DPA RF

Wireless Dearborn Protocol Adapter

Dearborn Group, Inc.

Key Benefits

- √ The DPA RF is a network bus adapter and analyzer for: CAN, Single Wire CAN, J1939, J1587, J1708, J1922, J1850 and J2284 plus OEM diagnostic software packages.
- √ Designed for the Heavy Truck and Bus market plus off-road construction, agriculture, marine and similar uses.
- √ Diagnostics support: RP1210A, J1939, ATEC1 and others.
- √ Has a proprietary Wireless RF interface for up to 2 miles.
- √ Deutsch connectors, OBDII and custom cables available.
- √ Useful for diagnostics, development, end-of-line testing, Data Acquisition and Hardware-in-the-Loop simulation.
- √ PC software: OEM Diagnostics, Dearborn Group's DLM, Labview and user custom using supplied DLLs.
- √ Supports Cummins, Detroit Diesel, Wabco/Meritor, Caterpillar, Mack, Allison, Eaton, Navistar and many more...
- √ Portable and rugged with a sturdy metal case.
- √ Designed and Made in the USA. Supported everywhere.

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The DPA Family of Diagnostic Adapters

The DPA series of vehicle diagnostic adapters is designed specifically for the truck, bus, heavy duty and military markets but has applications wherever a supported protocol, such as CAN or J1939, is used.

The DPA connects between the vehicle and a laptop or other PC which uses software normally provided by the engine, transmission, HVAC or body module manufacturer to provide diagnostic and operating information about these systems.

The DPA connects to the PC using a serial port, USB or a wireless modem and to the vehicle with a Deutsch, OBDII or custom connector.

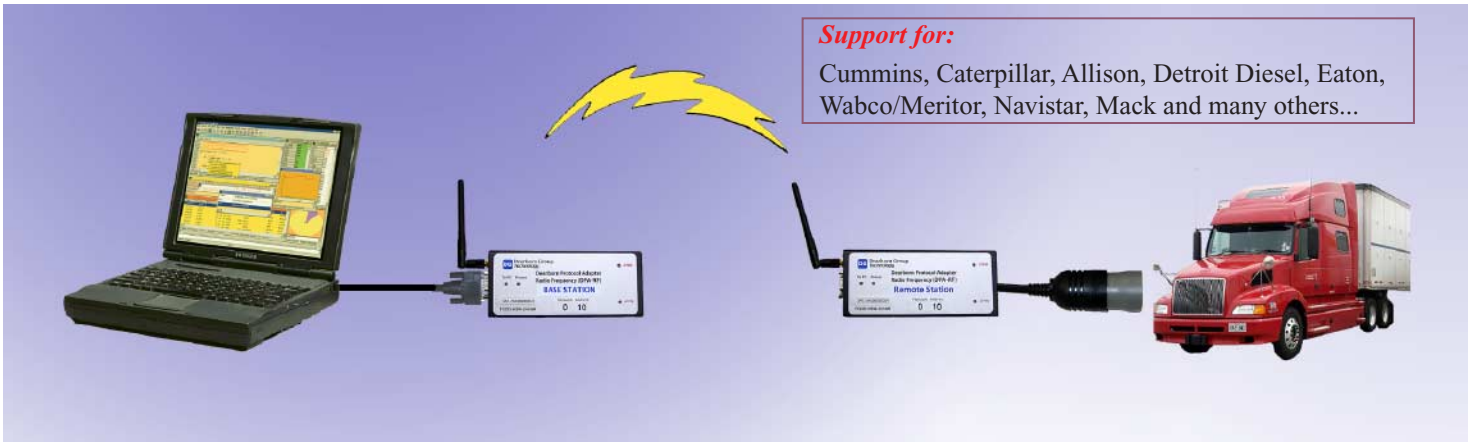
The DPA family conforms to the RP1210A, J1939 and J1587/J1708 standards which heavy duty vehicle system manufacturers adhere to for diagnostic purposes. This is allows the PC diagnostics software provided by the system manufacturer (i.e. Cummins or Allison) to reliably communicate with the DPA.

Commercial applications include major diesel engine, transmission, body, HVAC and ABS brake manufacturers. The DPA is currently used in the SPORT-ICE (Army) and VADS (Marines) military programs to provide vehicle diagnostics. There are thousands of DPAs working satisfactorily in the field.

The Wireless DPA: The DPA RF

The DPA RF consists of a Base Station and a Remote Station as illustrated below. It is possible to have up to 16 of these pairs since each pair is assigned its own frequency.

The Remote will connect to and communicate with the vehicle. The Remote will communicate wirelessly with the Base Station and data will be safely transferred between the vehicle electronic controllers and the PC. Software provided by the system manufacturer will allow service personnel to view trouble and informational codes. Any other functions provided such as reprogramming are easily handled over the wireless link for up to 2 miles allowing a vehicle to remain in the yard instead of in valuable garage space.



