Getting started with OBDCOM

Thanks for choosing OBDCOM!
In addition to being a guide to using the tool, this manual has some practical information and some tips you may find useful.

Warnings

DO NOT attempt to operate or observe a computer while driving!

- Diagnostics should be done while the car is STOPPED and PARKED SAFELY. ALWAYS OBEY ALL TRAFFIC LAWS.
- Most readings can be taken while stationary. If data must be obtained while moving, a passenger should operate the computer from the rear seat to avoid risk of injury.
- Read and follow all of the warnings and steps in this guide and in the Quick Start guide before using OBDCOM.
- You can drain the car battery by leaving the key in for long periods. Start the engine to keep the battery charged.
- Working on your own vehicle is done at your own risk. Safety precautions should always be taken, and you should seek advice from a qualified automotive technician.
- Always refer to a service manual for the vehicle before performing any repairs or disassembly.
- If any cables are visibly damaged, stretched, or pinched, do not connect the tool.
- If the interface enclosure (black box) has been opened or damaged, do not connect the tool.
- Any tampering with the tool voids your satisfaction guarantee and may void the warranty. Any returned tool that has been tampered with or physically damaged will incur a restocking fee. The interface enclosure is glued closed and the circuits will be damaged if opened.
- If the connectors on either end of the tool do not mate easily with the socket on the vehicle or on the computer, do not force them. Contact sales@obdcom.com if you are not sure about the connections.
- Never connect the tool to anything other than a standard USB port connector and standard OBD2 connector/socket in a car.

Your use of OBDCOM indicates your acceptance of all warnings. If you disagree with any of the warnings above, please email sales@obdcom.com

Setting up OBDCOM on the computer

Before you can use OBDCOM, you need to install the DRIVERS and the SOFTWARE on the laptop computer. The following explains how to do that step-by-step.

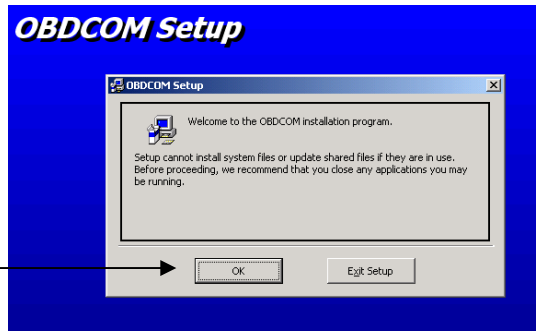
Installing the OBDCOM Drivers

1. Insert the OBDCOM software CD.
2. Wait at least 10 seconds for the computer to recognize the CD.
3. Open the **My Computer** icon on your desktop by double-clicking on it.
4. Open the **CDROM** icon by double-clicking on it.
5. Double-click **DRIVERS** to install the drivers.
6. A black box will appear on the screen for a few seconds, and then it will disappear.
7. Once the black box disappears, the driver installation is complete. You can continue on to the next section, **Installing the software**.

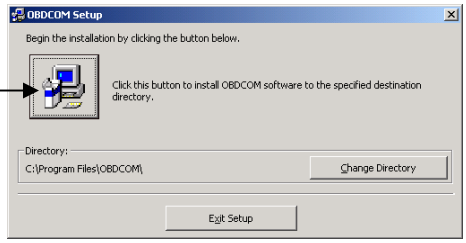
Installing the OBDCOM software

1. Exit ALL other software you have running on the computer BEFORE installing OBDCOM.
2. Put the OBDCOM CD in the CDROM drive. Give the computer time to recognize the CD.
3. Open the **My Computer** icon on your desktop by double-clicking on it.
4. Open the **CDROM** icon by double-clicking on it.
5. Double-click **SETUP** to start installing OBDCOM.

