

GS2000 Based Module Evaluation Board Hardware

User Guide

GS2K-EVB-HW-UG-001210

Modules

GS2011M and GS2100M

Board Revisions

EVB 2.0 and EVB 3.0

GainSpan® 802.11b/g/n Ultra-Low Power WiFi® Series Modules

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About This Manual

This manual provides guidelines for setting up and using the GainSpan® GS2000 based module evaluation board that supports the GS2011M and GS2100M modules.

Refer to the following sections:

- [Revision History, page 6](#)
- [Audience, page 6](#)
- [Standards, page 6](#)
- [Documentation Conventions, page 7](#)
- [Documentation, page 10](#)
- [References, page 12](#)
- [Contacting GainSpan Technical Support, page 13](#)
- [Returning Products to GainSpan, page 14](#)
- [Accessing the GainSpan Portal, page 15](#)

Revision History

This version of the *GainSpan GS2000 Based Module Evaluation Board Hardware User Guide* contains the following new information listed in [Table 1, page 6](#).

Table 1 Revision History

Version	Date	Remarks
1.0	November 2013	Initial Release
1.1	February 2014	Updated GS2011M and GS2100M specifications. See A.1 GS2011M Evaluation Board Specifications, page 45 and A.6 GS2100M Evaluation Board Specifications, page 50 . Added supported information for GS2011M and GS2100M evaluation board Revision 3.0. GS2011M Evaluation Board Components. See Table 8, page 21 . GS2100M Evaluation Board Components. See Table 10, page 27 .
1.2	November 2014	Added GS2011M and GS2100M Evaluation Board Specifications for EVB revision 3.0. See Appendix A GS2000 Evaluation Board Specifications, page 45 . Added GS2011M and GS2100M Evaluation Board Connector Pinouts for EVB revision 3.0. See Appendix B Connector Pinouts, page 55 .

Audience

This manual provides instructions on how to setup and use the GS2000 based module evaluation board along with component description, jumper settings, board specifications, and pinouts.

Standards

The standards that are supported by the GainSpan GS module supports IEEE 802.11b/g/n.

Documentation Conventions

This manual uses the following text and syntax conventions:

- Special text fonts represent particular commands, keywords, variables, or window sessions
- Color text indicates cross-reference hyper links to supplemental information
- Command notation indicates commands, subcommands, or command elements

[Table 2, page 7](#), describes the text conventions used in this manual for software procedures that are explained using the AT command line interface.

Table 2 Document Text Conventions






Convention Type	Description
command syntax monospaced font	This monospaced font represents command strings entered on a command line and sample source code. AT XXXX
Proportional font description	Gives specific details about a parameter. <Data> DATA
UPPERCASE Variable parameter	Indicates user input. Enter a value according to the descriptions that follow. Each uppercased token expands into one or more other token.
lowercase Keyword parameter	Indicates keywords. Enter values exactly as shown in the command description.
[] Square brackets	Enclose optional parameters. Choose none; or select one or more an unlimited number of times each. Do not enter brackets as part of any command. [parm1 parm2 parm3]
? Question mark	Used with the square brackets to limit the immediately following token to one occurrence.
<ESC> Escape sequence	Each escape sequence <ESC> starts with the ASCII character 27 (0x1B). This is equivalent to the Escape key. <ESC>C
<CR> Carriage return	Each command is terminated by a carriage return.
<LF> Line feed	Each command is terminated by a line feed.

Table 2 Document Text Conventions (Continued)

Convention Type	Description
<CR> <LF> Carriage return Line feed	Each response is started with a carriage return and line feed with some exceptions.
< > Angle brackets	Enclose a numeric range, endpoints inclusive. Do not enter angle brackets as part of any command.
<SSID>	
= Equal sign	Separates the variable from explanatory text. Is entered as part of the command.
	PROCESSID = <CID>
. dot (period)	Allows the repetition of the element that immediately follows it multiple times. Do not enter as part of the command.
	.AA:NN can be expanded to 1:01 1:02 1:03.
A.B.C.D IP address	IPv4-style address. 10.0.11.123 IPv6-style address.
X:X::X:X IPv6 IP address	3ffe:506::1 Where the :: represents all 0x for those address components not explicitly given.
LINE End-to-line input token	Indicates user input of any string, including spaces. No other parameters may be entered after input for this token. string of words
WORD Single token	Indicates user input of any contiguous string (excluding spaces). singlewordnospaces

Table 3, page 9, describes the symbol conventions used in this manual for notification and important instructions.

Table 3 Symbol Conventions

Icon	Type	Description
	Note	Provides helpful suggestions needed in understanding a feature or references to material not available in the manual.
	Alert	Alerts you of potential damage to a program, device, or system or the loss of data or service.
	Caution	Cautions you about a situation that could result in minor or moderate bodily injury if not avoided.
	Warning	Warns you of a potential situation that could result in death or serious bodily injury if not avoided.
	Electro-Static Discharge (ESD)	Notifies you to take proper grounding precautions before handling a product.

Documentation

The GainSpan documentation suite listed in [Table 4, page 10](#) includes the part number, documentation name, and a description of the document. The documents are available on the GainSpan Portal. Refer to [Accessing the GainSpan Portal, page 15](#) for details.

Table 4 Documentation List

Part Number	Document Title	Description
GS2K-QS-001205	GainSpan GS2000 Based Module Kit Quick Start Guide	Provides an easy to follow guide on how to unpack and setup GainSpan GS2000 based module kit for the GS2011M and GS2100M modules.
GS2K-EVB-FP-UG-001206	GainSpan GS2000 Based Module Programming User Guide	Provides users steps to program the on-board Flash on the GainSpan GS2000 based modules using DOS or Graphical User Interface utility provided by GainSpan. The user guide uses the evaluation boards as a reference example board.
GS2K-SMP-EXP-UG-001207	GainSpan GS2000 Based Module Sample Examples for using Serial-to-WiFi AT Commands to Create TCP or UDP Connection User Guide	Provides an easy to follow instructions on how to setup, create, and run connection examples for UDP client/server and TCP client/server. This manual also provides instructions for provisioning the board, setting up Limited AP mode, and WiFi Protected Setup (WPS), and Web provisioning over Ad-hoc.
GS2011-S2W-APP-PRG-RG-001208	GainSpan Serial-to-WiFi Adapter Application Programmer Reference Guide	Provides a complete listing of AT serial commands, including configuration examples for initiating, maintaining, and evaluating GainSpan WiFi GS2011M series modules.
GS2100-S2W-APP-PRG-RG-001208	GainSpan Serial-to-WiFi Adapter Application Programmer Reference Guide	Provides a complete listing of AT serial commands, including configuration examples for initiating, maintaining, and evaluating GainSpan WiFi GS2100M series modules.
GS2K-SDK-DB-UG-001209	GS2000 Based Module Software Development Kit and Debugging User Guide	This manual provides SDK user installation instructions, IAR IDE workbench application, and I-Jet hardware used for JTAG Serial-to-WiFi (S2W) and TLS application development and debugging.

Table 4 Documentation List (Continued)

Part Number	Document Title	Description
GS2K-EVB-HW-UG-001210	GainSpan GS2000 Based Module Evaluation Board Hardware User Guide.	Provides instructions on how to setup and use the GS2000 based module evaluation board along with component description, jumper settings, board specifications, and pinouts.
GS2011M-DS-001211	GainSpan GS2011M Low Power WiFi Module Data Sheet	Provides information to help WiFi system designers to build systems using GainSpan GS2011M module and develop wireless applications.
GS2100M-DS-001212	GainSpan GS2100M Low Power WiFi Module Data Sheet	Provides information to help WiFi system designers to build systems using GainSpan GS2100M module and develop wireless applications.
GS2K-HTTP-EAP-UG-001213	GainSpan GS2000 Based Module Configuration Examples for using Serial-to-WiFi AT Commands to Create HTTP, HTTPS, and EAP Connection User Guide	Provides an easy to follow instructions on how to setup, create, and run connection examples for HTTP, HTTPS, and EAP.
GS2011MxxS-DS-001214	GainSpan GS2011MxxS Low Power WiFi Module Data Sheet	Provides information to help WiFi system designers to build systems using GainSpan GS2011MxxS module and develop wireless applications.
GS2K-IP2WIFI-APP-PRG-RG-001247	GainSpan GS2000 Based Module IP-to-WiFi Adapter Application Programmer Reference Guide	Provides a complete listing of AT serial commands, including configuration examples for initiating, maintaining, and evaluation GainSpan IP-to-WiFi GS2000 based modules.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments by logging into [GainSpan Support Portal](#). If you are using e-mail, be sure to include the following information with your comments:

- Document name
- URL or page number
- Hardware release version (if applicable)
- Software release version (if applicable)

References

The GainSpan references listed in [Table 5, page 12](#) are available on the GainSpan Portal. Refer to [Accessing the GainSpan Portal, page 15](#) for details.

Table 5 Other Documents and References

Title	Description
Schematics	GS2000 Based Module Evaluation Board schematics supporting: <ul style="list-style-type: none">• GS2011M Revision 2.0 and Revision 3.0• GS2100M Revision 2.0 and Revision 3.0
Module Firmware and Programming Utilities	<ul style="list-style-type: none">• Serial-to-WiFi (S2W) based firmware• Temperature and Light Sensor (TLS) based firmware<ul style="list-style-type: none">– For use with GS2011M EVK only• Firmware Release Notes• GSFlashprogram utility for programming the modules
Smart Phone Applications	<ul style="list-style-type: none">• Smart Phone applications for iOS and Android to evaluate and demonstrate the Temperature and Light Sensor (TLS) firmware.<ul style="list-style-type: none">– For use with GS2011M EVK only
Software Utilities	Serial terminal program to evaluate and demonstrate Serial-to-WiFi (S2W) applications

Contacting GainSpan Technical Support

Use the information listed in [Table 6, page 13](#), to contact the GainSpan Technical Support.

Table 6 GainSpan Technical Support Contact Information

North America	1 (408) 627-6500 - techsupport@gainspan.com
Outside North America	Europe: EUsupport@gainspan.com China: Chinasupport@gainspan.com Asia: Asiasupport@gainspan.com
Postal Address	GainSpan Corporation 3590 North First Street Suite 300 San Jose, CA 95134 U.S.A.

For more Technical Support information or assistance, perform the following steps:

1. Point your browser to <http://www.gainspan.com>.
2. Click **Contact**, and click **Request Support**.
3. Log in using your customer **Email** and **Password**.
4. Select the **Location**.
5. Select **Support Question** tab.
6. Select **Add New Question**.
7. Enter your technical support question, product information, and a brief description.

The following information is displayed:

- Telephone number contact information by region
- Links to customer profile, dashboard, and account information
- Links to product technical documentation
- Links to PDFs of support policies

Returning Products to GainSpan

If a problem cannot be resolved by GainSpan technical support, a Return Material Authorization (RMA) is issued. This number is used to track the returned material at the factory and to return repaired or new components to the customer as needed.



NOTE: Do not return any components to GainSpan Corporation unless you have first obtained an RMA number. GainSpan reserves the right to refuse shipments that do not have an RMA. Refused shipments will be returned to the customer by collect freight.

For more information about return and repair policies, see the customer support web page at: <https://www.gainspan.com/secure/login>.

To return a hardware component:

1. Determine the part number and serial number of the component.
2. Obtain an RMA number from Sales/Distributor Representative.
3. Provide the following information in an e-mail or during the telephone call:
 - Part number and serial number of component
 - Your name, organization name, telephone number, and fax number
 - Description of the failure
4. The support representative validates your request and issues an RMA number for return of the components.
5. Pack the component for shipment.

