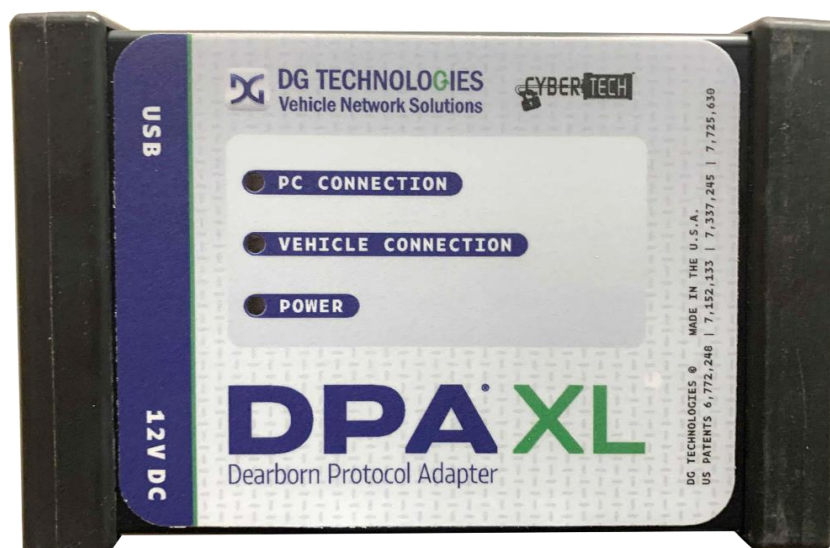# DG TECHNOLOGIES
Vehicle Network Solutions

DPA XL
User Manual

Protected by

CYBERGUARD

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Document Version: 1.5
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The DPA XL 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-in-the-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:

1   Contents

1 Introduction

How it works: The DPA XL is used to connect vehicle networks to personal computers (PCs). This allows programs written for the PC to retrieve pertinent information such as fault codes, component information, as well as perform bi-directional communications for component level diagnostics, tests, and component reprogramming.

The DPA XL communicates with the PC using either a USB cable or via Bluetooth (Class I or Class II), and comes standard with the latest Technology and Maintenance Council (TMC) Recommended Practice (RP) RP1210-compliant drivers, as well as Society of Automotive Engineers (SAE) J2534-compliant drivers.

1.1   Component Software Compatibility

The adapter you have purchased is provided with the latest Technology and Maintenance Council (TMC) RP1210/SAE J2534 compliant interface and has been tested with the following OEM and component applications:

- Allison DOC™
- Bendix® ACOM
- Caterpillar® Electronic Technician
- Cummins® Insite™
- Cummins PowerSpec
- Dana Diagnostic Tool™
- Detroit Diesel Diagnostic Link™
- Detroit Diesel Reprogramming Station™
- Eaton ServiceRanger
- Freightliner ServiceLink
- GM GDS2
- International® InTune
- International® Master Diagnostics

- International® NETS
- International® Auto Upgrade (AU)
- Isuzu IDSS II
- Volvo Mack VCADS/PTT
- Meritor-WABCO Toolbox
- Navistar® Diamond Logic Builder
- Navistar® HeRo
- Navistar® NavKal
- Navistar® NED
- Navistar® ServiceMaxx
- Paccar® Davie4
- Vansco VMMS
- ZF-Meritor TransSoft

Any application claiming RP1210/J2534 compliance should work if the application and adapter both support the same protocol(s) and operating system(s).

1.2 Standards and Protocols Supported

The adapter you have purchased provides more protocol and standards support than any other commercially available diagnostic adapter.

- ❑ TMC RP1210 API
- ❑ SAE J2534 API
- ❑ SAE J1939
- ❑ Single Wire CAN
- ❑ Dual Wire CAN
- ❑ CAN (ISO11898)
- ❑ ISO15765
- ❑ FT CAN
- ❑ CAN FD
- ❑ IESCAN - CAN@500k/J2284/GMLAN

- ❑ SAE J1708
- ❑ J1850 VPW (GM Class II)
- ❑ J1850 PWM
- ❑ ISO9141
- ❑ ISO9141-2
- ❑ ISO14230
- ❑ GMLAN (HSCAN, SWCAN)
- ❑ GMUART (SAE J2740)

1.3 DPA XL 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)
Wireless Connection	Bluetooth (DPA XL is equipped with Class 1 radio)
Vehicle-Side Connector	DB25 Female
PC-Side Connector	Standard B-Type USB Jack
Auxiliary Power Jack	12 Volt DC
PC Device Drivers	TMC RP1210 Compliant Driver SAE J2534 and SAE J2534-2 Passthru Drivers

1.4 System Requirements

We recommend a computer compatible with the latest version of the TMC RP1208 (PC Selection Guidelines for Service Tool Applications).

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)

1.5 Standard Kit Configurations

The DPA XL has the following standard kit (DG-400-10819 configurations:

- DPA XL unit, DG P/N 450-DGT-1000812
- DG 15 Foot USB Cable - DG P/N DG-15-1-USB-M-CABLE
- VSI NxGen/DPA XL Freightliner-Cascadia J1939 cable, DG P/N DG-295-10836
- Small Softcase (12x8x3), DG P/N SC1283

Two other alternative kits are also available:

- DPA XL Automotive Kit – DG P/N 400-10876
- DPA XL W/6/9p Y Cable Kit – DG P/N – DG-400-10867

There are limited uses for the 12V DC power jack. It may be used for the following:

- Benchtop programming
- Usage with a SAE J1939 Breakout box

<div style="border: 2px solid red; text-align: center; color: red;">

WARNING
The DPA XL should NOT be powered via the 12V DC power jack and DB-25 (Deutsch or OBD-II cable) simultaneously.

Connecting to multiple power sources may cause damage to the hardware.

</div>

1.5.1 Powering the Hardware

Once a power source has been connected, the POWER LED should light green. Lights will first flash in a red, white, and blue sequence indicating that CyberGuard protection is enabled. Depending on the vehicle, the key may need to be turned to turn the key to the on position before data link traffic and / or power is supplied through the diagnostic connector.

1.5.2 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.

1.6 DPA XL Configuration Utility

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

Start ➔ DGTech DPA XL ➔ DPA XL Config Utility
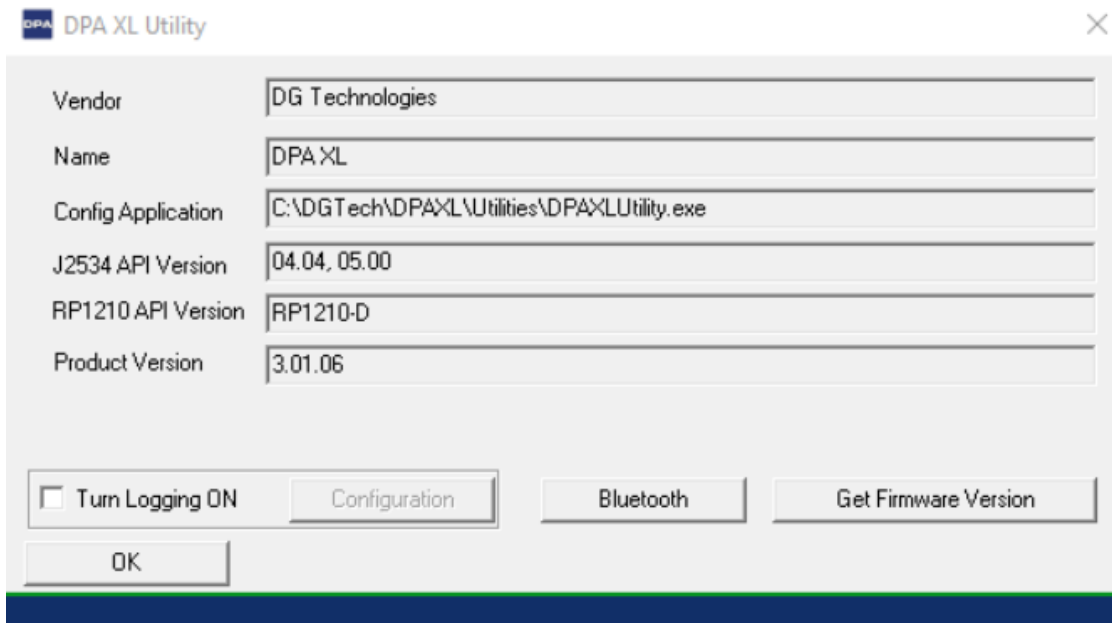
Figure 1 DPA XL Configuration Utility

