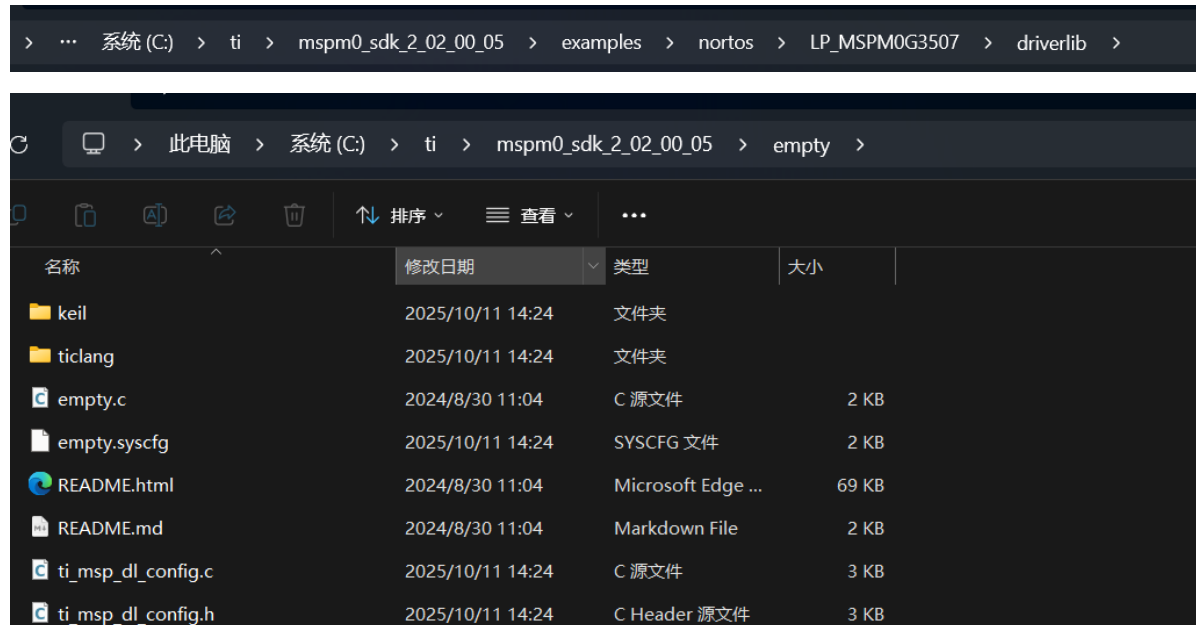


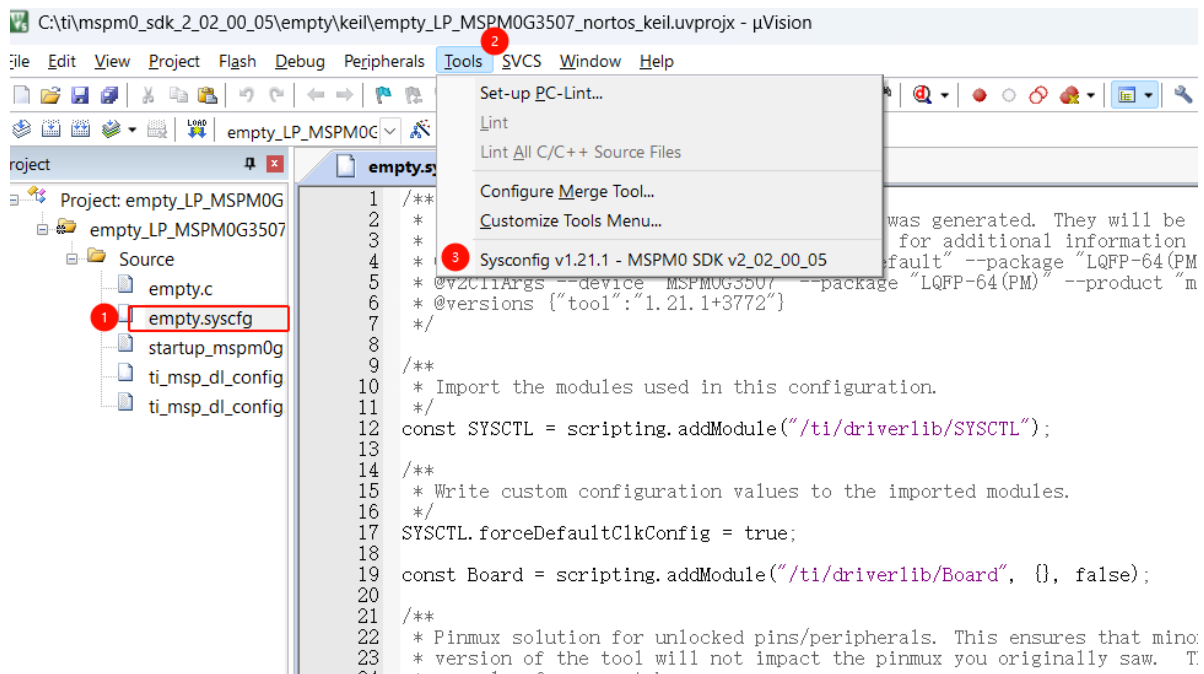
MSPM0 Clock Configuration

If MSPM0 uses the internal crystal oscillator, the maximum CPU clock frequency can only be set to (32MHz). We have added a 40MHz high-frequency clock on the board. In this section, we will configure the clock tree to make MSPM0 work at 80MHz clock frequency.

Copy the empty project from the SDK to the SDK path



Double-click empty.syscfg to open the file, then click on the sysconfig tool under tool in the toolbar



After opening the sysconfig tool, we enable the clock tree under SYSCTL

SysConfig - C:\ti\mspm0_sdk_2_02_00_05\empty\empty.syscfg*

FILE ABOUT

Type Filter Text...

Software > SYSCTL

PROJECT CONFIGURATION...
Project Config... 1/1

MSPM0 DRIVER LIBRARY ...

