

IGNITION CATALOGUE

8th Edition



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THE COMPANY

M&W Ignitions was formed in 1996 with the goal of being the number one performance ignition system supplier in Australia. Our products have found rapid acceptance in Australia and around the world with proven performance in V8 Supercar (**Bathurst Winner 1998, 2000, 2001, 2002, 2003, 2004), Daytona 24hr, Super Touring, Offroad, Drag Racing and on the Street. With our on going development program you can look forward to the many new products we have planned.

All our ignition modules (Inductive, CDI) are designed using the latest CAD/CAM and electronics technology. Our rigorous test program includes bench, road and competition testing to ensure the best possible performance and reliability.

For 2005 our whole range of CDI systems has been redesigned to further improve performance in all areas they are smaller, lighter, more powerful and use less current.

**M&W supplied to Motec.



M&W Product Warranty

12 months warranty from date of purchase is given providing the product is installed and used as per supplied instructions. Freight charges for returns will be borne by the customer.

Internet

Our web site www.mwignitions.com contains full online technical data and sales information.

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INTRODUCTION

The Ignition system is one of the most important factors in obtaining the maximum performance from your engine. There are two basic types of ignition, capacitive discharge (CDI) and inductive discharge. M&W Ignitions make both types and these are explained further on in this catalogue. We also offer a complete range of ignition coils for various applications.

Our UEGO wide range air fuel ratio measurement system uses a true "wide range" sensor and is the *ultimate* tuning tool.

If you have aftermarket injection our products are approved for use with Motec, Haltech, GEMS, EMS, Microtech, Link and Wolf systems and in many cases can be triggered by the existing factory ignition module (ie. module trigger).

At M&W all our ignition products use -40°C to +105°C or -40°C to +125°C rated intergrated circuits for maxmium reliabity and performance. Look inside some other brands and you will see not all ignition systems are created equal.



An important point to remember

Your ignition system is a *system* and so should be treated as such. If one part of the system is not up to scratch then the total system will suffer. You can have the best performing ignition module and or coil on your car but if you have old leads, a bad rotor button or worn out spark plugs then the whole system is not going to perform.



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CDI INTRODUCTION

THE CDI ADVANTAGE

In a standard inductive ignition system all the spark energy is stored within the magnetic field of the coil and defined by the equation:

W = Energy (Joules)

$$W = \frac{1}{2}LI^2$$

L = Primary inductance (Henries)

I = Primary current (Amps)

A typical modern coil for use with an electronic ignition system has a primary resistance of 0.5 Ohm and a primary inductance of 3.5mH. If this coil is driven to a primary current of 6A it will give a maximum spark energy of 63mJ and require a minimum of 3 milliseconds to recharge (dwell) between events. The energy figure may be raised by either increasing the primary current or primary inductance however this also increases the dwell time and there by reduces the engine speed at which spark energy begins to fall.

If the above described ignition system was used on a V8 engine maximum spark energy would be available up to 5,000 rpm and from there it would start to decrease.

In a CDI ignition system 12V from the vehicles electrical system is stepped up by an inverting power supply to approximately 450V which is then stored within a capacitor:

W = Energy (Joules)

$$W = \frac{1}{2}CV^2$$

C = Capacitance (Farads)

V = Voltage

If a 0.5uF capacitor is charged to 450V the maximum energy would be 100mJ. Due to the high efficiency of the inverter supply it is capable of recharging the capacitor in approximately 1 millisecond giving a maximum ignition frequency of 1,000Hz or 15,000 rpm on a V8 engine before any loss in spark energy occurs.

Another advantage is the comparatively high rate at which the secondary voltage from the ignition coil rises which gives the CDI ignition its great ability to fire a spark plug under conditions where an inductive system of equal energy would fail.

PRO CDI INTRODUCTION

Our **PRO** series of **CDI** systems all contain a small but powerful microprocessor to ensure optimum spark energy is delivered at all times. By designing a new highly efficient ferrite core inverter we have been able to dramatically reduce the primary current draw without effecting the spark output. Using the latest Mosfet and IGBT technology the **PRO** range of CDI's represent the state of the art in performance ignition systems. For 2005 our range of CDI's have been completely redesigned for even more performance.