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.
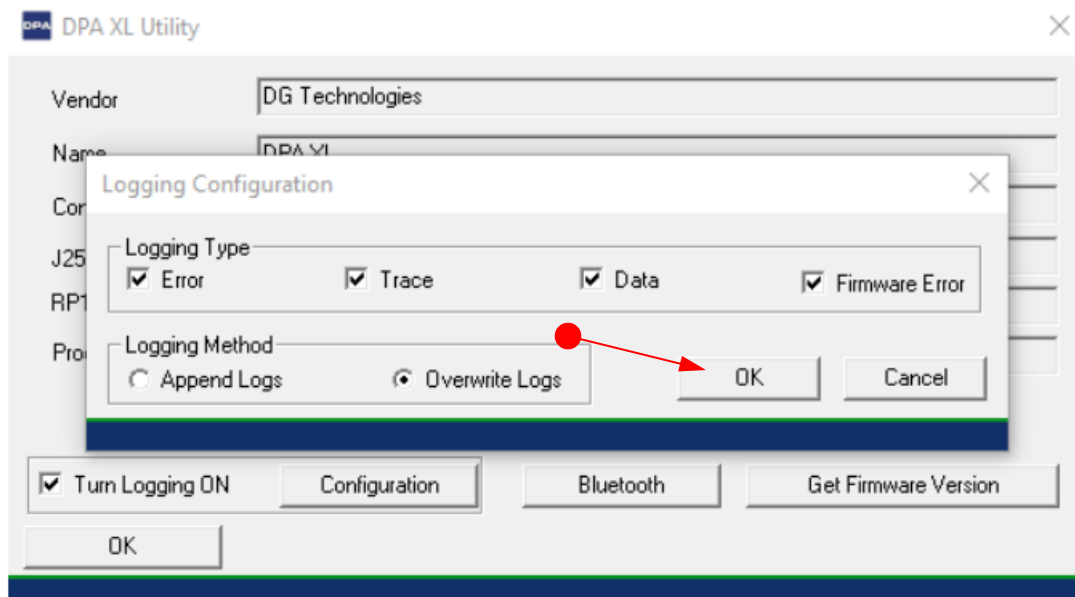
Figure 2 DPA XL Configuration Utility – Select Logging Configuration

1.7 Setting Up Your Heavy-Duty OEM Diagnostic Applications

1.7.1 Compliant Application

The DPA XL works with all RP1210 compliant applications that support SAE J1708/J1587, CAN/SAE J1939/ISO15765, SAE J1850 VPW (GM Class II), ISO9141, ISO14230, SWCAN, FTCAN and SAE J1850 PWM protocols along with many others. This section shows how to configure the most common RP1210-compliant diagnostic applications to work with the DPA XL.

1.7.2 General Setup for RP1210 OEM Application

The following examples show how to select the DPA XL tool you will be using. Selecting an RP1210 adapter, commonly referred to as a Vehicle Datalink Adapter (VDA) <u>varies widely</u> from different OEM applications; however, the terminology remains similar. The following table helps to introduce you to the terminology and helps you to make the correct selections the first time.

You must set up every application (in their own individual way) to use the DPA XL. Not all OEM applications save the adapter configuration. Some applications make the user select the adapter to be used every time the application is opened.

If You See These Terms	Select This
Vendor API DLL Manufacturer Adapter Manufacturer	DG Technologies DPA XL DGDPAXL
Device Name Adapter Name	The description of the tool can vary widely depending upon what part of the vendor ini file that the application is displaying. In general look for the tool name "DPA XL" that you will be using followed by the connection type you plan on using. • DPA XL, USB
Device Number DeviceID	1 = DPA XL
Protocol (Depends on Application)	Most Commonly Encountered: • SAE J1708 (SAE J1708/SAE J1587) • SAE J1939 • ISO15765 • CAN

1.7.3 Allison DOC

NOTE: Steps are for version 2020.1.0 (Build 08/21/2020); other versions vary slightly.

1. Start program
2. Click **F4 - Connect**
3. Select the Correct Transmission Type
4. Uncheck **Smart Connect**
5. Click **Connect**
6. Set Translator Device to **DPA5 Multi-Application, USB**
7. Select protocol of **SAE J1939**, **CAN, SAE J1708** or **SAE J1850**
8. Click **Advanced Setup**
9. Select Vendor of **DGDPAXL**
10. Select Protocol of **SAE J1939**, **CAN, SAE J1708** or **SAE J1850**
11. Select Devise Name of **DPA XL**
12. Device may be grayed-out on some selections
13. Select Channel of Auto, 1, 2, 3, or 4. Channel may not appear with some selections
14. Click **OK**

1.7.4 Bendix ACom Diagnostics

NOTE: Steps are for version 6.16; other versions vary slightly.

1. Start program
2. In Starter for ACom Diagnostics 6.16 window, click on PC/check mark/Truck icon located bottom, middle-right
3. In Communications devise settings window [RP1210 tab] Available hardware interfaces – select **DPA XL (DPA XL)**
4. Select green circle with check mark
5. Highlight ECU (if known) and select **Start with ECU**
6. If ECU not known, select **Detect ECU**
7. Follow on-screen instructions

1.7.5 Caterpillar Electronic Technician (CAT ET)

1. Start Program
2. Click Utilities ➔ Preferences ➔ Modify from the menu bar
3. Click on **Communications** tab (it could already be selected)
4. Select **RP1210 Compliant Device**
5. Click **Advanced**
6. Select Device Name
7. Click **OK**
8. Check **Enable Dual Data Link Service**
9. Click **OK**

Additional CAT ET Configuration Notes:

    a.   Enable Dual Data Link. This checkbox should be **checked** in most cases. However, on some older SAE J1708 (ATA) only vehicles, ET will not work with this checkbox checked. If ET does not connect, try **un-checking**, or **checking** this button.

    b.   The DPA product line does not support the CAT Data Link (CDL) protocol that is still common among certain CAT off-highway vehicles and industrial stationary equipment. **CDL is a proprietary protocol and there are no generic adapters on the market that support this protocol.**

        o   To find out if your vehicle/equipment is CDL or a standard protocol (SAE J1708/ATA, SAE J1939), you should look at the diagnostic connector for that equipment in the service manual.

1.7.6 Cummins INSITE

NOTE: Steps are for version 8.6.196 / DP; other versions vary slightly.

PowerSpec Version 5.5 or newer is required to use the DPA XL. Older versions of PowerSpec were not completely RP1210-compliant.

1. Start Program
2. Locate text box bottom, middle, click on down arrow
3. Click on **Add New…**
4. Click **Next | RP1210 Adapters (Next)**
5. Select Vendor:
      a. **DG Technologies DPA XL**
6. Select Adapter
      a. **DPA XL**
7. Select Protocol:
      a. Auto Detect (or choose protocol for your engine)
8. Click Datalink Adapter Connection Test (must be connected to data link), verify successful connection.
9. Click **OK | Next | Next | Save** selection

1.7.7 Detroit Diesel Diagnostic Link/Diagnostic Link

NOTE: Steps are for version 8.12SP2; other versions vary slightly.

There are several ways to select the adapter:

1.7.7.1 From Inside DDDL

1. From Desktop click on **SID Configure** icon
2. Highlight **DPA XL**
3. Select **OK**

1.7.7.2 Desktop Detroit Diesel Electronic Tool Suite

1. Select Detroit Diesel Electronic Tool Suite icon from desktop.
2. Select **Configure**
3. Select **DG DPA XL**, select **OK** button
4. Select **Refresh**
5. Click on highlighted DDDL 7 or DDDL 6 item

1.7.7.3 Diagnostic Link (version 6.50) Icon on Your Desktop

1. Select Diagnostic Link icon from desktop
2. Select Look at active and inactive faults
3. To change the adapter, select Tools | Options | Interface
4. Select Device Name from Local Communication Interface drop-down list.
5. Select **OK**

1.7.8 Dana Diagnostic Tool

1. Start program
2. Under **Adapter Selection**, choose **DG Technologies DPA XL: DPA XL**
3. Select **Connect J1708** or **Connect J1939** or **Connect PLC** as appropriate for your controller

1.7.9 DDEC Reports

1. Start program
2. Select Tools | Set Connection interface | DPA XL
3. Select **OK**

1.7.10   Eaton ServiceRanger

1. Start Program
2. Click Go To tab
3. Select Settings
4. Under **Communication Adapter** choose **DPA XL**
5. Under **J1587 Connection** choose **DG DPA XL USB; Protocol=J1708; Speed=9600**
6. Under **J1939 Connection** choose **DG DPA XL USB; Protocol=J1939; Channel=1; Speed=Auto**
7. If connecting via Bluetooth, Select the **DG DPA XL # [Bluetooth ID] Bluetooth**) for both the SAE J1708 and SAE J1939 device.
8. Click **Apply**

