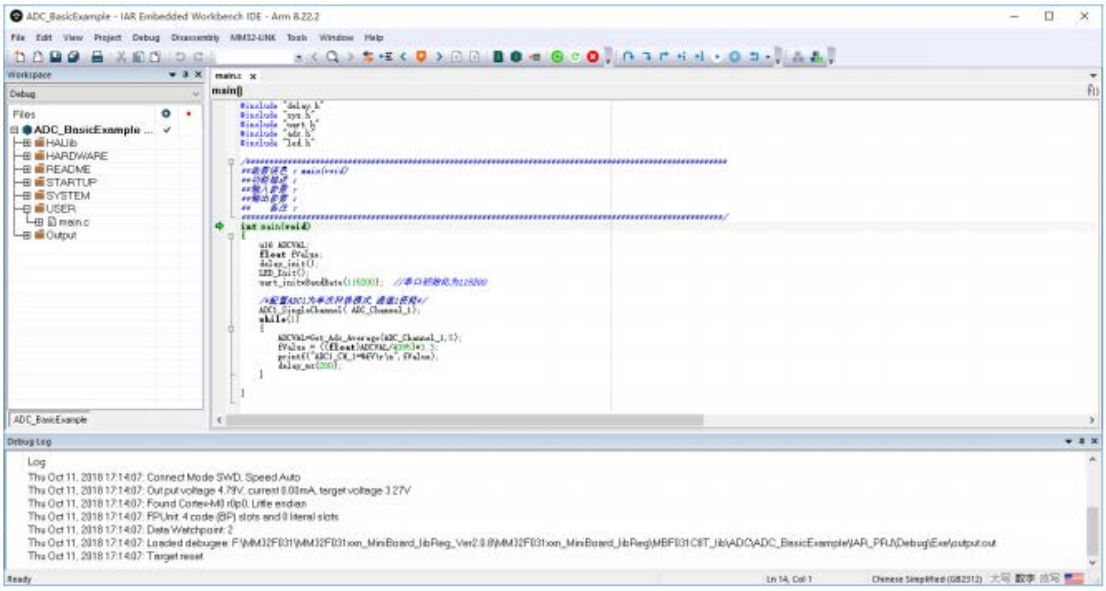
IAR: Select Third-Party Driver in the Debugger of Options, and then enter $TOOLKIT_DIR$\bin\armmm32link.dll in the Third-Party Driver column of the Debugger\Third-Party Driver of Options.


Options for node "ADC_BasicExample"
Category:
General Options
Static Analysis
Runtime Checking
C/C++ Compiler
Assembler
Output Converter
Custom Build
Build Actions
Linker
Debugger
Simulator
CADI
CMSIS DAP
GDB Server
I-jet/JTAGjet
J-Link/J-Trace
TI Stellaris
Nu-Link
PE micro
ST-LINK
Third-Party Driver
TI MSP-FET
TI XDS
Factory Settings
Setup
Download
Images
Extra Options
Multicore
Plugins
Driver
Third-Party Driver
1
Run to
main
Setup macros
Use macro file(s)
Device description file
Override default
$TOOLKIT_DIR$\config\debugger\MM\MM32F031C8T.ddf
OK
Cancel



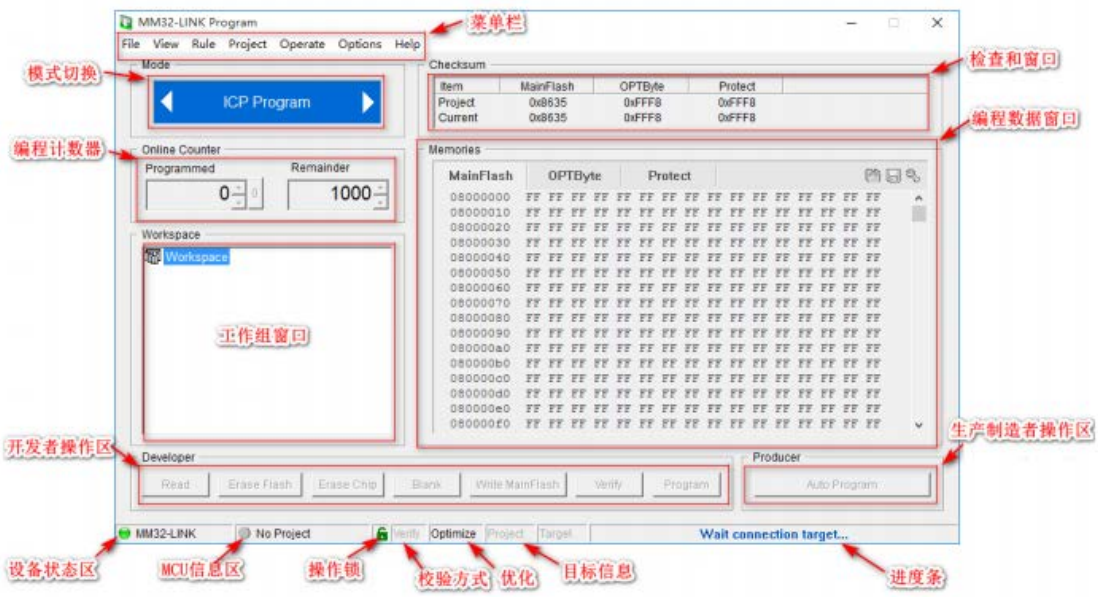
After configuring according to Steps 1, 2, and 3, click Debug or Ctrl+D for downloading and debugging after compiling in IAR project.

Then, enter the IAR debugging interface:



6. MM32-LINK Program (programming software)

6.1 Software interface



(1) Device status area

If the status indicator is green, the device is connected correctly; if the status indicator is red, the device is not connected; if the status indicator is yellow, the device is in standby state; the device name is displayed on the right.

(2) MCU information Area

When the status indicator is gray, the target object is not connected; when the status indicator is yellow, the target object is connected, waiting for operation; when the status indicator is green, the operation result is correct; when the status indicator is red, the operation result is incorrect and the project MCU and Flash in the programmer are displayed.

(3) Operation lock

Program can be locked by double-clicking the lock button; green indicates the unlocked status, and red indicates the locked status. Only the manufacturer operation area can be used in the locked status.

(4) Verification method

Double-click the Verif key, to select the quick verification method and standard verification method.

(5) Optimization

Enable the online programming optimization and disable the process by double-clicking the Optimize key.

(6) Target information

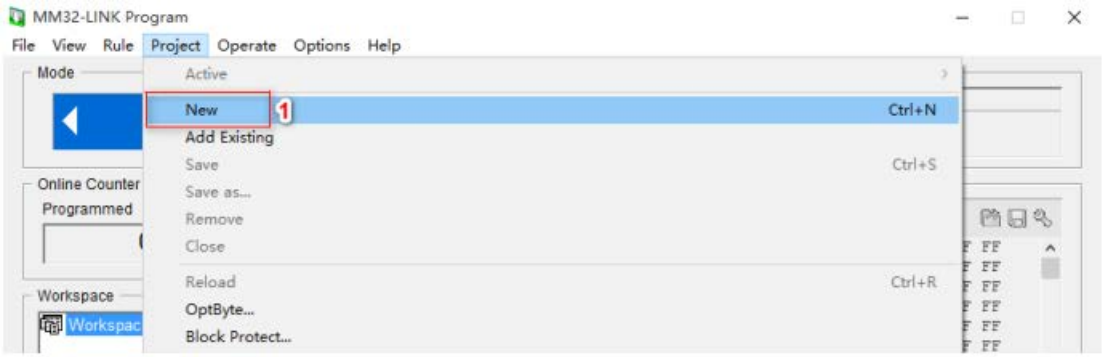
Open the target information window and close the target information window by double-clicking the Project key.