Ignition Coils for CDI

Most modern inductive ignition coils are designed to work at continuous energy levels of approximately 65 millijoules, when they are used with the 100+ millijoule energy and fast rising voltages found in CDI systems they quickly overheat.

Purpose built CDI ignition coils have significantly lower resistance and inductance which reduces their effect of choking and absorbing the energy flow. This construction is possible as they are simply used as a voltage transformer and are not required to store the spark energy.

We have found during testing that typical plastic cased inductive ignition coils can literally melt down in a short period of time when used on a V8 motor running continuous at high engine speeds. During the testing phase of our high reliability CDI systems we have found it necessary to force cool the ignition coil to prevent it from being damaged.

Manufacturers of CDI ignition systems often quote excessively high and misleading spark energy figures, sacrificing component reliability for numeric output.

We have found through extensive testing that approximately 100mJ provides sufficient energy for most racing applications and if the ignition coil is directly mounted on top of the spark plug (such as in some current production cars) then as little as 50mJ will suffice.

However for high boost drag racing methanol engines we offer our 250mJ Pro-Drag series.

PRO CDI INTRODUCTION

PRO CDI SELECTION GUIDE

	PRO 10	PRO 12	PRO 14	PRO Drag	PRO Drag2	PRO Drag4	Rotary
Compact case							
Tach output							
Energy 105mJ							
Energy 250mJ							
Dual energy							
Max Ign Freq Hz	600	600	600	600	350	350	350
ECU trigger							
Module trigger							
Hall trigger							
Reluctor trigger							
1 Channel output							
2 Channel output							
4 Channel output							
Maximum current	6A	7A	7A	17A	17A	17A	7A
Weight grams	530	685	685	800	800	800	870

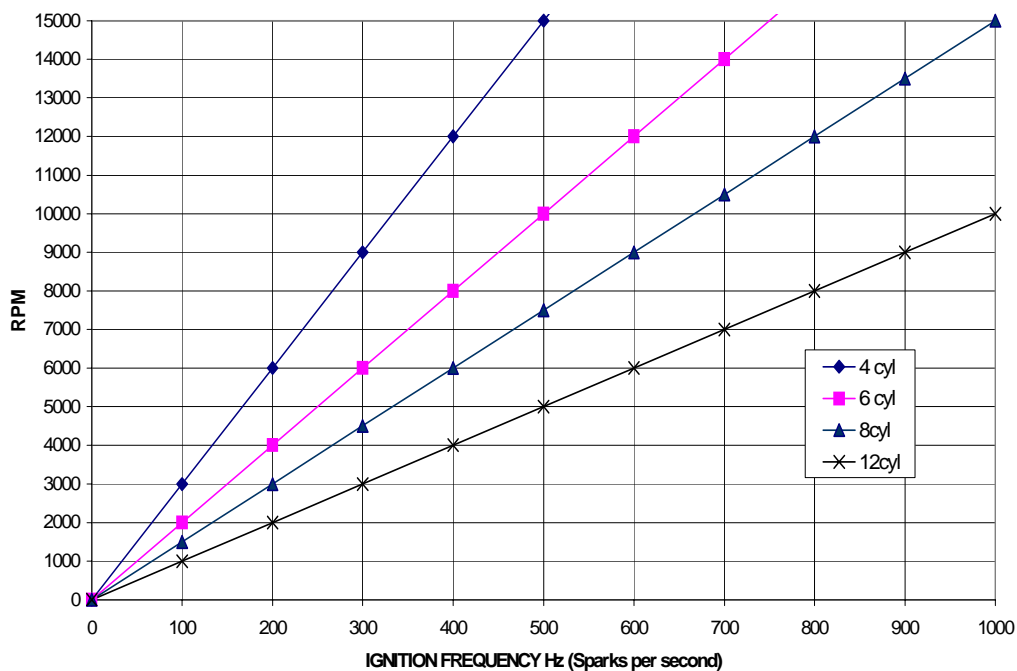
All PRO CDI kits come complete with connector, connector terminals, inline fuse and wiring instructions. They should be mounted in a part of the engine bay which receives fresh air flow. Do not mount near exhaust headers. The units are conformal coated but should be kept out of direct water spray. It is recommended that the coil wires should not exceed 1 metre in length. When installing in high vibration environments (such as race cars with solid mounted engines) it is recommended that suitable rubber vibration mounts be used.

