EXAMPLE NAME: FREERTOS_XMC45

OVERVIEW: This example demonstrates an implementation of a multi-threaded application using FREERTOS APP that send and receive messages through the FreeRTOS message queues and toggles two digital IOs when the queue transaction is successful.

This example is suitable to run on Infineon XMC4500 development boards.

DESCRIPTION:

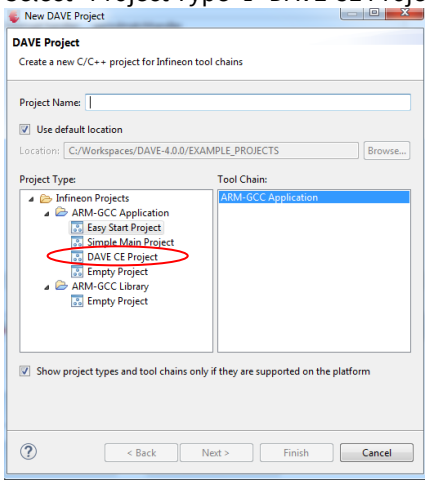
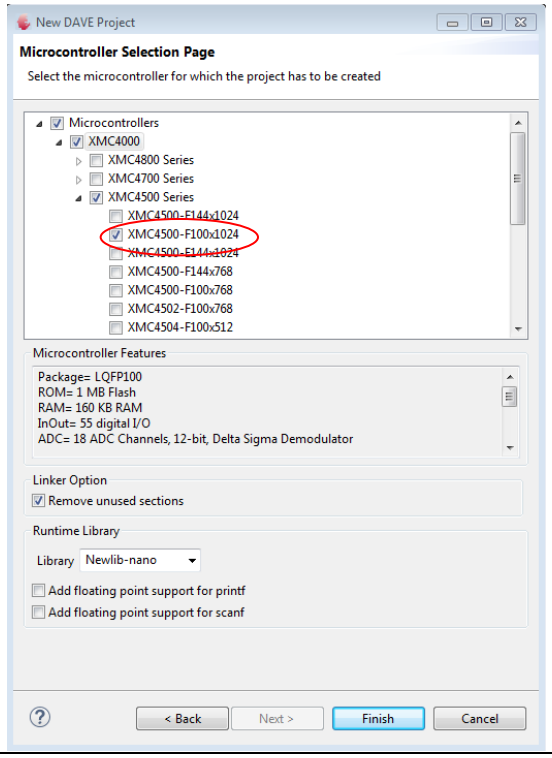
- FREERTOS APP toggles two LEDs connected to P1.0 and P1.1 at 1 Hz frequency.

REQUIRMENTS:

Boards Required: XMC4500 Relex Kit Board (Order Nr: KIT_XMC45_RELAX_V1)

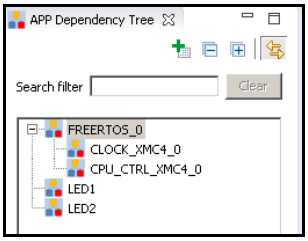
HOW TO CREATE THE PROJECT:

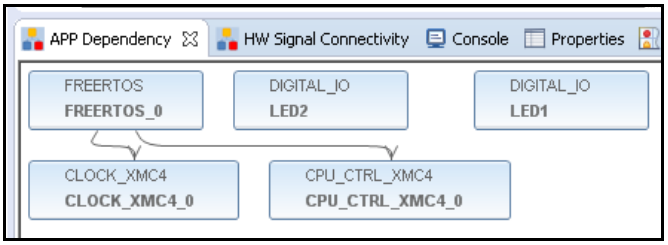
1. Open the DAVE CE and use  "Add IDE New Project Wizard" on the toolbar to add a new DAVE Project.

