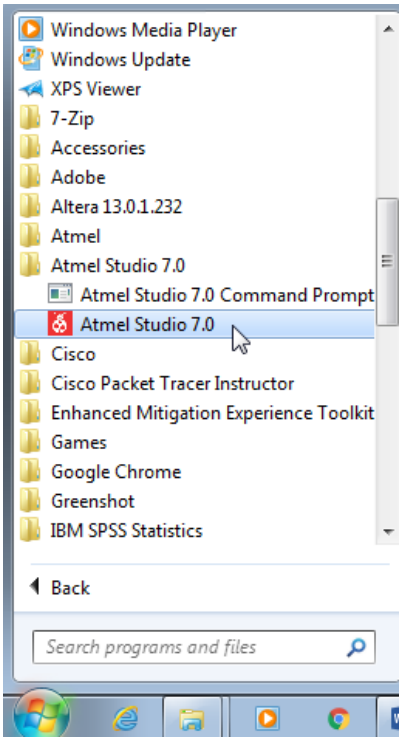
Introduction to Creating the FreeRTOS project on the SAMD21 Xplained Pro

1. Open Atmel Studio **7.0** by selecting the Windows Start->All Programs->Atmel Studio 7.0.



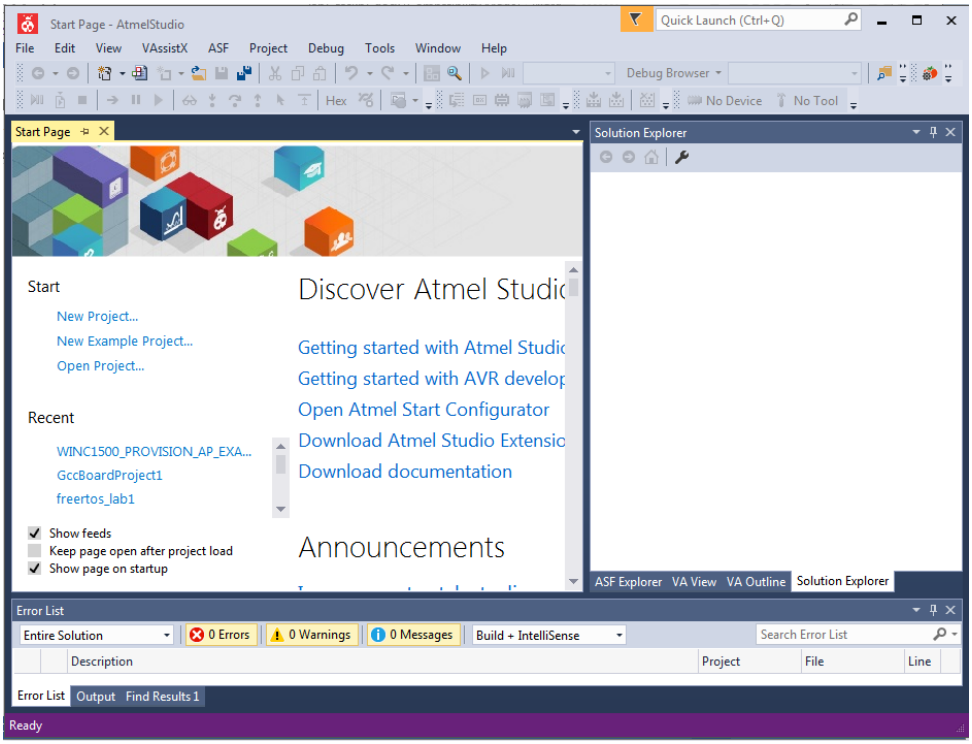
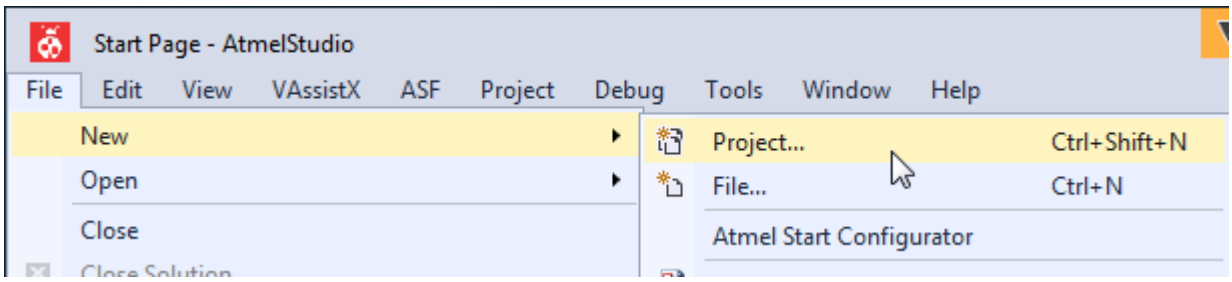


