

NEW ENGINE MANAGEMENT SYSTEMS

M1 MAGNESIUM SERIES ECUS



Race smart.



>>> THE FUTURE OF ENGINE CONTROL

There comes a time to make a change...



For more than twenty years a distinctive gold box has embodied the MoTeC brand of ECU. Instantly recognised, internationally respected.

The M800 - MoTeC's benchmark model that raised the bar in aftermarket engine management worldwide as one of the first systems to offer Drive by Wire throttle control and continuously variable cam control.

Now MoTeC takes engine control into a new era with the launch of the **M1 MAGNESIUM SERIES**. A new look, and a completely new approach.



MoTeC's 'M1' Magnesium Series ECUs are encased in magnesium alloy, a robust, lightweight material ideal for the extremes of motorsport. The rugged black finish provides a protective layer and ensures maximum heat dissipation, while the compact size offers numerous advantages for a variety of applications.

The technology behind the M1 Series is unique. It provides unparalleled flexibility for customised control, along with comprehensive security strategies that make these innovative ECUs equally well suited to unrestricted and fully regulated categories.

Numerous models will be phased into the M1 family over time, including direct injection (diesel and petrol/gasoline), Plug-In and specially sealed units for marine installations.

With clever engineering that looks to the future, MoTeC's M1 Series ECUs have been designed to adapt to tomorrow's challenges.

Endless possibilities, total control.

M1 SERIES FEATURES*

- Extremely compact and lightweight in robust magnesium cases
- Latest generation high performance processor
- Unprecedented flexibility and customisation
- Configurable firmware for user-defined ECU functionality
- Direct injection diesel and petrol/gasoline capability
- Suitable for modern engines with Drive by Wire, variable cam control, multiple CAN buses etc.
- Broad range of models to suit cars, bikes, boats and custom vehicles
- Solutions for every level, from professional teams through club competition and weekend racers down to road going performance enthusiasts
- M1 series suits Control ECU applications due to comprehensive security features and configurability
- Extensive I/O on larger models (M190 has 52 outputs, 43 inputs, 6 communication ports)
- Input expansion using VIMs
- Large logging memory (up to 250 MB) with Ethernet for fast downloads
- Advanced logging features (high speed, multiple logs (with access logins), Pro Analysis)
- Knock Control Inputs
- Programmable injector drive characteristics and full diagnostics
- Programmable Digital Input system for Ref/Sync, wheel speeds etc. with programmable trigger levels and full diagnostics
- Ref/Sync waveform capture
- Lambda measurement via MoTeC LTC Lambda to CAN modules - allows for many Lambda sensors
- Compatible with MoTeC's new IGN4 compact 4 channel ignition coil amplifier and DHB Dual Half Bridge module
- Compatible with existing MoTeC products such as SLM, Dash Loggers etc.
- All Auxiliary Outputs have PWM (Pulse Width Modulated) capability
- Built-in 3 axis accelerometer

*Some features are planned for future releases. Not all features will be available on all models.



M1 MAGNESIUM SERIES



SECURITY

The M1 ECU series allows different levels of access for different users, e.g. engine tuner, drive train tuner, data engineers. Each can have separate logins to restrict access to particular areas of the tuning and data logging.

Smart security strategies make the M1 ideal for Control ECU applications, providing scrutineering personnel with access to specific information. Selected parts of the ECU can be locked down while still allowing teams to access necessary tuning parameters.

Security is implemented with robust techniques making it virtually impossible to change the ECU function without authored permission.

STANDARD CONFIGURATIONS

MoTeC will provide standard configurations that will be targeted at specific engines and applications, rather than the one-size-fits-all approach on current generation ECUs. This tailored configuration method will result in fewer parameters and menu items, simplifying the setup and tuning experience.

The user will still have access to the usual tuning tables and necessary setup parameters.

CUSTOM CONFIGURATIONS

Many users will have specific requirements that call for a non-standard configuration. The operation of the M1 ECU can be customised to meet these different needs in one of the following ways:

MoTeC Configuration

MoTeC will provide a service to customise the functionality of the ECU for individual needs. For example, the operation can be modified to include different traction control strategies or additional compensation tables.

User Configuration

Users will also be able to completely customise the ECU functionality if desired, enabling them to create their own control strategies. (Requires MoTeC training)

Third Party Configuration

A limited number of third party developers that have been fully trained by MoTeC will be able to provide customisation services to end users.



DATA LOGGING

All M1 series ECUs feature a large logging memory and options for advanced features such as high speed logging (up to 1 kHz), multiple logs with separate access logins and input expansion using VIMs (Versatile Input Modules).

In many applications the ECU can control both engine and chassis, as well as being a fully featured data logger.



