oMG

oMG 2000 Installation Guide

SIERRA WIRELESS®

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Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless modem are used in a normal manner with a well-constructed network, the Sierra Wireless modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless modem, or for failure of the Sierra Wireless modem to transmit or receive such data.oMG 2000 Installation Guide

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Do not operate the Sierra Wireless modem in any aircraft, whether the aircraft is on the ground or in flight. In aircraft, the Sierra Wireless modem **MUST BE POWERED OFF**. When operating, the Sierra Wireless modem can transmit signals that could interfere with various onboard systems.

Note: Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Sierra Wireless modems may be used at this time.

The driver or operator of any vehicle should not operate the Sierra Wireless modem while in control of a vehicle. Doing so will detract from the driver or operator's control and operation of that vehicle. In some states and provinces, operating such communications devices while in control of a vehicle is an offence.

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Revision History

Revision number	Release date	Changes
1	May 2016	Imported content from oMG-ED-121010 r1.5 Added shielded cable recommendation in Rear Panel on page 7.

Contents

1: Overview

This document provides installation and testing instructions for the Four Port oMG, also known as the oMG 2000. For the remainder of this document, the unit will be referred to as the oMG.

1.1 Who Should Read This Guide

Installing and testing an oMG system is a two-stage process that typically involves:

- A professional installer with experience in automotive security, communications, or audio systems who performs the physical installation in a vehicle.
- An information technology (IT) specialist who performs the turn-up test of the installed system.

1.2 What is the oMG

The Four Port oMG is a ruggedized edge server computer and wireless gateway, designed for use in harsh mobile and portable environments. The gateway extends the utility and convenience of LAN networking to vehicular environments and response sites. Through the integration of Ethernet, 802.11/Wi-Fi, third generation (3G) cellular networks and fourth generation (4G) LTE networks, the Gateway is a truly mobile solution.

1.3 Before Installing

This manual assumes that the appropriate wide area network (WAN) interface card is already installed in the oMG base unit and that your cellular network provider has activated the card.

In most cases, the WAN interface card is already present when you purchase the system. If you need to install this card yourself, refer to one of the oMG modem installation guides, available at source.sierrawireless.com.

1.4 Installation Overview

The oMG can be installed in any type of vehicle. Sierra Wireless has designed the oMG system to be simple to install. The system is preconfigured with the appropriate software and firmware—no software installation or setup is required.

To install the oMG system, you need to mount the base unit and the WAN antenna and connect the base unit to a 12V DC or 24V DC power source.

Sierra Wireless recommends that a professional vehicle electronics installer, perform the installation. Professional installers are better able to tailor the procedure to meet the specific requirements for each vehicle.

Note: An experienced installer typically completes a standard installation in approximately half an hour.

1.5 Related Publications

Table 1-1: Related Publications

Title and Publication Number	Description
oMG Operation and Configuration Guide	Provides basic operating instructions and describes how to change the system configuration with the web-based local configuration interface.
SIM Card Installation Guide	Provides directions on installing SIM cards into the oMG.
oMG 2000 Series Antenna Connections	Descriptions all of the variations of the oMG 2000 series back plane layouts.

2: System Description

This section identifies the system components and describes the external interfaces of the system.

2.1 System Components

Figure 2-1 shows the typical components of the oMG system including the oMG itself, the power cord, and the WAN/GPS/WLAN antenna:

Figure 2-1: Typical oMG system components

The base unit contains the CPU, hard drive, and communication interface cards. On the outside of the unit are the LAN and WAN ports, a GPS port, the power connector, the power reset switch, and the status LEDs.

The power cord typically connects to the electrical system of the vehicle.

Various types of WAN antennas are available. The pad type in Figure 2-1 is the most common and attaches to the roof of the vehicle.

2.2 External Interfaces and Connectors

The external interfaces of the system consist primarily of the connectors and controls on the rear panel plus the status indicators on the top of the case.

2.2.1 Rear Panel

Figure 2-2 and Figure 2-3 below show the typical external interfaces and connectors on the rear panel of the base unit. Note that there are different build options and configurations for the oMG 2000 and your unit may not look exactly like these.

WAN connectivity (i.e. antenna ports that the oMG uses to access a WAN) can be provided by a pair of TNC ports labeled WAN1 and WAN2 as shown in Figure 2-2, or through RP-SMA connectors labeled WAN1-A/B and WAN2-A/B as shown in Figure 2-3.

Special Note: For best performance, please use shielded Ethernet RJ-45 cables for all installations that require LAN and WAN port cable connectivity.

