



Telemetry Configuration and User Guide

oMG



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Rev 1

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Revision History

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1	May 13, 2016	Updated to new SWI doc number

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Who Should Read this Document?

This guide covers all topics related to the installation, configuration and usage of Telemetry and is intended to be used by the following audiences:

- **Hardware and Vehicle Installers** should read the following sections:
 - [Chapter 5 - Telemetry Verification Kit](#): describes the kit used to verify which vehicle parameters can be read by Telemetry for a particular vehicle.
 - [Chapter 6 - Telemetry Hardware](#): describes the hardware and installation process.
- **System Administrators** should read [Chapter 7 - Configuring the Telemetry Application](#) which describes how to enable and configure the Telemetry application on the oMG and oMM and how to set up user accounts and thresholds so that Telemetry information is available to fleet operators.
- **Fleet Operators** should read the [Chapter 8 - Operation](#), which describes how to view Telemetry information.

Related Publications

Table 1-1: Related Publications

Title and Publication Number	Description
oMM-ED-110201- Operation and Configuration Guide for oMM	Describes the configuration and usage of the oMM including the user interface, reports and other related functionality
oMM-ED-140403 - oMM Report Guide	Provides detailed information about all of the reports available on the oMM
oMG-ED-121110 - oMG 2000 Installation Guide	Describes how to install an oMG into a vehicle

»» | 2: What is Telemetry?

Telemetry is an add-on application module for the oMM/oMG which provides automotive self-diagnosis and reporting.

Telemetry interfaces with a vehicle using the standard OBD-II protocol. OBD (On-Board Diagnostics) is the electronic interface system of compliant automobiles. OBD-II is an updated OBD standard which is mandatory for cars sold in the US after 1996. Through OBD-II, Telemetry gains real-time access to diagnostic data generated by various electronic systems embedded within a vehicle.

Note: Telemetry does not support fault clearing (e.g., reset the check engine light) when faults are found, and the availability of diagnostic data may be limited by the make and year of the vehicle.

Telemetry requires an OBD-II compliant scan tool to read the diagnostic data from the vehicle and this tool is provided by Sierra Wireless. Telemetry sends the vehicle data to the oMG which must be configured with the Telemetry module in order to access the data. The oMG then passes this data to the oMM where it can be used to generate reports such as driver behavior, fuel consumption, and vehicle diagnostics.

For more information about OBD-II, please refer to: http://en.wikipedia.org/wiki/On_Board_Diagnostics.



3: Who Should use HD Telemetry?

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Telemetry is designed for fleet managers, service managers and technicians, human resource managers, and other personnel who manage fleets, fleet personnel and associated data.

Telemetry is applicable to vehicles equipped with Onboard Diagnostics Version 2 (OBD-II) data bus connections, which are typically light truck and passenger vehicles.

Telemetry information may be limited to specific makes and models of vehicles. For more information contact your vehicle's manufacturer or Sierra Wireless sales representative.

»» 4: Theory of Operation

HD Telemetry has three main operations:

- OBD-II data collection through the oMG
- OBD-II data viewing via the oMM Dashboard
- OBD-II data alerting and reporting via the oMM

OBD-II Data Collection

The oMG collects OBD-II data in real-time from the OBD-II scan tool that it is connected to. There is a wide range of information which can be collected including vehicle speed, engine temperature and battery voltage.

The oMG stores the returned OBD-II data and forwards it to the oMM for viewing purposes. The oMG can store OBD-II data for up to a few days when WAN connectivity is not available and will forward the data once the connection is re-established. Note that the amount of data which can be stored depends on your configuration.

For a complete list of OBD-II data monitored by Telemetry, see [Telemetry Parameters](#).

OBD-II Data Viewing

OBD-II data is available for viewing on the oMM. This requires a special Telemetry management module to be activated on the oMM. This module includes a dashboard, stats, events, and a map view as well as specialized Telemetry Reports and Thresholds.

For more information about setting up Telemetry on the oMM, see [Chapter 7 - Configuring the Telemetry Application](#).

For more information about using Telemetry and viewing data, see [Chapter 8 - Operation](#).

OBD-II Data Reporting and Alerting

The oMM can generate reports and send out alerts to specified users based on defined thresholds on the OBD-II data.

For more information about setting up Telemetry Thresholds, see [oMM Thresholds Setup](#).

For more information about Telemetry reports see [Telemetry Reports](#).

5: Telemetry Verification Kit

Sierra Wireless provides a Telemetry Verification Kit to each customer who has purchased Telemetry, which can be used to check if a vehicle will be compatible with the Telemetry application installed on an oMG.

This kit enables a laptop running special verification software to check which OBD-II Parameter IDs (PID's) are output by the vehicle's on-board computer, thereby indicating which parameters an oMG will be able to report on for that vehicle.

Components

The Telemetry Verification Kit includes the following components:

- **OBD-II diagnostic cable:** connects to the vehicle OBD-II socket and one side of the OBD-II scan tool.



Figure 5-1: HD Scanner and Cables

- **Scanner.**
- **Scanner-to-serial port cable:** cable for connecting between the serial port on the scanner and the serial port on the laptop.
- **USB-to-serial converter cable:** optional cable for USB connectivity between the scanner and a USB port on the laptop.
- **USB stick:** contains the self-booting software utility to be run on a laptop which is used for verifying compatibility.

Before Running

Connect the scanner to the laptop as follows:

1. Plug the male end of the scanner-to-serial port cable into the scanner. Do not plug the other end into the laptop at this point.
2. (Optional) For USB connectivity, plug the serial end of the USB-to-serial converter cable into the scanner-to-serial port cable. This will enable a laptop to communicate using USB instead of serial.

3. Plug the serial end of the OBD-to-serial cable into the other end of the scanner. Do not plug in the OBD end of the cable into the vehicle at this point.

