DG TECHNOLOGIES
Vehicle Network Solutions

VSI-2534

User Manual

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This document describes DG Technologies VSI-2534. The VSI-2534 is an SAE J2534 Pass-Thru device with its primary purpose to program automotive ECUs (Electronic Control Units).

The VSI-2534 is also useful for vehicle diagnostics, development, general design, hardware-in-the-loop simulation and anywhere communications with a vehicle network are required.

I M P O R T A N T

To ensure your success with this product, it is essential that you read this document carefully before using the hardware.

Damage caused by misuse of the hardware is not covered under product warranty. When using this manual, please remember the following:

- ❑ This manual may be changed, in whole or in part, without notice.

- ❑ DG assumes no responsibility for any damage resulting from the use of this hardware and software.

- ❑ Specifications presented herein are provided for illustration purposes only and may not accurately represent the latest revisions of hardware, software or cabling.

- ❑ No license is granted, by implication or otherwise, for any patents or other rights of DG or of any third party.

Contents

1.   Introduction

How it works: A PC is connected to a vehicle through the VSI-2534 "Pass-Thru device" to the OBD-II J1962 connector and on to the ECUs. The VSI-2534 provides the translation interface between the PC and the vehicle or module.

The user software application on the PC sends and receives data to the vehicle using the DG Technologies VSI-2534.

Provides support for: the most current version of the J2534 API (Version 04.04) and D-PDU API.

Supports the following protocols:

>CAN (ISO 11898, J2284)
Single-Wire CAN
ISO15765
ISO 9141
KWP2000
J1850 PWM (Ford SCP)
J1850 VPWM (both GM Class 2 and Chrysler)
SCI
GM-UART

Features:

- USB 2.0 connection to a PC for fast downloads. (Operates at full network speed with fast and efficient data transfers.)

- Connects to a vehicle with an OBDII cable or a custom cable.

- Runs the SAE J1699 Vehicle Validation software.

- On or off-board J2534 module programming.

- Programming voltages – 5 to 20 V in 100 mV steps.

- Useful for diagnostics or module development.

1.1   VSI-2534 hardware specifications

Dimensional   **Height:** 4.375 in
                     Width: 6.625 in.
                     Depth: 1.312 in.

Weight   **VSI-2534 tool:** 13.3 oz.
                     OBD II cable: 10.9 oz.

Electrical   **Nominal Voltage:**   12 VDC
                     Maximum Voltage: 27 VDC
                     Current consumption: Less than 200 mA at 12 VDC
                     Temperature range: - 40 C to + 85 C

1.2   Power Connector

The VSI-2534 can be powered via either a power jack (12V DC) **OR** via the supplied OBD II cable attached to the vehicle. (See 1.3.1 for more information on 12V DC usage)

<u>**WARNING**</u>: The VSI-2534 **SHOULD NOT** be powered via the power jack **AND** the supplied OBD II cable **SIMULTANEOUSLY**. Connecting to multiple power sources may cause damage to the hardware.

1.2.1   Powering up the hardware
Once a power source has been connected, the POWER LED should light green. See Section 1.3.2 for details.

1.2.2   Vehicle network connection
The vehicle network connection can be made by using the supplied OBD II cable or by a custom cable to the hardware's DB-25 (female) connector, see Appendix A.

1.3　Hardware overview

The following figures show the external features of the VSI-2534:

Figure 1: VSI-2534 Front & Side Views

1.3.1　Toggle Switch

The Toggle Switch can be used to simulate the vehicle ignition switch (on/off) when the VSI-2534 is powered via a 12V DC input. An example of this scenario would be reflashing on the bench. When powered via. the supplied OBDII cable, the Toggle Switch is not active.

1.3.2　DB-25

This is the connector where the OBDII cable connects and powers the VSI-2534 from the vehicle connection.

1.3.3　DB-9

This is no longer in use.

1.3.4　USB

This is where the USB cable connects to the device to the PC.

1.3.5　12V DC

This is the external Power Connector.

1.3.6 Status Indicators

The VSI-2534 has three status LEDs that indicate activity of the following functions:

- **PC Connection** – Indicates that the VSI-2534 has established a connection to the PC, and if the link is "active."

- **Vehicle Connection** – Indicates that the vehicle network connection is established / active.

- **Power** – Indicates that the VSI-2534 is connected to a power supply (either via the jack plug or through a vehicle connection), and whether or not the unit is operating properly.

