

TWR-WIFI-GS1500M

Lab Guide

Rev. 1

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Revision History

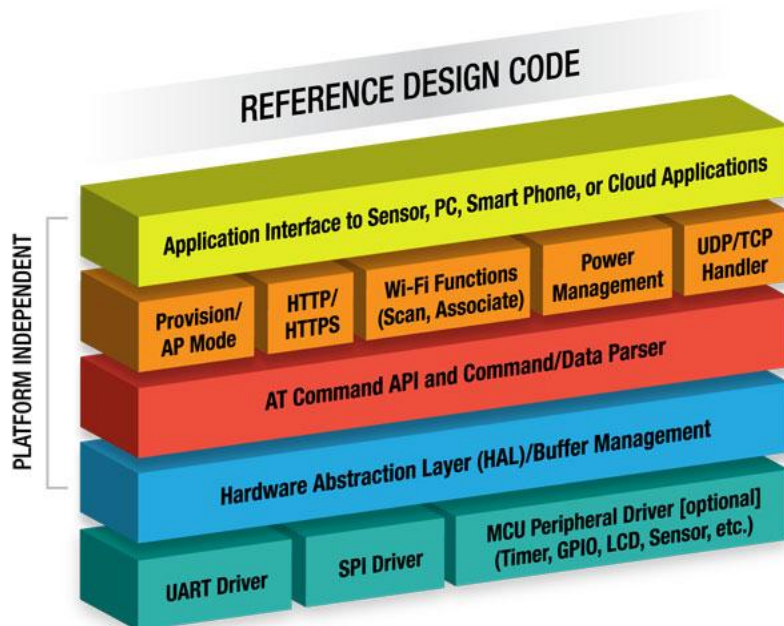
Revision	Date	Changes
1.0	Sept 2012	Initial Release

1 Purpose

This document covers how to demonstrate applications using the TWR-WIFI-GS1500M Tower peripheral module. The TWR-K60N512 Tower MCU module is used to communicate with the TWR-WIFI-GS1500M. This document also covers how to configure the Tower System and an iPhone to run the demos.

The demo software provides reference example for the MCU serial driver and application software. The demo software uses AT commands to showcase advanced features of the TWR-GS1500M Serial to Wi-Fi firmware such as Limited AP mode, embedded DHCP, multicast NDS/Service Discovery (used by Bonjour), embedded Web Server for accessing embedded web pages, XML parser, security, and UDP/TCP/IP/HTTP(s) protocols.

The MCU code is architected to have small memory footprint, and be mostly platform independent with only the driver being MCU specific as shown in the diagram below. This allows for user to easily port to other host microcontrollers. The reference MCU code is developed using IAR Embedded Workbench IDE. The memory footprint for the reference demo is around 2K bytes of RAM and 12K bytes of FLASH. This code includes library of all the AT commands supported by the TWR-GS1500M device, but most applications do not use all the AT commands so memory footprint will vary based on the application.



2 Configure Hardware

To run the demos with the TWR-K60N512 hardware, and software projects, make certain that the jumpers and switches on the TWR-WIFI-GS1500M are in their default locations as shown below.

