

## Advanced Engine Management System ECM88Axxx

The ECM88Axxx engine management system meets the performance and reliability needs of converted diesel engines, as well as dedicated Gasoline, CNG, LPG and Hydrogen engines. It is the ideal single-system solution.

### Key Benefits

- Three systems in one - integrated fuel, ignition and vehicle speed control
- Best fuel economy and range with Deceleration Fuel Cut-Off (DFCO) - stops fuel flow during gear shifting, coasting and braking
- Maximum power, torque and fuel economy through optimized ignition and fuel control
- OEM quality
- Versatile fleet analysis software monitors operation of your fleet
- Professional, experienced turnkey support
- Euro VI emissions standard capable
- On-Board Diagnostics (OBD)
- CAN Capable (J1939)
- Gasoline, CNG, LPG or Hydrogen options
- 4, 6, 8, 10, 12 and 16 cylinder configurations
- 12 or 24 Volt systems
- Weatherproof control module and wiring
- Ideal for buses/trucks/gensets and marine



### Key Features

- Electronic Throttle (Drive-by-Wire)
- Lean-burn Control
- Knock Sensing

### Additional Features

- Programmable by authorized technicians
- Coil per cylinder, inductive non-wasted spark ignition
- Active spark diagnostics with protective response logic
- Vehicle speed limiting capability
- Self-learning continually optimizes air/fuel ratio for BEST fuel economy and power



## Advanced Engine Management System ECM88A

	Features & Specifications		Typical Function & Comments
<b>Processor</b>	MC9S12X-series Motorola Processor	16bit @ 40 MHz	
	Flash Memory	512 kB	<ul style="list-style-type: none"> <li>main code storage</li> </ul>
	RAM	32 kB	<ul style="list-style-type: none"> <li>temporary data storage</li> </ul>
	EEPROM	4 kB	<ul style="list-style-type: none"> <li>Operational data and trouble code storage</li> </ul>
<b>Power, Environmental &amp; Physical</b>	<b>Operating Voltage</b>		
	Nominal Operating Voltage	12 or 24 VDC, auto-sensing	
	Maximum Continuous / Short-term Voltage	32 VDC / - 40 VDC	
	<b>Electrical Protection</b>		
	Spike Protection	6600 W	<ul style="list-style-type: none"> <li>5 x SAE standard</li> </ul>
	Reverse Polarity Protection	Internally protected to -30V	<ul style="list-style-type: none"> <li>applies if power and ground wires are swapped</li> </ul>
	<b>Internal Power Supplies</b>		
	1 x 5 V, 800 mA regulated supply		<ul style="list-style-type: none"> <li>Internal ECM usage only</li> </ul>
	3 x 5 V, 34 mA regulated sensor supplies		<ul style="list-style-type: none"> <li>sensor supplies are independent of each other</li> </ul>
	<b>Environmental</b>		
	Rated ambient temperature	-40 - +121 °C	<ul style="list-style-type: none"> <li>max internal temp - lower recommended</li> </ul>
Enclosure	cast Aluminum	<ul style="list-style-type: none"> <li>water, chemical and RFI-resistant</li> </ul>	
Connectors	52 pin+28 pin sealed camlock	<ul style="list-style-type: none"> <li>includes 4 high current pins</li> </ul>	
<b>Physical</b>			
Mass with enclosure	~ 1000 grams		
Dimensions (L x W x H)	~ 185 mm x 166 mm x 37 mm		
<b>Inputs</b>		<b>Analog</b>	
	4	Inputs with pulldowns	<ul style="list-style-type: none"> <li>pressure sensors</li> </ul>
	8	Inputs with pulldowns	<ul style="list-style-type: none"> <li>position, other sensors</li> </ul>
	4	Dual-scale resistor pullup	<ul style="list-style-type: none"> <li>coolant &amp; air temp, exhaust temp, fuel temp</li> </ul>
		<b>High-Speed Digital (Timer)</b>	
	2	Variable reluctance with pulldowns	<ul style="list-style-type: none"> <li>crankshaft, camshaft position</li> </ul>
	3	Digital or Hall-effect with pulldowns	<ul style="list-style-type: none"> <li>crankshaft, camshaft position or vehicle speed</li> </ul>
		<b>Standard Digital</b>	
	6	Standard digital input	<ul style="list-style-type: none"> <li>switches and slow-speed digital devices</li> </ul>
		<b>Specialized</b>	
2	Knock sensor inputs		
1	Universal Exhaust Gas Oxygen (UEGO) Sensor input	<ul style="list-style-type: none"> <li>lean-burn lambda control, some <math>\lambda=1</math></li> </ul>	
1	Stoichiometric oxygen sensor input (2 sensors if UEGO not used)	<ul style="list-style-type: none"> <li><math>\lambda=1</math> control, multi-bank, pre &amp; post-catalyst</li> </ul>	
<b>Outputs</b>		<b>Digital</b>	
	2	5 A PWM output drivers	<ul style="list-style-type: none"> <li>O2 sensor heaters</li> </ul>
	5	1 A PWM output drivers	<ul style="list-style-type: none"> <li>Solenoids, indicator lights, relays</li> </ul>
	4	1 A standard output drivers	<ul style="list-style-type: none"> <li></li> </ul>
	1	Tachometer output (low current)	<ul style="list-style-type: none"> <li>One pulse per cylinder</li> </ul>
	8	Ignition coil IGBT outputs with hardware overcurrent protection, dwell time limiting, avalanche, short circuit and low coil current protection	<ul style="list-style-type: none"> <li>Distributorless ignition</li> </ul>
	8	Peak-and-hold PWM injector drivers: configurable peak and hold current setpoint and duration, also can be used for saturated injectors	<ul style="list-style-type: none"> <li>all common injector styles are software programmable with diagnostic monitoring</li> </ul>
	1	Drive-By-Wire 7 A peak H-bridge driver	<ul style="list-style-type: none"> <li>electronic throttle control</li> </ul>
1	Stepper motor 1 A Dual H-bridge driver	<ul style="list-style-type: none"> <li>idle air control, feedback carbureted control (fuel restriction or air-bleed)</li> </ul>	
<b>Comm</b>	1	Controller Area Network (CAN) data bus channels J1939	<ul style="list-style-type: none"> <li>industry standard for communication with peripherals and other control modules</li> </ul>
	1	ISO 14230 K-Line serial	<ul style="list-style-type: none"> <li>ISO-standard diagnostic tool protocol</li> </ul>