

Delphi Multec[®] High Function Engine Management Systems

Delphi High Function Engine Management Systems are cost-effective families of systems that provide a complete, easy-to-manage package and allow vehicle manufacturers to tailor content as desired. Delphi can provide all necessary algorithms, calibration services, as well as the required components and full on-board diagnostics.

The systems are designed to help vehicle manufacturers meet current and even more stringent future vehicle emission standards around the world including Euro IV, Euro V and Euro VI, and U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) standards such as Tier 2, LEV, ULEV II, SULEV and PZEV.

They offer features such as active valve train components and gasoline/electric hybrid capabilities to help vehicle manufacturers meet fuel economy standards such as U.S. Corporate Average Fuel Economy (CAFE) and greenhouse gas emissions requirements, such as European Automobile Manufacturers Association (ACEA) CO₂ fleet average.

Delphi's Multec High Function Engine Management Systems also provide features that can assist vehicle manufacturers meet consumer demands for improved power and torque. Additionally, they can support flexible fuel applications including ethanol and compressed natural gas, which are important considerations for many markets.

► Benefits

- System components are optimized to provide the vehicle manufacturer with the required performance objectives within a cost-effective, complete package.
- Delphi can calibrate the manufacturer's software or create software for the manufacturer.
- Delphi provides a single point of contact for the program so it is easy for the manufacturer to manage and execute.
- Delphi's experienced and knowledgeable local teams with systems development, calibration, and validation capabilities can provide fast response and fast time-to-market. A complete engine management system can, in many cases, be delivered in less than 12 months.
- Scalable systems allow the manufacturer to use the same base engine and system to meet multiple local and export market requirements, including Europe and North America.

► Typical Applications

Delphi High Function Engine Management Systems are designed to support most multi-port fuel injection (MPFI) 3-, 4-, 5-, 6- and 8-cylinder gasoline engine programs. They can also support alternate fuel requirements, such as ethanol and compressed natural gas.



Delphi's High Function Engine Management Systems provide manufacturers with a complete, easy-to-manage package tailored to customer requirements.

► **Delphi High Function Engine Management System Applications and Features Summary**

Applications	Delphi High Function EMS
Engine	3, 4, 5, 6, or 8 cylinders
Fuel Type	Gasoline Ethanol blends such as E85 and E0-E100 (with or without gasoline subtank) Compressed natural gas (CNG)
Emissions Standards Support Capabilities	Euro IV, V and VI U.S. LEV II, U.S. ULEV II, U.S. SULEV and U.S. PZEVV Other standards also supported
Diagnostics	EOBD and OBD II (CAN and KW2000)
Features and Content	
Electronic Control Unit (ECU)	Delphi MT 80/90 families Injector Driver Module (IDM) available in conjunction with MT80 family GDi application as a cost-effective alternative for platforms with low GDi penetration
Microprocessor	32 bit
Torque Based Control	Included
Fuel Injection	Port fuel injection — Multec® 3.5 Port Fuel Injector Ethanol — Multec® Heated Tip Port Fuel Injector CNG injection — optional
Ignition System	Coil per plug High energy option Ion sensing option Multi-charge option
Throttle Control	Electronic (non-contacting sensor)
Exhaust Gas Recirculation (EGR) Valve	Available
Cam Phasing	Dual independent intake and exhaust
Discrete Valve Lift Control	Cylinder deactivation option Two-step valve lift option
Continuously Variable Valve Lift	Available for development
Knock Control	Electronic vibration based with enhanced digital signal processing
Turbo Charging Control	Mechanical and electronic wastegate control
Active Intake Tuning Control	Intake runner, plenum, and/or mixture motion control Also available as part of the Delphi Integrated Air/Fuel Module
Engine Temperature Control	Available
Hybrid Control	Interface to Delphi power electronics and inverter (available)
Generator Control	Available
Starter Motor Control	Available
Transmission Control	Via Controller Area Network (CAN) to transmission control electronics Integrated into the ECU (available)
Digital Engine Speed and Position Sensor	Crank and up to four cams (true power on optional)
Switching Oxygen Sensor	Engine out and post-converter, one per bank
Wide Range Oxygen Sensor	Option for one per bank
Air Meter	Modular or probe configurations available for flexible packaging options
Purge Control Actuator	Available
Fuel Vapor Pressure Sensor	Available for U.S. OBD II
Manifold Absolute Pressure/Manifold Air Temperature (MAP/MAT) Sensor	Available for flex fuel applications

► **Performance Advantages**

Delphi's High Function Engine Management Systems provide an easy and convenient way to implement a complete system. They offer features that can help vehicle manufacturers improve fuel economy, enhance engine performance, and meet targeted emissions standards. Delphi's unique understanding of the complete system and our full range of major component development capabilities contribute to superior component design and cost-effective systems. Delphi provides in-depth knowledge of regional market requirements — especially for North America and Europe — to help vehicle manufacturers with new product launches almost anywhere in the world.

► **The Delphi Advantage**

Delphi has a long history of supplying gasoline engine management systems and components that have helped automotive manufacturers overcome market and regulatory challenges. Delphi provides unique systems-level knowledge and analysis capabilities. Delphi offers a complete engine management systems portfolio, including: valve train, ignition, fuel injection, air and fuel management, electronics, sensors and actuators, fuel handling and evaporative emissions systems.

As a global leader in engine management systems technology, Delphi can help manufacturers meet emissions requirements, improve fuel economy and enhance performance. Delphi is a source for high value solutions and our expertise is built into every product. Delphi's flexible engineering approach encourages collaboration. And, Delphi has a thorough understanding of automotive markets around the world and a global network of resources.

