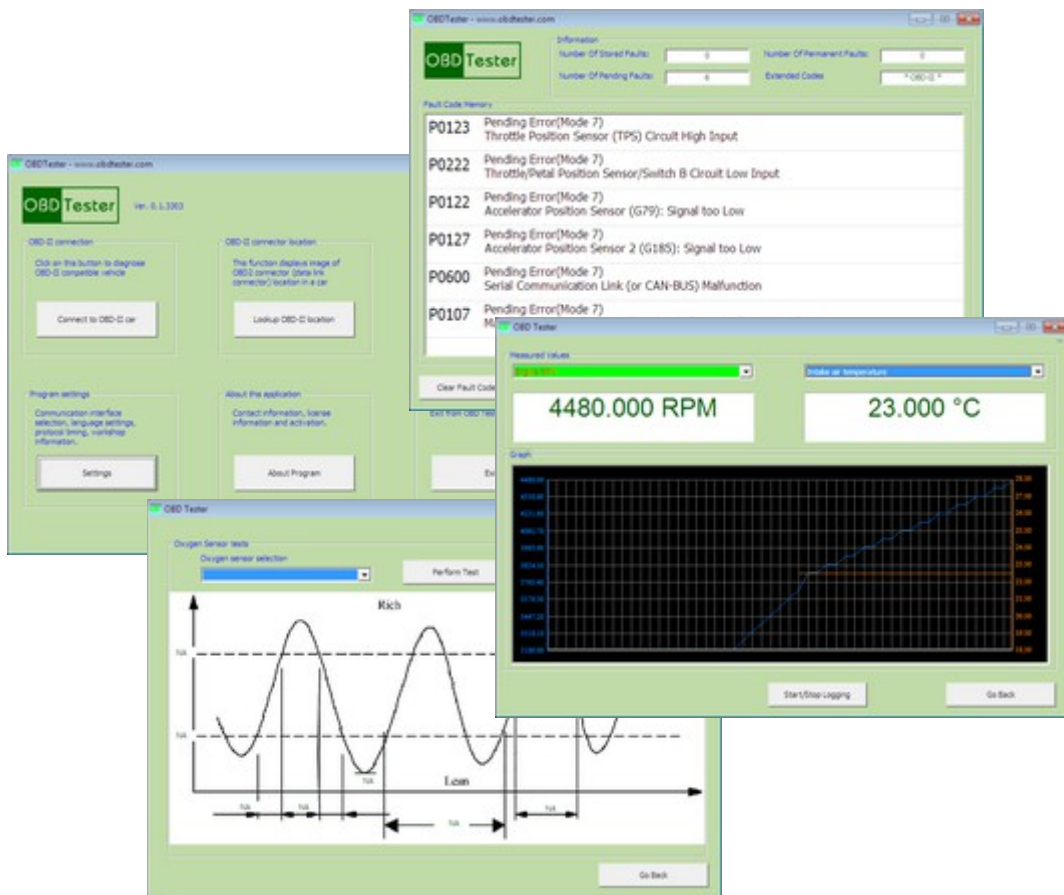


# OBD Tester user manual

[www.obdtester.com/](http://www.obdtester.com/)



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# 1 Introduction

Thank you for purchasing the ELM-USB diagnostic interface and OBDTester software. ELM-USB interface and OBDTester software are powerful and professional tools for automotive diagnosis. Please read carefully this User Manual before using the product.

We hope you'll find our products useful. In case you have any questions, problems or feedback please contact as at [support@secons.com](mailto:support@secons.com).

## 1.1 OBD-II diagnostics

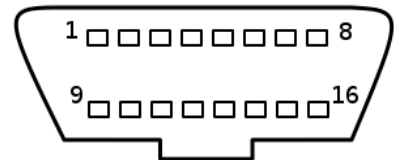
On-board diagnostics - OBD-II are standards related to vehicles diagnostics and reporting capability related to emission system (engine, gearbox, etc.). It's available on vehicles manufactured since 1996 in USA and since 2000 in Europe. These standards are mandatory in European Union since 2001 for petrol engines and since 2003 for diesel engines. These standards are often referred to as EOBD.

OBD-II standard makes possible to read diagnostic trouble codes, control units (ECU) state, sensor values, perform tests, etc.

Standards included in OBD-II and supported by OBDTester software are ISO-9141, SAE J1962, SAE J1850, ISO-14230 (KWP-2000) and ISO-15765 (CAN-BUS).

## 1.2 OBD-II connector

The OBD-II specification defines standardized hardware interface— female 16-pin (2x8) J1962 connector. The OBD-II connector is required to be within 2 feet of the steering wheel (unless an exemption is applied for by the manufacturer, in which case it is somewhere within reach of the driver).



Shape of connector is shown on the right hand side picture. OBDTester allows to display location of connector in vehicles.

Example list of vehicles supported by OBDTester is at <http://www.obdtester.com/carinfo/>.

The ELM-USB cable which is part of the product is used to interface between the OBD-II connector in the vehicle and the computer.



### **1.3 Supported OBD-II protocols**

ELM-USB and OBDTester support all of 5 OBD-II protocols - SAE J1850 PWM, SAE J1850 VPW, ISO9141-2, ISO14230-4 (KWP2000), and since 2003 also ISO 15765-4/SAE J2480.

*Note: Some products advertise support for 9 or even more protocols. This is because they mistakenly count protocol variants as separate communication protocols. If you add 4 variants of CAN-BUS to our list, you are on 9.*

### **1.4 Supported OBD-II modes**

Full OBD2 mode support (Mode 1 to Mode 10/0xA):

- Mode 1: Measured values, readiness code, OBD2 status
- Mode 2: Freeze frame
- Mode 3: Fault codes
- Mode 4: Fault codes clearing
- Mode 5: Oxygen (lambda) sensor tests
- Mode 6: Non-continuously monitored tests
- Mode 7: Fault codes
- Mode 8: On-board devices controlling
- Mode 9: Vehicle information (VIN code, part number, etc).
- Mode 10/0xA: Fault codes

### **1.5 Functions**

- OBD-II state and readiness codes
- Identification
- Vehicle manufacturer specific DTC codes support
- Printing of DTC
- Measured values
  - Graphical and textual measured values
  - Log if values in format compatible with VCDS VagScope
- Oxygen sensor tests
- Measurement of non-continuous values
- Measurement of engine torque
- Actuators tests
- OBD-II connector (DLC) location image database
- OBDTester is optimized for use on Netbooks such as Asus eee
- Program runs on multiple x86 platforms (Microsoft® Windows®, GNU/Linux, ...)

