

# **TWR-WIFI-RS2101 – Ultra Low Power 802.11n Wi-Fi Tower Peripheral Card**

**Lab Guide**

**Version 1.1**

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## 1 Introduction

This document will guide you through the use of the Freescale MQX™ RTOS and the Redpine Signals Wi-Fi MQX enablement patch. It will walk you through the compile and download process using the CodeWarrior™ integrated development environment.

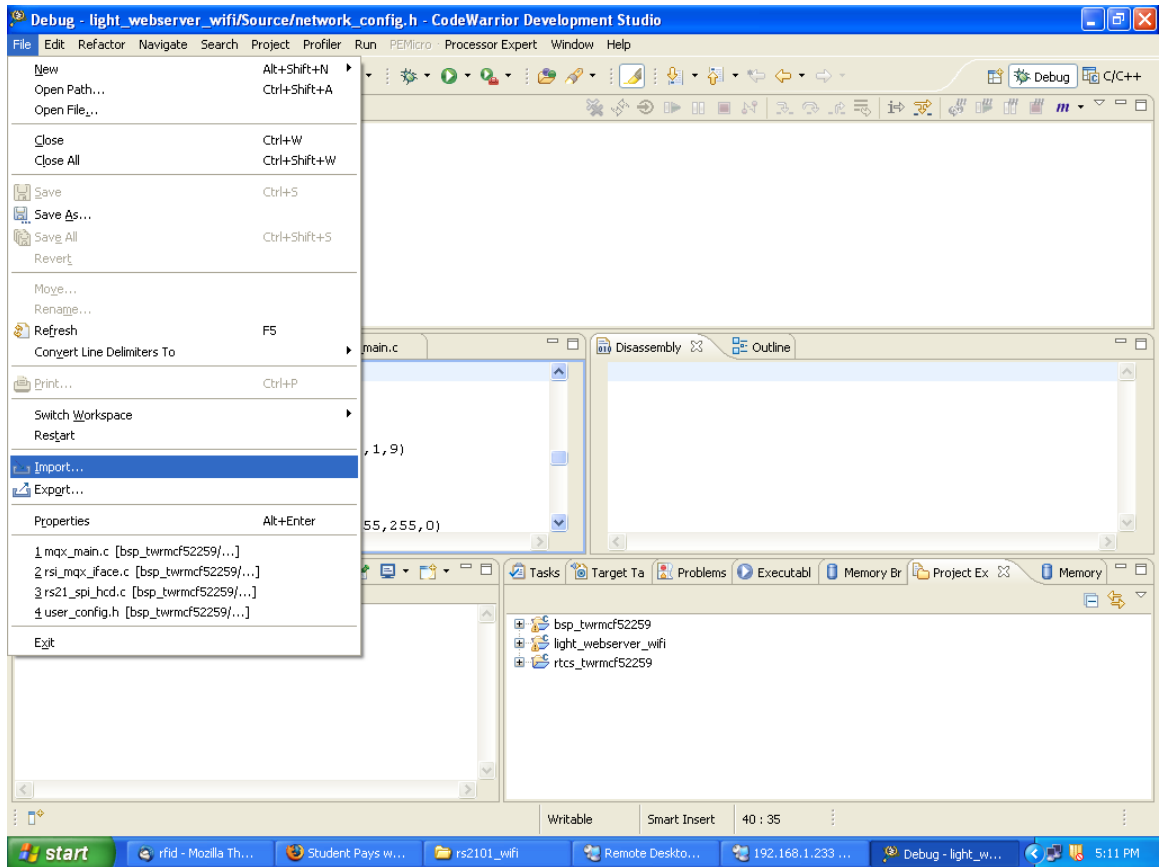
Any Tower MCU with a SPI host controller can control the TWR-WIFI-RS2101 card. However, the lab presented in this document uses the TWR-MCF5225X.

### 1.1: Step by Step Instructions

After the installation of the RS9110-N-11-21 enablement patch, the default internet communication path is set to Wi-Fi. To switch back to wired Ethernet, please open the `network_config.h` file as described in step 14 below, and look for line of code `#define DEMOCFG_USE_WIFI` and set it as follows:

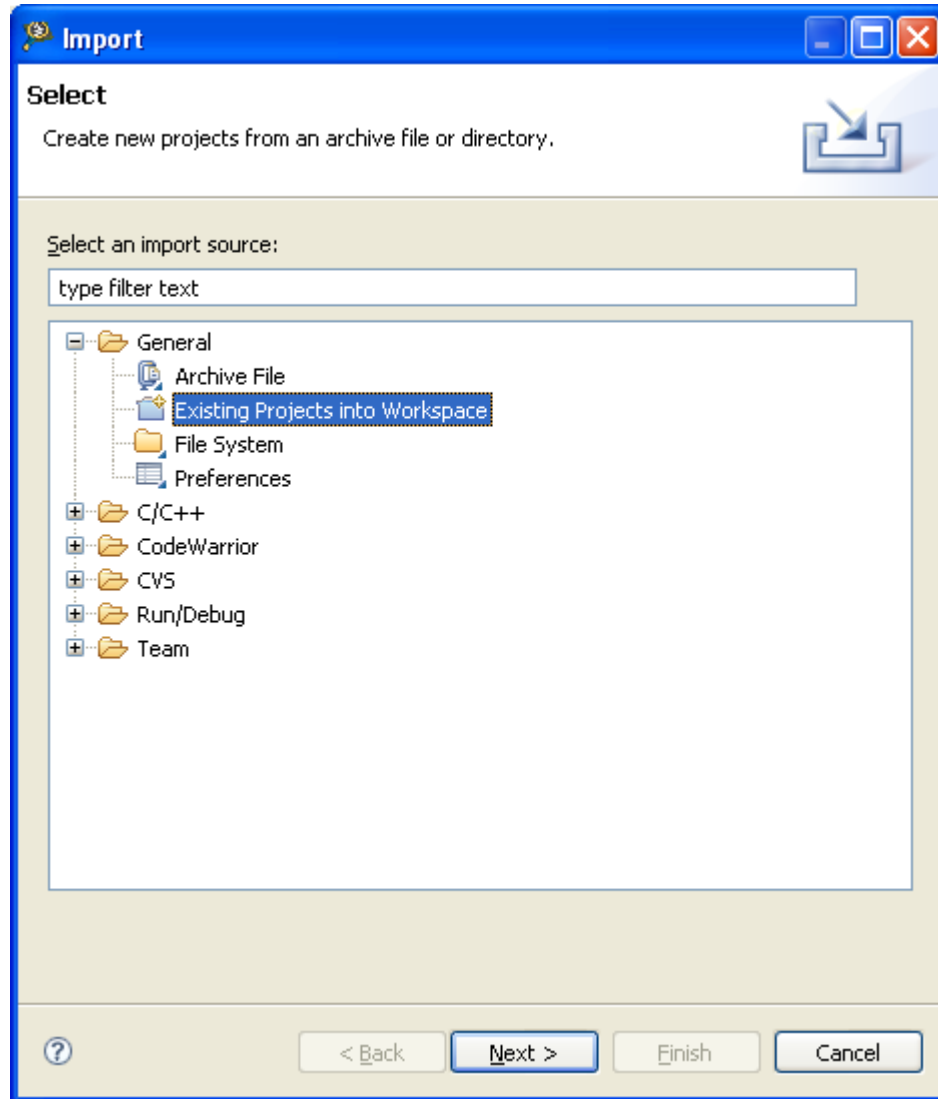
```
#define DEMOCFG_USE_WIFI 0
```

1. Set up the 802.11b/g/n Wi-Fi Access Point and configure its Wi-Fi settings like the SSID name, channel number, etc. For the purpose of the demo, the local network IP address of the Access Point has to be 192.168.1.X (X = 0 to 254).
2. Launch the CodeWarrior™ for Microcontrollers V10 IDE
3. From the Menu, click on *File* → *Import* as shown in the figure below.