IGNITION FREQUENCY INFORMATION

Ignition Frequency

Ignition frequency is an often misunderstood specification. The ignition frequency graph shows how the ignition requirements for engines with different number of cylinders is dramatically different. An ignition system firing at 4000 RPM on an 8 cylinder engine is equal to firing at 8000 RPM on a 4 cylinder engine. As explained in the PRO CDI introduction an inductive system starts to fall off over 350 Hz so you can see why production 12 cylinder engines often have dual ignition systems (which halves the frequency) as the spark energy fall off begins at only 3500 RPM !

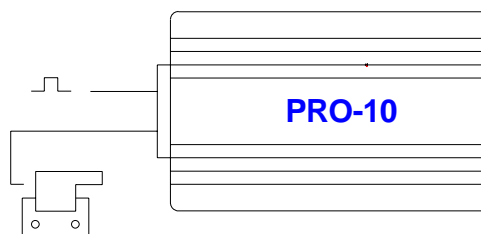
IGNITION FREQUENCY GRAPH



Need more info ?

M&W Ignitions can advise on the most suitable ignition system for your application whether it be CDI or inductive, street or competition. For your technical questions email us at sales@mwignitions.com

PRO-10 MICROPROCESSOR CDI



The **PRO-10** is designed for high rpm competition use. The **PRO-10** undergoes extensive bench testing for high reliability in racing and endurance applications. Available in Points/module, Hall effect or reluctor triggered versions. In most cases it can be triggered from the existing ignition module.

Hall/ECU triggered Part# **CDI010/E**
Points/module triggered Part# **CDI010/PM**
Reluctor triggered Part# **CDI10/R**

PRO-10 SPECIFICATIONS

- Maximum ignition frequency = 600Hz
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 480V
- Output is short circuit protected
- Reverse polarity and load dump protected
- **Spark energy = 115mJ**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm,H=40mm, L=110mm
- Weight = 530 grams
- Maximum current draw = 5A

CAUTION! Due to the high voltage used by this system (480V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

PRO-12 MICROPROCESSOR CDI



Note: PRO-14 shown.
PRO-12 uses same
case and connector.

Part# **CDI012**

The **PRO-12** is a dual channel version of the **PRO-10**. The **PRO-12** is designed for direct fire (waste spark) and coil per cylinder applications. It features two separate trigger inputs and coil outputs that must be fired alternately (minimum time between channels firing = 1.0 mS).

PRO-12 SPECIFICATIONS

- Maximum ignition frequency = 600/350Hz
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 480V
- Output is short circuit protected
- Reverse polarity load dump protected
- **Spark energy = 115/170mJ (normal/high power modes)**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm, H=40mm, L=140mm
- Weight = 685 grams
- Maximum current draw = 7A
- **Dual coil output channels**

CAUTION! Due to the high voltage used by this system (480V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

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PRO-14 MICROPROCESSOR CDI



Part# **CDI014**

The **PRO-14** is a four channel version of the **PRO-10**. The **PRO-14** is designed for direct fire (waste spark) and coil per cylinder applications. It features four trigger inputs and four coil outputs which may be configured in a number of ways.

