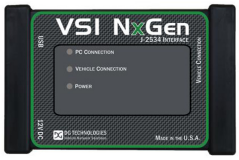
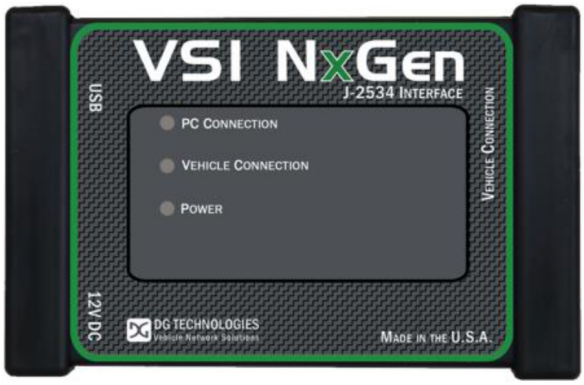


DG TECHNOLOGIES VSI NxGen Reprogramming and Diagnostic Pass-Thru Device User Manual

VSI NxGen Reprogramming and Diagnostic Pass-Thru Device



User Manual

Contents hide

VSI NxGen Reprogramming and Diagnostic Pass-Thru Device

This document describes the DG Technologies VSI NxGen. Per the SAE J2534 standard the VSI NxGen is a compliant diagnostic and programming (Pass-Thru) device. SAE J2534 describes this device as a pc-based, software-driven solution with the purpose being to connect to the vehicle network and provide OEM, dealer-level ECU (Electronic Control Unit) programming, diagnostic functionality and access to security features, such as key programming, airbag module programming and others.
The VSI NxGen has a very robust set of features, capabilities and functions including cybersecurity enhancements by CyberTech from DG Technologies and is protected by CyberGuard inside. It is also useful for vehicle ECU development, general design, hardware-inthe-loop simulation and anywhere bi-directional communications with a vehicle network are required.

IMPORTANT

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 or 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.

Introduction

How it works: A PC is connected to the VSI NxGen using the USB Cable and then to the vehicle network through the OBD II J1962 16 pin connector. The VSI NxGen provides the translation interface between the PC and the vehicle electronic network.
The user software application on the PC sends and receives data to the vehicle using the DG Technologies VSI NxGen.
Provides support for: the most current version of the Society of Automotive Engineers (SAE) J2534-compliant drivers and D-PDU API (for GM only).
Any application claiming J2534 compliance should work if the application and adapter both support the same protocol(s) and operating system(s).

Standards and Protocols Supported

VSI NxGen provides more protocol and standards support than any other commercially available diagnostic adapter in the automotive industry.

❑ SAE J2534 API (v04.04 & v05.00)
❑ Single Wire CAN
❑ Dual Wire CAN
❑ CAN (ISO11898)
❑ ISO15765
❑ FT CAN
❑ CAN FD
❑ IESCAN – CAN@500k/J2284/GMLAN
❑ J1850 VPW (GM Class II)
❑ J1850 PWM
❑ ISO9141
❑ ISO9141-2
❑ ISO14230
❑ GMLAN (HSCAN, SWCAN)
❑ GMUART (SAE J2740)
❑ SCI

VSI NxGen Hardware Specifications

Feature	Data
Dimensions	6.625 x 4.375 x 1.312 inches
Voltage Requirements	9 – 32 Volts DC
Current Requirements	250mA maximum through voltage range
Operating Temperature Range	-40 to +85C
Wired PC Communications Type	USB Version 1.1 or Higher
Wired Connection	USB Cable (up to 15 feet)
Vehicle-Side Connector	DB25 Female
PC-Side Connector	Standard B-Type USB Jack
Auxiliary Power Jack	12 Volt DC
PC Device Drivers	SAE J2534 and SAE J2534-2 Passthru Drivers

System Requirements

Item	Requirement
PC	IBM-Compatible
Processor	1GHz or faster
RAM	4GB
USB Port	USB Version 1.1 or Higher
Operating System	Windows 10 & 11 (32-bit or 64-bit)

Power Connector
The VSI NxGen has 3 possible sources of power:

- Power jack (12V DC)
- DB-25 connector powered by vehicle. Vehicle cable 16 PIN J1962 OBDII cable attached to the vehicle
- USB connection to host PC

There are limited uses for the 12V DC power jack. It may be used for benchtop programming.
WARNING
The VSI NxGen SHOULD NOT be powered via the 12V DC power jack and the supplied OBD II cable simultaneously.
Connecting to multiple power sources may cause damage to the hardware.
Powering the Hardware
Once a power source has been connected, the POWER LED should be green. Vehicle ignition key ON.
Vehicle Network Connection
The vehicle network connection can be made by using the supplied vehicle cable or by a custom cable to the hardware's DB-25 (female) connector.

