



Dearborn Protocol Adapter 4 Plus

DPA4PMA – Multi-Application Drivers

Installation and User Manual

DPA4PMA Driver Version:	1.36
DPA4PSA Driver Version:	1.36
Native Drivers Version:	10.16
DPA 4 Plus Firmware Version:	60.020
eDPA 4 Plus Firmware Version:	64.014
RP1210 Utilities:	1.31



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The accompanying software, provided for use with the DPA is also copyrighted. Permission is granted to copy this software for back-up purposes only.

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.
- ❑ Dearborn Group, Inc. 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.
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The DPA Product line and the products supporting the DPA have been awarded the following U.S. Patents:

Patent #	Date	Patent Overview
6,772,248	08-03-04	Protocol adapter for in-vehicle networks.
7,152,133	12-19-06	Expanded functionality protocol adapter for in-vehicle networks.
7,337,245	02-26-08	Passing diagnostic messages between a vehicle network and a computer.
7,725,630	05-25-10	Passing diagnostic messages between a vehicle network and a computer using J1939 or J1708.
8,032,668	10-04-11	Passing diagnostic messages between a vehicle network and a computer using J1939 or J1708.
8,152,557	04-10-12	Positive locking mechanism for USB connected devices.
7,984,225	07-19-11	ASCII gateway to in-vehicle networks.
7,660,934	02-09-10	ASCII gateway to in-vehicle networks.

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Table of Contents

Table of Contents	3
1. Safety First	5
2. Introducing the DPA 4 Plus	6
2.1. Legacy DG DPA Adapters	6
2.2. OEM Software Compatibility	6
2.3. Standards and Protocols Supported	7
2.4. System Requirements	8
3. Getting Started with the DPA (Steps 1-4 of 6)	9
3.1. Driver Installation	9
3.2. Connect USB Cable to the DPA and Then to PC	10
3.3. Connect Vehicle-Side Cable to the DPA	10
3.4. Connect Vehicle-Side Cable to the Vehicle	10
3.5. Finalize PC Install	11
3.6. Automatic Firmware Update (Step 6 of 6)	11
4. Troubleshooting / Validating Your DPA with Adapter Validation Tool (AVT)	12
4.1. Adapter Validation Tool "Startup" Program	12
4.2. Rule of Thumb for Selecting a Vehicle Protocol for Testing	12
4.3. Connection-Related Issues	13
4.4. Not Seeing DPA in OEM Application VDA Selection List	16
4.5. USB-Related Issues	17
4.6. Advanced Testing Dialog	17
5. Setting Up Your RP1210-Compliant OEM Diagnostic Applications	19
5.1. Notes on Selecting an RP1210 Compliant Adapter	19
5.2. Configuring Applications to Use the DPA 4 Plus	19
5.3. Allison DOC	19
5.4. Bendix ABS Diagnostics	20
5.5. Caterpillar Electronic Technician	20
5.6. Cummins Insite	20
5.7. Cummins PowerSpec (5.5 or Newer)	21
5.8. Detroit Diesel Diagnostic Link V7	21
5.9. Detroit Diesel Diagnostic Link Version 6.47	22
5.10. Dana Diagnostic Tool 2.x.x	22
5.11. Eaton ServiceRanger 3.x	22
5.12. Freightliner ServiceLink (Single CAN Channel, Will Not Work with Cascadia)	22
5.13. International Truck and Engine	23
5.14. Meritor-WABCO ABS Toolbox	23
5.15. Volvo/Mack VCADS Pro	24
5.16. Volvo/Mack Premium Tech Tool (PTT)	24
6. This Chapter Left Blank Intentionally	25
7. Explaining Multi-Application and Single-Application Drivers	26
7.1. Why Two OEM Applications May Not Work when Sharing the DPA	26
8. RP1210 Options Program	27
8.1. RP1210 Options Notes; RP1210 DPA Driver Sets	27
8.2. Set Options for DPA Device/API	28
8.3. J1939 Fast Transport Layer (FAST_TRANSPORT Option)	28
8.4. Debug Logging Level (RP1210 INI Option DebugLevel)	28
8.5. Debug File Name (RP1210 INI Option DebugFile)	28
8.6. Debug File Size (RP1210 INI Option DebugFileSize)	28
8.7. Debug File Mode (RP1210 INI Option DebugMode)	29
8.8. Automatic Firmware Update	29
8.9. DPA 5 Bluetooth Configuration Utility	30
8.10. Add SA Drivers to RP121032.INI Button	30
9. This Chapter Left Blank Intentionally	31
10. Product Specifications	32
10.1. DPA 4 Plus Physical and Electrical	32
10.2. DPA 4 Plus Pinouts	32
11. DG Update – Program Overview	33

11.1.	DG Driver Update – Internet Connection Required	33
11.2.	DG Driver Update – Initial Screen	33
11.1.	DG Driver Update – Main Update Screen	34
11.2.	Advanced Settings – Setting Default Time for Check for Updates	36
12.	Technical Support and Return Merchandise Authorization (RMA)	37
12.1.	Technical Support	37
12.2.	Return Merchandise Authorization (RMA)	37
13.	Warranty Information and Limitation Statements	38
13.1.	Warranty Information	38
13.2.	Limitation Statements	38
14.	Appendix A – DPA 4 Plus Manual Firmware Update	39
14.1.	Launch the DPA Firmware Updater Program	40
15.	Appendix B – Software Developer/Integrator Notes	41
15.1.	Bundling the DPA with Your OEM Installation – Silent Install	41
16.	Appendix C - This Chapter Left Blank Intentionally	42
17.	Appendix D - Windows Vista and Windows 7/8 Support Notes	43
17.1.	UAC and the TMC RP1210 Standard	43
17.2.	UAC and the Dearborn Group Adapter Validation Tool (AVT)	43
17.3.	UAC Requirements for All DPA Utility Programs	43
17.4.	More Information on UAC	43
18.	Appendix E – DPA Utilities Information for This Release	44
19.	Appendix F – List of Acronyms Used in this Document	45
20.	Appendix G. Testing and Troubleshooting of a J1939 Network	46
20.1.	J1939 Network Types	46
20.2.	CAN/J1939 Termination Resistor	46
20.3.	Properly Terminated J1939 Network (Term Resistors at Logical End Points)	47
20.4.	Aftermarket Additions Improperly Installed	47
20.5.	J1939 Network Testing Step 1 (Termination Resistance)	48
20.6.	J1939 Network Testing Step 2 (CAN/J1939 High and CAN/J1939 Low To Ground) ...	49
20.7.	J1939 Network Testing Step 3 (Roll Call)	50
21.	Appendix H. Commonly Requested Cable Drawings	51
21.1.	DPA 4 Plus to DPA 4 Plus “Back-to-Back” Cable	51
22.	Appendix I. Volvo/Mack 2013 (and Newer Vehicles) and the DPA 4 Plus	52
23.	Appendix J. Notes on Using Windows 8	53
23.1.	Using the Windows Desktop and Classic Start 8	53
23.2.	Using Windows 8 Life Tiles	53
24.	Appendix K. - Windows XP Installation Issues (USB Drivers Fail to Register)	54
24.1.	Verify the Adapter Is Not Recognized	54
24.2.	Run the Hardware Update Wizard	55
25.	Appendix L. - Windows XP Installation Issues (Drivers Lock-Up the PC)	57
26.	Appendix M – Sample Source Code for Software Engineers	58
26.1.	RP1210 Sample Source Code	58
26.2.	J2534 Sample Source Code	58

1. Safety First

It is essential that the user read this document carefully before using the hardware.

The DPA device is to be used by those trained in the troubleshooting and diagnostics of light-duty through heavy-duty vehicles. The user is assumed to have a very good understanding of the electronic systems contained on the vehicles and the potential hazards related to working in a shop-floor environment.

Dearborn Group, Inc. understands that there are numerous safety hazards that cannot be foreseen, so we recommend that the user read and follow all safety messages in this manual, on all of your shop equipment, from your vehicle manuals, as well as internal shop documents and operating procedures.



- ❑ Always block drive, steer, and trailer wheels both front and back when testing.
- ❑ Use extreme caution when working around electricity. When diagnosing any vehicle, there is the risk of electric shock both from battery-level voltage, vehicle voltages, and from building voltage.
- ❑ Do not smoke or allow sparks or open flames near any part of the vehicle fueling system or vehicle batteries.
- ❑ Always work in an adequately ventilated area, and route vehicle exhaust outdoors.
- ❑ Do not use this product in an environment where fuel, fuel vapor, exhaust fumes, or other potentially hazardous liquids, solids, or gas/vapors could collect and/or possibly ignite, such as in an unventilated area or other confined space, including below-ground areas.

2. Introducing the DPA 4 Plus

The DPA 4 Plus product is used to connect vehicle communication networks and personal computers (PCs). This allows programs written for the PC to retrieve pertinent vehicle information such as fault codes, component information, as well as perform vehicle and component level diagnostics, tests, and component reprogramming. The DPA 4 Plus communicates with the PC using a USB cable and comes standard with Technology and Maintenance Council (TMC) Recommended Practice (RP) RP1210C-compliant drivers that are backward compatible with RP1210A and RP1210B.



The DPA 4 Plus

2.1. Legacy DG DPA Adapters

This release (DPA4PMA) does not support previous Dearborn Group adapters such as the DPA II, DPA II+, DPA III+, DPA 4 or DPA RF. The additional requirements of RP1210C have made supporting these legacy devices impossible. These legacy devices (all out of production and unsupported) will continue to operate using the DG121032 drivers. The DG121032 release will also work with the DPA 4 Plus.

2.2. OEM Software Compatibility

The adapter you have purchased is provided with a Technology and Maintenance Council (TMC) RP1210A and RP1210B compliant interface and has been validated against the following OEM and component applications:

- | | |
|--|---|
| <input type="checkbox"/> Allison DOC™ | <input type="checkbox"/> International® Diamond Logic Builder |
| <input type="checkbox"/> Bendix® ACOM | <input type="checkbox"/> International® InTune |
| <input type="checkbox"/> Caterpillar® Electronic Technician | <input type="checkbox"/> International® Master Diagnostics |
| <input type="checkbox"/> Cummins® Insite™ | <input type="checkbox"/> International® ServiceMaxx |
| <input type="checkbox"/> Cummins PowerSpec™ | <input type="checkbox"/> Mack and Volvo VCADS/PTT |
| <input type="checkbox"/> Dana Diagnostic Tool™ | <input type="checkbox"/> Meritor-WABCO Toolbox |
| <input type="checkbox"/> Detroit Diesel Diagnostic Link™ | <input type="checkbox"/> Perkins EST |
| <input type="checkbox"/> Detroit Diesel Reprogramming Station™ | <input type="checkbox"/> Vansco VMMS |
| <input type="checkbox"/> Eaton ServiceRanger | <input type="checkbox"/> ZF-Meritor TransSoft |
| <input type="checkbox"/> Freightliner ServiceLink | |

Any application claiming RP1210A, RP1210B, or RP1210C compliance should work if the application and adapter both support the same protocol(s) and operating system(s).

2.3. Standards and Protocols Supported

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

2.3.1. Operating Systems and Standards Supported

- ❑ Operating Systems
 - Windows Vista® 32-bit and 64-bit Versions
 - Windows 7® 32-bit and 64-bit Versions
 - Windows 8® 32-bit and 64-bit Versions
- ❑ TMC RP1210A, TMC RP1210B, TMC RP1210C
- ❑ CE Certification
- ❑ Vehicle Electronic Programming Station (VEPS) J2214/J2461

2.3.2. RP1210 Defined Protocols Supported

- ❑ J1939
 - J1939@250k – Standard J1939
 - J1939@500k – Per J1939/14
 - Automatic Baud Rate Detection Capable
- ❑ CAN (ISO11898)
 - Automatic Baud Rate Detection Capable
- ❑ CAN@500k/J2284/GMLAN
 - The IESCAN protocol name is also CAN@500k.
 - Automatic Baud Rate Detection Capable
- ❑ J1708/J1587
- ❑ J1850 VPW (Class 2)
 - The following protocol names are supported: J1850, J1850_416K, J1850_104K. The send and read message format was changed from RP1210A to RP1210B for this protocol. DG supports both formats. The J1850 indicates the RP1210A format for sending and reading data. The J1850_416K, J1850_104K names indicate the RP1210B format.

2.3.3. Additional Protocols Supported by Native Drivers

- ❑ J2411 (Single Wire CAN)
- ❑ ALDL

2.3.4. RP1210_ClientConnect() Modifiers Supported (CAN Automatic Baud Rate Detection, Channel)

The DPA 4 Plus supports automatic CAN baud rate detection as required by RP1210C in preparation for J1939 moving from a speed of 250k to 500k. To support this, the API supports this through an application issuing a modifier to the RP1210_ClientConnect() function call (for any CAN protocol):

- RP1210_ClientConnect("J1939:Baud=Auto")
- RP1210_ClientConnect("CAN:Baud=Auto")
- RP1210_ClientConnect("ISO15765:Baud=Auto")
- RP1210_ClientConnect("J2284:Baud=Auto")

If the application wants to know what speed they connected at, they can issue the command:

- RP1210_SendCommand(RP1210_Get_Protocol_Connection_Speed)

2.4. System Requirements

If you are not familiar with selecting a PC platform for your diagnostic applications, Dearborn Group, Inc. recommends starting with a computer that is compatible with the latest version of the TMC RP1208 (PC Selection Guidelines for Service Tool Applications). In addition to the aforementioned document, the following items are recommended or required.

