User Manual:
GSM1208PB001MAN

Enfora GSM1208
Quad-Band SA-G
User Manual

Revision 1.02

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General

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In some instances, certain aspects of the product warranty may also be covered in a separate written agreement between Enfora and the distributor or reseller, if any, from whom purchaser purchased the product. That agreement may provide, for example, a longer warranty period or a different product return procedure that may also be available to purchaser (e.g., the product may be returned to Enfora through the distributor or reseller).

This limited warranty shall be governed by the laws of the State of Texas, United States of America, without regard to conflict of laws principles. This limited warranty shall not be governed in any respect by the United Nations Convention on Contracts for the International Sale of Goods.

Revision History

Revision Number	Release Date	Description of Changes
1.00	06/03/04	Initial release
1.01	02/14/05	Updated warranty and technical support information
1.02	04/05/06	Added CE Label information

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1   Introduction

1.1   About the GSM1208 SA-G

The GSM1208 SA-G is a compact, stand-alone wireless IP (GSM/GPRS) modem. The platform also includes an external interface that provides I/O, analog inputs and DAC outputs, audio, and ground lines for easy access. The GSM/GPRS Spider SA is designed for computing devices operating Windows 98 SE, XP, 2000 Professional and ME. The platform can also be used as a stand-alone serial device with other vertical applications. The GSM1208 SA-G provides maximum versatility in a single affordable device.

1.2   About this Manual

Contained in this manual are instructions on how to install and configure the GSM1208 SA-G modem. Please follow the instructions herein closely to avoid damaging the GSM1208 SA-G modem.

The GSM1208 SA-G modem contains an Enfora Enabler-IIG OEM module. Detailed information pertaining to the specifications and operation of the module will pertain, in part, to the GSM1208 SA-G platform.

The information can be accessed at the Enfora website under Support/Integrator Downloads. .

Refer to the following documentation for additional information, if required:

Enabler-G AT Command Set GSM0102PB001MAN
Enabler-IIG Integration Guide GSM0108PB001
Enfora GSM-GPRS Family UDP-API Reference GSM0102PB002MAN

GSM0000AN001 - Enabler-G PPP Configuration for Windows 98
GSM0000AN002 - Enabler-G PPP Configuration for Windows 2000
GSM0000AN003 - Enabler-G Data Circuit Switched Call Configuration and Use
GSM0000AN004 - Enabler-G SMS Configuration and Use
GSM0000AN005 - Enabler-G Automated Network Connection Configuration and Use
GSM0000AN006 - Enabler-G Module Status Query
GSM0000AN007 - Enabler-G Status Reporting
GSM0000AN008 - Enabler-G PPP Configuration for Windows XP
GSM0000AN009 - Dynamic IP Assignment Support
GSM0000AN010 - Enabler-G PPP Configuration for PocketPC 2002
GSM0000AN011 - PAD Configuration and Use
GSM0000AN012 - Network Transparency Configuration for PAD
GSM0000AN013 - Enabler-G Sleep Mode Configuration and Use
GSM0000AN014 - Anytime PPP API Access

1.3   System Requirements

- Windows 98 SE / XP / 2000 Professional / ME operating systems or other serial-enabled platform
- One standard RS-232 serial port for GSM/GPRS Spider SA configuration
- One standard plug for speaker and microphone*

*not required for stand alone operation

1.4   Spider SA Front and Back View

Figure 1: Front view of GSM1208 SA-G modem.

Figure 2: Rear view of GSM1208 Spider SA-G modem.

2   Regulatory Compliance

2.1 FCC

The modem was tested and certified to meet FCC Parts 15 in a stand-alone configuration, which demonstrated that the GSM1208 SA-G complies with Part 15 emission limits. FCC Part 22 & Part 24 is covered by the Enfora Enabler-IIG "modular approval" process for a transmitter. This approach, described by FCC Public Notice DA 00-131407 released June 26, 2000, is intended to afford relief to equipment manufacturers by eliminating the requirement for obtaining a new equipment authorization for the same transmitter when installed in a new device.

