XPOS Software Development Environment Manual

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Document management

Version history

date	version	modify the record	author

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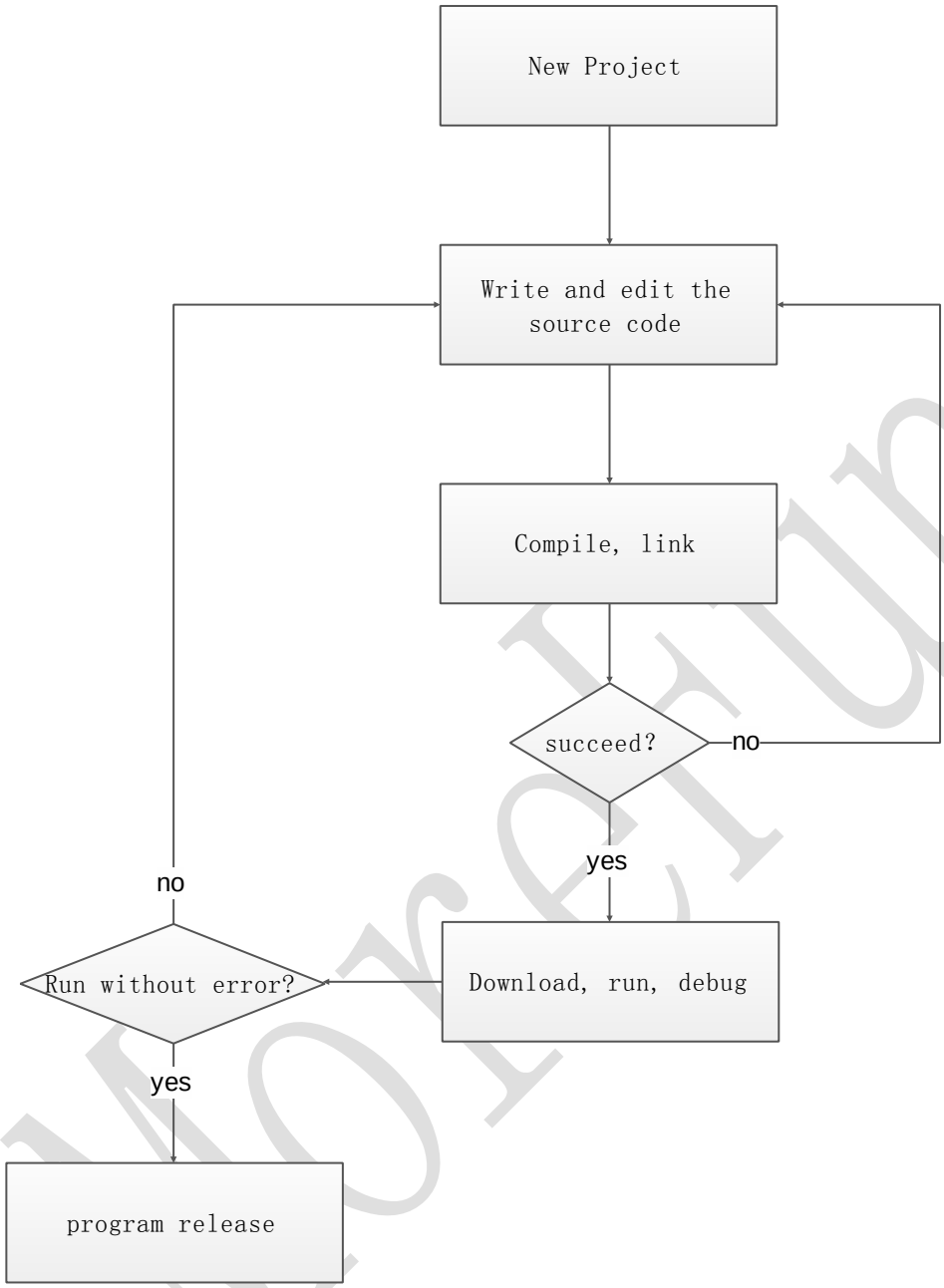
1 Introduction

XPOS SDK is Fujian MoreFun Electronic Technology Co., Ltd. for the simple series of terminal custom secondary development package. Development environment using C / C + + development language, IAR compiler. Simple series of terminal software system kernel using ucos embedded real-time operating system, GUI use Cube independent research and development of XGUI architecture to support file system programming and FLASH absolute address space to read and write, the middle layer of the interface with the hardware interface and common components , Provides a friendly secondary development interface and related examples, simplifying the application based on the cube simple series of terminals on the threshold to improve application development efficiency.

XPOS SDK for Fujian Cube simple series terminal: MF90, H9, MP70.。

2 Software Development Process Description

The basic process for writing a terminal program is as follows:



3 Typical application flow

Writing programs on a terminal is very similar or even simpler on a PC; it typically contains only an application that does not have a return value, and then the system is controlled by the program after

initializing the system. The application is mainly written in C language.

The program starts with the main function that you are familiar with. Please note that main does not return a function. main function is running after the first step is to initialize the hardware interface such as display devices, keyboard, card interface and ucosii operating system.

After the initialization is complete, the first will create a UI thread, which is also known as the main thread. This thread is used to draw the UI interface and some operations that are not time consuming. And some time-consuming operations need to create other threads to perform, it and the UI thread through the message and semaphore to synchronize the operation.

UI threads are composed of multiple pages, each page has a while loop, the internal loop by constantly calling xgui_GetMessageWithTime to check the various events. When an event occurs after the application will try to run it, continue to call after the end of xgui_GetMessageWithTime wait for the next event.

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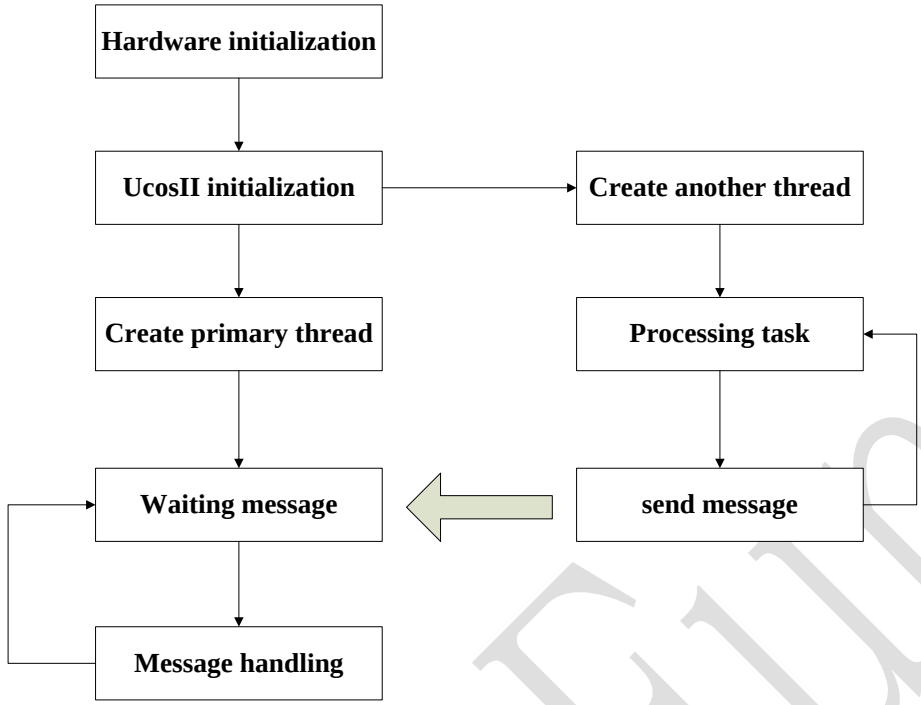
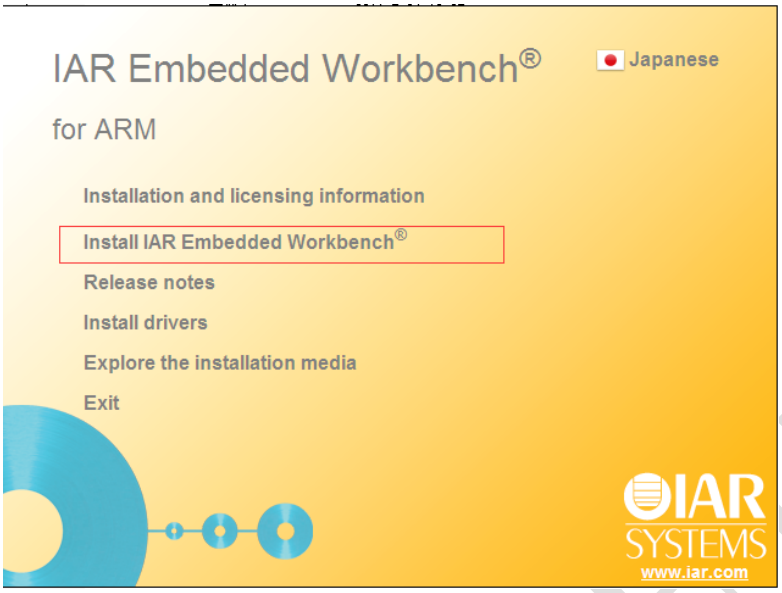


4 IDE Instructions for use

The development environment for the terminal program is IAR ARM. For detailed installation and use instructions for IAR, refer to the manual and related documentation. The following only describes some of the main considerations of the IAR development program. IAR ARM version is greater than 6.7. This document describes IAR ARM 7.4 as an example.

In order to facilitate the development, it is recommended that customers based on our DEMO project development, DEMO project has set up all the parameters. If you need special projects to create your own projects, please refer to the following sections for proper project configuration.

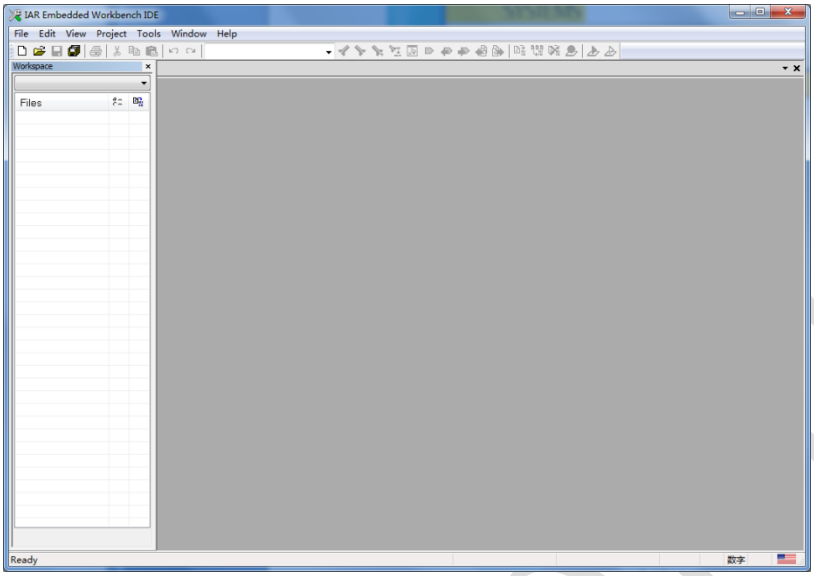
4.1 Tool installation



After running the installer, select the red box above the option to install. After the installation is successful, the following interface will be displayed.