Item	Requirement
PC	IBM-Compatible
Processor	1GHz or Faster
RAM	1GB
USB Port	USB Version 1.1 or Higher
Operating System	Windows Vista (32-bit or 64-bit) Windows 7 (32-bit or 64-bit) Windows 8 (32-bit or 64-bit)

3. Getting Started with the DPA (Steps 1-4 of 6)

If you ordered the DPA 4 Plus as part of a kit, it should include the following items:

- ❑ DPA 4 Plus Diagnostic Tool
- ❑ 6-pin/9-pin Deutsch Connector Y Cable, for vehicle-side connection
- ❑ USB Cable
- ❑ Driver Installation CD

Please note that Dearborn Group, Inc. does customize our kits for our vendors, so what you receive may vary.

3.1. Driver Installation

Attention!

- ✓ Install DPA 4 Plus drivers before connecting DPA to your PC.
- ✓ To install drivers you must be logged into the administrator account or have administrator privileges.
- ✓ If you run into problems installing the drivers or the DPA, please do not hesitate to contact technical support at (248) 888-2000.

Attention!

DPA drivers are provided on the Installation CD and are installed by inserting the disc into your PC's CD-ROM drive. The latest drivers are also available at <http://www.dgtech.com/download.php>.

If you have any questions about the install, do not hesitate to call our Technical Support department.

If setup does not begin automatically, use the following sequence:

Start → Run → [CD_Drive_Letter]:\DPA4Plus_RP1210.exe and click **OK**



Once the drivers are installed, you will be prompted to restart your computer. While your PC is rebooting, continue following the next instructions.

3.2. Connect USB Cable to the DPA and Then to PC

Remove the sticker covering the USB port and connect the USB cable to the DPA and PC. The USB cable that comes with the DPA has ears that allow the cable to be screwed into standoff screws on the DPA frame, greatly reducing the chance of breaking the USB connector on the DPA circuit board.

PC-side USB Cable



3.3. Connect Vehicle-Side Cable to the DPA



WARNING!

Connect the vehicle-side cable to your DPA. **Do not connect to vehicle first! Pins 6 and 8 on the DB25 connector are power and ground and can arc if not careful, potentially blowing a fuse on the vehicle!**

Vehicle-side Cable



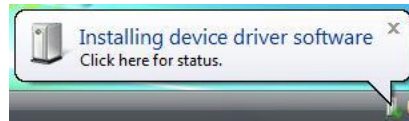
Example: 6-pin/9-pin Deutsch Y Cable

3.4. Connect Vehicle-Side Cable to the Vehicle

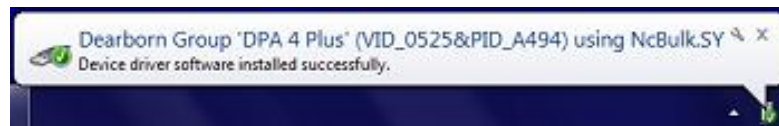
Now, connect the DPA to the vehicle, verifying that the DPA Power LED is lit.

3.5. Finalize PC Install

When the DPA is first powered up and connected to the PC, the following status balloon appears in the bottom right corner. This status messages displays for several seconds.



After Windows has finished adding the device drivers, the following screen indicates success and you will see the next image at the bottom of the Windows taskbar. Press the **Close** button. Your DPA 4 Plus drivers have been installed successfully.



3.6. Automatic Firmware Update (Step 6 of 6)

When a DPA PC drivers release is made, a specific set of DPA firmware is validated with that release. In this release the firmware that was validated can be found on the cover page of this manual.

DG strongly recommends that users keep their DPA up-to-date with the latest firmware revision.

Automatic Firmware Update is an option that is most likely turned **On** in your installation. Some customers receive special drivers where this is not the case, however this paragraph assumes that this option is turned on, and set to a value of 1. To learn more about this option, see the chapter entitled **RP1210 Options Program**.

After you have finished installing the Windows device drivers (Step 5 of 6) you can begin using your DPA. If the **Automatic Firmware Update** option is on (by default, it is), every time you connect to the DPA, the drivers check to see if a newer version of firmware is available on the hard drive. If a newer version is available the user will be prompted (see Figure 6.1) to upgrade to that version. If the user selects **Yes**, the upgrade process begins automatically. When the upgrade process is complete, the connect sequence for that application will continue. Most applications can handle the delay; however there is a possibility that the user may have to restart their application.

The following is the dialog box that will be displayed if out-of-date firmware is detected. We recommend pressing **Yes** and upgrading.

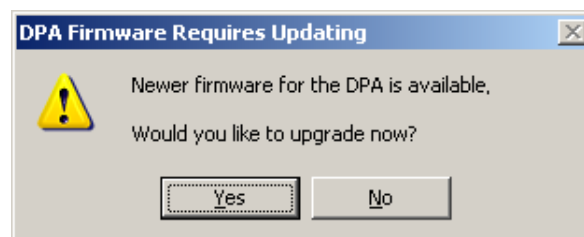


Figure 6.1. DPA Firmware Out of Date Dialog Box

4. Troubleshooting / Validating Your DPA with Adapter Validation Tool (AVT)

If your OEM application is having trouble using the DPA after following the instructions in this manual for configuring that application, you can use the Adapter Validation Tool (AVT) to troubleshoot the DPA and validate that the DPA drivers are installed properly, the PC can communicate with the DPA, and the DPA can see messages on the data bus.

- ❑ Most DPA technical support calls about OEM applications not working come from users who have not configured that OEM application to use the DPA, or who have selected the incorrect protocol.

After you have followed the instructions to install the DPA drivers, connect the DPA to the vehicle and ensure the **Power** LED is on. Then connect it to the PC and listen for the familiar da-ding “USB device found” sound. If you cannot hear this sound, the PC cannot communicate with the DPA and you will not be able to get AVT to be successful. Try another USB port until you hear that sound.

- ❑ **If you plug in a DPA (or any other USB device) and get the New Hardware Found wizard, do not click Cancel. Go through the wizard completely! IF YOU CLICK Cancel, THE DPA WILL NOT WORK!**

4.1. Adapter Validation Tool “Startup” Program

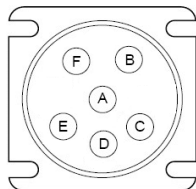
The light and medium-duty world is different in the standards used to write software than the medium and heavy-duty world. For the most part (other than the new Volvo platform), it is based on the diagnostics connector. Due to the difference, DG has changed the startup of the Adapter Validation Tool (AVT) application. Now, when you click AVT on the desktop or from the start menu, a screen will be displayed asking the user what version of AVT to run.



THE DPA 4 PLUS WILL NOT WORK WITH AVT (OBDII) SINCE THE DPA 4 PLUS DOES NOT COME WITH SAE J2534 COMPLIANT DRIVERS. YOU MUST CHOOSE THE PICTURE OF THE TRUCK (AVT MD/HD)

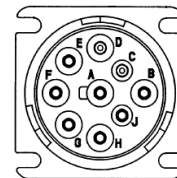
- ✚ Click on the MD/HD truck button if you have a 6 or 9-pin Deutsch connector. This is most typically found on medium and heavy-duty vehicles and J1708/J1587 and J1939 are the most common protocols.

4.2. Rule of Thumb for Selecting a Vehicle Protocol for Testing



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.

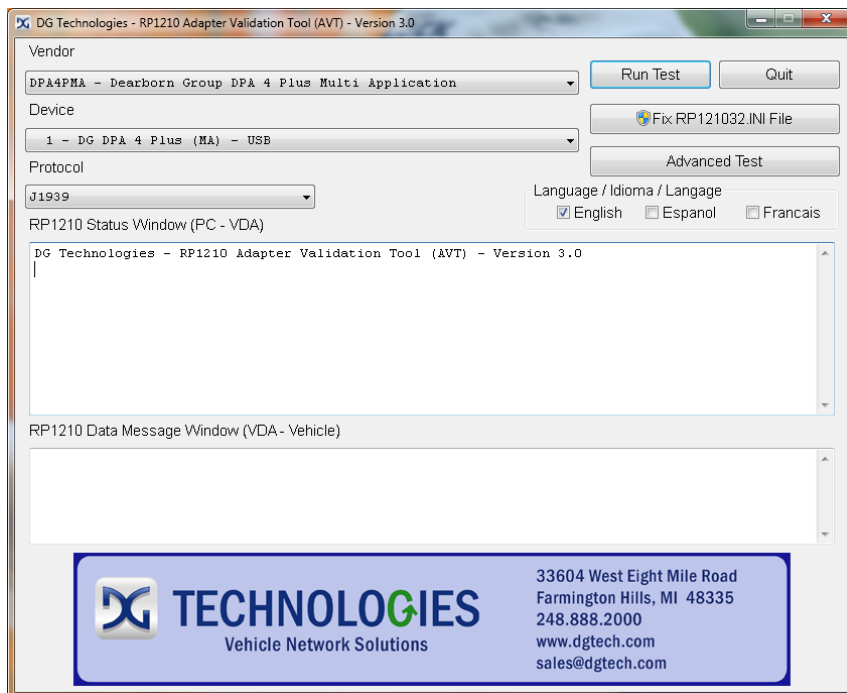
There are typically three problem areas with RP1210 VDA devices. Each problem is discussed in the following sections:

4.3. Connection-Related Issues

After you have followed the instructions in this manual to install the DPA drivers, connect the DPA to the vehicle and ensure the **Power** LED is on. Then connect it to the PC and listen for the familiar da-ding “USB device found” sound. If you cannot hear this sound, the PC cannot communicate with the DPA and you will most likely end up not being able to get AVT to be successful. Try another USB port until you hear that sound.

Run AVT either from the **Adapter Validation Tool (AVT)** link on your desktop, or from the **Start Programs** menu:

Start → Programs → Dearborn Group Products → DPA 4 Plus DPA4PMA → Adapter Validation Tool



Select the correct DPA adapter:

- ❑ **Vendor** DPA4PMA – Dearborn Group DPA 4 Plus Multi-Application
- ❑ **Device** 1 – DG DPA 4 Plus (MA) - USB
- ❑ **Protocol** J1708, J1850, CAN or J1939 (depending on your application)

Then click the **Run Test** button. Depending on the results of the test, both the **RP1210 Status Window** and **RP1210 Data Message Window** will turn **green** (pass) or **red** (fail).

4.3.1. AVT Test Outcomes

If the **RP1210 Status Window** turns **red**, then there is a problem causing the PC not to communicate with the DPA. This may be something as simple as having power to the DPA or a USB issue. Disconnect the DPA from the vehicle and PC; then reconnect them, this time connecting to another USB port on the PC.

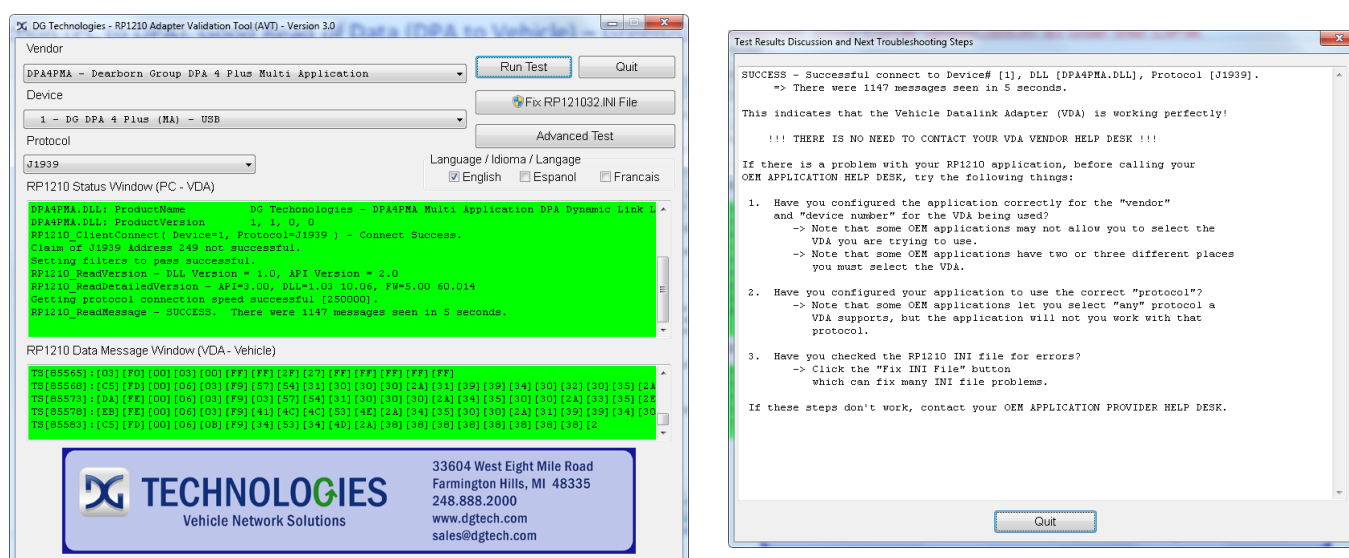
If the **RP1210 Status Window** turns **green** and the **RP1210 Data Message Window** turns **red**, then the PC is seeing the DPA, but not seeing messages from the data bus. Check the vehicle ignition switch and vehicle to adapter cabling. Disconnect the DPA from the vehicle and PC; then reconnect them.

*If you see data in the **RP1210 Data Message** Window, your DPA is installed and functioning properly! Refer to the chapter on how to configure your OEM application to use the DPA.*

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 those instructions, you cannot get the DPA working, please contact DG technical support.

- ❑ Many DPA technical support calls could have been avoided by following the instructions on the **Test Results Discussion and Next Steps** screen.