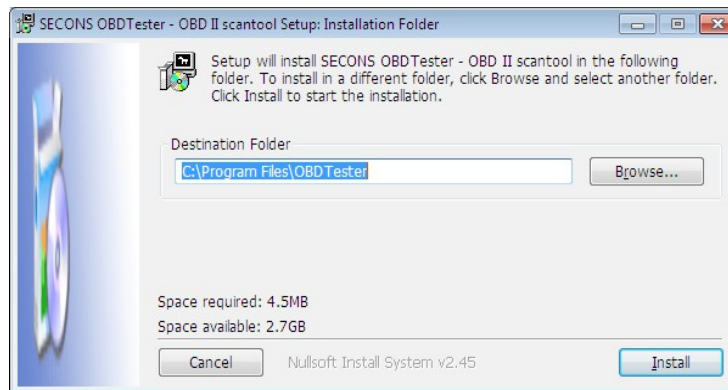
## 2 OBDTester software and drivers installation

### 2.1 Microsoft Windows operating System

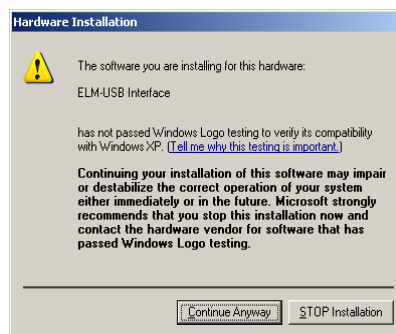
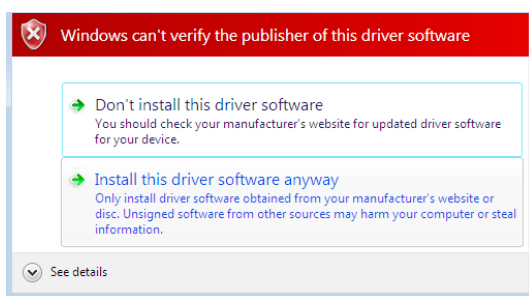
1. Insert OBDTester installation CD to your CD-ROM drive
2. Run installation file OBDTesterSetup.exe
3. Choose language for the installer



4. Choose your destination folder for the OBDTester



ELM-USB drivers are automatically updated during the OBDTester installation. When prompted to install „unsigned“ drivers, click on *Install this driver software anyway* (Microsoft® Windows® 7) or *Continue Anyway* (Microsoft® Windows® XP. ).



Microsoft® Windows® will automatically install drivers when you plug-in the ELM-USB to USB port.

Driver installation isn't required for operation on GNU/Linux system.

## 2.2 Microsoft Windows 8 driver installation

In case of problem with installing drivers on Windows 8, please follow these steps:

1. Press Windows Key + R
2. In the window that appears, type: "shutdown.exe /r /o /f /t 00"
3. Press "OK" button
4. The System will restart to a "Choose an option" screen
5. Select "Troubleshoot" from "Choose an option" screen
6. Select "Advanced options" from "Troubleshoot" screen
7. Select "Windows Startup Settings" from "Advanced options" screen
8. Click "Restart" button
9. System will restart to "Advanced Boot Options" screen
10. Select "Disable Driver Signature Enforcement" (press number on keyboard for option shown on screen)
11. Once the system starts, install the APM / FTDI / Arduino drivers as you would on Windows 7



Windows Vista & 7 required signed all .sys files (we use usbser.sys shipped by Microsoft with valid digital signature). Final version of Windows 8 requires also signed .inf file (which is not in our case). The above procedure helps to override unsigned .inf file. Once driver is installed, the program will work properly.

## 2.3 GNU/Linux System

Our diagnostic application are tested to work under Linux. No native Linux binary is available, however we have created our programs to work under Linux and other systems using Wine.

### 2.3.1 Requirements

- Linux 2.6.x with USB support (or FreeBSD)
- USB CDC Driver
- Wine 1.0.1

Recent Debian Linux or Ubuntu meet the above requirements.

### 2.3.2 Setting up devices

Driver installation isn't required for operation on GNU/Linux system. Diagnostic applications require access to /dev/ttyACMx devices from Wine environment. This can be set-up very easily using these commands:

```
ln -s /dev/ttyACM0 ~/.wine/dosdevices/com5
ln -s /dev/ttyACM1 ~/.wine/dosdevices/com6
ln -s /dev/ttyACM2 ~/.wine/dosdevices/com7
ln -s /dev/ttyACM3 ~/.wine/dosdevices/com8
```

Diagnostic interface should be then visible from the OBDTester diagnostic application.

### 2.3.3 Installation

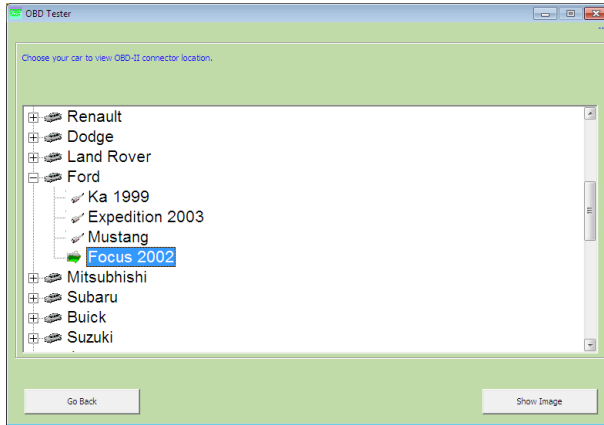
Programs can be installed by launching setup .exe file using wine, e.g. wine OBDTesterSetup.exe.



You can download the latest version of OBDTester from [www.obdtester.com](http://www.obdtester.com)

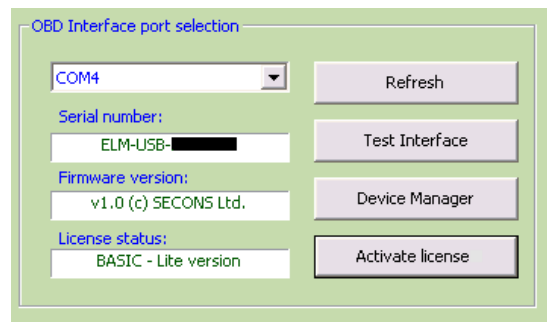
### 3 First steps

1. Connect the ELM-USB to your computer. LED indicator should light green.
2. Connect ELM-USB to OBD-II connector in the vehicle.  
If you cannot find location of the OBD-II connector, you can use OBDTester location image database, available under *Lookup OBD-II location* from main menu:



#### 3. Set-up OBDTester application

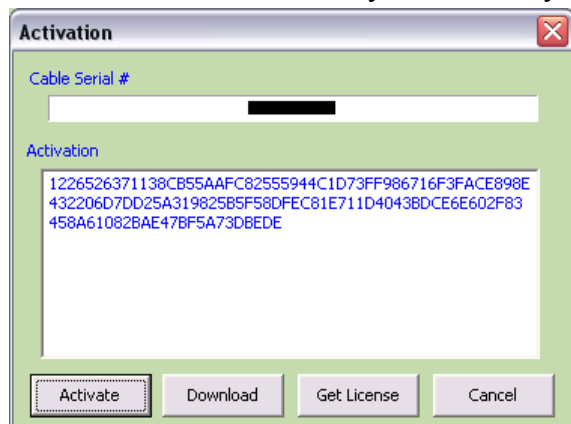
Select *Settings* from OBDTester main menu and configure ELM-USB port. After click *Refresh* button OBDTester should find port to which is ELM-USB connected. Choose these port. Click *Test Interface* to make sure everything is OK, you should see fulfilled *Serial number* and *License status* box.



