HD Telemetry Configuration and User Guide

oMG

SIERRA WIRELESS®

4118616
Rev 1

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 blasting is in progress, where explosive atmospheres may be present, near medical equipment, near life support equipment, or any equipment which may be susceptible to any form of radio interference. In such areas, the Sierra Wireless modem **MUST BE POWERED OFF**. The Sierra Wireless modem can transmit signals that could interfere with this equipment.

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

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

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

Limitation of Liability

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.

Patents

This product may contain technology developed by or for Sierra Wireless Inc. This product includes 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® and the Sierra Wireless logo are registered trademarks of Sierra Wireless.

Watcher® is a registered trademark of Netgear, Inc., used under license.

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
	E-mail:	sales@sierrawireless.com
Post:	Sierra Wireless 13811 Wireless Way Richmond, BC Canada V6V 3A4	
Fax:	1-604-231-1109	
Web:	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

Revision History

Revision number	Release date	Changes
1	May 5, 2016	• Updated to SWI Template, updated to SWI doc #, minor image layout updates.

Contents

1: Overview

Who Should Read This Document?

The target audience for this document are system administrators and Sierra Wireless Engineers who will install and configure Heavy Duty (HD) Telemetry. It is assumed that the audience has access to the appropriate account and password on the oMG and oMM to configure Telemetry.

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

2: What is HD Telemetry?

HD Telemetry is an add-on application, which monitors a number of Parameter IDs (PIDs)/Suspect Parameter Numbers (SPN) specific to heavy duty commercial trucks.

HD Telemetry interfaces with a vehicle via the HDODB (Heavy Duty Onboard Diagnostics) port.

HD Telemetry communicates with a vehicle's electronic interface system to gain real-time access to diagnostic data generated by the various electronic systems embedded within a vehicle.

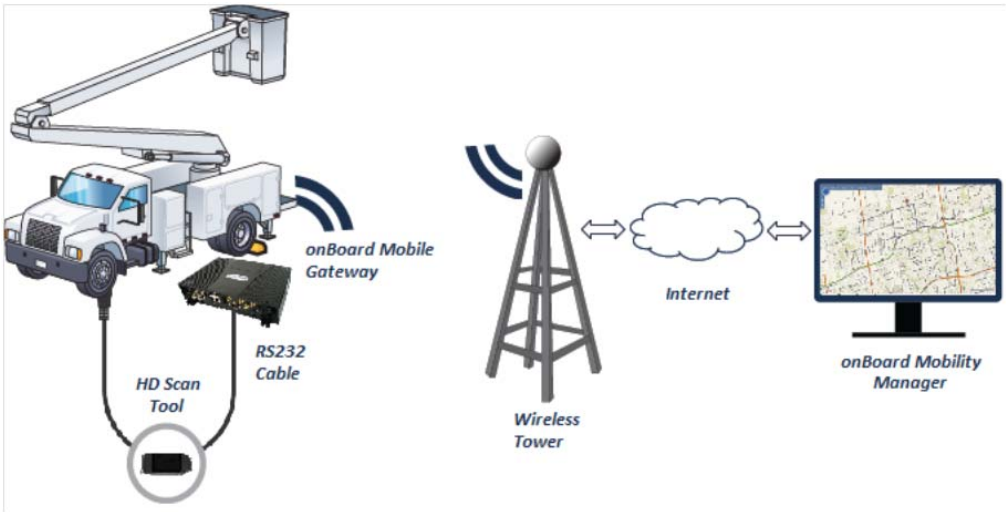


Figure 2-1: Overview of HD Telemetry

Note: HD 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.

HD Telemetry requires a special scan tool to read the diagnostic data from the vehicle and this tool is provided by Sierra Wireless. HD Telemetry sends the vehicle data to the oMG which must be configured with the HD 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.

3: Who Should Use HD Telemetry?

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

HD Telemetry information may be limited to specific makes and models of vehicles. Contact your Sierra Wireless sales representative for further details.

