

# OVMS

## Open Vehicle Monitoring System



[www.openvehicles.com](http://www.openvehicles.com)

**Tesla Roadster (v1.x and v2.x)  
Guide v1.2.3 (7<sup>th</sup> May 2012)**

## **History**

V1.2.3	7 <sup>th</sup> May 2012	Reorganization to be more install-time linear
v1.2.2	1 <sup>st</sup> Apr 2012	Updates to match v1.2.2 car firmware
v1.2	12 <sup>th</sup> Mar 2012	Updates to match v1.2 car firmware
v1.0	10 <sup>th</sup> Jan 2012	Initial version written

## Welcome

The OVMS (Open Vehicle Monitoring System) team is a group of enthusiasts who are developing a means to remotely communicate with our cars, and are having fun while doing it.

The OVMS module is a low-cost hardware device that you install in your car simply by installing a SIM card, connecting the module to your car's CAN bus via your car's Diagnostic port connector, and positioning a cellular antenna. Once connected to the CAN bus, the OVMS module enables remote control and monitoring of your car.

There are two ways for you to communicate with the OVMS module:

1. Send text messages from a cell phone to the OVMS module's phone number. The module will respond back via text messaging. If you want, the OVMS module can also send text messages to you when the car reaches certain states.
2. Use a smartphone App. Both the OVMS module and the App communicate with an OVMS server via UDP/IP or TCP/IP over the Internet. The smartphone Apps provide a richer experience and more functionality, but they do require a data plan on the SIM card you purchase and install in the OVMS module.

Initial configuration of the OVMS module is done via SMS. Once configured, you can use either SMS and/or the cellphone Apps to communicate with the OVMS module.



### **Warning!**

*OVMS is a hobbyist project, not a commercial product. It was designed by enthusiasts for enthusiasts. Installation and use of this module requires some technical knowledge, and if you don't have that we recommend you contact other users in your area to ask for assistance.*

The OVMS module is continuously powered by the car, even when the car is off, but it uses very little power (especially compared to the Tesla Roadster's 53KWh battery pack).



### **Warning!**

*While the OVMS module uses extremely low power, it does continuously draw power from the car's battery, so it will contribute to 'vampire' power drains. Do not allow your car battery to reach 0% SOC, and if it does, plug in and charge the car as soon as possible. Failure to do this can result in unrecoverable failure of the car's battery.*

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## The OVMS Module



The OVMS module contains a low-power micro-controller control board and a GSM cellular modem. It plugs into the car's diagnostics port (from where it receives power and listens to the car's internal communications), and provides monitoring and control functions via either SMS messages or smartphone apps (over the Internet).

### Cellular Service and SIM card Choices

Prior to installation in the car, you will need to install a pre-activated full-size SIM card that uses a GSM cellular network in the OVMS module. The OVMS module only supports the GSM network, NOT the CDMA network nor iDEN. In the US, both AT&T and T-Mobile use GSM, and so are suitable. Note that Sprint, Verizon, MetroPCS, US Cellular, and Nextel in the US are NOT suitable. Most of Europe uses GSM.

If you only wish to use text message control, then you only need an SMS messaging plan. If you wish to use smartphone Apps to control the car (recommended), then you will need a GPRS data plan. Note that even if you plan to use smartphone App exclusively, you will need to send and receive several text messages during initial setup.

For typical App usage, we estimate that you will only need around 2MB a month for data usage, but that can vary by user. Note that if you enable the location streaming feature you will use more data. The smartphone Apps help you monitor your usage.

## OVMS Module Installation

### 1. Activating the SIM card

You will need to pre-activate the SIM card (usually by placing it in a normal cellular telephone and going through whatever steps your cellular provider requires to activate the service). You cannot activate the SIM card in the OVMS module. Make sure the SIM card is not Locked (aka PIN protected).

You should write down the telephone number that your cellular carrier has allocated to the SIM card. If you are using GPRS data you will also need the carrier's Cellular Network APN, Username and Password for GPRS service. Sometimes the Cellular Network Username and Password are not required, but that is carrier dependent.

### 2. Obtaining an OpenVehicles account

If you haven't done so already, visit <http://www.OpenVehicles.com> and register for a user account. This will be your OpenVehicle Username and OpenVehicle Password. If you intend to use Text Messaging only to communicate with the OVMS module, this step is not needed. It is needed for smartphone App access, which provides not only a more intuitive interface, but also enables more functionality.

### 3. Registering the Car's VehicleID and OVMS Server Password

Send an email to [info@OpenVehicles.com](mailto:info@OpenVehicles.com) that includes:

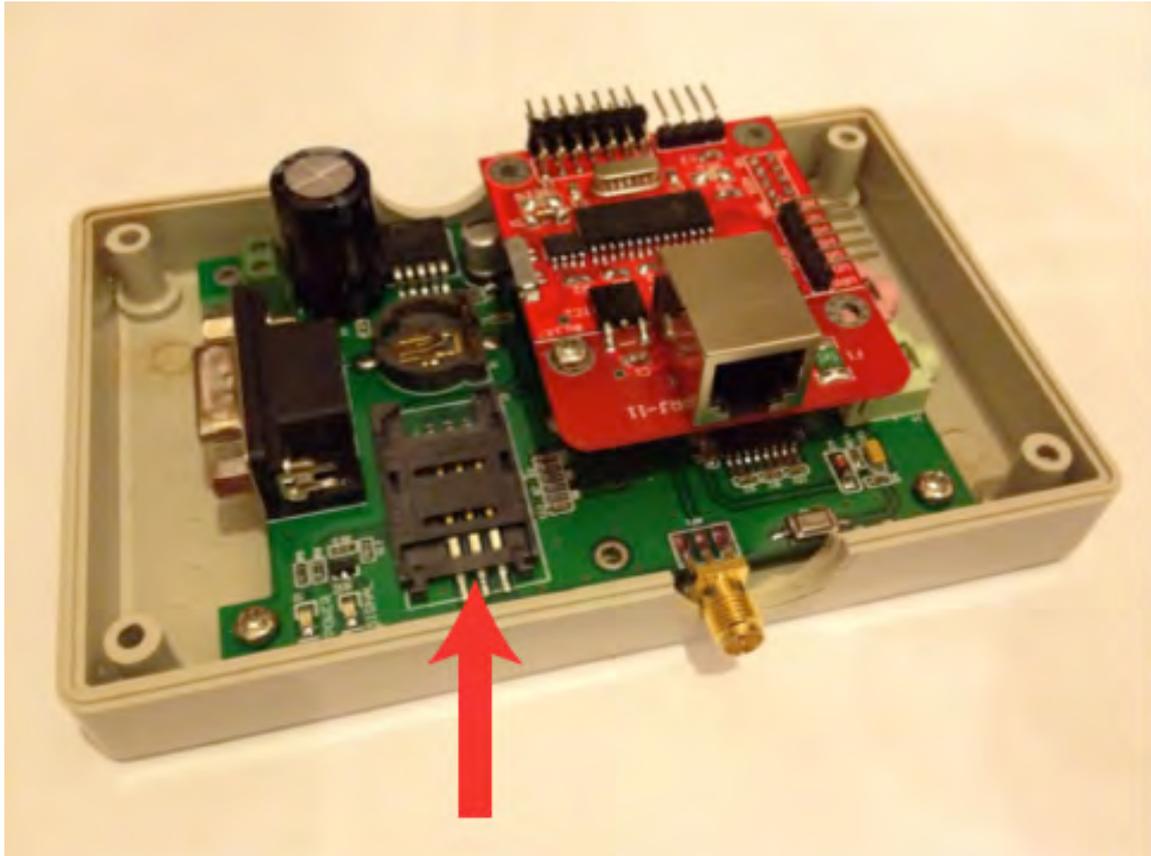
- a) Your OpenVehicle Username from Step 2, above.
- b) The VehicleID you want to use. For Tesla Roadsters, this is typically a country abbreviation followed by the last 4 digits of your car's VIN, for instance: **US1007**.
- c) The OVMS Server Password you want to use.

If you intend to use Text Messaging only to communicate with the OVMS module, this step is not needed. It is needed for smartphone App access.

### 4. Installing the SIM card

Before opening the OVMS module box, scribe a pencil mark across both halves. You will use this mark to ensure that you reassemble the box in the correct orientation (otherwise the LEDs won't be visible). Remove the four screws on the underside and open the two halves of the box.

The SIM card holder is located on the modem board, as indicated by the red arrow in the photo on the next page. Look closely at the holder to identify where the cut-off corner of the SIM card should go. Slide the plastic cover to open, slide the SIM card into the card slot, then slide back to secure it in place.



*OVMS in-car-module (some minor variation is expected amongst different versions)*

## 5. Enabling/Disabling GPRS Data access

The OVMS module includes a hardware switch that enables or disables the GPRS data mode, which is used by the smartphone Apps. The switch is on the main (top most and smaller) circuit board. See the yellow arrow in the photo at the top of the next page.