Figure 1.Start page of Amtel Studio 7.0

2. Create a new project by selecting **File >> New >> Project…** (or Ctrl+Shift+N).



A pop-up window as below opens.

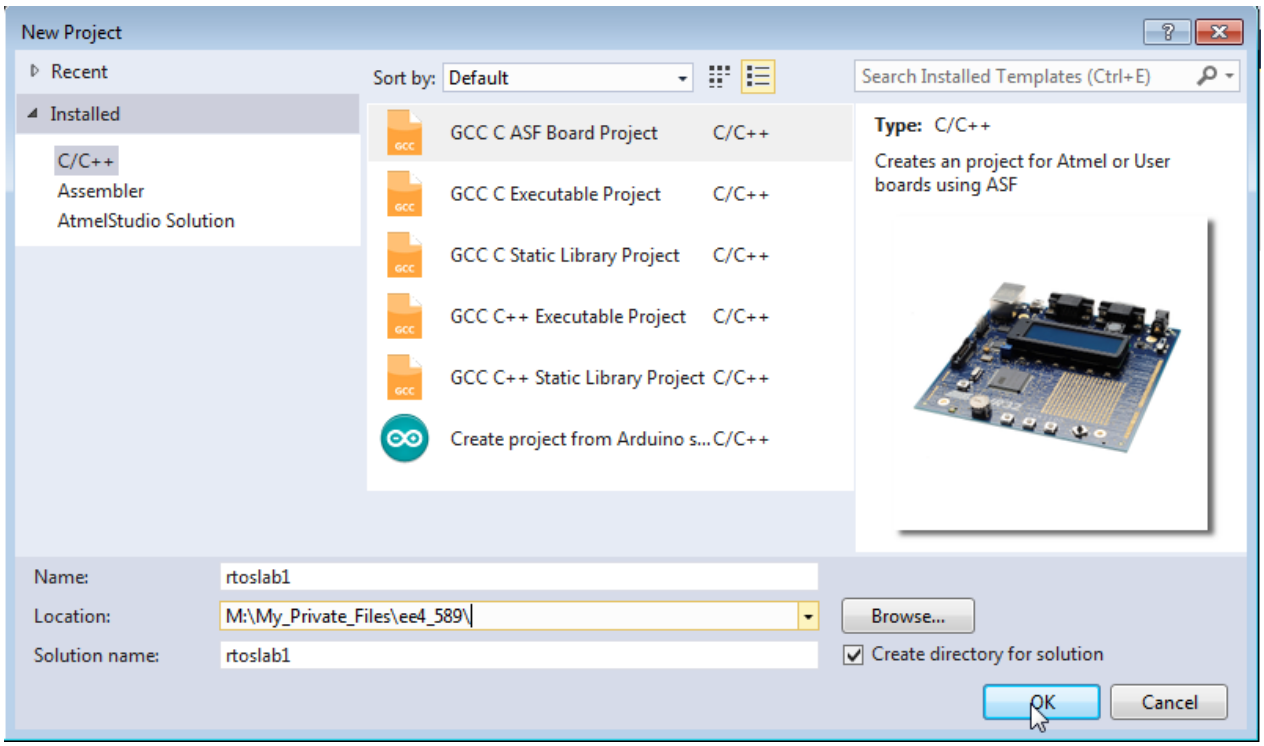


Figure 2. New Project window

In the above window, select the **Installed -> C/C++ -> GCC C ASF Board Project C/C++.** Choose the meaningful **Name** (e.g., rtoslab1) and **location** (e.g., creating a folder in your public folder on the mavdisk). Then, click OK button.

