Over The Air Firmware Update (OTAFU)

Application Note

Supports modules
GS2011Mxx and GS2100Mxx

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Release History

Version	Date	Remarks
1.0	June 2014	Initial Release

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Chapter 1 Overview

There are two methods of OTAFU mechanism supported for the GS2011M and GS2100M. Both methods required external flash and utilize it to transfer the image before programming the images into the internal flash of the module.

OTAFU Push Method

Based on OTAFU HTTP Push mechanism. In this method GS2011M and GS2100M acts as a HTTP server and a client such as PC can use a web browser and push new firmware into the device.

OTAFU Pull Method

Based on OTAFU HTTP Pull mechanism. In this method the GS2011M and GS2100M acts as a HTTP client and is the recommended method as it uses the standard HTTP protocol. This method required external flash and an HTTP server. The GainSpan module is the HTTP client, and it will perform an HTTP GET for the firmware from the HTTP server (see Table 1).

Table 1: OTAFU Method

	Method 1 **HTTP PULL**	**Method 2** **HTTP PUSH**
Support in GS2011M	YES	YES
Support in GS2100M	YES	YES

NOTE: Firmware update can only be done within the same application type (i.e., from WPS version X to WPS version Y). This cannot be done between different binary options (Web version X to WPS version X), i.e., between web provisioning and WPS or Enterprise Security or RF Test.

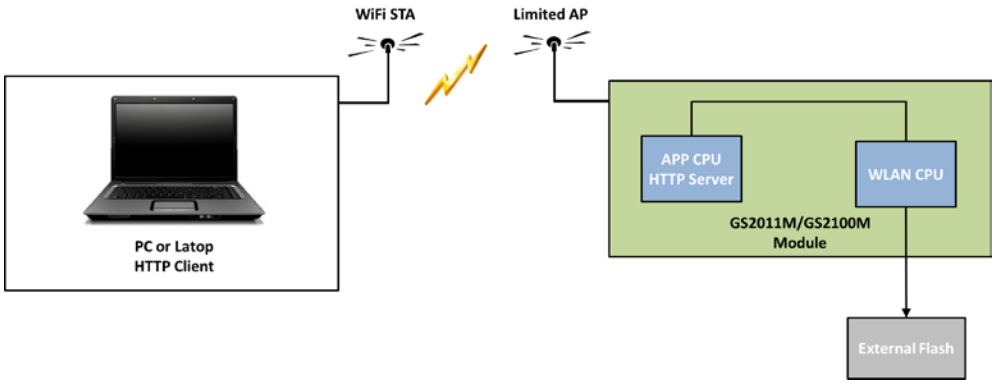
Chapter 2 HTTP PUSH Method

In HTTP PUSH method, GS2011M or GS2100M acts as an HTTP server and clients (PC) could POST latest firmware images to the GS2011M or GS2100M web server. The Evaluation Kit (EVK) provides the ability to evaluate this feature using a web browser on a PC.

NOTE: OTAFU ADK will be needed for customization.

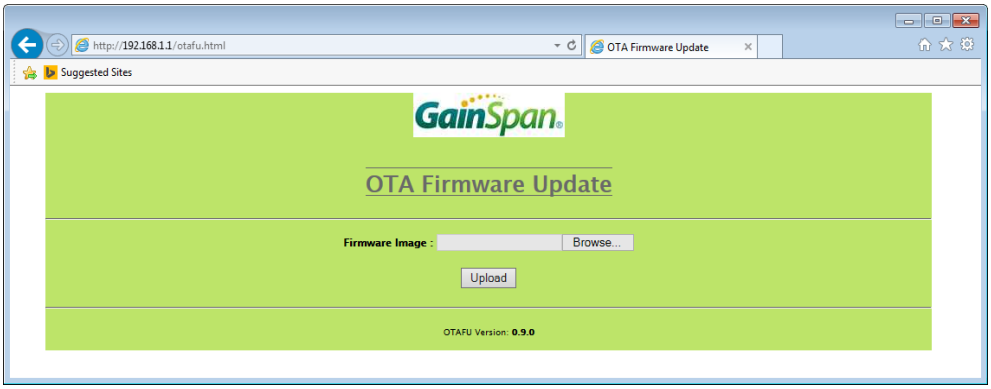
Figure 1 shows connection setup for the GS2011M or GS2100M as limited AP or Infrastructure.