Hardware Details

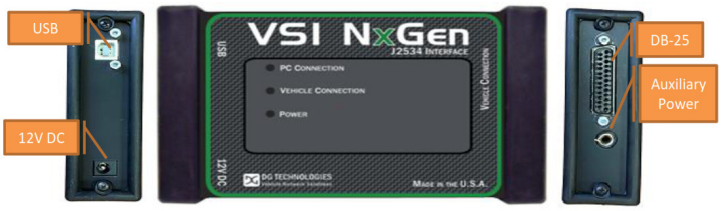


Figure 1 - VSI NxGen Front & Sides

The following figure shows the external features of the VSI NxGen:

External Connections

DB-25
This is the connector where the OBDII cable connects and powers the VSI NxGen from the vehicle connection.
Auxiliary Power
This is an external power port required for some older Hyundai/Kia vehicles and is provided per the SAE J2534 specification.
USB
USB cable connection. Allows connection of the VSI NxGen to the PC.
12V DC
This is the external 12-volt Power Connector.

Status Indicators
The VSI NxGen has three status LEDs that indicate activity of the following functions:

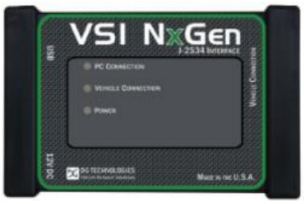
- PC Connection – Indicates that the VSI NxGen has established a connection to the PC, and if the link is active".
- Vehicle Connection – Indicates that the vehicle network connection is established / active.
- Power – Indicates that the VSI NxGen is connected to a power supply plug, through a vehicle connection or by the USB cable connection. This LED supplies information on whether the unit is operating properly.

LED Name	LED State	Description
PC Connection	Off	PC has not initialized communication with VSI NxGen via the USB link.
	On Solid Red	PC has initialized communication with VSI NxGen via the USB.
Vehicle Connection	On Alternating Red / Green	Indicates communications activity on the PC VSI NxGen connection via USB.
	Off	No vehicle network protocol channel has been initialized for use.
	On Solid Red	One or more vehicle network protocol channels have been initialized for use. No bus activ
	On Alternating Red / Green	There is activity on one or more vehicle network protocol channels.
Power		
	Yellow	Unit not configured properly – Contact Customer Support.
	Off	No power supplied to the VSI NxGen unit.
	Power Light On Solid Green	Unit is powered either via the vehicle connector or the external power jack. Unit is operating properly.
Bootloader Missing	Power Light On Solid Red	Unit is powered either via the vehicle connector or the external power jack. Unit is **not** operating properly. Contact Technical Support.
	All LEDs Off	If unit is properly powered up to a known, good power supply, the unit must be serviced. Contact Customer Support.
Bootloader New SW Image Needed	All LEDs Blue	The Firmware Update is needed.
Bootloader Reflash in Progress	All LEDs Blink	The Firmware Update is running.
Bootloader Manual Reboot Needed	All LEDs Green	The user must power cycle the unit. This should not normally happen.

Software Installation

Only the Windows 10 & 11 operating system is supported by the VSI NxGen.
The installation for the VSI NxGen includes files that are specific to this tool (found at **https://www.dgtech.com/downloads/**). Most of the utility programs that DG distributes can be used by multiple DG tools and are distributed via DG Tech Utilities install, which is included with the VSI NxGen software installation.

Installing the VSI NxGen Software



1. Go to **https://www.dgtech.com/downloads/**, locate the VSI NxGen and select Download.
2. In the lower, corner of the window, locate the above file and double-click on it. Or, using the up-arrow, select Open.

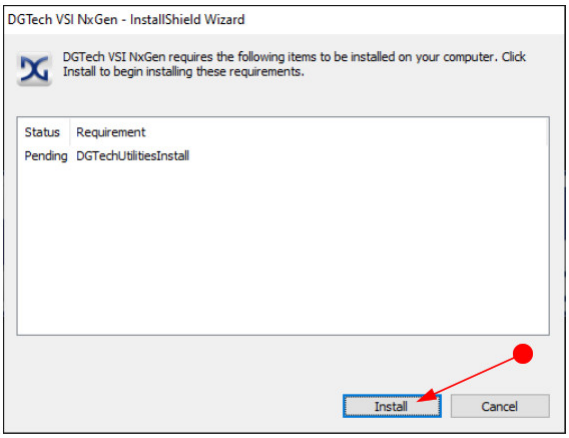


Figure 2 - Required Software Screen

3. Select Install. **Note:** The installation process is 2-fold. First, DG Utilities will install, then the VSI NxGen will install.

i.

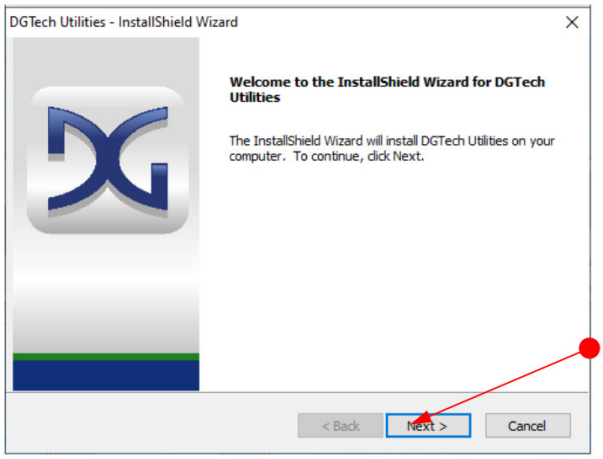


Figure 3 - Installation Welcome

4. After all the software requirements have been met, the InstallShield Wizard for DGTech VSI NxGen will now be displayed. Click Next to continue. Click Cancel to stop the installation.