4: Theory of Operation

HD Telemetry has three main operations:

- HD Telemetry data collection through the oMG
- HD Telemetry data viewing via the oMM Dashboard
- HD Telemetry data alerting and reporting via the oMM

5: HD Telemetry Verification Kit

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

This kit enables a laptop running special verification software (included in the kit) to check which HD PID's are being output by the vehicle's onboard computer, therefore indicating which parameters an oMG will be able to report on for that vehicle.

Components

The Telemetry Verification Kit includes the following components:

- **Heavy duty diagnostic cable**: connects to the vehicle's Deutsch socket and one side of the scan tool.

Figure 5-1: HD Scanner and Cables

- **AutoTap 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 Autotap 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 your laptop to communicate using USB instead of serial.
3. Plug the serial end of the Deutsch-to-serial cable into the other end of the Autotap scanner. Do not plug in the Deutsch end of the cable into the vehicle at this point.

Note: this manual assumes that a vehicle is available and that the customer has a laptop on which they know how to access the BIOS.

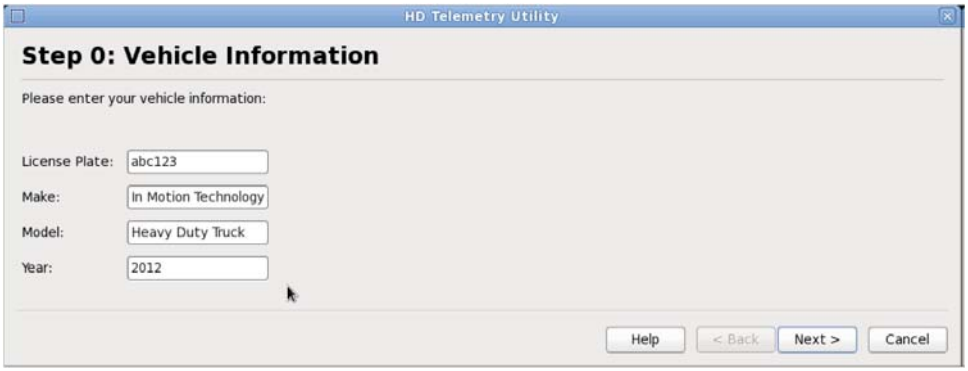
Running the Utility

Insert the USB stick from the HD 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.

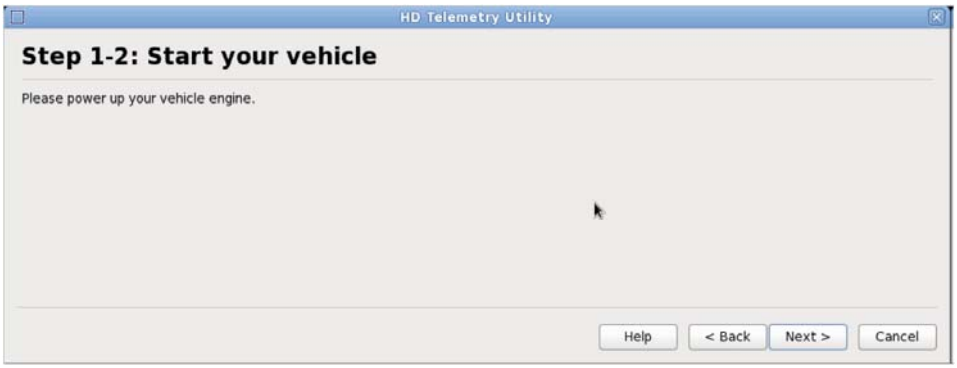
Upon successfully booting the HD Telemetry Verification Kit utility from the USB stick, proceed through the following screens:

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



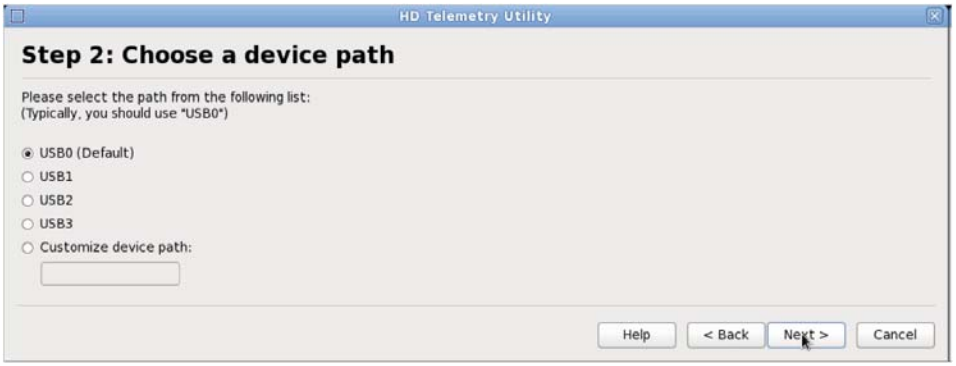
2. Connect the Deutsch end of your serial-to-Deutsch cable to the vehicle and click **Next** on the Scantool page