1.7.11   Freightliner ServiceLink

NOTE: Including Cascadia Model – Dual CAN Channels Start program

1. From the top menu bar, choose **Admin**
2. Click on **Show All Devices**.
3. Vendor   =   **DG Technologies DPA XL**
4. J1708 Device =   Select Device Name
5. J1939 Device =   Select Device Name
6. CAN Device
7. Click **Configure**
8. Select Device Name
9. Click **Save Settings**

1.7.12   Meritor-WABCO Toolbox

1. Start Program
2. Select Utilities
3. Select Adapter Selection
4. Select Vendor: **DG Technologies DPA XL**
5. Select Protocol: **J1939 or J1708**
6. Select Adapter: **DPA XL**
7. Select OK, then select X (top right) to close the Utilities Menu
8. Select **Toolbox**
9. Click **System Setup;** then select **Adapter Selection**
10. Verify selections are correct, select **OK**
11. Click on the Truck icon to start communication

1.7.13   Volvo/Mack Software

1.7.13.1   Volvo/Mack Premium Tech Tool (PPT) – Ver 2.X

1. Start Program
2. Select Settings from the PTT menu
3. Go to the Communication Unit tab:
4. Highlight DG Technologies DPA XL Application USB or DG Technologies DPA XL USB.
5. Verify radio button in default column is selected
6. Select Configuration…
7. Click on Advanced Settings, then select the down arrow on the right side of the text box
8. Highlight and click selection
9. Select the OK button
10. Verify DG DPA XL (SA) USB (or (MA) USB) is listed underneath Device Description:
11. Select the OK button

   - Wait a few minutes to establish connection. If connection doesn't occur, re-boot the PC.
   - Do not select *Connect* immediately after PTT opens. Reading product data.... will appear after a little bit of time while the connection is being established.

1.7.13.2   Volvo/Mack Premium Tech Tool (PPT) – Ver 1.X

1. Start Program
2. Select Settings from the PTT menu
3. Go to the Communication Unit configuration tab:
    - It is here that you select the settings for each adapter that you may use.   For example, if you have an RP1210A adapter, it is here that you select which adapter, port, and protocol.
    - NOTE: This identifies the settings for each adapter. It does not select which adapter the PTT application will use to communicate with the vehicle.
4. Go to the Comm unit selection tab:
    - It is here that you identify which adapter is to be used by the PTT application to communicate with the vehicle. You may have to change this selection depending upon the vehicle.
    - For example, if you typically use an 88890020 adapter in direct mode, when you need to communicate with an older vehicle you will need to change to RP1210A adapter or the 9998555 adapters, depending upon the vehicle.

1.7.13.3   Volvo/Mack VCADS – From Initial VCADS Setup

1. When prompted to configure a Communication Unit select **RP1210A adapter**
2. When prompted for the adapter, select Device Name
3. Select **USB** for the Port
4. Select **J1708** for the protocol
5. When prompted for the Electrical Systems
    a. Click **Volvo Trucks – VERSION2** and select **RP1210A Adapter**
    b. Click **Volvo Trucks – Vehicle electronics '98** and select **RP1210A Adapter**
    c. Click **Mack Trucks – V-MAC I/II/III, ITC** and select **RP1210A Adapter**
    d. Click **Volvo Trucks – V-MAC IV** and select **RP1210A Adapter**
6. Continue with installation

1.7.13.4   Volvo/Mack VCADS – From Inside VCADS

1. Start Program
2. Click the **Tools** menu and choose **Options**
3. Select the **Comm. Unit Configuration** tab
4. Select **RP1210A Adapter** and then select Device Name
5. Select the correct **Port** (USB or Bluetooth)
6. Select **J1708** for the protocol
7. Go to the **Comm. Unit Selection** tab:
    a. Click **Volvo Trucks – VERSION2** and select **RP1210A Adapter**
    b. Click **Volvo Trucks – Vehicle electronics '98** and select **RP1210A Adapter**
    c. Click **Mack Trucks – V-MAC I/II/III, ITC** and select **RP1210A Adapter**
    d. Click **Volvo Trucks – V-MAC IV** and select **RP1210A Adapter**
8. Click **OK**

1.7.14 Navistar/International Software

1.7.14.1 International Truck and Engine – Master Diagnostics

1. Start program
2. Choose File ➔ MD Settings➔ COM Device ➔ Window with general VDA selection
3. Select *Dearborn Group DPA XL* ➔ Window with specific port select your tools Device Name.

1.7.14.2 Navistar Hydraulic ABS

1. Start program
2. Choose File ➔ Hydraulic ABS Settings ➔ COM Device ➔ Window with general VDA selection
3. Select *Dearborn Group DPA XL* ➔ Window with specific port select your tools Device Name

1.7.14.3 Navistar IPC

1. Start program
2. Choose File ➔ Settings ➔ COM Device ➔ Window with general VDA selection
3. Select *Dearborn Group DPA XL* ➔ Window with specific port select your tools Device Name

1.7.14.4 Service Assistant

1. Start program
2. Press third button from the top along the left side (has an icon that looks like a miniature interface cable)
   a. A window comes up that says Communication Device Selection and has two drop down boxes
   b. Select *Dearborn Group DPA XL* ➔ Select your tools Device Name

1.7.14.5 Navistar Diamond Logic Builder (DLB)

1. Select Diamond Logic Builder icon from desktop
2. Enter username/password; select OK
3. Choose Tools➔ Select Com Link ➔ Listing of adapters
4. Select DG Technologies DPA XL ➔ DPA XL ➔ SAE J1939 protocol
5. Choose Tools ➔ Active Com Link or select F6

1.7.14.6   Navistar NavKal

1. Select NavKal icon from desktop
2. Enter username and password (if required)
3. Select Connection ➔ Select COM Link ➔ DG Technologies DPA XL ➔ DPA XL ➔ select J1708 or J1939 depending on engine type
4. "Searching for Engine" appears
5. Select engine type when prompted and click **OK** button

1.7.14.7   Navistar HeRo

1. Select HeRo icon from the desktop
2. Enter username and password (if required)
3. Select Connection ➔ Select COM Link ➔ DG Technologies DPA XL ➔ DPA XL ➔ select J1708 or J1939 depending on engine type
4. Select **Connect & Scan** button

1.7.14.8   Navistar Engine Diagnostics

1. Select NED icon from the desktop
2. Enter username and password (if required)
3. Select Connection ➔ Select COM Link ➔ DG Technologies DPA XL ➔ DPA XL ➔ select J1939
4. Select Connection | Activate Com Link or F6 if connection has not started

1.7.14.9   Navistar ServiceMaxx J1939 or ServiceMaxx J1707

1. Select ServiceMaxx icon from desktop
2. Enter username and password (if required)
3. Select Tools ➔ Select COM Link ➔ DG Technologies DPA XL ➔ select your tools Device Name ➔ select J1939 or J1708 depending on engine type.
4. "Searching for Engine" appears
5. Select engine type when prompted and click **OK** button

1.8 General Setup for J2534 OEM Application

Setting up and reflashing of a component using a J2534-compliant OEM is out of the scope of this manual. For more information, select https://www.dgtech.com/oem-service-websites/ . In general, there will be a screen that will appear at some point that allows a user to select a J2534-compliant **Vendor** and **Device** for the reflashing event. When you see this type of screen, choose **DG Technologies** and/or the **DPA XL**.
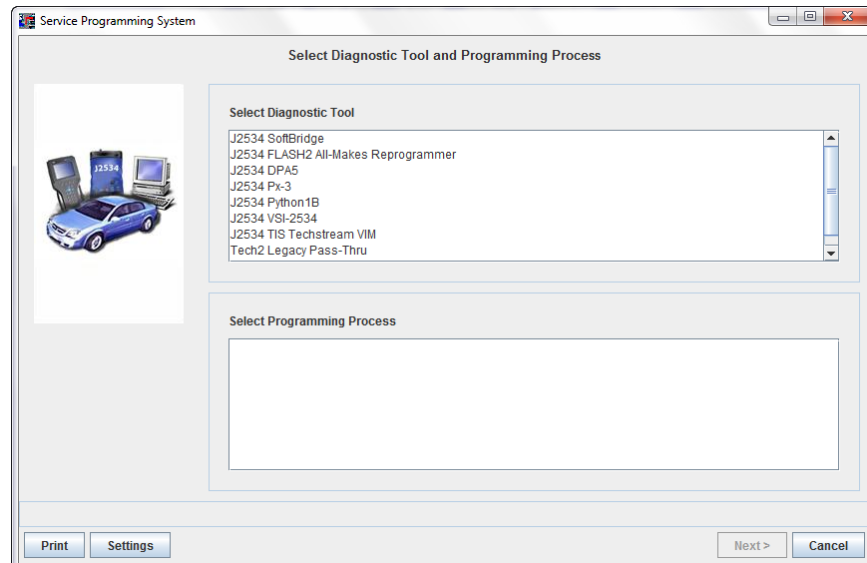