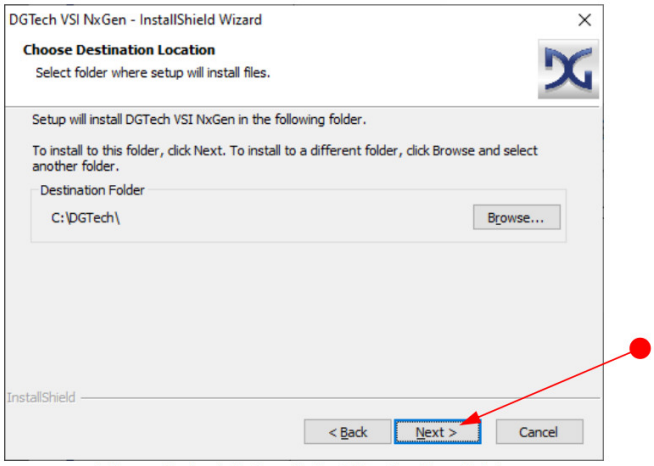


Figure 4 - Installation Select Destination Folder

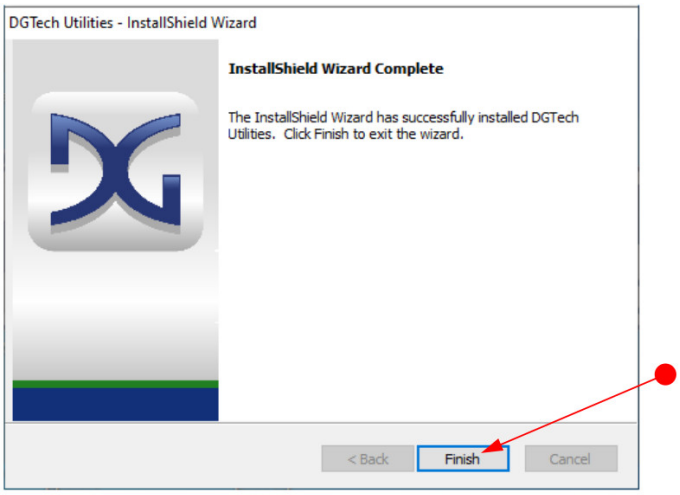


Figure 5 - DG Tech Utilities Select Finish

5. The suggested destination location is C:\DGTech\. Click Next to continue.

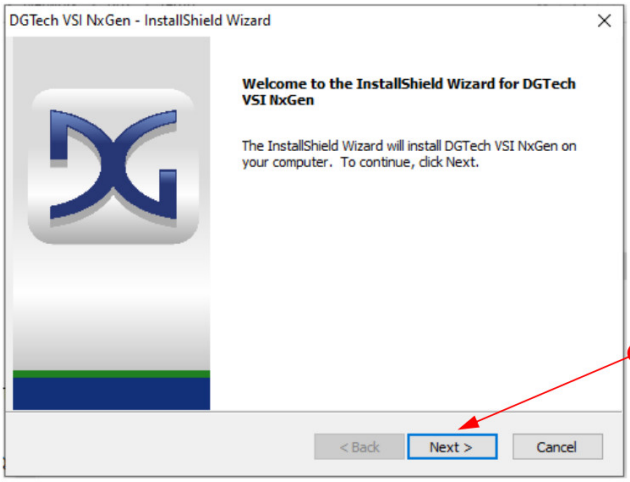


Figure 6 - DGTech VSI NxGen Installation Select Next >

6. Select Finish when the installation of DG Tech Utilities is complete.

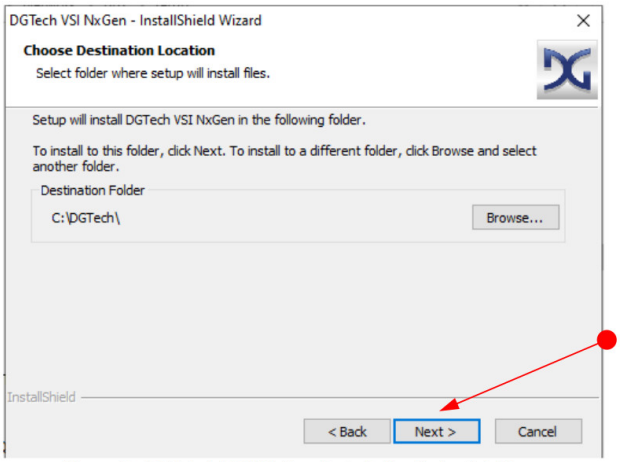


Figure 7 - DGTech VSI NxGen Installation Select Folder

7. Select Next > to install DG Tech VSI NxGen.
8. Select Next > if you want to install VSI NxGen into the recommended destination folder. If you want to install the software into another folder, select Browse and choose the folder you want to use.