Guidelines for Packing Components for Shipment

To pack and ship individual components:

- When you return components, make sure they are adequately protected with packing materials and packed so that the pieces are prevented from moving around inside the carton.
- Use the original shipping materials if they are available.
- Place individual components in electrostatic bags.
- Write the RMA number on the exterior of the box to ensure proper tracking.



CAUTION! Do not stack any of the components.

Accessing the GainSpan Portal

To find the latest version of GainSpan documentation supporting the GainSpan product release you are interested in, you can search the GainSpan Portal website by performing the following steps:



NOTE: *You must first contact GainSpan to set up an account, and obtain a customer user name and password before you can access the GainSpan Portal.*

1. Go to the [GainSpan Support Portal](#) website.
2. Log in using your customer **Email** and **Password**.
3. Click the **Getting Started** tab to view a Quick Start tutorial on how to use various features within the GainSpan Portal.
4. Click the **Actions** tab to buy, evaluate, or download GainSpan products.
5. Click on the **Documents** tab to search, download, and print GainSpan product documentation.
6. Click the **Software** tab to search and download the latest software versions.
7. Click the **Account History** tab to view customer account history.
8. Click the **Legal Documents** tab to view GainSpan Non-Disclosure Agreement (NDA).

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Chapter 1 Hardware Overview

This chapter provides an overview of the GainSpan® GS2000 based module evaluation board features for the GS2011M and GS2100M modules.

- [GainSpan GS2011M Ultra-Low Power 802.11b/g/n Module, page 17](#)
- [GainSpan GS2100M Low Power 802.11b/g/n Module, page 23](#)
- [Evaluation Board Software, page 29](#)

1.1 GainSpan GS2011M Ultra-Low Power 802.11b/g/n Module

The GS2011M module provides a quick, easy, and cost effective way for device and appliance manufacturers to add WiFi connectivity to their products. The module provides UART/SPI/SDIO interface connection for an embedded design using a 8/16/32-bit micro controller. The GS2011M module supports ultra-low power mode enabling designs for both battery powered or line powered applications. Alternatively, it can be run self-contained without a host (to develop a hostless application an SDK is required).

The GS2011M is an ideal solution for organizations with limited WiFi 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 runs the full WiFi and TCP/IP networking stacks on module, completely offloading the host micro controller. The module supports a complete suite of security protocols, also without tasking the host micro controller, including WPA/WPA2-Enterprise and Personal security modes, legacy WEP encryption, and upper layer security protocols such as TLS/SSL and HTTPS. For ease of provisioning, the module can be set up simply and easily from a smart phone or laptop through the innovative Limited AP mode or with WiFi Protected Setup (WPS 2.0). In addition, the module includes two analog to digital converter (ADC) pins for connecting sensors.

The GainSpan GS2011M module is designed to support the following features:

- An on-board antenna or u.FL connector to add an external antenna for extended range
- Full Wireless LAN and Network services offload solution minimizes load on host processor
- Ultra low power consumption through dynamic management modes: Standby, Sleep, Deep Sleep
- Easy provisioning with Limited AP or WiFi protected set up (WPS 2.0)
- IEEE 802.11 b/g/n connectivity
- UART, SPI, SDIO interface to micro controller
- Security: 802.11i, WPA/2-Personal and Enterprise, legacy WEP, TLS

1.1.1 GS2011M Module Evaluation Board

Figure 1, page 18 illustrates key components included on the GS2011M evaluation board. The evaluation board supports GS2011M module and provides access to SDIO, SPI, UART, and GPIO interfaces. The evaluation board includes temperature and light sensors, USB interfaces, power jumpers for power measurement, a daughter board header, and buttons for various features. Table 7, page 19 lists the evaluation board components on the GS2011M EVB 2.0. Table 8, page 21 lists the evaluation board components on the GS2011M EVB 3.0.

Figure 1 GS2011M Evaluation Board Components

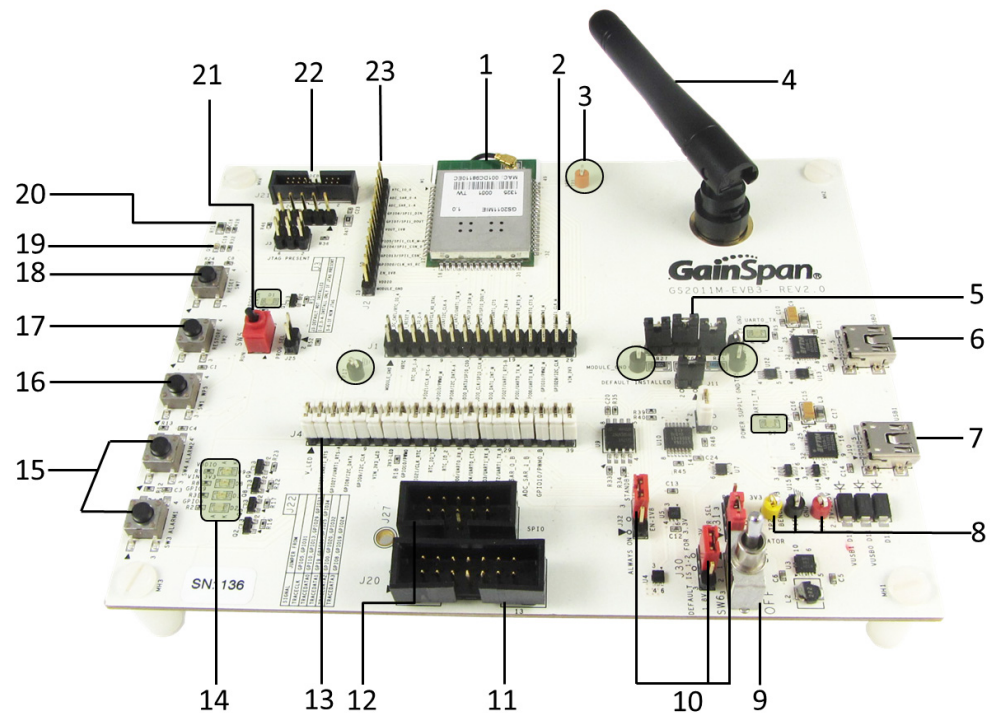


Table 7 GS2011M Module Evaluation Board Components - EVB 2.0

No.	Feature	Description
1	RF Module	GS2011M
2	Daughter Board Header (J1)	Header to facilitate connection to a daughter board
3	Test Points (TP1, TP5, TP6, TP7, and TP17)	Test points for connecting VPP, Active, Deep Sleep, Standby, and Ground (see Appendix B Connector Pinouts, page 55 for more information on test point and description)
4	ANT2	Antenna used to communicate
5	Power Measurement Jumpers (J11, J14, J15, and J16)	Jumpers to facilitate measurement of current consumption of module, (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
6	I/O Port (J6)	Mini USB Connector (USB0)
7	I/O Port (J10)	Mini USB Connector (USB1)
8	Test Points (TP2, TP3, and TP16)	Test points for connecting external power supply (see Appendix B Connector Pinouts, page 55 for more information on test point and description)
9	On/Off Switch (SW6)	Power ON/OFF switch
10	Power Jumpers (J30, J31, J32)	See Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description
11	SDIO Connector (J20)	Secure Digital Input/Output connector
12	SPI Connector (J19)	Serial connector
13	LED Select Jumper (J4)	If installed (default), these jumpers enable LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
14	LEDs	Status LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
15	Alarm Switch (SW3, SW4)	Push button switch for Alarm 1 and Alarm 2
16	WPS Switch (SW1)	Push button switch to enter WPS mode (<i>not used</i>)
17	Restore Switch (SW2)	Push button switch to restore the board to factory default settings (<i>not used</i>)
18	Reset Switch (SW7)	Push button switch to reset the GS2011M
19	Light Sensor (Q10)	Used to detect and read light sensor data when using the TLS mobile application
20	Temperature Sensor (RT1)	Used to detect and read temperature sensor data when using the TLS mobile application

Table 7 GS2011M Module Evaluation Board Components - EVB 2.0 (Continued)

No.	Feature	Description
21	Program Switch (SW5)	RUN: Normal Operation (<i>default</i>) PROGRAM: For programming the module
22	JTAG Connector (J21)	Used for testing and debugging the GS2011M evaluation board
23	Test Point Header (J2)	Additional module pins that don't go to daughter board header



NOTE: For GS2011M hardware specifications, refer to the GainSpan GS2011M WiFi Module Data Sheet.

Table 8 GS2011M Module Evaluation Board Components - EVB 3.0

No.	Feature	Description
1	RF Module	GS2011M
2	Daughter Board Header (J1)	Header to facilitate connection to a daughter board
3	Test Points (TP1, TP5, TP6, TP7, and TP17)	Test points for connecting VPP, Active, Deep Sleep, Standby, and Ground (see Appendix B Connector Pinouts, page 55 for more information on test point and description)
4	ANT2	Antenna used to communicate
5	Power Measurement Jumpers (J14 and J15)	Jumpers to facilitate measurement of current consumption of module, (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
6	I/O Port (J6)	Mini USB Connector (USB0)
7	I/O Port (J10)	Mini USB Connector (USB1)
8	Test Points (TP3 and TP16)	Test points for connecting external power supply (see Appendix B Connector Pinouts, page 55 for more information on test point and description)
9	On/Off Switch (SW6)	Power ON/OFF switch
10	Power Jumpers (J31, J32)	See Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description
11	SDIO Connector (J20)	Secure Digital Input/Output connector
12	SPI Connector (J19)	Serial connector
13	LED Select Jumper (J4)	If installed (default), these jumpers enable LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
14	LEDs	Status LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
15	Alarm Switch (SW3, SW4)	Push button switch for Alarm 1 and Alarm 2
16	WPS Switch (SW1)	Push button switch to enter WPS mode (<i>not used</i>)
17	Restore Switch (SW2)	Push button switch to restore the board to factory default settings (<i>not used</i>)
18	Reset Switch (SW7)	Push button switch to reset the GS2011M
19	Light Sensor (Q10)	Used to detect and read light sensor data when using the TLS mobile application

Table 8 GS2011M Module Evaluation Board Components - EVB 3.0 (Continued)

No.	Feature	Description
20	Temperature Sensor (RT1)	Used to detect and read temperature sensor data when using the TLS mobile application
21	Program Switch (SW8)	RUN: Normal Operation (<i>default</i>) PROGRAM: For programming the module
22	JTAG Connector (J21)	Used for testing and debugging the GS2011M evaluation board
23	Test Point Header (J2)	Additional module pins that don't go to daughter board header

1.2 GainSpan GS2100M Low Power 802.11b/g/n Module

The GS2100M module provides a quick, easy, and cost effective way for device and appliance manufacturers to add WiFi connectivity to their products. Intended for smart energy and sensor applications, the module runs the SEP 2.0 Smart Energy Profile stack and has 3 high bit-rate sigma-delta ADCs for high resolution sensor and measurement devices.

This module provides a UART/SPI/SDIO serial interface or WiFi connectivity to embedded design with an 8/16/32-bit micro controller. Alternatively, it can be run self-contained without a host.

The GS2100M is an ideal solution for organizations with limited WiFi 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 runs the full WiFi and TCP/IP networking stacks, completely offloading the host micro controller. It supports a complete suite of security protocols, also without tasking the host micro controller, including WPA/WPA2-Enterprise and Personal security modes, legacy WEP encryption, and upper layer security protocols such as TLS/SSL and HTTPS. For ease of provisioning, the module can be set up simply and easily from a smart phone or laptop through the innovative Limited AP mode or with WiFi Protected Setup (WPS 2.0).

