



The Link ElectroSystems **LEM^{G3}** is an advanced fully adjustable standalone wire-in engine management system. The LEM^{G3} provides precision control of fueling, ignition, boost and most other control systems found on modern engines. Engines from 2 to 12 cylinders, rotary, turbocharged, supercharged and naturally aspirated can be controlled using the LEM^{G3}.

The **LEM^{G3}** is the next generation of the successful LEM ECU. The original LEM ECU evolved over the last 10 years to become one of the most widely used entry level ECU's. With the new G3 version comes not only new hardware but a complete new software platform. This new design retains ease of installation as with the original, but now allows a level of tuneability only available in high end aftermarket ECU's.

Most significant improvements over the original LEM:

- G3 Software Platform:
 - In field upgradeable – free software updates can be downloaded and installed without even removing the ECU.
 - High Resolution Tuning – Up to 440 zone fuel and ignition tables with user definable load and RPM centres.
 - Air Temperature and Barometric Pressure Compensation.
 - Up to 4D Fuel and Ignition Mapping
 - Use PCLink V3.xx – Has advanced time saving tuning features
- Digital Trigger Decoding – No more sub-boards, select your trigger setup in PCLink
- Fully optioned idle control – Use a two/three terminal solenoid or four/six terminal stepper motor.
- Four Ignition Drives – Run up to four individual coils (allows up to 8 cylinder wasted spark).
- On board USB – No need to purchase a special tuning adapter.
- Auxiliary Outputs – Up to 11 user configurable auxiliary outputs.



To ensure precision control, the **LEM^{G3}** runs one of the fastest microprocessors used in after market engine management. This ensures fueling and ignition can be controlled with unprecedented precision while leaving ample time left for other features.

As well as being a fully featured engine management system, the **LEM^{G3}** also boasts (at no extra cost):

- Real Time Programmable – Tuning adjustments are effective immediately under all conditions.
- On Board Data Logging – 32 M bits of on board flash memory
- Boost Control – 3D open and closed loop boost control
- Idle Control – Open and closed loop idle control
- Motorsport Features – Antilag, Launch Control and Flat Shifting
- Dual Fuel, Ignition and Boost Tables – Can be switched together or independently
- Closed loop lambda control

No longer is wiring of the ECU's inputs and outputs constrained. The **LEM^{G3}**'s configurable input and output channels allow the installer / tuner to decide what will be connected to each input / output. In fact even unused ignition and injection channels can be used as additional configurable outputs. Output channels can be configured as:

- Idle Speed Control (Solenoid or Stepper)
- Fuel Pump
- Fuel Pump Speed Control
- Engine Fan
- Air Con Clutch
- Air Con Fan
- Intercooler Spray
- Tacho
- Check Engine Light
- Purge Solenoid

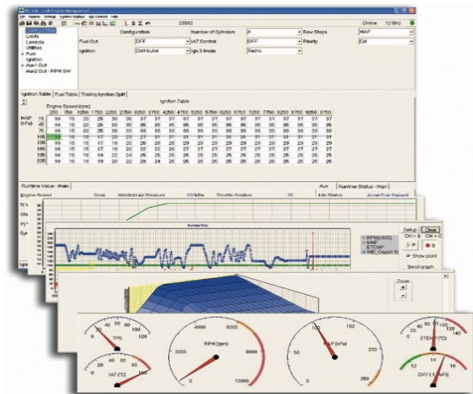
And where a pre-configured output type is not suitable, each output can be configured as a 'General Purpose' (GP) output. General Purpose outputs can be:

- Pulse Width Modulated (PWM) based on a 3D table
- Switched based on up to three logical conditions. Combine RPM, Manifold Absolute Pressure, Throttle Position, Intake Air Temp, Percent Fuel flow, Engine Coolant Temperature, Gear Position or Digital Input State. Your imagination is the limit!

An example is the configuration of a GP output to disable NOS injection in third gear only, but only if the boost is over 10 psi.

All Link ECU's are configured and tuned using our highly regarded tuning package PCLink. PCLink allows real time adjustment, viewing and logging of all ECU parameters. ECU configurations can be saved to the PC for later reference. PCLink is available for FREE download from www.LinkECU.com. As well as being a complete tuning package for the LEM^{G3}, PCLink offers the following time saving tuning features:

- Online Help – One click for help on any ECU function.
- Improved Map/Table Editing Functions – Advanced editing functions for fast adjustment of high resolution fuel and ignition tables.
- Import/Export Tuning Values – Various values can be imported and exported from one ECU to another without affecting other tuning values (e.g. export a fuel map only to another Link ECU).