Click OK →

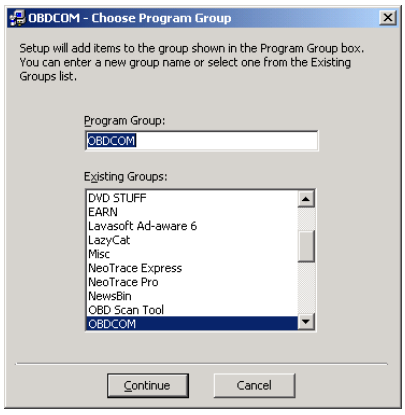


Click this button →



If you see messages that ask if you want to keep existing files, always answer **YES**

6. Keep clicking the **Continue** and **OK** buttons as needed to finish the installation



Making the connections

1. Read all of the warnings on page 2.

2. Connect the OBDCOM USB connector to a USB port on your computer.
   If you did not already install the drivers and software, stop now and go to page 3.

3. Locate the OBD2 diagnostic connector in your car. It should be similar to the picture below. This is usually under the dash on the driver's side, on almost 99% of vehicles. Usually it is more to the left, closer to the hood release. It can also be next to the center console. Sometimes it can be hard to find the first time. It may be covered by a cap or small door that you just pop off by hand. On a few cars, the socket is located near the ashtray. On a couple cars it is hidden behind the ashtray or behind the coin box. It is always INSIDE the car, near the driver, not under the hood. Plug in the OBDCOM interface. Make sure it slides onto the socket completely, but do not use excessive force. It may be necessary to wiggle it a bit.

4. Turn the car's ignition switch to the RUN position. When the key is in the RUN position, the dashboard should light up.

5. It is not necessary to start the engine to use OBDCOM. **In fact, some trouble codes can not be cleared from the car unless the engine is stopped.** When the engine is running, you can, of course, view more real-time diagnostic information.

6. Leaving the key in the "run" position for long periods can drain the car battery. Be sure to start the car if you are going to be doing diagnostics for an extended period, so that the battery is kept charged.

Starting OBDCOM for the first time

1. Power up the computer and let Windows finish loading. If you have not installed the software and drivers yet, go back to pages 3 and 4.
2. **You should not run any other software while using OBDCOM**, **especially Palm-Sync and Hot-Sync**, and even some virus scanners that run in the background. These programs can interfere with the communications and result in error messages when you try to use OBDCOM. For best results, shut down all other programs before using OBDCOM.
3. Click the Windows Start button, then Programs, then find OBDCOM in the list and click on it. Once it opens, you should see the main OBDCOM screen:

4. **You do not need to change anything in the Setup screen**. OBDCOM configures itself and locates the hardware automatically.
5. If you do not have the OBDCOM cable connected to the car now, go back to page 5 and follow those steps before going any farther.
6. If you have the OBDCOM cable connected to your car and computer now, and the ignition key is in the RUN position, you can click the CONNECT button now to attempt to communicate with the car.
7. The Connection Status indicator at the bottom of the OBDCOM window, shown below will changes colors to let you know if the computer and the car are communicating. It may take several seconds for the computer and car to establish the connection.

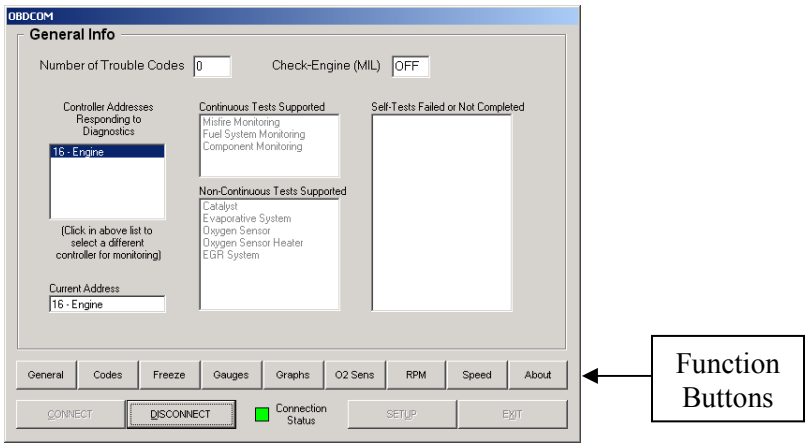
Black = Not connected
Yellow = Trying to connect
Green = Connected
Red = Connection interrupted

If you get an error message, please see the online troubleshooting guide:

www.ToolError.com

If followed closely, that guide will solve 99% of the problems that you may have trying to get a connection to the vehicle.