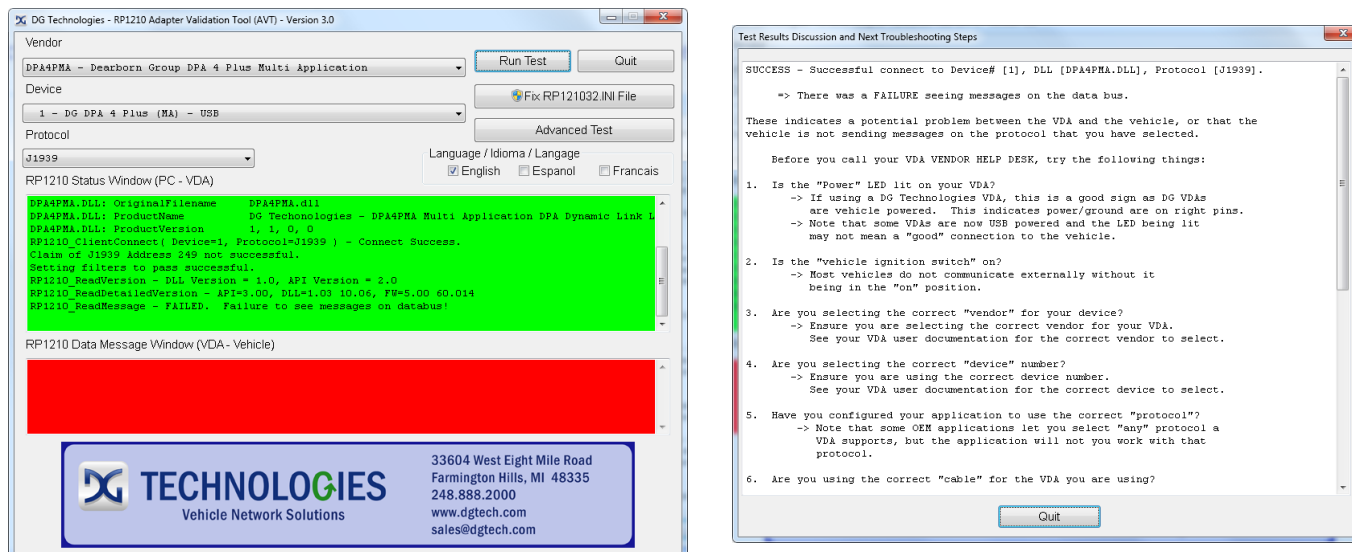
4.3.2. Good Connection (PC to DPA), Good Read of Data (DPA to Vehicle) – Green/Green



The above screen snapshots show the PC successfully connecting to the DPA (RP1210 Status Window) and the successful reading of data bus data (RP1210 Data Message Window) from the J1939 data bus.

- ❑ A Green/Green result indicates the DPA is working perfectly and is seeing data on the data bus. The area to work on is configuring the OEM application to use the DPA.

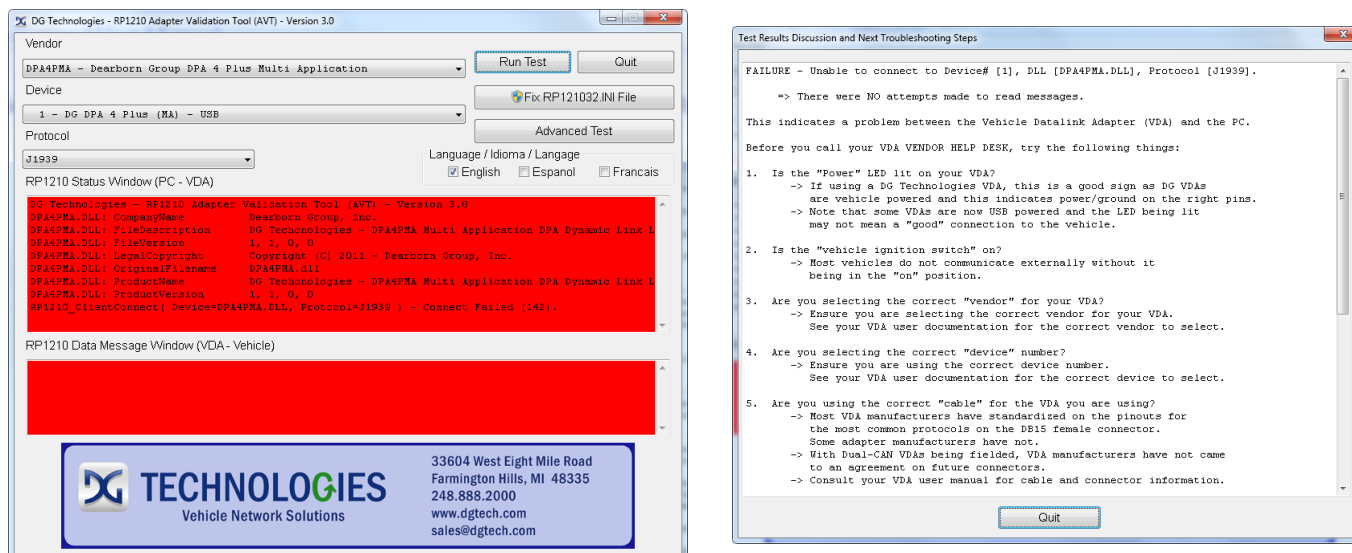
4.3.3. Good Connection (PC to DPA), Not Able To Read Data (DPA to Vehicle) – Green/Red



The above screen snapshots show the PC successfully connecting to the DPA (RP1210 Status Window) but AVT is not able to read data bus data (RP1210 Data Message Window) from the data bus selected (J1939).

- ❑ A Green/Red result indicates the DPA is working perfectly, but it is not seeing data on the data bus that was selected. Choose another protocol and check that the ignition switch is on.

4.3.4. Bad Connection (PC to DPA), Not Able To Read Data (DPA to Vehicle) – Red/Red



The above screen snapshots show the PC not connecting to the DPA (RP1210 Status Window).

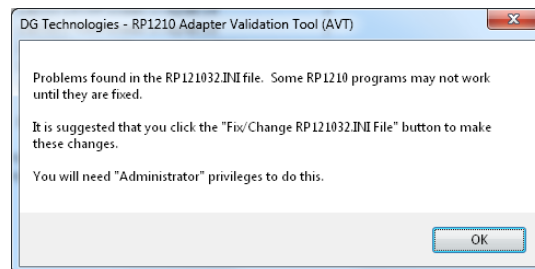
- ❑ A Red/Red result indicates the PC is not seeing the DPA. Unplug DPA from vehicle and PC and reconnect to both using a different USB port. Ensure that you hear the da-ding "USB Device Found" sound. If you cannot hear the sound, reboot the PC and run AVT again. DG has been getting a lot of DPA technical support calls where OEM applications crash and keep the DPA device open.

4.4. Not Seeing DPA in OEM Application VDA Selection List

If you have installed the DPA drivers and can get AVT to a Green/Green outcome, you should be able to configure your diagnostic application to use the DPA. If your diagnostic application does not display **DG DPA 4 Plus (MA), USB** in their VDA selection dialog box, this could indicate one of three things:

1. The application is not RP1210 compliant and does not work with the DPA.
 - a. Some applications require a specific, proprietary adapter.
2. Application is RP1210 compliant, but DPA does not support the protocol needed.
3. Problem with the main RP121032 INI file.
 - a. Some VDAs create issues with the RP121032 INI file when they install/uninstall.
 - b. Many OEM diagnostic applications are aware of this issue and can read through the errors.

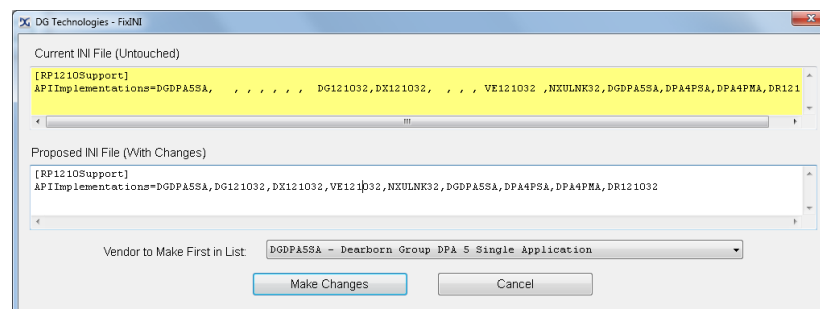
When the AVT software is launched, you will be told if a problem exists in the main RP121032 INI file. If you wish to fix this issue (**very highly recommended**), press the **Fix/Change RP121032.INI File** button on the main screen. If your PC is running Windows Vista or Windows 7, you will be prompted for administrator privileges. The following is the dialog box that will appear when AVT is launched and a problem is found in the main RP121032 INI file.



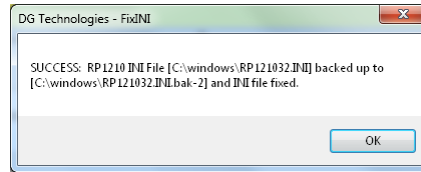
When you press the **Fix/Change RP121032.INI File** button, AVT will bring up a separate program called **Fix INI** that will allow you to view and fix the RP121032 INI file if there are errors detected. You can also change the VDA that appears first in the list of the OEM diagnostic software applications.

In the example below, a bad INI file was detected (depicted by a yellow background). Note the multiple commas and spaces between entries.

Click the **Make Changes** button and the INI file problem will be corrected. If you wish to make a specific adapter first in the list, you can select that vendor in the **Vendor to Make First in List** before pressing the **Make Changes** button.



The next picture shows the dialog box indicating that the INI file was fixed.



4.5. USB-Related Issues

If you plug in a DPA (or any other USB device) and get the New Hardware Found wizard, do not click cancel. Go through the wizard completely! **IF YOU SELECT *Cancel*, THE DPA WILL NOT WORK!**

Windows has many USB eccentricities that are generally solved by unplugging a device and then plugging that device back in. Sometimes you have to plug that device into another USB port.

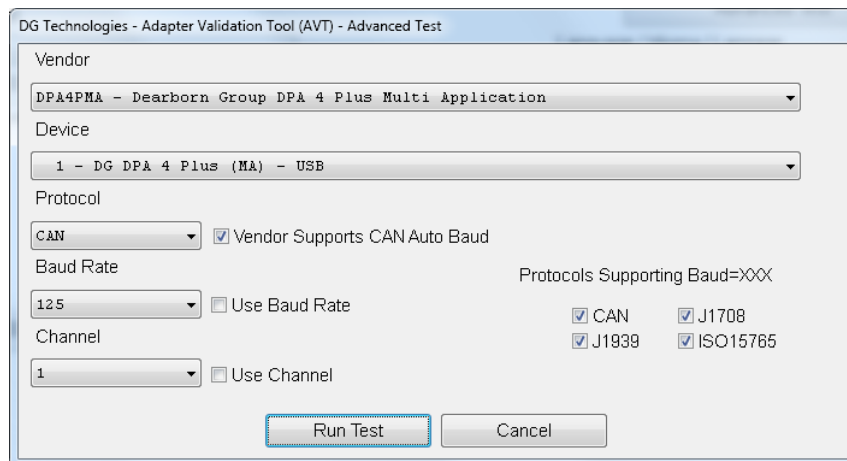
4.6. Advanced Testing Dialog

With the J1939 data bus moving to 500k, there is a lot of RP1210 and J1939 committee focus on VDA vendors doing J1939 automatic baud detection to detect either a 250k or 500k J1939 data bus without creating issues. There is also a growing need for advanced testing on vehicles that have a second CAN data bus.

The DPA4PMA API Supports the following commonly used RP1210_ClientConnect() modifications:

- ☐ Protocol:Baud=Auto
- ☐ Protocol:Baud=XXX
- ☐ Protocol:Channel=X
- ☐ Protocol:Baud=Auto;Channel=X
- ☐ Protocol:Baud=XXX;Channel=X

Pressing the **Advanced Test** button brings up the dialog box shown below.



4.6.1. Vendor, Device, Protocol

Vendor, **Device** and **Protocol** fields are the same as described in normal testing above.

4.6.2. 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.

4.6.3. 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.

4.6.4. Vendor Supports CAN Auto Baud Checkbox

This checkbox indicates whether or not 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.

4.6.5. Protocols Supporting Baud=XXX

These checkboxes indicate whether or not 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.

4.6.6. Advanced Testing Commands – No Error Checking

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. Setting Up Your RP1210-Compliant OEM Diagnostic Applications

The DPA 4 Plus works with all RP1210A, B, and C compliant applications that support J1708/J1587, J1939, CAN, and J1850 protocols. The DPA also works with other applications that were written to use non-RP1210 compliant DPA native drivers for other protocols, such as GM UART. This section shows how to configure the most common diagnostic applications to work with the DPA.

5.1. Notes on Selecting an RP1210 Compliant Adapter

Selecting a RP1210 adapter, commonly referred to as a Vehicle Datalink Adapter (VDA) varies widely from application to application; however, the terminology remains pretty much the same. 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!
- ✦ Not all OEM applications save the adapter configuration! Some 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	Dearborn Group DPA 4 Plus Multi-Application Or DPA4PMA
Device Device Name Adapter Name	DG DPA 4 Plus (MA) DG DPA 4 Plus (MA), USB
Device Number	1
Port COM Port Communications Port	USB
Protocol (Depends on Application)	Most Commonly Encountered: ✓ J1708 ✓ J1939

5.2. Configuring Applications to Use the DPA 4 Plus

The following examples show how to select your DPA 4 Plus device.

5.3. Allison DOC

1. Start program
2. Click **Connect to Vehicle**
3. Select the correct transmission type
4. Uncheck **Smart Connect**
5. Click **Connect**
6. Click **Advanced Setup**
7. Select vendor of **Dearborn Group DPA 4 Plus Multi-Application**
8. Select protocol of **J1939** or **J1708**
9. Select correct device of **DG DPA 4 Plus (MA)**
10. Click **OK**

5.4. Bendix ABS Diagnostics

NOTE: DO NOT RUN Bendix ABS Diagnostics until you have done the following:

1. Start program
2. If **Diagnostic Interface Selection** dialog box does not appear, click on **Vehicle Interface Adapter** icon
3. Select **RP1210A Device Using J1708 Line: DG DPA 4 Plus (MA)**
4. Click **OK**

A screen appears indicating that device selection was a success.

