oMG 500 Installation Guide

oMG

oMG-ED-130507
1.2
October 2, 2015

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.

Safety and Hazards

Do not operate the Sierra Wireless modem in areas where cellular modems are not advised without proper device certifications. These areas include environments where cellular radio can interfere such as explosive atmospheres, medical equipment, or any other equipment which may be susceptible to any form of radio interference. The Sierra Wireless modem can transmit signals that could interfere with this equipment.

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.

Limitations of Liability

This manual is provided "as is". Sierra Wireless makes no warranties of any kind, either expressed or implied, including any implied warranties of merchantability, fitness for a particular purpose, or noninfringement. The recipient of the manual shall endorse all risks arising from its use.

The information in this manual is subject to change without notice and does not represent a commitment on the part of Sierra Wireless. SIERRA WIRELESS AND ITS AFFILIATES SPECIFICALLY DISCLAIM LIABILITY FOR ANY AND ALL DIRECT, INDIRECT, SPECIAL, GENERAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFITS OR REVENUE OR ANTICIPATED PROFITS OR REVENUE ARISING OUT OF THE USE OR INABILITY TO USE ANY SIERRA WIRELESS PRODUCT, EVEN IF SIERRA WIRELESS AND/OR ITS AFFILIATES HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR THEY ARE FORESEEABLE OR FOR CLAIMS BY ANY THIRD PARTY.

Notwithstanding the foregoing, in no event shall Sierra Wireless and/or its affiliates aggregate liability arising under or in connection with the Sierra Wireless product, regardless of the number of events, occurrences, or claims giving rise to liability, be in excess of the price paid by the purchaser for the Sierra Wireless product.

Customer understands that Sierra Wireless is not providing cellular or GPS (including A-GPS) services. These services are provided by a third party and should be purchased directly by the Customer.

SPECIFIC DISCLAIMERS OF LIABILITY: CUSTOMER RECOGNIZES AND ACKNOWLEDGES SIERRA WIRELESS IS NOT RESPONSIBLE FOR AND SHALL NOT BE HELD LIABLE FOR ANY DEFECT OR DEFICIENCY OF ANY KIND OF CELLULAR OR GPS (INCLUDING A-GPS) SERVICES.

Patents

This product may contain technology developed by or for Sierra Wireless Inc.

This product may include technology licensed from QUALCOMM®.

This product is manufactured or sold by Sierra Wireless Inc. or its affiliates under one or more patents licensed from InterDigital Group and MMP Portfolio Licensing.

Copyright

Trademarks

Sierra Wireless®, AirPrime®, AirLink®, AirVantage®, WISMO® and the Sierra Wireless and Open AT logos are registered trademarks of Sierra Wireless, Inc. or one of its subsidiaries.

Windows® and Windows Vista® are registered trademarks of Microsoft Corporation.

Macintosh® and Mac OS X® are registered trademarks of Apple Inc., registered in the U.S. and other countries.

QUALCOMM® is a registered trademark of QUALCOMM Incorporated. Used under license.

Other trademarks are the property of their respective owners.

Contact Information

Sales Desk:	Phone:	1-604-232-1488
	Hours:	8:00 AM to 5:00 PM Pacific Time
	Contact:	http://www.sierrawireless.com/sales
Post:	Sierra Wireless 13811 Wireless Way Richmond, BC Canada V6V 3A4	
Technical Support:	Hours:	6:30 AM to 4:30 PM Pacific Time
	Email:	imt-support@sierrawireless.com
	Phone:	1-866-468-2968
	KBase:	http://imt-kbase.sierrawireless.com/
Web:	http://www.sierrawireless.com/	

Consult our website for up-to-date product descriptions, documentation, application notes, firmware upgrades, troubleshooting tips, and press releases: www.sierrawireless.com

Document History

Version	Date	Updates
1.2	October 2, 2015	Enhanced LED blink pattern table
1.1	February 27, 2015	Updated to SWI Template.

Contents

List of Figures

List of Tables

1. Introduction

This document provides installation and testing instructions for the oMG 500.

