



What Does Your Car Know That You Don't?

OBDII Diagnostic Scan Tool
&
Performance Analyzer

User Manual
For Version 4 Software

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General Information

Scan Tool Types

There are two types of scan tool currently in circulation from Bowser Electronics. The older version, identified by either the rectangular case or the slim line case with serial numbers below OBD-006-500 and the newer version identified by the slim line case with serial numbers OBD-006-500 and up. The only difference between the older and newer version is the support for the CAN Protocol. While all software releases will continue to support the older scan tool design, only software version 3.0.0 and higher can be used with the newer version scan tools. To be certain which scan tool version you have, with the scan tool connected to both a vehicle and pc, start the scan tool software and go to the Utility – Scan Tool Data tab. Firmware versions starting with ‘01’ are older and starting with ‘02’ are newer.

In addition to the Bowser Electronics scan tools, our software also supports the ELM line of scan tools including the ElmScan using the ELM320, ELM322, ELM323, and ELM327 chips.

Features

- Display data in either graph or table form
- All graphs zoom, pan, print and save in bitmap form.
- Global OBD-II Domestic, Asian and European Coverage (1996 and up)
- OBD-II Extended Data Coverage available for Ford, GM, and Chrysler
- CAN Enabled – No Adapters Required
- OBD-II Mode 6 and Mode 9 support with full definitions
- Save Data captured for future analysis.
- Performance Analysis Module includes Dyno, Acceleration and Brake testing.
- Vehicle Protocols Supported: CAN (11 and 29 bit header, 250k and 500k baud), J1850 PWM, J1850 VPW, ISO-9141, ISO-14230, Keyword 2000, and SCI (with Chrysler Extended Data).

Is My Car OBD-II Compatible?

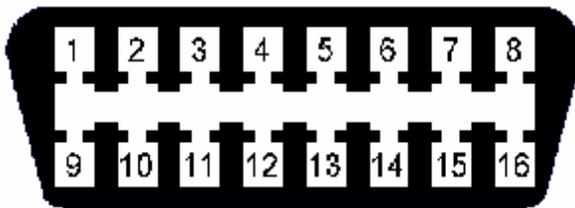
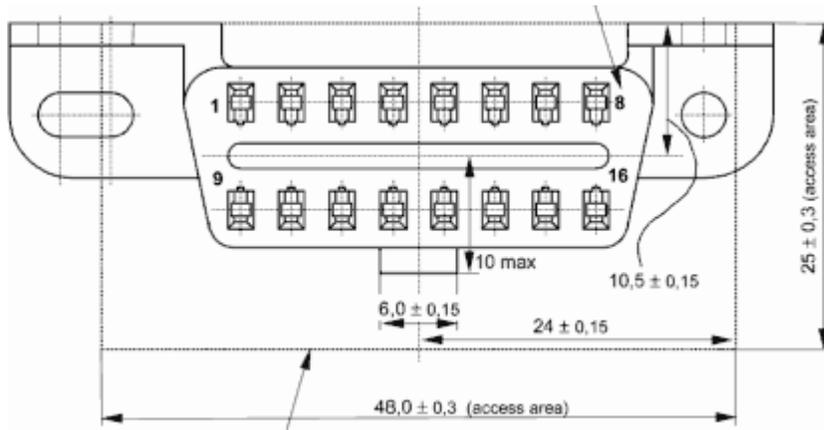
All cars and light trucks built and sold in the United States after January 1, 1996 were required to be OBD II equipped. In general, this means all 1996 model year cars and light trucks are compliant, even if built in late 1995.

There are two ways to tell if your vehicle is OBD II equipped:

- 1) There will be an OBD-II Connector in the driver’s area.
- 2) The under the hood emission sticker will say "OBD II compliant".

The OBD Connector

Here is a layout and pin out of the OBD connector found in most cars. The connector can be found in the driver’s area of the vehicle.



- Pin 2 - J1850 Bus+
- Pin 4 - Chassis Ground
- Pin 5 - Signal Ground
- Pin 6 - CAN High (J-2284)
- Pin 7 - ISO 9141-2 K Line
- Pin 10 - J1850 Bus
- Pin 14 - CAN Low (J-2284)
- Pin 15 - ISO 9141-2 L Line
- Pin 16 - Battery Power

How Do I Tell Which Protocol My Vehicle Uses

On 1996 and later vehicles, you can tell which protocol is used by examining the OBD-II Connector:

- J1850 PWM** -- The connector should have contacts in pins **2, 4, 5, 10,** and **16.**
- J1850 VPW** -- The connector should have contacts in pins **2, 4, 5,** and **16,** but **not 10.**
- ISO** -- The connector should have contacts in pins **4, 5, 7, 16** and **sometimes 15.**
- CAN** -- The connector should have contacts in pins **4, 5, 6, 14,** and **16.**

There may be more pins than those listed present in your connector. These are generally for vehicle specific features.

Where Is My OBDII Connector Located?

SAE standard J1962 mandates the location of the OBDII connector as follows:

Consistency of Location – The vehicle connector shall be located in the passenger compartment in the area bounded by the driver’s end of the instrument panel to 300mm beyond the vehicle centerline, attached to the instrument panel, and accessible from the driver’s seat. The preferred location is between the steering column and the vehicle centerline. The vehicle connector shall be mounted to facilitate mating and unmating.

Ease of Access – Access to the vehicle connector shall not require a tool for the removal of an instrument panel cover, connector cover, or any barriers. The vehicle connector should be fastened and located so as to permit a one-handed/blind insertion of the mating test equipment connector.

Visibility – The vehicle connector should be out of the occupant’s (front and rear seat) normal line of sight but easily visible to a “crouched” technician.

Bottom line here..... It should be somewhere in plain sight under the driver’s dash area.

Getting Started

PC Requirements

- Pentium II or faster IBM PC Compatible Computer
- Windows 95, 98, Me, Xp, or 2000 Operating System
- 20 Mb free disk space
- Video – 800x600 or higher using Small Fonts
- Windows Compatible Printer
- DB9 Serial Port capable of 57,600 baud with CTS available or USB to RS-232 adapter on Com 1 to Com 16

Software Installation

Beginning Installation

There are two methods to start the installation program.

First, if downloading the program from the website, right click on the ‘DiagScanInstall’ link and click ‘Save As’. Save the program to your desktop. Next, double-click on the ‘DiagScanInstall’ icon on your desktop and click ‘OK’ to begin installation.



Second, if installing from CD, insert the CD into the CDROM and close the CDROM tray. The install program should start automatically. If the program does not start automatically, double click on the ‘My Computer’ Icon, double click on the CD-drive, and double click the ‘Setup’ program icon.

When the setup program starts, the system will copy the files necessary to complete the install. If the system does not have all necessary dll files installed, it may request the computer be restarted. If it does, restart and begin the setup program as above.



Choose 'OK' to start the installation or 'Exit Setup' to abort the setup. Next, you will be prompted to choose the installation directory. Click 'Change Directory' to select another directory if desired.



We recommend you accept the default directory as our update extract to the default directory. Then, click the install icon. The setup program will automatically create start menu program groups and icons. You may change the name of the program group if desired. Select 'Continue' to continue. Next, the Data Access component installation will begin.

Windows 9x (95, 98, and Me) Data Access Components

If you have a Windows 9x operating system, you may be prompted with a DCOM98 for Windows installation prompt. Click 'Yes' to install DCOM98. Next, click 'Yes' again to accept the DCOM98 license agreement. DCOM98 will prompt you to restart your computer. DO NOT RESTART at this time. If you do restart by mistake, simply re-start the setup program.

Windows XP, 2000 Data Access Components

When installing the Diagnostic Scan Tool software on a Windows XP or 2000 machine, the data access components will automatically install in the background.

Installation Finish

Once the data access components are installed, the rest of the program files are copied to the installation directory and the setup program prompts you to let you know installation was successful.



Click 'OK' to finish the setup program.

You are now ready to begin using your OBD-II Diagnostic Scan Tool. On the Start menu, choose Programs – Bowser Electronics – OBDII Diagnostic Scan Tool to start the program. **If there is a problem with the program starting, try restarting your computer after the installation is complete. ** On startup, you will be prompted if your screen size is set too small to display all program information. Also, the first time the program starts, you will be prompted to set your com port. Do so by selecting Tool – Com and choosing a valid com port.

Using Your OBD-II Diagnostic Scan Tool

Connect Your PC to the Scan Tool

The connection from the OBDII Diagnostic Scan Tool to the PC is made via a DB9 Male to DB9 Female RS-232 serial cable. Connect the DB9 female end of the cable to any available serial port on the PC. Connect the DB9 male end to the Scan Tool at the connector labeled 'To PC'. This program will recognize Com Ports from 1 to 16 and works with USB to Serial Port adapters.

Start Your Vehicle

The ignition must be in the "ON" position to be in Communication with the Scan Tool. The engine may have to be running for the Scan Tool to access your vehicle's diagnostic information.

Connect Your Vehicle to the Scan Tool

The connection from the OBDII Diagnostic Scan Tool to the vehicle is made via a DB9 Female to J1979 OBDII cable. Connect the DB9 female end of the cable to the Scan Tool at the connector labeled 'To Vehicle'. Connect the OBD end of the cable to the vehicle diagnostic connector. This connector is located in the driver's area and is mandated to be easily accessible and no further than 3ft. from the steering wheel. Typically, it is located under the dashboard in the driver's area.

***** CAUTION: The DB9 Female to J1979 OBDII cable is not meant to be connected directly into an RS-232 port and severe damage may result if attempted. *****

Run the DiagScan Program

From the Start Menu, select Programs→ Bowser Electronics→ DiagScan.

Program Startup

At program startup, communication initialization with the Scan Tool is repeatedly attempted. Once communication with the Scan Tool is established, vehicle communication is verified. During the startup process, a banner informing the user of the initialization progress is displayed. This banner can be closed by clicking anywhere in the blank area.

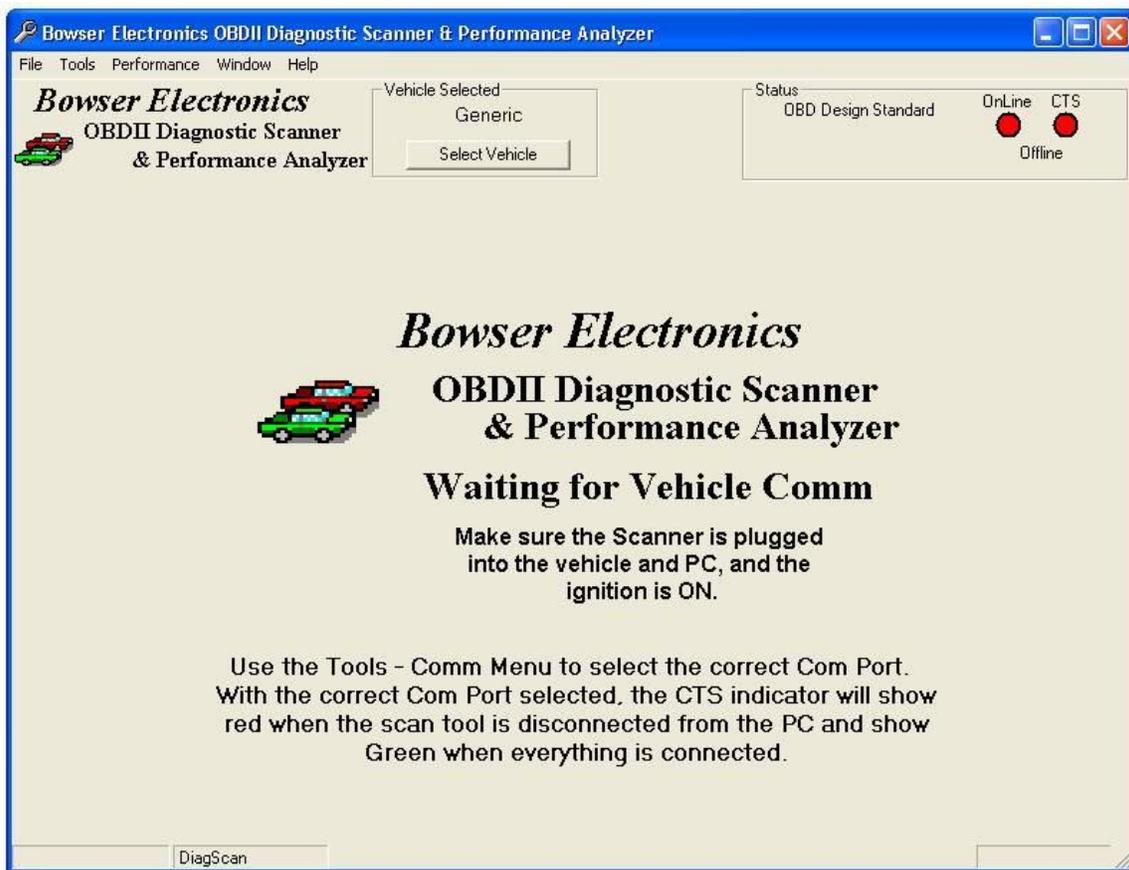
During initialization, the vehicle is queried for support information and MIL status.