Figure 3 Example of General Motors TIS2Web - J2534 Application VDA Selection Screen

2 Hardware Details

The following figure shows the external features of the DPA XL:
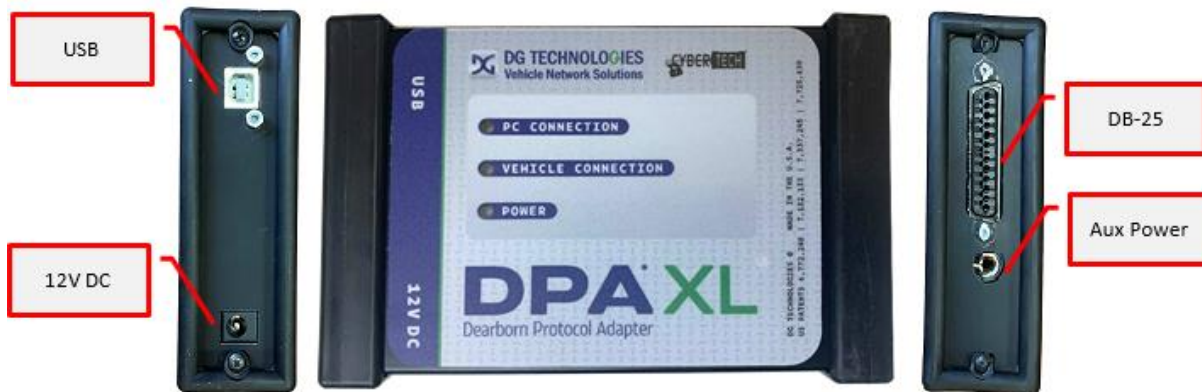
Figure 4 DPA XL Front & Side Views

2.1 DB-25

This is the connector where the 9 PIN Deutsch Cable (P/N DG-295-10811) or 16 PIN J1962 OBDII Cable (P/N 295-DGT-1000717) connects and powers the DPA XL from the vehicle connection.

2.2 Auxiliary Power

This is an external power port required for some older Hyundai/Kia vehicles and is provided per the SAE J2534 specification.

2.3 USB

USB cable connection. Allows connection of the DPA XL to the PC.

2.4 12V DC

This is the external 12-volt Power Connector. Not used when the 9 PIN Deutsch Cable (P/N DG-295-10811) or 16 PIN J1962 OBDII Cable (P/N 295-DGT-1000717) is used.

2.5 Status Indicators

The DPA XL has three status LEDs that indicate activity of the following functions:
- **PC Connection** – Indicates that the DPA XL 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 DPA XL is connected to a power supply (plug through a vehicle connection or by the USB cable), and whether the unit is operating properly.

- **Cyberguard – Red, white and blue light sequence on power up indicates CyberGuard protection is enabled.**

DPA XL Back Label:

DG Technologies
Model: DPA XL

www.dgtech.com

CONTAINS FCC ID: QOQWT11u
CONTAINS IC: 5123A-WT11u

U.S. Patent Pending 12/660,389
Dearborn Group, INC.

Red, white and blue light sequence on power up indicates CyberGuard protection is enabled.
CYBERGUARD

Made in the USA

LED Name	LED State	Description
PC Connection	Off	PC has not initialized communication with DPA XL via the USB or Bluetooth data link.
Vehicle Connection	On Solid Red	PC has initialized communication with DPA XL via the USB or Bluetooth data link. No bus activity.
	On Alternating Red / Green	Communications activity on the PC DPA XL connection via USB or Bluetooth data link.
	Off	No vehicle network protocol channel has been initialized for use.
Power	On Solid 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.
	Yellow	Unit not configured correctly. Contact Customer Support
	Off	No power supplied to the DPA XL unit.
Bootloader Missing	Power Light On Solid Green	Unit is powered either via the vehicle connector or the external power jack. Unit is operating properly.
	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	A Firmware Update is needed.
Bootloader Reflash in Progress	All LEDs Blink	A Firmware Update is running.
Bootloader Manual Reboot Needed	All LEDs Green	The user must power cycle the unit. This should not normally happen.

3   Software Download and Installation

Only the Windows 10 & 11 operating system is supported by the DPA XL.

The installation for the DPA XL 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 DPA XL software installation.

3.1   Software Requirements

The following software requirements need to be met before the DPA XL software can be loaded:
- Microsoft Visual C++ 2015 Update 3 Redistributable Package
- Microsoft NET Framework 3.5 (Web download)
- Microsoft NET Framework 4.5.2 Web
- DG Tech Utilities

3.2   Installing the DPA XL Software

1. Download the latest install from https://www.dgtech.com/downloads/
2. Launch the installation program
3. If required software is not present, a screen similar to the one below will be displayed. All required software installations must take place before the installation can be run. Please install required software by selecting *Install*.
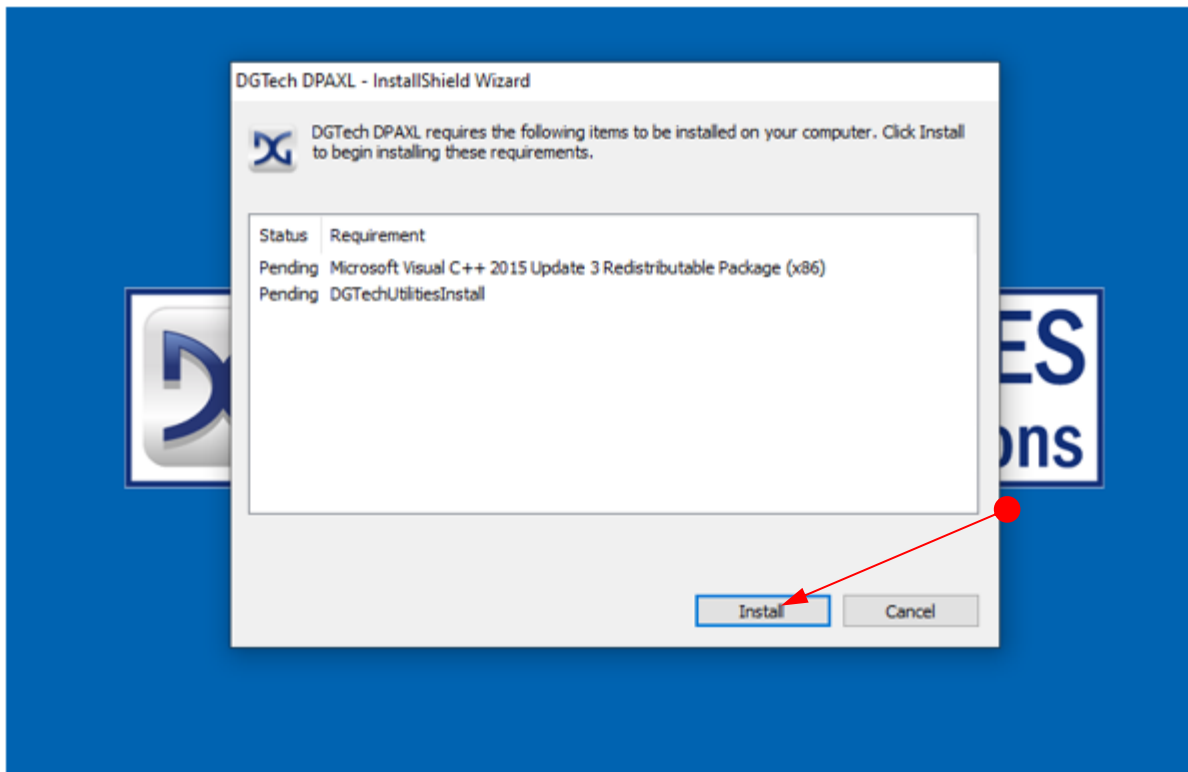
Figure 5 Installation - Required Software Screen

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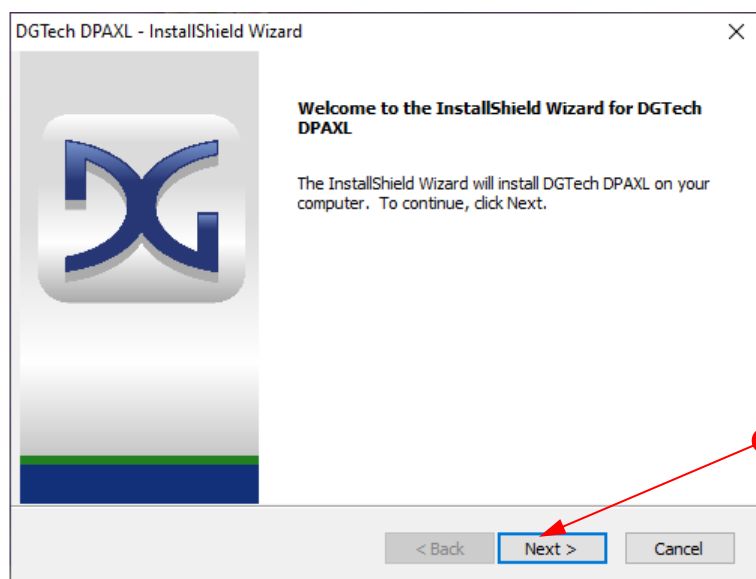