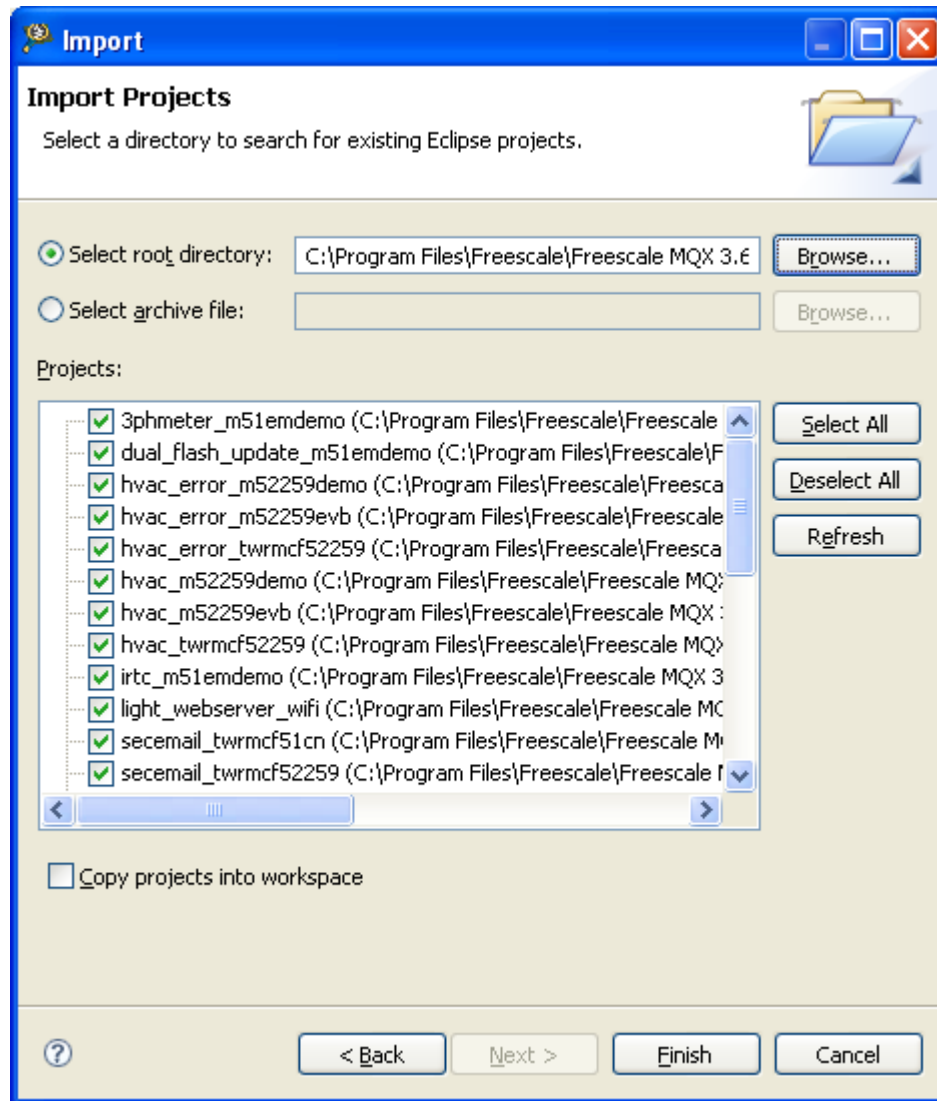
**Figure 1: Import – Stage 1**

4. Chose “Existing Projects into Workspace” under “General” as shown in Figure 2 below and click the “Next” Button.



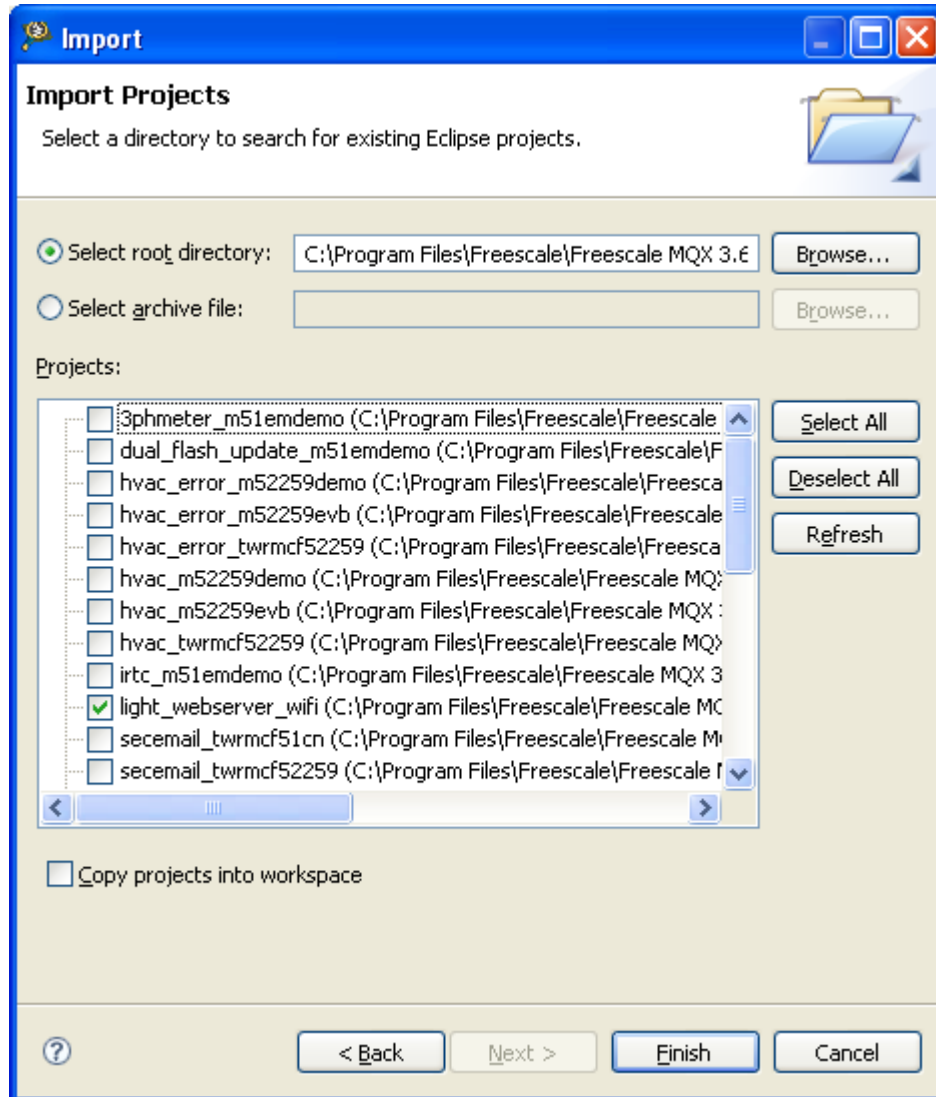
**Figure 2: Import – Stage 2**

5. In the next window, click on "Browse" to chose the C:\Program Files\Freescale\Freescale MQX3.6\demo as shown in the Figure 3 below.