SYSTEM (9)
Board 1/1
Configuration NVM
DMA
GPIO
MATHACL
RTC
SYSCTL 1/1
SYSTICK
WWDTC

ANALOG (6)
ADC12
COMP
DAC12
GPAMP
OPA
VREF

COMMUNICATIONS (6)
I2C

SYSCTL

Graphical Clock Configuration
Use Clock Tree

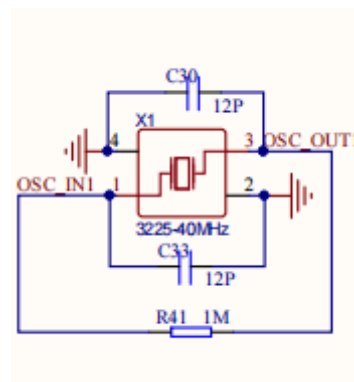
Power & Systems Configuration
Run Power Policy RUN0
Low Power Policy SLEEP0
Supplied Operational Voltage (VDD) 3.3
BOR Threshold 0
Enable Write Lock
Enable Sleep On Exit
Enable Event On Pending
Disable NRST Pin
VBOOST Operating Mode ONDEMAND

Flash Controller (FlashCtl) Configuration

Problems
There are no problems in the current design

Generated Files
Filter: all
File name Category
ti_msp_dl_config.c MSPM0 Driver Li
ti_msp_dl_config.h MSPM0 Driver Li
empty.syscfg Configuration Sc
3 Total Files

MSPM0G3507 (Device)
LQFP-64(PM) (Package)



PA6/HFCLK_IN/HFXOUT 46 OSC_OUT1 X
PA5/HFXIN/FCC_IN 45 OSC_IN1 X

From the schematic, we can see that our crystal is connected to PA5 and PA6 pins

LFCLK_IN_EXT
LFXT
EXLFMUX

4 MHz
SYSOSC
SYSOSC_4M
32.000 MHz
SYSOSC

HFCLK_IN_EXT
HFXT
EXHFMUX

HFCLK

SYSPLL

CLK0_DIV
CLK2X_DIV
CLK1_DIV

HFXT

Type
Input Frequency (MHz)
Enable HFXT
HFXT Frequency Range
HFXT Startup Time

Pin Function
40
40,000 MHz
32 and 48 MHz
100

Signal	RUN0	SLEEP0
CPUCCLK	80 MHz	UNAVAILABLE
LFCLK	32.768 kHz	32.768 kHz
MCLK	80 MHz	80 MHz
MFCLK	4 MHz	4 MHz
MFPCCLK	DISABLED	DISABLED

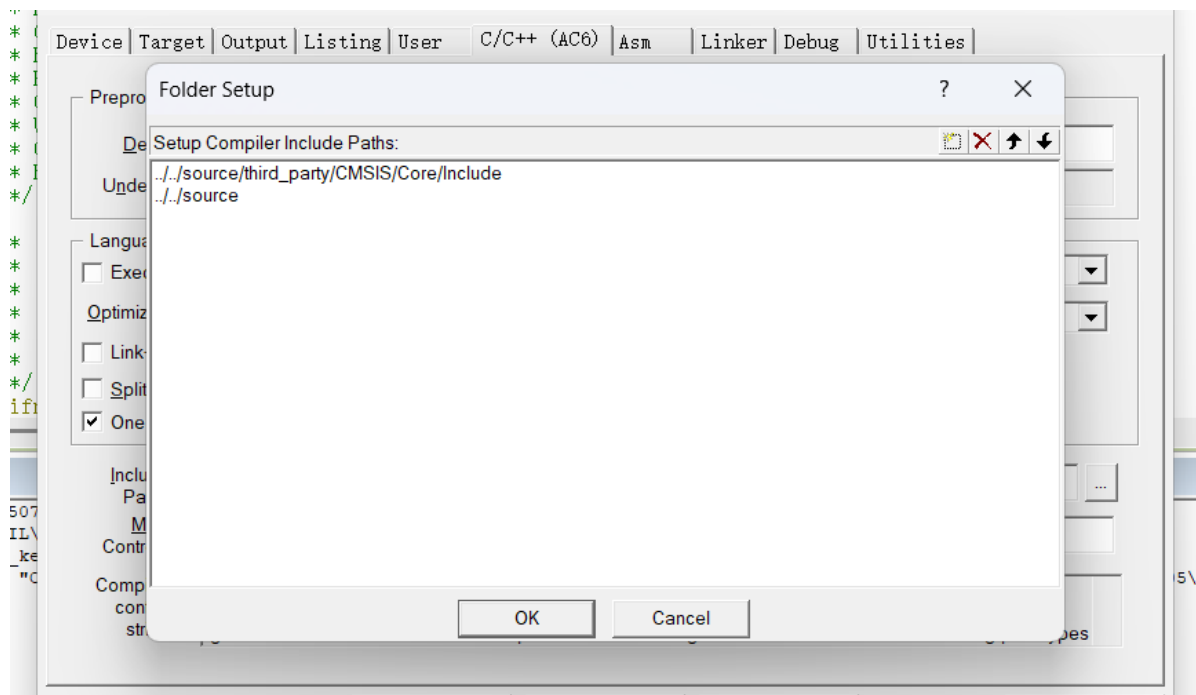
The configuration can refer to the figure below and can be modified according to your actual situation