The GainSpan GS2100M module is designed to support the following features:

- An on-board antenna or u.FL connector to add an external antenna for extended range
- Full Wireless LAN and Network services offload solution minimizes load on host processor
- Enables Smart Energy Profiles; Smart Thermostat and Load Control
- High resolution sensing and energy measurements
- Easy provisioning with Limited AP or WiFi protected set up (WPS 2.0)
- Low power consumption through dynamic management modes: Standby, Sleep, Deep Sleep
- IEEE 802.11 b/g/n connectivity
- UART, SPI, SDIO interface to micro controller
- Security: 802.11i, WPA/2-Personal and Enterprise, legacy WEP

The GainSpan 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 WiFi. Applications include smart energy, healthcare and fitness, industrial controls, commercial building automation, and consumer electronics.

1.2.1 GS2100M Module Evaluation Board

Figure 2, page 24 illustrates key components included on the GS2100M evaluation board. The evaluation board supports GS2100M module and provides access to SDIO, SPI, UART, and GPIO interfaces. The evaluation board includes USB interfaces, power jumpers for power measurement, a daughter board header, and buttons for various features. Table 9, page 25 lists the evaluation board components on the GS2100M EVB 2.0. Table 10, page 27 lists the evaluation board components on the GS2100M EVB 3.0.

Figure 2 GS2100M Evaluation Board Components

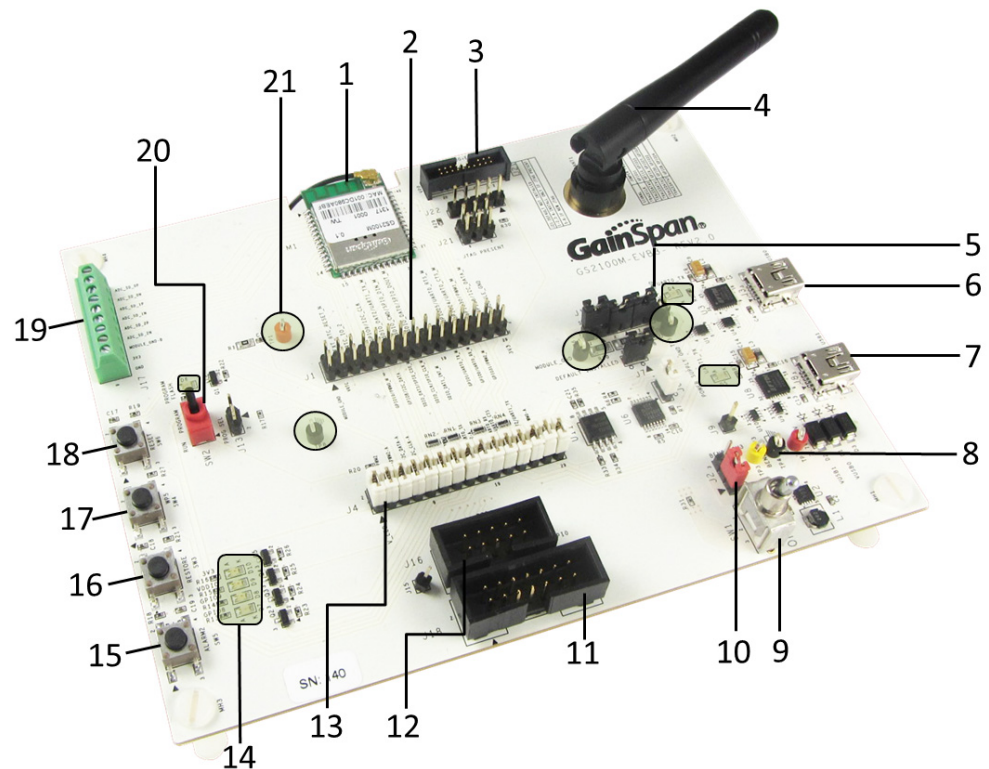


Table 9 GS2100M Module Evaluation Board Components - EVB 2.0

No.	Feature	Description
1	RF Module	GS2100M
2	Daughter Board Header (J1)	Header to facilitate connection to a daughter board
3	JTAG Connector (J19)	Used for testing and debugging the GS2100M evaluation board
4	ANT1	Antenna used to communicate
5	Power Measurement Jumpers (J7, J10, J11, and J12)	Jumpers to facilitate measurement of current consumption of module, (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
6	I/O Port (J6)	Mini USB Connector (USB0)
7	I/O Port (J10)	Mini USB Connector (USB1)
8	Test Points (TP2, TP3, and TP4)	Test points for connecting external power supply (see Appendix B Connector Pinouts, page 55 for more information on test point and description)
9	On/Off Switch (SW1)	Power ON/OFF switch
10	Power Jumper (J2)	See Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description
11	SDIO Connector (J18)	Secure Digital Input/Output connector
12	SPI Connector (J16)	Serial Peripheral Interface connector
13	LED Select Jumper (J4)	If installed (default), these jumpers enable LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
14	LEDs	Status LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
15	Alarm Switch (SW5)	Push button switch for Alarm 2
16	Restore Switch (SW4)	Push button switch to restore the board to factory default settings (<i>not used</i>)
17	WPS Switch (SW3)	Push button switch to enter WPS mode (<i>not used</i>)
18	Reset Switch (SW6)	Push button switch to reset the GS2100M

Table 9 GS2100M Module Evaluation Board Components - EVB 2.0 (Continued)

No.	Feature	Description
19	Analog to Digital Converter (ADC) Connector (J17)	A 3 high bit-rate Sigma Delta ADC connector for high resolution sensor and measurement devices
20	Program Switch (SW2)	RUN: Normal Operation (<i>default</i>) PROGRAM: For programming the module
21	Test Points (TP1, TP5, TP6, TP7, and TP8)	Test points for connecting VPP, Active, Deep Sleep, Standby, and Ground (see Appendix B Connector Pinouts, page 55 for more information on test point and description)



NOTE: For GS2100M hardware specifications, refer to the GainSpan GS2100M WiFi Module Data Sheet.

Table 10 GS2100M Module Evaluation Board Components - EVB 3.0

No.	Feature	Description
1	RF Module	GS2100M
2	Daughter Board Header (J1)	Header to facilitate connection to a daughter board
3	JTAG Connector (J19)	Used for testing and debugging the GS2100M evaluation board
4	ANT1	Antenna used to communicate
5	Power Measurement Jumpers (J10, J11, and J12)	Jumpers to facilitate measurement of current consumption of module, (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
6	I/O Port (J3)	Mini USB Connector (USB0)
7	I/O Port (J8)	Mini USB Connector (USB1)
8	Test Points (TP3 and TP4)	Test points for connecting external power supply (see Appendix B Connector Pinouts, page 55 for more information on test point and description)
9	On/Off Switch (SW1)	Power ON/OFF switch
10	Power Jumper (J2)	See Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description
11	SDIO Connector (J18)	Secure Digital Input/Output connector
12	SPI Connector (J16)	Serial Peripheral Interface connector
13	LED Select Jumper (J4)	If installed (default), these jumpers enable LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
14	LEDs	Status LEDs (see Appendix A GS2000 Evaluation Board Specifications, page 45 for more information on jumper settings and description)
15	Alarm Switch (SW5)	Push button switch for Alarm 2
16	Restore Switch (SW4)	Push button switch to restore the board to factory default settings (<i>not used</i>)
17	WPS Switch (SW3)	Push button switch to enter WPS mode (<i>not used</i>)
18	Reset Switch (SW6)	Push button switch to reset the GS2100M

Table 10 GS2100M Module Evaluation Board Components - EVB 3.0 (Continued)

No.	Feature	Description
19	Analog to Digital Converter (ADC) Connector (J17) Analog to Digital Converter (ADC) Header (J26)	A 3 high bit-rate Sigma Delta ADC connector and header for high resolution sensor and measurement devices
20	Program Switch (SW7)	RUN: Normal Operation (<i>default</i>) PROGRAM: For programming the module
21	Test Points (TP1, TP5, TP6, TP7, and TP8)	Test points for connecting VPP, Active, Deep Sleep, Standby, and Ground (see Appendix B Connector Pinouts, page 55 for more information on test point and description)

1.3 Evaluation Board Software

The evaluation board ships with Serial-to-WiFi firmware, which uses the UART interface at 9600 Baud, 8-bit (8), No parity bit (N), one stop bit (1) that abstracts the hardware and provides Wireless LAN (WLAN) and Network Services for embedded applications.



NOTE: To use other I/O interfaces for Serial-to-WiFi, such as SPI, or to customize firmware features you can build the binaries using the SDK Builder and reprogram the module using the `gs2k_flashprogram` utility. If using Serial-to-WiFi with SPI, you will need to wire the host to the SPI0 connector or use the daughter board connector. Refer to the GS2011M or GS2100M evaluation board schematic for connections.

To evaluate a hostless application such as Temperature and Light Sensor (TLS), refer to the *GainSpan Temperature and Light Sensor (TLS) Demo Application Note*.



NOTE: Additional software/documentation are available on the GainSpan Support Portal website: www.gainspan.com/secure/login.



NOTE: For re-programming the module, use the `gs2k_flashprogram` GUI tool and follow the steps per the GainSpan GS2000 Based Module Programming User Guide.



NOTE: The Temperature and Light Sensor (TLS) application is supported on the GS2011M evaluation board only.

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Chapter 2 Setting Up the Evaluation Board

This chapter introduces the tasks that are typically required to setting up the GainSpan® GS2000 based module evaluation board for GS2011M and GS2100M. You can begin the setup process as soon as the site preparation is complete and the board is unpacked and inspected.

Refer to [Appendix A GS2000 Evaluation Board Specifications](#), page 45 in this manual regarding electrical and environmental requirements.

The following sections are covered in this chapter:

- [Preparing for Evaluation Board Setup](#), page 31
- [Setting Up the GS2000 Based Module Evaluation Board](#), page 34
- [Power Guidelines, Requirements, and Safety Specifications](#), page 35

2.1 Preparing for Evaluation Board Setup

This section describes how to prepare for setting up the GS2000 based module evaluation board. It discusses the following topics:

- [Site Preparation](#), page 32
- [Safety Guidelines and Standards](#), page 32
- [Environmental Requirements](#), page 32
- [Unpacking and Inspecting the GS2000 Based Module Evaluation Board](#), page 33
- [Placing the GS2000 Based Module Evaluation Board on a Tabletop](#), page 34
- [Electrical Guidelines](#), page 35
- [Connecting Power](#), page 35

2.1.1 Site Preparation

The following table ([Table 11, page 32](#)) summarizes the tasks you need to perform when preparing to setup your GS2000 based module evaluation board.

Table 11 Setup Checklist

Item and/or Task	Notes
Verify that the environmental factors such as temperature and humidity do not exceed required tolerances	
Plan evaluation board location	
Acquire cables	
Download product documentation	

2.1.2 Safety Guidelines and Standards

To ensure that you setup the evaluation board safely, observe the following guidelines:

- Review the information in [Appendix A GS2000 Evaluation Board Specifications, page 45](#) and observe all safety information and precautions and warnings provided throughout this manual.
- Comply with all applicable safety requirements, practices, and standards. Refer to [Appendix A GS2000 Evaluation Board Specifications, page 45](#).
- After setting up the evaluation board, protect your equipment by using an ESD approved grounding strap whenever handling board components.

2.1.3 Environmental Requirements

The following Environmental Requirements must be taken into consideration when setting up the evaluation board. Specific details and values for following key environmental requirements are listed in [Table 12, page 45](#) and [Table 17, page 50](#).

2.1.4 Unpacking and Inspecting the GS2000 Based Module Evaluation Board

This section describes how to remove the evaluation board from its shipping box, and determine that you received all of the required equipment.