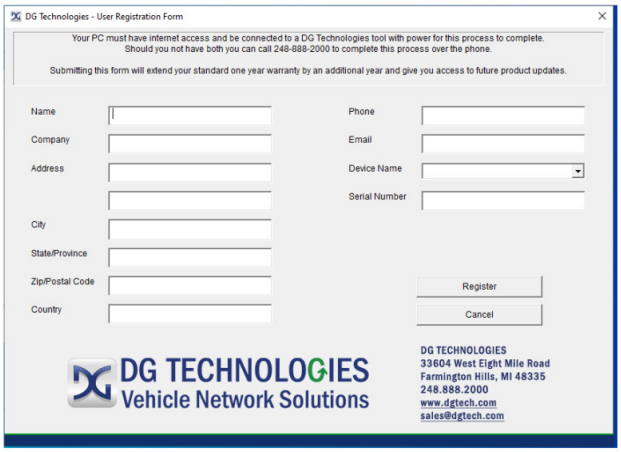


Figure 8 - DGTech User Registration Form

9. After all files are installed, you can register your tool with DG. When the Product Registration Form displayed above is submitted, you will receive the latest product update information. To register your tool your PC must have internet access and be connected to a DG Technologies tool with power to complete the process. Enter the information in the form below and select the Register button.
   a. As an alternative to this you can call the number displayed on the screen to continue the process over the phone.

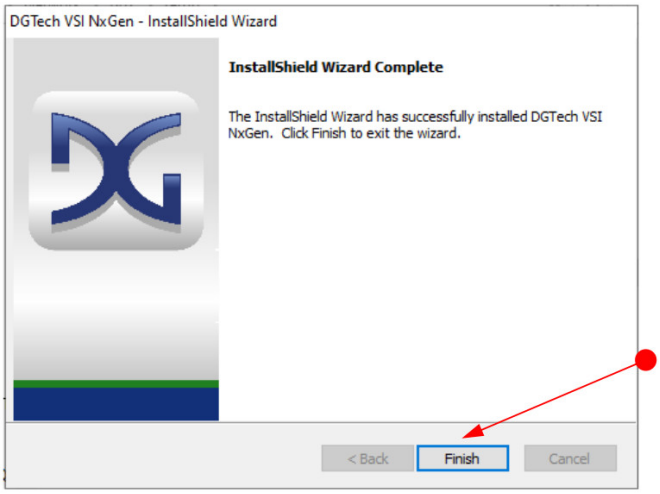


Figure 9 - DG Tech VSI NxGen Finish Selection

10. Select Finish, when the installation of VSI NxGen is successful.

VSI NxGen Configuration Utility

The VSI NxGen tool comes with support for many protocols (see Standards and Protocols Supported). The VSI NxGen Configuration Utility will tell you what protocols, API versions, and Product Version are supported. You can also use the VSI NxGen Configuration Utility to get the current firmware version. Utility can be found in:

Start ➔ DGTech VSI NxGen ➔ VSI NxGen Config Utility

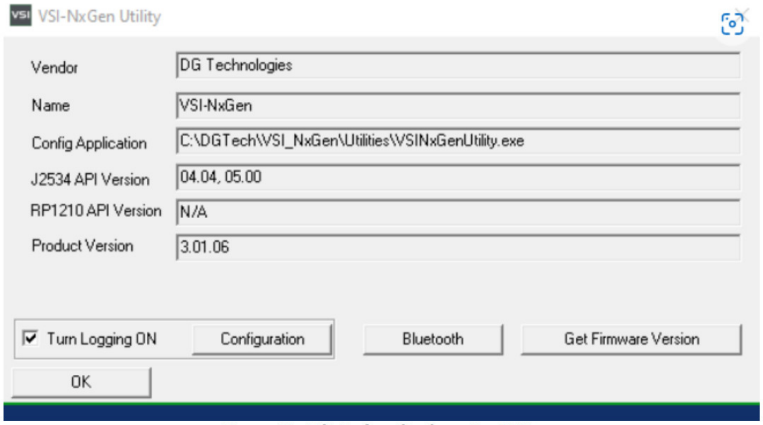


Figure 10 - VSI NxGen Configuration Utility

A Logging Configuration box will be listed with a number of selections. Select the Logging Type and Logging Method you are going to use. Then select the OK button to confirm the selection.

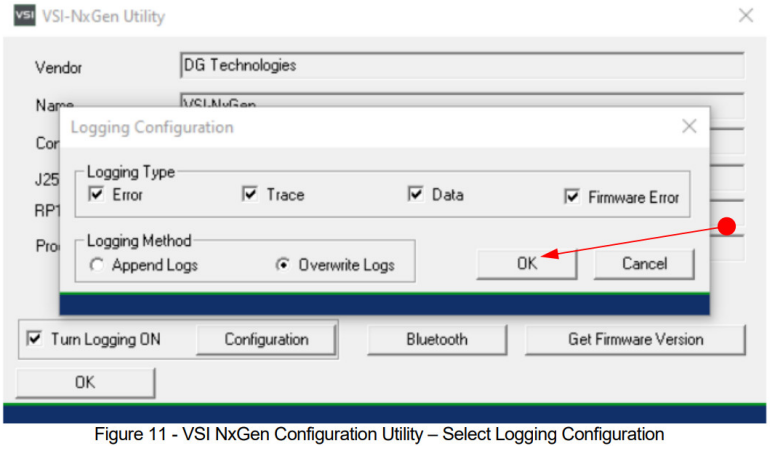


Figure 11 - VSI NxGen Configuration Utility – Select Logging Configuration

Hardware Connection to the PC

The above image depicts the typical connection to the vehicle.