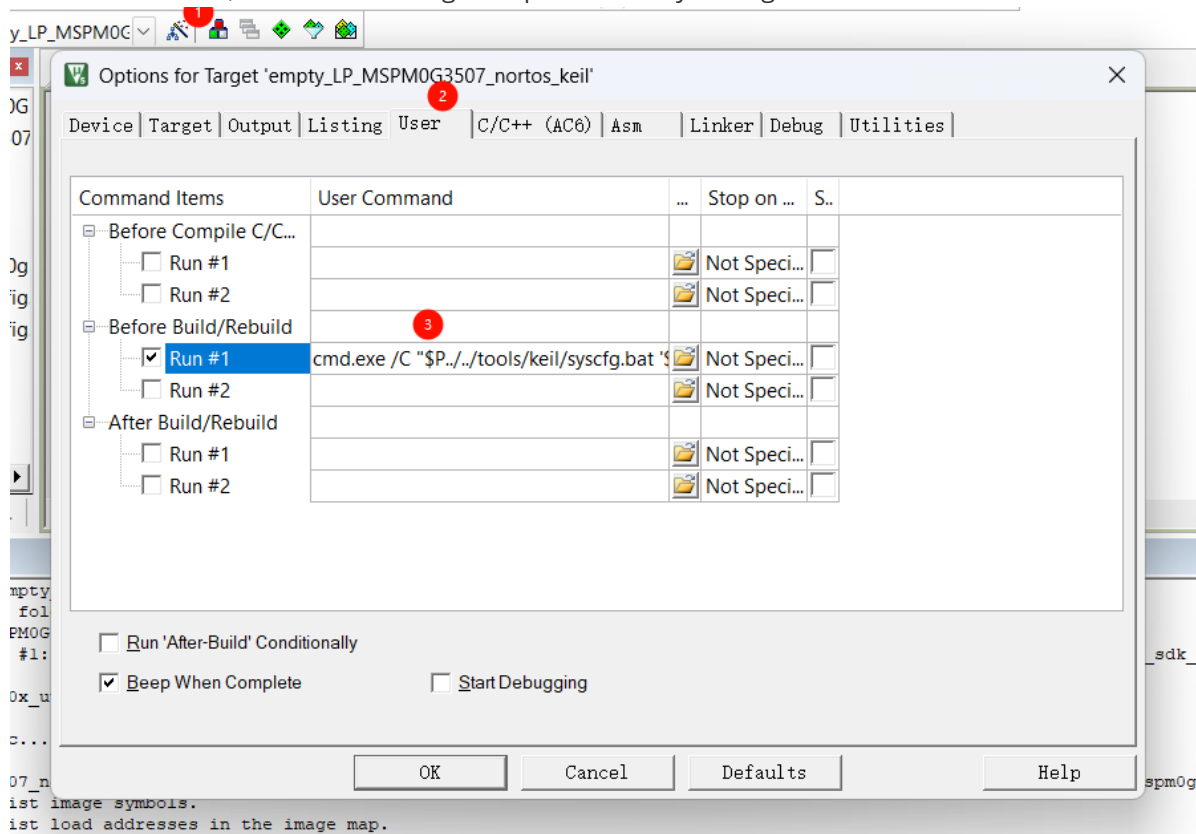
After saving, we return to Keil and compile directly. We will see two errors, which are caused by incorrect header file paths.



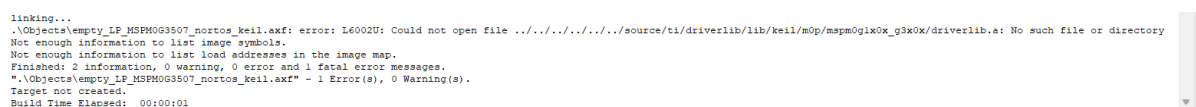
We need to modify the relative paths of these two folders as shown below

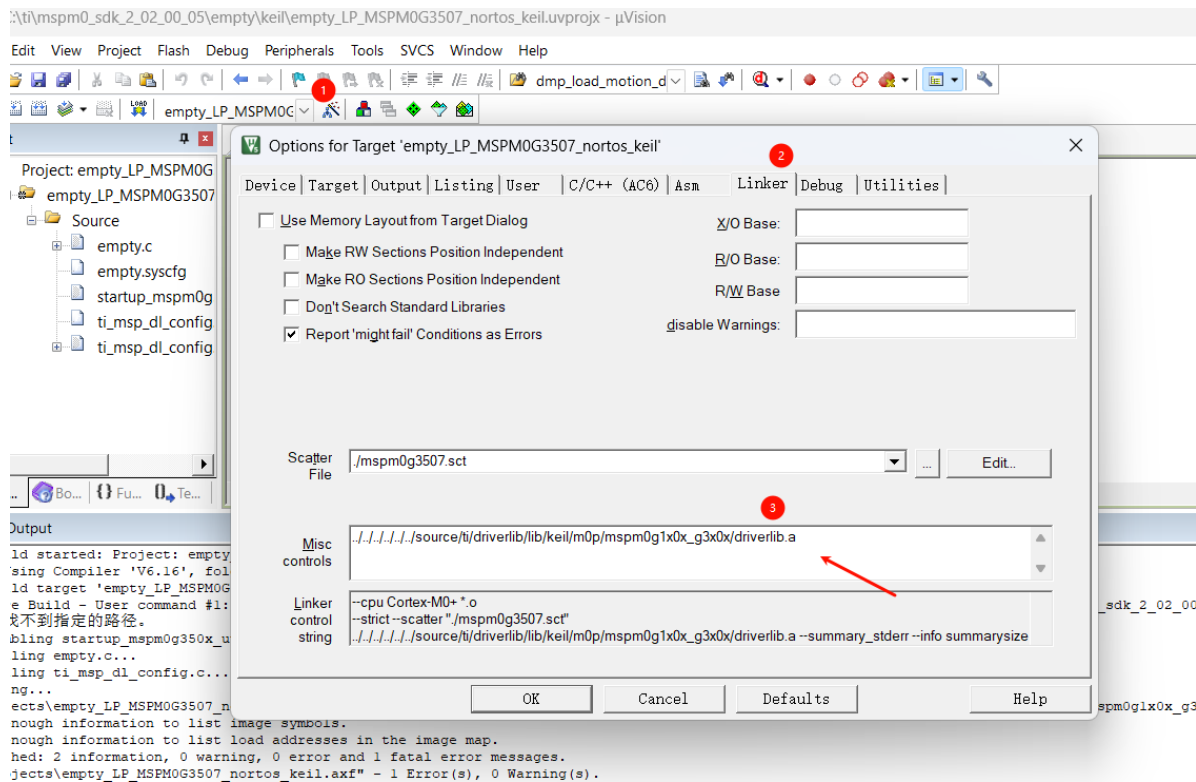


After modification, we need to change the path of the sysconfig.bat file below as shown below

