

OBD 2007 POCKET PC – INSTALLATION GUIDE

INSTALLATION

The download of *OBD 2007 for Pocket PC* from www.glmsoftware.com is contained within a zip file. The zip file should be unzipped to any convenient directory of your hard disk – for example `c:\downloads\obd2007`.

The download contains two files, a pdf help file (what you are reading) and a file called `installer.exe` that will install *OBD 2007 for Pocket PC* to your Pocket PC. The `installer.exe` is a desktop installation executable that is run from your desktop. It therefore assumes that you have an Active Sync connection with your device. Please ensure that before you run `installer.exe` that your device is connected correctly via Active Sync.

`Installer.exe` is quite large about 7MB. It contains various Microsoft CAB files for all devices supported by *OBD 2007 for Pocket PC* including Pocket PC 2003, Windows Mobile 5 and Windows Mobile 6, plus the executable of *OBD 2007 for Pocket PC*. Only the files required for your device are transferred to your device and at the completion of the install, the installer itself is also deleted from the device. If your device already contains the correct version of .Net Compact Framework Version 2.0 SP2 then those files will be skipped during the installation. A log file is created during the install called `Installer.txt` and is located in the My Device directory. This is a simple text file that documents all the actions of the `installer.exe` and is very useful in tracking a problem with the install. In the unlikely event that you do experience a problem installing *OBD 2007 for Pocket PC*, please ensure that you include a copy of this file when contacting support@glmsoftware.com.

Tip: If you are required to install .Net Compact Framework V2, then after it has installed, it will request a soft reset. After the soft reset the installer should resume from where it left off, if it doesn't, then just rerun the installer, this time as the .Net Compact Framework is now installed, it will be skipped.

After starting `installer.exe` the following screen will appear.

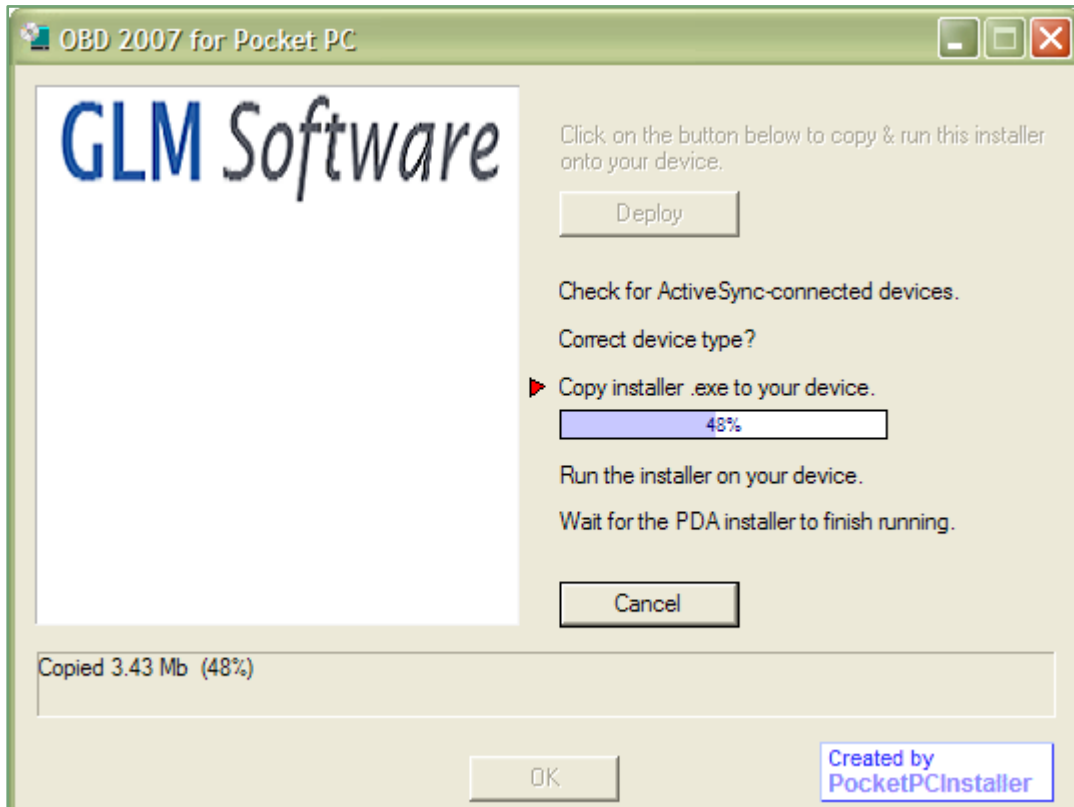


Figure 1 - Installer of OBID 2007 for Pocket PC

When you are ready click the deploy button. There are a number checks performed as documented in the above screen. The installer is copied to your device and then run from your device. A progress bar gives feedback to the progress of the install from the desktop. The following screen represents one of the typical screens displayed while installing to the device.

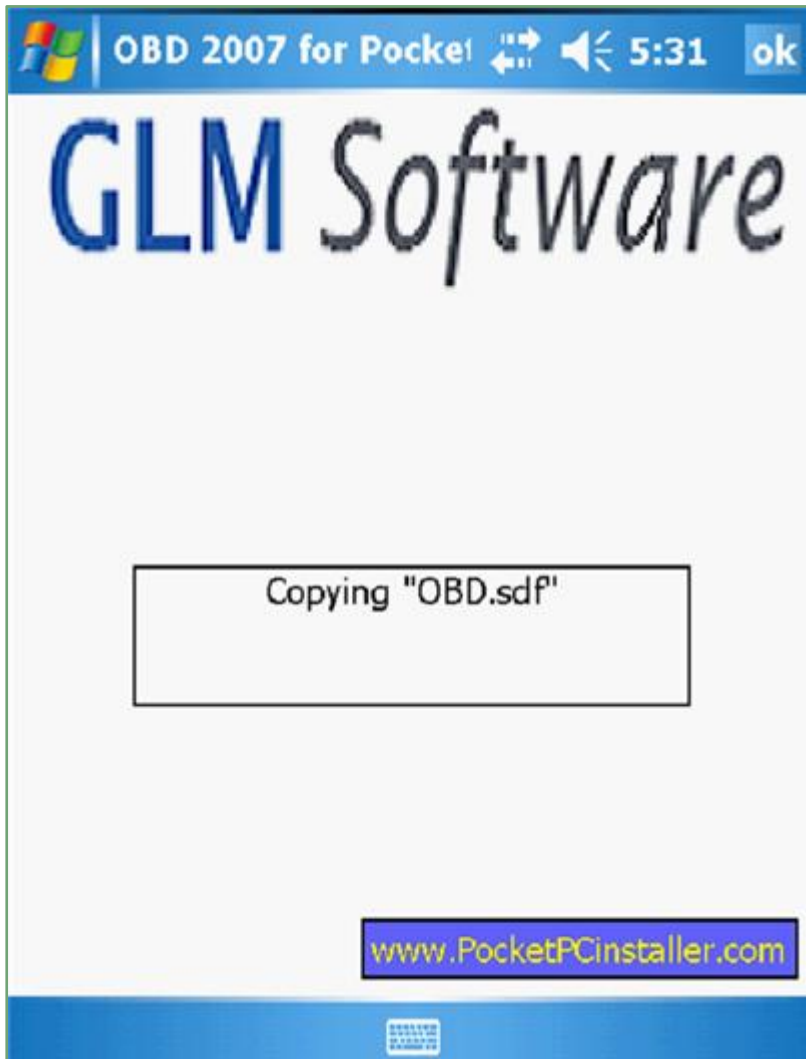


Figure 2 - Installing OBD 2007 for Pocket PC to device

At the completion of the install, shortcuts will be created for the Start menu and Programs on your device. It may not be possible to create the Start menu shortcut if all slots are already taken. This can be done manually if required via the Menu applet. To start *OBD 2007 for Pocket PC* tap the shortcut or use File Explorer to navigate to Program Files\OBD2007 and tap the OBD2007.exe from there. The OBD2007.exe has a rpm meter icon associated with it.

PRODUCT ACTIVATION

When you start *OBD 2007 for Pocket PC* for the first time, it will immediately display the Product Activation Window. This applies whether you have downloaded *OBD 2007 for Pocket PC* to demo or you have purchased it. To allow potential users to demo *OBD 2007 for Pocket PC* it will run for 7 days with the complete feature set enabled – previous demo versions of our products had limited functionality. We feel the newer versions will give our potential customers a far better experience of what *OBD 2007 for Pocket PC* can do if they can use all the features of the product. Therefore *OBD 2007 for Pocket PC* has to be first activated by our server. When you request a demo copy of *OBD 2007 for Pocket PC* from our website we will supply you with a link to the download plus an activation key. If you purchase the product we supply a similar link, the activation key, plus an additional registration code.

To activate or register the product you must have an active internet connection. Please ensure that you can connect to your favourite web page before trying to activate or register *OBD 2007 for Pocket PC*. To activate *OBD 2007 for Pocket PC* simply copy/paste the activation key from the GLM Software confirmation email in the textbox labelled *Enter Activation Key*. On pasting or typing a valid activation key the *Activate* button will be enabled. Click the *Activate* button and the activation process will begin with our server. A progress bar will appear to the left of the *Activate* button indicating the progress of the activation process. At the completion of the activation process a message will appear with an indication of success or failure. The only valid reasons for failure would be an invalid activation key or a fault at our server. If for some reason there is a fault with our server, the same activation key can be used at a later time. The activation key only becomes **used** after a successful activation.

It may be necessary to momentarily turn off any firewalls to allow the activation process to access the internet.

Tip: For those of you who use Pocket Controller-Professional. You may use Pocket Controller running on the desktop to simply copy/paste the activation key or registration key.

The Activation window is shown below.