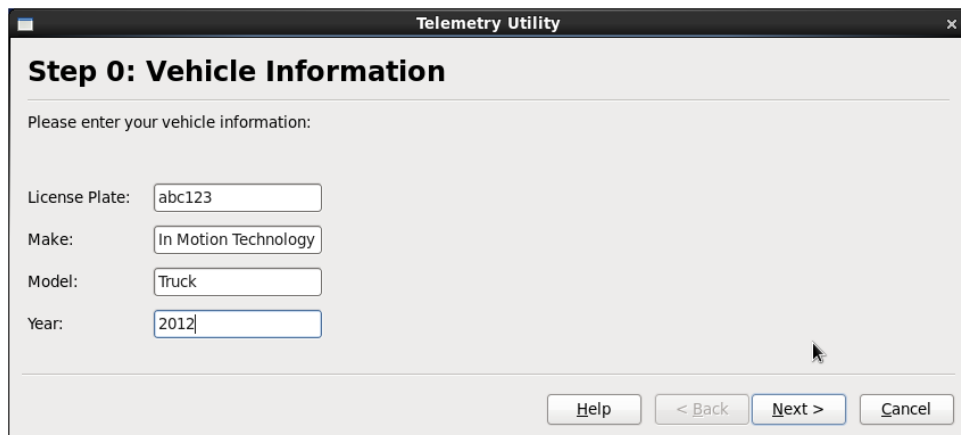
Running the Utility

Insert the USB stick from the Telemetry Verification Kit into a free USB port on the laptop, and proceed to boot the laptop from the USB stick.

Note: if your laptop does not boot from a USB stick, you will need to access your laptop's BIOS settings and modify them to enable booting from USB.

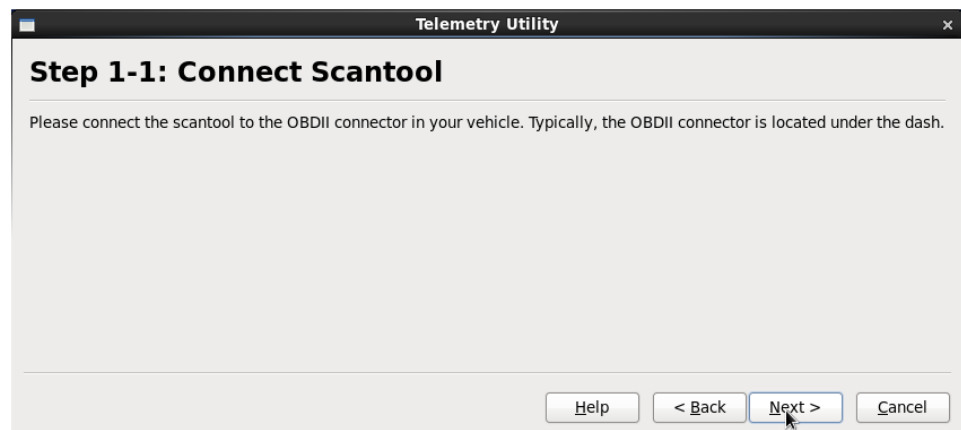
Upon successfully booting the Telemetry Verification Kit utility from the USB stick, proceed through the following screens:

1. Input the vehicle information and then click **Next**:



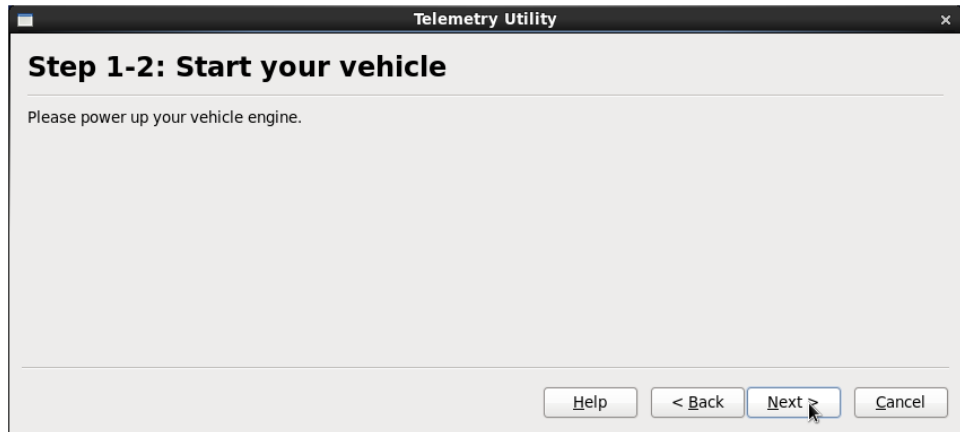
The screenshot shows a window titled "Telemetry Utility" with a close button (X) in the top right corner. The main heading is "Step 0: Vehicle Information". Below the heading, it says "Please enter your vehicle information:". There are four input fields: "License Plate:" with the value "abc123", "Make:" with the value "In Motion Technology", "Model:" with the value "Truck", and "Year:" with the value "2012". At the bottom right, there are four buttons: "Help", "< Back", "Next >", and "Cancel".

2. Connect the OBD end of your serial-to-OBD cable to the vehicle and click **Next** on the *Scantool* page:

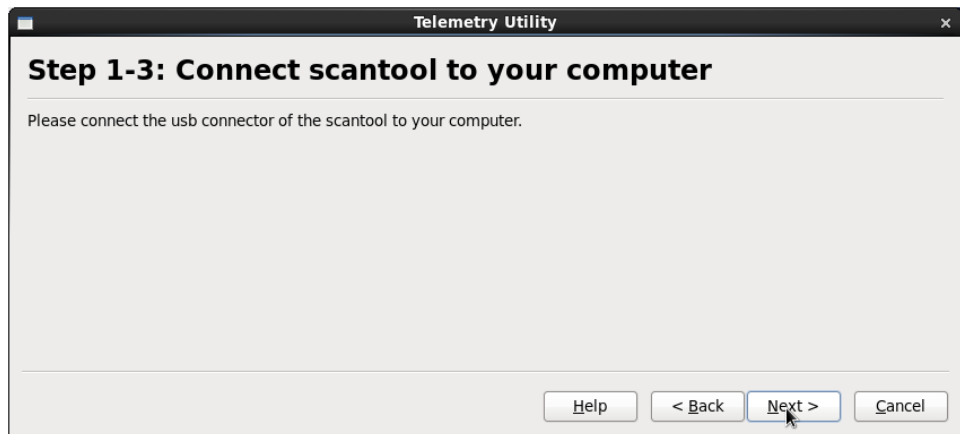


The screenshot shows a window titled "Telemetry Utility" with a close button (X) in the top right corner. The main heading is "Step 1-1: Connect Scantool". Below the heading, it says "Please connect the scantool to the OBDII connector in your vehicle. Typically, the OBDII connector is located under the dash." At the bottom right, there are four buttons: "Help", "< Back", "Next >", and "Cancel".