4.2 Project creation

4.2.1 Start the IDE



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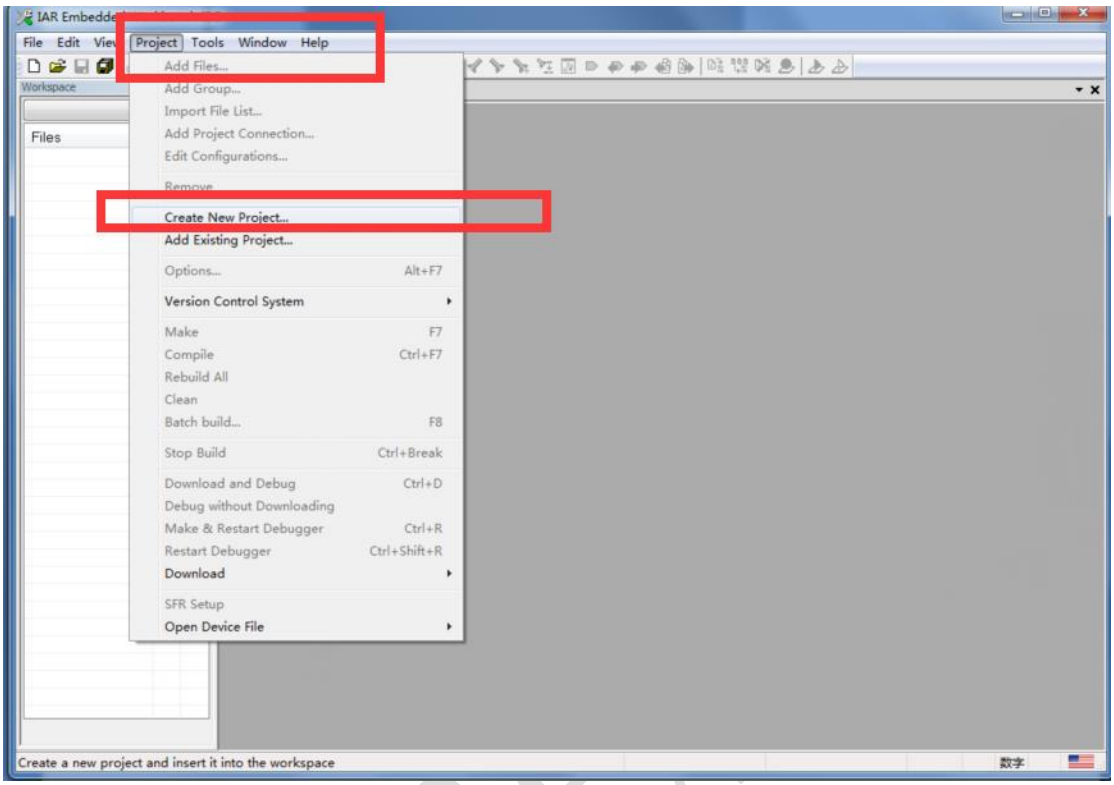
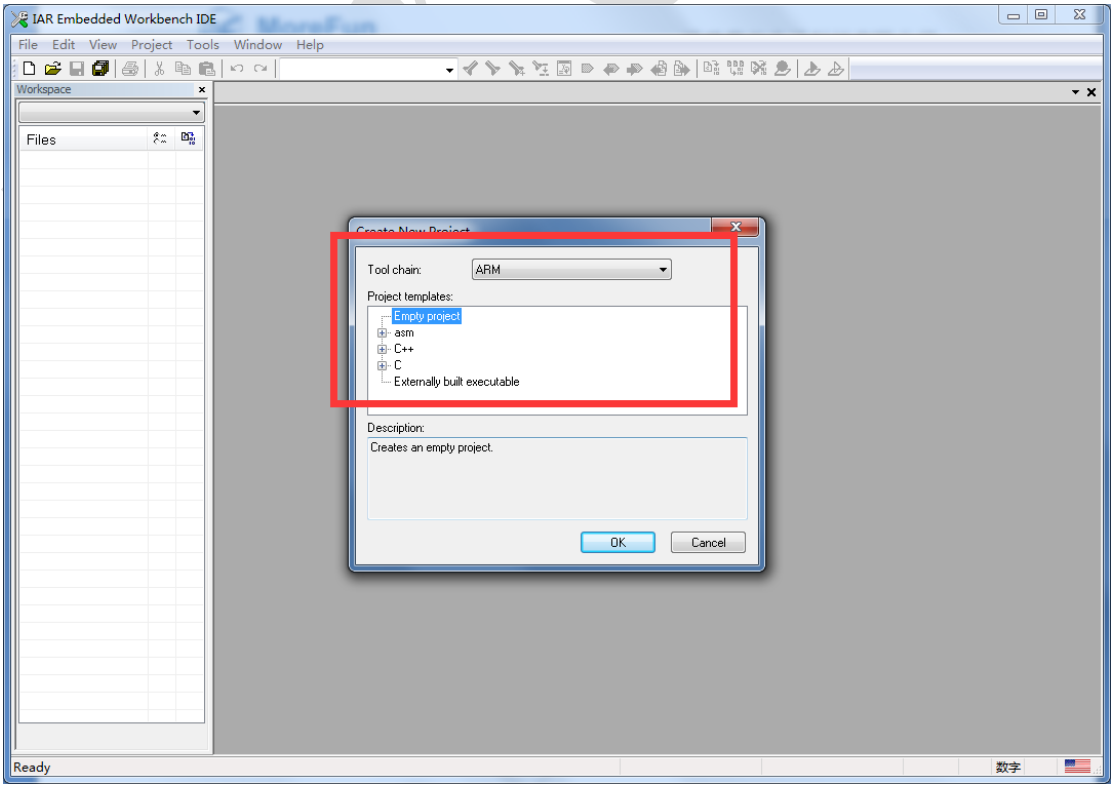
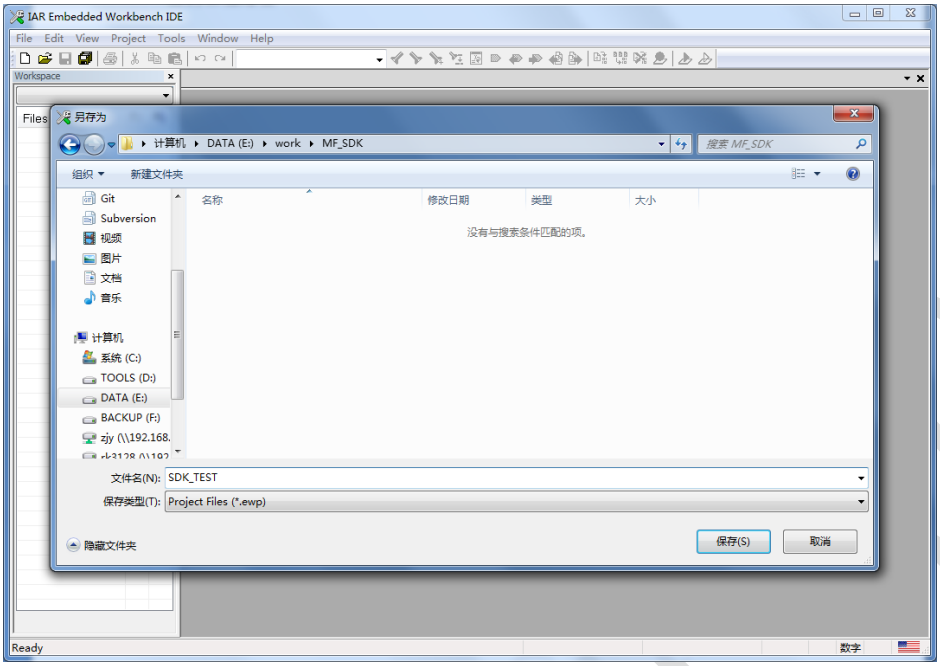
4.2.2 New Project



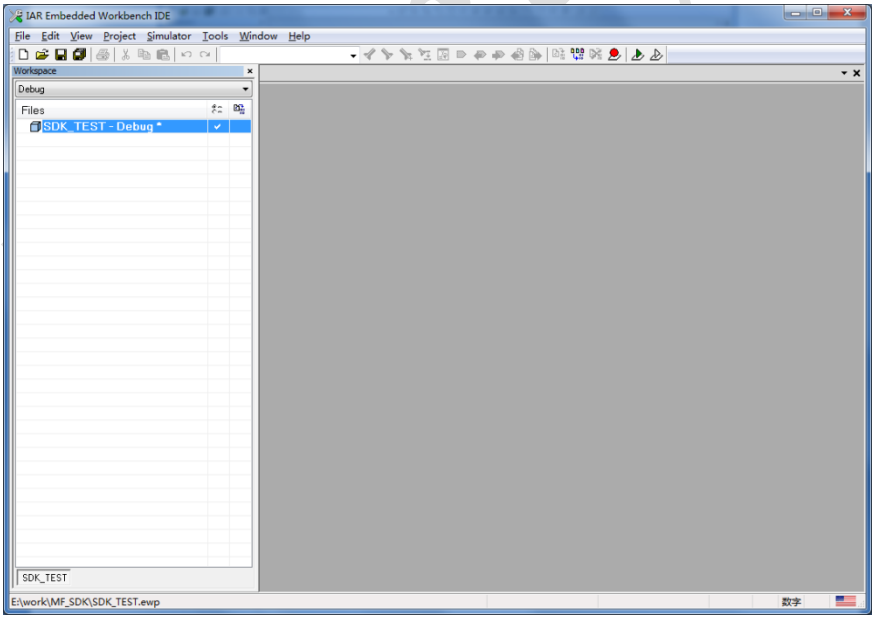


Select the corresponding option in the red box to create an empty

project. Select OK to save. Select the appropriate project path when saving.



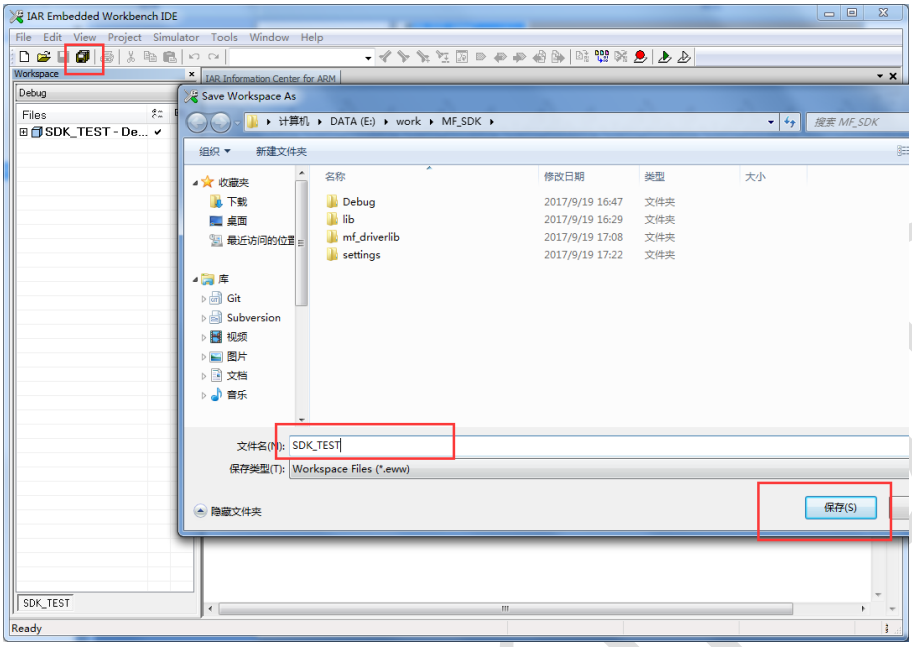
After selecting Save, you create an empty project.



4.2.3 Creating a work area

After creating an empty project, select the save all button in the

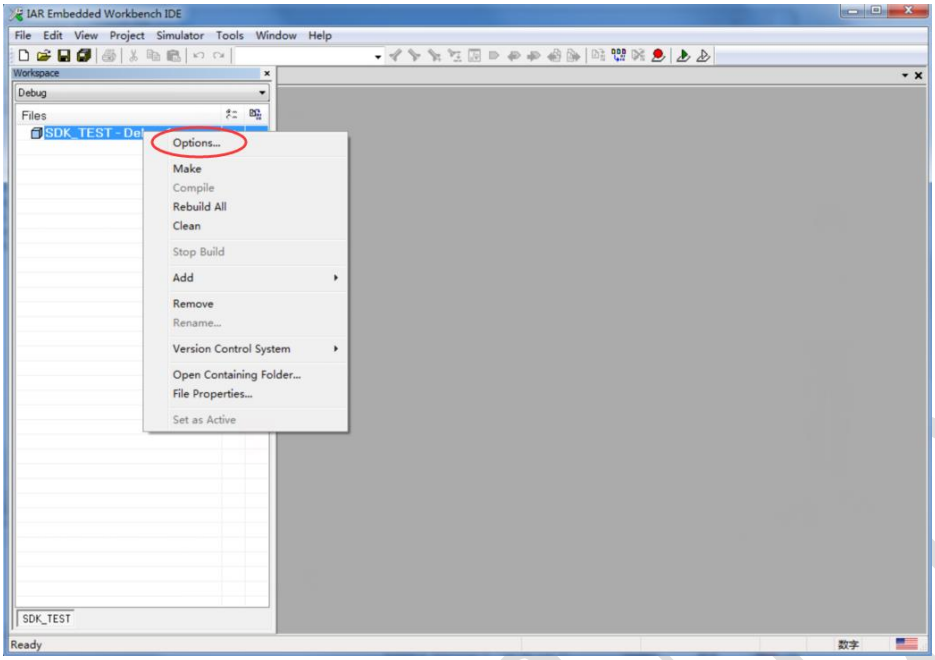
upper left corner. It will pop up the dialog box to create a work area, enter a workspace name, and then select save。