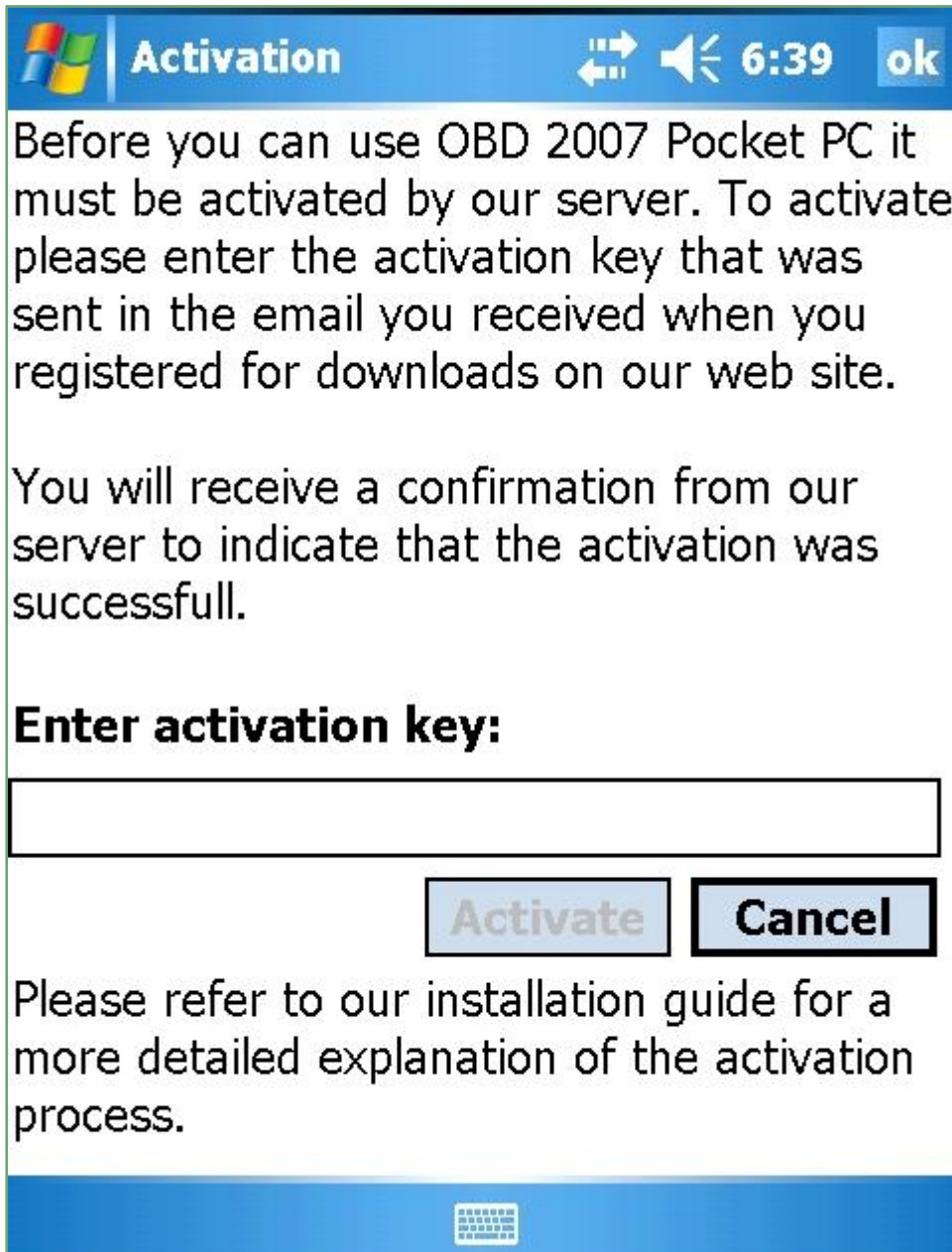


Figure 3 - Activation window

At the completion of the activation process *OBD 2007 for Pocket PC* is ready to run and the caption of the screen will display *7 days remaining*. Demo users are now free to explore the program for the next 7 days. The caption at the top of the screen will count down each day as a reminder until the evaluation copy expires. *OBD 2007 for Pocket PC* can be converted to an unrestricted copy at any time during the 7 days or even at the end of the period, by purchasing from our web site and registering the product. There is no need to download any additional copies.

If you are a demo user, you can skip the next section regarding Product Registration and proceed directly to our Program Guide.

PRODUCT REGISTRATION

The registration process is almost identical to the activation process, which you have already performed. However the registration process uses a registration code which is supplied via the GLM Software email you received when you completed your purchase of *OBD 2007 for Pocket PC*.

As an owner of the product, you may complete the registration process at any time during the next 7 days or you can even wait until the evaluation period expires. The registration button is not disabled when the evaluation period expires.

Please note that the registration of the product limits the use of the product to the device that the product is installed on. If you haven't installed the product to the device you wish to use it on, please ensure that you do install it again to the correct machine before attempting to register the product.

To register *OBD 2007*, the product must be first purchased from our web site www.glmsoftware.com. On receipt of payment a registration code will be sent to the email address you entered during the purchase procedure.

Copy and paste the registration code from the GLM Software confirmation email into the textbox labeled Enter Registration Code. On pasting a valid registration code the Register button will be enabled. Click the Register button and the registration process will begin with our server. A progress bar will appear to the left of the Registration Details button indicating the progress of the registration process.

At the completion of the registration process a message will appear with an indication of success or failure. The only valid reasons for failure would be an invalid registration code or a fault at our server. If for some reason there is a fault with our server, the same registration code can be used at a later time. The registration code only becomes used after a successful registration.

To register your product, please use the registration window as shown below.

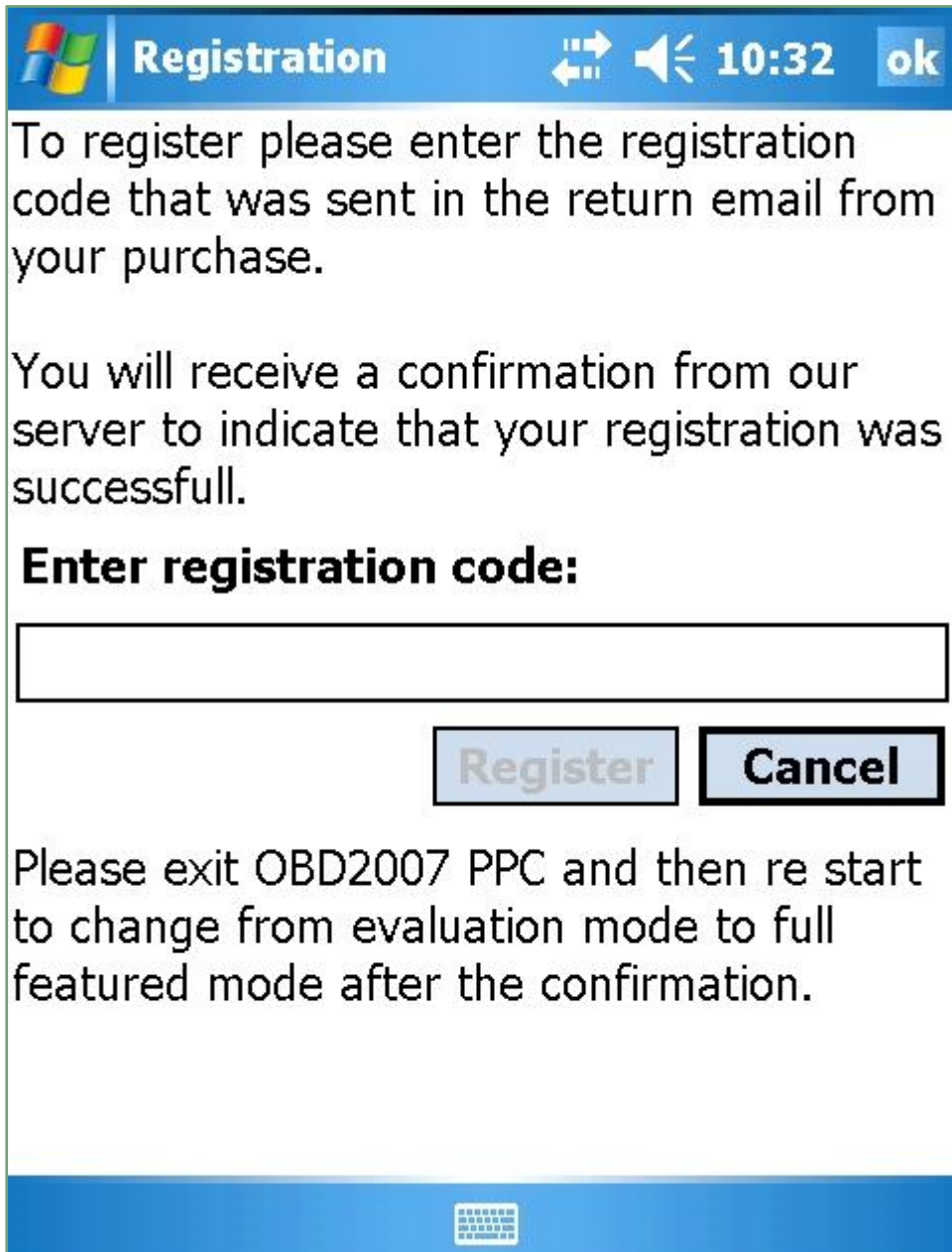


Figure 4 - Registration window

It may be necessary to momentarily turn off any firewalls to allow the registration process to access the internet.

INTRODUCTION

This guide presumes you have already connected your scan tool to your vehicle. For details on how to connect your scan tool to your vehicle please see the manufacturer's instructions. For trouble shooting your connection please see our guide **Connection Trouble Shooting** at the end of this document.

When you start *OBD 2007 for Pocket PC* for the first time the following screen is displayed.

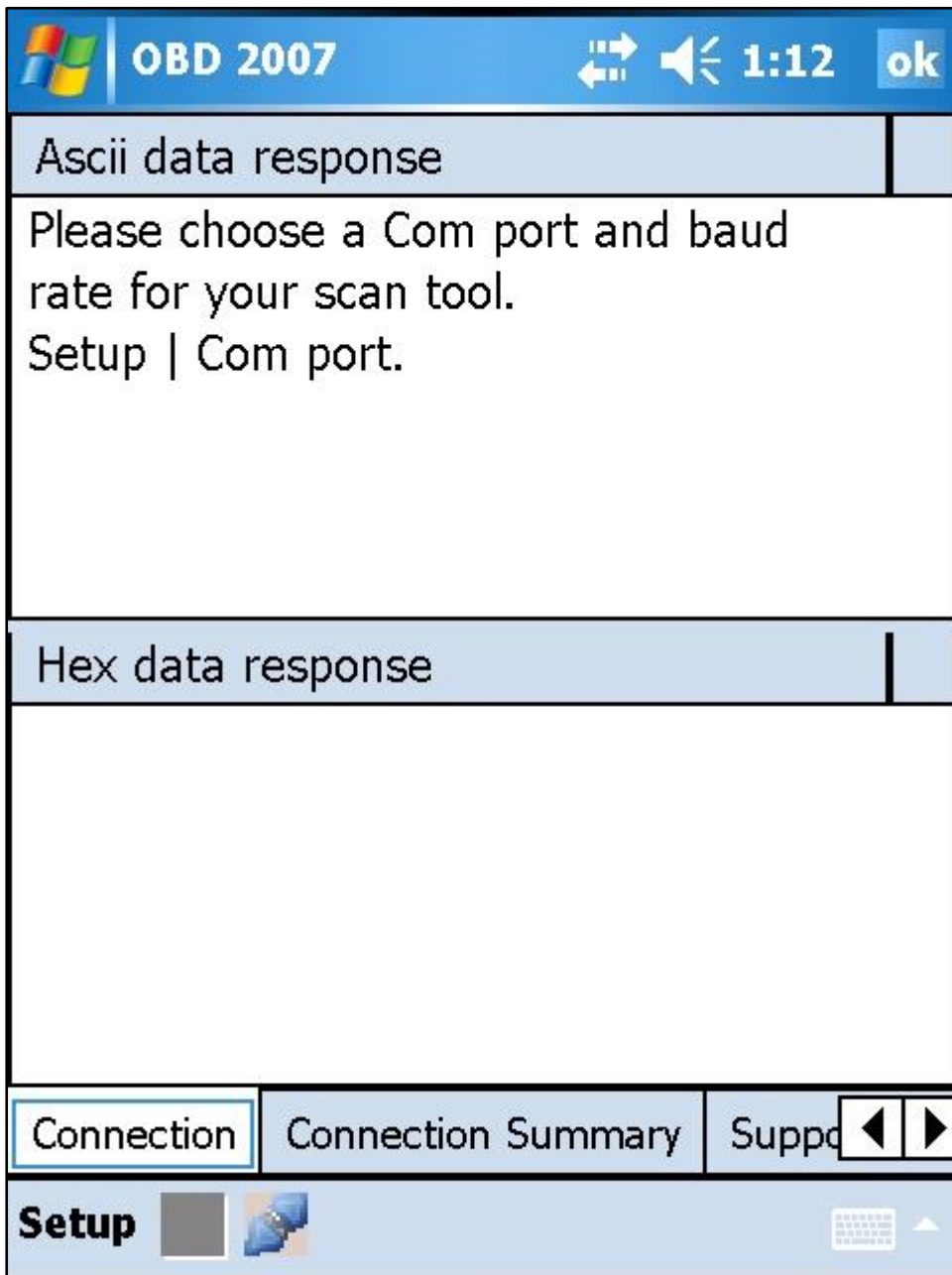


Figure 5 - Vehicle not connected

The Connection button is disabled at this stage, as *OBD 2007 for Pocket PC* has not as yet made a connection with the scan tool. Before you can make a connection you must choose an appropriate Com port for your Pocket PC. There are two possible ways to connect your scan tool to your Pocket PC. If your make and model of Pocket PC is supplied with a serial cable, you can use that serial cable to connect to the serial connection of your OBDII scan tool utilising the serial cable that came with your scan tool. The default Com port on a Pocket PC is usually used for that type of connection and is known as Com1. The baud rate for a cable connection should be set to 9600.

