

*Race Technology*

**ECU Serial Interface**

**OBD Version**

**Instruction Manual**



Version 1.1

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## **1 Introduction**

The Race Technology On-Board Diagnostics (OBD) ECU serial interface is a small unit (35 x 24 x 8mm) which when connected to a B&B OBDII interface will enable diagnostic data to be read from the vehicle and transmitted in a format which is understood by the Race Technology range of products. The output data from the interface can be used directly with a PC to display the vehicle data, with a dashboard such as the DASH1 or DASH2 to monitor in-vehicle information, or with a data logger to record the data and further analyse on a PC

## **2 Parts Supplied**

The OBDII serial interface is supplied with the following components. Please take a moment to check that you have all of these items and inform Race Technology of any shortages immediately:

- ECU serial interface unit with 3 x 9 way connectors and power cable
- Null modem serial cable – only required if the ECU interface is to be reflashed with new firmware. This is not required during normal operation and should only be carried out with explicit instructions to do so from Race Technology
- B&B OBDII interface with driver and manual CD
- Terminator connector
- Race Technology software CD
- Instruction manual

## **3 Before You Begin**

In order for the DL1 or DL2 data logger and DASH1 or DASH2 display to function correctly with the OBDII serial interface it is first necessary to ensure that all units are using the most up to date version of their respective firmware. Display units and data loggers shipped with the ECU serial interface will already have the correct firmware version installed, but if you have received the ECU serial interface separately to use with your existing data logger and/or display unit you will need to update the firmware on these units. The updated firmware files are included on the software CD supplied with the OBDII serial interface, along with a short technical note that explains how to identify the correct firmware file for each unit. Please take a few moments to read this file. If you are in any doubt about which file to use or the reflashing procedure, please contact Race Technology before proceeding.

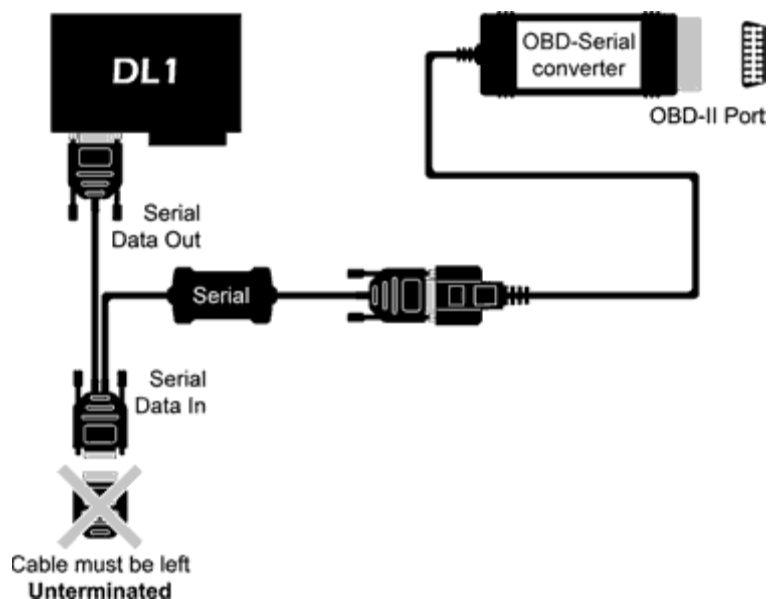
## 4 Connecting the ECU Serial Interface

There are ten different ways in which the OBD ECU serial interface can be used:

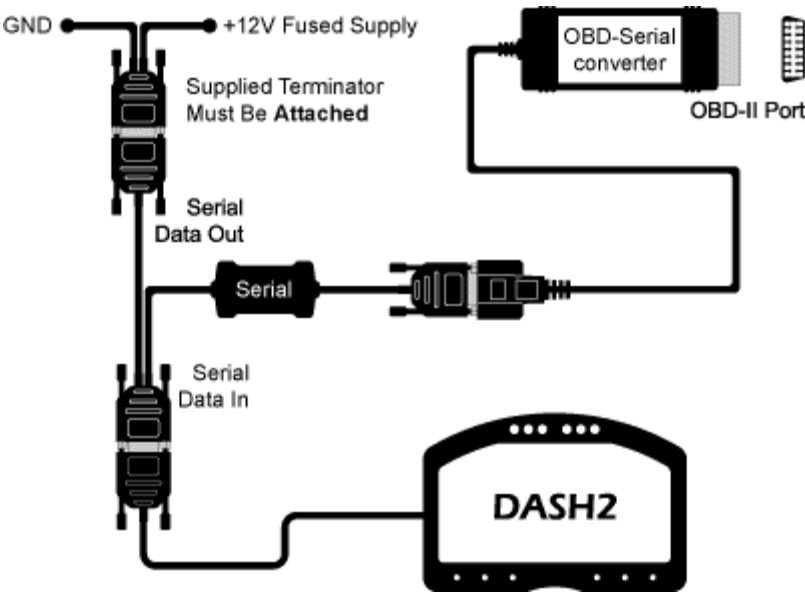
1. With DL1 or DL2 data logger and ECU
2. With DASH2 display (in standalone mode) and ECU
3. With DL1 or DL2, and DASH1, DASH2 or DASH3, and ECU
4. Connected to a PC compatible computer for reflashing (only recommended when given explicit instructions to do so by Race Technology)
5. With DL1 or DL2 for data logging and PC running Race Technology Monitor software for real time data viewing
6. With PC running Race Technology Monitor software for real time data viewing
7. With VIDEO4 combined video/data logger and ECU
8. With VIDEO4, and DL1 or DL2, and ECU
9. With VIDEO4, and DASH1, DASH2, DASH3 or VOB, and ECU
10. With VIDEO4, and DL1 or DL2, and DASH1, DASH2, DASH3 or VOB, and ECU

The connections for each type of installation are shown below.

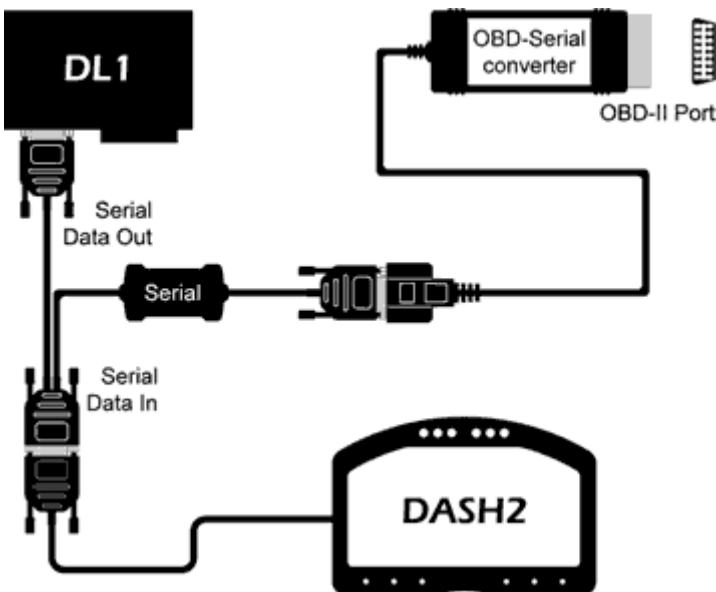
### 4.1 DL1 or DL2 Data Logger Only



### 4.2 DASH2 Display Only



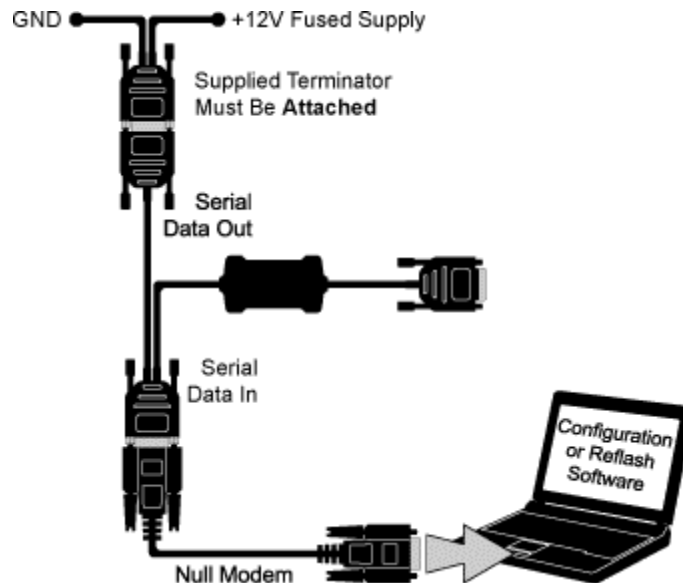
### 4.3 Data Logger and Display



## 4.4 PC Compatible Computer for Reflashing

The connection procedure for reflashing Race Technology interface products is illustrated in the diagram below.

