

# How To: Renesas RL78/G14 with WiFi

## Description

The RL78/G14 is a 16-bit CPU core by Renesas Electronics that's equipped with WiFi and numerous sensors. It's a single board configuration that lends itself to numerous applications including IoT. This example will focus on a RL78/G14 "C" example making use of the integrated Gainspan WiFi adapter and several on-board sensors.

This "How To" will provide the step-by-step details on how to assemble, configure, and load the Renesas RL78/G14 to publish the following data:

- Information Log Messages
- Location Data (Latitude, Longitude, etc.)
- Sample Attribute Information
- Analog Potentiometer, Temperature, and Luminosity Property Data

This example will also demonstrate cloud methods to turn on/off the LEDs on the RL78/G14.

## Software Prototyping Platform

The IAR Embedded Workbench will be used throughout this example.

## Requirements

The following items are requirements for a working Renesas RL78/G14 IoT:

- Renesas RL78/G14 Demonstration Kit and sample starter software
- Windows Compatible PC with Internet Access

## Setup

Setup for the Renesas RL78/G14 IoT consist of these steps:

1. Signup for an M2M Account on the Management Portal
2. Download the getting started file from the Management Portal

3. Create a new “Thing” Definition on the Management Portal

1. Open the downloaded file and extract the ‘RenesasThingDef.json’ file to your PC’s desktop
2. Select ‘Developer’ from the Management Portal
3. Click on ‘Thing definitions’ and then click the ‘Import’ button
4. Click the ‘Attach File’ button and select the JSON file copied in the previous step
5. Press the ‘Import’ to import the thing definition into the ORG

4. Create an Application token for your thing definition

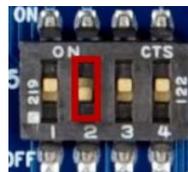
- Select ‘Developer’ from the Management Portal
- Click on ‘Applications’ and then click the ‘New Application’ button
- In the ‘Name’ field enter ‘RenesasApp’
- In the ‘Description’ field enter ‘Renesas App’
- In the ‘Auto Registration Thing Definition ID’ select ‘Renesas IoT Device’
- Check the ‘Org Admin’ checkbox and press the ‘Add’ button
- Record the ‘Token’ ID that is provided for a subsequent step – this is your Application token

5. Install the Renesas TL78/G14 Quick Start Software from the DVD included within the TL78/G14 Demonstration kit.

6. Download and install the IAR Embedded Workbench

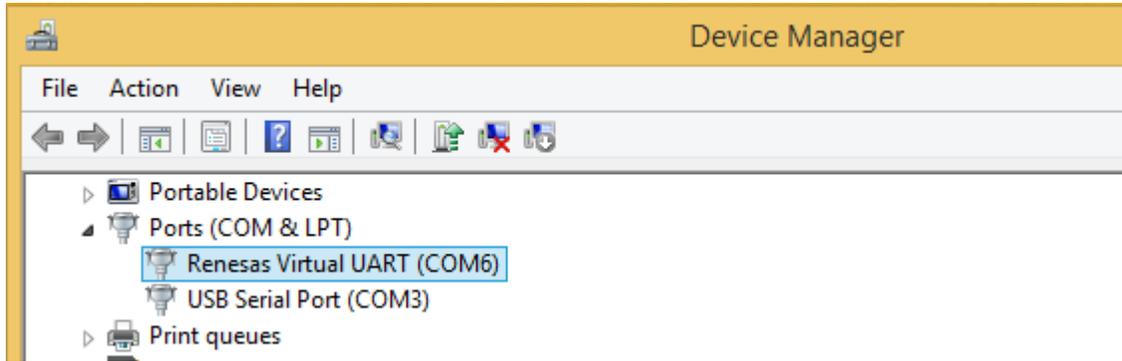
- Click on this [link](#).
- Scroll down and Click on the “RL78” option
- Download the IAR workbench per the instructions listed on the page. (The size unlimited IAR version will be required for this example. )

7. Place the RL78/G14 RDK into debug mode by setting switch 5 (SW5) on the RDK to ON, OFF, ON, ON – see figure below.



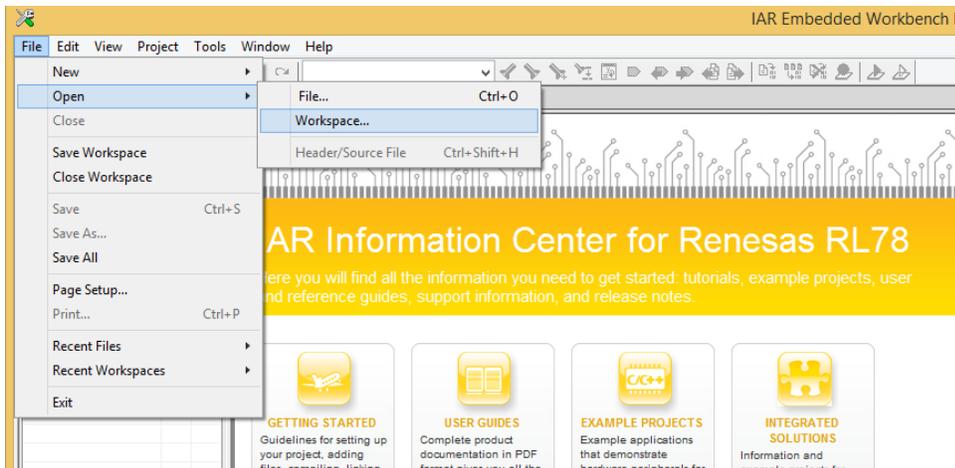
8. Connect the USB power cable from your computer to your RL78/G14 and allow your Windows system to recognize the new RL78/G14 device.