Figure 1: GS2011M/GS2100M Limited AP and Infrastructure Connection Setup



Clients could utilize the web applications hosted by GS2011M or GS2100M in web server or utilize native applications developed in PC to post firmware images (see Figure 2).

Figure 2: Web Application



OTAFU PUSH Method Serial-to-WiFi Commands

The following steps must be performed to enable OTAFU PUSh method using Serial-to-WiFi commands.

1. AT+WRXACTIVE=1
2. AT+WRXPS=0
3. AT+NSET=192.168.4.1,255.255.255.0,192.168.4.1
4. AT+DHCPSRVR=1
5. AT+WM=2
6. AT+WEBPROV=,, (starts web server. Provide a username/password or none)

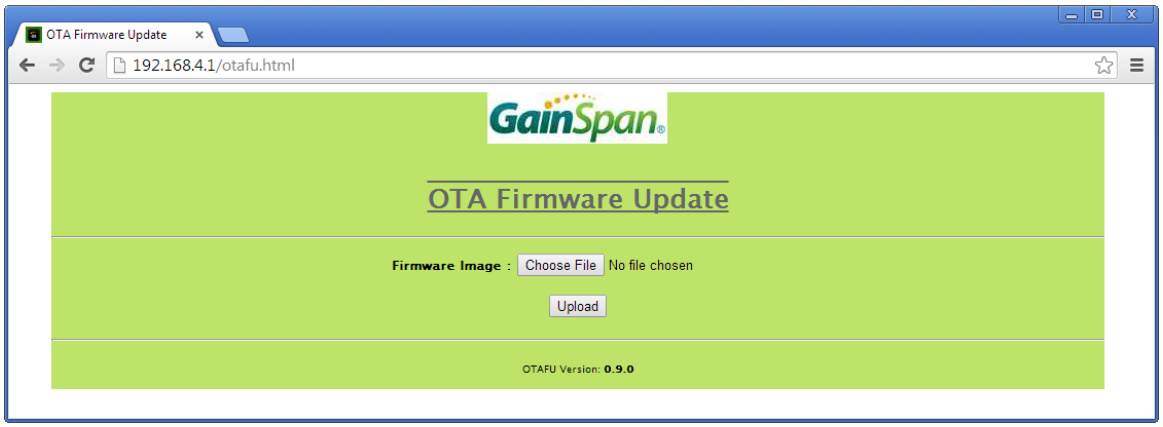
   This will start a wireless network with a default IP address (e.g., 192.168.4.1) assigned to the device, and the DHCP server is enabled so clients connecting to the network will be assigned an IP address by the server.
7. AT+WA=OTAFU_AP,,6
8. Connect your PC to the wireless network "OTAFU_AP" that is created by the device (see Figure 3).

Figure 3: Connected to OTAFU_AP

9. Once connected, open a web browser and go to the following URL: http://<your device ip>/otafu.html.

10. In this example the default IP addres s (192.168.4.1) is used. Type, http://192.168.4.1/otafu.html. This will bring up the web page shown in Figure 4.

Figure 4: Choose Firmware Image File



8. Choose a firmware image file. The firmware image file will display (see Figure 4).

9. Click the **Upload** button. This will perform the firmware update.

10. Once programming is completed, the browser will display a success message (see Figure 5) and the serial terminal application will display a message “APP Reset External Flash FW-UP-SUCCESS” (see Figure 6).