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

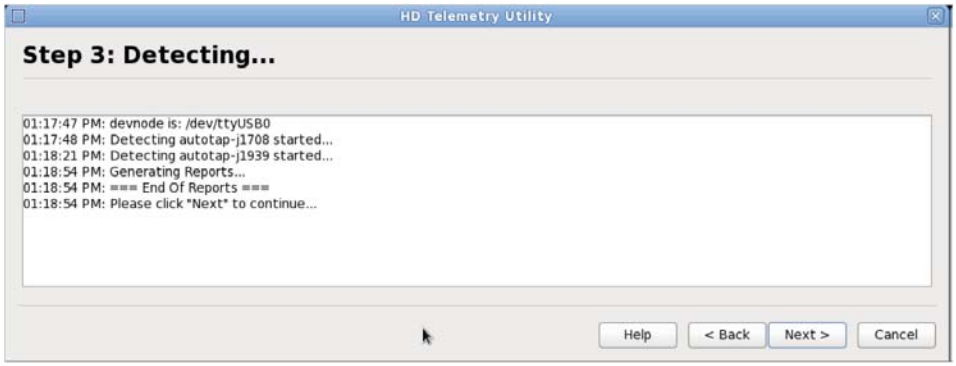


4. Connect the serial or USB end of the cable from the Autotap scanner to the computer on the Scantool page and click **Next**.

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):