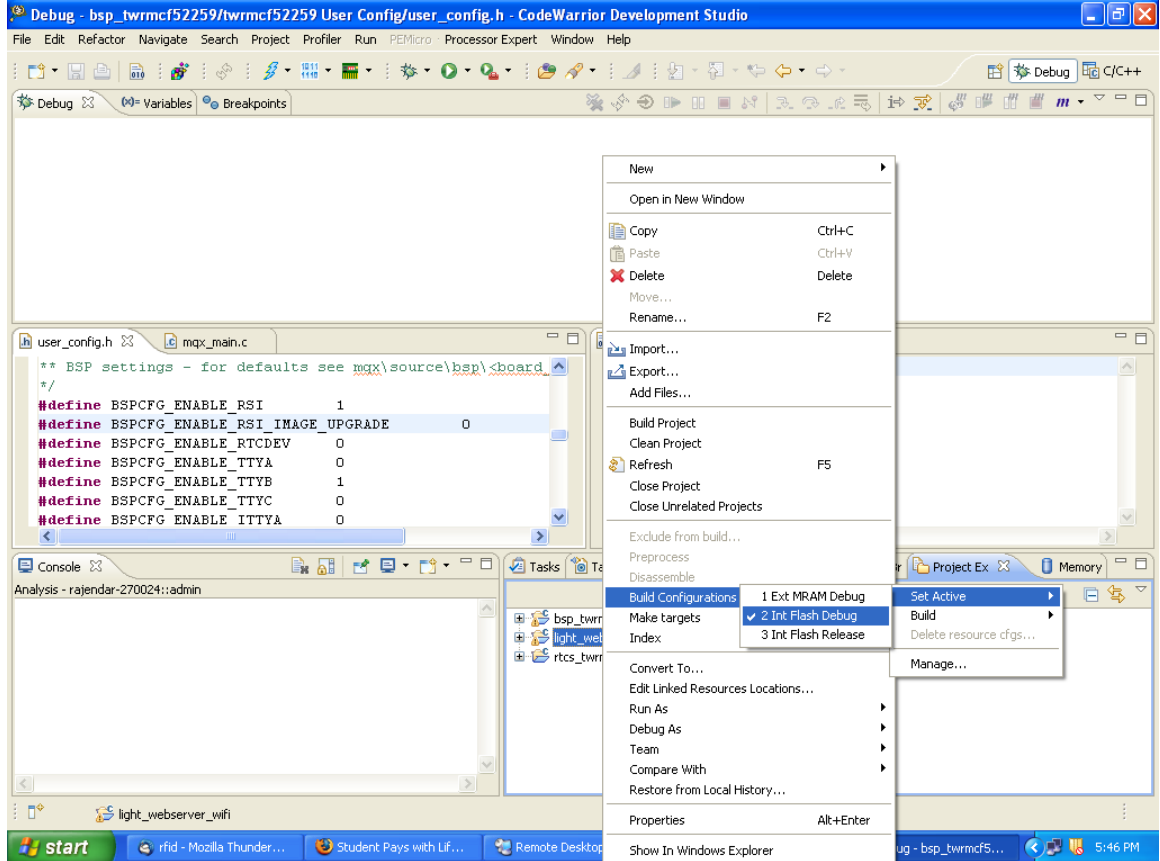
**Figure 3: Import – Stage 3**

6. The list of available projects in the chosen directory appears, with all of them selected apart from the ones already imported into the workspace. Click on “Deselect All”. Then look for the “light\_webserver\_wifi” project and select it. Click the “Finish” button as shown in Figure 4 below.



**Figure 4: Import – Stage 4**

7. The project is successfully imported into the Workspace after some time. Next, import the bsp\_twrmcf52259 and rtcs\_twrmcf52259 projects, if not imported already. The path for these projects is C:\Program Files\Freescale\Freescale MQX3.6
8. Apply the TWR-WIFI-RS2101 enablement patch or follow the Driver Reference Manual's Section 7 to enable the RS9110-N-11-21 device driver support into the BSP project, bsp\_twrmcf52259.
9. Ensure that "Build Configuration → Set Active → Int Debug" is selected for all the projects as shown in Figure 5 below.