Figure 5: Firmware Upgrade

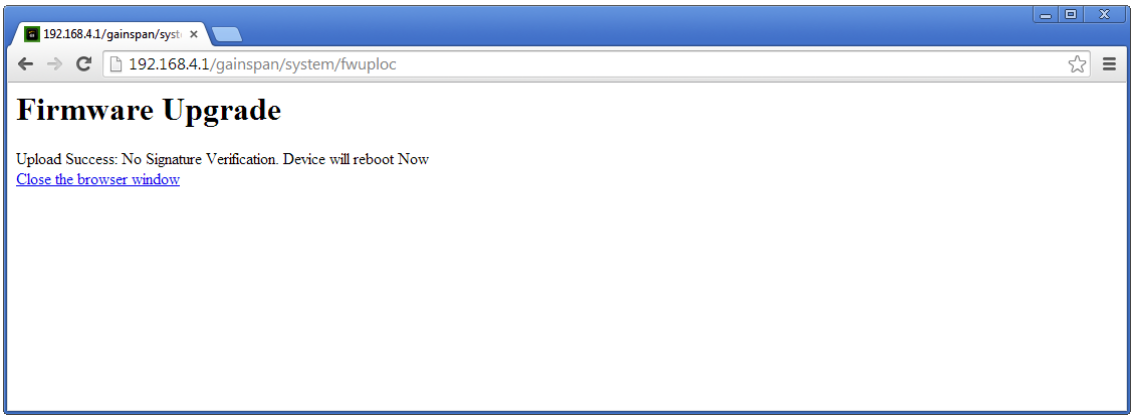
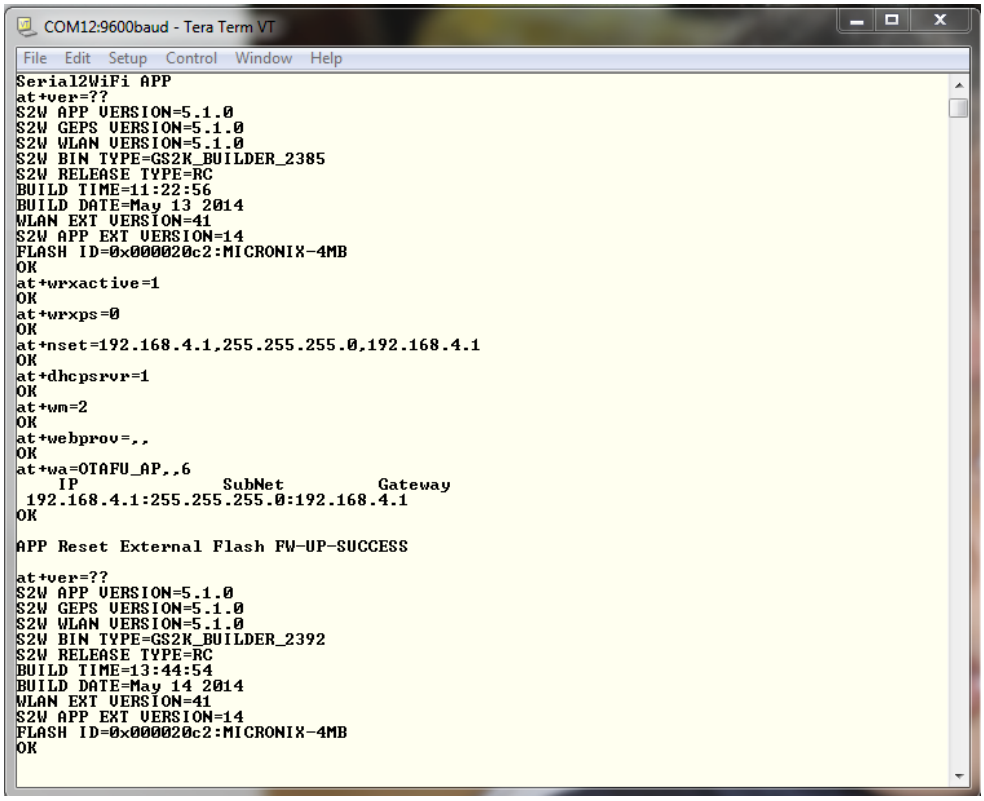