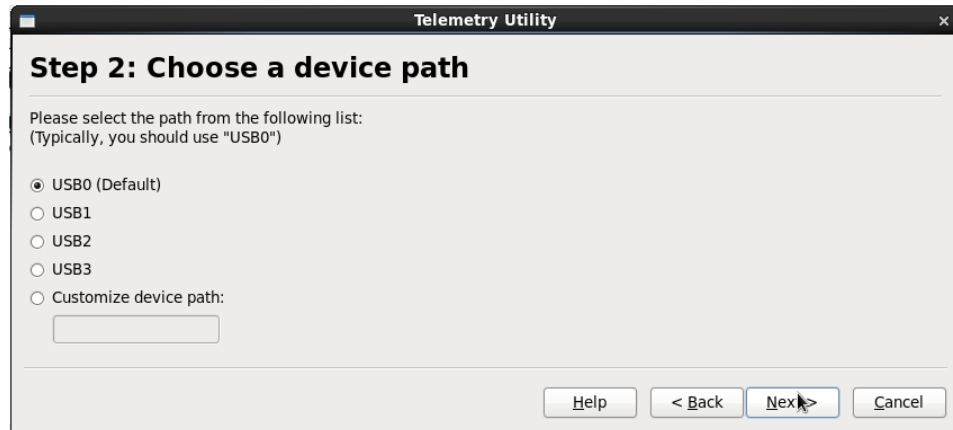
3. Start the vehicle when prompted and then click **Next**:



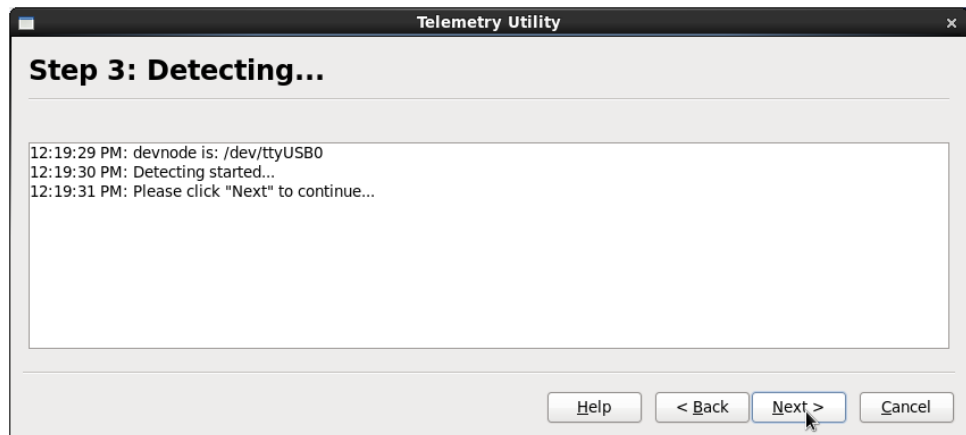
4. Connect the serial or USB end of the cable from the scanner to the computer on the *Scantool* page and click **Next**.



5. Select the USB port where the scanner is connected to and click **Next**. Alternatively, if using a serial cable, select **Customize device path** and enter the devices path (e.g. /dev/ttyS0):

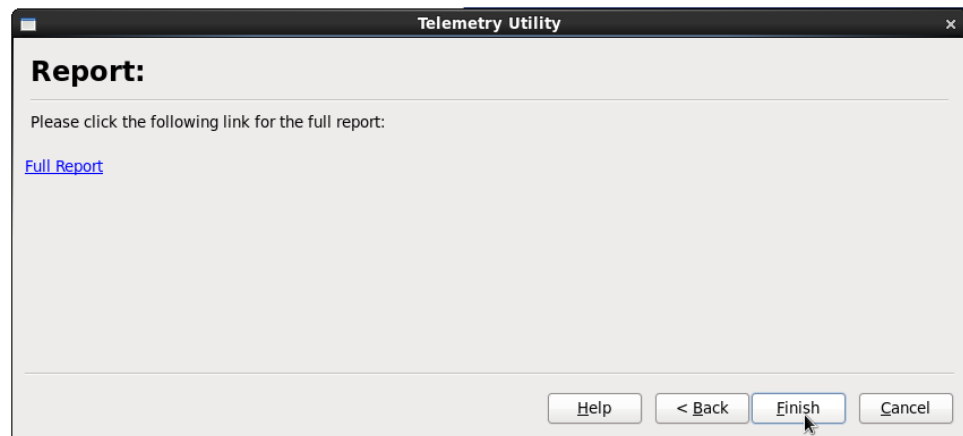


6. The compatibility check process will run:



The final report is saved in /Desktop on the USB stick in HTML format. Each time the utility is run, a new entry is added to the files, allowing for information from an entire fleet to be saved and reloaded.

7. To view the report click on **Full Report**, or click on **Finish** to exit:



Sample Report

The following screenshot shows an example report generated by the utility:

General Info:			
License Plate	abc123		
Make	In Motion Technology		
Model	ECU Simulator		
Year	2011		
ECU protocol	ISO		
VIN	Not Found		
Odometer Estimation	Not Found		

Telemetry Application Compatibility:			
8 PIDs found, 39 PIDs not found.			
PID Description	PID	PID Value	Found on the vehicle?
Monitor status since DTC's cleared	Mode 0x01 - PID 0x1		Found
Fuel system status	Mode 0x01 - PID 0x3	1	Found
Calculated engine load value	Mode 0x01 - PID 0x4		Not Found
Engine coolant temperature	Mode 0x01 - PID 0x5	143	Found
Short term fuel % trim-Bank 1	Mode 0x01 - PID 0x6		Not Found
Long term fuel % trim-Bank 1	Mode 0x01 - PID 0x7		Not Found
Short term fuel % trim-Bank 2	Mode 0x01 - PID 0x8		Not Found
Long term fuel % trim-Bank 2	Mode 0x01 - PID 0x9		Not Found
Intake manifold absolute pressure	Mode 0x01 - PID 0xb		Not Found
Engine RPM	Mode 0x01 - PID 0xc	2652	Found
Vehicle speed	Mode 0x01 - PID 0xd	60	Found
Intake air temperature	Mode 0x01 - PID 0xf		Not Found
MAF air flow rate	Mode 0x01 - PID 0x10	152.96	Found
Throttle position	Mode 0x01 - PID 0x11		Not Found
Commanded secondary air status	Mode 0x01 - PID 0x12		Not Found
OBD standards this vehicle conforms to	Mode 0x01 - PID 0x14	6	Found
Run time since engine start	Mode 0x01 - PID 0x1f	106	Found
Distance traveled with malfunction indicator lamp (MIL) on	Mode 0x01 - PID 0x21		Not Found
Fuel Rail Pressure (relative to manifold vacuum)	Mode 0x01 - PID 0x22		Not Found
Fuel Rail Pressure (diesel)	Mode 0x01 - PID 0x23		Not Found
Commanded EGR	Mode 0x01 - PID 0x2c		Not Found
EGR Error	Mode 0x01 - PID 0x2d		Not Found

Figure 5-2: Example of Telemetry Utility Report

Note: if a vehicle parameter is shown as "Not Found" in the report, this means that the vehicle does not support it and it will not be available to the oMM.

