m800

engine management system

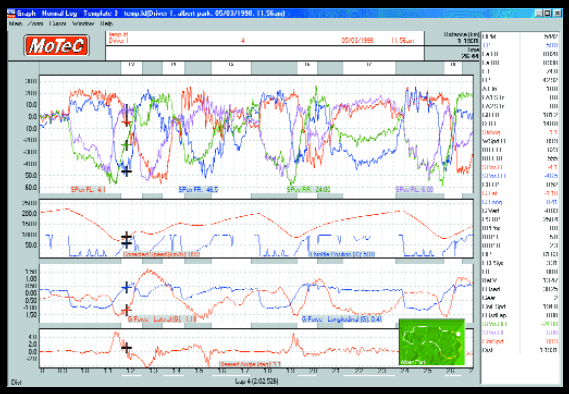
smaller. faster. better.

MoTeC in control

ENGINE MANAGEMENT

Since ***MoTeC*** was founded in 1987, the concept has been simple: build a business on the basis of providing quality products and services using the latest technology available. This philosophy of providing the best possible solutions, based on powerful hardware and easy to use software, has lead to ***MoTeC***'s great successes, worldwide.

MoTeC combines innovative product designs with an outstanding package of total customer support and an exceptional two year product warranty. This has made ***MoTeC*** one of the world's leading providers of Engine Management and Data Acquisition systems.



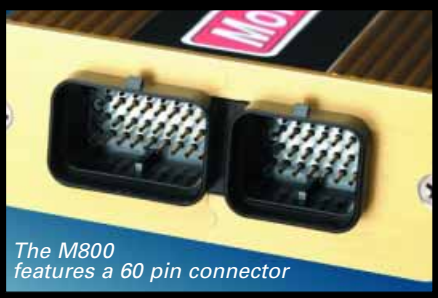
The main function of a programmable Engine Management System/ Engine Control Unit (ECU) is to provide full control of the engine over all possible ranges of operating conditions. At any given point (load/rpm site) the user is able to precisely set the amount of fuel injected and the optimum ignition timing.

The number of sites over which the engine is tuned can also be chosen, allowing extra sites for fine-tuning in certain areas (if required).

It does this by taking measurements from a number of sensors, then uses the calibration data to make compensations to the basic engine map based on current operating conditions.

M800 ENGINE MANAGEMENT SYSTEM

The M800 offers the next generation in Engine Management Systems. This system has been developed through rigorous research and practical field-testing. The M800 retains all the best features of our previous ECUs, while offering a combination of unsurpassed power and flexibility.



The M800 features a 60 pin connector

smaller.

- Compact and lightweight, only 500 grams.
- Only half the weight and half the size of the previous generation ECU.

faster.

- Upgraded microprocessor and memory accelerates overall speed.
- A new generation time co-processor enhances control of Fuel and Ignition
- Leading edge processor means data can be logged at up to 200 samples per second.

better.

- A digital triggering system that is customisable and programmable to suit any engine and includes sophisticated diagnostics that monitor the quality of trigger signals.
- The M800 talks to most existing sensors within your vehicle, saving costly additions of new sensors.

DIGITAL TRIGGERING SYSTEM

Flexibility – Programmable Trigger Levels: The DTS gives greater flexibility allowing the exact trigger levels to be set to suit the trigger sensor system. This ensures maximum compatibility with the trigger sensors.

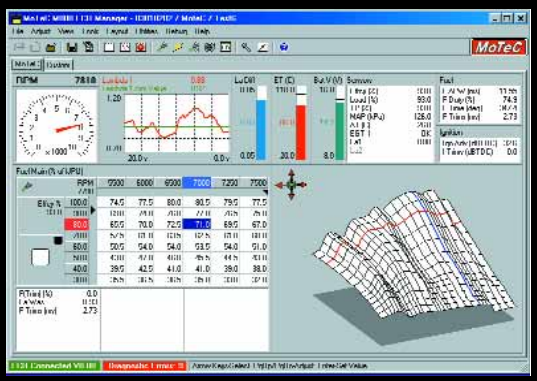
Improved Noise Rejection – Programmable Filter Characteristics: Programmable filter characteristics allow the noise filter characteristics to be adjusted to suit the sensor system which gives improved noise rejection. This ensures the integrity of the trigger signals even in the most noisy environments.

Advanced Diagnostics: The DTS continuously monitors the quality of the trigger sensor signals and will give a warning if the quality of the signal is poor allowing trigger system problems to be rectified before they cause an operational problem.

Accuracy: Precision timing accuracy due to true zero crossing detection for magnetic trigger sensors.