If you've purchased OBDTester PROFESSIONAL license, please click on *Activate license* button to open activation window and update your license. You have to save settings (or *Apply* button) by clicking on *Save* button before activation process. In the activation window click *Download* button (you have to be connected to the Internet) to automatically download the license data from our server. You will see license data in *Activation* box). Alternatively you can copy and paste license data into editing area. Than save and activate the license by clicking on *Activate* button. You will be notified if the activation was successful.

Some functions of OBDTester are limited without PROFESSIONAL license. If you didn't buy it with your ELM-USB interface, you can do it anytime on-line at <http://www.obdtester.com/order> or push *Get license* button.

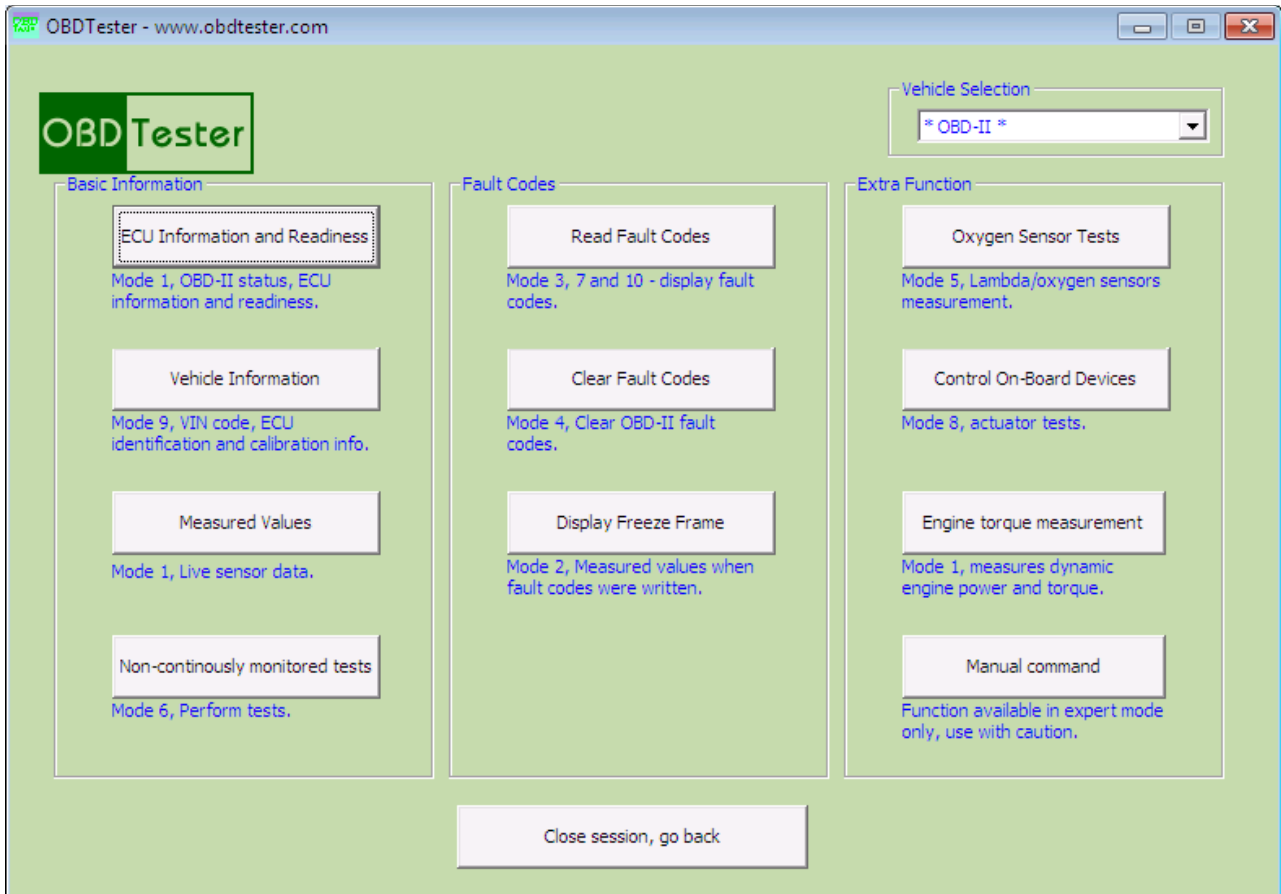
4. Save settings and return to main menu.
5. Turn ignition ON, but don't start an engine.
6. Push button *Connect to OBD-II car*.  
OBD-II interface starts connecting to vehicle and LED indicator starts blinking orange.
7. You are ready to use diagnostic functions now.





## 4 OBD-II diagnostic functions

Diagnostic functions menu is divided into three parts. *Basic Information*, *Fault Codes* and *Extra Functions*.



*Vehicle Selection* box allows you to select vehicle manufacturer to perform brand-specific diagnostic tasks or display enhanced diagnostic trouble codes. This functionality is available only in PROFESSIONAL version of the OBDTester.

## 4.1 ECU Information and Readiness

Button is located in *Basic information* section of diagnostic menu.



### 4.1.1 Readiness

**Readiness** informations contains basic tests for ECU, tests can result into one of three states

- successful test
- test performed and found failure
- unsupported test

### 4.1.2 MIL - *Malfunction indicator lamp*

MIL or *Check Engine Light* is an indicator of malfunction of the engine control unit. Common indicators are display here:



The light has two stages:

**steady** - indicating a minor fault such as a loose gas cap or failing oxygen sensor

**flashing** - indicating a severe fault, that will eventually destroy the catalytic converter

When the MIL is lit, the engine control unit stores a trouble code related to the malfunction (DTC and readiness), number of fault codes is display in *Number of stored DTCs* box.

Description of trouble code reading is in chapter 4.5

### **4.1.3 Fuel System Status**

Checks state of engine regulation feedback loop controlling fuel. Feedback loop can operate in one of three modes:

- Open loop
- Closed loop
- No data (Engine ECU does not implement this function)

### **4.1.4 OBD-II support**

Used to bring information about variant of OBD-II vehicle. European vehicles use variant EOBD (Europe On-Board Diagnostics).

### **4.1.5 Diagnostic protocol**

Display which protocol is used for ECU communication.

For example *ISO15765-4 (CAN 11/500)* means CAN-BUS, communicating according ISO15765 protocol on 500kB/s bit-rate with 11-bit identifier.

