

Real-Time systems [ELEC-H-410]

Troubleshooting μ C/OS-II

2014–2015

Purpose

You will soon start your master thesis and your first job. There will not be someone to help you solve problems you can solve by yourself.

The course ELEC-H-410 “Real-Time Systems” is based on a Real-Time Operating System (RTOS) running on a microcontroller. Because of the conception of the RTOS, all code must be recompiled after any change. Because of that, errors occur sometimes. To help you troubleshoot them, this document explains how to fix some of them.

This document explains:

- Error solving methodology
- Missing search paths error
- Tool suite location error

1 Error solving methodology

This section explains the general methodology to troubleshoot errors/bugs.

The general methodology is:

1. Read the error message¹
2. Understand the error message
3. Determine which part of the toolchain is involved
4. Imagine possible solutions
5. Fix your error

2 Search paths for project files

For some reasons, MPLab is sometimes unable to find the OS configuration files `os_cfg.h` and `app_cfg.h` which are present in your project folder.

2.1 Error message

Also see figure below.

```
[...] error: app_cfg.h: No such file or directory
[...] error: os_cfg.h: No such file or directory

[...]

[...] error: 'OS_LOWEST_PRIO' undeclared here (not a function)
[...] error: 'OS_TASK_IDLE_STK_SIZE' undeclared here (not a function)
[...] error: 'OS_MAX_TASKS' undeclared here (not a function)
[...]
```

¹The assistant will **NOT** help you if you don't do that!

```

Output
Build | Version Control | Find in Files | PICkit 2
Executing: "C:\Program Files (x86)\Microchip\MPLAB C30\bin\pic30-gcc.exe" -omf-elf-mcpu=33FJ256GP710 -x c -c "os_tmr.c" -o "os_tmr.o" -I"C:\Documents and Settings\labo\Mes documents\ELEC-H-410\Jeudi\Exercices\periodicity" -I"C:\M...
In file included from os_tmr.c:25:
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:44:21: error: app_cfg.h: No such file or directory
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:45:20: error: os_cfg.h: No such file or directory
In file included from os_tmr.c:25:
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:737: error: 'OS_LOWEST_PRIO' undeclared here (not in a function)
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:749: error: 'OS_TASK_IDLE_STK_SIZE' undeclared here (not in a function)
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:757: error: 'OS_MAX_TASKS' undeclared here (not in a function)
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1436:2: error: #error "OS_CFG.H: Missing OS_EVENT_EN: Enable (1) or Disable (0) code generation for Event Flags"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1480:2: error: #error "OS_CFG.H: Missing OS_MBOX_EN: Enable (1) or Disable (0) code generation for MAILBOXES"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1514:2: error: #error "OS_CFG.H: Missing OS_MEM_EN: Enable (1) or Disable (0) code generation for MEMORY MANAGER"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1540:2: error: #error "OS_CFG.H: Missing OS_MUTEX_EN: Enable (1) or Disable (0) code generation for MUTEX"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1562:2: error: #error "OS_CFG.H: Missing OS_Q_EN: Enable (1) or Disable (0) code generation for QUEUES"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1612:2: error: #error "OS_CFG.H: Missing OS_SEM_EN: Enable (1) or Disable (0) code generation for SEMAPHORES"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1642:2: error: #error "OS_CFG.H: Missing OS_MAX_TASKS: Max. number of tasks in your application"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1659:2: error: #error "OS_CFG.H: Missing OS_TASK_IDLE_STK_SIZE: Idle task stack size"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1663:2: error: #error "OS_CFG.H: Missing OS_TASK_STAT_EN: Enable (1) or Disable(0) the statistics task"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1667:2: error: #error "OS_CFG.H: Missing OS_TASK_STAT_STK_SIZE: Statistics task stack size"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1671:2: error: #error "OS_CFG.H: Missing OS_TASK_STAT_STK_CHK_EN: Check task stacks from statistics task"
C:\Micrium\Software\uCOS-II\Source\ucos_ii.h:1675:2: error: #error "OS_CFG.H: Missing OS_TASK_CHANGE_PRIO_EN: Include code for OSTaskChangePrio()"

```

2.2 Meaning

`app_cfg.h` and `os_cfg.h` not found in include search paths.

Consequence : some constants are not defined.

2.3 Part of the toolchain

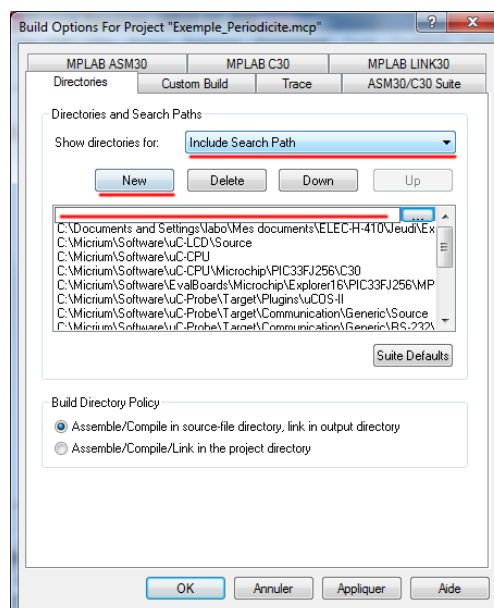
This is a compiler complaint.

2.4 Possible solutions

- Redefine the constant in your file (bad idea)
- Tell the compiler where to find the files (good idea).

2.5 Fix the problem

1. Go to: Project/Build Options.../Project
2. Then to Directories/Include search path
3. Add a New path
4. Enter your project folder path
5. Clic OK
6. Recompile your project



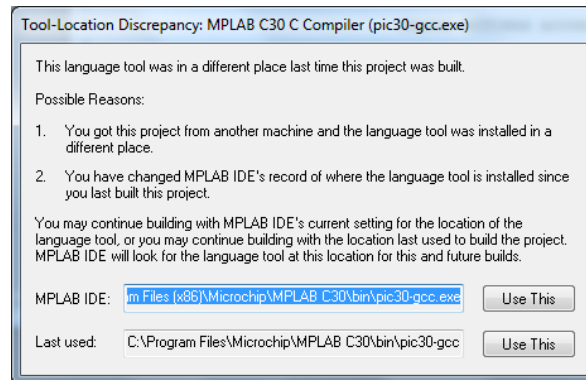
3 Tool suite location

Projects were written on a 32bit OS and the OS you are using to edit it now is 64bit, resulting in changes in the C:/Program Files directory structure.

3.1 Error message

|| "Couldn't locate build tool. Check tool locations."

or "Tool-Location Discrepancy" message box:



3.2 Meaning

You want me to use picC30-gcc.exe, but I can't find the executable file.

3.3 Part of the tool chain

This is a project management/makefile problem.

3.4 Possible solutions

- Move/install the compile chain in the expected directory (bad idea).
- Tell your project manager where the executable file is (good idea).

3.5 Fix the problem

1. Go to Project/Set Language Tool Locations
2. Then to Microchip C30 Toolsuite/Executables/MPLab C30 C Compiler
3. Browse to the correct location (C:\Program Files (x86)\Microchip\MPLAB C30\bin\pic30-gcc.exe see picture below).
4. Recompile your project.