The unpacking process is described in the following steps:

1. Remove the packing slip from the shipping box. Use this paper work to validate the contents.
2. Prepare to remove the evaluation board from the shipping box.
 - Remove cabling from the box and set it aside
 - Remove any documentation from the box and set it aside
3. Carefully lift the evaluation board from the shipping container.
4. Remove the protective ESD bag from the evaluation board.
5. Set all protective packaging aside for later use.
6. Inspect the contents for damage.

If damaged, contact your GainSpan distributor to file a RMA (see [Returning Products to GainSpan](#), page 14).

2.2 Setting Up the GS2000 Based Module Evaluation Board

This section describes how to perform the following installation tasks:

- Place the evaluation board on a secure flat surface
- Connect all cabling
- Apply and verify power to the evaluation board

2.2.1 Placing the GS2000 Based Module Evaluation Board on a Tabletop

The evaluation board must be set on a sturdy tabletop or workbench environment. Use safe practices when placing evaluation boards next to each other.

2.3 Power Guidelines, Requirements, and Safety Specifications

The following sections contain important safety, planning, and power requirements information.

2.3.1 Electrical Guidelines

When connecting power to the evaluation board, observe all caution and warning statements. The following guidelines will help ensure your safety and protect the equipment. However, these guidelines may not cover all potentially hazardous situations you may encounter during board installation.

- Always disconnect all cables before installing
- Keep the evaluation board area clear and free of dust during and after installation
- The evaluation board operates safely when it is used in accordance with its marked electrical ratings and product usage instructions.



WARNING! Before connecting or re-connecting header and test point cabling, turn the power switch off and disconnect the mini-USB cable from the board.

2.3.2 Connecting Power

The evaluation board gets power from a computer USB port via the mini-USB cable.

The board is designed to operate on only one USB connection. Power can also be supplied from the USB1 port or a 3.3V Bench Supply to TP2 (Yellow).



ESD ALERT! Charged devices and circuit boards can discharge without detection. Although this product features patented or protection circuitry, damage may occur on devices subjected to high energy. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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Chapter 3 Initial Board Connections and Configuration

This chapter describes how to quickly administer initial settings and start a Serial-to-WiFi application on a GainSpan® GS2000 based module evaluation board.

The following sections are covered in this chapter:

- Connecting the Board to a Communication Port, page 37
- Providing Power to the Evaluation Board, page 40
- Configuring the Board for Wireless Network, page 42

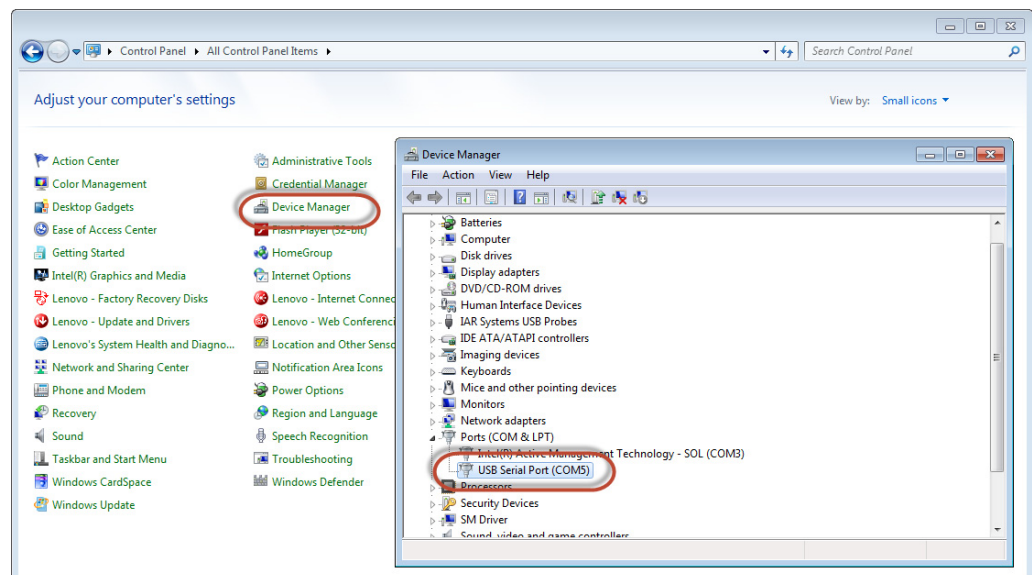
3.1 Connecting the Board to a Communication Port

There are a few basic connections that must be addressed in order to communicate with the GS2000 based module evaluation board.

Perform the following:

1. Plug the **mini-USB** cable into the **USB0** port on the evaluation board, and plug the other end of the **mini-USB** cable into the **USB** port on a computer.
2. From the Windows desktop, open the Device Manager as shown in [Figure 3, page 37](#). The USB Serial port is listed under Ports (COM & LPT).

Figure 3 Windows Device Manager Properties





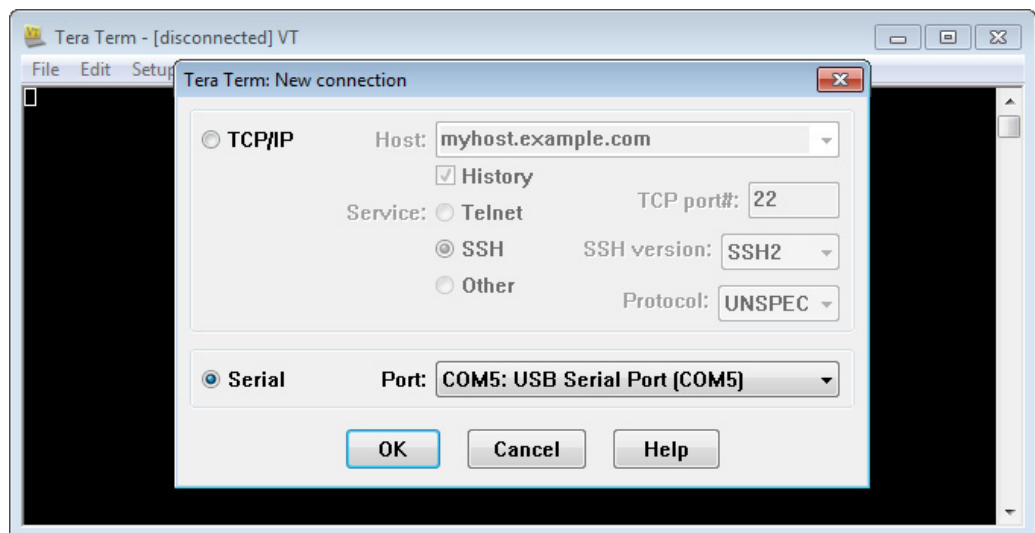
NOTE: The FTDI Virtual COM port driver can enumerate devices to any one of a number of COM ports. It is necessary to find the COM port being used to communicate with the GS2000 based module evaluation board.

3. Open the GS2000 software release folder, and unzip the files to a location on your C:\ drive.
4. Under the SW Utilities folder, select the Tera Term VT terminal emulation application (*teraterm_utf8-4.58* or later) to install.
5. Open the Tera Term VT from your desktop and select the serial port associated with the evaluation board (see [Figure 4, page 38](#)).



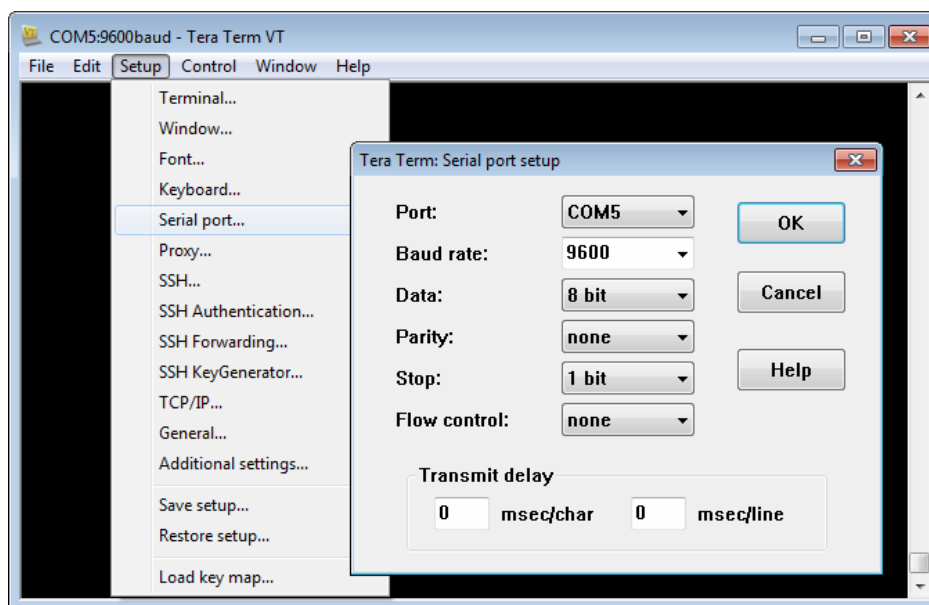
NOTE: The Serial Port must match the port identified.

Figure 4 Connect Evaluation Board to a Serial Port



6. Setup the Serial Port (COM port) as shown in [Figure 5, page 39](#).

Figure 5 Select Serial Port (COM port) Settings



NOTE: For Temperature and Light Sensor (TLS) application set the Baud Rate to 115200.

3.2 Providing Power to the Evaluation Board

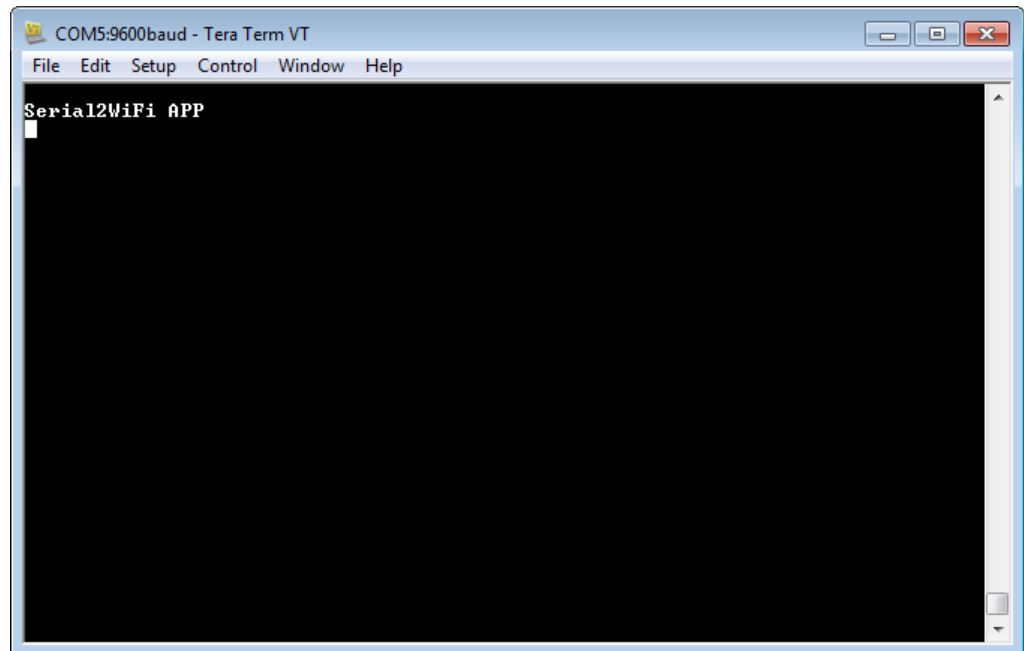
To provide power to the GS2000 based module evaluation board perform the following procedures:

- Connect power to the evaluation board

3.2.1 Connecting Power to the Board

1. Plug the **mini-USB** cable into the **USB0** port on the evaluation board and plug the other end of the **mini-USB** cable into a **USB** port on a computer.
2. Turn the PROGRAM/RUN switch to the **RUN** position.
3. Turn the ON/OFF switch to the **ON** position.
4. The **Serial2WiFi APP** ready prompt will display within the Tera Term VT window (see [Figure 6, page 40](#)).