Once the system is initialized, select the vehicle type by clicking the Select Vehicle button at the top of the screen. Then, select the vehicle specifics from the dropdowns and click OK. You may now navigate through the screens by clicking any of the tabs or using the menu drop downs.

If initialization is taking an excessive amount of time (typically the Scan Tool takes less than 10 seconds to establish communication with the vehicle), verify the following:

- Vehicle connection
- PC connection
- Scan Tool Indicators

If initialization does not occur, refer to Troubleshooting (page 33).



Scan Tool Specification

PC Connection

The connection from the OBDII Diagnostic Scan Tool to the PC is made via a DB9 Female Connector in the end of the Scan Tool labeled 'To Computer'. Do not use a null modem cable. Connect the DB9 female end of the cable to any available serial port on the PC. This program will recognize Com Ports from 1 to 16 and works with USB to Serial Port adapters. The Scan Tool uses the following pins for computer connection:

Signal	DB9
Scan Recv	2
Scan Xmit	3
Gnd	5
CTS	8

Vehicle Connection

The connection from the OBDII Diagnostic Scan Tool to the vehicle is made via a DB9 Male connector in the end of the Scan Tool labeled 'To Vehicle'. Use a DB9 Female to J1962 OBDII cable. ***** CAUTION: This cable is not meant to be connected directly into an RS-232 port and severe damage may result if attempted. ***** Connect the DB9 female end of the cable to the Scan Tool and connect the OBD end of the cable to the vehicle diagnostic connector. Typically, the vehicle connector is located under the dashboard in the driver area. The Scan Tool uses the following pins for vehicle connection:

Signal	DB9	OBD
Signal Gnd	1	5
Chassis Gnd	2	4
CAN High	3	6
9141-2 K	4	7
CAN Low	5	14
J1850 -	6	10
J1850 +	7	2
9141-2 L	8	15
Batt +12v	9	16

Scan Tool Electrical Specifications

The Scan Tool operates on 12-18vdc at 0.250A supplied by the vehicle. All power is derived from this supply and it is internally limited to 0.500A. Vehicle communication conforms to SAE J1978 for all communication protocols. Serial communication with the PC conforms to RS-232 Standards.

Scan Tool Indicators

The Scan Tool has several LED's that indicate the status of the tool. Upon connection to the vehicle, the Scan Tool automatically begins to try to establish communication with the vehicle. As it cycles through the protocols, the protocol LEDs change to indicate which protocol the Scan Tool is currently trying to initialize. The Scan Tool takes ~8 seconds to cycle through all protocols.

Protocol	LED A	LED B
PWM	Off	Off
VPW	Off	On
ISO	On	Off
CAN	On	On

When vehicle initialization is complete, the 'Pulse' LED begins to blink at ~10Hz.

Also, the B protocol LED blinking along with the pulse LED indicates the scan tool has detected the Chrysler SCI adapter.

If all three lights are blinking, the rate of blinking determines the cause:

All three lights blinking rapidly (~10 times per second): The scan tool is in reprogramming mode. Use the Tools – Scan Tool Flash menu to reprogram.

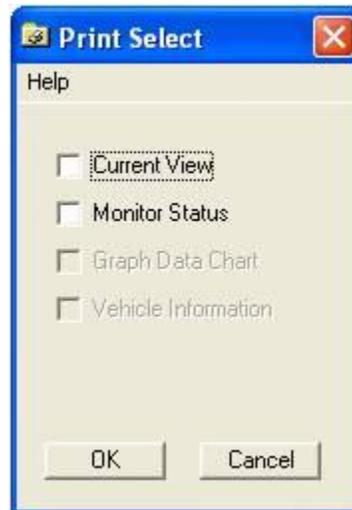
All three lights blinking slowly (~1 time per second): The scan tool has detected a short on the vehicle bus line. Disconnect the scan tool immediately as damage to the scan tool may result.

Program Menus

File

Print

Use the print dialog box to select items to print then customize print settings through the use of the Windows standard printer setup dialog. Only items with valid information to print will be available for selection. Multiple selections are allowed. After selecting items, click 'OK' to continue to the Printer dialog or 'Cancel' to cancel the print. All charts may also be printed by clicking the printer icon on the chart itself.



Items Available to Print:

- § Current View – Prints the program screen exactly as it appears. Use this to print any view in the program.
- § Monitor Status – Prints the information in the 'Monitor Status' tab.
- § Graph Data Chart – Prints the chart in the 'Capture Data' tab.
- § Vehicle Information – Prints the information in the 'Vehicle Info' tab.

Save

Use the save dialog box to select items to save and customize save settings through the use of the Windows standard save dialog. Only items with valid information to save will be available for selection. Multiple selections are allowed. Checking 'Create New Directory' will create a new directory located in the one you select and add all selected files to it. After selecting items, click 'OK' to continue to the Save dialog or 'Cancel' to cancel the save. In the Save dialog, the file name you select is used as the directory name if 'Create New Directory' is selected and as the prefix for all files selected for save. The suffix is the name of the data selected for save.



Items Available to Save:

- § Diagnostic Data – This information is helpful for Bowser Electronics to determine the source of any trouble you may be having communicating with the scan tool or vehicle.
- § Log File – Saves the data in the 'Event Log' box of the 'Utility – Vehicle Data' tab. This data shows a time stamped listing of all activity during a program session.
- § Captured Data – Saves the data in the 'Capture Data' tab.
- § Table Data – Saves the data in the 'Table Sensor Data' box of the 'Utility – Vehicle Data' tab. This data is accumulated from the sensor data screen.
- § Cont Recv Data – Saves the data in the 'Utility – Continuous Receive' tab
- § Manual Xmit Data – Saves the data in the 'Utility – Manual Communication' tab
- § Monitor Status Data – Saves the data in the 'Monitor Status' tab
- § Vehicle Info Data – Saves the data in the 'Vehicle Info' tab
- §

Exit

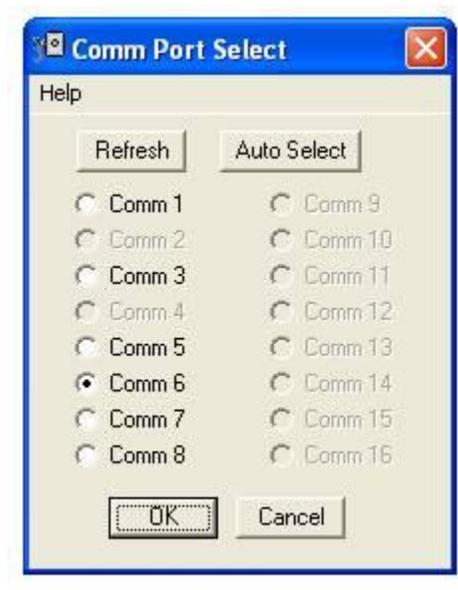
Selecting Exit will:

- Terminate Communication between the Scan Tool and the PC
- Close Communication with database
- Save all Program Settings
- End the Program

Tools

Com

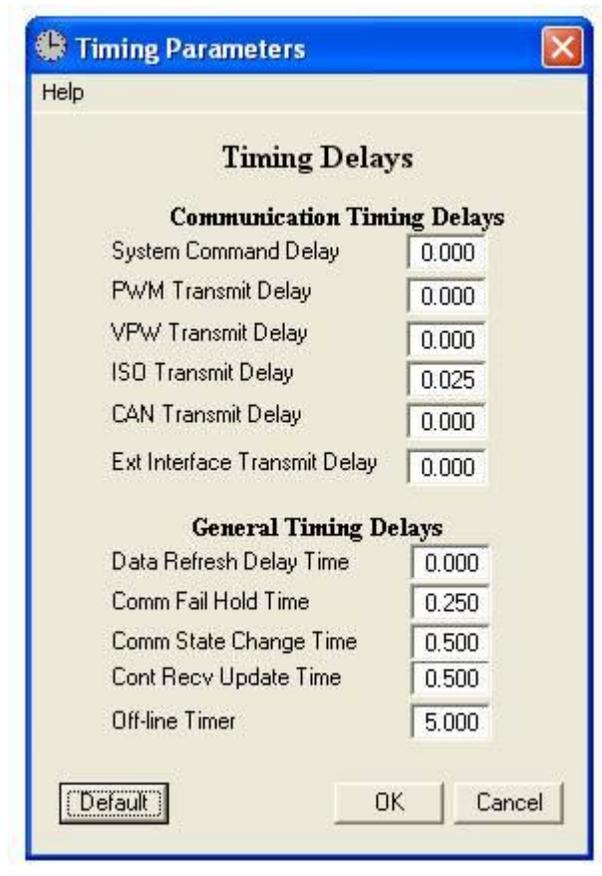
Use the Com dialog to select which Com Port the PC will use to connect to the Scan Tool. When selected, Com Ports 1-16 are tested and only ports present on the system are enabled for selection. After selecting a port, click 'OK' to initialize Communication on the port or click 'CANCEL' to keep your previous settings. Use the 'Refresh' button to re-test all Com Ports. This is useful if a USB to Serial Adapter is connected after opening the Com dialog. 'Auto Select' will poll all available com ports and try to automatically determine if the scan tool is present. The program automatically remembers which port was last used and uses it the next time the program is run.



Timing

Use the Timing Dialog to change basic timing parameters used in the program to ensure proper Communication and updating during operation. The 'Communication Timing Delays' are minimum times between successive requests. The 'General Timing Delays' set timing for program events. By default, they are set to the minimum times possible to allow for maximum Communication speed and best program performance. If they are changed, the program automatically remembers the changes and uses them the next time the program is run. After making changes, click 'OK' to update the parameters, click 'Cancel' to keep the current settings.

Clicking 'Default' will load the default settings but not save them. Only clicking 'OK' will save the settings.