1.3.7 Status Indicators Table

LED Name	LED State	Description
PC Connection	Off	PC has not initialized communication with VSI-2534 via the USB data link.
	On (Solid Red)	PC has initialized communication with VSI-2534 via the USB data link. No bus activity.
	On (Alternating Red / Green)	Activity on the PC-VSI-2534 connection via USB data link.
Vehicle Connection	Off	No vehicle network protocol channel has been initialized for use.
	On (Red)	One or more vehicle network protocol channels have been initialized for use. No bus activity.
	On (Alternating Red / Green)	There is activity on one or more vehicle network protocol channels.
Power	Off	No power supplied to the VSI-2534 unit.
	On (Solid Green)	Unit is powered either via the vehicle connector or the external power jack. Unit is operating properly.
	On (Solid Red)	Unit is powered either via the vehicle connector or the external power jack. Unit is **not** operating properly.
Table 1: LED Descriptions		

2.   Software Setup
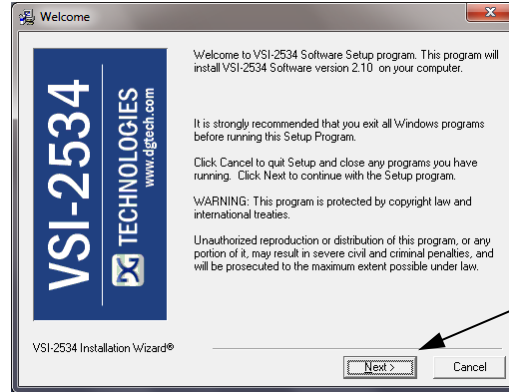
1. If it does not start automatically, locate the "Setup_VSI2534.EXE" file on the CD and double-click on it to start the software setup, and then click "Next".
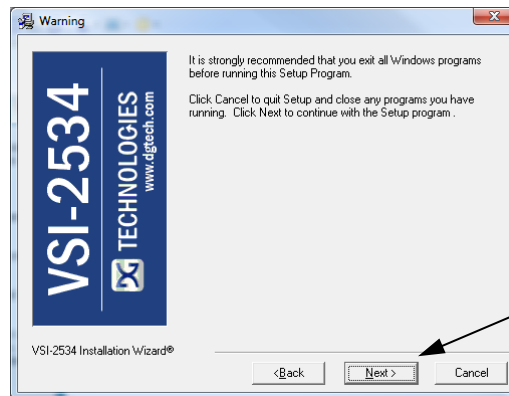
2. Exit all open Windows programs and click "Next" to continue.
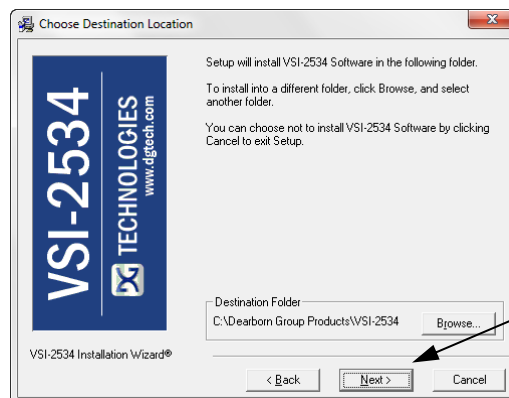
3. Choose Destination Location for the installation. The default location is C:\Dearborn Group Products\VSI-2534. Click "Next" to continue.
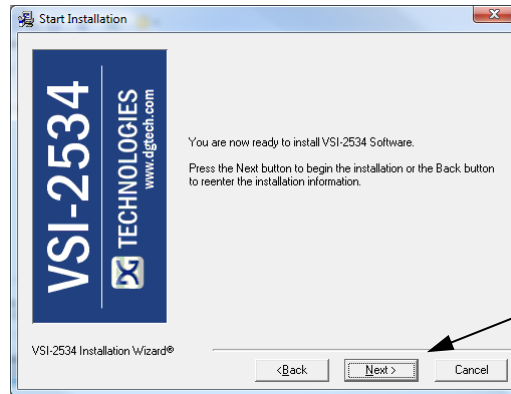
4. Click "Next" to continue.
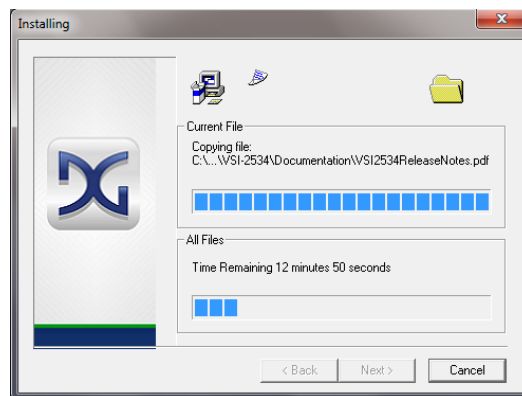
5. Installing…