Unlike other after market ECU's, the **LEM^{G3}** connects directly to the PC using a high speed USB port and commonly available USB cable. There is no need to purchase additional tuning cables or adapters.

For further inquiries or a list of Link Dealers visit www.LinkECU.com

For technical inquiries contact tech@LinkECU.com

LEM^{G3} Technical Specifications

Engine Configurations:

- 2-12 Cylinder Distributed
- 2-8 Cylinder Wasted Spark
- 2-4 Cylinder Direct Spark
- 1-2 Rotor
- User Configurable Firing Order

Fueling Adjustments:

- Up to 440 Zone Fuel Table with configurable load and RPM centres. MGP, MAP and load options.
- Dual Fuel Tables
- Up to 4D Fuel Mapping
- Injection Rate
- Master Enrichment
- Pre Crank Prime
- Crank Enrichment
- Post Start Enrichment
- Warm Up Enrichment
- Acceleration Enrichment
- IAT Fuel Correction
- Injector Deadtime
- Overrun Fuel Cut
- Idle Load Trims
- Fuel Temperature Correction

Ignition Adjustments:

- Crank Dwell Extension
- Maximum Advance
- Spark Duration
- Dwell Time
- Up to 440 Zone Ignition Table with configurable load and RPM centres. MGP, MAP and TPS load options.
- Dual Ignition Tables
- Up to 4D Ignition Mapping
- Individual Cylinder Ignition Trim
- IAT Trim
- ECT Trim

Limits:

- Engine Temperature Dependent Soft and Hard RPM Limit
- Engine Temperature Dependent Soft and Hard Boost Limit
- Vehicle Speed Limit
- System Voltage Limit

Triggering:

- Digital Trigger Decoding
- Choose from configurable trigger patterns or preset triggering options.

MotorSport Features:

- Antilag (Group N and Group A modes)
- Launch/Traction Control
- Flat Shifting

Auxiliary Output Options:

- General Purpose Output
- General Purpose PWM
- Idle Speed Control (Solenoid or Stepper)
- Fuel Pump
- Fuel Pump Speed Control
- Engine Fan
- Air Con Clutch
- Air Con Fan
- Intercooler Spray
- Tacho
- Check Engine Light
- Purge Solenoid

Processing:

- 40 MHz Specialised Automotive Microprocessor
- Ignition control to 0.1 degree, fuel to 0.01 ms
- 32 Bit Calculation
- 10 Bit ADC Resolution
- Max 20000 RPM

Inputs/Outputs

- 2 High Current Injector Drives
- 4 Ignition Channels
- 8 Auxiliary Outputs
- 1 Digital Input
- +5V Out
- +8V Out
- 2 Temperature Inputs
- 2 0-5V Analog Inputs
- 2 Trigger Signal Inputs (Reluctor, Optical or Hall Sensors)
- Internal MAP Sensor (2.5 Bar Absolute)

Communications:

- On Board USB (Tuning Port)
- Serial
- CAN Bus

Analog Inputs:

- Wideband O2 (from external controller)
- Boost Adjust Signal
- Voltage (0-5V)
- Pyro (from external controller)
- General Purpose Pressure

Boost Control:

- Open or Closed Loop
- Engine Temp Correction
- IAT Correction
- Dual Boost Tables

Idle Control:

- Open or Closed Loop
- Solenoid or Stepper Motor ISC Valve
- Aircon, Engine Fan or Power Steer idle up

Temperature Inputs:

- Custom or preset temperature sensors (IAT, ECT, Fuel Temp. or General Purpose Temp.)

Physical:

- Length :
- Width :
- Height :
- Weight :
- Connector : 26 Pin Automotive

Package Contents:

- LEM^{G3} ECU
- 2 Metre Wiring Harness
- Mounting Brackets and Screws
- Wiring and Installation Instructions
- PCLink Tuning Software and USB Drivers

Additional Accessories (Purchased Separately):

- Intake Air Temperature Sensor
- Throttle Position Sensor
- 1,2 or 3 Channel Link Igniter
- Wideband O2 Controller
- Injector Ballast Resistor Packs

For further inquiries or a list of Link Dealers visit www.LinkECU.com

For technical inquiries contact tech@LinkECU.com