9. Open the Windows “Device Manager” on your computer
10. Find the Renesas RL78/G14 under “Ports” – it will be listed as “Renesas Virtual UART” and take note of the COM port assigned (COM6 in this specific example)



11. From within the file downloaded in step 2
  - Copy all the files into the C:\deviceWISE folder

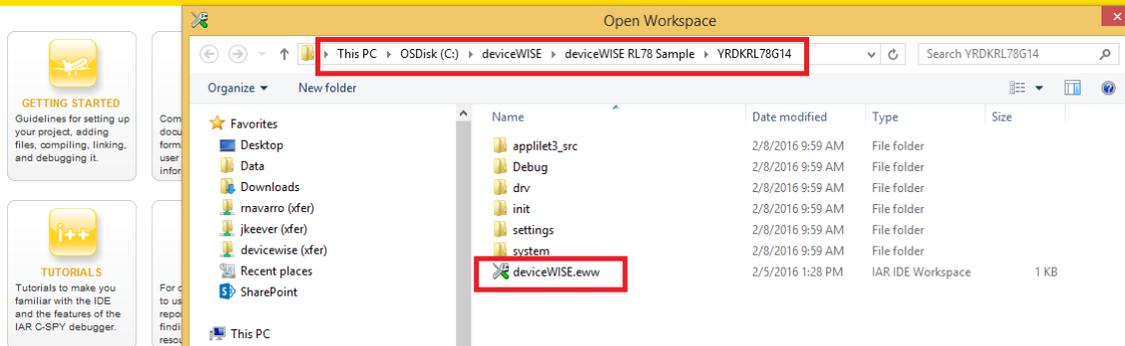
12. Launch the IAR workbench and select File, Open, Workspace



13. Open the sample deviceWISE.eww project that was download into the C:\deviceWISE folder

## IAR Information Center for Renesas RL78

Here you will find all the information you need to get started: tutorials, example projects, user and reference guides, support information, and release notes.



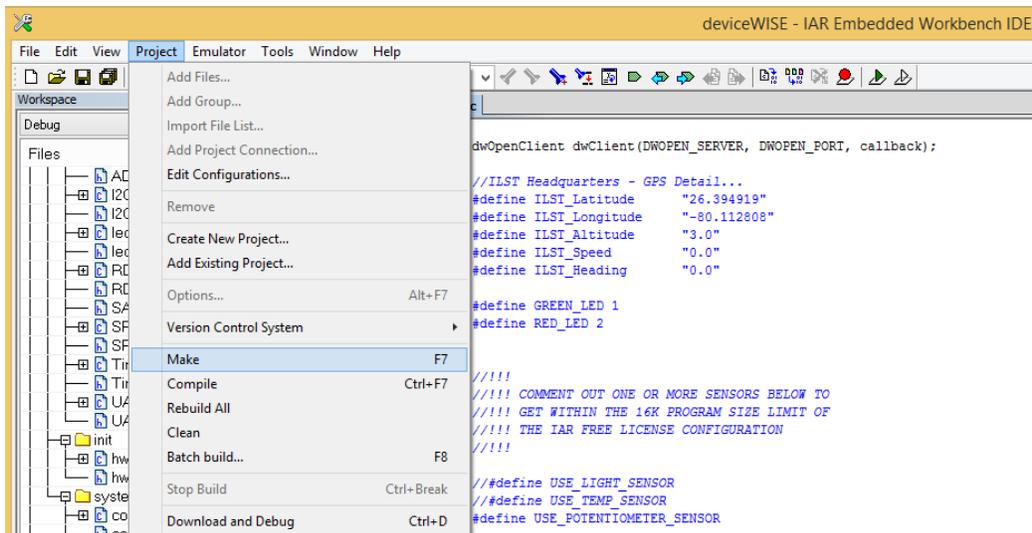
14. Open the main.c file and scroll down to line 53 and enter the WiFi SSID and Password for your WiFi network.

```
//Wi-Fi Network - SSID / Password
#define WIFI_SSID      "MyNetworkSSID"
#define WIFI_PW       "MyNetworkPW"
```