6. Ensure that you do not have the VSI-2534 hardware connected to the PC's USB port. Click "OK" to continue.
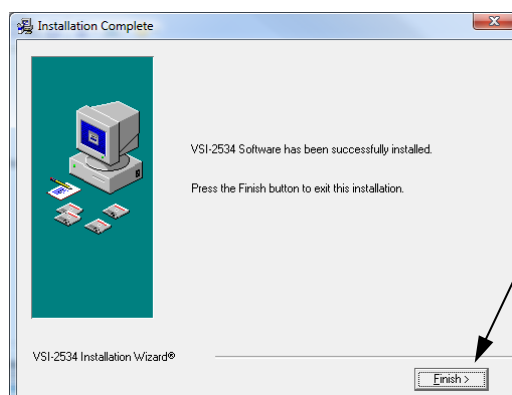
7. Installation is complete. Click "Finish", then click "OK" to reboot the PC.

3.   Hardware Configuration

3.1   First Time Hardware Connection to the PC

Note: For Windows Vista or 7 32-bit ONLY, see below. For Windows Vista or 7, 64-bit, a screen will display in the lower right corner of the screen indicating automatic driver installation.
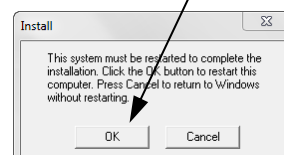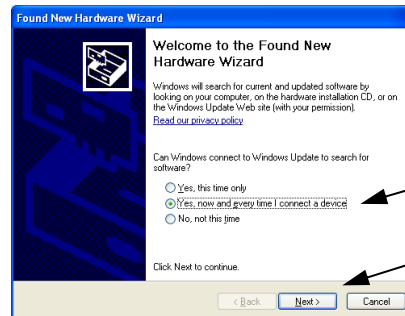

Step 1: Connect the VSI-2534 to a power source (Power adapter or powered from the OBD II cable). Note: do not power unit from multiple sources. Power LED must be a solid Green. Connect USB Cable to PC. In some versions of Windows the final step in driver installation is automatic. In others, the Windows Found New Hardware Wizard will run to finalize driver installation. This can take a few moments to come up.

Step2: Select "Install the software automatically" or "Yes now – and every time I connect a new device" and click "Next".

Step3: Click "Finish".

3.2 Typical Hardware Connection to the PC

Step 1: Connect the VSI-2534 to a power source (12V Power adapter **or** powered from the OBD II cable). <u>Note</u>: Do not power unit from multiple sources. Power LED must be a solid GREEN.

Step 2: Connect the VSI-2534's USB cable to the PC that the software was installed on and note that the Power LED is a solid Green and the PC Connection LED is a solid RED.
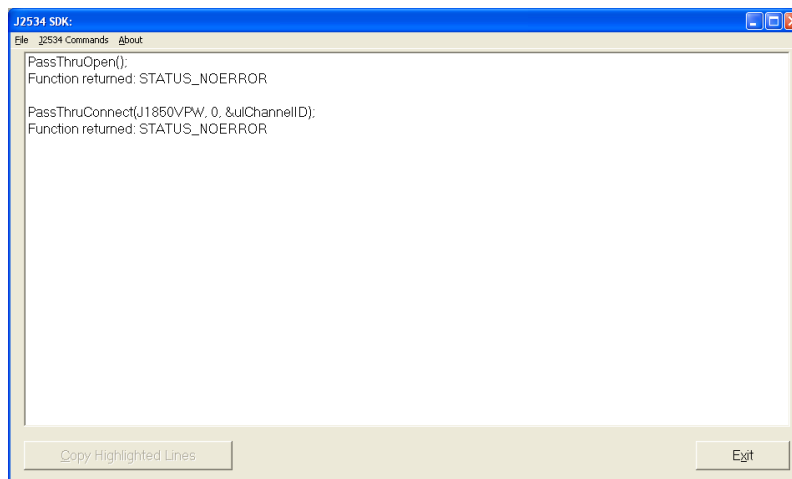
Step 3: Connect the OBDII cable provided to the vehicle or using an application such as the DG 2534 SDK (Software Development Kit), shown above, a user can open a link to the hardware and connect with a protocol to a Vehicle or an Electronic Control Module (ECU). <u>Note</u>: after this connection, the Vehicle Connection LED is a solid RED.