5.5. Caterpillar Electronic Technician

1. Start program
2. Click Utilities → Preferences → Communications from the menu bar
3. Click on **Communication Interface Device** dropdown box
4. Select **RP1210 Compliant Device**
5. Click **Advanced**
6. Select **(DG DPA 4 Plus (MA))** in the RP1210 Communication Adapter Device box
7. Click **OK**
8. Check **Enable Dual Data Link Service**
9. Click **OK**

CAT ET Notes:

- ✚ Enable Dual Data Link. This checkbox should be “checked” in most cases. However, on some older J1708 (ATA) only vehicles, ET will not work with this checkbox checked. If ET does not connect, try “un-checking”, or “checking” this button.
- ✚ 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. If you must connect to a CDL network, you must go to your local CAT distributor and purchase a CAT adapter.
 - To find out if your vehicle/equipment is CDL or a standard protocol (J1708/ATA, J1939), you should look at the diagnostic connector for that equipment in the service manual.


5.6. Cummins Insite

1. Start Program.
2. Click on File → Connections → Add New Connection.
3. Click **Next**.
4. Click radio button for **RP1210 Adapters** and click **Next**.
5. Select correct vendor, device, and protocol:
 - a. **Dearborn Group DPA 4 Plus Multiple Application**
 - b. **DG DPA 4 Plus (MA)**
 - c. **Auto Detect.**
 - i. **If you are on an older vehicle and it does not connect, choose J1708.**
6. Click **Next** and a Connection Name screen appears.
7. Click **Next** and a screen prompts you to indicate whether you want to make this connection active or set up another connection.
8. Click on **make this connection active**.
9. Click **Finish**.

5.7. Cummins PowerSpec (5.5 or Newer)

1. Start Program.
2. Click on **Advanced**.
3. Click **Settings** button.
4. Datalink Adapter:
 - a. **Dearborn Group DPA 4 Plus Multi Application**
5. **Device List:**
 - a. **DG DPA 4 Plus (MA)**
6. **Datalink Protocol:**
 - a. Auto Detect (or choose protocol for your engine).
7. Click **Save** button.

PowerSpec Notes:

-  PowerSpec Version 5.5 is required to use the DPA 5. Older versions of PowerSpec were not completely RP1210-compliant.

5.8. Detroit Diesel Diagnostic Link V7

5.8.1. From Windows Start Menu

1. Start → Programs → Detroit Diesel → Diagnostic Link → SID configure
2. Select **DG DPA 4 Plus (MA)**
3. Click **OK**

5.8.2. From Inside DDDL

1. Tools → Options → Connections Tab → SID Configure from the menu bar
2. Select **DG DPA 4 Plus (MA)**
3. Click **OK**

5.9. Detroit Diesel Diagnostic Link Version 6.47

There are two ways to open v6.47, depending on your installation.

A. If you have the Detroit Diesel Electronic Tool Suite on your desktop:

1. Select Detroit Diesel Electronic Tool Suite icon from desktop.
2. Select Configure button.
3. Select DG DPA 4 Plus (MA) USB, USB, select OK button.
4. Select Refresh button.
5. Click on highlighted DDDL 6 item.
6. Select Look at active and inactive faults.

B. If you have the Diagnostic Link 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 DG DPA 4 Plus (MA) USB, USB from Local Communication Interface drop-down list.
5. Select OK button.

5.10. Dana Diagnostic Tool 2.x.x

1. Start program
2. Under **Adapter Selection**, choose **Dearborn Group DPA 4 Plus Multi-Application:DG DPA 4 Plus (MA) USB, USB**
3. Select **Connect J1708** or **Connect J1939** or **Connect PLC** as appropriate for your controller.

5.11. Eaton ServiceRanger 3.x

1. Start program
2. Click Tools → Settings → Connection from the menu bar
3. Under Driver choose **Dearborn Group DPA 4 Plus Multi-Application**
4. Select **DG DPA 4 Plus (MA)** for both the J1708 and J1939 device
5. Click **OK**

5.12. Freightliner ServiceLink (Single CAN Channel, Will Not Work with Cascadia)

The DPA 4 Plus will work with ServiceLink on the Freightliner Cascadia, however you will not be allowed to work on the 2nd CAN channel. If you need to service Cascadia models, you should upgrade to a DPA 5 that has two separate CAN channels.

1. Start program
2. From the top menu bar, choose **Admin**
3. From the left menu bar, choose **Vehicle**
4. Click on **Show All Devices**
5. In the Vendor box, choose **Dearborn Group DPA 4 Plus Multi-Application**
6. Select **DG DPA 4 Plus (MA)** in the J1708, J1939, and CAN dropdowns
7. Click **Save Settings**

5.13. International Truck and Engine

5.13.1. Master Diagnostics (MD Fleet)

File → MD Settings → COM Device → Window with general adapter selection
Dearborn Group DPA 4 Plus Multi-Application → Window with specific port **DG DPA 4 Plus (MA)**

5.13.2. Navistar Hyd ABS

File → Hydraulic ABS Settings → COM Device → Window with general adapter selection
Dearborn Group DPA 4 Plus Multi-Application → Window with specific port **DG DPA 4 Plus (MA)**

5.13.3. Navistar IPC

File → Settings → COM Device → Window with general adapter selection
Dearborn Group DPA 4 Plus Multi-Application → Window with specific port **DG DPA 4 Plus (MA)**

5.13.4. Diamond Logic Builder (DLB)

Tools → Select Com Link → Listing of adapters **Dearborn Group DPA 4 Plus Multi-Application** → Listing of ports **DG DPA 4 Plus (MA)**

5.13.5. Service Assistant (The new MD Fleet)

1. Press the third button from the top along the left side (has an icon that looks like a miniature interface cable)
2. A window comes up that says Communication Device Selection
3. Box 1 is device selection **Dearborn Group DPA 4 Plus Multi-Application**
4. Box 2 is Device ID **DG DPA 4 Plus (MA)**

5.13.6. ServiceMaxx:

1. Select ServiceMaxx icon from desktop
2. Enter username and password (if required)
3. Select Tools → Select COM Link → Dearborn Group DPA 4 Plus Multiple Application → DG DPA 4 Plus (MA) USB, USB → select J1708 or J1939 depending on engine type.
4. "Searching for Engine" appears
5. Select engine type when prompted and click OK button.

5.14. Meritor-WABCO ABS Toolbox

1. Start program
2. Click **System Setup**
3. Select **COM Port**
4. Select **Dearborn Group DPA 4 Plus Multi-Application**; the protocol to use is J1939 or J1708
5. Select **DG DPA 4 Plus (MA)** and click **OK**

5.15. Volvo/Mack VCADS Pro

5.15.1. From Initial VCADS Setup

1. When prompted to configure a **Communication Unit**, instead of the “9998555” or “88890020” entries, select **RP1210A adapter**
2. When prompted for the adapter, select **DG DPA 4 Plus (MA)**
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

5.15.2. From Inside VCADS

1. Start program
2. Click the Tools → Options from the menu bar
3. Select the **Comm. Unit Configuration** tab
4. Select **RP1210A Adapter** and then select **DG DPA 4 Plus USB**
5. Select **USB** for the Port
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**

5.16. Volvo/Mack Premium Tech Tool (PTT)

NOTE: The DPA 4 Plus will not work on a 2013 or newer Volvo/Mack chassis with a Volvo engine. That particular vehicle platform requires a diagnostic adapter have 2 separate CAN channels. You should upgrade to a DPA 5 if you need to service that vehicle platform.

1. Select PTT → Settings from the menu bar
2. Select **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.
3. **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.

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7. Explaining Multi-Application and Single-Application Drivers

This release of the DPA drivers supports multiple applications running simultaneously (i.e. sharing the DPA). For example, there may be a time where you need to run an engine and transmission application at the same time or there may be a need to run a data logging application alongside your engine diagnostics. It has been DG's experience that when several OEM applications are running simultaneously, especially on a crowded J1939 data bus, they sometimes miss critical timing events and do not behave as they would normally.

7.1. Why Two OEM Applications May Not Work when Sharing the DPA

Running two or more OEM applications that were not designed to **share** an adapter in a situation where they are in fact **sharing the adapter** is a hit-or-miss scenario. They might work well together and they may not. The two big reasons some work well together and others don't is **J1939 addressing** and **timing related**.

7.1.1. J1939 Addressing Issues

Per SAE J1939, every ECM or application using a VDA must go through a process to **claim** a J1939 address. According to J1939, before an ECM or application can send or receive long messages (greater than the standard 8-byte CAN messages); an address must be claimed. These **long** messages are sent using what is called the J1939 Transport Protocol (TP). Long messages are used for data such as make, model, serial number, VIN, and for reprogramming and calibration (very common in OEM diagnostic applications).

The past RP1210 specifications (RP1210-0, RP1210A, and RP1210B) implied that a Vehicle Diagnostic Adapter (VDA) should have only 1 J1939 address. This means the VDA will handshake for TP messages to/from 1 specific J1939 address. This meant that if one application claims 249 and another application connected while **sharing the VDA** (i.e. Multi-Application mode) and claimed address 250; one address will get dropped. This means that only one of those applications will be capable of sending and receiving long TP messages. If the application that had its address get dropped depends on these long TP messages, it may not behave properly.

Another problem is that some OEM applications don't handle the RP1210 return value "ERR_ADDRESS_LOST" when they lose their **claimed** J1939 address. The application may keep running oblivious to the fact they are not going to get any long messages; no matter how many times they request them.

The DPA drivers behave in a **semi-shared-addressing** scenario. If the first application claims an address like 249, and the second application claims 249, then both apps will get TP messages destined for 249. If the second application were to claim 250, it would be denied.

7.1.2. Timing Related Issues

The second most common reason that two OEM applications don't work well together is timing. OEM applications expect to send a message out and read a response back from a controller in **X** amount of time. When two or more applications are sharing the VDA, messages are stacked for sending in some sort of a transmit buffer and received messages are also stacked in a receive buffer (commonly called a **queue**). When you stack message requests and responses, this slows down the send/receive process and many applications **timeout** because of it. The more applications sharing the VDA, the more potential there is for a delay or timeout scenario.

7.1.3. OEM Applications are NOT Tested in a Shared VDA Scenario

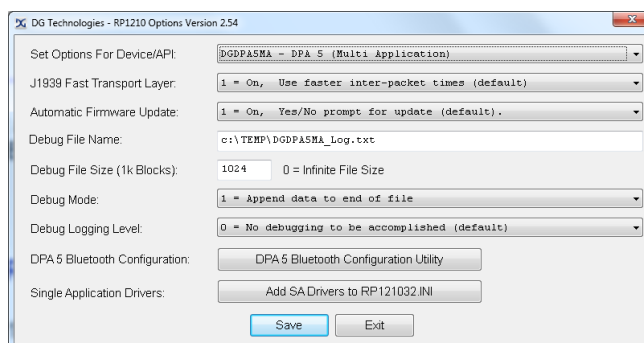
NO OEM APPLICATIONS CLAIM TO BE MULTI-APPLICATION CAPABLE!

None of them test with another OEM application running. They assume that they are the only application running on that PC through the VDA they are using.

This is why if you want to run multiple apps at the same time, some apps have to be started first before the second application. Sometimes, they just won't work no matter what you do!

8. RP1210 Options Program

The RP1210 Options program allows you to set and configure various aspects of the DPA 5. The following sections describe the roles of the variables. The DPA 5 Bluetooth Configuration Utility is discussed later.



8.1. RP1210 Options Notes; RP1210 DPA Driver Sets

Version 2.0 (and higher versions) of the RP1210 Options program adds the capability of modifying the settings for all DPA driver sets that are installed on your computer. Version 2.53 (and higher) added support for the DG d-briDGe product and DG Netbridge products. Below is a table that briefly describes each driver.

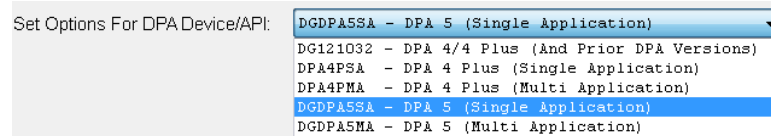
Driver Set	Description
DG121032	DPA 4, 4 Plus and Prior DPAs (Single Application) Allows only one RP1210 application to run at a time. Products supported by this driver include DPA 4, DPA RF, DPA III Plus, and the DPA 4 Plus.
DPA4PSA	DPA 4 Plus Variants (Single Application) Allows only one RP1210 application to run at a time.
DPA4PMA	DPA 4 Plus Variants (Multiple Application) Allows more than one RP1210 application to run at a time.
DGDPA5MA	DPA 5 Variants (Multiple Application) Allows more than one RP1210 application to run at a time.
DGDPA5SA	DPA 5 Variants (Single Application) Allows only one RP1210 application to run at a time.
DBRIDGEM	d-briDGe Variants (Multiple Application) Allows more than one RP1210 application to run at a time.
DBRIDGES	d-briDGe Variants (Single Application) Allows only one RP1210 application to run at a time.
NBRIDGEM	Netbridge Variants (Multiple Application) Allows more than one RP1210 application to run at a time.
NBRIDGES	Netbridge Variants (Single Application) Allows only one RP1210 application to run at a time.

The **DPA 5 Bluetooth Configuration Utility** button will only be available if a DPA 5 API is selected.

8.2. Set Options for DPA Device/API

When selecting **RP1210 Options** from the program menu of an installed DPA driver set, the program should default this field to that particular DPA driver set. Note that you can only modify driver sets that have been installed.

If you want to modify an option for any DPA driver set, you select that DPA driver set with this field.



8.3. J1939 Fast Transport Layer (FAST_TRANSPORT Option)

When this option is in the **On (Default)** position, it significantly decreases reprogramming and reflashing times over the J1939 data bus by reducing the amount of time between J1939 transport protocol (TP) packets (used to break large messages into CAN 8-byte packets for transmitting on the data bus). With this option turned on, however, some PC applications and vehicle controllers may not be able to keep up with the DPA.