1.1. Who Should Read This Guide

Installing and testing an oMG 500 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 500

The oMG 500 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 an activated cellular SIM Card has been installed as per the instructions in the oMG 500 Quick Set-up Guide (see Section 1.5 - Related Publications below).

1.4. Installation Overview

The oMG 500 can be installed in any type of vehicle. Sierra Wireless has designed the oMG system to be simple to install.

To install the oMG 500, 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.

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

1.5. Related Publications

Title and Publication Number	Description
oMG-ED-130504 oMG 500 Quick Set-Up Guide	Describes how to quickly setup the oMG 2000 for basic operation
oMG-ED-121006 oMG Operation and Configuration Guide for R3	Provides basic operating instructions and describes how to change the system configuration with the web-based local craft interface.

Title and Publication Number	Description
oMG-ED-120202 SIM Card Installation Guide	Describes how to install SIM cards required when embedded cellular modems are used

2. System Description

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

2.1. System Components

The images below show the typical system components of the oMG 500.

Figure 1 - oMG 500

Figure 2 - Power Cable

Figure 3 - Multi-radio External Antenna

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 the figure 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 4 shows the external interfaces and connectors on the rear panel of the base unit.

Note: there are different build options and configurations for the oMG 500 and your unit may not look exactly like this. For a full reference of all build options see the Sierra Wireless Knowledgebase.

Figure 4 - Rear Panel Connectors

Table 1 describes each of these controls and connectors.

Table 1 - Rear Panel Controls and Connectors

Label	Description
RESET	The primary function of the Rest button is to trigger the oMG 500 to reboot its operating system which may be necessary from time to time following configuration changes or when troubleshooting operational issues. It can also be used to initiate a factory reset of the oMG 500's configuration by pressing and holding the button for 30 seconds when it is powered-on. Finally, the oMG 500 can be configured so that it does not automatically start when power is applied. When this option is enabled, the user must manually start the oMG 500 by pressing this button.
WAN1-A, WAN1-B	RP SMA connector for attaching the external antenna to the primary WAN Interface. For signal diversity with LTE and 802.11n, both connections are required.
WAN2-A, WAN2-B	RP SMA connector for attaching the external antenna to the optionally-ordered secondary WAN interface. For signal diversity with LTE and 802.11n, both connections are required.

Label	Description
ETH 1, 2, 3, and 4	RJ45 ports 10/100 Base-T Ethernet connections. Each port can be individually configured as either a LAN or WAN connection. Default configuration: ETH 1 to 3 are configured as LAN ports. ETH4 is configured as a WAN port.
USB	The system supports two type-A, Universal Serial Bus (USB) 1.1/2.0 ports for supporting external accessory interfaces such as Bluetooth and USB-to-Serial.
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.
GPS	SMA connector to connect an antenna interface for the internal GPS module.
LAN1-A LAN1-B	RP SMA jacks for connecting an antenna to the Wireless Local Area Network (WLAN). Antennas can be externally mounted to improve signal strength for devices used outside of the vehicle. For signal diversity with 802.11n, both connections are required.
POWER	Self-locking three-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 500 has three external LEDs that indicate system status. These are located on the front-left corner of the top of the case. Figure 5 shows these indicators.

Figure 5 - Status Indicators

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

Table 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

LED			
		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, call Support.

3. Installing the oMG in a Vehicle

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

3.1. Basic Procedure

The installation process for the oMG 500 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 6 and Figure 7.
- 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. (20cm) between the WLAN and WAN antennas and any person during normal operation.