Figure 2-2: Variation 1—TNC Ports for WAN Antennas

Figure 2-3: Variation 2—RP-SMA Ports for WAN Antennas

Table 2-1 describes each of the controls and connectors on the oMG.

Table 2-1: Rear Panel Controls and Connectors

POWER ON/OFF	The power switch has multiple functions: • To turn the unit on when the auto-on function is disabled. • To turn the unit off when auto-on function is disabled or power cycle the unit when the auto-on function is enabled. • To restore the system to factory defaults: Press and hold the button for 8 seconds while the unit is on (i.e. the yellow LED is on solid). The main purpose of a factory reset is to recover from any configuration conflict that has resulted in locking out the LAN or Wi Fi interface.
GPS	SMA connector to connect an antenna interface for the internal GPS module.
WAN/LAN Antenna Connections Variation 1	• WAN1, WAN2: TNC connector for a WAN antenna. Up to two WAN antenna interfaces are supported using these two WAN connectors. The default configuration uses only WAN1. • ANT1, ANT2: Used to connect WiFi Wide Area Network (Wi-Fi WAN) antenna interfaces. Use ANT1 for non-MIMO applications and ANT1 and ANT2 for MIMO applications. • ANT3, ANT4, ANT5: Used to connect other types of wireless antenna when additional radios are installed. • LAN1: RP SMA jacks for connecting up to two Wireless Local Area Network (WLAN) antenna interfaces. Can be individually configured as a LAN or WAN connection. In the default configuration, LAN1 is used for Wireless LAN where oMG acts as a DHCP server.

Table 2-1: Rear Panel Controls and Connectors (Continued)

WAN/LAN Antenna Connections Variation 2	• WAN1-A/B, WAN2-A/B: RP-SMA Connectors for primary and secondary Wi Fi connectivity, each supporting MIMO • WAN3-A/B: Used for Wi Fi WAN • WAN4-A/B: Used for USB/Express Pocket Cellular • LAN1-A/B: Used for Wi Fi LAN for connecting up to two Wireless Local Area Network (WLAN) antenna interfaces.
ETH 1, 2, 3, and 4	RJ45 ports 10/100 Base-T Ethernet connections. Can individually be configured as a LAN or WAN connection. Default configuration: the oMG acts as a DHCP server. The oMG ETH1, ETH2, and ETH3 ports are configured by default to be LAN ports. ETH4 is configured by default as a WAN port. Connector type: RJ45.
RS232	DB9 DTE serial interface which can be configured for various applications. In the default configuration, the detailed system log is output to this interface for troubleshooting purposes. Default setting: 115,200 bps, 8 bits, no parity.
USB	The system supports two type-A, Universal Serial Bus (USB) 1.1/2.0 ports. The default configuration is disabled.
POWER	Self locking 3-pin 12-Volt DC, 2.7 Amp power connector. The connector on the power cable is keyed for alignment and has a sleeve that can be tightened to prevent accidental disconnection.

2.2.2 Status Indicators

The oMG base unit has three external LEDs that indicate system status. These are located on the front-left corner of the top of the case, adjacent to the logo. Figure 2-4 shows these indicators.

Figure 2-4: Status Indicators

Table 2-2 describes the status LEDs and how to interpret them.

Table 2-2: Description of status indicator LEDs

LED			
Label	**Color**	**Behavior**	**Indicates**
Power	Amber	Off	oMG is not powered or is in sleep mode
		Slow flashing (One per second)	Powering up
		On solid	oMG is fully powered up
		Rapid flashing (Four per second)	Shut down sequence started
Status	Green	Off	oMG is not on or is initializing
		Rapid flashing (Four per second)	Searching for network connection
		Three rapid flashes, then off for one second (repeating)	Software update is in progress. (DO NOT REBOOT OR POWER DOWN THE oMG)
		On solid	Network connection is up and normal
		Slow flashing (One per second)	Error status: either no card or network settings are incorrect
External	Red	Off	Normal operation
		On for two seconds, then off (repeating)	Initial power connection made
		Two flashes per second	The unit is shutting down due to a temperature or voltage problem
		Slow flashing (One per second)	Temperature is out of range
		Rapid flashing (Four per second)	Voltage is out of range (e.g. power has been applied, but ignition has not been detected)
		Solid (with Green flashing)	BIOS is being updated. (DO NOT REBOOT OR POWER DOWN THE oMG)
	All three	Rapid flashing (Four per second)	Failed reboot multiple times, contact Sierra Wireless Technical Support (see Contact Information on page 3).

3: Installing the oMG System in a Vehicle

This section describes the procedure for installing the system and provides important considerations and specific details where appropriate.