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Private Branding

The DPA series is designed for private branding with the addition of proprietary protocols, hardware, features and logos. Many firms have chosen this route to provide their own branded diagnostic hardware. This provides a validated platform that can also be conveniently used on other manufacturers's sub-systems and DG maintains compatibility

802.11 (WiFi) versus Proprietary Protocols

Wireless networks usually use either the familiar WiFi protocol which is also known as 802.11b or 802.11g or a proprietary protocol that is generally not well known to the general public. Both have pros and cons. Both generally use the same 2.4 GHz frequency band. Neither need any government radio licenses.

WiFi (80211.b or 802.11g)

WiFi is the system used for wireless communications for PCs and its biggest drawbacks are signal congestion and a potential lack of security. Components for WiFi are widely available and at low cost. The remote hardeware module must normally be custom developed.

There are 12 WiFi channels but only three can be used in the same vicinity without interference. Anyone in the neighbourhood can setup a WiFi base station so interference can be troublesome.

The WiFi protocol makes it easy for outsiders to detect such a network. However, accessing the network is difficult if it is correctly configured with the appropriate security settings.

The Dearborn Group Proprietary Protocol

DG uses a proprietary system to address these issues. It is a 2.4 GHz frequency hopping system. This means that the frequency of operation is always changing. This increases security as it is difficult for an outsider to detect a rapidly changing frequency.

Reliability increases because several problems are reduced due to frequency hopping. These include electrical noise, RF interference from other equipment and signal degradation due to multipath reflections. These problems cause the desired signal to have reduced range, strength and lower data transfer rates.

The DG protocol allows only a remote-to-base communications and therefore provides security against eavesdropping. The frequency hopping technique frustrates any jamming attempts. This system operates independently from WiFi networks and therefore will not provide a link to your private network.

The DPA always knows what is the next frequency to be "hopped to" and never loses step. Error checking with a retransmission capability is used to ensure trouble free operation.

Installation and Placement

The two parts of the Wireless DPA can be located nearly anywhere. They do not need line-of-sight from each other for proper operation, especially for short distances.

The Base Station will often be located in a convenient location in the shop close to the PC. It is also possible to have a laptop at or in the vehicle if desired for convenience.

The antennae of the Base and Remote Stations are located directly on the DPA case as shown in the photo on the right. This gives excellent reception capabilities and normally an external antenna is not needed.

The Remote Station will connect to the vehicle through the standard Deutsch connector. The vehicle will provide power to the Wireless DPA through this connector.

The software from the manufacturer of the vehicle subassemblies such as the engine and transmission will be loaded into the PC and started. No configuration is needed for wireless operation.

At this point, if the vehicle is running, this software will now communicate through the Wireless DPA and the service technician can query the vehicle's electronic modules and display trouble codes and other pertinent information as provided for.

Operational Range

The Wireless DPA will operate up to 2 miles with line-of-site positioning outdoors. It is expected that the required range will be much less than this and will normally be enough so the technician can query a vehicle while it is located outside the garage in the yard. Range indoors is hard to predict due to unknown factors such as wall construction and equipment but normally is satisfactory for typical installations.

Placing the stations higher from the ground will extend the range as will the absence of metal in the stations' line-of-site and low electrical and RF interference.

Frequency hopping is very effective because wireless range is usually reduced because of multipath signals and not distance. Multipath interference is the same effect as ghosting on television sets and causes similar problems.

DPA Model Categories

There are four current categories: DPA III, DPA III*Plus,* DPA RF and DPA 4. The DPA III and *Plus* and the DPA RF connect to the PC with a RS232 (COMx serial) link and the DPA 4 connects with USB 2.0. The DPA 4 is an advanced version of the DPA III with more features and a more powerful processor (Freescale Coldfire vs. 196).

☑ All DPAs support J1939 in hardware for higher throughput.

☑ The *Plus* designation and the DPA 4 provide backwards hardware compatibility for Kenmore, Cummins, Inline I, Bendix and others.

☑ All DPAs can be ordered with Single Wire CAN (SW CAN).

DPA III and DPA III *Plus* (DPA 3)

☑ All DPA IIIs support RP1210A, CAN, J1939, J1708 and Pass-Through physical layers. Specific models add additional protocols.

☑ The DPA III/i and DPA III/iSW are an ASCII based DPAs for systems without Windows or with WinCE. SW is Single Wire CAN.

Custom Applications

The DPA family including the Wireless DPA can be adapted for any heavy vehicle application. DG provides software APIs for easy integration into customer programs. The DPA supports J1939 (CAN), J1708, J1850 PWM (Class II), ISO9141, SWCAN and GM UART. DG also offers the Gryphon/Hercules analyzer and the Python for J2534 and general diagnostic applications. See www.dgtech.com for more details.

For more information:

For more information regarding the DPA Series or other products and services, to find technical specifications, pricing, unlisted protocols or to locate your local representative, contact the Dearborn Group at sales@dgtech.com, visit www.dgtech.com or call at (248) 488-2080.

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