Figure 6 Installation - Welcome

5. The suggested destination location is C:\DGTech\. Click **Next** to continue.
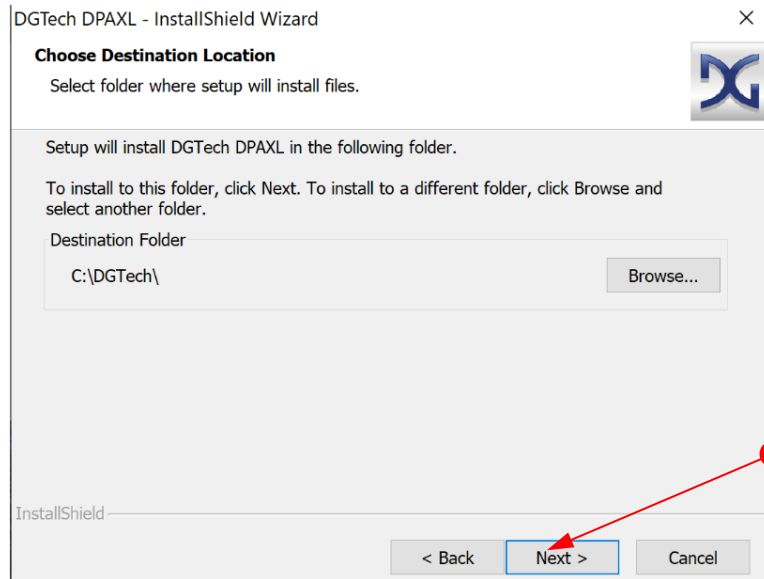
Figure 7 Installation – Select Destination Folder

6. After all files are installed, you can register your tool with DG. When the Product Registration Form displayed below 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 8 Installation - Hardware Registration

7. When installation is successful, click ***Finish***.

Figure 9 Installation – Finish

4 Hardware Connection to the PC

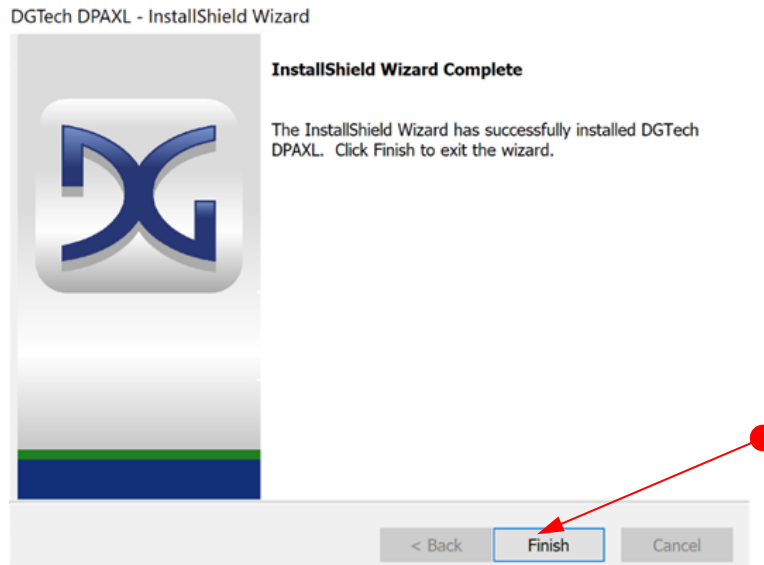The above image depicts typical connection to vehicle.

IMPORTANT: the following sequence of connections must be followed, otherwise damage to vehicle or DPA XL may occur.

You can use the Adapter Validation Tool software included in DGTech Utilities to troubleshoot communication problems.

4.1 Connect Cables to Tool

Cable connections to the DPA XL are made secure more secure by thumb screws. This prevents unintentional disconnects to the hardware.

4.2 Connect Tool to Computer

Connect the DPA XL's USB cable to the computer. If you are going to use a Bluetooth connection to the DPA XL do not connect the USB cable to the computer - Fig 1.

4.3 Connect Tool to Vehicle

Connect the DPA XL to the vehicle or module with the 9 PIN Deutsch Cable (P/N DG-295-10811) or 16 PIN J1962 OBDII Cable (P/N 295-DGT-1000717) – Fig 2.

4.4 Power Warning

In most instances power is supplied to the tool using the vehicle connector. You may have to turn the key on to enable power to this connector. The Power LED should be a solid `Green` if the unit is powered. **Do not power unit from multiple sources. If power is being available via vehicle connector do not connect power to the 12V DC connector.**

4.5 Bluetooth Setup

1. Once the DPA XL drivers are installed on PC, plug-in the USB cable to the DPA XL, then the USB cable to the PC. Wait to hear the familiar windows chime and for the DPA XL Power LED to be a solid green. *(Note: BT should not be used for ECU programming.)*
2. Go to Windows -> DG Tech DPA XL -> DPA XL Config Utility. Select 'Yes' to pop-up message.
3. Select 'Select Device'.
4. Select 'Configure Bluetooth Discovery'.
5. Select 'Enable'.
6. Select 'OK'.
7. Select 'Exit'.
8. Select 'Exit'.
9. Select on 'OK'.
10. Go to windows -> Settings and select 'Devices' *(Note: Screens may very depending on Windows version & scale.)*
11. Select 'Bluetooth & other devices'.
12. Select 'Add Bluetooth or other devices'.
13. Select 'Bluetooth'.
14. Wait for a moment for the 'DPA XL…' device to appear and select it.
15. Connected! Select 'Done' & close out of the 'Settings' screen.
16. Go back to the still-open Bluetooth window and select 'Select Bluetooth Device'.
17. From the drop-down menu, select the 'DPA XL #xxx-xxxx-xxxx' device, then select 'OK'. *(Note: Device ID can be confirmed by looking at the back of the DPA XL and the bar code number. First 4 digits of the bar code do not apply.)*

18. Notice the Device ID is now shown at the bottom of the dialog box. Select 'Exit' OR to enable 'Cyberguard', continue at step 21.

Note: After any configuration changes, such as those shown above, and before connecting to DG Diagnostics or an OEM application, disconnect ALL power from DPA XL for about 10 seconds, then repower DPA XL.

What is CyberGuard in relation to Bluetooth? If there are multiple Bluetooth compatible devices (PC's, cellphones, etc.) in the area, for example, and you don't want your DPA XL to be seen or 'discovered' by those devices, you can do that thru the 'Configure Bluetooth Discovery' button. In the 'Configure Bluetooth Discovery', you can 'Enable' or 'Disable' this discovery.

19. Ensure the USB cable is connected to the DPA XL and the PC.
20. Go to windows -> DG Tech DPA XL -> DPA XL Config Utility. Select 'Yes' to pop-up message.
21. Select 'Select Device'.
22. Select 'Configure Bluetooth Discovery'.
23. Select 'Disable'.
24. Select 'OK'.
25. Select 'Exit'.
26. Select 'Exit'.

To 'Enable' Bluetooth discovery so the DPA XL can be seen by other Bluetooth devices or be 'discovered' by those devices, follow steps 19-22 above, select 'Enable' in step 23, then follow remaining steps 24-26.

5 Included Software Applications

5.1 DG Update

DG Update is an application that is installed with your DPA Tech Utilities. 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 DG Technologies products. With this application running regularly, this will keep your DPA XL up-to-date with drivers and firmware. DG Technologies recommends our customers keep up to date so that your OEM and component manufacturer diagnostic applications run smoothly.

DO NOT DISCONNECT POWER FROM THE DPA XL 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 invoked manually from the Windows Start Menu:

Start ➔ DGTech Utilities ➔DG Update

5.1.1 DG Update – Internet Connection Required

The DG 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 Internet.

5.1.2 DG Update – Main Update Screen

The main screen appears 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.

