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The *Car-Pal*<sup>TM</sup> OBD Interface Unit needs little introduction if you know about electronic diagnostic of vehicle information. This section has been written to provide full details on the features of OBD (on-board diagnostics) and the benefits of diagnosing and fault clearing. There is also a guide on vehicle compatibility.

Click on any of the following to find out more information:

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If you have further requirements or questions please contact us directly at [info@vitalengineering.co.uk](mailto:info@vitalengineering.co.uk).

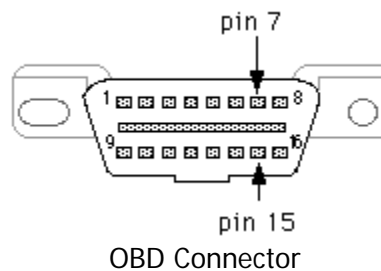


with *Car-Pal*<sup>TM</sup> 

### On which vehicles does the *Car-Pal*<sup>TM</sup> OBD Interface Unit work?

The *Car-Pal*<sup>TM</sup> OBD Interface Unit is designed to work on OBD-II / EOBD compliant vehicles. 2001 and newer petrol cars sold in Europe are EOBD compliant.

Some pre-2001 petrol vehicles and post-2001 diesel vehicles have a 16-pin connectors but are not EOBD compliant.



If in doubt, locate your OBD connector and inspect which pins are present. The connector must have pins 4, 5, and 16 for power and ground. Then the following sets of pins may be present, depending upon the protocol in use:

- Pin 7 should be present for ISO 9141-2 and ISO 14230 (KWP2000) communications. Pin 15 may or may not be present for these protocols.

- Pin 2 and pin 10 are present for SAE J1850 protocols.
- Pin 6 and pin 14 are present for CAN bus (ISO 15765-4) protocols.

Or ask us about your vehicle through our feedback page.

- Works with all ISO based petrol cars for sale to Europe since 2001
- Works with all ISO based petrol cars for sale to USA since 1996
- Works with OBD II/EOBD protocols ISO 9141-2 (ISO) and ISO 14230 (KWP 2000)
- Works with OBD II/EOBD protocols SAE J1850 PWM and VPW.
- Works with OBD II/EOBD protocols CAN bus (ISO 15765-4).
- Supports diesel vehicles where OBD II compliance is present.

### General Answer to the Car Support Question:

**Petrol vehicles** sold in **Europe** from **2001** (or manufactured from **2000**) and **diesel cars** sold from **2004** (or manufactured from **2003**). **Petrol vehicles** sold for the **USA** market since **1996** may also be supported.

European and Asian manufacturers OBD-II / EOBD compliant cars, including, but not limited to:

AC, Aixam, Alfa Romeo, Aston Martin, Audi, Austin, Bentley, BMW, Bristol, Cadillac, Caterham, Chevrolet, Chrysler, Citroen, Daewoo, Daihatsu, Daimler, Datsun, Dodge, Ferrari, Fiat, Ford, GMC, Holden, Honda, Hummer, Hyundai, Infiniti, Isuzu, Jaguar, Jeep, Jensen, Kia, Lada, Lamborghini, Lancia, Land Rover, Lexus, Lincoln, Lotus, Marcos, Maserati, Maybach, Mazda, McLaren, Mercedes-Benz, Mercury, MG, Mini, Mitsubishi, Morgan, Morris, Nissan, Noble, Opel, Pagani, Panther, Peugeot, Pilgrim, Plymouth, Pontiac, Porsche, Proton, Reliant, Renault, Riley, Rolls-Royce, Rover, Saab, Seat, Skoda, Smart, Subaru, Sunbeam, Suzuki, Talbot, Toyota, Triumph, TVR, Ultima, Vauxhall, Volkswagen, Volvo, Westfield, Yugo

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### What information can I get from my vehicle with the *Car-Pal*<sup>TM</sup> OBD Interface Unit?