A more common connection, especially with late model Pocket PCs is to use a Bluetooth connection. However to use a Bluetooth connection, you will need to obtain a Bluetooth serial adapter and connect it to your scan tool. Bluetooth serial adapters can either be supplied with your scan tool (for example Car-Pal BT unit or ElmScan5 Wireless) or purchased separately from suppliers such as Socket Communication www.socketcom.com or AirCable www.aircable.net. To be used successfully both of these products require 5V power to power the BT radio of the adapter. The power can be sourced via pin 9 on the DB9 connector of the non BT enabled scan tools. Keep in mind that some models of the various scan tools will require modifications to bring power to pin 9. Please check with the scan tool manufacturer.

At this point we will assume that you have acquired a BT serial adapter either purchased separately or purchased with your scan tool. The next step is to pair the two BT units – that is the BT serial adapter and the BT serial port of your Pocket PC. Most Pocket PCs come with a Bluetooth wizard to make this a relatively painless experience. Bluetooth provides many services on a Pocket PC, what we are looking for is the serial port service.

You can use the Bluetooth Manager wizard of the Pocket PC to step through the process. The first step is to discover the services that another device offers (e.g. in our Bluetooth serial adapter). When you start the process the Bluetooth manager of the Pocket PC will search for available devices. When found they will be listed separately with an icon representing each device that is found. Tap on the name of your device, and the Bluetooth manager will then retrieve a list of the services of that device. Tap on the service in our case the serial port service and the Bluetooth manager will then create a shortcut for the device. Tap on the shortcut e.g. for an ElmScan5 Wireless it would be something like “Scantool.net-DA4C: SPP” and select connect. A successful connection should be made. We now have made a connection but will still do not know the serial port number at this stage.

The next stage is to select Bluetooth Settings – tap on services and select Serial Port from the list of Bluetooth services. Check the checkbox Enable Service and then click the Advanced button. This will list the Bluetooth Serial Settings and show two settings, one an Inbound COM port and another for the Outbound COM port. The Outbound port number is the one that is required for the port combo box of the Com port setup window as shown below.

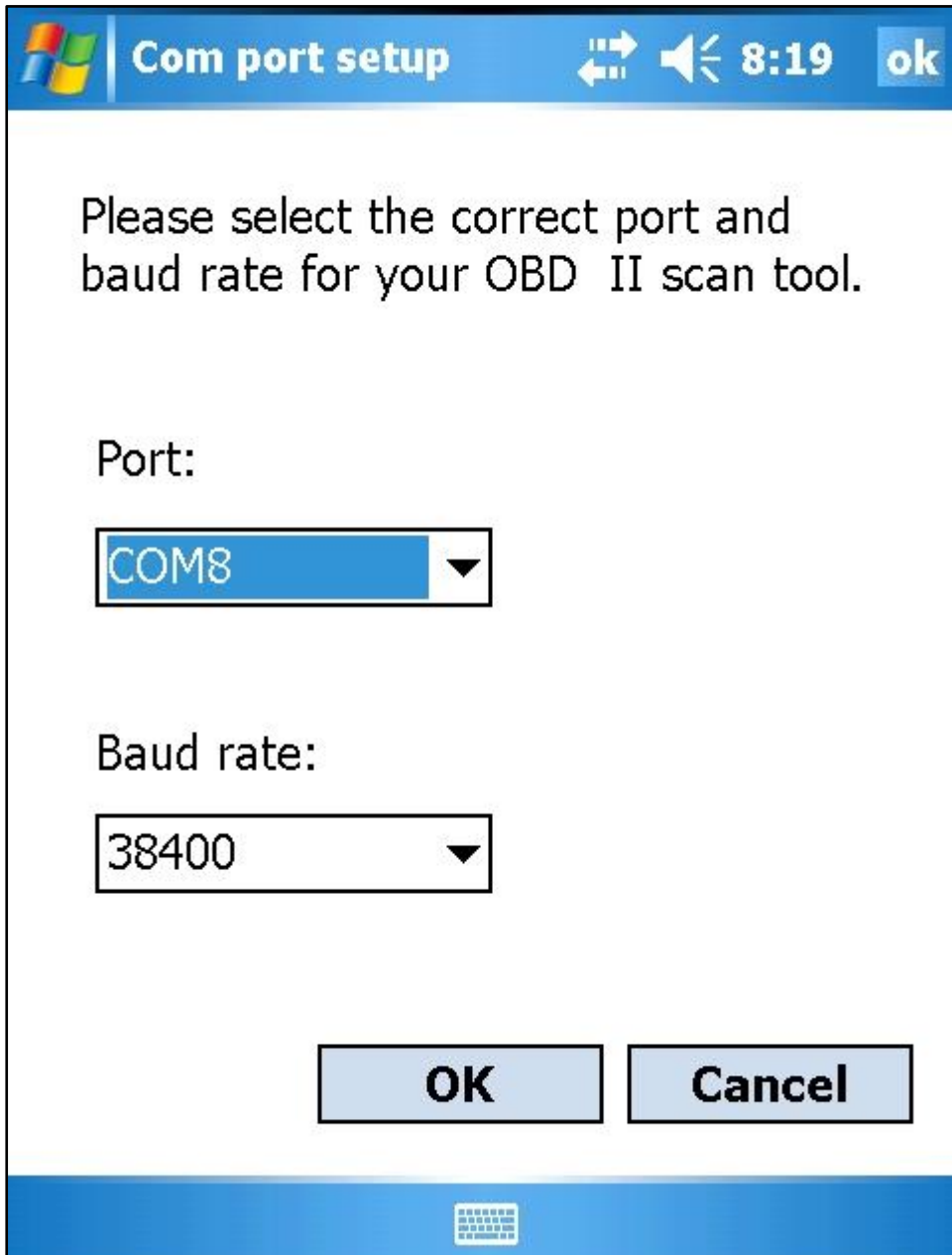


Figure 6 - Com port setup

Now return to the *OBD 2007 for Pocket PC*, and select Setup | Com port from the main menu. The Com port setup window will appear with a similar appearance to the above window. The top combo box will contain one or more serial ports, select the Out bound com port established from the previous step. The second combo box contains the baud rate setting. The usual setting for Bluetooth is 38400 baud. Please note that you must have your scan tool baud rate set to the same setting. It may be necessary to open up your scan tool and change the jumper pin if your scan tool is still set to 9600 baud. Please follow your manufacturer's instructions to change the baud rate.

When you close this window the program will remember the settings, so this task shouldn't have to be performed again. We are now ready to connect to the vehicle.

The following diagram is from Scantool.net showing the jumper pins.

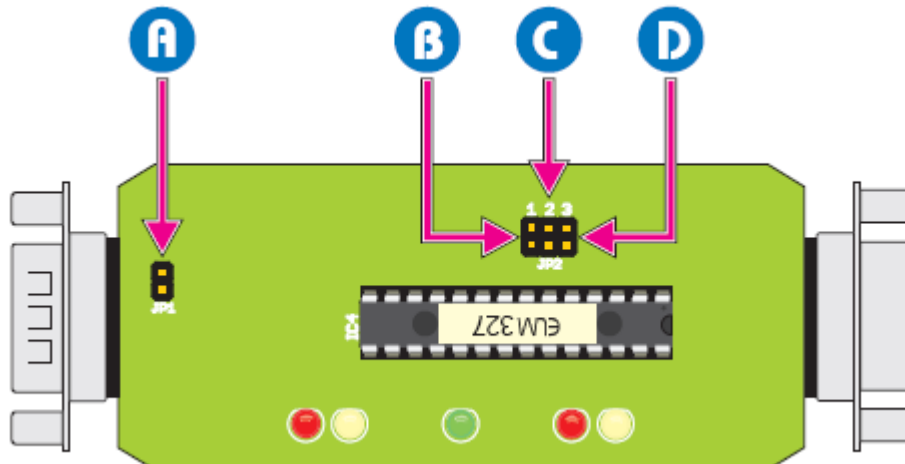


Figure 7 - ElmScan 5 jumper pins

In the diagram above, the middle pin marked C is the baud rate setting. Jumper on equates to 38400, and jumper off is 9600.

CONNECT TO VEHICLE

When you are sure that the scan tool is properly connected to the OBD plug and your Pocket PC. Switch the ignition to the ON position – do not start the engine at this stage.

On the connection tab, tap the Connect button and the window should then look similar to the following window after a couple of seconds. The information displayed will depend on the protocol of the vehicle.

When you tap the Connect button *OBD 2007 for Pocket PC* goes through an initialization sequence, searching automatically for the correct protocol for the vehicle. When it connects successfully, it also builds a list of information about the particular vehicle. This window is split into two panels, the top panel is known as Ascii data. Most of the information there is in English and describes the various initialization steps. The bottom panel is the raw data with English like prefixes where appropriate.

This raw data is hexadecimal data received back from the vehicle. This is very useful information for those of you who know how to read this data. It is not essential that you understand this data because *OBD 2007 for Pocket PC* will translate it into meaningful data on the other tabs, but for those of you who are conversant with ISO 15031-5, the hex data can be very useful in understanding the information presented on each tab.