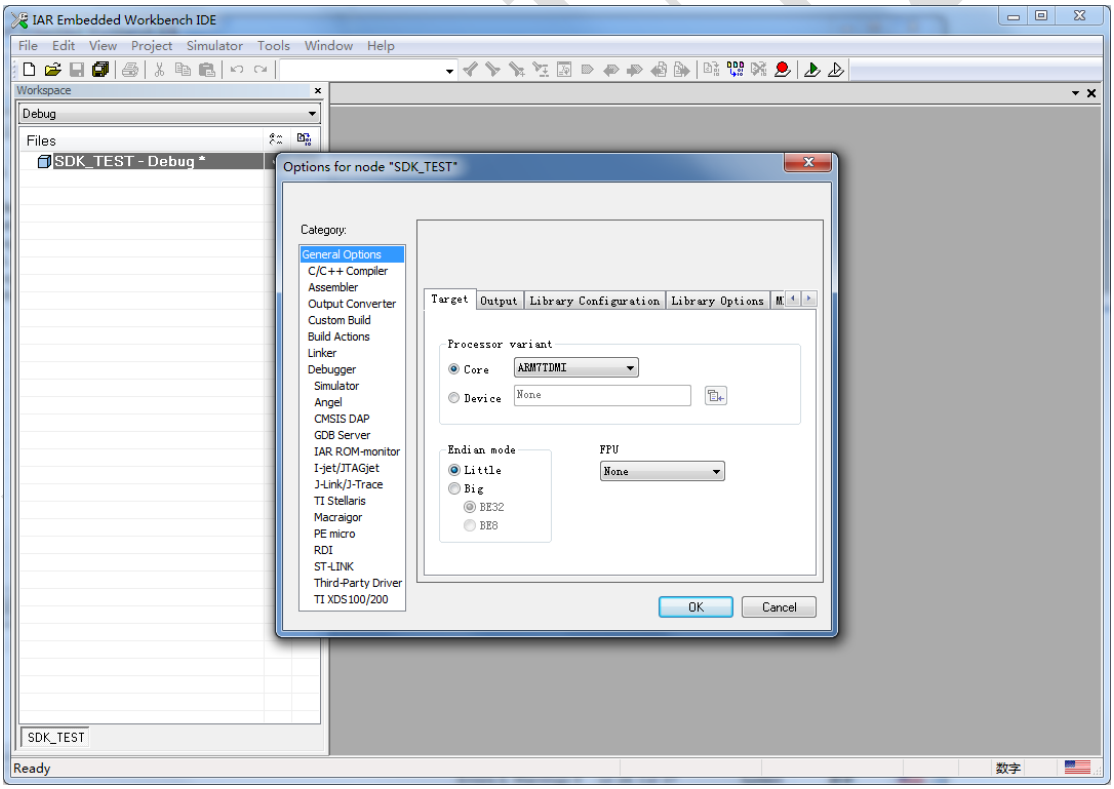


4.3 Project configuration

4.3.1 Open the setup interface

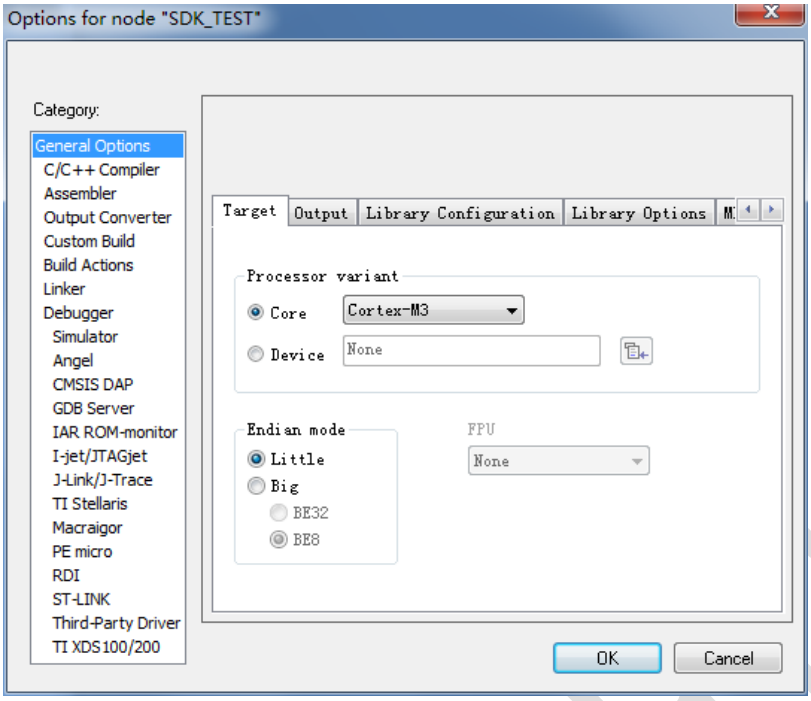
Select the corresponding project and then right, will display a menu, and then select the options button, you can enter the project settings menu.





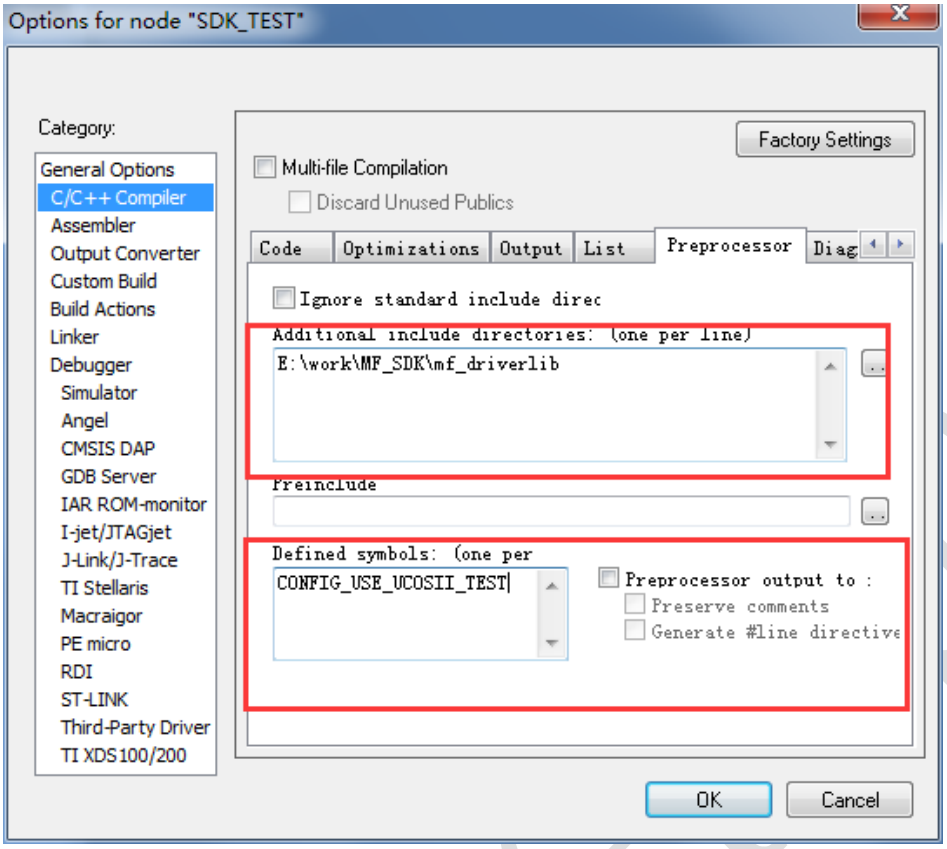
4.3.2 Set the processor type

Select cortex-m3. Then select OK to save.



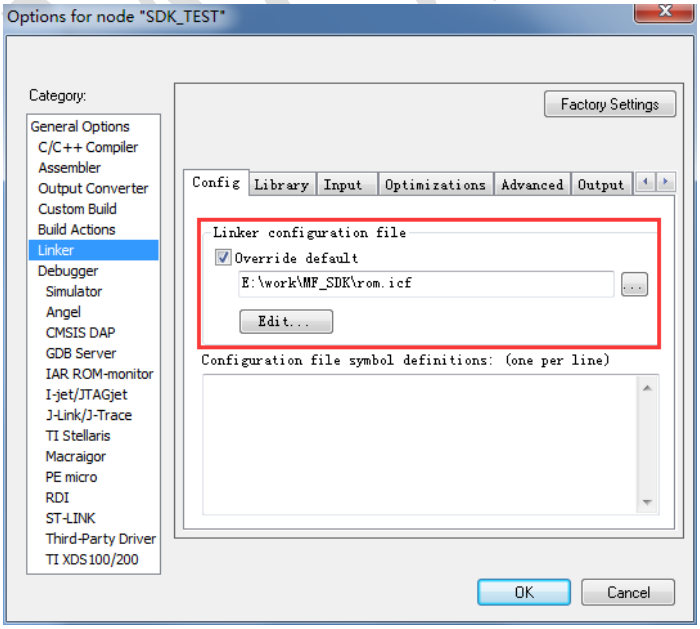
4.3.3 Set the header file path and macro definition

Here you set the include file path (such as the SDK header file) and the associated macro definition for the program header file. After setting, select OK to save.



4.3.4 Set the link file

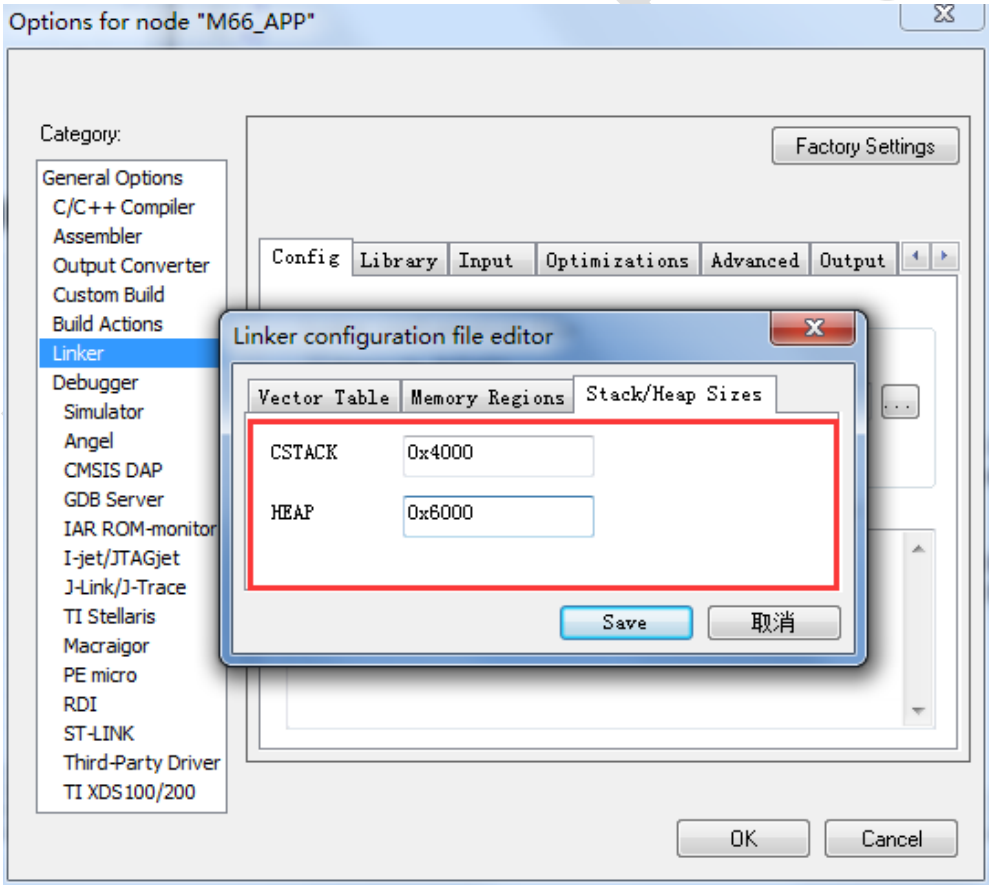
The link script is used to configure the running address of the program. After setting, select OK to save.



