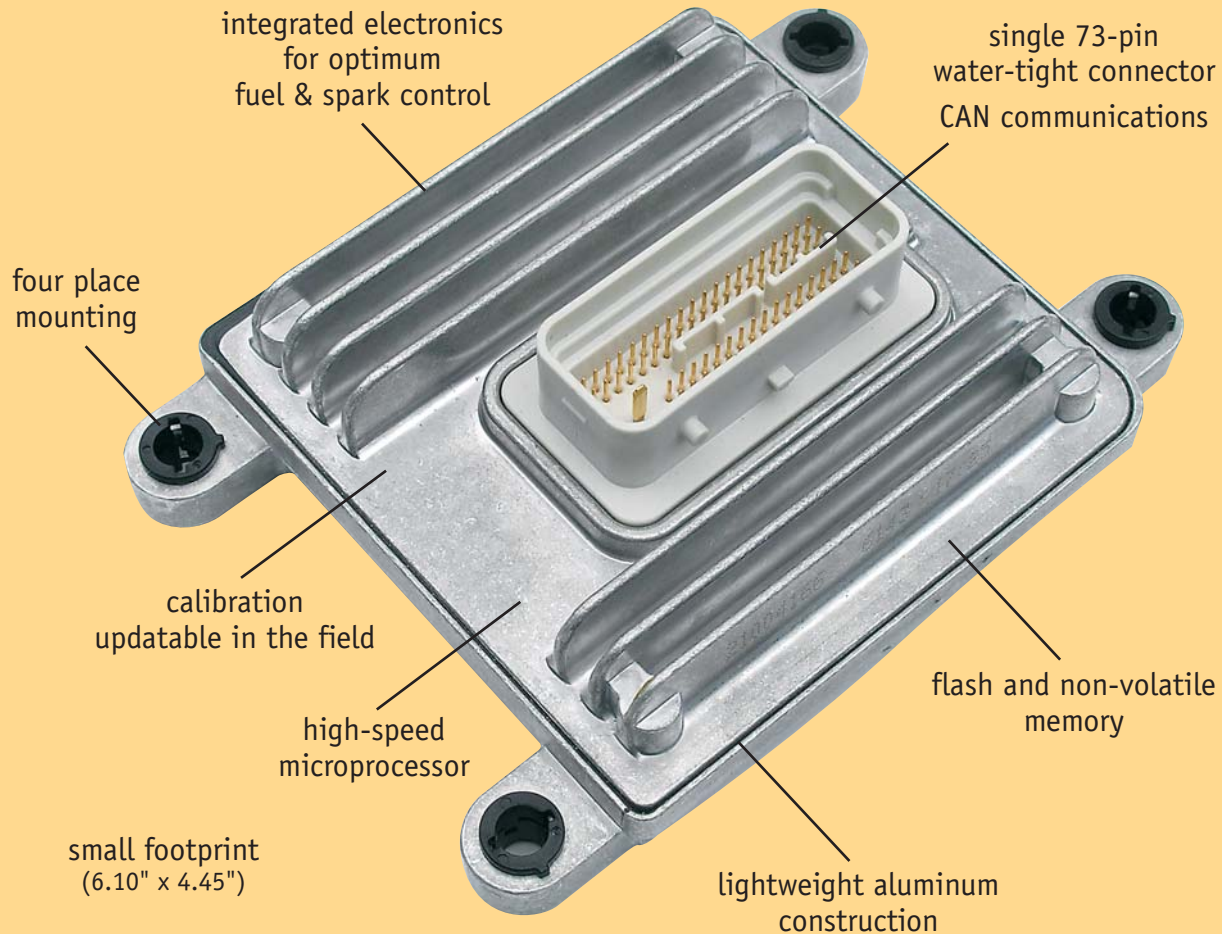


# V2-ECM™

## V-Twin Engine Control Module



## *2008 Emissions Requirement Solution*

**V2-ECM™** is a professional Engine Control Module (ECM) that enables engines to operate more efficiently, reliably and economically. Meet the 2008 EPA/CARB emissions requirements with this low cost and durable module. Designed to withstand the grueling motorcycle environment, the **V2-ECM™** optimizes engine performance by measuring multiple instantaneous events to enable real-time adjustment

of fuel and spark. Its up-integrated design reduces size and wiring, and flash programming provides on-motorcycle calibration update capability. Electronic fuel injection uses sophisticated microprocessor technology to precisely meter the optimum quality of fuel for every situation. The result is low emissions, smooth idling, responsive performance, reduced maintenance and instant starts.