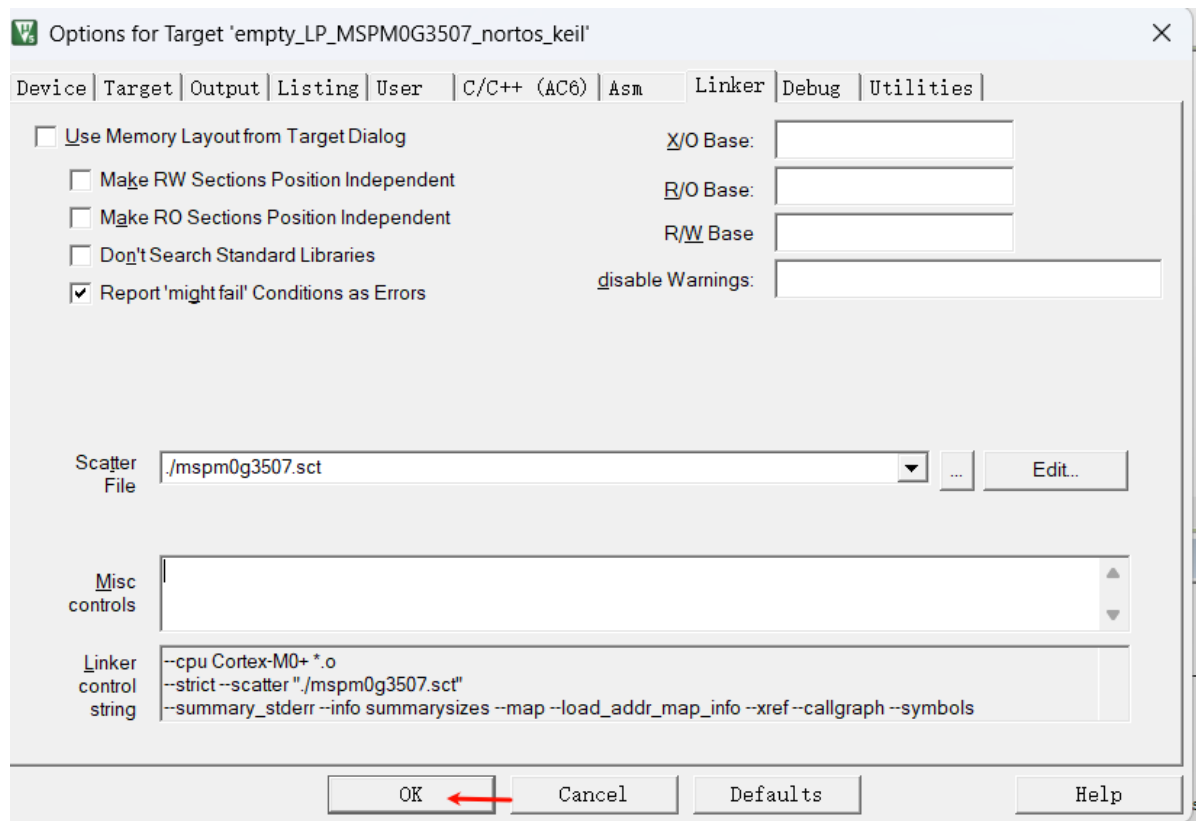


Compile again





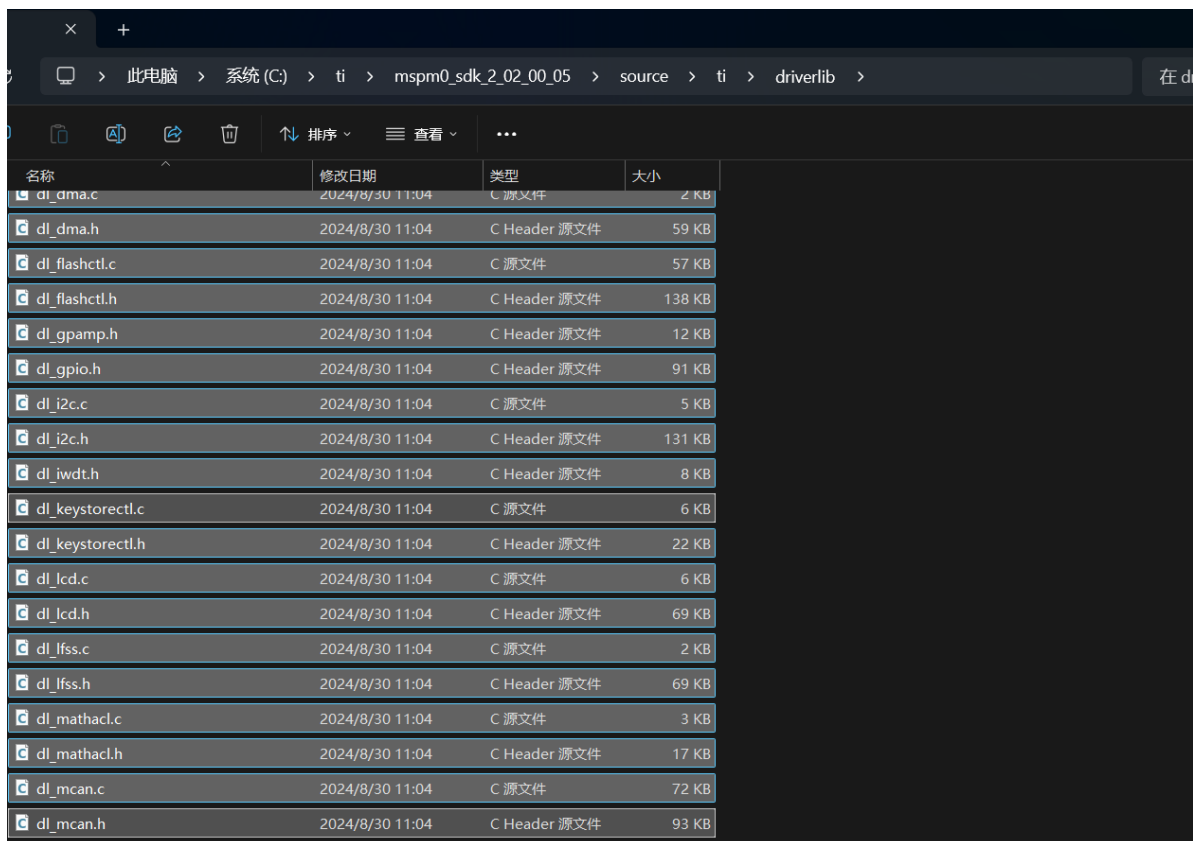
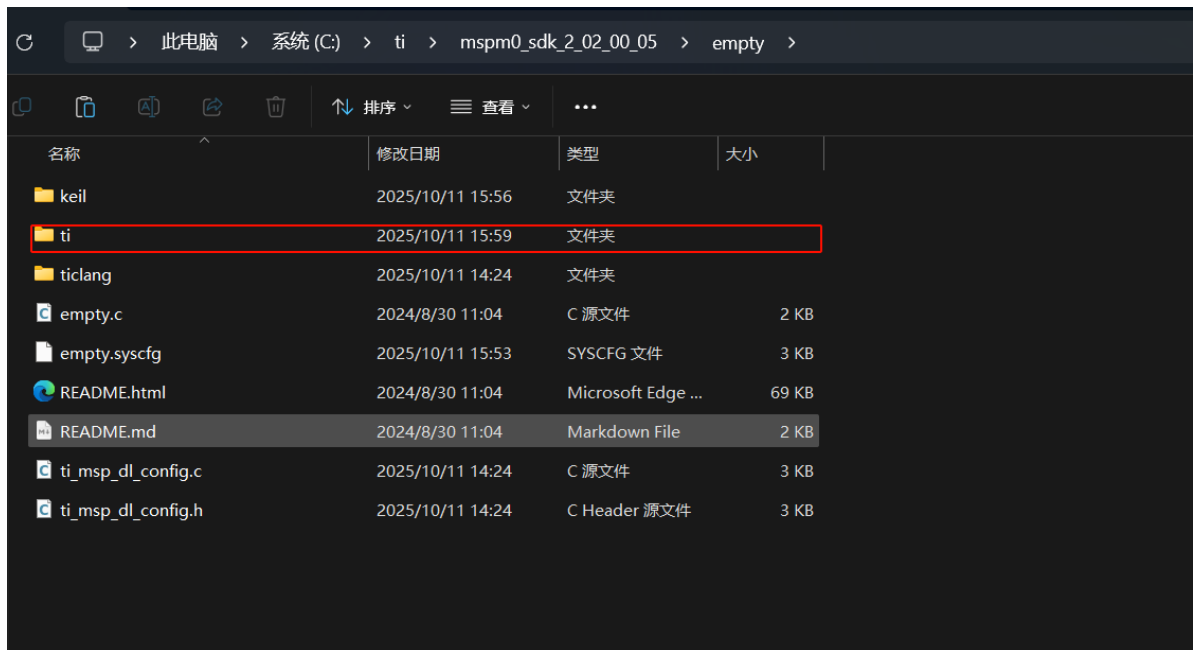
Delete this part of the content



After compiling again, the following error is reported

```
Before Build - User command #1: cmd.exe /C "C:\ti\mspm0_sdk_2_02_00_05\empty\keil\...\tools\keil\syscfg.bat "C:\ti\mspm0_sdk_2_02_00_05\empty\keil\" empty.sysc
Using Sysconfig Tool from "C:\ti\sysconfig_1.21.1\sysconfig_cli.bat"
"Update the file located at <sdk path>/tools/keil/syscfg.bat to use a different version"
Running script...
Validating...
Generating Code (empty.syscfg)...
Writing C:\ti\mspm0_sdk_2_02_00_05\empty\ti_msp_dl_config.c...
Writing C:\ti\mspm0_sdk_2_02_00_05\empty\ti_msp_dl_config.h...
assembling startup_mspm0g350x_uvision.s...
compiling empty.c...
compiling ti_msp_dl_config.c...
linking...
.\Objects\empty_LP_MSPM0G3507_nortos_keil.axf: Error: L6218E: Undefined symbol DL_Common_delayCycles (referred from ti_msp_dl_config.o).
.\Objects\empty_LP_MSPM0G3507_nortos_keil.axf: Error: L6218E: Undefined symbol DL_SYSTCL_configSYSPLL (referred from ti_msp_dl_config.o).
.\Objects\empty_LP_MSPM0G3507_nortos_keil.axf: Error: L6218E: Undefined symbol DL_SYSTCL_setHFCLKSourceHFXTParams (referred from ti_msp_dl_config.o).
.\Objects\empty_LP_MSPM0G3507_nortos_keil.axf: Error: L6218E: Undefined symbol DL_SYSTCL_switchMCLKfromSYSOSCtoHSCLK (referred from ti_msp_dl_config.o).
```

We create a new ti folder in the project path, then copy all source files and header files from the driverlib directory in the SDK path to the ti folder as shown below



Then we need to enter this folder in the SDK directory:

mspm0_sdk_2_02_00_05\source\ti\driverlib\m0p\sysctl and copy the two selected files below to the ti directory