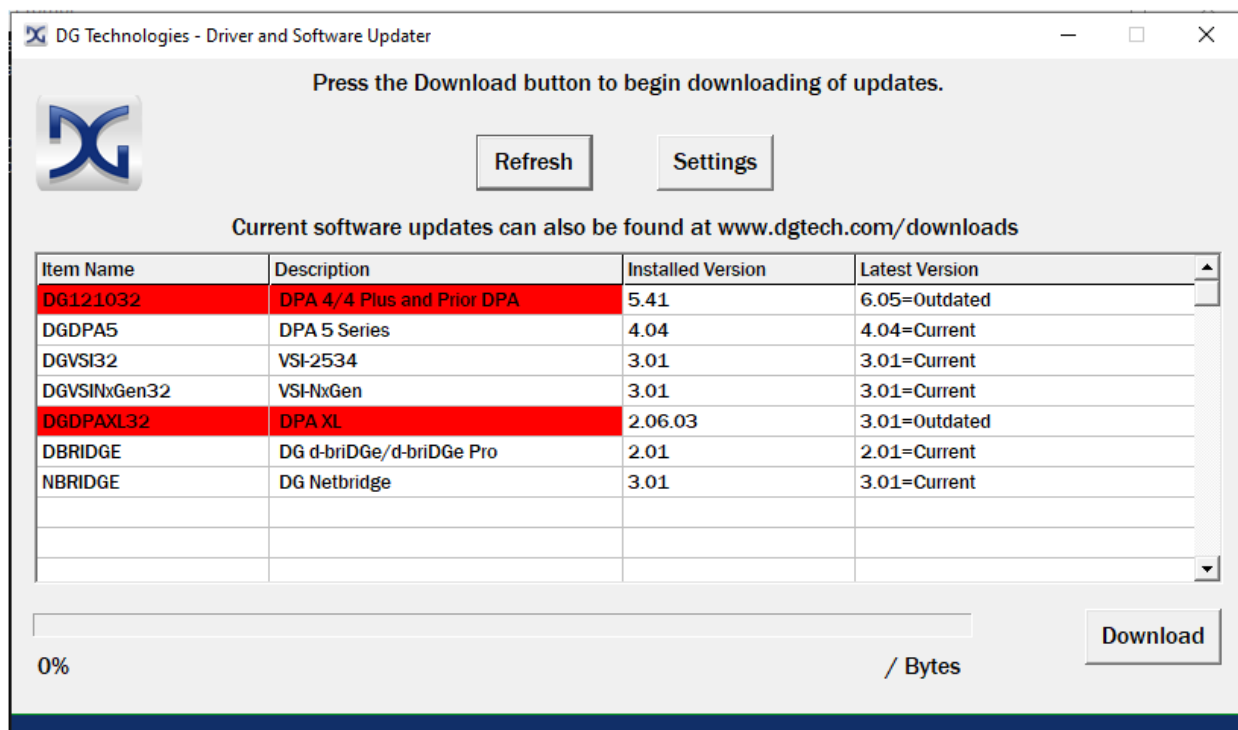| Item Name	Description	Installed Version	Latest Version
DG121032	DPA 4/4 Plus and Prior DPA	5.41	6.05=Outdated
DGDPA5	DPA 5 Series	4.04	4.04=Current
DGVSI32	VSI-2534	3.01	3.01=Current
DGVSINxGen32	VSI-NxGen	3.01	3.01=Current
DGDPAXL32	DPA XL	2.06.03	3.01=Outdated
DBRIDGE	DG d-briDGe/d-briDGe Pro	2.01	2.01=Current
NBRIDGE	DG Netbridge	3.01	3.01=Current

Figure 10 DG Update – Main Update Screen

Connect your PC to the Internet and click the **Refresh** 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. Should an install be out of date the color of the row will be red.

5.1.3 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.
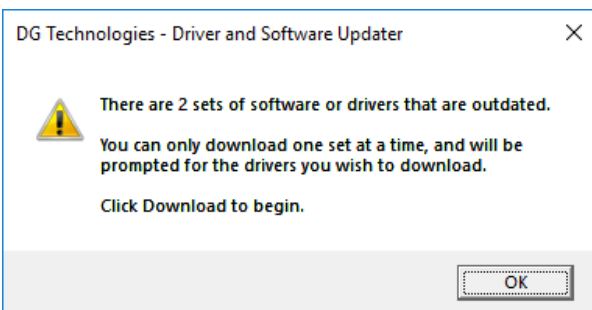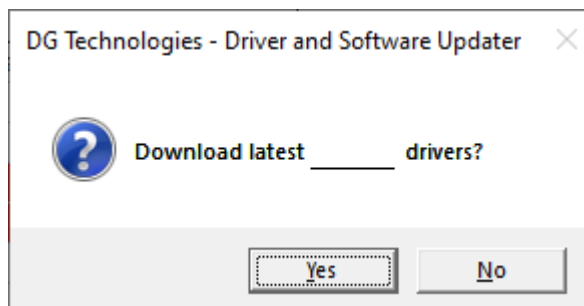

Figure 11 DG Update - Out of Date Message

Figure 12 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 DPA 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.

5.1.4 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.
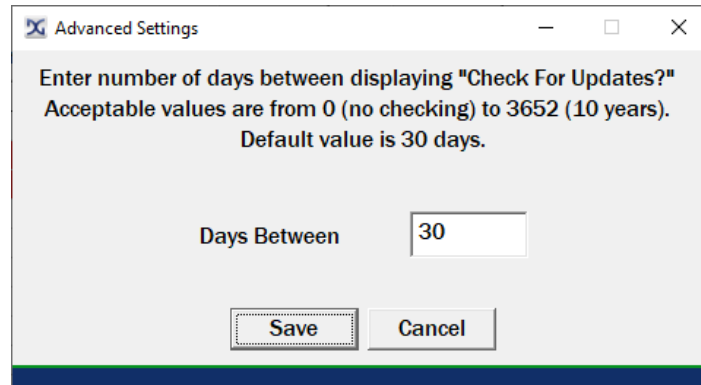

Figure 13 DG Update - Advanced Settings

5.2 AVT Software

If your OEM application is having trouble communicating with the Diagnostic Tool, 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,
- Detection of data link activity.
- Please check that the OEM application is configured to use the selected Diagnostic Tool, and the correct protocol is selected.

5.2.1 AVT Startup

Click AVT on the desktop or from the start menu and a screen will be displayed with two different AVT versions to choose from.
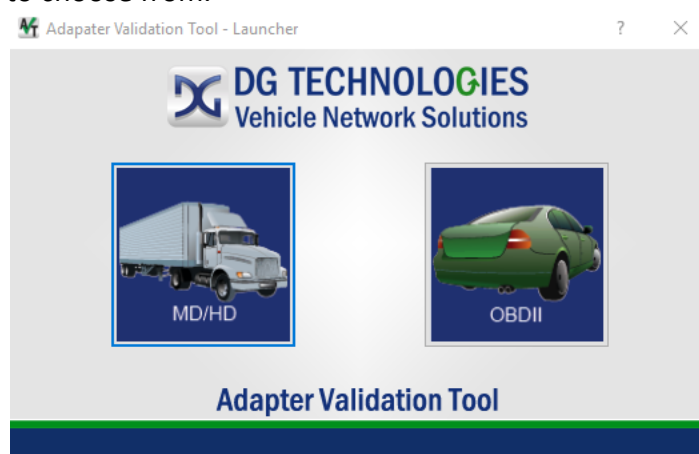

Figure 14 - AVT Startup

- Click on the MD/HD truck selection if you are connecting to a heavy duty or medium duty vehicle. The data bus protocols most often found on these vehicles include J1939, ISO15765 and J1708/J1587.

- Click on the OBDII car selection if are connecting to a light or medium-duty vehicles. The data bus protocols most often found on these vehicles include CAN/ISO15765, J1850, ISO9141, and ISO14230.
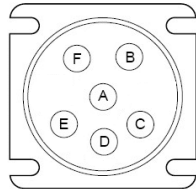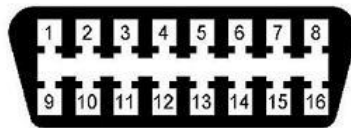

J1708 Connector (6-pin Deutsch)

This connector only has
the J1708/J1587 protocol.
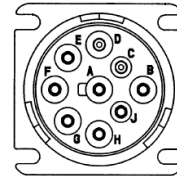
J1939 Connector (9-pin Deutsch)
OEMs switched to this connector when they
moved to J1939. J1708 may not be
available.

J1962 Connector
Most often found in light or medium duty vehicles.
Some heavy-duty vehicles also use this connector.

Figure 15 - Vehicle Diagnostic Connectors

5.2.2 AVT MD/HD Application

Figure 16 AVT HD - Main Screen

1. Connect the tool you want to test to the vehicle
2. Select the Vendor and Device you want to test the connection to
3. Then click the **Test Connections** selection.
4. Depending on the results of the test, both the **RP1210 Status Window Message** will turn **Green** (pass) or **Red** (fail).
   a. If the **Status Window** turns **Red**, there is a problem causing the PC to not communicate with the Diagnostic Tool. Disconnect the Diagnostic Tool from the vehicle and PC; then reconnect them, this time connecting to another USB port on the PC.
   b. If the **Status Window** turns **Green** and data message window turns **Red**, then the PC is connecting to the Diagnostic Tool, but not receiving messages. Check the vehicle ignition switch and vehicle to adapter cabling. Disconnect the Diagnostic Tool from the vehicle and PC; then reconnect them.