This option has long existed, and many OEM and component manufacturers using the DPA for end of line (EOL) programming stations have used it successfully. If you encounter a diagnostic or reprogramming/reflashing application that is having problems with the DPA using the J1939 protocol, we recommend setting this parameter temporarily to the **Off** position and then retrying the application.

This parameter makes little, if any, difference during standard diagnostic sessions.

8.4. Debug Logging Level (RP1210 INI Option DebugLevel)

This is an RP1210B introduced INI file option designed to record vehicle data bus data and other pertinent driver data to a text file. Chances are you will never need to use this, **DebugFile**, **DebugFileSize**, and **DebugMode** options unless you are directed by an OEM or DG to investigate possible software issues. Potential values for this option are:

- 0 = No Debugging to be Accomplished (Default).
- 1 = Only Connect/Disconnect/Error Messages.
- 2 = Add RP1210_SendCommand Calls.
- 3 = Add all Sent Messages (with Filtering).
- 4 = Add all Received Messages (with Filtering).

Changing this value to something besides 0 (the default) will cause the DPA drivers to start logging DPA driver and vehicle data bus data to the **DebugFile** based on the selected value.

8.5. Debug File Name (RP1210 INI Option DebugFile)

When **DebugLevel** is on (1-4), this is the file that will receive the data logging output in text format. This file is in ASCII and can be read using a text editor. The default value for this option is in the Windows temporary directory, with a filename appropriate for the driver set.

8.6. Debug File Size (RP1210 INI Option DebugFileSize)

When **DebugLevel** is on (1-4), this is how large the **DebugFile** can grow in bytes. The formula is (**DebugFileSize** * 1024), so if you want to allow the **DebugFileName** the ability to grow to 2 megabytes, you would set this value to 2048. The default value for this parameter is 1024, or 1 megabyte.

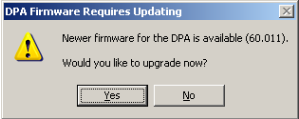
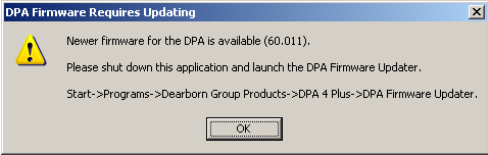
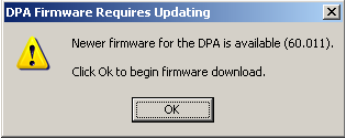
8.7. Debug File Mode (RP1210 INI Option DebugMode)

When **DebugLevel** is on (1-4) and this option is in the 1 (Default) position, the DPA drivers will append data to **DebugFile** (which could have data from previous logging) until it reaches the end of the file (1024 * **DebugFileSize**). When reaching the end of the file, the DPA drivers will erase **DebugFile** and start writing new data to the file.

When **DebugLevel** is on and this option is in the 0 (Overwrite File Contents) position, the DPA drivers will erase **DebugFile** and begin writing data to the file until it reaches the end of the file (1024 * **DebugFileSize**). When reaching the end of the file, the DPA drivers will erase **DebugFile** and start writing new data to the file.

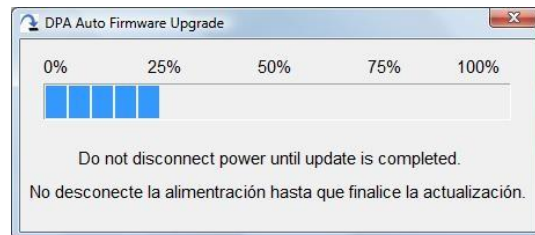
8.8. Automatic Firmware Update

Setting the variable **Automatic Firmware Update** to the **Value** causes the drivers to exhibit the behavior in the **Action** column.

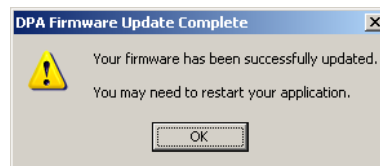
Value	Action
0	Automatic firmware update is turned off. No automatic checking for new firmware.
1	Automatic firmware update is turned on. The user has a choice as to whether or not to upgrade.  If the user selects Yes , the firmware is automatically updated. If the user chooses No , then the drivers connect the application to the vehicle. This is the default.
2	Automatic firmware checking is turned on. The user is only told that there is new firmware available and told they should run the DPA Firmware Updater.  When the user chooses OK , then the drivers connect the application to the vehicle. The user can then update the DPA at their convenience.
3	Automatic firmware update is turned on. The user is told there is new firmware and the firmware is downloaded automatically as soon as they press the OK button.  When the user selects OK , the firmware is automatically updated.
4	Automatic firmware update is turned on. The user is not prompted and the download begins automatically.

8.8.1. When the Drivers Call the DPA Firmware Updater

In the event that the automatic update is chosen, the DPA drivers launch the DPA Firmware Updater, which handles the downloading of new firmware. Once the firmware has started downloading, the user should not stop it. Aborting a firmware download may cause the device to become unresponsive and require the hardware to be shipped back to the manufacture for repair. The following is the dialog box showing the DPA Firmware Updater during an automatic update:



When the update is complete, the following dialog box is displayed and the DPA drivers attempt to let the application that was suspended continue executing. Most applications can handle the interruption; however there is a possibility that the user may have to restart their application.



8.9. DPA 5 Bluetooth Configuration Utility

This button opens the DPA 5 Bluetooth Configuration Utility. This allows the user to create RP1210 DeviceID entries from DPA 5 Bluetooth Pairings. This utility has its own help file.

8.10. Add SA Drivers to RP121032.INI Button

This button is used to add the “Single Application” version of a driver to the RP121032.INI file. By default, only the “Multi-Application” driver entry is written to the RP121032.INI file, but there are times under the direction of a DG technical support representative that you may be asked to press this button.

9. This Chapter Left Blank Intentionally

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10. Product Specifications

10.1. DPA 4 Plus Physical and Electrical

Feature	Data
Dimensions	6.1 x 2.5 x 1.2 inches
Voltage Requirements	9 – 32 VDC
Current Requirements	250mA max through voltage range
Operating Temperature Range	-40 to +85C
Wired PC Communications Type	USB Version 1.1 or Higher
Wired Connection	Gold-plated USB Cable (up to 15 feet)
Vehicle-Side Connector	DB15 Female
PC-Side Connector	Standard B-Type USB Jack
PC Device Drivers	TMC RP1210C Compliant Drivers DG Native Drivers

10.2. DPA 4 Plus Pinouts

Vehicle-Side Assignments for DPA 4 Plus (DB15 Female).

Pin	DPA 4 Plus
Ground	6
Power (9-32vdc)	8
J1708-	14
J1708+	15
CAN1 Shield	7
CAN1 Lo	12
CAN1 Hi	13
CAN1 Term 1*	3
CAN1 Term 2*	4
SW CAN	10
ALDL	1
J1850 Hi	5

* Connecting these two pins (Term1/Term2) applies a 120-Ohm terminating resistor to the CAN/J1939 network.

Pins that are not mentioned are reserved and should not have anything attached to them.

11. DG Update – Program Overview

DG Update is an application that is installed with your DPA 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 → DPA 4 Plus DPA4PMA → DG Update

11.1. 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.dtech.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.

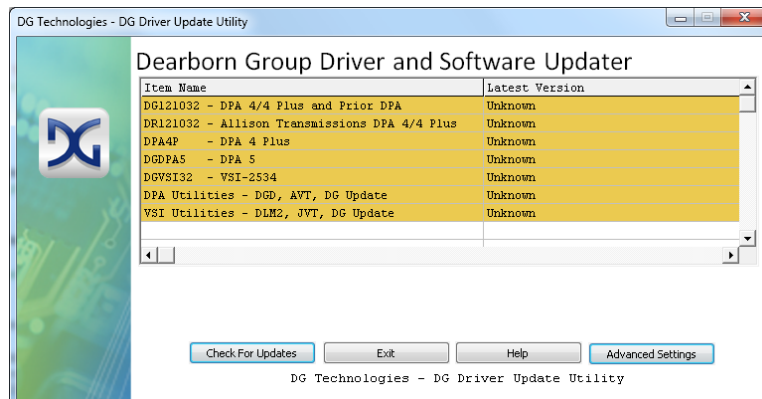
11.2. DG Driver Update – Initial Screen

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.



11.1. 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.

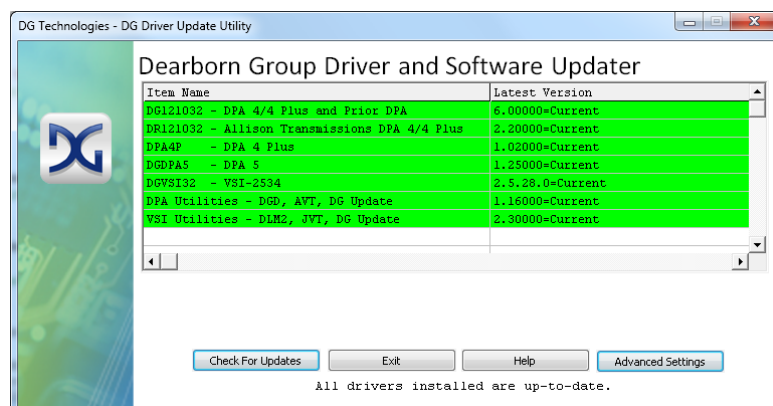


Connect your PC to the Internet and click the **Check For Updates** button. Due to the nature of TCP/IP communications, errors connecting or sending/receiving of data are slow to appear, however the user will eventually be notified if there was a problem.

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.

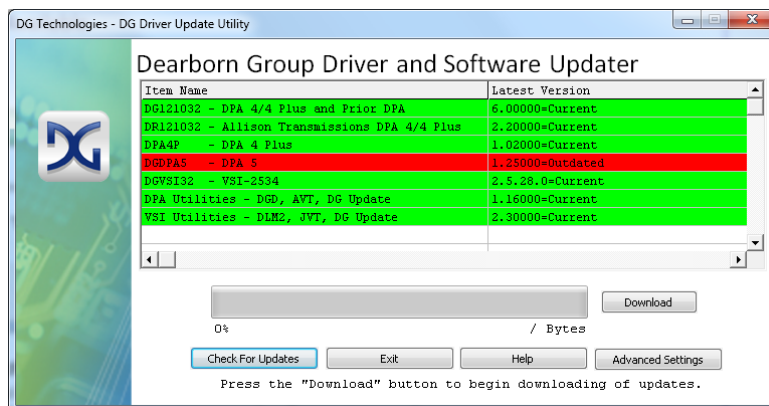
Color	Description
Green	Drivers up-to-date. No update necessary.
Red	Drivers are outdated. Update recommended.
Blue	Drivers on your PC are newer than current version. This usually indicates you are running a beta copy of the DPA drivers.

11.1.1. Successful Connect – No Updates Available



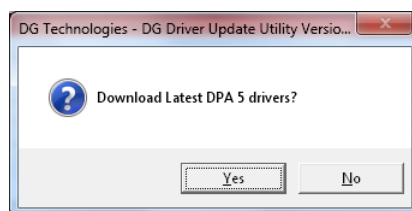
In this case, all drivers are current (green), and the **Download** button and progress bar do not display (see next paragraph). Clicking **Exit** will exit the program.

11.1.2. Successful Connect – Updates Available



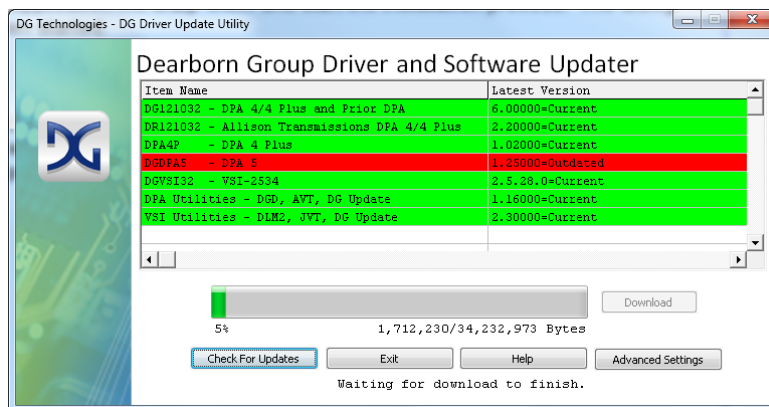
In this case, the DPA 5 drivers are out of date (red), and the **Download** button and progress bar show up on the screen. The progress bar will keep you informed of the download progress should you choose to download the latest drivers by clicking the **Download** button.

When you click the **Download** button, you will be prompted to confirm starting of the download.



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. The reason that only one can be downloaded at a time is that after the drivers are unzipped the installation program begins automatically. The DG Update program must exit because the installation program may have a newer version of the DG Driver Update utility to install.

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.



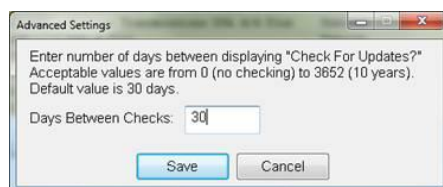
After the drivers have been downloaded (to the Windows temp directory – if you wish to save them for other machines), they will be unzipped and the program will exit right after starting the new driver installation. Follow the installation instructions in the appropriate User Manual.

11.2. 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 **Advanced Settings** button.



The following dialog box will be displayed. To turn off the checking prompt, set the value to zero. Otherwise, you can set the number of days between checks.



12. Technical Support and Return Merchandise Authorization (RMA)

12.1. Technical Support

After reading and following the troubleshooting and validation procedures and 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.

Users not residing in the United States should contact your local DG representative.