3.1 Basic Procedure

The installation process for the oMG system varies depending on the specific application. The basic procedure includes the following steps:

1. Mount the base unit.
2. Mount the antenna.
3. Attach the power cord to the appropriate electrical system wiring of the vehicle.

3.2 Installation Details

Before you perform the installation, carefully read the details in this section.

3.2.1 Proper Handling

The base system is a ruggedized computer. However, as with any electronic equipment, proper handling is required and can be achieved using these guidelines:

- If you are not an experienced installer, first obtain training in safe procedures for electrical wiring in vehicles.
- Ensure that the power source is off during installation.
- Do not subject the system to environmental hazards such as shock, excessive vibration, or wetness during or after installation.

3.2.2 Base Unit Location and Clearances

You can mount the base unit under the deck lid or on the floorboard of the equipment storage of the vehicle. To select a mounting location, consider the following requirements:

- The location must accommodate the size of the unit and the positions of the mounting tabs; see Figure 3-1 on page 12 and Figure 3-2 on page 13.
- Allow sufficient clearance space on both ends of the base unit and above the base unit to let you connect the various components and perform other maintenance tasks. The minimum clearance is 3.5 in. (9 cm).
- Position the base unit to avoid damage when other items are placed into or removed from the equipment storage.
- Allow a distance of at least 7.9 in. (20 cm) between the WLAN and WAN antennas and any person during normal operation.