8. Once the Connection Status is steady green, the display will change to show some general diagnostic information, similar to the picture below.



9. Now you can click the Function Buttons to explore the diagnostic information. The next section of the manual covers what each function does and how you might use it to help fix your car. First, a quick summary of the functions:

General Shows the status and results of the diagnostic tests that the car automatically performs on its own. These tests may show up as “incomplete” if you have recently cleared trouble codes. From this, you can check what is called the "readyness" of the vehicle to pass an emissions test.

Codes Shows any diagnostic trouble codes (DTC) stored in the car’s engine control unit (ECU). Also has a description for most known codes.

Freeze Shows the freeze-frame (if available). This is the condition of sensors in the vehicle when a DTC was stored, like vehicle speed or intake temperature.

Gauges Shows real-time sensor data as digital or analog gauges which can be arranged on the windows desktop.

Graphs Shows real-time sensor data in graphical form.

O2 Sens Shows the measurements from the oxygen sensor(s) in the car and how the computer is compensating.

RPM Displays a single RPM (tachometer) gauge.

Speed Displays a single speedometer and allows a rough measurement of acceleration time.

Using OBDCOM

The rest of the manual is divided up by function. It is best to read the entire manual from beginning to end, but if you want, you can skip quickly to the section you are interested in.

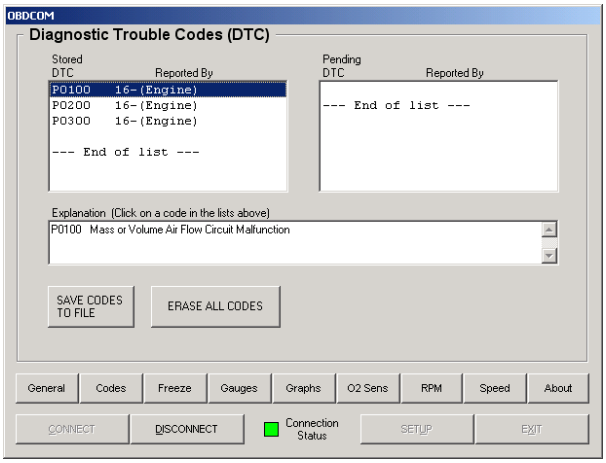
Reading and clearing trouble codes

Diagnostic Trouble Codes (DTCs) are stored by the car's onboard computer (ECU) whenever a problem is detected. Some problems need to happen more than once before the check-engine light is turned on. If a problem was detected, but the check-engine light isn't on, this is a "pending" DTC, meaning as far as the ECU is concerned, it isn't a serious enough problem to alert the driver yet. Other problems will cause the check engine light to turn on right away. Those we refer to as "stored" codes because they stay until the problem is fixed, and then the check engine light needs to be cleared. If a pending DTC happens enough times, it will become a stored DTC and the check-engine light will go on. Sometimes when the check engine light is on, the car goes into "safe" mode, or "limp home" mode, where it uses a safe set of running parameters and bypasses whatever sensor is giving bad readings. Usually the car runs poorly while in this safe mode, and it will stay that way until you fix the problem and/or clear the error code. DTCs usually start with the letter "P" and have 4 numbers following. It is important to include all of the zeros when talking about DTCs.

Establish the connection with the car as usual, and click the **Codes** function button. In a few seconds you should see the screen shown here.