M800 SOFTWARE

The M800 software has been designed with an emphasis on useability, which enables you to quickly optimise the setup of your vehicle. It is both user friendly for the beginner and a powerful tool for experts. All software is menu driven and has extensive help screens.



The key software is:

ECU Manager Tuning Software

The ECU Manager software is designed for setup, tuning and diagnostics of the M800. Tuning may be done on-line (with the ECU connected) or offline. The ECU Manager software allows viewing of all sensor readings, output settings, status reading, compensations and diagnostic errors.

Other features include: Quick Lambda (automated fuel adjustment), 3D graphing of calibration tables, site target, output testing, files comparison, user definable screen layouts, table inter-polation, table export, table mathematics and on-line help.

Interpret - Analysis

The Interpret software provides advanced tools to assist in analysing the logged data quickly and efficiently. Data can be collected from M800's internal log memory, by telemetry, or by direct connection to a PC. The information contained within the log files can be viewed numerically or graphically.

M800 UPGRADES

The M800 has various options which are field upgradable using a password and enabling system. Upgrade options include:

Logging

Gives you access to continuous recording of the operating parameters of the engine and vehicle including diagnostic features.

Pro Analysis

Enables advanced data analysis with Graph Overlays, XY Plots, Maths Functions, Virtual Instrument Display and Track Maps.

Wideband Lambda

(air fuel ratio)

Allows the use of NTK, UEGO or Bosch LSU high accuracy Wideband Lambda sensors.

Telemetry

Enables the transmission of data from the M800, whilst in operation, to another point (e.g. the pits) in real time.

DIAGNOSTICS MONITORING SYSTEM

The diagnostics monitoring system monitors all aspects of the ECU operation, including:
Advanced diagnostics on the Digital Trigger System.
Open Circuit and Short circuit detection on the Injector, Ignition and Auxiliary Outputs.
Sensor fault detection on the sensor inputs.

This system helps to identify many of the wiring and sensor faults that may occur during operation allowing problems to be fixed quickly, particularly when combined with the ECU's powerful data logging system.

INDIVIDUAL CURRENT SETTING OF INJECTORS

The current drive characteristics of each injector output is individually programmable. This allows different types of injectors to be used in Hi/Lo injector applications.

M800 ENGINE MANAGEMENT SYSTEM

INPUTS

Ref and Sync Trigger
- Magnetic Sensors (User Programmable Trigger Levels)
- Hall Sensors

6 Temperature Inputs
User Programmable as
- Engine Temperature
- Air Temperature
- Oil Temperature
- Other sensors configurable

8 Voltage Inputs
User Programmable as
- Map Sensor
- Mass Air Flow Sensor
- Gear Position
- Other sensors configurable

2 Lambda Sensor Inputs
User Programmable as
- Narrow Band and
- High Speed Wide Band

4 Digital Inputs
User Programmable as
- Wheel Speeds
- Nitrous Control
- Speed Limiting
- Other sensors configurable

POWER

COMMUNICATIONS
- CAN for diagnostics, tuning and logging retrieval
- RS232 for telemetry or device comms

OUTPUTS

8 (12) Fuel Injector Drivers
- Programmable Current Outputs
- Unused outputs can be used as Auxiliary Outputs
- Up to 8 low ohm injectors
- Up to 12 high ohm injectors

6 Ignition Drivers
- Up to 6 outputs for multi coil applications
- Unused outputs can be used as Auxiliary Outputs

8 Auxiliary Outputs
Programmable as
- Waste Gate Control
- Idle Up valves
- Fuel Pump Relay
- Stepper Motor Control
- Driver Warning Lights
- Additional Devices
- Drive by Wire
- CAM Control

Sensor Power Supply
- Separate Engine and Auxiliary Sensor Supplies

M880

Also available in this range:

M880: Based on the M800 with an Autosport (military type) connector and 4 Mb of logging memory.

MoTeC Support:

With ***MoTeC*** you can be assured of the highest level of customer support; our dealers are fully trained to the ***MoTeC*** standard and comprehensive information is provided at the ***MoTeC*** website (including downloadable diagrams, software and application notes). ***MoTeC*** also runs seminars with worldwide experts on engine management and data acquisition. All backed up by a full two year worldwide warranty.