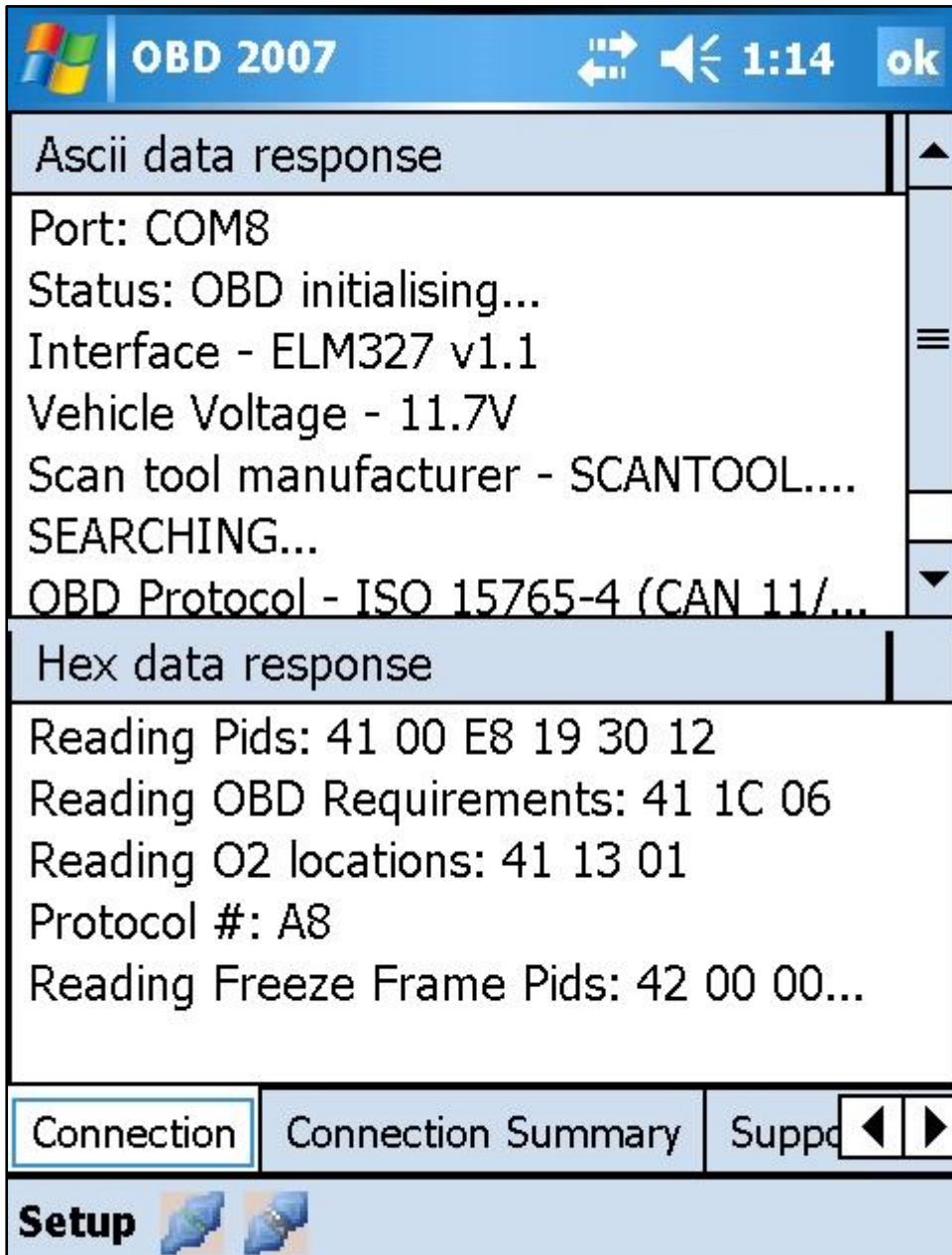


Figure 8 – Connecting

At the completion of the initialization sequence *OBD 2007 for Pocket PC* will present a message box stating that all the pids have been read. Please wait for this message box to appear as it signals the completion of the initialization process. When you close the message box you are ready to move on to all the other tabs of *OBD 2007 for Pocket PC*.

When the initialization is complete, *OBD 2007 for Pocket PC* will report back the protocol of the vehicle and its OBD requirements, the interface and make of scan tool, the status of the Mil Lamp and the number of Diagnostic Troubles Codes (DTCs) that are set all appear on the **Connection Summary** tab.

An important piece of information is the Region Information as this setting determines the units (either metric or imperial) of the data that will be displayed on the various tabs of *OBD 2007 for Pocket PC*. This setting is controlled by the Windows operating system from the Settings applet.

Please make sure that your Pocket PC is set to match your region. A typical **Connection Summary** tab is displayed below.



Figure 9 - Connection summary

If you are unable to connect to your vehicle please read our guide **Connection Trouble Shooting**.

Tip: Some older OBD-II complaint vehicles can have connection issues, or even let go of the connection during a session. OBD 2007 for Pocket PC has a timeout procedure, which will automatically try to re-establish the connection after approximately 8 seconds. When reading Pids for example on the "Read Vehicles Pids" tab, if you notice the lights are flashing on your scan tool, but no data is being displayed, check that the OBD Rx light is flashing. If it is not, then after approximately 8 seconds OBD 2007 for Pocket PC will perform the initialization process again and automatically start displaying data from the Pids without further intervention from you.

A similar circumstance can arise with these older vehicles when you cancel a continuous read by clicking the Cancel Read button. If you then attempt to restart by clicking the Read button, it is possible that the connection has been lost and no data will appear. Again the timeout procedure will be activated and the connection should automatically be obtained again. Another common problem is that some of the older vehicles will require more than 1 attempt to connect. You may see a message "CANNOT CONNECT", immediately followed by another message "SEARCHING...". Under normal circumstances the connection will succeed on the second attempt. If you have one of these vehicles, you can eliminate the two attempt connections, by removing the OBD-II plug connection and reinserting before clicking the Connect button for each connection session.

OBD 2007 RESET TIME OUT VALUE

OBD 2007 Reset timeout value is the number of seconds elapsed before OBD 2007 will automatically reset the Elm327 chip and re attempt to make connection with the vehicle's ECU.

Some older protocols require longer than others to make the initial connection. During the OBD 2007 initialization procedure the Elm scan tool will search all the possible protocols to establish the correct protocol for a particular vehicle. If this setting is set too low, then it is possible that OBD 2007 may re issue its reset procedure before the correct protocol can be established. If this appears to be the case as evidenced by repeated "UNABLE TO CONNECT" messages on the Connection tab try increasing this figure by a couple of seconds until you are able to obtain a connection. The default value is 14 seconds.

Note it is not unusual for an ISO9141-2 vehicle to give one UNABLE TO CONNECT message before completing a successful connection. The rule of thumb here is to watch the lights on your scan tool. If they become inactive, wait the required OBD 2007 Reset timeout period and you should then observe the lights flashing as the initialization sequence is triggered.

This reset timeout value is also used when in continuous read mode if the vehicle's connection to the ECU ever lets go. Some protocols require a wake up message be sent every couple of seconds to keep the connection alive with the ECU if no commands are being sent during idle periods. If the Elm327 automatic wake message fails to keep the connection to the ECU alive, then the OBD 2007 Reset Timeout will automatically be triggered and you will notice that the lights of your scan tool will automatically start flashing again as the connection is re established.

ELM327 TIME OUT VALUE

OBD 2007 for Pocket PC defaults the time out value of the ELM327 chip to 50 milliseconds. This default value is usually ok for most vehicles. If you do have connection problems and are experiencing NO DATA values as shown as a response to many of the values on the Connection tab, you can attempt to increase the time out value.

After sending a request, the ELM327 waits a preset time before declaring that there was no response from the vehicle i.e. a NO DATA response. Even if there was a response the ELM327 will still wait this time to be sure that there are no more responses. By setting this time out value we can cause the ELM327 to wait longer or shorter times.

If you appear to be not getting data, increase the time out amount. However a too high value will unnecessarily slow the application for no benefit. Try the default value of 50 milliseconds and gradually increase it, if you suspect that you are not getting data.

Select a higher value, disconnect and connected again to use the new value. The value will be saved and persisted until it is changed again.

The Elm327 adjust time out value window displayed below can be accessed from main menu - Setup | Adjust Elm327 time out value.

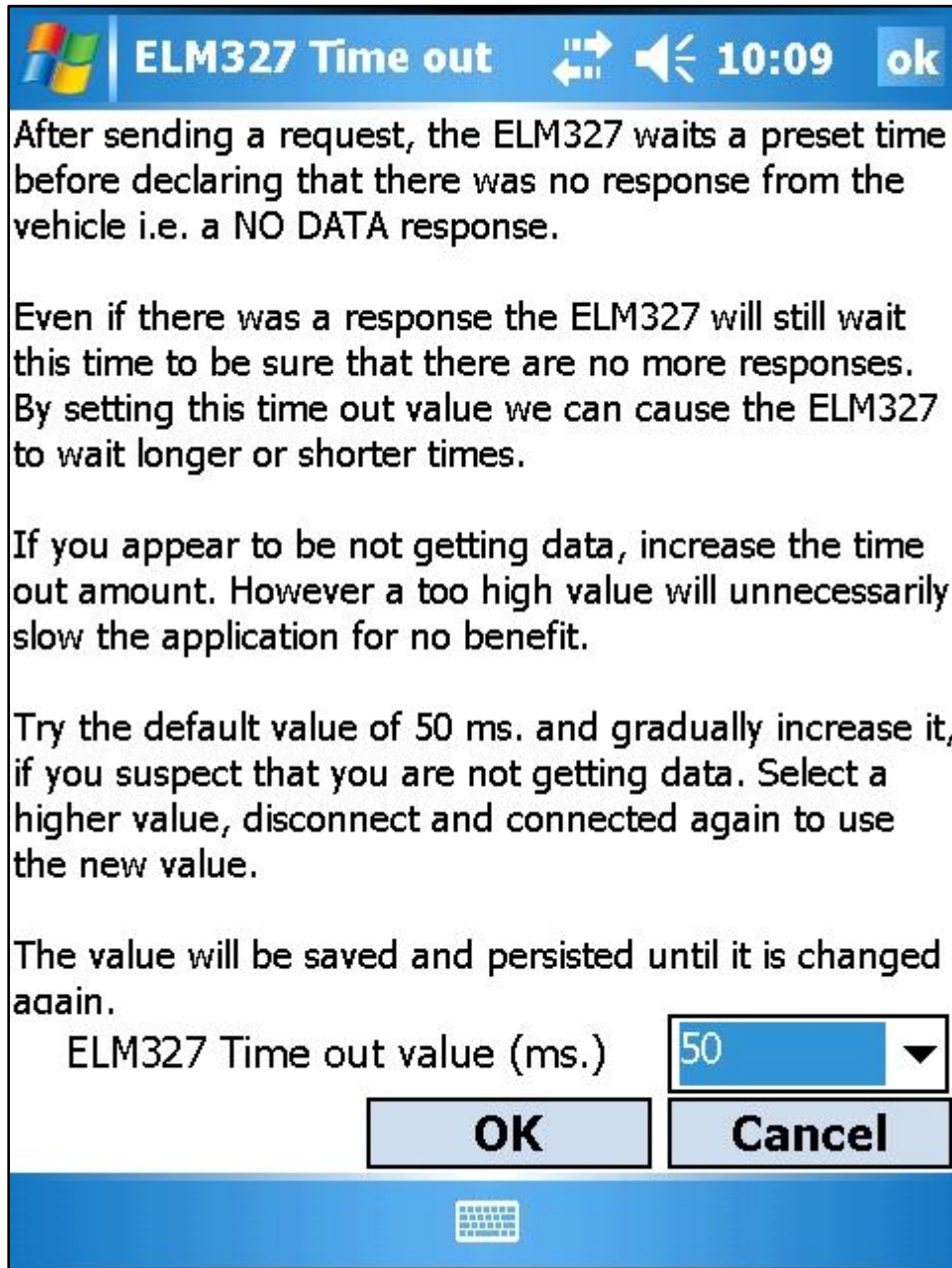


Figure 10 - Elm time out value

POCKET PC POWER SETTING

Normally a Pocket PC is designed to automatically turn off after a predetermined time. This setting, known as the battery power setting is user adjustable from 1 minute to 5 minutes. This feature is designed of course to save battery life.

Because OBDII testing with *OBD 2007 for Pocket PC* can take considerably longer than the maximum of 5 minutes, especially if you are doing extensive data logging, *OBD 2007 for Pocket PC*

overrides this setting to prevent the Pocket PC from turning off. When you exit *OBD 2007 for Pocket PC* the existing setting is reactivated, so this feature is only in effect while you are operating *OBD 2007 for Pocket PC*.

Another setting of the Pocket PC also designed to save battery life, is the screen backlight setting which can be adjusted from 10 seconds to 5 minutes. We do not override this setting, because the screen is very demanding of power and we don't wish to prematurely exhaust your battery. Therefore if you are doing extensive logging and want to check the output and the screen has dimmed, you will need to tap the screen to re activate it. You may find it more convenient to adjust the backlight setting to some longer interval.

SUPPORTED PIDS

During the initialization process *OBD 2007 for Pocket PC* builds a list of Parameter Identifications (PIDs) for the particular vehicle. The tab **Supported Pids** presents a list of PIDS that this vehicle supports. This list is built from a master list of 90 Pids. These are known as Pids, 0x00 through 0x5A in hexadecimal notation or 0 through 90 in decimal notation. If you would like a further understanding of Parameter Identifications please download www.elmelectronics.com/DSheets/ELM327DS.pdf for a complete description.