IMPORTANT: the following sequence of connections must be followed, otherwise damage to vehicle or VSI NxGen may occur.
Step 1: Connect the VSI NxGen to the OBD II cable). Note: Do not power unit from multiple sources.
Step 2: Connect the VSI NxGen'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 16 PIN J1962 OBDII Cable to the vehicle. Note: after this connection and Key is ON, the Vehicle Connection LED is a solid Red.

Included Software Applications

DG Update

The purpose of this application is to ensure the most current version of the VSI NxGen software drivers are installed. For the best user experience, it is essential that the current version is

used at all times. Also, refer to the Firmware Updater section to ensure the firmware is also up-to-date DO NOT DISCONNECT POWER FROM THE VSI NxGen DURING AN UPDATE!!!

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 used manually from the Windows Start Menu:

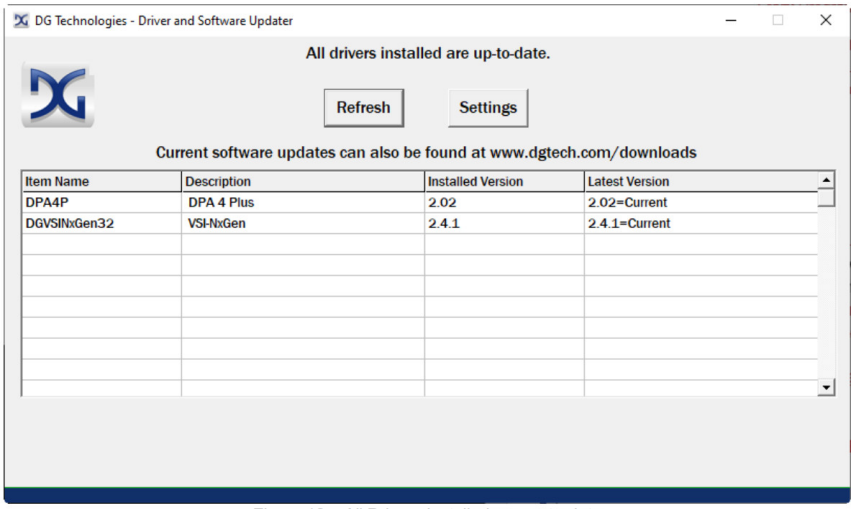


Figure 12 – All Drivers Installed are up-to-date

Start ➔ DGTech Utilities ➔DG Update The above screen shows All drivers installed are up-to-date.

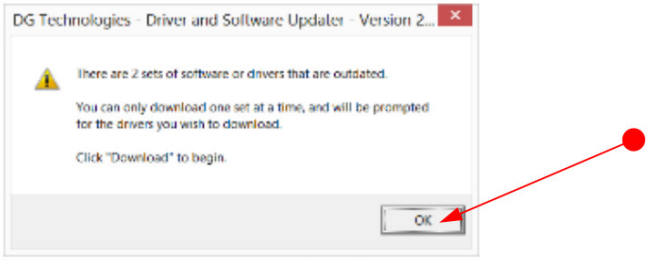


Figure 13 – Drivers are Out of Date

NOTE: The 30-day default setting can be changed by selecting the Settings button. If Drivers are out of date, this message box will be shown. Select OK.

DG Update – Drivers Out of Date

In this example, the VSI-2534 drivers are out of date (Red). Only if updates are available will the Download button and progress bar appear on the screen. Select Download.

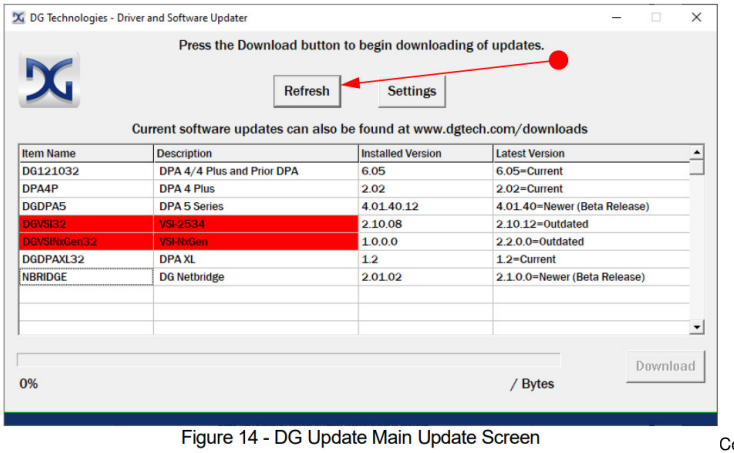


Figure 14 - DG Update Main Update Screen

Connect your PC to the Internet and click the Refresh button. If the check for updates was successful, the second column of will display information showing the most current versions. Should an install be out of date the color of the row will be red.

Successful Connect – Update Available

In this case above, two of the products are out of date (Red), the user will be automatically 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.