Refer to the chapter on how to configure your OEM application to use the Diagnostic Tool.

Read the **Test Results Discussion and Next Steps** screen carefully and follow those directions to help diagnose where the issue may be. If, after reading and following the instructions and you cannot get the Diagnostic Tool working, please contact DG technical support.

5.2.2.1 Good Connection (PC to Diagnostics Tool), Good Read of Data (Diagnostic Tool to Vehicle) – Green/Green

The screen snapshot below shows the PC successfully connecting to the Diagnostic Tool (RP1210 Status Window). Green in the Status window indicates a good connection to the tool. The Protocol Status bars indicate success/fail for each protocol that is scanned by default. If the status bar is green, then data was detected, and the corresponding baud rate is displayed.
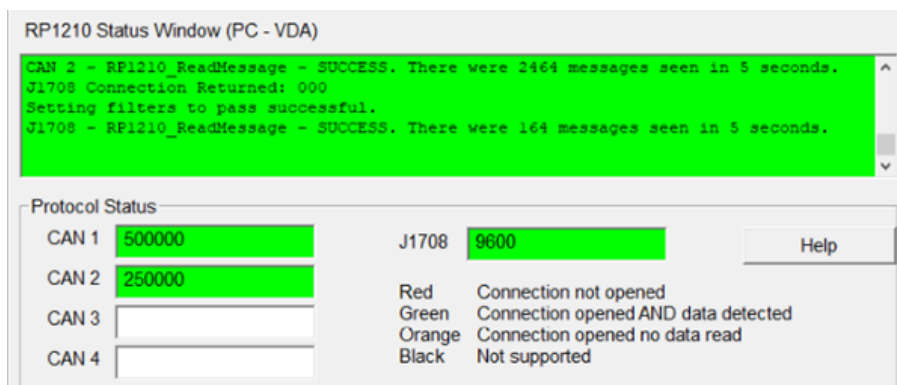

Figure 17 AVT HD - Green / Green

5.2.2.2 Good Connection (PC to Diagnostics Tool), Not Able to Read Data (Diagnostic Tool to Vehicle) – Green/Orange

The data buses are automatically scanned. The above screen snapshots show the PC successfully connecting to the Diagnostic Tool, but AVT was not able to read bus data. No data was read from CAN Channel 2 or 4. An Orange result on CAN Channel 3 indicates the Diagnostic Tool is connected, do no data was detected.

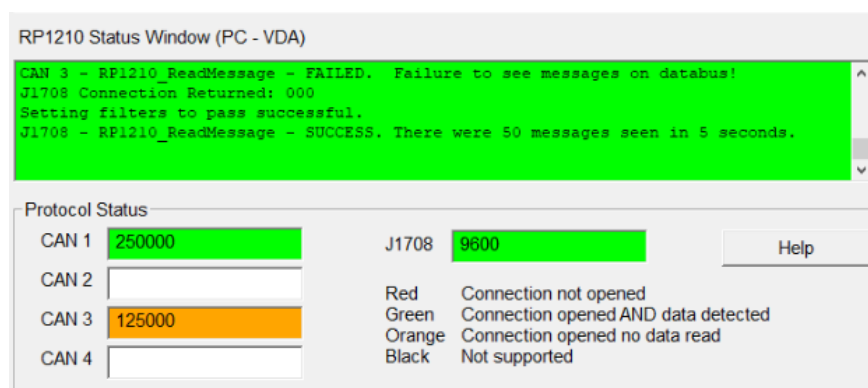Figure 18 - AVT HD - Green / Orange

5.2.2.3 Not Seeing Diagnostic Tool Device in VDA Selection List – Red/Red

The screen snapshot below shows the PC not connecting to the Diagnostic Tool. A red result indicates a bad Diagnostic Tool connection and the software is unable to read data. The test has failed. Follow directions on Test Results Discussion and Troubleshooting Steps screen and run test again.
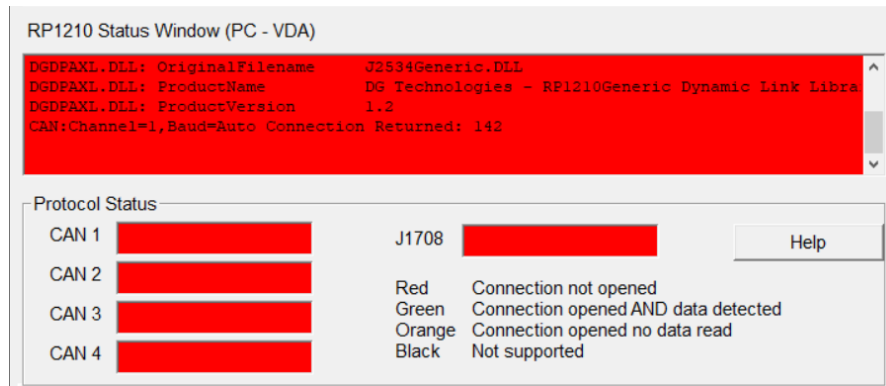
Figure 19 AVT HD - Red / Red

5.2.2.3.1 AVT HD Results

If you have installed the Diagnostic Tool drivers and can get AVT to a <mark>Green/Green</mark> outcome, you should be able to configure your diagnostic application to use the Diagnostic Tool. If your diagnostic application does not display in the VDA selection dialog box, this could indicate one of three things:

1. The application is not compliant and does not work with the Diagnostic Tool.
    a. Some applications require a specific, proprietary adapter.
2. Application is compliant, but Diagnostic Tool does not support the protocol needed.
3. Problem with the main INI file.
    a. Some VDAs create issues with the INI file when they install/uninstall.
    b. Many OEM diagnostic applications are aware of this issue and can read through the errors.

5.2.2.4 AVT HD Fix RP121032.INI File

When the AVT software is launched, you will be told if a problem exists in the main INI file. If you wish to fix this issue, which we highly recommended, press the **Fix RP121032.ini File** button on the main screen. The following is the dialog box that will appear when AVT is launched and a problem is found in the main INI file.
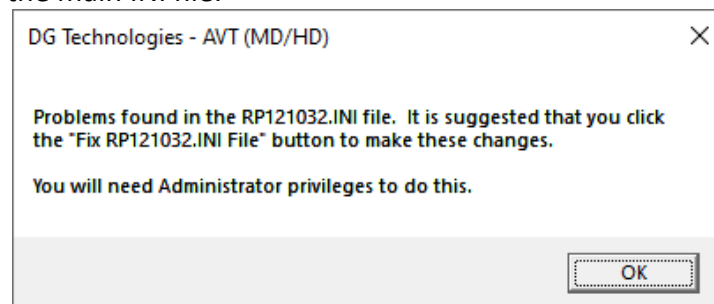
Figure 20 AVT HD - Fix INI Message Box

When you choose the **Fix RP121032.INI File** button, AVT will bring up a separate program called **Fix INI** that will allow you to view and fix the INI file if there are errors detected.

In the example below, a bad INI file was detected (depicted by a yellow background). Click the *Make Changes* button and the INI file problem will be corrected.
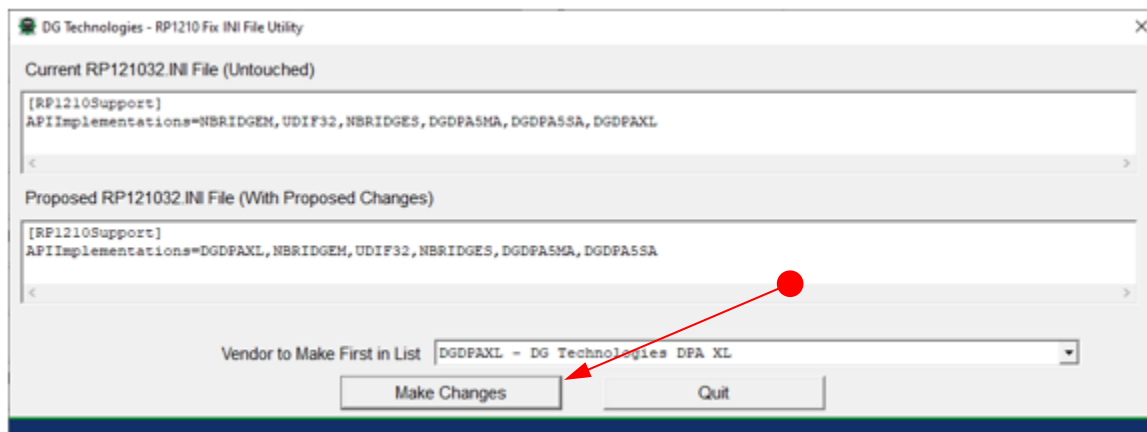
Figure 21 Fix INI - Make Changes

5.2.2.5 Advanced Testing Dialog (Vendor/Device/Protocol)

Should you need to scan other protocols to see if they are present, you can do so by using the Advanced Testing Interface. This allows you to choose baud rate and channel that a Vender/Tool supports. This option is mainly used for engineering purposes and requires some knowledge of the vehicle's diagnostic link setup.