SPECIFICATIONS & MODEL COMPARISON

ENGINE MANAGEMENT SYSTEMS	M800	M880
GENERAL		
Microprocessor - 3.3V 32 Bit with next generation time co-processor and 32MHz internal operation	✔	✔
Quality Standard	ISO 9002	ISO 9002
Manufacturing Standard - IPC-S-815-A Class 3 High Reliability	✔	✔
Warranty Parts & Labour	2 year	2 year
Burn in –10 to 70 Deg C for 32 hours	✔	✔
ECU Control Software stored in updatable memory	✔	✔
High RFI Immunity	✔	✔
Low heat generation	✔	✔
Battery transient protection	✔	✔
Environmentally sealed electronics	✔	✔
Water-proof connector with gold plated contacts	✔	✔
Autosport connector	✘	✔
Case Size (mm)	147 x 105 x 40	147 x 105 x 40
Weight (kg)	0.500	0.525
Communication to PC or Dash Logger: - RS232 and CAN	✔	✔
Cylinders	1,2,3,4,5,6,8,10,12	1,2,3,4,5,6,8,10,12
Engines 2 stroke, 4 stroke, Rotary (1 to 4)	✔	✔
Maximum RPM	> 20,000	> 20,000
OPERATING CONDITION		
Internal Temperature Range (Deg C)	-10 ~ 85 Deg	-10 ~ 85 Deg
Ambient Temperature (Deg C) (Depending on load & ventilation)	-10 ~ 70 Deg	-10 ~ 70 Deg
Operating Voltage	6 ~ 22V DC	6 ~ 22V DC
Operating Current (ECU only)	0.5 A max.	0.5 A max.
Reverse Battery Protection	External Fuse	External Fuse
COMPUTER SOFTWARE		
Tuning, setup, diagnostic & utility software	✔	✔
Computer Requirements	IBM PC with printer port, Win 95 to XP	IBM PC with printer port, Win 95 to XP
Built-in help system	✔	✔
Basic Data Logging Analysis	Opt. 1	Opt. 1
Advanced Analysis Software: Graph Overlays, XY Plots, Maths Functions, Virtual Instrument Display, Track Maps	Opt. 3	Opt. 3
INJECTION		
Type	Sequential	Sequential
Number	8 low ohm, 12 high ohm (Opt.6)	8 low ohm, 12 high ohm (Opt.6)
User Programmable Current	0.5 ~ 6 Amp peak	0.5 ~ 6 Amp peak
Individual Programmable Peak Current	✔	✔
Individual Programmable Hold Current	✔	✔
User Definable Battery Compensation	✔	✔
FUEL CALIBRATION		
Accuracy	0.00001 sec	0.00001 sec
RPM & Load Sites are user programmable	✔	✔
Main Table (3D) - RPM sites x Load sites	40 x 21	40 x 21
End of Injection Primary & Secondary (3D) - RPM sites x Load sites	20 x 11	20 x 11
Individual Cylinder Trim	✔	✔
Individual Cylinder Tables (3D) – RPM sites x Load sites	20 x 11	20 x 11
Secondary Injector Balance Table (3D) - RPM sites x Load sites	20 x 11	20 x 11
Adjustable MAP, Engine & Air Temperature Compensations	✔	✔
Auxiliary Compensations	5	5
Gear Compensation	✔	✔
Accel./Deccel. Clamp, Decay & Sensitivity	✔	✔
Cold Start (5 parameters)	✔	✔
Multi Pulse	Opt. 9	Opt. 9
Number	6	6
1 output may drive up to 8 coils using the MoTeC Ignition Expander or CDI	✔	✔
Ignition Interface allows connection to most OEM Ignition systems	✔	✔
Accuracy	0.25 degree	0.25 degree
RPM & Load Sites are user programmable	✔	✔
Main Table (3D) - RPM sites x Load sites	40 x 21	40 x 21
Individual Cylinder Trim	✔	✔
Individual Cylinder Tables (3D) – RPM sites x Load sites	20 x 11	20 x 11
Adjustable MAP, Engine & Air Temperature Compensations	✔	✔
Auxiliary Compensations	5	5
Gear Compensation	✔	✔
Accel. Adv. Clamp, Decay & Sensitivity	✔	✔
Dwell Time – RPM x Battery Voltage	10 x 11	10 x 11
Odd Fire engine capability	✔	✔
Rotary Ignition Split	✔	✔
Multispark	Opt. 9	Opt. 9