The M1 series uses the acclaimed *i2 Standard* or *i2 Pro* analysis software, providing extensive data analysis features. (See separate brochure)





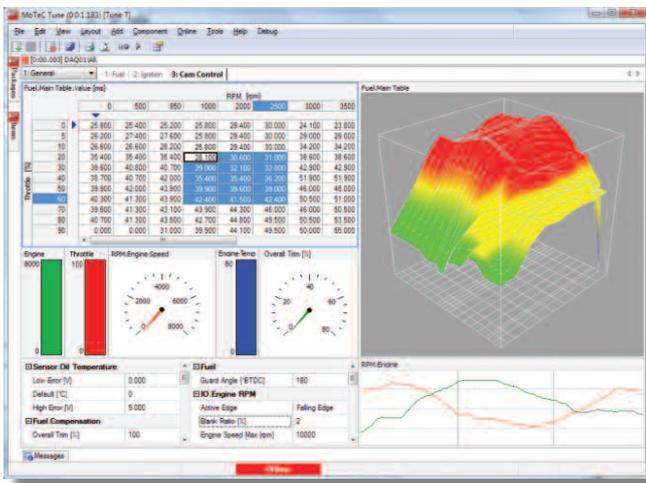
SOFTWARE SETUP & TUNE

TUNE SOFTWARE

Tune provides access to the tuning features of the M1 ECU. It is highly flexible allowing multiple, customised screen layouts similar to the *i2* Data Analysis software.

The *Tune* program is unique in that it adapts to any customisations that have been made to the ECU via the *Setup* software. As Tables, Parameters or Channels are added, *Tune* automatically conforms to provide access to these items.

It also features on screen logging whereby data from the ECU is automatically recorded for quick and easy analysis directly on the tuning screens.

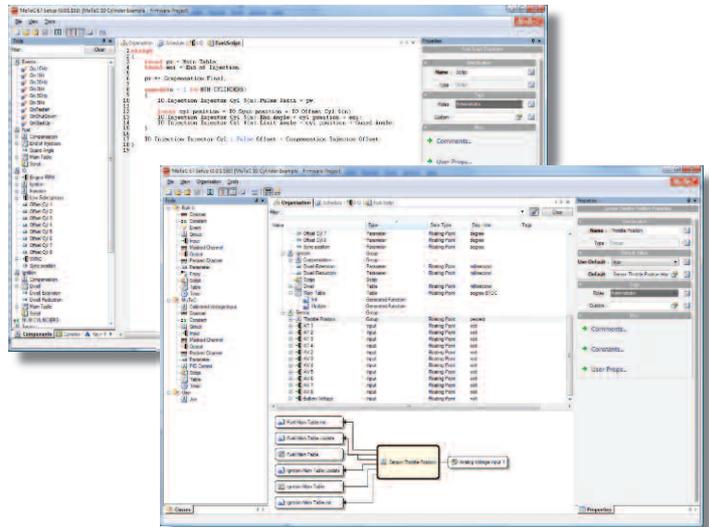


SETUP SOFTWARE

Setup is used to customise the functionality of the ECU, providing an unprecedented level of control. It allows the user to add Tables, Parameters and Channels and to enter 'Script' that defines how the ECU operates. The Script is a 'C' like programming language that allows entry of logic, calculations and algorithms.

For most customers it is not necessary to use the *Setup* software because MoTeC will provide flexible configurations for many applications, and will also offer a service to customise the operation of an ECU for the user.

If the user would prefer to perform their own ECU customisation, they can be trained in the use of *Setup*. MoTeC will also support third party developers that can provide customisation services to end users.



MODEL SPECIFICATIONS

FEATURES	MODEL SERIES	M110 SPORT	M130 SPORT	M140 SPORT	M150 SPORT	M170 PRO	M180 PRO	M190 PRO
Connector (Type/Number of Pins) P = Plastic Connector (Sport) AS = Autosport (Pro)		P/60	P/60	P/120	P/120	AS/66	AS/136	AS/136
Injector Type P = Port Injection D = Direct Injection*		P	P	D	P	P	D	P
Injector Outputs ^ H = High Ohm L = Low Ohm Peak & Hold D = Direct Injection*		8H	8L	8D	12L	8L	12D	12L + 12H
Ignition Outputs (max ^)		8	8	8	12	8	12	12
Aux Outputs Low Side/Half Bridge		2/6	2/6	6/10	6/10	2/6	6/10	6/10
Inputs (AV/AT/Knock)		8/4/2	8/4/2	17/6/4	17/6/4	8/4/2	17/6/4	17/6/4
Digital Inputs (UDIG/DIG)		7/0	7/0	12/4	12/4	8/0	12/4	12/4
CAN Bus/ RS232/ LIN		1/0/0	1/0/0	3/1/1	3/1/1	1/0/0	3/1/1	3/1/1
PC Comms (Ethernet)		Y	Y	Y	Y	Y	Y	Y
Max Logging Memory Size (MB)		60	120	120	120	250	250	250
Options for Logging Input Expansion, Multiple Logs, Fast Logging, Pro Analysis, Telemetry etc.		N	Y	Y	Y	Y	Y	Y
Size (mm)		107 x 127 x 39	107 x 127 x 39	162 x 127 x 39	162 x 127 x 39	107 x 127 x 39	162 x 127 x 39	162 x 127 x 39
Weight (approx.)		280g	300g	500g	450g	300g	540g	480g
Availability		Q3/09	Q3/09	Q3/09	Q3/09	Q2/09 Field Testing now	Q3/09	Q2/09 Field Testing now

*Programmable as Piezo or Inductive ^Unused injector and ignition outputs can be used as low side auxiliary outputs.

AUSTRALIA: MoTeC Research Centre (Head Office) +61 3 9761 5050
UK/ EUROPE: MoTeC Europe Ltd +44 8700 119 100

USA (West): MoTeC Systems USA +1 714 897 6804
USA (East): MoTeC Systems East +1 704 799 3800

www.motec.com