3. Board Selection window opens. Check **Select By Board**, Choose **BoardTypes** as **Atmel**, enter **d21** in the **search box** as shown below. Then, select the device **SAM D21 Xplained Pro – ATSAMD21J18A.** Then, click OK button.

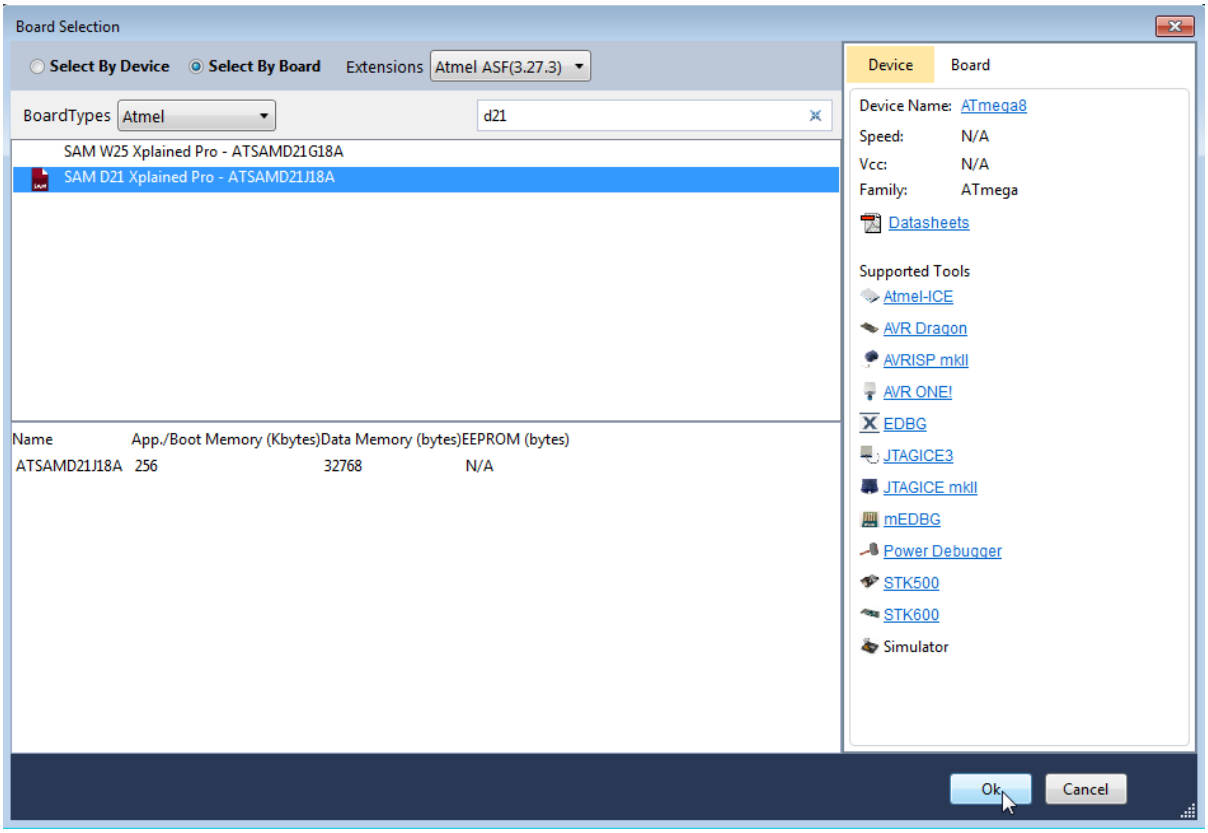
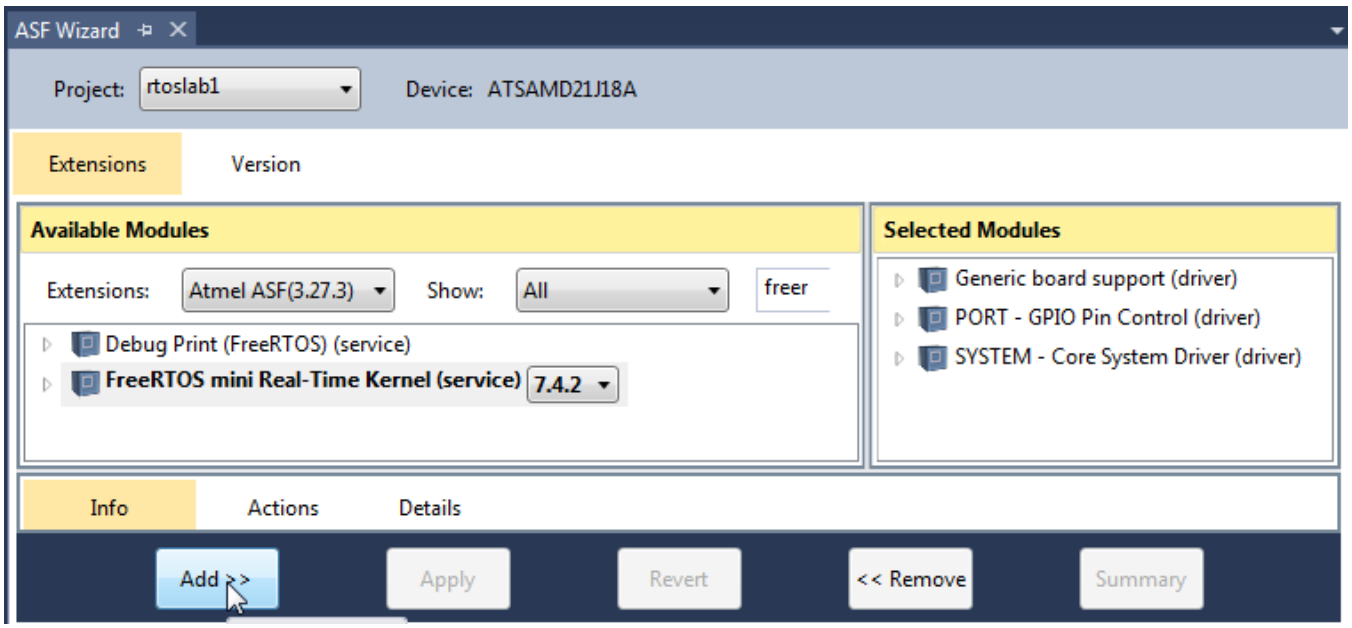
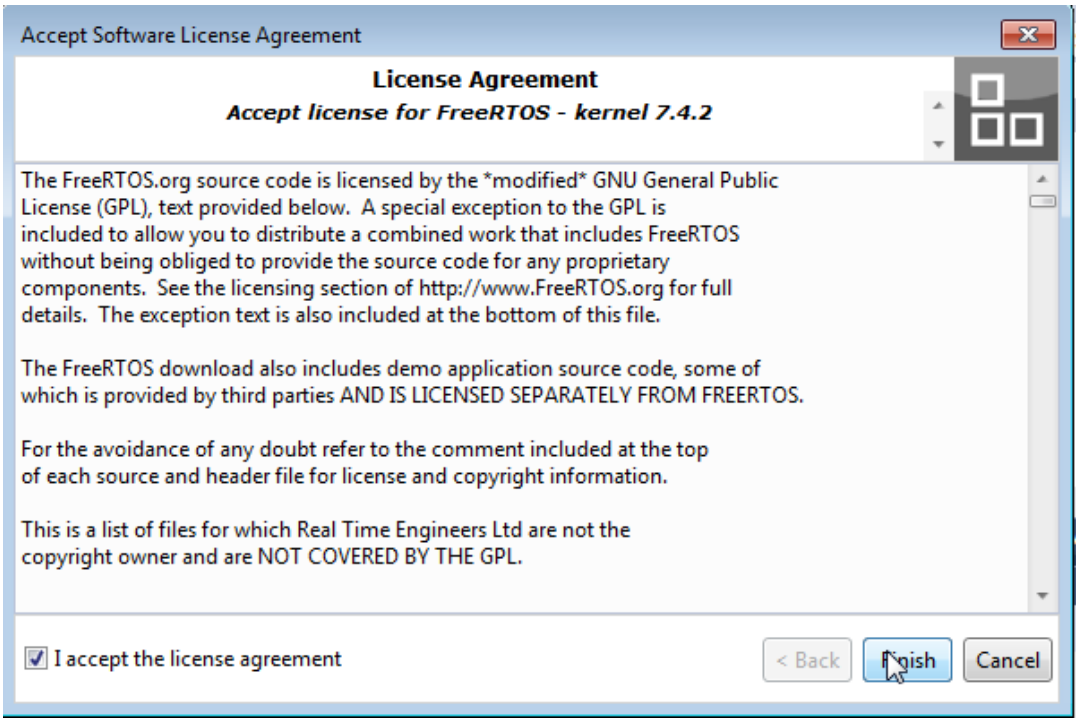