In order to use the GSM1208 SA-G without additional FCC certification approvals, the installation must meet the following conditions:

> For the transmitter to meet the MPE categorical exclusion requirements of 2.1091, the ERP must be less than 1.5 watts for personnel separation distance of at least 20 cm (7.9 in). Therefore, the maximum antenna gain cannot exceed +3.3dBi. If greater than 1.5 watts exists, then additional testing and FCC approval is required.

2.2 R&TTE - $C\epsilon$

> The GSM1208 SA-G modem has been fully tested and complies with all the requirements of EN301 489-1, EN301 489-7 and EN60950-1:2001. Compliance to EN301 511 has been demonstrated by testing on both the GSM1208 and the integrated GSM0108 module.

2.3 Disclaimer

The information and instructions contained within this publication comply with all FCC, GCF, PTCRB, R&TTE, IMEI and other applicable codes that are in effect at the time of publication. Enfora disclaims all responsibility for any act or omissions, or for breach of law, code or regulation, including local or state codes, performed by a third party.

Enfora strongly recommends that all installations, hookups, transmissions, etc., be performed by persons who are experienced in the fields of radio frequency technologies. Enfora acknowledges that the installation, setup and transmission guidelines contained within this publication are guidelines, and that each installation may have variables outside of the guidelines contained herein. Said variables must be taken into consideration when installing or using the product, and Enfora shall not be responsible for installations or transmissions that fall outside of the parameters set forth in this publication.

Enfora shall not be liable for consequential or incidental damages, injury to any person or property, anticipated or lost profits, loss of time, or other losses incurred by Customer or any third party in connection with the installation of the Products or Customer's failure to comply with the information and instructions contained herein.

3   Installation

3.1 Subscriber Identity Module (SIM) Card

The SIM, an integral part of any GSM terminal device, is a "smart card" that is programmed with subscriber information. The user information consists of an International Mobile Subscriber Identity (IMSI) number, which is registered with the GSM service provider, and an encryption Ki (pronounced "key"). This information consists of a microprocessor and memory installed on a plastic card. To install the SIM card into the modem, insert the SIM card in the modem as shown below in Figure 3.

Note: The SIM is *not* provided with the GSM1208 SA-G modem. The SIM must be obtained from the GSM service provider and must be provisioned by the operator for data and/or voice. Always take care to protect the SIM: the GSM terminal will not operate without the SIM installed.

Figure 3: Inserting a SIM Card in a GSM1208 SA-G Module

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3.2 Connecting the Power Supply

The GSM1208 SA-G modem can utilize input power ranging from 5 Vdc to 30 Vdc. If your unit did not include a power supply or if you wish to configure a separate power interface, the following connector parts can be used to mate with the existing modem power connector:

Connector Pins - Molex 39-00-0207 MINIFIT TERM CRP FEM CHN BS TIN 18-24

Plastic Housing - Molex 39-01-2020 4.20mm (.165") Pitch Mini-Fit, Jr.™ Receptacle, Dual Row (the Enfora GSM/GPRS Spider SA incorporates a 2-pin configuration)

WARNING:
When assembling the Molex connector, plug the Positive (+) power lead in the bottom of the Molex connector. Improper connections will render the unit inoperable and will void the product warranty.

Proper Molex Configuration

(-   )Power Lead

(+)Power Lead
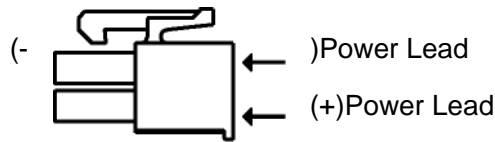
To supply power to the GSM1208 SA-G modem, connect the power supply to the power connector (labeled "**Power**") on the modem. Connect the other end of the power cable to a power source.

Note: Make sure the SIM card is inserted prior to connecting the power supply to the Spider SA.