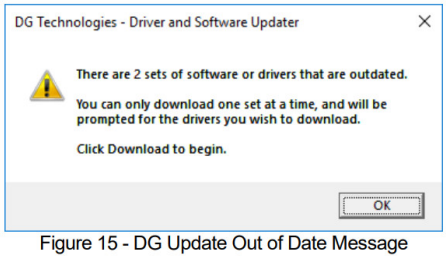


Figure 15 - DG Update Out of Date Message

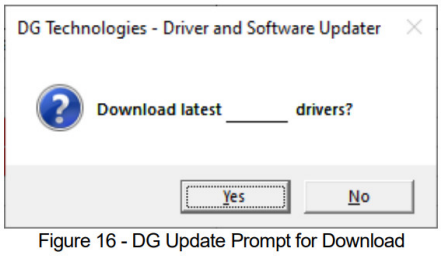


Figure 16 - DG Update Prompt for Download

Note: The DG Update application can only download and install one

item at a time.
The user will be prompted for which ever 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 NxGen or shut down 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.

Advanced Settings – Setting Default Time 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.

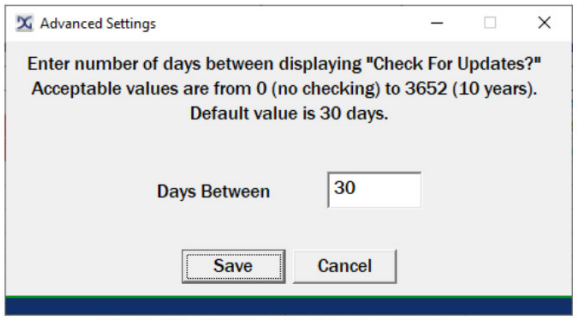


Figure 17 - DG Update Advanced Settings

AVT Software

If your OEM application is having trouble communicating with the VSI NxGen, you can use the Adapter Validation Tool (AVT) to help troubleshoot this problem. AVT allows you to determine:

- If your drivers are installed correctly
- If a connection to your tool can be made
- If a connection to your vehicle for PC communications is working
- Please check that the OEM application is configured to use the VSI NxGen, and the correct protocol is selected.

AVT Startup

Click AVT on the desktop or from the start menu. If you have RP1210 and J2534 drivers installed on your computer you will see the AVT Launcher screen. Since the VSI NxGen does not support RP1210 you should always choose the Car / OBDII image if you are presented with this screen.

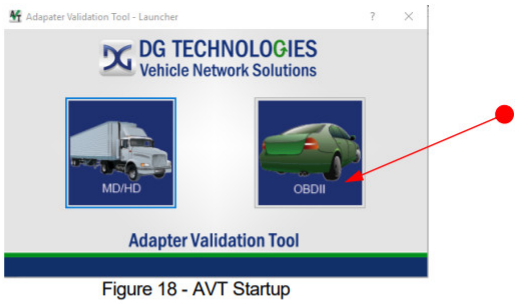


Figure 18 - AVT Startup

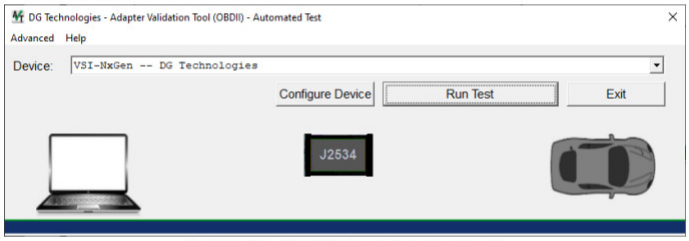


Figure 19 - AVT OBDII Automated Test

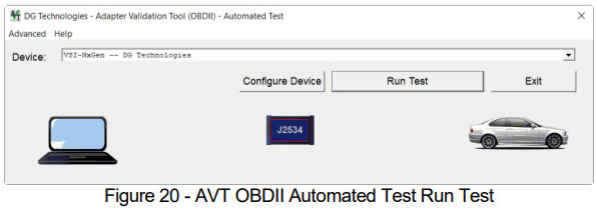


Figure 20 - AVT OBDII Automated Test Run Test

- Turn vehicle ignition to the key-on, engine-off (KOEO) position. Select Run Test.
- **Note:** In the Device: dropdown, the VSI NxGen is selected. If using a different device, make the applicable selection.

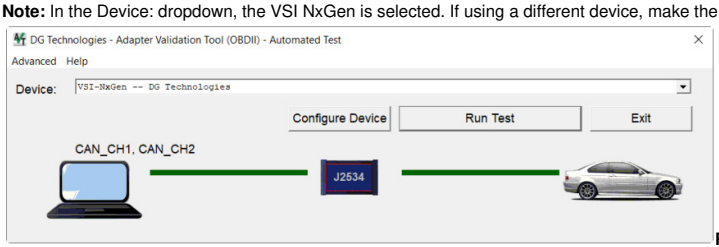


Figure 21 – AVT OBDII Automated Test Successful Connection

- Solid Green lines will appear in the successful connection locations. If a Red line appears between either side, check those connections and Run Test again.
- **Note:** By selecting Help from the menu, a more detailed User Manual for this application is available.

DG Data Recorder

The purpose of this Data Recorder allows the users to record data from the vehicle networks via DG Technologies' vehicle adapters. It is capable of recording 100% data on the connected channels & protocols. It can be used to record data at the same time as an adapter is in use by another application or it can be used in standalone mode to record data when no other application is running.

