



# GS2011M Ultra-Low Power High Speed 802.11b/g/n Module

## Backwards-Compatible



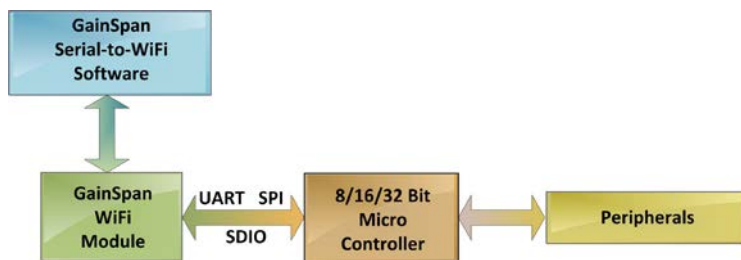
The GS2011M is an ultra-low power module that provides a quick, easy, and cost effective way for device and appliance manufacturers to add Wi-Fi connectivity to their products. The module provides a high speed serial interface connection to an embedded design built on an 8/16/32-bit microcontroller. The SDIO interface can be clocked at up to 40MHz.

The GS2011M is an ideal solution for organizations with limited Wi-Fi or RF expertise or for those seeking faster time to market, as it reduces RF design time and removes the burden of testing and certification. The module is IEEE 802.11b/g/n compliant, and meets worldwide regulatory and Wi-Fi Alliance certification requirements.

The module includes two analog to digital converter (ADC) pins for connecting energy measurement and other sensors. It runs the full Wi-Fi and TCP/IP networking stacks on module, completely offloading the host microcontroller. The module supports a complete suite of security protocols, also without tasking the host microcontroller, including WPA/WPA2-Enterprise and Personal security modes, legacy WEP encryption, and upper layer security protocols such as TLS/SSL and HTTPS. Alternatively, it can be run self-contained without a host.

For ease of provisioning, the module can be set up simply and easily from a smartphone or laptop through the innovative Limited AP mode or with Wi-Fi Protected Setup (WPS).

The GS2011M is available with an u.FL connector to add an external antenna for max performance or a ceramic chip for convenience while saving space. US/Canada (FCC/IC), Europe (CE/ETSI), Japan (TELEC), and Wi-Fi certified.



GS2011M System Block Diagram

SKU	Antenna Option
GS2011MIE	External (u.FL)
GS2011MIZ	Ceramic Chip

### BENEFITS:

- Adds low power, high speed Wi-Fi and Internet connectivity to any device with a microcontroller and serial host interface
- Certified module reduces development time, testing, and certification, accelerating time to market
- Easy upgrade path: footprint and pin compatible with GS1011M and GS1500M modules
- Full offload solution minimizes load on host processor
- Easy smartphone provisioning with Limited AP or Wi-Fi Protected Setup (WPS)
- Ultra low power consumption through dynamic power management modes and on module DC to DC regulator
- Extended range

### FEATURES:

- IEEE 802.11 b/g/n connectivity with PHY rates up to 72 Mbps
- Limited AP, Wi-Fi Direct with concurrent mode, WPS 2.0
- UART, SPI, SDIO interface to microcontroller
- 27 configurable I/O
- Interface clock rate: 40MHz on SDIO, 30MHz on SPI (master), 10MHz on SPI (slave), and 921k baud on UART
- Extensive networking stack and services
- Security: 802.11i, WPA2–Personal and Enterprise, legacy WEP, TLS

### MODULE HIGHLIGHTS:

- Power source:
  - 3.3V main supply
  - 3.3V I/O
  - 1.6V to 3.6V Battery
- Certification: FCC, IC, CE/ETSI, TELEC, Wi-Fi
- I/O interfaces : SPI, UART, SDIO, I<sup>2</sup>C, I<sup>2</sup>S, GPIO, ADC, JTAG, PWM
- Industrial Grade

**GS2011M MODULE SPECIFICATIONS**

<b>Backwards compatibility</b>	Pin compatible to GS1011MIE, GS1011MIP, GS1011MEE, GS1011MEP and GS1500M. Same size and footprint as GS1011MIE and GS1011MIP
<b>Radio Protocol</b>	IEEE 802.11b/g/n
<b>Pin Count</b>	49 pins
<b>RF Output Power (Typical)</b>	+17 dBm (802.11b 1Mbps), +15dBm (802.11g 6Mbps), +14dBm (802.11n MCS0)
<b>Rx Sensitivity</b>	-91 dBm (802.11b 1Mbps), -88 dBm (802.11g 6Mbps), -88 dBm (802.11n MCS0)
<b>Wake From Standby Time</b>	1.25 millisecond
<b>RF Operating Frequency</b>	2.4 - 2.495 GHz
<b>Supported Data Rates</b>	72, 65, 58, 43, 29, 22, 14, 7 Mbps (802.11n), 54, 48, 36, 24, 18, 12, 9, 6 Mbps (802.11g) 11, 5.5, 2, 1 Mbps (802.11b)
<b>Antenna</b>	External Antenna (u.FL connector) or Ceramic Chip
<b>Operating Temperature</b>	-40° to +85°C
<b>Security Protocols</b>	WPA/WPA2 - Personal, WPA/WPA2 - Enterprise (PEAP, EAP-FAST, EAP-TLS, EAP-TTLS), WEP, TLS/SSL Client and Server, HTTPs
<b>Networking Protocols</b>	TCP, UDP, IPv4, IPv6, TLS Client and Server, SNTP client, DHCP Client and Server v4, DHCP Client and Server v6, DNS Client and Server, HTTP Client and Server, XML Parser
<b>Certifications and Compliance</b>	FCC, IC, TELEC, CE/ETSI, RoHS, Wi-Fi CERTIFIED
<b>I/O Interfaces</b>	SPI, UART, SDIO, I <sup>2</sup> C, I <sup>2</sup> S, GPIO (27), ADC (2), JTAG, PWM (3), RTC (3)
<b>Host Connections</b>	SPI, UART, SDIO
<b>Internal Flash</b>	4 MB
<b>Outline Dimensions</b>	22.8 mm x 32.5 mm x 3.63 mm (shield)
<b>I/O Voltage</b>	3.3V
<b>Operating Voltage</b>	2.7-3.6V
<b>V<sub>BAT</sub></b>	1.6-3.6V

**TARGET APPLICATIONS**

The GainSpan GS2011M module is easily designed into embedded systems, allowing customers to develop a broad array of devices and appliances that connect to other local devices or the Internet over Wi-Fi. Applications include healthcare and fitness, smart energy, industrial controls, commercial building automation, and consumer electronics.

**GS2011M Block Diagram**