PRO-14 SPECIFICATIONS

- Maximum ignition frequency = 600/350Hz
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 480V
- Output is short circuit protected
- Reverse polarity load dump protected
- **Spark energy = 115/170mJ (normal/high power modes)**
- 12V tachometer output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm,H=40mm, L=140mm
- Weight = 685 grams
- Maximum current draw = 7A
- **4 coil output channels**

CAUTION! Due to the high voltage used by this system (480V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

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MAZDA ROTARY MICROPROCESSOR CDI



Part# **CDI014**

The rotary CDI is a special four channel unit that allows 4 outputs to be run at full power with or without split. This unit is specifically designed for the Mazda rotary engine. It features four trigger inputs and four coil outputs which may be configured in a number of ways.

Please contact us for specific application information.

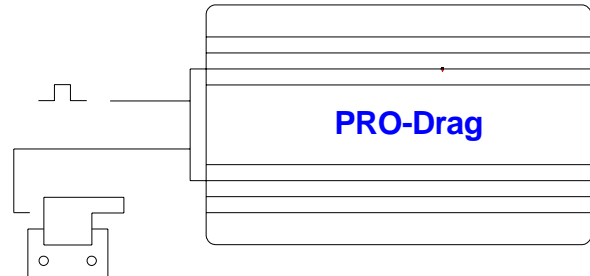
ROTARY CDI SPECIFICATIONS

- Maximum RPM = 10500
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 480V
- Output is short circuit protected
- Reverse polarity load dump protected
- **Spark energy = 115mJ**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm,H=40mm, L=150mm
- Weight = 870 grams
- Maximum current draw = 7A
- **4 coil output channels**

CAUTION! Due to the high voltage used by this system (480V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

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PRO-*Drag* MICROPROCESSOR CDI



The **PRO-*Drag*** is a **drag race only** high energy CDI. This is our ultimate race CDI and has been proven on high boost methanol drag engines. The **PRO-*Drag*** is designed with lightweight heatsinks for maximum power with minimum weight and therefore **should not** be used for extended operation such as circuit racing and road (street) use. Available in Points/module, Hall effect or reluctor triggered versions. In most cases it can be triggered from the existing ignition module.

Hall/ECU triggered Part# **CDI011/E**
Points/module triggered Part# **CDI011/PM**
Reluctor triggered Part# **CDI011/R**

PRO-*Drag* SPECIFICATIONS

- Maximum ignition frequency = 600Hz
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 500V
- Output is short circuit protected
- Reverse polarity load dump protected
- **Spark energy = 250mJ**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm,H=40mm, L=150mm
- Weight = 800 grams
- Maximum current draw = 17A

CAUTION! Due to the high voltage used by this system (500V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

PRO-*Drag*2 MICROPROCESSOR CDI



Note: PRO-14 shown.
PRO-*Drag*2 uses
same case and
connector.

Part# **CDI013**

The **PRO-*Drag*2** is a dual channel version of the **PRO-*Drag***. This is our ultimate multichannel race CDI and has been proven on high boost methanol drag engines. The **PRO-*Drag*2** is designed for direct fire (waste spark) and coil per cylinder applications. It features two separate trigger inputs and coil outputs that must be fired alternately (minimum time between channels firing = 1.0 mS).

PRO-*Drag*2 SPECIFICATIONS

- Maximum ignition frequency = 600Hz
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 500V
- Output is short circuit protected
- Reverse polarity load dump protected
- **Spark energy = 250mJ**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm,H=40mm, L=150mm
- Weight = 800 grams
- Maximum current draw = 17A
- **Dual coil output channels**

CAUTION! Due to the high voltage used by this system (500V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

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PRO-*Drag*4 MICROPROCESSOR CDI



Note: PRO-14 shown.
PRO-*Drag*4 uses
same case and
connector.

Part# **CDI015**

The **PRO-*Drag*4** is a four channel version of the **PRO-*Drag***. The **PRO-*Drag*** is designed for direct fire (waste spark) and coil per cylinder applications. It features four trigger inputs and four coil outputs which may be configured in a number of ways.