Figure 4: Connecting The Power Supply To GSM1208 SA-G

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The following tables provide the power characteristics of the GSM1208 SA-G modem. Current measurements were taken under the following test conditions:

Input = 12Vdc
Measurements made using Tektronix Current Probe
Measurements are in milliamps and are **typical** measurements under the specified test conditions using a direct connection to an Agilent 8960 Test Set.
Measurement taken after command at+cops=0 (GSM) and at+cgatt=1 (GPRS)

GSM1208 SA-G (@ 12 Volts)			Typical Average Current (mAmps)	Typical Peak Current (Amps)
GSM 850 & GSM 900	GSM	1 TX 1 RX 1 RX Idle	138 mA 72 mA 35 mA	.93 A @ 32.5 dBm
DCS 1800 & PCS 1900	GSM	1 TX 1 RX 1 RX Idle	120 mA 70 mA 35 mA	.66 A @ 28.5 dBm

Table 1: GSM Operating Power

GSM 1208 SA-G (@12 Volts)			Typical Average Current (mAmps)	Typical Peak Current (Amps)
GSM 850 & GSM 900	GPRS	1 TX /1RX 1 RX Idle	126 mA 76 mA 33 mA	.75 A @ 32.5 dBm
DCS 1800 & PCS 1900	GPRS	1 TX /1RX 1 RX Idle	114 mA 84 mA 33 mA	.68 A @ 28.5 dBm

Table 2: GPRS Operating Power

3.3   Connecting the Serial Cable

To connect the GSM1208 SA-G with a local computing device, connect one end (male end) of the 9-wire RS232 Serial Cable to the GSM1208 SA-G port labeled "**Serial**" and connect the other end to a computer.

Figure 5: Connecting the Serial Cable to GSM1208 SA-G

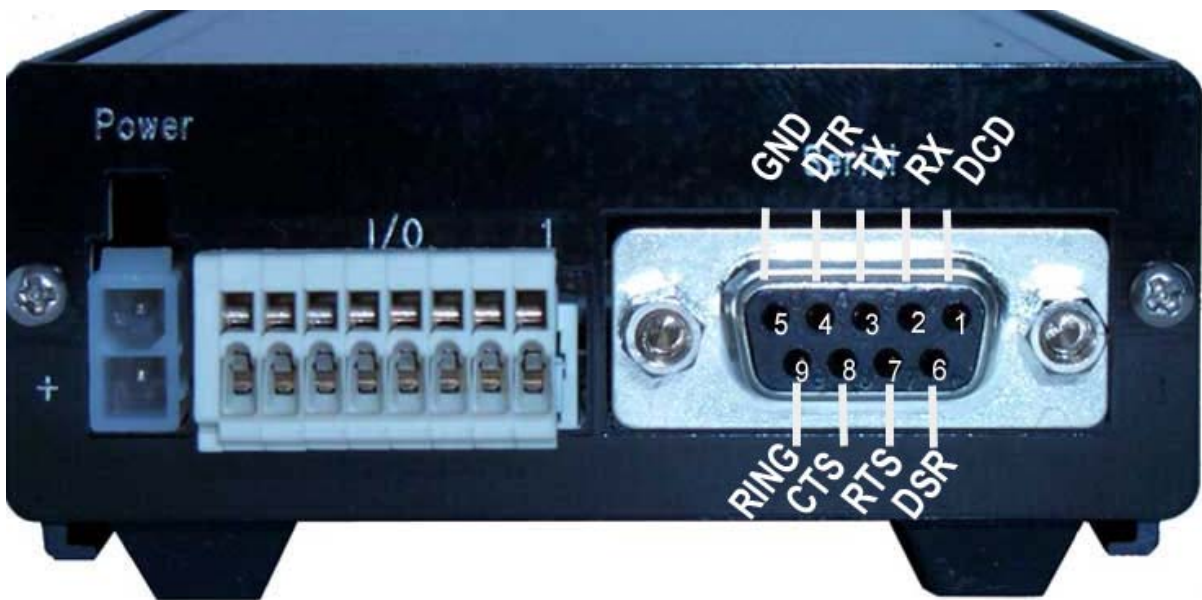The following figure provides the Spider SA serial pinout information.