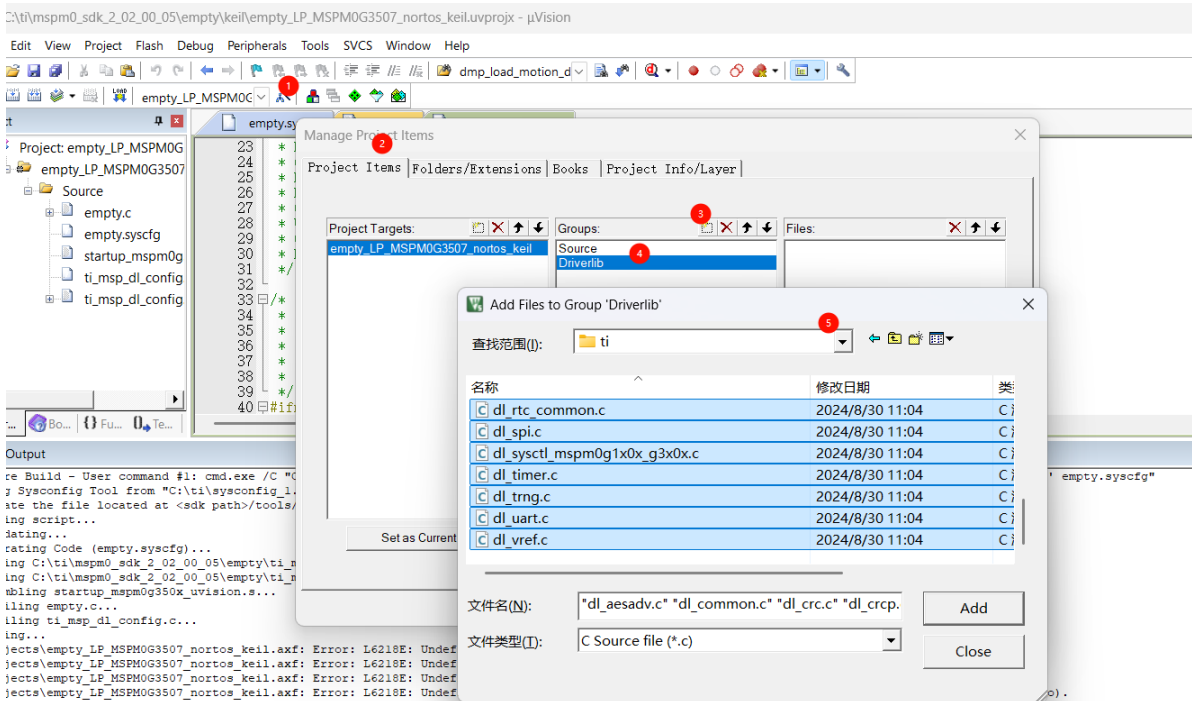
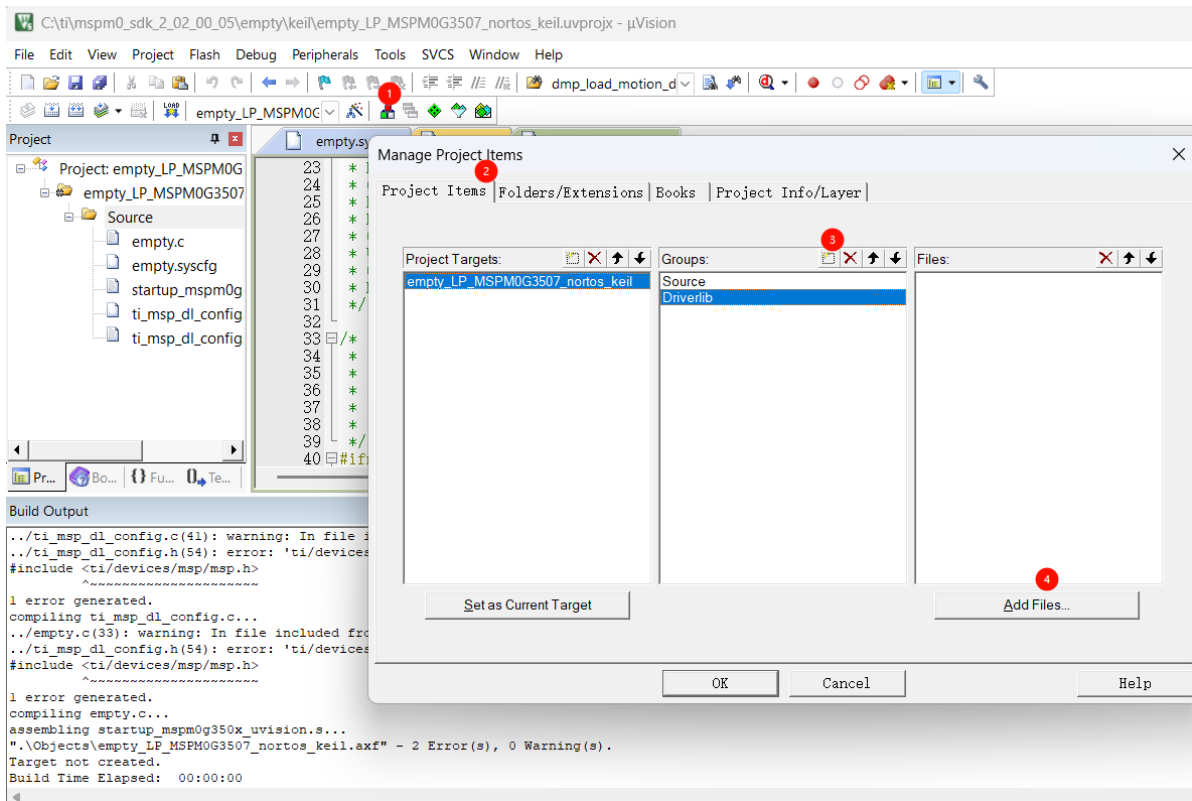
在 sysctl 中