DG Technologies Technical Support

Phone: (248) 888-2000
Fax: (248) 888-1188
E-mail: techsupp@dgtech.com
Web site: www.dgtech.com

12.2. Return Merchandise Authorization (RMA)

If technical support has deemed that there may be a physical problem with your DPA, 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# xxxxxxxx
DG Technologies
33604 West 8 Mile Road
Farmington Hills, MI 48335

13. Warranty Information and Limitation Statements

13.1. Warranty Information

The Dearborn Group, Inc. DPA 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.

Dearborn Group, 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 Dearborn Group, Inc. determines has been damaged by the customer's abuse, misuse, negligence, improper assembly, modification, or improper 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 DPA is warranted for 90 days after a warranty repair, or to end of the original factory warranty period, whichever is longer.

13.2. Limitation Statements

13.2.1. General Limitation and Risk Assignment

To the maximum extent permitted by applicable law, Dearborn Group, Inc. 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.

13.2.2. Exclusion of Incidental, Consequential and Certain Other Damages

To the maximum extent permitted by applicable law, in no event shall Dearborn Group, Inc. 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 Dearborn Group, Inc. or any supplier has been advised of the possibility of such damages.

13.2.3. 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 Dearborn Group, Inc. 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.

13.2.4. Right to Revise or Update without Notice

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

13.2.5. 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.

13.2.6. Contact

Please direct all inquiries to:

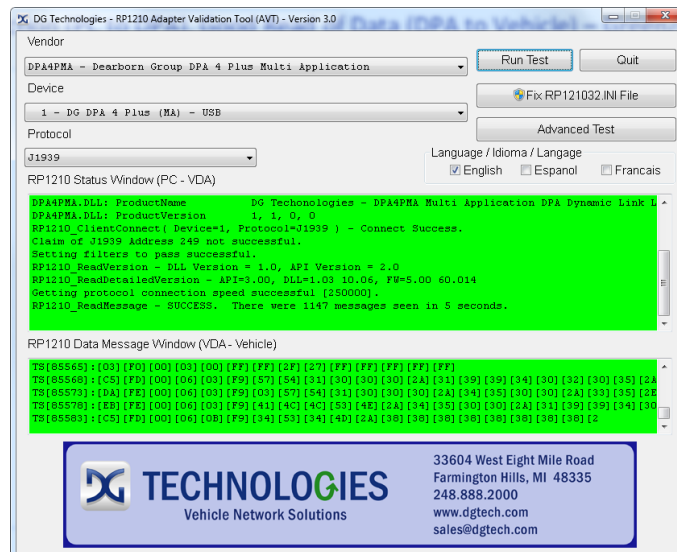
Dearborn Group, Inc.
33604 West Eight Mile Road
Farmington Hills, MI 48335
Phone (248) 888-2000
Fax (248) 888-9977

14. Appendix A – DPA 4 Plus Manual Firmware Update

With the **Automatic Firmware Update** variable set to 1 (default), you will probably never need to do a manual update of firmware unless specifically called on by DG technical support. However, if you have to do a manual firmware update, follow the instructions below.

To find which version of firmware you have, use the Adapter Validation Tool after connecting the DPA to a power source.

Start → Programs → Dearborn Group Products → DPA 4 Plus DPA4PMA → Adapter Validation Tool

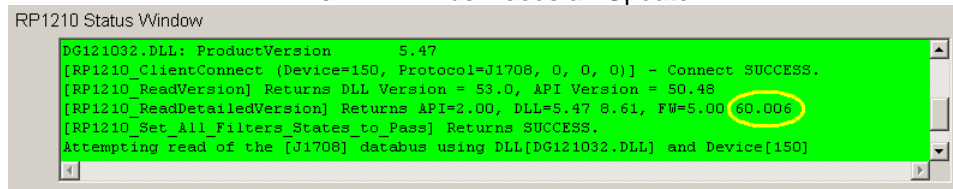


Select the correct DPA adapter:

- ☐ **Vendor** DPA4PMA – Dearborn Group DPA 4 Plus Multi-Application
- ☐ **Device** 1 – DG DPA 4 Plus (MA) - USB
- ☐ **Protocol** J1708 (any protocol works)

Then click the **Run Test** button. When the test has finished running, go to the **RP1210 Status Window** and scroll down to the line that reads [RP1210_ReadDetailedVersion] and look for the entry “FW=”. The last numbers on the line indicates which version of firmware you have (note the yellow circle). If you are not at the level defined on the front page of this manual, then you need to run the DPA Firmware Updater outlined in the following steps. The following screen shows the user is not at the current firmware revision, indicating they need a firmware update.

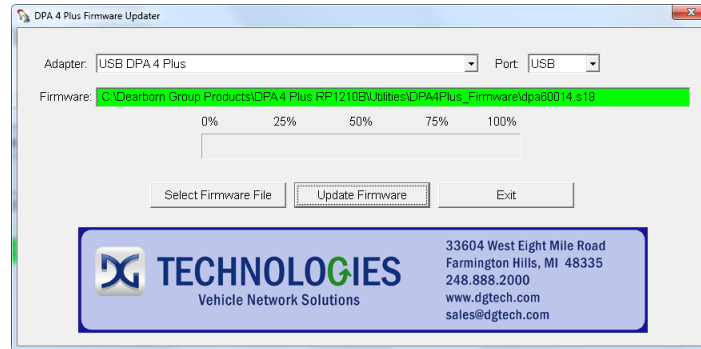
This DPA 4 Plus Needs an Update



14.1. Launch the DPA Firmware Updater Program

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

Start → Programs → Dearborn Group Products → DPA 4 Plus DPA4PMA → DPA Firmware Updater



3. Select **USB - DPA 4 Plus** with Port **USB** (already selected by default).
4. Select the correct firmware file (the latest version is already selected by default). If the firmware file exists, the Firmware box will turn **green**.
 - a. NOTE: Firmware files are located in separate sub-directories under the Utilities directory where the DPA drivers are installed, typically:
 - ❑ C:\Program Files\Dearborn Group Products\DPA 4 Plus\Utilities\DPA4Plus_Firmware
5. Click on the **Update Firmware** button and select **Yes** if you receive a warning dialog.
6. After the download is finished, disconnect power from the DPA, wait 5 seconds and then reconnect power.

15. Appendix B – Software Developer/Integrator Notes

This section is relevant only to software development engineers and systems integrators.

15.1. Bundling the DPA with Your OEM Installation – Silent Install

15.1.1. Silent Installation Now Available

DG has introduced a silent installation that software installation engineers can call that will install all DPA files that would normally be installed by running the installation interactively.

- ❑ The silent installation will not prompt the user or display a screen at any point.
- ❑ After the install, a reboot of the PC is necessary.

15.1.2. Silent Install Command Line

DPA4Plus_RP1210.EXE /s /d_SILENT_

15.1.3. Controlling Automatic Firmware Update Variable on Silent Install

If you are a software development engineer or system integrator and wish to use the silent installation, but you want to change the **Automatic Firmware Update** setting to a value other than 1 (default), you can do so by changing the registry value of the following variable during a post-installation event.


HKEY_LOCAL_MACHINE\SOFTWARE\Dearborn Group Products\FirmwareUpdaterDPA4P\UpdateFirmware

This variable is of the REG_SZ data type, however only the first character ('0','1','2','3') is used by the RP1210 Options program and the DPA drivers.

16. Appendix C - This Chapter Left Blank Intentionally

This page has been left blank so that the chapter numbers in this manual align with those in the DPA 5 User Manual.

17. Appendix D - Windows Vista and Windows 7/8 Support Notes

Microsoft® has made great strides in updating their operating systems to protect against malicious software. With Windows Vista, Microsoft introduced User Account Control (UAC). UAC strictly enforces the differences between an administrator and a standard user account. When an action that could potentially compromise the PC such as writing files to the C:\Windows directory or registry is requested, the user is prompted for an administrator name and password. If the user is already an administrator, they are still prompted to confirm the action. Generally speaking, whenever you see the Microsoft security shield  icon on a button, you will need an administrator's password to perform that operation.

17.1. UAC and the TMC RP1210 Standard

Before Windows Vista, it was common for applications to put INI and other types of configuration files in the default Windows directory, typically C:\Windows. The RP1210A standard requires that the RP121032.INI file be located in this directory, along with all of the vendor INI files. On Windows Vista, this means that a standard user cannot make changes to the main RP121032.INI file, nor can they make changes to the vendor INI files when UAC is enabled.

17.2. UAC and the Dearborn Group Adapter Validation Tool (AVT)

A standard user will be able to run the AVT program and troubleshoot the PC-DPA-vehicle connection, but will not be able to fix a problem in the RP121032.INI file without an administrator password (see the section on troubleshooting in this document). The graphic below is from the Adapter Validation Tool (AVT), showing the Microsoft security shield on the **Fix/Change RP121032.INI File** button.



17.3. UAC Requirements for All DPA Utility Programs

The DPA utility programs (listed below) have been modified to conform to UAC. The following list shows these programs and privileges required to run them:

Program	Privileges Required	Notes
Adapter Validation Tool (MD/HD)	Standard User	Administrator needed for Fix/Change RP121032.INI File .
Adapter Validation Tool (OBDII)	Standard User	
Adapter Validation Tool Launcher	Standard User	
DG Diagnostics Launcher	Standard User	
RP1210 Options	Administrator	
DG Diagnostics (MD/HD)	Standard User	Cannot save/record data bus files to a protected directory.
DG Diagnostics (OBDII)	Standard User	Cannot save/record data bus files to a protected directory.
DPA Firmware Updater	Standard User	
Sample Source Code	Standard User	
Bluetooth Configuration	Administrator	
DG Update	Standard User	Standard user can use program but install of new drivers will prompt the user for the administrator password.

17.4. More Information on UAC

For more detailed information on UAC, there is a helpful article at <http://www.wikipedia.org> or you can go directly to the Microsoft website <http://www.microsoft.com> and search for "UAC".

18. Appendix E – DPA Utilities Information for This Release

The DPA utility applications (i.e. AVT, DGD, RP1210 Options) are common amongst all DPA products and have been split into their own release called **RP1210 Utilities**. This allows DG to distribute changes to these applications without having to release a new DPA DLL for every API (i.e. DGDPA5MA, DGDPA4PMA, DG121032). Since DG Update looks for this separate installation, it handles downloads and updates to the utility applications.

The version of DPA Utilities installed with this DPA API included:

Utility	Version
Adapter Validation Tool Launcher	1.2
Adapter Validation Tool (MD/HD)	3.8
Adapter Validation Tool (OBDII)*	1.0.0.8
FixINI	3.3
DG Diagnostics Launcher	1.00
DG Diagnostics (MD/HD)	2.87
DG Diagnostics (OBDII)	1.01
DG Update	1.60
RP1210 Options	2.58
DPA 5 Bluetooth Configuration Utility	1.52
RP1210 Sample Source Code/EXE – C Language	2.70
J2534 Sample Source Code/EXE – C Language	1.24
RP1210 Sample Source Code/EXE – C# Language	1.00
J2534 Sample Source Code/EXE – C# Language	1.00
RP1210 Sample Source Code – Python Language	1.20
DPA Firmware Updater	5.53

* Note that Adapter Validation Tool (OBDII) is not part of RP1210 Utilities, but is part of the DPA 5 J2534 installation.

19. Appendix F – 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	Dearborn Group
DPA	Dearborn Protocol Adapter
DTC	Diagnostic Trouble Codes
ID	Identification
ISO	International Standards Organization
JVT	J2534 Validation Tool
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

20. Appendix G. Testing and Troubleshooting of a J1939 Network

20.1. J1939 Network Types

There are two standards that OEMs follow when designing their CAN/J1939 network, J1939-11 and J1939-15.

20.1.1. J1939-11

The J1939-11 standard calls for twisted-pair wire **with** a shield. The shield is typically grounded at the engine ECM or negative battery post and must only be grounded at one spot on the vehicle. This standard is not commonly implemented because of the added cost of the shielding. The main issues with this network are too many, or too few, termination resistors (see Figure G2) or breaks in wire and insulation due to kinks, and vibration. This standard calls for the external termination resistors shown in Figure G2.

20.1.2. J1939-15

The J1939-15 standard calls for twisted-pair wire **without** a shield and is the most widely adopted. The main issues with this network are breaks in the wire and insulation due to kinks, vibration and rubbing, wire and connector corrosion, and too many, or too few, termination resistors. In the J1939-15 specification, termination resistors are commonly found inside of ECMs which are easily “activated” by shunting several pins at that ECMs connection to the vehicle wiring harness. This configuration makes it very easy to have a termination resistor problem and is much more difficult to diagnose.

20.2. CAN/J1939 Termination Resistor

The following image shows a picture of a 120 Ohm resistor typically found within vehicle ECMs and an image of a J1939 termination resistor that is commonly found on J1939-11 networks.