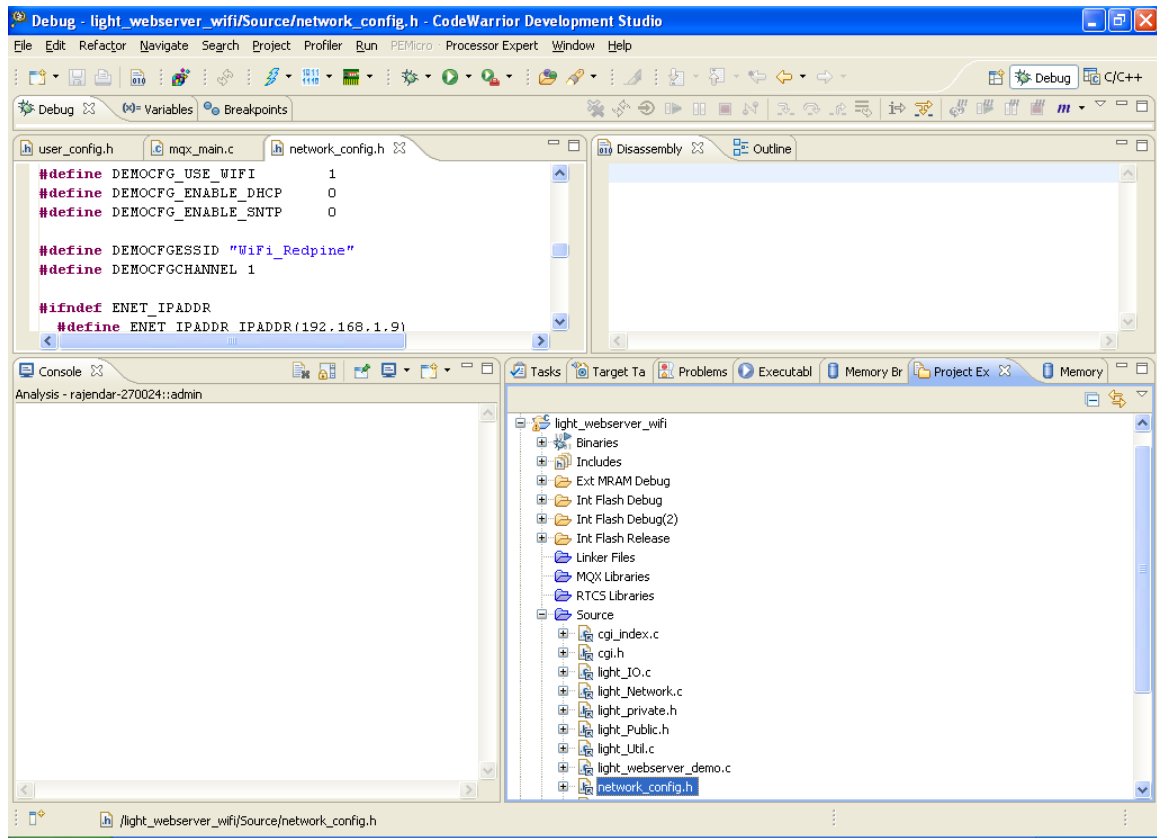
**Figure 5: Set Active Configuration as Debug**

10. Select the bsp\_twrnmc52259 project in the project explorer tab and build the project. Right clicking on the project lists the actions possible as shown in Figure 5 above and "Build Project" is one of them, to build a project.
11. Similarly, build the rtcs\_twrnmc52259 project.
12. The network parameters like SSID, channel number, IP address, etc., can be modified as per the current network in the network\_config.h file of the light\_webserver\_wifi project as shown in the Figure 6 below. Select the light\_webserver\_wifi project in the Project Explorer tab and unfold the directories to find the source entry for network\_config.h. The following parameters control the Wireless network setup.

```
#define DEMOCFGESSID "Wi-Fi_eNbedded" // SSID
#define DEMOCFGCHANNEL 0 // Channel
#define DEMOCFGPSK "12345678" // Pre-Shared Key
#define ENET_IPADDR IPADDR (192, 168, 1, 9) // IP Address
#define ENET_IPMASK IPADDR (255,255,255,0) // Subnet Mask
#define ENET_IPGATEWAY IPADDR (192.168.1.1) // Gateway
```