Figure 6: Serial Pinout

3.4 Connecting the GSM/GPRS Antenna

4 The antenna is supplied by the user. The antenna must have a nominal impedance of 50 Ohms. The VSWR must be less than 2.0:1. System antenna gain should be 0-2 dB for optimum performance. See section 2 Regulatory Compliance

FCC.

The GSM1208 SA-G modem operates in the following frequency bands 850/900/1800/1900 MHz. Care needs to be taken when connecting the antenna since the right type of antenna will be required for proper operation of the modem. The antenna connector on the GSM1208 SA-G modem is SMA Female. The antenna has to be connected to the connector labeled "**Antenna**" as shown below in Figure 7.

Figure 7: GSM1208 SA-G Connecting the Antenna

4.1 Attaching a Microphone/Speaker

To place a voice call, insert a microphone/speaker to the port labeled "**MIC AUDIO**" as shown below in Figure 8. The plug is a standard 2.5mm audio connector. Many existing mobile phone headsets can be used.

Figure 8: Attaching a Headset to the GSM1208 SA-G Modem

4.2 Using the GSM1208 SA-G Modem I/O Interface

The GSM1208 SA-G Modem provides an external I/O connector that can be used to interface with other devices. The mating I/O connector and operating tool part numbers are provided below:

Wago I/O Connector – 733-108 FEMALE CONNECTOR WITH CAGE-CLAMP - 8 POLE

Connector Tool – 233-332 OPERATING TOOL FOR FRONT-ENTRY WIRING OF
            SERIES 233

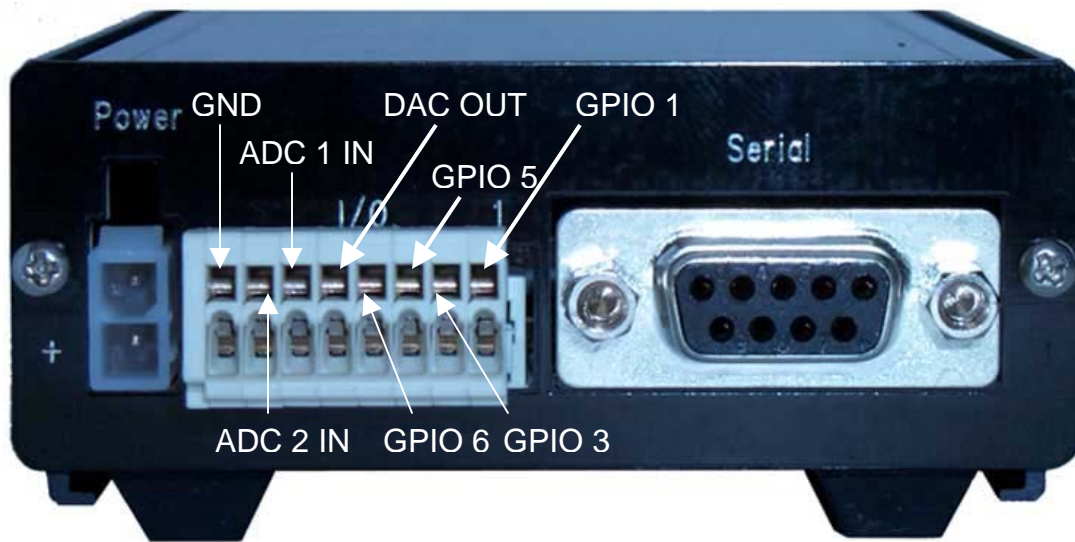The Wago connector is attached to the SA as shown in Figure 9.

Figure 9: Wago I/O Connector Attachment

The insertion of a bare wire in the Wago I/O connector is shown in Figure 10.

Figure 10: Wago Connector Wire Insertion

The I/O pin configuration is provided in Figure 11.