3.3 Hardware Configuration Information

By running the "VSI-2534 Config Utility", located in Start > All Programs > DGTech VSI-2534, a user can find out Hardware version, protocol support, and other information.
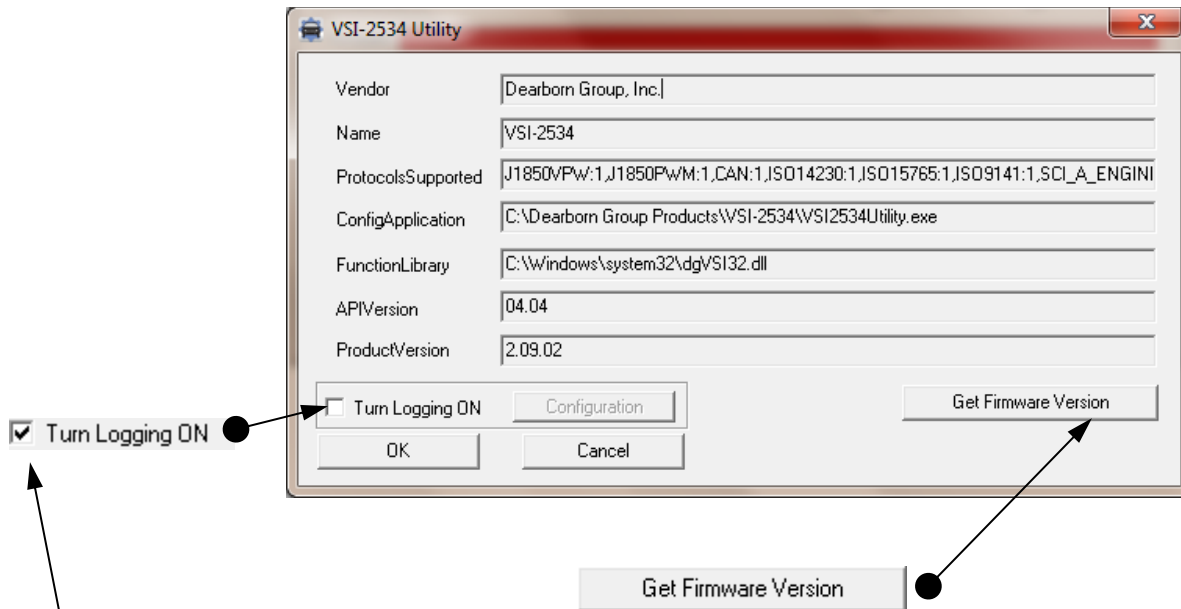
The "Get Firmware Version" button provides the Firmware version of the VSI-2534 hardware. <u>Note</u>: Do not have any other application running that uses the J2534 library.

The "Turn Logging ON" checkbox enables the Configuration button. The Configuration button enables the user to set "Logging Type" and "Logging Method" to create VSI-2534 DLL log. <u>Note</u>: Do not have any other application running that uses the J2534 library.
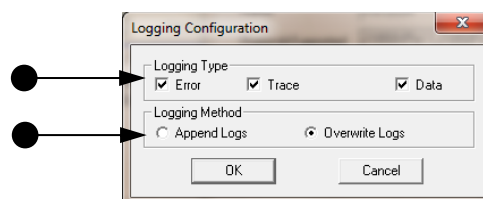
Protocols Supported: J1850VPW, J1850PWM, CAN, ISO9141, ISO14230, ISO15765, SCI_A_ENGINE:1, SCI_A_TRANS:1, SCI_B_ENGINE:1, SCI_B_TRANS:1, SWCAN_ISO15765_PS, SWCAN_PS, GM_UART_PS

J2534 API Version: 04.04
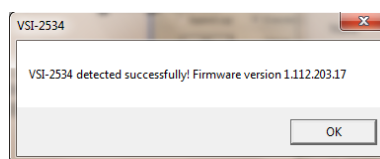
4. Software

4.1 VSI-2534 Validation Utility

Please refer to the "DG VSI-2534 Validation Utility User Guide" found in: Start>Programs>Dearborn Group Products>VSI-2534>Documentation.

4.2 DG Assist

Please refer to the "DG Assist User Manual" found in: Start>Programs>Dearborn Group Products>DG Assist.

4.3 DG Diagnostics OBDII

Please refer to the DG Diagnostics OBDII User Guide found in: Start>Programs>Dearborn Group Products>VSI-2534>Documentation.

4.4 Data Link Monitor 2 (DLM2)

Please refer to the "DLM2 Manual" found in: Start>Programs>Dearborn Group Products>DLM2.

4.5 Software Development Kit (SDK)

Please refer to the "DG J2534 SDK Manual" found in: Start>Programs>Dearborn Group Products>VSI-2534>Documentation.