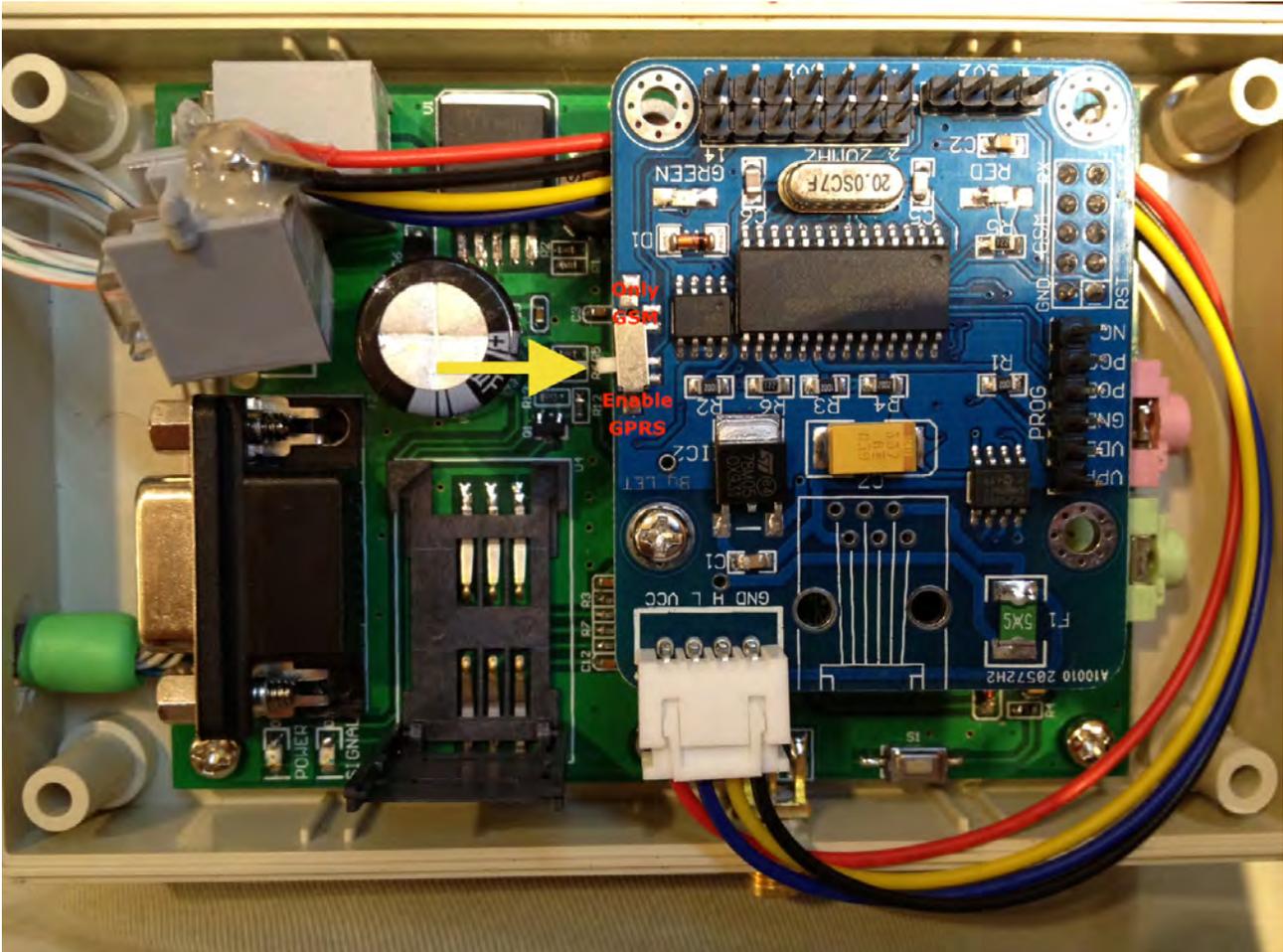
Sliding the switch towards the LED lights will disable GPRS data communication, limiting communication to SMS text messages. Sliding it towards the power connection will enable both smartphone app (GPRS data) and text message (GSM) modes.

If you will solely be using text messages to communicate with the OVMS module, then you should slide the switch to disable GPRS data communication. If you will be using a smartphone App, then make sure the switch is set to enable GPRS data communication.



### **Warning!**

*You should only enable GPRS data mode after you have registered your vehicle on an OVMS server (see [Step #3](#)). Once enabled, you should ensure that the module correctly connects to the server. Do not leave GPRS enabled without a correct server registration, or high data charges may result from the module's repeated failed attempts to connect to the server.*



*GSM Only / GPRS Enable Switch*

The switch is useful when diagnosing problems connecting to the OVMS server. If an incorrect Cellular Network APN/Username/Password combination has been entered, the OVMS module may not respond to text messages because it's trying to establish a GPRS data connection. The solution to this is to slide the switch to the GPRS data disable position. You can then fix the network settings via text messages. If the OVMS module is connected to the car, you must reboot the module after changing the switch position. This is done either by unplugging the module, waiting several seconds, and reconnecting, or by sending the SMS command "RESET" to the module

Now you can close the OVMS box, making sure to align the pencil marks you previously made, and tighten the four screws. Please take care not to over-tighten these screws, as they screw into plastic threads. We recommend that you loosen/tighten these screws manually - don't use a power screwdriver for this.

## **6. Connecting the GSM antenna**

The OVMS module comes with an adhesive-backed GSM antenna designed to provide excellent cellular service. It has a long cable to enable various placement options. The antenna has a center pin that inserts inside a hole in the exposed threads on the OVMS module box. Then tighten the locking nut – by hand should be fine. Be sure not to bend the center pin of the cable when installing.