Assuming you have successfully connected, you can now move to the **Supported Pids** tab. This tab allows you to select any combination of the Pids that your vehicle supports to view on the next tab **Read Vehicle Pids**.

If your vehicle doesn't support a particular Pid do not expect to see it in the list as the **Supported Pids** tab only displays Pids that your vehicle supports. In some older vehicles this list can be very sparse. There is nothing that the software or the scan tool can do about this, the software and the scan tool can only report what is available.

CAN vehicles normally support many more Pids than any other protocols as the CAN protocol is the latest protocol and was first used in 2004 year models. Note all vehicles manufactured from Jan 1st 2008 will only support the CAN protocol.

The Pids with a padlock icon beside them indicate Pids that don't have dynamic values, therefore it would be pointless to be able to select them.

You can be as selective as you like when selecting Pids to view. Just check or uncheck Pids as required. The more Pids selected the slower the response will be. To get a response from the ECU, the scan tool has to send a command for that particular Pid, so the more Pids selected, the more commands that have to be sent by *OBD 2007* to the scan tool and each response from the ECU to the scan tool has to be processed successively by *OBD 2007*.

The following is an example of the **Supported Pids** tab.

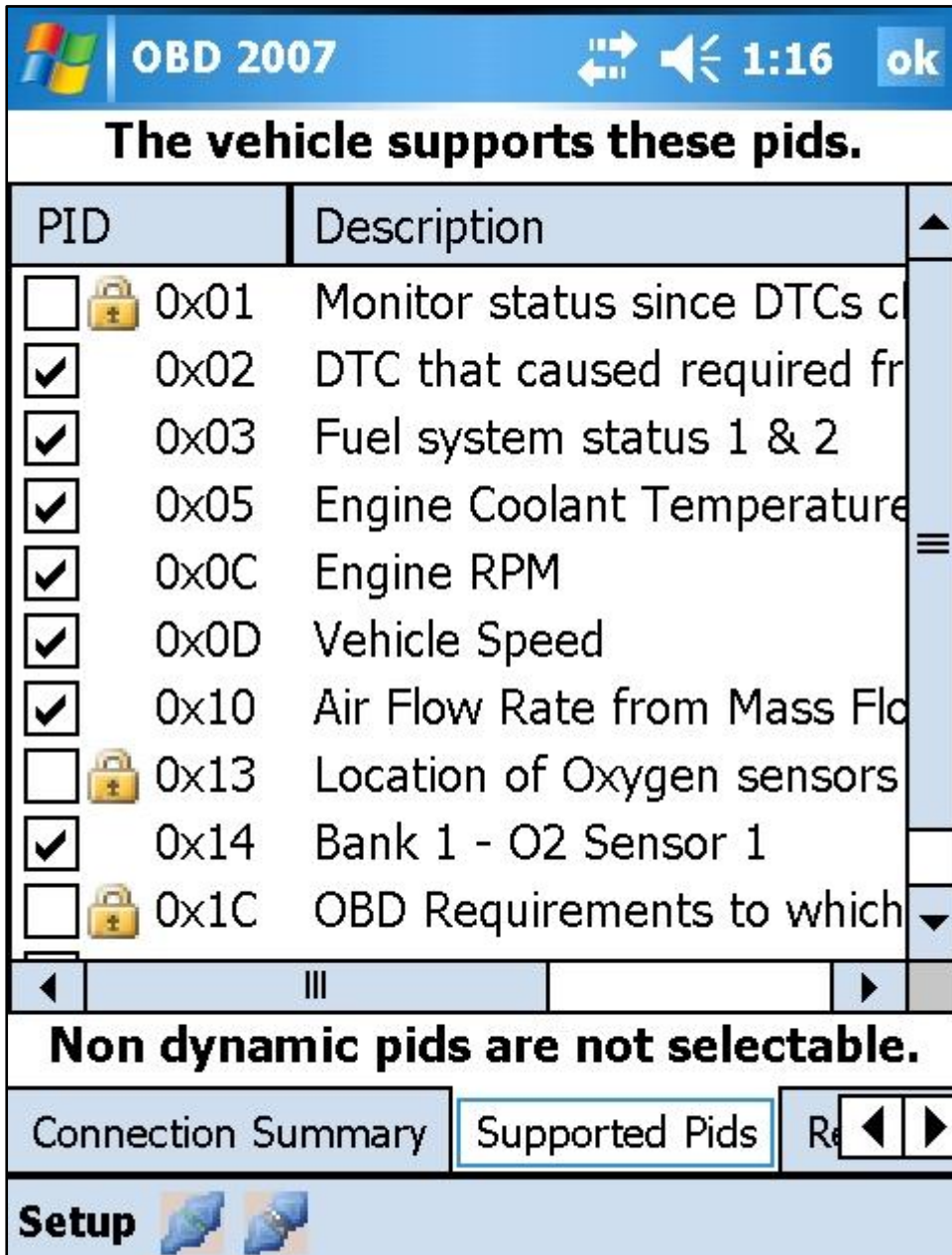


Figure 11 - Supported pids

READ PIDS

After selecting the Pids you wish to view, select the **Read Pids** tab and tap the middle of the screen. A context menu will appear with two menu items Read Pids and Stop Reading. Tap the Read Pids item. If you haven't started the vehicle's engine, do so now.

The program will now display in "real time" the values of each of the selected Pids. See the figures below for a typical display. *OBID 2007* automatically displays Pid values either in metric or imperial units based on the current regional settings of your Pocket PC. If you swap to the **Connection** tab while reading the Pids you will see the raw data in hexadecimal format from the vehicle in the list labelled Hex data response.

OBD 2007 will display certain tabs in either portrait or landscape mode, if your device supports screen rotation. If your device does support multiple orientations, then two additional toolbar buttons will appear. One to rotate your screen through 90 degrees to Landscape mode and another to rotate it back to Portrait mode. If you are viewing a tab in Landscape mode and you then select another tab that does not support rotation, your screen will be automatically returned to Portrait mode.

PID	Description	Value
0x02	DTC that caused require...	
0x03	Fuel system status 1 & 2	Open l...
0x05	Engine Coolant Tempera...	84
0x0C	Engine RPM	1908
0x0D	Vehicle Speed	99
0x10	Air Flow Rate from Mass...	28.80
0x14	Bank 1 - O2 Sensor 1	0.240 ...
0x1F	Time since Engine Start	00:01:49

Figure 12 - Reading Pids - Portrait mode

A NOTE ABOUT CONTEXT MENUS

Context menus are available on nearly every tab in *OBD 2007*. Just hold your stylus down on each tab window and a pop menu will appear. Tap your menu choice and the command will execute. Various menu items could be disabled depending on the OBD features of your particular vehicle and or the state of the connection at the time you tap.

OBD 2007				1:43	ok
PID	Description	Value	Units		
0x02	DTC that caused require...				
0x03	Fuel system status 1 & 2	Open l...	-		
0x05	Engine Coolant Tempera...	84	°C		
0x0C	Engine RPM	1902	rpm		
0x0D	Vehicle Speed	99	km/h		
0x10	Air Flow Rate from Mass...	28.80	g/s		
0x14	Bank 1 - O2 Sensor 1	0.235 ...	v - %S...		
0x1F	Time since Engine Start	00:01:49	hrs:mi...		
Read Pids		Readiness Status		Trouble Codes	
				O2 Sensors	
Setup					

Figure 10 - Reading Pids - Landscape mode

The display will update continuously for each Pid until the Cancel Read menu item is tapped. The speed of the update will depend on the protocol of the vehicle and the number of Pids being shown. Reducing the number of Pids selected will speed up the update of the display considerably. CAN vehicles have the fastest refresh rate and update, while all the other protocols are much slower. For more information re protocol's speed refer to www.elmelectronics.com/DSheets/ELM327DS.pdf.

LOGGING

There are two forms of logging, diagnostic and data. Diagnostic logging is on by default and data logging is off by default. Both items are available from the Setup menu and can be toggled either on or off.

Diagnostic logging is on by default. This means that for every connect session, a log file is built which displays all the commands and responses between the scan tool and the ECU for that session. This can be very useful for later analysis, but assumes knowledge of the documentation of ISO-15031-5. If you would prefer to turn logging off, it is controlled by the Setup | Log diagnostics to File menu item. If you click the item it toggles between checked and unchecked. Checked is logging on, the default.

With logging on a file is created for each session in the directory where the OBD 2007 executable resides. The naming convention for the file is "logddmmyyyy hhmms.txt". Please note that these

files can grow quite large during a long session and probably should be deleted when they are no longer required.

Data logging is off by default. Data logging is specific to the **Reads Pids** tab. Data logging files use a similar naming convention to the diagnostic log files, the only difference being the letters “OBD” inserted at the front of the name of the file. OBD logging does not contain raw data, but the actual values as shown on the **Read Pids** tab. These files are in CSV format and are therefore suitable for importing into Excel by the Excel data import wizard for further analysis. After you exit the program you will find a file with the following naming convention “OBDDLogddmmyyyy hhmms.txt.”

To import the data into Excel, copy the file to the desktop and use the following steps with the Excel import wizard. On step 1 choose Delimited and in file origin combo box choose Unicode UTF-8, then click Next. On the next window uncheck tab and check comma and then click Next. On the next window highlight the last column and select the radio button “Text” then click Finish and then OK. You will now have the data correctly formatted in a spreadsheet. The columns displayed are Pid number, Pid description, Value, Units and Time stamp. For the data logging file to be created you must choose the menu entry Setup | Log OBD Data to file prior to tapping the Read Pids menu item on the **Reads Pids** tab.

READINESS STATUS

The next tab is the **Readiness Status**. This displays the result of service \$01, Pid \$01 – the command is sent to the ECU by the scan tool. It will return the number of emission-related power train Diagnostic Trouble Codes (DTCs) and the status of the Malfunction Indicator Lamp (MIL). If the vehicle has more than one ECU that supports this service, there could be multiple responses e.g. power train and transmission ECU's. If more than one ECU responds there will be multiple entries in the combo box labelled ECU #.

This tab also displays the results of standardized Continuous and Non Continuous tests. Note that not all vehicles support each test, hence the supported column. If the test results in no DTCs and the MIL status as off – then all emission controls are in good working order. If however there are DTCs and the MIL is activated, then you will need to move to the **Trouble Codes** tab to read the DTCs (trouble codes) that caused the MIL to activate. Below you will find a typical **Readiness Status** display.