4.6 DG Updater

DG Update is an application that is installed with your VSI drivers. It will run (by default) once every 30 days, and will keep you up-to-date with the latest versions of drivers for all your DPA, DG Diagnostics, and VSI-2534 products. With this application running regularly and Automatic Firmware Update (see DPA user manual) turned on, this will keep your DPAs up-to-date with drivers and firmware. DG recommends our customers keep up-to-date so that your OEM and component manufacturer diagnostic applications run smoothly.

The utility will run once every 30 days as a user logs on. This value is configurable, but defaults to 30 days. It can also be invoked manually from the Windows Start Menu:

Start > Programs > Dearborn Group Products > VSI-2534 > DG Update

4.6.1 DG Driver Update – Internet Connection Required

The DG Driver Update utility depends on successfully connecting to the Internet (to one of DG's servers) to retrieve the latest version information and to download the latest drivers and applications if necessary.
Many companies install firewalls and virus protection and these may block the DG server queries and responses. If you are connected to the Internet and have issues running DG Update (getting "Unable to connect to the

internet to check for updates." messages), ensure that your firewall or virus protection will allow a connection to the following Internet host/site and port: **fh.dgtech.com, port 8888**. There are too many firewall and virus programs on the market to cover in this manual, however if you contact your network administrator and give him the host and port number, he should be able to configure your PC to allow the communication. You may also consult the Windows help system and/or the documentation for your firewall and/or virus protection software.

4.6.2 DG Driver Update – Initial Screen

When the utility runs as a user logs on, the following screen will appear in the lower right hand corner of the screen. If you want to check for updates, ensure that your PC is connected to the Internet and click Continue. Clicking Cancel will cause DG Update to wait until the next time it is scheduled to run. Clicking Continue will bring up the main update screen.

4.6.3. DG Driver Update – Main Update Screen

The main screen appears looking like this. Depending on which products are installed on your PC, the grid will display pertinent information about them. When selecting DG Update from the Windows Start Menu, this is the first screen to appear.
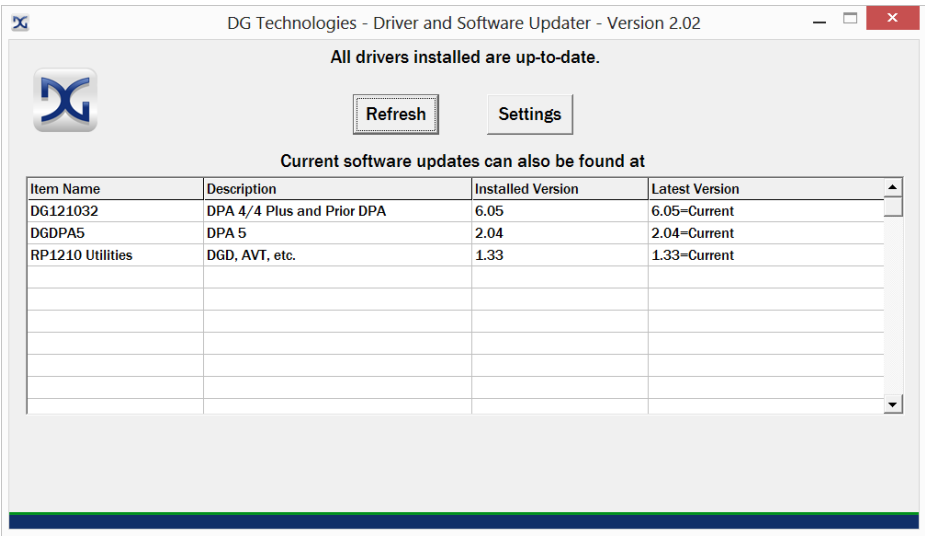
Connect your PC to the Internet and click the Check for Updates button. Due to the nature of TCP/IP communications, errors connecting or sending/receiving of data are slow to appear, however the user will eventually be notified if there was a problem.

If the check for updates was successful, the second column of the grid will display information returned from the DG server showing the most current versions and the Install Status row will change to red, green or blue.
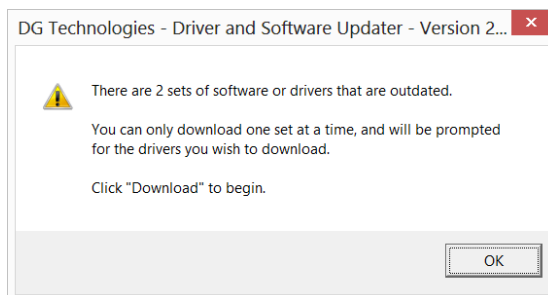
Color	Description
Green	Drivers up-to-date. No update necessary.
Red	Drivers are outdated. Update recommended.
Blue	Drivers on your PC are newer than current version. This usually indicates you are running a beta copy of the DPA drivers.