Figure 3. Board Selection Window

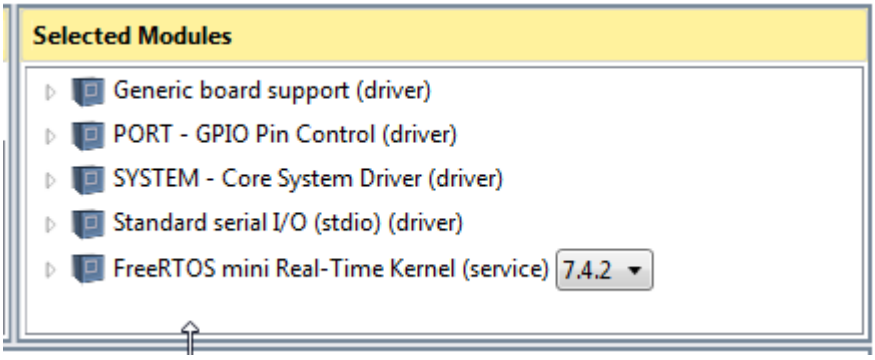
4. Now, a new ASF board project for SAM D21 Xplained pro has been created.
5. Add FreeRTOS service into this project by ASF Wizard. Select **ASF >> ASF Wizard (Alt+W)** or click the icon  on the menu. The ASF Wizard is opened in the Editor window as shown below. Enter **freeRTOS** as searching keyword.