Figure 6 Serial-to-WiFi Application Ready

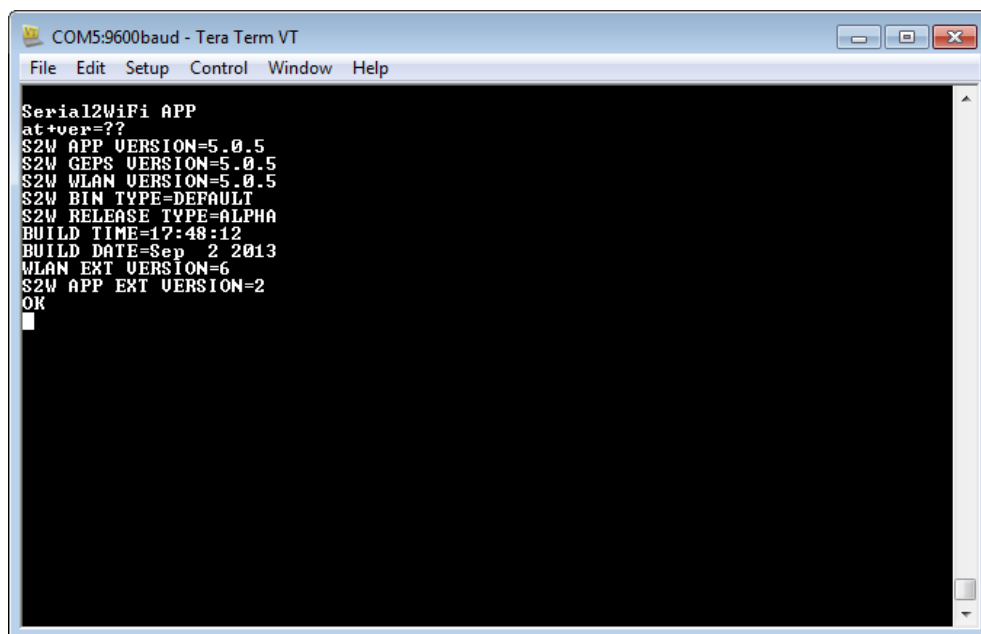


5. Enter a basic AT command.

AT+VER=?

6. This command will respond back with the Serial-to-WiFi firmware version (see Figure 7, page 41).

Figure 7 Serial-to-WiFi Firmware Version



```
COM5:9600baud - Tera Term VT
File Edit Setup Control Window Help

Serial2WiFi APP
at+ver=??
S2W APP VERSION=5.0.5
S2W GEPS VERSION=5.0.5
S2W WLAN VERSION=5.0.5
S2W BIN TYPE=DEFAULT
S2W RELEASE TYPE=ALPHA
BUILD TIME=17:48:12
BUILD DATE=Sep 2 2013
WLAN EXT VERSION=6
S2W APP EXT VERSION=2
OK
```

7. Setup an Access Point (AP) that is specific to your environment and network.

3.3 Configuring the Board for Wireless Network

This section describes how to configure network settings on the GS2000 based module evaluation board for the first time.

When configuring the evaluation board for the first time, make sure you have completed the setup according to the hardware setup instructions in [Chapter 2 Setting Up the Evaluation Board, page 31](#). Before you setup the board, make sure you are using a computer connected to the same network as the board, and obtain the correct serial communication port information.

3.3.1 Connect to a Network

To begin connecting the GS2000 based module evaluation board to a network, use the AT command, by connecting a computer or laptop with a terminal emulation program.

To look for available wireless networks, perform the following:

1. Enable DHCP by issuing the command.

```
AT+NDHCP=1
```

2. Scan for available WiFi access points within your network by issuing the command.

```
AT+WS
```

3. Enter the SSID associated with the access point and channel number (optional).

```
AT+WA=<SSID>
```

The evaluation board will receive an IP address from the access point DHCP server.

The IP address, subnet, and gateway of the GainSpan node will be displayed upon successful association (see Figure 8, page 43).

Figure 8 Receiving IP Address from the Access Point DHCP Server

```

COM5:9600baud - Tera Term VT
File Edit Setup Control Window Help

Serial2WiFi APP
at+ver=?
S2W APP VERSION=5.0.6
S2W GEPS VERSION=5.0.6
S2W WLAN VERSION=5.0.6
S2W BIN TYPE=DEFAULT
S2W RELEASE TYPE=ALPHA
BUILD TIME=11:25:06
BUILD DATE=Nov 15 2013
WLAN EXT VERSION=7
S2W APP EXT VERSION=4
FLASH ID=0x000025c2:MICRONIX-4MB
OK
at+ndhcp=1
ERROR: INVALID INPUT
at+ndhcp=1
ERROR: INVALID INPUT
at+ver=?
S2W APP VERSION=5.0.6
S2W GEPS VERSION=5.0.6
S2W WLAN VERSION=5.0.6
S2W BIN TYPE=DEFAULT
S2W RELEASE TYPE=ALPHA
BUILD TIME=11:25:06
BUILD DATE=Nov 15 2013
WLAN EXT VERSION=7
S2W APP EXT VERSION=4
FLASH ID=0x000025c2:MICRONIX-4MB
OK
at+ndhcp=1
OK
at+us
      BSSID          SSID          Channel  Type  RSSI  Security
64:a0:e7:5d:6f:74.  GS-Guest      11.      INFRA  -37   NONE
64:a0:e7:5d:6f:76.  GS-Corp       11.      INFRA  -35   WPA2-ENTERPRISE
64:a0:e7:5d:6f:73.  GS-Exp        11.      INFRA  -37   WPA2-ENTERPRISE
00:23:69:bf:b8:a2.  exosite_wireless_dms  11.      INFRA  -63   WPA2-PERSONAL
00:24:97:18:3a:f1.  Physio_Test   11.      INFRA  -53   WPA2-PERSONAL
2c:3f:38:5a:c1:7:14.  GS-Guest      11.      INFRA  -78   NONE
98:fc:11:24:b4:a1.  GainSpanDemo  11.      INFRA  -23   NONE
2c:3f:38:5a:c1:7:16.  GS-Corp       11.      INFRA  -75   WPA2-ENTERPRISE
c0:c1:c0:c1:2c:39.  GS_BGN_Test   11.      INFRA  -57   NONE
c0:c1:c0:bf:63:9b.  NpeGuest      11.      INFRA  -57   NONE
00:1d:c9:22:05:70.  KeplerProv     11.      INFRA  -66   NONE
68:7f:74:4a:5c:4c.  RaviGS        11.      INFRA  -66   WPA2-PERSONAL
00:23:69:b8:66:ab.  KeplerGS      11.      INFRA  -65   NONE
No. Of AP Found=13
OK

```

For more information on how to setup application examples for:

- UDP and TCP client/server connections either in station (infrastructure mode) or Limited AP mode.
- Demonstrate Temperature and Light Sensor (TLS) mobile application on iOS and Android devices.
- Web Provisioning using Limited AP Provision mode and WiFi Protected Setup (WPS).

Refer to the *GainSpan Temperature and Light Sensor (TLS) Demo Application Note*.

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Appendix A GS2000 Evaluation Board Specifications

This appendix summarizes the physical, electrical, environmental specifications, on-board jumper and switch settings for the GainSpan® GS2011M and GS2100M evaluation boards.

The following sections are covered in this appendix:

- [GS2011M Evaluation Board Specifications, page 45](#)
- [GS2011M Evaluation Board LEDs, page 46](#)
- [GS2011M Evaluation Board Sensors, page 47](#)
- [GS2011M Evaluation Board Switches, page 47](#)
- [GS2011M Evaluation Board Jumper Settings, page 48](#)
- [GS2100M Evaluation Board Specifications, page 50](#)
- [GS2100M Evaluation Board LEDs, page 51](#)
- [GS2100M Evaluation Board Switches, page 52](#)
- [GS2100M Evaluation Board Jumper Settings, page 53](#)

A.1 GS2011M Evaluation Board Specifications

Table 12, page 45 lists the GS2011M evaluation board specifications.

Table 12 GS2011M Evaluation Board Specifications

Feature	Description
Radio Protocol	IEEE 802.11b/g/n
RF Operating Frequency	2.4 GHz
Supported Data Rates	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)
Antenna	External Antenna (u.FL connector) or On-board Antenna
Operating Temperature	-40°C to +85°C
Security Protocols	WPA/WPA2 - Personal, WPA/WPA1 - Enterprise (PEAP, EAP-FAST, EAP-TLS, EAP-TTLS), WEP, TLS/SSL Client and Server, HTTPS
Networking Protocols	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
I/O Interfaces	SPI, UART, SDIO, I ² C, I ² S, GPIO, ADC (12-bit), JTAG
Host Connections	SPI, UART, SDIO (typically to an external micro controller)

Table 12 GS2011M Evaluation Board Specifications (Continued)

Feature	Description
Outline Dimensions	22.8mm x 32.5mm x 3.63mm (shield)
I/O Voltage	3.3V VDDIO
Operating Voltage	2.7-3.6V



NOTE: For complete GS2011M module specifications, refer to the GainSpan GS2011M WiFi Module Data Sheet.

A.2 GS2011M Evaluation Board LEDs

Table 13, page 46 lists the GS2011M evaluation board LEDs.

Table 13 GS2011M Evaluation Board LEDs

LED State	EVB 2.0	EVB 3.0	Description
Power	VIN_3V3 - D8	VIN_3V3 - D8	LED on board will be Solid GREEN indicating board is ON and receiving input voltage
	3V3 - D9	3V3 - D9	LED on board will be Solid GREEN indicating board is ON and receiving power voltage
General Purpose Input/Output	GPIO8 - D2	GPIO30 - D2	General Purpose LED's controlled either by Serial-to-WiFi AT commands or by TLS firmware
	GPIO9 - D3	GPIO31 - D3	General Purpose LED's controlled either by Serial-to-WiFi AT commands or by TLS firmware
RUN/PROGRAM FLASH	PROGRAM - D1	PROGRAM - D1	LED on board will be Solid RED when the RUN/PROGRAM switch is set to PROGRAM mode
Universal Asynchronous Receiver/Transmitter	UART0 - D5	UART0 - D5	LED on board will be Solid AMBER indicating that the board is transmitting through the USB0 port
	UART1 - D7	UART1 - D7	LED on board will be Solid AMBER indicating that the board is transmitting through the USB1 port

A.3 GS2011M Evaluation Board Sensors

Table 14, page 47 lists the GS2011M evaluation board sensors.

Table 14 GS2011M Evaluation Board Sensors

Sensor State	EVB 2.0 and EVB 3.0	Description
Light Sensor	Q10	Used to detect and read light sensor data when using the Temperature and Light Sensor (TLS) mobile application
Temperature Sensor	RT1	Used to detect and read temperature sensor data when using the Temperature and Light Sensor (TLS) mobile application

A.4 GS2011M Evaluation Board Switches

Table 13, page 46 lists the GS2011M evaluation board switches.