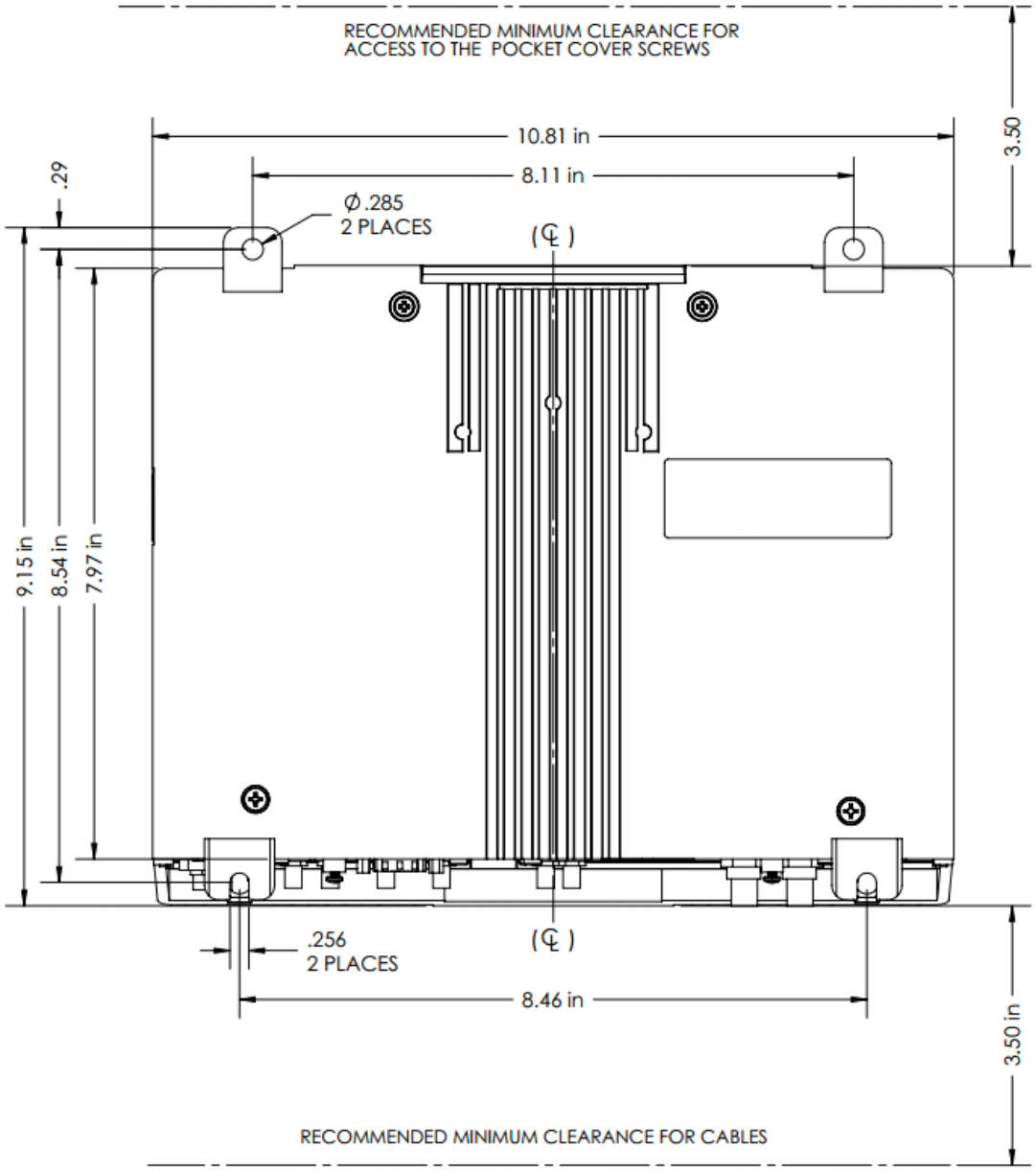

Figure 3-1: Base Unit Bottom View—Dimensions and Clearances

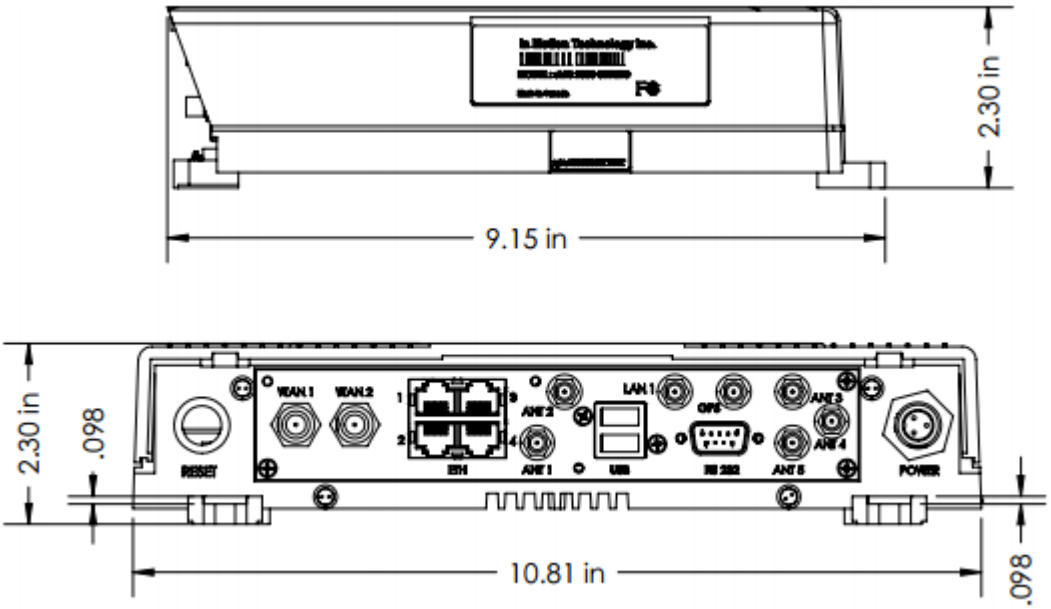

Figure 3-2: Base Unit Side View—Dimensions

3.2.3 Base Unit Orientation

Install the base unit so that the rear panel faces away from the equipment storage opening. This provides the most protection to the cable connections and any antennas on the rear panel.

In a typical installation, the system powers on automatically when the vehicle ignition switch is on, and shuts down automatically when the ignition switch is off. Therefore, you do not normally use the Power Reset button on the rear panel in such an installation. If you need to perform a manual power up or power down, the clearances specified in Base Unit Location and Clearances on page 11 will ensure adequate access to the power button.

3.2.4 Power Connection

The oMG system requires a 12V DC or 24V DC power source. In most installations, you use one of the following sources:

- The main battery of the vehicle; power to the oMG system is switched by the vehicle ignition switch.
- A separate 12V DC or 24V DC battery that powers other special equipment in the vehicle; power to the oMG system is switched by the master switch of this power system.

Note: In most contexts, this manual refers only to the case of connecting the system to the vehicle battery and switching power with the ignition switch. You can interpret this instead to mean the separate battery and its master switch.

While the vehicle ignition is off, the oMG system is in sleep mode and draws less than 2 mA in this mode. When the ignition is turned on, the system starts its power-up sequence. When the ignition is turned off again, the system performs its controlled shutdown sequence before it resumes its sleep mode.

Connect one end of the oMG power cord to the 12V DC or 24V DC power source and the other end to the POWER port on the rear panel of the base unit. The following subsections provide the details.

3.2.4.1 Connecting to the Power Source

Table 3-1 identifies the three wires in the oMG power cable.

Table 3-1: Wires in the Power Cord

Wire color	Purpose
Red	+V supply (12V/24VDC). This line induces a 2.5 A fuse.
Black	0 V return
White	Ignition switch (+12V/24V for operation, 0 V for standby)

When you connect the oMG power cord to the 12V/24V DC power source, ensure that the connection has the proper polarity. Connect to the power source as shown in Figure 3-3.