Timing Parameters:

System Comand Delay – Minimum time between system Comands. Default = 0.010

PWM Transmit Delay – Minimum time between PWM requests. Default = 0.010

VPW Transmit Delay – Minimum time between VPW requests. Default = 0.010

ISO Transmit Delay – Minimum time between ISO requests. Default = 0.050

CAN Transmit Delay – Minimum time between CAN requests. Default = 0.010

Ext Interface Transmit Delay – Minimum time between Ext Interface (SCI) requests. Default = 0.010

Data Refresh Delay Time – Time to wait between updating data in the database and refreshing the data tables. Default = 1.000

Com Fail Hold Time – Time to wait between a Com failure and a retry or next request. This time should always be greater than 0.1 seconds to allow any vehicle bus errors to clear. Default = 0.250

Com State Change Time – Time to wait for the scan tool to change the CTS signal after receiving a request. This time should always be greater than 0.1 seconds to allow any vehicle bus errors to clear. Default = 0.500

Cont Receive Update Time – Time between com port buffer reads. If the 'InBufferSize' shown on the status bar during continuous receive is increasing with each update, try lowering the update time. Default = 0.500

Offline Timer – Time to wait with CTS red before deciding Communication with the Scan Tool is lost.

Logging Enabled

The 'Logging Enabled' menu item allows you to turn off internal data logging. This may be useful if your system resources are limited and you are reading data for long periods of time. Each time the software is started, Logging is by default enabled and must be turned off manually.

Security

The 'Security' menu item provides a dialog to check your current security access status, retrieve your security access key, and enter security access codes. The first time the security menu is accessed; the following licensing disclaimer is displayed and must be acknowledged. When you e-mail us for a security access code, be sure to include your name, the invoice number, and the scan tool serial number.

Software Products requiring a security access code are not refundable once a security code has been issued. All software is provided as a single seat license and as such, a maximum of 3 security codes will be issues in any 12 month period.

On Initial startup, your program will have no security access as shown here:



After entering a valid security and clicking 'OK' the program will display your current access:



If the access you expected wasn't added to the access list, the security code was entered incorrectly and should be retried.

Whenever the security dialog is entered it will re-list your granted access:



Reinitialize

The 'Reinitialize' menu item will cause the program to re-request support information from the Scan Tool and vehicle. Use this Command if you suspect a Communication error has caused the system not to recognize all functions available from the vehicle.

Refresh

The 'Refresh' menu item will cause the program to refresh all data currently displayed. If data is not refreshing on the screen as it is acquired, try increasing the 'Refresh delay time' under the 'Tools – Timing' menu.

Auto Log On

The 'Auto Log On' menu item allows you to turn off automatic vehicle log on. This may be useful if you are working offline and the program execution becomes slow from continuously trying to find the scan tool.

Units

Use the units menu to select whether sensor data is displayed in English or Metric units. The current selection will have a check mark next to it. The program automatically remembers which unit type was last selected and uses it the next time the program is run. If a conversion is not available to change units, the default unit of the sensor will be displayed.

Scan Tool Flash

The 'Scan Tool Flash' menu item provides a dialog to update the firmware in CAN enabled scan tools only. Non-CAN scan tool, with serial numbers below OBD-006-500 or with the old style rectangular case are not reprogrammable but can be updated by replacing the microprocessor chip. For more info contact Support@BowserElectronics.com or check our website.

The Scan Tool Flash module is designed to 'trap' the scan tool and force it into the reprogramming mode. The scan tool must remain connected to a vehicle and to the pc during the reprogramming process. The vehicle does not need the ignition on or the engine running during this process. Upon selecting the Scan Tool Flash menu, the following dialog appears:



Click 'OK' to continue through the reprogramming process. Once completed, the software should be restarted and the scan tool should be disconnected from the vehicle and reconnected.

Performance

Use the performance menu to access the different tabs in the Performance module. Select any performance menu loads the Performance module and opens the corresponding module tab. Detailed information on the Performance module can be found elsewhere in this manual.

Window

Use the window menu to navigate between different tabs of the program. Selecting any window navigates to that tab. A check next to the tab name indicates which tab is currently selected.

Help

Current Tab

Displays the help dialog for the tab currently selected. This can provide a shorter path to the information you need.

Using Your Scan Tool

Displays the help dialog for the Using Your Scan Tool help topic.

Troubleshooting

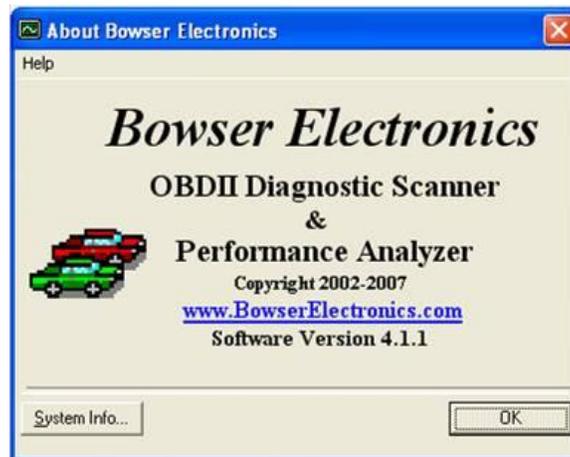
Displays the help dialog for the Troubleshooting help topic. For more information refer to Troubleshooting (page 33)

Contents

Displays the help dialog main menu. Navigate from here to locate specific information.

About

The About dialog box displays software version and system information. Also, it provides a short cut to the Bowser Electronics website.



Program Navigation

Selecting Your Vehicle Type

In the 'Vehicle Selected' frame at the top of the screen, click 'Select Vehicle'. Use the drop downs to select Make, Year, Model, and Engine Type. Select the options that best describe the vehicle you are connecting to and click 'OK'. When the Vehicle info is changed, Manufacturer Specific Trouble Code Descriptions and Monitor Test Descriptions are updated automatically with any new information available. In some instances, you may see "All" on a list with other selections. In this case, All refers to all except those listed.

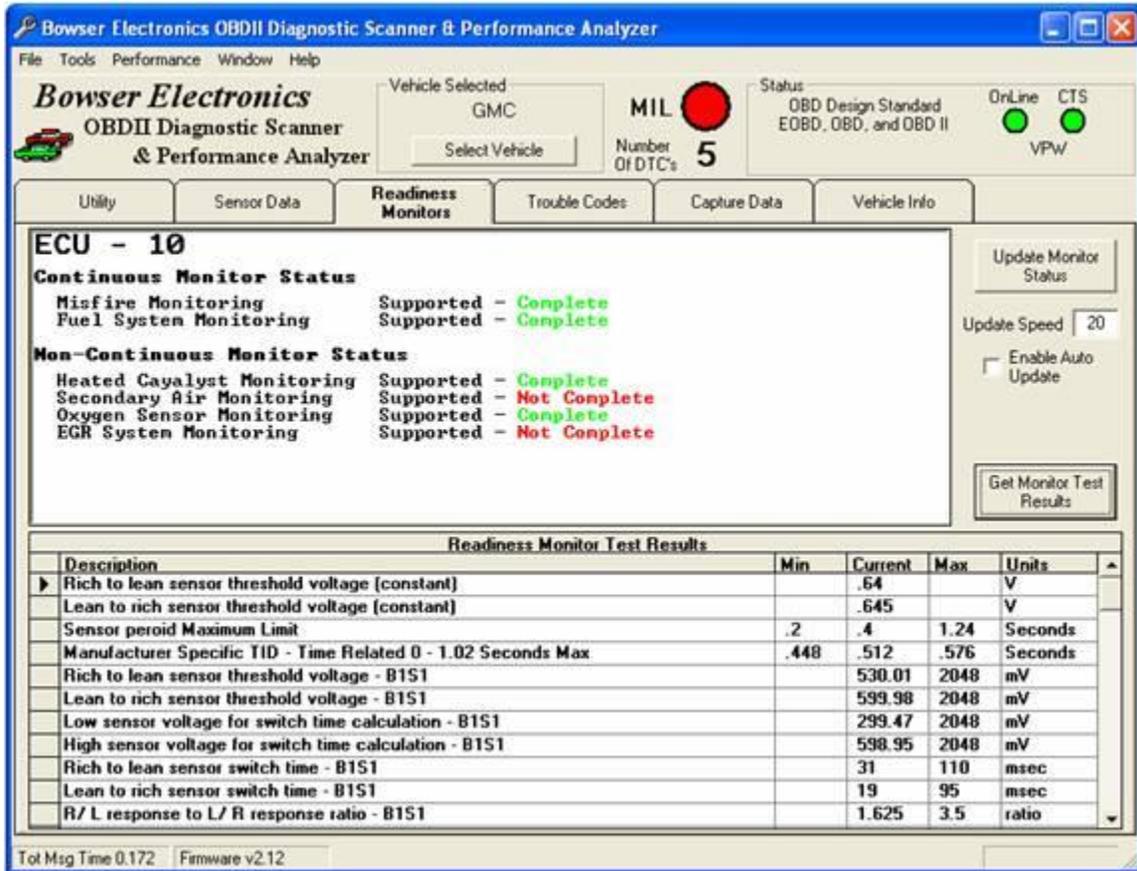


Trouble Codes Present?

The 'MIL' (Malfunction Indicator Lamp) indicator will be red if active OBD-II trouble codes are present in your vehicle. The number of 'DTC's (Diagnostic Trouble Codes) is indicated next to the MIL indicator. Both are updated through the 'Readiness Monitor' tab.

OBD Design Standard

Once a connection is made with your vehicle, the OBD Design standard your vehicle was designed to is indicated on the upper right part of the screen. If 'OBDII' is not part of the indicated Design Standard, some functions of this program may not work properly.



Scan Tool Status

Two indicators in the upper right portion of the screen indicate the status of communications both from the PC to Scan Tool as well as from the Scan Tool to the Vehicle. The 'On-Line' indicator is green when the Scan Tool has successfully initialized communication with the vehicle. The 'CTS' indicator indicates the state readiness the Scan Tool is in. Green indicates the Scan Tool is ready for communication from the PC and red indicates the Scan Tool is busy or not connected. If the Scan Tool is busy for more time than allowed by the 'Tools – Timing – Offline Timer' parameter, the entire system will go offline and begin attempts to re-initialize.

Also, check the Scan Tool itself to be sure it is powered on and communicating with the vehicle.

The Status Bar

The Status Bar, at the bottom of the program window, uses four panels to display information about program execution. The use of the four panels can change depending on the function currently selected.

During General Communication:

The left two panels show information about message request/response timing and scan tool firmware version; the right panel shows how many valid messages were received, and the large middle panel shows general text messages indicating progress and/or errors during Communication.

Definitions for specific tabs, when different from above, are shown in their respective help files.

Information Tabs

Tabs are used to group and access different types of information about the vehicle and to perform other functions through out the program. There are two ways to navigate from tab to tab in the program.

First, the 'Window' menu drop down lists all tabs and sub-tabs, and shows a check next to the currently active tab. Clicking on any menu item in the window list causes that tab to be displayed.

Second, the Tabs can be directly accessed by clicking on the text of the tab of interest.

Information Tabs

Utility

The Utility tab shows several dialogs that allow the user to see Communication data, Scan Tool memory, perform vehicle bus monitoring, and manually transmit messages to the vehicle bus.

Vehicle Data

The Vehicle Data tab shows data from the Scan Tool in various states of formatting.

The Event Log box shows information about the program session. Information includes startup parameters, vehicle data requests, and Com port information.

The Table Sensor Data box shows data obtained through the Sensor Data. Each time the sensor list is modified, a new header is written.

To clear all boxes, click the 'Clear Data' button. Any or all boxes can be saved as 'csv' files through the 'File – Save' menu.