ENGINE MANAGEMENT SYSTEMS	M800	M880
BOOST CONTROL		
Main Table (3D) - RPM Sites x User Defined Sites	20 x11	20 x11
Engine, Air & Exhaust Temperature Compensation	✔	✔
Auxiliary Compensation	1	1
TRIGGER SENSORS		
Directly Compatible with most OEM trigger systems including: Hall, Magnetic and Optical types Multi-tooth (eg: Mazda and Toyota) 1 or 2 Missing Teeth (eg: Porsche) Many other special types including: Ford narrow tooth, Nissan optical, Harley Davidson	✔	✔
Digital Signal Processing with Advanced Diagnostics	✔	✔
SENSOR INPUTS		
Throttle Position, Manifold Pressure, Engine and Air Temperature	✔	✔
Auxiliary Sensor Inputs	10	10
Digital/Speed Inputs	4	4
AIR FUEL RATIO INPUTS		
Narrow Band Air Fuel Ratio	✔	✔
Wideband Air Fuel Ratio - High Speed, Temperature Compensated	Opt. 2	Opt. 2
NTK or Bosch LSU Type	2	2
Range – Lambda	0.70 to 32.0	0.70 to 32.0
Resolution – Lambda	0.001	0.001
Useable as Auxillary Sensor Inputs	2	2
DATA LOGGING		
Allows Logging of all ECU parameters	Opt. 1	Opt. 1
Memory Size	1Mb	1Mb or 4Mb
Individual Parameter & Rate Selection	✔	✔
Logging Rate – (samples per second)	1 to 200	1 to 200
Logging Time – 28 Par. + Diag. at 5/sec	76 minutes	Up to 304 minutes
Interpret Software – Graphical Analysis	Opt. 1 or Opt. 2	Opt. 1 or Opt. 2
– Advanced Analysis	Opt. 3	Opt. 3
Maximum parameters logged	128	128
Maximum logging throughput	10 kbytes/sec	10 kbytes/sec
SPECIAL FUNCTIONS		
CAM Control	Opt. 7	Opt. 7
Drive by Wire	Opt. 8	Opt. 8
Traction Control & Launch Control	Opt.5 (2, 3 or 4 wheel)	Opt.5 (2, 3 or 4 wheel)
Narrow Band Lambda Control	✔	✔
Wideband Lambda Control	Opt. 2	Opt. 2
Gear Change Ignition Cut	Opt. 5	Opt. 5
Boost Enhancement (Anti-lag)	Opt. 5	Opt. 5
Warning Alarms (Sensor HI / LO)	✔	✔
Gear Detection	✔	✔
Ground Speed Limiting	✔	✔
Dual RPM Limit	✔	✔
Nitrous Oxide Enrich / Retard	✔	✔
Air Conditioner Request	✔	✔
Over Run Fuel Cut	✔	✔
Standard Sensor Calibrations	✔	✔
Programmable Sensor Calibrations	✔	✔
RPM Limit, Hard or Soft cut, fuel and/ or ignition	✔	✔
Number of Auxiliary	8	8
All outputs are PWM or switched capable	✔	✔
4 Wire Stepper Motor Capable	✔	✔
Number of Outputs with High and Low Side drive	6	6
Auxiliary Outputs can be used for: Turbo Wastegate Control, Idle Speed Control Fuel Used Output, Tacho Output Shift Light, Driver Warning Alarm RPM / Load dependent device User definable Table (20x11) with selectable axis parameters Slip Warning, Fuel Pump Relay Thermatic Fan, Air Conditioner Fan and Clutch		
Unused Injector Outputs may be used for general functions as per Auxiliary outputs	✔	✔
Unused Ignition Outputs may be used for general functions	✔	✔
Injectors Open Circuit, Short Circuit, Peak Current not reached	✔	✔
Sensors Open & Short Circuit	✔	✔
Ref/Sync noise warning & error diagnostics (noise, runt pulses and amplitude)	✔	✔
Operating Errors: RPM Limit Exceeding, Injector overduty, Over Boost, Low Battery, REF Error etc.	✔	✔
Allows real time monitoring & data acquisition via a telemetry link	Opt. 4	Opt. 4

Notes - ✔: Standard ✘: Not available Opt. 1: Logging Opt. 2: Lambda Single or Dual Opt. 3: Pro Logging Opt. 4: Telemetry Opt. 5: Advanced functions Opt. 6: 10/12 Cylinder Opt. 7: CAM Control Opt. 8: Drive by Wire Opt. 9: Multi Spark

www.motec.com.au

MoTeC Research Centre
121 Merrindale Drive Croydon South, 3136 Victoria, Australia
Tel: 61 3 9761 5050 Fax: 61 3 9761 5051

MoTeC Europe Ltd
Unit 14, Twyford Mill Industrial Estate, Oxford Rd Adderbury
Nr Banbury, Oxon, UK OX17 3HJ
Tel: 44 8700 119 100 Fax: 44 8700 111 922

MoTeC Systems USA
5355 Industrial Drive Huntington Beach California, 92649 U.S.A
Tel: 1 714 895 7001 Fax: 1 714 897 8782

MoTeC Systems East
169-2 Gasoline Alley Mooresville, NC 28117, USA
Tel: 1 704 799 3800 Fax: 1 704 7993874

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