Hopefully you don't have any trouble codes. If you do, click on a DTC in the list to see a short explanation in the box below it.

There are few things you can do with this information… You can write it down or save it to a file for later reference (good idea). You can also erase the error codes, and hope they don't come back. If they do come back, you can decide whether you want to tackle the problem yourself, or go to a repair shop to get it looked at. If you decide to go to a repair shop, at least you will have an idea of what is wrong and not have to worry about whether the mechanic is trying to take your money.

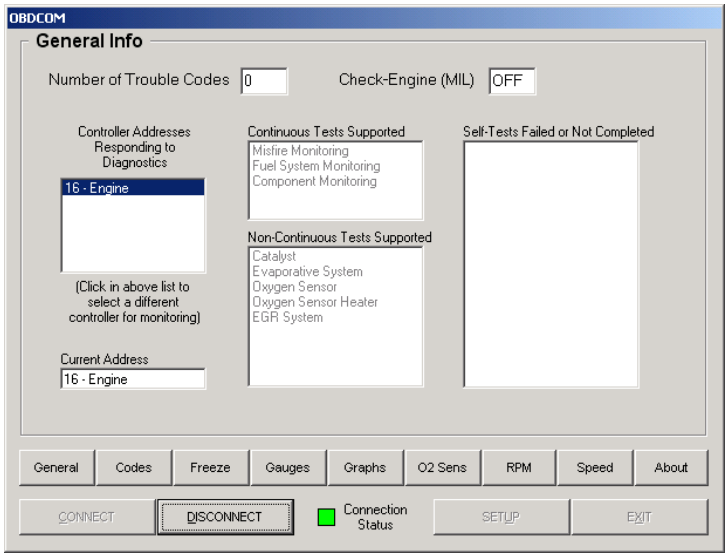


NOTE: When you erase codes, you also clear all of the self-tests your car does while you drive. Some emissions inspections check to see if the self tests are completed. **It is NOT advisable to clear error codes right before you bring your car in for an emissions inspection. They may fail the car if the self-tests are incomplete.** The car generally needs to be driven for 2 days to allow for the self-tests to finish. See page 10 for more details on self-tests.

If you prefer the do-it-yourself route, it is unfortunate that the software really can't tell you how to FIX the problem. You need to either consult a service manual, or make use of the internet to find out what other people have done to fix this kind of problem. There are hundreds of websites where people share information about repairing their cars. Most of these websites are specific to just a few makes or models of cars, so you can get specific information for free by searching the discussion forums on those sites. Just search for the DTC (in the example above, P0100 is one of them). Keep in mind that most of these people online are not experts. They are do-it-yourselfers and might not have all their facts straight, but the online forums are still a valuable tool to point you in a direction to hopefully help you fix your car. Feel free to contact us and we can help point you in the right direction too.
There is NO substitute for a good service manual.

Checking status of built-in self-tests

Your car continuously runs tests on itself, checking to see if anything is wrong. This involves checking if any sensors are giving strange readings that are not what the ECU expects for a given set of conditions. These tests are run while you drive, depending on the driving conditions. Emissions inspections in some states use these pass/fail indications to decide whether the car will pass inspection. The results of these tests are stored and you can check to see if they are completed or if they failed. To display the following screen, click the **General** function button.



The "Tests Supported" lists show what tests your car does on itself. "Failed or Not Completed" lists those tests that either have not finished running or have failed. If a test actually fails, you will usually get a check engine light, or at least a pending DTC, so anything in this list is usually just not completed yet. Sometimes your car just doesn't get a chance to complete a test because of the driving conditions. Also, right after you clear error codes, usually all of the tests move to the "Not Completed" list. During the next few drives, your car will perform the tests again and the list will eventually be empty again as shown in the example above, unless there is still something wrong with the car. **Note that for this reason, it is NOT advisable to clear error codes right before you bring your car in for an emissions inspection. They may fail the car if the tests are incomplete.** If you have repairs to make and codes to clear, plan on doing that several days before you have an inspection appointment, so that you have enough time to drive the car and let it complete the self-tests.