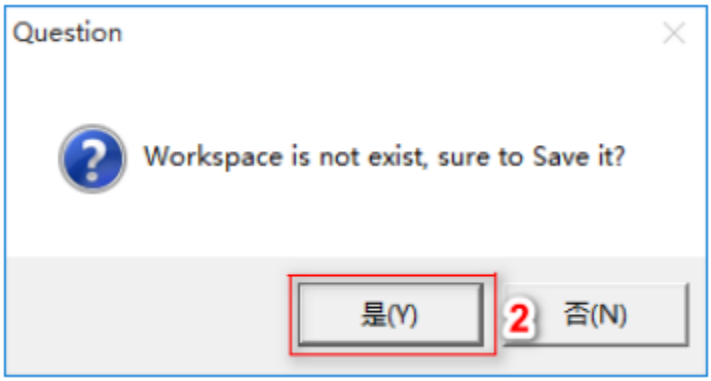
(7) Prompt information and process bar

The progress bar will show the operation prompt information and operation progress.

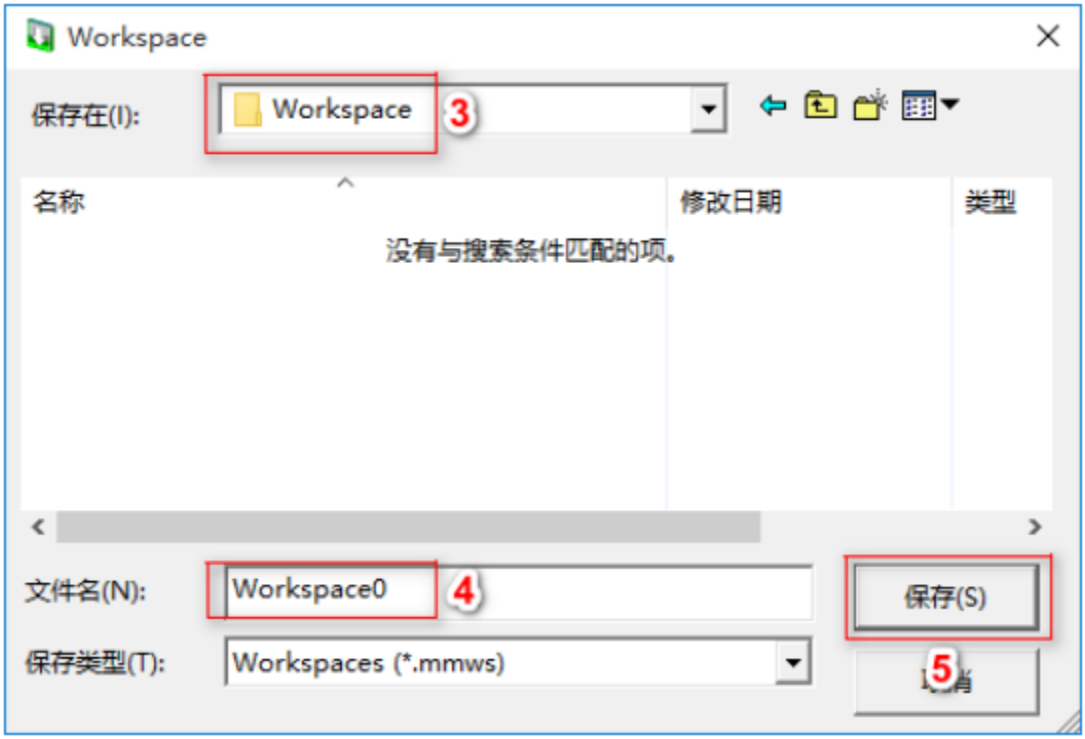
6.2 New project

When using MM32-LINK programming software in the first time, the user may create new projects through Project | New Project command in Menu. The specific steps are as follows:

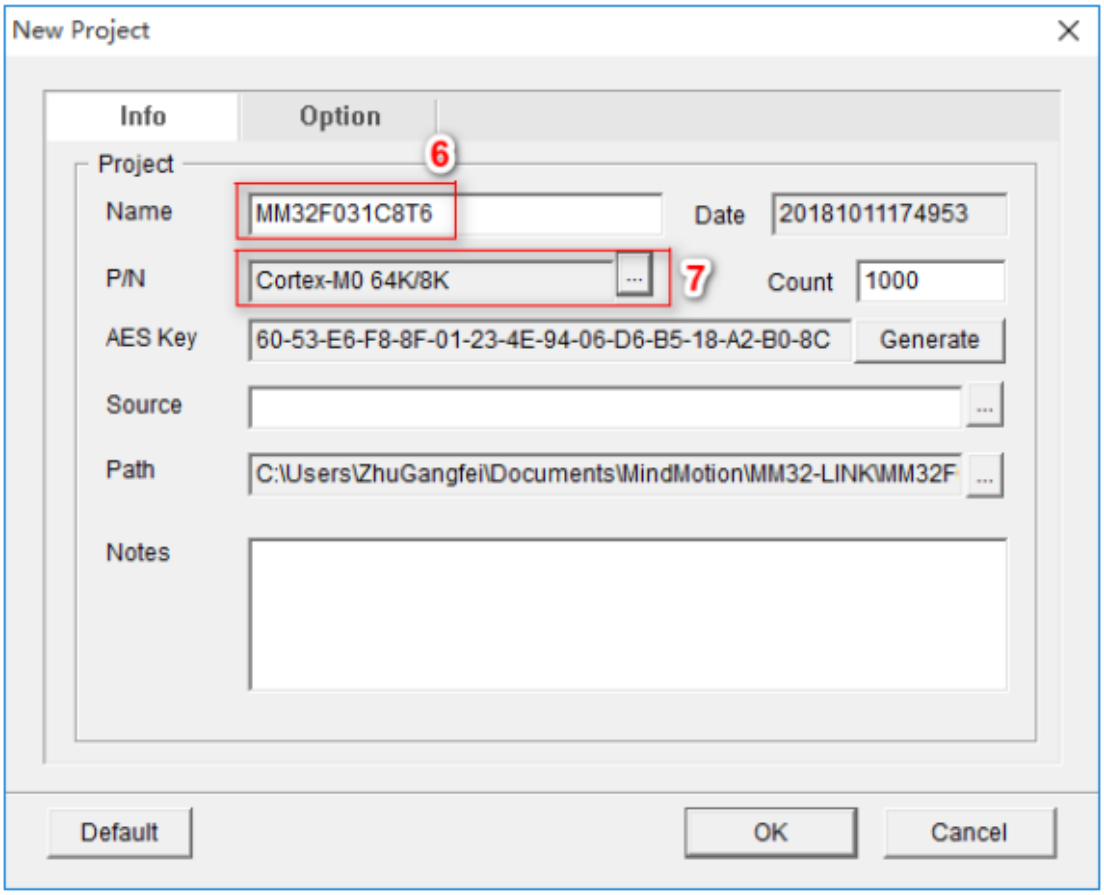




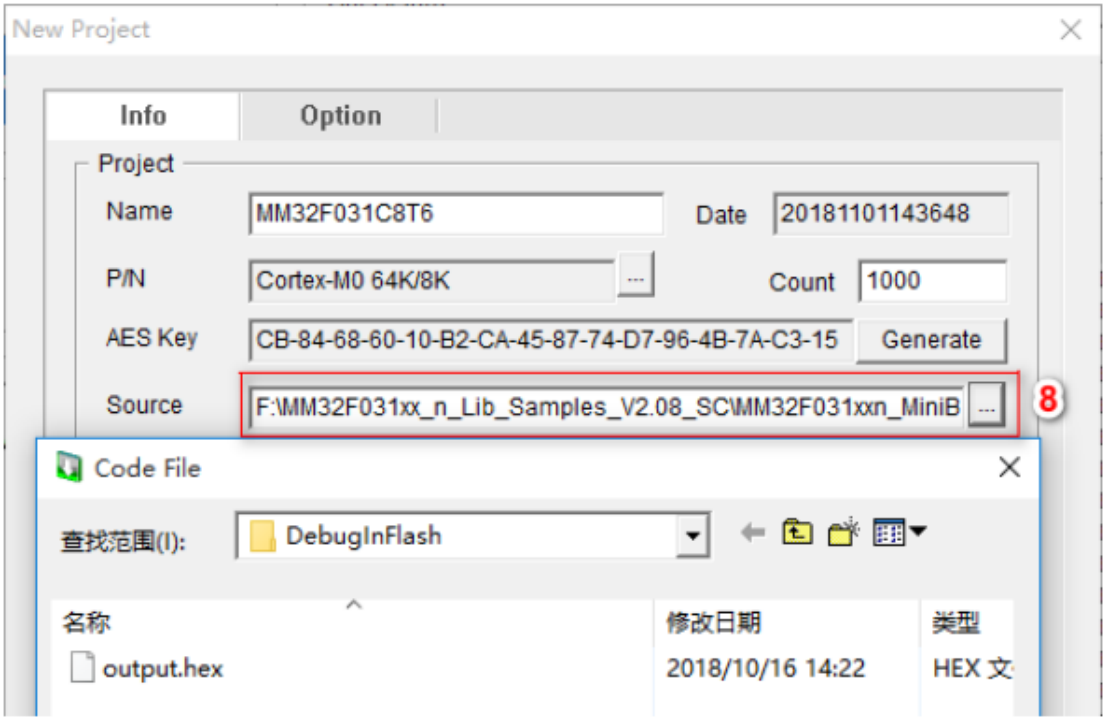
When you first create a project, you will be asked to create a Workspace; select the Workspace to save path, name it, and then click Save.



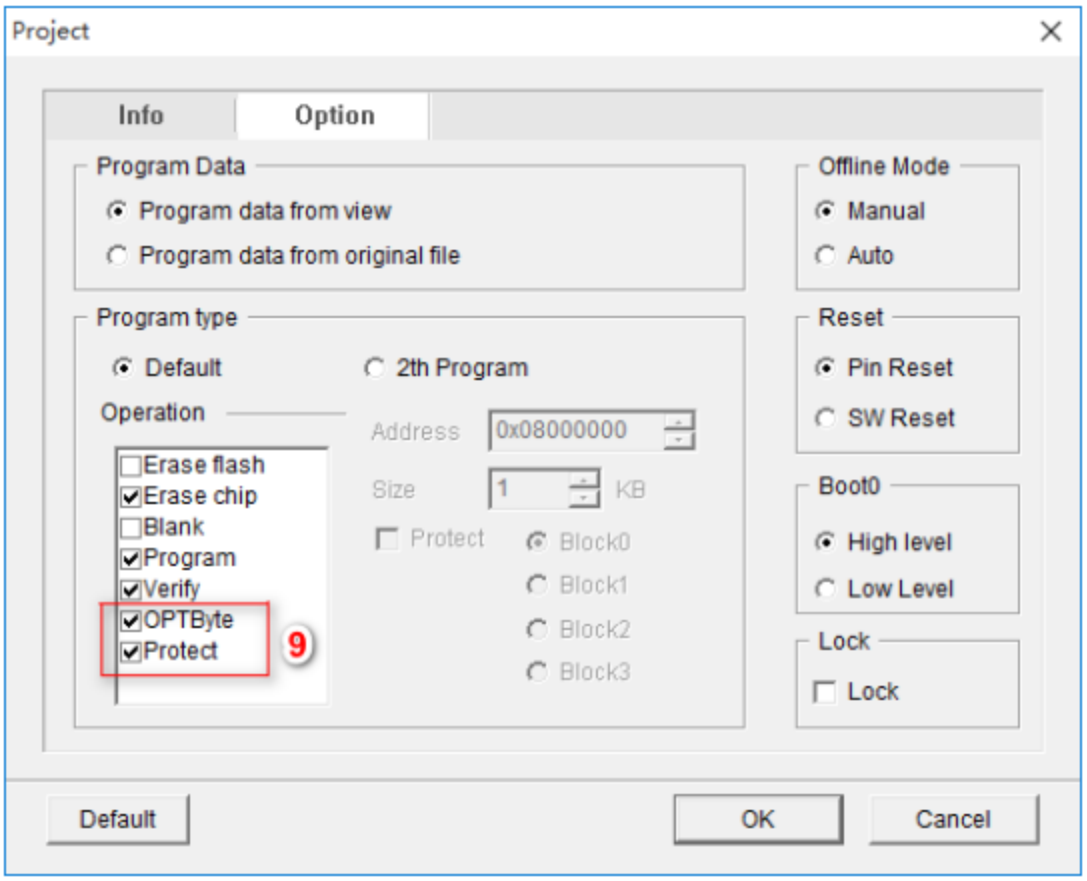
Enter the project name and select the corresponding PartNumber according to MCU core, Flash capacity and SRAM size.