4.6.4 Successful Connect – Updates Available

Out of date message box
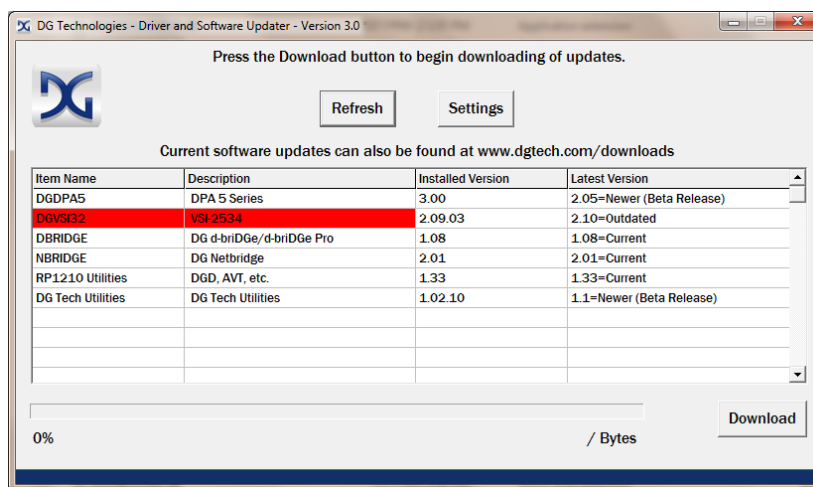
Progress bar and Download button shown

In this case, the VSI-2534 drivers are out of date (red), the user will be presented with a prompt notifying them that there are updates available. Only if updates are available will the **Download** button and progress bar show up on the screen. The progress bar will keep you informed of the download progress should you choose to download the latest drivers by clicking the **Download** button.

When you click the **Download** button, you will be prompted to confirm starting of the download.
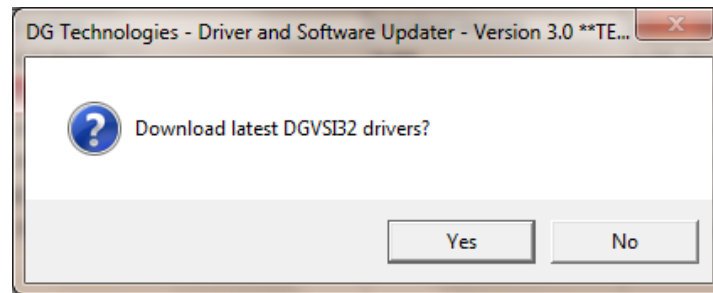
Prompt asking if drivers should be downloaded

Note: The DG Update application can only download and install one item at a time. The user will be prompted for whichever one they want to update first.

After choosing **Yes**, the program will download the drivers and update the progress bar while doing so. Once the drivers have been downloaded, the application will unzip them and start the installation process. The dialog box will go away after the install has been started.

Do not disconnect your VSI or shut down your computer until installation is complete

After the drivers have been downloaded (to the Windows temp directory – if you wish to save them for other machines), they will be unzipped and the program will exit right after starting the new driver installation. Follow the installation instructions in the appropriate User Manual.

4.6.5 Advanced Settings – Setting Default Time for Check for Updates

If you want to turn off, or alter the timeout period where the user is prompted to check for updates (the dialog below), press the **Settings** button. The advanced settings dialog box will be displayed. To turn off the checking prompt, set the value to 0 (zero). Otherwise, you can set the number of days between checks.

Small dialog box that appears In the system tray
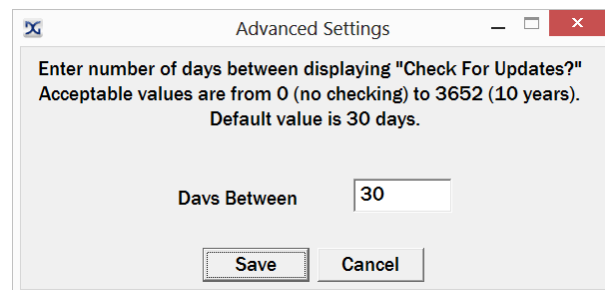
Advanced settings screen

4.7 Hardware/Firmware Update of the VSI-2534

Step 1: Go to: Start>All Programs>DGTech VSI-2534>FirmwareUpdater.
***NOTE:** Adaptor must be plugged in*
Select the drop-down menu for "Adapter" and select "VSI-2534 USB".