6: Telemetry Hardware

The Telemetry Application uses data from the vehicle diagnostic bus (OBDII) which is obtained via a scanner. The scanner must be purchased from Sierra Wireless and comes with the additional components described below. The part number for this kit is: IMTMIS010.

Required Components

The following Sierra Wireless hardware components are required to enable and use the Telemetry Application on an oMG:

1. oMG with a minimum software release of 2.8.5 or greater is recommended.
2. Telemetry Application Module (can be pre-installed if ordered with oMG1000).
3. Scan tool kit (supplied by Sierra Wireless) which includes:
 - a. 15' OBD cable that connects the scan tool to the vehicle OBD port
 - b. Telemetry scan tool.
 - c. Custom 10' RS232 cable (containing female DB9 connectors on both ends) that connects the scan tool to the oMG.

Installation

This section assumes that the oMG is properly installed and configured with a network service card. Refer to the oMG Operation Guide for more information on configuring an oMG. The person performing the installation is expected to be familiar with the location of the OBD-II connector in the vehicle.

1. Power on the oMG, and verify it can connect to a WAN service (a steady green light should show).
2. Verify the oMG meets the software requirements for the Telemetry Application Module. In the event the oMG requires a new version, please contact Sierra Wireless Technical Support for InMotion Solutions (IMS) to schedule an over-the-air software upgrade.

Note: you must have a valid support plan in place in order to receive this upgrade.

3. Locate the OBD-II port in the vehicle. The OBD-II port is an electrical socket most commonly located under the vehicle dashboard on the driver's side near the center console.
4. Install the Sierra Wireless-supplied scan tool by first attaching the male SAE J1962 16-pin connector of the scan tool to the vehicle's OBD-II port. SAE J1962 is the technical name for OBD-II connectors. Depending on the particular vehicle, you may wish to tie-wrap the cable in place to ensure the cable and scan tool do not disconnect as a result of vibration during subsequent operations.
5. Next, attach the Sierra Wireless provided custom serial cable connecting the male serial connector of the scan tool, and the serial connector of the oMG.



Figure 6-1: Connecting an OBD-II Scanner Between the oMG and a Vehicle

7: Configuring the Telemetry Application

Configuration is required on both the oMG and oMM in order for Telemetry to collect data and present it to the user. The following subsections assume the reader is familiar with using the oMM and accessing an oMG through the web interface.

oMG

The steps provided below apply to oMG Software version 3.x. For oMGs running Version 2.x Software see [One Port oMG](#).

Enabling Telemetry on an oMG

Use the following steps to enable Telemetry on an oMG:

1. Connect to the oMG LAN. In a web browser, go to <http://welcome.to.inmotion/MG-LCI> and log in as administrator.

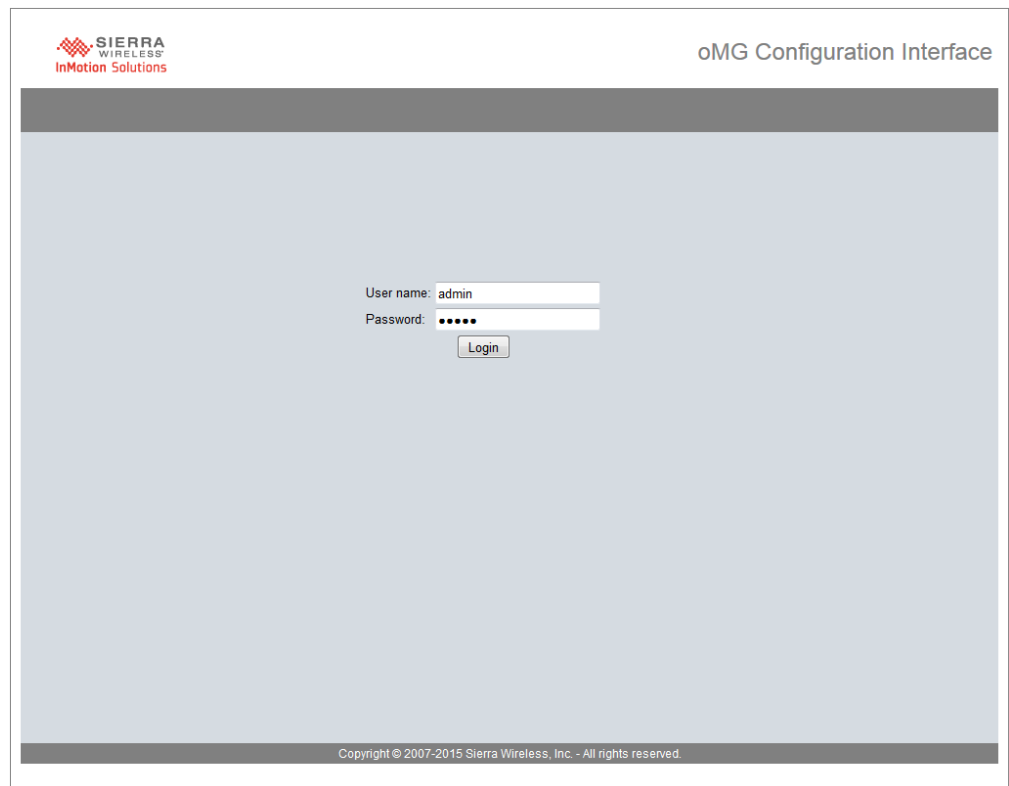


Figure 7-1: Login

2. Navigate to **Devices > Serial**, use the dropdown menu to select Application from the default 'SerialConsole'. This will allow the rear panel serial port to be used for communication with the scan tool.

3. Navigate to **Applications > Telemetry**.

Note: if the Telemetry Configuration tab is not available, then the Telemetry Application has not been installed on the oMG. If this is the case, call IMS support to request a software upgrade.