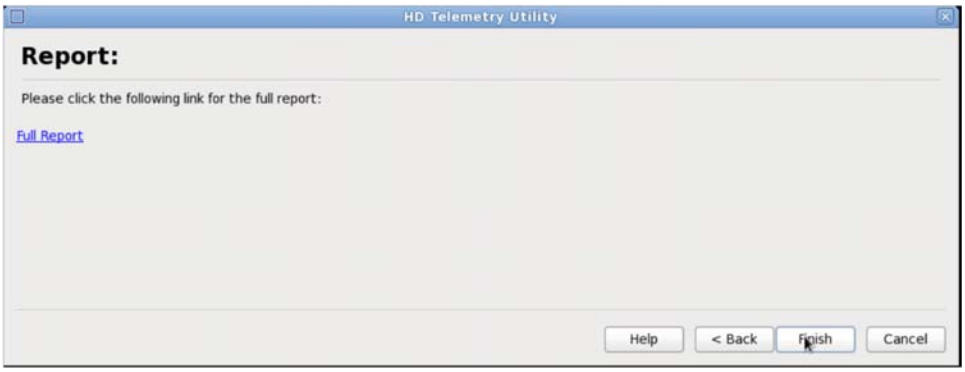


6. The compatibility check process will run:



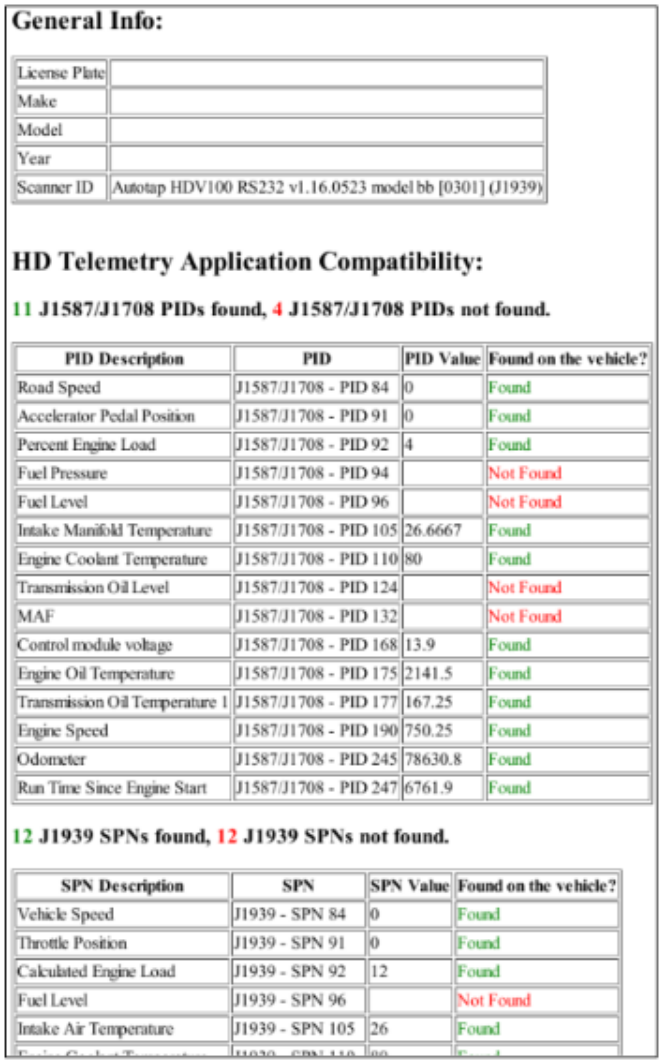
7. The final report is saved in */Desktop* on the USB stick in HTML format. Each time the utility is run, a new entry is added to the files, allowing for information from an entire fleet to be saved and reloaded.

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	
Make	
Model	
Year	
Scanner ID	Autotap HDV100 RS232 v1.16.0523 model bb [0301] (J1939)

HD Telemetry Application Compatibility:

11 J1587/J1708 PIDs found, 4 J1587/J1708 PIDs not found.

PID Description	PID	PID Value	Found on the vehicle?
Road Speed	J1587/J1708 - PID 84	0	Found
Accelerator Pedal Position	J1587/J1708 - PID 91	0	Found
Percent Engine Load	J1587/J1708 - PID 92	4	Found
Fuel Pressure	J1587/J1708 - PID 94		Not Found
Fuel Level	J1587/J1708 - PID 96		Not Found
Intake Manifold Temperature	J1587/J1708 - PID 105	26.6667	Found
Engine Coolant Temperature	J1587/J1708 - PID 110	80	Found
Transmission Oil Level	J1587/J1708 - PID 124		Not Found
MAF	J1587/J1708 - PID 132		Not Found
Control module voltage	J1587/J1708 - PID 168	13.9	Found
Engine Oil Temperature	J1587/J1708 - PID 175	2141.5	Found
Transmission Oil Temperature 1	J1587/J1708 - PID 177	167.25	Found
Engine Speed	J1587/J1708 - PID 190	750.25	Found
Odometer	J1587/J1708 - PID 245	78630.8	Found
Run Time Since Engine Start	J1587/J1708 - PID 247	6761.9	Found

12 J1939 SPNs found, 12 J1939 SPNs not found.

SPN Description	SPN	SPN Value	Found on the vehicle?
Vehicle Speed	J1939 - SPN 84	0	Found
Throttle Position	J1939 - SPN 91	0	Found
Calculated Engine Load	J1939 - SPN 92	12	Found
Fuel Level	J1939 - SPN 96		Not Found
Intake Air Temperature	J1939 - SPN 105	26	Found

Figure 5-2: Example of the HD Telemetry Utility Report

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

6: HD Telemetry Hardware

The HD Telemetry Application uses data from the vehicle diagnostic bus 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: IMTMIS070 (6-pin) or IMTMIS071 (9-pin).

Required Components

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

1. Sierra Wireless oMG with a minimum software release of 3.x or greater is required.
2. Sierra Wireless Telemetry Application Module.
3. Scan toolkit (supplied by Sierra Wireless) which includes the following:
   a. 25' OBD cable that connects scan tool to vehicle HDOBD port (there are two formats for this connector: 6-pin and 9-pin. Check with your vehicle manufacturer prior to ordering from Sierra Wireless).
   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 and Configuration Guide for more information on configuring an oMG. The installer is expected to be familiar with the location of the Deutsch connector in the vehicle.