Enter Project Name Select "Project Type ➔ DAVE CE Project"	Select Processors Info ➔XMC4500 Series ➔ XMC4500-F100X1024
	

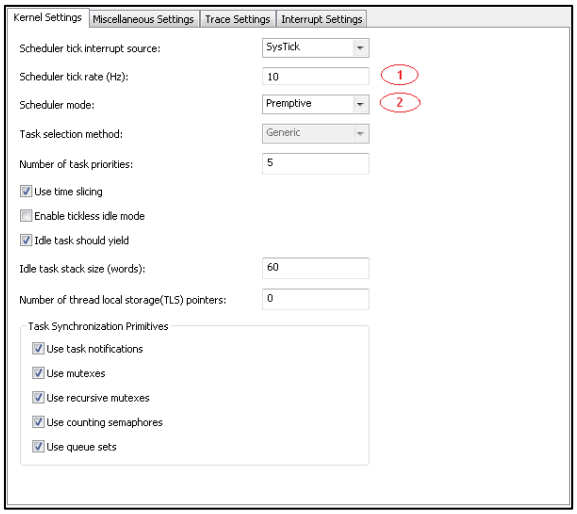
2. Use the  "Add New APP" in the toolbar to add 1 instance of FREERTOS and 2 instances of DIGITAL_IO APPs. Configure the APP instances with the following configurations.

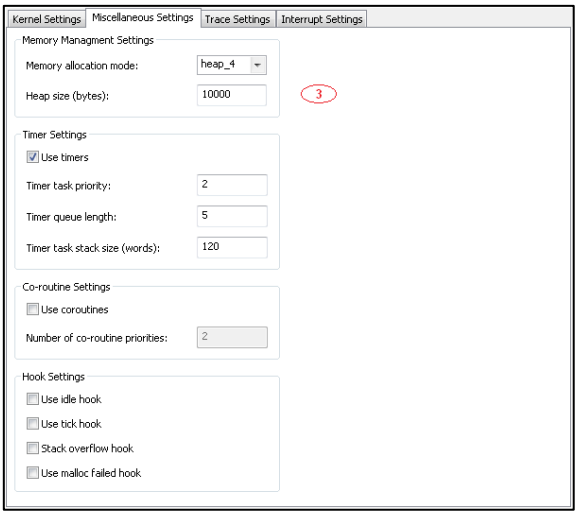
Views: APP Dependency Tree and APP Dependency



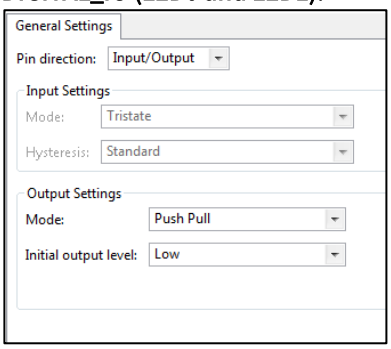


FREERTOS:

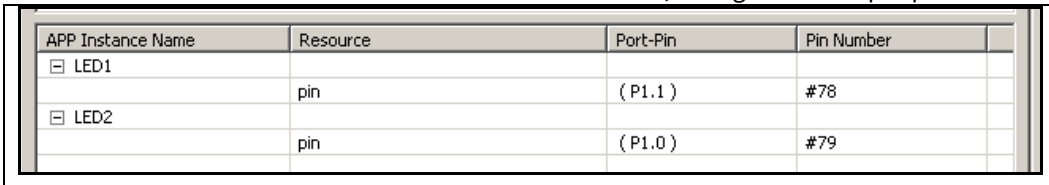




DIGITAL_IO (LED0 and LED1):



3. Use the  "Manual Pin Allocator" found in the toolbar, configure the output pins for the LEDs.



APP Instance Name	Resource	Port-Pin	Pin Number
LED1			
	pin	(P1.1)	#78
LED2			
	pin	(P1.0)	#79

4. Generate the code for configurations made and change main.c accordingly.
5. Build and download to the microcontroller.

HOW TO TEST:
Download and run the demo in the microcontroller.