Figure 22 AVT HD - Advance Test

5.2.2.5.1 Baud Rate Drop Down List Box

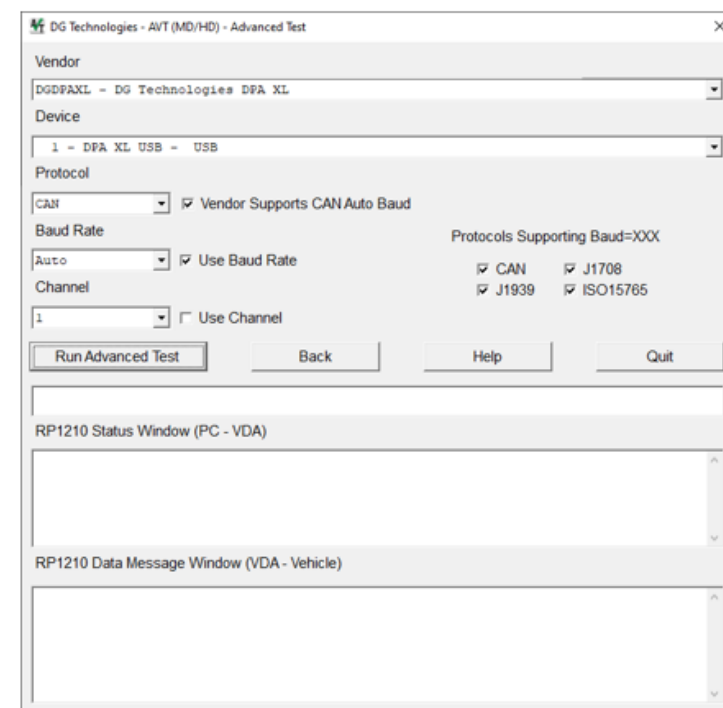The Baud Rate drop down list box allows the user to select one of the supported protocol speeds for the selected protocol. The entries in this list box come from the VDA vendor's INI file. Click the Use Baud Rate checkbox to activate a "Protocol: Baud=XXX" connection. If both the Use Baud Rate and Use Channel checkboxes are checked, then AVT will initiate a "Protocol: Baud=XXX; Channel=X" connection.

5.2.2.5.2 Channel Drop Down List Box

The **Channel** drop down list box allows the user to select one of the supported channels for the selected device. The entries in this list box come from the VDA vendor's INI file. Click the **Use Channel** checkbox to activate a "Protocol: Channel=X" connection. If both the **Use Baud Rate** and **Use Channel** checkboxes are checked, then AVT will initiate a "Protocol: Baud=XXX; Channel=X" connection.

5.2.2.5.3 Vender Supports CAN Auto Baud Checkbox

This checkbox indicates whether the API supports CAN (CAN, J1939, ISO15765) automatic baud detection. Even though this variable may be set to TRUE, the next four fields indicate whether the API supports Baud=XXX connect formats for CAN, J1939, and ISO15765. This field is just an informational field, and not all VDA vendors will support this feature.

5.2.2.5.4 Protocols Supporting Baud-XXX

These checkboxes indicate whether the API supports setting a specific baud rate (or automatic baud detection) for a specific protocol. These entries come from the VDA vendor's INI file. These fields are just for informational purposes. Not all VDA vendors will support this feature.

5.2.2.5.5 Advanced Testing Commands

When using this dialog box to initiate an advanced test, there is no error checking done to prevent the user from initiating a "Baud=XXX" or "Channel=X" connection to a VDA even if the vendor does not support that connection format.

5.3 DPA XL Firmware Update
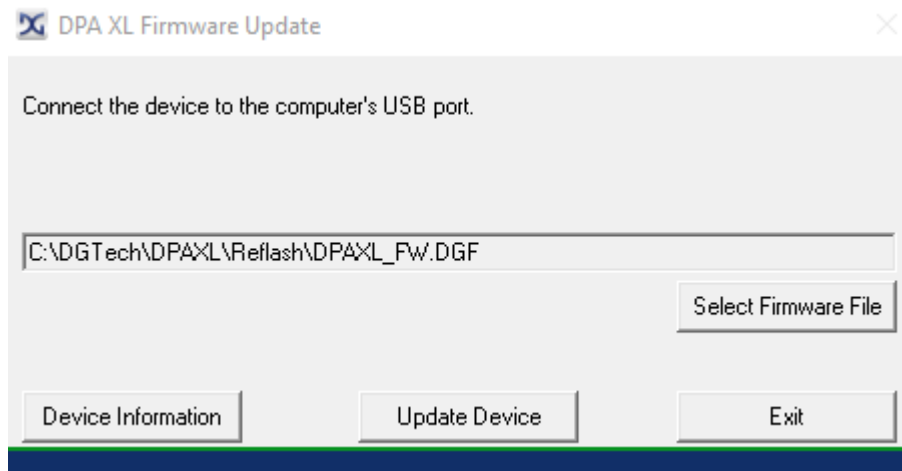
Figure 23 DPA XL Firmware Updater

5.3.1 Launch the DPA XL Firmware Update Programs Manually

1. Stop all applications that are using the DPA XL (if any)
2. Start the DPA XL Firmware Update program

    Start ➔ DGTech DPA XL ➔ DPA XL Firmware Update
3. Choose Select Firmware File to proceed
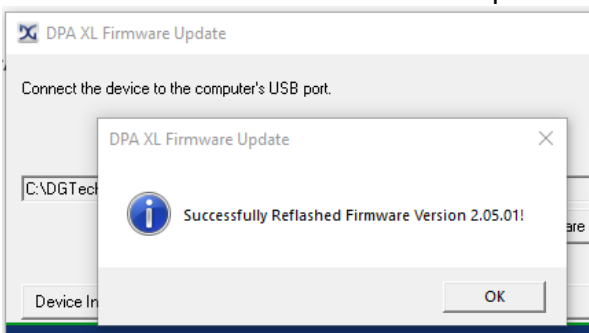
Figure 24 DPA XL Firmware Update - Success
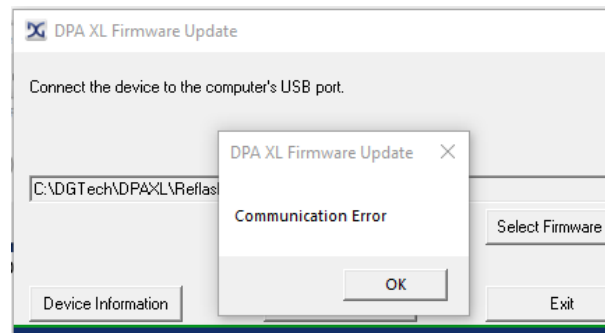
Figure 25 DPA XL Firmware Update – Failure

4. Select the correct firmware file (the latest version is already selected by default).
5. Firmware files are in separate sub-directories under the Utilities directory where the DPA XL drivers are installed, typically:

    C:\ DGTech\DPAXL\Reflash
6. Click on the **Update Device** button, if you want to update the firmware in your DPA XL.

DO NOT DISCONNECT POWER FROM THE DPA XL 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 DPA XL, you will be issued 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 DPA XL 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 DPA XL 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

Appendix C.   FCC and Certification Industry Canada

The DPA XL has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules (see the back of the DPA XL for FCC and IC specific identifications). These limits are designed to provide reasonable protection against harmful interference in a residential installation. The DPA XL uses and generates radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. If the DPA XL does cause harmful interference to radio or television reception, which can be determined by turning the affected equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving and/or sending antennas.
- Increase the separation between the DPA XL and the affected receiving equipment.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product complies with FCC OET Bulletin 65 radiation exposure limits set forth for an uncontrolled environment.

Industry Canada

Operation of the DPA XL is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes not expressly approved by DG Technologies, Inc. to the DPA XL could void the user's authority to operate the DPA XL. The following is a sample rear label from the DPA XL depicting the FCC and IC identifiers.

Figure 26 Bluetooth Label

The following are the DPA XL Bluetooth details as required to be published by the FCC.

Operating Frequency	2.4GHz
Power Output Maximum	< 4.4dBi
Contains Transmitter Module FCC ID:	QOQWT11u
Transmitter Bluetooth QDID	B012647

Appendix D.   List of Acronyms Used in 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