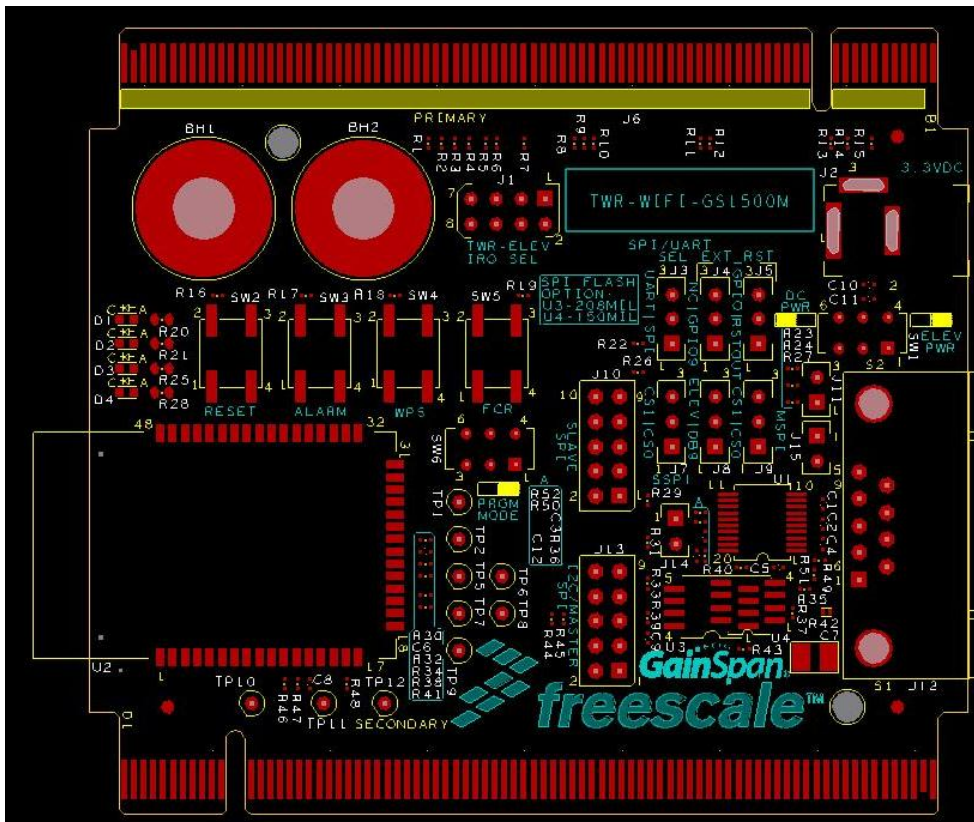


Figure 1. TWR-WIFI-GS1500M Default Jumper Settings

Table 1. TWR-WIFI-GS1500M Default Jumper and Switch Settings

Jumper	Option	Setting	Description
SW1	Power Supply Input	ELEV PWR	Power from Tower System 3.3V
		DC PWR	Power from DC power jack (J2)
SW6	Mode Selection	RUN	GS1500M in standard "run" mode
		PRGM	GS1500M in program mode
J1	Interrupt Selection	1-2	Connect GS1500M interrupt to Tower IRQ_G (B56)
		3-4	Connect GS1500M interrupt to Tower IRQ_E (B58)
		5-6	Connect GS1500M interrupt to Tower IRQ_C (B60)
		7-8	Connect GS1500M interrupt to Tower IRQ_A (B62)
J3	SPI/UART Selection	1-2	Select SPI as serial interface
		2-3	Select UART as serial interface
J4	GS1500M Reset Selection	1-2	Connect GS1500M Reset to Tower GPIO9 (A9)
J5		2-3	No connection
J7	Slave SPI Port CS Selection	1-2	Connect GS1500M Reset to Tower RSTOUT (A63)
		2-3	Connect GS1500M Reset to Tower GPIO1 (B21)
J8	UART Routing Selection	1-2	Connect Tower SPI0_CS0 to slave SPI CS on GS1500M
		2-3	Connect Tower SPI0_CS1 to slave SPI CS on GS1500M
J9	Master SPI Port CS Selection	1-2	Connect GS1500M UART0 to on-board RS232/DB9
		2-3	Connect GS1500M UART0 to Tower System
J11	Power Isolation and Current Measurement	1-2	Connect Tower SPI1_CS1 to master SPI CS on GS1500M
		2-3	Connect Tower SPI1_CS0 to master SPI CS on GS1500M
J14	RS232 Transceiver Force-off	ON	Connect GS1500M power supplies to the 3.3V supply source
		OFF	Isolate GS1500M from power supplies. J11 can be used to measure the energy consumption of the VBAT, VDDIO, and EN_1V8 supplies to the GS1500M.
J15	UART CTS Isolation	ON	RS232 transceiver operates in normal mode
		OFF	RS232 transceiver forced off

Note: J3 jumper is not applicable when running Serial-to-Wi-Fi firmware. The firmware version loaded on the module determines the interface used. This jumper is relevant if using IP2WIFI.

The TWR-K60N512 should be set to its default settings as described in the TWR-K60N512 Quick Start Guide and User’s Manuals.

Assemble your Tower system consisting of the TWR-K60N512 and TWR-WIFI-GS1500M. Be careful to match the Primary edge of each module to the Primary (or Functional on older systems) TWR-ELEV module. Connect a USB cable between your development PC and the TWR-K60N512 PWR/OSBDM USB connector.