PRO-*Drag*4 SPECIFICATIONS

- Maximum ignition frequency = 600Hz
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = + 5 to +15V (restrictions apply)
- Ignition coil voltage = 500V
- Output is short circuit protected
- Reverse polarity load dump protected
- **Spark energy = 250mJ**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=130mm,H=50mm, L=150mm
- Weight = 800 grams
- Maximum current draw = 17A
- **4 coil output channels**

CAUTION! Due to the high voltage used by this system (500V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

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Porsche replacement CDI



We have two special versions of the **PRO-10** that replace the 3 pin (points trigger) and 6 pin (reluctor trigger) Bosch CDI used on the Porsche 911. (Note: minor rewiring and different mounting required).

3 pin replacement Part# **CDI010/B3**

6 pin replacement Part# **CDI010/B6**

Porsche PRO-10 SPECIFICATIONS

- Maximum ignition frequency 350Hz (7000 RPM 6cyl)**
- Supply voltage = 13.8 DC (negative ground only)
- Operating voltage = +5 to +15V (restrictions apply)
- Ignition coil voltage = 380V
- Output is short circuit protected
- Reverse polarity and load dump protected
- **Spark energy = 108mJ**
- 12V tacho output
- LED indicator power/trigger
- -40°C to +105°C
- Dimensions W=110mm,H=40mm, L=110mm
- Weight = 530 grams
- Maximum current draw = 4A @ 350 Hz

** contact us for race high RPM applications

CAUTION! Due to the high voltage used by this system (400V+), touching the primary side of the ignition coil when the engine is running may result in a painful electric shock.

SINGLE OUTLET IGNITION COILS

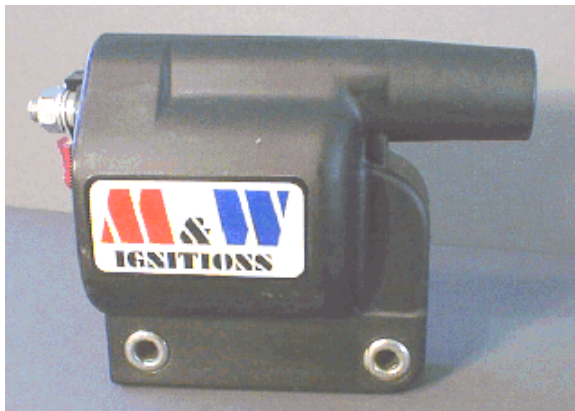


SPECIFICATIONS:

- Single secondary output **CDI** coil
- Primary resistance - 0.2 ohms
- Two pin connector
- Plastic encapsulated
- Complete with mounting kit (not shown)

Part# **COI005**

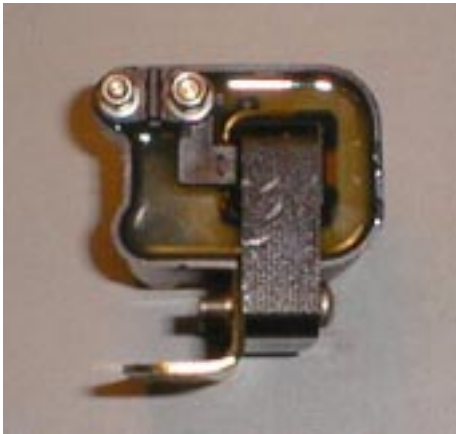
(PRO CDI use ONLY)



SPECIFICATIONS:

- Single secondary output
 - Primary resistance - 0.4 ohms
 - Screw terminals
 - Complete with mounting bracket
 - Plastic encapsulated with external core
- Part# **COI001B**

DUAL OUTLET IGNITION COIL



SPECIFICATIONS

- Dual secondary output
 - Primary resistance - 0.5 ohms
 - Secondary resistance - 12K ohms
 - Primary inductance - 3.5mH
 - Secondary inductance - 36H
 - Screw connections
 - Plastic encapsulated, external core construction
- Part# **COI002**

SPECIFICATIONS

- Two **COI002** coils
- Laser cut mild steel bracket
- Suitable for direct fire 4 cylinder applications

Part# **PAK004**



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CDI ONLY IGNITION COIL PACK

These coils are specially designed for CDI operation and should not be used for inductive systems under any circumstances. These ferrite coils provide the ultimate fast rise time high energy CDI spark.