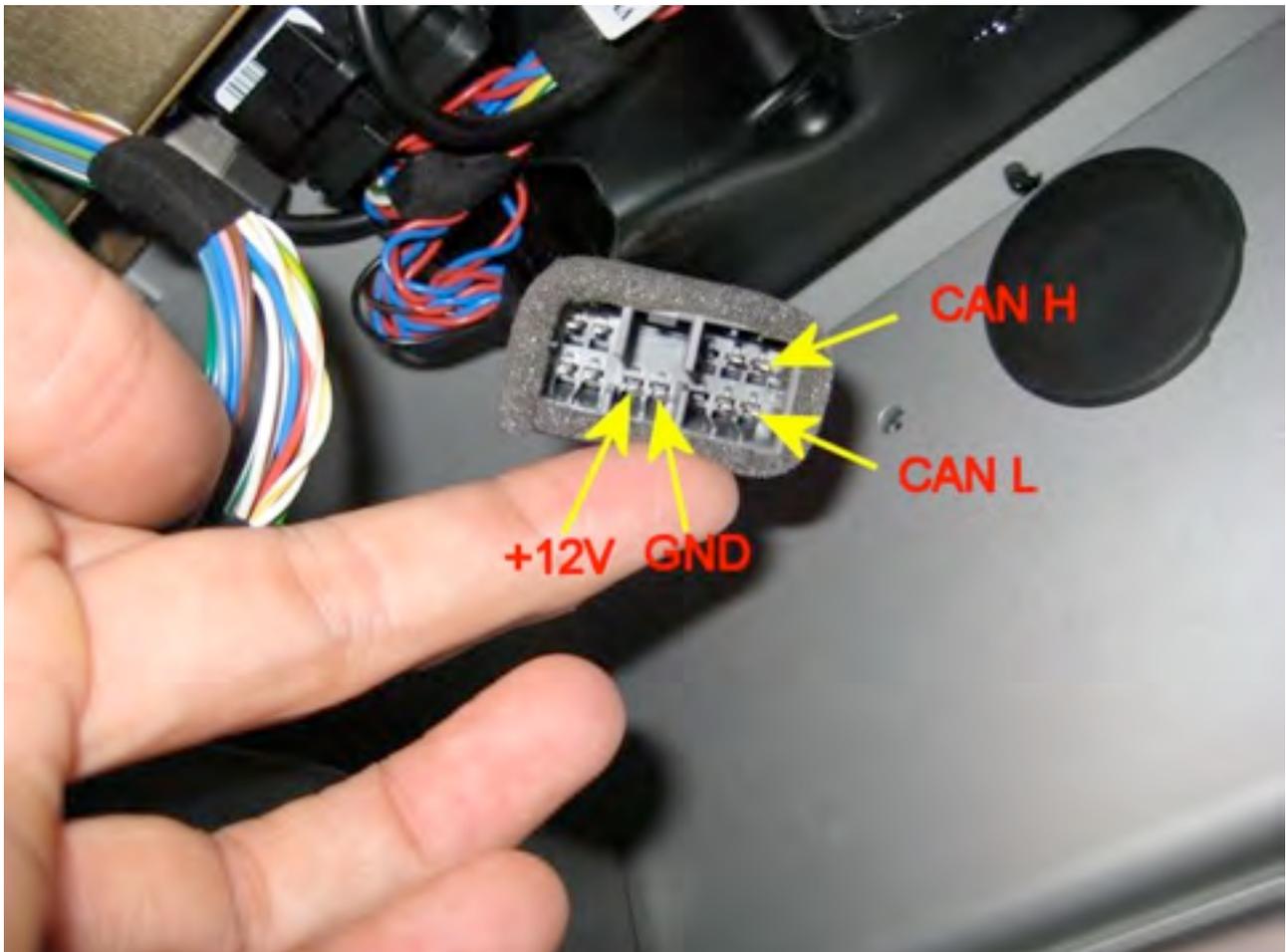
For now, lay the end of the antenna somewhere exposed so that it gets a good signal.

## 7. Connecting the OVMS module

The OVMS module has two LED lights. When the OVMS module is connected to the car, it will go through a start-up sequence, which is reported through its LED lights as follows:

- A) The RED light will come on solid for up to 2 seconds while the cellular modem is powering up.
- B) The RED light will flash quickly for 8-10 seconds while the modem is initializing.
- C) The RED and GREEN lights will slowly alternately blink (about a second apart) for up to 3 minutes while the modem looks for a cellular signal
- D) The GREEN light will turn on solid, and the RED light will turn off when a successful GSM cellular connection has been established.

The OVMS module is connected to your Roadster via the CAN bus diagnostic port connector, which is located in the passenger footwell. It is made of plastic that is wrapped in grey foam, as shown in the photo below. Typically, the connector is wedged into the front wall near the center console so it won't rattle. Pull the connector out and note the orientation of the pins, especially the void above the +12V and Ground pins.



*Tesla Roadster DIAG port connector*

It will be more convenient to leave the OVMS module on the floor for now so that you can monitor the LED light sequence when it is first connected.



**Warning!**

*If, when you plug the OVMS into the car, you see any interference to, or strange behaviour of, car systems – immediately unplug the module and contact Open Vehicles for assistance. Never leave a module connected in such circumstances.*

Ensure that the car is turned off (remove the key!), orient the OVMS module's connector to the car's connector appropriately, and slide them together until you feel/hear them snap into place.

You should immediately see the lights on the OVMS module go through States A through D, as defined above. When you eventually see a solid GREEN light, your OVMS Module is ready to receive and send Text Messages.

Note that if States A&B go into an infinite loop (A-B-A-B-A-B, etc.), that indicates that the cellular modem could not be initialized. See [Appendix D](#) for some steps to try if that happens to your OVMS.

At this point, check the car. Tap on the VDS in the centre console and make sure it turns on. Insert the key, turn on the car, and make sure everything works as expected. If you see any problems at all with the car, disconnect the OVMS module and contact [support@OpenVehicles.com](mailto:support@OpenVehicles.com) for assistance.