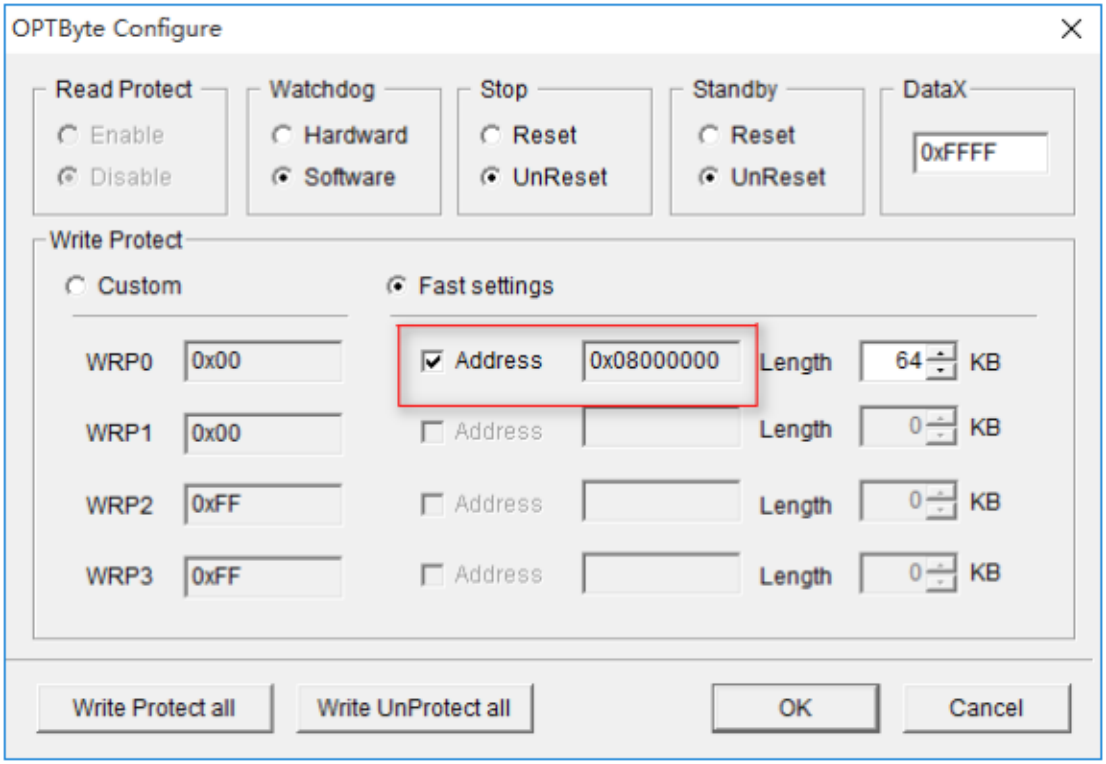
Add . hex file to be burnt



OPTByte represents the option byte write protection, Protect represents the protection option; select the enable write protection and read protection.

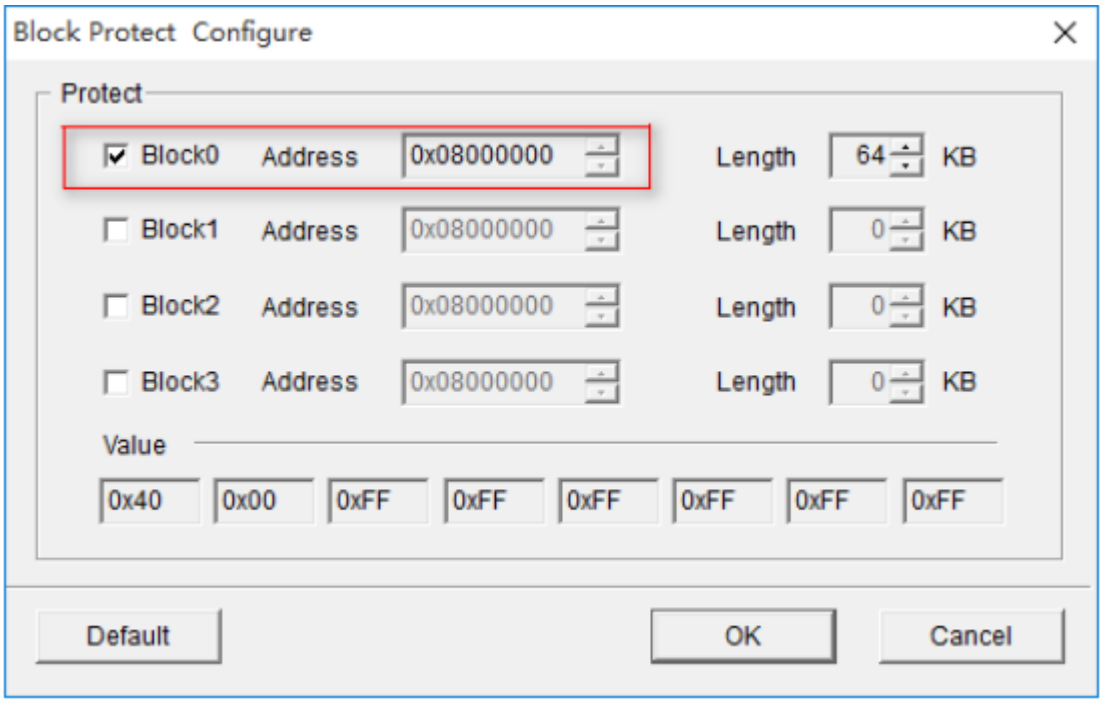


Start the Project\OPTByte Configure data visual editing dialog box and select the Fast Settings. Then, select Option in front of Address, and configure write protection for the 64K-Flash.



After that, check that the address 0x1ffff800 under the Memories\OPTByte dialog box is written into the configuration content.

Start the Project\OPTByte Configure dialog box and select Option in front of Block0, to configure write protection for the 64K-Flash.

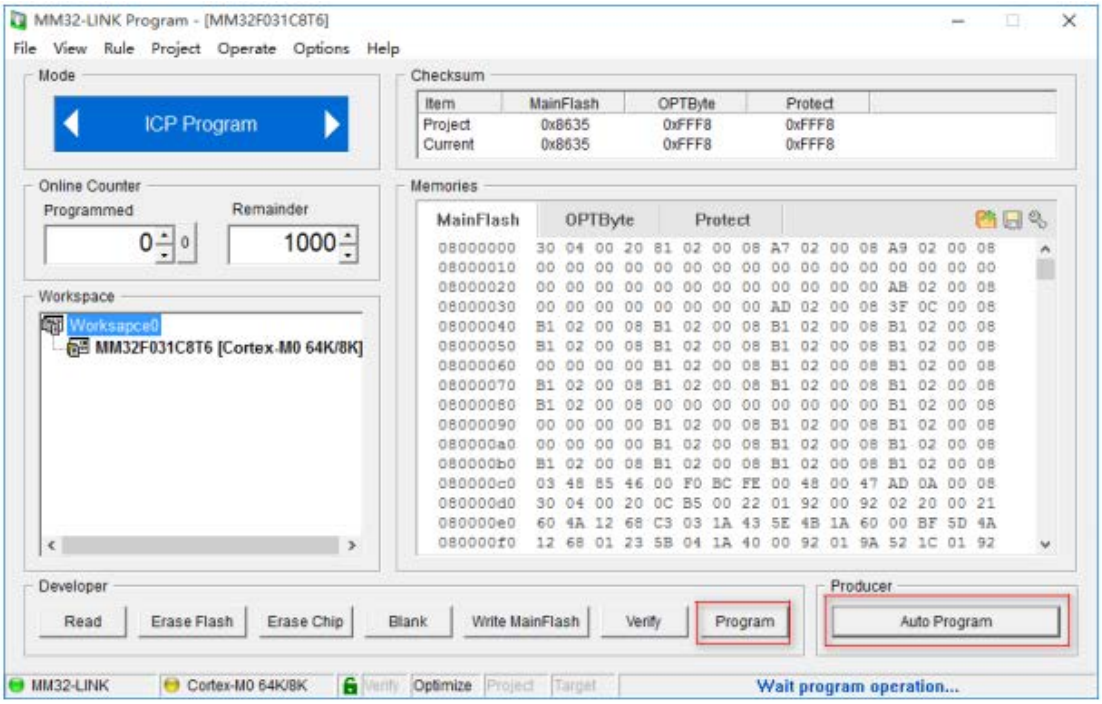


After that, check that the address 0x1ffe0000 under the Memories\Protect dialog box is written into the configuration content.