1. Power on the oMG, and verify it can connect to a WAN service (steady green light).
2. Verify the oMG meets the software requirements for the HD 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 Deutsch port in the vehicle. The Deutsch 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 cable with the Deutsch connector to the vehicle's Deutsch port and the other end of the cable to the scanner.

5. 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.
6. 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 a Scanner Between the oMG and a Heavy Duty Vehicle

7: Configuring the HD Telemetry Application

Configuration is required on both oMG and oMM for HD Telemetry to operate. The following subsections assume the reader is familiar with using the oMM and accessing an oMG through the web interface.

Enabling Telemetry on an oMG

Use the following steps to enable HD 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.

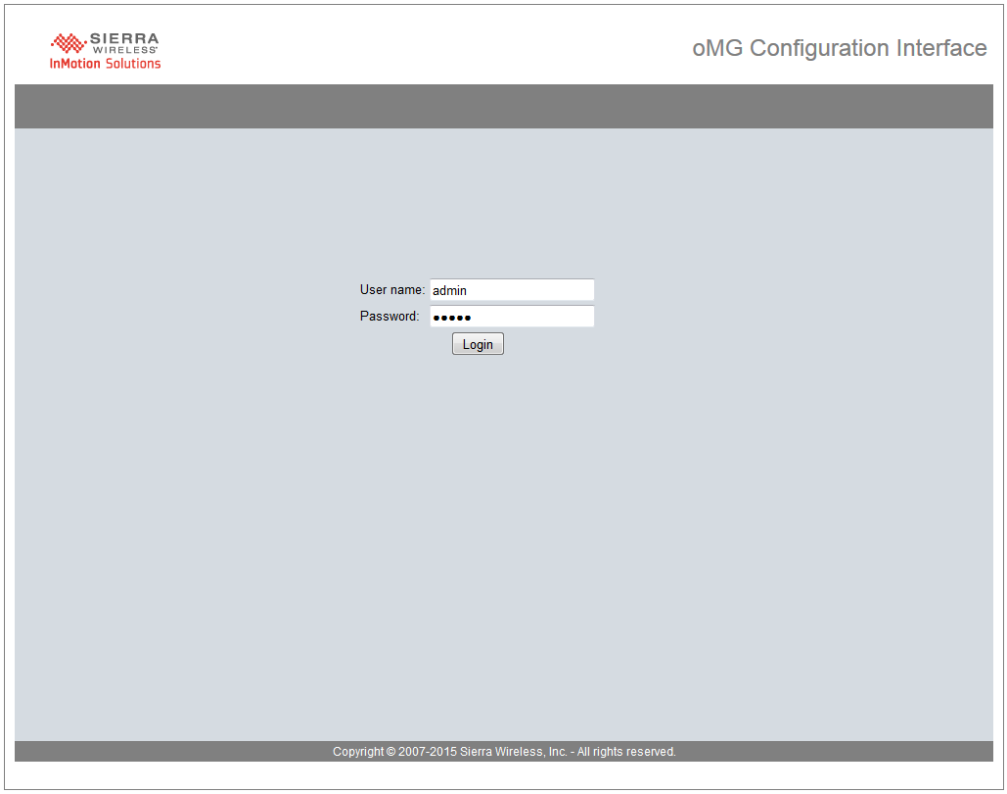


Figure 7-1: Login Screen

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 > HD Telemetry**.

Note: if the Telemetry 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** to activate the HD Telemetry application.