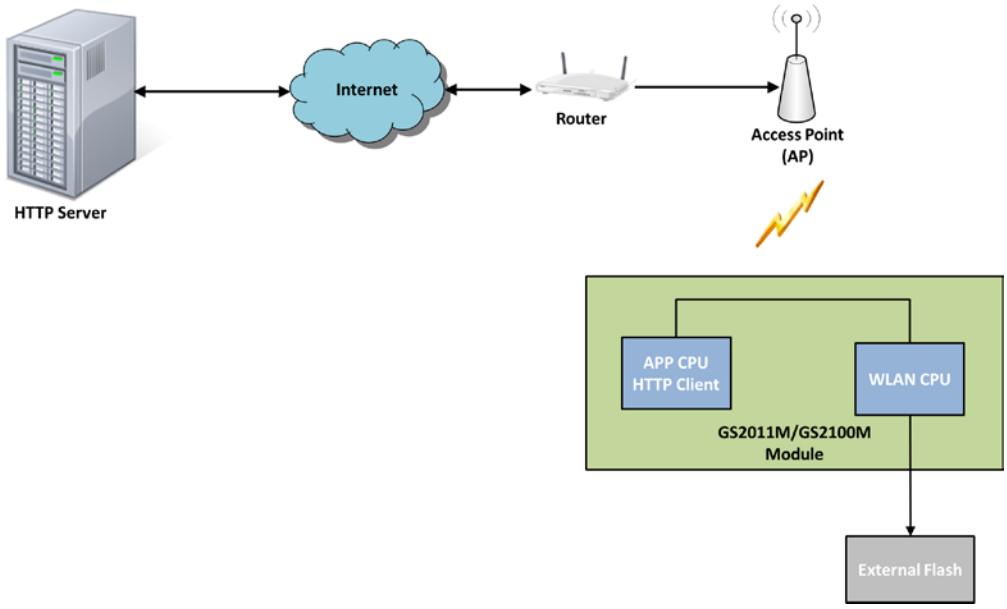
Figure 6: APP Reset External Flash Successful



Chapter 3 HTTP PULL Method

In the HTTP PULL method, GS2011M or GS2100M act as the HTTP client and retrieves the firmware images from any standard HTTP server (see Figure 7).

Figure 5: HTTP PULL Method



OTAFU PULL Method Serial-to-WiFi Commands to Update Firmware

The following steps must be performed to enable OTAFU PULL method using Serial-to-WiFi commands.

1. Connect the node to an Access Point (AP).

   ```
   AT+VER=??
   AT+NDHCP=1
   AT+WA=OTAFU_AP,,66
   ```

2. Configure HTTP headers.

   ```
   AT+HTTPCONF=20,Mozilla/4.0
   AT+HTTPCONF=11,192.168.3.133
   AT+HTTPCONF=7,application/x-www-form-urlencoded
   AT+HTTPCONF=3,Keep-Alive
   ```

3. Configure External Flash firmware upgrade parameters.

   ```
   AT+SOTAFWUPCONF=0,192.168.3.133
   AT+SOTAFWUPCONF=1,80
   AT+SOTAFWUPCONF=7,http://192.168.3.133/gs2000_SingleImage.bin
   ```

4. Start External Flash FWUP using the following command.

   ```
   AT+SOTAFWUPSTART
   ```

5. Once downloaded is complete, *"Download Complete. FWUP from Ext Flash"* message appears.

6. Once update is finished, *"APP Reset External Flash FW-UP-SUCCESS"* message appears.

Example AT Command Sequence

Figure 8 shows an example of the AT command sequence for Serial-to-WiFi PULL method firmware update.