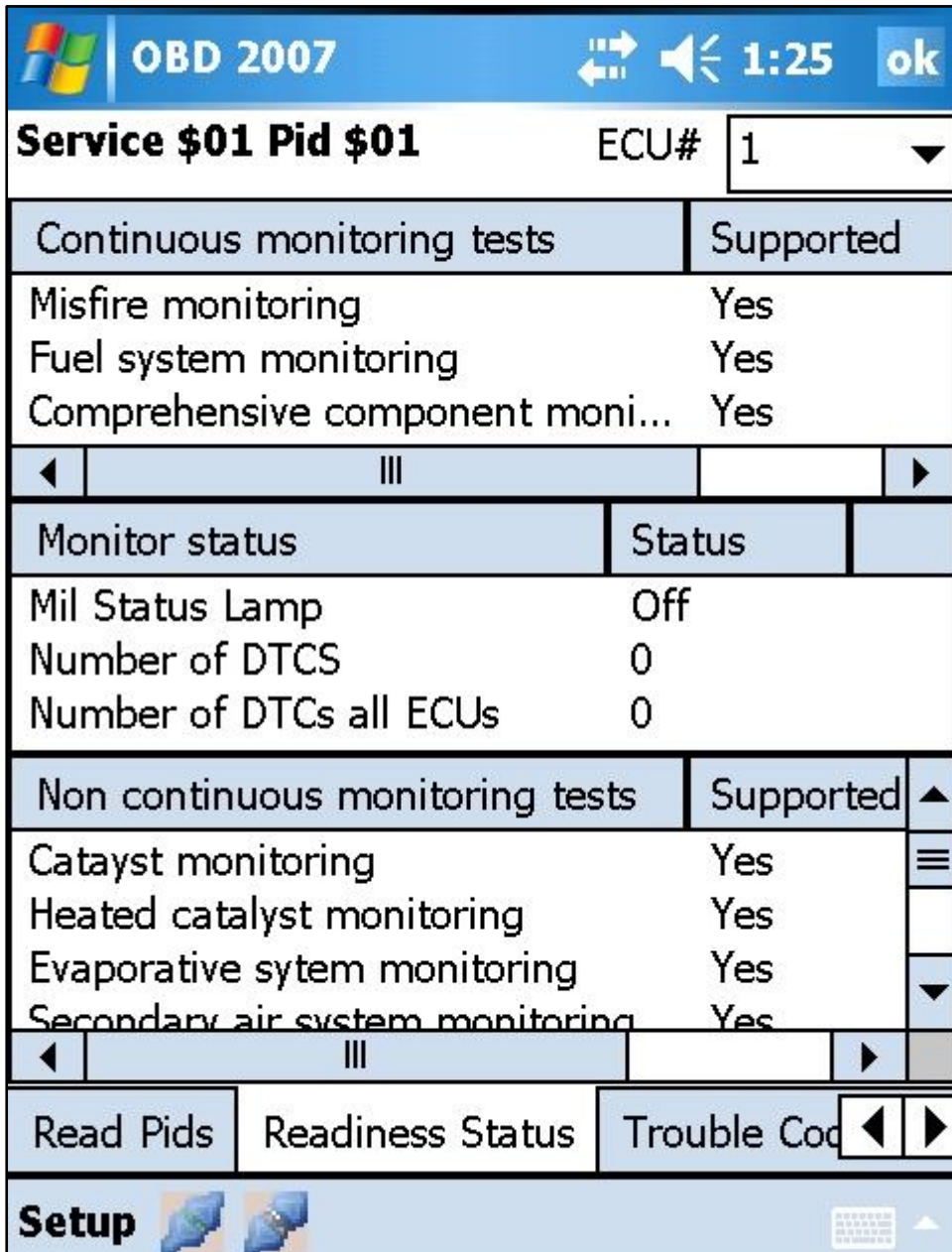


Figure 13 - Readiness status

DIAGNOSTIC TROUBLE CODES

If your vehicle has a problem, this is the tab that should guide you to solving the problem. When you tap the Read menu item the scan tool will send two commands to the ECU – two responses will be received for stored trouble codes or pending trouble codes. A list of trouble codes and their descriptions will be displayed in both panels if appropriate.

Now that you know what the problem is, it should be a relatively simple task for a technician or yourself to replace the defective part and repeat the test at the completion of the repair. When you are satisfied that the problem has been rectified, use the Clear DTCs button to turn off your MIL light and clear the existing DTCs. Note to turn off the MIL and clear the DTCs the engine must not be running, but the ignition should be on. *OBD 2007* will display a warning window, asking

you to confirm that you want the command executed. A typical "Trouble Codes" window is displayed below.

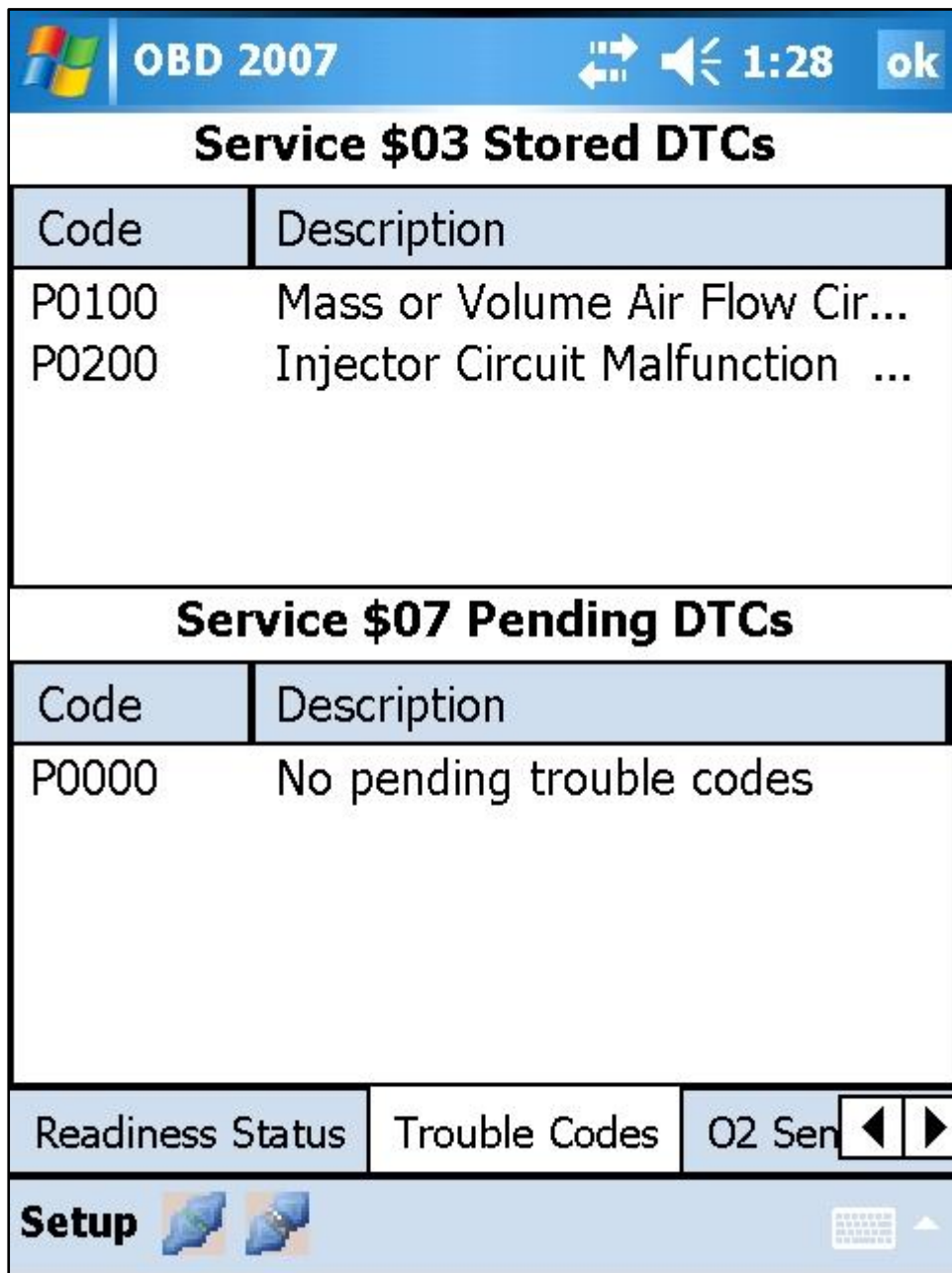


Figure 14 - Trouble codes

The following window will be displayed with you tap the Clear Troubles Codes menu item on the **Trouble Codes** tab

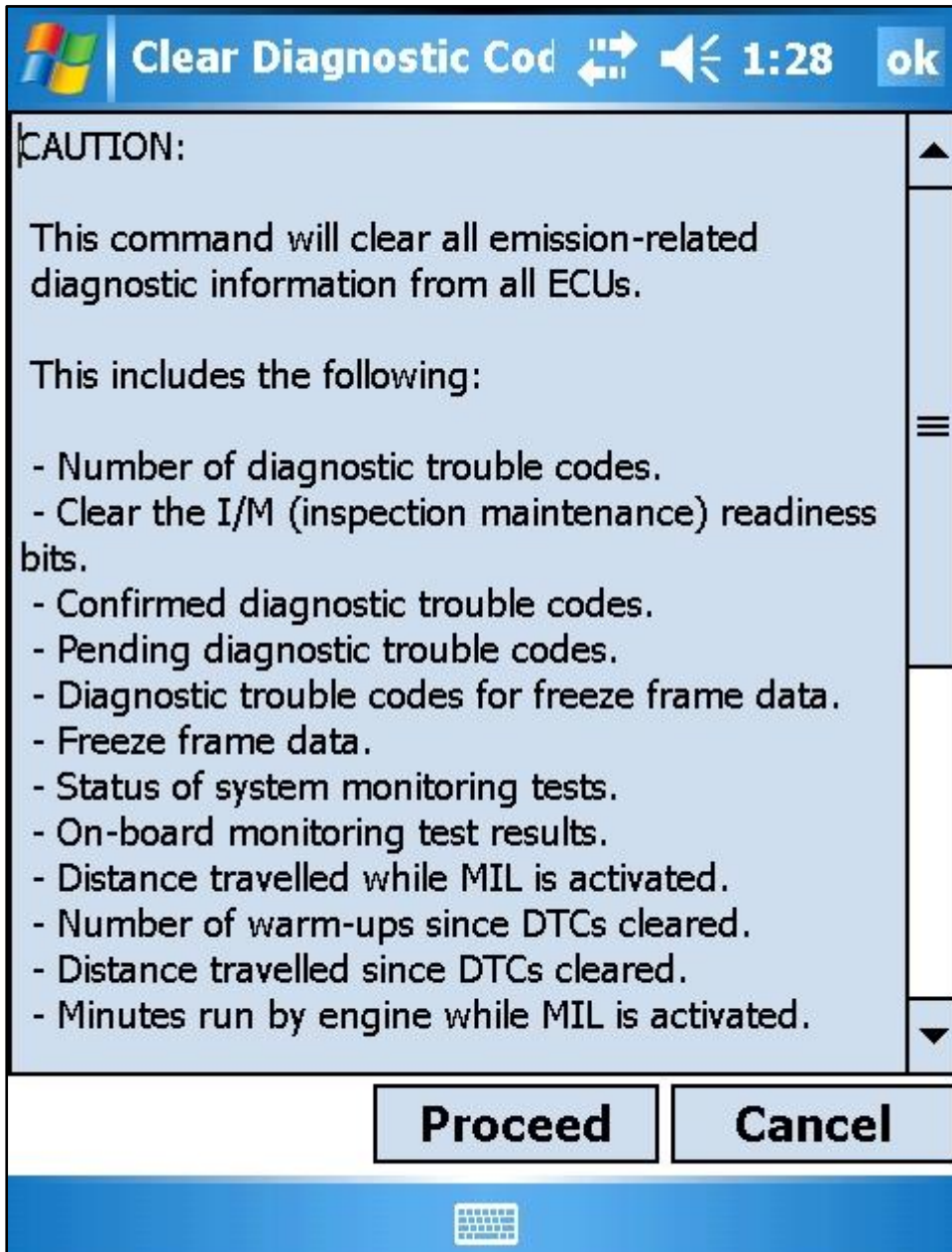


Figure 15 - About to clear DTCs

FREEZE FRAME DATA

If the vehicle has developed a fault, the freeze frame data will record the DTC that set the fault and provide a snapshot of the Pid data as it was at the time the DTC was set. This can be a great assistance in diagnosing the problem at a later time. Don't overlook this information when determining the reason for a fault.

The Pids supported by this service are very similar to the supported Pids as presented in the **Supported Pids** tab although usually they will be a subset of those Pids. The following window contains a typical display of a Freeze Frame window with a DTC set.