4. Under *Master Options*, check **Enable** and click on **Submit**. This configures the OBD-II agent service to run automatically whenever the oMG reboots.
5. Navigate to *Telemetry > Telemetry Status* to set the Odometer value.
 - a. Under *Odometer Reference Update*, enter the current odometer value in the *Current Odometer* field.

Note: the vehicle's engine must be turned ON for this step. If required, this step can be completed at a later time.

- b. Select **km** or **mi** for the Current Odometer field's units.
- c. Click on **Submit**.

Note: when the vehicle is serviced, the Current Odometer value may need to be reconfigured.

OnBoard Diagnostic (OBDII) Status	
Agent	
Time	Thu Jul 26 16:19:38 2012
State	ACTIVE_SCAN
Attachment	/dev/ttySO
Adapter	Multiplex Engineering T16 RS232
VIN Identifier	
Vehicle	unknown
Protocol	CAN
Odometer Estimate	
Calculated Value	24681.240000
Error Bound	1.000000
Dref	7266.240000
TSref	Mon Apr 23 18:46:55 2012 UTC
Mode	OBDII DISTANCE (PID31)
Odometer Reference Update	
Current Odometer	7266.2
	+ km - mi
	Submit

Figure 7-2: OBDII Status page

6. The scanner can be connected directly to the serial port or into a USB port (requires a USB-to-Serial adaptor). If the default serial connector is not used, select the appropriate device from the list under *OBDII Adapter Attachment*.

The default PIDs should not be changed unless authorized by Sierra Wireless, as they represent the underlying Telemetry data reported to the oMM. For more information about changing these values, please contact IMS support.

\$05	✖	Engine coolant temperature	10.0	degrees C	900.0	s
\$06	○	Short term fuel trim Bank 1	10.0	percent	0.0	s
\$07	○	Long term fuel trim Bank 1	10.0	percent	0.0	s
\$08	○	Short term fuel trim Bank 2	10.0	percent	0.0	s
\$09	○	Long term fuel trim Bank 2	10.0	percent	0.0	s
\$0a	○	Fuel pressure	30.0	kPa	0.0	s
\$0b	○	Intake manifold absolute pressure	5.0	kPa	0.0	s
\$0c	✖	Engine RPM	100.0	RPM	60.0	s
\$0d	✖	Vehicle speed	5.0	km/h	60.0	s
\$0e	○	Timing advance	5.0	degrees relative to first cylinder	0.0	s
\$0f	✖	Intake air temperature	5.0	degrees C	0.0	s
\$10	○	Mass air flow rate	10.0	g/s	0.0	s
\$11	○	Throttle position	5.0	percent	0.0	s
\$1f	✖	Run time since engine start	60.0	seconds	0.0	s
\$21	✖	Distance traveled with MIL illuminated	5.0	km	60.0	s
\$22	○	Fuel rail pressure (relative to manifold vacuum)	5.0	kPa	600.0	s
\$23	○	Fuel rail pressure (diesel)	10.0	kPa	600.0	s
\$2c	○	Commanded EGR	10.0	percent	0.0	s
\$2d	○	EGR error	10.0	percent	0.0	s
\$2e	○	Commanded evaporative purge	10.0	percent	0.0	s
\$2f	✖	Fuel level input	2.0	percent	120.0	s
\$30	○	Number of warm-ups since codes cleared	1.0		0.0	s
\$31	✖	Distance traveled since codes cleared	1.0	km	0.0	s
\$32	○	Evaporative system vapor pressure	50.0	Pa	600.0	s
\$33	✖	Barometric pressure	0.2	kPa	600.0	s
\$3c	○	Catalyst temperature, bank 1 sensor 1	5.0	degrees C	600.0	s
\$3d	○	Catalyst temperature, bank 1 sensor 2	5.0	degrees C	600.0	s
\$3e	○	Catalyst temperature, bank 2 sensor 1	5.0	degrees C	600.0	s
\$3f	○	Catalyst temperature, bank 2 sensor 2	5.0	degrees C	600.0	s
\$42	○	Control module voltage	0.1	volts	600.0	s
\$43	○	Absolute load value	3.0	percent	60.0	s
\$44	○	Command equivalence ratio	0.001		0.0	s
\$45	○	Relative throttle position	5.0	percent	0.0	s
\$46	✖	Ambient air temperature	2.0	degrees C	600.0	s
\$47	○	Absolute throttle position B	5.0	percent	0.0	s
\$48	○	Absolute throttle position C	5.0	percent	0.0	s
\$49	○	Accelerator position D	5.0	percent	0.0	s
\$4a	○	Accelerator position E	5.0	percent	0.0	s
\$4b	○	Accelerator position F	5.0	percent	0.0	s
\$4c	○	Commanded throttle actuator	5.0	percent	0.0	s
\$4d	✖	Run time with MIL illuminated	10.0	minutes	43200.0	s
\$4e	○	Time since trouble codes cleared	10.0	minutes	43200.0	s
\$52	○	Ethanol fuel percent	1.0	percent	0.0	s

Submit

Figure 7-3: PIDs

oMM

The oMM presents telemetry related data in three ways: via the Dashboard, the Telemetry Dashboard tab and through a series of Telemetry reports.

Enabling an oMM to view this information requires proper configuration of user accounts and the creation of thresholds for the Telemetry stats which are of interest to the fleet managers in your organization. The configuration steps for these items are described in the following subsections.

Note: the following steps assume that a user account has already been created and that the user has been granted permission to view the main Dashboard tab.

User Accounts

Use the following steps to grant an existing user access to the Telemetry Dashboard tab and the Telemetry reports on the oMM.

Note: this procedure is performed by Sierra Wireless for hosted oMMs.

1. Log in to the oMM using an administrator account.
2. Navigate to *Admin > Users* and click on the link for an existing user name to modify that user.

