



Software Development Kit 2.2

PRODUCT OVERVIEW

The GainSpan Software Development Kit (SDK) enables firmware engineers to extend middleware software provided by GainSpan or develop embedded applications for the GS1011. Whether the design integrates the GS1011 module with a host microcontroller (MCU) or uses the GS1011 SoC, developers have control and scalability of firmware running on the GS1011.

This SDK contains a development board with the GS1011MEE module, embedded software (source/binary code), configuration management system, firmware update system, networking middleware, RTOS, device drivers, an integrated development environment (IDE) and JTAG hardware. Two SDK options are available: basic and professional SDKs.

With the professional SDK, software development teams have access to source code for the GainSpan embedded software and can design & run highly custom applications for the GS1011 SoC and GS1011 modules. Software engineers can use and modify sample applications as a baseline for new ones. With most of the GEPS software available in source, software engineers can scale-down the binary size as necessary.

With the basic SDK, software development teams can expand embedded web pages for device specific configuration (GainSpan provides Wi-Fi and IP network configuration pages) and expand the Serial to Wi-Fi interface software for custom APIs. Software engineers can extend basic capabilities of the firmware on the GS1011 Modules.

DEVELOPMENT BOARD

GainSpan development board contains the GS1011MEE, Wi-Fi subsystem and connectors to integrate with a host MCU board or with board-level components like sensors. It enables engineering teams to start software development against functional HW prior to the availability of custom boards.

Connection:

- Serial DB9 (2) for terminal program, MCU connection (via UART) with AT command set and/or debug output
- JTAG connector for single-step debugging of embedded firmware and custom device drivers
- Headers for UART and SPI interfaces
- Headers for access to GS1011MEE modules pins

Buttons:

- External reset button to simulate external reset signal
- Alarm 1 & Alarm 2 buttons to simulate external wake-up signals

Switches:

- Flash programming
- SPI/UART select
- JTAG enable/disable

LEDs:

- 3 user-defined
- Dedicated power indicator

Sensors:

- Temperature and light sensors



BENEFITS:

- Reduces development, testing and certification times, accelerating time to market for embedded application for the GS1011 modules and GS1011 SoC
- Reduces time to production with production board options:
 - GS1011 Modules
 - Reference designs for custom boards with GS1011 SoC
- Ubiquitous LAN and internet connectivity
- Scalable code-size of embedded software
- Rapid device deployment with provisioning options: WPS and embedded web pages for configuration
- Firmware update mechanism
- Ultra low power consumption through dynamic power management

FEATURES:

- Source code and binary
 - Serial to Wi-Fi interface, TLS and Scan applications
 - Configuration web pages
- Source and binary to GEPS, HTTP server/client, networking middleware and RTOS (Professional SDK only)
- Complete Wi-Fi & networking services software
- Wi-Fi Security
 - WPA/2- Enterprise
 - WPA/2-PSK, WPA, WEP
- IDE and JTAG debugging

GAINSPAN EMBEDDED SOFTWARE 2.2



GainSpan Embedded Platform Software (GEPS) 2.2 is middleware software that abstracts the HW and provides network services for customer's embedded application. With GEPS, manufacturers can focus development on their value-add application by using comprehensive APIs provided by GEPS. GEPS runs on the RTOS on ARM7 networking services core on the GS1011.

Wi-Fi Firmware executes on the ARM7 Wi-Fi core as a Wi-Fi off-load engine that includes Wi-Fi security protocols, Wi-Fi Protected Setup and the 802.11 MAC.

SAMPLE EMBEDDED APPLICATIONS

The SDK includes source code and binaries of sample embedded applications.

- Serial to Wi-Fi interface software
- Temperature-Light Sensor (TLS) application
- Wi-Fi scan application

CONFIGURATION MANAGEMENT

The SDK contains a reference PC application and embedded software that enable OEMs to have a baseline configuration management system. The system is based on SNMP which enables end-users to view and configure:

- IP and Mac addresses
- Wi-Fi device client configuration: Security (WEP, WPA, WPA2); Scan list of access points
- Power management
 - o Mode selection
 - o Battery warning level
 - o Battery standby
 - o Battery checkpoint
- SNMP IP address of management application
- Error logging (read only)

FIRMWARE PROVISIONING

The SDK contains a reference PC application and embedded software that enable OEMs to have a baseline firmware provisioning system. End-users can update (wirelessly or wired) the following:

- Application firmware, middleware and RTOS
- Wi-Fi Firmware

GREEN HILLS IDE AND RTOS



Green Hills Software's MULTI Integrated Development Environment (IDE) includes the industry's most powerful and proven tools for developing embedded software with maximum reliability, maximum performance, and minimum code size. With the MULTI's sophisticated capabilities, you can develop, debug, and optimize code more quickly, significantly reducing both development cost and time.

The μ -velocity real-time microkernel is the smallest of Green Hills Software's family of royalty-free operating systems. It is implemented as a C library so it can be easily ported to a number of target architectures. Its simple design as well as integration with the best-in-class MULTI tools make μ -velocity both easy to learn and simple to use. Both MULTI and μ -velocity are tightly integrated with GainSpan products.



SDK OPTIONS

SDK Components	Basic	Professional
Software Development Tools		
Green Hills MULTI IDE	5.0.6	5.0.6
JTAG Debugging	Macraigor	Macraigor
Green Hills Compiler	✓	✓
WireShark Protocol Analyzer	✓	✓
WILD Configurator	✓	✓
GSDemo	✓	✓
Development board with GS1011MEE	✓	✓
Wi-Fi Access Point	✓	✓
Source code for drivers for host MCU	✓	✓
Wireless Firmware	Binary only	Binary only
Serial to Wi-Fi application	Source & Binary	Source & Binary
GEPS 2.2	Binary only	Source & Binary
Green Hills uVelocity RTOS	Binary only	Source & Binary
Green Hills Networking Stack	Binary only	Source & Binary
Scan App and TLS applications	NA	Source & Binary