The *Car-Pal*<sup>TM</sup> OBD Interface Unit is a type of device known in the automotive industry as a "scan tool". This section tells you more about how scan tools can access a vehicle's ECU to get information.

Modern automobiles rely upon computers to control and monitor all aspects of vehicle operation. Today's car contains numerous on-board computers (ECU's) responsible for many systems such as the engine management, transmission, and anti-lock brakes.

The ECU relies upon a variety of sensors to monitor vehicle operation such as speed, engine RPM, coolant temperature, and oxygen sensors. While driving, if the vehicle's on-board computer system detects a problem the computer reports the error using a

Diagnostic Trouble Code. A Diagnostic Trouble Code number indicates the problem with the vehicle.

The following information is readily available in a clear graphical and numerical format on all supported computer platforms:

- Throttle position
- Engine RPM
- Vehicle speed
- Calculated load value
- Ignition timing advance
- Intake air flow rate
- Short term fuel trim (x 2)
- Long term fuel trim (x 2)
- Air temperature
- Coolant temperature
- Oxygen sensors (up to 4)
- Read diagnostics trouble codes (DTC)
- Clear Check Engine lamp

The *Car-Pal™* OBD Interface Unit will read and clear codes and display live data from the EOBD diagnostics system. This covers engine, power train and emissions faults. It will not read or clear codes from other systems such as SRS, ABS or Suspension systems.

- Retrieves and clears both Generic and Manufacturer specific diagnostic trouble codes (DTC)
- Displays live sensor data and freeze frame data (PC platform only)
- Communicates with Engine Management System and Emissions Systems
- Switches off 'Check Engine' Light
- Displays generic code definitions on-screen
- Record and playback data (Depends on software)
- Includes detailed online instruction manuals
- Fully compatible with the CAN protocols used on some vehicles built since 2004/2005.
- Fully compatible with PWM, VPWM protocols used on some USA vehicles, including GM, Chrysler and Ford.

If the vehicle ECU has detected a problem, the driver is informed using the "Check Engine" light on the vehicle's dashboard. This light is also known as the Malfunction Indicator Light (MIL). When this light illuminates, a Diagnostic Trouble Code is saved into the ECU memory ready for the *Car-Pal™* OBD Interface Unit to send the value to your PC, PDA or Palm device.

Periodic checking of the Diagnostic Trouble Codes helps detect problems before costly repairs may be needed. Once the vehicle is repaired, the Diagnostic Trouble Code(s) can be erased from the ECU using the *Car-Pal™* OBD Interface Unit and the Check Engine light may be extinguished.

Many service centres, mobile services and repair shops charge to read the Diagnostic Trouble Code from the vehicle's ECU memory. Owning your own scan tool enables you to read and clear the Diagnostic Trouble Codes as often as necessary.

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### What are the advantages of using a wireless system such as Bluetooth?

The *Car-Pal™* OBD Interface Wireless Unit is a portable wireless device and has much more flexibility than cabled units. This gives many advantages to the user.

Diagnostic equipment for car repair has been simplified by replacing cables by wireless connections. Bluetooth is a wireless communication standard mostly found in mobile phones, PC's, PDA and Palm devices. It allows these devices to communicate with each other without having to connect a cable.

- The *Car-Pal™* OBD Interface Wireless Unit is a portable wireless device and has much more flexibility than cabled units. In the "cleanroom" environment of the modern motor workshop cables are a nuisance and a health and safety hazard.
- The Bluetooth wireless technology allows a Bluetooth enabled PC, PDA or Palm computer to be used long distances (up to 100m or 300ft) from the OBD-II port. You would obviously be able to work under the hood, round the back or under the vehicle watching real time OBD-II data without having to move cables as you move.
- Hands-free data recording also adds to safety while test-driving. Cabled diagnostic systems often prevent data recording on a test run as the driver's foot well is full of obstructive cables. This problem is eliminated with the *Car-Pal™* OBD Interface Wireless Unit.
- Be anywhere around the vehicle manipulating or measuring sensors or actuators and have your computer displaying live data from the ECU.