PID	Description	Value	Units
0x02	DTC that caused require...	P0100	-
0x05	Engine Coolant Tempera...	40	°C
0x0C	Engine RPM	1234	rpm
0x0D	Vehicle Speed	67	km/h

Figure 16 - Freeze frame data

OXYGEN SENSORS

The next tab **O2 Sensors** displays detailed information about each Oxygen Sensor. During the initialization sequence *OBD 2007* determines the location of the Oxygen sensors and the Test ID (Tids) that the Oxygen sensors support. The supported Oxygen sensors were first displayed under the **Supported Pids** tab. These will appear in the combo box at the bottom of the window. The supported Tids are not selectable, only the Tids supported by the test vehicle will be checked. Not all vehicles support service \$05 including CAN vehicles. See the **On Board Monitoring** and **On Board Monitoring (CAN vehicles)** tabs for more information re O2 sensors.

Oxygen sensor tests should be considered in conjunction with Pid 0x03 Fuel System status. When the engine is cold and during warm up, the O2 sensors are not used to adjust fuel trim and the Fuel System Status will report Open Loop. When the engine and O2 sensors have warmed up the Fuel System will go Closed Loop using the O2 sensor(s) as feedback for fuel control. It is possible for one Fuel System to be in Closed Loop and the other Open Loop, the O2 Sensors values should indicate which.

A typical O2 Sensor window is displayed below.

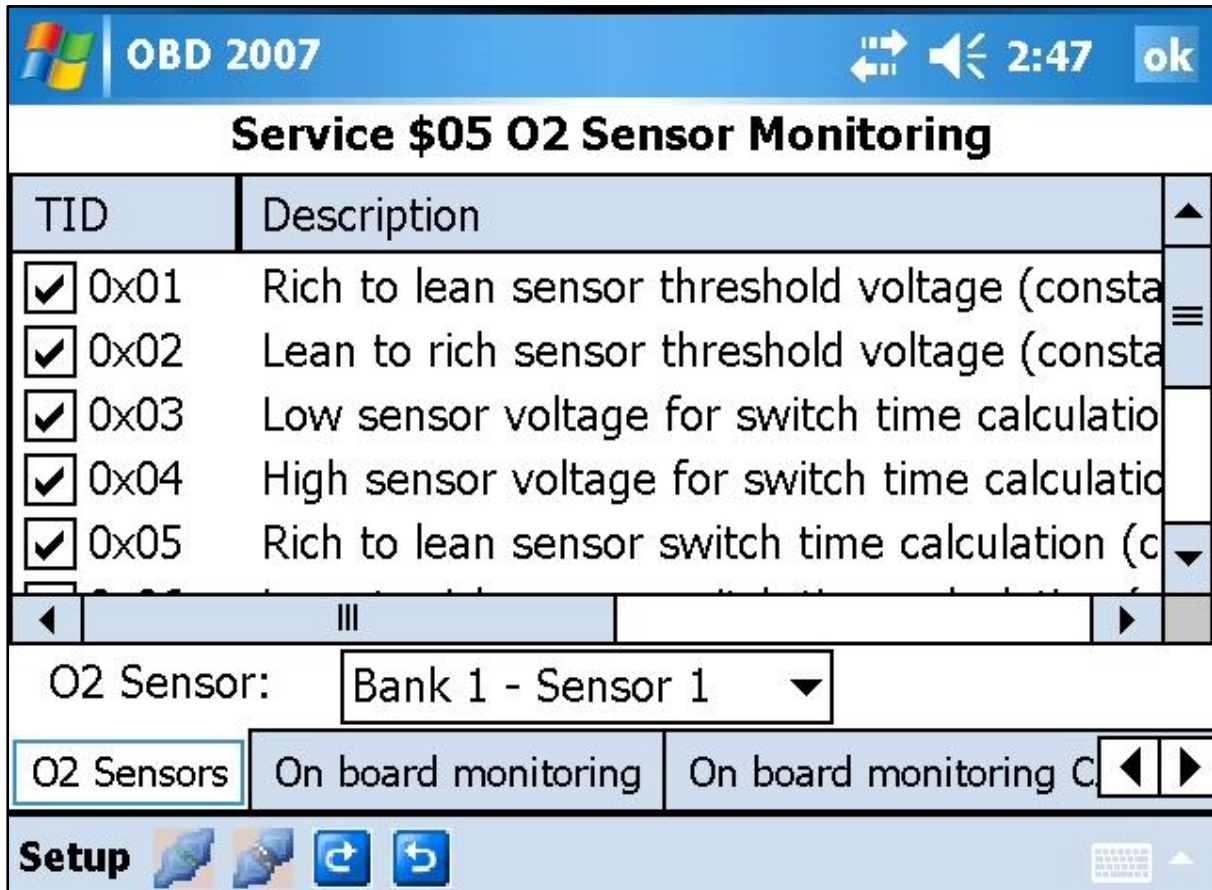


Figure 17 - Oxygen Sensors

ON BOARD MONITORING TESTS

There are two tabs for On Board Monitoring, one for non CAN vehicles and another for CAN vehicles. More information is available for CAN vehicles hence the extra tab.

On Board Monitoring includes standardised Test IDs plus manufacture specific Test IDs. O2 sensor information for CAN vehicles is only available via the **On Board Monitoring (CAN Vehicles)** tab as service \$05 is not supported for CAN vehicles. On Board monitoring allows access to the results of tests of specific components that are either continuously monitored (e.g. misfire monitoring) and components that are non-continuously monitored (e.g. catalyst system). The vehicle manufacturer is responsible for the assignment of manufacturer defined test ids and therefore you may have to consult the respective workshop manuals for the definitions of these test ids. The following window contains a typical display of an On Board monitoring window.

To read the results of each test you can scroll horizontally to see the results column. For any TestID that fails, the complete row will be drawn with a red background to help pin point the problem.

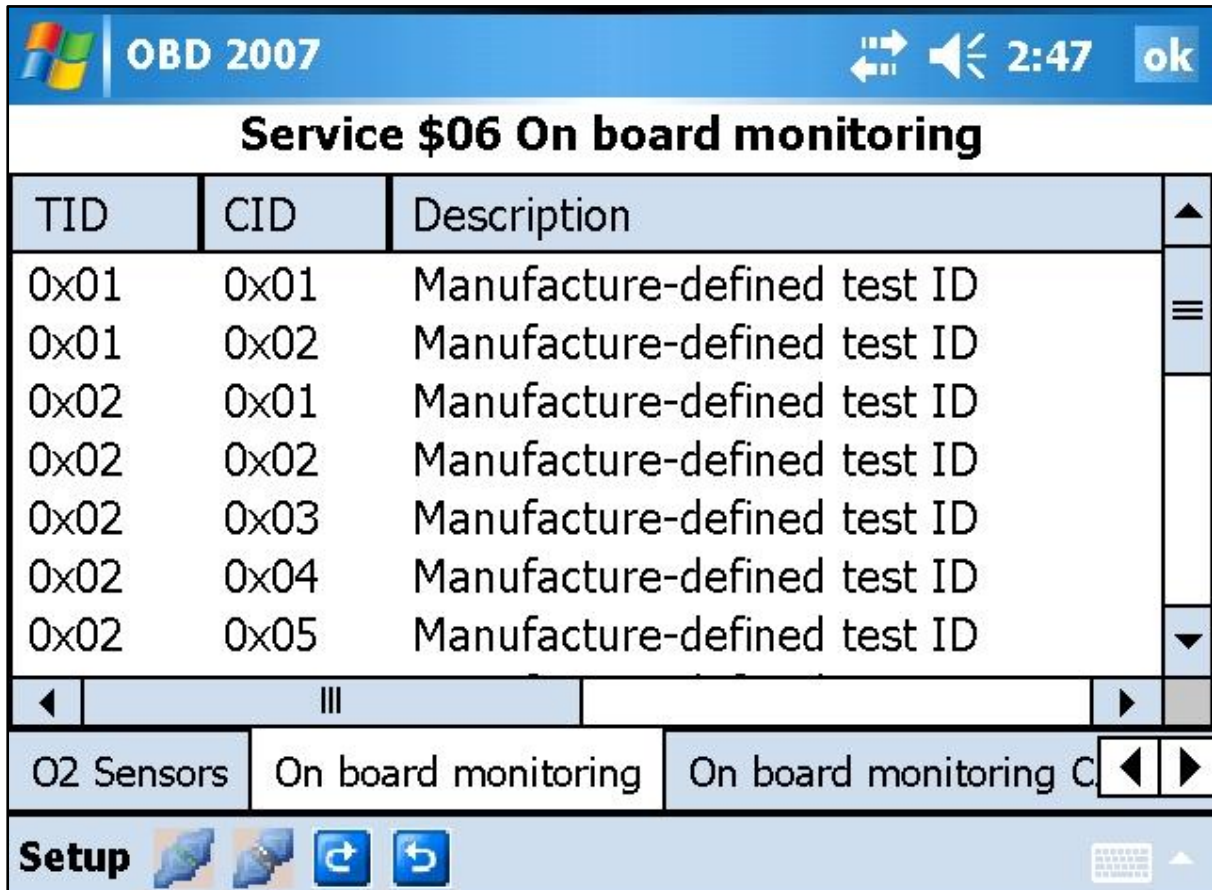


Figure 18 - On board monitoring

VEHICLE INFORMATION

Not all vehicles support service \$09. If your vehicle does not support this service the Read menu item will be disabled. Vehicle information includes items such as Vehicle Identification Number (VIN), Calibration Identifications and Calibration Verification Numbers for supported ECU's. If your vehicles supports InfoType \$08 this tab will also display In-use Performance Tracking.