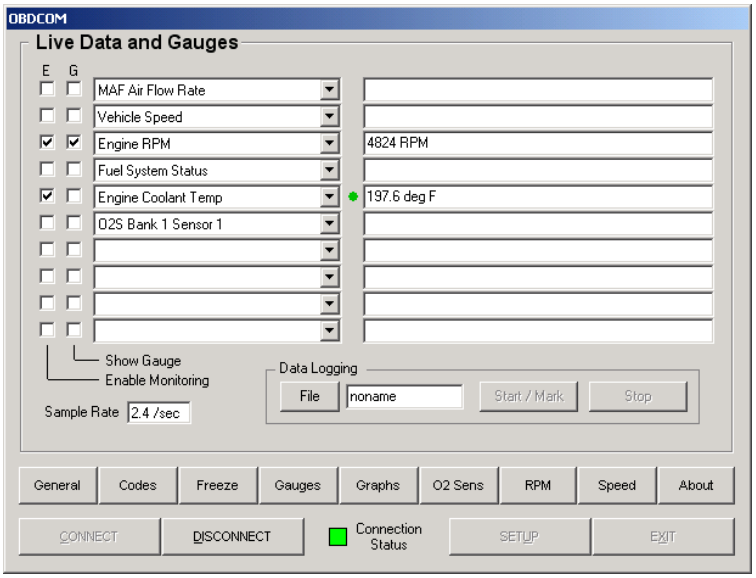
From this General Info screen, you can check what is called the "readyness" of the vehicle to pass an emissions test. A clear right column means all the self-tests have passed.

Displaying real-time sensor data

DO NOT attempt to operate or observe a computer while driving!

This is usually considered to be the "fun" part of having a computer connected to the car because you can see what is going on with the sensors as it happens, in real-time. The data can also be very useful to help you track down a problem with your car that only happens sometimes under certain conditions. You can also log the data to a file to examine it more closely later.

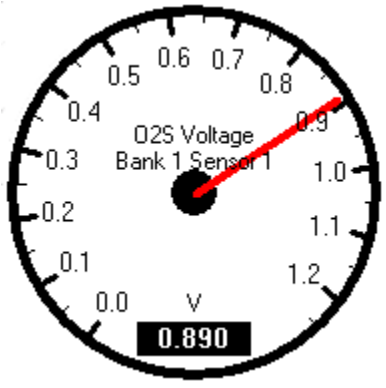
First, click the **Gauges** function button. You will see the following display.



OBDCOM can monitor up to 10 sensors simultaneously. Because of the way the OBD2 system works, the sensors must be read one at a time, sequentially. If you monitor more sensors, the update speed gets slower, so you should monitor only the sensors necessary to get the job done.

Think of the ten rows on this screen as channels. You get to pick what is on each channel, and whether that channel is working or not. The first column with the letter "E" above it is used to **E**nable a channel. The second column with the letter "G" is used to turn on a **G**auge for that channel. The third column lets you select which sensor is monitored on that channel. The fourth column will display the data coming from that sensor.

For example, if you want to view the Engine RPM, first find it in the third column, or use one of the drop-down boxes in the third column to select it manually. Then, Enable monitoring of that sensor by checking the box under the "E" column. The data should immediately begin to display in the fourth column. If you want to see a Gauge, check the box in the "G" column. The gauge should appear on the screen. You can drag the gauge around with the mouse, and you can switch it between analog and digital display by right-clicking on it with the right mouse button.



There are two sizes for the analog gauges. The first two channels have large gauges, and the rest of them have the smaller gauge shown here. If you want a particular sensor displayed with a large gauge, then use one of the first two channels to display it. You can get a digital style gauge by right-clicking the gauge face.

