

ENGINE MANAGEMENT SYSTEM	M400
GENERAL	
Microprocessor - 3.3V 32 Bit with next generation time co-processor and 32MHz internal operation	✓
Quality Standard	ISO 9002
Manufacturing Standard - IPC-S-815-A Class 3 High Reliability	✓
Warranty Parts and Labour	2 year
Burn in -10 to 70 Deg C, 10 cycles in 32 hours	✓
ECU Control Software stored in updateable Flash memory	✓
High RFI Immunity	✓
Low heat generation when using low ohm injectors	✓
Battery transient protection	✓
Environmentally sealed electronics	✓
Waterproof connector with gold plated contacts	✓
Case Size (mm)	147 x 105 x 40
Weight (kg)	0.500
PC Communications	CAN
Logger and Display Communications	CAN and RS232
Cylinders	1, 2, 3, 4 Sequential
Engines 2 stroke, 4 stroke, Rotary (2 Rotor)	✓
Maximum RPM	> 20,000
OPERATING CONDITIONS	
Internal Temperature Range (Deg C)	-10 ~ 85 Deg
Ambient Temperature (Deg C) (Depending on load and ventilation)	-10 ~ 70 Deg
Operating Voltage	6 ~ 22V DC
Operating Current (ECU only)	0.5 A max.
Reverse Battery Protection	External Fuse
COMPUTER SOFTWARE	
Tuning, setup, diagnostic and utility software (Windows)	✓
Computer Requirements	IBM PC with printer port, Win 95 to XP
Built-in help system	✓
Data Logging Analysis	Opt. 1
User definable screen layouts	✓
INJECTION OUTPUTS	
Switchmode, high efficiency, low heat generation	✓
Type	Peak and hold
Number	4
Injector Resistance	> 0.1 Ohm
User Programmable Current	0.5 ~ 6 Amp peak
User Definable Battery Compensation	✓
FUEL CALIBRATION	
Accuracy	0.000002 sec
RPM and Load Sites are user programmable	✓
Main Table (3D) - RPM sites x Load sites	40 x 21
End of Injection Primary and Secondary (3D) - RPM sites x Load sites	20 x 11
Individual Cylinder Trim	✓
Individual Cylinder Tables (3D) - RPM sites x Load sites	20 x 11
Secondary Injector Balance Table (3D) - RPM sites x Load sites	20 x 11
Auxiliary Compensations (any channel)	2
Adjustable MAP, Engine and Air Temperature, Fuel Pressure, Fuel Temperature and Gear Compensations	✓
Accel./Deccel. Clamp, Decay and Sensitivity	✓
Cold Start (5 parameters)	✓
End of injection compensation (any channel)	2
Adjustable injector dead-time compensation	✓
IGNITION OUTPUTS	
Number	4
Ignition Interface allows connection to most OEM Ignition systems	✓
IGNITION CALIBRATION	
Accuracy	0.1 degree
RPM and Load Sites are user programmable	✓
Main Table (3D) - RPM sites x Load sites	40 x 21
Individual Cylinder Trim	✓
Individual Cylinder Tables (3D) - RPM sites x Load sites	20 x 11
Adjustable MAP, Engine and Air Temperature, Gear Compensations	✓
Auxiliary Compensations (any channel)	2
Gear Compensation	✓
Accel. Adv. Clamp, Decay and Sensitivity	✓
Dwell Time - RPM x Battery Voltage	10 x 11
Odd Fire engine capability (any angle)	✓
Rotary Ignition Split	✓
BOOST CONTROL	
Main Table (3D) - RPM Sites x User Defined Sites	20 x 11
Engine, Air and Exhaust Temperature Compensation	✓
Auxiliary Compensation (any channel)	1

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STANDARD FEATURES	
Narrow Band Lambda Control	✓
Wideband Lambda Control using external meter	✓
Switched Cam Control	✓
Driver Warning Alarm and Shift Light Control	✓
Tacho Output	✓
Gear Detection	✓
Dual RPM Limit	✓
Ground Speed Limiting	✓
Nitrous Oxide Enrich / Retard	✓
Air Conditioner Fan and Clutch Control	✓
Over Run Fuel Cut	✓
Programmable Sensor Calibrations	✓
RPM Limit, Hard or Soft cut, fuel and/or ignition	✓
Turbo Wastegate Control	✓
Intercooler Spray Bars	✓
Idle Speed Control (Pulse Width Modulated, Stepper, Drive by Wire)	✓
RPM / Load Dependent Valves	✓
Fuel Used Output	✓
Fuel Pressure Control	✓
Fuel Pump Relay Control	✓
Alternator Control	✓
Thermatic Fan Control	✓
Slip Warning Light	✓
User Definable 3D Output Tables with selectable axis parameters	✓
OPTIONAL FEATURES (Necessary for some applications)	
Data Logging	Opt. 1
Onboard Wideband Lambda Sensor Controller for NTK UEGO & Bosch LSU sensors	Opt. 2 (Single)
Traction Control and Launch Control (2, 3 or 4 wheel)	Opt. 3
Gear Change Ignition Cut (Flat shifts)	Opt. 3
High/Low Injection (Staged Injection)	Opt. 3
Overrun Boost Enhancement (Anti-lag)	Opt. 3*
Continuously Variable Cam Control	Opt. 4
Drive by Wire Throttle	Opt. 5
AUXILIARY OUTPUTS	
Number of Auxiliary Outputs	8
All outputs are Pulse Width Modulated or Switched capable	✓
4 Wire Stepper Motor capable	✓
Number of Outputs with High and Low Side drive	6
Auxiliary Outputs can be used for standard and optional functions as required	✓
TRIGGER SENSORS	
Directly Compatible with most OEM trigger systems including:	
Hall, Magnetic and Optical types	✓
Multi-tooth (e.g. Mazda and Toyota)	
1 or 2 Missing Teeth (e.g. Porsche)	
Many other special types incl. 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
Digital/Speed Inputs	4
AIR FUEL RATIO INPUTS	
Narrow Band	✓
Wideband using external meter	✓
Single onboard Wideband, fully temperature compensated using high speed, professional type NTK UEGO or Bosch LSU sensors	Opt. 2
Range - Lambda	0.70 to 32.0
Resolution - Lambda	0.001
Lambda inputs also usable as 0-5V analogue input	1
DATA LOGGING	
Logging of all ECU parameters	Opt. 1
Memory, Non-Volatile Flash	512k
Individual Parameter and Rate Selection	✓
Logging Rate - samples per second	1 to 200
Logging Time - 28 Parameters + Diagnostics at 5/sec	38 minutes
Interpreter Software - Graphical Analysis	✓
Maximum parameters logged	64
Maximum logging throughput	10 kbytes/sec
DIAGNOSTICS	
Injectors Open Circuit, Short Circuit, Peak Current not reached	✓
Sensors Open and Short Circuit	✓
Ref/Sync noise warning and error diagnostics (noise, runt pulses and amplitude)	✓
Operating Errors: RPM Limit Exceeding, Injector Overduty, Over Boost, Low Battery, REF Error etc.	✓