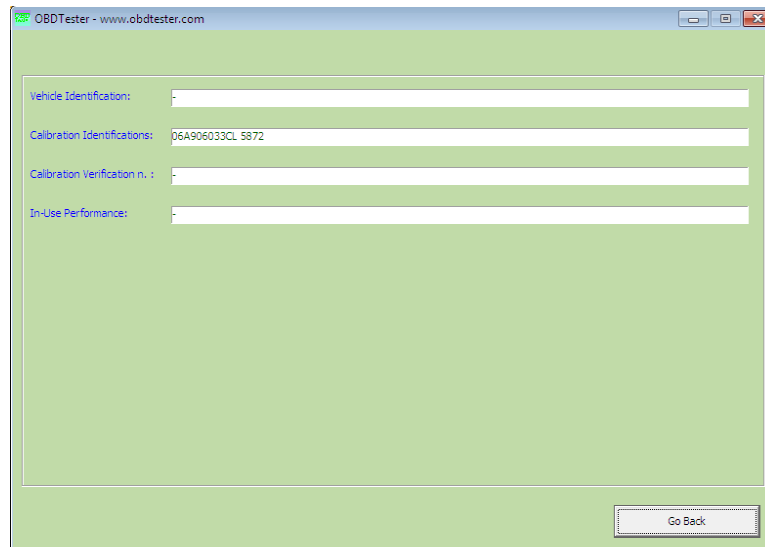
### **4.1.6 Save supported PIDs**

This functionality is intended for development and debugging purposes, it is not required for diagnostics.

## 4.2 Vehicle information

This function uses OBD-II mode 9 which displays:

- Unique VIN (Vehicle Identification Number)
- Calibration verification and identification
- In-use performance



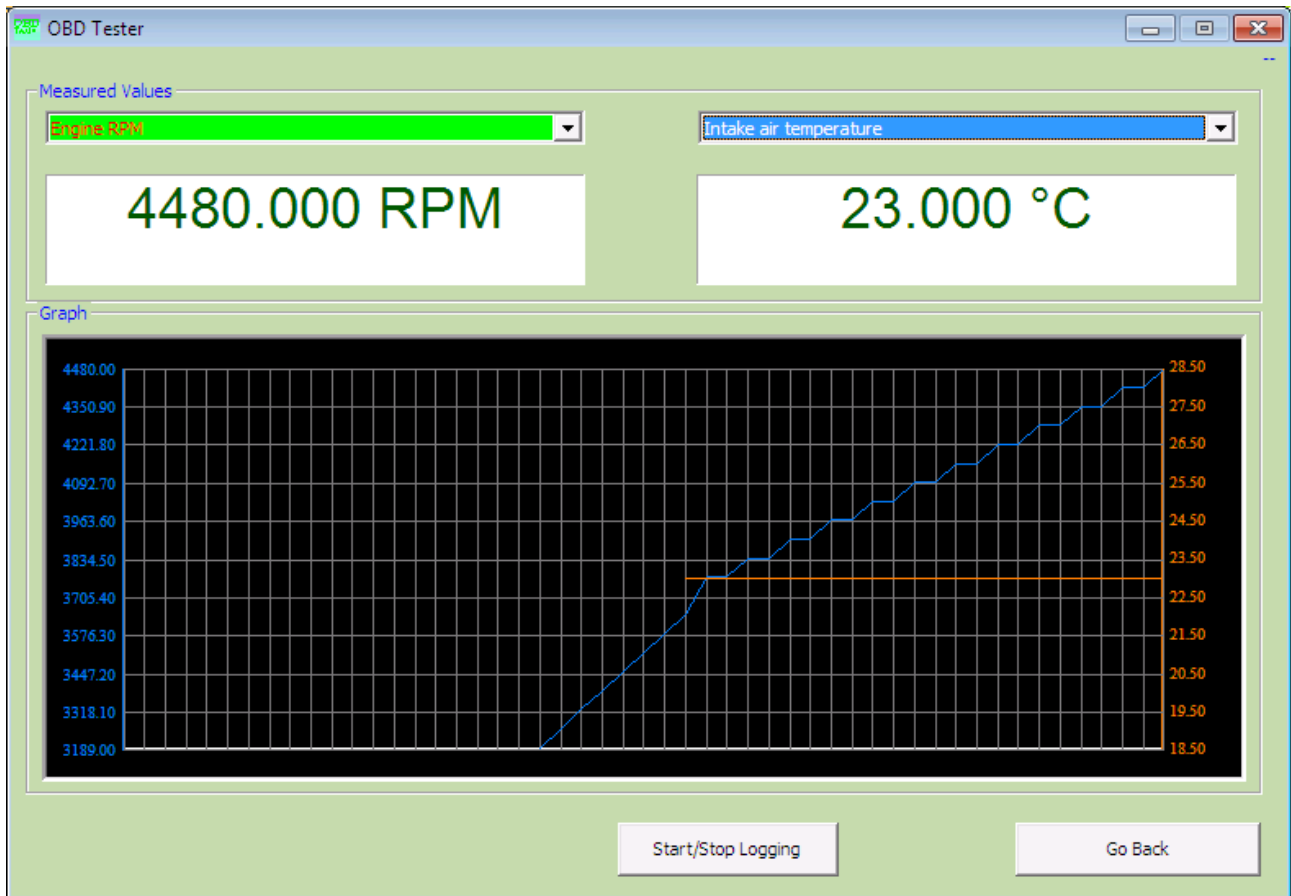
The screenshot shows a web browser window titled "OBDTester - www.obdtester.com". The interface has a light green background and contains the following fields:

- Vehicle Identification: -
- Calibration Identifications: 06A906033CL 5872
- Calibration Verification n. : -
- In-Use Performance: -

A "Go Back" button is located at the bottom right of the interface.

