ECED 4402: Real Time Systems
# Tutorial 3: Running a Program

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Introduction

After following the steps in the previous tutorials, it is now possible to download and run a program on the board.

Target Configuration File

The Target Configuration File (TCF) is a file that specifies the connection configurations for the IDE and allows it to connect to the microcontroller. It has a suffix ".ccxml" in its name. Following the steps from Tutorial 1, it should automatically be generated when creating a project. However, it must be verified that the active TCF has the correct microcontroller selected, i.e. the Tiva TM4C1294NCPDT. Make sure that this board is selected and the connection type is configured to be "Stellaris In-Circuit Debug Interface". Double-click the TCF file to open and verify this as seen below:
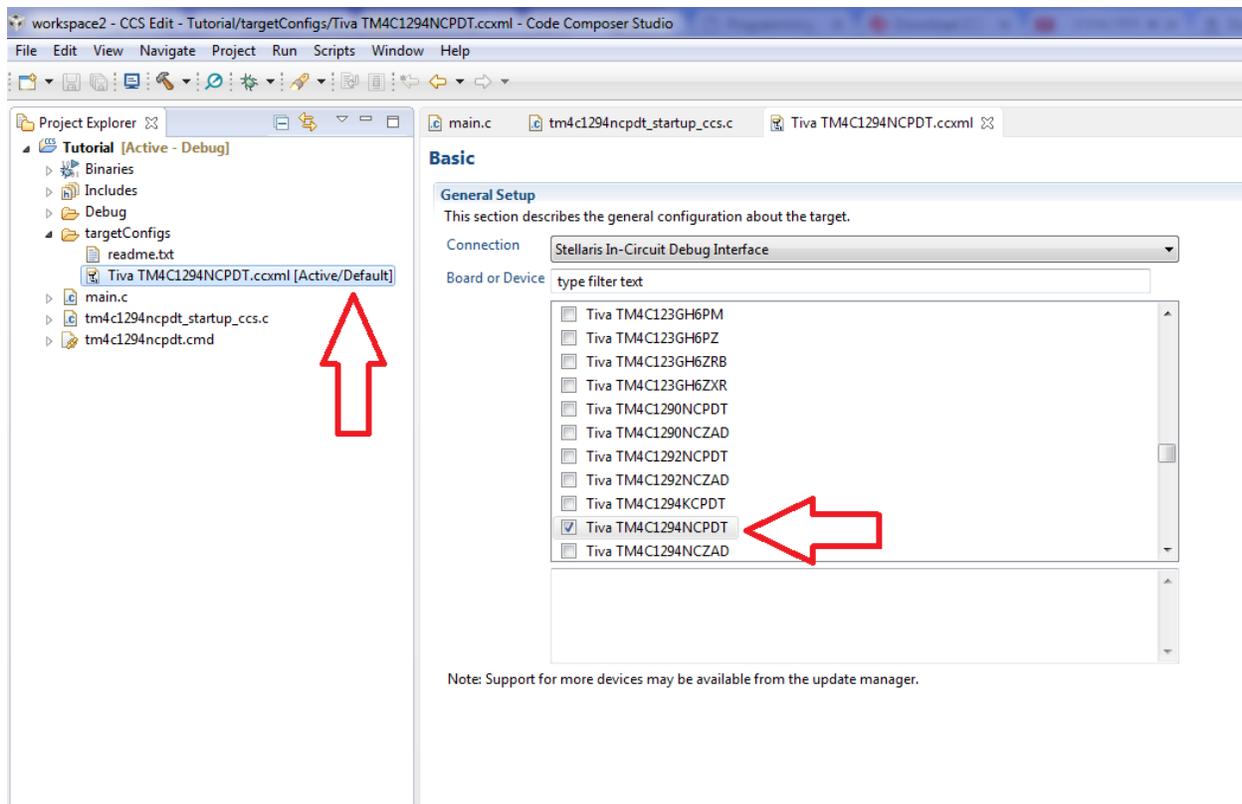
Debug Configuration File

The Debug Configuration File (DCF) is a file that specifies the configuration settings for starting a debug and download session with the microcontroller. It can be created automatically by CCS. Below are the steps to create a DCF with CCS:
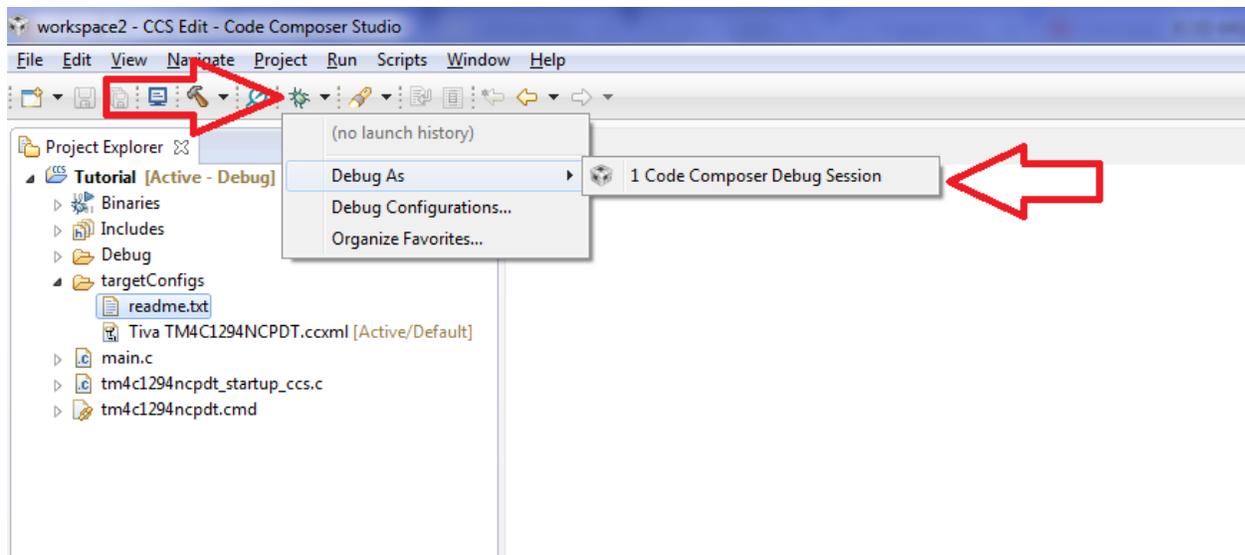
Click the debug button, ❄, and select "Code Composer Debug Session" through "Debug As". Given the correct TCF setup, the DCF will automatically be setup and a debug session will be started. The written program will be downloaded to Tiva and debugging or execution can start.

Running a Simple Program

Once the debugging session is started, we can then start the program. Below is the source code for a simple program that the Tiva can run.

Below is snapshot of an example debug session:

The value of counter can be verified as the program is run. Open the variables window by clicking the menu 'View' and then 'Variables'.

Debugging Commands

There are a variety of debugging command and features available (some the student will have to explore on their own). The most important are highlighted below:

Start Command
To start and run the program freely, use this button.

Step-Into Command
To step move into the code, step by step (line by line), use this command. Note this is useful when checking specific behavior in between parts of code that is causing error.

Step-Over Command
To step move over a code, use this command. Note however, the code is still executed. It is not shown in the debugger.

Step-Out-Of Command
This button steps-out of a code branch; for example, if you are stepping through an if-statement, this command will exit the if-statement and pause outside of it. I.e. it has 'stepped out of' the if-statement.

Halt Command
This button stops the command and ends its execution.