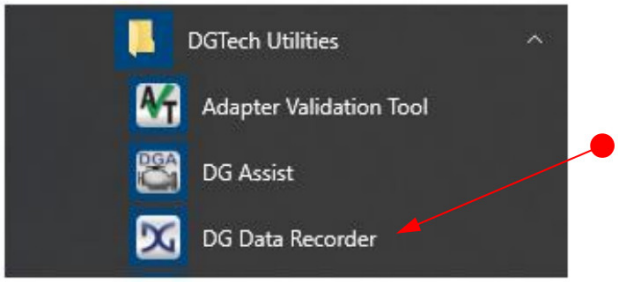
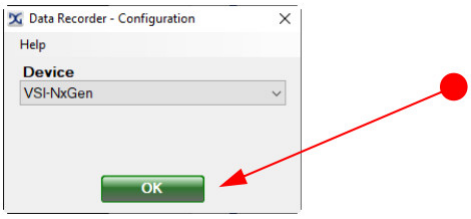


Figure 22 – Data Recorder Selection Under DGTech Utilities

The Data Recorder selection can be found under DGTech Utilities from the desktop or from the start menu.



- Go to: ⊞ ➔ DGTech Utilities ➔ DG Data Recorder.

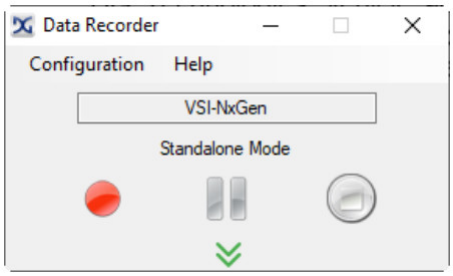


Figure 24 – DG Data Recorder Drop-Down Arrow

- Device being used, VSI NxGen, should be shown. If not, use drop-down arrow and select. Select OK.
- Indicator Table

Indicator	Definition
	Start Recording
	Pause Recording
	Stop Recording

- Make appropriate selections to Start, Pause and Stop recordings.
- To view, print or email log file, the log file is found here: C:\DGTech\DGTech Utilities\Logs. File will read: DataRecorder-VSI-NxGen.csv. Check the file date/time to ensure it coincides with the log date/time.
- **Note:** By selecting Help from the menu, a more detailed User Manual for this application is available.

DG Diagnostics

This application provides all available data from the vehicle as it relates to OBDII and other applicable SAE standards.

Figure 26 – DG Diagnostics

- The icon above, on the left, was added to the PC desktop during software installation.

  Select the icon OR go to: ⊞ ➔ DGTech Utilities ➔ DG Diagnostics. Select OBDII for automotive.

  Note: The larger window on the right will not appear if only the VSI NxGen software is installed. Go to the next step.

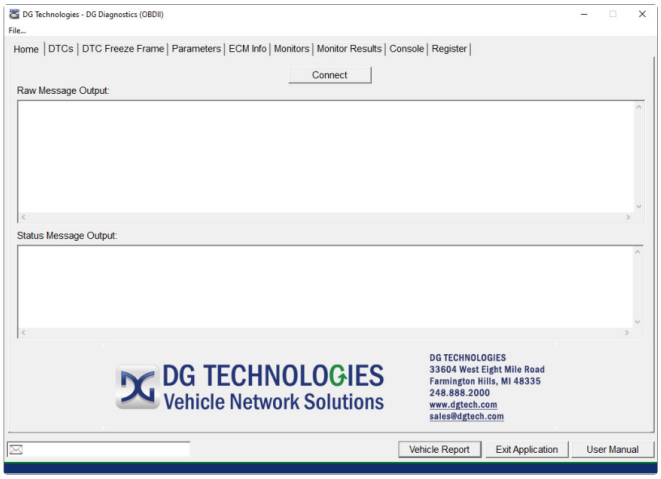


Figure 27 – Connection Screen

- Ensure proper connections of VSI NxGen with PC and vehicle. Key is ON, Engine is OFF.
- Using the tabs shown, choose and review available information.
- **Note:** A more detailed User Manual for this application can be found by selecting the User Manual button located on the lower, right-hand corner of the application.

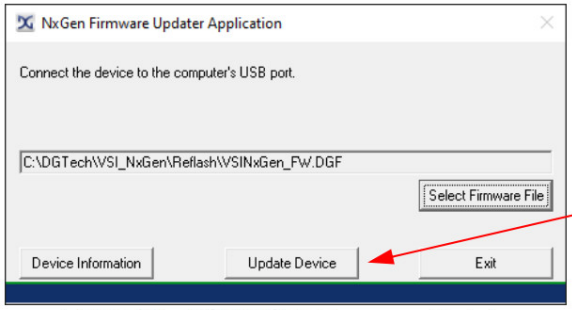


Figure 28 - VSI NxGen Firmware Update

VSI NxGen Firmware Update **Launch the VSI NxGen Firmware Update Programs Manually**

1. Stop all applications that are using the VSI NxGen (if any)
2. Start the VSI NxGen Firmware Update program
3. Start ➔ DGTech VSI NxGen ➔ VSI NxGen Firmware Updater
4. Select “Update Device”
5. Firmware files are in separate sub-directories under the Utilities directory where the VSI NxGen drivers are installed, typically: C:\ DGTech\VSI NxGen\Reflash
6. Click on the Update Device button, if you want to update the firmware in your device.