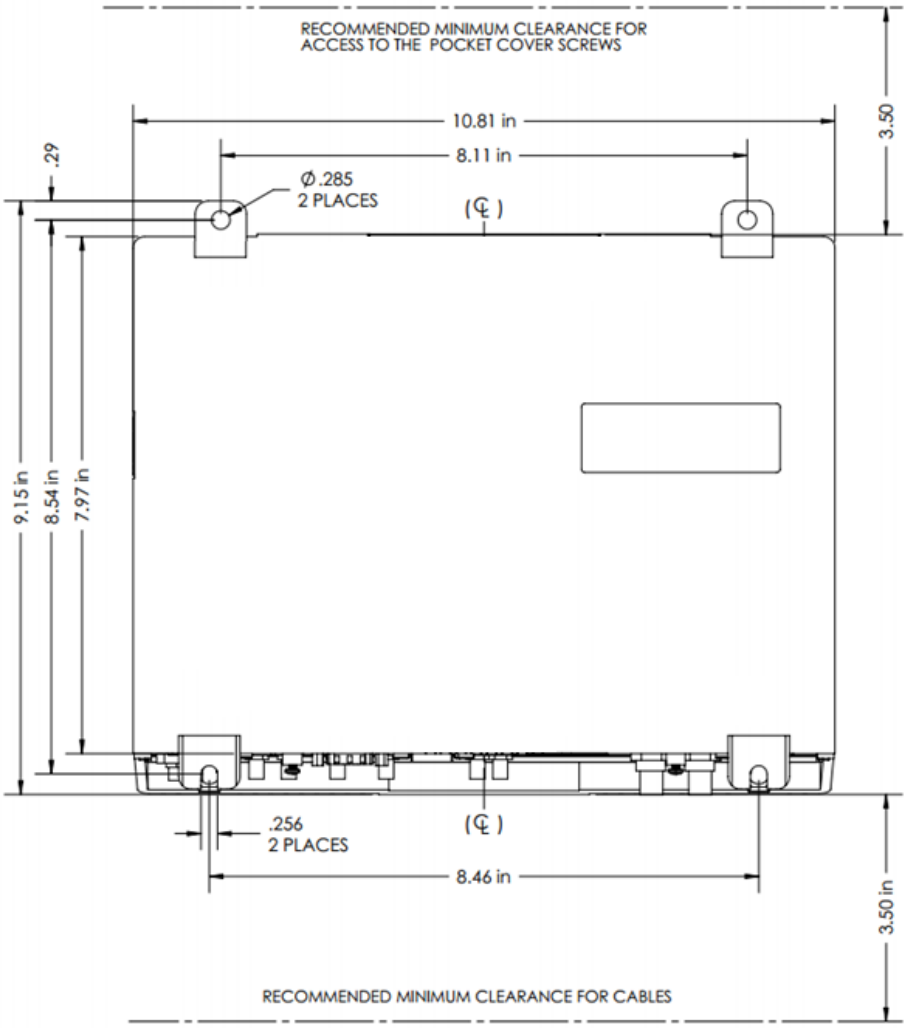

Figure 6 - Bottom View—Dimensions and Clearance

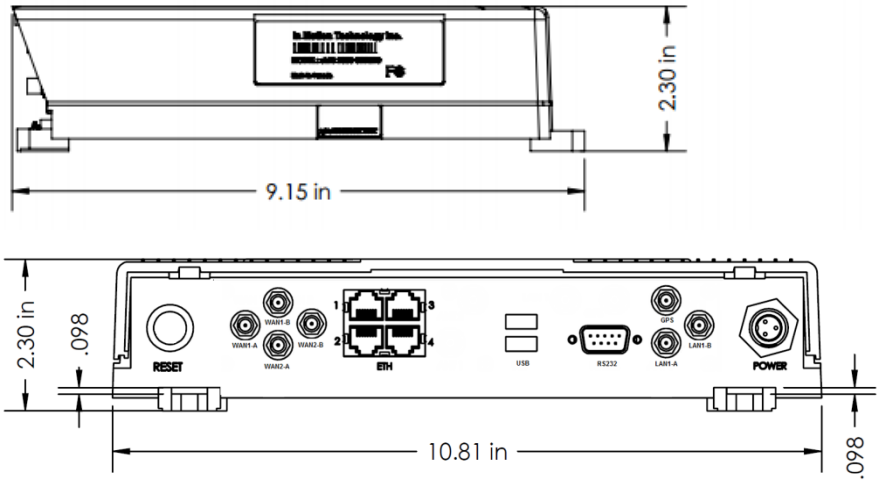

Figure 7 - Side View—Dimensions

3.2.3. Orientation

Install the oMG 500 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 Section 3.2.2 will ensure adequate access to the power button.