Suggestions for mounting the OVMS module, positioning the cellular antenna, and routing the wires are provided later in this document. The photo below shows an OVMS module connected to the CAN bus and mounted to the front wall:



*Position of the module in the passenger footwell*

## 8. Registering your cell phone with the OVMS Module

By registering a cell phone with OVMS, that phone can then send commands to the OVMS module without needing to supply the OVMS Module Password. For security purposes, to send commands from other cell phones (or any SMS send-capable device/website), you'll need to supply the OVMS Module Password.

For your convenience, we recommend creating an Address Book entry in your cell phone for your car using the phone number of the SIM card you installed. Give it a descriptive name. To register your cell phone with OVMS, send the following Text Message to the car, exactly as follows:

```
REGISTER OVMS
```

Note that "OVMS" is the default OVMS Module Password, and that the "REGISTER" command must be all uppercase.

If all is well, within a few seconds OVMS will Text Message you back with:

```
Your phone has been registered as the owner.
```

At this point, the telephone number of your phone has been registered and remembered by the OVMS module. You don't need the OVMS Module Password to talk to the car from this cell phone, as the car will use CallerID to recognize it.

## 9. Changing the OVMS Module Password

You should now change the default OVMS Module Password to one of your own choosing. Choose a password between 4 and 22 characters in length, with no spaces. The OVMS Module Password is case-sensitive. To set it, send a Text Message to the car from the registered cell phone, as follows:

```
PASS MYNEWPASSWORD
```

(obviously replacing MYNEWPASSWORD with the secret password of your choice)

If all is well, within a few seconds the car will Text Message you back with:

```
Your password has been changed.
```

At this point, you have Text Message monitoring of the car!

One useful command you can send to the car is:

```
STAT
```

This will result in OVMS sending you back a Text Message back with Charge Mode, Charge Status, Ideal Range, and SOC (Battery State of Charge).

Another command you can send is:

```
GPS
```

This will result in OVMS sending you back a Text Message back with a Google Maps link that will show you the location of the car.

If you want to send these commands from a different cell phone than the Registered phone, simply add the OVMS Module Password to the command, for instance:

```
STAT MYNEWPASSWORD  
GPS MYNEWPASSWORD
```

See [Appendix A](#) for a complete list of SMS commands.

## 10. Configuring the GPRS Data Connection (Optional, but recommended)

If you don't want to use a smartphone App to control the car, you can skip this step and proceed to mount the OVMS module and antenna.

Configuring of the GPRS connection is done via the PARAMS Text Message command. This can be sent only from the Registered cellphone (see [Step 8](#)). There are 9 parameters to be set, as follows:

- 1) Distance Units:
  - a. "K" for Kilometres,
  - b. "M" for Miles.
  
- 2) Notification Mechanism(s):
  - a. "SMS" for Text Message to the Registered cellphone,
  - b. "IP" for Push notifications to your smartphone Apps.
  - c. "SMS, IP" for both mechanisms
  
- 3) OVMS Server IP address  
This is the IP address of the OVMS server you want to use. The Tesla Motors Club has graciously agreed to provide a server free of charge to OVMS users (see <http://www.teslamotorsclub.com/showthread.php/7705-PR-OpenVehicles-com-selects-Tesla-Motors-Club-as-technology-partner?p=118126&viewfull=1#post118126>). That IP address is **64.111.70.40**. You can if you wish use another server (contact [info@openvehicles.com](mailto:info@openvehicles.com) for information on how to configure your own server). Note that you will need to tell your smartphone App to use the same server you specify here.
  
- 4) Cellular Network APN  
You should have gotten this information from your cellular provider in Step 1. For AT&T in the US, the correct value is "WAP.CINGULAR". Problems here are the biggest cause of issues with getting data access properly configured.
- 5) Cellular Network Username  
You should have gotten this information from your cellular provider in Step 1. For AT&T in the US you can often leave this field blank, which is done via a dash "-".
- 6) Cellular Network Password  
You should have gotten this information from your cellular provider in Step 1. For AT&T in the US you can often leave this field blank, which is done via a dash "-".
  
- 7) The VehicleID you selected back in Step 3.
  
- 8) The OVMS Server Password you selected back in Step 3.
  
- 9) Paranoid mode:
  - a. "P" will enable this mode
  - b. "-" will disable this mode

When enabled, the server is unable to decode the messages it's relaying between the OVMS Module and your smartphone Apps.

An example of a proper PARAMS command is:

```
PARAMS M SMS,IP 64.111.70.40 WAP.CINGULAR - - US1007 MyOVMServerPasword -
```

Note that a dash character is used to skip over fields you aren't setting.

If all is well, within a few seconds the car will Text you back with:

```
System parameters have been set.
```

Note that when the OVMS module is connected to the GPRS network, the RED light will blink rapidly, which indicates a good GPRS connection. Thus, the desired steady state of Lights when both GSM and GPRS are connected is:

GREEN Light ON, RED Light Blinking fairly rapidly

If you're having problems configuring GPRS data, consult [Appendix D](#), which contains some diagnostic LED light codes and a procedure to possibly identify and rectify the problem.

## 11. Installing the OVMS App for your smartphone.

Smartphone Apps are available for both iOS and Android mobile phones. You can find the apps in the Apple iTunes and Android Marketplace stores.