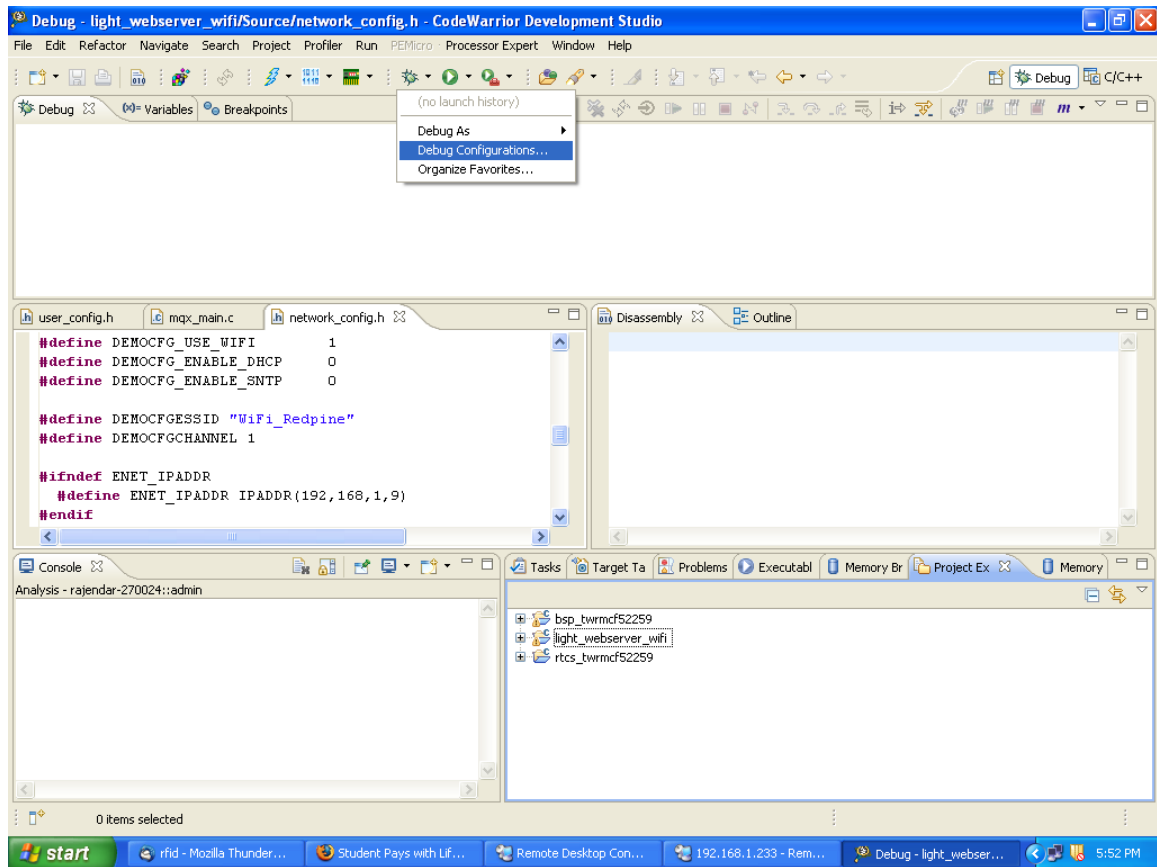


The IP address (192.168.1.9) for the Tower system and Gateway address (192.168.1.1) are shown here as examples for the purpose of this Lab.



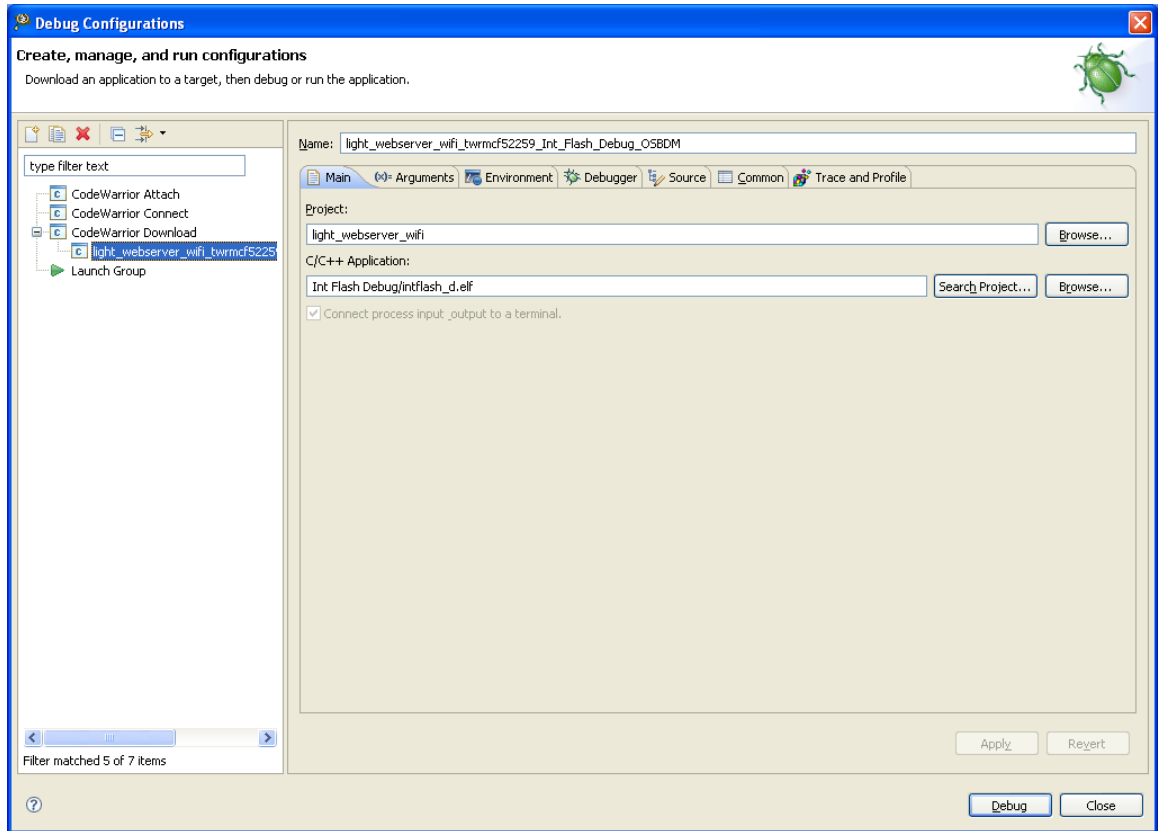
**Figure 6: Configure Network Parameters**

13. Now build the `light_webserver_wifi` project.
14. In the Menu chose "Debug → Debug Configurations" as shown in the Figure 7 below.