Table 15 GS2011M Evaluation Board Switches

Switch State	EVB 2.0	EVB 3.0	Description
WPS	SW1	SW1	Push button switch to enter WPS mode (not supported at this time)
Restore	SW2	SW2	Push button switch to restore the board to factory default settings
Alarm	SW3	SW3	Push button for Alarm1
	SW4	SW4	Push button for Alarm2
Program Flash	SW5	SW8	Toggle switch to set the board in RUN mode (default)
			Toggle switch to set the board in PROGRAM mode to program the module
ON/OFF	SW6	SW6	Toggle switch to power ON/OFF the GS2011M evaluation board
Reset	SW7	SW7	Push button switch to reset the GS2011M evaluation board

A.5 GS2011M Evaluation Board Jumper Settings

Table 16, page 48 lists the GS2011M evaluation board jumper settings.

Table 16 GS2011M Evaluation Board Jumper Settings

Jumper State	Jumper on EVB 2.0	Description	Jumper on EVB 3.0	Description
JTAG Header	J3 (default not installed) for TRACE connector J22	If JTAG is present, install jumpers on pins 1-2 and 3-4. If new JTAG install jumper on pins 5-6. See B.1.1 GS2011M JTAG Cortex Debug Connector Pinouts, page 56 .	No Jumper connector present	See B.1.1 GS2011M JTAG Cortex Debug Connector Pinouts, page 56 .
LED Select (all jumpers installed-default)	J4 - D1	Install jumper enables LED for Program Flash	J4 - D1	Install jumper enables LED for Program Flash
	J4 - D2	Install jumper enables LED for GPIO8	J4 - D2	Install jumper enables LED for GPIO30
	J4 - D3	Install jumper enables LED for GPIO9	J4 - D3	Install jumper enables LED for GPIO31
	J4 - D8	Install jumper enables LED for VDDIO (turns OFF in Standby mode)	J4 - D8	Install jumper enables LED for VDDIO (turns OFF in Standby mode)
	J4 - D9	Install jumper enables LED for 3V3 (turns ON in Standby mode)	J4 - D9	Install jumper enables LED for 3V3 (turns ON in Standby mode)
Power Measurement	J11	Installed (default)	N/A	N/A
	J14	Active mode (default installed)	J14	Active mode (default installed)
	J15	Deep Sleep mode (default installed)	J15	Deep Sleep mode (default installed)
	J16	Standby mode (default installed)	N/A	N/A
UART0	J29	Install jumper on pins 1-2 (default installed)	J29	Install jumper on pins 1-2 (default installed)
Power	J30	Setting 3.3V or 1.8V	N/A	N/A
	J31	Install jumper on pins 1-2: Regulated 3.3V via on board voltage regulator Install jumper on pins 2-3: External 3.3V bench supply	J31	Install jumper on pins 1-2: Regulated 3.3V via on board voltage regulator Install jumper on pins 2-3: External 3.3V bench supply
	J32	Install jumper on pins 2-3: Standby Mode (default)	J32	Install jumper on pins 2-3: Standby Mode (default)

Table 16 GS2011M Evaluation Board Jumper Settings (Continued)

Jumper State	Jumper on EVB 2.0	Description	Jumper on EVB 3.0	Description
GPIO8	N/A	N/A	J24	Install jumper enables GPIO8 I2C Data
GPIO9	N/A	N/A	J33	Install jumper enables GPIO9 I2C Clock
Note: Power is turned off to the board during Standby mode.				

A.6 GS2100M Evaluation Board Specifications

Table 17, page 50 lists the GS2100M evaluation board specifications.

Table 17 GS2100M Evaluation Board Specifications

Feature	Description
Radio Protocol	IEEE 802.11b/g/n
RF Operating Frequency	2.4 GHz
Supported Data Rates	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)
Antenna	External Antenna (u.FLconnector) or Internal PCB Antenna
Operating Temperature	-40°C to +85°C
Security Protocols	WPA/WPA2 - Personal, WPA/WPA2 - Enterprise (PEAP, EAP-FAST, EAP-TLS, EAP-TTLS), WEP, TLS/SSL Client and Server, HTTPS
Networking Protocols	TCP, UDP, IPv4, IPv6, TLS Client and Server, SNTP Client, DHCP Client and Server v4, DHCP Client and Server v6, DNS Client and Server, mDNS, DNS-SD, HTTP Client and Server, XML Parser
I/O Interfaces	SPI, UART, SDIO, I ² C, GPIO, ADC (16-bit), JTAG
Host Connections	SPI, UART, SDIO (typically to an external micro controller)
Outline Dimensions	18 mm x 25 mm x 2.5 mm (shield)
I/O Voltage	1.8V or 3.3V VDDIO
Operating Voltage	2.7-3.6V



NOTE: For complete GS2100M module specifications, refer to the GainSpan GS2100M WiFi Module Data Sheet.

A.7 GS2100M Evaluation Board LEDs

Table 18, page 51 lists the GS2100M evaluation board LEDs.

Table 18 GS2100M Evaluation Board LEDs

LED State	EVb 2.0	EVb 3.0	Description
Power	VDDIO - D9	VDDIO - D9	LED on board will be Solid GREEN indicating board is ON and receiving input voltage
	3V3 - D10	3V3 - D10	LED on board will be Solid GREEN indicating board is ON and receiving power voltage
General Purpose Input/Output	GPIO8 - D7	GPIO30 - D7	General Purpose LED's controlled either by Serial-to-WiFi AT commands or by TLS firmware
	GPIO9 - D8	GPIO31 - D8	General Purpose LED's controlled either by Serial-to-WiFi AT commands or by TLS firmware
RUN/PROGRAM FLASH	PROGRAM - D6	PROGRAM - D6	LED on board will be Solid RED when the RUN/PROGRAM switch is set to PROGRAM mode
Universal Asynchronous Receiver/Transmitter	UART0 - D5	UART0 - D4	LED on board will be Solid AMBER indicating that the board is transmitting through the USB0 port
	UART1 - D7	UART1 - D5	LED on board will be Solid AMBER indicating that the board is transmitting through the USB1 port

A.8 GS2100M Evaluation Board Switches

Table 19, page 52 lists the GS2100M evaluation board switches.

Table 19 GS2100M Evaluation Board Switches

Switch State	EVB 2.0	EVB 3.0	Description
WPS	SW3	SW3	Push button switch to enter WPS mode (not supported at this time)
Restore	SW4	SW4	Push button switch to restore the board to factory default settings
Alarm	SW5	SW5	Push button for Alarm2
Reset	SW6	SW6	Resets to factory default (not available)
Program Flash	SW2	SW7	Toggle switch to set the board in RUN mode (default)
			Toggle switch to set the board in PROGRAM mode to program the module
ON/OFF	SW1	SW1	Toggle switch to power ON/OFF the GS2100M evaluation board

A.9 GS2100M Evaluation Board Jumper Settings

Table 20, page 53 lists the GS2100M evaluation board jumper settings.

Table 20 GS2100M Evaluation Board Jumper Settings

Jumper State	Jumper on EVB 2.0	Description	Jumper on EVB 3.0	Description
JTAG Header	J3 (default not installed) for TRACE connector J22	If JTAG is present, install jumpers on pins 1-2 and 3-4. If new JTAG, install jumper on pins 5-6. See B.2.1 GS2100M JTAG Cortex Debug Connector Pinouts , page 65.	No Jumper connector present	See B.2.1 GS2100M JTAG Cortex Debug Connector Pinouts , page 65.
LED Select (all jumpers installed-default)	J4 - D1	Install jumper enables LED for Program Flash	J4 - D1	Install jumper enables LED for Program Flash
	J4 - D7	Install jumper enables LED for GPIO8	J4 - D7	Install jumper enables LED for GPIO8
	J4 - D8	Install jumper enables LED for GPIO9	J4 - D8	Install jumper enables LED for GPIO9
	J4 - D9	Install jumper enables LED for VDDIO (turns OFF in Standby mode)	J4 - D9	Install jumper enables LED for VDDIO (turns OFF in Standby mode)
	J4 - D10	Install jumper enables LED for 3V3 (turns ON in Standby mode)	J4 - D10	Install jumper enables LED for 3V3 (turns ON in Standby mode)
Power Measurement	J10	Active mode (default installed)	J10	Active mode (default installed)
	J11	Deep Sleep mode (default installed)	J11	Deep Sleep mode (default installed)
	J12	Standby mode (default installed)	J12	Standby mode (default installed)
Power	J2	Install jumper on pins 1-2: Regulated 3.3V via on board voltage regulator	J2	Install jumper on pins 1-2: Regulated 3.3V via on board voltage regulator
		Install jumper on pins 2-3: External 3.3V bench supply		Install jumper on pins 2-3: External 3.3V bench supply
Note: Power is turned off to the board during Standby mode.				

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Appendix B Connector Pinouts

This appendix describes the pinouts for the JTAG, SPI, SDIO, Headers, and JTAG Test Header connectors on the GainSpan® GS2011M and GS2100M evaluation boards (EVB 2.0 and EVB 3.0).

The following sections are covered in this appendix:

- [GS2011M Evaluation Board Pinouts, page 56](#)
- [GS2100M Evaluation Board Pinouts, page 65](#)

B.1 GS2011M Evaluation Board Pinouts

B.1.1 GS2011M JTAG Cortex Debug Connector Pinouts

One JTAG debugging connector (J21) on the GS2011M evaluation board uses a 20-pin connector. [Table 21, page 56](#) gives the pin assignments.

Table 21 JTAG Cortex Debug Connector Pin Assignments - EVB 2.0 and EVB 3.0

Pin No.	Signal Name	Description
1	VDDIO	100nF Voltage Input Output
2	JTAG_TMS	Joint Test Action Group TAP (Test Access Point) State Control
3	GND	Ground
4	JTAG_TCK	Joint Test Action Group TAP (Test Access Point) Clocking
5	GND	Ground
6	JTAG_TDO	Joint Test Action Group TAP (Test Access Point) Data Output
7	NC	Not Connected
8	JTAG_TDI	Joint Test Action Group TAP (Test Access Point) Data Input
9	NC	Not Connected
10	EXT_RESET_n	External reset
11	NC	Not Connected
12	TRACECLK	Trace Clock to Trace Clock Connector J22 pin 1. Jumper from GPIO5, GPIO31
13	NC	Not Connected
14	TRACEDATA0	To Trace Connector J22 pin 2. Jumper from GPIO10, GPIO13, GPIO29, and GPIO33
15	GND	Ground
16	TRACEDATA1	To Trace Connector J22 pin 3. Jumper from GPIO9, GPIO21, GPIO25, and GPIO34
17	GND	Ground
18	TRACEDATA2	To Trace Connector J22 pin 4. Jumper from GPIO0, GPIO20, and GPIO32
19	GND	Ground
20	TRACEDATA3	To Trace Connector J22 pin 5. Jumper from GPIO8, GPIO19, and GPIO24

B.1.2 GS2011M SPI0 Connector Pinouts

One Serial Peripheral Input connector (J19) on the GS2011M evaluation board uses a 10-pin connector. [Table 22](#), [page 57](#) gives the pin assignments.

Table 22 SPI0 Connector Pin Assignments - EVB 2.0 and EVB 3.0

Pin No.	Signal Name	Description
1	SDIO_DAT1_INT	Secure Digital Input Output Data 1 Initialization
2	GND	Ground
3	CON1 - J27	Connection 1 to Jumper J27
4	NC	Not Connected
5	SDIO_DAT0/SPIO_DOUT	Secure Digital Input Output Data 0 and Serial Port Input Output Data Out
6	NC	Not Connected
7	SDIO_CLK/SPIO_CLK	Secure Digital Input Output Clock and Serial Port Input Output Clock
8	SDIO_CMD/SPIO_DIN	Secure Digital Input Output Command and Serial Port Input Output Data In
9	SDIO_DAT3/SPIO_CS0	Secure Digital Input Output Data 3 and Serial Port Input Output CS0
10	GND	Ground

B.1.3 GS2011M SDIO Test Connector Pinouts

One Secure Digital Input/Output connector (J20) on the GS2011M evaluation board uses a 14-pin connector. [Table 23, page 58](#) gives the pin assignments.