## 12. Configuring the iPhone OVMS App

There are 2 screens, in different locations required for setup of the OVMS iPhone App:

### A) Application Settings

Launch the iPhone Settings App, scroll down and press the “Open Vehicle” row. There are 4 fields to enter:

**Server:** Enter the same Server IP Address you used in Step 10’s PARAMS command. Note that while you need to use the IP Address in the PARAMS command, for the smartphone App you can use either the IP Address or the equivalent URL. Note that if you use the URL syntax do NOT include the “[www.](#)” prefix. For the Tesla Motors Club Server (IP Address **64.111.70.40**), the correct complete URL is “tmc.openvehicles.com”

**Port:** Leave at the default 6867

**Username:** Enter OpenVehicle Username you registered back in Step 2.

**Password:** Enter the OpenVehicle Password you registered back in Step 2.

### B) Car Settings

Choose the “Cars” tab at the bottom right and create a new Car. There are 4 fields to enter here:

**Car:** Enter the VehicleID you used in Step 3.

**Label:** Enter what you want your car to be called. This can be anything.

**Network Password:** Enter the OVMS Server Password you used in Step 3.

**User Password:** Enter the OVMS Module Password you created in Step 10.

You can also choose a picture to represent your car.

At this point, you should be able choose the Battery, Car, and Location tabs to see information on your vehicle.

### 13. Enabling Car Control

By default OVMS is configured to only monitor the car's state and not make changes. If you wish to control aspects of the car's charging, change lock state, engage/disengage valet mode, or wake-up the car remotely, etc., you will first need to enable writing to the CAN bus.

You can enable the CAN Write feature by sending the following as two separate Text Messages from the registered cell phone:

```
FEATURE 15 1
```

```
RESET
```

To disable CAN Write via SMS, send the following as two separate Text Messages from the registered cell phone:

```
FEATURE 15 0
```

```
RESET
```

Note that after enabling or disabling CAN Write you must reboot the module, which is done via the RESET command.

CAN Write can also be enabled via some of the smartphone Apps using the "Feature" setting page. On the current iPhone application, that's accessed off of the "Control" panel, which is gotten by going to the "Settings" tab at the bottom, clicking the "(>)" button to view/edit the car's settings, clicking the "Control" button at the top right, and then clicking the "Features" button. Change to value to 0 or 1 as desired, then return to the Control page and click "Reset OVMS Module."

### 14. Supporting v1.5 Tesla Roadsters

OVMS module firmware v1.2.2 and later supports operation in v1.5 Tesla Roadsters. However, you must tell the OVMS module that your car is a v1.5, otherwise the charge status messages will not be correctly interpreted.

You can do this in one of two ways:

1. Send the following Text Message from the registered cell phone to the car

```
FEATURE 14 1
```

2. Using the OVMS smartphone App (Android or Apple iOS), set Feature #14 to 1.

You do not need to reset the module after changing this feature.

See [Appendix B](#) for additional values supported by Feature #14 for any car (not just v1.5s):

Add 2 to suppress "Access Denied" SMS responses

Add 4 to suppress all outbound SMS messages.



## 15. Mounting the OVMS Module

The OVMS Module is best secured to the front wall of the passenger footwell using the adhesive velcro tape provided. With the module connected to the CAN bus, experiment with various placements until you find a suitable spot. For the Velcro attachment to work, you'll want to choose a spot on the front wall that's flat for the entire size of the module (hint: avoid the big round black plastic thing).

Here is an example mounting of the OVMS Module in a left-hand-drive Roadster, on the front wall of the passenger (right side) footwell:



*Position of OVMS module in passenger footwell(Courtesy Michael Thwaite)*

Mounting is straightforward:

1. Ensure both velcro strips are fixed together.
2. Remove the adhesive backing from one side, and securely fasten it to the back of the OVMS module.
3. Using a clean dry cloth, clean the area of the car passenger footwell wall to which you are going to attach the module.

4. Remove the adhesive backing from the side of the velcro strip facing the car, and then firmly push the OVMS module into place - holding it still for a few seconds to allow the adhesive to work.
5. You can then remove and reinstall the OVMS module as desired via the velcro.

## 16. Locating the Antenna and Routing the Antenna cable

You will find the performance of this antenna fantastic - and much better than even your cellphone, but proper placement is essential. Since it has a very long cable, you can place the antenna just about wherever you want, but please ensure it is high-up on the car and away from any metal objects that might interfere with the signal.

Possible areas include the bottom of the windscreen/windshield on the passenger side, the top of the windscreen on the passenger side (hidden by the sun visor), behind the passenger on the side pillar, in the rear window, or under the dashboard (for the brave and experienced at dismantling Tesla Roadster dashboards).

### **Example A: Bottom of the windscreen/windshield on the passenger side**

In a Right-Hand-Drive car (passenger on the left), it looks like this:



*Example antenna placement in a right-hand-drive car (left-hand-side passenger)*

To route the antenna cable, you will need to remove the fuse-box cover (one screw that needs to be turned 90degrees - marked with the top red arrow in the picture below), then

two screws from the box below the fuse box (these screws should be completely removed in order to be able to remove the box and access the compartment beneath). You do not need to adjust anything in the fuse box - you only need the cover removed to make it easier to route the cable.