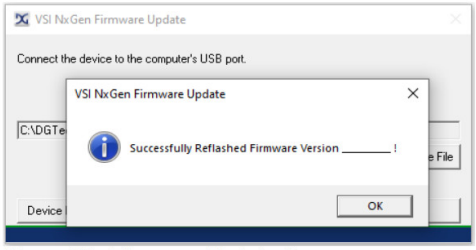


Figure 29 - Firmware Update Success

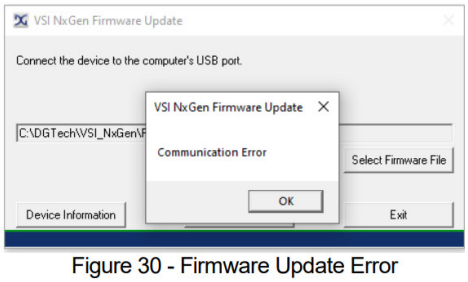


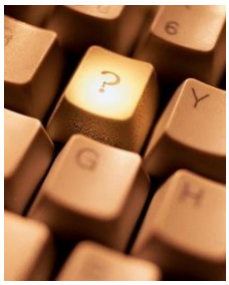
Figure 30 - Firmware Update Error

DO NOT DISCONNECT POWER FROM THE VSI NxGen DURING A FIRMWARE UPDATE!!! ALLOW THE UPDATE TO FINISH!

Appendix A. Technical Support and Return Merchandise

Technical Support

After reading and following the troubleshooting and validation procedures in this document please check the FAQ page at **www.dgtech.com/faqs/**. If you are still not 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 and the serial number.



DG Technologies Technical Support

Phone: 1-248-888-2000
Fax: 1-248-888-9977
E-mail: **techsupp@dgtech.com**
Website: **www.dgtech.com/tech-support**
Users not residing in the United States should contact your local DG representative or e-mail **techsupp@dgtech.com**

Return Merchandise Authorization (RMA)

If technical support has deemed that there may be a physical problem with your VSI NxGen, 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 Repair Services
Attn: RMA# xxxxxxx
DG Technologies
33604 West 8 Mile Road
Farmington Hills, MI 48335

Appendix B. Warranty Information and Limitation Statements

Warranty Information

DG Technologies, Inc. the VSI NxGen 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 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 1-248-888-2000 and must be included with the product being returned (for more details, see section Return Merchandise Authorization (RMA)). A VSI NxGen is warranted for 90 days after a warranty repair, or to end of the original factory warranty period, whichever is longer.

Limitation Statements

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.

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.

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.

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.

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.

Contact Information

Please direct all inquiries to: DG Technologies
33604 West 8 Mile Road
Farmington Hills, MI 48335
Phone 1-248-888-2000
Fax 1-248-888-9977

Changes not expressly approved by DG Technologies, Inc. to the VSI NxGen could void the user's authority to operate the VSI NxGen.

Appendix C. List of Acronyms Used in this Document

Acronym	Description
API	Application Programming Interface
CAN	Controller Area Network
CAN FD	Controller Area Network Flexible Data
DG	DG Technologies
DoIP	Diagnostics over IP
DPDU API	Diagnostic Protocol Data Application Programming Interface
DW CAN	Dual Wire Controller Area Network
Class2	GM's implementation of SAE J1850 Protocol
ECU	Electronic Control Unit.
FTCAN	Fault Tolerant Controller Area Network
FW	Firmware
ID	Identification
ISO	International Standards Organization
ISO14230	Keyword protocol running over UART
ISO9141	Serial Communication Protocol implemented in Ford & CARB
J2534	SAE Specification for Legislated Reprogramming Support
LED	Light Emitting Diode
KWP	Keyword Protocol
KWP2000	Keyword Protocol 2000 (ISO 14230)
OBD	On Board Diagnostics
OEM	Original Equipment Manufacturer
PC	Personal Computer
PWM	Pulse Width Modulation, used in Ford's implementation of J1850
RP1210	TMC recommended practice Windows Application Programming Interface (API)
RAM	Random Access Memory
SAE	Society of Automotive Engineers
SCI	DCX's proprietary UART based protocol
SCP	Standard Corporate Protocol, Ford's implementation of J1850 (J1850 PWM)
STG	Short to Ground
SWCAN	Single Wire Controller Area Network
TMC	Technology and Maintenance Council
UAC	User Account Control
USB	Universal Serial Bus
VBAT	Vehicle Battery
VDA	Vehicle Datalink Adapter
VNI	Vehicle Network Interface
VPW	Variable Pulse Width Modulation used in GM implementation of J1850

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Documents / Resources

DG TECHNOLOGIES VSI NxGen Reprogramming and Diagnostic Pass-Thru Device [pdf] User Manual
VSI NxGen Reprogramming and Diagnostic Pass-Thru Device, VSI NxGen, Reprogramming and Diagnostic Pass-Thru Device, Diagnostic Pass-Thru Device, Thru Device

References

- Controller Area Network | Article about Controller Area Network by The Free Dictionary
- FAQ's | DG Technologies
- Tech Support | DG Technologies
- Home | DG Technologies
- Home | DG Technologies
- Downloads | DG Technologies Product Updates
- dgtech.com/wp-content/uploads/2021/01/Cyberguard-logo-2.png