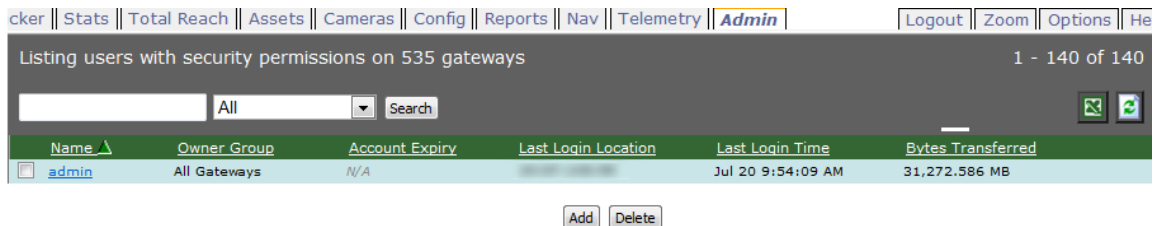


Figure 7-4: Admin/Users Screen

3. Under *Privileges*, ensure **Read/Write** is enabled for oMM.

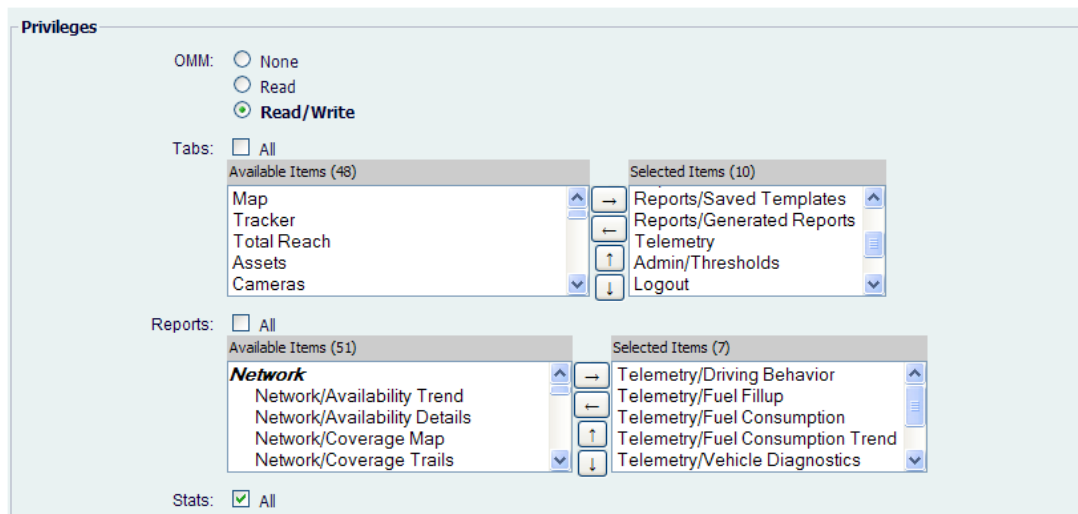


Figure 7-5: User Access Configuration

4. Ensure that **Tabs** is checked or locate **Telemetry** in the Available Items list and click on -> to add it to the list of available tabs.
5. Ensure that **Reports** is checked or locate the telemetry related reports in the Available Items list and click on ? to add it to the list of available reports.
6. Under *Preferences*, ensure **Use applicable telemetry stats in default order** is checked for the Telemetry Dashboard field to show all Telemetry stats on the *Telemetry Dashboard* tab. To show only certain items, check off this field, select the desired Stats to show and click -> to add them to the list of available *Telemetry Stats*.

Note: the availability of Telemetry Stats is based on whether those Stats have been reported by the oMGs associated with the oMM.

Note: when operating on a hosted oMM, the available Stat types may include those not reported by your current fleet. This occurs because the hosted oMM software lists all Stats types available including those reported by other fleets.

7. Click on **Save**.

oMM Thresholds Setup

Telemetry Thresholds corresponding to Telemetry Stats, are used for displaying alerts both on the Dashboard and Telemetry Dashboard tabs.

Thresholds are usually created by Sierra Wireless during the provisioning stage of the oMM, but may need to be created by an oMM's administrator. For more information about creating and configuring thresholds, see the oMM Operation and Configuration Guide.

For a complete list of Telemetry PIDs which can be reported as Stats, see [Telemetry Parameters](#).

8: Operation

Once Telemetry has been properly configured, it should start automatically and operate continuously whenever the oMG is powered up.

The oMG Telemetry software will use its configuration settings to report changes to PID values to the oMM. The oMM will automatically receive data from all oMGs having an appropriately configured Telemetry application.

Telemetry Data can be viewed in three areas on the oMM:

Dashboard tab: displays the Stats and Thresholds which have been defined for Telemetry amongst those for other subsystems.

Telemetry Dashboard tab: displays only Telemetry related Stats and Thresholds.

Reports: a number of Telemetry reports are included as part of the Telemetry package, which provide high level information such as vehicle usage, driving behavior etc.

Note: in the event that the scanner becomes disconnected or the OBD-II connector is defective, the oMM should report a Disconnected message. This may result in unexpectedly large amounts of information being stored in the oMM database related to the disconnection state, which may need to be periodically purged.

If operating on a hosted oMM, this procedure will be performed according to Sierra Wireless maintenance schedules and data retention policies. Note that you will not be able to control retention policies on the hosted service and you may want to acquire your own oMM appliance. Please contact IMS Sales if you are interested in hosting your own oMM appliance.

Dashboard

The oMM's Dashboard displays the configured Stats and Thresholds which include both those related to Telemetry and as well as those defined for other measurable subsystems.

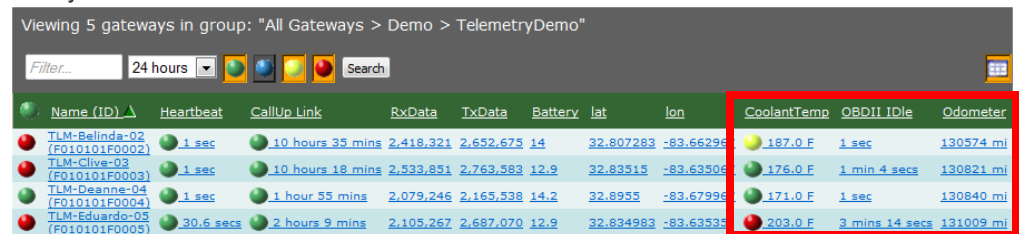


Figure 8-1: Dashboard with Telemetry Stats and Thresholds

Thresholds display alerts (warning, errors etc) when a Stat's value has exceeded a specified range. For example, the Dashboard shown in Figure 8-1 shows different colored Threshold bubbles for the *CoolantTemp* Telemetry Stat.

Telemetry Stats marked as N/A (not applicable) indicate that either the Stat cannot be reported by the vehicle or that it hasn't been reported yet.