### 4.3 Measured values

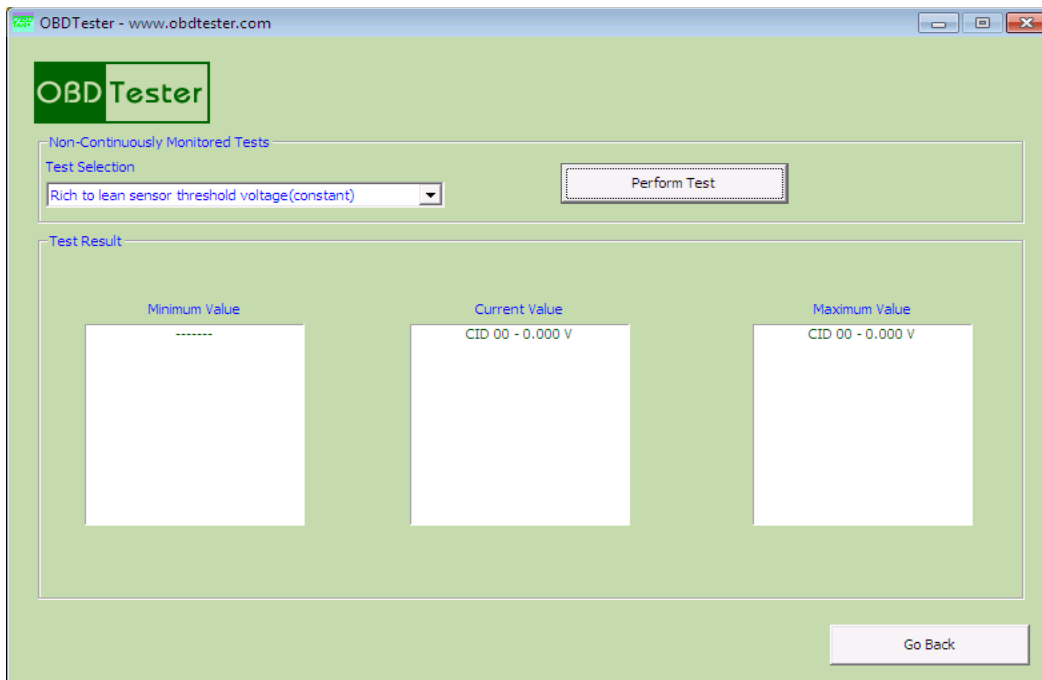
This function uses OBD-II mode 1 and is used to display two measured values (also known as live data or sensor values) simultaneously. Measured parameters can be chosen from selectors at the top of the window.



Measured values can be saved/logged to a file. The logfile is standard csv file and it is compatible with VagScope or can be imported to Microsoft Excel or OpenOffice Calc.

#### 4.4 Non-continuously monitored tests

This function uses OBD-II mode 6 which requests On-Board Monitoring Test Result for Continuously and Non-Continuously Monitored Systems. There are typically a minimum value, maximum value, and a current value for each non-continuous monitored parameter or test.



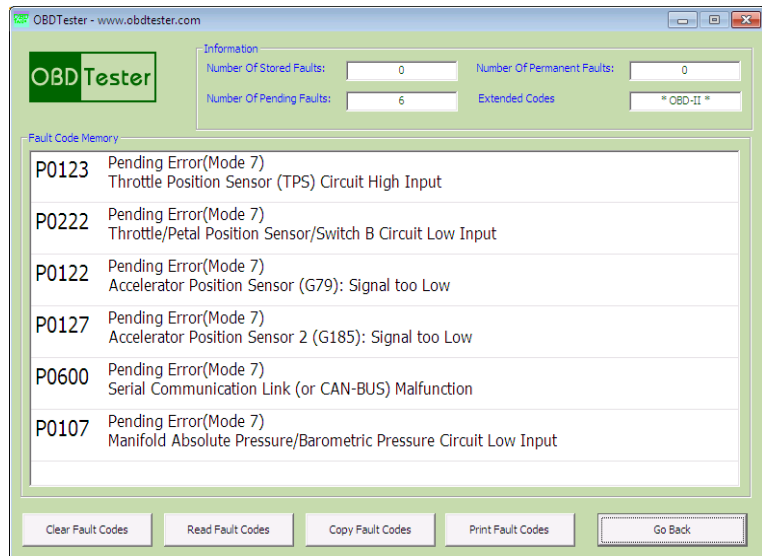
## 4.5 Read Fault Codes

Functions related to fault codes is located in *Fault Codes* section. OBD - II diagnostic fault codes are standardized by SAE standards to help find problems in a vehicle.

This function allows to read fault codes (DTC – Diagnostic Trouble Codes) stored in ECU. All three OBD-II fault modes are supported.

*Clear Fault Codes* button delete codes from ECU, this is same functionality like function *Clear Fault Codes* described in chapter 4.6.

*Read trouble codes* button re-reads all fault codes once more.



### 4.5.1 Mode 3

These trouble codes are “confirmed”, which means that appear regularly and therefore are more significant and should be considered seriously.

### 4.5.2 Mode 7

These trouble codes were detected during current or last completed driving cycle. When vehicle completed driving cycle and error was detected, ECU switch on MIL and “transfer” error to mode 3.

This enables the external test equipment to obtain "pending" diagnostic trouble codes detected during current or last completed driving cycle. This is used by service technicians after a vehicle repair, and after clearing diagnostic information to see test results after a single driving cycle to determine if the repair has fixed the problem.

### 4.5.3 Mode 10

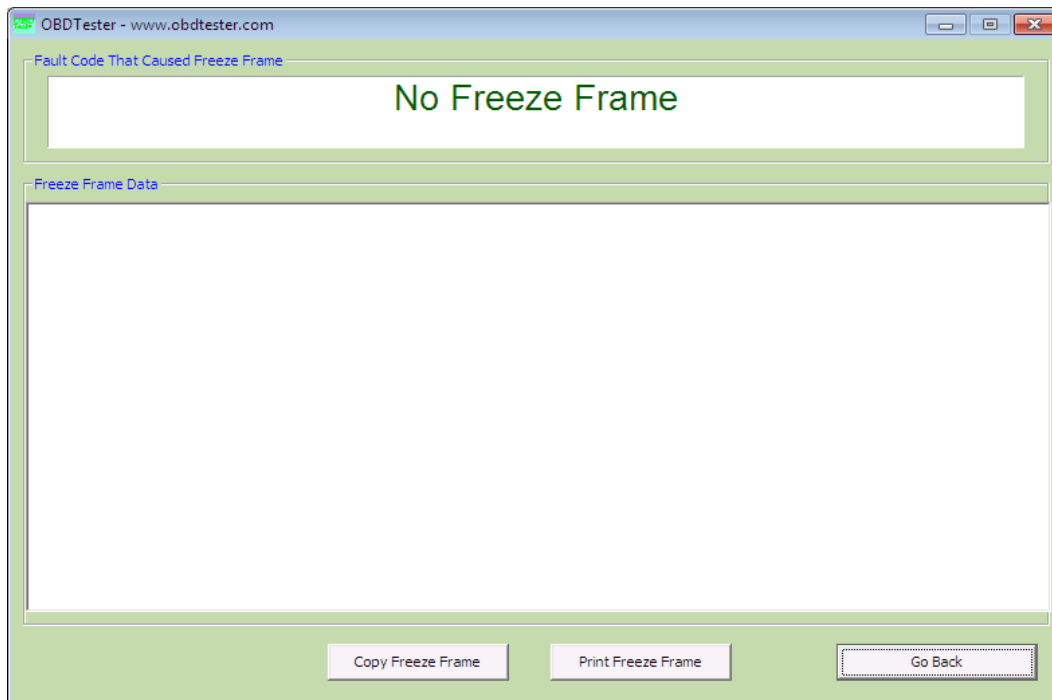
Is the newest mode supported from year 2009 and is used to check deleted trouble codes from mode three. It is not possible to clear fault codes stored in mode 10, they will automatically be cleared after several driving cycles.

## 4.6 Clear Fault Codes

This function uses OBD-II Mode 4 and is available from diagnostic menu or fault code listing. Is used to clear all DTCs saved in mode 3.