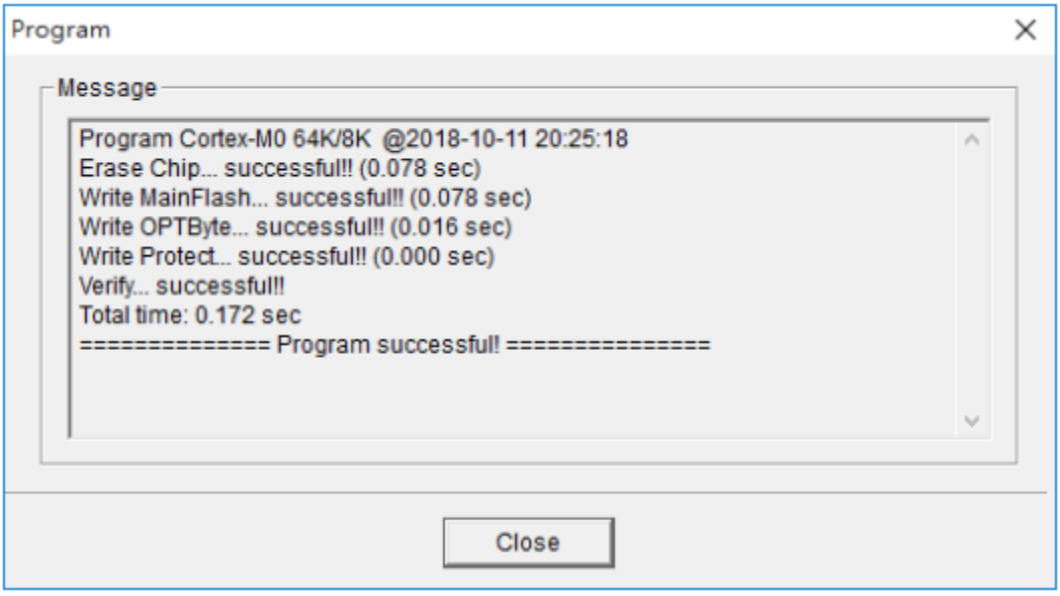
7. Burning operation of programmer

7.1 Online ICP burning

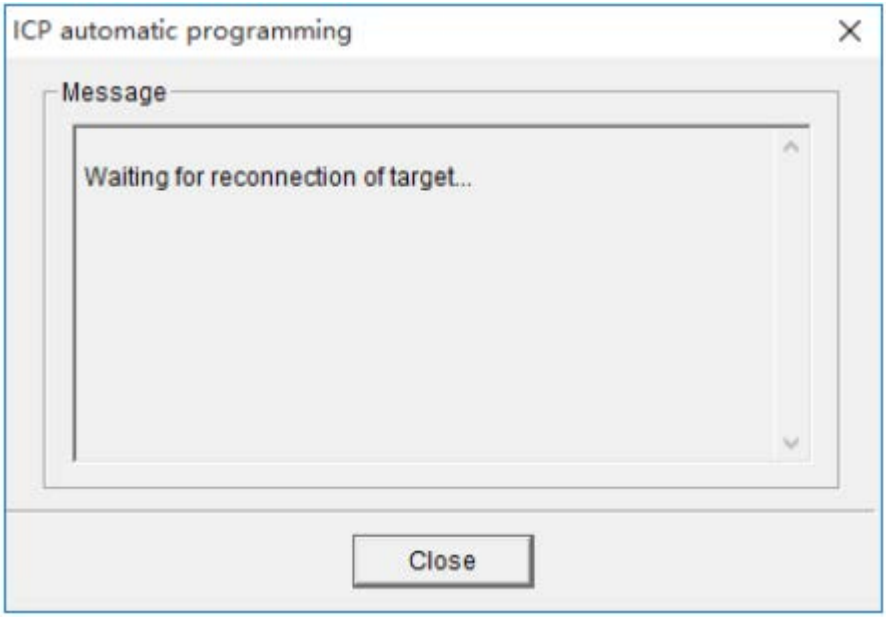
The MM32-LINK programmer is connected to the MM32-MiniBoard in an online ICP mode, and the ICP Program mode is selected for the upper computer software.



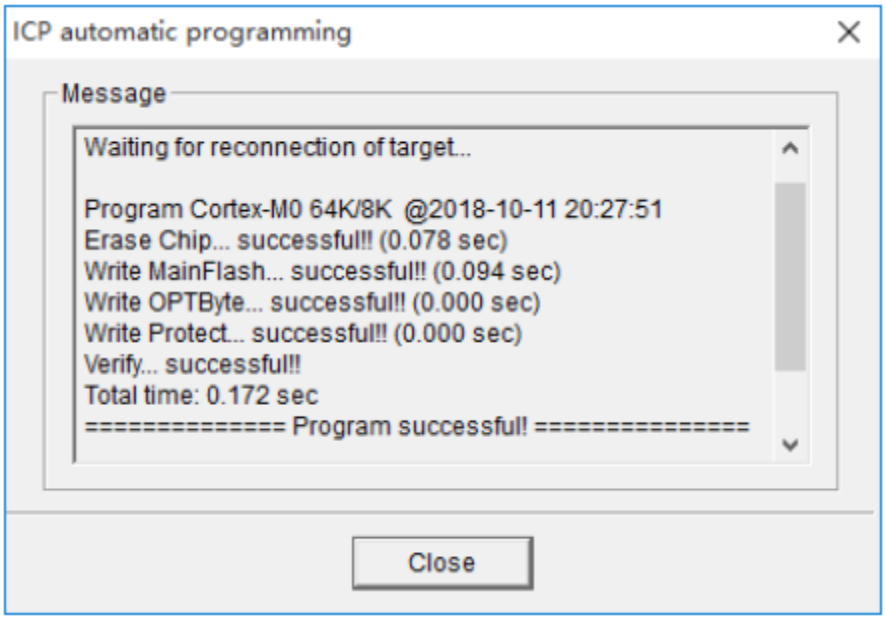
Click Program for program burning, as shown in the figure:



Click Auto Program for automatic programming, as shown in the following figure:

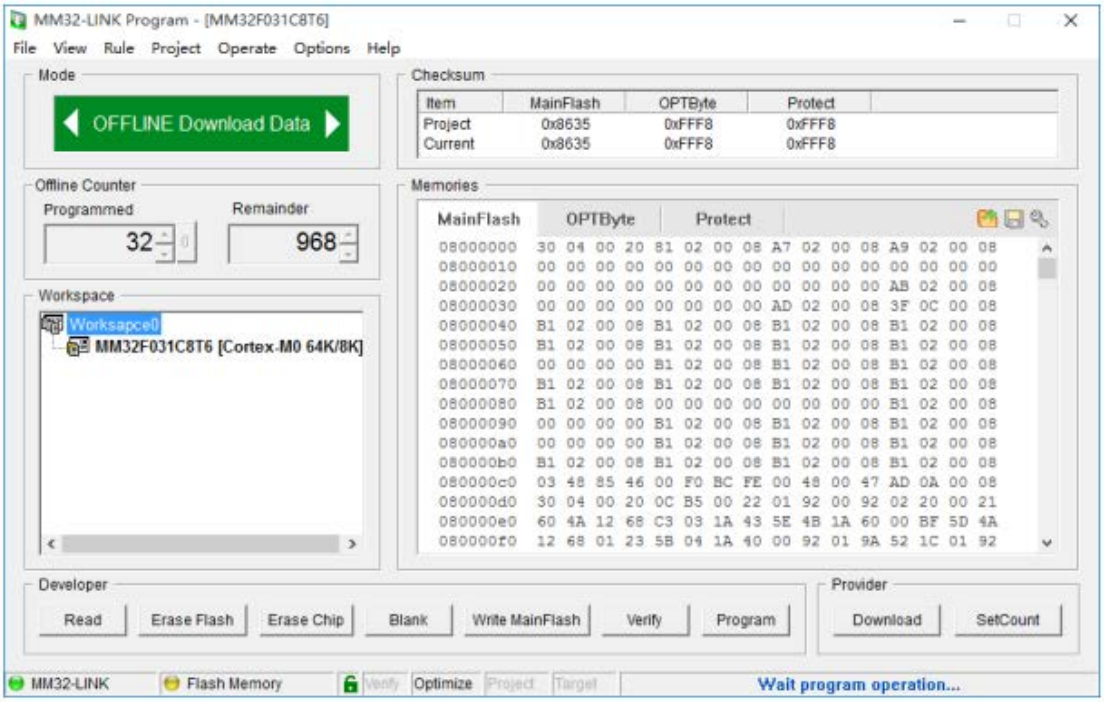


Disconnect the MM32-LINK programmer from the MM32-MiniBoard target board, and then power up again for automatic programming.

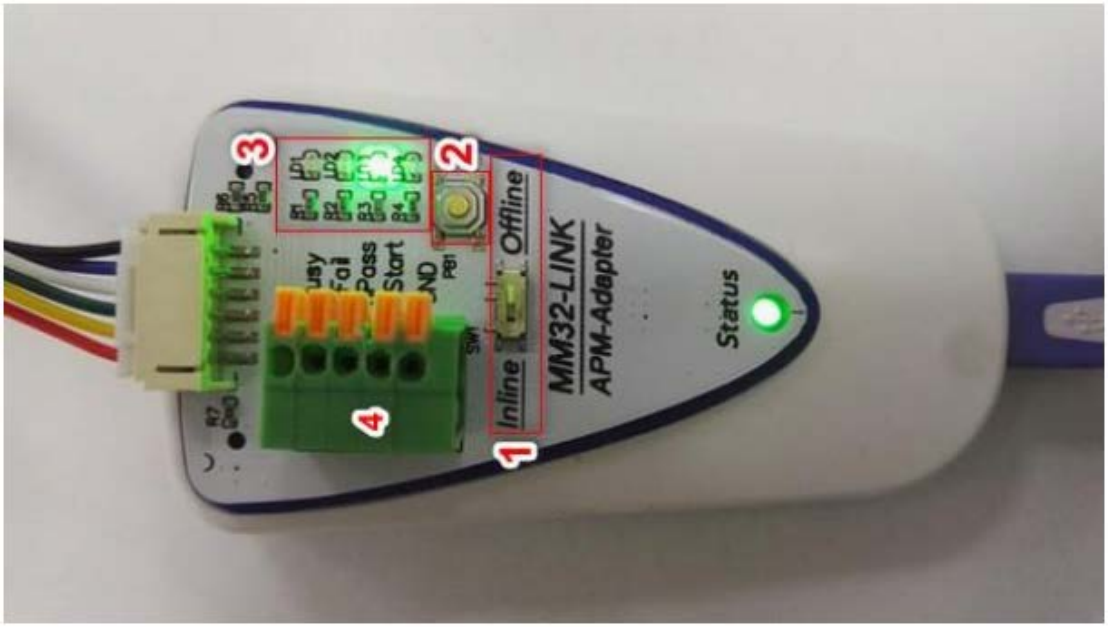


7.2 Offline ICP burning

The MM32-LINK programmer is connected to MM32-MiniBoard in an offline ICP mode, and the OFFLINE Download Data mode is selected for the upper computer software of the programmer. After the setting, the following interface will pop up:



7.2.1 Select APM-Adapter (programming adapter)



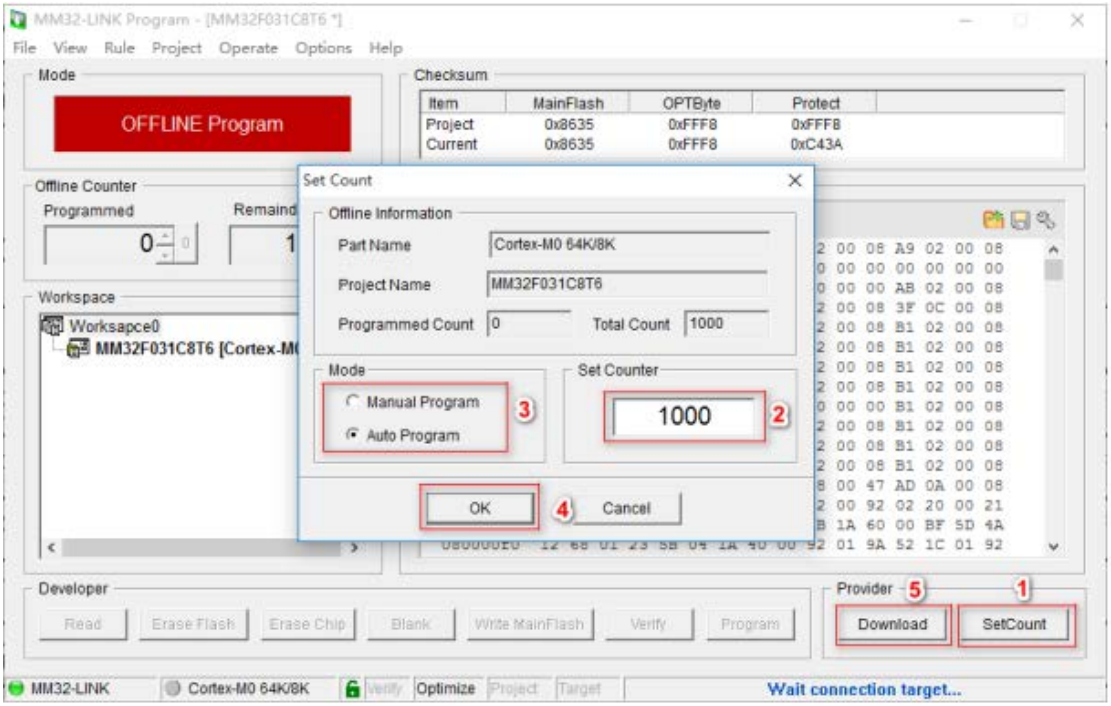
1 is a toggle switch for mode selection. When the switch is turned to Offine, the upper computer software will automatically switch to the OFFLINE Program mode;

2 is the manual download button. Once the button is pressed, the program will be burnt;