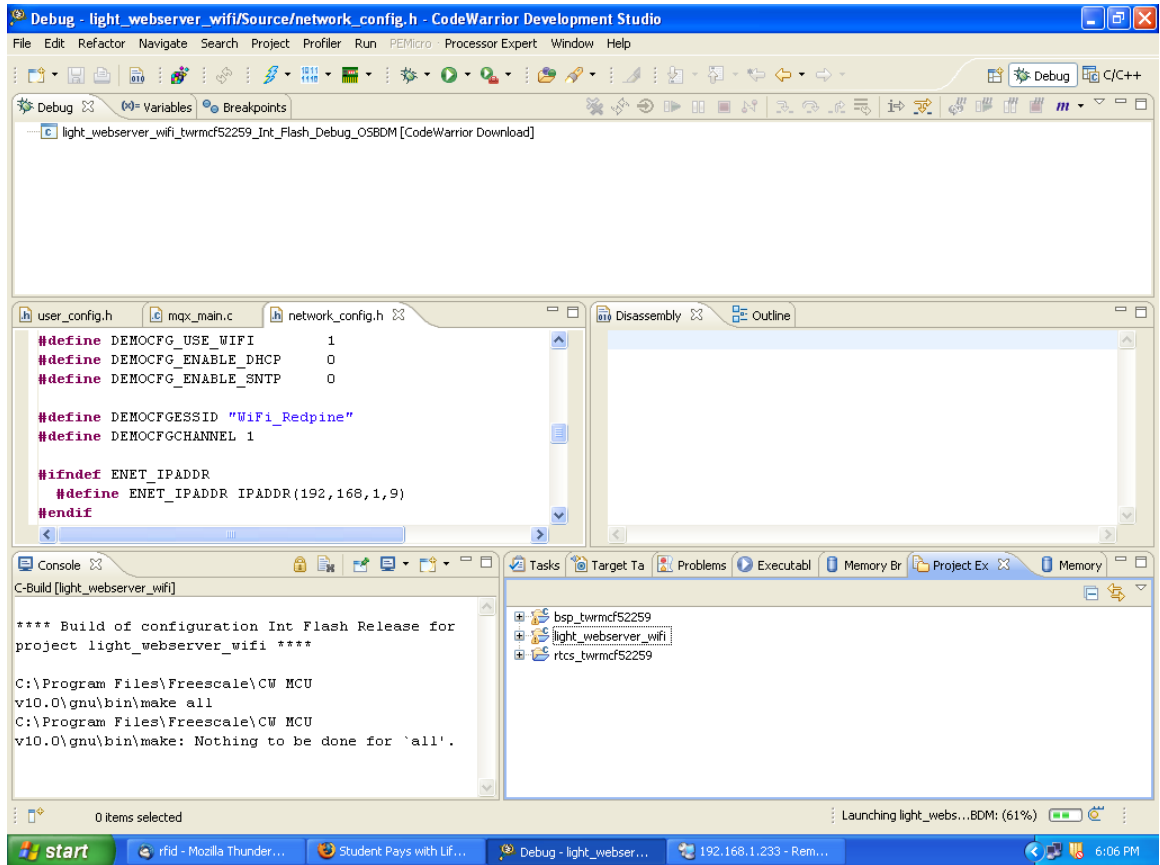
**Figure 7: Debug Menu**

15. A window appears as shown in Figure 8 below. Chose the "light\_webserver\_wifi\_twrnmc52259\_Int\_Flash\_Debug\_OSBDM" target in the left pane and click the "Debug" button. This will start the compiling and downloading of the binary image into the MCU Flash.