## 4.7 Display Freeze Frame

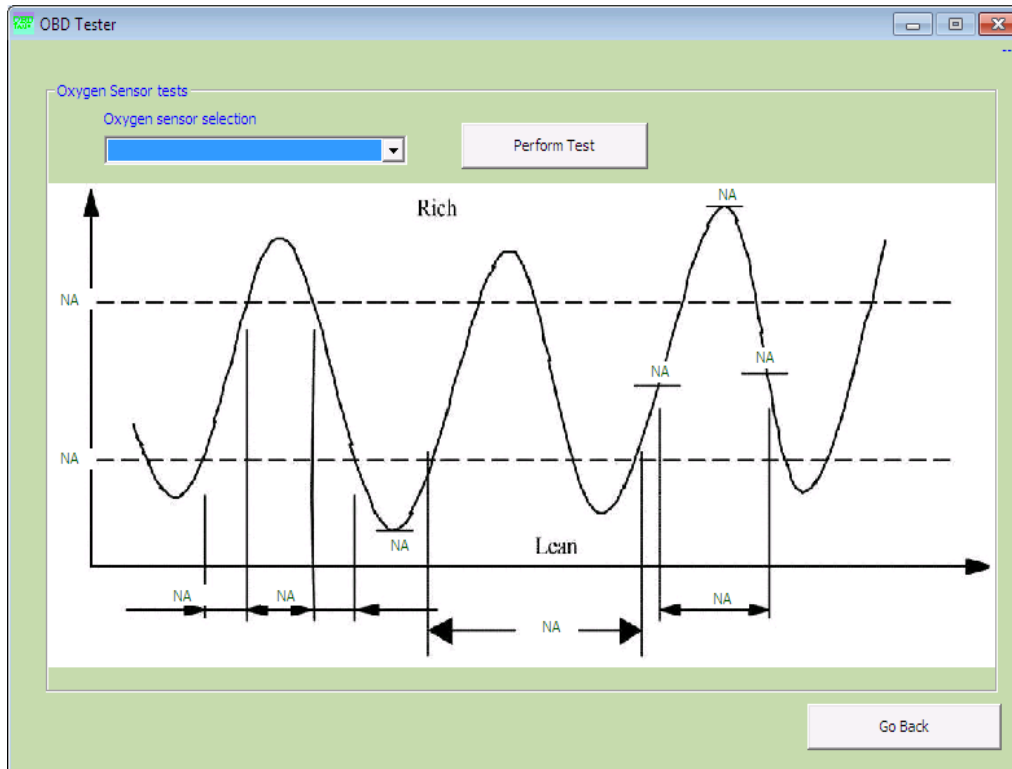
This function uses OBD-II mode 2. In this mode we can see measured values in the time of the first trouble code appearance.





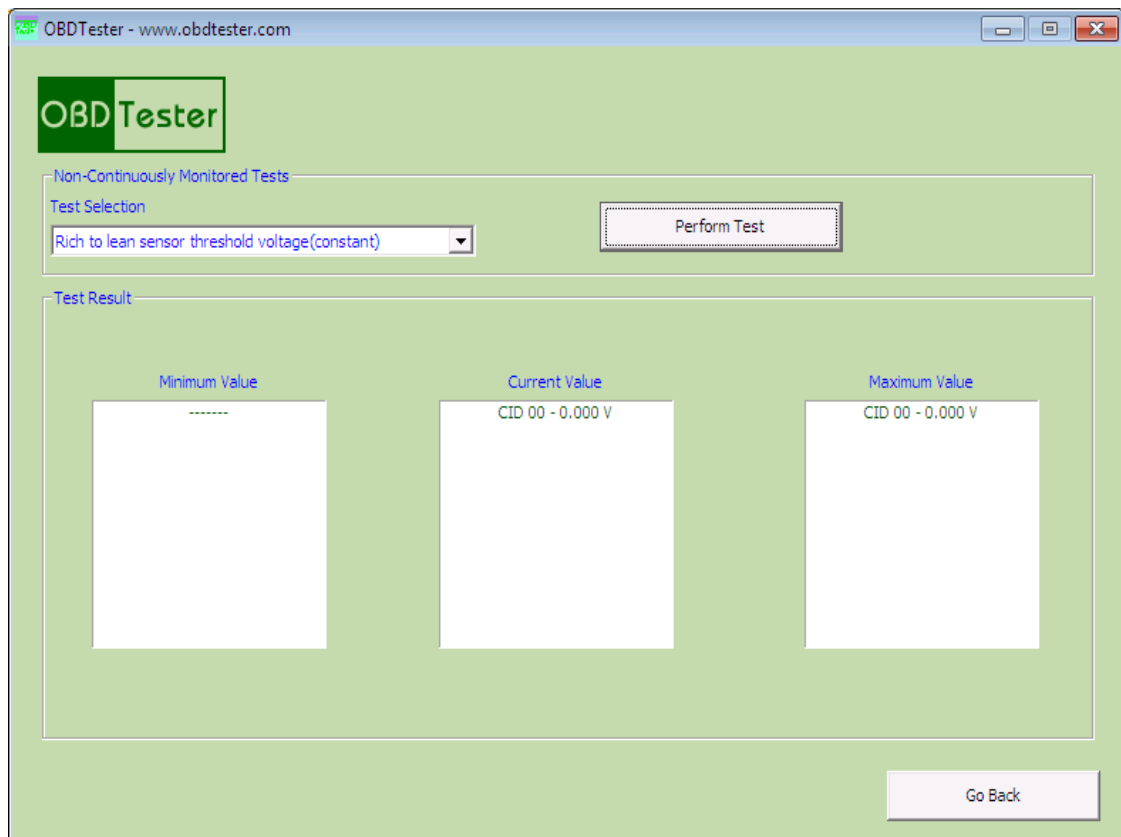
## 4.8 Oxygen sensors test

This functionality uses OBD-II mode 5 and monitor voltage level on oxygen sensors (lambda sensor). Values are measured in various regulation modes and phases of oxygen sensor.