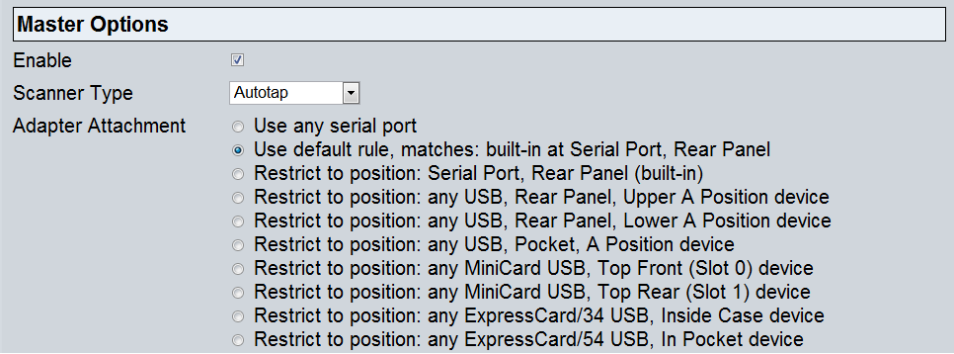


Figure 7-2: Master Options

5. In most cases, setting the *Scanner Type to Autotap* will work. However if your vehicle supports both J1708 and J1939 and you want to ensure that a specific protocol is used, select if from the list.
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 *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. Note that some vehicles may use the term SPN (Suspect Parameter Number) in place of PID. Click **Submit** to save the configuration changes.

Bit-mapped SPNs

SPN	Enabled	Description	Report When Bits Change By	Report When Value Stable For
701	☐	Auxiliary I/O SPN 701-716	??	?? s
976	☐	PTO Governor State	??	?? s

Numeric SPNs

SPN	Enabled	Description	Report When Value Changes By		Report When Value Stable For	
84	☑	Wheel based vehicle speed	5.0	km/h	60.0	s
91	☐	Accelerator Pedal Position 1	5.0	percent	0.0	s
92	☐	Calculated percent load at current speed	10.0	percent	0.0	s
96	☑	Fuel level 1	2.0	percent	120.0	s
105	☑	Engine Intake Manifold Temperature 1	5.0	degrees C	0.0	s
110	☑	Engine coolant temperature	10.0	degrees C	900.0	s
124	☐	Transmission Oil Level	??	percent	??	s
132	☐	Engine Intake Air Mass Flow Rate	10.0	g/s	0.0	s
168	☐	Battery Potential	0.1	volts	600.0	s
175	☐	Engine Oil Temperature	??	C	??	s
177	☐	Transmission Oil Temperature 1	??	C	??	s
190	☑	Engine Speed	100.0	RPM	60.0	s
247	☑	Engine total hours of operation	60.0	seconds	0.0	s
512	☐	Drivers Demand Engine Percent Torque	??	percent	??	s
513	☐	Actual Engine Percent Torque	??	percent	??	s
3236	☐	Aftertreatment 1 Exhaust Gas Mass Flow	??	kg/h	??	s
3480	☐	Aftertreatment 1 Fuel pressure 1	50.0	kPa	0.0	s

Submit

Figure 7-3: HD PIDs

7. Click **Submit** to save the configuration changes.

oMM

The oMM presents HD 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 HD 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

To view HD Telemetry data on the oMM, an oMM user must first be configured with permission to access the *Telemetry*, *Reports*, and *Stats* tabs.

Note: this step is performed by Sierra Wireless for hosted accounts.

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.