Start with the cable at the windscreen/windshield and route it down the side of the passenger door front pillar. The plastic corner marked with the green arrow in the picture below can be pulled back slightly, and you can push the cable through into the open bottom compartment. Pull the cable through there so that the antenna is where you want it and there is no loose cable outside the box. The antenna itself can be mounted to the windscreen/windshield by first cleaning the area with a clean dry cloth, removing the adhesive backing tape, then firmly pushing the antenna against the glass and waiting a few seconds for the adhesive to stick.

Now for the tricky bit. You need to get the cable through to the passenger footwell, but it is tight. It is much easier to get a guide wire up into the fuse box compartment than to get the antenna cable down into the passenger footwell. So, we recommend you use a small (12inches / 30cm or so) piece of stiff wire to use as a guide and push it up from the area marked by the green arrow on the bottom right of the picture below. Once the guide wire is in the fuse box, push it down into the lower compartment you opened and wrap it around the antenna cable. You can then pull the guide wire back down into the passenger footwell, bringing the antenna cable with it.

The antenna cable can then be screwed in to the OVMS module. You can then tidy up any loose cable, and screw-back the lower compartment box (two screws) and fuse box cover (one screw 90degrees to lock).



*Access and routing beneath fuse box in a right-hand drive car (left-hand-side passenger)*

## **Example B: Beside the passenger headrest**

A few users have reported that the antenna cable is long enough to reach back to the area around the passenger head. This approach doesn't require a guide wire to route the antenna cable through the waterfall area (which may be quite inflexible in carbon fibre).

The module is placed in the passenger footwell, near the DIAG port connector. From there, the antenna cable is routed through the base of the waterfall, under the door sill, and up the side of the door frame.

The door sill is held in place by velcro and is easily removed. You may have to loosen the "waterfall" (held in place by four screws around the fuse box area). The antenna cable can then be placed on top of the metal of the chassis sill, between the velcro strips, and routed up through the existing plastic trunking. At this point, the door sill can then be put back in place.

*Antenna placement*

*Routing of cable in door sill and up into plastic trunking*



The antenna can either be placed on the plastic beside the door near the passenger's head, or further back in the rear window of the car.

## **Thanks**

So many people to thank: W.Petefish for sourcing the car connector, Fuzzylogic for the original hardware and software design and demonstration of it working, Scott451 for figuring out many of the Roadster CAN bus messages, Tom Saxton for v1.5 Roadster testing, Michael Thwaite for pictures of antenna installation, Bennett Leeds for wordsmithing the manual, and many others for showing that this kind of thing can work in the real world.

The Open Vehicles Team

# Appendices

## Appendix A – SMS Commands

The following table lists the supported SMS commands:

Command	Function
REGISTER <password>	Register the calling telephone as the owner's telephone. The given <password> must match that stored in the phone (the factory default password is "OVMS"). See <a href="#">Step #8</a> .
PASS <password>	Change the user password stored in the module to <password>. This command can only be issued from the previously registered phone. We recommend that all owners change the default password upon first installation of the module in the car. See <a href="#">Step #9</a> .
GPS	Request an SMS reply containing a Google Map link indicating the car's position (as last reported by the car's GPS). This command can only be issued by the registered phone.
GPS <password>	Similar to the previous GPS command, but this command can be issued from any telephone.
STAT	Request an SMS reply containing charge and battery status. This command can only be issued by the registered phone.
STAT <password>	Similar to the previous STAT command, but this command can be issued from any telephone.
PARAMS?	Request an SMS reply containing all configured parameters. This command can only be issued by the registered phone. Note that the reply will be a large SMS that may not work on some carriers.
PARAMS <parameters>	Set the parameters to the space-separated list of parameters provided. This command can only be issued by the registered phone. See <a href="#">Step #10</a> .
FEATURE <feature> <value>	Set the specified feature # to the specified value. See <a href="#">Appendix B</a> for the supported features and possible values. This command can only be issued by the registered phone.
RESET	Reboots the OVMS module. This command can only be issued by the registered phone.

<password> is the OVMS Module Password that you set in [Step #9](#).

## Appendix B – Feature List

The following table lists the supported features and values

Feature #	Function
0	Experimental: Digital speedometer function. The value >0 will enable this feature and specify the aggressiveness of the function.
1	n/a
2	n/a
3	n/a
4	n/a
5	n/a
6	n/a
7	n/a
8	Location streaming feature. If this is enabled (value >0), when one or more Apps are connected, the car will stream the GPS location in real-time. Without this enabled, the location will be sent once per minute. Note that this may increase GPRS network usage.
9	Minimum SOC. If this is enabled (value >0 and <=100), when the car SOC falls to the defined value an SMS/PUSH alert notification will be sent.
10	n/a
11	n/a
12	n/a
13	n/a
14	Car Bits: A bitmap. The values are derived by adding together the following sub-values: 1 – Add 1 if this is a 2008 (v1.x) Tesla Roadster. 2 – Add 2 to suppress “Access Denied” SMS responses 4 – Add 4 to suppress all outbound SMS messages
15	CAN Write: If this is enabled (value >0), the CAN bus is write-enabled and commands can be issued to control the car. If disabled (value=0), the can bus is kept in listen-only mode.