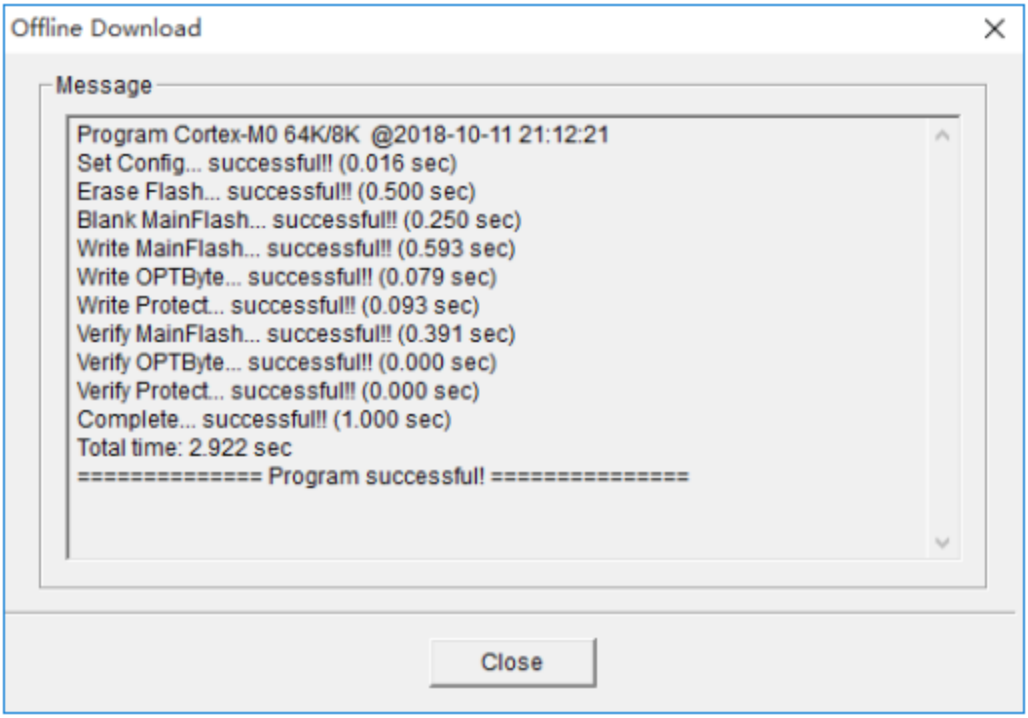
3 is an LED indicator, and blue, green, red and yellow represent start programming, programming successful, programming failed and busy signal respectively.

4 is a 5-core socket and can be connected to an automatic burner. In the 5-core socket, Busy represents the output programming end signal, nFAIL represents the output programming error signal, nPASS represents the output programming correct signal, nSTART represents the input programming start signal, and GND represents the power ground.

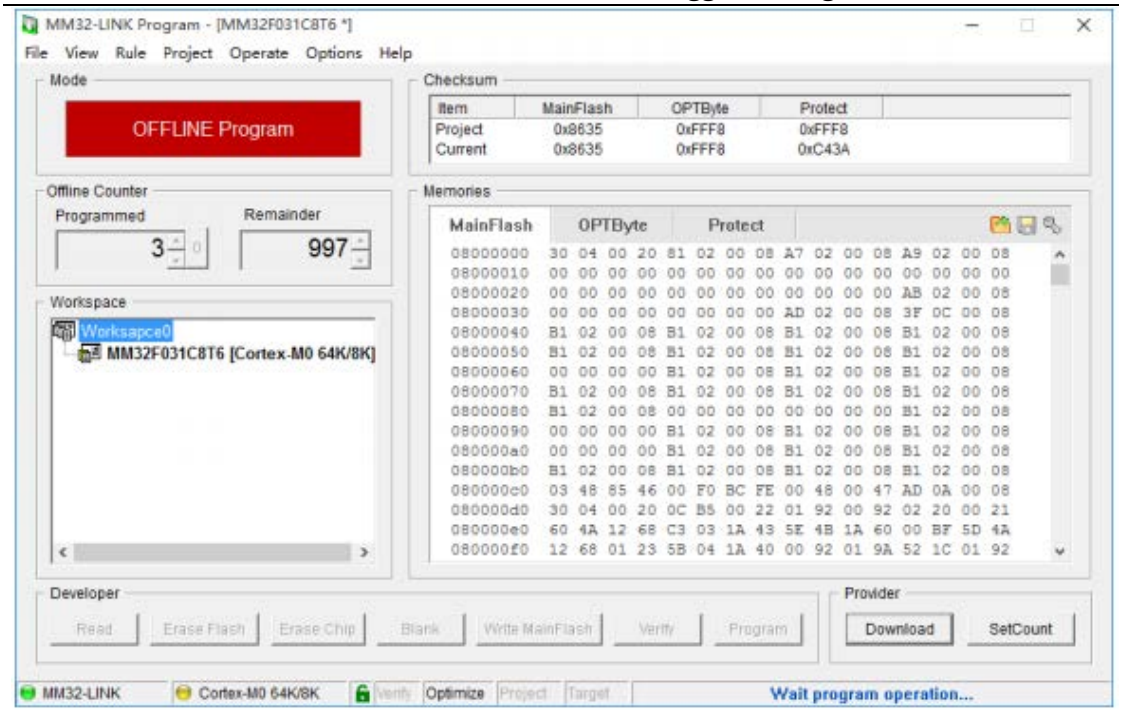
In OFFLINE Program mode, click the SetCount key to initiate the offline download settings. In the figure, 2 is used to set the amount of offline downloads, 3 to set the offline download mode, and 4 to complete the setting.



Click 5, to download the program to the internal memory of MM32-LINK device.



Once PB1 key on APM-Adapter (programming adapter) is pressed or nSTART signal is input, the program will be downloaded once, and the offline programming counter value will be automatically incremented by 1.



7.2.2 Select ICP-Adapter (programming adapter)

There are two LED indicators, of which the green indicator represents the automatic programming mode, and the red indicator represents the manual programming mode.

There are two buttons, Button 1 is the mode switching button and Button 2 is the manual programming button. In the automatic mode, the manual button is disabled.

After the ICP-Adapter (programming adapter) +MM32-LINK programmer is connected to the computer, the upper computer of the programmer will automatically switch to OFFLINE Program mode. The setting process in OFFLINE Program mode is the same as that of APM-Adapter (programming adapter).

In the automatic mode, the LED light is green. If the adapter is disconnected from the target board and then reconnected, a "ding" sound will be heard, the program is downloaded successfully once, and the offline programming counter value will be automatically incremented by 1.

In the manual mode, the LED light is red. If Button 2 is pressed, a "ding" sound will be heard, the program is downloaded successfully once in the offline mode, and the offline programming counter value will be automatically incremented by 1.

8. MM32-LINK password setting

8.1 Password setting

Open Options\Password, to pop up the Password Setting dialog box, which allows users to set MM32-LINK device protection password and Program operation password; enter the device protection password and operation password in the Password column on the left of the dialog box, and confirm them in the Confirm column on the right. The password shall be figures or characters at least in 4 digits. After the setting of the MM32-LINK device protection password, the internal memory area of the device is protected, and data in the area cannot be read and written without the password. The user may deliver the equipment to third-party manufacturers for batch burning, to ensure data safety. The user shall remember the device protection password. When forgetting the device protection password, the user shall contact the original factory to clear the password protection function.