- The *Car-Pal™* OBD Interface Unit is listed in the Bluetooth product directory. Vital Engineering Ltd is recognised by the Bluetooth special interest group as an adopter Member due to design excellence and use of Bluetooth in embedded, mobile device and desktop computing environments.

With a wireless Palm, PDA or PC moving around the vehicle is easy. With cabled tools changing cable runs is time consuming and requires re-routing and reconnection of cables and user must be close to the component under test or diagnostic connector.

The Bluetooth hardware used in the *Car-Pal™* OBD Interface

Wireless Unit uses a "serial port" service for communications. This means that only Bluetooth devices with a serial port client can access the vehicle information via the *Car-Pal™* OBD Interface Wireless Unit. If your device has Bluetooth check that it has a serial port client. It is very rare that a PC, PDA or Palm device which has Bluetooth won't have a serial port client. Ask us if you are in any doubt.

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### What use is the information from the vehicle's ECU?

The *Car-Pal™* OBD Interface Wireless Unit provides full access to the vehicle's ECU data. This gives plenty of information to the user.

- Access Diagnostic Trouble Codes - reported by your vehicle's ECU.
- Service and maintain your own vehicle
- Live sensor display

The Reads and displays reason for Check Engine Light or MIL (Malfunction Indicator Light). The light indicates presence of fault codes (DTC, Diagnostic Trouble Codes)

When buying a second-hand or used vehicle a prospective buyer can connect the *Car-Pal™* OBD Interface Unit to the vehicle and in a few seconds determine if the vehicle has a problem recorded by the ECU. Remember that not all Diagnostic Trouble Codes illuminate the Check Engine light and accessing the vehicle's ECU is the only way to obtain the information.

You may also access the vehicle's computer to get live sensor information on a test run. The software will collect the data from the ECU via Bluetooth and display it in a graphical and numerical format. As the information is coming direct from the ECU the accuracy is as good as the manufacturer or the dealership workshop would get.

Line graphs with customized colour and display settings show time-sensitive, live data signals with second-by-second data recording. Comes with built in DTC (Diagnostic Trouble Code) database. Each trouble code has a definition which describes the problem the vehicle has experienced. The software presents this definition in a clear easy to read format.

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### How do I connect the *Car-Pal™* OBD Interface Unit to my vehicle?



It is very simple to connect the *Car-Pal™* OBD Interface Unit to your vehicle.

The *Car-Pal™* OBD Interface Unit connects to the vehicle using the standard, easy-to-locate electrical connector found inside the vehicle near the driver's position. No tools are required to access the connector. Once connected, the scan tool communicates with

the vehicle's computer (ECU) to obtain diagnostic information. This information is then presented wirelessly via Bluetooth, or via the serial / RS232 cable for another computer (PC, PDA, Palm) device to access.

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#### How would I use this device?

It is very simple to use the *Car-Pal™* OBD Interface Unit and the software for the PC, Palm, Windows Smartphone or PDA.

A typical use would be as follows:

1. Connect the *Car-Pal™* OBD Interface Unit to your vehicle. The cobalt status LED's will come on once the ignition key is in the ignition-on-engine-off position or the ignition-on-engine-on position.
2. From your PC, PDA or Palm device run the software supplied to you with the *Car-Pal™* OBD Interface Unit.
3. If you are using Bluetooth: the first thing your software will do is search the area for the OBD Bluetooth Transmitter using a technique known as device discovery. Once it has found the OBD Bluetooth Transmitter you will notice the four LED's (two red, two green) on the OBD Bluetooth Transmitter flashing. This means live data is being transferred from your vehicle's ECU to your computer. However, if you are using the serial RS232 cable you simply tell the software to open the COM (serial) port to which you connected the cable.
4. Read the Diagnostic Trouble Codes from the ECU.
5. If a DTC is retrieved focus the attention on specific components or systems described by the fault code(s).
6. Replace the defective component(s) or correct the faulty system.
7. Use the software to erase the Diagnostic Trouble Code (DTCs).