Scan Tool Data

The Scan Tool Data tab provides an interface for the user to see and change the Status and EEPROM settings of the Scan Tool.

All settings in the Converter EEPROM frame may be changed by clicking on the value of the item to be changed. When the mouse moves over a setting that can be changed, the pointer changes to a straight up arrow pointer from the normal pointer. Enter data as instructed and click 'OK' to change or click 'Cancel' to abort the operation. The check boxes have no prompt and change immediately upon clicking then. The program automatically sets the EEPROM to work correctly with the program.

Click 'Refresh Data' to update all fields on the screen.

Click 'Default EEPROM' to set changes back to factory values.

Continuous Receive Mode

The Continuous Receive tab provides an interface for the user to monitor traffic on the vehicle bus. To initiate monitoring, click the 'Cont Receive' button. The update interval time is set in the 'Tools – Timing' menu. After data is accumulated, click the 'Cont Receive' button to stop monitoring. The button is red when monitoring is stopped and green during monitoring. During monitoring, all other tabs are disabled to prevent data collisions. Once monitoring is complete, the 'Add Descriptions' button can be clicked to decode the header information and add descriptions to the packets. Clicking the 'Clear Data' button will clear all data from the box.

During monitoring the status bar panel will show the following:

The left panel will show the total time to retrieve and process the incoming data.

The large center panel will show:

Which bus is being monitored

Message Rate in Frames/second

InBufferSize in bytes used of total bytes available

The right panel will show the total number of messages received.

The following data fields are displayed:

Message, Priority, In-Frame Response, Address Mode, In-Frame Response Type, Message Type, Target Address, Target Type, Target Name, Source Address, Source Type, and Source Name.

The data can be saved by using the 'File – Save' menu.

Manual Vehicle Communication Mode

The Manual Communication tab provides an interface for the user to manually obtain information. The user may request data from the scan tool or vehicle, manually calculate CRC or Checksums, as well as lookup DTC descriptions for all installed vehicles and code types. For a complete list of Scan Tool Comands, see the OBD-121 data sheet on the Bowser Electronics web site. For detailed information concerning vehicle message structure and format, see SAE documents J1979, J2190, and J2178 parts 1-4.

Manual Transmit/Receive

To send a request message, type the request as a 2 character per byte hex message (i.e. 616AF10101). Do Not include checksum/crc byte as it is automatically appended. Type the number of return messages to wait for in the 'Return Messages' box. This makes Communication much quicker if you know how many messages will be returned. If unsure of the number of return messages, enter 0 to allow all messages. Then, click the 'Transmit' button to send the request. The request and any responses will appear in the 'Manual Receive' box. To clear this box, click the 'Clear' button.

There are several entry boxes to customize how requests and responses are handled.

- § Screen Physical Responses – If you make a physically addressed request, you scan screen out any responses not specifically addressed to the scan tool.
- § Remove 7F Responses – Physically addressed requests may return a negative response usually indicating an unsupported request. Use this check box to filter out these responses.
- § Auto Update – Select Auto Update to automatically request data from the scan tool or vehicle at the interval entered in the Update Interval box. Please note: the update interval is in milliseconds (1000mS = 1 Second).
- § Decode Data – Responses may be automatically decoded by entering the start byte of the response value, the number of bytes in the response value, the offset, and the gain for scaling the response. The decoded response will appear next to the response string.

For a complete list of Scan Tool Comands, see the OBD-121 data sheet on the Bowser Electronics web site. For detailed information concerning vehicle message structure and format, see SAE documents J1979, J2190, and J2178 parts 1-4.

Manual CRC/Checksum

The 'Calc CRC/Checksum' box can be used to calculate CRC or Checksum for any message. Type the request as a 2 character per byte hex message (i.e. 616AF10101) and click the 'CRC' or 'CS' button. The result is appended to the message in the box.

Manual DTC Description Lookup

The DTC Description Lookup can be used to query the data base for DTC descriptions based on the Vehicle and DTC code selected. To select a vehicle, use the drop down box. If your vehicle does not appear, only Generic codes are supported. Enter the trouble code you wish to lookup (i.e. P0300) and click 'Look Up DTC'. If there is a match in the database, the description will be displayed. If there is no match, the box will display 'No Match Found'.

Manual Data

The following data fields are displayed:

Request Message, Reply Number, Reply Message, and Time

The data can be saved by using the 'File – Save' menu.

Sensor Data

The Sensor Data tab shows information from all available Real Time Sensors. The table displays the ECU (Electronic Control Unit) number, text description, current value, and units as selected in the Tools – Units menu.

ECU	Description	Current Value	Units
10	0x10 - Absolute Throttle Position	5.88	%
10	0x10 - Bank 1 Long Term Fuel Trim	3.91	%
10	0x10 - Bank 1 Short Term Fuel Trim	-4.69	%
10	0x10 - Calculated Load Value	8.24	%
10	0x10 - Commanded EGR	5.49	%
10	0x10 - Commanded Secondary Air Status	Atmosphere/Off	
10	0x10 - EGR Error	7.03	%
10	0x10 - Engine Coolant Temperature	176	Deg F
10	0x10 - Engine RPM	817	RPM
10	0x10 - Fuel Rail Pressure (gauge)	46.12	PSI
10	0x10 - Fuel System 1 Status	Closed Loop	
10	0x10 - Fuel System 2 Status	Not Used	
10	0x10 - Ignition Timing Advance for #1 Cyl	17	Deg
10	0x10 - Intake Air Temperature	15.8	Deg F
10	0x10 - Intake Manifold Absolute Pressure	24.875	inHg
10	0x10 - Mass Air Flow	15.7	CFM
10	0x10 - O _x Bank 1 - Sensor 1 Output Voltage	.99	V
10	0x10 - O _x Bank 1 - Sensor 1 ST Fuel Trim	0	%
10	0x10 - O _x Bank 1 - Sensor 2 Output Voltage	1.035	V
10	0x10 - O _x Bank 1 - Sensor 2 ST Fuel Trim	99.22	%
10	0x10 - Vehicle Speed Sensor	9.32	MPH

The table may be manually updated by clicking the 'Update Now' button. Automatic table update is enabled by checking the 'Enable Auto Update' check box. Automatic updates will occur at the update speed specified in the 'Update Speed' drop down. Automatic updates only occur while the Sensor Data tab is active.

Low = 7.5 second delay

Medium = 2.5 second delay

High = 0.5 second delay

Max = No delay, All screen updates turned off for maximum data through put

Alternately, an automatic update time from 0.01 to 60 may be entered manually.

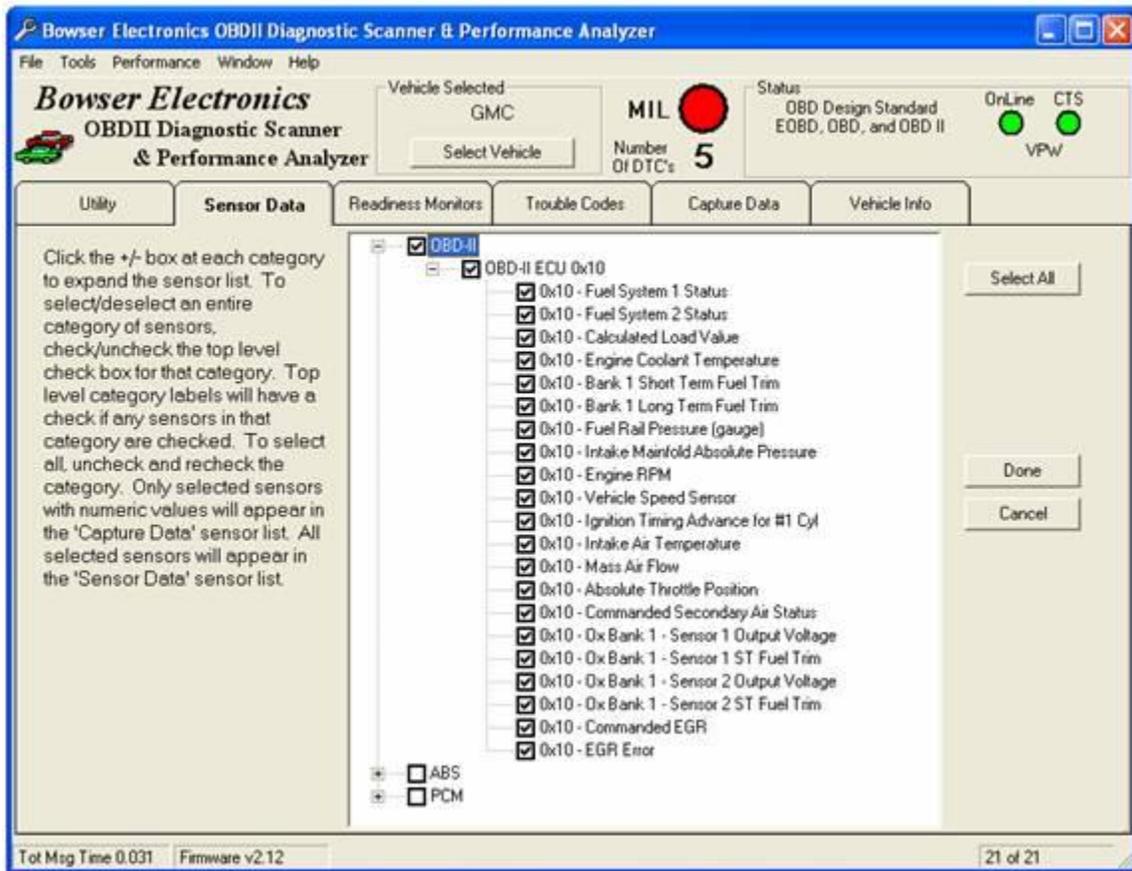
The program automatically remembers the 'Update Speed' and 'Enable Auto Update' settings and uses them the next time the program is run.

Use the 'Edit Sensor List' button to select which available sensors will be included in the Sensor Data Table. If there is an Extended Data Package installed, there will be several categories of sensors to select from. By default, the OBD-II Sensor list is available for all vehicles and includes the list of sensors supported by the vehicle. Click the +/- box at each category to expand the sensor list. To select/deselect an entire category of sensors, check/uncheck the top level check box for that category. Top level category

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labels will have a check if any sensors in that category are checked. To select all, uncheck and recheck the category. Only selected sensors with numeric values will appear in the 'Capture Data' sensor list. All selected sensors will appear in the 'Sensor Data' sensor list. At program startup, all OBD-II supported sensors are selected. Any time the vehicle type or model is changed, all sensor are deselected and must be checked again.



For Extended Data Sensors, not all sensors will be supported by all vehicles. Check the 'Auto Remove Unsupported Sensors' to remove these sensors from the Sensor Data table as they are detected.

Every sensor value is time stamped and saved, each time there is an update, in the 'Utility – Vehicle Data – Table Data' box. Each time the sensor list is changed, a new header is written.

The data can be saved by using the 'File – Save' menu and selecting 'Table Data'.

Readiness Monitors

The Readiness Monitors tab shows information about the Continuous and Non-Continuous monitors.

Readiness Monitors will show either 'Complete' or 'Not Complete' in green and red respectively. The data, if any, contained in the 'Readiness Monitor Test Results' table may not be valid if the corresponding Monitor is 'Not Complete'. Some readiness monitors require a complete drive cycle to indicate complete. A drive cycle is generally defined as a steady throttle low speed then high speed then low speed drive. For specific information about your vehicle drive cycle, check your factory shop manual or search the web. The information may be manually updated by clicking the 'Update Monitor Status' button. Automatic update is enabled by checking the 'Enable Auto Update' check box. Automatic updates will occur at the update speed specified in the 'Update Speed' entry box. Automatic updates occur in the background as time from other processes permit.