OBSERVATIONS:
- For every second, the LEDs toggle when a message from the RTOS message queue is sent and received. This toggling pattern repeats.

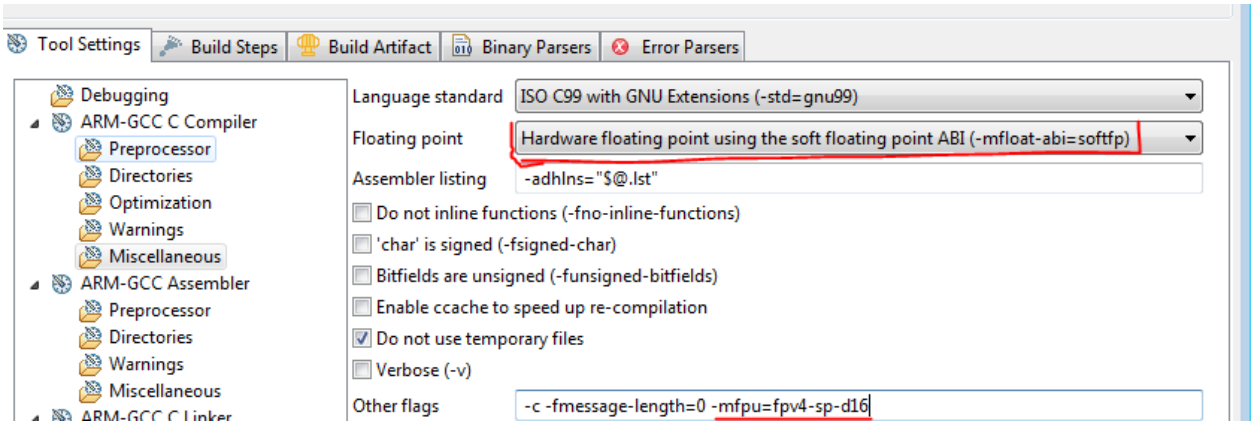
HINTS WHEN MIGRATING EXAMPLE TO OTHER DEVICES IN THE SAME XMC FAMILY:
Ensure that the assigned pins P1.0 and P1.1 are available in the target device.

NOTE: Example project released with DAVE4.1.2 when imported in DAVE4.1.4, may give following errors:

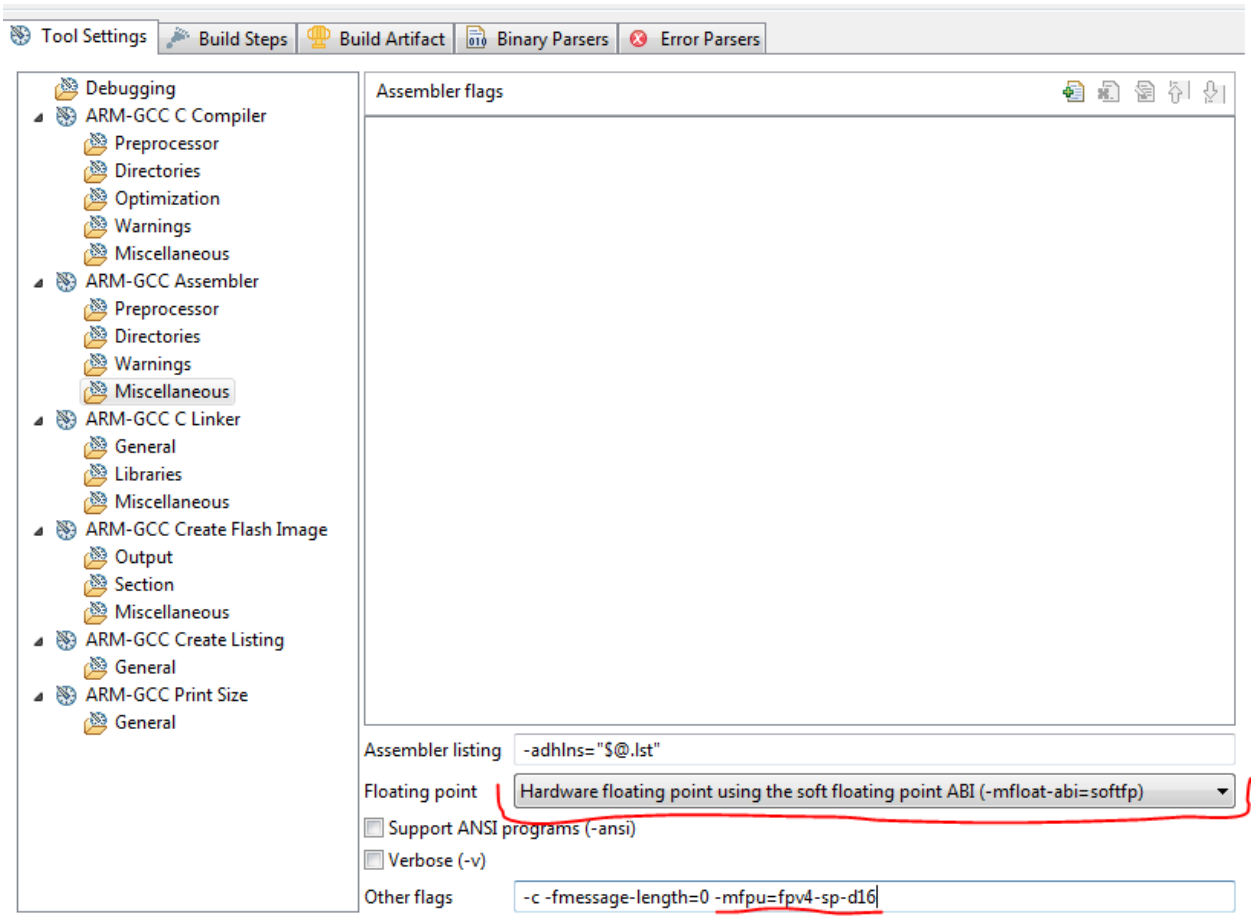
```
'Building file: ../Dave/Generated/FREERTOS/port.c'
'Invoking: ARM-GCC C Compiler'
{standard input}: Assembler messages:
"C:\DAVEv4\DAVE-4.1.4\eclipse\ARM-GCC-49/bin/arm-none-eabi-gcc" -DXMC4500_F100x1024 -I"C:\Workspaces\DAVE-4.
Dave/Generated/FREERTOS/subdir.mk:49: recipe for target 'Dave/Generated/FREERTOS/port.o' failed
{standard input}:409: Error: selected processor does not support Thumb mode `vstmdbeq r0!,{s16-s31}'
{standard input}:411: Error: instruction not allowed in IT block -- `stmdb r0!,{r4-r11,r14}'
{standard input}:432: Error: selected processor does not support Thumb mode `vldmiaeq r0!,{s16-s31}'
{standard input}:434: Error: instruction not allowed in IT block -- `msr psp,r0'
make: *** [Dave/Generated/FREERTOS/port.o] Error 1
make: *** Waiting for unfinished jobs....
```

To eliminate this error, follow below steps:

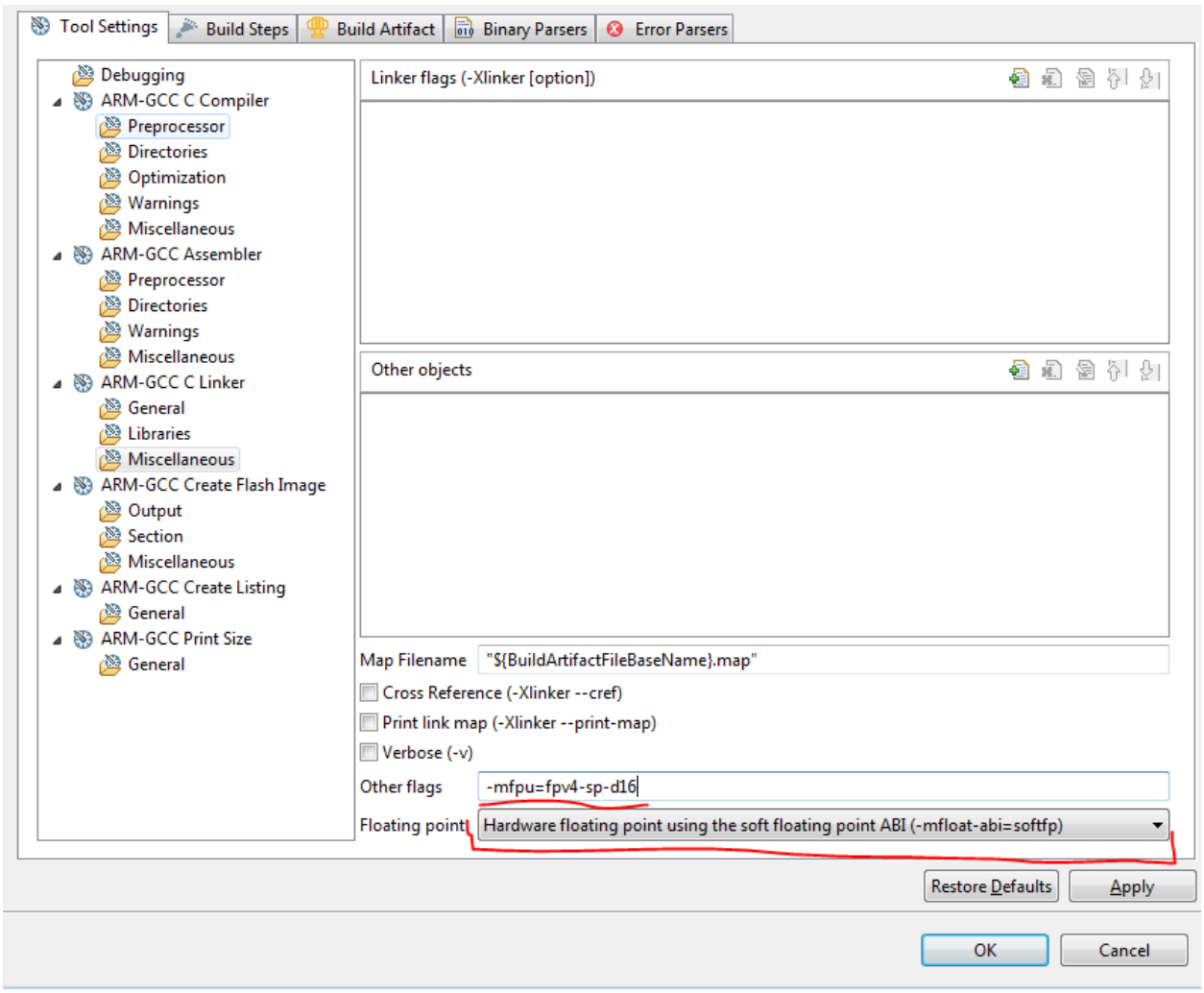
1. Click on File -> properties -> C/C++ Build -> Settings -> ARM GCC C Compiler -> Miscelaneous -> DO THE FOLLOWING CHANGES MARKED IN RED:



2. Click on File -> properties -> C/C++ Build -> Settings -> ARM GCC C Assembler -> Miscelaneous -> DO THE FOLLOWING CHANGES MARKED IN RED:



3. Click on File -> properties -> C/C++ Build -> Settings -> ARM GCC C Linker -> Miscelaneous -> DO THE FOLLOWING CHANGES MARKED IN RED:



4. Click on ‘Apply’ and ‘OK’
5. Re-build the project and debug