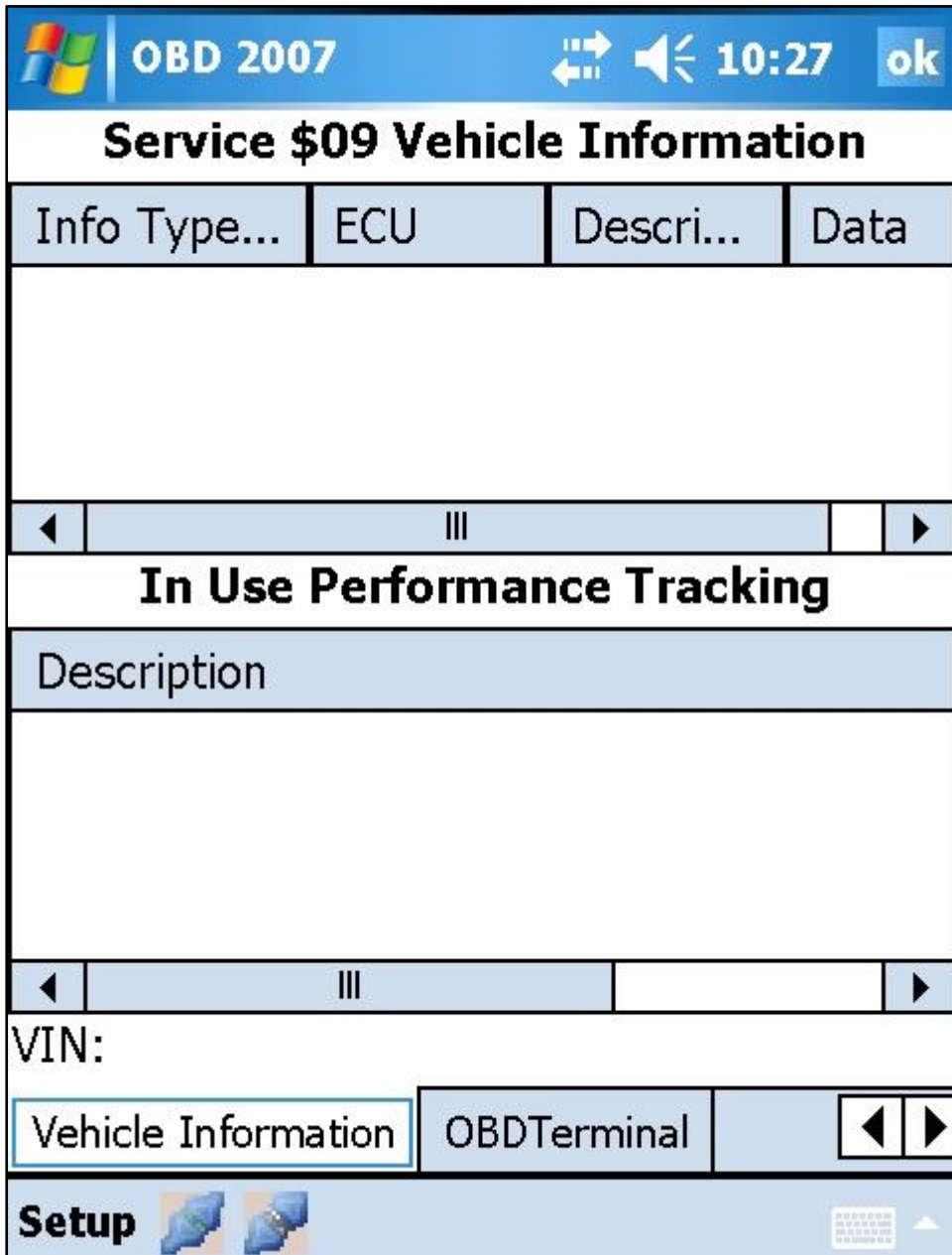


Figure 19 - Vehicle Information

OBD TERMINAL

The OBD Terminal tab is a convenience feature for advanced users and is not strictly OBD compliant. It performs a similar function to Hyperterminal in that it allows you to manually enter commands from OBD 2007 that can be addressed directly to the scan tool or the ECU of the vehicle through your OBD scan tool. It presumes you are familiar with the command set of the ELM 327 chip and are conversant enough to know what commands can be entered. ELM Electronics has detailed information about all the commands that can be issued through the OBD Terminal tab. See the follow datasheet for more information

<http://www.elmelectronics.com/DSheets/ELM327DS.pdf>.

Depending on what commands you issue from the OBD Terminal tab, it is recommended that after using OBD Terminal that you disconnect using the Disconnect button on the toolbar and then reconnect using the Connect button. When you Connect, *OBD 2007* runs through an initialization sequence and set many parameters. It is quite likely that the values of these parameters could be changed when manually issuing commands. Please note that it is very unlikely that you could damage your scan tool or ECU using the OBD Terminal feature, but we advise not using it if you are not familiar with the command set of the ELM 327 chip.

The following window shows a typical display of an OBD Terminal window.

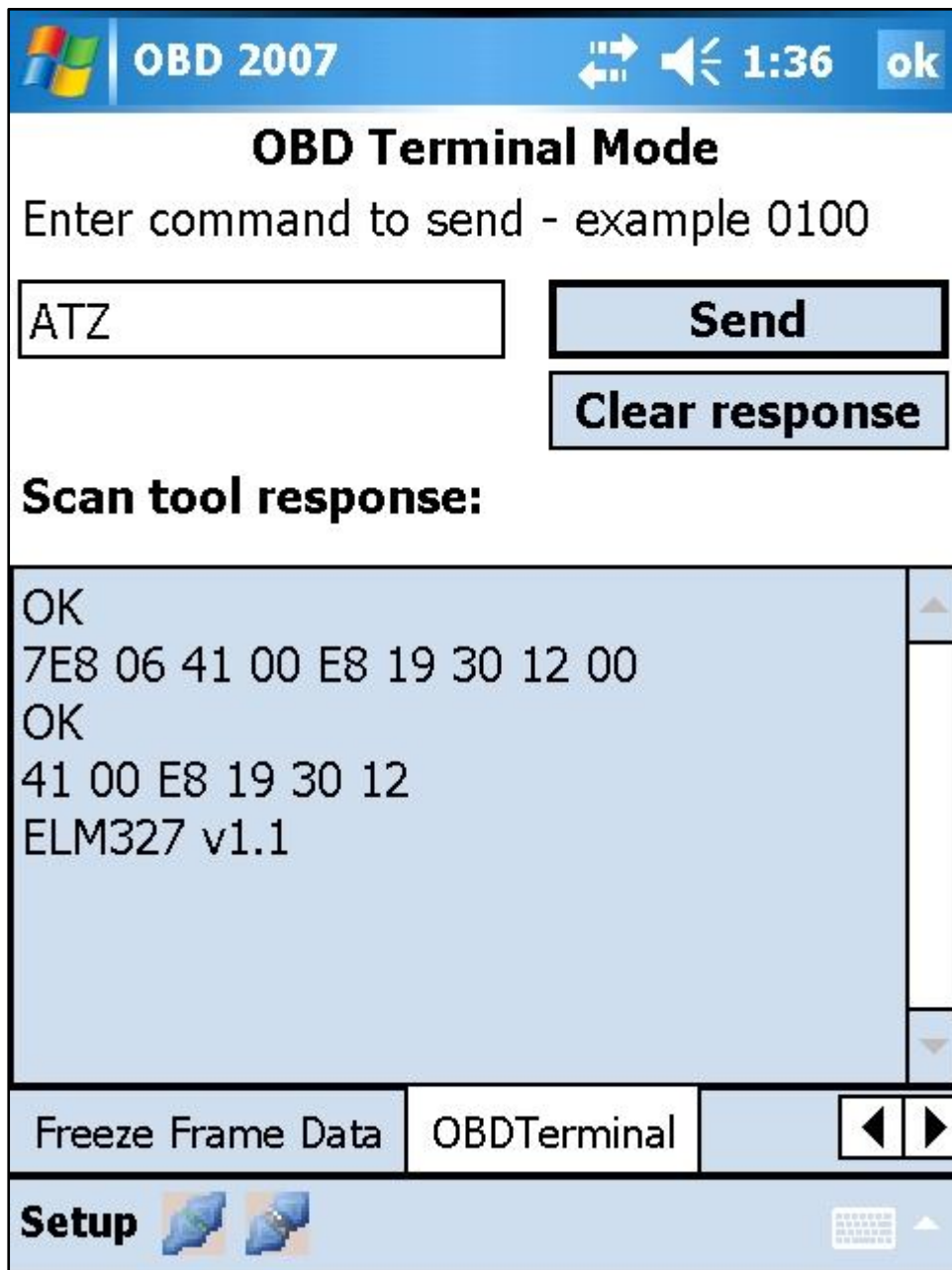


Figure 20 - OBD Terminal mode

CONNECTION TROUBLE SHOOTING FOR PC AND POCKET PC

There are 3 types of connections that can be used with the scan tools that *OBD 2007* supports.

Serial cables are usually only available on older laptops and desktop computers. Desktop computers aren't conducive to this type work because the computer needs to be connected to a vehicle via a scan tool.

USB/Serial cable or straight USB connection is the most common type of connection. Follow the instructions for installing the driver.

Bluetooth serial. This is an unwired connection between the scan tool and the laptop. Bluetooth serial is the preferred connection for our *OBD 2007 Pocket PC* and *OBD2007 Smartphone* product. At the time of writing Car-Pal is the only Bluetooth ELM327 based unit which works unmodified with *OBD 2007*. Scantool.net have recently released their ElmScan 5 Wireless unit. Both the non wireless ElmScan5 and the AllInOne scan tool can be adapted to use a Bluetooth Serial adapter Module. These types of adapters are available from Socket Communications www.socketcom.com and Aircable www.aircable.net. To be used successfully each of these products requires 5V power to power the BT radio of the adapter. The power can be sourced via pin 9 on the DB9 connector of the scan tool. Keep in mind that some models of the various scan tools will require modifications to bring power to pin 9. Please check with the scan tool manufacturer.

From reading most of the scan tool manufacturer's forums the most common type of problem reported is trying to connect to a non OBD-II compliant vehicle. At first glance this seems quite ridiculous, but it happens time and again. The reason for this is that although OBD-II has been a requirement in the US since 1996, it was not necessarily taken up by other countries until more recently, 2000 in the UK and Europe and 2006 in Australia. Some vehicles appear to be compliant because they have what appears to be an OBD-II connector. Before you buy a scan tool make sure your vehicle is OBD-II compliant. The various scan tool manufacturers do have links to sites that list a vehicle's OBD-II compatibility, but if in doubt check with the motor manufacturer or distributor in your country.

Each scan tool comes with detailed instructions for connecting to your vehicle, but still there are connection failures. Some of the connection failures are in fact due to poorly written software. If you are having connection problems – there is a tool on every Window's computer that should be able to solve the connection problem. Look under Programs | Accessories | Communications and you will find Hyperterminal and for those of you using a Pocket PC consider downloading Zterm, both products perform identical functions. That is they can communicate with the serial port on your computer and the scan tool.

If your computer can communicate with your scan tool through Hyperterminal then it will work with *OBD 2007*. There are only two requirements – make sure the scan tool is communicating with the correct serial port and that the baud rate is correct. When the Hyperterminal window opens go to File | Properties set the Com port and baud rate.

Now type ATZ, the command to reset the device and the response should be

```
ELM327 v1.1
```

If you get this response, then you know the connection is ok. If not, you have done something wrong during the setup or your vehicle is not OBD-II compliant.

For a complete description of using Hyperterminal refer to the following link

<http://www.scantool.net/support/index.php? m=knowledgebase& a=viewarticle&kbarticleid=25&nav=0,6>

BLUETOOTH CONNECTION NOTES FOR PC AND POCKET PC

Nearly all new laptops and Pocket PCs come with Bluetooth wireless support built in. The following are some notes to assist you in connecting a BT enabled scan tool. After installing the software for the first time, you will note that the Connect and Disconnect buttons on the Connection tab are disabled. This is because *OBD 2007* at this stage is not aware of which Com port to be used. For Bluetooth to be used successfully a virtual serial port has to be established before you can enter that serial port number into the *OBD 2007* Com port setup window. Since the BT radio has to be powered before it can work, unlike a USB/Cable connection, the BT scan tool must be connected to your vehicle via the OBD connector to successfully establish a virtual serial port for the BT scan tool. With the ignition switch on, the vehicle powers by the scan tool and the BT radio (see notes above for other types of serial adapters).

The following describes the procedure for a laptop computer, but the procedure for a Pocket PC is very similar and most Pocket PCs have a wizard to take you through the process. If your laptop uses a wizard just follow the steps on the wizard, if not click on the Bluetooth icon in control panel or on the taskbar. We know the BT service we want to use (Bluetooth serial) what we need the computer to do is scan for nearby devices that support that service. Once you start the search the computer should return a list of products within your "Bluetooth Neighbourhood". If there is an option to only show certain devices, make sure you choose all devices.

When the device is found it will be represented by an icon with a descriptive name describing the device. For example a Car-Pal unit will show Car-Pal OBD 100xxx – the xxx part of the number is different for each Car-Pal unit. The next step will show something like Car-Pal 100xxx AT Serial. You will then be asked to configure the BT unit. The configuration can either be secured or non secured – if you choose secure you will be asked to enter the pin number (usually 0000) of your BT scan tool. At the completion of the configuration a serial port number will be assigned, such as Com8. Please note this serial port number. This is the value you must select when you start *OBD 2007* and open the Com port setup window.

This is a once only configuration. *OBD 2007* remembers the Com port between successive uses of the program. Of course if you change back to USB/Serial cable at any time you would have to change the com port number to match the USB/Serial cable.

REFERENCES

International Standard ISO 15031-5 Available www.iso.org

SEA International SEA J1979 Available www.sae.org

Both of these are technically equivalent, but at the time of writing the ISO product appears to be more current.