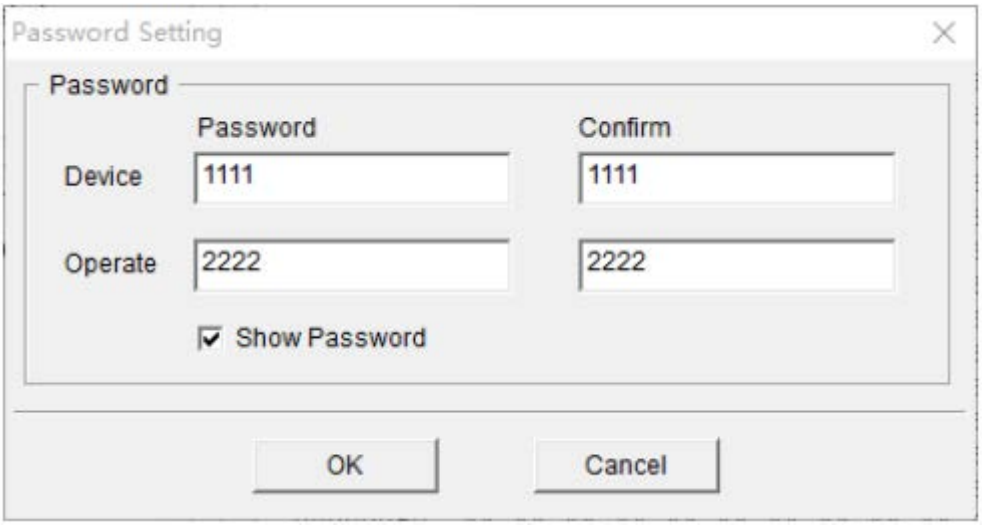


Figure 5 Password Setting Dialog Box

After setting the password, the user will find the Operation Confirmation dialog box when using SetCount and Download, which requires the user to enter the operation password.

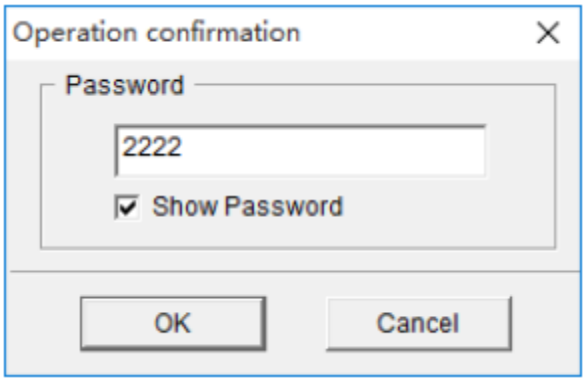


Figure 6 Operation Confirmation Dialog Box

8.2 Modify password

After setting the password, when the user starts the Options\Password, Modify Password dialog box will pop up automatically. At this time, the user may modify the device password and

operation password by verifying the device password. When the password box displays "*", the original password will not be changed.

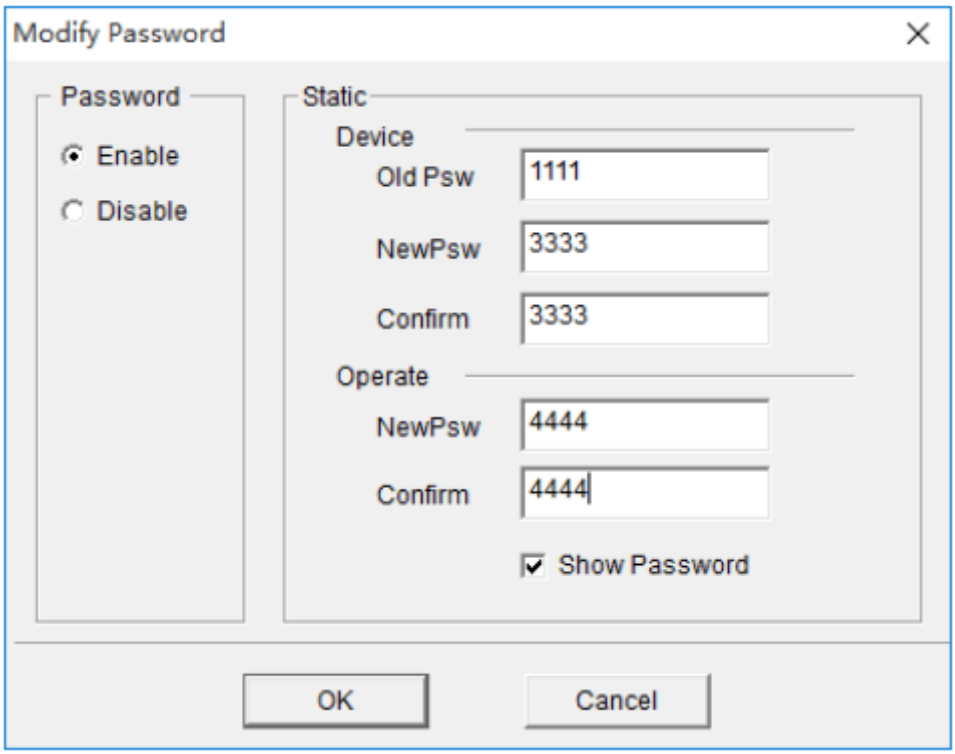


Figure 7 Modify Password Dialog Box

8.3 Password protection disabling function

After setting the password, when the user starts the Options\Password, Modify Password dialog box will pop up automatically. At this time, the user may disable the password protection by verifying the device password.

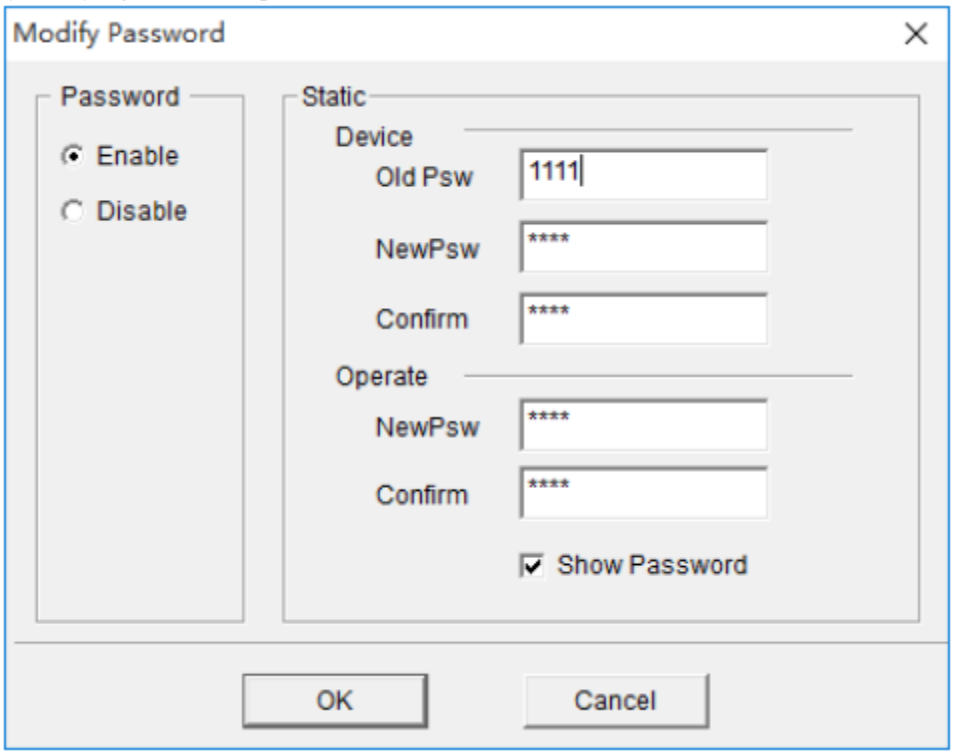


Figure 8 Password Protection Disabling Dialog Box