4.3.5 stack and heap space size configuration

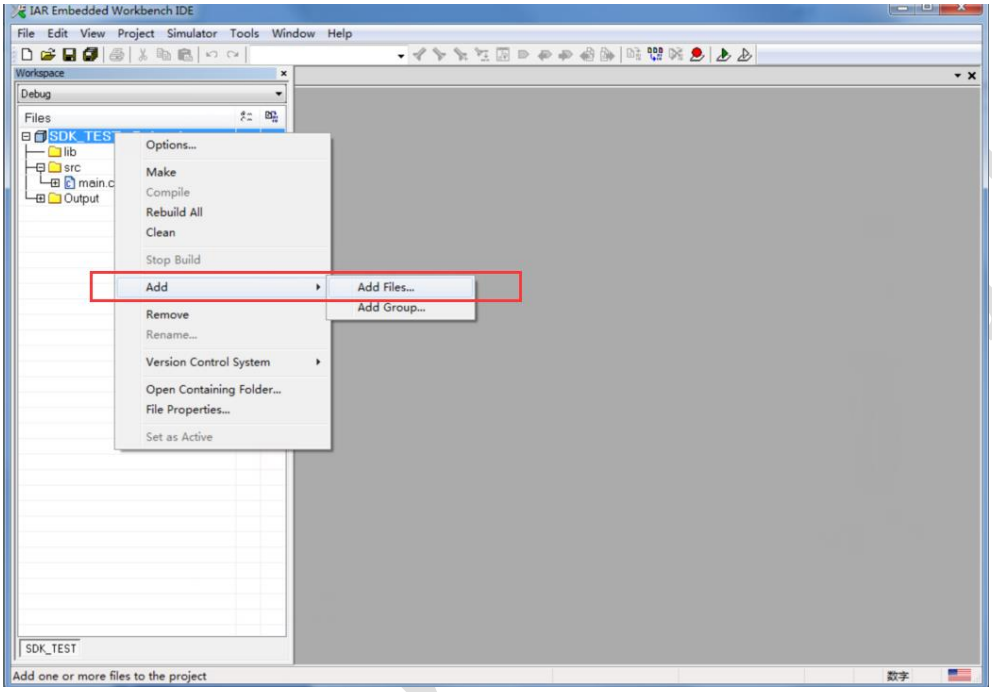
After selecting the link script, select the link button on the page, select the Edit button, you can set the stack and heap. The specific size can be configured according to application requirements, due to the need for hardware interrupt handling, the stack size can not be less than 2K.

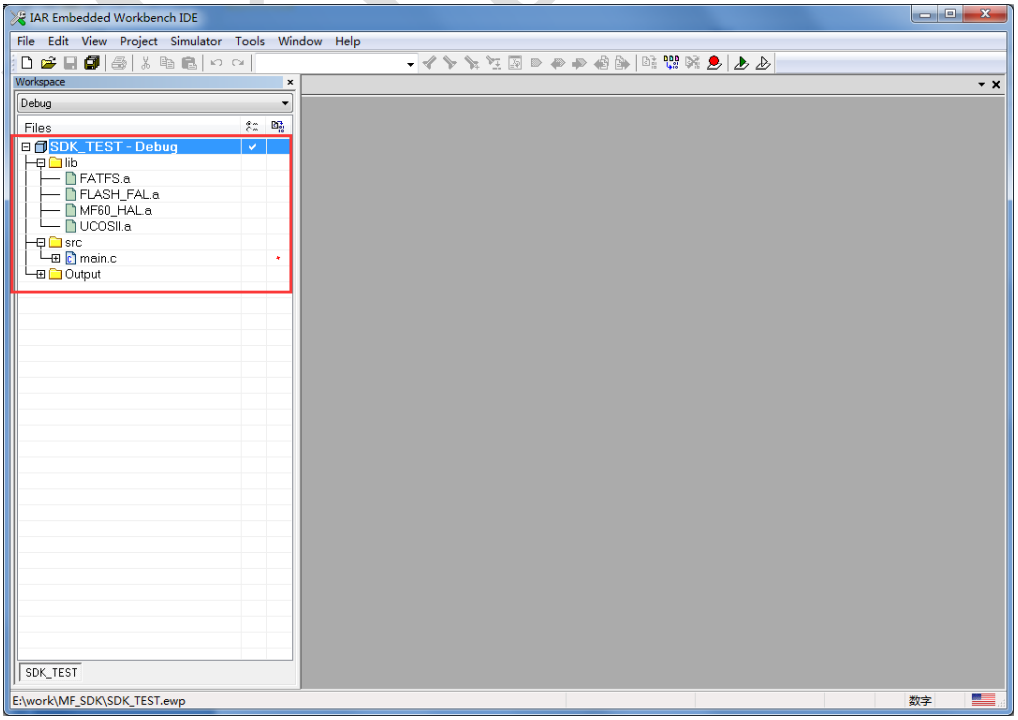
You can also directly edit the link script file that is ICF file configuration.



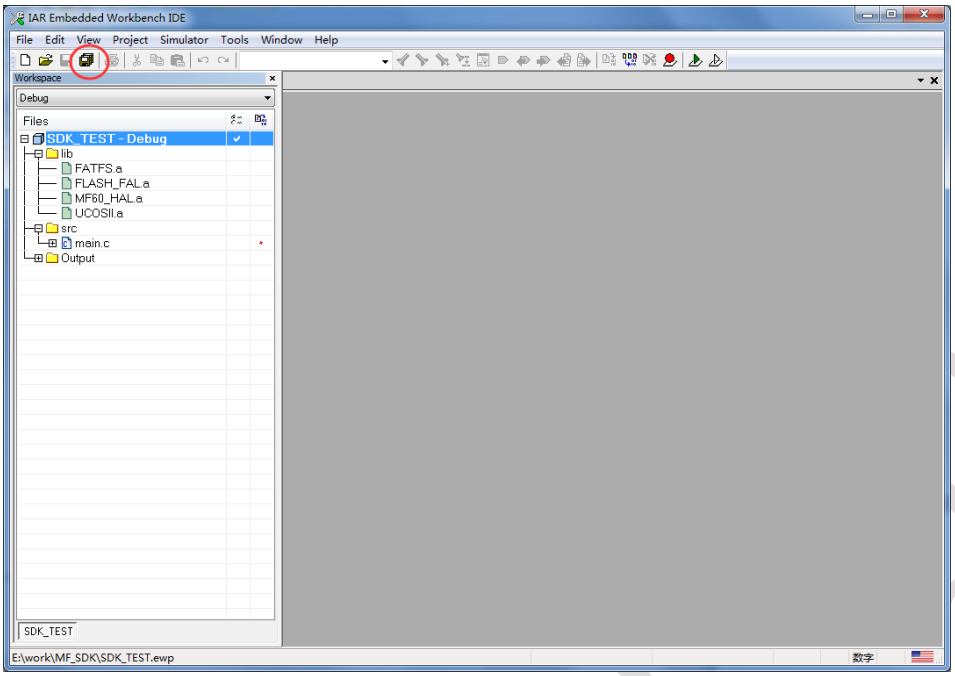
4.3.6 Add compiled files and library files

Select the appropriate project, and then through the right-click menu, you can achieve the file to add, including the library file to add (such as the SDK library).



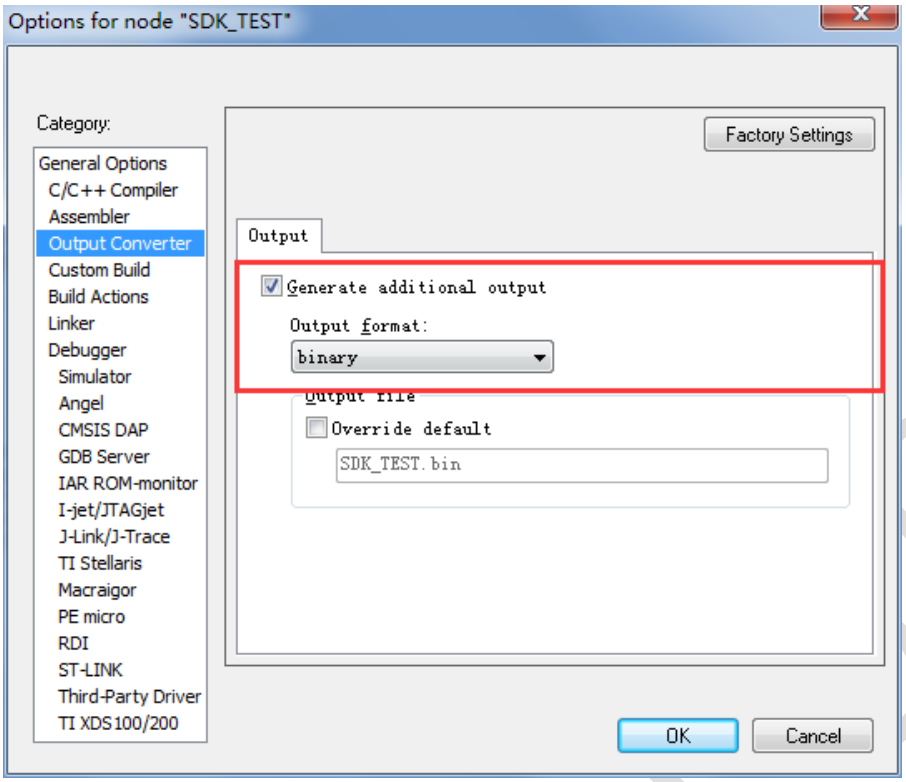


Here we add a source file and 4 library files.



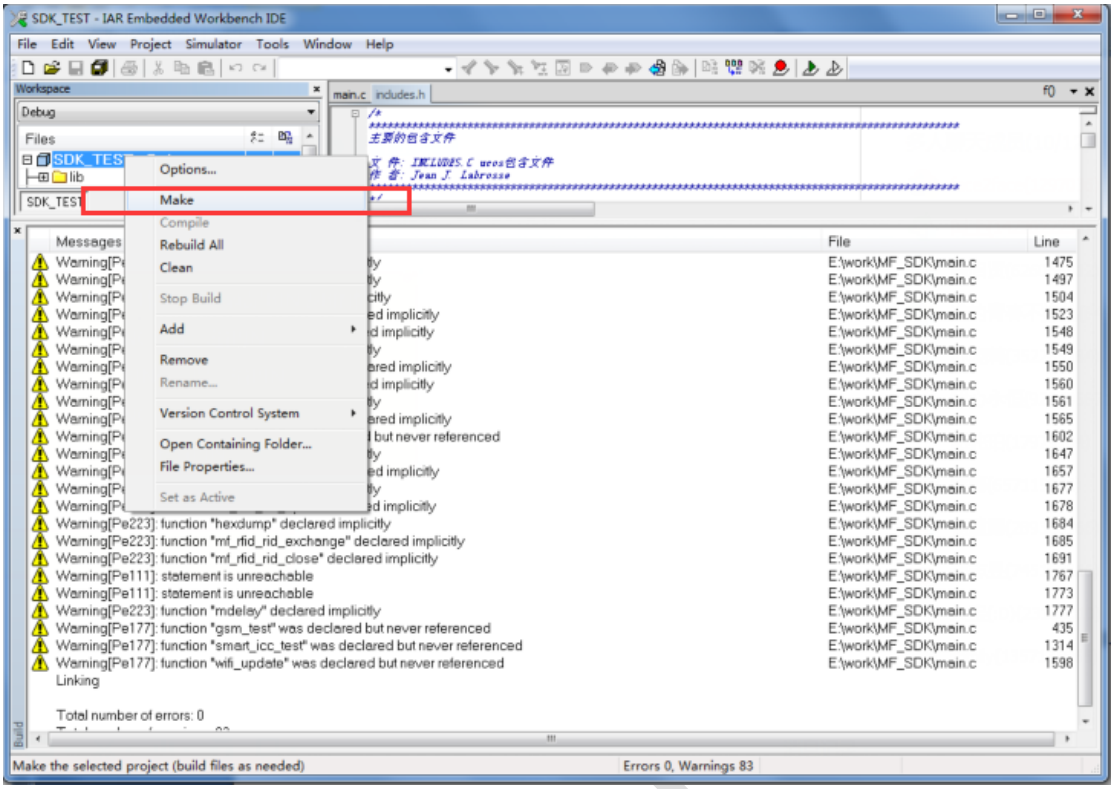
4.3.7 Set the output file format

Set the final generated program format to binary format.



4.4 Engineering compilation

After you complete the project configuration and file addition, you can compile. Select the corresponding project, right-click menu to select make, will begin to compile. Compiled results and intermediate files, stored in the project directory debug or release directory.



5 Write and compile source code

After the establishment and configuration of the project, you can start the development work. Code editing can use IAR own editing work. You can also use other text editing tools, such as ultraedit, notepad ++, source insight, and so on.