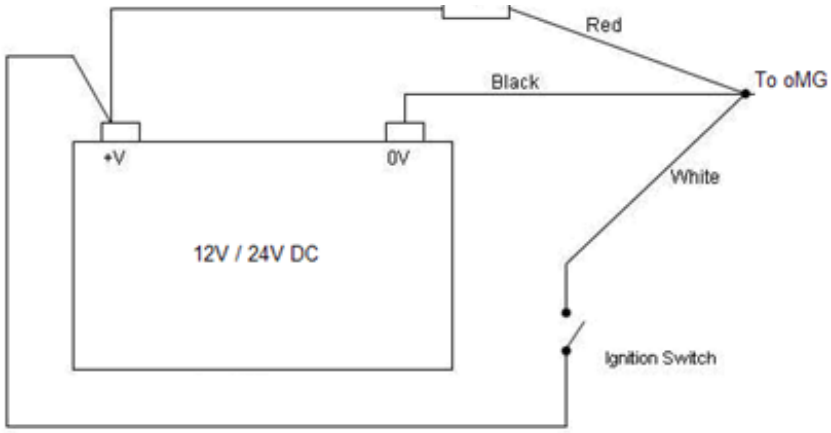

Figure 3-3: Electrical Connection

3.2.4.2 Connecting to the oMG Base Unit

Figure 3-4 shows the power port on the rear panel of the oMG base unit. To align the pins correctly, align the key on the power cord connector with the corresponding indentation on the port and fully insert the connector. Slide the plastic sleeve on the connector up over the port and turn it clockwise until it locks into place. This protects the power cord against accidental disconnection caused by the vibration of the vehicle.

Figure 3-4: Power port on the base unit

3.2.5 Cable Management and Best Practice

It is important for the installer to ensure the cables attached to the oMG are properly managed. Proper cable management will eliminate unnecessary installation complications, allow for ease of maintenance, and prolong cable longevity.

Complications as a result of undue handling of cables may void the unit's warranty. The installer must adhere to the following practices:

1. Label each cable that is attached to the oMG. For example: WAN Antenna 1, GPS, WiFi LAN, Ethernet to Device X.
2. Protect the cables using a proper cable conduit.
3. Secure each cable connected to the oMG via a permanent fixture as shown in Figure 3-5.

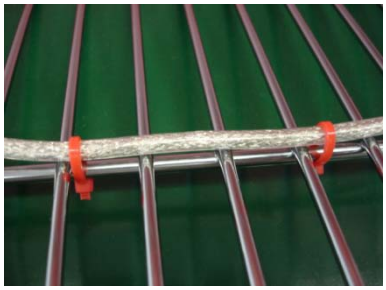

Figure 3-5: Example of Cable Stress Relief

4: Testing the oMG System after Installation

After completing the installation of the oMG system in a vehicle, perform the turn-up test described below to verify that the system operates properly. This procedure is typically performed by an IT specialist with experience in:

- TCP/IP
- Wi-Fi networks
- Cellular uplinks

1. Turn on the vehicle ignition and confirm that the base unit Power and Status LEDs are lit. For more information about interpreting the status indicators, see Status Indicators on page 9.
2. Use a Wi-Fi-equipped notebook computer to verify that the wireless local area network (WLAN) of the oMG system is available. Check for the availability of the SSID that your organization has set (if any), or for the default SSID (the oMG's serial number).
   - Example: Verify presence of WLAN with Windows

     In the Windows system, click the Wireless Network Connection icon in the taskbar notification area. When the Wireless Network Connection window appears, check that the SSID that you expect is in the Choose a wireless network list.
3. Connect to the oMG network from your notebook computer.
4. Verify that the oMG system is operational in one or more of the following ways:
   a. Check the TCP/IP configuration of your computer (e.g. in Windows, use the `ipconfig` command in a command-line window). The IP address of your computer has been set to 172.22.0.x, where x is in the range of 100 to 200.
   b. Ping the default gateway, which is 172.22.0.1.
   c. With a web browser, browse to the Local Configuration Interface (LCI) of the oMG system at the following URL: http://welcome.to.inmotion/MG-LCI
5. Verify that you can access the Internet:
   a. Browse to a reliable website using a web browser.
   b. Access your e-mail service using your e-mail client.
   c. Use an application that your organization provides in order to access the network of your organization. For example, establish a virtual private network (VPN) connection to your organization.

Note: If you have a problem with any of these steps, contact Sierra Wireless Technical Support (see Contact Information on page 3).