Figure 6: Serial-to-WiFi PULL Method AT Command Sequence

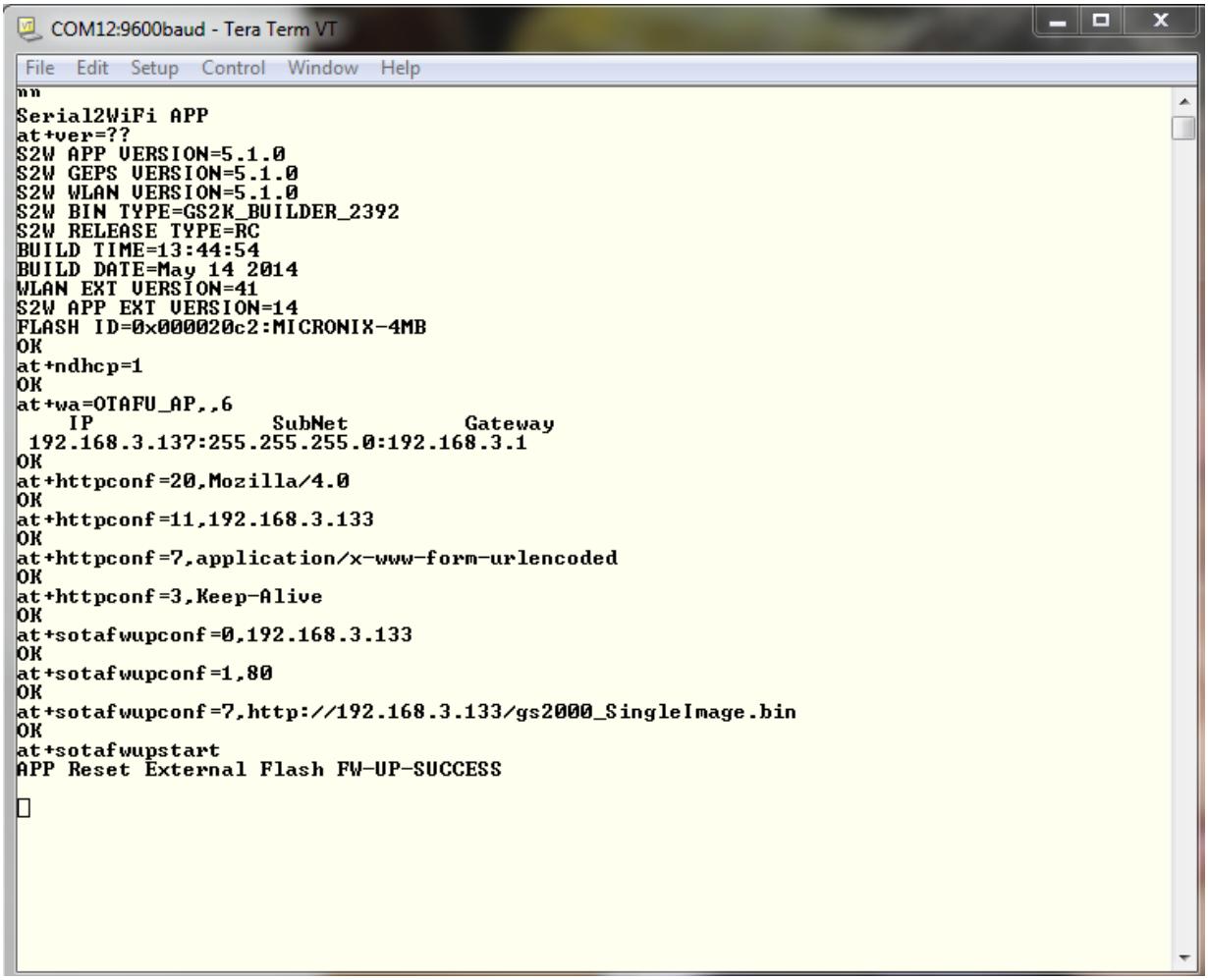


Figure 7 shows the Serial-to-WiFi PULL method version updated.

Figure 7: Verifying Serial-to-WiFi PULL Method Build Updated