Figure G1

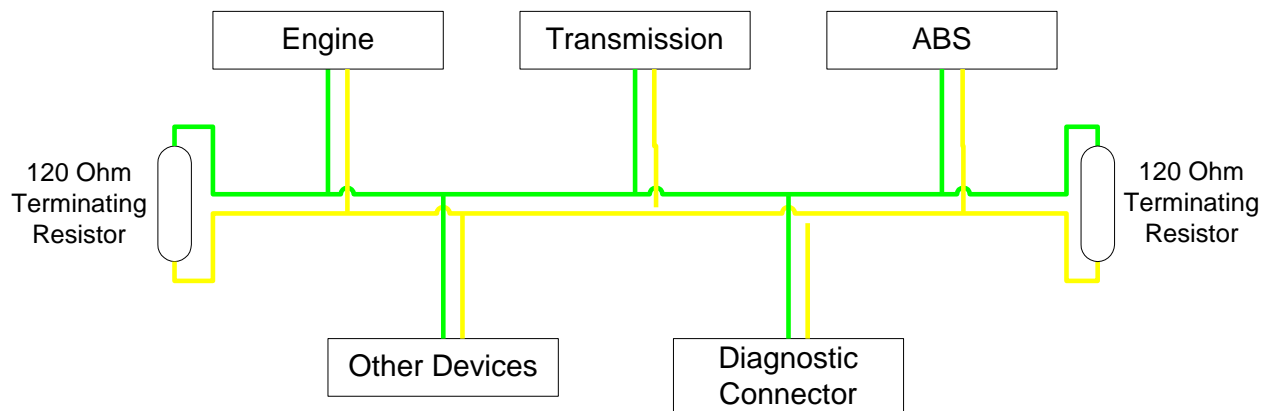
Image of a 120 Ohm resistor.
Brown, Red, Brown with +/- 5% tolerance (Gold)



Figure G2

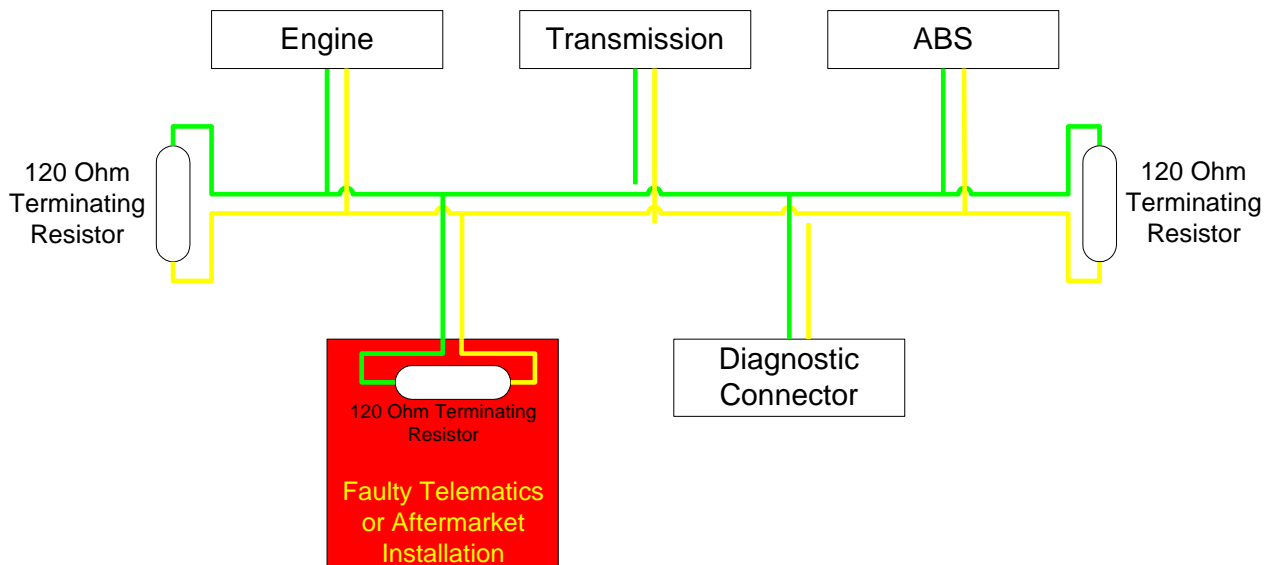
Image of J1939 Terminating Resistor on J1939-11 Network (Twisted Shielded Pair)

20.3. Properly Terminated J1939 Network (Term Resistors at Logical End Points)



20.4. Aftermarket Additions Improperly Installed

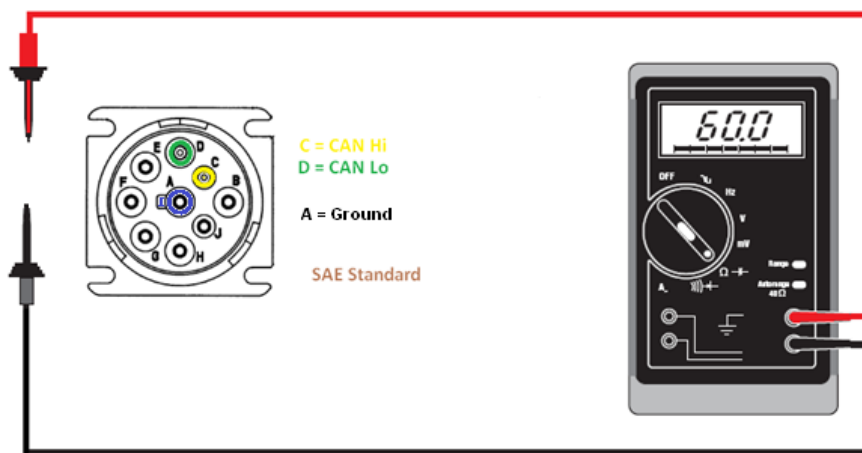
Aftermarket add-ons can cause J1939 network issues by over-terminating the J1939 databus.



20.5. J1939 Network Testing Step 1 (Termination Resistance)

To test for proper CAN/J1939 network termination requires standard hand tools and a standard Volt/Ohm meter. Follow these steps:

1. Completely power down the vehicle. This is done at the battery disconnect, or by removing the positive terminal from the battery.
 - a. This step cannot be bypassed as invalid values will affect the test outcome.
2. With Ohm meter, measure the resistance between pins C (CAN/J1939 High) and D (CAN/J1939 Low) on the 9-pin Deutsch diagnostic connector. If you are not working on a heavy-duty vehicle, read your vehicle/equipment literature as to where **CAN High** and **CAN Low** can be found.

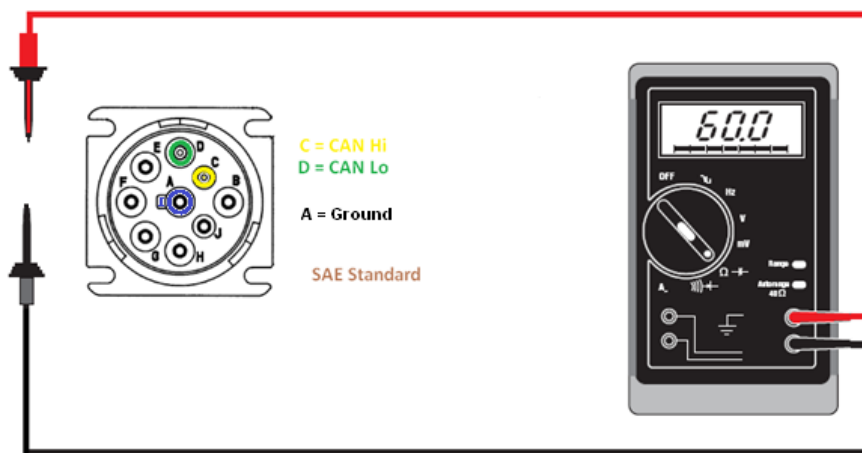


Value Obtained	Issue	Resolution
Between 54-66 Ohms	Properly terminated network.	Resistance Ok, try Step 2.
Greater than 120 Ohms	Open circuit or missing a terminating resistor.	Install a terminating resistor at the network end. See OEM literature for terminating resistor location and for further troubleshooting information.
Less than 44 Ohms	More than two terminating resistors or J1939 wires are shorted together somewhere.	Remove extraneous terminating resistors by reading OEM literature for where the two terminating resistors should have been installed.

20.6. J1939 Network Testing Step 2 (CAN/J1939 High and CAN/J1939 Low To Ground)

To test for CAN/J1939 wire shorts to ground requires standard hand tools and a standard Volt/Ohm meter. Follow these steps:

1. Completely power down the vehicle. This is done at the battery disconnect, or by removing the positive terminal from the battery.
 - a. This step cannot be bypassed as invalid values will affect the test outcome.
2. With Ohm meter, measure the resistance between pins C (CAN/J1939 High) and A (Ground). Then measure the resistance between pins D (CAN/J1939 Low) and A (Ground). If you are not working on a heavy-duty vehicle, read your vehicle/equipment literature as to where **CAN High**, **CAN Low** and **Ground** can be found.

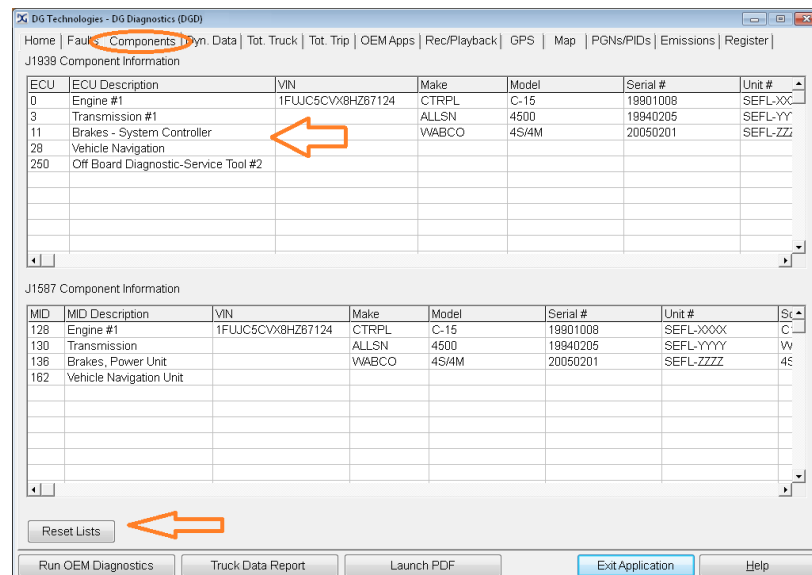


Value Obtained	Issue	Resolution
About 10k Ohms or Greater	No shorts to ground.	Try Step 3.
Less than 10k Ohms	Wire shorted to ground.	Repair or replace J1939 harness. See OEM literature for further testing of individual data bus wiring, and potential replacement of databus segments.

20.7. J1939 Network Testing Step 3 (Roll Call)

To test for controllers transmitting on the databus (commonly called **Roll Call**) and potentially leaving the databus because of an error condition (BUS_OFF) requires a Dearborn Group DPA device, a personal computer (PC) with drivers for that DPA device installed, and a copy of DG Diagnostics software (free with purchase of a DPA device). For more information on DG Diagnostics see the DPA User Manual (available from the Start -> Programs menu).

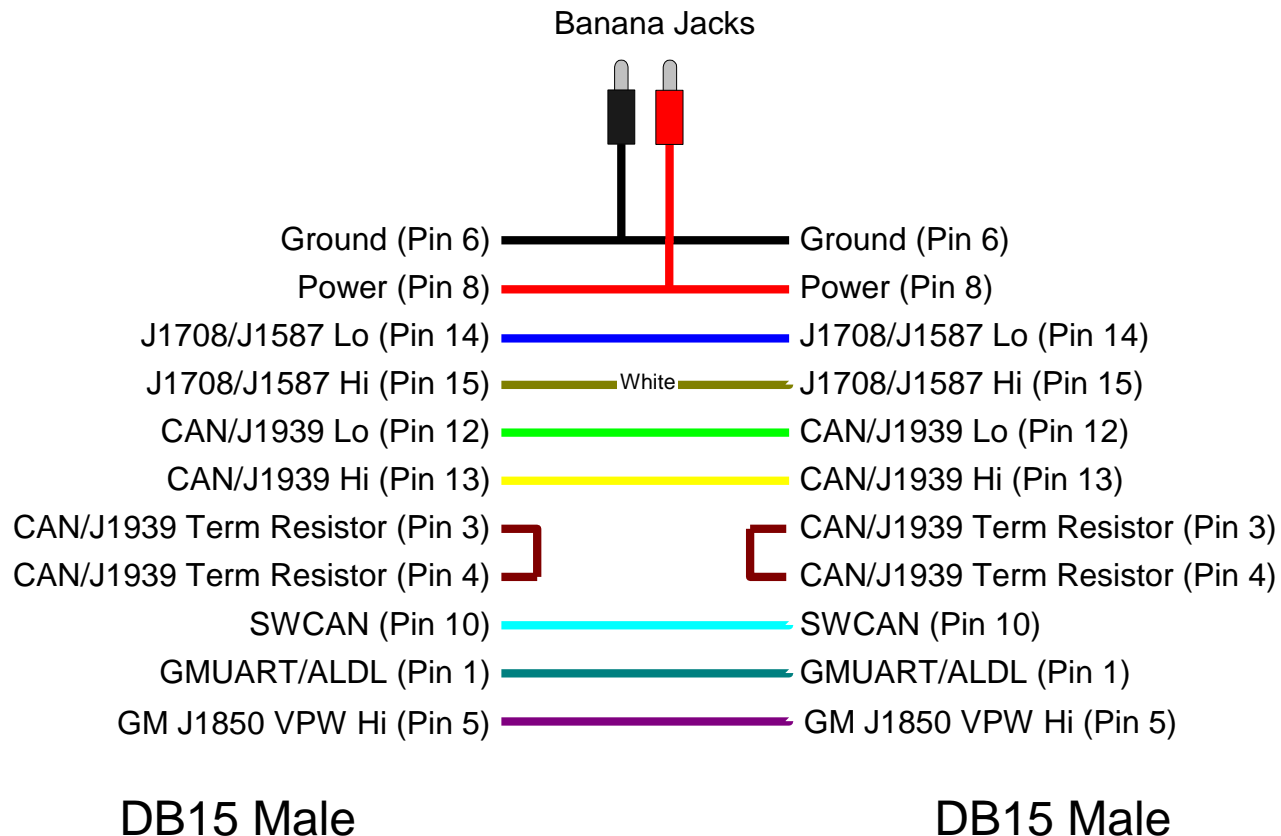
1. Power up the vehicle and turn ignition switch on.
2. Connect DPA device to the vehicle/equipment diagnostic connector.
3. Start **DG Diagnostics** by using the shortcut icon on the desktop. On the **Home** tab, select the correct DPA and Device and click **Connect** button.
4. Go to the **Components** tab. Wait for 30 seconds to ensure all ECMs that are supposed to be transmitting on J1939 are listed (top arrow).
- a. If a component is not transmitting that should be, refer to the OEM literature on how to diagnose that component.
5. Press the **Reset Lists** button and wait another 30 seconds. If a controller has disappeared, then that controller has went into a **BUS_OFF** state indicating something is wrong with that components ability to transmit on the CAN/J1939 data bus.
- a. Refer to the OEM literature on how to fully diagnose that component.