Note: *If the oMG 500 will be mounted on a vertical surface, it must be mounted with the antenna connectors facing down or to the side and not facing up.*

3.2.4. Power Connection

The oMG 500 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 500 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 500 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 500 is in sleep mode and draws less than 2 mA of current. 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 500 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 identifies the three wires in the oMG 500 power cable.

Table 3 - Wires in the Power Cord

Wire Color	Purpose
Red	+V supply (12V/24V DC). This line includes 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 500 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 below.

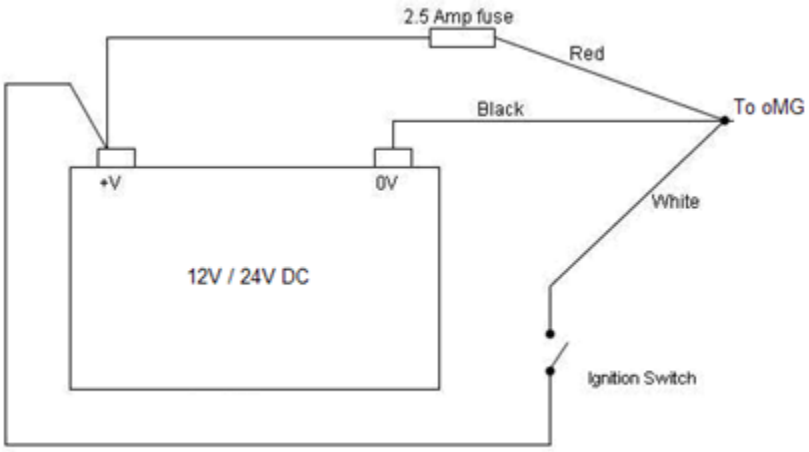

Figure 8 - Electrical Connection

3.2.4.2. Connecting to the oMG 500

Figure 9 shows the power port on the rear panel of the oMG 500. 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.

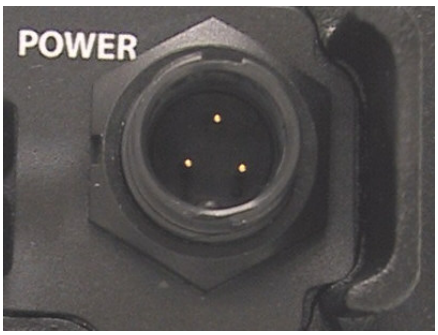

Figure 9 - Power port on the Base Unit

3.2.5. Cable Management and Best Practice

It is important for the installer to ensure the cables attached to the oMG 500 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&2, GPS, WiFi LAN, Ethernet to Device X.
2. Protect the cables using a cable conduit.
3. Secure each cable connected to the oMG via a permanent fixture as shown in Figure 10.

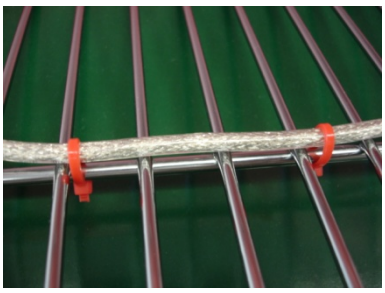

Figure 10 - Example of Cable Stress Relief

4. TESTING THE OMG SYSTEM AFTER INSTALLATION

After completing the installation of the oMG 500 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 Section 2.2.2.
2. Use a Wi-Fi-equipped notebook computer to verify that the wireless local area network (WLAN) of the oMG 500 is broadcasting. The default SSID will be the oMG 500s 12-digit Electronic Serial Number or ESN (e.g. J140112J1234) and there will be no password.
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. on Windows, use the *ipconfig* command in a command-line window). The IP address of your computer should be 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. With a web browser, browse to a reliable website.
   b. With your e-mail client, access your e-mail service.
   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 IMS Support.