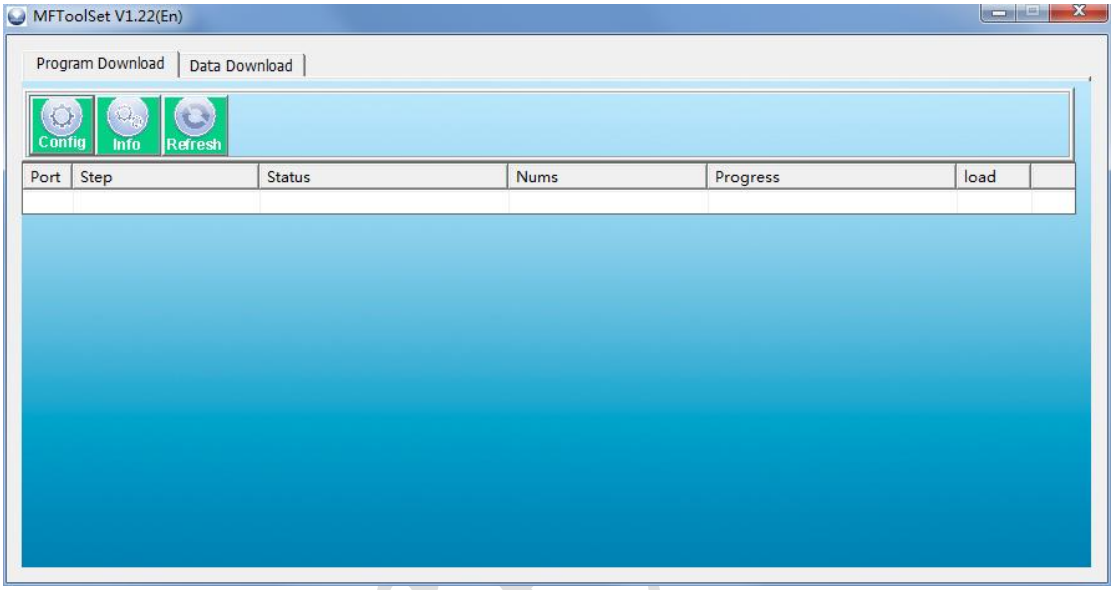
6 Code Download

If the program compiles the link without error, you can download the

generated binary executable file to the terminal for testing.

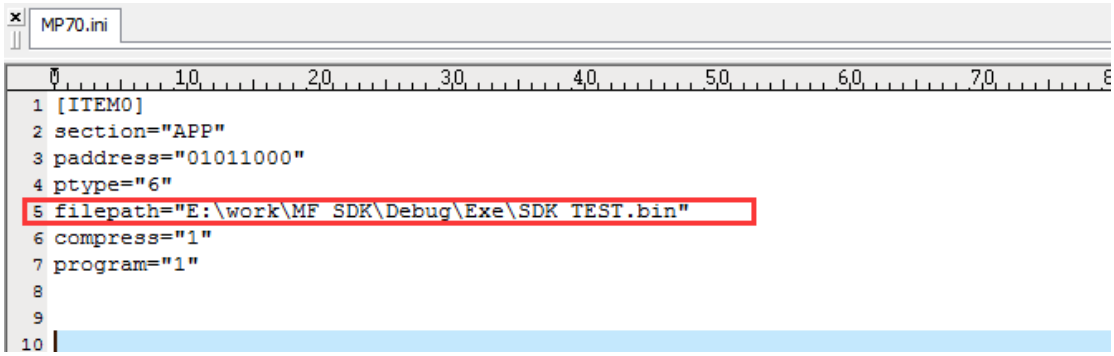
6.1 Download Tool

Download the program need to use the Rubik's caster download tool MFToolSet.



6.1.1 Configuration File Editing

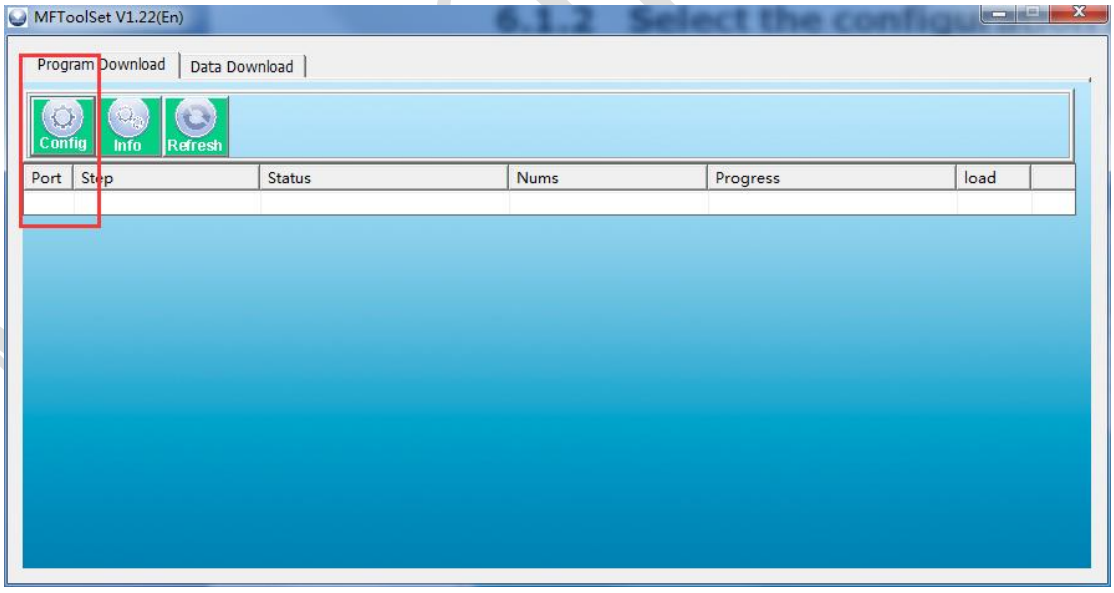
Use the INI configuration file to configure the download tool. The configuration file specifies the address of the program download and the path to the download program. SDK will provide a template for the configuration file, the user only need to modify the path to download the program can be. There are differences in the configuration files for different models. Please select the parameter template for the corresponding model. For example, MP70 configuration file for the MP70.ini. The contents of the document are as follows:



As shown above, the user only need to modify the program path within the red box according to the actual situation. Other parameters do not need to be adjusted.

6.1.2 Select the configuration file

After modifying the configuration file, you can select the corresponding configuration file in the tool's setup menu.



6.2 Connect PC and Terminal

Before downloading, you need to connect the terminal to the PC. The current device has two ways and PC connection: RS232 physical serial port, USB CDC virtual serial port.

6.2.1 MP70 Connection

MP70 is connected to USB using PC. This way you need to install the corresponding CDC driver. Refer to "6 USB Driver Installation" for details on how to install the drive. If you install the PC successfully inside the device manager will see a virtual COM port.

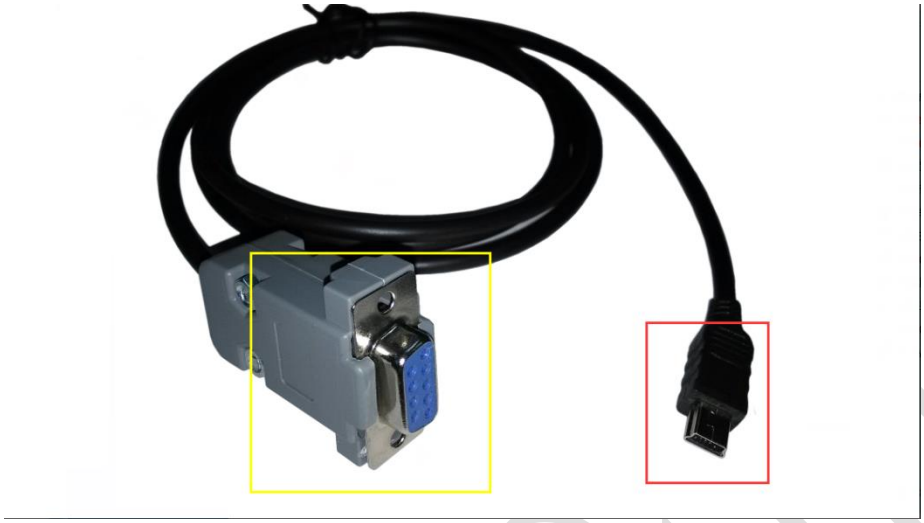
Connect the USB cable used, as shown below:

The small end of the need for Micro USB port. And most of the android phone data cable is the same. The micro usb termination device, the other end of the PC.

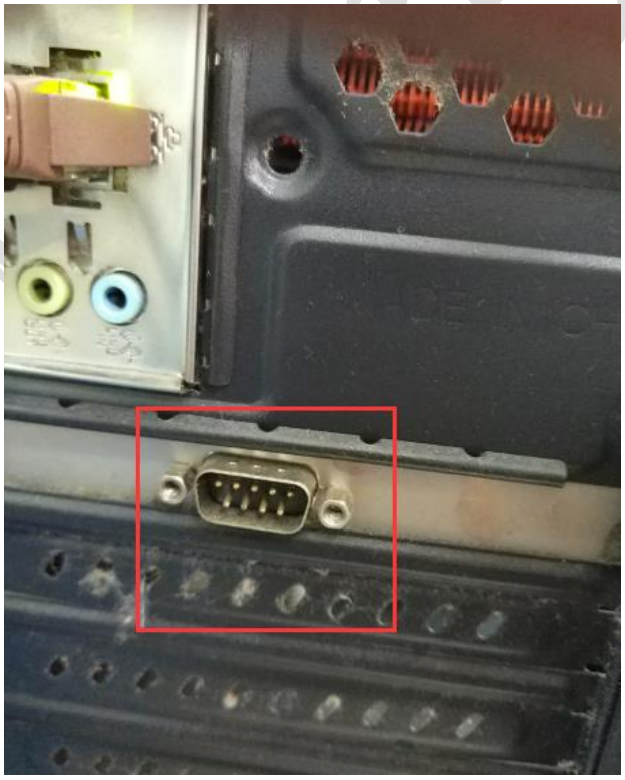
6.2.2 H9,MF90connection

H9 and MF90 are connected via RS232 interface and PC. Connect the cable

to use the custom cube line, as shown below:



Small head is the red box marked the mouth of the device. The other end of the mouth (yellow box marked the port) for the standard serial port. If the PC has a physical serial port, then directly with this line can be connected with the PC:



If the PC does not have a physical serial port, you need a USB to RS232 line for bridging. As shown below:

The connection is as follows:

6.3 Into the Download Mode

The terminal must enter the download mode to upgrade the program. Different types of terminals, into the download mode is the same way. Boot process, keep pressing the 1 key (note can not always press, to press repeatedly), enter the download mode, the LCD will have the appropriate tips, as shown below:

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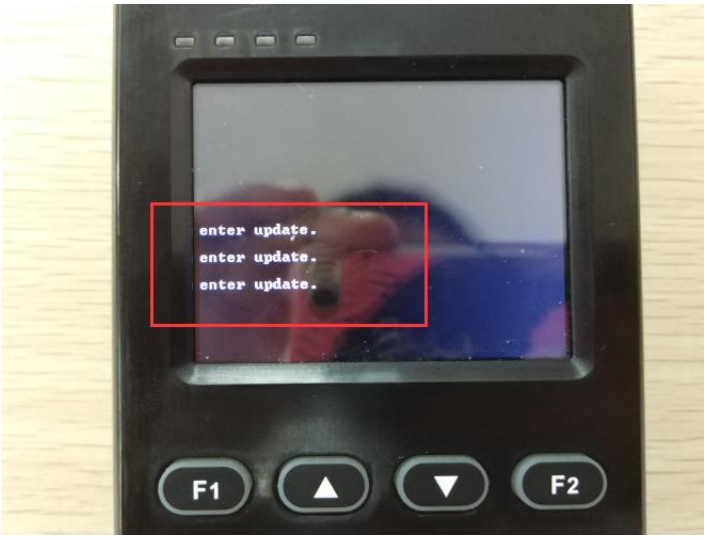
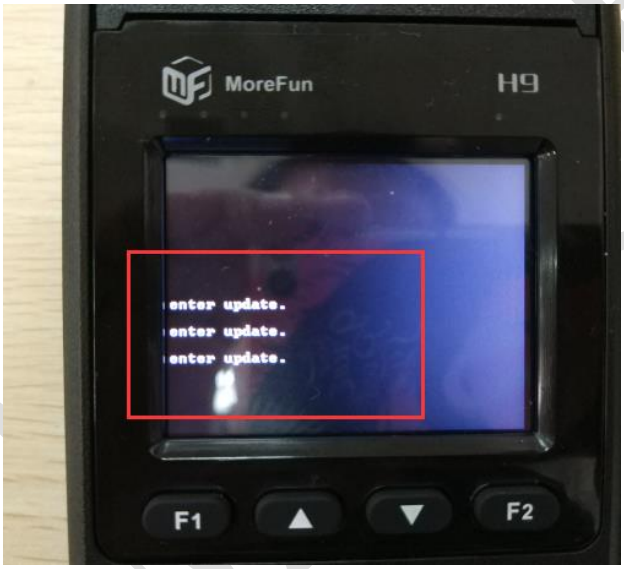