Telemetry Dashboard Tab

The Telemetry Dashboard tab displays the Telemetry Stats reported by a gateway or group of gateways selected in the oMM's gateway tree. To show alerts including errors and warnings for a Stat, a Threshold must be defined corresponding to that Stat.

Viewing 5 gateways in group: "All Gateways > Demo > TelemetryDemo"

Filter... 24 hours [Color icons] Search [Calendar, Chart, Home icons]

Name (ID) ^	Vehicle Speed	Engine RPM	Odometer	CoolantTemp
TLM-Belinda-02 (F010101F0002)	0 mph	654	130574 mi	181.0 F
TLM-Clive-03 (F010101F0003)	0 mph	657	130821 mi	176.0 F
TLM-Deanne-04 (F010101F0004)	63 mph	2,262	130844 mi	178.0 F
TLM-Eduardo-05 (F010101F0005)	0 mph	653	131009 mi	203.0 F

Figure 8-2: Figure 10 - Telemetry Dashboard Tab

The availability of the columns on the Telemetry Dashboard tab depends on:

- which Telemetry Stats have been permitted for display for the current user (see [User Accounts](#)) and
- which Stats have been reported by a gateway or selected fleet of gateways. For those gateways which have not reported a parameter, "N/A" (not applicable) will be shown in place of a parameter value.

The values shown for each oMG represent the last values reported by those oMGs. The frequency of updates is controlled by the Report When Value Changes By and the Report When Value Stable For options defined for each parameter on the oMG. For more information about configuring these fields see [Enabling Telemetry on an oMG](#).

Telemetry Reports

Telemetry reports provide high level information about the data acquired from the vehicle. The following Telemetry reports are available:

Driving Behavior: provides information about driving behaviors such as speed, idling, acceleration etc.

Vehicle Hours: shows how long a vehicle has been running including both driving time and idle time.

Fuel Fillup: displays data on the date/time, location and fuel fill-up amounts.

Fuel Consumption: provides information about fuel consumption and efficiency based on runtime, fuel cost etc.

Fuel Consumption Trend: summarizes fuel consumption over a period of time.

Vehicle Diagnostics: reports on vehicle voltage, coolant and MIL.

Odometer Check: compares the odometer value obtained from Telemetry data against that acquired from GPS data.

Unauthorized Usage: provides information about vehicle usage based on a configurable set of operating parameters.

All Telemetry reports may be accessed using the *Reports -> Telemetry -> <specific telemetry report>* menu:

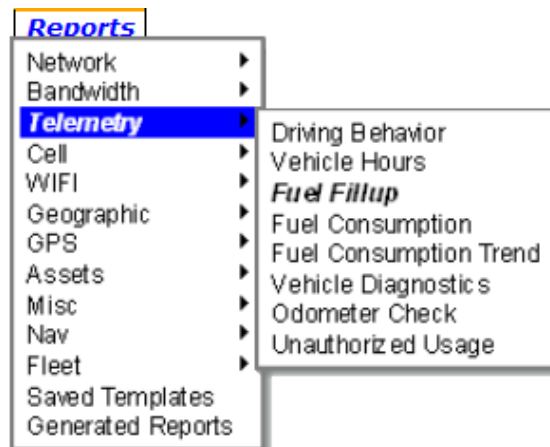


Figure 8-3: Figure 11 - Telemetry Reports Menu

For detailed information about each report see the oMM Report Guide listed in [Related Publications](#).

For information about configuring access to the various Telemetry reports, see [User Accounts](#).

9: Troubleshooting

No Data Received

Ensure that the Telemetry scanner is properly connected. If the scanner is not connected, the oMM should report that the scanner is disconnected.

If the scanner is not physically connected to the OBDII port or if the OBDII port on the vehicle is defective, the Telemetry panel will show 0 (zero) or N/A.

Name (ID) ▾	CoolantTemp	OBDII Idle	Odometer	Intake AirTemp	Scanner	Vehicle Speed	Engine RPM
TLM-Albert-01 (F010101F0001)	186.0 F	676 days 17 hours	94482 mi	105.0 F	0	0 mph	1,192
TLM-Belinda-02 (F010101F0002)	185.0 F	1 min 3 secs	130802 mi	-41.0 F	0	2 mph	668
TLM-Clive-03 (F010101F0003)	162.0 F	11 mins 5 secs	130820 mi	-41.0 F	1	0 mph	646
TLM-Deanne-04 (F010101F0004)	160.0 F	5 mins 33 secs	130964 mi	-41.0 F	0	29 mph	3,007
TLM-Eduardo-05 (F010101F0005)	167.0 F	7.3 secs	130973 mi	-41.0 F	1	0 mph	652

Figure 9-1: Scanner Disconnection Status in Telemetry Panel

When the scanner is not connected or the engine is OFF, navigate to the *Telemetry Status* tab (in the LCI) to verify the state of the scanner. If the scanner is operating normally, the State field should indicate *ACTIVE_SCAN* as shown below. If the scanner is disconnected it should display *INIT*. If the scanner is connected but the engine is off it should display *INVALID_ECU_CONNECTION*.



Figure 9-2: Scanner Disconnection Status in LCI

A disconnected message indicates that the scanner is not physically connected to the OBDII port or the OBDII port on the vehicle may be defective.

Incorrect Odometer Value

When the odometer is set manually via the LCI, the Odometer will increment based on the *Distance since codes cleared PID*. If the DSCC is reset during maintenance of the vehicle or if the battery is removed, the odometer value may need to be re-entered via the LCI.

Missing Data

Some older vehicles may not support all PIDs. In such a case, the oMM may show N/A. The only exception is with the Odometer value that can be set manually if the DSCC (Distance Since Code Clear) is available.

To check which ID's are being reported by a vehicle, use the Verification Kit described in [Chapter 5 - Telemetry Verification Kit](#).