### 4.4.1 OBD Interface, CAN and ECU Serial Interface:

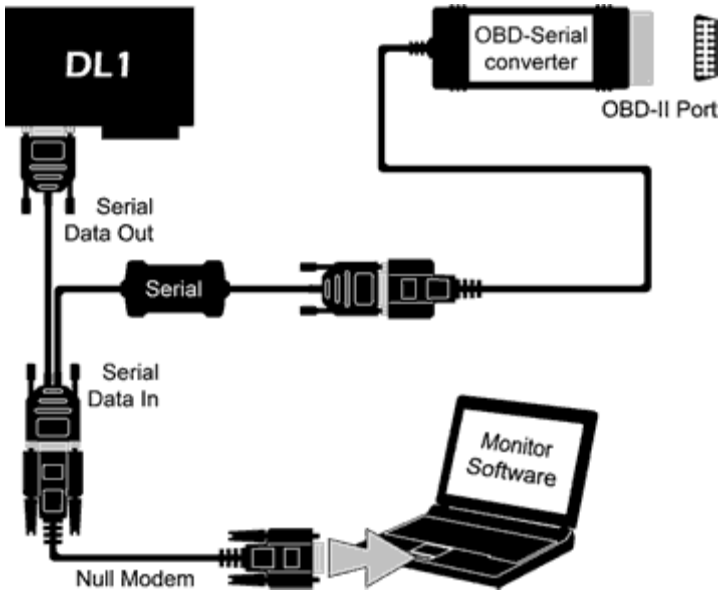


### 4.4.2 Reflashing Procedure

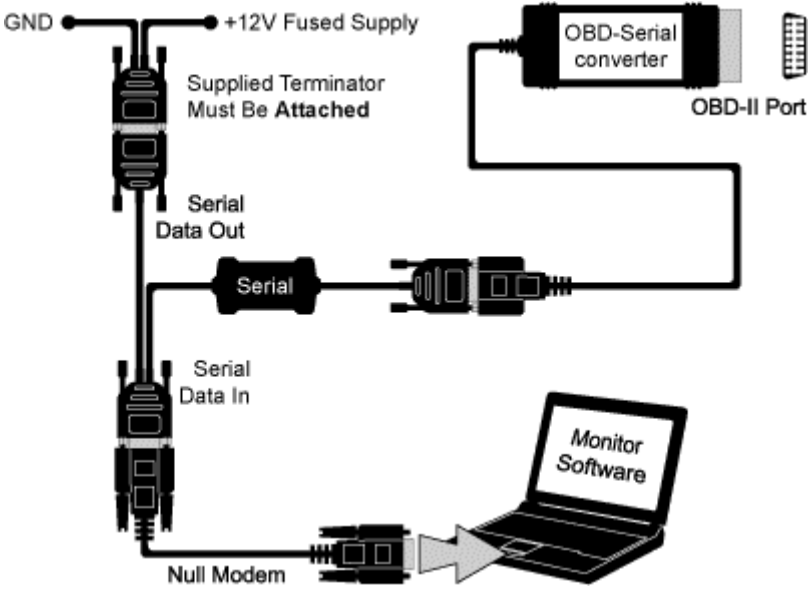
After connecting the ECU serial interface as shown above, ensure that the power to the unit is initially turned off. Use the Reflash Utility provided with the Race Technology software to reflash the unit. This is normally found from the Windows start menu by following programs \ Race Technology \ configuration \ reflash. Then follow the on screen instructions provided by the Reflash Utility

**WARNING: Only reflash the ECU serial interface if specifically instructed to do so by Race Technology. Any malfunction due to reflashing without observing this warning will result in the warranty being void.**

### 4.5 Data Logger and PC for Real Time Data Viewing



### 4.6 PC Only for Real Time Data Viewing



## 4.7 Daisy Chaining

Race Technology ECU serial interfaces may also be daisy-chained together by connecting the output of the first unit to the input of the second unit.