A wireless access point will be required. Setup the wireless access point as desired and take note of the SSID and any security setting (if enabled). Ensure that your development PC can connect to the wireless access point.

3 Configure Software

This demo/lab walk-through guide uses the software listed below. Visit the links provided below to download and install the software if you do not already have it installed.

1. IAR for ARM – <http://www.iar.com/en/Products/IAR-Embedded-Workbench>
2. TWR-WIFI-GS1500M Demonstration Software for TWR-WIFI-GS1500M and TWR-K60N512 - <http://www.freescale.com/TWR-WIFI-GS1500M>

4 Running the Demos

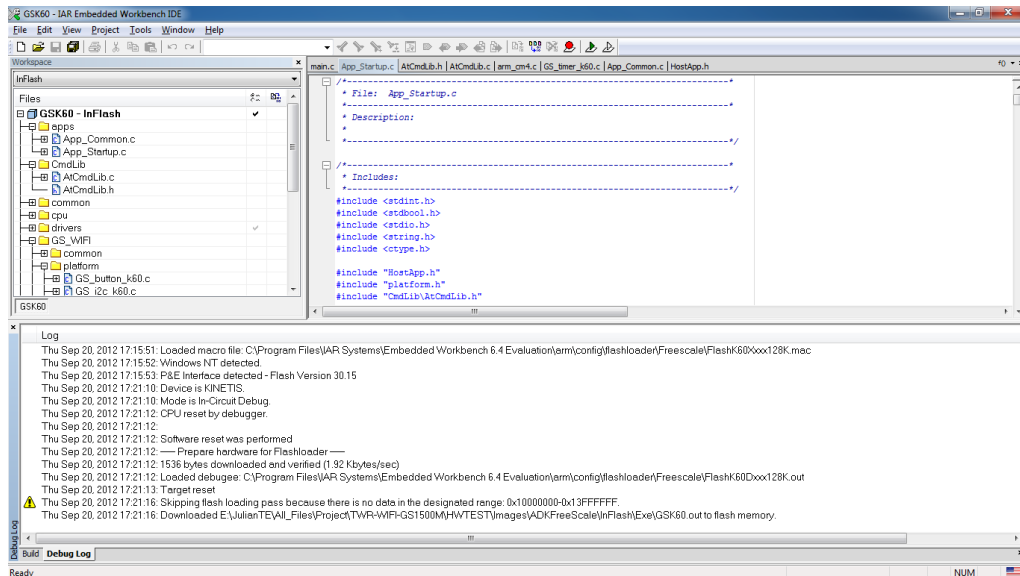
This reference code shows the following two demo's that use Limited AP mode:

- 1) Embedded web server demo
- 2) Smart Phone Demo with service discovery (Bonjour)

Below are steps to run the demos (web server and iOS) on the TWR-K60N512 with the TWR-WIFI-GS1500M:

STEP 1:

- a) Download the *TWR-WIFI-GS1500M Demonstration Software* and unzip.
- b) Start the IAR Embedded Workbench and open the workspace GSK60.eww.
- c) Rebuild the project ("Make" button) and download to the demo target ("Download and Debug" button). Run the demo by pressing the "Go" button, pressing the F5 key or recycling the power to the Tower System.

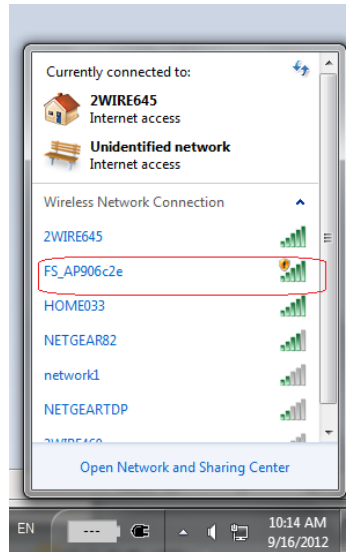


NOTE 1: When downloading code via OSBDM/OSJTAG, a request may be made to update firmware and to set the OSBDM/OSJTAG in boot loader mode (J10), follow the on-screen instructions to perform the upgrade.

NOTE 2: The firmware loaded on the TWR-WIFI-GS1500M currently supports the UART interface and the demo code on the TWR-K60N512 uses UART interface.