Note: Features #0 through #7 are *volatile*. They are used for experimental features and their values will be set to zero whenever the module is reset or powered off. These features are typically only available in EXPERIMENTAL firmware, not in PRODUCTION firmware.

## Appendix C – Parameter List

The following table lists the arguments to the PARAMS command:

Parameter #	Parameter	Function
1	MILESKM	“M” for miles, or “K” for kilometers
2	NOTIFIES	Notification method: “SMS”, “IP” or “SMS,IP”
3	SERVERIP	OVMS Server IP Address
4	GPRSAPN	Cellular Network APN
5	GPRSUSER	Cellular Network Username
6	GPRSPASS	Cellular Network Password
7	MYID	VehicleID
8	NETPASS1	OVMS Server Password
9	PARANOID	“P” for paranoid mode, or blank otherwise
10	S_GROUP	Social Group name
11	n/a	n/a
12	n/a	n/a
13	n/a	n/a
14	n/a	n/a
15	n/a	n/a
16	n/a	n/a
17	n/a	n/a
18	n/a	n/a
19	n/a	n/a
20	n/a	n/a
21	n/a	n/a
22	n/a	n/a
23	n/a	n/a
24	n/a	n/a

Note: Paranoid mode will further encrypt messages between the car and the apps, so that even the server cannot decode the data.

## Appendix D – LED Diagnostic Light States

GREEN light solid ON means the module has a proper GSM connection.

RED light blinking rapidly means the module has a good GRPS data connection. If you haven't configured the unit for GRPS data (which requires both hardware switch described in Step 5 set to "Enable" and a proper PARAMS command as described in Step 10), the RED light will be OFF.

Other states you might see:

- RED OFF, GREEN OFF:

Assuming the OVMS Module has power, this indicates that the system has lost GSM connectivity and is waiting for it to come back. If after 2 minutes of waiting GSM connectivity doesn't come back, the OVMS module will actively try to re-connect, as indicated by the GREEN and RED lights slowly alternatively blinking.

- GREEN and RED lights SLOW ALTERNATIVELY BLINKING (about once a second):

The system is trying to establish a GSM connection with the carrier. This combination should not last for more than 3 minutes (usually much less unless there is a GSM connectivity issue).

- GREEN OFF, RED SLOWLY BLINKING (about once a second):

The system is trying to reset the GSM connection. It previously had GSM connectivity, but has since lost it, and is now waiting for the modem to stabilise before trying to establish a connection to the network carrier again. This combination might persist for about 30 seconds.

- RED ON, GREEN OFF:

The system is having problems communicating with the modem and is performing a hard reboot. This combination should persist for at most 10 seconds.

- RED light short rapid blinks, and GREEN light solid on:

Both the GSM and GPRS networks are up and connected ok. This is the ideal state once you have configured GPRS.

- GREEN STAYS OFF but the following cycle repeats: RED ON solid for up to 2 seconds then RED flashing quickly for 8-10 seconds.

This indicates that the modem couldn't be initialized. There are a few of things you can do to narrow down the problem:

1. Check the cable going to the car, at the diag port connector. Unplug the module and make sure the pins look ok and no wires have come loose.
2. Check the antenna connection and that the antenna is not near any metal objects.

Unplug the Module and open it to perform the following checks:

- A) Check the 2pin and 4pin connectors going to the boards in the OVMS module. Make sure everything is tight and no wires have come loose.
- B) Check the connection between the SIMCOM and PIC boards. Make sure the connector lines up and nothing has come loose.
- C) Check that the SIM card is properly installed. Try the SIM card in a phone and check that it can send and receive Text Messages. It should not have any PIN lock. If possible, try a different SIM in the OVMS Module.
- D) Disconnect the white 4 pin connector from the PIC controller board, so that only the SIMCOM modem is connected. Reconnect the module to the car and ensure you get both a solid green light on the SMCOM modem board, and a blinking blue light on the SIMCOM modem board. If you don't get the blinking blue light, try pressing and holding the reset button for 1/2 second - you should then get a solid blue followed by a blinking blue. If this test is ok, that means the SIMCOM modem board is getting +12V from the car ok. Reconnect the 4 pin connector to the PIC controller board.
- E) Unplug the module from the car again and disconnect the white 2 pin connector from the SIMCOM modem board, so that only the PIC controller is connected. Reconnect the Module to the car and ensure you get (a) no green light on the PIC controller, (b) a flashing red on the PIC controller for a few times (perhaps 8 or so), (c) a solid red light on the PIC controller, (d) repeat from step (b). If this test is ok, that means the PIC controller board is getting +12V from the car ok. Unplug the Module from the car and reconnect the 2 pin connector to the SIMCOM modem board.

Put everything back together (you can leave the top of the box off for the moment, until we've found and fixed the problem), plug the Module into the car and wait for at least 10 minutes to see if there is any change in behavior.

If it is still not working, please let us know the results of the above tests, and details on the SIM card you are using. Please also take a picture of the box open (showing both boards, the sim in place, antenna connected, and lights on), and send to [support@openvehicles.com](mailto:support@openvehicles.com).