The B&B interface will need to be plugged in to the vehicle OBDII port. The location of this port can be found from the following website:

*<http://www.obdclearinghouse.com/oemdb/>*

**Note:** The interface unit can take up to a minute to establish a connection with the vehicle. The connection process is initiated when the ignition of the vehicle is turned on. Until this time there will be no output from the OBDII interface and you will not be able to communicate through the unit to control a DASH2 from a DL1.

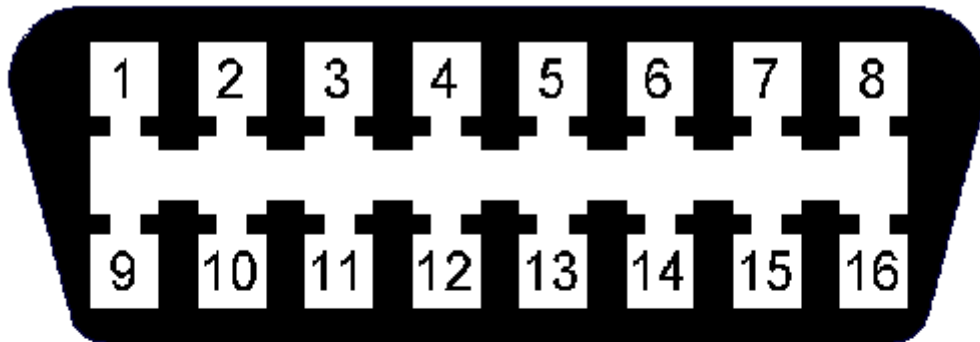
## 4.8 Compatibility

Not all vehicles which have OBD are compatible with the Serial Interface, this version works with the following protocols:

- J1850VPW
- J1850PWM
- ISO9141-2
- KWP2000 (ISO14230-4)

This interface model is not compatible with vehicles having CAN OBD. If you believe that your car has a CAN interface, please contact Race Technology to obtain the correct adapter.

## 4.9 Vehicle OBD Connector Pin Assignments



- 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

**J1850 VPW**--The connector should have metallic contacts in pins **2, 4, 5, and 16**, but **not 10**.

**ISO 9141-2**--The connector should have metallic contacts in pins **4, 5, 7, 15, and 16**.

**J1850 PWM**--The connector should have metallic contacts in pins **2, 4, 5, 10, and 16**.

## 5 Data Output Channels

The data sent from the OBD port and the update rate varies from vehicle to vehicle. As such it is not possible to say exactly which channels of data will be present. If all channels are available then the following will be provided:

Source	RT Channel Name	Resolution
Engine load	Auxiliary 1 (%)	0.1%
Coolant temp	Water temp	0.1°C
Lambda 1 short term trim	Lambda 1 short term trim	0.1%
Lambda 2 short term trim	Lambda 2 short term trim	0.1%
Lambda 1 long term trim	Lambda 1 long term trim	0.1%
Lambda 2 long term trim	Lambda 2 long term trim	0.1%
Fuel Pressure	Fuel Pressure	0.1kPa
Manifold Pressure	Inlet Post Intercooler 1	0.1kPa
Engine speed	Engine speed	25RPM
Ignition angle	Ignition angle	0.1°C
Inlet air temperature	Inlet Pre Turbo Temp 1	0.1°C
Throttle position	Throttle position	0.1%
Lambda 1	Lambda 1	0.01
Lambda 2	Lambda 2	0.01
Fuel level	Auxiliary 2 (%)	0.1%

The OBD interface will automatically read all available channels from the vehicle. If some of the above channels do not appear this does not mean that the system is not working – it is most likely that these channels are not available from the vehicle.

## **6 Appendix A. Pin Connections**

### **6.1.1 Serial Data In Connector**

9 Way Male D-Type

PIN 2 RS232 Input

PIN 3 RS232 Pass through

PIN 5 Ground

PIN 7 Power

### **6.1.2 Serial Data Out Connector**

9 Way Female D-Type

PIN 2 RS232 Output

PIN 3 RS232 Pass through

PIN 5 Ground

PIN 7 Power

### **6.1.3 ECU Connector**

9 Way Male D-Type

PIN 2 RS232 Input

PIN 3 RS232 Output

PIN 5 Ground

## **7 *Appendix B. Specifications***

Dimensions: 35 x 24 x 8mm

Mass: Approx 85g

Cable lengths: Approx 25cm

Power supply: 9-16V @40mA

Sealing: IP44

Operating Temp: 0-70°C

Serial Baud Rate: 115.2kbaud