Logging sensor data

Once you have enabled one or more "channels" of real-time sensor data (see page 10), you can start saving this data to a file to be examined later. Click the **File** button. You should browse to a folder on your computer that you can easily find, like "My Documents". Enter a file name to save the data to. The connection to the car may be temporarily interrupted (red connection indicator) after completing this step, but it will return to normal after a few seconds. To begin saving data to the file, click the **Start/Mark** button. The "Data Logging" caption will flash to let you know it is saving the sensor data. If you want to set a mark in the file (a sort of bookmark), you can click the Start/Mark button again. This can be useful to mark off a particular event in the file, such as a left turn or something else of interest. You can do this as many times as you want. To stop logging, just click the **Stop** button. The file is saved at that point. You can start again, and the new data would be added to the end of the file.

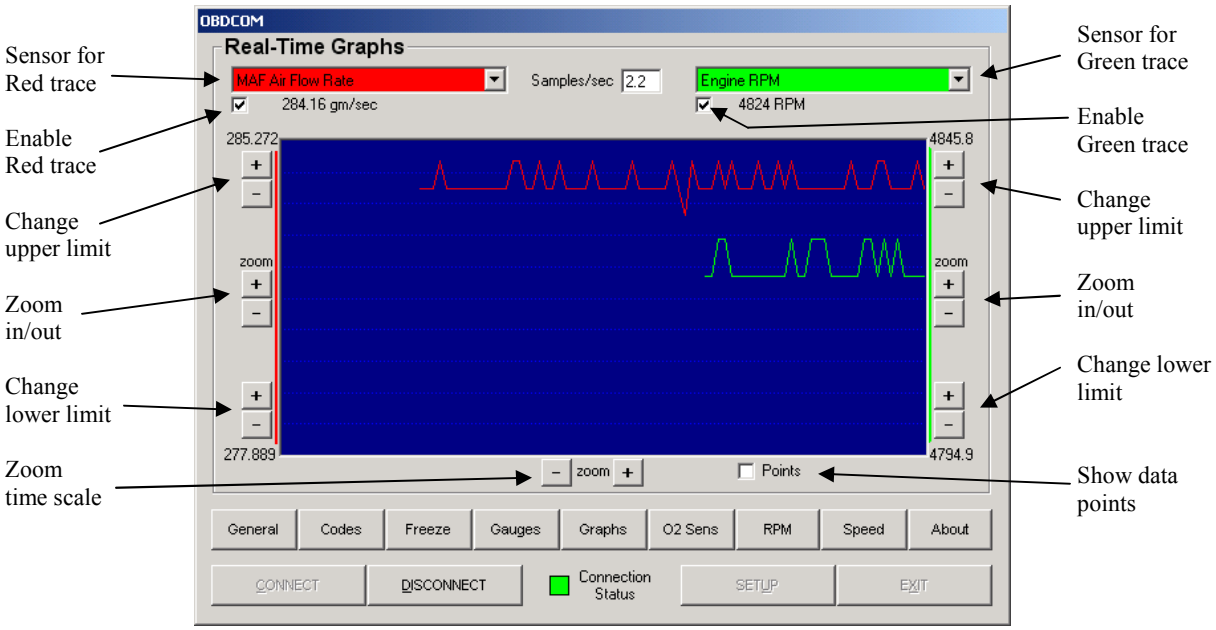
So what do you do with the log file? The file format is CSV, or "comma separated values", which is a standard spreadsheet format. After finishing with OBDCOM, open the file in Microsoft Excel or any spreadsheet program that reads CSV files. In Excel, you can view the data, do calculations on it, and even generate charts and graphs. For more on how to do this, you should consult the documentation for Excel. Below is an example of what you see in Excel when you open the CSV file.