The Readiness Monitor Test Results table shows information about the monitor tests on the vehicle from both Mode \$05 and Mode \$06 oxygen sensor and general test results. Click the 'Get Monitor Test Data' button to update the table. If no information is available, the system will show an error box. If information is available, the table will display the results. The table displays Test Description, Minimum Limit, Current Value, Maximum Limit, and Units. Be sure to select a Vehicle Type first to get manufacturer specific descriptions when available.

ECU - 10

Continuous Monitor Status

Misfire Monitoring Supported - Complete
 Fuel System Monitoring Supported - Complete

Non-Continuous Monitor Status

Heated Catalyst Monitoring Supported - Complete
 Secondary Air Monitoring Supported - Not Complete
 Oxygen Sensor Monitoring Supported - Complete
 EGR System Monitoring Supported - Not Complete

Description	Min	Current	Max	Units
Rich to lean sensor threshold voltage (constant)		.64		V
Lean to rich sensor threshold voltage (constant)		.645		V
Sensor period Maximum Limit	.2	.4	1.24	Seconds
Manufacturer Specific TID - Time Related 0 - 1.02 Seconds Max	.448	.512	.576	Seconds
Rich to lean sensor threshold voltage - B1S1		530.01	2048	mV
Lean to rich sensor threshold voltage - B1S1		599.98	2048	mV
Low sensor voltage for switch time calculation - B1S1		299.47	2048	mV
High sensor voltage for switch time calculation - B1S1		598.95	2048	mV
Rich to lean sensor switch time - B1S1		31	110	msec
Lean to rich sensor switch time - B1S1		19	95	msec
R/L response to L/R response ratio - B1S1		1.625	3.5	ratio

It is recommended to enable the automatic update as this updates the MIL indicator also. An automatic update time from 0.5 to 60 seconds may be entered manually.

The program automatically remembers the 'Update Speed' and 'Enable Auto Update' settings and uses them the next time the program is run.

The Readiness Monitor Status data can be saved or printed by using the 'File – Save' menu or 'File – Print' menu and selecting 'Monitor Status'. The Readiness Monitor Test Results table is written to the Event Log and can be saved by using the 'File – Save' menu and selecting 'Log File'.

Trouble Codes

The Trouble Codes tab shows information about Why and What set the MIL (Malfunction Indicator Lamp).

The DTC's (Diagnostic Trouble Codes) may be retrieved from the vehicle by clicking the 'Retrieve DTCs' button. The table will display DTC Type, ECT, Code, and Description. The DTC Type may be either 'A' or 'P'. An 'A' indicates a code that is activating the MIL and a P is a pending code not yet causing an active MIL. Descriptions for Manufacturer Specific DTC's will only be displayed if the Vehicle Type has been selected.

Freeze frame data is a snapshot of the vehicle sensors when a DTC is set. While the MIL is active, click the 'Get Freeze Frame Data' button to retrieve the sensor data. Freeze frame data may be invalid if no MIL is set. The frame is a Hex number from 00 to FF. Only frame '00' is mandated but other frames may contain data as well if multiple codes are set. Set the frame number before clicking the 'Get Freeze Frame Data' button.

DTC's may be cleared by clicking the 'Clear DTCs' button. You will be prompted to be sure you want to clear the codes. Click 'OK' to clear the active DTC's or click 'Cancel' to abort the operation. Once the codes are cleared, the vehicle is queried to be sure the codes have been cleared. The MIL, both on vehicle and in the program, should return to normal, and the DTC table should show no active DTC's.

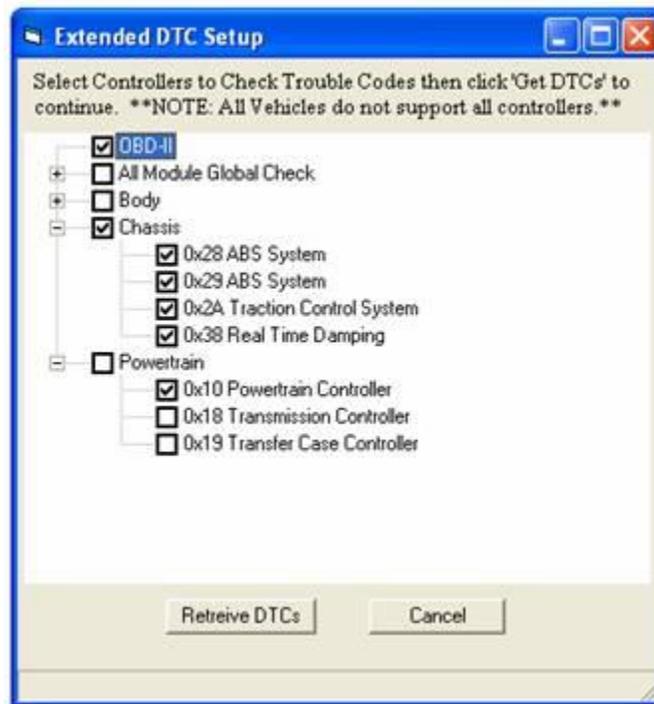
Diagnostic Trouble Codes

Type	ECU	Code	Description
Active	10	P0301	Cylinder 1 Misfire Detected
Active	10	P0263	Cylinder 1 Contribution/Balance Fault
Active	10	P1381	Misfire Detected - No Communication with Brake Control Module
Active	10	P0473	Exhaust Pressure Sensor High
Active	10	P1601	Serial Comm. Problem With Device 1
Pending	10	P1566	Engine RPM Too High - Cruise Control Disabled

Freeze Frame Data

ECU	Description	Current Value	Units
10	DTC that saved freeze frame data	P0301	
10	Fuel System 1 Status	Open Loop	
10	Fuel System 2 Status	Not Used	
10	Calculated Load Value	9.02	%
10	Engine RPM	3250	RPM
10	Vehicle Speed Sensor	24.23	MPH
10	Absolute Throttle Position	44.71	%
10	Distance Travelled With MIL Active	309	Miles
10	Commanded EGR	13.33	%
10	EGR Error	3.12	%

If an extended data package is installed for the vehicle type selected, the following screen will appear whenever the 'Retrieve DTCs' or 'Clear DTCs' buttons are clicked.



Select ECUs to retrieve or clear by checking the appropriate check box. Click the +/- to expand/collapse the category trees. Entire categories may be selected by checking the category name. The 'All ECUs' box indicates the vehicle will accept a trouble code request addressed to all ECUs in the vehicle. This greatly reduces time needed to obtain and clear trouble codes. When the 'All ECUs' check box is checked or cleared, all other items are set to match. Click the Retrieve / Clear DTCs button to continue or click Cancel to cancel.

Every trouble code and sensor value is time stamped and saved, each time there is an update, in the 'Utility – Vehicle Data – Event Log' box. The data can be saved by using the 'File – Save' menu and selecting 'Log File'.

Capture Sensor Data

Live Data Capture

Up to five vehicle sensors at a time may be constantly monitored and recorded. To set up a data capture, select at least one vehicle sensor from the drop downs on the left side of the screen. Only sensors previously added to the available sensor list show up on the drop down list. Use the Edit Available Sensor List button to select sensors to be on the list. Sensors may be selected in any order and will automatically enable/disable accordingly. Next, select a 'Capture Speed' from the drop down or enter one manually.

Low = 1 second delay

Medium = 0.5 second delay

High = 0.001 second delay (As fast as possible with the display on)

Max = As fast as possible (No Text or Chart display is available to minimize system overhead)

Any update time from 0.001 to 60 may be entered manually.

Then, click 'Capture Start' to begin. Live Data will appear under the sensor drop down, on the chart, and in the text box. Toggle between the chart and text by clicking 'Show Chart' and 'Show Text'. Each sensor drop down is highlighted with the graph plot color for easy identification. Both Chart and Text are disabled during 'Max' capture speed. No other tabs can be selected while data is being captured.

The program automatically remembers the 'Capture Speed' and 'Show Chart/Text' settings and uses them the next time the program is run.

Load Previously Saved Capture File

Previously captured data may also be loaded and displayed by using the Load File button. Select the file to be loaded and click 'Open'. The file must be a valid Capture Data CSV file or the program will alert you that the file can not be opened. The data can then be zoomed, or printed as needed. To switch back to live data capture mode, click the 'Switch to Live Capture' button on the right side of the screen.

Save Capture File

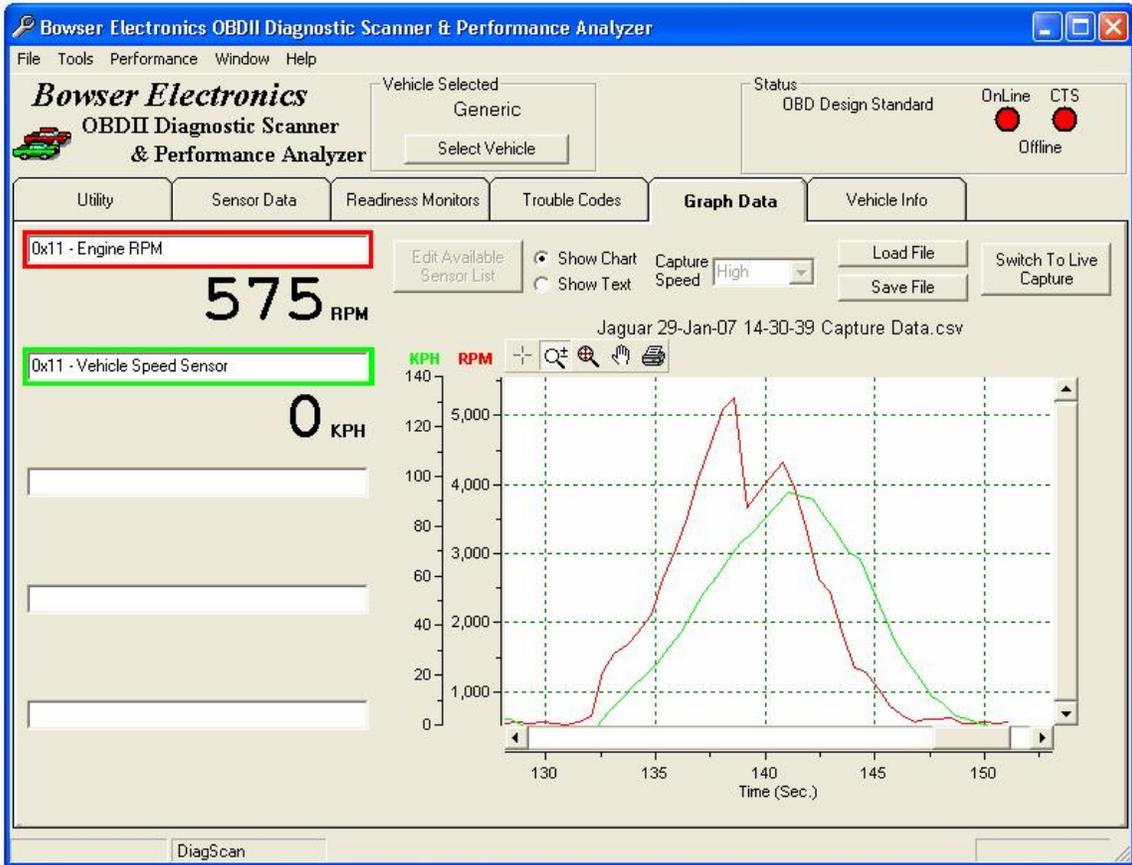
Once the graph is displayed as you like, the graph data may be saved. You can save either the entire graph file or only the data displayed in the current zoom view.

