



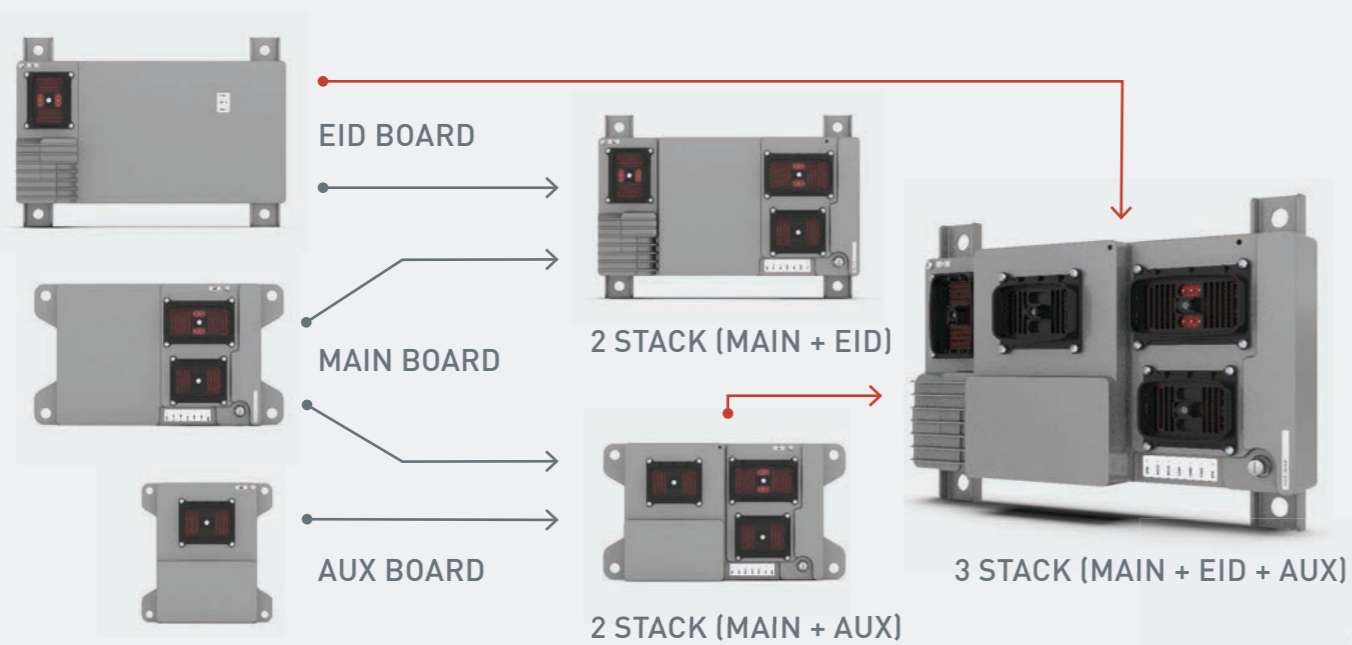
# LECM

LARGE ENGINE CONTROL MODULES  
FOR IMPROVED ENGINE PERFORMANCE

# LECM

## LARGE ENGINE CONTROL MODULE

The LECM provides a single, engine-mounted module that can be used to control all aspects of the engine's operation. These include speed and load control, air/fuel ratio control, ignition or injector control, misfire and knock detection, air/gas/exhaust flow control, the engine's start and stop routines, all the monitoring and engine-protection-related alarms associated with each function, as well as on-board data logging and communications.



The LECM provides a single-box approach that can be built up with interlocking modules into a single engine-mountable assembly.

- Each module can be used as a stand-alone controller or mixed and matched as stacked configurations to address specific application needs.
- Each module has its own microprocessor running its own program with shared information between modules so that all the modules play together as a seamless system.
- Marine-certified; available with application software for turnkey solutions and as an open platform.

## PRODUCT VARIANTS



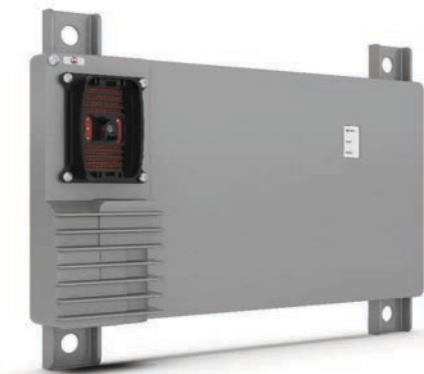
### MAIN: ENGINE CONTROL UNIT

The LECM Main module offers an advanced hardware architecture with a powerful processor and extensive I/O and Ethernet to support the evolving needs of OEMs. Ethernet can be used for a service interface, an HMI/PLC interface using Modbus TCP/IP, for remote diagnostic emails, and for an IIOT interface to a local gateway.



### AUX: COMBUSTION CONTROL

24-channel analog inputs can be configured as knock, pressure or thermocouple input. The Aux hardware supports FFT-based knock detection, advanced knock: pressure sensor assist for knock calibration, in-cylinder pressure-based, real-time combustion diagnostics & control (RT-CDC) and thermocouple monitoring.



### EID (ELECTRONIC IGNITION/ INJECTION DRIVER) MODULE

One 20-channel module to drive any combination of injector (main chamber, pre chamber, micro-pilot & common rail) and ignition. Programmable current profile offers the ability to meet any desired energy delivery.

- Ignition: Spark plug wear estimation (plug life indicator)
- SOGAV injection driver: Valve open time and valve close time detection
- Common rail: Multi-shot injection offers static and dynamic fuel trimming

THIS SINGLE-MODULE APPROACH LOWERS HARDWARE, WIRING AND TROUBLE-SHOOTING COSTS, WHILE REDUCING DEVELOPMENT AND INSTALLATION TIME.



# LECM APPLICATIONS, SYSTEMS AND OPEN PLATFORM

## LECM APPLICATIONS AND SYSTEMS

The LECM manages and controls reciprocating engines used in power generation, marine propulsion, locomotive and industrial engine, and process markets. The hardware can be purchased with fully validated application software for gas, diesel, or dual fuel engines.

### Data Logging and Connectivity:

- The LECM is not only built to satisfy the requirements driven by advancements in combustion technology, but also to meet the requirements in the age of Industrial Internet of Things (IIOT).

## LECM AS OPEN PLATFORM

The LECM supports a model-based design that enables rapid application development time, improves agility, and enhances validation and verification. The software also allows control system designers to insert their own market-differentiating control algorithms; thereby helping OEMs retain their core intellectual property.

### Key Features:

- Consolidates all engine control functions into one module
- Engine-mounted
- Marine-certified
- Single service tool used for all engine functions
- Ability to add exclusive control algorithms

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