Enabling the Telemetry Option Package in Software Version 2.x

Use the following steps to enable Telemetry on a unit running version 2.x:

1. Connect to the oMG LAN.
2. Using a web browser, login as admin to the LCI (<http://welcome.to.inmotion/MG-LCI>)
3. Click the **Application** button:

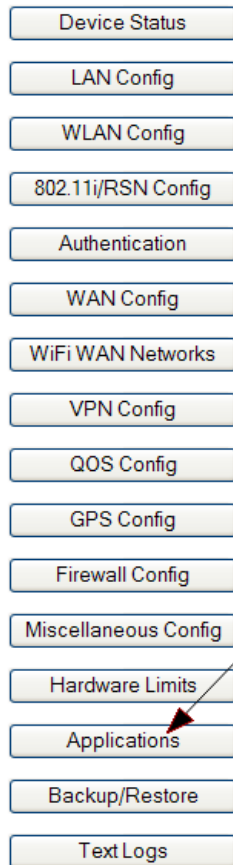


Figure 1-1: Application Button

4. From the *Application Tab* menu, select **Telemetry**



Figure 1-2: Application Menu Page

5. Enable **Telemetry**, and click **Save**. This configures the ODB-II-agent service to auto-run after each time the oMG reboots. In the event the vehicle is not reporting an incremental odometer reading, the odometer value can be manually set from this screen. Changing the value should only be done when the vehicle engine is ON. The new value will take effect after the vehicle moves 1 mile (or kilometer) from its current location.

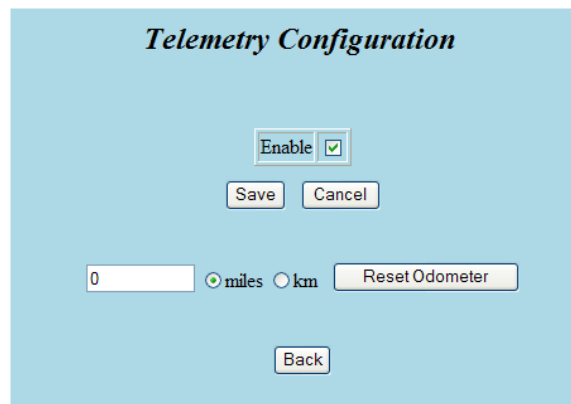


Figure 1-3: Telemetry Enabled and Odometer Adjustment

6. Reboot the oMG by pressing the power button on the back of the oMG. Alternatively, the unit can be rebooted by selecting Backup/Restore from the LCI and select Reboot oMG. The Telemetry service should auto-start upon reboot.

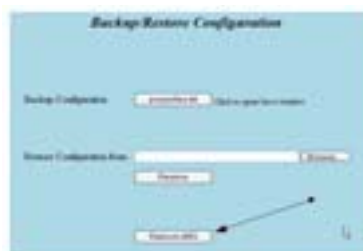


Figure 1-4: Rebooting the oMG

»» B: Telemetry Parameters

B

The following list describes the OBD-II vehicle parameters which can be reported as Telemetry Stats to the oMM. A full list of OBD-II PIDs is available at: http://en.wikipedia.org/wiki/OBD-II_PIDs.

Note that some parameters may not be available on some vehicles. Also, the parameters are measured in metric units on the oMG, but can be reported in either metric or imperial units on the oMM depending on the measurement units selected in the oMM's user preferences. If imperial is selected as the display unit on the oMM, then the oMM will automatically convert the values from metric.

Table 2-1: Telemetry Parameters

Absolute Throttle Position B/C:	Percentage of Throttle Applied
Absolute load value	The percentage of air mass per intake stroke.
Accelerator position D/E/F	The absolute throttle position measured as a percentage of full throttle.
Ambient air temperature	The barometric pressure measured in kilopascals.
Calculated engine load value	The percentage of available torque in use.
Catalyst temperature bank1/2 sensor 1/2	The temperature of the catalyst substrate measured in degrees Celsius.
Commanded EGR	The percentage of EGR being commanded.
Fuel/Air commanded equivalence ratio	The commanded open loop equivalence ratio while the system is in open loop. This parameter should report 100% when in closed loop.
Commanded evaporative purge	The percent of purge being commanded.
Commanded throttle actuator	The amount (percent) by which the throttle is commanded open.
Control module voltage	The voltage being delivered to the control module.
Diagnostic trouble code	Standard OBD codes which may have different meanings for each manufacturer. To interpret codes, search the internet for a list of OBD diagnostic trouble codes (DTC) for the manufacturer of your vehicle.
Distance since MIL on	The Malfunction Indicator Lamp (MIL) is the 'engine warning lamp' which shows on the vehicle dashboard when a problem is detected with some component or function of the vehicle. This parameter measures the distance in kilometers driven since the MIL came on. If it is zero, that means the MIL is not on, or the vehicle has not been driven since it did come on.
Distance since codes cleared	The distance travelled since the last DTCs were cleared by a scan tool. Measured in kilometers.

Table 2-1: Telemetry Parameters

Absolute Throttle Position B/C:	Percentage of Throttle Applied
EGR error	
Engine coolant temperature	The engine coolant temperature measured in degrees Celsius.
Engine RPM	The speed of the engine (revolutions per minute).
Evaporative system vapor pressure	The evaporative vapor pressure of the fuel system measured in pascals.
Ethanol fuel percent	The percentage of alcohol fuel in ethanol fuel
Fuel level input	Shown as a percentage of the tank
Fuel pressure	Measured in kilopascals
Fuel rail pressure gauge	Relevant to manifold vacuum. Measured in kilopascals.
Intake air temperature	Measured in degrees Celsius.
Intake manifold absolute pressure	Measured in kilopascals
Long term fuel trim bank 1/2	The long term fuel trim percentage
Mass air flow rate	The rate of air entering the engine measured in grams per second.
MILon	Indicates whether the MIL is on or off. A value of 1 or 0 will be displayed accordingly. See 'Distance Since the MIL on parameter above for more details on MIL.
Number of warm ups since codes reset	The number of vehicle warm up cycles which have occurred since the last time all trouble codes were cleared.
ODB scanner connected	Indicates if the scanner is currently connected (a value of 1) or is disconnected (a value of 0).
Odometer	Shows odometer reading of the vehicle. Note: This parameter is dependant on the Distance since codes cleared (DSCC) PID. If "DSCC" is not available on the vehicle, then this parameter will not be reported.
Relative throttle position	The relative throttle position percentage.
Run time since engine start	The total time in seconds since the engine was started.
Short term fuel trim bank 1/2	The Short Term Fuel Trim percentage.
Throttle position	The amount (percentage) of how open the throttle is.
Time at idle	The amount of time spent idling.

Table 2-1: Telemetry Parameters

Absolute Throttle Position B/C:	Percentage of Throttle Applied
Timing advance	The advance of the ignition timing measured in degrees relative to the first cylinder.
Vehicle speed	The last recorded velocity of the vehicle. Measured in kilometers per hour.
VIN	Vehicle Identification Number. Unique 17 digit serial number assigned to the vehicle by the manufacturer.