名称	修改日期	类型	大小
dl_sysctl_mspm0c110x.c	2024/8/30 11:04	C 源文件	7 KB
dl_sysctl_mspm0c110x.h	2024/8/30 11:04	C Header 源文件	70 KB
dl_sysctl_mspm0g1x0x_g3x0x.c	2024/8/30 11:04	C 源文件	13 KB
dl_sysctl_mspm0g1x0x_g3x0x.h	2024/8/30 11:04	C Header 源文件	103 KB
dl_sysctl_mspm0gx51x.c	2024/8/30 11:04	C 源文件	15 KB
dl_sysctl_mspm0gx51x.h	2024/8/30 11:04	C Header 源文件	127 KB
dl_sysctl_mspm0l11xx_l13xx.c	2024/8/30 11:04	C 源文件	6 KB
dl_sysctl_mspm0l11xx_l13xx.h	2024/8/30 11:04	C Header 源文件	72 KB
dl_sysctl_mspm0l122x_l222x.c	2024/8/30 11:04	C 源文件	10 KB
dl_sysctl_mspm0l122x_l222x.h	2024/8/30 11:04	C Header 源文件	108 KB

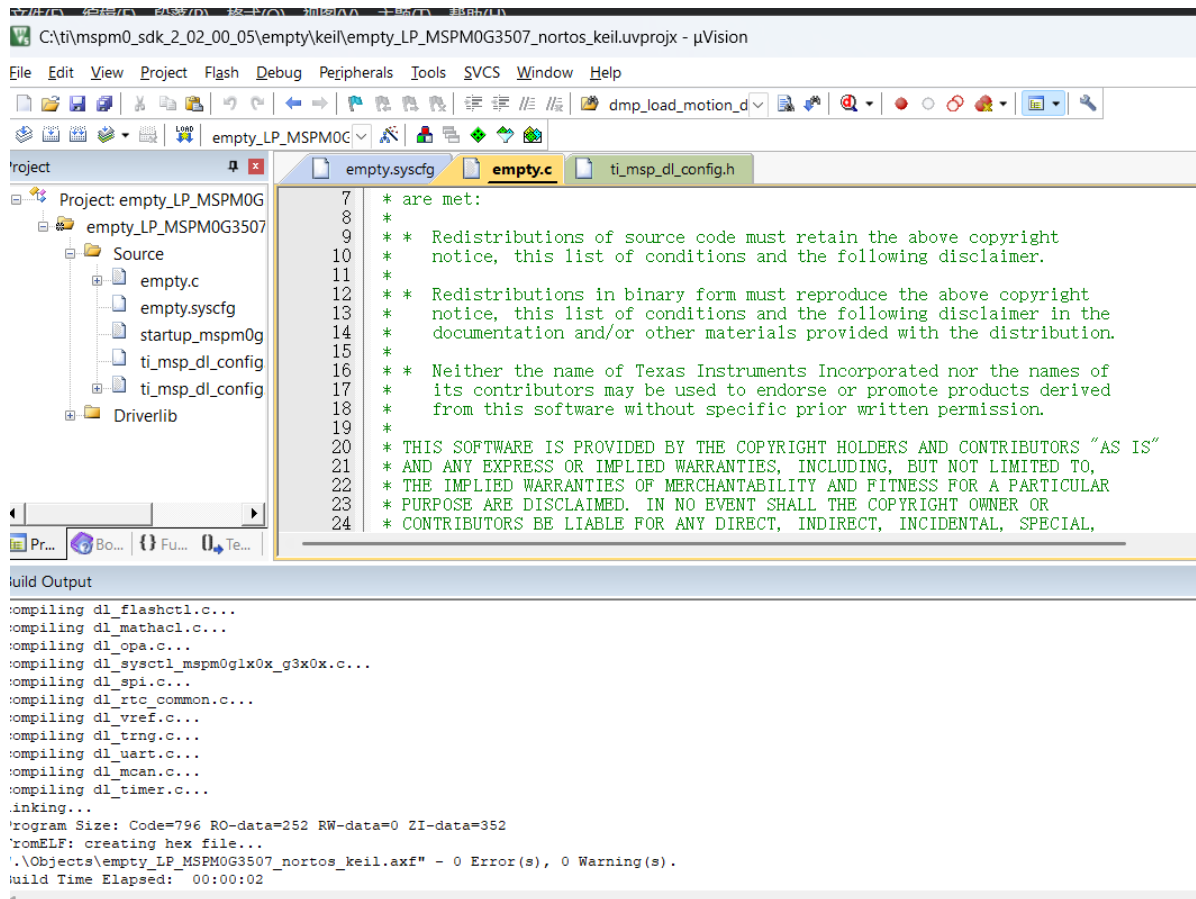
As shown below

名称	修改日期	类型	大小
dl_spi.c	2024/8/30 11:04	C 源文件	9 KB
dl_spi.h	2024/8/30 11:04	C Header 源文件	79 KB
dl_tamperio.h	2024/8/30 11:04	C Header 源文件	29 KB
dl_timer.c	2024/8/30 11:04	C 源文件	50 KB
dl_timer.h	2025/7/25 14:47	C Header 源文件	147 KB
dl_timera.h	2025/7/25 12:33	C Header 源文件	53 KB
dl_timerg.h	2024/8/30 11:04	C Header 源文件	31 KB
dl_trng.c	2024/8/30 11:04	C 源文件	3 KB
dl_trng.h	2024/8/30 11:04	C Header 源文件	21 KB
dl_uart.c	2024/8/30 11:04	C 源文件	12 KB
dl_uart.h	2025/8/28 15:52	C Header 源文件	116 KB
dl_uart_extend.h	2024/8/30 11:04	C Header 源文件	47 KB
dl_uart_main.h	2025/8/28 17:23	C Header 源文件	35 KB
dl_vref.c	2024/8/30 11:04	C 源文件	3 KB
dl_vref.h	2024/8/30 11:04	C Header 源文件	12 KB
dl_wwdt.h	2024/8/30 11:04	C Header 源文件	20 KB
driverlib.h	2024/8/30 11:04	C Header 源文件	4 KB
dl_sysctl_mspm0g1x0x_g3x0x.c	2024/8/30 11:04	C 源文件	13 KB
dl_sysctl_mspm0g1x0x_g3x0x.h	2024/8/30 11:04	C Header 源文件	103 KB