193				
194	Time	MAF Air Flow (gm/sec) [0~327.675]	Time	RPM (1/min) [0~8000]
195	9:42:32 PM	284.16	9:42:32 PM	4824
196	9:42:32 PM	284.16	9:42:32 PM	4824
197	9:42:33 PM	284.16	9:42:33 PM	4824
198	9:42:33 PM	284.8	9:42:33 PM	4824
199	9:42:33 PM	284.16	9:42:34 PM	4824
200	9:42:34 PM	284.8	9:42:34 PM	4824
201	9:42:34 PM	284.16	9:42:34 PM	4824
202	9:42:35 PM	284.16	9:42:35 PM	4824
203	9:42:35 PM	284.16	9:42:35 PM	4824
204				

Line 194 above is the heading line. This obviously tells you what each column means when you started logging data. Every time you click Start/Mark you will get a new heading line in the file.

Displaying graphs

Real-time graphs can be used for any number of things, one of which is to visualize a correlation between two sensor readings. Say the engine stumbles when you rev to a particular RPM. Maybe you could monitor other sensors to see which one changes suddenly. A better example might be for checking oxygen sensors which have a signature waveform that constantly cycles up and down as the ECU constantly tries to compensate and adjust the fuel mixture. A sensor that has a weak or irregular signal compared to others, or compared to known correct values, would be one to take a closer look at. Once you have clicked the **Graphs** function button, refer to the diagram below.

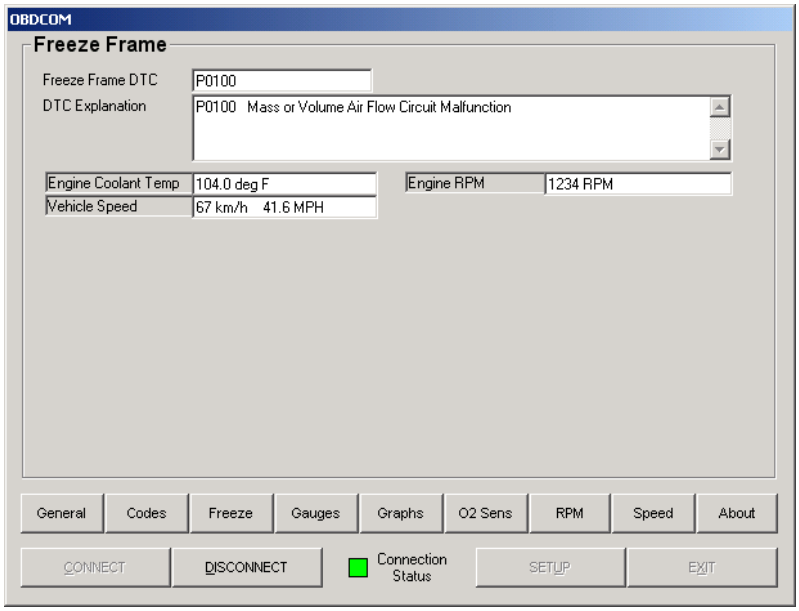


Sometimes a picture is worth a thousand words. The graphs may help you quickly see a problem better than just looking at columns of numbers or gauges. Similarly, the functions of all the controls on the graphs screen are easier to learn just by using them and observing how the display changes, rather than reading about them.

You can select the sensors to monitor for the red and green traces by clicking the drop-down box and making a selection. The purpose of the Enable checkboxes here is so you can turn off one trace and achieve a higher sampling rate with just one sensor being graphed. The upper and lower limit buttons let you shift the trace up and down by changing the end points on that axis. The zoom buttons for each axis of course stretch the trace vertically. The time scale Zoom buttons let you display more or less of the data in the width of the window. The effect this has is to either keep more of the trace on the screen for a longer time or to spread the points farther apart and make the trace move faster across the screen. Show data points puts small tick marks on each sample point on the trace.