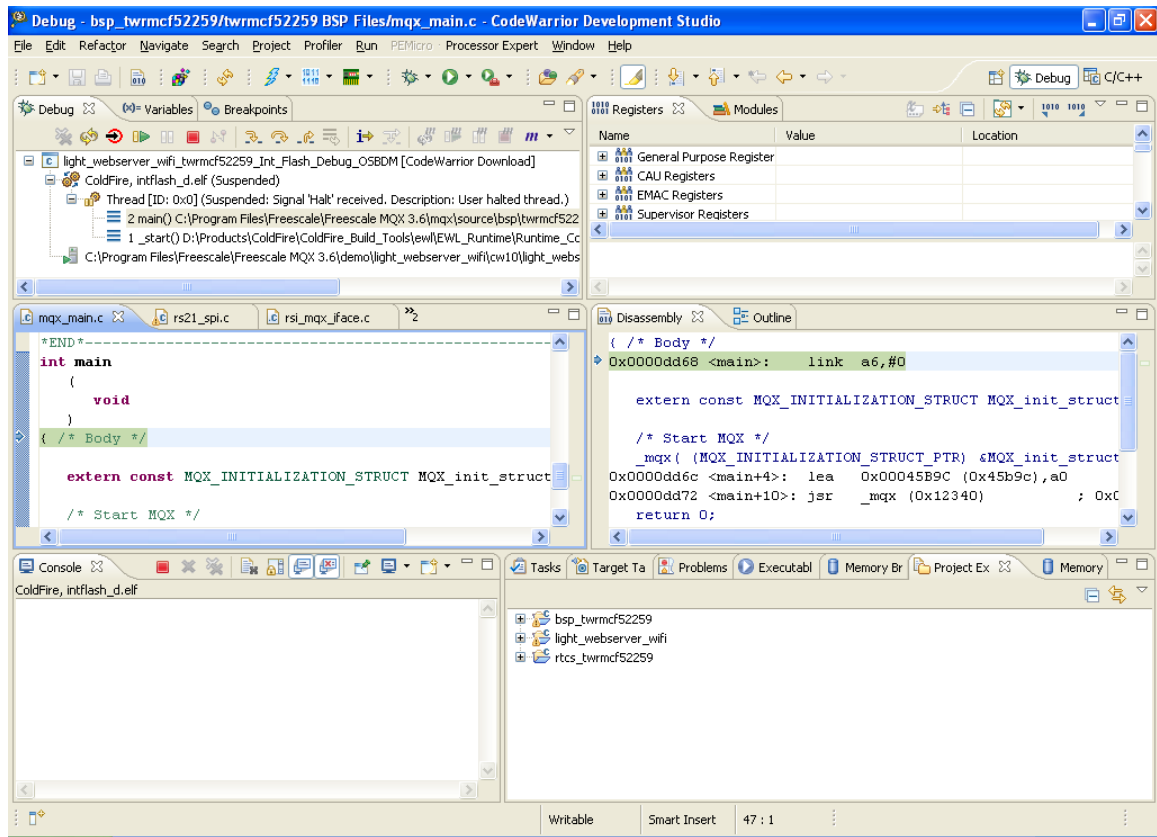
**Figure 8: Debug Configurations**

16. The download process will take some time and the progress is shown in the right side bottom as shown in the Figure 9 below.



**Figure 9: Progress of the Download Activity**

17. When the download is finished the application debug starts as shown below in Figure 10. Press the F8 key to run the application.



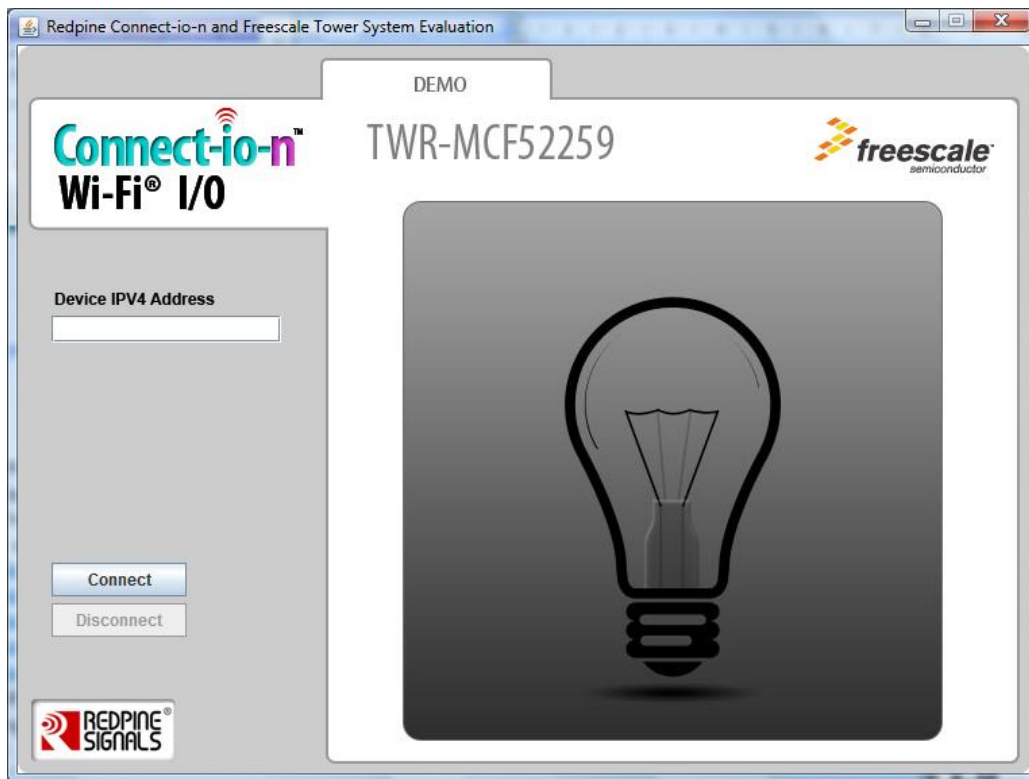
**Figure 10: Run the Application**

18. The Tower system will connect to the configured Access Point as soon as the application is run.
19. Connect your computer to the Access Point (through WLAN or Ethernet) and then ping the IP address assigned to the TWR-WIFI-RS2101 device to verify the connection (open up a command prompt by going to "Start-> Accessories-> Command Prompt" and type "ping 192.168.1.9").
20. Next, open a browser on the computer and type <http://192.168.1.9> into the browser to view the webpage hosted by the Web server on the Tower system. The page will be as shown in Figure 11.



**Figure 11: Web page of the Tower System**

21. Locate the TWR-WIFI-RS2101\_GUI.jar application in the demo\light\_webserver\_wifi\Demo\_Application folder. Ensure that Java JRE 1.6.0 is installed on the computer.
22. Double-click on the Application. The window shown in Figure 12 appears.



**Figure 12: Demo Application**

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23. Enter the IP address of the TWR-WIFI-RS2101 card (192.168.1.9 in this demo) and click on the Connect button in the above screen. This establishes a TCP connection between the computer and the TWR-WIFI-RS2101 card.
  24. By rotating the potentiometer present on the Tower MCU board the user can observe the change in the intensity of the bulb in the GUI.

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### **Document History**

<b>S.No.</b>	<b>Version No.</b>	<b>Date</b>	<b>Changes</b>
1.	1.0	July 2010	Initial Version
2.	1.1	Nov 2010	Updated headers/footers; updated step 21



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