Table 23 SDIO Test Connector Pin Assignments - EVB 2.0 and EVB 3.0

Pin No.	Signal Name	Description
1	SDIO_DAT2_UART1_TX	Secure Digital Input Output Data Bit 2 Universal Asynchronous Receiver Transmitter 1 Transmitter Output
2	GND	Ground
3	SDIO_DAT3/SPI0_CS0	Secure Digital Input Output Data Bit 3 SPI0 Chip Select 0
4	GND	Ground
5	SDIO_CMD/SPI0_DIN	Secure Digital Input Output Command SPI0 Data Input from HOST
6	GND	Ground
7	NC	Not Connected
8	NC	Not Connected
9	SDIO_CLK/SPI0_CLK	Secure Digital Input Output Clock SPI0 Clock Input from the HOST
10	GND	Ground
11	SDIO_DAT0/SPI0_DOUT	Secure Digital Input Output Data 0 SPI0 Data Output to HOST
12	GND	Ground
13	SDIO_DAT1_INT	Secure Digital Input Output Data 1 Interrupt
14	GND	Ground

B.1.4 GS2011M Daughter Board Header Connector Pinouts

The daughter board header enables different daughter cards to be connected to the evaluation board. The head signals list the primary function and also provides the alternate functions that are available on the module. This header connector (J1) on the GS2011M evaluation board uses a 30-pin connector.

Table 24, page 59 gives the pin assignments and their alternate MUX functions on the GS2011M EVB 2.0.

Table 24 Daughter Board Header Connector Pin Assignments - EVB 2.0

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	Module_GND	Ground	2	DC_DC_CNTL/RTC_IO_4	VIN_3V3 Regulator Control Output/RTC Digital Input/Output
3	VRTC	Embedded Real Time Clock Power Supply	4	EXT_RESET_n	Device Reset Input
5	RTC_IO_1	Embedded Real Time Clock Input/Output 1	6	RTC_IO_2	Embedded Real Time Clock Input/Output 2
7	GPIO21/CLK_RTC	General Purpose Input Output/Clock Internal RTC Clock Circuitry Test Point	8	GPIO19/CLK_HS_XTAL	General Purpose Input Output/XTAL Clock Circuitry Test Point
9	GPIO10/PWM0_M	General Purpose Input Output Pulse Width Modulator 0	10	GPIO9/I2C_CLK	General Purpose Input Output Inter-Integrated Circuit Clock
11	GPIO8/I2C_DATA	General Purpose Input Output Inter-Integrated Circuit Data	12	SDIO_DATA2_UART1_TX_M	Secure Digital Input Output Data Bit 2 / Universal Asynchronous Receiver Transmitter 1 Transmitter Output
13	SDIO_DATA3/SPI0_CS0_M	Secure Digital Input Output Data Bit 3 / SPI 0 Chip Select Input 0 from the HOST (Active Low)	14	SDIO_CMD/SPI0_DIN_M	Secure Digital Input Output Command Input / SPI 0 Receive Data Input from HOST
15	SDIO_CLK/SPI0_CLK_M	Secure Digital Input Output Clock / SPI 0 Clock Input from the HOST	16	SDIO_DAT0/SPI0_DOUT_M	Secure Digital Input Output Data Bit 0 / SPI 0 Transmit Data Output to the HOST
17	SDIO_DAT1_INT_M	General Purpose Input Output / 4-bit SDIO Data Bit 1 / SDIO SPI Mode Interrupt	18	GPIO26/UART1_CTS	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Clear to Send Input

Table 24 Daughter Board Header Connector Pin Assignments - EVB 2.0 (Continued)

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
19	GPIO27/UART1_RTS	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Request to Send Output	20	GPIO3/UART1_RX	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Receive Input
21	GPIO1/UART0_TX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Transmitter Output	22	GPIO25/UART0_RTS_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Request to Send Output
23	GPIO0/UART0_RX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Receive Input	24	GPIO24/UART0_CTS_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Clear to Send Input
25	GPIO31/PWM2_M	General Purpose Input Output / Pulse Width Modulation Output 2	26	GPIO30/PWM1_M	General Purpose Input Output / Pulse Width Modulation Output 1
27	GPIO29/I2C_CLK	General Purpose Input Output / I ² C Clock	28	GPIO5/SPI1_CLK_M	General Purpose Input Output / Serial Peripheral Interface 1 Bus Clock
29	VIN_3V3	Single Supply Port	30	Module_GND	Ground

Table 24, page 59 gives the pin assignments and their alternate MUX functions on the GS2011M EVB 3.0. This header connector (J1) on the GS2011M evaluation board uses a 36-pin connector.

Table 25 Daughter Board Header Connector Pin Assignments - EVB 3.0

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	GND	Ground	2	DC_DC_CNTL/RTC_IO_4	DC to DC Power Control Real Time Clock Input/Output 4
3	VRTC	Embedded Real Time Clock Power Supply	4	EXT_RTC_RESET_n	Device Reset Input
5	RTC_IO_1	Real Time Clock Input/Output 1	6	RTC_IO_2	Embedded Real Time Clock Input/Output 2
7	GPIO21/CLK_RTC	General Purpose Input Output Clock / Real Time Clock	8	GPIO19/CLK_HS_XTAL	General Purpose Input Output/XTAL Clock Circuitry Test Point
9	GPIO10/PWM0_M	General Purpose Input Output / Pulse Width Modulator 0	10	GPIO9/I2C_CLK	General Purpose Input Output / Inter-Integrated Circuit Clock
11	GPIO8/I2C_DATA	General Purpose Input Output / Inter-Integrated Circuit Data	12	SDIO_DAT2_UART1_TX_M	Secure Digital Input Output Data Bit 2 / Universal Asynchronous Receiver Transmitter 1 Transmitter Output
13	SDIO_DATA3/SPI0_CS0_M	Secure Digital Input Output Data Bit 3 / SPI0 Chip Select Input 0 from the HOST (Active Low)	14	SDIO_CMD/SPI0_DIN_M	Secure Digital Input Output / SPI 0 Receive Data Input from the HOST
15	SDIO_CLK/SPI0_CLK_M	Secure Digital Input Output Clock / SPI 0 Clock Input from the HOST	16	SDIO_DAT0/SPI0_DOUT_M	Secure Digital Input Output Data Bit 0 / SPI0 Transmit Data Output to the HOST
17	SDIO_DAT1_INT_M	Secure Digital Input Output SPI Mode Interrupt	18	GPIO26/UART1_CTS	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Clear to Send
19	GPIO27/UART1_RTS	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Request to Send	20	GPIO3/UART1_RX	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Request to Send Output

Table 25 Daughter Board Header Connector Pin Assignments - EVB 3.0 (Continued)

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
21	GPIO1/UART0_TX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Transmitter Output	22	GPIO25/UART0_RTS_M	General Purpose Input Output / Asynchronous Receiver Transmitter 0 Request to Send Output
23	GPIO0/UART0_RX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Request to Send Output	24	GPIO24/UART0_CTS_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Clear to Send Input
25	GPIO31/PWM2	General Purpose Input Output / Pulse Width Modulation Output 2. This is also the program pin for the module	26	GPIO30/PWM1	General Purpose Input Output / Pulse Width Modulation Output 1
27	GPIO29/I2C_CLK	General Purpose Input Output Inter-Integrated Circuit Clock	28	GPIO5/SPI1_DIN_M	General Purpose Input Output / Serial Peripheral Interface 1 Data Input from the HOST
29	VIN_3V3	Single Supply Port	30	GND	Ground
31	GPIO4/SPI1_CSN_0	General Purpose Input Output / Serial Peripheral Interface 1 Chip Select Input 0	32	GPIO6/SPI1_DIN_M	General Purpose Input Output / Serial Peripheral Interface 1 Data Input from the HOST
33	GPIO7/SPI1_DOUT_M	General Purpose Input Output / Serial Peripheral Interface 1 Data Output to HOST	34	GPIO13/SPI1_CSN_1_M	General Purpose Input Output / Serial Peripheral Interface 1 Chip Select Input 1
35	VDDIO	Voltage Input Output	36	NC	Not Connected

B.1.5 GS2011M Test Point Header Connector Pinouts

These test points are used for external testing of the evaluation board. This header connector (J2) on the GS2011M evaluation board uses a 13-pin connector. [Table 26](#), [page 63](#) gives the pin assignments on EVB 2.0.

Table 26 Test Point Header Connector Pin Assignments - EVB 2.0

Pin No.	Signal Name	Description
1	RTC_IO_0	Real Time Clock Input Output 0
2	ADC_SAR_0	Analog to Digital Converter / Successive Approximation Register 0
3	ADC_SAR_1	Analog to Digital Converter / Successive Approximation Register 1
4	GPIO6/SPI1_DIN	General Purpose Input Output / Serial Peripheral Interface 1 Bus Data Input
5	GPIO7/SPI1_DOUT	General Purpose Input Output / Serial Peripheral Interface 1 Bus Data Output
6	VOUT_1V8	Internal 1.8V V _{OUT} (internally regulated)
7	GPIO5/SPI1_CLK_M	General Purpose Input Output / Serial Peripheral Interface 1 Bus Clock
8	GPIO4/SPI1_CSn_0	General Purpose Input Output / Serial Peripheral Interface 1 Chip Select _0 (Active Low)
9	GPIO13/SPI1_CSn_1	General Purpose Input Output / Serial Peripheral Interface 1 Chip Select _1 (Active Low)
10	GPIO20/CLK_HS_RC	General Purpose Input Output / Internal RTC Clock Circuitry Test Point
11	EN_1V8	Internal 1.8V regulator enable port-Active High
12	VDDIO	All I/O voltage domain (can be tied to VIN_3V3 or tied to HOST I/O supply)
13	Module_GND	GND

Table 27, page 64 gives the pin assignments on EVB 3.0.

Table 27 Test Point Header Connector Pin Assignments - EVB 3.0

Pin No.	Signal Name	Description
1	RTC_IO_0	Real Time Clock Input Output 0
2	ADC_SAR_0	Analog to Digital Converter / Successive Approximation Register 0
3	ADC_SAR_1	Analog to Digital Converter / Successive Approximation Register 1
4	NC	Not Connected
5	NC	Not Connected
6	VOUT_1V8	Internal 1.8V V_{OUT} (internally regulated)
7	NC	Not Connected
8	NC	Not Connected
9	NC	Not Connected
10	GPIO20/CLK_HS_RC	General Purpose Input Output / Internal RTC Clock Circuitry Test Point
11	EN_1V8	Internal 1.8V regulator enable port-Active High
12	VDDIO	All I/O voltage domain (can be tied to VIN_3V3 or tied to HOST I/O supply)
13	GND	Ground

B.2 GS2100M Evaluation Board Pinouts

B.2.1 GS2100M JTAG Cortex Debug Connector Pinouts

One JTAG debugging connector (J19) on the GS2100M evaluation board uses a 20-pin connector. [Table 28, page 65](#) gives the pin assignments.