Figure 11: GPIO Pin Configuration

Five general-purpose signals (GPIO1, GPIO3, GPIO5, and GPIO6) are provided. One (1) DAC output (DAC OUT), two (2) Analog Inputs (ADC 1 IN & ADC 2 IN) and a ground PIN (GND). The GPIO signals may be selected as inputs or outputs. The IO characteristics are provided in Table 3:

I/O Lines	Parameter/Conditions	MIN	TYP	MAX	UNIT
V_{IL}	Input Voltage – Low	-0.5		0.9	Vdc
V_{IH}	Input Voltage – High	2.0		14.0	Vdc
V_{OL}	Output Voltage – Low			0.65	Vdc
V_{OH}	Output Voltage – High	2.4		3.0	Vdc
	The output driver can source 2 mA and is in series with 1220 ohm. Therefore, it can only generate the specified output voltage into an open circuit				
I_{IL} / I_{IH}	Input Leakage Current	-1		1	µA

Digital-To-Analog Output	Parameter/Conditions	MIN UNIT	TYP	MAX	
DAC_{BRES}	DAC Binary Resolution		10		Bits
T_S	Settling Time		10		µS
V_{OMAX}	Output Voltage w/Code Maximum	2.0	2.2	2.4	Vdc
V_{OMIN}	Output Voltage w/Code Minimum	0.18	0.24	0.3	Vdc

Analog-To-Digital Input	Parameter/Conditions	MIN	TYP	MAX	UNIT
ADC_{BRES}	ADC Binary Resolution Scale factor is 0.02. A reading of 250 = 5 V.		10		Bits
V_{ADC}	ADC Range (±5%)	1		25	Vdc
Z_{ADC}	ADC Input Impedance	55			kΩ

Table 3: SA-G GPIO Characteristics

4.3 LED Functions

The GSM1208 SA-G modem has two LED's on the front panel.

PWR: Indicates power to the modem. Solid when the modem is turned on.

REG: Indicates GSM network registration status. Flashing when attempting to register on a GSM network. Solid when the modem is registered with a GSM network.

4.4   Mounting the GSM/GPRS Spider SA

The GSM1208 SA-G includes a mounting bracket for remote installation

The bracket should be used as a template to mark screw holes for installation. See Figure 12: GSM1208 SA-G Mounting Bracket (attached). The mounting holes are designed for a number 10 screw. Once mounting holes have been located for placement, the mounting plate can be easily broken into two parts as demonstrated in Figure 13: GSM1208 SA-G Mounting Bracket (separated). Each piece of the bracket can now be inserted at the ends of the unit as demonstrated in Figure 14: GSM1208 SA-G Bracket Installation and Figure 15: GSM1208 SA-G Mounting Bracket (ready to mount).

Figure 12: GSM1208 SA-G Mounting Bracket (attached)

Figure 13: GSM1208 SA-G Mounting Bracket (separated)