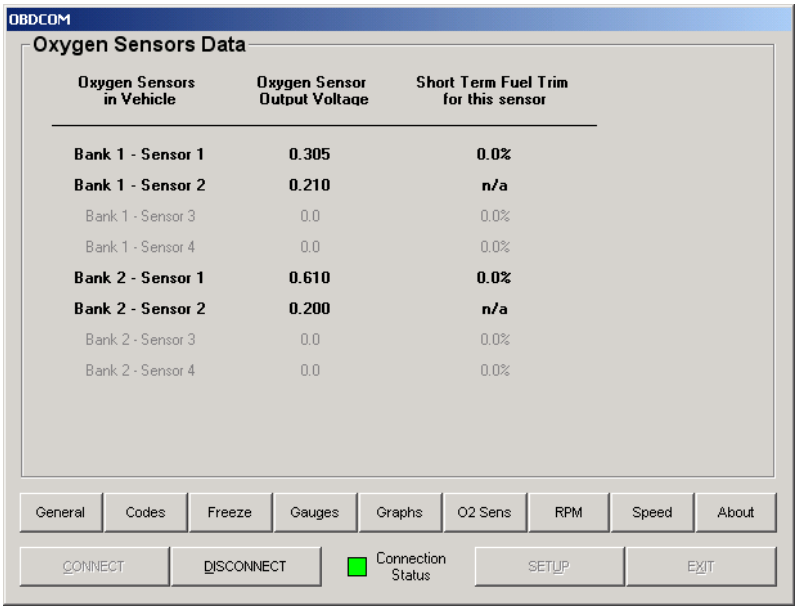
Viewing Freeze-frame data

On many cars, when a DTC is stored that triggers the check-engine light, a "freeze frame" is also stored to show you what else was going on at the time the malfunction occurred. Click on the **Freeze** function button to bring up the following screen. In the example below, when DTC P0100 was stored, the ECU logged the coolant temperature, engine RPM, and vehicle speed at the same time. Having this information may help you better understand the cause of the DTC.



Checking O2 sensor information

The oxygen sensors are an important part of the feedback system that allows your car to maximize power and economy while reducing emissions under all operating conditions. There are oxygen sensors located close to the engine that are used to regulate the fuel delivery in real-time, and there may be others that are farther down the exhaust system. The lower numbered ones are closer. When the ECU is using oxygen sensor data to regulate the fuel delivery, it is said to be in "closed loop" mode. If an oxygen sensor malfunction is detected by the ECU, it is forced to run in "open loop" mode, because it doesn't have the necessary feedback information from the exhaust gases to decide how to regulate fuel and air. Other conditions that cause open loop mode are when the engine is first warming up, or under hard acceleration. This is done to keep the engine running safely under unfavorable or extreme conditions. Long term fuel trim is how much the ECU is compensating to maintain the desired rich/lean fuel-to-air mixture. Long term fuel trim is the result of the ECU's learning over time how the system performs (since each car is a little different), so next time you start your car, it is ready to run just about as well as it did yesterday and the day before. This value varies very slowly over a long time. Short term fuel trim shows how much the ECU is compensating given the oxygen sensor reading that it has at that instant. This value usually changes constantly while the engine is running. Any unusual behavior here might be a sign of a bad oxygen sensor or wiring. When you click **O2 Sens**, this screen will help you check the sensors and check for unusual readings. For a more thorough explanation of how oxygen sensors and fuel trim work, you may wish to do a search for "Oxygen sensor operation" online. **NOTE: Some cars use a "wideband" oxygen sensors, or Lambda sensors. Those readings do not appear on this screen. You can see the reading from the wideband sensors on the 'Live Data' or 'Graphs' screen in OBDCOM.**



Using the speedometer display

DO NOT attempt to operate or observe a computer while driving!

DO NOT violate any traffic laws!

The main purpose of the speedometer display is to do approximate acceleration tests. Enter the start and end speeds, then "arm" the timer and begin accelerating. The timer will start as soon as the lower speed has been passed and stop when the higher speed has been exceeded. The accuracy of this test is unfortunately limited to how quickly the data can be read from the ECU.