SPECIFICATIONS:

- Two CDI ferrite single output coils
- Double mounting block
- Suitable for direct fire rotary motors and other coil per cylinder applications

Part# **PAK005**

CONNECTORS



7 PIN CONNECTORS (as used on all ignition modules)

Part# **CON001** (black)

Part# **CON002** (grey)

Terminals to suit 7 pin connector.

Part# **CON007**

Rubber boot to suit 7 pin connector.

Part# **CON006**

Pro Crimper to suit 7
pin connector terminals.

Part# **CON005**



Low cost **Crimper** to suit
7 pin connector terminals.

Part# **CON004**



Inductive (Transistor) Ignition Systems



All M&W ignition modules (igniters) are supplied complete with matching connector and rubber boot, mounting hardware, fitting instructions and 12 months warranty. A pre made wiring harness is available upon request.

Ignition Coils

For maximum performance we suggest you use an ignition coil with a primary resistance between 0.4 and 0.8 ohm and a primary inductance between 2.5mH and 3.5mH such as our high energy transformer style coils. Under no circumstances use a series ballast resistor. Ignition coils with a resistance up to 1 ohm and 6mH inductance will work however spark energy may suffer.

Mounting

Where possible the ignition module should be mounted on a metal surface and in an air flow region to aid cooling. **Do not** mount the module directly on the engine or on the firewall near the exhaust !

Spark Plugs

Under normal circumstances there should be no need to change the heat range or gap of the spark plugs you are using. Due to the high energy output from our inductive ignition systems it may be possible to enlarge the plug gap for better performance. We suggest you try increasing the plug gap to 0.060" (1.5mm) on naturally aspirated engines, if any miss-firing is detected under load, reduce the gap in stages until it is eliminated.

High Tension Leads

Due to the high energy generated by our ignition systems we recommend you replace any carbon suppressed HT leads with high quality spiral wound magnetically suppressed metal core leads.

CAUTION! The use of ignition coils above 1 ohm may cause missfiring, overheating or damage to the igniter or ignition coil and void any warranty claims.

9A ECU TRIGGERED (ECU DWELL)



Single channel part# **IGN008**



Double channel part# **IGN009**

Triple channel part# **IGN010**

These igniters contain no dwell control or automatic shutdown and are designed to be driven by an intelligent engine management computer which has a dwell controlled output. Single, double and triple output modules are available.

SPECIFICATIONS

- Operating temperature range -40°C to +125°C
- Operating voltage +12V to +18V
- Reverse polarity protection
- Fully potted construction
- Load dump protection
- Current limit = 9A
- Full over temperature protection with current foldback.

Triggering

These modules are designed to be triggered with a square wave current source signal which has an amplitude less than 15V and is capable of supplying 10mA drive. When using a pull up resistor for drive supply we suggest you select a value between 220 - 390 ohms. The signal rising edge determines the start of coil dwell and ignition occurs on the falling edge.

MOUNTING HARDWARE



Mounting bracket and screws
to suit COI001 and COI002 coils.

Part# **BRA001**



Mounting bracket as used
on PAK004.

Part# **BRA003**

UEGO LAMBDA/AIR FUEL RATIO METER

UEGO LAMBDA/AFR SYSTEM

The high speed Air Fuel Ratio measurement system uses a high performance wide range NGK UEGO sensor and features 10 - 20/1 AFR. The UEGO controller has a 0-5V analog output and is suitable for use with aftermarket ECU's and data acquisition systems that can accept 0-5V inputs. It also features a RS232 output with software available for DOS, Windows 95/98/NT and PocketPC showing real time AFR trace display (Windows display shown below). Check the web site for the latest UEGO data sheet to download.



M&W multi-mode compact LCD



UEGO controller



Laptop Dos and Windows