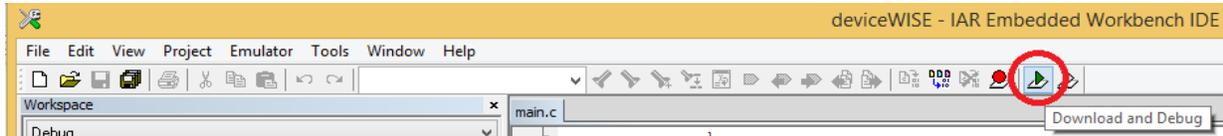
15. Scroll down to line 57 and enter your Application Token obtained in Step 4 above.

```
//Cloud Credentials
#define DWOPEN_APPTOKEN "bf2YxzRd44WxoDE8" //Application Token
#define DWOPEN_SERVER  "api.devicewise.com"
#define DWOPEN_PORT    1883
```

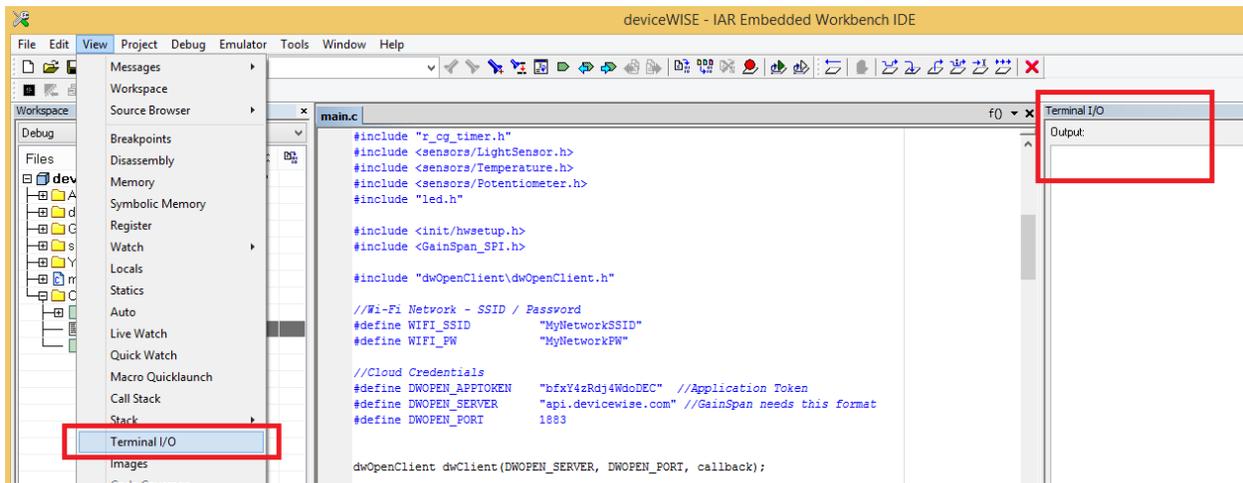
16. Build the sample project by selecting Project and then 'Make' from the IAR menu bar



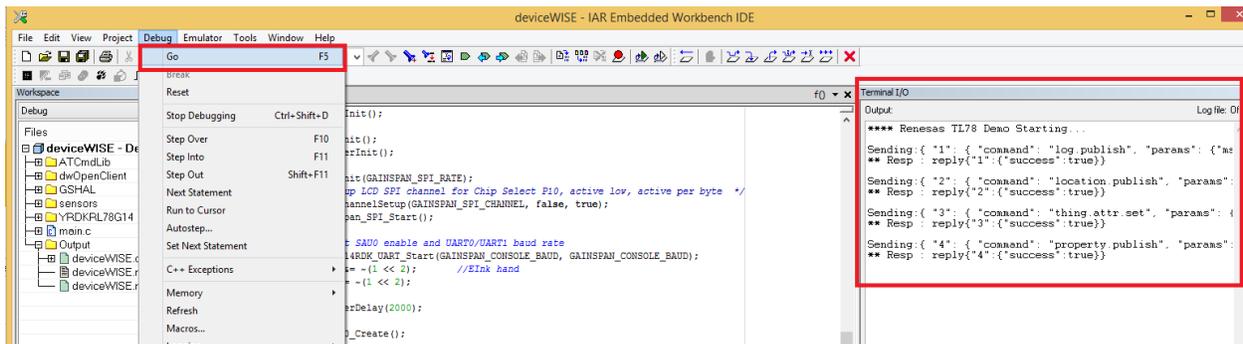
17. After successfully building the project, press the download and debug button.



18. Select View and Terminal I/O to display the Terminal I/O view so that you can see the sample project output messages.



19. Select "Debug" and "Go" from the IAR workbench to start your sample program. After a few seconds you'll see some output from your sample program in the "Terminal I/O" view.



20. Open the "Things" page on the Management Portal to display your device

21. Open your 'Thing' device by clicking the 'view' icon (the eyeball) next to your device. The sensor data will display accordingly.
22. Use the 'Methods' tab to turn ON and OFF LEDs