Capture Data Chart Operation

After capturing sensors or loading a capture file, the data can be zoomed, saved, or printed as needed. Details on general chart operation can be found in the Chart Operation section and only features specific to the Capture Data section are presented here.

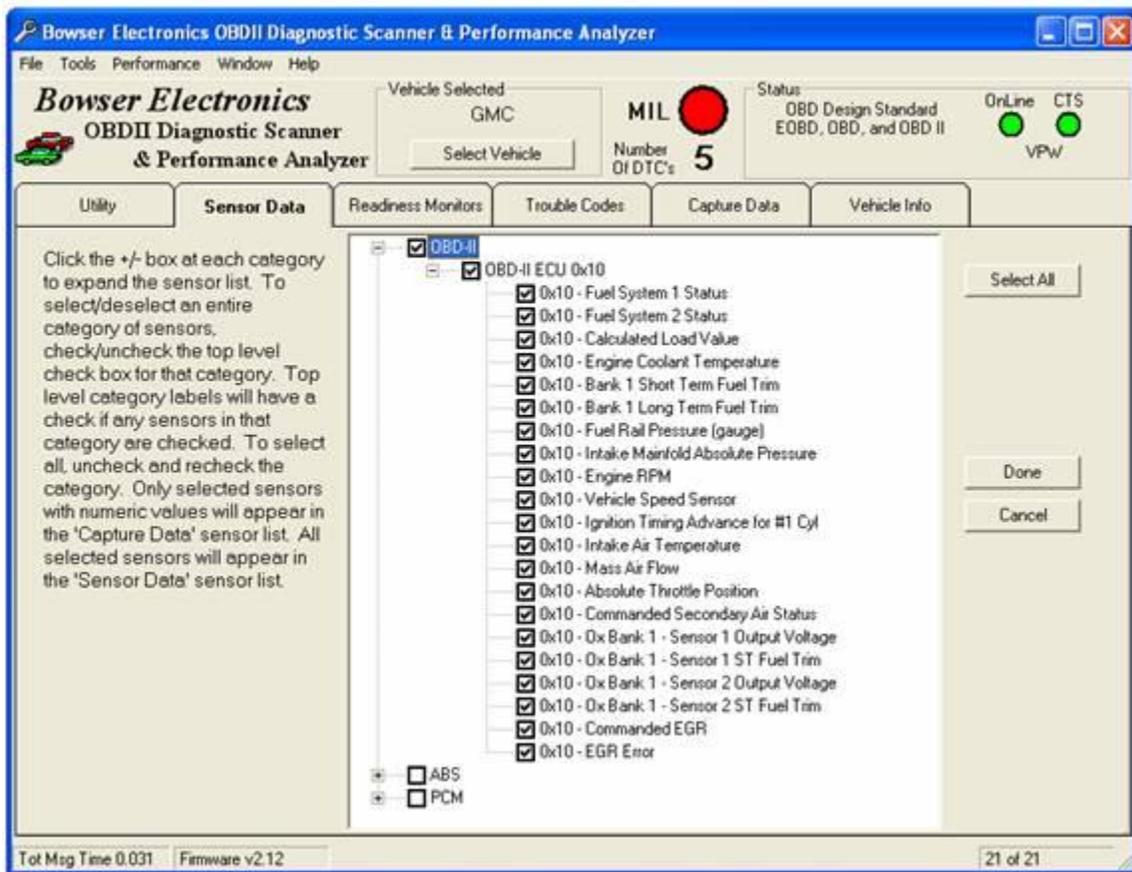
Anytime data is displayed on the chart, each data series will be displayed with its own Y axis scale and plot color. This plot color is also used to color the Y axis scale units and the display boxes on the left to allow for easy understanding of the plots.

Using the crosshair mode, data point values are updated on the left side large display as the cross hair is moved on the chart.



Adding Sensors to the Dropdown

To add available sensors in the dropdown, use the 'Edit Available Sensor List' button to select which available sensors will be included in the Sensor Data Table. If there is an Extended Data Package installed, there will be several categories of sensors to select from. By default, the OBD-II Sensor list is available for all vehicles and includes the list of sensors supported by the vehicle. Click the +/- box at each category to expand the sensor list. To select/deselect an entire category of sensors, check/uncheck the top level check box for that category. Top level category labels will have a check if any sensors in that category are checked. To select all, uncheck and recheck the category. Only selected sensors with numeric values will appear in the 'Capture Data' sensor list. All selected sensors will appear in the 'Sensor Data' sensor list. At program startup, all OBD-II supported sensors are selected. Any time the vehicle type or model is changed, all sensor are deselected and must be checked again.

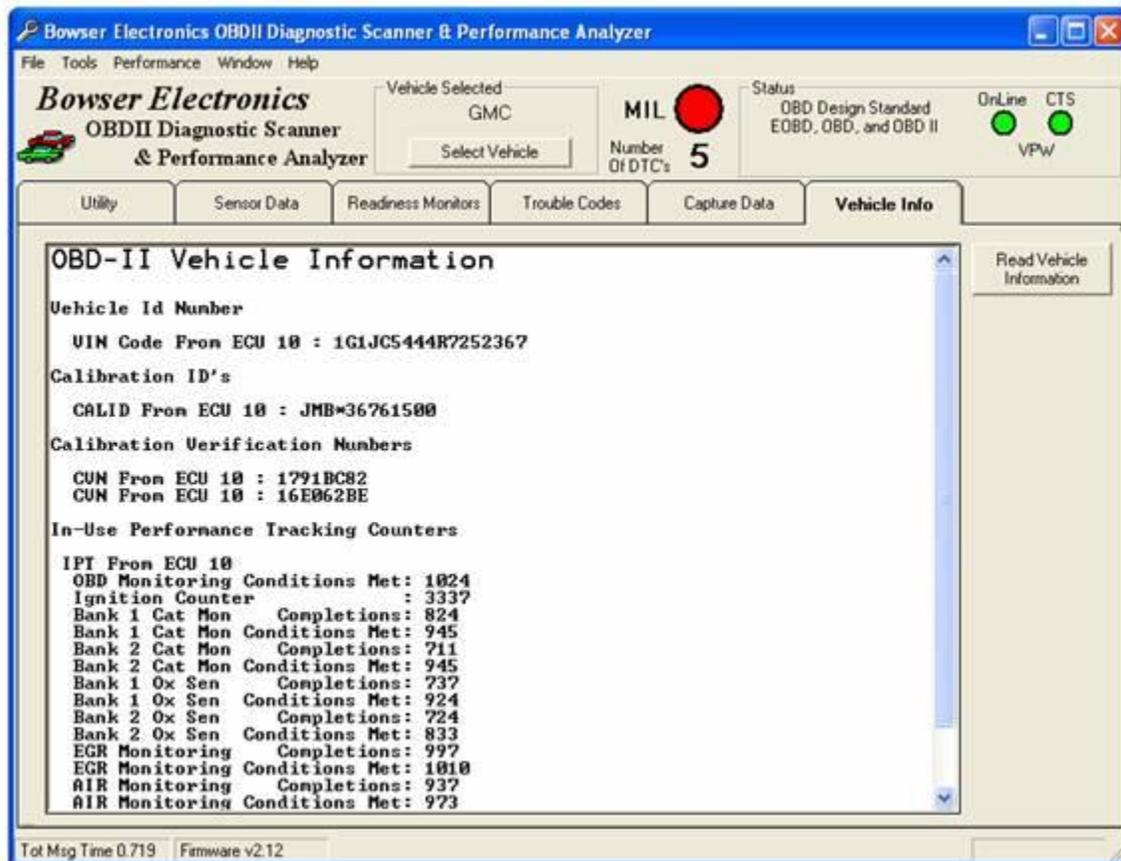


*Note: For Extended Data Sensors, not all sensors will be supported by all vehicles.

Vehicle Information

The Vehicle Info Tab displays vehicle information including VIN, Calibration IDs, Calibration Verification Numbers, and In-Use Performance Tracking Counters. Not all vehicles support will support all of these functions. When used with extended data enabled, more vehicle specific information is read and displayed when available.

The Vehicle Info data can be saved or printed by using the 'File – Save' menu or 'File – Print' menu and selecting 'Vehicle Info'.



Performance Module

The performance module is designed to give you accurate measures of engine power, acceleration, and braking power. Care should be taken not to break any local laws or exceed the limits of your vehicle. The performance module will not support vehicles that are not OBD-II compatible and/or do not support the vehicle speed and engine RPM sensors.

Menu

File - Print

Use the print dialog box to print the chart on the current tab then customize print settings through the use of the Windows standard printer setup dialog. All charts may also be printed by clicking the printer icon on the chart itself.

File-Save

Use the save dialog box to save the current tab chart data and customize save settings through the use of the Windows standard save dialog.

File-Exit

Use the exit dialog to close the Performance Module. This feature is equivalent to closing the window with the 'X' in the upper right corner of the screen.

Help-Current Tab

Displays the help dialog for the tab currently selected. This can provide a shorter path to the information you need.

Help-Troubleshooting

Displays the help dialog for the Troubleshooting help topic. For more information refer to Troubleshooting (page 33)

Help-Contents

Displays the help dialog main menu. Navigate from here to locate specific information.

Parameter Setup

Use the Parameter Setup Screen to load vehicle information, weather information, and to edit the triggers for live performance runs.

Vehicle Data

Vehicle data is used only for Dyno calculations. Enter information or select your vehicle from the drop down menu. After changing any information, you may use the Save button to save the profile. You will be prompted for a profile name or to overwrite the current profile. The default profile can not be changed or deleted. You may select a profile and click the delete button to remove it from your list.

Data Fitting Constants

The data fitting constants are stored with the vehicle profile and are used to determine how to fit your speed and rpm data. Use the lowest Order of Fit (Default=3) possible for satisfactory graphing. Once you select an order of fit for a particular vehicle, it shouldn't be changed. Changing the order of fit can change the results of future dyno runs. The Min Fit Points (Default=5) is used to determine the minimum number of data points in a series to try to fit. The Min Change Points (Default=1) is used to

help the system determine when the RPM changes direction from acceleration to deceleration. The default should provide satisfactory performance.

Weather Conditions

The weather conditions are used along with the drag coefficient and frontal area to calculate drag forces and also to correct the Horsepower and Torque readings to SAE J1349 standards.

Triggers

The triggers are used to set change thresholds in the live performance runs to automatically start or end the run. If the end triggers are not reached, any run can be manually stopped by clicking the Stop button. The Dyno live performance run waits until the engine RPM exceeds the Start RPM trigger and runs until the engine RPM reaches the End RPM trigger. The Acceleration performance run waits for zero speed, then runs the acceleration run until the vehicle decelerates at a rate higher than the Stopping G-Force trigger. The Braking performance run waits for the deceleration force to exceed the starting G-Force trigger, and runs until the vehicle reaches zero speed.

Load Previously Saved Data

The Dyno, Acceleration, and Braking Tabs each have a button to load your previously saved data. If a Dyno file does not have the vehicle profile name and weather info present, the program will alert you so you can use the current settings or defaults.

Performance Chart Operation

The Dyno, Acceleration, and Braking charts each update the real time data fields and for the Dyno chart, power and torque displays, when the crosshairs are used on a chart with Time as the X axis scale.