MP70



H9

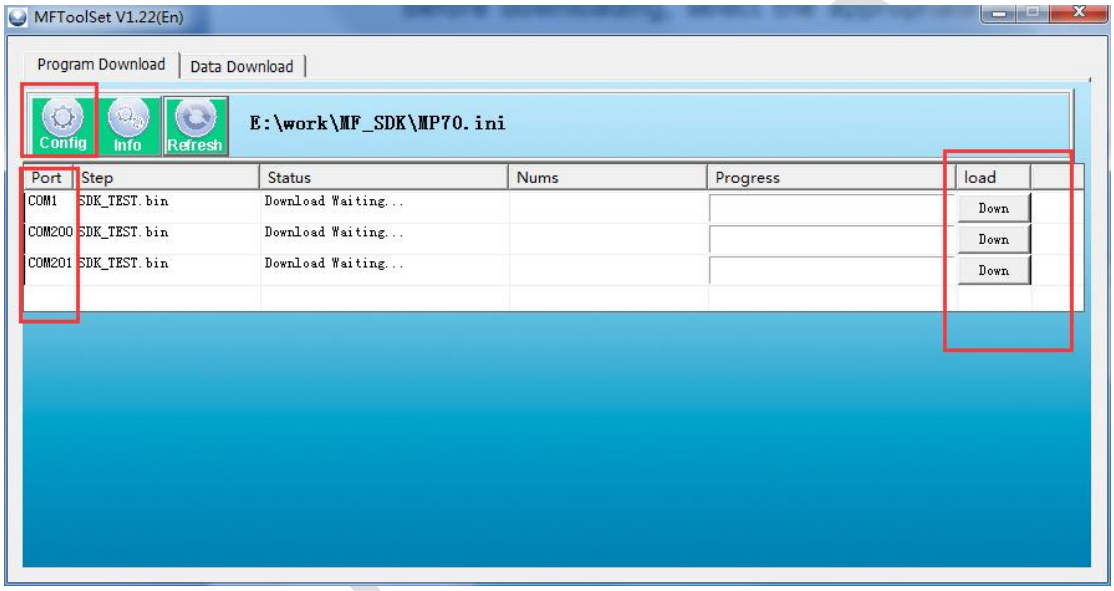
If the operation is in the download mode, follow the steps below to exit the upgrade mode:

MP70: Remove the USB cable, long press the power button to perform a hard shutdown action.

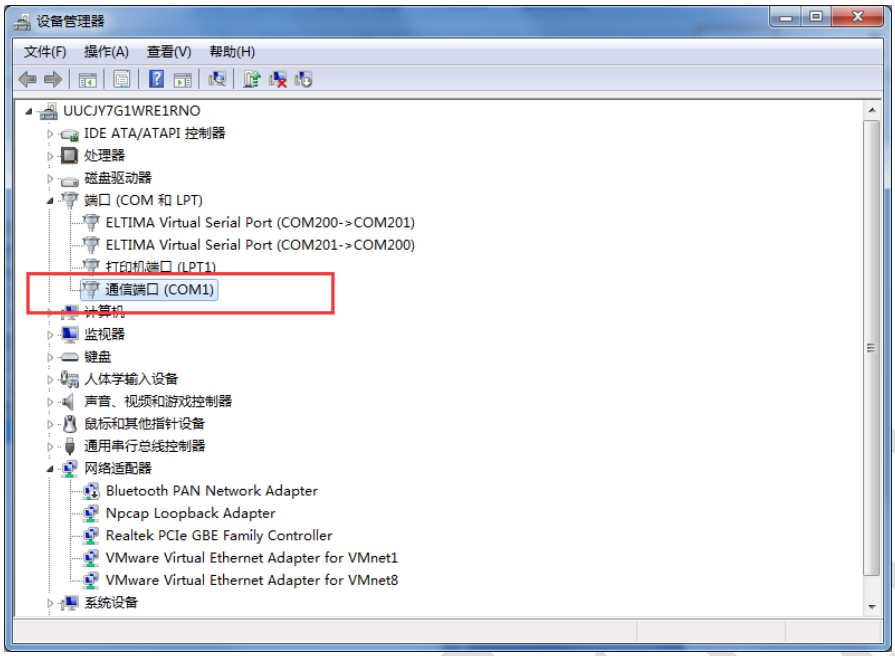
H9, MF90: open the battery compartment, remove the battery shutdown.

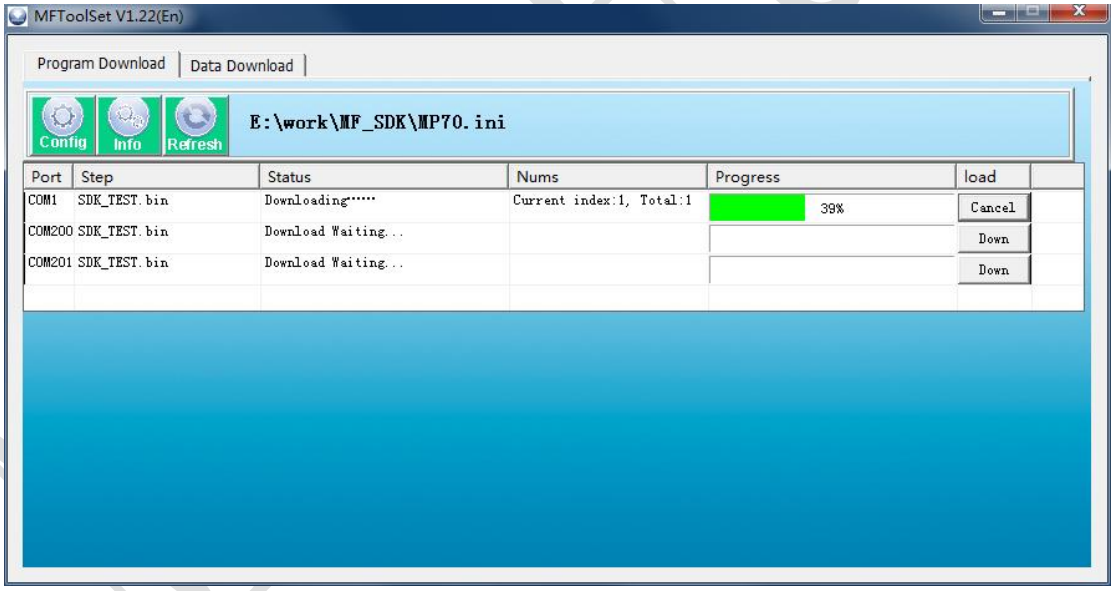
6.4 Download

After the device enters the download mode and is connected to the PC, you can use the download tool to download the program. Before downloading, select the appropriate download profile in the setup menu.

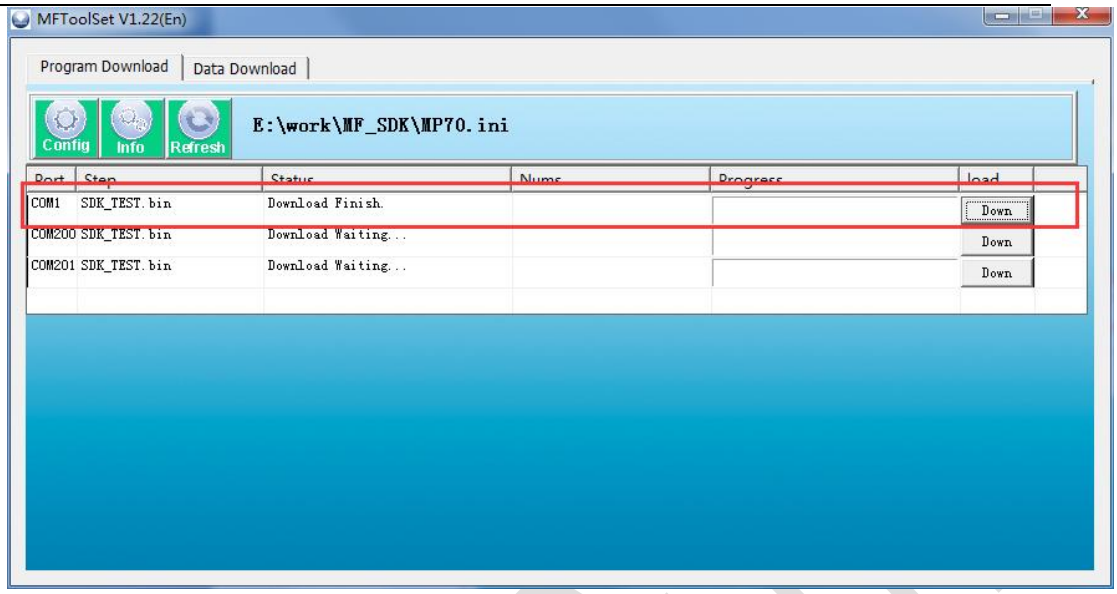


In the device manager can see, the device connected to the PC which COM port above, such as here corresponds to COM1. So in the download tool to find COM1 corresponding to the download, and then select the download, it will start the download process.





When the download is complete, download the tools and equipment will have a corresponding LCD tips, as shown below:



After downloading, press 2 key to restart the device will run the newly downloaded program.

7 Code debugging

Terminal only supports log output debugging, does not support simulation online debugging (such as JTAG, SWD, etc.). Log is through the terminal DEBUG port output, PC can use secureCRT and other serial tools to view the log.

There are two ways to log output:

7.1 Control DBEUG port output log

Terminal has a DEBUG interface with the PC communication, MP70 for the USB port (USB CDC), MF90, H9 for the RS232 serial port. The application can directly open the DEBUG port, the formatting of the log information directly to the corresponding port. The DEBUG port on the terminal corresponds to the port number MF_UART_COM20.

7.2 mf_log_debug

The application can call the mf_log_debug interface output log, which only supports partial formatted parameters and is non-thread safe and can not be called concurrently. By default, the output of this interface is masked. You need to call the mf_console_switch interface to turn on the output.

When using this method to output logs. The application can no longer control the DEBUG port for communication.

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8 USB CDC drive installation

When using the USB cable to connect directly, you need to install the cube dedicated USB CDC driver. MP70, MP60 need to install this driver. When the device is powered on and the driver is installed for the first time, please follow the steps below to install the driver.

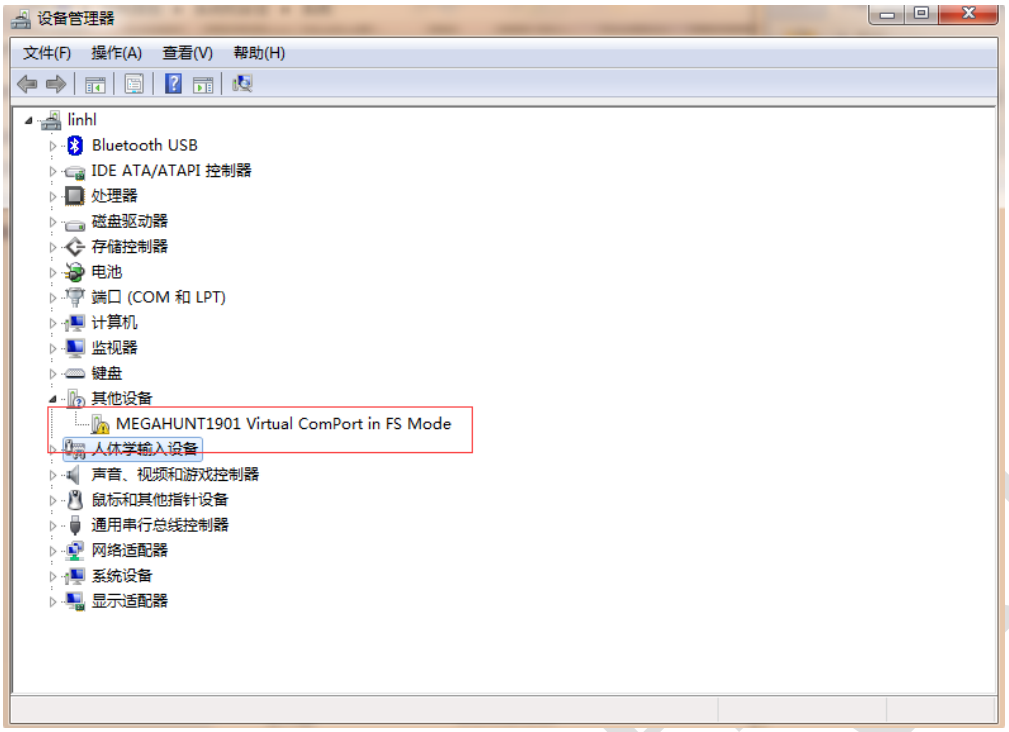
8.1 Step1

Press the power button to boot, connect the USB data cable. Manually copy the usbser.sys file to the C: \ Windows \ System32 \ drivers directory. If it is XP system please select the 32-bit version.。

Right-click "Computer" and select Properties. Open the Device Manager

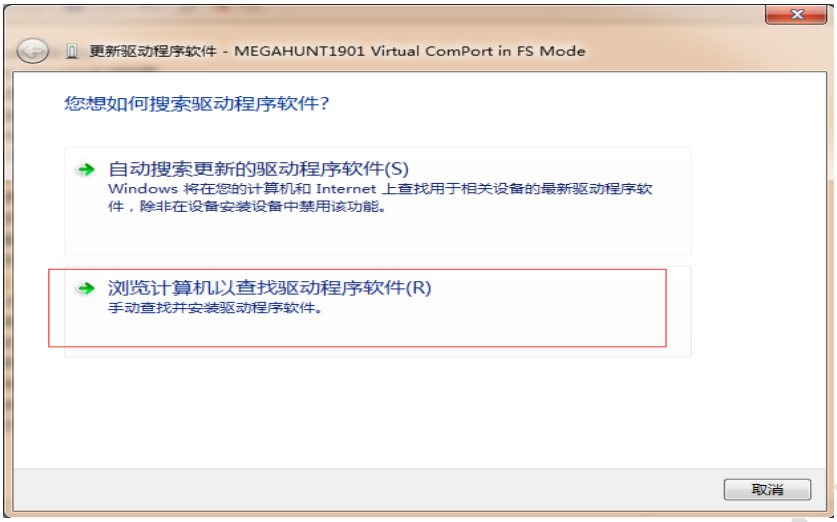
8.2 Step 2

If the device and PC have the correct connection, you will see the following information:



8.3 Step 3

Right click on "MEGAHUNT1901 Virtual ComPort in FS Mode" and select "Update Driver Software". Then the following interface will be displayed, and then select the option in the red box to install.