Step 2: Click on "Yes".

Step 3: Updating the Firmware...
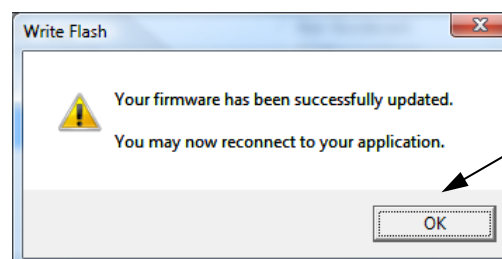
Step 4: Firmware has been updated. Click "OK"

5. Technical Support and Return Merchandise Authorization (RMA)

5.1. Technical Support
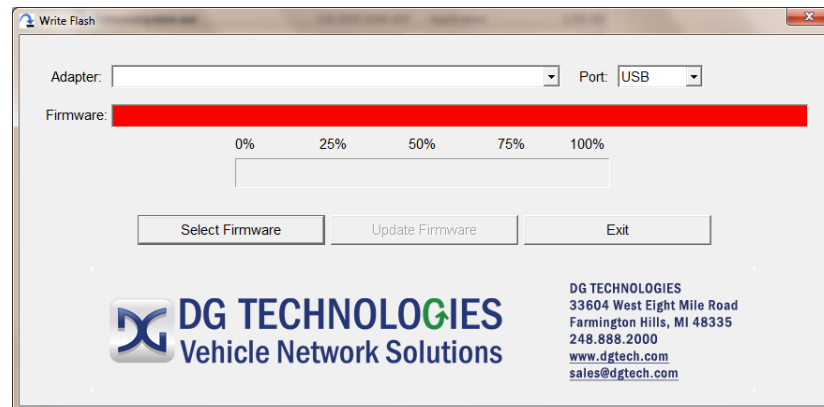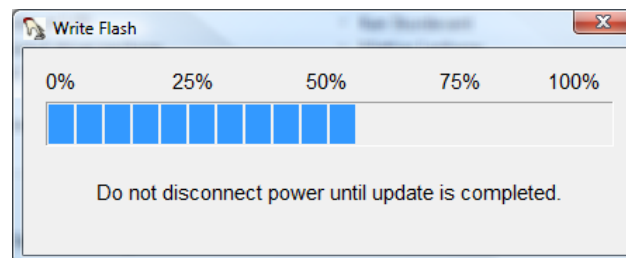
After reading and following the troubleshooting and validation procedures and still not being able to resolve an issue, please feel free to contact DG technical support. For users in the United States, technical support is available from 9 a.m. to 5 p.m. Eastern Time. You may also fax or e-mail your questions to us. For prompt assistance, please include your voice telephone number.

DG Technologies Technical Support
Phone: (248) 888-2000
Fax: (248) 888-9977
E-mail: techsupp@dgtech.com
Web site: www.dgtech.com

Users not residing in the United States should contact your local DG representative or e-mail techsupp@dgtech.com

5.2. Return Merchandise Authorization (RMA)

If technical support has deemed that there may be a physical problem with your VSI, you will be issued you an RMA number. You would then return the product along with any documentation of ownership you have (proof of purchase/price) to the following address:

Product Service/Repairs
Attn: RMA# xxxxxxx
DG Technologies
33604 West 8 Mile Road
Farmington Hills, MI 48335

6. Warranty Information and Limitation Statements

6.1. *Warranty Information*

DG Technologies VSI-2534 is warranted against defects in materials and workmanship for two (2) years following date of shipment. Cables (both USB and vehicle) are warranted for 90 days.

DG Technologies, Inc. will, at its option, repair or replace, at no cost to the customer, products which prove to be defective during the warranty period, provided the defect or failure is not due to misuse, abuse, or alteration of the product. The customer is responsible for shipment of the defective product to DG. This warranty does not cover damage to any item that DG Technologies determines has been damaged by the customer's abuse, misuse, negligence, improper assembly, modification, or operation of the product.

A Return Merchandise Authorization (RMA) number must be issued to the customer by our Technical Support Department at (248) 888-2000 and must be included with the product being returned (for more details, see section *Return Merchandise Authorization (RMA)*). A VSI is warranted for 90 days after a warranty repair, or to end of the original factory warranty period, whichever is longer.

6.2. *Limitation Statements*

6.2.1. General Limitation and Risk Assignment

To the maximum extent permitted by applicable law, DG Technologies and its suppliers provide support services on an "as-is" basis and disclaim all other warranties and conditions not specifically stated herein, whether express, implied or statutory, including, but not limited to, any warranties of merchantability or fitness for a particular purpose, lack of viruses, accuracy or completeness of responses, results, lack of negligence or lack of workmanlike effort, and correspondence to description. The user assumes the entire risk arising out of the use or performance of the device, its operating system components, and any support services.