Manipulating Chart Data

Dyno, Acceleration, and Braking Charts may each be edited to provide only the data you wish to have analyzed. Chart data can only be edited in the 'Raw Data' chart view. To edit the chart, use the zoom feature to zoom in on only the data you want. Then, click the "Trim Data to Plot View" button. The data will be trimmed and the re-loaded into the chart. For the Dyno tab, all statistics will be re-calculated. Once you have the view you want, select other charts to analyze your performance run. To undo the zoom, click the 'Default Plot View' button.

Save Current Data

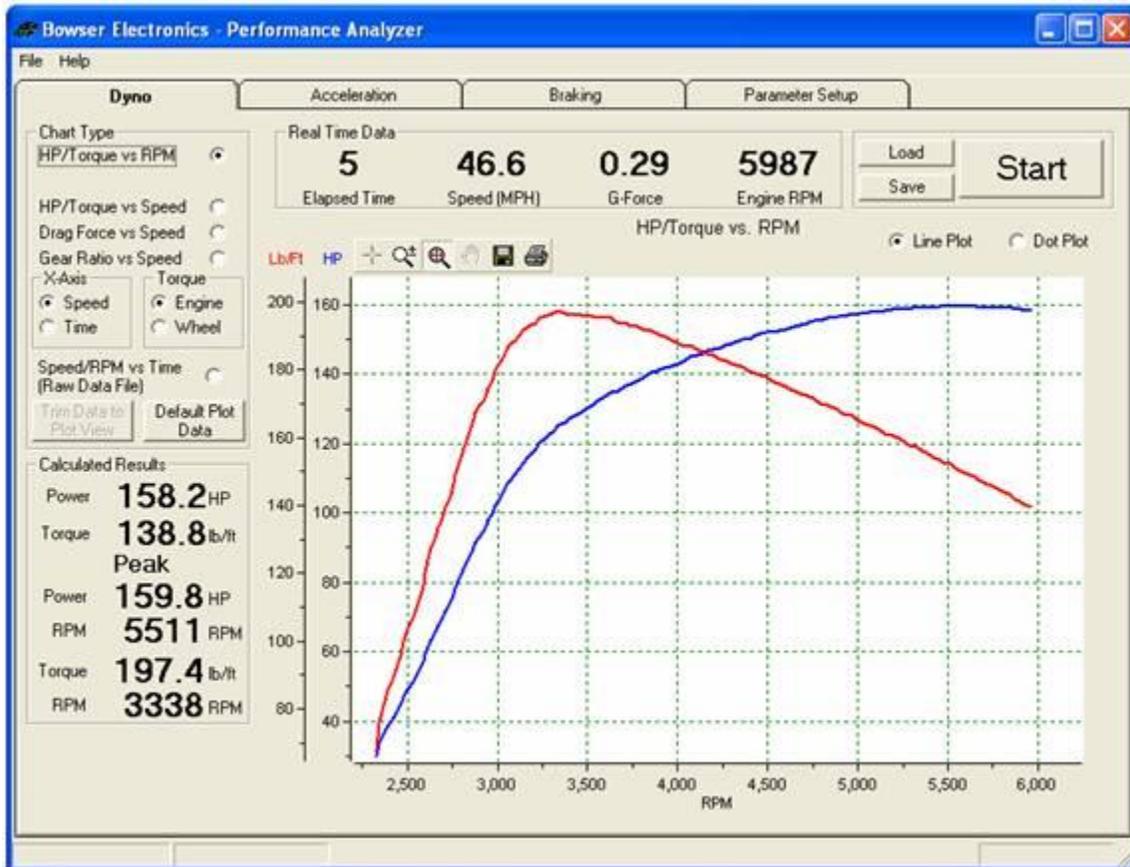
The Dyno, Acceleration, and Braking Tabs each have a button to save your data. You can choose to either save the trimmed data or the whole file. You may also re-save files that were loaded. When Dyno files are saved, the vehicle profile name and current weather conditions are saved as well.

Start Live Performance Run

The Dyno, Acceleration, and Braking Tabs each have a button for you to start a live performance run. Click the start button and the program verifies communication with the vehicle and monitors for the start trigger condition as outlined above in Triggers. The start button also changes to the stop button and any run can be aborted or stopped by clicking stop. Any data retrieved during a live performance run is displayed in the chart upon normal completion or manual stop. The data can then be trimmed or analyzed as is.

Dyno

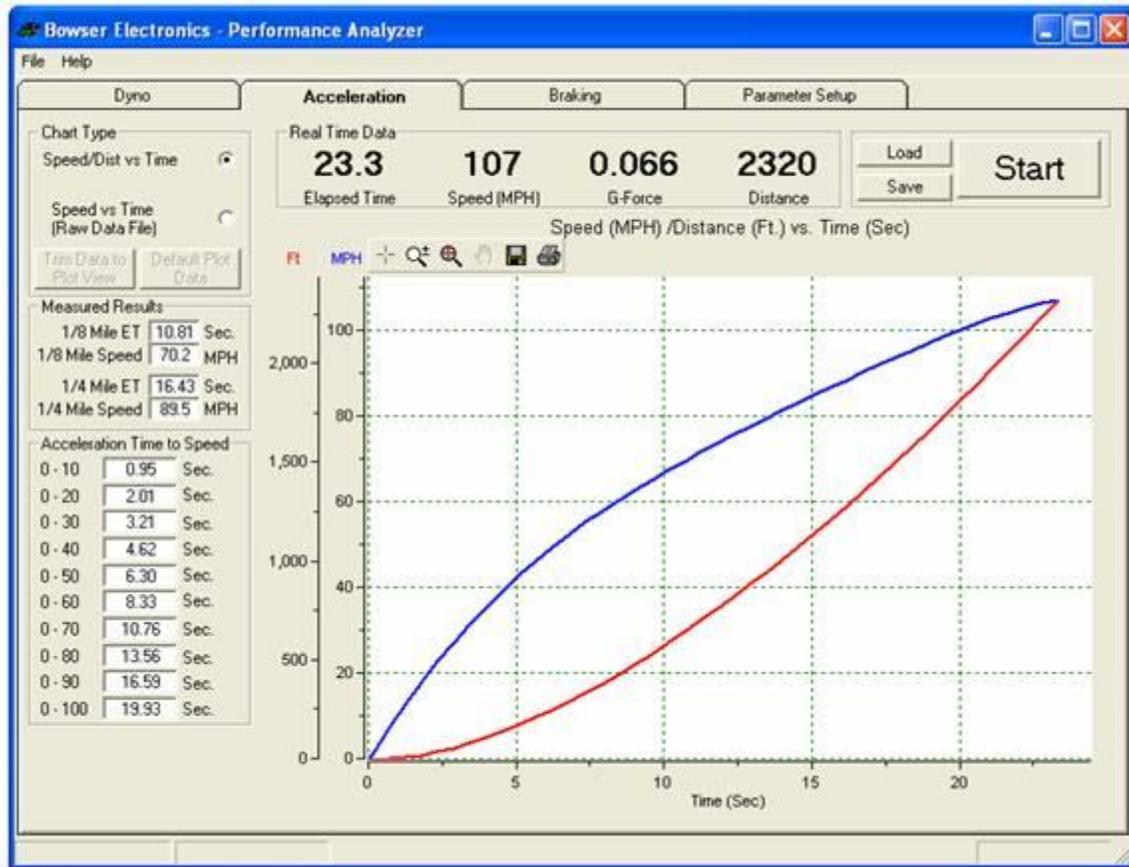
The Dyno Tab displays information about Power, Torque, Drag, and Gear Ratio. Maximum Horsepower and Torque are calculated and displayed with the RPM at peak. Graphs are available to display (Horsepower and Torque vs. RPM, Speed, or Time), (Drag Force vs. Speed or Time), and (Gear Ratio vs. Speed or Time). The X-Axis can be switched between Speed and Time by selecting the X-Axis option button for speed or time. Also, Torque displayed can be either Engine Torque or Wheel Torque and is selected with the Torque option buttons.



Once data is either loaded or captured via live performance run, outlined above, you can trim your data if necessary, and then select the graph to analyze the data and display.

Acceleration

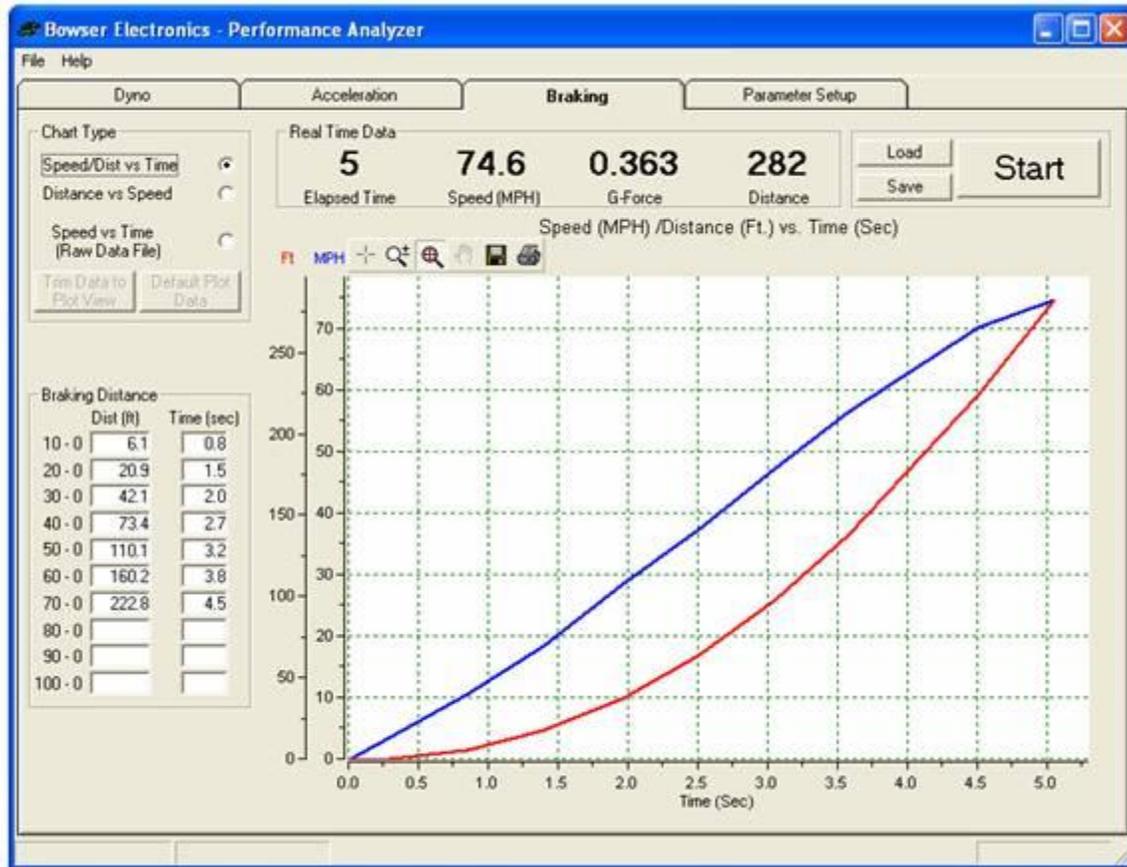
The Acceleration Tab displays information about the Acceleration time and time to distance for your vehicle. Time to Speed statistics are calculated for each 10 MPH increment up to 100 MPH. Graphs are available to display (Speed and Distance vs. Time) and (Distance vs. Speed).



Once data is either loaded or captured via live performance run, outlined above, you can trim your data if necessary, and then select the graph to analyze the data and display. If the data does not start with a zero point or there are fewer than 5 data points, the program will display an error.