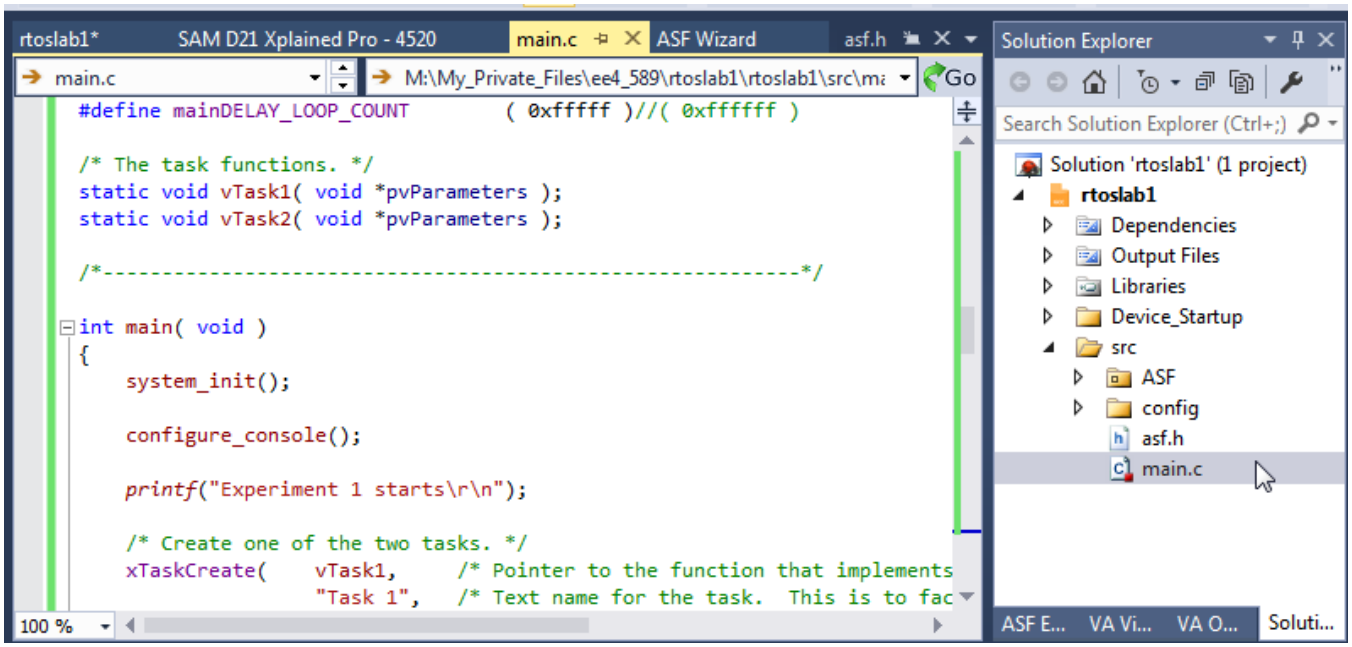
6. Select the **FreeRTOS mini Real-Time Kernel (service) 7.4.2**, click **Add>>** button to add this ASF module into the project; then click the **Apply** button.
   As FreeRTOS is the third-party software, so you need to accept this license agreement before you could use this service. Then click **Finish** button.



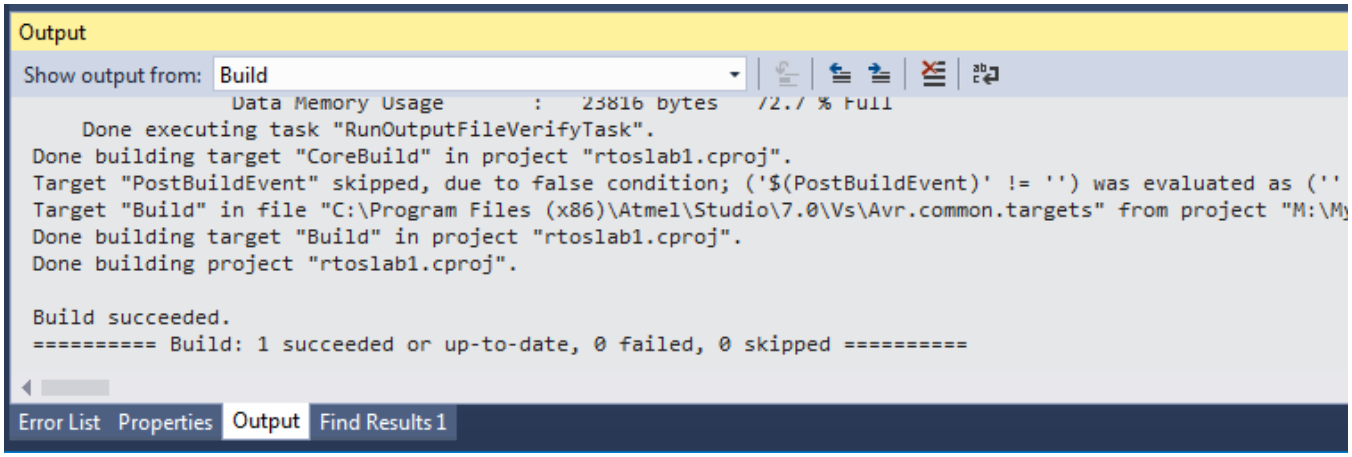
7. If the ASF module named as “standard Serial I/O (stdio)” has not been the **Selected Modules** into your project, Please add and apply it into this project as FreeRTOS module. The figure below shows all the basic ASF modules that are necessary by this project.