Figure 14: GSM1208 SA-G Bracket Installation

Figure 15: GSM1208 SA-G Mounting Bracket (ready to mount)
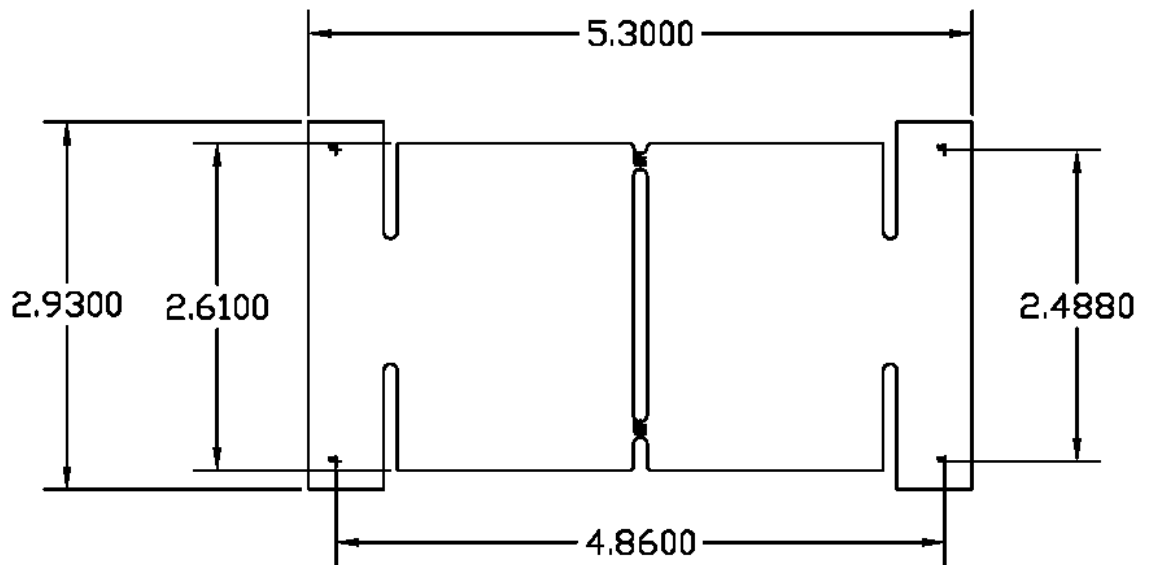

Figure 16: Mounting Bracket Dimensions

5 Frequently Asked Questions (FAQ)

Q. How do I configure a PPP connection for the Windows 98?
A. Refer to "*GSM0000AN001 - Enabler-G PPP Configuration for Windows 98*" application note for details.

Q. How do I configure a PPP connection for Windows 2000?
A. Refer to the "*GSM0000AN002 - Enabler-G PPP Configuration for Windows 2000*" application note for details.

Q. How do I send and receive data and voice calls to/from a remote host?
A. Refer to "*GSM0000AN003 - Enabler-G Data Circuit Switched Call Configuration and Use*" application note for details.

Q. How do I send and receive SMS messages?
A. Refer to "*GSM0000AN004 - Enabler-G SMS Configuration and Use*" application note for details.

Q. How do I automate GSM/GPRS network connectivity on the SA-G?
A. Refer to the "*GSM0000AN005 - Enabler-G Automated Network Connection Configuration and Use*" application note for details.

Q. How do I query modem status parameters?
A. Refer to "*GSM0000AN006 - Enabler-G Module Status Query*" application note for details.

Q. How can I set detailed status reporting?
A. Refer to the "*GSM0000AN007 - Enabler-G Status Reporting*" application note for details.

Q. How do I configure a PPP connection for Windows XP?
A. Refer to the "*GSM0000AN008 - Enabler-G PPP Configuration for Windows XP*" application note for details.

Q. How can I use the Dynamic IP reporting feature on the SA-G?
A. Refer to the "*GSM0000AN009 - Dynamic IP Assignment Support*" application note for details.

Q. How do I configure a PPP connection for PocketPC 2002?
A. Refer to the "*GSM0000AN0010 - Enabler-G PPP Configuration for PocketPC 2002*" application note for details.

Q. How can I use the UDP Packet Assembler/Disassembler feature on the SA-G?
A. Refer to the "*GSM0000AN011 - PAD Configuration and Use*" application note for details.

Q. How do I configure transparent or non-transparent access using PAD on the SA-G?
A. Refer to the "*GSM0000AN012 - Network Transparency Configuration for PAD*" application note for details.

Q. How do I configure different sleep modes on the SA-G?
A. Refer to the "*GSM0000AN013 - Enabler-G Sleep Mode Configuration and Use*" application note for details.

Q. How do I configure the SA-G for PPP API access without having network connectivity?
A. Refer to the "*GSM0000AN014 - Anytime PPP API Access*" application note for details.

6 Tech Support

For problems stemming from your network access, contact your GSM/GPRS carrier service. For technical support and customer service dealing with the modem itself, contact the company where you purchased the product. If you purchased the product directly from Enfora, visit the SUPPORT page on the Enfora website: http://www.enfora.com.