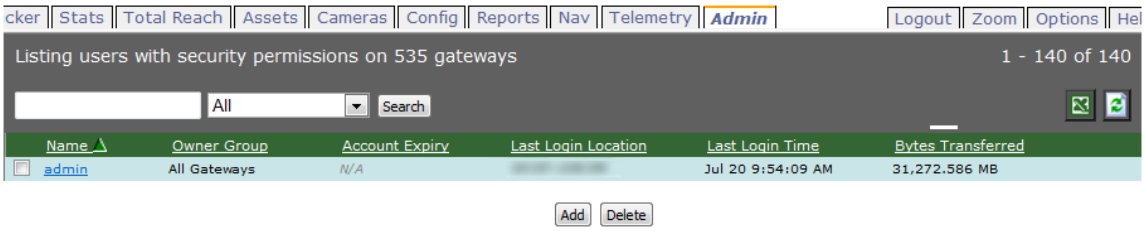


Figure 7-4: Admin / Users Screen

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

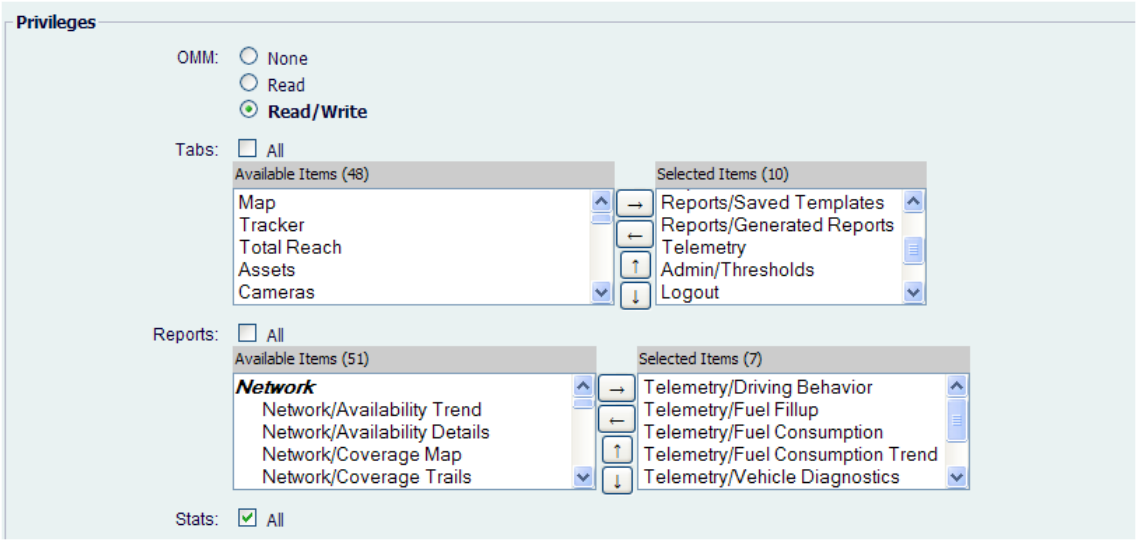


Figure 7-5: User Access Configuration

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

HD Telemetry Thresholds corresponding to HD 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 HD Telemetry PIDs which can be reported as Stats, see Summary of HD Telemetry PID/SPNS.

8: Operation

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

The oMG HD 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.

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

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

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

Reports: a number of Telemetry reports are included as part of the HD 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 HDODB 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 HD Telemetry and as well as those defined for other measurable subsystems.

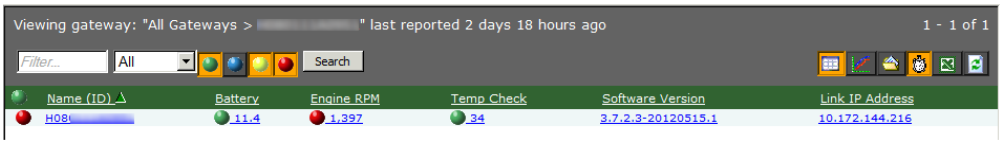


Figure 8-1: Dashboard with HD Telemetry Stats and Thresholds

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 a different colored Threshold bubble for the *Engine RPM* Telemetry Stat.

HD 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.

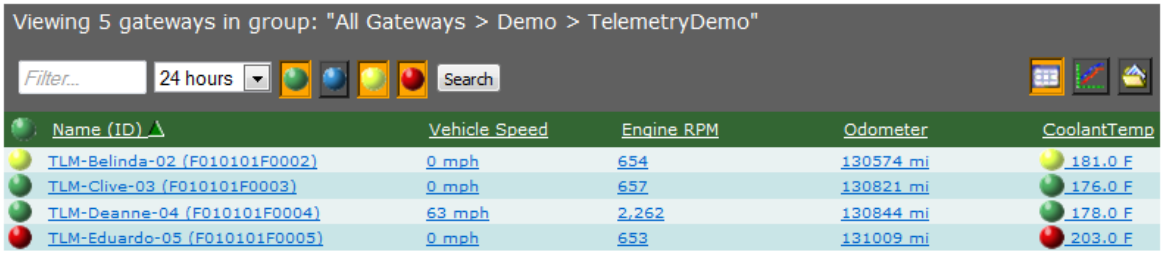


Figure 8-2: Telemetry Dashboard Tab

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

- which HD 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:

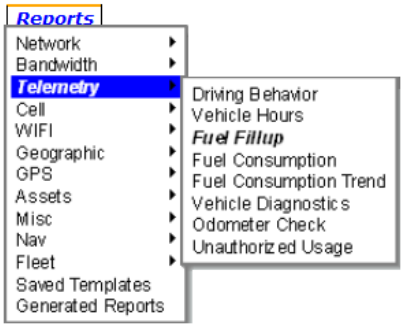


Figure 8-3: Telemetry Reports Menu

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 HD 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 HDODB port or if the HDODB 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

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

Heavy Duty Telemetry Status

Agent

Time	Fri Aug 24 15:16:20 2012
State	ACTIVE_SCAN
Attachment	/dev/ttyUSB2
Adapter	Autotap HDV100 RS232 v1.16.0523 model bb [0301] (J1939)
VIN/Identifier	

Odometer

Odometer Value 0.000000

Monitored SPNs

SPN	Description	Value
84	Wheel based vehicle speed	38.2305
91	Accelerator Pedal Position 1	unknown
92	Calculated percent load at current speed	unknown
96	Fuel level 1	unknown
105	Engine Intake Manifold Temperature 1	unknown
110	Engine coolant temperature	85
124	Transmission Oil Level	unknown
132	Engine Intake Air Mass Flow Rate	unknown
168	Battery Potential	unknown
175	Engine Oil Temperature	unknown
177	Transmission Oil Temperature 1	unknown
190	Engine Speed	1123.38
247	Engine total hours of operation	unknown
512	Drivers Demand Engine Percent Torque	unknown
513	Actual Engine Percent Torque	unknown
701	Auxiliary I/O SPN 701-716	unknown
976	PTO Governor State	unknown
3236	Aftertreatment 1 Exhaust Gas Mass Flow	unknown
3480	Aftertreatment 1 Fuel pressure 1	unknown

Figure 9-2: Scanner Disconnection Status in LCI

Missing Data

Some vehicles may not support all PIDs or may use a proprietary method that is not supported by Sierra Wireless. In such a case, the oMM Dashboard or Telemetry Dashboard may not display this PID or may show N/A rather than a value. To check which ID's are being reported by a vehicle, use the HD Verification Kit described in HD Telemetry Verification Kit.

A: Summary of HD Telemetry PID/SPNS

The following list describes the HD vehicle parameters which can be reported as Telemetry Stats to the oMM.

Table 1-1: Telemetry PID/SPNS

Actual Engine Torque	The Calculated output of the Engine
Auxliary I/O #1 - #16	The current status of auxiliary input/output functions.
Control Module Voltage	Electrical potential of the battery.
Driver Demand Engine Torque	The requested torque output of the engine by the driver.
DTC Diagnostic Trouble Code	A set of information that helps to understand the failure that is being reported.
Engine Coolant Temperature	The engine coolant temperature measured in degrees Celsius.
Engine Load	The ratio of actual engine percent torque to maximum indicated torque available at the current engine speed.
Engine Oil Temperature	
Engine RPM	Rotational velocity of crankshaft.
Exhaust Gas Mass Air Flow	The calculated exhaust gas mass upstream of the after treatment system in exhaust bank.
Fuel Level (%)	Ratio of volume of fuel to the total volume of fuel storage container.
Fuel Pressure	Pressure of the fuel for aftertreatment.
Intake Manifold Temperature	Temperature of pre-combustion air in intake manifold of engine air supply system.
Mass Air Flow	Mass flow rate of fresh air entering the engine air intake.
Odometer	Shows odometer reading of the vehicle
PTO Governor State	The current state of the Power Take-Off (PTO) device
Seat Belt Warning Lamp	Indicator of whether seat belt warning lamp is on or off.
Throttle Position	The ratio of actual position of the accelerator pedal to the maximum position of the pedal.
Time Since Engine Start	The calculated time since engine starts.
Transmission Oil Level	Ratio of volume of transmission sump oil to recommended volume.
Transmission Oil Temperature	Temperature of the transmission oil.

Table 1-1: Telemetry PID/SPNS

Actual Engine Torque	The Calculated output of the Engine
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.