We create a new directory in the project to store these files. We name it Driverlib and then add all source files from the ti folder in the previous step to this directory

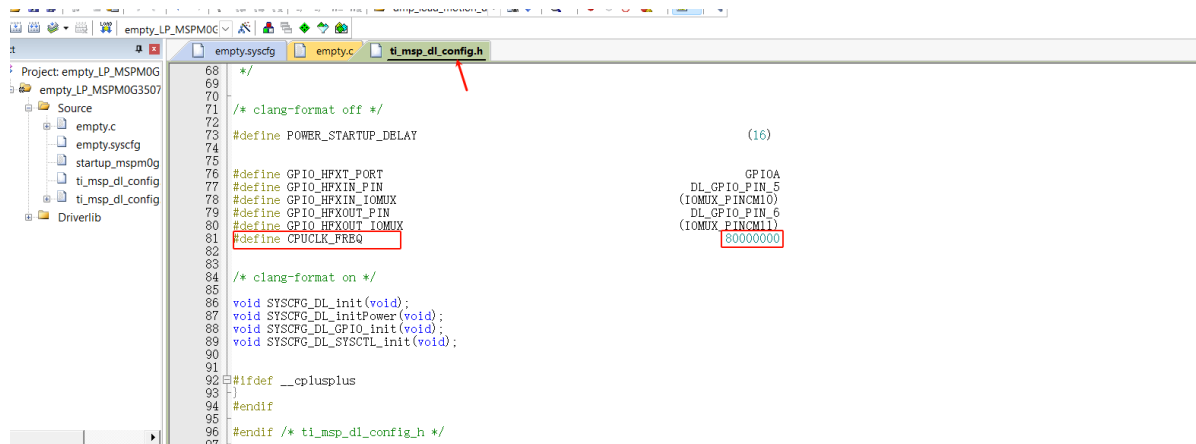


Compile again



```
C:\ti\mspm0_sdk_2_02_00_05\empty\keil\empty_LP_MSPM0G3507_nortos_keil.uvprojx - uVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
empty_LP_MSPM0C
Project: empty_LP_MSPM0G
empty_LP_MSPM0G3507
Source
empty.c
empty.syscfg
startup_mspm0g
ti_msp_dl_config
ti_msp_dl_config
Driverlib
empty.syscfg empty.c ti_msp_dl_config.h
7 * are met:
8 *
9 * * Redistributions of source code must retain the above copyright
10 * * notice, this list of conditions and the following disclaimer.
11 *
12 * * Redistributions in binary form must reproduce the above copyright
13 * * notice, this list of conditions and the following disclaimer in the
14 * * documentation and/or other materials provided with the distribution.
15 *
16 * * Neither the name of Texas Instruments Incorporated nor the names of
17 * * its contributors may be used to endorse or promote products derived
18 * * from this software without specific prior written permission.
19 *
20 * THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS"
21 * AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO,
22 * THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR
23 * PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR
24 * CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL,
Build Output
compiling dl_flashctl.c...
compiling dl_mathacl.c...
compiling dl_opa.c...
compiling dl_sysctl_mspm0g1x0x_g3x0x.c...
compiling dl_spi.c...
compiling dl_rtc_common.c...
compiling dl_vref.c...
compiling dl_trng.c...
compiling dl_uart.c...
compiling dl_mcan.c...
compiling dl_timer.c...
linking...
Program Size: Code=796 RO-data=252 RW-data=0 ZI-data=352
romELF: creating hex file...
'.\Objects\empty_LP_MSPM0G3507_nortos_keil.axf' - 0 Error(s), 0 Warning(s).
Build Time Elapsed: 00:00:02
```

At this point, our configuration is successful



```
empty_LP_MSPM0C
Project: empty_LP_MSPM0G
empty_LP_MSPM0G3507
Source
empty.c
empty.syscfg
startup_mspm0g
ti_msp_dl_config
ti_msp_dl_config
Driverlib
empty.syscfg empty.c ti_msp_dl_config.h
68 */
69
70 /* clang-format off */
71
72 #define POWER_STARTUP_DELAY (16)
73
74 #define GPIO_HFXT_PORT GPIOA
75 #define GPIO_HFXT_PIN DL_GPIO_PIN_5
76 #define GPIO_HFXIN_IOMUX (IOMUX_PINCM10)
77 #define GPIO_HFXIN_IOMUX (IOMUX_PINCM10)
78 #define GPIO_HFXOUT_PIN DL_GPIO_PIN_6
79 #define GPIO_HFXOUT_IOMUX (IOMUX_PINCM11)
80 #define GPIO_HFXOUT_IOMUX (IOMUX_PINCM11)
81 #define CPUCLK_FREQ 8000000
82
83 /* clang-format on */
84
85 void SYSCFG_DL_init(void);
86 void SYSCFG_DL_initPower(void);
87 void SYSCFG_DL_GPIO_init(void);
88 void SYSCFG_DL_SYSCTL_init(void);
89
90 #ifdef __cplusplus
91 }
92 #endif
93
94 #endif /* ti_msp_dl_config.h */
Build Output
compiling dl_flashctl.c...
compiling dl_mathacl.c...
compiling dl_opa.c...
compiling dl_sysctl_mspm0g1x0x_g3x0x.c...
compiling dl_spi.c...
compiling dl_rtc_common.c...
compiling dl_vref.c...
compiling dl_trng.c...
compiling dl_uart.c...
compiling dl_mcan.c...
compiling dl_timer.c...
linking...
Program Size: Code=796 RO-data=252 RW-data=0 ZI-data=352
romELF: creating hex file...
'.\Objects\empty_LP_MSPM0G3507_nortos_keil.axf' - 0 Error(s), 0 Warning(s).
Build Time Elapsed: 00:00:02
```