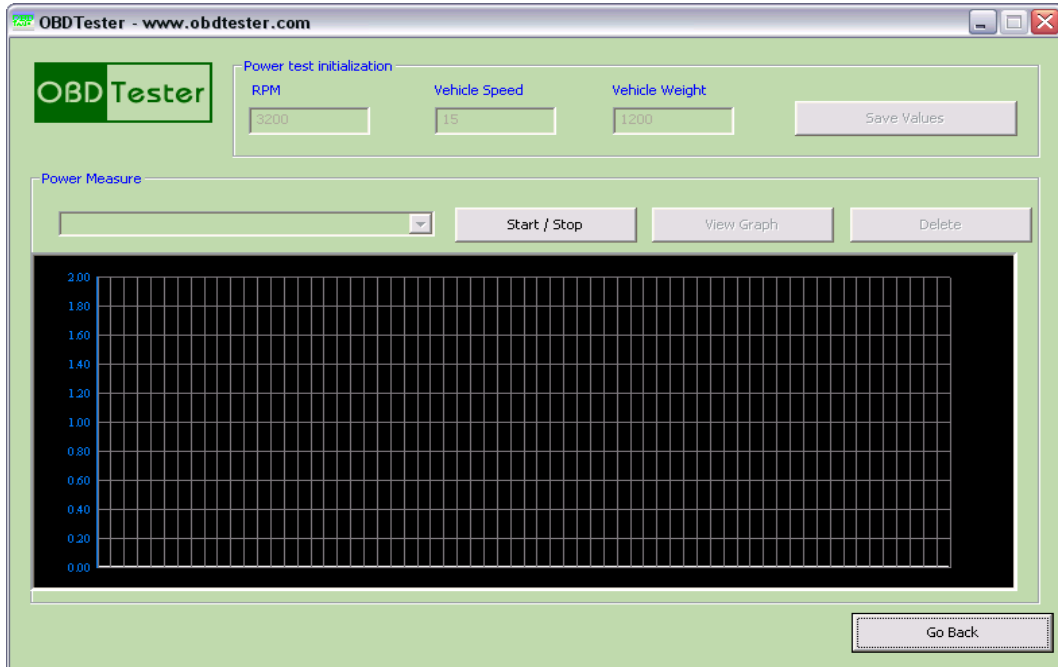
## 4.9 Control On-board devices

This function uses OBD-II mode 8, which allows the test device to control the operation of an on-board system, test or component. This function is also commonly called actuator test.



## 4.10 Engine torque measurement

This function uses OBD-II mode 1 to measure engine speed and vehicle speed. Engine power and torque can be dynamically calculated from these two values and displayed in chart.



## 4.11 **Manual command**

Is used to send and receive data and commands directly to the ELM-USB interface in form defined in OBD-II standards. You can edit data in command line. Data are in hexadecimal form, 8bits divided by space.

Example: Reading trouble codes.

*Request: 03*

*Response: 43 10 11 10 25*

<i>03</i>	- mode number
<i>43</i>	- mode number + 0x40
<i>10 11</i>	- 1. trouble code
<i>10 25</i>	- 2. trouble code



**This functionality is intended only for experts and application developers. You can damage vehicle by improper use!**

## 5 Extra functions

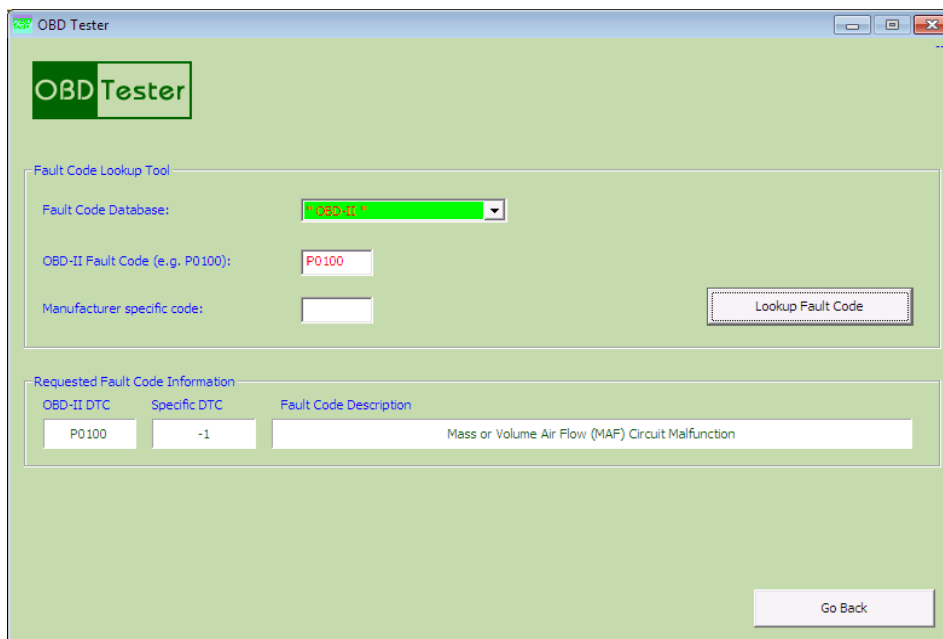
Extra functions are available from the main menu.

### 5.1 OBD-II DCL finder

Is used to display OBD-II connector location in a selected vehicle.

### 5.2 DTC Lookup

In this function you can retrieve meaning of generic and proprietary OBD-II DTCs. It is not required to be connected to a vehicle to use this function.