STEP 2: Web – Server Demo

Power on the Tower board and the TWR-WIFI-GS1500M device acts as an AP, generates its own Wi-Fi network and runs the embedded web Server Application. The Wi-Fi network SSID will be FS_APxxxxxx, where xxxxxx is last 6 digits of your board MAC address. Connect your PC or Tablet or HandHeld device Wi-Fi client to this AP (FS_APxxxxxx) network.



STEP 3:

After the PC is connected to the AP, open a PC browser and enter URL: 192.168.240.1/fsl.html. The browser will display the demo server webpage. Click Switch button to toggle the 4 LEDs ON/OFF on the TWR-K60N512 board.

Rotate the demo tower to see the accelerometer x, y, z change with the movement. Adjusting the potentiometer on the TWR-K60N512 board will control the Light value on the webserver.

Note: Temperature is not supported at this time so the displayed value will not change.



STEP 4: Smart Phone Demo

Users may run the sensor demo using an iOS device (iPhone, iTouch or iPad) and see embedded discovery (bonjour) functionality of the TWR-WIFI-GS1500M module. Go to Apple iTUNES store and download and install the free GainSpan-Freescale Wi-Fi Sensor Application, if necessary.

GainSpan-Freescale Wi-Fi Sensor



STEP 5:

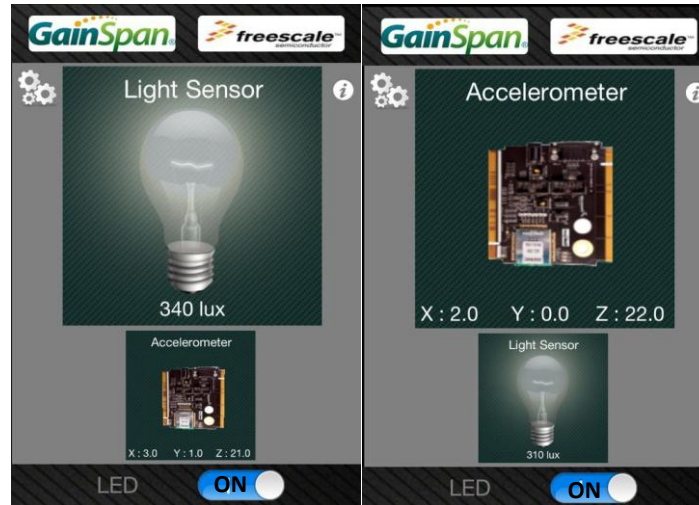
On the iOS device, enable Wi-Fi and connect to the SSID (FS_APxxxxxx) presented by the TWR board as described in Step 1. Once connected, launch the smartphone application. The application uses bonjour or mDNS or Service Discovery to identify the TWR system (freescale1). Select the freescale1 device. This will launch the application and it will display the sensor information as shown in Step 6.

Note: If for some reason discovery fails or is not supported by the handheld or tablet, application will request user to manually enter the IP address. Enter IP address of 192.168.240.1

STEP 6:

Toggle the LED ON/OFF button to change the 4 LED's status on the TWR-K60N512 board. Select the accelerometer sensor and rotate the tower to see the picture and accelerometer x, y, z change with the movement of the board.

Adjust the potentiometer on the TWR-K60N512 board to control the light intensity on the smartphone.



5 Troubleshooting

If you are unable to communicate wirelessly from a PC to the Tower System, try the following:

1. Ensure the Tower system is assembled correctly. Each tower module has a primary and secondary card edge connector. The primary side must be connected to the Primary (or Functional in older systems) Elevator.
2. With the target application running, check on the PC if the wireless network (SSID) is seen during its scan. Try connecting and pinging (192.168.240.1) the target tower system. If you can't ping the target, then it is unlikely you can run the demo. Try power cycling the TWR board and trying the steps again.

6 Next Steps

For further understanding and customization of the code, review the App_startup.c and main.c files for different features supported in the code and reading of the various sensors.

In addition, to understand all the features available on the TWR-G1500M serial to Wi-Fi firmware, and the various AT commands supported and their usage, refer to the Serial-to-Wi-Fi Adapter Guide available from GainSpan's website support section.

For additional information on GainSpan products, visit GainSpan website www.gainspan.com

For additional information on Freescale products, visit Freescale website www.freescale.com