21. Appendix H. Commonly Requested Cable Drawings

21.1. DPA 4 Plus to DPA 4 Plus “Back-to-Back” Cable

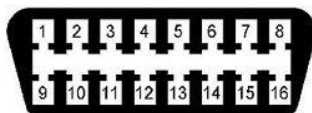
This cable is for use with a second PC running a simulator or other software.



22. Appendix I. Volvo/Mack 2013 (and Newer Vehicles) and the DPA 4 Plus

The DPA 4 Plus will not work with Volvo PTT on the 2013 and newer Volvo/Mack chassis with a Volvo engine, but will work with the 2013 and newer Volvo/Mack chassis with a Cummins engine. If you need to service the Volvo/Volvo platform, you will need to upgrade to the DPA 5 which has two CAN channels and the ISO15765 protocol.

The following are the pinouts of this newer Volvo platform.



Pin	CAN Channel	Function
3	CAN 2 +	J1939 +
5		GND
6	CAN 1 +	ISO15765 +
11	CAN 2 -	J1939 -
12		J1708 +
13		J1708 -
14	CAN 1-	ISO15765 -
16		BAT (+12V)

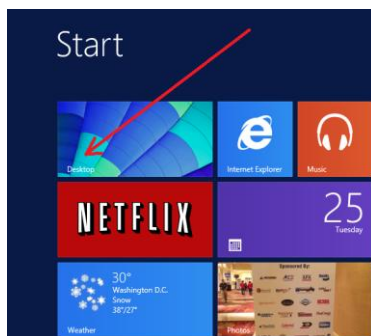
23. Appendix J. Notes on Using Windows 8

Windows 8 is the newest Microsoft Operating System. The Graphical User Interface (GUI) is very different from previous versions of Windows. If you have not used Windows 8 before, you can get to your DG Applications in two different ways.

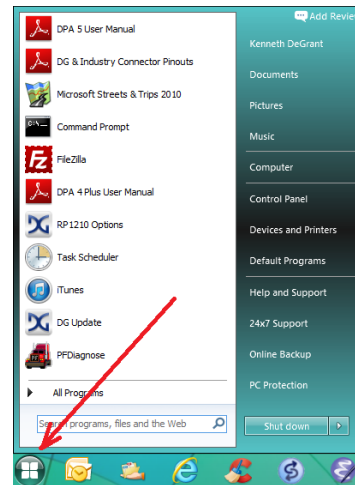
23.1. Using the Windows Desktop and Classic Start 8

This is what DG recommends. Classic Start 8 is a free Windows 8 app that makes it look like Windows 7. Classic Start 8 provides a “Start” menu so that all of the instructions here in this manual (Start -> Programs -> Dearborn Group Products -> etc.) still apply. It can be obtained from the following website <http://www.classicstart8.com/>

After installing Classic Start 8, rebooting, and then logging in, click your desktop icon (left photo) and then click the Start button (right photo). Classic Start 8 provides the “Start Menu” functionality.



Windows 8 Default User Interface Showing The “Desktop” Life Tile.

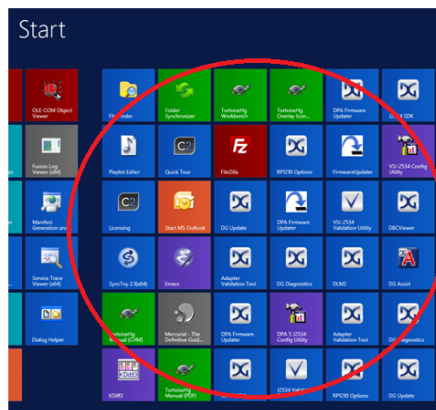


Classic Start 8 Application Providing Classic “Windows Start Menu” Functionality.

23.2. Using Windows 8 Life Tiles

You can use the Life Tiles to get to DG applications; however this does not provide quick access to the DG user manuals. Therefore, the best option is using Classic Start 8 (discussed above).

To use the Life Tiles, you can use the scrollbar at the bottom of the screen or you can use the arrow keys to scroll to the right until you find the DG applications (DG icons). Clicking on an icon runs that application.



24. Appendix K. - Windows XP Installation Issues (USB Drivers Fail to Register)

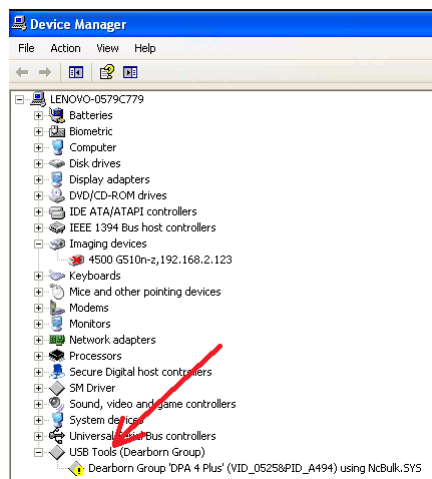
Windows XP is no longer supported by Microsoft or DG, but this section remains because certain Windows XP machines with Service Pack 3 (SP3) installed has issues. The Netchip USB drivers used in DG adapters may not be recognized. When plugging in a DG adapter product, typically you will hear the familiar positive “da-ding” Windows sound showing the device was recognized by the USB host controller and the drivers for it were registered successfully by the operating system. In some circumstances when you plug in the adapter you may hear nothing, or you will hear a negative set of tones “duh duh dump”. In this case the device drivers are not recognized and the adapter will be inoperable. Follow these steps to manually install and register the device drivers for the operating system.

24.1. Verify the Adapter Is Not Recognized

The following example shows a DPA 4 Plus, however the process is the same for all DG DPA products. Press the Windows **Start** button, find the **My Computer** entry and then right click on **Properties**. Select the **Hardware** tab and press the **Device Manager** button.

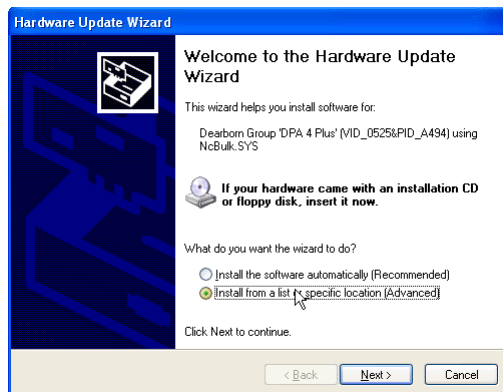


Find the **USB Tools (Dearborn Group)** entry. Notice the yellow exclamation point. This means the drivers are not registering properly. Select the entry, right click and select **Update Driver**.



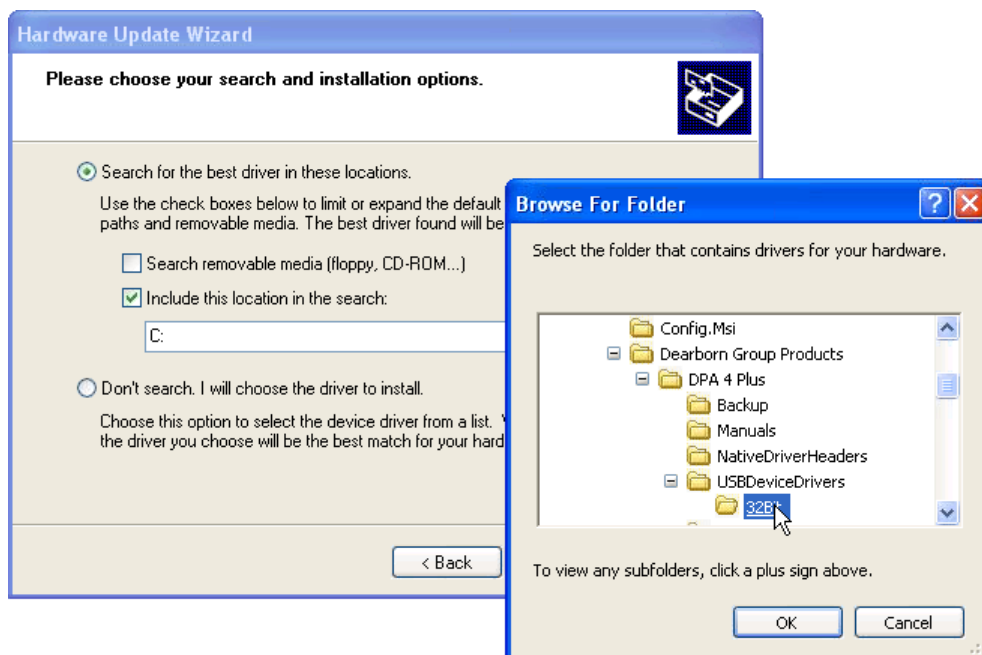
24.2. Run the Hardware Update Wizard

The following screen will appear. Select ***Install from a list or specific location (Advanced)*** and then press the ***Next*** button.

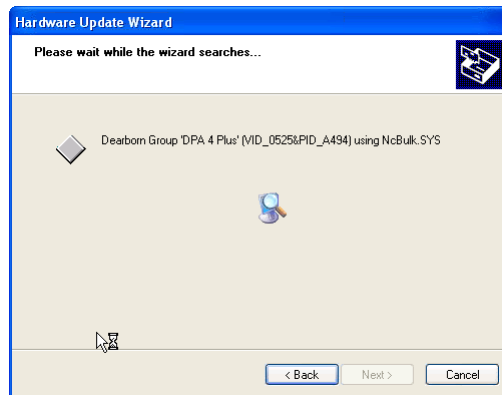


Select the ***Search for the best driver in these locations*** radio button. Then check the ***Include this location in the search:*** checkbox, then press the ***Browse*** button.

You must now locate the correct directory for the USB device drivers. The typical install base directory for DG products is ***C:\Dearborn Group Products*** however the user can change this at install time. Go to the base directory, press the [+] plus sign and choose the correct product subdirectory (this example shows the ***DPA 4 Plus*** directory). Then press the [+] plus sign on the ***USBDeviceDrivers*** folder and select the ***32Bit*** subfolder and press ***Ok***.



This screen will then appear showing progress as the USB device drivers are registered. On an even smaller number of machines with Windows XP SP3, this process will hang and the computer will freeze (usually on the file NCGen.sys or NCPnP.sys file). In this case, see the next section.



After the device is successfully registered, this screen will appear and you will then be able to use your adapter.



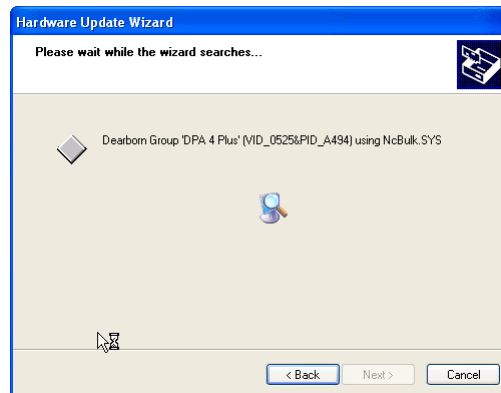
25. Appendix L. - Windows XP Installation Issues (Drivers Lock-Up the PC)

Windows XP is no longer supported by Microsoft or DG, but this section remains because on a very small number of machines with Windows XP SP3 installed, when you plug in the DPA, it will lock up the PC while the device drivers are being installed (usually on the file NCGen.sys or NCPnP.sys file).

If this screen (below) is displayed for more than 5 minutes, try to start any other program to see if the PC is frozen.

If the PC is frozen:

1. Unplug the adapter.
2. Reboot the PC.
3. Press **F8** repeatedly as machine boots. When the **Safe Mode Menu** appears, choose the **Safe Mode** entry.
4. After the PC boots into **Safe Mode**, plug in the adapter to every USB port and run the New Hardware Wizard.
5. Reboot the PC and then you will be able to use the adapter.



26. Appendix M – Sample Source Code for Software Engineers

DG Technologies provides the most complete and comprehensive set of RP1210 and J2534 sample source code for software engineers looking to read data from vehicle and equipment data buses. These files show all software engineering concepts for using either the RP1210 or J2534 API, including:

- ✚ Declaring RP1210 and J2534 Function Headers and Function Pointers
- ✚ Loading the RP1210 and J2534 Dynamic Link Library (DLL) and Assigning Function Pointers
- ✚ (Open) Connecting to a Data Bus Protocol and Setting Filters for Communications
- ✚ (Read) Reading Messages, Printing Read Messages, and Decoding Message Data into Engineering Units
- ✚ (Write) Sending Messages, Printing Transmitted Messages, and Encoding Data to be Sent
- ✚ (Close) Disconnecting from the Data Bus and Freeing the DLL and Resources

These files typically reside in the following directory:

C:\Dearborn Group Products\RP1210 Utilities\SampleSource

26.1. RP1210 Sample Source Code

Language/Environment	File Name(s)
C/C++	SampleSource.c
C#	RP1210SampleCodeCSharp.cs
Python	SampleSource.py
VB.Net	VBRP1210SampleSource.vb
Matlab	For a future release.
Labview	For a future release.

26.2. J2534 Sample Source Code

Language/Environment	File Name(s)
C/C++	J2534SampleSourceISO15765.cpp
C#	J2534SampleCodeCSharp.cs
Python	For a future release.
VB.Net	VBJ2534SampleSource.vb
Matlab	DPA5End.m DPA5Start.m DPA5_PassThruReadMsgs.m DPA5_PassThruWriteMsgs.m libfunctionsview.pdf MatLab_J2534_Syntax.ppt
LabView	For a future release.