更新驱动程序软件 - MEGAHUNT1901 Virtual ComPort in FS Mode
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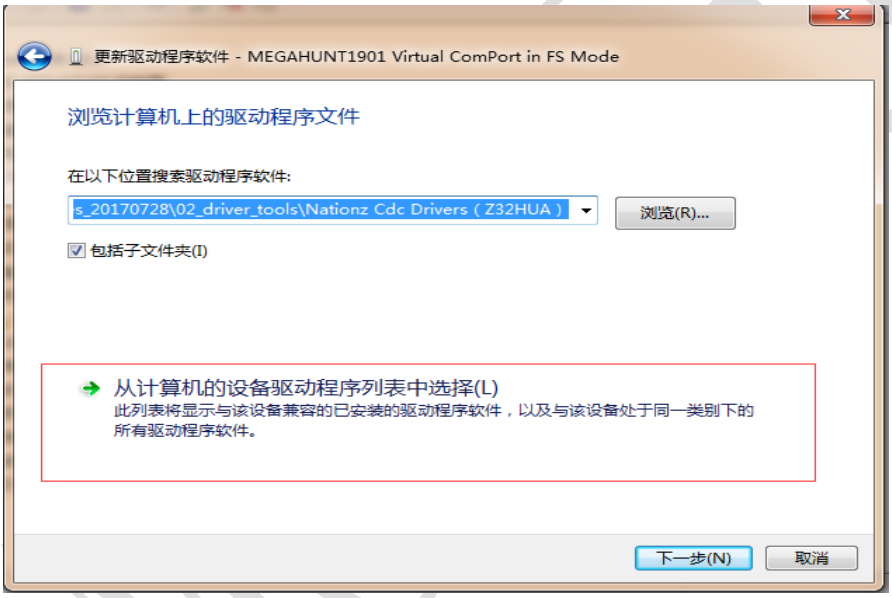
自动搜索更新的驱动程序软件(S)
Windows 将在您的计算机和 Internet 上查找用于相关设备的最新驱动程序软件，除非在设备安装设备中禁用该功能。
浏览计算机以查找驱动程序软件(R)
手动查找并安装驱动程序软件。
取消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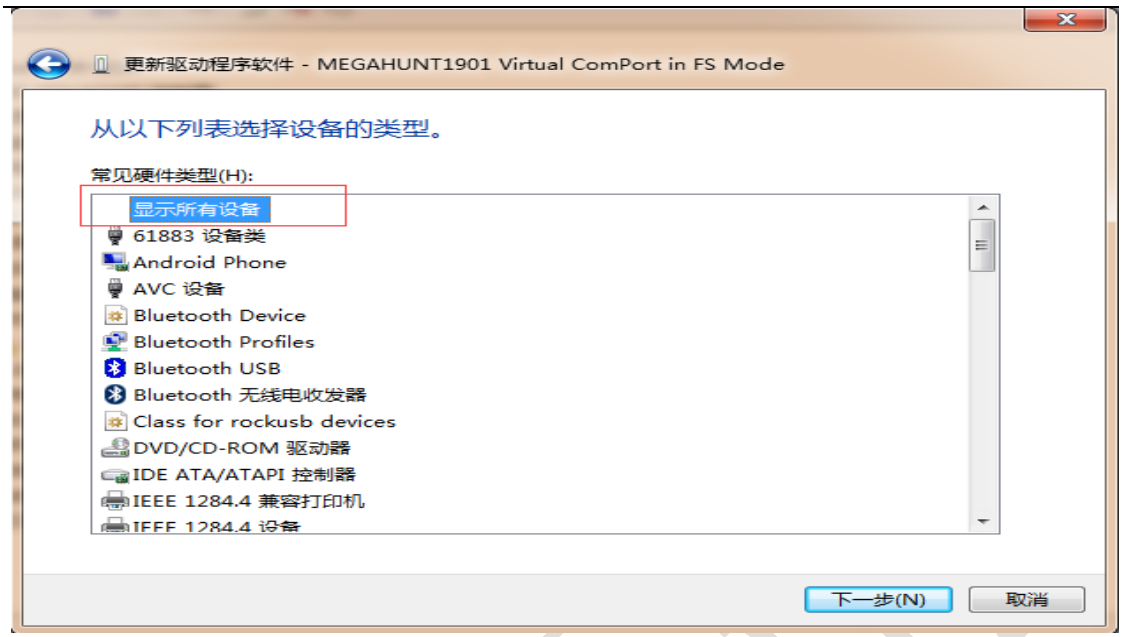
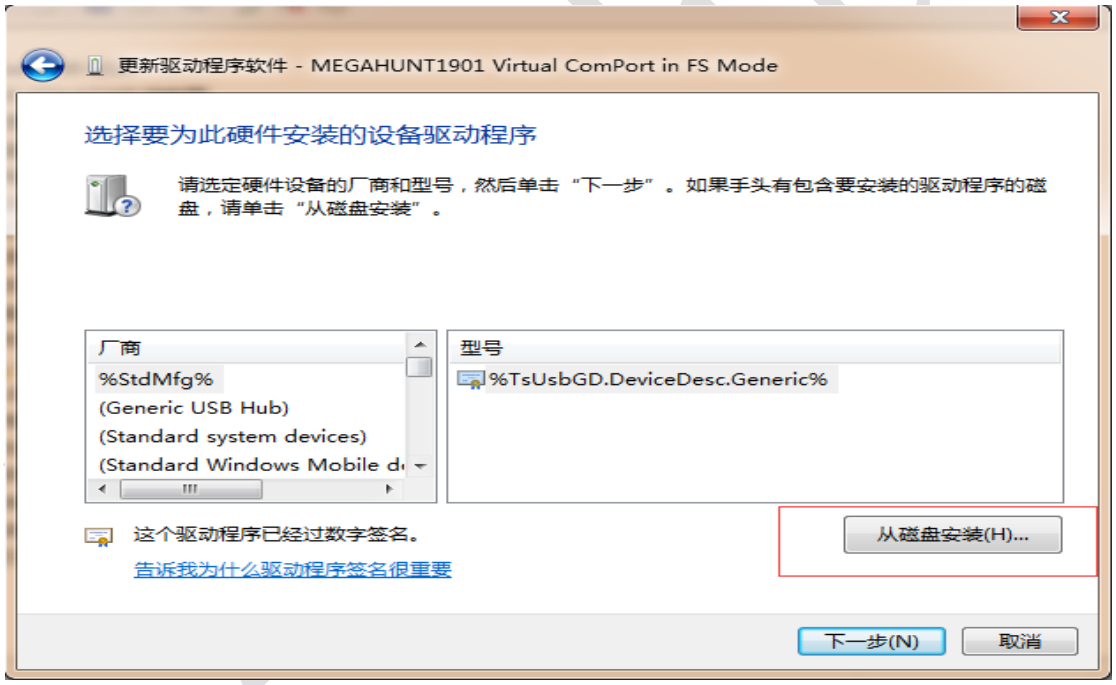
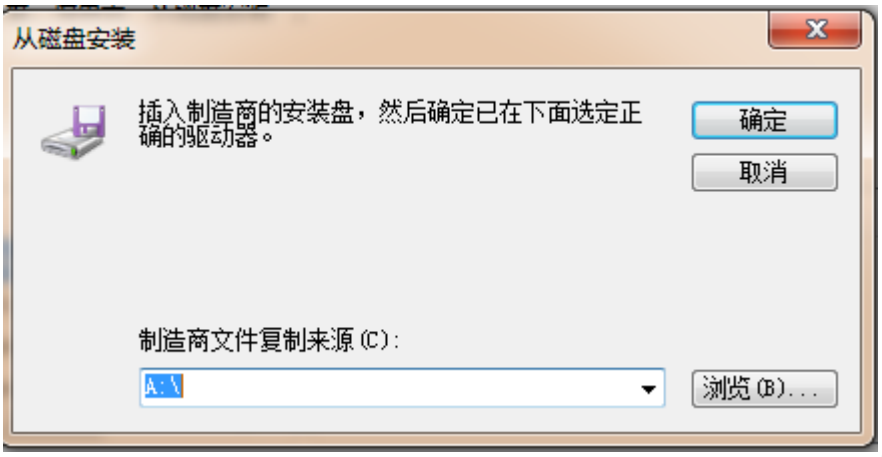
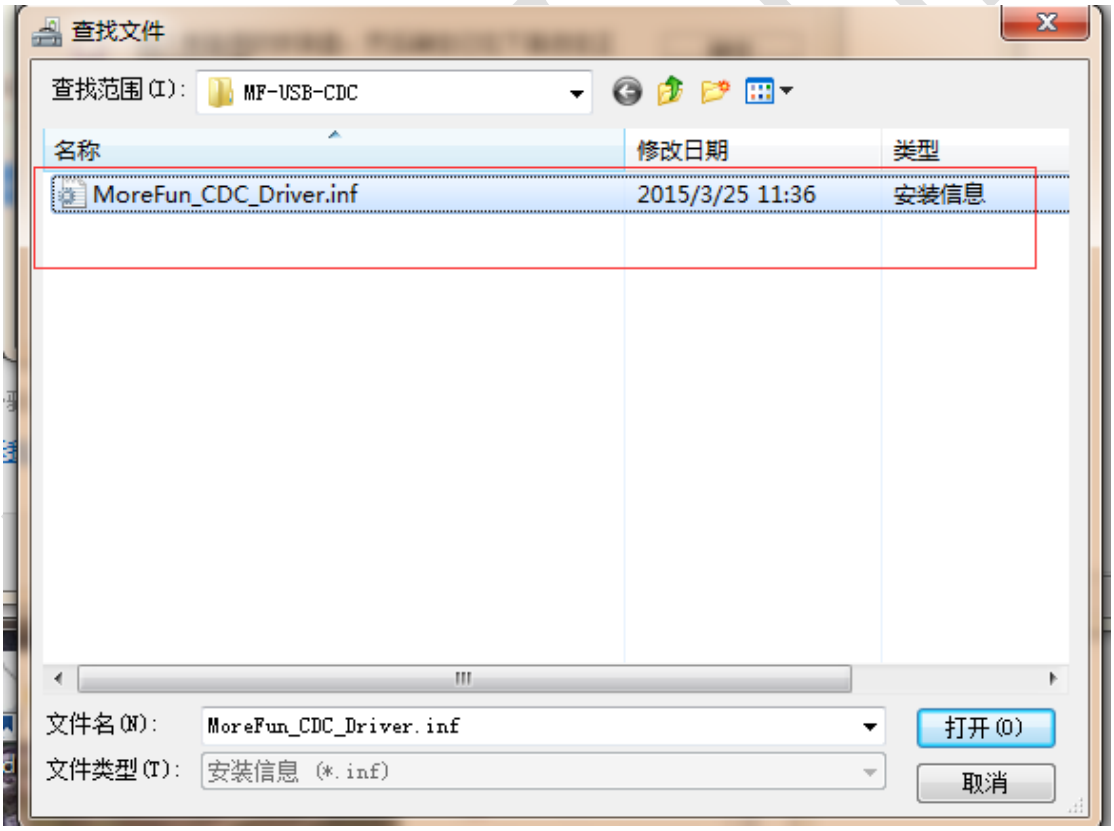
浏览计算机上的驱动程序文件
在以下位置搜索驱动程序软件:
s_20170728\02_driver_tools\Nationz Cdc Drivers (Z32HUA)
浏览(R)...
包括子文件夹(I)
从计算机的设备驱动程序列表中选择(L)
此列表将显示与该设备兼容的已安装的驱动程序软件，以及与该设备处于同一类别下的所有驱动程序软件。
下一步(N)
取消