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#### More information on the *Car-Pal™* OBD Interface Unit

The OBD Bluetooth Transmitter connects to the OBD-2 connector in your car. It uses power from the vehicle and has four status LED's to indicate power on and data transfer activity.

Access the device from any other platform, such as a PC, Palm or PDA, equipped with a Bluetooth receiver or a serial connector, depending on which *Car-Pal™* OBD Interface Unit you bought.

All our products come complete with VitalScan OBD diagnostic software so you can connect straight away and start exploring your car's system. Once connected, you are then governed to what you can do by software from you PC, PDA, Smartphone or Palm device.

Third party software may also be used in conjunction with the *Car-Pai™* OBD Interface Unit. Please contact us to see if your software will work with the *Car-Pai™* OBD Interface Unit.

The following functions can be performed through the *Car-Pai™* OBD Interface Unit; fault code reading, turn off the MIL lamp, O2 sensor tests, access ECU monitors, read freeze frame data, get live sensor information, get vehicle VIN numbers.

#### Full Feature Listing - OBD Device

- OBD-2 connector
- Bluetooth Class 1 Device - up to 300 feet (100 m) OR
- Serial Connector with cable of 1400mm.
- Four Status LED's
- Overall unit size: 64 x 46 x 26 mm
- Overall unit weight 42 g
- Rugged, splash-proof, design with ISO, SAE and CAN bus interfaces for use both at home and in a commercial workshop environments
- Lower power consumption despite strong transmitter power
- Operates direct from the vehicle's own battery (DC +12v) supply, with built-in over voltage and short circuit protection
- No external power supply required. Suitable for laptop, PDA, Palm and Smartphone based applications.
- Fully compliant ISO9141-2, ISO 14230 (KWP 2000), SAE J1850 PWM and VPW, and CAN bus (ISO 15765-4).interfacing
- Bi-directional serial communication in automotive diagnostic applications
- Fully ISO compliant and interfaces with both the K and L lines
- Electronically isolated from the vehicle's data-stream
- Compatible with a wide range of third party diagnostic software.
- Full Feature Listing - Accessing the information
- Diagnostics tool for all OBD (ISO / EOBD only) compliant cars
- Retrieve and clear fault codes from the engine management system
- View engine sensor values in real time
- Graph any vehicle sensor values on screen simultaneously
- View the freeze frame data from the ECU at the moment the MIL (warning light) was illuminated
- Record and save continuous sensor data.

The *Car-Pai™* OBD Interface Unit interfaces to the vehicle OBD-II bus on one side and utilizes Bluetooth or a serial cable to communicate with a host computer on the other.

The host can be a Windows based PC, a Palm compatible handheld or a PDA. If your host computer does not already have Bluetooth we can supply the necessary equipment.

The *Car-Pai™* OBD Interface Unit is an OBD-II interface.

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### What do customers say about the *Car-Pal™* OBD Interface Unit?

"I received the *Car-Pal™* interface and it is very cool. The thing I like best about the *Car-Pal™* is that it is tiny! I could leave it plugged in all the time." - Dana Peters (Canada)

"The *Car-Pal™* is really my car's diagnostic doctor, diagnosing and clearing all the engine check light with a click of a button. Will recommend it for any car! Great job, Vital Engineering!" - Danny Lee (Singapore)

"I like the compactness of the *Car-Pal™* and I like the Bluetooth. This has amazing capabilities" - Rick Dorsey (USA)

- "The best wireless solution for understanding how my car is performing".
- "I have installed a powered cradle in my car now, so I am using the OBD Bluetooth Transmitter every time I drive the car".
- "Ease of use and lack of cables make it ideal for the workshop environment".

Want to add your opinion? Send us a mail to [feedback@vitalengineering.co.uk](mailto:feedback@vitalengineering.co.uk).

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