8. Open the main.c file in the Editor window by double clicking the main.c icon in the Solution Explorer window. **Replace the default main.c with the code in the file main_ex1.c (available in D2L).**



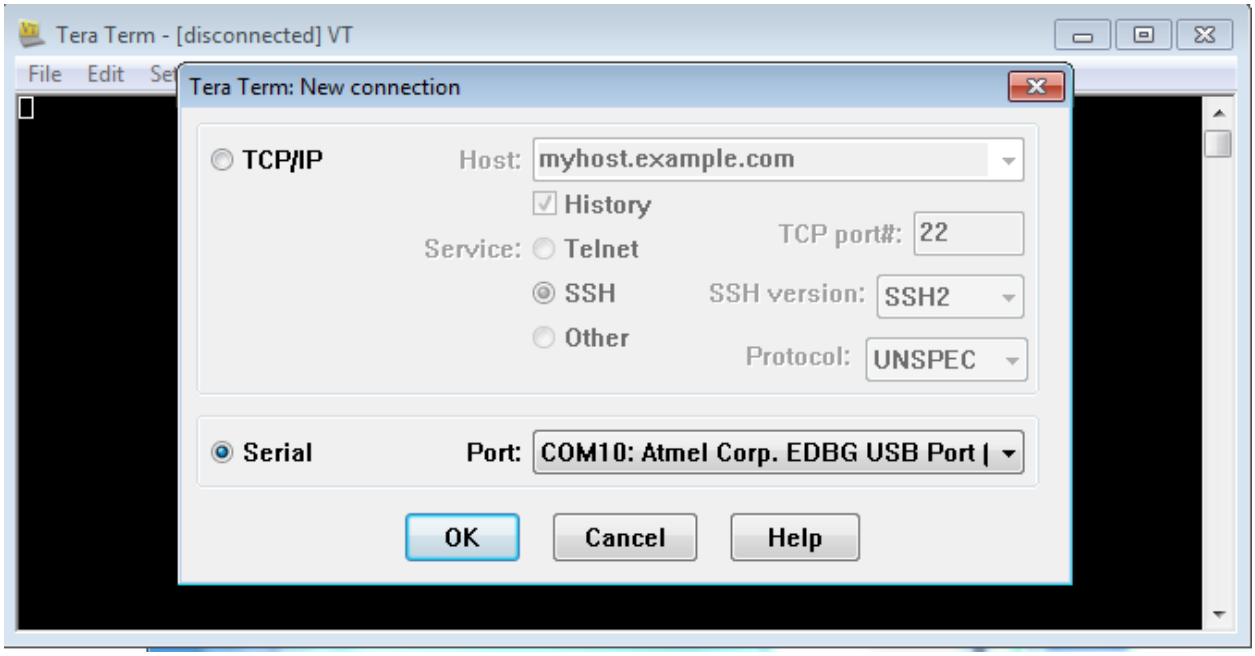
9. Build the Atmel project. You could get the following outputs from the OUTPUT window.



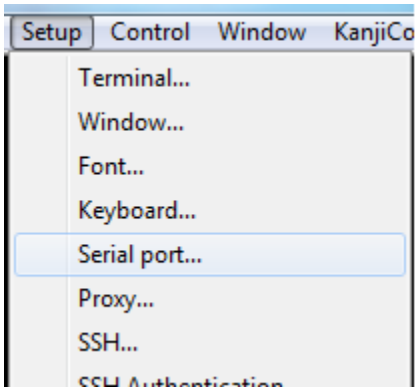
10. Connect the board to the PC via usb cable if you have not done. Note, The USB DEBUG port on the D21 board should be connected, NOT Target USB port.