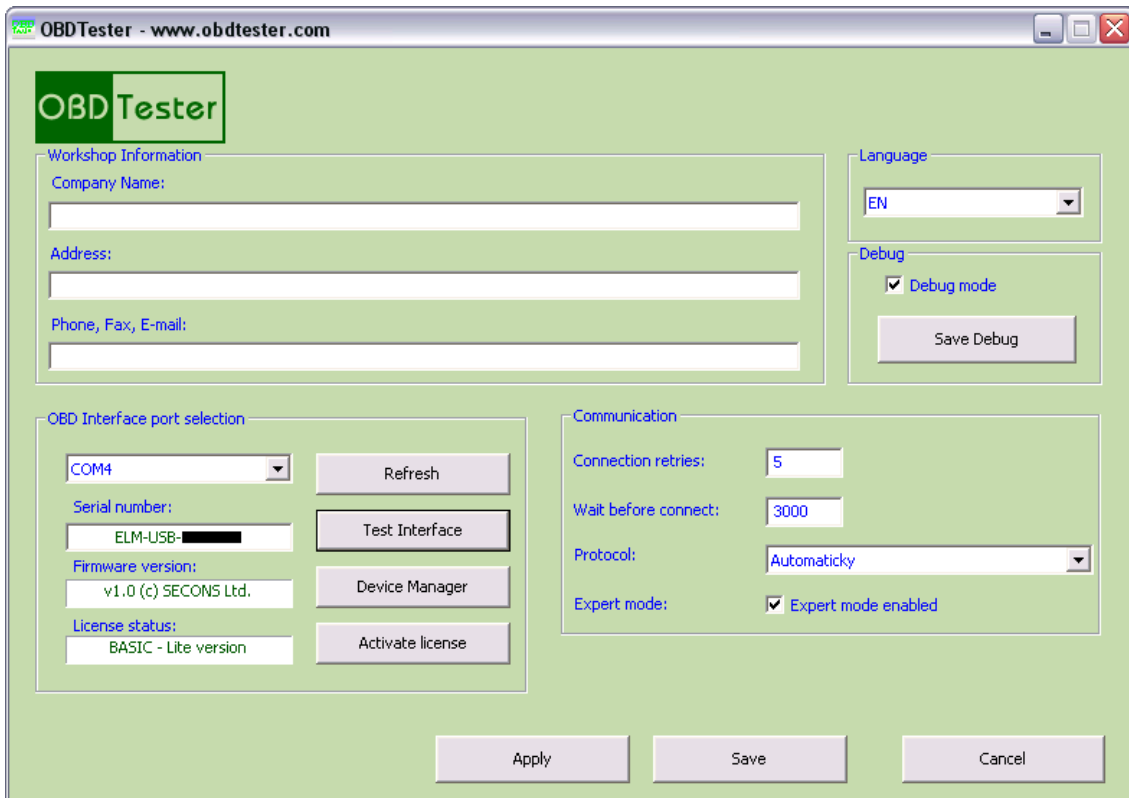


The screenshot shows the 'OBD Tester' application window. The title bar reads 'OBD Tester'. The main interface has a green background. At the top left, there is a logo for 'OBDTester'. Below the logo, there is a section titled 'Fault Code Lookup Tool'. This section contains three input fields: 'Fault Code Database:' with a dropdown menu showing 'Generic DTCs', 'OBD-II Fault Code (e.g. P0100):' with a text box containing 'P0100', and 'Manufacturer specific code:' with an empty text box. To the right of these fields is a button labeled 'Lookup Fault Code'. Below this section is another section titled 'Requested Fault Code Information'. This section contains a table with three columns: 'OBD-II DTC', 'Specific DTC', and 'Fault Code Description'. The table has one row of data: 'P0100', '-1', and 'Mass or Volume Air Flow (MAF) Circuit Malfunction'. At the bottom right of the application window, there is a button labeled 'Go Back'.

OBD-II DTC	Specific DTC	Fault Code Description
P0100	-1	Mass or Volume Air Flow (MAF) Circuit Malfunction

## 6 Software settings

Click on *Settings* button in main menu. In *Settings* window you can set communication port, which will be used to communicate with OBD-II interface (ELM-USB cable), vehicle protocol used by the OBD-II interface, OBDTester user interface language, etc.



### 6.1 Workshop information

Workshop information is used for printing of DTC and freeze frame. Information about workshop e.g. Company name, Address, etc. are printed along with trouble codes or freeze frame, which is useful for customer protocol printing.

### 6.2 OBD Interface port selection

OBDTester will find newly installed ELM-USB interface after clicking to “*Refresh*” button. You can choose port if multiple interfaces are connected simultaneously.

### 6.3 Communication

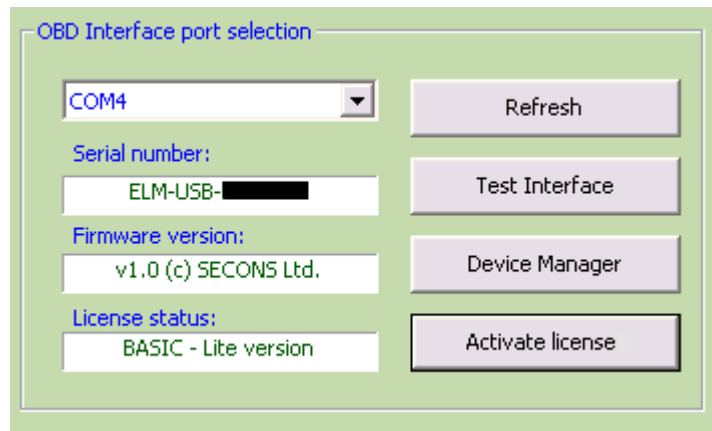
*Protocol* list allows to specify communication protocol between vehicle and OBD-II interface. This is useful only if you are diagnosing one type of vehicle, connection establishing time will be shorter. Normally use *Automatic* option.

*Wait before connect* is used to define time after attempt to establish connection failed.

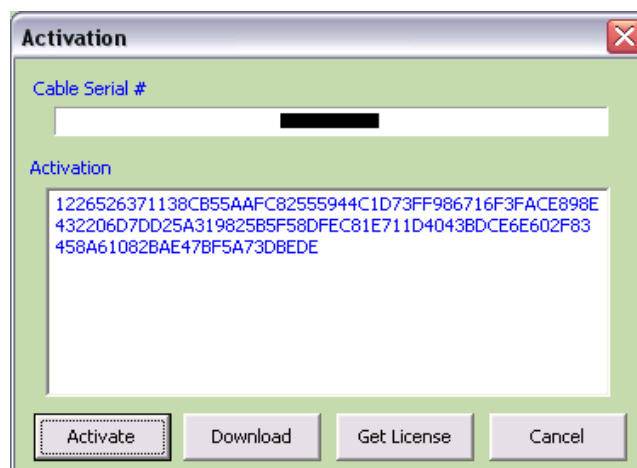
*Connection retries* define number of attempts to establish connection if there is an error.

## 6.4 License

If you have purchased OBDTester PROFESSIONAL license, you can activate the license in window available by clicking on the *Activate license* button. You should save changes in settings by clicking *Save* button before activation.



In the window that will open you have to click *Download* button (you have to be connected on Internet) first for download a license data from server. You can see encrypted license data in *Activation* box. In *Cable Serial* box is serial number of your OBD-II interface.



To save license data and activate the license click on the *Activate* button. If the activation is successful, then the following dialog will appear.



If you didn't buy PROFESSIONAL license with OBD-II interface, you can order it from <http://www.obdtester.com/order> or by clicking on *Get license* button.

## **6.5 Debug**

Is dedicated for problem solving and debugging purposes only. It is used to log whole communication to a logfile. You can save data to file by clicking on *Save Debug*, and then send it us by e-mail.

## **6.6 Expert mode enable**

Expert mode enables *Manual command* button as described in chapter 4.11.



## 7 Troubleshooting

### 7.1 Improperly displayed national characters

This problem is usually caused by incorrect settings in *Regional and Language Options* in Microsoft® Windows®.

The problem can be solved very easily:

1. From *Control panel* menu/window open *Regional and Language Options*
2. Open panel *Advanced* and in box *Language for non-Unicode programs* choose your national language

### 7.2 OBDTester can't connect to vehicle

If you are not able to establish connection with OBD-II vehicle/ECUs, check these possible causes:

- Check if you've turned engine ignition on
- Turn ignition OFF and ON again
- Disconnect OBD-II interface from vehicle and computer and connect it again
- Check protocol you've chosen in *Settings* window, more in chapter 6.3, set to automatic if unsure
- Test OBD-II interface (ELM-USB cable) in menu settings by clicking on *Test Interface* button

### 7.3 Can't locate OBD-II interface

If you click on *Test interface* button and information „Not ELM Cable“ appears, make sure that operating system found OBD-II interface (ELM-USB interface). You can assure it in *Device Manager* in block *Ports(COM & LPT)*. You can open it by clicking *Device Manager* button in menu *Settings* in OBDTester or on *Start* → *Setting* → *Control Panel* → *System* → *Hardware* → *Device Manager*.

The following screenshot shows that OS Microsoft® Windows® found ELM-USB cable in port COM4.