6.2.2. Exclusion of Incidental, Consequential and Certain Other Damages

To the maximum extent permitted by applicable law, in no event shall DG Technologies or its suppliers be liable for any special, incidental, indirect or consequential damages whatsoever, including but not limited to: damages for loss of profit, loss of confidential or other information; business interruption; personal injury; loss of privacy, failure to meet any duty (including good faith or of reasonable care); negligence; and any other pecuniary or other loss related to the use of or the inability to use the device, components or support services or the provision of or failure to provide support services or otherwise in connection with any provision, even if DG Technologies or any supplier has been advised of the possibility of such damages.

6.2.3. Limitation of Liability and Remedies

Notwithstanding any damages that you might incur for any reason whatsoever (including, without limitation, all damages referenced above and all direct or general damages), in no event shall the liability of DG Technologies and any of its suppliers exceed the price paid for the device. The user assumes the entire risk and liability from the use of this device.

6.2.4. Right to Revise or Update without Notice

DG Technologies reserves the right to revise or update its products, software and/or any or all documentation without obligation to notify any individual or entity.

6.2.5. Governance

The user agrees to be governed by the laws of the State of Michigan, USA, and consents to the jurisdiction of the state court of Michigan in all disputes arising out of or relating to the use of this device.

6.2.6. Contact

Please direct all inquiries to:
DG Technologies
33604 West 8 Mile Road
Farmington Hills, MI 48335
Phone (248) 888-2000
Fax (248) 888-1188

7.   Troubleshooting

7.1 VSI-2534 Validation Utility

Please refer to the "DG VSI-2534 Validation Utility User Guide" found in:
Start>Programs>VSI-2534>Documentation.

7.2 Windows "Side-by-Side" Error

Call Technical Support for assistance. 248-888-2000

7.3 OEM Application Troubleshooting

Please refer to the "DG OEM Application Troubleshooting Guide" found in:
"COMING SOON".

Appendix A – Pin Assignment for the OBD II Cable

VSI-2534 OBD II Cable Pin Assignment

J1962 Connector	VSI-2534 Purpose/Function	VSI-2534 DB 25
1	Single Wire CAN	1
2	SAE J1850 (+)	2
3	(not connected)	
4	Chassis Ground	4
5	Signal Ground	5
6	ISO 15765-4 / CAN High SCI_A_ENGINE (Rx) Programming Voltage	6 & 24 *
7	ISO 9141 / ISO 14230 K-line SCI_A_ENGINE (Tx) SCI_A_TRANS (Tx) SCI_B_ENGINE (Tx)	7
8	(not connected)	
9	GMUART SCI_B_TRANS (Rx) Programming Voltage	9 & 20 *
10	SAE J1850 (-)	10
11	Programming Voltage	11
12	SCI_B_ENGINE (Rx) Programming Voltage	12
13	Programming Voltage	13
14	ISO 15765-4 / CAN Low Programming Voltage SCI_A_TRANS (Rx)	14 & 25 *
15	ISO 9141 / ISO 14230 L-line Short to Ground SCI_B_TRANS (Tx)	15
16	Unswitched Battery Voltage	16
	Not Used	3, 8, 17 -19, 21 - 23

* NOTE: These pairs of pins are either connected together in the VSI-2534 tool or connected in the OBD II cable.

   Pins 6 and 24 are connected together within the VSI-2534 tool.
   Pins 9 and 20 are connected together within the OBD II cable.
   Pins 14 and 25 are connected together within the VSI-2534 tool.

Appendix B – List of Acronyms Used in this Document

Various acronyms have been used throughout this document.

Acronym	Description
API	Application Programming Interface
AVT	Adapter Validation Tool
CAN	Controller Area Network
CD	Compact Disk
CD-ROM	Compact Disk - Read Only Memory
DG	DG Technologies
DPA	DG Protocol Adapter
DTC	Diagnostic Trouble Codes
ID	Identification
ISO	International Standards Organization
LED	Light Emitting Diode
OBD	On Board Diagnostics
OEM	Original Equipment Manufacturer
PC	Personal Computer
RAM	Random Access Memory
RP	Recommended Practice (see TMC)
SAE	Society of Automotive Engineers
TMC	Technology and Maintenance Council
UAC	User Account Control
USB	Universal Serial Bus
VDA	Vehicle Datalink Adapter