11. Open the Tera Term window by double clicking the icon 

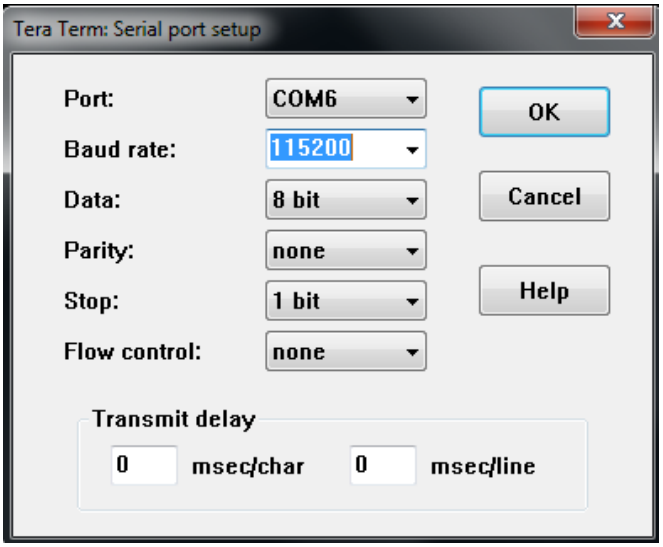
on the desktop. Choose **Serial** Connection and the **Port** as **COMXX:Atmel Corp. EDBG USB PORT** as shown below.



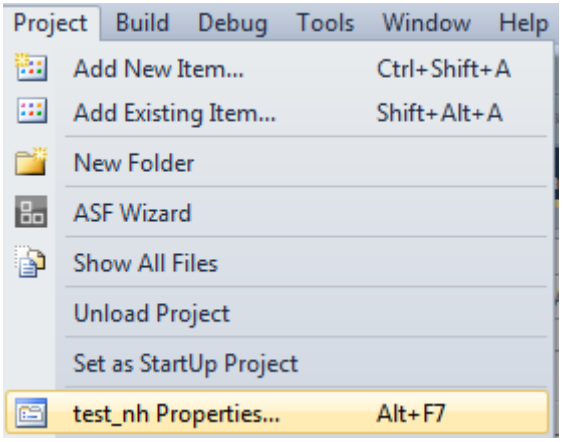
12. Click OK button. Then configure the serial port, by selecting **Setup >> Serial Port…**



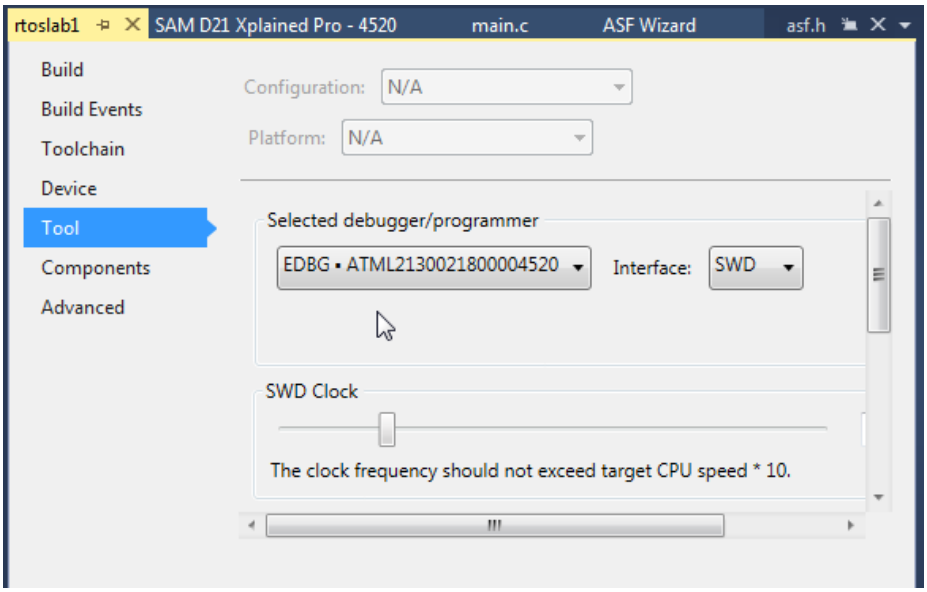
On the setup window, Change the Baud rate to 115200. Others remain without change. Then, click OK.



13. Configure the Tool chain of the project by clicking **Project >> ## Properties…**



The tool configuration should be as following.



14. Now debug the project by clicking the StartDebug icon  , then run  . The terminal window should show the strings similar to the following.