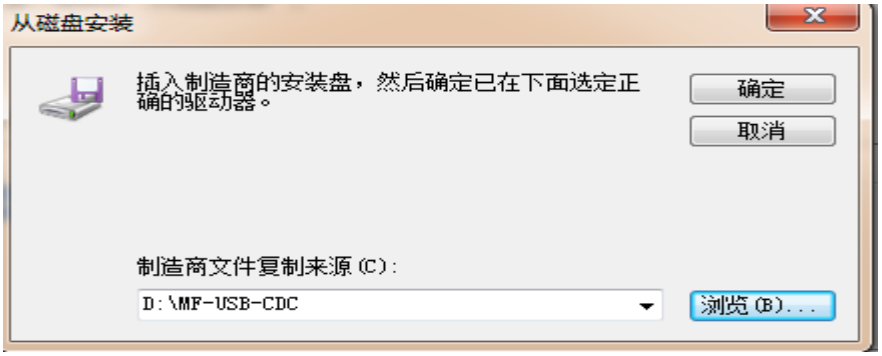

更新驱动程序软件 - MEGAHUNT1901 Virtual ComPort in FS Mode
从以下列表选择设备的类型。
常见硬件类型(H):
显示所有设备
61883 设备类
Android Phone
AVC 设备
Bluetooth Device
Bluetooth Profiles
Bluetooth USB
Bluetooth 无线电收发器
Class for rockusb devices
DVD/CD-ROM 驱动器
IDE ATA/ATAPI 控制器
IEEE 1284.4 兼容打印机
下一步(N)
取消

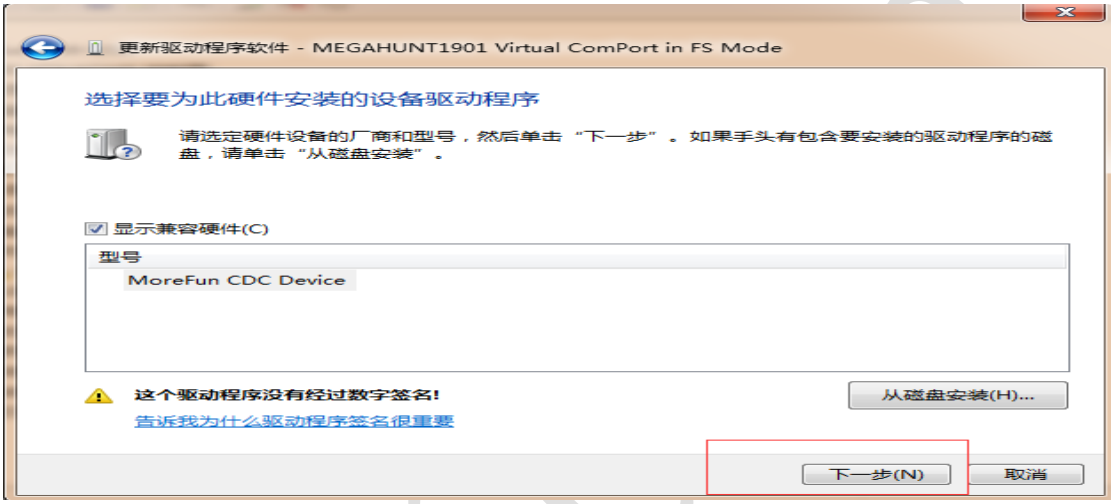

更新驱动程序软件 - MEGAHUNT1901 Virtual ComPort in FS Mode
选择要为此硬件安装的设备驱动程序
请选定硬件设备的厂商和型号，然后单击“下一步”。如果手头有包含要安装的驱动程序的磁盘，请单击“从磁盘安装”。
厂商
%StdMfg%
(Generic USB Hub)
(Standard system devices)
型号
%TsUsbGD.DeviceDesc.Generic%
这个驱动程序已经过数字签名。
告诉我为什么驱动程序签名很重要
从磁盘安装(H)...
下一步(N)
取消

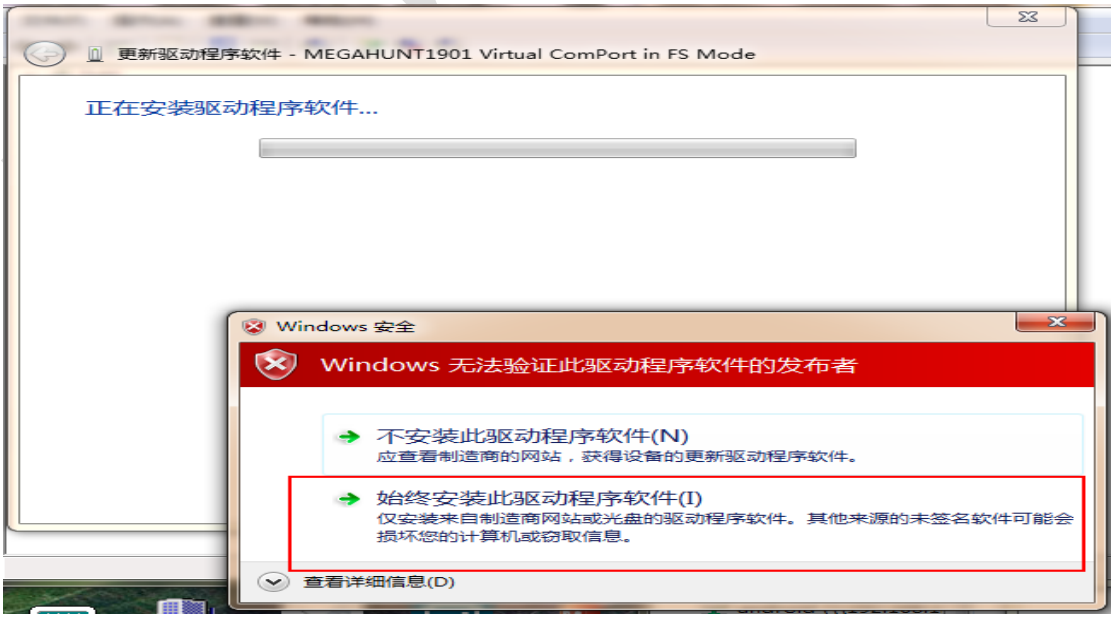


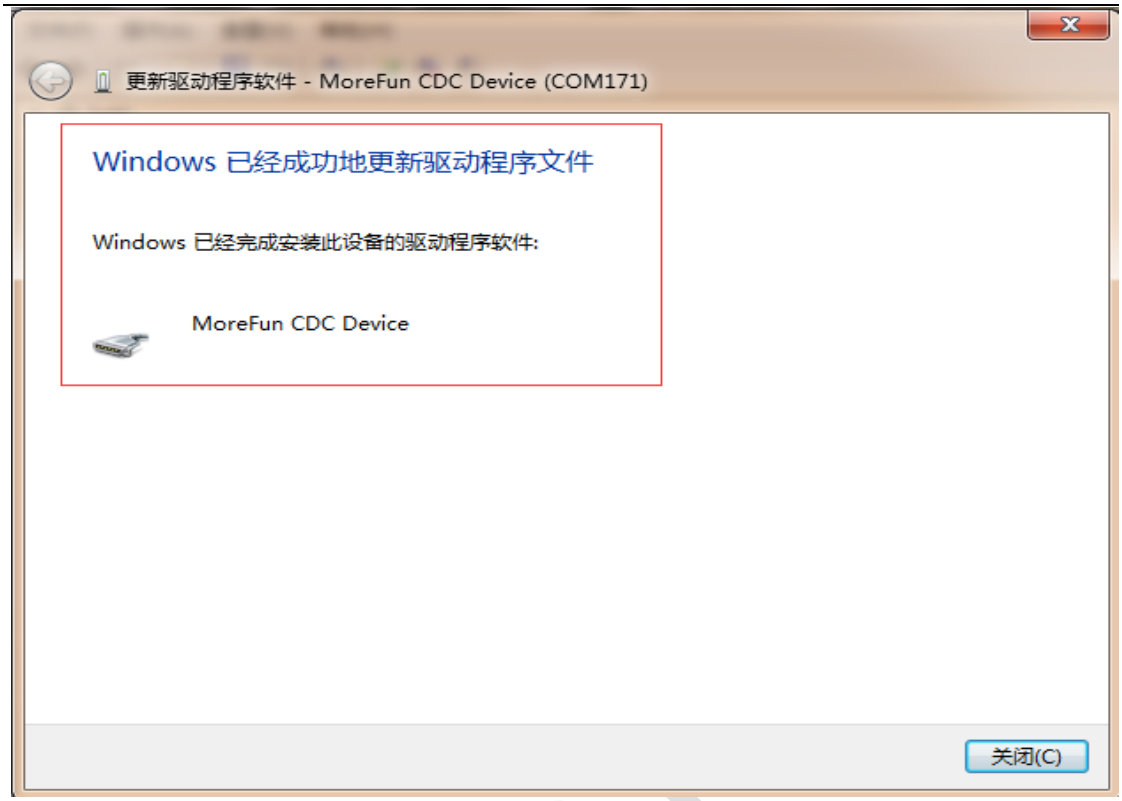
Select the corresponding driver INF file here.



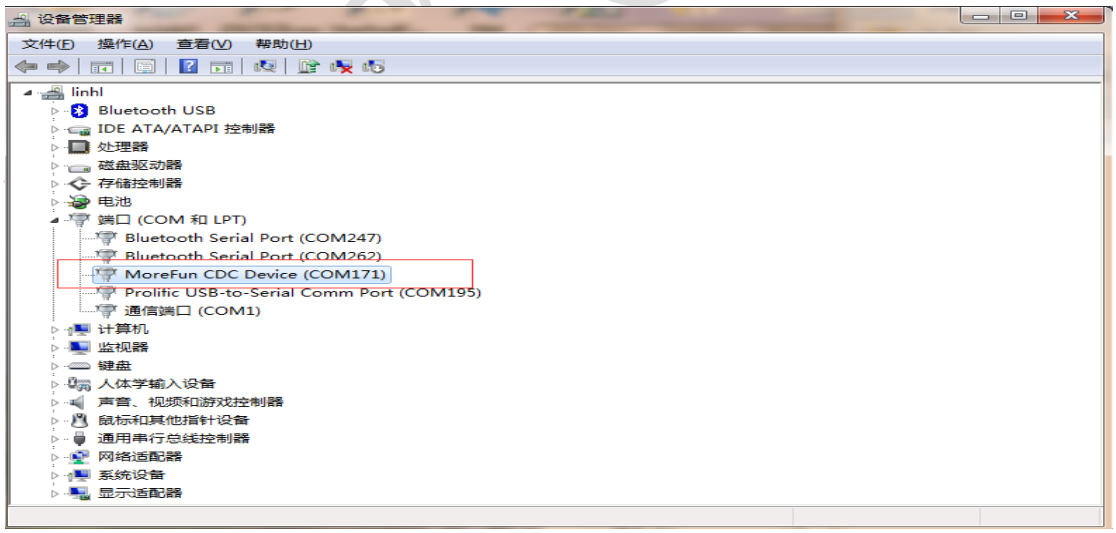

从磁盘安装
插入制造商的安装盘，然后确定已在下面选定正确的驱动器。
确定
取消
制造商文件复制来源(C):
D:\MF-USB-CDC
浏览(B)...


更新驱动程序软件 - MEGAHUNT1901 Virtual ComPort in FS Mode
选择要为此硬件安装的设备驱动程序
请选定硬件设备的厂商和型号，然后单击“下一步”。如果手头有包含要安装的驱动程序的磁盘，请单击“从磁盘安装”。
显示兼容硬件(C)
型号
MoreFun CDC Device
这个驱动程序没有经过数字签名!
告诉我为什么驱动程序签名很重要
从磁盘安装(H)...
下一步(N)
取消


更新驱动程序软件 - MEGAHUNT1901 Virtual ComPort in FS Mode
正在安装驱动程序软件...
Windows 安全
Windows 无法验证此驱动程序软件的发布者
不安装此驱动程序软件(N)
应查看制造商的网站，获得设备的更新驱动程序软件。
始终安装此驱动程序软件(I)
仅安装来自制造商网站或光盘的驱动程序软件。其他来源的未签名软件可能会损坏您的计算机或窃取信息。
查看详细信息(D)



After the installation is successful, in the device manager which will see the corresponding break number information.



MoreFun