Braking

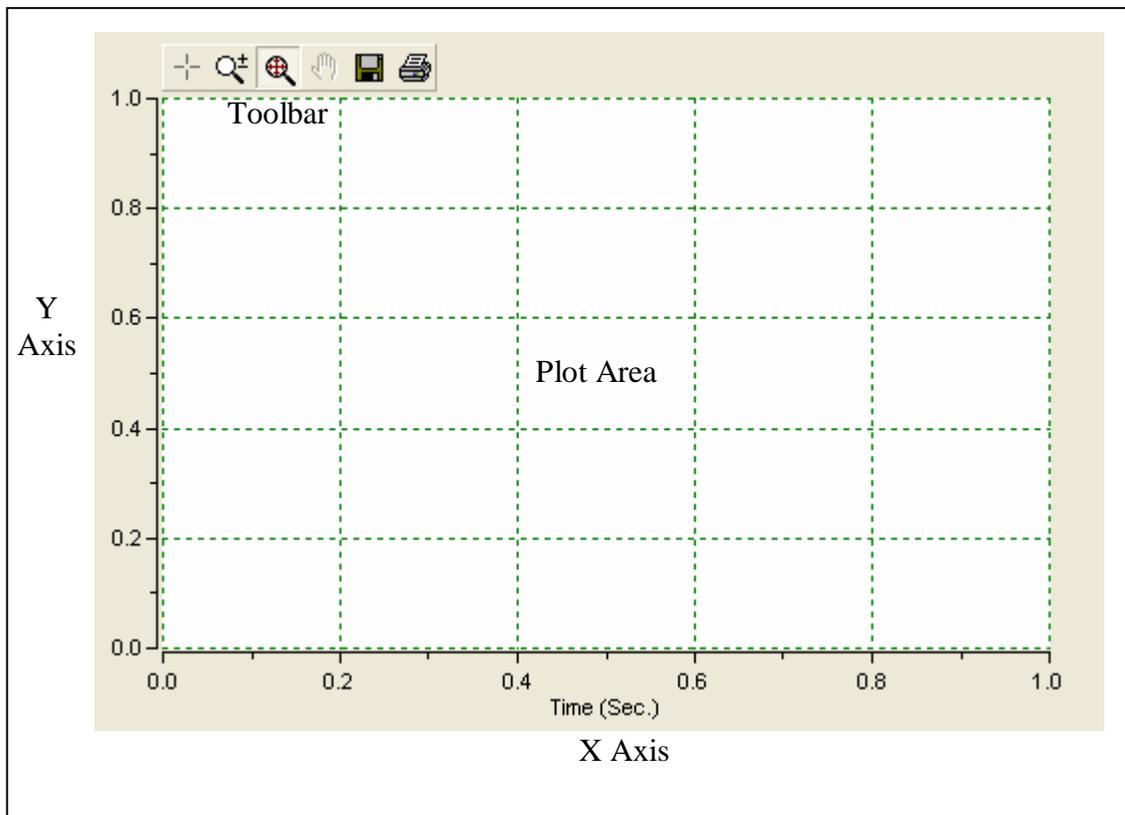
The Braking Tab displays information about the braking time and distance for your vehicle. Speed to stop statistics are calculated for each 10 MPH increment for both distance to stop and time to stop. Graphs are available to display (Speed and Distance vs. Time) and (Distance vs. Speed).



Once data is either loaded or captured via live performance run, outlined above, you can trim your data if necessary, and then select a graph to analyze the data and display. If the data does not end with a zero point or there are fewer than 5 data points, the program will display an error.

Chart Operation

The Charts used through out the program allow the user to easily customize the view and save or print the chart images. The chart has the following features selectable from the Toolbar located in the upper left corner of each chart.



Crosshairs



Select this button to view the coordinates of different points within the plot. The X-coordinates and Y-coordinates, are displayed, one for each scale. Upon selecting this button, the crosshairs are displayed in the plot area in green. To determine the coordinates at a desired position, hold the left mouse button down, and move the crosshairs to the desired location. To disable the crosshairs mode, deselect this button.

Zoom in/out



Select this button to zoom in on a specific window area within the plot. Upon selecting this button, the mouse cursor changes to a magnifying glass when the mouse is positioned over the plot area. Left-click on the mouse to indicate the start of the area to zoom in on. Hold down on the left button to select the area. Release the left button once the area to zoom in on has been selected. The plot is redrawn to display the selected area. Use the scrollbars or the pan function to view other segments of the graph. To zoom out in stages, position the mouse over the plot area and right-click. To view the complete graph again, select the Zoom out all button. To disable the zoom in/out mode, deselect this button.

Zoom out all



This button is selected by default when the chart is first displayed. Select this button to display the plot in

its complete form. Scrolling is not required to view segments of the graphs. Hence, the scroll bars are not visible and the pan function is disabled.

Pan

The Pan function becomes available when the chart is zoomed in. Select this button to dynamically scroll the chart in any direction. Position the mouse at a specific location, then hold the left mouse button down to anchor the mouse to that chart location. Drag the mouse to position the chart as desired. When the left mouse button is released, panning stops. To pan again, move the mouse to another chart location, hold the left mouse button down, and then drag the mouse to position the chart as desired. To disable panning, deselect this button.

Save Image

Select this button to save an image of the chart to either a bitmap file (*.bmp) or enhanced metafile (*.emf). The image is a capture of the chart as it is at that moment. Upon selecting this button, a Save As dialog is displayed whereby you can enter the filename, specify where to save the file, and select the file type - i.e. bitmap or enhanced metafile. Select the Save button to perform the save and close the Save As dialog. Saving the charts can take several seconds, during which there will appear to be no activity.

Print Chart

Select this button to print the chart image. The chart image is scaled to fit the printable area based on the paper size and the Printer Settings - left, top, right and bottom margins and orientation (portrait or landscape). The aspect ratio (height-to-width) is maintained. The print dialog will appear to select the printer to use and to customize settings. Printing the charts can take several seconds, during which there will appear to be no activity.

Troubleshooting

Having trouble getting everything you can out of our products? We want to help! Below are some first steps for troubleshooting. If you can't find what you need here, please feel free to contact us at Support@BowserElectronics.com and provide as much detail as possible and we will work with you to resolve your issues.

The program doesn't work:

Make sure you follow the software installation instructions (page 6). Most installation problems stem from DCOM98 and or MDAC not installing correctly. While we make every attempt to provide the most recent drivers, both of these may be downloaded from www.microsoft.com and installed separately. If your problems continue, check your installation directory for the file "errors.txt". If the file is present, e-mail it to us to help you determine what the problem is.

I can't see the whole program:

The program window is fixed in size to fit on a screen with 800x600 resolution or higher. Also, the font type must be set to 'Small Fonts'. To check your machine, on the start menu, click 'Settings → Control Panel → Display. On the 'Settings' tab the screen size should be set to 800x600 or higher. Also on the 'Settings' tab, click the 'Advanced' button to review the font size. It should not be set to large.

The OBD-II Diagnostic Scan Tool doesn't see my car:

Make sure your car ignition is turned on and the engine is running. The Scan Tool can't initialize until the car is on and running. If that doesn't do it then make sure your car is OBD-II compatible. This unit has been tested with CAN, PWM, VPW, ISO-9141, and ISO-14230 (KPW-2000). Be sure to verify the connector pin out in the General Information Section. The CAN protocol is only supported on scan tools with serial numbers 500 and above.

The Computer won't talk to the Scan Tool:

Ensure that the correct Com port is selected by clicking on the 'Utilities – Com' menu in the program and selecting the correct Com port. When Com pairs 1 and 3 or 2 and 4 are used, problems can arise. Com 1 and Com 3 use the same interrupt as do Com 2 and Com 4. You will know you have selected the correct Com port when the CTS indicator is red when the scan tool is disconnected from the pc and green when the scan tool is connected to the vehicle and pc. You can also use the auto select button in the Com dialog to automatically look for the scan tool. This feature requires that the scan tool be connected to the vehicle and pc during the check.

All of the lights are flashing:

There are two times when all of the lights on the scan tool will flash.

First, if the lights are flashing rapidly, ~1 time per second, the scan tool has detected a short on one of the vehicle bus communication lines. Disconnect the scan tool immediately as this can cause damage to the scan tool. Shorts on the vehicle bus line usually happen with the ISO protocol line on later model vehicles. The most common cause is aftermarket items such as radios replacing factory originals that used the communication bus. The scan tool program will detect this condition and alert you if this happens.

The second instance for all of the lights to flash is when the scan tool is in reprogramming mode. This only applies to CAN enabled scan tools with serial numbers above 500. When in reprogramming

mode, the scan tool will flash all of the lights at a rate of ~10 times per second. Some causes of forcing the scan tool into reprogramming mode are: Loss of scan tool power during reprogramming. The scan tool must remain powered during the reprogramming process. Also, cranking the engine with a weak battery can cause the scan tool go into a low power condition which will cause it to revert to the reprogramming mode. Never crank the engine with any scan tool connected to the vehicle. The scan tool will alert you if this happens and prompt you to reprogram the scan tool.

If you are using a USB to Serial Port adapter and have Communication problems:

- § Make sure you set the driver to emulate an available Com port.
- § Make sure you select the correct Com port in the program under the Tools - Com Port menu.
- § If you plug your USB adapter into a different USB port, the Com port number will change.
- § Be sure you connect your USB adapter before starting the program.
- § Be sure your USB drivers are up to date. Rarely are USB adapters supplied with current drivers. Check the manufacturers website for updates.
- § If the CTS indicator in the top right corner is always on, you have an adapter problem or the incorrect Com port is selected.
- § We highly recommend Belkin, IO Gear, ATEN, or Prolific USB to Serial adapters. Adapters made using the FTDI chipset (Radio Shack and Cables Unlimited) suffer from poor performance. XP service pack 2 using a Prolific USB to Serial adapter requires an updated USB driver available from the Prolific website.

Scan Tool Warranty/Limitation Of Liability

Scan Tool Warranty

All products are quality tested before shipping and are guaranteed to be defect free in material and workmanship. We will repair or replace, at our option, any product that is defective within one year of original purchase. The customer is responsible for shipping the defective unit to Bowser Electronics and we will return your order at our expense.

Scan Tool Limitation of Liability Statement

We can not be responsible for how you use any of our products. The OBD-II Diagnostic Scan Tool is designed to be SAE J1978 compliant however compliance is not guaranteed. BOWSER ELECTRONICS DOES NOT ACCEPT LIABILITY BEYOND THE REMEDIES SET FORTH HEREIN, INCLUDING ANY LIABILITY FOR PRODUCTS NOT BEING AVAILABLE FOR USE OR FOR LOST OR CORRUPTED DATA OR SOFTWARE, OR THE PROVISION OF SERVICES AND SUPPORT. BOWSER ELECTRONICS WILL NOT BE LIABLE FOR LOST PROFITS, LOSS OF BUSINESS OR OTHER CONSEQUENTIAL, SPECIAL, INDIRECT OR PUNITIVE DAMAGES, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY THIRD PARTY EXCEPT AS EXPRESSLY PROVIDED HEREIN. YOU AGREE THAT FOR ANY LIABILITY RELATED TO THE PURCHASE OF PRODUCTS OR SERVICES BUNDLED WITH THE PRODUCTS, BOWSER ELECTRONICS IS NOT LIABLE OR RESPONSIBLE FOR ANY AMOUNT OF DAMAGES ABOVE THE AGGREGATE DOLLAR AMOUNT YOU PAID FOR THE PURCHASE GOVERNED BY THIS AGREEMENT.