Table 28 JTAG Cortex Debug Connector Pin Assignments - EVB 2.0 and EVB 3.0

Pin No.	Signal Name	Description
1	VDDIO	100nF Voltage Input Output
2	JTAG_TMS	Joint Test Action Group Test Mode Select
3	GND	Ground
4	JTAG_TCK	Joint Test Action Group Test Clock
5	GND	Ground
6	JTAG_TDO	Joint Test Action Group Test Data Out
7	NC	Not Connected
8	JTAG_TDI	Joint Test Action Group Test Data In
9	NC	Not Connected
10	EXT_RTC_RESET_n	Device Reset Input
11	NC	Not Connected
12	TRACECLK	To Trace Clock Connector J22 pin 1. Jumper from GPIO31
13	NC	Not Connected
14	TRACEDATA0	To Trace Connector J22 pin 2. Jumper from GPIO10 and GPIO33
15	GND	Ground
16	TRACEDATA1	To Trace Connector J22 pin 3. Jumper from GPIO9, GPIO25, and GPIO34
17	To Header J21	To Header J21. If JTAG present, install 1-2 and 3-4. If new JTAG, install 5-6
18	TRACEDATA2	To Trace Connector J22 pin 4. Jumper from GPIO0 and GPIO32
19	GND	Ground
20	TRACEDATA3	To Trace Connector J22 pin 5. Jumper from GPIO8 and GPIO24

B.2.2 GS2100M SPI0 Connector Pinouts

One Serial Peripheral Input connector (J16) on the GS2100M evaluation board uses a 10-pin connector. [Table 29, page 66](#) gives the pin assignments.

Table 29 SPI0 Connector Pin Assignments - EVB 2.0 and EVB 3.0

Pin No.	Signal Name	Description
1	SDIO_DAT1_INT	Secure Digital Input Output Data 1 Initialization
2	GND	Ground
3	N/A	Not Applicable
4	NC	Not Connected
5	SDIO_DAT0/SPI0_DOUT	Secure Digital Input Output Data 0 and Serial Peripheral Interface 0 Data Output
6	NC	Not Connected
7	SDIO_CLK/SPI0_CLK	Secure Digital Input Output Clock and Serial Peripheral Interface 0 Clock
8	SDIO_CMD/SPI0_DIN	Secure Digital Input Output Command and Serial Peripheral Interface 0 Data Input
9	SDIO_DAT3/SPI0_CS0	Secure Digital Input Output Data 3 and Serial Peripheral Interface 0 Chip Select 0
10	GND	Ground

B.2.3 GS2100M SDIO Test Connector Pinouts

One Secure Digital Input/Output connector (J18) on the GS2100M evaluation board uses a 14-pin connector. [Table 30](#), [page 67](#) gives the pin assignments.

Table 30 SDIO Test Connector Pin Assignments - EVB 2.0 and EVB 3.0

Pin No.	Signal Name	Description
1	SDIO_DAT2_UART1_TX	Secure Digital Input Output Data 2 / Universal Asynchronous Receiver Transmitter 1 Transmitter
2	GND	Ground
3	SDIO_DAT3/SPI0_CS0	Secure Digital Input Output Data 3 / Serial Peripheral Interface 0 Chip Select 0
4	GND	Ground
5	SDIO_CMD/SPI0_DIN	Secure Digital Input Output Command and Serial Peripheral Interface 0 Data Input
6	GND	Ground
7	NC	Not Connected
8	NC	Not Connected
9	SDIO_CLK/SPI0_CLK	Secure Digital Input Output Clock and Serial Peripheral Interface 0 Clock
10	GND	Ground
11	SDIO_DAT0/SPI0_DOUT	Secure Digital Input Output Data Bit 0 / Serial Peripheral Interface 0 Data Output
12	GND	Ground
13	SDIO_DAT1_INT	Secure Digital Input Output Data Bit 1 / Interrupt
14	GND	Ground

B.2.4 GS2100M Daughter Board Header Connector Pinouts

The daughter board header enables different daughter cards to be connected to the evaluation board. The head signals list the primary function and also provides the alternate functions that are available on the module. This header connector (J1) on the GS2100M evaluation board uses a 30-pin connector.

Table 31, page 68 gives the pin assignments and their alternate MUX functions on the GS2100M EVB 2.0.

Table 31 Daughter Board Header Connector Pin Assignments - EVB 2.0

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	Module_GND	Ground	2	NC	Not Connected
3	VRTC	Embedded Real Time Clock Power Supply	4	EXT_RTC_RESET_n	Device Reset Input
5	NC	Not Connected	6	RTC_IO_2	Embedded Real Time Clock Input/Output 2
7	NC	Not Connected	8	NC	Not Connected
9	GPIO10/PWM0_M	General Purpose Input Output / Pulse Width Modulator 0	10	GPIO9/I2C_CLK	General Purpose Input Output / Inter-Integrated Circuit Clock
11	GPIO8/I2C_DATA_A	General Purpose Input Output / Inter-Integrated Circuit Data	12	SDIO_DAT2_UART1_TX_M	Secure Digital Input Output Data Bit 2 / Universal Asynchronous Receiver Transmitter 1 Transmitter Output
13	SDIO_DATA3/SPI0_CS0_M	Secure Digital Input Output Data Bit 3 / SPI0 Chip Select Input 0 from the HOST (Active Low)	14	SDIO_CMD/SPI0_DIN_M	Secure Digital Input Output / SPI 0 Receive Data Input from the HOST
15	SDIO_CLK/SPI0_CLK_M	Secure Digital Input Output Clock / SPI 0 Clock Input from the HOST	16	SDIO_DAT0/SPI0_DOUT_M	Secure Digital Input Output Data Bit 0 / SPI0 Transmit Data Output to the HOST
17	SDIO_DAT1_INT_M	Secure Digital Input Output SPI Mode Interrupt	18	NC	Not Connected
19	NC	Not Connected	20	NC	Not Connected
21	GPIO1/UART0_TX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Transmitter Output	22	GPIO25/UART0_RTS_M	General Purpose Input Output / Asynchronous Receiver Transmitter 0 Request to Send Output
23	GPIO0/UART0_RX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Request to Send Output	24	GPIO24/UART0_CTS_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Clear to Send Input

Table 31 Daughter Board Header Connector Pin Assignments - EVB 2.0 (Continued)

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
25	GPIO31/PWM2_M	General Purpose Input Output / Pulse Width Modulation Output 2. This is also the program pin for the module	26	GPIO30/PWM1_M	General Purpose Input Output / Pulse Width Modulation Output 1
27	NC	Not Connected	28	GPI28/I2C_DATA_M	General Purpose Input Output / Inter-Integrated Circuit Data
29	VIN_3V3	Single Supply Port	30	Module_GND	Ground

Table 31, page 68 gives the pin assignments and their alternate MUX functions on the GS2100M EVB 3.0.

Table 32 Daughter Board Header Connector Pin Assignments - EVB 3.0

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
1	GND	Ground	2	DC_DC_CNTL/RT C_IO_4	DC to DC Power Control Real Time Clock Input/Output 4
3	VRTC	Embedded Real Time Clock Power Supply	4	EXT_RTC_RESET_ n	Device Reset Input
5	NC	Not Connected	6	RTC_IO_2	Embedded Real Time Clock Input/Output 2
7	NC	Not Connected	8	NC	Not Connected
9	GPIO10/PWM0_M	General Purpose Input Output / Pulse Width Modulator 0	10	GPIO9/I2C_CLK	General Purpose Input Output / Inter-Integrated Circuit Clock
11	GPIO8/I2C_DATA	General Purpose Input Output / Inter-Integrated Circuit Data	12	SDIO_DAT2_UAR T1_TX_M	Secure Digital Input Output Data Bit 2 / Universal Asynchronous Receiver Transmitter 1 Transmitter Output
13	SDIO_DATA3/SPI0_ CS0_M	Secure Digital Input Output Data Bit 3 / SPI0 Chip Select Input 0 from the HOST (Active Low)	14	SDIO_CMD/SPI0_ DIN_M	Secure Digital Input Output / SPI 0 Receive Data Input from the HOST
15	SDIO_CLK/SPI0_C LK_M	Secure Digital Input Output Clock / SPI 0 Clock Input from the HOST	16	SDIO_DAT0/SPI0_ DOUT_M	Secure Digital Input Output Data Bit 0 / SPI0 Transmit Data Output to the HOST
17	SDIO_DAT1_INT_ M	Secure Digital Input Output SPI Mode Interrupt	18	GPIO26/UART1_C TS	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Clear to Send
19	GPIO27/UART1_RT S	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Request to Send	20	GPIO3/UART1_RX	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 1 Request to Send Output
21	GPIO1/UART0_TX_ M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Transmitter Output	22	GPIO25/UART0_R TS_M	General Purpose Input Output / Asynchronous Receiver Transmitter 0 Request to Send Output

Table 32 Daughter Board Header Connector Pin Assignments - EVB 3.0 (Continued)

Pin No.	Signal Name	Description	Pin No.	Signal Name	Description
23	GPIO0/UART0_RX_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Request to Send Output	24	GPIO24/UART0_CTS_M	General Purpose Input Output / Universal Asynchronous Receiver Transmitter 0 Clear to Send Input
25	GPIO31/PWM2_M	General Purpose Input Output / Pulse Width Modulation Output 2. This is also the program pin for the module	26	GPIO30/PWM1_M	General Purpose Input Output / Pulse Width Modulation Output 1
27	NC	Not Connected	28	GPI28/I2C_DATA_M	General Purpose Input Output / Inter-Integrated Circuit Data
29	VIN_3V3	Single Supply Port	30	GND	Ground
31	NC	Not Connected	32	NC	Not Connected
33	NC	Not Connected	34	NC	Not Connected
35	NC	Not Connected	36	NC	Not Connected

B.2.5 GS2100M Analog Digital Converter Terminal Connector

The Analog Digital Converter (ADC) is used for connecting external analog devices for evaluating. This connector (J17) on the GS2100M evaluation board uses 9 independent screws to connect wires. [Table 33, page 72](#) gives the pin assignments on the GS2100M EVB 2.0.

Table 33 Analog Digital Converter Terminal Connector - EVB 2.0

Pin No.	Signal Name	Description
1	ADC_SD_0p	Sigma Delta ADC differential positive input 0
2	ADC_SD_0n	Sigma Delta ADC differential negative input 0
3	ADC_SD_1p	Sigma Delta ADC differential positive input 1
4	ADC_SD_1n	Sigma Delta ADC differential negative input 1
5	ADC_SD_2p	Sigma Delta ADC differential positive input 2
6	ADC_SD_2n	Sigma Delta ADC differential negative input 2
7	Module_GND	Ground
8	3V3	Single Supply Port
9	GND	Ground

These Analog Digital Converters (ADC) are used for connecting external analog devices for evaluating. There are two ways to connect external analog devices to the evaluation board EVB 3.0. Terminal Connector (J17) uses 9 independent screws to connect wires, and Header (J26) uses 9 independent pins to connect wires. [Table 34, page 72](#) gives the pin assignments for both ADCs on the GS2100M EVB 3.0.

Table 34 Analog Digital Converter (ADC) Terminal and Header - EVB 3.0

Pin No.	Signal Name	Description
1	ADC_SD_0p	Sigma Delta ADC differential positive input 0
2	ADC_SD_0n	Sigma Delta ADC differential negative input 0
3	ADC_SD_1p	Sigma Delta ADC differential positive input 1
4	ADC_SD_1n	Sigma Delta ADC differential negative input 1
5	ADC_SD_2p	Sigma Delta ADC differential positive input 2
6	ADC_SD_2n	Sigma Delta ADC differential negative input 2
7	DC_DC_CNTL_N/RTC_IO_4	DC to DC Control Real Time Clock input 4
8	VIN_3V3	Single Supply Port
9	GND	Ground