# V2-ECM™

## V-Twin Engine Control Module

### Features

- **Fuel Control** – V2-ECM™ utilizes a true speed density algorithm that reads RPM, engine load and temperature, as well as altitude and boost for precision fuel control. Accel and decel fuel is calculated dynamically to determine the correct quantity of fuel required during transitions. Injector Base Pulse Width (BPW) correction factor is applied continuously based on battery voltage.
- **Load Determination** – Synchronous MAP reads based on crank position and time.
- **Closed Loop** – Fuel control is continuously adjusted by single or dual O<sub>2</sub> sensors which provide feedback for the front and rear fuel trim, allowing for low emissions and optimum catalytic converter performance (if required).
- **Fuel Trim Values** – Short and long term fuel trim stored in non-volatile memory.
- **Optimal Spark Control** – Based on RPM and engine load, the program computes a spark angle. Sophisticated correction factors, such as engine coolant temperature, manifold air temperature, altitude, and boost are then applied. In addition to providing the optimal timing, the controller provides the optimal coil charging time. Ignition voltage, engine speed, and temperature are considered when computing the dwell time that will allow the coil to provide the hottest spark possible.
- **Temperature Compensation** – Continually adjusts spark timing to keep engine within safe, efficient limits.
- **Altitude Compensation** – Changes in altitude result in automatic adjustments to fuel & spark timing.
- **Idle Stabilization** – At idle a microprocessor algorithm constantly adjusts spark timing for smooth idling.
- **Automatic Dwell Control** – If the battery or alternator are providing weak voltage, the system automatically compensates by charging the coil longer, which increases the voltage sent to the spark plug.
- **RPM Limitation** – The controller supports a RPM limiting based on various parameters including the capability of controlling maximum engine speed and vehicle speed to variable thresholds.
- **Bank/Cylinder Select** – Determined by crank angle and MAP during crank.
- **Boosted Applications** – Fuel and spark control for 2-Bar turbocharged or supercharged engine.
- **Coil-Near-Plug Capability** – Coil-near-plug ignition system for more accurate ignition timing and better spark.
- **Crank Wheel** – Select in calibration for 32-2 or 24-2 pulses per revolution.
- **RPM Range** – Maximum engine speed 9,000 RPM.
- **Tachometer Output** – Digital output for engine speed.
- **CAN Interface Capability** – Controller Area Network (CAN) serial data interface protocol.
- **Dual Wide-Band** – Inputs (0-5v) for two wide range UEGO based analyzers for calibration purposes.
- **Cylinder Selection** – 1 or 2-cylinder selection by calibration within the same controller.
- **Electronic Fan Control**

### Dynamic Calibration Functions

- **Accel Fuel Enrichment** – based on delta TPS and delta Map
- **Decel Fuel Enleanment** – enabled by delta TPS and delta Map
- **Power Enrichment** – fuel enabled by TPS set point
- **Air Fuel Ratio Control** – Open loop A/F table based on engine temperature, load, RPM

### Benefits

- **Versatile** - Calibration can be optimized for many engine displacements and configurations to meet specific customer requirements - works on most models.
- **Greater Performance** - Increased fuel economy, smooth acceleration, enhanced cold weather start-ups and extended engine life.
- **EPA and CARB Compliance** - lower emissions with proper calibration.
- **Onboard Diagnostics** – OBD-I type diagnostics reduce repair time.
- **Self-Diagnostics** – Service technicians can read diagnostic codes to determine failed component for quick and accurate system servicing.
- **Reprogrammable Calibration** – Quickly recalibrate the system in the field, using a laptop PC.
- **Engine Load Compensation** – Sophisticated programming continually adjusts fuel injection & spark timing to compensate for changes in engine load.
- **Spark Optimization** – More power, more torque, stable idle speed, less emissions, and longer engine life.
- **Fuel Optimization** – Reduce fuel costs and gain power, torque, fewer emissions, and extend engine life.
- **Fuel Economy** – Closed loop control allows for reduced fuel consumption with reduced emissions.
- **Safety Function** – Tip over sensor input for engine kill.
- **Quality Throughout** – Design, construction and firmware by a trusted high-volume OEM for long service life, with professional optimized calibration by Powertrain Electronics for lowest emissions.

### V2-ECM™ Specifications

16-bit microprocessor with 256 KB flash memory enables high-speed processing and in-vehicle memory updates  
2 fuel injector outputs  
2 high-current coil drivers (IGBT5)  
155 x 113 mm (6.10 x 4.45 in) footprint allows mounting flexibility  
Single 73-pin connector

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